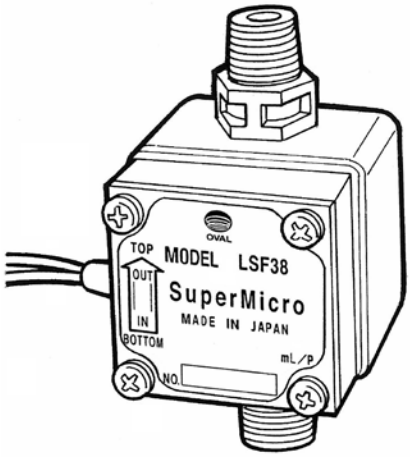
SPARLING/OVAL

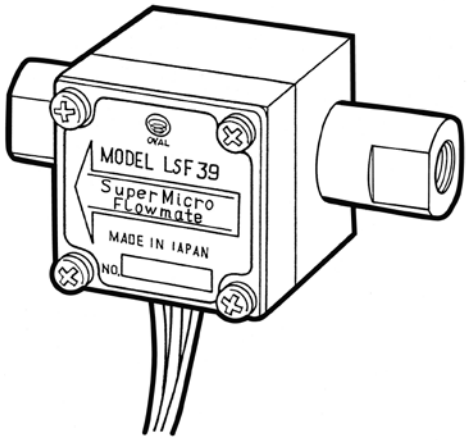
OPERATION MANUAL

Super Micro Flow Mate
FLOW MATE (OVAL M-Ⅲ)

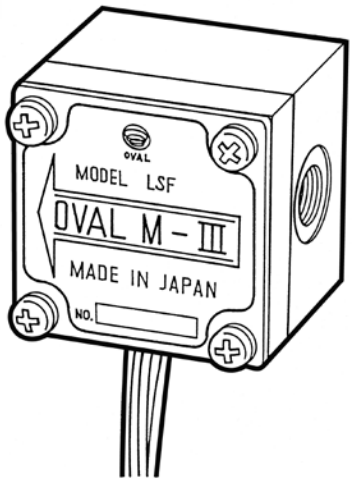
MODEL LSF 38 / 39 / 40□□-□□ / 41 / 45



Super Micro 38



Super Micro 39
Fittings provided (option)



Meter Sizes 40, 41, and 45

CE

Every OVAL product is manufactured and functionally tested under stringent quality control before shipment. In order to maintain its design performance throughout its life, this manual offers the operator the necessary installation, operation and maintenance information. Be well familiar with these instructions before you place your meter in service and retain it at the field location for ready reference.

CONTENTS

CONVENTIONS

Shown in this manual are the signal words NOTE, **CAUTION** and **WARNING**, as described in the examples below:

➡ NOTE: Notes are separated from the general text to bring the user's attention to important information.

⚠ **CAUTION: Caution statements signal the user about hazards or unsafe practices which could result in minor personal injury or product or property damage.**

⚠ **WARNING: Warning statements signal the user about hazards or unsafe practices which could result in severe personal injury or death.**

1.BEFORE YOU BEGIN

Every meter is thoroughly tested before it leaves the factory. When received, it should be thoroughly inspected for any indication of damage during transit.
Necessary handling precautions are described in this section; read the instructions carefully. As for other information, refer to the respective section. For any inquiries, contact your nearest Sparling/OVAL sales office.

⚠ **CAUTION**
When you make inquiries, include the product name, model code, serial number, ratings and other pertinent information.

1.1 Transit Consideration

(1) To safeguard against damage during transit, transport FLOW MATE (Sparling/OVAL M-Ⅲ) to the installation site in the original cardboard container used for shipment from the factory if circumstances permit.
(2) FLOW MATE (Sparling/OVAL M-Ⅲ) is adjusted and inspected completely with all the components of the meter-sensor unit, pulse generator, etc. For this reason, treat them as one complete assembly.

1.2 Storage Considerations

If the meter is going to be stored for long periods of time upon receipt before installation, it could be damaged or deteriorated due to unforseen circumstances. If a lengthy storage is expected, the following precautions should be taken:
(1) Keep FLOW MATE (Sparling/OVAL M-Ⅲ) in store in the same container used for shipment from Sparling/OVAL if possible.
(2) Place of storage should conform to the following requirements:
- ★ Free from rainwater.
- ★ Free from vibration and impact shocks.
- ★ Temperature and relative humidity in the storage place are at or near room temperature and humidity (around 25°C and 65% RH).

(3) If FLOW MATE (Sparling/OVAL M-Ⅲ) that has once been placed in service is to be stored, it should be purged with clean air, N_2 gas, etc. to remove residual process fluid from the meter interior, fittings, tubing inner walls, housing exterior and other components.

➡ NOTE: Use clean detergent, etc. to remove contaminants if necessary. Do not allow the meter to spin too fast during the flushing or cleansing process.

(4) ⚠ **CAUTION**
The Super Micro 38 has a plastic resin molded joint; therefore, excessive tightening or repitition of mounting and dismounting more than necessary may result in broken joint or loss of airtightness due to deformed taper screw.

(5) If you want to store the meter for extended periods of time, keep it stored under the conditions similar to those during shipment.

1.3 Structural Consideration

FLOW MATE (Sparling/OVAL M-Ⅲ) is intended for indoor use. Do not expose it to rainwater or running water.

2. OPERATING CONDITIONS

To maintain the stated high accuracy and long service life of FLOW MATE (Sparling/OVAL M-Ⅲ), make sure that the flowrate, pressure, temperature and viscosity are held within the ratings, The operating conditions appear in the GENERAL SPECIFICATIONS on page 15. Confirm these ratings before commencing operation.

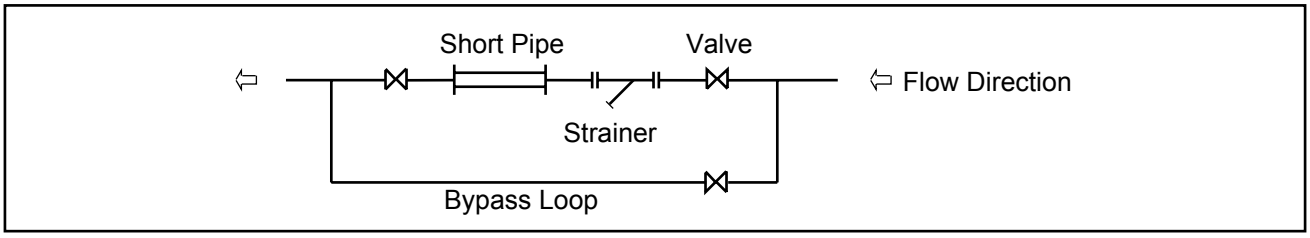
⚠ CAUTION

If the body material of FLOW MATE (Sparling/OVAL M-Ⅲ) is aluminum + anodized aluminum coating, it is not servicable for water and corrosive liquids.

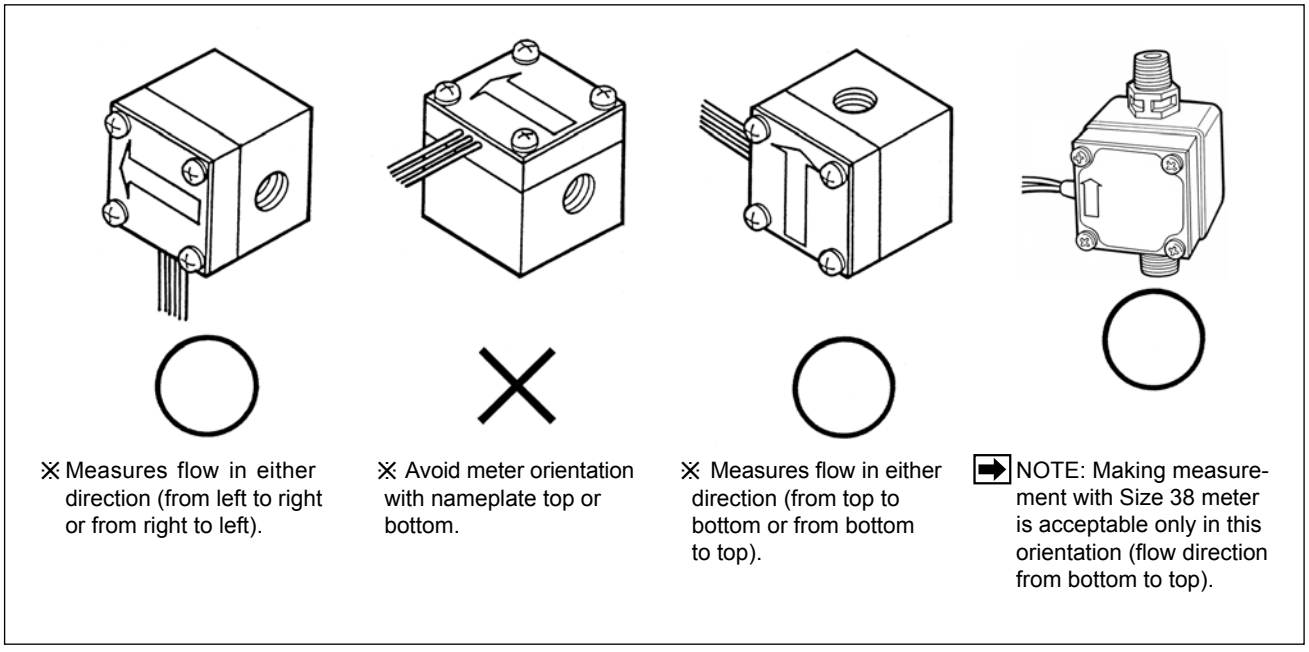
3. INSTALLATION

3.1 Tubing Considerations

(1) The tubing assembly must be thoroughly flushed. Flushing must be performed before meter installation. Couple a short pipe section in place of the meter (see the flushing set-up given below).



(2) The meter should be installed exercising due care to avoid pipe strains.
(3) When screwing in the fittings, be very careful not to allow metal chips and seal tape protrusions to get into the meter.
(4) The meter should be located downstream of the pump.
(5) Flow direction must conform to the arrow mark indicated on the meter body.
(6) The strainer should be located upstream of, and as close to the meter as possible.
(7) The physical orientation of the meter should be such that its nameplate is vertical as shown below.
(8) When installing Size 38 meter in the tubing assembly, screwing torque at the fitting should be held within 10N•m.



4. WIRING

➡ NOTE: Also see the topic "WIRING" in the instruction manual of the receiving instrument used.

4.1 Field Wiring

(1) Cables for field wiring

The following cables should be used unless otherwise specified.

Shielded chloroprene cabtyre cables (kind 2, JIS C 3327, shielded) or shielded vinyl cabtyre cables (JIS C 3312, shielded) with a conductor area 1.25mm².

3-conductor cables may be used to suit your specific application. Shielded end should be grounded at the ground terminal of the receiving instrument.

(2) Transmission length

With transmission cables conforming to JIS C 3327 or C 3312 conductor area 1.25mm², the maximum transmission length is typically one kilometer.

➡ NOTE: If it exceeds one kilometer, consult factory.

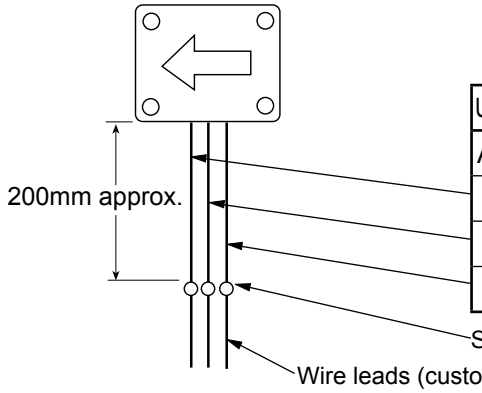
(3) Prevention of inductive interference

To minimize the possibility of stray current pickup, route the field wiring sufficiently away from other power cables and power circuits.

⚠ **CAUTION: Verify the validity of flowmeter (pulse generator) to receiving instrument combination by their product No., instrument No., etc, before making wiring connections.**

4.2 Electrical Connections

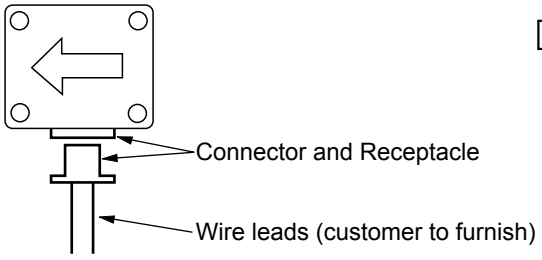
◆ 3-Wire System (MR sensor): Meter sizes 38, 39, 40, 41, and 45



➡ NOTE ※ : Unfactored pulses only with Meter sizes 38 and 39 .

Unfactored pulse	Factored pulse		
All models ※	Size 40 (1mL/p)	Size 41 (1mL/p)	Size 45 (10mL/p)
WHT: SIG	GRN: SIG	YEL: SIG	GRN: SIG
RED: +V	RED: +V	RED: +V	RED: +V
BLK: 0V	BLK: 0V	BLK: 0V	BLK: 0V

◆ 2-Wire System (reed switch): Meter sizes 40, 41, and 45 (unfactored pulses only)



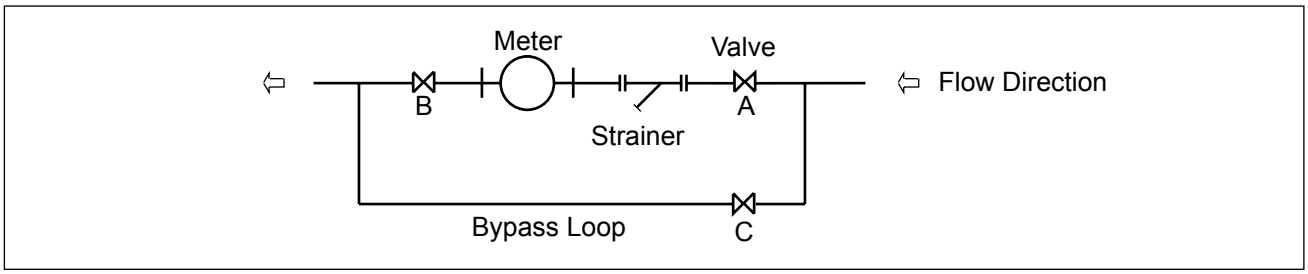
➡ NOTE: 1. Remove connector terminals and crimp wire leads for installation.
2. The sensor is of reed switch type. Polarity observation is not required.

5. OPERATING INSTRUCTIONS

5.1 Operation

Adhere to the operations sequence outlined below for the first time operation, allowing the process fluid flow within the flow range specified.

➡ NOTE: See the tubing diagram below.



(1) Shut off upstream valve (A) on the inlet side and valve (B) on the outlet side and then open bypass line valve (C) to allow the fluid in the bypass line, thereby removing weld spatters, metal chips, scales and other foreign matter left in the tubing assembly.

⚠ **CAUTION: This is particularly important for new or rebuilt tubing assemblies.**

(2) Carefully and slightly at first, open valve (A) upstream of the meter progressively and then, slightly at first, open valve (B) downstream of the meter progressively.

(3) Slowly close bypass line valve (C) and make sure that the total counter in the receiving instrument advances in response. Bubbles in the measuring chamber can produce meter errors; bleeding all air is essential at the time of meter installation in the tubing assembly.
With Meter Size 38, allowing the fluid at 50ml/min. or so for more than one minute is suggested.
With meters other than Size 38, allow the fluid at a rate 10 to 20% of the maximum flowrate for more than 15 minutes and ensure that all the air has escaped from the tubing assembly.
In applications where temperature exceeds 60?, run the meter at least for 30 minutes in this state to ensure that heat distribution in the measuring chamber becomes uniform.

(4) Following the break-in (preheating) period, shut off bypass line valve (C) completely and open upstream valve (A) progressively until fully open and slowly open downstream valve (B) until the rated flow is reached.

(5) Flowrate should be regulated with downstream valve (B) and should be held within the rating.

(6) The strainer net should be inspected for condition and cleaned on a regular basis.
A newly installed tubing assembly in particular requires daily net inspection for condition to prevent any flow obstructions. The service intervals may be reduced progressively to, say once a week thereafter.

⚠ **CAUTION: Use extra care to avoid running the meter too fast.**

5.2 Operating Precautions

(1) When changing flowrates:

In applications where the flowrate varies or where shutoff valve opening and closure takes place in batch operation, avoid rapid changes in flowrate across the meter.

Operating the meter at flowrates in excess of the maximum allowable flowrate will nullify the guaranteed accuracy, reduce the meter life and may result in faulty conditions, such as burn of bearings or rotor-to-measuring chamber contact.

(2) Where the temperature of metered fluid changes:

Avoid rapid temperature changes in the meter. Temperature changes of the fluid in the meter should be held with in 3°C per minute.

Extra care should be used particularly when making a flow measurement in batch operation without the provision of heat tracing of the tubing where the fuid temperature differs from atmospheric temperature.

If rapid temperature changes are anticipated, heat trace the tubing assembly as well as the meter.

(3) Liquids of low steam pressure:

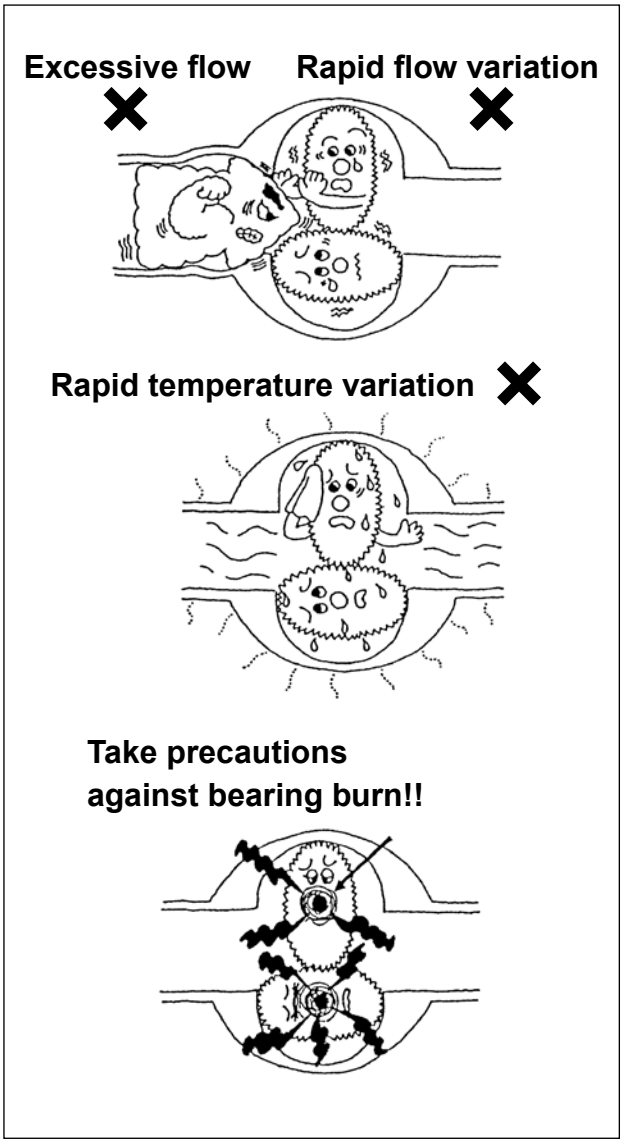
Liquids with low viscosity and low steam pressure can easily vaporize and their temperature and pressure should therefore be strictly controlled.

During operation, the temperature of bearings in the meter usually runs higher than that of the metered fluid. Vapors around the bearings can present problems, such as unusual noise and bearing seizure.

(4) Highly corrosive liquids:

When you make a measurement of highly corrosive liquids, appropriate materials should be used for tanks and tubing assembly.

Heterogeneous materials originally contained in the metered fluid, or certain substances that have leaked out of the tanks and/or tubing of inappropriate materials, may lead to costly downtime, as a result of locked rotors, for example, when they are allowed into the measuring chamber.



⚠ **CAUTION**

5.3 Safety Precautions Before Operation Shutdown

(1) Valves should be closed progressively.

Rapid valve closure could, under certain tubing conditions, cause a sharp pressure rise by water hammer, or hydraulic shock, which can result in damage to the meter.

(2) Precautions against pressure buildup on closure

Complete closure of valves upstream and downstream of the meter creates a totally enclosed space between them and a rapid buildup resulting from a rise in atmospheric temperature can be a potential source of damage to the meter.

(3) Liquids ready to adhere or gel

With liquids that tend to adhere, solidify or gel when allowed to reside, flush away the metered liquids thoroughly with appropriate detergent from the interior of meter before shutting down meter operation. Negligence of this precaution and leaving the meter as it is, you may possibly have problems when you want to start the meter the next time.

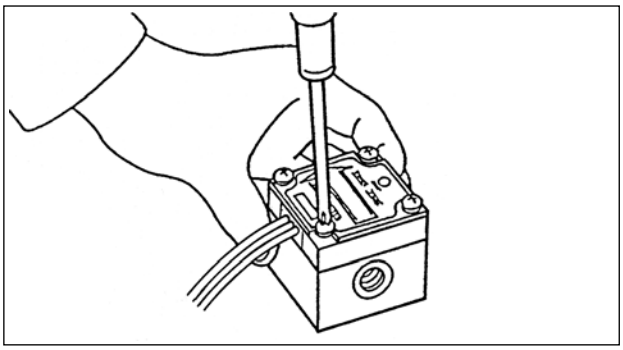
6. DISASSEMBLY AND INSPECTION

◎ **While recommended servicing intervals vary according to the given operating conditions, the**
◎ **general rule to follow is to perform periodic disassembly and inspection once a year.**
Refer to the exploded views on pages 12 to 14.

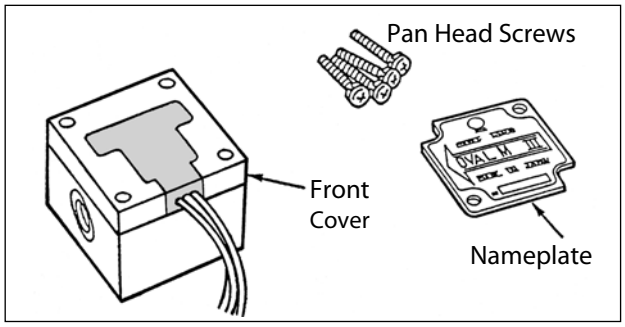
6.1 Meter Body Disassembly and Inspection

Complaint - Fluid will not run.
The most likely cause is that scales become jammed in the oval rotors, making them immovable and blocking the fluid flow.

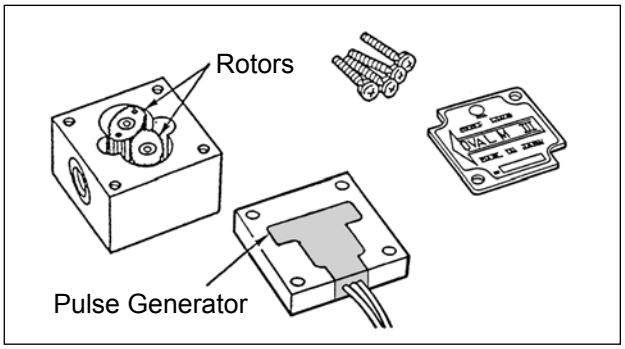
⚠ **CAUTION: Be sure to turn off power before you start servicing.**



① Take off all four pan head with cross point screwdriver.



② With pan head screws taken off, the front cover and pulse generator are now separable from the meter body. Be careful not to drop the meter body.



③ With the front cover removed, the measuring chamber and oval rotors are accessible.

④ Remove the oval rotors from the measuring chamber and inspect individual component parts for condition.

➡ NOTE:The rotor shafts should be drawn out axially.

(a) Are oval rotors jammed by foreign solids?
(b) Are rotors, shafts and other components worn?
(c) Are the inner walls of measuring chamber and front cover damaged?
(d) Are signal generating magnets rusted?

Upon completion of these inspections, wash clean the oval rotors, rotor shafts, measuring chamber and front cover thoroughly with fresh water or cleaning oil.

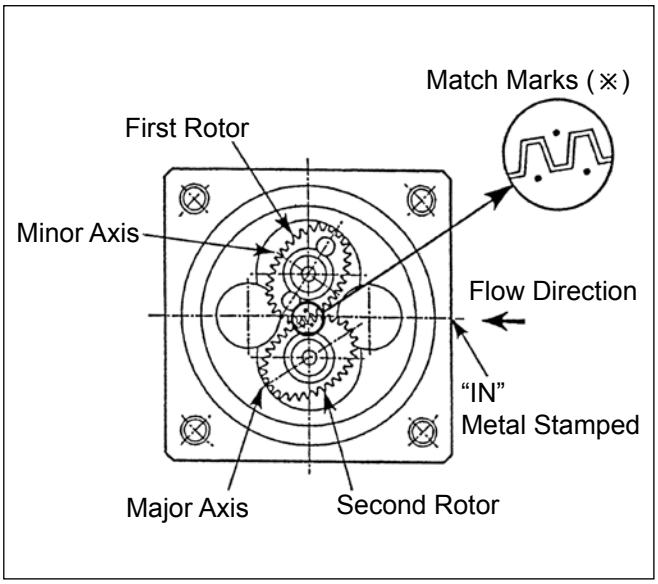
⚠ **CAUTION**

1. **Deep scoring, high spots caused by impressions, or other irregularities, should be reconditioned to be smooth and flat with oilstone.**
2. **FLOW MATE (Sparling/OVAL M-Ⅲ) is a precision instrument. Disassembly and inspection should be conducted indoors as a general rule. If it is desired to make disassembly and inspection without removing the meter from the tubing assembly, reduce internal pressure in the tubing assembly completely to zero, shut off valves upstream and downstream of the meter completely, drain the tubing assembly and then place a suitable liquid receptacle immediately below the meter. Use extra care to keep out dirt, sand or other contaminants from disassembled component parts.**

6.2 Meter Body Assembly

⚠ **Precautions Before Assembly:**
Wash clean oval rotors, inner walls of rotor shaft bearings, measuring chamber and inlet/outlet ports thoroughly to remove dirt, sand and other contaminants completely.

(1) Rotor installation
Installation is correct with the signal generating magnet embedded side facing the front cover. The first rotor (match mark "•") installs on the upper shaft when the flow direction is from right to left.
The second rotor (match mark "• •") installs on the lower shaft. Install the rotors carefully with match marks as shown in the inset.



➡ NOTES
1. (※): Match marks are stamped only on product code "LSF □ □ C □–□ □" (metal rotors).
2. Match marks do not appear on rotors of material K (special resin) or P (PPS resin, PEEK resin). Verify proper gear engagement at step (2) below.

(2) Confirming the rotor engagement
Hand rotate the rotors at least one complete revolution to see that they are correctly engaged.

(3) Front cover installation
Firstly, install the O-ring in place. If the O-ring is damaged or swollen by the metered fluid, it may not seat properly in the front cover groove. If this is the case, replace it with a new one.
Install four pan head screws and tighten them uniformly until the front cover is firmly secured to the meter body.

(4) Checking smooth rotation
Check smooth rotation of the rotors and proper output pulse counting with the connected receiving instrument by allowing air or water into the meter.

⚠ **CAUTION**
Rotation check should be conducted within a range of slow rotor rotation.
Allowing the rotors to spin too fast will lead to burn or other damage to the components.

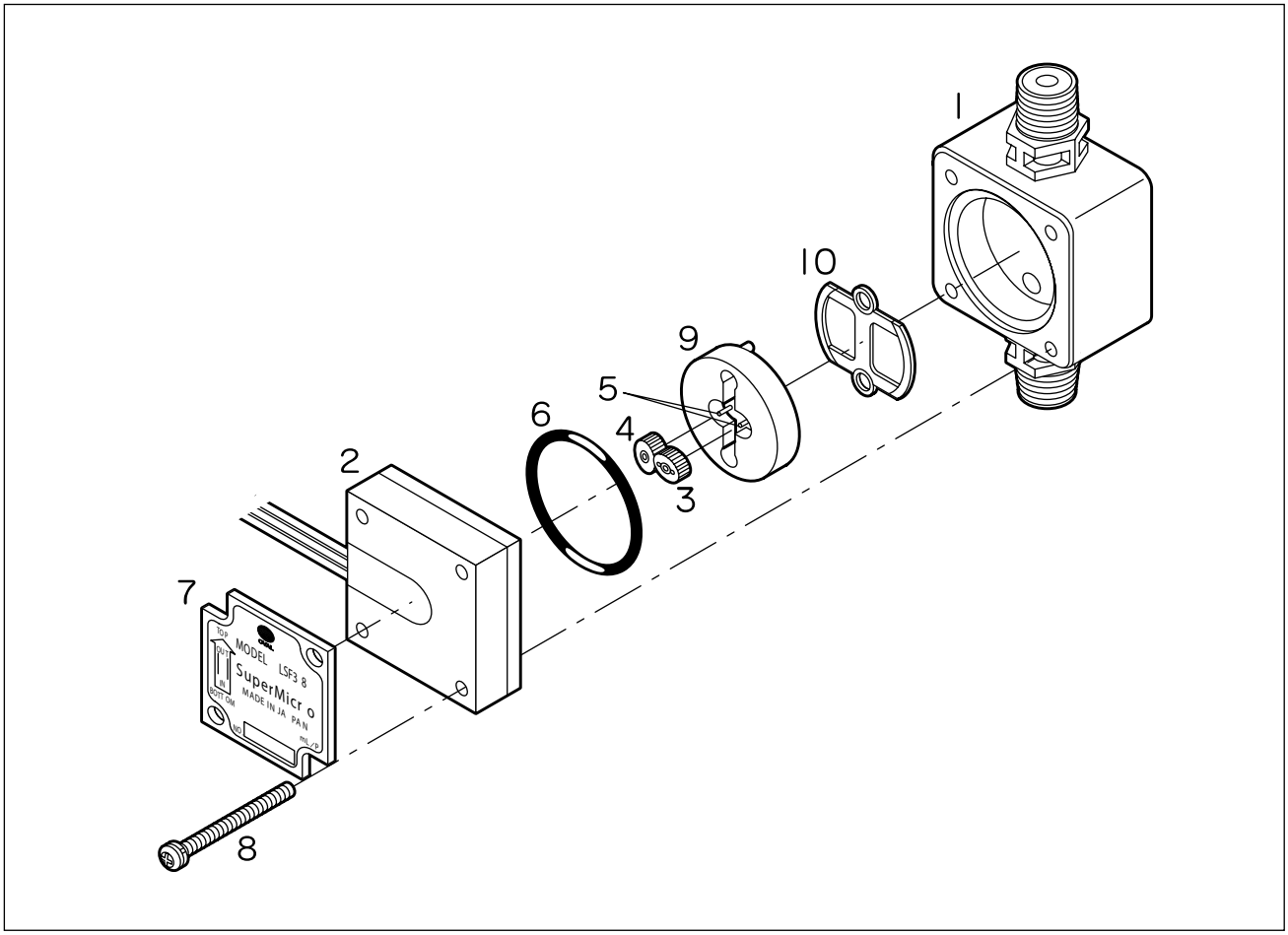
7. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	HANDLING
1. Counter will not count	1. Flowrate low.	1. Open valves progressively.
	2. Pump pressure or head pressure low.	2. Taking pressure loss of the entire tubing system into account, select a proper pump pressure or head pressure.
	3. Power source voltage is out of specification.	3. Supply 12 to 24 VDC power to the pulse generator.
	4. Oval rotors are jammed by foreign matter, interrupting the flow.	4. Disassemble the meter body by referring to the meter body disassembly and inspection procedure in Section 6. Wash clean the rotors and related components.
	5. The oval rotors are installed the wrong way.	5. Install the rotors correctly, referring to the meter body assembly and inspection procedure in Sec. 6.2.
2. Liquid leaks.	1. Incomplete seal of the tubing.	1. Tighten up the tube connections or replace gaskets.
	2. Incomplete front cover seal of the meter body.	2. Check front cover fitting bolts for tightness and replace O-ring with new one.
3. Counts while the valve remains closed.	1. Liquid leaks from valves or tube connections.	1. Inspect valves and tube connections for condition.
	2. Air builds up somewhere between the valve and meter; pulsating pump pressure causes a rocking motion of the rotors.	2. Let the air escape. Provide a check valve and accumulator.
4. Accumulated total too high.	1. Rocking motion of rotors by pulsating flow.	1. Provide a check valve and accumulator.
	2. Influenced by external magnetic fields. (The flowsensor picks up external magnetic fields from a motor, generator, etc.)	2. Shield from external magnetic fields.
	3. Air entrapped.	3. Provide an air vent.
5. Accumulated total too low.	1. Influenced by external magnetic fields.	1. Shield from external magnetic fields.

8. EXPLODED VIEWS AND PARTS LISTS

8.1 Meter Size 38

◇**Exploded View**◇



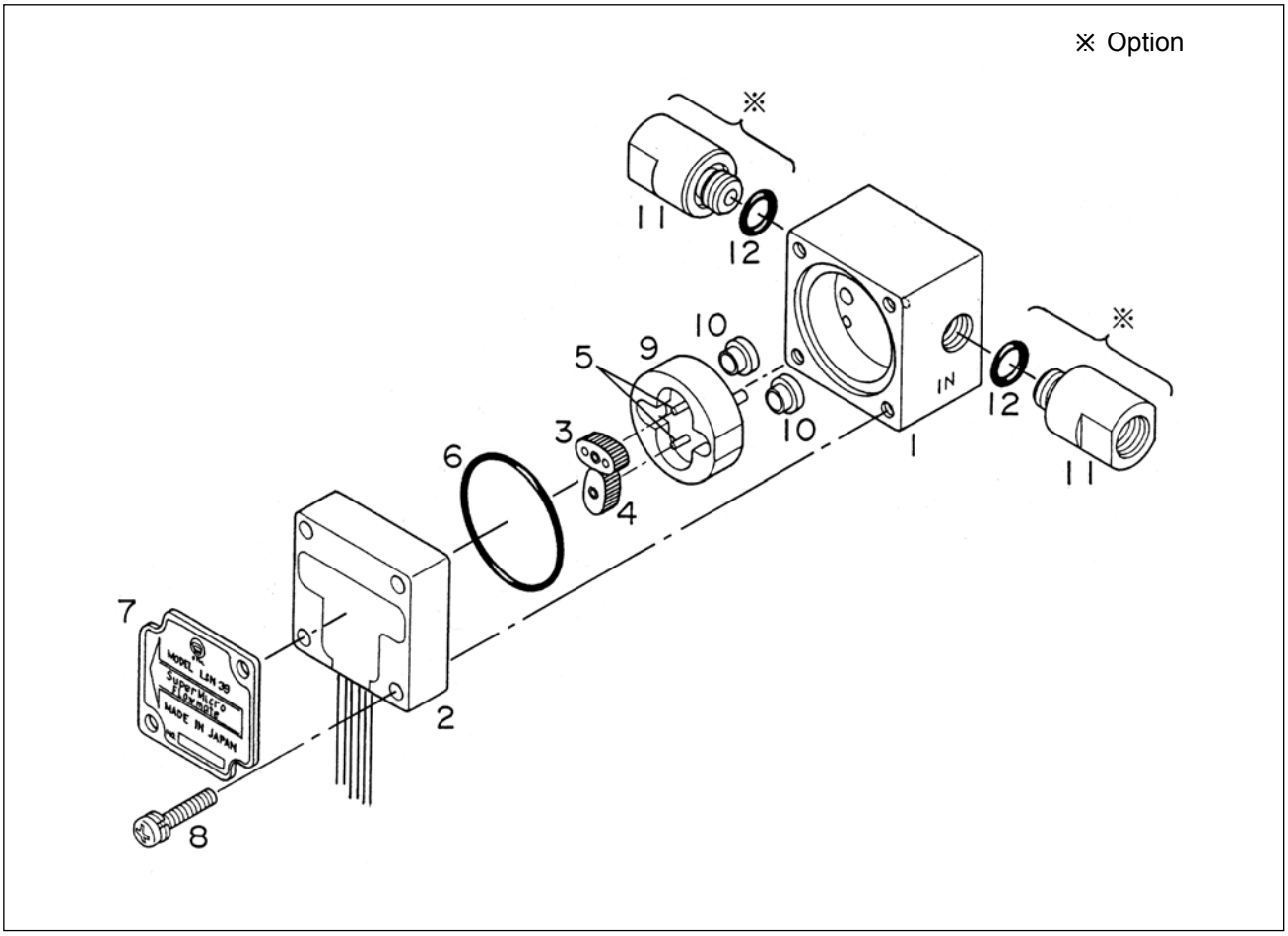
◇**Parts List**◇

Symbol No.	Part Name	Q'ty	Remarks
1	Meter Body	1	
2	Front Cover with MR Sensor	1	Molded MR sensor built in (lead wires 200mm)
3	First Rotor	1	Signal generating magnet embedded
4	Second Rotor	1	
5	Rotor Shaft	2	Press fit into the inner case
6	O-Ring	1	S-32
7	Nameplate	1	
8	Screw	4	M4×35 washer, hex nut provided
9	Inner Case	1	
10	Inner Case Retaining Gasket	1	

- **When ordering replacement parts, please specify the product No., flowmeter model, instruction manual No., symbol No., part name, quantity desired, etc.**

8.2 Meter Size 39

◇**Exploded View**◇



◇ **Parts List**◇

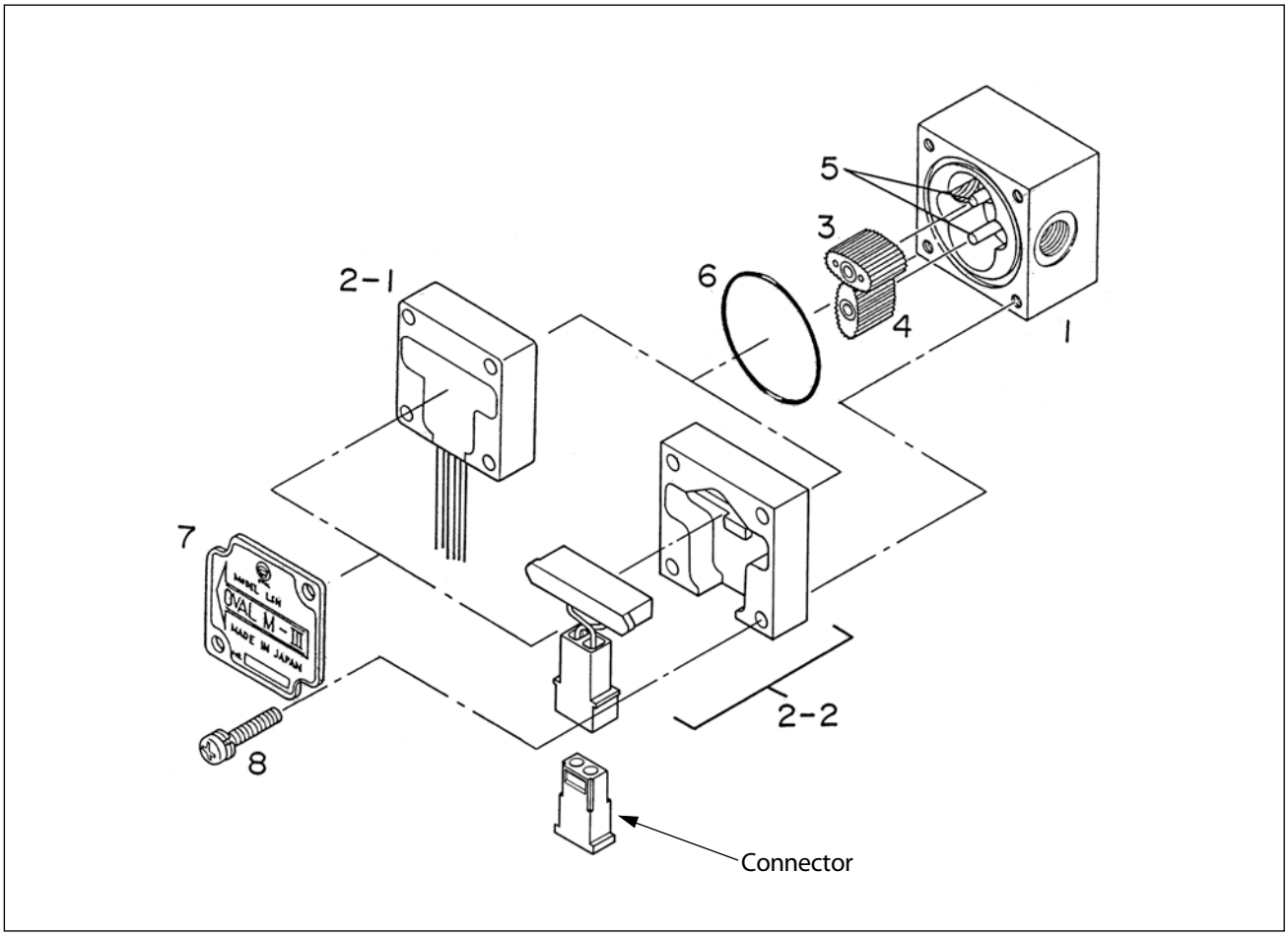
Symbol No.	Part Name	Q'ty	Remarks
1	Meter Body	1	
2	Front Cover with MR Sensor	1	Molded MR sensor built in (lead wires 200mm)
3	First Rotor	1	Signal generating magnet embedded
4	Second Rotor	1	
5	Rotor Shaft	2	Press fit into the inner case
6	O-Ring	1	S-32
7	Nameplate	1	
8	Screw	4	Washer provided (M4×20)
9	Inner Case	1	
10	Seal Cap	2	
※11	Fitting	2	300 mesh net incorporated
※12	O-Ring for Fitting	2	S-10

➡ NOTE : ※ Option

- **When ordering replacement parts, please specify the product No., flowmeter model, instruction manual No., symbol No., part name, quantity desired, etc.**

8.3 Meter Sizes 40, 41 and 45

◇**Exploded View**◇



◇**Parts List**◇

Symbol No.	Part Name	Q'ty	Remarks
1	Meter Body	1	
2-1	Front Cover with MR Sensor	1	Molded MR sensor built in (lead wires 200mm)
2-2	Front Cover with Reed Switch	1	Connector provided
3	First Rotor	1	With bearing and signal generating magnet (Meter size 40 without bearings)
4	Second Rotor	1	With bearing (Meter size 40 without bearing)
5	Rotor Shaft	2	Press fit into the meter body with built-in O-ring
6	O-Ring	1	Meter sizes 40, 41: S-32 ; Meter size 45 : S-42
7	Nameplate	1	
8	Screw	4	Washer provided (Meter sizes 40, 41: M4×20 ; Meter size 45 : M5×25)

- **When ordering replacement parts, please specify the product No., flowmeter model, instruction manual No., symbol No., part name, quantity desired, etc.**

9. GENERAL SPECIFICATIONS

(1) Flow Ranges (Accuracy: ±1%)

Unit in L/h

Viscosity / Meter Size	Water	0.3mPa•s to less than 0.8mPa•s	0.8mPa•s to less than 2.0mPa•s	2.0mPa•s to less than 5.0mPa•s	5.0mPa•s to less than 200mPa•s	5.0mPa•s to less than 1000mPa•s	Rotor Material
Super Micro 38	0.09 to 3	———	———	———	———	———	PEEK resin
Super Micro 39	———	———	0.12 to 6	0.12 to 6	———	———	PPS resin
40	———	1.5 to 50	1.0 to 50	0.7 to 50	———	0.5 to 50	Special resin
41	———	3.0 to 100	2.0 to 100	1.5 to 100	———	1.0 to 100	Special resin
	———	7.0 to 100	4.0 to 100	2.0 to 100	1.0 to 100	———	Stainless steel
45	———	10.0 to 500	7.0 to 500	4.0 to 500	———	2.5 to 500	Special resin
	———	25.0 to 500	15.0 to 500	7.0 to 500	3.5 to 500	———	Stainless steel

(2) Meter Body

Item		Description									
Meter Size		Super Micro 38 (※1)	Super Micro 39	40		41			45		
Connections/Nominal Dia		R1/4 male	G1/8(w / fitting: Rc1/4 (※3))	Rp1/8 (6mm)		Rp1/8 (6mm)			Rp1/4 (8mm)		
Accuracy		0.09 to 0.18L/h ±10% RD 0.18 to 3L/h ±3%RD	0.12 to 0.3L/h ±8% RD 0.3 to 6L/h ±3% RD	±1% of reading							
Operating Temp. Range		−10 to +60°C	−20 to +80°C								
Max. Operating Pressure		0.3MPa	0.49MPa	0.98MPa							
Material (※2)	Meter Body	P	C	L	C	L	C	C	L	C	C
	Rotors	P	P	K	K	K	K	C	K	K	C

➡NOTES: ※1. Acceptable physical orientation of Meter Size 38 is bottom to top only.

※2. C: Stainless steel (basic body SUS316; rotors SUS316 sintered)

L: Aluminum + anodized aluminum (Meter material “L” is not serviceable for water and corrosive liquids.)

K: Special resin

P: PPS resin (For applications other than water, pure water, and oils, consult the factory.)

P: PEEK resin (water and pure water only) Meter Size 38 only.

※3. Fittings furnished with Meter Size 39 have a built-in 300 mesh net.

(3) Pulse Generator

1. MR Sensor (standard)

Unit in L/h

Item		Description	
		Meter Size 38	Meter Sizes 39, 40, 41 and 45
Method of Detection		A magnetoresistive (MR) sensor converts alternating magnetic fields to a voltage output.	
Speed of Response		1000Hz max. (MR sensor alone)	
Ambient Temp. Range		–20 to +80°C	
Output Pulse ※	Voltage pulse	Voltage pulse "0" / "1" = 1VDC max. / [supply volt.] – 2VDC min. (resistive load 10kΩ min.) [supply volt.] –2VDC min. 1VDC max.	Voltage pulse "0" / "1" = 0.5VDC max. / 6.2 to 7.6VDC (resistive load 10kΩ min.) 6.2 to 7.6VDC 0.5VDC
	Duty ratio(%)	$4.0 \leq \frac{H}{H+L} \times 100 \leq 65.0$	
Transmission Length		1 kilometer max. (cable used is CVVS 1.25 to 2.00mm^2)	
Power Source		12 to 24VDC ±10%	
Current Drain (power consumption)		10mA max. (0.3W max.)	

※ Measurement units of output pulses (MR sensor models)

Meter Size	Factored Pulse		Unfactored Pulse		Max. Flowrate L/h
	Pulse unit mL/P	Freq. at max. flowrate Hz	Nominal meter factor mL/P	Freq. at max. flowrate Hz	
Super Micro 38	———	———	0.0550	15.2	3
Super Micro 39	———	———	0.161	10.4	6
40	1	13.9	0.25	55.6	50
41	1	27.8	0.5	55.6	100
45	10	13.9	2.5	55.6	500

※ Applicable Standards

Applicable EU Directives	EMC Directive: 2004/108/EC
Applicable standards, etc.	EMC Directives EN55011 : 1988/A1 : 1999 Group 1, Class B EN61000-6-2 : 2001

➡ NOTE: To meet compliance requirements, a lightning protector (M SYSTEM: MDP-SP or equiv.) must be used.

2. Reed Switch (excluding options / Meter Sizes 38, 39)

Item	Description
Max. operating voltage	AC: 45V; DC: 45V
Contact current capacity	10W or 0.5A (resistive load)
Contact withstanding voltage	DC: 250V R.M.S. for one min.
Output pulse ※	Contact-closure pulse (unfactored pulse only)
Operating ambient temp.	–20 to +85°C (relative humidity 90% max.)

※ Measurement units of output pulses (reed switch)

Meter size	Unfactored Pulse		Max. flowrate L/h
	Nom. meter factor mL/P	Freq. at max. flowrate Hz	
40	0.5	27.8	50
41	1.0	27.8	100
45	5.0	27.8	500

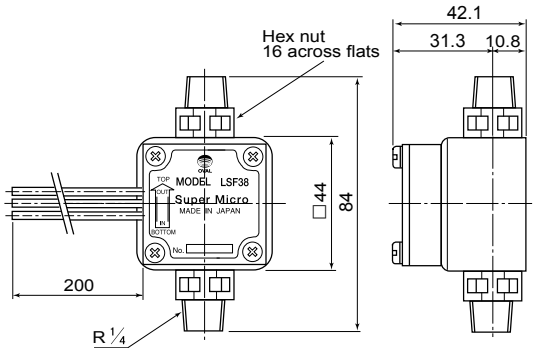
10. OUTLINE DIMENSIONS

● **MR sensor generator equipped**

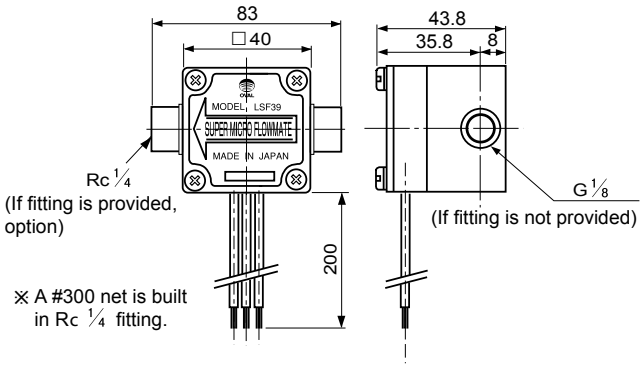
➡ NOTE: For lead wire connections, see Sec. 4.2 on page 5.

All dimensions in millimeters

● Super Micro 38

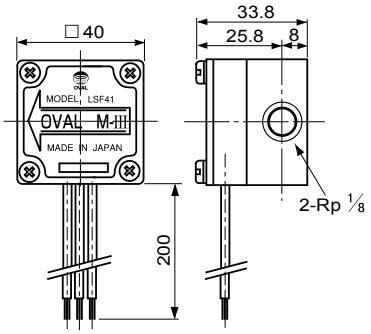


● Super Micro 39

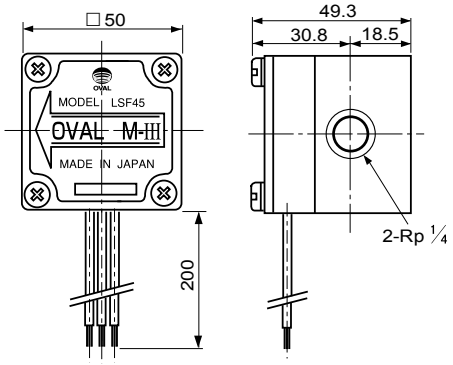


➡ NOTES: 1. For Meter Size 38, prepare a strainer (mesh #300). Meter Size 39 without fitting requires a strainer (mesh #300).
2. For lead wire connections, see Sec. 4.2 on page 5.

● Meter sizes 40 and 41

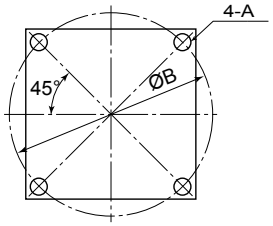


● Meter size 45



➡ NOTE: For lead wire connections, see Sec. 4.2 on page 5.

● Mounting dims.



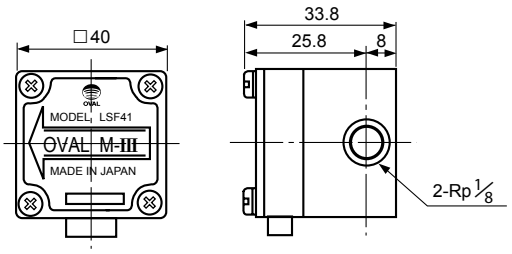
Meter size	A	B	Scr. depth
39	M4	45	6
40	M4	45	6
41	M4	45	6
45	M5	56	15

Fig. 10.1

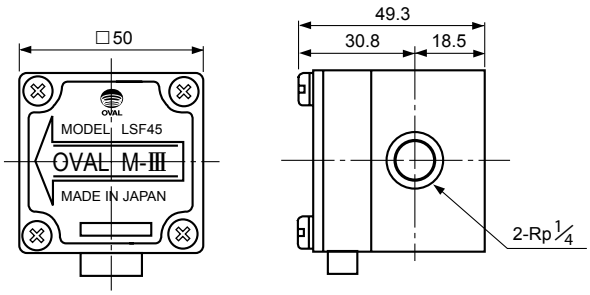
■ Reed Switch Generator Provided

All dimensions in millimeters

● Meter sizes 40 and 41



● Meter sizes 45



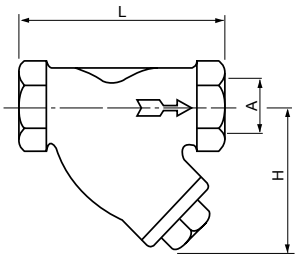
➡ NOTE: See Sec. 4.2 (page 5) for lead-wire connections.

Fig. 10.2

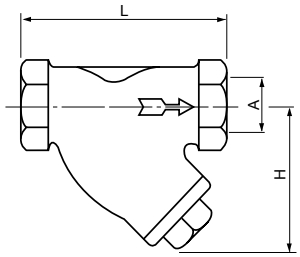
■ Strainers (YS12 and 13)

Applicable meter sizes: 40, 41 and 45
Max. operating pressure: 1.57MPa
Body material: FC200 (cast iron) or
SCS14A (stainless steel)
Net material: SUS316 (stainless steel)

● Outline (Material B)



● Outline (Material C)



● **Length Table**

All dimensions in millimeters

Category	Nominal size A	Material	L	H (approx.)	Net Mesh No.
YS12 (for Meter Sizes 40 and 41)	Rc1/8 (6mm) ※1	B	110 ※2	60	200
		C	95 ※2	50	200
YS13 (for Meter Size 45)	Rc1/4 (8mm)	B	80	60	200
		C	65	50	200

➡ NOTES
※ 1: Meter Sizes 40 and 41 with R1/4×Rc1/8 bushings.
(Bushings are contained in the same package as the strainer.)
※ 2: Dimensions with bushing installed (for reference purpose).

Fig. 10.3

11. PRODUCT CODE EXPLANATION

● Flow Mate

Item	Product Code										Description	Combination				
	①	②	③	④	⑤	⑥	⑦	–	⑧	⑨		38	39	40	41	45
Model	L	S	F								FLOW MATE (OVAL M-Ⅲ)	○	○	○	○	○
Meter Size				3	8						R 1/4 male	○				
				3	9						G1/8 (Rc1/4 depending on optionally available fittings. A 300-mesh net is built in.)		○			
				4	0						Rp 1/8 (6mm)			○		
				4	1						Rp 1/8 (6mm)				○	
				4	5						Rp 1/4 (8mm)					○
Major Parts Materials						P					Meter body (C) + Rotors (P: PEEK resin) Meter size 38 only	○	×	×	×	×
						P					Meter body (C) + Rotors (P: PPS resin) Meter size 39 only	×	○	×	×	×
						C					Meter body (C) + Rotors (C)	×	×	×	○	○
						L					Meter body (L) + Rotors (K)	×	×	○	○	○
						P					Meter body (C) + Rotors (K)	×	×	○	○	○
Process Connection (fittings)							0	–			Less fittings	○	○	○	○	○
							8	–			Fittings provided (option)	×	○	○	○	○
Pulse Generator									M		MR sensor	○	○	○	○	○
									R		Reed switch (option)	×	×	○	○	○
Pulse Type										1	Unfactored	○	○	○	○	○
										2	Factored (MR sensor only)	×	×	○	○	○

NOTE: ○: Available
×: Not available

● Strainer

Item	Product Code					Description
	①	②	③	④	⑤	
Model	Y	S				M-Ⅲ Strainer
Nominal Dia.			1	2		Rc1/8 (Fits Meter sizes 40 and 41.)
			2	3		Rc1/4 (Fits Meter size 45.)
Material					B	FC200
					C	SCS14A

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IDS LSF S-176-7-E (2)

All specifications are subject to change without notice for improvement.

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