

GEMÜ C58 iComLine

Pneumatically operated 3/2-way diaphragm globe valve

EN

Operating instructions



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Keep the document for future reference.

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1 General information

1.1 Information

- 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 Definition of terms

Working medium

The medium that flows through the GEMÜ product.

Control function

The possible actuation functions of the GEMÜ product.

Control medium

The medium whose increasing or decreasing pressure causes the GEMÜ product to be actuated and operated.


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 <ul style="list-style-type: none"> ► 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! <ul style="list-style-type: none"> ► Non-observance can cause death or severe injury.

 WARNING	
	Potentially dangerous situation! <ul style="list-style-type: none"> ► Non-observance can cause death or severe injury.

 CAUTION	
	Potentially dangerous situation! <ul style="list-style-type: none"> ► Non-observance can cause moderate to light injury.

NOTICE	
	Potentially dangerous situation! <ul style="list-style-type: none"> ► Non-observance can cause damage to property.

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

Symbol	Meaning
	Danger of explosion!
	Corrosive chemicals!
	Hot plant components!

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 substances.

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:

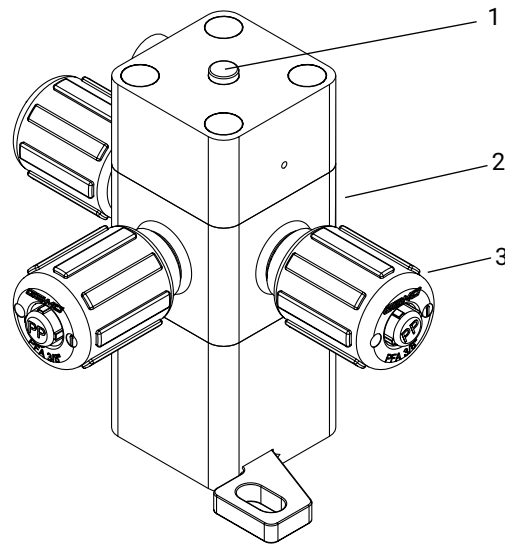
9. Keep this document available at the place of use.
10. Observe the safety information.
11. Operate the product in accordance with this document.
12. Operate the product in accordance with the specifications.
13. Maintain the product correctly.
14. Do not carry out any maintenance work and repairs not 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 Construction



No.	Name	Materials
1	Optical position indicator	
2	Valve body with actuators	Modified PTFE, polytetrafluoroethylene Exterior body parts: PVDF
3	Flare connections with union nut	Union nut: CPFA, PVDF or PFA
	Seals	PTFE

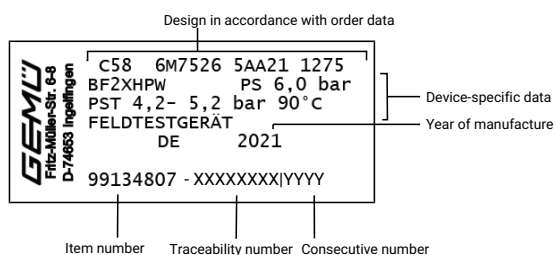
3.2 Description

GEMÜ C58 is an ultra-pure 3/2-way process valve in order to change over between a supply and two outlets, whereby it can also be operated in the other flow direction. The switch position can be detected using an optical position indicator. The 3/2-way process valve is suitable for ultra-pure and corrosive media. All media wetted parts are made of pure and highly resistant PTFE. The 3/2-way process valve is therefore particularly suitable for applications in media supply or in the process area of semiconductor production.

3.3 Function

The GEMÜ C58 3/2-way process valve is designed for use in piping. It controls a flowing medium insofar as it can be actuated by a control medium. Functionally, the process valve can be used to switch between two outlets or two inlets. This must be controlled via the operation direction.

3.4 Product label



The manufacturing month is coded under the traceability number and can be requested from GEMÜ. The product was manufactured in Germany.

4 Correct use

DANGER

Danger of explosion!

- ▶ Risk of death or severe injury
- Do **not** use the product in potentially explosive zones.

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.

The product is not intended for use in potentially explosive areas.

- Use the product in accordance with the technical data.

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
3-way plastic globe valve, pneumatic	C58
2 Connection size	Code
1/4", international code: 4	4
3/8", international code: 6	6
1/2", international code: 8	8
3 Body configuration	Code
Multi-port design	M
4 Connection type	Code
Flare connection with CPFA union nut	73
Flare connection with PVDF union nut	75
Flare connection with PFA union nut	77
Super 300 type Pillar connection	79
PrimeLock connection	PL
5 Valve body material	Code
Modified PTFE, polytetrafluoroethylene	26
6 Seal material	Code
PTFE	5

7 Zero position	Code
COM to A OPEN (NO) COM to B CLOSED (NC)	A
8 Actuator version	Code
Actuator size 2, seat diameter 8.50 mm, standard orientation	A21
9 Connection size 2	Code
1/4", international code-2: 4	4
3/8", international code-2: 6	6
1/2", international code-2: 8	8
10 Connection type, spigot 2	Code
Flare connection with CPFA union nut	73
Flare connection with PVDF union nut	75
Flare connection with PFA union nut	77
Super 300 type Pillar connection	79
PrimeLock connection	PL
11 High Purity version	Code
High Purity white	HPW

Order example

Ordering option	Code	Description
1 Type	C58	3-way plastic globe valve, pneumatic
2 Connection size	8	1/2", international code: 8
3 Body configuration	M	Multi-port design
4 Connection type	75	Flare connection with PVDF union nut
5 Valve body material	26	Modified PTFE, polytetrafluoroethylene
6 Seal material	5	PTFE
7 Zero position	A	COM to A OPEN (NO) COM to B CLOSED (NC)
8 Actuator version	A21	Actuator size 2, seat diameter 8.50 mm, standard orientation
9 Connection size 2	8	1/2", international code-2: 8
10 Connection type, spigot 2	75	Flare connection with PVDF union nut
11 High Purity version	HPW	High Purity white

6 Technical data

6.1 Medium

Working medium: Corrosive, inert, gaseous and liquid media which have no negative impact on the physical and chemical properties of the body and diaphragm material.

6.2 Temperature

Media temperature: -10 – 130 °C
Observe pressure/temperature diagram

Ambient temperature: 0 – 60 °C

Storage temperature: 0 – 60 °C

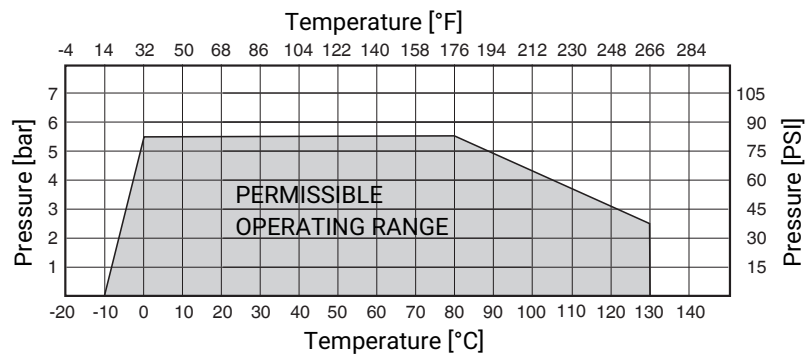
6.3 Pressure

Operating pressure: max. 5.5 bar
Observe control pressure / operating pressure diagram

Vacuum: 400 mbar absolute
The service life of the valve may be affected if exposed to a greater vacuum or when the valve is installed on the pump suction side.

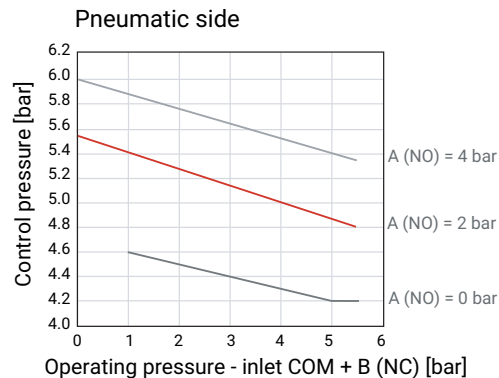
Pressure rating: PN 6

Pressure/temperature diagram:

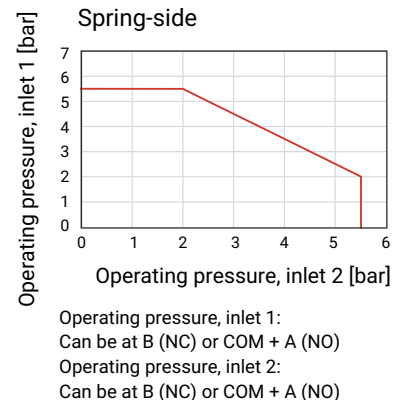


The pressure/temperature diagram is only an aid. The data refers to water as a working medium. A change of operating conditions or other media may result in deviations. In case of doubt it is advisable to test the behaviour of the material under the defined operating conditions by means of a test installation.

Control pressure/operating pressure diagram:



Under the seat (C-> A): can be used up to 5.5 bar
Over the seat (A-> C): can be used with max. 4 bar without back pressure
Information applies to specified control pressure range!



Operating pressure, inlet 1:
Can be at B (NC) or COM + A (NO)
Operating pressure, inlet 2:
Can be at B (NC) or COM + A (NO)

Control pressure: 4.2 – 6.0 bar

Filling volume: 1.7 cm³
Pneumatic side in closed position

Kv value:

Connection	Kv values
Flare 1/4"	4.24
Flare 3/8"	13.8
Flare 1/2"	12.9
PrimeLock 1/4"	4.55
PrimeLock 3/8"	13.5
PrimeLock 1/2"	12.9
Pillar 1/4"	4.59
Pillar 3/8"	13.1
Pillar 1/2"	12.7

Kv values in l/min

6.4 Product conformity

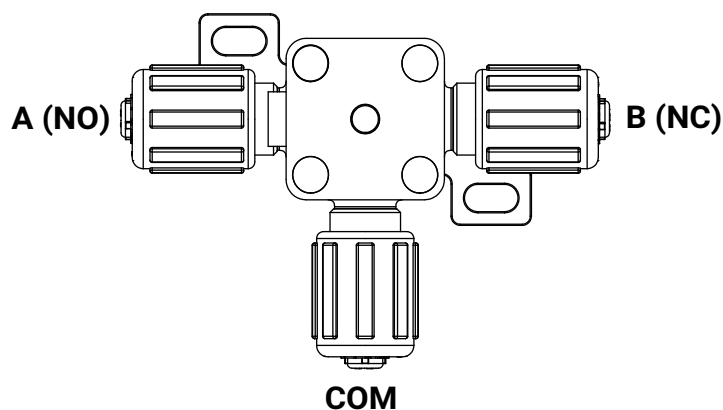
Machinery Directive: 2006/42/EC

6.5 Mechanical data

Installation position: Optional (fixing by lugs)

Weight: Actuator size 2 with protection caps without control air connector: approx. 250.0 g (depending on connection design)

Flow direction:



Not actuated:

A (NO) -> COM

COM -> A (NO)

Actuated:

B (NC) -> COM

COM -> B (NC)

Function:

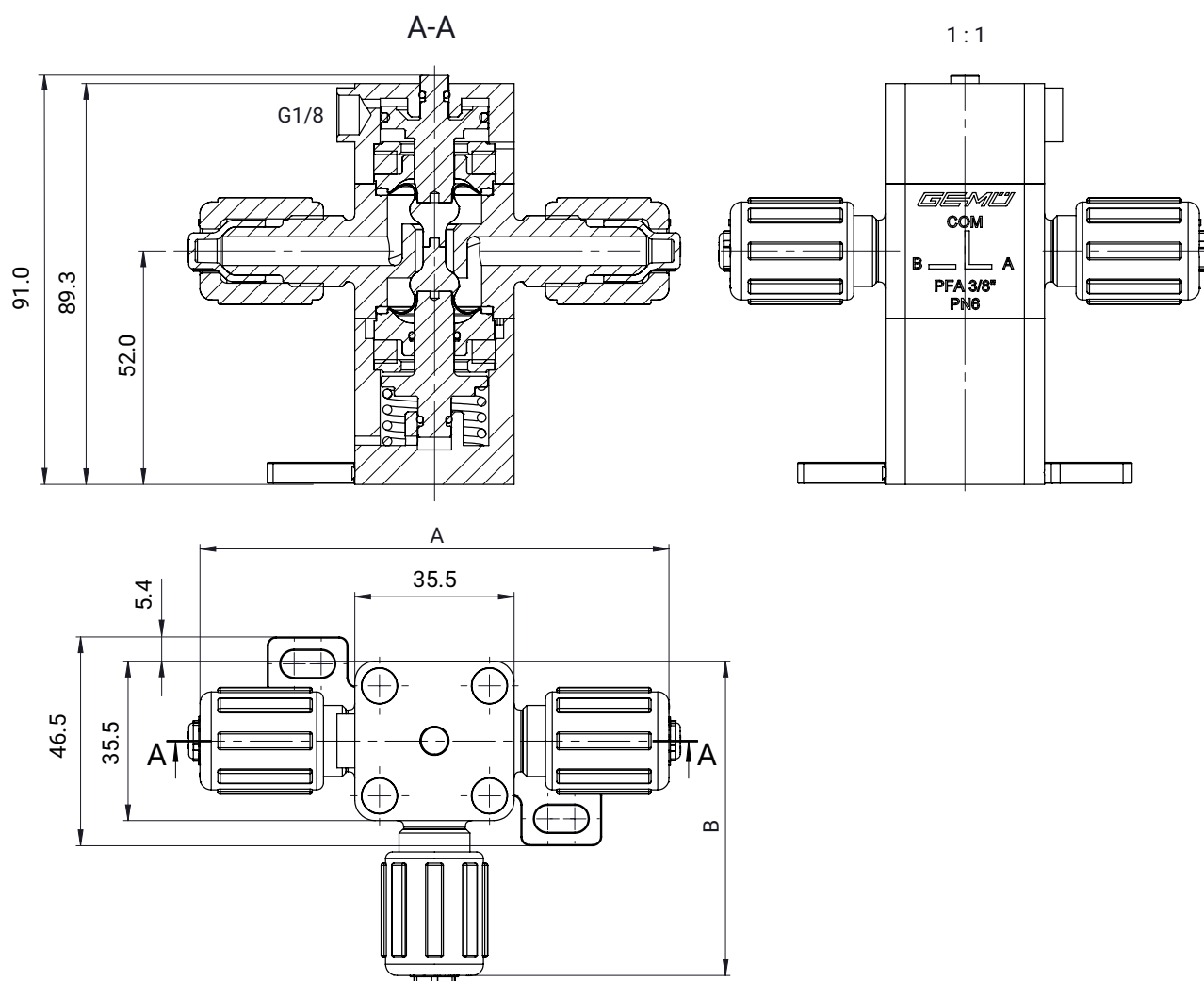
- The valve can be operated with either a joint inlet or a joint outlet
- When not actuated, the flow takes place between the connections A (NO) and COM
- When actuated, the flow takes place between the connections B (NC) and COM

The position indicator is OPEN when the valve is not actuated.

The position indicator is CLOSED when the valve is actuated.

7 Dimensions

7.1 Connection size 1/4" (code 4), 3/8" (code 6), 1/2" (code 8)



Connection	A	B
Flare 1/4"	98.5	67.0
Flare 3/8"	104.5	70.0
Flare 1/2"	107.5	71.5
PrimeLock 1/4"	88.1	61.8
PrimeLock 3/8"	88.1	61.8
PrimeLock 1/2"	92.7	64.1
Pillar 1/4"	57.5	46.5
Pillar 3/8"	65.5	50.5
Pillar 1/2"	70.5	53.0

Dimensions in mm

8 Manufacturer's information

8.1 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.

8.2 Opening the packaging

The product is sealed in two plastic bags and packaged in a box.

CAUTION

Do not open the box in the cleanroom!

- Contamination risk!

CAUTION

Open the box carefully and outside the cleanroom. Do not use a knife or sharp object. Avoid tearing open the outer plastic bag.

- Contamination risk!
- Reduces product purity!

The box contains the double-sealed ultra-pure 3/2-way process valve.

CAUTION

Avoid tearing open the outer plastic bag. Only open the internal Nylon-PE plastic bag in the cleanroom immediately prior to installation.

- Contamination risk!
- Reduces product purity!

8.3 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.

8.4 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.

9 Installation in piping

CAUTION

Fixing with suitable media resistant plastic bolts (not included in the scope of delivery)

- Corrosion and contamination when using metal bolts.

9.1 Preparing for installation

WARNING

The equipment is subject to pressure!

- Risk of severe injury or death.
- Depressurize the plant.
- Completely drain the plant.

WARNING



Corrosive chemicals!

- Risk of caustic burns.
- Wear suitable protective gear.
- Completely drain the plant.

CAUTION



Hot plant components!

- Risk of burns.
- Only work on plant that has cooled down.

CAUTION

Exceeding the maximum permissible pressure.

- Damage to the product.
- Provide precautionary measures against exceeding the maximum permitted pressures caused by pressure surges (water hammer).

CAUTION

Use as step.

- Damage to the product.
- Risk of slipping-off.
- Choose the installation location so that the product cannot be used as a foothold.
- Do not use the product as a step or a foothold.

NOTICE

Suitability of the product!

- The product must be appropriate for the piping system operating conditions (medium, medium concentration, temperature and pressure) and the prevailing ambient conditions.

NOTICE

Tools

- The tools required for installation and assembly are not included in the scope of delivery.
- Use appropriate, functional and safe tools.

1. Ensure the product is suitable for the relevant application.
2. Check the technical data of the product and the materials.
3. Keep appropriate tools ready.
4. Wear appropriate protective gear, as specified in the plant operator's guidelines.
5. Observe appropriate regulations for connections.
6. Have installation work carried out by trained personnel.
7. Shut off plant or plant component.
8. Secure plant or plant component against recommissioning.
9. Depressurize the plant or plant component.
10. Completely drain the plant (or plant component) and let it cool down until the temperature is below the media vaporization temperature and cannot cause scalding.
11. Decontaminate, rinse and ventilate the plant or plant component properly.
12. Lay piping so that the product is protected against transverse and bending forces, and also from vibrations and tension.
13. Only mount the product between matching aligned pipes (see following chapters).
14. Flow direction and installation position are optional.

9.2 Installation with flare connections

1. For preparation and connection of the flare connections, please refer to GEMÜ FlareStar® brochure and GEMÜ Flare and assembly instructions.
2. Push the flared tube onto the flare connection.
3. Screw the union nut over it.
4. Depending on the ambient conditions, use resistant and suitable connection fittings.

10 Pneumatic connections

1. Use suitable connectors.
2. Connect the control medium lines tension-free and without any bends or knots.

10.1 Control functions

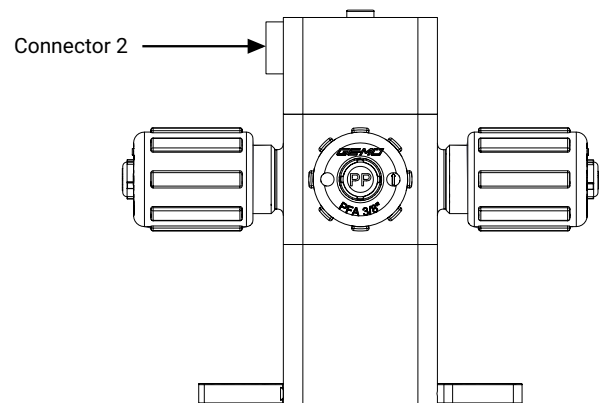
Control function A

COM to A (NO) = OPEN

COM to B (NC) = CLOSED

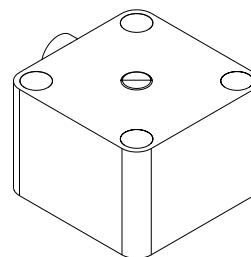
Valve resting position:

- Due to the spring force, the passage between COM and B (NC) is closed.
- Passage between COM and A (NO) is open.
- Activation of the actuator (connector 2) opens the passage between COM and B (NC) and closes the passage between COM and S (NO).
- Venting the valve causes the passage between COM and B (NC) to be closed via spring force.

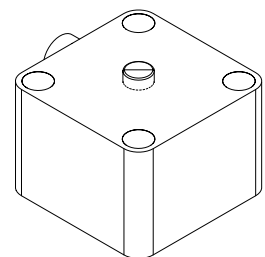


10.2 Operation

Optical position indicator



Actuated



Not actuated

Optical position indicator activated:

Between COM and B (NC) open

Between COM and A (NO) closed

Optical position indicator not activated:

Between COM and A (NO) open

Between COM and B (NC) closed

11 Commissioning

WARNING



Corrosive chemicals!

- ▶ Risk of caustic burns.
- Wear suitable protective gear.
- Completely drain the plant.

CAUTION

Leakage

- ▶ Emission of dangerous materials.
- Provide precautionary measures against exceeding the maximum permitted pressures caused by pressure surges (water hammer).

CAUTION

Cleaning agent

- ▶ Damage to the GEMÜ product.
- The plant operator is responsible for selecting the cleaning material and performing the procedure.

1. Check the tightness and the function of the product (close and reopen the product).
2. Flush the piping system of new plant and following repair work (the product must be fully open).
 - ⇒ Harmful foreign matter has been removed.
 - ⇒ The product is ready for use.
3. Commission the product.
4. Commissioning of actuators in accordance with the enclosed instructions.

12 Troubleshooting

Error	Error cause	Troubleshooting
Control medium escaping from leak detection hole*	Spindle seal leaking	Replace complete product
Working medium escaping from leak detection hole	Diaphragm faulty	Replace complete product
The product does not open or does not open fully	Actuator defective	Replace complete product
	Foreign matter in the product	Replace complete product
	Control pressure too low	Operate the product at the specified control pressure (see chapter "Technical data")
	Actuator spring faulty	Replace complete product
	Pilot valve faulty	Check and replace pilot valve
	Condensation water in the actuator	In the event of temperature fluctuations between the ambient air and the control medium, dehumidify the control medium
The product is leaking downstream (does not close or does not close fully)	Operating pressure too high	Operate the product with operating pressure specified in datasheet
	Valve seat damaged	Replace complete product
	Foreign matter between diaphragm and valve seat	Replace complete product
	Actuator defective	Replace complete product
	Diaphragm faulty	Replace complete product
	Control pressure too low or control medium not connected	Operate the product with the control pressure specified in the datasheet / connect control medium
	Actuator spring faulty	Replace complete product
The product is leaking between actuator and valve body	Actuator/valve body damaged	Replace complete product
	Bolting between valve body and actuator loose	Retighten bolting between valve body and actuator
Connection between valve body and piping leaking	Incorrect installation	Check installation of valve body in piping
	Threaded connections / unions loose	Tighten threaded connections / unions
Valve body leaking	Valve body leaking or corroded	Replace complete product

* see the "Construction" chapter

13 Inspection and maintenance

WARNING

The equipment is subject to pressure!

- ▶ Risk of severe injury or death.
- Depressurize the plant.
- Completely drain the plant.

CAUTION



Hot plant components!

- ▶ Risk of burns.
- Only work on plant that has cooled down.

NOTICE

Exceptional maintenance work!

- ▶ Damage to the GEMÜ product.
- Any maintenance work and repairs not described in these operating instructions must not be performed without consulting the manufacturer first.

The operator must carry out regular visual examination of the GEMÜ products dependent on the operating conditions and the potential danger in order to prevent leakage and damage.

The product also must be disassembled and checked for wear in the corresponding intervals.

1. Have servicing and maintenance work performed by trained personnel.
2. Wear appropriate protective gear as specified in plant operator's guidelines.
3. Shut off plant or plant component.
4. Secure the plant or plant component against recommissioning.
5. Depressurize the plant or plant component.
6. Actuate GEMÜ products which are always in the same position four times a year.

14 Removal from piping

1. Remove in reverse order to installation.
2. Deactivate the control medium.
3. Disconnect the control medium line(s).
4. Disassemble the product. Observe warning notes and safety information.

15 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.

16 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 product, GEMÜ cannot process credits or repair work but will dispose of the goods at the operator's expense.

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

17 EU Declaration of Incorporation according to the EC Machinery Directive 2006/42/EC



EU Declaration of Incorporation

according to the EC Machinery Directive 2006/42/EC, Annex II B

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

hereby declare under our sole responsibility that the below-mentioned product complies with the relevant essential health and safety requirements in accordance with Annex I of the above-mentioned Directive.

Product: GEMÜ C58
Product name: Pneumatically operated 3/2-way diaphragm globe valve
The following essential health and safety requirements of the EC Machinery Directive 2006/42/EC, Annex I have been applied or adhered to: 1.1.2.; 1.1.3.; 1.1.5.; 1.3.2.; 1.3.3.; 1.3.4.; 1.3.7.; 1.5.3.; 1.5.5.; 1.5.6.; 1.6.1.; 1.6.3.; 1.6.4.; 1.7.1.; 1.7.1.1.; 1.7.2.; 1.7.3.; 1.7.4.; 1.7.4.1.; 1.7.4.2.; 1.7.4.3.
The following harmonized standards (or parts thereof) have been applied: EN ISO 12100:2010

We also declare that the specific technical documents have been created in accordance with part B of Annex VII.

The manufacturer undertakes to transmit relevant technical documents on the partly completed machinery to the national authorities in response to a reasoned request. This communication takes place electronically.

This does not affect the industrial property rights.

The partly completed machinery may be commissioned only if it has been determined, if necessary, that the machinery into which the partly completed machinery is to be installed meets the provisions of the Machinery Directive 2006/42/EC.

M. Barghoorn
Head of Global Technics
Ingelfingen, 01/12/2022

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

www.gemu-group.com
info@gemu.de



GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG
Fritz-Müller-Straße 6-8, 74653 Ingelfingen-Criesbach, Germany
Phone +49 (0) 7940 1230 · info@gemue.de
www.gemu-group.com

Subject to alteration

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