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163	2.9.5.1	MNH 310 701 TT/MNH 310 711 TT MNH 311 701 TT/MNH 311 711 TT	G 1/4" G 1/4"	air spring return spring return
	2.9.5.2	5-way solenoid valves		
164	2.9.5.2.1	MNH 510 701 TT/MNH 510 711 TT MNH 511 701 TT/MNH 511 711 TT	G 1/4" G 1/4"	air spring return spring return
165	2.9.5.2.2	MNH 520 701 TT MNH 531 701 TT	G 1/4" G 1/4"	double solenoid 5/3-way
	2.9.5.3	Flow regulators with Namur interface		
166		DRN 3 611 TT/DRN 5 611 TT		
167	2.10	Coils and Connectors		
168	2.10.1	MA 16/MA 16 L		Solenoid system 16 mm
169	2.10.2	MA 22/MA 22 L/MA 22 D		Standard coils 22 mm
170	2.10.3	ST 16/ST 22/ST 22 L 500/ST 30 ATEX		Connectors
171	2.10.4.1	MA 22 EEx M II T4/MA 30 EEx i.A. IIC T6		Explosion-proof coils

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.

Quick Finder for Manifold Systems

We offer a large variety of manifold systems. In order to choose the appropriate combination of manifold plate and 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** in the column.

Modular Manifold-System indicated **B**.

3 way solenoid valves

position of ports			port size			manifold		valves n.c.		valves n.o.		comment	
1	2	3	1	2	3	type	page	type	page	type	page		
plate	plate	valve	G 1/8"	M5	operator	RD 3.. 104	2.5.1.2.1	MD 311 104	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	2.5.1.2.1	n.a.	n.a.	direct acting	T
plate	valve	valve	G 1/4"	M5	operator	R ..	2.6.1.1	MH 312	2.5.1.2.2	n.a.	n.a.	direct acting	
plate	valve	valve	G 1/4"	G 1/8"	operator	R ..	2.6.1.1	MH 315	2.5.1.2.2	n.a.	n.a.	direct acting	
plate	valve	valve	G 1/4"	pif 4 mm	operator	R ..	2.6.1.1	MH 314	2.5.1.2.2	n.a.	n.a.	direct acting	
plate	valve	valve	G 1/4"	pif 6 mm	operator	R ..	2.6.1.1	MH 316	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	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	2.6.1.2	MD 310 343	2.5.1.2.4	MOD 310 343	2.5.1.2.4	solenoid pilot	T
plate	valve	plate	G 1/4"	pif 6 mm	G 1/4"	RD 3.. 403	2.6.1.2	MD 310 463	2.5.1.2.4	MOD 310 463	2.5.1.2.4	solenoid pilot	T
plate	valve	plate	G 1/4"	G 1/8"	G 1/4"	RD 3.. 403	2.6.1.2	MD 310 403	2.5.1.2.4	MOD 310 403	2.5.1.2.4	solenoid pilot	T
plate	plate	plate	G 1/4"	pif 4 mm	G 1/4"	RD 3.. 344	2.6.1.3	MD 310 304	2.5.1.2.5	MOD 310 304	2.5.1.2.5	solenoid pilot	T
plate	plate	plate	G 1/4"	pif 6 mm	G 1/4"	RD 3.. 464	2.6.1.3	MD 310 404	2.5.1.2.5	MOD 310 404	2.5.1.2.5	solenoid pilot	T
plate	valve	plate	G 3/8"	G 1/4"	G 3/8"	R 3.. 703	2.6.1.4	MH 310 703	2.5.1.2.6	MOH 310 703	2.5.1.2.6	solenoid pilot	
plate	valve	plate	G 3/8"	G 1/4"	G 3/8"	R 3.. 703 G	2.6.1.4	MH 310 701 G	2.5.1.1.12	MOH 310 701 G	2.5.1.1.12	solenoid pilot	G
plate	valve	plate	G 3/8"	G 1/4"	G 3/8"	R 3.. 703 G	2.6.1.4	MH 320 701 G	2.5.1.1.15			double pilot	G
plate	valve	plate	G 3/8"	G 1/4"	G 3/8"	R 3.. 703 G	2.6.1.4	MH 331 701 G	2.5.1.3			3/3 way valves	G
plate	valve	plate	G 3/8"	G 1/4"	G 3/8"	R 3.. 803	2.6.1.5	MH 331 803	2.5.1.3			3/3 way valves	
plate	valve	plate	G 1/2"	G 1/2"	G 1/2"	R 3.. 121 G	2.6.1.5	MH 310 121 G	2.5.1.1.12	MOH 310 121 G	2.5.1.1.12	solenoid pilot	G
plate	valve	plate	G 1/2"	G 1/2"	G 1/2"	R 3.. 121 G	2.6.1.5	MH 320 121 G	2.5.1.1.15			double pilot	G
plate	valve	plate	G 1/2"	G 1/2"	G 1/2"	R 3.. 121 G	2.6.1.5	MH 331 121 G	2.5.1.3			3/3 way valves	G

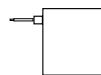
5 way solenoid valves

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	2.6.2.1	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	2.6.2.1	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	2.6.2.1	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	2.6.2.1	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	2.6.2.2	MH 510 501 G	2.5.2.1.5	MH 520 501 G	2.5.2.1.10	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	2.6.2.2	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	2.6.2.2	MH 510 701 G	2.5.2.1.5	MH 520 701 G	2.5.2.1.10	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	2.6.2.2	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	2.6.2.3	MH 510 803	2.5.2.2.2	MH 520 803	2.5.2.2.6	MH 53. 803	2.5.3.2.2	
plate	valve	plate	G 1/2"	G 1/2"	G 1/2"	R 5.. 121 G	2.6.2.3	MH 510 121 G	2.5.2.1.5	MH 520 121 G	2.5.2.1.10	MH 53. 121 G	2.5.3.1.4	G
plate	plate	plate	G 1/8"	pif 4 mm	G 1/8"	RD 5.. 344	2.6.2.4	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	2.6.2.4	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	2.6.2.5	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	2.6.2.5	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	2.6.2.5	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	2.6.2.5	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

MA 16/MA 16 L



MA 16



MA 16 L



16 mm wide solenoid system for valves type MD and MK, including valve-head.

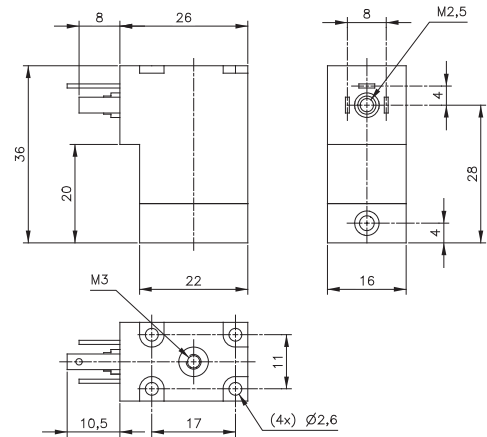
Coil made from 25 % glass filled thermoplastic PA material, epoxy filled. Valve head glass filled thermoplastic PA (standard) or anodised aluminium (on request). Valve-head includes a manual override to push.

MA 16

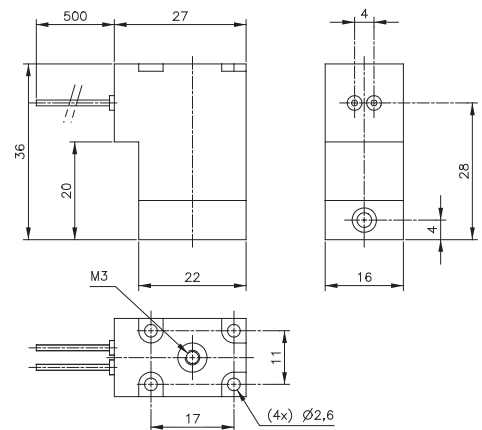
interface form C (DIN EN 175301-803), with 8 mm contact distance, connectors are displayed on page 2.10.3. Equipped with appropriate connector coil offers IP 65.

MA 16 L (Flying leads version)

have a standard cable length of 500 mm, others are available on request. The coils are not grounded, take national safety regulations into consideration!

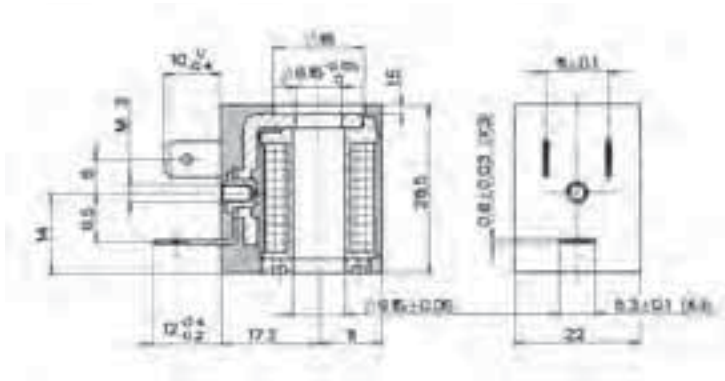


MA 16



MA 16 L

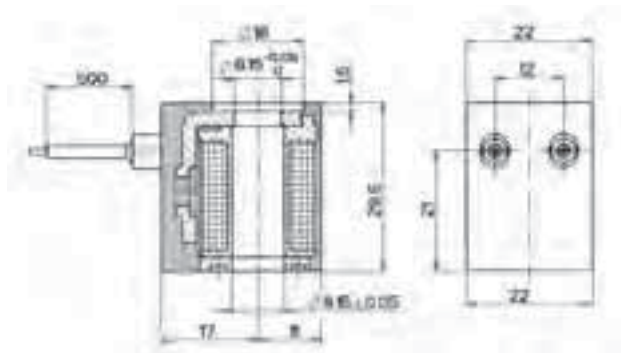
Type	Voltage	Ampere	Power cons.	Connection
MA 16 6DC	6 V=	300 mA	1,8 W	Form C (DIN EN 175301-803)
MA 16 L 6DC	6 V=	300 mA	1,8 W	Flying leads 500 mm long
MA 16 12DC	12 V=	150 mA	1,8 W	Form C (DIN EN 175301-803)
MA 16 L 12DC	12 V=	150 mA	1,8 W	Flying leads 500 mm long
MA 16 24DC	24 V=	75 mA	1,8 W	Form C (DIN EN 175301-803)
MA 16 L 24DC	24 V=	75 mA	1,8 W	Flying leads 500 mm long
MA 16 24AC	24 V~	125 mA	3 VA	Form C (DIN EN 175301-803)
MA 16 L 24AC	24 V~	125 mA	3 VA	Flying leads 500 mm long
MA 16 110AC	110 V~	27 mA	3 VA	Form C (DIN EN 175301-803)
MA 16 L 110AC	110 V~	27 mA	3 VA	Flying leads 500 mm long
MA 16 230AC	230 V~	13 mA	3 VA	Form C (DIN EN 175301-803)
MA 16 L 230AC	230 V~	13 mA	3 VA	Flying leads 500 mm long



MA 22/MA 22 D



22 mm wide coils for solenoid valves of MH-type, 22 mm, 30 mm and 40 mm wide.



MA 22 L

MA 22

Housing made from heat resistant thermoplastic polyester material with 30 % glass filled. Interface industryform B (DIN / ISO 436 50), connectors are displayed on page 2.10.3. Equipped with appropriate connector, solenoid offers IP 65.

MA 22 L (Flying leads version)

Housing made from heat resistant thermoplastic polyester material with 30 % glass filled. Standard cable length of 500 mm, others are available on request. The coils are not grounded, please take national safety regulations into consideration!

MA 22 D (Epoxy version)

Housing made from Epoxy, interface industryform B (DIN/ISO 436 50). Equipped with connector ST 22 and ST 222 V (please refer to page 2.10.3.) solenoid system offers IP 65. Equipped with connector ST 22 L 500 and additional O-rings the system offers IP 67.

Type	Voltage	Ampere	Power cons.	Connection
MA 22 12 DC	12 V=	250 mA	3 W	Industryform Type B (DIN 436 50)
MA 22 24DC	24 V=	125 mA	3 W	Industryform Type B (DIN 436 50)
MA 22 L5 24DC	24 V=	125 mA	3 W	Flying leads
MA 22 48DC	48 V=	62 mA	3 W	Industryform Type B (DIN 436 50)
MA 22 24AC	24 V~	200 mA	5 VA	Industryform Type B (DIN 436 50)
MA 22 110AC	110 V~	45 mA	5 VA	Industryform Type B (DIN 436 50)
MA 22 L5 110AC	110 V~	45 mA	5 VA	Flying leads
MA 22 230AC	230 V~	22 mA	5 VA	Industryform Type B (DIN 436 50)
MA 22 L5 230AC	230 V~	22 mA	5 VA	Flying leads
MA 22 D 24DC	24 V=	125 mA	3 W	Industryform Type B (DIN 436 50)
MA 22 D 230AC	230 V~	22 mA	5 VA	Industryform Type B (DIN 436 50)

ST 16/ST 22/ ST 22 L 500/ST 30



Connectors as accessories for Hafner valves.

Type ST 16 and ST 22

using the enclosed flat seal and fastening screw and nut appropriately the system reaches protection class IP 65 in accordance to IEC 60 529.

Type ST 22 L 500

in combination with MA 22 D, using the enclosed flat seal, adding 2 O-rings at the top of the solenoid system and fastening screw and nut appropriately the system reaches protection class IP 67 in accordance to IEC 60 529.

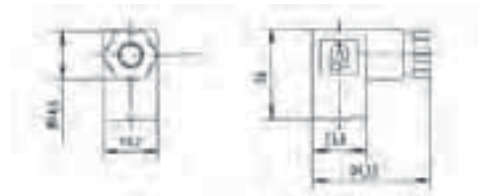
Type ST 30 ATEX

is an ATEX approved connector especially designed for being used in combination with the intrinsically safe coil MA 30 EEx ia C T6 24= displayed on page 2.10.4.

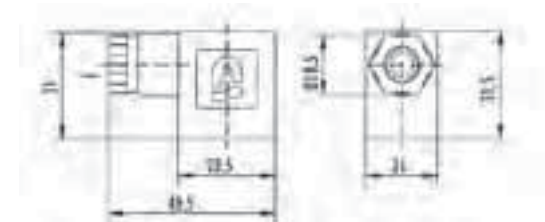
Delivery includes connector, flat nitril gasket and fixing screw (zinc-plated steel).

Other connectors are available on request.

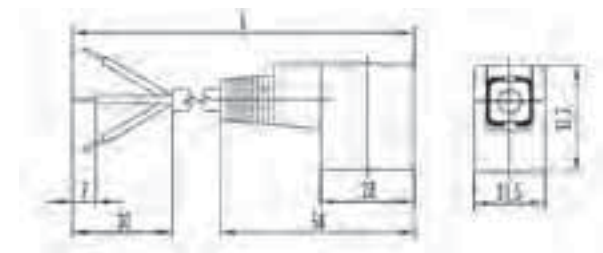
ST 30 ATEX is an in ATEX-approved connector especially designed for the use in combination with the EEx i.A. coil displayed on page 2.10.2.



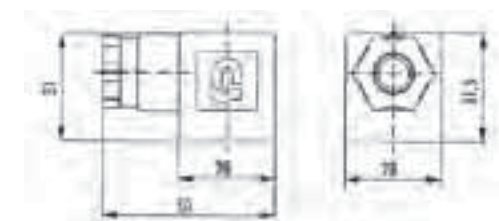
ST 16



ST 22



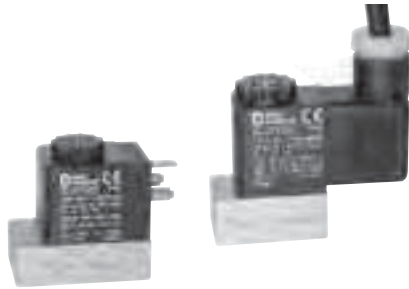
ST 22 L 500



ST 30

Type	Form	LED	VAR	Operat. voltage	Max. current	cable diamter
ST 16	C, ISO 15219	no	no	0 - 250 V	6 A	5 - 6,5 mm
ST 162 V 24	C, ISO 15219	red	yes	24 V ±10%	6 A	5 - 6,5 mm
ST 162 V 230	C, ISO 15219	red	yes	230 V ±10%	6 A	5 - 6,5 mm
ST 22	Industrial	no	no	0 - 250 V	10 A	6 - 8 mm
ST 222 V 24	Industrial	red	yes	24 V ±10%	10 A	6 - 8 mm
ST 222 V 230	Industrial	red	yes	230 V ±10%	10 A	6 - 8 mm
ST 22 L 500	Industrial	no	no	0 - 250 V	6 A	6,5 mm
ST 30 ATEX	A, ISO 4400	no	no	230 V ±10%	10 A	6 - 8 mm

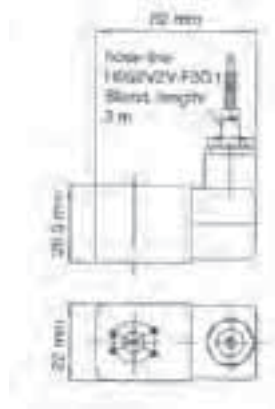
MA 22 EEx M II T4/MA 30 EEx i.A. IIC T6



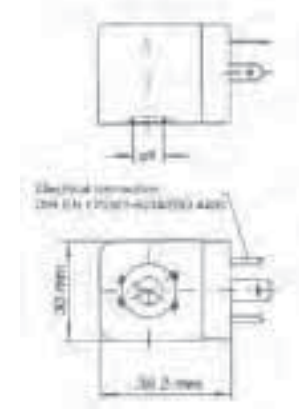
Atex approved solenoid valves for explosion-hazardous environment.

Product can be used in the following zones and categories:

Category	1		2	
	gas	dust	gas	dust
Zone	1	21	2	22
Protektion	EEx ia	stock	stock	included 1
	EEx m	stock	on request	included 1
	EEx na	on request	on request	on request



MA 22 EEx M II T4



MA 30 EEx i.A. IIC T6

Temperature range: - 10°C to + 50°C

Standard cable length for MA 22 EEx M II T4:
3 m, others on request.

Electrical connection for MA 30 EEx i.A. IIC T6:
DIN EN 175301-803-A / ISO4400, certified connector
offered on page 2.10.3.

The following valves are available as systems
for explosion-hazardous environment:

Please notice: Maximum operating pressure for valves equipped with EEx i.A. solenoid is 8 bar!
Admissible peak value of barrier: 28 VDC, 115 mA, 1,6 Watt.

Delivery includes valve with appropriately assembled operator system, coil, manual and declaration of conformity (066/04).

Types		Page				
MH 311 012	MH 311 015	2.5.1.1.2				
MH 312	MH 315	2.5.1.2.2				
MH 310 501	MOH 310 501	MH 310 701	MOH 310 701	MH 310 801	MOH 310 801	2.5.1.1.10
MH 310 101	MOH 310 101	MH 310 121	MOH 310 121			2.5.1.1.11
MH 320 501	MH 320 701	MH 320 801				2.5.1.1.13
MH 320 101	MH 320 121					2.5.1.1.14
MH 510 501	MH 510 701	MH 510 801				2.5.2.1.3
MH 510 101	MH 510 121					2.5.2.1.4
MH 520 501	MH 520 701	MH 520 801				2.5.2.1.8
MH 520 101	MH 520 121					2.5.2.1.9
MH 53_501	MH 53_701	MH 53_801				2.5.3.1.2
MH 53_101	MH 53_121					2.5.3.1.3
MNH 310 701	MNH 310 711	MNH 310 121				2.8.1.1.1/2
MNH 510 701	MNH 510 711	MNH 510 121				2.8.1.2.1/2
MNH 520 701	MNH 520 121					2.8.1.2.3
MNH 531 701	MNH 531 121					2.8.1.3

Type	Operating press.	Power consumption	Temp. class	Ignition prot.
MA 22 EEx M II T4 24=	max. 10 bar	5,0 Watt	T 4	encapsulation
MA 22 EEx M II T4 110~	max. 10 bar	4,5 VA	T 4	encapsulation
MA 22 EEx M II T4 230~	max. 10 bar	5,1 VA	T 4	encapsulation
MA 30 EEx i.A. IIC T6 24=	max. 8 bar	max. 115 mA / 1,6 Watt	T 6	intrinsic safety

Other voltages on request