

# Frequency Converter

# FM-1D/K

Frequency to Current Converter and Flow-Rate Indicator



## Description

The FM-1D/K is a  $\mu$ 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"> <li>Current Output Load</li> </ul>	0-20mA or 4-20ma (selectable) Maximum 1000 Ohm (at nominal supply voltage) Maximum 700 Ohm with connected 3-wire pulser
<ul style="list-style-type: none"> <li>Response time</li> </ul>	14 step selectable damping (no damping = 1, max damping = 14)
<ul style="list-style-type: none"> <li>Max. Transmission distance</li> </ul>	+/- 8.7 miles/14 km (at 500 Ohm load w/cable cross section of 1mm <sup>2</sup> )
<ul style="list-style-type: none"> <li>Pulse Output</li> </ul>	Relay closure, max. 48 V AC/DC, 1 A, voltage free, close time 500ms, max. 1Hz
<ul style="list-style-type: none"> <li>Max. Transmission distance</li> </ul>	+/- 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.

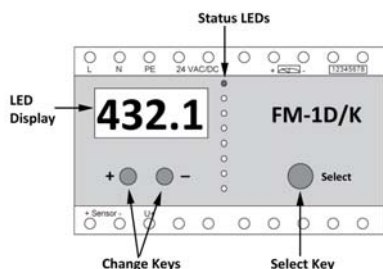
## Intrinsic Safety

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.

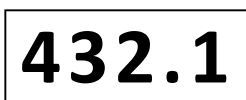
### Protection

- 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.

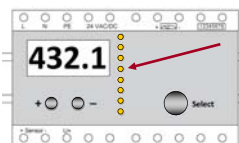
### Standard Mode

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

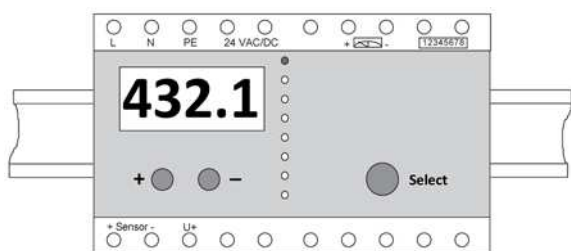
#### Numeric Display



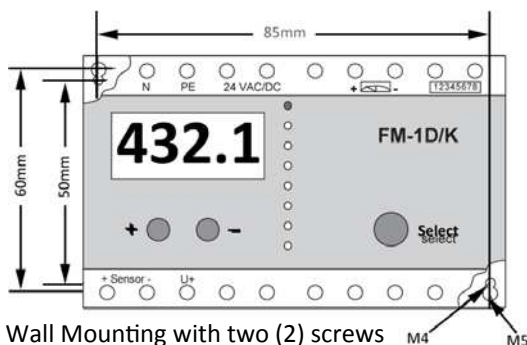
#### Status LEDs



Status LEDs	Program mode	Standard mode
●  GPM M <sup>3</sup> /Hr	Flowrate range. Setting the end value directly in m <sup>3</sup> /h from 0.001 ... 9999 m <sup>3</sup> /h.	Flowrate. The momentary flowrate is indicated in m <sup>3</sup> /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	Pulse validity input. Entry in liters per pulse.	Pulse validity input. Checking the settings.
●  123.4 GAL M <sup>3</sup>	Pulse validity output. Entry from 0.001...9999m <sup>3</sup> 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

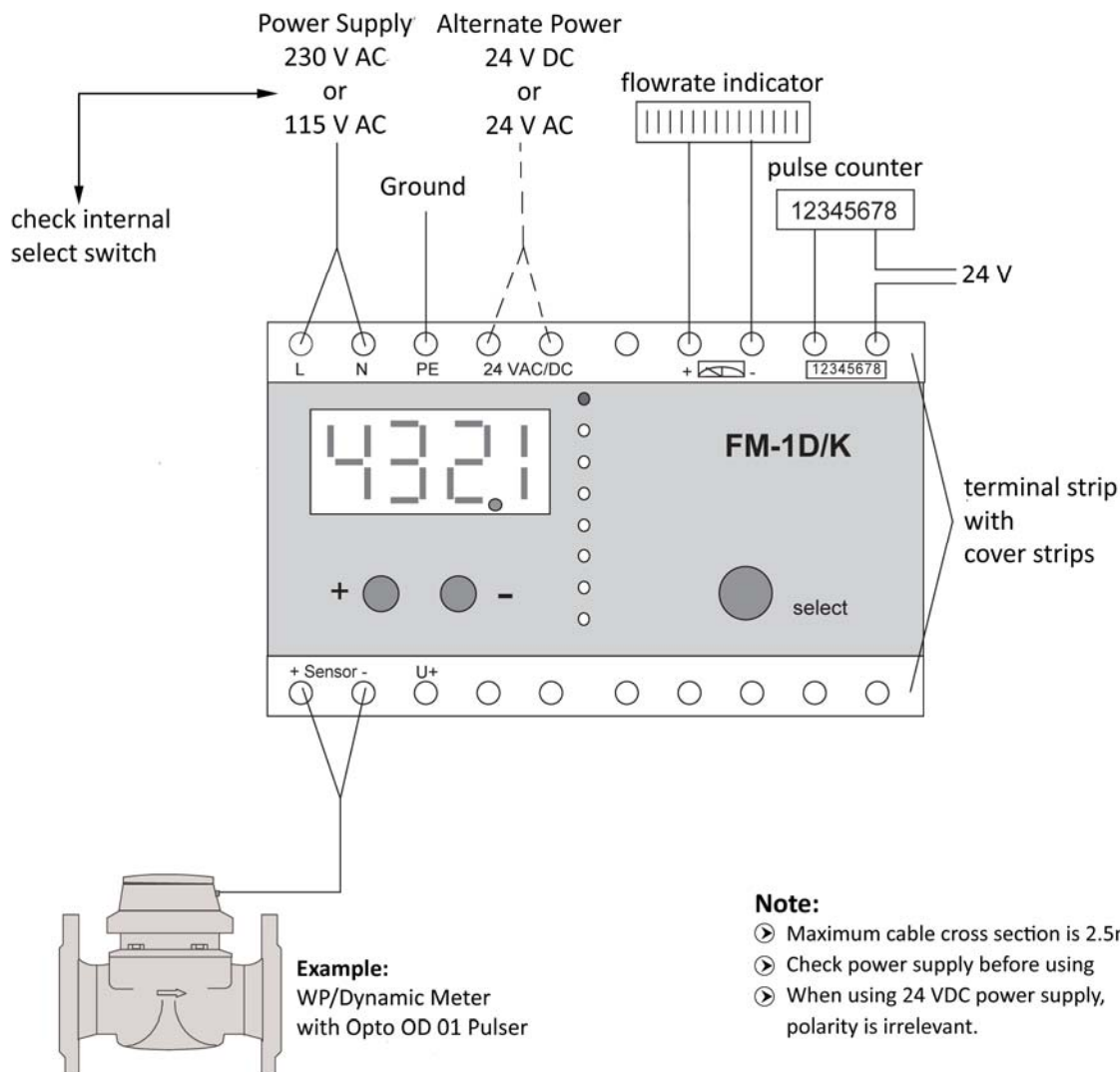


Wall Mounting with two (2) screws M4 M5



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## Connection



**Note:**

- Maximum cable cross section is 2.5mm<sup>2</sup>
- Check power supply before using
- When using 24 VDC power supply, polarity is irrelevant.