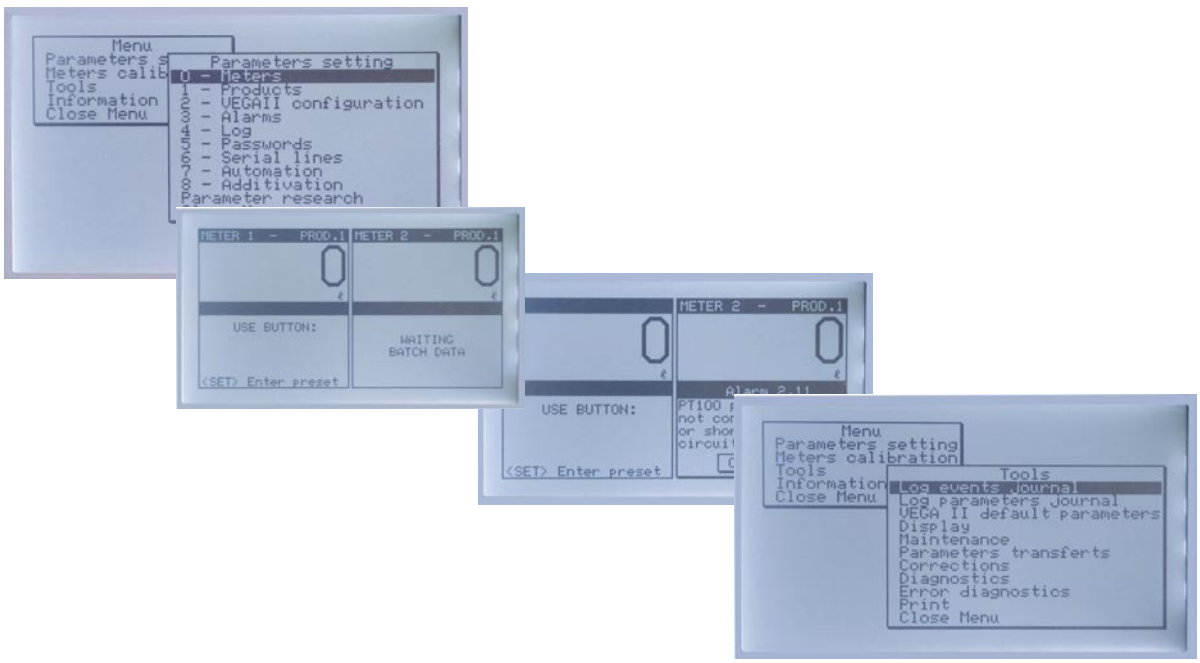
H. HERMANN EHLERS GMBH

Fördern - Messen - Regeln - Dosieren - Verdichten

Ingenieurbüro - Werksvertretungen

VEGA II

Electronic counter



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The **VEGA II** electronic counter is compatible with almost any type of flow meter, it is an instrument for handling the measurement, the control and automation of liquid products.
Typical applications include tank truck, rail car or barge loading at bulk petrochemical plants, custody transfer applications and truck deliveries.

Construction

The shape and dimensions of the electronic counter have been designed:

» to allow the counter to be mounted directly on the PD meter in place of the mechanical register. This offers a simple and economic solution as the pulse emitter is incorporated in the VEGA II counter
» to allow remote mounting; this is mandatory when VEGA II is being used for two meters
» to allow easy access for maintenance purposes, the electronics are completely accessible once the cover has been removed
» to simplify the retrofit of aged VEGA counters, by maintaining the plant layout
» to have an "all in one " unit without the need of an additional box for power supply, relays, barriers etc.

VEGA II is approved according to ATEX Directive as II 2 G - EEx d IIB T6 and IP66.

Features and general characteristics

Different versions have been developed according to the required functions, as well different software for the specific applications.
Dedicated literature is available from **IBE** on request or can be downloaded from our web site.
The general characteristics of all the versions are:

» Compatibility with almost any type of flow meter
VEGA II can be matched with:
  » a volumetric PD meter provided with standard coupling (in this version the VEGA II has the pulser inside and can be mounted directly onto the meter)
  » one or two volumetric PD meters provided with pulse transmitters
  » turbine meters or any meter based on any working principle as long as it is providing pulses proportional to the measured quantity.

» Simple construction. The basic electronics consist of three pc-boards plugged into a purpose designed rack which can be removed in few seconds. Future updating and upgrading can be performed just by replacing or adding pc-boards.
» User friendly on screen instructions guide you through all operations. In particular, the operator's functions are extremely simple and clearly separate from those of the technicians.
» Self-diagnosis of all functions, both of the unit and of the externally linked devices, with detailed read-out.
» Strong and reliable, a heavy duty counter, suitable for use demanding industrial environments:
  » high protection rating (IP66) against liquids and solids penetration.
  » push buttons commands and outputs are completely solid state
  » optical decoupling of signals
  » heating device, with thermostat
  » electronic boards are mounted on internal anti-shock supports.

» Safety and security:
Parameters having metric influence are protected by a "hardware key" and by seals. Passwords with different access levels allow only the authorised persons to enter diagnostic functions and working parameters.

» Broad communication capability
VEGA II works as an intelligent terminal for the supervision and automation systems, to which it can be linked to via serial communication line. Further lines are available for devices and instruments such as injectors, densitometers, or dedicated printers.

Functions

Read out
All information is clearly visible on a single screen with graphic (permanent back-light) display.
When used with two meters, data is shown for each meter in different well separated fields.
» resettable totalisers, delivered observed volume
» resettable totalisers, delivered standard (compensated) volume
» two non resettable totalisers for observed or standard volume
» preset quantity
» instantaneous and average flow rate
» instantaneous and average temperature
» diagnostic information and I/O status
The quantities are displayed in the chosen programmable units of measure.
When used with two meters, the screen is divided in half and the data is shown for each meter in a separate area of the display.
During programming procedures instructions are displayed on screen to guide the user through the process.

Pre-setting (batch control) of the delivered volume
Via a two stage valve control performing:
» low flow start
» slowing down and final closing
» anticipating the final closing (to compensate valve inertia)
Auxiliary outputs are provided for controlling the pumps.
A "multistep" digital control valve can also be used, allowing the flow rate regulation at prefixed values.

Flow rate measure

VEGA II Electronic counter

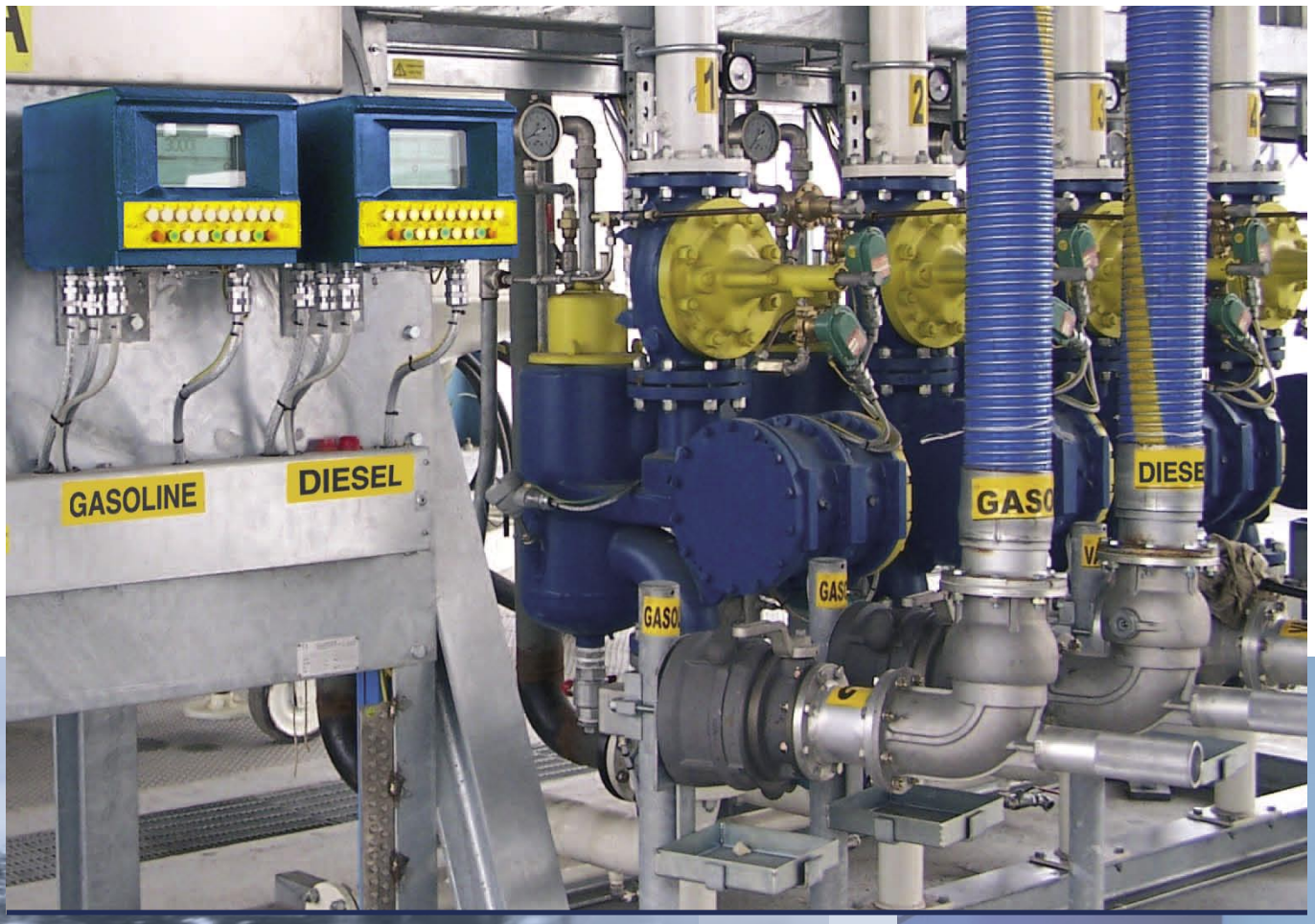
Continuous read out of the instantaneous or average value, in the selected engineering units. Alarm threshold for minimum and maximum flow rate, freely programmable.

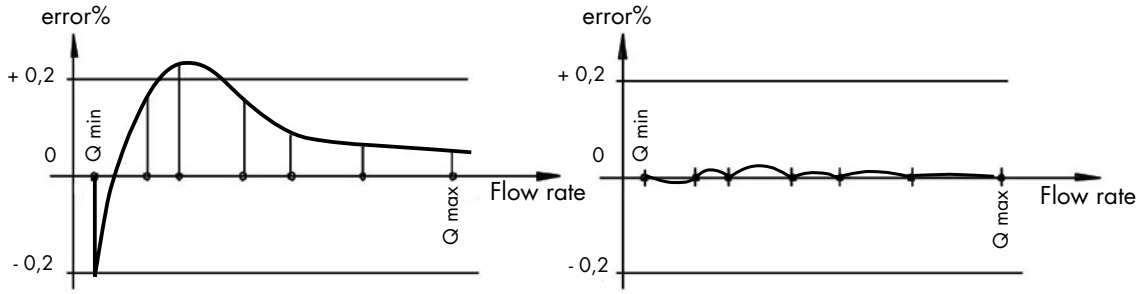
Temperature compensation (compensating versions):
» temperature detection: via thermal resistor Pt100
» reference temperature: programmable (typically 15°C or 60°F for petroleum products)
» method of calculation: according to ASTM S. 1250, API Standard D2540 e IP200 code.
» product temperature range: –40°C ÷ +200°C
» density range @ 15°C: 500 ÷ 1100 kg/m^3
» display and pre-setting of:
- observed quantity
- standard (compensated) quantity
- weight

Real time clock

Date, hour, minutes, seconds are automatically updated and can be transmitted together with delivery data (to a computer or a printer).
Data storage, programmed parameters and delivery data are stored into a permanent memory, along with the data of more than 100 previous deliveries, with events and alarms.
The internal battery allows to VEGA II to work in stand alone mode in the event of power failure.

Calibration and error curve linearisation
» self- calibration:
By following proper procedures the volume correction factor is automatically worked out by simply entering the prover volume.
» linearisation:
It is possible to perform the error curve compensation in max 10 points of the flow rate range, by means a special algorithm performing a linear interpolation.
The following graphs show respectively a typical error curve and the resulting corrected curve.





Typical error curve **Corrected error curve**

Three communication lines for example to one or more computers, dedicated printers or a printer sharing device, with possibility to choose from EIA RS 232/422/485 transmission standards.

Automatic switch on ("wake-up" function)
Even if the VEGA II has been switched off, if a suitable pulse emitter is used and the internal battery is charged, VEGAII is able to detect the meter is moving, and to store the delivered volumes.

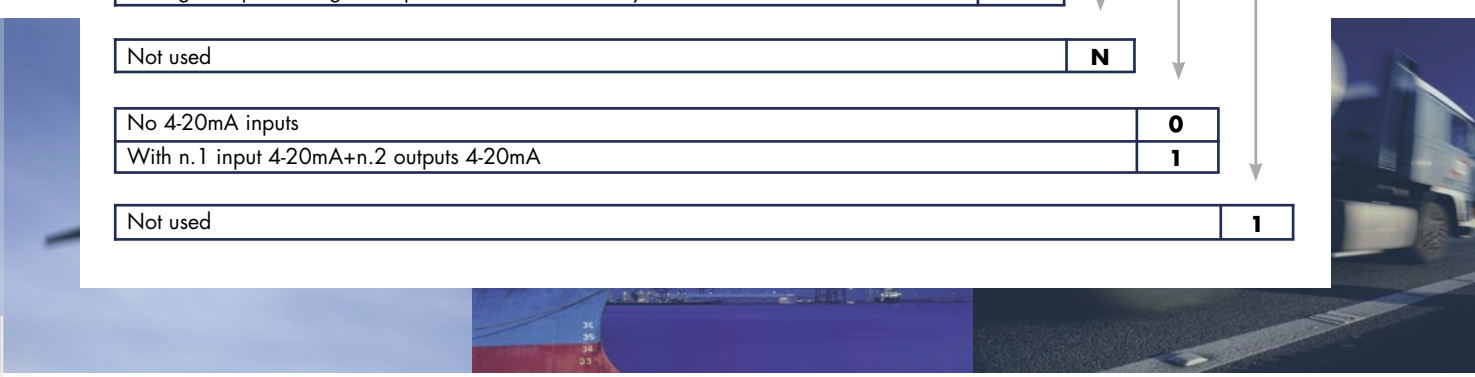
Metrological and custody transfer seals
A "hardware key" allows authorised persons (to set, via the programming operations), all the parameters having influence from metric and fiscal point of view (e.g. calibration factor, or the units of measure).
This key, externally operable, can be sealed in custody transfer applications and if removed the delivery is stopped.
Access to internal electronics can also be sealed for protection.

Diagnostic checks
Special care has been taken on such checks, which are fundamental in an instrument for metric and custody use.
» process control alarms:
- no pulses within a set time after START
- minimum and maximum flow rate
- valve closing failure

» system self – diagnostic alarms:
- efficiency of the display board
- CPU (Watch dog), ROM and RAM control
- power supply control (power failure)
- thermal resistors control.

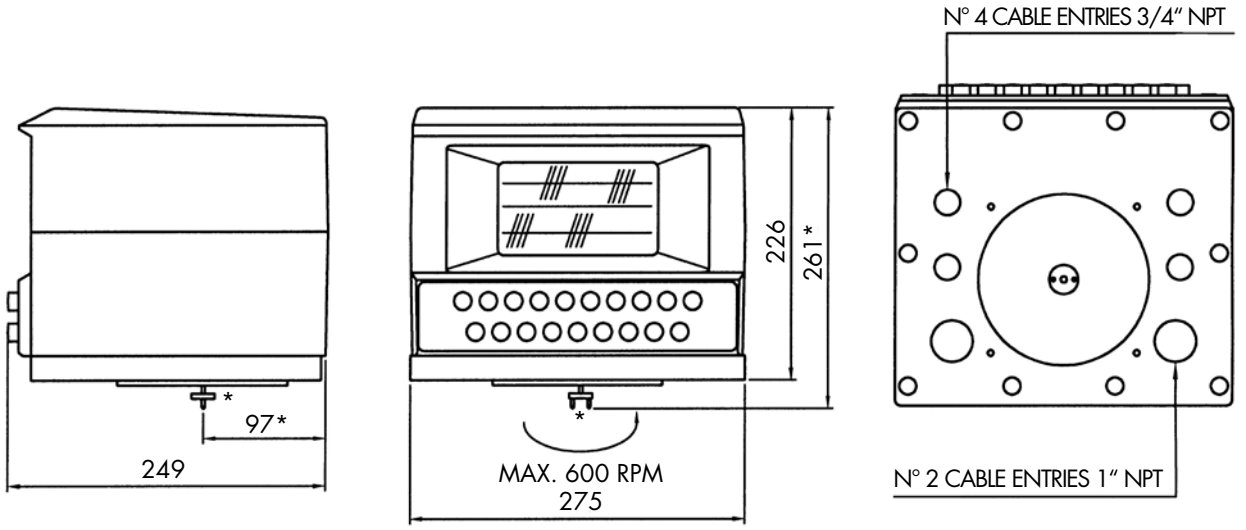
Technical specifications

Hardware Versions	**X**	**X**	**X**	**X**	**-**	**X**	**N**	**X**	**1**
Counter+preset	**3**								
Counter+preset+temperature compensator	**4**								
Mounting on board with encoder		**1**							
Remote mounting without encoder		**2**							
One meter			**9**						
Two meters			**6**						
Supply voltage 115÷230 Vac				**5**					
Supply voltage 20÷30 Vdc				**7**					
Without optional DIGITAL I/O						**0**			
16 digital inputs+8 digital outputs+n. 4 solid state relays Vac+n. 4 mechanical relays						**1**			
16 digital inputs+8 digital outputs+n. 4 solid state relays Vdc+n. 4 mechanical relays						**2**			
16 digital inputs+8 digital outputs+n. 8 mechanical relays						**3**			
16 digital inputs+8 digital outputs+n. 8 solid state relays Vac						**4**			
16 digital inputs+8 digital outputs+n. 8 solid state relays Vdc						**5**			
Not used							**N**		
No 4-20mA inputs								**0**	
With n.1 input 4-20mA+n.2 outputs 4-20mA								**1**	
Not used									**1**



Technical specifications

Firmware versions	Dedicated software-versions for different applications are continuosly under development i.e. loading, tanker gravity unloading, blending. For more information see specific data-sheet	
Mechanical characteristics	**Housing material**	Aluminium casting,
	Dimensions/Weight	275 x 226 x 249 mm 20Kg approx
	Fitting	» **On the meter** by means of n° 4 M6 screws » **Remote** by means of dedicated support
	Cable entries	» N° 2 hole s 1" NPT » N° 4 holes 3/4" NPT



*Only for mounting on the meter

Environment	**Ambient operating temperature**	-25÷+55°C
	Storage temperature	-40÷+65°C
Housing protection	**Humidity**	5÷95%UR with condensation
	Ex environment to ATEX	II 2 G EEx-d IIB T6 IP66 Approval INERIS 00 ATEX 0025

VEGA II
Electronic counter

Electrical characteristics

Main Power supply	»115÷230Vac (-15/+10%), 50/60Hz 40VA » 20÷30Vdc – 40VA	**Additional power outputs (on I/O board)**	N° 8, as standard power outputs
Inputs from pulse emitters	N°2 inputs from pulses emitter; one or two channels shifted 90° (open collector, push pull). DC power available 5 or15 VDC, 100 mA $_{Max}$	**Analog input (I/O analog board)**	» N° 2 from Pt100, or 3 4 wire class A » N° 2, from 4÷20mA, 2 wire
Digital inputs	N°16 inputs from switches powered by VEGAII (15 Vdc) or externally powered	**Analog output (I/O analog board)**	N° 2 4÷20mA, 2 wire
Additional digital inputs (I/O board)	N°16, as above	**Serial communication (standard on CPU board)**	» N° 2 ports two wires RS232/ RS485 settable » N° 1 port 4 wires RS422/ 485 settable » CAN
Digital outputs	N°8 powered by VEGA II (+15VDC 1A max for all outputs) or externally powered 5÷28VDC	**Anti- moisture heating device**	40WA, controlled by thermostat
Pulses outputs	N°4 dedicate (characteristics as above)	**Internal battery**	NI Mih – 12VDC 1.2 A/h
Additional digital outputs (I/O board)	N°8 (characteristics as above)	**Display**	LCD backlighted graphic 240x128 pixel; contrast automatic adjustment
Power outputs	N°8, optional: » relay 3A/250 VAC max » solid state 2A/280 VAC » solid state 3A/60 VDC	**Key-pad**	From 0 to 19 keys, numeric and functional. Actuation via solid state sensors
Compliance with norms	» Directive EMC 89/336/CEE » Directive 94/9/CE (ATEX) » Safety rules for measuring instruments (EN 61010-1)		
Weight and measure approvals	» OIML R117 Test report BEV T05-1158 » W&M approvals in Italy, Spain, Swiss, Austria, Russia, India and other Countries. » MID approval pending		

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