



### Model Number

#### KFU8-FSSP-1.D

Frequency voltage current converter  
40 kHz version

### Features

- Limit frequency 40 kHz
- Voltage or current output
- Incrementing output (Spacing factor 1 ... 9999)
- Multi-range power pack
- 2-, 3-, 4-wire and NAMUR sensors as well as rotary encoder connectable
- Auxiliary power output for sensors
- Connection via Power Rail
- Period measurement
- Display: Input in Hz or 1/min, output in V or mA
- adjustable updating of indication (0,001 ... 2,5 s)

### Technical data

#### Functional safety related parameters

MTTF<sub>d</sub> 100 a

#### Supply

Rated voltage 196 ... 250 V AC ; 98 ... 127 V AC; 47 ... 63 Hz  
20.4 ... 27.6 V DC

Fusing external fusing 4 A

Power consumption AC: < 5 VA  
DC: < 5 W

#### Indicators/operating means

Type 4-digit, 7-segment red display, 7 mm digit height

Display interval 0.002 ... 9999 Hz or  
0.01 ... 9999 min<sup>-1</sup>

Parameter assignment keypad-driven menu

#### Input 1

Connection terminals 8-, 9+

Connectable sensor types NAMUR sensors according to DIN EN 60947-5-6

Open loop voltage 8.2 V DC

Short-circuit current 6.5 mA

Switching point 1.2 ... 2.1 mA Switching hysteresis approx. 0.2 mA

Impedance 1.2 kOhm

#### Input 2

Switching point high: 16 ... 30 V DC; max.10 mA; R<sub>i</sub> ≅ 3 kOhm  
low: 0 ... 6 V DC

Connection terminals 7+, 13- sensor supply  
terminals 14, 15 NPN/PNP input (galvanically isolated)

Connectable sensor types 2-, 3-, or 4-wire proximity switches and incremental rotary encoder

Sensor supply 19 ... 28 V DC non-stabilised; ≤ 30 mA short-circuit protected

#### Output

Analog voltage output 0 ... 10 V DC; 2 ... 10 V DC; 30 mA max.; resolution: 12 mV; R<sub>i</sub> ≥ 330 Ω (terminal 5+, 6-)

Analog current output 0 ... 20 mA; 4 ... 20 mA; resolution: 25 µA; R<sub>i</sub> ≤ 600 Ω (terminal 4-, 5+)

Digital incrementing ≥ (U<sub>b</sub> -3 V), 20 mA, short-circuit proof (Terminals 1-, 2+) with frequency division F<sub>in</sub> /1 ... F<sub>in</sub> /9999

#### Transfer characteristics

Input frequency ≤ 40000 Hz, pulse pause/pulse length: ≥ 12 µs

Deviation ≤ 0.2 % of full-scale value

Changing interval 5 ms (Internal processing time)

#### Standard conformity

Electromagnetic compatibility acc. to EN 50081-2 / EN 50082-2

#### Ambient conditions

Ambient temperature -25 ... 50 °C (-13 ... 122 °F)

Storage temperature -40 ... 85 °C (-40 ... 185 °F)

Relative humidity max. 80 %, not condensing

Altitude 0 ... 2000 m

Operating conditions The device has only to be used in an indoor area.

#### Mechanical specifications

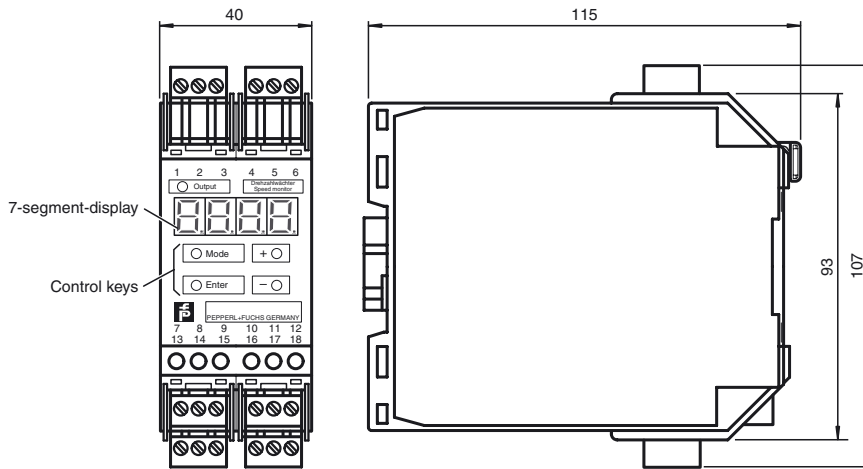
Protection degree IP20

Connection coded, removable terminals, max. core cross-section 0.34 ... 2.5 mm<sup>2</sup>

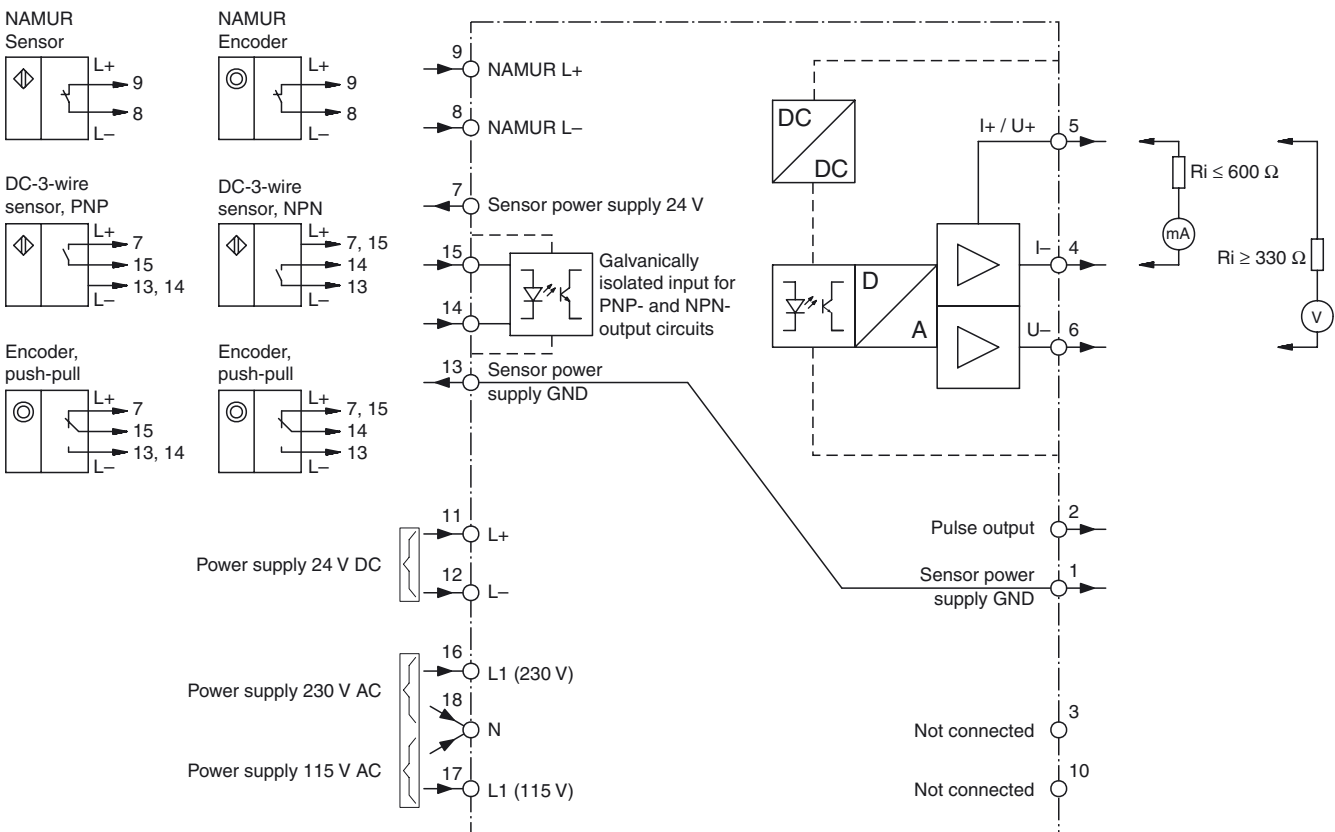
Construction type modular terminal housing in Makrolon, System KF

Mounting snap-on to 35 mm standard rail or screw fixing

Dimensions



Electrical connection



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## Function

The KFU8-FSSP-1.D frequency-voltage/current converter is a device for displaying and monitoring periodic signals, which occur in almost all areas of the automation and processing industry, i.e. frequencies in general and rotational speeds in particular.

Input pulses are evaluated according to the cycle method, i.e. by measurement of the periodicity, and are converted into a frequency or rotational speed by a  $\mu$  controller. Depending on the measurement range value selected, the  $\mu$  controller calculates a voltage or current value proportionate to the input frequency and exports this value via a digital-analog converter.

The following analogue signals are available for selection: 0 V ... 10 V, 2 V ... 10 V, 0 mA ... 20 mA, 4 mA ... 20 mA.

The serially switched output provides the input frequency which can be subdivided by the adjustable factor (1 ... 9999).

Special consideration was given to the frequently occurring special case of rotational speed measurement during the development of the device. This makes it possible for the display and inputs to be either Hz or in  $\text{min}^{-1}$ .

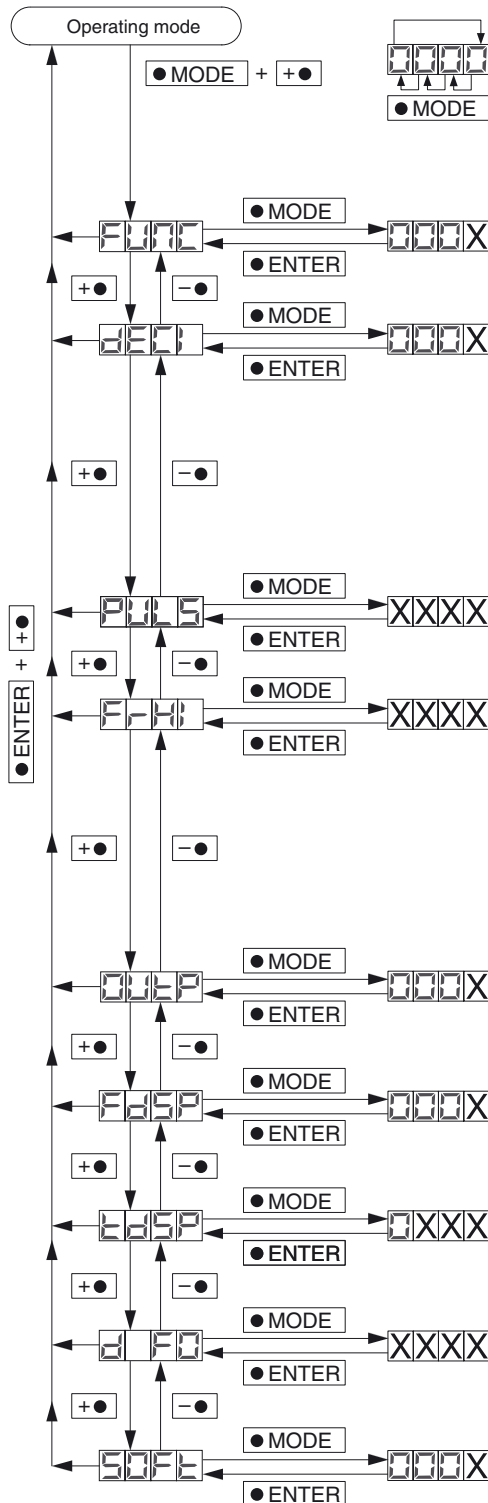
In addition, in applications with signal encoders that return multiple pulses per revolution, it is possible to operate automatically at the actual speed of the drive by assigning the number (1 ... 1200).

The frequency/voltage/current converter is supplied with 115 V AC, 230 V AC or 24 V DC. When it is connected with alternating voltage it provides an unstabilised 24-VDC source of power for the signal encoder.

All commonly available two- three- or four-wire proximity switches and incremental encoders on the input galvanically separated by an optical coupler are accepted as a signal source. In addition, two terminals are reserved for connecting proximity switches or incremental encoders in accordance with DIN 19234 (NAMUR).

The input signal frequency in Hz or the speed in  $\text{min}^{-1}$  - or the output signal voltage in V or current in mA - appears in a 4-place 7-segment LED display on the front of the device. Parameters can be set with 4 buttons underneath the display.

Function description



Function selection:  
 X=0: Frequency measurement 0.002 Hz...9999 Hz  
 X=1: Speed measurement 0.01 min<sup>-1</sup>...9999 min<sup>-1</sup>  
 Factory set: X = 1

Display and measurement range:  
 0 ≤ X ≤ 3 at frequency measurement  
 0 ≤ X ≤ 2 at speed measurement  
 Factory set: X = 0

X	Frequency [Hz]	Speed [min <sup>-1</sup> ]
0000	0 ... 9999	
000.1	0 ... 999.9	
00.02	0 ... 99.99	
0.003	0 ... 9.999	-

Signal divider:  
 Number of signals per rotation  
 (is ignored during frequency measurement)  
 1 ≤ XXXX ≤ 1200, Factory set: XXXX = 1

Measurement range final value:  
 Frequency or speed, by which 10 V or 20 mA are applied to the analog output.  
 0 ≤ XXXX ≤ 9999, Factory set: XXXX = 9999  
 Teach in of the current frequency or speed value as a measurement range final value by pressing the "MODE" button and then the "ENTER" button.

X	Analog output
0	0 V ... 10 V
1	2 V ... 10 V
2	0 mA ... 20 mA
3	4 mA ... 20 mA

Factory set: X = 0

Display:  
 X=0: Frequency or speed  
 X=1: Voltage display or current display  
 Factory set: X = 0

Display rate:  
 0.01 s ≤ X.XX ≤ 2.5 s  
 Factory set: X.XX = 0.33 s

Division factor for pulse output:  
 1 ≤ XXXX ≤ 9999  
 Factory set: XXXX = 1

Software-version number:  
 Can only be read.

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