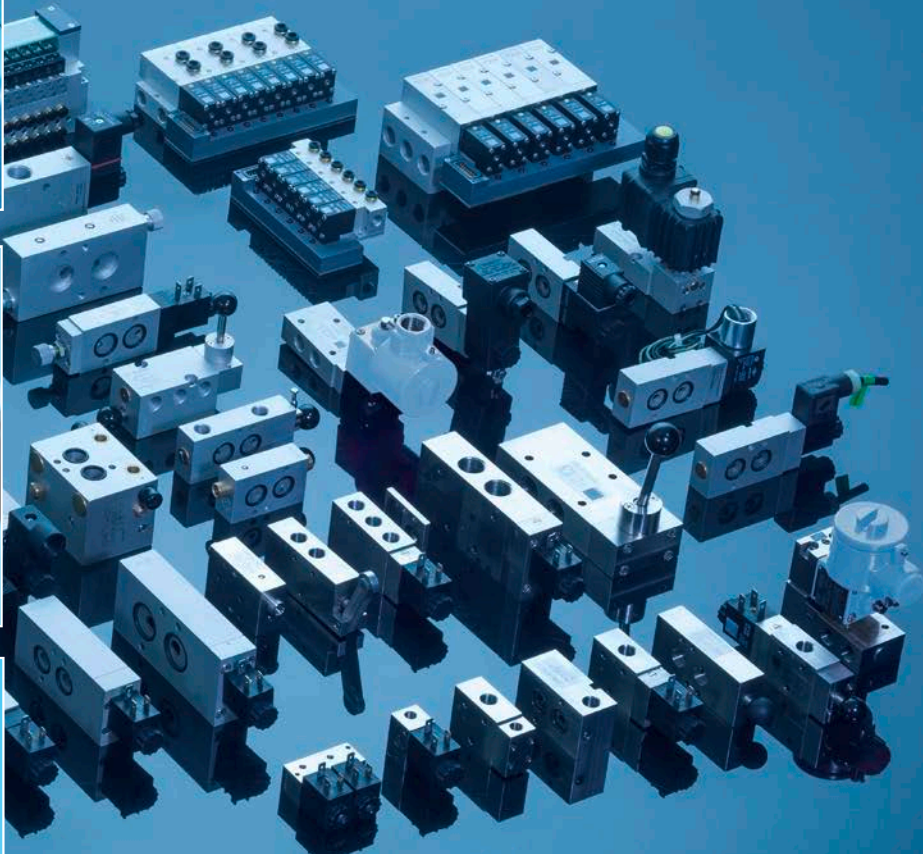
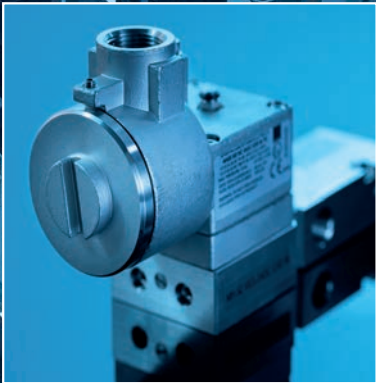


# Valves 2023



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Excellence in Pneumatics

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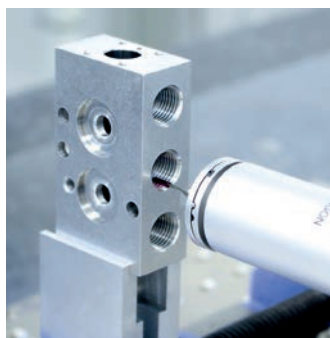
# More than 30 Years of Excellence in Pneumatics

The HAFNER team has been accompanying its partners in automation technology for over 30 years.

In the past three decades the company has developed from a simple workshop to a medium-sized company. Starting with clamping elements and profiles for automation technology, the focus of everything we do has been on pneumatic valves since 1993.



We produce our valves nowadays on a total manufacturing area of over **2,000 m<sup>2</sup>**. The founding team of 4 has meanwhile grown to over **100 employees**. In addition to the factory in Hungary, our German export office serves our partners in over 50 countries around the world. We owe this growth to our customers and our team and we are very proud of what we have achieved together.



Then as now, our team of pneumatics enthusiasts develop customized valves according to your requirements. And it doesn't always have to be a large quantity. Our modular product range allows maximum flexibility even for small and medium quantities.

Fast product developments and delivery times are particularly important to us so that your projects can be implemented quickly and downtimes can be kept short.

Low failure rates, a long service life and everything 100 % Made in Europe.

This is what distinguishes our valves today and also in the future!



# Product-Catalogue 2023

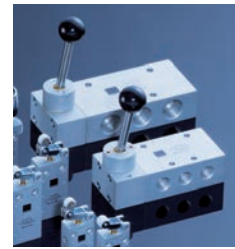
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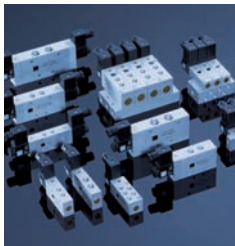
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Chapter 2.2



Lever Actuated Valves  
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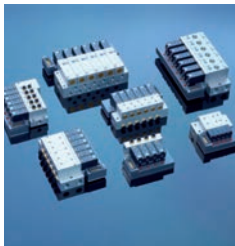
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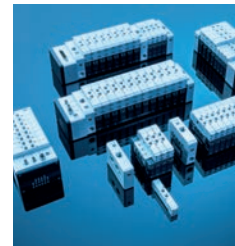
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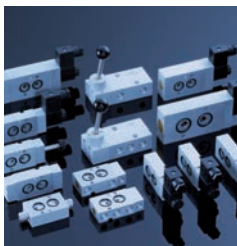
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M5

M5

pif 4 mm

G 1/8"

G 1/8" - G 1/4"

G 1/8" - G 1/4"

ports on bottom

panel mounting

heavy duty

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26 2.1.2.1 BV/BR/BL 511 201

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M5

G 1/8"

G 1/8" - G 1/4"

heavy duty

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40 2.2.11 BHP 520 442/462



M5

pif 4 mm - G 1/8"

M5 - G 1/8"

G 1/8"

G 1/8"

G 1/8" - G 1/4"

G 1/8" - G 1/4"

pif 4 - 6 mm

pif 4 - 6 mm

3/2 way

5/2 way

3 positions

pneumo-electric switch

3/2 way, push-pull

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G 1/8" - G 1/4"

1/4" NPT

G 3/8" - G 1/2" - G 3/4"

spring return

indexed

spring return/indexed

spring return

indexed

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G 1/8" - G 1/4"

1/4" NPT

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spring return

indexed

spring return/indexed

spring return

indexed





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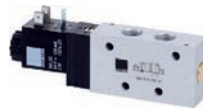
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78	2.5.1.1.3	MH 311 209	G 1/4" 3/2 way direct
79	2.5.1.1.4	MH 311 305/MOH 311 305 MH 311 309/MOH 311 309 MH 211 305/MH 211 309	G 1/8" 3/2 way direct G 1/4" 3/2 way direct G 1/8" - G 1/4" 2/2 way direct
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82	2.5.1.1.7	MH 311 313/MH 311 317	G 1/8" - G 1/4" 3/2 way banjo alu
83	2.5.1.1.8	MD 310 401/MOD 310 401 MD 310 461/MOD 310 461	G 1/8" single solenoid pif 6 mm single solenoid
84	2.5.1.1.9	MH 210 501/MH 210 701	G 1/8" - G 1/4" 2/2 way single solenoid
85	2.5.1.1.10	MH 310 501 G/MOH 310 501 G MH 310 701 G/MOH 310 701 G	G 1/8" single solenoid G 1/4" single solenoid
86	2.5.1.1.11	MH 310 101/MOH 310 101 MH 310 121/MOH 310 121 MH 310 181/MOH 310 181 MH 310 121 NPT/MOH 310 121 NPT	G 3/8" single solenoid G 1/2" single solenoid G 3/4" single solenoid 1/2" NPT single solenoid
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94	2.5.2.1.3	MH 510 101/MH 510 121/MH 510 181 MH 510 121 NPT	G 3/8" - G 1/2" - G 3/4" single solenoid 1/2" NPT single solenoid
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96	2.5.2.1.5	MH 520 501 G/MH 520 701 G MH 520 701 G NPT	G 1/8" - G 1/4" double solenoid 1/4" NPT double solenoid, dual
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		MD 520 404	all ports in the plate	double solenoid
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150	2.8.3.3	T_16 5__ 464	pif 6 mm all ports in plate
151	2.8.3.4	T_22 5__ 504/T_22 5__ 704	G 1/8" - G 1/4" all ports in plate
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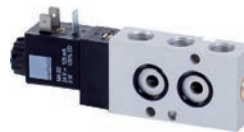


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# General Technical Information for HAFNER Valves

## Temperature range:

### Solenoid valves

MH, MNH with DC coils	-10°C ... +60°C
MH, MNH with AC coils	-10°C ... +50°C
TT series	-50°C ... +50°C
MD, MK	-10°C ... +50°C

### BV, BR, BL, BA

Series 201/301	-20°C ... +50°C
Series 501/701	-10°C ... +60°C
TT series	-50°C ... +50°C

### BG, BH, HV\_, P

Standard	-10°C ... +60°C
TT series 500/700	-50°C ... +50°C
TT series 121	-50°C ... +80°C

### DRN, DR, D, ES, VA

Standard	-10°C ... +50°C
TT series	-50°C ... +50°C

### UB, SENR

Standard	-10°C ... +50°C
TT series	-40°C ... +50°C

Several customer-specific items have been catered for an enlarged temperature range.

## Leakage rate at 6 bar pressure:

All (100 % of) the HAFNER valves leaving the factory are individually tested on function and leakage.

The following leakage rate is allowed and a valve is still rated as good with the following:

Port size	Valve series	Allowed leaked rate in cm <sup>3</sup> /min	
		Internal	External
M5 - G 1/4"	Direct acting	4	2
M5	201	4	2
M5	301	4	2
G 1/8"	401	4	2
G 1/8"	501	4	2
G 1/4"	701	6	3
G 1/4"	801	7	3,5
G 3/8"	101	11	5,5
G 1/2"	121	15	7,5
G 3/4"	181	30	15

### Low temperature valves of the "TT-series" below -40°C

G 1/8"	501 TT	10	5
G 1/4"	701 TT	15	5
G 1/2"	121 TT	25	5

standard materials used for HAFNER-valves	standard valves		stainless steel			low temperature		
	M5 - G1/8" - G1/4"	G3/8" - G1/2" - G3/4"	G1/4"		G1/2"	G1/4"	G1/2"	
			VES	KES				
valve body	anodised aluminum, 5 - 8 µm	anodised aluminum, 5 - 8 µm	stainless steel 1.4404	stainless steel 1.4404	stainless steel 1.4404	anodised aluminum, 5 - 8 µm	anodised aluminum, 5 - 8 µm	
pilot-head	body	PA 6.6 30% glass filled	anodised aluminum, 5 - 8 µm	stainless steel 1.4404	PA 6.6 30% glass filled	stainless steel 1.4404	anodised aluminum, 5 - 8 µm	anodised aluminum, 5 - 8 µm
	inner parts	brass NBR	brass NBR	stainless steel 1.4404 FPM	stainless steel 1.4404 FPM	stainless steel 1.4404 FPM	brass NBR	brass NBR
	operator	brass magnetic stainless steel FPM	brass magnetic stainless steel FPM	stainless steel 1.4305 magnetic stainless steel FPM	stainless steel 1.4305 magnetic stainless steel FPM	stainless steel 1.4305 magnetic stainless steel FPM	brass magnetic stainless steel NBR	brass magnetic stainless steel NBR
spool	stainless steel 1.4104	stainless steel 1.4104	stainless steel 1.4404	stainless steel 1.4404	stainless steel 1.4404	stainless steel 1.4104	stainless steel 1.4104	
sealing system	brass NBR	brass NBR	stainless steel 1.4404 PUR	stainless steel 1.4404 PUR	stainless steel 1.4404 FKM	brass PUR	brass PUR	
other inner parts	brass NBR POM	brass NBR POM	stainless steel 1.4404 FPM POM	stainless steel 1.4404 FPM POM	stainless steel 1.4404 FPM POM	brass NBR POM	brass NBR POM	

	BA-valves	HV-valves	BH-valves	BHP-valves
actuating elements	PA 6.6 30% glass filled	duroplast FP 31 P/PA	duroplast FP 31 P/PA	ABS-plastic

springs	stainless steel 1.4310
---------	------------------------

## General Warranty:

The general warranty is 12 months from delivery. Warranty expires when valves have been opened.

## Recommended signal length:

The recommended signal length to reach full flow is 50 msek.

## Voltage tolerance:

The general voltage tolerance of all solenoid systems is +/- 10%.

In accordance to CETOP position paper „PP07 Machine Directive 2006/42/EC“: Single valves placed on the market are not ... within the meaning of Annex V, point 4 of Machine Directive 2006/42/EC.

**The HAFNER company policy is one of a continuous improvement process.** We therefore reserve the right to amend, enhance and change specifications of the products presented in this document without notice.

## Operation and required air-quality:

The valves are designed for being used with cleaned and lubricated or cleaned and unlubricated compressed air.

Required Air-quality-level in accordance to ISO 8573-1:2010: 7 - 4 - 4 for particles - water - oil  
Please dimension the valves according to the required orifice size. Significant overdimensioning, equivalent to a significantly larger orifice size of the valve in relation to the air supply, can lead to switching problems and pressure drops.

## Lubrication:

Valves do not require any lubrication but lubrication in general increases the life-time of the products. Please avoid to lubricate the valves during a certain period of time and let them run dry later. For low-temperature-items: Do not lubricate as most kinds of oil and grease do not properly operate below - 25°C.



The HAFNER valve type numbering system consists of at least 3 blocks.

Block 4 to be used for voltage indication or special suffixes.

Please note: This overview is not intended to be exhaustive.

# 701

Block 3

# 24DC

Block 4

## Size & Position of Ports

### In-line valves:

	Orifice size	Ports	Position of Ports
201	2 mm	M5	Standard
202	2 mm	M5	On one side
243	2 mm	Pif 4 mm	Side of valve
301	3 mm	G 1/8"	Standard
302	3 mm	M5	On one side
341	3 mm	Pif 4 mm	Standard
401	4 mm	G 1/8"	Standard
461	4 mm	Pif 6 mm	Standard
442	4 mm	Pif 4 mm	On one side
462	4 mm	Pif 6 mm	On one side
501	5 mm	G 1/8"	Standard
502	5 mm	G 1/8"	On one side
701	7 mm	G 1/4"	Standard
711	7 mm	G 1/4"	Ports swapped (NAMUR valves only)
801	8 mm	G 1/4"	Standard
101	10 mm	G 3/8"	Standard
121	12 mm	G 1/2"	Standard
181	18 mm	G 3/4"	Standard

### Direct acting valves:

	Orifice size	Ports	Position of Ports
010	1 mm	M5	Standard
012	1,2 mm	M5	Standard
015	1,2 mm	G 1/8"	Standard
205	2 mm	G 1/8"	Standard
209	2 mm	G 1/4"	Standard
305	3 mm	G 1/8"	Standard
309	3 mm	G 1/4"	Standard
014	1,2 mm	G 1/8"	Banjo-screw (port 2)
019	1,2 mm	G 1/8" – pif 6 mm	Banjo-screw (port 2)
013	1,2 mm	G 1/8"	Banjo-screw (port 2)
017	1,2 mm	G 1/8" – G 1/4"	Banjo-screw (port 2)
313	3 mm	G 1/8"	Banjo-screw (port 2)
317	3 mm	G 1/8" – G 1/4"	Banjo-screw (port 2)

### Valves for manifold assembly:

	Orifice size	Ports	Position of Ports
105	1,2 mm	G 1/4" – G 1/8"	Modular system, direct acting
239	3 mm	G 1/4"	Modular system, direct acting
339	3 mm	G 1/4"	Modular system, direct acting
304	3 mm	Flange for manifold	All on one side
503	5 mm	G 1/8"	
		Flange for manifold	1,3,5 on one side as flange
504	5 mm	Flange for manifold	All on one side
703	7 mm	G 1/8"	
		Flange for manifold	1,3,5 on one side as flange
704	7 mm	Flange for manifold	All on one side
104	10 mm	Flange for manifold	All on one side

## Suffixes

Block 4 is to be used to indicate the voltage at solenoid valves or to give further information on special executions.

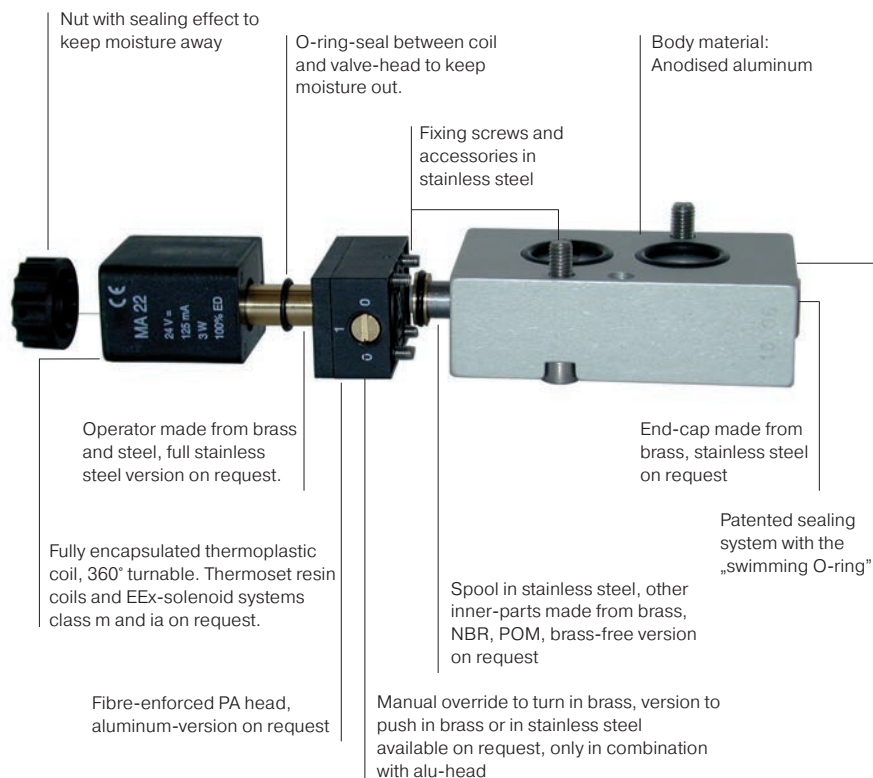
Block 4 can consist of several suffixes.

Voltages	6VDC, 12VDC, 24VDC, 48DC, 24AC, 110AC, 230AC
O.S.	without coil
NPT	NPT threads
TT	Low temperature
HT	High temperature
VES	Full stainless steel
KES	Stainless steel with PA pilot-head
G	Valves can be used in-line and also on manifold plates
Ex	ATEX-approved non-electrical valve
Ex ia	ATEX-approved for Ex ia coils
Ex m	ATEX-approved for Ex m coils
Ex ec	ATEX-approved for Ex ec coils
Ex e mb	ATEX-approved for Ex e mb coils
Ex dm	ATEX-approved for Ex dm coils
Ex d	ATEX-approved for Ex d coils
EDS	Brass-free to the outside
BMF	Entirely brass-free
EMT	Ematal-version

**Please note: Valves type "G" (e.g. 701 G) can be used as an in-line valve as well as for manifold assembly.**



Besides maximum flow of 1.250 NI/min at compact design there are 11 more competitive advantages of the HAFNER valve series 701.



Different customers have demand for different manual overrides. HAFNER offers a standard but on demand variations are an option.



**Series MH**

Manual override to turn by screw driver:

- Direct acting valves
- 22+ mm wide valves (by default)



**Series MD**

Manual override to push, momentary:

- Direct acting valves
- 16 mm wide valves (by default)
- 22+ mm wide valves



**Series MF**

Manual override to turn by hand:

- Direct acting valves
- 22+ mm wide valves



**Series MHF**

Manual override to turn by hand and recess for screw-driver use:

- Direct acting valves
- 22+ mm wide valves



16 mm

**Series MHD**

Manual override to push plus detent position by turning:

- Direct acting valves
- 16 mm wide valves
- 22+ mm wide valves



**M-Version**

Without manual override:

- An option for all 22 mm + wide valves

22+ mm

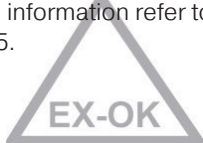






## Mechanically Actuated Valves

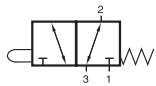
Selected models can be used in explosion hazardous environment. For detailed information refer to chapter 2.15.



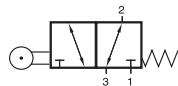
Selected models are available for low temperature application. For detailed information refer to chapter 2.12.



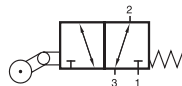
# BV/BR/BL 311 201



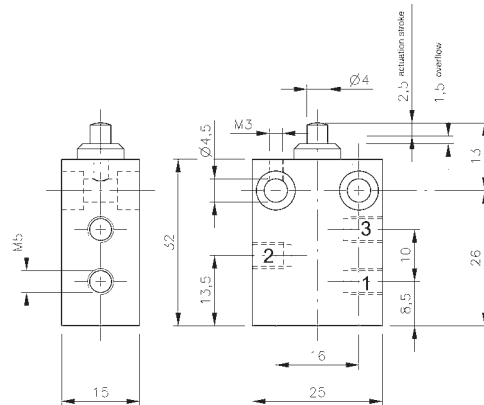
BV 311 201



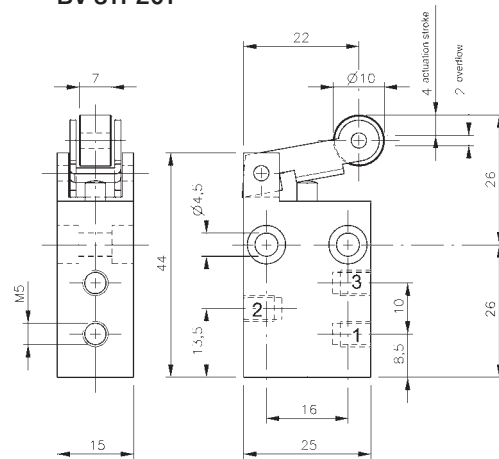
BR 311 201



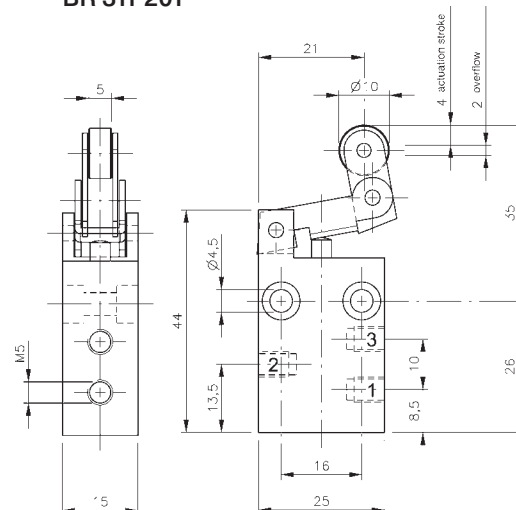
BL 311 201



**BV 311 201**



**BR 311 201**



**BL 311 201**

Mechanically actuated 3/2-way spool valve with mechanical spring. All ports are on the side of the valve.

If pressure is applied to port 1 the function is normally closed.  
If pressure is applied to port 3 the function is normally open.

The use of the ports is interchangeable.

Exhaust can be throttled.

Valves can be used for technical vacuum too.

Type	Port size	Air flow	Operating press.	Actuating force	Weight
BV 311 201	M5	125 l/min	-0,9 - 10 bar	14 N	0,033 kg
BR 311 201	M5	125 l/min	-0,9 - 10 bar	9 N	0,041 kg
BL 311 201	M5	125 l/min	-0,9 - 10 bar	9 N	0,044 kg

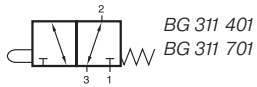








# BG 311 401/BG 311 701



**BG 311 401** stem actuated 3/2-way spool valve with mechanical spring, G 1/8".

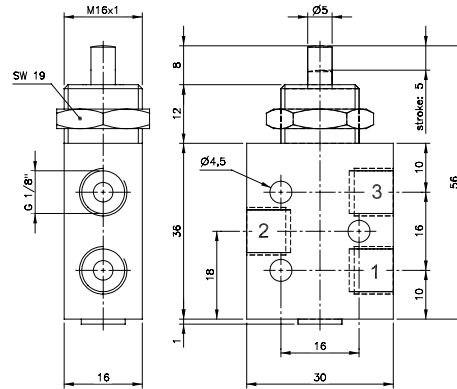
**BG 311 701** heavy duty stem actuated 3/2-way spool valve with mechanical spring, G 1/4".

If pressure is applied to port 1 the function is normally closed.  
If pressure is applied to port 3 the function is normally open.

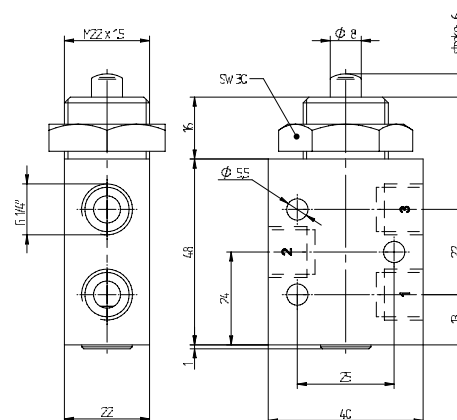
Suitable for wall or panel mounting. Nut for panel mounting M16 x 1 for G 1/8"-valves or M22 x 1,5 for G 1/4"-valves are included.

The use of the ports is interchangeable.

Exhaust can be throttled.



**BG 311 401**

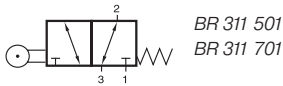


**BG 311 701**

Type	Actuation	Port size	Air flow	Operating press.	Actuating force	Weight
BG 311 401	push	G 1/8"	450 l/min	2 - 10 bar	11 N	0,056 kg
BG 311 701	push	G 1/4"	1250 l/min	1 - 10 bar	17 N	0,13 kg



# BR 311 501/BR 311 701



Heavy-duty 3/2-way roller-lever spool valve with mechanical spring, offering high air flow.

Lever-construction has proven capabilities in rough environmental applications for decades.

Lever is made from zinc plated steel.

If pressure is applied to port 1 the function is normally closed.  
If pressure is applied to port 3 the function is normally open.

The use of the ports is interchangeable.

Exhaust can be throttled.

On request:

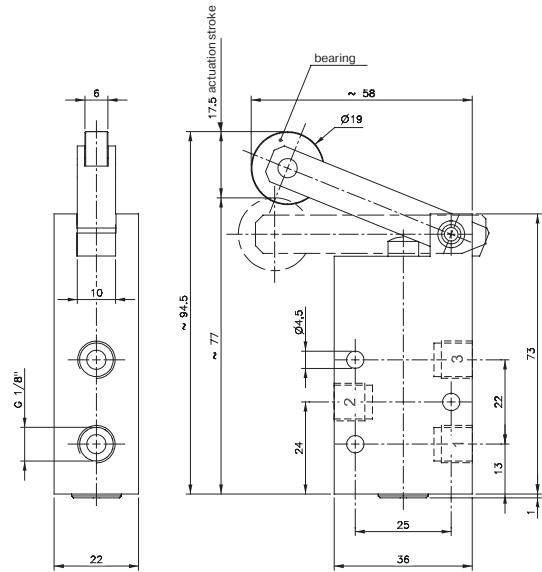
Roller-lever valves with idle return.

Low temperature version:

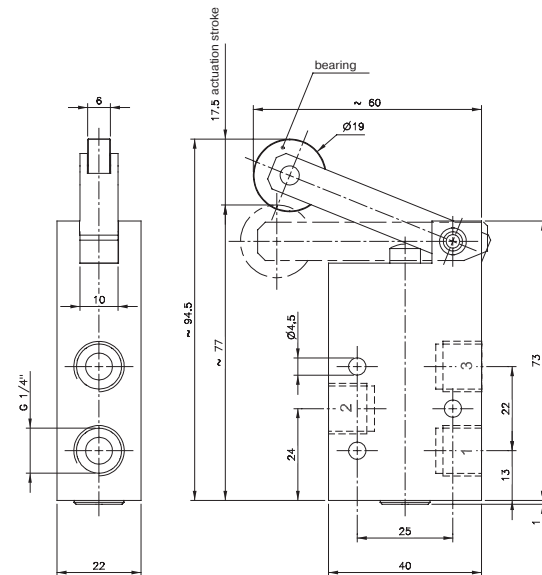
In this case the ports are not interchangeable, standard:

Pressure at port 1 = normally closed, normally open version to be ordered separately.

Valves can be used for technical vacuum too.

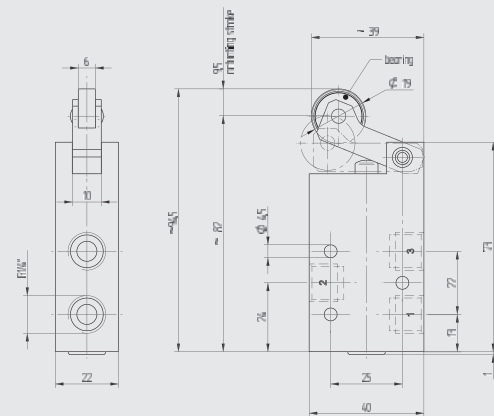


**BR 311 501**



**BR 311 701**

*Also available with a short stainless steel lever. Actuating force is around 9 N.*

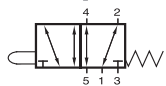


Type	Port size	Air flow	Operating press.	Actuating force	Weight
BR 311 501	G 1/8"	650 l/min	1 - 10 bar	3,5 N	0,19 kg
BR 311 701	G 1/4"	1250 l/min	1 - 10 bar	3,5 N	0,20 kg

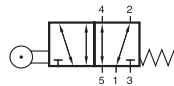




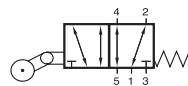
# BV/BR/BL 511 201



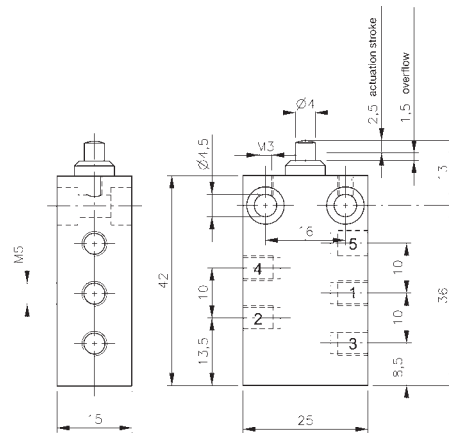
BV 511 201



BR 511 201



BL 511 201



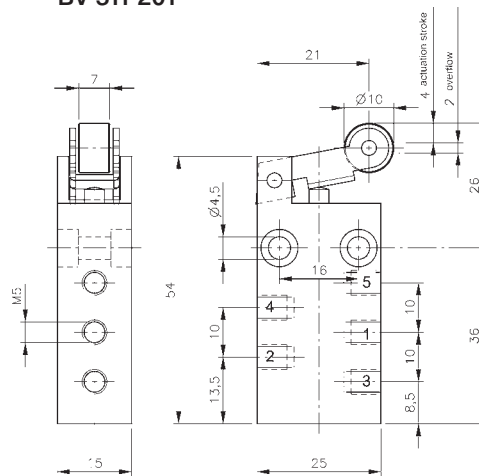
**BV 511 201**

Mechanically actuated 5/2-way spool valve with mechanical spring.

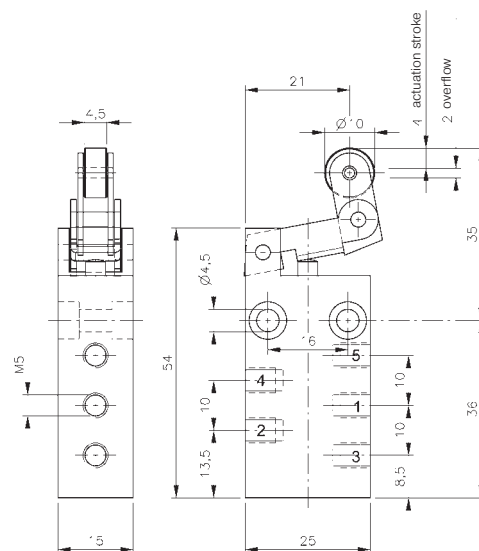
Normally open from 1 to 2 and from 4 to 5. Operated open from 1 to 4 and 2 to 3.

Exhaust can be throttled.

Valves can be used for technical vacuum too.



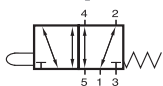
**BR 511 201**



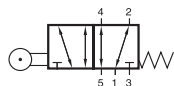
**BL 511 201**

Type	Port size	Air flow	Operating press.	Actuating force	Weight
BV 511 201	M5	125 l/min	-0,9 - 10 bar	14 N	0,043 kg
BR 511 201	M5	125 l/min	-0,9 - 10 bar	9 N	0,051 kg
BL 511 201	M5	125 l/min	-0,9 - 10 bar	9 N	0,054 kg

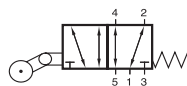
# BV/BR/BL 511 301



BV 511 301



BR 511 301



BL 511 301

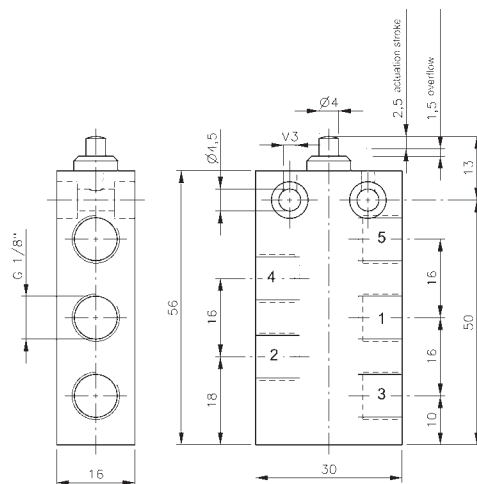


Mechanically actuated 5/2-way spool valve with mechanical spring.

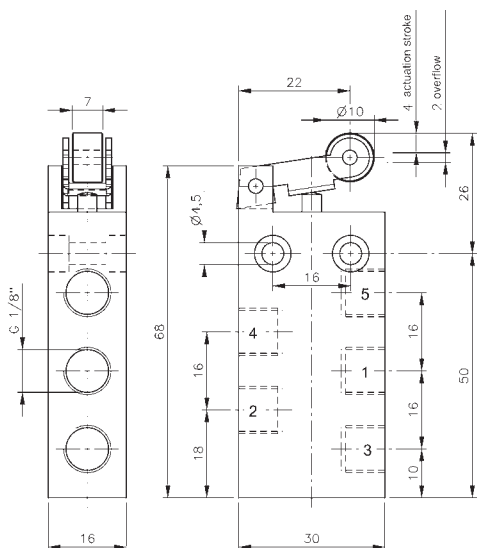
Normally open from 1 to 2 and from 4 to 5. Operated open from 1 to 4 and 2 to 3.

Exhaust can be throttled.

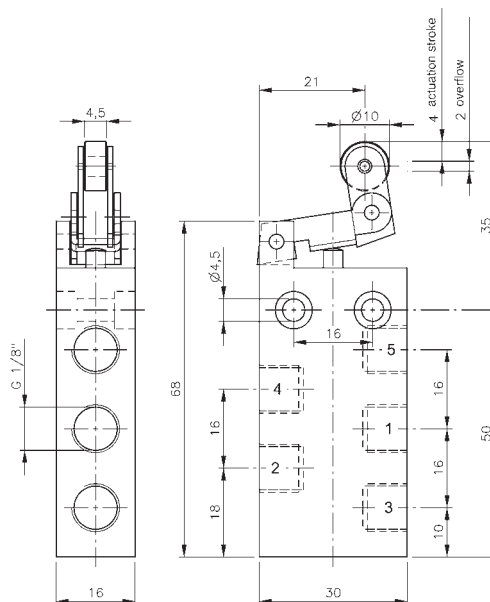
Valves can be used for technical vacuum too.



**BV 511 301**



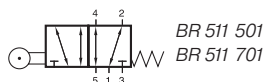
**BR 511 301**



**BL 511 301**

Type	Port size	Air flow	Operating press.	Actuating force	Weight
BV 511 301	G 1/8"	280 l/min	-0,9 - 10 bar	14 N	0,065 kg
BR 511 301	G 1/8"	280 l/min	-0,9 - 10 bar	10 N	0,077 kg
BL 511 301	G 1/8"	280 l/min	-0,9 - 10 bar	10 N	0,079 kg

# BR 511 501/BR 511 701



Heavy-duty 5/2-way roller-lever spool valve with mechanical spring. High flow especially for the trucking and railway industry. Lever-construction has proven capabilities in railway applications for decades.

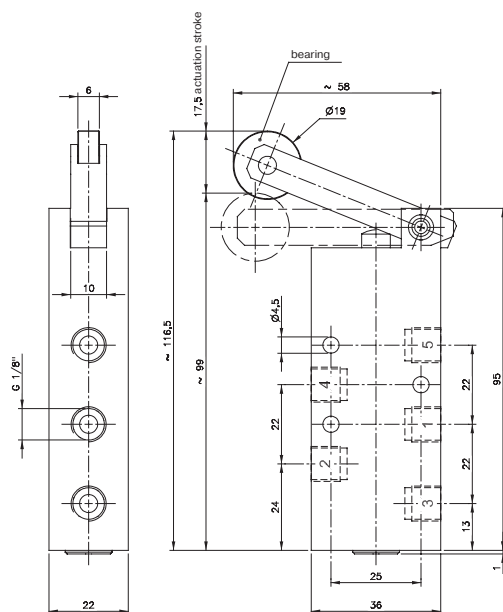
Normally open from 1 to 2 and 4 to 5.  
Operated open from 1 to 4 and 2 to 3.

Exhaust can be throttled.

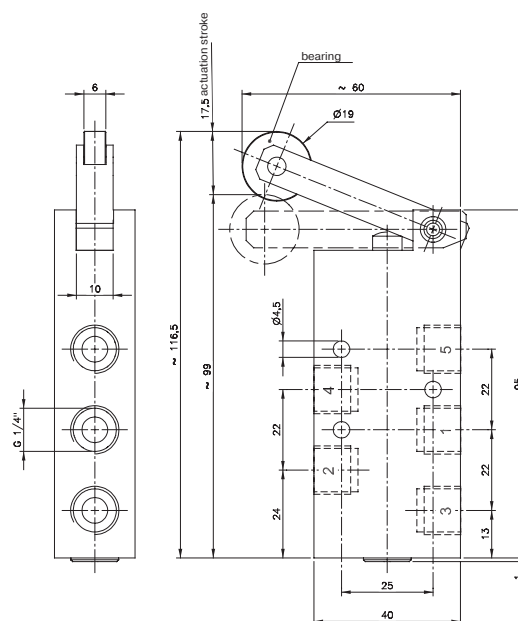
On request:  
Roller-lever valves with idle return.

Low temperature version:  
In this case the ports are not interchangeable, standard:  
Pressure at port 1 = normally closed, normally open version to be ordered separately.

Valves can be used for technical vacuum too.

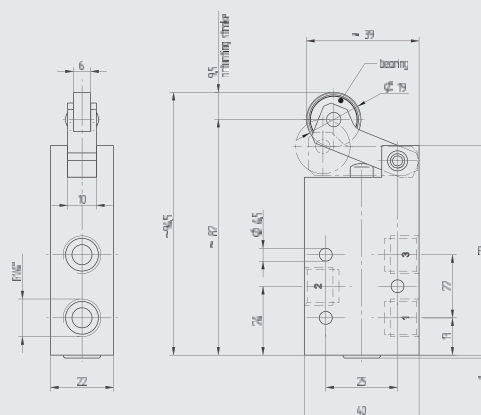


**BR 511 501**



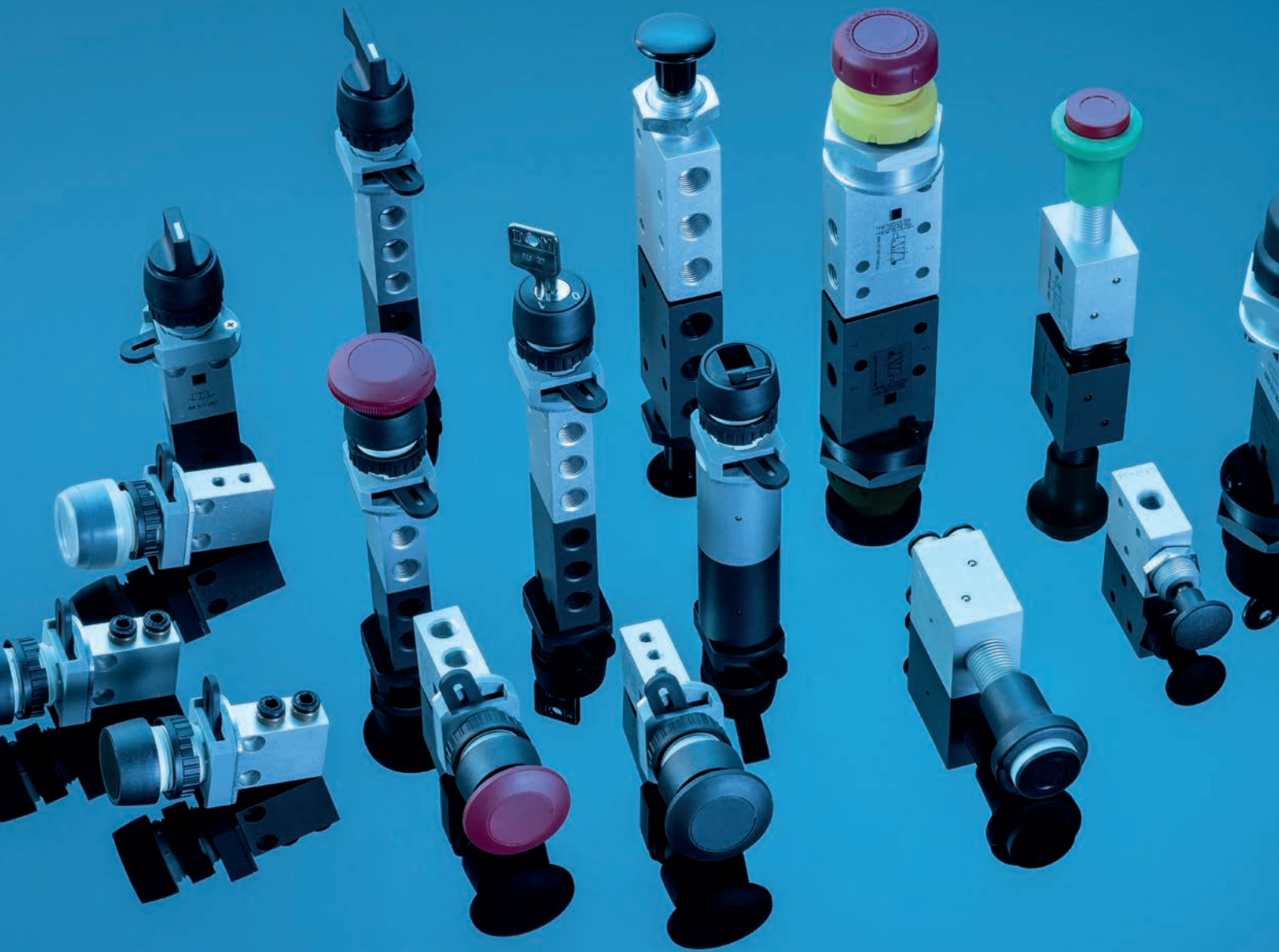
**BR 511 701**

Also available with a short stainless steel lever. Actuating force is around 9 N.



Type	Port size	Air flow	Operating press.	Actuating force	Weight
BR 511 501	G 1/8"	650 l/min	1 - 10 bar	3,5 N	0,23 kg
BR 511 701	G 1/4"	1250 l/min	1 - 10 bar	3,5 N	0,25 kg

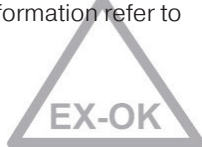




# 2.2

## Valves for Panel Mounting

Selected models can be used in explosion hazardous environment. For detailed information refer to chapter 2.15.



Selected models are available for low temperature application. For detailed information refer to chapter 2.12.

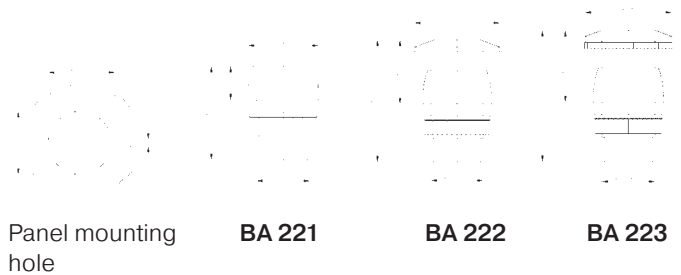


# BA-Series: Ø 22 mm Actuators for Panel Mounting



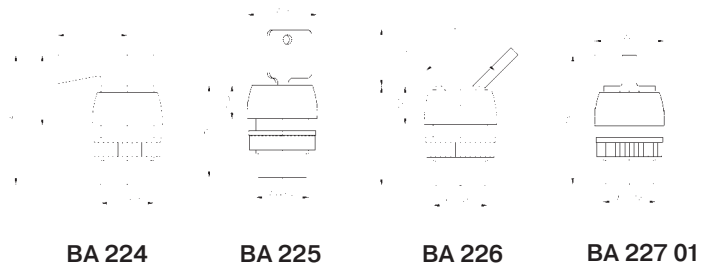
**BA-Series:** Actuating elements for 22 mm panel mounting hole. Actuators can be used with valves type BA ... displayed on page 2.2.3, 2.2.4 and 2.2.7.

- Materials: Polyamide
- Temperature range: -25°C ... +55°C  
(consider temperature limitations of the valve)
- IP protection: IP 65  
(IP 66 with dust protection cap BA 221 SSK)



Actuating elements can be used in explosion hazardous environment zone 2 and 22.

According to the directive 2014/34/EU, Article 1 and Article 2, these products do not fall under the scope of the ATEX directive, because they are not capable of causing an explosion through their own potential sources of ignition. So, these products are not marked in terms of the ATEX directive. An ignition risk assessment has been carried out.















BA 221 \_\_ and BA 225 00 can be used in explosion group IIC / IIIC.

BA 222 01, BA 223 02, BA 224 01, BA 226 01 and BA 227 01 can be used in explosion group IIB / IIIC.



**BA 221 SSK**

Type	Actuation	Colour	Actuating force	Weight
BA 221 01	Push button	black	16 N	0,014 kg 
BA 221 02	Push button	red	16 N	0,014 kg 
BA 221 03	Push button	green	16 N	0,014 kg 
BA 221 04	Push button	yellow	16 N	0,014 kg 
BA 221 05	Push button	blue	16 N	0,014 kg 
BA 221 06	Push button	white	16 N	0,014 kg 
BA 222 01	Palm button	black	16 N	0,020 kg 
BA 223 02*	Palm button w. detend	red	27 N	0,026 kg 
BA 224 01	Rotary lever long	black	42 N/cm	0,021 kg 
BA 225 00	Locking switch		25 N	0,080 kg 
BA 226 01	Switch	black	16 N/cm	0,019 kg 
BA 227 01	Rotary lever short	black	16 N/cm	0,018 kg 
BA 221 SSK	Transparent dust protection cap for BA 221 __			0,009 kg

\* available on request: for 30 mm panel mouting hole.

# BAS-Series: Ø 30 mm Actuators for Panel Mounting

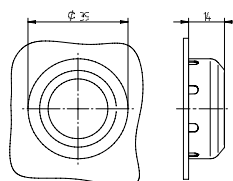
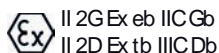


**BAS-Series:** Actuating elements for 30 mm panel mounting hole. Ideal for demanding applications.

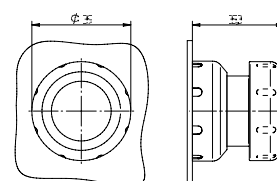
Actuators can be used with valves type BAS ... displayed on page 2.2.5. and 2.12.2.1.

- Materials: Polyamide, seals silicon
- Temperature range: -60°C ... +70°C  
(consider temperature limitations of the valve)
- IP protection: IP 66

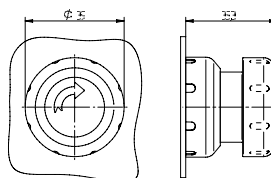
Elements are ATEX as well as IECEx approved and can be used in explosion hazardous environment zone 1, 2, 21 and 22.



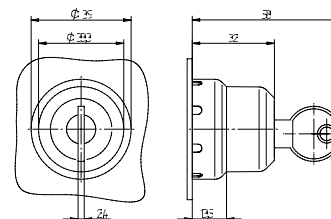
BA 301 01 Ex



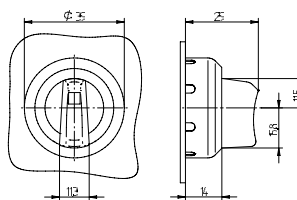
BA 302 02 Ex








BA 303 02 Ex



BA 305 00 Ex

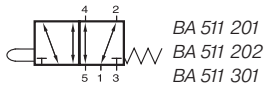


BA 307 01 Ex

Type	Actuation	Colour	Actuating force	Weight
BA 301 01 Ex	Push button	black	8.5 N	0,034 kg 
BA 302 02 Ex	Palm button	red/yellow	8.5 N	0,05 kg 
BA 303 02 Ex	Palm button with detend	red	52 N	0,05 kg 
BA 305 00 Ex	Locking switch	black	1 N	0,05 kg 
BA 307 01 Ex	Rotary lever	black	1 N	0,04 kg 



# BA 511 201/BA 511 202/BA 511 301

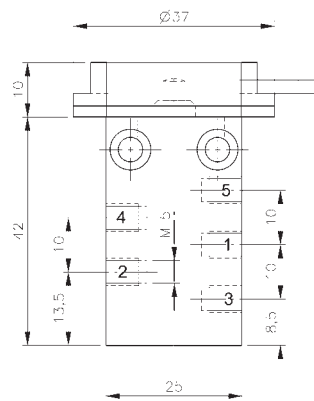


5/2-way spool valve with mechanical spring for panel mounting.

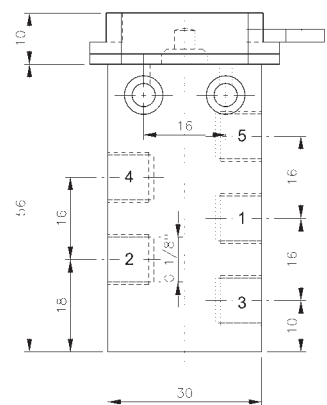
Actuating elements are displayed on page 2.2. 1.

Exhaust can be throttled.

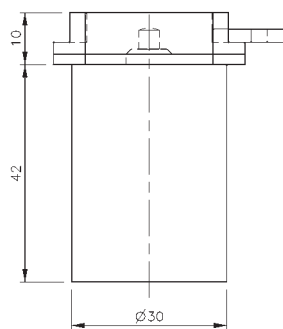
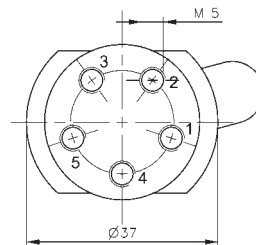
Selected valves can be used for technical vacuum too.



**BA 511 201**



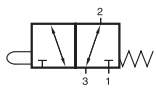
**BA 511 301**



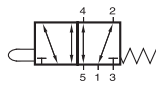
**BA 511 202**

Type	Port size	Air flow	Operating press.	Actuating force	Weight
BA 511 201	M5	125 l/min	-0,9 - 10 bar	14 N	0,053 kg
BA 511 202	M5	125 l/min	-0,9 - 10 bar	14 N	0,095 kg
BA 511 301	G 1/8"	280 l/min	-0,9 - 10 bar	14 N	0,075 kg

# BAS 311 301/BAS 511 301



BAS 311 301



BAS 511 301



3/2-way and 5/2-way spool valves with mechanical spring for panel mounting.

Actuating elements are displayed on page 2.2.2.

Valves can be used with technical vacuum too.

Available on request: Valves based on series 401 (air-flow rate 450 l/min).

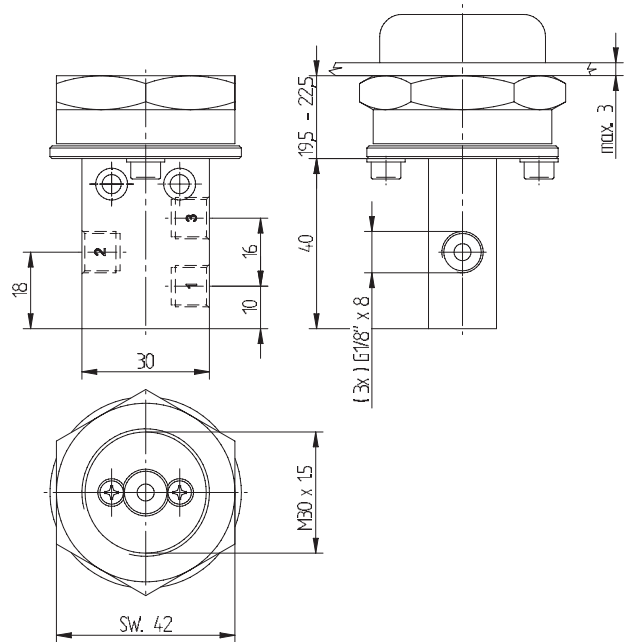
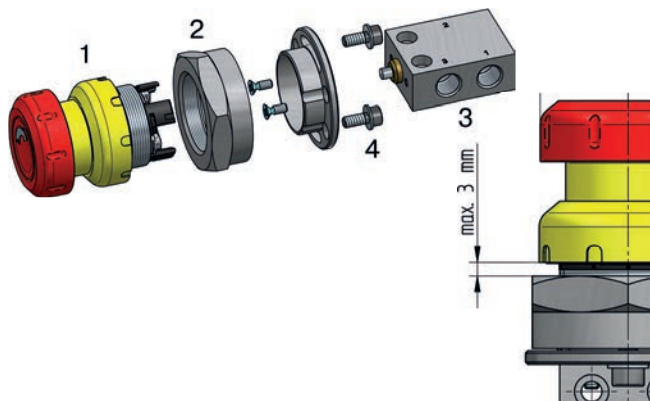
The valves can be also offered in a version for -40°C ... +65°C and for explosion hazardous environment zone 1, 2, 21 and 22. Please refer to page 2.12.2.1.

How to assemble the valve to the panel:

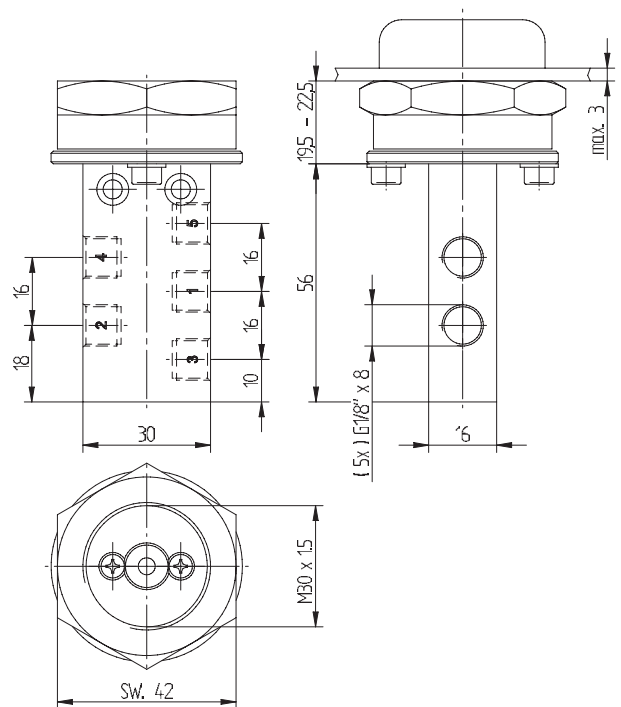
1. Insert the actuator (1) through the hole
2. Tighten the aluminum nut (2) firmly
3. Attach the valve (3) to the nut (2)
4. Fasten the valve with two screws (4)

Please note:

- The sheet thickness must not exceed 3 mm.
- Depending on the sheet thickness, a small gap may remain between the valve and the nut.
- Plastic panels are suitable from 2.5 mm, metal panels from 1.5 mm sheet thickness.



**BAS 311 301**

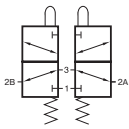


**BAS 511 301**

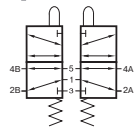
Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
BAS 311 301	3/2-way	G 1/8"	280 l/min	-0,9 - 10 bar	~ 14 N	0,08 kg
BAS 511 301	5/2-way	G 1/8"	280 l/min	-0,9 - 10 bar	~ 14 N	0,11 kg



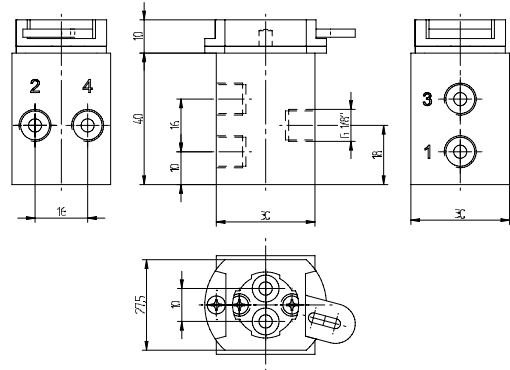
# BA 430 301/BA 730 301/BA 334 01



BA 430 301



BA 730 301



BA 430 301

**BA 430 301**

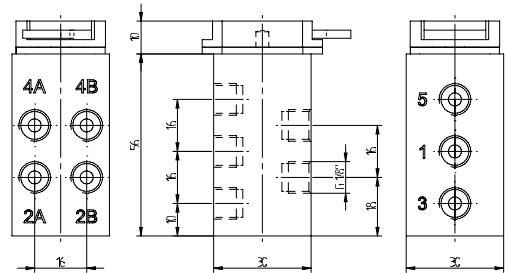
4/3-way spool valve for panel mounting. Middle position exhausted. Typical application: for controlling two single-acting actuators.

**BA 730 301**

7/3-way spool valve for panel mounting. Typical application: for controlling two double-acting actuators.

**BA 334 01**

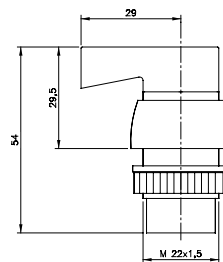
3-position rotary lever long with detent. Please note: Although the valves have a mechanic spring inside, the actuator is with detent.



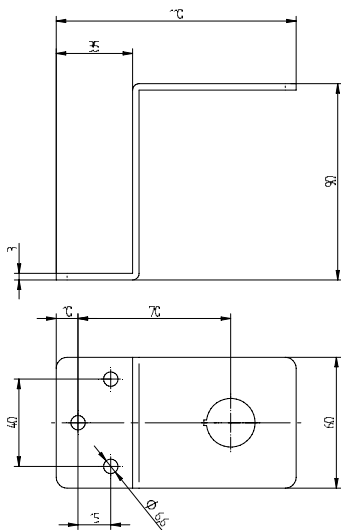
BA 730 301

**BW BA 22**

Mounting bracket to install a panel mounting valve without a control panel.



BA 334 01

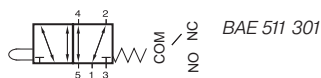
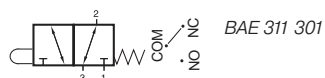


BW BA 22

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
BA 430 301	double 3/2-way	G 1/8"	280 l/min	-0,9 - 10 bar	14 N	0,110 kg
BA 730 301	double 5/2-way	G 1/8"	280 l/min	-0,9 - 10 bar	14 N	0,150 kg
BA 334 01	Rotary lever long	-	-	-	42 N/cm	0,021 kg
BW BA 22	Mounting bracket	-	-	-	-	0,265 kg



# BAE 311 301/BAE 511 301



The BAE 311 301 is a 3/2-way spool valve with mechanical spring for panel mounting that can either be used normally closed (pressure at port 1) or normally open (pressure at port 3).

The BAE 511 301 is a 5/2-way spool valve with mechanical spring for panel mounting.

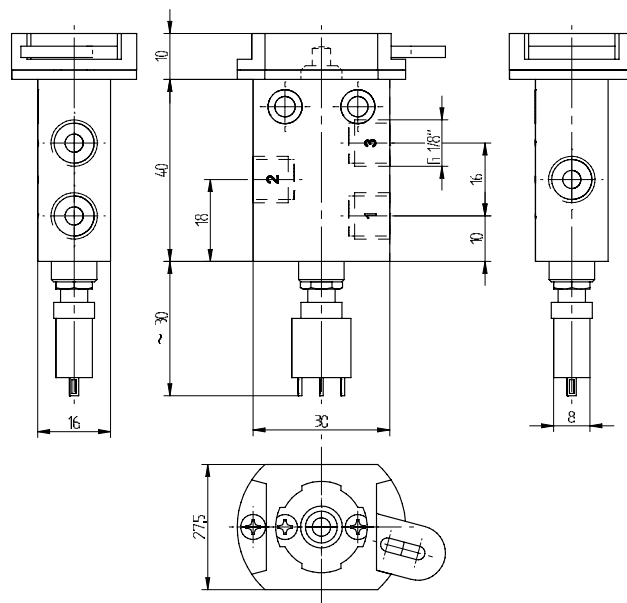
The valves include an electric switch that is actuated at the same time.

The electrical switch can be used up to 6 A / 125 VAC. Switch can be connected in two ways either normally open or normally closed.

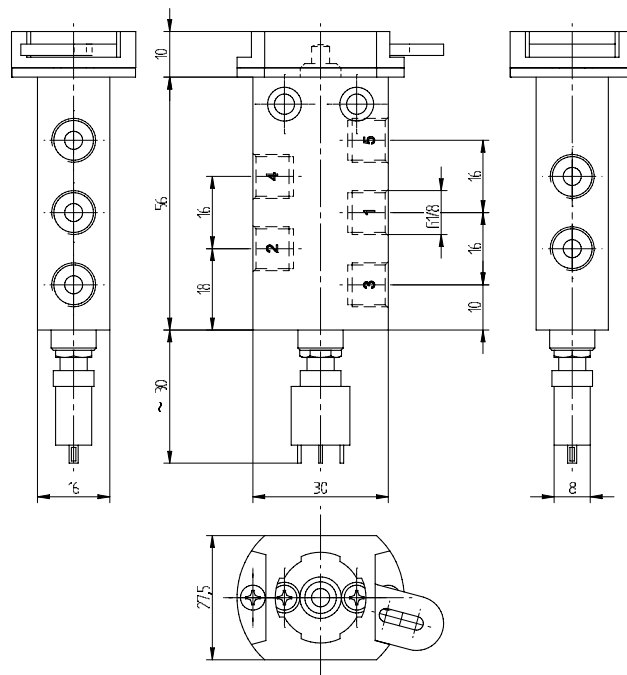
The electrical switch can also be combined with BA 311 201 and BA 511 201 on demand.

Actuation elements are displayed on page 2.2. 1.

Please order including actuation element.



**BAE 311 301**

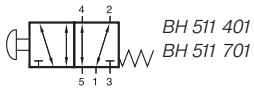


**BAE 511 301**

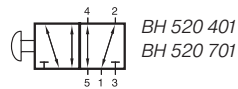
Type	Port size	Air flow	Operating press.	Actuating force	Weight
BAE 311 301	G 1/8"	280 l/min	-0,9 - 10 bar	17 N	0,08 kg
BAE 511 301	G 1/8"	280 l/min	-0,9 - 10 bar	17 N	0,097 kg



# BH 511 401/BH 520 401 BH 511 701/BH 520 701



BH 511 401  
BH 511 701



BH 520 401  
BH 520 701



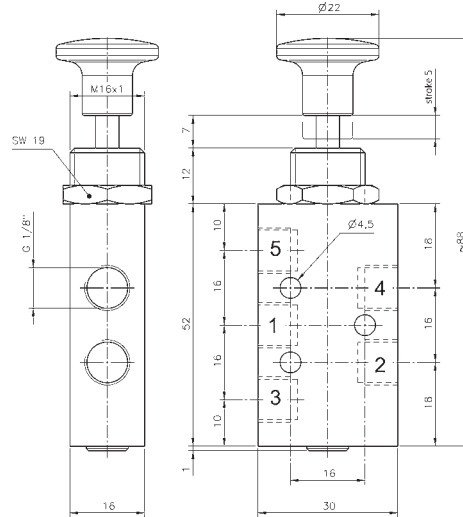
Manually actuated 5/2-way spool valve either with spring return to outer position (type 511) or with two stable positions (type 520).

Normally open from port 1 to 2 and from port 4 to 5.  
Operated open from port 1 to 4 and port 2 to 3.

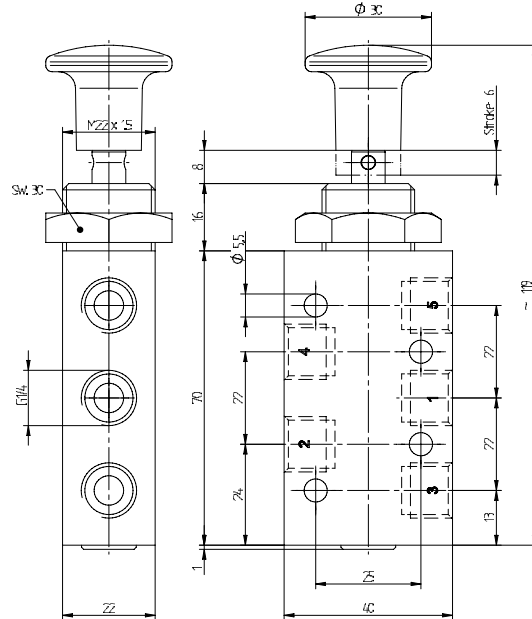
Exhaust can be throttled.

Suitable for wall or panel mounting. Nut for panel mounting, M16 x 1 for G 1/8"-valves or M22 x 1,5 for G 1/4"-valves is included.




Selected valves can be used for technical vacuum too.



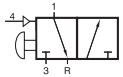
**BH 511 401/BH 520 401**



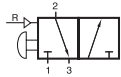
**BH 511 701/BH 520 701**

Type	Port size	Air flow	Operating press.	Actuating force	Weight
BH 511 401	G 1/8"	450 l/min	1 - 10 bar	11 N	0,080 kg
BH 520 401	G 1/8"	450 l/min	1 - 10 bar	12 N	0,080 kg 
BH 511 701	G 1/4"	1250 l/min	-0,9 - 10 bar	17 N	0,180 kg 
BH 520 701	G 1/4"	1250 l/min	-0,9 - 10 bar	18 N	0,180 kg 

# BHP 320 442/BHP 320 462



BHP 320 442



BHP 320 462



Manually actuated 3/2-way spool valve with 2 stable positions and pneumatic reset.

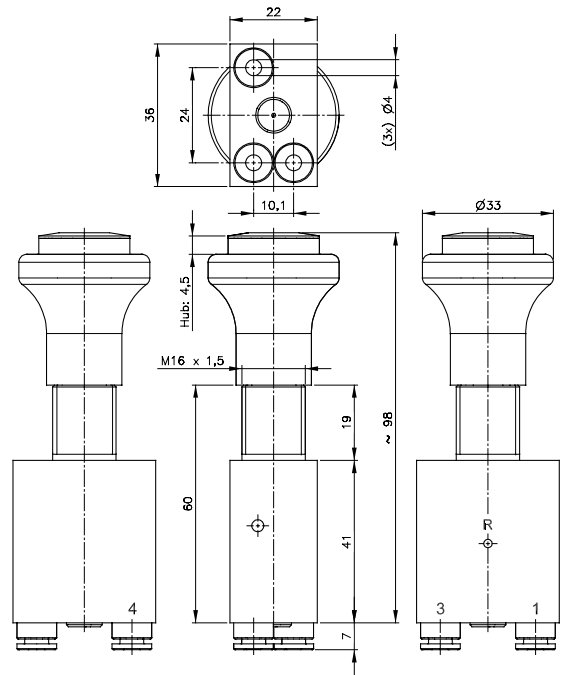
Ports on the bottom of the valve are equipped with integrated push-in fittings. Exhaust is undeducted. Valve is equipped with FKM seals.

If pressure is applied to port 4 (pneumatic reset-port) the stem is pulled in. The knob carries an indicator ring that sticks out when the valve is pulled = actuated.

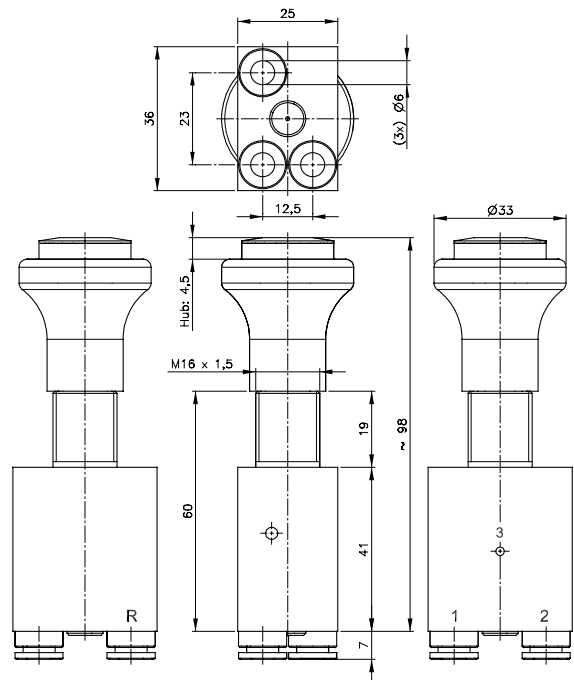
The following knob-colours are available:

Colour code	Colour of knob	Colour of indicator
01	black	white
02	red	white
03	green	red
04	yellow	white
05	blue	white

If requested we add fixing nut DIN 439-VZ-M16x1,5 material: steel zinc plated.



BHP 320 442

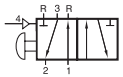


BHP 320 462

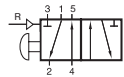
Type	Function	Ports	Air flow	Operating press.	Reset press.	Weight
BHP 320 442 _	3/2-way	pif 4 mm	300 l/min	1 - 16 bar	5 bar	0,13 kg
BHP 320 462 _	3/2-way	pif 6 mm	300 l/min	1 - 16 bar	5 bar	0,13 kg

Please add two digits for colour of knob.

# BHP 520 442/BHP 520 462



BHP 520 442



BHP 520 462



Manually actuated 5/2-way spool valve with 2 stable positions and pneumatic reset.

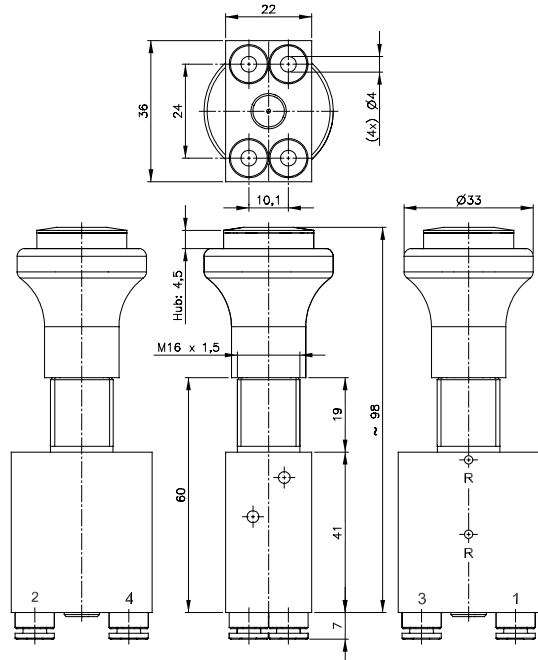
Ports on the bottom of the valve are equipped with integrated push-in fittings. Exhaust is undeducted. Valve is equipped with FKM seals.

If pressure is applied to port 4 (pneumatic reset-port) the stem is pulled in. The knob carries an indicator ring that sticks out when the valve is pulled = actuated.

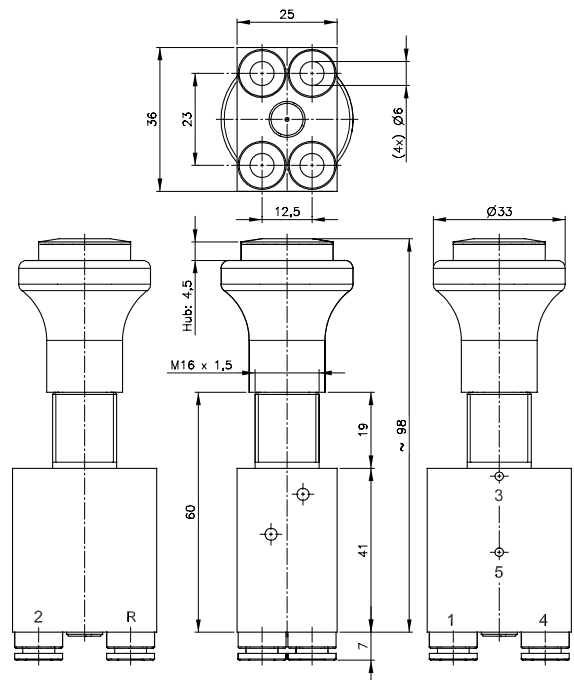
The following knob-colours are available:

Colour code	Colour of knob	Colour of indicator
01	black	white
02	red	white
03	green	red
04	yellow	white
05	blue	white

If requested we add fixing nut DIN 439-VZ-M16x1,5 material: steel zinc plated.



BHP 520 442

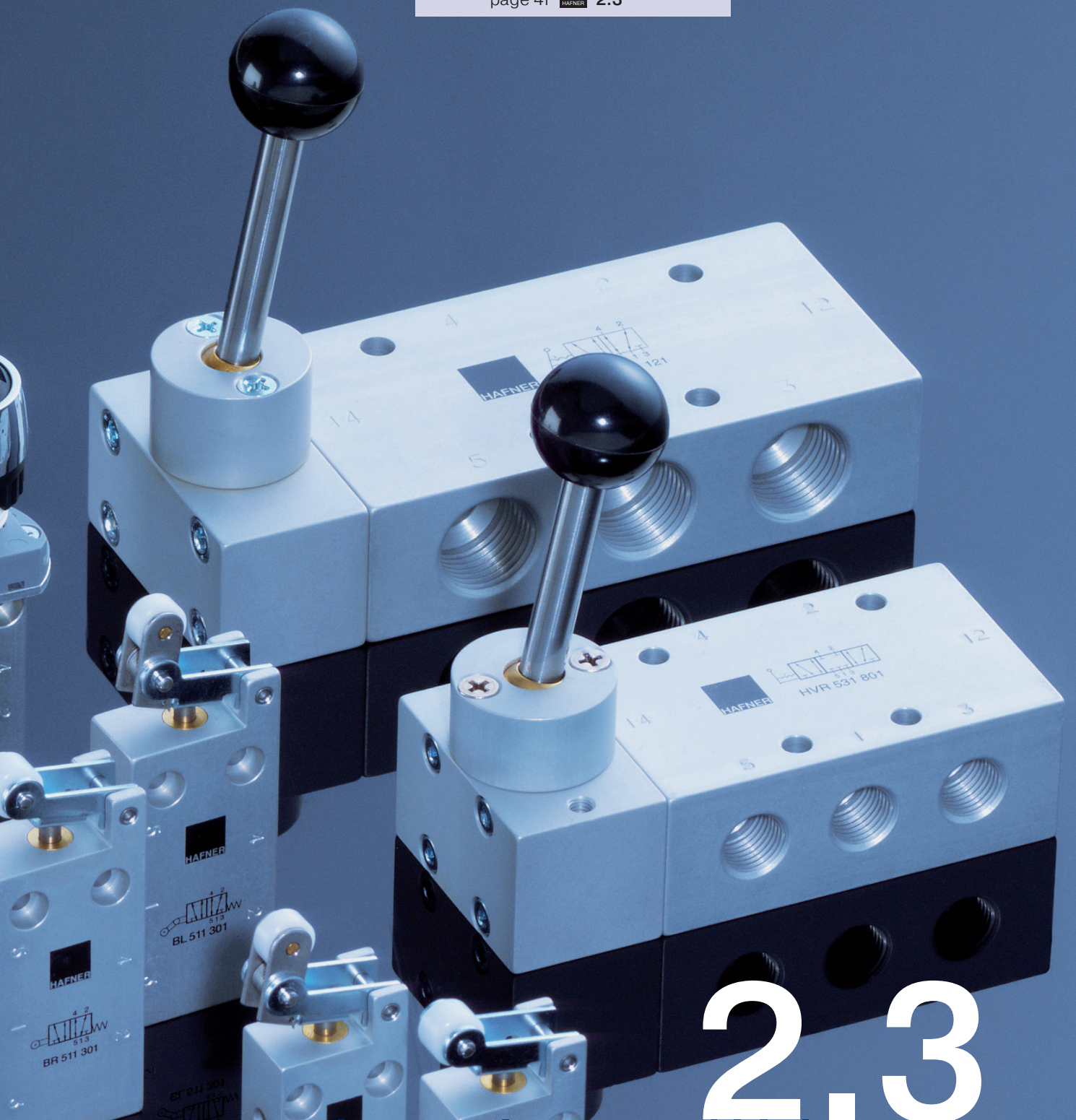


BHP 520 462

Type	Function	Ports	Air flow	Operating press.	Reset press.	Weight
BHP 520 442 _	5/2-way	pif 4 mm	300 l/min	1 - 16 bar	5 bar	0,14 kg
BHP 520 462 _	5/2-way	pif 6 mm	300 l/min	1 - 16 bar	5 bar	0,14 kg

Please add two digits for colour of knob.

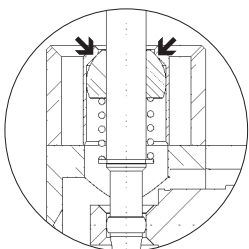




# 2.3

## Lever Actuated Valves

Selected valves can be used for technical vacuum too.



Instead of a rubber-gaitor that never lasts long, HAFNER seals all the lever valves with a metallic seal.



Selected models are available for low temperature application. For detailed information refer to chapter 2.12.

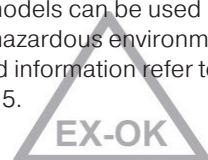


**316** Selected models are available in stainless steel. For detailed information refer to chapter 2.13.

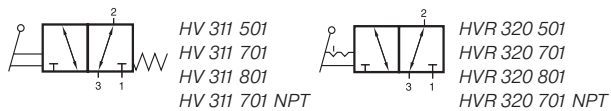


Selected models can be equipped with FKM seals for high temperature environment up to 120 °C.

Selected models can be used in explosion hazardous environment. For detailed information refer to chapter 2.15.



# HV 311 501/HV 311 701/HV 311 801 HVR 320 501/HVR 320 701/HVR 320 801



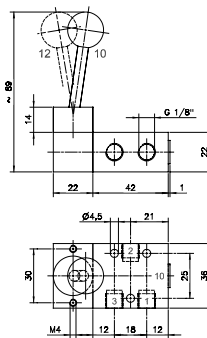
Lever actuated 3/2-way spool valve.

Type HV      spring return  
 Type HVR    indexed

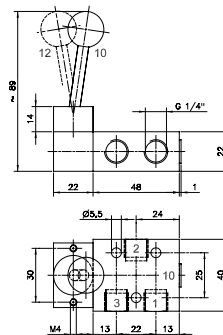
If pressure is applied to port 1 the function is normally closed.  
 If pressure is applied to port 3 the function is normally open.

The lever is sealed by using a metal ball.

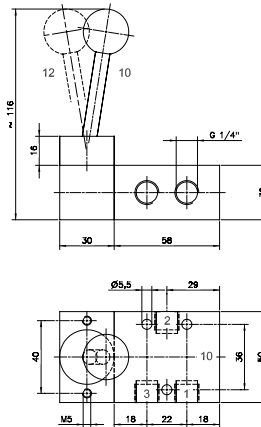
Exhaust can be throttled.



**HV 311 501/HVR 320 501**



**HV 311 701/HVR 320 701  
 HV 311 701 NPT/HVR 320 701 NPT**

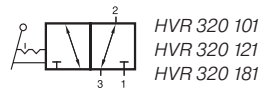
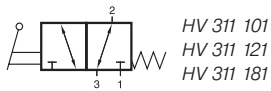


**HV 311 801/HVR 320 801**

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
HV 311 501	spring ret.	G 1/8"	650 l/min	1 - 10 bar	20 N	0,19 kg
HV 311 701	spring ret.	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,20 kg
HV 311 801	spring ret.	G 1/4"	1450 l/min	1 - 10 bar	25 N	0,46 kg
HVR 320 501	indexed	G 1/8"	650 l/min	1 - 10 bar	20 N	0,19 kg
HVR 320 701	indexed	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,20 kg
HVR 320 801	indexed	G 1/4"	1450 l/min	1 - 10 bar	25 N	0,46 kg
HV 311 701 NPT	spring ret.	1/4" NPT	1250 l/min	1 - 10 bar	20 N	0,20 kg
HVR 320 701 NPT	indexed	1/4" NPT	1250 l/min	1 - 10 bar	20 N	0,20 kg



# HV 311 101/HV 311 121/HV 311 181 HVR 320 101/HVR 320 121/HVR 320 181



Lever actuated 3/2-way spool valve.

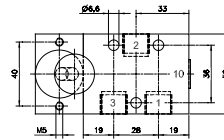
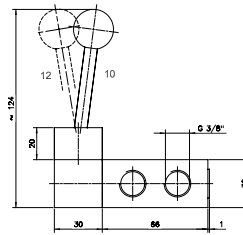
Type HV      spring return  
Type HVR    indexed

If pressure is applied to port 1 the function is normally closed.  
If pressure is applied to port 3 the function is normally open.

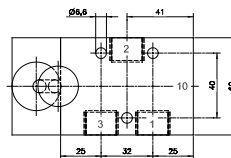
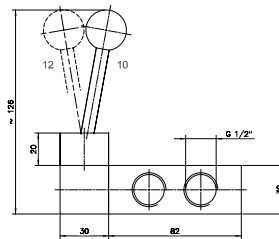
The lever is sealed by using a metal ball.

Exhaust can be throttled.

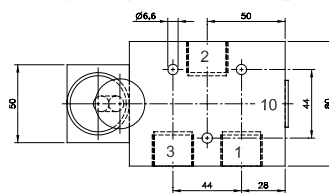
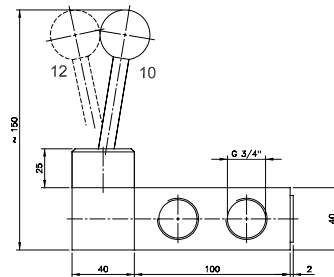
Versions with 1/2" NPT ports available on request.



**HV 311 101/HVR 320 101**



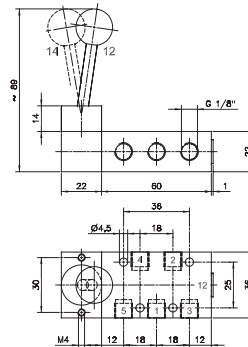
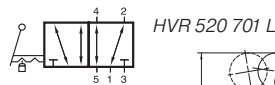
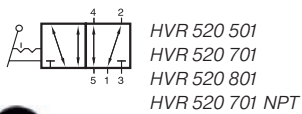
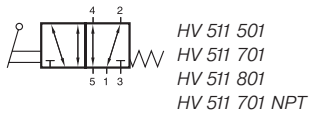
**HV 311 121/HVR 320 121**



**HV 311 181/HVR 320 181**

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight	
HV 311 101	spring ret.	G 3/8"	2250 l/min	1 - 10 bar	25 N	0,49 kg	
HV 311 121	spring ret.	G 1/2"	3000 l/min	1 - 10 bar	32 N	0,69 kg	
HV 311 181	spring ret.	G 3/4"	6000 l/min	1 - 10 bar	40 N	1,31 kg	
HVR 320 101	indexed	G 3/8"	2250 l/min	1 - 10 bar	25 N	0,49 kg	
HVR 320 121	indexed	G 1/2"	3000 l/min	1 - 10 bar	32 N	0,69 kg	
HVR 320 181	indexed	G 3/4"	6000 l/min	1 - 10 bar	40 N	1,31 kg	

# HV 511 501/HV 511 701/HV 511 801 HVR 520 501/HVR 520 701/HVR 520 701 L HVR 520 801



**HV 511 501/HVR 520 501**

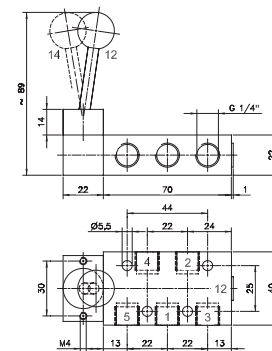
Lever actuated 5/2-way spool valve.

Type HV      spring return  
Type HVR    indexed

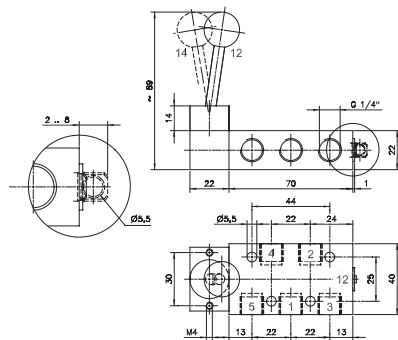
The lever is sealed by using a metal ball.

Exhaust can be throttled.

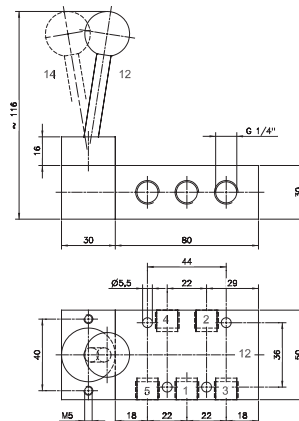
Type HVR 520 701 L with extended spool.  
The user can put a padlock into the drilling and thereby lock the valve. Padlock is not included in the delivery content.  
Valve is also designed to resist high temperatures of up to +120°C.



**HV 511 701/HVR 520 701  
HV 511 701 NPT/HVR 520 701 NPT**



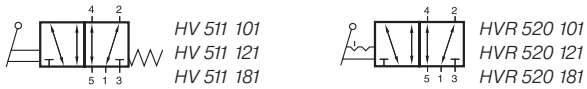
**HVR 520 701 L**



**HV 511 801/HVR 520 801**

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
HV 511 501	spring ret.	G 1/8"	650 l/min	1 - 10 bar	20 N	0,22 kg
HV 511 701	spring ret.	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,24 kg
HV 511 801	spring ret.	G 1/4"	1450 l/min	1 - 10 bar	25 N	0,55 kg
HVR 520 501	indexed	G 1/8"	650 l/min	1 - 10 bar	20 N	0,22 kg
HVR 520 701	indexed	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,24 kg
HVR 520 701 L	indexed	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,24 kg
HVR 520 801	indexed	G 1/4"	1450 l/min	1 - 10 bar	25 N	0,55 kg
HV 511 701 NPT	spring ret.	1/4" NPT	1250 l/min	1 - 10 bar	20 N	0,24 kg
HVR 520 701 NPT	indexed	1/4" NPT	1250 l/min	1 - 10 bar	20 N	0,24 kg

# HV 511 101/HV 511 121/HV 511 181 HVR 520 101/HVR 520 121/HVR 520 181



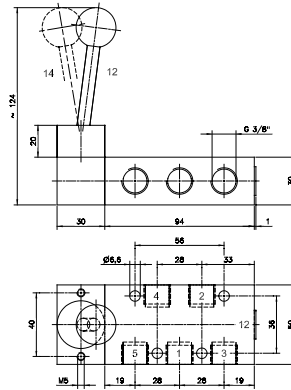
Lever actuated 5/2-way spool valve.

Type HV      spring return  
Type HVR    indexed

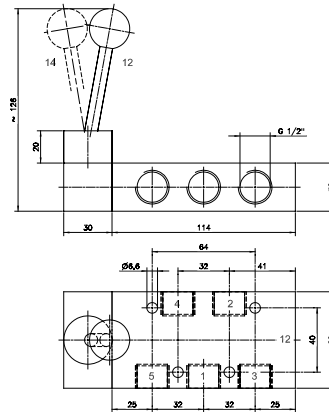
The lever is sealed by using a metal ball.

Exhaust can be throttled.

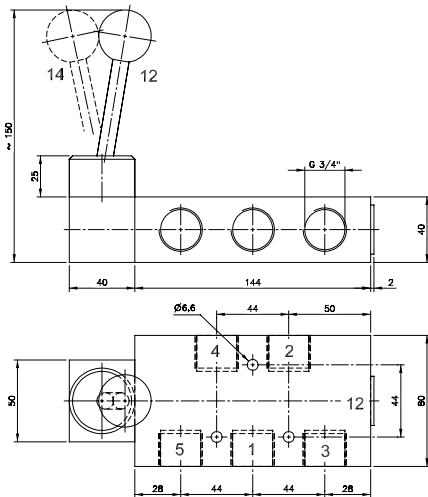
Versions with 1/2" NPT ports available on request.



**HV 511 101/HVR 520 101**



**HV 511 121/HVR 520 121**

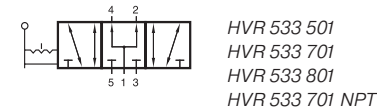
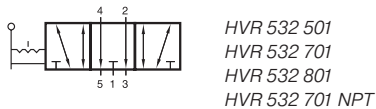
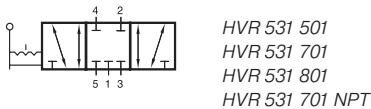
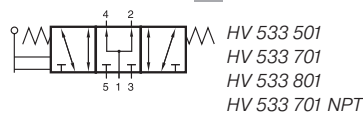
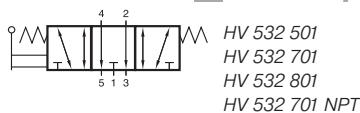
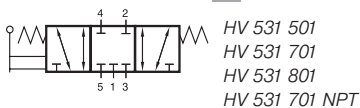


**HV 511 181/HVR 520 181**

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight	
HV 511 101	spring ret.	G 3/8"	2250 l/min	1 - 10 bar	25 N	0,60 kg	
HV 511 121	spring ret.	G 1/2"	3000 l/min	1 - 10 bar	32 N	0,79 kg	
HV 511 181	spring ret.	G 3/4"	6000 l/min	1 - 10 bar	40 N	1,64 kg	
HVR 520 101	indexed	G 3/8"	2250 l/min	1 - 10 bar	25 N	0,60 kg	
HVR 520 121	indexed	G 1/2"	3000 l/min	1 - 10 bar	32 N	0,79 kg	
HVR 520 181	indexed	G 3/4"	6000 l/min	1 - 10 bar	40 N	1,64 kg	



# HV 53\_501/HV 53\_701/HV 53\_801 HVR 53\_501/HVR 53\_701/HVR 53\_801



Lever actuated 5/3-way spool valve.

Type HV spring return to middle position

Type HVR indexed

Type 531 centre closed

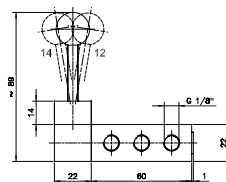
Type 532 centre exhausted

Type 533 centre pressurised

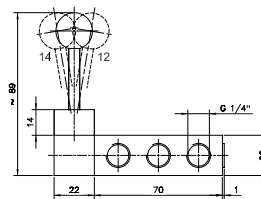
When ordering please complete the type number by 1, 2 or 3 according to the type required.

The lever is sealed by using a metal ball.

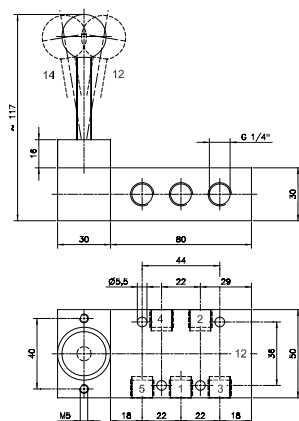
Exhaust can be throttled.



**HV 53\_501/HVR 53\_501**



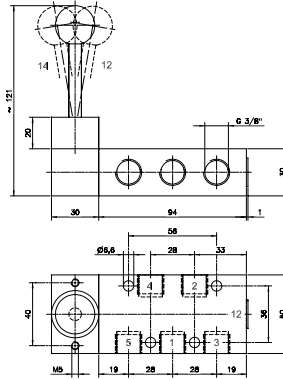
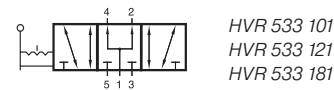
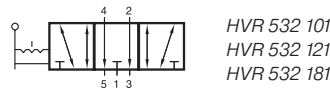
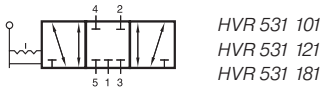
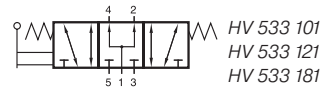
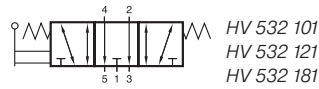
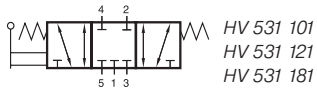
**HV 53\_701/HVR 53\_701  
HV 53\_701 NPT/HVR 53\_701 NPT**



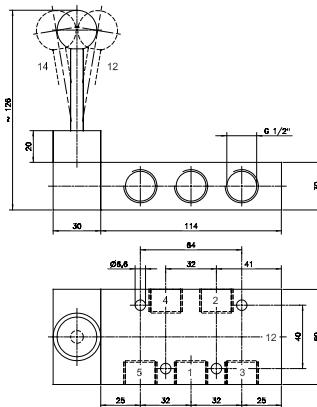
**HV 53\_801/HVR 53\_801**

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
HV 53_501	spring ret.	G 1/8"	650 l/min	1 - 10 bar	20 N	0,22 kg
HV 53_701	spring ret.	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,24 kg
HV 53_801	spring ret.	G 1/4"	1450 l/min	1 - 10 bar	25 N	0,55 kg
HVR 53_501	indexed	G 1/8"	650 l/min	1 - 10 bar	20 N	0,22 kg
HVR 53_701	indexed	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,24 kg
HVR 53_801	indexed	G 1/4"	1450 l/min	1 - 10 bar	25 N	0,55 kg
HV 53_701 NPT	spring ret.	1/4" NPT	1250 l/min	1 - 10 bar	20 N	0,24 kg
HVR 53_701 NPT	indexed	1/4" NPT	1250 l/min	1 - 10 bar	20 N	0,24 kg

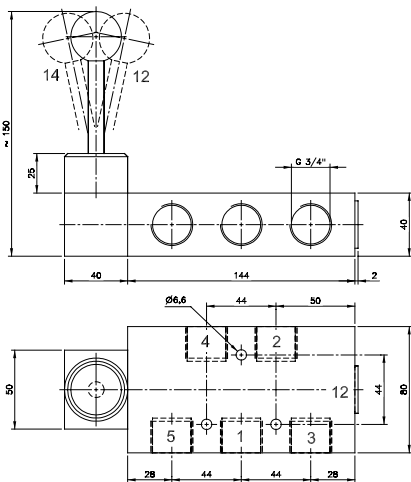
# HV 53\_ 101/HV 53\_ 121/HV 53\_ 181 HVR 53\_ 101/HVR 53\_ 121/HVR 53\_ 181



**HV 53\_ 101/HVR 53\_ 101**



**HV 53\_ 121/HVR 53\_ 121**



**HV 53\_ 181/HVR 53\_ 181**

Lever actuated 5/3-way spool valve with.

Type HV spring return to middle position  
Type HVR indexed

Type 531 centre closed  
Type 532 centre exhausted  
Type 533 centre pressurised

When ordering please complete the type number by 1, 2 or 3 according to the type required.

The lever is sealed by using a metal ball.

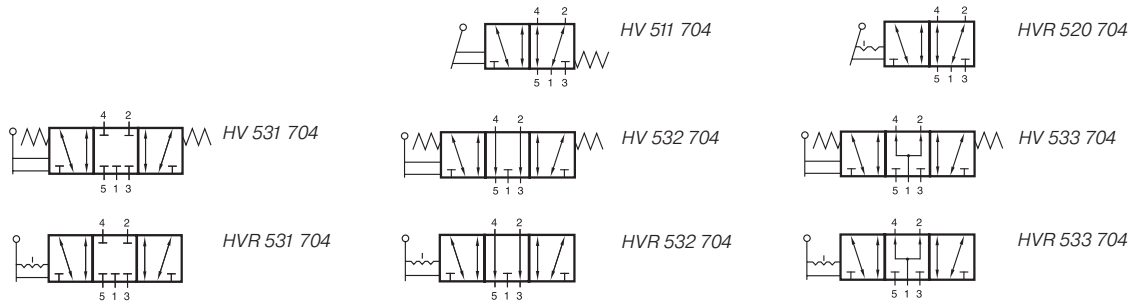
Exhaust can be throttled.

Versions with 1/2" NPT ports available on request.

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
HV 53_ 101	spring ret.	G 3/8"	2250 l/min	1 - 10 bar	25 N	0,60 kg
HV 53_ 121	spring ret.	G 1/2"	3000 l/min	1 - 10 bar	32 N	0,80 kg
HV 53_ 181	spring ret.	G 3/4"	6000 l/min	1 - 10 bar	40 N	1,64 kg
HVR 53_ 101	indexed	G 3/8"	2250 l/min	1 - 10 bar	25 N	0,60 kg
HVR 53_ 121	indexed	G 1/2"	3000 l/min	1 - 10 bar	32 N	0,80 kg
HVR 53_ 181	indexed	G 3/4"	6000 l/min	1 - 10 bar	40 N	1,64 kg



# HV 511 704/HVR 520 704 HV 53\_704/HVR 53\_704



Lever actuated 5/2-way and 5/3-way spool valves. All the ports are in the plate.

Type HV            spring return  
Type HVR        indexed

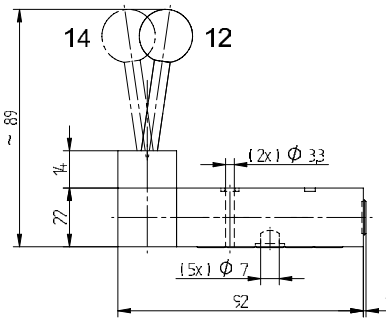
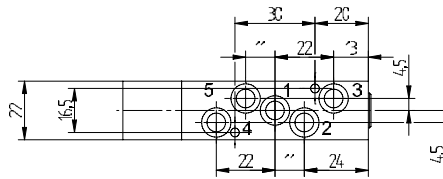
Type 511 and 520            5/2-way  
Type 531            centre closed            5/3-way  
Type 532            centre exhausted        5/3-way  
Type 533            centre pressurised       5/3-way

The lever is sealed by using a metal ball.

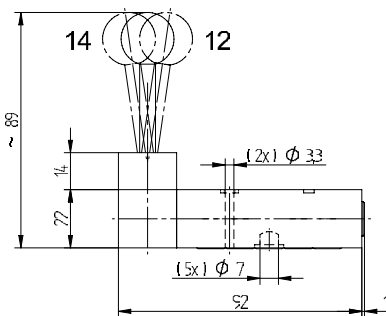
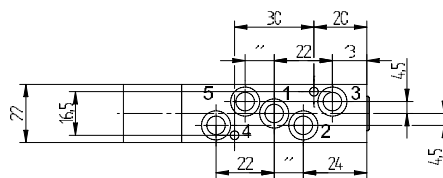
Manifolds are displayed on page 2.7.2.8.

Blanking plates are also available type BP 5 704.

Mounting screws and seals are included.

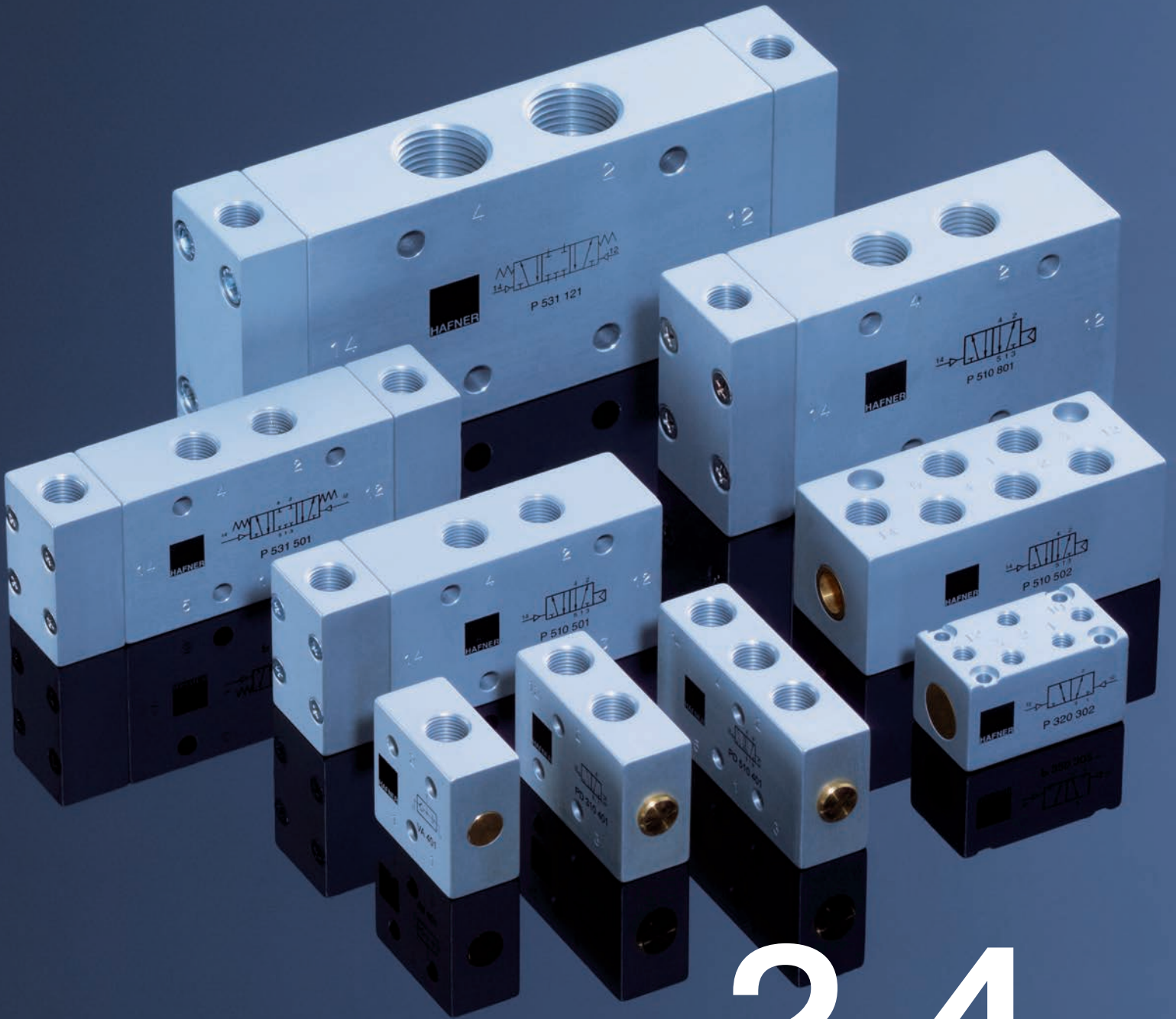


**HV 511 704/HVR 520 704**



**HV 53\_704/HVR 53\_704**

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
HV 511 704	5/2-way spring ret.	Ø 7 mm	1250 l/min	1 - 10 bar	20 N	0,20 kg
HVR 520 704	5/2-way indexed	Ø 7 mm	1250 l/min	1 - 10 bar	20 N	0,20 kg
HV 53_704	5/3-way spring ret.	Ø 7 mm	1250 l/min	1 - 10 bar	20 N	0,20 kg
HVR 53_704	5/3-way indexed	Ø 7 mm	1250 l/min	1 - 10 bar	20 N	0,20 kg



# 2.4

## Pilot Actuated Valves

Selected valves can be used for technical vacuum too.



Selected models are available for low temperature application.  
For detailed information refer to chapter 2.12.



Selected models can be equipped with FKM seals for high temperature environment up to 120 °C.



Selected models are available in stainless steel.  
For detailed information refer to chapter 2.13.

Selected models are available for explosion hazardous environment.  
For detailed information refer to chapter 2.15.

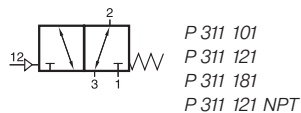
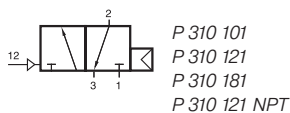








# P 310 101/P 310 121/P 310 181 P 311 101/P 311 121/P 311 181



Pneumatically actuated 3/2-way spool valve.

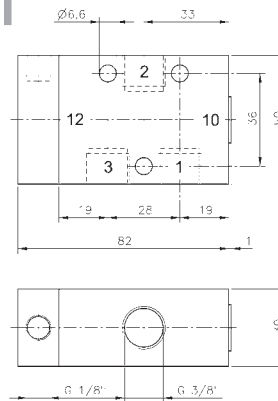
Type P 310 \_\_\_ with air-spring-return.

Operating pressure and actuating pressure should be at the same level. Pressure can be applied to port 1 (NC) or port 2 (NO).

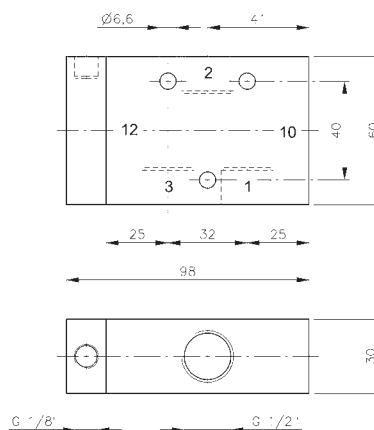
Type P 311 \_\_\_ with mechanical spring return. Pressure can be applied to port 1 (NC), port 2 (NO) or port 3 (switch).

If 2/2-way is required, please use type P 311 \_\_\_\_. Ports can be fully plugged.

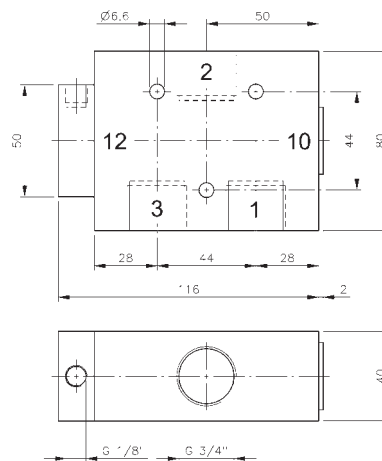
Exhaust can be throttled.







**P 310 101/P 311 101**



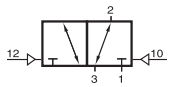
**P 310 121/P 311 121  
P 310 121 NPT/P 311 121 NPT**



**P 310 181/P 311 181**

Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 310 101	G 3/8"	2250 l/min	1,5 - 10 bar	the same	0,32 kg 
P 310 121	G 1/2"	3000 l/min	1 - 10 bar	the same	0,45 kg  
P 310 181	G 3/4"	6000 l/min	1 - 10 bar	the same	0,85 kg
P 311 101	G 3/8"	2250 l/min	1 - 10 bar	3 - 10 bar	0,32 kg
P 311 121	G 1/2"	3000 l/min	1 - 10 bar	3 - 10 bar	0,45 kg 
P 311 181	G 3/4"	6000 l/min	1 - 10 bar	3 - 10 bar	0,85 kg
P 310 121 NPT	1/2" NPT	3000 l/min	1 - 10 bar	the same	0,45 kg 
P 311 121 NPT	1/2" NPT	3000 l/min	1 - 10 bar	3 - 10 bar	0,45 kg 

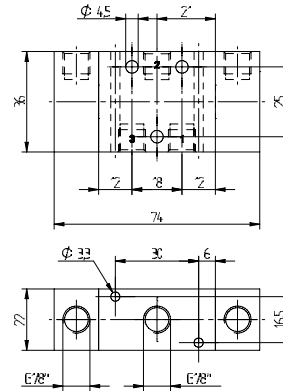
# P 320 501 G/P 320 701 G/ P 320 801



P 320 501 G  
 P 320 701 G  
 P 320 801



G-Series 501 G/701 G



**P 320 501 G**

Pneumatically actuated 3/2-way spool valve actuated by impulse.

If signal is applied to 12 the valve is open from 1 to 2 and 3 is blocked.

If signal is applied at 10 the valve is open from 2 to 3.

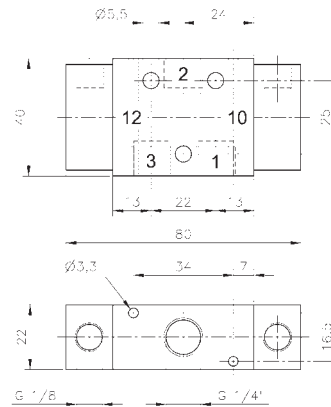
The G-Series valves offer the flexibility of in-line fitment as well as the option of being assembled on to a manifold as shown. Plates are displayed on page 2.7.1.3.

Position is kept until next pneumatic signal is applied.

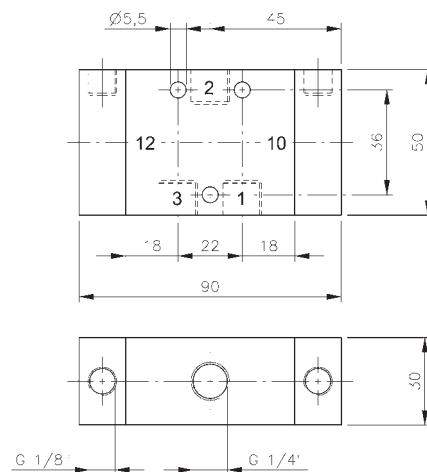
Operating pressure can also be applied to 2.

Exhaust can be throttled.

Versions with dominating piston Type 322 available on request.



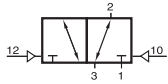
**P 320 701 G**



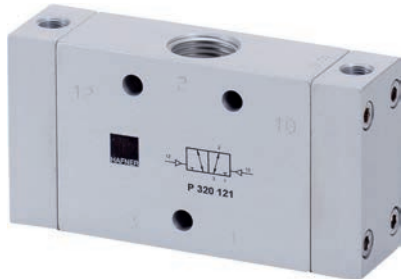
**P 320 801**

Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 320 501 G	G 1/8"	650 l/min	1 - 10 bar	2,5 - 10 bar	0,16 kg
P 320 701 G	G 1/4"	1250 l/min	1 - 10 bar	2,5 - 10 bar	0,17 kg
P 320 801	G 1/4"	1450 l/min	1 - 10 bar	2,5 - 10 bar	0,34 kg

# P 320 101/P 320 121/P 320 181



P 320 101  
P 320 121  
P 320 181



Pneumatically actuated 3/2-way spool valve actuated by impulse.

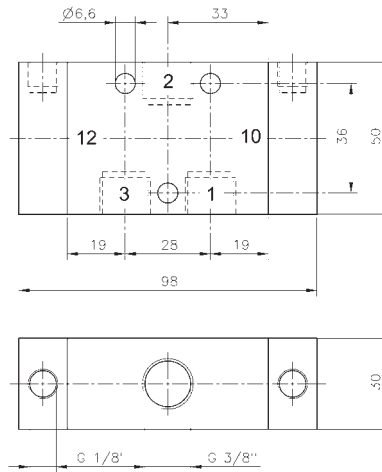
If signal is applied to 12 the valve is open from 1 to 2 and 3 is blocked.

If signal is applied at 10 the valve is open from 2 to 3.

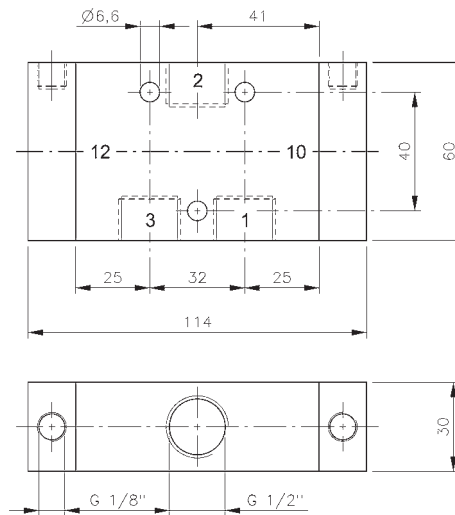
Operating pressure can also be applied to 2.

Position is kept until next pneumatic signal is applied.

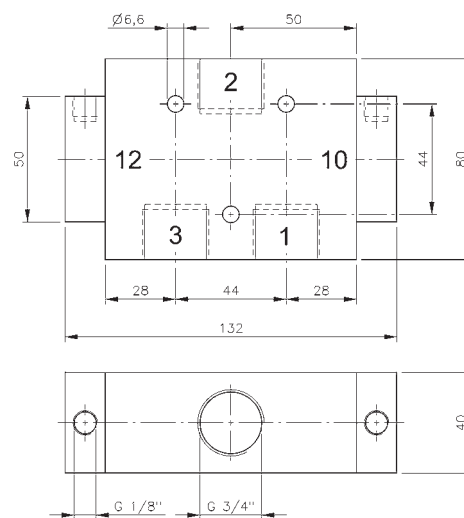
Exhaust can be throttled.



**P 320 101**



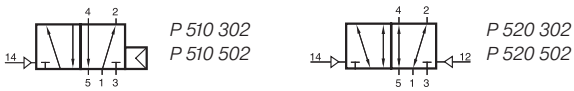
**P 320 121**



**P 320 181**

Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 320 101	G 3/8"	2250 l/min	1 - 10 bar	2,5 - 10 bar	0,38 kg
P 320 121	G 1/2"	3000 l/min	1 - 10 bar	2,5 - 10 bar	0,52 kg
P 320 181	G 3/4"	6000 l/min	1 - 10 bar	2 - 10 bar	0,88 kg

# P 510 302/P 510 502/P 520 302/P 520 502



Pneumatically actuated 5/2-way spool valve.

**Type 510:**

Actuated by permanent signal and equipped with air spring return.

Normally open from 1 to 2 and from 4 to 5.

If pressure is applied at 14 the valve is open from 1 to 4 and 2 to 3.

Operating pressure and actuating pressure should be at the same level.

**Type 520:**

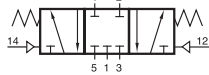
Pneumatically actuated 5/2-way spool valve actuated by impulse.

If signal is applied to 14 the valve is open from 1 to 4 and 2 to 3, 5 is closed.

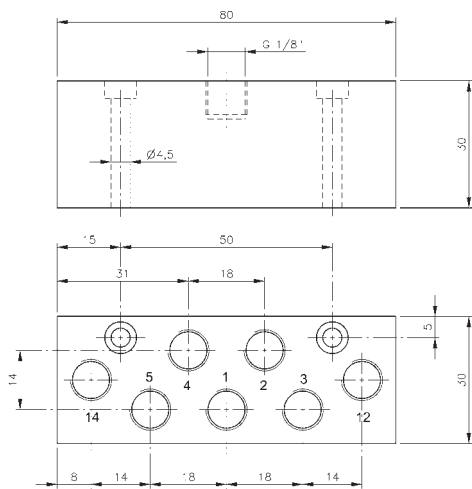
If signal is applied to 12 the valve is open from 1 to 2 and 4 to 5.

Position is kept until next pneumatic signal is applied.

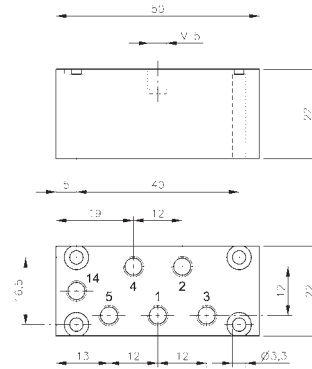
5/3-way centre closed version type P 531 302 available on request.



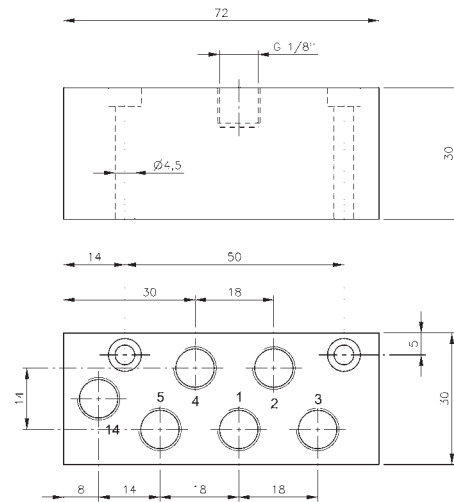
Exhaust can be throttled.



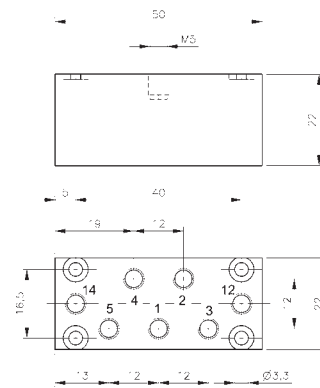
**P 520 502**



**P 510 302**



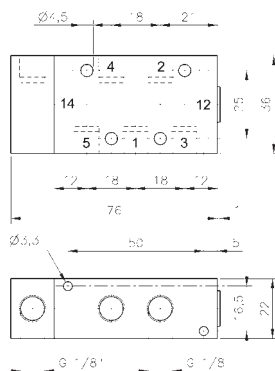
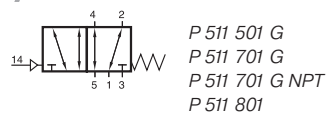
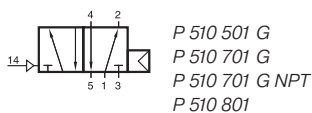
**P 510 502**



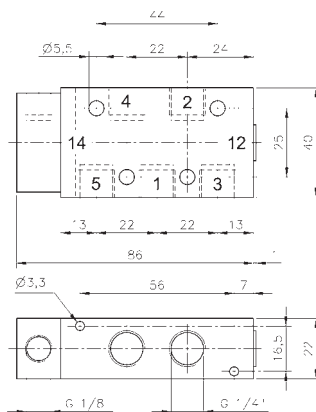
**P 520 302**

Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 510 302	M5	180 l/min	2 - 10 bar	the same	0,07 kg
P 510 502	G 1/8"	650 l/min	2 - 10 bar	the same	0,17 kg
P 520 302	M5	180 l/min	1 - 10 bar	2 - 10 bar	0,07 kg
P 520 502	G 1/8"	650 l/min	1 - 10 bar	2 - 10 bar	0,17 kg

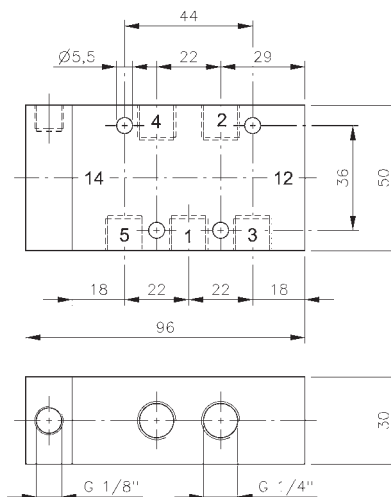
# P 510 501 G/P 510 701 G/P 510 801 P 511 501 G/P 511 701 G/P 511 801



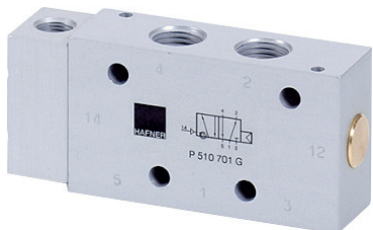
**P 510 501 G/P 511 501 G**



**P 510 701 G/P 511 701 G  
P 501 701 G NPT/P 511 701 G NPT**



**P 510 801/P 511 801**



G-Series 501 G/701 G



Pneumatically actuated 5/2-way spool valve.

Type P 510 \_\_\_ with air-spring-return.

Operating pressure and actuating pressure should be at the same level.

Type P 511 \_\_\_ with mechanical spring return.

Normally open from 1 to 2 and from 4 to 5.

If pressure is applied at 14 the valve is open from 1 to 4 and 2 to 3.

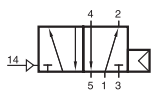
The G-Series valves offer the flexibility of in-line fitment as well as the option of being assembled on to a manifold as shown. Manifolds for valves type 501 G are displayed on page 2.7.2.2, manifolds for valves type 701 G are displayed on page 2.7.2.3.

Exhaust can be throttled.

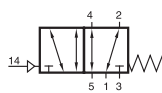
Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 510 501 G	G 1/8"	650 l/min	2 - 10 bar	the same	0,16 kg
P 510 701 G	G 1/4"	1250 l/min	2 - 10 bar	the same	0,18 kg
P 510 801	G 1/4"	1450 l/min	1,5 - 10 bar	the same	0,38 kg
P 511 501 G	G 1/8"	650 l/min	1 - 10 bar	3 - 10 bar	0,16 kg
P 511 701 G	G 1/4"	1250 l/min	1 - 10 bar	3 - 10 bar	0,18 kg
P 511 801	G 1/4"	1450 l/min	1 - 10 bar	3 - 10 bar	0,38 kg
P 510 701 G NPT	1/4" NPT	1250 l/min	2 - 10 bar	the same	0,18 kg
P 511 701 G NPT	1/4" NPT	1250 l/min	1 - 10 bar	3 - 10 bar	0,18 kg



# P 510 101/P 510 121/P 510 181 P 511 101/P 511 121/P 511 181



P 510 101  
P 510 121  
P 510 181  
P 510 121 NPT



P 511 101  
P 511 121  
P 511 181  
P 511 121 NPT



Pneumatically actuated 5/2-way spool valve.

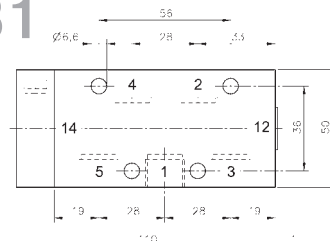
Type P 510 \_\_\_ with air-spring-return.  
Operating pressure and actuating pressure should be at the same level.

Type P 511 \_\_\_ with mechanical spring return.

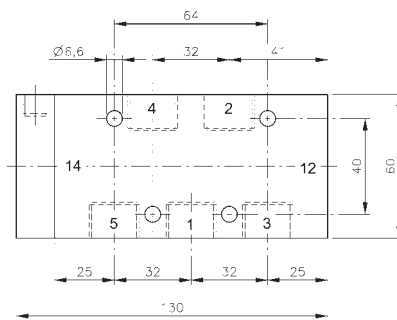
Normally open from 1 to 2 and from 4 to 5.  
If pressure is applied at 14 the valve is open from 1 to 4 and 2 to 3.

Exhaust can be throttled.

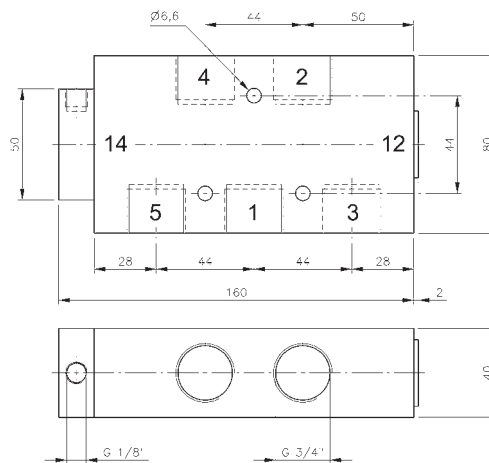
Valves type P 510 121 G and P 511 121 G for manifolds displayed on page 2.7.2.5.



**P 510 101/P 511 101**



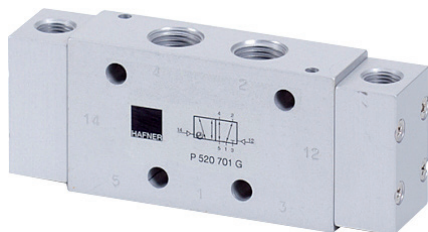
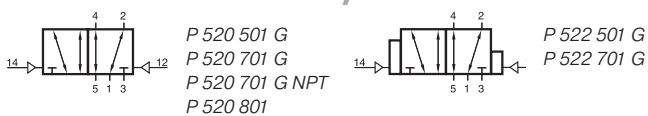
**P 510 121/P 511 121  
P 510 121 NPT/P511 121 NPT**



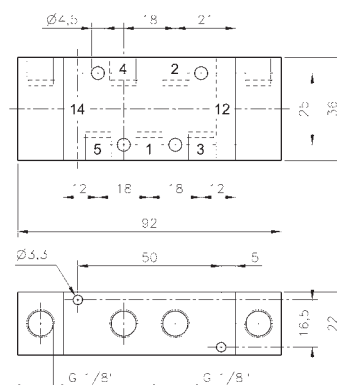
**P 510 181/P 511 181**

Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 510 101	G 3/8"	2250 l/min	1,5 - 10 bar	the same	0,42 kg
P 510 121	G 1/2"	3000 l/min	1 - 10 bar	the same	0,59 kg
P 510 181	G 3/4"	6000 l/min	1 - 10 bar	the same	1,18 kg
P 511 101	G 3/8"	2250 l/min	1 - 10 bar	3 - 10 bar	0,42 kg
P 511 121	G 1/2"	3000 l/min	1 - 10 bar	3 - 10 bar	0,59 kg
P 511 181	G 3/4"	6000 l/min	1 - 10 bar	3 - 10 bar	1,18 kg
P 510 121 NPT	1/2" NPT	3000 l/min	1 - 10 bar	the same	0,59 kg
P 511 121 NPT	1/2" NPT	3000 l/min	1 - 10 bar	3 - 10 bar	0,59 kg

# P 520 501 G/P 520 701 G/P 520 801 P 522 501 G/P 522 701 G



G-Series 501 G/701 G



**P 520 501 G/P 522 501 G**

Pneumatically actuated 5/2-way spool valve.

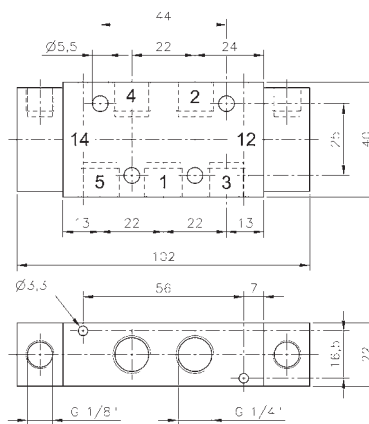
Type P 520 \_\_\_ double pilot  
Type P 522 \_\_\_ double pilot dominating at port 14

If signal is applied to 14 the valve is open from 1 to 4 and 2 to 3, 5 is closed.  
If signal is applied to 12 the valve is open from 1 to 2 and 4 to 5.

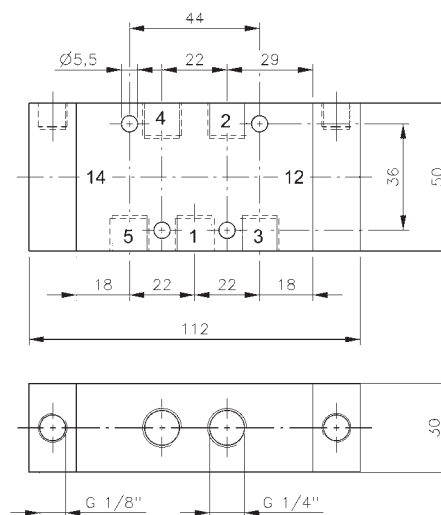
Position is kept until next pneumatic signal is applied.

The G-Series valves offer the flexibility of in-line fitment as well as the option of being assembled on to a manifold as shown. Manifolds for valves type 501 G are displayed on page 2.7.2.2, manifolds for valves type 701 G are displayed on page 2.7.2.3.

Exhaust can be throttled.



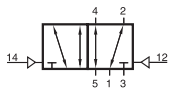
**P 520 701 G/P 522 701 G  
P 520 701 G NPT**



**P 520 801**

Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 520 501 G	G 1/8"	650 l/min	1 - 10 bar	2 - 10 bar	0,20 kg
P 522 501 G	G 1/8"	650 l/min	1 - 10 bar	2 - 10 bar	0,20 kg
P 520 701 G	G 1/4"	1250 l/min	1 - 10 bar	2 - 10 bar	0,22 kg
P 522 701 G	G 1/4"	1250 l/min	1 - 10 bar	2 - 10 bar	0,22 kg
P 520 801	G 1/4"	1450 l/min	1 - 10 bar	1,5 - 10 bar	0,44 kg
P 520 701 G NPT	1/4" NPT	1250 l/min	1 - 10 bar	2 - 10 bar	0,22 kg

# P 520 101/P 520 121/P 520 181



P 520 101  
 P 520 121  
 P 520 181  
 P 520 121 NPT



Pneumatically actuated 5/2-way spool valve actuated by impulse.

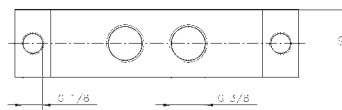
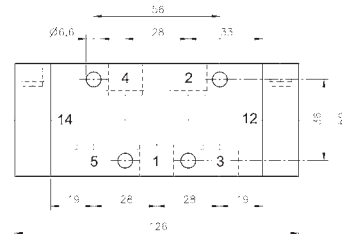
If signal is applied to 14 the valve is open from 1 to 4 and 2 to 3, 5 is closed.

If signal is applied to 12 the valve is open from 1 to 2 and 4 to 5.

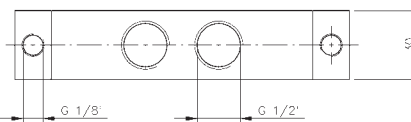
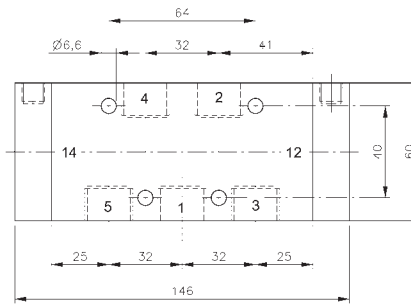
Position is kept until next pneumatic signal is applied.

Exhaust can be throttled.

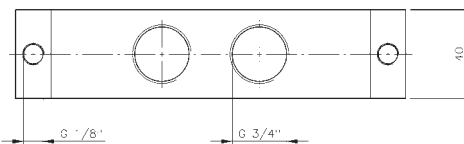
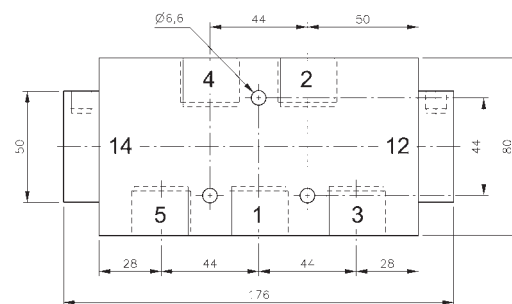
Valve type P 520 121 G for manifolds displayed on page 2.7.2.5.



**P 520 101**



**P 520 121/P 520 121 NPT**

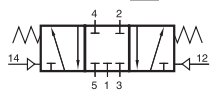


**P 520 181**

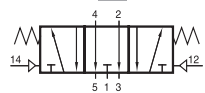
Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 520 101	G 3/8"	2250 l/min	1 - 10 bar	1,5 - 10 bar	0,48 kg
P 520 121	G 1/2"	3000 l/min	1 - 10 bar	1 - 10 bar	0,67 kg
P 520 181	G 3/4"	6000 l/min	1 - 10 bar	1 - 10 bar	1,22 kg
P 520 121 NPT	1/2" NPT	3000 l/min	1 - 10 bar	1 - 10 bar	0,67 kg



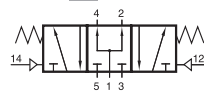
# P 53\_ 501 G/P 53\_ 701 G/P 53\_ 801



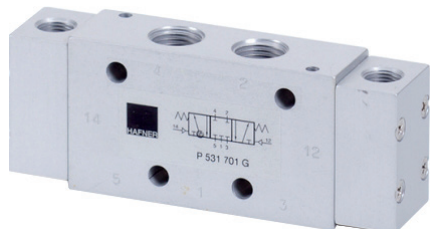
P 531 501 G  
P 531 701 G  
P 531 701 G NPT  
P 531 801



P 532 501 G  
P 532 701 G  
P 532 701 G NPT  
P 532 801



P 533 501 G  
P 533 701 G  
P 533 701 G NPT  
P 533 801



G-Series 501 G/701 G



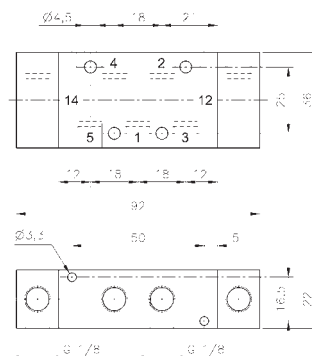
Pneumatically actuated 5/3-way spool valve with spring return to middle position.

- Type 531 centre closed
- Type 532 centre exhausted
- Type 533 centre pressurised

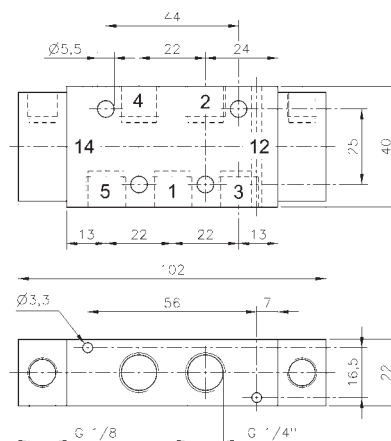
When ordering please complete the type number by 1, 2 or 3 according to the type in need.

The G-Series valves offer the flexibility of in-line fitment as well as the option of being assembled on to a manifold as shown. Manifolds for valves type 501 G are displayed on page 2.7.2.2, manifolds for valves type 701 G are displayed on page 2.7.2.3.

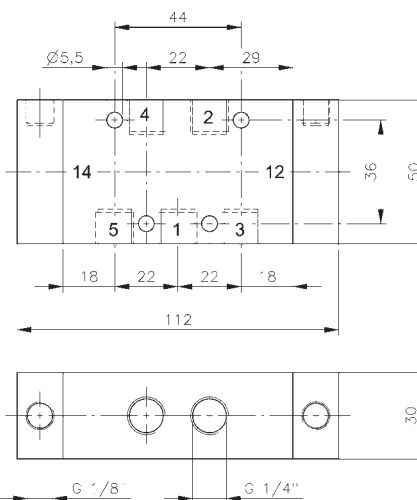
Exhaust can be throttled.



P 53\_ 501 G



P 53\_ 701 G/P 53\_ 701 G NPT

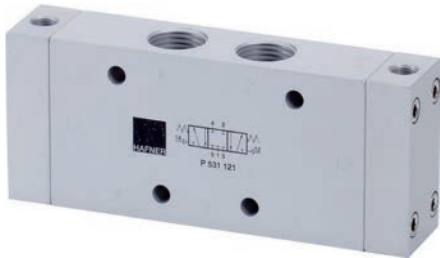
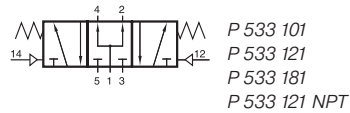
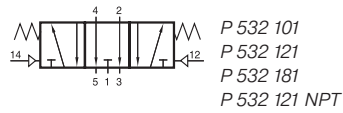
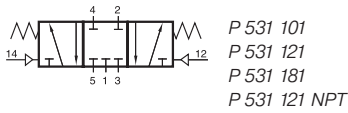


P 53\_ 801

Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 53_ 501 G	G 1/8"	650 l/min	1 - 10 bar	3 - 10 bar	0,20 kg
P 53_ 701 G	G 1/4"	1250 l/min	1 - 10 bar	3 - 10 bar	0,22 kg
P 53_ 801	G 1/4"	1450 l/min	1 - 10 bar	3 - 10 bar	0,44 kg
P 53_ 701 G NPT	1/4" NPT	1250 l/min	1 - 10 bar	3 - 10 bar	0,22 kg



# P 53\_ 101/P 53\_ 121/P 53\_ 181



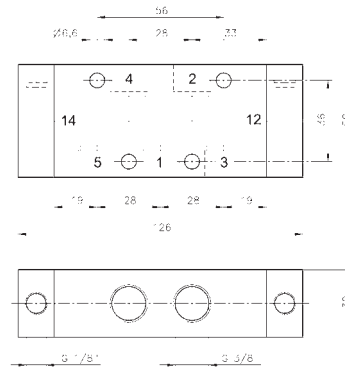
Pneumatically actuated 5/3-way spool valve with spring return to middle position.

- Type 531 centre closed
- Type 532 centre exhausted
- Type 533 centre pressurised

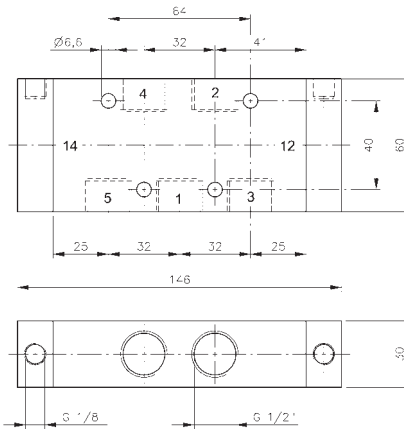
When ordering please complete the type number by 1, 2 or 3 according to the type required.

Exhaust can be throttled.

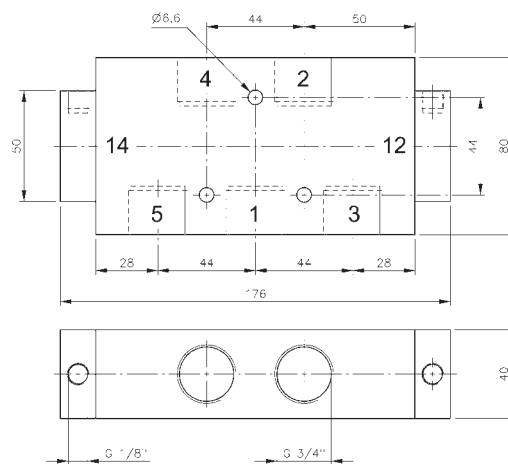
Valve type P 53\_ 121 G for manifolds displayed on page 2.7.2.5.



**P 53\_ 101**



**P 53\_ 121/P 53\_ 121 NPT**

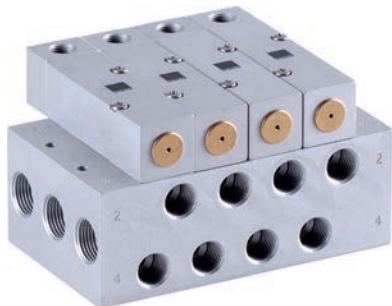
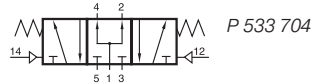
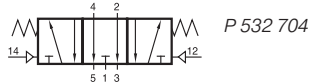
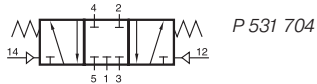
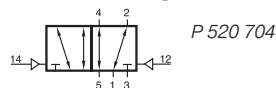
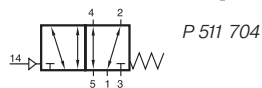
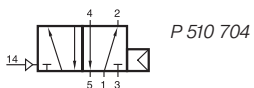


**P 53\_ 181**

Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 53_ 101	G 3/8"	2250 l/min	1 - 10 bar	3 - 10 bar	0,49 kg
P 53_ 121	G 1/2"	3000 l/min	1 - 10 bar	3 - 10 bar	0,69 kg
P 53_ 181	G 3/4"	6000 l/min	1 - 10 bar	3 - 10 bar	1,22 kg
P 53_ 121 NPT	1/2" NPT	3000 l/min	1 - 10 bar	3 - 10 bar	0,69 kg

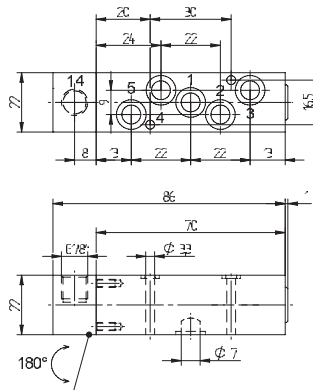


# P 510 704/P 511 704/P 520 704/P 53\_704



Pneumatically actuated 5/2-way and 5/3-way spool valves.  
All the ports are in the plate.

- |          |                    |                              |
|----------|--------------------|------------------------------|
| Type 510 | single pilot       | air spring return, 5/2-way   |
| Type 511 | single pilot       | mech. spring return, 5/2-way |
| Type 520 | double pilot       | 5/2-way                      |
| Type 531 | centre closed      | 5/3-way                      |
| Type 532 | centre exhausted   | 5/3-way                      |
| Type 533 | centre pressurised | 5/3-way                      |

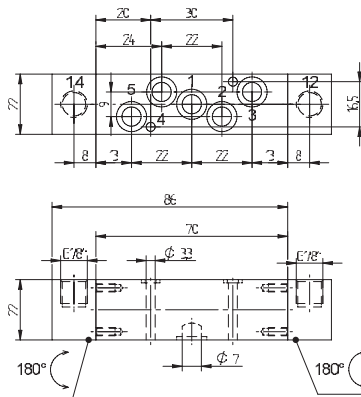


**P 510 704**

Manifolds are displayed on page 2.7.2.8.

Blanking plates are also available type BP 5 704.

Mounting screws and seals are included.

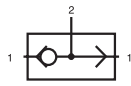


**P 520 704/P 53\_704**

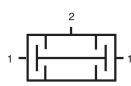
Type	Function	Port size	Air flow	Operating press.	Actuating press.	Weight
P 510 704	5/2-way air spring	Ø 7 mm	1250 l/min	2 - 10 bar	the same	0,20 kg
P 511 704	5/2-way mech. spring	Ø 7 mm	1250 l/min	1 - 10 bar	3 - 10 bar	0,20 kg
P 520 704	5/2-way double pilot	Ø 7 mm	1250 l/min	1 - 10 bar	2 - 10 bar	0,29 kg
P 53_704	5/3-way	Ø 7 mm	1250 l/min	1 - 10 bar	3 - 10 bar	0,29 kg



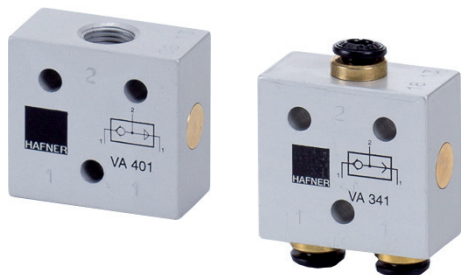
# VA 341/VA 361/VA 401 ES 341/ES 401



VA 341  
VA 361  
VA 401



ES 341  
ES 401



### VA 341/VA 361/VA 401: OR-gate

The OR-gate has two inputs 1 and one output 2.

The shuttle valve is used when only one of two possible signals is required to pass on a signal.

Function: If one of two signal inputs are activated, an output signal on port 2 is present and the other input is blocked.

In case of pressurising both inputs at different pressure levels, the higher pressure is fed to port 2.

### ES 341/ES 401: AND-gate

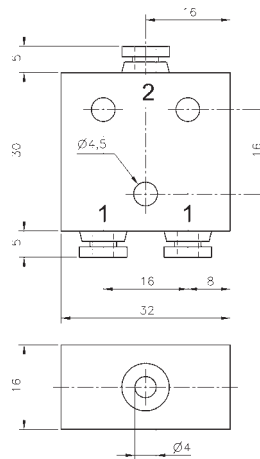
The AND-gate has two inputs 1 and one output 2.

The dual-pressure valve is used when at least 2 signals are required before a signal is passed on.

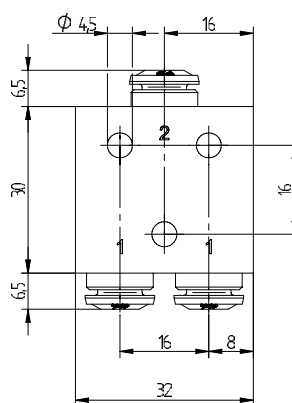
Function: Only when both inputs are pressurised output 2 is pressurised.

If two different pressures are applied the lower pressure is fed to output 2.

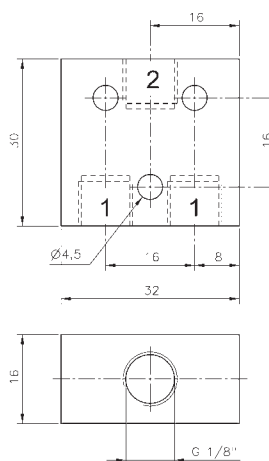
In case of only one signal at one of the two ports 1, the output 2 is blocked.



VA 341/ES 341



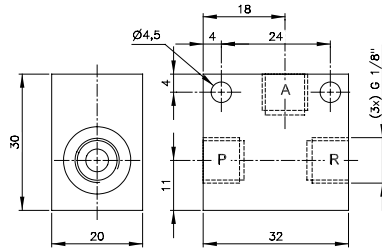
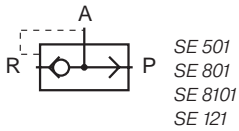
VA 361



VA 401/ES 401

Type	Function	Port size	Air flow	Operating press.	Weight
VA 341	OR	pif 4 mm	280 l/min	1 - 10 bar	0,04 kg
VA 361	OR	pif 6 mm	280 l/min	1 - 10 bar	0,04 kg
VA 401	OR	G 1/8"	280 l/min	1 - 10 bar	0,04 kg
ES 341	AND	pif 4 mm	280 l/min	1 - 10 bar	0,04 kg
ES 401	AND	G 1/8"	280 l/min	1 - 10 bar	0,04 kg

# SE 501/SE 801/SE 8101/SE 121



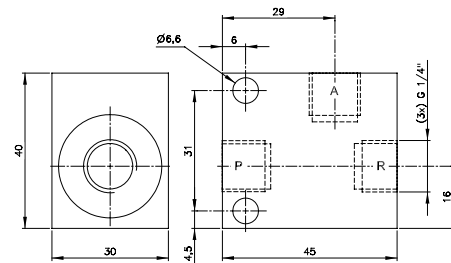
**SE 501**

Quick-exhaust valve which can also be used as non-return valve as well as or-gate.

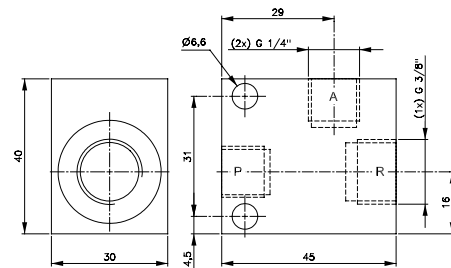
If used as a non-return valve please plug port R. Open from P to A, closed from A to P.

If used as an or-gate connect pressure to P and R. Port A is outlet.

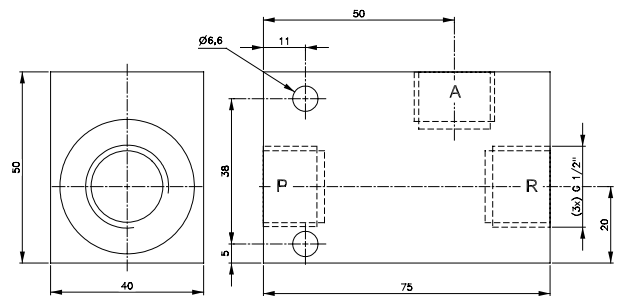
Temperature range: -20° C to +80° C











**SE 801**



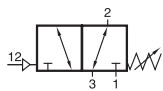
**SE 8101**



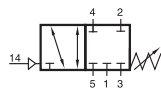
**SE 121**

Type	Port size A + P	Port size R	Air flow from A to R	Operating press.	Weight
SE 501	G 1/8"	G 1/8"	564 l/min	0,3 - 10 bar	0,06 kg  
SE 801	G 1/4"	G 1/4"	1188 l/min	0,2 - 10 bar	0,18 kg  
SE 8101	G 1/4"	G 3/8"	1188 l/min	0,2 - 10 bar	0,18 kg  
SE 121	G 1/2"	G 1/2"	3600 l/min	0,5 - 10 bar	0,26 kg  

# P 311 501 SR/P 411 701 SR P 411 701 SR NPT



P 311 501 SR



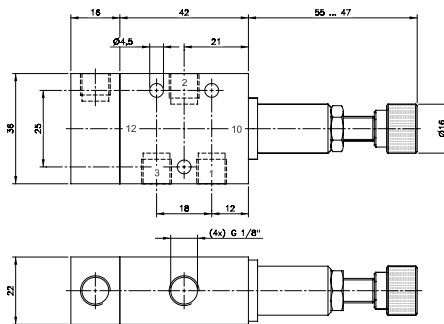
P 411 701 SR  
P 411 701 SR NPT



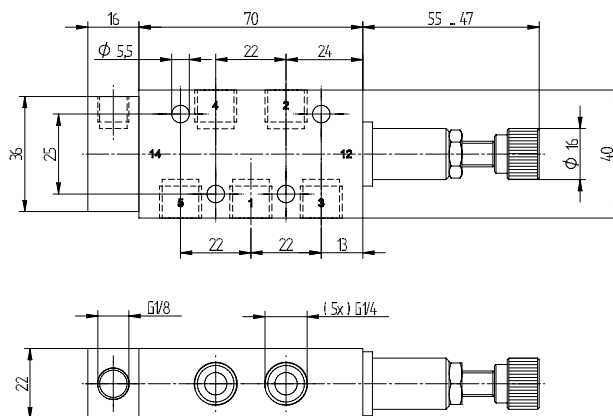
**P 311 501 SR** pneumatically actuated 3/2-way valve with mechanical spring return. Valve can be used normally closed (pressure at port 1) and normally open (pressure at port 3). Can also be used as 2/2-way valve. Unused port to be closed with a silencer or plug.

**P 411 701 SR** pneumatically actuated 4/2-way valve with mechanical spring return. Valve either blocks all ports or is open from 1 to 4 and from 3 to 2. Port 5 is a vent port and should have a silencer installed, do not plug.

Valve can be used as an **adjustable pneumatic pressure switch**. By turning the hand-wheel the required minimum actuation pressure can be set. Adjustment is not independent from operation pressure. Switch-on pressure differs from switch-off pressure due to a hysteresis of around 1.5 bar. The hysteresis is the difference between the pressure point when the valve is opening (e.g. 5 bar) and closing (e.g. 3.5). The 1.5 bar hysteresis is just a reference point as it is depending on the friction force. The proportion between the friction force and the force of the air is changing when the air pressure increases. Therefore the hysteresis is getting smaller when the set actuating pressure increases.



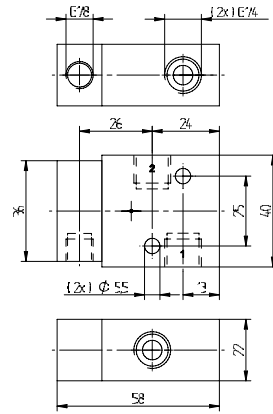
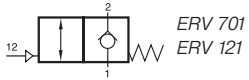
**P 311 501 SR**



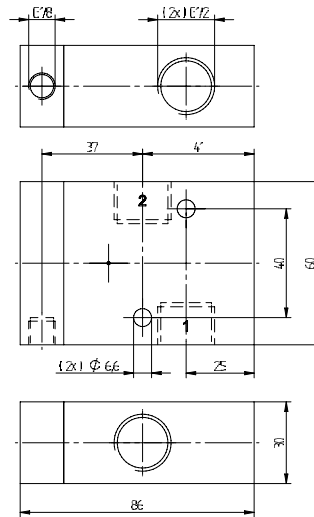
**P 411 701 SR/P 411 701 SR NPT**

Type	Port size	Air flow	Operating press.	Regulating range act. press.	Max. act. press.	Weight
P 311 501 SR	G 1/8"	650 l/min	1 - 10 bar	3 - 6 bar	10 bar	0,16 kg
P 311 501 SR 02	G 1/8"	650 l/min	1 - 10 bar	5 - 8 bar	10 bar	0,16 kg
P 311 501 SR 03	G 1/8"	650 l/min	1 - 10 bar	2 - 4 bar	10 bar	0,16 kg
P 411 701 SR	G 1/4"	1250 l/min	1 - 10 bar	3 - 6 bar	10 bar	0,21 kg
P 411 701 SR NPT	1/4" NPT	1250 l/min	1 - 10 bar	3 - 6 bar	10 bar	0,21 kg

# ERV 701/ERV 121



**ERV 701**



**ERV 121**

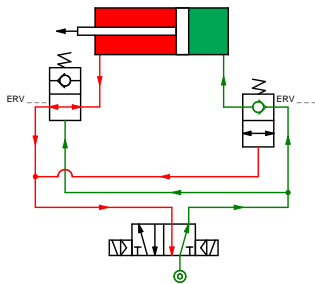
Pilot operated non-return valve.

Port 1 is blocked in basic position, but port 2 can exhaust through port 1.

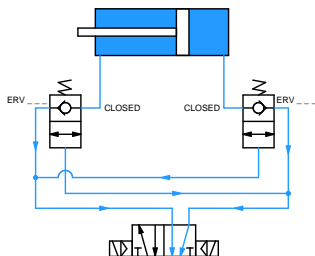
When a pilot signal is applied to port 12, the valve opens from 1 to 2.

Valve can be used to lock the air in a cylinder in case of loss of air pressure.

Cylinder in movement:



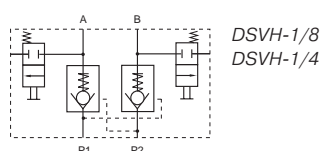
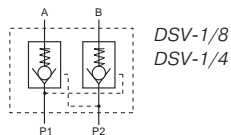
Pressure loss:



Type	Port size 1 and 2	Port size 12	Air flow	Operating press.	Weight
ERV 701	G 1/4"	G 1/8"	1250 l/min	1 - 10 bar	0,14 kg
ERV 121	G 1/2"	G 1/8"	3000 l/min	1 - 10 bar	0,45 kg



# DSV-1/8 / DSV-1/4 / DSVH-1/8 / DSVH-1/4



Pressure holding valves to hold a double acting actuator at the current position in case of pressure failure.

The valve consists of two non-return valves which will be unlocked by pressurising port P1 or P2.

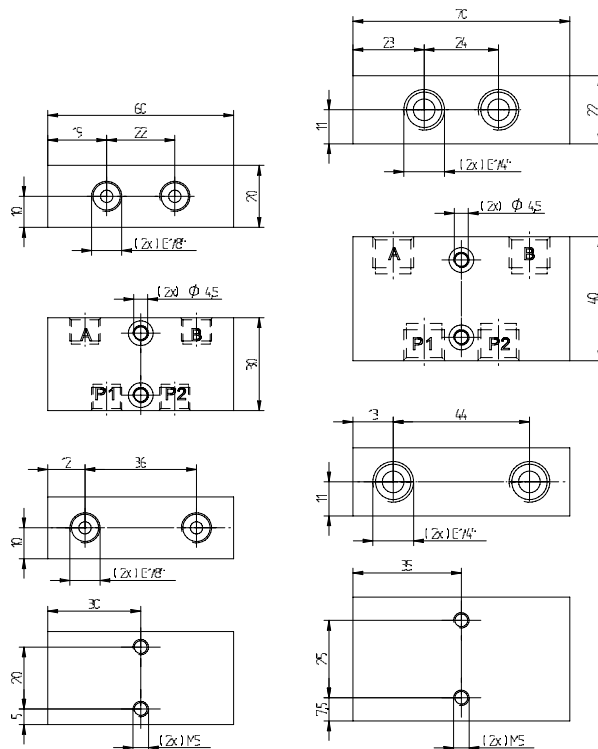
Installation between pilot valve and actuator.

In case of pressure failure, the valve is locking the air in the gripper and thereby it does not lose its load.

Type DSVH with manual exhaust function. The user can exhaust the actuator manually by pushing the manual exhaust buttons.

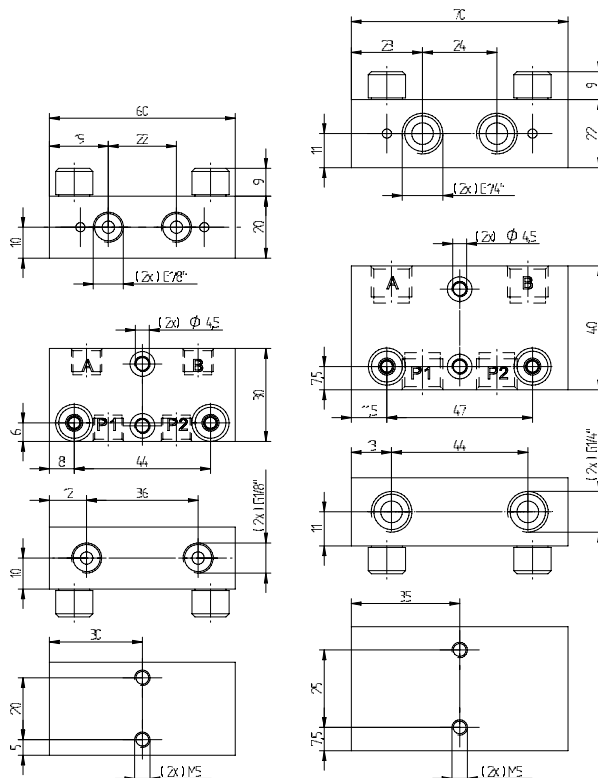
Inner parts are made of brass and POM, seals are made of NBR.

The valve is often used in combination with pneumatic grippers.



**DSV-1/8**

**DSV-1/4**



**DSVH-1/8**

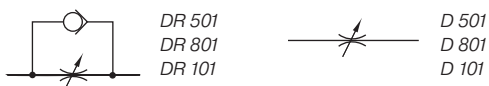
**DSVH-1/4**

Type	Port size	Air flow P to A/B	Air flow A/B to P	Operating press.	Weight
DSV-1/8	G 1/8"	230 l/min	360 l/min	1 - 10 bar	0,10 kg
DSV-1/4	G 1/4"	650 l/min	1000 l/min	1 - 10 bar	0,12 kg
DSVH-1/8	G 1/8"	230 l/min	360 l/min	1 - 10 bar	0,16 kg
DSVH-1/4	G 1/4"	650 l/min	1000 l/min	1 - 10 bar	0,18 kg





# DR 501/DR 801/DR 101 D 501/D 801/D 101



Block form flow regulator.

### Type DR

uni-directional block form flow regulator.

Air streaming in the direction of the throttle can be regulated by turning the spindle. In the opposite direction air streams unthrottled.

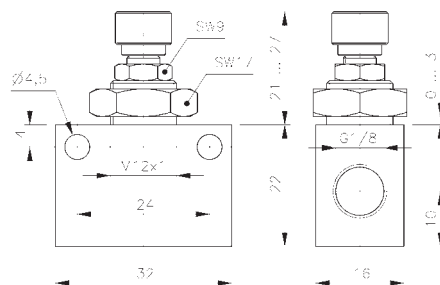
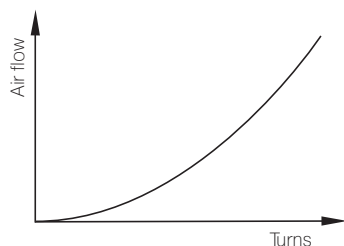
### Type D

bi-directional flow regulator. Air is regulated in both directions.

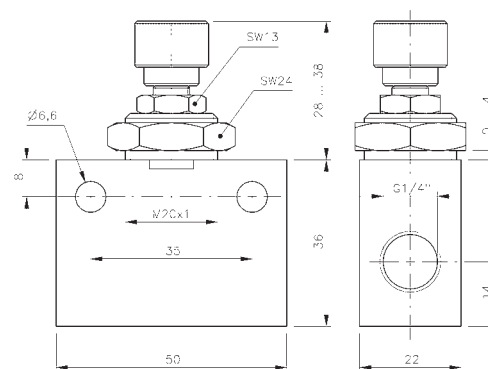
The throttle can be adjusted very precisely along the entire regulation range.

Adjustment can be locked.

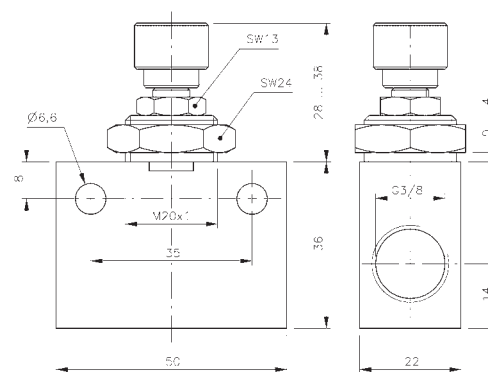
Suitable for wall and panel mounting.  
Nut is included.



**DR 501/D 501**



**DR 801/D 801**



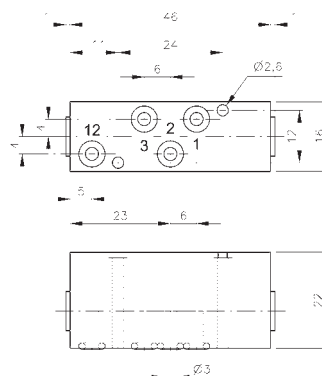
**DR 101/D 101**

Type	Port size	Air flow*	Airflow in opposite direction*	Operating press.	Weight
D 501	G 1/8"	450 l/min	450 l/min	0,5 - 10 bar	0,04 kg
D 801	G 1/4"	1150 l/min	1150 l/min	0,5 - 10 bar	0,13 kg
D 101	G 3/8"	1450 l/min	1450 l/min	0,5 - 10 bar	0,13 kg
DR 501	G 1/8"	450 l/min	450 l/min	2 - 10 bar	0,04 kg
DR 801	G 1/4"	1150 l/min	1150 l/min	2 - 10 bar	0,13 kg
DR 101	G 3/8"	1450 l/min	1450 l/min	2 - 10 bar	0,13 kg

\* Values at 10 bar inlet pressure and without back pressure.



# P 310 304/P 311 304 P 320 304/P 322 304/RP 3 344



**P 310 304/P 311 304**

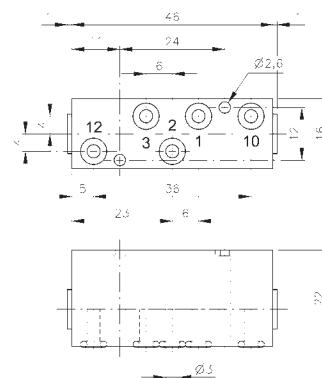
Pneumatically actuated 3/2-way spool valves.  
To be assembled to plate RP 3 344.

Four different versions are offered:

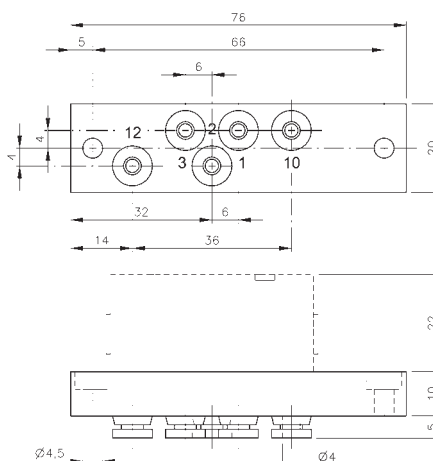
- P 310 304 valve with air-spring return
- P 311 304 valve with mechanical spring return  
Pressure applied to port 1 = YES-function  
Pressure applied to port 3 = NOT-function
- P 320 304 double pilot valve
- P 322 304 double pilot valve dominating at port 12

For P 310 304 the operating and actuating pressure should be at the same level.

RP 3 344 is designed for carrying one 3/2-way valve type P 310 304, P 311 304, P 320 304 or P 322 304.  
The plate is equipped with 5 push-in fittings for 4 mm tube.



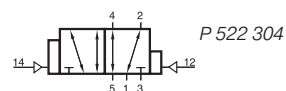
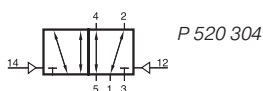
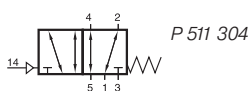
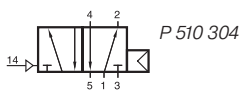
**P 320 304/P 322 304**



**RP 3 344**

Type	Port size	Air flow	Operating press.	Actuating press	Weight
P 310 304	Ø 3 mm	280 l/min	2 - 10 bar	the same	0,04 kg
P 311 304	Ø 3 mm	280 l/min	2 - 10 bar	3 - 10 bar	0,04 kg
P 320 304	Ø 3 mm	280 l/min	2 - 10 bar	2,5 - 10 bar	0,04 kg
P 322 304	Ø 3 mm	280 l/min	2 - 10 bar	2,5 - 10 bar	0,04 kg
RP 3 344	pif 4 mm				0,04 kg

# P 510 304/P 511 304 P 520 304/P 522 304/RP 5 344



Pneumatically actuated 5/2-way spool valves.  
To be assembled to plate RP 5 344.

Four different versions are offered:

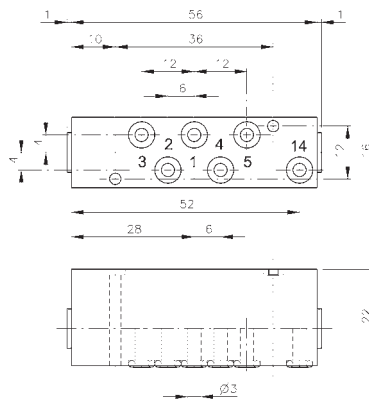
- P 510 304 valve with air-spring return
- P 511 304 valve with mechanical spring return
- P 520 304 double pilot valve
- P 522 304 double pilot valve dominating at port 14

5/3-way valves are available on request.

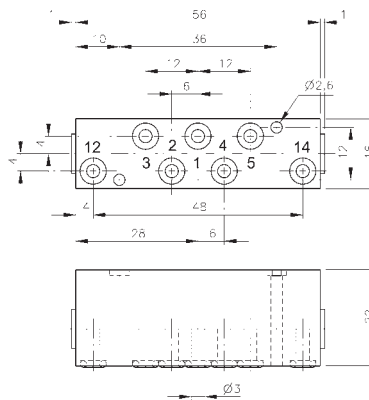
For P 510 304 the operating and actuating pressure should be at the same level.

RP 5 344 is designed for carrying one piece 5-way valve type P 510 304, P 511 304, P 520 304 or P 522 304.

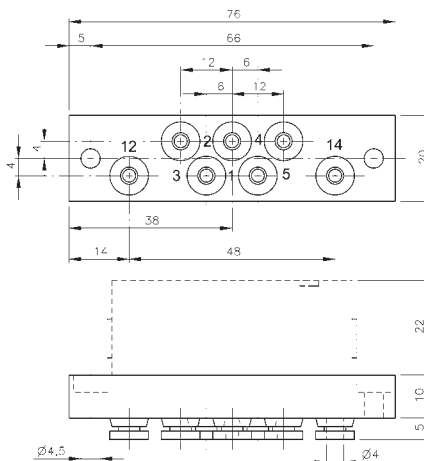
3/2-way valves can also be assembled to that plate.  
The plate is equipped with 7 push-in fittings for 4 mm tube.



**P 510 304/P 511 304**



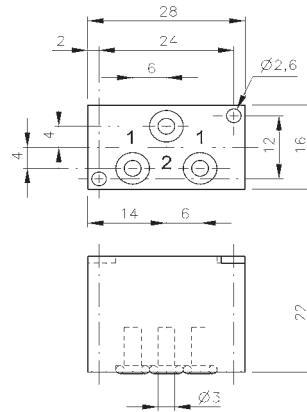
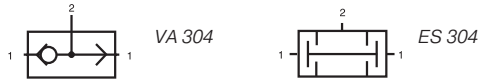
**P 520 304/P 522 304**



**RP 5 344**

Type	Port size	Air flow	Operating press.	Actuating press	Weight
P 510 304	Ø 3 mm	280 l/min	2 - 10 bar	the same	0,06 kg
P 511 304	Ø 3 mm	280 l/min	2 - 10 bar	3 - 10 bar	0,06 kg
P 520 304	Ø 3 mm	280 l/min	2 - 10 bar	2,5 - 10 bar	0,06 kg
P 522 304	Ø 3 mm	280 l/min	2 - 10 bar	2,5 - 10 bar	0,06 kg
RP 5 344	pif 4 mm				0,04 kg

# VA 304/ES 304/RP 2 344



**VA 304/ES 304**

## VA 304: OR-gate

The OR-gate has two inputs 1 and one output 2.

The shuttle valve is used when only one of two possible signals is required to pass on a signal.

Function: If one of two signal inputs are activated, an output signal on port 2 is present and the other input is blocked.

In case of pressurising both inputs at different pressure levels, the higher pressure is fed to port 2.

## ES 304: AND-gate

The AND-gate has two inputs 1 and one output 2.

The dual-pressure valve is used when at least 2 signals are required before a signal is passed on.

Function: Only when both inputs are pressurised output 2 is pressurised.

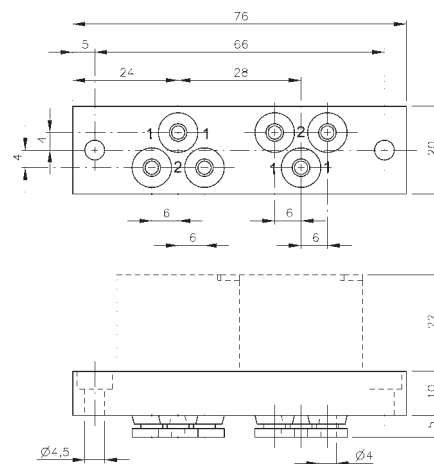
If two different pressures are applied the lower pressure is fed to output 2.

In case of only one signal at one of the two ports 1, the output 2 is blocked.



Both elements can be assembled to RP 2 344.

Plate can carry 2 pieces AND- or OR-gates.

Both types can be mixed on the plate. The plate is equipped with 6 push-in fittings for 4 mm tube.

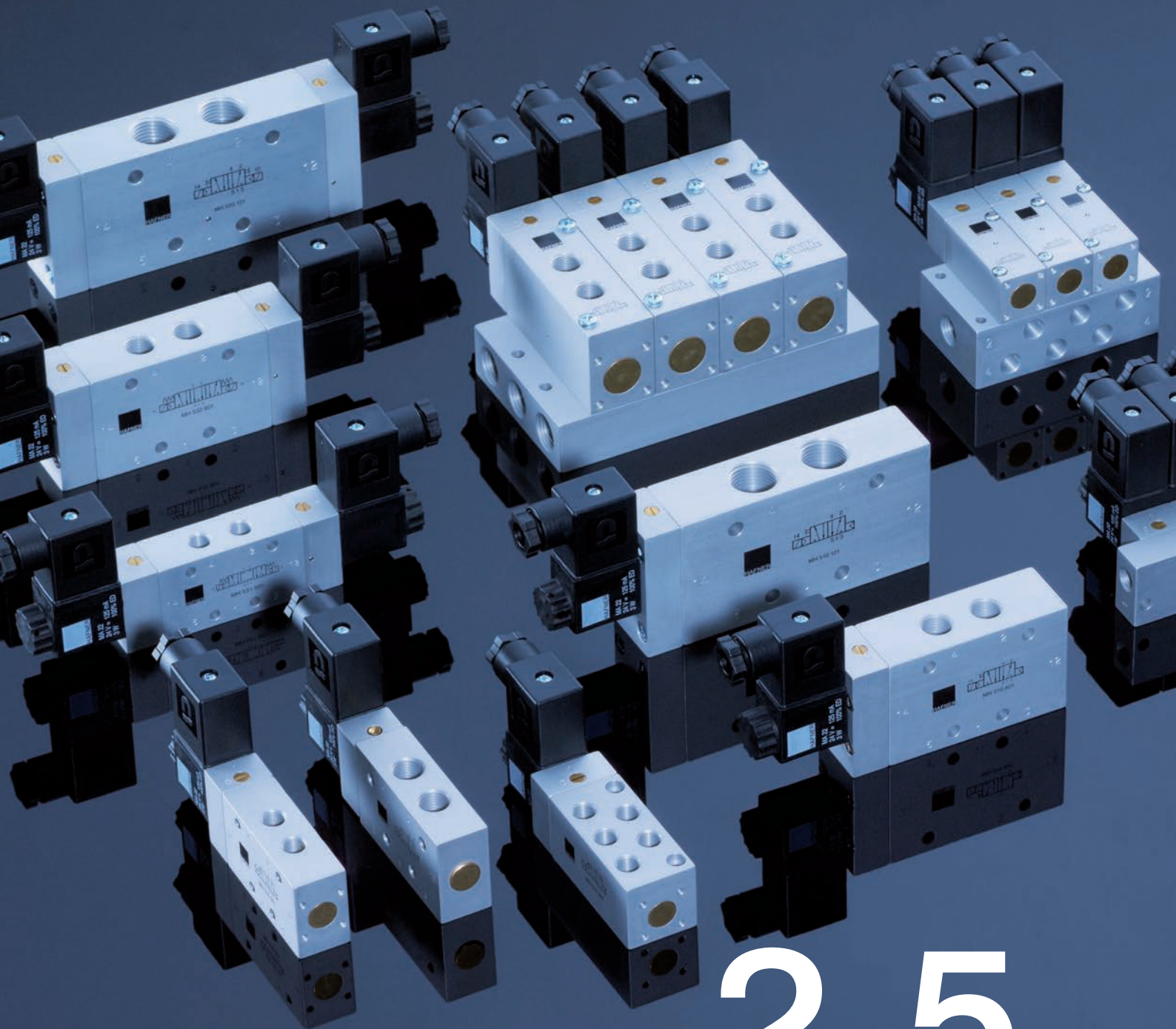


**RP 2 344**

Type	Function	Port size	Air flow	Operating press.	Weight
VA 304	OR	Ø 3 mm	280 l/min	1 - 10 bar	0,03 kg 
ES 304	AND	Ø 3 mm	280 l/min	1 - 10 bar	0,03 kg 
RP 2 344	plate	pif 4 mm			0,04 kg







# 2.5

## Solenoid Valves



Selected models are available for low temperature application. For detailed information refer to chapter 2.12.



Selected models are available with high flow and low power consumption. For detailed information refer to chapter 2.5.5.

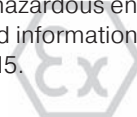


Selected models are available in stainless steel. For detailed information refer to chapter 2.13.

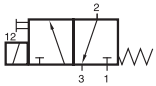


Selected models can be equipped for high temperature environments up to 80 °C, DC only!

Selected models are available for explosion hazardous environment. For detailed information refer to chapter 2.15.



# MD 311 010



MD 311 010



Direct acting 3/2-way solenoid, valve normally closed (n.c.), equipped with mechanical spring return.

By closing port 3 valve can be converted into a 2/2-way valve.

Available with solenoid operators:

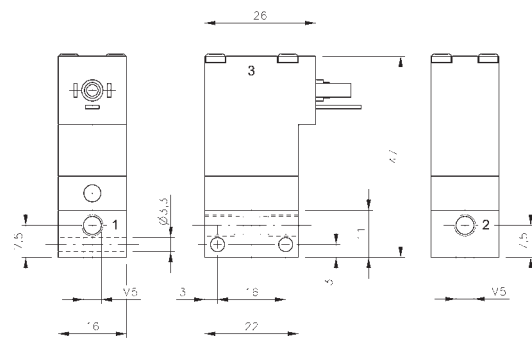
24V=, 12V=, 6V= either for connector form

C ISO 15217 or with flying leads, standard cable length 500 mm.

For details about solenoid system, please refer to page 2.14.1.

Valves are generally equipped with manual override to push.

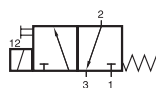
Valves can be used for technical vacuum too.



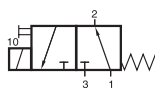
MD 311 010

Type	Funktion	Port size	Air flow	Operating press.	Power consumption	Weight
MD 311 010	n.c.	M5	30 l/min	-0,9 - 10 bar	1,8 W =	0,05 kg

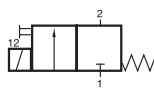
# MH 311 012/MOH 311 012/MH 211 012 MH 311 015/MOH 311 015/MH 211 015



MH 311 012  
MH 311 015



MOH 311 012  
MOH 311 015



MH 211 012  
MH 211 015



Direct acting 3/2-way and 2/2-way solenoid valve equipped with mechanical spring return.

### Type MH 311 \_\_\_

Normally closed, port 1 and 2 in the valve, port 3 at the top of the solenoid with manual override.

### Type MOH 311 \_\_\_

Normally open, port 2 and 3 in the valve, port 1 at the top of the solenoid with manual override.

### Type MH 211 \_\_\_

2/2-way valve n.c. with manual override.

By closing port 3 3/2-way valves can be converted into 2/2-way version.

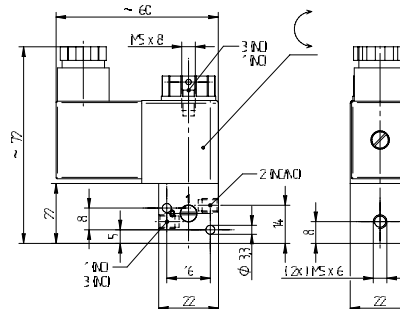
Please note: Drawings are for MH 311 \_\_\_-valves. For MOH-valves ports 1 and 3 are swapped, for MH 211 port 3 is not existing. MOH 311 and MH 211-valves are equipped with a flat plastic nut.

Available with solenoid operators:

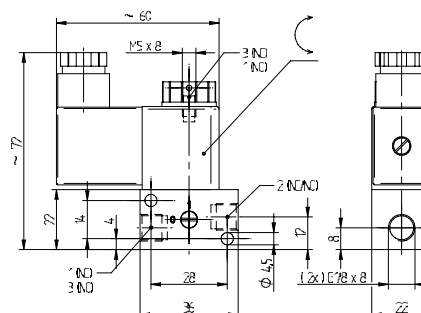
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves can be used for technical vacuum too.

Versions with a normally open operator system (port 1 in the body) available on request.



MH 311 012/MOH 311 012/MH 211 012

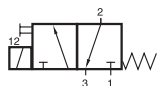


MH 311 015/MOH 311 015/MH 211 015

Type	Ways	Function	Port size			Air flow	Operating pressure	Power-consumption	Weight
			1	2	3				
MH 311 012	3/2	n.c.	M5	M5	M5	40 l/min	-0,9 - 10 bar	3 W = / 5 VA ~	0,12 kg
MH 311 015	3/2	n.c.	G 1/8"	G 1/8"	M5	50 l/min	-0,9 - 10 bar	3 W = / 5 VA ~	0,14 kg
MOH 311 012	3/2	n.o.	M5	M5	M5	40 l/min	-0,9 - 10 bar	3 W = / 5 VA ~	0,12 kg
MOH 311 015	3/2	n.o.	M5	G 1/8"	G 1/8"	50 l/min	-0,9 - 10 bar	3 W = / 5 VA ~	0,14 kg
MH 211 012	2/2	n.c.	M5	M5		40 l/min	-0,9 - 10 bar	3 W = / 5 VA ~	0,12 kg
MH 211 015	2/2	n.c.	G 1/8"	G 1/8"		50 l/min	-0,9 - 10 bar	3 W = / 5 VA ~	0,14 kg



# MH 311 209



MH 311 209

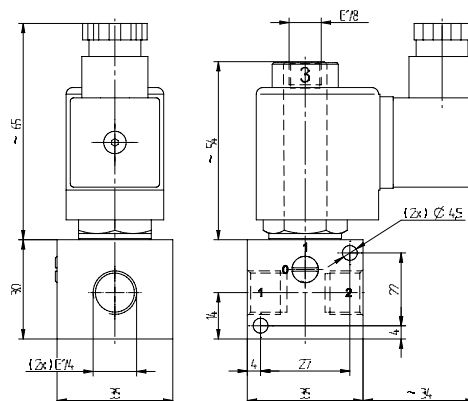


Normally closed direct acting 3/2-way solenoid valve equipped with mechanical spring return.  
Orifice size: 2 mm, max. pressure 10 bar.

Available with solenoid operators: 230V/50Hz, 24V/50 Hz, 24V=.  
Others on request.

Valves are generally equipped with manual override.

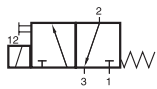
Suitable solenoid coils type MA 30 S13 \_\_ and connectors Form A (30 mm) type ST 30 can be found on page 2.14.5.



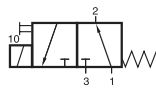
MH 311 209

Type	Port size			Air flow	Operating press.	Power cons.	Weight
	1	2	3				
MH 311 209	G 1/4"	G 1/4"	G 1/8"	120 l/min	0 - 10 bar	10 W = /13/11 VA ~	0,31 kg

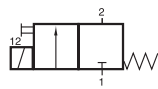
# MH 311 305/MH 311 309/MOH 311 305 MOH 311 309/MH 211 305/MH 211 309



MH 311 305  
MH 311 309



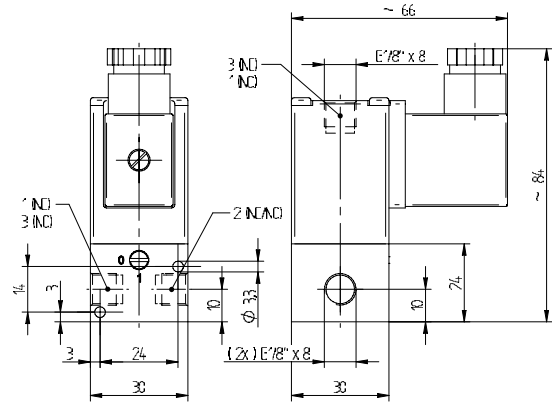
MOH 311 305  
MOH 311 309



MH 211 305  
MH 211 309



Direct acting 3/2-way and 2/2-way solenoid valve equipped with mechanical spring return.  
Orifice size: 3 mm, max. pressure: 7 bar.



MH 311 305/MOH 311 305/MH 211 305

**Type MH 311 \_\_\_**

Normally closed, port 1 and 2 in the valve, port 3 at the top of the solenoid

**Type MOH 311 \_\_\_**

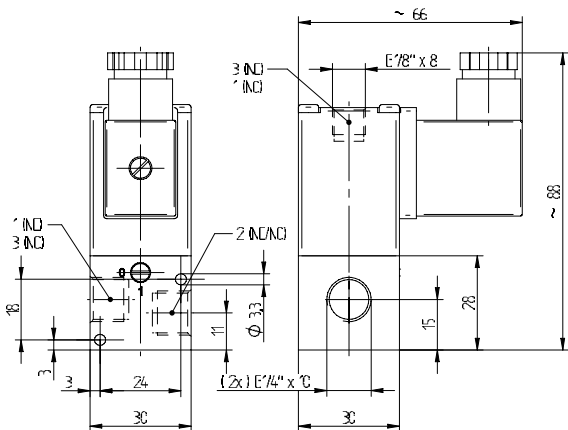
Normally open, port 2 and 3 in the valve, port 1 at the top of the solenoid

**Type MH 211 \_\_\_**

2/2-way valve n.c.

Please note:

Drawings are for MH 311 \_\_\_-valves. For MOH-valves ports 1 and 3 are swapped, for MH 211 port 3 is not existing.



MH 311 309/MOH 311 309/MH 211 309

Available with solenoid operators: 230V/50Hz, 24V/50Hz, 24V=.

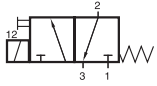
Valves are generally equipped with manual override.

Connector Industry B (22 mm). Flying leads on request.

Type	Ways	Function	Port size			Air flow	Operating pressure	Power consumption	Weight
			1	2	3				
MH 311 305	3/2	n.c.	G 1/8"	G 1/8"	G 1/8"	200 l/min	0 - 7 bar	7,5 W = /8,5 VA ~	0,17 kg
MH 311 309	3/2	n.c.	G 1/4"	G 1/4"	G 1/8"	200 l/min	0 - 7 bar	7,5 W = /8,5 VA ~	0,18 kg
MOH 311 305	3/2	n.o.	G 1/8"	G 1/8"	G 1/8"	200 l/min	0 - 7 bar	7,5 W = /8,5 VA ~	0,17 kg
MOH 311 309	3/2	n.o.	G 1/4"	G 1/4"	G 1/8"	200 l/min	0 - 7 bar	7,5 W = /8,5 VA ~	0,18 kg
MH 211 305	2/2	n.c.	G 1/8"	G 1/8"		200 l/min	0 - 7 bar	7,5 W = /8,5 VA ~	0,17 kg
MH 211 309	2/2	n.c.	G 1/4"	G 1/4"		200 l/min	0 - 7 bar	7,5 W = /8,5 VA ~	0,18 kg



# MH 311 019 6/MH 311 019 1/8



MH 311 019



Direct acting 3/2-way solenoid valve equipped with spring return. Orifice size 1.3 mm.

Normally closed, port 1 swivel either 1/8" or 6 mm pif, port 2 as banjo screw, exhaust through operator system with manual override.

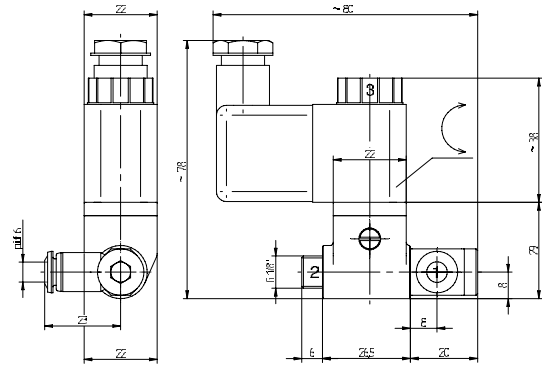
Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Available accessory:

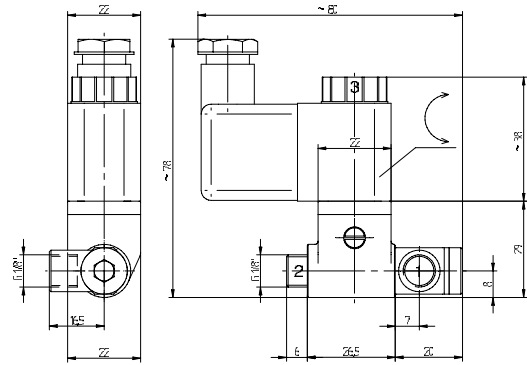
**KV SET 02**

Reducer fitting for banjo-screw to change from 1/8" to 1/4", with captive seal.

Version with a normally open operator system (port 1 in the body) available on request.



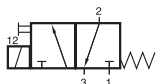
**MH 311 019 6**



**MH 311 019 1/8**

Type	Funct.	Port 1	Port 2 banjo	Port 3	Air flow	Operating pressure	Power consumption	Weight
MH 311 019 6	n.c.	Swivel 6 mm pif	G 1/8"	M5	50 l/min	-0,9 - 10 bar	3 W= / 5 VA	0,16 kg
MH 311 019 1/8	n.c.	Swivel G 1/8"	G 1/8"	hole	50 l/min	-0,9 - 10 bar	3 W= / 5 VA	0,16 kg

# MH 311 013/MH 311 017



MH 311 013  
MH 311 017



Direct acting 3/2-way solenoid valve equipped with mechanical spring return, normally closed.

Port 2 is a banjo that can be screwed directly into the actuator that is to be controlled.

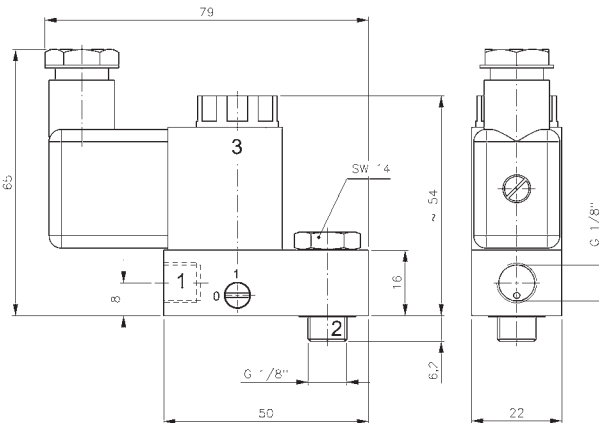
On request:

- Products with port 1 in NPT
- Products normally open
- 2/2-way version

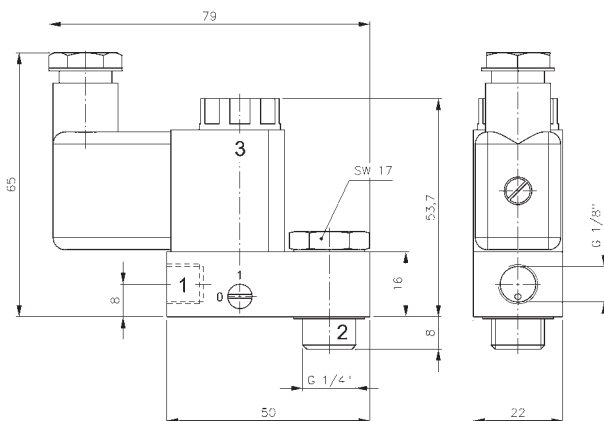
Available with solenoid operators:

230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override.



**MH 311 013**



**MH 311 017**

MH 311 013 and MH 311 017 are designed for piloting angle seat valves or small spring-return actuators.

When assembling this type of valve to a spring-return actuator, please take into consideration that there is no exhaust air recirculation ("purge").

Instead of the standard banjo-screw, the valve can also be equipped with a flow-regulating banjo-screw.

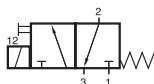
Three different versions are available on request: Banjo-screw to regulate the opening speed, the closing speed as well as the opening and closing speed (not independent).



Version with integrated flow-regulator available on request.

Type	Function	Port			Air flow	Operating pressure	Power consumption	Weight
		1	2 banjo	3				
MH 311 013	n.c.	G 1/8"	G 1/8"	M5	50 l/min	0 - 10 bar	3 W = / 5 VA ~	0,14 kg ❄️
MH 311 017	n.c.	G 1/8"	G 1/4"	M5	50 l/min	0 - 10 bar	3 W = / 5 VA ~	0,16 kg ❄️

# MH 311 313/MH 311 317



MH 311 313  
MH 311 317



Direct acting 3/2-way solenoid valve equipped with mechanical spring return, normally closed.  
Orifice size: 3 mm, max. pressure: 7 bar.

Port 2 is a banjo that can be screwed directly into the actuator that is to be controlled.

On request:

- Products with port 1 in NPT
- Products normally open
- 2/2-way version

Available with solenoid operators: 230V/50Hz, 24V/50Hz, 24V=.

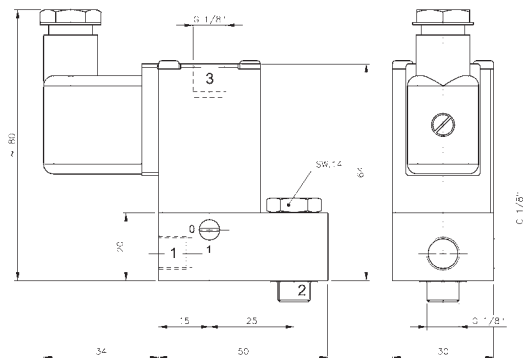
Valves are generally equipped with manual override.

Connector Industry B (22 mm). Flying leads on request.

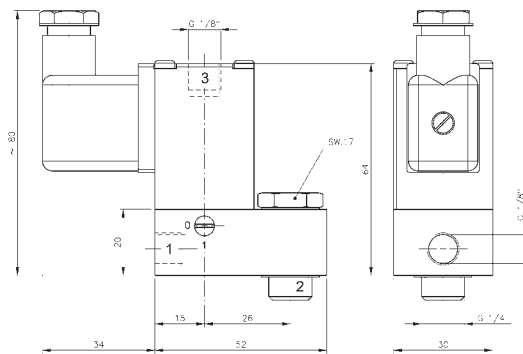
MH 311 313 and MH 311 317 are designed for piloting angle seat valves or small spring-return actuators.

When assembling this type of valve to a spring-return actuator, please take into consideration that there is no exhaust air recirculation ("purge").

Instead of the standard banjo-screw, the valve can also be equipped with a flow-regulating banjo-screw. Three different versions are available on request: Banjo-screw to regulate the opening speed, the closing speed as well as the opening and closing speed (not independent).



**MH 311 313**

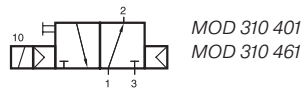
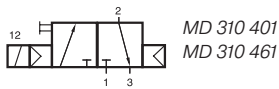


**MH 311 317**



Type	Function	Port			Air flow	Operating pressure	Power consumption	Weight
		1	2 banjo	3				
MH 311 313	n.c.	G 1/8"	G 1/8"	G 1/8"	150 l/min	0 - 7 bar	7,5 W = /8,5 VA ~	0,21 kg
MH 311 317	n.c.	G 1/8"	G 1/4"	G 1/8"	150 l/min	0 - 7 bar	7,5 W = /8,5 VA ~	0,22 kg

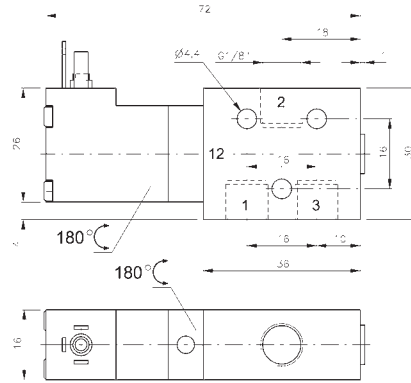
# MD 310 401/MD 310 461 MOD 310 401/MOD 310 461



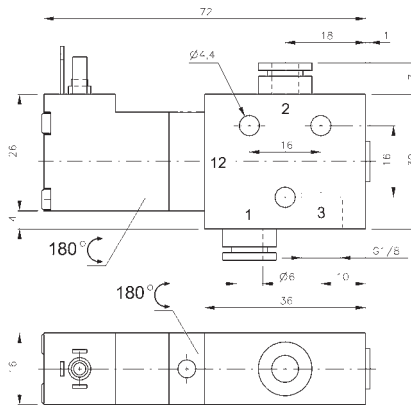
3/2-way solenoid valve normally closed (MD) or normally open (MOD) actuated by permanent signal and equipped with air spring return.

Available with solenoid operators:  
24V=, 12V=, 6V= either for connector form C ISO 15217 or with flying leads, standard cable length 500 mm. For details about solenoid system, please refer to page 2.14.1.

Valves are generally equipped with manual override to push.



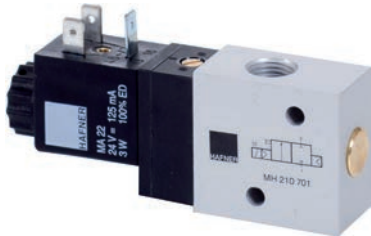
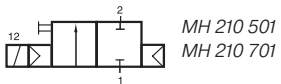
**MD 310 401/MOD 310 401**



**MD 310 461/MOD 310 461**

Type	Function	Port size 1 and 2	Air flow	Operating pressure	Power consumption	Weight
MD 310 401	n.c.	G 1/8"	450 l/min	3 - 10 bar	1,8 W =	0,09 kg
MD 310 461	n.c.	pif 6 mm	450 l/min	3 - 10 bar	1,8 W =	0,10 kg
MOD 310 401	n.o.	G 1/8"	450 l/min	3 - 10 bar	1,8 W =	0,09 kg
MOD 310 461	n.o.	pif 6 mm	450 l/min	3 - 10 bar	1,8 W =	0,10 kg

# MH 210 501/MH 210 701

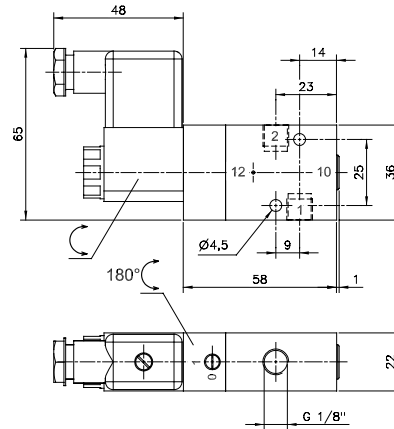


2/2-way solenoid valve, normally closed, actuated by permanent signal and equipped with air spring return.

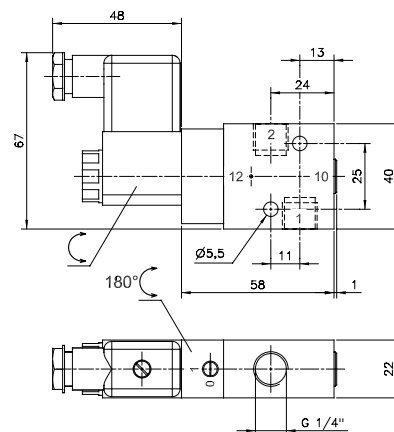
Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override.

Normally open version (MOH) on request.



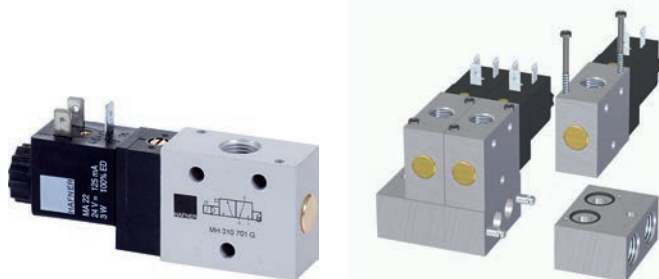
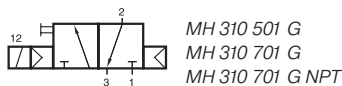
**MH 210 501**



**MH 210 701**

Type	Port size	Air flow	Operating press.	Power consumption	Weight
MH 210 501	G 1/8"	650 l/min	2 - 10 bar	3 W = / 5 VA ~	0,20 kg
MH 210 701	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,21 kg

# MH 310 501 G/MH 310 701 G MOH 310 501 G/MOH 310 701 G



3/2-way solenoid valve normally closed (MH) or normally open (MOH) actuated by permanent signal and equipped with air spring return.

The G-Series valves offer the flexibility of in-line fitment as well as the option of being assembled on to a manifold as shown. Manifolds are displayed on page 2.7.1.3.

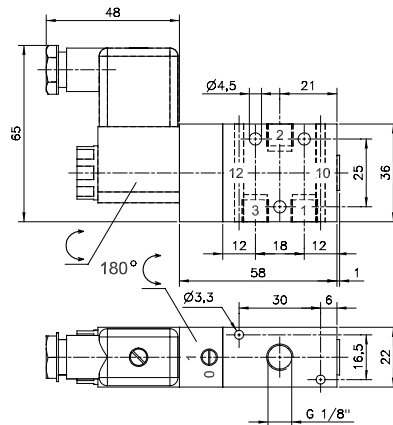
Normally open and normally closed products can be mixed on one plate.

Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

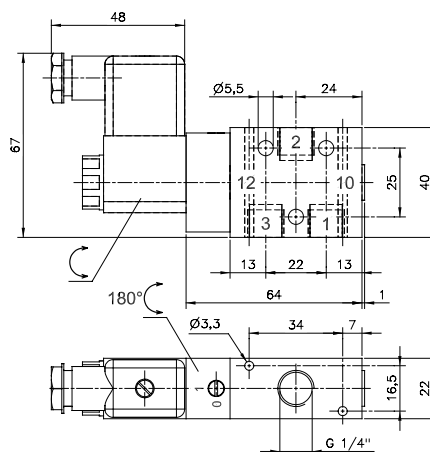
Valves are generally equipped with manual override.  
If requested without manual override please order M 310 \_\_\_ / MO 310 \_\_\_.

Please note:  
Do not close port 3 to convert into a 2-way valve.

Bistable double solenoid versions type „MH 320“ available on request.



**MH 310 501 G/MOH 310 501 G**



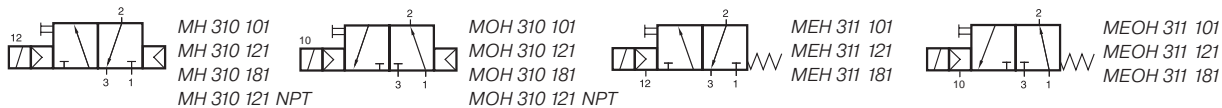
**MH 310 701 G/MOH 310 701 G  
MH 310 701 G NPT/MOH 310 701 G NPT**

Type	Function	Port size	Air flow	Operating press.	Power consumption	Weight
MH 310 501 G	n.c.	G 1/8"	650 l/min	2 - 10 bar	3 W = / 5 VA ~	0,20 kg
MH 310 701 G	n.c.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,21 kg
MOH 310 501 G	n.o.	G 1/8"	650 l/min	2 - 10 bar	3 W = / 5 VA ~	0,20 kg
MOH 310 701 G	n.o.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,21 kg
MH 310 701 G NPT	n.c.	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,21 kg
MOH 310 701 G NPT	n.o.	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,21 kg





# MH 310 101/MH 310 121/MH 310 181 MOH 310 101/MOH 310 121/MOH 310 181



3/2-way solenoid valve normally closed (MH) or normally open (MOH) actuated by permanent signal and equipped with air spring return.

Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override. If requested without manual override please order M 310 \_\_\_ / MO 310 \_\_\_.

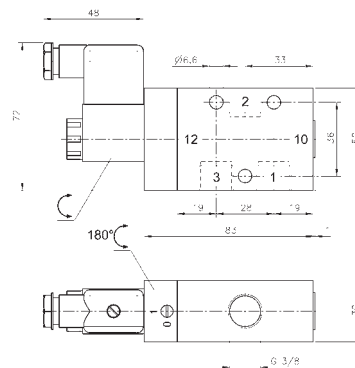
Valves are also available with external pilot feed.  
Type: MEH 311 \_\_\_ (n.c.) or MEOH 311 \_\_\_ (n.o.).  
Port 12: G 1/8".

Minimum actuation pressure: 3 bar.  
Operating pressure: 0 - 10 bar.  
Version for vacuum on request.

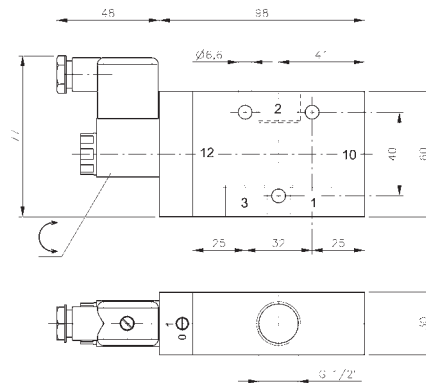
Please note:  
Do not close port 3 to convert into a 2-way valve.

Valve type M(O)H 310 101 G for manifolds displayed on page 2.7.2.4.

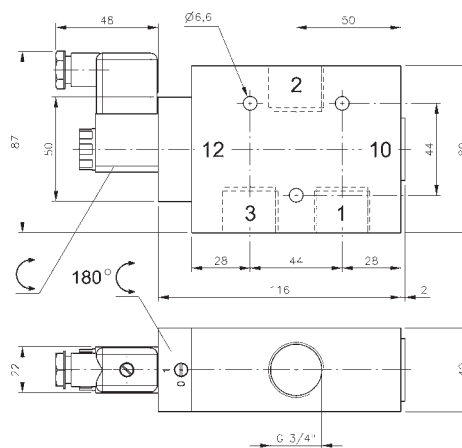
Bistable double solenoid versions type „MH 320“ available on request.



**MH 310 101/MOH 310 101**



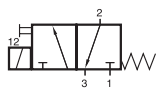
**MH 310 121/MOH 310 121  
MH 310 121 NPT/MOH 310 121 NPT**



**MH 310 181/MOH 310 181**

Type	Function	Port size	Air flow	Operating press.	Power consumption	Weight
MH 310 101	n.c.	G 3/8"	2250 l/min	1,5 - 10 bar	3 W = / 5 VA ~	0,41 kg
MH 310 121	n.c.	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,53 kg
MH 310 181	n.c.	G 3/4"	6000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,88 kg
MOH 310 101	n.o.	G 3/8"	2250 l/min	1,5 - 10 bar	3 W = / 5 VA ~	0,41 kg
MOH 310 121	n.o.	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,53 kg
MOH 310 181	n.o.	G 3/4"	6000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,88 kg
MH 310 121 NPT	n.c.	1/2" NPT	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,53 kg
MOH 310 121 NPT	n.o.	1/2" NPT	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,53 kg

# MH 312/MH 314/MH 315/MH 316



MH 312  
MH 314  
MH 315  
MH 316



System consisting of direct actuated 3/2 way solenoid valves actuated by permanent signal and a manifold plate for common pressure supply (1). Exhaust through the operator tube.

Normally closed with manual override to turn. Exhaust at the top of the operator tube, ported M5. Common exhaust line to be assembled on the top using banjo joints is available on request.

Available with solenoid operators  
230V/50 Hz, 110V/50 Hz, 24V/50 Hz, 48V=  
24V=, 12V=.

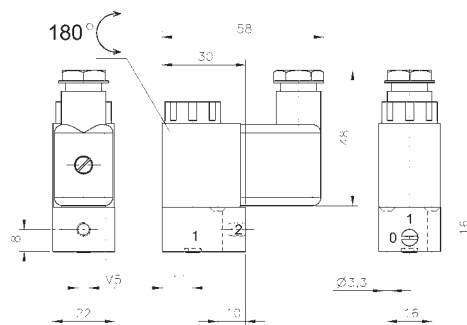
Different types of valves can be mixed on one plate.

Manifolds are displayed on page 2.7.1.1.

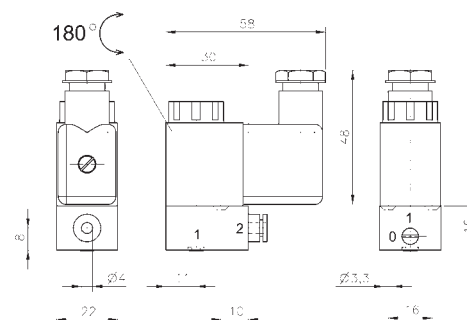
Blanking plates are also available: Type no. BP 3.

Mounting screws and seals are included.

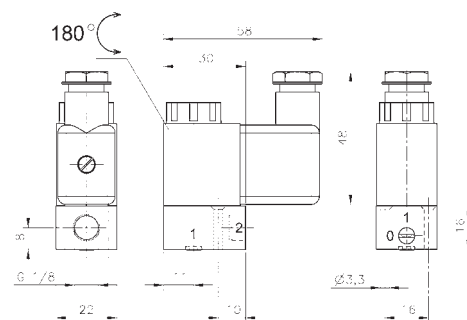
Valves can be used for technical vacuum too.



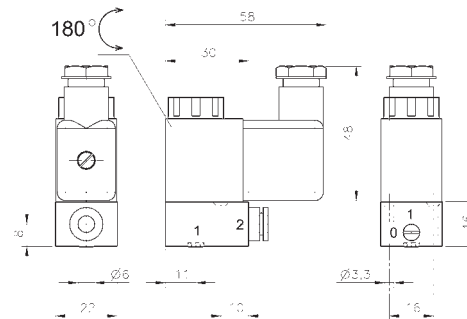
**MH 312**



**MH 314**



**MH 315**

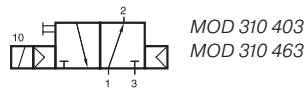
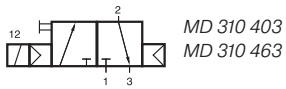


**MH 316**

Type	Function	Port 2	Air flow	Operating press.	Power consumption	Weight
MH 312	n.c.	M5	40 l/min	-0,9 - 10 bar	3 W = / 5 VA ~	0,13 kg
MH 314	n.c.	pif 4 mm	40 l/min	-0,9 - 10 bar	3 W = / 5 VA ~	0,13 kg
MH 315	n.c.	G 1/8"	50 l/min	-0,9 - 10 bar	3 W = / 5 VA ~	0,13 kg
MH 316	n.c.	pif 6 mm	50 l/min	-0,9 - 10 bar	3 W = / 5 VA ~	0,13 kg



# MD 310 403/MD 310 463 MOD 310 403/MOD 310 463



3/2-way solenoid valve normally closed (MD) or normally open (MOD) for assembling on a manifold plate. Port 2 in the valve.

Available with solenoid operators:  
24V=, 12V=, 6V= either for connector form  
C ISO 15217 or with flying leads, standard cable length  
500 mm.  
For details about solenoid system, please refer to page  
2.14.1.

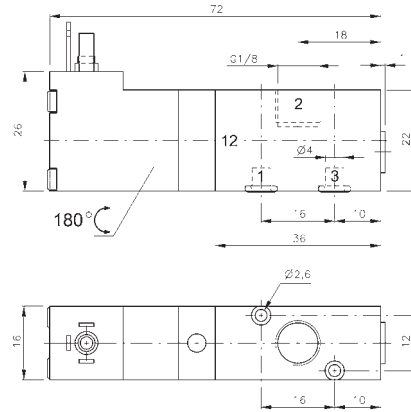
Valves are generally equipped with manual override to push.

Manifolds are displayed on page 2.7.1.2.

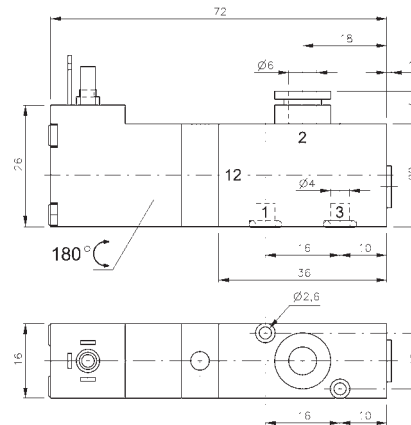
Valves normally open and normally closed can be mixed on  
one manifold plate!

Blanking plates are also available type BP 3 403.

Mounting screws and seals are included.



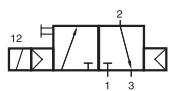
**MD 310 403/MOD 310 403**



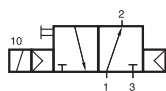
**MD 310 463/MOD 310 463**

Type	Function	Port size	Air flow	Operating press.	Power consumption	Weight
MD 310 403	n.c.	G 1/8"	450 l/min	3 - 10 bar	1,8 W =	0,09 kg
MD 310 463	n.c.	pif 6 mm	450 l/min	3 - 10 bar	1,8 W =	0,09 kg
MOD 310 403	n.o.	G 1/8"	450 l/min	3 - 10 bar	1,8 W =	0,09 kg
MOD 310 463	n.o.	pif 6 mm	450 l/min	3 - 10 bar	1,8 W =	0,09 kg

# MD 310 404/MOD 310 404



MD 310 404



MOD 310 404



3/2-way solenoid valve normally closed (MD) or normally open (MOD) for assembling on a manifold plate. All the ports are in the plate.

Available with solenoid operators:  
24V=, 12V=, 6V= either for connector form C ISO 15217 or with flying leads, standard cable length 500 mm. For details about solenoid system, please refer to page 2.14.1.

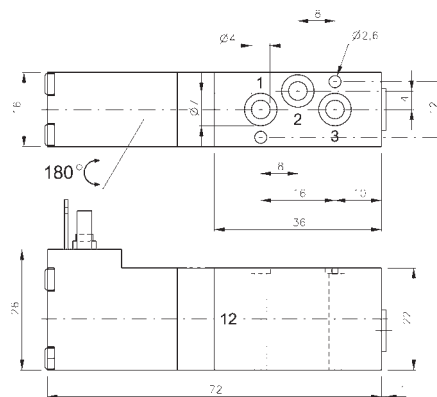
Valves are generally equipped with manual override to push.

Manifolds are displayed on page 2.7.1.2.

Valves normally open and normally closed can be mixed on one manifold plate!

Blanking plates are also available type BP 3 404.

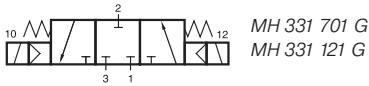
Mounting screws and seals are included.



MD 310 404/MOD 310 404

Type	Function	Air flow	Operating press.	Power consumption	Weight
MD 310 404	n.c.	450 l/min	3 - 10 bar	1,8 W =	0,09 kg
MOD 310 404	n.o.	450 l/min	3 - 10 bar	1,8 W =	0,09 kg

# MH 331 701 G/MH 331 121 G



G-Series 501 G/701 G



G-Series 121 G



3/3-way solenoid valve with spring return to middle position, actuated by permanent signal. Valve is to be used when a single acting cylinder or any other single acting actuator such as a lifting bag or car-suspension needs to be held in an intermediate position.

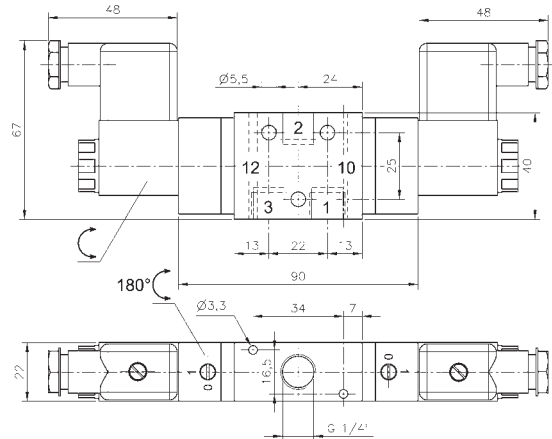
Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

The G-Series valves offer the flexibility of in-line fitment as well as the option of being assembled on to a manifold as shown. Plates are displayed on page 2.7.1.3.

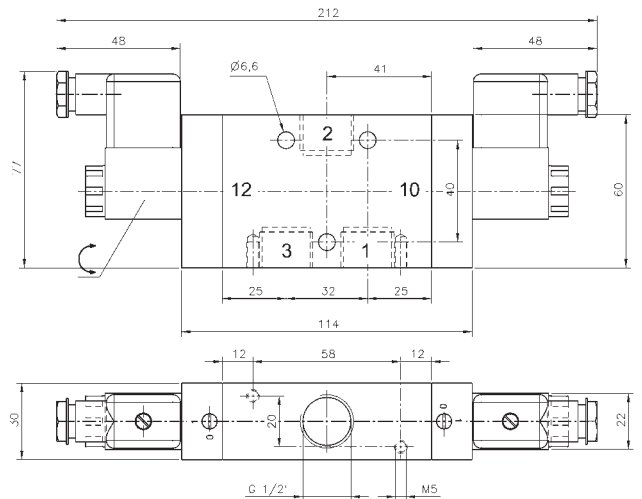
Valves G 1/2" have to be assembled onto the plate by fixing screws from the bottom through the plate into the valve.

Valves are generally equipped with manual override to turn.

Please note:  
Valves will be discontinued.



**MH 331 701 G**



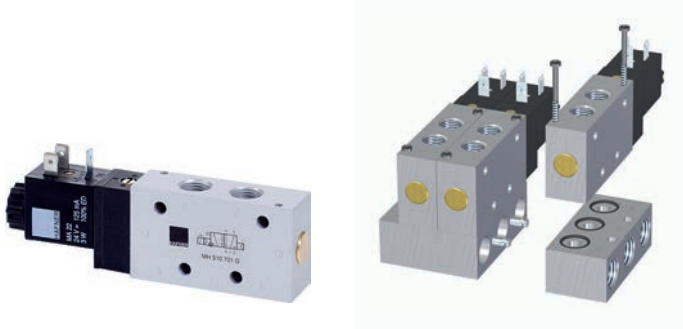
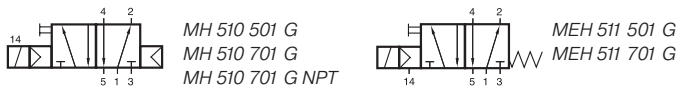
**MH 331 121 G**

Type	Port size	Air flow	Operating press.	Power consumption	Weight
MH 331 701 G	G 1/4"	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,32 kg
MH 331 121 G	G 1/2"	3000 l/min	3 - 10 bar	3 W = / 5 VA ~	0,72 kg





# MH 510 501 G/MH 510 701 G



5/2-way solenoid valve actuated by permanent signal and equipped with air spring return.

The G-Series valves offer the flexibility of in-line fitment as well as the option of being assembled on to a manifold as shown. Manifolds for valves type 501 G are displayed on page 2.7.2.2, manifolds for valves type 701 G are displayed on page 2.7.2.3.

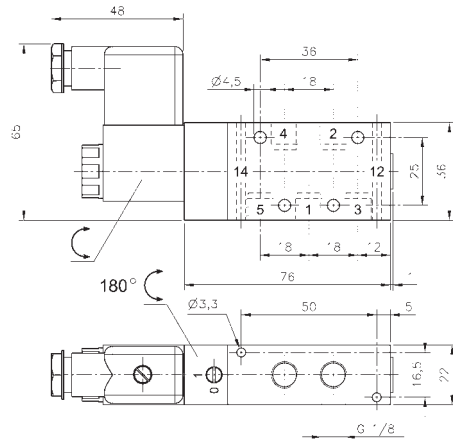
Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override. If requested without manual override please order M 510 \_\_\_\_.

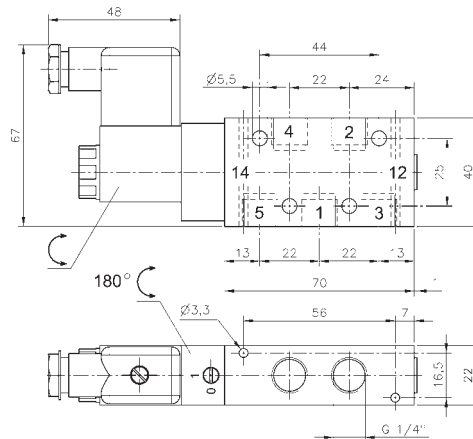
Valves are also available with external pilot feed.  
Type: MEH 511 \_\_\_\_ G.  
Port 14: M5.

Minimum actuation pressure: 3 bar.  
Operating pressure: 0 - 10 bar.

Version for vacuum on request.



**MH 510 501 G**

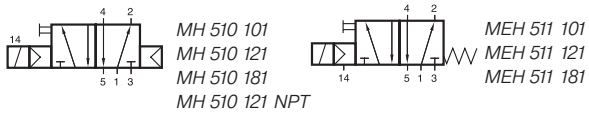


**MH 510 701 G/MH 510 701 G NPT**

Type	Port size	Air flow	Operating press.	Power consumption	Weight
MH 510 501 G	G 1/8"	650 l/min	2 - 10 bar	3 W = / 5 VA ~	0,23 kg
MH 510 701 G	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,25 kg
MH 510 701 G NPT	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,25 kg



# MH 510 101/MH 510 121/MH 510 181



5/2-way solenoid valve actuated by permanent signal and equipped with air spring return.

Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override.  
If requested without manual override please order M 510 \_\_\_\_.

Valves are also available with external pilot feed.

Type: MEH 511 \_\_\_\_.

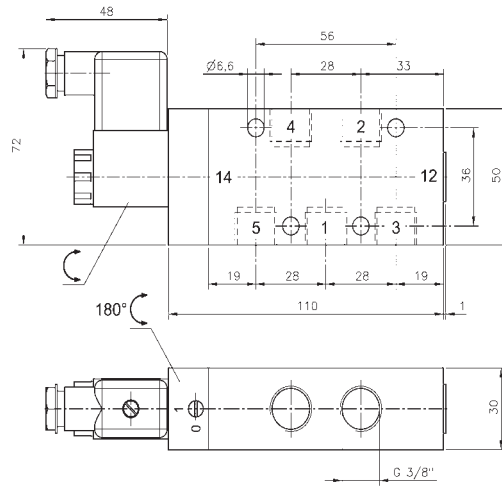
Port 14: G 1/8".

Minimum actuation pressure: 3 bar.

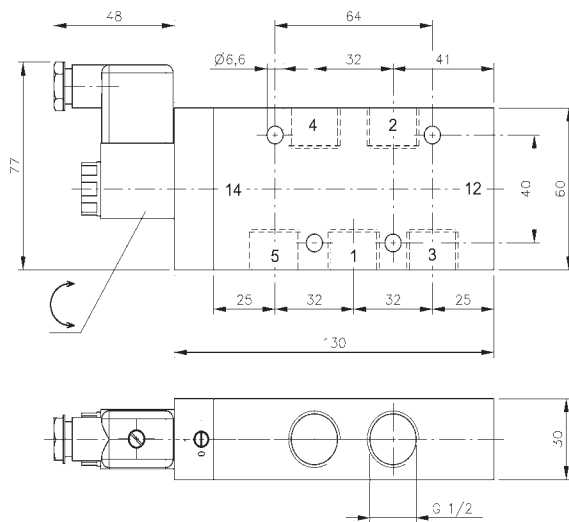
Operating pressure: 0 - 10 bar.

Version for vacuum on request.

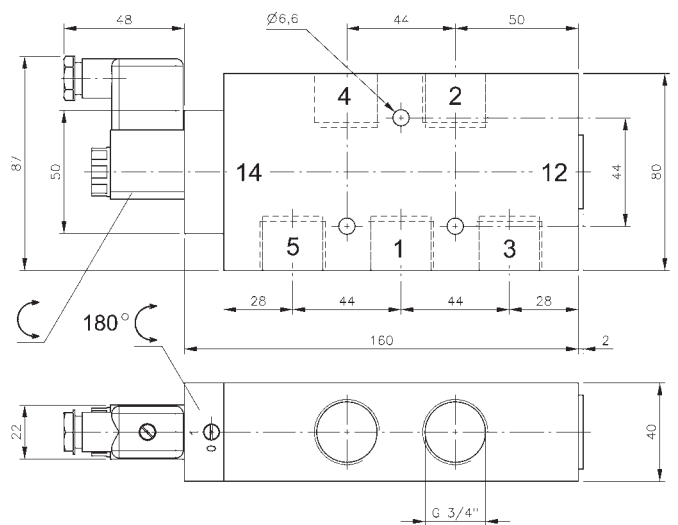
Valve type MH 510 101 G for manifolds displayed on page 2.7.2.4 and valve type MH 510 121 G for manifolds displayed on page 2.7.2.5.



**MH 510 101**



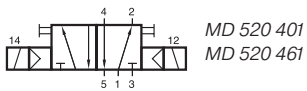
**MH 510 121/MH 510 121 NPT**



**MH 510 181**

Type	Port size	Air flow	Operating press.	Power consumption	Weight
MH 510 101	G 3/8"	2250 l/min	1,5 - 10 bar	3 W = / 5 VA ~	0,50 kg
MH 510 121	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,67 kg
MH 510 181	G 3/4"	6000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,29 kg
MH 510 121 NPT	1/2" NPT	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,67 kg

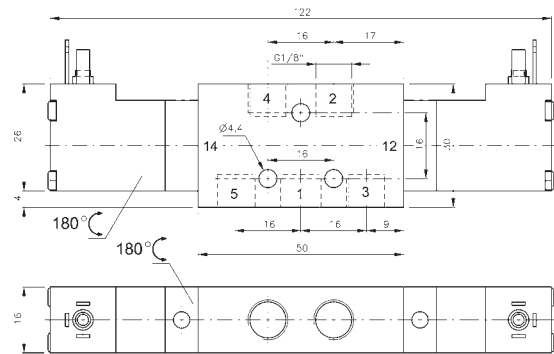
# MD 520 401/MD 520 461



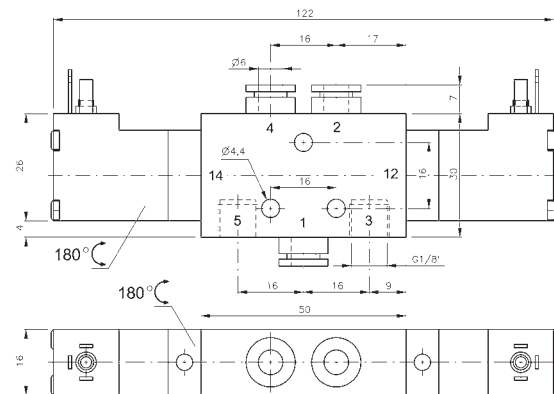
5/2-way double solenoid valve actuated by impulse. Position is kept until an electrical signal is applied to the opposite side even when not attached to electrical source.

Available with solenoid operators:  
 24V=, 12V=, 6V= either for connector form C ISO 15217 or with flying leads, standard cable length 500 mm. For details about solenoid system, please refer to page 2.14.1.

Valves are generally equipped with manual override to push.



**MD 520 401**

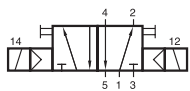


**MD 520 461**

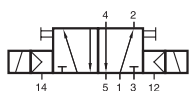
Type	Ports 1, 2, 4	Air flow	Operating press.	Power consumption	Weight
MD 520 401	G 1/8"	450 l/min	3 - 10 bar	1,8 W =	0,15 kg
MD 520 461	pif 6 mm	450 l/min	3 - 10 bar	1,8 W =	0,16 kg



# MH 520 101/MH 520 121/MH 520 181



MH 520 101  
 MH 520 121  
 MH 520 181  
 MH 520 121 NPT



MEH 520 101  
 MEH 520 121  
 MEH 520 181



5/2-way double solenoid valve actuated by impulse. Position is kept until an electrical signal is applied to the opposite side even when not attached to electrical source.

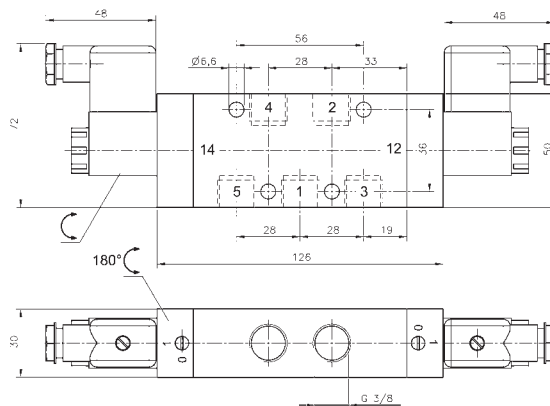
Available with solenoid operators:  
 230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override.  
 If requested without manual override please order M 520 \_\_ \_.

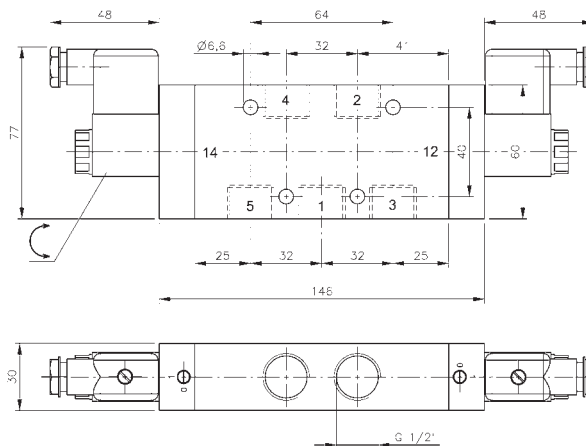
Valves are also available with external pilot feed.  
 Type: MEH 520 \_\_ \_ .  
 Ports 12 and 14: G 1/8".  
 Minimum actuation pressure: 2,5 bar.  
 Operating pressure: 0 - 10 bar.

Version for vacuum on request.

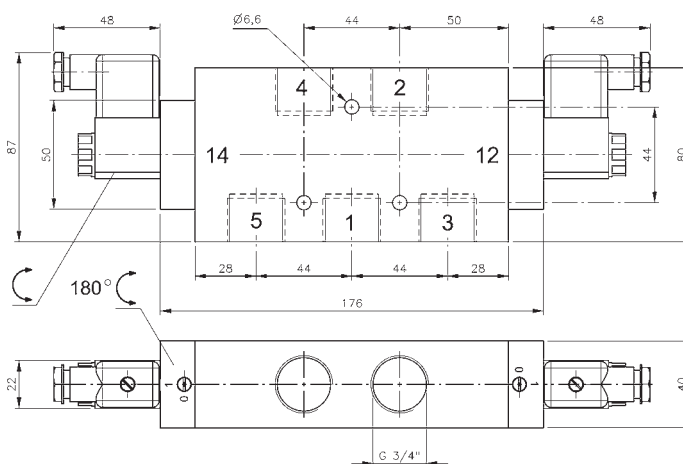
Valve type MH 520 101 G for manifolds displayed on page 2.7.2.4 and valve type MH 520 121 G for manifolds displayed on page 2.7.2.5.



**MH 520 101**



**MH 520 121/ MH 520 121 NPT**



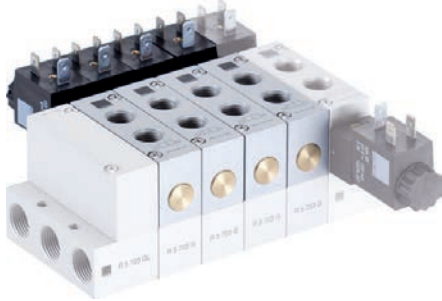
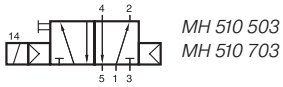
**MH 520 181**

Type	Port size	Air flow	Operating press.	Power consumption	Weight
MH 520 101	G 3/8"	2250 l/min	1,5 - 10 bar	3 W = / 5 VA ~	0,66 kg
MH 520 121	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,84 kg
MH 520 181	G 3/4"	6000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,45 kg
MH 520 121 NPT	1/2" NPT	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,84 kg





# MH 510 503/MH 510 703



5/2-way solenoid valve actuated by permanent signal and equipped with air spring return. Ports 2 and 4 are in the valve, ports 1, 3 and 5 in the manifold plate.

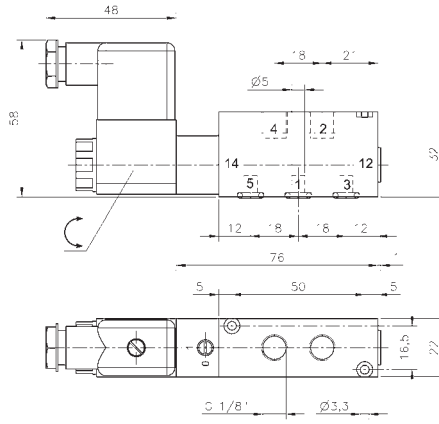
Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override.  
If requested without manual override please order M 510 \_\_\_\_.

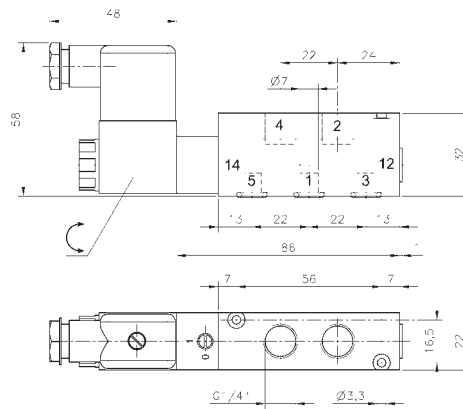
Manifolds for valves type 503 are displayed on page 2.7.2.2,  
manifolds for valves type 703 are displayed on page 2.7.2.3.

Blanking plates are also available type BP 5 503 or BP 5 703.

Mounting screws and seals are included.



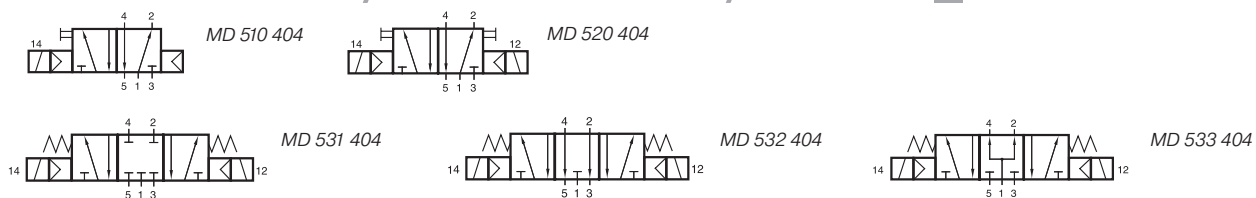
**MH 510 503**



**MH 510 703**

Type	Ports 2, 4	Air flow	Operating press.	Power consumption	Weight
MH 510 503	G 1/8"	650 l/min	2 - 10 bar	3 W = / 5 VA ~	0,22 kg MK
MH 510 703	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,23 kg MK

# MD 510 404/MD 520 404/MD 53\_404



5-way solenoid valves with all the ports in the plate.

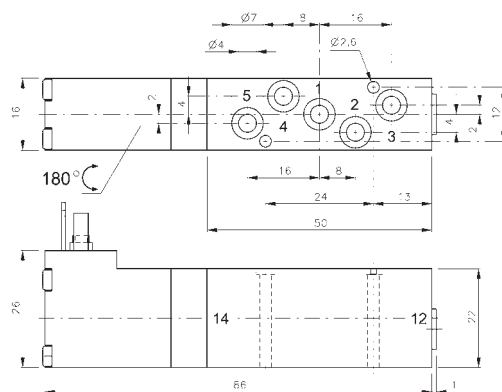
- Type 510 Air spring return
- Type 520 Double solenoid actuated by impulse
- Type 531 centre closed
- Type 532 centre exhausted
- Type 533 centre pressurised

Available with solenoid operators:  
 24V=, 12V=, 6V= either for connector form C ISO 15217 or with flying leads, standard cable length 500 mm.  
 For details about solenoid system, please refer to page 2.14.1.

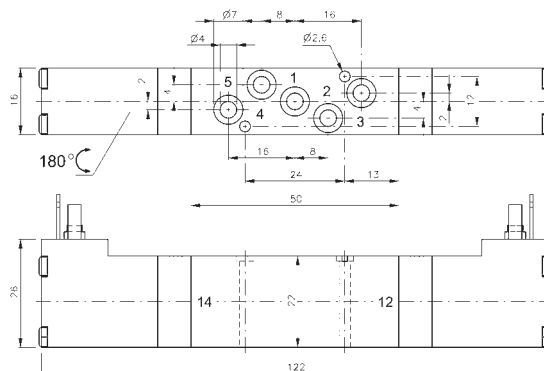
Valves are generally equipped with manual override to push.

Manifolds are displayed on page 2.7.2.6.  
 Blanking plates are also available type or BP 5 404.

Mounting screws and seals are included.



**MD 510 404**

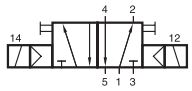


**MD 520 404/MD 53\_404**

Type	Function	Port size	Air low	Operating press.	Power consumption	Weight
MD 510 404	Spring return	Ø 4 mm	450 l/min	3 - 10 bar	1,8 W =	0,10 kg
MD 520 404	Bistable	Ø 4 mm	450 l/min	3 - 10 bar	1,8 W =	0,14 kg
MD 53_404	5/3-way	Ø 4 mm	450 l/min	3 - 10 bar	1,8 W =	0,14 kg



# MD 520 403/MD 520 463



MD 520 403  
MD 520 463



5/2-way double solenoid valve actuated by impulse. Position is kept until an electrical signal is applied to the opposite side even when not attached to electrical source. Ports 2 and 4 are in the valve, ports 1, 3 and 5 in the manifold plate.

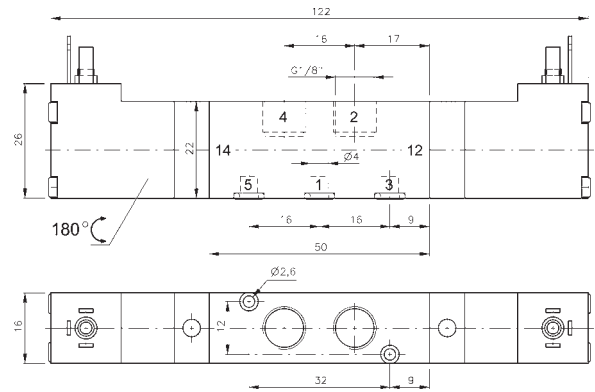
Available with solenoid operators:  
24V=, 12V=, 6V= either for connector form  
C ISO 15217 or with flying leads, standard cable length  
500 mm. For details about solenoid system, please refer to  
page 2.14.1.

Valves are generally equipped with manual override to push.

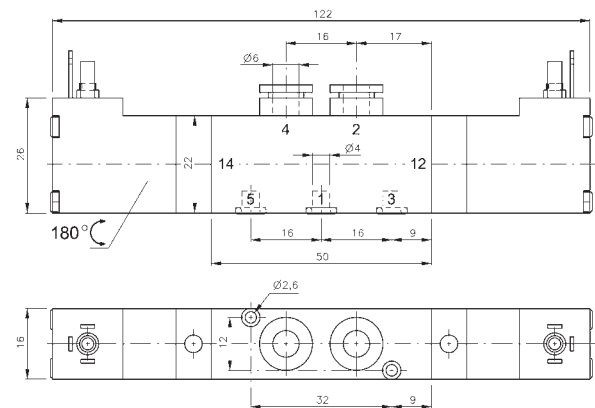
Manifolds are displayed on page 2.7.2.1.

Blanking plates are also available type BP 5 403.

Mounting screws and seals are included.



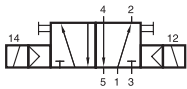
**MD 520 403**



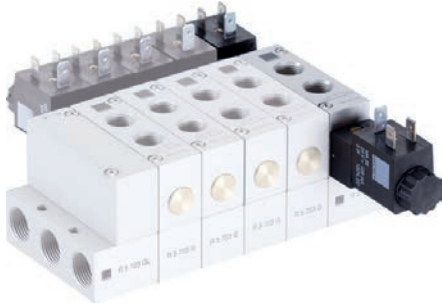
**MD 520 463**

Type	Ports 1, 2, 4	Air flow	Operating press.	Power consumption	Weight
MD 520 403	G 1/8"	450 l/min	3 - 10 bar	1,8 W =	0,14 kg
MD 520 463	pif 6 mm	450 l/min	3 - 10 bar	1,8 W =	0,15 kg

# MH 520 503/MH 520 703



MH 520 503  
MH 520 703



5/2-way double solenoid valve actuated by impulse. Position is kept until an electrical signal is applied to the opposite side even when not attached to electrical source. Ports 2 and 4 are in the valve, ports 1, 3 and 5 in the manifold plate.

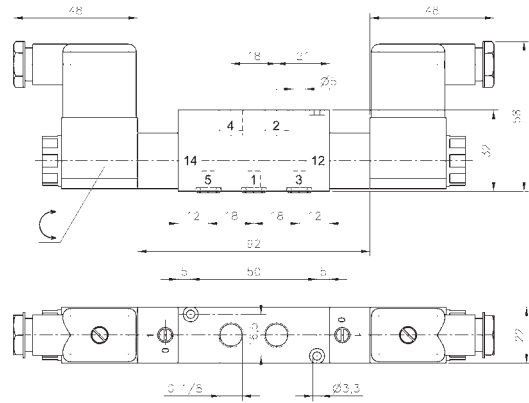
Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override. If requested without manual override please order M 520 \_\_\_\_.

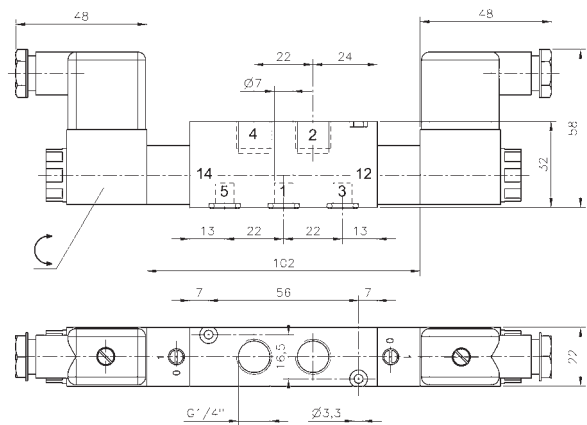
Manifolds for valves type 503 are displayed on page 2.7.2.2, manifolds for valves type 703 are displayed on page 2.7.2.3.

Blanking plates are also available type BP 5 503 or BP 5 703.

Mounting screws and seals are included.



**MH 520 503**

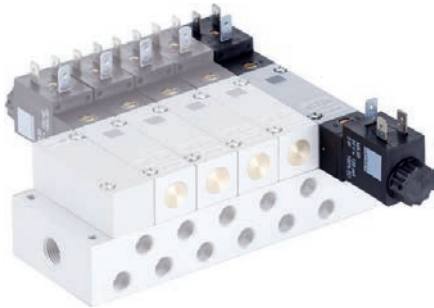
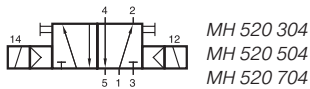


**MH 520 703**

Type	Ports 2, 4	Air flow	Operating press.	Power consumption	Weight	
MH 520 503	G 1/8"	650 l/min	2 - 10 bar	3 W = / 5 VA ~	0,31 kg	MK
MH 520 703	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,33 kg	MK



# MH 520 304/MH 520 504/MH 520 704



5/2-way double solenoid valve actuated by impulse. Position is kept until an electrical signal is applied to the opposite side even when not attached to electrical source. All the ports are in the plate.

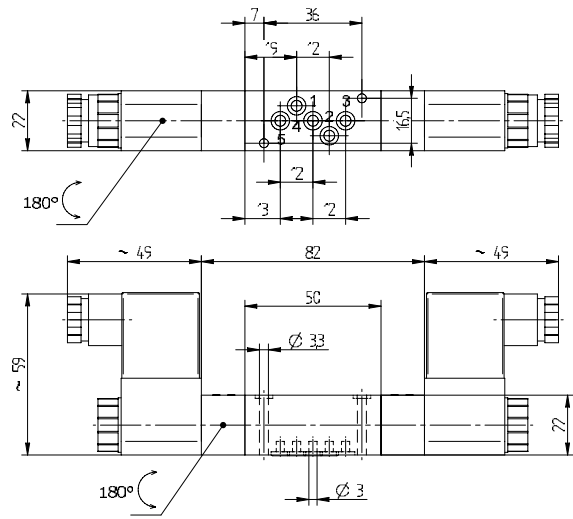
Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override.  
If requested without manual override please order M 520 \_\_\_\_.

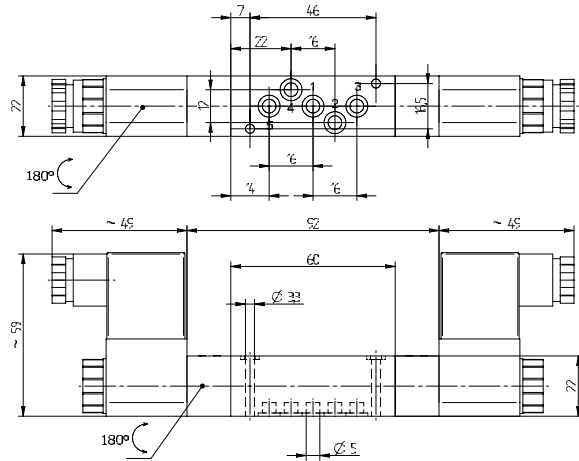
Manifolds for valves type 304 and 504 are displayed on page 2.7.2.7.  
Manifolds for valves type 704 are displayed on page 2.7.2.8 and 2.7.2.9.

Blanking plates are also available type BP 5 304, BP 5 504 or BP 5 704.

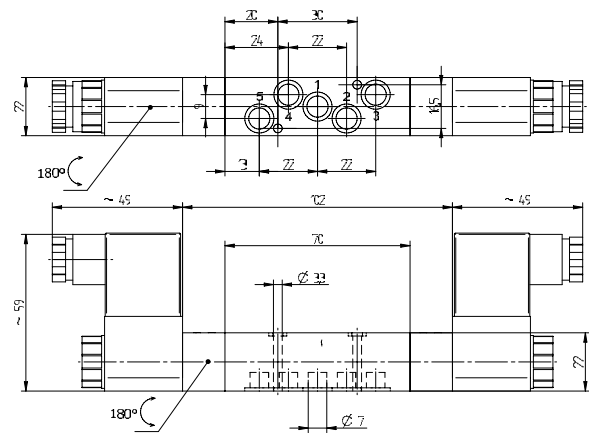
Mounting screws and seals are included.



**MH 520 304**



**MH 520 504**

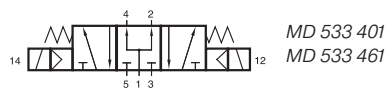
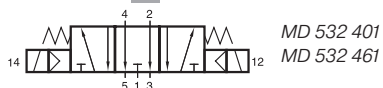
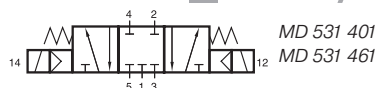


**MH 520 704**

Type	Port size	Air flow	Operating press.	Power consumption	Weight
MH 520 304	Ø 3 mm	220 l/min	2 - 10 bar	3 W = / 5 VA ~	0,25 kg
MH 520 504	Ø 5 mm	650 l/min	2 - 10 bar	3 W = / 5 VA ~	0,27 kg
MH 520 704	Ø 7 mm	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,29 kg



# MD 53\_401/MD 53\_461



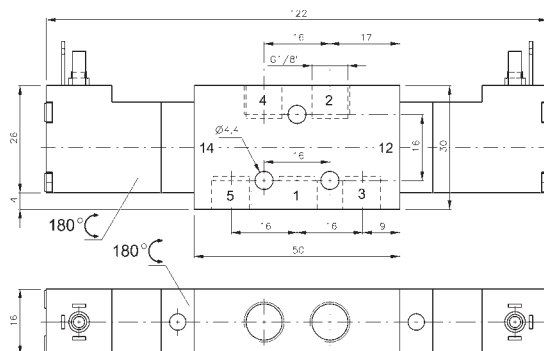
5/3-way solenoid valve with spring return to middle position, actuated by permanent signal.

- Type 531 centre closed
- Type 532 centre exhausted
- Type 533 centre pressurised

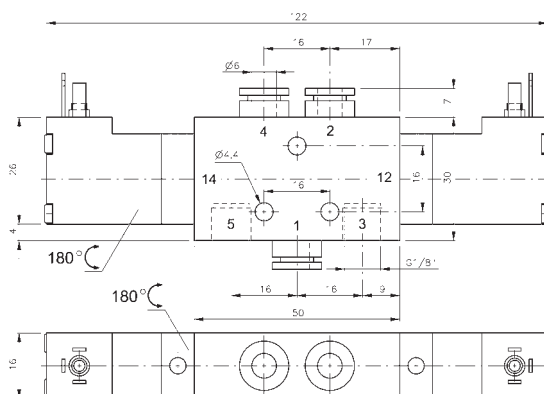
When ordering please complete the type number by 1, 2 or 3 according to the type required.

Available with solenoid operators:  
24V=, 12V=, 6V= either for connector form C ISO 15217 or with flying leads, standard cable length 500 mm. For details about solenoid system, please refer to page 2. 14. 1.

Valves are generally equipped with manual override to push.



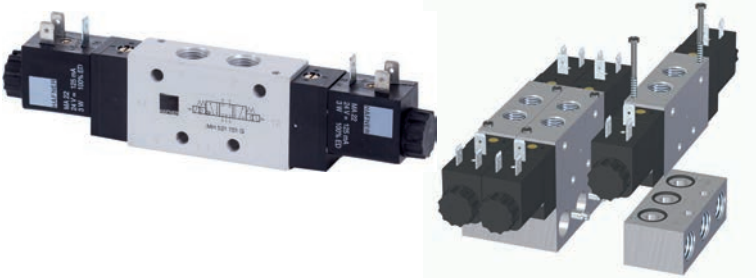
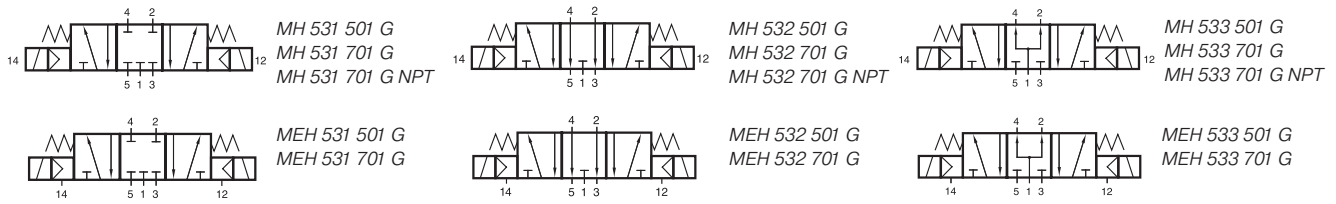
**MD 53\_401**



**MD 53\_461**

Type	Ports 1, 2, 4	Air flow	Operating press.	Power consumption	Weight
MD 53_401	G 1/8"	450 l/min	3 - 10 bar	1,8 W =	0,15 kg
MD 53_461	pif 6 mm	450 l/min	3 - 10 bar	1,8 W =	0,16 kg

# MH 53\_ 501 G/MH 53\_ 701 G



5/3-way solenoid valve with spring return to middle position, actuated by permanent signal.

- Type 531     centre closed
- Type 532     centre exhausted
- Type 533     centre pressurised

When ordering please complete the type number by 1, 2 or 3 according to the type required.

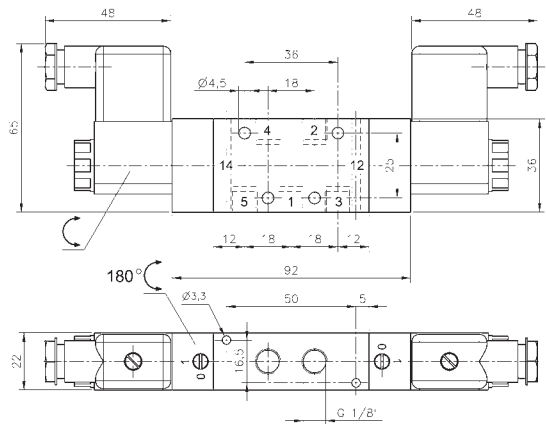
The G-Series valves offer the flexibility of in-line fitment as well as the option of being assembled on to a manifold as shown. Manifolds for valves type 501 G are displayed on page 2.7.2.2, manifolds for valves type 701 G are displayed on page 2.7.2.3.

Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

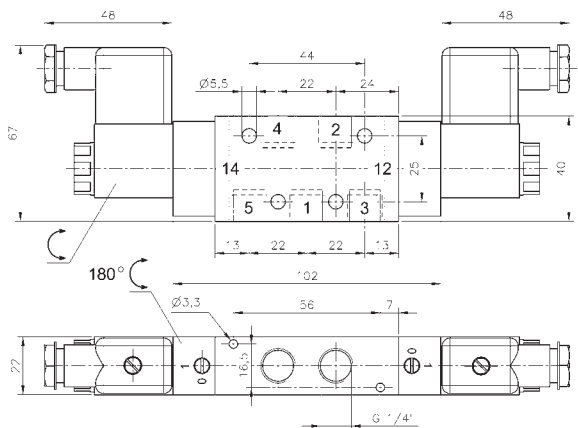
Valves are generally equipped with manual override. If requested without manual override please order M 53\_ \_ \_ \_ G.

Valves are also available with external pilot feed.  
Type: MEH 53\_ \_ \_ \_ G (please add 1 digit for type and 3 digits for size).  
Ports 12 and 14: M5.  
Minimum actuation pressure: 3 bar.  
Operating pressure: 0-10 bar.

Version for vacuum on request.



**MH 53\_ 501 G**

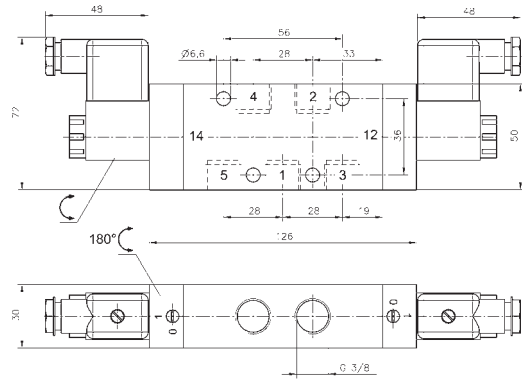
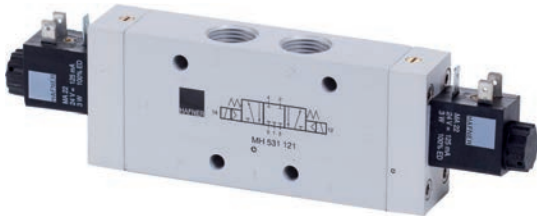
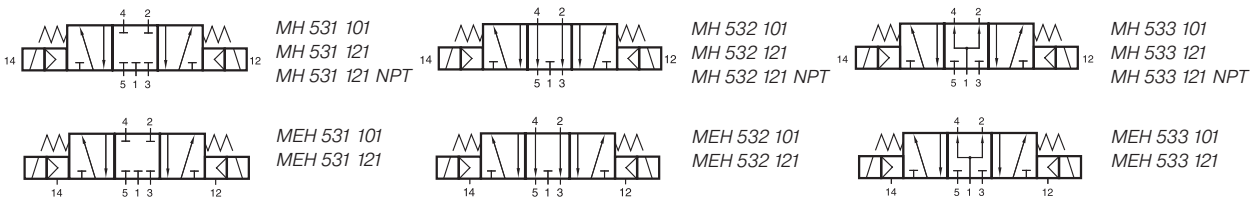


**MH 53\_ 701 G/MH 53\_ 701 G NPT**

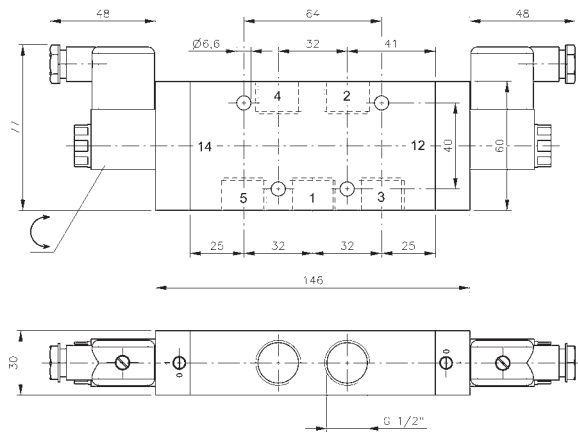
Type	Port size	Air flow	Operating press.	Power consumption	Weight
MH 53_ 501 G	G 1/8"	650 l/min	3 - 10 bar	3 W = / 5 VA ~	0,33 kg
MH 53_ 701 G	G 1/4"	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,35 kg
MH 53_ 701 G NPT	1/4" NPT	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,35 kg



# MH 53\_ 101/MH 53\_ 121



**MH 53\_101**



**MH 53\_121/MH 53\_ 121 NPT**

5/3-way solenoid valve with spring return to middle position, actuated by permanent signal.

- Type 531 centre closed
- Type 532 centre exhausted
- Type 533 centre pressurised

When ordering please complete the type number by 1, 2 or 3 according to the type required.

Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override. If requested without manual override please order M 53\_ \_ \_ \_.

Valves are also available with external pilot feed.  
Type: MEH 53 \_ \_ \_ \_ (please add 1 digit for type and 3 digits for size).

Ports 12 and 14: G 1/8".  
Minimum actuation pressure: 3 bar.  
Operating pressure: 0-10 bar.

Version for vacuum on request.

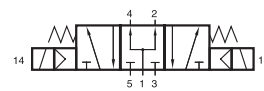
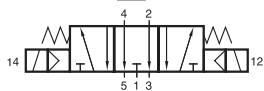
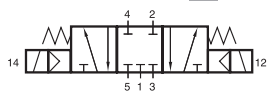
Valve type MH 53\_ 101 G for manifolds displayed on page 2.7.2.4 and valve type MH 53\_ 121 G for manifolds displayed on page 2.7.2.5.

G 3/4" versions available on request.

Type	Port size	Air flow	Operating press.	Power consumption	Weight
MH 53_ 101	G 3/8"	2250 l/min	1,5 - 10 bar	3 W = / 5 VA ~	0,66 kg
MH 53_ 121	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,84 kg
MH 53_ 121 NPT	1/2" NPT	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,84 kg



# MD 53\_403/MD 53\_463



5/3-way solenoid valve with spring return to middle position, actuated by permanent signal. Ports 2 and 4 are in the valve, ports 1, 3 and 5 in the manifold plate.

- Type 531 centre closed
- Type 532 centre exhausted
- Type 533 centre pressurised

When ordering please complete the type number by 1, 2 or 3 according to the type required.

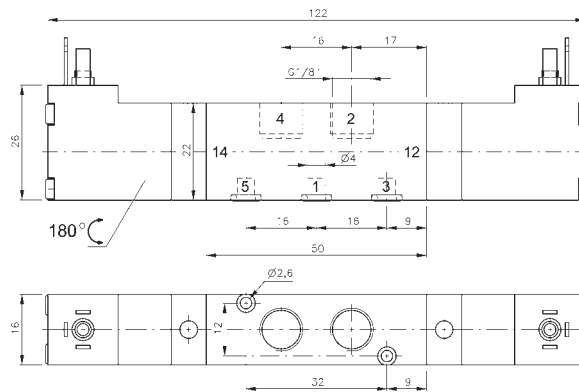
Available with solenoid operators:  
24V=, 12V=, 6V= either for connector form C ISO 15217 or with flying leads, standard cable length 500 mm. For details about solenoid system, please refer to page 2.14.1.

Valves are generally equipped with manual override to push.

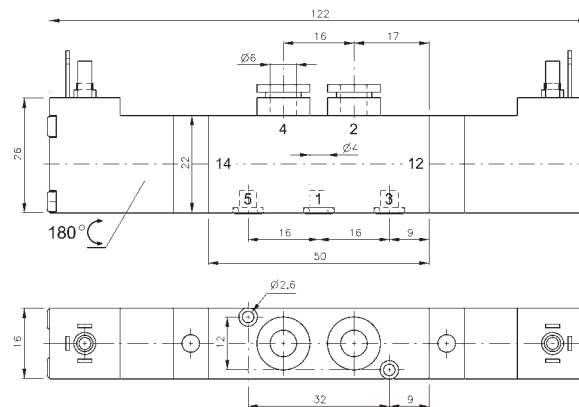
Manifolds are described on page 2.7.2.1.

Blanking plates are also available type BP 5 403.

Mounting screws and seals are included.



**MD 53\_403**



**MD 53\_463**

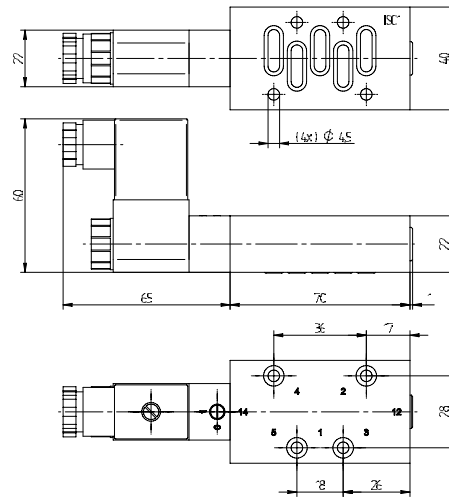
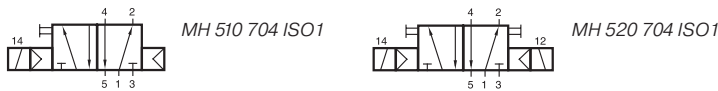
Type	Ports 1, 2, 4	Air flow	Operating press.	Power consumption	Weight
MD 53_403	G 1/8"	450 l/min	3 - 10 bar	1,8 W =	0,14 kg
MD 53_463	pif 6 mm	450 l/min	3 - 10 bar	1,8 W =	0,15 kg



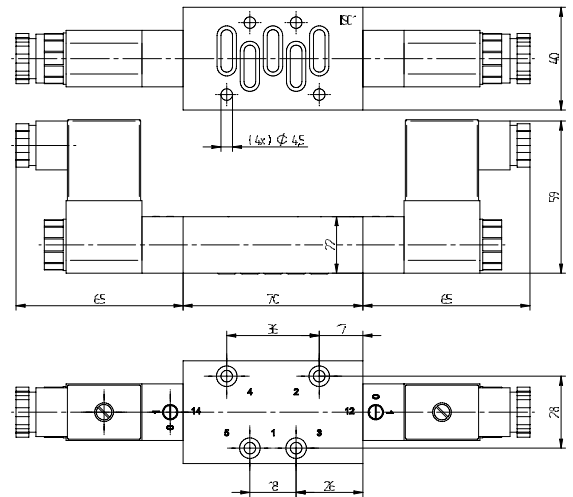




# MH 510 704 ISO1 / MH 520 704 ISO1 RP 5 704 ISO1



**MH 510 704 ISO1**



**MH 520 704 ISO1**

5-way solenoid valve and sub-base according to ISO 5599-1 size ISO 1.

Type 510 5/2-way single solenoid, with air spring return  
Type 520 5/2-way double solenoid, actuated by impulse

5/3-way centre closed available on request.

Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 48V/50Hz, 24V/50 Hz, 24V=, 12V=.

Valves are generally equipped with manual override.

Mounting screws and seals are included.

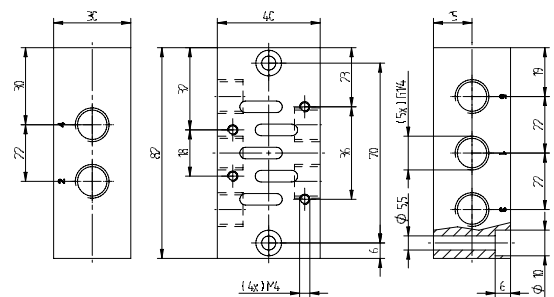
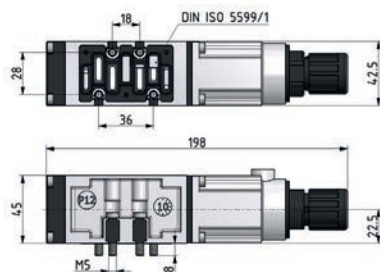
## RP 5 704 ISO1

Single sub-base with 5 x G 1/4" threads.

## ISO.1 P12

Flange-mounted pressure regulator which can be put between the sub-base and valve.

Adjustable pressure range: 0,5 - 10 bar



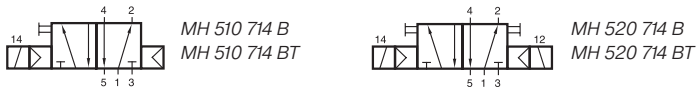
**RP 704 ISO1**

Type	Port size	Air flow	Operating press.	Power consumption	Weight
MH 510 704 ISO1	Ø 7 mm	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,28 kg
MH 520 704 ISO1	Ø 7 mm	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,39 kg
RP 5 704 ISO1	G 1/4"	1250 l/min		3 W = / 5 VA ~	0,23 kg





# MH 510 714 B/MH 510 714 BT MH 520 714 B/ MH 520 714 BT



5-way solenoid valve with standardized interface which is widely used in packaging machines for bulk materials such as cement.

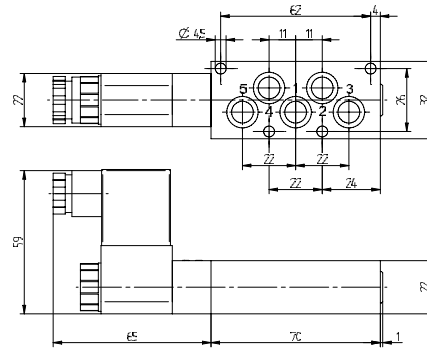
Type 510 5/2-way single solenoid, with air spring return  
Type 520 5/2-way double solenoid, actuated by impulse

Type B For manifold assembly  
Type BT For valve terminal assembly, including intermediate plate type ZP 714 BT

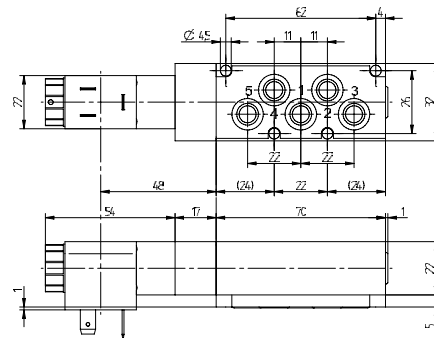
Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 48V/50Hz, 24V/50 Hz, 24V=, 12V=.

Valves are generally equipped with manual override.

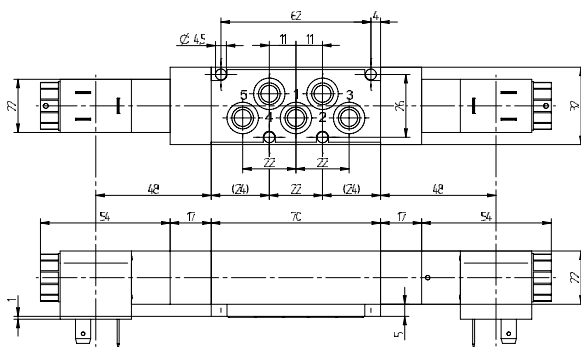
Mounting screws and seals are included.



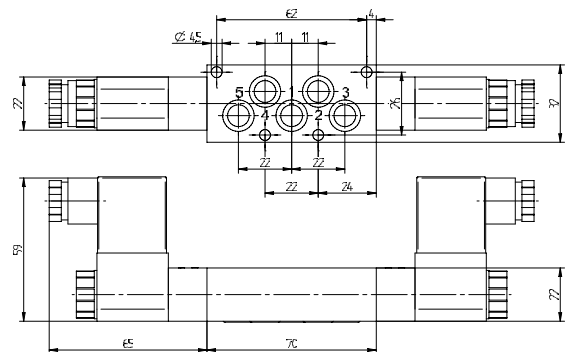
**MH 510 714 B**



**MH 510 714 BT**



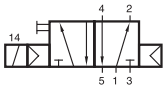
**MH 520 714 BT**



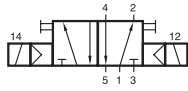
**MH 520 714 B**

Type	Usage	Port size	Air flow	Operating press.	Power cons.	Weight
MH 510 714 B	Manifold	Ø 7 mm	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,20 kg
MH 520 714 B	Manifold	Ø 7 mm	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,29 kg
MH 510 714 BT	Valve Terminal	Ø 7 mm	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,30 kg
MH 520 714 BT	Valve Terminal	Ø 7 mm	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,44 kg

# MH 510 704 J / MH 520 704 J



MH 510 704 J



MH 520 704 J



5-way solenoid valve with standardized interface which is widely used in packaging machines for bulk materials such as cement.

- Type 510 5/2-way single solenoid, with air spring return
- Type 520 5/2-way double solenoid, actuated by impulse

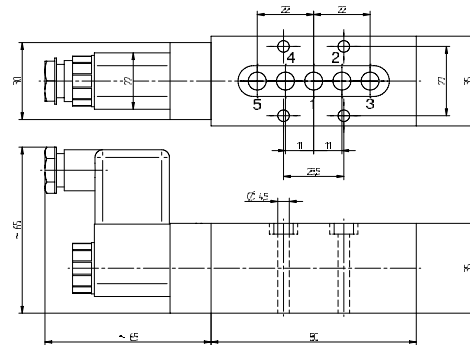
Available with solenoid operators:  
 230V/50Hz, 110V/50Hz, 48V/50Hz, 24V/50 Hz, 24V=, 12V=.

Valves are generally equipped with manual override.

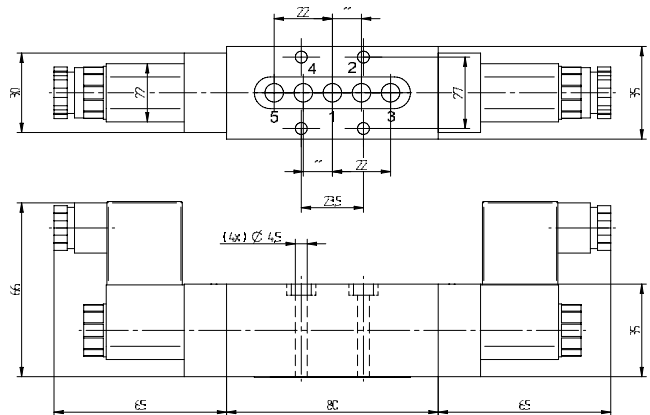
Mounting screws and seals are included.

Pneumatically actuated versions available on request.

Valves can be put onto the single base-plate type R 520 704 J which is displayed on the following page.



**MH 510 704 J**



**MH 520 704 J**

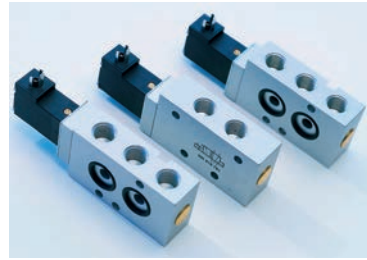
Type	Function	Port size	Air flow	Operating press.	Power cons.	Weight
MH 510 704 J	5/2-way single solenoid	Ø 7 mm	1250 l/min	1,5 - 10 bar	3 W = / 5 VA ~	0,55 kg
MH 520 704 J	5/2-way double solenoid	Ø 7 mm	1250 l/min	1,5 - 10 bar	3 W = / 5 VA ~	0,68 kg



# MK-Series

## MK

The MK- series is a combination of the 1.8 Watt solenoid-system MD 401 (detailed information on page 2.14.1) and the G 1/4" valves of the 700-series with a flow of 1.250 NL/min. The following valves are available:



MK 310 701 G	3/2-way single solenoid, n.c.	dual use	description on page 2.5.1.1.10
MOK 310 701 G	3/2-way single solenoid, n.o.	dual use	page 2.5.1.1.10
MK 510 701 G	5/2-way single solenoid	dual use	page 2.5.2.1.2
MK 520 701 G	5/2-way double solenoid	dual use	page 2.5.2.1.5
MK 531 701 G	5/3-way centre closed	dual use	page 2.5.3.1.2
MK 532 701 G	5/3-way centre exhausted	dual use	page 2.5.3.1.2
MK 533 701 G	5/3-way centre pressurised	dual use	page 2.5.3.1.2
MK 510 703	5/2-way single solenoid	manifold	page 2.5.2.2.2
MK 520 703	5/2-way double solenoid	manifold	page 2.5.2.2.6
MK 531 703	5/3-way centre closed	manifold	page 2.5.3.2.2
MK 532 703	5/3-way centre exhausted	manifold	page 2.5.3.2.2
MK 533 703	5/3-way centre pressurised	manifold	page 2.5.3.2.2
MK 510 704	5/2-way single solenoid	manifold	page 2.5.2.2.4
MK 520 704	5/2-way double solenoid	manifold	page 2.5.2.2.7
MK 531 704	5/3-way centre closed	manifold	page 2.5.3.2.3
MK 532 704	5/3-way centre exhausted	manifold	page 2.5.3.2.3
MK 533 704	5/3-way centre pressurised	manifold	page 2.5.3.2.3

as well as valves with NAMUR-interface, please refer to chapter 2.10.



## Advantages

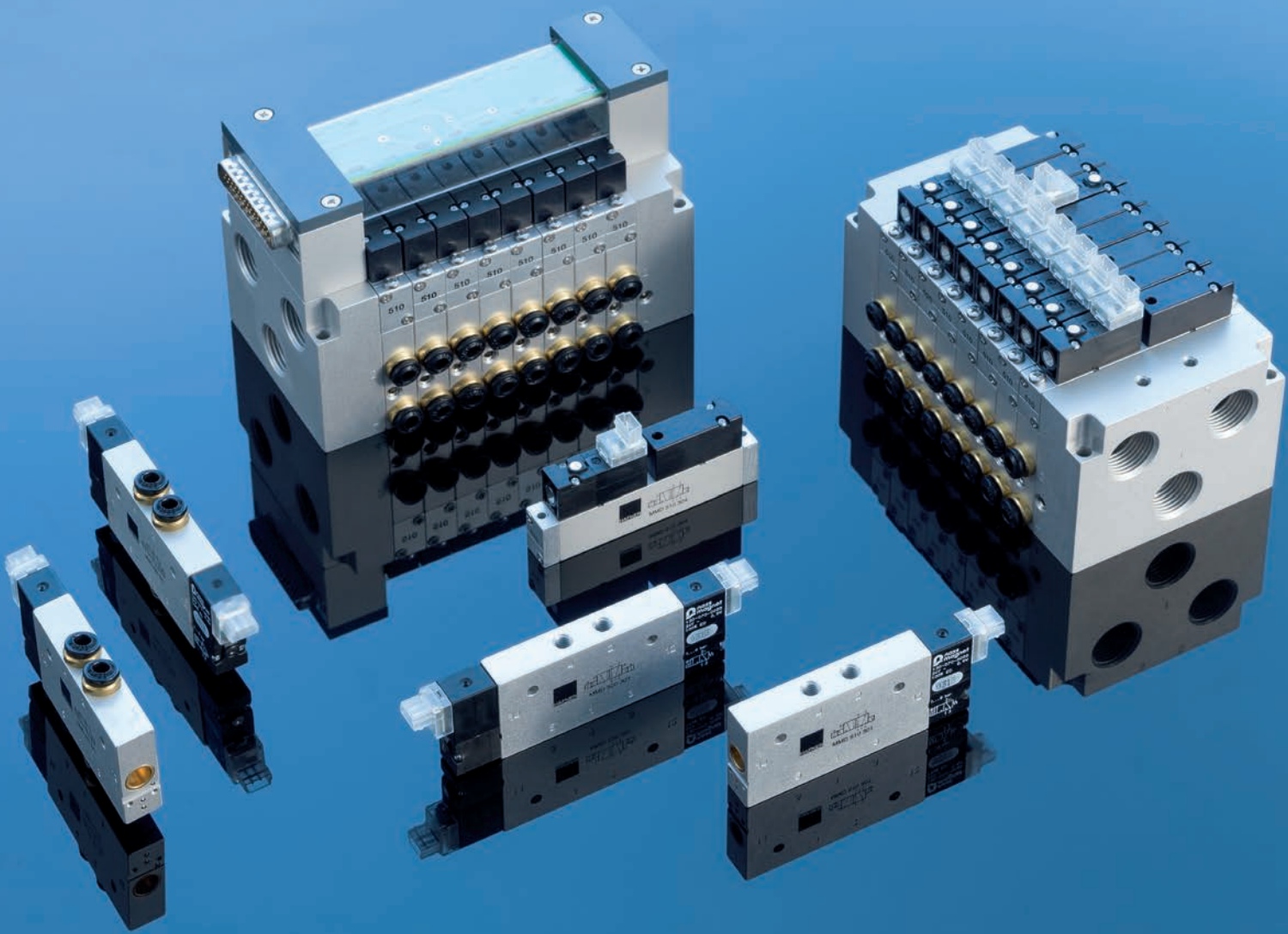
- **High flow**
- **Compact design**
- **Low power consumption**



The valves are also used for the **22 mm terminals**, described in chapter 2.8.







# 2.6

## 10 mm Solenoid Valves

# MMD 510 301 24DC/MMD 510 341 24DC



MMD 510 301 24DC  
MMD 510 341 24DC



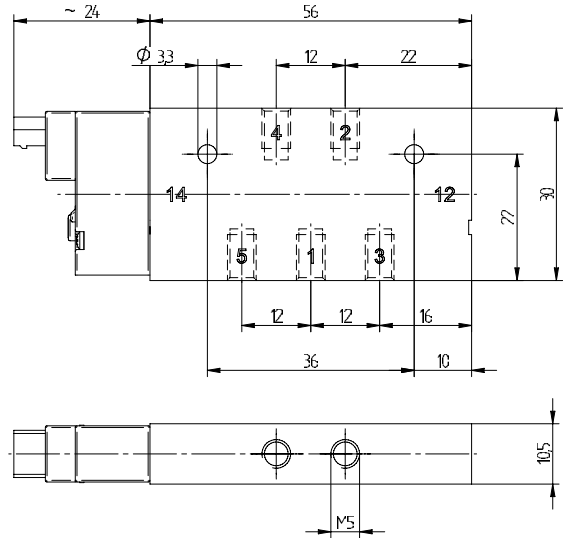
5/2-way solenoid valve actuated by permanent signal and equipped with air spring return.

Available with 24V= solenoid system for connector according to JPC standard.  
12V= available on request.

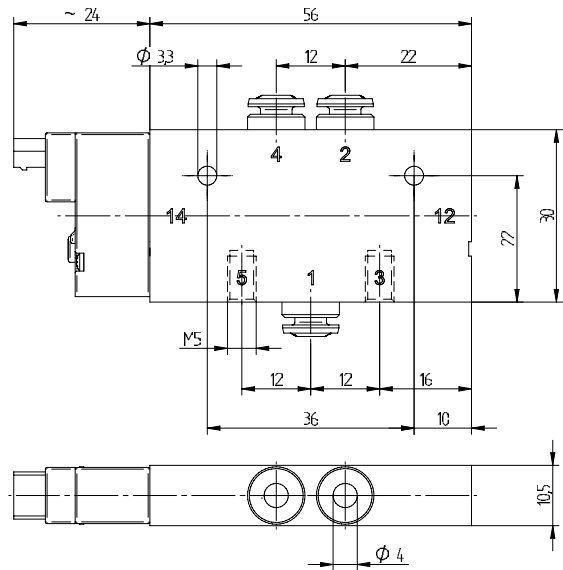
Solenoid with integrated LED and varistor. Protection class IP 40.

Valves are generally equipped with manual override to push.

Connector according to JPC standard with a cable length of 300 mm is included.



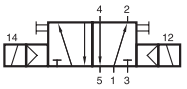
**MMD 510 301 24DC**



**MMD 510 341 24DC**

Type	Ports 1,2,3	Air flow	Operating press.	Power consumption	Weight
MMD 510 301 24DC	M5	230 l/min	3 - 8 bar	0,6 W	0,058 kg
MMD 510 341 24DC	pif 4 mm	230 l/min	3 - 8 bar	0,6 W	0,064 kg

# MMD 520 301 24DC/MMD 520 341 24DC



MMD 520 301 24DC  
MMD 520 341 24DC



5/2-way double solenoid valve actuated by impulse. Position is kept until an electrical signal is applied to the opposite side even when not attached to electrical signal.

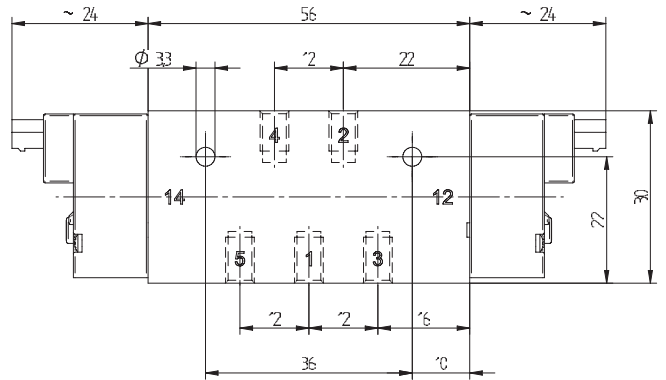
Available with 24V= solenoid system for connector according to JPC standard.

12V= available on request.

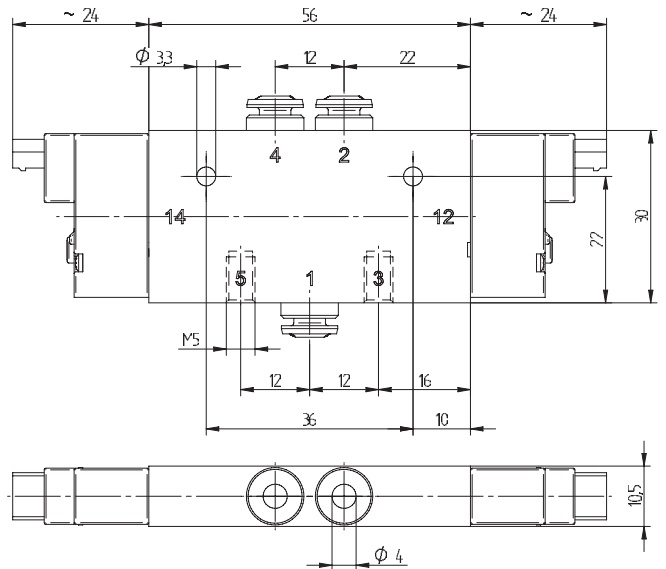
Solenoid with integrated LED and varistor. Protection class IP 40.

Valves are generally equipped with manual override to push.

Connectors according to JPC standard with a cable length of 300 mm are included.



**MMD 520 301 24DC**



**MMD 520 341 24DC**

Type	Ports 1,2,3	Air flow	Operating press.	Power consumption	Weight
MMD 520 301 24DC	M5	230 l/min	3 - 8 bar	0,6 W	0,058 kg
MMD 520 341 24DC	pif 4 mm	230 l/min	3 - 8 bar	0,6 W	0,064 kg

# MMD 53\_ 301 24DC/MMD 53\_ 341 24DC



5/3-way solenoid valve with spring return to middle position, actuated by permanent signal.

- Type 531            centre closed
- Type 532            centre exhausted
- Type 533            centre pressurised

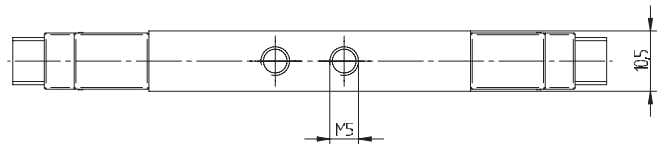
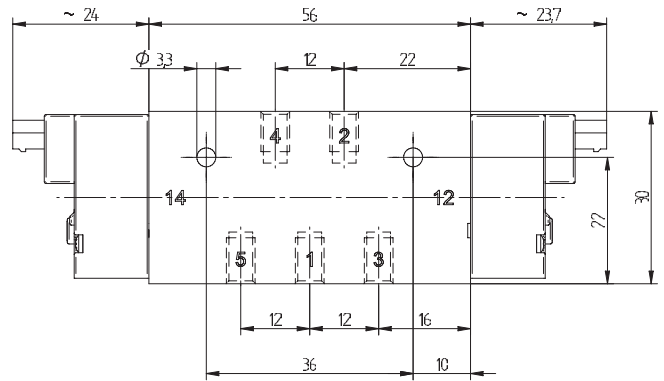
When ordering please complete the type number by 1, 2 or 3 according to the type required.

Available with 24V= solenoid system for connector according to JPC standard.  
12V= available on request.

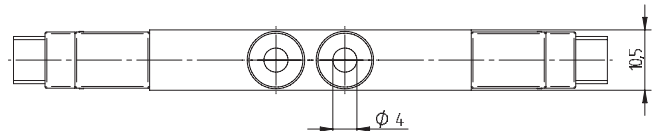
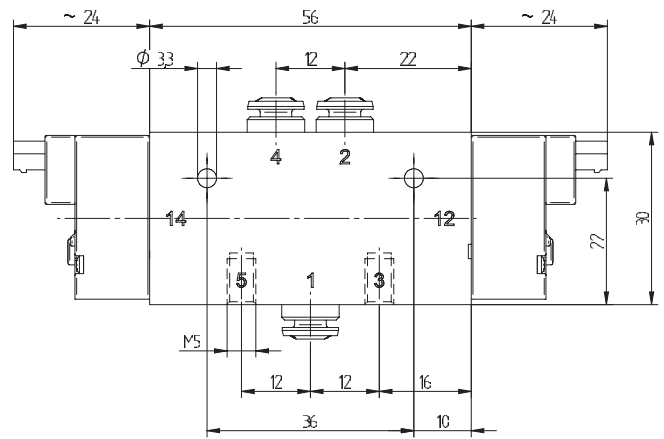
Solenoid with integrated LED and varistor. Protection class IP 40.

Valves are generally equipped with manual override to push.

Connectors according to JPC standard with a cable length of 300 mm are included.



**MMD 510 301 24DC**

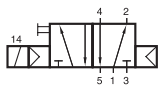


**MMD 510 341 24DC**

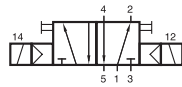
Type	Ports 1,2,3	Air flow	Operating press.	Power consumption	Weight
MMD 53_ 301 24DC	M5	230 l/min	3 - 8 bar	0,6 W	0,068 kg
MMD 53_ 341 24DC	pif 4 mm	230 l/min	3 - 8 bar	0,6 W	0,074 kg



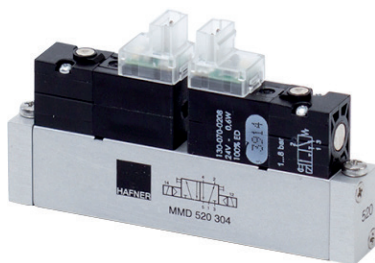
# MMD 510 304 24DC/MMD 520 304 24DC



MMD 510 304 24DC



MMD 520 304 24DC



### MMD 510 304

5/2-way solenoid valve actuated by permanent signal and equipped with air spring return. All the ports are in the plate.

### MMD 520 304

5/2-way double solenoid valve actuated by impulse. Position is kept until an electrical signal is applied to the opposite side even when not attached to electrical signal. All the ports are in the plate.

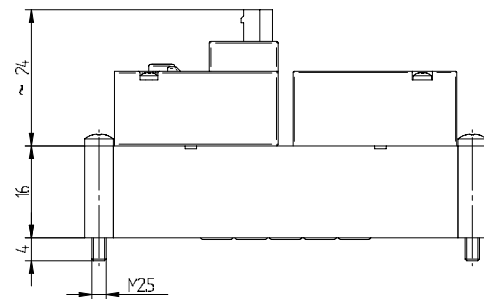
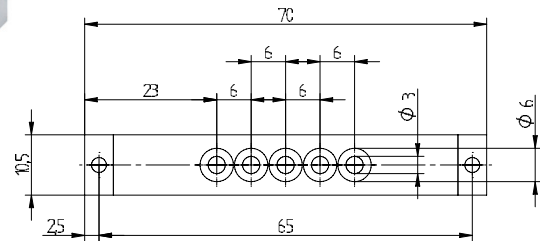
Available with 24V= solenoid system for connector according to JPC standard.  
12V= available on request.

Solenoid with integrated LED and varistor. Protection class IP 40.

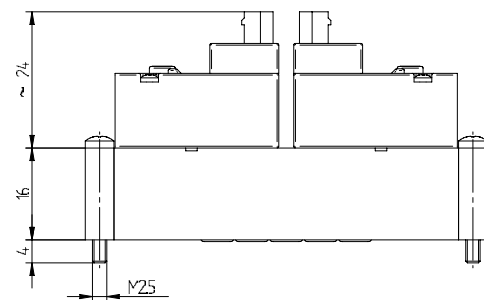
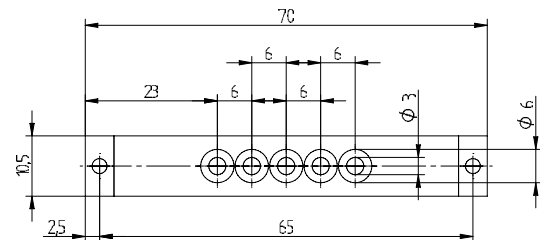
Valves are generally equipped with manual override to push.

Connector according to JPC standard with a cable length of 300 mm is included.  
MMD 520 304 24DC equipped with two connectors.

Modular manifold system type RM 5 304 on page 2.6.2.4, valve terminals on page 2.6.2.5.



MMD 510 304 24DC

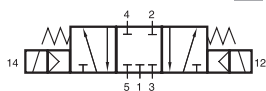


MMD 520 304 24DC

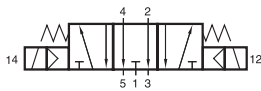
Type	Ports 1,2,3	Air flow	Operating press.	Power consumption	Weight
MMD 510 304 24DC	Ø 3 mm	230 l/min	3 - 8 bar	0,6 W	0,054 kg
MMD 520 304 24DC	Ø 3 mm	230 l/min	3 - 8 bar	0,6 W	0,054 kg



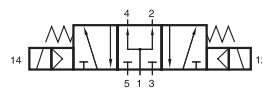
# MMD 53\_ 304 24DC



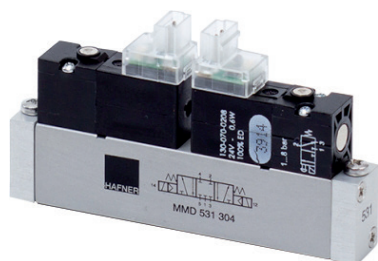
MMD 531 304 24DC



MMD 532 304 24DC



MMD 533 304 24DC



5/3-way solenoid valve with spring return to middle position, actuated by permanent signal. All the ports are in the plate.

- Type 531            centre closed
- Type 532            centre exhausted
- Type 533            centre pressurised

When ordering please complete the type number by 1, 2 or 3 according to the type required.

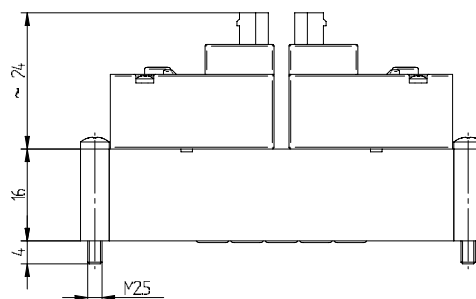
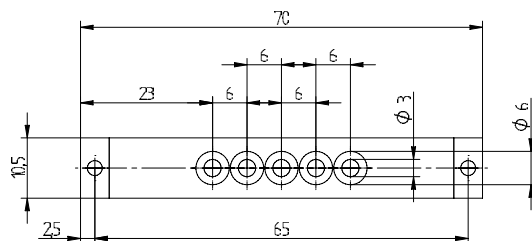
Available with 24V= solenoid system for connector according to JPC standard.  
12V= available on request.

Solenoid with integrated LED and varistor. Protection class IP 40.

Valves are generally equipped with manual override to push.

Connectors according to JPC standard with a cable length of 300 mm are included.

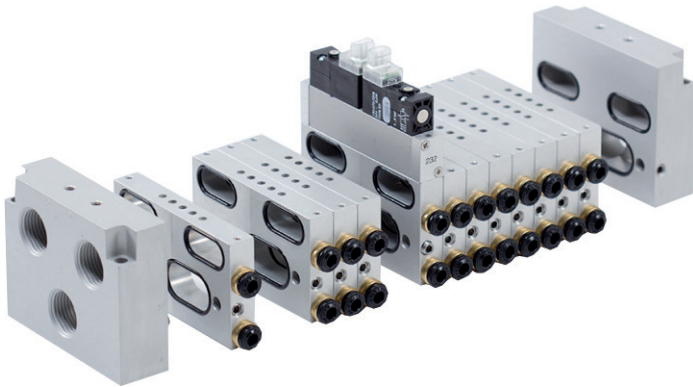
Modular manifold system type RM 5 304 on page 2.6.2.4, valve terminals on page 2.6.2.5.



**MMD 53\_ 304 24DC**

Type	Ports 1,2,3	Air flow	Operating press.	Power consumption	Weight
MMD 53_ 304 24DC	Ø 3 mm	230 l/min	3 - 8 bar	0,6 W	0,054 kg

# RM 5\_\_344



Modular manifold system for common connection to ports 1 (pressure), 3 and 5 (exhaust). Ports 2 and 4 of the individual valves are also located in the manifold plate and equipped with 4 mm push-in fittings.

The system can be build and taken apart just by operating two hexagon socket screws. Additional stations can be added at any position and any time.

Valves to be screwed from the top onto the modular manifold plate.

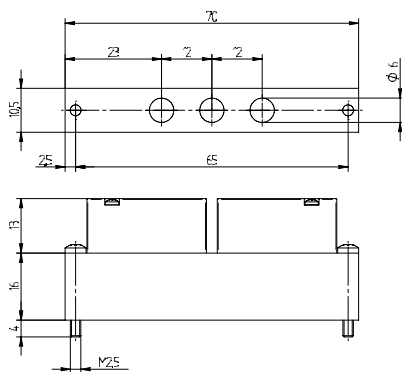
The following valves can be assembled to the manifold plate RM 5\_\_304:

Type	Function	Page
MMD 231 304 24DC	Double 3/2-way (NC&NC)	2.6.2.1
MMD 232 304 24DC	Double 3/2-way (NC&NO)	2.6.2.1
MMD 233 304 24DC	Double 3/2-way (NO&NO)	2.6.2.1
MMD 510 304 24DC	5/2 single sol.	2.6.2.2
MMD 520 304 24DC	5/2 double sol.	2.6.2.2
MMD 531 304 24DC	5/3 solenoid, closed	2.6.2.3
MMD 532 304 24DC	5/3 solenoid, exhausted	2.6.2.3
MMD 533 304 24DC	5/3 solenoid, pressurised	2.6.2.3

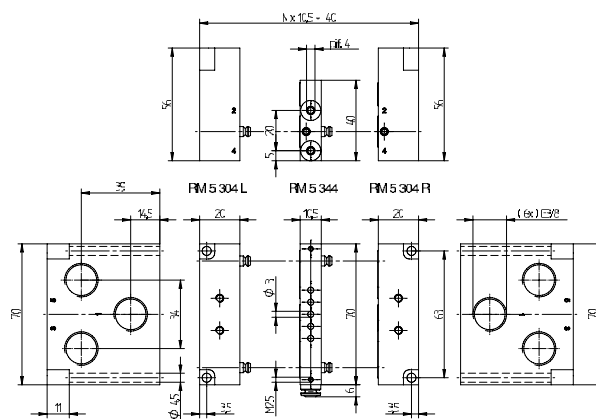
Blanking plates are also available type BPM 5 304.

The plates can also be ordered assembled by the manufacturer. In this case order RM 5\_\_344. Please add two digits for the number of positions required.

End-plates do not offer a valve-position.



**BPM 5 304**



**RM 5 304 L/RM 5 344/RM 5 304 R**

Type	Function	Ports	Weight
RM 5 304 L	End-plate left	G 3/8"	0,176 kg
RM 5 304 R	End-plate right	G 3/8"	0,176 kg
RM 5 344	Individual position	pif 4 mm	0,064 kg
BPM 5 304	Blanking plate	–	0,054 kg

# T\_10 5\_\_344

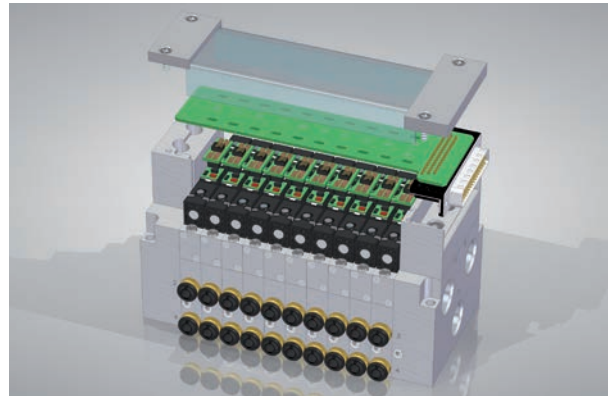


Valve terminal with 2 to 20 valve positions for valves with one or two solenoids. Common connection to ports 1 (pressure), 3 and 5 (exhaust).  
 Ports 2 and 4 of the individual valves are also located in the manifold plate and equipped with 4 mm push-in fittings.

Valves are screwed from the top onto the modular manifold plate. Electric part is added afterwards. The electric part has a defined number of positions and can be chosen with cable connection either on the left or on the right side. The following illustration shows a TR 10 510 344.  
 The TL 10 has the connector on the opposite side.

Blanking plates are also available type BPM 5 304, displayed on page 2.6.2.4.  
 The valve terminal will be equipped and tested by the manufacturer. Please advise configuration.

End-plates do not offer a valve-position.

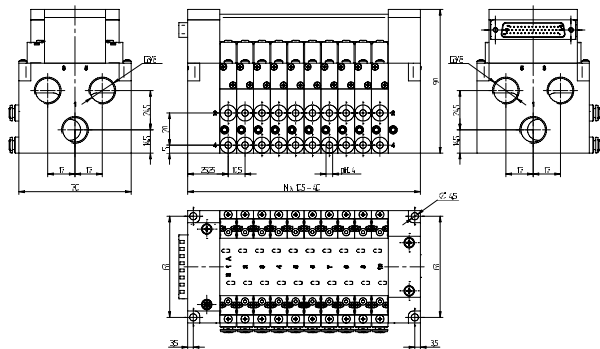


The following valves can be assembled to the valve terminal T\_10 5\_\_344:

Type	Function	Page
MMD 231 304 24DC	Double 3/2-way (NC&NC)	2.6.2.1
MMD 232 304 24DC	Double 3/2-way (NC&NO)	2.6.2.1
MMD 233 304 24DC	Double 3/2-way (NO&NO)	2.6.2.1
MMD 510 304 24DC	5/2 single sol.	2.6.2.2
MMD 520 304 24DC	5/2 double sol.	2.6.2.2
MMD 531 304 24DC	5/3 solenoid, closed	2.6.2.3
MMD 532 304 24DC	5/3 solenoid, exhausted	2.6.2.3
MMD 533 304 24DC	5/3 solenoid, pressurised	2.6.2.3



Element with ports 2+4 on the bottom:  
 RM 5 344 K1



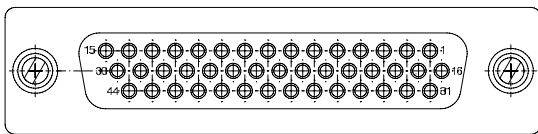
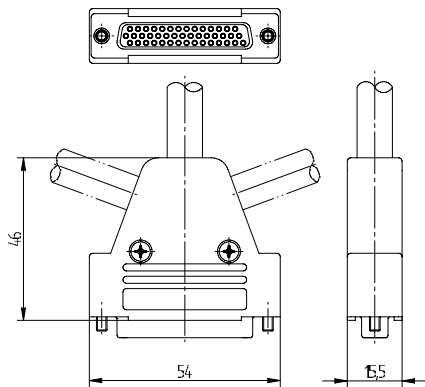
T\_10 5\_\_344

Type	Connector	Ports	Comment
TR 10 5__344	On the right side	front side	Please amend the type nr. by the required positions
TL 10 5__344	On the left side	front side	Please amend the type nr. by the required positions
TR 10 5__344 K1	On the right side	bottom	Please amend the type nr. by the required positions
TL 10 5__344 K1	On the left side	bottom	Please amend the type nr. by the required positions

# ST 54 20 L3000/ST 54 40 L3000



Straight electrical connector for 10 mm valve terminals.  
 Cable can be offset by 2 x 90°.  
 Standard cable length 3000 mm, others on request.



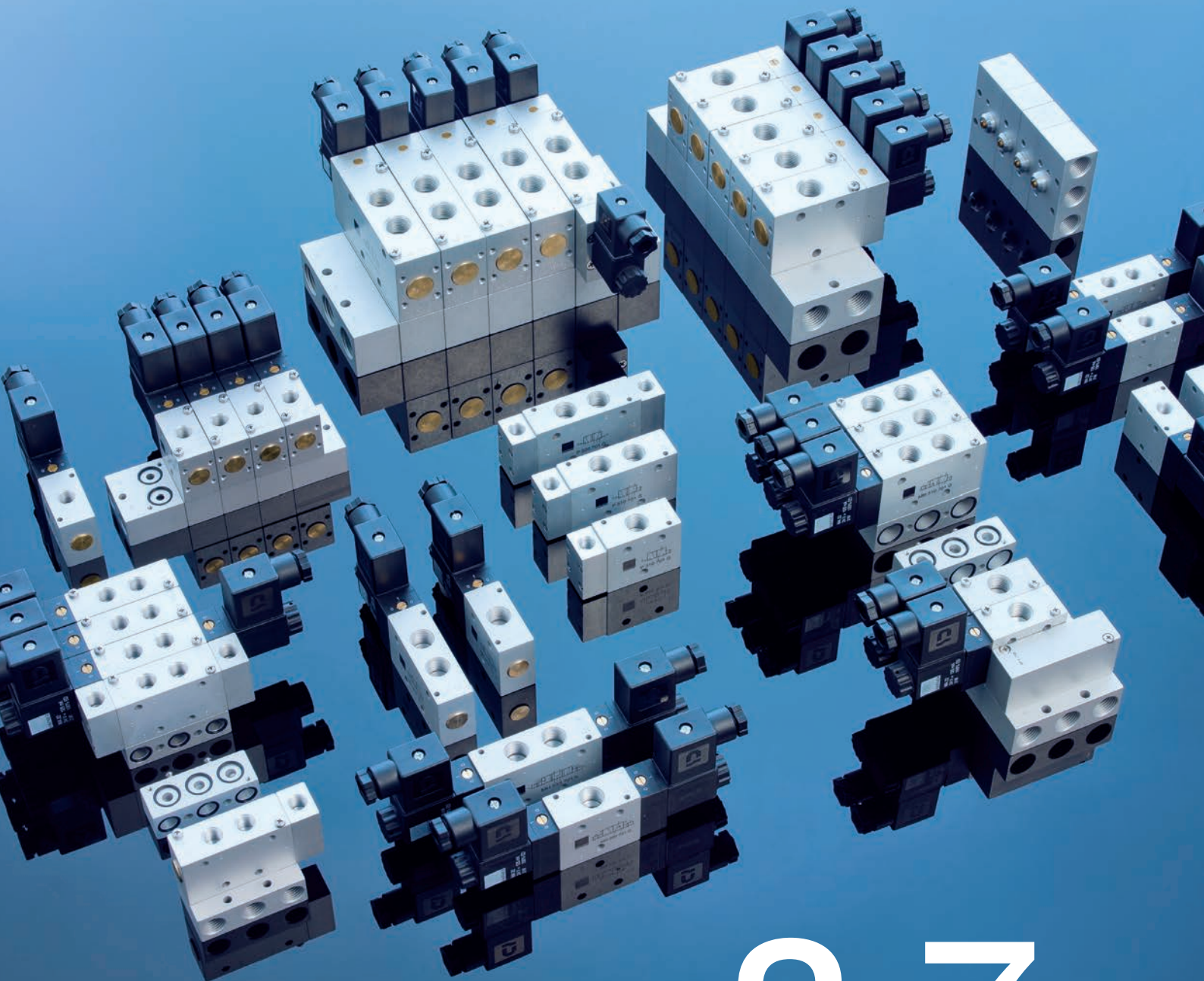
**PIN-numbering**

Valve	Solenoid	Colour	PIN
1	A	brown	23
	B	yellow	37
2	A	green	38
	B	red	22
3	A	blue	9
	B	pink	7
4	A	grey	24
	B	violet	36
5	A	black	39
	B	brown-green	21
6	A	white-green	10
	B	red-blue	6
7	A	grey-pink	25
	B	yellow-brown	35
8	A	white-yellow	40
	B	pink-brown	20
9	A	white-pink	11
	B	grey-brown	5
10	A	white-grey	26
	B	white-red	34
11	A	white-blue	41
	B	grey-green	19
12	A	brown-black	12
	B	white-black	4
13	A	brown-red	27
	B	pink-green	33
14	A	yellow-grey	42
	B	green-red	18
15	A	yellow-blue	13
	B	green-blue	3
16	A	yellow-pink	28
	B	grey-blue	32
17	A	yellow-black	29
	B	green-black	17
18	A	yellow-red	43
	B	grey-red	2
19	A	pink-blue	14
	B	grey-black	31
20	A	pink-red	44
	B	blue-black	16
common +/- up to 10 valves		white	8
2. common +/- for 10 to 20 valves		brown-blue	8
Without function		pink-black	
		red-black	

Solenoid A and B are marked on the terminal.  
 For TR10 solenoids A are on valve-side 12, the B solenoids are on valve-side 14.  
 For TL10 solenoids A are on valve-side 14, the B solenoids are on valve-side 12.

Type	Comment
ST 54 20 L3000	Connector for up to 10 valves
ST 54 40 L3000	Connector for up to 20 valves





# 2.7

## Manifold Plates

## R \_\_



Common connection to port 1 (pressure).

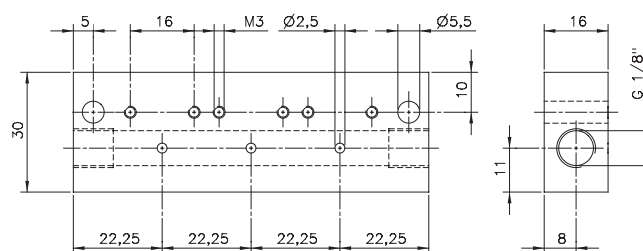
The following valves can be assembled to the manifold plate type **R \_\_**:

- MH 312 port 2: M5
- MH 314 port 2: pif 4 mm
- MH 315 port 2: G 1/8"
- MH 316 port 2: pif 6 mm

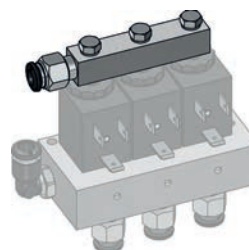
All the valves are displayed on page 2.5.1.2.1.

Blanking plates are also available type BP 3.

*All the manifold plates offered by HAFNER-Pneumatik can be equipped with the DIN-rail mounting clips.*



**R \_\_** Orifice size: 8,5 mm



Exhaust rail - RS 03

Available on request:

Exhaust rail to collect the exhausting air at the operator tube. Please ask for our type RS \_\_ . Please add two digits for the number of positions required. Push-in fitting not included.

Stations	Type	Weight
2	R 02	0,08 kg
3	R 03	0,11 kg
4	R 04	0,13 kg
5	R 05	0,16 kg
6	R 06	0,19 kg
8	R 08	0,24 kg
10	R 10	0,30 kg
12	R 12	0,35 kg

# RD 3\_\_403/RD 3\_\_464

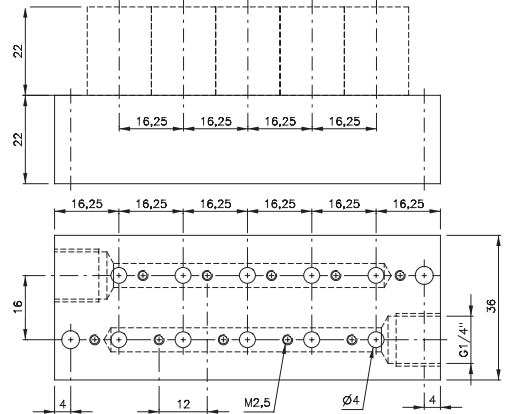


Manifold plate type **RD 3\_\_403**:  
Common connection to port 1 (pressure) and 3 (exhaust).

The following valves can be assembled to the manifold:

- 3/2-way n.c. G 1/8" MD 310 403 page 2.5.1.2.3
- 3/2-way n.o. G 1/8" MOD 310 403 page 2.5.1.2.3
- 3/2-way n.c. pif 6 mm MD 310 463 page 2.5.1.2.3
- 3/2-way n.o. pif 6 mm MOD 310 463 page 2.5.1.2.3

Blanking plates are also available type BP 3 403.



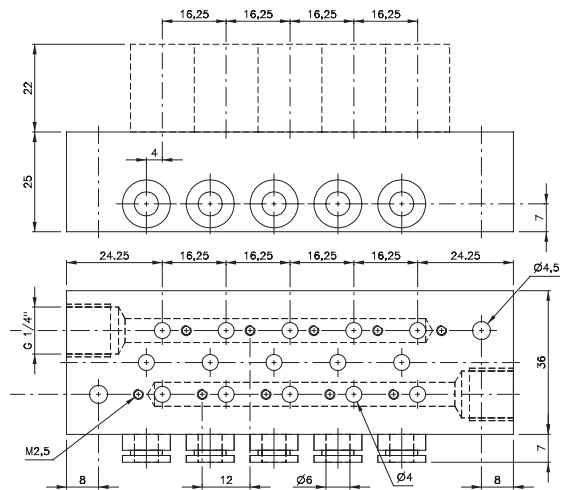
**RD 3\_\_403** Orifice size: 6 mm

Manifold plate type **RD 3\_\_464**.  
Common connection to port 1 (pressure) and 3 (exhaust).  
The individual ports 2 are also in the manifold plate equipped with push-in fittings.

The following valves can be assembled to the manifold:

- 3/2-way n.c. MD 310 404 page 2.5.1.2.4
- 3/2-way n.o. MOD 310 404 page 2.5.1.2.4

Blanking plates are also available type BP 3 404.



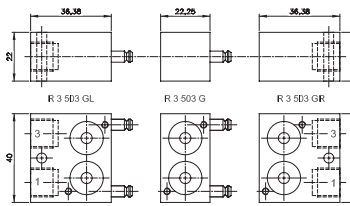
**RD 3\_\_464** Orifice size: 6 mm

Please note:  
Due to the compact design of the plate if a larger number of valves are to switch at the same time please do not select plates with more than 6 stations.

Stations	Type	Weight	Type	Weight
2	RD 302 403	0,09 kg	RD 302 464	0,15 kg
3	RD 303 403	0,13 kg	RD 303 464	0,19 kg
4	RD 304 403	0,16 kg	RD 304 464	0,23 kg
5	RD 305 403	0,19 kg	RD 305 464	0,26 kg
6	RD 306 403	0,23 kg	RD 306 464	0,30 kg
7	RD 307 403	0,27 kg	RD 307 464	0,34 kg
8	RD 308 403	0,30 kg	RD 308 464	0,38 kg
9	RD 309 403	0,33 kg	RD 309 464	0,41 kg
10	RD 310 403	0,36 kg	RD 310 464	0,49 kg
12	RD 312 403	0,43 kg	RD 312 464	0,53 kg
14	RD 314 403	0,49 kg	RD 314 464	0,60 kg
16	RD 316 403	0,55 kg	RD 316 464	0,68 kg



# RB 3\_\_ 503 G/RB 3\_\_ 703 G



Parts of modular manifold RB 3\_\_ 503 G

Modular manifold system for common connections to ports 1 (pressure) and 3 (exhaust). The system can be build and taken apart just by operating two hexagon socket screws. Additional stations can be added at any position and any time. End-plates are equipped with threads for adding DIN-rail mounting clips.

The following valves can be assembled to the system **RB 3\_\_ 503 G**:  
 3/2 single sol. n.c. G 1/8" MH 310 501 G page 2.5.1.1.10  
 3/2 single sol. n.o. G 1/8" MOH 310 501 G page 2.5.1.1.10

The system consists of:  
 End-plate right type R 3 503 GR  
 End-plate left type R 3 503 GL  
 Individual position type R 3 503 G

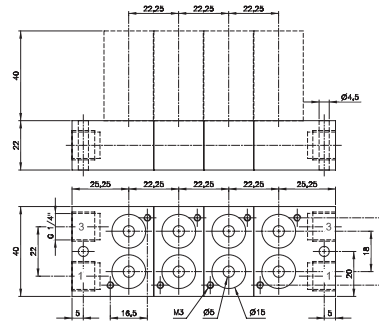
Blanking plates are also available type BP 3 503.

The following valves can be assembled to the system **RB 3\_\_ 703 G**:  
 3/2 single sol. n.c. G 1/4" MH 310 701 G page 2.5.1.1.10  
 3/2 single sol. n.o. G 1/4" MOH 310 701 G page 2.5.1.1.10

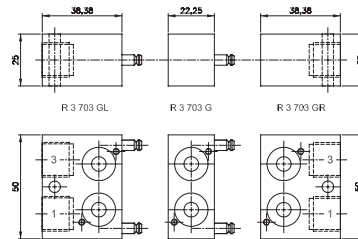
The system consists of:  
 End-plate right type R 3 703 GR  
 End-plate left type R 3 703 GL  
 Individual position type R 3 703 G

Blanking plates are also available type BP 3 703.

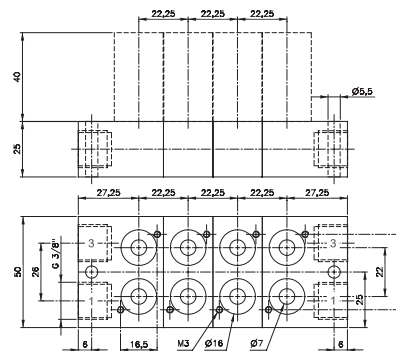
The plates can also be ordered assembled by the manufacturer. In this case order RB 3\_\_ 503 G (1/8") or RB 3\_\_ 703 G (1/4"). Please add two digits for the number of positions required.



**RB 3\_\_ 503 G** Orifice size: 10 mm



Parts of modular manifold RB 3\_\_ 703 G



**RB 3\_\_ 703 G** Orifice size: 15 mm

Type	Function	Weight
R 3 503 GR	End-plate right	0,07 kg
R 3 503 GL	End-plate left	0,07 kg
R 3 503 G	Individual position	0,05 kg

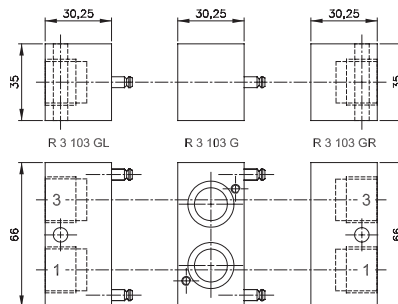
Type	Function	Weight
R 3 703 GR	End-plate right	0,11 kg
R 3 703 GL	End-plate left	0,11 kg
R 3 703 G	Individual position	0,07 kg
R 3 703 G D1	Individual position, with individual valve isolation	0,08 kg



**BS 503/BS 3 703**

By adding a special plug (type BS 503/BS 3 703), two different pressures can be attached at the same manifold plate. The plug is intercepting the air-supply in the manifold plate wherever the customer likes to. Type BS 503 for manifold RB\_503 G and BS 3 703 for manifold RB\_703 G.

# RB 3\_\_ 103 G



Parts of modular manifold **RB 3\_\_ 103 G**

Series 103 G modular manifold system for common connections to ports 1 (pressure) and 3 (exhaust). The system can be build and taken apart just by operating two hexagon socket screws. Additional stations can be added at any position and any time. End-plates are equipped with threads for adding DIN-rail mounting clips.

The following valves can be assembled to the system  
**RB 3\_\_ 103 G:**

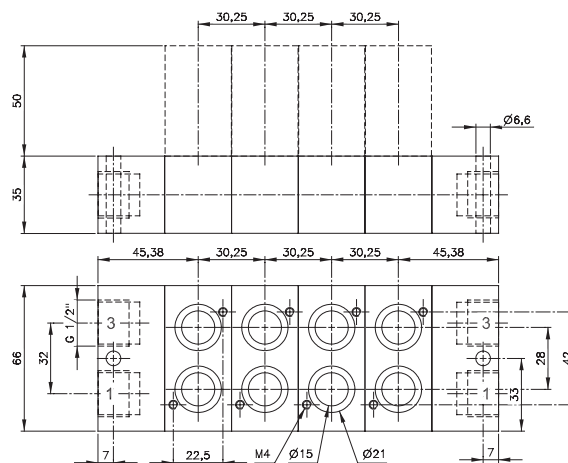
- 3/2 single sol. n.c.    G 3/8" MH 310 101 G    page 2.5.1.1.11
- 3/2 single sol. n.o.    G 3/8" MOH 310 101 G    page 2.5.1.1.11

Further technical details on the valves can be found on the pages mentioned above. Drawings of the "G-version" valves with the additional mounting holes for manifold mounting can be found on this page.

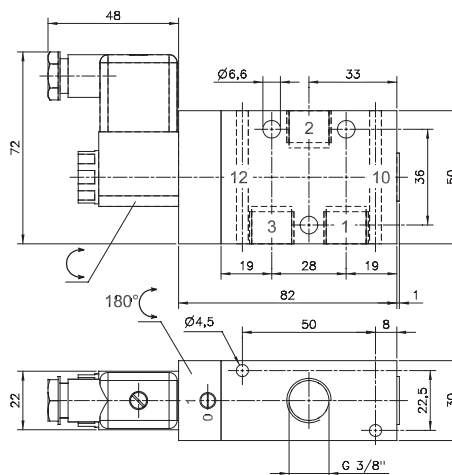
- The system consists of:
- End-plate right type R 3 103 GR
- End-plate left type R 3 103 GL
- Individual position type R 3 103 G

Blanking plates are also available type BP 3 103.

Please note:  
 End-plates of series 103 G are not offering an individual valve position. The plates can also be ordered assembled by the manufacturer. In this case order RB 3\_\_ 103 G (3/8"). Please add two digits for the number of positions required.



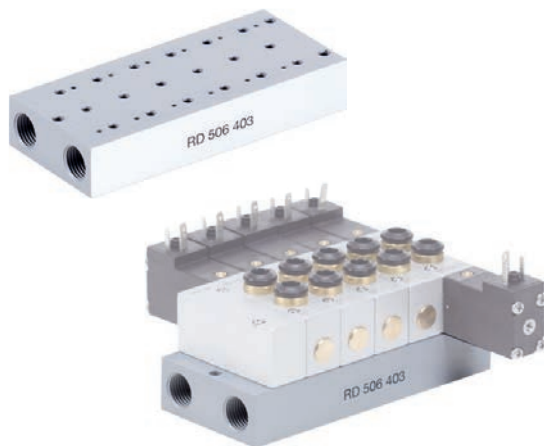
**RB 3\_\_ 103 G** Orifice size: 19 mm



**MH 310 101 G/MOH 310 101 G**

Type	Function	Weight
R 3 103 GR	End-plate right	0,14 kg
R 3 103 GL	End-plate left	0,15 kg
R 3 103 G	Individual position	0,12 kg

# RD 5\_\_403



Common connection to port 1 (pressure), 3 and 5 (exhaust).

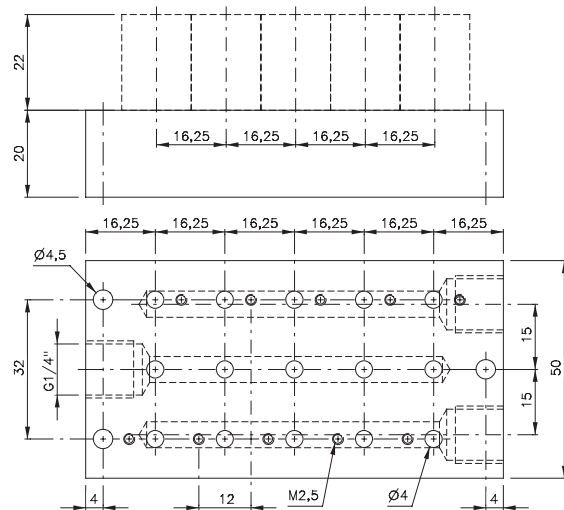
The following solenoid valves can be assembled to the manifold plate type **RD 5\_\_403**:

5/2 single sol.	G 1/8"	MD 510 403	page 2.5.2.2.1
5/2 single sol.	pif 6 mm	MD 510 463	page 2.5.2.2.1
5/2 double sol.	G 1/8"	MD 520 403	page 2.5.2.2.5
5/2 double sol.	pif 6 mm	MD 520 463	page 2.5.2.2.5
5/3-way	G 1/8"	MD 53_403	page 2.5.3.2.1
5/3-way	pif 6 mm	MD 53_463	page 2.5.3.2.1

Blanking plates are also available type BP 5 403.

Please note:

Due to the compact design of the plate if a larger number of valves are to switch at the same time please do not select plates with more than 6 stations.



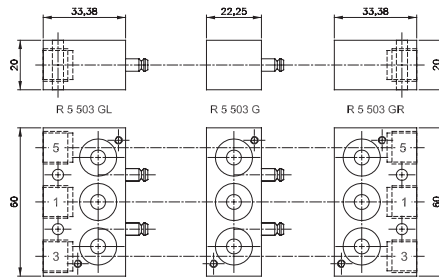
**RD 5\_\_403** Orifice size: 10 mm

Stations	Type	Weight
2	RD 502 403	0,12 kg
3	RD 503 403	0,16 kg
4	RD 504 403	0,20 kg
5	RD 505 403	0,24 kg
6	RD 506 403	0,28 kg
7	RD 507 403	0,32 kg
8	RD 508 403	0,37 kg
9	RD 509 403	0,41 kg
10	RD 510 403	0,45 kg
12	RD 512 403	0,53 kg
14	RD 514 403	0,62 kg
16	RD 516 403	0,69 kg

# RB 5 \_\_ 503 G



Modular manifold system for common connections to ports 1 (pressure), 3 and 5 (exhaust). The system can be build and taken apart just by operating two hexagon socket screws. Additional stations can be added at any position and any time. End-plates are equipped with threads for adding DIN-rail mounting clips.



**Parts of modular manifold RB 5 \_\_ 503 G**

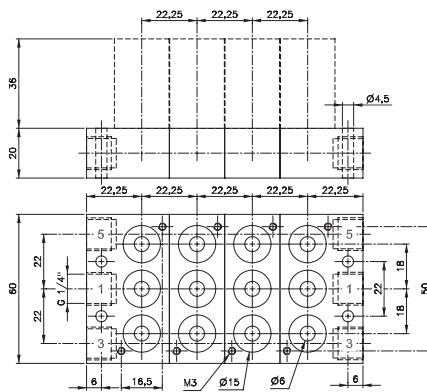
The following valves can be assembled to the system **RB 5 \_\_ 503 G**:

**Solenoid valves:**

5/2 single sol.	G 1/8"	MH 510 501 G	page 2.5.2.1.2
5/2 single sol.	G 1/8"	MH 510 503	page 2.5.2.2.2
5/2 double sol.	G 1/8"	MH 520 501 G	page 2.5.2.1.5
5/2 double sol.	G 1/8"	MH 520 503	page 2.5.2.2.6
5/3 solenoid	G 1/8"	MH 53_ 501 G	page 2.5.3.1.2
5/3 solenoid	G 1/8"	MH 53_ 503	page 2.5.3.2.2

**Pneumatically actuated valves:**

5/2 air spring	G 1/8"	P 510 501 G	page 2.4.2.2
5/2 mech. spring	G 1/8"	P 511 501 G	page 2.4.2.2
5/2 double pilot	G 1/8"	P 52_ 501 G	page 2.4.2.4
5/3	G 1/8"	P 53_ 501 G	page 2.4.3.1



**RB 5 \_\_ 503 G** Orifice size: 10 mm

The system consists of:

- End-plate right type R 5 503 R
- End-plate left type R 5 503 GL
- Individual position type R 5 503 G

Blanking plates are also available type BP 5 503.

The plates can also be ordered assembled by the manufacturer. In this case order RB 5 \_\_ 503 G. Please add two digits for the number of positions required.

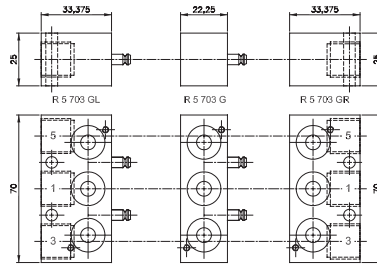


**BS 503**

By adding a special plug (type BS 503), two different pressures can be attached at the same manifold plate. The plug is intercepting the air-supply in the manifold plate wherever the customer likes to.

Type	Function	Weight
R 5 503 GR	End-plate right	0,08 kg
R 5 503 GL	End-plate left	0,08 kg
R 5 503 G	Individual position	0,06 kg

# RB 5 \_\_ 703 G



Parts of modular manifold RB 5 \_\_ 703 G

Modular manifold system for common connections to ports 1 (pressure), 3 and 5 (exhaust). The system can be built and taken apart just by operating two hexagon socket screws. Additional stations can be added at any position and any time. End-plates are equipped with threads for adding DIN-rail mounting clips.

The following valves can be assembled to the system **RB 5 \_\_ 703 G**:

**Solenoid valves:**

5/2 single sol.	G 1/4"	MH 510 701 G	page 2.5.2.1.2
5/2 single sol.	G 1/4"	MH 510 703	page 2.5.2.2.2
5/2 double sol.	G 1/4"	MH 520 701 G	page 2.5.2.1.5
5/2 double sol.	G 1/4"	MH 520 703	page 2.5.2.2.6
5/3 solenoid	G 1/4"	MH 53_ 701 G	page 2.5.3.1.2
5/3 solenoid	G 1/4"	MH 53_ 703	page 2.5.3.2.2

**Pneumatically actuated valves:**

5/2 air spring	G 1/4"	P 510 701 G	page 2.4.2.2
5/2 mech. spring	G 1/4"	P 511 701 G	page 2.4.2.2
5/2 double pilot	G 1/4"	P 52_ 701 G	page 2.4.2.4
5/3 pneum.	G 1/4"	P 53_ 701 G	page 2.4.3.1

The system consists of:

- End-plate right type R 5 703 GR
- End-plate left type R 5 703 GL
- Individual position type R 5 703 G

Blanking plates are also available type BP 5 703.

NPT-ported end-plates available on request.

The plates can also be ordered assembled by the manufacturer. In this case order RB 5 \_\_ 703 G. Please add two digits for the number of positions required.

**Additional:**

1.) Combine 3-way and 5-way valves on the same plate. By adding R 53 703 G elements to the standard R 5 703 G elements, 3-way as well as 5-way valves can be mixed on the same plate (e.g. MH 510 701 G and MH 310 701 G).

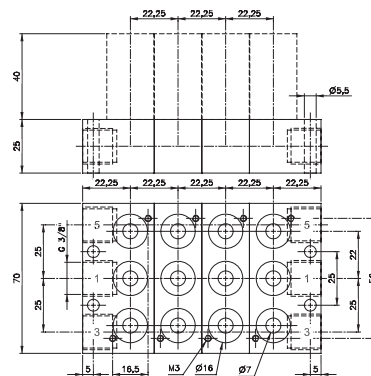
2.) Individual valve isolation.

In certain industries the user appreciates, if he can take away air pressure at any valve on the plate individually. Valves can easily be exchanged by closing port 1 on the reverse side of the plate without interruption of the air-supply of the other valves.

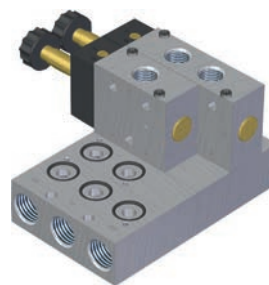
The system consists of:

- End-plate right type R 5 703 GR D1
- End-plate left type R 5 703 GL D1
- Individual position type R 5 703 G D1

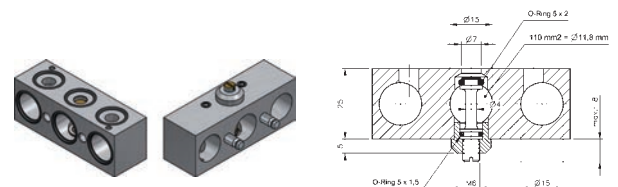
Type	Function	Weight
R 5 703 GR	End-plate right	0,13 kg
R 5 703 GL	End-plate left	0,12 kg
R 5 703 G	Individual position	0,09 kg
R 5 703 G D1	Individual position with individual valve isolation	0,09 kg



RB 5 \_\_ 703 G Orifice size: 15 mm



**1.) Combination of 3- and 5-way valves**



**2.) Individual valve isolation (R 5 703 G D1)**



BS 703

By adding a special plug (type BS 703), two different pressures can be attached at the same manifold plate. The plug is intercepting the air-supply in the manifold plate wherever the customer likes to.



# RB 5 \_\_ 103 G



Modular manifold system for common connections to ports 1 (pressure), 3 and 5 (exhaust). The system can be build and taken apart just by operating two hexagon socket screws. Additional stations can be added at any position and any time. End-plates are equipped with threads for adding DIN-rail mounting clips.

The following valves can be assembled to the system

**RB 5 \_\_ 103 G:**

- 5/2 single solenoid G 3/8" MH 510 101 G page 2.5.2.1.3
- 5/2 double solenoid G 3/8" MH 520 101 G page 2.5.2.1.6
- 5/3 solenoid G 3/8" MH 53\_ 101 G page 2.5.3.1.3

Further technical details on the valves can be found on the pages mentioned above. Drawings of the "G-version" valves with the additional mounting holes for manifold mounting can be found on this page.

The system consists of:

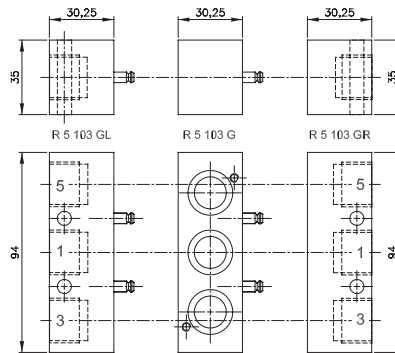
- End-plate right type R 5 103 GR
- End-plate left type R 5 103 GL
- Individual position type R 5 103 G

Blanking plates are also available type BP 5 103.

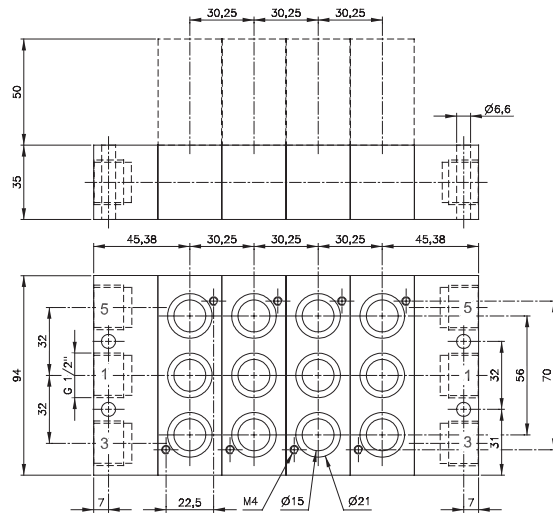
Please note:

End-plates are not offering an individual valve-position.

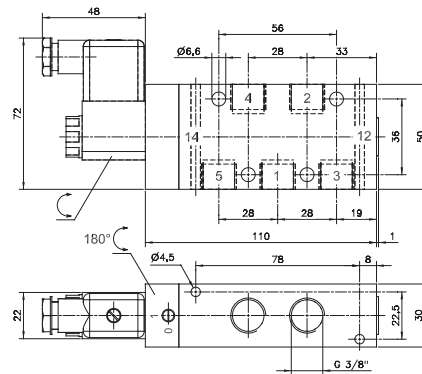
The plates can also be ordered assembled by the manufacturer. In this case order RB 5 \_\_ 103 G. Please add two digits for the number of positions required.



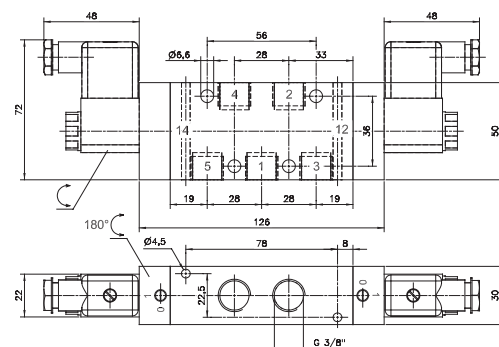
Parts of modular manifold RB 5 \_\_ 103 G



R 5 \_\_ 103 G Orifice size: 19 mm



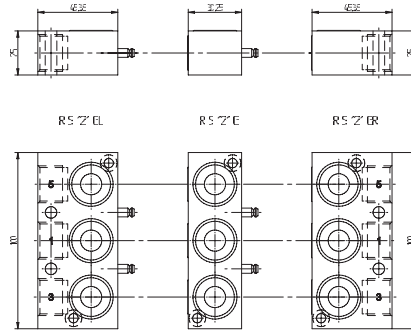
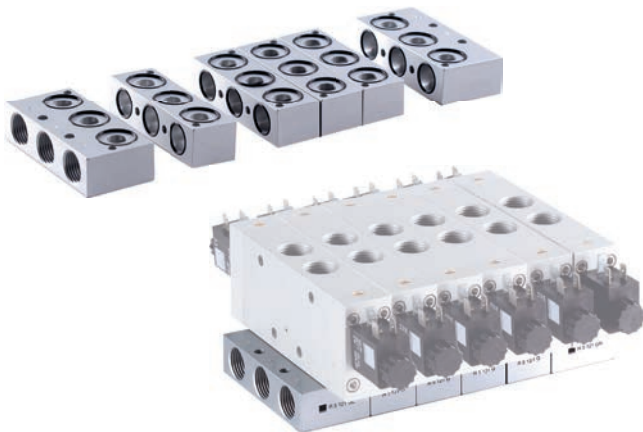
MH 510 101 G



MH 520 101 G/MH 53\_ 101 G

Type	Function	Weight
R 5 103 GR	End-plate right	0,20 kg
R 5 103 GL	End-plate left	0,21 kg
R 5 103 G	Individual position	0,18 kg

# RB 5 \_\_ 121 G



Parts of modular manifold RB 5 \_\_ 121 G



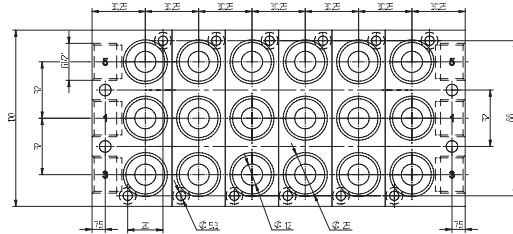
The following valves can be assembled to the system **RB 5 \_\_ 121 G**:

**Solenoid valves:**

- 5/2 single sol. G 1/2" MH 510 121 G page 2.5.2.1.3
- 5/2 double sol. G 1/2" MH 520 121 G page 2.5.2.1.6
- 5/3 solenoid G 1/2" MH 53\_ 121 G page 2.5.3.1.3

**Pneumatically actuated valves :**

- 5/2 single pilot G 1/2" P 510 121 G page 2.4.2.3
- 5/2 double pilot G 1/2" P 520 121 G page 2.4.2.5
- 5/3 pneumatic G 1/2" P 53\_ 121 G page 2.4.3.2



**RB 5 \_\_ 121 G** Orifice size: 17 mm

Further technical details on the valves can be found on the pages mentioned above. Drawings of the "G-version" valves with the additional mounting holes for manifold mounting can be found on this page.

Blanking plates are also available type BP 5 121 G.

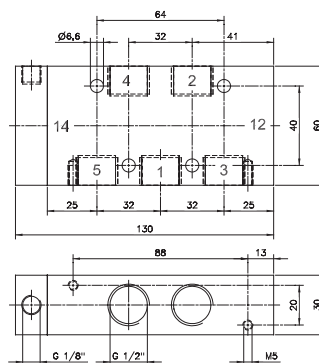
The system consists of:

- End-plate right type R 5 121 GR
- End-plate left type R 5 121 GL
- Individual position type R 5 121 G

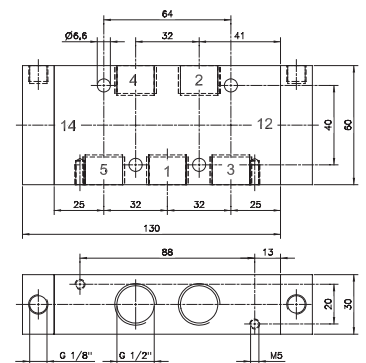
The plates can also be ordered assembled by the manufacturer.

In this case order RB 5 \_\_ 121 G (G 1/2").

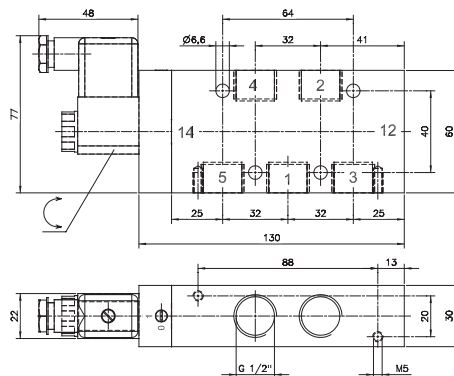
Please add two digits for the number of positions required.



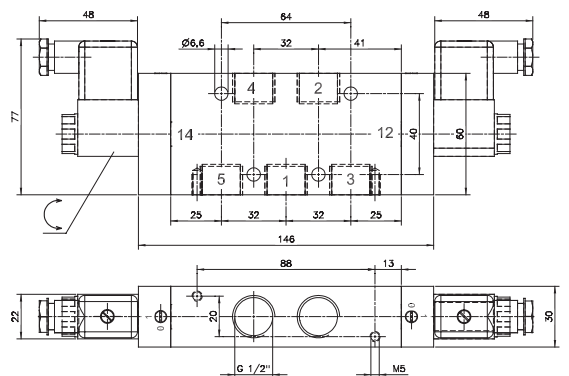
**P 510 121G**



**P 520 121 G / P 53\_ 121 G**



**MH 510 121 G**

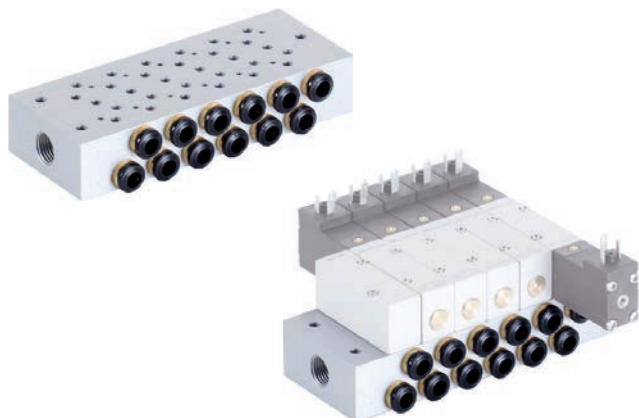


**MH 520 121 G / MH 53\_ 121 G**

Type	Function	Weight
R 5 121 GR	End-plate right	0,24 kg
R 5 121 GL	End-plate left	0,24 kg
R 5 121	Individual position	0,15 kg



## RD 5\_\_464



Common connection to port 1 (pressure), 3 and 5 (exhaust). The individual ports 2 and 4 are also in the manifold plate equipped with push-in fittings.

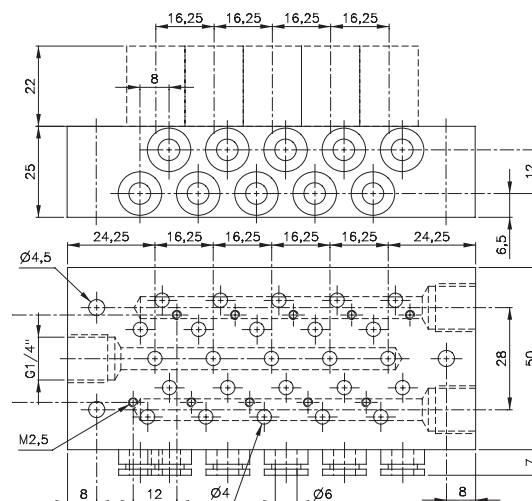
The following solenoid valves can be assembled to the manifold plate type **RD 5\_\_464** (pif 6 mm):

5/2 single sol.	MD 510 404	page 2.5.2.2.3
5/2 double sol.	MD 520 404	page 2.5.2.2.3
5/3-way	MD 53_404	page 2.5.2.2.3

Blanking plates are also available type BP 5 404.

Please note:

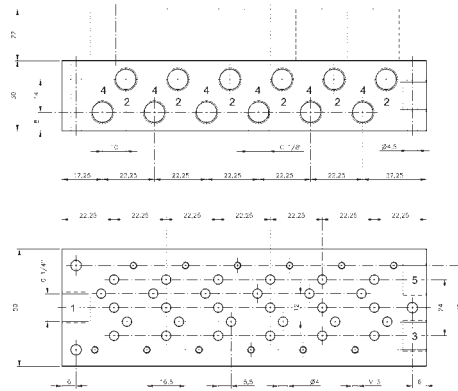
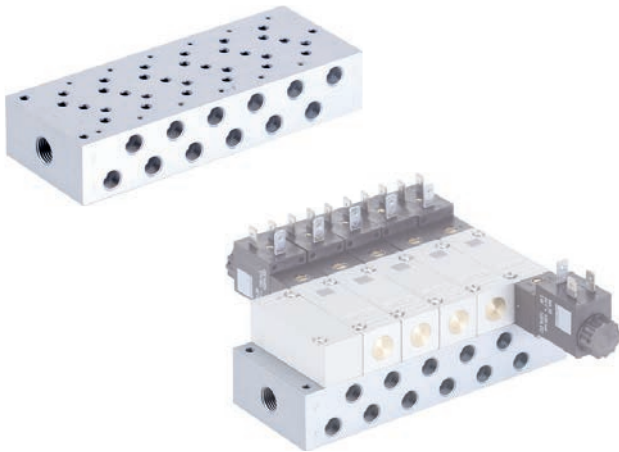
Due to the compact design of the plate if a larger number of valves are to switch at the same time please do not select plates with more than 6 stations.



**RD 5\_\_464** Orifice size: 6 mm

Stations	Type	Weight
2	RD 502 464	0,21 kg
3	RD 503 464	0,27 kg
4	RD 504 464	0,33 kg
5	RD 505 464	0,38 kg
6	RD 506 464	0,44 kg
7	RD 507 464	0,50 kg
8	RD 508 464	0,55 kg
9	RD 509 464	0,60 kg
10	RD 510 464	0,66 kg
12	RD 512 464	0,77 kg
14	RD 514 464	0,88 kg
16	RD 516 464	0,99 kg

# R 5\_\_ 304/R 5\_\_ 504/R 5\_\_ 704



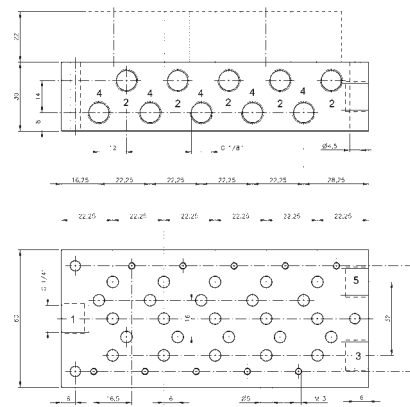
**R 5\_\_ 304** Orifice size: 6 mm

Common connection to port 1 (pressure), 3 (exhaust) and 5 (exhaust). The ports 2 and 4 of the individual valves are also located in the manifold plate.

The following solenoid valves can be assembled to the manifold plate type **R 5\_\_ 304** (G 1/8" orifice 3 mm):  
 5/2 single sol. MH 510 304 page 2.5.2.2.4  
 5/2 double sol. MH 520 304 page 2.5.2.2.7  
 5/3-way MH 53\_ 304 page 2.5.3.2.3

Blanking plates are also available type BPH 5 304.

The following solenoid valves can be assembled to the manifold plate type **R 5\_\_ 504** (G 1/8" orifice 5 mm):  
 5/2 single sol. MH 510 504 page 2.5.2.2.4  
 5/2 double sol. MH 520 504 page 2.5.2.2.7  
 5/3-way MH 53\_ 504 page 2.5.3.2.3



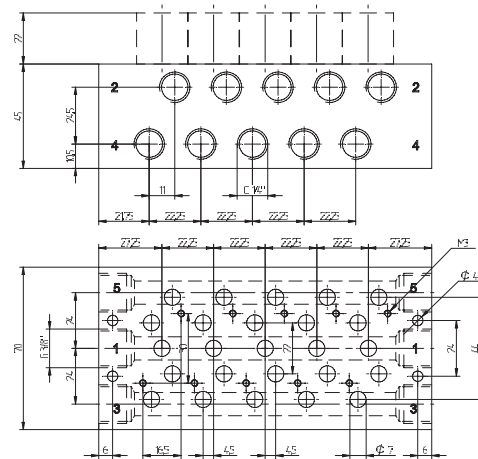
**R 5\_\_ 504** Orifice size: 6,6 mm

Blanking plates are also available type BP 5 504.

The following valves can be assembled to the manifold plate type **R 5\_\_ 704** (G 1/4").

5/2-way MH 510 704 page 2.5.2.2.4  
 5/2-way MH 520 704 page 2.5.2.2.7  
 5/3-way MH 53\_ 704 page 2.5.3.2.3

Blanking plates are also available type BP 5 704.



**R 5\_\_ 704** Orifice size: 10 mm

Stations	Type	Weight	Type	Weight	Type	Weight
2	R 502 304	0,26 kg	R 502 504	0,30 kg	R 502 704	0,54 kg
3	R 503 304	0,34 kg	R 503 504	0,40 kg	R 503 704	0,72 kg
4	R 504 304	0,42 kg	R 504 504	0,50 kg	R 504 704	0,90 kg
5	R 505 304	0,51 kg	R 505 504	0,60 kg	R 505 704	1,10 kg
6			R 506 504	0,70 kg	R 506 704	1,25 kg
8			R 508 504	0,89 kg	R 508 704	1,60 kg
10			R 510 504	1,08 kg	R 510 704	1,95 kg
12			R 512 504	1,29 kg	R 512 704	2,32 kg

# RB 5\_\_704 K1



Bottom side

Modular manifold system with all ports on the bottom. Plates are designed for assemblage in control cabinets.

Common connection to port 1 (pressure), 3 (exhaust) and 5 (exhaust). The ports 2 and 4 of the individual valves are also located in the manifold plate. The system can be build up and taken apart by just operating two hexagon socket screws. Additional stations can be added at any position and any time.

The following valves can be assembled to the system

**RB 5\_\_704 K1:**

- 5/2 single solenoid      MH 510 704      page 2.5.2.2.4
- 5/2 double solenoid    MH 520 704      page 2.5.2.2.7
- 5/3 solenoid            MH 53\_704      page 2.5.3.2.3

3/2-way functions by closing either port 2 or 4.

The system consists of:

- End-plate right            type R 5 704 K1 R
- End-plate left            type R 5 704 K1 L
- Individual position      type R 5 704 K1

Blanking plates are also available type BP 5 704.

Please note:

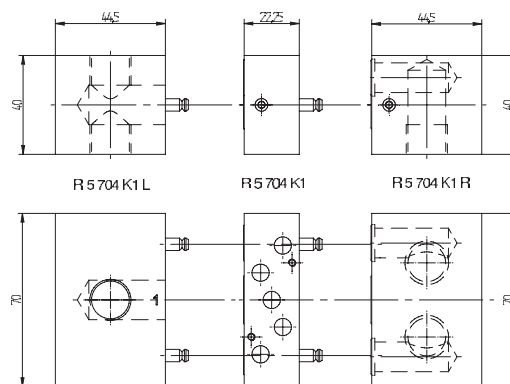
End-plates are not offering an individual valve-position.

The plates can also be ordered assembled by the manufacturer. In this case order **RB 5\_\_704 K1**. Please add two digits for the number of positions required.

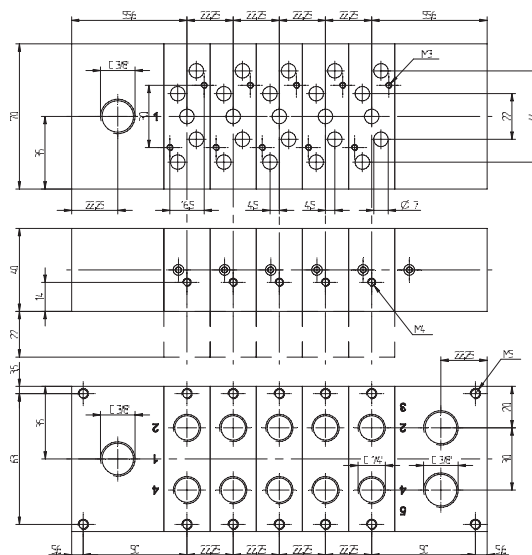
In case the customer wants to have the FRL inside the box, the endplate left offers as second supply port that faces inside the box. One of the two has to be closed with a G 3/8" plug.

The individual plates are also available with individual valve isolation type R 5 704 K1 D1. In certain industries the user appreciates, if he can take away air pressure at any valve on the plate individually. Valves can easily be exchanged by closing the plug in port 1 without interruption of the air-supply of the other valves.

Wider elements for usage with wider coils (e.g. ATEX-approved versions) are available on request.



Parts of modular manifold RB 5\_\_704 K1



# Control Cabinets built by HAFNER



Bottom side



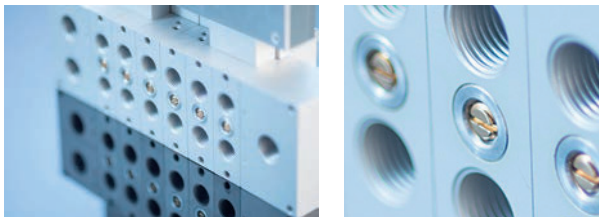
Bottom side

HAFNER offers a range of products designed to make the assemblage of manifolds and valve terminals inside a control cabinet as easy as possible. No tubing needs to stay inside the box!

- **Series 704 K1** with a maximum air-flow of 1.250 l/min  
Further information on page 2.7.2.9 and 2.8.3.5
- **Series 104 K1** with a maximum air-flow of 2.250 l/min on request

### The HAFNER system offers distinct advantages:

- Less effort to assemble = significant time-savings
- No bulk-head fittings required
- Less installation material = significant material savings
- No hoses inside the box
- Less risk of leakage inside the box, significant air savings



### Available as a special feature:

Manifolds with **individual valve isolation screw** (suffix D1 to type-number).

Valves can easily be exchanged by closing the plug in port 1 without interruption of the air-supply of the other valves.



Image source: Voith GmbH

### Application examples:

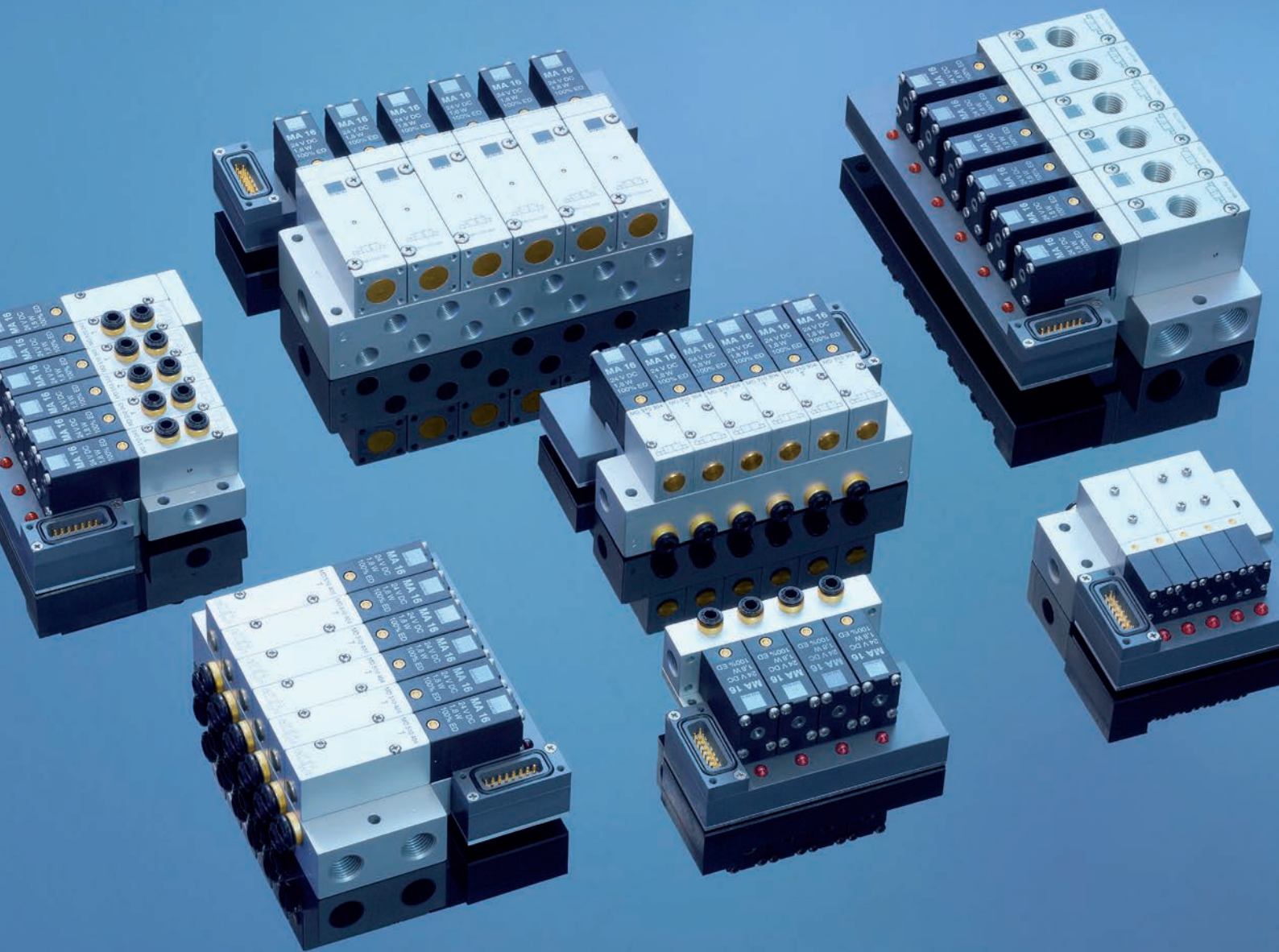
Control cabinet with 8 x 5/2-way single solenoid valves with 7 mm orifice, assembled on a valve terminal. Manifold is having the individual valve isolation feature.



Image source: Voith GmbH

Air distributor cabinet with pressure regulator, main shut-off valve and 12 outlets.



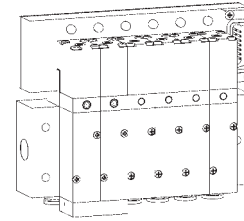
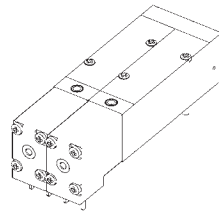


# 2.8

## Valve Terminals with 15 pin Sub-D connector

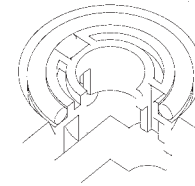
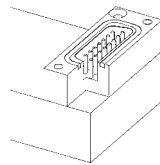
# General Information on Valve Terminals

Valve terminal for valves 24 V= and 24 V~.  
 All valves with 1.8 Watt/3 VA power consumption.  
 2 - 14 stations available, equipped with varistor and red LED. Common Minus or Plus on white cable.



Double solenoid valves (5/2-way and 5/3-way) occupy 2 spaces.

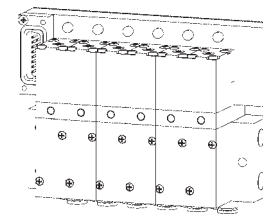
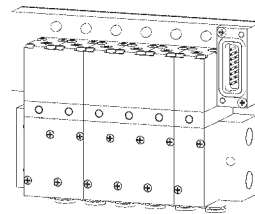
The system is highly water resistant. D-sub-multipin connector and individual valve positions are sealed with NBR O-rings against water and humidity offering IP 65.



**Seal at connector**

**Seal at valve**

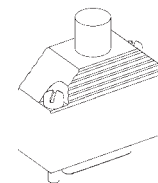
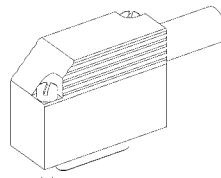
Position of the connector can be chosen at the right or at the left hand side of the terminal.



**Connector right = TR16**

**Connector left = TL16**

Cable can be supplied with an elbow or a straight electrical connector. Standard cable length is 3 m others are available on request. For details please refer to page 2.8.4.



**ST40 W\_\_**

**ST40 G\_\_**

**General order information:**

When ordering a HAFNER valve terminal please proceed as follows:

The electrical and pneumatical manifold has the type-number:

For ordering the required valves add a T to the order code, e.g. MD 510 404 T.

The cable with the connector as displayed on page 2.8.4.

All items to be ordered separately but assembled by manufacturer.

**T** \_ \_ \_ \_ \_  
**1 2 3 4 5 6 7 8**

**1**  
 R or L: Defining the side of the connector  
 R = right, L = left

**2**  
 16 for valves 16 mm wide  
 22 for valves 22 mm wide

**3**  
 3 or 5: Defining if the plate is for 3- or 5-way valves

**4, 5**  
 number of positions, 02 to 14

**6, 7, 8**  
 defining size and position of the ports, please refer to page 2.7.1.2 to 2.7.2.9

# T\_163\_\_403



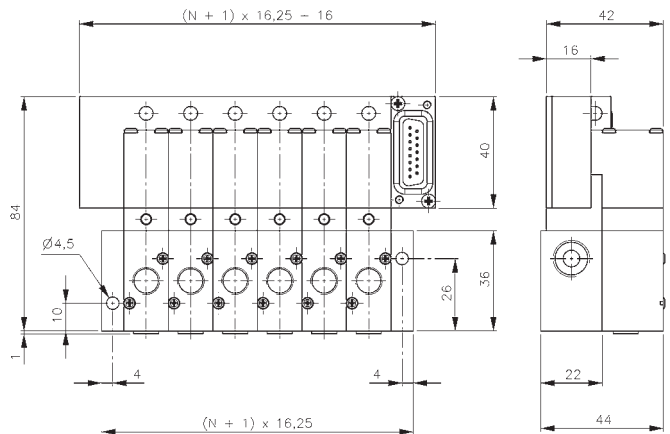
Valve terminal with 3-way valves, orifice size 4 mm, port 2 is in the valve. Port 2 is either equipped with thread G 1/8" or with push-in fitting for 6 mm tube.

The terminal is available from 2 to 14 stations (4 to 12 preferred stock item). Every station is equipped with a varistor and a red LED for coils 24 V=.

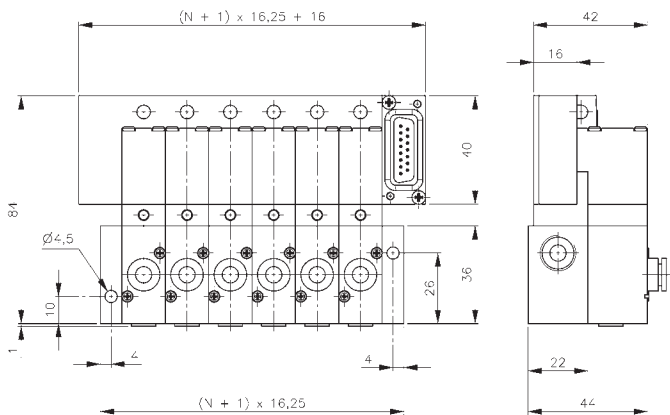
The pneumatic manifold is displayed and described on page 2.7.1.2, type RD 3\_\_403.

Valves for terminal use offer a 1.8 Watt solenoid, turned by 180° and no 3rd pin (ground). For ordering please add a T to the regular type-number e.g. MD 310 463 T 24DC.

Blanking plates are also available type BP 3 403 T.



**T\_163\_\_403**  
equipped with valves type 403 T



**T\_163\_\_403**  
equipped with valves type 463 T

The following valves can be used on that type of valve-terminal:

Type	Function	Page	Comment
MD 310 403 T	n.c.	2.5.1.2.4	all four types of valves can be mixed on one plate
MD 310 463 T	n.c.	2.5.1.2.4	all four types of valves can be mixed on one plate
MOD 310 403 T	n.o.	2.5.1.2.4	all four types of valves can be mixed on one plate
MOD 310 463 T	n.o.	2.5.1.2.4	all four types of valves can be mixed on one plate

For additional order information please refer to page 2.8.1.





# T\_163\_\_464



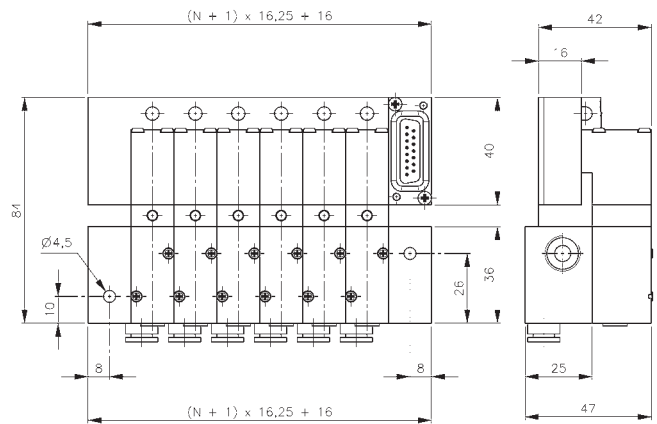
Valve terminal with 3-way valves, all ports are in the plate. Type 464 orifice size 4 mm, port 2 is equipped with push-in fitting for 6 mm tube.

The terminal is available from 2 to 14 stations (4 to 12 preferred stock item). Every station is equipped with a varistor and a red LED for coils 24 V=.

The pneumatic manifolds are displayed and described on page 2.7.1.2, type RD 3\_\_464.

Valves for terminal use offer a 1.8 Watt solenoid, turned by 180° and no 3rd pin (ground). For ordering please add a T to the regular type-number e.g. MD 310 404 T 24DC.

Blanking plates are also available type BP 3 404 T.



**T\_163\_\_464**  
equipped with valves type 404 T

The following valves can be used on T\_163\_\_464 n.c. and n.o. can be mixed.

Type	Function	Page
MD 310 404 T	n.c.	2.5.1.2.4
MOD 310 404 T	n.o.	2.5.1.2.4

For additional order information please refer to page 2.8.1.

# T\_16 5\_\_403



Valve terminal with 5-way valves, orifice size 4 mm, ports 2 and 4 are in the valve. Ports 2 and 4 are either equipped with thread G 1/8" or with push-in fittings for 6 mm tube.

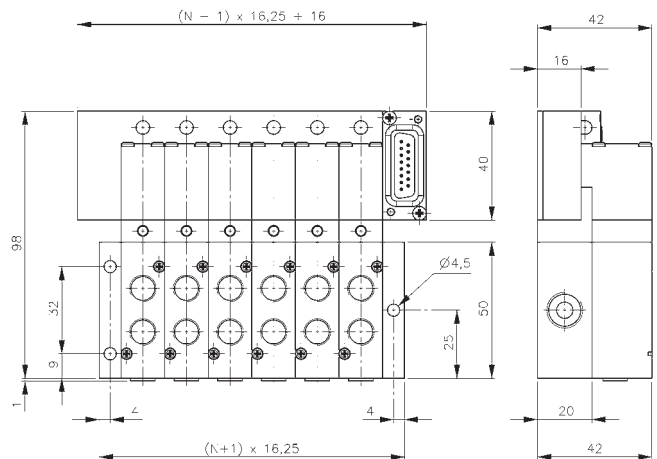
The terminal is available from 2 to 14 stations (4 to 12 preferred stock item). Every station is equipped with a varistor and a red LED for coils 24 V=.

The pneumatic manifold is displayed and described on page 2.7.2.1, type RD 5\_\_403.

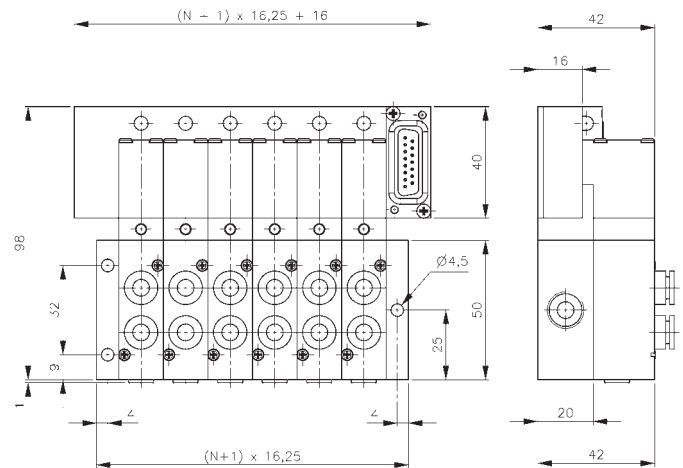
Valves for terminal use offer a 1.8 Watt solenoid, turned by 180° and no 3rd pin (ground). For ordering please add a T to the regular type-number e.g. MD 510 403 T 24DC.

"Double body valves" (5/2-way impulse and 5/3-way-valves) occupy 2 spaces as described on page 2.8. 1.

Blanking plates are also available type BP 5 403 T.



**T\_16 5\_\_403**  
equipped with valves type 403 T



**T\_16 5\_\_403**  
equipped with valves type 463 T

The following valves can be used on that type of valve terminal:

Type	Function	Page	Comment
MD 510 403 T	single sol.	2.5.2.2.1	
MD 510 463 T	single sol.	2.5.2.2.1	
MD 520 403 T	double sol.	2.5.2.2.5	double body
MD 520 463 T	double sol.	2.5.2.2.5	double body
MD 53_403 T	5/3-way	2.5.3.2.1	double body, 3 versions available, refer to description
MD 53_463 T	5/3-way	2.5.3.2.1	double body, 3 versions available, refer to description

For additional order information please refer to page 2.8.1.

# T\_22 5\_\_ 503/T\_22 5\_\_ 703



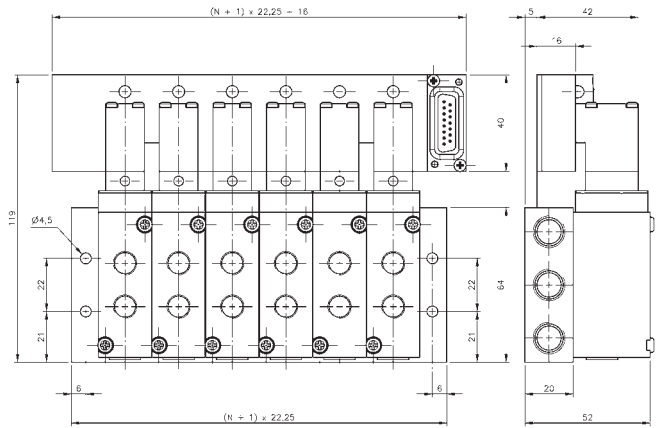
Valve terminal with 5-way valves, ports 2 and 4 are in the valve.  
 Type 503 orifice size 5 mm, G 1/8"  
 Type 703 orifice size 7 mm, G 1/4"

The terminal is available with 2, 3, 4, 5, 6, 8, 10, 12 positions, others on request. Every station is equipped with a varistor and a red LED for coils 24 V=.

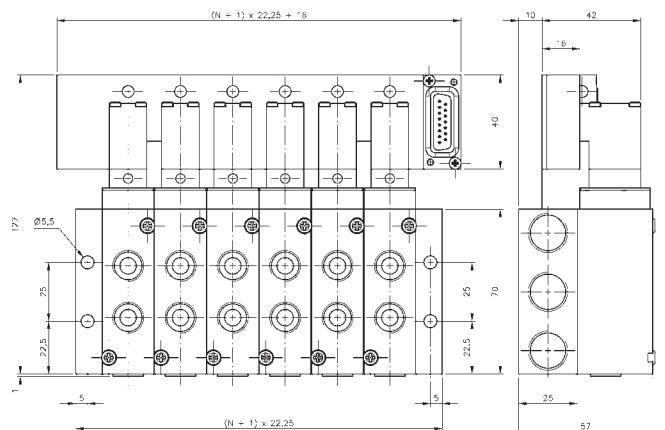
The pneumatic manifolds are displayed and described on page 2.7.2.2 type RB 5\_\_ 503, on page 2.7.2.3 type RB 5\_\_ 703.

Valves for terminal use offer a 1.8 Watt solenoid, turned by 180° and no 3rd pin (ground).  
 Order-number valves: MK 5\_\_ \_03 T 24DC.

Blanking plates are also available type BP 5 503 T or type BP 5 703 T.



**T\_22 5\_\_ 503**  
**equipped with valves type 503 T**



**T\_22 5\_\_ 703**  
**equipped with valves type 703 T**

The following valves can be used on T\_22 5\_\_ 503:

Type	Function	Page	Comment
MK 510 503 T	single sol.	2.5.2.2.2	
MK 520 503 T	double sol.	2.5.2.2.6	double body
MK 53_ 503 T	5/3-way	2.5.3.2.2	double body, 3 versions available, refer to description

The following valves can be used on T\_22 5\_\_ 703:

Type	Function	Page	Comment
MK 510 703 T	single sol.	2.5.2.2.2	
MK 520 703 T	double sol.	2.5.2.2.6	double body
MK 53_ 703 T	5/3-way	2.5.3.2.2	double body, 3 versions available, refer to description

**For additional order information please refer to page 2.8.1.**

## T\_16 5\_\_464



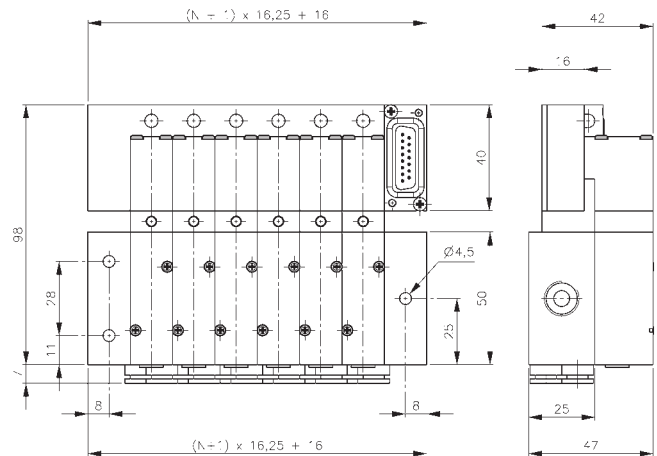
Valve terminal with 5-way valves, orifice size 4 mm, all the ports are in the plate. Ports 2 and 4 are equipped with push-in fittings for 6 mm tube.

The terminal is available from 2 to 14 stations (4 to 12 preferred stock item). Every station is equipped with a varistor and a red LED for coils 24 V=.

The pneumatic manifold is displayed and described on page 2.7.2.6, type RD 5\_\_464.

Valves for terminal use offer a 1.8 Watt solenoid, turned by 180° and no 3rd pin (ground). For ordering please add a T to the regular type-number e.g. MD 510 404 T 24DC. "Double body valves" (5/2-way impulse and 5/3-way-valves) occupy 2 spaces as described on page 2.8.1.

Blanking plates are also available type BP 5 404 T.



**T\_16 5\_\_464**  
equipped with valves type 404 T

The following valves can be used on that type of valve terminal:

Type	Function	Page	Comment
MD 510 404 T	single sol.	2.5.2.2.3	
MD 520 404 T	double sol.	2.5.2.2.3	double body
MD 53_404 T	5/3-way	2.5.2.2.3	double body, 3 versions available, refer to description

For additional order information please refer to page 2.8.1.

# T\_22 5\_\_504/T\_22 5\_\_704



Valve terminal with 5-way valves, all the ports are in the plate.

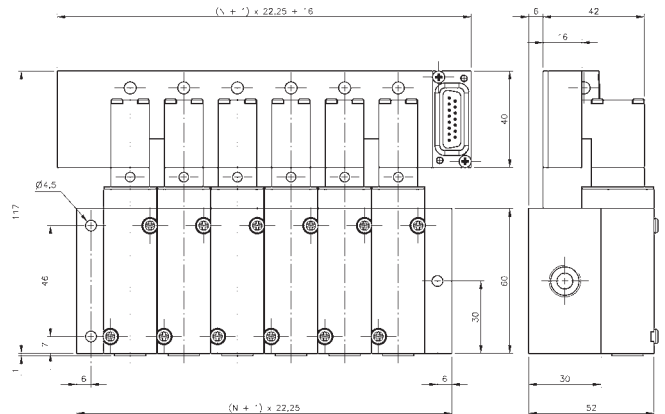
Type 504 orifice size 5 mm, G 1/8"  
 Type 704 orifice size 7 mm, G 1/4"

The terminal is available with 2, 3, 4, 5, 6, 8, 10, 12 positions, others on request. Every station is equipped with a varistor and a red LED for coils 24 V=.

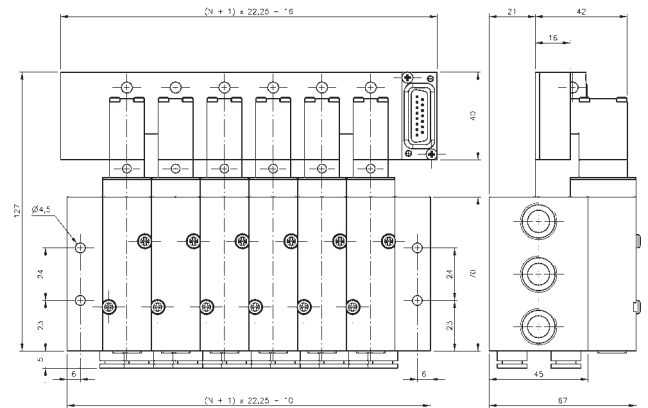
The pneumatic manifolds are displayed and described on page 2.7.2.7, type RB 5\_\_504, on page 2.7.2.8 type RB 5\_\_704.

Valves for terminal use offer a 1.8 Watt solenoid, turned by 180° and no 3rd pin (ground).

Order-number valves: MK 5\_\_04 T 24DC.  
 Blanking plates are also available type BP 5 504 T or type BP 5 704 T.



**T\_22 5\_\_504**  
 equipped with valves type 504 T



**T\_22 5\_\_784**  
 equipped with valves type 704 T

The following valves can be used on T\_22 5\_\_504:

Type	Function	Page	Comment
MK 510 504 T	single sol.	2.5.2.2.4	
MK 520 504 T	double sol.	2.5.2.2.7	double body
MK 53_504 T	5/3-way	2.5.3.2.3	double body, 3 versions available, refer to description

The following valves can be used on T\_22 5\_\_704:

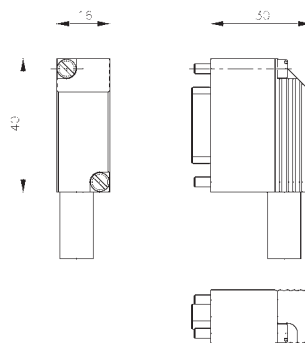
Type	Function	Page	Comment
MK 510 704 T	single sol.	2.5.2.2.4	
MK 520 704 T	double sol.	2.5.2.2.7	double body
MK 53_704 T	5/3-way	2.5.3.2.3	double body, 3 versions available, refer to description

For additional order information please refer to page 2.8.1.





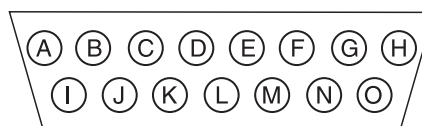
# Connectors and Cable ST40 W\_\_



**ST40 W\_\_**

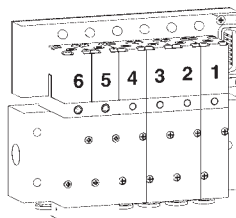
Connector and cables for HAFNER valve-terminals.  
 O-ring seal assures best protection against water and humidity.  
 Standard cable length is 3 m, others are available on request.

2 screws are included.



### Relationship of valve-position, cable-colour and PINS in the connector

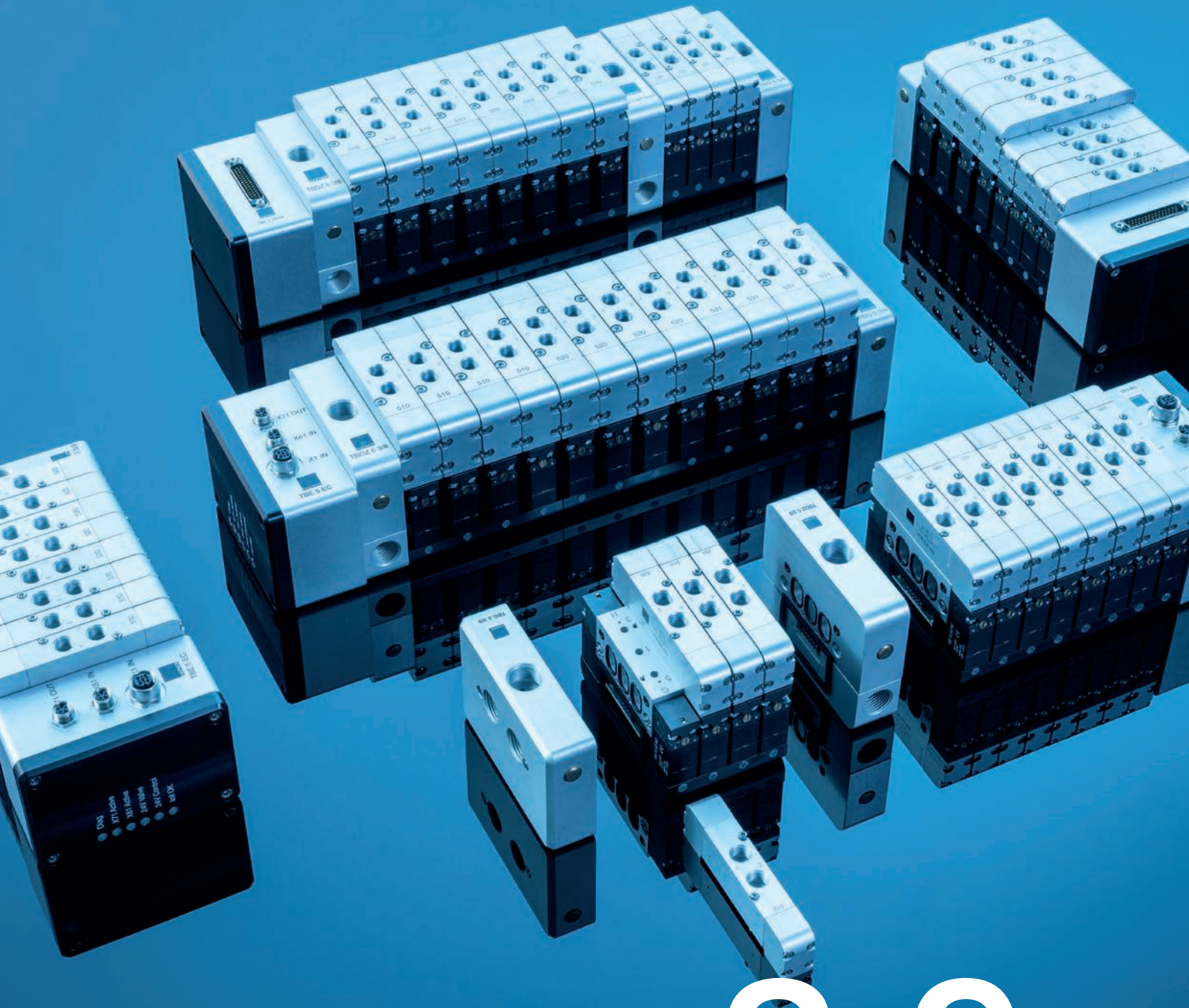
Position of solenoid	Colour of cable	PIN
1	brown	K
2	green	M
3	yellow	C
4	grey	F
5	pink	J
6	blue	N
7	red	B
8	black	G
9	violet	I
10	grey-pink	O
11	blue-red	A
12	white-green	H
13	brown-green	D
14	white-yellow	E
common – or + white		L



**Please be aware: Always count position of solenoid from the connector !**

Type	Exit of cable	Number of laces
ST40 W06	at the side	7, 6 positions and common Plus or Minus
ST40 W14	at the side	15, 14 positions and common Plus or Minus





# 2.9

**Valve Terminal Series HBS  
with EtherCAT, PROFINET or D-Sub**

# Valve Terminals – Series HBS

Modular valve terminal system with different electric control modules:

- EtherCAT
- PROFINET
- D-Sub

On request: CANopen, EtherNet/IP

Orifice size: Series 403 – 4 mm – 450 NI/min  
Series 503 – 5 mm – 650 NI/min

Temperature range: -10 ... +80°C  
Pressure range: 3 ... 10 bar  
Voltage: 24VDC, with LED and short circuit protection  
Power consumption: 1,8 Watt  
IP Protection: IP 55

Terminals are equipped with threads for adding DIN-rail mounting clips.



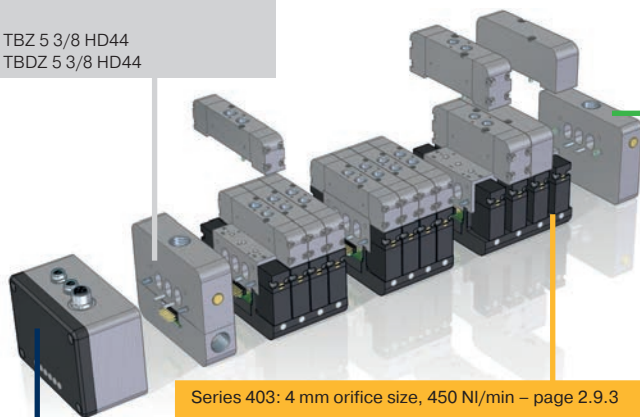
**Additional air supply modules (optionally) – page 2.9.6**

For EtherCAT and PROFINET:

Without through-hole TBZ 5 3/8  
With through-hole TBDZ 5 3/8

For D-Sub:

Without through-hole TBZ 5 3/8 HD44  
With through-hole TBDZ 5 3/8 HD44



Main connection module with air supply and exhaust ports – page 2.9.6  
TBG 5 3/8

**Electrical connection modules – page 2.9.2**

EtherCAT TBE 5 ECH  
PROFINET TBE 5 PN  
D-Sub TBE 5 HD44

**Series 403: 4 mm orifice size, 450 NI/min – page 2.9.3**

**4 station manifold**  
EtherCAT, PROFINET TB 16 5 403 04 EC  
D-Sub TB 16 5 403 04 HD44

**Valves**  
VTB 231 403 Double 3/2 – NC&NC  
VTB 232 403 Double 3/2 – NC&NO  
VTB 233 403 Double 3/2 – NO&NO  
VTB 510 403 5/2 – single solenoid  
VTB 520 403 5/2 – double solenoid  
VTB 531 403 5/3 – centre closed  
VTB 532 403 5/3 – centre exhausted  
VTB 533 403 5/3 – centre pressurised  
VTB 16 BP Blanking plate

**Series 503: 5 mm orifice size, 650 NI/min – page 2.9.3**

**4 station manifold**  
EtherCAT, PROFINET TB 22 5 503 04 EC  
D-Sub TB 22 5 503 04 HD44

**Valves**  
VTB 231 503 Double 3/2 – NC&NC  
VTB 232 503 Double 3/2 – NC&NO  
VTB 233 503 Double 3/2 – NO&NO  
VTB 510 503 5/2 – single solenoid  
VTB 520 503 5/2 – double solenoid  
VTB 531 503 5/3 – centre closed  
VTB 532 503 5/3 – centre exhausted  
VTB 533 503 5/3 – centre pressurised  
VTB 22 BP Blanking plate

**How to order a complete terminal**

**Example:**

<b>ECH</b> Electrical connection module	<b>4E</b> 4 station manifold equipped with 4 x VTB 510 403	<b>DZ</b> Air supply module (optionally), can be put at any position	<b>2K20</b> 4 station manifold equipped with 2 x VTB 231 503 and 2 x VTB 520 503	<b>F1</b> Fixing element (optionally)
--	---	---	---	--

**Electrical connection modules**

Type	Code
TBE 5 ECH	ECH
TBE 5 HD44	HD44
TBE 5 PN	PN

**Valves**

**Series 403**

Type	Code
VTB 231 403	A
VTB 232 403	B
VTB 233 403	C
VTB 510 403	E
VTB 520 403	F
VTB 531 403	G
VTB 532 403	H
VTB 533 403	I
VTB 16 BP	J

**Series 503**

Type	Code
VTB 231 503	K
VTB 232 503	L
VTB 233 503	M
VTB 510 503	N
VTB 520 503	O
VTB 531 503	P
VTB 532 503	Q
VTB 533 503	R
VTB 22 BP	S

**Air supply modules (optionally)**

Type	Code
With through-hole	DZ
Without through-hole	Z

**Fixing elements**

Type	Code
DIN-W clip	DIN-W
Fixing element	F1

Please note:

Series 403 and 503 can be mixed in the same terminal, but not on the same 4 station manifold. Connectors have to be ordered separately and can be found on page 2.9.7.



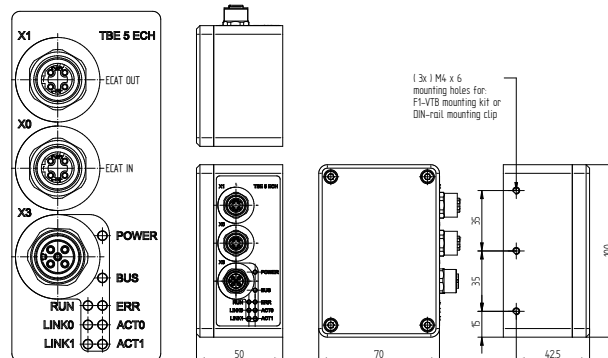
# TBE 5 ECH/ TBE 5 PN/ TBE 5 HD44



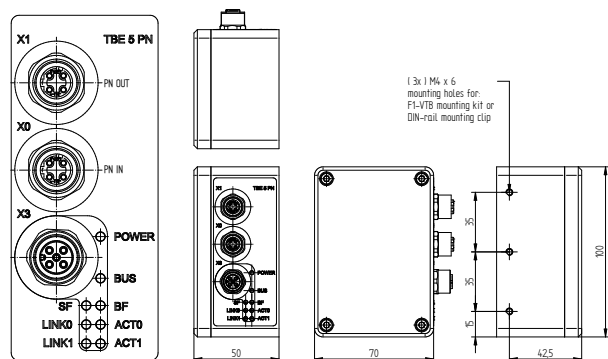
Electric modules with EtherCAT, PROFINET and D-Sub connection.

Supply voltage: 24VDC (+/- 10%)  
 Drive: PNP  
 Maxim. Admissible current [A] 3 per pins

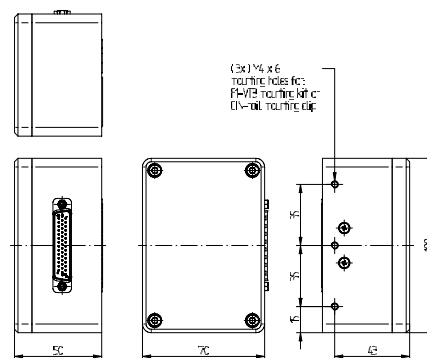
Modules are equipped with threads for adding DIN-rail mounting clips.  
 Connectors and fixing accessories can be found on page 2.9.7.



**TBE 5 ECH**



**TBE 5 PN**



**TBE 5 HD 44**

Type	Connection	Electrical connection [24VDC]	Max. number of valves	Maximum current at 24VDC [A]	Weight
TBE 5 ECH	EtherCAT	M12 connector - X3: Power M12 connector - X0: EtherCAT IN M12 connector - X1: EtherCAT OUT	32 valves (64 solenoids)	5	0,5 kg
TBE 5 PN	PROFINET	M12 connector - X3: Power M12 connector - X0: PROFINET IN M12 connector - X1: PROFINET OUT	32 valves (64 solenoids)	5	0,5 kg
TBE 5 HD44	D-Sub	44-pin connector	16 valves (32 solenoids)	2,4	0,5 kg

# TB 16 5 403 04 EC / TB 16 5 403 04 HD44 TB 22 5 503 04 EC / TB 22 5 503 04 HD44



Modular valve terminal system for common connection to ports 1 (pressure), 3 and 5 (exhaust). Ports 2 and 4 are located in the valves with G1/8 thread.

Each manifold provides four valve stations. The 24VDC solenoid system is part of the manifold and is equipped with a manual override to turn as well as LED and varistor.

For the HD44 (D-Sub) system a maximum of four manifolds can be combined which means that the terminal can be equipped with a maximum of 16 pieces double-solenoid valves.

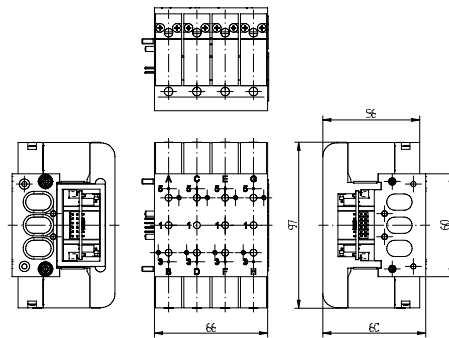
For the EC (EtherCAT and PROFINET) system a maximum of eight manifolds can be combined which means that the terminal can be equipped with a maximum of 32 pieces double-solenoid valves.

The electronics of the base distribute the signals coming from the electrical connection module between the pilot valves. The system can be built and taken apart just by operating two internal threaded cylinder screws.

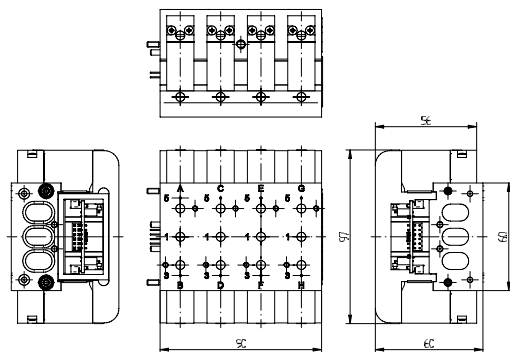
Additional manifolds and intermediate air supply modules can be added at any position.

The valves are mounted from top onto the manifolds. Blanking plates are also available type VTB 16 BP (series 403) and VTB 22 BP (series 503).

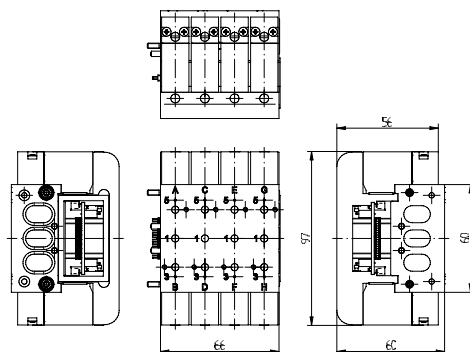
The valve terminal will be equipped and tested by the manufacturer. Please advise configuration.



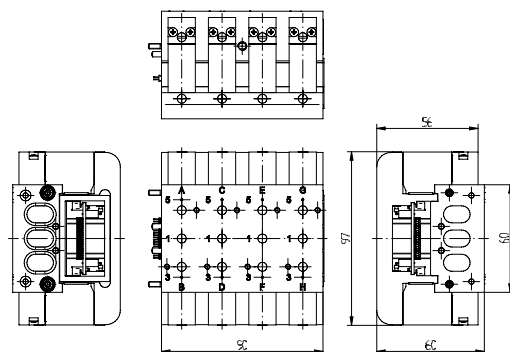
**TB 16 5 403 04 EC**



**TB 22 5 503 04 EC**



**TB 16 5 403 04 HD44**

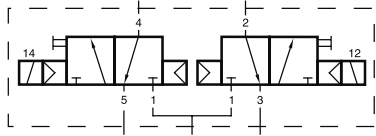


**TB 22 5 503 04 HD44**

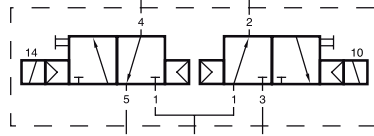
Type	Connection	Series	Orifice size	Weight
TB 16 5 403 04 EC	EtherCAT, PROFINET	403	Ø 4 mm	0,70 kg
TB 22 5 503 04 EC	EtherCAT, PROFINET	503	Ø 5 mm	0,83 kg
TB 16 5 403 04 HD44	D-Sub	403	Ø 4 mm	0,70 kg
TB 22 5 503 04 HD44	D-Sub	503	Ø 5 mm	0,83 kg



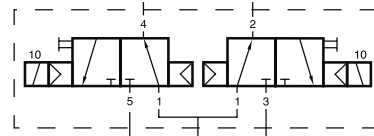
# VTB 23\_403/VTB 23\_503



VTB 231 403  
VTB 231 503



VTB 232 403  
VTB 232 503



VTB 233 403  
VTB 233 503



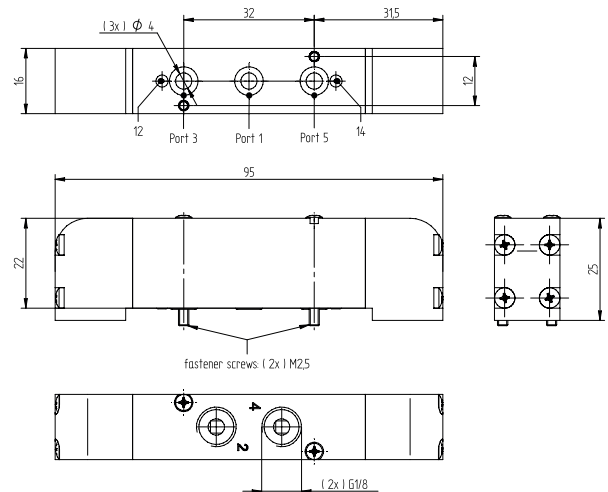
Double 3/2-way valve actuated by permanent signal and equipped with air spring return.

- Type 231 NC & NC
- Type 232 NC & NO
- Type 233 NO & NO

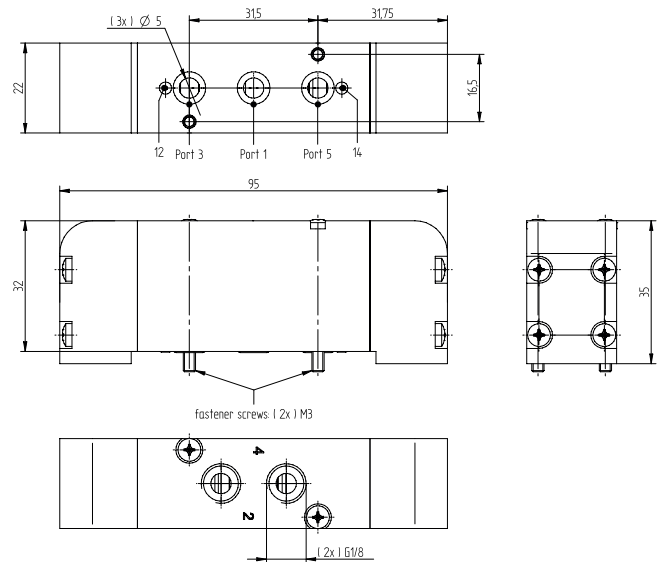
When ordering please complete the type number by 1, 2 or 3 according to the type required.

24V= solenoid is part of the 4-station manifold plate displayed on page 2.9.3.

Ports 2 and 4 are in the valve, ports 1, 3 and 5 in the manifold plate.



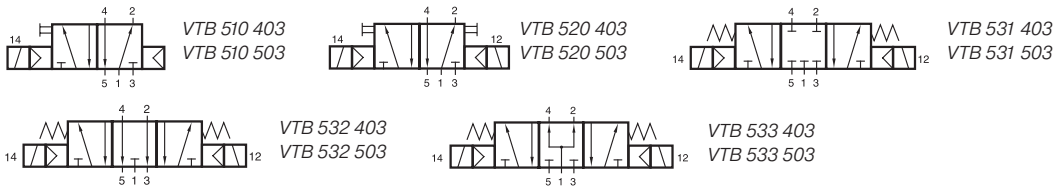
**VTB 23\_403**



**VTB 23\_503**

Type	Ports 2,4	Air flow	Operating press.	Power consumption	Weight
VTB 23_403 24DC	G 1/8"	450 l/min	3 - 10 bar	1,8 W	0,10 kg
VTB 23_503 24DC	G 1/8"	650 l/min	3 - 10 bar	1,8 W	0,19 kg

# VTB 510 403/VTB 520 403/VTB 53\_ 403 VTB 510 503/VTB 520 503/VTB 53\_ 503



### VTB 510 403 / VTB 510 503

5/2-way valve actuated by permanent signal and equipped with air spring return.

### VTB 520 403 / VTB 520 503

5/2-way double pilot valve actuated by impulse. Position is kept until an electrical signal is applied to the opposite side even when not attached to electrical signal.

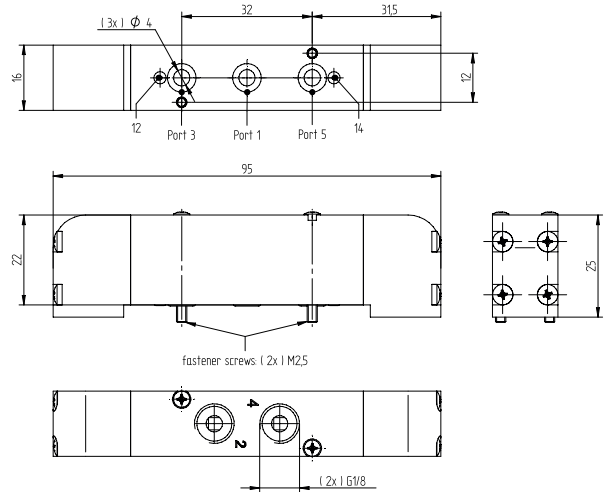
### VTB 53\_ 403 / VTB 53\_ 503

5/3-way valve with spring return to middle position, actuated by permanent signal.

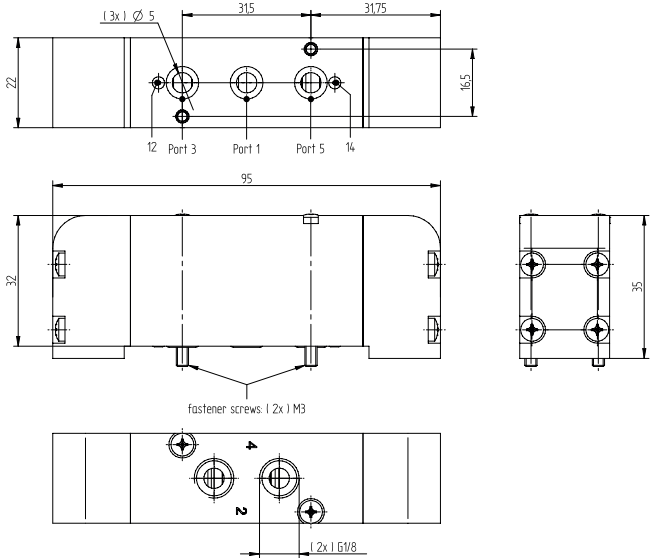
- Type 531 centre closed
- Type 532 centre exhausted
- Type 533 centre pressurised

When ordering please complete the type number by 1, 2 or 3 according to the type required.

24V= solenoid is part of the 4-station manifold plate displayed on page 2.9.3.  
Ports 2 and 4 are in the valve, ports 1, 3 and 5 in the manifold plate.



### VTB 5\_ 403



### VTB 5\_ 503

Type	Ports 2,4	Air flow	Operating press.	Power consumption	Weight
VTB 510 403 24DC	G 1/8"	450 l/min	3 - 10 bar	1,8 W	0,10 kg
VTB 510 503 24DC	G 1/8"	650 l/min	3 - 10 bar	1,8 W	0,19 kg
VTB 520 403 24DC	G 1/8"	450 l/min	3 - 10 bar	1,8 W	0,10 kg
VTB 520 503 24DC	G 1/8"	650 l/min	3 - 10 bar	1,8 W	0,19 kg
VTB 53_ 403 24DC	G 1/8"	450 l/min	3 - 10 bar	1,8 W	0,10 kg
VTB 53_ 503 24DC	G 1/8"	650 l/min	3 - 10 bar	1,8 W	0,19 kg

# TBG 5 3/8 /TBZ 5 3/8 /TBDZ 5 3/8 TBZ 5 3/8 HD44 /TBDZ 5 3/8 HD44



Main connection module and modules for intermediate air supply. Air supply and exhaust ports threaded G 3/8". Orifice size 10 mm, 2.500 NI/min.

Modules are equipped with threads for adding DIN-rail mounting clips.

**TBG 5 3/8:**

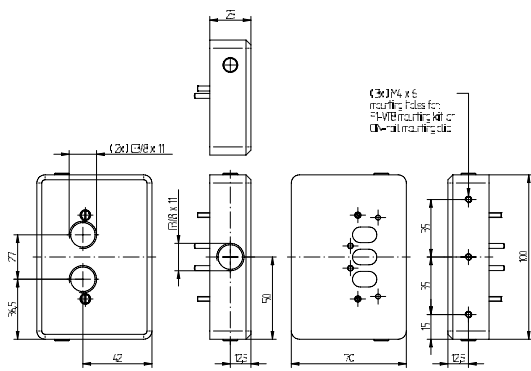
Main connection module with air supply and exhaust ports.

**TBZ 5 3/8 (HD44):**

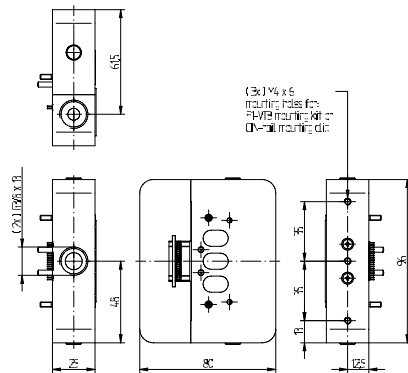
Intermediate air supply module without through-hole. Interrupts pressure supply. Module can be used to operate the valve terminal with different pressures.

**TBDZ 5 3/8 (HD44):**

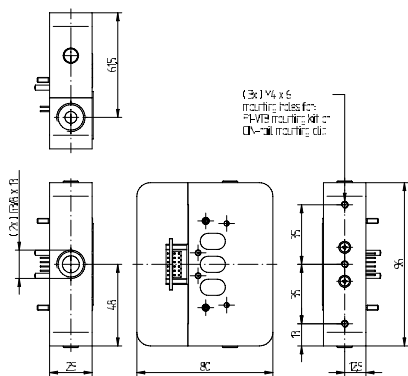
Intermediate air supply module with through-hole to increase the air volume.



**TBG 5 3/8**



**TBZ 3/8 / TBDZ 5 3/8**



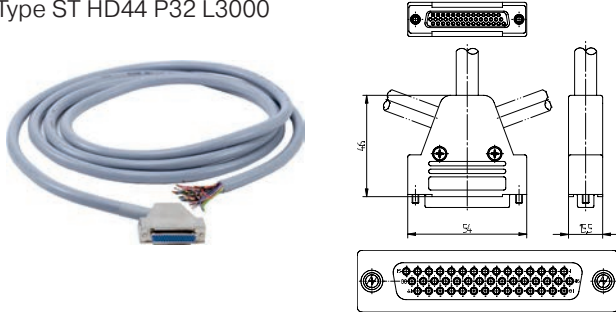
**TBZ 5 3/8 HD44 / TBDZ 5 3/8 HD44**

Type	Function	Connection	Weight
TBG 5 3/8	Main connection module	EtherCAT, PROFINET, D-Sub	0,44 kg
TBZ 5 3/8	Intermediate air supply, without through-hole	EtherCAT, PROFINET	0,45 kg
TBDZ 5 3/8	Intermediate air supply, with through-hole	EtherCAT, PROFINET	0,45 kg
TBZ 5 3/8 HD44	Intermediate air supply, without through-hole	D-Sub	0,45 kg
TBDZ 5 3/8 HD44	Intermediate air supply, with through-hole	D-Sub	0,45 kg

# Connectors and fixing accessories

## Connector for D-Sub

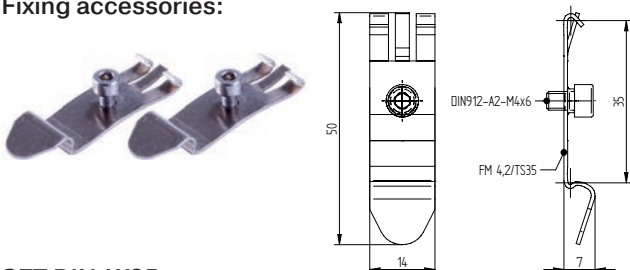
Straight electrical connector for D-sub terminals.  
 Cable can be offset by 2 x 90°.  
 Standard cable length 3000 mm, others on request.  
 Type ST HD44 P32 L3000



Position	Solenoid	PIN	Colour	PIN
1	A	1	white	1
1	B	2	brown	2
2	A	3	green	3
2	B	4	yellow	4
3	A	5	gray	5
3	B	6	pink	6
4	A	7	blue	7
4	B	8	red	8
5	A	9	black	9
5	B	10	violet	10
6	A	11	gray-pink	11
6	B	12	red-blue	12
7	A	13	white-green	13
7	B	14	brown-green	14
8	A	15	white-yellow	15
8	B	16	yellow-brown	16
9	A	17	white-gray	17
9	B	18	gray-brown	18
10	A	19	white-pink	19
10	B	20	pink-brown	20
11	A	21	white-blue	21
11	B	22	brown-blue	22
12	A	23	white-red	23
12	B	24	brown-red	24
13	A	25	white-black	25
13	B	26	brown-black	26
14	A	27	gray-green	27
14	B	28	yellow-gray	28
15	A	29	pink-green	29
15	B	30	yellow-pink	30
16	A	31	green-blue	31
16	B	32	yellow-blue	32

Pin 33-44 common GND  
 Please count position of solenoid from the electrical connection module.  
 Solenoids A and B are marked on the electrical connection module.

## Fixing accessories:



### SET DIN-W35

2 pieces of DIN-clips with screws which can be assembled to TBE/TBG/TBZ and TBDZ modules.  
 Width 14 mm / height 50,0 mm / depth 7 mm

## Connectors for EtherCAT / PROFINET

*Industrial Ethernet Cable*  
 M8 – RJ45, straight, 4-pin  
 Type ST EC M8M-RJ45-2M

*Industrial Ethernet Cable*  
 M8 – M8, straight  
 Type ST EC M8M-M8M-2M

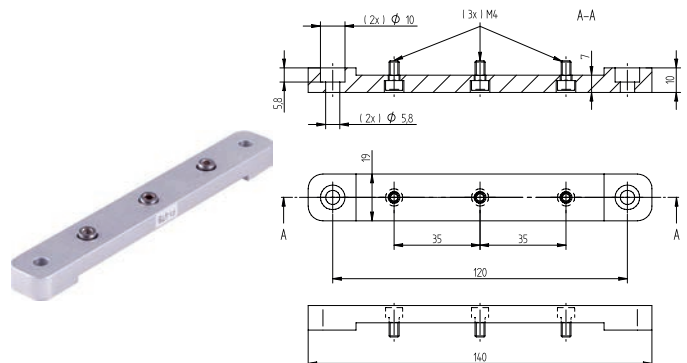


- Ethernet cable: 4-pin, AWG 26
- CAT 5E acc. to ISO/IEC 11801, EN 50173, EIA/TIA 568-A
- Jacket material: PUR
- Shielding: Aluminum-laminated polyester film, copper braid
- Jacket diameter: 4.8 mm
- Suitable for drag chain use
- UV resistant
- Oil resistant acc. to IEC 60811-2-1 and DIN VDE 0282 part 10
- Free from silicone, PVC and LABS
- Free from halogen acc. to IEC 60754-2
- Flame retardant acc. to IEC 60332-1-2
- Approval: cULus
- RoHS compliant
- Protection class IP67
- Cable length: 2.0 m

*Power supply cable*  
 Type ST PS M12M-5P-2M

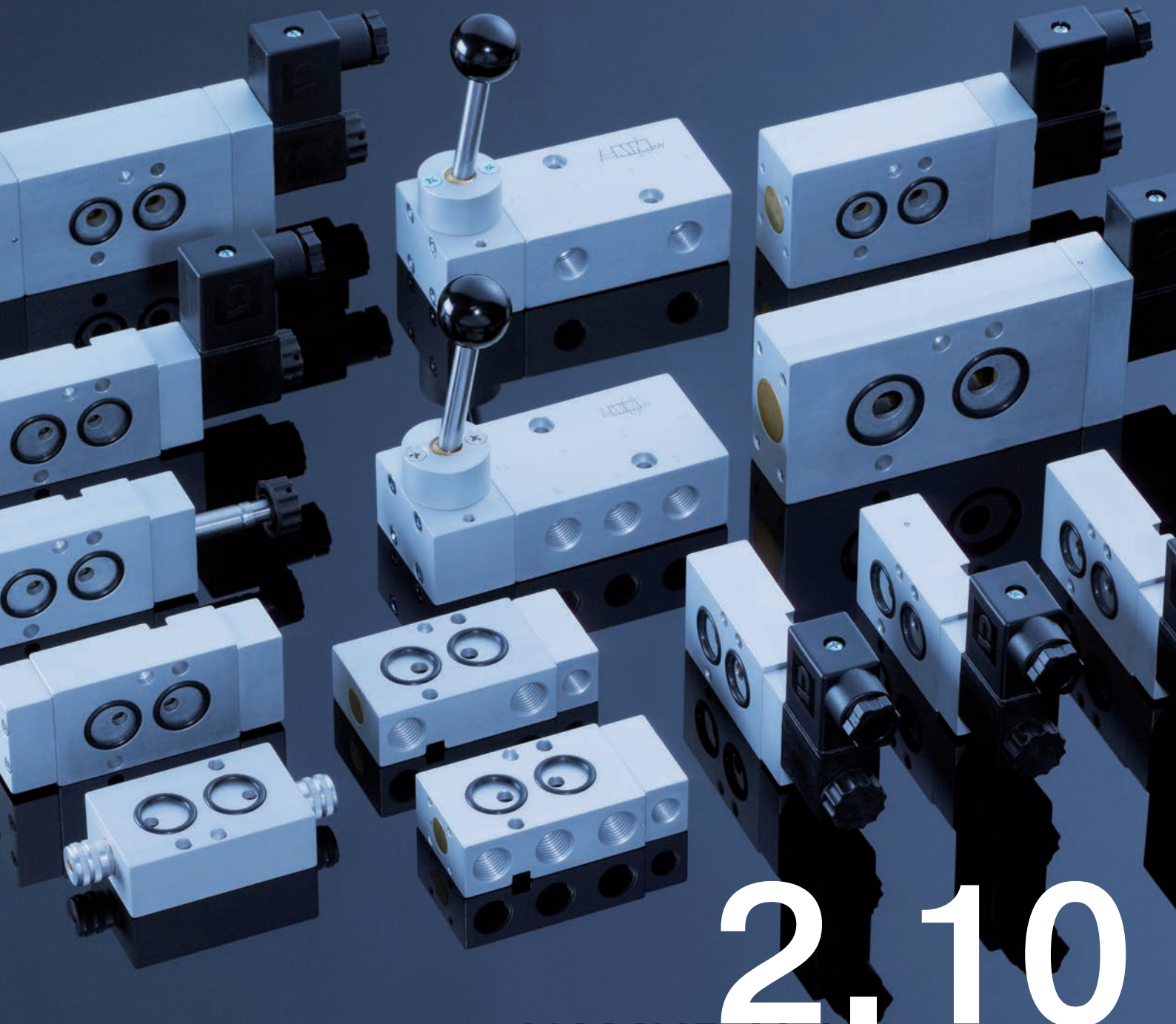


- Male M12, straight, 5-pin
- Jacket material: PUR
- Suitable for drag chain use
- Resistant to chemicals, UV radiation and oils
- Flame retardant (FT2 acc. to UL 1581, IEC 60332-2-2)
- Resistant to welding sparks
- Free from halogen, silicone, PVC and LABS
- Particularly resistant to abrasion
- Approval: cULus
- RoHS compliant
- Protection class: IP67, IP69K
- Cable length: 2.0 m



### F1-VTB

Fixing element with screws which can be assembled to the TBE, TBZ, TBDZ and TBG modules.



# 2.10

## NAMUR-Valves

NAMUR 1/4" also called "NAMUR 1" in accordance to VDI/VDE 3845. NAMUR 1/2" also called "NAMUR 2".



Selected models are available for low temperature application.  
For detailed information refer to chapter 2.12.



Selected models can be equipped for high temperature environments up to 80 °C, DC only!



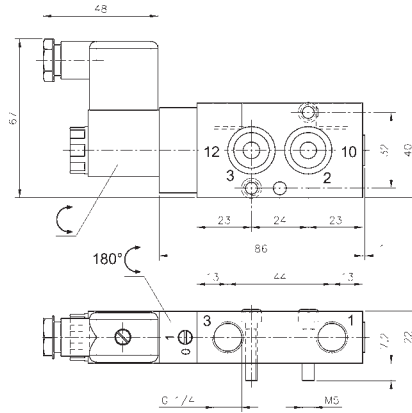
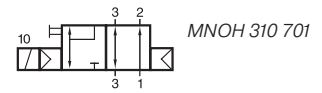
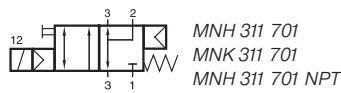
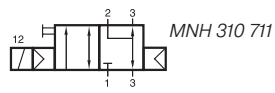
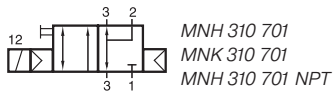
Selected models are available in stainless steel.  
For detailed information refer to chapter 2.13.

Selected models are available for explosion hazardous environment.  
For detailed information refer to chapter 2.15.





# MNH 310 701/MNH 310 711/MNH 311 701 MNOH 310 701/MNK 310 701/MNK 311 701



**MNH 310 701/MNH 311 701/MNOH 310 701  
MNH 310 701 NPT/MNH 311 701 NPT**

3/2-way solenoid valve, actuated by permanent signal.  
Interface according to 1/4" NAMUR-standard, with exhaust air recirculation ("purge").

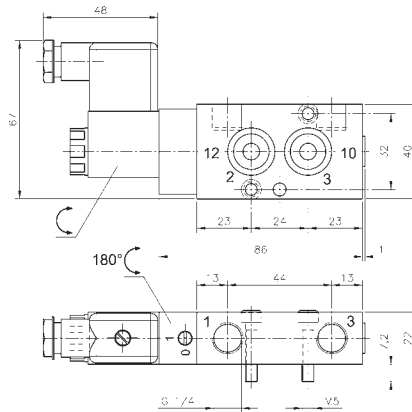
- Type MNH 31\_7\_1 normally closed
- Type MNOH 31\_701 normally open
- Type MNK 31\_701 n.c. low power

MNH 310 701, MNH 310 711, MNOH 310 701 and MNK 310 701 with pneumatic spring return, MNH 311 701 and MNK 311 701 with combined spring assuring a fail-safe function.

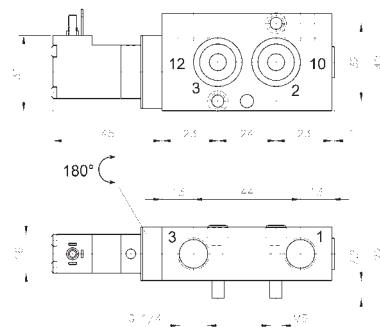
**MNH** generally with manual override to turn with solenoid operators 230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

**MNK** with manual override to push with solenoid operators 24V=, 12V=, 6V=.

Delivery includes 1 pin, 2 screws and 2 O-rings.



**MNH 310 711 ports 2 and 3 are swapped!**

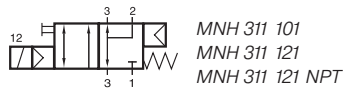
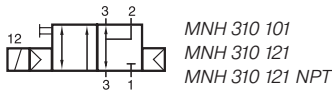


**MNK 310 701/MNK 311 701**

Type	Function	Port size	Air flow	Operating press.	Power consumption	Weight
MNH 310 701	n.c.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNOH 310 701	n.o.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNH 310 711	n.c.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNH 311 701	n.c.	G 1/4"	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNK 310 701	n.c.	G 1/4"	1250 l/min	2 - 10 bar	1,8 W = / 3 VA ~	0,21 kg
MNK 311 701	n.c.	G 1/4"	1250 l/min	2,5 - 10 bar	1,8 W = / 3 VA ~	0,21 kg
MNH 310 701 NPT	n.c.	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNH 311 701 NPT	n.c.	1/4" NPT	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,26 kg



# MNH 310 101/MNH 311 101 MNH 310 121/MNH 311 121



3/2-way solenoid valve, actuated by permanent signal.  
Interface according to NAMUR-standard, with exhaust air recirculation ("purge").

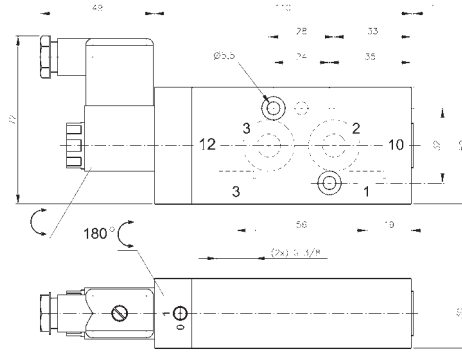
Type 101 according to 1/4" NAMUR-standard  
Type 121 according to 1/2" NAMUR-standard

MNH 310 101, MNH 310 121 with pneumatic spring return,  
MNH 311 101 and MNH 311 121 with combined spring assuring a fail-safe function.

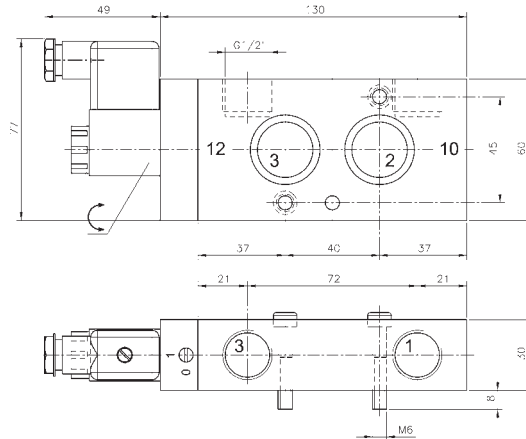
Available with solenoid operators:  
24V=, 12V=, 6V=.

The valves are generally equipped with manual override to turn.




Delivery includes 1 pin, 2 screws, 2 O-rings.



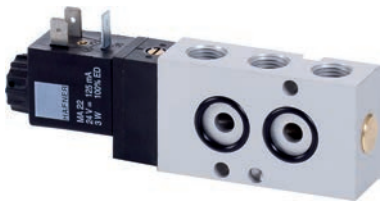
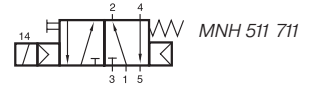
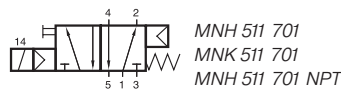
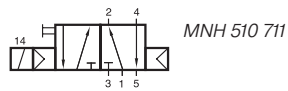
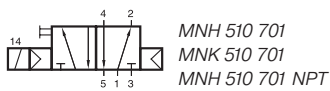
**MNH 310 101/MNH 311 101**



**MNH 310 121/MNH 311 121  
MNH 310 121 NPT/MNH 311 121 NPT**

Type	NAMUR	Port size	Air flow	Operating press.	Power consumption	Weight
MNH 310 101	1/4"	G 3/8"	2250 l/min	1,5 - 10 bar	3 W = / 5 VA ~	0,55 kg
MNH 311 101	1/4"	G 3/8"	2250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,55 kg
MNH 310 121	1/2"	G 1/2"	3000 l/min	1,0 - 10 bar	3 W = / 5 VA ~	0,70 kg 
MNH 311 121	1/2"	G 1/2"	3000 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,70 kg 
MNH 310 121 NPT	1/2"	1/2" NPT	3000 l/min	1,0 - 10 bar	3 W = / 5 VA ~	0,70 kg 
MNH 311 121 NPT	1/2"	1/2" NPT	3000 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,70 kg

# MNH 510 701/MNH 510 711/MNH 511 701 MNH 511 711/MNK 510 701/MNK 511 701



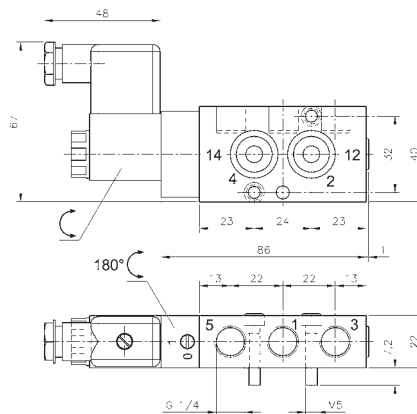
5/2-way solenoid valve, actuated by permanent signal.  
Interface according to 1/4" NAMUR-standard.

MNH 510 701, MNH 510 711 and MNK 510 701 with pneumatic spring return, MNH 511 701, MNH 511 711 and MNK 511 701 with combined spring.

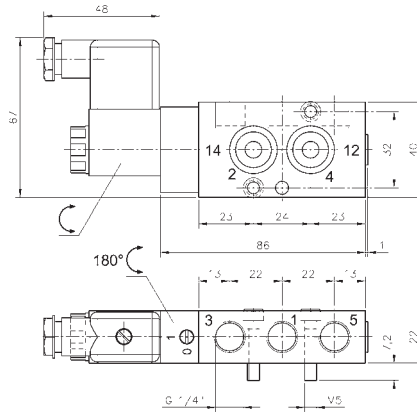
**MNH** generally with manual override to turn with solenoid operators 230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

**MNK** with manual override to push with solenoid operators 24V=, 12V=, 6V=.

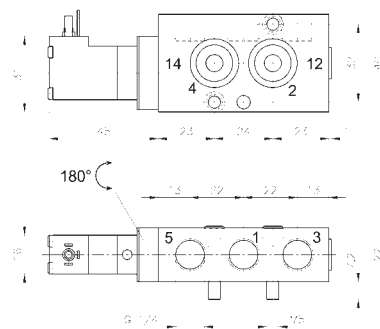
Delivery includes 1 pin, 2 screws, 2 O-rings.



**MNH 510 701/MNH 511 701**  
**MNH 510 701 NPT/MNH 511 701 NPT**



**MNH 510 711/MNH 511 711**  
**ports 2,4,3,5 are swapped!**



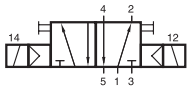
**MNK 510 701/MNK 511 701**

Type	Port size	Air flow	Operating press.	Power consumption	Weight
MNH 510 701	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNH 510 711	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNH 511 701	G 1/4"	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNH 511 711	G 1/4"	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNK 510 701	G 1/4"	1250 l/min	2 - 10 bar	1,8 W = / 3 VA ~	0,21 kg
MNK 511 701	G 1/4"	1250 l/min	2,5 - 10 bar	1,8 W = / 3 VA ~	0,21 kg
MNH 510 701 NPT	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNH 511 701 NPT	1/4" NPT	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,26 kg





# MNH 520 701/MNH 520 101/MNH 520 121 MNK 520 701



MNH 520 701  
 MNH 520 101  
 MNH 520 121  
 MNK 520 701  
 MNH 520 701 NPT  
 MNH 520 121 NPT

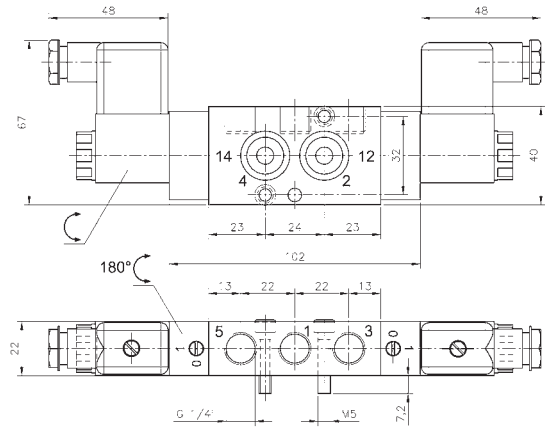


5/2-way solenoid valve actuated by impulse. Position is kept until next electrical signal even when not attached to electrical source. Interface according to NAMUR-standard.

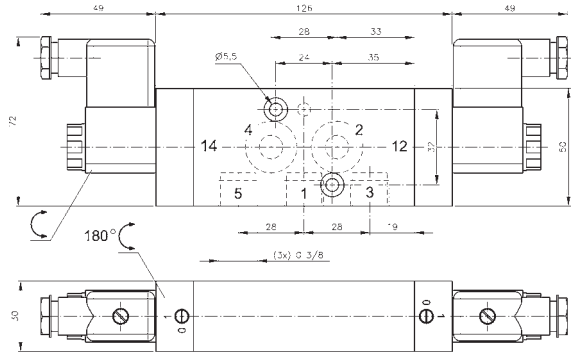
**MNH** generally with manual override to turn with solenoid operators 230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V-, 12V=.

**MNK** with manual override to push with solenoid operators 24V=, 12V=, 6V=.

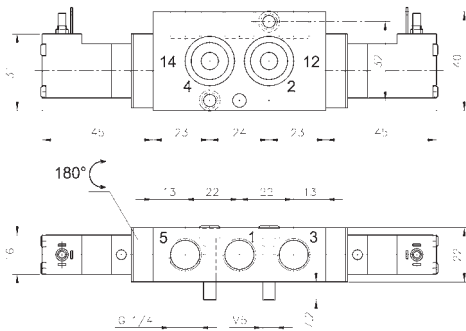
Delivery includes 1 pin, 2 screws, 2 O-rings.



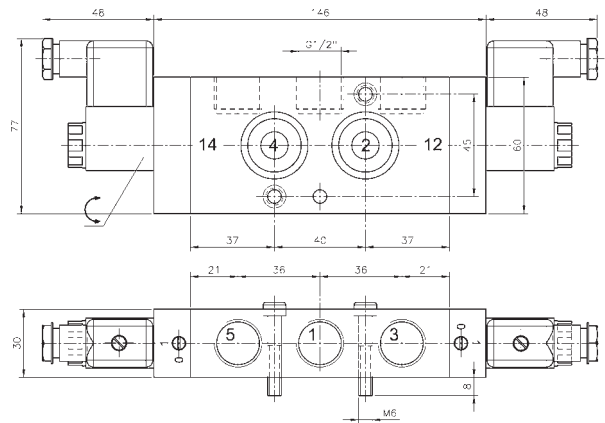
**MNH 520 701/MNH 520 701 NPT**



**MNH 520 101**



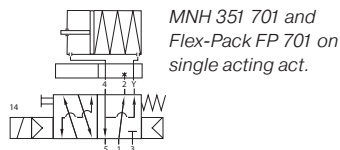
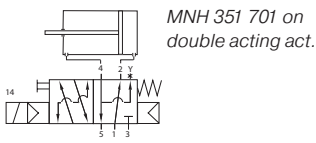
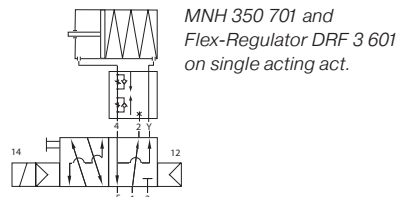
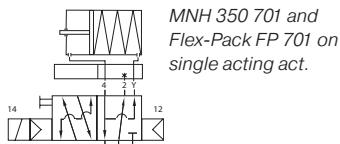
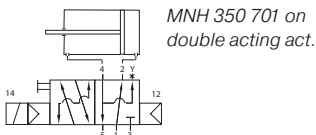
**MNK 520 701**



**MNH 520 121/MNH 520 121 NPT**

Type	NAMUR	Port size	Air flow	Operating press.	Power consumption	Weight
MNH 520 701	1/4"	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,35 kg
MNH 520 101	1/4"	G 3/8"	2250 l/min	1,5 - 10 bar	3 W = / 5 VA ~	0,84 kg
MNH 520 121	1/2"	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,87 kg
MNK 520 701	1/4"	G 1/4"	1250 l/min	2 - 10 bar	1,8 W = / 3 VA ~	0,31 kg
MNH 520 701 NPT	1/4"	1/4" NPT	1250 l/min	1,5 - 10 bar	3 W = / 5 VA ~	0,35 kg
MNH 520 121 NPT	1/2"	1/2" NPT	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,87 kg

# NAMUR-Flex



5/2-way solenoid valve, actuated by permanent signal. Interface according to 1/4" NAMUR-standard. Adding the „Flex-Pack“, converts the valve into a 3/2-way NAMUR-valve with exhaust-air recirculation (“purge”).

MNH 350 701 with pneumatic spring return, MNH 351 701 with combined spring.

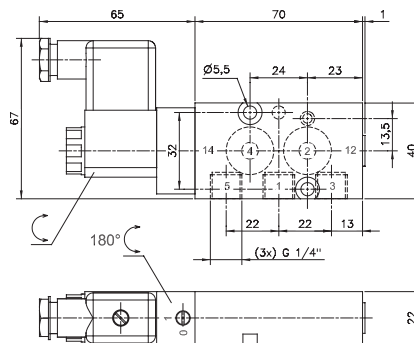
Valves are available with solenoid operators: 230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=

Valves are generally equipped with manual override.

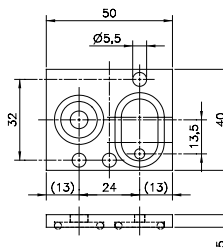
Delivery of valve includes 1 pin, 2 screws, 2 O-rings.

Instead of the Flex-Pack the „Flex-regulator“ Type DRF 601 converts the function of the valve and offers the possibility to control opening- and closing-speed of a spring-return actuator independently.

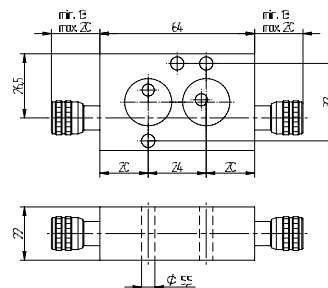
Delivery of FP 701 and DRF 3 601 includes longer screws and seals. DRF 3 601 also includes a plug to close port 3 of the valve.



**MNH 350 701/MNH 351 701**  
**MNH 350 701 NPT/MNH 351 701 NPT**



**FP 701 A**



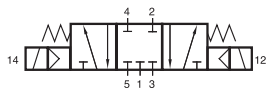
**DRF 3 601**

Type	Material	Orifice 4	Orifice 2-3	Weight
FP 701 A	alu	7 mm	4 mm	0,016 kg
DRF 3 601	alu + brass	0,5 - 6 mm	4 mm	0,18 kg

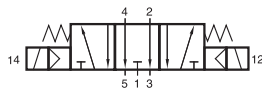
Type	Port size	Air flow	Operating press.	Power consumption	Weight
MNH 350 701	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNH 351 701	G 1/4"	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNH 350 701 NPT	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,26 kg
MNH 351 701 NPT	1/4" NPT	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,26 kg



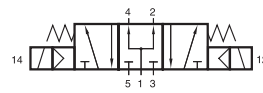
# MNH 531 701/MNH 532 701/MNH 533 701 MNH 531 101/MNH 531 121/MNK 531 701



MNH 531 701  
MNH 531 101  
MNH 531 121  
MNK 531 701  
MNH 531 701 NPT  
MNH 531 121 NPT



MNH 532 701



MNH 533 701



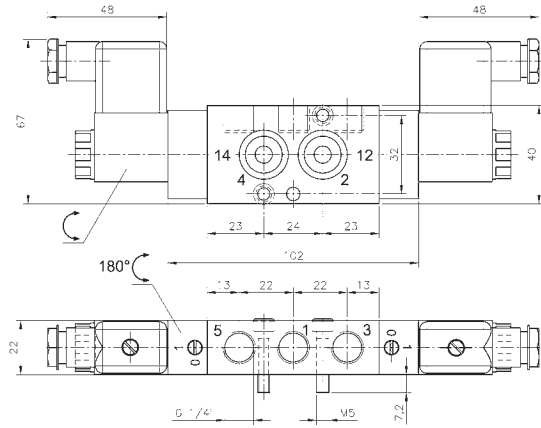
5/3-way solenoid valve with spring return to middle position.  
Interface according to NAMUR-standard.

- Type 531 centre closed
- Type 532 centre exhausted
- Type 533 centre pressurised

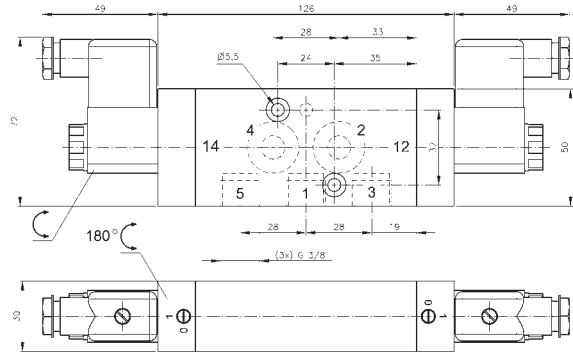
**MNH** generally with manual override to turn with solenoid operators 230V/50Hz, 110V/50Hz, 24V/50Hz, 48V~, 24V~, 12V~.

**MNK** with manual override to push with solenoid operators 24V~, 12V~, 6V~.

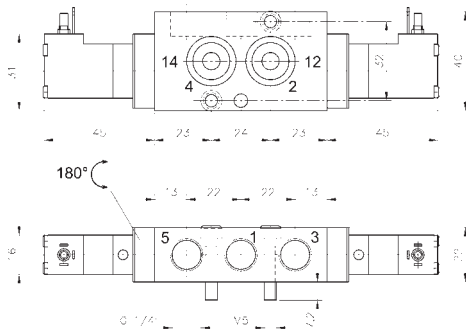
Delivery includes 1 pin, 2 screws and 2 O-rings.



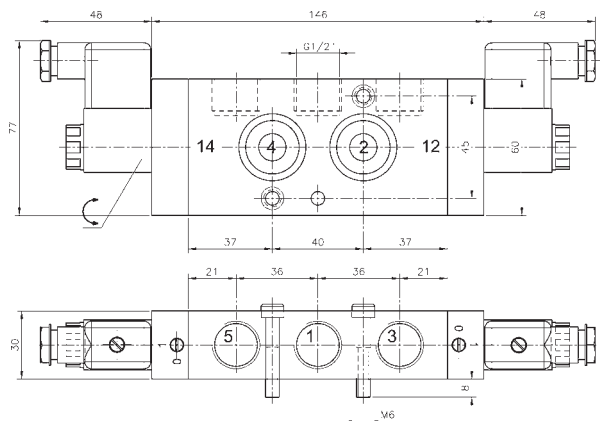
**MNH 53\_701/MNH 531 701 NPT**



**MNH 531 101**



**MNK 531 701**

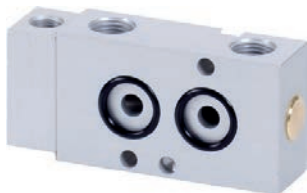
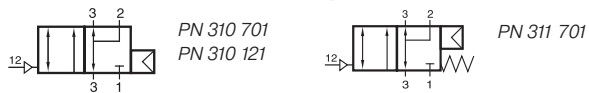


**MNH 531 121/MNH 531 121 NPT**

Type	NAMUR	Port size	Air flow	Operating press.	Power consumption	Weight
MNH 53_701	1/4"	G 1/4"	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,36 kg
MNH 531 101	1/4"	G 3/8"	2250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,84 kg
MNH 531 121	1/2"	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,87 kg
MNK 531 701	1/4"	G 1/4"	1250 l/min	3 - 10 bar	1,8 W = / 3 VA ~	0,32 kg
MNH 531 701 NPT	1/4"	1/4" NPT	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,36 kg
MNH 531 121 NPT	1/2"	1/2" NPT	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	0,87 kg



# PN 310 701/PN 311 701/PN 310 121



Pneumatically actuated 3/2-way spool valve. Interface according to NAMUR-standard with exhaust recirculation („purge“).

PN 310 701 and PN 310 121 with pneumatic spring. For valves with pure pneumatic spring operating and actuation pressure should be at the same level.

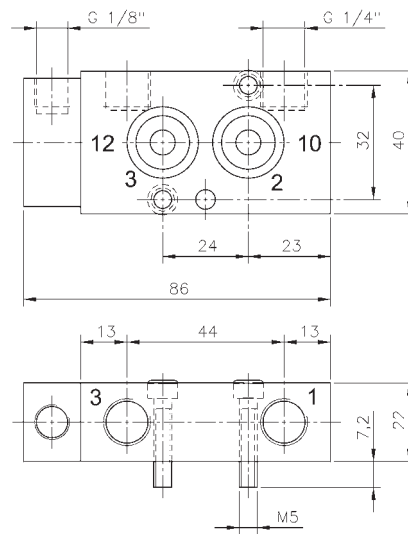
PN 311 701 with combined mechanical and pneumatic spring return.

Port sizes type 701: 1 and 3: G 1/4"  
12: G 1/8"

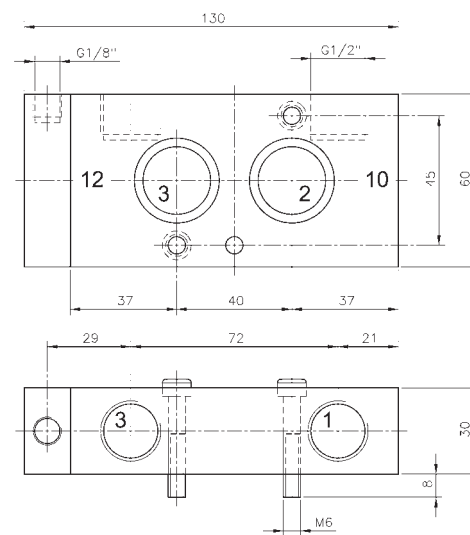
Port sizes type 121: 1 and 3: G 1/2"  
12: G 1/8"

Delivery includes 1 pin, 2 screws, 2 O-rings.

*NPT ported valves are available on request.*



**PN 310 701/PN 311 701**

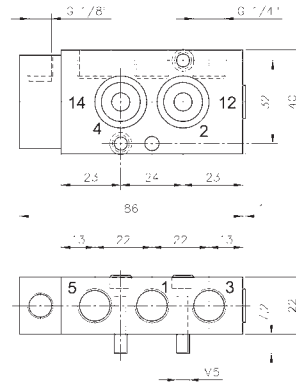
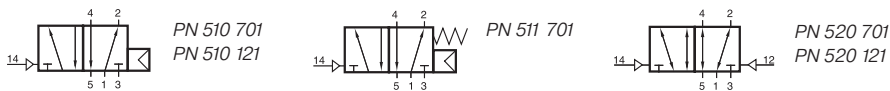


**PN 310 121**

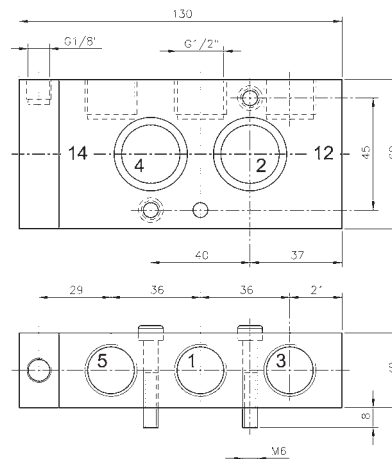
Type	NAMUR	Port size	Air flow	Operating press.	Actuation press.	Weight
PN 310 701	1/4"	G 1/4" - G 1/8"	1250 l/min	2 - 10 bar	the same	0,20 kg
PN 311 701	1/4"	G 1/4" - G 1/8"	1250 l/min	3 - 10 bar	3 - 10 bar	0,20 kg
PN 310 121	1/2"	G 1/2" - G 1/8"	3000 l/min	1 - 10 bar	the same	0,62 kg



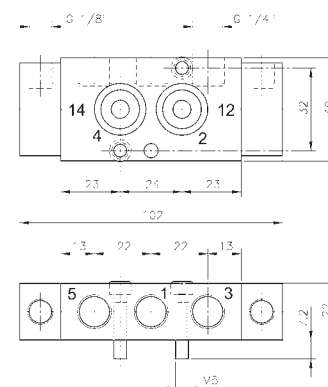
# PN 510 701/PN 511 701/PN 510 121 PN 520 701/PN 520 121



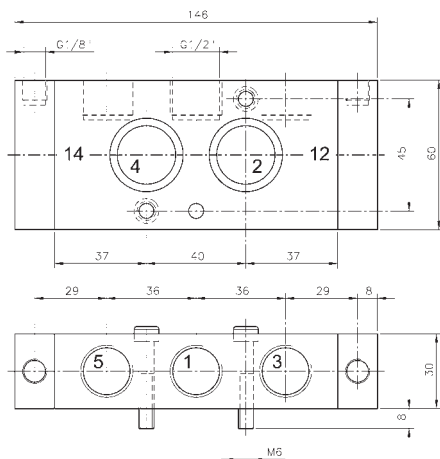
**PN 510 701/PN 511 701**



**PN 510 121**



**PN 520 701**



**PN 520 121**

Pneumatically actuated 5/2-way spool valve. Interface according to NAMUR-standard.

PN 510 701 and PN 510 121 with pneumatic spring. For valves with pure pneumatic spring operating and actuation pressure should be at the same level. PN 511 701 with combined mechanical and pneumatic spring return. PN 520 with double pilot.

Port sizes type 701: 1, 3 and 5: G 1/4"  
12 and 14: G 1/8"

Port sizes type 121: 1, 3 and 5: G 1/2"  
12 and 14: G 1/8"

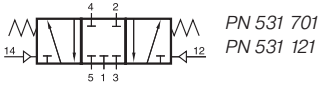
Delivery includes 1 pin, 2 screws, 2 O-rings.

*NPT ported valves are available on request.*

Type	NAMUR	Port size	Air flow	Operating press.	Actuating press.	Weight
PN 510 701	1/4"	G 1/4" - G 1/8"	1250 l/min	2 - 10 bar	the same	0,19 kg
PN 511 701	1/4"	G 1/4" - G 1/8"	1250 l/min	3 - 10 bar	3 - 10 bar	0,19 kg
PN 510 121	1/2"	G 1/2" - G 1/8"	3000 l/min	1 - 10 bar	the same	0,60 kg
PN 520 701	1/4"	G 1/4" - G 1/8"	1250 l/min	1 - 10 bar	2 - 10 bar	0,22 kg
PN 520 121	1/2"	G 1/2" - G 1/8"	3000 l/min	1 - 10 bar	1 - 10 bar	0,67 kg



# PN 531 701/PN 531 121



Pneumatically actuated 5/3-way spool valve with spring return to middle position, centre closed. Interface according to NAMUR-standard.

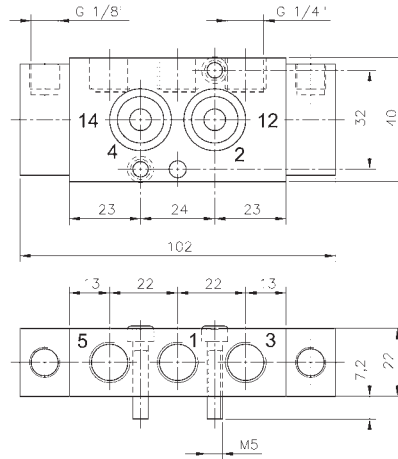
Port sizes type 701: 1, 3 and 5: G 1/4"  
12 and 14: G 1/8"

Port sizes type 121: 1, 3 and 5: G 1/2"  
12 and 14: G 1/8"

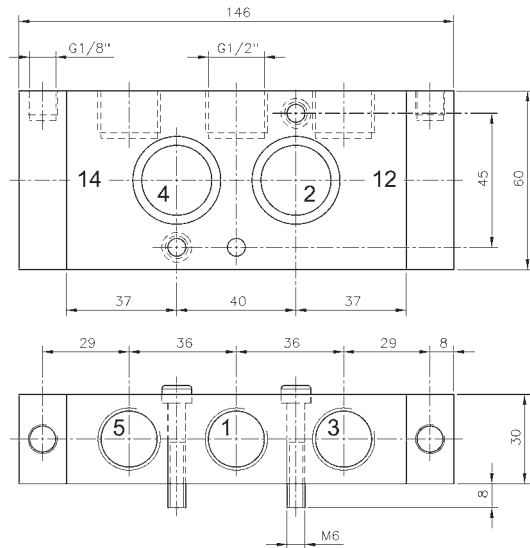
Other 5/3-way versions (centre exhausted or pressurised) are available on request.

Delivery includes 1 pin, 2 screws, 2 O-rings.

*NPT ported valves are available on request.*



**PN 531 701**

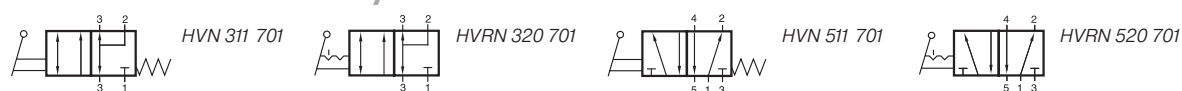


**PN 531 121**

Type	NAMUR	Port size	Air flow	Operating press.	Actuation press.	Weight
PN 531 701	1/4"	G 1/4" - G 1/8"	1250 l/min	1 - 10 bar	3 - 10 bar	0,22 kg
PN 531 121	1/2"	G 1/2" - G 1/8"	3000 l/min	1 - 10 bar	3 - 10 bar	0,67 kg



# HVN 311 701/HVRN 320 701 HVN 511 701/HVRN 520 701



Lever actuated spool valves with interface according to 1/4" NAMUR- standard.

4 versions are offered:

HVN 311 701 3/2-way, normally closed with spring return

HVRN 320 701 3/2-way, indexed

HVN 511 701 5/2-way with spring return

HVRN 520 701 5/2-way indexed

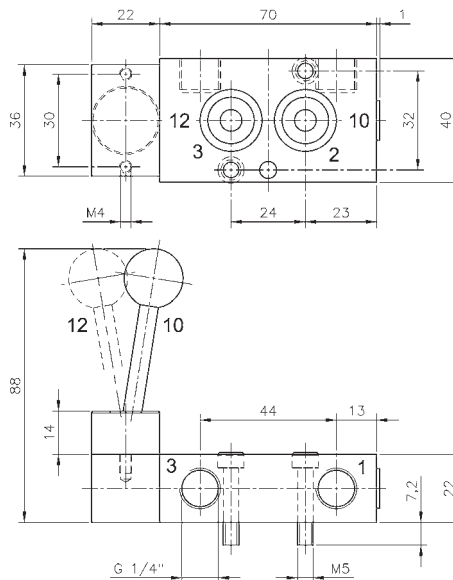
3/2-way valves offer exhaust air recirculation („purge“).

The lever is sealed by using a metal ball.

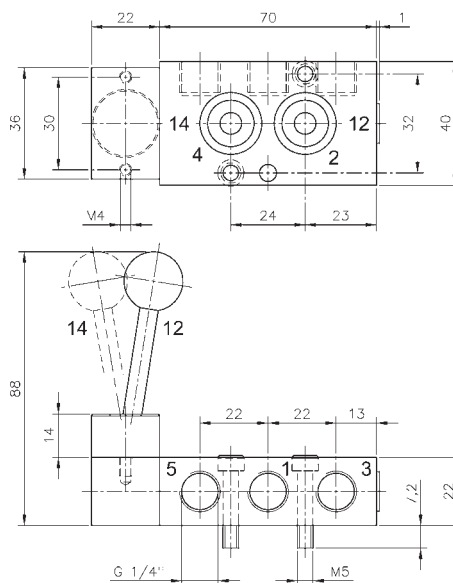
Exhaust can be throttled.

Delivery includes 1 pin, 2 screws, 2 O-rings.

*NPT ported versions and 5/3-way valves are available on request.*



**HVN 311 701/HVRN 320 701**



**HVN 511 701/HVRN 520 701**

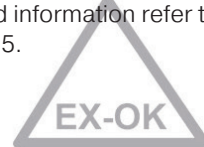
Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
HVN 311 701	3/2-way spring	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,24 kg
HVRN 320 701	3/2-way indexed	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,24 kg
HVN 511 701	5/2-way spring	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,24 kg
HVRN 520 701	5/2-way indexed	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,24 kg



# 2.11

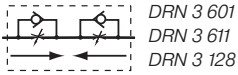
## Accessories for Smart Valve Automation

Selected models can be used in explosion hazardous environment. For detailed information refer to chapter 2.15.



# DRN 3 601/DRN 3 611/DRN 3 128

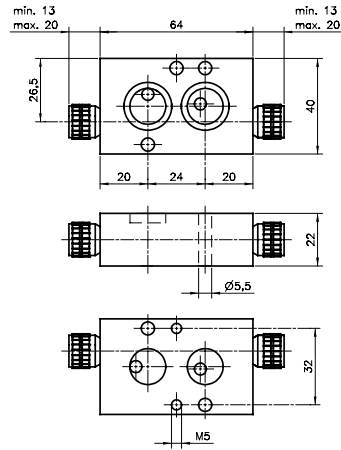
Flow regulator plate



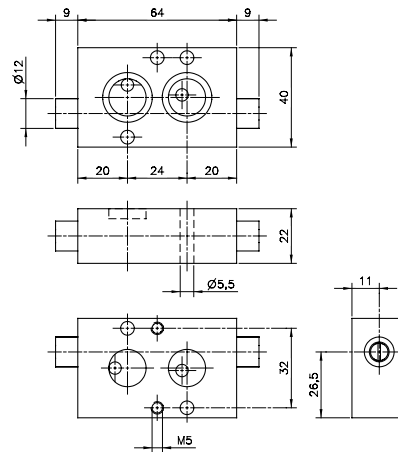
Block form flow regulator as intermediate plate, interface according to NAMUR-standard, for 3/2-way valves with exhaust air recirculation.

To regulate the forward stroke of a single acting pneumatic actuator and to regulate the exhaust air going into the spring return unit. DRN 3 601 and DRN 3 128 to be operated manually, DRN 3 611 with a screw-driver.

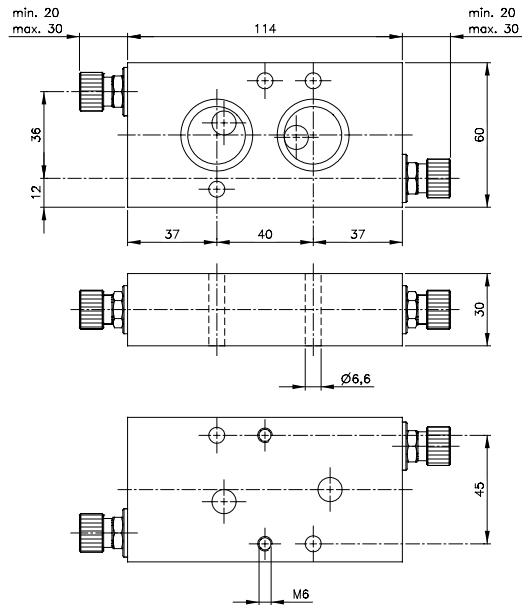
If flow regulator is required with G 1/4" ports, plate GPN 1/4 can be added. For details please refer to page 2.11.13. Delivery includes 1 pin, 2 screws, 2 O-rings.



**DRN 3 601**



**DRN 3 611**



**DRN 3 128**

Type	Function	NAMUR	Port size	Max. air flow*	Operating pressure	Weight
DRN 3 601	3-way	1/4"	Ø 5 mm	650 l/min	0,5 - 10 bar	0,18 kg
DRN 3 611	3-way	1/4"	Ø 5 mm	650 l/min	0,5 - 10 bar	0,18 kg
DRN 3 128	3-way	1/2"	Ø 8 mm	1.500 l/min	0,5 - 10 bar	0,60 kg

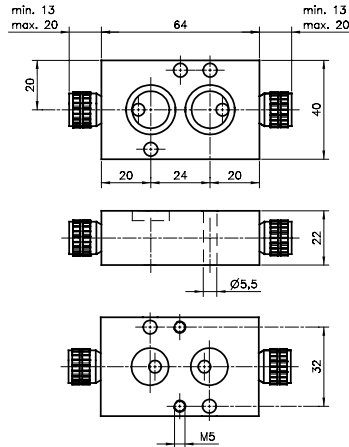
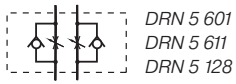
\* Values at 10 bar inlet pressure and without back pressure.





# DRN 5 601/DRN 5 611/DRN 5 128

Flow regulator plate



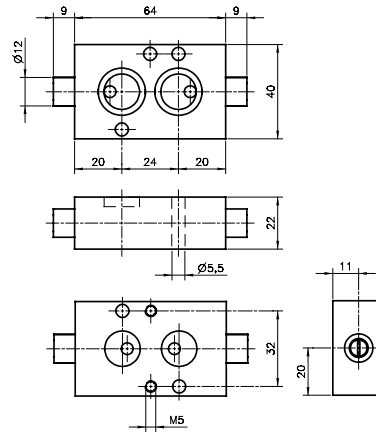
**DRN 5 601**

Block form flow regulator as intermediate plate, interface according to NAMUR-standard, for 5-way valves only.

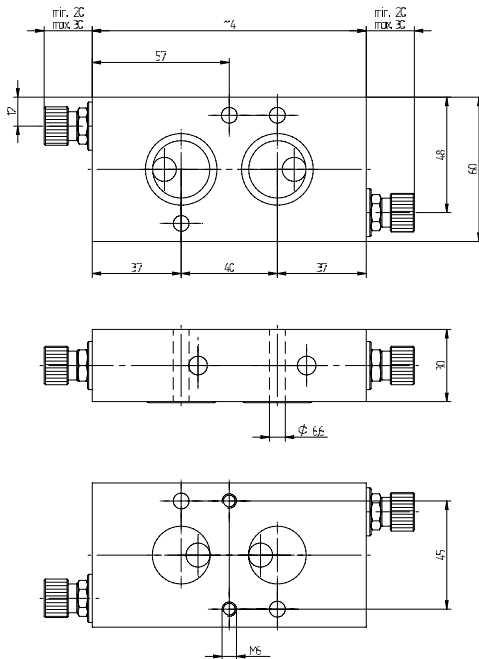
To regulate the forward- and backward-stroke of a double acting pneumatic actuator. DRN 5 601 and DRN 5 128 to be operated manually, DRN 5 611 with a screw-driver.

If flow regulator is required with G 1/4" ports, plate GPN 1/4 can be added. For details please refer to page 2.11.13.

Delivery includes 1 pin, 2 screws, 2 O-rings.



**DRN 5 611**



**DRN 5 128**

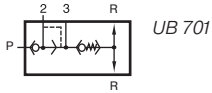
Type	Function	NAMUR	Port size	Max. air flow*	Operating pressure	Weight
DRN 5 601	5-way	1/4"	Ø 5 mm	650 l/min	0,5 - 10 bar	0,18 kg
DRN 5 611	5-way	1/4"	Ø 5 mm	650 l/min	0,5 - 10 bar	0,18 kg
DRN 5 128	5-way	1/2"	Ø 8 mm	1.500 l/min	0,5 - 10 bar	0,60 kg

\* Values at 10 bar inlet pressure and without back pressure.



# UB 701

Air-recirculation block for single acting actuators



The air-recirculation block guarantees, that only exhausting air from the actuation chamber is going into the spring chamber, no ambient atmosphere is sucked-in.

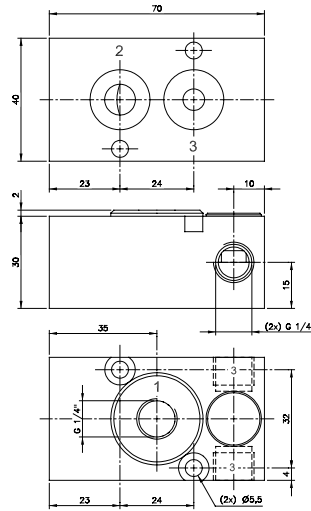
Valve is designed for spring return pneumatic actuators with 1/4" NAMUR-interface to be controlled by a remote piloted 3/2-way valve.

Standard with G 1/4" pilot port. Materials being used:

- Body: aluminum
- Diaphragm: NBR
- Other inner parts: brass

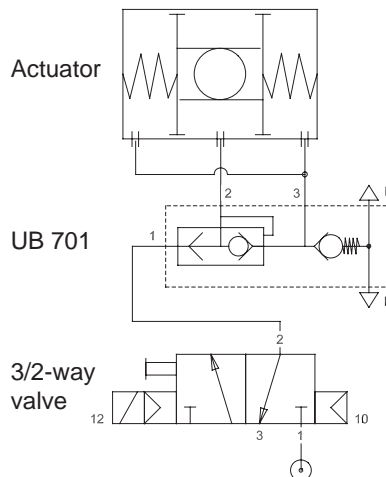
One of the two exhaust ports 3 to be closed by a plug.

Delivery includes 2 screws, 2 O-rings, 1/4" plug for port 3.



**UB 701**

**Function:**



Type	NAMUR	Port size	Air flow	Operating pressure	Weight
UB 701	1/4"	G 1/4"	1250 l/min	1 - 10 bar	0,22 kg





# PN 411 721/BHN 420 701

Short-cut valve when using manual gearbox



Intermediate valve for assemblage onto the actuator with 1/4" NAMUR-interface. Blocks signals from pilot-valve and short-cuts both actuator chambers. It offers a 1/4" NAMUR-interface towards the pilot-valve (use as sandwich plate) as well as ports G 1/4" for piped application.

Delivery includes 2 screws, 2 O-rings.

### Function PN 411 721

As long as a pneumatic signal is applied, the valve forwards the signals applied to 2 and 4 through to X and Y. When no pneumatic signal is applied the ports 2 and 4 are shortcut.

On request:

Valve that is normally blocked, type PN 411 711.

### Function BHN 420 701

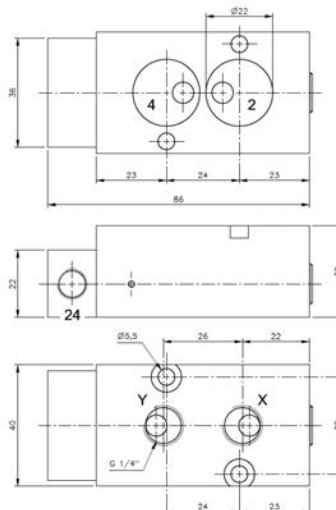
As long as the knob is pulled, the valve forwards the signals applied to 2 and 4 through to X and Y. When knob is pushed the ports 2 and 4 are shortcut.

### Typical application

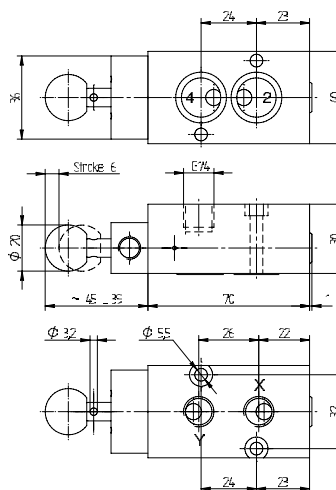
On automated process-valve equipped with a gear-box for manual actuation in case of emergency.

When failure occurs, compressed air might get trapped in the actuator. Manual operation might damage the actuator. Valve assures, that the user doesn't have to close the process valve against the force of the air.

Version with 1/2" NAMUR-interface available on request.



**PN 411 721**

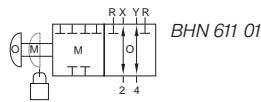
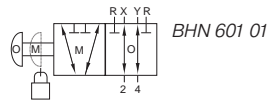
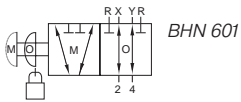


**BHN 420 701**

Type	Port size	Air flow	Operating press.	Actuating press.	Actuating Force	Weight
PN 411 721	G 1/4"-1/4" NAMUR	1250 l/min	1,5 - 10 bar	3 - 10 bar		0,20 kg
BHN 420 701	G 1/4"-1/4" NAMUR	1250 l/min	1 - 10 bar		18 N	0,22 kg

# BHN 601/BHN 601 01/BHN 611 01

Manual actuated block and vent/block and block



Intermediate valve for assemblage onto the actuator with 1/4" NAMUR-interface. Blocks signals from pilot-valve.

BHN 601 exhausts actuator when knob is pulled. Lockable in standard operation mode (O-position).

BHN 601 01 exhausts actuator when knob is pushed. Lockable in manual mode (M-position). Protection against unintended use with pin.

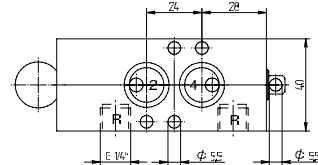
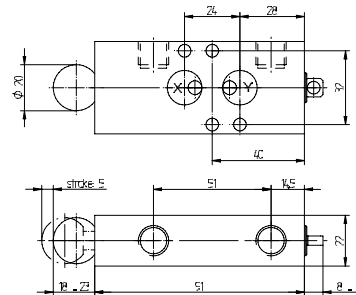
Typical application: to avoid injuries of maintenance personal when working on installed process equipment.

BHN 611 01 blocks actuator when knob is pushed. Lockable in manual mode (M-position). Protection against unintended use with pin.

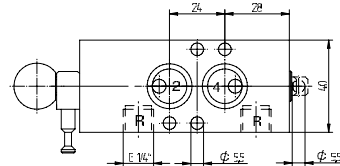
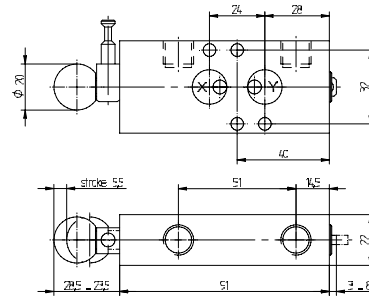
Typical application: For process valves on tanks where maintenance people have to go into the tank.

If the valve is required with G 1/4" ports, plate GPN 1/4 can be added. For details please refer to page 2.11.13.

Delivery includes 1 pin, 2 screws, 2 O-rings.



**BHN 601**



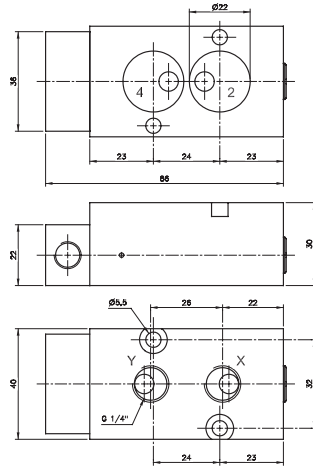
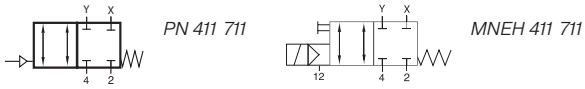
**BHN 601 01/ BHN 611 01**

Type	Function	lockable	Air flow	Operating press.	Actuation force	Weight
BHN 601	vents actuator	O-position	900 l/min	1 - 10 bar	18 N	0,23 kg
BHN 601 01	vents actuator	M-position	900 l/min	1 - 10 bar	18 N	0,24 kg
BHN 611 01	blocks actuator	M-position	900 l/min	1 - 10 bar	18 N	0,24 kg



# PN 411 711/MNEH 411 711

Pneumatically and electrically actuated block and block valve



**PN 411 711**

Valve blocks signals from pilot valve and offers a so-called „stay-put“ or „fail-in-place“ function. Intermediate valve for assemblage onto the actuator with 1/4“ NAMUR-interface. It offers a 1/4“ NAMUR-interface towards the pilot-valve (use as sandwich) as well as G 1/4“ ports (piped application).

**Function:**

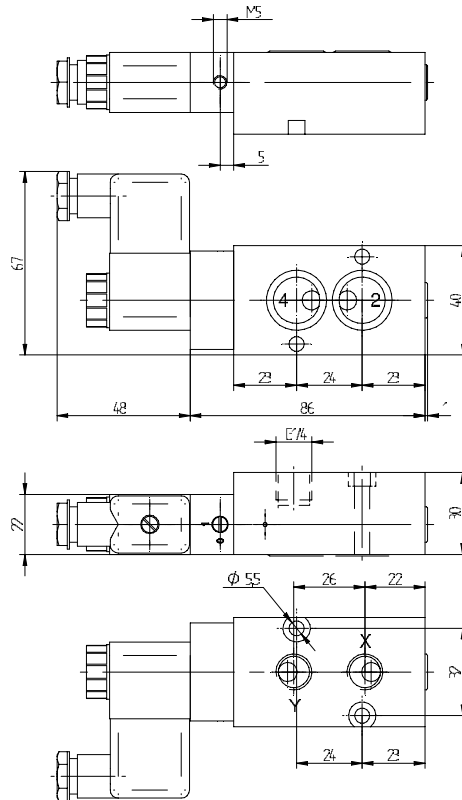
As long as the valve is actuated, it forwards the signals from the pilot valve which are applied to port X and Y through to 2 and 4. As soon as the actuating signal is taken away or cuts off all ports will be blocked.

Valves can be also used in combination with a positioner.

- PN 411 711 operated by air.
- MNEH 411 711 operated by solenoid and additional external pilot air supply. Equipped with manual override to turn.

MNEH 411 711 available with solenoid operators: 230V/50Hz, 110V/Hz, 24V/50 Hz, 48V=, 24V=, 12V=.

Delivery includes 2 screws, 2 O-rings.



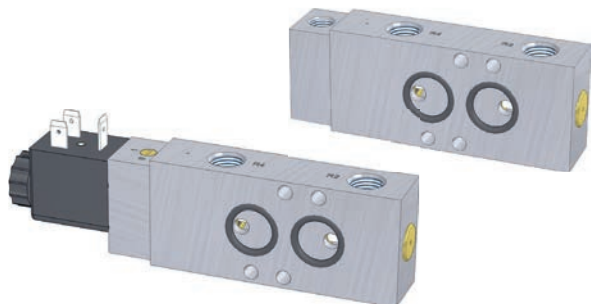
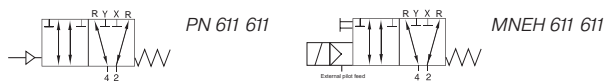
**MNEH 411 711**

Type	Port size	Air flow	Operating press.	Actuation press.	Power cons.	Weight
PN 411 711	G 1/4" - 1/4" NAMUR	1250 l/min	1 - 10 bar	3 - 10 bar		0,27 kg
MNEH 411 711	G 1/4" - 1/4" NAMUR	1250 l/min	1 - 10 bar	3 - 10 bar (port 12)	3 W = / 5 VA ~	0,35 kg



# PN 611 611/MNEH 611 611

Pneumatically and electrically actuated block and vent valve



Valve blocks signals from pilot valve and exhausts the actuator. Intermediate valve for assemblage onto the actuator with 1/4" NAMUR-interface. It offers a 1/4" NAMUR-interface towards the pilot-valve (use as sandwich).

**Function:**

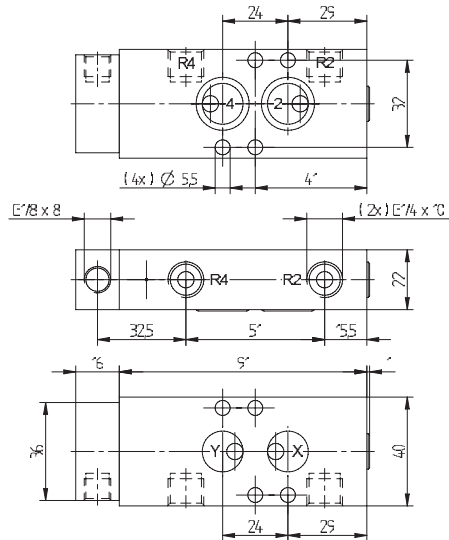
As long as the valve is actuated, it forwards the signals from the pilot valve which are applied to port X and Y through to 2 and 4. As soon as the actuating signal is taken away or cuts off ports X and Y will be blocked and ports 2 and 4 can exhaust through the R ports.

- PN 611 611      operated by air.
- MNEH 611 611    operated by solenoid and additional external pilot air supply. Equipped with manual override to turn.

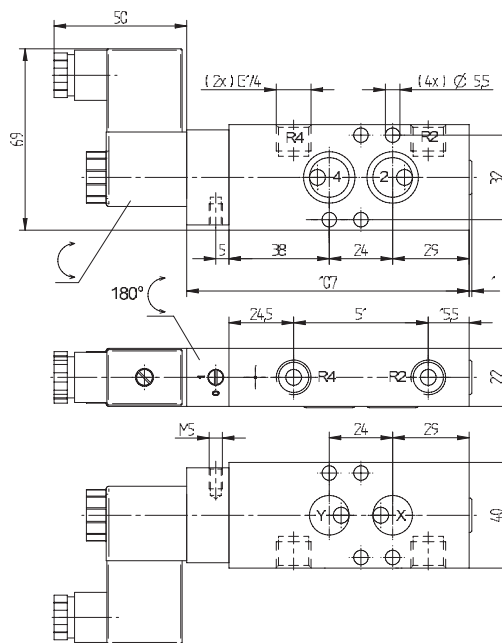
MNEH 611 611 available with solenoid operators: 230V/50Hz, 110V/Hz, 24V/50 Hz, 48V=, 24V=, 12V=.

If valve is required with G 1/4" ports, plate GPN 1/4 can be added. For details please refer to page 2.11.13.

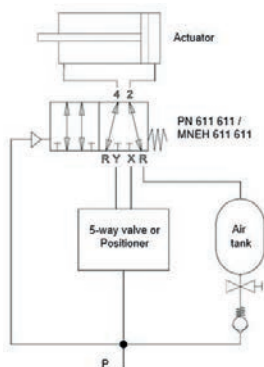
Delivery includes 1 pin, 2 screws, 2 O-rings.



**PN 611 611**



**MNEH 611 611**

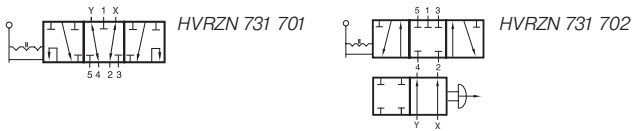


Valves can be also used to realize a failsafe function on double acting actuators. For this purpose an external air tank can be connected to any of the two R ports like in the exemplary circuit below.

Type	Port size	Air flow	Operating press.	Actuation press.	Power cons.	Weight
PN 611 611	G 1/4" NAMUR	900 l/min	1 - 10 bar	3 - 10 bar		0,26 kg
MNEH 611 611	G 1/4" NAMUR	900 l/min	1 - 10 bar	3 - 10 bar (port 12)	3 W = / 5 VA ~	0,34 kg

# HVRZN 731 701/HVRZN 731 702

Pneumo-manual override valve for positioners



Lever valve for direct assemblage to an actuator with 1/4" NAMUR-interface.

Valves offer the possibility to override a positioner.

## Version 731 701:

Normally the lever is in the middle position and the actuator is piloted by the positioner. In this position the valve just feeds the signals from the positioner through to the actuator. In case of electric / electronic problems the actuator can be opened or closed manually.

### Advantages of version 701 :

Only one lever to manipulate (no second actuation elements). Overrides in manual mode the positioner, manual mode and automatic mode truly independent.

## Version 731 702:

If the knob is pushed, air flows from the positioner from Y to 4 and from X to 2.

If the knob is pulled valve is in manual mode.

The lever valve is to be used as a centre closed 5/3-way valve, actuator can be fully opened, fully closed or put into intermediate position.

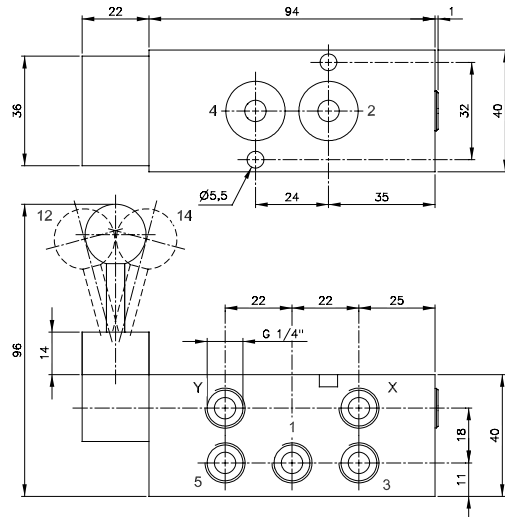
### Advantage of version 702:

Offers in manual mode a centre closed 5/3-way-valve. Version 701 is in manual mode a 5/2-way-valve.

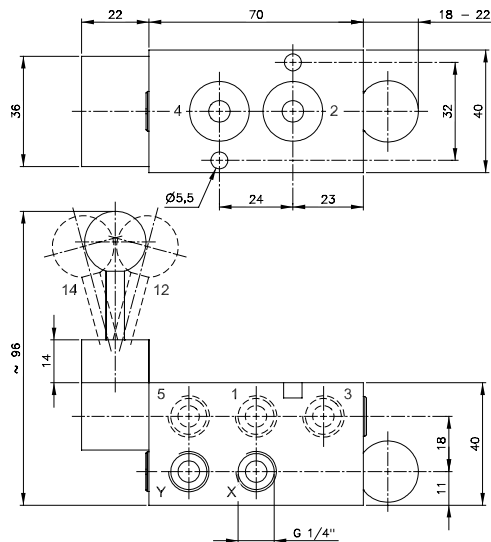
## Safety lever:

In order to avoid unintended manual actuation the lever of both versions has to be pulled thoroughly for being manipulated out of central position.

Delivery includes 2 screws, 2 O-rings.



HVRZN 731 701

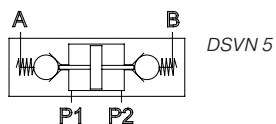


HVRZN 731 702

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
HVRZN 731 701	5/2-way indexed	G 1/4"	1250 l/min	1 - 10 bar	~ 25 N	0,53 kg
HVRZN 731 702	5/3-way indexed	G 1/4"	1250 l/min	1 - 10 bar	~ 25 N	0,45 kg

# DSVN 5

Pressure holding valve



Pressure holding valve to hold a double acting actuator at the current position in case of cut-off of pressure supply.

The valve is consisting of two non-return valves which will be unlocked by pressurising port P1 or P2.

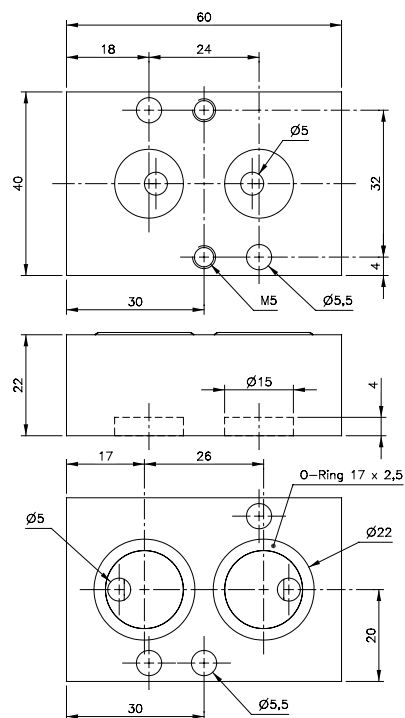
Installation between pilot valve and actuator.

Inner parts are made from brass and POM, seals are made from NBR.

If the valve is required with G 1/4" ports, plate GPN 1/4 can be added.

For details please refer to page 2.11.13.

Delivery includes 1 pin, 2 screws, 2 O-rings.

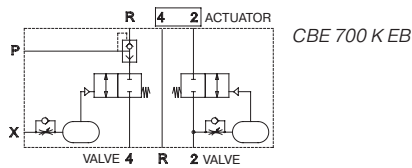
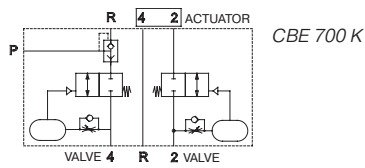


**DSVN 5**

Type	NAMUR	Air flow P to A/B	Air flow A/B to P	Operating pressure	Weight
DSVN 5	1/4"	230 l/min	360 l/min	1 - 10 bar	0,10 kg

# CBE 700 K/CBE 700 K EB

Controlblock for single-acting actuators to control butterfly valves with inflatable valve-seat



Control block for single-acting actuators with interface according to 1/4" NAMUR-standard, to be used on process-valves with inflatable valve seat.

The control-block has to receive it's signals to open and close from a 5/2-way NAMUR-valve.

Please note that it does not work with a 3/2-way valve.

The block can only be used for spring-close applications.

Air is used to open the actuator; spring is closing it.

The spring-chamber won't be pressurised during the closing movement.

The block does not offer the exhaust-air recirculation (purge) of the spring-chamber.

The block also offers a fail-close function. If the electricity and/or air signal cuts-off the actuator will close by the force of the springs. However, in case the air is away the valve-seat won't be pressurised.

Opening- and closing-time-delay can be adjusted independently but they are related to the operating pressure. At 6 bar time-delay can be adjusted between 0 and 2 seconds.

Type **CBE 700 K EB** with additional port X: pressurizing of the inflatable seal does not start before a pneumatic signal is received.

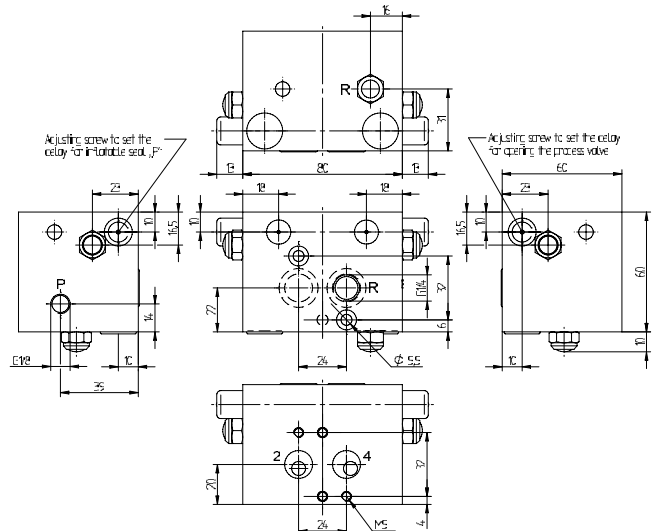
If the block is required with G 1/4" ports, plate GPN 1/4 can be added. For details please refer to page 2.11.13.

Delivery includes 2 screws, 2 O-rings, 2 protection caps.

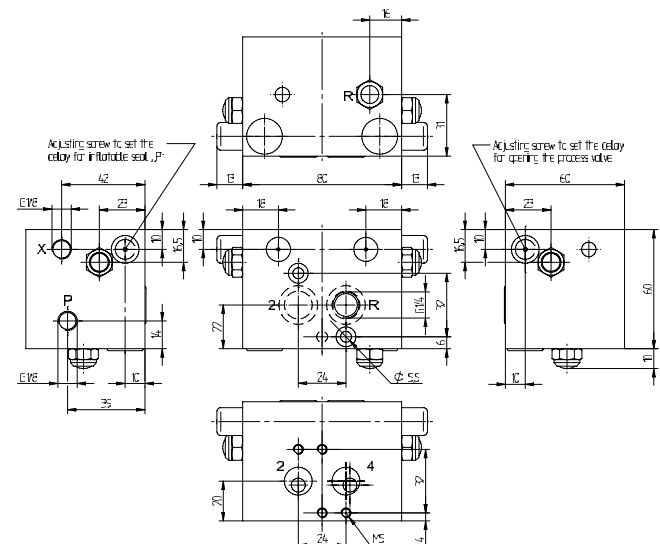
Please note:

If a pressure regulator is used between the CBE 700 (port P) and the inflatable seal, an additional quick exhaust valve is needed to exhaust the seal.



Temperature range: -25°C ... +50°C



**CBE 700 K**

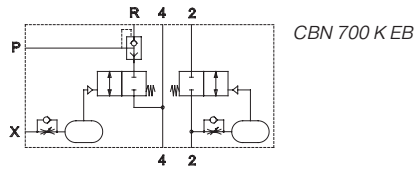
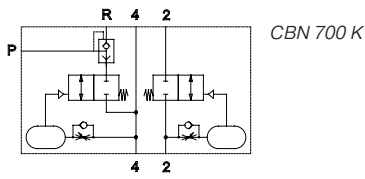


**CBE 700 K EB**

Type	NAMUR	Port P	Port X	Air flow act.	Operating press.	Air flow seal	Weight	
CBE 700 K	1/4"	G 1/8"		900 l/min	3 - 10 bar	400 l/min	0,80 kg	
CBE 700 K EB	1/4"	G 1/8"	G 1/8"	900 l/min	3 - 10 bar	400 l/min	0,80 kg	

# CBN 700 K/CBN 700 K EB

Controlblock for double acting actuators to control butterfly valves with inflatable valve-seat



Control block for double acting actuators with interface according to 1/4" NAMUR-standard, to be used on process-valves with inflatable valve seat.

The control-block receives it's signals to open and close from a standard 5/2-way NAMUR-valve.

The block is to be put between the actuator and the NAMUR-valve (flange-version).

The closing-signal is fed through to the actuator, the seal is inflated with time-delay.

When the process-valves is to be opened first the seal is deflated, with time-delay the actuator opens the process-valve.

Opening- and closing-time-delay can be adjusted independently but they are related to the operating pressure.

At 6 bar time-delay can be adjusted between 0 and 2 seconds.

Type **CBN 700 K EB** with additional port X: pressurizing of the inflatable seal does not start before a pneumatic signal is received.

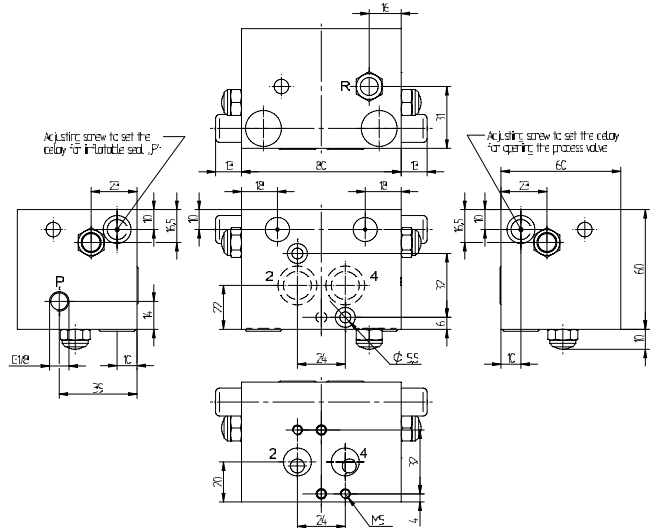
If the block is required with G 1/4" ports, plate GPN 1/4 can be added. For details please refer to page 2.11.13.

Delivery includes 2 screws, 2 O-rings, 2 protection caps.

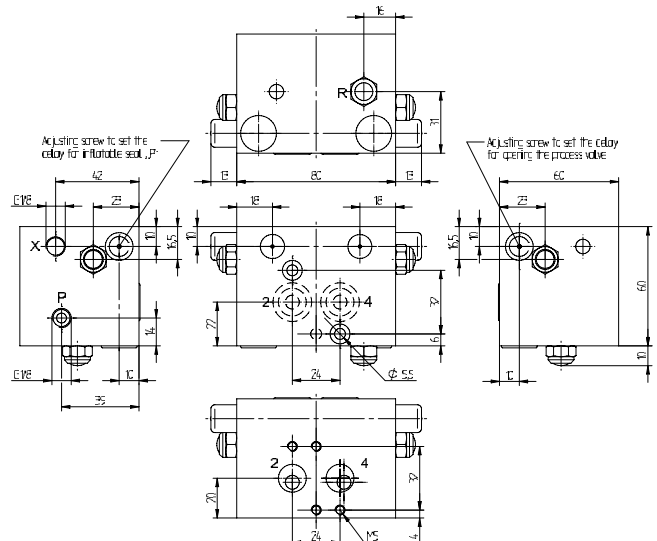
Please note:

If a pressure regulator is used between the CBN 700 (port P) and the inflatable seal, an additional quick exhaust valve is needed to exhaust the seal.

Temperature range: -25°C ... +50°C



**CBN 700 K**



**CBN 700 K EB**

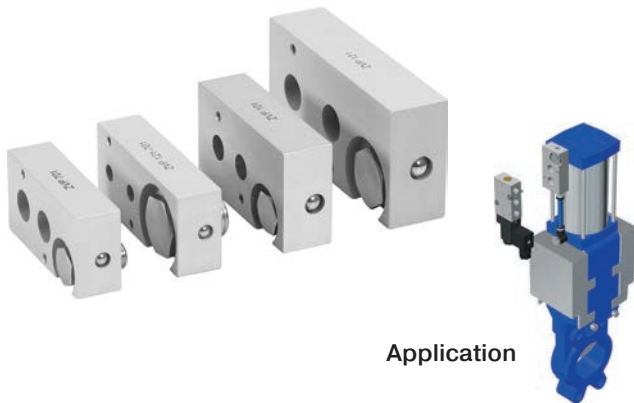
Type	NAMUR	Port P	Port X	Air flow act.	Operating press.	Air flow seal	Weight	
CBN 700 K	1/4"	G 1/8"		900 l/min	3 - 10 bar	400 l/min	0,80 kg	Ex
CBN 700 K EB	1/4"	G 1/8"	G 1/8"	900 l/min	3 - 10 bar	400 l/min	0,80 kg	Ex





# ZVP 701/ZVP 101/ZVP 121/ZVP 121-701

Plates for cylinder-valve combinations – 1. for standard pneumatic cylinders



Application

Plates to combine NAMUR-valves with double acting cylinders / the actuation element of a knife gate valve.

The plates can be attached to different cylinders, independent on their stroke.

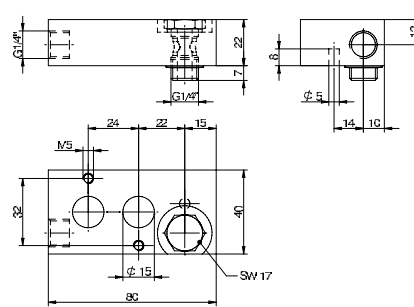
ZVP 701 to be assembled onto a cylinder with G 1/4" ports (diameter 32, 40, 50 mm according to ISO 6431/ISO 15552). Designed for an orifice size 7 mm in combination with e.g. MNH 510 711.

ZVP 101 to be assembled onto a cylinder with G 3/8" ports (diameter 63, 80 mm according to ISO 6431/ISO 15552). Designed for an orifice size 10 mm in combination with e.g. MNH 510 101.

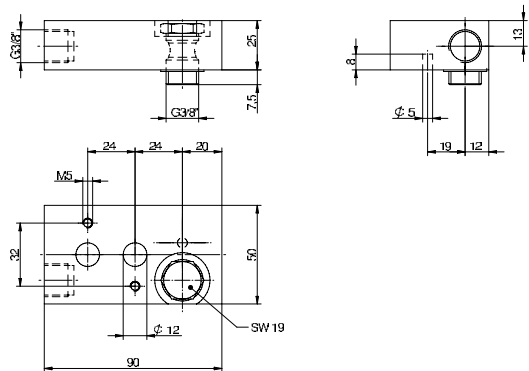
ZVP 121 to be assembled onto a cylinder with G 1/2" ports (diameter 100, 125 mm according to ISO 6431/ISO 15552). Designed for an orifice size 12 mm in combination with e.g. MNH 510 121.

ZVP 121-701 to be assembled onto a cylinder with G 1/2" ports and equipped with a NAMUR-valve of 1/4" standard.

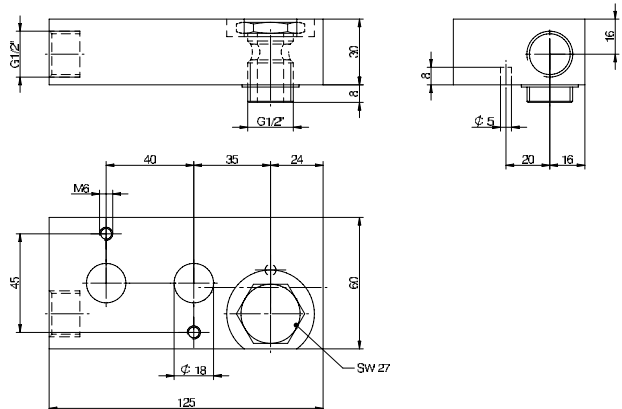
Delivery contains the plate and the banjo for one port. Straight male fittings and rotating elbow fittings to make the other connection can be supplied on request.



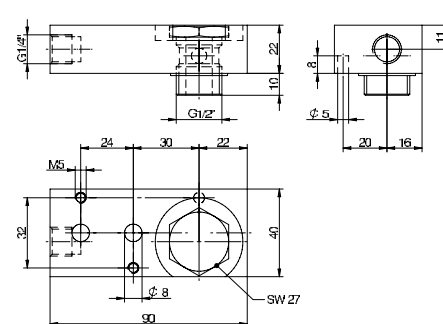
ZVP 701



ZVP 101



ZVP 121

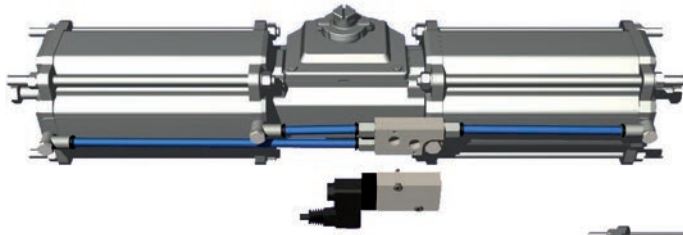


ZVP 121-701

Type	Port A	Port B	NAMUR	Orifice	Weight
ZVP 701	Banjo G 1/4"	G 1/4"	1/4"	7 mm	0,35 kg
ZVP 101	Banjo G 3/8"	G 3/8"	1/4"	10 mm	0,40 kg
ZVP 121	Banjo G 1/2"	G 1/2"	1/2"	12 mm	0,45 kg
ZVP 121-701	Banjo G 1/2"	G 1/4"	1/4"	7 mm	0,35 kg

# ZVPS 701/ZVPS 101/ZVPS 121

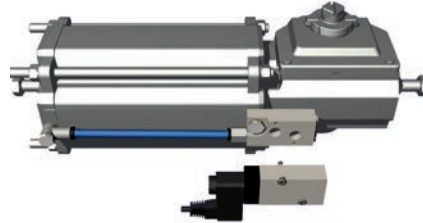
Plates for cylinder-valve combinations – 2. for scotch-yoke actuators



Double cylinder actuator



Single cylinder actuator, piped

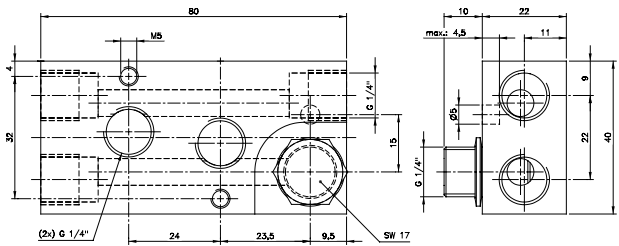


Single cylinder actuator, NAMUR

Plates to combine NAMUR-valves with scotch-yoke-actuators.

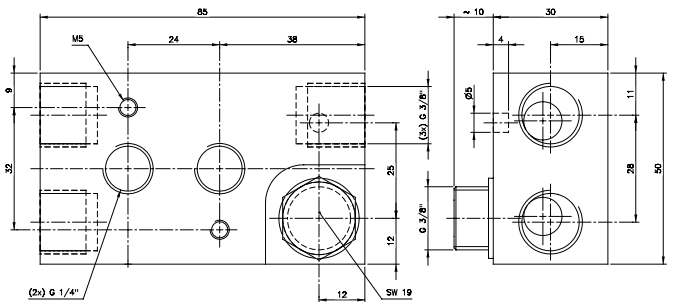
The plates can be attached to different actuators, independent on their stroke.

ZVPS 701 to be assembled onto an actuator with G 1/4" ports. Designed for an orifice size 7 mm in combination with e.g. MNH 510 711.



**ZVPS 701**

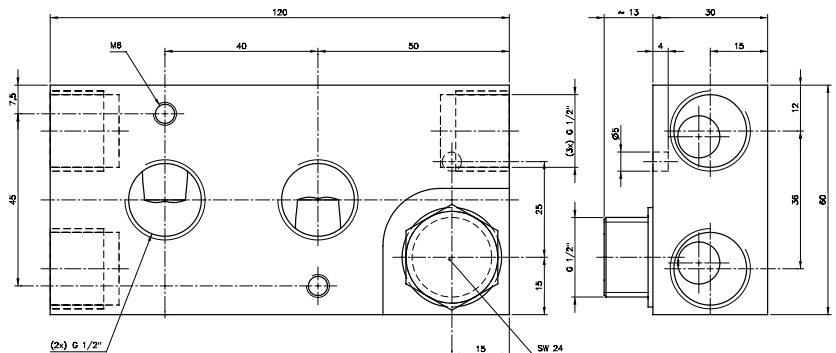
ZVPS 101 to be assembled onto an actuator with G 3/8" ports. Designed for an orifice size 10 mm in combination with e.g. MNH 510 101.



**ZVPS 101**

ZVPS 121 to be assembled onto an actuator with G 1/2" ports. Designed for an orifice size 12 mm in combination with e.g. MNH 510 121.

Delivery contains the plate and the banjo for one port. Straight male fittings and rotating elbow fittings to make the other connection can be supplied on request.



**ZVPS 121**

Type	Port A	Port B	Port C + O	NAMUR	Orifice	Weight
ZVPS 701	Banjo G 1/4"	G 1/4"	G 1/4"	1/4"	7 mm	0,35 kg
ZVPS 101	Banjo G 3/8"	G 3/8"	G 1/4"	1/4"	10 mm	0,40 kg
ZVPS 121	Banjo G 1/2"	G 1/2"	G 1/2"	1/2"	12 mm	0,45 kg

# Cylinder Series LAZ

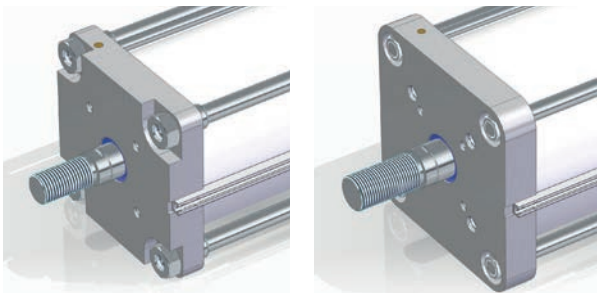
Linear Actuators with NAMUR-interface



Cylinder series with integrated NAMUR mounting port pattern. This allows to assemble NAMUR-valves and accessories directly to the cylinder.

## Key features:

- Double acting
- Cylinder standard similar to ISO 15552
- Diameter: 80 ... 320 mm
  - 80 – 125 mm: Profile tube
  - 160 – 320 mm: with tie rods
- Stroke length: 25 ... 1000 mm (others on request)
- Actuators diameter 80 – 160 mm with interface to solenoid valve according to VDI/VDE 3845 (NAMUR 1 – 1/4“), 200 – 320 mm with NAMUR 2 – 1/2“ interface.
- All cylinders with magnetic piston as a standard



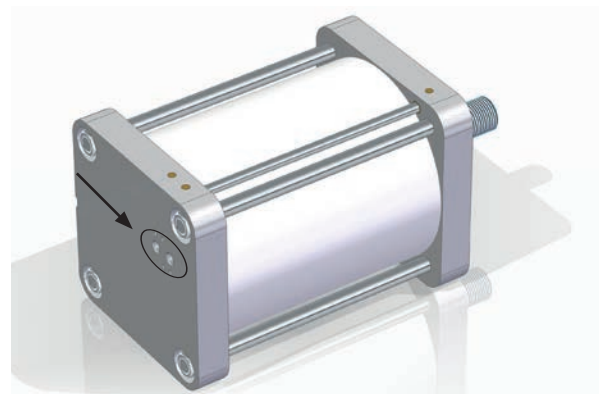
These kind of cylinders are mainly used for the automation of knife-gate-valves. Therefore the head of the cylinder has a mounting port pattern according to DIN 3358/ISO 5210 for direct mounting to knife-gate-valves.

Other interfaces on request.

Diameter up to 125 mm with NAMUR-interface at the bottom and long side of the cylinder for maximum flexibility. Unused ports to be plugged. Starting diameter 160 mm only with one NAMUR-interface at the bottom.



Diameter up to 125 mm



Diameter from 160 mm

**For further information, please contact us.**







# 2.12

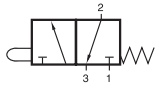
## „HAFNER on the Rocks“ Low Temperature Valves

Selected models are available for explosion hazardous environment. For detailed information refer to chapter 2.15.

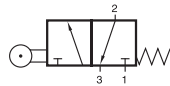




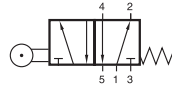
# BG 311 701 TT/BR 311 701 TT/BR 511 701 TT



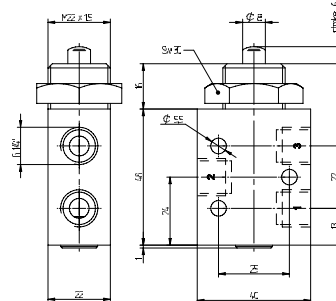
BG 311 701 TT



BR 311 701 TT



BR 511 701 TT



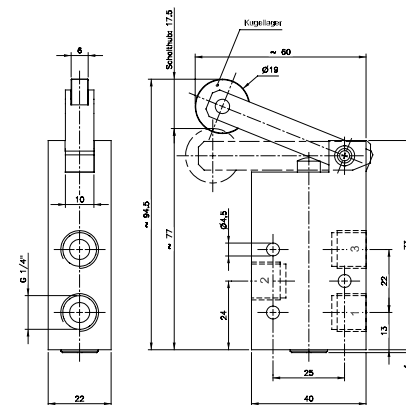
BG 311 701 TT

**BG 311 701 TT** heavy duty stem actuated 3/2-way spool valve with mechanical spring for low temperature environment -50° C to + 50° C. Suitable for wall or panel mounting. Nut for panel mounting M22 x 1,5 is included.

**BR 311 701 TT / BR 511 701 TT** heavy duty roller-lever spool valve with mechanical spring for low temperature environment -50° C to + 50° C. Lever-construction has proven capabilities in rough environmental applications for decades.

- BR 311 701 TT     3/2-way, spring return
- BR 511 701 TT     5/2-way, spring return

Due to the specific design of the low temperature seals pressure has to be applied to port 1.  
For other versions (e.g. normally open) please get in touch with the manufacturer.



BR 311 701 TT

Please note:

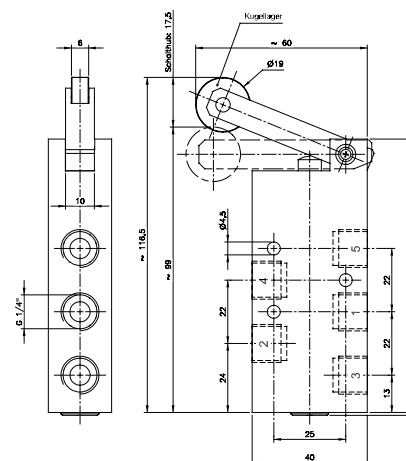
When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of the environment and media.

Air has to be dried!

Below -40° C the leakage-rate of the valve can increase.

Further information on page 15. Use unlubricated air only.

Exhaust can be throttled.

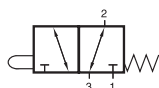


BR 511 701 TT

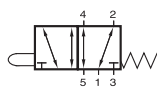
Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
BG 311 701 TT	3/2-way spring ret.	G 1/4"	1250 l/min	1 - 10 bar	17 N	0,13 kg
BR 311 701 TT	3/2-way spring ret.	G 1/4"	1250 l/min	1 - 10 bar	3,5 N	0,20 kg
BR 511 701 TT	5/2-way spring ret.	G 1/4"	1250 l/min	1 - 10 bar	3,5 N	0,25 kg



# BAS 311 501 TT AIR Ex/BAS 511 501 TT AIR Ex



BAS 311 501 TT AIR Ex



BAS 511 501 TT AIR Ex



3/2-way and 5/2-way spool valves with mechanical spring for panel mounting. For low temperature environment -40°C to +65°C and for explosion hazardous environment zone 1, 2, 21 and 22.

- II 2 G Ex h IICT6 Gb  
-40°C Ta +65°C
- II 2 D Ex h IICT80°C  
Db -40°C Ta +65°C

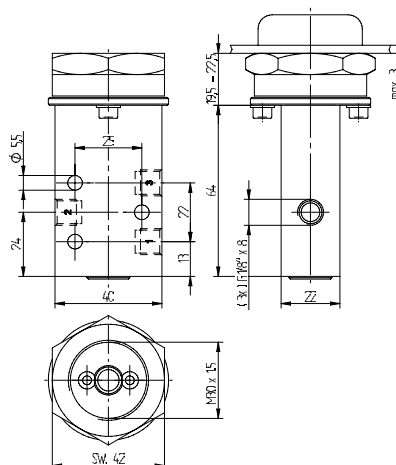
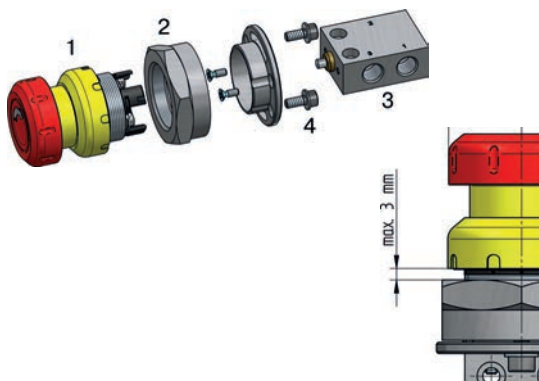
Actuating elements are displayed on page 2.2.2.

How to assemble the valve to the panel:

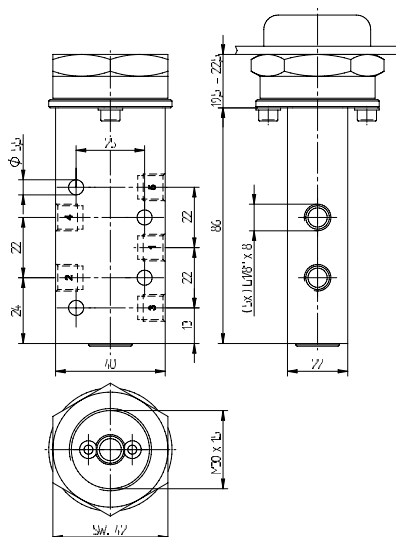
1. Insert the actuator (1) through the hole
2. Tighten the aluminum nut (2) firmly
3. Attach the valve (3) to the nut (2)
4. Fasten the valve with two screws (4)

Please note:

- The sheet thickness must not exceed 3 mm.
- Depending on the sheet thickness, a small gap may remain between the valve and the nut.



BAS 311 501 TT AIR Ex

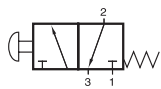


BAS 511 501 TT AIR Ex

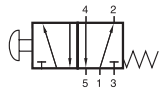
Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
BAS 311 501 TT AIR Ex	3/2-way	G 1/8"	650 l/min	1 - 10 bar	~ 40 N	0,20 kg
BAS 511 501 TT AIR Ex	5/2-way	G 1/8"	650 l/min	1 - 10 bar	~ 40 N	0,26 kg

# BH 311 701 TT/BH 320 701 TT

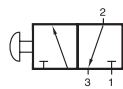
# BH 511 701 TT/BH 520 701 TT



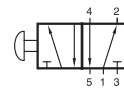
BH 311 701 TT



BH 511 701 TT



BH 320 701 TT



BH 520 701 TT



Manually actuated spool valve for low temperature environment - 50° C to + 50° C.

- BH 311 701 3/2-way, normally closed, spring return
- BH 320 701 3/2-way, indexed
- BH 511 701 5/2-way, spring return
- BH 520 701 5/2-way, indexed

Due to the specific design of the low temperature seals pressure has to be applied to port 1.  
For other versions (e.g. normally open) please get in touch with the manufacturer.

Please note:

When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!

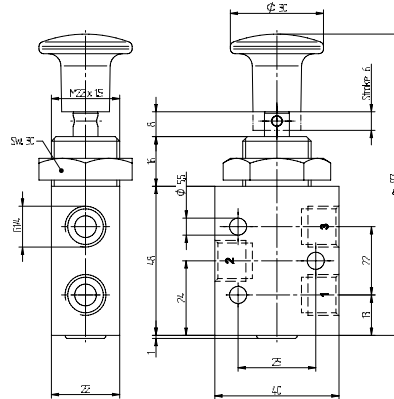
Below - 40° C the leakage-rate of the valve can increase.

Further information on page 15.

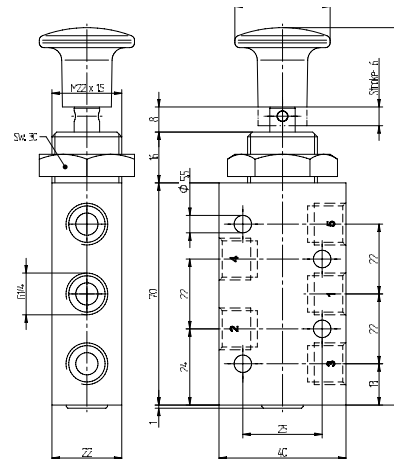
Use unlubricated air only.

Exhaust can be throttled.

Suitable for wall or panel mounting. Nut for panel mounting M22 x 1,5 is included.



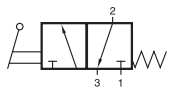
BH 311 701 TT/ BH 320 701 TT



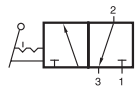
BH 511 701 TT/ BH 520 701 TT

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
BH 311 701 TT	3/2-way spring ret.	G 1/4"	1250 l/min	1 - 10 bar	17 N	0,14 kg
BH 320 701 TT	3/2-way indexed	G 1/4"	1250 l/min	1 - 10 bar	18 N	0,14 kg
BH 511 701 TT	5/2-way spring ret.	G 1/4"	1250 l/min	1 - 10 bar	17 N	0,18 kg
BH 520 701 TT	5/2-way indexed	G 1/4"	1250 l/min	1 - 10 bar	18 N	0,18 kg

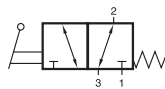
# HV 311 701 TT/HV 311 121 TT HVR 320 701 TT/HVR 320 121 TT



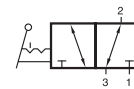
HV 311 701 TT



HVR 320 701 TT



HV 311 121 TT



HVR 320 121 TT



Lever actuated 3/2-way spool valve for low temperature environment - 50° C to + 50° C (series 701), +80° C (series 121).

Type HV 311 normally closed, spring return  
Type HVR 320 indexed

The lever is sealed by using a metal ball.

### Valves type 701 TT:

Due to the specific design of the low temperature seals pressure has to be applied to port 1.

For other versions (e.g. normally open) please get in touch with the manufacturer.

Please note:

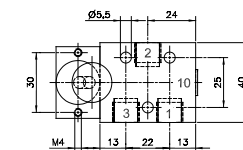
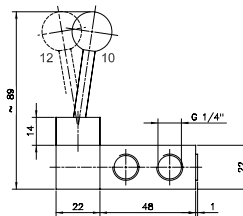
When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!

Below - 40° C the leakage-rate of the valve can increase.

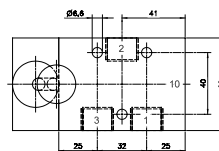
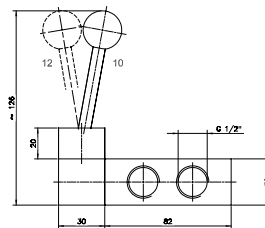
Further information on page 15.

Use unlubricated air only.



Exhaust can be throttled.



HV 311 701 TT/HVR 320 701 TT

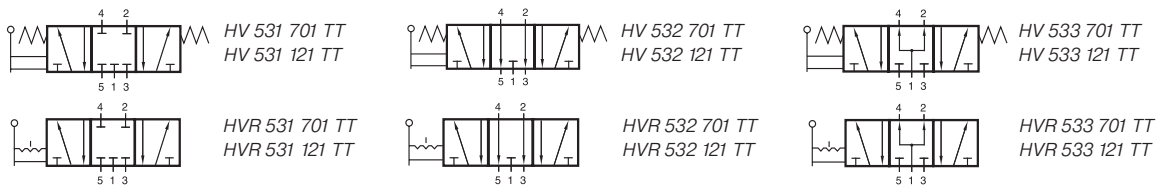


HV 311 121 TT/HVR 320 121 TT

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
HV 311 701 TT	3/2-way spring ret.	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,20 kg 
HV 311 121 TT	3/2-way spring ret.	G 1/2"	3000 l/min	1 - 10 bar	32 N	0,69 kg
HVR 320 701 TT	3/2-way indexed	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,20 kg 
HVR 320 121 TT	3/2-way indexed	G 1/2"	3000 l/min	1 - 10 bar	32 N	0,69 kg



# HV 53\_ 701 TT/HV 53\_ 121 TT HVR 53\_ 701 TT/HVR 53\_ 121 TT



Lever actuated 5/3-way spool valve for low temperature environment - 50° C to + 50° C (series 501/701), +80° C (series 121).

Type HV spring return to middle position  
Type HVR indexed

Type 531 centre closed  
Type 532 centre exhausted  
Type 533 centre pressurised

When ordering please complete the type number by 1, 2 or 3 according to the type required.

The lever is sealed by using a metal ball.

### Valves type 701 TT:

Due to the specific design of the low temperature seals pressure has to be applied to port 1. If other function is required please get in touch with the manufacturer.

Please note:

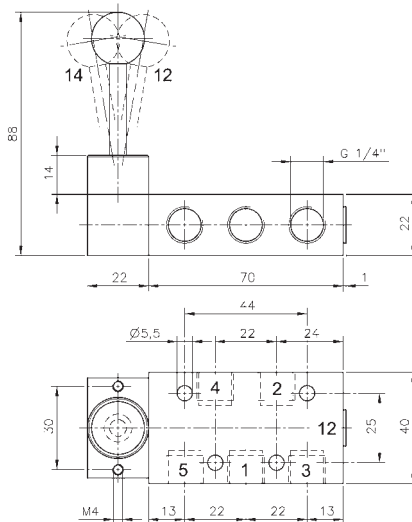
When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!

Below - 40° C the leakage-rate of the valve can increase. Further information on page 15.

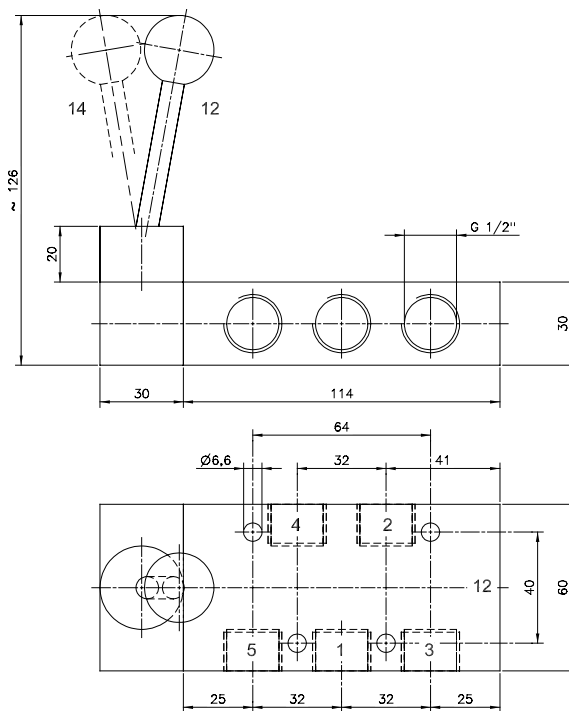
Use unlubricated air only.

For type HV 531 701 TT and HVR 531 701 TT: pressure at port 1 has to be ≥ pressure at 2 and 4. If pressure supply is lost, 2 or 4 can exhaust and actuator might move

Exhaust can be throttled.



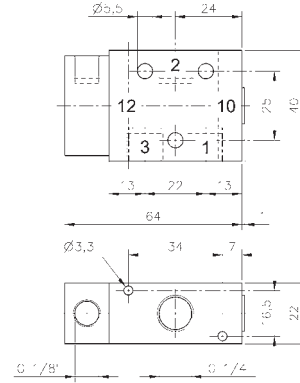
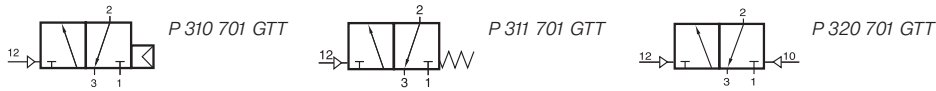
**HV 53\_ 701 TT/HVR 53\_ 701 TT**



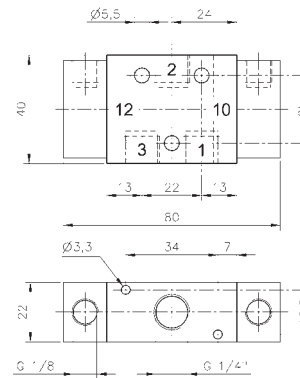
**HV 53\_ 121 TT/HVR 53\_ 121 TT**

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
HV 53_ 701 TT	spring ret.	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,24 kg
HVR 53_ 701 TT	indexed	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,24 kg
HV 53_ 121 TT	spring ret.	G 1/2"	3000 l/min	1 - 10 bar	32 N	0,79 kg
HVR 53_ 121 TT	indexed	G 1/2"	3000 l/min	1 - 10 bar	32 N	0,79 kg

# P 310 701 GTT/P 311 701 GTT/P 320 701 GTT



**P 310 701 GTT/P 311 701 GTT**



**P 320 701 GTT**

Pneumatically actuated 3/2-way spool valve for low temperature environment - 50° C to + 50° C.

- Type 310      single pilot n.c. air-spring return  
operating and actuating pressure  
should be at the same level.
- Type 311      single pilot n.c. mechanical  
spring return
- Type 320      double pilot

GTT: dual use, valves can be used in-line as well as on manifold plates. Manifolds are displayed on page 2.7.1.3.

Due to the specific design of the low temperature seals pressure has to be applied to port 1. For other versions (e.g. normally open) please get in touch with the manufacturer.

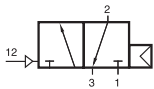
Please note:  
When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!  
Below - 40° C the leakage-rate of the valve can increase to. Further information on page 15.  
Use unlubricated air only.

Exhaust can be throttled.

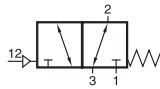
Type	Function	Port size	Air flow	Operating press.	Actuating press.	Weight
P 310 701 GTT	n.c. air return	G 1/4"	1250 l/min	3 - 10 bar	the same	0,14 kg
P 311 701 GTT	n.c. mech. spring	G 1/4"	1250 l/min	3 - 10 bar	3 - 10 bar	0,14 kg
P 320 701 GTT	double pilot	G 1/4"	1250 l/min	3 - 10 bar	≥ operating press.	0,17 kg



# P 310 121 TT/P 311 121 TT



P 310 121 TT



P 311 121 TT



Pneumatically actuated 3/2-way spool valve for low temperature environment  $-50^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$ .

Type P 310 121 TT with air-spring-return.  
Operating pressure and actuating pressure should be at the same level.

Type P 311 121 TT with mechanical spring return.

If pressure is attached to port 1 the function is normally closed.  
If pressure is applied to port 3 the function is normally open.  
Pressure can only be attached to port 2 if valve has a mechanical spring (type P 311 121 TT).

Exhaust can be throttled.

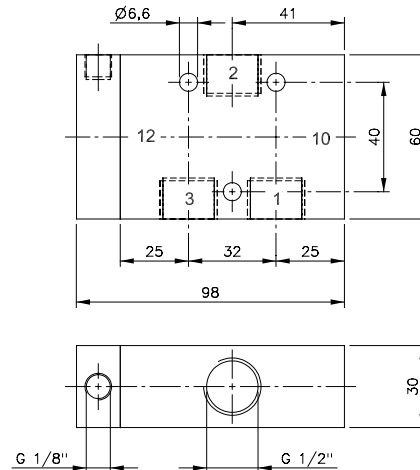
Please note:

When operated below  $0^{\circ}\text{C}$  the pressure condensation point has to be at least  $15^{\circ}\text{C}$  below the temperature of environment and media. Air has to be dried!



Below  $-40^{\circ}\text{C}$  the leakage-rate of the valve can increase.

Further information on page 15.

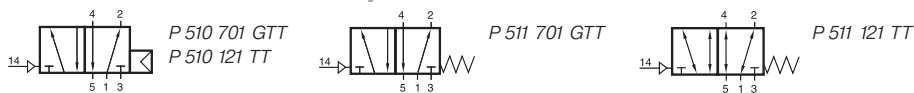
Use unlubricated air only.



P 310 121 TT/P 311 121 TT

Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 310 121 TT	G 1/2"	1250 l/min	3 - 10 bar	3 - 10 bar	0,45 kg 
P 311 121 TT	G 1/2"	1250 l/min	3 - 10 bar	3 - 10 bar	0,45 kg 

# P 510 701 GTT/P 511 701 GTT P 510 121 TT/P 511 121 TT



Pneumatically actuated 5/2-way spool valve for low temperature environment - 50° C to + 50° C (series 701), +80° C (series 121).

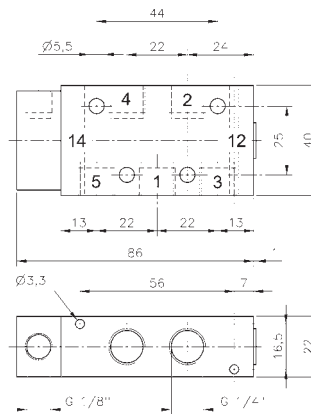
- Type 510    single pilot air-spring return  
operating and actuating pressure  
should be at the same level.
- Type 511    single pilot mechanical spring return

GTT: dual use, valves can be used in-line as well as on manifold plates. Manifolds are displayed on page 2.7.2.3.

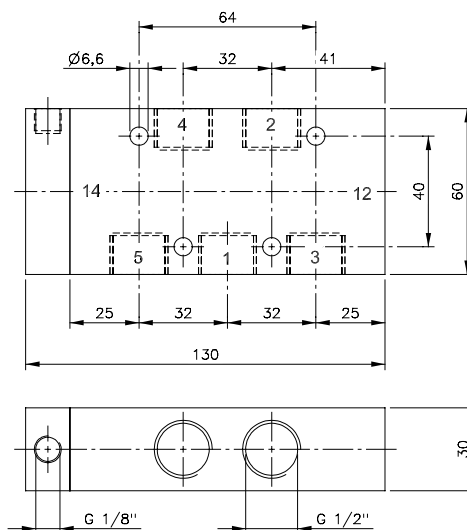
Please note:  
When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!  
Below - 40° C the leakage-rate of the valve can increase.  
Further information on page 15.  
Use unlubricated air only.

Valves type P 51\_ 701 GTT:  
Due to the specific design of the low temperature seals pressure has to be applied to port 1.  
For other versions please get in touch with the manufacturer.

Exhaust can be throttled.



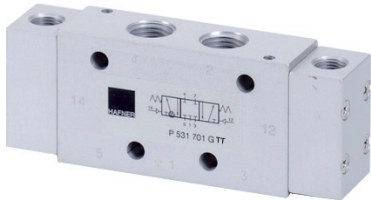
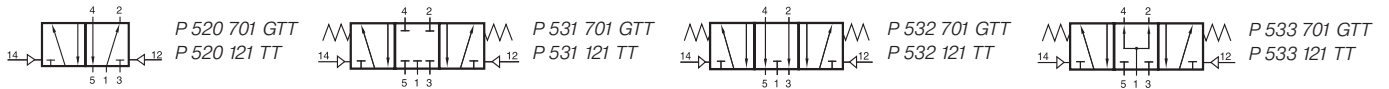
**P 510 701 GTT/P 511 701 GTT**



**P 510 121 TT/P 511 121 TT**

Type	Function	Port size	Air flow	Operating press.	Actuating press.	Weight
P 510 701 GTT	air return	G 1/4"	1250 l/min	3 - 10 bar	3 - 10 bar	0,18 kg
P 511 701 GTT	mech. spring	G 1/4"	1250 l/min	3 - 10 bar	3 - 10 bar	0,18 kg
P 510 121 TT	air return	G 1/2"	3000 l/min	3 - 10 bar	3 - 10 bar	0,59 kg
P 511 121 TT	mech. spring	G 1/2"	3000 l/min	3 - 10 bar	3 - 10 bar	0,59 kg

# P 520 701 GTT/P 520 121 TT P 53\_701 GTT/P 53\_121 TT



Pneumatically actuated 5-way valves for low temperature environment- 50° C to + 50° C (series 701), +80° C (series 121).

- Type 520 double pilot
- Type 531 5/3-way centre closed
- Type 532 5/3-way centre exhausted
- Type 533 5/3-way centre pressurised

GTT: dual use, valves can be used in-line as well as on manifold plates. Manifolds are displayed on page 2.7.2.3.

Please note:

When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!

Below - 40° C the leakage-rate of the valve can increase.

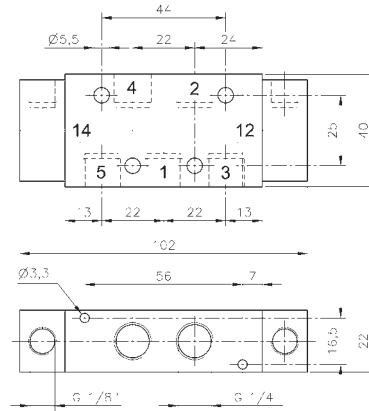
Further information on page 15.

Use unlubricated air only.

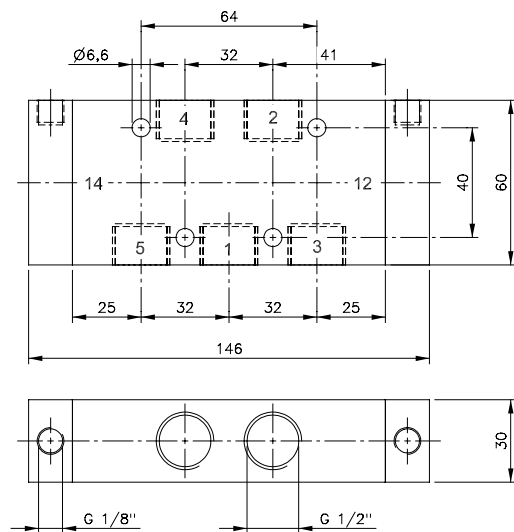
For type P 531 701 GTT:

Pressure at port 1 has to be  $\geq$  pressure at 2 and 4. If pressure supply is lost, 2 or 4 can exhaust and actuator might move.

Exhaust can be throttled.



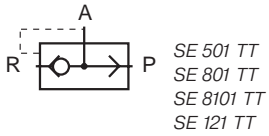
**P 520 701 GTT/P 53\_701 GTT**



**P 520 121 TT/P 53\_121 TT**

Type	Port size	Air flow	Operating press.	Actuating press.	Weight
P 520 701 GTT	G 1/4"	1250 l/min	3 - 10 bar	$\geq$ operating press.	0,22 kg
P 520 121 TT	G 1/2"	3000 l/min	3 - 10 bar	3 - 10 bar	0,67 kg
P 53_701 GTT	G 1/4"	1250 l/min	3 - 10 bar	3 - 10 bar	0,22 kg
P 53_121 TT	G 1/2"	3000 l/min	3 - 10 bar	3 - 10 bar	0,67 kg

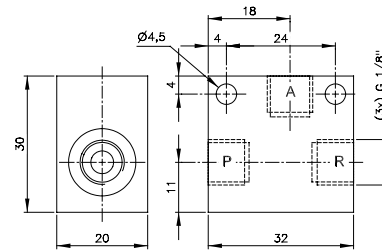
# SE 501 TT/SE 801 TT/SE 8101 TT/SE 121 TT



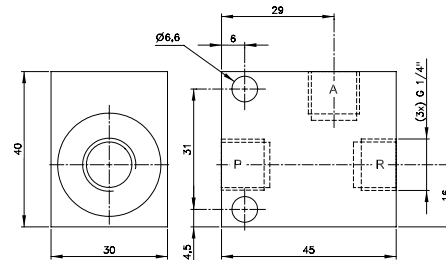
Quick-exhaust valve which can also be used as non-return valve as well as or-gate. For low temperature environment - 40° C to + 80° C.

If used as a non-return valve please plug port R.  
Open from P to A, closed from A to P.

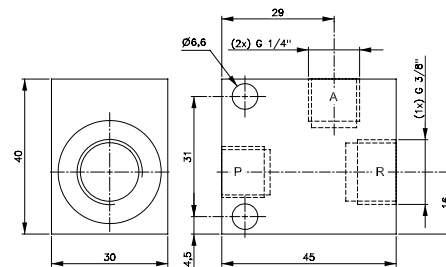
If used as an or-gate connect pressure to P and R.  
Port A is outlet.



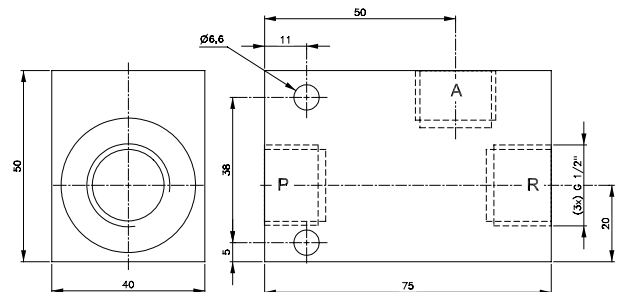
**SE 501 TT**



**SE 801 TT**



**SE 8101 TT**



**SE 121 TT**

Type	Port size A + P	Port size R	Air flow from A to R	Operating press.	Weight
SE 501 TT	G 1/8"	G 1/8"	564 l/min	0,3 - 10 bar	0,06 kg
SE 801 TT	G 1/4"	G 1/4"	1188 l/min	0,2 - 10 bar	0,18 kg
SE 8101 TT	G 1/4"	G 3/8"	1188 l/min	0,2 - 10 bar	0,18 kg
SE 121 TT	G 1/2"	G 1/2"	3600 l/min	0,5 - 10 bar	0,26 kg

# VA 401 TT/ES 401 TT



Logic elements for temperature environment  $-50^{\circ}\text{C}$  to  $+50^{\circ}\text{C}$ .

## VA 401 TT OR-gate

The OR-gate has two inputs 1 and one output 2.

The shuttle valve is used when only one of two possible signals is required to pass on a signal.

Function: If one of two signal inputs are activated, an output signal on port 2 is present and the other input is blocked.

In case of pressurising both inputs at different pressure levels, the higher pressure is fed to port 2.

## ES 401 TT AND-gate

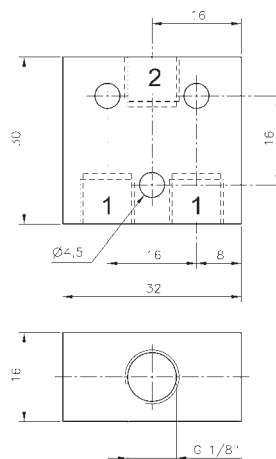
The AND-gate has two inputs 1 and one output 2.

The dual-pressure valve is used when at least 2 signals are required before a signal is passed on.



Function: Only when both inputs are pressurised output 2 is pressurised.

If two different pressures are applied the lower pressure is fed to output 2.

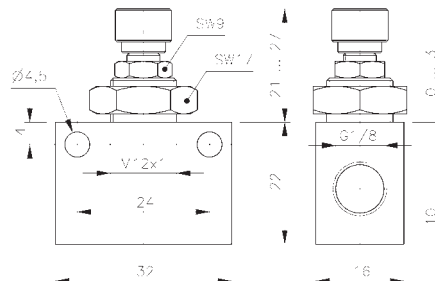
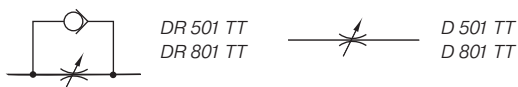
In case of only one signal at one of the two ports 1, the output 2 is blocked.



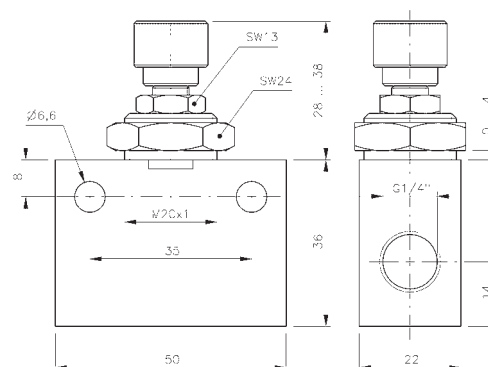
VA 401 TT/ES 401 TT

Type	Function	Port size	Air flow	Operating press.	Weight
VA 401 TT	OR	G 1/8"	280 l/min	1 - 10 bar	0,04 kg 
ES 401 TT	AND	G 1/8"	280 l/min	1 - 10 bar	0,04 kg 

# DR 501 TT/DR 801 TT/D 501 TT/D 801 TT



**DR 501 TT/D 501 TT**



**DR 801 TT/D 801 TT**

Block form flow regulator for low temperature environment  
-50°C to +50°C.

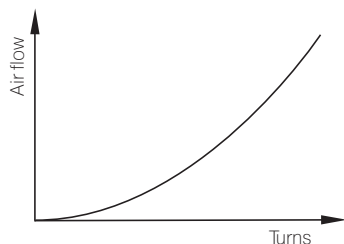
Type DR  
uni-directional block form flow regulator.  
Air streaming in the direction of the throttle can be regulated  
by turning the spindle. In the opposite direction air streams  
unthrottled.

Type D  
bi-directional flow regulator. Air is regulated in both directions.

The throttle can be adjusted very precisely along the entire  
regulation range.

Adjustment can be locked.

Suitable for wall and panel mounting.  
Nut is included.

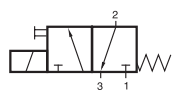


Type	Port size	Air flow*	Airflow in opposite direction*	Operating press.	Weight
D 501 TT	G 1/8"	450 l/min	450 l/min	0,5 - 10 bar	0,04 kg
D 801 TT	G 1/4"	1150 l/min	1150 l/min	0,5 - 10 bar	0,13 kg
DR 501 TT	G 1/8"	450 l/min	450 l/min	2 - 10 bar	0,04 kg
DR 801 TT	G 1/4"	1150 l/min	1150 l/min	2 - 10 bar	0,13 kg

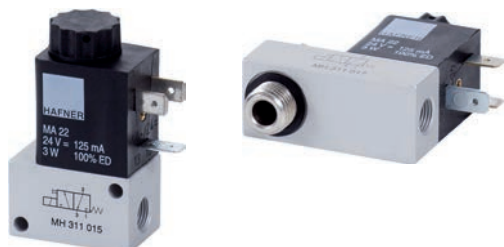
\* Values at 10 bar inlet pressure and without back pressure.



# MH 311 012 TT/MH 311 015 TT MH 311 013 TT/MH 311 017 TT



MH 311 012 TT  
MH 311 015 TT  
MH 311 013 TT  
MH 311 017 TT



Direct acting 3/2-way solenoid valve equipped with mechanical spring return for low temperature environment - 50° C to + 50° C.

By closing port 3 the valves can be converted into 2/2-way version.

MH 311 013 TT and MH 311 017 TT are designed for piloting angle seat valves or small spring-return actuators.

When assembling this type of valve to a spring-return actuator, please take into consideration that there is no exhaust air recirculation (“purge”).

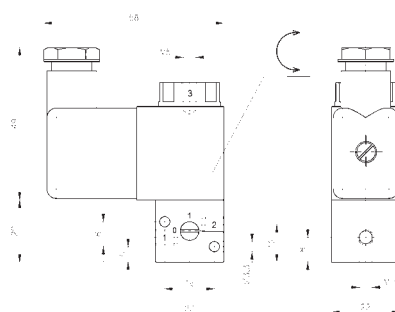
Please note:

When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!

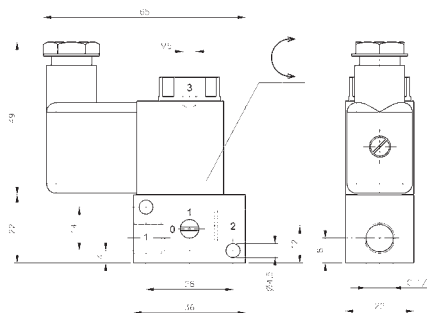
Use unlubricated air only.

Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=,  
24V=, 12V=.

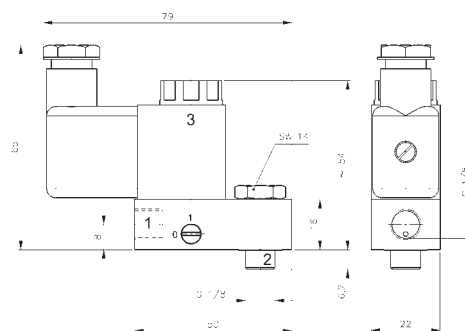
Valves are equipped with manual override to turn.



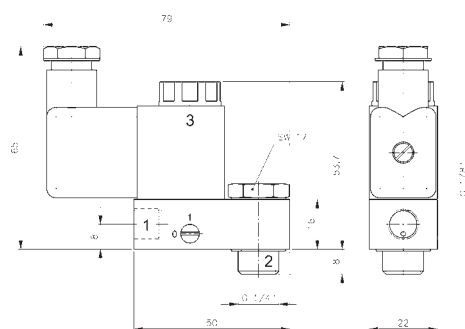
**MH 311 012 TT**



**MH 311 015 TT**



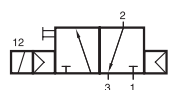
**MH 311 013 TT**



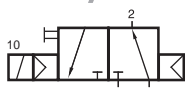
**MH 311 017 TT**

Type	Port size			Air flow	Operating press.	Power consumption	Weight	
	1	2	3					
MH 311 012 TT	M5	M5	M5	40 l/min	0 - 10 bar	3 W = / 5 VA ~	0,12 kg	Ex
MH 311 015 TT	G 1/8"	G 1/8"	M5	50 l/min	0 - 10 bar	3 W = / 5 VA ~	0,14 kg	Ex
MH 311 013 TT	G 1/8"	G 1/8" Banjo	M5	50 l/min	0 - 10 bar	3 W = / 5 VA ~	0,14 kg	Ex
MH 311 017 TT	G 1/8"	G 1/4" Banjo	M5	50 l/min	0 - 10 bar	3 W = / 5 VA ~	0,16 kg	Ex

# MH 310 701 GTT/MOH 310 701 GTT



MH 310 701 GTT



MOH 310 701 GTT



3/2-way solenoid valve for low temperature environment  
- 50° C to + 50° C.

Type MH 310 single solenoid n.c. air-spring return  
Type MOH 310 single solenoid n.o. air-spring return

Valves can be used in-line as well as on manifold plates.  
Manifolds are displayed on page 2.7.1.3.

Available with solenoid operators  
230V/50 Hz, 110V/50 Hz, 24V/50 Hz, 48V=, 24V~, 12V=.

Valves are equipped with manual override to turn.

Please note:

When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!

Below - 40° C the leakage-rate of the valve can increase.

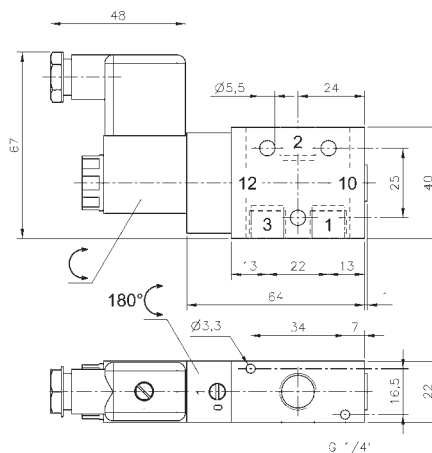
Further information on page 15.

Use unlubricated air only.

Valves are also available with external pilot feed.

NPT ported valves are available on request.

G 1/2" version available on request.

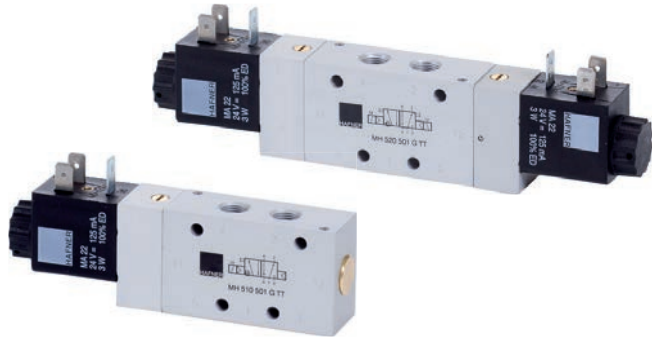
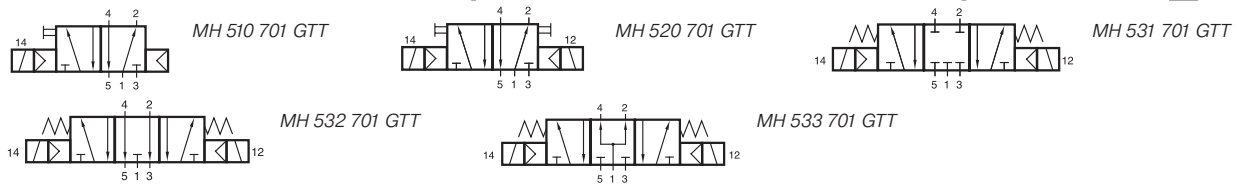


**MH 310 701 GTT/MOH 310 701 GTT**

Type	Function	Port size	Air flow	Operating press.	Power cons.	Weight
MH 310 701 GTT	n.c.	G 1/4"	1250 l/min	2 - 10 bar*	3 W = / 5 VA ~	0,23 kg
MOH 310 701 GTT	n.o.	G 1/4"	1250 l/min	2 - 10 bar*	3 W = / 5 VA ~	0,23 kg

\* Below -20° C the operating pressure increases to 3 bar.

# MH 510 701 GTT/MH 520 701 GTT/MH 53\_701 TT



5-way solenoid valve for low temperature environment  
- 50° C to + 50° C.

- Type 510      Air spring return
- Type 520      5/2-way double solenoid,  
                    actuated by impulse
- Type 531      5/3-way centre closed
- Type 532      5/3-way centre exhausted
- Type 533      5/3-way centre pressurised

Valves are dual use, they can be used in-line as well as on manifold plates. Manifolds are displayed on page 2.7.2.3.

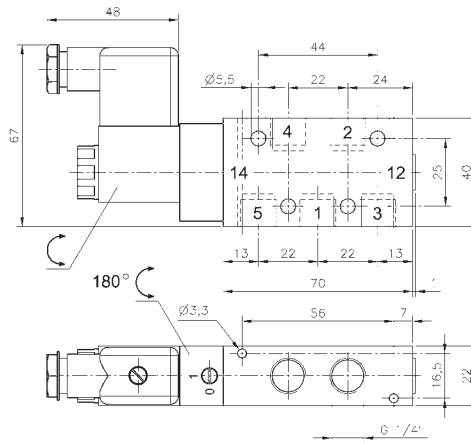
Available with solenoid operators  
230V/50 Hz, 110V/50 Hz, 24V/50 Hz, 48V=, 24V=, 12V=.

Valves are equipped with manual override to turn.

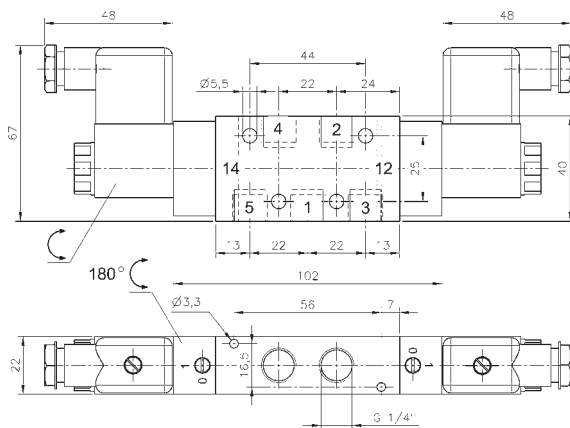
Please note:  
When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!  
Below - 40° C the leakage-rate of the valve can increase.  
Further information on page 15.  
Use unlubricated air only.

- On request:
- Valves with external pilot feed
  - With NPT threads
  - With G 1/2" ports

For type 531:  
pressure at port 1 has to be ≥ pressure at 2 and 4. If pressure supply is lost, 2 or 4 can exhaust and actuator might move.



**MH 510 701 GTT**

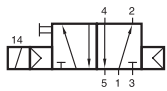


**MH 520 701 GTT/MH 53\_701 GTT**

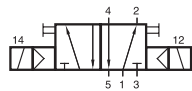
Type	Function	Port size	Air low	Operating press.	Power cons.	Weight
MH 510 701 GTT	Spring return	G 1/4"	1250 l/min	2 - 10 bar*	3,0 W = / 5,0 VA ~	0,27 kg
MH 520 701 GTT	Bistable	G 1/4"	1250 l/min	2 - 10 bar*	3,0 W = / 5,0 VA ~	0,40 kg
MH 53_701 GTT	5/3-way	G 1/4"	1250 l/min	3 - 10 bar	3,0 W = / 5,0 VA ~	0,40 kg

\* Below -20° C the operating pressure increases to 3 bar.

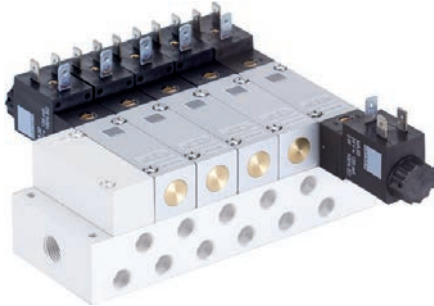
# MH 510 504 TT/MH 510 704 TT MH 520 504 TT/MH 520 704 TT



MH 510 504 TT  
MH 510 704 TT



MH 520 504 TT  
MH 520 704 TT



5-way solenoid valves for low temperature environment  
- 50° C to + 50° C.

All the ports are in the plate, plates are displayed on page  
2.7.2.7 and 2.7.2.8.

Type 510 With air spring return  
Type 520 Double solenoid, actuated by impulse

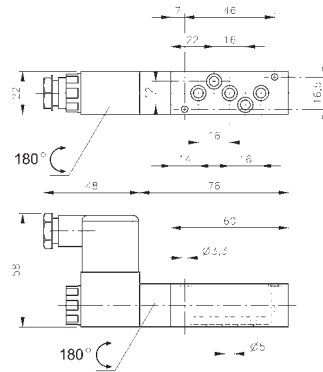
Available with solenoid operators  
230V/50 Hz, 110V/50 Hz, 24V/50 Hz, 48V=, 24V=, 12V=.

Valves are equipped with manual override to turn.

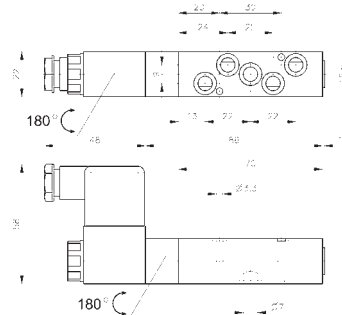
Please note:  
When operated below 0° C the pressure condensation point  
has to be at least 15° C below the temperature of environment  
and media. Air has to be dried!

Below - 40° C the leakage-rate of the valve can increase.  
Further information on page 15.  
Use unlubricated air only.

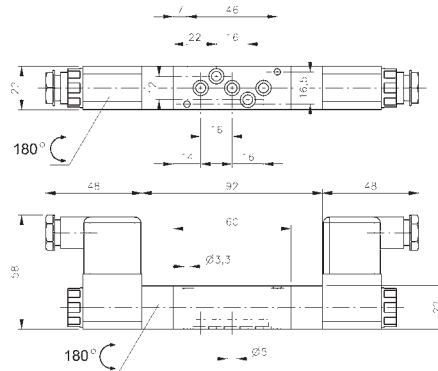
Mounting screws and seals are included.  
5/3-way versions available on request.



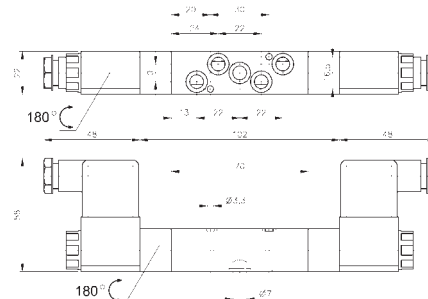
**MH 510 504 TT**



**MH 510 704 TT**



**MH 520 504 TT**

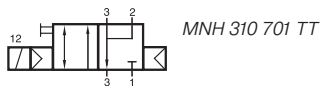


**MH 520 704 TT**

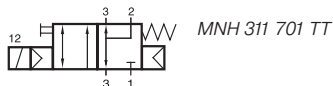
Type	Port size	Air flow	Operating press.	Power consumption	Weight
MH 510 504 TT	Ø 5 mm	650 l/min	2 - 10 bar*	3 W = / 5 VA ~	0,21 kg
MH 510 704 TT	Ø 7 mm	1250 l/min	2 - 10 bar*	3 W = / 5 VA ~	0,22 kg
MH 520 504 TT	Ø 5 mm	650 l/min	2 - 10 bar*	3 W = / 5 VA ~	0,32 kg
MH 520 704 TT	Ø 7 mm	1250 l/min	2 - 10 bar*	3 W = / 5 VA ~	0,34 kg

\* Below -20° C the operating pressure increases to 3 bar.

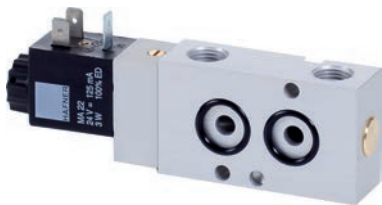
# MNH 310 701 TT/MNH 311 701 TT



MNH 310 701 TT



MNH 311 701 TT



3/2-way solenoid valve, actuated by permanent signal for low temperature environment - 50° C to + 50° C.  
Interface according to NAMUR-standard, with exhaust air recirculation (purge).

Type MNH 310 \_\_\_ with pneumatic spring return  
Type MNH 311 \_\_\_ with combined spring assuring a fail-safe function in case of cut-off of pressure supply.

Available with solenoid operators  
230V/50 Hz, 110V/50 Hz, 24V/50 Hz, 48V~, 24V~, 12V~.

Valves are equipped with manual override to turn.

Please note:

When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!

Below - 40° C the leakage-rate of the valve can increase.

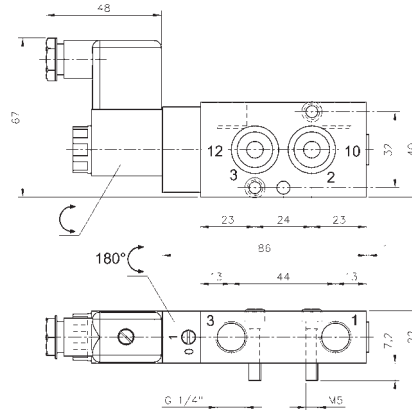
Further information on page 15.

Use unlubricated air only.


Delivery includes 1 pin, 2 screws, 2 O-rings.

NPT ported valves are available on request.

G 1/2" version available on request.

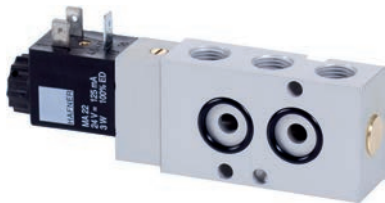
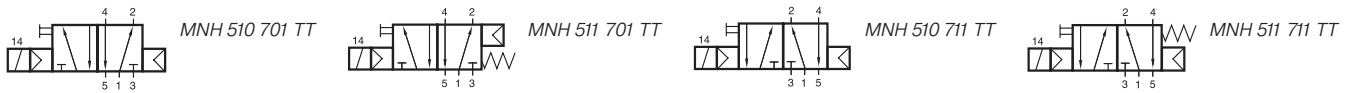


**MNH 310 701 TT/MNH 311 701 TT**

Type	NAMUR	Port size	Air flow	Operating press.	Power consumption	Weight
MNH 310 701 TT	1/4"	G 1/4"	1250 l/min	2 - 10 bar*	3 W = / 5 VA ~	0,28 kg 
MNH 311 701 TT	1/4"	G 1/4"	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,28 kg 

\* Below -20° C the operating pressure increases to 3 bar.

# MNH 510 701 TT/MNH 511 701 TT MNH 510 711 TT/MNH 511 711 TT



5/2-way solenoid valve, actuated by permanent signal for low temperature environment - 50° C to + 50° C.  
Interface according to NAMUR-standard, with exhaust air recirculation (purge).

Type MNH 510 \_\_\_ with pneumatic spring return  
Type MNH 511 \_\_\_ with combined spring

Available with solenoid operators  
230V/50 Hz, 110V/50 Hz, 24V/50 Hz, 48V=,  
24V~, 12V=.

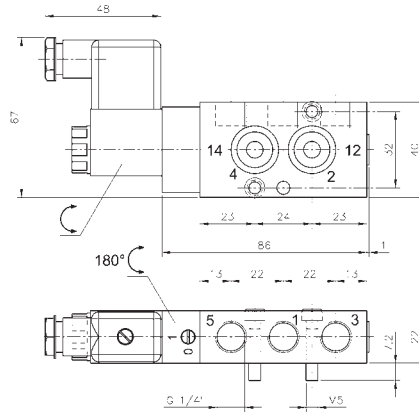
Valves are equipped with manual override to turn.

Please note:  
When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!  
Below - 40° C the leakage-rate of the valve can increase.  
Further information on page 15.  
Use unlubricated air only.

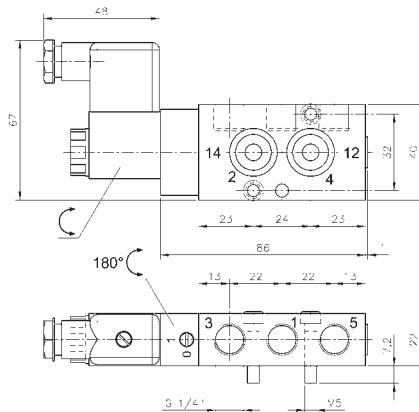
Delivery includes 1 pin, 2 screws, 2 O-rings.

NPT ported valves are available on request.

G 1/2" version available on request.



**MNH 510 701 TT/MNH 511 701 TT**



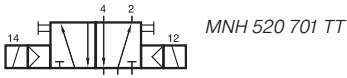
**MNH 510 711 TT/MNH 511 711 TT  
ports 2 and 4 are swapped!**

Type	NAMUR	Port size	Air flow	Operating press.	Power consumption	Weight
MNH 510 701 TT	1/4"	G 1/4"	1250 l/min	2 - 10 bar*	3 W = / 5 VA ~	0,28 kg
MNH 511 701 TT	1/4"	G 1/4"	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,28 kg
MNH 510 711 TT	1/4"	G 1/4"	1250 l/min	2 - 10 bar*	3 W = / 5 VA ~	0,28 kg
MNH 511 711 TT	1/4"	G 1/4"	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,28 kg

\* Below -20° C the operating pressure increases to 3 bar.



# MNH 520 701 TT/MNH 53\_701 TT



MNH 520 701 TT



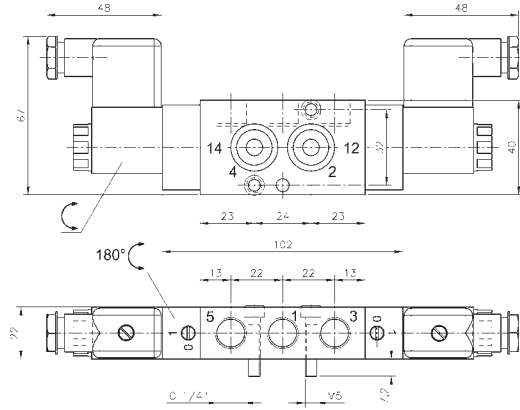
MNH 531 701 TT



MNH 532 701 TT



MNH 533 701 TT



**MNH 520 701 TT/MNH 53\_701 TT**

5-way solenoid valves for low temperature environment  
 - 50° C to + 50° C.  
 Interface according to NAMUR-standard.

- Type 520 5/2-way double solenoid, actuated by impulse
- Type 531 5/3-way centre closed
- Type 532 5/3-way centre exhausted
- Type 533 5/3-way centre pressurised

Available with solenoid operators:  
 230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override.

Please note:  
 When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!  
 Below - 40° C the leakage-rate of the valve can increase. Further information on page 15.  
 Use unlubricated air only.

For type 531 701:  
 pressure at port 1 has to be ≥ pressure at 2 and 4. If pressure supply is lost, 2 or 4 can exhaust and actuator might move.

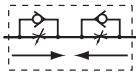
Delivery includes 1 pin, 2 screws, 2 O-rings.

NPT ported valves are available on request.

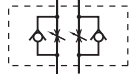
Type	NAMUR	Port size	Air flow	Operating press.	Power cons.	Weight
MNH 520 701 TT	1/4"	G 1/4"	1250 l/min	2 - 10 bar*	3 W = / 5 VA ~	0,41 kg
MNH 53_701 TT	1/4"	G 1/4"	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,41 kg

\* Below -20° C the operating pressure increases to 3 bar.

# DRN 3 611 TT/DRN 5 611 TT



DRN 3 611 TT



DRN 5 611 TT



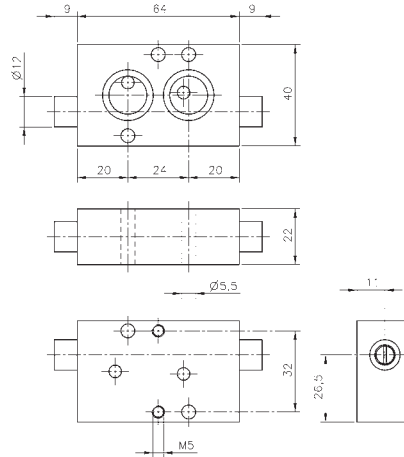
Block form flow regulator as intermediate plate, interface according to 1/4" NAMUR-standard for low temperature environment - 50° C to + 50° C.

**Type DRN 3 611 TT:**  
for 3/2-way valves with exhaust air recirculation only. To regulate the forward stroke of a single acting pneumatic actuator and to regulate the exhaust air going into the spring return unit independently. To be operated with a screw-driver.

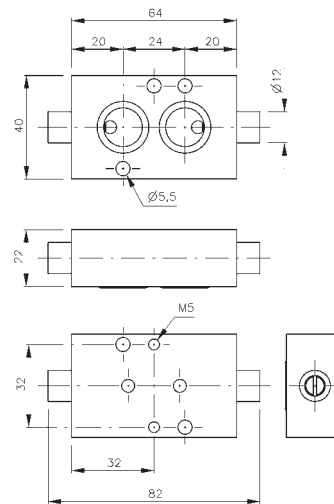
**Type DRN 5 611 TT:**  
for 5/2 and 5/3 way valves only. To regulate the forward- and backward stroke of a double acting pneumatic actuator. To be operated with a screw-driver.

**Please note:**  
When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!  
Use unlubricated air only.



Delivery includes 1 pin, 2 screws (50 mm long), 2 O-rings.



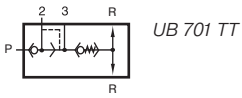
**DRN 3 611**



**DRN 5 611**

Type	Function	Port size	Max. air flow	Operating pressure	Weight
DRN 3 611 TT	3-way	Ø 5 mm	650 l/min	0,5 - 10 bar	0,18 kg 
DRN 5 611 TT	5-way	Ø 5 mm	650 l/min	0,5 - 10 bar	0,18 kg 

# UB 701 TT



The air-recirculation block guarantees, that only exhausting air from the actuation chamber is going into the spring chamber, no ambient atmosphere is sucked-in.

Valve is designed for spring return pneumatic actuators with 1/4" NAMUR-interface to be controlled by a remote piloted 3/2-way valve.

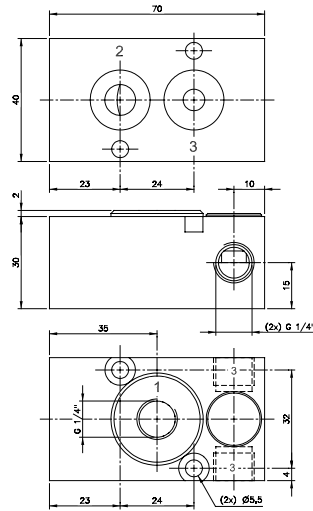
Standard with G 1/4" pilot port. Materials being used:

- Body: aluminum
- Diaphragm: NBR
- Other inner parts: brass

One of the two exhaust ports 3 to be closed by a plug.

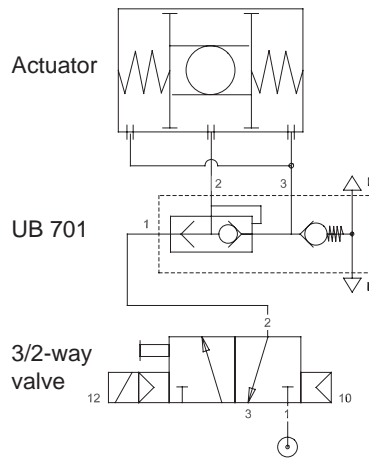
Delivery includes 2 screws, 2 O-rings, 1/4" plug for port 3.

Temperature range: -40°C to +50°C



**UB 701 TT**

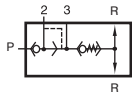
Function:



Type	NAMUR	Port size	Air flow	Operating pressure	Weight
UB 701 TT	1/4"	G 1/4"	1250 l/min	1 - 10 bar	0,22 kg



# SENR 207 01 TT



SENR 207 01 TT



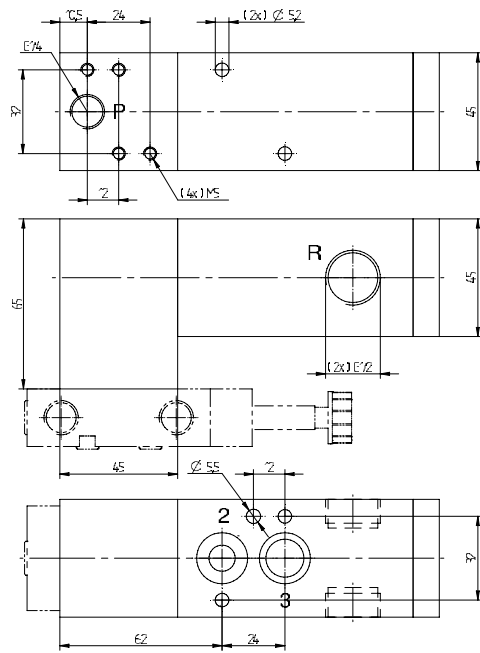
Quick-exhaust block for external piping and universal NAMUR-valve mounting for low temperature environment -40°C to +50°C.

The valve is designed for fast closing of spring-return actuators with 1/4" NAMUR-interface.

The block assures that only compressed air that has been used to open the actuator is used in the spring-chamber (non-return-function). Excess air is released very fast by the quick-exhaust valve, exhaust-port G 1/2", orifice 10 mm. The non-return valve makes absolutely sure that no ambient atmosphere can be sucked into the actuator.

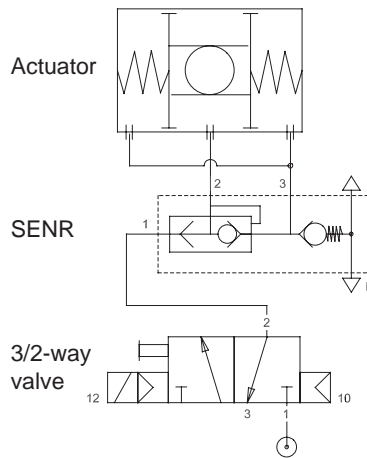
Two exhaust-ports R allow that the product can always be assembled so the silencer faces downwards.

Delivery includes 2 screws, 2 O-rings, 1/2" plug for port R.

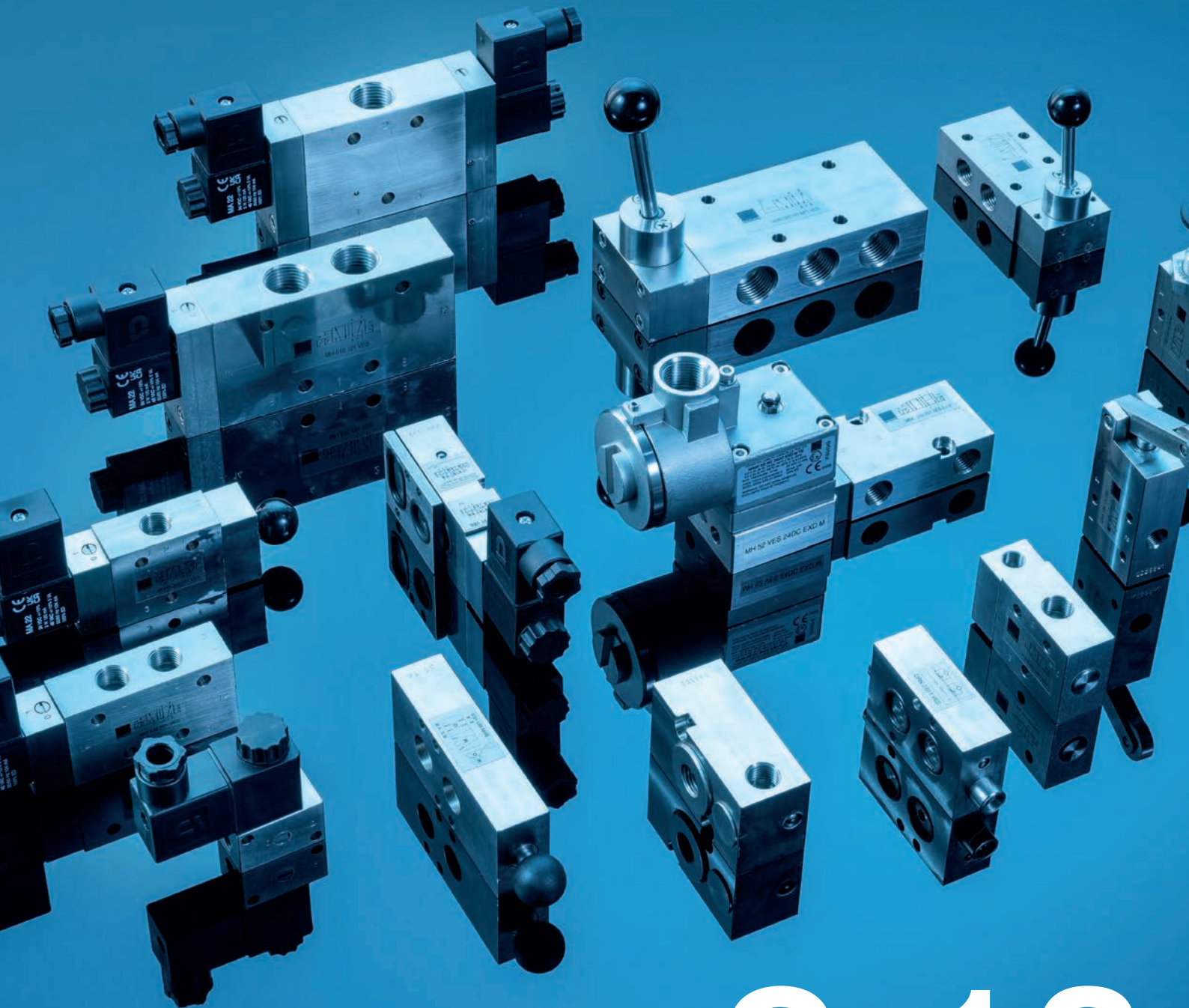


SENR 207 01 TT

Function:



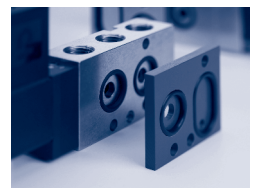
Type	NAMUR	Port P	Port R	Air flow P to 2	Air flow exhaust	Operating press.	Weight
SENR 207 01 TT	1/4"	G 1/4" - 1/4" NAMUR	G 1/2"	1250 l/min	2500 l/min	2 - 10 bar	0,85 kg



# 2.13

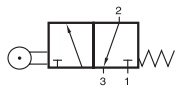
## „Heavy Metal“ Stainless Steel Valves

Selected models are available for explosion hazardous environment.  
For detailed information refer to chapter 2.15.

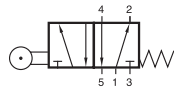


Selected models are available for low temperature application.  
For detailed information refer to chapter 2.12.

# BR 311 501 VES/BR 511 701 VES



BR 311 501 VES



BR 511 701 VES



Mechanically actuated roller-lever spool valve with mechanical spring.

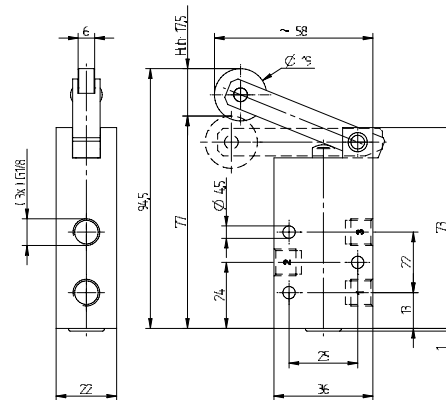
BR 311 501 VES 3/2-way n.c.

BR 511 701 VES 5/2-way

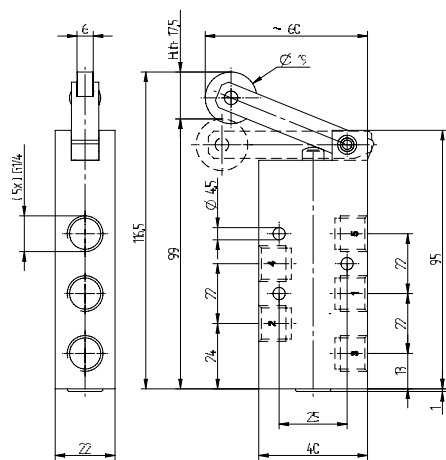
Exhaust can be throttled.

Due to the specific design of the internal parts pressure has to be applied to port 1. For other versions please contact the manufacturer.

Also available with a short stainless steel lever.



BR 311 501 VES

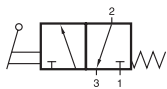


BR 511 701 VES

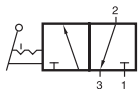
Type	Port size	Air flow	Operating press.	Actuating force	Weight
BR 311 501 VES	G 1/8"	650 l/min	1 - 10 bar	5 N	0,45 kg
BR 511 701 VES	G 1/4"	1250 l/min	1 - 10 bar	5 N	0,55 kg



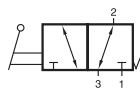
# HV 311 701 VES/HVR 320 701 VES HV 311 121 VES/HVR 320 121 VES



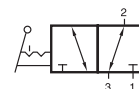
HV 311 701 VES  
HV 311 701 NPT VES



HVR 320 701 VES  
HVR 320 701 NPT VES



HV 311 121 VES  
HV 311 121 NPT VES



HVR 320 121 VES  
HVR 320 121 NPT VES



Lever actuated 3/2-way spool valve.

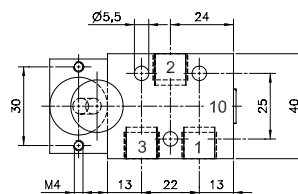
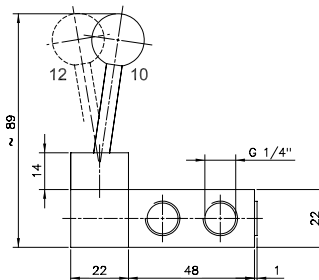
Body parts are made from stainless steel 316L / 1.4404, seals FKM/PUR (series 701).

Type HV                    spring return  
Type HVR                indexed

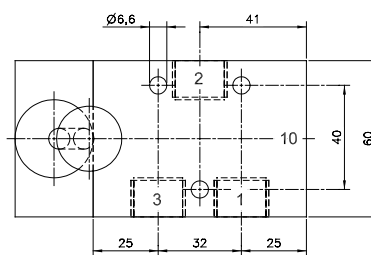
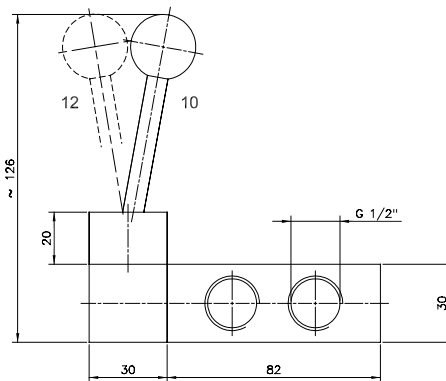
Series 701:  
Due to the specific design of the internal parts pressure has to be applied to port 1. For other versions please contact the manufacturer.

Series 121:  
Can be used normally closed and normally open.

Exhaust can be throttled.



**HV 311 701 VES/HVR 320 701 VES  
HV 311 701 NPT VES/HVR 320 701 NPT VES**

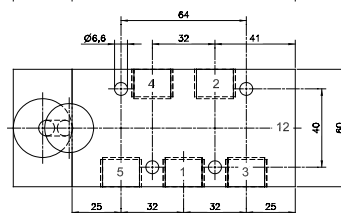
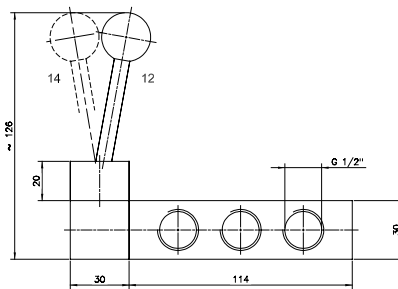
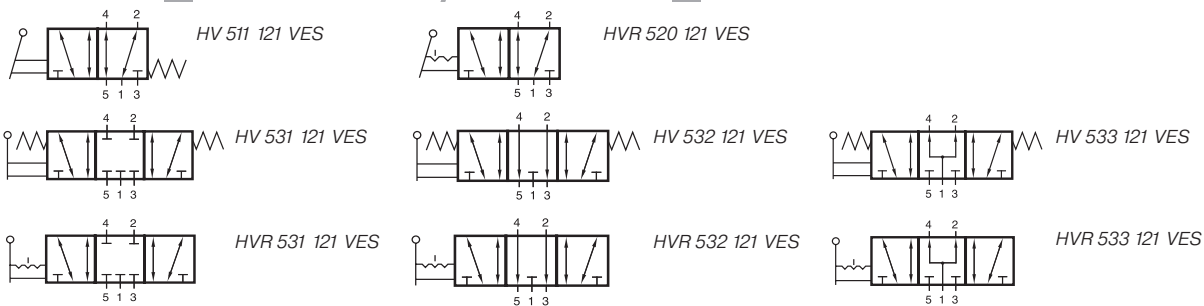


**HV 311 121 VES/HVR 320 121 VES  
HV 311 121 NPT VES/HVR 320 121 NPT VES**

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
HV 311 701 VES	spring ret.	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,35 kg
HVR 320 701 VES	indexed	G 1/4"	1250 l/min	1 - 10 bar	20 N	0,35 kg
HV 311 701 NPT VES	spring ret.	1/4" NPT	1250 l/min	1 - 10 bar	20 N	0,35 kg
HVR 320 701 NPT VES	indexed	1/4" NPT	1250 l/min	1 - 10 bar	20 N	0,35 kg
HV 311 121 VES	spring ret.	G 1/2"	3000 l/min	1 - 10 bar	32 N	1,10 kg
HVR 320 121 VES	indexed	G 1/2"	3000 l/min	1 - 10 bar	32 N	1,10 kg
HV 311 121 NPT VES	spring ret.	1/2" NPT	3000 l/min	1 - 10 bar	32 N	1,10 kg
HVR 320 121 NPT VES	indexed	1/2" NPT	3000 l/min	1 - 10 bar	32 N	1,10 kg



# HV 511 121 VES/HVR 520 121 VES HV 53\_ 121 VES/HVR 53\_ 121 VES



Lever actuated 5/2-way and 5/3-way spool valves.

Body parts are made from stainless steel 316L / 1.4404, seals FKM.

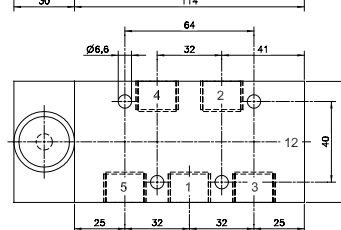
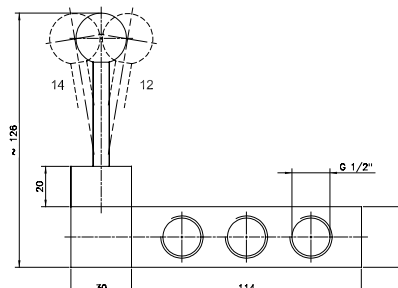
Type HV                    spring return  
Type HVR                  indexed

Type 511 and 520                    5/2-way  
Type 531                    centre closed                    5/3-way  
Type 532                    centre exhausted                5/3-way  
Type 533                    centre pressurised               5/3-way

The lever is sealed by using a metal ball.

Exhaust can be throttled.

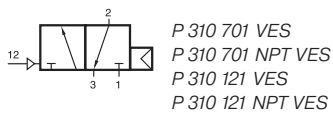
**HV 511 121 VES/HVR 520 121 VES  
HV 511 121 VES NPT/HVR 520 121 VES NPT**



**HV\_53\_ 121 VES/HV\_53\_ 121 VES NPT**

Type	Function	Port size	Air flow	Operating press.	Actuating force	Weight
HV 511 121 VES	Spring ret.	G 1/2"	3000 l/min	1 - 10 bar	32 N	1,60 kg
HVR 520 121 VES	Indexed	G 1/2"	3000 l/min	1 - 10 bar	32 N	1,60 kg
HV 53_ 121 VES	Spring ret.	G 1/2"	3000 l/min	1 - 10 bar	32 N	1,60 kg
HVR 53_ 121 VES	Indexed	G 1/2"	3000 l/min	1 - 10 bar	32 N	1,60 kg
HV 511 121 NPT VES	Spring ret.	1/2" NPT	3000 l/min	1 - 10 bar	32 N	1,60 kg
HVR 520 121 NPT VES	Indexed	1/2" NPT	3000 l/min	1 - 10 bar	32 N	1,60 kg
HV 53_ 121 NPT VES	Spring ret.	1/2" NPT	3000 l/min	1 - 10 bar	32 N	1,60 kg
HVR 53_ 121 NPT VES	Indexed	1/2" NPT	3000 l/min	1 - 10 bar	32 N	1,60 kg

# P 310 701 VES/P 311 701 VES P 310 121 VES/P 311 121 VES



Pneumatically actuated 3/2-way spool valve.

Body parts are made from stainless steel 316L / 1.4404, seals in FKM / PUR (series 701).

Type P 310 \_\_\_ VES single pilot valve with air-spring-return. Operating pressure and actuating pressure should be at the same level.

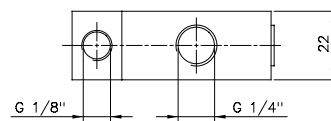
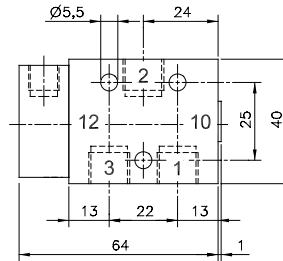
Type P 311 701 VES single pilot valve with combined spring return.

Type P 311 121 VES single pilot valve with mechanic spring return.

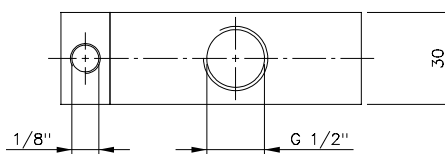
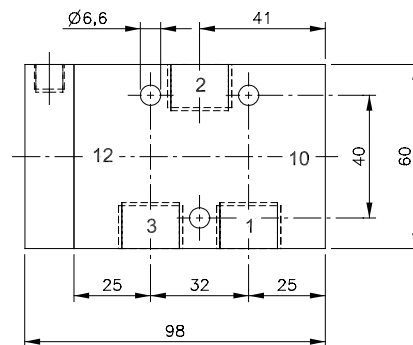
Double pilot valves are available on request.

Exhaust can be throttled.

For 1/4"-size: Due to the specific design of the internal parts pressure has to be applied to port 1.  
For other versions (e.g. normally open) please contact the manufacturer.



**P 310 701 VES/ P 311 701 VES  
P 310 701 NPT VES/ P 311 701 NPT VES**

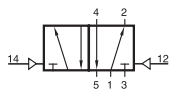


**P 310 121 VES/ P 311 121 VES  
P 310 121 NPT VES/ P 311 121 NPT VES**

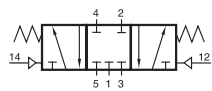
Type	Port size	Air flow	Operating press.	Actuating press.	Weight	
P 310 701 VES	G 1/4"	1250 l/min	2 - 10 bar	the same	0,35 kg	Ex ❄
P 311 701 VES	G 1/4"	1250 l/min	2 - 10 bar	3 - 10 bar	0,35 kg	Ex ❄
P 310 701 NPT VES	G 1/4"	1250 l/min	2 - 10 bar	the same	0,35 kg	Ex ❄
P 311 701 NPT VES	G 1/4"	1250 l/min	2 - 10 bar	3 - 10 bar	0,35 kg	❄
P 310 121 VES	G 1/2"	3000 l/min	2 - 10 bar	the same	1,20 kg	Ex
P 311 121 VES	G 1/2"	3000 l/min	2 - 10 bar	3 - 10 bar	1,20 kg	Ex
P 310 121 NPT VES	G 1/2"	3000 l/min	2 - 10 bar	the same	1,20 kg	Ex
P 311 121 NPT VES	G 1/2"	3000 l/min	2 - 10 bar	3 - 10 bar	1,20 kg	



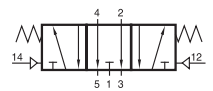
# P 520 701 VES/P 53\_ 701 VES P 520 121 VES/P 53\_ 121 VES



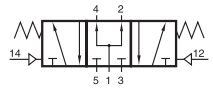
P 520 701 VES  
P 520 121 VES



P 531 701 VES  
P 531 121 VES



P 532 701 VES  
P 532 121 VES



P 533 701 VES  
P 533 121 VES



Pneumatically actuated 5/2-way and 5/3-way spool valves, actuated by impulse.

Body parts are made from stainless steel 316L / 1.4404, seals FKM / PUR (series 701).

Type P 520 \_\_\_ VES

5/2-way double pilot. Position is kept until next pneumatic signal is applied.

Operating pressure and actuating pressure should be at the same level.

Type P 53\_ 701 and 121 VES

5/3-way valves.

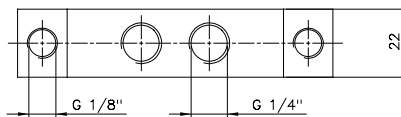
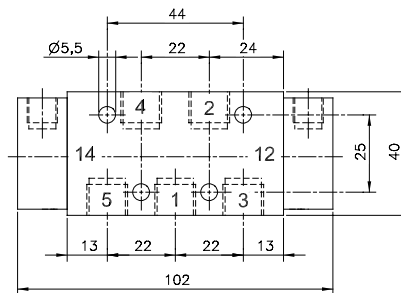
- Type 531            centre closed
- Type 532            centre exhausted
- Type 533            centre pressurised

When ordering please complete the type number by 1, 2 or 3 according to the type required.

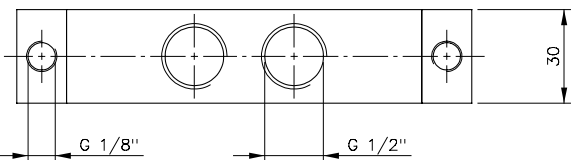
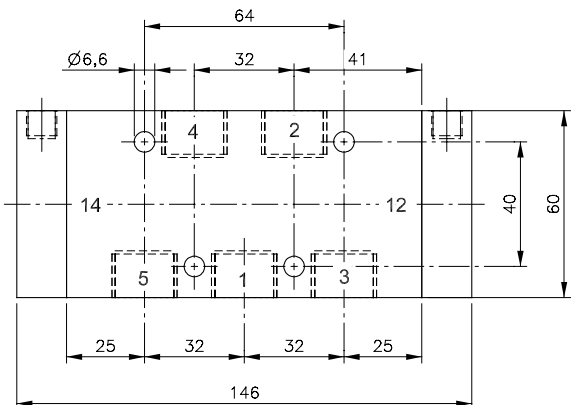
For 1/4"-size: Due to the specific design of the internal parts pressure has to be applied to port 1. For other versions please contact the manufacturer.

For type P 531 701 VES: pressure at port 1 has to be  $\geq$  pressure at 2 and 4. If pressure supply is lost, 2 or 4 can exhaust and actuator might move.

1/2" NPT on request.



**P 520 701 VES/ P 53\_ 701 VES  
P 520 701 NPT VES/ P 53\_ 701 NPT VES**

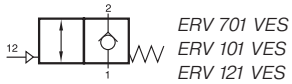


**P 520 121 VES/ P 53\_ 121 VES**

Type	Port size	Function	Air flow	Oper. press.	Actuating press.	Weight	
P 520 701 VES	G 1/4"	double pilot	1250 l/min	2 - 10 bar	the same	0,50 kg	Ex ❄️
P 520 701 NPT VES	1/4" NPT	double pilot	1250 l/min	2 - 10 bar	the same	0,50 kg	Ex ❄️
P 520 121 VES	G 1/2"	double pilot	3000 l/min	2 - 10 bar	the same	1,70 kg	Ex
P 53_ 701 VES	G 1/4"	5/3-way	1250 l/min	2 - 10 bar	3,0 - 10 bar	0,50 kg	Ex ❄️
P 53_ 701 NPT VES	G 1/4"	5/3-way	1250 l/min	2 - 10 bar	3,0 - 10 bar	0,50 kg	Ex ❄️
P 53_ 121 VES	G 1/2"	5/3-way	3000 l/min	2 - 10 bar	3,0 - 10 bar	1,70 kg	Ex



# ERV 701 VES/ERV 101 VES/ERV 121 VES



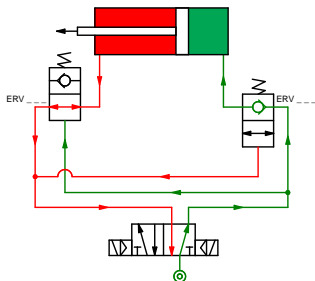
Pilot operated non-return valve.

Port 1 is blocked in basic position, but port 2 can exhaust through port 1.

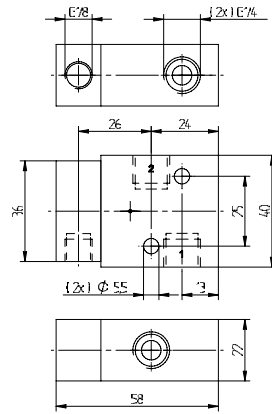
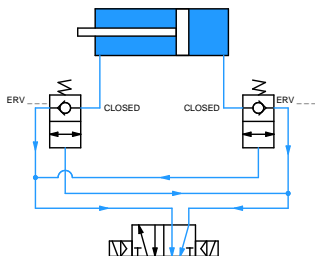
When a pilot signal is applied to port 12, the valve opens from 1 to 2.

Valve can be used to lock the air in a cylinder in case of loss of air pressure.

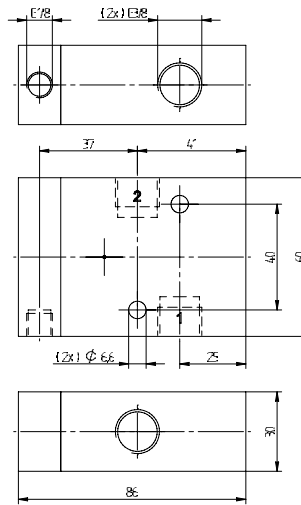
Cylinder in movement:



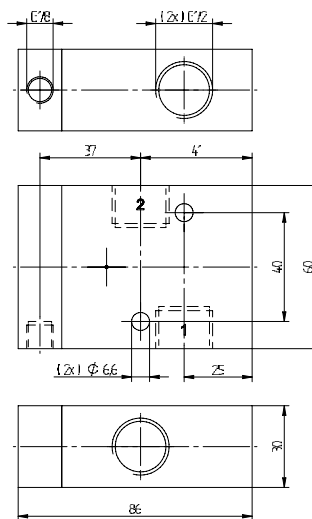
Pressure loss:



**ERV 701 VES**



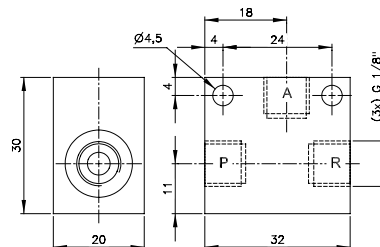
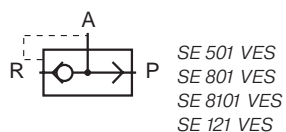
**ERV 101 VES**



**ERV 121 VES**

Type	Port size 1 and 2	Port size 12	Air flow	Operating press.	Weight
ERV 701 VES	G 1/4"	G 1/8"	1250 l/min	1 - 10 bar	0,33 kg
ERV 101 VES	G 3/8"	G 1/8"	2250 l/min	1 - 10 bar	0,90 kg
ERV 121 VES	G 1/2"	G 1/8"	3000 l/min	1 - 10 bar	1,20 kg

# SE 501 VES/SE 801 VES SE 8101 VES/SE 121 VES



**SE 501 VES**

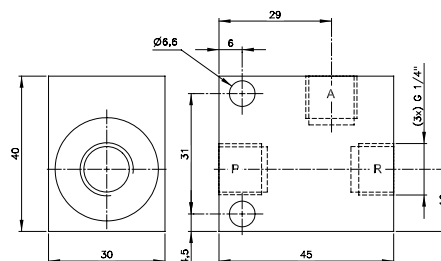
Quick-exhaust valve which can also be used as non-return valve as well as or-gate.

Body parts made from stainless steel 316L / 1.4404, rubber parts from NBR.

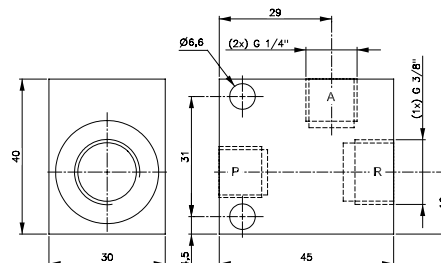
If used as a non-return valve please plug port R. Open from P to A, closed from A to P.

If used as an or-gate connect pressure to P and R. Port A is outlet.

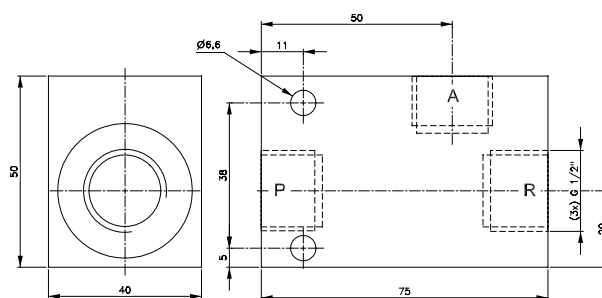
Temperature range: -20° C to +80° C



**SE 801 VES**



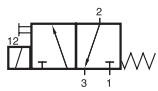
**SE 8101 VES**



**SE 121 VES**

Type	Port size A + P	Port size R	Air flow from A to R	Operating press.	Weight
SE 501 VES	G 1/8"	G 1/8"	564 l/min	0,3 - 10 bar	0,12 kg ❄️
SE 801 VES	G 1/4"	G 1/4"	1188 l/min	0,2 - 10 bar	0,42 kg ❄️
SE 8101 VES	G 1/4"	G 3/8"	1188 l/min	0,2 - 10 bar	0,41 kg ❄️
SE 121 VES	G 1/2"	G 1/2"	3600 l/min	0,5 - 10 bar	0,84 kg ❄️

# MH 311 015 VES



MH 311 015 VES



Direct acting 3/2-way solenoid valve equipped with mechanical spring return.

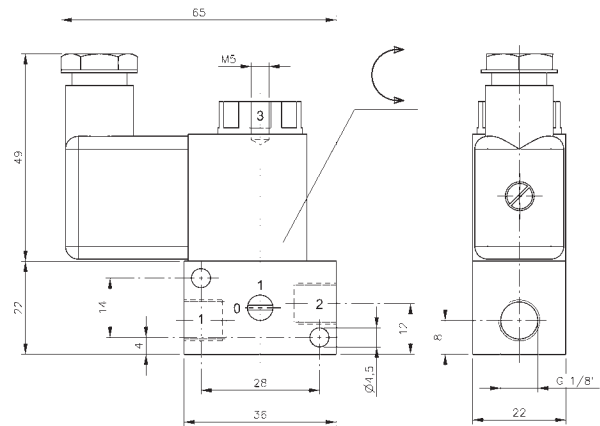
Valve body is made from stainless steel, material: 1.4404. Plunger-seals are made of FKM.

Normally closed, port 1 and 2 in the valve, port 3 at the top of the solenoid.

By closing port 3 valve can be converted into a 2/2-way valve.

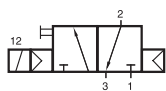
Available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are generally equipped with manual override.

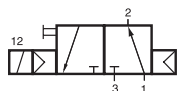

**MH 311 015 VES**

Type	Function	Port size			Air flow	Operation press.	Power consumption	Weight
		1	2	3				
MH 311 015 VES	n.c.	G 1/8"	G 1/8"	M5	50 l/min	0 - 10 bar	3 W = / 5 VA ~	0,14 kg

# MH 310 701 VES/MH 310 701 KES MOH 310 701 VES/MOH 310 701 KES



MH 310 701 VES  
MH 310 701 KES  
MH 310 701 NPT VES  
MH 310 701 NPT KES



MOH 310 701 VES  
MOH 310 701 KES  
MOH 310 701 NPT VES  
MOH 310 701 NPT KES

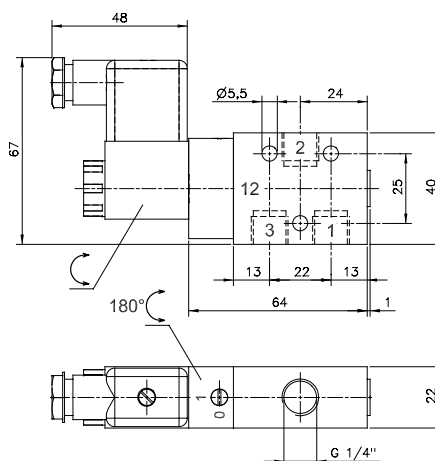


3/2-way solenoid valve normally closed (MH) or normally open (MOH) actuated by permanent signal and equipped with air spring return.

Body parts are made from stainless steel 316L / 1.4404. Customer has the choice between two versions VES and KES, for details refer to the table below.

Available with solenoid operators :  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are equipped with manual override to be turned.

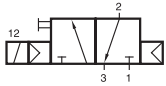


**MH 310 701 VES/KES**  
**MOH 310 701 VES/KES**  
**MH 310 701 NPT VES/KES**  
**MOH 310 701 NPT VES/KES**

Type	Pilot head	Seals	Other rubber parts
VES	1.4404	PUR	FKM
KES	PA	PUR	FKM

Type	Function	Port size	Air flow	Operating press.	Power cons.	Weight
MH 310 701 VES	n.c.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,42 kg
MH 310 701 KES	n.c.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,35 kg
MOH 310 701 VES	n.o.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,42 kg
MOH 310 701 KES	n.o.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,35 kg
MH 310 701 NPT VES	n.c.	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,42 kg
MH 310 701 NPT KES	n.c.	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,35 kg
MOH 310 701 NPT VES	n.o.	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,42 kg
MOH 310 701 NPT KES	n.o.	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,35 kg

# MH 310 121 VES



MH 310 121 VES  
MH 310 121 NPT VES



3/2-way solenoid valve normally closed actuated by permanent signal and equipped with air spring return.

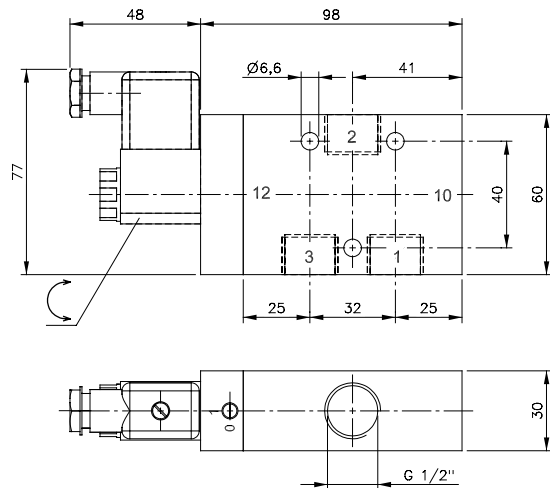
Body parts are made from stainless steel 316L / 1.4404, rubber parts are made from FKM.

Valves are available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are equipped with manual override to be turned.

Normally open version on request.

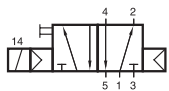
G 3/4" available on request.



**MH 310 121 VES**  
**MH 310 121 NPT VES**

Type	Function	Port size	Air flow	Operating press.	Power cons.	Weight
MH 310 121 VES	n.c.	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,20 kg
MH 310 121 NPT VES	n.c.	1/2" NPT	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,20 kg

# MH 510 701 VES/MH 510 701 KES MH 510 121 VES



MH 510 701 VES/KES  
MH 510 701 NPT VES/KES  
MH 510 121 VES  
MH 510 121 NPT VES



5/2-way solenoid valves actuated by permanent signal and equipped with air spring return.

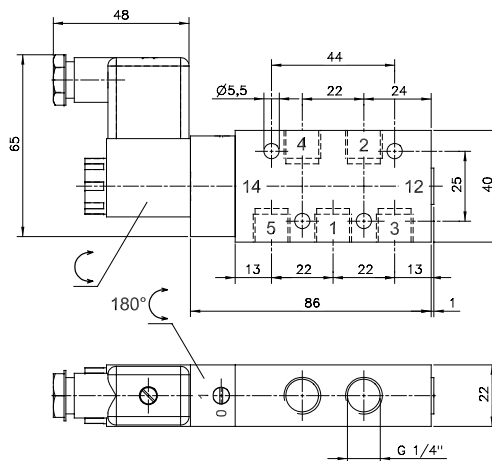
Body parts are made from stainless steel 316L / 1.4404.

For series 701 the customer has the choice between two versions VES and KES, for details refer to the table below.

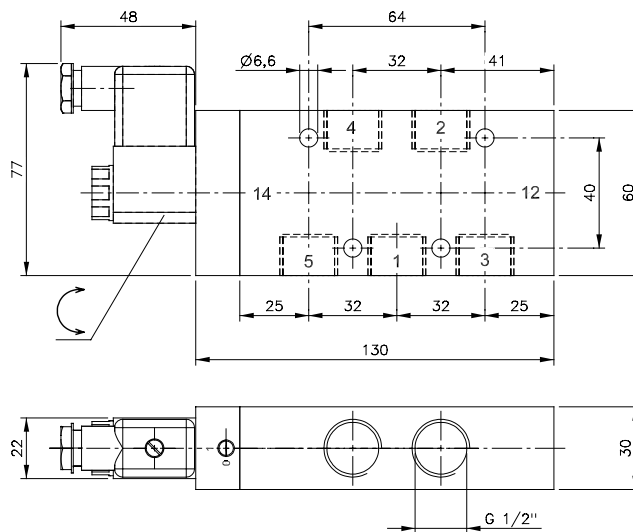
Available with solenoid operators :  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are equipped with manual override to be turned.

G 3/4" available on request.



**MH 510 701 VES/KES**  
**MH 510 701 NPT VES/KES**



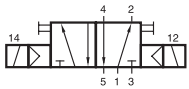
**MH 510 121 VES**  
**MH 510 121 NPT VES**

Type	Pilot head	Seals	Other rubber parts
701 VES	1.4404	PUR	FKM
701 KES	PA	PUR	FKM
121 VES	1.4404	FKM	FKM

Type	Function	Port size	Air flow	Operating press.	Power cons.	Weight	
MH 510 701 VES	single sol.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,53 kg	Ex
MH 510 701 KES	single sol.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,46 kg	
MH 510 701 NPT VES	single sol.	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,53 kg	Ex
MH 510 701 NPT KES	single sol.	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,46 kg	
MH 510 121 VES	single sol.	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,50 kg	Ex
MH 510 121 NPT VES	single sol.	1/2" NPT	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,50 kg	Ex



# MH 520 701 VES/MH 520 701 KES MH 520 121 VES



MH 520 701 VES/KES  
MH 520 701 NPT VES/KES  
MH 520 121 VES  
MH 520 121 NPT VES



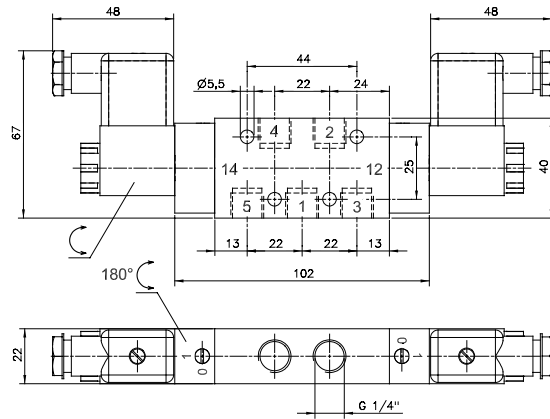
5/2-way double solenoid valve.  
Position is kept until an electrical signal is applied to the opposite side even when not attached to an electrical source.

Body parts are made from stainless steel 316L / 1.4404, rubber parts FKM, PUR (series 701).  
Series 701: Customer has the choice between two versions KES and VES, for details refer to the table below.

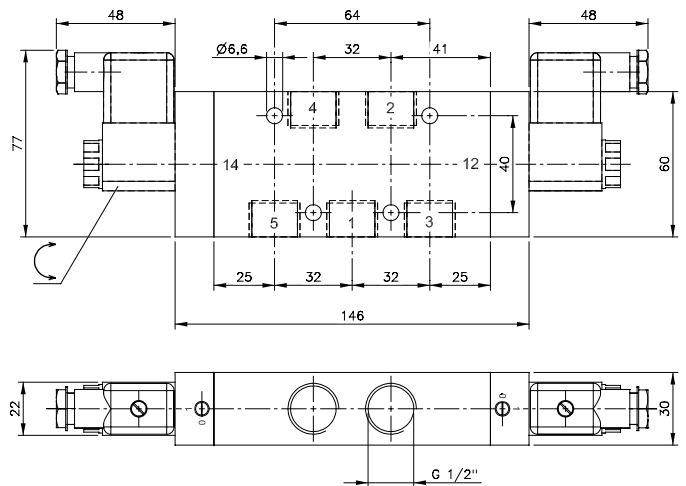
Valves are available with solenoid operators: 230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are equipped with manual override to be turned.

G 3/4" available on request.



**MH 520 701 VES/KES  
MH 520 701 NPT VES/KES**

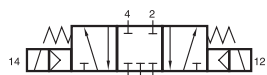


**MH 520 121 VES  
MH 520 121 NPT VES**

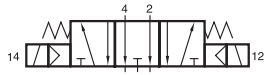
Type	Pilot head	Seals	Other rubber parts
701 VES	1.4404	PUR	FKM
701 KES	PA	PUR	FKM
121 VES	1.4404	FKM	FKM

Type	Port size	Air flow	Operating Press.	Power consumption	Weight	
MH 520 701 VES	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,74 kg	☼❄️
MH 520 701 KES	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,60 kg	
MH 520 701 NPT VES	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,74 kg	☼❄️
MH 520 701 NPT KES	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,60 kg	
MH 520 121 VES	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,70 kg	☼
MH 520 121 NPT VES	1/2" NPT	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,70 kg	☼

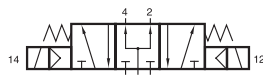
# MH 53\_701 VES/MH 53\_701 KES MH 53\_121 VES



MH 531 701 VES/KES  
MH 531 701 NPT VES/KES  
MH 531 121 VES  
MH 531 121 NPT VES



MH 532 701 VES/KES  
MH 532 701 NPT VES/KES  
MH 532 121 VES  
MH 532 121 NPT VES



MH 533 701 VES/KES  
MH 533 701 NPT VES/KES  
MH 533 121 VES  
MH 533 121 NPT VES



5/3-way valves actuated with spring return to middle position, actuated by permanent signal.

Body parts are made from stainless steel 316L / 1.4404.

Series 701: Customer has the choice between two versions KES and VES, for details refer to the table below.

Type 531            centre closed  
Type 532            centre exhausted  
Type 533            centre pressurised

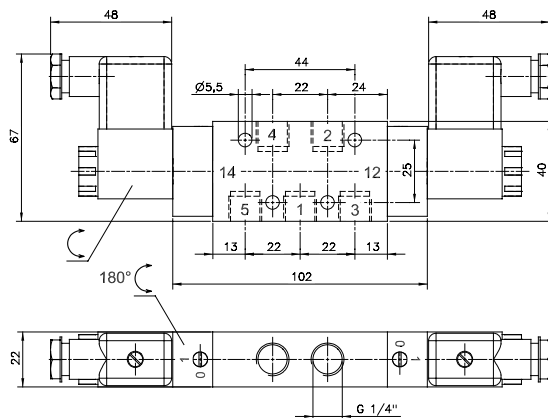
When ordering please complete the type number by 1, 2 or 3 according to the type required.

Valves are available with solenoid operators: 230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

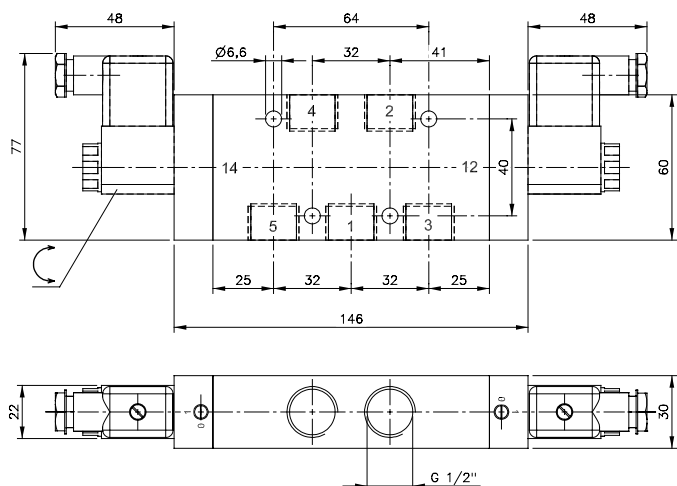
Valves are equipped with manual override to be turned.

For type 531 701: pressure at port 1 has to be  $\geq$  pressure at 2 and 4. If pressure supply is lost, 2 or 4 can exhaust and actuator might move.

G 3/4" available on request.



**MH 53\_701 VES/KES**  
**MH 53\_701 NPT VES/KES**

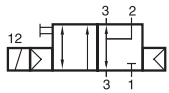


**MH 53\_121 VES**  
**MH 53\_121 NPT VES**

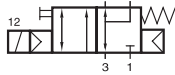
Type	Pilot head	Seals	Other rubber parts
701 VES	1.4404	PUR	FKM
701 KES	PA	PUR	FKM
121 VES	1.4404	FKM	FKM

Type	Port size	Air flow	Operating Press.	Power consumption	Weight
MH 53_701 VES	G 1/4"	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,74 kg
MH 53_701 KES	G 1/4"	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,60 kg
MH 53_701 NPT VES	1/4" NPT	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,74 kg
MH 53_701 NPT KES	1/4" NPT	1250 l/min	3 - 10 bar	3 W = / 5 VA ~	0,60 kg
MH 53_121 VES	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,70 kg
MH 53_121 NPT VES	1/2" NPT	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,70 kg

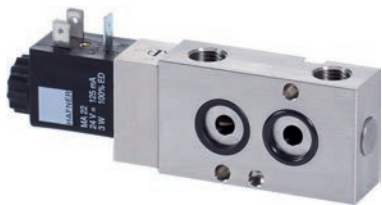
# MNH 310 701 VES/MNH 310 701 KES MNH 311 701 VES/MNH 311 701 KES MNH 310 121 VES/MNH 311 121 VES



MNH 310 701 VES  
MNH 310 701 KES  
MNH 310 701 NPT VES  
MNH 310 701 NPT KES  
MNH 310 121 VES



MNH 311 701 VES  
MNH 311 701 KES  
MNH 311 701 NPT VES  
MNH 311 701 NPT KES  
MNH 311 121 VES



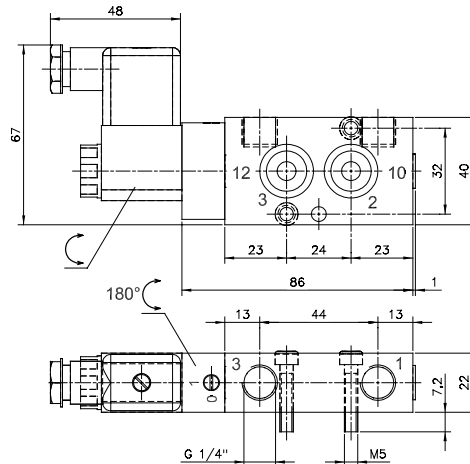
3/2-way solenoid valve, actuated by permanent signal.  
Interface according to NAMUR-standard, with exhaust air recirculation (purge).

Type MNH 310 with pneumatic spring return.  
Type MNH 311 with combined spring assuring a fail-safe function in case of cut-off of pressure supply.

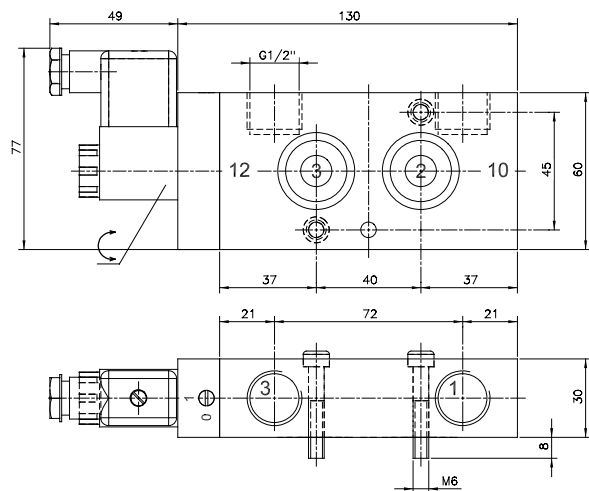
Body parts are made from stainless steel 316L / 1.4404.  
Series 701: Customer has the choice between two versions VES and KES, for details refer to the table below.

Available with solenoid operators :  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are equipped with manual override to be turned.  
Delivery includes 1 pin, 2 screws, 2 O-rings.  
Series 121 with NPT-ports available on request.



**MNH 310 701 VES/KES**  
**MNH 311 701 VES/KES**  
**MNH 310 701 NPT VES/KES**  
**MNH 311 701 NPT VES/KES**

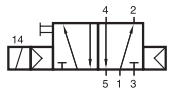


**MNH 310 121 VES/MNH 311 121 VES**

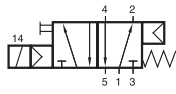
Type	Pilot head	Seals	Other rubber parts
701 VES	1.4404	PUR	FKM
701 KES	PA	PUR	FKM
121 VES	1.4404	FKM	FKM

Type	Function	Port size	Air flow	Operating press.	Power cons.	Weight
MNH 310 701 VES	air-spring	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,57 kg
MNH 310 701 KES	air-spring	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,49 kg
MNH 311 701 VES	comb. spring	G 1/4"	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,57 kg
MNH 311 701 KES	comb. spring	G 1/4"	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,49 kg
MNH 310 701 NPT VES	air-spring	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,57 kg
MNH 310 701 NPT KES	air-spring	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,49 kg
MNH 311 701 NPT VES	comb. spring	1/4" NPT	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,57 kg
MNH 311 701 NPT KES	comb. spring	1/4" NPT	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,49 kg
MNH 310 121 VES	air-spring	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,50 kg
MNH 311 121 VES	comb. spring	G 1/2"	3000 l/min	2,5 - 10 bar	3 W = / 5 VA ~	1,50 kg

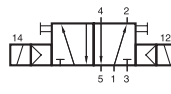
# MNH 510 701 VES/MNH 510 701 KES MNH 511 701 VES/MNH 511 701 KES MNH 520 701 VES/MNH 520 701 KES



MNH 510 701 VES  
MNH 510 701 KES  
MNH 510 701 NPT VES  
MNH 510 701 NPT KES



MNH 511 701 VES  
MNH 511 701 KES  
MNH 511 701 NPT VES  
MNH 511 701 NPT KES



MNH 520 701 VES  
MNH 520 701 KES  
MNH 520 701 NPT VES  
MNH 520 701 NPT KES



5/2-way solenoid valve. Interface according to 1/4" NAMUR-standard.

Type MNH 510 \_\_ \_\_ single solenoid actuated by permanent signal and equipped with air spring return.

Type MNH 520 \_\_ \_\_ double solenoid actuated by impulse. Position is kept until an electric signal is applied to the opposite side even when not attached to an electrical source.

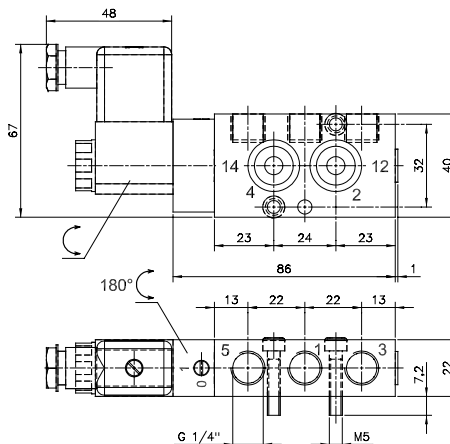
Body parts are made from stainless steel 316L / 1.4404. Customer has the choice between two versions VES and KES, for details refer to the table below.

Available with solenoid operators :  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V~, 12V~.

Valves are equipped with manual override to be turned.

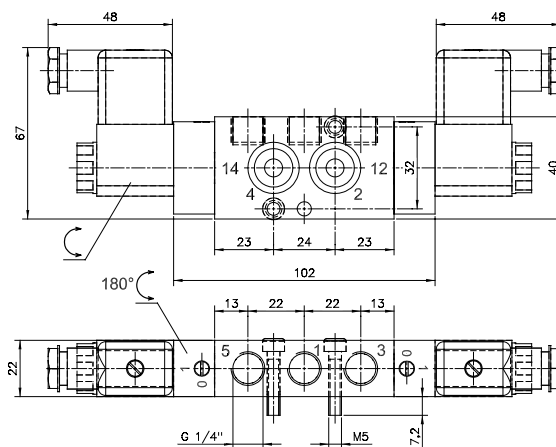
Delivery includes 1 pin, 2 screws, 2 O-rings.

5/3-way valves on request.



**MNH 510 701 VES/KES  
MNH 511 701 VES/KES**

**MNH 510 701 NPT VES/KES  
MNH 511 701 NPT VES/KES**



**MNH 520 701 VES/KES  
MNH 520 701 NPT VES/KES**

Type	Pilot head	Seals	Other rubber parts
VES	1.4404	PUR	FKM
KES	PA	PUR	FKM

Type	Function	Port size	Air flow	Operating press.	Power cons.	Weight
MNH 510 701 VES	air-spring	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,57 kg
MNH 510 701 KES	air-spring	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,49 kg
MNH 511 701 VES	comb. spring	G 1/4"	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,57 kg
MNH 511 701 KES	comb. spring	G 1/4"	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,49 kg
MNH 520 701 VES	double sol.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,67 kg
MNH 520 701 KES	double sol.	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,58 kg
MNH 510 701 NPT VES	air-spring	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,57 kg
MNH 510 701 NPT KES	air-spring	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,49 kg
MNH 511 701 NPT VES	comb. spring	1/4" NPT	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,57 kg
MNH 511 701 NPT KES	comb. spring	1/4" NPT	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,49 kg
MNH 520 701 NPT VES	double sol.	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,67 kg
MNH 520 701 NPT KES	double sol.	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,58 kg

# MNH 510 121 VES/MNH 511 121 VES



5/2-way solenoid valve. Interface according to 1/2" NAMUR-standard.

Type MNH 510 121 with pneumatic spring return

Type MNH 511 121 with combined spring

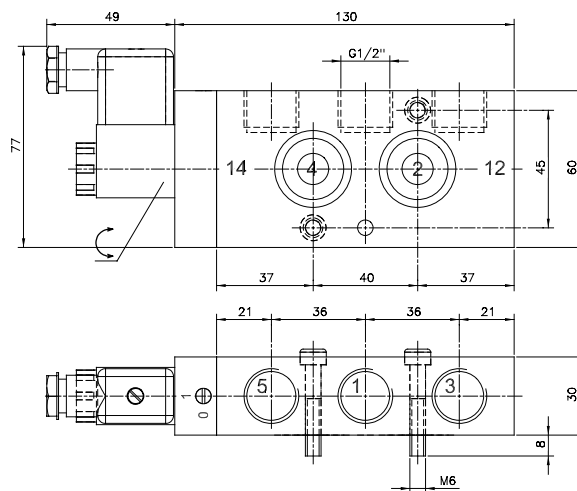
Body parts are made from stainless steel 316L / 1.4404.

Available with solenoid operators :

230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=.

Valves are equipped with manual override to be turned.

Delivery includes 1 pin, 2 screws, 2 O-rings.



**MNH 510 121 VES**

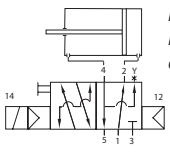
**MNH 511 121 VES**

Type	Pilot head	Seals	Other rubber parts
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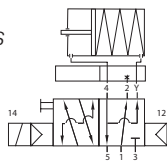
121 VES	1.4404	FKM	FKM
---------	--------	-----	-----

Type	Function	Port size	Air flow	Operating press.	Power cons.	Weight
MNH 510 121 VES	air-spring	G 1/2"	3000 l/min	1 - 10 bar	3 W = / 5 VA ~	1,50 kg
MNH 511 121 VES	comb. spring	G 1/2"	3000 l/min	2,5 - 10 bar	3 W = / 5 VA ~	1,50 kg

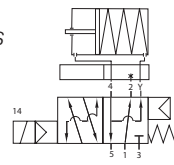
# MNH 350 701 VES/MNH 350 701 KES MNH 351 701 VES/MNH 351 701 KES



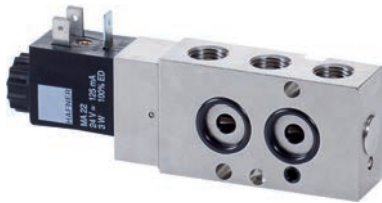
MNH 350 701 VES/KES  
MNH 350 701 NPT VES/KES  
on double acting act.



MNH 350 701 VES/KES  
MNH 350 701 NPT VES/KES  
and Flex-Pack  
on single acting act.



MNH 351 701 VES/KES  
MNH 351 701 NPT VES/KES  
and Flex-Pack  
on single acting act.



5/2-way solenoid valve, actuated by permanent signal. Interface according to 1/4" NAMUR-standard. Adding the „Flex-Pack“, converts the valve into a 3/2-way NAMUR-valve with exhaust-air recirculation (“purge”).

MNH 350 701 with pneumatic spring return,  
MNH 351 701 with combined spring.

Body parts are made from stainless steel 316L / 1.4404. Customer has the choice between two versions VES and KES, for details refer to the table below.

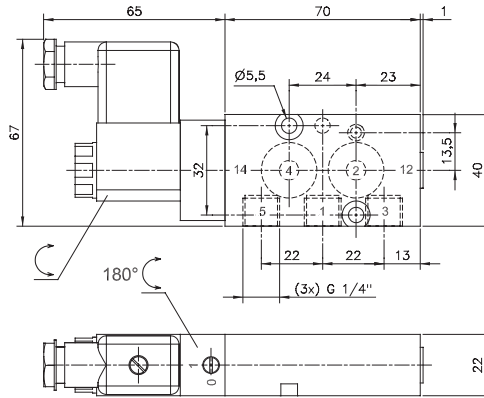
Valves are available with solenoid operators:  
230V/50Hz, 110V/50Hz, 24V/50Hz, 48V=, 24V=, 12V=

Valves are generally equipped with manual override.

Delivery includes 1 pin, 2 screws, 2 O-rings.

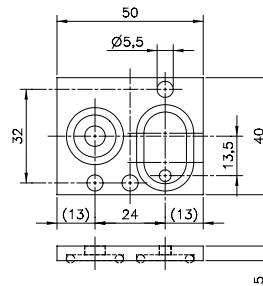
Instead of the Flex-Pack the „Flex-regulator“ Type DRF 601 converts the function of the valve and offers the possibility to control opening- and closing-speed of a spring-return actuator independently.

Delivery of FP 701 VES includes longer screws and seals.



**MNH 350 701 VES/KES  
MNH 351 701 VES/KES**

**MNH 350 701 NPT VES/KES  
MNH 351 701 NPT VES/KES**



**FP 701 VES**

**Type Pilot head Seals Other rubber parts**

VES 1.4404 PUR FKM

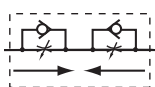
KES PA PUR FKM

**Type Material Orifice 4 Orifice 2-3 Weight**

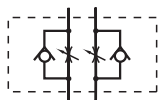
FP 701 VES 1.44.04 7 mm 4 mm 0,025 kg

Type	Function	Port size	Air flow	Operating press.	Power Cons.	Weight	
MNH 350 701 VES	air-spring	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,57 kg	☑❄
MNH 350 701 KES	air-spring	G 1/4"	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,49 kg	
MNH 351 701 VES	comb. spring	G 1/4"	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,57 kg	❄
MNH 351 701 KES	comb. spring	G 1/4"	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,49 kg	
MNH 350 701 NPT VES	air-spring	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,57 kg	☑❄
MNH 350 701 NPT KES	air-spring	1/4" NPT	1250 l/min	2 - 10 bar	3 W = / 5 VA ~	0,49 kg	
MNH 351 701 NPT VES	comb. spring	1/4" NPT	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,57 kg	❄
MNH 351 701 NPT KES	comb. spring	1/4" NPT	1250 l/min	2,5 - 10 bar	3 W = / 5 VA ~	0,49 kg	

# DRN 3 611 VES/DRN 5 611 VES



DRN 3 611 VES



DRN 5 611 VES



Block form flow regulator as intermediate plate, interface according to 1/4" NAMUR-standard.

Type DRN 3 611 VES:

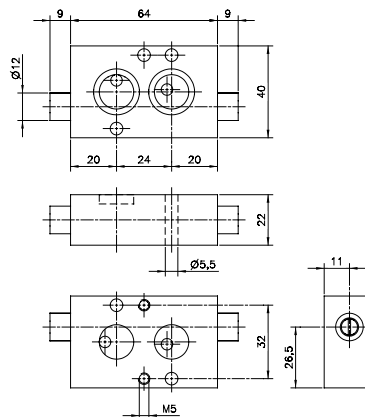
For 3/2-way valves with exhaust air recirculation. To regulate the forward stroke of a single acting pneumatic actuator and to regulate the exhaust air going into the spring return unit.

Type DRN 5 611 VES:

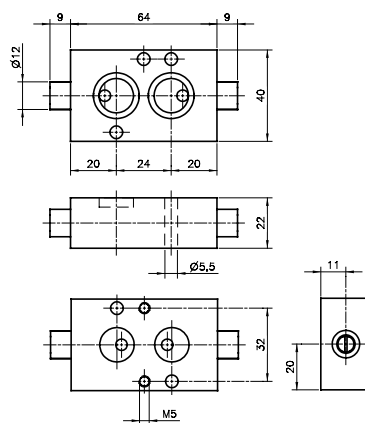
For 5/2 and 5/3 way valves only. To regulate the forward- and backward-stroke of a double acting pneumatic actuator.

To be operated with a screw-driver.

Delivery includes 1 pin, 2 screws, 2 O-Rings.



DRN 3 611 VES



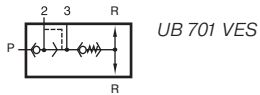
DRN 5 611 VES

Type	Function	Port size	Max. air flow	Operating press.	Weight
DRN 3 611 VES	3-way valves	Ø 5mm	650 l/min	0,5 - 10 bar	0,42 kg
DRN 5 611 VES	5-way valves	Ø 5mm	650 l/min	0,5 - 10 bar	0,42 kg





# UB 701 VES



The HAFNER NAMUR air-recirculation block guarantees, that only exhausting air from the actuation side is going into the spring chamber and for sure no ambient atmosphere.

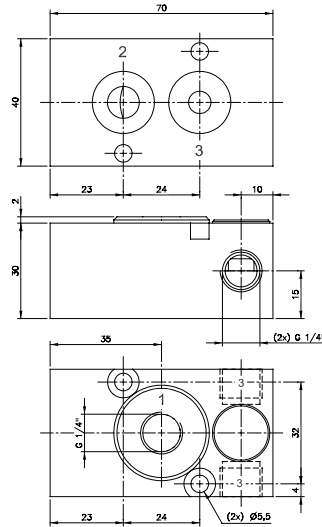
Valve is designed for spring return pneumatic actuators with 1/4" NAMUR-Interface to be controlled by a remote piloted 3/2-way valve.

Standard with G 1/4" pilot port. Materials being used:

- Body: Stainless steel 1.4404
- Membrane: NBR
- Other inner parts: Stainless steel 1.4404, 1.4310, 1.4031

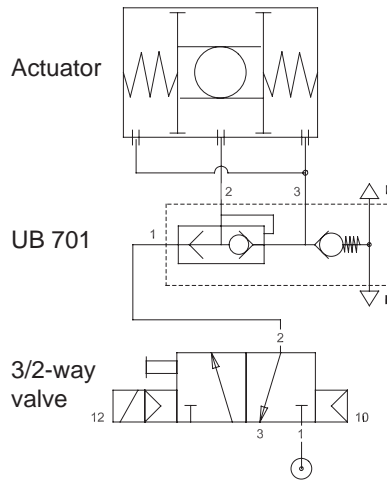
One of the two exhaust ports 3 to be closed by a plug. Plug is not included.

Delivery includes 2 screws and 2 O-Rings.



**UB 701 VES**

Function:



Type	NAMUR	Port size	Air flow	Operating pressure
UB 701 VES	1/4"	G 1/4"	1250 l/min	1 - 10 bar

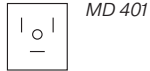




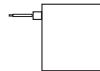
# 2.14

## Coils and Connectors

# MD 401/ST 16



MD 401



MD 401 L



MD 401



ST 16



ST 16 V\_\_

16 mm wide solenoid system for solenoid valves type MD and MK, including valve-head with manual override to push.

Coil made from 25 % glass filled thermoplastic PA material, epoxy filled. Valve head glass filled thermoplastic PA including a manual override to push.

### Type MD 401

Interface form C (DIN EN 175301-803), with 8 mm contact distance. Equipped with appropriate connector, solenoid system offers IP 65.

### Type MD 401 L

Version with flying leads. Cable length 500 mm, others available on request. The coils are not grounded, take national safety regulations into consideration!

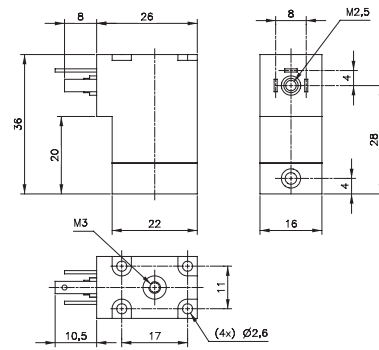
### Suitable connectors:

#### Type ST 16

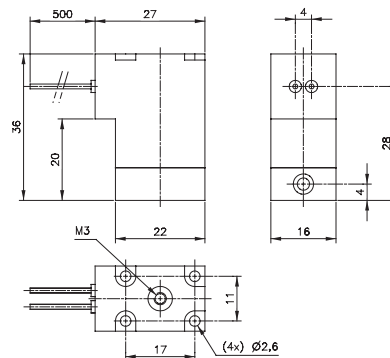
Connector with black housing. Using the enclosed flat seal, fastening screw and nut appropriately the system reaches protection class IP 65 in accordance to IEC 60 529.

#### Type ST 162 V\_\_

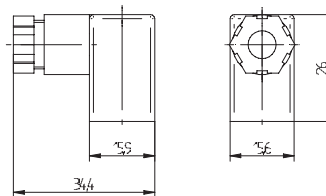
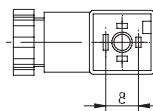
Connector with LED and varistor. Using the enclosed flat seal, fastening screw and nut appropriately the system reaches protection class IP 65 in accordance to IEC 60 529.



MD 401



MD 401 L



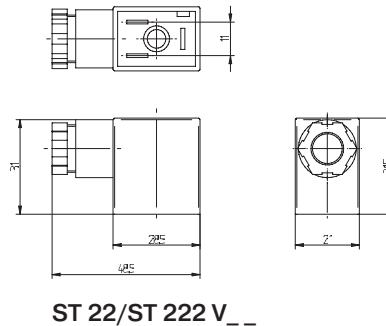
ST 16/ST 162 V\_\_

Type	Voltage	Ampere	Power cons.	Connection	Weight
MD 401 6DC	6 V=	300 mA	1,8 W	Form C (EN 175301-803)	0,037 kg
MD 401 6DC L	6 V=	300 mA	1,8 W	Flying leads 500 mm long	0,037 kg
MD 401 12DC	12 V=	150 mA	1,8 W	Form C (EN 175301-803)	0,037 kg
MD 401 12DC L	12 V=	150 mA	1,8 W	Flying leads 500 mm long	0,037 kg
MD 401 24DC	24 V=	75 mA	1,8 W	Form C (EN 175301-803)	0,037 kg
MD 401 24DC L	24 V=	75 mA	1,8 W	Flying leads 500 mm long	0,037 kg

Type	LED	VAR	Operat. Voltage	Max. current	Cable diameter	Connection	Weight
ST 16 E1N	no	no	0 - 250 V	6 A	5 - 6,5 mm	Form C (EN 175301-803)	0,015 kg
ST 16 2 V 24	red	yes	24 V ± 10 %	6 A	5 - 6,5 mm	Form C (EN 175301-803)	0,015 kg
ST 16 2 V 230	red	yes	230 V ± 10 %	6 A	5 - 6,5 mm	Form C (EN 175301-803)	0,015 kg



# ST 22/ST 22 L 5000/ST 222 V \_\_ L 1500 ST 22 M12/ST 22 NPTF



ST 22/ST 222 V \_\_

Connectors for coils type MA 22.

## Type ST 22

Connector with black housing.

Using the enclosed flat seal, fastening screw and nut appropriately the system reaches protection class IP 65 in accordance to IEC 60 529.

## Type ST 222 V \_\_

Connector with LED and varistor.

Using the enclosed flat seal, fastening screw and nut appropriately the system reaches protection class IP 65 in accordance to IEC 60 529.

## Type ST 22 L 5000

Connector with black housing and 5 meter moulded cable.

In combination with the HAFNER Epoxy coils type MA 22 D, adding two O-rings at the top of the solenoid system, fastening screw and nut appropriately the system reaches protection class IP 67 in accordance to IEC 60 529. Seal is part of the housing.

## Type ST 222 V \_\_ L 1500

Connector with LED and varistor and 1,5 meter moulded cable.

In combination with the HAFNER Epoxy coils type MA 22 D, adding two O-rings at the top of the solenoid system, fastening screw and nut appropriately the system reaches protection class IP 67 in accordance to IEC 60 529. Seal is part of the housing.

## ST 22 M12

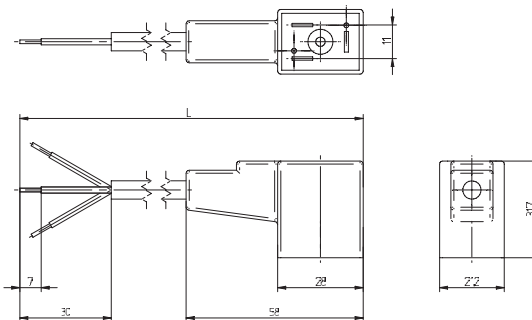
Connector with black housing and M12 x 1 connection.

Using the enclosed flat seal, fastening screw and nut appropriately the system reaches protection class IP 65 in accordance to IEC 60 529.

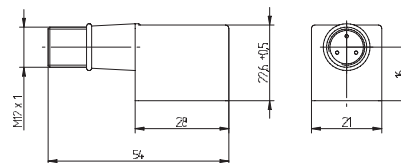
## ST 22 NPTF

Connector with black housing and 1/2" NPTF conduit connection.

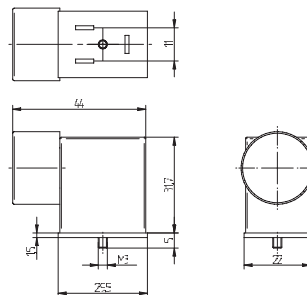
Using the enclosed flat seal, fastening screw and nut appropriately the system reaches protection class IP 65 in accordance to IEC 60 529.



ST 22 L 5000/ ST 222 V \_\_ L 1500



ST 22 M12



ST 22 NPTF

Other connectors are available on request.

Type	LED	VAR	Operat. voltage	Max. current	Cable diameter	Cable length [mm]	Cable material	Connection	Weight
ST 22 E1N	no	no	0 - 250 V	10 A	6 - 8 mm			Industry form B - M16x1.5	0,025 kg
ST 22 2 V 24	red	yes	24 V ± 10 %	10 A	6 - 8 mm			Industry form B - M16x1.5	0,025 kg
ST 22 2 V 110	red	yes	110 V ± 10 %	10 A	6 - 8 mm			Industry form B - M16x1.5	0,025 kg
ST 22 2 V 230	red	yes	230 V ± 10 %	10 A	6 - 8 mm			Industry form B - M16x1.5	0,025 kg
ST 22 L 5000	no	no	0 - 250 V	6 A	6,5 mm	5.000	PVC	Industry form B	0,37 kg
ST 22 2 V 24 L 1500	red	yes	24 V ± 10 %	6 A	6,5 mm	1.500	PUR	Industry form B	0,14 kg
ST 22 2 V 110 L 1500	red	yes	110 V ± 10 %	6 A	6,5 mm	1.500	PVC	Industry form B	0,14 kg
ST 22 2 V 230 L 1500	red	yes	230 V ± 10 %	6 A	6,5 mm	1.500	PVC	Industry form B	0,14 kg
ST 22 M12	no	no	0 - 250 V	4 A				Industry form B - M12x1	0,021kg
ST 22 NPTF	no	no	0 - 250 V	10 A				Industry form B - 1/2" NPTF	0,020 kg



# MA 22 DIN/MA 22 D M12/MA 30 S9



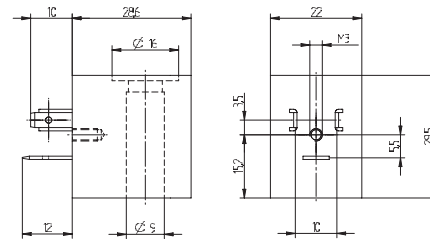
MA 22 DIN



MA 22 D 24DC M12



MA 30 S9

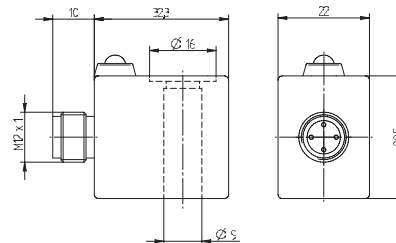


MA 22 DIN

22 mm wide coils for solenoid valves of the MH-series, type MH, MOH, MEH, MEOH, MNH and MNOH.

## Type MA 22 DIN

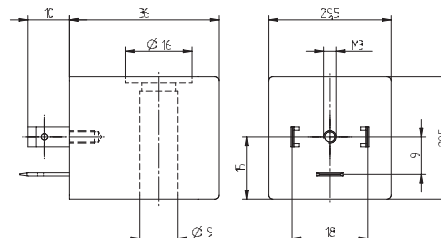
Housing made from heat resistant thermoplastic polyester material 30 % glass filled.  
Form B according to EN 175301-803.  
Isolation class F. Wire class H.  
Equipped with appropriate connector, solenoid offers IP 65.



MA 22 D 24DC M12

## Type MA 22 D 24DC M12

Housing made from Epoxy.  
Connection M12x1 according to DIN EN 60947-5-2.  
Coil with yellow LED.  
Isolation class F. Wire class H.  
Equipped with appropriate connector, solenoid offers IP 67.



MA 30 S9

30 mm wide coil for solenoid valves of the MH-series, type MH, MOH, MEH, MEOH, MNH and MNOH.

When used with valve series MNH or MNOH, please consider that a NAMUR distance plate type ZPN 5 (page 2.11.13) might be needed.

## Type MA 30 S9

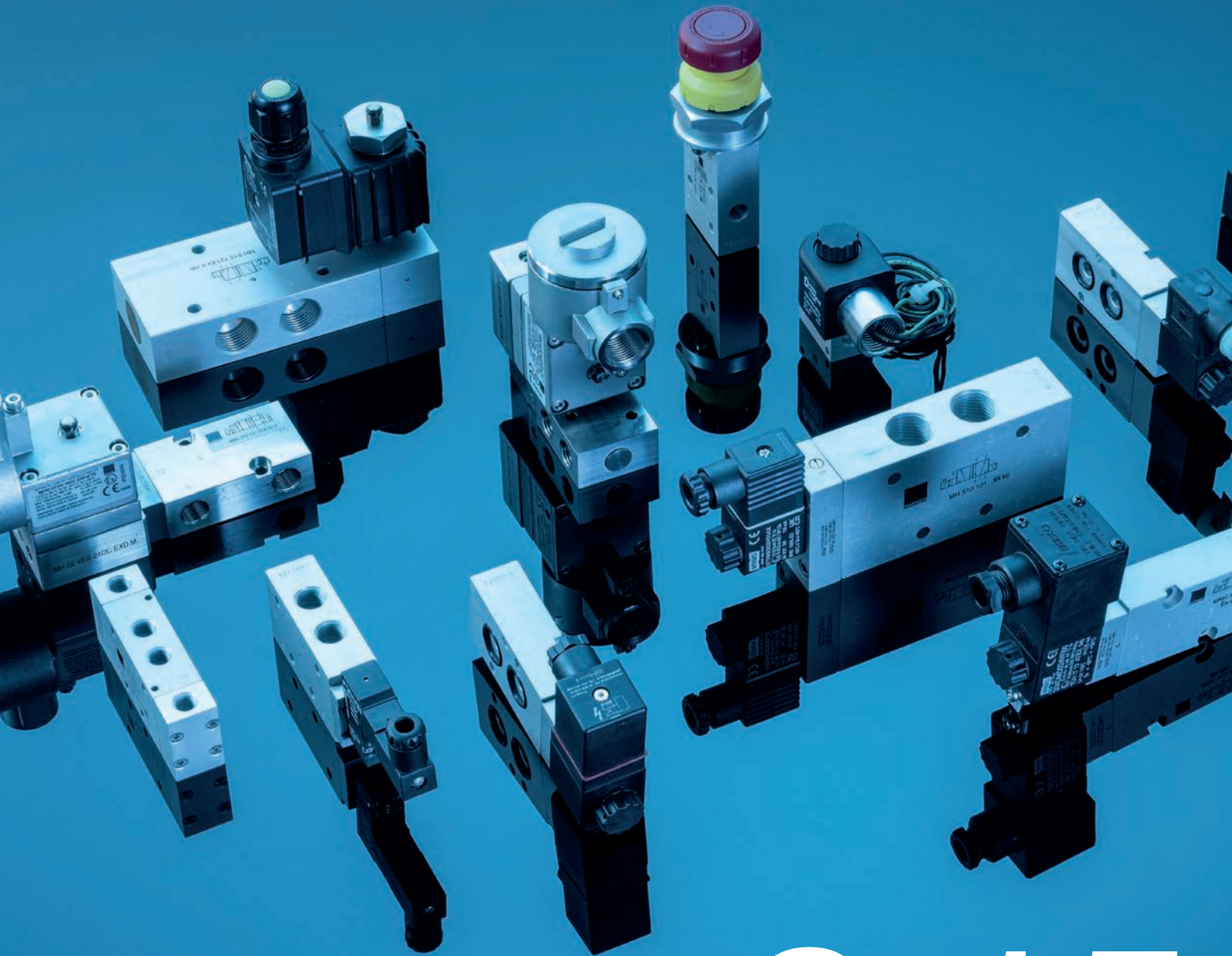
Housing made from heat resistant thermoplastic polyester material 30% glass filled.  
Form A according to EN 17301-803.  
Isolation class F. Wire class H.  
Equipped with appropriate connector, solenoid offers IP 65.

Suitable connectors for MA 30 S9 coils, type ST 30 ..., can be found on page 2.14.5.

Type	Voltage	Tolerance	Ampere	Power cons.	LED	Connection	Weight
MA 22 24DC DIN	24 V=	±10 %	110 mA	2,6 W	no	Form B (EN 175301-803)	0,05 kg
MA 22 230AC DIN	230 V~	±10 %	26 mA	6 VA	no	Form B (EN 175301-803)	0,05 kg
MA 22 D 24DC M12 X CE	24 V=	±10 %	175 mA	4,2 W	yellow	M12x1	0,07 kg
MA 30 S9 24DC X CE	24 V~	±10 %	83 mA	2 W	no	Form A (EN 175301-803)	0,10 kg
MA 30 S9 110AC X CE	110 V~	±10 %	27 mA	3 VA	no	Form A (EN 175301-803)	0,10 kg
MA 30 S9 230AC X CE	230 V~	±10 %	13 mA	3 VA	no	Form A (EN 175301-803)	0,10 kg







# 2.15

## Products for Explosion Hazardous Environment



# General information on HAFNER products for explosion hazardous environment

Since July 1, 2003, devices and protective systems for use in explosion protection areas must be approved according to Directive 94/9 / EC - known as the ATEX Directive. This has been replaced by the latest ATEX 2014/34 / EU directive.

## Essential when applying the ATEX directive:

- Non-electrical equipment (e.g. pneumatic actuators and valves) fall within the scope of application.
- Basic safety requirements are defined.
- The devices are divided into groups and categories, which in turn are assigned to corresponding zones. Zones are to be defined by the operator in accordance with ATEX directive 137.
- The CE mark is mandatory.
- Each device must be accompanied by an operating manual and a declaration of conformity.
- The directive also takes dust explosion protection into account.
- It applies to mining and all other potentially explosive areas

## When and where can an explosion occur?

Explosions can always occur where flammable gases, liquids or dusts are produced, transported or stored. Under certain conditions, explosive mixtures arise in connection with air. In such potentially explosive areas, a small spark is often enough to trigger an explosion. Areas at risk of explosion can be found, for example, in chemical factories, refineries, tank systems, paint factories or sewage treatment plants and in other areas in which dust-forming bulk materials are processed or transported, e.g. in grain mills, feed mills and cement plants.

## What are potential ignition sources?

Exemplary electrical ignition sources:	Exemplary mechanical ignition sources:	Other exemplary ignition sources:
<ul style="list-style-type: none"> <li>• Sparking that occurs when contacts are opened</li> <li>• Electrical equalizing currents</li> <li>• Electrostatic discharge</li> <li>• Hot surfaces of coils</li> </ul>	<ul style="list-style-type: none"> <li>• Hot surfaces caused by friction</li> <li>• Adiabatic compression</li> <li>• Sparks generated by hitting</li> </ul>	<ul style="list-style-type: none"> <li>• Open fire</li> <li>• Overheating bearings or brakes</li> <li>• Self-ignition (exothermic compounds)</li> <li>• Lightning strike</li> </ul>

## Products subject to approval according to the ATEX directive

- Electrical equipment
- Non-electrical equipment such as:
  - Cylinders
  - Rodless cylinders
  - Valves
  - Hoses (must be antistatic)

This affects all devices that have their own potential ignition source (see above).

## Products not subject to approval according to the ATEX directive

The following product examples do not have their own ignition sources and can be used in certain hazard zones in accordance with the manufacturer's instructions:

- Pneumatic accessories
- Mechanical accessories
- Air preparation units
- Fittings
- Check- and flow regulator valves

But: These devices must be protected from falling objects as well.

# General information on HAFNER products for explosion hazardous environment

## Overview of product groups, categories and zones according to ATEX 2014/34 / EU and ATEX 137

According to the ATEX 2014 directive, the manufacturer must assess his products and label them accordingly:



- Divide into product groups and categories for use in different zones
- Divide into temperature classes
- Divide into explosion groups
- Determination of the permissible ambient temperatures

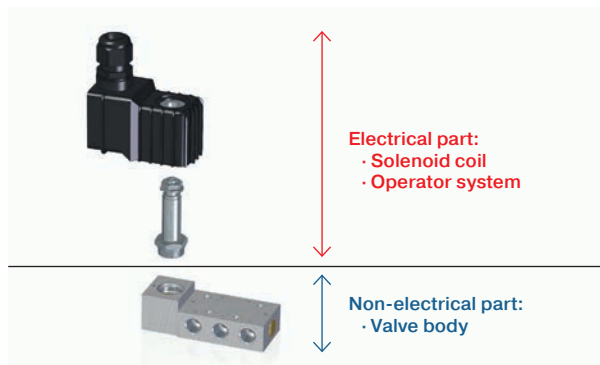
In accordance with ATEX 137, the system builder or operator must assess the system and define appropriate protective measures (e.g. in the context of an explosion protection document):



- Divide the system into zones according to the hazard potentials determined
- Determine temperature classes
- Determine explosion groups
- Determination of the occurring ambient temperatures

The plant manufacturer is responsible for ensuring that the selected components meet the requirements.

### The ATEX directive differentiates between an electrical and non-electrical device.



Electrical devices are, for example, solenoid systems. Cylinders, valves and the mechanical part of the solenoid valves are considered as “non-electrical devices”.

### Electrical and non-electrical devices are identified using the same scheme.

1. Example identification of a **non-electrical device**:



II	2G	Ex	h	IIC	T6	Gb	X
II	2G	Ex	h	IIC	T6	Gb	X

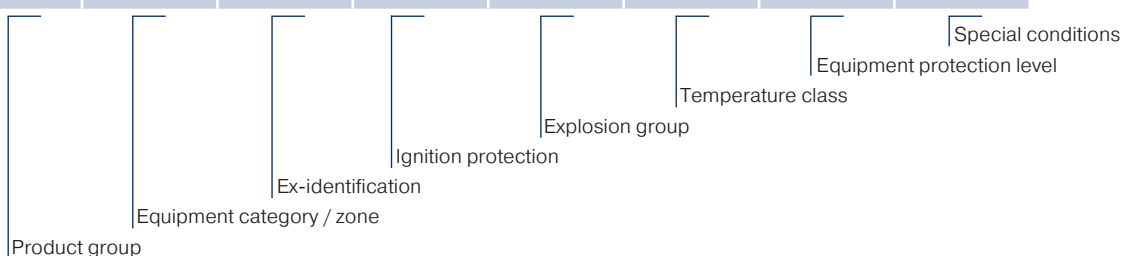
Example identification of an **electrical device**:



II	2G	Ex	e mb	IIC	T6	Gb	X
II	2G	Ex	e mb	IIC	T6	Gb	X

The two identifications differ only in terms of the type of ignition.

Gas atmosphere  
Dust atmosphere



In addition, the ambient temperature in which it is permitted to be used (e.g.  $-10^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$ ) is also printed on the products.

In the case of devices that have both markings, the respective lower Ex characteristic values shall be used.

In addition, a CE mark is mandatory.

# General information on HAFNER products for explosion hazardous environment

## Product group:

### Product group I

Products from product group I are distinguished between M1 and M2. Both are suitable for mining applications. They are not in our focus as HAFNER does not offer suitable equipment.

### Product group II

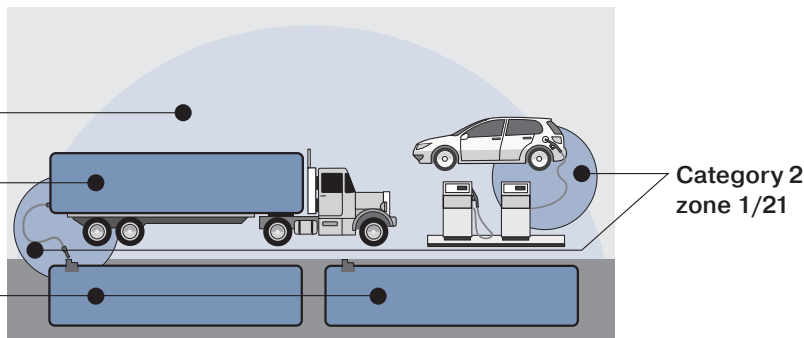
All other products for explosion hazardous environment are in this group.

## Category:

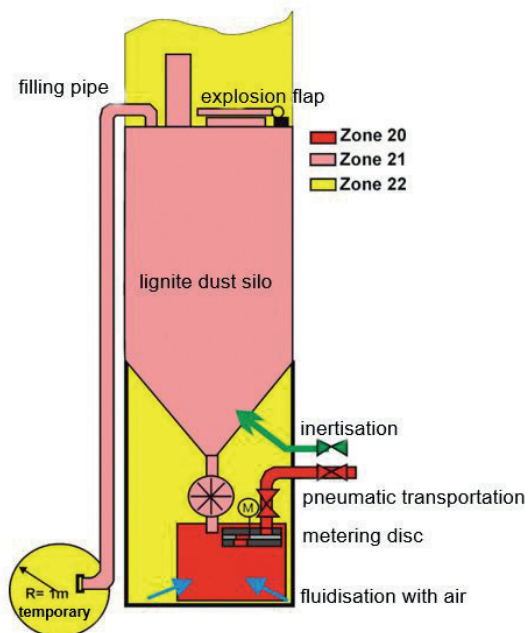
### Gas:

Category 3  
zone 2/22

Category 1  
zone 0/20



### Dust:



### Category I

An area in which an explosive mixture is continuously present or present for long periods > 1000 hours/year.

### Category II

An area in which an explosive mixture is occasionally present 10 – 1000 hours/year.

### Category III

An area in which an explosive mixture is not likely to occur in normal operation and if it occurs it will exist only for a short time < 10 hours/year.

# General information on HAFNER products for explosion hazardous environment

	Zones for Gases	Zones for Dust
<b>Category 1</b>	<b>Zone 0</b> Area in which an explosion hazardous atmosphere consisting of air and inflammable gases, vapors or fog is present constantly or over a longer period of time. > 1000 hours/year	<b>Zone 20</b> Area in which an explosion hazardous atmosphere consisting of a dust-cloud or a mix of air and dust is present constantly or over a longer period of time. > 1000 hours/year
<b>Category 2</b>	<b>Zone 1</b> Area in which there is a probability that under normal conditions an explosion hazardous atmosphere consisting of air and inflammable gases, vapors or fog can be present. 10 – 1000 hours/year	<b>Zone 21</b> Area in which there is a probability that under normal conditions an explosion hazardous atmosphere consisting of a dust-cloud or a mix of air and dust can be present. 10 – 1000 hours/year
<b>Category 3</b>	<b>Zone 2</b> Area in which once and a while an explosion hazardous atmosphere consisting of air and inflammable gases, steam or vapors can be present. < 10 hours/year	<b>Zone 22</b> Area in which once and a while an explosion hazardous atmosphere consisting of a dust-cloud or a mix of air and dust can be present. < 10 hours/year

Covered by the HAFNER product range

## Comparison of product category according to ISO 2014/34/EU with product category according to EN ISO 80079-36:

EN ISO 80079-36		Directive 2014/34/EU	
EPL	Group	Product group	Category
Ma	I (Mining)	I (Mining)	M1
Mb			M2
Ga	II (Gas)	II (Non-mining applications)	1G
Gb			2G
Gc			3G
Da	III (Dust)		1D
Db			2D
Dc			3D

## Ignition protection (examples):

	General definition:	For HAFNER products:
c	Constructional safety	general protection for mechanical ATEX
i	Intrinsic safety	called ia for solenoids
ec	Increased safety	
mb	Encapsulation	with cable
me	Encapsulation enhanced safety	called Ex emb with junction box
d	Flameproof enclosure	with junction box
dm	Flameproof encapsulation	with junction box

# General information on HAFNER products for explosion hazardous environment

## Explosion group

Depending on the type of protection, explosion-protected equipment for gases, mists and vapours is divided into three explosion groups (IIA-IIIB-IIC). The explosion group is a measure of the ignition transmission capability of gases (explosive atmosphere). The requirements on the equipment increase from IIA to IIC. Consequently, products classified IIC/IIIC can also be used in IIB/IIIB and IIA/IIIA.

Gas group device	Use in gas groups	Example	Danger increases
IIA	IIA	Propane	↓
IIB	IIA + IIB	Ethylene	
IIC	IIA + IIB + IIC	Hydrogen	

## Temperatur classes:

Flammable gases and vapours are divided into temperature classes in accordance with their flammability. The ignition temperature is the lowest temperature of a heated surface at which the ignition of a gas/air or vapour/air mixture occurs. In other words, it is the lowest temperature value at which a hot surface can ignite the corresponding explosive atmosphere.



The maximum surface temperature of electrical equipment must always be lower than the ignition temperature of the gas/air or vapour/air mixture in which it is used.

Equipment of a higher temperature class (e.g. T6) can therefore also be used for lower temperature classes (T1-T5).

Temperature class	Temperature range of the mix (°C)	Max. surface temperature (°C)	Typical gases
T1	≥ 450°C	450°C	Methane, acetone, ammonia, methanol, propane, acetic acid, town gas, hydrogen
T2	≥ 300 - 450°C	300°C	Ethylene, acetylene
T3	≥ 200 - 300°C	200°C	Petroleum, diesel, heating oils, hydrogen sulphide
T4	≥ 135 - 200°C	135°C	Acetaldehyde, ethyl ether
T5	≥ 100 - 135°C	100°C	
T6	≥ 85 - 100°C	85°C	Carbon disulphide

## Temperature classes, heating of the devices and ambient temperature



On non-electrical devices, the temperature range in which the devices can be operated must be specified. The ambient temperature range is marked by "Ta." on any HAFNER solenoid valve (example):

  II 2 G Ex h IIC T6 Gb  
-10°C ≤ Ta ≤ +50°C

  II 2 D Ex h IIIC T80°C  
Db -10°C ≤ Ta ≤ +50°C

On electrical and non-electrical devices, the maximum surface temperature is also specified. For gas atmosphere as temperature class, for dust atmosphere as absolute temperature [°C].

The temperature specification for dust is 5 °C below the maximum temperature of the temperature class.

  II 2G Ex e mb IIC T6 Gb  
II 2D Ex tb mb IIIC T80°C Db



# General information on HAFNER products for explosion hazardous environment

If the permissible ambient temperature range is not printed on the device, you can find it in the instructions and declaration of conformity.

Please note that solenoid valves can have a different ambient temperature range and maximum surface temperature for the valve body (non-electrical part) and the solenoid system (electrical part).

The user is limited by the lower values for the ambient temperature. The highest specified maximum surface temperature represents the relevant restriction for the application.

Example: valve has T6 imprint, coil T4. Then T4 counts.

## Products without an own potential source of ignition

For products without an own potential source of ignition, HAFNER issues clearance certificates. These products are not marked in terms of the ATEX directive, but an ignition risk assessment has been carried out.



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**ATEX CLEARANCE CERTIFICATE**

The company **HAFNER Pneumatika Kft.** hereby declares that the products

Actuating elements:  
BA 221 ... , BA 225 00  
Manually and mechanically actuated valves:  
BH 320 401, BH 520 401, BV 311 301, BV 511 301, BR 311 301, BR 311 501  
Logic elements:  
VA 401, VA 304, VA 341, VA 361, ES 401, ES 304, ES 341, DR 501, DR 801, DR 101, SE 501, SE 801, SE 8101, SE 121  
Hand-lever valves:  
HV 311 501, HV 311 701, HV 311 801, HV 311 101, HV 311 121,  
HVR 320 501, HVR 320 701, HVR 320 801, HVR 320 101, HVR 320 121,  
HV 511 501, HV 511 701, HV 511 801, HV 511 101, HV 511 121,  
HVR 520 501, HVR 520 701, HVR 520 801, HVR 520 101, HVR 520 121,  
HV 53\_ 501, HV 53\_ 701, HV 53\_ 801, HV 53\_ 101, HV 53\_ 121,  
HVR 53\_ 501, HVR 53\_ 701, HVR 53\_ 801, HVR 53\_ 101

Valves with Interface according to NAMUR-Standard:  
HVN 311 701, SENR 20, SENR 207, SENR 207 01, SENR 121 01, UB 701, UB 701 E, UB 701 VES, UB 701 NPT VES, UB 701 01 NPT VES,  
BHN 601, BHN 601 01, BHN 601 VES, BHN 611 01, BHN 611 02, BHN 611 02 EDS, BHN 611 02 VES, BHN 601 01 VES, BHN 611 01 VES,  
BHN 611 01 VES AIR, BHN 601 02, BHN 611 01 LL, BHN 611 04 LL, BHN 601 01 EHT, BHN 601 NPT, BHN 420 701,  
DRN 3 601, DRN 3 611, DRN 5 601, DRN 5 611, DRN 3 128, DRN 5 128

may not be put into service before the system in which it will be incorporated is declared to comply with the provisions of the European directive 2006/42/EC about the Safety of Machines, and with the regulations transposing it into national law.  
According to the directive 2014/34/EU, Article 1 and Article 2, these products do not fall under the scope of the ATEX directive, because they are not capable of causing an explosion through their own potential sources of ignition.  
So, these products are not marked in terms of the ATEX directive. An ignition risk assessment has been carried out.  
If the installation regulations for devices and facilities in potentially explosive atmospheres and areas are compiled with (e.g. ISO 80079-36, EN 60079-14, EN 61241-14), the equipment can be used as following:  
Group II, Category 2, Gas (II 2 G): for Zones 1, 2, in explosion group IIC.  
Group II, Category 2, Dust (II 2 D): for Zones 21, 22, in explosion group IIIC.  
Permitted temperature class: T6.  
Allowed ambient temperature: -10°C ≤ Ta ≤ +50°C.  
Products with "TT" suffix in the type number: -50°C ≤ Ta ≤ +50°C.

**Important notes:**

- The installation regulations valid in the designated country of use are to be observed.
- Dust deposits are to be removed regularly.
- The installation and operation instructions provided by the manufacturer are to be considered compellingly.
- Compressed air must be produced outside of the hazardous area.
- The use of any flammable or explosive flow medium is not permitted.
- Connect conductive metal parts together for potential equalization and ground the entire system.
- If the above-mentioned products are built-in in a higher-level machine / tool / equipment, the risks of this machine / tool / equipment have to be assessed by the manufacturer of the higher-level machine / tool / equipment.

07.03.2023, Halászi


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Gergely Ujváry  
General Manager

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| VAT-Nr.: 10579785-2-08 | [ertekesites@hafner-pneumatika.com](mailto:ertekesites@hafner-pneumatika.com) | [www.hafner-pneumatika.com](http://www.hafner-pneumatika.com) |

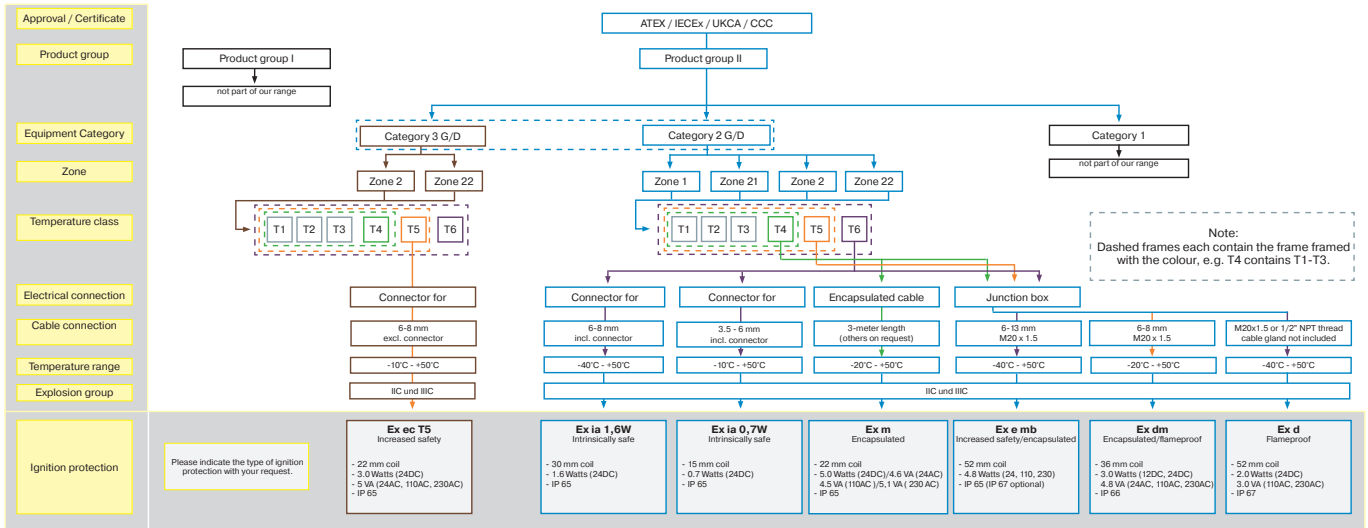
According to the directive 2014/34/EU, Article 1 and Article 2, these products do not fall under the scope of the ATEX directive. You can find a product list on page 2.15.3.

Please note that there are two different ATEX clearance certificates for products that can be used in explosion group IIC / IIIC and IIB / IIIC.

# General information on HAFNER products for explosion hazardous environment

## Temperature classes, heating of the devices and ambient temperature

The following product selection tree can help to determine the correct type of ignition protection. However, only ATEX products are considered here. Some of these are also certified per IECEx. See table on page 2.15.6.1. CSA/FM approved coils can be found on page 2.15.6.2.3.





Errors and omissions excepted



# Non-electric valves for explosion hazardous environment

## Pneumatically actuated valves and panel mounting valves series “BAS”

The following pneumatically actuated valves and panel mounting valves of the series “BAS” are available for the use in explosion hazardous environment.

Marking on valve, products for zone 2, 22

  II 3 G Ex h IIC T6 Gb  
-10°C ≤ Ta ≤ +50°C

  II 3 D Ex h IIIC T80°C  
Db -10°C ≤ Ta ≤ +50°C

Marking on valve, products for zone 1, 21, 2, 22

  II 2 G Ex h IIC T6 Gb  
-10°C Ta +50°C

  II 2 D Ex h IIIC T80°C  
Db -10°C Ta +50°C

Low temperature versions with adjusted temperature range.



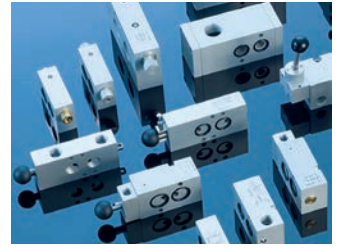
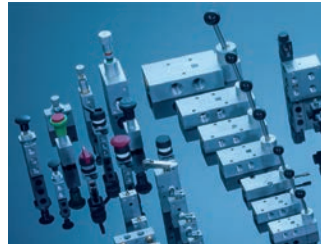
Type	ATEX zone	Function	Port size	Further information on valve on page	Low Temp.	Stainl. Steel
<b>Panel mounting valves</b>						
BAS 311 501 TT AIR Ex	1, 21, 2, 22	3/2-way, for panel mounting	G 1/8"			2.12.2.1
BAS 511 501 TT AIR Ex	1, 21, 2, 22	5/2-way, for panel mounting	G 1/8"			2.12.2.1
BAS 30_ Ex	1, 21, 2, 22	Actuating elements	-	2.2.2		
<b>Pneumatically actuated valves</b>						
P 310 502 EX	1, 21, 2, 22	3/2-way, single pilot	G 1/8"	2.4.1.1		
P 310 501 G EX	1, 21, 2, 22	3/2-way, single pilot	G 1/8"	2.4.1.2		
P 310 701 G EX	1, 21, 2, 22	3/2-way, single pilot	G 1/4" - 1/4" NPT	2.4.1.2	2.12.5.1	2.13.3.1
P 310 801 EX	1, 21, 2, 22	3/2-way, single pilot	G 1/4"	2.4.1.2		
P 310 101 EX	1, 21, 2, 22	3/2-way, single pilot	G 3/8"	2.4.1.3		
P 310 121 EX	1, 21, 2, 22	3/2-way, single pilot	G 1/2" - 1/2" NPT	2.4.1.3	2.12.5.2	2.13.3.1
P 310 181 EX	1, 21, 2, 22	3/2-way, single pilot	G 3/4"	2.4.1.3		
P 311 501 G EX	2, 22	3/2-way, single pilot, mech. spring	G 1/8"	2.4.1.2		
P 311 701 G EX	2, 22	3/2-way, single pilot, mech. spring	G 1/4" - 1/4" NPT	2.4.1.2	2.12.5.1	2.13.3.1
P 311 801 EX	2, 22	3/2-way, single pilot, mech. spring	G 1/4"	2.4.1.2		
P 311 101 EX	2, 22	3/2-way, single pilot, mech. spring	G 3/8"	2.4.1.3		
P 311 121 EX	2, 22	3/2-way, single pilot, mech. spring	G 1/2" - 1/2" NPT	2.4.1.3	2.12.5.2	2.13.3.1
P 311 181 EX	2, 22	3/2-way, single pilot, mech. spring	G 3/4"	2.4.1.3		
P 320 502 EX	1, 21, 2, 22	3/2-way, double pilot	G 1/8"	2.4.1.1		
P 320 501 G EX	1, 21, 2, 22	3/2-way, double pilot	G 1/8"	2.4.1.4		
P 320 701 G EX	1, 21, 2, 22	3/2-way, double pilot	G 1/4" - 1/4" NPT	2.4.1.4	2.12.5.1	
P 320 801 EX	1, 21, 2, 22	3/2-way, double pilot	G 1/4"	2.4.1.4		
P 320 101 EX	1, 21, 2, 22	3/2-way, double pilot	G 3/8"	2.4.1.5		
P 320 121 EX	1, 21, 2, 22	3/2-way, double pilot	G 1/2" - 1/2" NPT	2.4.1.5		
P 320 181 EX	1, 21, 2, 22	3/2-way, double pilot	G 3/4"	2.4.1.5		
P 510 502 EX	1, 21, 2, 22	5/2-way, single pilot	G 1/8"	2.4.2.1		
P 510 501 G EX	1, 21, 2, 22	5/2-way, single pilot	G 1/8"	2.4.2.2		
P 510 701 G EX	1, 21, 2, 22	5/2-way, single pilot	G 1/4" - 1/4" NPT	2.4.2.2	2.12.5.3	2.13.3.2
P 510 801 EX	1, 21, 2, 22	5/2-way, single pilot	G 1/4"	2.4.2.2		
P 510 101 EX	1, 21, 2, 22	5/2-way, single pilot	G 3/8"	2.4.2.3		
P 510 121 EX	1, 21, 2, 22	5/2-way, single pilot	G 1/2" - 1/2" NPT	2.4.2.3	2.12.5.3	2.13.3.2
P 510 181 EX	1, 21, 2, 22	5/2-way, single pilot	G 3/4"	2.4.2.3		
P 511 501 G EX	2, 22 (VES version also 1, 21)	5/2-way, single pilot, mech. spring	G 1/8"	2.4.2.2		
P 511 701 G EX	2, 22 (VES version also 1, 21)	5/2-way, single pilot, mech. spring	G 1/4" - 1/4" NPT	2.4.2.2	2.12.5.3	2.13.3.2
P 511 801 EX	2, 22	5/2-way, single pilot, mech. spring	G 1/4"	2.4.2.2		
P 511 101 EX	2, 22	5/2-way, single pilot, mech. spring	G 3/8"	2.4.2.3		
P 511 121 EX	2, 22	5/2-way, single pilot, mech. spring	G 1/2" - 1/2" NPT	2.4.2.3	2.12.5.3	2.13.3.2
P 511 181 EX	2, 22	5/2-way, single pilot, mech. spring	G 3/4"	2.4.2.3		
P 520 502 EX	1, 21, 2, 22	5/2-way, double pilot	G 1/8"	2.4.2.1		
P 520 501 G EX	1, 21, 2, 22	5/2-way, double pilot	G 1/8"	2.4.2.4		
P 520 701 G EX	1, 21, 2, 22	5/2-way, double pilot	G 1/4" - 1/4" NPT	2.4.2.4	2.12.5.4	2.13.3.3
P 520 801 EX	1, 21, 2, 22	5/2-way, double pilot	G 1/4"	2.4.2.4		
P 520 101 EX	1, 21, 2, 22	5/2-way, double pilot	G 3/8"	2.4.2.5		
P 520 121 EX	1, 21, 2, 22	5/2-way, double pilot	G 1/2" - 1/2" NPT	2.4.2.5		2.12.3.3
P 520 181 EX	1, 21, 2, 22	5/2-way, double pilot	G 3/4"	2.4.2.5		
P 53_ 501 G EX	1, 21, 2, 22	5/3-way, 3 options	G 1/8"	2.4.3.1		
P 53_ 701 G EX	1, 21, 2, 22	5/3-way, 3 options	G 1/4" - 1/4" NPT	2.4.3.1	2.12.5.4	2.13.3.3
P 53_ 801 EX	1, 21, 2, 22	5/3-way, 3 options	G 1/4"	2.4.3.1		
P 53_ 101 EX	1, 21, 2, 22	5/3-way, 3 options	G 3/8"	2.4.3.2		
P 53_ 121 EX	1, 21, 2, 22	5/3-way, 3 options	G 1/2" - 1/2" NPT	2.4.3.2	2.12.5.4	2.13.3.3
P 53_ 181 EX	1, 21, 2, 22	5/3-way, 3 options	G 1/2" - 1/2" NPT	2.4.3.2		
P 311 501 SR EX	2, 22	3/2-way adjustable pneumatic pressure switch	G 1/8"	2.4.5.3		
P 411 701 SR EX	2, 22	5/2-way adjustable pneumatic pressure switch	G 1/4"	2.4.5.3		
<b>Pneumatically actuated valves with interface according to NAMUR-Standard</b>						
PN 310 701 EX	1, 21, 2, 22	3/2-way, single sol.	G 1/4" - 1/4" NAMUR	2.10.2.1	contact us	contact us
PN 311 701 EX	1, 21, 2, 22	3/2-way, single sol., comb. spring	G 1/4" - 1/4" NAMUR	2.10.2.1		
PN 310 121 EX	1, 21, 2, 22	3/2-way, single sol.	G 1/2" - 1/2" NAMUR	2.10.2.1		
PN 510 701 EX	1, 21, 2, 22	5/2-way, single sol.	G 1/4" - 1/4" NAMUR	2.10.2.2	contact us	contact us
PN 510 121 EX	1, 21, 2, 22	5/2-way, single sol.	G 1/2" - 1/2" NAMUR	2.10.2.2		
PN 520 701 EX	1, 21, 2, 22	5/2-way, double sol.	G 1/4" - 1/4" NAMUR	2.10.2.2	contact us	
PN 520 121 EX	1, 21, 2, 22	5/2-way, double sol.	G 1/2" - 1/2" NAMUR	2.10.2.2		
PN 53_ 701 EX	1, 21, 2, 22	5/3-way, 3 options	G 1/4" - 1/4" NAMUR	2.10.2.3	contact us	
PN 53_ 121 EX	1, 21, 2, 22	5/3-way, 3 options	G 1/2" - 1/2" NAMUR	2.10.2.3		
PN 611 611 EX	2, 22	Pneumatically actuated block and vent valve	1/4" NAMUR	2.11.8		
CBE 700 K EX	1, 21, 2, 22	Controlblock for butterfly valves with inflatable valve-seat, single acting	1/4" NAMUR	2.11.11		
CBE 700 K EB EX	1, 21, 2, 22	Controlblock for butterfly valves with inflatable valve-seat, single acting, with feedback port	1/4" NAMUR	2.11.11		
CBN 700 K EX	1, 21, 2, 22	Controlblock for butterfly valves with inflatable valve-seat, double acting	1/4" NAMUR	2.11.12		
CBN 700 K EB EX	1, 21, 2, 22	Controlblock for butterfly valves with inflatable valve-seat, double acting, with feedback port	1/4" NAMUR	2.11.12		

# Products with clearance certificate



Products which do not fall under the scope of the ATEX directive can be supplied with a clearance certificate. The prerequisite for this is that a risk assessment has been carried out by the manufacturer. According to that, the products can be used in the ATEX zones specified below.

Products with clearance certificate do not carry any ATEX marking. For products which are not mentioned in the table, please contact the manufacturer.



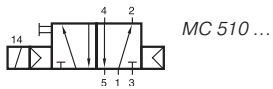
Type	ATEX zone	Explosion group Gas / Dust	Function	Port size	Further information on valve on page		
					Aluminum	Low Temp.	Stainl. Steel
<b>Panel mounting valves</b>							
BA 311 301	1, 21, 2, 22	IIB / IIIC	3/2-way, for panel mounting	G 1/8"	2.2.3		
BA 511 301	1, 21, 2, 22	IIB / IIIC	5/2-way, for panel mounting	G 1/8"	2.2.4		
BA 221 _ _	1, 21, 2, 22	IIC / IIIC	Push buttons	-	2.2.1		
BA 225 00	1, 21, 2, 22	IIC / IIIC	Locking switch	-	2.2.1		
BA 222 01	1, 21, 2, 22	IIB / IIIC	Palm button	-	2.2.1		
BA 223 02	1, 21, 2, 22	IIB / IIIC	Palm button with detend	-	2.2.1		
BA 224 01	1, 21, 2, 22	IIB / IIIC	Rotary lever long	-	2.2.1		
BA 226 01	1, 21, 2, 22	IIB / IIIC	Switch	-	2.2.1		
BA 227 01	1, 21, 2, 22	IIB / IIIC	Rotary lever short	-	2.2.1		
<b>Manually and mechanically actuated valves</b>							
BH 320 401	1, 21, 2, 22	IIC / IIIC	3/2-way, push-pull valve	G 1/8"	2.2.8		
BH 320 701	1, 21, 2, 22	IIB / IIIC	3/2-way, push-pull valve	G 1/4"	2.2.8		
BH 520 401	1, 21, 2, 22	IIC / IIIC	5/2-way, push-pull valve	G 1/8"	2.2.9		
BH 520 701	1, 21, 2, 22	IIB / IIIC	5/2-way, push-pull valve	G 1/4"	2.2.9		
BV 311 301	1, 21, 2, 22	IIC / IIIC	3/2-way, stem actuated	G 1/8"	2.1.1.4		
BV 511 301	1, 21, 2, 22	IIC / IIIC	3/2-way, stem actuated	G 1/8"	2.1.2.2		
BR 311 301	1, 21, 2, 22	IIC / IIIC	3/2-way, roller lever	G 1/8"	2.1.1.4		
BR 311 501	1, 21, 2, 22	IIC / IIIC	3/2-way, roller lever	G 1/8"	2.1.1.6		
<b>Logic elements</b>							
VA 401	1, 21, 2, 22	IIC / IIIC	OR-gate	G 1/8"	2.4.5.1	2.12.6.2	
VA 304	1, 21, 2, 22	IIC / IIIC	OR-gate	Manifold	2.4.6.3		
VA 341	1, 21, 2, 22	IIC / IIIC	OR-gate	G 1/8"	2.4.5.1		
VA 361	1, 21, 2, 22	IIC / IIIC	OR-gate	6 mm pif	2.4.5.1		
ES 401	1, 21, 2, 22	IIC / IIIC	AND-gate	G 1/8"	2.5.4.1	2.12.6.2	
ES 304	1, 21, 2, 22	IIC / IIIC	AND-gate	Manifold	2.4.6.3		
ES 341	1, 21, 2, 22	IIC / IIIC	AND-gate	4 mm pif	2.4.5.1		
DR 501	1, 21, 2, 22	IIC / IIIC	Block form flow regulator, uni	G 1/8"	2.4.5.7	2.12.6.3	
DR 801	1, 21, 2, 22	IIC / IIIC	Block form flow regulator, uni	G 1/4"	2.4.5.7	2.12.6.3	
DR 101	1, 21, 2, 22	IIC / IIIC	Block form flow regulator, uni	G 3/8"	2.4.5.7	2.12.6.3	
SE 501	1, 21, 2, 22	IIC / IIIC	Quick-Exhaust valve	G 1/8"	2.5.4.2	2.12.6.1	2.13.3.5
SE 801	1, 21, 2, 22	IIC / IIIC	Quick-Exhaust valve	G 1/4"	2.5.4.2	2.12.6.1	2.13.3.5
SE 8101	1, 21, 2, 22	IIC / IIIC	Quick-Exhaust valve	G 1/4" - G 3/8"	2.5.4.2	2.12.6.1	2.13.3.5
SE 121	1, 21, 2, 22	IIC / IIIC	Quick-Exhaust valve	G 1/2"	2.5.4.2	2.12.6.1	2.13.3.5
<b>Hand-lever valves</b>							
HV 311 501	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	G 1/8"	2.3.1.1		
HV 311 701	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	G 1/4"	2.3.1.1	2.12.4.1	2.13.2.1
HV 311 801	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	G 1/4"	2.3.1.1		
HV 311 101	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	G 3/8"	2.3.1.2		
HV 311 121	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	G 1/2"	2.3.1.2	2.12.4.1	2.13.2.1
HV 311 181	1, 21, 2, 22	IIB / IIIC	3/2-way, spring return	G 3/4"	2.3.1.2		
HVR 320 501	1, 21, 2, 22	IIC / IIIC	3/2-way, indexed	G 1/8"	2.3.1.1		
HVR 320 701	1, 21, 2, 22	IIC / IIIC	3/2-way, indexed	G 1/4"	2.3.1.1	2.12.4.1	2.13.2.1
HVR 320 801	1, 21, 2, 22	IIC / IIIC	3/2-way, indexed	G 1/4"	2.3.1.1		
KVR 320 101	1, 21, 2, 22	IIC / IIIC	3/2-way, indexed	G 3/8"	2.3.1.2		
HVR 320 121	1, 21, 2, 22	IIC / IIIC	3/2-way, indexed	G 1/2"	2.3.1.2	2.12.4.1	2.13.2.1
HVR 320 181	1, 21, 2, 22	IIB / IIIC	3/2-way, indexed	G 3/4"	2.3.1.2		
HV 511 501	1, 21, 2, 22	IIC / IIIC	5/2-way, spring return	G 1/8"	2.3.2.1		
HV 511 701	1, 21, 2, 22	IIC / IIIC	5/2-way, spring return	G 1/4"	2.3.2.1	2.12.4.2	2.13.2.2
HV 511 801	1, 21, 2, 22	IIC / IIIC	5/2-way, spring return	G 1/4"	2.3.2.1		
HV 511 101	1, 21, 2, 22	IIC / IIIC	5/2-way, spring return	G 3/8"	2.3.2.2		
HV 511 121	1, 21, 2, 22	IIC / IIIC	5/2-way, spring return	G 1/2"	2.3.2.2	2.12.4.2	2.13.2.3
HV 511 181	1, 21, 2, 22	IIB / IIIC	5/2-way, spring return	G 3/4"	2.3.2.2		
HVR 520 501	1, 21, 2, 22	IIC / IIIC	5/2-way, indexed	G 1/8"	2.3.2.1		
HVR 520 701	1, 21, 2, 22	IIC / IIIC	5/2-way, indexed	G 1/4"	2.3.2.1	2.12.4.2	2.13.2.2
HVR 520 801	1, 21, 2, 22	IIC / IIIC	5/2-way, indexed	G 1/4"	2.3.2.1		
HVR 520 101	1, 21, 2, 22	IIC / IIIC	5/2-way, indexed	G 3/8"	2.3.2.2		
HVR 520 121	1, 21, 2, 22	IIC / IIIC	5/2-way, indexed	G 1/2"	2.3.2.2	2.12.4.2	2.13.2.3
HVR 520 181	1, 21, 2, 22	IIB / IIIC	5/2-way, indexed	G 3/4"	2.3.2.2		
HV 53_ 501	1, 21, 2, 22	IIC / IIIC	5/3-way, spring return, 3 options	G 1/8"	2.3.3.1		
HV 53_ 701	1, 21, 2, 22	IIC / IIIC	5/3-way, spring return, 3 options	G 1/4"	2.3.3.1	2.12.4.3	2.13.2.2
HV 53_ 801	1, 21, 2, 22	IIC / IIIC	5/3-way, spring return, 3 options	G 1/4"	2.3.3.1		
HV 53_ 101	1, 21, 2, 22	IIC / IIIC	5/3-way, spring return, 3 options	G 3/8"	2.3.3.2		
HV 53_ 121	1, 21, 2, 22	IIC / IIIC	5/3-way, spring return, 3 options	G 1/2"	2.3.3.2	2.12.4.3	2.13.2.3
HV 53_ 181	1, 21, 2, 22	IIB / IIIC	5/3-way, spring return, 3 options	G 3/4"	2.3.3.2		
HVR 53_ 501	1, 21, 2, 22	IIC / IIIC	5/3-way, indexed, 3 options	G 1/8"	2.3.3.1		
HVR 53_ 701	1, 21, 2, 22	IIC / IIIC	5/3-way, indexed, 3 options	G 1/4"	2.3.3.1	2.12.4.3	2.13.2.2
HVR 53_ 801	1, 21, 2, 22	IIC / IIIC	5/3-way, indexed, 3 options	G 1/4"	2.3.3.1		
HVR 53_ 101	1, 21, 2, 22	IIC / IIIC	5/3-way, indexed, 3 options	G 3/8"	2.3.3.2		
HVR 53_ 121	1, 21, 2, 22	IIC / IIIC	5/3-way, indexed, 3 options	G 1/2"	2.3.3.2	2.12.4.3	2.13.2.3
HVR 53_ 181	1, 21, 2, 22	IIB / IIIC	5/3-way, indexed, 3 options	G 3/4"	2.3.3.2		
<b>Valves with Interface according to NAMUR-Standard</b>							
HVN 311 701	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	1/4" NAMUR	2.10.3		
SENR 20	1, 21, 2, 22	IIC / IIIC	Quick-exhaust valve with NAMUR interface, G 1/4"	1/4" NAMUR	2.11.4	contact us	
SENR 207	1, 21, 2, 22	IIC / IIIC	Quick-exhaust valve with NAMUR interface, 1/4" NAMUR	1/4" NAMUR	2.11.4	contact us	
SENR 207 01	1, 21, 2, 22	IIC / IIIC	Quick-exhaust valve with NAMUR interface, G 1/4" + 1/4" NAMUR	1/4" NAMUR	2.11.4	2.12.8.5	contact us
SENR 121 01	1, 21, 2, 22	IIC / IIIC	Quick-exhaust valve with NAMUR interface, G 1/4" + 1/4" NAMUR	1/2" NAMUR	contact us		
UB 701	1, 21, 2, 22	IIC / IIIC	Air-recirculation block with NAMUR interface	1/4" NAMUR	2.11.3	2.12.8.4	2.13.5.6
BHN 601	1, 21, 2, 22	IIC / IIIC	Block- and bleed valve, vents actuator, O-position lockable	1/4" NAMUR	2.11.6		contact us
BHN 601 01	1, 21, 2, 22	IIC / IIIC	Block- and bleed valve, vents actuator, M-position lockable	1/4" NAMUR	2.11.6		
BHN 611 01	1, 21, 2, 22	IIC / IIIC	Block- and bleed valve, blocks actuator, M-position lockable	1/4" NAMUR	2.11.6		contact us
BHN 420 701	1, 21, 2, 22	IIC / IIIC	Short-cut valve	1/4" NAMUR	2.11.5		
DRN 3 601	1, 21, 2, 22	IIC / IIIC	3-way flow regulator plate	1/4" NAMUR	2.11.1		
DRN 3 611	1, 21, 2, 22	IIC / IIIC	3-way flow regulator plate	1/4" NAMUR	2.11.1	2.12.8.3	2.13.5.5
DRN 5 601	1, 21, 2, 22	IIC / IIIC	5-way flow regulator plate	1/4" NAMUR	2.11.2		
DRN 5 611	1, 21, 2, 22	IIC / IIIC	5-way flow regulator plate	1/4" NAMUR	2.11.2	2.12.8.3	2.13.5.5
DRN 3 128	1, 21, 2, 22	IIC / IIIC	3-way flow regulator plate	1/2" NAMUR	2.11.1		
DRN 5 128	1, 21, 2, 22	IIC / IIIC	5-way flow regulator plate	1/2" NAMUR	2.11.2		





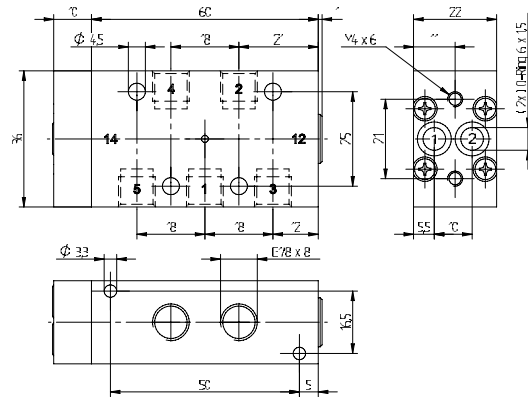
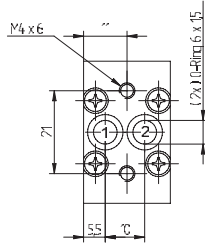
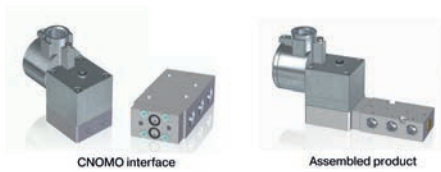


# MC 510 501 G ... Ex/MC 510 701 G ... Ex MC 510 121 ... Ex



MC 510 ...

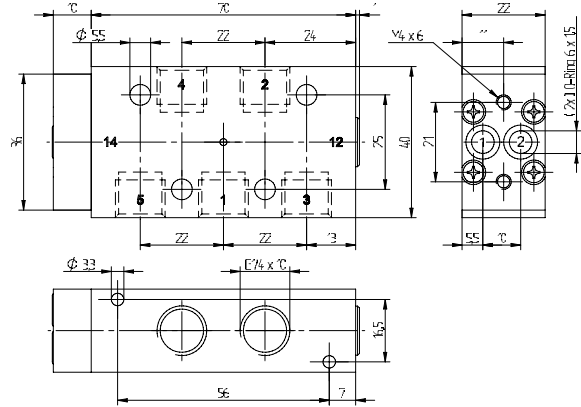
Please note: ISO-symbol has been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



MC 510 501 G ... Ex

Valves with CNOMO-interface to be used with explosion proof solenoid systems displayed on page 2.15.6.7.5. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

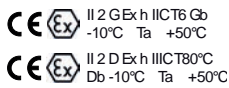
Please note for low temperature valves 701...TT: When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried! Below -40°C the leakage-rate of the valve can increase to 10 cm<sup>3</sup> / min. Use unlubricated air only.



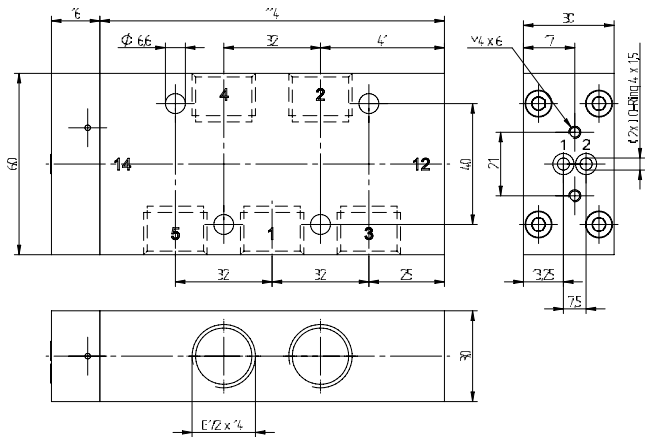
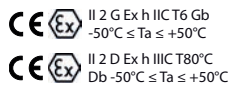
MC 510 701 G ... Ex \*

Zone: 1, 2, 21, 22  
Temperature class: T6

Marking on valve:  
Standard temperature



Low temperature (TT)



MC 510 121 Ex ...

\*Valves without "G" in the type number don't contain the vertical mounting holes for manifold assembly as displayed in the drawing.

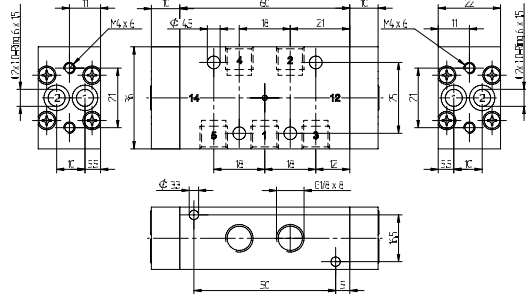
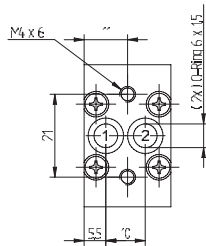
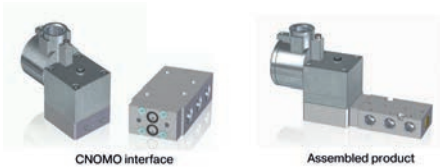
Type	Function	Material	Temp. range	Port size	Air flow	Operating press.	Weight
MC 510 501 G Ex	5/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/8"	650 l/min	2 - 10 bar	0,15 kg
MC 510 701 G Ex	5/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar	0,17 kg
MC 510 701 GTT Ex	5/2-way, single sol.	Aluminum	-50°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar*	0,17 kg
MC 510 701 VES Ex	5/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar	0,42 kg
MC 510 701 VES TT Ex	5/2-way, single sol.	Stainless steel	-50°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar*	0,42 kg
MC 510 121 Ex	5/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	0,59 kg
MC 510 121 VES Ex	5/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	1,39 kg

\* Below -20° C the operating pressure increases to 3 bar.

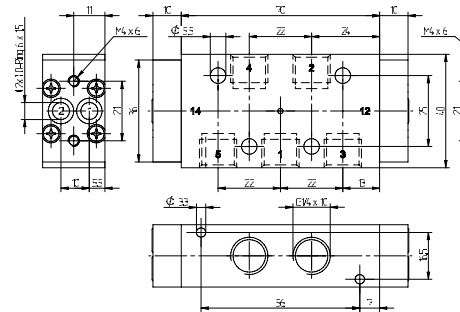
# MC 520 501 G ... Ex/MC 520 701 G ... Ex/MC 520 121 ... Ex MC 53\_501 G ... Ex/MC 53\_701 G ... Ex/MC 53\_121 ... Ex



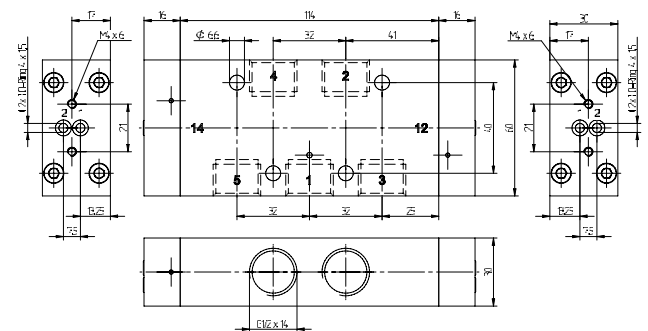
Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



MC 520 501 G ... Ex / MC 53\_501 G ... Ex



MC 520 701 G ... Ex \* / MC 53\_701 G ... Ex \*



MC 520 121 ... Ex / MC 53\_121 ... Ex

Valves with CNOMO-interface to be used with explosion proof solenoid systems displayed on page 2.15.6.7.5. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

Please note for low temperature valves 701...TT: When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried! Below -40° C the leakage-rate of the valve can increase to 10 cm<sup>3</sup> / min. Use unlubricated air only.

Zone: 1, 2, 21, 22  
Temperature class: T6

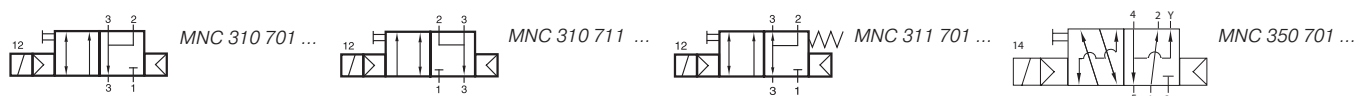
Marking on valve:  
Standard temperature  
 II 2 G Ex h IICT6 Gb  
 -10°C Ta +50°C  
 II 2 D Ex h IIICT80°C  
 Db -10°C Ta +50°C  
 Low temperature (TT)  
 II 2 G Ex h IICT6 Gb  
 -50°C ≤ Ta ≤ +50°C  
 II 2 D Ex h IIICT80°C  
 Db -50°C ≤ Ta ≤ +50°C

\*Valves without "G" in the type number don't contain the vertical mounting holes for manifold assembly as displayed in the drawing.

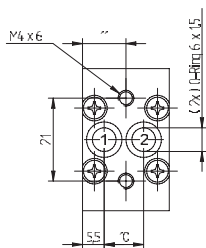
Type	Function	Material	Temp. range	Port size	Air flow	Operating press.	Weight
MC 520 501 G Ex	5/2-way, double sol.	Aluminum	-10°C ... +50°C	G 1/8"	650 l/min	2 - 10 bar	0,17 kg
MC 520 701 G Ex	5/2-way, double sol.	Aluminum	-10°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar	0,19 kg
MC 520 701 GTT Ex	5/2-way, double sol.	Aluminum	-50°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar*	0,19 kg
MC 520 701 VES Ex	5/2-way, double sol.	Stainless steel	-10°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar	0,52 kg
MC 520 701 VES TT Ex	5/2-way, double sol.	Stainless steel	-50°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar*	0,52 kg
MC 520 121 Ex	5/2-way, double sol.	Aluminum	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	0,68 kg
MC 520 121 VES Ex	5/2-way, double sol.	Stainless steel	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	1,48 kg
MC 53_501 G Ex	5/3-way	Aluminum	-10°C ... +50°C	G 1/8"	650 l/min	3 - 10 bar	0,17 kg
MC 53_701 G Ex	5/3-way	Aluminum	-10°C ... +50°C	G 1/4"	1250l/min	3 - 10 bar	0,19 kg
MC 53_701 GTT Ex	5/3-way	Aluminum	-50°C ... +50°C	G 1/4"	1250l/min	3 - 10 bar	0,19 kg
MC 53_701 VES Ex	5/3-way	Stainless steel	-10°C ... +50°C	G 1/4"	1250l/min	3 - 10 bar	0,52 kg
MC 53_701 VES TT Ex	5/3-way	Stainless steel	-50°C ... +50°C	G 1/4"	1250l/min	3 - 10 bar	0,52 kg
MC 53_121 Ex	5/3-way	Aluminum	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	0,68 kg
MC 53_121 VES Ex	5/3-way	Stainless steel	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	1,48 kg

\* Below -20° C the operating pressure increases to 3 bar.

# MNC 350 701 ... Ex/MNC 310 701 ... Ex/MNC 311 701 ... Ex MNC 310 711 ... Ex/MNC 310 121 ... Ex/MNC 311 121 ... Ex ...



Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.

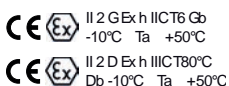


Valves with CNOMO-interface to be used with explosion proof solenoid systems displayed on page 2.15.6.7.5. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

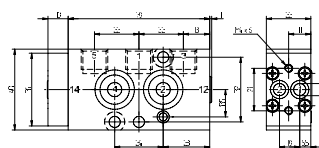
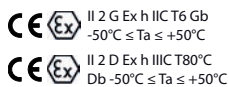
Please note for low temperature valves 701...TT: When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried! Below -40°C the leakage-rate of the valve can increase to 10 cm<sup>3</sup> / min. Use unlubricated air only.

Zone: 1, 2, 21, 22  
Temperature class: T6

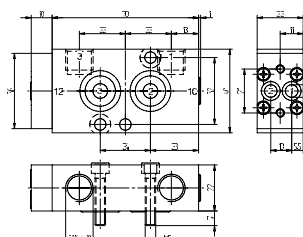
Marking on valve:  
Standard temperature



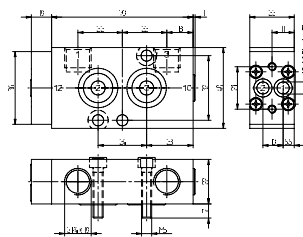
Low temperature (TT)



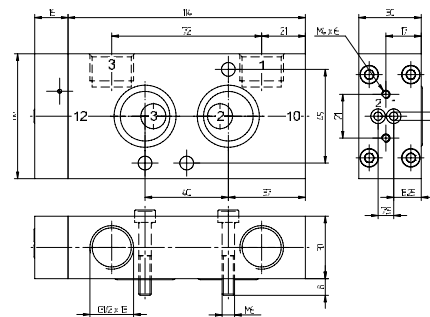
**MNC 350 701 ... Ex**



**MNC 31\_701 ... Ex**



**MNC 310 711 ... Ex**

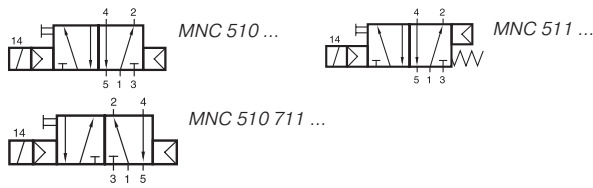


**MNC 310 121 ... Ex**

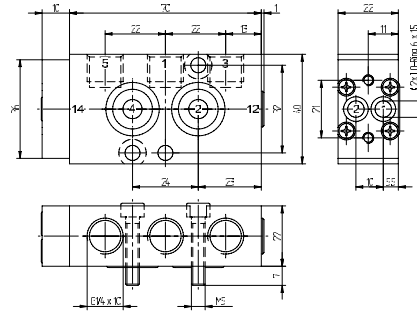
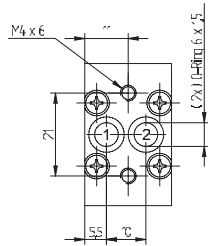
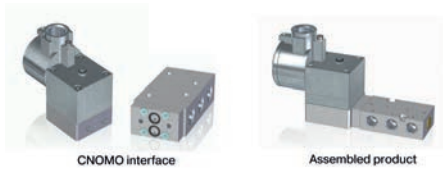
Type	Function	Material	Temp. range	Port size	Air flow	Operating press.	Weight
MNC 350 701 Ex	3/2-way & 5/2-way	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,18 kg
MNC 350 701 VES Ex	3/2-way & 5/2-way	Stainless steel	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,46 kg
MNC 350 701 VES TT Ex	3/2-way & 5/2-way	Stainless steel	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,46 kg
MNC 310 701 Ex	3/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,18 kg
MNC 310 701 TT Ex	3/2-way, single sol.	Aluminum	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,18 kg
MNC 310 701 VES Ex	3/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,46 kg
MNC 310 701 VES TT Ex	3/2-way, single sol.	Stainless steel	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,46 kg
MNC 311 701 Ex	3/2-way, single sol., comb. spring	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2,5 - 10 bar*	0,18 kg
MNC 311 701 TT Ex	3/2-way, single sol., comb. spring	Aluminum	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	3 - 10 bar	0,18 kg
MNC 311 701 VES Ex	3/2-way, single sol., comb. spring	Stainless steel	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2,5 - 10 bar*	0,46 kg
MNC 311 701 VES TT Ex	3/2-way, single sol., comb. spring	Stainless steel	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	3 - 10 bar	0,46 kg
MNC 310 711 Ex	3/2-way, single sol., swapped ports	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,18 kg
MNC 310 121 Ex	3/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	0,62 kg
MNC 310 121 VES	3/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	1,38 kg
MNC 311 121 Ex	3/2-way, single sol., comb. spring	Aluminum	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	2,5 - 10 bar	0,62 kg

\* Below -20° C the operating pressure increases to 3 bar.

# MNC 510 701 ... Ex/MNC 511 701 ... Ex/MNC 510 711 ... Ex MNC 510 121 ... Ex/MNC 511 121 Ex



Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



MNC 51\_701 ... Ex

Valves with CNOMO-interface to be used with explosion proof solenoid systems displayed on page 2.15.6.7.5. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

Please note for low temperature valves 701...TT: When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried! Below -40° C the leakage-rate of the valve can increase to 10 cm<sup>3</sup> / min. Use unlubricated air only.

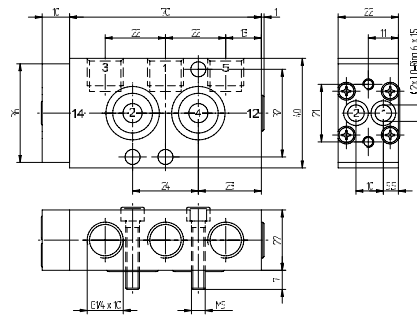
Zone: 1, 2, 21, 22  
Temperature class: T6

Marking on valve:  
Standard temperature

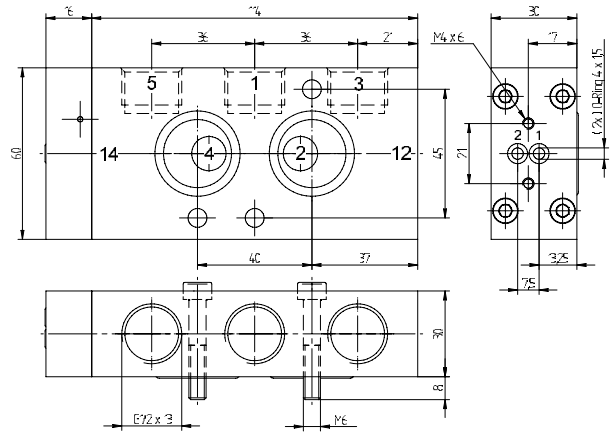
**CE Ex** II 2 G Ex h IIC T6 Gb  
-10°C Ta +50°C  
**CE Ex** II 2 D Ex h IIC T80°C  
Db -10°C Ta +50°C

Low temperature (TT)

**CE Ex** II 2 G Ex h IIC T6 Gb  
-50°C ≤ Ta ≤ +50°C  
**CE Ex** II 2 D Ex h IIC T80°C  
Db -50°C ≤ Ta ≤ +50°C



MNC 510 711 ... Ex



MNC 51\_121 ... Ex

Type	Function	Material	Temp. range	Port size	Air flow	Operating press.	Weight
MNC 510 701 Ex	5/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,18 kg
MNC 510 701 TT Ex	5/2-way, single sol.	Aluminum	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,18 kg
MNC 510 701 VES Ex	5/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,46 kg
MNC 510 701 VES TT Ex	5/2-way, single sol.	Stainless steel	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,46 kg
MNC 511 701 Ex	5/2-way, single sol., comb. spring	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2,5 - 10 bar	0,18 kg
MNC 511 701 TT Ex	5/2-way, single sol., comb. spring	Aluminum	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2,5 - 10 bar*	0,18 kg
MNC 511 701 VES Ex	5/2-way, single sol., comb. spring	Stainless steel	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2,5 - 10 bar	0,46 kg
MNC 511 701 VES TT Ex	5/2-way, single sol., comb. spring	Stainless steel	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2,5 - 10 bar*	0,46 kg
MNC 510 711 Ex	5/2-way, single sol., swapped ports	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2,5 - 10 bar	0,18 kg
MNC 510 121 Ex	5/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	0,62 kg
MNC 510 121 VES	5/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	1,38 kg
MNC 511 121 Ex	5/2-way, single sol., comb. spring	Aluminum	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	2,5 - 10 bar	0,62 kg

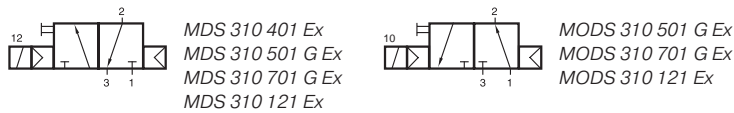
\* Below -20° C the operating pressure increases to 3 bar.



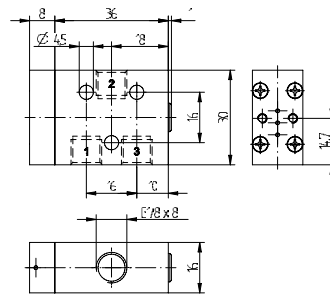




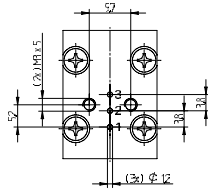
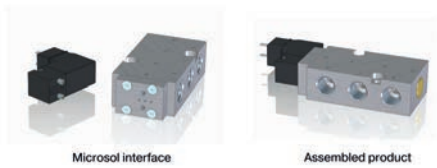
# MDS 310 401 Ex/M(O)DS 310 501 G Ex M(O)DS 310 701 G Ex/M(O)DS 310 121 Ex



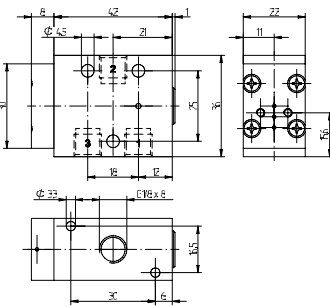
Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



**MDS 310 401 Ex**



Valves with Microsol interface to be used with explosion proof solenoid systems displayed on page 2.15.6.4.2. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.



**M(O)DS 310 501 G Ex**

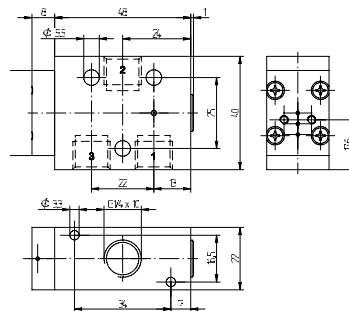
Zone: 1, 2, 21, 22  
Temperature class: T6

Marking on valve  
 II 2 G Ex h II CT6 Gb  
 -10°C Ta +50°C  
 II 2 D Ex h III CT80°C  
 Db -10°C Ta +50°C

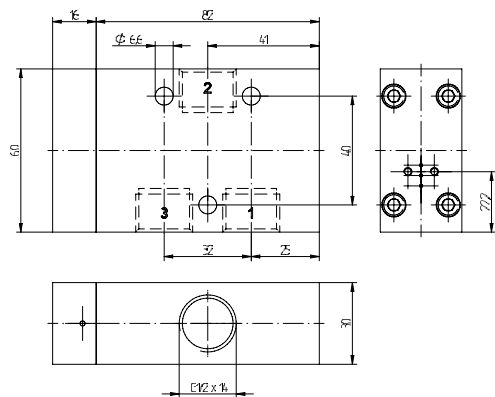
Material valve body: Aluminum

Temperature range: -10°C ... +50°C

Please note that valves can be also used with other Microsol solenoid systems for explosive and non-explosive area. The following systems are available on request: high temperature +80°C, low power consumption, LABS-free, AC-solenoids.



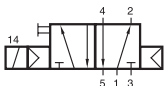
**M(O)DS 310 701 G Ex**



**M(O)DS 310 121 Ex**

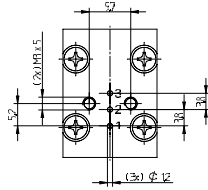
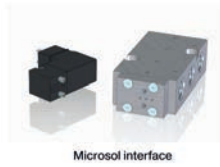
Type	Function	Port size	Air low	Operating press.	Weight
MDS 310 401 Ex	3/2-way, single sol.	G 1/8"	450 l/min	3 - 10 bar	0,06 kg
MDS 310 501 G Ex	3/2-way, single sol.	G 1/8"	650 l/min	2 - 10 bar	0,11 kg
MODS 310 501 G Ex	3/2-way, n.o. single sol.	G 1/8"	650 l/min	2 - 10 bar	0,11 kg
MDS 310 701 G Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	1250 l/min	2 - 10 bar	0,12 kg
MODS 310 701 G Ex	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	1250 l/min	2 - 10 bar	0,12 kg
MDS 310 121 Ex	3/2-way, single sol.	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	0,45 kg
MODS 310 121 Ex	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	0,45 kg

# MDS 510 401 Ex/MDS 510 501 G Ex MDS 510 701 G Ex/MDS 510 121 Ex



MDS 510 401 Ex  
MDS 510 501 G Ex  
MDS 510 701 G Ex  
MDS 510 121 Ex

Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



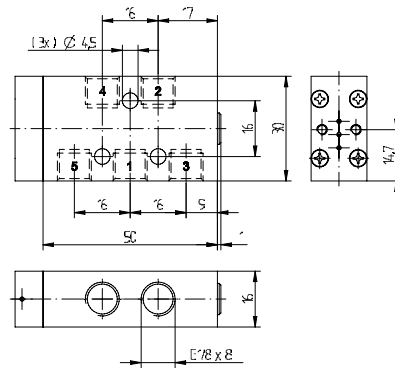
Valves with Microsol interface to be used with explosion proof solenoid systems displayed on page 2.15.6.4.2. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

Zone: 1, 2, 21, 22  
Temperature class: T6

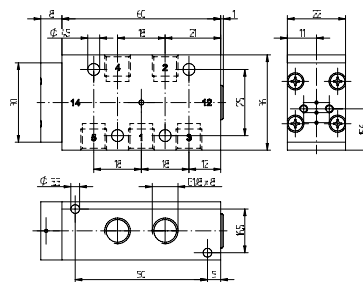
Marking on valve  
 II 2 G Ex h II CT6 Gb  
 -10°C Ta +50°C  
 II 2 D Ex h III CT80°C  
 Db -10°C Ta +50°C

Material valve body: Aluminum  
Temperature range: -10°C ... +50°C

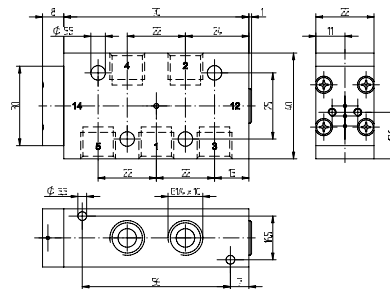
Please note that valves can be also used with other Microsol solenoid systems for explosive and non-explosive area. The following systems are available on request: high temperature +80°C, low power consumption, LABS-free, AC-solenoids.



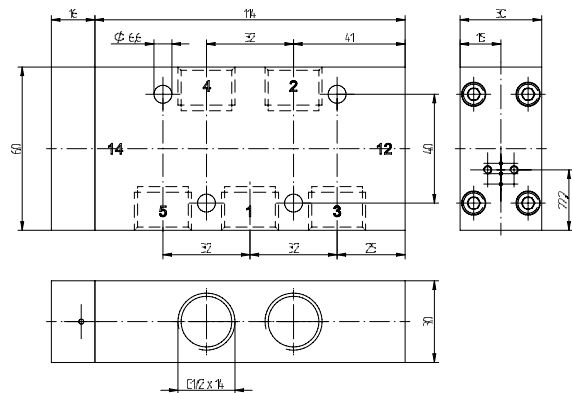
MDS 510 401 Ex



MDS 510 501 G Ex



MDS 510 701 G Ex



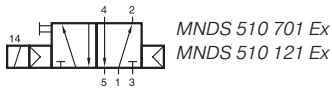
MDS 510 121 Ex

Type	Function	Port size	Air flow	Operating press.	Weight
MDS 510 401 Ex	5/2-way, single sol.	G 1/8"	450 l/min	3 - 10 bar	0,06 kg
MDS 510 501 G Ex	5/2-way, single sol.	G 1/8"	650 l/min	2 - 10 bar	0,14 kg
MDS 510 701 G Ex	5/2-way, single sol.	G 1/4" -1/4" NPT	1250 l/min	2 - 10 bar	0,16 kg
MDS 510 121 Ex	5/2-way, single sol.	G 1/2" -1/2" NPT	3000 l/min	1 - 10 bar	0,59 kg

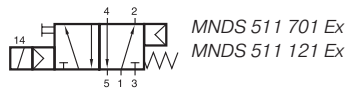




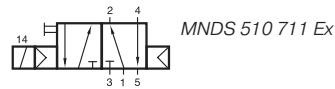
# MNDS 510 701 Ex/MNDS 511 701 Ex MNDS 510 711 Ex/MNDS 510 121 Ex/MNDS 511 121 Ex



MNDS 510 701 Ex  
MNDS 510 121 Ex

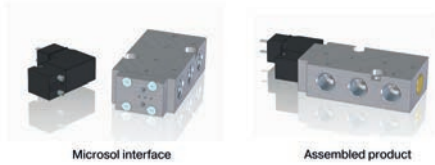


MNDS 511 701 Ex  
MNDS 511 121 Ex



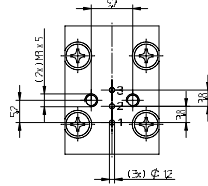
MNDS 510 711 Ex

Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



Microsol interface

Assembled product



Valves with Microsol interface to be used with explosion proof solenoid systems displayed on page 2.15.6.4.2. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

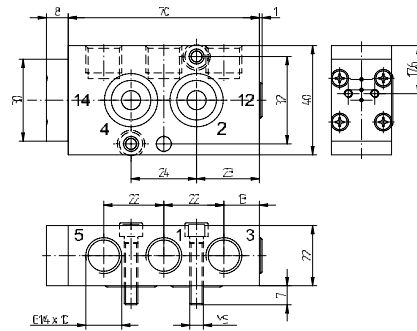
Zone: 1, 2, 21, 22  
Temperature class: T6

Marking on valve  
 II 2 G Ex h II CT6 Gb  
 -10°C Ta +50°C  
 II 2 D Ex h III CT80°C  
 Db -10°C Ta +50°C

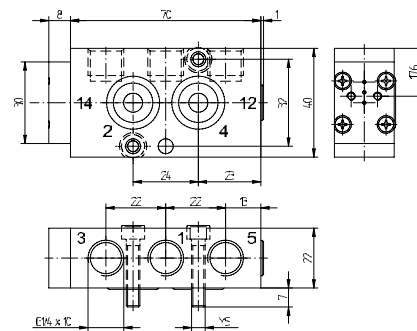
Material valve body: Aluminum

Temperature range: -10°C ... +50°C

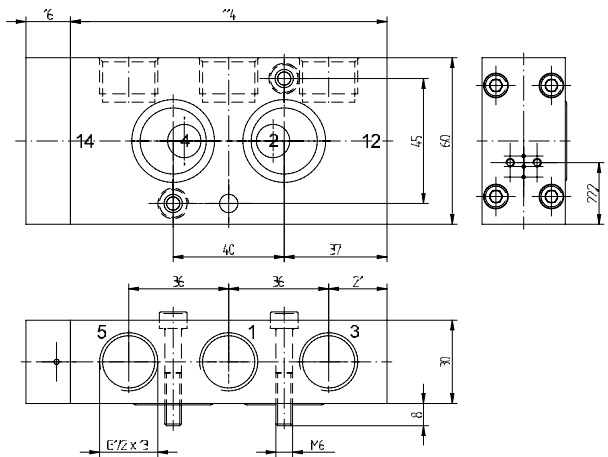
Please note that valves can be also used with other Microsol solenoid systems for explosive and non-explosive area. The following systems are available on request: high temperature +80°C, low power consumption, LABS-free, AC-solenoids.



MNDS 51\_701 Ex



MNDS 510 711 Ex



MNDS 51\_121 Ex

Type	Function	Port size	Air flow	Operating press.	Weight
MNDS 510 701 Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	1250 l/min	2 - 10 bar	0,17 kg
MNDS 511 701 Ex	5/2-way, single sol., comb. spring	G 1/4" - 1/4" NPT	1250 l/min	2,5 - 10 bar	0,17 kg
MNDS 510 711 Ex	5/2-way, single sol., swapped ports	G 1/4"	1250 l/min	2 - 10 bar	0,17 kg
MNDS 510 121 Ex	5/2-way, single sol.	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	0,62 kg
MNDS 511 121 Ex	5/2-way, single sol., comb. spring	G 1/2" - 1/2" NPT	3000 l/min	2,5 - 10 bar	0,62 kg





# Solenoid valves for explosion hazardous environment

## General overview

Our customers have the choice between numerous solenoid systems of different ignition protection types. Those can be combined with valves made from aluminum or stainless steel designed for different temperature ranges.



		Ex ec	Ex ia 1.6W	Ex ia 0.7W	Ex m
		Increased safety	Intrinsically safe	Intrinsically safe	Encapsulation
Page Coil		2.15.6.5.3	2.15.6.3.5	2.15.6.4.2	2.15.6.2.4
Page Valves		2.15.6.5.1 – 2	2.15.6.3.1 – 4	2.15.6.4.1	2.15.6.2.1 – 2
					
Certificates	ATEX	✓	✓	✓	✓
	IECEX		✓	✓	✓
	CSA / FM				
	UKCA	✓			
	CCC		on request		on request
Zone	1G		✓	✓	✓
	2G	✓	✓	✓	✓
	21D		✓	✓	✓
	22D	✓	✓	✓	✓
Temperature class		T5	T6	T6	T4
Explosion group		IIC / IIIC	IIC / IIIC	IIC / IIIC	IIC / IIIC
Temperature range		-10°C to +50°C	-40°C to +50°C	-10°C to +50°C	-20°C to +50°C
Electrical connection		Plug for 6 - 8 mm cable	Plug for 6 - 8 mm cable	Plug for 3.5 - 6 mm cable	3 metre moulded cable, 10 metres on request
Power consumption		3.0 Watts (24DC) 5 VA (24AC, 110AC, 230AC)	1.6 Watts (24DC)	0.7 Watts (24DC)	5.0 Watts (24DC) / 4.6 VA (24AC) 4.5 VA (110AC) / 5.1 VA (230 AC)
IP protection class		IP 65	IP 65	IP 65	IP 65

		Ex emb	Ex dm	Ex d	Ex m CSA/FM
		Increased safety / encapsulation	Encapsulation / flameproof	Flameproof	Encapsulation
Page Coil		2.15.6.6.4	2.15.6.8.3	2.15.6.7.5	2.15.6.2.3
Page Valves		2.15.6.6.1 – 3	2.15.6.8.1 – 2	2.15.6.7.1 – 4	2.15.6.2.1 - 2
					
Certificates	ATEX	✓	✓	✓	
	IECEX	✓		✓	
	CSA / FM				✓
	UKCA				
	CCC			on request	
Zone	1G	✓	✓	✓	Class I, Zone 1, Ex m II T4 Class I, Div. 1 & Div. 2, Gr. A,B,C,D Class II, Gr. E, F, G; Class III; T4
	2G	✓	✓	✓	
	21D	✓	✓	✓	
	22D	✓	✓	✓	
Temperature class		T6	T5	T6	T4
Explosion group		IIC / IIIC	IIC / IIIC	IIC / IIIC	
Temperature range		-40°C to +50°C	-20°C to +50°C	-40°C to +50°C	-20°C to +60°C
Electrical connection		M20x1.5 6 – 13 mm	M20x1.5 6 – 8 mm	M20x1.5 or 1/2" NPT Cable gland not included	Conduit 1/2" NPT 60 cm strands
Power consumption		4,8 Watts (24, 110, 230)	3.0 Watts (12DC, 24DC) 4.8 VA (24AC, 110AC, 230AC)	2.0 Watts (24DC) 3.0 VA (110AC, 230AC)	4.5 Watts (12DC) / 4.6 Watts (24DC) 6.8 VA (110AC) / 7.7 VA (220AC, 240AC)
IP protection class		IP 65 (IP 67 optional)	IP 66	IP 67	IP 65

# ATEX-approved valves – Ex m – standard temperature range – aluminum



Material: Aluminum, anodized  
 Zone: 1, 2, 21, 22  
 Temperature range: -10°C ... +50°C  
 Ignition protection type: Ex m (encapsulation)  
 Temperature class: T4

Marking on valve  II 2 G Ex h IIC T6 Gb  
 -10°C ≤ Ta ≤ +50°C  
 II 2 D Ex h IIC T80°C  
 Db -10°C ≤ Ta ≤ +50°C

A low temperature version for -20°C ... +50°C is also available on request. Please note that the system is restricted by the minimum ambiente temperature for the coil of -20°C.

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 210 501 Ex m	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MH 210 701 Ex m	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MH 311 012 Ex m	3/2-way direct acting	M5	in-line	2.5.1.1.2
MH 311 015 Ex m	3/2-way direct acting	G 1/8"	in-line	2.5.1.1.2
MH 311 013 Ex m	3/2-way direct acting	G 1/8"	banjo screw	2.5.1.1.6
MH 311 017 Ex m	3/2-way direct acting	G 1/4"	banjo screw	2.5.1.1.6
MH 312 Ex m	3/2-way direct acting	M5	manifold	2.5.1.2.1
MH 315 Ex m	3/2-way direct acting	G 1/8"	manifold	2.5.1.2.1
MH 310 501 G Ex m	3/2-way, single sol.	G 1/8"	dual use*	2.5.1.1.10
MOH 310 501 G Ex m	3/2-way, n.o. single sol.	G 1/8"	dual use*	2.5.1.1.10
MH 310 701 G Ex m	3/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MOH 310 701 G Ex m	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MH 310 101 G Ex m	3/2-way, single sol.	G 3/8"	dual use*	2.7.1.4
MOH 310 101 G Ex m	3/2-way, n.o. single sol.	G 3/8"	dual use*	2.7.1.4
MH 310 101 Ex m	3/2-way, single sol.	G 3/8"	in-line	2.5.1.1.11
MOH 310 101 Ex m	3/2-way, n.o. single sol.	G 3/8"	in-line	2.5.1.1.11
MH 310 121 Ex m	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MOH 310 121 Ex m	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MH 310 181 Ex m	3/2-way, single sol.	G 3/4"	in-line	2.5.1.1.11
MOH 310 181 Ex m	3/2-way, n.o. single sol.	G 3/4"	in-line	2.5.1.1.11
MH 310 101 G Ex m	3/2-way, single sol.	G 3/8"	dual use*	2.5.1.1.17
MOH 310 101 G Ex m	3/2-way, n.o. single sol.	G 3/8"	dual use*	2.5.1.1.17
MH 310 121 G Ex m	3/2-way, single sol.	G 1/2"	dual use*	2.5.1.1.17
MOH 310 121 G Ex m	3/2-way, n.o. single sol.	G 1/2"	dual use*	2.5.1.1.17
MH 510 501 G Ex m	5/2-way, single sol.	G 1/8"	dual use*	2.5.2.1.2
MH 510 701 G Ex m	5/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.2
MH 510 101 Ex m	5/2-way, single sol.	G 3/8"	in-line	2.5.2.1.3
MH 510 121 Ex m	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MH 510 181 Ex m	5/2-way, single sol.	G 3/4"	in-line	2.5.2.1.3
MH 510 504 Ex m	5/2-way, single sol.	5 mm orifice	manifold**	2.5.2.2.4
MH 510 704 Ex m	5/2-way, single sol.	7 mm orifice	manifold**	2.5.2.2.4
MH 520 501 G Ex m	5/2-way, double sol.	G 1/8"	dual use*	2.5.2.1.5
MH 520 701 G Ex m	5/2-way, double sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.5
MH 520 101 Ex m	5/2-way, double sol.	G 3/8"	in-line	2.5.2.1.6
MH 520 121 Ex m	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MH 520 181 Ex m	5/2-way, double sol.	G 3/4"	in-line	2.5.2.1.6
MH 520 504 Ex m	5/2-way, double sol.	5 mm orifice	manifold**	2.5.2.2.7
MH 520 704 Ex m	5/2-way, double sol.	7 mm orifice	manifold**	2.5.2.2.7
MH 53_ 501 G Ex m	5/3-way, diff. versions	G 1/8"	dual use*	2.5.3.1.2
MH 53_ 701 G Ex m	5/3-way, diff. versions	G 1/4" - 1/4" NPT	dual use*	2.5.3.1.2
MH 53_ 101 Ex m	5/3-way, diff. versions	G 3/8"	in-line	2.5.3.1.3
MH 53_ 121 Ex m	5/3-way, diff. versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3
MH 53_ 504 Ex m	5/3-way, diff. versions	5 mm orifice	manifold**	2.5.3.2.3
MH 53_ 704 Ex m	5/3-way, diff. versions	7 mm orifice	manifold**	2.5.3.2.3

Type	Function	Port size	Installation	Further inform. on valve
<b>Valves with interface according to NAMUR-standard</b>				
MNH 350 701 Ex m	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.3
MNH 310 701 Ex m	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 311 701 Ex m	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 310 711 Ex m	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNH 310 121 Ex m	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 311 121 Ex m	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 510 701 Ex m	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 511 701 Ex m	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 510 711 Ex m	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNH 510 121 Ex m	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 511 121 Ex m	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 520 701 Ex m	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNH 520 121 Ex m	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNH 53_ 701 Ex m	5/3-way, diff. versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.4
MNH 53_ 121 Ex m	5/3-way, diff. versions	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.4


\* dual use valves can either be used in-line or on a manifold plate.  
 \*\* all ports in plate

Solenoids are described on page 2.15.6.2.4.

Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

# ATEX-approved valves – Ex m – standard temperature range – stainless steel



Material: Stainless steel, 316L   
 Zone: 1, 2, 21, 22  
 Temperature range: -10°C ... +50°C  
 Ignition protection type: Ex m (encapsulation)  
 Temperature class: T4

Marking on valve  II 2 G Ex h IIC T6 Gb  
 -10°C ≤ Ta ≤ +50°C  
 II 2 D Ex h IIIC T80°C  
 Db -10°C ≤ Ta ≤ +50°C

A low temperature version for -20°C ... +50°C is also available on request. Please note that the system is restricted by the minimum applicable temperature of the coil of -20°C.

The following **solenoid valves** are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 015 VES Ex m	3/2-way direct acting	G 1/8"	in-line	2.13.4.1
MH 310 701 VES Ex m	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES Ex m	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 310 121 VES Ex m	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.3
MH 510 701 VES Ex m	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 510 121 VES Ex m	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.4
MH 520 701 VES Ex m	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 520 121 VES Ex m	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.5
MH 53_ 701 VES Ex m	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6
MH 53_ 121 VES Ex m	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.13.4.6

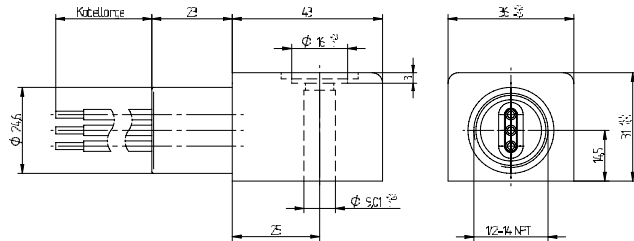
#### Valves with interface according to NAMUR-standard

MNH 350 701 VES Ex m	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES Ex m	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES Ex m	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 310 121 VES Ex m	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.1
MNH 510 701 VES Ex m	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES Ex m	5/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 510 121 VES Ex m	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.3
MNH 520 701 VES Ex m	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Solenoids are described on page 2.15.6.2.4.

Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

# MA 36 EEx m II T4 CSA FM



MA 36 EEx m II T4 CSA FM

CSA / FM approved encapsulated coils for gas and dust explosion-hazardous environment with 60 cm flying leads.

Voltage: Delivery on request:  
12VDC, 24VDC, 110VAC,  
220VAC, 240VAC

Voltage tolerance: - 10...+ 10%

Relative duty cycle: 100 %

Temperature range: -20°C ... +60°C

Protection according  
to EN 60529: IP 65

Material solenoid coil: Thermoplasticpolyester

Coil rating according to  
DIN VDE 0580: Class H

Conduit: 1/2" NPT

As the coil is 36 mm wide, a spacer plate called "ZPN 8" has to be used, in case of combination with our NAMUR-valve series 700. If used with NAMUR-valve series 121 a spacer plate called "ZPN 6-5" has to be used. You can find both plates on page 2.11.13.

CSA/FM approval is only valid as long as the associated components are used.

Please note:  
The coil is not approved according to ATEX.

## Hazardous Locations:

Ex m II T4 and Division 1

Specifications in accordance to CSA certificate:

Class I, Division 1, Groups A, B, C and D; Class II, Groups E, F and G; Class III Class I, Division 2, Groups A, B, C, D.

Specifications in accordance to FM certificate:

Explosion-proof Class I, Division 1, Groups A, B, C, D, T4, Ta = 60 °C  
encapsulation/explosion-proof Class I, Zone 1, AEx m II T4, Ta = 60 °C  
dust-ignition-proof for Class II/III, Division 1, Groups E, F and G, T4, Ta = 60 °C  
Nonincendive Class I, Division 2, Groups A, B, C, D, T4, Ta = 60 °C  
Suitable for Class II, III, Division 2, Groups E, F, G, T4, Ta = 60 °C

The current standards can be found in the certificates.

Type	Voltage	Operating press.	Power cons.	Temperature class
MA 36 EEx M II T4 CSA FM 12DC	12 V=	max. 10 bar	4,5 Watt	T4 (135° C)
MA 36 EEx M II T4 CSA FM 24DC	24 V=	max. 10 bar	4,6 Watt	T4 (135° C)
MA 36 EEx M II T4 CSA FM 110AC	110 V~	max. 10 bar	6,8 VA	T4 (135° C)
MA 36 EEx M II T4 CSA FM 220AC	220 V~	max. 10 bar	7,7 VA	T4 (135° C)
MA 36 EEx M II T4 CSA FM 240AC	240 V~	max. 10 bar	7,7 VA	T4 (135° C)

# MA 22 EEx m II T4

When this solenoid system is used in combination with „ATEX certified“ mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21 and 22.



ATEX and IEC Ex approved encapsulated coils for gas and dust explosion-hazardous environment.

The standard cable length is 3 meter, others on request.

Voltage tolerance: -10...+10 %

Relative duty cycle: 100 %

Temperature range: -20°...+50° C

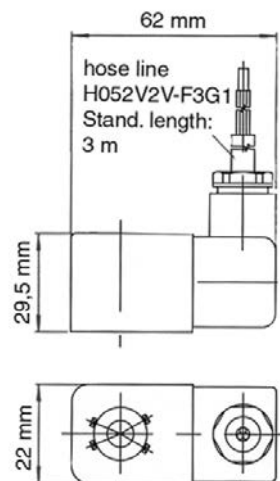
Insulation class of insulating materials according to DIN VDE 0580: F

Protection with mounted plug-in connector according to IEC 529: IP 65

Moulding material: Thermoplasticpolyester

Marking on coil:   II 2G Ex mb IIC T4 Gb  
II 2D Ex mb tb IIIC T130°C Db

The ATEX approval is only valid as long as the associated components are used.





MA 22 EEx m II T4

Type	Operating press.	Power consumption	Temperature class
MA 22 EEx M II T4 24DC	max. 10 bar	5,0 Watt	T4 (135° C)
MA 22 EEx M II T4 24AC	max. 10 bar	4,6 VA	T4 (135° C)
MA 22 EEx M II T4 110AC	max. 10 bar	4,5 VA	T4 (135° C)
MA 22 EEx M II T4 230AC	max. 10 bar	5,1 VA	T4 (135° C)

# ATEX-approved valves – Ex ia – standard temperature range – aluminum



Material: Aluminum, anodized  
 Zone: 1, 2, 21, 22  
 Temperature range: -10°C ... +50°C  
 Ignition protection type: Ex ia  
 (intrinsically safe)  
 Temperature class: T6

Marking on valve  II 2 G Ex h IIC T6 Gb  
 -10°C ≤ Ta ≤ +50°C  
 II 2 D Ex h IIC T80°C  
 Db -10°C ≤ Ta ≤ +50°C

Please note:  
 Maximum operating pressure for valves with Ex ia solenoid system is 8 bar!

Coil is 30 mm wide!

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 210 501 Ex ia	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MH 210 701 Ex ia	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MH 311 012 Ex ia	3/2-way direct acting	M5	in-line	2.5.1.1.2
MH 311 015 Ex ia	3/2-way direct acting	G 1/8"	in-line	2.5.1.1.2
MH 310 501 G Ex ia	3/2-way, single sol.	G 1/8"	in-line	2.5.1.1.10
MOH 310 501 G Ex ia	3/2-way, n.o. single sol.	G 1/8"	in-line	2.5.1.1.10
MH 310 701 G Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MOH 310 701 G Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MH 310 101 Ex ia	3/2-way, single sol.	G 3/8"	in-line	2.5.1.1.11
MOH 310 101 Ex ia	3/2-way, n.o. single sol.	G 3/8"	in-line	2.5.1.1.11
MH 310 121 Ex ia	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MOH 310 121 Ex ia	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MH 310 181 Ex ia	3/2-way, single sol.	G 3/4"	in-line	2.5.1.1.11
MOH 310 181 Ex ia	3/2-way, n.o. single sol.	G 3/4"	in-line	2.5.1.1.11
MH 510 501 G Ex ia	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.2
MH 510 701 G Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.2
MH 510 101 Ex ia	5/2-way, single sol.	G 3/8"	in-line	2.5.2.1.3
MH 510 121 Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MH 510 181 Ex ia	5/2-way, single sol.	G 3/4"	in-line	2.5.2.1.3
MH 520 501 G Ex ia	5/2-way, double sol.	G 1/8"	in-line	2.5.2.1.5
MH 520 701 G Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.5
MH 520 101 Ex ia	5/2-way, double sol.	G 3/8"	in-line	2.5.2.1.6
MH 520 121 Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MH 520 181 Ex ia	5/2-way, double sol.	G 3/4"	in-line	2.5.2.1.6
MH 53_501 G Ex ia	5/3-way, different versions	G 1/8"	in-line	2.5.3.1.2
MH 53_701 G Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.5.3.1.2
MH 53_101 Ex ia	5/3-way, different versions	G 3/8"	in-line	2.5.3.1.3
MH 53_121 Ex ia	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3

#### Valves with interface according to NAMUR-standard

MNH 350 701 Ex ia	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.3
MNH 310 701 Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 311 701 Ex ia	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 310 711 Ex ia	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNH 310 121 Ex ia	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 311 121 Ex ia	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 510 701 Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 511 701 Ex ia	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 510 711 Ex ia	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNH 510 121 Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 511 121 Ex ia	5/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 520 701 Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNH 520 121 Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNH 53_701 Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.4
MNH 53_121 Ex ia	5/3-way, centre closed	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.4

\* dual use valves can either be used in-line or on a manifold plate.

Solenoids are described on page 2.15.6.3.5.

Delivery contains valve with the appropriate operator system, coil, connector, manual and declaration of conformity.



# ATEX-approved valves – Ex ia – low temperature range – aluminum



Material: Aluminum, anodized  
 Zone: 1, 2, 21, 22  
 Temperature range: -40°C ... +50°C ❄️  
 Ignition protection type: Ex ia (intrinsically safe)  
 Temperature class: T6

Marking on valve

CE Ex II 2 G Ex h IIC T6 Gb  
 -50°C ≤ Ta ≤ +50°C

CE Ex II 2 D Ex h III C T80°C  
 Db -50°C ≤ Ta ≤ +50°C

Please note:  
 Maximum operating pressure for valves with Ex ia solenoid system is 8 bar!

Coil is 30 mm wide!

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 012 TT Ex ia	3/2-way direct acting	M5	in-line	2.12.7.1.1
MH 311 015 TT Ex ia	3/2-way direct acting	G 1/8"	in-line	2.12.7.1.1
MH 310 701 GTT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.1.2
MOH 310 701 GTT Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.1.2
MH 520 701 GTT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.2.2
MH 53_701 GTT Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	dual use*	2.12.7.2.2

#### Valves with interface according to NAMUR-standard


MNH 310 701 TT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNH 311 701 TT Ex ia	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNH 510 701 TT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 511 701 TT Ex ia	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 510 711 TT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 520 701 TT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2
MNH 531 701 TT Ex ia	5/3-way, centre closed	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2





\* dual use valves can either be used in-line or on a manifold plate.

Solenoids are described on page 2.15.6.3.5.  
 Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

# ATEX-approved valves – Ex ia – standard temperature range – stainless steel



Material: Stainless steel, 316L   
 Zone: 1, 2, 21, 22  
 Temperature range: -10°C ... +50°C  
 Ignition protection type: Ex ia (intrinsically safe)  
 Temperature class: T6

Marking on valve   II 2 G Ex h IIC T6 Gb  
 -10°C ≤ Ta ≤ +50°C  
  II 2 D Ex h IIC T80°C  
 Db -10°C ≤ Ta ≤ +50°C

Please note:  
 Maximum operating pressure for valves with Ex ia solenoid system is 8 bar!

Coil is 30 mm wide!

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 015 VES Ex ia	3/2-way direct acting	G 1/8"	in-line	2.13.4.1
MH 310 701 VES Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 310 121 VES Ex ia	3/2-way, single sol.	G 1/2"	in-line	2.13.4.3
MH 510 701 VES Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 510 121 VES Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.4
MH 520 701 VES Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 520 121 VES Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.5
MH 53_701 VES Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6
MH 53_121 VES Ex ia	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.13.4.6


#### Valves with interface according to NAMUR-standard

MNH 350 701 VES Ex ia	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES Ex ia	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 310 121 VES Ex ia	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.1
MNH 510 701 VES Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES Ex ia	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 510 121 VES Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.3
MNH 520 701 VES Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Solenoids are described on page 2.15.6.3.5.  
 Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

# ATEX-approved valves – Ex ia – low temperature range – stainless steel



Material: Stainless steel, 316L   
 Zone: 1, 2, 21, 22  
 Temperature range: -40°C ... +50°C ❄️  
 Ignition protection type: Ex ia (intrinsically safe)  
 Temperature class: T6

Marking on valve  II 2 G Ex h IIC T6 Gb  
 -50°C ≤ Ta ≤ +50°C  
 II 2 D Ex h IIIC T80°C  
 Db -50°C ≤ Ta ≤ +50°C

Please note:  
 Maximum operating pressure for valves with Ex ia solenoid system is 8 bar!

Coil is 30 mm wide!

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 015 VES TT Ex ia	3/2-way direct acting	G 1/8"	in-line	2.13.4.1
MH 310 701 VES TT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES TT Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 510 701 VES TT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 520 701 VES TT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 53_701 VES TT Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6

#### Valves with interface according to NAMUR-standard

MNH 350 701 VES TT Ex ia	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES TT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES TT Ex ia	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 510 701 VES TT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES TT Ex ia	5/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 520 701 VES TT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Solenoids are described on page 2.15.6.3.5.  
 Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

# MA 30 EEx ia tD II CT6 24DC

When this solenoid system is used in combination with „ATEX certified“ mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21, and 22.



ATEX and IEC Ex approved intrinsic safety coil and connector for gas and dust explosion-hazardous environment. Electrical connection according to DIN EN 175301-803-A / ISO 4400.

**Coil:**

Electrical characteristics: 21,6... 28 V DC  
 >37 mA  
 final temperature rise 18 K  
 275 Ohm +/-8 %

Relative duty cycle: 100 %

Temperature range: -40°... +50° C

Insulation class of insulating materials according to DIN VDE 0580: F

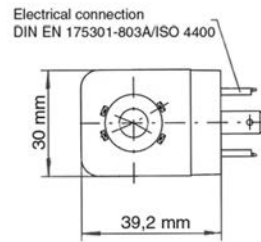
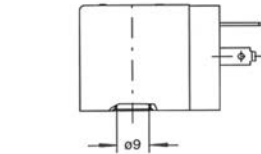
Protection level with connector according to EN 60529: IP 65

Moulding material: Thermoset resin (Epoxy)

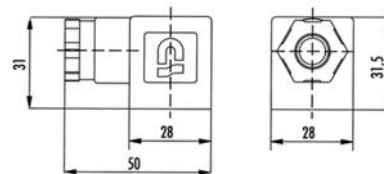
Marking on coil: II 2G Ex ia IIB/IIC T6  
 II 2D Ex tb IIIC T80°C

**Barrier:**

Electrical characteristics: 21,6... 28 V DC  
 Admissible peak value: 28 V DC  
 115 mA  
 1,6 W



**MA 30 EEx ia tD II CT6 24DC**



**ST 30 Ex ia**

**Order Code: MA 30 EEx ia tD II CT6 24DC**

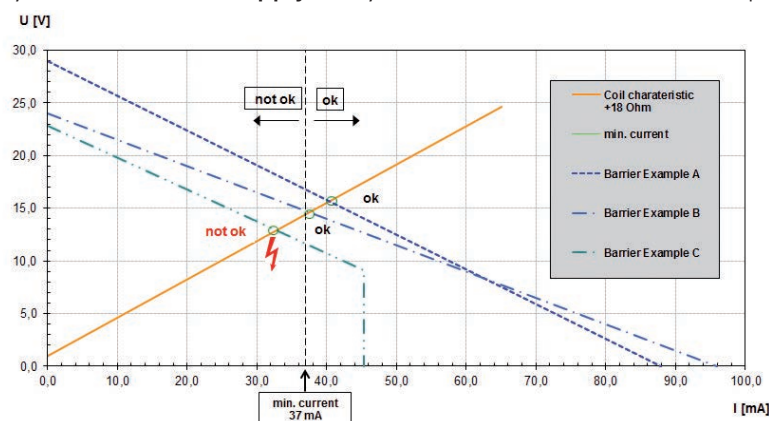
As the coil is 30 mm wide, a spacer plate „ZPN 5“ has to be used, in case of combination with our NAMUR-valve series 700 refer to page 2. 11. 13.

ST 30 Ex ia is an ATEX approved connector, especially designed for being used in combination with the intrinsic safety coil. For dust approval (zone 21), this original connector is mandatory.

Delivery includes connector ST 30 Ex ia, flat nitril gasket and fixing screw (zinc-plated steel). Form according to A - ISO 4400, no LED, no varistor, operating voltage 0 – 250 V, max. current 10 A, cable diameter 6 – 8 mm.

**How to select a suitable barrier:**

**I/U Characteristics supply units/solenoid coil**



The ATEX approval is only valid as long as the associated components are used.

# ATEX-approved valves – Ex ia 0.7W – standard temperature range – aluminum



Material: Aluminum, anodized  
 Zone: 1, 2, 21, 22  
 Temperature range: -10°C ... +50°C ❄️  
 Ignition protection type: 24DC Ex ia (intrinsic safety)  
 Temperature class: T6

Marking on valve: **CE** **Ex** II 2 G Ex h IIC T6 Gb  
 -10°C ≤ Ta ≤ +50°C  
**CE** **Ex** II 2 D Ex h IIC T80°C  
 Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further information on valve on page
MDSF 210 501 24DC Ex ia	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MDSF 210 701 24DC Ex ia	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MDSF 310 401 24DC Ex ia	3/2-way, single sol.	G 1/8"	in-line	2.5.1.1.8
MDSF 310 501 G 24DC Ex ia	3/2-way, single sol.	G 1/8"	dual use*	2.5.1.1.10
MODSF 310 501 G 24DC Ex ia	3/2-way, n.o. single sol.	G 1/8"	dual use*	2.5.1.1.10
MDSF 310 701 G 24DC Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MODSF 310 701 G 24DC Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MDSF 310 121 24DC Ex ia	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MODSF 310 121 24DC Ex ia	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MDSF 510 401 24DC Ex ia	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.1
MDSF 510 501 G 24DC Ex ia	5/2-way, single sol.	G 1/8"	dual use*	2.5.2.1.2
MDSF 510 701 G 24DC Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.2
MDSF 510 121 24DC Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MDSF 520 401 24DC Ex ia	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.4
MDSF 520 501 G 24DC Ex ia	5/2-way, double sol.	G 1/8"	dual use*	2.5.2.1.5
MDSF 520 701 G 24DC Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.5
MDSF 520 121 24DC Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MDSF 53_ 501 G 24DC Ex ia	5/3-way, diff. versions	G 1/8"	dual use*	2.5.3.1.2
MDSF 53_ 701 G 24DC Ex ia	5/3-way, diff. versions	G 1/4"	dual use*	2.5.3.1.2
MDSF 53_ 121 24DC Ex ia	5/3-way, diff. versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3

## Valves with interface according to NAMUR-standard

MNDSF 350 701 24DC Ex ia	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.3
MNDSF 310 701 24DC Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNDSF 311 701 24DC Ex ia	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNDSF 310 711 24DC Ex ia	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNDSF 310 121 24DC Ex ia	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNDSF 311 121 24DC Ex ia	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNDSF 510 701 24DC Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNDSF 511 701 24DC Ex ia	5/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNDSF 510 711 24DC Ex ia	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNDSF 510 121 24DC Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNDSF 511 121 24DC Ex ia	5/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNDSF 520 701 24DC Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNDSF 520 121 24DC Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNDSF 53_ 701 24DC Ex ia	5/3-way, diff. versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.4
MNDSF 53_ 121 24DC Ex ia	5/3-way, diff. versions	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.4

Direct acting valves available on request.  
 Solenoids described on page 2.15.6.4.2.  
 Delivery contains valve with the appropriate coil, connector,  
 manual and declaration of conformity.

# FES 15 3/2 NC 24DC Ex ia

When this solenoid system is used in combination with „ATEX certified“ mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21, and 22.



ATEX approved intrinsic safety coil and connector for gas and dust explosion-hazardous environment. System is also IECEx approved. Electrical connector with two pins according to form C (EN 175301-803).

Rated Characteristics:    Un: 24V  
                                       In: 30.0 mA  
                                       Pn: 0.72 W  
                                       Winding resistance: 800 Ω +/- 5%

Safety Parameters:        Ui: 26.3 V  
                                       Li: 139 mA  
                                       Li: negligible  
                                       Ci: negligible

Voltage tolerance:        -10...+10 %

Relative duty cycle:        100 %

Temperature range:       -10°...+50° C

Pressure range:            See valve specifications  
                                       max. 8 bar

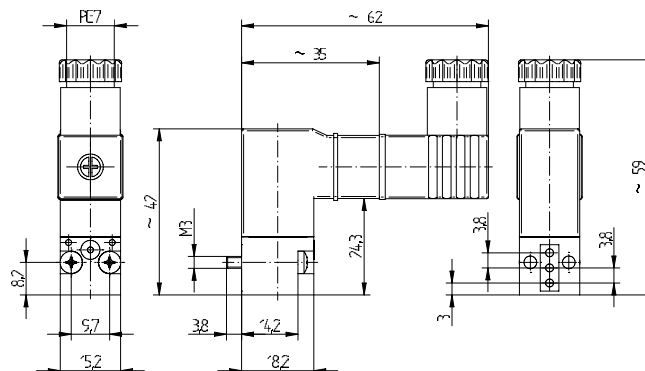
Insulation class of insulating materials according to DIN VDE 0580:        F

Protection with mounted plug-in connector according to IEC 529:    IP 65

Moulding material:        Glass fiber reinforced PA

Marking on coil:              II 1G Ex ia II CT6 Ga  
                                       II 1D Ex ia II CT85°C Da

Cable diameter:            3.5 – 6.0 mm



**FES 15 3/2 NC 24DC Ex ia**

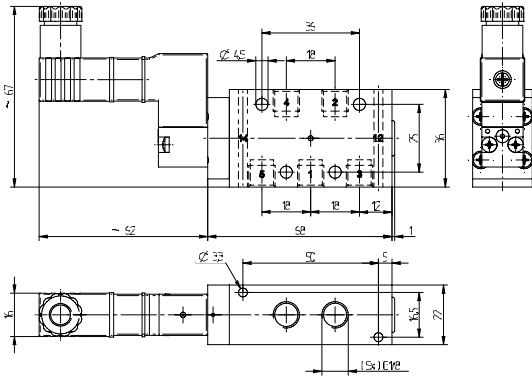


Connector included.

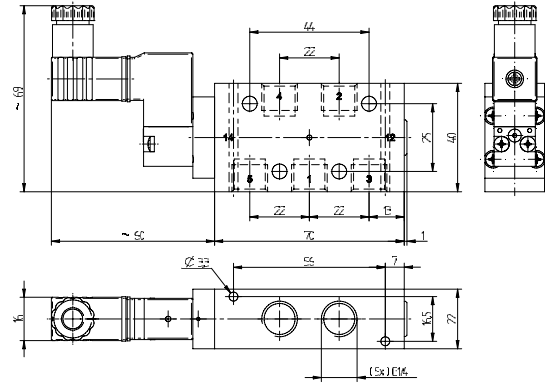
The ATEX approval is only valid as long as the **associated components are used.**



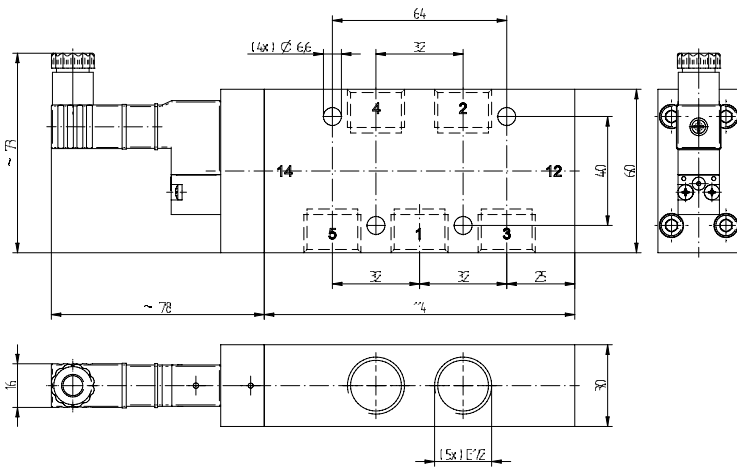
# Example drawings of solenoid valves with EX ia 0.7 W solenoid system.



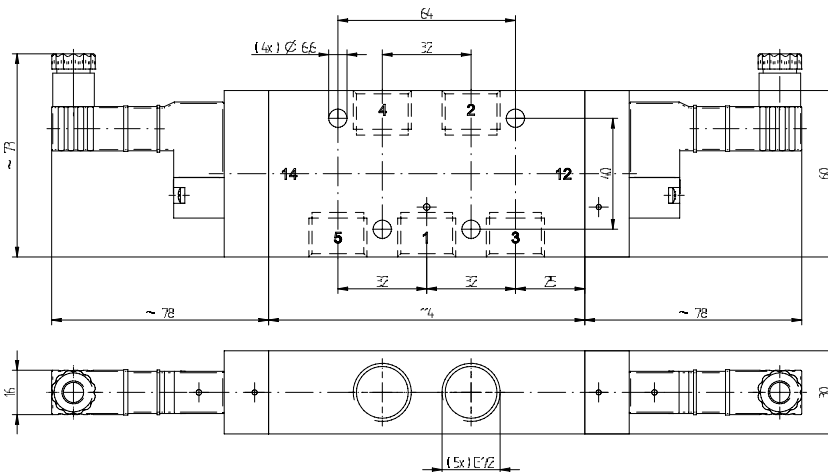
**MDSF 510 510 G 24DC Ex ia**



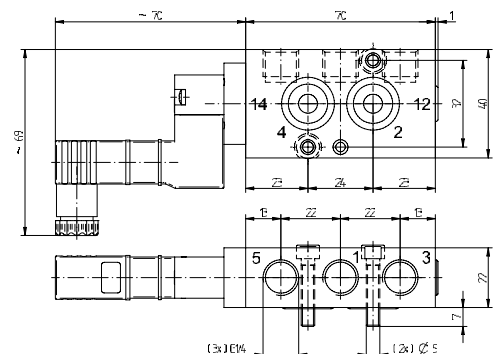
**MDSF 510 701 G 24DC Ex ia**



**MDSF 510 121 24DC Ex ia**



**MDSF 520 121 24DC Ex ia**



**MNDSF 510 701 24DC Ex ia**

# ATEX-approved valves – Ex ec and tc – standard temperature range – aluminum



Material: Aluminum, anodized, head PA  
 Zone: 2, 22  
 Temperature range: -10°C ... +50°C  
 Ignition protection gas: Ex ec (increased safety)  
 Ignition protection dust: Ex t (protection using enclosure)\*\*  
 Temperature class: T6

Marking on valve

**CE** **Ex** II 3 G Ex h IIC T6 Gb  
 -10°C ≤ Ta ≤ +50°C  
**CE** **Ex** II 3 D Ex h IIIC T80°C  
 Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

\*\* only in combination with appropriate connector.

Type	Function	Port size	Installation	Further inform. on valve
MH 210 501 Ex ec	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MH 210 701 Ex ec	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MH 311 012 Ex ec	3/2-way direct acting	M5	in-line	2.5.1.1.2
MH 311 015 Ex ec	3/2-way direct acting	G 1/8"	in-line	2.5.1.1.2
MH 311 013 Ex ec	3/2-way direct acting	G 1/8"	banjo screw	2.5.1.1.6
MH 311 017 Ex ec	3/2-way direct acting	G 1/4"	banjo screw	2.5.1.1.6
MH 312 Ex ec	3/2-way direct acting	M5	manifold	2.5.1.2.1
MH 315 Ex ec	3/2-way direct acting	G 1/8"	manifold	2.5.1.2.1
MH 310 501 G Ex ec	3/2-way, single sol.	G 1/8"	in-line	2.5.1.1.10
MOH 310 501 G Ex ec	3/2-way, n.o. single sol.	G 1/8"	in-line	2.5.1.1.10
MH 310 701 G Ex ec	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MOH 310 701 G Ex ec	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MH 310 101 Ex ec	3/2-way, single sol.	G 3/8"	in-line	2.5.1.1.11
MOH 310 101 Ex ec	3/2-way, n.o. single sol.	G 3/8"	in-line	2.5.1.1.11
MH 310 121 Ex ec	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MOH 310 121 Ex ec	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MH 310 181 Ex ec	3/2-way, single sol.	G 3/4"	in-line	2.5.1.1.11
MOH 310 181 Ex ec	3/2-way, n.o. single sol.	G 3/4"	in-line	2.5.1.1.11
MH 510 501 G Ex ec	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.2
MH 510 701 G Ex ec	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.2
MH 510 101 Ex ec	5/2-way, single sol.	G 3/8"	in-line	2.5.2.1.3
MH 510 121 Ex ec	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MH 510 181 Ex ec	5/2-way, single sol.	G 3/4"	in-line	2.5.2.1.3
MH 510 504 Ex ec	5/2-way, single sol.	5 mm orifice	manifold	2.5.2.2.4
MH 510 704 Ex ec	5/2-way, single sol.	7 mm orifice	manifold	2.5.2.2.4
MH 520 501 G Ex ec	5/2-way, double sol.	G 1/8"	in-line	2.5.2.1.5
MH 520 701 G Ex ec	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.5
MH 520 101 Ex ec	5/2-way, double sol.	G 3/8"	in-line	2.5.2.1.6
MH 520 121 Ex ec	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MH 520 181 Ex ec	5/2-way, double sol.	G 3/4"	in-line	2.5.2.1.6
MH 520 504 Ex ec	5/2-way, double sol.	5 mm orifice	manifold	2.5.2.2.7
MH 520 704 Ex ec	5/2-way, double sol.	7 mm orifice	manifold	2.5.2.2.7
MH 53_ 501 G Ex ec	5/3-way, different versions	G 1/8"	in-line	2.5.3.1.2
MH 53_ 701 G Ex ec	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.5.3.1.2
MH 53_ 101 Ex ec	5/3-way, different versions	G 3/8"	in-line	2.5.3.1.3
MH 53_ 121 Ex ec	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3
MH 53_ 504 Ex ec	5/3-way, different versions	5 mm orifice	manifold	2.5.3.2.3
MH 53_ 704 Ex ec	5/3-way, different versions	7 mm orifice	manifold	2.5.3.2.3

#### Valves with interface according to NAMUR-standard

MNH 350 701 Ex ec	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.3
MNH 310 701 Ex ec	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 311 701 Ex ec	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 310 711 Ex ec	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNH 310 121 Ex ec	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 311 121 Ex ec	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 510 701 Ex ec	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 511 701 Ex ec	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 510 711 Ex ec	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNH 510 121 Ex ec	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 511 121 Ex ec	5/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 520 701 Ex ec	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNH 520 121 Ex ec	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNH 53_ 701 Ex ec	5/3-way, different versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.4
MNH 53_ 121 Ex ec	5/3-way, centre closed	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.4



Solenoids are described on page 2.15.6.5.3.

Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.





\* dual use valves can either be used in-line or on a manifold plate.

# ATEX-approved valves – Ex ec and tc – standard temperature range – stainless steel



Material: Stainless steel, 316L   
 Zone: 2, 22  
 Temperature range: -10°C ... +50°C   
 Ignition protection gas: Ex ec (increased safety)  
 Ignition protection dust: Ex t (protection using enclosure)\*  
 Temperature class: T6

Marking on valve

  II 3 G Ex h IIC T6 Gb  
 -10°C ≤ Ta ≤ +50°C  
  II 3 D Ex h IIIC T80°C  
 Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

\* only in combination with appropriate connector.

Type	Function	Port size	Installation	Further inform. on valve
MH 311 015 VES Ex ec	3/2-way direct acting	G 1/8"	in-line	2.13.4.1
MH 310 701 VES Ex ec	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES Ex ec	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 310 121 VES Ex ec	3/2-way, single sol.	G 1/2"	in-line	2.13.4.3
MH 510 701 VES Ex ec	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 510 121 VES Ex ec	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.4
MH 520 701 VES Ex ec	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 520 121 VES Ex ec	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.5
MH 53_ 701 VES Ex ec	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6
MH 53_ 121 VES Ex ec	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.13.4.6

## Valves with interface according to NAMUR-standard

MNH 350 701 VES Ex ec	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES Ex ec	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES Ex ec	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 310 121 VES Ex ec	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.1
MNH 510 701 VES Ex ec	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES Ex ec	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 510 121 VES Ex ec	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.3
MNH 520 701 VES Ex ec	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Solenoids are described on page 2.15.6.5.3.  
 Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

# MA 22 EEx ec T5

## ST 22 Ex



ATEX approved coil and connector for gas (increased safety) and dust (protection using enclosure) explosion-hazardous environment.

### Coil MA 22 EEx ec T5:

Voltage tolerance: +/- 10 %

Relative duty cycle: 100 %

Temperature range: -10°... +50° C

Insulation class of insulating materials according to DIN VDE 0580:

F

Protection with connector according to EN 60529:

IP 65

Moulding material:

Termoplasticpolyester

Marking on coil:

**CE** **Ex** II 3G Ex ec IIC T5 Gc  
II 3D Ex tc IIIC T95°C Dc

Delivery content without ATEX approved connector. Please order connector type ST 22 Ex separately.

### Connector ST 22 Ex:

Connector can be used in combination with MA 22 EEx ec T5 coils. Connector is classified for zone 1 and 21 cat. II G/D. Please consider that our Ex ec coils are classified for zone 2 and 22 cat. III G/D only.

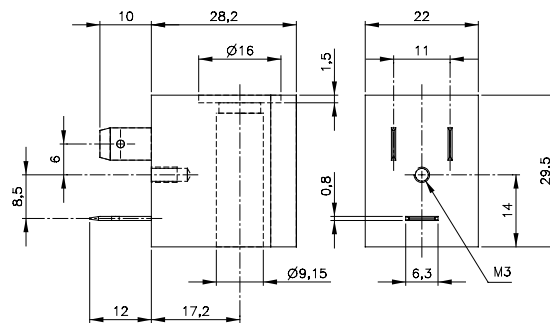
Using the enclosed flat seal, fastening screw and nut appropriately the system reaches protection class IP65 in accordance to IEC 60 529.

Marking on connector:

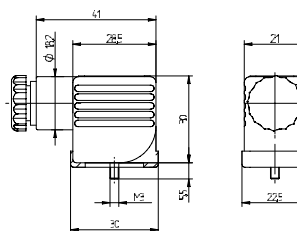
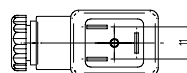
**CE** **Ex** II 2G Ex eb IIC T5 Gb  
II 2D Ex tb IIIC T100°C Db

The ATEX approval is only valid as long as the associated components are used.

When this solenoid system is used in combination with "ATEX certified" mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 2 and 22.



**MA 22 EEx ec T5**



**ST 22 Ex**

Type	Operating press.	Power cons.	Temp. class	Connection
MA 22 EEx ec T5 24DC	max. 10 bar	3 W	T5 (95° C)	Industryform Type B (DIN/ISO 436 50)
MA 22 EEx ec T5 24AC	max. 10 bar	5 VA	T5 (95° C)	Industryform Type B (DIN/ISO 436 50)
MA 22 EEx ec T5 110AC	max. 10 bar	5 VA	T5 (95° C)	Industryform Type B (DIN/ISO 436 50)
MA 22 EEx ec T5 230AC	max. 10 bar	5 VA	T5 (95° C)	Industryform Type B (DIN/ISO 436 50)

Type	Form	LED	VAR	Operat. voltage	Max. current	Cable diameter
ST 22 Ex	Industrial	no	no	0 - 250 V	10 A	6 - 8 mm



**Other voltages are available on request.**

# ATEX-approved valves – Ex e mb – standard temperature range – aluminum



Material: Aluminum, anodized  
 Zone: 1, 2, 21, 22  
 Temperature range: -10°C ... +50°C  
 Ignition protection type: Ex e mb (encapsulation with junction box)  
 Temperature class: T6

Marking on valve

 II 2 G Ex h IIC T6 Gb  
 -10°C ≤ Ta ≤ +50°C  
 II 2 D Ex h III C T80°C  
 Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 210 501 Ex e mb	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MH 210 701 Ex e mb	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MH 310 501 G Ex e mb	3/2-way, single sol.	G 1/8"	in-line	2.5.1.1.10
MOH 310 501 G Ex e mb	3/2-way, n.o. single sol.	G 1/8"	in-line	2.5.1.1.10
MH 310 701 G Ex e mb	3/2-way, single sol.	G 1/4"-1/4" NPT	in-line	2.5.1.1.10
MOH 310 701 G Ex e mb	3/2-way, n.o. single sol.	G 1/4"-1/4" NPT	in-line	2.5.1.1.10
MH 310 101 Ex e mb	3/2-way, single sol.	G 3/8"	in-line	2.5.1.1.11
MOH 310 101 Ex e mb	3/2-way, n.o. single sol.	G 3/8"	in-line	2.5.1.1.11
MH 310 121 Ex e mb	3/2-way, single sol.	G 1/2"-1/2" NPT	in-line	2.5.1.1.11
MOH 310 121 Ex e mb	3/2-way, n.o. single sol.	G 1/2"-1/2" NPT	in-line	2.5.1.1.11
MH 310 181 Ex e mb	3/2-way, single sol.	G 3/4"	in-line	2.5.1.1.11
MOH 310 181 Ex e mb	3/2-way, n.o. single sol.	G 3/4"	in-line	2.5.1.1.11
MH 510 501 G Ex e mb	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.2
MH 510 701 G Ex e mb	5/2-way, single sol.	G 1/4"-1/4" NPT	in-line	2.5.2.1.2
MH 510 101 Ex e mb	5/2-way, single sol.	G 3/8"	in-line	2.5.2.1.3
MH 510 121 Ex e mb	5/2-way, single sol.	G 1/2"-1/2" NPT	in-line	2.5.2.1.3
MH 510 181 Ex e mb	5/2-way, single sol.	G 3/4"	in-line	2.5.2.1.3
MH 520 501 G Ex e mb	5/2-way, double sol.	G 1/8"	in-line	2.5.2.1.5
MH 520 701 G Ex e mb	5/2-way, double sol.	G 1/4"-1/4" NPT	in-line	2.5.2.1.5
MH 520 101 Ex e mb	5/2-way, double sol.	G 3/8"	in-line	2.5.2.1.6
MH 520 121 Ex e mb	5/2-way, double sol.	G 1/2"-1/2" NPT	in-line	2.5.2.1.6
MH 520 181 Ex e mb	5/2-way, double sol.	G 3/4"	in-line	2.5.2.1.6
MH 53_501 G Ex e mb	5/3-way, different versions	G 1/8"	in-line	2.5.3.1.2
MH 53_701 G Ex e mb	5/3-way, different versions	G 1/4"-1/4" NPT	in-line	2.5.3.1.2
MH 53_101 Ex e mb	5/3-way, different versions	G 3/8"	in-line	2.5.3.1.3
MH 53_121 Ex e mb	5/3-way, different versions	G 1/2"-1/2" NPT	in-line	2.5.3.1.3

#### Valves with interface according to NAMUR-standard

MNH 350 701 Ex e mb	3/2-way & 5/2-way	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.3
MNH 310 701 Ex e mb	3/2-way, single sol.	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 311 701 Ex e mb	3/2-way, comb. spring	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 310 711 Ex e mb	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNH 310 121 Ex e mb	3/2-way, single sol.	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 311 121 Ex e mb	3/2-way, comb. spring	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 510 701 Ex e mb	5/2-way, single sol.	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 511 701 Ex e mb	5/2-way, comb. Spring	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 510 711 Ex e mb	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNH 510 121 Ex e mb	5/2-way, single sol.	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 511 121 Ex e mb	5/2-way, comb. spring	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 520 701 Ex e mb	5/2-way, double sol.	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNH 520 121 Ex e mb	5/2-way, double sol.	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNH 53_701 Ex e mb	5/3-way, different versions	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.4
MNH 53_121 Ex e mb	5/3-way, centre closed	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.4

Solenoids are described on page 2.15.6.6.4.





Example drawings including the solenoid are displayed on page 2.15.6.6.5.

Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

# ATEX-approved valves – Ex e mb – low temperature range – aluminum



Material: Aluminum, anodized  
 Zone: 1, 2, 21, 22  
 Temperature range: -40°C ... +50°C ❄️  
 Ignition protection type: Ex e mb (encapsulation with junction box)  
 Temperature class: T6

Marking on valve   II 2 G Ex h IIC T6 Gb  
 -50°C ≤ Ta ≤ +50°C  
  II 2 D Ex h IIIIC T80°C  
 Db -50°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 310 701 GTT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.1.2
MOH 310 701 GTT Ex e mb	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.1.2
MH 510 701 GTT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.2.1
MH 520 701 GTT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.2.2
MH 53_ 701 GTT Ex e mb	5/3-way, different versions	G 1/4" - 1/4" NPT	dual use*	2.12.7.2.2

#### Valves with interface according to NAMUR-standard



MNH 310 701 TT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNH 311 701 TT Ex e mb	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNH 510 701 TT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 511 701 TT Ex e mb	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 510 711 TT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 520 701 TT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2
MNH 531 701 TT Ex e mb	5/3-way, centre closed	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2





Solenoids are described on page 2.15.6.6.4.  
 Example drawings including the solenoid are displayed on page 2.15.6.6.5.  
 Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.



# ATEX-approved valves – Ex e mb – low temperature range – stainless steel



Material: Stainless steel, 316L   
 Zone: 1, 2, 21, 22  
 Temperature range: -40°C ... +50°C   
 Ignition protection type: Ex e mb (encapsulation with junction box)  
 Temperature class: T6

Marking on valve   II 2 G Ex h IIC T6 Gb  
 -50°C ≤ Ta ≤ +50°C  
  II 2 D Ex h IIIC T80°C  
 Db -50°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 310 701 VES TT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES TT Ex e mb	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 510 701 VES TT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 520 701 VES TT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 53_ 701 VES TT Ex e mb	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6

#### Valves with interface according to NAMUR-standard

MNH 350 701 VES TT Ex e mb	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES TT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES TT Ex e mb	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 510 701 VES TT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES TT Ex e mb	5/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 520 701 VES TT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Solenoids are described on page 2.15.6.6.4.

Example drawings including the solenoid are displayed on page 2.15.6.6.5.

Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

1/2" stainless steel valves in standard temperature range on request.

# MA 52 EEx e mb IIC T6

When this solenoid system is used in combination with "ATEX certified" mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21 and 22.



Details of junction box

ATEX and IEC Ex approved encapsulated coil with junction box for gas and dust explosion-hazardous environment.

Voltage tolerance: - 10...+ 10%  
 Relative duty cycle: 100 %  
 Temperature range: -40°C...+50°C

Insulation class of insulating Materials according to DIN VDE 0580: F

Protection according to EN 60529: IP 65  
 (IP 67 with nut type M G 1/8 M5 in combination with exhaust protection fitting type ESR M5)

Moulding material: Thermoplasticpolyester

Cable Gland: M20 x 1,5  
 for cable diameters 6 – 13 mm

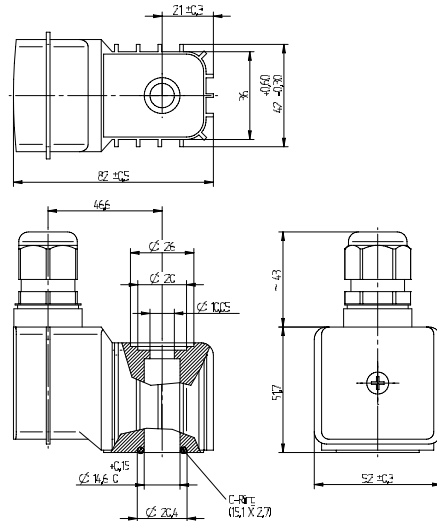
Please note:  
 Same coil for DC and AC.

Marking on coil:  II 2G Ex e mb IIC T6 Gb  
 II 2D Ex tb mb IIIC T80°C Db

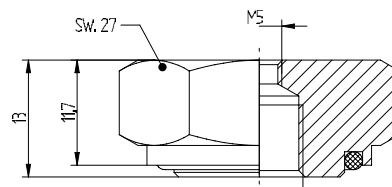
The ATEX approval is only valid as long as the associated components are used.

Important installation instructions:

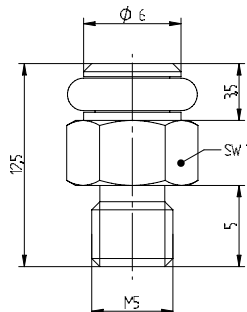
Connecting cables and connecting lines shall be suitable for permanent application in a temperature range of -40 °C up to +105 °C and must be laid fixed to the device. The user shall provide for a strain relief. When using silicone or silicone-containing cables for connection or cables that are not resistant to scoring, these shall be protected against mechanical damage. For further instructions, please ask us for the operating manual.



MA 52 EEx e mb IIC T6



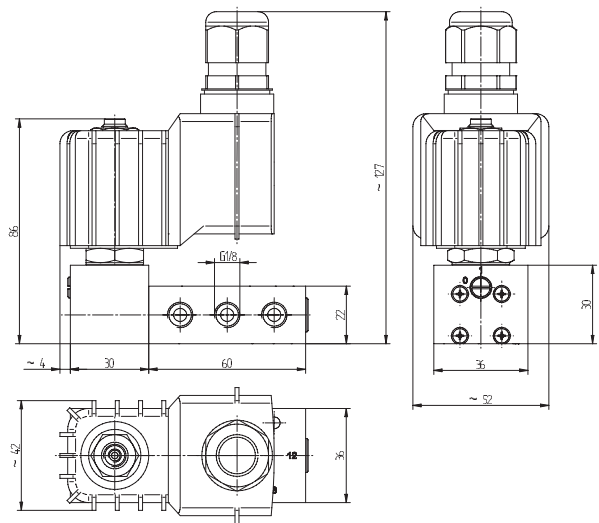
M G 1/8 M5



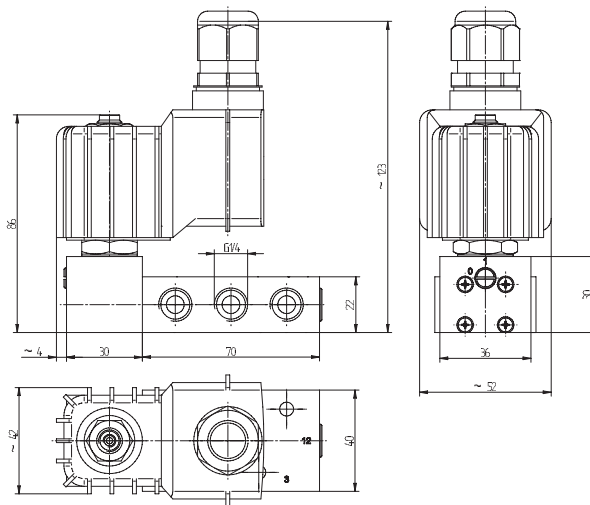
ESR M5

Type	Operating press.	Power cons.	Temperature class
MA 52 EEx e mb IIC T6 24	max. 10 bar	4,8 Watt	T6 (85° C)
MA 52 EEx e mb IIC T6 110	max. 10 bar	4,8 Watt	T6 (85° C)
MA 52 EEx e mb IIC T6 230	max. 10 bar	4,8 Watt	T6 (85° C)

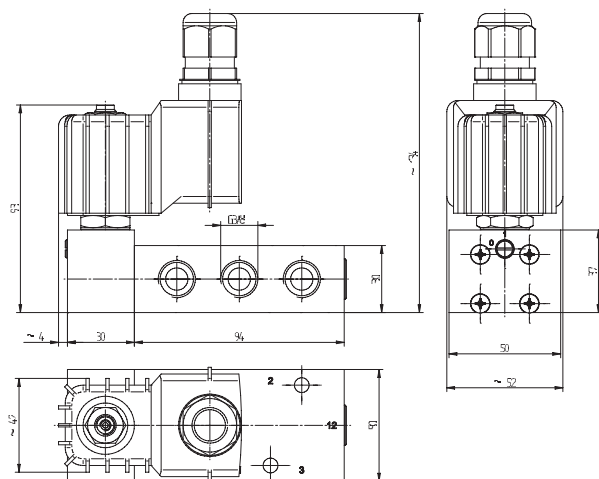
# Example drawings of solenoid valves with Ex e mb solenoid system



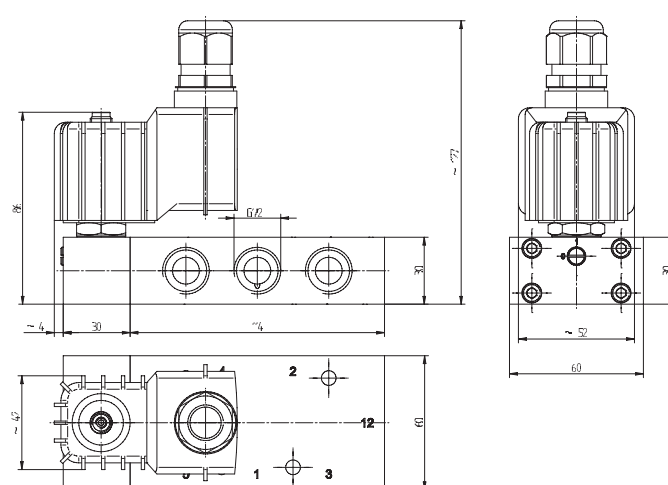
MH 510 501 Ex e mb IIC T6



MH 510 701 Ex e mb IIC T6 /  
MNH 510 701 EX e mb IIC T6

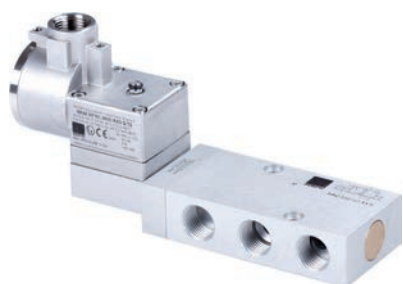


MH 510 101 Ex e mb IIC T6



MH 510 121 Ex e mb IIC T6 /  
MNH 510 121 Ex e mb IIC T6

# ATEX-approved valves – Ex d – standard temperature range – aluminum



Material: Aluminum, anodized  
 Zone: 1, 2, 21, 22  
 Temperature range: -10°C ... +50°C  
 Ignition protection type: Ex d – flameproof  
 Temperature class: T6 (solenoid)

Marking on valve

**CE Ex** II 2 G Ex h IIC T6 Gb  
 -10°C ≤ Ta ≤ +50°C  
**CE Ex** II 2 D Ex h IIIC T80°C  
 Db -10°C ≤ Ta ≤ +50°C

The following **solenoid valves** are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 017 24DC Ex d M	3/2-way, direct acting	G 1/8"	banjo screw G 1/4"	2.15.4.1
MH 311 018 24DC Ex d m	3/2-way, direct acting	G 1/4"	in-line	2.15.4.1
MC 210 501 Ex	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MC 210 701 Ex	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MC 310 501 G Ex	3/2-way, single sol.	G 1/8"	in-line	2.5.1.1.10
MOC 310 501 G Ex	3/2-way, n.o. single sol.	G 1/8"	in-line	2.5.1.1.10
MC 310 701 G Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MOC 310 701 G Ex	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MC 310 121 Ex	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MOC 310 121 Ex	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MC 510 501 G Ex	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.2
MC 510 701 G Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.2
MC 510 121 Ex	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MC 520 501 G Ex	5/2-way, double sol.	G 1/8"	in-line	2.5.2.1.5
MC 520 701 G Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.5
MC 520 121 Ex	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MC 53_ 501 G Ex	5/3-way, different versions	G 1/8"	in-line	2.5.3.1.2
MC 53_ 701 G Ex	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.5.3.1.2
MC 53_ 121 Ex	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3

## Valves with interface according to NAMUR-standard

MNC 350 701 Ex	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.3
MNC 310 701 Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNC 311 701 Ex	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNC 310 711 Ex	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNC 310 121 Ex	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNC 311 121 Ex	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNC 510 701 Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNC 511 701 Ex	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNC 510 711 Ex	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNC 510 121 Ex	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNC 511 121 Ex	5/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNC 520 701 Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNC 520 121 Ex	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNC 53_ 701 Ex	5/3-way, different versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.4
MNC 53_ 121 Ex	5/3-way, centre closed	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.4

Interface between valve body and solenoid system according to CNOMO, therefore the types are called MC.

Base plate assembly due to solenoid coil is not possible.

Flameproof solenoids are displayed on page 2.15.6.7.5.

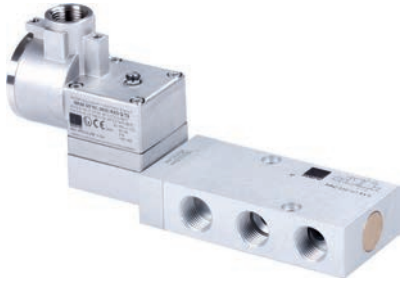
Example drawings including the solenoid are displayed on page 2.15.6.7.6.

Please note: If the valve is ordered fully assembled with the Ex d coil from page 2.15.6.7.5, the type number of the valve changes from MC to MH, MOC to MOH and MNC to MNH.

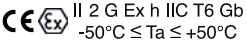

For example: MH 310 701 G 24DC Ex d

Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.

# ATEX-approved valves – Ex d – low temperature range – aluminum



Material: Aluminum, anodized  
 Zone: 1, 2, 21, 22  
 Temperature range: -50°C ... +50°C ❄️  
 Solenoid coil limited to -40°C  
 Ignition protection type: Ex d – flameproof  
 Temperature class: T6 (solenoid)

Marking on valve   


The following **solenoid valves** are available:

Type	Function	Port size	Installation	Further inform. on valve
MC 310 701 GTT Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.12.7.1.2
MOC 310 701 GTT Ex	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.12.7.1.2
MC 510 701 GTT Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.12.7.2.1
MC 520 701 GTT Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.12.7.2.2
MC 53_ 701 GTT Ex	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.12.7.2.2

## Valves with interface according to NAMUR-standard

MNC 310 701 TT Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNC 311 701 TT Ex	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNC 510 701 TT Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNC 511 701 TT Ex	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNC 510 711 TT Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNC 520 701 TT Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2
MNC 531 701 TT Ex	5/3-way, centre closed	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2

Interface between valve body and solenoid system according to CNOMO, therefore the types are called MC.

Base plate assembly due to solenoid coil is not possible.

Flameproof solenoids are displayed on page 2.15.6.7.5.

Example drawings including the solenoid are displayed on page 2.15.6.7.6


Please note: If the valve is ordered fully assembled with the Ex d coil from page 2.15.6.7.5, the type number of the valve changes from MC to MH, MOC to MOH and MNC to MNH.

For example: MH 310 701 G 24DC Ex d





Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.

# ATEX-approved valves – Ex d – standard temperature range – stainless steel



Material: Stainless steel, 316L   
 Zone: 1, 2, 21, 22  
 Temperature range: -10°C ... +50°C  
 Ignition protection type: Ex d – flameproof  
 Temperature class: T6 solenoid

Marking on valve

  II 2 G Ex h IIC T6 Gb  
 -10°C ≤ Ta ≤ +50°C  
  II 2 D Ex h IIC T80°C  
 Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MC 310 701 VES Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOC 310 701 VES Ex	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MC 310 121 VES Ex	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.3
MC 510 701 VES Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MC 510 121 VES Ex	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.4
MC 520 701 VES Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MC 520 121 VES Ex	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.5
MC 53_ 701 VES Ex	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6
MC 53_ 121 VES Ex	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.13.4.6

## Valves with interface according to NAMUR-standard

MNC 350 701 VES Ex	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNC 310 701 VES Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNC 311 701 VES Ex	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNC 310 121 VES Ex	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.1
MNC 510 701 VES Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNC 511 701 VES Ex	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNC 510 121 VES Ex	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.3
MNC 520 701 VES Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Interface between valve body and solenoid system according to CNOMO, therefore the types are called MC.

Base plate assembly due to solenoid coil is not possible.

Flameproof solenoids are displayed on page 2.15.6.7.5.

Example drawings including the solenoid are displayed on page 2.15.6.7.6.



Please note: If the valve is ordered fully assembled with the Ex d coil from page 2.15.6.7.5, the type number of the valve changes from MC to MH, MOC to MOH and MNC to MNH.





For example: MH 310 701 G 24DC Ex d

Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.

# ATEX-approved valves – Ex d – low temperature range – stainless steel



Material: Stainless steel, 316L   
 Zone: 1, 2, 21, 22  
 Temperature range: -50°C ... +50°C   
 Solenoid coil limited to - 40°C  
 Ignition protection type: Ex d – flameproof  
 Temperature class: T6 (solenoid)

Marking on valve   II 2 G Ex h IIC T6 Gb  
 -50°C ≤ Ta ≤ +50°C  
  II 2 D Ex h III C T80°C  
 Db -50°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MC 310 701 VES TT Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOC 310 701 VES TT Ex	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MC 510 701 VES TT Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MC 520 701 VES TT Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MC 53_701 VES TT Ex	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6

#### ValVES TT with interface according to NAMUR-standard

MNC 350 701 VES TT Ex	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNC 310 701 VES TT Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNC 311 701 VES TT Ex	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNC 510 701 VES TT Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNC 511 701 VES TT Ex	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNC 520 701 VES TT Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Interface between valve body and solenoid system according to CNOMO, therefore the types are called MC.  
 Base plate assembly due to solenoid coil is not possible.  
 Flameproof solenoids are displayed on page 2.15.6.7.5.  
 Example drawings including the solenoid are displayed on page 2.15.6.7.6.

Please note: If the valve is ordered fully assembled with the Ex d coil from page 2.15.6.7.5, the type number of the valve changes from MC to MH, MOC to MOH and MNC to MNH.  
 For example: MH 310 701 G 24DC Ex d.  
 Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.




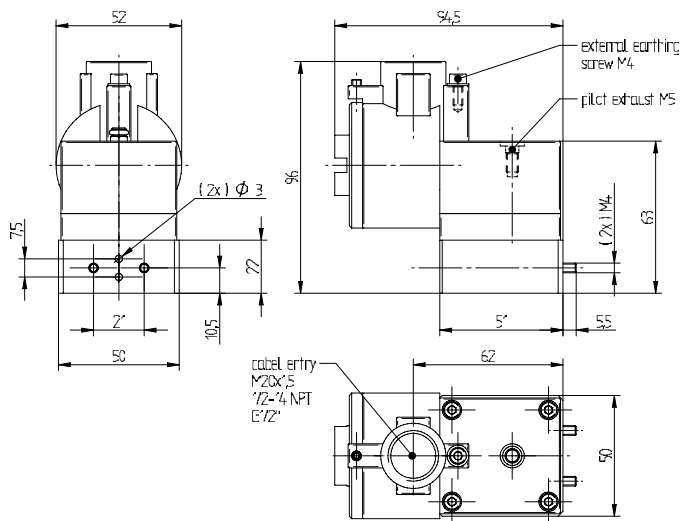
# MH 52 Ex d/MH 52 VES Ex d

When this solenoid system is used in combination with "ATEX certified" mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21 and 22.



ATEX and IECEx approved flameproof coil for gas and dust explosion hazardous environment.

Voltages:	24VDC, 110VAC, 230VAC
Voltage tolerance:	- 10...+ 10 %
Relative duty cycle:	100 %
Temperature range:	-40°C...+50°C (please consider temperature range of the selected valve)
Ignition protection type:	Flameproof
Protection according to EN 60529:	IP 67
Coil rating according to DIN VDE 0580:	Class F
Wire class:	H
Ex-marking on coil:	 II 2G Ex db IICT6 Gb II 2D Ex tb IIIC T80°C Db
Manual override:	bistable to turn, others on request



MH 52 .... (VES) Ex d

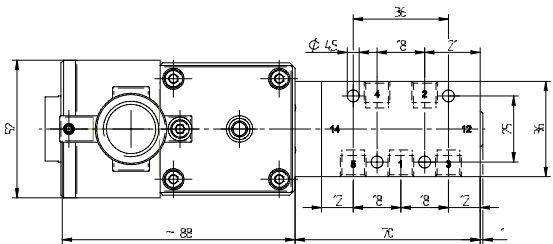
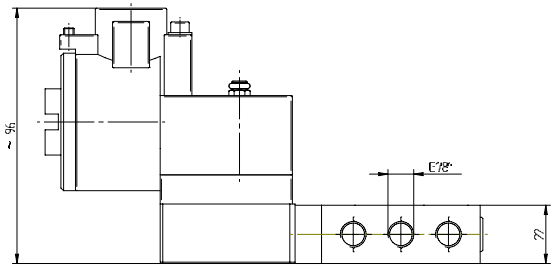
Delivery content without cable gland. Ex d rated cable glands can be supplied on request.

The ATEX approval is only valid as long as the associated components are used.

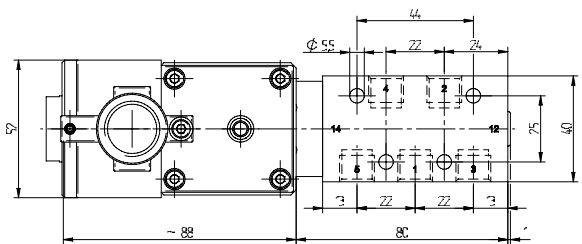
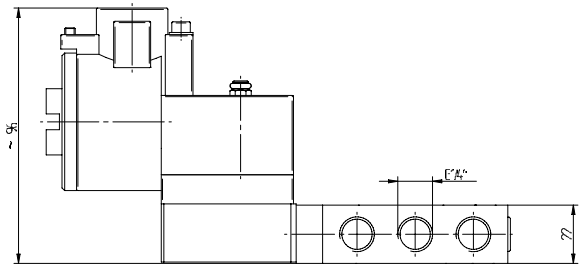
Type	Pilot-head	Operating press.	Power cons.	Temperature class	Weight
MH 52 24DC Ex d *	Aluminum	max. 10 bar	2.0 Watt	T6 (85° C)	1,15 kg
MH 52 VES 24DC Ex d *	Stainless steel	max. 10 bar	2.0 Watt	T6 (85° C)	1,45 kg
MH 52 110AC Ex d *	Aluminum	max. 10 bar	3.0 VA	T6 (85° C)	1,15 kg
MH 52 VES 110AC Ex d *	Stainless steel	max. 10 bar	3.0 VA	T6 (85° C)	1,45 kg
MH 52 230AC Ex d *	Aluminum	max. 10 bar	3.0 VA	T6 (85° C)	1,15 kg
MH 52 VES 230AC Ex d *	Stainless steel	max. 10 bar	3,0 VA	T6 (85° C)	1,45 kg

\* Please add letter for cable gland thread: - M = M20x1.5  
- N = 1/2-14 NPT

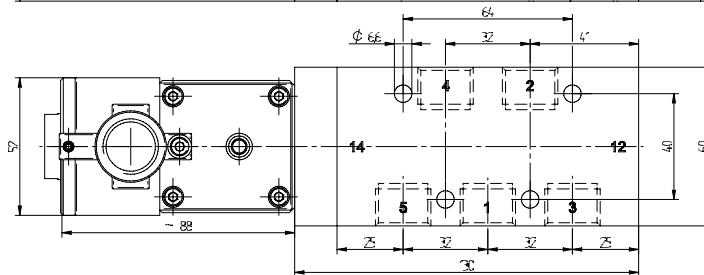
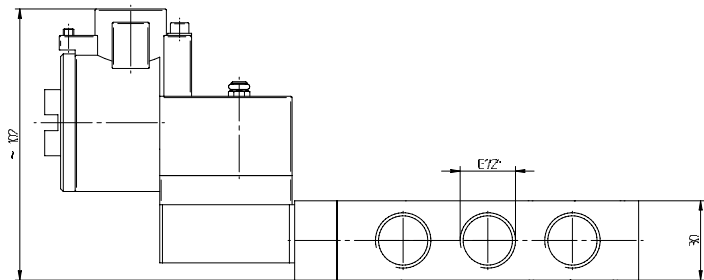
# Example drawings of solenoid valves with Ex d solenoid system



**MC 510 501 Ex d**

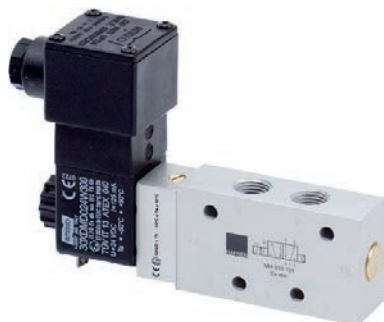


**MC 510 701 Ex d/  
MNC 510 701 Ex d**



**MC 510 121 Ex d/  
MNC 510 121 Ex d**

# ATEX-approved valves – Ex dm – standard temperature range – aluminum



Material:	Aluminum, anodized
Zone:	1, 2, 21, 22
Temperature range:	-10°C ... +50°C
Ignition protection type:	Ex dm (encapsulated-flameproof with junction box)
Temperature class:	T5
Marking on valve:	<b>CE</b> <b>Ex</b> II 2 G Ex h IIC T6 Gb -10°C ≤ Ta ≤ +50°C <b>CE</b> <b>Ex</b> II 2 D Ex h IIIC T80°C Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 210 501 Ex dm	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MH 210 701 Ex dm	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MH 311 012 Ex dm	3/2-way direct acting	M5	in-line	2.5.1.1.2
MH 311 015 Ex dm	3/2-way direct acting	G 1/8"	in-line	2.5.1.1.2
MH 310 501 G Ex dm	3/2-way, single sol.	G 1/8"	dual use*	2.5.1.1.10
MOH 310 501 G Ex dm	3/2-way, n.o. single sol.	G 1/8"	dual use*	2.5.1.1.10
MH 310 701 G Ex dm	3/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MOH 310 701 G Ex dm	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MH 310 101 Ex dm	3/2-way, single sol.	G 3/8"	in-line	2.5.1.1.11
MOH 310 101 Ex dm	3/2-way, n.o. single sol.	G 3/8"	in-line	2.5.1.1.11
MH 310 101 G Ex dm	3/2-way, single sol.	G 3/8"	dual use*	2.5.1.1.11
MOH 310 101 G Ex dm	3/2-way, n.o. single sol.	G 3/8"	dual use*	2.5.1.1.11
MH 310 121 Ex dm	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MOH 310 121 Ex dm	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MH 310 181 Ex dm	3/2-way, single sol.	G 3/4"	in-line	2.5.1.1.11
MOH 310 181 Ex dm	3/2-way, n.o. single sol.	G 3/4"	in-line	2.5.1.1.11
MH 510 501 G Ex dm	5/2-way, single sol.	G 1/8"	dual use*	2.5.2.1.2
MH 510 701 G Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.2
MH 510 101 Ex dm	5/2-way, single sol.	G 3/8"	in-line	2.5.2.1.3
MH 510 121 Ex dm	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MH 510 181 Ex dm	5/2-way, single sol.	G 3/4"	in-line	2.5.2.1.3
MH 520 501 G Ex dm	5/2-way, double sol.	G 1/8"	dual use*	2.5.2.1.5
MH 520 701 G Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.5
MH 520 101 Ex dm	5/2-way, double sol.	G 3/8"	in-line	2.5.2.1.6
MH 520 121 Ex dm	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MH 520 181 Ex dm	5/2-way, double sol.	G 3/4"	in-line	2.5.2.1.6
MH 53_ 501 G Ex dm	5/3-way, diff. versions	G 1/8"	dual use*	2.5.3.1.2
MH 53_ 701 G Ex dm	5/3-way, diff. versions	G 1/4" - 1/4" NPT	dual use*	2.5.3.1.2
MH 53_ 101 Ex dm	5/3-way, diff. versions	G 3/8"	in-line	2.5.3.1.3
MH 53_ 121 Ex dm	5/3-way, diff. versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3

#### Valves with interface according to NAMUR-standard

MNH 350 701 Ex dm	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.3
MNH 310 701 Ex dm	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 311 701 Ex dm	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 310 711 Ex dm	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNH 310 121 Ex dm	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 311 121 Ex dm	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 510 701 Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 511 701 Ex dm	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 510 711 Ex dm	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNH 510 121 Ex dm	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 511 121 Ex dm	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 520 701 Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNH 520 121 Ex dm	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNH 53_ 701 Ex dm	5/3-way, diff. versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.4
MNH 53_ 121 Ex dm	5/3-way, diff. versions	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.4

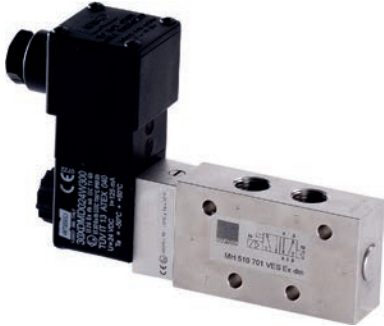
Base plate assembly due to width of solenoid coil (36 mm) is not possible.


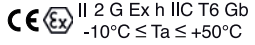

Encapsulated flameproof solenoids are displayed on page 2.15.6.8.3.

A low temperature version for -20°C ... +50°C is also available on request. Please note that the system is restricted by the minimum ambient temperature for the coil of -20°C.

Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.

# ATEX-approved valves – Ex dm – standard temperature range – stainless steel



Material:	Stainless steel, 316L 
Zone:	1, 2, 21, 22
Temperature range:	-10°C ... +50°C
Ignition protection type:	Ex dm (encapsulated-flameproof with junction box)
Temperature class:	T5
Marking on valve:	 

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 015 VES Ex dm	3/2-way direct acting	G 1/8"	in-line	2.13.4.1
MH 310 701 VES Ex dm	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES Ex dm	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 310 121 VES Ex dm	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.3
MH 510 701 VES Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 510 121 VES Ex dm	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.4
MH 520 701 VES Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 520 121 VES Ex dm	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.5
MH 53_ 701 VES Ex dm	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6
MH 53_ 121 VES Ex dm	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.13.4.6

#### Valves with interface according to NAMUR-standard

MNH 350 701 VES Ex dm	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES Ex dm	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES Ex dm	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 310 121 VES Ex dm	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.1
MNH 510 701 VES Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES Ex dm	5/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 510 121 VES Ex dm	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.3
MNH 520 701 VES Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

If the coil will be used with a NAMUR-valve of series 700, an 8 mm distance plate is required. Please contact us. Encapsulated flameproof solenoids are displayed on page 2.15.6.8.3.

A low temperature version for -20°C ... +50°C is also available on request. Please note that the system is restricted by the minimum ambient temperature for the coil of -20°C.

Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.

# MA 36 EEx dm IIC T5

When this solenoid system is used in combination with "ATEX certified" mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21 and 22.



ATEX approved encapsulated coil with flameproof junction box for gas and dust explosion-hazardous environment.

Voltages: 12VDC, 24VDC, 24VAC, 110VAC, 230VAC

Voltage tolerance: - 10...+ 10%

Relative duty cycle: 100 %

Temperature range: -20°C...+50°C

Ignition protection type: Coil encapsulated, junction box flameproof

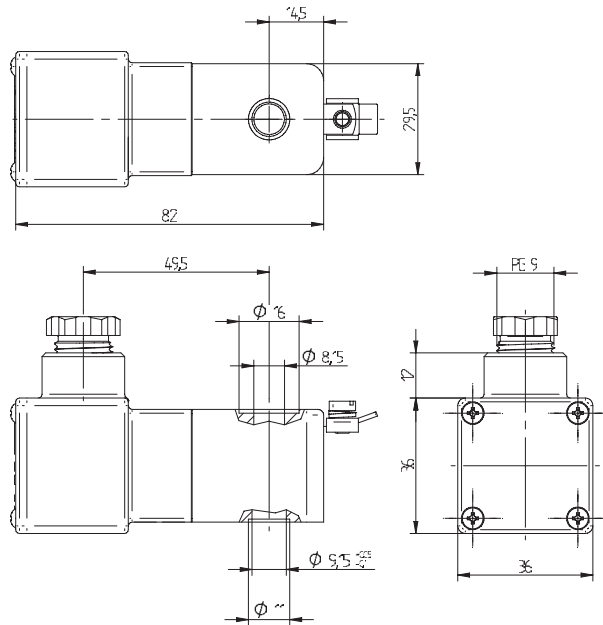
Protection with connector according to EN 60529: IP 66

Moulding material: Thermoplasticpolyester

Coil rating according to DIN VDE 0580: Class F

Cable Gland: PG 9 DIN 40-430 for cable diameters 6 – 8 mm

Marking on coil:  II 2G Ex db mb IIC T5 Gb  
II 2D Ex tb IIIC T95°C IP66 Db

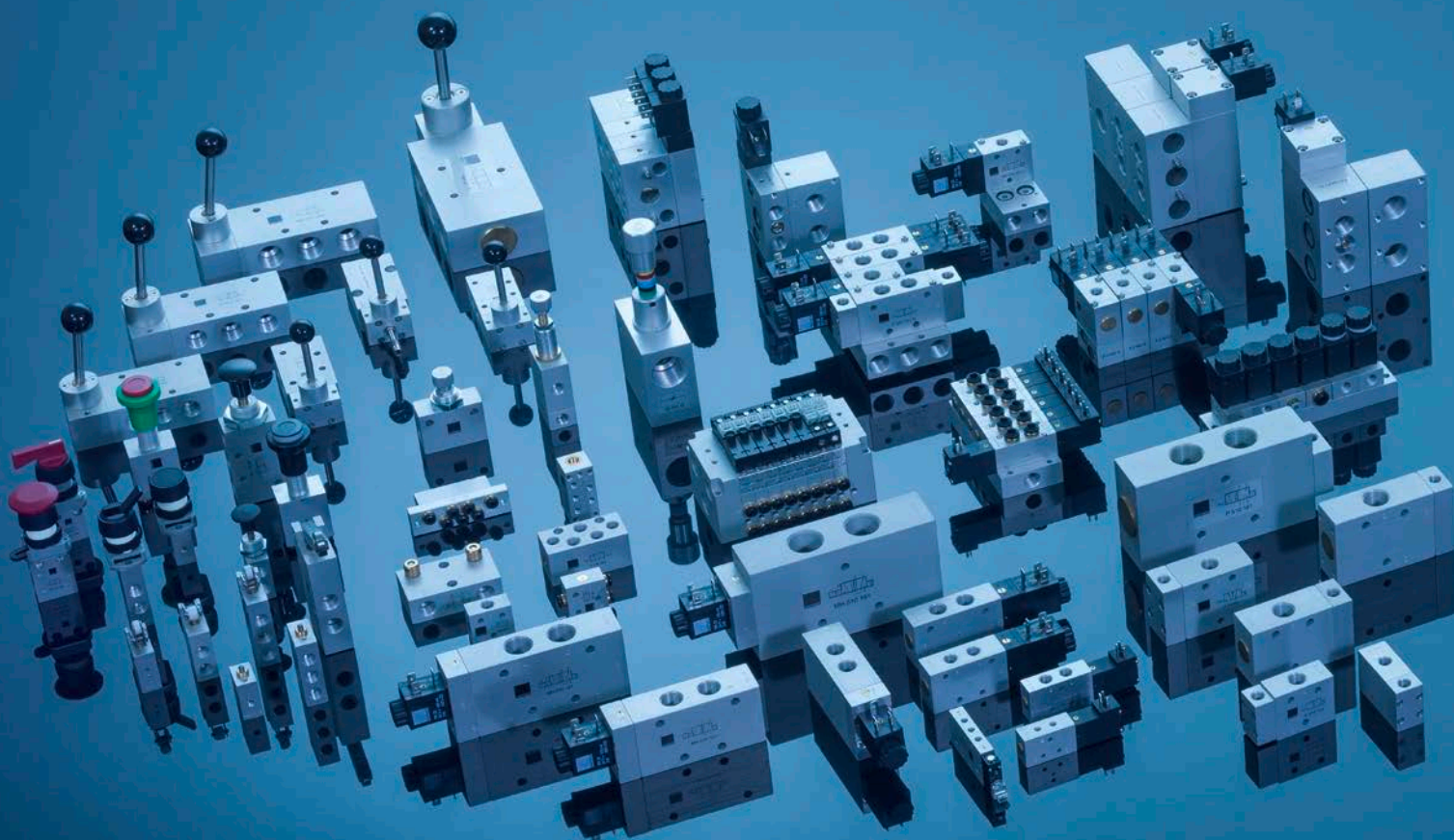


MA 36 EEx dm IIC T5\_ \_

As the coil is 36 mm wide, a spacer plate called "ZPN 8" has to be used, in case of combination with our NAMUR-valve series 700. If used with NAMUR-valve series 121 a spacer plate called "ZPN 6-5" has to be used. You can find both plates on page 2.11.13.

The ATEX approval is only valid as long as the associated components are used.

Type	Operating press.	Power cons.	Temperature class
MA 36 EEx dm IIC T5 12DC	max. 10 bar	3,0 Watt	T5 (100 °C)
MA 36 EEx dm IIC T5 24DC	max. 10 bar	3,0 Watt	T5 (100 °C)
MA 36 EEx dm IIC T5 24AC	max. 10 bar	4,8 VA	T5 (100 °C)
MA 36 EEx dm IIC T5 110AC	max. 10 bar	4,8 VA	T5 (100 °C)
MA 36 EEx dm IIC T5 230AC	max. 10 bar	4,8 VA	T5 (100 °C)



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