



## Control- and feedback head for integrated mounting on Robolux valves Type 2036

- Compact stainless steel design
- Contactless valve position registration
- Coloured illuminated status display
- Fieldbus AS-Interface (optional)
- Version for ATEX / IECEx

Product variants described in the data sheet may differ from the product presentation and description.

### Can be combined with



#### Type 2036

Robolux multi-way multiport diaphragm valve, pneumatically operated

### Type description

Feedback Type 8685 and control head Type 8686 are optimized for integrated mounting on pneumatically operated actuators Type 2036 Robolux. The adjustment to the individual actuator size is done through DIP-switches.

As compact units the devices contain the complete automation functionality of both individually operated actuator pistons. Depending on the configuration the electrical and visual position feedback is done by non-contact switches and high-power LEDs. Integrated pilot valves control the actuator pistons and AS-interface communication is available. Using appropriate barriers both types feature intrinsically safety acc. to ATEX. In this way a complete concept for decentralized automation is feasible.

The compact body is especially distinguished by its hygienic design, materials being chemically resistant against cleaning media and a proven IP protection. In addition the Control Head Type 8686 features an integrated compressed air filter to protect the pilot valve function against particles through the compressed air supply.

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## 1. General technical data

### 1.1. Control and feedback head Type 8685 and 8686

Product properties	
Dimensions	Detailed information can be found in chapter "3. Dimensions" on page 7.
Material	
Body	PPS, stainless steel
Seal	EPDM
Cover	PC
Communication	
Fieldbus	AS-Interface
Performance data	
Position sensor	
Stroke range for linear actuator	
Valve spindle	RV50=6.0 mm, RV70=9.5 mm, RV110=13.5 mm
Position feedback	Reed sensors (contactless)
Electrical data	
Operating voltage	
Pilot valve	24 V DC $\pm$ 10 % Max. input voltage <sup>1)</sup> For Exi variant: see "1.5. Exi version Type 8685/8686" on page 5
Residual ripple	10 %
power consumption	0,8 W every valve
Limit switches	24 V DC $\pm$ 10 % 8.2 V DC (Ex-i-NAMUR switch amplifier) U < 12 V, Ii < 20 mA, Pi < 60 mW (Ex barrier)
Protection class	3 acc. to VDE 0580
Electrical connection	
Multipole version	M12 (8 pin), M12 (4 pin) with 1 m cable (AS-Interface)
Cable gland version	M16 x 1.5 (cable $\varnothing$ 6.5 mm), screw terminals (1.0 mm <sup>2</sup> )
Pneumatic data	
Control medium	
Dust content	Neutral gases, air, quality class acc. to ISO 8573 - 1
Particle density	Class 5 (< 40 $\mu$ m particle size)
Pressure dew point	Class 5 (< 10 mg/m <sup>3</sup> )
Oil content	Class 3 (< -20 °C)
	Class 5 (< 25 mg/m <sup>3</sup> )
Air supply filter	
Mesh size	Exchangeable
Supply pressure	-0.1 mm
Pilot air ports	3...7 bar <sup>2)</sup>
	Threaded connection G 1/8
Approvals and certificates	
Conformity	Acc. to CE acc. to EMV2004/108/EG
Environment and installation	
Operating conditions	
Ambient temperature (max.)	0...+55 °C
Degree of protection	IP65/67 acc. to EN 60529
Installation and mechanical data	
Installation position	As required, preferably with actuator in upright position
Adapter kits	Detailed information can be found in chapter "Adapter kits" on page 15.

1.) Feed-in valves:

Max. input power  $P_i = 1.1$  mW

Max input power and maximum input current acc. to the following table

Ui [V]	15	18	20	22	25	28	30	35
Ii [mA]	900	440	309	224	158	120	101	73

Internal capacity and inductance negligible

2.) The supply pressure must be 0.5...1 bar above the minimum required control pressure of the valve actuator.

**1.2. Without fieldbus communication: 24 V DC**

Electrical data	
Operating voltage	24 V DC
Residual ripple	10 %
Power consumption	<2 W
Voltage tolerance	± 10 %
Output	Max. 100 mA per output, short-circuit protected
Electrical connection	
Multipole	M12 (8 pin)
Cable gland	M12 × 1.5 (cable Ø 6.5 mm), screw terminals (1.0 mm <sup>2</sup> / max. port cross-section 0.25 mm <sup>2</sup> )

**1.3. With fieldbus communication: AS-Interface Type 8685**

Product properties	
Profile	S-O.A.E (A/B slave, max. 62 slaves/master)
Electrical data	
<b>Operating voltage</b>	29.5...31.6 V DC
Via bus cable	Acc. to specification
Separated from bus signal	On request
Max. current consumption (2 terminal position reached)	35 mA
Electrical connection	M12, 4 pin with 1 m cable on flat cable clip
Programming data	See <b>operating manual</b> ▶

**1.4. With fieldbus communication: AS-Interface Type 8686**

Product properties	
Profile	S-7.A.E (A/B slave, max, 62 slaves/master)
Electrical data	
<b>Operating voltage</b>	29.5...31.6 V DC
Via bus cable	Acc. to specification
Separated from bus signal	On request
Max. Current consumption (2 valves activated and 2 position feedback active)	120 mA
Outputs	
Contact rating	≤ 2 × 0.8 W (above AS-Interface)
Watch-dog function	Integrated
Inputs	
Sensor operating voltage	24 V ± 10 % (above AS-Interface)
Current carrying capacity	≤ 50 mA short circuit protected
Switching level High	≥ 10 V
Input current High	≤ 1.5 mA
Input current Low	≤ 0.1 mA
Electrical connection	M12, 4-poilig with 1 m cable on flat cable clip
Programming data	See <b>operating manual</b> ▶

## 1.5. Exi version Type 8685/8686

**Electrical data****Operating voltage**

Limit switches Operates with Ex-i-NAMUR switch amplifier: 8.2 V DC  
Operates with Ex barrier<sup>1)</sup>:  
Max. input voltage  $U_i < 12$  V DC

Pilot valve Control valve component for Ex valve coils<sup>2)</sup>

Limit switches status Only electrical feedback

Current consumption Operates with Ex-i-NAMUR switch amplifier:  
< 1.2 mA (terminal position reached)  
> 2.1 mA (terminal position not reached)  
Operates with Ex barrier<sup>1)</sup>:  
Max. input current  $I_i < 50$  mA

Electrical connection Cable gland M12 × 1.5 (cable Ø 6.5 mm);  
Screw terminals 1.0 mm<sup>2</sup>/max. port cross-section: 8685: 0.25 mm<sup>2</sup>, 8686: 0.14 mm<sup>2</sup>

**Approvals and certificates**

Ignition protection IIG Ex ia IIC T4 Gb (BVS 13 ATEX E 039 X)  
Ex ia IIC T4 Gb (IECEX BVS 13.0047 X)

**Environment and installation**

Operating conditions Medium temperature of adapted process valve Type 2036  
T (Medium): 0...130 °C (safety requirement value)

1.) Electrical feed-in through intrinsically safe electric circuit of type of protection Ex ia IIC. Each circuit (end position) has the following safety related max data:

Max. input voltage  $U_i = 12$  V DC / max. input current  $I_i = 50$  mA

Max. input power  $P_i = 60$  mW

Internal capacity and inductance negligible

2.) Feed-in valves:

Max. input power  $P_i = 1.1$  mW

Max input power and maximum input current acc. to the following table

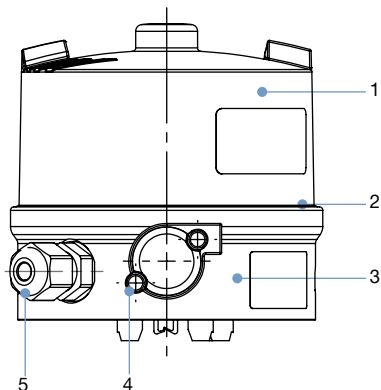
<b><math>U_i</math> [V]</b>	15	18	20	22	25	28	30	35
<b><math>I_i</math> [mA]</b>	900	440	309	224	158	120	101	73

Internal capacity and inductance negligible

## 2. Materials

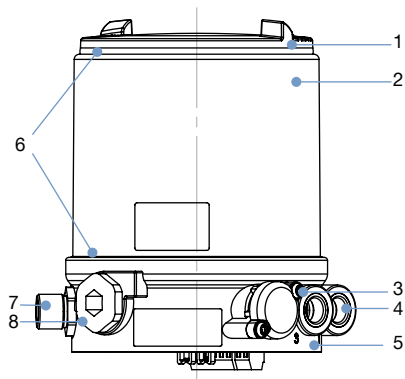
### 2.1. Material specifications

#### Type 8685



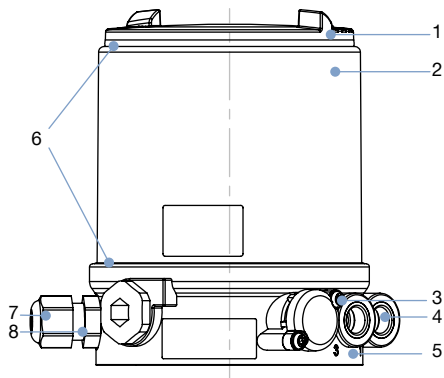
No.	Element	Material
1	Cover	PC
2	Seal	EPDM
3	Basic housing	PPS
4	Screws	Stainless steel
5	Cable gland	PA

#### Type 8686



No.	Element	Material
1	Cover	PC
2	Outer casing	EPDM
3	Screws	Stainless steel
4	Threaded ports G 1/8	Stainless steel
5	Basic housing	PPS
6	Seal	EPDM
7	Plug connector M12	Brass nickel-plated
8	Blanking-off plug	PA

#### Type 8686 Exi (NAMUR)



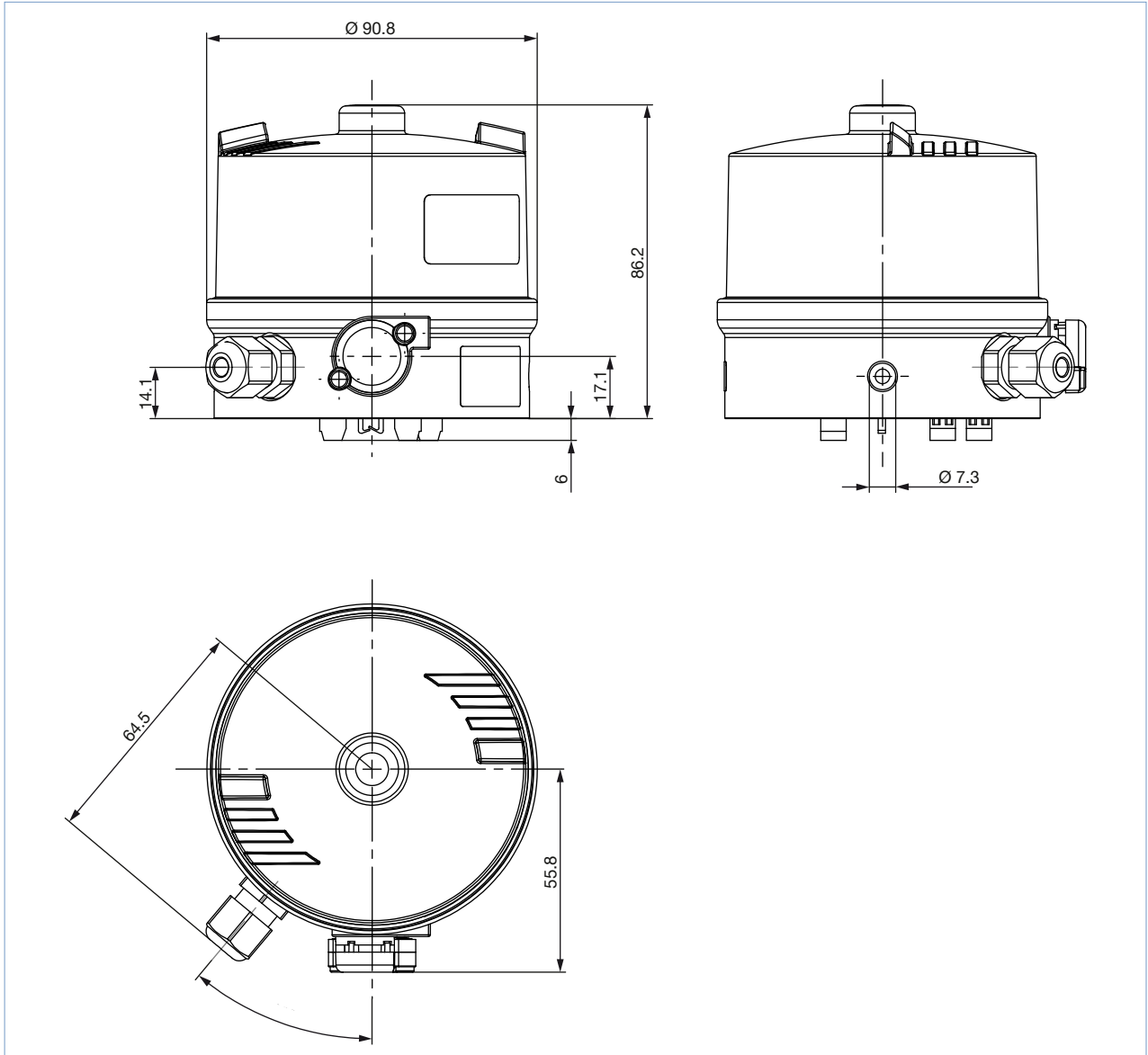
No.	Element	Material
1	Cover	PC
2	Outer casing	EPDM
3	Screws	Stainless steel
4	Threaded ports G 1/8	Stainless steel
5	Basic housing	PPS
6	Seal	EPDM
7	Cable connection	PA
8	Blanking-off plug	PA

### 3. Dimensions

#### 3.1. Type 8685

**Note:**

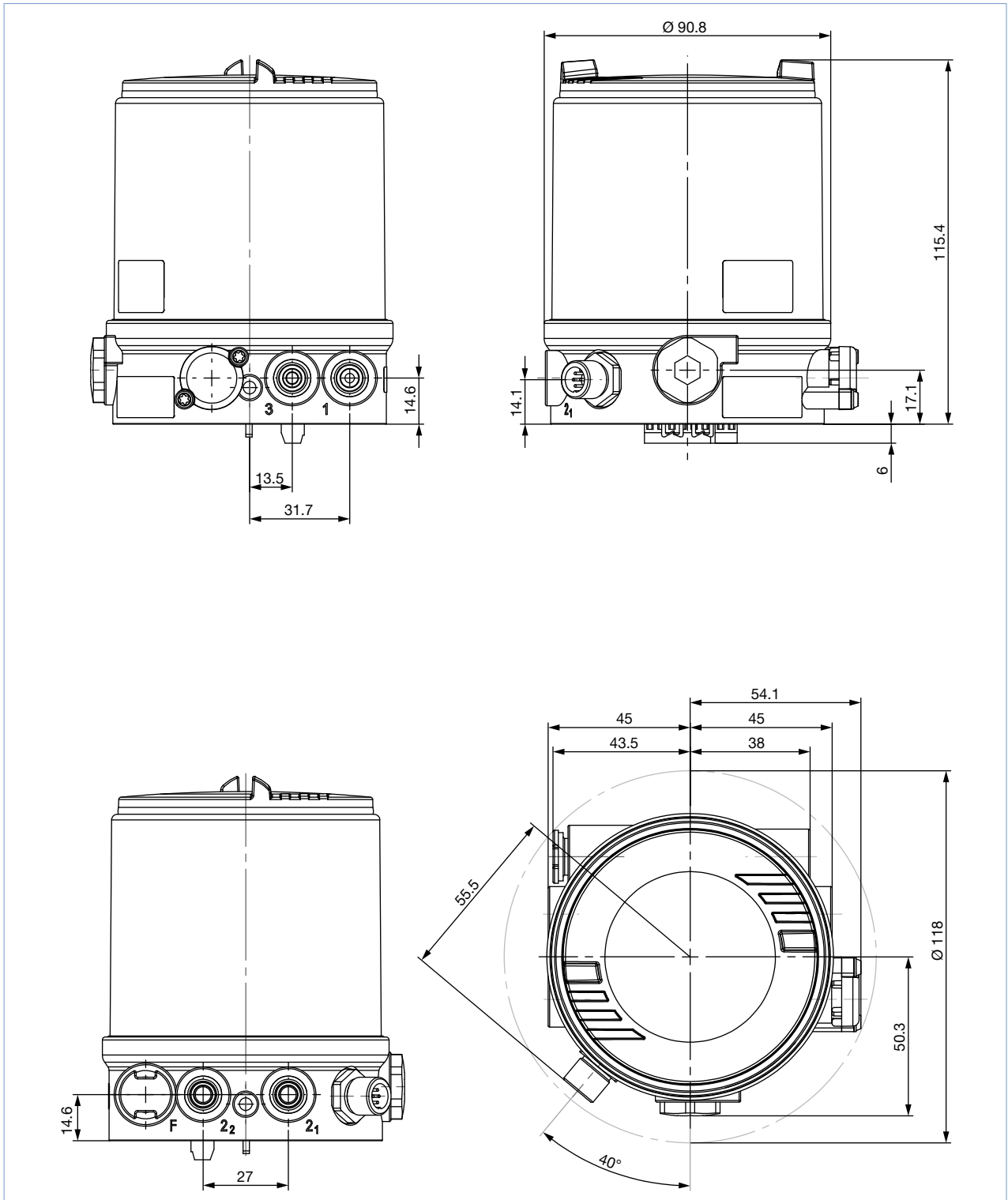
Dimensions in mm



3.2. Type 8686

**Note:**

Dimensions in mm

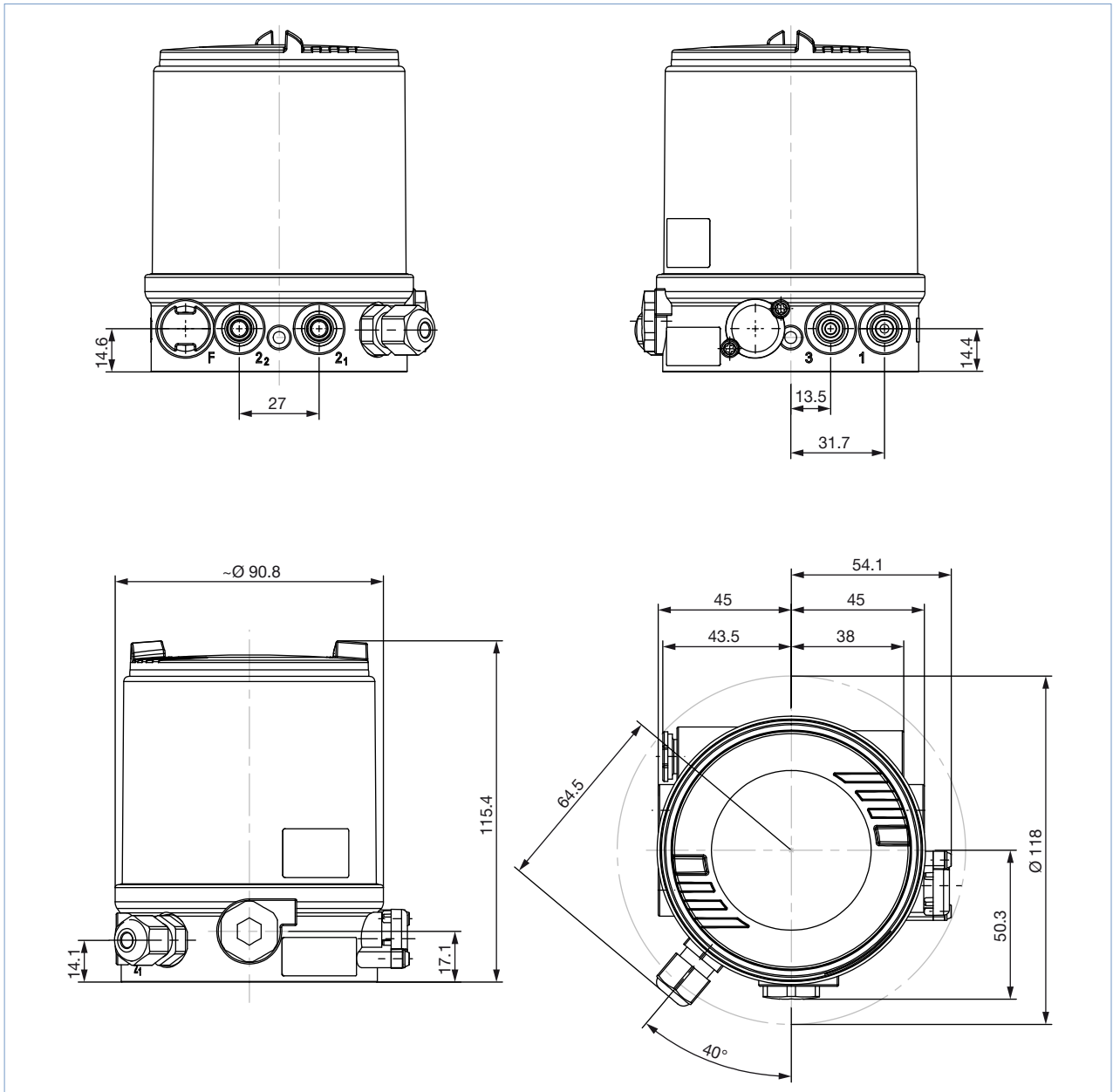




3.3. Type 8686 Exi (NAMUR)

Note:

Dimensions in mm

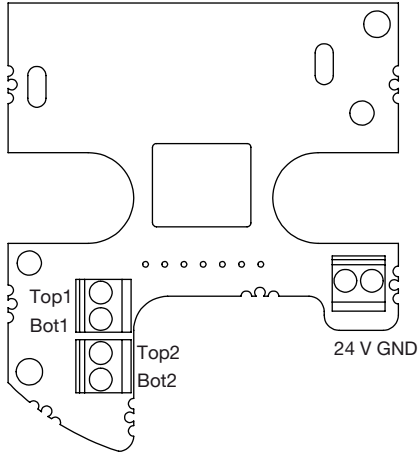


## 4. Device/Process connections

### 4.1. Electrical connections

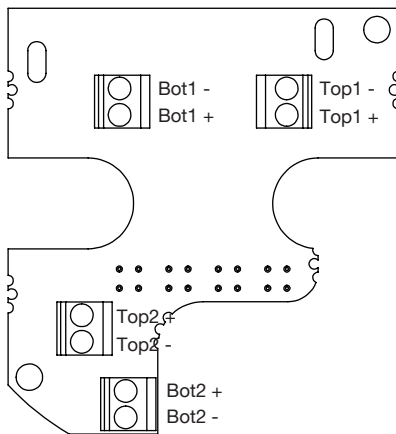
Without fieldbus communication 24 V DC: Type 8685

#### Cable gland



Description on circuit board	Description
24 V	Operating voltage + (24 V DC)
GND	Operating voltage – (GND)
Top 1	End positions above – Top actuator 1
Bot 1	End positions below – Bot actuator 1
Top 2	End positions above – Top actuator 2
Bot 2	End positions below – Bot actuator 2

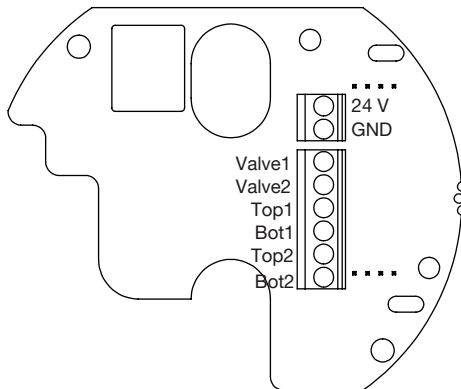
#### Exi (Namur): cable gland



Description on circuit board	Description
Top 1 +	End positions above + actuator 1
Top 1 –	End positions above – actuator 1
Bot 1 +	End positions below + actuator 1
Bot 1 –	End positions below – actuator 1
Top 2 +	End positions above + actuator 2
Top 2 –	End positions above – actuator 2
Bot 2 +	End positions below + actuator 2
Bot 2 –	End positions below – actuator 2

Without fieldbus communication 24 V DC: Typ 8686

Cable gland

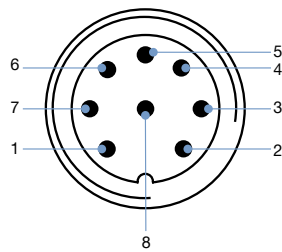


Description on circuit board	Description
Bot 2	End positions below – Bot actuator 2
Top 2	End positions above – Top actuator 2
Bot 1	End positions below – Bot actuator 1
Top 1	End positions above – Top actuator 1
Valve 2	Valve control Y2+ (actuator 2 operated)
Valve 1	Valve control Y1+ (actuator 1 operated)
GND	Operating voltage –
24 V DC	Operating voltage +

Multipole connection M12, 8 pin

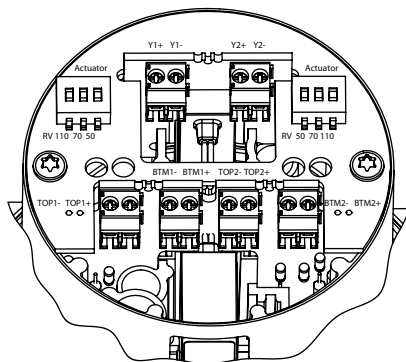
Note

Use only straight cable sockets.



Pin	Description	Assignment
1	Limit switches 3	End positions below – Bot actuator 2
2	Limit switches 4	End positions above – Top actuator 2
3	Limit switches 1	End positions below – Bot actuator 1
4	Limit switches 2	End positions above – Top actuator 1
5	Valve 2	Valve control Y2+
6	Valve 1	Valve control Y1+
7	GND	Operating voltage –
8	24 V DC	Operating voltage +



Exi (Namur): cable gland

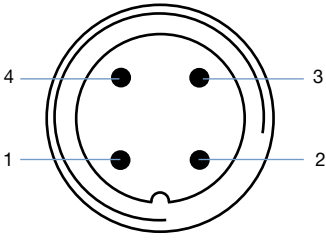


Description on circuit board	Description
TOP 1 +	End positions above + actuator 1
TOP 1 –	End positions above – actuator 1
BTM 1 +	End positions below + actuator 1
BTM 1 –	End positions below – actuator 1
TOP 2 +	End positions above + actuator 2
TOP 2 –	End positions above – actuator 2
BTM 2 +	End positions below + actuator 2
BTM 2 –	End positions below – actuator 2
Y1 +	Supply line valve1
Y1 –	Return circuit valve1
Y2 +	Supply line valve2
Y2 –	Return circuit valve2

AS-Interface connection: Type 8685 and 8686

**Circular plug M12, 4 pin**

Pin	Description	Control head Type 8686	Feedback head Type 8685
1	Bus +		
2	NC		
3	Bus -		
4	NC		



## 5. Product installation

### 5.1. Combination options with pneumatic process valves ELEMENT

**Note:**

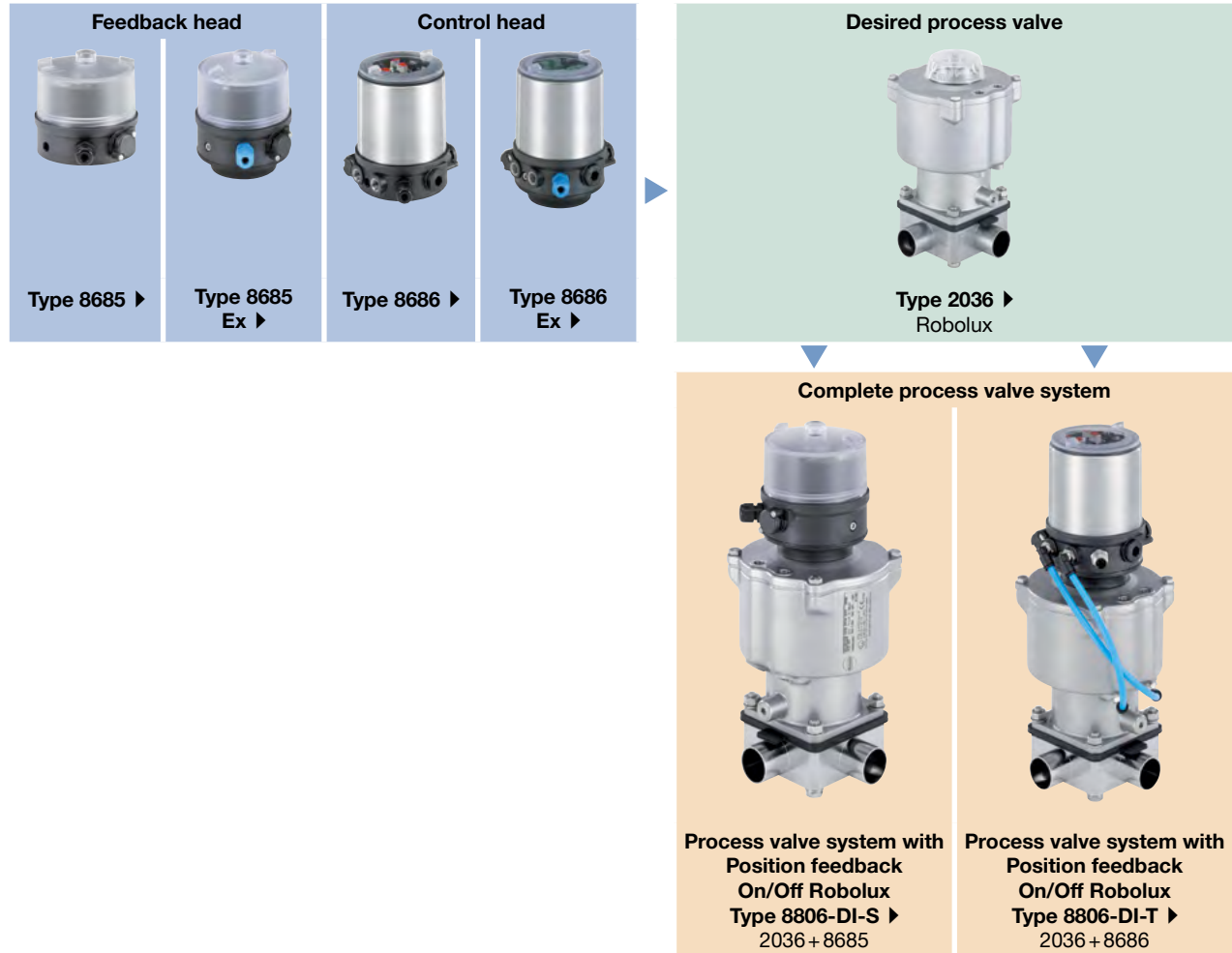
A complete **process valve system Type 8806** consists of **control head Type 8686** or **position feedback Type 8685**, **control valve Type 2036 Robolux** and an adapter set.

The following information is required to select a complete system:

- **Article no.** of the desired positioner control head **Type 8686** or feedback **Type 8685**
- **Article no.** of the desired control valve **Type 2036 Robolux**

You order two components and receive a completely assembled and tested valve.

#### Example for process valve systems



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## 6. Ordering information

### 6.1. Bürkert eShop – Easy ordering and quick delivery



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### 6.3. Ordering chart

Type	Communication	Electrical connection	Pneumatic function	Position feed-back	Pilot air ports	Article no.
8685	Without	Cable gland	Without	2 Switching points	Threaded connection G 1/8	231306
	AS-Interface A/B	Cable gland with 1 m cable on flat cable clip	Without	2 Switching points	Threaded connection G 1/8	231307
	Exi (Namur)	Cable gland	Without	2 Switching points	Threaded connection G 1/8	242249
8686	Without	M12 (8 pin)	2x single-acting DN 3.0	2 Switching points	Threaded connection G 1/8	231292
	AS-Interface A/B	Cable gland with 1 m cable on flat cable clip	2x single-acting DN 3.0	2 Switching points	Threaded connection G 1/8	231293
	Exi (Namur)	Cable gland	2x single-acting DN 3.0	2 Switching points	Threaded connection G 1/8	242250

#### Further versions on request



#### Additional






- Type 8686 ASI - variants with external power supply
- Type 8686 24 V DC - variants with cable gland

#### 6.4. Ordering chart accessories

##### Standard accessories

**Note:**



Must be ordered separately.

Description	Article no.
M12 socket, 8 pin, 5 m assembled cable	919267 
M12 socket, 8 pin, 2 m assembled cable	919061 
ASI flat cable clip with stainless steel socket M12 (spare part)	799646 
Silencer G 1/8 threaded connection	780779 
Pilot tool for cover mounting	674077 

##### Adapter kits

**Note:**

Must be ordered separately.

Description	Actuator size	Article no.
Adapter set for Type 8685	RV50, RV70, RV110	684267 
Adapter set for Type 8686	RV50, RV70, RV110	684268 

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