

# Speed Alarms with optional Analog Output

## Series D421.51 / D421.52



D421.51 Front View

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

The BRAUN Speed Alarm Series D421.5 measures the frequency (or any other physical quantity which can be transmitted as a pulse train) of the input signal and converts it into two setpoint alarms and, if required, into an 0/4...20 mA analog output. Programmable in conversion characteristics and outputs.

Characteristics features are extremely wide range, fast tracking response by pulse interval measurement, free programmable conversion parameters, and electronic programming by keys, with display assistance.

The signal input is designed to accept a wide range of transmitters: contact free speed sensing probes, incremental encoders, pulse wheel transmitters. Any flowmeter pulse signal output can be converted into an analog flowrate signal.

Display, setpoints and analog output may be assigned to any measured quantity. During its lifetime cycle the speed alarm is completely maintenance-free.

### KEY FEATURES

- 2 Speed Alarms as SPDT contacts
- Setpoints and their response characteristics individually programmable over the entire range from zero to high speed
- Measuring principle combining programmable fast response and averaging within wide limits
- Frequency range 0 Hz...100 kHz
- Control signal for start-up suppression
- 1 Analog Output 0/4...20 mA (option)
- 5 digit LCD display (8 mm)
- Universal Inputs, also for magnet inductive sensors (MPUs)
- Square wave pulse output

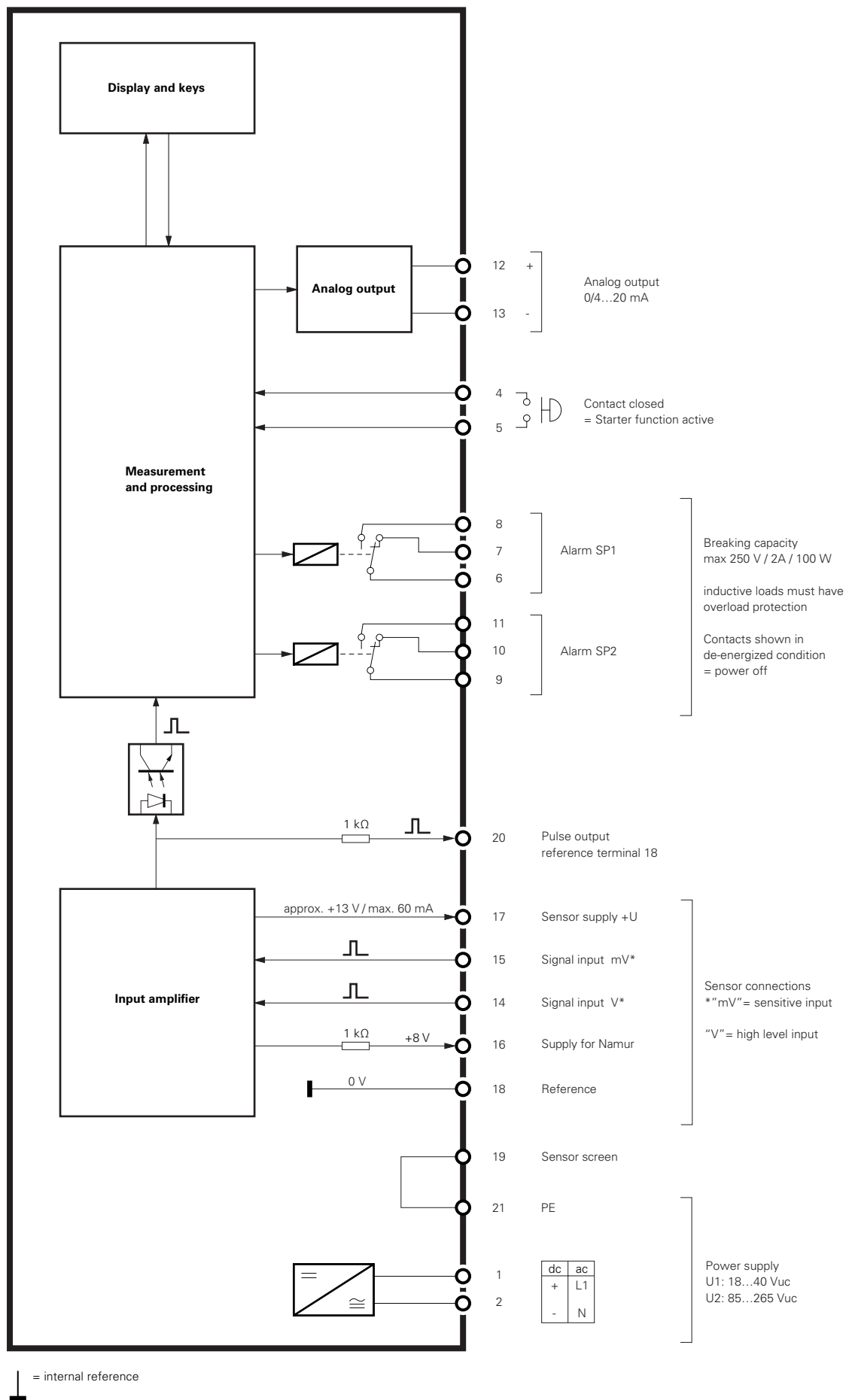
### BENEFITS

- Fast, precise and safe
- Maintenance-free during Lifetime, therefore minimized TCO
- Precise adjustment to the application data on site at the unit, by 5 digit scaling factor

## Specifications of D421.51 / D421.52

<b>Compatibility to Standards</b>	2014/30/EU, EN IEC 61000-6-4, EN IEC 61326-3-1 2014/35/EU, EN IEC 61010-1
<b>Measuring Principle</b>	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
<b>Analog Output (option)</b>	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
<b>Setpoint Alarms</b>	2 relay outputs, both with SPDT contacts
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, electronic switches 60 V, 0.1 A DC
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.
<b>Pulse Output</b>	Square wave with same sequence as input Level approx. 10 V with 1 k impedance
<b>Display</b>	5 digits with LCD figures, 8 mm high Indicating the variable during operation, parameters during the programming phase
<b>Programming</b>	Manually by front keys
Data protection	Parameters safe-guarded against power failure and code protected against unauthorized access
<b>Signal Input</b>	Isolated circuit, responding to pulse signals of any waveform and to AC-signals
Frequency range	0 Hz...100 kHz
Signal level range	Response level with step selection. 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 sensors or equivalent, NAMUR type sensors, tachogenerators, incremental encoders, MPUs
Sensor supply	13 V / max. 60 mA. Extra output 8 V via 1 kohm load resistor to passive 2 leads sensor types
<b>Input Signal Repeater</b>	Direct output: level 10 V, 1 k source impedance, isolated opto-coupler (to max. 30 V, 10 mA)
<b>Power Supply</b>	20...40 V <sub>uc</sub> = suffix U1 to model No. 85...265 V <sub>uc</sub> = suffix U2 to model No. Power consumption approx. 5 W Insulation category Class 1
<b>Connectors (Wiring)</b>	Screw mounting, terminal blocks, accepting 0.2...2.5 mm <sup>2</sup> cross section
<b>Operating Conditions</b>	Ambient temperature: 0...50 °C Increased temperature range: -20...+65 °C (suffix M to model No.) Relative humidity max. 95%, non-condensing
<b>Design</b>	Snap-on-track enclosure for 35 mm rail, field mounting enclosure (Option -G) on request
Dimensions	Length 70 mm, width 75 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. 0.3 kg

# Functional and Wiring Diagram



## Ordering Key D421.5x

**D421.5 a b c d**

### Functions included

a = 1 : 2 speed alarms outputs as SPDT  
 a = 2 : 2 speed alarms (SPDT) + 1 analog output 0/4-20 mA

### Supply Voltage

b = U1 : 18...40 Vuc  
 b = U2 : 85...265 Vuc

### Mark for specific option

c = M : increased temperature range (-20...+65°C)  
 (omit if not required)

### Enclosure

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

### Examples:

- D421.51U2 : 2 speed alarms, 85...265 Vuc
- D421.52U1 : 2 speed alarms + 1 analog output 0/4 - 20 mA, 18...40 Vuc
- D421.52U2M : 2 speed alarms + 1 analog output 0/4 - 20 mA, 85...265 Vuc, increased temperature range
- D421.51U1-G : 2 speed alarms, 18...40 Vuc, field mounting enclosure with transparent cover
- D421.52U1M-G : 2 speed alarms + 1 analog output 0/4 - 20 mA, 20...265 Vuc, increased temperature range, field mounting enclosure with transparent cover

## BRAUN – Speed Monitoring and Protection Systems for Rotating Equipment

BRAUN is a worldwide leading supplier of protection systems for rotating equipment in industrial applications that require the highest standards of safety and availability.

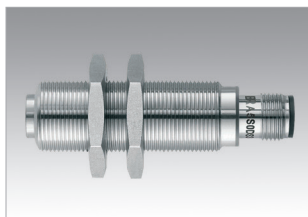
For more than 50 years BRAUN systems have been protecting the facilities of the world's leading companies within the power generation, oil, gas and chemical industries. BRAUN Protection Systems have been installed in over 100 countries worldwide, especially in those areas where rotational equipment safety is of the highest priority.

Our solutions comprise a variety of products for the detection, reporting 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**

