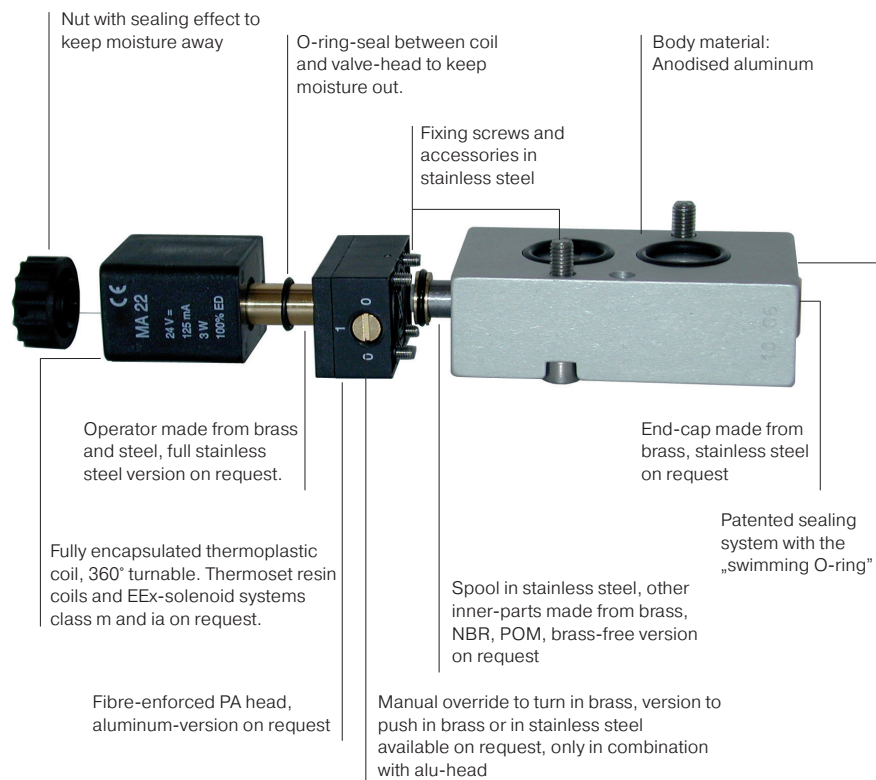


Besides maximum flow of 1.250 NI/min at compact design there are 11 more competitive advantages of the Hafner valve series 701.



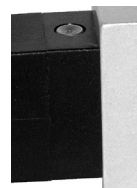
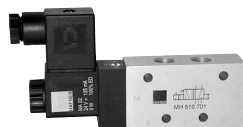
Different customers have demand for different manual overrides. Hafner offers a standard but on demand variations are an option.



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:

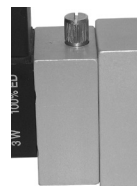
- Direct acting valves
- 16 mm wide valves (by default)
- 22+ mm wide valves



Series MF

Manual override to turn by hand:

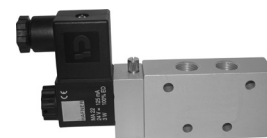
- Direct acting valves
- 22+ mm wide valves



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



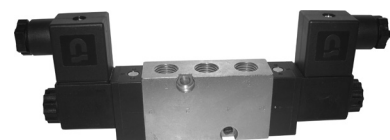
22+ mm



M-Version

Without manual override:

- An option for all 22 mm + wide valves



General Technical Information for Hafner Valves

Temperature range:

Type-number	Temperature range
BV, BR, BL, BA	-20°C to +50°C
BG, BH	-10°C to +60°C
HV, HVR, P	-10°C to +60°C
MH, MNH DC-version	-10°C to +60°C
MH, MNH AC-version	-10°C to +50°C
MD, MK	-10°C to +50°C
TT series 500/700	-50°C to +50°C
TT series 121	-40°C to +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 ³ /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	10	5

General Warranty:

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

Recommended signal length:

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

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.

Voltage tolerance:

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

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 1.43 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.

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

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

24DC

Block 4

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 nA	ATEX-approved for Ex nA 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

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

HAFNER

Quick Finder for Manifold Systems

page 20

We offer a large variety of manifold systems. In order to choose the appropriate combination of manifold plate and solenoid valves please consult the list below.

The different valves which can be assembled to one type of manifold plate are described in the same row.

Manifold systems that can be equipped with our D-Sub-terminal system are indicated by a **T** in the last column.

Valves that can be used in-line and on manifold plates are indicated by a **G**.

Modular Manifold-System indicated by a **B**.

3 way solenoid valves

position of ports			port size			manifold		3/2 way single sol.			3/2 way double sol.		comment	
1	2	3	1	2	3	type	page	type n.c.	type n.o.	page	type	page		
plate	plate	valve	G 1/8"	M5	operator	RD 3__104	2.5.1.2.1	MD 311 104	n.a.	2.5.1.2.1	n.a.	n.a.	direct acting	T
plate	plate	valve	G 1/8"	pif 4 mm	operator	RD 3__144	2.5.1.2.1	MD 311 104	n.a.	2.5.1.2.1	n.a.	n.a.	direct acting	T
plate	valve	valve	G 1/4"	M5	operator	R __	2.7.1.1	MH 312	n.a.	2.5.1.2.2	n.a.	n.a.	direct acting	
plate	valve	valve	G 1/4"	G 1/8"	operator	R __	2.7.1.1	MH 315	n.a.	2.5.1.2.2	n.a.	n.a.	direct acting	
plate	valve	valve	G 1/4"	pif 4 mm	operator	R __	2.7.1.1	MH 314	n.a.	2.5.1.2.2	n.a.	n.a.	direct acting	
plate	valve	valve	G 1/4"	pif 6 mm	operator	R __	2.7.1.1	MH 316	n.a.	2.5.1.2.2	n.a.	n.a.	direct acting	
plate	plate	valve	G 1/4"	G 1/4"	G 1/8"	R 33	2.5.1.2.3	MH 339	n.a.	2.5.1.2.3	n.a.	n.a.	direct acting	B
plate	valve	plate	G 1/8"	pif 4 mm	G 1/8"	RD 3__303	2.7.1.2	MD 310 343	MOD 310 343	2.5.1.2.4	n.a.	n.a.	3/2 way valves	T
plate	valve	plate	G 1/4"	pif 6 mm	G 1/4"	RD 3__403	2.7.1.2	MD 310 463	MOD 310 463	2.5.1.2.4	n.a.	n.a.	3/2 way valves	T
plate	valve	plate	G 1/4"	G 1/8"	G 1/4"	RD 3__403	2.7.1.2	MD 310 403	MOD 310 403	2.5.1.2.4	n.a.	n.a.	3/2 way valves	T
plate	plate	plate	G 3/8"	pif 4 mm	G 3/8"	RM 5__344	2.6.2.4		MMD 23_304	2.6.2.1			double 3/2 way valves	T
plate	plate	plate	G 1/4"	pif 4 mm	G 1/4"	RD 3__344	2.7.1.3	MD 310 304	MOD 310 304	2.5.1.2.5	n.a.	n.a.	3/2 way valves	T
plate	plate	plate	G 1/4"	pif 6 mm	G 1/4"	RD 3__464	2.7.1.3	MD 310 404	MOD 310 404	2.5.1.2.5	n.a.	n.a.	3/2 way valves	T
plate	valve	plate	G 1/4"	G 1/8"	G 1/4"	RB 3__503 G	2.7.1.4	MH 310 501 G	MOH 310 501 G	2.5.1.1.16	MH 320 501 G	2.5.1.1.20	3/2 way valves	GB
plate	valve	plate	G 3/8"	G 1/4"	G 3/8"	RB 3__703 G	2.7.1.4	MH 310 701 G	MOH 310 701 G	2.5.1.1.16	MH 320 701 G	2.5.1.1.20	3/2 way valves	GT
plate	valve	plate	G 3/8"	G 1/4"	G 3/8"	RB 3__703 G	2.7.1.4	MH 331 701 G		2.5.1.3			3/3 way valves	G
plate	valve	plate	G 1/2"	G 3/8"	G 1/2"	RB 3__103 G	2.7.1.5	MH 310 101 G	MOH 310 101 G	2.5.1.1.17	MH 320 101 G	2.5.1.1.20	3/2 way valves	GB
plate	valve	plate	G 1/2"	G 1/2"	G 1/2"	R 3__121 G	2.7.1.5	MH 310 121 G	MOH 310 121 G	2.5.1.1.17	MH 320 121 G	2.5.1.1.20	3/2 way valves	G
plate	valve	plate	G 1/2"	G 1/2"	G 1/2"	R 3__121 G	2.7.1.5	MH 331 121 G		2.5.1.3			3/3 way valves	G

5 way solenoid valves

position of ports			port size			manifold		5/2 single sol.		5/2 double sol.		5/3 way		
1	2+4	3+5	1	2+4	3+5	type	page	type	page	type	page	type	page	
plate	valve	plate	G 1/8"	M5	G 1/8"	RD 5__303	2.7.2.1	MD 510 303	2.5.2.2.1	MD 520 303	2.5.2.2.5	MD 53_303	2.5.3.2.1	T
plate	valve	plate	G 1/8"	pif 4 mm	G 1/8"	RD 5__303	2.7.2.1	MD 510 343	2.5.2.2.1	MD 520 343	2.5.2.2.5	MD 53_343	2.5.3.2.1	T
plate	valve	plate	G 1/4"	G 1/8"	G 1/4"	RD 5__403	2.7.2.1	MD 510 403	2.5.2.2.1	MD 520 403	2.5.2.2.5	MD 53_403	2.5.3.2.1	T
plate	valve	plate	G 1/4"	pif 6 mm	G 1/4"	RD 5__403	2.7.2.1	MD 510 463	2.5.2.2.1	MD 520 463	2.5.2.2.5	MD 53_463	2.5.3.2.1	T
plate	valve	plate	G 1/4"	G 1/8"	G 1/4"	RB 5__503 G	2.7.2.2	MH 510 501 G	2.5.2.1.5	MH 520 501 G	2.5.2.1.11	MH 53_501 G	2.5.3.1.4	GB
plate	valve	plate	G 1/4"	G 1/8"	G 1/4"	RB 5__503 G	2.7.2.2	MH 510 503	2.5.2.2.2	MH 520 503	2.5.2.2.6	MH 53_503	2.5.3.2.2	TB
plate	valve	plate	G 3/8"	G 1/4"	G 3/8"	RB 5__703 G	2.7.2.3	MH 510 701 G	2.5.2.1.5	MH 520 701 G	2.5.2.1.11	MH 53_701 G	2.5.3.1.4	GB
plate	valve	plate	G 3/8"	G 1/4"	G 3/8"	RB 5__703 G	2.7.2.3	MH 510 703	2.5.2.2.2	MH 520 703	2.5.2.2.6	MH 53_703	2.5.3.2.2	TB
plate	valve	plate	G 3/8"	G 1/4"	G 3/8"	RB 5__803	2.7.2.5	MH 510 803	2.5.2.2.2	MH 520 803	2.5.2.2.6	MH 53_803	2.5.3.2.2	B
plate	valve	plate	G 1/2"	G 3/8"	G 1/2"	RB 5__103 G	2.7.2.4	MH 510 101 G	2.5.2.1.6	MH 520 101 G	2.5.2.1.12	MH 53_101 G	2.5.3.1.5	GB
plate	valve	plate	G 1/2"	G 1/2"	G 1/2"	RB 5__121 G	2.7.2.5	MH 510 121 G	2.5.2.1.6	MH 520 121 G	2.5.2.1.12	MH 53_121 G	2.5.3.1.5	GB
plate	plate	plate	G 3/8"	pif 4 mm	G 3/8"	RM 5__344	2.6.2.4	MMD 510 304	2.6.2.2	MMD 520 304	2.6.2.2	MMD 53_304	2.6.2.3	T
plate	plate	plate	G 1/8"	pif 4 mm	G 1/8"	RD 5__344	2.7.2.6	MD 510 304	2.5.2.2.3	MD 520 304	2.5.2.2.7	MD 53_304	2.5.3.2.3	T
plate	plate	plate	G 1/4"	pif 6 mm	G 1/4"	RD 5__464	2.7.2.6	MD 510 404	2.5.2.2.3	MD 520 404	2.5.2.2.7	MD 53_404	2.5.3.2.3	T
plate	plate	plate	G 1/4"	G 1/8"	G 1/4"	R 5__304	2.7.2.7	MH 510 304	2.5.2.2.4	MH 520 304	2.5.2.2.8	MH 53_304	2.5.3.2.4	T
plate	plate	plate	G 1/4"	G 1/8"	G 1/4"	R 5__504	2.7.2.7	MH 510 504	2.5.2.2.4	MH 520 504	2.5.2.2.8	MH 53_504	2.5.3.2.4	T
plate	plate	plate	G 3/8"	G 1/4"	G 3/8"	R 5__704	2.7.2.8	MH 510 704	2.5.2.2.4	MH 520 704	2.5.2.2.8	MH 53_704	2.5.3.2.4	T
plate	plate	plate	G 3/8"	pif 8 mm	G 3/8"	R 5__784	2.7.2.8	MH 510 704	2.5.2.2.4	MH 520 704	2.5.2.2.8	MH 53_704	2.5.3.2.4	T
plate	plate	plate	G 3/8"	G 1/4"	G 3/8"	RB 5__704 K1	2.7.2.9	MH 510 704	2.5.2.2.4	MH 520 704	2.5.2.2.8	MH 53_704	2.5.3.2.4	T
plate	plate	plate	G 1/2"	G 3/8"	G 1/2"	RB 5__104 K1	2.7.2.10	MH 510 104	2.5.2.2.4	MH 520 104	2.5.2.2.8	MH 53_104	2.5.3.2.4	T

HAFNER