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Quick Guide FR(MU)1000

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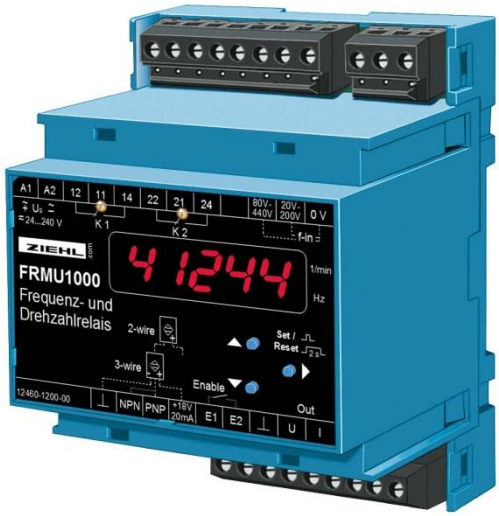
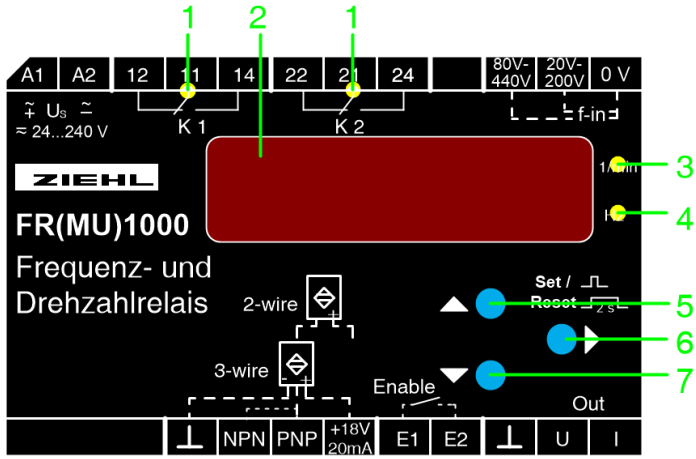
- Frequency- and Revolutions relay

Detailed operating manual see: http://www.ziehl.com/de/produkte/detail/FRMU1000-79

1 Display and controls





1 LEDs relay state
2 Digital display, 5 digits
3 LED speed measuring (1/min)
4 LED frequency measuring (Hz)
5 Pushbutton up
6 Pushbutton set/reset
7 Pushbutton down

2 Presetting

2 programs (Pr) can be selected. Due to these Programs the device can be easily adapted to the application. Choose the Program fitting to your application and after that change the parameters! When changing the program all parameters are reseted upon "factory setting".
(see chart " factory setting")

Selecting the program:
Keep the button "Set" pressed for 10 s when applying the supply voltage. Then program (Pr 1 ... Pr 2) can be choosen with the pushbuttons up/down and confirmed with set.

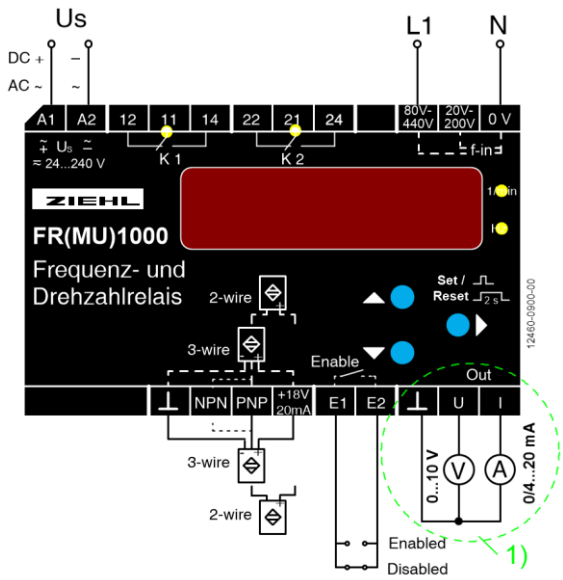
Pr 1 = Revolutions control (factory setting) (1/min)
Pr 2 = Frequency control (Hz)

2.1 Factory setting

In case of programme change all parameters are set back on factory setting.

Menu-item	Parameter	Value		My data
		Pr 1	Pr 2	
InPut	Input type	PnP	U1-U2	
MuLt	Multiplier	1	-	
diu	Divisor	1	-	
SuM	Mean value	4	4	
Alarm 1 AL 1 (K1)	Limit 1 (lower window limit)	500	48.00	
	Func (Function)	n_r	MIN	
	ALHi (upper window limit)	-	52.00	
	H (Hysterisis)	10	1.00	
	dAL (Alarm-delay)	0.50	0.10	
	doF (Switch-back delay)	0.50	0.10	
	rEL (Relais function)	r	r	
Alarm 2 AL 2 (K2)	Limit 2 (lower window limit)	5000	47.00	
	Func (Function)	OUT	MIN	
	ALHi (upper window limit)	-	53.00	
	H (Hysterisis)	100	1.00	
	dAL (Alarm-delay)	0.50	0.10	
	doF (Switch-back delay)	0.50	0.10	
	rEL (Relais function)	r	r	
dEnAb	Start-up-delay	2.0	0.1	
ddiSP	Display delay	0.5	0.5	
out (nur FRMU)	Type	0-10	0-10	
	____ (Zero)	0	0.00	
	---- (Fullscale)	5000	100.00	
CodE	on / oFF	oFF	oFF	
	Pin	00504	00504	

Indication of software version: push „Set“ 10 s in display mode.



3 Connecting diagram

4 Important Information

DANGER!
Hazardous voltage!
Will cause death or serious injury. Turn off and lock out all power supplying this device before working on this device.

To use the equipment flawless and safe, transport and store properly, install and start professionally and operate as directed.
Only let persons work with the equipment who are familiar with installation, start and use and who have appropriate qualification corresponding to their function. They must observe the contents of the instructions manual, the information which are written on the equipment and the relevant security instructions for the setting up and the use of electrical units.

The equipments are built according to DIN / EN and checked and leave the plant according to security in perfect condition. If, in any case the information in the instructions manual is not sufficient, please contact our company or the responsible representative.
Instead of the industrial norms and regulations written in this instructions manual valid for Europe, you must observe out of their geographical scope the valid and relevant regulations of the corresponding country.

Observe the maximum temperature permissible when installing in switching cabinet. Make sure sufficient space to other equipment or heat sources. If the cooling becomes more difficult e.g. through close proximity of apparatus with elevated surface temperature or hindrance of the cooling air, the tolerable environmental temperature is diminishing.

Attention!
When all relays are programmed in operation current mode (= pick up at alarm), a loss of the supply voltage or an instrument failure can remain unidentified. When the relay is applied as control instrument, the operator must ensure, that this error is recognized by regular examinations. We recommend to program and accordingly evaluate at least one relay in the closed-circuit current mode.

Attention! Universal power supply
The device has got a universal power supply, that is suitable for DC- and AC-voltages. Before connecting the device to supply-voltage make sure that the connected voltage corresponds with the voltage on the lateral type on the device.

5 Installation

The unit can be installed as follows:

- Installation in switchgear cabinet on 35 mm mounting rail according to EN 60715
- With screws M4 for installation on walls or panel. (additional latch included in delivery)
  Connection according to connection plan or type plate.

6 Operation

6.1 Indications of the digital display

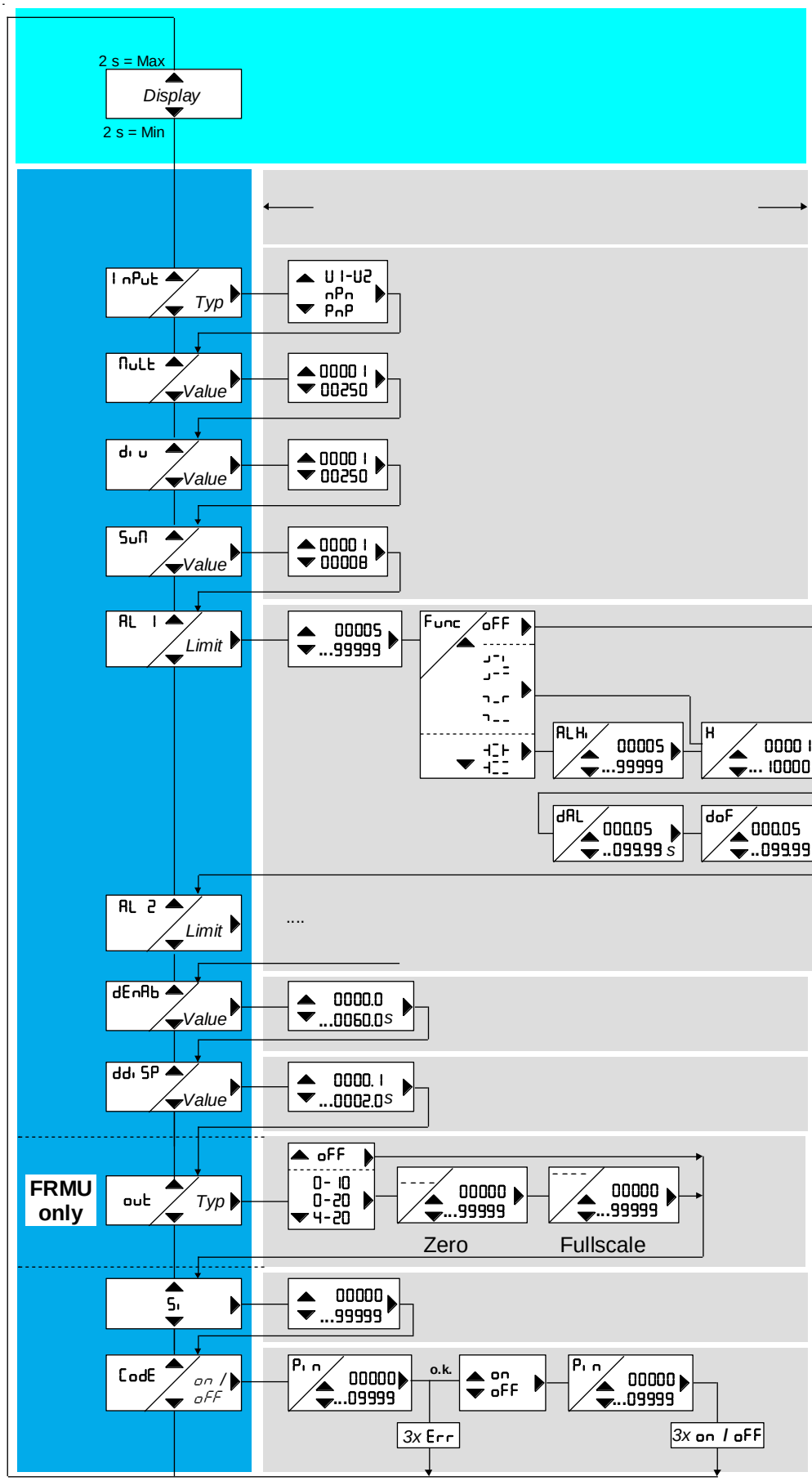
Pr 1 / Pr 2	program number
A1, A2	alarm 1, alarm 2 active
A12	alarm 1 and alarm 2 active
+ L	alarm locked (locked), „reset“ is necessary.
dEn	remaining time until monitoring is activated (start-up-delay dEnAb is ending)
InPut	input
U1-U2	frequency input (f - in)
nPn	three wire proximity-switch NPN
PnP	three wire proxy-switch PNP or two wire proxy-switch
MuLt	multiplier
di v	divisor
SuM	mean value
AL 1, AL 2	alarm limit (lower limit when monitoring a window)
Func	alarm function
oFF	alarm off
	overspeed / over frequency without reclosing lock
	overspeed / over frequency with reclosing lock.
	underspeed / under frequency without reclosing lock
	underspeed / under frequency with reclosing lock
	window monitoring without reclosing lock
	window monitoring with reclosing lock
ALhi	upper limit when monitoring a window
H	hysterisis
dAL	switching-delay
doF	switch-back-delay
rEL	function of relay
r	closed-current mode, contacts 11-12 resp. 21-22 close at an alarm
A	operating-current mode, contacts 11-14 (21-24) close at an alarm
dEnAb	start-up-delay
ddi SP	display delay
on, oFF	on/off
Si	simulation
CodE	code (pin)
Pin	ex works 00504

FRMU only:

out	analog output
0- 10	0...10 V voltage output
0/4-20	0/4...20 mA current output
----	value for 0 V, 0/4 mA at the output
----	value for 10 V, 20 mA at the output

6.2 Program 1: Pr 1 / Speed Monitoring

Operation with pushbuttons:



Up
Down
Set
Reset
= >2s Set

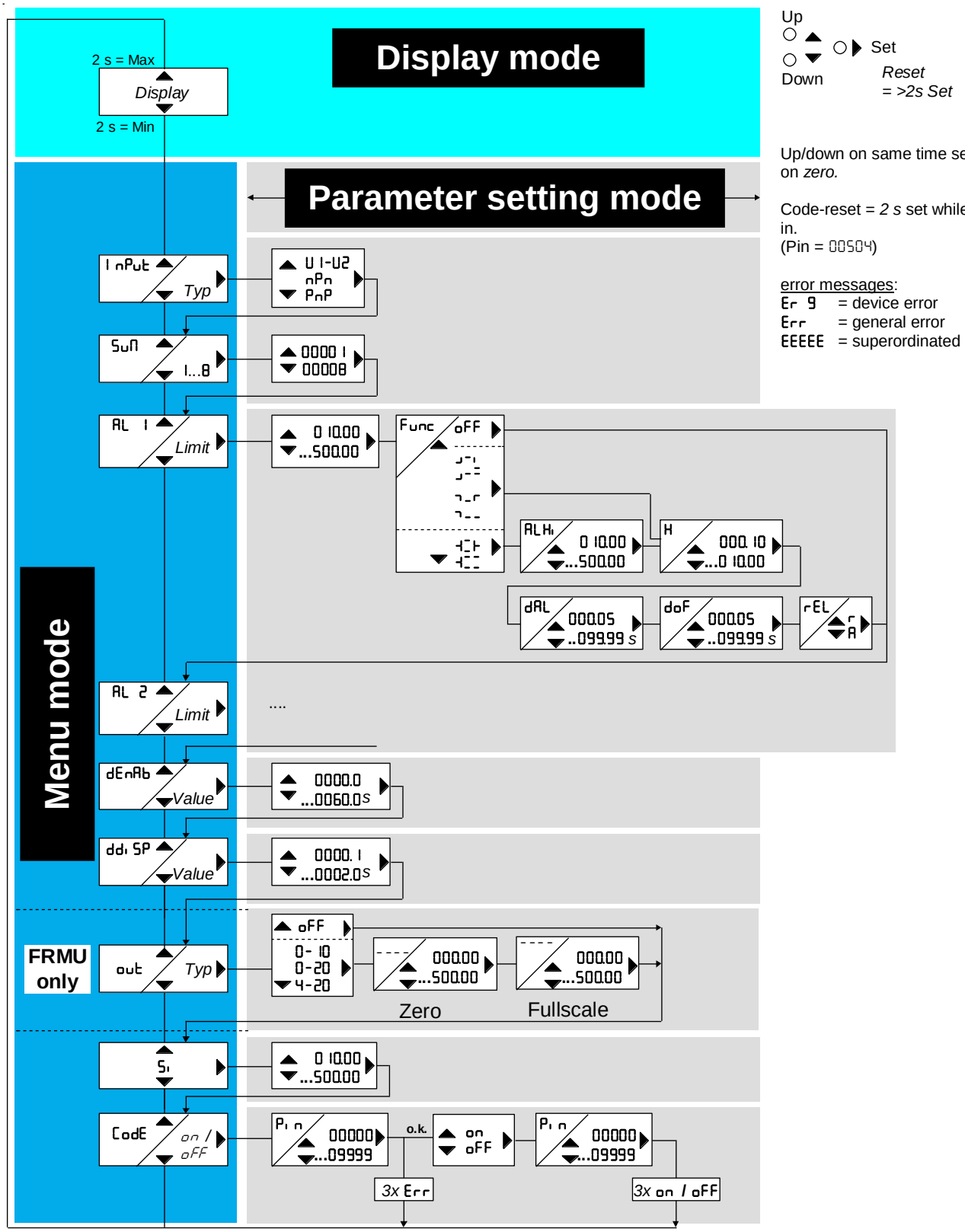
Up/down at same time sets values on *zero*.

Code-reset = *2 s* set while switching in.
(Pin = 00504)

error messages:
Er 9 = device error
Err = general error
EEEEE = superordinated range

6.3 Program 2: Pr2 / Frequency Monitoring

Operation with pushbuttons:



Up
Down
Set
Reset
= >2s Set

Up/down on same time sets values on *zero.*

Code-reset = *2 s* set while switching in.
(Pin = 00504)

error messages:
Er 9 = device error
Err = general error
EEEEE = superordinated range

7 Error search and measures

Device cannot be programmed – Code lock

The code lock gives protection against unauthorized manipulation of the device. When code lock is activated the parameters can not be changed. The pin can be typed in by the user.
Pin unknown? Make code-reset: When switching in supply-voltage keep pushed button „Set“ for **2 s**.
Display shows: "88888"; "CodE"; "oFF"; "88888" release button „Set“.
Code = oFF, Pin = 00504.

Indicated value does not correspond to input signal

Correct program chosen?
Input type (InPut) selected correct?
Multiplier and divisor programmed correct when monitoring speed (Pr I)?

Indication „Erg“

Erg is an internal fault of the device. Switch off- and on the power-supply.
If after that there still is an error indicated, the unit must be sent to the factory for repair.

8 Technical data

Rated supply voltage Us:	AC/DC 24 – 240 V
Tolerance	DC 20,4 - 297 V AC 20 - 264 V
Frequency	0, 40...500 Hz, from AC 80 V: 10...500 Hz
Input	< 3 W < 10 VA
Relay-output:	2 x 1 Changer (CO)
Switching voltage	max. AC 400 V
Switching current	max. 5 A
Switching power	max. 1250 VA (ohm resistive load) max. 48 W at DC 24 V
Nominal operating current Ie:	
AC 15	Ie = 2 A Ue = 250 V
DC 13	Ie = 2 A Ue = 24 V Ie = 0.2 A Ue = 240 V
Contact life mechanic	15×10^6 Switching cycles
Contact life electrical.	2×10^5 Switching cycles at AC 250 V / 3 A 5×10^5 Switching cycles at AC 250 V / 2 A 1×10^5 Switching cycles at AC 250 V / 0,8 A

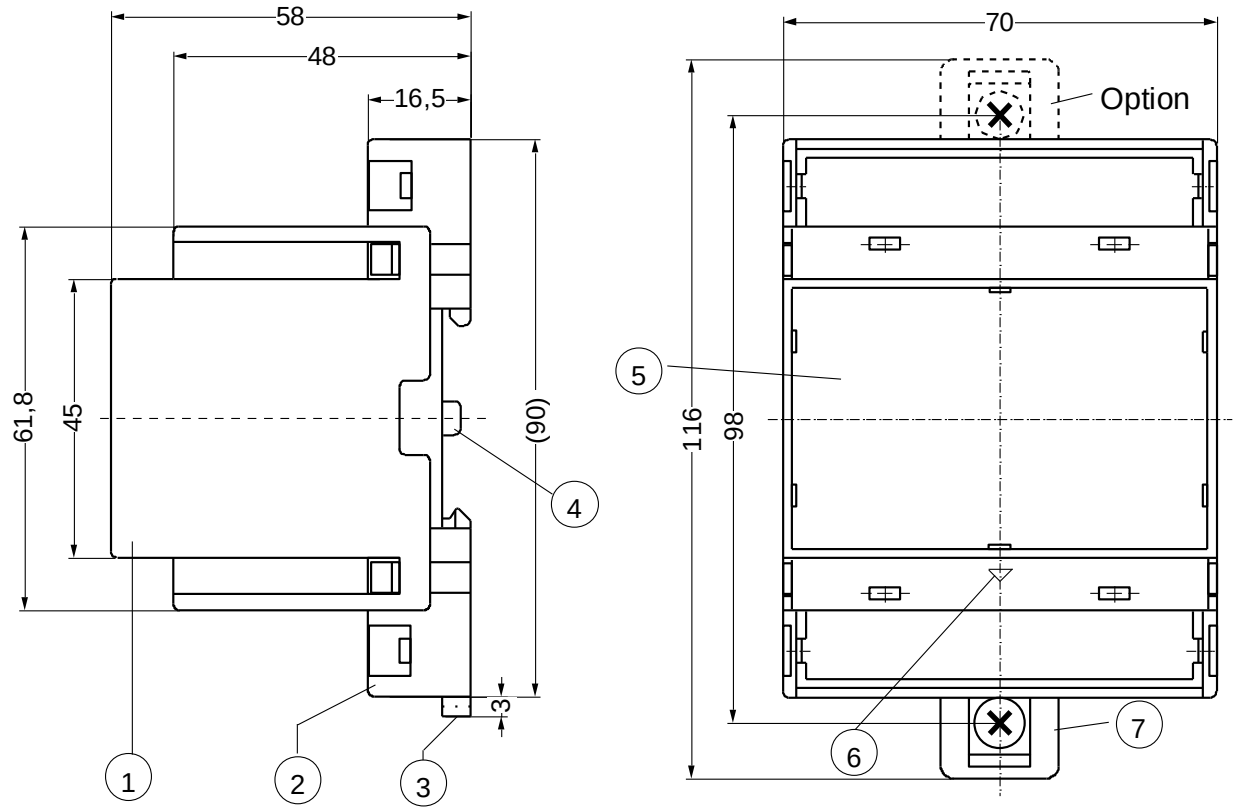
Measuring inputs	
f-in -> Order-number U226134 + U226135	Frequency 10,00 ... 500,00 Hz • admissible voltage AC 20...200 V (71kΩ Ri) • admissible voltage AC 80...440 V (300kΩ Ri)
f-in -> Order-number U226138	Frequency 10,00 ... 500,00 Hz • admissible voltage AC 110...300 V (400kΩ Ri) • admissible voltage AC 210...830 V (730kΩ Ri)
Three wire - PNP	U_{Max} 28 V; switching threshold approx. 10 V
Three wire - NPN	18 V / 3,5 mA; switching threshold approx. 9 V
Two wire- proximity switch	18 V / 3,5 mA (24 V DC) Switching threshold approx. 1,5 mA
Switching frequency	max. 1,6 kHz; 99999 1/min

Cable length for proximity switch	PNP, NPN, 2-wire
Resistance of line	≤ 10 Ω / line
Capacity of line	≤ 22 nF 0…800Hz; ≤ 10 nF 800...1600 Hz
e.g. max. length of cable	< 150 m with cable LIFYY11Y 3*0,34 mm at 0…800Hz
Measuring error	± 0,05 % of measured value ± 1 Digit
Temperature factor	< 0,002 %/K
Measuring time	1 Period * ƧuՈ (number mean values) >= 3 Periods; after placing the measuring signal
Auxiliary supply +18 V 20 mA	16 ... 21 V max. 20 mA
Enable E1-E2	18 V / 3 mA Switching threshold approx. 9 V
Analogue output: (FRMU only)	electrically insulated to input f - in (U1-U2)
Voltage output 0...10 V	max. 10 mA error <0,1 % of full scale
Temperature factor	< 0,01 %/K
Current output 0/4...20 mA	max. 500 Ω error <0,15 % of full scale
Temperature factor	< 0,015 %/K
Error from burden	(250 Ω - resistance)/250 Ω * 0,15 % of final value
Nominal rise time	<20ms + messuring time
Resolution analog output	>= 11,6 bit

Subject to technical changes

9 Type V4

Dimensions in mm



1 Cover
2 Base
3 Bar for snap mounting
4 Latch for sealing
5 Front panel
6 Position downward
7 For fixing to wall with screws, Ø 4,2 mm