

# Speed (Frequency) Converter to Analog Signal Series D421.31



D421.31 Front View

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

The BRAUN Frequency to Analog Converter Series D421.31 converts speed, flowrate, frequency (or any other physical quantity which can be transmitted as a pulse train) into an analog signal. Programmable in conversion characteristics and signal output: dc-voltage or current, with or without live zero.

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 time interval between signal pulses is evaluated to measure the process variable. Obviously, this ensures the fastest response to the process signal, tracking from one to the other signal period. A minimum measuring time of 5 milliseconds however is maintained, to ensure stabilization at high signal frequency.

The converter signal input is designed to accept a wide range of transmitters: contact free speed sensing probes, incremental encoders, pulse wheel transmitters. Any flow-meter pulse signal output can be converted into an analog flowrate signal. Preamplifiers can be used, and also ex-barriers.

Display and analog output may be assigned to any measured quantity. The converter can be customized to suit every application. During its lifetime cycle the converter is completely maintenance-free.

### KEY FEATURES

- Conversion of speed or a similar variable (flowrate, for instance) as transmitted by a frequency, into an analog signal for any further evaluation
- Measuring principle combining programmable fast response and averaging within wide limits
- Frequency range 0 Hz...100 kHz with programmable high and low end
- 1 Analog Output 0/4...20 mA or 0/2...10 V
- 5 digit LCD display (8 mm)
- Universal Inputs, also for magnet inductive sensors (MPUs)
- Square wave pulse output

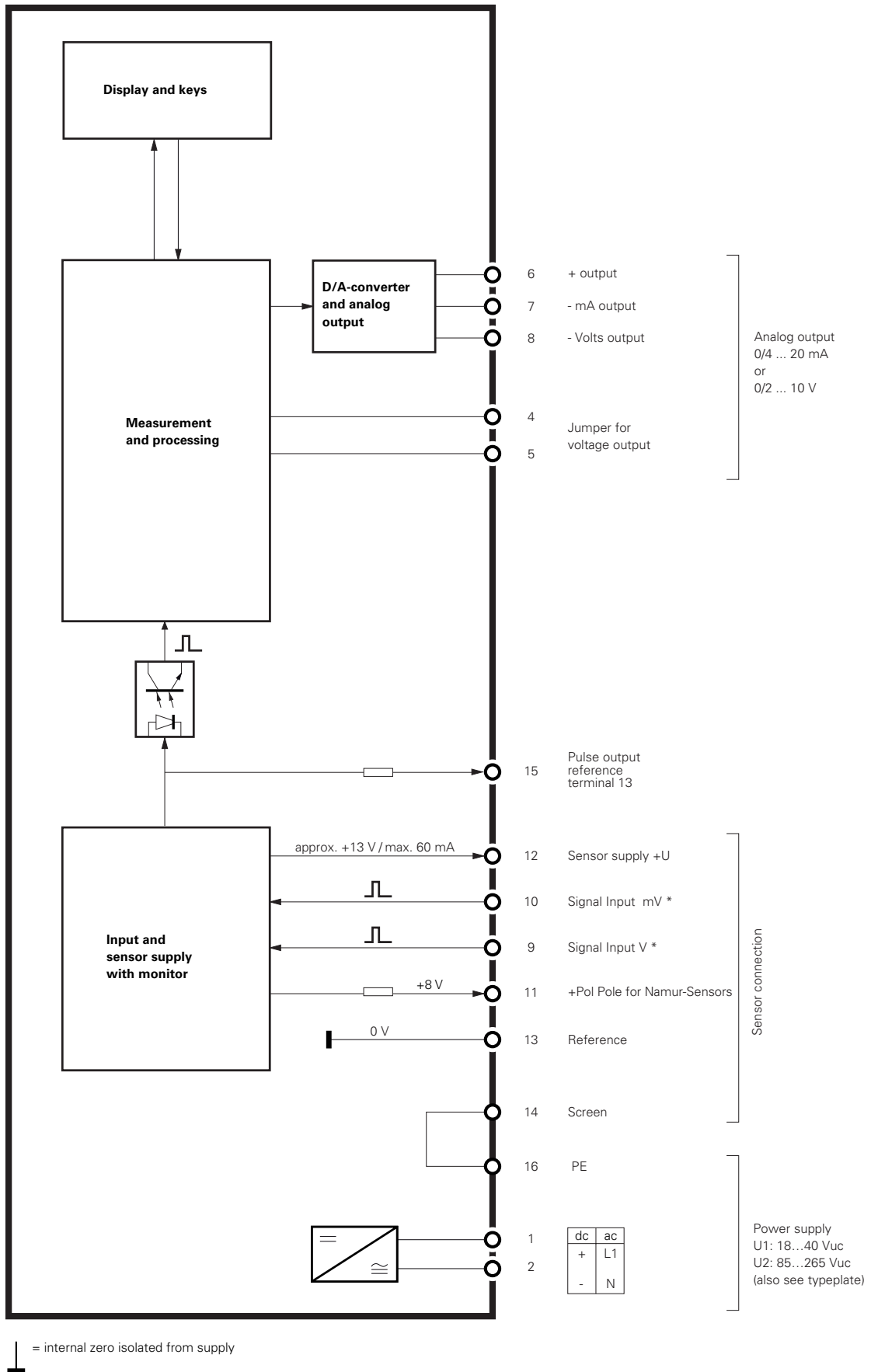
### BENEFITS

- Fast, precise and safe
- Maintenance-free during Lifetime, therefore minimized TCO
- Establishing a precise relation between analog output and measured quantity by an easily programmable 5 digit scaling factor

## Specifications of D421.31

<b>Conformity to Standards</b>	Directive 2014/30/EU (Electromagnetic Compatibility Directive) 2014/35/EU (Low Voltage Directive) 2011/65/EU (RoHS Directive)	Standard EN IEC 61000-6-4, EN IEC 61326-3-1 EN IEC 61010-1 EN 50581:2012
<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</b>	Isolated and protected against external short circuit. Current 0/4...20 mA with max. load of 500 ohms, convertible to voltage 0/2...10 V with max. load 10 mA.	
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>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 D421.31

D421.31 | a | b | c

### Supply Voltage

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

### Mark for specific option

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

### Enclosure

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

### Examples:

D421.31U1 : with supply voltage 18...40 Vuc

D421.31U2 : with supply voltage 85...265 Vuc

D421.31U1M : with supply voltage 18...40 Vuc for  
increased temperature range (-20...+65°C)

D421.31U2M-G : with supply voltage 85...265 Vuc for  
increased temperature range (-20...+65°C)  
and version with field mounting enclosure

## 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.

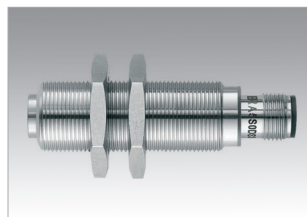
For more than 50 years BRAUN systems have been protecting the facilities of the world's leading companies within the power generation, oil, gas and chemical industries. BRAUN Protection Systems have been installed in over 100 countries worldwide, especially in those areas where rotational equipment safety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

