DFA 2.00 GW

24-230V
DC / 50..60Hz / <4 W

Digitaler Frequenz-Analog-Umformer
DFA 2.00 GW

4.001 l/s
167m³

↑ T1
↓ T2
T3

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Namur (Kontakt)
1 (5) weiß
3 (7) braun

Refl.-Lichtschranke
3 (7) braun
2 (6) weiß
1 (5) grün

Refl.-LS. mit Verstärker
3 (7) braun
4 (8) weiß
1 (5) grün

Digital
Frequency-Analog-Transducer

User manual

Contents

> **Read these operating instructions carefully before commissioning the digital Frequency-Analog-Transducer!**   ⚠

The range of application of the digital Frequency-Analog-Transducer includes primarily the transmission of instantaneous values and forms the basis for the display and/ or registration of the flow in pipelines.

The current output also serves for regulation and monitoring tasks.

The microprocessor controlled Frequency-Analog-Transducer converts the pulses from the donors of the water meter (main and secondary meter) in a direct current (digital to analog converter). The current here is proportional to the instantaneous flow.
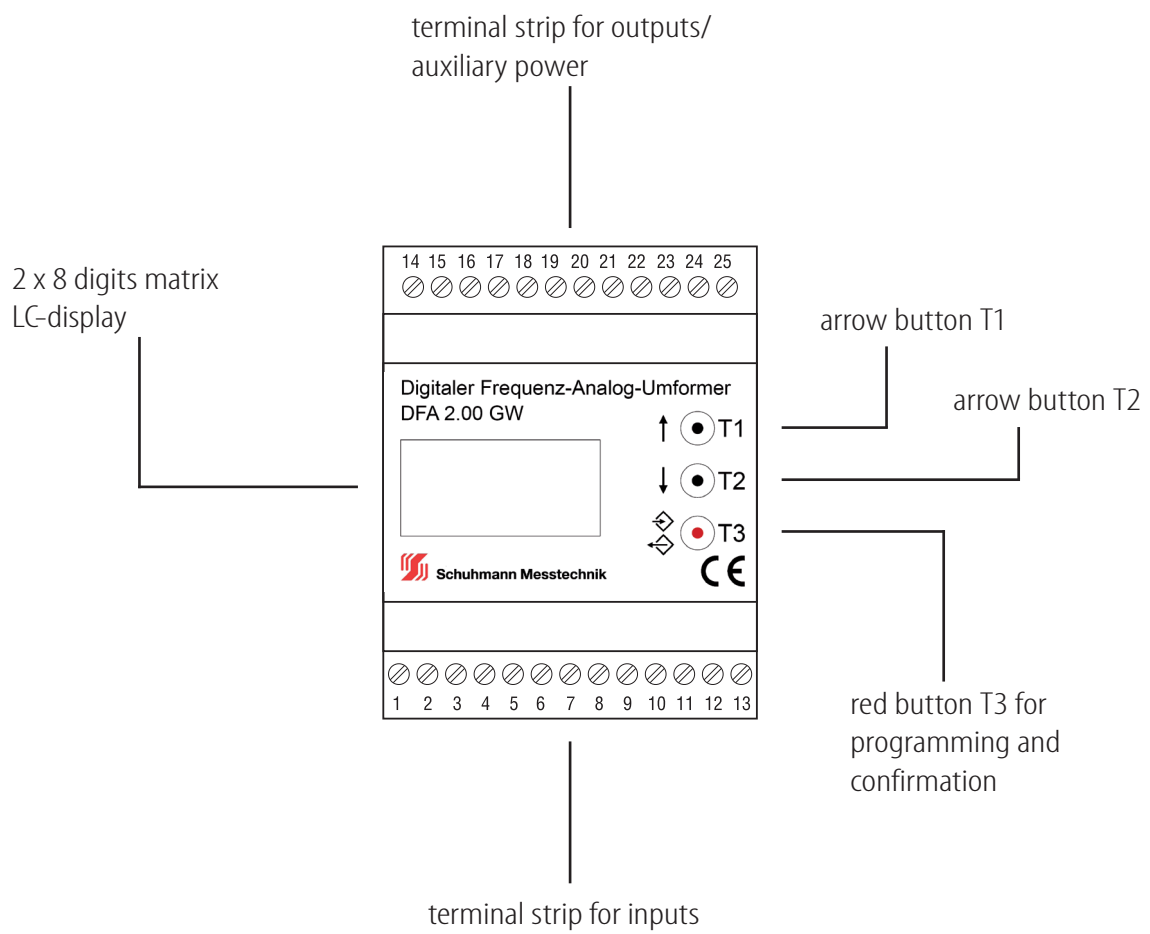
At two donors, the pulses are added.

Furthermore, the device is used to scale high resolution pulses in decadal pulses (e.g. m^3).

The programming of the transducer DFA 2.00 GW is performed by the three push buttons on the front panel.

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terminal strip for outputs/
auxiliary power

2 x 8 digits matrix
LC–display

arrow button T1

arrow button T2

14 15 16 17 18 19 20 21 22 23 24 25

Digitaler Frequenz-Analog-Umformer
DFA 2.00 GW

↑ T1

↓ T2

T3

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CE

1 2 3 4 5 6 7 8 9 10 11 12 13

red button T3 for
programming and
confirmation

terminal strip for inputs

Push buttons on the frontpanel
(symbols of menu navigation).

gray arrow button T1

gray arrow button T2

red configuration button T3

The arrow buttons T1 and T2 can be used to navigate between different measuring values. With that, changes and selections are carried out in programming mode, too.

By briefly pressing the red button T3 in the basic display, you enter the programming mode.

The different menu items are changed by briefly pressing T3 based on the menu overview.

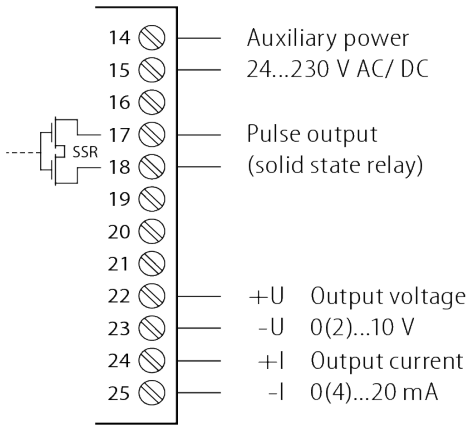The last displayed/ configured value will be stored automatically by switching to the next menu item after pressing T3.

Information:

If you want to exit a menu or cancel an unwanted change, the red button T3 must to be pressed longer than 3 sec. or the main menu will start after 60 sec. by itself (in both cases, no settings will be stored).
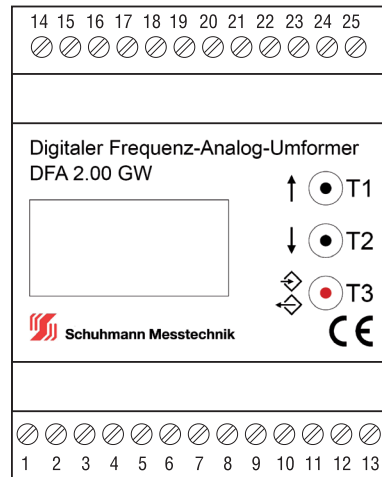
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Auxiliary power/ outputs:

Terminal	Description
14	Auxiliary power
15	24...230 V AC/ DC
16	
17	Pulse output
18	(solid state relay)
19	
20	
21	
22	+U Output voltage
23	-U 0(2)...10 V
24	+I Output current
25	-I 0(4)...20 mA

SSR

14 15 16 17 18 19 20 21 22 23 24 25

Digitaler Frequenz-Analog-Umformer
DFA 2.00 GW

↑ ● T1
↓ ● T2
⬦⬦ ● T3

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1 2 3 4 5 6 7 8 9 10 11 12 13

Input channel 1 + channel 2:

Namur/ contact

brown [3] +
white [1] -

channel 1:
4
3
2
1

reflecting light barrier with amplifier

green [1]
white [4]
brown [3]

reflecting light barrier

green [1]
white [2]
brown [3]

Namur/ contact

brown [7] +
white [5] -

channel 2:
8
7
6
5

reflecting light barrier with amplifier

green [5]
white [8]
brown [7]

reflecting light barrier

green [5]
white [6]
brown [7]
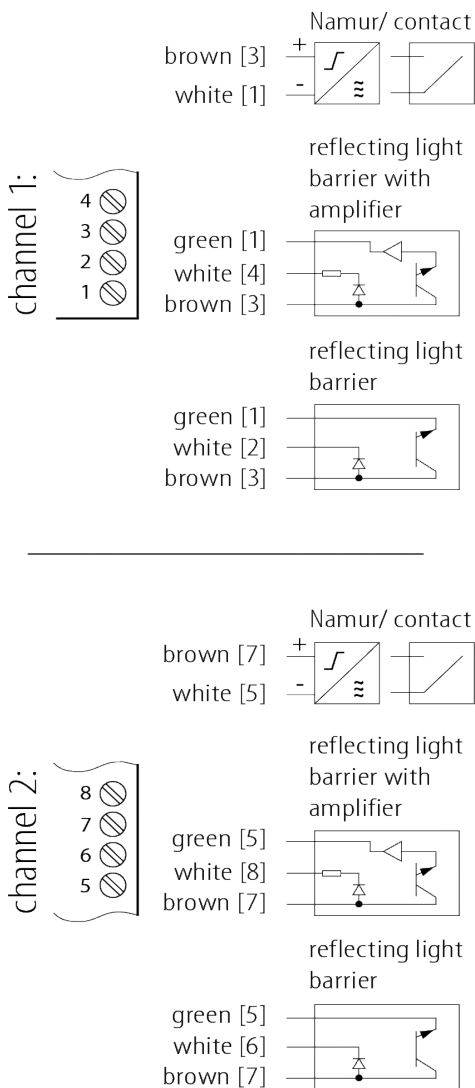
Before switching on the supply voltage or auxiliary power always observe the information on the device!

⚠

1. Connecting all sensors (inputs at DFA 2.00 GW) and the following peripheral (outputs at DFA 2.00 GW).

2. First, connecting the switched off/ de-energized supply leads.

3. Turning on/ applying the supply voltage.

After turning on the supply voltage the basic display appears on the LC-display:

– display of the instantaneous flow in l/ s or m^3/ h

– display of the current meter reading (previous flow) in m^3

```
1.234 l/s
123456m³
```

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Programming mode:

red configuration button T3

In programming mode, all numerical values or parameters can be changed.
To enter the programming mode, starting from the basic display, press the red button T3 shortly.

Information:

Numerical values can only be changed if no access code has been defined yet, or if in requesting of the code number the correct access code is entered!

Change of preselected values:

For changing a value, first start the process by pressing the button T1 or T2. The value to be changed, will now flash in the LC-display. With the selection buttons T1 or T2 the desired value can be selected.
Confirmation of the selected value by T3. It appears the next menu item.

Changing of numerical values:

By pressing the button T1 or T2 it flashes the digit to be modified (starting from the right).
Adjust the desired value with the selection buttons T1 (higher) or T2 (lower).
Confirmation of the adjusted value with T3. Next digit flashes. Additional settings as described.

Information:

For numerical values with a comma, the decimal point can not be moved. All decimal places must be defined and set. In addition to the numbers 0...9, a space can be chosen.

Terminating the entry (insert a space):

If a position will be equipped with a space, this will be recognized as „ended entry".

By subsequently pressing the red button T3 shortly, the flashing position disappears.

Pressing of T3 once again confirm and stores the setting being performed. The display changes to the next menu item.

Information:

If the selection buttons T1 or T2 are pressed instead of the red button T3, a change can be performed again (the value to be changed flashes again).
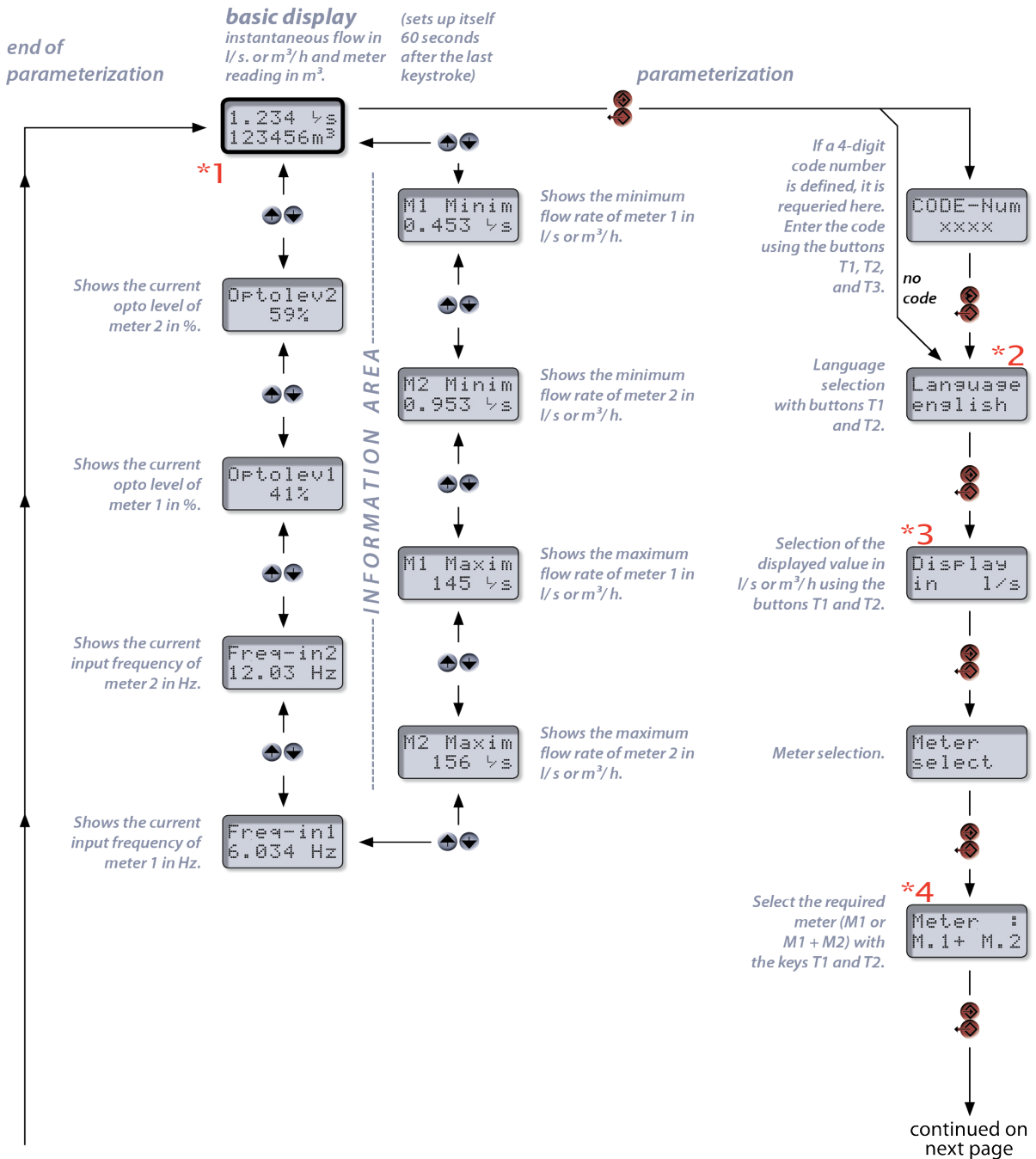
If you enter too large or too small numerical values, a message „value too small" or „value too large" appears in the LC-display for 2 sec.

At the same time, the number limit will be shown. The entry can be started again.

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OVERVIEW-MENÜ

basic display
instantaneous flow in l/s. or m³/h and meter reading in m³.

(sets up itself 60 seconds after the last keystroke)

end of parameterization

parameterization

```
1.234 l/s
123456m³
```
*1

If a 4-digit code number is defined, it is requeried here. Enter the code using the buttons T1, T2, and T3.

```
CODE-Num
  xxxx
```

no code

```
M1 Minim
0.453 l/s
```
Shows the minimum flow rate of meter 1 in l/s or m³/h.

Shows the current opto level of meter 2 in %.

```
Optolev2
  59%
```

Language selection with buttons T1 and T2.

```
Language
english
```
*2

```
M2 Minim
0.953 l/s
```
Shows the minimum flow rate of meter 2 in l/s or m³/h.

Shows the current opto level of meter 1 in %.

```
Optolev1
  41%
```

Selection of the displayed value in l/s or m³/h using the buttons T1 and T2.

```
Display
in   l/s
```
*3

```
M1 Maxim
 145 l/s
```
Shows the maximum flow rate of meter 1 in l/s or m³/h.

Shows the current input frequency of meter 2 in Hz.

```
Freq-in2
12.03 Hz
```

Meter selection.

```
Meter
select
```

```
M2 Maxim
 156 l/s
```
Shows the maximum flow rate of meter 2 in l/s or m³/h.

Shows the current input frequency of meter 1 in Hz.

```
Freq-in1
6.034 Hz
```

Select the required meter (M1 or M1 + M2) with the keys T1 and T2.

```
Meter  :
M.1+ M.2
```
*4

INFORMATION AREA

Legend: ⬆⬇ [T1/T2] navigation/selection (in parametrization)   [T3] Next (parametrization); longer than 3 sec. --> abort

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*1 **basic display:**

as the selection in the parameterization
menu: (see *3)

display in l/ s

```
1.234 l/s
123456m³
```

display in m³/ h

```
1.234m³/h
123456m³
```

*2 **language selection:**

select the languages:

english

```
Language
english
```

german

```
SPRACHE
Deutsch
```

*3 **displayed value:**

selection of the displayed value:

display in l/ s

```
Display
in   l/s
```

display in m³/ h

```
Display
in   m³/h
```

*4 **meter selection:**

selection of the required meter:

only meter 1

```
Meter  :
only M.1
```

meter 1 and meter 2 added

```
Meter  :
M.1+ M.2
```

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OVERVIEW-MENÜ

Parameterize meter 1. One pulse corresponds to ...l.

`Meter- 1 valency`

Settings for pulse output.

`Pulse- output`

*5 Enter the valency with T1, T2 and T3.

`x.xxx l pr pul`

Selection: no pulses, only out of M1 or M1 + M2.

`output no pulse`   `output of M.1`   `output of M.1+2`

*9 Choice 0..20 mA/ 0..10 V or 4..20mA/ 2..10 V. (T1, T2)

`x..20mA/ x..10V`

*6 Select continuous pulses or pulse packages. (T1, T2).

`impuls- xxxxxxxx`

meter reading

`Meter indicat.`

Output pulse time in msec. Setting with T1, T2 and T3.

`Period xxxmsec`

Range for selecting voltage or current.

`Select UI range`

only selected meter 1

Current meter reading. Adjustment with T1, T2 and T3.

`Meter m³ xxxxx`

Pulse valency for output - fixed values. Select with buttons T1 and T2.

*10

`1 Pulse per xxxX`

Parameterize meter 2. One pulse corresponds to ...l.

`Meter- 2 valency`

Full scale of the output in l/ sec. or m³/ h. (T1, T2 and T3)

*8

`Scal-end xxxx.x⅃s`

*5 Enter the valency with T1, T2 and T3.

`x.xxx l pr pul`

Entering a new code number YES/ NO; Buttons T1, T2.

`CODE-Num new   xxx`

Pulse valency for output - freely adjustable.

`choose p.factor`

*7 Damping constant of the output in sec. (T1, T2, T3)

`Damping xxx sec`

*6 Select continuous pulses or pulse packages. (T1, T2).

`impuls- xxxxxxxx`

NO

YES

Entering a new code number or cancel the code (right point between 9 and 0 *). (Buttons T1, T2 und T3)

`CODE-Num -cancel-`

`CODE-Num xxxx`

*cancel code number

Pulse valency for output - set free with the buttons T1, T2 and T3.

`1Pul.per xxxxx.x1`

Analog - output settings.

`Analog- output`

Legend: ⬆⬇ [T1/ T2] navigation/ selection (in parametrization)   [T3] Next (parametrization); longer than 3 sec. --> abort

*5 **meter (pulses) valency:**

e.g. meter indication 10 l/ imp.
--> specification then 10.000 in field x.xxx

valency

```
   x.xxx
l pr pul
```

*6 **impulse behavior M1 or M2:**

selection between continuous pulses or pulse packages (break time with subsequently high pulse frequency):
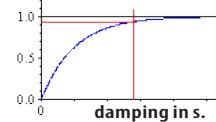
continuous pulses

```
impuls-
continuo
```

pulse packages

```
impuls-
package
```

*7 **damping coefficient output:**

specification of the damping behavior (reaction) at the output with respect to the abrupt change in the input:

damping

```
Damping
 xxx sec
```

step response

1.0
0.5
0.0
 0   **damping in s.**

*8 **setting the full scale:**

e.g.: At a flow rate of 63 l/ sec. a current of 20 mA has to flow at the analog output.
--> setting of 63.0 in field xxxx.x
note: Make sure to set this value always useful, because a input signal filter has been placed above this value!

full scale

```
Scal-end
xxxx.x/s
```

*9 **analog output selection:**

select the value of the output signal such as 0...20 mA/ 0...10 V or proof against wire breakage 4...20 mA/ 2...10 V:

selection
0...20 mA/ 0...10 V

```
0..20mA/
0..10V
```

selection
4...20 mA/ 2...10 V

```
4..20mA/
2..10V
```

*10 **pulse valency:**

selection of the pulse valency by fixed values (or continue to freely selectable pulses):

1 pulse per 1 liter

```
1 Pulse
per   1l
```

... per 10 liter

```
1 Pulse
per  10l
```

... per 100 liter

```
1 Pulse
per 100l
```

... per 1 m^3

```
1 Pulse
per  1m³
```

... per 10 m^3

```
1 Pulse
per 10m³
```

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Input:

Namur EN 50227 or potential free contact:

max. current:	$I_{max} = 8$ mA
max. voltage:	$U_{max} = 8$ V
connection terminals:	5, 7 (see connection diagram page 6)

reflecting light barrier:

connection terminals:	5, 6, 7 (see connection diagram page 6)

reflecting light barrier with amplifier:

connection terminals:	5, 7, 8 (see connection diagram page 6)
input frequency range:	0,1 Hz ... 100 Hz

Output:

I: load–independent DC current:	0(4)...20 mA	permissible load max. 540 Ω
connection terminals:	24, 25 (see connection diagram page 6)	

U: load–independent DC voltage:	0(2)...10 V	perm. load ≥ 3 kΩ simultaneous operat.
		perm. load ≥ 1 kΩ exclusive
connection terminals:	22, 23 (see connection diagram page 6)	

pulse output (solid state relay):	max. 230 V AC
	max. 100 mA
pulse length:	0,02...10 sec.
pulse or limit value:	adjustable
connection terminals:	17, 18 (see connection diagram page 6)

Adjustment:

The function set up has to be carried out by 3 front side push buttons and the display.

Display:

LC–display:	2 x 8 digits	matrix – display for instantaneous value and parametrization
		– instantaneous flow (m³/ h or l/ s)
		– min./ max. flow rate
		– current meter reading
		– menu navigation

Environmental conditions:

Storage temperature:	–20...+70 °C
Operating temperature:	–10...+55 °C
Isolation voltage:	
1 kV eff. 1 sec.	input <–> output
4 kV eff. 1 sec.	auxiliary power <–> in–, output
4 kV eff. 1 sec.	output <–> output

Auxiliary power:

wide range:	24...230 V AC/ DC
	< 4 W
Influence of auxiliary power:	< 0,1 %

Characteristics of transmission:

Linearity error:	< 0,2 %
Temperature error:	< 0,5 %
Load influence I:	< 50 ppm of final value
Load influence U:	< 0,2 % at 1 kΩ load
Setting time:	< 500 msec.

Directive:

EMC*:	EN 61000–6
	EN 61326–1
	EN 61000–4

*minimum deviations possible during HF–radiation influence

Low voltage directive:	2006/95/EG

Mounting details:

Housing for top hat rail

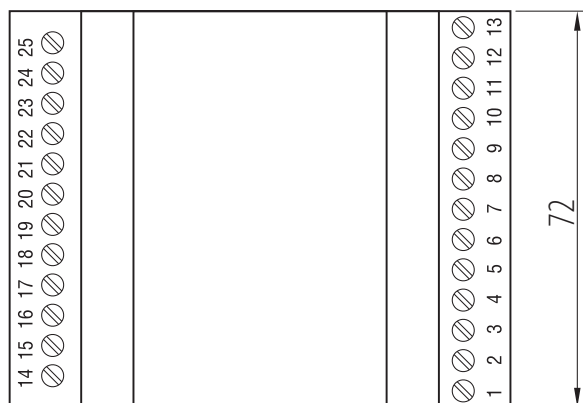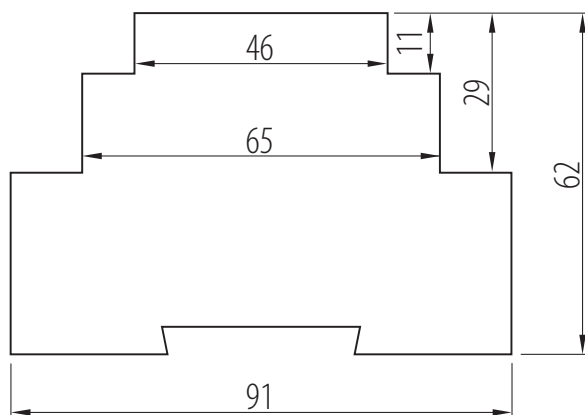|	
Type of protection:	IP 30 housing
Mounting rail fixed according to	EN 50022–35 x 6,2 mm
Width:	72 mm
Weight:	250 g
Material:	Polycarbonate (PC) + ABS
Approval:	CE
Connection:	screw clamps 0,2...2,5 mm²

Please check parameter before initial operation!

Dimensions:

Notes:

_____

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