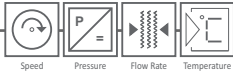


INSTRUCTION MANUAL IM 324 E

Device: Flow Computer GDR 1501
Content: Instruction manual
Rev. No.: IM 324 E V0.1-2020-02-24-FW816

Rev.-Nr.: IM 324 E V0.1-2020-02-24-FW816



User information

- Prior to installing the equipment or before attempting initial start-up, please read this manual thoroughly.
- Please ensure to observe all information and warnings provided in this manual.
- The serial number of the equipment can be found on the identification plate. You will need this information when ordering spare parts. The plate is attached to the outside of the device.
- Installation, start-up and maintenance may only be performed by an electrician. The local guidelines of the place of installation have to be observed.
- Maintenance may only be performed under dead-voltage conditions for personal security reasons.
- In order of guarantee operational safety, only the manufacturer's original spare parts shall be installed.
- Operating the equipment for purposes other than its intended use shall void all warranty claims and product liability. Noncompliance with the intended use refers to but is not limited to improper installation, start-up, operation, maintenance and neglecting the information provided in this manual.
- The device must be integrated into the lightning protection concept of the plant.



Please ensure to operate this device only in accordance with this manual. Departure from these instructions will void and nullify all warranty claims and jeopardizes the operating safety of the device.

We reserve the right to engineering changes, which may necessitate deviations from the current data provided in this manual. Should you require additional information or questions arise that are not sufficiently covered in this manual, please contact us at the following address:

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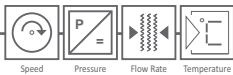
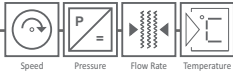


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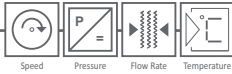
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1 Common

The flow computer of the GDR 1501 series are used to calculate the current gas quantity. The actual amount of gas can be displayed in cubic meters or liters on an hourly or minute basis. The total quantity counter can be output in cubic meters or liters. The counter can display up to 100 million cubic meters. The resolution is 0.1 litres.

The devices process an input signal regarding the gas flow. For connection three different types of inputs are available. The gas flow meters GD 300 / GD 500 can be connected directly to the platinum wire sensor in the NON-ATEX area. In the ATEX area, the pulse input is connected via the HB 300 Ex. An input for open collector and reed relays is integrated to connect third-party products.

The current output gives the current flow rate per hour or minute and the solid state relay passes the defined pulses to a superior PLC system.

With the **ECO** and **PRO** version the normalized flow per hour or minute can be calculated and transferred with the current output. The standardization can be calculated according to the standards DIN 1343, DIN 6358, DIN ISO 2533, DIN 102 / ISO 1-1975.

The required values of pressure and temperature are defined in the **ECO** version with fixed values. The **PRO** version provides two additional current inputs for a pressure and temperature sensor.

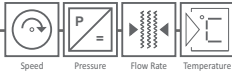
All parameter settings / configuration can be set using the touch keypad.

2 Technical data

The device series GDR 1501 is based on the modular principle. This means that the inputs and outputs as well as software options can be optimally adapted to the individual requirements of the system. The section gives you an overview of the available variants and options.

2.1 Input

INPUT 1 FLOW RATE	<ul style="list-style-type: none"> - Input for platinum wire sensor (GD 300/GD 500) (only NON-ATEX) or - Impulse input for HB 300-R000000 (GD 300/GD 500), HB 300 Ex-R000000 (GD 300 Ex/GD 500 Ex) or - Third party devices with Open-Collector, Reed relay, input frequency up to 1 kHz
INPUT 2 TEMPERATURE	<ul style="list-style-type: none"> - 4 - 20 mA, 2 wire = -100 - 999 °C (12 bit) or - Pt100, 3 wire (12 bit)
INPUT 3 PRESSURE	4 - 20 mA, 2 wire = 0 - 1000 bar (12 bit)



2.2 Output

OUTPUT	4 - 20 mA = 0 - (x) Bm ³ /h, l/h, Bm ³ /min, l/min (only Eco and Pro: Nm ³ /h, NL/h, Nm ³ /min, NL/min) flow rate (freely programmable), input resistance 500 Ohm
--------	---

2.3 Relays

K1:	Relay (NO) freely programmable <ul style="list-style-type: none"> - pulse output (0,1, 1 oder 10 oder 100 m³ per impulse, freely programmable), counter output quantity <u>or</u> - limit value <u>or</u> - device status
K2:	Relay (NO) freely programmable <ul style="list-style-type: none"> - pulse output (0,1, 1 oder 10 oder 100 m³ per impulse, freely programmable), counter output quantity <u>or</u> - limit value <u>or</u> - device status

2.4 Electrical values

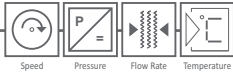
ACCURACY	± 0,05 % EW ± 1 Digit bei 23°C
POWER SUPPLY	24 V, DC ± 3 V

2.5 Environmental influences

AMBIENT TEMPERATURE	-10 bis +60°C
STORAGE TEMPERATURE	-20 bis +85°C
TEST VOLTAGE	3 kV
HUMIDITY CLASS	E-DIN 40040
ELECTROMAGNETIC COMPATIBILITY	acc. to EN 50082-2

2.6 Display, housing, weight

DISPLAY	4 rows à 20 characters
STANDARD HOUSING WALL MOUNTING	dimensions: 151 mm (W) x 125 mm (H) x 60 mm (D) material: polycarbonate UL 94 V0 protection class: IP 65 weight: approx. 600 g
HOUSING OPTIONS	<ul style="list-style-type: none"> - mounting parts for DIN rail mounting - fixing parts for direct mounting on gas flowmeter GD 300 (only NON ATEX applications)



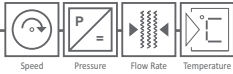
3 Device codes

	BASIC	Eco	PRO
GDR 1501-xxxx-0000	0241	0249	0041
Inputs			
1: Flow rate: input for platinum wire sensor (GD 300/GD 500) (only NON-ATEX) <u>or</u>	•	•	•
1: Flow rate: impulse input for HB 300-R000000 (GD 300/GD 500), HB 300 Ex-R000000 (GD 300 Ex/GD 500 Ex) <u>or</u>	•	•	•
1: Flow rate: Third party devices with Open-Collector, Reed relay, input frequency up to 1 kHz	•	•	•
2: Temperature: 4 - 20 mA, 2 wire = -100 - 999 °C (12 bit) <u>or</u>		v	•
2: Temperature (Pt100): 3 wire (12 bit)		v	•
3: Pressure: 4 - 20 mA, 2-Leiter = 0 - 1000 bar (12 bit)		v	•
Output			
1: 4 - 20 mA = 0 - (x) Bm ³ /h, l/h, Bm ³ /min, l/min (only Eco and Pro: Nm ³ /h, NL/h, Nm ³ /min, NL/min) flow rate (freely programmable), input resistance 500 Ohm	•	•	•
Relay			
K1 (NO) freely programmable - pulse output (0,1, 1 or 10 or 100 m ³ per impulse, freely programmable), counter output quantity <u>or</u> - limit value <u>or</u> - device status	•	•	•
K2 (NO) freely programmable - pulse output (0,1, 1 or 10 or 100 m ³ per impulse, freely programmable), counter output quantity <u>or</u> - limit value <u>or</u> - device status	•	•	•

V = virtual input for freely programmable fixed values

Table 1: Device codes

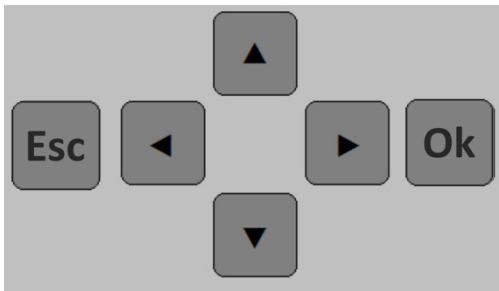
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4 Operating overview

4.1 Touch keypad

The GDR 1501 is programmed directly on the device using the capacitive touch keyboard.



	left
	right
	upwards
	downwards
	cancel, escape
	confirm, enter

Figure 1: Touch keypad

The menu is guided using the buttons:

4.2 Display: Device start

The start-up screen appears when the device is started. After approx. 10 seconds, the device automatically switches to the first LIVE screen.

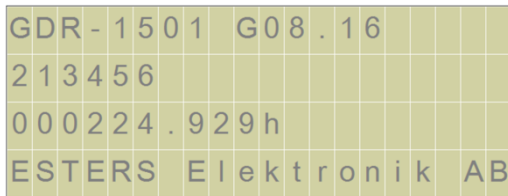
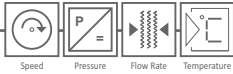


Figure 2: Display device start

The GDR 1501 differentiates between two screen types, the so-called LIVE screen including error messages (ERROR screens) and the PARAMETER screen.



4.3 Display: LIVE screen

Depending on the device parameterization, corresponding LIVE screens are displayed in relation to the current measured values and settings relating to the connected sensors. Screens that are not relevant to the operating mode of the device are hidden accordingly. The display interval can be set by the user.

A setting of 0 prevents the automatic switchover¹.

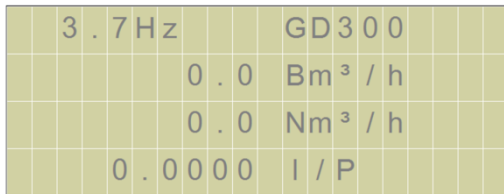


Figure 4: Measurement value flow rate

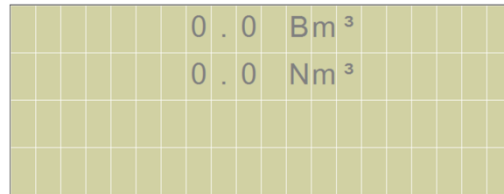


Figure 3: Meter reading

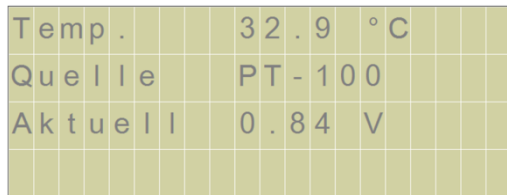


Figure 5: Measurement value temperature

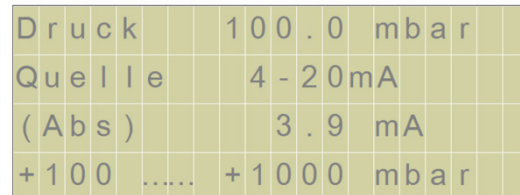


Figure 6: Measurement value pressure

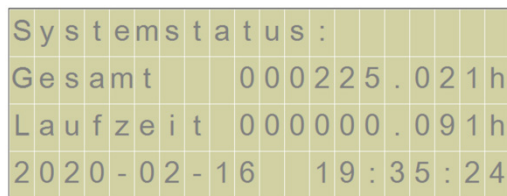




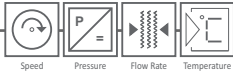


Figure 7: System status

Navigation

		Switch between LIVE screens
		Back to first LIVE screen
		Hold for some time Opens PARAMETER screen

¹ Parameter # 1207 display time (System >> display time) determines the intervals at which the screen changes to the next one. If the parameter is set to 0, automatic switching is deactivated.



4.4 Display: ERROR Screens (Error messages)

In case of an error, an ERROR screen is appended to the LIVE SCREEN for each active error. If the automatic switching of the LIVE SCREENS is deactivated, the appropriate error screen is automatically displayed when an error occurs. If the error is gone, the system switches back to the last LIVE SCREEN.

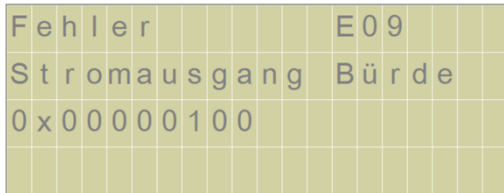


Figure 8: Error screen

4.5 Display: PARAMETER screen

The device is parameterized on the PARAMETER screen. Starting from the LIVE screen, you can reach the PARAMETER screen by holding down the ENTER key.

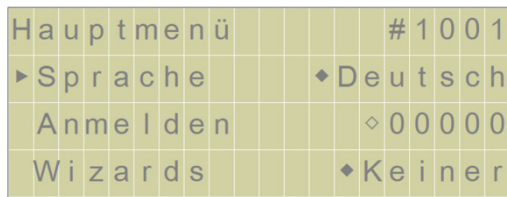
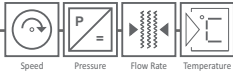


Figure 9: Main menu (PARAMETER SCREEN)

The menu opens with hierarchy level 1. At this level, the user can make all the necessary settings for commissioning. To protect the parameters, the user can define a pin (PIN1). The pin assigned ex works is: 10000.



4.5.1 Explanations of the menu

The main menu is shown as a tree structure. Tree nodes can be setting values (PARAMETERS), commands (COMMANDS) or submenu items. Every parameter and every menu tree node have a unique ID code. A parameter can be "open" (adjustable) or closed (locked). This is indicated by a symbol (open or closed diamond).

Legend:

1 0 0 1

Unique parameter ID or menu node ID

ID Code ◊ 0 0 0 0 0

Open/ adjustable parameter

f l o w T [1] . y ◆ 2 0 . 0 0 0

Closed/ locked parameter

▶ A b m e l d e n

Command

▶ S y s t e m »

Sub menu

Navigation:



Back one menu level



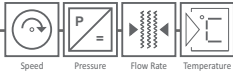
Hold for some time
Leaves menu and switches back to LIVE screen



Switch menu item with up- or downward



Opens a sub menu, starts a command or edits a parameter



Change parameter

Navigate according to the previous explanations to the desired parameter that you want to adjust and confirm with Enter. The edit mode appears.

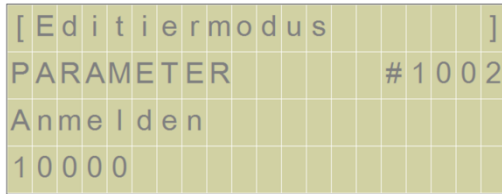








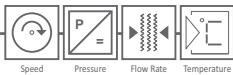


Figure 10: Edit mode

Navigation:

-   Adjust digits
-   Move cursor
-  Save changes and leave edit mode
-  Abort without saving changes and leave edit mode
-  Hold for some time
Reload value
-  Hold for some time
Load default value

After exiting the edit mode with "ENTER" you return to the previous position in the menu tree. When editing a "linked" parameter, the next following parameter of the chain is opened for editing instead (e.g. time-year, time-month, time-day ... time-minute). The chain is interrupted if a parameter is not saved ("ESC").



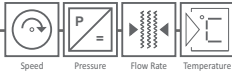
5 Menu structure and Parameter IDs

ID	MAIN MENUE STRUCTURE	READ	WRITE
#1001	Language ²	x	
#1002	Login ³	x	x
#1007	Logout	x	x
#1005	Wizards	x	
#1006	Function ⁴	x	x
#1200	System	x	
	#1201 Operating mode #1202 Display #1204 LED #1207 Display time #1210 Time&Date #1211 Year #1212 Month #1213 Day #1214 Day of week #1215 Hour #1216 Minute	x	
#1500	Process	x	
	#1206 Flow A #1208 Flow B #1510 Temperature (Temp) #1511 Source #1512 Fixed value °C #1513 Min. value °C #1514 Max. value °C #1520 Pressure #1521 Source #1522 Fixed value mbar #1523 Min. value mbar #1524 Max. value mbar #1525 Relative/ absolut #1526 Hydrostatic pressure #1530 Standard #1531 Ref. Temp. °C #1532 Ref. Pressure mbar	x	

² The language can only changes in hierarchy level 2, the assigned (ex work) PIN is: 10000.

³ Login (# 1002) is a special parameter, it is used to enter a PIN code to increase the hierarchy level

⁴ Function (# 1006) of special parameters, you can use this to jump directly to the parameter or menu node using the ID.



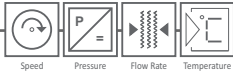
#1600	Relay	X	
	#1203 Pulse weight cm ³ /puls	x	
	#1601 Pulse length ms		
	#1602 Pulse length ms		
	#1610 Relay 1		
	#1611 Relay 2		
#1800	Current Output	x	
	#1801 Active	x	
	#1810 Flow		
	#1811 Flow (4mA) l/h		
	#1812 Flow (20mA) l/h		

Table 2: Menu structure and Parameter IDs

6 Device error list

CODE	GERMAN	ENGLISH
E01	EEP Hardware	EEP hardware
E02	Parametersatz	Param data
E03	Seriennummer	Serial number
E04	Eingang Überlauf	Input overflow
E05	Ausgang Überlauf	Output overflow
E06	Empfangspuffer	RX buffer
E07	Empfangsdaten	RX data
E08	Sensorbruch	Sensor bereak
E09	Stromausgang Bürde	Current output load
E10	Touch Hardware	Touch Hardware
E11	LCD Hardware	LCD Hardware
E12	RTC Hardware	RTC Hardware
E13	Uhrzeit Datenverlust	Time data lost
E14	Sensorbruch Temp.	Sensor fail temp
E15	Sensorbruch Druck	Sensor fail press.
E16	System param. 171x	System param. 171x

Table 3: Device errors



7 Connecting diagram and terminal allocation

TERMINAL	No.	
Platinum wire sensor #1	1	
	2	
HB 300-R000000/ HB 300 Ex/R000000 Third-party device #1	5	GND
	6	Signal
	7	+ 24 V
Power Supply 24 V/DC	11	GND
	12	+24 V
Relay: K2 (NO)	28	
	29	
Relay: K1 (NO)	30	
	31	

TERMINAL	No.	
Output: mA	32	GND
	33	+
Temperature (T): pt100	34	GND
	35	U1
	36	U2
Pressure (P): mA	37	+
	38	GND
Temperature (T): mA	39	GND
	40	+

Table 4: Terminal allocation

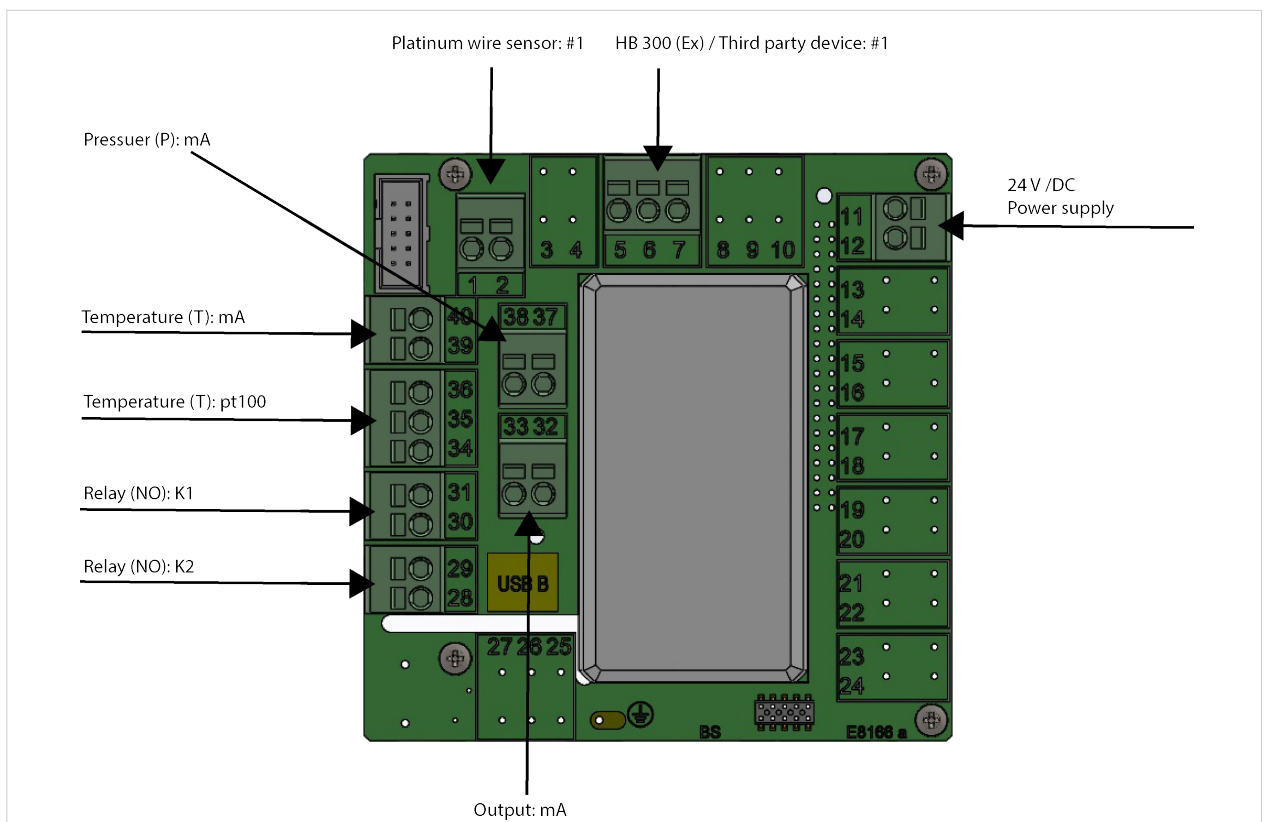
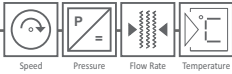


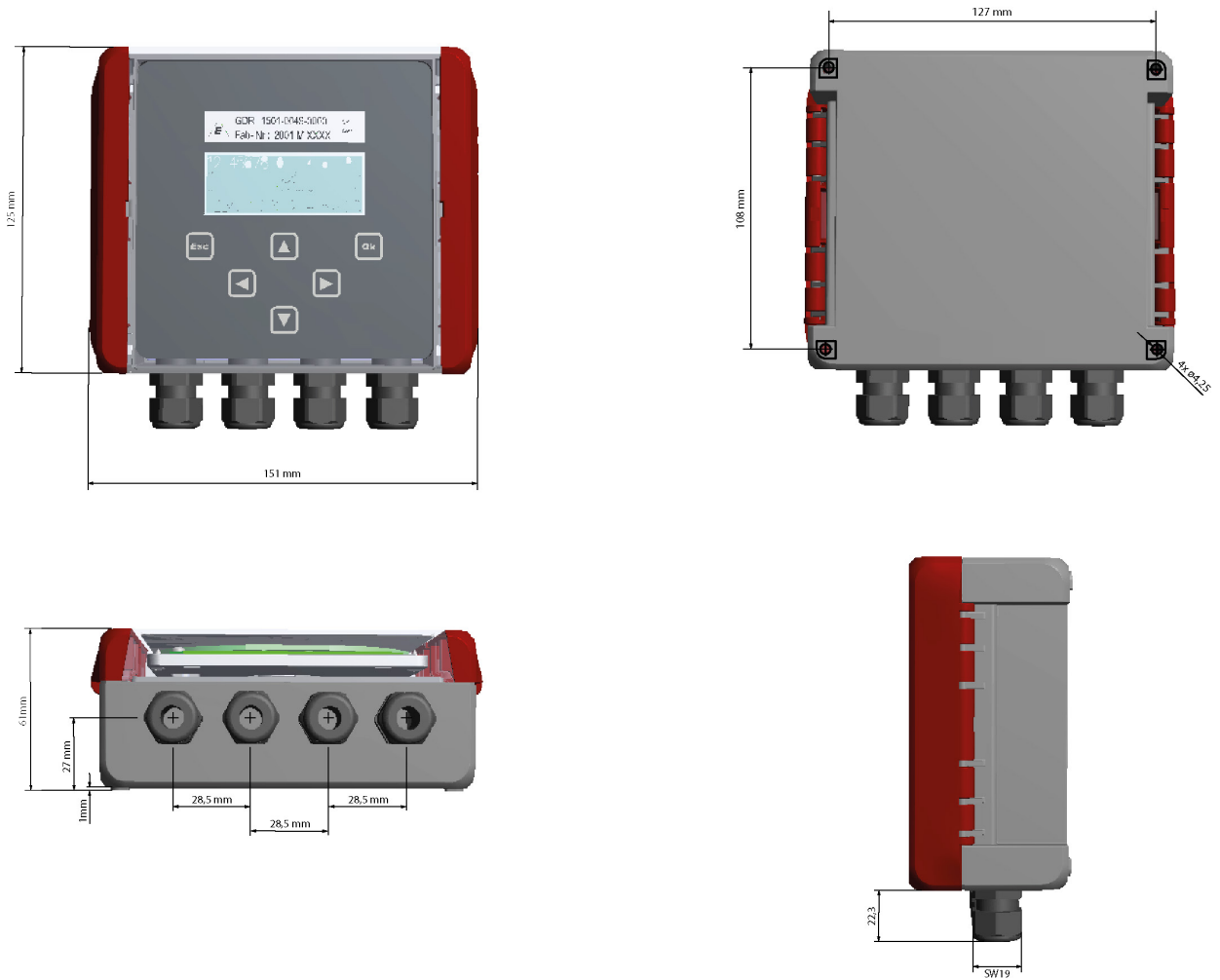
Figure 11: Terminal allocation

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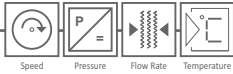
8 Housing Dimensions

8.1 Housing for wall mounting



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Figure 12: Dimension housing, wall-mounting



8.2 Housing with DIN rail-mounting (option HT)

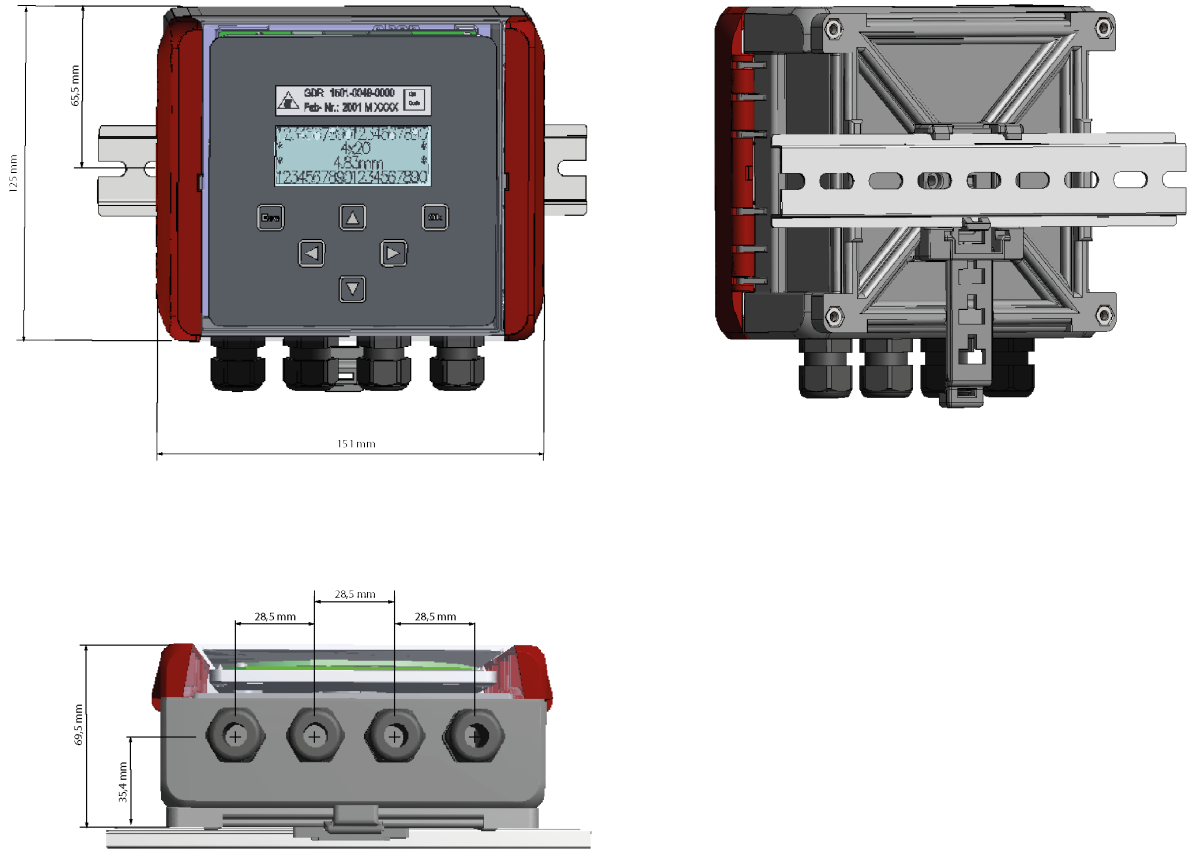


Figure 13: Dimension housing, DIN rail-mounting

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