KOBOLD

Operating Instructions

for

Dosing Electronic

Model: ZED-D

or DF-…DLxxx

or *Model*-…GxxR

ZED-D

1. Contents

Manufactured and sold by:

Kobold Messring GmbH
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2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.
The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EWG-machine guidelines.

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition.
Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:
The standard delivery includes:
- Dosing Electronic model: ZED-D
- Operating Instructions

4. Regulation Use

Any use of the Dosing Electronic, model: ZED-D, which exceeds the manufacturer's specification may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Operating Principle

The evaluation unit changes the frequency signal of the pickup into a 3(4)-digit flow reading with adjustable scale (topline of display), and a scalable analogue signal. The dosage is displayed in the bottom line of the display. The unit of measurement can be selected.

Included are two relays with floated output changeover contacts for various functions. The relay (S1) can be used to execute the flow monitoring, total volume monitoring, fine dosage or the pump control.

When the flow is being continuously monitored, it checks if the freely adjustable limits are exceeded or fallen short of. A choice can be made between threshold value and window monitoring. Switching point, hysteresis, window point, and switch-on or switch-off delay can be set as desired. If monitoring of the total volume is selected, a check is made to see if the adjustable quantity limit is exceeded.

The dosage relay (S2) switches on when the dosage process starts, and then switches off again, once the dosage has flowed through. The dosage process can be interrupted by using the Start/Stop switch. By taking a correction quantity into account, it is possible to take any special features or conditions of the system into account. By entering a fine dosage, the bypass valve can be controlled with the relay (S1). A red LED indicates the relay's switching status.

The Analogue output is available as a current output with 0(4)...20 mA or a voltage output with 0...10 V. The parameter names in the menu can be displayed in either German or English. If used where the flow readings change rapidly, the display can be pacified and the analogue reading averaged by switching on some software. If the maximum set flow (exceeded range) is exceeded, it will be shown on the display. The set parameters can be protected against unauthorised alteration using a password function.

Range of functions

Dosage and flow meter with digital display, switch and analogue output:

- Measurement and display of dosage, total and flow Quantities
- Free scaling using Teach-In or input of frequency and measured value
- Interval counter (number of dosing processes)
- 2 control inputs
- 1 dosage output
- 1 switching output, freely programmable as flow monitor or for monitoring the total quantity
- Analogue output 0(4)-20 mA or 0-10 V

6. Electrical Connection

6.1 ZED-D, DRB-…GxxR, DPE-…GxxR
fieldhousing and control panel installation
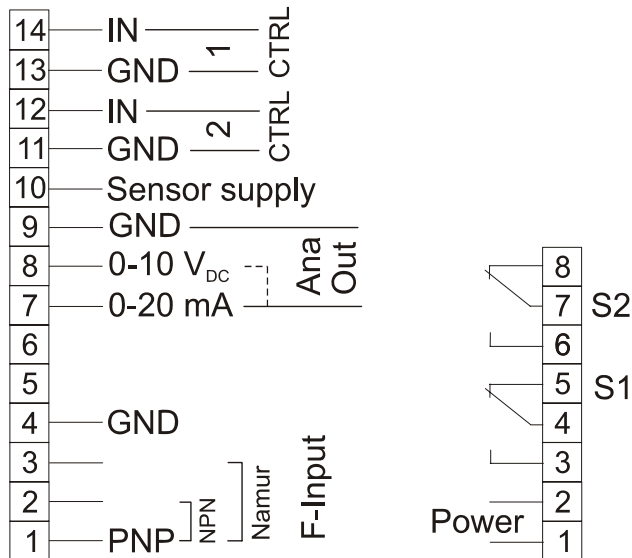

```
*) Ctrl 1 -- GND => Start
   Ctrl 2 -- GND => Stop
   Ctrl 1 -- Ctrl 2 -- GND => Reset Dosing
```

6.2 DF-…DLxxx, Model-…GxxR
cable connection

Wire number	DF Dosing electronics
1	+24 V_{DC}
2	GND
3	4-20 mA
4	GND
5	Ctrl 2 *)
6	Ctrl 1 *)
7	Relay S1 N/O
8	Relay S1 COM
9	Relay S2 N/O
10	Relay S2 COM

```
*) Ctrl 1 -- GND => Start
   Ctrl 2 -- GND => Stop
   Ctrl 1 -- Ctrl 2 -- GND => Reset Dosing
```

ZED-D

6.3 Model-…GxxR
plug connection

-G31 R

+ Vs

0 - 10 V$_{DC}$ Out

Ctrl 2 *

Ctrl 1 *

GND

1   2

5

4   3

30 V$_{AC/DC}$ / 2 A

S 1

S 2

1   2

7   8   3

6   5   4

-G34 R

+ Vs

0 (4) - 20 mA Out

max. 500 Ω

Ctrl 2 *

Ctrl 1 *

GND

1   2

5

4   3

30 V$_{AC/DC}$ / 2 A

S 1

S 2

1   2

7   8   3

6   5   4
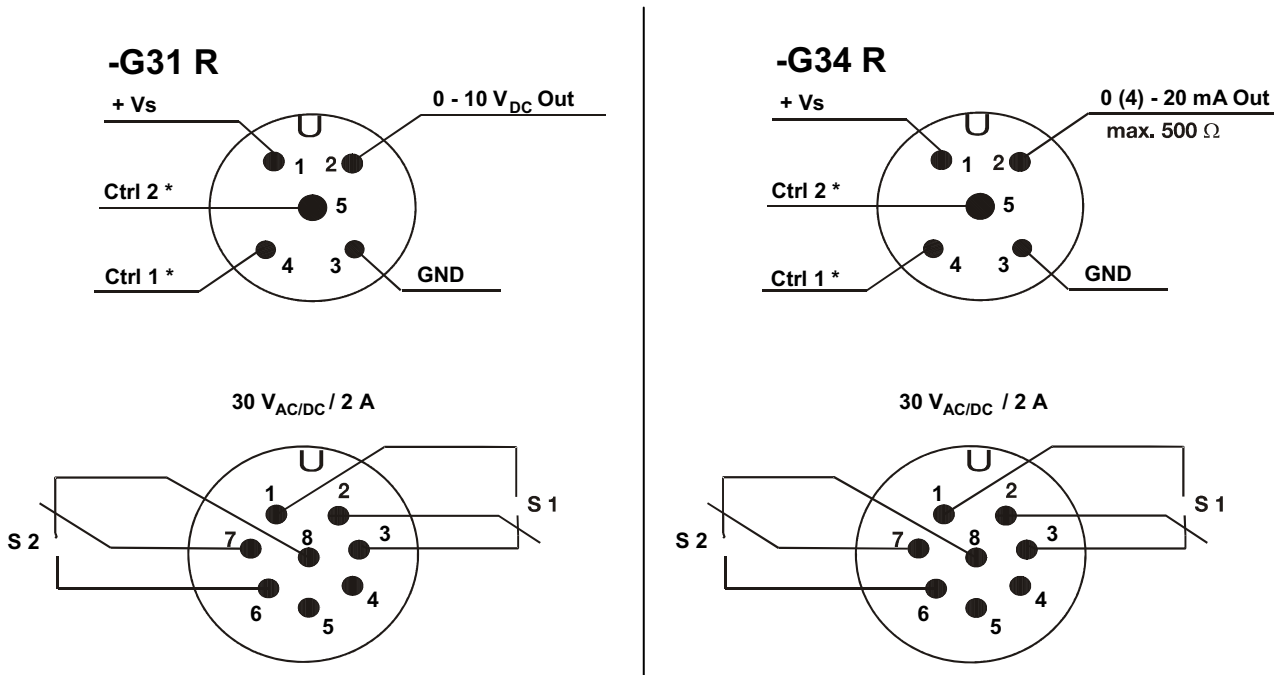
*) Ctrl 1 -- GND => Start
   Ctrl 2 -- GND => Stop
   Ctrl 1 -- Ctrl 2 -- GND => Reset Dosing

6.4 Connection example

PNP-Sensor

14
13
12
11
10 Sensor supply
9
PNP- 8
3-wire 7
6
5
4 GND
3
2
1 PNP F-Input

NPN-Sensor

14
13
12
11
10 Sensor supply
9
NPN 8
3-wire 7
6
5
4 GND
3
2 NPN
1 F-Input

NAMUR-Sensor

```
14
13
12
11
10  Sensor supply
 9
 8
 7
 6
 5
 4
 3 ┐
 2 │ Namur   F-Input
 1 ┘
```
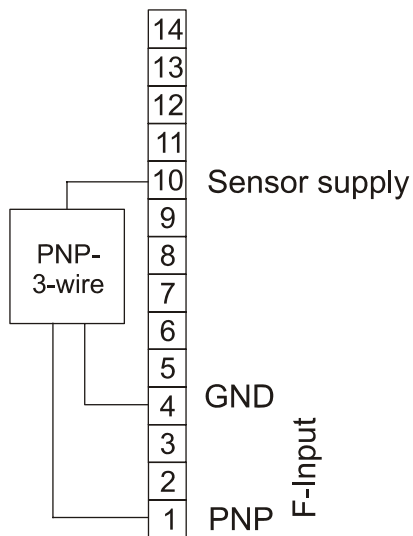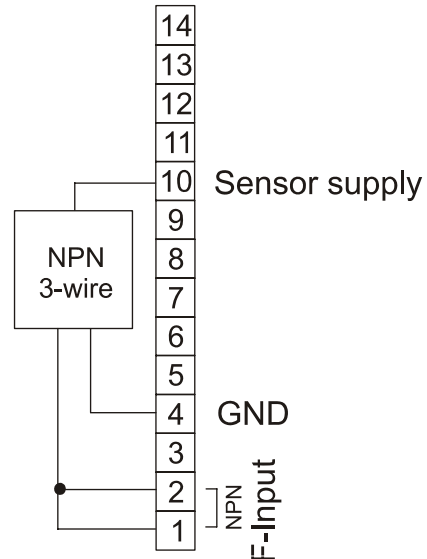
NAMUR   +

NAMUR   -
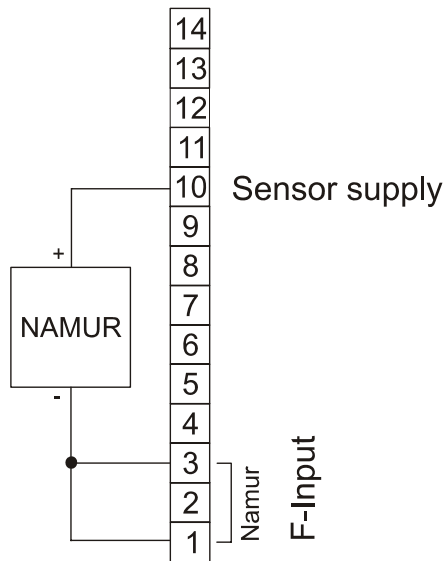
7. Operation / Configuration / Adjustments

7.1 General

Only the menu items which lines are marked in the selection matrix in grey colour, are available in the respective instrument version.

Italic **written values are blinking in the display, if they have been chosen for any input.**

The parameter can only be changed, if the security code has been entered correctly! The message „locked" will appear if the input has not been activated.

ZED-D

7.2 Function of the control keys

Operating mode >Measure< :

| PGM/ENTER |

- Press briefly 1x: → a) Display dosage interval counter or
                     → b) Reset status reports.

- Press briefly 2x: → Display current total quantity, then
                     → Display corresponding scale unit.

- Press for 3 sec: → Switch to operating mode >**Parameterize**<

| ▼ | + | ▲ |
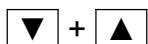
- Press for 3 sec: → Enter dosage
                    (only if parameter | DMdirect | is switched to **"yes"**).

| START/STOP |

- Press briefly: → a) Start dosage process.
                      → b) Interrupt dosage process.

- Press for 3 sec: → Initialising and then poss. abortion of dosage operation.

Operating mode >Parameterize< :

| PGM/ENTER |

- Press briefly: → a) Open parameter group or
                      → b) Change parameter (go lower in menu level) or
                      → c) Adopt value input.

- Press for 3 sec: → Abort input (ESC) and go back one
                         menu level.

▼

- Press briefly: → a) Select parameter group or parameter or
                   → b) Reduce digit position (when entering of numerical value) or
                   → c) Select list value (e.g. ... L/m, L/h, m³/m, ...).

▲

- Press briefly: → a) Select parameter group or parameter or
                   → b) Increase digit position (when entering of numerical value) or
                   → c) Select list value (e.g. ... m³/m, L/h, L/m, ...).

START/STOP

- No function in >**Parameterize**< operating mode.

Note: If no button is pressed for 20 seconds during parameterising, the instrument automatically switches back into >measuring< mode.

7.3 Character explanation for main menu

(**e**) - Button PGM/ENTER press shortly.
(**E**) - Button PGM/ENTER press and hold for approx. 3 seconds.
(▼) - Button ▼ press shortly.
(▲) - Button ▲ press shortly.

7.4 General Settings

ZED-D

		Level 1 choose parameter-groups		Level 2 display parameter, choose functions		Level 3 enter/change values, carry out functions			DF-...DLxxx / Model-...GxxR	ZED-D	Configurationlevel ZED-Devices Activation with PW = 6571
Operating Mode > MEASURING <	(E) → ← (E)	GENERAL ADJUSTM. (▼)↓	(e) → ← (E)	Language german (▼)↓ (▲)↑	(e) → ← (E)	Language english	(▲) → ← (▼)	Language german	▓	▓	
			← (E)	fUnitFS m3/h (▼)↓ (▲)↑	(e) → ← (E)	FUnitFS mL/m...	(▲) → ← (▼)	fUnitFS ...GPH			▓
			← (E)	fValueFS 2700m3/h (▼)↓ (▲)↑	(e) → ← (E)	VALUE INPUT					▓
			← (E)	fMinVal 100.0 L/m (▼)↓ (▲)↑	(e) → ← (E)	VALUE INPUT					▓
			← (E)	fPls/rev 3 (▼)↓ (▲)↑	(e) → ← (E)	fPls/rev 0...	(▲) → ← (▼)	fPls/rev ...10			▓
			← (E)	fJumpVD 5 % (▼)↓ (▲)↑	(e) → ← (E)	fJumpVD 1 % ...	(▲) → ← (▼)	fJumpVD ... 20 %			▓
			← (E)	fOverflV 100 % (▼)↓ (▲)↑	(e) → ← (E)	fOverflV 100 % ...	(▲) → ← (▼)	fOverflV ... 200 %			▓
			← (E)	fFactor factory (▼)↓ (▲)↑	(e) → ← (E)	fFactor customer	(▲) → ← (▼)	fFactor factory	▓		
			← (E)	UserUnit 115,6271 (▼)↓ (▲)↑	(e) → ← (E)	VALUE INPUT			▓	▓	

GENERAL SETTINGS		
Menu Item	**Parameter / Function**	**Explanation / Values / Other**
Language	Select menu language	German or English
fUnitFS *	Measuring unit for flow measurement	mL/s, mL/m, L/s, L/m, L/h, m^3/m, m^3/h, GPM, GPH, UU/s, UU/m, UU/h
fValueFS *	Maximum measuring range value for flow measurement	Range = 0,00...99,9..._100...9999
fMinVal *	Minimum measuring range value for flow measurement	Basis is fValueFS and fUnitFS If the level drops below this, the flow indicator goes to 0.
fPls/rev*	Impulse per sensor wheel revolution	Number of impulses per revolution of the sensor wheel or the like Necessary for long-term period averaging if the readings per revolution vary. The function is switched off when the input value is 1.
fJumpVD *	Flow switch value for attenuation cut-off	Value in %, basis is fValueFS and fUnitFS. Attenuation does not function if the switch value is 0%.
fOverflV	Flow overflow value (overflow)	Value in %, basis is fValueFS and fUnitFS. If exceeded, an M100 report is generated and faded in, alternating with the flow indicator. The report is saved and can be reset by briefly pressing the PGM key.
fFactor	Select pulse ration	Selection of works calibration or user calibration. (only for devices Model DF-...DLxxx and Model-...GxxR)
UserUnit.	Special volume unit	Customer-specific special unit UU. The value entered corresponds to the number of litres of the special unit, e.g. in the case of the unit *Barrel* the factor would for example be 115.6271.

*) Only for ZED devices: Device-specific parameter, is only visible after activation in the SecCode menu item in the SERVICE menu group, and can be changed.

ZED-D

7.5 Flow and analogue output
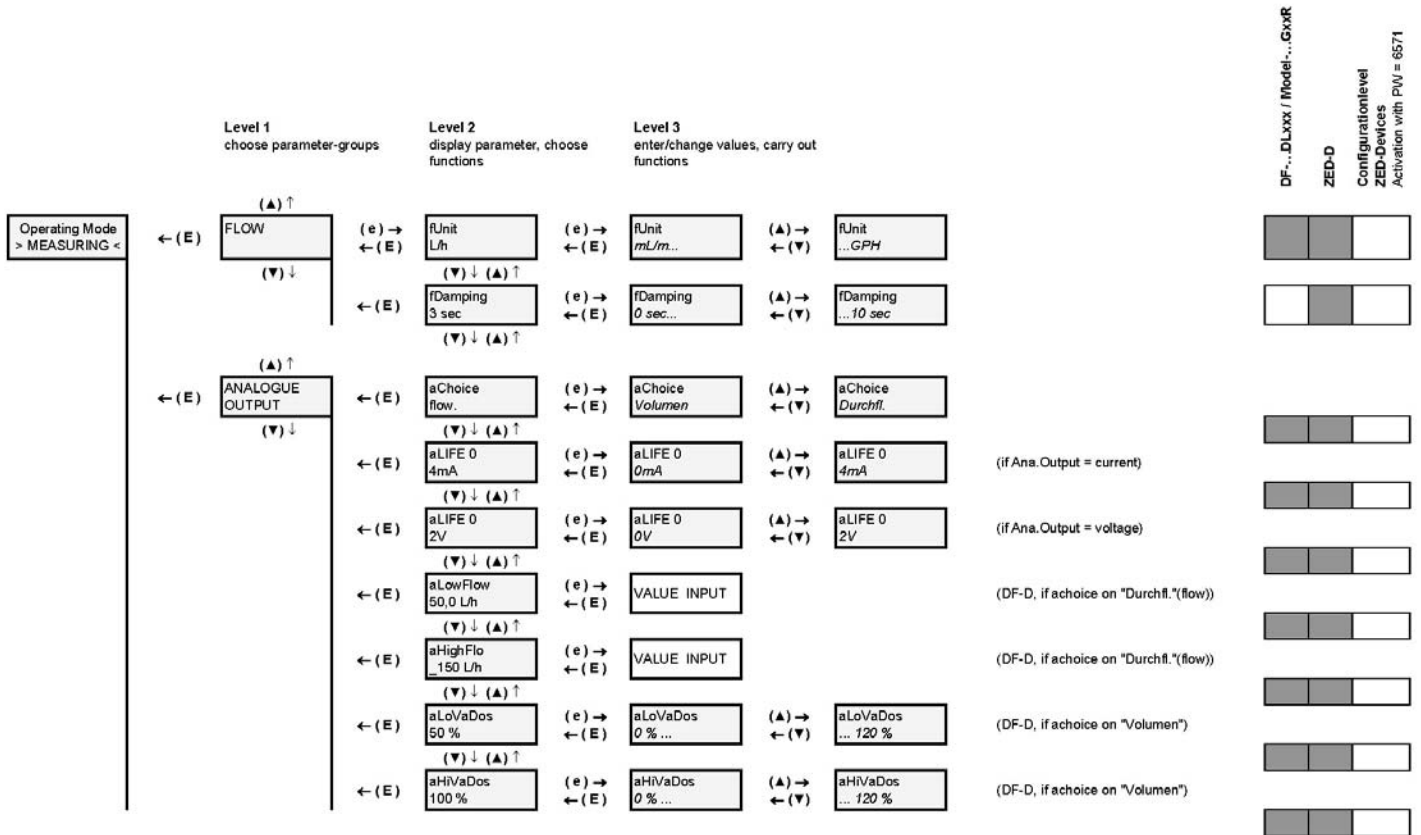

Level 1
choose parameter-groups

Level 2
display parameter, choose functions

Level 3
enter/change values, carry out functions

Operating Mode
> MEASURING <

← (E)

(▲) ↑
FLOW
(▼) ↓

(e) →
← (E)

fUnit
L/h
(▼) ↓ (▲) ↑

(e) →
← (E)

fUnit
mL/m...

(▲) →
← (▼)

fUnit
...GPH

fDamping
3 sec
(▼) ↓ (▲) ↑

(e) →
← (E)

fDamping
0 sec...

(▲) →
← (▼)

fDamping
...10 sec

← (E)

(▲) ↑
ANALOGUE
OUTPUT
(▼) ↓

← (E)

aChoice
flow.
(▼) ↓ (▲) ↑

(e) →
← (E)

aChoice
Volumen

(▲) →
← (▼)

aChoice
Durchfl.

aLIFE 0
4mA
(▼) ↓ (▲) ↑

(e) →
← (E)

aLIFE 0
0mA

(▲) →
← (▼)

aLIFE 0
4mA

(if Ana.Output = current)

aLIFE 0
2V
(▼) ↓ (▲) ↑

(e) →
← (E)

aLIFE 0
0V

(▲) →
← (▼)

aLIFE 0
2V

(if Ana.Output = voltage)

aLowFlow
50,0 L/h
(▼) ↓ (▲) ↑

(e) →
← (E)

VALUE INPUT

(DF-D, if achoice on "Durchfl."(flow))

aHighFlo
_150 L/h
(▼) ↓ (▲) ↑

(e) →
← (E)

VALUE INPUT

(DF-D, if achoice on "Durchfl."(flow))

aLoVaDos
50 %
(▼) ↓ (▲) ↑

(e) →
← (E)

aLoVaDos
0 % ...

(▲) →
← (▼)

aLoVaDos
... 120 %

(DF-D, if achoice on "Volumen")

aHiVaDos
100 %

(e) →
← (E)

aHiVaDos
0 % ...

(▲) →
← (▼)

aHiVaDos
... 120 %

(DF-D, if achoice on "Volumen")

DF-...DLxxx / Model-...GxxR

ZED-D

Configurationlevel
ZED-Devices
Activation with PW = 6571

FLOW		
Menu Item	**Parameter / Function**	**Explanation / Values / Other**
fUnit	Unit of flow indicator	mL/s, mL/m, L/s, L/m, L/h, m^3/m, m^3/h, GPM, GPH, UU/s, UU/m, UU/h
fDamping	Attenuation of reading fluctuations in the flow indicator	The attenuation pacifies the flow indicator. The attenuation value is the approximate equivalent of the setting time of the display value to c. 90 % of a measured value jump in seconds. (Parameter is blocked at DF-...DLxxx devices).

ANALOGUE OUTPUT		
Menu Item	**Parameter / Function**	**Explanation / Values / Other**
aChoice	Selection of analogue source	Flow: gauged analogue value of flow measurement Volume: current volume in percentage of dosage
aLIFE 0	Select Life Zero	Offset at power output: 0 mA or 4 mA Offset at power output: 0 V or 2V
aLowFlow	Flow reading at 0/4 mA or 0/2 V	Lower flow reading of gauged output range, value has the same unit as the flow indicator, (only if aChoice is set to Flow)
aHighFlo	Flow reading at 20 mA or 10 V	Upper flow reading of gauged output range, value has the same unit as the flow indicator, (only if aChoice is set to Flow)
aLoVaDos	Percentage the dosage at 0/4 mA or 0/2 V	Lower volume value of gauged output range. - Range: 0...120 % - The difference |aHiVaDos – aLoVaDos| may not be less than 10 %. - aLoVaDos > aHiVaDos is also possible. (only if aChoice is set to Volume)
aHiVaDos	Percentage the dosage at 20 mA or 10 V	Upper volume reading of gauged output range. - Range: 0...120 % - The difference |aHiVaDos – aLoVaDos| may not be less than 10 %. - aLoVaDos > aHiVaDos is also possible. (only if aChoice is set to Volume)

ZED-D

7.6 Relay output

Level 1
choose parameter-groups

Level 2
display parameter, choose functions

Level 3
enter/change values, carry out functions

DF-...DLxxx / Model-...GxxR

ZED-D

Configurationlevel
ZED-Devices
Activation with PW = 6571

Operating Mode > MEASURING <	←(E)	RELAY S1	(e)→ ←(E)	s1Funct. Flow	(e)→ ←(E)	s1Funct. TA-Limit...	(▲)→ ←(▼)	s1Funct. ...FineDose

(▲)↑

(▼)↓

(▼)↓ (▲)↑

s2Char. Limit — ←(E) — (e)→ ←(E) — s2Char. Window — (▲)→ ←(▼) — s2Char. Limit

(▼)↓ (▲)↑

←(E) s1SPoint _8,0 L/h — (e)→ ←(E) — VALUE INPUT — (only if s1Funct. = Flow)

(▼)↓ (▲)↑

←(E) s1Hyste _2,0 L/h — (e)→ ←(E) — VALUE INPUT — (only if s1Funct. = Flow)

(▼)↓ (▲)↑

←(E) s1WPoint 18,0 L/h — (e)→ ←(E) — VALUE INPUT — (only if s1Funct. = Flow und s1Char. = Window)

(▼)↓ (▲)↑

←(E) s1SDelay _1,0 sec — (e)→ ←(E) — VALUE INPUT — (only if s1Funct. = Flow)

(▼)↓ (▲)↑

←(E) s1RDelay 20,0 sec — (e)→ ←(E) — VALUE INPUT — (only if s1Funct. = Flow)

(▼)↓ (▲)↑

←(E) s1TA-Lim 2000,0 — (e)→ ←(E) — VALUE INPUT — (only if s1Funct. = TA-Limit)

(▼)↓ (▲)↑

←(E) s1PumpAT _1,5 sec — (e)→ ←(E) — VALUE INPUT — (only if s1Funct. = PumpCtrl)

(▼)↓ (▲)↑

←(E) s1PumpDT _5,0 sec — (e)→ ←(E) — VALUE INPUT — (only if s1Funct. = PumpCtrl)

RELAY S1		
Menu Item	**Parameter / Function**	**Explanation / Values / Other**
s1Funct	Relay1 Function selection	Flow: Monitoring of an adjustable flow value (s1SPunkt). GM Limit: Monitoring of an adjustable total volume (s1TA-Lim). PumpCtrl: Dosage pump control. FineDose: Fine dosage valve control. see → 8.0 Relay functions
s1Char.	Relay1 Switch characteristic	Limit: Monitoring a reading (s1Spunkt). Window: Monitoring an adjustable measuring range (s1Spunkt...s1WPoint). (only if **s1Funct.** is set to **Flow**)
s1SPunkt	Relay1 Switchpoint	Reading is in the same units as the flow indicator. (only if **s1Funct.** is set to **Flow**)
s1Hyste	Relay1 Hysteresis	Reading is in the same units as the flow indicator. (only if **s1Funct.** is set to **Flow**)
s1WPoint	Relay1 Windowpoint	Reading is in the same units as the flow indicator. (only if **s1Funct.** is set to **Flow** und **s1Char.** auf **Window**)
s1SDelay.	Relay1 Switch delay	Value input is always in the following format Range: _0,0...99,9 sec (only if **s1Funct.** is set to **Flow**)
s1RDelay.	Relay1 Reset delay	Value input is always in the following format Range: _0.0...99.9 sec (only if **s1Funct.** is set to **Flow**)
s1TA-Lim	Relay1 Total volume limit value	Reading is in the same units as the total volume unit in dosage unit menu group. (only if **s1Funct.** Is set to **GM Limit**)
s1PumpAT	Relay1 Pump control lead time	Reading determines pump lead time (Rel 1) before dosage begins Range = _0.0...99.9 sec (only if **s1Funct.** is set to **PumpCtrl**) see → 8.2 Pump control
s1PumpDT	Relay1 Pump control coast down time	Reading determines pump coast down time (Rel 1) after end of dosage Range = _0,0...99.9 sec (only if **s1Funct.** is set to **PumpCtrl**) see → 8.2 Pump control

ZED-D

7.7 Dosing

Level 1
choose parameter-groups

Level 2
display parameter, choose functions

Level 3
enter/change values, carry out functions

DF-...DLxxx / Model-....GxxR

ZED-D

Configurationlevel
ZED-Devices
Activation with PW = 6571

Operating Mode
> MEASURING <   ←(E)

(▲)↑
DOSING   (e)→
          ←(E)
(▲)↑

DM-Unit
L   (e)→
     ←(E)

DM-Unit
mL...   (▲)→
         ←(▼)

DM-Unit
...gal

(▼)↓ (▲)↑
←(E)

DAmount
200,000   (e)→
           ←(E)

VALUE INPUT

(▼)↓ (▲)↑
←(E)

FDAmount
10,5   (e)→
        ←(E)

VALUE INPUT

(▼)↓ (▲)↑
←(E)

DACorrct
-20,000   (e)→
           ←(E)

VALUE INPUT

(▼)↓ (▲)↑
←(E)

DAdirect
yes   (e)→
       ←(E)

DMdirect
no   (▲)→
      ←(▼)

DMdirect
yes

(▼)↓ (▲)↑
←(E)

Icnt =0?
no   (e)→
      ←(E)

Icnt =0?
yes   (▲)→
       ←(▼)

Icnt =0?
no

(▼)↓ (▲)↑
←(E)

TA-Unit
m3   (e)→
      ←(E)

TA-Unit
mL...   (▲)→
         ←(▼)

TA-Unit
...gal

(▼)↓ (▲)↑
←(E)

TA =0?
no   (e)→
      ←(E)

TA =0?
yes   (▲)→
       ←(▼)

TA =0?
no

DOSAGE UNIT		
Menu Item	**Parameter / Function**	**Explanation / Values / Other**
DM-Unit	Unit of dosage	Unit of dosage quantity mL, L, m^3, gal, mgal, UU (User Unit, see → UserUnit.)
DAmount	Dose	Numerical value of dosage quantity
FDAmount	Fine dose	Numerical value of the fine dosage Unit set as in DM-Unit. (Function see → 8.1 Dosage)
DACorrct	Correction quantity	Numerical value of correction quantity Unit set as in DM-Unit. A negative reading causes the dosage relay S2 to switch off before the zero reading on the dosage meter is reached. Any coast-down quantity needed can be corrected with this entry. A positive reading causes the dosage to be increased by the appropriate constant amount. The dosage relay S2 only switches the dosage meter off once the reading has exceeded the 0 value. Any quantity lacking can be corrected with this entry. (Function see → 8.1 Dosage)
DMdirect	Dosage – direct input	Activation of direct dosage via the (E), (+)- und (−)- keys, without having to go into the menu. Start of input by simultaneously pressing of (> 3sec) the (+)- and the (−)- keys. Unit set as in DM-Unit. yes: Direct input of the dosage activated by keys (default). no: Input of dosage only possible in the menu.
ICNT =0?	Set interval counter to 0	The interval counter only counts dosage processes that have been carried out completely. yes: Interval counter = 0 no: no action
TA-Unit	Total quantity display Unit	Total quantity display unit mL, L, m^3, gal, mgal, UU (User Unit, see → UserUnit.)
TA =0?	Set total quantity display to 0	The total quantity meter counts the total flow quantity (also the non-dosed flow). yes: Total quantity meter = 0 no: No action

ZED-D

7.8 User alignment and Service-Settings

| | DF-...DLxxx / Model-...GxxR | ZED-D | Configurationlevel ZED-Devices Activation with PW = 6571 |

Level 1
Choose parameter-groups

Level 2
Display parameter, choose functions

Level 3
Enter/change values, carry out functions

Operating Mode
> MEASURING <   ←(E)

(▲)↑

CAL USER   (e)→ / ←(E)

(▼)↓

CAL Freq
20,27578   (e)→ / ←(E)

(▼)↓ (▲)↑

FlowVal
50,0   ←(E)

(▼)↓ (▲)↑

FlowUnit
L/m   ←(E)

(▼)↓ (▲)↑

Freq.Val
200,0 Hz   ←(E)

FLOWVALUE
INPUT   (e)→

(e)↓

SELECTION
mL/m...GPH   (e)→

(e)↓

FREQUENCY
INPUT   (e)→

(e)↓

CALCULATE
Calibration Fakt.

(▼)↓ (▲)↑

CAL Vol.
39000,12   (e)→ / ←(E)

(▼)↓ (▲)↑

PulseCnt
1800   (e)→ / ←(E)

(▼)↓ (▲)↑

Vol.Val
10,5   ←(E)

(▼)↓ (▲)↑

Vol.Unit
L   ←(E)

COUNTING
PULSES   (e)→

(e)↓

VOLUME
INPUT   (e)→

(e)↓

SELECTION
mL...gal   (e)→

(e)↓

CALCULATE
Calibration Fakt.

(▲)↑

SERVICE   (e)→ / ←(E)

SecCode
Input   (e)→ / ←(E)

VALUE INPUT   (e)→ / ←(E)

(▼)↓ (▲)↑

SecCode
change   ←(E)

VALUE INPUT   (e)→ / ←(E)

(▼)↓ (▲)↑

Save Prm
no   ←(E)

Save Prm
yes   (e)→ / ←(E)

Save Prm
no   (▲)→ / ←(▼)

(▼)↓ (▲)↑

Load Prm
no   ←(E)

Load Prm
yes   (e)→ / ←(E)

Load Prm
no   (▲)→ / ←(▼)

(▼)↓ (▲)↑

Restore
Default   ←(E)

VALUE INPUT   (e)→ / ←(E)

	USER CALIBRATION
Menu Item	**Function / Explanation**
CAL Freq*	Calibrate by entering frequency and flow. In the menu item `CAL Freq` The bottom line always shows the current pulse value of the User calibration. Calibration process: a) `FlowVal` Enter nominal flow value of the sensor. > (e) press > b) `FlowUnit` Enter unit for flow value. > (e) press > c) `Freq.Val` Enter nominal frequency > finish with (e). The new pulse value of the User calibration. is calculated from the three values and saved as user calibration for the flow measurement. e.g. 20.2757 pls/litre.
CAL Vol.	Calibration process using impulse counting and volume input (cc procedure). In the menu item `CAL Vol.` The bottom line always shows the current pulse value of the User calibration.. Calibration process: a) `PulseCnt` measures number of impulses (e) press > start counter (impulses are counted) > (e) press > stops counter. b) `Vol.Val` Enter measured volume value > (e) press. c) `Vol.Unit` Enter unit for volume value > finish with (e). The pulse value of the User calibration.is calculated from the three values and is saved as the user calibration for the flow measurement. e.g. 3900,5 pls./L.

*) CAL Freq – Only possible with ZED devices.

Note: With ZED devices it is necessary to enable the device-specific parameter input in the menu Item `SecCode` in the menu `SERVICE` in order to activate the `CAL USER` function.

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SERVICE		
Menu Item	**Parameter / Function**	**Explanation / Values / Other**
SecCode Input	Enter security code.	Input of 4-digit security code and enablement of the parameter change. The following passwords have been defined: 3461 – General menu release 6571 – Activates the device-specific parameters (only ZED devices)
SecCode change	Change security code	Define or change security code for the first time or change. If no code (= 0000) has been set, then the parameter values set are unsecured!
Save Prm	Save parameter record	Save current settings
Load Prm	Load parameter record	Restore saved settings (reload).
Restore Default	Reset to works default settings	Load initial setting with password 2541. The function is blocked when the sensor has been factory-calibrated (only ZED devices).

7.9 Error report

Error code	Reason	Reset
E102	UU User unit may not be ≤ 0	Correct parameter
E142	Distance between upper and lower analogue value too small (based on the actual flow)	Correct parameter
E143	Distance between upper and lower analogue value too small (based on the dosing amount)	Correct parameter
E162	Hysteresis too large	Correct parameter
E242	Frequency must be between 0,2 and 2000 Hz	Correct parameter
E245	Calculated pulse value out of valid range	Correct parameter
M100	Overflow (M103 has priority)	Acknowledge with PGM button
M103	Overflow while dosing	Acknowledge with PGM button
####	Value does not fit in the display	Choose suitable measuring unit

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8. Relay Functions

8.1 Dosing (REL S1) with correction amount & fine dosing (REL 2)
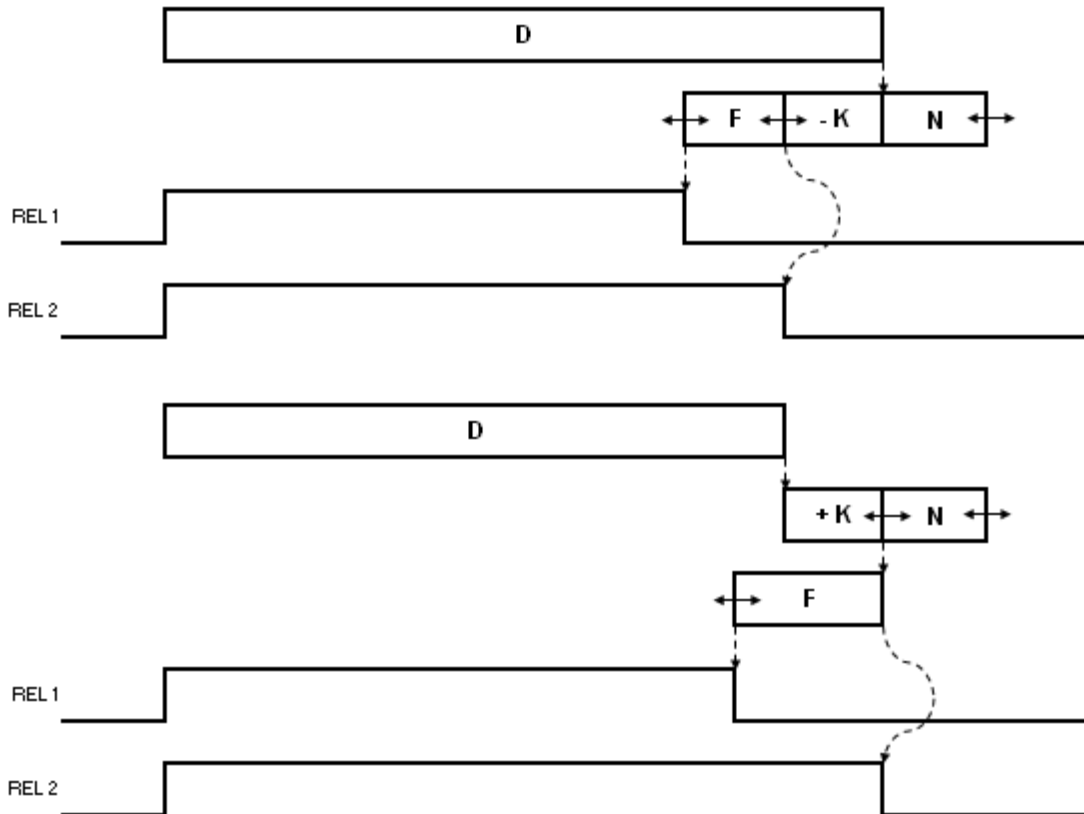
D - DAmount   dosing amount
F - FDAmount   fine dosing amount
-K - DMCorrct   correction amount (if negative)
+K - DACorrct   correction amount (if positive)
N -   follow-up amount
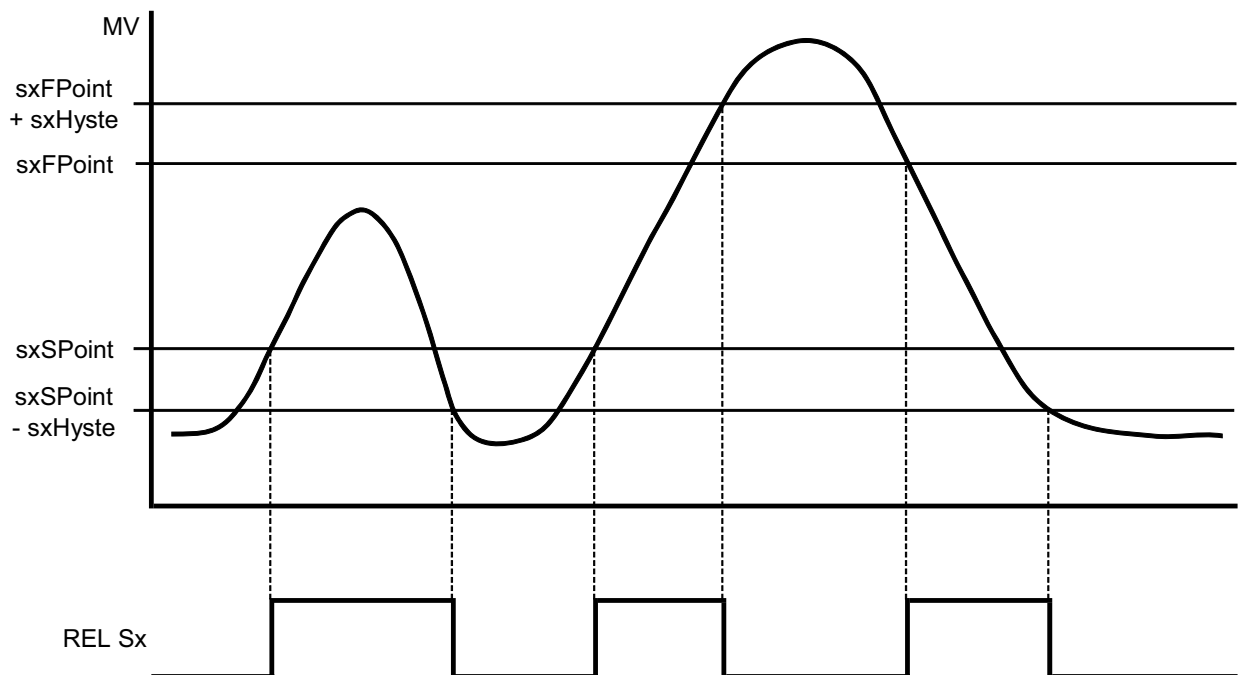
8.2   Dosing (REL S2) & Pump control (REL S1)
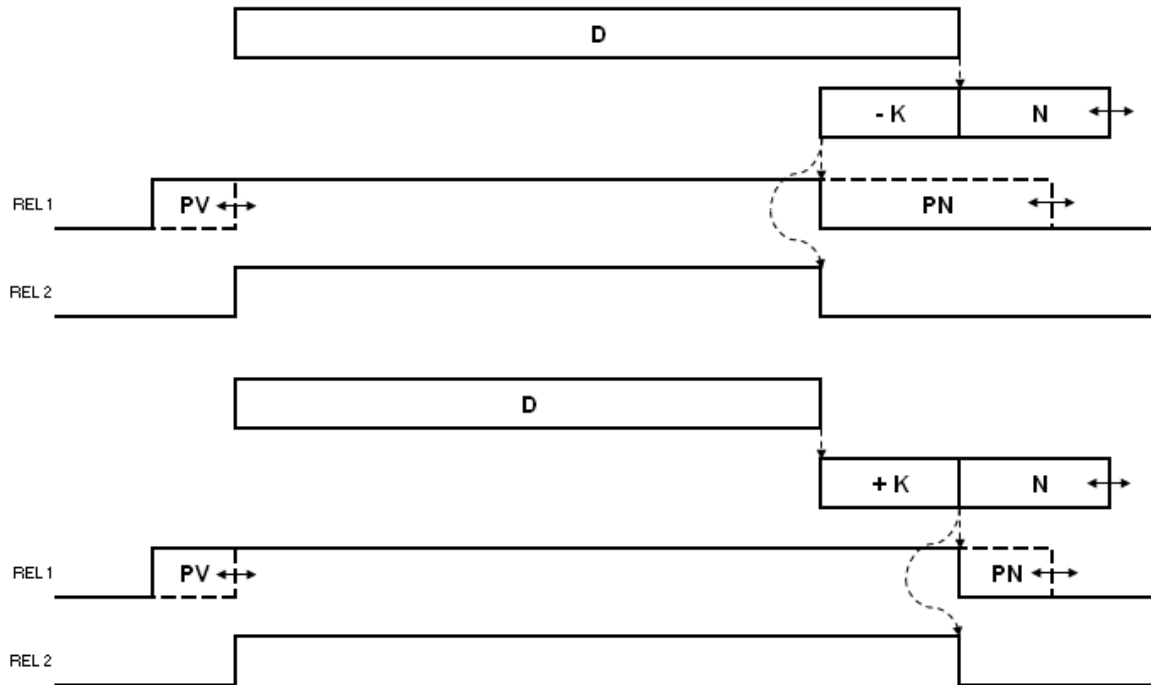
D -   DAmount   dosing amount
-K -   DACorrct   correction amount (if negative)
+K -   DACorrct   correction amount (if positive)
PV -   s1PumpAT   pump flow
PN -   s1PumpDT   pump backlash
N -   follow-up amount

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8.3 Switching characteristic limit value

MV

sxSPoint

sxSPoint
- sxHyste

REL Sx
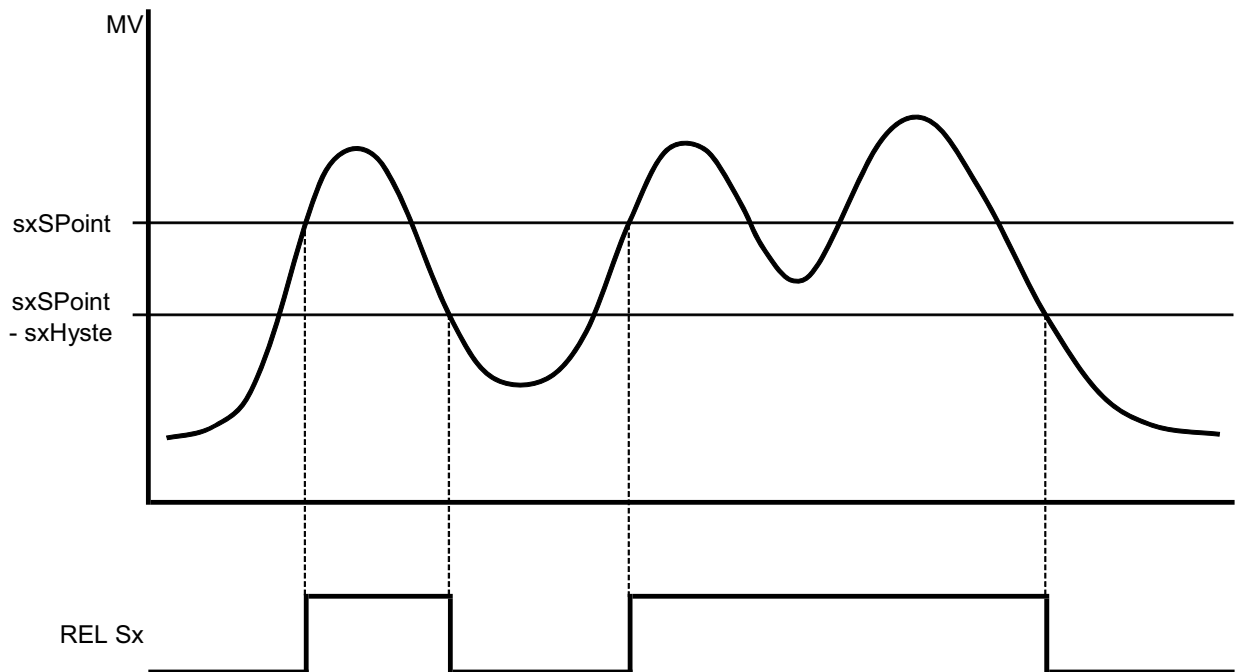
8.4 Switching characteristic window

MV

sxFPoint
+ sxHyste

sxFPoint

sxSPoint

sxSPoint
- sxHyste

REL Sx

9. Technical Information

Display:	2 x 8-digit alphanumeric, LCD module, illuminated
Display rate:	$1\ s^{-1}$
Flow display:	3- or 4-digit (XX.X, X.XX or XXXX)
Flow units:	mL/s, mL/m, L/s, L/m, L/h, m^3/m, m^3/h, GPM, GPH, user unit per h/min/s selectable
Quantity meter:	8-digit
Dosage:	5-digit
Quantity units:	mL, L, m^3, gal, mgal, user unit selectable
Measurement input:	0.2...2000 Hz (5...24 V_{DC}), TTL, PNP, NPN, Namur
Parameter input:	menu controlled, German or English
Parameter protection:	4-digit password
Control elements:	4 keys
Custom. comparison:	by entering the frequency and measured or in the Teach-In procedure (level calibration)
Control inputs:	start, stop, reset function
Relay outputs:	2 x changer max. 250 $V_{AC/DC}$ /2 A max. 5 A / 1000 VA
Voltage supply:	24 V_{DC} ±20 %, approx. 80 mA or 90...250 V_{AC} / max. 3 VA
Analogue output:	0(4)-20 mA Load: max. 500 Ω (300 Ω at AC-Supply) or 0-10 V (Load: >100 kΩ)
Apparent power:	15 V (at 24 V_{DC}) / max. 50 mA 12 V (AC-supply) / max. 50 mA
Ambient temp.:	-20...+70 °C
Dimensions:	96 x 96 x 109 mm (LxWxD) incl. screw clamp (control panel installat.) 117 x 117 x 127 mm (LxWxD) (field casing)
Aperture size:	$92+^{0.8}$ x $92+^{0.8}$ mm (control panel installation)
Casing material:	fibreglass reinforced Noryl, (control panel installation) powder coated aluminium/PA 66 (field casing)
Protection type:	IP 40 on front clamp IP 00 (control panel installation) IP 65 (field casing)
Mounting:	mounting clip Form B (DIN 43 835) (control panel installation) wall and pipe mounting (field casing)
Connection:	plug-in terminal strip (control panel installation) cable connection (field casing)
Weight:	approx. 360 g (control panel installat.) approx. 1240 g (field casing)

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## 10. Order Codes

(Order example: **ZED-DF10 KS 4R P**)

| Supply	Model	Electrical connection	Analogue output	Casing
90-250 V_{AC}	**ZED-DF10**			**P** = control panel installation 96x96 mm
24 V_{DC}	**ZED-DF13**	**KS** = terminal strip (control panel installation) **MS** = cable connection M 18 (Feldgehäuse)	**4R** = 0(A)-20 mA **1 R** = 0-10 V	**F** = field casing 116 x116 mm **S** = field casing with wall mount, infinitely variable pivotable **R** = field casing with pipe mounting

The order details of a ZED electronic in combination with a flow sensor can be found in the data sheet of the measuring device.

11. Dimensions

ZED-D Control panel installation (casing P)
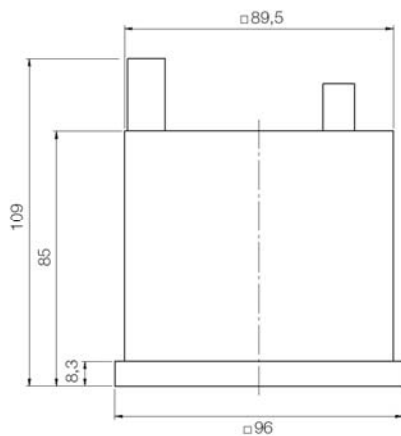
ZED-D field housing
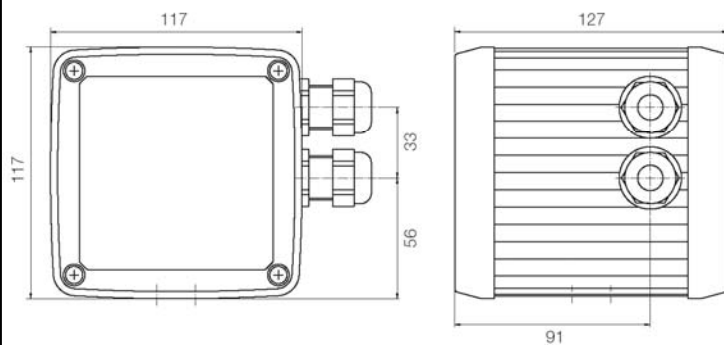
12. Declaration of Conformance

We, KOBOLD Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Dosing Electronic   Model: ZED-D

to which this declaration relates is in conformity with the standards noted below:

EN 61326-1   2006-10
Electrical equipment for control and instrumentation technology and laboratory use – EMC-requirements (industrial area)

DIN EN 61010-1   2002-08
Safety requirements for electrical measuring-, control- and laboratory instruments.

EN 60529, DIN VDE 0470-1   1992-11
Protection type housing (IP-Code)

Also the following EWG guidelines are fulfilled:

89/336 EEC   EMC Directive
73/23 EEC   low voltage Directive

Hofheim, 12. Nov. 2007

H. Peters
General Manager

M. Wenzel
Proxy Holder