

Construction

GEMÜ 650TL is a manual tapping valve with automatic closing function which is designed for use in sterile applications. This piston actuated diaphragm valve has a "keep-closed" override of manual operation. The valve can only be operated (opened / closed), if a control medium is applied to the actuator. When the control medium supply is switched off, the valve closes and can no longer be operated manually.

Example: If the flow velocity in a piping loop is reduced (e.g. if too many tapping points are open), flow may drop below a critical level. This special GEMÜ 650TL valve can be used to specifically close tapping points automatically via the central process control system in order to reduce the tapping quantity and thus to increase the piping loop flow velocity.

Features

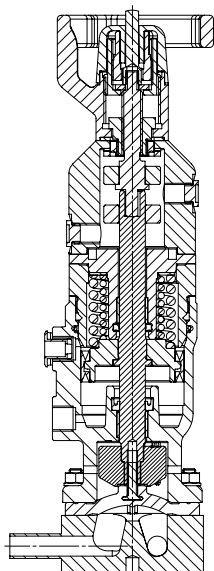
- Suitable for inert and corrosive* liquid and gaseous media
- Valve body and diaphragm available in various materials and designs
- Compact design (ideal when space is at a premium)
- Various connections available
- CIP/SIP cleaning and sterilizing capabilities
- Standard optical position indicator

Advantages

- Hermetic separation between medium and actuator
- Optional flow direction
- Installation for an optimized draining is possible
- Control air connectors positioned in-line with piping, 90° offset optional
- Feedback of closed position (pneumatic piston and/or handwheel) via optionally available proximity switches

* see information on working medium on page 2

Sectional view



Technical data

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.

The valve will seal in both flow directions up to full operating pressure (gauge pressure).

Temperatures

Medium temperature -10 to 100 °C

Sterilisation temperature ⁽¹⁾

| | |
|---------------------|--|
| EPDM (code 13/3A) | max. 150 °C ⁽²⁾ , max. 60 min per cycle |
| EPDM (code 17) | max. 150 °C ⁽²⁾ , max. 180 min per cycle |
| PTFE/EPDM (code 54) | max. 150 °C ⁽²⁾ , no time limit per cycle |
| PTFE/EPDM (code 5M) | max. 150 °C ⁽²⁾ , no time limit per cycle |

¹ The sterilisation temperature is valid for steam (saturated steam) or superheated water.

² If the sterilisation temperatures listed above are applied to the EPDM diaphragms for longer periods of time, the service life of the diaphragms will be reduced. In these cases, maintenance cycles must be adapted accordingly. This also applies to PTFE diaphragms exposed to high temperature fluctuations.

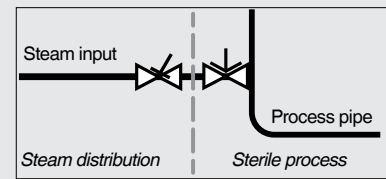
PTFE diaphragms can also be used as moisture barriers; however, this will reduce their service life.

The maintenance cycles must be adapted accordingly.

GEMÜ 555 and 505 globe valves are particularly suitable for use in the area of steam generation and distribution.

The following valve arrangement for interfaces between steam pipes and process pipes has proven itself over time:

A globe valve for shutting off steam pipes and a diaphragm valve as an interface to the process pipes.



Ambient temperature 0 to 60 °C

Control medium

Inert gases

Max. permissible temperature of control medium 60 °C

Filling volume

| Diaphragm size | DN | Actuator size | Piston diameter | Control function 1 |
|----------------|-----------|---------------|-----------------|----------------------|
| 8 | 4 ...15 | 0 | 32 mm | 0.01 dm ³ |
| 10 | 10 ... 20 | 1 | 50 mm | 0.02 dm ³ |
| 25 | 15 ...25 | 2 | 63 mm | 0.06 dm ³ |

| Actuator | MG | Operating pressure [bar] | | Control pressure [bar] |
|----------|----|--------------------------|-------|------------------------|
| | | EPDM | PTFE | C.f.1 |
| 0 | 8 | 0 - 8 | 0 - 6 | 5 - 7 |
| 1 | 10 | 0 - 5 | 0 - 5 | 5 - 7 |
| 2 | 25 | 0 - 5 | 0 - 5 | 4 - 7 |

All pressures are gauge pressures. Operating pressure values were determined with static operating pressure applied on one side of a closed valve. Sealing at the valve seat and atmospheric sealing is ensured for the given values.

Information on operating pressures applied on both sides and for high purity media on request

MG = diaphragm size

Order data

| Body configuration | Code |
|--|------|
| Tank bottom valve body | B** |
| 2/2-way body | D |
| T body | T* |
| * For dimensions see T Valves brochure | |
| ** Dimensions and versions on request | |

| Valve body material | Code |
|--|------|
| 1.4435, investment casting | C3 |
| 1.4435 (316L), forged body | 40 |
| 1.4435 (BN2), forged body $\Delta Fe < 0.5\%$ | 42 |
| 1.4435 (316L), block material | 41 |
| 1.4435 (BN2), block material $\Delta Fe < 0.5\%$ | 43 |
| 1.4539, forged body | F4 |

| Connection | Code |
|--|------|
| Butt weld spigots | |
| Spigots DIN | 0 |
| Spigots EN 10357 series B (formerly DIN 11850 series 1) | 16 |
| Spigot EN 10357 series A (formerly DIN 11850 series 2) / DIN 11866 series A | 17 |
| Spigots DIN 11850 series 3 | 18 |
| Spigots JIS-G 3447 | 35 |
| Spigots JIS-G 3459 | 36 |
| Spigots SMS 3008 | 37 |
| Spigots BS 4825 Part 1 | 55 |
| Spigot ASME BPE / DIN 11866 series C | 59 |
| Spigot ISO 1127 / EN 10357 series C / DIN 11866 series B | 60 |
| Spigots ANSI/ASME B36.19M Schedule 10s | 63 |
| Spigots ANSI/ASME B36.19M Schedule 40s | 65 |
| Threaded connections | |
| Threaded spigots DIN 11851 | 6 |
| One side threaded spigot, other side cone spigot and union nut, DIN 11851 | 62 |
| Aseptic unions on request | |
| Clamp connections | |
| Clamps ASME BPE for pipe ASME BPE, length ASME BPE | 80 |
| Clamps DIN 32676 series B for pipe EN ISO 1127, length EN 558, series 7 | 82 |
| Clamps ASME BPE for pipe ASME BPE, length EN 558, series 7 | 88 |
| Clamps DIN 32676 series A for pipe DIN 11850, length EN 558, series 7 | 8A |
| Clamps SMS 3017 for pipe SMS 3008, length EN 558, series 7 | 8E |
| Aseptic clamps on request | |
| For overview of available valve bodies for GEMÜ 650 TL see datasheet GEMÜ 650 standard | |

| Diaphragm material | Code |
|---|--------|
| EPDM | 13 3A* |
| EPDM | 17 |
| EPDM | 36 |
| PTFE/EPDM, one-piece | 54* |
| PTFE/EPDM, two-piece | 5M |
| * for diaphragm size 8 | |
| Material complies with FDA requirements | |

| Control function | Code |
|----------------------|------|
| Normally closed (NC) | 1 |

| Actuator size | Code |
|-------------------------------------|------|
| Actuator size 0 (diaphragm size 8) | 0 |
| Actuator size 1 (diaphragm size 10) | 1 |
| Actuator size 2 (diaphragm size 25) | 2 |

| Actuator version | Code |
|---|------|
| Control air connectors in flow direction | T |
| Control air connectors 90° offset to flow direction | R |

| Actuator function | Code |
|---|------|
| Pneumatically operated with "keep-closed" override of manual operation" | L |

Order data

Internal surface finishes for forged and block material bodies ¹

| Readings for Process Contact Surfaces | Mechanically polished ² | | Electropolished | |
|---------------------------------------|------------------------------------|------|--------------------------|------|
| | Hygienic class DIN 11866 | Code | Hygienic class DIN 11866 | Code |
| Ra ≤ 0.80 µm | H3 | 1502 | HE3 | 1503 |
| Ra ≤ 0.60 µm | - | 1507 | - | 1508 |
| Ra ≤ 0.40 µm | H4 | 1536 | HE4 | 1537 |
| Ra ≤ 0.25 µm ³ | H5 | 1527 | HE5 | 1516 |

| Readings for Process Contact Surfaces acc. to ASME BPE 2016 ⁴ | Mechanically polished ² | | Electropolished | |
|--|------------------------------------|------|------------------------------|------|
| | ASME BPE Surface Designation | Code | ASME BPE Surface Designation | Code |
| Ra Max. = 0.76 µm (30 µinch) | SF3 | SF3 | - | - |
| Ra Max. = 0.64 µm (25 µinch) | SF2 | SF2 | SF6 | SF6 |
| Ra Max. = 0.51 µm (20 µinch) | SF1 | SF1 | SF5 | SF5 |
| Ra Max. = 0.38 µm (15 µinch) | - | - | SF4 | SF4 |

Internal surface finishes for investment cast bodies

| Readings for Process Contact Surfaces | Mechanically polished ² | |
|---------------------------------------|------------------------------------|------|
| | Hygienic class DIN 11866 | Code |
| Ra ≤ 6.30 µm | - | 1500 |
| Ra ≤ 0.80 µm | H3 | 1502 |
| Ra ≤ 0.60 µm ⁵ | - | 1507 |

¹ Surface finishes of customized valve bodies may be limited in special cases.

² Or any other finishing method that meets the Ra value (acc. to ASME BPE).

³ The smallest possible Ra finish for pipe connections with an internal pipe diameter < 6 mm is 0.38 µm.

⁴ When using these surfaces, the bodies are marked according to the specifications of ASME BPE.

The surfaces are only available for valve bodies which are made of materials (e.g. GEMÜ material codes 40, 41, F4, 44) and use connections (e.g. GEMÜ connection codes 59, 80, 88) according to ASME BPE.

⁵ Not possible for GEMÜ connection code 59, DN 8 and GEMÜ connection code 0, DN 4.

Ra acc. to DIN EN ISO 4288 and ASME B46.1

Order data

| Order example | 650 | 25 | T | 60 | 41 | 17 | 1 | 2 | T | L | 25 | 60 | 1503 |
|----------------------------------|-----|----|---|----|----|----|---|---|---|---|----|----|------|
| Type | 650 | | | | | | | | | | | | |
| Nominal size | | 25 | | | | | | | | | | | |
| Body configuration (code) | | | T | | | | | | | | | | |
| Connection (code) | | | | 60 | | | | | | | | | |
| Valve body material (code) | | | | | 41 | | | | | | | | |
| Diaphragm material (code) | | | | | | 17 | | | | | | | |
| Control function (code) | | | | | | | 1 | | | | | | |
| Actuator size (code) | | | | | | | | 2 | | | | | |
| Actuator version (code) | | | | | | | | | T | | | | |
| Actuator function (code) | | | | | | | | | | L | | | |
| Nominal size (mm)* | | | | | | | | | | | 25 | | |
| Connection (code)* | | | | | | | | | | | | 60 | |
| Surface finish (Code see page 4) | | | | | | | | | | | | | 1503 |

* only in T-valve version

For querying the positions of the pneumatic actuator and the handwheel, a proximity switch each must be ordered separately:

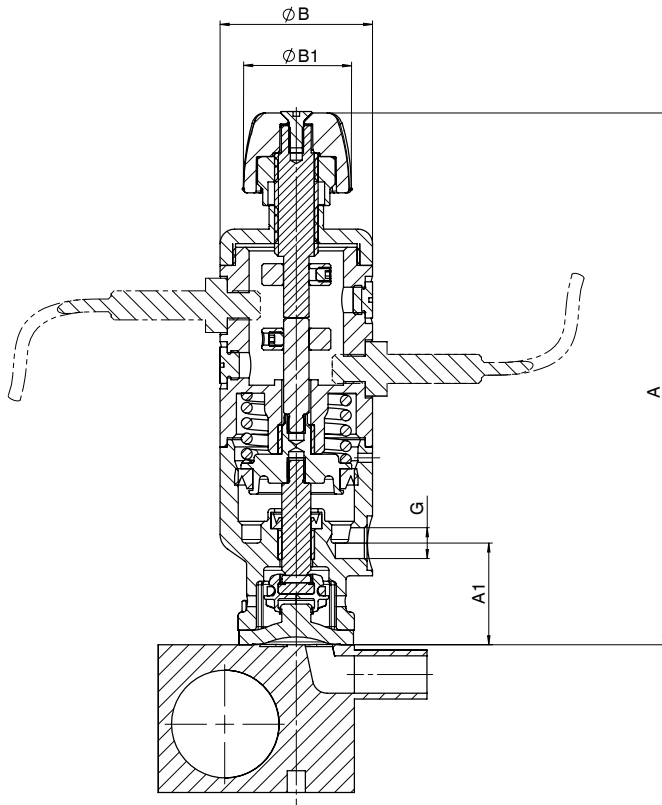
| Order example - Proximity switches | | |
|--|--------------|--------------------------------|
| Version | Connection | Order code |
| 3 - wire - PNP, make contact IP67, 10 - 60 V DC, 100 mA | 2 m cable | 1200 M08 Z 12 040 02M0 B J 001 |
| | M12 x 1 plug | 1200 M08 Z 12 060 M124 B J 002 |

Other proximity switches on request

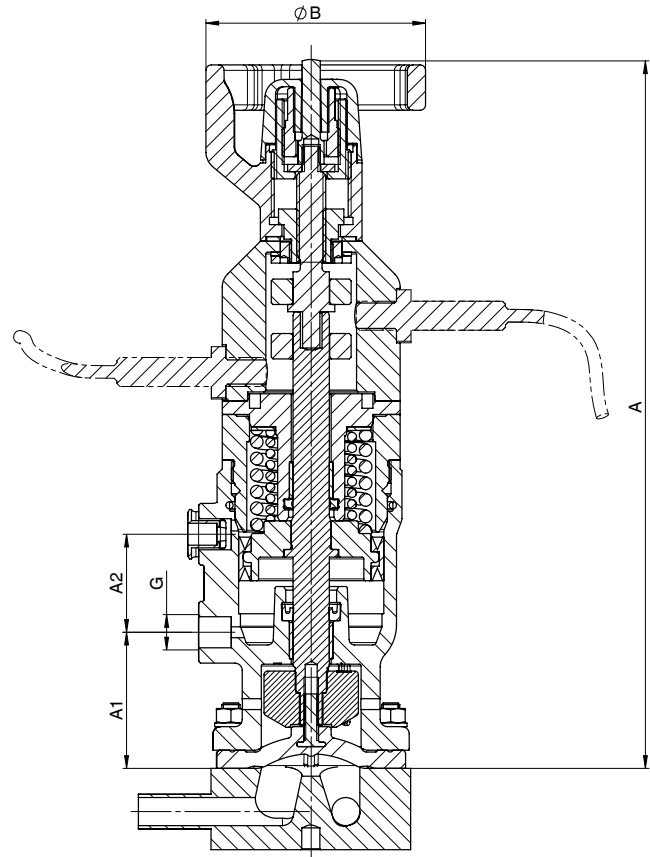
Dimensions [mm]

| Actuator dimensions | | | | | | | |
|---------------------|----------------|-----|------|----|----|-----|-------|
| Actuator size | Diaphragm size | A | A1 | A2 | øB | øB1 | G |
| 0 | 8 | 146 | 26.5 | - | 42 | 32 | G 1/8 |
| 1 | 10 | 196 | 37.0 | 27 | 60 | - | G 1/8 |
| 2 | 25 | 264 | 51.0 | 24 | 85 | - | G 1/4 |

GEMÜ 650 0TL



GEMÜ 650 1TL / GEMÜ 650 2TL



Proximity switch M8x1 (flush mountable) not included in the scope of delivery (see bottom of page 4 GEMÜ type 1200)

Notes:

- For T body dimensions see brochures "T valves for sterile applications" (diaphragm size 8 - 25).
- 2/2-way bodies are also available for GEMÜ 650TL, see datasheet of type 650 (diaphragm size 8 - 25).
- GEMÜ 650TL can also be mounted to M600 and tank bottom valve bodies.

For further metal diaphragm valves, accessories and other products, please see our Product Range catalogue and Price List.
Contact GEMÜ.