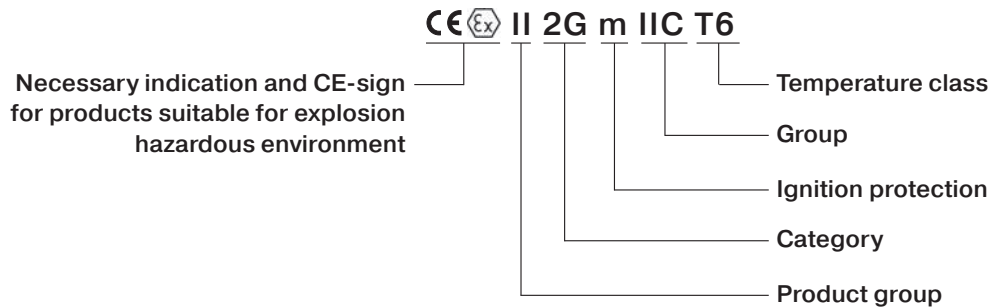


8.

Products for Explosion Hazardous Environment

General information on Hafner products for explosion hazardous environment

Example marking of an electric product for explosion hazardous environment:



Product group:

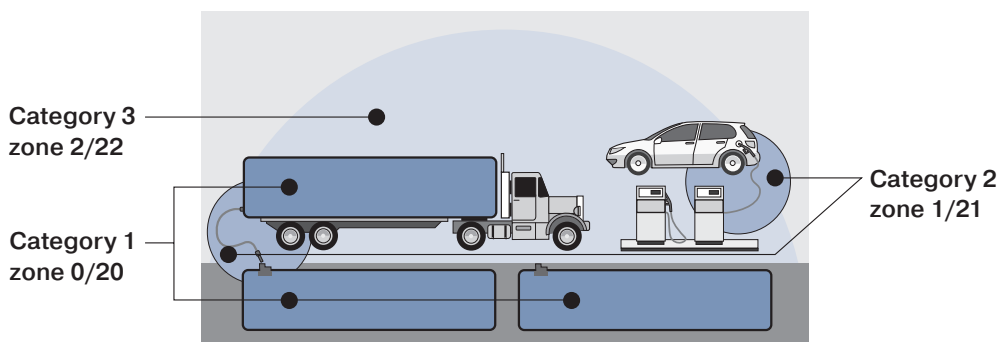
Product group I

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:



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
Category 1	Zone O 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	Zone 20 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
Category 2	Zone 1 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	Zone 21 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
Category 3	Zone 2 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	Zone 22 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

Ignition protection (examples):

	General definition:	For Hafner products:
c	Constructional safety	general protection for mechanical ATEX
i	Intrinsic safety	called ia for solenoids
na	Non sparking	
m	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

Group:

For various substances the explosive and spark ignition capability of a potentially explosive mixture are characteristics. Vapors and gases are classified in groups. The criteria for the subdivision are the maximum experimental safe gap and the minimum ignition current. Those are determined under precisely defined test conditions for various vapors and gases. Please refer to IEC60079-1A and IEC60079-3.

The hazard increases from group IIA to IIC, therefore the requirements applicable to electrical equipment become more strict. Consequently products classified IIC can also be used in IIB and IIA.

Temperatur classes:

Temperature class	Max. permitted surface temperature of equipment
T1	450°C
T2	300°C
T3	200°C
T4	135°C
T5	100°C
T6	85°C

T6 contains all other temperature classes

General information on Hafner products for explosion hazardous environment

Specific requirements for Dust atmospheres:

When products are to be used in dust atmosphere (zones 20, 21, 22) the following rules have to be obeyed:

1. Maximum surface temperature has to be indicated on the product.
2. For mechanic products (such as valves) the temperature-range for which the product is suitable has to be indicated on the item.
3. The IP-protection class has to be indicated.

Example of print-on on a Hafner-valve suitable for dust atmosphere:

CE II 2D c T4 - 10° < Ta < 50°C

Example of print-on on a coil suitable for dust atmosphere:

CE II 2D IP 65 T130°C

Non-electric valves for explosion hazardous environment:

Apart from solenoid valves also manually, mechanically and pneumatically actuated valves are part of our range. These valves are available for the use in zones 1, 21, 21, 22 gas and dust atmosphere.















ATEX-certified pneumatically actuated valves for low-temperature applications as well as stainless steel products are available on request.

Solenoid valves for explosion hazardous environment

General information – 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 classes.

Valve	Temp.-range	Ignition protection type		
		Ex na (non-sparking)	Ex ia (intrinsically safe)	Ex m (encapsulation)
				
Aluminum	-10°C ... + 50°C	✓	✓	✓
Stainless steel 	-10°C ... + 50°C	✓	✓	✓
Aluminum	-40°C ... + 50°C ❄️	n.a.	✓	n.a.
Stainless steel 	-40°C ... + 50°C ❄️	n.a.	✓	n.a.
Zone		2, 22	1, 21, 2, 22	1, 21, 2, 22
IEC-Ex rated			✓	✓
Reference:		8.2.4	8.2.3	8.2.2

Valve	Temp.-range	Ignition protection class		
		Ex e mb (encapsulation with junction box)	Ex dm (flameproof with junction box)	Ex d (flameproof with junction box)
				
Aluminum	-10°C ... + 50°C	✓	✓	✓
Stainless steel 	-10°C ... + 50°C	✓	✓	✓
Aluminum	-40°C ... + 50°C ❄️	✓	✓	✓
Stainless steel 	-40°C ... + 50°C ❄️	✓	✓	✓
Zone		1, 21, 2, 22	1, 21, 2, 22	1, 21, 2, 22
IEC-Ex rated				on request
Reference:		8.2.5	8.2.7	8.2.6

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  II2G/D c T4 -10°C Ta 50°C

A low temperature version for -20°C ... +50°C is also available on request. Please notice 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 information on valve on page
MH 311 012 Ex m	3/2-way direct acting	M5	in-line	4.2
MH 311 015 Ex m	3/2-way direct acting	G 1/8"	in-line	4.2
MH 311 013 Ex m	3/2-way direct acting	G 1/8"	banjo screw	4.6
MH 311 017 Ex m	3/2-way direct acting	G 1/4"	banjo screw	4.6

Valves with interface according to NAMUR-standard				
MNH 350 701 Ex m	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.3
MNH 310 701 Ex m	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.1.1
MNH 310 711 Ex m	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.1.1.1
MNH 310 121 Ex m	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.1.2
MNH 510 701 Ex m	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.2.1
MNH 510 711 Ex m	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.1.2.1
MNH 510 121 Ex m	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.2.2
MNH 520 701 Ex m	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.2.3
MNH 520 121 Ex m	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.2.3
MNH 53_ 701 Ex m	5/3-way, different versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.4
MNH 531 121 Ex m	5/3-way, centre closed	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.4


* dual use valves can either be used in-line or on a manifold plate.

Solenoids are described on page 8.2.2.4

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   II2G/D c T4 -10°C Ta 50°C

A low temperature version for -20°C ... +50°C is also available on request. Please notice 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 information on valve on page
MH 311 015 VES Ex m	3/2-way direct acting	G 1/8"	in-line	6.2.1
MH 310 701 VES Ex m	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MOH 310 701 VES Ex m	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MH 310 121 VES Ex m	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	6.2.3
MH 510 701 VES Ex m	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.4
MH 510 121 VES Ex m	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	6.2.4
MH 520 701 VES Ex m	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	6.2.5
MH 520 121 VES Ex m	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	6.2.5
MH 53_ 701 VES Ex m	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	6.2.6
MH 53_ 121 VES Ex m	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	6.2.6
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	6.3.3
MNH 310 701 VES Ex m	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.1
MNH 510 701 VES Ex m	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2
MNH 520 701 VES Ex m	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2

Solenoids are described on page 8.2.2.4

Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

MA 36 EEx m II T4 CSA FM

CSA / FM approved encapsulated coils for gas and dust explosion-hazardous environment.

Voltage: Delivery on request:
12VDC, 24VDC, 110VAC,
220VAC, 240VAC

Voltage tolerance: - 10...+ 10%

Relative duty cycle: 100 %

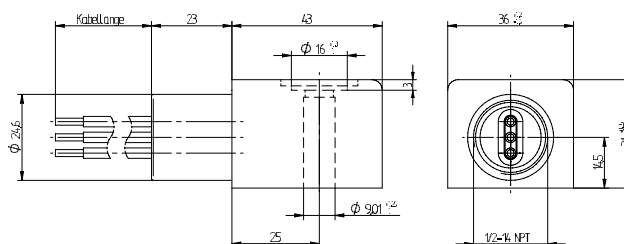
Temperature range: -20°C ... +60°C

Protection according to EN 60529: IP 65

Material solenoid coil: Thermoplasticpolyester

Coil rating according to DIN VDE 0580: Class H

Conduit: 1/2" NPT



MA 36 EEx m II T4 CSA FM

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 3. 15.

CSA/FM approval is only valid as long as the associated components are used.

Please notice:
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.

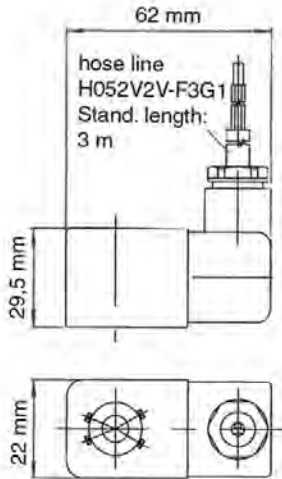
Specifications in accordance to FM certificate:

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 12=	12 V=	max. 10 bar	4,5 Watt	T4 (135° C)
MA 36 EEx M II T4 CSA FM 24=	24 V=	max. 10 bar	4,6 Watt	T4 (135° C)
MA 36 EEx M II T4 CSA FM 110~	110 V~	max. 10 bar	6,8 VA	T4 (135° C)
MA 36 EEx M II T4 CSA FM 220~	220 V~	max. 10 bar	7,7 VA	T4 (135° C)
MA 36 EEx M II T4 CSA FM 240~	240 V~	max. 10 bar	7,7 VA	T4 (135° C)

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 and 21.



MA 22 EEx m II T4



ATEX approved encapsulated coils for gas and dust explosion-hazardous environment.

System is also IEC-Ex approved.

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 IIT 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.

Type	Operating press.	Power consumption	Temperature class
MA 22 EEx M II T4 24=	max. 10 bar	5,0 Watt	T4 (135° C)
MA 22 EEx M II T4 110~	max. 10 bar	4,5 VA	T4 (135° C)
MA 22 EEx M II T4 230~	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   II2G/D c T6 -10°C Ta 50°C

Please notice:
 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 information on valve on page
MH 311 012 Ex ia	3/2-way direct acting	M5	in-line	4.2
MH 311 015 Ex ia	3/2-way direct acting	G 1/8"	in-line	4.2
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	2.1.3
MNH 310 701 Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.1.1
MNH 310 711 Ex ia	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.1.1.1
MNH 310 121 Ex ia	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.1.2
MNH 510 701 Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.2.1
MNH 510 711 Ex ia	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.1.2.1
MNH 510 121 Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.2.2
MNH 520 701 Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.2.3
MNH 520 121 Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.2.3
MNH 53_ 701 Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.4
MNH 53_ 121 Ex ia	5/3-way, centre closed	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.4

* dual use valves can either be used in-line or on a manifold plate.

Solenoids are described on page 8.2.3.5.

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** II2G/D c T6 -40°C Ta 50°C

Please notice:
 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 information on valve on page
MH 311 012 TT Ex ia	3/2-way direct acting	M5	in-line	5.2.1
MH 311 015 TT Ex ia	3/2-way direct acting	G 1/8"	in-line	5.2.1
MH 310 501 TT Ex ia	3/2-way, single sol.	G 1/8"	in-line	5.2.2
MOH 310 501 TT Ex ia	3/2-way, n.o. single sol.	G 1/8"	in-line	5.2.2
MH 310 701 GTT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	5.2.2
MOH 310 701 GTT Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	dual use*	5.2.2
MH 320 501 TT Ex ia	3/2-way, double sol.	G 1/8"	in-line	5.2.2
MH 320 701 GTT Ex ia	3/2-way, double sol.	G 1/4"	dual use*	5.2.2
MH 510 501 GTT Ex ia	5/2-way, single sol.	G 1/8"	dual use*	5.2.3
MH 510 701 GTT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	5.2.3
MH 520 501 GTT Ex ia	5/2-way, double sol.	G 1/8"	dual use*	5.2.4
MH 520 701 GTT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	dual use*	5.2.4
MH 53_501 GTT Ex ia	5/3-way, different versions	G 1/8"	dual use*	5.2.4
MH 53_701 GTT Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	dual use*	5.2.4


Valves with interface according to NAMUR-standard				
MNH 350 701 TT Ex ia	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	contact manufacturer
MNH 310 701 TT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.1
MNH 510 701 TT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.2
MNH 510 711 TT Ex ia	5/2-way, single sol.	G 1/4"	1/4" NAMUR	5.3.2
MNH 520 701 TT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.3
MNH 531 701 TT Ex ia	5/3-way, centre closed	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.3

* dual use valves can either be used in-line or on a manifold plate.

Solenoids are described on page 8.2.3.5.
 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   II2G/D c T6 -10°C Ta 50°C

Please notice:
 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 information on valve on page
MH 311 015 VES Ex ia	3/2-way direct acting	G 1/8"	in-line	6.2.1
MH 310 701 VES Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MOH 310 701 VES Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MH 310 121 VES Ex ia	3/2-way, single sol.	G 1/2"	in-line	6.2.3
MH 510 701 VES Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.4
MH 510 121 VES Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	6.2.4
MH 520 701 VES Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	6.2.5
MH 520 121 VES Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	6.2.5
MH 53_ 701 VES Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	6.2.6
MH 53_ 121 VES Ex ia	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	6.2.6

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	6.3.3
MNH 310 701 VES Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.1
MNH 510 701 VES Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2
MNH 520 701 VES Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2



* dual use valves can either be used in-line or on a manifold plate.

Solenoids are described on page 8.2.3.5.

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   II2G/D c T6 -40°C Ta 50°C

Please notice:
 Maximum operating pressure for valves with Ex ia
 solenoid system is 8 bar!

The following solenoid valves are available:

Type	Function	Port size	Installation	Further information on valve on page
MH 311 015 VES TT Ex ia	3/2-way direct acting	G 1/8"	in-line	6.2.1
MH 310 701 VES TT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MOH 310 701 VES TT Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MH 510 701 VES TT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.4
MH 520 701 VES TT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	6.2.5
MH 53_701 VES TT Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	6.2.6

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	6.3.3
MNH 310 701 VES TT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.1
MNH 510 701 VES TT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2
MNH 520 701 VES TT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2

* dual use valves can either be used in-line or on a manifold plate.

Solenoids are described on page 8.2.3.5.

Delivery contains valve with the appropriate operator
 system, coil, manual and declaration of conformity.

MA 30 Ex ia tD II CT6 24 DC



ATEX approved intrinsic safety coil and connector for gas and dust explosion-hazardous environment. System is also IEC-Ex approved. 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

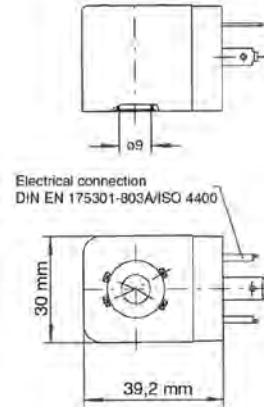
Moulding material: Thermoset resin (Epoxy)

Marking on coil: II 2G Ex ia IIB/IIC T6
II 2D Ex tb IIIC T80°C

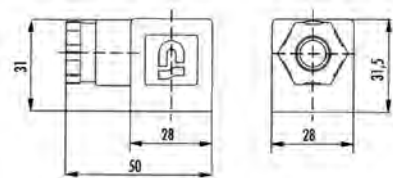
Barrier:

Electrical characteristics: 21,6... 28 V DC
Admissible peak value: 28 V DC
115 mA
1,6 W

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 and 21.



MA 30 Ex ia tD II CT6 24 DC



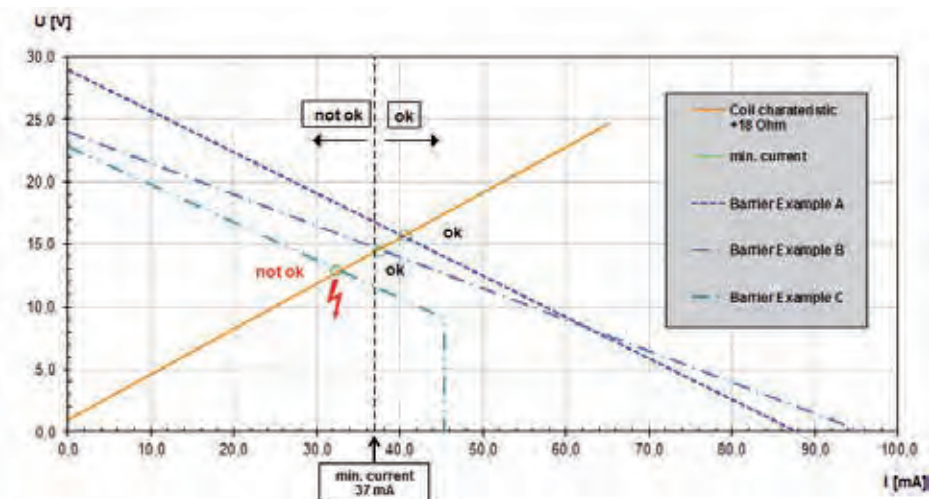
ST 30 Ex ia

Order Code: MA 30 Ex ia tD II CT6 24 DC

As the coil is 30 mm wide, a spacer plate called „ZPN 5“ has to be used, in case of combination with our NAMUR valve series 700 refer to page 3. 15.

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 nA – standard temperature range – aluminum



Material: Aluminum, anodized, head PA
 Zone: 2, 22
 Temperature range: -10°C ... +50°C
 Ignition protection type: Ex nA (non-sparking)
 Temperature class: T5

Marking on valve   II3G/D c T5 -10°C ≤ Ta ≤ 50°C
 II3G/D c T6 -10°C ≤ Ta ≤ 50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further information on valve on page
MH 311 012 Ex nA	3/2-way direct acting	M5	in-line	4.2
MH 311 015 Ex nA	3/2-way direct acting	G 1/8"	in-line	4.2
MH 311 013 Ex nA	3/2-way direct acting	G 1/8"	banjo screw	4.6
MH 311 017 Ex nA	3/2-way direct acting	G 1/4"	banjo screw	4.6

Valves with interface according to NAMUR-standard				
MNH 350 701 Ex nA	3/2-way & 5/2-way	G 1/4" - NPT	1/4" NAMUR	2.1.3
MNH 310 701 Ex nA	3/2-way, single sol.	G 1/4" - NPT	1/4" NAMUR	2.1.1.1
MNH 310 711 Ex nA	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.1.1.1
MNH 310 121 Ex nA	3/2-way, single sol.	G 1/2" - NPT	1/2" NAMUR	2.1.1.2
MNH 510 701 Ex nA	5/2-way, single sol.	G 1/4" - NPT	1/4" NAMUR	2.1.2.1
MNH 510 711 Ex nA	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.1.2.1
MNH 510 121 Ex nA	5/2-way, single sol.	G 1/2" - NPT	1/2" NAMUR	2.1.2.2
MNH 520 701 Ex nA	5/2-way, double sol.	G 1/4" - NPT	1/4" NAMUR	2.1.2.3
MNH 520 121 Ex nA	5/2-way, double sol.	G 1/2" - NPT	1/2" NAMUR	2.1.2.3
MNH 53_701 Ex nA	5/3-way, different versions	G 1/4" - NPT	1/4" NAMUR	2.1.4
MNH 531 121 Ex nA	5/3-way, centre closed	G 1/2" - NPT	1/2" NAMUR	2.1.4


* dual use valves can either be used in-line or on a manifold plate.

Solenoids are described on page 8.2.4.3

Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

ATEX-approved valves – Ex nA – standard temperature range – stainless steel



Material: Stainless steel, 316L 
 Zone: 2, 22
 Temperature range: -10°C ... +50°C
 Ignition protection type: Ex nA (non-sparking)
 Temperature class: T5

Marking on valve   II3G/D c T5 -10°C ≤ Ta ≤ 50°C
 II3G/D c T6 -10°C ≤ Ta ≤ 50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further information on valve on page
MH 311 015 VES Ex nA	3/2-way direct acting	G 1/8"	in-line	6.2.1
MH 310 701 VES Ex nA	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MOH 310 701 VES Ex nA	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MH 310 121 VES Ex nA	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	6.2.3
MH 510 701 VES Ex nA	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.4
MH 510 121 VES Ex nA	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	6.2.4
MH 520 701 VES Ex nA	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	6.2.5
MH 520 121 VES Ex nA	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	6.2.5
MH 53_701 VES Ex nA	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	6.2.6
MH 53_121 VES Ex nA	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	6.2.6

Valves with interface according to NAMUR-standard

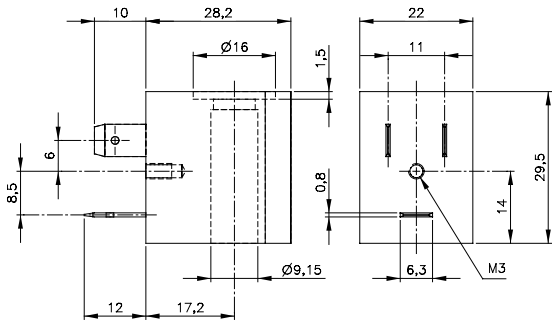
MNH 350 701 VES Ex nA	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.3
MNH 310 701 VES Ex nA	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.1
MNH 510 701 VES Ex nA	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.2.2
MNH 520 701 VES Ex nA	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.2.2

* dual use valves can either be used in-line or on a manifold plate.

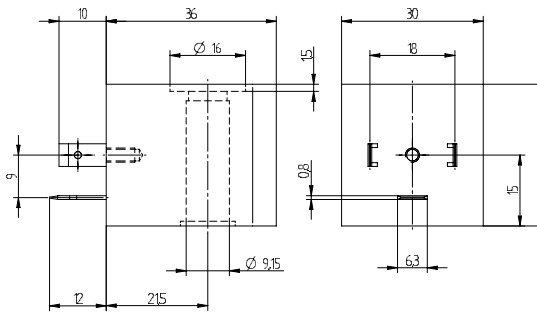
Solenoids are described on page 8.2.4.3.

Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

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 nA T5 24DC



MA 30 EEx nA T6 24DC



ATEX approved non-sparking coil for gas and dust explosion-hazardous environment.

Coil:

Voltage tolerance: 24 V DC +/- 10 %

Relative duty cycle: 100 %

Temperature range: -15°... +50° C

Insulation class of insulating materials according to DIN VDE 0580: F

Protection with connector according to EN 60529: IP 65

Moulding material: Termoplastico polyester

Marking on coil:

T5: II 3G Ex nA IIC T5 Gc
II 3D Ex tc IIC 95°C Dc

T6: II 3G Ex nA IIC T6 Gc
II 3D Ex tc IIC 80°C Dc

Delivery content without ATEX approved connector.

30 mm wide ATEX connector available, type ST 30 Ex nA.
22 mm wide ATEX connector available, type ST 22 Ex.
Please refer to page 7.3.

The ATEX approval is only valid as long as the associated components are used.

Type	Operating press.	Power cons.	Temp. class	Connection
MA 22 EEx nA T5 24DC	max. 10 bar	3,0 Watt	T5 (100° C)	Industryform B (DW 436 50)
MA 30 EEx nA T6 24DC	max. 10 bar	2,0 Watt	T6 (85° C)	Form A (ISO 440)

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   II2G/D c T6 -10°C Ta 50°C

The following solenoid valves are available:

Valves with interface according to NAMUR-standard				
Type	Function	Port size	Installation	Further information on valve on page
MNH 350 701 Ex e mb	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.3
MNH 310 701 Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.1.1
MNH 310 711 Ex e mb	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.1.1.1
MNH 310 121 Ex e mb	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.1.2
MNH 510 701 Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.2.1
MNH 510 711 Ex e mb	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.1.2.1
MNH 510 121 Ex e mb	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.2.2
MNH 520 701 Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.2.3
MNH 520 121 Ex e mb	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.2.3
MNH 53_701 Ex e mb	5/3-way, different versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.1.4
MNH 531 121 Ex e mb	5/3-way, centre closed	G 1/2" - 1/2" NPT	1/2" NAMUR	2.1.4

Solenoids are described on page 8.2.5.4.

Example drawings including the solenoid are displayed on page 8.2.5.5.

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   II2G/D c T6 -40°C Ta 50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further information on valve on page
MH 310 501 TT Ex e mb	3/2-way, single sol.	G 1/8"	in-line	5.2.2
MOH 310 501 TT Ex e mb	3/2-way, n.o. single sol.	G 1/8"	in-line	5.2.2
MH 310 701 GTT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	5.2.2
MOH 310 701 GTT Ex e mb	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	5.2.2
MH 320 501 TT Ex e mb	3/2-way, double sol.	G 1/8"	in-line	5.2.2
MH 320 701 TT Ex e mb	3/2-way, double sol.	G 1/4"	in-line	5.2.2
MH 510 501 GTT Ex e mb	5/2-way, single sol.	G 1/8"	in-line	5.2.3
MH 510 701 GTT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	5.2.3
MH 520 501 GTT Ex e mb	5/2-way, double sol.	G 1/8"	in-line	5.2.4
MH 520 701 GTT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	5.2.4
MH 53_ 501 GTT Ex e mb	5/3-way, different versions	G 1/8"	in-line	5.2.4
MH 53_ 701 GTT Ex e mb	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	5.2.4

Valves with interface according to NAMUR-standard

MNH 350 701 TT Ex e mb	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	contact manufacturer
MNH 310 701 TT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.1
MNH 510 701 TT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.2
MNH 510 711 TT Ex e mb	5/2-way, single sol.	G 1/4"	1/4" NAMUR	5.3.2
MNH 520 701 TT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.3
MNH 531 701 TT Ex e mb	5/3-way, centre closed	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.3


Solenoids are described on page 8.2.5.4.

Example drawings including the solenoid are displayed on page 8.2.5.5.

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   II2G/D c T6 -40°C Ta 50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further information on valve on page
MH 310 701 VES TT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MOH 310 701 VES TT Ex e mb	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MH 510 701 VES TT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.4
MH 520 701 VES TT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	6.2.5
MH 53_ 701 VES TT Ex e mb	5/3-way, different version	G 1/4" - 1/4" NPT	in-line	6.2.6

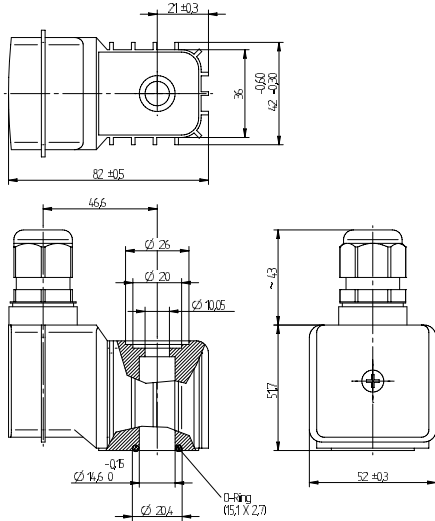
Valves with interface according to NAMUR-standard				
MNH 350 701 VES TT Ex e mb	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.3
MNH 310 701 VES TT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.1
MNH 510 701 VES TT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2
MNH 520 701 VES TT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2

Solenoids are described on page 8.2.5.2.

Example drawings including the solenoid are displayed on page 8.2.5.5.

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.

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 and 21.



MA 52 EEx e mb IIC T6



ATEX 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 67
Moulding material:	Thermoplasticpolyester
Cable Gland:	M20 x 1,5 for cable diameters 6 – 13 mm

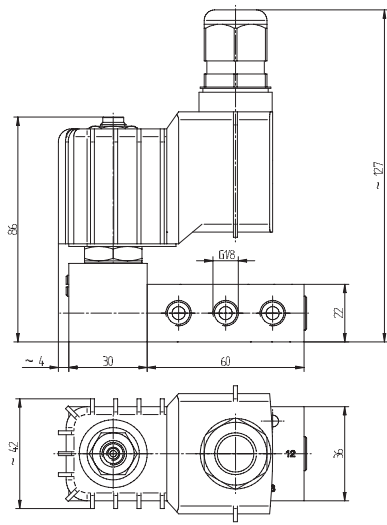
Please notice:
Same coil for 24VDC and 24VAC.

Marking on coil:  II 2G Ex e mb IIC T5 Gb
II 2D Ex tb mb IIIC T80°C Db

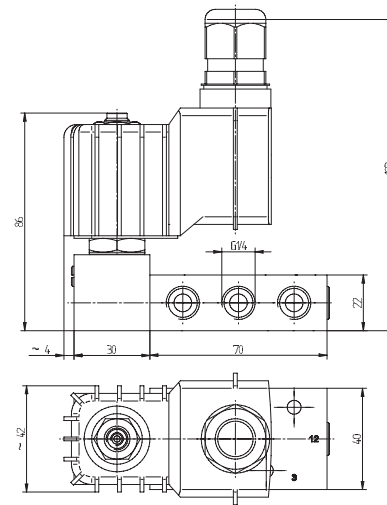
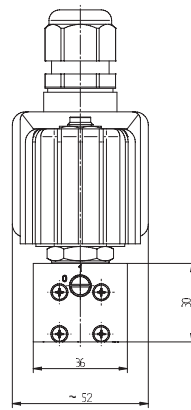
The ATEX approval is only valid as long as the associated components are used.

Type	Operating press.	Power cons.	Temperature class
MA 52 EEx e mb IIC T6 24	max. 10 bar	4,8 Watt / 4,3 VA	T6 (85° C)
MA 52 EEx e mb IIC T6 110~	max. 10 bar	4,4 VA	T6 (85° C)
MA 52 EEx e mb IIC T6 230~	max. 10 bar	4,8 VA	T6 (85° C)

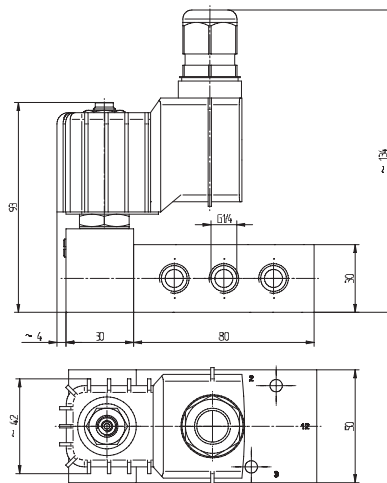
Example drawings of solenoid valves with Ex e mb solenoid system



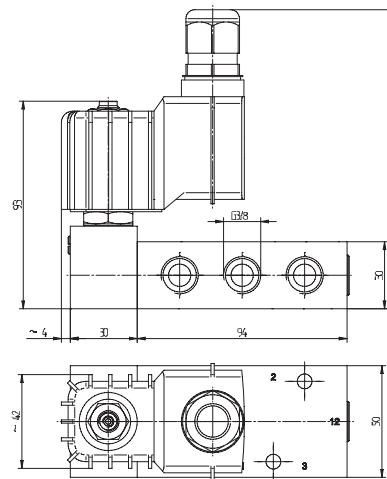
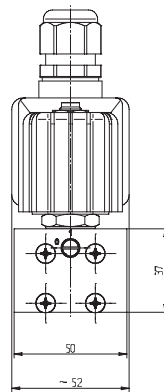
MH 510 501 Ex e mb IIC T6



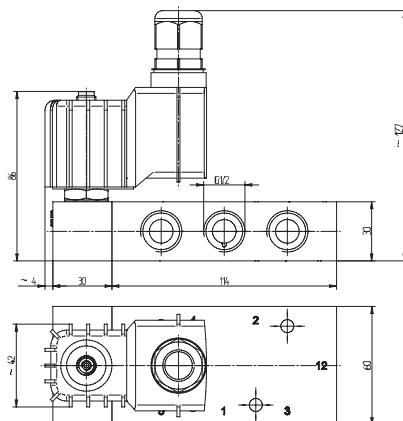
MH 510 701 Ex e mb IIC T6 /
MNH 510 701 EX e mb IIC T6



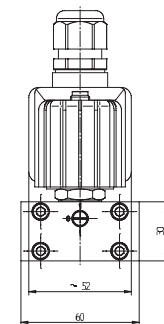
MH 510 801 Ex e mb IIC T6



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
 Solenoid coil limited to +40°C
 Ignition protection type: Ex d – flameproof
 Temperature class: T6 (solenoid)

Marking on valve   II2G/D c T6 -10°C Ta 40°C

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 8.2.6.5.

Example drawings including the solenoid are displayed on page 8.2.6.6.

The following solenoid valves are available:

Valves with interface according to NAMUR-standard					
Type	Function	Port size	Installation	Further information on valve on page	
MNC 350 701 Ex d	3/2-way & 5/2-way	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.3	
MNC 310 701 Ex d	3/2-way, single sol.	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.1.1	
MNC 310 711 Ex d	3/2-way, single sol.	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.1.1	
MNC 310 121 Ex d	3/2-way, single sol.	G 1/2" -1/2" NPT	1/2" NAMUR	2.1.1.2	
MNC 510 701 Ex d	5/2-way, single sol.	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.2.1	
MNC 510 711 Ex d	5/2-way, single sol.	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.2.1	
MNC 510 121 Ex d	5/2-way, single sol.	G 1/2" -1/2" NPT	1/2" NAMUR	2.1.2.2	
MNC 520 701 Ex d	5/2-way, double sol.	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.2.3	
MNC 520 121 Ex d	5/2-way, double sol.	G 1/2" -1/2" NPT	1/2" NAMUR	2.1.2.3	
MNC 53_ 701 Ex d	5/3-way, different versions	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.4	
MNC 53_ 121 Ex d	5/3-way, different versions	G 1/2" -1/2" NPT	1/2" NAMUR	2.1.4	

Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.

ATEX-approved valves – Ex d – low temperature range – aluminium



Material: Aluminum, anodized
 Zone: 1, 2, 21, 22
 Temperature range: -50°C ... +50°C ❄️
 Solenoid coil limited to
 -40°C ... +40°C,
 solenoids for -65°C on request
 Ignition protection type: Ex d – flameproof
 Temperature class: T6 (solenoid)

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 type MA 52 EEx d IIC T6 24DC VES are displayed on page 8.2.6.5.

Marking on valve   II2G/D c T6 -50°C Ta 40°C

Example drawings including the solenoid are displayed on page 8.2.6.6.

The following solenoid valves are available:

Type	Function	Port size	Installation	Further information on valve on page
MC 310 501 GTT Ex d	3/2-way, n.c. single sol..	G 1/8"	in-line	5.2.2
MOC 310 501 GTT Ex d	3/2-way, n.o. single sol.	G 1/8"	in-line	5.2.2
MC 310 701 GTT Ex d	3/2-way, n.c. single sol.	G 1/4"	in-line	5.2.2
MOC 310 701 GTT Ex d	3/2-way, n.o. single sol..	G 1/4"	in-line	5.2.2
MC 320 501 GTT Ex d	3/2-way, double sol.	G 1/8"	in-line	5.2.2
MC 320 701 GTT Ex d	3/2-way, double sol.	G 1/4"	in-line	5.2.2
MC 510 501 GTT Ex d	5/2-way, single sol.	G 1/8"	in-line	5.2.3
MC 510 701 GTT Ex d	5/2-way, single sol.	G 1/4"	in-line	5.2.3
MC 520 501 GTT Ex d	5/2-way, double sol.	G 1/8"	in-line	5.2.4
MC 520 701 GTT Ex d	5/2-way, double sol.	G 1/4"	in-line	5.2.4
MC 53_501 GTT Ex d	5/3-way, different version	G 1/8"	in-line	5.2.4
MC 53_701 GTT Ex d	5/3-way, different version	G 1/4"	in-line	5.2.4

Valves with interface according to NAMUR-standard				
MNC 350 701 TT Ex d	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	contact manufacturer
MNC 310 701 TT Ex d	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.1
MNC 510 701 TT Ex d	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.2
MNC 510 711 TT Ex d	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.2
MNC 520 701 TT Ex d	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.3
MNC 531 701 TT Ex d	5/3-way, different version	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.3

Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.

ATEX-approved valves – Ex d – standard temperature range – stainless steel






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 type MA 52 EEx d IIC T6 24DC VES are displayed on page 8.2.6.5.

Example drawings including the solenoid are displayed on page 8.2.6.6.

Material: Stainless steel, 316L 
 Zone: 1, 2, 21, 22
 Temperature range: -10°C ... +50°C
 Solenoid coil limited to +40°C
 Ignition protection type: Ex d – flameproof
 Temperature class: T6 solenoid

Marking on valve   II2G/D c T6 -10°C Ta 40°C

The following **solenoid valves** are available:


Type	Function	Port size	Installation	Further information on valve on page
MC 310 701 VES Ex d	3/2-way, n.c. single sol..	G 1/4" - 1/4" NPT	in-line	6.2.2
MOC 310 701 VES Ex d	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MC 310 121 VES Ex d	3/2-way, n.c. single sol.	G 1/2" - 1/2" NPT	in-line	6.2.3
MC 510 701 VES Ex d	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.4
MC 510 121 VES Ex d	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	6.2.4
MC 520 701 VES Ex d	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	6.2.5
MC 520 121 VES Ex d	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	6.2.5
MC 53_ 701 VES Ex d	5/3-way, different version	G 1/4" - 1/4" NPT	in-line	6.2.6
MC 53_ 121 VES Ex d	5/3-way, different version	G 1/2" - 1/2" NPT	in-line	6.2.6

Valves with interface according to NAMUR-standard				
MNC 350 701 VES Ex d	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.3
MNC 310 701 VES Ex d	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.1
MNC 510 701 VES Ex d	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.2.2
MNC 520 701 VES Ex d	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.2.2

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 ... +40°C,
 solenoids for -65°C on request
 Ignition protection type: Ex d – flameproof
 Temperature class: T6 (solenoid)

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 type MA 52 EEx d IIC T6 24DC VES are displayed on page 8.2.6.5.

Marking on valve   II2G/D c T6 -50°C Ta 40°C

Example drawings including the solenoid are displayed on page 8.2.6.6.

The following **solenoid valves** are available:

Type	Function	Port size	Installation	Further information on valve on page
MC 310 701 VES TT Ex d	3/2-way, n.c. single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MOC 310 701 VES TT Ex d	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MC 510 701 VES TT Ex d	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.4
MC 520 701 VES TT Ex d	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	6.2.5
MC 53_701 VES TT Ex d	5/3-way, different version	G 1/4" - 1/4" NPT	in-line	6.2.6

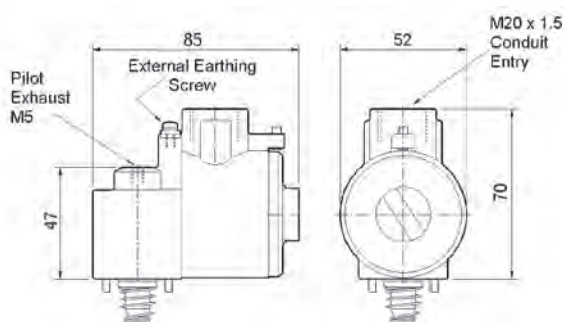
Valves with interface according to NAMUR-standard

MNC 350 701 VES TT Ex d	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.3
MNC 310 701 VES TT Ex d	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.1
MNC 510 701 VES TT Ex d	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2
MNC 520 701 VES TT Ex d	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2

Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.

MA 52 EEx d IIC T6 24 DC/ MA 52 EEx d IIC T6 24 DC VES

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 and 21.



MA 52 EEx D IIC T6 __ (VES)

ATEX approved flameproof coil for gas and dust explosion hazardous environment. Solenoids with IEC-Ex certificate on request.

Voltage: 24VDC
Voltage tolerance: - 10...+ 10 %
Relative duty cycle: 100 %
Temperature range: -40°C...+40°C, up to -65°C on request, valve limited to -50°C

Ignition protection type: flameproof

Protection according to ENBS60529 : 1992 : IP 66 with appropriate cable gland

Material solenoid coil: Stainless Steel

Coil rating according to DIN VDE 0580: Class F

Cable Gland: M20 x 1.5

Marking on coil:  II 2G Ex d IIC T6
II 2D Ex tD A21 IP66 T85°C

Delivery content without cable gland. Ex d rated cable glands can be supplied on request.

Technical details pilot head :

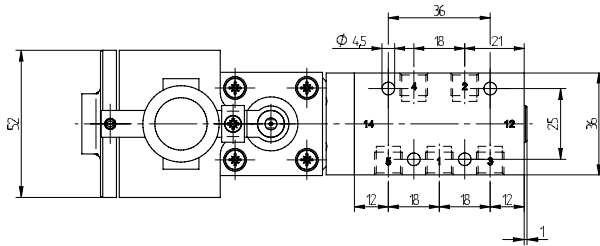
Material : Standard: Aluminum
Type VES: Stainless Steel

Manual override: bistable to turn, others on request

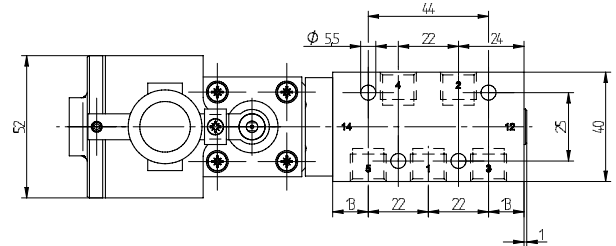
The ATEX approval is only valid as long as the associated components are used.

Type	Operating press.	Power cons.	Temperature class
MA 52 EEx d IIC T6 24 DC	max. 10 bar	3,0 Watt	T6 (85° C)
MA 52 EEx d IIC T6 24 DC VES	max. 10 bar	3,0 Watt	T6 (85° C)

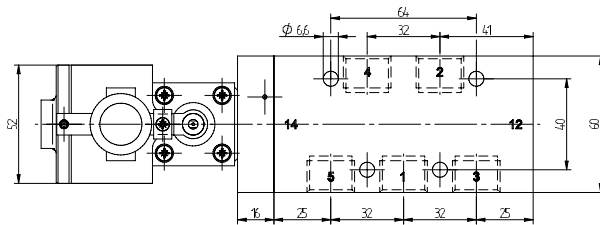
Example drawings of solenoid valves with Ex d solenoid system



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: **CE** **Ex** II2G/D c T5 -10°C Ta 50°C

Base plate assembly due to width of solenoid coil (36 mm) is not possible.

Encapsulated flameproof solenoids are displayed on page 8.2.7.5.

The following solenoid valves are available:

Type	Function	Port size	Installation	Further information on valve on page
MH 311 012 Ex dm	3/2-way direct acting	M5	in-line	4.2
MH 311 015 Ex dm	3/2-way direct acting	G 1/8"	in-line	4.2
MH 311 013 Ex dm	3/2-way direct acting	G 1/8"	in-line	4.6
MH 311 017 Ex dm	3/2-way direct acting	G 1/4"	in-line	4.6
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	2.1.3
MNH 310 701 Ex dm	3/2-way, single sol.	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.1.1
MNH 310 711 Ex dm	3/2-way, single sol.	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.1.1
MNH 310 121 Ex dm	3/2-way, single sol.	G 1/2" -1/2" NPT	1/2" NAMUR	2.1.1.2
MNH 510 701 Ex dm	5/2-way, single sol.	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.2.1
MNH 510 711 Ex dm	5/2-way, single sol.	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.2.1
MNH 510 121 Ex dm	5/2-way, single sol.	G 1/2" -1/2" NPT	1/2" NAMUR	2.1.2.2
MNH 520 701 Ex dm	5/2-way, double sol.	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.2.3
MNH 520 121 Ex dm	5/2-way, double sol.	G 1/2" -1/2" NPT	1/2" NAMUR	2.1.2.3
MNH 53_701 Ex dm	5/3-way, different versions	G 1/4" -1/4" NPT	1/4" NAMUR	2.1.4
MNH 53_121 Ex dm	5/3-way, different versions	G 1/2" -1/2" NPT	1/2" NAMUR	2.1.4

Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.

ATEX-approved valves – Ex dm – low temperature range – aluminum



Material: Aluminum, anodized
 Zone: 1, 2, 21, 22
 Temperature range: -50°C ... +50°C ❄️
 Ignition protection type: Ex dm (encapsulated-
 flameproof with junction box)
 Temperature class: T5

Marking on valve: **CE** **Ex** II2G/D c T5 -50°C Ta 50°C

Base plate assembly due to width of solenoid coil (36 mm) is not possible.

Encapsulated flameproof solenoids are displayed on page 8.2.7.5.

The following **solenoid valves** are available:

Type	Function	Port size	Installation	Further information on valve on page
MH 311 012 TT Ex dm	3/2-way direct acting	M5	in-line	5.2.1
MH 311 015 TT Ex dm	3/2-way direct acting	G 1/8"	in-line	5.2.1
MH 311 013 TT Ex dm	3/2-way direct acting	G 1/8"	in-line	5.2.1
MH 311 017 TT Ex dm	3/2-way direct acting	G 1/4"	in-line	5.2.1
MH 310 501 GTT Ex dm	3/2-way, n.c. single sol.	G 1/8"	in-line	5.2.2
MOH 310 501 GTT Ex dm	3/2-way, n.o. single sol.	G 1/8"	in-line	5.2.2
MH 310 701 GTT Ex dm	3/2-way, n.c. single sol.	G 1/4"	in-line	5.2.2
MOH 310 701 GTT Ex dm	3/2-way, n.o. single sol.	G 1/4"	in-line	5.2.2
MH 320 501 GTT Ex dm	3/2-way, double sol.	G 1/8"	in-line	5.2.2
MH 320 701 GTT Ex dm	3/2-way, double sol.	G 1/4"	in-line	5.2.2
MH 510 501 GTT Ex dm	5/2-way, single sol.	G 1/8"	in-line	5.2.3
MH 510 701 GTT Ex dm	5/2-way, single sol.	G 1/4"	in-line	5.2.3
MH 520 501 GTT Ex dm	5/2-way, double sol.	G 1/8"	in-line	5.2.4
MH 520 701 GTT Ex dm	5/2-way, double sol.	G 1/4"	in-line	5.2.4
MH 53_501 GTT Ex dm	5/3-way, different versions	G 1/8"	in-line	5.2.4
MH 53_701 GTT Ex dm	5/3-way, different versions	G 1/4"	in-line	5.2.4


Valves with interface according to NAMUR-standard

MNH 350 701 TT Ex dm	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	contact manufacturer
MNH 310 701 TT Ex dm	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.1
MNH 510 701 TT Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.2
MNH 510 711 TT Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.2
MNH 520 701 TT Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.3
MNH 531 701 TT Ex dm	5/3-way, different versions	G 1/4" - 1/4" NPT	1/4" NAMUR	5.3.3

Delivery contains valve with the 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:   II2G/D c T5 -10°C Ta 50°C

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 8.2.7.5.

The following solenoid valves are available:

Type	Function	Port size	Installation	Further information on valve on page
MH 311 015 VES Ex dm	3/2-way direct acting	G 1/8"	in-line	6.2.1
MH 310 701 VES Ex dm	3/2-way, n.c. single sol.	G 1/4" – 1/4" NPT	in-line	6.2.2
MOH 310 701 VES Ex dm	3/2-way, n.o. single sol.	G 1/4" – 1/4" NPT	in-line	6.2.2
MH 310 121 VES Ex dm	3/2-way, n.c. single sol.	G 1/2" – 1/2" NPT	in-line	6.2.3
MH 510 701 VES Ex dm	5/2-way, single sol.	G 1/4" – 1/4" NPT	in-line	6.2.4
MH 510 121 VES Ex dm	5/2-way, single sol.	G 1/2" – 1/2" NPT	in-line	6.2.4
MH 520 701 VES Ex dm	5/2-way, double sol.	G 1/4" – 1/4" NPT	in-line	6.2.5
MH 520 121 VES Ex dm	5/2-way, double sol.	G 1/2" – 1/2" NPT	in-line	6.2.5
MH 53_701 VES Ex dm	5/3-way, different version	G 1/4" – 1/4" NPT	in-line	6.2.6
MH 53_121 VES Ex dm	5/3-way, different version	G 1/2" – 1/2" NPT	in-line	6.2.6


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	6.3.3
MNH 310 701 VES Ex dm	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.1
MNH 510 701 VES Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2
MNH 520 701 VES Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2

Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.

ATEX-approved valves – Ex dm – low temperature range – stainless steel



Material: Stainless steel, 316L 
 Zone: 1, 2, 21, 22
 Temperature range: -50°C ... +50°C ❄️
 Ignition protection type: Ex dm (encapsulated-
 flameproof with junction box)
 Temperature class: T5

Marking on valve:   II2G/D c T5 -50°C Ta 50°C

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 8.2.7.5.

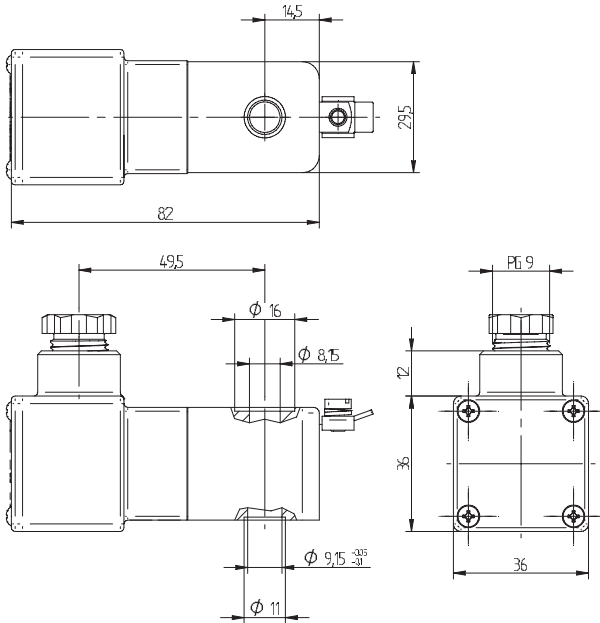
The following solenoid valves are available:

Type	Function	Port size	Installation	Further information on valve on page
MH 311 015 VES TT Ex dm	3/2-way direct acting	G 1/8"	in-line	6.2.1
MH 310 701 VES TT Ex dm	3/2-way, n.c. single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MOH 310 701 VES TT Ex dm	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	6.2.2
MH 510 701 VES TT Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	6.2.4
MH 520 701 VES TT Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	6.2.5
MH 53_701 VES TT Ex dm	5/3-way, different version	G 1/4" - 1/4" NPT	in-line	6.2.6

Valves with interface according to NAMUR-standard

MNH 350 701 VES TT Ex dm	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.3
MNH 310 701 VES TT Ex dm	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.1
MNH 510 701 VES TT Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2
MNH 520 701 VES TT Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	6.3.2

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 and 21.



MA 36 EEx dm IIC T5 _ _



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: -50°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

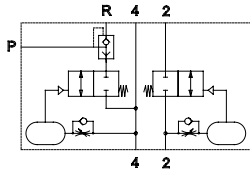
Marking on coil:   II 2G Ex db mb IIC T5 Gb
II 2D Ex tb IIIC T95°C IP66 Db

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 3. 15.

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 12 DC	max. 10 bar	3,0 Watt	T5 (100 °C)
MA 36 EEx dm IIC T5 24 DC	max. 10 bar	3,0 Watt	T5 (100 °C)
MA 36 EEx dm IIC T5 24 AC	max. 10 bar	4,8 VA	T5 (100 °C)
MA 36 EEx dm IIC T5 110 AC	max. 10 bar	4,8 VA	T5 (100 °C)
MA 36 EEx dm IIC T5 230 AC	max. 10 bar	4,8 VA	T5 (100 °C)

CBN 700 Ex



CBN 700 Ex



Control block for double acting actuators with interface according to 1/4" NAMUR-standard, to be used on process-valves with inflatable seal.

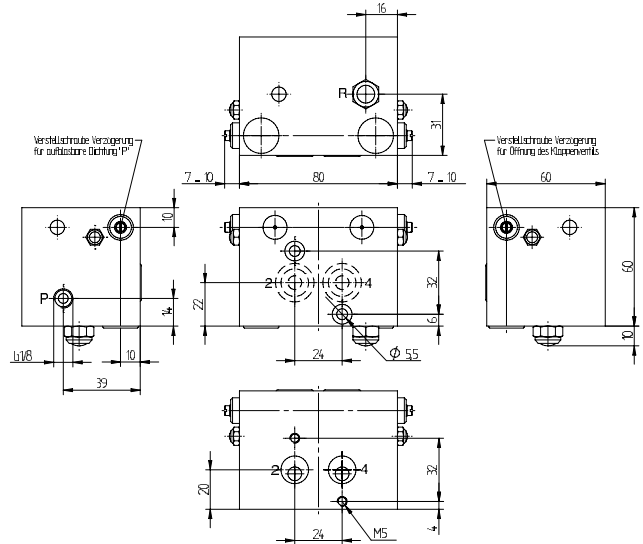
The control-block receives it's signals to open and close from a standard 5/2-way NAMUR valve. The block is to be put between the actuator and the NAMUR-valve (flange-version). The closing-signal is fed through to the actuator, the seal is inflated with time-delay.

When the process-valves is to be closed 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.

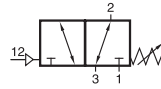
At 6 bar time-delay can be adjusted between 0 and 2 seconds.

Marking on valve:   II2G/D c T6 -10°C Ta 50°C

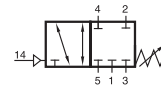


CBN 700 Ex

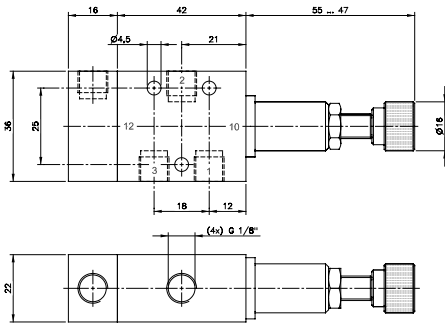
Type	NAMUR	Port size	Air flow act.	Air flow seal	Weight
CBN 700 Ex	1/4"	G 1/8"	900 l/min	400 l/min	0,80 kg



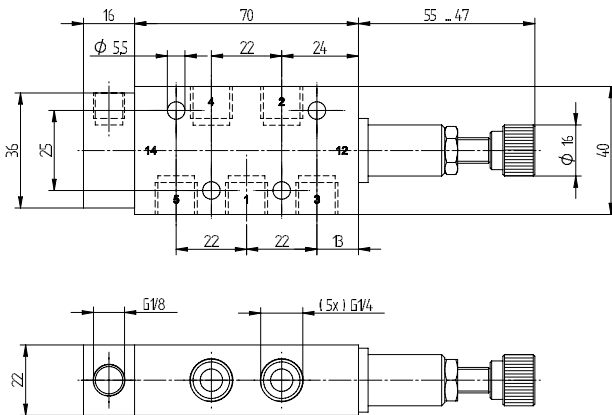
P 311 501 SR Ex



P 411 701 SR Ex



P 311 501 SR Ex



P 411 701 SR Ex

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 by 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.

Valve can be used as an **adjustable pneumatic pressure switch**. By turning the hand-wheel the required minimum actuation pressure can be set between 3 and 6 bar. Adjustment is not independent from operation pressure.

Please take care about the hysteresis of the spring.

Marking von valve: II2G/D c T6 -10°C Ta 50°C

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