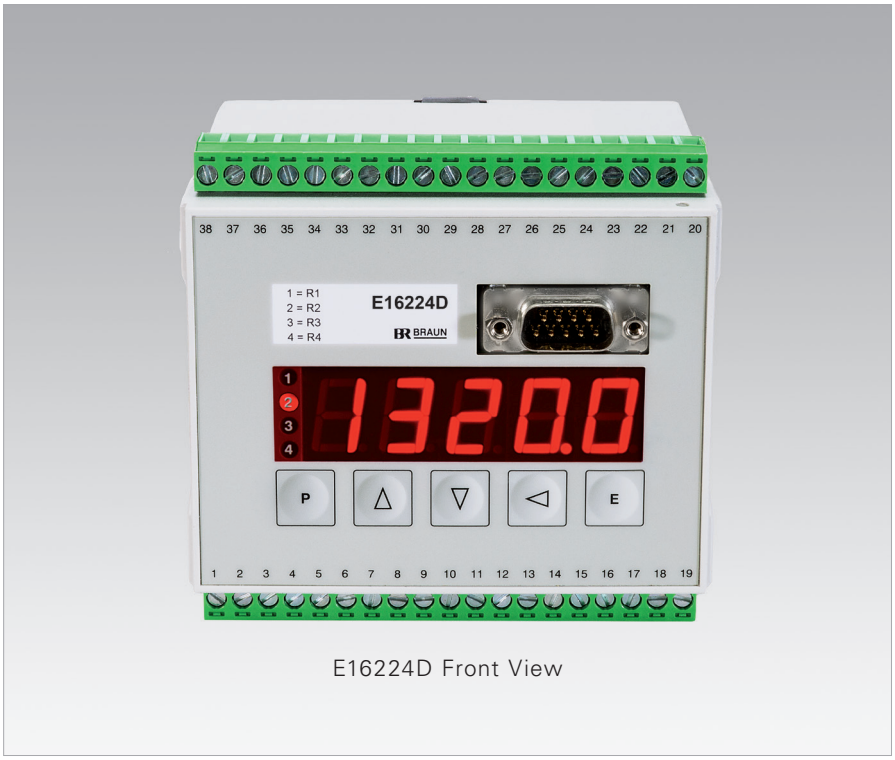
Dual Channel Monitor for Measurement of Speed and Ratio with SIL2 requirements

Series E16224D



E16224D Front View

KEY FEATURES

- SIL2 / IEC 61508:2010 compliant
- Dual Channel Speed and Ratio Monitor with sensor monitoring and self-test function
- Frequency range 0 Hz…50 kHz
- 1 Analog Output 0/4…20 mA
- Bright red digital LED display
- 1 Safety Output as DPST relay
- 3 Alarm Outputs as SPST relay
- 2 Signal Inputs for connection with two A5S series sensors
- PROFIBUS / RS232 Data Interface
- Universal Power Supply range 20…265 Vuc (U3) or 18…40 Vuc (U1)

BENEFITS

- Fast, precise and safe
- Maintenance-free during Lifetime, therefore minimized TCO
- Rapid and accurate response through period measurement

Fast, precise and safe – from zero motion to highest speed

The BRAUN Dual Channel Speed and Ratio Monitor Series E16224D for increased safety requirements is SIL2 / IEC 61508:2010 compliant. It receives input signals from speed sensors or flow rate transmitters. Two signal inputs are specially designed for our proven Differential-Hall-Effect based A5S sensors.

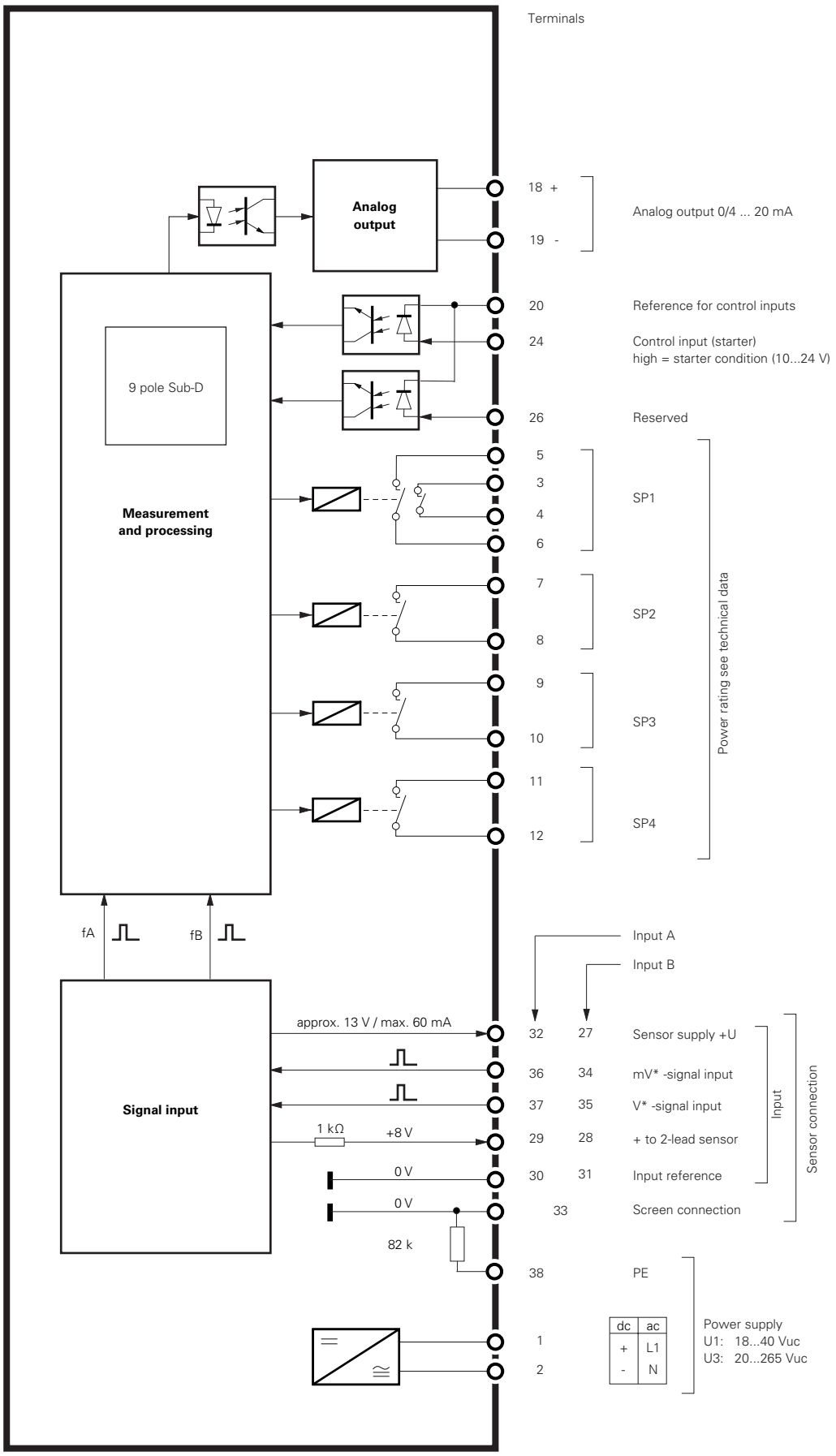
The monitor simultaneously measures one or two speed values (or other quantities transmitted as frequency) and computing their ratio or difference or sum, to read and monitor stretch / shrinkage or blend ratio, for instance.

Display, setpoints, and analog output may be adjusted to any speed. During its complete useful lifetime of 20 years, the monitor does not require any external proof tests and is completely maintenance-free.

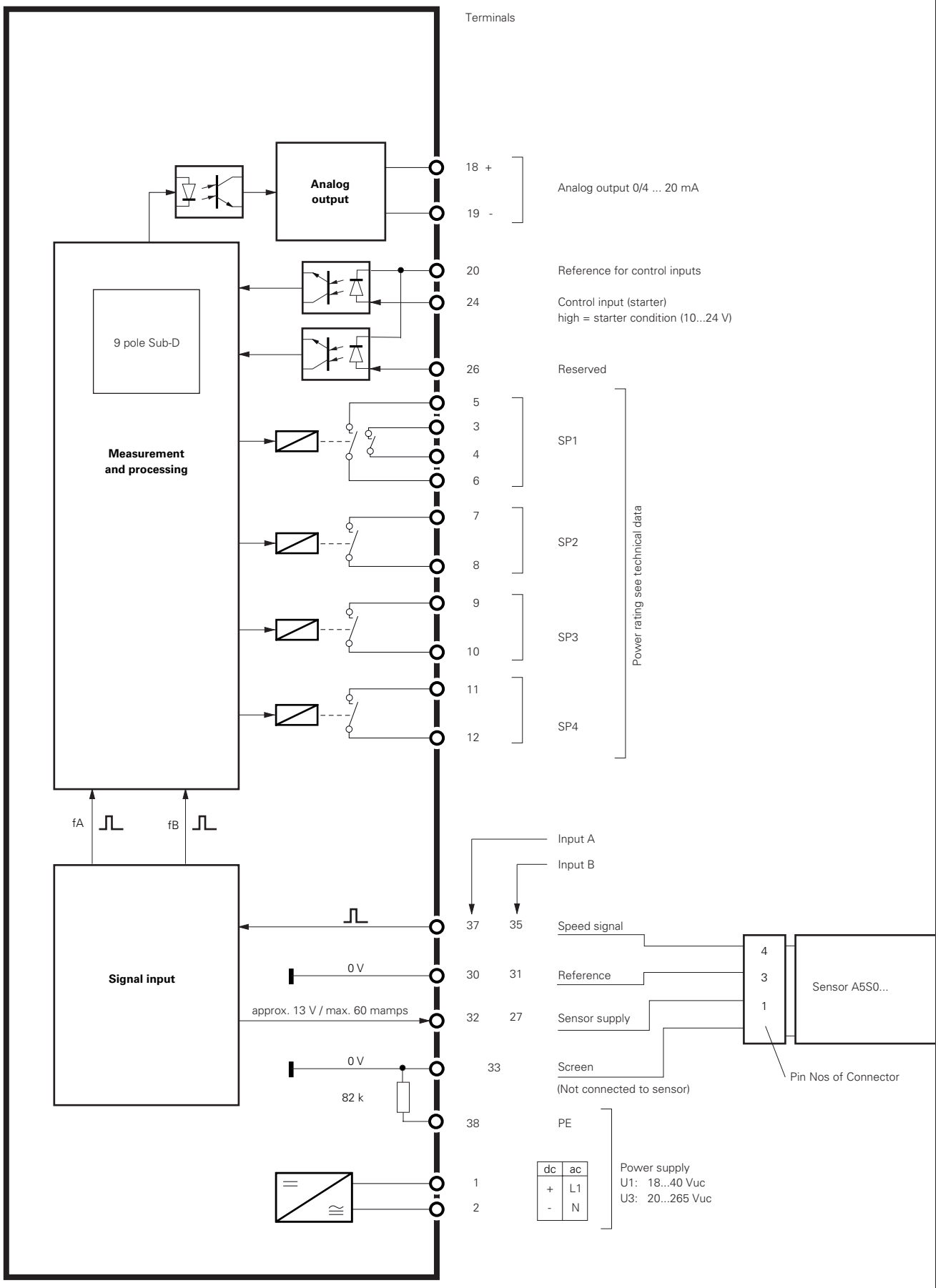
Specifications of E16224D

Conformity to Standards	**Directives**	**Standards**
	2014/30/EU (EMC Directive)	EN 61000-6-4, EN 61326-3-2
	2014/35/EU (Low Voltage Directive)	EN 61010-1
	2011/65/EU (RoHS Directive)	EN 50581
	SIL2 acc. IEC 61508:2010, EN ISO 13849:2008; PLc	
Measuring Principle	Frequency measurement, based on the input pulse distance, extended over a minimum period of time, programmable 5 milliseconds…9.999 seconds.	
Accuracy	±0.005% of value ±1 in last digit	
Response	1 input pulse interval + programmed minimum time + 5 milliseconds	
Analog Output	Isolated and protected against external short circuit. Current 0/4…20 mA with max. load of 500 ohms	
Range	High and low end of span programmable	
Resolution	12 bit (1 : 4096)	
Drift by temperature	<0.01% within 0…40 °C (32…104 °F)	
Long term stability	<0.25% during 5000 hours of operation	
Setpoint Alarms	Four individual setpoints, each with SPDT contacts, control an own relay output.	
Setpoints adjustment	Individually programmable from zero speed up to any high speed	
Response characteristics	Hysteresis individually programmable in its position and width	
Handling capacity	Relay contacts 250 V, 2 A, 100 W AC	
Alarm state position	Individually programmable for excess, no power and input failure condition, starter period	
Starter function	Released by external control signal (12…24 V) to isolated input. Extension programmable up to 999 sec.	
Display	5 digits with red LED figures, 15 mm high Indicating the variable during operation, parameters during the programming phase	
Data Interface	PROFIBUS / RS232 at front socket (Baud rate automatic for PROFIBUS, resp. programmable up to 38400 baud for RS232)	
Data output	Measurements and signals state, upon request	
Data input	Programming the parameters (equipment required see below)	
Programming	Manually by front keys, alternatively via RS232 (equipment required see below)	
Data protection	Parameters safe-guarded against power failure and code protected against unauthorized access	
Signal Input	Isolated circuit, responding to pulse signals of any waveform and to AC-signals	
Frequency range	0 Hz…50 kHz	
Signal level range	Minimum signal 50 mV RMS, maximum 100 V	
Input impedance	100 kohms	
Scaling factor	Programmable by 5 digits, considering any relation to the variable	
Suitable sensor types	All BRAUN A5S sensors	
Sensor failure monitoring	Short-circuit or interrupt of supply (NAMUR types also), signal lead break sensors (with push-pull output only). A detected failure sets any of the alarms into a pre-programmable state.	
Sensor supply	2x 13 V / max. 60 mA. Extra output 8 V via 1 kohm load resistor to passive 2 leads sensor types	
Power Supply	E16224D.U1: Supply voltage 18…40 Vuc E16224D.U3: Supply voltage 20…265 Vuc Power consumption approx. 8 W, Insulation category Class 1	
Connectors (Wiring)	Screw mounting, 2 plug-in terminal blocks, accepting 0.2…2.5 mm^2 cross section	
Operating Conditions	Ambient temperature: 0…50 °C (32…122 °F) Relative humidity max. 95%, non-condensing	
Design	Snap-on-track enclosure for 35 mm rail, field mounting enclosure (Option -G) on request	
Dimensions	Length 100 mm, width (including terminal blocks) 95 mm, height 110 mm	
Protection Grade	IP 40 for enclosure (also available in field mounting version, with transparent cover IP 65/NEMA 4) IP 20 for terminals	
Weight	approx. 0.4 kg	
Optional Accessories	**IS-RS232-S:** CD-ROM with Interface Software to program parameters **L3D03:** Plug-in adapter cable, with 9-pole Sub-D (female) plug to PC	

Function Diagram and Connections

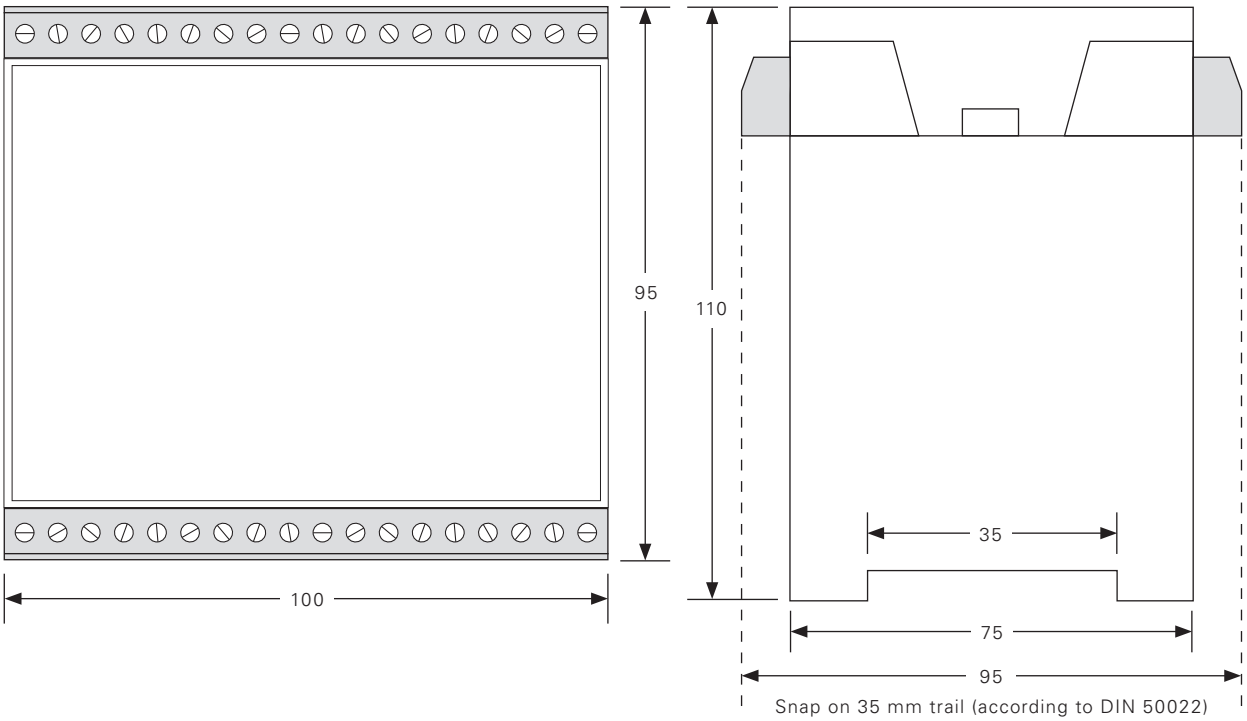


Function Diagram and Connections for A5S0... Sensors

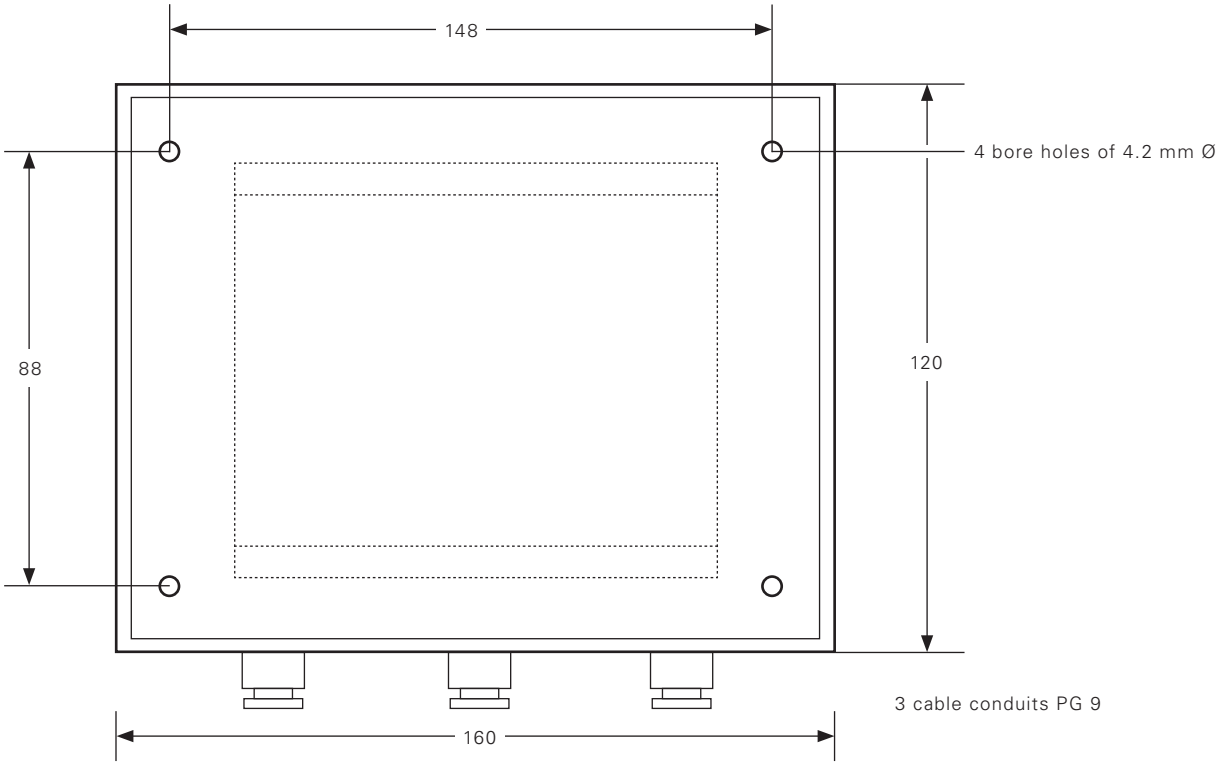


Dimensions (in mm)

Dimensions of Rail Mounting Enclosure (standard)



Dimensions of Field Mounting Enclosure (Option -G)



Ordering Key E16224D

E16224D.Ux b

Supply Voltage
U1 : 18…40 Vuc
U3 : 20…265 Vuc

Enclosure
b = suffix „-G“ : field mounting enclosure with transparent cover
(omit if not required)

Examples:

E16224D.U1	:	Supply Voltage 18…40 Vuc
E16224D.U3	:	Supply Voltage 20…265 Vuc
E16224D.U1-G	:	Supply Voltage 18…40 Vuc, field mounting enclosure with transparent cover
E16224D.U3-G	:	Supply Voltage 20…265 Vuc, field mounting enclosure with transparent cover

BRAUN – Speed Monitoring and Protection Systems for Rotating Equipment

BRAUN Industrial Electronics develops, produces and sells an array of "Rotating Equipment" protection systems for use in industrial applications worldwide with the focus on overspeed protection. These systems comply with the highest standards of safety and availability.

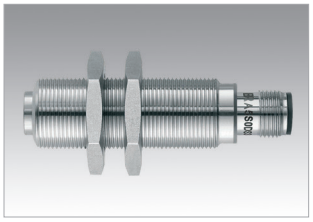
As a globally leading technology provider with over 50 years of experience, BRAUN has been continually meeting and mastering the challenges associated with protecting the facilities of companies within the power generation, oil, gas, and chemical industries. Our protection systems are installed in more than 100 countries around the world and are mainly used in safety-critical applications with rotating parts.

For our OEM customers, BRAUN is both a solution oriented systems provider and a reliable partner.

Our solutions comprise a variety of products for the detection and monitoring of speed and related parameters.

Always matching the requirement. Always the perfect solution for safety and availability.

PROTECTION SYSTEMS



SPEED SENSORS

TACHOMETERS

PORTABLE TACHOMETERS

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BRAUN
Speed and Frequency

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