

3/2-WAY QUICK EXHAUST SAFETY VALVES

SERIES MD SAFEMAX



- According to Machinery Directive 2006/42/CE
- Integrated 24 V
- Easy integration with Series MD FRL units
- Solutions to reach Performance Level E
- OFF status valve signaling LEDs

Series MD SAFEMAX solenoid valves are equipped with an integrated sensor that detects the position of the spool and enables to quickly exhaust the system in case of emergency.

The sensor is in ON status (LED switched on, electric contact closed) when the valve is in rest position (NC).

The single channel valve is classified in category 2 and can reach Performance level D.

The double channel valve is classified in category 4 and can reach Performance level E.

The user is responsible to perform the installation in compliance with the requirements of the ISO EN 13849-1 standard.

Please note: the safety valve is not sufficient, alone, to guarantee the safety function. Its setup requires the use of a monitoring device.

The Machinery Directive (MD) 2006/42 / EC establishes the safety requirements that a machine must respect in order to protect the health of people during its use.

Series MD SAFEMAX solenoid valves comply with ISO 13849-1, regarding the safe design of control systems that perform safety functions.

General Data

Type of construction	Modular, compact, spool-type
Materials	See TABLE OF MATERIALS on the following page
Ports	Interchangeable threaded cartridges with thread G1/8, G1/4, G3/8, 1/8 NPTF, 1/4 NPTF or 3/8 NPTF or super-rapid fitting for tube Ø6, Ø8 and Ø10 mm or Ø1/4", Ø5/16" and Ø3/8"
Mounting	In-line
Working temperature	-5°C ÷ 50°C
Working pressure	2 ÷ 10 bar
Nominal range of use	See FLOW RATE GRAPHS on the next pages
Fluid	Compressed air
Flow rate	Single version: 1→2 = 1900 NL/min 2→3 (6 bar; ΔP 1) = 1150 NL/min (free flow; 6 bar, with silencer and exhaust into the atmosphere) Double version: 1→2 = 1420 NL/min 2→3 (6 bar; ΔP 1) = 1150 NL/min (free flow; 6 bar, with silencer and exhaust into the atmosphere)
Category and PL	Single version Cat. 2 up to PL d Double version Cat. 4 up to PL e
B10d	2.000.000 cycles
Protection class	IP 65
Response time when discharging (ISO 12238)	120 ms
COIL CHARACTERISTICS	
Coil connection	DIN EN 175-301-803-B
Coil power supply voltage	24V DC (±10%) 3,1W (ED 100%)
SENSOR CHARACTERISTICS	
Sensor connection	With wires, M8
Sensor power supply voltage	10-30V DC
Operation	Magnetoresistive
Type of contact	N.O. PNP, signal ON with solenoid valve in NC position
Maximum current	200 mA

3/2-WAY QUICK EXHAUST SAFETY VALVES
SERIES MD SAFEMAX - CODING EXAMPLES

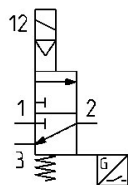
Coding example

MD	1	-	V	16	2	1	B	-	3/8	-	ST
MD	SERIES										
1	SIZE										
V	COMPONENT 3/2-way valve										
16	CONSTRUCTION Internal servo-pilot										
2	CHANNEL 2 = Single 4 = Double										
1	ACCESSORIES 0 = Without silencer 1 = With silencer										
B	SENSOR A = CE sensor, cable length 2 m B = CE sensor, cable length 5 m C = CE sensor, M8 connector										
3/8	PORT = Without cartridge 1/8 = G1/8 1/4 = G1/4 3/8 = G3/8 6 = Tube Ø6 8 = Tube Ø8 10 = Tube Ø10 1/8TF = 1/8 NPTF 1/4TF = 1/4 NPTF 3/8TF = 3/8 NPTF 04TF = Tube Ø1/4" 05TF = Tube Ø5/16" 06TF = Tube Ø3/8"										
ST	MOUNTING = Without mounting accessories ST = Rear bracket D = Through-bolts										

N.B.: if the inlet cartridge (IN) is different than the outlet cartridge (OUT), both dimensions must be stated. The inlet cartridge (IN) must be larger than or equal to the outlet cartridge (OUT), for example: MD1-V1621B-3/8-1/4-ST.

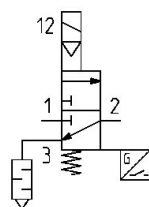
3/2-WAY QUICK EXHAUST SAFETY VALVES
SERIES MD SAFEMAX - PNEUMATIC SYMBOLS**Symbols for single version**

SF01

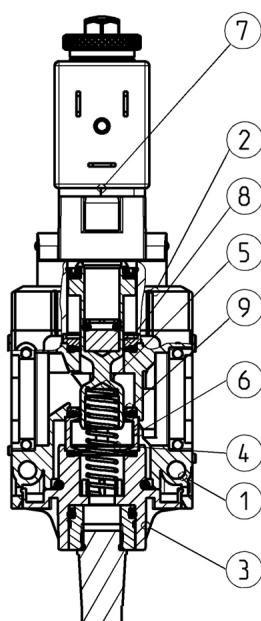


without silencer

SF03



with silencer

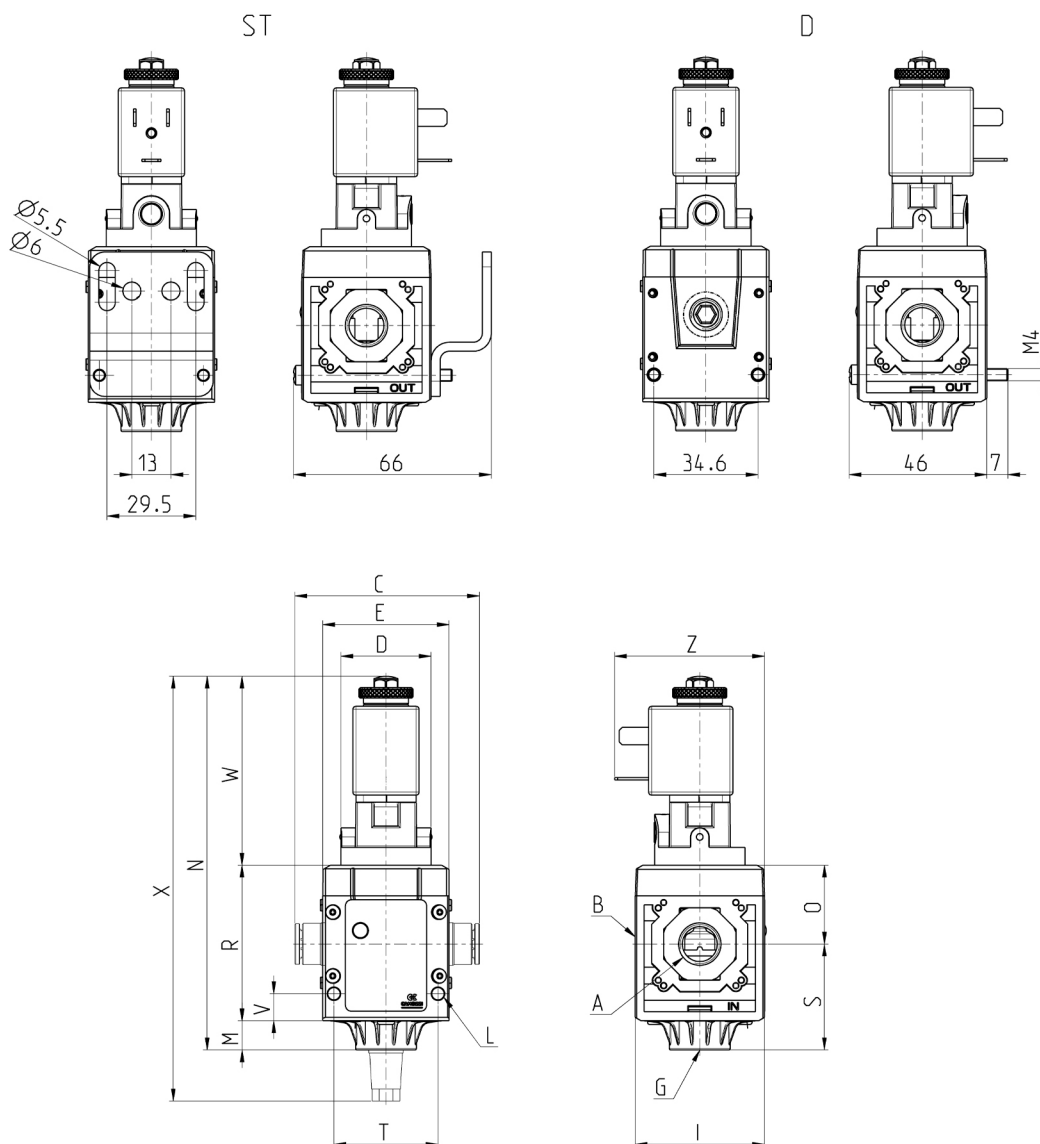
Series MD SAFEMAX single valve - materials

PARTS	MATERIALS
1 - Body	PA
2 - Covering	PA
3 - Cover	PA + brass
4 - Spring	Steel
5 - Spool	Steel, NBR, neodymium
6 - Cage element	Brass
7 - Solenoids	Copper, brass, steel, PET
8 - Spacer	Brass
9 - Spacer	Brass
O-ring and seals	NBR, FKM

AIR TREATMENT

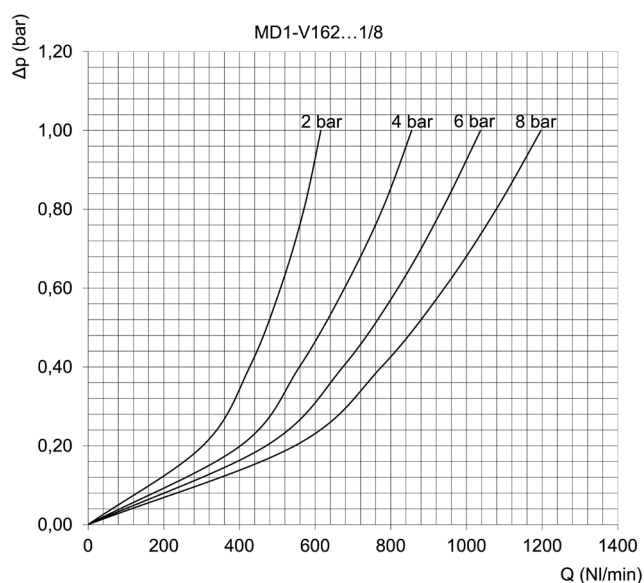
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Series MD SAFEMAX single valve



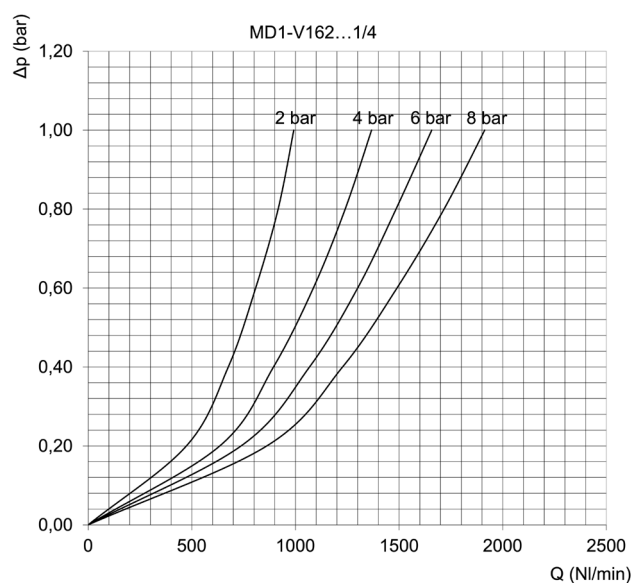
Mod.	A	C	D	E	G	I	L	M	N	O	R	S	T	V	X	Z	W	Weight (Kg)
MD1-V1620°-..	-	42	Ø30	42	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,3
MD1-V1620°-..	G1/8	42	Ø30	42	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,3
MD1-V1620°-..	G1/4	42	Ø30	42	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,3
MD1-V1620°-..	G3/8	42	Ø30	42	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,3
MD1-V1620°-..	Ø6	47	Ø30	42	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,3
MD1-V1620°-..	Ø8	62	Ø30	42	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,3
MD1-V1620°-..	Ø10	67	Ø30	42	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,3
MD1-V1621°-..	-	42	Ø30	42	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,3
MD1-V1621°-..	G1/8	42	Ø30	42	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,3
MD1-V1621°-..	G1/4	42	Ø30	42	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,3
MD1-V1621°-..	G3/8	42	Ø30	42	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,3
MD1-V1621°-..	Ø6	47	Ø30	42	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,3
MD1-V1621°-..	Ø8	62	Ø30	42	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,3
MD1-V1621°-..	Ø10	67	Ø30	42	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,3

FLOW RATE GRAPHS



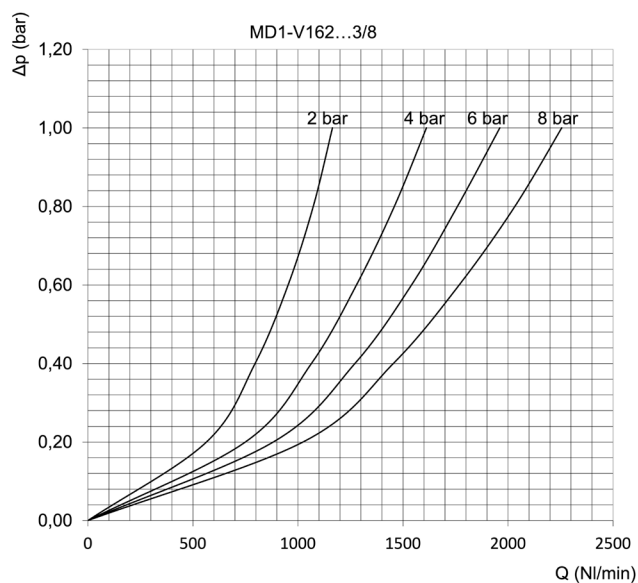
Ports with interchangeable G1/8 threaded cartridges

Δp = Pressure drop (bar)
Q = Flow (NL/min)



Ports with interchangeable G1/4 threaded cartridges

Δp = Pressure drop (bar)
Q = Flow (NL/min)



Ports with interchangeable G3/8 threaded cartridges

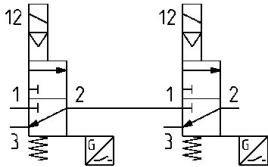
Δp = Pressure drop (bar)
Q = Flow (NL/min)

3/2-WAY QUICK EXHAUST SAFETY VALVES
SERIES MD SAFEMAX - PNEUMATIC SYMBOLS

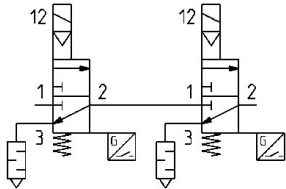
Symbols for double version

SF05

SF07

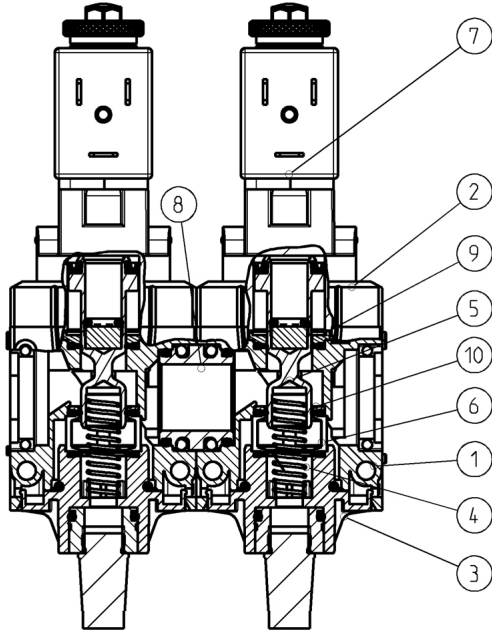


without silencer



with silencer

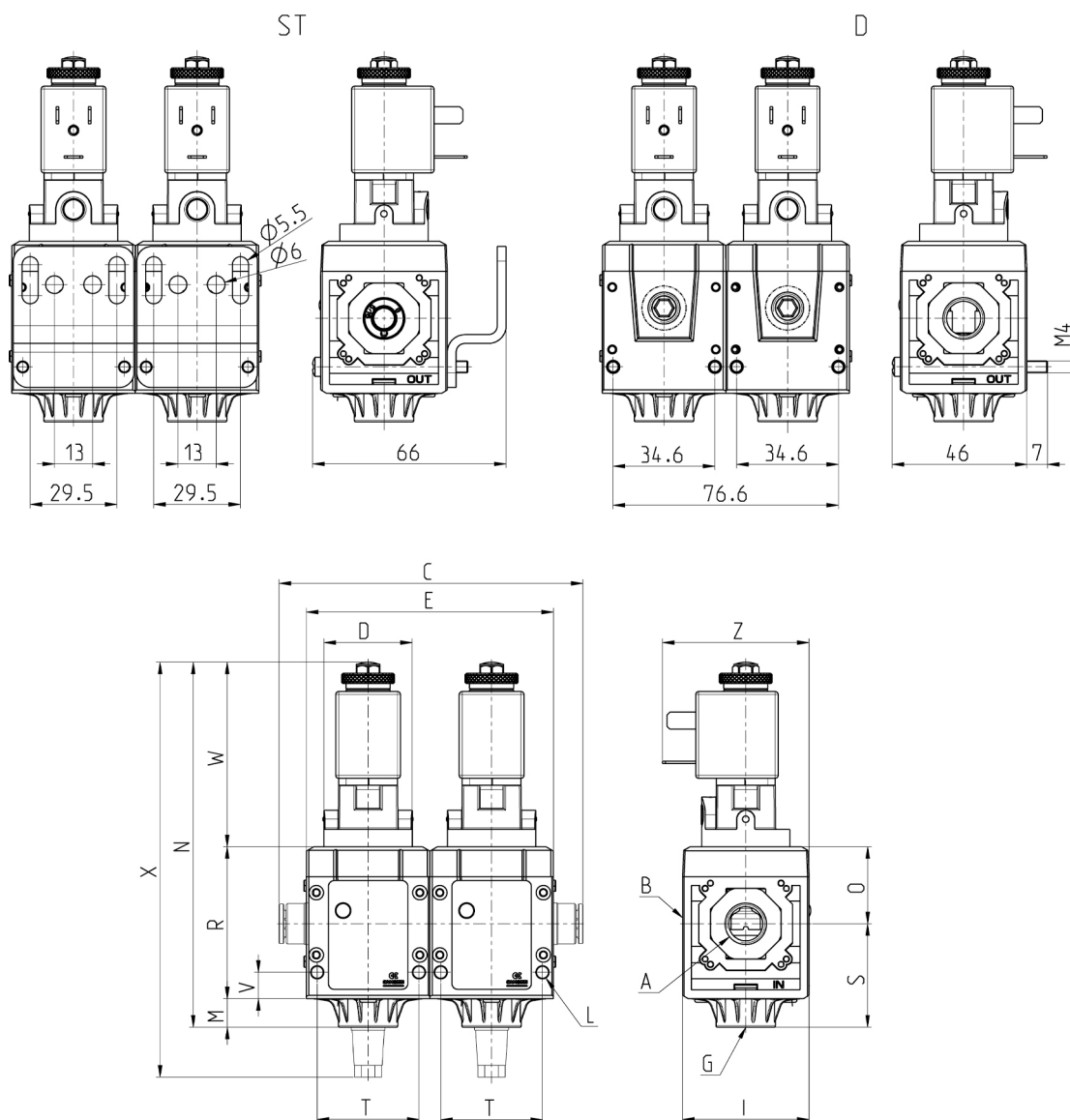
Series MD SAFEMAX double valve - materials



PARTS	MATERIALS
1 - Body	PA
2 - Covering	Polyamide
3 - Cover	PA + Brass
4 - Spring	Steel
5 - Spool	Steel, NBR, Neodymium
6 - Cage element	Brass
7 - Solenoids	Copper, Brass, Steel, PET
8 - Nipple	Nickel-plated Brass + NBR
9 - Spacer	Brass
10 - Spacer	Brass
O-ring and seals	NBR, FKM
Sensor	Electronic waste

3/2-WAY QUICK EXHAUST SAFETY VALVES SERIES MD SAFEMAX - DIMENSIONS

Series MD SAFEMAX double valve



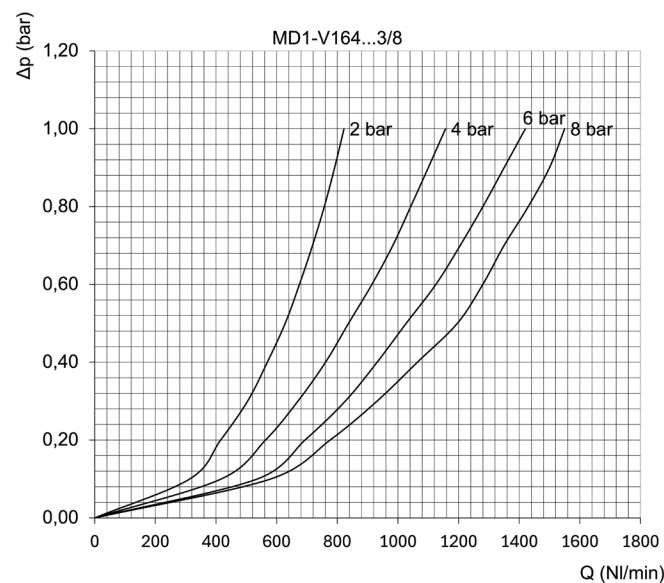
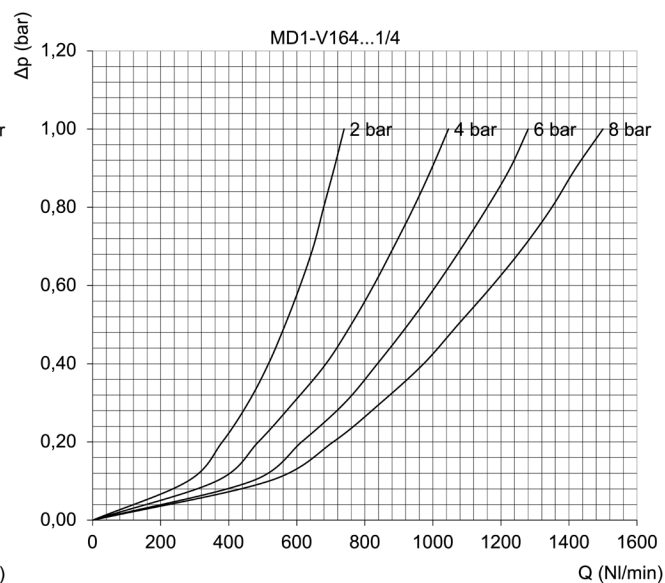
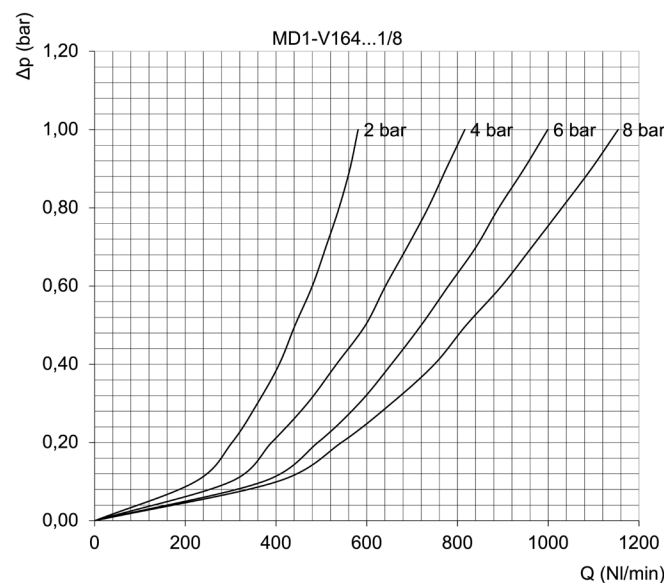
AIR TREATMENT

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Mod.	A	C	D	E	G	I	L	M	N	O	R	S	T	V	X	Z	W	Weight (Kg)
MD1-V1640°-...	-	84	Ø30	84	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,6
MD1-V1640°-...	G1/8	84	Ø30	84	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,6
MD1-V1640°-...	G1/4	84	Ø30	84	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,6
MD1-V1640°-...	G3/8	84	Ø30	84	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,6
MD1-V1640°-...	Ø6	94	Ø30	84	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,6
MD1-V1640°-...	Ø8	124	Ø30	84	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,6
MD1-V1640°-...	Ø10	134	Ø30	84	G1/8	43	Ø4	9,5	124	26,2	51,7	35,1	34,6	9	-	50	63	0,6
MD1-V1641°-...	-	84	Ø30	84	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,6
MD1-V1641°-...	G1/8	84	Ø30	84	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,6
MD1-V1641°-...	G1/4	84	Ø30	84	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,6
MD1-V1641°-...	G3/8	84	Ø30	84	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,6
MD1-V1641°-...	Ø6	94	Ø30	84	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,6
MD1-V1641°-...	Ø8	124	Ø30	84	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,6
MD1-V1641°-...	Ø10	134	Ø30	84	G1/8	43	Ø4	9,5	-	26,2	51,7	35,1	34,6	9	141	50	63	0,6

3/2-WAY QUICK EXHAUST SAFETY VALVES
SERIES MD SAFEMAX - DIAGRAMS

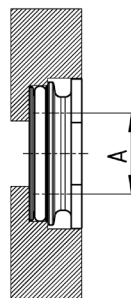
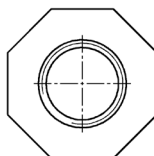
FLOW RATE GRAPHS



Threaded cartridges Mod. MD1-A-...



Supplied with:
 2x nickel-plated threaded cartridges
 4x special white zinc-plated screws Ø4,5 TC/RC

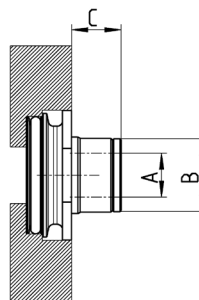


Mod.	A
MD1-A-1/8	G1/8
MD1-A-1/4	G1/4
MD1-A-3/8	G3/8
MD1-A-1/8TF	1/8 NPTF
MD1-A-1/4TF	1/4 NPTF
MD1-A-3/8TF	3/8 NPTF

Integrated cartridges with super-rapid fitting Mod. MD1-A-...



Supplied with:
 2x integrated nickel-plated cartridges with super-rapid fitting
 4x special white zinc-plated screws Ø4,5 TC/RC

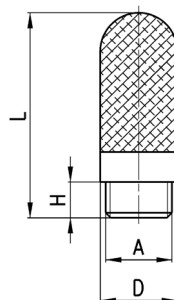


Mod.	A	B	C
MD1-A-6	Ø6	12,7	8,5
MD1-A-8	Ø8	14,2	10
MD1-A-10	Ø10	16,5	12,5
MD1-A04TF	Ø1/4"	12,7	8,5
MD1-A-05TF	Ø5/16"	14,2	10
MD1-A-06TF	Ø3/8"	16,5	12,5

Silencers Series 2928

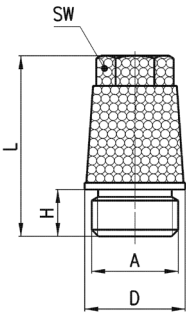


Operating temperature:
 - 40 / + 80 °C



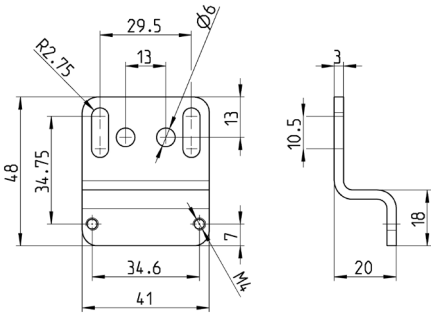
Mod.	A	D	H	L	Max. oper. pressure	Flow rate (NL/min)	Noise db (A)
2928 1/8	G1/8	12,9	6,5	34,5	10	1450	67

Silencers Series 2921



Mod.	A	D	H	L	SW	Max. oper. pressure	Flow rate (NL/min)	Noise db (A)
2921 1/8	G1/8	12	4,5	21,5	8	10	1730	81

Rear bracket Mod. MD1-ST/1



Mod.
MD1-ST/1

Screws for wall mounting Mod. MD1-D



Mod.
MD1-D

Series MD SAFEMAX
3/2-way quick exhaust safety valves
Use and maintenance instructions

Mat. 93-7534-0054 Rev.-- Doc. 5000069845 Ver.00
(This is a translation of the original instructions)

Series MD SAFEMAX cut-off valves allow supply and a safe and quick exhaust of the pneumatic circuit. The valve integrates a sensor that reads the position of the spool, making the valve status available. The products comply with the following technical standards: EN ISO 4414:2010 - Pneumatic fluid power – General rules and safety requirements for systems and their components; EN ISO 13849-1 that establishes safety requirements and provides guidance on the design and integration of components, classifies the single valve suitable for use in systems up to category 4.

For more information regarding the declarations of conformity, see the Certifications section on the website http://shop.camozzi.com

Table with 2 columns: Feature, Specification. Rows include Safety function, Mission time, Construction, Ports, Mounting, Operating temperature, Operating pressure, Flow, Medium, Sound pressure level, Maximum value of the weighted instantaneous sound pressure, Response time, COIL SPECIFICATIONS, Connection, Voltage, SENSOR SPECIFICATIONS, Connection, Voltage, Operation, Type of contact, Max. current, COMPLIANCE WITH EN ISO 13849-1 STANDARD, Performance level, Solenoid valve reliability data.

The person responsible for the correct implementation of the safety solution, compliance with the directives and regulations in force, the fulfillment of the PL in accordance with UNI EN ISO 13849-1, the execution of an overall risk analysis, for example in accordance with UNI EN ISO 12100 is the manufacturer of the final machinery.

The safety modules used to manage and control the solenoid valves that comply with the Machinery Directive, periodically provide test pulses to check the presence of short-circuits and the functioning of the outputs related with their ability to switch off. These test pulses have a different duration depending on the manufacturer of the PLC. The Series MD Safemax quick exhaust safety valves can receive test pulses of maximum 2 ms without generating malfunctions or false switchings. In case the PLC is programmed to provide longer pulses and it is not possible to reduce their duration, it is necessary to deactivate these pulses to avoid abnormal switchings.

2 General recommendations

Please comply with the recommendations for safe use described in this document. These recommendations are classified so as to identify the level of danger and the possible associated risk.

- WARNING In extreme conditions, errors or carelessness could lead to serious injury or death
- Some hazards can be associated with the product only after it has been installed on the machine/equipment. It is the responsibility of the end user to identify these hazards and reduce the risks associated with them.
- For information regarding the reliability of the components, contact Camozzi Automation.
- Read the information in this document carefully before using the product.
- Keep this document in a safe place and close at hand for the whole of the product life cycle.
- Pass this document on to any subsequent holder or user.
- The instructions in this manual must be followed in combination with the instructions and further information regarding the product described in this manual, which can be found using the following references:
 - Website www.catalogue.camozzi.com
 - Camozzi Automation Valves and solenoid valves Catalogue
 - Customer Service
- Assembly and commissioning must be performed by qualified and authorised personnel only, according to these instructions.
- It is the responsibility of the system/machine designer to choose correctly the most appropriate pneumatic component according to the required use.

The use of appropriate personal protection is recommended minimise the risk of injury.

- For all those situations of use not covered in this manual and in situations in which damage could be caused to property, persons or animals, contact Camozzi Automation before use.
- Do not make unauthorised modifications to the product. In the event of any such modifications, the user shall be liable for any possible damage caused to property, persons or animals.
- It is recommended to comply with all safety regulations that apply to the product.
- Do not perform any maintenance on the machine/system until you have verified the safety of work conditions.
- Before installation or maintenance, make sure that the specifically designed safety locks have been activated, then shut down the electricity power supply (where necessary) and the system pressure supply, draining all the residual compressed air from the system and deactivating the residual energy stored in springs, condensers, containers and gravity.
- After installation or maintenance, reconnect the system's pressure and electricity supply (where necessary) and check the proper operation and tightening of the product.
- In case of leaks or malfunctioning, the product must not be put into operation.
- Do not wash the product with aggressive substances or varnish it before consulting Camozzi Automation.

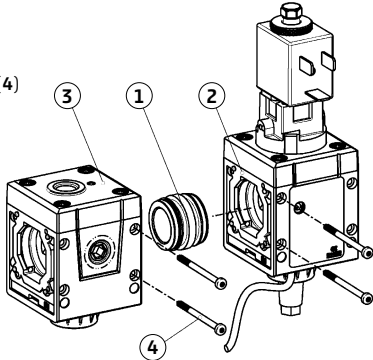
3 Installation and commissioning

- Do not install the product in the presence or proximity of strong electromagnetic fields or large masses of ferromagnetic material
- When unpacking, take great care not to damage the product.
- Check for any defects caused by transport or storage of the product.
- Remove all the securing/locking devices of the moving parts.
- Separate the packaging materials for recycling or disposal according to the regulations in force in your country.
- Before operating the component, check that the characteristics and performance stated in the catalogue correspond to those required.
- Use appropriate overpressure protection devices when installing the component.
- Prevent, as far as possible, any sudden changes in pressure in the circuit on which the component is installed.
- Ensure that the air discharged from the component is conveyed to an area where it cannot cause danger to the surrounding equipment and persons.
- When installing the component, make sure that there is no danger due to mechanical movements.
- Install the component in an area where set-up and maintenance can be easily performed and do not lead to hazards for the operator.
- Check the proper operation of the product at least once a month. In case of long periods of inactivity of the product, check its proper operation before starting the system.

4 Assembly instructions

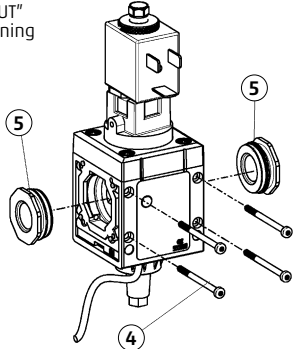
4.1 Connection of modules with nipple

- Insert the nipple (1) into an "IN" or an "OUT" seat of a mounting module (2)
- Bring the two modules (2) and (3) closer together
- Fix the two modules with the screws (4) tightening into the appropriate holes



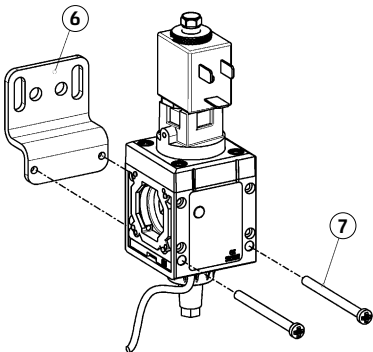
4.2 Assembly of the threaded connections

- Insert the connection (5) into an "IN" or an "OUT"
- Fix the connections with the screws (4) tightening into the appropriate holes

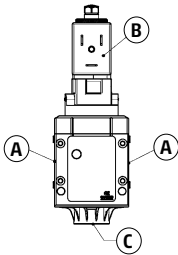


4.3 Assembly of bracket

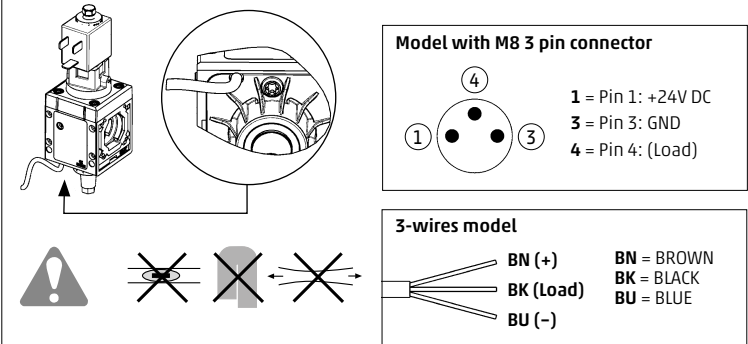
- Place the bracket (6) on the valve
- Tighten the screws (7) (max 2Nm)



- G 1/8 G1/4 G3/8
1/8 NPTF 1/4 NPTF 3/8 NPTF
TUBE: Ø6 - Ø8 - Ø10 - Ø1/4" - Ø5/16" - Ø3/8"
- DIN EN 175 301-803-B connector
(see available Camozzi 122* models in the catalogue)
- G1/8



5 Sensor connection



Attention! In the 3-wires version, do not connect the black to the blue and do not connect the black wire to any pole of the power supply. Do not squash, bend, stretch the cables.

6 Use

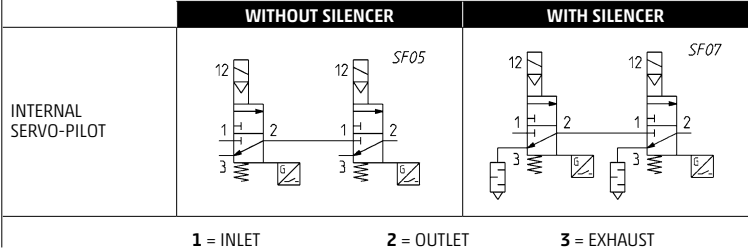
- Before operating the product, check that the pressure of the compressed air supply and all the operating conditions are within the tolerance values.
- The product must be supplied only with compressed air according to ISO 8573-1:2010 [7:4:4]
- The use of the product with liquids or not neutral gases is not permitted.
- The LED on the valve indicates the status of the product, please see the table below:

Table with 3 columns: LED status, Contact, Meaning. Rows: LED on (Closed, Valve NOT activated), LED off (Open, Valve activated).

- Do not exceed the technical specifications illustrated in the Camozzi Products Catalogue.
- Unless specific intended use, do not use the product in environments where there may be direct contact with corrosive gases, chemicals, salt water, water or steam.

7 Operation

The operation of the different versions of the valve is reported below:



8 Identification of faults and/or exceptional situations

Table with 3 columns: Failure, Cause, Solution. Rows include Leakage, No pressure, No electric signal, Valve is blocked, Failure to remove the drive signal, Presence of strong electromagnetic masses, Wrong sensor connection, Sensor does not read.

In case the malfunction found is not among those described, contact Camozzi Automation Service.

9 Maintenance

- In case the silencer is used, check it periodically and replace it when it is clogged.
- In order to guarantee the performances declared, switch the valves at least once every 30 days at nominal voltage.

10 Ecological Information

- At the end of the product's life, we recommend the separation of materials for recycling purposes. Detailed information on the nature of the materials used are reported in the sheet below.
- Comply with the disposal of waste material regulations in force in your country.

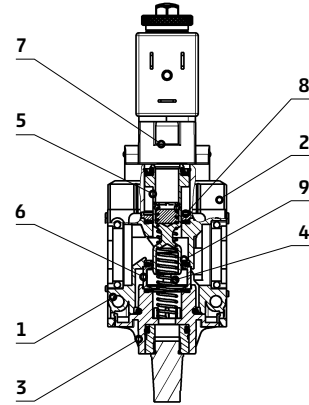
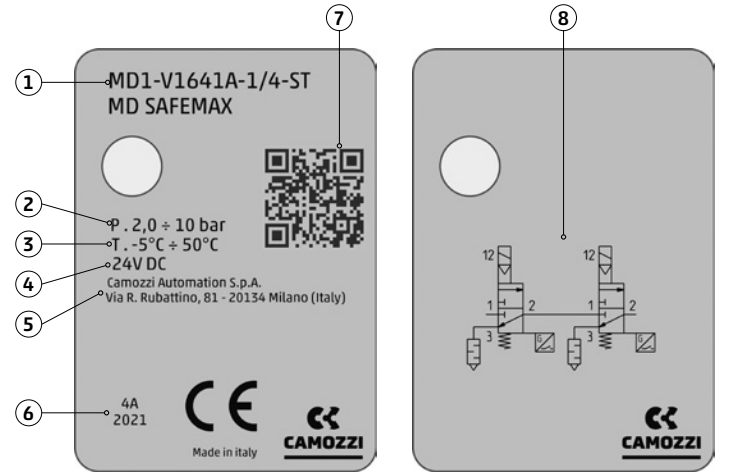


Table with 3 columns: Num., Parts, Materials. Rows: 1 Body (PA), 2 Covering (PA), 3 Plug (PA + Brass), 4 Spring (Stainless steel), 5 Spool (Stainless steel, NBR, Neodymium), 6 Cage element (Brass), 7 Solenoids (Copper, Brass, Stainless steel, PET), 8 Spacer (Brass), 9 Spacer (Brass), - O-Ring and seals (NBR, FKM), - Sensor (Electric waste).

11 Label

- Information shown on the label:

- Commercial code
- Operating pressure
- Operating temperature
- Power supply voltage
- Registered office
- Production date
- QR code **
- Pneumatic symbol



** The QR code leads to the link from which you can download the relative product catalogue and the declaration of conformity