

## GEMÜ 44A0

### Multi-functional valve actuation



#### Features

- Communication and programming interface IO-Link
- Self-initialization through autonomous detection of end positions
- Condition monitoring through integrated sensor system
- Configuration and status diagnostics via the GEMÜ App
- Contactless position detection
- Electrical and mechanical position indicator as well as advanced diagnostic messages via high-visibility LED
- Uniform mounting kit with integrated air supply and control pressure detection
- ASi-5 fieldbus connection

#### Description

Independent of the actuator size, the GEMÜ 44A0 multi-functional valve actuation, as an automation module, is compatible with all pneumatically operated process valves with single acting linear actuator of the new valve generation. Depending on the order variant and the set device functions, the connected process valves can be controlled conventionally open/closed (combi switch-box) or the valve position can be precisely controlled (positioner). Contactless position detection determines the valve position precisely, reliably and without being subject to wear. The current valve position is displayed via high visibility LEDs, and fed back via electrical signals. In addition to this, there is an integrated mechanical position indicator. Modern communication interfaces, an integrated sensor system and the GEMÜ app operating option are all features that characterize this innovative product.

#### Technical specifications

- **Ambient temperature:** -10 to 60 °C
- **Supply voltages:** 24 V DC I or as per fieldbus specification
- **Electrical connection types:** M12 plug
- **Communication modes:** ASi-5 I Bluetooth I IO-Link
- **Protection class:** IP 65
- **Mode of action:** Single acting
- **Operating pressure :** 0.5 to 7 bar

Technical data depends on the respective configuration



## Product description

### Construction

Actuator **A** must be ordered separately.



| Item | Name                                                    | Materials          |
|------|---------------------------------------------------------|--------------------|
| 1    | Housing cover, black                                    | PC                 |
| 2    | Housing ventilation                                     | ePTFE              |
| 3    | LED signalling window                                   | PC                 |
| 4    | Transparent cap                                         | PC                 |
| 5    | Electrical threaded connection                          | SS/1.4305          |
| 6    | Pneumatic connectors                                    | SS/1.4305          |
| 7    | Seal                                                    | FKM                |
| 8    | Type E1B0 Bluetooth module (optional) with slider cover | -                  |
| -    | Mounting plate (only size 1)                            | Anodized aluminium |

## High visibility LEDs

As well as the electrical position indicator and error output, a visual signal of the various operating conditions is emitted by high visibility LEDs 1 integrated into the housing. The LEDs are arranged so that two light bands integrated on the side are illuminated, making the condition also apparent from a distance. The following conditions are illustrated here:



### Valve position indicator for OPEN/CLOSE actuation device function (combi switchbox) <sup>1)</sup>

| Colour of high visibility LEDs |                        | Function                                      |
|--------------------------------|------------------------|-----------------------------------------------|
| Standard                       | Inversed <sup>2)</sup> |                                               |
| Green                          | Orange                 | Process valve in OPEN position                |
| Orange                         | Green                  | Process valve in CLOSED position              |
| Flashing green                 | Flashing orange        | Movement of process valve in OPEN direction   |
| Flashing orange                | Flashing green         | Movement of process valve in CLOSED direction |

### Valve position indicator for positioner device function <sup>1)</sup>

| Colour of high visibility LEDs |                         | Function                         |
|--------------------------------|-------------------------|----------------------------------|
| Standard                       | Inversed <sup>2)</sup>  |                                  |
| Orange (100% brightness)       | Green (100% brightness) | Process valve in CLOSED position |
| Green 25% brightness           | Orange 25% brightness   | Process valve ≤ 25% open         |
| Green 50% brightness           | Orange 50% brightness   | Process valve ≤ 50% open         |
| Green 75% brightness           | Orange 75% brightness   | Process valve ≤ 75% open         |
| Green 100% brightness          | Orange 100% brightness  | Process valve > 75% open         |

<sup>1)</sup> The valve position indicator can be dimmed or deactivated via parameters.

<sup>2)</sup> Inverted display can be activated via parameters

### Status indication of all device functions

| Colour of high-visibility LEDs | Function                        |
|--------------------------------|---------------------------------|
| Standard                       |                                 |
| Flashing yellow/white          | Initialization active           |
| Flashing white                 | Localization active             |
| Flashing orange/red            | General warning active          |
| Flashing red                   | General error active            |
| Flashing yellow/turquoise      | Maintenance required            |
| Flashing blue (briefly)        | Wireless connection established |
| Flashing purple/green          | Internal update process active  |
| Flashing turquoise (briefly)   | Device start                    |
| Lit up red (permanently)       | Serious error (device faulty)   |

## Overview of available functions

| Function                                                                                                 | OPEN/CLOSE actuation | Positioner |
|----------------------------------------------------------------------------------------------------------|----------------------|------------|
| Adjustable device function for order version: Basic device version (code B)                              | X                    | -          |
| Adjustable device function for order version: Positioner device version (code C)                         | X                    | X          |
| Start initialization                                                                                     | X                    | X          |
| Deactivation/dimming of high-visibility position indicator                                               | X                    | X          |
| Position feedback OPEN                                                                                   | X                    | X          |
| Position feedback CLOSED                                                                                 | X                    | X          |
| Reading option for the current valve position (0.0 to 100.0%)                                            | X                    | X          |
| Reading option for initialized end positions                                                             | X                    | X          |
| Reading option for the determined travel time                                                            | X                    | X          |
| Reading option for the condition monitoring sensor values (temperature, air humidity, internal pressure) | X                    | X          |
| Adjustable warning threshold for exceeding or not reaching the sensor values                             | X                    | X          |
| Transmission of warning or error messages                                                                | X                    | X          |
| Automatic detection of the valve control function                                                        | X                    | X          |
| Monitoring the valve movement profile for deviations (diagnostic function)                               | X                    | X          |
| Feedback for operating mode                                                                              | X                    | X          |
| Location function                                                                                        | X                    | X          |
| Inversion of LED colours                                                                                 | X                    | X          |
| Inversion of feedback signals                                                                            | X                    | X          |
| Switch point setting (tolerance)                                                                         | X                    | X          |
| Operating hours counter reading                                                                          | X                    | X          |
| Cycle counter reading (on-site)                                                                          | X                    | X          |
| Total cycle counter reading                                                                              | X                    | X          |
| Digital parameter representation                                                                         | X                    | X          |
| Configurable process data variables                                                                      | X                    | X          |
| App operating option (BLE)                                                                               | X                    | X          |
| Reset to default settings                                                                                | X                    | X          |
| Adjustable error position                                                                                | X                    | X          |
| Adjustable preferred direction (for implausible signals)                                                 | X                    | X          |
| Self-commissioning function (autonomous detection of end positions)                                      | X                    | -          |
| Open and close valve via control bit                                                                     | X                    | -          |
| Control valve position (0–100%)                                                                          | -                    | X          |
| Adjustable control characteristics                                                                       | -                    | X          |

| Function                                                       | OPEN/CLOSE actuation | Positioner |
|----------------------------------------------------------------|----------------------|------------|
| Adjustable permissible system deviation (dead zone)            | -                    | X          |
| Adjustable regulating distance limit (stroke/travel stop)      | -                    | X          |
| Freely definable error position                                | -                    | X          |
| Break/control operation signal change-over                     | -                    | X          |
| Configurable split-range function                              | -                    | X          |
| Inversion of the set value direction of action                 | -                    | X          |
| Configurable control characteristic                            | -                    | X          |
| Adjustable close tight function (separate for OPEN and CLOSED) | -                    | X          |

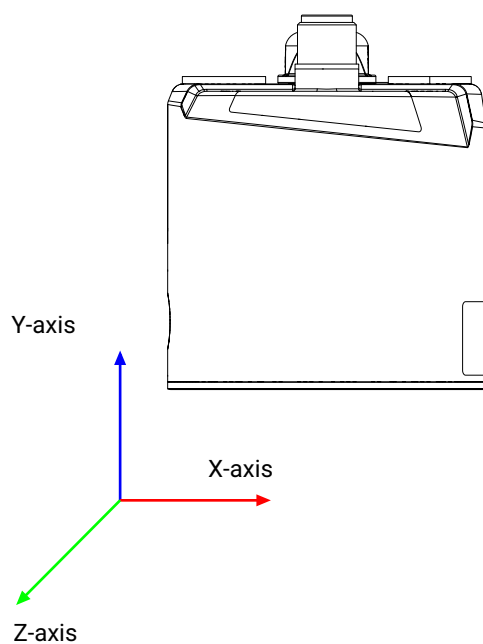
## Sensor system for status monitoring

Various sensors are installed on the device which make it possible to diagnose the status. The measured values are output on the electrical interface(s) and so can be processed. Additionally, for each relevant measured value, warning thresholds are defined that generate a warning or error message when they are not reached or are exceeded. This means that unacceptable influences that would damage the device or reduce its service life can be reacted to in a timely manner.

The following measured values are detected internally:

- Internal temperature
- Internal humidity
- Internal pressure
- Control air supply pressure
- Installation position (in two directions)
- Acceleration (in three axes)
- Current consumption
- Supply voltage

The axes for evaluating the acceleration in the X, Y and Z directions are defined in accordance with the visualisation below.



The following correlation is provided in the details of the mounting angles:

- The frontal inclination angle corresponds to the Z axis.
- The side inclination angle corresponds to the X axis.

## Integrated diagnostic functions

GEMÜ 44A0 has integrated diagnostic functions that provide information early on about irregularities in the switch or control characteristics of pneumatically operated process valves (shut off and control valves). These diagnostic functions continuously monitor the movements of the actuator and detect deviations from normal operating behaviour.

This can generate the following messages:

### OPEN/CLOSE actuation device function:

- **“No movement or incorrect movement in the Open/Closed direction”:**  
Indicates that no or incomplete movement has taken place (e.g. due to no or insufficient control pressure or mechanical blockage).
- **“Duration error in the Open/Closed direction”:**  
Indicates an above-average switching time, e.g. in the event of a pressure drop or mechanical resistance.
- **“Undefined change in position in the Open/Closed direction”:**  
Indicates unexpected movements without valid actuation (e.g. for leakages or uncontrolled pressure changes).

### Positioner device function:

- **“No movement or incorrect movement”:**  
Indicates that no or incomplete movement has taken place or the valve position does not correspond to the specified target variable (e.g. due to no or insufficient control pressure or mechanical blockage).

These diagnostic functions, including the resulting diagnostic messages, can be deactivated via parameters.

## Range overview

### Compatibility with linear actuators on the new platform generation

Every size is compatible with one or more actuator sizes of valves with linear actuators on the new platform generation. Please ensure that the size is compatible with the actuator size on the selected valve.

| 44A0 size | Compatible actuator size |
|-----------|--------------------------|
| 1         | 1                        |
| 2         | 2, 3                     |
| 3         | 4, 5, 6                  |

## Order data

The order data provide an overview of standard configurations.

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

Note: If there are restrictions on the customer or on the system side which prohibit the use of a Bluetooth interface, we recommend using an order variant with a deactivated Bluetooth interface or without a Bluetooth interface.

For designs with a Bluetooth interface, the option also exists to deactivate the interface via parameters independently later or to uninstall the type E1B0 Bluetooth module.

For designs without a Bluetooth interface, the option also exists to retrofit the interface independently later.

Note:

- Basic device version (code B) = OPEN/CLOSE valve actuation (combi switchbox)
- Positioner device version (code C) contains both the positioner function and OPEN/CLOSE actuation (adjustable via parameter)

## Order codes

| 1 Type                           | Code |
|----------------------------------|------|
| Multi-functional valve actuation | 44A0 |
| 2 Electrical interface           | Code |
| IO-Link                          | IO   |
| ASi-5                            | A5   |
| 3 Action                         | Code |
| Single acting                    | 1    |
| 4 Direction of movement          | Code |
| Linear                           | L    |
| 5 Device version                 | Code |
| Basic                            | B    |
| Positioner                       | C    |
| 6 Interface/size                 | Code |
| Size 1                           | 1    |
| Size 2                           | 2    |
| Size 3                           | 3    |
| 7 Body material                  | Code |
| Plastic                          | P    |
| 8 Options                        | Code |
| Without                          | 0    |
| 9 Electrical connection          | Code |
| M12 connector                    | 1    |
| 10 Air supply                    | Code |
| Integrated                       | I    |
| 11 Wireless interface            | Code |
| Bluetooth                        | B    |
| Without                          | 0    |
| 12 Local user interface          | Code |
| LEDs                             | L    |
| 13 Mechanical option             | Code |
| Without                          | 0    |

**Order example**

| Ordering option         | Code | Description                      |
|-------------------------|------|----------------------------------|
| 1 Type                  | 44A0 | Multi-functional valve actuation |
| 2 Electrical interface  | OK   | IO-Link                          |
| 3 Action                | 1    | Single acting                    |
| 4 Direction of movement | L    | Linear                           |
| 5 Device version        | B    | Basic                            |
| 6 Interface/size        | 2    | Size 2                           |
| 7 Body material         | P    | Plastic                          |
| 8 Options               | 0    | Without                          |
| 9 Electrical connection | 1    | M12 connector                    |
| 10 Air supply           | I    | Integrated                       |
| 11 Wireless interface   | B    | Bluetooth                        |
| 12 Local user interface | L    | LEDs                             |
| 13 Mechanical option    | 0    | Without                          |

## Technical data

### Medium

|                            |                                                                                           |
|----------------------------|-------------------------------------------------------------------------------------------|
| <b>Working medium:</b>     | Compressed air and inert gases                                                            |
| <b>Dust content:</b>       | Class 3, max. particle size 5 µm, max. particle density 5 mg/m <sup>3</sup>               |
| <b>Pressure dew point:</b> | Class 4, max. pressure dew point +3 °C                                                    |
| <b>Oil content:</b>        | Class 5, max. oil concentration 25 mg/m <sup>3</sup><br>Quality classes to DIN ISO 8573-1 |

### Temperature

|                                    |             |
|------------------------------------|-------------|
| <b>Ambient temperature:</b>        | -10 – 60 °C |
| <b>Control medium temperature:</b> | -20 – 60 °C |
| <b>Storage temperature:</b>        | -20 – 70 °C |

### Pressure

|                          |                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Control pressure:</b> | 0.5 max. 7 bar<br>The applied pressure must not exceed the maximum control pressure of the process valve.<br>(If the measured control pressure is ≤ 1.0 bar, a warning is issued as standard to indicate that the control pressure has not been reached, and if it is ≥ 7.1 bar, a warning is issued to indicate that the control pressure has been exceeded. The warning thresholds can be changed.) |
| <b>Air consumption:</b>  | 0 NI/min (when idle)                                                                                                                                                                                                                                                                                                                                                                                  |

### Product compliance

|                        |            |
|------------------------|------------|
| <b>EMC Directive:</b>  | 2014/30/EU |
| <b>RoHS Directive:</b> | 2011/65/EU |

#### Approval:

| IO-Link                      | ASi-5                            |
|------------------------------|----------------------------------|
| IO-Link specification V1.1.4 | ASi-5 specification V1.04 Rev. 1 |

### Mechanical data

|                               |                                                 |
|-------------------------------|-------------------------------------------------|
| <b>Installation position:</b> | Optional                                        |
| <b>Weight:</b>                | Size 1: 240 g<br>Size 2: 262 g<br>Size 3: 798 g |

#### Travel sensor:

|                                                                                                                                                                                                                                  | Size 1 and 2                                                                 | Size 3  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|---------|
| <b>Minimum stroke <sup>1)</sup>:</b>                                                                                                                                                                                             | 2.0 mm                                                                       | 5.0 mm  |
| <b>Maximum stroke <sup>2)</sup>:</b>                                                                                                                                                                                             | 29.0 mm                                                                      | 45.0 mm |
| <b>Correlation between travel sensor spindle/valve position <sup>3)</sup></b>                                                                                                                                                    | Retracted (top) ± 100% (valve open)<br>Extended (bottom) ± 0% (valve closed) |         |
| <sup>1)</sup> Relevant for successful initialization                                                                                                                                                                             |                                                                              |         |
| <sup>2)</sup> Corresponds to the linearized stroke range                                                                                                                                                                         |                                                                              |         |
| <sup>3)</sup> Relative to the setting value <b>0 = deactivated</b> of the "Inversion of travel sensor signal" parameter. If the inversion of the travel sensor signal is activated, the correlation is correspondingly inverted. |                                                                              |         |

### Operating conditions

**Ambient conditions:** Use indoors and outdoors  
 Dry and wet environments

**Height:** Up to 2000 m (above sea level)

**Relative air humidity:** 0–100%

| Protection class: | Single device as supplied      | Mounted to actuator |
|-------------------|--------------------------------|---------------------|
|                   | Unintended operating condition | IP 65               |

**Degree of contamination:** 4 (pollution degree)

### Electrical data

| Supply voltage Uv: | IO-Link                                               | ASi-5                                                   |
|--------------------|-------------------------------------------------------|---------------------------------------------------------|
|                    | 18–30 V DC (in accordance with IO-Link specification) | 26.5–31.6 V DC (in accordance with ASi-5 specification) |

**Duty cycle:** Continuous duty

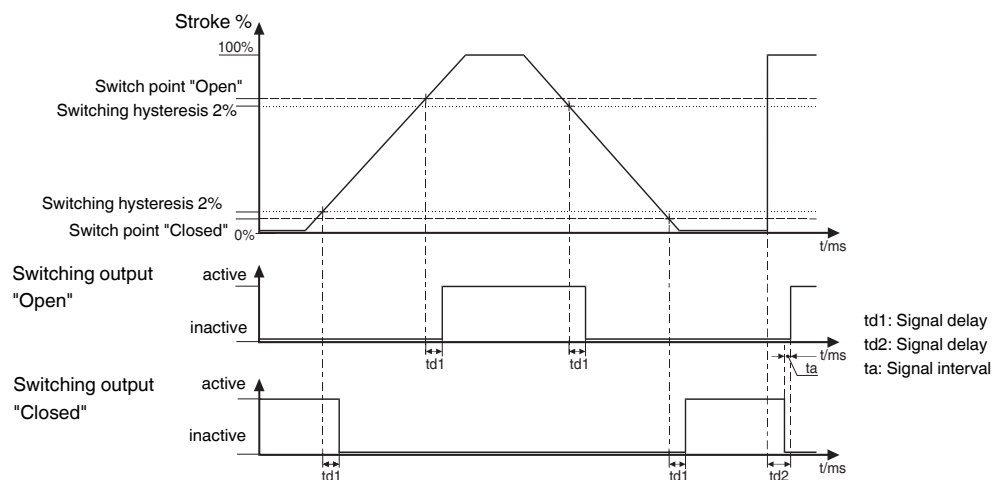
**Reverse polarity protection:** yes

**Electrical protection class:** III

| Current consumption: | IO-Link     | ASi-5       |
|----------------------|-------------|-------------|
|                      | Max. 135 mA | Max. 130 mA |

**Electrical connection type:** 1 x 5-pin M12 plug (A-coded)

### Switching characteristic:



Switch points in data in percent of the programmed stroke, with reference to the lower end position (0%)

**Switch points:**

|                                 | Size 1 and 2                                                                      | Size 3  |
|---------------------------------|-----------------------------------------------------------------------------------|---------|
| <b>Switch point CLOSED</b>      | Default setting: 12% (adjustable from 0–90%)                                      |         |
| <b>Switch point OPEN</b>        | Default setting: 75% (adjustable from 10–100%)                                    |         |
| <b>Min. switch point CLOSED</b> | 0.8 mm                                                                            | 1.2 mm  |
| <b>Min. switch point OPEN</b>   | 0.5 mm                                                                            | 0.75 mm |
| <b>Switching hysteresis</b>     | 2%<br>(relative to the initialized range upstream of the respective switch point) |         |

If the percentage switch points dependent on the programmed stroke are less than the permissible min. switch points, the min. switch points apply automatically. The min. switch points refer to the value before achieving the initialized end position values for the respective item. For example, the CLOSED end position is output at the very latest from 0.8 or 1.2 mm before reaching the initialized end position value of the CLOSED position. The detection and feedback of end positions can also take place earlier (dependent on the stroke) due to the set percentage value of switch point OPEN or CLOSED. A difference of at least 10% must be maintained between the switch point settings.

**Travel sensor:**

**Linearity:** < 0.6%  
**Repeatability:** < 0.3%

- These values refer to properties including influences of a reference interference field in the form of an identical device with the smallest possible distance to each other.
- The data can only be guaranteed and complied with within the defined functional stroke range of the valves provided. These are a maximum of 25 mm for size 1 and size 2 and a maximum of 41 mm for size 3.

**Interface:**

|              | Bluetooth Low Energy<br>(only with integrated wireless interface)                                                                                                                                                                            | IO-Link                                                    | ASi-5                                                      |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|
| Function     | Parameterization, configuration, diagnostics and operation                                                                                                                                                                                   | Parameterization, configuration, diagnostics and operation | Parameterization, configuration, diagnostics and operation |
| Prerequisite | Compatible smartphone/tablet with Android or iOS <sup>1)</sup> <ul style="list-style-type: none"> <li>• Apple iOS: Version 16.6 or higher</li> <li>• Android: Version 8.0 ("Oreo") or higher</li> <li>• Bluetooth 4.0 LE or newer</li> </ul> | IO-Link master spec. 1.1                                   | Compatible ASi-5 Master                                    |
| Version      | Bluetooth 5.4 (Low Energy)                                                                                                                                                                                                                   | IO-Link spec. V1.1.4                                       | ASi-5 spec V1.04                                           |

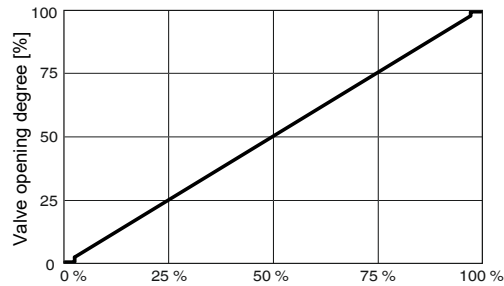
<sup>1)</sup> The compatible GEMÜ App can be downloaded in the respective stores (Apple App Store or Google Play Store).

**Positioner data (positioner device function)**

**Note:**

The following diagram is valid for valves with a standard assignment of the spindle position to the valve position.  
 (See section "Mechanical data, correlation between travel sensor spindle/valve position")

**Control diagram:**



**Note:** The control diagram shown here relates to the parameter values at the factory. The control diagram can be influenced/changed by multiple parameters (for example, "Inversion of the travel sensor signal" and/or "Control characteristic")

The digital electro-pneumatic positioner automatically detects the control function of the valve during initialization: Normally open (NO) or normally closed (NC).

For the 0% signal specification, the position of the valve is closed.

The close tight function that is integrated as standard ensures that the valve is moved completely to the end position when the signal "Open valve" or "Close valve" is specified.

**Positioner information:**

|                                  |                                                                                                     |
|----------------------------------|-----------------------------------------------------------------------------------------------------|
| System deviation:<br>(dead zone) | 1% default setting<br>0.1–25.0% (can be set at fixed values)<br>0.1–5.0% (adaptive self-adjustment) |
| Parameterization:                | via IO-Link, ASi-5 or app                                                                           |
| Initialization:                  | automatically via IO-Link, ASi-5 or app                                                             |
| Close tight function:            | Closed: Set value $\leq 0.5\%$<br>Open: Set value $\geq 99.5\%$<br>(alterable via parameter)        |

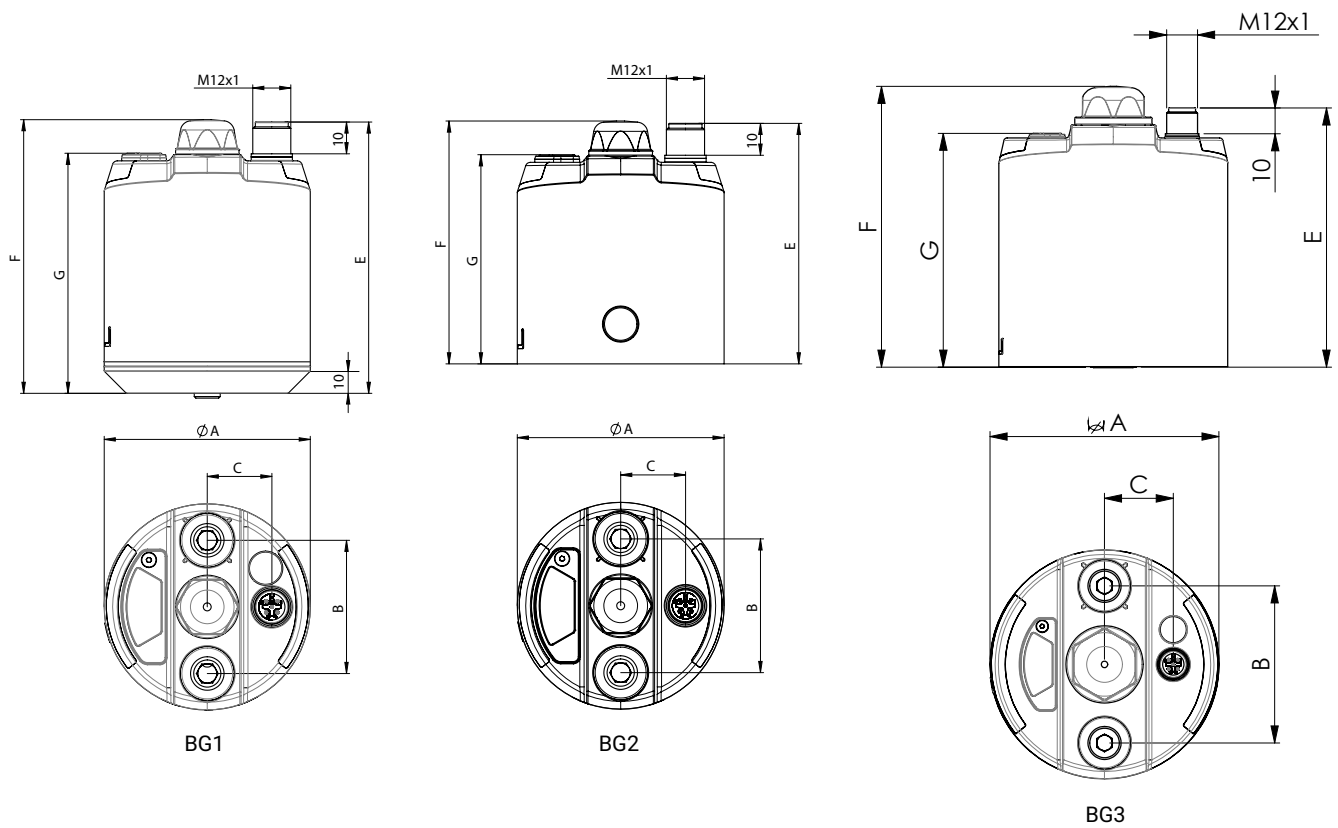
**Sensor system for status monitoring**

| Value                                     | Value range                                         | Sensor resolution | Deviation                                            | Typical deviation.                                 | Long-term stability |
|-------------------------------------------|-----------------------------------------------------|-------------------|------------------------------------------------------|----------------------------------------------------|---------------------|
| Internal temperature                      | -40 to 100 °C                                       | 0.016 °C          | ± 1.60 °C <sup>1)</sup>                              | ± 0.20 °C <sup>1)</sup>                            | < ± 0.02 °C/year    |
| Internal humidity                         | 0 to 100%                                           | 0.03%             | ± 3.5% between 20 to 80%<br>± 6.5% between 0 to 100% | ± 2% between 20 to 80%<br>± 3.5% between 0 to 100% | ± 0.25%/year        |
| Internal pressure                         | 260 to 1260 mbar                                    | 24 bit            | ± 1.0 mbar                                           | ± 0.1 mbar                                         | -                   |
| Control air supply pressure               | 0 to 30 bar                                         | 1.31 mbar         | ± 110 mbar                                           | ± 30 mbar                                          | ± 30 mbar/year      |
| Actuator chamber pressure                 | 0 to 30 bar                                         | 1.31 mbar         | ± 110 mbar                                           | ± 30 mbar                                          | ± 30 mbar/year      |
| Installation position (in two directions) | -180° to 180°                                       | 16 bit            | - <sup>2)</sup>                                      | ± 3.1° <sup>2)</sup>                               | -                   |
| Acceleration (in three axes)              | -156.96 m/s <sup>2</sup> to 156.96 m/s <sup>2</sup> | 16 bit            | ± 1.48 m/s <sup>2</sup>                              | ± 0.52 m/s <sup>2</sup>                            | -                   |
| Current consumption                       | 0 to 375 mA                                         | 16 bit            | ± 3.0 mA                                             | ± 0.5 mA                                           | -                   |
| Supply voltage                            | 0 to 36 V                                           | 16 bit            | ± 0.5 V                                              | ± 0.05 V                                           | -                   |

<sup>1)</sup> The value is measured on the inside of the housing with the corresponding influences of the device electronics (e.g. heating).

<sup>2)</sup> The data refers to a vibration-free status. In the case of vibrations, the deviation can be significantly greater or a value can no longer be determined.

## Dimensions



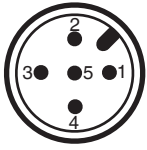
|               | $\varnothing A$ | B    | C    | E     | F     | G    |
|---------------|-----------------|------|------|-------|-------|------|
| <b>Size 1</b> | 65.0            | 42.0 | 20.4 | 85.6  | 86.3  | 75.7 |
| <b>Size 2</b> | 65.0            | 42.0 | 20.4 | 75.6  | 76.3  | 65.7 |
| <b>Size 3</b> | 88.9            | 61.0 | 26.7 | 100.7 | 109.1 | 90.8 |

BG = size  
Dimensions in mm

## Electrical connection

### IO-Link connection

IO-Link

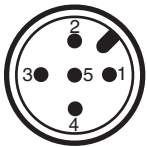


|   | Description                  |
|---|------------------------------|
| 1 | Uv+, 24 V DC, supply voltage |
| 2 | n.c.*                        |
| 3 | Uv-, GND                     |
| 4 | C/Q IO-Link                  |
| 5 | n.c.*                        |

\* Pins 2 and 5 are not relevant for the function and may therefore be populated (visible) or not populated (not present).

### ASi-5 connection

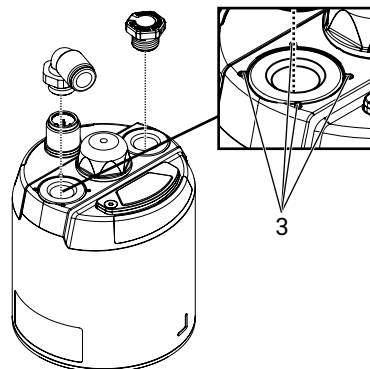
ASi-5



|   | Description    |
|---|----------------|
| 1 | AS-Interface + |
| 2 | n.c.*          |
| 3 | AS-Interface - |
| 4 | n.c.*          |
| 5 | n.c.*          |

Pins 2, 4 and 5 are not relevant for the function, so the connector may either be equipped with these (visible) or not equipped with these (not present).

### Pneumatic connection



| Connection | Marking                   | Designation                                                        | Connection size                                       |
|------------|---------------------------|--------------------------------------------------------------------|-------------------------------------------------------|
| 1          | Marking on the connection | Air supply connection (with integrated control pressure detection) | Size 1 and size 2: <b>G1/8</b><br>Size 3: <b>G1/4</b> |

## Pneumatic connection

| Connection | Marking           | Designation                                                     | Connection size                                       |
|------------|-------------------|-----------------------------------------------------------------|-------------------------------------------------------|
| 2          | (without marking) | Venting connection and process valve spring chamber ventilation | Size 1 and size 2: <b>G1/8</b><br>Size 3: <b>G1/4</b> |

The product comes with two pneumatic connections (for commercially available 6x4 mm pneumatic tubing) and a venting plug as standard. These are provided as follows:

| Control function of valve actuator                                          | Connector 1          | Connector 2   |
|-----------------------------------------------------------------------------|----------------------|---------------|
| Single acting<br>(NO or NC)<br><small>(see figure at the top right)</small> | Pneumatic connection | Venting plug* |

\* With piped air outlet: Pneumatic connection. The venting plug is not suitable for IP 67 and is not recommended for damp ambient conditions.

## Error response

| Error                                                                                                                       | Process valve                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electrical power supply failure or minimum supply voltage not reached                                                       | <b>Vented</b>                                                                                                                                                                |
| Pneumatic compressed air supply failure or minimum control pressure not reached                                             | <b>Vented</b>                                                                                                                                                                |
| Malfunctions detected by the software in the <b>Error</b> category (see operating instructions, chapter "Troubleshooting")  | Set error position ("Error position" parameter) is performed.<br>- "Hold position",<br>- "Open",<br>- "Closed",<br>- <b>"Safety position" *</b> ,<br>or<br>- "Free position" |
| Malfunctions detected by the software in the <b>Error2</b> category (see operating instructions, chapter "Troubleshooting") | <b>Vented</b>                                                                                                                                                                |
| * Safety position = default setting. The actuator is <b>vented</b> in the process.                                          |                                                                                                                                                                              |
| These error responses are <b>not</b> a substitute for the required plant-specific precautions and safety facilities.        |                                                                                                                                                                              |

## Specific data relating to IO-Link

|                                |                           |
|--------------------------------|---------------------------|
| <b>Physics:</b>                | Physics 2 (3-wire design) |
| <b>Port configuration:</b>     | Type A port               |
| <b>Transmission rate:</b>      | 38400 baud                |
| <b>Min. cycle time:</b>        | 10 ms                     |
| <b>Vendor ID:</b>              | 401                       |
| <b>Device ID:</b>              | 4497409 (0x44A001)        |
| <b>ISDU support:</b>           | Yes                       |
| <b>SIO operation:</b>          | No                        |
| <b>IO-Link specification:</b>  | V1.1.4                    |
| <b>Data storage:</b>           | Yes                       |
| <b>Block parameterization:</b> | Yes                       |

**Information for IO-Link:** IODD files can be downloaded via <https://ioddfinder.io-link.com/> or [www.gemugroup.com](http://www.gemugroup.com).

## Specific data – AS-Interface

**AS-Interface specification:** ASI-5 Spec. V1.04 Rev. 1

**Vendor-ID:** 0x0191

**Process data width:** 3 bytes

**Address:** max. 96 ASI-5 slaves (ASI-5 operation),  
max. 31 or 62 ASI-5 slaves in mixed operation with ASI-3

**Cycle time:** 20.32 ms of process data with max. expansion with 96 ASI-5 slaves

**ASI profile ID:** 0x803003 (vendor profile)

ASI DD information: The ASI DD file can be downloaded from [www.gemugroup.com](http://www.gemugroup.com).

## Process data

| Outputs (master → device) |                        |                                                                                                                             |                                                                                                                           |
|---------------------------|------------------------|-----------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Bit                       | Description            | Default setting function                                                                                                    | Logic                                                                                                                     |
| 0                         | Digital device input 1 | “OPEN/CLOSE actuation” device function: Pilot valve actuation<br>“Positioner” device function: Deactivated                  | “OPEN/CLOSE actuation” device function:<br>0 = Integrated pilot valve not actuated<br>1 = Integrated pilot valve actuated |
| 1                         | Digital device input 2 | Deactivated                                                                                                                 |                                                                                                                           |
| 2                         | Digital device input 3 | Initialization input                                                                                                        | 0 = normal operation<br>1 = activate initialization                                                                       |
| 3                         | Digital device input 4 | Localization input                                                                                                          | 0 = location function inactive<br>1 = activate location function                                                          |
| 4                         | Digital device input 5 | Deactivated                                                                                                                 |                                                                                                                           |
| 5                         | Digital device input 6 | Deactivated                                                                                                                 |                                                                                                                           |
| 6                         | Digital device input 7 | Deactivated                                                                                                                 |                                                                                                                           |
| 7                         | Digital device input 8 | Deactivated                                                                                                                 |                                                                                                                           |
| 8 to 23                   | Set value input        | “OPEN/CLOSE actuation” device function: Deactivated<br>“Positioner” device function: Specification of target valve position | 0.0 to 100.0%<br>Process valve position                                                                                   |

| Device-side digital input signals can be used to start various actions, such as starting initialization/location function<br>The function can be set by the associated non-cyclical parameter data |                 |                          |                                                                                                                                                                                                                                              |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Digital device input 1 to 8 function                                                                                                                                                               | 0               | Deactivated              | No function                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                    | 1 <sup>1)</sup> | Actuation of pilot valve | The integrated pilot valve is actuated if this signal is active.                                                                                                                                                                             |
|                                                                                                                                                                                                    | 3               | Initialization input     | Initialization is activated if this signal is active.                                                                                                                                                                                        |
|                                                                                                                                                                                                    | 4               | Localization input       | The location function is activated if this signal is active.                                                                                                                                                                                 |
|                                                                                                                                                                                                    | 5               | On/off error position    | If there is no active signal, the valve is moved to the defined position via the “Error position” parameter. If this signal is active, operation is performed in accordance with the set operating mode.                                     |
|                                                                                                                                                                                                    | 6 <sup>2)</sup> | Break/Normal control     | If there is no active signal, the automatic control system is paused and the valve is therefore kept in the current position. If this signal is active, control is performed in accordance with the set value signal and set operating mode. |

| Device-side digital input signals can be used to start various actions, such as starting initialization/location function<br>The function can be set by the associated non-cyclical parameter data |                 |                               |                                                                                                                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                    | 7 <sup>2)</sup> | Open until OPEN travel stop   | If there is an active signal, the process valve is moved to the mechanical OPEN end position (thereby also leaving a set operating range)   |
|                                                                                                                                                                                                    | 8 <sup>2)</sup> | Open until CLOSED travel stop | If there is an active signal, the process valve is moved to the mechanical CLOSED end position (thereby also leaving a set operating range) |
| 1) Only "OPEN/CLOSE actuation" device function                                                                                                                                                     |                 |                               |                                                                                                                                             |
| 2) Only "Positioner" device function                                                                                                                                                               |                 |                               |                                                                                                                                             |

| Inputs (device → master) |                         |                                    |                                                                                  |
|--------------------------|-------------------------|------------------------------------|----------------------------------------------------------------------------------|
| Bit                      | Description             | Default setting function           | Logic                                                                            |
| 0                        | Digital device output 1 | OPEN feedback                      | 0 = process valve not in OPEN position<br>1 = process valve in OPEN position     |
| 1                        | Digital device output 2 | CLOSED feedback                    | 0 = process valve not in CLOSED position<br>1 = process valve in CLOSED position |
| 2                        | Digital device output 3 | Feedback for initialization active | 0 = normal operation<br>1 = initialization mode active                           |
| 3                        | Digital device output 4 | Deactivated                        |                                                                                  |
| 4                        | Digital device output 5 | Deactivated                        |                                                                                  |
| 5                        | Digital device output 6 | Deactivated                        |                                                                                  |
| 6                        | Digital device output 7 | Deactivated                        |                                                                                  |
| 7                        | Digital device output 8 | Deactivated                        |                                                                                  |
| 8 to 23                  | Analogue device output  | Valve position feedback            | 0.0 to 100.0% process valve position                                             |

Device-side digital output signals can be used to output various statuses, for example end position feedback/errors/alarms.  
→ The function can be set via the associated non-cyclical parameter data

|                                       |                 |                                    |                                                                                       |
|---------------------------------------|-----------------|------------------------------------|---------------------------------------------------------------------------------------|
| Digital device output 1 to 8 function | 0               | Deactivated                        | No function                                                                           |
|                                       | 1               | OPEN feedback                      | Feedback for valve position OPEN                                                      |
|                                       | 2               | CLOSED feedback                    | Feedback for valve position CLOSED                                                    |
|                                       | 3               | Error output                       | Output if an error is detected                                                        |
|                                       | 4               | Warning output                     | Output if a warning is detected                                                       |
|                                       | 5               | Feedback for initialization active | Feedback when initialization is active                                                |
|                                       | 6 <sup>1)</sup> | Feedback for "Off" operating mode  | Feedback when the product is in operating mode "Off" (see "Operating mode" parameter) |

<sup>1)</sup> Only "Positioner" device function

## System commands

The following system commands are supported by the device:

IO-Link: For IO-Link, these can be transmitted via the subindex 0x0002.

ASi-5: For ASi-5, these specific commands can be transmitted via the following code.

| Designation                        | IO-Link code | ASi-5 code | Description                                                                                                                                                                                                                                                                                          |
|------------------------------------|--------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Application Reset (only IO-Link)   | 0x81         | /          | Resets the technology-specific parameters. This allows the device to be brought into a pre-defined state without interrupting the corresponding communication and without the need for a switch-off cycle.                                                                                           |
| Back-to-Box (only IO-Link)         | 0x83         | /          | This function allows the device to be reset to the original parameterization. This command is useful if, for example, a device is removed from an existing plant and reactivated as a spare part. After the command has been executed, IO-Link communication is stopped until the next device start. |
| Reset Cycle Counter User           | 0xA2         | 0xC2       | Resets the user switching cycle counter.                                                                                                                                                                                                                                                             |
| Reset Valve Actuation Counter User | 0xA3         | 0xC3       | Resets the user valve actuation counter.                                                                                                                                                                                                                                                             |

## Accessories



### GEMÜ 1219

#### Cable socket / cable plug M12

GEMÜ 1219 is an M12, 5-pin connector (cable socket/cable plug). Straight and/or 90° angled plug type. Defined cable length or with threaded connection without cable. Various materials available for the threaded ring.

It is recommended that a straight connector is used for this product.

| Description     | Length        | Order number |
|-----------------|---------------|--------------|
| 5-pin, straight | without cable | 88205544     |
|                 | 2 m cable     | 88205542     |
|                 | 5 m cable     | 88205543     |
|                 | 10 m cable    | 88270972     |
|                 | 15 m cable    | 88346791     |
| 5-pin, angle    | without cable | 88205545     |
|                 | 2 m cable     | 88205534     |
|                 | 5 m cable     | 88205540     |
|                 | 10 m cable    | 88210911     |
|                 | 15 m cable    | 88244667     |



### GEMÜ 1560

#### IO-Link master

The GEMÜ 1560 IO-Link master is used for parametrization, actuation, commissioning and for evaluating process and diagnostics data on products with IO-Link interface with communication standard in accordance with IEC 61131-9. The IO-Link master is available with USB port for use on a computer or with a Bluetooth or WLAN interface for use on mobile devices (iOS and Android). GEMÜ 1560 can be ordered separately or as a set for GEMÜ products including the required adapter.

| Description                             | Order designation     | Order number |
|-----------------------------------------|-----------------------|--------------|
| IO-Link master kit (adapter plus cable) | 1560USBS 1 A40A12AU A | 99072365     |
| IO-Link master kit (adapter plus cable) | 1560 BTS 1 A20A12AA A | 99130458     |



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