# Safety Basic Monitors

**Safety Basic Monitors**

**2 x electronic safe outputs**

**Up to 4 x 2 channels safe inputs**
• optionally the safe inputs will be used as well as standard inputs and signal outputs

**Safe ASi outputs are supported**
• max. 32 independent ASi outputs multiple safe ASi outputs possible via a single address

**Chip card for storage of configuration data**

**Protection category IP20**

(Figure similar)

| Figure | Model | Inputs Safety, SIL 3, Cat. 4 | Inputs safety, expandable to | Outputs Safety, SIL 3, cat. 4 | Safety outputs, independent according to SIL 3, expandable to | Safety communication | Fieldbus interface | 1 power supply, 1 gateway for 2 ASi networks, inexpensive power supplies | Diagnostic and configuration interface (1) | Article no. |
|---|---|---|---|---|---|---|---|---|---|---|
| | Safety Basic Monitor with extended features | 3 x 2 channels input 3 optional for speed monitor up to 4 kHz | max. 31 x 2 channels, max. 1891 in max. configuration | 2 release circuits; 2 x electronic safe output | max. 32, max. 991 in max configuration | Safe Link | ASi monitors | yes, max. 0,5 A/ASi network, max. 8 A with ASi power supply | Ethernet diagnostic (2) | **BWU2852** |
| | Safety Basic Monitor with extended features | 4 x 2 channels inputs 3+4 optional for speed monitor up to 4 kHz | max. 31 x 2 channels | 2 release circuits; 2 x electronic safe output | max. 16 | – | ASi monitors | yes, max. 0,5 A/ASi network, max. 8 A with ASi power supply | USB | **BWU2700** |

(1) **Diagnostic and configuration interface**
**"USB"**: Access to ASi Master and Safety Monitor with Bihl+Wiedemann proprietary software by using the USB interface.
**"Ethernet diagnostic"**: Access to ASi Master and Safety Monitor with Bihl+Wiedemann software by using the Ethernet diagnostic interface.

(2) Modbus TCP diagnostic capability from **Ident.no.: 15775** (see lateral label). No Modbus TCP fieldbus is supported. For a full-fledged Modbus TCP fieldbus interface use one of our Modbus TCP gateways in stainless steel or Modbus TCP gateways with integrated safety monitor.
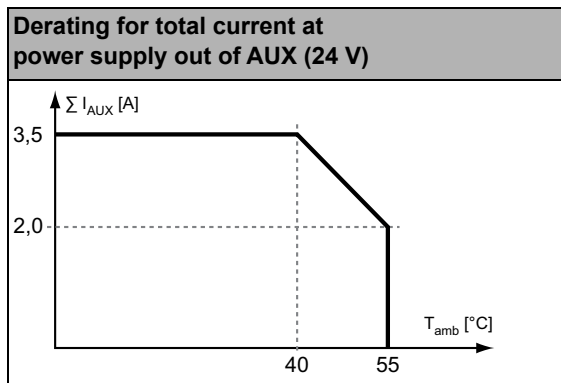EtherNet/IP diagnostic capability from **Ident.no.: 20829** (see lateral label). No EtherNet/IP fieldbus is supported. For a full-fledged EtherNet/IP fieldbus interface use one of our EtherNet/IP gateways in stainless steel or EtherNet/IP gateways with integrated safety monitor.
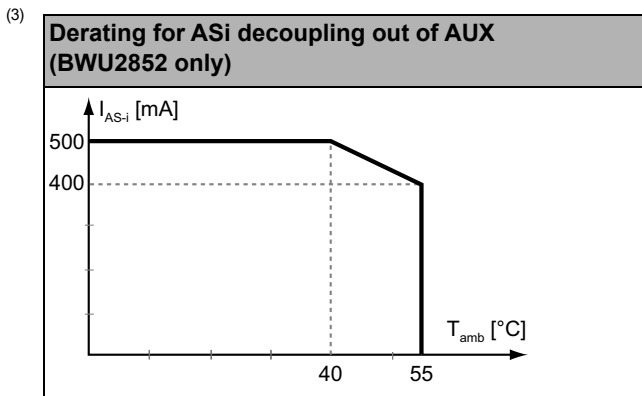
# Safety Basic Monitors

| Article no. | BWU2700 | BWU2852 |
|---|---|---|
| **Connection** | | |
| ASi/AUX connection | push-in terminals | |
| Periphery connection | push-in terminals | |
| Length of connector cable | unlimited [1] | |
| **Safety Monitor** | | |
| Respond delay | < 40 ms | |
| **ASi Master** | | |
| ASi Master | integrated | |
| **Diagnostic interface** | | |
| Type | USB | RJ-45 acc. to IEEE 802.3, EtherNet/IP diagnostic [5], Modbus TCP diagnostic [6] |
| Baud rate | – | 10/100 Mbaud half-duplex/ full-duplex |
| Safety communication | – | Safe Link |
| Card slot | chip card (32 kB) for storage of configuration data | |
| **ASi** | | |
| Voltage | 30 V (18 ... 31,6 V) | |
| Max. current consumption | 200 mA [2] | |
| Max. current with internal decoupling out of AUX | 500 mA [2], [3] | |
| **AUX** | | |
| Voltage | 24 V (20 ... 30 V) (PELV) | |
| Max.current consumption | max. 4 A | |
| **Input** | | |
| Number | 4 x 2-channel safe inputs SIL3, cat. 4 or 8 standard inputs and signaling outputs | 3 x 2-channel safe inputs SIL3, cat. 4 or 6 standard inputs and signaling outputs |
| Switching current | 15 mA (T = 100 µs), continuously 4 mA at 24 V | |
| Safety signal | floating contacts or OSSDs | |
| Supply voltage | out of AUX | |
| Sensor supply | short-circuit and overload protected according to EN 61131 | |
| Network connection between the safe input terminals | max. resistance 150 Ω | |
| Switching threshold | U<5 V (low) U>15 V (high) | |
| **Output** | | |
| Number | 2 (4) output switching elements; semiconductor outputs (output circuits 1 and 2) max. contact load: 700 mA$_{DC-13}$ at 24 V [2] | |
| Supply voltage | out ofAUX | |
| Actuator supply | short-circuit and overload protected according to EN 61131 | |
| Max. output current signal outputs | 10 mA per output | |
| Max. output current for OSSD supply | 1,4 A (S71) [2] | – |
| Test pulse | if output is on: minimum interval between 2 test pulses: 250 ms (from safety version 4.3); maximum pulse width 1 ms | |
| **Speed monitor function** | | |
| Safe monitoring | speed | |
| Signal | sensors/initiators (24V) | |
| Number of monitored axes | up to 4 independent axes | up to 2 independent axes |

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# Safety Basic Monitors

| Article no. | BWU2700 | BWU2852 |
|---|---|---|
| **Display** | | |
| LED S1 ... Sn (yellow) | state of safe input S1 ... S8 | state of safe input S1 ... S6 |
| LED SM (green/yellow/red) | state of Safety Monitor | |
| LED ASi M (green/yellow/red) | state of ASi master | |
| LED O1 (green/yellow/red) | output 1 has switched | |
| LED O2 (green/yellow/red) | output 2 has switched | |
| LED NET (green) | – | Modbus communication active |
| 1 button | Service | |
| **UL-specifications (UL508)** | | |
| External protection | An isolated source with a secondary open circuit voltage of ≤30 $V_{DC}$ has to be protected with a 3 A maximum over current. 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. | |
| **Ambient** | | |
| Applied standards | EN 60529<br>EN 61508, SIL 3<br>EN 62061, SIL 3<br>EN 61131<br>EN 61000-6-2<br>EN 61000-6-4<br>EN ISO 13849-1, Performance-Level e | |
| Operation altitude | max. 2000 m | |
| Ambient temperature | 0 °C … +55 °C | -30 °C … +55 °C [7] |
| | no condensation permitted | |
| Storage temperature | -25 °C … +85 °C | -25 °C … +85 °C |
| Housing | plastic, for DIN rail mounting | |
| Protection class | IP20 | |
| Tolerable loading referring to humidity | according to EN 61131-2 | |
| Voltage of insulation | ≥ 500 V | |
| Weight | 160 g | |
| Dimensions (W / H / D in mm) | 22,5 / 99 / 114 | |
| Mounting position | vertical (mounting rail horizontal, ASi clamps pointing downwards) [4] | |
| Mounting | Can be combined with Bihl+Wiedemann devices of the same design and neighboring devices with max. 3 W heat radiation. For higher heat radiation, a minimum distance of one module width (22.5 mm) must be provided. | |
| | There is no fixed limit for the connecting cable between the speed monitor and the encoder. However, it is recommended to keep the connecting cable between the speed monitor and the encoder as short as possible in order to avoid possible interference, e.g. EMC. | |

[1] Loop resistance ≤ 150 Ω

[2]

**Derating for total current at power supply out of AUX (24 V)**



$\Sigma\, I_{AUX}$ [A]

$T_{amb}$ [°C]

3,5 — 2,0 — 40 — 55

(3)

**Derating for ASi decoupling out of AUX (BWU2852 only)**



(4) Make sure there is adequate ventilation. The supply air temperature at the bottom of the housing may not exceed values specified under ambient temperature.

(5) EtherNet/IP for diagnostics from Ident. No. >20829.

(6) Modbus/TCP for diagnostics from Ident. No. >15775.

(7) temperature range up to -30°C from Ident. No. ≥16254.

| Article no. | BWU2700 | BWU2852 |
|---|---|---|
| **ASi Safety Monitor** | | |
| Safety Monitor | Safety Basis Monitor, with extended features | |
| Optimized to ASi Monitor operations | no | |
| Release circuits | 16 | 32 |
| Antivalent switches for local inputs | yes | |
| Standstill monitors of local inputs | 4 x 50 Hz | 3 x 50 Hz |
| Standstill/speed monitors of local inputs | 2-4 axes, up to 4 kHz | 1-2 axes, up to 4 kHz |
| **Electrical data** | | |
| Power supply decoupling unit | integrated | |

## Wiring rules

| | Push-in terminals, 2 /3 /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 |

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# Safety Basic Monitors

| BWU2700 | BWU2852 | Terminals | Description |
|---|---|---|---|
| | | S22, S21, S12, S11 | safety input terminal input 1 |
| | | S42, S41, S32, S31 | safety input terminal input 2 |
| | | S62, S61, S52, S51 | safety input terminal input 3 |
| | | S71, S72, S81, S82 | safety input terminal input 4 (except BWU2852) |
| | | $1.14_{ext.out}$ | semiconductor output 1 |
| | | $2.14_{ext.out}$ | semiconductor output 2 |
| | | $0\,V_{ext.out}$ | ground for semiconductor output |
| | | ASi +, ASi - | connection to the ASi Bus |
| | | AUX $+_{ext.in}$, AUX $-_{ext.in}$ | power supply input |

## Accessories:

- **Safety Software for Configuration, Diagnosis and Programming (art. no. BW2916)**
- **Chip card, memory capacity 32 kB (art. no. BW2079)**
- **Safe Contact Expander 1 or 2 independent channels (art. no. BWU2548 / BWU2539)**
- **Safe Contact Expander 10 A or 20 A (art. no. BW3016 / BW3281)**
- **ASi Safety 4I/2O Module, 4 x 2 channels safety inputs and 2 fast electronic safety outputs in IP20 (art. no. BWU2314) as supplementary module**
- **ASi Speed Monitor (art. no. BWU2427 / BWU2849) as supplementary module**
- **USB cable for Safety Basic Monitor (art. no. BW2530)**

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