



## PWM control electronics for electromagnetic proportional valves

- Programmable digital electronics
- Converts an analogue input signal into a PWM output signal
- Adjustable PWM frequency
- Digital communication (bùS) possible
- Optional integrated time control and digital/analogue inputs

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

### Can be combined with



**Type 2873**  
Direct-acting 2 way standard solenoid control valve



**Type 6013**  
Plunger valve 2/2 way direct-acting

### Type description

The digital control electronics Type 8605 are used to operate proportional solenoid control valves in a power range from 40 - 2000 mA. The electronics convert an external standard signal into a pulse-width modulated (PWM) signal, which enables infinite adjustment of the opening of the proportional valve and hence a fluidic output parameter (e.g. flow rate). An internal current control with the duty cycle of the PWM signal as an actuating variable ensures that every value of the input signal, irrespective of the thermal state of the coil, is unambiguously assigned a given value of the effective coil current. A display and operating keys allow the electronics to be easily adapted to a particular proportional valve and to the specific conditions of an application. In order to integrate the control unit - and thus also the proportional valve - into a higher-level controller, the CAN-based variant of the control unit (called bùS) is required. Parameterisation and configuration of the proportional valve can be performed quickly and easily using the Bürkert Communicator software. Furthermore, the bùS control electronics enables the integration of shut-off valves into bùS/CAN systems. By using the integrated time control function, a shut-off valve can be opened or closed for a certain period of time. This enables, for example, batch control solutions in filling processes. Optionally, Type 8605 can be equipped with an additional I/O board. This allows the connection of external sensors or switches. The valve behaviour on these input signals can be configured (e.g. 2-point control).

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## 1. General technical data

### 1.1. Type 8605 control for proportional valves

Product properties	Analogue version	büS version
Dimensions	Detailed information can be found in chapter "2.1. Type 8605 control for proportional valves" on page 4.	
<b>Material</b>		
Cable plug	Polyamide / PC	Polyamide / PC
DIN rail	Polyamide / PBT	
Ramp function	Time adjustable from 0 to 10 sec.	Time adjustable from 0 to 10 sec.
Version	<ul style="list-style-type: none"> <li>Cable plug for direct mounting (terminal strip with PG bushing or M12 plug, 4 pin)</li> <li>DIN rail version (DIN EN 50022)</li> </ul>	Cable plug for direct mounting (M12 plug, 5 pin)
<b>Electrical data</b>		
Operating voltage	12...24 V DC	12...24 V DC
Power consumption	ca. 1 W (without valve)	ca. 1 W (without valve)
Voltage tolerance	± 10 %	± 10 %
Residual ripple	< 5 %	< 5 %
Output current (valve)	PWM: Max. 2 A	PWM: Max. 2 A
Input signal	Standard signals: 0...20 mA, 4...20 mA or 0...5 V, 0...10 V (configurable)	Digital control via CANopen based system bus (büS)
Input impedance	< 200 Ω (with current input) > 20 kΩ (with voltage input)	120 Ω (required terminating resistor in the büS network, not included in scope of delivery)
Output signal for valve control	PWM signal: Frequency adjustable from 80 Hz to 6 kHz	PWM signal: Frequency adjustable from 80 Hz to 6 kHz
<b>Approvals and certificates</b>		
<b>Degree of protection</b>		
Cable plug	IP65	IP65
DIN rail	IP40	
<b>Environment and installation</b>		
Ambient temperature	-10...60 °C	-10...60 °C

### 1.2. Type 8605 (büS) control for shut-off/solenoid valves

Product properties	büS version
Dimensions	Detailed information can be found in chapter "2.2. Type 8605 (büS) control for shut-off/solenoid valves" on page 6.
<b>Material</b>	
Cable plug	Polyamide / PC
Version	<ul style="list-style-type: none"> <li>Cable plug for direct mounting (M12-plug, 5 pin)</li> <li>Cable plug for direct mounting (M12-plug, 5 pin) and sensor input (M12 socket, 5 pin)</li> </ul>
Time switch	Freely parameterizable via communicator
<b>Electrical data</b>	
Operating voltage	12...24 V DC
Power consumption	ca. 1 W (without valve)
Voltage tolerance	± 10 %
Residual ripple	< 5 %
Output current (valve)	Max. 1 A 100 % ED
Input signal	Digital control via CANopen based system bus (büS)
Input impedance	120 Ω (required terminating resistor in the büS network, not included in scope of delivery)
Output signal for valve control	Nominal voltage or 0 V

**Approvals and certificates**

**Degree of protection**

Cable plug IP65

**Environment and installation**

Ambient temperature -10...60 °C

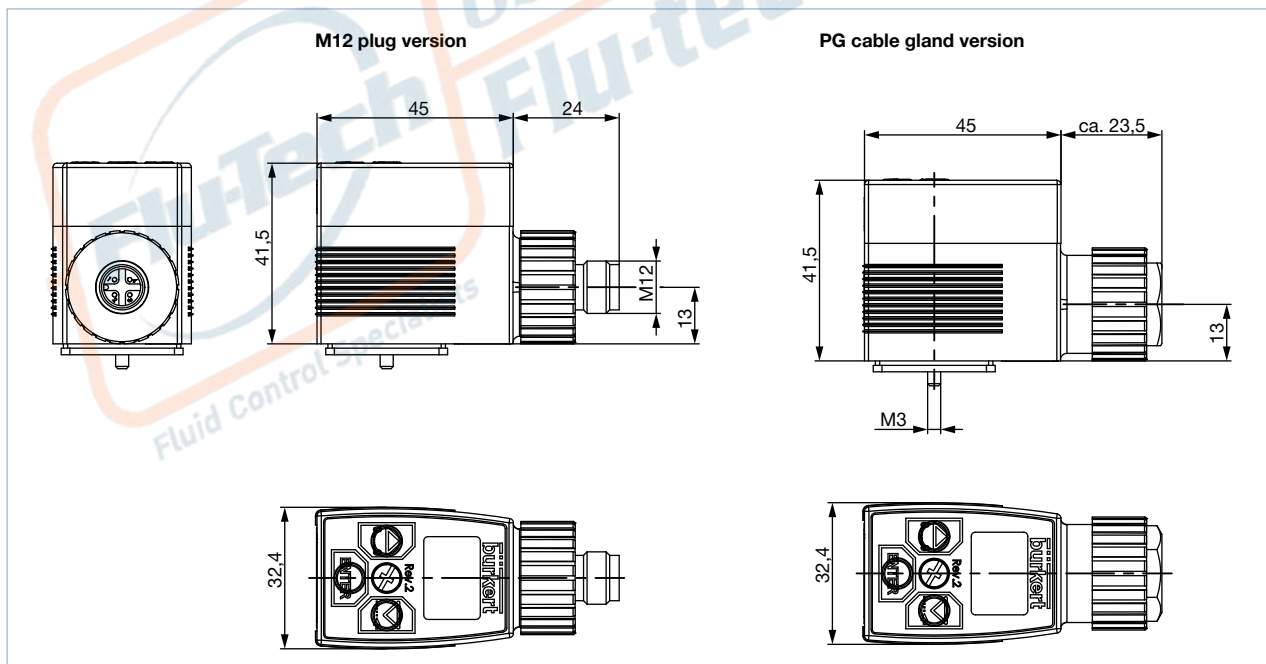
**2. Dimensions**

**2.1. Type 8605 control for proportional valves**

**Cable plug with control unit (analogue version only)**

**Note:**

Dimensions in mm

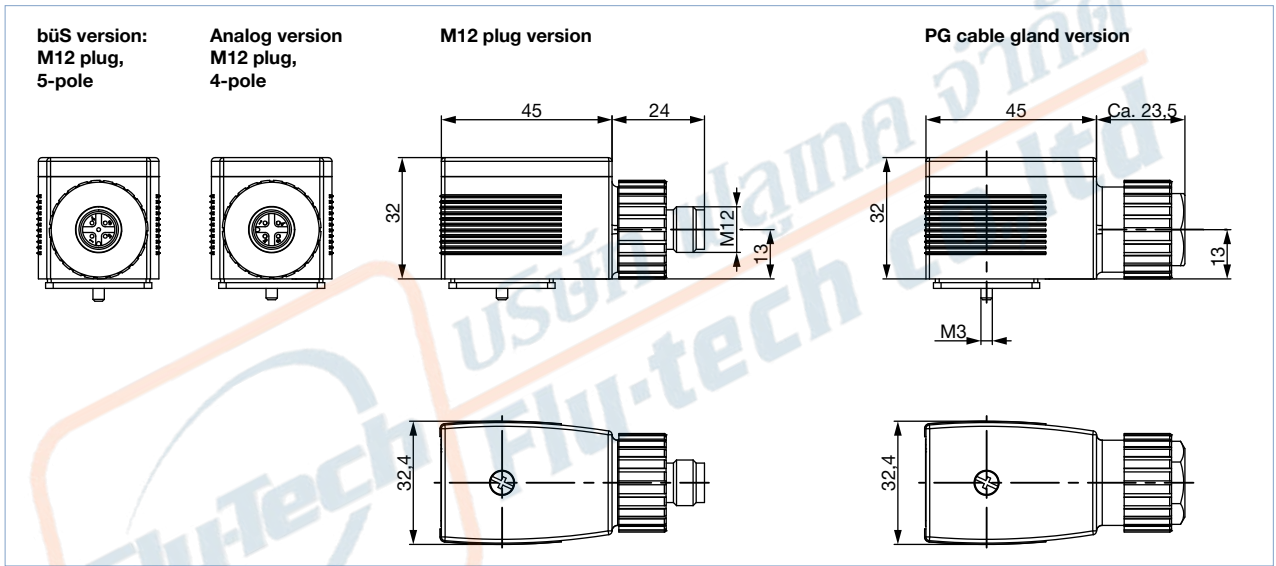


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Cable plug without control unit (analogue and bus versions, for bus version only M12 plug, 5 pin)

Note:

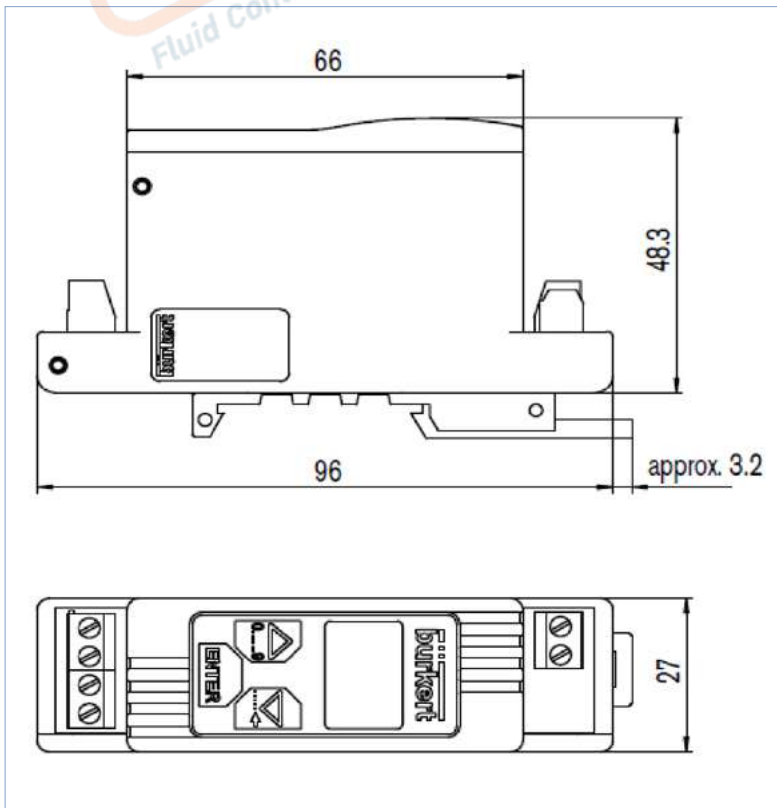
Dimensions in mm



DIN rail version (analogue variant only)

Note:

Dimensions in mm



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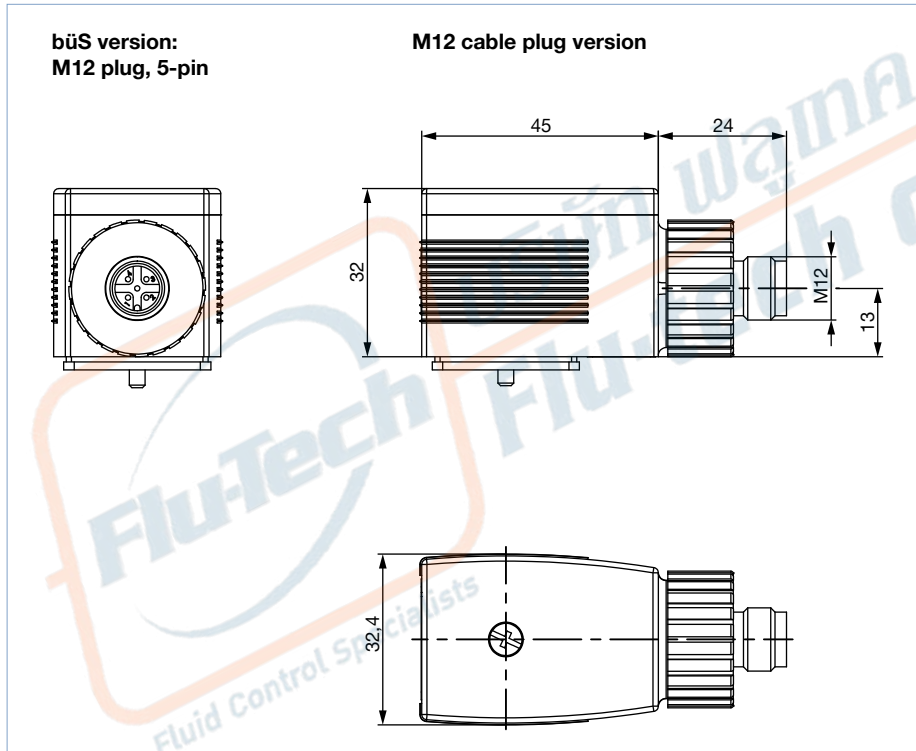


2.2. Type 8605 (büS) control for shut-off/solenoid valves

Cable plug M12 plug, 5 pin

Note:

Dimensions in mm

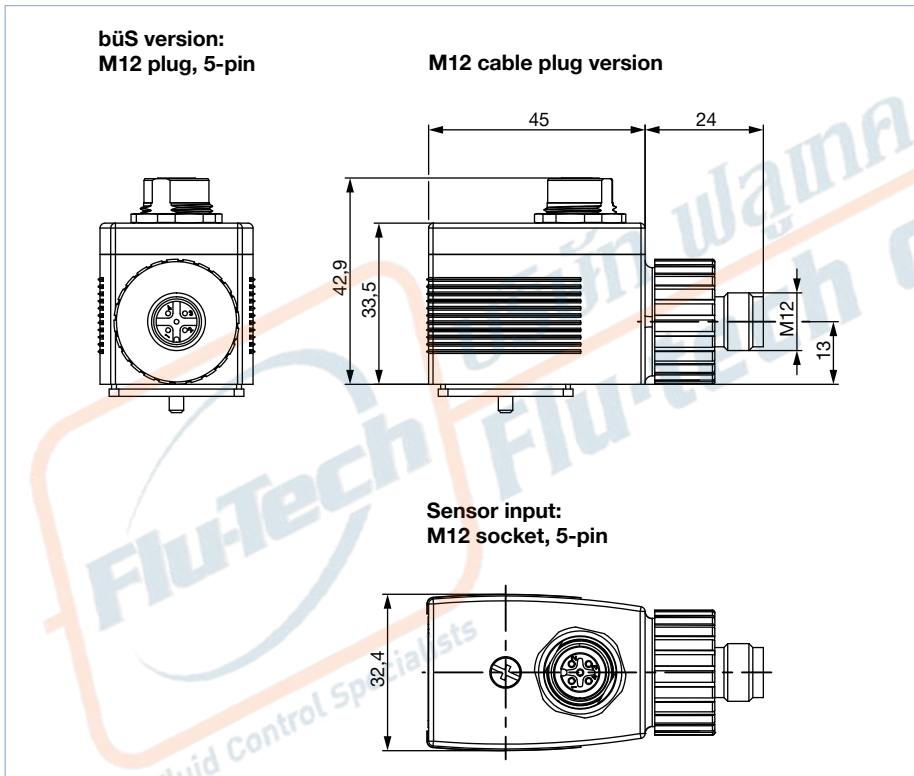


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Cable plug M12 male connector, 5 pin and sensor input M12 female connector, 5 pin

**Note:**

Dimensions in mm



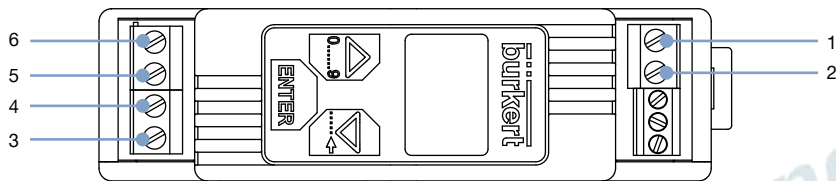
### 3. Device/Process connections

#### 3.1. Pin assignment

Type 8605 control for proportional valves

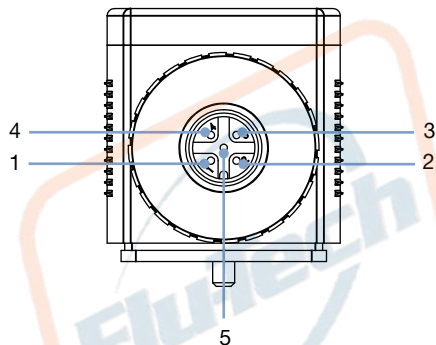
Cable plug PG feed-through											
	<table border="1"> <thead> <tr> <th>No.</th> <th>Element</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Standard signal +</td> </tr> <tr> <td>2</td> <td>Standard signal GND</td> </tr> <tr> <td>3</td> <td>GND</td> </tr> <tr> <td>4</td> <td>+ 12...24 V DC</td> </tr> </tbody> </table>	No.	Element	1	Standard signal +	2	Standard signal GND	3	GND	4	+ 12...24 V DC
	No.	Element									
	1	Standard signal +									
	2	Standard signal GND									
	3	GND									
4	+ 12...24 V DC										
Cable plug M12 plug, 4 pin											
	<table border="1"> <thead> <tr> <th>No.</th> <th>Element</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Standard signal GND</td> </tr> <tr> <td>2</td> <td>GND</td> </tr> <tr> <td>3</td> <td>+ 12...24 V DC</td> </tr> <tr> <td>4</td> <td>Standard signal +</td> </tr> </tbody> </table>	No.	Element	1	Standard signal GND	2	GND	3	+ 12...24 V DC	4	Standard signal +
	No.	Element									
	1	Standard signal GND									
	2	GND									
	3	+ 12...24 V DC									
4	Standard signal +										

**DIN rail**



No.	Element
1	Valve
2	Valve
3	Standard signal +
4	Standard signal GND
5	GND
6	+12...24 V DC

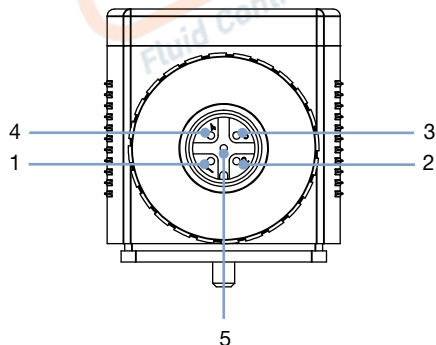
**Cable plug M12 plug 5 pin (bÜS variant)**



No.	Element
1	Shield
2	12...24 V
3	GND
4	CAN_H
5	CAN_L

**Type 8605 (bÜS) control for shut-off/solenoid valves**

**Cable plug M12 plug 5 pin (bÜS variant)**

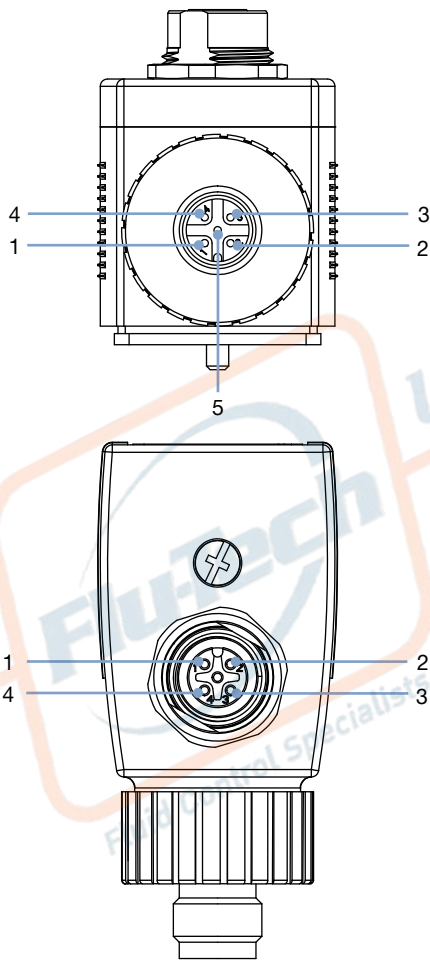


No.	Element
1	Shield
2	12...24 V
3	GND
4	CAN_H
5	CAN_L

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## Cable plug M12 plug, 5 pin and sensor input M12 socket, 5 pin (bÜS variant)



## No. Element

1	Shield
2	12...24 V
3	GND
4	CAN_H
5	CAN_L

## No. Element

1	24 V DC
2	DI2 (Digital input, frequency input)
3	GND
4	AI1/DI1 (Analogue input, digital input)

## 4. Product operation

### 4.1. Functional overview

#### Type 8605 control for proportional valves

- Microcontroller controlled electronics
- Compensation of solenoid coil heating by internal current control
- Configurable ramp function
- Adjustable zero point switch-off
- Continuously adjustable PWM frequency
- Easy adaptation of the minimum and maximum current (opening start or full opening) to the actual pressure conditions
- Display and button (analogue version)
- Switchable input standard signal (analogue version)
- Digital communication based on CANopen (bÜS variant)

Visit product website ►

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**Type 8605 (büS) control for shut-off/solenoid valves**

- Microcontroller controlled electronics
- Digital communication on CANopen basis
- Integrated time control function
- Switching counter
- Energy-saving operation through power reduction
- Optional digital/analogue inputs, if required with 2-point control, for version with sensor input

**5. Ordering information****5.1. Bürkert eShop – Easy ordering and quick delivery****Bürkert eShop – Easy ordering and fast delivery**

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### 5.3. Ordering chart

#### Type 8605 control for proportional valves

##### Note:

- For two possible current ranges, the smaller one should be preferred.
- When using the control electronics in combination with valves from other manufacturers, make sure that these valves do not fall below a minimum load of 7Ω. Activation of valves with a lower minimum load will damage the Type 8605 electronic control unit.

Version	Max. coil current range [mA]	Article no.	2861, 2871 24 V DC	2861, 2871 12 V DC	2863, 2873 24 V DC	2863, 2873 12 V DC	2865, 2875 24 V DC	2865, 2875 12 V DC	2836 24 V DC	6024 24 V DC	6024 12 V DC	6223 24 V DC	6223 12 V DC
			Cable plug with PG gland	200...1000	316530			x	x	x			x
Cable plug with M12 connection	200...1000	316528			x	x	x			x		x	
Cable plug with PG gland	500...2000	316529				x	x	x	x	x	x		x
Cable plug with M12 connection	500...2000	316526				x	x	x	x	x	x		x
Cable plug with PG gland without control unit	200...1000	316521			x	x	x			x		x	
Cable plug with M12 connection without control unit	200...1000	316522			x	x	x			x		x	
Cable plug with PG gland without control unit	500...2000	316523				x	x	x	x	x	x		x
Cable plug with M12 connection without control unit	500...2000	316525				x	x	x	x	x	x		x
DIN rail	40...220	316531	x										
DIN rail	200...1000	316532	x	x	x	x	x			x		x	
DIN rail	500...2000	316533				x	x	x	x	x	x		x
Cable plug with M12 connection büS PWM <sup>1.)</sup>	200...1000	355655			x	x	x			x		x	
Cable plug with M12 connection büS PWM <sup>1.)</sup>	500...2000	364714				x	x	x	x	x	x		x

1.) Available from April 2020

#### Type 8605 (büS) control for shut-off/solenoid valves








Version	Article no.
Cable plug with M12 connection	302988
Cable plug with M12 connection and sensor input (M12)	302990

### 5.4. Ordering chart accessories

#### Analogue version

Accessory	Article no.
Control unit for Type 8605 Cable plug	582878
Right-angle plug M12 4-pol.	784301
M12 connecting cable 4-pol. 5 m length	918038
Cover set (for control electronics without control unit)	670549

## büS version

Selection of accessories	Article no.
büS-stick set 1 (incl. connection cable (M12 and micro-USB), büS-stick with integrated terminating resistor, power supply and other accessories)	772426 
büS-stick set 2 (connection cable (M12 and micro-USB), büS-stick with integrated terminating resistor)	772551 
büS-Y distributor, M12	772420 
büS-Y distributor, M12 with voltage interruption	772421 
Terminating resistor, plug, M12	772424 
Terminating resistor, socket, M12	772425 
büS-cable extension, 0.2 m (connecting M12 plug on M12 socket)	772402 
büS-cable extension, 0.5 m (connecting M12 plug on M12 socket)	772403 