GEMÜ R90

Metal disco check valve

EN **Operating instructions**

further information
webcode: GW-R90

Contents

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.

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 of explosion!
	Risk of crushing!
	Corrosive chemicals!
	Hot plant components!
	Replacement of spare parts

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

Item	Name	Materials
1	Body	1.4408, CC333G, 1.0619, 1.4469 (super duplex)
2	Disc	1.4408, CC333G, 1.0619, 1.4469 (super duplex)
3	Spring	1.4571, C4 (Hastelloy)
4	Spring cross	1.4408, CC333G, 1.0619, 1.4469 (super duplex)

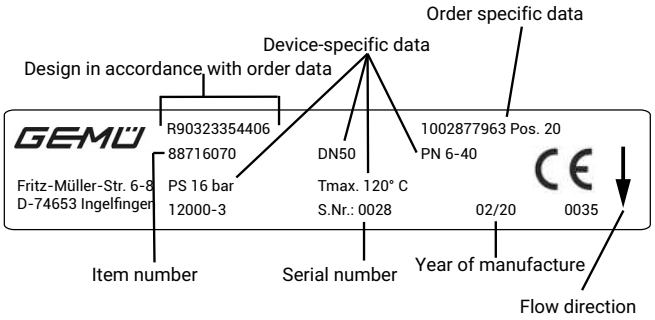
3.2 Description

The GEMÜ R90 is a metal disco check valve with flange connection and standardized length to DIN EN 558. The valve body, disc and seal are available in various materials. In the version with metallic seal, the GEMÜ R90 valve can be used at high temperatures up to 400 °C.

3.3 Function

The flow of fluid causes disc **2** in the check valve to open. Check valves need a low opening pressure. The resulting opening force moves the disc 2 against the spring 3 by overcoming the the weight force of the disc 2 and the spring force of the spring 3 so that the medium is released.

3.4 Product label



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.

5 Availability

DN	Pressure range	Version	Materials		
			Body	Disc, spring cross	Spring
15 - 100	0 - 25 bar	1	CC333G	CC333G	C4 (Hastelloy)
		2	CC333G	1.4408	1.4571
15 - 300	0 - 40 bar	3	1.4408	1.4408	1.4571
		4	1.0619, galvanised	1.4408	1.4571
		5	1.4469 (super duplex)	1.4469 (super duplex)	C4 (Hastelloy)

6 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
Disco check valve, metal	R90

2 DN	Code
DN 15	15
DN 20	20
DN 25	25
DN 32	32
DN 40	40
DN 50	50
DN 65	65
DN 80	80
DN 100	100
DN 125	125
DN 150	150
DN 200	200
DN 250	250
DN 300	300

3 Operating pressure	Code
16 bar	3
25 bar	5
40 bar	6

4 Connection type	Code
PN 6 / flange EN 1092, face-to-face dimension FTF EN 558-1 series 49 (R90), series 16 (R91)	1
PN 10 / flange EN 1092, face-to-face dimension FTF EN 558-1 series 49 (R90), series 16 (R91)	2
PN 16 / flange EN 1092, face-to-face dimension FTF EN 558-1 series 49 (R90), series 16 (R91)	3
PN 25 / flange EN 1092, face-to-face dimension FTF EN 558-1 series 49 (R90), series 16 (R91)	5
PN 40 / flange EN 1092, face-to-face dimension FTF EN 558-1 series 49 (R90), series 16 (R91)	6
ANSI B16.5, Class 150, face-to-face dimension FTF EN 558-1 series 49 (R90), series 16 (R91)	D
ANSI B16.5, Class 300, face-to-face dimension FTF EN 558-1 series 49 (R90), series 16 (R91)	M

5 Body material	Code
1.4408 / ASTM A351 / CF8M	4
1.0619 / ASTM A216 / WCB	5
1.4469, SUPERDUPLEX / ASTM A890 Grade 5A	D
CC333G / 2.0975 / C954	G

6 Shut-off element material	Code
1.4408 / ASTM A351 / CF8M	4
1.4469, SUPERDUPLEX / ASTM A890 Grade 5A	D
CC333G / 2.0975 / C954	G

7 Guide element material	Code
1.4408 / ASTM A351 / CF8M	4
1.4469, SUPERDUPLEX / ASTM A890 Grade 5A	D
CC333G / 2.0975 / C954	G

8 Shut-off seal material	Code
Steel	0
EPDM (FDA, DVGW-Water certification)	2
PTFE	5
EPDM	E
NBR	N
FKM	V

9 Spring material	Code
1.4571	6
HASTELLOY C-4 / 2.4610	7

10 Special version	Code
Without	
ATEX certification	X

11 Type of design	Code
Without	
Media wetted area cleaned to ensure suitability for paint applications, parts sealed in plastic bag	0101
Valve free of oil and grease, media wetted area cleaned and packed in PE bag	0107
Check valve with bonded O-ring	2577

Order example

Ordering option	Code	Description
1 Type	R90	Disco check valve, metal
2 DN	32	DN 32
3 Operating pressure	3	16 bar
4 Connection type	3	PN 16 / flange EN 1092, face-to-face dimension FTF EN 558-1 series 49 (R90), series 16 (R91)
5 Body material	5	1.0619 / ASTM A216 / WCB
6 Shut-off element material	4	1.4408 / ASTM A351 / CF8M
7 Guide element material	4	1.4408 / ASTM A351 / CF8M
8 Shut-off seal material	0	Steel
9 Spring material	6	1.4571
10 Special version		Without
11 Type of design		Without

7 Technical data

7.1 Medium

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

The valves are not suitable for fluids containing solids.

7.2 Temperature

Media temperature:

Seal material:

Steel (code 0):	-196 to 400 °C (design 3)
NBR (code N):	-30 to 100 °C
EPDM (code 2, E):	-65 to 150 °C
FKM (code V):	-30 to 230 °C
PTFE (code 5):	-196 to 250 °C

For temperatures above 300 °C a compression spring made of Hastelloy C4 (code 7) is required.

Ambient temperature: -20 to 95 °C

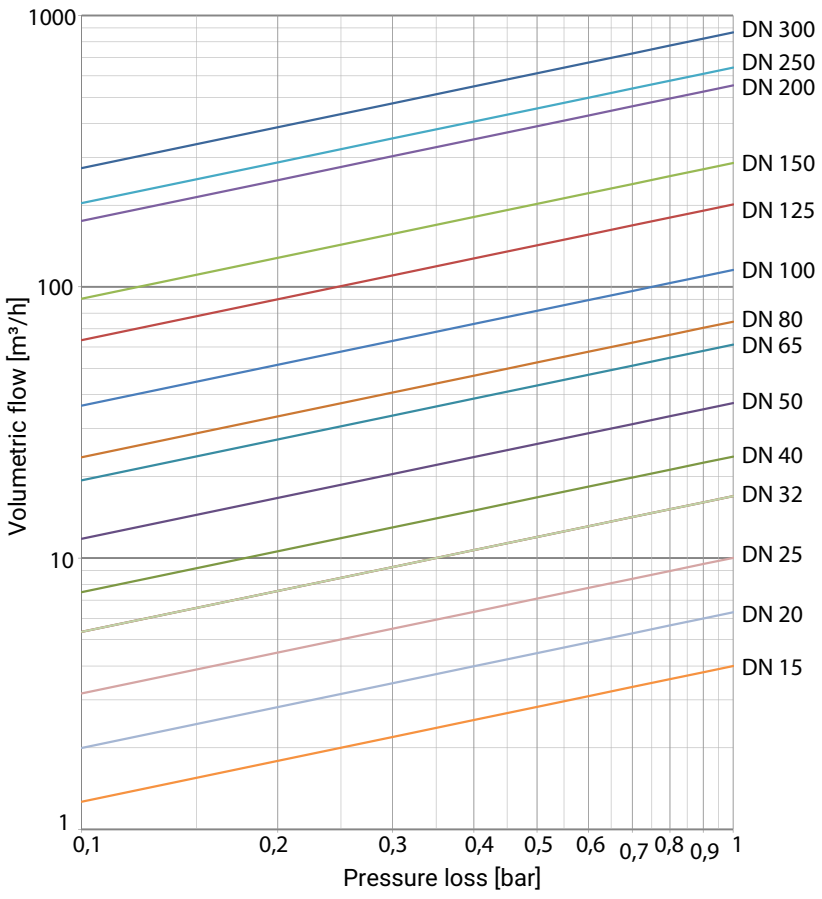
7.3 Pressure

Operating pressure: max. 50 bar

Vacuum: Can be used up to a vacuum of 100 mbar (abs), or with bonded O-ring (K-no. 2577) up to a vacuum of 20 mbar (abs)

These values apply to room temperature and air. The values may deviate for other media and other temperatures.

Pressure loss:



Disc opening pressure:

DN	Piping			
				without spring
	↔	↑	↓	↑
15	~ 20	~ 24	~ 16	~ 4
20	~ 20	~ 25	~ 15	~ 5
25	~ 20	~ 25	~ 15	~ 5
32	~ 20	~ 26	~ 14	~ 6
40	~ 20	~ 27	~ 13	~ 7
50	~ 20	~ 28	~ 12	~ 8
65	~ 20	~ 29	~ 11	~ 9
80	~ 20	~ 30	~ 10	~ 10
100	~ 20	~ 33	~ 7	~ 13
125	~ 30	~ 46	~ 14	~ 16
150	~ 30	~ 47	~ 13	~ 17
200	~ 30	~ 51	~ 9	~ 21
250	~ 40	~ 64	~ 16	~ 24
300	~ 40	~ 68	~ 12	~ 38

Pressures in mbar

Leakage rate:

A acc. to EN 12266-1 (with plastic seal)
G acc. to EN 12266-1 (metallic sealing)

Pressure/temperature correlation:

DN	Design 2/3								
	Temperature [°C]								
	-196*	20.0	100.0	150.0	200.0	250.0	300.0	350.0	400.0*
15	50.0	40.0	40.0	40.0	40.0	40.0	40.0	41.7	40.0
20	50.0	40.0	40.0	40.0	40.0	40.0	40.0	39.6	38.0
25	50.0	40.0	40.0	40.0	40.0	40.0	40.0	41.3	39.6
32	50.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	35.7
40	50.0	40.0	40.0	40.0	40.0	40.0	40.0	37.5	36.0
50	50.0	40.0	40.0	40.0	40.0	40.0	40.0	36.7	35.2
65	50.0	40.0	40.0	40.0	40.0	40.0	40.0	35.9	34.4
80	50.0	40.0	40.0	40.0	40.0	40.0	40.0	36.4	34.9
100	50.0	40.0	40.0	40.0	40.0	40.0	40.0	37.9	36.3
125	50.0	40.0	36.0	32.7	29.7	27.5	25.6	37.6	36.1
150	50.0	40.0	33.1	33.1	27.3	25.3	23.2	39.2	37.6
200	50.0	40.0	29.0	26.5	23.9	22.2	20.7	32.5	31.2
250	50.0	40.0	28.9	26.1	23.8	21.8	20.5	41.7	40.0
300	50.0	40.0	28.1	25.7	23.1	21.5	20.0	35.6	34.1

Pressures in bar

* Design 2 may only be used from -10 to 350 °C.

Pressure/temperature correlation:

DN	Design 4								
	Temperature [°C]								
	-10.0	20.0	100.0	150.0	200.0	250.0	300.0	350.0	400.0
15	40.0	40.0	40.0	40.0	40.0	40.0	40.0	22.4	21.6
20	40.0	40.0	40.0	40.0	40.0	40.0	40.0	22.6	21.8
25	40.0	40.0	40.0	40.0	40.0	40.0	40.0	25.9	25.0
32	40.0	40.0	40.0	40.0	40.0	40.0	40.0	24.8	23.9
40	40.0	40.0	40.0	40.0	40.0	40.0	40.0	25.5	24.5
50	40.0	40.0	40.0	40.0	40.0	40.0	40.0	26.4	25.4
65	40.0	40.0	40.0	40.0	40.0	40.0	40.0	27.0	26.0
80	40.0	40.0	40.0	40.0	40.0	40.0	40.0	28.2	27.2
100	40.0	40.0	40.0	40.0	40.0	40.0	40.0	29.7	28.6
125	50.0	40.0	36.0	32.7	29.7	27.5	25.6	31.8	30.6
150	50.0	40.0	33.1	30.2	27.3	25.3	23.2	37.3	35.9
200	50.0	40.0	29.0	26.5	23.9	22.2	20.7	32.5	31.2
250	50.0	40.0	28.9	26.1	23.8	21.8	20.5	37.6	36.2
300	50.0	40.0	28.8	26.5	23.8	22.1	20.6	35.6	34.1

Pressures in bar

DN	Design 1/5							
	Temperature [°C]							
	-10.0	20.0	100.0	150.0	200.0	250.0	300.0*	350.0*
15	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
20	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
25	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
32	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
40	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
50	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
65	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
80	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
100	50.0	50.0	50.0	50.0	50.0	50.0	50.0	50.0
125	50.0	50.0	50.0	50.0	50.0	50.0	-	-
150	50.0	50.0	50.0	50.0	50.0	50.0	-	-
200	50.0	50.0	50.0	50.0	50.0	50.0	-	-
250	50.0	50.0	50.0	50.0	50.0	50.0	-	-
300	50.0	50.0	50.0	50.0	50.0	50.0	-	-

Pressures in bar

* Design 5 may only be used from -10 to 250 °C.

Kv values:

DN	Kv values
15	4.0
20	7.0
25	10.0
32	17.0
40	24.0
50	37.0
65	61.0
80	74.0
100	115.0
125	201.0
150	286.0
200	553.0
250	643.0
300	867.0

Kv values in m^3/h

If disc springs are used, the Kv value is reduced.

7.4 Product compliance

Pressure Equipment Directive: 2014/68/EU

Food: FDA*
BfR XXI cat. 4*

Drinking water: KTW*
DVGW*
* only with seal material EPDM

Explosion protection: ATEX (2014/34/EU)

7.5 Mechanical data

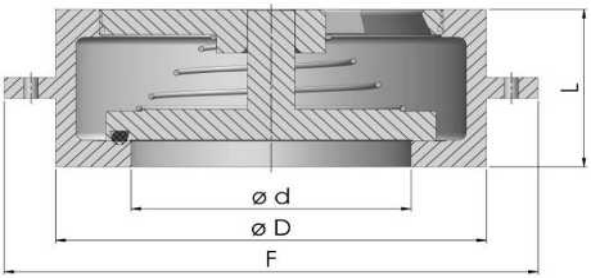
Weight:

DN	Design				
	1	2	3	4	5
15	0.12	0.11	0.11	0.12	0.12
20	0.19	0.19	0.2	0.2	0.19
25	0.31	0.31	0.32	0.32	0.31
32	0.5	0.5	0.52	0.51	0.5
40	0.6	0.61	0.62	0.62	0.61
50	1.02	1.03	1.06	1.05	1.03
65	1.64	1.66	1.71	1.69	1.66
80	2.45	2.48	2.54	2.52	2.48
100	3.83	3.89	3.98	3.95	3.88
125	-	-	8.44	8.37	8.23
150	-	-	12.37	12.26	12.06
200	-	-	23.94	23.74	23.35
250	-	-	39.21	38.88	38.23
300	-	-	58.26	57.81	56.81

Weights in kg

8 Dimensions

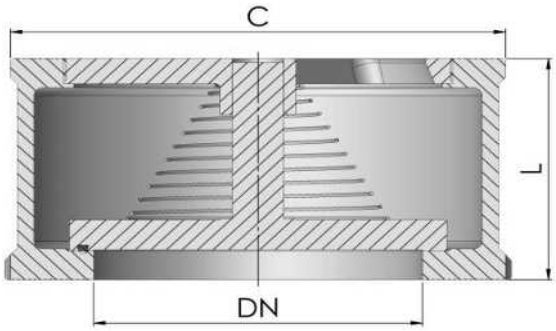
DN 15 to 100

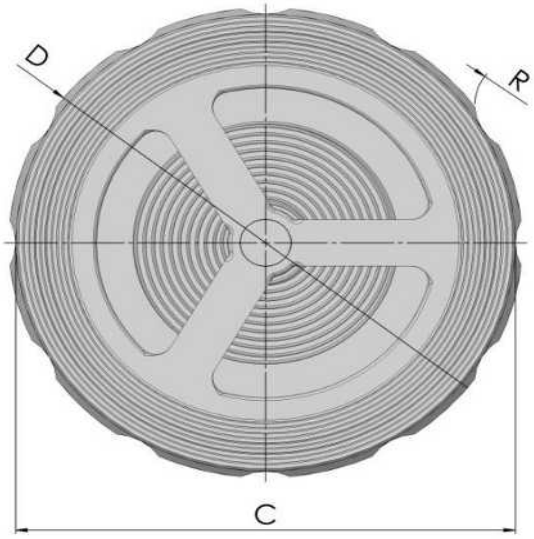


DN	ø d	ø D	F	L
15	15.0	43.0	57.0	16.0
20	19.0	53.0	72.0	19.0
25	25.0	63.0	79.0	22.0
32	32.0	75.0	92.0	28.0
40	38.0	80.0	97.0	31.5
50	47.0	95.0	113.0	40.0
65	63.0	115.0	137.0	46.0
80	77.0	131.0	154.0	50.0
100	97.5	150.0	186.0	60.0

Dimensions in mm

DN 125 to 300





DN	Connection type								
	PN 10 (code 2), PN 16 (code 3)			PN 25 (code 5)		PN 40 (code 6)	ANSI (code D)	L	DN
	C	D	R	C	R	D	D		
125	194.0	194.0	-	194.0	-	194.0	194.0	90.0	118.5
150	220.0	220.0	-	220.0	-	220.0	220.0	106.0	141.0
200	275.0	280.0	11.0	286.0	30.0	294.0	280.0	140.0	190.0
250	331.0	340.0	13.0	344.0	33.0	356.0	340.0	145.0	229.0
300	380.0	386.0	11.0	404.0	33.0	421.0	404.0	160.0	280.0

Dimensions in mm

9 Manufacturer's information

9.1 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.

9.2 Packaging

The product is packaged in a cardboard box which can be recycled as paper.

9.3 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.

9.4 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.

10 Installation in piping

10.1 Preparing for installation

⚠ DANGER

Risk of crushing!

- ► Risk of severe injury.
- ● Depressurize the plant before performing any work on the product.
- ● Observe correct handling procedures.

⚠ 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 appropriate 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.

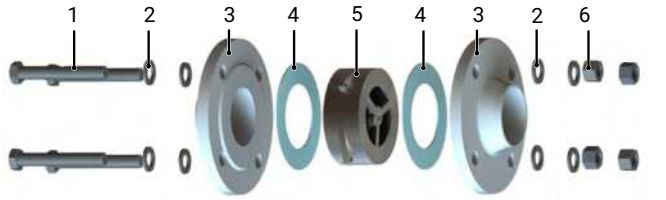
NOTICE

Tools

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

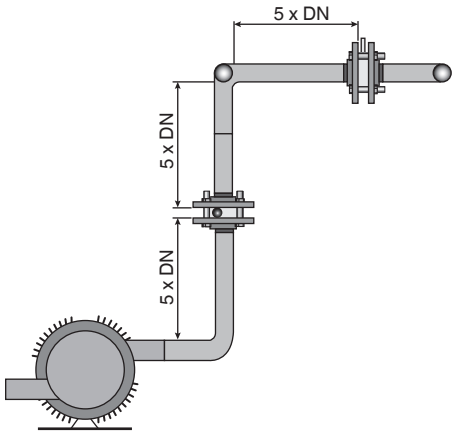
1. Ensure the product is suitable for the relevant application.
2. Check the technical data of the product and the materials.
3. Keep appropriate tools ready.
4. Wear appropriate protective gear, as specified in the plant operator's guidelines.
5. Observe appropriate regulations for connections.
6. Have 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. Correctly decontaminate, rinse and ventilate the plant or plant component.
12. Lay piping so that the product is protected against transverse and bending forces, and also from vibrations and tension.
13. Only install the product between matching aligned pipes (see chapters below).
14. Pay attention to the installation position: Horizontal or vertical.
    Exception: Check valves without a closing spring can only be installed in vertical piping with a flow direction from bottom to top.
15. Pay attention to the direction of the working medium: positioned in-line with flow direction

10.2 Installation



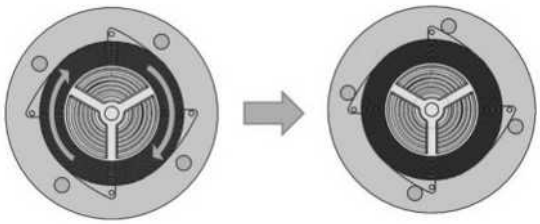
Item	Designation
1	Flange bolts
2	Washers
3	Flange
4	Seal
5	Check valve
6	Nuts

1. Carry out preparations for installation (see chapter "Preparing for installation").
2. Inspect check valve and suitable gaskets for possible damage before installation. Check the check valve for freedom of movement. Damaged parts must not be installed.
3. Make sure that you only install check valves whose pressure class, chemical resistance, connection and dimensions are appropriate for the conditions of use.
4. Provide a straight pipe section of at least five times the nominal diameter upstream and downstream of the check valve.



5. Use flanges to EN1092-1 or EN1092-2 for metal piping.
6. Do not mount directly on a pump flange.
7. Avoid pulsating flow conditions and water hammer.
8. Observe the flow direction of the check valve.
9. Turn the valve to centre it.

⇨ The valve is centred when the centring pins are positioned at the flange bolts.



10. Put one washer **2** onto each of the flange bolts **1**.
11. Insert two flange bolts **1** through the lower flange holes. These can act as a holder when in the installation position with a horizontal flow direction.
12. Insert a check valve **5** between the flanges **3** and seals **4** and place it on the two flange bolts **1**.
13. For large valves that can no longer be moved by hand, use a lifting gear.
14. Insert a suitable flange connection seal **4** between the flange **3** and the check valve **5** and centre between the flanges **3** with the check valve **5**.
15. Insert the remaining flange bolts **1** into the flange holes.
16. Put one washer onto each of the flange bolts [**1** [1] and then attach a nut **6** to each of them.
17. Then centre the check valve **5**, including flange connection seals, between the flanges **3**.

⇨ The check valve **5** is secured in its central position by the flange bolts **1** and the respective shape of the valve.

18. Tighten the flange bolts **1** to the appropriate torque in a diagonal pattern.

Flange bolt torques	
Thread	**Torque [Nm]**
M 10	30
M 12	50
M 16	130
M 20	250
M 24	420
M 27	600

11 Commissioning

⚠ WARNING

Corrosive chemicals!

► Risk of caustic burns
● Wear appropriate 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).

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.

12 Troubleshooting

Error	Possible cause	Troubleshooting
Excessive noise	Settling section not complied with	Install valve in a suitable position
	Flow rate too low	Select smaller nominal size
No flow present	Valve installed wrong way round	Align flow direction arrow with flow direction
	Too low flow rate	Increase pressure/flow rate
	Disc stuck	Clean or replace valve
	Closing spring too strong	Use a weaker closing spring
Leakage rate too high	O-ring damage	Replace O-ring
	Disc deformed	Replace disc
	Sealing surface damaged	Revise sealing surface, replace housing if necessary
	Sealing surface contaminated	Clean sealing surface
	Wear	Replace affected components
	Closing spring worn/defective	Replace closing spring
Leakage at flange	Flange not sufficiently tightened	Check connector elements and retighten if necessary
	Sealing surface/seal damaged	Revise sealing surface, replace housing/ seal if applicable
	Sealing surface/seal contaminated	Clean sealing surface/seal

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.

⚠ CAUTION

- Servicing and maintenance work must only be performed by trained personnel.
- GEMÜ shall assume no liability whatsoever for damage caused by improper handling or third-party actions.
- In case of doubt, contact GEMÜ prior to commissioning.

⚠ CAUTION

Pretensioned spring!

► Damage to the device.
- Slowly release the tension in the spring.

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.

13.1 Spare parts

The product can only be repaired at GEMÜ. The replacement of spare parts may only be carried out by GEMÜ. If this procedure is not observed, the purchaser's guarantee rights and the manufacturer's legal liability cease. This can also lead to a loss of all rights to claim damages.

⚠ CAUTION

Replacement of spare parts

► Damage to the GEMÜ product.
- Do not dismantle the product but send it completely to GEMÜ.

1. Remove the product completely from the plant using appropriate tools.
2. Send the product with return declaration to GEMÜ (see “Returns“, page 22).

14 Removal from piping

NOTICE

► If defective, the entire product must be replaced.

1. Observe (see “Safety information“, page 5) the safety information.
2. Undo the nuts **6** of all flange bolts **1**.
3. Fully remove all of the nuts **6** and washers **2** from the flange bolts **1**.
4. Pull the flange bolts **1** out of the flange holes.

⇨ For a horizontal flow, the bottom flange bolts **1** can remain inserted in order to facilitate disassembly.

5. Secure the check valve **5** against falling down.
6. Pull the flange bolts **1** out of the flange holes.
7. Remove the check valve **5** out of the flange **3** (for large valves, use a lifting gear and a suitable lifting tackle).
8. Remove the remaining flange bolts **1** out of the flange holes.
9. Place the check valve down **5** on a suitable underlay.
10. Insert and centre the new check valve **5** with new seals **4**.
11. Tighten the flange bolts **1**.

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 Declaration of Incorporation according to 2006/42/EC (Machinery Directive)

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.

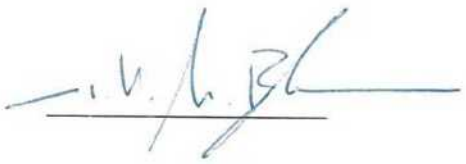
Product:	GEMÜ R90
Product name:	Metal disco check valve
The following essential health and safety requirements of the EC Machinery Directive 2006/42/EC, Annex I have been applied or adhered to:	1.1.2.; 1.1.3.; 1.3.2.; 1.3.4.; 1.3.7.; 1.5.13.; 1.5.4.; 1.5.5.; 1.5.7.; 1.5.8.; 1.6.1.; 1.6.5.; 1.7.1.; 1.7.1.1.; 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, 25/07/2023

18 Declaration of conformity according to 2014/68/EU (Pressure Equipment Directive)

EU Declaration of Conformity

in accordance with 2014/68/EU (Pressure Equipment Directive)

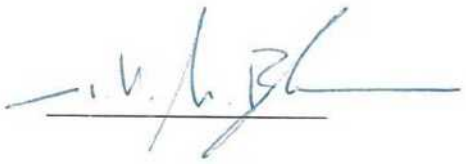
We, the company	GEMÜ Gebr. Müller Apparatebau GmbH & Co. KG Fritz-Müller-Strasse 6–8 74653 Ingelfingen-Criesbach, Germany

hereby declare under our sole responsibility that the below-mentioned product complies with the regulations of the above-mentioned Directive.

Product:	GEMÜ R90
Product name:	Metal disco check valve
Applied conformity assessment procedure(s):	Module H
The following harmonized standards (or parts thereof) have been applied:	EN 16668:2016 + A1:2018

Information for products with a nominal size ≤ DN 25:

The products are developed and produced according to GEMÜ's in-house process instructions and standards of quality 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-marking.



M. Barghoorn
Head of Global Technics

Ingelfingen, 25/07/2023

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