

ASi Safety Input Modules, IP20

- for optoelectronic protective devices, floating contacts or safety mats
- for antivalent optoelectronic protective devices and floating contacts



(Figure similar)



Figure	Inputs Safety, SIL 3, Cat. 4	Safety signal inputs	Outputs digital	Input voltage (sensor supply) (1)	Output voltage (actuator supply) (2)	ASi address (3)	Article no.
	1 x 2 channels	floating contacts	2 x electronic	out of ASi	out of AUX	1 single address	BWU1939
	1 x 2 channels	floating contacts	2 x electronic	out of ASi	out of ASi	1 single address	BWU2724
	1 x 2 channels SIL 2, Cat. 3	safety mats 1.2 kΩ or 8.2 kΩ monitoring resistor	2 x electronic	out of AUX	out of AUX	1 single address	BWU2661
	1 x 2 channels	opto-electronic protective devices	2 x electronic	out of AUX	out of AUX	1 single address	BWU2577
	1 x 2 channels	floating contacts	2 x electronic	out of AUX	out of AUX	1 single address	BWU3013
	2 x 2 channels	floating contacts	4 x electronic	out of AUX	out of AUX	2 single addresses	BWU2707
	2 x 2 channels	floating contacts + antivalent opto-electronic protective devices	–	out of AUX	–	2 single addresses	BWU3671
	2 x 2 channels	floating contacts + opto-electronic protective devices	–	out of AUX	–	2 single addresses	BWU3696

(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.

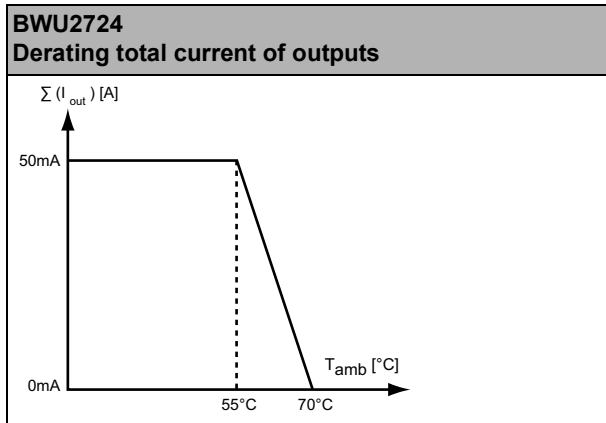
(3) **ASi address:**
AB addresses (max. 62 AB addresses/ASi network), 2 AB addresses (max. 31 modules with 2 AB addresses), Single addresses (max. 31 Single addresses/ASi network), mixed use allowed.

Article no.	BWU2724		BWU1939	BWU2707	BWU3013
Connection					
ASi / AUX Connection	COMBICON plugs, push-in terminals ⁽¹⁾				
Periphery connection	COMBICON plugs, push-in terminals ⁽¹⁾				
Length of connector cable	I/O: max. 15 m			unlimited ⁽⁸⁾	
ASi					
Profile	S-7.B.0, ID1=F			Node 1: S-7.B.0, ID1=F Node 2: S-7.B.0, ID1=E	S-7.B.0, ID1=F
Address	1 single address			2 single addresses	1 single address
Operating voltage	30 V _{DC} (22 ... 31,6 V)				
Required Master profile	≥M3				
Since ASi specification	2.1				
Max. current input	100 mA	80 mA	60 mA	35 mA	
Max. current consumption without sensor/ actuator supply	50 mA	80 mA	60 mA	35 mA	
AUX					
Voltage	–		24 V _{DC} (20 ... 30 V)		
Max. current input	–		1,5 A at output short-circuit	4 A max.	
Input					
Number	1 x 2-channels safe input			2 x 2-channels safe inputs	1 x 2-channels safe input
Safety signal inputs	floating contacts				
Switching current	static 4 mA at 24 V, dynamic 15 mA at 24 V (T = 100 μs)				
Power supply	out of ASi			out of AUX	
Switching threshold	10 mA, R < 150 Ω				
Output					
Number	2, electronic, short circuit protected			4, electronic, short circuit protected	2, electronic, short circuit protected
Power Supply	out of ASi			out of AUX	
Max. output current	up to 40 °C	Σ(Out) 50 mA ⁽²⁾	200 mA per output	1 A per output, Σ(Out) 3 A ⁽⁹⁾ ⁽¹⁰⁾	1 A per output ⁽¹⁰⁾
	at 45 °C			0,5 A per output, Σ(Out) 1,5 A ⁽⁹⁾ ⁽¹⁰⁾	0,5 A per output ⁽¹⁰⁾
	at 55 °C	–			
	at 70 °C	Σ(Out) 0 mA ⁽²⁾		–	–

Article no.	BWU2724	BWU1939	BWU2707	BWU3013
Display				
LED ASI (green)	on: ASi voltage on flashing: ASi voltage on, but peripheral fault ⁽³⁾ or address 0 off: no ASi voltage	on: ASi power supply on		
LED FLT/FAULT (red)	on: no data exchange flashing: peripheral fault ⁽³⁾			
LED ASI/FLT (red/green)	–	green: online red: no data exchange yellow/red flashing: address 0 red/green flashing: peripheral fault ⁽³⁾		
LED ASI/FLT2 (red/green)	–	green: online red: no data exchange yellow/red flashing: address 0 red/green flashing: peripheral fault ⁽³⁾ red flashing: ASi node 2 is switched off because ASi node 1 is addressed 0	–	
LED AUX (green)	–	on: 24 V _{DC} AUX off: no 24 V _{DC} AUX		
LED CC (red)	cross connection ⁽³⁾			
LEDs O1 ... On (yellow)	state of outputs O1, O2		state of outputs O1 ... O4	state of outputs O1, O2
LED S1 ... Sn (yellow)	state of inputs S1, S2		state of inputs S1 ... S4	state of inputs S1, S2
Environment				
Applied standards	EN 60529 EN ISO 13849-2 EN 61000-6-2 EN 61000-6-4 EN 61131-2 EN 62026-2 EN 62061 SIL3 EN ISO 13849-1 PLe cat 4			
It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe	yes ⁽⁴⁾	no ⁽⁷⁾		
Operating altitude	max. 2000 m			
Ambient temperature	-30 °C ... +55 °C (up to max. +70 °C) ⁽²⁾ ⁽⁵⁾ ⁽⁶⁾ ⁽⁹⁾ ⁽¹⁰⁾ no condensation permitted			
Storage temperature	-25 °C ... +85 °C			
Housing	plastic, for DIN rail mounting			
Pollution Degree	2			
Protection category	IP20			
Tolerable loading referring to humidity	according to EN 61131-2			
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms 10 ... 55 Hz, 0,5 mm amplitude			
Weight	60 g		160 g	
Dimensions (W / H / D in mm)	22,5 / 99,6 / 50,5		22,5 / 99,6 / 114	

⁽¹⁾ see table "Wiring rules"

(2)



(3) see table “Peripheral fault indication”

(4) The module is suitable for use in passively safe paths as it has no connection to an AUX potential.

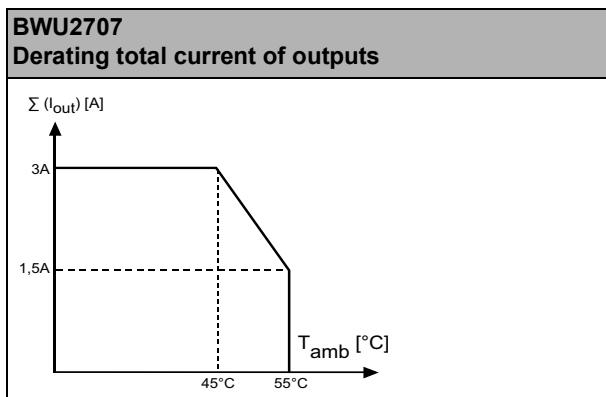
(5) temperature range up to -30°C from Ident.No. ≥ 16285 (BWU2724); Ident.No. ≥ 16284 (BWU1939).

(6) Maximum ambient operating temperature $+55^{\circ}\text{C}$ according UL certificate for the use in the USA and Canada.

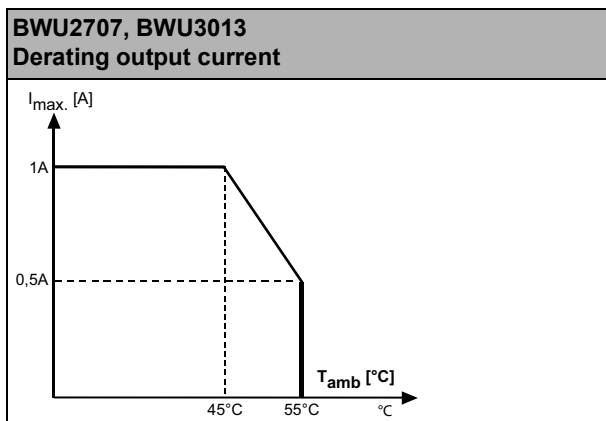
(7) The module is suitable for use in paths with a passively safe-switched AUX cable, since an exclusion of errors can be assumed for the connection of the two ASi and AUX potentials.

(8) loop resistance $\leq 150 \Omega$

(9)



(10)



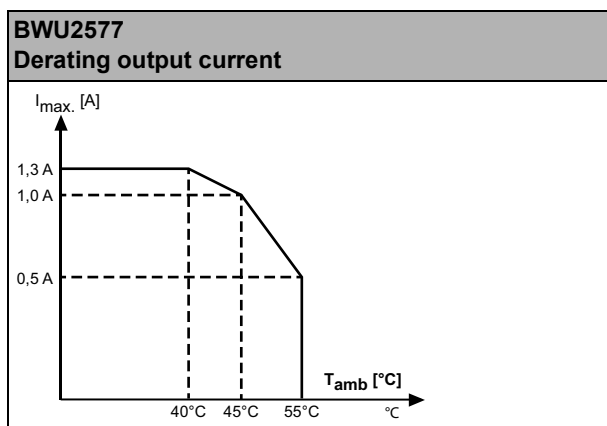
Article no.	BWU2577		BWU2661
Connection			
ASi / AUX Connection	COMBICON plugs, push-in terminals ⁽¹⁾		
Periphery connection	COMBICON plugs, push-in terminals ⁽¹⁾		
Length of connector cable	unlimited ⁽²⁾	I/O: max. 15 m	
ASi			
Profile	S-7.B.1, ID1=F		
Address	1 single address		
Operating voltage	30 V _{DC} (22 ... 31,6 V)		
Required Master profile	≥M3		
Since ASi specification	2.1		
Max. current input	35 mA		
Max. current consumption without sensor/ actuator supply	35 mA		
AUX			
Voltage	24 V _{DC} (20 ... 30 V)		
Max. current input	4 A max.		
Input			
Number	1 x 2-channels safe input		
Safety signal inputs	optoelectronic protective devices	safety mat with 1,2 kΩ or 8,2 kΩ monitoring resistor	
Power supply	out of AUX		
Power supply for external sensors	1,8 A out of AUX	-	
Switching threshold	V _{in} > 11 V for high level, input current ≥ 2,5 mA at 15 V	-	
OSSD input test pulses	0 ... 50 Hz	-	
OSSD input test pulse width	U _{aux} ≥ 21, 5 V = 0 ... 1 ms, test pulses possible U _{aux} ≥ 17 V = 0 ... 0,8 ms, test pulses possible U _{aux} < 17 V = 0 ... 0,6 ms	-	
Output			
Number	2, electronic, short circuit protected		
Power Supply	out of AUX		
Max. output current	up to 40 °C	1,3 A per output ⁽³⁾	1 A per output ⁽⁷⁾
	at 45 °C	1,0 A per output ⁽³⁾	
	at 55 °C	0,5 A per output ⁽³⁾	0,5 A per output ⁽⁷⁾
Display			
LED ASI (green)	on: ASi voltage on flashing: ASi voltage on, but peripheral fault ⁽⁴⁾ or address 0 off: no ASi voltage		
LED FLT/FAULT (red)	on: no data exchange flashing: peripheral fault ⁽⁴⁾		
LED AUX (green)	-	on: 24 V _{DC} AUX off: no 24 V _{DC} AUX	
LED CC (red)	-	sensor cable break ⁽³⁾	
LEDs O1 ... On (yellow)	state of outputs O1, O2		
LED S1 ... Sn (yellow)	state of inputs S1, S2	state of input S1	

Article no.	BWU2577	BWU2661
Environment		
Applied standards	EN 60529 EN ISO 13849-2 EN 61000-6-2 EN 61000-6-4 EN 61131-2 EN 62026-2	
	EN 62061 SIL3 EN ISO 13849-1 PLe cat 4	EN 62061 SIL2, EN ISO 13849-1 PLd cat 3
It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe	no ⁽⁵⁾	
Operating altitude	max. 2000 m	
Ambient temperature	-30°C ... +55 °C ⁽³⁾ ⁽⁶⁾ ⁽⁷⁾	
	no condensation permitted	
Storage temperature	-25 °C ... +85 °C	
Housing	plastic, for DIN rail mounting	
Pollution Degree	2	
Protection category	IP20	
Tolerable loading referring to humidity	according EN 61131-2	
Allowable shock and vibration stress	≤ 15 g, T ≤ 11 ms	
	10 ... 55 Hz, 0,5 mm amplitude	
Weight	60 g	
Dimensions (W / H / D in mm)	22,5 / 99,6 / 50,5	

(1) see table "Wiring rules"

(2) loop resistance ≤ 150 Ω

(3)



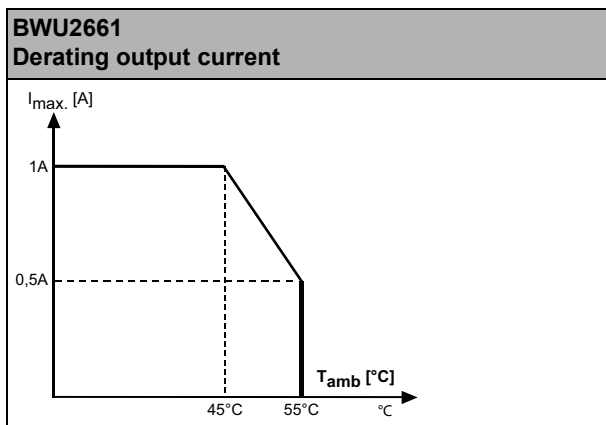
(4) See table "Peripheral fault indication"

(5) The module is not suitable for use in paths with a passively safe-switched AUX cable, since an exclusion of errors cannot be assumed for the connection of the two ASi and AUX potentials.

If the module is supplied from an unswitched AUX cable, this has no influence on the safety consideration for the paths with passively safe-switched AUX cable. In an ASi circuit, paths supplied from a passively safe-switched AUX cable and paths supplied from unswitched AUX potential can be used together.

(6) Temperature range up to -30°C from Ident.No. ≥16282 (BWU2577).

(7)



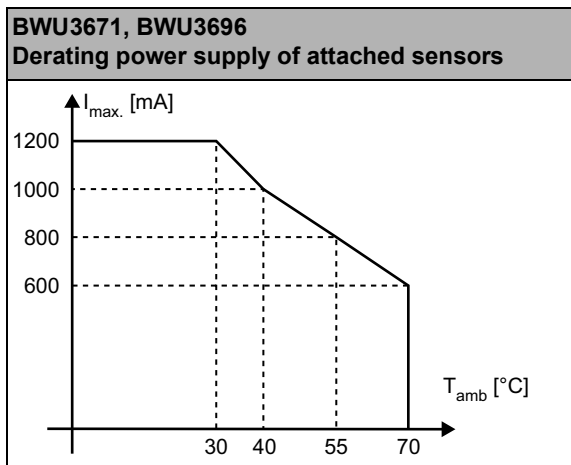
Article no.	BWU3671		BWU3696	
Connection				
ASi / AUX Connection	COMBICON plugs, push-in terminals ⁽¹⁾			
Periphery connection	COMBICON plugs, push-in terminals ⁽¹⁾			
Length of connector cable	unlimited ⁽²⁾			
ASi				
Profile	Node 1: S-7.B.0, ID1=F Node 2: S-7.B.0, ID1=E			
Address	2 single addresses			
Operating voltage	30 V _{DC} (18 ... 31,6 V)			
Required Master profile	≥M3			
Since ASi specification	2.1			
Max. current consumption	60 mA			
Max. current consumption without sensor/ actuator supply	60 mA			
AUX				
Voltage	24 V _{DC} (20 ... 30 V)			
Max. current consumption	max. 1300 mA			
Input				
Number	2 x 2-channels safe inputs			
Safety signal inputs	floating contacts (ASi node 1) + antivalent opto-electronic protective devices (ASi node 2)	floating contacts (ASi node 1) + opto-electronic protective devices (ASi node 2)		
Switching current	static 4 mA at 24 V, dynamic 15 mA at 24 V (T = 100 μs)			
Power supply	out of AUX			
Power supply for external sensor	up to +30 °C	1200 mA out of AUX ⁽³⁾		
	at +40 °C	1000 mA out of AUX ⁽³⁾		
	at +55 °C	800 mA out of AUX ⁽³⁾		
	at +70 °C	600 mA out of AUX ⁽³⁾		
Switching threshold	for floating contacts: 10 mA, R < 150 Ω for antivalent opto-electronic protective devices: V _{in} > 11 V for high level, input current ≥ 2,5 mA at 15 V	for floating contacts: 10 mA, R < 150 Ω for opto-electronic protective devices: V _{in} > 11 V for high level, input current ≥ 2,5 mA at 15 V		
OSSD input test pulses	0 ... 50 Hz			
OSSD input test pulse width	U _{aux} ≥ 21, 5 V = 0 ... 1 ms, test pulses possible U _{aux} ≥ 17 V = 0 ... 0,8 ms, test pulses possible U _{aux} < 17 V = 0 ... 0,6 ms			

Article no.	BWU3671	BWU3696
Display		
LED ASI /FLT1 (red/green)	green: online red: no data exchange yellow/red flashing: address 0 red/green flashing: peripheral error ⁽⁴⁾	
LED ASI /FLT2 (red/green)	green: online red: no data exchange yellow/red flashing: address 0 red/green flashing: peripheral error ⁽⁴⁾ red flashing: ASi node 2 is switched off because ASi node 1 is addressed 0	
LED AUX (green)	24 V DC AUX on	
LED CC (red)	cross connection ⁽⁴⁾	
LED S1 ... Sn (yellow)	state of inputs S1 ... S4	
Environment		
Applied standards	EN 60529 EN ISO 13849-2 EN 61000-6-2 EN 61000-6-4 EN 61131-2 EN 62026-2 EN 62061 SIL3 EN ISO 13849-1 PLe cat 4	
It can be used with a switched AUX cable, which is passively safe up to SIL3/PLe	no ⁽⁵⁾	
Operating altitude	max. 2000 m	
Ambient temperature	-30 °C ... +55 °C (up to max. +70 °C) ⁽³⁾⁽⁶⁾ (no condensation permitted)	
Storage temperature	-25 °C ... +85 °C	
Housing	plastic, for DIN rail mounting	
Pollution Degree	2	
Protection category	IP20	
Tolerable loading referring to humidity	according to EN 61131-2	
Allowable shock and vibration stress	$\leq 15 \text{ g}$, $T \leq 11 \text{ ms}$ 10 ... 55 Hz, 0,5 mm Amplitude	
Weight	160 g	
Dimensions (W / H / D in mm)	22,5 / 99,6 / 114	

(1) see table "Wiring rules"

(2) loop resistance $\leq 150 \Omega$

(3)



(4) see table "Peripheral fault indication"

(5) The module is not suitable for use in paths with a passively safe-switched AUX cable, since an exclusion of errors cannot be assumed for the connection of the two ASi and AUX potentials.

If the module is supplied from an unswitched AUX cable, this has no influence on the safety consideration for the paths with passively safe-switched AUX cable. In an ASi circuit, paths supplied from a passively safe-switched AUX cable and paths supplied from unswitched AUX potential can be used together.

(6) Maximum ambient operating temperature +55 °C according UL certificate for the use in the USA and Canada.

Wiring rules

Push-in terminals, 2 poles/4 poles (pitch 5 mm)	
General	
Nominal cross section	2.5 mm ²
Conductor cross section	
Conductor cross section solid	0.2 ... 2.5 mm ²
Conductor cross section flexible	0.2 ... 2.5 mm ²
Conductor cross section flexible, with ferrule	without plastic sleeve: 0.25 ... 2.5 mm ²
	with plastic sleeve: 0.25 ... 2.5 mm ²
2 conductors with same cross section, stranded, with TWIN ferrules	without plastic sleeve: 0.5 ... 1.5 mm ²
AWG	24 ... 14
Stripped insulation length	10 mm

UL-specifications (UL508) BWU1939, BWU2577, BWU2661, BWU2707, BWU2724, BWU2770, BWU2810, BWU3013, BWU3032, BWU3671, BWU3696	
External protection	An isolated source with a secondary open circuit voltage of $\leq 30 V_{DC}$ with a 3 A maximum over current protection. Over current protection is not required when a Class 2 source is employed.
In general	UL mark does not provide UL certification for any functional safety rating or aspects of the above devices.

Article no.	Peripheral fault indication				
	Cross connection	Overload sensor supply	Overload output	AUX voltage missing	Sensor cable break
BWU1939	•	–	–	–	–
BWU2577	–	–	•	•	–
BWU2661	–	–	•	•	•
BWU2707	•	–	–	•	–
BWU2724	•	–	•	–	–
BWU2770	•	–	–	•	–
BWU2810	•	–	•	–	–
BWU3013	•	–	–	•	–
BWU3032	•	–	–	–	–
BWU3671	• (1)	• (2)	–	•	–
BWU3696	• (1)	• (2)	–	•	–

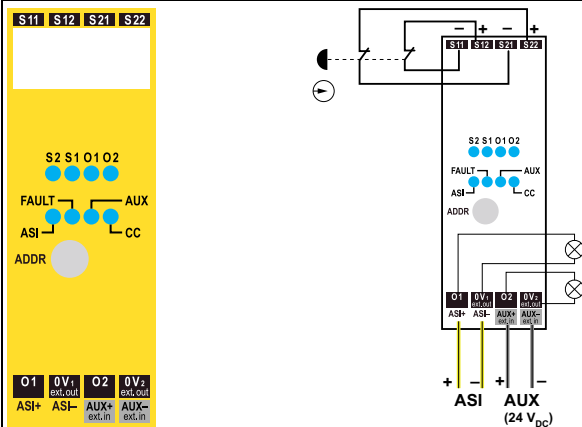
(1) ASi node 1 only

(2) ASi node 2 only

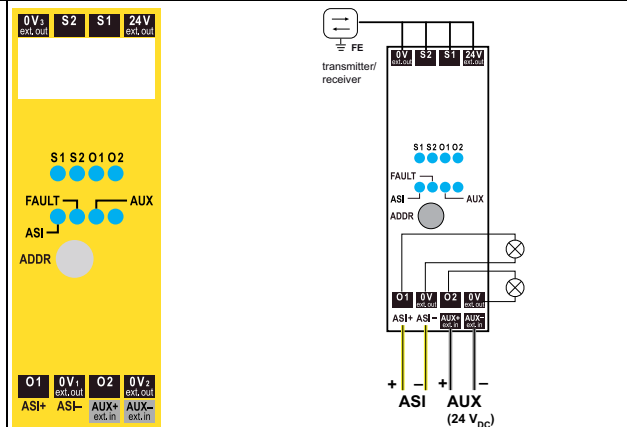
Programming:	ASi Bit-setting			
	D0	D1	D2	D3
Safe input				
BWU1939 / BWU2724 / BWU3013 / BWU3671 ASi node 1 / BWU3696 ASi node 1	S11 / S12		S21 / S22	
BWU2577	S1		S2	
BWU3671 ASi node 2 / BWU3696 ASi node 2	S3		S4	
BWU2661	sensor			
BWU2707 ASi node 1	S11 / S12		S21 / S22	
BWU2707 ASi node 2	S31 / S32		S41 / S42	
Output				
BWU1939 / BWU2577 / BWU2724 / BWU2661 / BWU3013	O1	O2	not used	not used
BWU2707 ASi node 1 /	O1	O2	not used	not used
BWU2707 ASi node 2	O3	O4	not used	not used
Parameter bit				
	P0	P1	P2	P3
BWU1939 / BWU2577 / BWU2661 / BWU2707 / BWU2724 / BWU3013	0: off/ 1: on (Watchdog)	not used	not used	not used
BWU3671 / BWU3696	not used	not used	not used	not used

Connections:

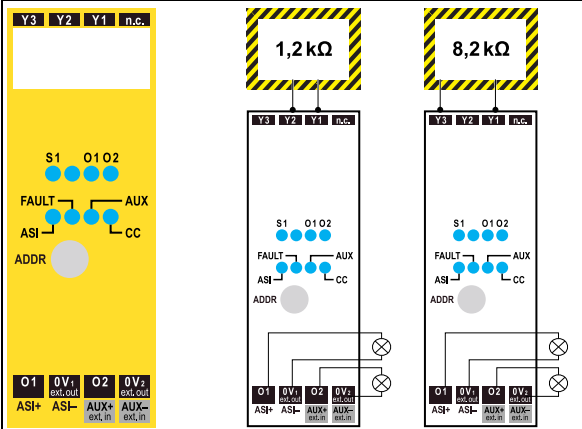
BWU1939



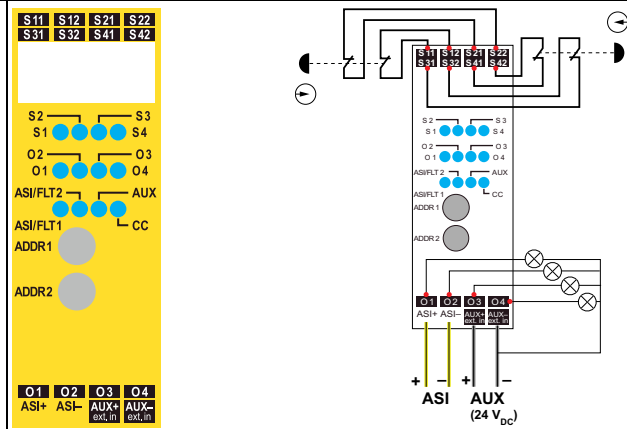
BWU2577

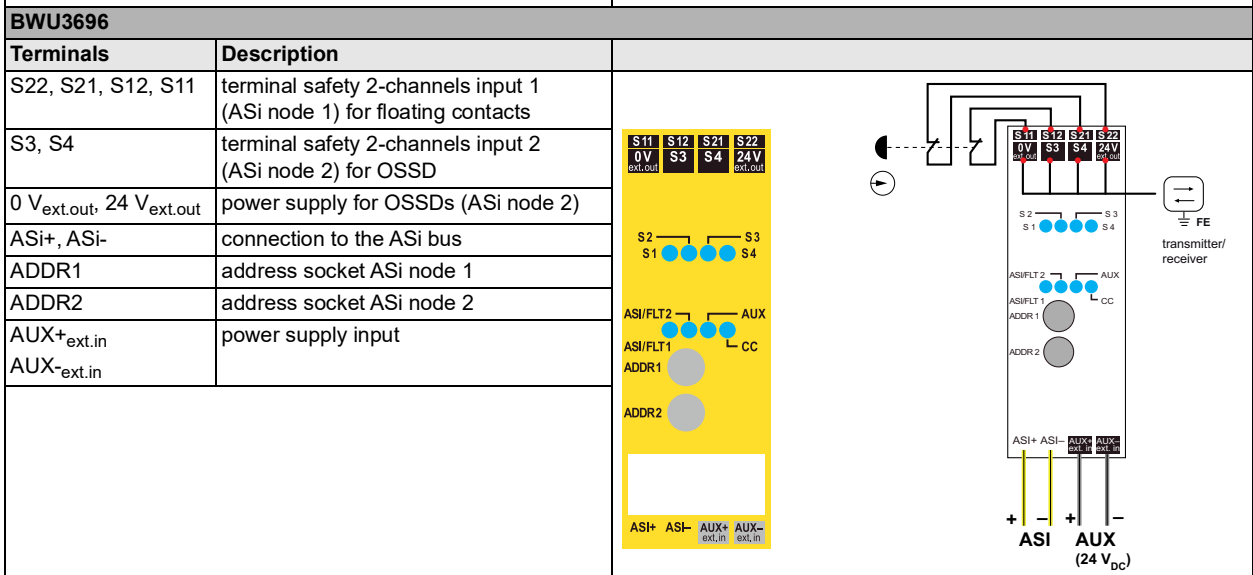
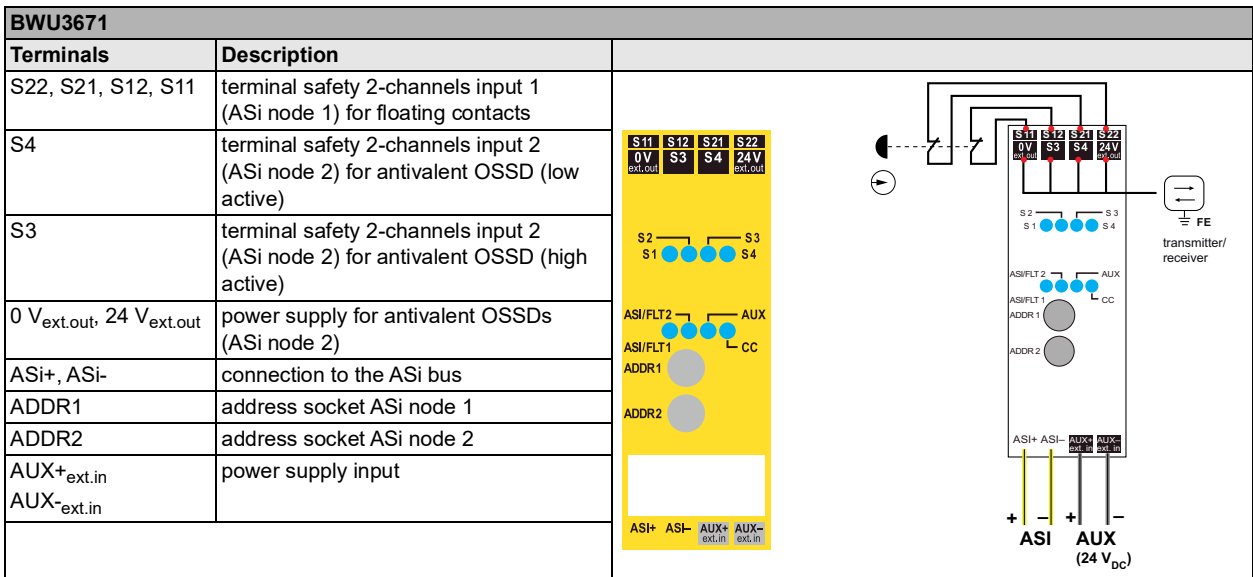
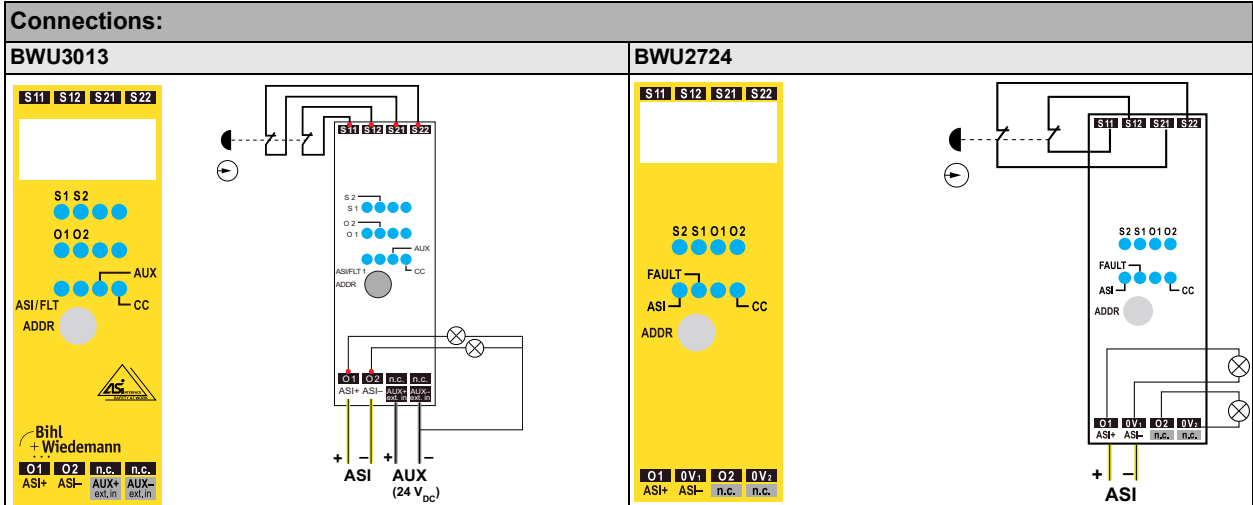



BWU2661



BWU2707





 A warning icon consisting of a triangle with an exclamation mark inside, and the text 'IP54' below it.	<p>Note</p> <p>To achieve passive safety, the device must be installed in a switching cabinet with protection class IP54.</p>
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Accessories:

- ASi-5/ASi-3 Address Programming Device (art. no. BW4708)
- Bihl+Wiedemann Safety Suite License - Safety Software for Configuration, Diagnostics and Commissioning (art. no. BW2916)