

FP-3031N FP-3031

Flow and Energy Computer for Steam, Liquids and Gases with advanced data recording

- · Handles up to 3 independent installations
- · 10 inputs for process data
- User configurable data presentation on color TFT display
- Math functions sum, difference, ratio
- Advanced data recording for process values and totalisers
- · USB port for data transfer
- Alarm & control functions, 4 output relays
- RS485 communication port, ASCII and Modbus RTU protocols
- Ethernet port, Modbus TCP and server WWW
- GSM module (option)
- One or two analog 4-20mA output (option)
- Software for configuration and recorded data presentation

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APPLICATION:

- . Measurement of steam and water in various industrial installations
- Measurements of industrial gases and typical or special liquids (like glycol, supercooled water, oils) in heat exchange systems with possibility of local alarming or simple control implementation
- Application in distributed control systems with local measurement and data display
- Systems with precise data logging for audit trials

APPLICATIONS FOR STEAM, LIQUIDS AND TECHNICAL GASES

Process values and calculations relevant to a single installation application are grouped in one system named main application. FP-3031 flow computer can handle up to two independent main applications A, B or C. A configuration wizard helps to setup one of possible applications:

- the flow and heat of a liquid medium,
- the flow and delta heat of a liquid medium in a closed supply-return installation,
- the flow and delta heat of a liquid medium in an installation with different supply and return flow rates,
- the flow and heat of a steam,
- the flow and delta heat in a closed steam-condensate installation,
- the flow and delta heat in a steam-condensate installation with different steam and condensate flow rates.
- the flow and delta heat in a steam-generating installation with the supplied water flow rate measured,
- the flow of a gas.

APPLICATION SCOPE FOR STEAM MEASUREMENTS

The flow computer performs flow and heat measurement of superheated or saturated steam or water according to IAPWS-IF97 recommendations in the operating range of temperature 0...800 °C and absolute pressure 0.05...16,52 MPa. Flow and energy measurements of liquids other than water are performed in the range of tabular values entered by user – density and enthalpy as function of temperature.

FLOW RATE MEASUREMENT

The flow computer can use:

- mass flowmeters,
- volume flowmeters
- differential pressure devices with approximation by square root curve,
- differential pressure devices (orifices and nozzles) according to iteration algorithm according to PN-EN ISO 5167 standard (only for water and steam).





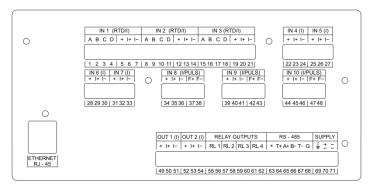




INPUTS

In the device there are five measuring inputs enabling connection of sensors and transmitters of various type:

- 3 x RTD/I three inputs designed for direct connection of resistive temperature sensors (Pt-100, Pt-200, Pt-500, Pt-1000 or Ni-100, Ni-200, Ni-1000) or 0/4-20 mA current loop transmitters,
- 4 x I four inputs enable connection of 0/4-20 mA current loop transmitter,
- 3 x I/PULS three inputs enable flow rate measurement from a pulse transmitter (0,001 Hz to 10 kHz) or 0/4-20mA current loop transmitter.



ADDITIONAL MEASUREMENTS AND CALCULATIONS

Additional measured or calculated values can be displayed besides the main application values. Up to 8 auxiliary channels may be set.

ALARMS & CONTROL, OUTPUT RELAYS

The flow computer is equipped with four solid state relay outputs 0,1 A / 60 V. Relays can react to the various events:

- alarm/control threshold over crossing,
- saturation of superheated steam,
- 0/4-20mA transmitter or RTD sensor failure or disconnection,
- close or open of binary input.

DATA RECORDING

2 GB of internal flash memory and extended functions of events and process values recording make it possible to perform analysis of technological processes and emergency conditions.

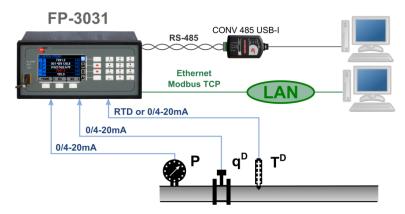
COMMUNICATION

- RS485 port (Modbus RTU or ASCII protocol).
- Ethernet port (Modbus TCP protocol and server WWW).
- GSM module (option), text messages to transfer information about selected alarms, failures, measurement values and totalisers.

VERSIONS

FP-3031	(N)	- x	- y	
				panel mount version
	N			wall mount version
		- 0		basic option with one main application A
		- 1		extended option with A, B and C applications
			- 0	option without analog 4-20mA output
			- 1	option with analog 4-20mA output
			- 2	option with analog 4-20mA outputs

APPLICATION EXAMPLE



Argentina

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Email: info@dastecsrl.com.ar Web: www.dastecsrl.com.ar Device version FP-3031 v1.29 / Datasheet version: 2016-07-15





Voluntary participation in regular monitoring according to ISO 9001:2008





TECHNICAL DATA

User interface, front panel						
Display type	LCD TFT color, 272 x 480 pixels					
Readout field size	43.8 mm x 77.4 mm					
LED indication	3 tri-color LEDs, red-orange-green					
Keyboard	19 membrane buttons					
Inputs organization						
	3 x RTD / I: IN1, IN2, IN3					
FP-3031, FP-3031N	4 x I: IN4, IN5, IN6, IN7					
	3 x I / PULS: IN8, IN9, IN10					
RTD type analog inputs						
Sensor type	Pt-100 x K, Ni-100 x K (K = 111)					
Consort type	K – multiplier, e.g: for Pt-200 K = 2 -200 +850 °C for Pt100 x K					
Measuring range	-200 +850 °C for Pt100 x K					
	-60 +150 °C for Ni100 x K 2- or 4-wires					
Sensor connection Wire resistance compensation	Constant within range -99.99 Ω - +99.99 Ω					
Maximum resistance of connecting wires						
A/D converter resolution	50 Ω 18 bits					
Accuracy (for Ta = +20 °C)	± 0,5 °C (typical ± 0,3 °C)					
Temperature drift	± 0,5					
Galvanic isolation between inputs	No, common potential GND for all inputs					
Galvanic isolation to supply voltage	400 VAC					
Galvariic isolation to supply voltage	FP-3031: three 4-pin screw type terminal blocks, max. cable					
	diameter 1,5 mm ²					
Wire connection	FP-3031N: spring type terminal block, cable diameter 0,2 mm ² –					
	1,5 mm ²					
0/4-20mA type	e analog inputs					
Signal type	0-20mA or 4-20mA					
Transmitter connection	Passive transmitter (supplied from measuring loop) or active					
	converter					
Input resistance	100 Ω ±10%					
Transmitters supply	24 V DC / max 22 mA					
A/D converter resolution	18 bits					
Accuracy (T _a = 20 °C)	±0,1% of the range (typical ±0,05% of the range)					
Temperature drift	Max ±50 ppm / °C					
Galvanic isolation between inputs	No, common potential GND for all inputs					
Galvanic isolation to supply voltage	400 VAC					
	FP-3031: ten 3-pin screw type terminal blocks, max. cable					
Wire connection	diameter 1,5 mm ²					
	FP-3031N: spring type terminal block, cable diameter 0,2 mm ² – 1,5 mm ²					
PULSE type inputs	(binary/pulse/frequency)					
Maximum input voltage	±28 VDC					
Galvanic isolation between inputs	No, common potential GND for all inputs					
Galvanic isolation to supply voltage	400 VAC					
117	State detection					
Functions	Pulse counting					
	Frequency measurement					
Measuring range	0,001 Hz to 10 kHz					
Measuring range	(0,001 Hz to 1 kHz with connected filtering capacitor)					
Minimum pulse width	20 μs					
·	0.5 ms, with filtrating capacitor					
Accuracy (T _a = 20 °C)	0,02%					
	FP-3031: three 2-pin screw type terminal blocks, max. cable					
Wire connection	diameter 1,5 mm ²					
THIS COMMODITY	FFP-3031N: spring type terminal block, cable diameter 0,2 mm ² –					
1	1,5 mm ²					







Configuration: OC / contact (default)						
Voltage(OC)	12 V					
Current (contact)	12 mA					
On / off threshold	2,7 V / 2,4 V					
Configuration: input voltage						
Input resistance	>10 kΩ					
On / off threshold	2,7 V / 2,4 V					
Voltage (open)	12 V					
NAMUR configuration						
High impedance state	0,4 mA – 1 mA					
Low impedance state	2.2 mA – 6.5 mA					
Compensated flow and heat energy measurement						
Accuracy of compensated steam, water, other liquid or technical gas flow	< 2% (typical < 0,5%)					
Frequency of measurement and calculation results	1 s					
4-20 mA analog outputs (optional)						
Number of outputs	1 or 2					
Output signal	4-20mA					
Maximum voltage between I+ and I-	28 VDC					
Loop resistance (for U _{cc} = 24 V)	0500 Ω					
Converter resolution D/A	16 bits					
Accuracy	0,1% of the range					
Current loop supply	External or from internal unit supply 24 V DC / 22 mA					
Galvanic isolation to supply voltage	400 VAC					
Wire connection	FP-3031: two 3-pin screw type terminal blocks, max. cable diameter 1,5 mm ² FP-3031N: spring type terminal block, cable diameter 0,2 mm ² – 1,5 mm ²					
Binary outputs						
Number of outputs	4, mutually separated					
Outputs type	Semiconductor relays					
Maximum load current	100 mA DC/AC					
Maximum voltage	60 V DC/AC					
Galvanic isolation	400 VAC					
Wire connection	FP-3031: two 8-pin screw type terminal blocks, max. cable diameter 1,5 mm ² FP-3031N: spring type terminal block, cable diameter 0,2 mm ² – 1,5 mm ²					
RS485 serial port						
Maximum load	32 receivers / transmitters					
Maximum line length	1200 m					
Maximum differential voltage A(+) – B(-)	-8 V +13 V					
Maximum total voltage A(+) – "ground" or B(-) – "ground"	-7 +12 V					
Transmitter minimum output signal	1,5 V (at $R_0 = 54 \Omega$)					
Receiver minimum sensitivity	$200 \text{ mV / R}_{WE} = 12 \text{ k}\Omega$					
Minimum impedance of data transmission line	27 Ω					
Internal terminating resistor	Yes, activated by short-circuit pins on terminal block					
Short circuit/ thermal protection	Yes					
·	ASCII					
Transmission protocol	Modbus RTU					
Baud rate	1.2, 2.4, 4.8, 9.6 ,19.2, 38.4, 57.6, 115.2 kbps					
Parity control	Even, Odd, None					
Frame	1 start bit, 8 data bits, 1stop bit					
Galvanic isolation	No					
Wire connection	FP-3031: 6-pin screw type terminal block, max. cable diameter 1,5 mm ² FP-3031N: spring type terminal block, cable diameter 0,2 mm ² – 1,5 mm ²					
Eth	ernet port					







Transmission protocol Interface Data buffer 300 B Number of opende connections (simultaneously) 4 Connector type ILED signaling USB port Socket type A type, according to USB standard Version USB port Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type A type, according to USB standard Version ISB 1.1 Socket type type type ISB 1.1 Socket type type type type type type type ty	Transcription and sol	Madisus TOP IOND (st.) BUOD					
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Red/green/yellow LED on front panel	Socket protection class	IP-54					
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Memory capacity 2 GB (nonvolatile memory) Recording format FAT16 (within a limited scope) Recording indication FP-3031 and FP-3031 N power supply FP-3031 and FP-3031 N power supply Supply voltage 24 VAC (+5% / -10%) are consumption 14 VA / 14 W FP-3031 N power supply Wire connection FP-3031N power Supply FP-3031 N power Supply FP-3031N spring type terminal block, max. cable diameter 1,5 mm² FP-3031N spring type terminal block, cable diameter 0,2 mm² - 1,5 mm² FP-3031N power Supply Supply voltage 100-240VAC 50/60 Hz Maximum power consumption 28 VA Wire connection Screw type terminal blocks, cable diameter 0,2 mm² - 1,5 mm² FP-3031 casing - dimensions FP-3031 casing - dimensions Casing type For panel surface, nonflammable plastic material _Noryl* FP-3031 is grown x 93.5 mm Housing depth with terminals (without extra space for cables) FP-3031: 96 mm x 192 mm x 63.5 mm Panel cut-out dimensions FP-3031: 186 +1,1 mm X 92 +0,6 mm Panel maximum thickness 5 mm Weight 19-30 FP-3031N casing - dimensions FP-3031 is mm x 192 mm x 63.5 mm Protection class from the front panel 19-30 FP-3031 is maximum power consumption 19-30 FP-3031 is maximum power consumption 24 mm x 257 mm X 125 mm (without cable glands) 247 mm X 257 mm X 125 mm (without cable glands) 247 mm X 257 mm X 125 mm (without cable glands) 247 mm X 257 mm X 125 mm (without cable glands) 247 mm X 257 mm X 125 mm (without cable glands) 247 mm X 257 mm X 125 mm (without cable glands) 247 mm X 257 mm X 125 mm (with cable glands) 240 m-340 mc X 257 mm X 125 mm (without cable glands) 240 memory 240 mm X 257 mm X 125 mm (without cable glands) 240 memory 240 mm X 257 mm X 125 mm (without cable glands) 240 memory 240 mm X 257 mm X 125 mm (without cable glands) 240 mm X 257 mm X 125 mm (without cable glands) 240 mm X 257 mm X 125 mm (without cable glands) 240 mm X 257 mm X 125 mm (without cable glands) 240 mm X 257 mm X 125 mm (without cable glands) 240 mm X 257 mm X 125 mm (without cable glands) 240 mm X 257 mm X 125 mm (without cable glands) 240 mm X 257 mm	Read/write signaling	Red/green/yellow LED on front panel					
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P-3031 and PP-3031N power supply							
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Supply voltage	Recording indication	Green-red USB LED on the front panel					
Auximum power consumption	FP-3031 and FP-3031N power supply						
24 VDC (15 30 VDC)		24 VAC (+5% / -10%)					
Maximum power consumption 14 \ \frac{VA}{14 \ \frac{V}}{15 \ \text{soft}} \	Supply voltage						
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Voluntary participation in regular monitoring according to ISO 9001:2008

