

Flow Monitoring System



Micro Motion

FISHER-ROSEMOUNT™ Managing The Process Better.™

FMS-3 Flow Monitoring System

The Micro Motion® FMS-3 Flow Monitoring System is a microprocessor-based batch controller with rate, total, and inventory indicators. The FMS-3, working from the frequency output of any Micro Motion transmitter, performs one- or two-stage batch control.

The FMS-3 can be ordered with a variety of operating programs for customized operation. Features of the FMS-3 include a 6-digit programmable setpoint and batch total. The user can select from eight flow units and three time bases, which can be scaled for extra-long batches and long-term inventory maintenance. Alarm relays can be set for primary and secondary batch control. Batch and total information is retained in memory even if power to the FMS-3 is interrupted.

The FMS-3 front panel features highly visible displays (LED or LCD) and a keypad for programming and operation. The LCD version includes a real-time clock/calendar. An optional RS-232 interface allows digital communications for remote programming, operation, and computer or printer interface. Remote operation can also be accomplished using the remote switch wiring.

The standard FMS-3 housing is a DIN 144 enclosure. Housing options include NEMA 4X (IP65) enclosures for an FMS-3 alone or an FMS-3 with a Micro Motion ELITE® RFT9739 transmitter, and explosion-proof enclosures.

Software options

LCD and LED versions

Standard

After the Start Batch button is pushed, output relays are energized. The standard FMS-3 software includes a "no input" safety feature. If flow is not detected within 10 seconds, or if flow is interrupted, the relays shut off.

With a computer interface in operation, the FMS-3 will output the following data to a printer: date and time, FMS-3 identification number, flow rate, batch total, total flow, setpoint, prewarn, and scale factor.

With the program lock enabled, the following modes are inaccessible: decimal point (DP), scale factor (SF), identification (ID), units of measure (UN), baud rate (BD), and clock (CL); while the following modes remain accessible: setpoint (SP), rate-batch (RB), rate-inventory (RI), and prewarn (PR).

"No input" disabled

The "no input" safety feature of the standard program is disabled. Relays remain energized whether or not flow is detected.

LCD version only

Print format for custody transfer

With a computer interface in operation, output to the printer will include only data relevant to custody transfer trade — date and time, FMS-3 identification number, and batch quantity.

LED version only

30-second "no input"

The 10-second "no input" safety feature of the standard program is increased to 30 seconds.

2-second "no input"

The 10-second "no input" safety feature of the standard program is decreased to 2 seconds.

Locked prewarn

In addition to those modes locked out by the standard program lock, the *locked prewarn* program provides the option of locking out changes to the user-defined prewarn value.

All but SP lock

In addition to those modes locked out by the standard program lock, the *all but SP lock* program provides the option of locking out the rate-inventory (RI) and prewarn (PR) modes. With this program, the setpoint (SP) and rate-batch (RB) modes remain unlocked.

SP Lock

Provides the option of locking out all modes, including setpoint (SP).

SP lock, "no input" disabled

Combines the features of the "no input" disabled and *SP lock* programs.

Setpoint lower than prewarn

Allows the user-defined prewarn value to be higher than the batch setpoint value.

FMS-3 specifications

Displays

Alphanumeric LCD or LED. 2-digit mode display, 6-digit setup/rate display, 8-digit totalizer display.

Two LEDs indicate the state of primary and secondary relays.

Flow rate display accuracy

±0.01%

Flow units

User-selected: ounces, pounds, kilopounds, tons, gallons, grams, kilograms, liters

Time units

User-selected: second, minute, hour

Operating temperature range

32 to 131°F (0 to 55°C)

Storage temperature range

-40 to 131°F (-40 to 55°C)

Power supply

110/115 ±25%, 48 to 62 Hz, 0.2 amp
220/230 VAC ±25%, 48 to 62 Hz, 0.1 amp
12-30 VDC, 1 amp

Warm-up time

30 minutes

Frequency input

Frequency: 0 to 20 kHz. High, 4.0 to 15.0 V; low, 0 to 1.0 V. Impedance: LCD, 50 ohms; LED, 1 K ohm.

Input/output port

Full duplex, RS-232-C serial input/output. Programmable 150-9600 baud rate.

Relays

Two relays (primary and secondary) rated to 28 VAC/VDC, 0.2 amp resistive maximum, Form C.

Relay state is dependent on user-defined prewarn and setpoint.

Environmental effects

Vibration

Meets SAMA PMC 31.1, Level 2, field mount conditions

Shock

Meets SAMA PMC 31.1, Level 2

Sunlight and heat

Exposure to sunlight or direct heat may damage LCD and circuit boards.

Housing options

DIN 144 — standard housing
Small NEMA 4X (IP65)¹
Large NEMA 4X (IP65)¹
NEMA 4X explosion-proof¹

Heater

Optional heater available with NEMA 4X (IP65) housing for operation of LCD in sub-freezing temperatures. AC-power supply only.

Certification

Certified by FM and CSA² for installation in the following areas:

FMS-3 in standard housing
Class I, Div. 2, Groups A, B, C, and D

FMS-3 in NEMA 4X explosion-proof housing
Class I, Div. 1, Groups C and D
Class I, Div. 2, Groups A, B, C, and D
Class II, Div. 1, Groups E, F, and G

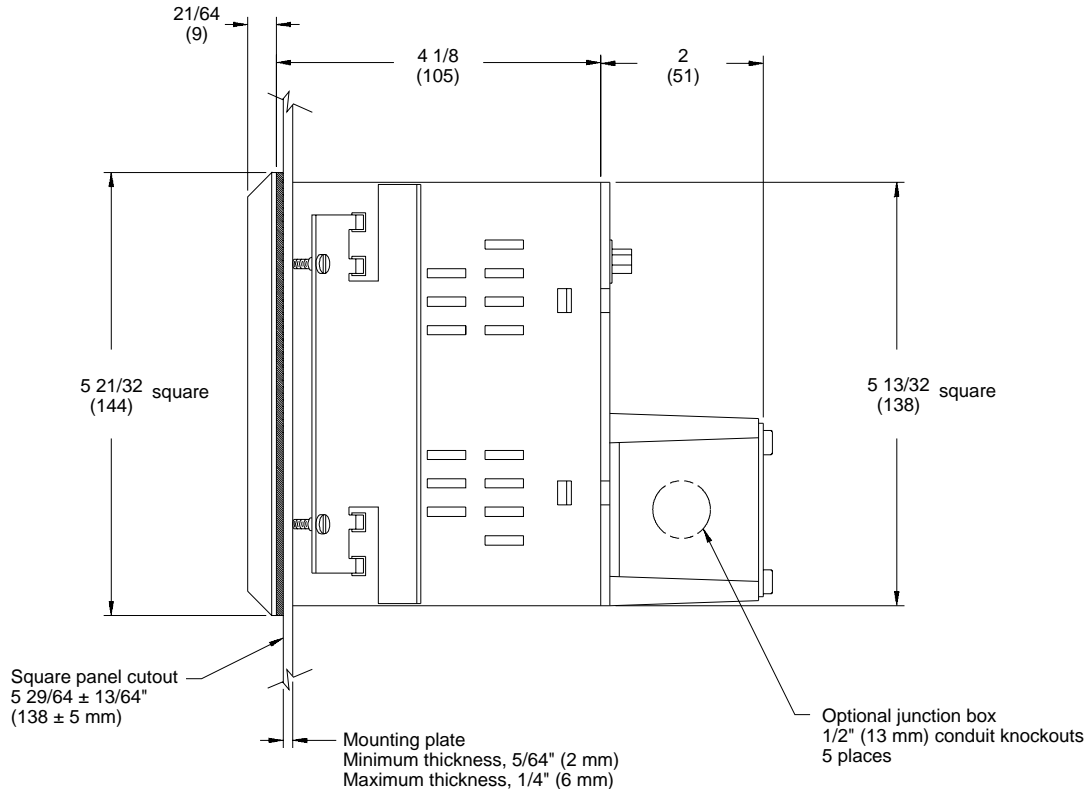
¹NEMA housing for FMS-3 without junction box only.

²CSA approval for FMS-3 without junction box only.

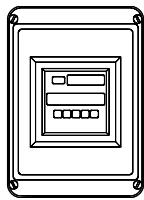
FMS-3 physical characteristics

Dimensions in inches
(mm)

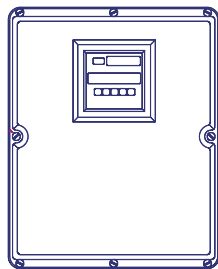
Standard housing



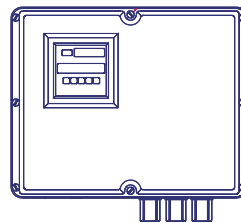
Optional housings



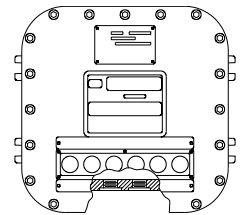
Small NEMA 4X housing
8 1/2 W x 12 H x 7 9/32 D
(216 W x 305 H x 185 D)



Large NEMA 4X housing for FMS-3 and RFT9712 transmitter
14 1/2 W x 18 H x 9 9/32 D
(368 W x 457 H x 236 D)



Large NEMA 4X housing for FMS-3 and RFT9739 transmitter
18 W x 14 1/2 H x 9 9/32 D
(457 W x 368 H x 236 D)



Explosion-proof housing
11 3/8 square x 9 D
(289 square x 229 D)

FMS-3 model number matrix

Model code	Power code	Output code	J-box code	Display code	Software code	Description
FMS						Flow Monitoring System
	1					110/115 VAC
	2					220/230 VAC
	3					12-30 VDC
		RS				With RS-232 port
		NA				Without RS-232 port
			0			Without junction box
			1			With junction box
				C		LCD
				E		LED
						<i>Available with display codes C</i>
					A	Standard
					B	"No input" disabled
					C	Print format for custody transfer
						<i>Available with display code E</i>
					A	Standard
					B	"No input" disabled
					C	Locked prewarn
					D	30-second "no input"
					E	All but SP lock
					F	Setpoint lower than prewarn
					G	2-second "no input"
					H	Setpoint lock
					I	Setpoint lock, "no input" disabled

Example*

FMS	1	RS	0	C	A
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* Example: FMS 1 RS 0 C A = Standard FMS-3 Flow Monitoring System; 110/115 VAC; RS-232 serial port; without junction box; liquid crystal display (LCD); standard program.

Optional housings and heaters

Housing code	Description
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NEMA4SM	NEMA 4X (IP65) enclosure for FMS-3 only
NEMA4LG1S	NEMA 4X (IP65) enclosure for FMS-3 with RFT9712 transmitter
NEMA4LG3S	NEMA 4X (IP65) enclosure for FMS-3 with RFT9739 transmitter
EXPLFMS	NEMA 4X explosion-proof enclosure for FMS-3 only
KA160	European IP65 explosion-proof enclosure for FMS-3 only
KA159	European IP65 explosion-proof enclosure for FMS-3 with RFT9712 transmitter

Heater code	Description
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N4HTR115	110/115 VAC heater installed with FMS-3 and RFT9739 in large NEMA 4X (IP65) enclosure
N4HTR230	220/230 VAC heater installed with FMS-3 and RFT9739 in large NEMA 4X (IP65) enclosure

Due to Micro Motion's commitment to continuous improvement of our products, all specifications are subject to change without notice.

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