



## DS230 / DS240 series Safety motion monitor for SinCos and incremental encoders / sensors

- Monitoring underspeed, overspeed, standstill and direction of rotation
- SIL3 and PLe certification
- Safety functions equivalent to EN61800-5-2 (SS1, SS2, SOS, SLS, SDI, SSM)
- Inputs for:
  - 2 SinCos encoders
  - 2 RS422 incremental encoders
  - 2 HTL / PNP incremental encoders, proximity switches or control signals
- Outputs (safety related):
  - 1 Relay output 5 ... 36 VDC (NO)
  - 1 Analogue output 4 ... 20 mA
  - 4 Control HTL outputs
- Signal splitter (safety related):
  - 1 SinCos Splitter output
  - 1 RS422 Splitter output
- Mounting to 35 mm top hat rail (according to EN 60715)
- USB interface for simple parametrization by the OS 6.0 operator surface
- Optional available display and programming unit BG230 for parametrization and indication

### Technical Specification:

<b>Power supply:</b>	Input voltage: 18 ... 30 VDC Protective circuit: reverse polarity protection Ripple: max. 10 % at 24 VDC Power consumption: approx. 150 mA (unloaded) Protection: external fuse (2.5 A, medium time-lag) necessary Connections: screw terminal, 1.5 mm <sup>2</sup>
<b>Encoder supply:</b>	Number: 2 Output voltage: approx. 2 VDC less the input voltage Output current: max. 200 mA per encoder Protective circuit: short-circuit-proof
<b>SinCos inputs:</b>	Number of inputs: 2 Channels: SIN+, SIN-, COS+, COS- Amplitude: 0.8 ... 1.2 V <sub>pp</sub> DC offset: 2.4 ... 2.6 VDC Frequency: max. 500 kHz Connections: SUB-D (male), 9-pin
<b>Incremental inputs:</b>	Number of inputs: 2 Format: RS422 (differential signal A, /A, B, /B) Frequency: max. 500 kHz Connections: screw terminal, 1.5 mm <sup>2</sup>

Technical Specification:		
<b>Control / incremental inputs:</b>	Number of inputs: Application: Signal level: Load: Frequency (control): Frequency (incremental): Connections:	2 (each complementary) connection of HTL encoders, proximity switches, or control commands PNP HTL (10 ... 30 V) max. 15 mA max. 1 kHz max. 250 kHz screw terminal, 1.5 mm <sup>2</sup>
<b>SinCos output:</b> (safety related)	Splitter output: Channels: Amplitude: DC offset: Frequency: Signal delay: Connector type:	of the SinCos 1 input SIN+, SIN-, COS+, COS- 0.8 ... 1.2 V <sub>pp</sub> 2.4 ... 2.6 VDC max. 500 kHz ca. 200 ns SUB-D (female), 9-pin
<b>Incremental output:</b> (safety related)	Splitter output: Format: Frequency: Connections:	of the SinCos 1, SinCos 2, RS422 1, RS422 2 or HTL 1 or HTL 2 input RS422 (differential signals A, /A, B, /B) max. 500 kHz screw terminal, 1.5 mm <sup>2</sup>
<b>Analogue output:</b> (safety related)	Current output: Resolution: Accuracy: Connections:	4 ... 20 mA (load max. 270 Ohm) 14 Bit ± 0,1% screw terminal, 1.5 mm <sup>2</sup>
<b>Control outputs:</b> (safety related)	Number of outputs: Output voltage: Output current: Switching characteristic: Protective circuit: Connections:	4 (each complementary) HTL (approx. 2 VDC less the input voltage) max. 30 mA per output push-pull short-circuit-proof screw terminal, 1.5 mm <sup>2</sup>
<b>Relay output:</b> (safety related)	Number of relays: Switching capability: Switching capacity: Connections:	two relays in series with forced-guided contacts (NO) 5 ... 36 VDC 5 mA ... 5 A screw terminal, 1.5 mm <sup>2</sup>
<b>USB interface:</b>	Version / connection:	USB 1.0 / Type B (female)
<b>LEDs:</b>	Green / yellow:	„ON“ / „ERROR“
<b>Switches:</b>	DIL switch:	1 x 3-pin
<b>Conformity and standards:</b>	MR 2006/42/EC: LV 2006/95/EC: EMC 2004/108/EC: Vibration resistance: Shock resistance:  RoHS 2011/65/EU:	EN ISO 13849-1, EN 61508, EN 62061 EN 61010-1 EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 61326-3-2 EN 60068-2-6 (sine, 7 g, 10 – 200 Hz, 20 cycles) EN 60068-2-27 (half sine, 30 g, 11 ms, 3 shocks) EN 60068-2-27 (half sine, 17 g, 6 ms, 4000 shocks) EN 50581
<b>Safety characteristic data:</b>	Classification: Approved Safety Function: System structure: System architecture: DC <sub>avg</sub> : SFF: MTTF <sub>D</sub> : PFH: $\lambda_{SD} / \lambda_{SU} / \lambda_{DD} / \lambda_{DU}$ : Safety functions:	SIL3/PLe (depends on the used encoder input signals) Certification No.: 44 207 14018601 dual-channel Cat. 3 / HFT = 1 97,07 % 99,2 % 38,1 years $3,76 * 10^{-8} h^{-1}$ $1,93 * 10^{-6} h^{-1} / 4,64 * 10^{-8} h^{-1} / 2,94 * 10^{-6} h^{-1} / 6,14 * 10^{-8} h^{-1}$ equivalent ... EN61800-5-2 for SS1, SS2, SOS, SLS, SDI, SSM (depending on the used encoder input signals)
<b>Enclosure:</b>	Material: Mounting: Dimensions: Protection class: Weight:	plastic to 35 mm top hat rail (according to EN 60715) 50 x 100 x 165 mm (w x h x d) IP20 ca. 390 g
<b>Ambient temperature:</b>	Operation: Storage:	-20 °C ... +55 °C / -4 °F ... +131 °F (without condensation) -25 °C ... +70 °C / -13 °F ... +158 °F (without condensation)
<b>BG230 unit: (optional)</b>	Display / Operation:	OLED-Display / Touch screen
<b>Available devices:</b>	DS230: All inputs and outputs as well as signal splitter function (SinCos- and RS422 output) DS236: All inputs and outputs, but without signal splitter function DS240: 1 SinCos input (SIL3/PLe), 2 control inputs, all outputs as well as signal splitter function (SinCos- / RS422 output) DS246: 1 SinCos input (SIL3/PLe), 2 control inputs, all outputs, but without signal splitter function	