GEMÜ 8253

Electrically operated solenoid valve

EN **Operating instructions**

further information
webcode: GW-8253

Contents

1 Allgemeines

1.1 Hinweise

- The descriptions and instructions apply to the standard versions. For special versions not described in this document the basic information contained herein applies in combination with any additional special documentation.
- Correct installation, operation, maintenance and repair work ensure faultless operation of the product.
- Should there be any doubts or misunderstandings, the German version is the authoritative document.
- Contact us at the address on the last page for staff training information.

1.2 Symbols used

The following symbols are used in this document:

Symbol	Meaning
●	Tasks to be performed
▶	Response(s) to tasks
–	Lists

1.3 Begriffsbestimmungen

Working medium

The medium that flows through the GEMÜ product.

1.4 Warning notes

Wherever possible, warning notes are organised according to the following scheme:

SIGNAL WORD	
Possible symbol for the specific danger	Type and source of the danger ▶ Possible consequences of non-observance. ● Measures for avoiding danger.

Warning notes are always marked with a signal word and sometimes also with a symbol for the specific danger.

The following signal words and danger levels are used:

⚠ DANGER

Imminent danger!

▶ Non-observance can cause death or severe injury.

⚠ WARNING

Potentially dangerous situation!

▶ Non-observance can cause death or severe injury.

⚠ CAUTION

Potentially dangerous situation!

▶ Non-observance can cause moderate to light injury.

NOTICE

Potentially dangerous situation!

▶ Non-observance can cause damage to property.

The following symbols for the specific dangers can be used within a warning note:

Symbol	Meaning
	Danger – high voltage
	Danger - hot surfaces

2 Safety information

The safety information in this document refers only to an individual product. Potentially dangerous conditions can arise in combination with other plant components, which need to be considered on the basis of a risk analysis. The operator is responsible for the production of the risk analysis and for compliance with the resulting precautionary measures and regional safety regulations.

The document contains fundamental safety information that must be observed during commissioning, operation and maintenance. Non-compliance with these instructions may cause:

- Personal hazard due to electrical, mechanical and chemical effects.
- Hazard to nearby equipment.
- Failure of important functions.
- Hazard to the environment due to the leakage of dangerous materials.

The safety information does not take into account:

- Unexpected incidents and events, which may occur during installation, operation and maintenance.
- Local safety regulations which must be adhered to by the operator and by any additional installation personnel.

Prior to commissioning:

1. Transport and store the product correctly.
2. Do not paint the bolts and plastic parts of the product.
3. Carry out installation and commissioning using trained personnel.
4. Provide adequate training for installation and operating personnel.
5. Ensure that the contents of the document have been fully understood by the responsible personnel.
6. Define the areas of responsibility.
7. Observe the safety data sheets.
8. Observe the safety regulations for the media used.

During operation:

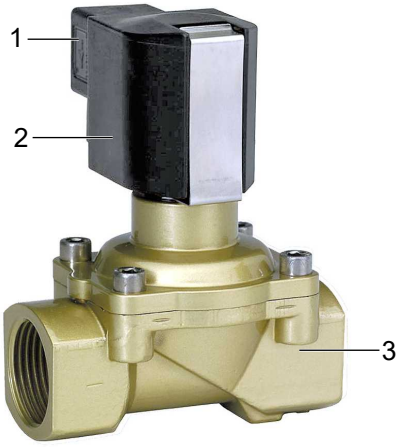
9. Keep this document available at the place of use.
10. Observe the safety information.
11. Operate the product in accordance with this document.
12. Operate the product in accordance with the specifications.
13. Maintain the product correctly.
14. Do not carry out any maintenance work and repairs not described in this document without consulting the manufacturer first.

In cases of uncertainty:

15. Consult the nearest GEMÜ sales office.

3 Product description

3.1 Aufbau



Item	Name	Materials
1	Plug	PA
2	Coil	Duresco NU 463V
3	Valve body	CW617N (brass) 1.4408, stainless steel
	Seal material	EPDM, NBR, FKM

3.2 Function

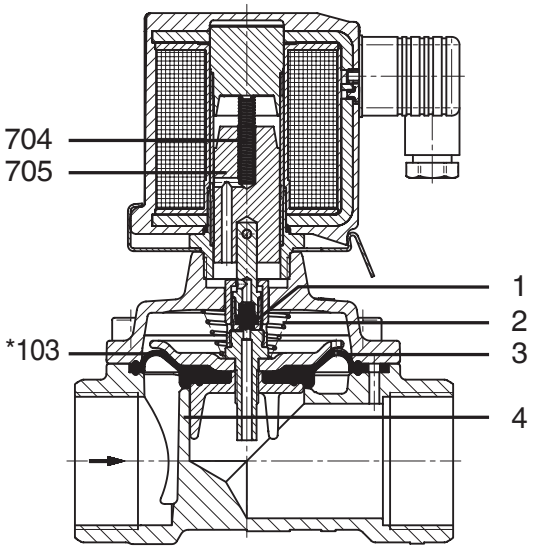


Fig. 1: Functional description (NC)

Switch position closed

The compression spring **704** in the armature **705** closes the pilot seat **1**. The diaphragm ***103** is pushed down onto the main valve seat **4** by a closing spring **2**. The medium flows through the control aperture **3** in the diaphragm into the control chamber above the diaphragm and thus increases the closing force.

Switch position open:

When voltage is applied, the armature **705** is attracted to the pole surface of the bush. The pressure of the medium from the control chamber reduces towards the valve outlet through the open pilot seat **1**. More medium flows away through the pilot seat 1 than can flow in through the control aperture **3** in the diaphragm. The differential pressure produced lifts the diaphragm ***103** thus opening the main valve seat **4**.

All the parts marked * are included in the wearing parts kit. When ordering spare parts, please state the complete valve order number.

Switch position open

The compression spring **704** in the armature **705** opens the pilot seat **1**. The pressure of the medium from the control chamber above diaphragm ***103** reduces towards the valve outlet through the open pilot seat **1**.

More medium flows away from the control chamber through the pilot seat than can flow in through the control aperture **3** in the diaphragm. The differential pressure produced lifts the diaphragm thus opening the main valve seat **4**.

Switch position closed

When voltage is applied the pilot seat **1** is closed by the armature **705**. The medium flows through the control aperture **3** in the diaphragm ***103** into the control chamber above the diaphragm and moves the diaphragm into the closed position supported by the spring. The operating pressure increases the closing force.

All the parts marked * are included in the wearing parts kit. When ordering spare parts, please state the complete valve order number.

4 Correct use

⚠ DANGER

Danger of explosion!

- ► Risk of severe injury or death.
- ● Do not use the product in potentially explosive zones.
- ● Only use the product in potentially explosive zones confirmed in the declaration of conformity.

⚠ WARNING

Improper use of the product

- ► Risk of severe injury or death.
- ► Manufacturer liability and guarantee will be void.
- ● Only use the product in accordance with the operating conditions specified in the contract documentation and in this document.

The product is designed for installation in piping systems and for controlling a working medium.

1. Use the product in accordance with the technical data.
2. Note the supplement acc. to ATEX
3. Please note the flow direction on the valve body.

5 Order data

The order data provide an overview of standard configurations.

Please check the availability before ordering. Other configurations available on request.

Order codes

1 Type	Code
Solenoid valve, with positive lift diaphragm	8253

2 DN	Code
DN 8	8
DN 10	10
DN 15	15
DN 20	20
DN 25	25
DN 32	32
DN 40	40
DN 50	50

3 Body configuration	Code
2/2-way body	D

4 Connection type	Code
Threaded socket DIN ISO 228	1
Threaded socket NPT	31

5 Valve body material	Code
CW617N (brass)	12
1.4408, stainless steel	37

6 Seal material	Code
NBR	2
FKM	4
EPDM	14

7 Control function	Code
Normally closed (NC)	1
Normally open (NO)	2

8 Voltage	Code
24 V	24
110 V	110
230 V	230

9 Frequency	Code
DC	DC
50 - 60 Hz	50/60

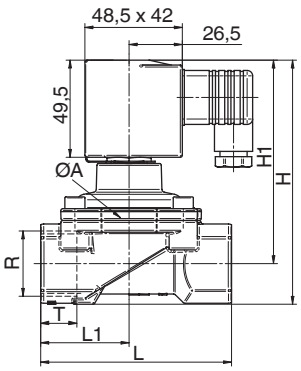
10 Special version	Code
Without	
ATEX version	X

Order example

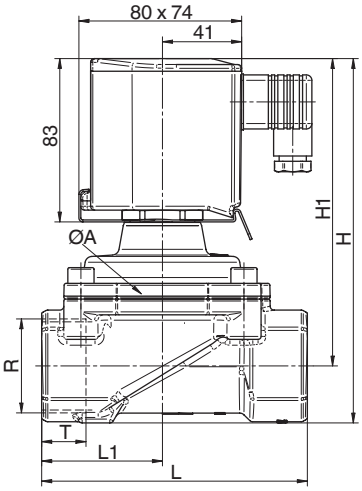
Ordering option	Code	Description
1 Type	8253	Solenoid valve, with positive lift diaphragm
2 DN	25	DN 25
3 Body configuration	D	2/2-way body
4 Connection type	1	Threaded socket DIN ISO 228
5 Valve body material	12	CW617N (brass)
6 Seal material	2	NBR
7 Control function	1	Normally closed (NC)
8 Voltage	230	230 V
9 Frequency	50/60	50 - 60 Hz
10 Special version		Without

6 Dimensions

DN 8 - 25



DN 32 - 50



DN	Connection type code [1]								
	1, 31					1		31	
	A	H	H1	L	L1	R	T	R	T
8	44.0	104.0	92.5	60.0	27.5	G 1/4	12.0	1/4” NPT	10.0
10	44.0	104.0	92.5	60.0	27.5	G 3/8	12.0	3/8” NPT	10.5
15	44.0	108.0	94.5	67.0	31.0	G 1/2	14.0	1/2” NPT	13.5
20	50.0	115.0	99.0	80.0	36.5	G 3/4	16.0	3/4” NPT	14.0
25	62.0	124.0	103.5	95.0	44.0	G 1	18.0	1” NPT	17.0
32	92.0	186.0	157.0	132.0	60.0	G 1¼	20.0	1¼” NPT	17.0
40	92.0	186.0	157.0	132.0	60.0	G 1½	22.0	1½” NPT	17.0
50	109.0	201.5	167.0	160.0	74.0	G 2	24.0	2” NPT	17.5

Dimensions in mm

1) **Connection type**
Code 1: Threaded socket DIN ISO 228
Code 31: Threaded socket NPT

7 Manufacturer's information

7.1 Delivery

- Check that all parts are present and check for any damage immediately upon receipt.

The product's performance is tested at the factory. The scope of delivery is apparent from the dispatch documents and the design from the order number.

7.2 Transport

1. Only transport the product by suitable means. Do not drop. Handle carefully.
2. After the installation dispose of transport packaging material according to relevant local or national disposal regulations / environmental protection laws.

7.3 Storage

1. Store the product free from dust and moisture in its original packaging.
2. Avoid UV rays and direct sunlight.
3. Do not exceed the maximum storage temperature (see chapter "Technical data").
4. Do not store solvents, chemicals, acids, fuels or similar fluids in the same room as GEMÜ products and their spare parts.

8 Installation and operation

⚠ CAUTION

Functional impairment of the solenoid valve by contaminated media!

► The solenoid valve will cease to open or close if the control apertures are blocked or if the armature is blocked by dirt.
- The piping system should be cleaned before installing the solenoid valve.
- Fit a strainer with a mesh size of ≤ 0.25 mm in front of the valve inlet if the media are contaminated.
- Switch the solenoid valve at least once a month.

⚠ CAUTION

Destruction of the solenoid valve by freezable medium!

► The solenoid valve is not frost-protected.
- Solenoid valves using freezable media should only be operated above freezing point.

⚠ CAUTION

Danger from flow contrary to flow direction!

► Damage to the solenoid valve.
- Only operate the solenoid valve in flow direction.
- Take precautionary measures in case of expected reverse flow (e.g. check valve).

8.1 Installation

⚠ CAUTION

Do not use the solenoid coil as a lever

► If the solenoid coil is used as a lever, the solenoid coil and bush could be destroyed.
- Use only the spanner flats provided to screw the solenoid valve to the piping.

⚠ CAUTION

Damage to the valve body

- The solenoid valve may only be installed in aligned pipes in order to avoid stresses in the valve body.

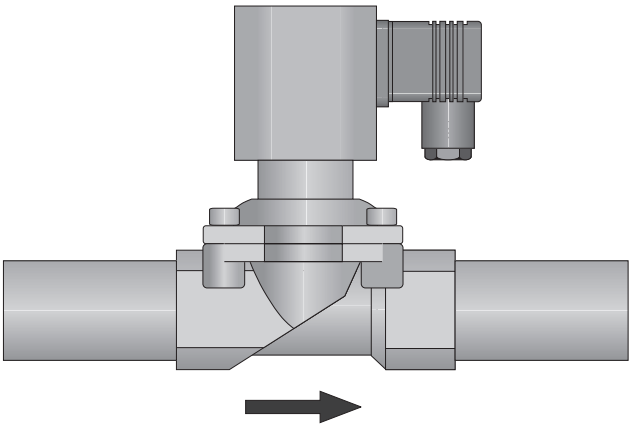


Fig. 2: Installing the solenoid valve

1. Clean the piping system before installing the valve.
2. If necessary, fit a strainer in front of the valve inlet.
3. Remove the protection caps from the valve inlet and valve outlet.
4. Screw the solenoid valve onto the pipeline according to the direction of flow and seal with a suitable sealant.
5. Use the spanner flat to screw it on.

9 Electrical connection

NOTICE

Important:

► A plug with an integrated bridge rectifier must be used for the AC design.

⚠ DANGER

Risk of electric shock

► Risk of injury or death (if operating voltage is higher than safe extra low voltage).
► Electric shock can cause severe burns and fatal injury.
● Work on electrical connections only by qualified trained personnel.
● Disconnect the cable from the power supply before making the electrical connection.
● Connect the protective earth conductor.

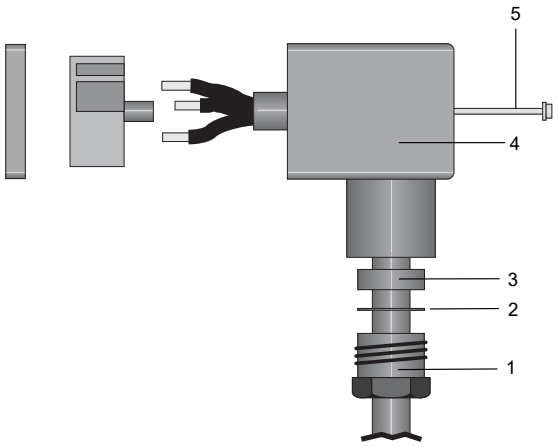


Fig. 3: Inserting the cable

1. Remove the cable gland **1** and fixing screw **5**.
2. Guide the cable through the cable gland **1**, washer **2,** rubber sleeve **3** and then through the plug housing **4**.
3. Connect the cable.

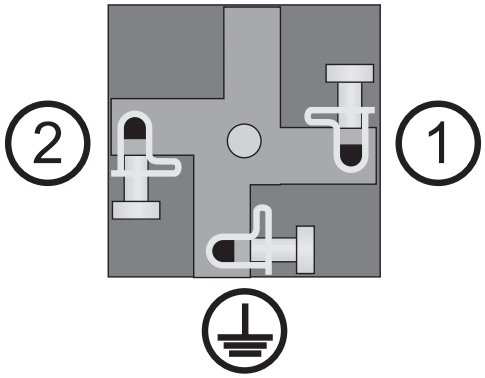


Fig. 4: Connection to the terminal block

Item	Connection
1	Supply voltage
2	Supply voltage
⏚	Protective earth conductor

4. Connect the cable to the relevant terminals on the terminal block.
5. Push the terminal block into the housing of the plug until it audibly clicks in position.
6. Tighten the locking screw on the plug.

Mounting the plug

7. Push the rubber sleeve 3 and washer 2 into the plug housing 4.
8. Tighten the cable gland 1.
9. Push the plug onto the mount.
10. Fix the plug with the fixing screw 5.

⇨ The plug is mounted.

10 Commissioning

⚠ CAUTION

Foreign matter

► Damage to the valves.

● If the plant is new and after repairs, rinse the piping system with the valves fully open.

⇨ The plant operator is responsible for selecting the cleaning material and performing the procedure.

1. Make sure that the unit is installed properly.
2. Test the function of the solenoid valve.
3. Check the tightness of the media connections and the solenoid valve itself.
4. Fill the solenoid valve slowly with medium.

11 Inspection and maintenance

⚠ WARNING

Danger of burning from hot surfaces!

► Solenoid coil heats up during operation.

● Allow the solenoid coil and piping to cool down before servicing work.

Preventive maintenance / cleaning is recommended in consideration of the operating conditions and in the event of noticeable changes in switching times or noise arising during switching.

All the parts marked * are included in the wearing parts kit. When ordering spare parts, please state the complete valve order number.

11.1 Inspection

Check the solenoid coil at regular intervals, depending upon the ambient conditions, for cracks and deposits of dirt and check the plug for secure location and good sealing.

The operator is responsible for determining appropriate inspection intervals.

11.2 Cleaning

⚠ CAUTION

Foreign matter

► Damage to the valves.

● If the plant is new and after repairs, rinse the piping system with the valves fully open.

⇨ The plant operator is responsible for selecting the cleaning material and performing the procedure.

11.3 Solenoid coil replacement

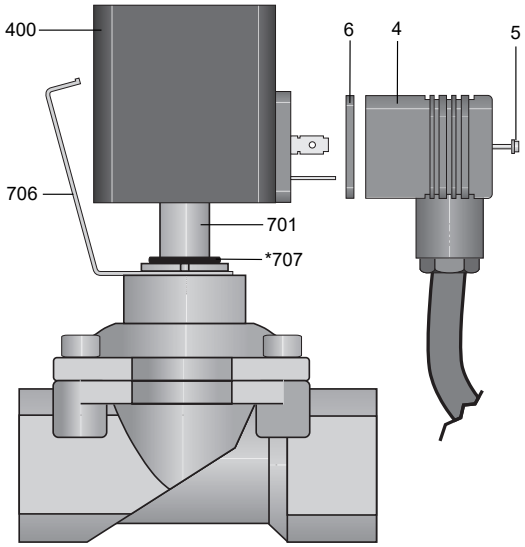


Fig. 5: Solenoid coil replacement

1. Disconnect the plug **4** from power supply.
2. Remove the fixing screw **5**.
3. Pull the plug **4** and gasket **6** off the solenoid coil **400**.
4. Disengage the spring clip **706** and pull the solenoid coil **400** off the bush **701**.
5. Check the O-ring ***707** 701on the bush **701** for hardening and replace if necessary.
6. Place a new solenoid coil on the bush and engage the spring clip.
7. Push the plug and gasket onto the solenoid coil and tighten with the fixing screw (60 Ncm).

11.4 Armature replacement

⚠ WARNING

Danger from medium spurting out!

- ► Danger of injury.
- ● Servicing work on the solenoid valve should only be carried out after the piping has been depressurized and drained!

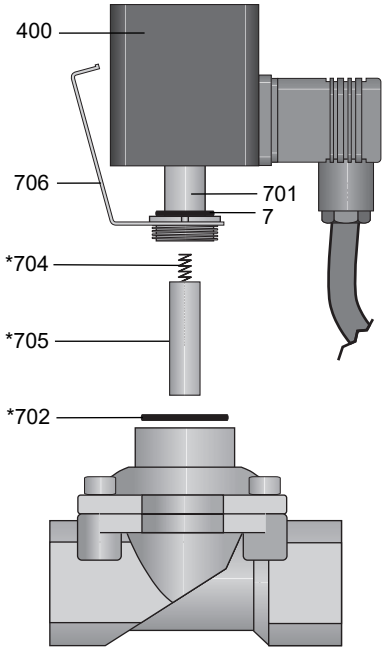


Fig. 6: Armature replacement

1. Release the pressure from the solenoid valve and from the piping and drain off.
2. Disconnect the solenoid coil from power supply.
3. Disengage the spring clip **706** and pull the solenoid coil **400** off the bush **701**.
4. Unscrew the bush **701** with threaded insert **7** (SW 22) and remove it.
5. Take O-ring ***702** out of groove.
6. Replace O-ring ***702**, compression spring ***704** and armature ***705**.
7. Screw in bush **7** with threaded insert (20 Nm ± 10 %).
8. Place the solenoid coil on the bush and engage the spring clip.

11.5 Diaphragm replacement

⚠ WARNING

Danger from medium spurting out!

- ► Danger of injury.
- ● Servicing work on the solenoid valve should only be carried out after the piping has been depressurized and drained!

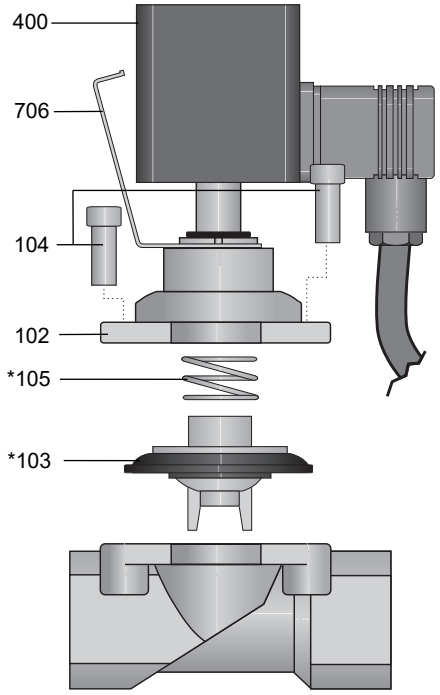


Fig. 7: Diaphragm replacement

1. Release the pressure from the solenoid valve and from the piping and drain off.
2. Disconnect the solenoid coil **400** from power supply.
3. Disengage the spring clip **706** and pull the solenoid coil **400** off the bush.
4. Remove cover screws **104** and remove valve cover **102**.
5. Replace diaphragm ***103** and compression spring ***105**.
6. Place the valve cover on the valve body and tighten with the cover screws diagonally.

Tightening torque for the cover screws:

Thread	Torque
M4	2.0 Nm ± 10 %
M5	3.6 Nm ± 10 %
M6	6.0 Nm ± 10 %
M8	16.0 Nm ± 10 %
M10	31.0 Nm ± 10 %

12 Troubleshooting

Error	Error cause	Troubleshooting
No function	No power supply	Check power supply and connection with product label
	Solenoid coil faulty	Replace solenoid valve
	Operating pressure too high	Check operating pressure, reduce if necessary
	Diaphragm faulty	Replace diaphragm
	Control aperture contaminated	Clean solenoid valve, fit strainer in front if necessary
	Armature blocked	Clean the armature and bush, replace the armature if necessary
	Valve does not switch	Use a plug with an integrated bridge rectifier (for AC design)
Solenoid valve leaking	Main valve seat leaking	Clean main valve seat, replace diaphragm if necessary

13 Disposal

1. Pay attention to adhered residual material and gas diffusion from penetrated media.
2. Dispose of all parts in accordance with the disposal regulations/environmental protection laws.

Parts	Disposal
Valve bodies, valve covers	in accordance with material identification
Screws, armatures, bushes, compression springs	as metallic core scrap
O-rings, diaphragms, sealing and plastic parts	as domestic waste type commercial waste
Solenoid coil	as electrical scrap

14 Returns

Legal regulations for the protection of the environment and personnel require that the completed and signed return delivery note is included with the dispatch documents. Returned goods can be processed only when this note is completed. If no return delivery note is included with the GEMÜ product, GEMÜ cannot process credits or repair work but will dispose of the goods at the operator's expense.

1. Clean the GEMÜ 8253 .
2. Request a return delivery note from GEMÜ.
3. Complete the return delivery note.
4. Send the GEMÜ 8253 with a completed return delivery note to GEMÜ.

15 Information

NOTICE

Note on staff training:

► Please contact us at the address on the last page for staff training information.

Should there be any doubts or misunderstandings in the preceding text, the German version of this document is the authoritative document!

16 Declaration of conformity according to 2014/68/EC (Pressure Equipment Directive)

We, GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Straße 6-8
74653 Ingelfingen-Criesbach, Germany

declare that the product listed below complies with the safety requirements of the Pressure Equipment Directive 2014/68/EU.

Description of the pressure equipment: GEMÜ 8253
Notified body: TÜV Rheinland Industrie Service GmbH
Number: 0035
Certificate no.: 01 202 926/Q-02 0036
Conformity assessment procedure: Module H1
Technical standard used: EN 1983, AD 2000

Note for products with a nominal size ≤ DN 25:
The products are developed and produced according to GEMÜ process instructions and quality standards which comply with the requirements of ISO 9001 and ISO 14001. According to Article 4, Paragraph 3 of the Pressure Equipment Directive 2014/68/EU these products must not be identified by a CE-label.

Joachim Brien
Head of Technical Department
Ingelfingen-Criesbach

17 EU Declaration of Conformity

We, GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Straße 6-8
74653 Ingelfingen-Criesbach, Germany

declare that the product listed below complies with the following directives:

- Low Voltage Directive 2014/35/EU
- EMC Directive 2014/30/EU

Product: GEMÜ 8253

Ensure compliance with the limiting values of the harmonised standards EN 61000-6-3 and EN 61000-6-2 and thus meeting the requirements of the Electromagnetic compatibility directive 2014/30/EU (2004/108/EC) by suitable electrical wiring of the solenoid valves.

Joachim Brien
Head of Technical Department
Ingelfingen-Criesbach

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