**FEATURES**

- **Input:**
  - 2-wire initiator (Namur) or potential free contact
  - optional: second input for addition/subtraction

- **Output:**
  - Current (0)4…20 mA and/or Voltage 0(2)...10 V
  - optional:
    - Switching outputs with integrated frequency divider or limit switch

- **Pulse conversion 0,01 Hz…10 kHz**

- **Parameterization, handling and actual value indication by display**

- **Galvanic 3-way isolation of 4 kV**

**FUNCTION**

The DFA8 is converting input a signal generated by various frequency sensors into a standard current and voltage signal.

He is used for the flow rate measurement, logging of rotation speed, monitoring of motors etc.

The parameterization is made by the 2 front side push-buttons and indicated by display.

The 4-digit actual value display is free scalable. The actual flow through volume, the minimal or maximum measuring value of the past 60 minutes or 24 hours can be displayed.

The DFA 8.10 and DFA 8.20 are equipped with a switching output, used as frequency divider.

The DFA 8.30/ DFA 8.31/ DFA 8.32 have 2 switching outputs, used as frequency divider or limit switch.

A second input which can be used as an adder or subtractor is available with the DFA 8.40/ DFA 4.31/ DFA 8.42, additional to the 2 switching outputs.
Digital Frequency Analog Transducer

DFA 8.00 G

DFA 8.00 T

OVERVIEW-MENU FOR DFA 8.00/8.10/8.20/8.30/8.31/8.32

**description**

- **actual indicated value in**: $L\cdot SE \triangleq \text{l/sec.}$
- **9-h**: $\triangleq \text{m/h}$
- **Hertz**: $\triangleq \text{Hz} \triangleq \text{1000 rpm}$
- **rot**: $\triangleq \text{l/min.}$

- **actual value at input 1 as Hz.**

- **minimal occurred value since last call-up of this program (up to max. 60 min.) or smallest measurand since 24 h if last call up is greater than 60 min.**

- **maximal occurred value since last call-up of this program (up to max. 60 min.) or biggest measurand since 24 h if last call up is greater than 60 min.**

**main menu**

- **Parameterize mode**: (see page 4-16 and 4-17)
- **> 2 sec.**

- **Option**

**Legend:**

- **selection**
- **next**

*There is a constant change between the actual indicated value and the display of the menu item.*
**DESCRIPTION**

- Actual indicated value in **L•SE** ≈ l/sec.
- Actual value at input 1 as Hz.
- Minimal occurred value at input 1 since last call up of this program (up to max. 60 min.) or smallest measurement since 24 h if last call up is greater than 60 min.
- Maximal occurred value at input 1 since last call up of this program (up to max. 60 min.) or biggest measurement since 24 h if last call up is greater than 60 min.
- Actual value at input 2 as Hz.
- Minimal occurred value at input 2 since last call up of this program (up to max. 60 min.) or smallest measurement since 24 h if last call up is greater than 60 min.
- Maximal occurred value at input 2 since last call up of this program (up to max. 60 min.) or biggest measurement since 24 h if last call up is greater than 60 min.

---

**MAIN MENU**

- Parameterize mode (see page 4-16 and 4-17)

---

**LEGEND:**
- Selection
- Next

*There is a constant change between the actual indicated value and the display of the menu item.*
PARAMETERIZING-MENU

<table>
<thead>
<tr>
<th>adjustable range</th>
<th>description</th>
<th>menu</th>
<th>adjustable range</th>
</tr>
</thead>
<tbody>
<tr>
<td>l/sec</td>
<td>unity selection for all displays and parameter settings</td>
<td>DISP</td>
<td></td>
</tr>
<tr>
<td>m/h</td>
<td>with selection of l/sec, m/h, l/min.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hertz</td>
<td>input quality rating of sensor: x litre per impulse</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rpm</td>
<td>with selection of Hertz, 1000 rpm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>l/min</td>
<td>input quality rating of sensor: x revolutions per impulse</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Option

- only I1 active
- allocation of I1 and I2: e.g. output = I1 + I2
- Impulse output: after this value an impulse is being generated: e.g. \( oP_{Pu} = 10 \) litre
- Impulse output duration in seconds: 0.001...9.999 sec. (comma defined)

Legend: selection next

*1 There is a constant change between the actual indicated value and the display of the menu item.

04-16
**PARAMETERIZING-MENU**

<table>
<thead>
<tr>
<th>adjustable range</th>
<th>description</th>
<th>menu*1</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20</td>
<td>0...20 mA/ 0...10 V</td>
<td>change value</td>
</tr>
<tr>
<td>4-20</td>
<td>4...20 mA/ 2...10 V</td>
<td></td>
</tr>
<tr>
<td>0-10</td>
<td>0...10 mA/ 0...5 V</td>
<td></td>
</tr>
<tr>
<td>20-0</td>
<td>20...0 mA/ 10...0 V</td>
<td></td>
</tr>
<tr>
<td>20-4</td>
<td>20...4 mA/ 10...2 V</td>
<td></td>
</tr>
<tr>
<td>10-0</td>
<td>10...0 mA/ 5...0 V</td>
<td></td>
</tr>
</tbody>
</table>

1.0...999,9 sec. (comma defined)

select outputsignal

<table>
<thead>
<tr>
<th>change value</th>
</tr>
</thead>
</table>

attenuation of the outputsignal

<table>
<thead>
<tr>
<th>option</th>
</tr>
</thead>
</table>

**e.g.:**

at unit l/sec. and final value 20 mA:

ScAL = 35

35 l/sec. = 20 mA

i.e.:
input: 0...35 l/sec.
will be changed into:
output: 0...20 mA

define scaling for outputrange:
coupling between 100% input- and 100% outputrange:
x = final value analoge output
Inputfrequency filter = ScAL -value * 1,5

**SPrE**

relay: limit value
transistor: impulse output

Limit switch:
selection of output: relay or transistor

<table>
<thead>
<tr>
<th>option</th>
</tr>
</thead>
</table>

**SPtr**

relay: limit value
transistor: impulse output

| option |

0...99,99 sec.

raising delay for limit value

| option |

0...99,99 sec.

switching off delay for limit value

| option |

displayed for 2 seconds

**End**

back to overview-menu, page 4-14/ 4-15

**Legend:**

- selection
- next *1 There is a constant change between the actual indicated value and the display of the menu item.
### Change Value

**Change Value** *(select \( \bullet \) to change the menu item):*

<table>
<thead>
<tr>
<th>Preset Value</th>
<th>Change Position 1</th>
<th>Value Changed to „6“</th>
<th>Confirm Value</th>
<th>Change Position 2</th>
<th>Changed to „3“</th>
<th>Confirm Value</th>
<th>Value Changed to „1,036“</th>
<th>3x Confirm for Position 3.+4., Save and Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>↑</td>
<td>1006</td>
<td>↓</td>
<td>1006</td>
<td>↑</td>
<td>1036</td>
<td>1036</td>
<td></td>
</tr>
</tbody>
</table>

### Define Decimal Place

**Define Decimal Place:**

<table>
<thead>
<tr>
<th>Preset Value</th>
<th>Change Position 1</th>
<th>Position 1 Unchanged</th>
<th>Change Position 2</th>
<th>Select Comma</th>
<th>Confirm Comma</th>
<th>„0“ Selected with ( \bullet )</th>
<th>Confirm Value</th>
<th>Value Changed to „100,0“</th>
<th>3x Confirm for Position 3.+4., Save and Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000</td>
<td>( \rightarrow )</td>
<td>1000</td>
<td>↑</td>
<td>1000</td>
<td>↑</td>
<td>1000</td>
<td>↑</td>
<td>1000</td>
<td></td>
</tr>
</tbody>
</table>

### Delete Decimal Place

**Delete Decimal Place:**

<table>
<thead>
<tr>
<th>Preset Value</th>
<th>Change Position 1</th>
<th>Comma Selected</th>
<th>Confirm Value</th>
<th>Comma Set</th>
<th>Confirm Value</th>
<th>Change Position 2 with ( \bullet )</th>
<th>Confirm Value</th>
<th>Value Changed to „1050“</th>
<th>3x Confirm for Position 3.+4., Save and Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000.5</td>
<td>↑</td>
<td>( \rightarrow )</td>
<td>1000.9</td>
<td>↑</td>
<td>1000</td>
<td>1000</td>
<td>↑</td>
<td>1000.9</td>
<td></td>
</tr>
</tbody>
</table>

### Delete Positions

**Delete Positions:**

<table>
<thead>
<tr>
<th>Preset Value</th>
<th>Go to Position 2</th>
<th>Position 2 Changeable</th>
<th>Change Position 2</th>
<th>Change Position 2 with ( \bullet ) to „_“</th>
<th>Confirm Value</th>
<th>Space Saved, Value: „9“</th>
<th>Save and Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>8219</td>
<td>( \rightarrow )</td>
<td>8219</td>
<td>82.9</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Details of Operation

The displayed position gets changed with the push-button \( \bullet \). Values such as \( \rightarrow \) to \( \rightarrow \), minus \( \bullet \), comma \( \bullet \), and space \( \rightarrow \) are possible.

Use the push-button \( \bullet \) to confirm the actual position and go to the next or return to the main menu after changing the last digit. Break-off possible by pushing \( \bullet \) longer.

### Legend

- Digit on display blinks.
- Display of comma.
- Space
- Selection
- Confirm
**Input:**
Namur EN 50227 or potential free contact:
- max. current: $I_{\text{max}} = 8 \text{ mA}$
- max. voltage: $U_{\text{max}} = 8 \text{ V}$
- connection input 1: terminal 4 -, 5 + (door installation: 3 -, 4 +)
- connection input 2 (optional): terminal 6 -, 3 + (door installation: 5 -, 6 +)

**Output:**
- I: load-independent DC current:
  - connection: 0(4)...20 mA permissible load max. 600 Ω (door installation: 11 -, 12 +)
- U: load-independent DC voltage:
  - connection: 0(2)...10 V permissible load max. $\geq 3 \text{ kΩ}$ simultaneous operation permissible load max. $\geq 1 \text{ kΩ}$ exclusive (door installation: 9 -, 10 +)
- transistor output (optional):
  - max. 50 Hz
  - max. 50 V
  - max. 50 mA
  - pulse length: 0,01...10 sec.
  - pulse or limit value: adjustable
  - connection: see connection diagram (door installation: 14 -, 15 +)
- relay output (optional):
  - closer (door installation: changer)
  - max. switching current: 8 A
  - max. switching voltage: 250 V AC
  - mechanical life cycle: $30 \times 10^6$ cycles
  - contact life cycle: $10^6$ cycles
  - pulse length: 0,1...10 sec.
  - pulse or limit value: adjustable
  - connection: see connection diagram (door installation: 18, 19, 20)

**Direct current limit range:**
1. ohmic load
2. inductive load

**Adjustment:**
The function setup has to be carried out by front side push-button and display (see at Page 4–14).

**Display:**
4-digit LC-display with 4 bargraphs to indicate the relay status of inputs and outputs.
1. input 1
2. input 2
3. status pulse output
4. status output limit value

---

**Connection Diagram:**

DFA 8.00 G
DFA 8.00 T
Environmental conditions:
Storage temperature: -40...+70 °C
Operating temperature: 0...55 °C
Isolation voltage: 4 kV eff. 1 sec.
input-output- auxiliary voltage

Auxiliary power:
Housing for top hat rail:
wide range: 20...253 V AC / DC < 3 W
Door installation:
wide range: 20...253 V AC / DC < 3 W

Characteristics of transmission:
Linearity error: < 0,1 % of final value
Temperature error: < 10 ppm/K

Directive:
EMC Directive: 2014/30/EU*
Low Voltage Directive: 2014/35/EU
*minimum deviations possible during HF-radiation influence

Connecting diagram:

Ordering information:
Type:
- DFA 8.00 GW
  wide range housing analog output I and U
- DFA 8.00 TW
  wide range door inst. analog output I and U
- DFA 8.10 GW
  wide range housing analog output I and U relay output (closer)
- DFA 8.20 GW
  wide range housing analog output I and U transistor output

Type:
- DFA 8.30 TW
  wide range door inst. analog output I and U relay output (changer) transistor output
- DFA 8.31 GW
  wide range housing analog output I relay output (closer) transistor output
- DFA 8.32 GW
  wide range housing analog output U relay output (closer) transistor output

With 2 inputs, limit switch, pulse output:
- DFA 8.40 TW
  wide range door inst. analog output I and U relay output (changer) transistor output
- DFA 8.41 GW
  wide range housing analog output I relay output (closer) transistor output
- DFA 8.42 GW
  wide range housing analog output U relay output (closer) transistor output

Mounting details:
Housing for top hat rail:
Type of protection: IP 40 housing
IP 10 clamps
Mounting rail fixed according to
EN 50022-35 x 6,2 mm
Width: 22,5 mm
Weight: 210 g
Material: Polyamide PA
Flammability class: V0 (UL94)
Approval: CE
Connection: screw clamps ≤ 2 x 2,5 mm²

Door installation:
Type of protection: IP 54 Front
Front frame: 96 x 48 mm
Installation depth: 138,5 mm
Weight: 290 g
Material: PC / ABS
Flammability class: V0 (UL94)
Approval: CE
Connection: plugg. screw clamps 0,14...1,5 mm²

For safety reasons we recommend to mount the housing for top hat rail with a distance of approx. 5 mm to each other.