





(Figure similar)

Figure	Type	Inputs analog	Outputs analog	Input voltage (sensor supply) <sup>(1)</sup>	Output voltage (actuator supply) <sup>(2)</sup>	ASi address <sup>(3)</sup>	Art. no.
	IP20, 22,5 mm x 92 mm 4 x COMBICON	2 x 4 ... 20 mA / 0 ... 10 V	—	selectable, from ASi or AUX, default ASi	—	1 AB address	<b>BWU1897</b>
	IP20, 22,5 mm x 92 mm 4 x COMBICON	2 x 4 ... 20 mA / 0 ... 10 V	—	selectable, from ASi or AUX, default ASi	—	1 single address	<b>BWU1345</b>
	IP20, 22,5 mm x 92 mm 4 x COMBICON	—	2 x 0 ... 20 mA / 0 ... 10 V	—	selectable, from ASi or AUX, default ASi	1 single address	<b>BWU1412</b>
	IP20, 22,5 mm x 92 mm 4 x COMBICON	—	2 x 0 ... 20 mA / 0 ... 10 V	—	selectable, from ASi or AUX, default AUX	1 single address	<b>BWU1727</b>
	IP20, 22,5 mm x 92 mm 4 x COMBICON	—	2 x -10 V ... +10 V	—	out of AUX	1 single address	<b>BWU2224</b>
	IP20, 22,5 mm x 105 mm 6 x COMBICON	4 x 4 ... 20 mA	—	from ASi or AUX, auto switching	—	1 single address	<b>BWU1364</b>
	IP20, 22,5 mm x 105 mm 6 x COMBICON	4 x 0 ... 10 V	—	from ASi or AUX, auto switching	—	1 single address	<b>BWU1365</b>
	IP20, 22,5 mm x 105 mm 6 x COMBICON	4 x Pt100	—	out of ASi	—	1 single address	<b>BWU1368</b>
	IP20, 22,5 mm x 105 mm 6 x COMBICON	4 x thermocouple type J	—	out of ASi	—	1 single address	<b>BWU1933</b>
	IP20, 22,5 mm x 105 mm 6 x COMBICON	4 x thermocouple type K	—	out of ASi	—	1 single address	<b>BWU2243</b>
	IP20, 22,5 mm x 105 mm 6 x COMBICON	—	4 x 0 ... 20 mA	—	from ASi or AUX, auto switching	1 single address	<b>BWU1366</b>
	IP20, 22,5 mm x 105 mm 6 x COMBICON	—	4 x 0 ... 10 V	—	from ASi or AUX, auto switching	1 single address	<b>BWU1367</b>

- (1) **Input voltage (sensor supply):** inputs are supplied by ASi or by AUX (auxiliary 24 V power). If supplied by ASi, inputs shall not be connected to earth or to external potential.
- (2) **Output voltage (actuator supply):** outputs are supplied by ASi or by AUX (auxiliary 24 V power). If supplied by ASi, outputs shall not be connected to earth or to external potential
- (3) **ASi address:** 1 AB address (max. 62 AB addresses/ASi network), 2 AB addresses (max. 31 modules with 2 AB addresses), Single addresses (max. 31 Single addresses/ASi network), mixed use allowed.  
For modules with two ASi nodes the second ASi node is turned off as long as the first ASi node is addressed to address "0".  
Upon request, ASi nodes are available with specific ASi address profiles.

Article No.	BWU1897	BWU1345	BWU1364	BWU1365	BWU1368	BWU1933	BWU2243
General Data							
Device type	Input						
Connection							
ASi/AUX connection	COMBICON clamp						
Periphery connection	COMBICON clamp						
ASi							
Profile	S-7.A.9	S-7.3					
Address	1 AB address	1 single address					
Required Master profile	≥M4	≥M3					
Since ASi specification	3.0	2.1					
Operating voltage	30 V (18 ...31,6 V)	30 V (19 ...31,6 V)	30 V (24 ...31,6 V)	30 V (18 ...31,6 V)			
Max. current consumption	< 80 mA					< 100 mA	
AUX							
Voltage	24 V (18 ... 30 V)				–		
Max. current consumption	500 mA				–		
Input							
Number	2 (4 ... 20 mA/ 0 ... 10 V)		4 (4 ... 20 mA)	4 (0 ... 10 V)	4 (Pt100)	4 (thermo- couple type J)	4 (thermo- couple type K)
Resolution	14 Bit (1 µA / 1mV)	16 Bit (1 µA / 1 mV)	16 Bit (1 µA)	16 Bit (1 mV)	16 Bit (0,1 °C)	16 Bit (0,1 °C)	
Range of value	4000 ... 20000 dec. / 0 ... 10000 dec.		4000 ... 20000 dec.	0 ... 10000 dec.	-200 °C ... +850 °C	-200 °C ... +760 °C	
Internal resistance	50 Ω / 100 kΩ				–	1 MΩ	
Max. input voltage	25 V				–		
Max. input current	40 mA				–		
Power supply	out of ASi or out of AUX				out of ASi		
Power supply of attached sensors	500 mA out of AUX 50 mA out of ASi				50 mA		
Output							
Resolution	–						
Range of value	–						
Resistance of the actuators	–						
Max. output current	–						
Power supply	–						
Power supply of attached actuators	–						
Environment							
Applied standards	EN 61000-6-2 EN 61000-6-4 EN 60529						
Can be used in passively safe paths up to SIL3/PLe	no <sup>(1)</sup>				yes <sup>(2)</sup>		
Operating altitude	max. 2000 m						
Operating temperature	0 °C ... +70 °C						
Storage temperature	-25 °C ... +85 °C						
Housing	plastic, for DIN rail mounting						
Pollution degree	2						
Protection category	IP20						
Voltage of insulation	≥ 500 V						
Weight	120 g		145 g				
Dimension (W / H / D in mm)	22,5 / 99 / 92		25 / 105 / 114				

<sup>(1)</sup> The module is not suitable for use in passively safe paths because an exclusion of errors cannot be assumed for the connection of the two potentials, ASi and AUX.

<sup>(2)</sup> The module is suitable for use in passively safe paths as it has no connection to an AUX potential.

Article No.	BWU1366	BWU1367	BWU1412	BWU1727	BWU2224
General Data					
Device type	output				
Connection					
ASi/AUX connection	COMBICON clamps				
Periphery connection	COMBICON clamps				
ASi					
Profile	S-7.3				S-7.3.5
Address	1 single address				
Required Master profile	≥ M3				
Since ASi specification	2.1				
Operating voltage	30 V (24 ... 31,6 V)	30 V (18 ... 31,6 V)			
Max. current consumption	<80 mA				<100 mA
AUX					
Voltage	24 V (18 ... 30 V)				
Max. current consumption	500 mA				
Input					
Resolution	—				
Range of value	—				
Internal resistance	—				
Max. input voltage	—				
Max. input current	—				
Power supply	—				
Power supply of attached sensors	—				
Output					
Number	4 (0 ... 20 mA)	4 (0 ... 10 V)	2 (0 ... 20 mA/0 ... 10 V)	2 (-10 V ... +10 V)	
Resolution	16 Bit (1 µA)	16 Bit (1 mV)	16 Bit (1 µA / 1 mV)	16 Bit	
Range of value	0 ... 20000 dec.	0 ... 10000 dec.	0 ... 20000 dec. / 0 ... 10000 dec.	-10000 ... +10000 dec.	
Resistance of the actuators	—				≥1 kΩ
Max. output current	—				10 mA
Power supply	out of ASi or out of AUX				out of AUX
Power supply of attached actuators	500 mA out of AUX 50 mA out of ASi				500 mA
Environment					
Applied standards	EN 61000-6-2 EN 61000-6-4 EN 60529				
Can be used in passively safe paths up to SIL3/PLe	no <sup>(1)</sup>				
Operating altitude	max. 2000 m				
Operating temperature	0 °C ... +70 °C				0 °C ... +60 °C
Storage temperature	-25 °C ... +85 °C				
Housing	plastic, for DIN rail mounting				
Pollution degree	2				
Protection category	IP20				
Voltage of insulation	≥ 500 V				
Weight	145 g		120 g		
Dimension (W / H / D in mm)	22,5 / 105 / 114		22,5 / 99 / 92		

<sup>(1)</sup> The module is not suitable for use in passively safe paths because an exclusion of errors cannot be assumed for the connection of the two potentials, ASi and AUX.

## Wiring rules

	Push-in terminals
<b>General</b>	
Nominal cross section	2.5 mm <sup>2</sup>
<b>Conductor cross section</b>	
Conductor cross section solid	0.2 ... 2.5 mm <sup>2</sup>
Conductor cross section flexible	0.2 ... 2.5 mm <sup>2</sup>
Conductor cross section flexible, with ferrule	without plastic sleeve: 0.2 ... 2.5 mm <sup>2</sup>
	with plastic sleeve: 0.25 ... 2.5 mm <sup>2</sup>
2 conductors with same cross section, stranded, with TWIN ferrules	without plastic sleeve: 0.5 ... 1.5 mm <sup>2</sup>
AWG	24 ... 14
Stripped insulation length	10 mm

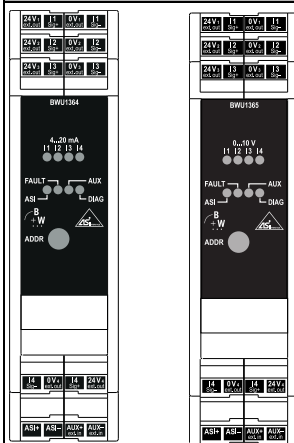
## Programming

Bit	Bit setting			
	input			
Bit	P3	P2	P1	P0
BWU1345	0: both channels in current mode and without broken wire recognition 1: normal operation	1: peripheral fault is indicated 0: peripheral fault is not indicated	0: channel 2 is not projected 1: channel 2 is projected	0: 60 H filter in A/D converter active 1: 50 H filter in A/D converter active
BWU1364 / BWU1365	0: peripheral fault is not indicated 1: peripheral fault is indicated	Analog module is switched on/-off (bit combination P1 and P2)		
BWU1368	0: 4 wire-mode 1: 2 wire-mode	A peripheral fault can be released through channel X (bit combination P1 and P2)		
BWU1897	—	1: peripheral fault is indicated 0: peripheral fault is not indicated	0: both channels in current mode and without broken wire recognition 1: normal operation	
BWU1933 / BWU2243	0: external cold-junction compensation 1: internal cold-junction compensation	Analog module is switched on/-off (bit combination P1 and P2)	A peripheral fault can be released through channel X (bit combination P1 and P2)	

Combination of input bits P1 and P2											
BWU1364, BWU1365						BWU1368, BWU1933, BWU2243					
Channel c.X is						Peripheral fault can be released through channel					
P1	P2	c.1	c.2	c.3	c.4	P1	P2	1	2	3	4
0	0	on	off	off	off	0	0	yes	no	no	no
0	1	on	on	off	off	0	1	yes	yes	no	no
1	0	on	on	on	off	1	0	yes	yes	yes	no
1	1	on	on	on	on	1	1	yes	yes	yes	yes



## Connections BWU1364, BWU1365

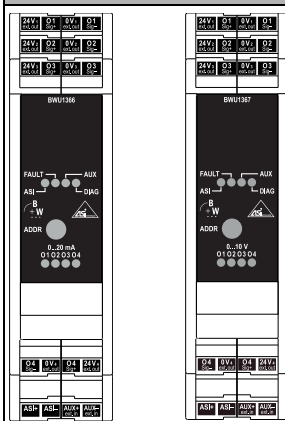


## LEDs BWU1364, BWU1365

PWR (green)	ASi voltage
FAULT (red)	ASi communication error, peripheral fault
AUX (green)	Voltage supply 24 V for the analog part
DIAG (green)	Diagnosis
I1 ... I4 (yellow)	State of channel I1, I2, I3, I4

The current supply of the sensors can be made out of ASi or an external voltage supply (according to PELV). The current supply switches automatically to the supply out of external voltage supply, as soon as an external voltage is connected. The analog sensors and ASi are galvanically separated.

## Connections BWU1366, BWU1367



## LEDs BWU1366, BWU1367

PWR (green)	ASi voltage
FAULT (red)	ASi communication error, peripheral fault
AUX (green)	Voltage supply 24 V for the analog part
DIAG (green)	Diagnosis
O1 ... O4 (yellow)	State of channel O1, O2, O3, O4

The current supply of the actuators can be made out of ASi or an external voltage supply (according to PELV). The current supply switches automatically to the supply out of external voltage supply, as soon as an external voltage is connected. The actuators and ASi are galvanically separated.

## Connections BWU1368

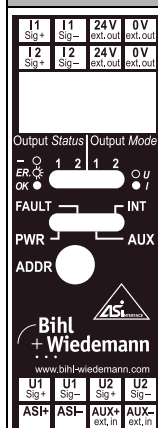


## LEDs BWU1368

PWR (green)	ASi voltage
FAULT (red)	ASi communication error, peripheral fault
I1 ... I4 (yellow)	State of channel I1, I2, I3, I4

The measuring sensors and ASi are galvanically separated.

## Connections BWU1412, BWU1727

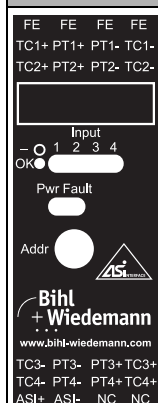


## LEDs BWU1412, BWU1727

PWR (green)	ASi voltage
FAULT (red)	ASi communication error, peripheral fault
AUX (green)	Voltage supply 24 V for the analog part
INT (green)	Voltage supply for the analog part out of ASi
Analog 1 (green)	State of channel 1
Analog 2 (green)	State of channel 2
Analog 1 (green)	Channel 1: on: current measurement; off: voltage measurement
Analog 2 (green)	Channel 2: on: current measurement; off: voltage measurement

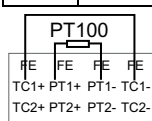
Current or voltage modules can be attached over different clamps. The current supply of the actuators can take place depending upon position of a slide switch from ASi or from external voltage (after PELV). The position of the slide switch is indicated over LEDs. BWU1897: With the help of a 2. slide switch the 2. channel in favor of faster data communication can be switched off.

## Connections BWU1933, BWU2243



## Terminal connections BWU1933, BWU2243

FE	Functional earth
TCx±	Thermo element +/- (inputs 1 - 4)
PTx±	PT100 +/- (External cold junction compensation)
ASi±	ASiinterface +/-
n.c.	Not connected



The inputs ch. 2, ch. 3 and ch 4 are connected with a bridge and a resistor (in default state) to become a valid input value and to avoid peripheral faults.

This can also be obtained by setting the parameter P1 and P2.

The temperature is measured using cold junction temperature compensation. The analog sensors are galvanical separated to ASi. For internal compensation the peripheral fault can be caused by a broken wire of the thermocouple. For the external compensation (Pt100 in connectors 2 and 3) the peripheral fault can also be caused by a broken wire or a short circuit of the Pt100 element. A short circuit of the TC cannot be recognized as an error.

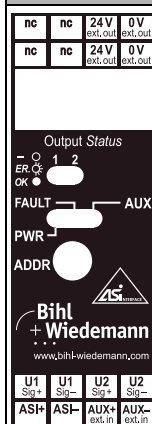
### Note:

Precise cold junction compensation requires vertical mounting and natural air circulation. A clearance of at least 5 cm each side is required!

## LEDs BWU1933, BWU2243

PWR (green)	ASi voltage
FAULT (red)	ASi communication error, peripheral fault
In1 ... In4 (yellow)	State of channel I1, I2, I3, I4

## Connections BWU2224



## LEDs BWU2224

PWR (green)	ASi voltage
FAULT (red)	On: ASi communication error; flashing: peripheral fault
AUX (green)	Voltage supply 24 V for the analog part
1 (yellow)	State of channel 1
2 (yellow)	State of channel 2

U1 Sig.- and U2 Sig.- connected.

The outputs are short circuit. The output channels have a common reference potential. The actuators are controlled from separate 24 V and they are galvanically isolated from ASi and AUX.

## Accessories:

- **ASi-5/ASi-3 Address Programming Device (art. no. BW4708)**