

# Table of Contents

page

17 **General Technical Information**

18 **The Hafner type numbering system**

20 **Quick Finder for Manifold Systems**



21 **2.1 Mechanically Actuated Valves**

**2.1.1 3/2 way valves**

22	2.1.1.1	BV/BR/BL 311 201	M5	
23	2.1.1.2	BV/BR/BL 311 202	M5	ports on bottom
24	2.1.1.3	BV/BR/BL 311 243	pif 4 mm	
25	2.1.1.4	BV/BR/BL 311 301	G 1/8"	
26	2.1.1.5	BG/BZ 311 401/BG 311 701	G 1/8" - G 1/4"	panel mounting
27	2.1.1.6	BR 311 501/BR 311 701	G 1/8" - G 1/4"	heavy duty

**2.1.2 5/2 way valves**

28	2.1.2.1	BV/BR/BL 511 201	M5	
29	2.1.2.2	BV/BR/BL 511 301	G 1/8"	
30	2.1.2.3	BR 511 501/BR 511 701	G 1/8" - G 1/4"	heavy duty

31 **2.2 Valves for Panel Mounting**



32	2.2.1	BA 311 201/BA 311 202/BA 311 203 BA 311 243/BA 311 301	M5 pif 4 mm - G 1/8"	3/2 way
33	2.2.2	BA 511 201/BA 511 202/BA 511 301	M5 - G 1/8"	5/2 way
34	2.2.3	Ø 22mm Actuators for Panel Mounting		
35	2.2.4	BA 430 301/BA 730 301/BA 334 01	G 1/8"	3 positions
36	2.2.5	BAE 311 301/BAE 511 301	G 1/8"	pneumo-electric switch
37	2.2.6	BH 311 401/BH 320 401/BH 311 701/BH 320 701	G 1/8" - G 1/4"	3/2 way, push-pull
38	2.2.7	BH 511 401/BH 520 401/BH 511 701/BH 520 701	G 1/8" - G 1/4"	5/2 way, push-pull
39	2.2.8	BHP 320 442/462	pif 4 - 6 mm	3/2 way pneumatic reset
40	2.2.9	BHP 520 442/462	pif 4 - 6 mm	5/2 way pneumatic reset

41 **2.3 Lever Actuated Valves**



**2.3.1 3/2 way valves**

42	2.3.1.1	HV 311 501/HV 311 701/HV 311 801 HVR 320 501/HVR 320 701/HVR 320 801	G 1/8" - G 1/4"	spring return indexed
		HV 311 701 NPT/HVR 320 701 NPT	1/4" NPT	spring return/indexed
43	2.3.1.2	HV 311 101/HV 311 121/HV 311 181 HVR 320 101/HVR 320 121/HVR 320 181 HV 311 121 NPT/HVR 320 121 NPT	G 3/8" - G 1/2" - G 3/4"	spring return indexed spring return/indexed

**2.3.2 5/2 way valves**

44	2.3.2.1	HV 511 501/HV 511 701/HV 511 801/HVR 520 501 HVR 520 701/HVR 520 701 L/HVR 520 801 HV 511 701 NPT/HVR 520 701 NPT	G 1/8" - G 1/4"	spring return indexed spring return/indexed
			1/4" NPT	spring return/indexed

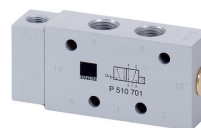


## Table of Contents

page 6



page

45	2.3.2.2	HV 511 101/HV 511 121/HV 511 181 HVR 520 101/HVR 520 121/HVR 520 181 HV 511 121 NPT/HVR 520 121 NPT	G 3/8" - G 1/2" - G 3/4" spring return indexed 1/2" NPT spring return/indexed
<b>2.3.3 5/3 way valves</b>			
46	2.3.3.1	HV 53_ 501/HV 53_ 701/HV 53_ 801 HVR 53_ 501/HVR 53_ 701/HVR 53_ 801 HV 53_ 701 NPT HVR 53_ 701 NPT	G 1/8" - G 1/4" spring return indexed 1/4" NPT spring return 1/4" NPT indexed
47	2.3.3.2	HV 53_ 101/HV 53_ 121/HV 53_ 181 HVR 53_ 101/HVR 53_ 121/HVR 53_ 181 HV 53_ 121 NPT HVR 53_ 121 NPT	G 3/8" - G 1/2" - G 3/4" spring return indexed 1/2" NPT spring return 1/2" NPT indexed
<b>2.3.4 Base-mounted valves</b>			
48	2.3.4.1	HV 511 704/HVR 520 704 HV 53_ 704/HVR 53_ 704	
49	2.4	<b>Pilot Actuated Valves</b>	
<b>2.4.1 3/2 way valves</b>			
50	2.4.1.1	P 310 302/P 310 502	G-type for in-line and manifold use (dual) M5 - G 1/8" air spring return
51	2.4.1.2	P 310 501/P 310 701/P 310 801 P 311 501/P 311 701/P 311 801	G 1/8" - G 1/4" air spring return G 1/8" - G 1/4" mech. spring
52	2.4.1.3	P 310 101/P 310 121/P 310 181 P 311 101/P 311 121/P 311 181 P 310 121 NPT/P 311 121 NPT	G 3/8" - G 1/2" - G 3/4" air spring return G 3/8" - G 1/2" - G 3/4" mech. spring 1/2" NPT air/mech. spring return
53	2.4.1.4	P 310 701 G/P 310 121 G P 311 701 G/P 311 121 G P 310 701 G NPT/P 311 701 G NPT	G 1/4" - G 1/2" air spring, dual G 1/4" - G 1/2" mech. spring, dual 1/4" NPT air/mech. spring, dual
54	2.4.1.5	P 320 302/P 320 502 P 322 302/P 322 502	M5 - G 1/8" double pilot M5 - G 1/8" dominating
55	2.4.1.6	P 320 501/P 320 701 G/P 320 801 P 322 501/P 322 701 G	G 1/8" - G 1/4" double pilot G 1/8" - G 1/4" dominating
56	2.4.1.7	P 320 101/P 320 121/P 320 181	G 3/8" - G 1/2" - G 3/4" double pilot
<b>2.4.2 5/2 way valves</b>			
57	2.4.2.1	P 510 302/P 510 502	G-type for in-line and manifold use (dual) M5 - G 1/8" air spring return
58	2.4.2.2	P 510 501/P 510 701/P 510 801 P 511 501/P 511 701/P 511 801	G 1/8" - G 1/4" air spring return G 1/8" - G 1/4" mech. spring
59	2.4.2.3	P 510 101/P 510 121/P 510 181 P 511 101/P 511 121/P 511 181 P 510 121 NPT/P 511 121 NPT	G 3/8" - G 1/2" - G 3/4" air spring return G 3/8" - G 1/2" - G 3/4" mech. spring 1/2" NPT air/mech. spring return
60	2.4.2.4	P 510 501 G/P 510 701 G/P 510 121 G P 511 501 G/P 511 701 G/P 511 121 G P 510 701 G NPT/P 511 701 G NPT	G 1/8" - G 1/4" - G 1/2" air spring, dual G 1/8" - G 1/4" - G 1/2" mech. spring, dual 1/4" NPT air/mech. spring, dual
61	2.4.2.5	P 520 302/P 520 502	M5 - G 1/8" double pilot
62	2.4.2.6	P 520 501/P 520 701/P 520 801 P 522 501/P 522 701	G 1/8" - G 1/4" double pilot G 1/8" - G 1/4" dominating
63	2.4.2.7	P 520 101/P 520 121/P 520 181 P 520 121 NPT	G 3/8" - G 1/2" - G 3/4" double pilot 1/2" NPT double pilot
64	2.4.2.8	P 520 501 G/P 520 701 G/P 520 121 G P 522 501 G/P 522 701 G P 520 701 G NPT	G 1/8" - G 1/4" - G 1/2" double pilot, dual G 1/8" - G 1/4" dominating, dual 1/4" NPT double pilot, dual
<b>2.4.3 5/3 way valves</b>			
65	2.4.3.1	P 53_ 501/P 53_ 701/P 53_ 801	G-type for in-line and manifold use (dual) G 1/8" - G 1/4"
66	2.4.3.2	P 53_ 101/P 53_ 121/P 53_ 181 P 53_ 121 NPT	G 3/8" - G 1/2" - G 3/4" 1/2" NPT
67	2.4.3.3	P 53_ 501 G/P 53_ 701 G/P 53_ 121 G P 53_ 701 G NPT	G 1/8" - G 1/4" - G 1/2" dual 1/4" NPT



## Table of Contents

page

68	<b>2.4.4</b> 2.4.4.1	<b>Base-mounted valves</b> P 510 704/P 520 704/P 53_ 704			
	<b>2.4.5</b>	<b>Pneumatic and logic elements</b>			
69	2.5.4.1	VA 341/VA 361/VA 401/ES 341/ES 401		pif 4 mm, G 1/8"	OR- / AND-gate
70	2.5.4.2	SE 501/SE 801/SE 8101/SE 121		G 1/8" - G 1/4" - G 1/2"	Quick exhaust (valve)
71	2.5.4.3	P 311 501 SR/P 411 701 SR/ P 411 701 SR NPT		G 1/8" - G 1/4" 1/4" NPT	Pneum. pressure switch Pneum. pressure switch
72	2.4.5.4	ERV 701/ERV 101/ERV 121		G 1/8" - G 3/8" - G 1/2"	Pilot operated non-return
73	2.4.5.5	DSV-1/8 /DSV-1/4 /DSVH-1/8 /DSVH-1/4		G 1/8" - G 1/4"	Pressure holding valve
74	2.4.5.6	PFF 520 701/PFFR 520 701		G 1/4"	Oscillating/Flip-Flop valve
75	2.4.5.7	DR 501/DR 801/DR 101/D 501/D 801/D 101		G 1/8" - G 3/8"	Flow regulator
76	2.4.5.8	D 181 G/D 181 0_		G 3/4"	Flow regulator
	<b>2.4.6</b>	<b>Sub-base mounted pneumatic valves – Logic elements</b>			
77	2.4.6.1	AND 204/OR 204/YES 204/NOT 204 RP LG 204		all ports in the plate AND/OR/YES/NOT function G 1/8"	
78	2.4.6.2	P 310 304/P 311 304/P 320 304/P 322 304 RP 3 344		all ports in the plate 3/2 way pif 4 mm	
79	2.4.6.3	P 510 304/P 511 304/P 520 304/P 522 304 RP 5 344		all ports in the plate 5/2 way pif 4 mm	
80	2.4.6.4	VA 304/ES 304 RP 2 344		all ports in the plate OR-/AND-gates pif 4 mm	
81	<b>2.5</b>	<b>Solenoid Valves</b>			
	<b>2.5.1</b>	<b>3/2 way valves and 2/2 way valves</b>			
	<b>2.5.1.1</b>	<b>3/2 way and 2/2 way in-line valves</b>		G-type for in-line and manifold use (dual)	
82	2.5.1.1.1	MD 311 010		M5	3/2 way direct
83	2.5.1.1.2	MH 311 012/MOH 311 012/MX 311 012 MH 311 015/MOH 311 015/MX 311 015 MH 211 012/MH 211 015		M5 G 1/8" M5 - G 1/8"	3/2 way direct 3/2 way direct 2/2 way direct
84	2.5.1.1.3	MH 311 205/MH 311 209		G 1/8" - G 1/4"	3/2 way direct
85	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" G 1/4" G 1/8" - G 1/4"	3/2 way direct 3/2 way direct 2/2 way direct
86	2.5.1.1.5	M 311 012 OX/R 02 M 211 02 OX		M5 - G 1/8"	Valves for oxygen
87	2.5.1.1.6	MH 311 105/MOH 311 105/MX 311 105		G 1/8" - G 1/4"	3/2 way direct PA
88	2.5.1.1.7	MH 311 014/MOH 311 014/MH 311 019/MX 311 019		G 1/8" - G 1/4"	3/2 way banjo PA
89	2.5.1.1.8	MH 311 013/MH 311 017		G 1/8" - G 1/4"	3/2 way banjo alu
90	2.5.1.1.9	MH 311 313/MH 311 317		G 1/8" - G 1/4"	3/2 way banjo alu
91	2.5.1.1.10	MD 310 301/MOD 310 301 MD 310 341/MOD 310 341		M5 pif 4 mm	single solenoid single solenoid
92	2.5.1.1.11	MD 310 401/MOD 310 401 MD 310 461/MOD 310 461		G 1/8" pif 6 mm	single solenoid single solenoid
93	2.5.1.1.12	MH 310 302/MOH 310 302 MH 310 502/MOH 310 502		M5 G 1/8"	single solenoid single solenoid
94	2.5.1.1.13	MH 210 501/MH 210 701		G 1/8" - G 1/4"	2/2 way single solenoid
95	2.5.1.1.14	MH 310 501/MOH 310 501 MH 310 701/MOH 310 701 MH 310 801/MOH 310 801		G 1/8" G 1/4" G 1/4"	single solenoid single solenoid single solenoid
96	2.5.1.1.15	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" G 1/2" G 3/4" 1/2" NPT	single solenoid single solenoid single solenoid single solenoid

# Table of Contents

page 8

page				
97	2.5.1.1.16	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	G 1/8" G 1/4" 1/4" NPT	single solenoid, dual single solenoid, dual single solenoid, dual
98	2.5.1.1.17	MH 310 101 G/MOH 310 101 G MH 310 121 G/MOH 310 121 G	G 3/8" G 1/2"	single solenoid, dual single solenoid, dual
99	2.5.1.1.18	MH 320 501/MH 320 701/MH 320 801	G 1/8" - G 1/4"	double solenoid
100	2.5.1.1.19	MH 320 101/MH 320 121/MH 320 181	G 3/8" - G 1/2" - G 3/4"	double solenoid
101	2.5.1.1.20	MH 320 501 G/MH 320 701 G MH 320 101 G/MH 320 121 G	G 1/8" - G 1/4" G 3/8" - G 1/2"	double solenoid, dual double solenoid, dual
<b>2.5.1.2 3/2 and 2/2 way base-mounted valves</b>				
102	2.5.1.2.1	MD 311 104/RD 3__ 104/RD 3__ 144	M5 - pif 4 mm	direct actuated
103	2.5.1.2.2	MH 312/MH 315/MX 315 MH 314/MH 316	M5 - G 1/8" pif 4 mm / 6 mm	direct actuated direct actuated
104	2.5.1.2.3	MH 339/MH 239/R 33 R/R 33 L	G 1/4"	direct modular
105	2.5.1.2.4	MD 310 343/MOD 310 343 MD 310 403/MOD 310 403 MD 310 463/MOD 310 463	pif 4 mm G 1/8" pif 6 mm	single solenoid single solenoid single solenoid
106	2.5.1.2.5	MD 310 304/MOD 310 304 MD 310 404/MOD 310 404	all ports in plate all ports in plate	single solenoid single solenoid
<b>2.5.1.3 3/3 way valves</b>				
107	2.5.1.3	MH 331 701 G/MH 331 121 G	G 1/4" - G 1/2"	
<b>2.5.2 5/2 way valves</b>				
<b>2.5.2.1 In-line valves</b>				
109	2.5.2.1.1	MD 510 301/MD 510 341 MD 510 401/MD 510 461	G-type for in-line and manifold use (dual) M5 - pif 4 mm	single solenoid single solenoid
110	2.5.2.1.2	MH 510 302/MH 510 502	G 1/8" - pif 6 mm	single solenoid
111	2.5.2.1.3	MH 510 501/MH 510 701/MH 510 801	M5 - G 1/8"	single solenoid
112	2.5.2.1.4	MH 510 101/MH 510 121/MH 510 181 MH 510 121 NPT	G 1/8" - G 1/4" G 3/8" - G 1/2" - G 3/4"	single solenoid single solenoid
113	2.5.2.1.5	MH 510 501 G/MH 510 701 G MH 510 701 G NPT	1/2" NPT G 1/8" - G 1/4" 1/4" NPT	single solenoid single solenoid, dual single solenoid, dual
114	2.5.2.1.6	MH 510 101 G/MH 510 121 G	G 3/8" - G 1/2"	single solenoid, dual
115	2.5.2.1.7	MD 520 301/MD 520 341 MD 520 401/MD 520 461	M5 - pif 4 mm G 1/8" - pif 6 mm	double solenoid double solenoid
116	2.5.2.1.8	MH 520 302/MH 520 502	M5 - G 1/8"	double solenoid
117	2.5.2.1.9	MH 520 501/MH 520 701/MH 520 801	G 1/8" - G 1/4"	double solenoid
118	2.5.2.1.10	MH 520 101/MH 520 121/MH 520 181 MH 520 121 NPT	G 3/8" - G 1/2" - G 3/4" 1/2" NPT	double solenoid double solenoid
119	2.5.2.1.11	MH 520 501 G/MH 520 701 G MH 520 701 G NPT	G 1/8" - G 1/4" 1/4" NPT	double solenoid, dual double solenoid, dual
120	2.5.2.1.12	MH 520 101 G/MH 520 121 G	G 3/8" - G 1/2"	double solenoid, dual
<b>2.5.2.2 Base-mounted valves</b>				
121	2.5.2.2.1	MD 510 303/MD 510 343 MD 510 403/MD 510 463	M5 - pif 4 mm G 1/8" - pif 6 mm	single solenoid single solenoid
122	2.5.2.2.2	MH 510 503/MH 510 703/MH 510 803	G 1/8" - G 1/4"	single solenoid
123	2.5.2.2.3	MD 510 304/MD 510 404	all ports in the plate	single solenoid
124	2.5.2.2.4	MH 510 304/MH 510 504/MH 510 704 MH 510 104	all ports in the plate	single solenoid
125	2.5.2.2.5	MD 520 303/MD 520 343 MD 520 403/MD 520 463	M5 - pif 4 mm G 1/8" - pif 6 mm	double solenoid double solenoid
126	2.5.2.2.6	MH 520 503/MH 520 703/MH 520 803	G 1/8" - G 1/4"	double solenoid
127	2.5.2.2.7	MD 520 304/MD 520 404	all ports in the plate	double solenoid
128	2.5.2.2.8	MH 520 304/MH 520 504/MH 520 704 MH 520 104	all ports in the plate	double solenoid

## Table of Contents

page 9

page

	<b>2.5.3</b>	<b>5/3 way valves</b>		
	<b>2.5.3.1</b>	<b>In-line valves</b>		G-type for in-line and manifold use (dual)
129	2.5.3.1.1	MD 53_301/MD 53_341 MD 53_401/MD 53_461	M5 - pif 4 mm G 1/8" - pif 6 mm	
130	2.5.3.1.2	MH 53_501/MH 53_701/MH 53_801	G 1/8" - G 1/4"	
131	2.5.3.1.3	MH 53_101/MH 53_121/MH 53_181 MH 53_121 NPT	G 3/8" - G 1/2" - G 3/4" 1/2" NPT	
132	2.5.3.1.4	MH 53_501 G/MH 53_701 G MH 53_701 G NPT	G 1/8" - G 1/4" 1/4" NPT	dual dual
133	2.5.3.1.5	MH 53_101 G/MH 53_121 G	G 3/8" - G 1/2"	dual
	<b>2.5.3.2</b>	<b>Base-mounted valves</b>		M5 - pif 4 mm
134	2.5.3.2.1	MD 53_303/MD 53_343 MD 53_403/MD 53_463	G 1/8" - pif 6 mm G 1/8" - G 1/4"	
135	2.5.3.2.2	MH 53_503/MH 53_703/MH 53_803		all ports in the plate
136	2.5.3.2.3	MD 53_304/MD 53_404		all ports in the plate
137	2.5.3.2.4	MH 53_304/MH 53_504/MH 53_704 MH 53_104		
	<b>2.5.4.1</b>	<b>Base-mounted valves with standardized interface</b>		
138	2.5.4.1.1	MH 510 704 ISO1/MH 520 704 ISO1 RP 5 704 ISO1	ISO 1	
139	2.5.4.1.2	MH 510 184 ISO4/MH 520184 ISO4	ISO 4	
140	2.5.4.1.3	RB 5__184 K1 ISO4/RB 5__184 K2 ISO4	ISO 4	
141	2.5.4.1.4	MH 510 714 B/MH 510 714 BT MH 520 714 B/MH 520 714 BT	Industrial standard	
142	2.5.4.1.5	MH 510 704 J/MH 520 704 J/MH 53_704 J	Industrial standard	
143	2.5.4.1.6	SIMPG-5/1 /RP 5 704 J	Industrial standard	
145	<b>2.6</b>	<b>10 mm Solenoid Valves</b>		
	<b>2.6.1</b>	<b>In-line valves</b>		
146	2.6.1.1	MMD 510 301/MMD 510 341	M5 - pif 4 mm	5/2-way single solenoid
147	2.6.1.2	MMD 520 301/MMD 520 341	M5 - pif 4 mm	5/2-way single solenoid
148	2.6.1.3	MMD 53_301/MMD 5_341	M5 - pif 4 mm	5/3-way – 3 versions
	<b>2.6.2</b>	<b>Base-mounted valves / Manifold Plates / Valve Terminals</b>		
149	2.6.2.1	MMD 231 304/MMD 232 304/MMD 233 304	all ports in the plate	Double 3/2-way solenoid valves
150	2.6.2.2	MMD 510 304/MMD 520 304	all ports in the plate	5/2-way single & double solenoid
151	2.6.2.3	MMD 53_304	all ports in the plate	5/3-way – 3 versions
152	2.6.2.4	RM 5__344	For valves displayed on page 2.6.2.1, 2.6.2.2, 2.6.2.3	
153	2.6.2.5	T_10 5__344	pif 4 mm	all ports in the plate
154	2.6.3	ST 54 20 L3000/ ST 54 40 L3000	Straight connector	
155	<b>2.7</b>	<b>Manifold Plates</b>		
	<b>2.7.1</b>	<b>For 3 way valves</b>		
156	2.7.1.1	R__	For valves displayed on page 2.5.1.2.2	
157	2.7.1.2	RD 3__303/RD 3__403	For valves displayed on page 2.5.1.2.4	
158	2.7.1.3	RD 3__344/RD 3__464	For valves displayed on page 2.5.1.2.5	





# Table of Contents

page 10


page			
159	2.7.1.4	RB 3__ 503 G RB 3__ 703 G	For solenoid valves displayed on page 2.5.1.1.14, 2.5.1.1.18 For pneumatic valves of page 2.4.1.4, 2.4.1.6 For low temp. solenoids of page 2.11.4.1.2 For low temp. pneumatic v. of page 2.11.3.1
160	2.7.1.5	RB 3__ 103 G/R 3__ 121 G	For solenoid valves displayed on page 2.5.1.1.15, 2.5.1.1.18, 2.5.1.3
	<b>2.7.2</b>	<b>For 5 way valves</b>	
161	2.7.2.1	RD 5__ 303/RD 5__ 403	For valves displayed on page 2.5.2.2.1, 2.5.2.2.5, 2.5.3.2.1
162	2.7.2.2	RB 5__ 503 G	For solenoid valves displayed on page 2.5.2.1.5, 2.5.2.1.11, 2.5.3.1.4, 2.5.2.2.2, 2.5.2.2.6, 2.5.3.2.2 For pneumatic valves displayed on page 2.4.2.4, 2.4.2.8, 2.4.3.3 For low temp. solenoids of page 2.11.4.2.1, 2.11.4.2.2 For low temp. pneumatic valves of page 2.11.3.2, 2.11.3.3
163	2.7.2.3	R 5 503 GR/R 5 503 GL/R 5 503 G RB 5__ 703 G R 5 703 GR/R 5 703 GL/R 5 703 G	
164	2.7.2.4	RB 5__ 103 G R 5 103 GR/R 5 103 GL/R 5 103 G	
165	2.7.2.5	RB 5__ 803 R 5 803 GR/R 5 803 GL/R 5 803 G RB 5__ 121 G R 5 121 GR/R 5 121 GL/R 5 121 G	For valves displayed on page 2.5.2.1.6, 2.5.2.1.12, 2.5.3.1.5 For valves displayed on page 2.5.2.2.2, 2.5.2.2.6, 2.5.3.2.2 For solenoid valves displayed on page 2.5.2.1.6, 2.5.2.1.12, 2.5.3.1.5 For pneumatic valves of page 2.4.2.4, 2.4.2.8, 2.4.3.3
166	2.7.2.6	RD 5__ 344/RD 5__ 464	For valves displayed on page 2.5.2.2.3, 2.5.2.2.7, 2.5.3.2.3
167	2.7.2.7	R 5__ 304/R 5__ 504	For solenoid valves displayed on page 2.5.2.2.4, 2.5.2.2.8, 2.5.3.2.4 For low temp. solenoids of page 2.11.4.3.1, 2.11.4.3.2
168	2.7.2.8	R 5__ 704/R 5__ 784	
169	2.7.2.9	RB 5__ 704 K1 R 5 704 K1R/R 5 704 K1L/R 5 704 K1	
170	2.7.2.10	RB 5__ 104 K1 R 5 104 K1R/R 5 104 K1 L/R 5 104 K1 R	For solenoid valves displayed on page 2.5.2.2.4, 2.5.2.2.8, 2.5.3.2.4
172	<b>2.7.3</b>	<b>DIN-Rail mounting clips</b>	
173	<b>2.8</b>	<b>Valve Terminals</b>	
174	<b>2.8.1</b>	<b>General Information on Valve Terminals</b>	
	<b>2.8.2</b>	<b>Valve terminals with 3 way valves</b>	
175	2.8.2.1	T_ 16 3__ 104/T_ 16 3__ 144	M5 - pif 4 mm direct actuated
176	2.8.2.2	T_ 16 3__ 303	pif 4 mm port 2 in valve
177	2.8.2.3	T_ 16 3__ 403	G 1/8" - pif 6 mm port 2 in valve
178	2.8.2.4	T_ 22 3__ 703	G 1/4" port 2 in valve
179	2.8.2.5	T_ 16 3__ 344/T_ 16 3__ 464	pif 4 mm, pif 6 mm all ports in plate
	<b>2.8.3</b>	<b>Valves terminals with 5 way valves</b>	
180	2.8.3.1	T_ 16 5__ 303	M5 - pif 4 mm port 2 & 4 in valve
181	2.8.3.2	T_ 16 5__ 403	G 1/8" - pif 6 mm port 2 & 4 in valve
182	2.8.3.3	T_ 22 5__ 503/T_ 22 5__ 703	G 1/8" - G 1/4" port 2 & 4 in valve
183	2.8.3.4	T_ 16 5__ 344	pif 4 mm all ports in plate
184	2.8.3.5	T_ 16 5__ 464	pif 6 mm all ports in plate
185	2.8.3.6	T_ 22 5__ 504	G 1/8" all ports in plate
186	2.8.3.7	T_ 22 5__ 704/T_ 22 5__ 784	G 1/4" all ports in plate
187	2.8.3.8	T_ 22 5__ 704 K1	G 1/4" all ports in plate through



## Table of Contents



page 11

page

188	<b>2.8.4</b>	<b>Connectors and Cables</b>		
	2.8.4	ST40 W06/ST40 W14	Elbow connector	
		ST40 G06/ST40 G14	Straight connector	
				
189	<b>2.9</b>	<b>Valves with NAMUR-interface</b>		
	<b>2.9.1</b>	<b>Solenoid valves with NAMUR-interface</b>		
	<b>2.9.1.1</b>	<b>3/2 way valves</b>		
190	2.9.1.1.1	MNH 310 701/ MNOH 310 701	G 1/4"	
		MNH 310 711/MNH 311 701	G 1/4"	
		MNK 310 701/MNK 311 701	G 1/4"	low power
		MNH 310 701 NPT/MNH 311 701 NPT	1/4" NPT	
191	2.9.1.1.2	MNH 310 101/MNH 311 101	G 3/8"	max. flow
		MNH 310 121/MNH 311 121	G 1/2"	
		MNH 310 121 NPT/MNH 311 121 NPT	1/2" NPT	
	<b>2.9.1.2</b>	<b>5/2 way valves</b>		
192	2.9.1.2.1	MNH 510 701/MNH 510 711	G 1/4"	single solenoid
		MNH 511 701/MNH 511 711	G 1/4"	single solenoid
		MNK 510 701/MNK 511 701	G 1/4"	single solenoid, low power
		MNH 510 701 NPT/MNH 511 701 NPT	1/4" NPT	
193	2.9.1.2.2	MNH 510 101/MNH 511 101	G 3/8"	single solenoid, max. flow
		MNH 510 121/MNH 511 121	G 1/2"	single solenoid
		MNH 510 121 NPT/MNH 511 121 NPT	1/2" NPT	single solenoid
194	2.9.1.2.3	MNH 520 701/MNH 520 101/MNH 520 121	G 1/4" - G 3/8" - G 1/2"	double solenoid
		MNK 520 701	G 1/4"	double solenoid, low power
		MNH 520 701 NPT/MNH 520 121 NPT	1/4" NPT - 1/2" NPT	double solenoid
195	<b>2.9.1.3</b>	<b>NAMUR Flex</b>		
	<b>2.9.1.4</b>	<b>5/3 way valves</b>		
196	2.9.1.4	MNH 531 701/MNH 531 101/MNK 531 701	G 1/4" - G 3/8"	Centre closed
		MNH 532 701/MNH 533 701	G 1/4"	Centre exh./press.
		MNH 531 121	G 1/2"	Centre closed
		MNH 531 701 NPT/MNH 531 121 NPT	1/4" NPT - 1/2" NPT	Centre closed
	<b>2.9.2</b>	<b>Pneumatically actuated valves with NAMUR-interface</b>		
	<b>2.9.2.1</b>	<b>3/2 way valves</b>		
197	2.9.2.1	PN 310 701/PN 311 701/PN 310 121	G 1/4" - G 1/2"	
	<b>2.9.2.2</b>	<b>5/2 way valves</b>		
198	2.9.2.2	PN 510 701/PN 511 701/PN 510 121	G 1/4" - G 1/2"	single pilot
		PN 520 701/PN 520 121	G 1/4" - G 1/2"	double pilot
	<b>2.9.2.3</b>	<b>5/3 way valves</b>		
199	2.9.2.3	PN 531 701/PN 531 121	G 1/4" - G 1/2"	
	<b>2.9.3</b>	<b>Lever actuated valves with NAMUR-interface</b>		
200	2.9.3	HVN 311 701/HVRN 320 701	G 1/4"	3/2 way
		HVN 511 701/HVRN 520 701	G 1/4"	5/2 way
	<b>2.9.4</b>	<b>Valves with additional functions</b>		
201	2.9.4.1	Manual reset function		
202	2.9.4.2	Latch-lock function		
203	2.9.4.3	Electrically monitored switching function		

# Table of Contents

page 12

page				
				
<b>205</b>	<b>2.10.</b>	<b>Accessories for Smart Valve Automation</b>		
206	2.10.1	DRN 3 601/DRN 3 611/DRN 3 128		3-way flow regulator plates
207	2.10.2	DRN 5 601/DRN 5 611/DRN 5 128		5-way flow regulator plates
208	2.10.3	UB 701		Air-recirculation block for single acting actuators
209	2.10.4	SENR 20/SENR 207/SENR 207 01		Quick-exhaust-block with non-return valve
210	2.10.5	PN 411 721/BHN 420 701		Short-cut valve when using manual gearbox
211	2.10.6	BHN 601/BHN 601 01/BHN 611 01		Manual block and vent, block and block and short-cut valves
212	2.10.7	PN 411 711/MNEH 411 711		Pneumatically and electrically actuated block valves
213	2.10.8	PN 611 611/MNEH 611 611		Pneumatically and electrically actuated block and vent valves
214	2.10.9	HVRZN 731 701/HVRZN 731 702		Pneumo-manual override for positioners
215	2.10.10	SGV 700		Two-speed valve
216	2.10.11	DSVN 5		Pressure applied holding valve
217	2.10.12	CBN 700 K/CBN 700 K EB		Controlblock for butterfly-valves with inflatable valve-seat
218	2.10.13	Mounting Accessories		
219	2.10.14	ZVP 701/ZVP 101/ZVP 121/ZVP 121-701		Plates for cylinder valve combinations – standard cylinders
220	2.10.15	ZVPS 701/ZVPS 101/ZVPS 121		Plates for cylinder valve combinations – scotch-yoke actuators
221	2.10.16	Cylinder Series LAZ		Linear actuators with NAMUR-interface
				
<b>222</b>	<b>2.11</b>	<b>“Hafner on the Rocks” – Low-Temperature Valves</b>		
	<b>2.11.1</b>	<b>Mechanically Actuated Valves</b>		
223	2.11.1.1	BG 311 701 TT/BR 311 701 TT	G 1/4"	3/2 way
		BR 511 701 TT	G 1/4"	5/2 way
	<b>2.11.2</b>	<b>Push-Pull-Valves</b>		
224	2.11.2.1	BH 311 701 TT/BH 320 701 TT	G 1/4"	3/2 way
		BH 511 701 TT/BH 520 701 TT	G 1/4"	5/2 way
	<b>2.11.3</b>	<b>Lever-Valves</b>		
225	2.11.3.1	HV 311 501 TT/HV 311 701 TT/HV 311 121 TT	G 1/8" - G 1/4" - G 1/2"	3/2, spring return
		HVR 320 501 TT/HVR 320 701 TT/HVR 320 121 TT	G 1/8" - G 1/4" - G 1/2"	3/2, indexed
226	2.11.3.2	HV 511 501 TT/HV 511 701 TT/HV 511 121 TT	G 1/8" - G 1/4" - G 1/2"	5/2, spring return
		HVR 520 501 TT/HVR 520 701 TT/HVR 520 121 TT	G 1/8" - G 1/4" - G 1/2"	5/2, indexed
227	2.11.3.3	HV 53_ 501 TT/HV 53_ 701 TT	G 1/8" - G 1/4"	5/3, spring return
		HVR 53_ 501 TT/HVR 53_ 701 TT	G 1/8" - G 1/4"	5/3, indexed
228	2.11.3.4	HV 53_ 121 TT/HVR 53_ 121 TT	G 1/2"	5/3 way
	<b>2.11.4</b>	<b>Pneumatically Actuated Valves</b>		
229	2.11.4.1	P 310 501 TT/P 310 701 GTT	G 1/8" - G 1/4"	3/2, air spring return
		P 311 501 TT/P 311 701 GTT	G 1/8" - G 1/4"	3/2, spring return
		P 320 501 TT/P 320 701 GTT	G 1/8" - G 1/4"	3/2, double pilot
230	2.11.4.2	P 310 121 TT/P 311 121 TT	G 1/2"	3/2, (air) spring return
231	2.11.4.3	P 510 501 GTT/P 510 701 GTT/P 510 121 TT	G 1/8" - G 1/4" - G 1/2"	5/2, air spring return
		P 511 501 GTT/P 511 701 GTT/P 511 121 TT	G 1/8" - G 1/4" - G 1/2"	5/2, spring return
232	2.11.4.4	P 520 501 GTT/P 520 701 GTT/P 520 121 GTT	G 1/8" - G 1/4" - G 1/2"	5/2, double pilot
		P 53_ 501 GTT/P 53_ 701 GTT/P 53_ 121 TT	G 1/8" - G 1/4" - G 1/2"	5/3 way
	<b>2.11.5</b>	<b>Pneumatic and logic elements</b>		
233	2.11.5.1	SE 501 TT/SE 801 TT/SE 8101 TT/SE 121 TT	G 1/8" - G 1/4" - G 1/2"	Quick exhaust (valve)
234	2.11.5.2	VA 401 TT/ES 401 TT	G 1/8"	OR-/AND-Gate
235	2.11.5.3	DR 501 TT/DR 801 TT/D 501 TT/ D 801 TT	G 1/8" - G 1/4"	Flow regulator



## Table of Contents

page 13

page

	<b>2.11.6 Solenoid Valves</b>		
	<b>2.11.6.1 3/2-way valves</b>		
236	2.11.6.1.1 MH 311 012 TT/MH 311 015 TT	M5 - G 1/8"	direct actuated
	MH 311 013 TT/ MH 311 017 TT	G 1/8" - G 1/4"	banjo
237	2.11.6.1.2 MH 310 501 TT/MOH 310 501 TT	G 1/8"	single solenoid
	MH 310 701 GTT/MOH 310 701 GTT	G 1/4"	single solenoid
	MH 320 501 TT/MH 320 701 GTT	G 1/8" - G 1/4"	double solenoid
238	2.11.6.1.3 MH 310 121 TT	G 1/2"	single solenoid
	<b>2.11.6.2 5-way G-type valves in-line and manifold use (dual)</b>		
239	2.11.6.2.1 MH 510 501 GTT/MH 510 701 GTT/MH 510 121 TT	G 1/8" - G 1/4" - G 1/2"	5/2, air spring return
240	2.11.6.2.2 MH 520 501 GTT/MH 520 701 GTT	G 1/8" - G 1/4"	5/2, double solenoid
	MH 53_ 501 GTT/MH 53_ 701 GTT	G 1/8" - G 1/4"	5/3 way
241	2.11.6.2.3 MH 520 121 TT/MH 53_ 121 TT	G 1/2"	5/2, double solenoid, 5/3 way
	<b>2.11.6.3 5-way valves base-mounted</b>		
242	2.11.6.3.1 MH 510 304 TT/MH 510 504 TT	all ports in plate	5/2 air spring return
	MH 510 704 TT		
243	2.11.6.3.2 MH 520 304 TT/ MH 520 504 TT	all ports in plate	5/2 double solenoid
	MH 520 704 TT		
	MH 53_ 304 TT/MH 53_ 504 TT	all ports in plate	5/3 way
	MH 53_ 704 TT		
	<b>2.11.7 Valves with NAMUR-interface</b>		
	<b>2.11.7.1 3/2-way solenoid valves</b>		
244	2.11.6.1 MNH 310 701 TT/MNH 311 701 TT	G 1/4"	
	MNH 310 121 TT/MNH 311 121 TT	G 1/2"	
	<b>2.11.7.2 5-way solenoid valves</b>		
245	2.11.7.2.1 MNH 510 701 TT/MNH 510 711 TT	G 1/4"	air spring return
	MNH 510 121 TT	G 1/2"	air spring return
	MNH 511 701 TT/MNH 511 711 TT	G 1/4"	spring return
	MNH 511 121 TT	G 1/2"	spring return
246	2.11.7.2.2 MNH 520 701 TT	G 1/4"	double solenoid
	MNH 520 121 TT	G 1/2"	double solenoid
	MNH 53_ 701 TT	G 1/4"	5/3 way
	MNH 53_ 121 TT	G 1/2"	5/3 way
	<b>2.11.7.3 Flow regulators with NAMUR-interface</b>		
247	2.11.7.3 DRN 3 611 TT/DRN 5 611 TT		
	<b>2.11.7.4 Air-recirculation block</b>		
248	2.11.7.4 UB 701 TT		
	<b>2.11.7.5 Quick-exhaust-block</b>		
249	2.11.7.5 SENR 207 01 TT		
250	<b>2.12 Heavy Metal – Stainless Steel Valves</b>		
	<b>2.12.1 Mechanically actuated valves made from Stainless Steel</b>		
251	2.12.1.1 BR 311 501 VES/BR 511 701 VES	G 1/4"	3 way, 5/2 way
	<b>2.12.2 Manual valves made from Stainless Steel</b>		
252	2.12.2.1 HV 311 701 VES/HVR 320 701 VES	G 1/4"	3 way
	HV 311 121 VES/HVR 320 121 VES	G 1/2"	3 way
253	2.12.2.2 HV 511 701 VES/HVR 520 701 VES	G 1/4"	5/2 way
	HV 53_ 701 VES/HVR 53_ 701 VES	G 1/4"	5/3 way
254	2.12.2.3 HV 511 121 VES/HVR 520 121 VES	G 1/2"	5/3 way
	HV 53_ 121 VES/HVR 53_ 121 VES	G 1/2"	5/3 way

316



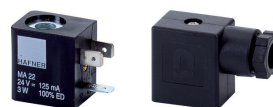
HAFNER

# Table of Contents

page 14

page

<b>2.12.3 Pneumatically actuated valves made from Stainless Steel</b>				
255	2.12.3.1	P 310 701 VES (NPT)/P 311 701 VES (NPT)	G 1/4"	3 way
		P 310 121 VES (NPT)/P 311 121 VES (NPT)	G 1/2"	3 way
256	2.12.3.2	P 510 701 VES (NPT)/P 511 701 VES (NPT)	G 1/4"	5/2 way
		P 510 121 VES (NPT)/P 511 121 VES (NPT)	G 1/2"	5/2 way
257	2.12.3.3	P 520 701 VES (NPT)/P 520 121 VES (NPT)	G 1/4" - G 1/2"	5/2 way
		P 53_ 701 VES (NPT)/P 53_ 121 VES (NPT)	G 1/4" - G 1/2"	5/3 way
258	2.12.3.4	ERV 701 VES/ERV 101 VES/ERV 121 VES	G 1/4" - G 3/8" - G 1/2"	Pilot operated non-return
259	2.12.3.5	SE 501 VES/SE 801 VES	G 1/8" - G 1/4"	Quick-exhaust (valve)
		SE 8101 VES/SE 121 VES	G 3/8" - G 1/2"	Quick-exhaust (valve)
<b>2.12.4 Solenoid valves made from Stainless Steel</b>				
260	2.12.4.1	MH 311 015 VES	G 1/8"	direct actuated
261	2.12.4.2	MH 310 701 VES/KES / MOH 310 701 VES/KES	G 1/4"	3/2 way
		MH 310 701 NPT VES/KES	1/4" NPT	3/2 way
		MOH 310 701 NPT VES/KES	1/4" NPT	3/2 way
262	2.12.4.3	MH 310 121 VES	G 1/2"	3/2 way
		MH 310 121 NPT VES	1/2" NPT	3/2 way
		MH 320 121 VES	G 1/2"	double solenoid
263	2.12.4.4	MH 510 701 VES/MH 510 701 KES	G 1/4"	5/2 way
		MH 510 701 NPT VES/MH 510 701 NPT KES	1/4" NPT	5/2 way
		MH 510 121 VES/MH 510 121 NPT VES	G 1/2" - 1/2" NPT	5/2 way
264	2.12.4.5	MH 520 701 VES/MH 520 701 KES	G 1/4"	5/2 way
		MH 520 701 NPT VES/MH 520 701 NPT KES	1/4" NPT	5/2 way
		MH 520 121 VES/MH 520 121 NPT VES	G 1/2" - 1/2" NPT	5/2 way
265	2.12.4.6	MH 53_ 701 VES/MH 53_ 701 KES	G 1/4"	5/3 way
		MH 53_ 701 NPT VES/MH 53_ 701 NPT KES	1/4" NPT	5/3 way
		MH 53_ 121 VES/MH 53_ 121 NPT KES	G 1/2" - 1/2" NPT	5/3 way
<b>2.12.5 Stainless Steel valves with NAMUR-interface</b>				
266	2.12.5.1	MNH 310 701 VES/KES	3/2 way	
		MNH 311 701 VES/KES		
		MNH 310 701 NPT VES/KES	1/4" NPT	
		MNH 311 701 NPT VES/KES	1/4" NPT	
		MNH 310 121 VES/MNH 311 121 VES	1/2"	
267	2.12.5.2	MNH 510 701 VES/KES	5/2 way	single solenoid
		MNH 511 701 VES/KES		
		MNH 520 701 VES/KES	5/2 way	double solenoid
		MNH 510 701 NPT VES/KES	1/4" NPT	single solenoid
		MNH 511 701 NPT VES/KES	1/4" NPT	single solenoid
		MNH 520 701 NPT VES/KES	1/4" NPT	double solenoid
268	2.12.5.3	MNH 510 121 VES/MNH 511 121 VES	1/2"	
269	2.12.5.4	MNH 350 701 VES/KES		NAMUR-Flex
		MNH 351 701 VES/KES		NAMUR-Flex
		MNH 350 701 NPT VES/KES	1/4" NPT	NAMUR-Flex
		MNH 351 701 NPT VES/KES	1/4" NPT	NAMUR-Flex
270	2.12.5.5	DRN 3 611 VES/DRN 5 611 VES/DRF 3 611 VES		flow regulators
271	2.12.5.6	UB 701 VES	G 1/4"	air-recirculation
272	2.12.5.7	PN 310 701 VES/PN 311 701 VES	G 1/4"	3/2 way NAMUR
		PN 510 701 VES/PN 511 701 VES	G 1/4"	5/2 way NAMUR
		PN 520 701 VES	G 1/4"	5/2 way NAMUR
		PN 531 701 VES	G 1/4"	5/3 way NAMUR
273	2.13	<b>Coils and Connectors</b>		
274	2.13.1	MD 401/ST 16		Solenoid system and connectors Form C, 16 mm
275	2.13.2	MA 22/MA 22 L/MA 22 D/ MA 22 U		Coils industry Form B, 22 mm
276	2.13.3	ST 22/ST 22 L 5000/ST 22 V __ L 1500		Connectors industry Form B, 22 mm
		ST 22 M12/ST 22 NPTF		



## Table of Content

page 15

page

277	2.13.4	MA 22 DIN/MA 22 M12/MA 20 S9	Coils industry Form B, 22 mm and Form A, 30 mm
278	2.13.5	MA 30 S13/ST 30/ESR	Coils and connectors Form A, 30 mm and exhaust protection fitting

279 **2.14. Products for Explosion Hazardous Environment**



280 **2.14.1 General Information**

287 **2.14.2 Non-electric valves for explosion hazardous environment**

**2.14.3 Solenoid valves for explosion hazardous environment**

288 2.14.3.1 Overview available solenoid systems

**2.14.3.2 Ex m**

289	2.14.3.2.1	Aluminum valves, standard temperature (-20°C on request)
290	2.14.3.2.2	Stainless steel valves, standard temperature (-20°C on request)
291	2.14.3.2.3	Solenoid coil: MA 36 EEx mII T4 CSA FM
292	2.14.3.2.4	Solenoid coil: MA 22 EEx mII T4

**2.14.3.3 Ex ia**

293	2.14.3.3.1	Aluminum valves, standard temperature
294	2.14.3.3.2	Aluminum valves, low temperature
295	2.14.3.3.3	Stainless steel valves, standard temperature
296	2.14.3.3.4	Stainless steel valves, low temperature
297	2.14.3.3.5	Solenoid coil: MA 30 EEx ia tD II CT6

**2.14.3.4 Ex nA**

298	2.14.3.4.1	Aluminum valves, standard temperature (-20°C on request)
299	2.14.3.4.2	Stainless steel valves, standard temperature (-20°C on request)
300	2.14.3.4.3	Solenoid coil: MA __ EEx nA T5

**2.14.3.5 Ex e mb**

301	2.14.3.5.1	Aluminum valves, standard temperature
302	2.14.3.5.2	Aluminum valves, low temperature
303	2.14.3.5.3	Stainless steel valves, low temperature
304	2.14.3.5.4	Solenoid coil: MA 52 EEx e mb IIC T6
305	2.14.3.5.5	Example drawings of solenoid valves with Ex e mb system

**2.14.3.6 Ex d**

306	2.14.3.6.1	Aluminum valves, standard temperature
307	2.14.3.6.2	Aluminum valves, low temperature
308	2.14.3.6.3	Stainless steel valves, standard temperature
309	2.14.3.6.4	Stainless steel valves, low temperature
310	2.14.3.6.5	Solenoid coil: MA 52 EEx d IIC T_/ MA 52 EEx d IIC T_VES
311	2.14.3.6.6	Example drawings of solenoid valves with Ex d system

**2.14.3.7 Ex dm**

312	2.14.3.7.1	Aluminum valves, standard temperature
313	2.14.3.7.2	Aluminum valves, low temperature
314	2.14.3.7.3	Solenoid coil: MA 36 EEx dm IIC T5

**2.14.4 ATEX approved accessories for Smart Valve Automation**

315	2.14.4.1	Controlblock for butterfly-valves with inflatable valve-seat: CBN 700 K (EB) Ex
316	2.14.4.2	Pneumatic pressure switch: P 311 501 SR Ex/P 411 701 SR Ex
317	2.14.4.3	Quick-exhaust-block with non-return valve: SENR 207 01 Ex

**2.14.5 ATEX connectors**

318	2.14.5.1	ST 22 Ex/ST 30 EX nA/ST 30 EX ia
-----	----------	----------------------------------