End-of-Life
successor: GDR 1501

Speed | Pressure | Flow Rate | Temperature

LP Flow Computer GDR 1404

direct calculation of the gas consumption in Nm³

Rev.-Nr.: GDR 1404-DS 307 E-V1.1 2017-08-10

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End-of-Life
successor: GDR 1501

Speed | Pressure | Flow Rate | Temperature

General description

The series GDR 1404 is characterized by direct calculation of the gas consumption in Nm³.

According to the configuration and the measuring method, the device collects data from up to 4 sensors (flow rate, pressure, temperaturee and hydrostatic pressure) which are necessary for the calculation in Nm³. If one of these values is not measured by a sensor, the Nm³ can be calculated with an adjustable fixed value.

The parameterisation of the device is carried out by PC using the software Esters Energy Efficiency und Device Manager (E3DM) via ethernet or USB interface

GDR 1404 with option Ethernet TCP/IP

- optional 4 more measured values for data acquisition
- optional data transfer via PROFIBUS DP, Modbus RTU, Modbus TCP, Ethernet TCP/IP
- optional measurement of partial gas quantity to operate over SPS
- optional input for measured value clearing
- integration into IT-networks using Ethernet TCP/IP to remote data transmission and devicecontrol
- at network loss persistent data management of the total counter reading for a period of 5years
- up to 12 devices curable through internal CANBUS
- optional connection of a gas analysis using RS 232 oder mA input (e.g. Awite, Bieler & Lang, Chemec, Esders, ExTox, Fresenius, Pronova, Union Instruments)
- Calculation according to DIN 1343, DIN 6358, DIN ISO 2533, DIN 102/ISO 1-1975
- integrated recorder to log measured values in a ring buffer for fast identification of faults during operation
- storage of logged data in an external SQL-database using the Energy Management and Configuration Software E3DM
- visualisation of data in time series using the Energy Management and Configuration Software E3DM
- integrated master display for monitoring of actual measured values (individually programmable) in E3DM

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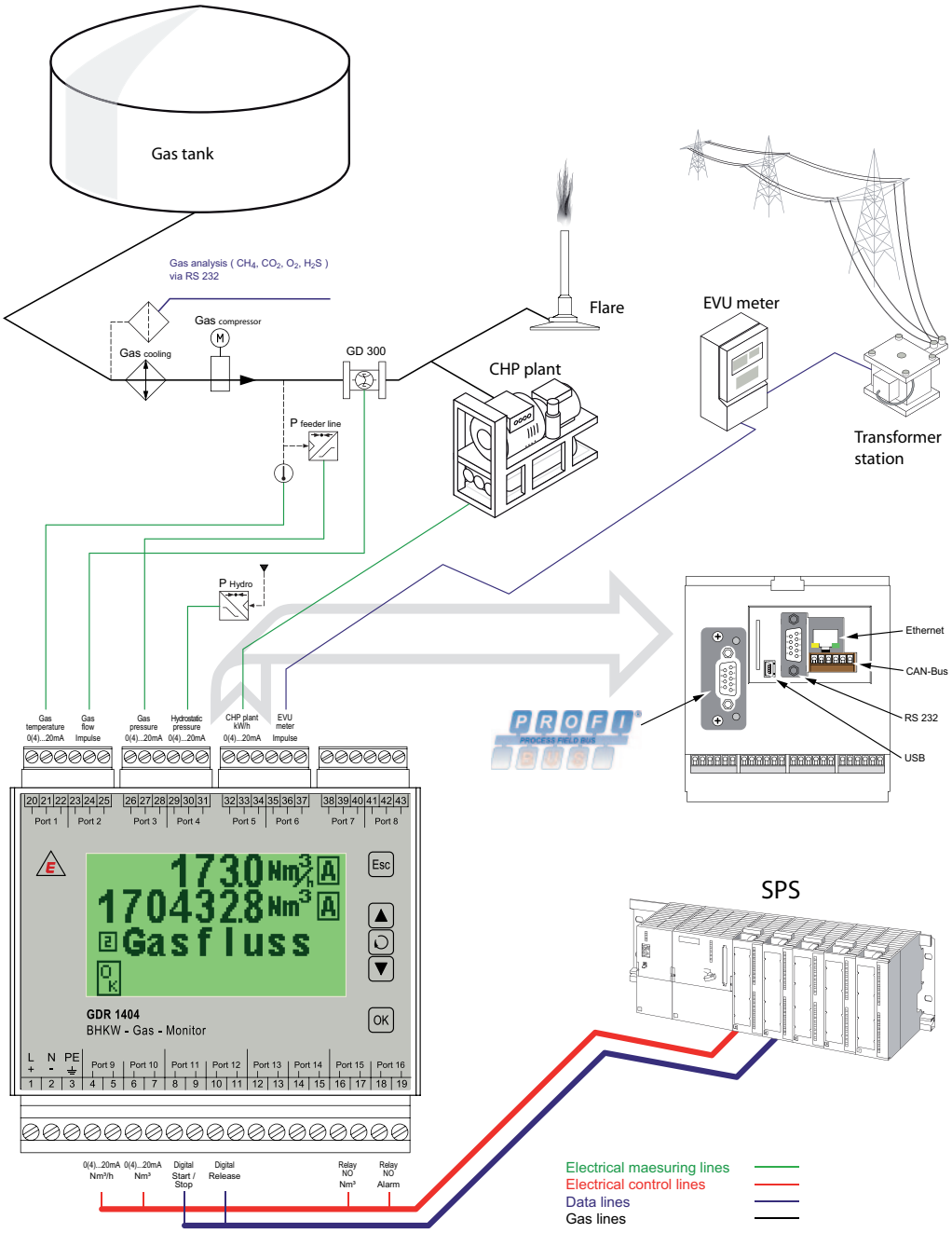
Application example



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Technical details

The devices of the series GDR 1404 are designed as a modular system. This system enables the configuration of inputs, outputs, interfaces and software options which are required according to the individual requirements of the installation and application. This section provides an overview of all technical information of the series.

MessInput	
Input 1 Temperature	0 (4) - 20 mA, 2-/3-wire (temperature) = -100 - 2000 °C (14 bit), input resistance < 100 Ohm using 20 mA
Input 2 Flow rate	0 (4) - 20 mA (flow rate) = 0 - 20.000 m³/h (14 bit), input resistance < 100 Ohm bei 20 mA oder pulse input for gas flow meter GD 300/GD 500 (Flow Rate), up to 1 kHz at 5 % duty cycle, pulse length > 500 ms
Input 3 Pressure	0 (4) - 20 mA, 2-/3-wire (pressure) = 0 - 30 bar (14 bit), input resistance < 100 Ohm using 20 mA
Input 4 Ambient pressure	0 (4) - 20 mA, 2-/3-wire (ambient pressure/hydrostatic pressure) = 0 - 30 bar (14 bit), input resistance < 100 Ohm using 20 mA
Input 5	0 (4) - 20 mA, 2-/3-wire, input resistance < 100 Ohm
Input 6	0 (4) - 20 mA, 2-/3-wire, input resistance < 100 Ohm
Input 7	0 (4) - 20 mA, 2-/3-wire, input resistance < 100 Ohm
Input 8	0 (4) - 20 mA, 2-/3-wire, input resistance < 100 Ohm
Input 11	digital gate input, partial quantity (start/stop)
Input 12	digital gate input, release

Output	
Output 1	0(4) - 20 mA = 0 - (x) Nm³/h flow rate (freely programmable), load 500 ohm
Output 2	0(4) - 20 mA = 0 - (x) Nm³ partial quantity (freely programmable), load 500 ohm

Relay (standard)	
K1: Counting output	Relay 1 or 10 or 100 Nm3 per pulse (freely programmable), counting output quantity, NO switch
K2: Device status	If an instrument failure occurs the relay is released. Superior systems are able to detect a failure in the measuring system through this signal (NO switch). Load 250 V, AC, 1,5A inductive

Electrical values	
Accuracy	± 0,05 % EW ± 1 digit at 23 °C
Power supply	24 V, DC ± 3 V

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Environmental influences	
Ambient temperature	-10 bis +55°C
Storage temperature	-20 bis +85°C
Test voltage	3 kV
Humidity class	E-DIN 40040
Electromagnetic compatibility	acc. to EN 61000

Display, Housing, Weight	
Display	6-digit LCD-display für flow rate in Nm³/h (resolution 0,1 Nm³) 8-digit LCD-display in Nm³ (resolution 0,1 Nm³) display height: 8 mm
Standard housing rail mounting	dimensions: 100 mm (B) x 100 mm (H) x 107 mm (T) protection class: IP 20 net weight: approx. 480 g
Protective housing wall mounting (Option M104)	dimensions: 343 mm (B) x 330 mm (H) x 210 mm (T) with tab and high-strength cable gland protection class: IP 65
Protective housing with ex-zone wall mounting (Option M105)	dimensions: 385,5 mm (B) x 487 mm (H) x 210 mm (T) with tab and high-strength cable gland protection class: IP 65

Software & Recorder	
Gasanalysis (optional)	data transmission of connected gas analysis (Awite, Bieler & Lang (GMC Biogas 08), Chemec (BC20, BC30), Esders (Goliath Biogas), ExTox (ET-4D2, ET-8D), Fresenius Umwelttechnik (BioBasic), Pronova (SSM6000), Union Instruments (INCA, Kaloriemeter)
E3DM	Esters Energy Efficiency and Device Manager Energie-Management- and Configurationssoftware for Microsoft Windows (32-Bit)
Recorder (optional)	ring buffer 4 GB integrated recorder to log measured values in a ring buffer over a period of several years

Interfacen	
RS 232 (optional)	9-pin connection for connecting gas analysis system
USB	Mini USB-connection (5-pin, USB 2.0) or configuration and data transfer through PC
CAN-bus (optional)	internal communication of up to 12 curable devices
PROFIBUS-DP (optional)	data transmision via PROFIBUS-DP Protokoll
Modbus RTU (optional)	data transmision via Modbus RTU Protokoll
Modbus TCP (optional)	data transmision via Modbus TCP Protokoll
Ethernet TCP/IP (optional)	integration into the IT network for configuration and data transfer by PC

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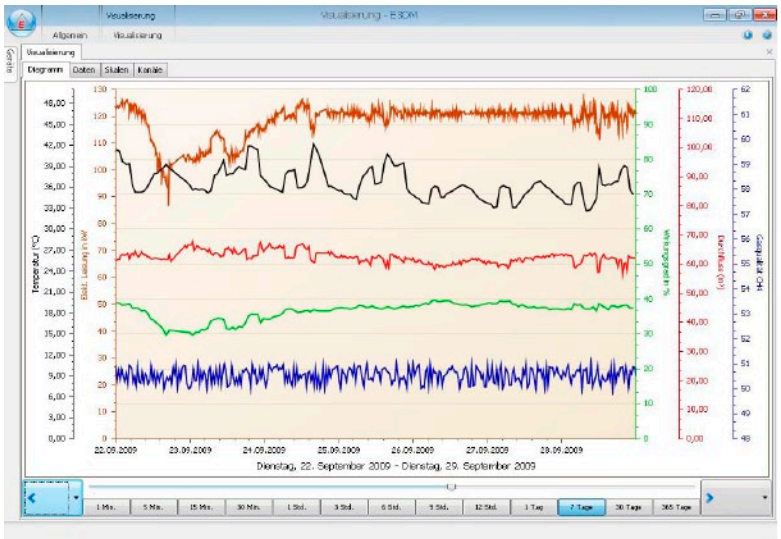
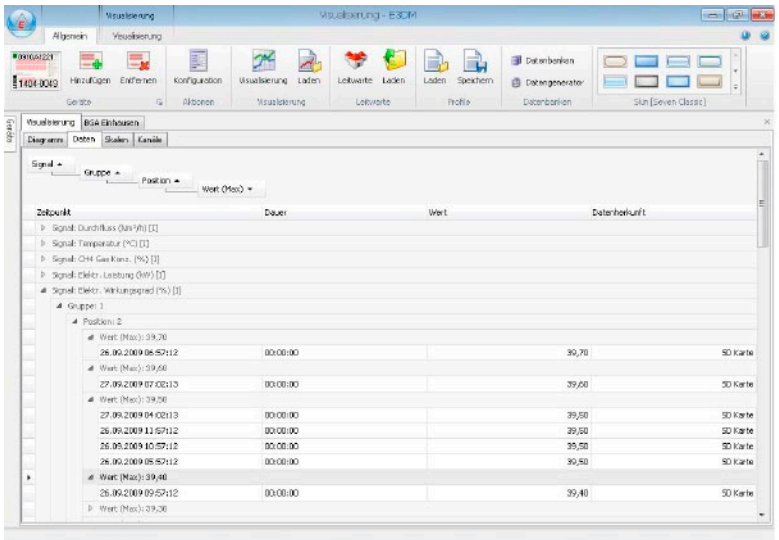
Software E3DM - Esters Energy Efficiency and Device Manager



The graphic visualization of the measured values continuously recorded in the ring buffer can be freely configurated by the user. In the illustration the following measured values are displayed:

- efficiency factor in %
  (Wirkungsgrad in %)
- flow (m3) (Flow rate m3)
- gas quality (CH4) (Gasqualität (CH4)
- electrical capacity in kW
  (elektrische Leistung in kW)
- temperature in °C (Temperatur in °C)



In the tabular visualization of the measured values continuously stored in the ring buffer the reported data can be assorted with multi-level column sort.

The illustration shows the data arranged according to signal and height of the measured values.

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In the master display the actual measured values are mapped. The amount of the displayed values and the graphical illustration can be adjusted individually.

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Order information

The ordering code consists of the device type GDR 1404 and an eight-digit code, which is devided into 2 parts with four points:

GDR 1404-xxxx-00yy

In the following tables the first four points are defined according to the desired equipment. The fifth and sixth positions are already defined by digit sequences. The last two digits define the content of functions (such as ring buffer, interfaces for industrial bus systems).

EXAMPLE:
GDR 1404-0049-001C M104

The LP Flow Computer has a pulse input for flow measurement, two inputs for pressure and temperature measurement, an input for hydrostatic pressure, a pulse input for the utility meter and the function for determining the efficiency. The unit is also equipped with the optional functions Profibus-DP interface, Ethernet TPC/IP interface, a 4 GB ring buffer and is built into the field housing M104 for wall mounting.

legend:
● hardware integrated
v virtual via software integrated (fixed value)

Devices with pulse input for flow measurement (GD 300, GD 500)

	ECONOMY		STANDARD				ADD. MEASURING CHANNELS							
GDR 1404-xxxx-00yy	0241	0249	0041	0049	005D	0069	0849	084D	1849	184D	0869	086D	1869	186D
INPUT														
1: 0 (4) - 20 mA, 2/3L temperature	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2: pulse, flow rate	●	●	●	●	●	●	●	●	●	●	●	●	●	●
3: 0 (4) - 20 mA, 2/3L pressure	v	v	●	●	●	●	●	●	●	●	●	●	●	●
4: 0 (4) - 20 mA, 2/3L ambient pressure	v	v	●	●	●	●	●	●	●	●	●	●	●	●
5: 0 (4) - 20 mA,							●	●	●	●	●	●	●	●
6: 0 (4) - 20 mA							●	●	●	●	●	●	●	●
7: 0 (4) - 20 mA									●	●			●	●
8: 0 (4) - 20 mA									●	●			●	●
OUTPUT														
9: 0 (4) - 20 mA = 0 - (x) Nm³/h flow rate		●		●	●	●	●	●	●	●	●	●	●	●
10: 0 (4) - 20 mA = 0 - (x) Nm³ part. quantity					●									
DIGITALE INPUT														
11: part. quantity (start/ stop)					●			●		●		●		●
12: release					●			●		●		●		●
INTERNE SOFTWARE														
integ. of gas analysis						●					●	●	●	●
K1 - K2: Relay	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Power supply: 24 V, DC	●	●	●	●	●	●	●	●	●	●	●	●	●	●

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Devices with mA-input for flow measurement (third-party products)

	Economy		Standard				Add. measuring channels			
GDR 1404-xxxx-00YY	0201	0209	0001	0009	001D	0029	0809	1809	0829	1829
Input										
1: 0 (4) - 20 mA, 2/3L temperature	●	●	●	●	●	●	●	●	●	●
2: 0 (4) - 20 mA, flow rate	●	●	●	●	●	●	●	●	●	●
3: 0 (4) - 20 mA, 2/3L pressure	V	V	●	●	●	●	●	●	●	●
4: 0 (4) - 20 mA, 2/3L ambient pressure	V	V	●	●	●	●	●	●	●	●
5: 0 (4) - 20 mA,							●	●	●	●
6: 0 (4) - 20 mA							●	●	●	●
7: 0 (4) - 20 mA									●	●
8: 0 (4) - 20 mA									●	●
Output										
9: 0 (4) - 20 mA = 0 - (x) Nm³/h flow rate		●		●	●	●	●	●	●	●
10: 0 (4) - 20 mA = 0 - (x) Nm³ part. quantity					●					
Digitale Input										
11: part. quantity (Start/Stop)					●			●		●
12: release					●			●		●
Interne Software										
integration of gas analysis						●			●	●
K1 - K2: Relay	●	●	●	●	●	●	●	●	●	●
Power Supply: 24 V, DC	●	●	●	●	●	●	●	●	●	●

Optional device funtions and housings

GDR 1407-xxxx-xxYC			
	0		without option
	1		interface PROFIBUS DP
	2		interface Modbus RTU
	4		interface Modbus TCP
		0	without option
		1	interface CAN-Bus
		4	interface Ethernet TCP/IP
		5	interface CAN-Bus, interface Ethernet TCP/IP
		8	ring buffer 4 GB (data logger)
		9	ring buffer 4 GB (data logger), interface CAN-Bus
		C	ring buffer 4 GB (data logger), interface Ethernet TCP/IP (Standard)
		D	ring buffer 4 GB (data logger), interface CAN-Bus, interface Ethernet TCP/IP

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Housing	
M104	field housing for wall mounting, protection class IP65
M105	field housing with Ex zone for wall mounting, protection class IP65

FIELD HOUSING M104 FOR WALL MOUNTING, IP 65

FIELD HOUSING M105 WITH EX-ZONE FOR WALL MOUNTING, IP 65

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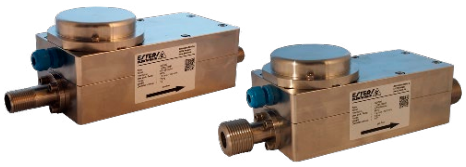
Fluidistor Gas Flowmeter GD 300

The Fluidistor Gas Flowmeter measures all technical and medical gases with a nominal width of DN 25 to DN 400 and a measurement range of 0,2 ... 20 ... 16.000 m^3/h.
Pressure: PN 10 - PN 25 - PN 40
Accuracy: ± 1,5 %

For further information see datasheet DS 312 E.



Compact Fluidistor Gas Flowmeter GD 500

The Compact Fluidistor Gas Flowmeter (stainless steel 1.4571) measures all technical and medical gases with a measurement range of 0,21 - 16,8 m^3/h (process connection G 1/2", G 1").
Pressure: PN 10 - PN 25 - PN 40
Accuracy: ± 1,5 %

For further information see datasheet DS 312 E.

Gas Analysis System Esters Goliath Biogas

Robust gas analysis with ATEX certification (mobile use) and integrated pump for the special use in the sector bio methane, landfill gas, sewage gas, mine gas and biogas.

For further information see datasheet DS 320 E.

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