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Flow-Converter UNICON®-DF

Flow measurement with pulse sensors

Features

- Measuring range programmable from -99999 ... 99999 Digit
- Measuring unit programmable e.g. l/s; l/min; l/h; m³/s....; (US)gal/s....; (US)bar(rel)/s....
- Totalizers programmable
- Additional 2. measuring input
- Output 4 ... 20mA, loop powered
- Pulse-output for external evaluation
- LCD-Text Display
- 2 electronic alarm outputs, voltage free
- Simulation mode for flow (manual operation)
- Protection IP65

Fieldcase
100x100x60 mm (BxHxT)

General

The Flow-Converter UNICON-DF is used in food technology, chemical and pharmaceutical industry and water technology. In connection with any type of pulse flow sensor the flow rate can be measured, displayed and converted in a 4 ... 20 mA signal. An additional feature is the summation function (totalizer). Using the alarm outputs a quantity dosage can be realized.

Short information

Programming	The front panel keypad can be used to program all designated functions.
Measurement value	The measured values are averaged continuously over a period of 0.1 ... 10 s (programmable). This period limits the minimum input frequence, because at least two impulses must arrive within.
Totalizers	2 counters (totalizers) are available. The daily totalizer can be reset manually. Automatic reset takes place by cutting off power. The overall totalizer is zero voltage protected and can only be reset by a special code (password protection).
Pulse output	Allows an external summation of flow quantity.
Alarm outputs	Switching performance of the alarm outputs is programmable as minimum or maximum function. The state of the alarm outputs is shown in the LCD-Display

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Technical data

Power supply

Supply voltage	: 12 ... 30 V DC, loop powered Using Namur sensors or sensors with NPN- and PNP output with power demand > 5 V/ > 2 mA a separate supply is necessary (12 ... 30 V DC).
Working temperature	: -10 ... 55 °C
Isolation	: between analog output/alarm output 1/alarm output 2/impulse output/external sensor supply
Rated voltage	: 500 V DC, between analog output/alarm output 1/alarm output 2/impulse output/ external sensor supply
CE - conformity	: EN50022, IEC61000-4-3/4/5

Measuring input

Typ	: Inductive transmitter (coil), Namur-sensor or e.g. Hall-Sensor (rectangular pulse) programmable. Alternatively extern pulses 0/5 ... 24 V DC.
Input coil	: switching threshold programmable from ±5 ... ±1000 mV
Input NPN-Sensor	: low level < 0.9 V , high level > 2.1 V pull-up-resistor 20 kΩ
Input PNP-Sensor	: low level < 0.9 V , high level > 2.1 V pull-down-resistor 20 kΩ
Input Namur	: low level < 1.4 mA , high level > 1.8 mA , hysteresis ca. 0.4 mA
Input frequence	: 0.1/10 ... 2000 Hz (depends on the programmed measuring interval)

Flow output

Current output	: 4 ... 20 mA, external load RA [Ω] $\leq \frac{\text{Supply voltage -12 V}}{0{,}02\ \text{A}}$
Accuracy	: < 0.1 % of the measuring value
Temperature coefficient	: < 0.01 %/ °C
Pulse output	: 12 ... 30 V DC, load max. 60 mA, short circuit protected
Pulse width	: 100 ms
Frequency	: max. 5 Hz Quantity/Volume per pulse programmable from 1 ... 99999 digit

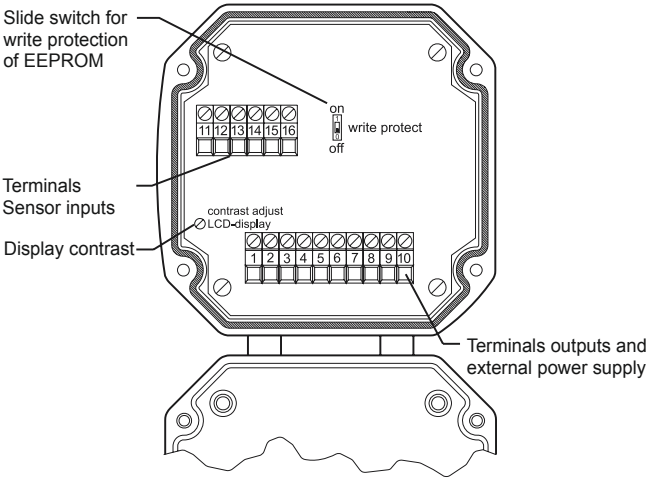
Alarm outputs

Transistor	: 12 ... 30 V DC, load max. 60 mA, short circuit protected
Voltage drop	: < 2 V (at max. load)

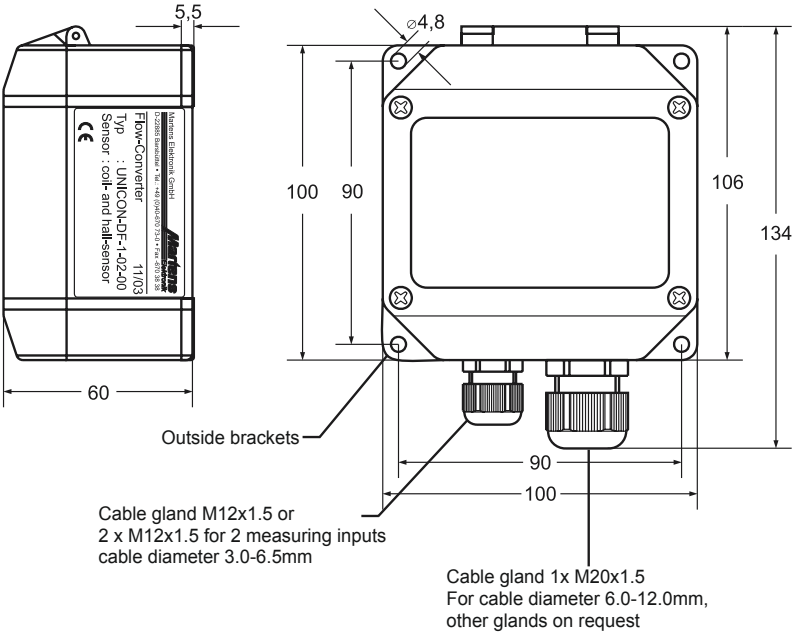
Display	: LCD- dot matrix, 4.9 mm character height, 2 lines each 16 characters
Flow	: -99999 ... 0 ... 99999 digit, max 3 decimal points
- Unit	: l/s, l/min, l/h; m³/s, m³/min, m³/h; (US)gal/s, (US)gal/min,(US)gal/h; bar(rel)/s, bar(rel)/min, bar(rel)/h
Totalizer	: -9999999 ... 0 ... 9999999 digit, max. 3 decimal points
- Unit	: l, m³, (US)gallon, barrel
- Storage	: Daily totalizer not voltage safe Overall totalizer voltage safe

Case	: Field-case
Material	: case polyamide with fibre-glass PA6-GF/GK 15/15 front foil polyester
Dimensions	: 100 x 100 x 60 mm (WxHxD)
Weight	: max. 360 g
Electrical connection	: Screw terminal pressure plate, 2.5 mm² flexible, 4 mm² wire
Protection	: IP65, terminals IP20 finger safe acc to German BGV A3

Legend (open lid)



Dimensions



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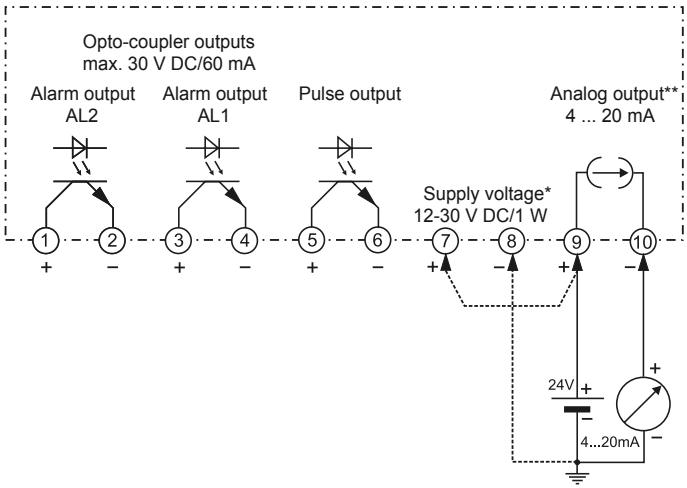
Connection diagram

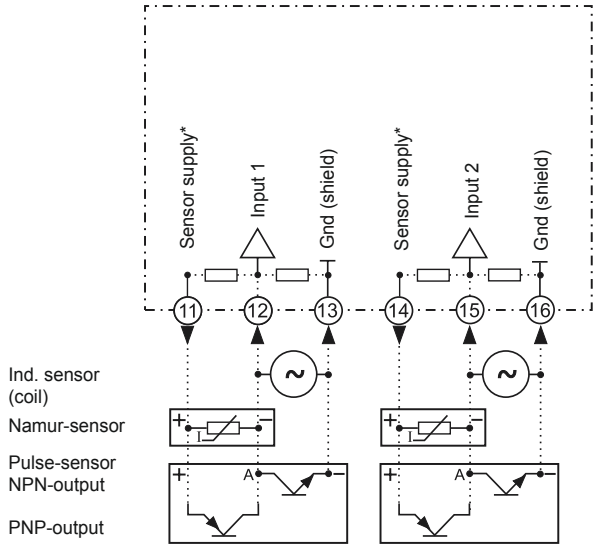
Terminals output



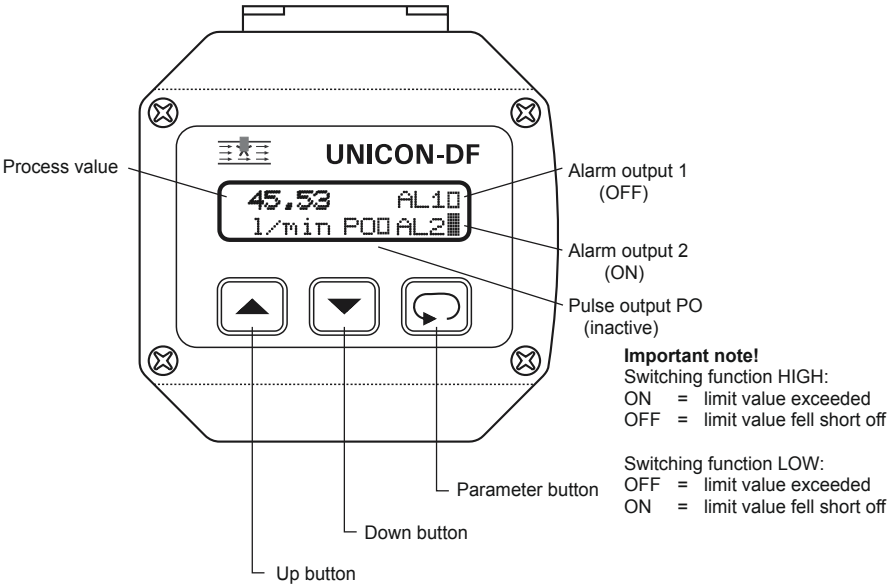
* For supplying the converter use terminals (9) and (10) as shown. If the converter is used for monitoring only, terminals (9) and (10) must be connected direct to the supply voltage.

** Separate supply voltage over the terminals 7 and 8 only when using Namur sensors (according to DIN EN60947) or sensors with NPN- or PNP output with power demand Ub > 5 V/> 2 mA.

Terminals sensor inputs



Panel controls and indicators



Important note!
Switching function HIGH:
ON = limit value exceeded
OFF = limit value fell short off

Switching function LOW:
OFF = limit value exceeded
ON = limit value fell short off

Instructions

Operating of the device is arranged in 2 levels. The desired parameter can be called by button . For selection within a parameter use buttons and .

Button combinations (press buttons at the same time):
+ 1 Parameter back
+ Parameter to “0" or minimum value

When the power supply is switched on, the UNICON initializes itself. The display shows the device type UNICON-CL and software version. After initializing the current measurement values are displayed.

The **configuration level** is called-up by pressing the button . Now all the parameters defining the function of the UNICON can be programmed. After pressing the button again, the entered data will be stored.

When the configuration is finished, or when no button is pressed for more than 120 seconds, the program jumps back to the working level. Leaving the **configuration level** is possible at any time when pushing the button for 2 seconds.

Error code:
Display is flashing the measured signal exceeds the programmed range

After installation, the device must be configurated for the intended use. See page 6.

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Programming

Notes to representation

Parameter is only displayed if configured

Parameter is only displayed if included (see order code)

Note! During the configuration only those parameters will be displayed, which are not excluded by other parameter settings.

Working level

Display **Description**

```
 45.5        AL1□
l/min        AL2■
```

Process-value flow
Output indication (only if activated).
□ = OFF and ■ = ON

```
Daily totalizer
     100m³
```

Daily totalizer
Reset to "0", by pressing buttons ▲ + ▼ together for 2 seconds.

```
Overall totaliz.
     55006m³
```

Overall totalizer
No reset in the working level possible.

Configuration level

Display **Description** (the display graphic contents factory settings)

1

```
■ deutsch
□ english
```

Language of the operating instructions
Selection with buttons ▲ and ▼.

2

```
Sensor1     ■Coil
□NPN □PNP □Namur
```

Measuring principle input 1
Coil, NPN, PNP or Namur -Sensor.
Selection with buttons ▲ and ▼.
For sensors with push-pull output, PNP must be selected.

3

```
Sensitiv. inp.1
±100mV
```

Input sensitivity (level indication) input 1 for Coil mode
Setting possible from ±5 ... ±1000 mV with buttons ▲ and ▼.

Note: The trigger level should be selected as large as possible in order to avoid fault measuremment

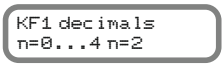
continue page 7

Display

Description (the display graphic contents factory settings)

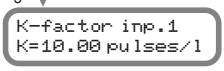
Sensor specifications for the K-factor see type plate or data-sheet of the installed sensor.

4



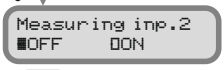
Decimals K-factor input 1
Selection with buttons ▲ and ▼.

5



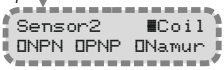
K-factor input 1, stated in pulses/litre (see sensor data sheet)
Setting possible from 1 ... 99999 digit with buttons ▲ and ▼.

6



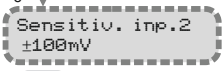
Measuring input 2 (only model type 2)
Selection with buttons ▲ and ▼.

7



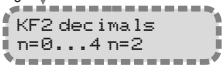
Measuring principle input 2
Coil, NPN, PNP or Namur -Sensor.
Selection with buttons ▲ and ▼.
For sensors with push-pull output , PNP must be selected.

8



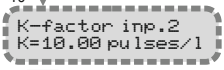
Input sensitivity (level indication) input 2 for Coil mode
Setting possible from ±5 ... ±1000mV with buttons ▲ and ▼.
Note: The trigger level should be selected as large as possible in order to avoid fault measurements.

9



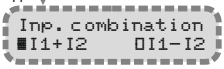
Decimals K-factor input 2
Selection with buttons ▲ and ▼.

10



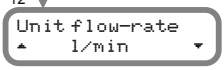
K-factor input 2, stated in pulses/litre (see sensor data sheet)
Setting possible from 1 ... 99999 digit with buttons ▲ and ▼.

11



Input combination
I1+I2 = Addition of the inputs.
I1−I2 = Subtraction of the inputs
Selection with buttons ▲ and ▼.

12



Measuring unit flow-rate
l/s, l/min, l/h; m³/s, m³/min, m³/h; (US) gal/s, (US) gal/min, (US)gal/h; bar(rel)/s, bar(rel)/min, bar(rel)/h
Selection with buttons ▲ and ▼.
In case of modification measuring range, volume quantity/pulse and alarm set-points will be converted automatically

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Display	Description (the display graphic contents factory settings)
13 FR MR decimals n=0...3 n=1	**Decimal places flow-rate measurement** Selection with buttons ▲ and ▼.
14 FR MR init.val. 0.01/min	**Flow-rate measuring range initial value (value for 4mA)** Setting possible from 0(– 99999) ... 99999 digit with buttons ▲ and ▼. (Negative values only device type 2)
15 FR MR end val. 1200.01/min	**Flow-rate measuring range end value (value for 20mA)** Setting possible from 0(– 99999) ... 99999 digit with buttons ▲ and ▼. (Negative values only device type 2) **Note:** if Initial value > End value the output works with decreasing characteristic.
16 Refresh time 0.5s	**Refresh time (display interval)** Attention! Within programmed measuring cycle at least 2 positive slopes must be detected. Setting possible from 0.1 ... 10.0 seconds with buttons ▲ and ▼. **Note:** Integration effect increases with measuring interval time
17 Conf. totalizer Code= 0	**Enter code to configure the totalizer ⇒ see page 11** 0 = Factory setting Setting possible with buttons ▲ and ▼. **Note:** With parameter "0" and active programming lock next parameter 23 "Alarm function AL1".
18 Adj.total code New code= 0	**Password setting for the totalizer configuration level** Setting possible from 0 ... 9999 digit with buttons ▲ and ▼. **Note:** Forgetting programmed code makes factory repair necessary
19 Totalizer ■OFF □ON	**Totalizers activation / deactivation** Selection with buttons ▲ and ▼.
20 Total. unit □l ■m³ □gal □bar	**Measuring unit totalizer** l, m³, (US)gal, bar(rel) Selection with buttons ▲ and ▼.
21 Total. decimals. n=0...3 n=0	**Decimal places totalizer** Selection with buttons ▲ and ▼.

continue page 9

Display	Description (the display graphic contents factory settings)
22 Clear totalizer press ▲ + ▼ for 2s	**Common-totalizer reset** Reset to "0" by pushing buttons ▲ + ▼ for 2 seconds.
23 Alarm AL1 ■OFF □FR □DT □OAT	**Alarm function AL1** Deactivated (OFF), flow (FR), daily-totalisator (DT) or overall-totalisator (OAT). Selection with buttons ▲ and ▼.
24 Alarm AL1 □LOW ■HIGH	**Switching function AL1** Selection with buttons ▲ and ▼.
25 Setpoint AL1 0.0l/min	**Setpoint AL1** Setting possible in the programmed measuring range with buttons ▲ and ▼.
26 Hysteresis AL1 0.1l/min	**Hysteresis AL1** Setting possible from 1 ... 65535 Digit with buttons ▲ and ▼.
27 Alarm AL2 ■OFF □FR □DT □OAT	**Alarm function AL2** Deactivated (OFF), flow (FR), daily-totalisator (DT) or overall-totalisator (OAT). Selection with buttons ▲ and ▼.
28 Alarm AL2 □LOW ■HIGH	**Switching function AL2** Selection with buttons ▲ and ▼.
29 Setpoint AL2 0.0l/min	**Setpoint AL2** Setting possible in the programmed measuring range with buttons ▲ and ▼.
30 Hysteresis AL2 0.1l/min	**Hysteresis AL2** Setting possible from 1 ... 65535 Digit with buttons ▲ and ▼.

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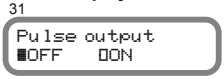
Display

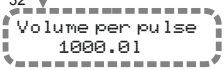
Description (the display graphic contents factory settings)

31



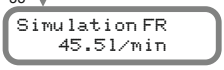
Pulse output for external evaluation
Selection with buttons ▲ and ▼.

32



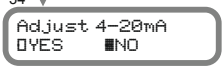
Volume quantity per pulse
It is possible to set an alarm output with value “0" for indication of negative flow-rate (via input 2).
Unit and decimals are copied from programmed flow parameters.
Setting possible from 1 ... 99999 Digit with buttons ▲ and ▼.

33



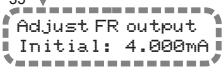
Simulation of flow-rate (manual mode)
Start value = actual value.
Setting possible within the programmed measuring range
with buttons ▲ and ▼.
Note: This parameter is not automatically exited after 120s

34



Adjustment of the process output
Selection with buttons ▲ and ▼.

35

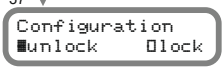


Correction initial value output flow-rate
Setting possible from 3.500 ... 5.000mA
with buttons ▲ and ▼.

36

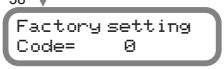
Correction end value output flow-rate
Setting possible from 19.000 ... 21.000mA
with buttons ▲ and ▼.

37

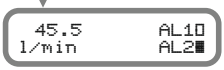


Programming lock.
If this parameter is set to lock condition, only setpoints of the alarm outputs AL1, AL2 and the totalizers will be displayed in the working level.
Press button ▲ and ▼ for min. 2 seconds

38



Parameter for factory setting



Return to working level

Error codes

Display	Description and remedy
Write protect!!	An entered parameter data could not be stored because write protection is activated by internal slide switch to position ON. Set switch to position OFF and modify again.
Wrong Code!!	Wrong code setting for totalizer programming (Password protection) After approx. 3 s an reset occurs.
XX Param.error please check	While examination of parameter memory XX errors were detected. Incorrect parameters were put back to factory setting. Check parameters and program again if necessary.
XX Param. error check 4-20mA too	While examination of parameter memory XX errors were detected. Incorrect parameters were put back to factory setting. Check parameters and program again if necessary. However the adjusted values for flow process output 4-20mA must be examined in the factory.

Comments to password protection

Access to totalizers can be locked by numeric code (password).

At factory the code is set to "0". Without changing the code, no password protection is active

Entering a 4-digit number (password) in parameter 18 "Adj. total code" will activate password protection.

Now calling again the totalizer parameters is only possible when entering the password in the menue "Konf.Totalisat.".

If working again with code number 0, programming continues with next step not concerning totalizer functions.

Entering a wrong code number, display shows "Wrong code". After 3 seconds the device will be reset. Configuration must be started again.

Attention!
Forgetting the password code makes factory repair necessary!!

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Ordering code:

	1.		2.		3.
UNICON-DF -	☐	-	☐	-	☐

1. Model

1 Measuring principle inductive sensor (Coil) Namur-sensor,
NPN- and PNP-sensor (pulses),
Output 4...20mA,
1 impulse output for extern evaluation,
2 electronic alarm outputs,
Supply voltage 12 ... 30V DC, loop powered

2 Feature as before, but
additional input for addition / subtraction,
(incl. 2-nd cable gland M12x1.5 in the housing)

2. Mounting

02 Field mounting
Connection of the flow sensor with separate connection cable

3. Options

00 without option