



Badger Meter

Industrial Registers

Models ER-420-AC, ER-420-DC & ER-420-LP

Totalizer and Rate of Flow Indicator with 4-20 mA Output Signal

DESCRIPTION

The Badger Meter® Model ER-420 series digital register is especially designed for computing and displaying total and rate of flow in fluid flow applications. The units are suitable to handle any volumetric flow meter with a pulse output.

OPERATION

Model ER-420 is fully menu-driven with understandable text. This register continues counting during programming.

The analog output with 10 bits resolution has programmable set points proportional to the flow rate for both 4 mA and 20 mA output.

A scaled pulse mirroring the count on the display is generated for use by external instruments. The maximum frequency is 20 Hz while the pulse width can be adjusted to suit both electromechanical and electronic counters.

OPERATOR FUNCTIONS

The operator has three functions available:

- TOTAL and flow rate are displayed.
- TOTAL can be reset by pressing **CLEAR** key twice.
- After pressing **SELECT**, accumulated TOTAL will be displayed (cannot be reset).



FEATURES

- Instantaneously displays rate of flow, total and accumulated total
- Scalable 4...20 mA analog output proportional to rate of flow
- Scalable pulse output
- Available in Loop Powered, AC or DC powered versions

SPECIFICATIONS

Display

Type	High intensity reflective numeric and alphanumeric LCD, UV-resistant
Digits	Seven 17 mm (0.67 in.) and eleven 8 mm (0.31 in.). Various symbols and measuring units
Refresh rate	User definable: 8 to 30/sec

Enclosures

General Control Keys	GRP (glassfiber-reinforced polyamide) enclosure with polycarbonate window, silicone and EPDM gaskets UV-stabilized and flame retardant material Three industrial micro-switch keys. UV-stabilized silicone keypad
Field/wall-mount enclosures Classification Drilling	Dimensions: 130 x 120 x 75 mm (5.10 in. x 4.72 in. x 2.95 in.) LxHxD. IP67 / NEMA4X Three 3/4 in. holes

Operating Temperature

Operational	-30...80° C (-22...178° F)
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Power Supply

ER-420-DC	24V AC / DC + 10%. Power consumption maximum is 0.5 Watt
ER-420-AC	115...230V AC + 10%. Power consumption maximum is 0.5 Watt
ER-420-LP	Output loop powered: 8...30V DC. Power consumption maximum is 0.5 Watt
Models DC/AC	The total consumption of the sensors, backlight and outputs may not exceed 400 mA @ 24V

Sensor Excitation

ER-420-LP	3.2V DC for pulse signals. NOTE: This is not a real sensor supply. It is suitable only for pulse sensors—like reed switches—with a very low power consumption.
ER-420 AC/DC	3.2, 8.2, 12 and 24V DC. Maximum is 400 mA @ 24V DC

Terminal Connections

Type	Removable plug-in terminal strip. Wire maximum is 1.5 mm ² and 2.5 mm ²
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Data Protection

Type	EEPROM backup of all settings, backup of running totals every minute Data retention is at least 10 years
Passcode	Configuration settings can be passcode protected

Environment

Electromagnetic compatibility	Compliant ref: EN 61326 (1997), EN 61010-1 (1993)
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Inputs

Flowmeter

Type P	NPN/PNP, open collector, reed switch, active pulse signals 8...12 and 24V
Frequency	Minimum 0 Hz, maximum 7 kHz for total and flow rate Maximum frequency depends on signal type and internal low-pass filter Example: Reed switch with low-pass filter: maximum frequency is 120 Hz
K-Factor	0.000010...9,999,999 with variable decimal position
Low-pass filter	Available for all pulse signals

Outputs

Analog Output

Function	Transmitting flow rate
Accuracy	10 bit. Error < 0.05%. Updates 10 times a second. Software function is to calibrate the 4.00 mA and 20.00 mA levels precisely within setup
Load	1 kOhm max.
Type ER-420-AC and ER-420-DC	Passive galvanically isolated output
Type AP	Passive 4...20 mA output; output loop powered

Transistor Output

Pulse output	Maximum frequency is 500 Hz for units with Rev. 03 and newer (60 Hz for units earlier than Rev. 03). Pulse length is user-definable between 7.8 msec up to 2 seconds
Function	One pulse output, transmitting accumulated total
Type ER-420-AC and ER-420-DC	Isolated mechanical relay output; maximum switch power is 230V AC to 0.5A
ER-420-LP	Passive transistor output, not isolated. Load maximum is 50V DC to 300 mA

Operational

Operator Functions

Displayed functions	<ul style="list-style-type: none"> • <i>Total</i> and/or <i>Flow Rate</i> • <i>Total</i> and <i>Accumulated Total</i> • <i>Total</i> can be reset to zero by pressing the CLEAR key twice • Multiplication factor: x1, x10, x100, x1000, x10000
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Total

Digits	7 digits
Units	L, m ³ , GAL, USGAL, kg, lb, bbl, ___ (no unit)
Decimals	0, 1, 2, or 3
Note	<i>Total</i> can be reset to zero

Accumulated Total

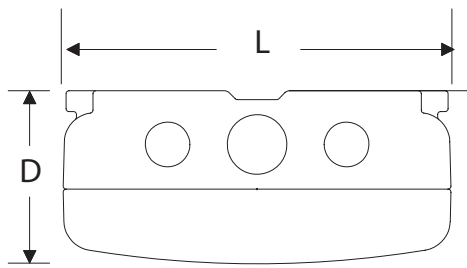
Digits	11 digits
Units / decimals	According to selection for <i>Total</i>

Flow Rate

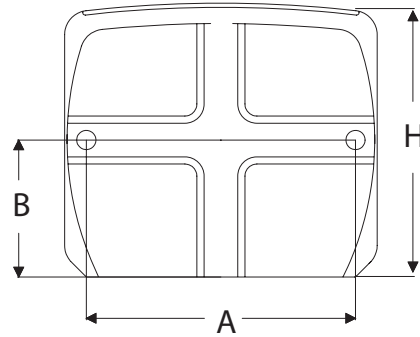
Digits	7 digits
Units	mL, L, m ³ , mg, g, kg, ton, GAL, bbl, lb, cf, REV, ___ (no unit), scf, Nm ³ , NL, P
Decimals	0, 1, 2, or 3
Time units	second, minute, hour, day

DIMENSIONS

Dimensions for ER-420 Remote



Top View



Rear View

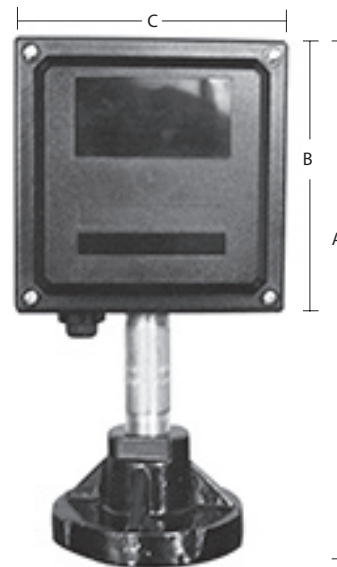
Length (L)	5.1 in. (130 mm)
Depth (D)	2.3 in. (58 mm)
Height (H)	4.5 in. (114 mm)
Bolt Circle (A)	4.4 in. (112 mm)
Centerline (B)	2.3 in. (57 mm)

Meter Mount Dimensions for ER-420 and NEMA 6P Adapter



Meter Mount

Height (A)	8.2 in. (208 mm)
Width (B)	5.1 in. (130 mm)
Width (C)	3.6 in. (91 mm)



Optional NEMA 6P Adapter for Remote Mounting ER-420

Height (A)	8.4 in. (213 mm)
Height (B)	4.7 in. (119 mm)
Width (C)	4.7 in. (119 mm)

Control. Manage. Optimize.

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