

Frequency Converter

FM-1D/K

Frequency to Current Converter and Flow-Rate Indicator



Description

The FM-1D/K is a μ P controlled frequency converter with display of Flow-Rate and Totals. It converts input pulses to an analog current signal proportional to the momentary flow rate.

The incoming are converted to:

- Standard signal current output
- Pulse Totalization
- LED indication of Flow-Rate and Totalization

Application

- Flow-Rate indication
- Remote reading
- Remote indication
- Remote transmission
- Batching and dosing
- Automation

Special Features

- Simple key input calibration
- Wall mounted or clipped onto a top hat rail according to EN 50022
- Accommodates a wide range of pulser inputs
- Pulse output via relay
- Available current outputs: 0-20mA, 4-20mA
- Reverse flow identification
- Input pulse monitoring
- Available test mode

Integrated on-site indication of :

- flow rate
 - counter reading
 - programming data
- Non-Volatile memory insure data retention in case of power failure

Available Versions

FM-1D/K, US Gallons, M/N: 182023
 FM-1D/K, Cubic Meters, M/N: 182021



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Specification

Power Supply	230 VAC (209-253V), 115 VAC (105-126V), 24 VDC (20-27V) and 24 VAC (17-27V)
Power consumption	3.5 VA (3 W)
Dimensions - inches / mm	3 15/16 x 2 7/8 x 4 1/2 inches - 100 x 73 x 14 mm (w x h x d)
Weight	+/- 1.5 lbs / 650 grams
Protection class	IP40
Temperature range (operation)	32°F to 158°F / 0°C to 70°C
Temperature range (storage)	14°F to 176°F / -10°C to 80°C

Input

Universal sensor input for external switch or proximity sensor acc. to DIN 19234 (Namur)	2-wire, 8.2 V, approximately 1 KOhm
Auxiliary voltage for feeding 3-wire sensor	12 V, 10mA
Input frequency range	0 - 0.1 to 0-1000 Hz for 0/4-20mA
Maximum cable length	+/- 19,685 feet / 6 km (depending on cable quality/condition)
Contact bounce suppressing	automatic - depending on the input frequency

Output

<ul style="list-style-type: none"> Current Output 	0-20mA or 4-20ma (selectable)
Load	Maximum 1000 Ohm (at nominal supply voltage) Maximum 700 Ohm with connected 3-wire pulser
Response time	14 step selectable damping (no damping = 1, max damping = 14)
Max. Transmission distance	+/- 8.7 miles/14 km (at 500 Ohm load w/cable cross section of 1mm ²)
<ul style="list-style-type: none"> Pulse Output 	Relay closure, max. 48 V AC/DC, 1 A, voltage free, close time 500ms, max. 1Hz
Max. Transmission distance	+/- 1640 feet / 500 m for a contact closure; 7.45 miles/12 km with an additional transistor relay

Display

4-Digit, 7-segment LED, 10mm digit height

- momentary flow-rate
 - counter reading
- programmable data:**
- flow-rate range
 - input pulse validity
 - Output pulse validity
 - standardized current range
 - response time

Calibration

3 input keys used in conjunction with LED dialog display with selectable protection code

Lighting Protection

To protect the FM-1D/K from voltage surges caused by lightning, installation of adequate lightning protection devices is recommended.

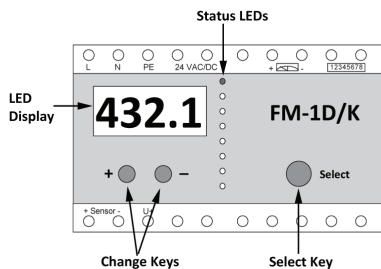
Intrinsic Safety

If the water meter/pulser is to be installed in a hazardous area, the FM-1D/K must be installed in a safe area with the pulse input isolated by means of a suitable transistor relay.



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Display



The numeric display of the FM-1D/K performs a dual function

- In **Program Mode** the settings are entered with the aid of the interactive display dialog
- In **Standard Mode**, the momentary measured values are displayed

Program Mode

- Select Key (Select) Select the indicated dimension.
- Change Key (+) or (-) Change to program mode (flashing status LED, flashing digit).
- Change Key (+) or (-) Modify the selected (flashing digit). The flashing status LED indicates the related dimension.
- Select Key (Select) Change the selected place digit.
- Select Key (Select) After the last (right) place: the modifications will be stored in a non-volatile memory and will not be lost in the event of a power failure.

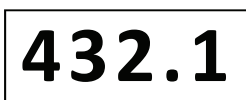
Protection

- Change keys (+) and (-) and select key Move to protect menu
- Change keys (+) and (-) Toggle between protected (Loc8) and open (Loc6) for changes
- Change keys (+) and (-) Confirm the set position mode
- “Loc8” indicates settings are protected and cannot be overwritten;
 - At program mode, the display will indicate “Loc” and it will not be possible to make or enter changes.

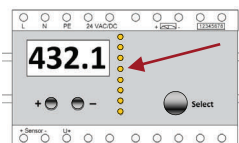
Standard Mode

- Select Key (Select) Selection of the measured value to be indicated

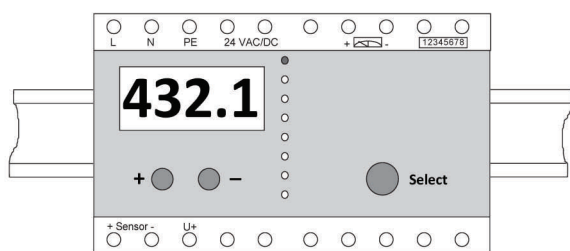
Numeric Display



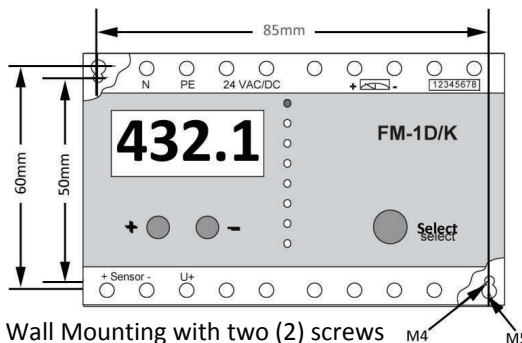
Status LEDs



Status LEDs	Program mode	Standard mode
GPM M ³ /Hr	Flowrate range. Setting the end value directly in m ³ /h from 0.001 ... 9999 m ³ /h.	Flowrate. The momentary flowrate is indicated in m ³ /h. At reverse flow [-0.00] is indicated
1234 5678	Counter reading. Presetting the start value; digits 1...4 and 5...8 are set separately. *)	Counter reading. Indicating the momentary totalization; digits 1...4 and 5...8 are indicated in two steps. *)
SENSOR I /	Pulse validity input. Entry in liters per pulse.	Pulse validity input. Checking the settings.
123.4 GAL M ³	Pulse validity output. Entry from 0.001...9999m ³ per pulse.	Pulse validity output. Checking the settings.
0/4 ... 20 mA	Current range output. Selectable 0...20 mA or 4...20 mA.	Current range output. Checking the settings.
1 ... 14	Response time of current output. Setting from 1 (no damping) to 14 (max. damping).	Response time of current output. Checking the settings.
Test	Test mode. Monitoring the cabling and function of the remote totalizer and flowrate indicator.	Test mode. Shows in standard mode the firmware revision of the FM1D/K.



Snap action on 35mm top hat rail to EN 50022



Wall Mounting with two (2) screws M4 M5

Connection

