

# Frequency- and Speed-Relay FRMU1000

## with integrated Measuring-Transducer

### FRMU1000



The FRMU1000 is a speed-monitor, a frequency-monitor and a measuring-transducer in one device.

2 limits with 1 relay each can be programmed for under- or over-speed, under- or overfrequency or each monitoring of a range (min/max).

The input for monitoring of speed can evaluate signals from proximity-sensors 2- or 3-wire, npn- or pnp. The display can be scaled. Thus the real speed of a shaft can be displayed, even though there are several pulses per revolution, e.g. from a cogwheel.

Application as Frequency-Relay:

Monitoring of frequencies in mains 16 2/3 to 400 Hz on maintaining a range (min/max).

Application as Speed-Relay:

Monitoring of overspeed or underspeed, each with pre-alarm and alarm, monitoring of maintaining a range (min/max) or monitoring of stop at machines and equipment, e.g. at conveyors, escalators or lifts or for monitoring of drive-belts.

Application as Measuring-Transducer:

In addition, the FRMU can be used as measuring-transducer to convert the input-signal into a standard-signal 0/4-20 mA or 0-10 V.

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### Function

#### Frequency:

- Measuring-inputs voltage AC 20-200 V/ 80-440 V oder AC 110-300 V/ 210-830 V (option)
- Monitoring of frequency of own supply-voltage
- Monitoring range 10-500 Hz
- Resolution of display 0,01 Hz

#### Speed:

- Monitoring range 5...99999 min<sup>-1</sup>
- Display can be scaled
- Measuring-input for capacitance-switches 2- or 3-wire, npn or pnp
- Start-up-delay programmable
- Start-input (activates device with switching on the monitored drive)

#### General:

- Setting in Hz or min<sup>-1</sup>
- 5-digit display
- Analog output DC 0/4-20 mA, or DC 0-10 V, freely scaleable (with isolation to frequency-input U1/U2)
- 2 limits/ 2 relays

- Programmable for each relay:
  - Monitoring of min, max or range
  - Hysteresis
  - Autoreset reclosing lock
  - Delay-time for switching and switching back down to 50 ms
  - Operating- or closed-current mode
- LEDs for state of relays and unit (Hz oder min<sup>-1</sup>)
- Storage of min- and max- values of the inputs
- Easy setting with 3 buttons
- Code lock against manipulation of settings
- Universal power supply AC/DC 24-240 V
- Terminals pluggable

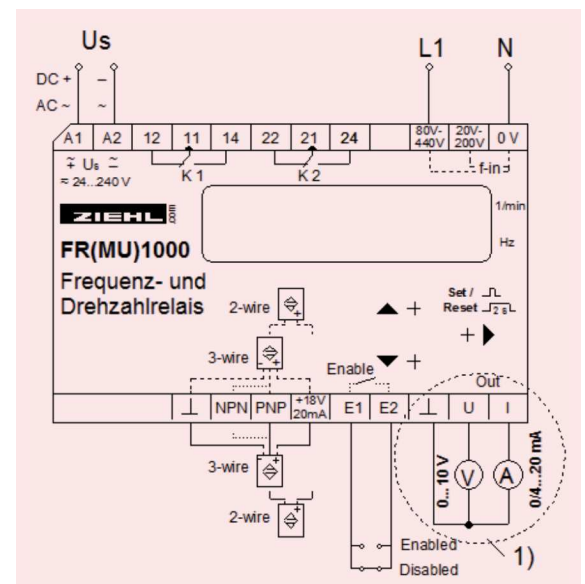
#### Order-numbers:

without analog output FR1000 **U226135**

with analog output FRMU1000

Input 20-200 / 80-440 V **U226134**

Input 110-300 / 210-830 V **U226138**



## Technical Data FRMU1000

Rated supply voltage $U_s$	AC/DC 24-240 V, <3W, <10VA (AC 20-264 V, DC 20,4-297 V)
Frequency	0, 40...500 Hz, > AC 80 V: 10...500 Hz
Measuring input Frequency	10.00-500.00 Hz
Admissible voltage	AC 20-200 V/ 80-440 V AC 110-300 V/ 210-830 V (option)
Measuring input Speed	5-99999 min <sup>-1</sup> PNP or NPN, 3-wire or 2-wire
Analog output	0/4-20 mA, max. 500 $\Omega$ , 0-10 V, max. 10 mA
max. error	< 0,15 % from FullScale + 0,015 %/K
Relay output	Type 3, see "general technical informations" 2 x 1 (change-over) contact
Test conditions	see "general technical informations"
Rated ambient temperature range	-20 °C ... +60 °C
Dimensions(h x w x d)	Design V4: 90 x 70 x 58 mm, mounting height 55 mm
Protection housing / terminals	IP 30/IP 20 (terminals pluggable)
Weight	app. 180 g
Attachment	on 35 mm DIN rail or with screws M 4

## Inductive Proximity Sensor IG2



Proximity-Sensor for Speed Relay  
FRMU 1000.

- 3-wire-connection PNP  
brown = +, blue = -, black = A
- nickel-plated brass
- flush-mounting possible
- max. 48.000 IPM (800 Hz)
- max. switching distance 4 mm  
(recommended  $\leq$  3 mm)

- Connection cable pluggable
- integrated protection against reverse polarity
- LED for state of output

Connection Cable

- Plug M 12, angled
- Length 5 m, 3 x 0,34 sqmm
- PUR cable sheath

## Technical Data

Rated supply voltage $U_s$	DC 10-30 V
Max. switching frequency	800 Hz = 48000 Imp/min
Max. switching distance	4 mm (recomm. $\leq$ 3 mm)
Factor of reduction	Ms: 0,45, Al: 0,4, Cu: 0,3
Rated amb. temp. range	-25 ... +70 degC
Housing	Threaded pipe M12x1
Material	nickel-plated brass
Weight	app. 26 g
Dimensions	M 12x1 / length 50 mm
Torque	max. 10 Nm
Connection	threaded plug M 12
Shock resistance	$\leq$ 30 g, $\leq$ 11 ms
Vibration resistance	$\leq$ 55 Hz, $\leq$ 1 mm
protection	IP 67
Order-number IG 2	U226003
Order-number cable	U226004