Rotation Speed Monitor

KFU8-DW-1.D

- Speed monitoring up to 40 kHz
- 1 pre-select value with relay output and LED indicator
- 2-, 3-, 4-wire and NAMUR sensors as well as rotary encoder connectable
- Start-up delay
- Menu driven operation via 4 front keys
- Period measurement
- Output signal can be inverted
- Display devices can be set between 0.1.....2.5 sec.

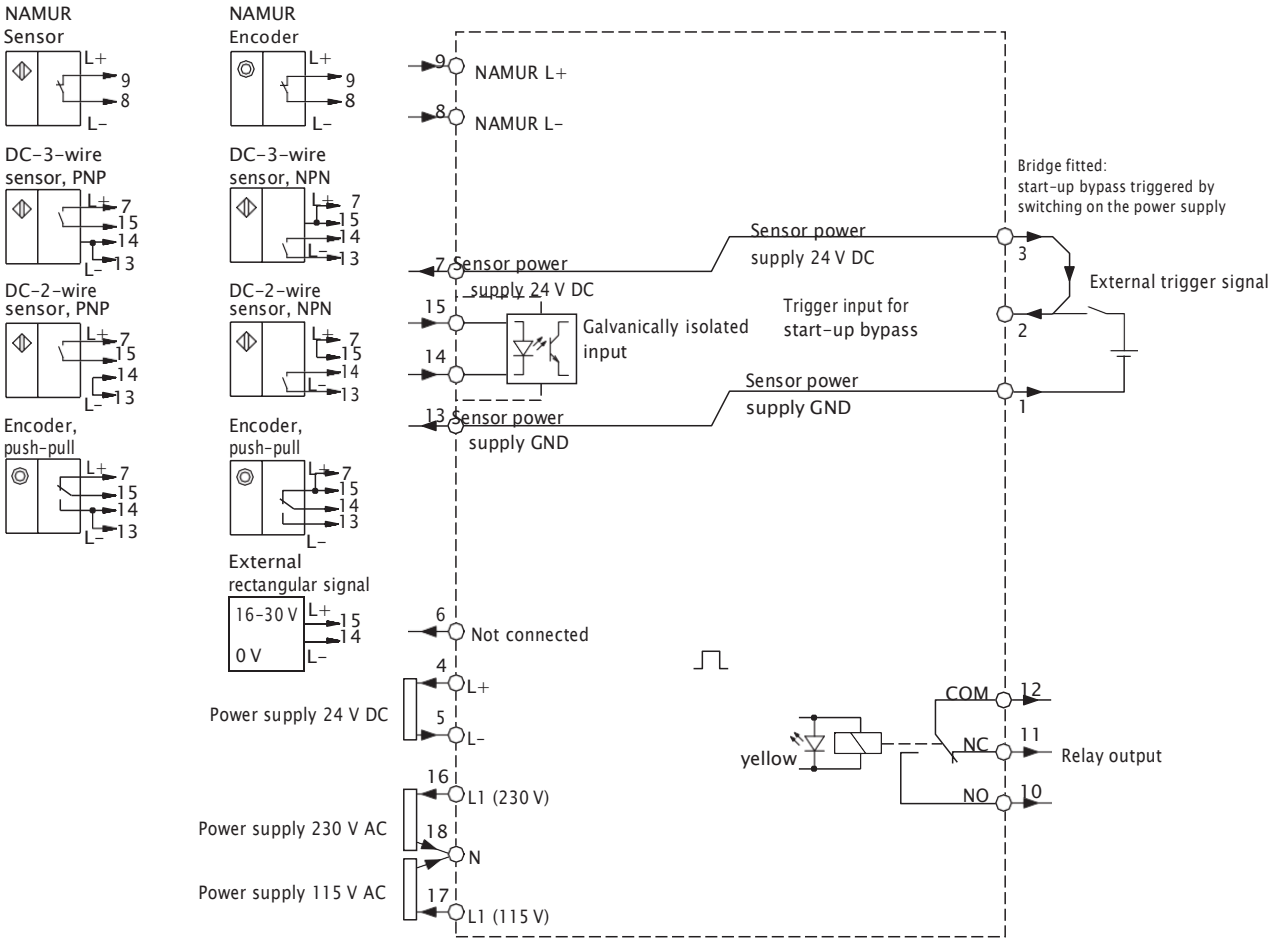
Technical Data

Functional safety related parameters		
$MTTF_d$		100 a
Supply		
Rated voltage	U_r	200 ... 230 V AC ; 100 ... 130 V AC; 50/60 Hz 20 VDC ... 30 VDC
Fusing		external fusing 4 A
Power consumption		AC: < 5 VA DC: < 5 W
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
Input frequency		0.002 ... 10000 Hz, pulse length/duration: ≥ 20µs
Impedance		1.2 kΩ
Input 2		
Switching point		high: 16 ... 30 V DC; max.10 mA due to integrated constant current sink; $R_i \cong 3$ kΩ low: 0 ... 6 V DC
Input frequency		0.002 ... 40000 Hz, pulse length/duration: ≥ 12µs
Connection		terminals 7+, 13- sensor supply terminals 14, 15 NPN/PNP input (galvanically isolated)
Connectable sensor types		Two, three, or four-wire proximity switch, incremental rotary encoder, or externally generated pulses 16 ... 30 V
Sensor supply		19 ... 28 V DC non-stabilised; ≤ 30 mA short-circuit protected
Input 3		
Start-up override		Triggering by external signal 16 ... 30 V or Place jumper between terminals 2/3 or by switching on supply voltage (terminal 2 and terminal 3 permanently bridged)
Hold-up time		0.1 ....999.9 s (External trigger signal)
Output		
Relay		1 changeover contact NO, NC, COM
Sensor supply		24 V DC ± 10 %, 30 mA , short-circuit protected
Contact loading		250 V AC/2 A/ cos ϕ ≥ 0.7 40 V DC/2 A
Delay		≤ 20 ms (incl. calculation time)
Mechanical life		≥ 30.000.000 switching cycles

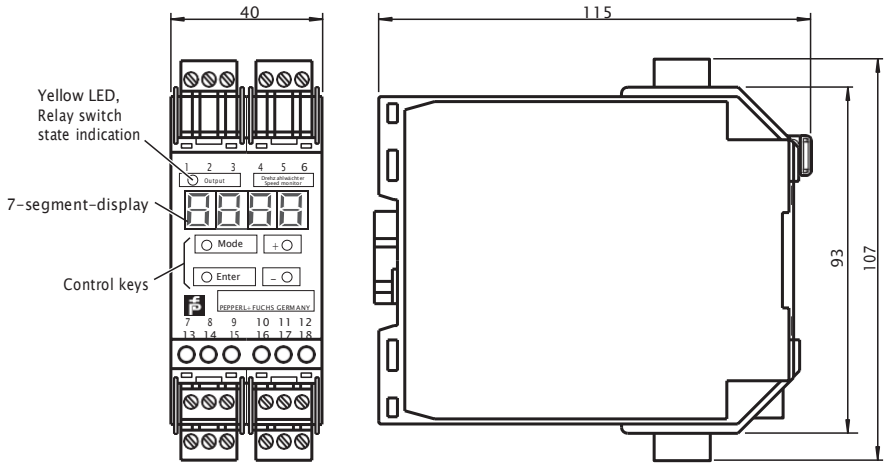
Technical Data

Transfer characteristics		
Changing interval		5 ms (Internal processing time)
Time delay before availability		≤ 400 ms
Measuring error		0 ... 40000 Hz: ≤ ±0,10% Display: ±1 digit
Timer function		ON-delay, OFF-delay, one shot, pulse extension
Time		0.... 999.9 s ; mode of operation reversible
Standard conformity		
Electromagnetic compatibility		acc. to EN 50081-2 / EN 50082-2
Ambient conditions		
Ambient temperature		-25 ... 40 °C (-13 ... 104 °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		
Connection assembly		**Caution:** Please be aware that the device may only be connected to a switchable power supply. The switch or circuit breaker must be easy to reach and identified as the separator for the device.
Degree of protection		IP20
Connection		coded, removable terminals , max. core cross section 0.34 ..... 2.5 mm^2
Construction type		modular terminal housing in Makrolon, System KF For use in the switch cabinet/switch cabinet module
Mounting		snap-on to 35 mm standard rail or screw fixing

Connection



Assembly



Additional Information

Device description

The KFU8-DW-1.D Speed Monitor is a device for the **indication and monitoring of periodic signals**, which occur in almost all areas of automation and process technology, i. e. of frequencies in general and rotational speeds in special cases. The input signals are evaluated in accordance with the cycle method, i. e. by measurement of the period of oscillation and conversion into frequency or rotational speed by a very fast µ controller.

The frequently occurring special case of rotational speed measurement has been paid particular attention in the development of the device. Thus **indication** and **input** can be either in **Hz** or in **rpm**. It is also possible, in applications involving slow processes, in which the signal sensors **provide many pulses per revolution**, to operate automatically with the **actual rotational speed** of the drive by specifying the number of pulses per revolution.

The indication of the measured value is provided on a **4-digit, 7-segment LED display** on the front of the device, with **up to 3 places after the decimal point**.

The monitoring function is achieved on the basis of a **limit value**, whose upper and lower hysteresis value is freely selectable within the respective display range.
The **output signal** is generated by a relay with a changeover contact, when the hysteresis limits are violated. Thanks to a high switching capability, the relay output can **be used for the direct activation** of an actuating element or **as an input signal for a higher level control system**.
Also, the switching status of the relay is indicated by means of a **yellow LED** on the front of the device.
A function block is connected in series with the relay, which **10 provides for various timer functions** and thus obviates the requirement for the subsequent addition of a timer relay. In addition to the **pull-in and drop-out delay, passing make contact and and pulse extension,** the **direction of operation of the relay**, i. e. monitoring of speed fluctuation about a nominal value, can also be selected.
The built-in **start-up override**, initiated when the power supply is switched on, or by an external signal, **prevents error signals** during the running up of the monitored system.

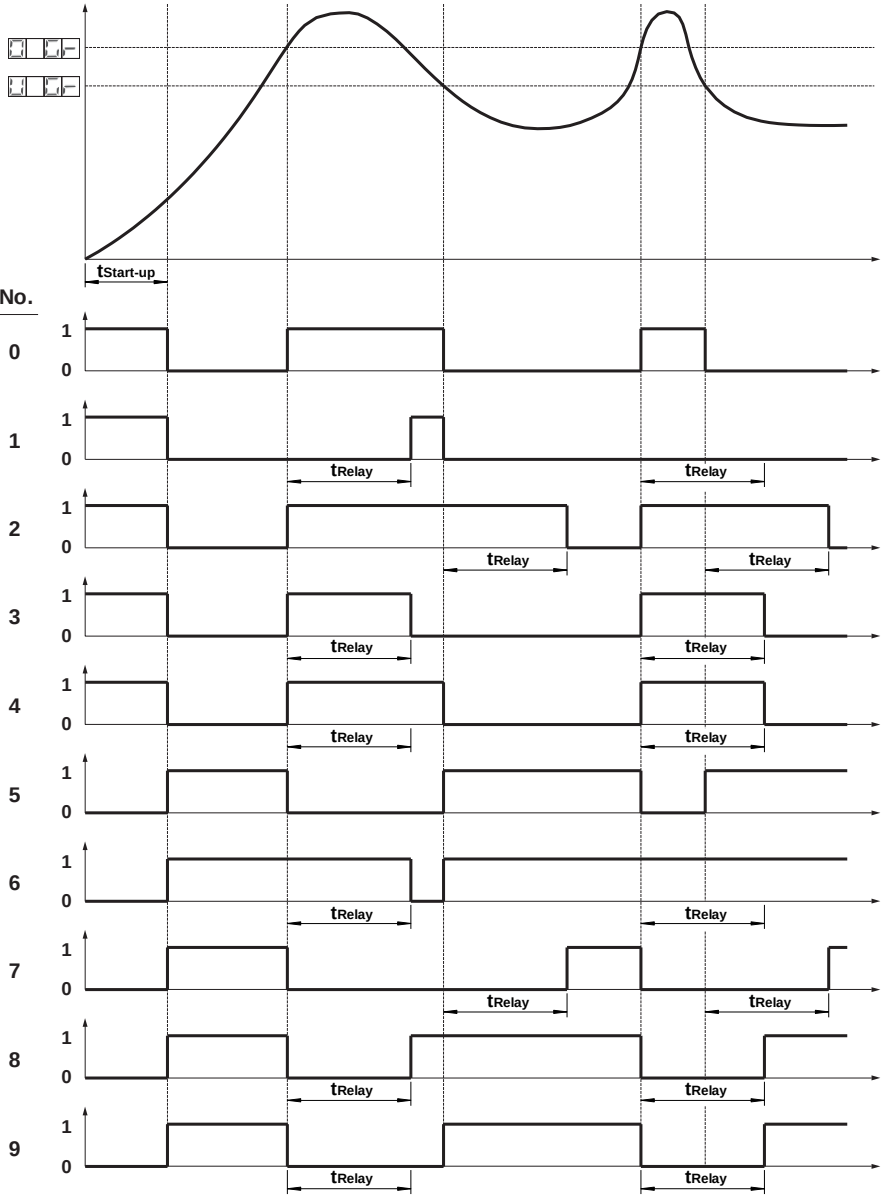
The speed monitor can be supplied with **115 V AC, 230 V AC or by a 24 V DC** supply and when connected to an alternating voltage it provides a **24 V DC source to supply the signal sensor**.

All current **two, three and four-wire proximity switches** and incremental **encoders** can be accepted as the signal sensor.In addition, two terminals are reserved for the connection of **proximity switches in accordance with DIN 19234 (NAMUR)**.

Terminal assignment

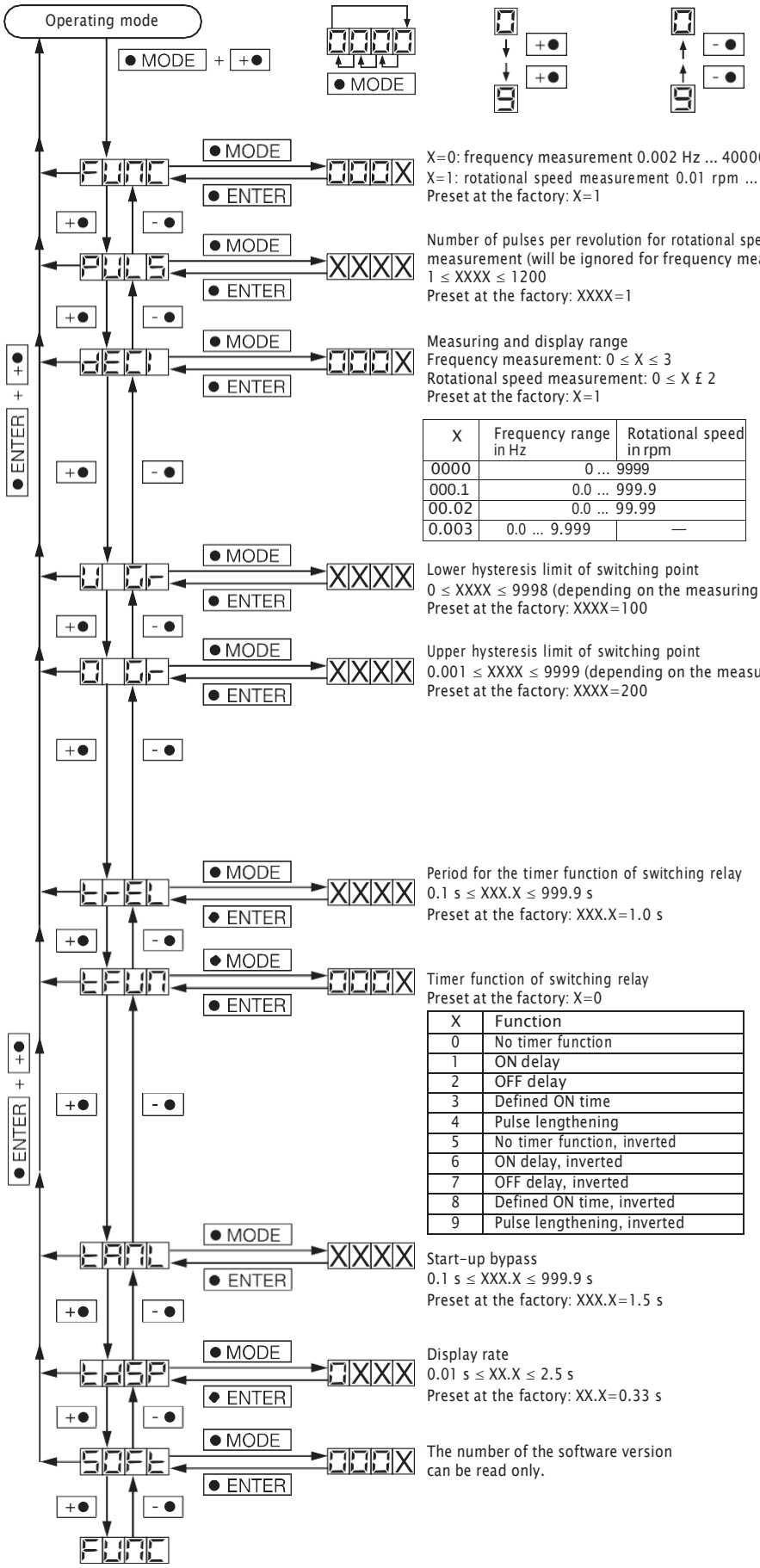
T. 1: Signal sensor supply GND
T. 2: Trigger input for start-up override
T. 3: Signal sensor supply +24 V DC
T. 4: Power supply + 24 V DC
T. 5: Power supply GND
T. 6: Not connected.
T. 7: Signal sensor supply +24 V DC
T. 8: NAMUR input L-
T. 9: NAMUR input L+
T. 10: Relay make contact, NO
T. 11: Relay break contact, NC
T. 12: Relay root, COM
T. 13: Signal sensor supply GND
T. 14: Signal sensor NPN input
T. 15: Signal sensor PNP input
T. 16: Power supply L1, 230 V AC
T. 17: Power supply L1, 115 V AC
T. 18: Power supply N

Timer functions, reversal of operating direction of the output relay



Function	No.
No timer function	0
ON delay	1
OFF delay	2
Defined ON time	3
Pulse lengthening	4
No timer function, inverted	5
ON delay, inverted	6
OFF delay, inverted	7
Defined ON time, inverted	8
Pulse lengthening, inverted	9

Operating principle



X=0: frequency measurement 0.002 Hz ... 40000 Hz
X=1: rotational speed measurement 0.01 rpm ... 9999 rpm
Preset at the factory: X=1

Number of pulses per revolution for rotational speed measurement (will be ignored for frequency measurement)
1 ≤ XXXX ≤ 1200
Preset at the factory: XXXX=1

Measuring and display range
Frequency measurement: 0 ≤ X ≤ 3
Rotational speed measurement: 0 ≤ X £ 2
Preset at the factory: X=1

X	Frequency range in Hz	Rotational speed in rpm
0000	0 ... 9999	
000.1	0.0 ... 999.9	
00.02	0.0 ... 99.99	
0.003	0.0 ... 9.999	—

Lower hysteresis limit of switching point
0 ≤ XXXX ≤ 9998 (depending on the measuring range)
Preset at the factory: XXXX=100

Upper hysteresis limit of switching point
0.001 ≤ XXXX ≤ 9999 (depending on the measuring range)
Preset at the factory: XXXX=200

Period for the timer function of switching relay
0.1 s ≤ XXX.X ≤ 999.9 s
Preset at the factory: XXX.X=1.0 s

Timer function of switching relay
Preset at the factory: X=0

X	Function
0	No timer function
1	ON delay
2	OFF delay
3	Defined ON time
4	Pulse lengthening
5	No timer function, inverted
6	ON delay, inverted
7	OFF delay, inverted
8	Defined ON time, inverted
9	Pulse lengthening, inverted

Start-up bypass
0.1 s ≤ XXX.X ≤ 999.9 s
Preset at the factory: XXX.X=1.5 s

Display rate
0.01 s ≤ XX.X ≤ 2.5 s
Preset at the factory: XX.X=0.33 s

The number of the software version can be read only.

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