

2.15

Products for Explosion Hazardous Environment



General information on HAFNER products for explosion hazardous environment

Since July 1, 2003, devices and protective systems for use in explosion protection areas must be approved according to Directive 94/9 / EC - known as the ATEX Directive. This has been replaced by the latest ATEX 2014/34 / EU directive.

Essential when applying the ATEX directive:

- Non-electrical equipment (e.g. pneumatic actuators and valves) fall within the scope of application.
- Basic safety requirements are defined.
- The devices are divided into groups and categories, which in turn are assigned to corresponding zones. Zones are to be defined by the operator in accordance with ATEX directive 137.
- The CE mark is mandatory.
- Each device must be accompanied by an operating manual and a declaration of conformity.
- The directive also takes dust explosion protection into account.
- It applies to mining and all other potentially explosive areas

When and where can an explosion occur?

Explosions can always occur where flammable gases, liquids or dusts are produced, transported or stored. Under certain conditions, explosive mixtures arise in connection with air. In such potentially explosive areas, a small spark is often enough to trigger an explosion. Areas at risk of explosion can be found, for example, in chemical factories, refineries, tank systems, paint factories or sewage treatment plants and in other areas in which dust-forming bulk materials are processed or transported, e.g. in grain mills, feed mills and cement plants.

What are potential ignition sources?

Exemplary electrical ignition sources:	Exemplary mechanical ignition sources:	Other exemplary ignition sources:
<ul style="list-style-type: none"> • Sparking that occurs when contacts are opened • Electrical equalizing currents • Electrostatic discharge • Hot surfaces of coils 	<ul style="list-style-type: none"> • Hot surfaces caused by friction • Adiabatic compression • Sparks generated by hitting 	<ul style="list-style-type: none"> • Open fire • Overheating bearings or brakes • Self-ignition (exothermic compounds) • Lightning strike

Products subject to approval according to the ATEX directive

- Electrical equipment
- Non-electrical equipment such as:
 - Cylinders
 - Rodless cylinders
 - Valves
 - Hoses (must be antistatic)

This affects all devices that have their own potential ignition source (see above).

Products not subject to approval according to the ATEX directive

The following product examples do not have their own ignition sources and can be used in certain hazard zones in accordance with the manufacturer's instructions:

- Pneumatic accessories
- Mechanical accessories
- Air preparation units
- Fittings
- Check- and flow regulator valves

But: These devices must be protected from falling objects as well.

General information on HAFNER products for explosion hazardous environment

Overview of product groups, categories and zones according to ATEX 2014/34 / EU and ATEX 137

According to the ATEX 2014 directive, the manufacturer must assess his products and label them accordingly:



- Divide into product groups and categories for use in different zones
- Divide into temperature classes
- Divide into explosion groups
- Determination of the permissible ambient temperatures

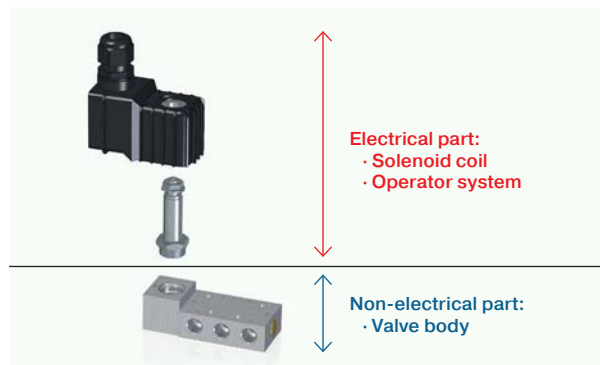
In accordance with ATEX 137, the system builder or operator must assess the system and define appropriate protective measures (e.g. in the context of an explosion protection document):



- Divide the system into zones according to the hazard potentials determined
- Determine temperature classes
- Determine explosion groups
- Determination of the occurring ambient temperatures

The plant manufacturer is responsible for ensuring that the selected components meet the requirements.

The ATEX directive differentiates between an electrical and non-electrical device.



Electrical devices are, for example, solenoid systems. Cylinders, valves and the mechanical part of the solenoid valves are considered as “non-electrical devices”.

Electrical and non-electrical devices are identified using the same scheme.

1. Example identification of a **non-electrical device**:



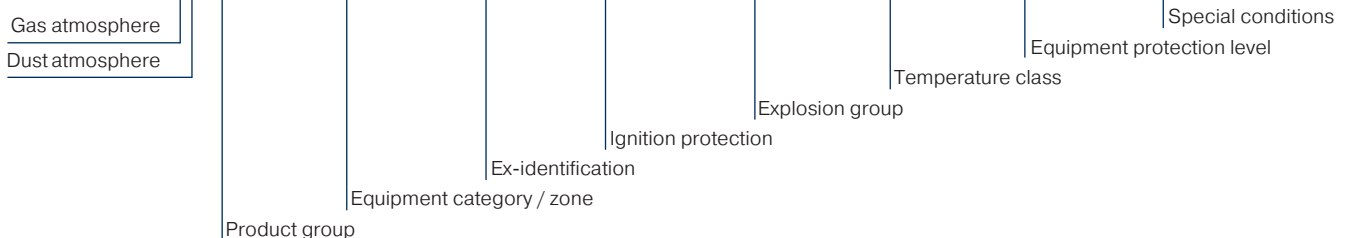
II	2G	Ex	h	IIC	T6	Gb	X
II	2G	Ex	h	IIC	T6	Gb	X

Example identification of an **electrical device**:



II	2G	Ex	e mb	IIC	T6	Gb	X
II	2G	Ex	e mb	IIC	T6	Gb	X

The two identifications differ only in terms of the type of ignition.



In addition, the ambient temperature in which it is permitted to be used (e.g. $-10^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$) is also printed on the products.

In the case of devices that have both markings, the respective lower Ex characteristic values shall be used.

In addition, a CE mark is mandatory.

General information on HAFNER products for explosion hazardous environment

Product group:

Product group I

Products from product group I are distinguished between M1 and M2. Both are suitable for mining applications. They are not in our focus as HAFNER does not offer suitable equipment.

Product group II

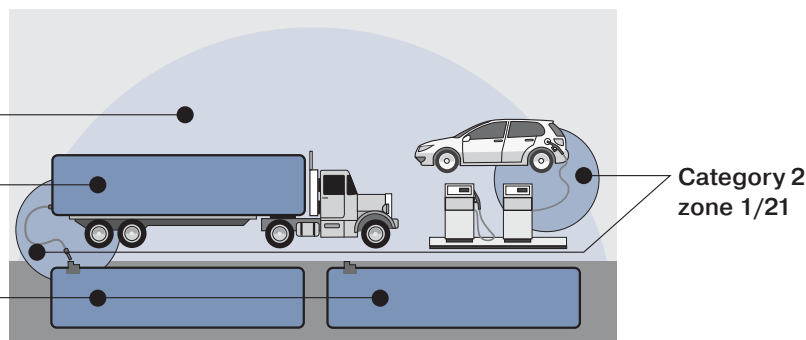
All other products for explosion hazardous environment are in this group.

Category:

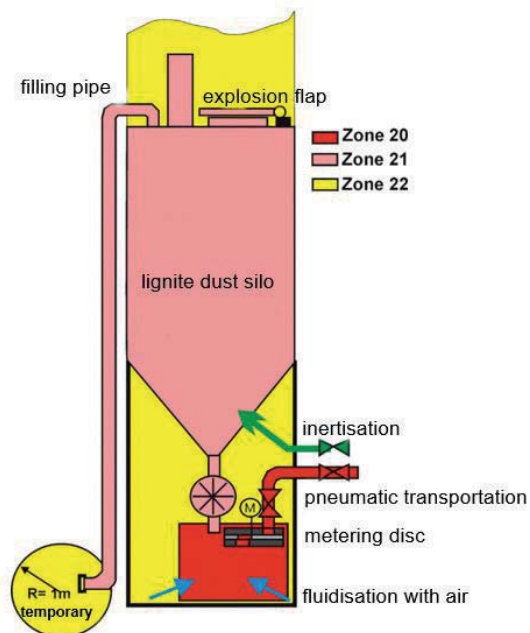
Gas:

Category 3
zone 2/22

Category 1
zone 0/20



Dust:



Category I

An area in which an explosive mixture is continuously present or present for long periods > 1000 hours/year.

Category II

An area in which an explosive mixture is occasionally present 10 – 1000 hours/year.

Category III

An area in which an explosive mixture is not likely to occur in normal operation and if it occurs it will exist only for a short time < 10 hours/year.

General information on HAFNER products for explosion hazardous environment

	Zones for Gases	Zones for Dust
Category 1	Zone 0 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

Comparison of product category according to ISO 2014/34/EU with product category according to EN ISO 80079-36:

EN ISO 80079-36		Directive 2014/34/EU	
EPL	Group	Product group	Category
Ma	I (Mining)	I (Mining)	M1
Mb			M2
Ga	II (Gas)	II (Non-mining applications)	1G
Gb			2G
Gc			3G
Da	III (Dust)		1D
Db			2D
Dc			3D

Ignition protection (examples):

	General definition:	For HAFNER products:
c	Constructional safety	general protection for mechanical ATEX
i	Intrinsic safety	called ia for solenoids
ec	Increased safety	
mb	Encapsulation	with cable
me	Encapsulation enhanced safety	called Ex emb with junction box
d	Flameproof enclosure	with junction box
dm	Flameproof encapsulation	with junction box

General information on HAFNER products for explosion hazardous environment

Explosion group

Depending on the type of protection, explosion-protected equipment for gases, mists and vapours is divided into three explosion groups (IIA-IIIB-IIC). The explosion group is a measure of the ignition transmission capability of gases (explosive atmosphere). The requirements on the equipment increase from IIA to IIC. Consequently, products classified IIC/IIIC can also be used in IIB/IIIB and IIA/IIIA.

Gas group device	Use in gas groups	Example	Danger increases
IIA	IIA	Propane	↓
IIB	IIA + IIB	Ethylene	
IIC	IIA + IIB + IIC	Hydrogen	

Temperatur classes:

Flammable gases and vapours are divided into temperature classes in accordance with their flammability. The ignition temperature is the lowest temperature of a heated surface at which the ignition of a gas/air or vapour/air mixture occurs. In other words, it is the lowest temperature value at which a hot surface can ignite the corresponding explosive atmosphere.



The maximum surface temperature of electrical equipment must always be lower than the ignition temperature of the gas/air or vapour/air mixture in which it is used.

Equipment of a higher temperature class (e.g. T6) can therefore also be used for lower temperature classes (T1-T5).

Temperature class	Temperature range of the mix (°C)	Max. surface temperature (°C)	Typical gases
T1	≥ 450°C	450°C	Methane, acetone, ammonia, methanol, propane, acetic acid, town gas, hydrogen
T2	≥ 300 - 450°C	300°C	Ethylene, acetylene
T3	≥ 200 - 300°C	200°C	Petroleum, diesel, heating oils, hydrogen sulphide
T4	≥ 135 - 200°C	135°C	Acetaldehyde, ethyl ether
T5	≥ 100 - 135°C	100°C	
T6	≥ 85 - 100°C	85°C	Carbon disulphide

Temperature classes, heating of the devices and ambient temperature



On non-electrical devices, the temperature range in which the devices can be operated must be specified. The ambient temperature range is marked by "Ta." on any HAFNER solenoid valve (example):

  II 2 G Ex h IIC T6 Gb
-10°C ≤ Ta ≤ +50°C

  II 2 D Ex h IIIC T80°C
Db -10°C ≤ Ta ≤ +50°C

On electrical and non-electrical devices, the maximum surface temperature is also specified. For gas atmosphere as temperature class, for dust atmosphere as absolute temperature [°C].

The temperature specification for dust is 5 °C below the maximum temperature of the temperature class.

  II 2G Ex e mb IIC T6 Gb
II 2D Ex tb mb IIIC T80°C Db

General information on HAFNER products for explosion hazardous environment

If the permissible ambient temperature range is not printed on the device, you can find it in the instructions and declaration of conformity.

Please note that solenoid valves can have a different ambient temperature range and maximum surface temperature for the valve body (non-electrical part) and the solenoid system (electrical part).

The user is limited by the lower values for the ambient temperature. The highest specified maximum surface temperature represents the relevant restriction for the application.

Example: valve has T6 imprint, coil T4. Then T4 counts.

Products without an own potential source of ignition

For products without an own potential source of ignition, HAFNER issues clearance certificates. These products are not marked in terms of the ATEX directive, but an ignition risk assessment has been carried out.



HAFNER Pneumatika Kft.
H-9228 Halászi, Püski út 3.
www.hafner-pneumatika.com
ertekezesites@hafner-pneumatika.com



ATEX CLEARANCE CERTIFICATE

The company **HAFNER Pneumatika Kft.** hereby declares that the products

Actuating elements:
BA 221 ... , BA 225 00
Manually and mechanically actuated valves:
BH 320 401, BH 520 401, BV 311 301, BV 511 301, BR 311 301, BR 311 501
Logic elements:
VA 401, VA 304, VA 341, VA 361, ES 401, ES 304, ES 341, DR 501, DR 801, DR 101, SE 501, SE 801, SE 8101, SE 121
Hand-lever valves:
HV 311 501, HV 311 701, HV 311 801, HV 311 101, HV 311 121,
HVR 320 501, HVR 320 701, HVR 320 801, HVR 320 101, HVR 320 121,
HV 511 501, HV 511 701, HV 511 801, HV 511 101, HV 511 121,
HVR 520 501, HVR 520 701, HVR 520 801, HVR 520 101, HVR 520 121,
HV 53_ 501, HV 53_ 701, HV 53_ 801, HV 53_ 101, HV 53_ 121,
HVR 53_ 501, HVR 53_ 701, HVR 53_ 801, HVR 53_ 101

Valves with Interface according to NAMUR-Standard:
HVN 311 701, SENR 207, SENR 207 01, SENR 121 01, UB 701, UB 701 E, UB 701 VES, UB 701 NPT VES, UB 701 01 NPT VES,
BHN 601, BHN 601 01, BHN 601 VES, BHN 611 01, BHN 611 02, BHN 611 02 EDS, BHN 611 02 VES, BHN 601 01 VES, BHN 611 01 VES,
BHN 611 01 VES AIR, BHN 601 02, BHN 611 01 LL, BHN 611 04 LL, BHN 601 01 EHT, BHN 601 NPT, BHN 420 701,
DRN 3 601, DRN 3 611, DRN 5 601, DRN 3 128, DRN 5 128

may not be put into service before the system in which it will be incorporated is declared to comply with the provisions of the European directive 2006/42/EC about the Safety of Machines, and with the regulations transposing it into national law.
According to the directive 2014/34/EU, Article 1 and Article 2, these products do not fall under the scope of the ATEX directive, because they are not capable of causing an explosion through their own potential sources of ignition.
So, these products are not marked in terms of the ATEX directive. An ignition risk assessment has been carried out.
If the installation regulations for devices and facilities in potentially explosive atmospheres and areas are compiled with (e.g. ISO 80079-36, EN 60079-14, EN 61241-14), the equipment can be used as following:
Group II, Category 2, Gas (II 2 G): for Zones 1, 2, in explosion group IIC.
Group II, Category 2, Dust (II 2 D): for Zones 21, 22, in explosion group IIIC.
Permitted temperature class: T6.
Allowed ambient temperature: -10°C ≤ Ta ≤ +50°C.
Products with "TT" suffix in the type number: -50°C ≤ Ta ≤ +50°C.

Important notes:

- The installation regulations valid in the designated country of use are to be observed.
- Dust deposits are to be removed regularly.
- The installation and operation instructions provided by the manufacturer are to be considered compellingly.
- Compressed air must be produced outside of the hazardous area.
- The use of any flammable or explosive flow medium is not permitted.
- Connect conductive metal parts together for potential equation and ground the entire system.
- If the above-mentioned products are built-in in a higher-level machine / tool / equipment, the risks of this machine / tool / equipment have to be assessed by the manufacturer of the higher-level machine / tool / equipment.

07.03.2023, Halászi



Gergely Ujváry
General Manager

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| HAFNER Pneumatika Kft. | H-9228 Halászi, Püski út 3. | Tel.: +36-96-573-012 |
| VAT-Nr.: 10579785-2-08 | ertekezesites@hafner-pneumatika.com | www.hafner-pneumatika.com |

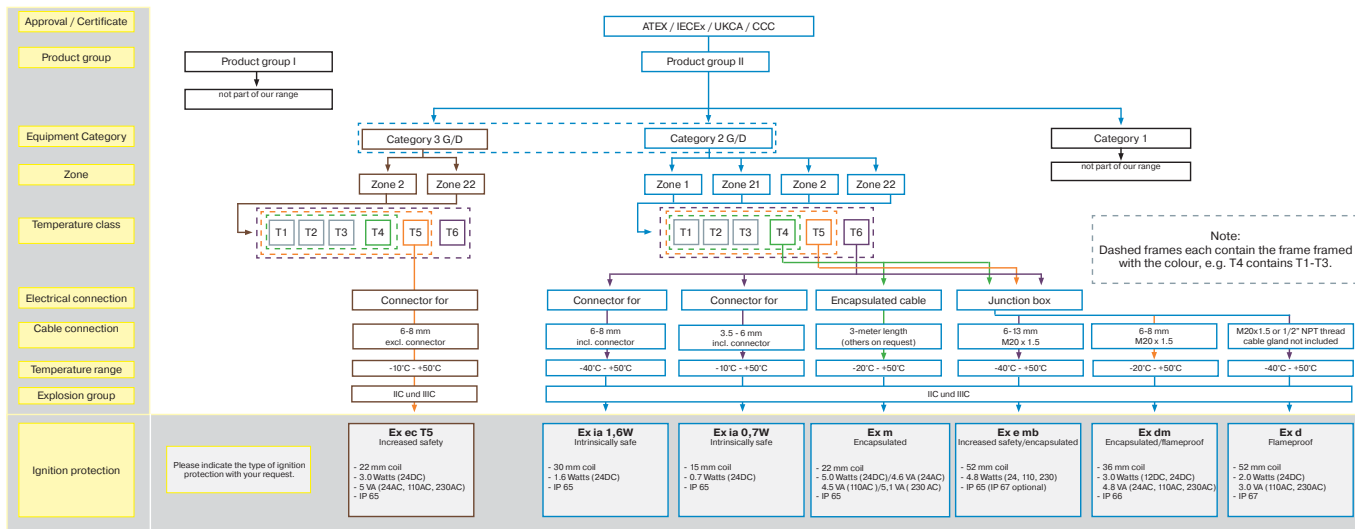
According to the directive 2014/34/EU, Article 1 and Article 2, these products do not fall under the scope of the ATEX directive. You can find a product list on page 2.15.3.

Please note that there are two different ATEX clearance certificates for products that can be used in explosion group IIC / IIIC and IIB / IIIC.

General information on HAFNER products for explosion hazardous environment

Temperature classes, heating of the devices and ambient temperature

The following product selection tree can help to determine the correct type of ignition protection. However, only ATEX products are considered here. Some of these are also certified per IECEx. See table on page 2.15.6.1. CSA/FM approved coils can be found on page 2.15.6.2.3.





Errors and omissions excepted



Non-electric valves for explosion hazardous environment

Pneumatically actuated valves and panel mounting valves series “BAS”



The following pneumatically actuated valves and panel mounting valves of the series “BAS” are available for the use in explosion hazardous environment.



Marking on valve, products for zone 2, 22


 II 2 G Ex h IIC T6 Gb
 $-10^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$


 II 2 D Ex h IIICT80°C
 Db $-10^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$

Marking on valve, products for zone 1, 21, 2, 22


 II 3 G Ex h IIC T6 Gb
 $-10^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$


 II 3 D Ex h IIICT80°C
 Db $-10^{\circ}\text{C} \leq T_a \leq +50^{\circ}\text{C}$



Low temperature versions with adjusted temperature range.

Type	ATEX zone	Function	Port size	Further information on valve on page Aluminum	Low Temp.	Stainl. Steel
Panel mounting valves						
BAS 311 501 TT AIR Ex	1, 21, 2, 22	3/2-way, for panel mounting	G 1/8"			2.12.2.1
BAS 511 501 TT AIR Ex	1, 21, 2, 22	5/2-way, for panel mounting	G 1/8"			2.12.2.1
BAS 30_ Ex	1, 21, 2, 22	Actuating elements	-	2.2.2		
Pneumatically actuated valves						
P 310 502 EX	1, 21, 2, 22	3/2-way, single sol.	G 1/8"	2.4.1.1		
P 310 501 G EX	1, 21, 2, 22	3/2-way, single sol.	G 1/8"	2.4.1.2		
P 310 701 G EX	1, 21, 2, 22	3/2-way, single sol.	G 1/4" - 1/4" NPT	2.4.1.2	2.12.5.1	2.13.3.1
P 310 801 EX	1, 21, 2, 22	3/2-way, single sol.	G 1/4"	2.4.1.2		
P 310 101 EX	1, 21, 2, 22	3/2-way, single sol.	G 3/8"	2.4.1.3		
P 310 121 EX	1, 21, 2, 22	3/2-way, single sol.	G 1/2" - 1/2" NPT	2.4.1.3	2.12.5.2	2.13.3.1
P 310 181 EX	1, 21, 2, 22	3/2-way, single sol.	G 3/4"	2.4.1.3		
P 311 501 G EX	2, 22	3/2-way, single sol., comb. spring	G 1/8"	2.4.1.2		
P 311 701 G EX	2, 22	3/2-way, single sol., comb. spring	G 1/4" - 1/4" NPT	2.4.1.2	2.12.5.1	2.13.3.1
P 311 801 EX	2, 22	3/2-way, single sol., comb. spring	G 1/4"	2.4.1.2		
P 311 101 EX	2, 22	3/2-way, single sol., comb. spring	G 3/8"	2.4.1.3		
P 311 121 EX	2, 22	3/2-way, single sol., comb. spring	G 1/2" - 1/2" NPT	2.4.1.3	2.12.5.2	2.13.3.1
P 311 181 EX	2, 22	3/2-way, single sol., comb. spring	G 3/4"	2.4.1.3		
P 320 502 EX	1, 21, 2, 22	3/2-way, double sol.	G 1/8"	2.4.1.1		
P 320 501 G EX	1, 21, 2, 22	3/2-way, double sol.	G 1/8"	2.4.1.4		
P 320 701 G EX	1, 21, 2, 22	3/2-way, double sol.	G 1/4" - 1/4" NPT	2.4.1.4	2.12.5.1	
P 320 801 EX	1, 21, 2, 22	3/2-way, double sol.	G 1/4"	2.4.1.4		
P 320 101 EX	1, 21, 2, 22	3/2-way, double sol.	G 3/8"	2.4.1.5		
P 320 121 EX	1, 21, 2, 22	3/2-way, double sol.	G 1/2" - 1/2" NPT	2.4.1.5		
P 320 181 EX	1, 21, 2, 22	3/2-way, double sol.	G 3/4"	2.4.1.5		
P 510 502 EX	1, 21, 2, 22	5/2-way, single sol.	G 1/8"	2.4.2.1		
P 510 501 G EX	1, 21, 2, 22	5/2-way, single sol.	G 1/8"	2.4.2.2		
P 510 701 G EX	1, 21, 2, 22	5/2-way, single sol.	G 1/4" - 1/4" NPT	2.4.2.2	2.12.5.3	2.13.3.2
P 510 801 EX	1, 21, 2, 22	5/2-way, single sol.	G 1/4"	2.4.2.2		
P 510 101 EX	1, 21, 2, 22	5/2-way, single sol.	G 3/8"	2.4.2.3		
P 510 121 EX	1, 21, 2, 22	5/2-way, single sol.	G 1/2" - 1/2" NPT	2.4.2.3	2.12.5.3	2.13.3.2
P 510 181 EX	1, 21, 2, 22	5/2-way, single sol.	G 3/4"	2.4.2.3		
P 511 501 G EX	2, 22 (VES version also 1, 21)	5/2-way, single sol., comb. spring	G 1/8"	2.4.2.2		
P 511 701 G EX	2, 22 (VES version also 1, 21)	5/2-way, single sol., comb. spring	G 1/4" - 1/4" NPT	2.4.2.2	2.12.5.3	2.13.3.2
P 511 801 EX	2, 22	5/2-way, single sol., comb. spring	G 1/4"	2.4.2.2		
P 511 101 EX	2, 22	5/2-way, single sol., comb. spring	G 3/8"	2.4.2.3		
P 511 121 EX	2, 22	5/2-way, single sol., comb. spring	G 1/2" - 1/2" NPT	2.4.2.3	2.12.5.3	2.13.3.2
P 511 181 EX	2, 22	5/2-way, single sol., comb. spring	G 3/4"	2.4.2.3		
P 520 502 EX	1, 21, 2, 22	5/2-way, double sol.	G 1/8"	2.4.2.1		
P 520 501 G EX	1, 21, 2, 22	5/2-way, double sol.	G 1/8"	2.4.2.4		
P 520 701 G EX	1, 21, 2, 22	5/2-way, double sol.	G 1/4" - 1/4" NPT	2.4.2.4	2.12.5.4	2.13.3.3
P 520 801 EX	1, 21, 2, 22	5/2-way, double sol.	G 1/4"	2.4.2.4		
P 520 101 EX	1, 21, 2, 22	5/2-way, double sol.	G 3/8"	2.4.2.5		
P 520 121 EX	1, 21, 2, 22	5/2-way, double sol.	G 1/2" - 1/2" NPT	2.4.2.5		2.12.3.3
P 520 181 EX	1, 21, 2, 22	5/2-way, double sol.	G 3/4"	2.4.2.5		
P 53_ 501 G EX	1, 21, 2, 22	5/3-way, 3 options	G 1/8"	2.4.3.1		
P 53_ 701 G EX	1, 21, 2, 22	5/3-way, 3 options	G 1/4" - 1/4" NPT	2.4.3.1	2.12.5.4	2.13.3.3
P 53_ 801 EX	1, 21, 2, 22	5/3-way, 3 options	G 1/4"	2.4.3.1		
P 53_ 101 EX	1, 21, 2, 22	5/3-way, 3 options	G 3/8"	2.4.3.2		
P 53_ 121 EX	1, 21, 2, 22	5/3-way, 3 options	G 1/2" - 1/2" NPT	2.4.3.2	2.12.5.4	2.13.3.3
P 53_ 181 EX	1, 21, 2, 22	5/3-way, 3 options	G 1/2" - 1/2" NPT	2.4.3.2		
P 311 501 SR EX	2, 22	3/2-way adjustable pneumatic pressure switch	-10°C ... +50°C	2.4.5.3		
P 411 701 SR EX	2, 22	5/2-way adjustable pneumatic pressure switch	-10°C ... +50°C	2.4.5.3		
Pneumatically actuated valves with interface according to NAMUR-Standard						
PN 310 701 EX	1, 21, 2, 22	3/2-way, single sol.	G 1/4" - 1/4" NAMUR	2.10.2.1	contact us	contact us
PN 311 701 EX	1, 21, 2, 22	3/2-way, single sol., comb. spring	G 1/4" - 1/4" NAMUR	2.10.2.1		
PN 310 121 EX	1, 21, 2, 22	3/2-way, single sol.	G 1/2" - 1/2" NAMUR	2.10.2.1		
PN 510 701 EX	1, 21, 2, 22	5/2-way, single sol.	G 1/4" - 1/4" NAMUR	2.10.2.2	contact us	contact us
PN 510 121 EX	1, 21, 2, 22	5/2-way, single sol.	G 1/2" - 1/2" NAMUR	2.10.2.2		
PN 520 701 EX	1, 21, 2, 22	5/2-way, double sol.	G 1/4" - 1/4" NAMUR	2.10.2.2	contact us	
PN 520 121 EX	1, 21, 2, 22	5/2-way, double sol.	G 1/2" - 1/2" NAMUR	2.10.2.2		
PN 53_ 701 EX	1, 21, 2, 22	5/3-way, 3 options	G 1/4" - 1/4" NAMUR	2.10.2.3	contact us	
PN 53_ 121 EX	1, 21, 2, 22	5/3-way, 3 options	G 1/2" - 1/2" NAMUR	2.10.2.3		
PN 611 611 EX	2, 22	Pneumatically actuated block and vent valve	-10°C ... +50°C	2.11.8		
CBE 700 K EX	1, 21, 2, 22	Controlblock for butterfly valves with inflatable valve-seat, single acting	1/4" NAMUR	2.11.11		
CBE 700 K EB EX	1, 21, 2, 22	Controlblock for butterfly valves with inflatable valve-seat, single acting, with feedback port	1/4" NAMUR	2.11.11		
CBN 700 K EX	1, 21, 2, 22	Controlblock for butterfly valves with inflatable valve-seat, double acting	1/4" NAMUR	2.11.12		
CBN 700 K EB EX	1, 21, 2, 22	Controlblock for butterfly valves with inflatable valve-seat, double acting, with feedback port	1/4" NAMUR	2.11.12		

Products with clearance certificate



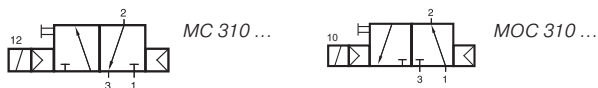
Products which do not fall under the scope of the ATEX directive can be supplied with a clearance certificate. The prerequisite for this is that a risk assessment has been carried out by the manufacturer. According to that, the products can be used in the ATEX zones specified below.

Products with clearance certificate do not carry any ATEX marking. For products which are not mentioned in the table, please contact the manufacturer.

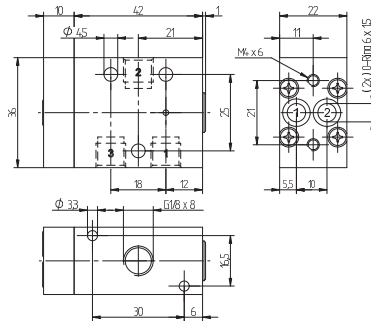
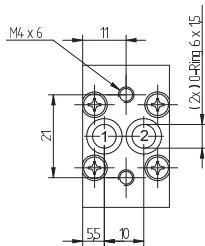


Type	ATEX zone	Explosion group Gas / Dust	Function	Port size	Further information on valve on page		
					Aluminum	Low Temp.	Stainl. Steel
Panel mounting valves							
BA 311 301	1, 21, 2, 22	IIB / IIIC	3/2-way, for panel mounting	G 1/8"	2.2.3		
BA 511 301	1, 21, 2, 22	IIB / IIIC	5/2-way, for panel mounting	G 1/8"	2.2.4		
BA 221 _ _	1, 21, 2, 22	IIC / IIIC	Push buttons	-	2.2.1		
BA 225 00	1, 21, 2, 22	IIC / IIIC	Locking switch	-	2.2.1		
BA 222 01	1, 21, 2, 22	IIB / IIIC	Palm button	-	2.2.1		
BA 223 02	1, 21, 2, 22	IIB / IIIC	Palm button with detend	-	2.2.1		
BA 224 01	1, 21, 2, 22	IIB / IIIC	Rotary lever long	-	2.2.1		
BA 226 01	1, 21, 2, 22	IIB / IIIC	Switch	-	2.2.1		
BA 227 01	1, 21, 2, 22	IIB / IIIC	Rotary lever short	-	2.2.1		
Manually and mechanically actuated valves							
BH 320 401	1, 21, 2, 22	IIC / IIIC	3/2-way, push-pull valve	G 1/8"	2.2.8		
BH 320 701	1, 21, 2, 22	IIB / IIIC	3/2-way, push-pull valve	G 1/4"	2.2.8		
BH 520 401	1, 21, 2, 22	IIC / IIIC	5/2-way, push-pull valve	G 1/8"	2.2.9		
BH 520 701	1, 21, 2, 22	IIB / IIIC	5/2-way, push-pull valve	G 1/4"	2.2.9		
BV 311 301	1, 21, 2, 22	IIC / IIIC	3/2-way, stem actuated	G 1/8"	2.1.1.4		
BV 511 301	1, 21, 2, 22	IIC / IIIC	3/2-way, stem actuated	G 1/8"	2.1.2.2		
BR 311 301	1, 21, 2, 22	IIC / IIIC	3/2-way, roller lever	G 1/8"	2.1.1.4		
BR 311 501	1, 21, 2, 22	IIC / IIIC	3/2-way, roller lever	G 1/8"	2.1.1.6		
Logic elements							
VA 401	1, 21, 2, 22	IIC / IIIC	OR-gate	G 1/8"	2.4.5.1	2.12.6.2	
VA 304	1, 21, 2, 22	IIC / IIIC	OR-gate	Manifold	2.4.6.3		
VA 341	1, 21, 2, 22	IIC / IIIC	OR-gate	G 1/8"	2.4.5.1		
VA 361	1, 21, 2, 22	IIC / IIIC	OR-gate	6 mm pif	2.4.5.1		
ES 401	1, 21, 2, 22	IIC / IIIC	AND-gate	G 1/8"	2.5.4.1	2.12.6.2	
ES 304	1, 21, 2, 22	IIC / IIIC	AND-gate	Manifold	2.4.6.3		
ES 341	1, 21, 2, 22	IIC / IIIC	AND-gate	4 mm pif	2.4.5.1		
DR 501	1, 21, 2, 22	IIC / IIIC	Block form flow regulator, uni	G 1/8"	2.4.5.7	2.12.6.3	
DR 801	1, 21, 2, 22	IIC / IIIC	Block form flow regulator, uni	G 1/4"	2.4.5.7	2.12.6.3	
DR 101	1, 21, 2, 22	IIC / IIIC	Block form flow regulator, uni	G 3/8"	2.4.5.7	2.12.6.3	
SE 501	1, 21, 2, 22	IIC / IIIC	Quick-Exhaust valve	G 1/8"	2.5.4.2	2.12.6.1	2.13.3.5
SE 801	1, 21, 2, 22	IIC / IIIC	Quick-Exhaust valve	G 1/4"	2.5.4.2	2.12.6.1	2.13.3.5
SE 8101	1, 21, 2, 22	IIC / IIIC	Quick-Exhaust valve	G 1/4" - G 3/8"	2.5.4.2	2.12.6.1	2.13.3.5
SE 121	1, 21, 2, 22	IIC / IIIC	Quick-Exhaust valve	G 1/2"	2.5.4.2	2.12.6.1	2.13.3.5
Hand-lever valves							
HV 311 501	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	G 1/8"	2.3.1.1		
HV 311 701	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	G 1/4"	2.3.1.1	2.12.4.1	2.13.2.1
HV 311 801	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	G 1/4"	2.3.1.1		
HV 311 101	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	G 3/8"	2.3.1.2		
HV 311 121	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	G 1/2"	2.3.1.2	2.12.4.1	2.13.2.1
HV 311 181	1, 21, 2, 22	IIB / IIIC	3/2-way, spring return	G 3/4"	2.3.1.2		
HVR 320 501	1, 21, 2, 22	IIC / IIIC	3/2-way, indexed	G 1/8"	2.3.1.1		
HVR 320 701	1, 21, 2, 22	IIC / IIIC	3/2-way, indexed	G 1/4"	2.3.1.1	2.12.4.1	2.13.2.1
HVR 320 801	1, 21, 2, 22	IIC / IIIC	3/2-way, indexed	G 1/4"	2.3.1.1		
KVR 320 101	1, 21, 2, 22	IIC / IIIC	3/2-way, indexed	G 3/8"	2.3.1.2		
HVR 320 121	1, 21, 2, 22	IIC / IIIC	3/2-way, indexed	G 1/2"	2.3.1.2	2.12.4.1	2.13.2.1
HVR 320 181	1, 21, 2, 22	IIB / IIIC	3/2-way, indexed	G 3/4"	2.3.1.2		
HV 511 501	1, 21, 2, 22	IIC / IIIC	5/2-way, spring return	G 1/8"	2.3.2.1		
HV 511 701	1, 21, 2, 22	IIC / IIIC	5/2-way, spring return	G 1/4"	2.3.2.1	2.12.4.2	2.13.2.2
HV 511 801	1, 21, 2, 22	IIC / IIIC	5/2-way, spring return	G 1/4"	2.3.2.1		
HV 511 101	1, 21, 2, 22	IIC / IIIC	5/2-way, spring return	G 3/8"	2.3.2.2		
HV 511 121	1, 21, 2, 22	IIC / IIIC	5/2-way, spring return	G 1/2"	2.3.2.2	2.12.4.2	2.13.2.3
HV 511 181	1, 21, 2, 22	IIB / IIIC	5/2-way, spring return	G 3/4"	2.3.2.2		
HVR 520 501	1, 21, 2, 22	IIC / IIIC	5/2-way, indexed	G 1/8"	2.3.2.1		
HVR 520 701	1, 21, 2, 22	IIC / IIIC	5/2-way, indexed	G 1/4"	2.3.2.1	2.12.4.2	2.13.2.2
HVR 520 801	1, 21, 2, 22	IIC / IIIC	5/2-way, indexed	G 1/4"	2.3.2.1		
HVR 520 101	1, 21, 2, 22	IIC / IIIC	5/2-way, indexed	G 3/8"	2.3.2.2		
HVR 520 121	1, 21, 2, 22	IIC / IIIC	5/2-way, indexed	G 1/2"	2.3.2.2	2.12.4.2	2.13.2.3
HVR 520 181	1, 21, 2, 22	IIB / IIIC	5/2-way, indexed	G 3/4"	2.3.2.2		
HV 53_ 501	1, 21, 2, 22	IIC / IIIC	5/3-way, spring return, 3 options	G 1/8"	2.3.3.1		
HV 53_ 701	1, 21, 2, 22	IIC / IIIC	5/3-way, spring return, 3 options	G 1/4"	2.3.3.1	2.12.4.3	2.13.2.2
HV 53_ 801	1, 21, 2, 22	IIC / IIIC	5/3-way, spring return, 3 options	G 1/4"	2.3.3.1		
HV 53_ 101	1, 21, 2, 22	IIC / IIIC	5/3-way, spring return, 3 options	G 3/8"	2.3.3.2		
HV 53_ 121	1, 21, 2, 22	IIC / IIIC	5/3-way, spring return, 3 options	G 1/2"	2.3.3.2	2.12.4.3	2.13.2.3
HV 53_ 181	1, 21, 2, 22	IIB / IIIC	5/3-way, spring return, 3 options	G 3/4"	2.3.3.2		
HVR 53_ 501	1, 21, 2, 22	IIC / IIIC	5/3-way, indexed, 3 options	G 1/8"	2.3.3.1		
HVR 53_ 701	1, 21, 2, 22	IIC / IIIC	5/3-way, indexed, 3 options	G 1/4"	2.3.3.1	2.12.4.3	2.13.2.2
HVR 53_ 801	1, 21, 2, 22	IIC / IIIC	5/3-way, indexed, 3 options	G 1/4"	2.3.3.1		
HVR 53_ 101	1, 21, 2, 22	IIC / IIIC	5/3-way, indexed, 3 options	G 3/8"	2.3.3.2		
HVR 53_ 121	1, 21, 2, 22	IIC / IIIC	5/3-way, indexed, 3 options	G 1/2"	2.3.3.2	2.12.4.3	2.13.2.3
HVR 53_ 181	1, 21, 2, 22	IIB / IIIC	5/3-way, indexed, 3 options	G 3/4"	2.3.3.2		
Valves with Interface according to NAMUR-Standard							
HVN 311 701	1, 21, 2, 22	IIC / IIIC	3/2-way, spring return	1/4" NAMUR	2.10.3		
SENR 20	1, 21, 2, 22	IIC / IIIC	Quick-exhaust valve with NAMUR interface, G 1/4"	1/4" NAMUR	2.11.4	contact us	
SENR 207	1, 21, 2, 22	IIC / IIIC	Quick-exhaust valve with NAMUR interface, 1/4" NAMUR	1/4" NAMUR	2.11.4	contact us	
SENR 207 01	1, 21, 2, 22	IIC / IIIC	Quick-exhaust valve with NAMUR interface, G 1/4" + 1/4" NAMUR	1/4" NAMUR	2.11.4	2.12.8.5	contact us
SENR 121 01	1, 21, 2, 22	IIC / IIIC	Quick-exhaust valve with NAMUR interface, G 1/4" + 1/4" NAMUR	1/2" NAMUR	contact us		
UB 701	1, 21, 2, 22	IIC / IIIC	Air-recirculation block with NAMUR interface	1/4" NAMUR	2.11.3	2.12.8.4	2.13.5.6
BHN 601	1, 21, 2, 22	IIC / IIIC	Block- and bleed valve, vents actuator, O-position lockable	1/4" NAMUR	2.11.6		contact us
BHN 601 01	1, 21, 2, 22	IIC / IIIC	Block- and bleed valve, vents actuator, M-position lockable	1/4" NAMUR	2.11.6		
BHN 611 01	1, 21, 2, 22	IIC / IIIC	Block- and bleed valve, blocks actuator, M-position lockable	1/4" NAMUR	2.11.6		contact us
BHN 420 701	1, 21, 2, 22	IIC / IIIC	Short-cut valve	1/4" NAMUR	2.11.5		
DRN 3 601	1, 21, 2, 22	IIC / IIIC	3-way flow regulator plate	1/4" NAMUR	2.11.1		
DRN 3 611	1, 21, 2, 22	IIC / IIIC	3-way flow regulator plate	1/4" NAMUR	2.11.1	2.12.8.3	2.13.5.5
DRN 5 601	1, 21, 2, 22	IIC / IIIC	5-way flow regulator plate	1/4" NAMUR	2.11.2		
DRN 5 611	1, 21, 2, 22	IIC / IIIC	5-way flow regulator plate	1/4" NAMUR	2.11.2	2.12.8.3	2.13.5.5
DRN 3 128	1, 21, 2, 22	IIC / IIIC	3-way flow regulator plate	1/2" NAMUR	2.11.1		
DRN 5 128	1, 21, 2, 22	IIC / IIIC	5-way flow regulator plate	1/2" NAMUR	2.11.2		

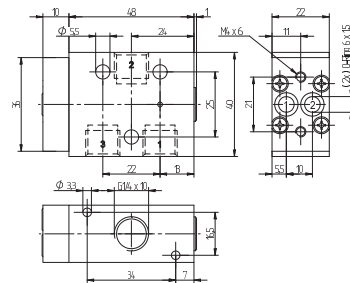
M(O)C 310 501 G ... Ex/M(O)C 310 701 G ... Ex M(O)C 310 121 ... Ex



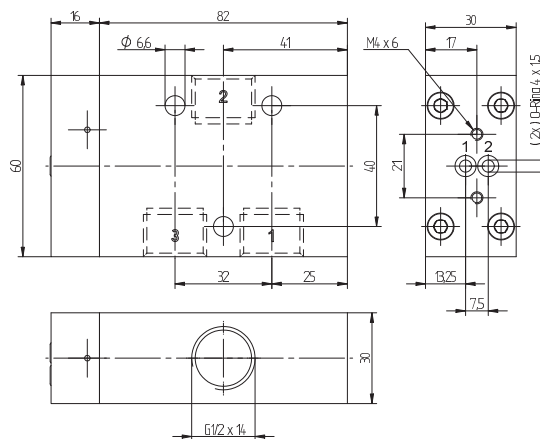
Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



M(O)C 310 501 G ... Ex



M(O)C 310 701 G ... Ex *



M(O)C 310 121 ... Ex

Valves with CNOMO-interface to be used with explosion proof solenoid systems displayed on page 2.15.6.7.5. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

Please note for low temperature valves 701... TT:
When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried!
Below -40°C the leakage-rate of the valve can increase to 10 cm³ / min. Use unlubricated air only.

Zone: 1, 2, 21, 22
Temperature class: T6

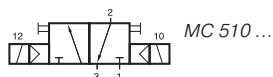
Marking on valve:
Standard temperature
 II 2 G Ex h IIC T6 Gb
 -10°C ≤ Ta ≤ +50°C
 II 2 D Ex h IIIC T80°C
 Db -10°C ≤ Ta ≤ +50°C
 Low temperature (TT)
 II 2 G Ex h IIC T6 Gb
 -50°C ≤ Ta ≤ +50°C
 II 2 D Ex h IIIC T80°C
 Db -50°C ≤ Ta ≤ +50°C

*Valves without "G" in the type number don't contain the vertical mounting holes for manifold assembly as displayed in the drawing.

Type	Function	Material	Temp. range	Port size	Air flow	Operating pressure	Weight
MC 310 501 G Ex	3/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/8"	650 l/min	2 - 10 bar	0,20 kg
MOC 310 501 G Ex	3/2-way, n.o. single sol.	Aluminum	-10°C ... +50°C	G 1/8"	650 l/min	2 - 10 bar	0,21 kg
MC 310 701 G Ex	3/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/4"	1250 l/min	2 - 10 bar	0,20 kg
MC 310 701 GTT Ex	3/2-way, single sol.	Aluminum	-50°C ... +50°C	G 1/4"	1250 l/min	3 - 10 bar	0,23 kg
MC 310 701 VES Ex	3/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/4"	1250 l/min	2 - 10 bar	0,42 kg
MC 310 701 VES TT Ex	3/2-way, single sol.	Stainless steel	-50°C ... +50°C	G 1/4"	1250 l/min	2 - 10 bar*	0,42 kg
MOC 310 701 G Ex	3/2-way, n.o. single sol.	Aluminum	-10°C ... +50°C	G 1/4"	1250 l/min	2 - 10 bar	0,21 kg
MOC 310 701 GTT Ex	3/2-way, n.o. single sol.	Aluminum	-50°C ... +50°C	G 1/4"	1250 l/min	2 - 10 bar*	0,23 kg
MOC 310 701 VES Ex	3/2-way, n.o. single sol.	Stainless steel	-10°C ... +50°C	G 1/4"	1250 l/min	2 - 10 bar	0,42 kg
MOC 310 701 VES TT Ex	3/2-way, n.o. single sol.	Stainless steel	-50°C ... +50°C	G 1/4"	1250 l/min	2 - 10 bar*	0,42 kg
MC 310 121 Ex	3/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	0,41 kg
MC 310 121 VES Ex	3/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	1,20 kg
MOC 310 121 Ex	3/2-way, n.o. single sol.	Aluminum	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	0,53 kg

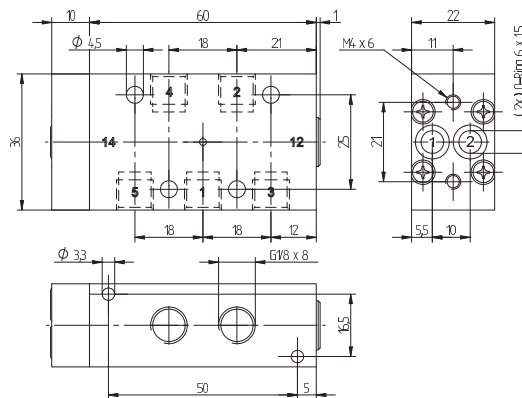
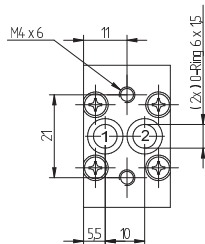
* Below -20° C the operating pressure increases to 3 bar.

MC 510 501 G ... Ex/MC 510 701 G ... Ex MC 510 121 ... Ex



MC 510 ...

Please note: ISO-symbol has been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



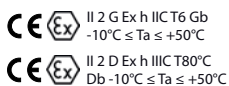
MC 510 501 G ... Ex

Valves with CNOMO-interface to be used with explosion proof solenoid systems displayed on page 2.15.6.7.5. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

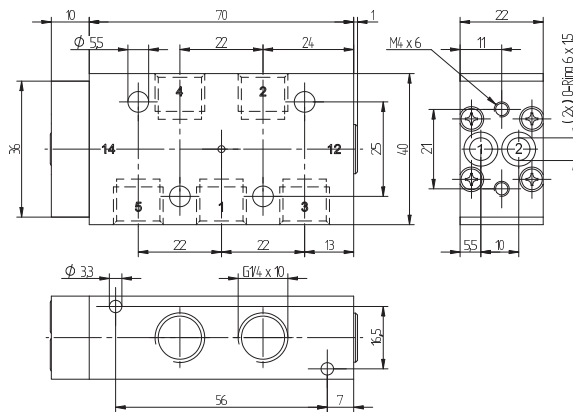
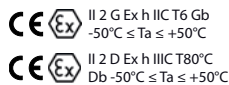
Please note for low temperature valves 701...TT: When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried! Below -40°C the leakage-rate of the valve can increase to 10 cm³ / min. Use unlubricated air only.

Zone: 1, 2, 21, 22
Temperature class: T6

Marking on valve:
Standard temperature

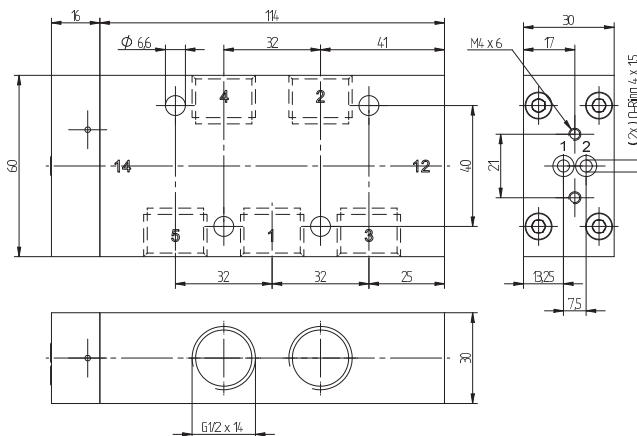


Low temperature (TT)



MC 510 701 G ... Ex *

*Valves without "G" in the type number don't contain the vertical mounting holes for manifold assembly as displayed in the drawing.

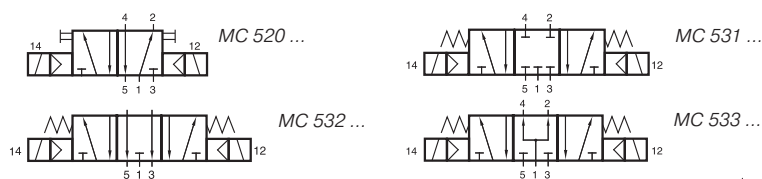


MC 510 121 Ex ...

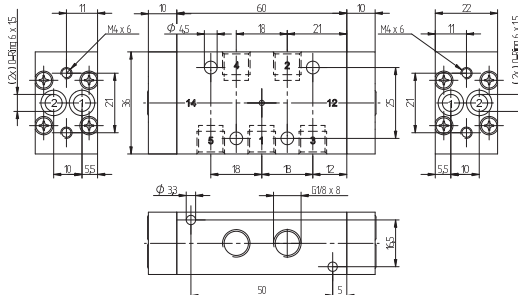
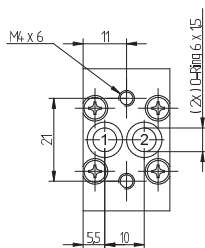
Type	Function	Material	Temp. range	Port size	Air flow	Operating press.	Weight
MC 510 501 G Ex	5/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/8"	650 l/min	2 - 10 bar	0,23 kg
MC 510 701 G Ex	5/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/4"	1250 l/min	2 - 10 bar	0,25 kg
MC 510 701 GTT Ex	5/2-way, single sol.	Aluminum	-50°C ... +50°C	G 1/4"	1250 l/min	2 - 10 bar*	0,27 kg
MC 510 701 VES Ex	5/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/4"	1250 l/min	2 - 10 bar	0,53 kg
MC 510 701 VES TT Ex	5/2-way, single sol.	Stainless steel	-50°C ... +50°C	G 1/4"	1250 l/min	2 - 10 bar*	0,53 kg
MC 510 121 Ex	5/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	0,67 kg
MC 510 121 VES Ex	5/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	1,50 kg

* Below -20° C the operating pressure increases to 3 bar.

MC 520 501 G ... Ex/MC 520 701 G ... Ex/MC 520 121 ... Ex MC 53_501 G ... Ex/MC 53_701 G ... Ex/MC 53_121 ... Ex

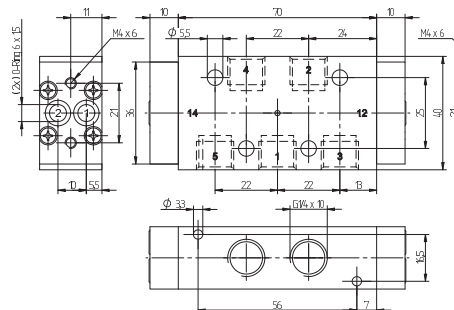


Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



MC 520 501 G ... Ex / MC 53_501 G ... Ex

Valves with CNOMO-interface to be used with explosion proof solenoid systems displayed on page 2.15.6.7.5. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.



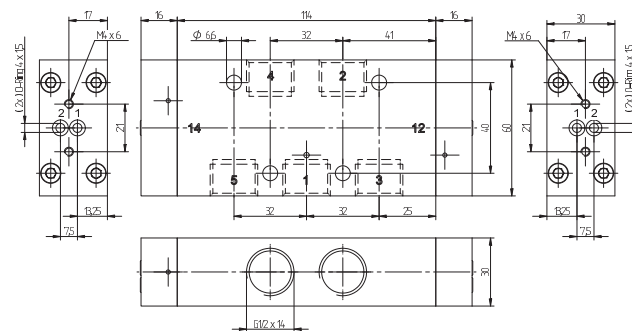
MC 520 701 G ... Ex * / MC 53_701 G ... Ex *

Please note for low temperature valves 701...TT: When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried! Below -40° C the leakage-rate of the valve can increase to 10 cm³ / min. Use unlubricated air only.

Zone: 1, 2, 21, 22
Temperature class: T6

Marking on valve:
Standard temperature

Low temperature (TT)



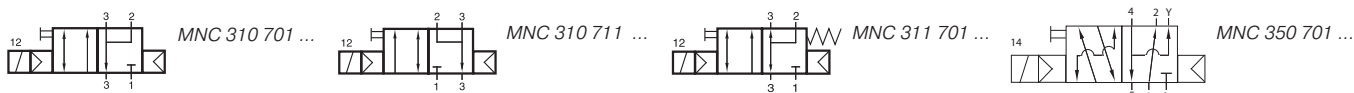
MC 520 121 ... Ex / MC 53_121 ... Ex

*Valves without "G" in the type number don't contain the vertical mounting holes for manifold assembly as displayed in the drawing.

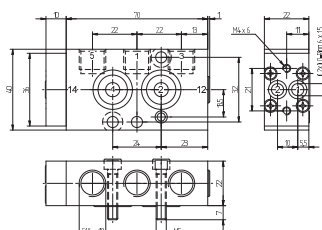
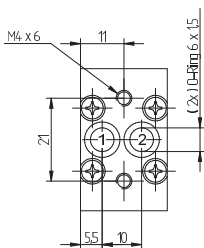
Type	Function	Material	Temp. range	Port size	Air flow	Operating press.	Weight
MC 520 501 G Ex	5/2-way, double sol.	Aluminum	-10°C ... +50°C	G 1/8"	650 l/min	2 - 10 bar	0,33 kg
MC 520 701 G Ex	5/2-way, double sol.	Aluminum	-10°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar	0,35 kg
MC 520 701 GTT Ex	5/2-way, double sol.	Aluminum	-50°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar*	0,40 kg
MC 520 701 VES Ex	5/2-way, double sol.	Stainless steel	-10°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar	0,74 kg
MC 520 701 VES TT Ex	5/2-way, double sol.	Stainless steel	-50°C ... +50°C	G 1/4"	1250l/min	2 - 10 bar*	0,74 kg
MC 520 121 Ex	5/2-way, double sol.	Aluminum	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	0,84 kg
MC 520 121 VES Ex	5/2-way, double sol.	Stainless steel	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	1,70 kg
MC 53_501 G Ex	5/3-way	Aluminum	-10°C ... +50°C	G 1/8"	650 l/min	3 - 10 bar	0,33 kg
MC 53_701 G Ex	5/3-way	Aluminum	-10°C ... +50°C	G 1/4"	1250l/min	3 - 10 bar	0,35 kg
MC 53_701 GTT Ex	5/3-way	Aluminum	-50°C ... +50°C	G 1/4"	1250l/min	3 - 10 bar	0,40 kg
MC 53_701 VES Ex	5/3-way	Stainless steel	-10°C ... +50°C	G 1/4"	1250l/min	3 - 10 bar	0,74 kg
MC 53_701 VES TT Ex	5/3-way	Stainless steel	-50°C ... +50°C	G 1/4"	1250l/min	3 - 10 bar	0,74 kg
MC 53_121 Ex	5/3-way	Aluminum	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	0,84 kg
MC 53_121 VES Ex	5/3-way	Stainless steel	-10°C ... +50°C	G 1/2"	3000 l/min	1 - 10 bar	1,70 kg

* Below -20° C the operating pressure increases to 3 bar.

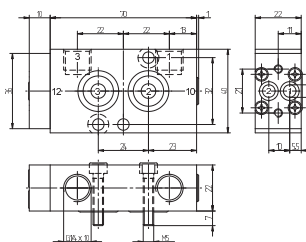
MNC 350 701 ... Ex/MNC 310 701 ... Ex/MNC 311 701 ... Ex MNC 310 711 ... Ex/MNC 310 121 ... Ex/MNC 311 121 ... Ex ...



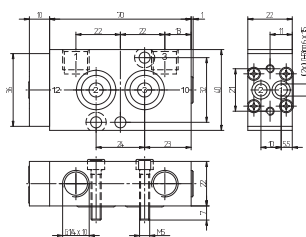
Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



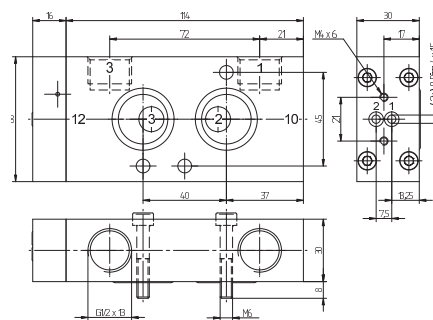
MNC 350 701 ... Ex



MNC 31_701 ... Ex



MNC 310 711 ... Ex



MNC 310 121 ... Ex

Valves with CNOMO-interface to be used with explosion proof solenoid systems displayed on page 2.15.6.7.5. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

Please note for low temperature valves 701...TT: When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried! Below -40°C the leakage-rate of the valve can increase to 10 cm³ / min. Use unlubricated air only.

Zone: 1, 2, 21, 22
Temperature class: T6

Marking on valve:
Standard temperature

CE Ex II 2 G Ex h IIC T6 Gb
-10°C ≤ Ta ≤ +50°C
CE Ex II 2 D Ex h IIIC T80°C
Db -10°C ≤ Ta ≤ +50°C

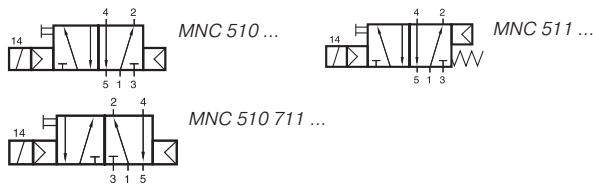
Low temperature (TT)

CE Ex II 2 G Ex h IIC T6 Gb
-50°C ≤ Ta ≤ +50°C
CE Ex II 2 D Ex h IIIC T80°C
Db -50°C ≤ Ta ≤ +50°C

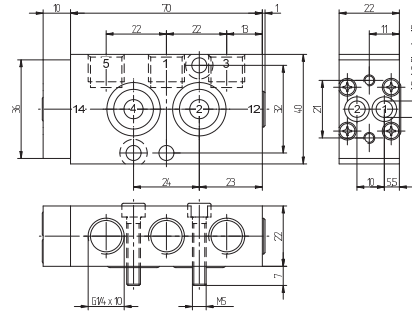
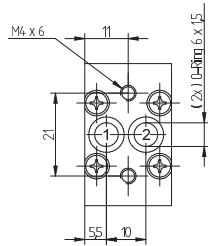
Type	Function	Material	Temp. range	Port size	Air flow	Operating press.	Weight
MNC 350 701 Ex	3/2-way & 5/2-way	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,24 kg
MNC 350 701 VES Ex	3/2-way & 5/2-way	Stainless steel	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,57 kg
MNC 350 701 VES TT Ex	3/2-way & 5/2-way	Stainless steel	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,57 kg
MNC 310 701 Ex	3/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,26 kg
MNC 310 701 TT Ex	3/2-way, single sol.	Aluminum	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,28 kg
MNC 310 701 VES Ex	3/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,57 kg
MNC 310 701 VES TT Ex	3/2-way, single sol.	Stainless steel	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,57 kg
MNC 311 701 Ex	3/2-way, single sol., comb. spring	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2,5 - 10 bar	0,26 kg
MNC 311 701 TT Ex	3/2-way, single sol., comb. spring	Aluminum	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	3 - 10 bar	0,28 kg
MNC 311 701 VES Ex	3/2-way, single sol., comb. spring	Stainless steel	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2,5 - 10 bar	0,57 kg
MNC 311 701 VES TT Ex	3/2-way, single sol., comb. spring	Stainless steel	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	3 - 10 bar	0,57 kg
MNC 310 711 Ex	3/2-way, single sol., swapped ports	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,26 kg
MNC 310 121 Ex	3/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	0,70 kg
MNC 310 121 VES	3/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	1,50 kg
MNC 311 121 Ex	3/2-way, single sol., comb. spring	Aluminum	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	2,5 - 10 bar	0,70 kg

* Below -20° C the operating pressure increases to 3 bar.

MNC 510 701 ... Ex/MNC 511 701 ... Ex/MNC 510 711 ... Ex MNC 510 121 ... Ex/MNC 511 121 Ex

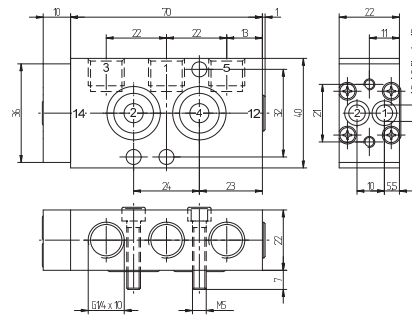


Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



MNC 51_701 ... Ex

Valves with CNOMO-interface to be used with explosion proof solenoid systems displayed on page 2.15.6.7.5. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

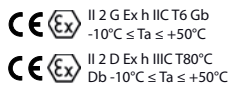


MNC 510 711 ... Ex

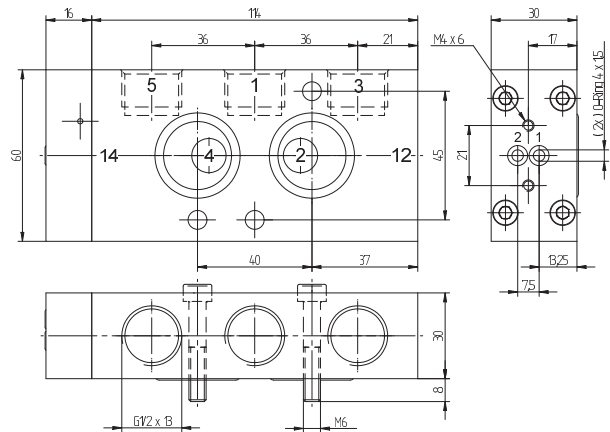
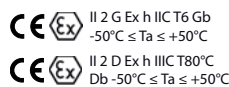
Please note for low temperature valves 701...TT: When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried! Below -40° C the leakage-rate of the valve can increase to 10 cm³ / min. Use unlubricated air only.

Zone: 1, 2, 21, 22
Temperature class: T6

Marking on valve:
Standard temperature



Low temperature (TT)

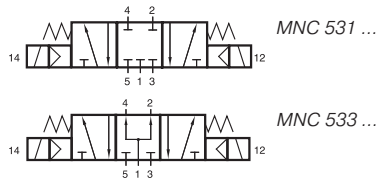
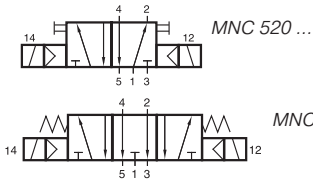


MNC 51_121 ... Ex

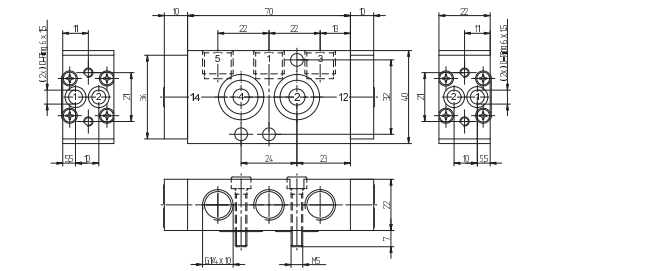
Type	Function	Material	Temp. range	Port size	Air flow	Operating press.	Weight
MNC 510 701 Ex	5/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,26 kg
MNC 510 701 TT Ex	5/2-way, single sol.	Aluminum	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,28 kg
MNC 510 701 VES Ex	5/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,57 kg
MNC 510 701 VES TT Ex	5/2-way, single sol.	Stainless steel	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,57 kg
MNC 511 701 Ex	5/2-way, single sol., comb. spring	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2,5 - 10 bar	0,26 kg
MNC 511 701 TT Ex	5/2-way, single sol., comb. spring	Aluminum	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	3 - 10 bar	0,28 kg
MNC 511 701 VES Ex	5/2-way, single sol., comb. spring	Stainless steel	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2,5 - 10 bar	0,57 kg
MNC 511 701 VES TT Ex	5/2-way, single sol., comb. spring	Stainless steel	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	3 - 10 bar	0,57 kg
MNC 510 711 Ex	5/2-way, single sol., swapped ports	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,26 kg
MNC 510 121 Ex	5/2-way, single sol.	Aluminum	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	0,70 kg
MNC 510 121 VES	5/2-way, single sol.	Stainless steel	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	1,50 kg
MNC 511 121 Ex	5/2-way, single sol., comb. spring	Aluminum	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	2,5 - 10 bar	0,70 kg

* Below -20° C the operating pressure increases to 3 bar.

MNC 520 701 ... Ex/MNC 520 121 ... Ex/MNC 53_701 ... Ex



Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.



MNC 520 701 ... Ex / MNC 53_701 ... Ex

Valves with CNOMO-interface to be used with explosion proof solenoid systems displayed on page 2.15.6.7.5. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

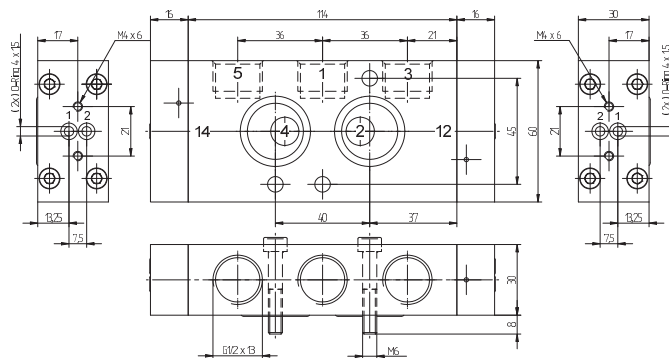
Please note for low temperature valves 701...TT: When operated below 0° C the pressure condensation point has to be at least 15° C below the temperature of environment and media. Air has to be dried! Below -40°C the leakage-rate of the valve can increase to 10 cm³ / min. Use unlubricated air only.

Zone: 1, 2, 21, 22
 Temperature class: T6

Marking on valve:

Standard temperature II 2 G Ex h IIC T6 Gb
 -10°C ≤ Ta ≤ +50°C
 II 2 D Ex h IIIC T80°C
 Db -10°C ≤ Ta ≤ +50°C

Low temperature (TT) II 2 G Ex h IIC T6 Gb
 -50°C ≤ Ta ≤ +50°C
 II 2 D Ex h IIIC T80°C
 Db -50°C ≤ Ta ≤ +50°C

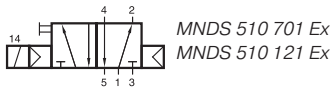


MNC 520 121 ... Ex

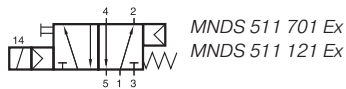
Type	Function	Material	Temp. range	Port size	Air flow	Operating press.	Weight
MNC 520 701 Ex	5/2-way, double sol.	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,35 kg
MNC 520 701 TT Ex	5/2-way, double sol.	Aluminum	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,41 kg
MNC 520 701 VES Ex	5/2-way, double sol.	Stainless steel	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar	0,41 kg
MNC 520 701 VES TT Ex	5/2-way, double sol.	Stainless steel	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	2 - 10 bar*	0,67 kg
MNC 520 121 Ex	5/2-way, double sol.	Aluminum	-10°C ... +50°C	G 1/2" - 1/2" NPT	3000 l/min	1 - 10 bar	0,87 kg
MNC 53_701 Ex	5/3-way	Aluminum	-10°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	3 - 10 bar	0,35 kg
MNC 53_701 TT Ex	5/3-way	Aluminum	-50°C ... +50°C	G 1/4" - 1/4" NPT	1250l/min	3 - 10 bar	0,41 kg

* Below -20° C the operating pressure increases to 3 bar.

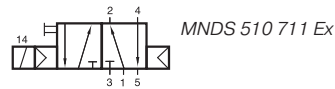
MNDS 510 701 Ex/MNDS 511 701 Ex MNDS 510 711 Ex/MNDS 510 121 Ex/MNDS 511 121 Ex



MNDS 510 701 Ex
MNDS 510 121 Ex



MNDS 511 701 Ex
MNDS 511 121 Ex



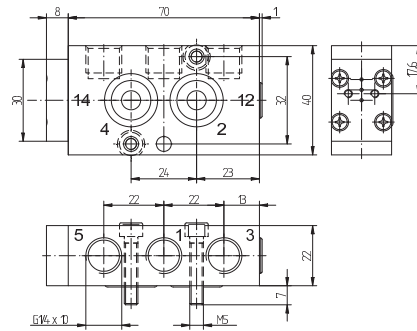
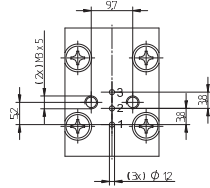
MNDS 510 711 Ex

Please note: ISO-symbols have been drawn with a solenoid and manual override symbol even though the solenoid system is not included. Please consider the technical specifications of the solenoid system whether it includes a manual override or not.

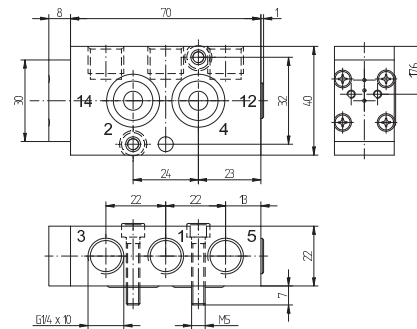


Microsol interface

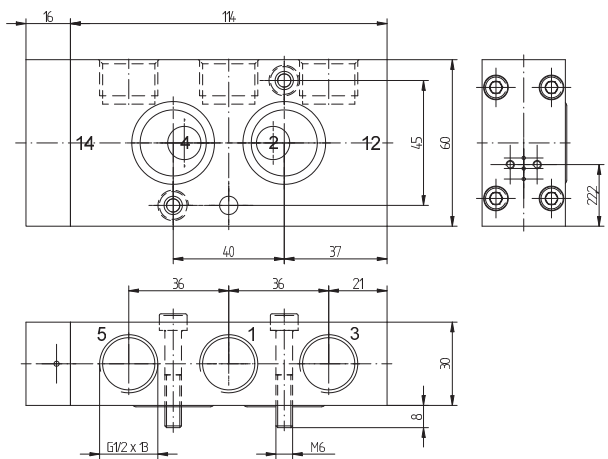
Assembled product



MNDS 51_701 Ex



MNDS 510 711 Ex



MNDS 51_121 Ex

Valves with Microsol interface to be used with explosion proof solenoid systems displayed on page 2.15.6.4.2. Please consider technical specifications and restrictions stated on the datasheet of the solenoid system.

Zone: 1, 2, 21, 22
Temperature class: T6

Marking on valve II 2 G Ex h IIC T6 Gb
-10°C ≤ Ta ≤ +50°C
 II 2 D Ex h IIC T80°C
Db -10°C ≤ Ta ≤ +50°C

Material valve body: Aluminum

Temperature range: -10°C ... +50°C

Please note that valves can be also used with other Microsol solenoid systems for explosive and non-explosive area. The following systems are available on request: high temperature +80°C, low power consumption, LABS-free, AC-solenoids.

Type	Function	Port size	Air flow	Operating press.	Weight
MNDS 510 701 Ex	5/2-way, single sol.	G 1/4" -1/4" NPT	1250 l/min	2 - 10 bar	0,17 kg
MNDS 511 701 Ex	5/2-way, single sol., comb. spring	G 1/4" -1/4" NPT	1250 l/min	2,5 - 10 bar	0,17 kg
MNDS 510 711 Ex	5/2-way, single sol., swapped ports	G 1/4"	1250 l/min	2 - 10 bar	0,17 kg
MNDS 510 121 Ex	5/2-way, single sol.	G 1/2" -1/2" NPT	3000 l/min	1 - 10 bar	0,61 kg
MNDS 511 121 Ex	5/2-way, single sol., comb. spring	G 1/2" -1/2" NPT	3000 l/min	2,5 - 10 bar	0,61 kg

Solenoid valves for explosion hazardous environment

General overview

Our customers have the choice between numerous solenoid systems of different ignition protection types. Those can be combined with valves made from aluminum or stainless steel designed for different temperature ranges.



		Ex ec	Ex ia 1.6W	Ex ia 0.7W	Ex m
		Increased safety	Intrinsically safe	Intrinsically safe	Encapsulation
Page Coil		2.15.6.5.3	2.15.6.3.5	2.15.6.4.2	2.15.6.2.4
Page Valves		2.15.6.5.1 – 2	2.15.6.3.1 – 4	2.15.6.4.1	2.15.6.2.1 – 2
					
Certificates	ATEX	✓	✓	✓	✓
	IECEX		✓	✓	✓
	CSA / FM				
	UKCA	✓			
	CCC		on request		on request
Zone	1G		✓	✓	✓
	2G	✓	✓	✓	✓
	21D		✓	✓	✓
	22D	✓	✓	✓	✓
Temperature class		T5	T6	T6	T4
Explosion group		IIC / IIIC	IIC / IIIC	IIC / IIIC	IIC / IIIC
Temperature range		-10°C to +50°C	-40°C to +50°C	-10°C to +50°C	-20°C to +50°C
Electrical connection		Plug for 6 - 8 mm cable	Plug for 6 - 8 mm cable	Plug for 3.5 - 6 mm cable	3 metre moulded cable, 10 metres on request
Power consumption		3.0 Watts (24DC) 5 VA (24AC, 110AC, 230AC)	1.6 Watts (24DC)	0.7 Watts (24DC)	5.0 Watts (24DC) / 4.6 VA (24AC) 4.5 VA (110AC) / 5.1 VA (230 AC)
IP protection class		IP 65	IP 65	IP 65	IP 65

		Ex emb	Ex dm	Ex d	Ex m CSA/FM
		Increased safety / encapsulation	Encapsulation / flameproof	Flameproof	Encapsulation
Page Coil		2.15.6.6.4	2.15.6.8.3	2.15.6.7.5	2.15.6.2.3
Page Valves		2.15.6.6.1 – 3	2.15.6.8.1 – 2	2.15.6.7.1 – 4	2.15.6.2.1 - 2
					
Certificates	ATEX	✓	✓	✓	
	IECEX	✓		✓	
	CSA / FM				✓
	UKCA				
	CCC			on request	
Zone	1G	✓	✓	✓	Class I, Zone 1, Ex m II T4 Class I, Div. 1 & Div. 2, Gr. A,B,C,D Class II, Gr. E, F, G; Class III; T4
	2G	✓	✓	✓	
	21D	✓	✓	✓	
	22D	✓	✓	✓	
Temperature class		T6	T5	T6	T4
Explosion group		IIC / IIIC	IIC / IIIC	IIC / IIIC	
Temperature range		-40°C to +50°C	-20°C to +50°C	-40°C to +50°C	-20°C to +60°C
Electrical connection		M20x1.5 6 – 13 mm	M20x1.5 6 – 8 mm	M20x1.5 or 1/2" NPT Cable gland not included	Conduit 1/2" NPT 60 cm strands
Power consumption		4,8 Watts (24, 110, 230)	3.0 Watts (12DC, 24DC) 4.8 VA (24AC, 110AC, 230AC)	2.0 Watts (24DC) 3.0 VA (110AC, 230AC)	4.5 Watts (12DC) / 4.6 Watts (24DC) 6.8 VA (110AC) / 7.7 VA (220AC, 240AC)
IP protection class		IP 65 (IP 67 optional)	IP 66	IP 67	IP 65

ATEX-approved valves – Ex m – standard temperature range – aluminum



Material: Aluminum, anodized
 Zone: 1, 2, 21, 22
 Temperature range: -10°C ... +50°C
 Ignition protection type: Ex m (encapsulation)
 Temperature class: T4

Marking on valve  II 2 G Ex h IIC T6 Gb
 -10°C ≤ Ta ≤ +50°C
 II 2 D Ex h IIIC T80°C
 Db -10°C ≤ Ta ≤ +50°C

A low temperature version for -20°C ... +50°C is also available on request. Please note that the system is restricted by the minimum ambiente temperature for the coil of -20°C.

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 210 501 Ex m	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MH 210 701 Ex m	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MH 311 012 Ex m	3/2-way direct acting	M5	in-line	2.5.1.1.2
MH 311 015 Ex m	3/2-way direct acting	G 1/8"	in-line	2.5.1.1.2
MH 311 013 Ex m	3/2-way direct acting	G 1/8"	banjo screw	2.5.1.1.6
MH 311 017 Ex m	3/2-way direct acting	G 1/4"	banjo screw	2.5.1.1.6
MH 312 Ex m	3/2-way direct acting	M5	manifold	2.5.1.2.1
MH 315 Ex m	3/2-way direct acting	G 1/8"	manifold	2.5.1.2.1
MH 310 501 G Ex m	3/2-way, single sol.	G 1/8"	dual use*	2.5.1.1.10
MOH 310 501 G Ex m	3/2-way, n.o. single sol.	G 1/8"	dual use*	2.5.1.1.10
MH 310 701 G Ex m	3/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MOH 310 701 G Ex m	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MH 310 101 G Ex m	3/2-way, single sol.	G 3/8"	dual use*	2.7.1.4
MOH 310 101 G Ex m	3/2-way, n.o. single sol.	G 3/8"	dual use*	2.7.1.4
MH 310 101 Ex m	3/2-way, single sol.	G 3/8"	in-line	2.5.1.1.11
MOH 310 101 Ex m	3/2-way, n.o. single sol.	G 3/8"	in-line	2.5.1.1.11
MH 310 121 Ex m	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MOH 310 121 Ex m	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MH 310 181 Ex m	3/2-way, single sol.	G 3/4"	in-line	2.5.1.1.11
MOH 310 181 Ex m	3/2-way, n.o. single sol.	G 3/4"	in-line	2.5.1.1.11
MH 310 101 G Ex m	3/2-way, single sol.	G 3/8"	dual use*	2.5.1.1.17
MOH 310 101 G Ex m	3/2-way, n.o. single sol.	G 3/8"	dual use*	2.5.1.1.17
MH 310 121 G Ex m	3/2-way, single sol.	G 1/2"	dual use*	2.5.1.1.17
MOH 310 121 G Ex m	3/2-way, n.o. single sol.	G 1/2"	dual use*	2.5.1.1.17
MH 510 501 G Ex m	5/2-way, single sol.	G 1/8"	dual use*	2.5.2.1.2
MH 510 701 G Ex m	5/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.2
MH 510 101 Ex m	5/2-way, single sol.	G 3/8"	in-line	2.5.2.1.3
MH 510 121 Ex m	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MH 510 181 Ex m	5/2-way, single sol.	G 3/4"	in-line	2.5.2.1.3
MH 510 504 Ex m	5/2-way, single sol.	5 mm orifice	manifold**	2.5.2.2.4
MH 510 704 Ex m	5/2-way, single sol.	7 mm orifice	manifold**	2.5.2.2.4
MH 520 501 G Ex m	5/2-way, double sol.	G 1/8"	dual use*	2.5.2.1.5
MH 520 701 G Ex m	5/2-way, double sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.5
MH 520 101 Ex m	5/2-way, double sol.	G 3/8"	in-line	2.5.2.1.6
MH 520 121 Ex m	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MH 520 181 Ex m	5/2-way, double sol.	G 3/4"	in-line	2.5.2.1.6
MH 520 504 Ex m	5/2-way, double sol.	5 mm orifice	manifold**	2.5.2.2.7
MH 520 704 Ex m	5/2-way, double sol.	7 mm orifice	manifold**	2.5.2.2.7
MH 53_ 501 G Ex m	5/3-way, diff. versions	G 1/8"	dual use*	2.5.3.1.2
MH 53_ 701 G Ex m	5/3-way, diff.versions	G 1/4" - 1/4" NPT	dual use*	2.5.3.1.2
MH 53_ 101 Ex m	5/3-way, diff. versions	G 3/8"	in-line	2.5.3.1.3
MH 53_ 121 Ex m	5/3-way, diff. versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3
MH 53_ 504 Ex m	5/3-way, diff. versions	5 mm orifice	manifold**	2.5.3.2.3
MH 53_ 704 Ex m	5/3-way, diff. versions	7 mm orifice	manifold**	2.5.3.2.3

Type	Function	Port size	Installation	Further inform. on valve
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	2.10.1.3
MNH 310 701 Ex m	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 311 701 Ex m	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 310 711 Ex m	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNH 310 121 Ex m	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 311 121 Ex m	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 510 701 Ex m	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 511 701 Ex m	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 510 711 Ex m	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNH 510 121 Ex m	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 511 121 Ex m	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 520 701 Ex m	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNH 520 121 Ex m	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNH 53_ 701 Ex m	5/3-way, diff. versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.4
MNH 53_ 121 Ex m	5/3-way, diff. versions	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.4


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

Solenoids are described on page 2.15.6.2.4.

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

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



Material: Stainless steel, 316L 
 Zone: 1, 2, 21, 22
 Temperature range: -10°C ... +50°C
 Ignition protection type: Ex m (encapsulation)
 Temperature class: T4

Marking on valve   II 2 G Ex h IIC T6 Gb
 -10°C ≤ Ta ≤ +50°C
  II 2 D Ex h IIIC T80°C
 Db -10°C ≤ Ta ≤ +50°C

A low temperature version for -20°C ... +50°C is also available on request. Please note that the system is restricted by the minimum applicable temperature of the coil of -20°C.

The following **solenoid valves** are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 015 VES Ex m	3/2-way direct acting	G 1/8"	in-line	2.13.4.1
MH 310 701 VES Ex m	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES Ex m	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 310 121 VES Ex m	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.3
MH 510 701 VES Ex m	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 510 121 VES Ex m	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.4
MH 520 701 VES Ex m	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 520 121 VES Ex m	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.5
MH 53_ 701 VES Ex m	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6
MH 53_ 121 VES Ex m	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.13.4.6

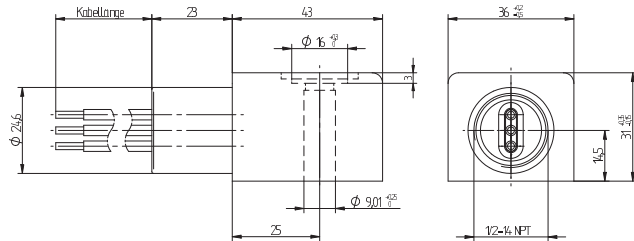
Valves with interface according to NAMUR-standard

MNH 350 701 VES Ex m	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES Ex m	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES Ex m	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 310 121 VES Ex m	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.1
MNH 510 701 VES Ex m	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES Ex m	5/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 510 121 VES Ex m	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.3
MNH 520 701 VES Ex m	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Solenoids are described on page 2.15.6.2.4.

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

MA 36 EEx m II T4 CSA FM



MA 36 EEx m II T4 CSA FM

CSA / FM approved encapsulated coils for gas and dust explosion-hazardous environment with 60 cm flying leads.

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

Voltage tolerance: - 10...+ 10%

Relative duty cycle: 100 %

Temperature range: -20°C ... +60°C

Protection according
to EN 60529: IP 65

Material solenoid coil: Thermoplasticpolyester

Coil rating according to
DIN VDE 0580: Class H

Conduit: 1/2" NPT

As the coil is 36 mm wide, a spacer plate called "ZPN 8" has to be used, in case of combination with our NAMUR-valve series 700. If used with NAMUR-valve series 121 a spacer plate called "ZPN 6-5" has to be used. You can find both plates on page 2.11.13.

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

Please note:
The coil is not approved according to ATEX.

Hazardous Locations:

Ex m II T4 and Division 1

Specifications in accordance to CSA certificate:

Class I, Division 1, Groups A, B, C and D; Class II, Groups E, F and G; Class III Class I, Division 2, Groups A, B, C, D.

Specifications in accordance to FM certificate:

Explosion-proof Class I, Division 1, Groups A, B, C, D, T4, Ta = 60 °C
encapsulation/explosion-proof Class I, Zone 1, AEx m II T4, Ta = 60 °C
dust-ignition-proof for Class II/III, Division 1, Groups E, F and G, T4, Ta = 60 °C
Nonincendive Class I, Division 2, Groups A, B, C, D, T4, Ta = 60 °C
Suitable for Class II, III, Division 2, Groups E, F, G, T4, Ta = 60 °C

The current standards can be found in the certificates.

Type	Voltage	Operating press.	Power cons.	Temperature class
MA 36 EEx M II T4 CSA FM 12DC	12 V=	max. 10 bar	4,5 Watt	T4 (135° C)
MA 36 EEx M II T4 CSA FM 24DC	24 V=	max. 10 bar	4,6 Watt	T4 (135° C)
MA 36 EEx M II T4 CSA FM 110AC	110 V~	max. 10 bar	6,8 VA	T4 (135° C)
MA 36 EEx M II T4 CSA FM 220AC	220 V~	max. 10 bar	7,7 VA	T4 (135° C)
MA 36 EEx M II T4 CSA FM 240AC	240 V~	max. 10 bar	7,7 VA	T4 (135° C)

MA 22 EEx m II T4

When this solenoid system is used in combination with „ATEX certified“ mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21 and 22.



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

The standard cable length is 3 meter, others on request.

Voltage tolerance: -10...+10 %

Relative duty cycle: 100 %

Temperature range: -20°...+50° C

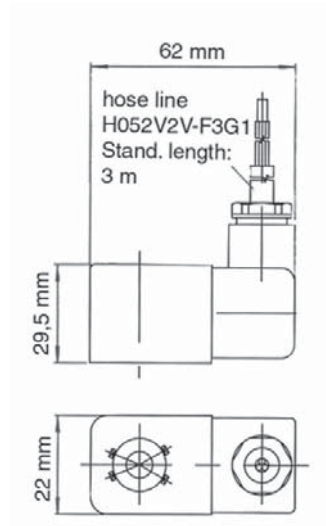
Insulation class of insulating materials according to DIN VDE 0580: F

Protection with mounted plug-in connector according to IEC 529: IP 65

Moulding material: Thermoplasticpolyester

Marking on coil:   II 2G Ex mb IIC T4 Gb
II 2D Ex mb tb IIIC T130°C Db

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





MA 22 EEx m II T4

Type	Operating press.	Power consumption	Temperature class
MA 22 EEx M II T4 24DC	max. 10 bar	5,0 Watt	T4 (135° C)
MA 22 EEx M II T4 24AC	max. 10 bar	4,6 VA	T4 (135° C)
MA 22 EEx M II T4 110AC	max. 10 bar	4,5 VA	T4 (135° C)
MA 22 EEx M II T4 230AC	max. 10 bar	5,1 VA	T4 (135° C)

ATEX-approved valves – Ex ia – standard temperature range – aluminum



Material: Aluminum, anodized
 Zone: 1, 2, 21, 22
 Temperature range: -10°C ... +50°C
 Ignition protection type: Ex ia
 (intrinsically safe)
 Temperature class: T6

Marking on valve  II 2 G Ex h IIC T6 Gb
 -10°C ≤ Ta ≤ +50°C
 II 2 D Ex h IIC T80°C
 Db -10°C ≤ Ta ≤ +50°C

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

Coil is 30 mm wide!

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 210 501 Ex ia	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MH 210 701 Ex ia	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MH 311 012 Ex ia	3/2-way direct acting	M5	in-line	2.5.1.1.2
MH 311 015 Ex ia	3/2-way direct acting	G 1/8"	in-line	2.5.1.1.2
MH 310 501 G Ex ia	3/2-way, single sol.	G 1/8"	in-line	2.5.1.1.10
MOH 310 501 G Ex ia	3/2-way, n.o. single sol.	G 1/8"	in-line	2.5.1.1.10
MH 310 701 G Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MOH 310 701 G Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MH 310 101 Ex ia	3/2-way, single sol.	G 3/8"	in-line	2.5.1.1.11
MOH 310 101 Ex ia	3/2-way, n.o. single sol.	G 3/8"	in-line	2.5.1.1.11
MH 310 121 Ex ia	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MOH 310 121 Ex ia	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MH 310 181 Ex ia	3/2-way, single sol.	G 3/4"	in-line	2.5.1.1.11
MOH 310 181 Ex ia	3/2-way, n.o. single sol.	G 3/4"	in-line	2.5.1.1.11
MH 510 501 G Ex ia	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.2
MH 510 701 G Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.2
MH 510 101 Ex ia	5/2-way, single sol.	G 3/8"	in-line	2.5.2.1.3
MH 510 121 Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MH 510 181 Ex ia	5/2-way, single sol.	G 3/4"	in-line	2.5.2.1.3
MH 520 501 G Ex ia	5/2-way, double sol.	G 1/8"	in-line	2.5.2.1.5
MH 520 701 G Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.5
MH 520 101 Ex ia	5/2-way, double sol.	G 3/8"	in-line	2.5.2.1.6
MH 520 121 Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MH 520 181 Ex ia	5/2-way, double sol.	G 3/4"	in-line	2.5.2.1.6
MH 53_ 501 G Ex ia	5/3-way, different versions	G 1/8"	in-line	2.5.3.1.2
MH 53_ 701 G Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.5.3.1.2
MH 53_ 101 Ex ia	5/3-way, different versions	G 3/8"	in-line	2.5.3.1.3
MH 53_ 121 Ex ia	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3

Valves with interface according to NAMUR-standard

MNH 350 701 Ex ia	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.3
MNH 310 701 Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 311 701 Ex ia	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 310 711 Ex ia	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNH 310 121 Ex ia	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 311 121 Ex ia	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 510 701 Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 511 701 Ex ia	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 510 711 Ex ia	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNH 510 121 Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 511 121 Ex ia	5/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 520 701 Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNH 520 121 Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNH 53_ 701 Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.4
MNH 53_ 121 Ex ia	5/3-way, centre closed	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.4

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

Solenoids are described on page 2.15.6.3.5.

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

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



Material: Aluminum, anodized
 Zone: 1, 2, 21, 22
 Temperature range: -40°C ... +50°C
 Ignition protection type: Ex ia (intrinsically safe)
 Temperature class: T6

Marking on valve

CE Ex II 2 G Ex h IIC T6 Gb
 -40°C ≤ Ta ≤ +50°C
 CE Ex II 2 D Ex h IIIIC T80°C
 Db -40°C ≤ Ta ≤ +50°C

Please note:

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

Coil is 30 mm wide!

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 012 TT Ex ia	3/2-way direct acting	M5	in-line	2.12.7.1.1
MH 311 015 TT Ex ia	3/2-way direct acting	G 1/8"	in-line	2.12.7.1.1
MH 310 701 GTT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.1.2
MOH 310 701 GTT Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.1.2
MH 520 701 GTT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.2.2
MH 53_701 GTT Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	dual use*	2.12.7.2.2

Valves with interface according to NAMUR-standard


MNH 310 701 TT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNH 311 701 TT Ex ia	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNH 510 701 TT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 511 701 TT Ex ia	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 510 711 TT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 520 701 TT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2
MNH 531 701 TT Ex ia	5/3-way, centre closed	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2

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





Solenoids are described on page 2.15.6.3.5.
 Delivery contains valve with the appropriate operator system,
 coil, manual and declaration of conformity.

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



Material: Stainless steel, 316L 
 Zone: 1, 2, 21, 22
 Temperature range: -10°C ... +50°C
 Ignition protection type: Ex ia (intrinsically safe)
 Temperature class: T6

Marking on valve

  II 2 G Ex h IIC T6 Gb
 -10°C ≤ Ta ≤ +50°C
  II 2 D Ex h IIC T80°C
 Db -10°C ≤ Ta ≤ +50°C

Please note:

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

Coil is 30 mm wide!

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 015 VES Ex ia	3/2-way direct acting	G 1/8"	in-line	2.13.4.1
MH 310 701 VES Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 310 121 VES Ex ia	3/2-way, single sol.	G 1/2"	in-line	2.13.4.3
MH 510 701 VES Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 510 121 VES Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.4
MH 520 701 VES Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 520 121 VES Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.5
MH 53_701 VES Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6
MH 53_121 VES Ex ia	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.13.4.6

Valves with interface according to NAMUR-standard



MNH 350 701 VES Ex ia	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES Ex ia	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 310 121 VES Ex ia	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.1
MNH 510 701 VES Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES Ex ia	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 510 121 VES Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.3
MNH 520 701 VES Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Solenoids are described on page 2.15.6.3.5.

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

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



Material: Stainless steel, 316L 
 Zone: 1, 2, 21, 22
 Temperature range: -40°C ... +50°C 
 Ignition protection type: Ex ia (intrinsically safe)
 Temperature class: T6

Marking on valve 


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

Coil is 30 mm wide!

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 015 VES TT Ex ia	3/2-way direct acting	G 1/8"	in-line	2.13.4.1
MH 310 701 VES TT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES TT Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 510 701 VES TT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 520 701 VES TT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 53_701 VES TT Ex ia	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6

Valves with interface according to NAMUR-standard

MNH 350 701 VES TT Ex ia	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES TT Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES TT Ex ia	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 510 701 VES TT Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES TT Ex ia	5/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 520 701 VES TT Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Solenoids are described on page 2.15.6.3.5.
 Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

MA 30 EEx ia tD II CT6 24DC

When this solenoid system is used in combination with „ATEX certified“ mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21, and 22.



ATEX and IEC Ex approved intrinsic safety coil and connector for gas and dust explosion-hazardous environment. Electrical connection according to DIN EN 175301-803-A / ISO 4400.

Coil:

Electrical characteristics: 21,6... 28 V DC
 >37 mA
 final temperature rise 18 K
 275 Ohm +/-8 %

Relative duty cycle: 100 %

Temperature range: -40°... +50° C

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

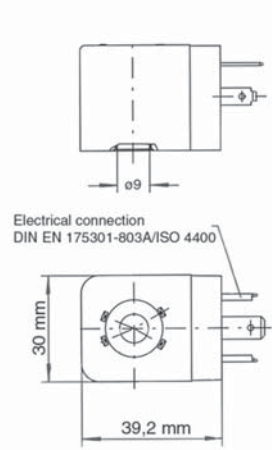
Protection level with connector according to EN 60529: IP 65

Moulding material: Thermoset resin (Epoxy)

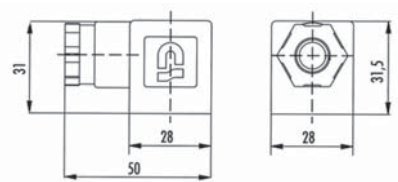
Marking on coil: II 2G Ex ia IIB/IIC T6
 II 2D Ex tb IIIC T80°C

Barrier:

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



MA 30 EEx ia tD II CT6 24DC



ST 30 Ex ia

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

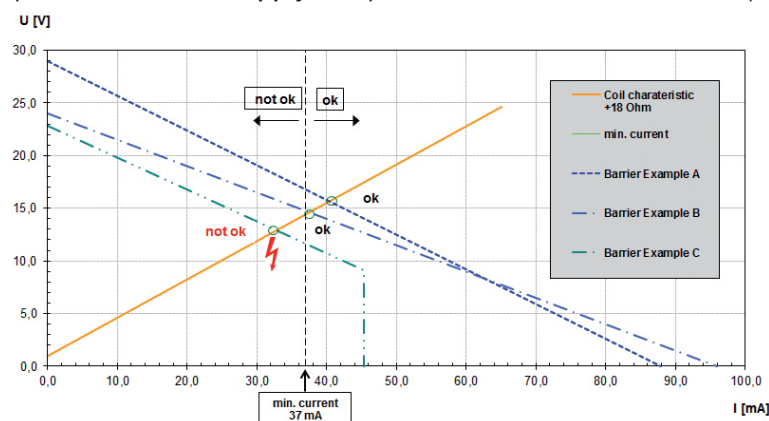
As the coil is 30 mm wide, a spacer plate „ZPN 5“ has to be used, in case of combination with our NAMUR-valve series 700 refer to page 2. 11. 13.

ST 30 Ex ia is an ATEX approved connector, especially designed for being used in combination with the intrinsic safety coil. For dust approval (zone 21), this original connector is mandatory.

Delivery includes connector ST 30 Ex ia, flat nitril gasket and fixing screw (zinc-plated steel). Form according to A - ISO 4400, no LED, no varistor, operating voltage 0 – 250 V, max. current 10 A, cable diameter 6 – 8 mm.

How to select a suitable barrier:

I/U Characteristics supply units/solenoid coil







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

ATEX-approved valves – Ex ia 0.7W – standard temperature range – aluminum



Material: Aluminum, anodized
 Zone: 1, 2, 21, 22
 Temperature range: -10°C ... +50°C ❄️
 Ignition protection type: 24DC Ex ia (intrinsic safety)
 Temperature class: T6

Marking on valve:   II 2 G Ex h IIC T6 Gb
 -40°C ≤ Ta ≤ +50°C
  II 2 D Ex h IIC T80°C
 Db -40°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further information on valve on page
MDSF 210 501 24DC Ex ia	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MDSF 210 701 24DC Ex ia	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MDSF 310 401 24DC Ex ia	3/2-way, single sol.	G 1/8"	in-line	2.5.1.1.8
MDSF 310 501 G 24DC Ex ia	3/2-way, single sol.	G 1/8"	dual use*	2.5.1.1.10
MODSF 310 501 G 24DC Ex ia	3/2-way, n.o. single sol.	G 1/8"	dual use*	2.5.1.1.10
MDSF 310 701 G 24DC Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MODSF 310 701 G 24DC Ex ia	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MDSF 310 121 24DC Ex ia	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MODSF 310 121 24DC Ex ia	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MDSF 510 401 24DC Ex ia	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.1
MDSF 510 501 G 24DC Ex ia	5/2-way, single sol.	G 1/8"	dual use*	2.5.2.1.2
MDSF 510 701 G 24DC Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.2
MDSF 510 121 24DC Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MDSF 520 401 24DC Ex ia	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.4
MDSF 520 501 G 24DC Ex ia	5/2-way, double sol.	G 1/8"	dual use*	2.5.2.1.5
MDSF 520 701 G 24DC Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.5
MDSF 520 121 24DC Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MDSF 53_ 501 G 24DC Ex ia	5/3-way, diff. versions	G 1/8"	dual use*	2.5.3.1.2
MDSF 53_ 701 G 24DC Ex ia	5/3-way, diff. versions	G 1/4"	dual use*	2.5.3.1.2
MDSF 53_ 121 24DC Ex ia	5/3-way, diff. versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3

Valves with interface according to NAMUR-standard

MNDSF 350 701 24DC Ex ia	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.3
MNDSF 310 701 24DC Ex ia	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNDSF 311 701 24DC Ex ia	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNDSF 310 711 24DC Ex ia	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNDSF 310 121 24DC Ex ia	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNDSF 311 121 24DC Ex ia	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNDSF 510 701 24DC Ex ia	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNDSF 511 701 24DC Ex ia	5/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNDSF 510 711 24DC Ex ia	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNDSF 510 121 24DC Ex ia	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNDSF 511 121 24DC Ex ia	5/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNDSF 520 701 24DC Ex ia	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNDSF 520 121 24DC Ex ia	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNDSF 53_ 701 24DC Ex ia	5/3-way, diff. versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.4
MNDSF 53_ 121 24DC Ex ia	5/3-way, diff. versions	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.4

Direct acting valves available on request.
 Solenoids described on page 2.15.6.4.2.
 Delivery contains valve with the appropriate coil, connector,
 manual and declaration of conformity.

FES 15 3/2 NC 24DC Ex ia

When this solenoid system is used in combination with „ATEX certified“ mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21, and 22.



ATEX approved intrinsic safety coil and connector for gas and dust explosion-hazardous environment. System is also IECEx approved. Electrical connector with two pins according to form C (EN 175301-803).

Rated Characteristics: Un: 24V
In: 30.0 mA
Pn: 0.72 W
Winding resistance: 800 Ω +/- 5%

Safety Parameters: Ui: 26.3 V
Li: 139 mA
Li: negligible
Ci: negligible

Voltage tolerance: -10...+10 %

Relative duty cycle: 100 %

Temperature range: -10°...+50° C

Pressure range: See valve specifications
max. 8 bar

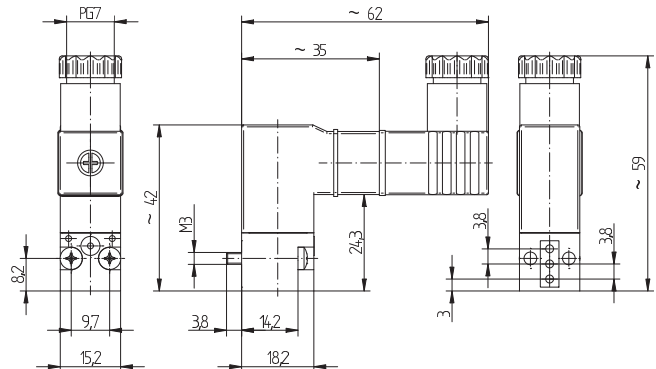
Insulation class of insulating materials according to DIN VDE 0580: F

Protection with mounted plug-in connector according to IEC 529: IP 65

Moulding material: Glass fiber reinforced PA

Marking on coil:  II 1G Ex ia IICT6 Ga
II 1D Ex ia IIIC T85°C Da

Cable diameter: 3.5 – 6.0 mm



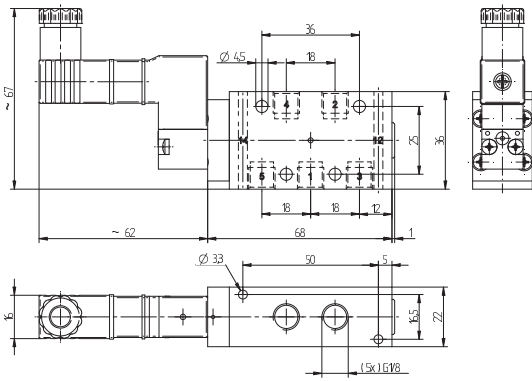
FES 15 3/2 NC 24DC Ex ia



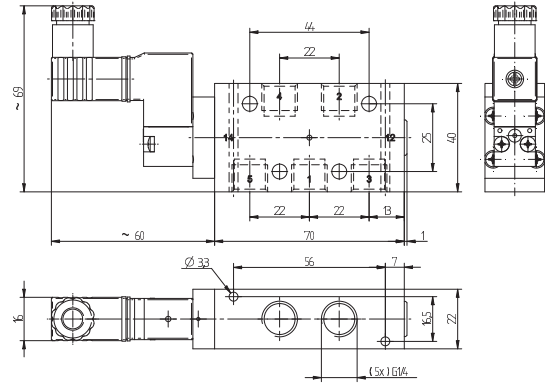
Connector included.

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

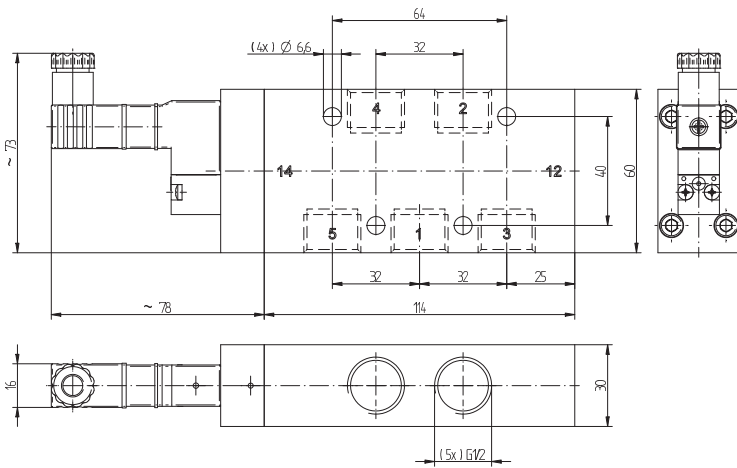
Example drawings of solenoid valves with EX ia 0.7 W solenoid system.



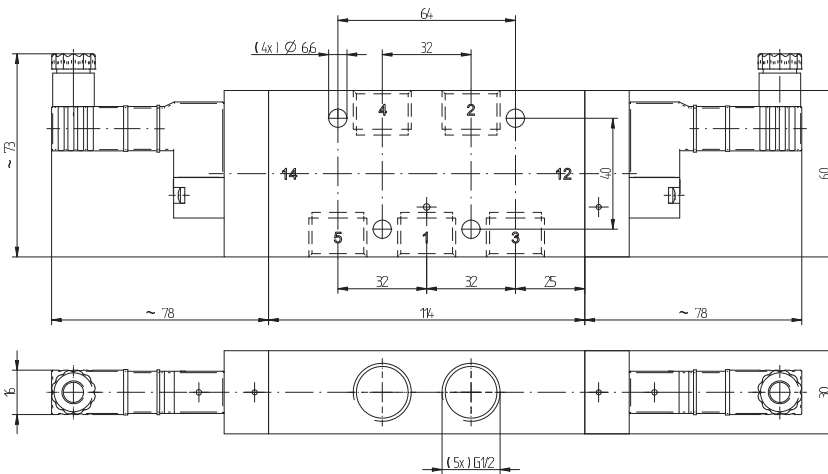
MDSF 510 510 G 24DC Ex ia



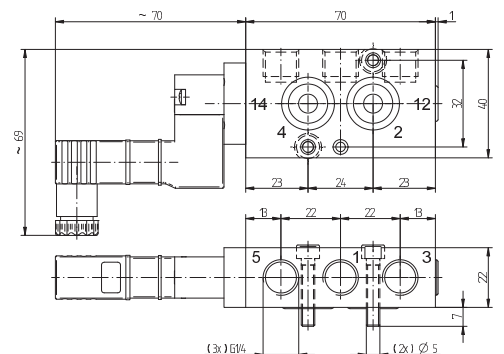
MDSF 510 701 G 24DC Ex ia



MDSF 510 121 24DC Ex ia



MDSF 520 121 24DC Ex ia



MNDSF 510 701 24DC Ex ia

ATEX-approved valves – Ex ec and tc – standard temperature range – aluminum



Material: Aluminum, anodized, head PA
 Zone: 2, 22
 Temperature range: -10°C ... +50°C
 Ignition protection gas: Ex ec (increased safety)
 Ignition protection dust: Ex t (protection using enclosure)**
 Temperature class: T6

Marking on valve

CE Ex II 3 G Ex h IIC T6 Gb
 -10°C ≤ Ta ≤ +50°C
CE Ex II 3 D Ex h IIIC T80°C
 Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

** only in combination with appropriate connector.

Type	Function	Port size	Installation	Further inform. on valve
MH 210 501 Ex ec	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MH 210 701 Ex ec	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MH 311 012 Ex ec	3/2-way direct acting	M5	in-line	2.5.1.1.2
MH 311 015 Ex ec	3/2-way direct acting	G 1/8"	in-line	2.5.1.1.2
MH 311 013 Ex ec	3/2-way direct acting	G 1/8"	banjo screw	2.5.1.1.6
MH 311 017 Ex ec	3/2-way direct acting	G 1/4"	banjo screw	2.5.1.1.6
MH 312 Ex ec	3/2-way direct acting	M5	manifold	2.5.1.2.1
MH 315 Ex ec	3/2-way direct acting	G 1/8"	manifold	2.5.1.2.1
MH 310 501 G Ex ec	3/2-way, single sol.	G 1/8"	in-line	2.5.1.1.10
MOH 310 501 G Ex ec	3/2-way, n.o. single sol.	G 1/8"	in-line	2.5.1.1.10
MH 310 701 G Ex ec	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MOH 310 701 G Ex ec	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MH 310 101 Ex ec	3/2-way, single sol.	G 3/8"	in-line	2.5.1.1.11
MOH 310 101 Ex ec	3/2-way, n.o. single sol.	G 3/8"	in-line	2.5.1.1.11
MH 310 121 Ex ec	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MOH 310 121 Ex ec	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MH 310 181 Ex ec	3/2-way, single sol.	G 3/4"	in-line	2.5.1.1.11
MOH 310 181 Ex ec	3/2-way, n.o. single sol.	G 3/4"	in-line	2.5.1.1.11
MH 510 501 G Ex ec	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.2
MH 510 701 G Ex ec	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.2
MH 510 101 Ex ec	5/2-way, single sol.	G 3/8"	in-line	2.5.2.1.3
MH 510 121 Ex ec	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MH 510 181 Ex ec	5/2-way, single sol.	G 3/4"	in-line	2.5.2.1.3
MH 510 504 Ex ec	5/2-way, single sol.	5 mm orifice	manifold	2.5.2.2.4
MH 510 704 Ex ec	5/2-way, single sol.	7 mm orifice	manifold	2.5.2.2.4
MH 520 501 G Ex ec	5/2-way, double sol.	G 1/8"	in-line	2.5.2.1.5
MH 520 701 G Ex ec	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.5
MH 520 101 Ex ec	5/2-way, double sol.	G 3/8"	in-line	2.5.2.1.6
MH 520 121 Ex ec	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MH 520 181 Ex ec	5/2-way, double sol.	G 3/4"	in-line	2.5.2.1.6
MH 520 504 Ex ec	5/2-way, double sol.	5 mm orifice	manifold	2.5.2.2.7
MH 520 704 Ex ec	5/2-way, double sol.	7 mm orifice	manifold	2.5.2.2.7
MH 53_ 501 G Ex ec	5/3-way, different versions	G 1/8"	in-line	2.5.3.1.2
MH 53_ 701 G Ex ec	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.5.3.1.2
MH 53_ 101 Ex ec	5/3-way, different versions	G 3/8"	in-line	2.5.3.1.3
MH 53_ 121 Ex ec	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3
MH 53_ 504 Ex ec	5/3-way, different versions	5 mm orifice	manifold	2.5.3.2.3
MH 53_ 704 Ex ec	5/3-way, different versions	7 mm orifice	manifold	2.5.3.2.3

Valves with interface according to NAMUR-standard

MNH 350 701 Ex ec	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.3
MNH 310 701 Ex ec	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 311 701 Ex ec	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 310 711 Ex ec	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNH 310 121 Ex ec	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 311 121 Ex ec	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 510 701 Ex ec	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 511 701 Ex ec	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 510 711 Ex ec	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNH 510 121 Ex ec	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 511 121 Ex ec	5/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 520 701 Ex ec	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNH 520 121 Ex ec	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNH 53_ 701 Ex ec	5/3-way, different versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.4
MNH 53_ 121 Ex ec	5/3-way, centre closed	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.4



Solenoids are described on page 2.15.6.5.3.

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





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

ATEX-approved valves – Ex ec and tc – standard temperature range – stainless steel



Material: Stainless steel, 316L 
 Zone: 2, 22
 Temperature range: -10°C ... +50°C 
 Ignition protection gas: Ex ec (increased safety)
 Ignition protection dust: Ex t (protection using enclosure)*
 Temperature class: T6

Marking on valve

  II 3 G Ex h IIC T6 Gb
 -10°C ≤ Ta ≤ +50°C
  II 3 D Ex h IIIC T80°C
 Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

* only in combination with appropriate connector.

Type	Function	Port size	Installation	Further inform. on valve
MH 311 015 VES Ex ec	3/2-way direct acting	G 1/8"	in-line	2.13.4.1
MH 310 701 VES Ex ec	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES Ex ec	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 310 121 VES Ex ec	3/2-way, single sol.	G 1/2"	in-line	2.13.4.3
MH 510 701 VES Ex ec	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 510 121 VES Ex ec	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.4
MH 520 701 VES Ex ec	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 520 121 VES Ex ec	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.5
MH 53_ 701 VES Ex ec	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6
MH 53_ 121 VES Ex ec	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.13.4.6

Valves with interface according to NAMUR-standard

MNH 350 701 VES Ex ec	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES Ex ec	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES Ex ec	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 310 121 VES Ex ec	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.1
MNH 510 701 VES Ex ec	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES Ex ec	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 510 121 VES Ex ec	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.3
MNH 520 701 VES Ex ec	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Solenoids are described on page 2.15.6.5.3.
 Delivery contains valve with the appropriate operator system, coil, manual and declaration of conformity.

MA 22 EEx ec T5

ST 22 Ex



ATEX approved coil and connector for gas (increased safety) and dust (protection using enclosure) explosion-hazardous environment.

Coil MA 22 EEx ec T5:

Voltage tolerance: +/- 10 %

Relative duty cycle: 100 %

Temperature range: -10°... +50° C

Insulation class of insulating materials according to DIN VDE 0580:

F

Protection with connector according to EN 60529:

IP 65

Moulding material:

Termoplasticpolyester

Marking on coil:

CE **Ex** II 3G Ex ec IIC T5 Gc
II 3D Ex tc IIIC T95°C Dc

Delivery content without ATEX approved connector. Please order connector type ST 22 Ex separately.

Connector ST 22 Ex:

Connector can be used in combination with MA 22 EEx ec T5 coils. Connector is classified for zone 1 and 21 cat. II G/D. Please consider that our Ex ec coils are classified for zone 2 and 22 cat. III G/D only.

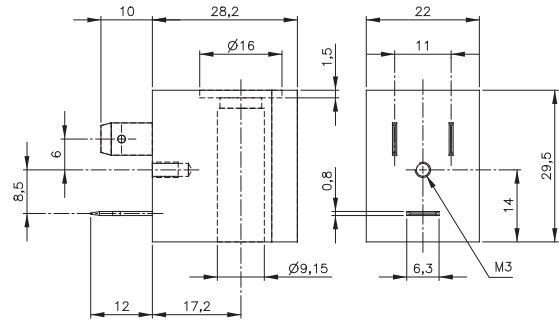
Using the enclosed flat seal, fastening screw and nut appropriately the system reaches protection class IP65 in accordance to IEC 60 529.

Marking on connector:

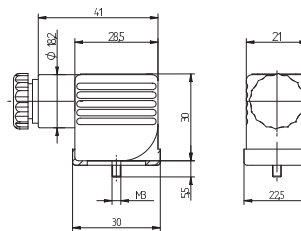
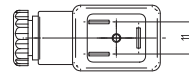
CE **Ex** II 2G Ex eb IIC T5 Gb
II 2D Ex tb IIIC T100°C Db

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

When this solenoid system is used in combination with "ATEX certified" mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 2 and 22.



MA 22 EEx ec T5



ST 22 Ex

Type	Operating press.	Power cons.	Temp. class	Connection
MA 22 EEx ec T5 24DC	max. 10 bar	3 W	T5 (95° C)	Industryform Type B (DIN/ISO 436 50)
MA 22 EEx ec T5 24AC	max. 10 bar	5 VA	T5 (95° C)	Industryform Type B (DIN/ISO 436 50)
MA 22 EEx ec T5 110AC	max. 10 bar	5 VA	T5 (95° C)	Industryform Type B (DIN/ISO 436 50)
MA 22 EEx ec T5 230AC	max. 10 bar	5 VA	T5 (95° C)	Industryform Type B (DIN/ISO 436 50)

Type	Form	LED	VAR	Operat. voltage	Max. current	Cable diameter
ST 22 Ex	Industrial	no	no	0 - 250 V	10 A	6 - 8 mm

Other voltages are available on request.

ATEX-approved valves – Ex e mb – standard temperature range – aluminum



Material: Aluminum, anodized
 Zone: 1, 2, 21, 22
 Temperature range: -10°C ... +50°C
 Ignition protection type: Ex e mb (encapsulation with junction box)
 Temperature class: T6

Marking on valve

II 2 G Ex h IIC T6 Gb
 -10°C ≤ Ta ≤ +50°C
 II 2 D Ex h III C T80°C
 Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 210 501 Ex e mb	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MH 210 701 Ex e mb	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MH 310 501 G Ex e mb	3/2-way, single sol.	G 1/8"	in-line	2.5.1.1.10
MOH 310 501 G Ex e mb	3/2-way, n.o. single sol.	G 1/8"	in-line	2.5.1.1.10
MH 310 701 G Ex e mb	3/2-way, single sol.	G 1/4"-1/4" NPT	in-line	2.5.1.1.10
MOH 310 701 G Ex e mb	3/2-way, n.o. single sol.	G 1/4"-1/4" NPT	in-line	2.5.1.1.10
MH 310 101 Ex e mb	3/2-way, single sol.	G 3/8"	in-line	2.5.1.1.11
MOH 310 101 Ex e mb	3/2-way, n.o. single sol.	G 3/8"	in-line	2.5.1.1.11
MH 310 121 Ex e mb	3/2-way, single sol.	G 1/2"-1/2" NPT	in-line	2.5.1.1.11
MOH 310 121 Ex e mb	3/2-way, n.o. single sol.	G 1/2"-1/2" NPT	in-line	2.5.1.1.11
MH 310 181 Ex e mb	3/2-way, single sol.	G 3/4"	in-line	2.5.1.1.11
MOH 310 181 Ex e mb	3/2-way, n.o. single sol.	G 3/4"	in-line	2.5.1.1.11
MH 510 501 G Ex e mb	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.2
MH 510 701 G Ex e mb	5/2-way, single sol.	G 1/4"-1/4" NPT	in-line	2.5.2.1.2
MH 510 101 Ex e mb	5/2-way, single sol.	G 3/8"	in-line	2.5.2.1.3
MH 510 121 Ex e mb	5/2-way, single sol.	G 1/2"-1/2" NPT	in-line	2.5.2.1.3
MH 510 181 Ex e mb	5/2-way, single sol.	G 3/4"	in-line	2.5.2.1.3
MH 520 501 G Ex e mb	5/2-way, double sol.	G 1/8"	in-line	2.5.2.1.5
MH 520 701 G Ex e mb	5/2-way, double sol.	G 1/4"-1/4" NPT	in-line	2.5.2.1.5
MH 520 101 Ex e mb	5/2-way, double sol.	G 3/8"	in-line	2.5.2.1.6
MH 520 121 Ex e mb	5/2-way, double sol.	G 1/2"-1/2" NPT	in-line	2.5.2.1.6
MH 520 181 Ex e mb	5/2-way, double sol.	G 3/4"	in-line	2.5.2.1.6
MH 53_501 G Ex e mb	5/3-way, different versions	G 1/8"	in-line	2.5.3.1.2
MH 53_701 G Ex e mb	5/3-way, different versions	G 1/4"-1/4" NPT	in-line	2.5.3.1.2
MH 53_101 Ex e mb	5/3-way, different versions	G 3/8"	in-line	2.5.3.1.3
MH 53_121 Ex e mb	5/3-way, different versions	G 1/2"-1/2" NPT	in-line	2.5.3.1.3

Valves with interface according to NAMUR-standard

MNH 350 701 Ex e mb	3/2-way & 5/2-way	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.3
MNH 310 701 Ex e mb	3/2-way, single sol.	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 311 701 Ex e mb	3/2-way, comb. spring	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 310 711 Ex e mb	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNH 310 121 Ex e mb	3/2-way, single sol.	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 311 121 Ex e mb	3/2-way, comb. spring	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 510 701 Ex e mb	5/2-way, single sol.	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 511 701 Ex e mb	5/2-way, comb. Spring	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 510 711 Ex e mb	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNH 510 121 Ex e mb	5/2-way, single sol.	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 511 121 Ex e mb	5/2-way, comb. spring	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 520 701 Ex e mb	5/2-way, double sol.	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNH 520 121 Ex e mb	5/2-way, double sol.	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNH 53_701 Ex e mb	5/3-way, different versions	G 1/4"-1/4" NPT	1/4" NAMUR	2.10.1.4
MNH 53_121 Ex e mb	5/3-way, centre closed	G 1/2"-1/2" NPT	1/2" NAMUR	2.10.1.4

Solenoids are described on page 2.15.6.6.4.

Example drawings including the solenoid are displayed on page 2.15.6.6.5.





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

ATEX-approved valves – Ex e mb – low temperature range – aluminum



Material: Aluminum, anodized
 Zone: 1, 2, 21, 22
 Temperature range: -40°C ... +50°C ❄️
 Ignition protection type: Ex e mb (encapsulation with junction box)
 Temperature class: T6

Marking on valve


 II 2 G Ex h IIC T6 Gb
 -40°C ≤ Ta ≤ +50°C

 II 2 D Ex h IIIIC T80°C
 Db -40°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 310 701 GTT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.1.2
MOH 310 701 GTT Ex e mb	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.1.2
MH 510 701 GTT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.2.1
MH 520 701 GTT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	dual use*	2.12.7.2.2
MH 53_ 701 GTT Ex e mb	5/3-way, different versions	G 1/4" - 1/4" NPT	dual use*	2.12.7.2.2

Valves with interface according to NAMUR-standard

Type	Function	Port size	Installation	Further inform. on valve
MNH 310 701 TT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNH 311 701 TT Ex e mb	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNH 510 701 TT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 511 701 TT Ex e mb	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 510 711 TT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNH 520 701 TT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2
MNH 531 701 TT Ex e mb	5/3-way, centre closed	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2



Solenoids are described on page 2.15.6.6.4.





Example drawings including the solenoid are displayed on page 2.15.6.6.5.

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

ATEX-approved valves – Ex e mb – low temperature range – stainless steel



Material: Stainless steel, 316L 
 Zone: 1, 2, 21, 22
 Temperature range: -40°C ... +50°C 
 Ignition protection type: Ex e mb (encapsulation with junction box)
 Temperature class: T6

Marking on valve   II 2 G Ex h IIC T6 Gb
 -40°C ≤ Ta ≤ +50°C
  II 2 D Ex h IIIC T80°C
 Db -40°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 310 701 VES TT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES TT Ex e mb	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 510 701 VES TT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 520 701 VES TT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 53_ 701 VES TT Ex e mb	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6

Valves with interface according to NAMUR-standard

MNH 350 701 VES TT Ex e mb	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES TT Ex e mb	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES TT Ex e mb	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 510 701 VES TT Ex e mb	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES TT Ex e mb	5/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 520 701 VES TT Ex e mb	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Solenoids are described on page 2.15.6.6.4.

Example drawings including the solenoid are displayed on page 2.15.6.6.5.

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

1/2" stainless steel valves in standard temperature range on request.

MA 52 EEx e mb IIC T6

When this solenoid system is used in combination with "ATEX certified" mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21 and 22.



Details of junction box

ATEX and IEC Ex approved encapsulated coil with junction box for gas and dust explosion-hazardous environment.

Voltage tolerance: - 10...+ 10%
 Relative duty cycle: 100 %
 Temperature range: -40°C...+50°C

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

Protection according to EN 60529: IP 65
 (IP 67 with nut type M G1/8 M5 in combination with exhaust protection fitting type ESR M5)

Moulding material: Thermoplasticpolyester

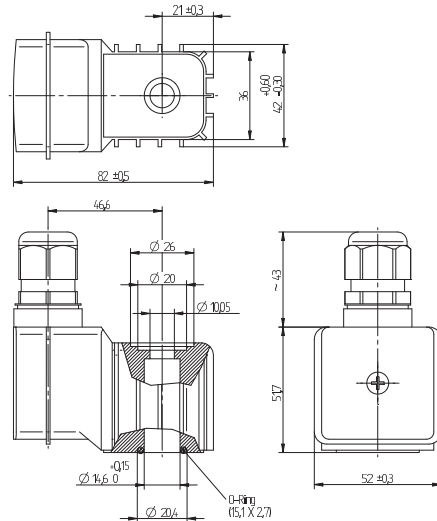
Cable Gland: M20 x 1,5
 for cable diameters 6 – 13 mm

Please note:
 Same coil for DC and AC.

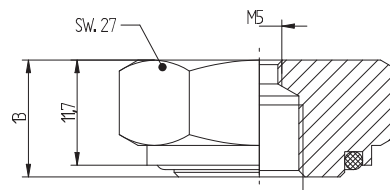
Marking on coil: II 2G Ex e mb IIC T6 Gb
 II 2D Ex tb mb IIC T80°C Db

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

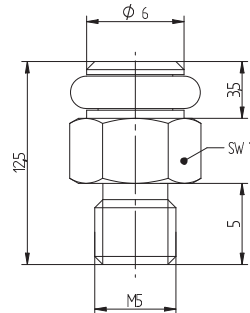
Important installation instructions:
 Connecting cables and connecting lines shall be suitable for permanent application in a temperature range of -40 °C up to +105 °C and must be laid fixed to the device. The user shall provide for a strain relief. When using silicone or silicone-containing cables for connection or cables that are not resistant to scoring, these shall be protected against mechanical damage. For further instructions, please ask us for the operating manual.



MA 52 EEx e mb IIC T6



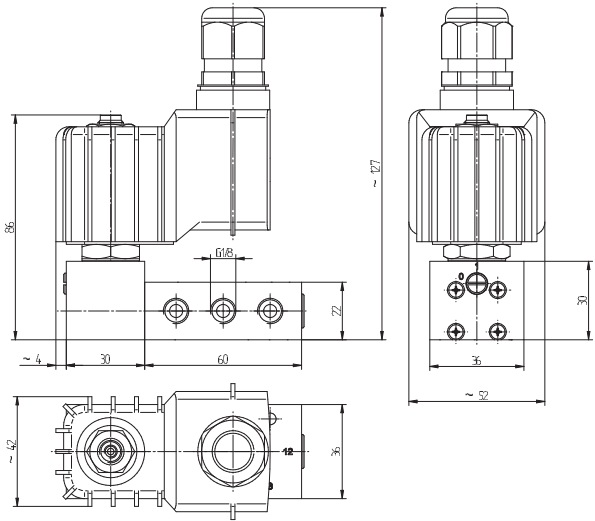
M G1/8 M5



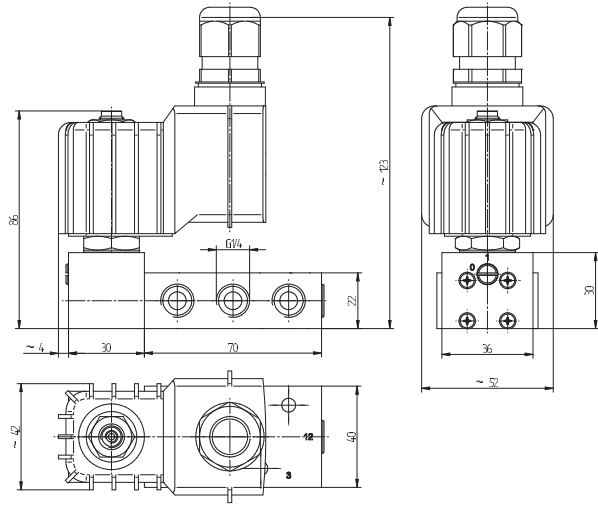
ESR M5

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

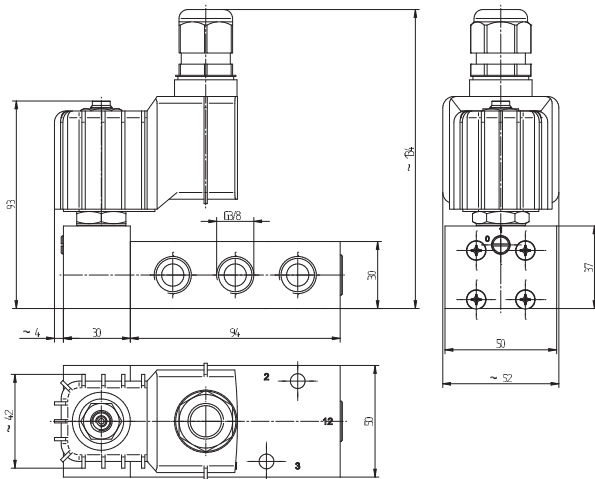
Example drawings of solenoid valves with Ex e mb solenoid system



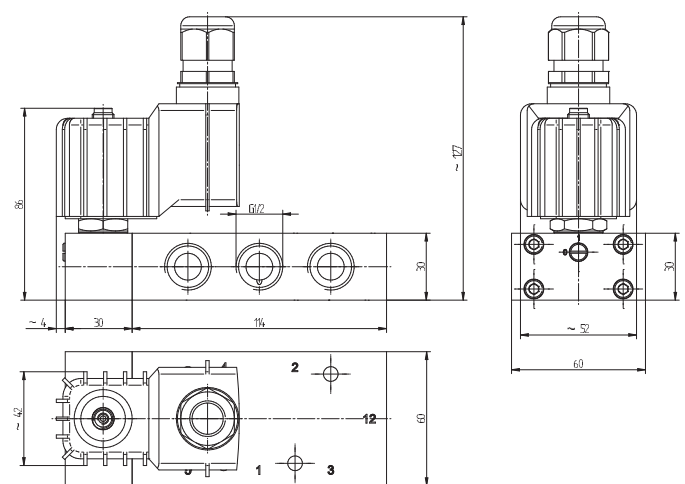
MH 510 501 Ex e mb IIC T6



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



MH 510 101 Ex e mb IIC T6



MH 510 121 Ex e mb IIC T6 /
MNH 510 121 Ex e mb IIC T6

ATEX-approved valves – Ex d – standard temperature range – aluminum



Material: Aluminum, anodized
 Zone: 1, 2, 21, 22
 Temperature range: -10°C ... +50°C
 Ignition protection type: Ex d – flameproof
 Temperature class: T6 (solenoid)

Marking on valve

CE Ex II 2 G Ex h IIC T6 Gb
 -10°C ≤ Ta ≤ +50°C
 CE Ex II 2 D Ex h IIIC T80°C
 Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 017 24DC Ex d M	3/2-way, direct acting	G 1/8"	banjo screw G 1/4"	2.15.4.1
MH 311 018 24DC Ex d m	3/2-way, direct acting	G 1/4"	in-line	2.15.4.1
MC 210 501 Ex	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MC 210 701 Ex	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MC 310 501 G Ex	3/2-way, single sol.	G 1/8"	in-line	2.5.1.1.10
MOC 310 501 G Ex	3/2-way, n.o. single sol.	G 1/8"	in-line	2.5.1.1.10
MC 310 701 G Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MOC 310 701 G Ex	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.5.1.1.10
MC 310 121 Ex	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MOC 310 121 Ex	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MC 510 501 G Ex	5/2-way, single sol.	G 1/8"	in-line	2.5.2.1.2
MC 510 701 G Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.2
MC 510 121 Ex	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MC 520 501 G Ex	5/2-way, double sol.	G 1/8"	in-line	2.5.2.1.5
MC 520 701 G Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.5.2.1.5
MC 520 121 Ex	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MC 53_ 501 G Ex	5/3-way, different versions	G 1/8"	in-line	2.5.3.1.2
MC 53_ 701 G Ex	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.5.3.1.2
MC 53_ 121 Ex	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3

Valves with interface according to NAMUR-standard

MNC 350 701 Ex	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.3
MNC 310 701 Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNC 311 701 Ex	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNC 310 711 Ex	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNC 310 121 Ex	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNC 311 121 Ex	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNC 510 701 Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNC 511 701 Ex	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNC 510 711 Ex	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNC 510 121 Ex	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNC 511 121 Ex	5/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNC 520 701 Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNC 520 121 Ex	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNC 53_ 701 Ex	5/3-way, different versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.4
MNC 53_ 121 Ex	5/3-way, centre closed	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.4

Interface between valve body and solenoid system according to CNOMO, therefore the types are called MC.

Base plate assembly due to solenoid coil is not possible.

Flameproof solenoids are displayed on page 2.15.6.7.5.

Example drawings including the solenoid are displayed on page 2.15.6.7.6.

Please note: If the valve is ordered fully assembled with the Ex d coil from page 2.15.6.7.5, the type number of the valve changes from MC to MH, MOC to MOH and MNC to MNH.

For example: MH 310 701 G 24DC Ex d

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

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



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

Marking on valve **CE** **Ex** II 2 G Ex h IIC T6 Gb
 -50°C ≤ Ta ≤ +50°C
CE **Ex** II 2 D Ex h IIIC T80°C
 Db -50°C ≤ Ta ≤ +50°C

The following **solenoid valves** are available:

Type	Function	Port size	Installation	Further inform. on valve
MC 310 701 GTT Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.12.7.1.2
MOC 310 701 GTT Ex	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.12.7.1.2
MC 510 701 GTT Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.12.7.2.1
MC 520 701 GTT Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.12.7.2.2
MC 53_ 701 GTT Ex	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.12.7.2.2

Valves with interface according to NAMUR-standard

MNC 310 701 TT Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNC 311 701 TT Ex	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.1
MNC 510 701 TT Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNC 511 701 TT Ex	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNC 510 711 TT Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.1
MNC 520 701 TT Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2
MNC 531 701 TT Ex	5/3-way, centre closed	G 1/4" - 1/4" NPT	1/4" NAMUR	2.12.8.2.2

Interface between valve body and solenoid system according to CNOMO, therefore the types are called MC.

Base plate assembly due to solenoid coil is not possible.

Flameproof solenoids are displayed on page 2.15.6.7.5.

Example drawings including the solenoid are displayed on page 2.15.6.7.6


Please note: If the valve is ordered fully assembled with the Ex d coil from page 2.15.6.7.5, the type number of the valve changes from MC to MH, MOC to MOH and MNC to MNH.

For example: MH 310 701 G 24DC Ex d



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

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



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

Marking on valve

 II 2 G Ex h IIC T6 Gb
 -10°C ≤ Ta ≤ +50°C
 II 2 D Ex h IIIC T80°C
 Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MC 310 701 VES Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOC 310 701 VES Ex	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MC 310 121 VES Ex	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.3
MC 510 701 VES Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MC 510 121 VES Ex	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.4
MC 520 701 VES Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MC 520 121 VES Ex	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.5
MC 53_ 701 VES Ex	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6
MC 53_ 121 VES Ex	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.13.4.6

Valves with interface according to NAMUR-standard

MNC 350 701 VES Ex	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNC 310 701 VES Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNC 311 701 VES Ex	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNC 310 121 VES Ex	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.1
MNC 510 701 VES Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNC 511 701 VES Ex	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNC 510 121 VES Ex	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.3
MNC 520 701 VES Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Interface between valve body and solenoid system according to CNOMO, therefore the types are called MC.

Base plate assembly due to solenoid coil is not possible.

Flameproof solenoids are displayed on page 2.15.6.7.5.

Example drawings including the solenoid are displayed on page 2.15.6.7.6.



Please note: If the valve is ordered fully assembled with the Ex d coil from page 2.15.6.7.5, the type number of the valve changes from MC to MH, MOC to MOH and MNC to MNH.



For example: MH 310 701 G 24DC Ex d

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

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



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

Marking on valve  II 2 G Ex h IIC T6 Gb
 -50°C ≤ Ta ≤ +50°C
 II 2 D Ex h IIIC T80°C
 Db -50°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MC 310 701 VES TT Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOC 310 701 VES TT Ex	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MC 510 701 VES TT Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MC 520 701 VES TT Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MC 53_701 VES TT Ex	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6

ValVES TT with interface according to NAMUR-standard

MNC 350 701 VES TT Ex	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNC 310 701 VES TT Ex	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNC 311 701 VES TT Ex	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNC 510 701 VES TT Ex	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNC 511 701 VES TT Ex	5/2-way, comb. Spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNC 520 701 VES TT Ex	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

Interface between valve body and solenoid system according to CNOMO, therefore the types are called MC.
 Base plate assembly due to solenoid coil is not possible.
 Flameproof solenoids are displayed on page 2.15.6.7.5.
 Example drawings including the solenoid are displayed on page 2.15.6.7.6.


Please note: If the valve is ordered fully assembled with the Ex d coil from page 2.15.6.7.5, the type number of the valve changes from MC to MH, MOC to MOH and MNC to MNH.
 For example: MH 310 701 G 24DC Ex d.
 Delivery contains valve with appropriate operator system, coil, manual and declaration of conformity.

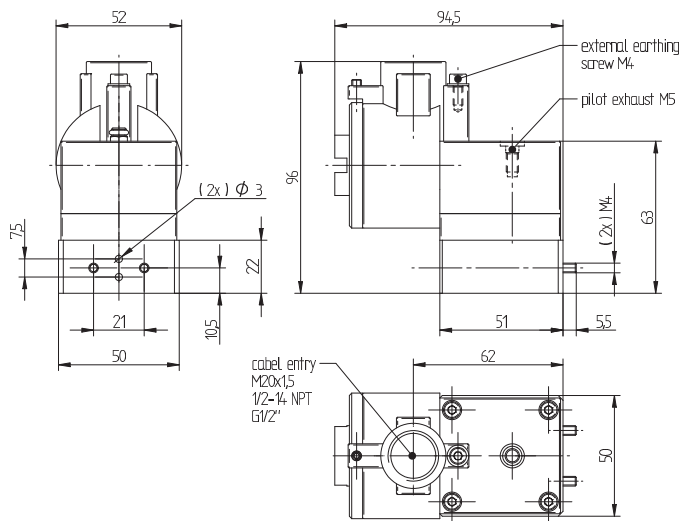
MH 52 Ex d/MH 52 VES Ex d

When this solenoid system is used in combination with "ATEX certified" mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21 and 22.



ATEX and IECEx approved flameproof coil for gas and dust explosion hazardous environment.

Voltages:	24VDC, 110VAC, 230VAC
Voltage tolerance:	- 10...+ 10 %
Relative duty cycle:	100 %
Temperature range:	-40°C...+50°C (please consider temperature range of the selected valve)
Ignition protection type:	Flameproof
Protection according to EN 60529:	IP 67
Coil rating according to DIN VDE 0580:	Class F
Wire class:	H
Ex-marking on coil:	 II 2G Ex db IIC T6 Gb II 2D Ex tb IIIC T80°C Db
Manual override:	bistable to turn, others on request



MH 52 (VES) Ex d

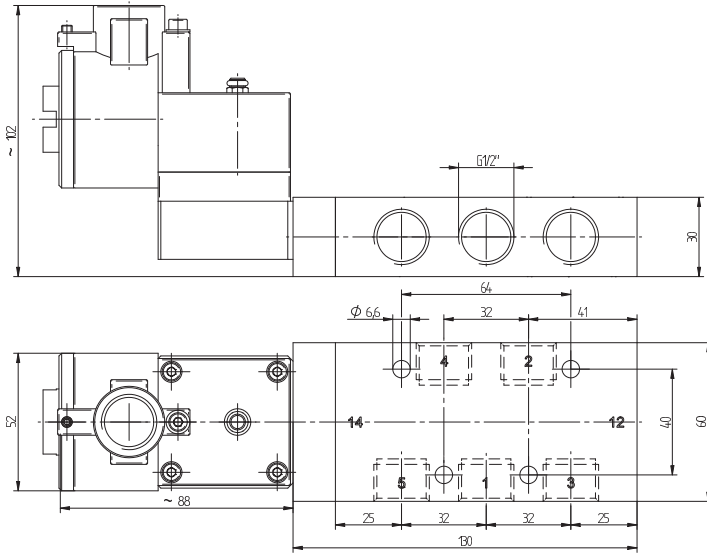
Delivery content without cable gland. Ex d rated cable glands can be supplied on request.

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

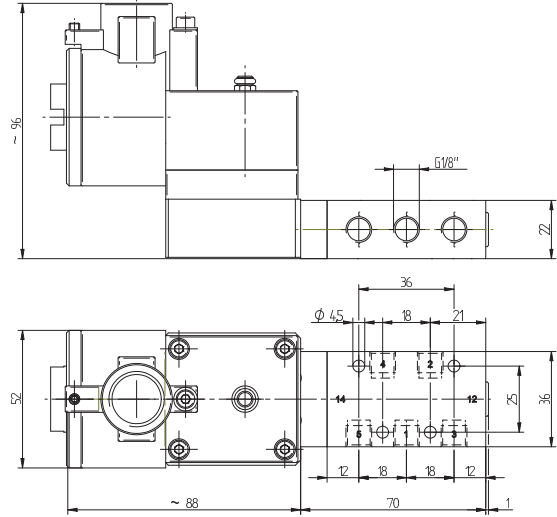
Type	Pilot-head	Operating press.	Power cons.	Temperature class	Weight
MH 52 24DC Ex d *	Aluminum	max. 10 bar	2.0 Watt	T6 (85° C)	1,15 kg
MH 52 VES 24DC Ex d *	Stainless steel	max. 10 bar	2.0 Watt	T6 (85° C)	1,45 kg
MH 52 110AC Ex d *	Aluminum	max. 10 bar	3.0 VA	T6 (85° C)	1,15 kg
MH 52 VES 110AC Ex d *	Stainless steel	max. 10 bar	3.0 VA	T6 (85° C)	1,45 kg
MH 52 230AC Ex d *	Aluminum	max. 10 bar	3.0 VA	T6 (85° C)	1,15 kg
MH 52 VES 230AC Ex d *	Stainless steel	max. 10 bar	3,0 VA	T6 (85° C)	1,45 kg

* Please add letter for cable gland thread: - M = M20x1.5
- N = 1/2-14 NPT

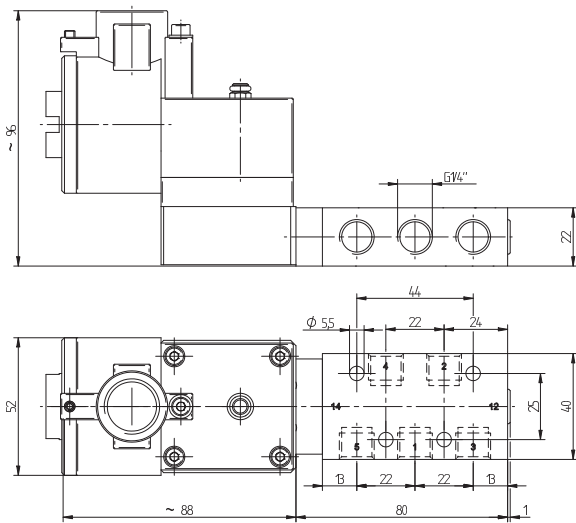
Example drawings of solenoid valves with Ex d solenoid system



MC 510 501 Ex d



**MC 510 701 Ex d/
MNC 510 701 Ex d**



**MC 510 121 Ex d/
MNC 510 121 Ex d**

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



Material:	Aluminum, anodized
Zone:	1, 2, 21, 22
Temperature range:	-10°C ... +50°C
Ignition protection type:	Ex dm (encapsulated-flameproof with junction box)
Temperature class:	T5
Marking on valve:	CE Ex II 2 G Ex h IIC T6 Gb -10°C ≤ Ta ≤ +50°C CE Ex II 2 D Ex h IIIC T80°C Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 210 501 Ex dm	2/2-way, single sol.	G 1/8"	in-line	2.5.1.1.9
MH 210 701 Ex dm	2/2-way, single sol.	G 1/4"	in-line	2.5.1.1.9
MH 311 012 Ex dm	3/2-way direct acting	M5	in-line	2.5.1.1.2
MH 311 015 Ex dm	3/2-way direct acting	G 1/8"	in-line	2.5.1.1.2
MH 310 501 G Ex dm	3/2-way, single sol.	G 1/8"	dual use*	2.5.1.1.10
MOH 310 501 G Ex dm	3/2-way, n.o. single sol.	G 1/8"	dual use*	2.5.1.1.10
MH 310 701 G Ex dm	3/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MOH 310 701 G Ex dm	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.1.1.10
MH 310 101 Ex dm	3/2-way, single sol.	G 3/8"	in-line	2.5.1.1.11
MOH 310 101 Ex dm	3/2-way, n.o. single sol.	G 3/8"	in-line	2.5.1.1.11
MH 310 101 G Ex dm	3/2-way, single sol.	G 3/8"	dual use*	2.5.1.1.11
MOH 310 101 G Ex dm	3/2-way, n.o. single sol.	G 3/8"	dual use*	2.5.1.1.11
MH 310 121 Ex dm	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MOH 310 121 Ex dm	3/2-way, n.o. single sol.	G 1/2" - 1/2" NPT	in-line	2.5.1.1.11
MH 310 181 Ex dm	3/2-way, single sol.	G 3/4"	in-line	2.5.1.1.11
MOH 310 181 Ex dm	3/2-way, n.o. single sol.	G 3/4"	in-line	2.5.1.1.11
MH 510 501 G Ex dm	5/2-way, single sol.	G 1/8"	dual use*	2.5.2.1.2
MH 510 701 G Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.2
MH 510 101 Ex dm	5/2-way, single sol.	G 3/8"	in-line	2.5.2.1.3
MH 510 121 Ex dm	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.3
MH 510 181 Ex dm	5/2-way, single sol.	G 3/4"	in-line	2.5.2.1.3
MH 520 501 G Ex dm	5/2-way, double sol.	G 1/8"	dual use*	2.5.2.1.5
MH 520 701 G Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	dual use*	2.5.2.1.5
MH 520 101 Ex dm	5/2-way, double sol.	G 3/8"	in-line	2.5.2.1.6
MH 520 121 Ex dm	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.5.2.1.6
MH 520 181 Ex dm	5/2-way, double sol.	G 3/4"	in-line	2.5.2.1.6
MH 53_ 501 G Ex dm	5/3-way, diff. versions	G 1/8"	dual use*	2.5.3.1.2
MH 53_ 701 G Ex dm	5/3-way, diff. versions	G 1/4" - 1/4" NPT	dual use*	2.5.3.1.2
MH 53_ 101 Ex dm	5/3-way, diff. versions	G 3/8"	in-line	2.5.3.1.3
MH 53_ 121 Ex dm	5/3-way, diff. versions	G 1/2" - 1/2" NPT	in-line	2.5.3.1.3

Valves with interface according to NAMUR-standard

MNH 350 701 Ex dm	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.3
MNH 310 701 Ex dm	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 311 701 Ex dm	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.1.1
MNH 310 711 Ex dm	3/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.1.1
MNH 310 121 Ex dm	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 311 121 Ex dm	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.1.2
MNH 510 701 Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 511 701 Ex dm	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.1
MNH 510 711 Ex dm	5/2-way, single sol.	G 1/4"	1/4" NAMUR	2.10.1.2.1
MNH 510 121 Ex dm	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 511 121 Ex dm	3/2-way, comb. spring	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.2
MNH 520 701 Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.2.3
MNH 520 121 Ex dm	5/2-way, double sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.2.3
MNH 53_ 701 Ex dm	5/3-way, diff. versions	G 1/4" - 1/4" NPT	1/4" NAMUR	2.10.1.4
MNH 53_ 121 Ex dm	5/3-way, diff. versions	G 1/2" - 1/2" NPT	1/2" NAMUR	2.10.1.4

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




Encapsulated flameproof solenoids are displayed on page 2.15.6.8.3.

A low temperature version for -20°C ... +50°C is also available on request. Please note that the system is restricted by the minimum ambient temperature for the coil of -20°C.

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

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



Material:	Stainless steel, 316L 
Zone:	1, 2, 21, 22
Temperature range:	-10°C ... +50°C
Ignition protection type:	Ex dm (encapsulated-flameproof with junction box)
Temperature class:	T5
Marking on valve:	 II 2 G Ex h IIC T6 Gb -10°C ≤ Ta ≤ +50°C  II 2 D Ex h IIC T80°C Db -10°C ≤ Ta ≤ +50°C

The following solenoid valves are available:

Type	Function	Port size	Installation	Further inform. on valve
MH 311 015 VES Ex dm	3/2-way direct acting	G 1/8"	in-line	2.13.4.1
MH 310 701 VES Ex dm	3/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MOH 310 701 VES Ex dm	3/2-way, n.o. single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.2
MH 310 121 VES Ex dm	3/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.3
MH 510 701 VES Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.4
MH 510 121 VES Ex dm	5/2-way, single sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.4
MH 520 701 VES Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	in-line	2.13.4.5
MH 520 121 VES Ex dm	5/2-way, double sol.	G 1/2" - 1/2" NPT	in-line	2.13.4.5
MH 53_ 701 VES Ex dm	5/3-way, different versions	G 1/4" - 1/4" NPT	in-line	2.13.4.6
MH 53_ 121 VES Ex dm	5/3-way, different versions	G 1/2" - 1/2" NPT	in-line	2.13.4.6

Valves with interface according to NAMUR-standard

MNH 350 701 VES Ex dm	3/2-way & 5/2-way	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.4
MNH 310 701 VES Ex dm	3/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 311 701 VES Ex dm	3/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.1
MNH 310 121 VES Ex dm	3/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.1
MNH 510 701 VES Ex dm	5/2-way, single sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 511 701 VES Ex dm	5/2-way, comb. spring	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2
MNH 510 121 VES Ex dm	5/2-way, single sol.	G 1/2" - 1/2" NPT	1/2" NAMUR	2.13.5.3
MNH 520 701 VES Ex dm	5/2-way, double sol.	G 1/4" - 1/4" NPT	1/4" NAMUR	2.13.5.2

If the coil will be used with a NAMUR-valve of series 700, an 8 mm distance plate is required. Please contact us. Encapsulated flameproof solenoids are displayed on page 2.15.6.8.3.

A low temperature version for -20°C ... +50°C is also available on request. Please note that the system is restricted by the minimum ambient temperature for the coil of -20°C.

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

MA 36 EEx dm IIC T5

When this solenoid system is used in combination with "ATEX certified" mechanical components conforming EN 13463-1:2001 and PrEN 13463-5:2000, the entire valve can be used in explosive hazardous environment zone 1, 2, 21 and 22.



ATEX approved encapsulated coil with flameproof junction box for gas and dust explosion-hazardous environment.

Voltages: 12VDC, 24VDC, 24VAC, 110VAC, 230VAC

Voltage tolerance: - 10...+ 10%

Relative duty cycle: 100 %

Temperature range: -20°C...+50°C

Ignition protection type: Coil encapsulated, junction box flameproof

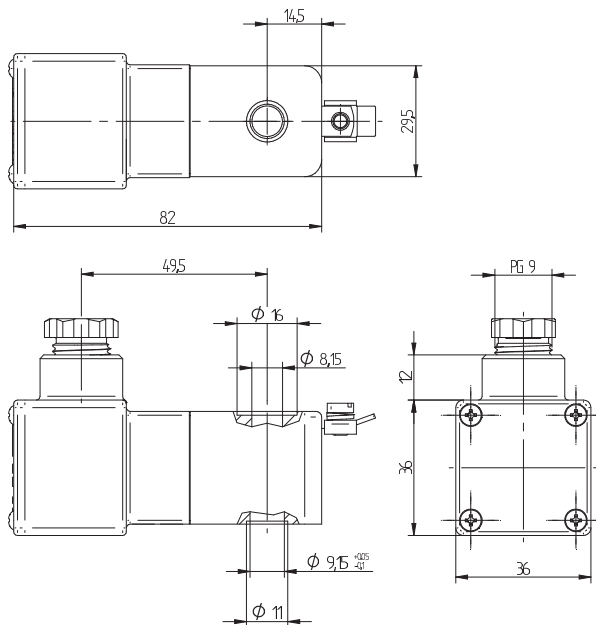
Protection with connector according to EN 60529: IP 66

Moulding material: Thermoplasticpolyester

Coil rating according to DIN VDE 0580: Class F

Cable Gland: PG 9 DIN 40-430 for cable diameters 6 – 8 mm

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



MA 36 EEx dm IIC T5_ _

As the coil is 36 mm wide, a spacer plate called "ZPN 8" has to be used, in case of combination with our NAMUR-valve series 700. If used with NAMUR-valve series 121 a spacer plate called "ZPN 6-5" has to be used. You can find both plates on page 2.11.13.

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

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