



LFE Electromagnetic Digital Flow Switch

The LFE flow switch is able to sense the flow of water and water-soluble coolant. It is also available as an integrated display or remote type solution.

FEATURES & BENEFITS

- Compact/lightweight
- Reverse flow can be detected
- Flow direction can be changed after installation
- 3 colour/2 screen display
- Display flow rate up to 200 l/min (LFE3 model)
- Instantaneous flow rate is displayed
- Parameters can be set



PRODUCT CONFIGURATION

1 MATERIAL

Enclosure - IP65

2 OPERATING FLUID TEMPERATURE

0 to 85°C

3 POWER CONSUMPTION




45 mA reduced by 10% when display is off

4 MINIMUM SETTING UNIT

0.1 l/min, 0.5 l/min and 1 l/min

5 MODEL VARIATIONS

LFE1, LFE2 and LFE3

Integrated display type/remote type	Flow range
 LFE1	From 0.5 l/min to 20 l/min
 LFE2	From 2 l/min to 100 l/min
 LFE3	From 5 l/min to 200 l/min

6 PRINCIPLE OF OPERATION

Measure the volume flow of conductive liquid by applying the Faraday's law of induction "when conductive object is moved through a magnetic field, a voltage will be generated".

7 PRESSURE LOSS

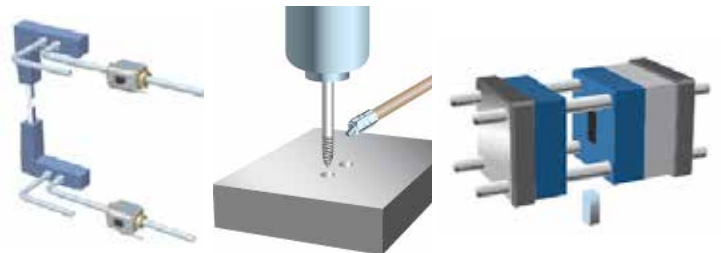
0.02 MPa or less

8 REPEATABILITY

±1.5 % F.S. (Analogue Output)

APPLICATIONS

- Flow control for cooling water for metal mold
- Flow control for pressurised cooling water for welding guns
- Flow control for water-soluble coolant



SPECIFICATIONS


MODEL	LFE1	LFE2	LFE3	
Applicable fluid	Water, Conductive fluids which do not corrode the fluid contact materials			
Applicable fluid conductivity	5 μ S/cm or more (micro Siemens)			
Detection Method	Electrostatic capacity type			
Ground	Negative ground			
Rated flow range	0.5 to 20 l/min	2.5 to 100 l/min	5 to 200 l/min	
Display flow range	0.4 to 24.0 l/min	2.0 to 120.0 l/min	4 to 240 l/min	
Set flow range	0.4 to 24.0 l/min	2.0 to 120.0 l/min	4 to 240 l/min	
Zero cut flow	0.4 l/min	2.0 l/min	4 l/min	
Minimum setting unit	0.1 l/min	0.5 l/min	1 l/min	
Accumulated volume per pulse (pulse width 50ms)	0.1 l/pulse	0.5 l/pulse	1 l/pulse	
Operating Fluid Temperature	0 to 85 °C (with no freezing and condensation)			
Display Units	Instantaneous flow rate l/min and accumulated flow l/min			
Repeatability	Displayed values \pm 2 % F.S. Analogue output \pm 1.5%			
Temperature Characteristics	Ambient Temperature	\pm 5 % F.S (25 °C reference)		
	Fluid Temperature	\pm 5 % F.S (25 °C reference)		
Operating pressure	0 to 10 Bar			
Proof pressure	2 Bar			
Accumulated flow range	99999999.9L by 0.1 L		999999999 L by 1 L	
	NPN or PNP open collector output			
Switch output	NPN or PNP open collector output			
Maximum load current	80 mA			
Maximum applied voltage	28 VDC			
Internal voltage drop	NPN: 1 V or less (at load current 80 mA) PNP: 1.5 V or less (at load current 80 mA)			
Response time	0.25 s/0.5 s/1 s/2 s/5 s			
Output protection	Short-circuit protection			
Output mode	Select from hysteresis mode, window comparator mode, accumulated output mode, or accumulated pulse output mode			
Analogue output				
Response Time	0.25 s/0.5 s/1 s/2 s/5 s			
Voltage Output	Output voltage: 1 to 5 V Output impedance: 1 k Ω			
Current Output	Output current: 4 to 20mA Max. load impedance: 600 Ω			
Hysteresis	Variable			
Display method	2-screen (Main screen: 4-digit, 7-segment, 2-colour, Red/Green; Sub screen: 6 digit, 11-segment, White) Display values updated 5 times per second			
Status LED's	Output 1, Output 2: (Orange)			
Power Supply Voltage	24 VDC \pm 10%			
Current Consumption	45 mA or less (Load current is not included)			
Environmental Resistance	Enclosure	IP65		
	Operating temperature range	0 to 50 °C (with no freezing and condensation)		
	Operating humidity range	Operating, Storage: 35 to 85% RH. (with no condensation)		
Standards and regulations	CE marking, RoHS			
Parts material in contact with fluid	PPS, FKM, C37 (Brass)			
Port size	3/8 (10A)	1/2 (15A)	3/4 (20A)	1 (25A)
Weight (Body)	Approx. 340 g	Approx. 400 g	Approx. 520 g	Approx 680 g

ORDERING CODES

Output specifications

Symbol	OUT
J	Analogue 1 to 5 V
K	Analogue 4 to 20 mA

Remote type sensor unit



Integrated display type



Rated flow range

Symbol	Rated flow range
1	0.5 to 20 l/min
2	2.5 to 100 l/min
3	5 to 200 l/min

Output specifications

Symbol	OUT1	OUT2
A	NPN	NPN
B	PNP	PNP
C	NPN	Analogue 1 to 5 V
D	NPN	Analogue 4 to 20mA

Option

Symbol	Lead wire with M12 connector (Length 3 m)	Bracket	Unit specifications
-	●	-	l/min
1	-	-	l/min
2	●	●	l/min
3	-	●	l/min
4*	●	-	gal/min
5*	-	-	gal/min
6*	●	●	gal/mmin
7*	-	●	gal/min

* Option 4, 5, 6, 7 cannot be selected when the output specification is J or K.
 Reference: 1 [l/min] = 0.2642 [gal/min]
 1 [gal/min] = 3.785 [l/min]

Port size

Symbol	Port size	Applicable model		
		LFE1	LFE2	LFE3
3	3/8	●	-	-
4	1/2	●	-	-
6	3/4	-	●	-
8	1	-	-	●

Thread type

Symbol	Type
-	Rc
N	NPT
F	G

OPTIONS/PART NO.

When only optional parts are required, order with the part number listed below.

Option	Part no.	Note	Weight
Lead wire with M12 connector	LFE-1-A3	Lead wire length 3 m	Approx 175 g

Option	Part no.	Note	Weight
Bracket	LFE-1-A3	Tapping screw for LEF1 (3 x 10), 4 pcs	Approx 45 g
	LFE-2-D	Tapping screw for LEF2 (3 x 10), 4 pcs	Approx 70 g
	LF3-3-D	Tapping screw for LEF3 (3 x 10), 4 pcs	Approx 70 g