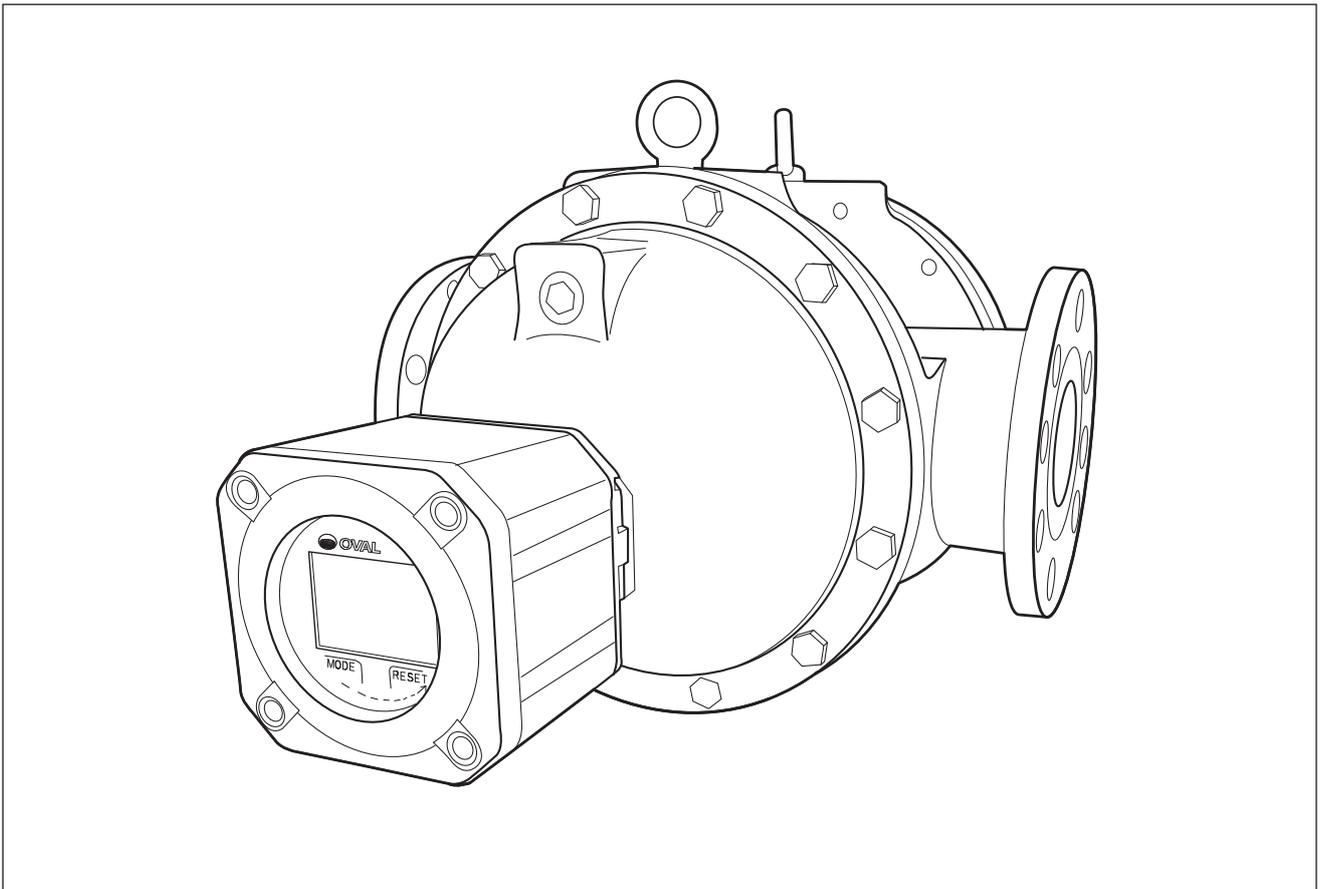




ULTRA UF-II

Meter Sizes: 80 and 81
Register Type: S (Standard type)



Every **ULTRA UF-II** (electronic register equipped flowmeter) is fabricated and shipped from our factory under stringent quality control. 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 the meter in service and retain this manual at the field location for ready reference.

◆ About Meter Size Designation ◆

The size of **OVAL** positive-displacement flowmeters is basically identified by a two-digit code. For details, see Section 13. **PRODUCT CODE EXPLANATION**.

CONTENTS

1. BEFORE YOU BEGIN	4
1.1 Confirming the Nameplate	4
1.2 Transportation Precautions	4
1.3 Storage Considerations	4
2. OPERATING CONDITIONS.....	5
3. GENERAL	6
4. PART NAMES	6
5. INSTALLATION	7
5.1 Considerations on Installation.....	7
5.2 Standard Installation, Horizontal Line	7
5.3 Standard Installation, Vertical Line.....	7
5.4 Example of Faulty Piping	7
6. HOW TO CHANGE FLOW DIRECTIONS.....	8
7. OPERATING INSTRUCTIONS	9
7.1 Flushing the Piping Assembly	9
7.2 Operating Considerations	9
8. DISASSEMBLY AND INSPECTION	10
8.1 Disassembly and Inspection Procedures.....	10
8.2 Assembly.....	12
8.3 Disassembly and Inspection as Installed in the Piping Assembly	12
8.4 Reconditioning the Rotor Gear Teeth.....	13
8.5 Signal Generating Magnet Disassembly and Reassembly Notes.....	13
9. TROUBLESHOOTING	14
10. EXPLODED VIEWS AND PARTS LIST	15
11. GENERAL SPECIFICATIONS.....	17
12. OUTLINE DIMENSIONS	17
13. PRODUCT CODE EXPLANATION	18

The indications **NOTE**, **CAUTION**, and **WARNING** shown throughout this manual are to draw your attention to specific items:

 **NOTE**

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

 **CAUTION**

Caution statements call attention to user about hazards or unsafe practices that could result in minor personal injury or property damage.

 **WARNING**

Warning statements call attention to user about hazards or unsafe practices that could result in serious personal injury or death.

1. BEFORE YOU BEGIN

Every ULTRA UF-II is thoroughly inspected before leaving the factory. When received, it should be thoroughly inspected for indication of rough handling during transportation. Necessary handling precautions are described in this section; read the instructions carefully.

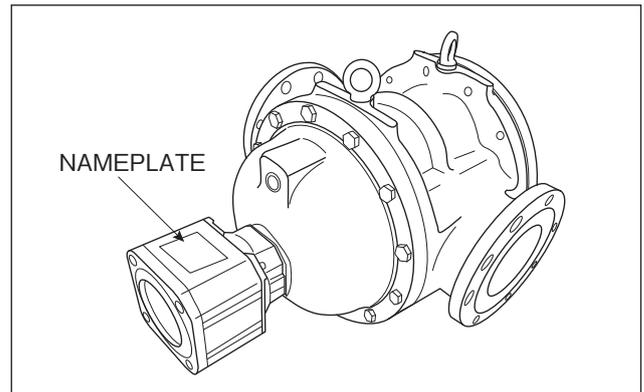
As for other information, find the respective sections from “CONTENTS”.

For any inquiries, contact your nearest OVAL designated sales office.

⚠ CAUTION: Make sure to specify product name, meter model, serial number (written in the name plate), rated specifications and other necessary information.

1.1 Confirming the Nameplate

Every ULTRA UF-II is assembled and adjusted according to individual specifications. Product code and ratings are stated on the nameplate of the register housing. Make sure that, by referring to the GENERAL SPECIFICATIONS, the product you received is fully in compliance with your order.



1.2 Transportation Precautions

- (1) To prevent unexpected problems, transport the flowmeter to the installation site using the original manufacturer's packing for shipment if circumstances permit.
- (2) ULTRA UF-II is adjusted and inspected as an assembly consisting of the meter body, sensor and register. It should therefore be handled as an integral assembly.
- (3) The register is accurately set up and adjusted. Do not attempt to remove the front cover to gain access to its internal assembly.

1.3 Storage Considerations

Storing the ULTRA UF-II for long periods of time upon receipt before installation can result in unexpected and undesirable conditions. When long-term storage is anticipated, take the following precautions:

- (1) Your ULTRA UF-II can best be stored in the manufacturer's original packing used for shipping if possible.
- (2) Place of storage should conform to the following requirements:
 - ★ Location free from rain and water.
 - ★ Location free from vibration and impact shocks.
 - ★ At room temperature with minimal temperature and humidity variation (around 25°C and 65% R.H.).
- (3) Purge the ULTRA UF-II that has once been placed in service with clean air, N₂ gas, etc. to prevent the metered fluid from adhering to the meter connections, piping inner walls, housing, etc. before storage. (Wash clean with suitable detergent if necessary.)
- (4) In case of storage for extended periods of time, good practice is to keep in store in the same containers used for shipment from the factory.

2. OPERATING CONDITIONS

To maintain the stated high accuracy and long service life of OVAL flowmeter, make sure that flowrate, pressure, temperature and viscosity are within the ratings as stamped on the meter register nameplate. Do not fail to confirm these ratings before placing it in service.

CAUTION

1. In cases where the register is exposed to elevated temperatures due to exposure to direct rays of the sun or to radiant heat, ensure, by providing a sunshade or similar protection, that the meter is used within the operating temperature range.
2. This flowmeter is not provided with subtract function. If pulsation in the flow (where the fluid moves back and forth in the pipeline under the influence of pressure) or reversal of flow exists, the total counter may show erratic reading, accumulating all incoming pulses irrespective of flow direction.

ULTRA UF-II			<small>MADE IN JAPAN MNPJ-237</small>
OVAL Corporation			
MODEL			
TAG. No		MAX PRESS.	
FLOW RANGE			
INT. ~			
CONT. ~			
FULL SCALE		TEMP.	PULSE UNIT
SERIAL No.		DATE	SIZE
FLUID			METER FACTOR
NOTE: 1. When measuring other liquids, consult us. 2. Place the meter body (outer case) in a horizontal position. For details see instruction manual.			

3. GENERAL

This flowmeter has been developed to meet the needs of precise flowrate measurement. The local direct-reading total counter is an all-electronic register built around a single-chip CPU. With latest electronic technologies used throughout, this versatile register displays accumulated total flow, instantaneous flowrate (digital readout) and provides, by option, a pulse and analog output proportional to the rate of flow.

In this meter, fluid flow is detected by sensing with an amorphous sensor the magnetic fields of permanent magnets embedded in the oval rotors. As a result, high reliability is achieved.

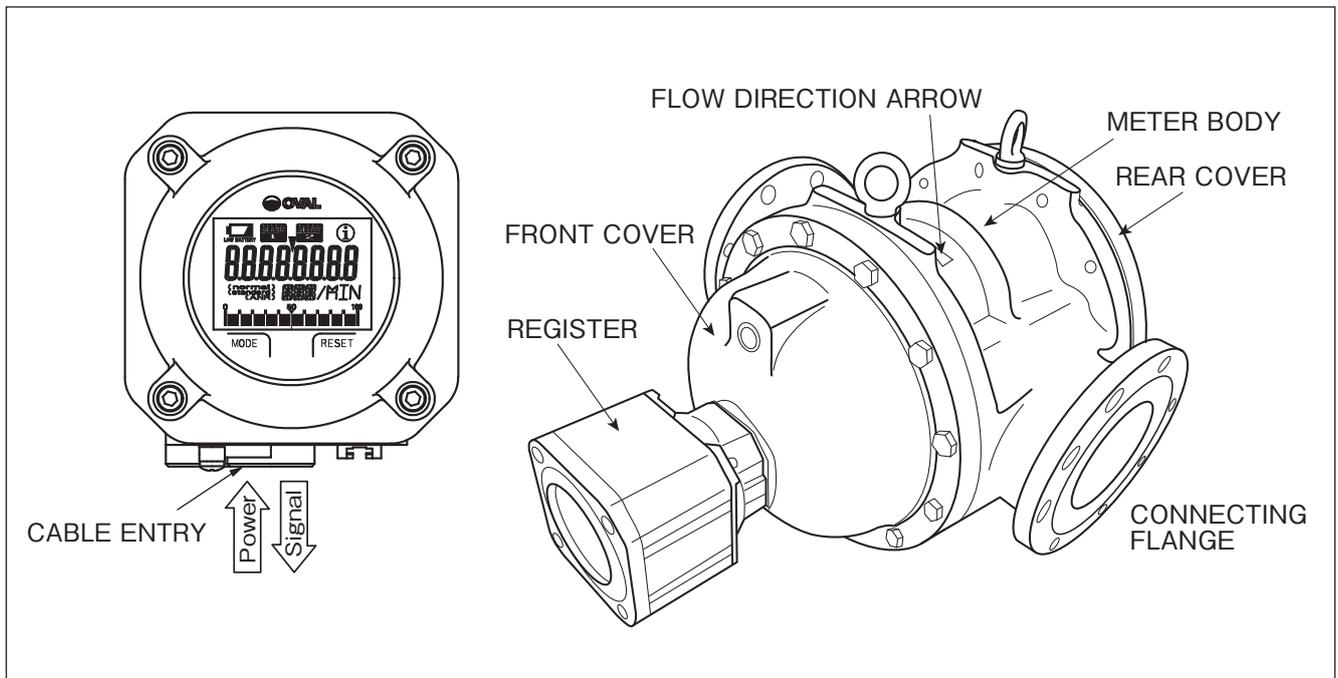
Features

- (1) Uniform-speed revolution, uniform flowrate, and uniform torque.
- (2) Exceptionally quiet with no noise and low vibration.
- (3) You can monitor accumulated total flow and instantaneous flowrate locally on the digital display.
- (4) When coupled with a remotely located receiving instrument, output signals can readily and simply be used for control, adjustment and recording.
- (5) IEC explosionproof construction offers increased safety in a compactly built body.
- (6) A non-volatile memory retains parameters and variables even in cases of power off or power failure.
- (7) Features an alarm indicator, including low battery alarm.

REFERENCE:

With the use over an extended time, the meter error will deviate more or less from the initial point. Upon request, we may conduct an instrumental error testing once again and establish a "new meter factor" when your ULTRA UF-II is returned to the factory for periodic inspection, etc.

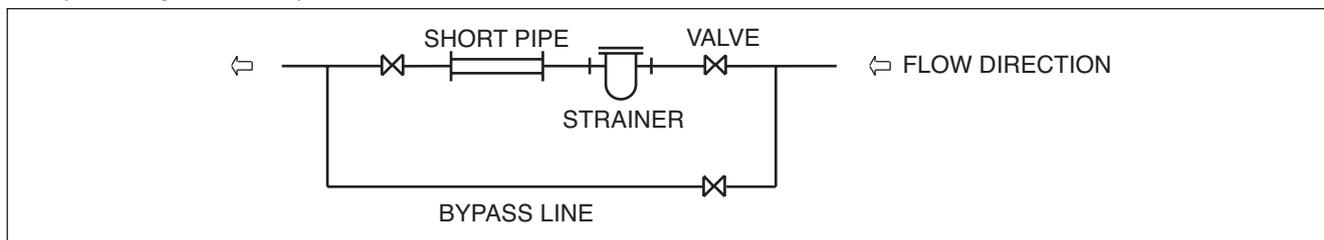
4. PART NAMES



5. INSTALLATION

5.1 Considerations on Installation

- Flush the piping assembly.
Flushing must be performed before meter installation. Install a short pipe in place of the meter at this time (See diagram below).

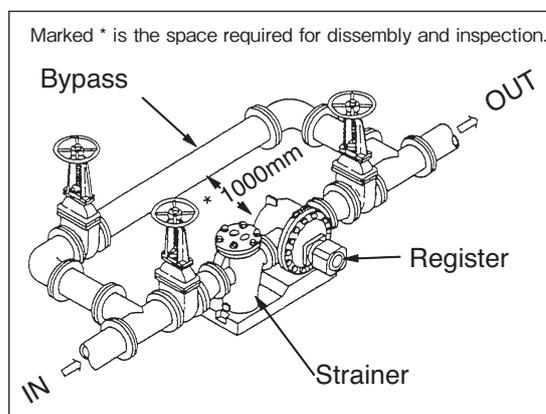


- Install the meter free from pipe strains.
 - The meter must be installed on the discharge side of the pump.
 - If the meter is to be used under tank head, give a head pressure larger than the total pressure loss of the piping system, strainer, meter, etc.
- ⇒ NOTE: Pressure losses of ULTRA UF-II and strainers are stated on the GENERAL SPECIFICATIONS.
- Meter installation is correct if the flow direction conforms to the arrow mark on the meter body.
 - The strainer is to be located upstream of, and as close to, the meter as possible.
 - Since the sensing element of the OVAL flowmeter detects the change of magnetic flux density, it must be isolated from the influence of any external magnetic flux. In order to prevent the possible influence of external magnetic flux, the meter should be located at least 5 meters from existing power equipment and conductors - potential sources of creating large magnetic and electric fields, such as motors and generators.
 - In case electric heating is desired, consult OVAL.
 - Lagging material, if used, must not cover the register and its adapter.

● Typical OVAL Flowmeter Installations

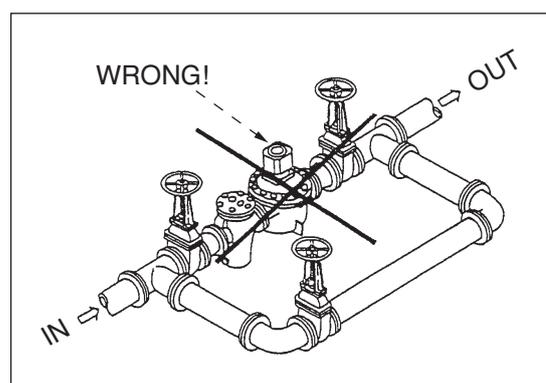
5.2 Standard Installation, Horizontal Line

- In case flow direction is from Right to Left, change places of meter and strainer.
- Arrange piping so as to facilitate drainage.
- Strainer should be inspected on a regular basis.



5.4 Example of Faulty Piping

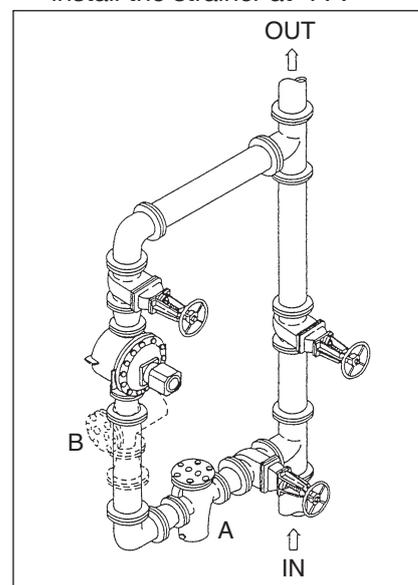
Do not install the meter in a position like this.



<<NOTE>> For outline dimensions and pipe connection dimensions, see the approval drawing.

5.3 Standard Installation, Vertical Line

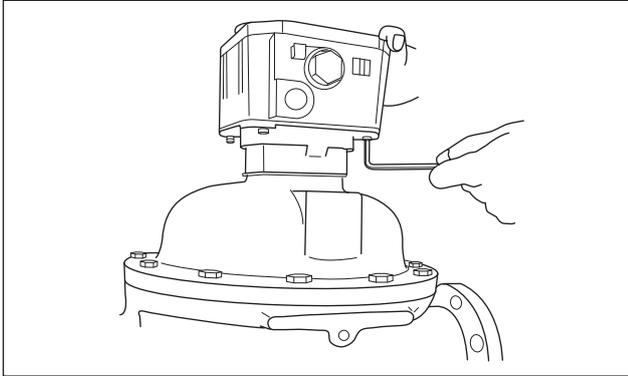
- If the flow direction is from top to bottom, change places of meter and strainer.
- Installing the strainer at "B" will make net reinstallation difficult at cleaning; we recommend to install the strainer at "A".



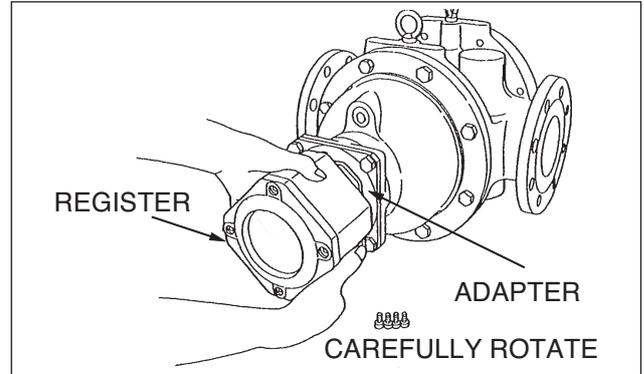
6. HOW TO CHANGE FLOW DIRECTIONS

⚠ CAUTION: Make sure to turn power OFF if the meter is remote output type.

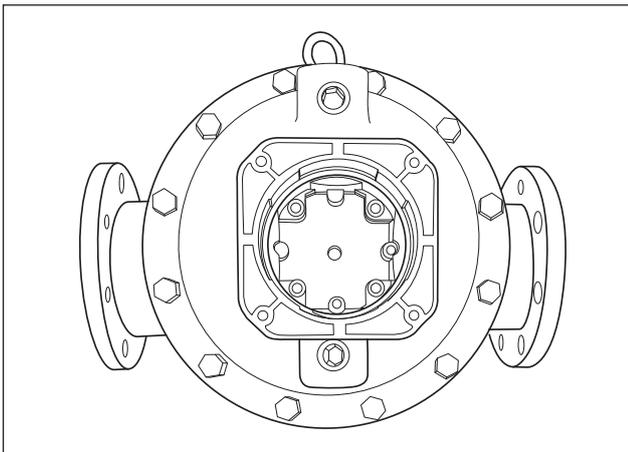
Change the orientation of the register and flowmeter body so that they agree with the actual flow direction desired.



- (1) Remove the four hexagon socket head cap screws (M6) with a hexagonal wrench key. To change the flow direction, remove the four screws shown in the picture, and rotate the register without removing it.



- (2) Holding the register assembly in both hands, carefully rotate and then secure with hex socket head screws to meet with the new flow direction.



If the register is removed, align the positioning pin of the register to the deep hole shown in the above figure to restore the register.

⚠ CAUTION:

1. Rotate the register assembly without separating from the adapter.
2. Do not attempt to rotate the register assembly more than one complete revolution.

➡ NOTE :

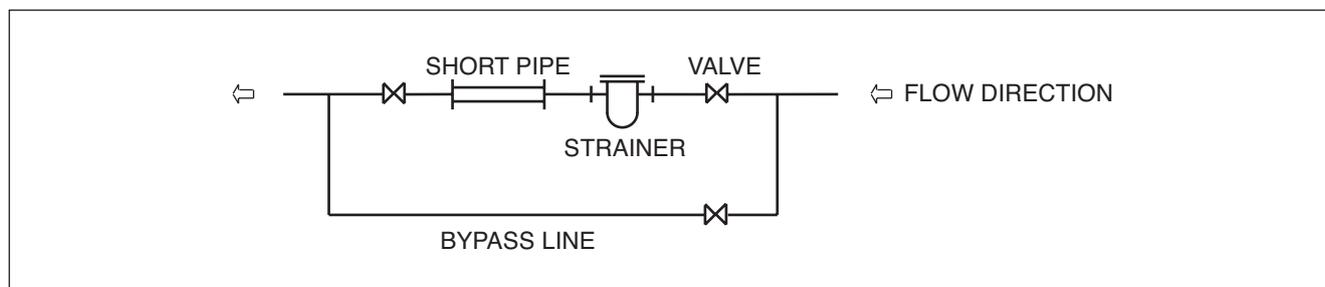
If you have separated the register assembly, install back again, restoring the conditions before changing flow directions. Then, follow the procedure step (2) (without separating the register assembly) again to make change to the desired flow direction.

7. OPERATING INSTRUCTIONS

7.1 Flushing the Piping Assembly

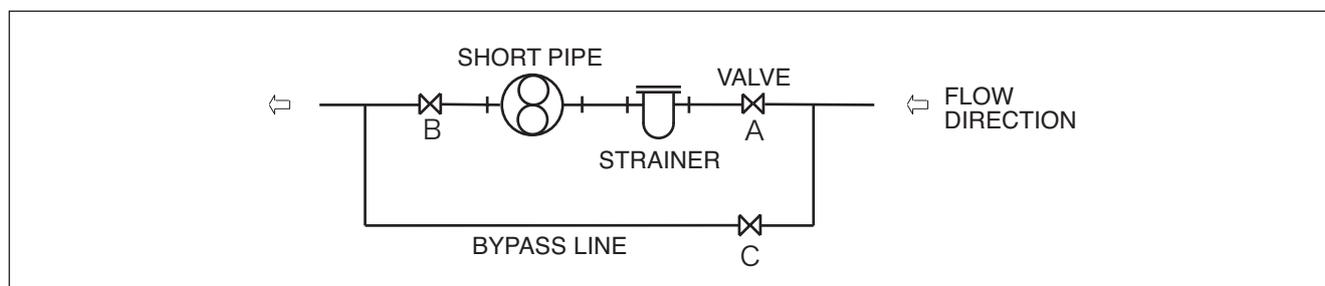
When removing the meter from the piping assembly, make sure to install a short pipe in place of the meter. It can cause costly damages to the meter if you attempt to flush away construction debris and other foreign matter with the meter installed.

⚠ CAUTION: Do not allow water to run across the meter, or it will cause internal components to gather rust and in time, hinder smooth rotation of the rotors.



⚠ 7.2 Operating Considerations

- (1) Carefully read the information stated on the nameplate before operation and make sure the operating conditions meet the specification.
- (2) Carefully follow the valve operations sequence given below (refer to the piping diagram below):
 - 1) Shut off valves (A) and (B).
 - 2) Gradually open valve (C) to allow the fluid in the bypass line.
 - 3) Slightly open valves (A) and (B). If necessary, slightly close valve (C). The flowrate at this point is correct if the register pointer moves slightly.
 - 4) In applications where temperature exceeds 80°C, run the meter at least for 10 minutes in the conditions (3) to ensure uniform heat distribution in the measuring chamber.
 - 5) Following the preheating period above, gradually close valve (C) in the bypass line and gradually open valves (A) and (B) until reaching the operating flowrate.
 - 6) Flowrate should be regulated with valve (B) downstream of the meter and should be held within the guaranteed flow range.
- (3) Strainer net shall be inspected and cleaned periodically on a regular basis. Especially on a new installation, inspection of the strainer net shall be conducted daily at first, and judging by the clogging condition, reduce the inspection cycle to every 2~3days afterwards.



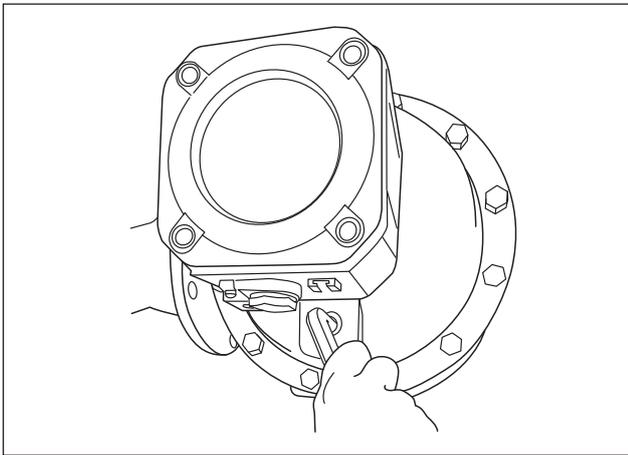
8. DISASSEMBLY AND INSPECTION

- ⦿ Although it depends on individual operating conditions, periodic disassembly and inspection should be performed at least once a year.

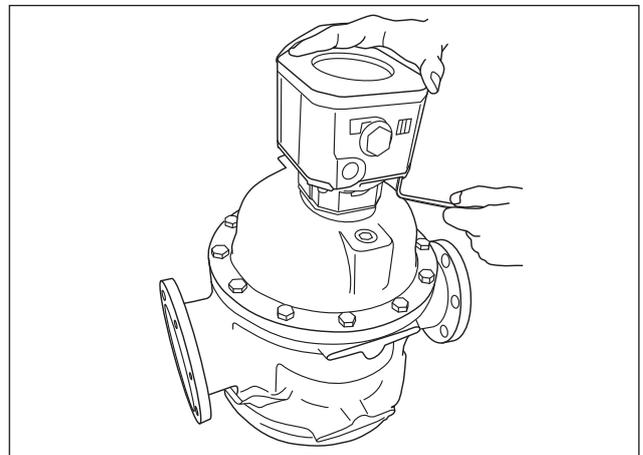
⚠ CAUTION

1. UF-II Flowmeter is a precision industrial instrument, therefore disassembly and inspection should be performed indoors. If it is desired to disassemble and inspect in the field, make sure to reduce the internal pressure of the piping assembly to a safe level, shut off valves upstream and downstream of the meter, drain the piping assembly and then place a suitable fluid receptacle directly below the UF-II Flowmeter.
Avoid dust or unwanted matters to contact the disassembled parts.
2. If the meter is of externally powered type, make sure to turn off power before you disassembly.

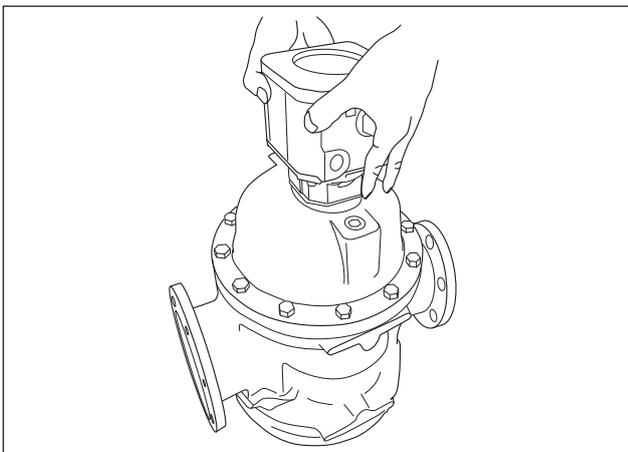
8.1 Disassembly and Inspection Procedures



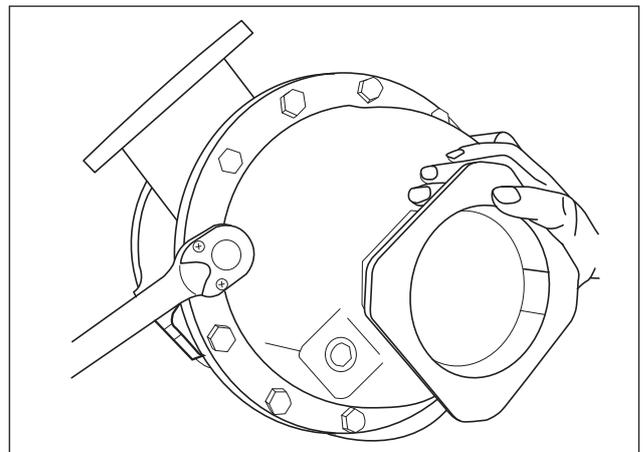
- (1) Remove the flowmeter from the piping assembly, drain the meter, to start with the following procedure.



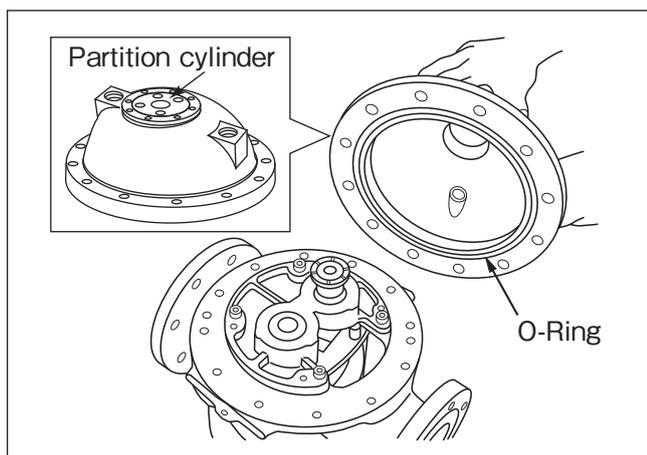
- (2) 1) Place the meter upright with the rear cover (103) down (register faces up).
2) Remove the four hexagon socket head cap screws fixing the register using a hexagonal wrench key.



- (3) Holding the register with both hands, carefully separate it.



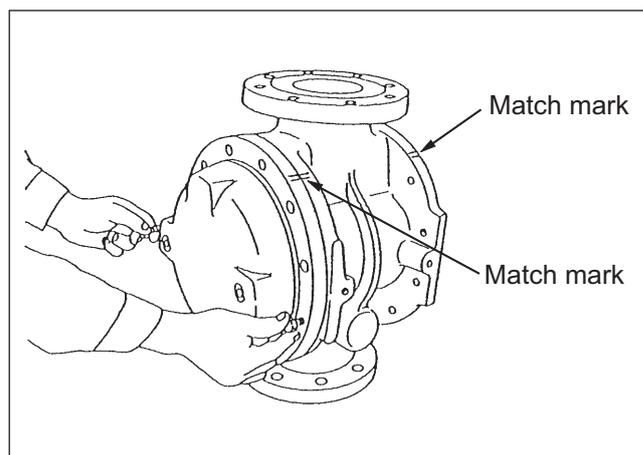
- (4) Remove the twelve front lid fastening bolts (114).
➡ NOTE :
 Do not disassemble the skirt and pressure-resistant partition cylinder.
 You can inspect the inside by removing the front lid.



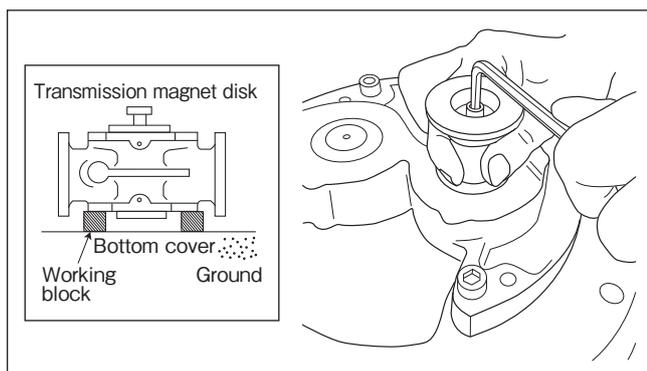
(5) Gently lift the front lid vertically and remove it.

➡ NOTE : When disassembling and assembling the front and rear lids, pay attention to the O-ring (105). When assembling, use grease to fix the O-ring to the lid before assembling.

➡ NOTE : Do not remove the partition cylinder (116) from the front lid. Doing so may cause liquid leakage.



(6) 1) Place the meter body with the flange face down.
2) Take off twelve rear cover fitting bolts (114) and remove the rear cover.

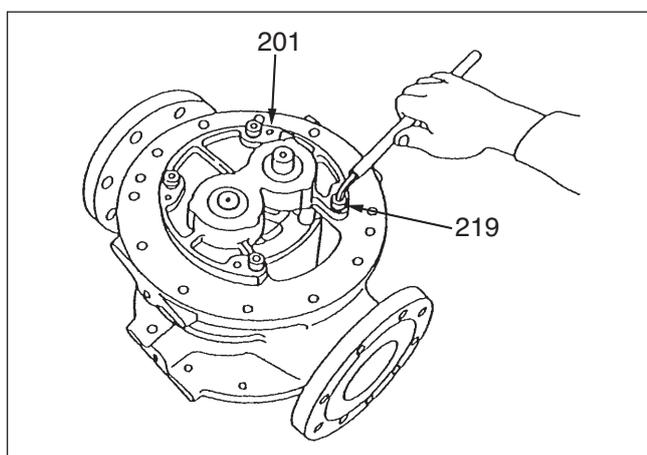


(7) 1) With the bottom cover (202) down, place the meter body upright so that the Transmission magnet disk is accessible from top. Place working blocks under the meter body as shown to hold the bottom cover off the ground at this time.

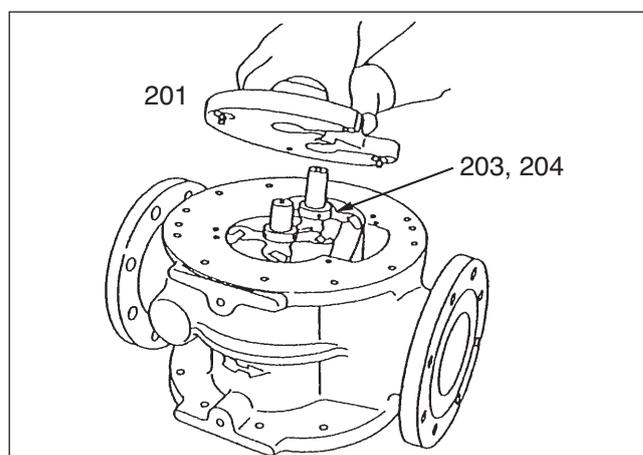
2) Remove the hexagon socket head cap screw (201) and remove the transmission magnet disk from the rotor shaft.

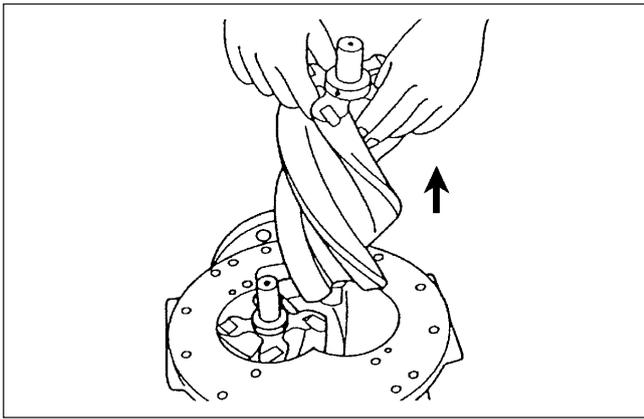
➡ NOTE : 1) When turning the hexagon socket head cap screw, fit a waste cloth tightly between the rotors to prevent them from rotating.

2) Be careful not to lose the rotation preventing pin (217) for the transmission magnet disk.

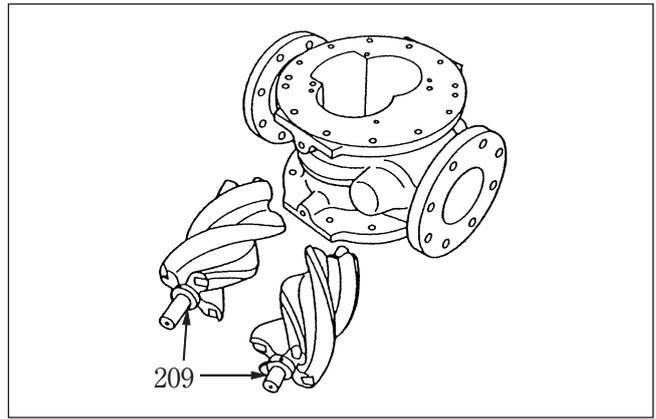


(8) Take off hex socket head bolts (219) and remove the top cover (201).





- (9) Remove the rotors (203) and (204). Since each rotor is integral with its shaft, hold the rotor to be removed first with both hands and carefully slide it vertically out of the chamber while rotating it in the direction of twist. Take extra care while doing this as the thrust rings (209) on the lower cover side can be loose and come off from the shafts.



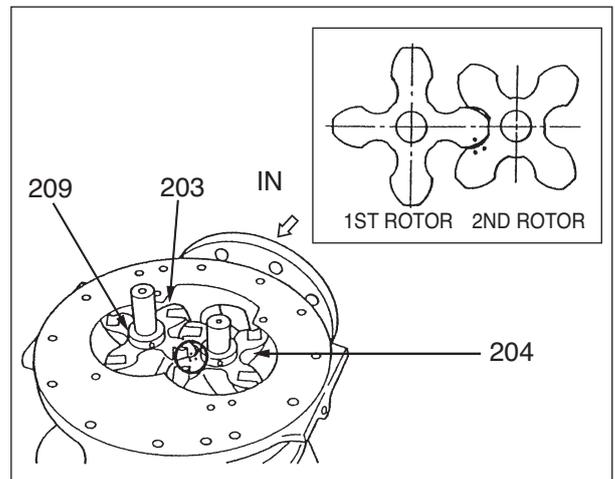
NOTE : Mark individual thrust rings (209) with identification marks on the respective rotors to ensure correct installation.

Individual components are accessible for inspection as described above.

- (10) Proceed to disassemble the bottom cover side. For thorough inspection, follow the procedure given below:
- 1) Place the meter body on the side.
 - 2) Take off hex socket head bolts (219) and separate the bottom cover (202). The bottom cover and bushings are now accessible for inspection.

8.2 Assembly

- (1) Clean thoroughly the rotors, measuring chamber, top cover, signal generating magnet assembly, and other components with suitable solvent. Make sure to keep dust and grime out before installation.
- (2) Thrust rings (209) must be installed in their original positions of respective rotors (203 and 204). Ensure at this time that the pin (210) for the thrust ring fits exactly in the slot on the rotor side.
- (3) When installing the rotors, the 1st rotor is identified as the one provided with the transmission gear according to the flow direction specified. The flow direction is from left to right in the drawing shown at right.
- (4) Match marks are stamped on the rotors as shown in the drawing. Install the rotors with these match marks aligned. After engaged, make several revolutions to ensure their smooth rotation.



- (5) When assembling the front lid, make sure that the register mounting seat is attached on top of the transmission magnet disk.

8.3 Disassembly and Inspection as Installed in the Piping Assembly

After having confirmed of the internal pressure of the piping assembly reduced to zero, remove the drain plug (107) to drain the meter, disassemble and inspect in the same manner as described in steps (2) through (9) in the previous "Disassembly and Inspection Procedures".

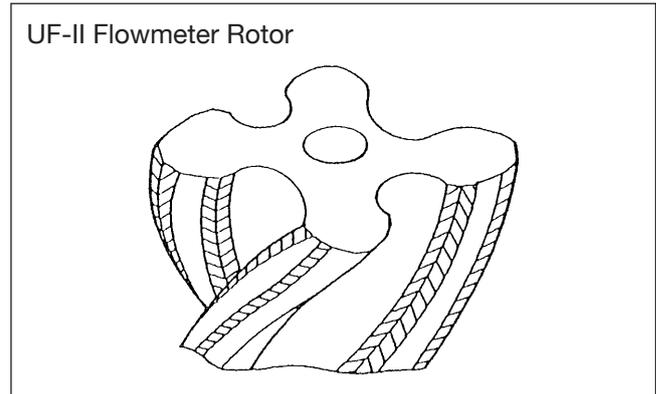
Approximate Internal Capacity of Meters

Meter Size	Approx. Capacity
80	8.5 liters
81	10 liters

8.4 Reconditioning the Rotor Gear Teeth

The shaded area of the rotor shown on the right figure indicates the area that comes in contact with the other rotor while rotating. Do not attempt to recondition these area unless absolutely necessary due to wears found during overhaul and inspection, If the rotors have score marks or deep scratches indicative of having jammed with foreign solids between the rotors, correct the protruded surface with an oil stone or similar abrasive tool until the affected is corrected and has same height with other shaded areas.

Other unshaded area with marks or scratches shall be corrected normally.



9. TROUBLE SHOOTING

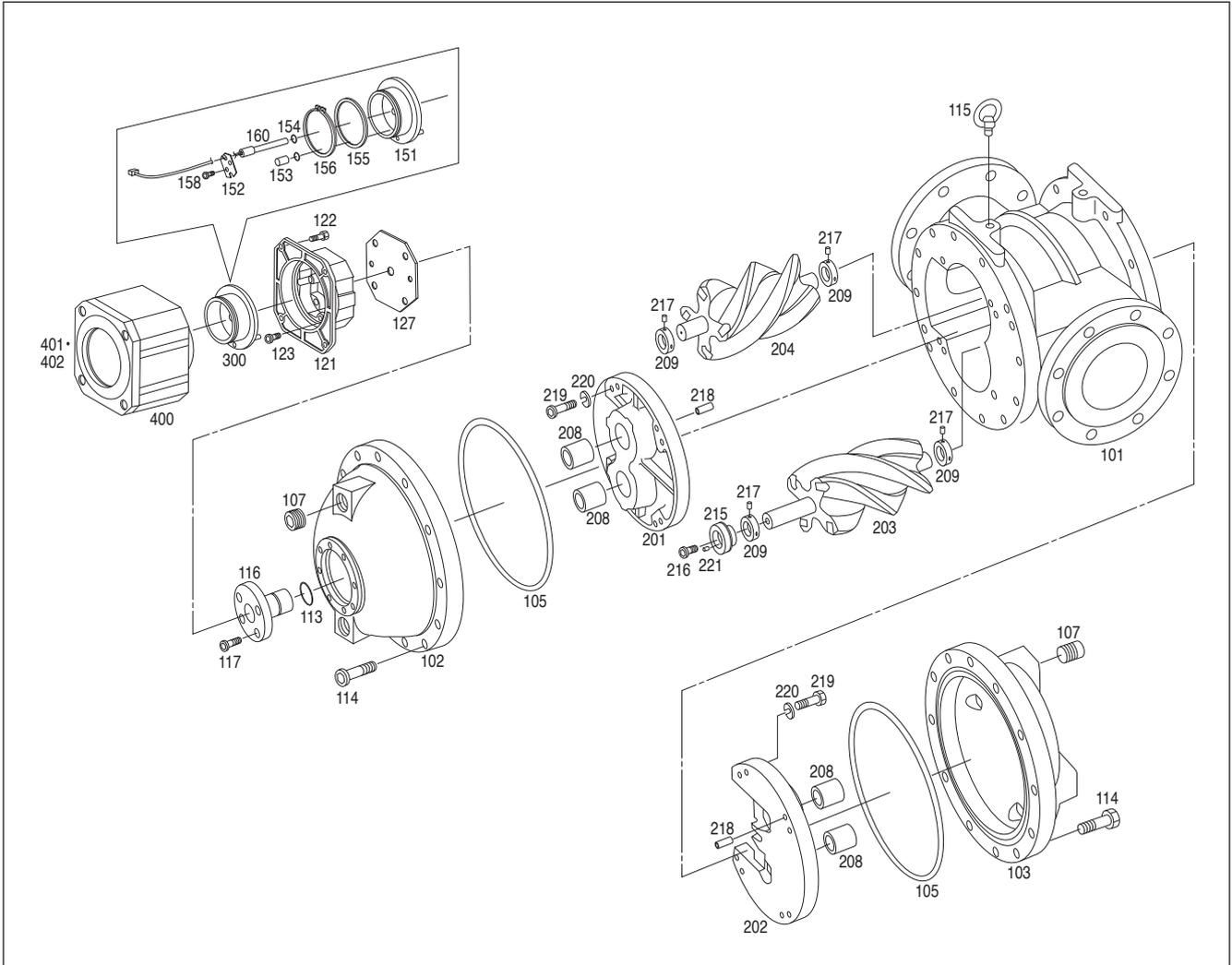
Symptom	Possible Cause	Action
1. Totalizer remains inoperative.	1. Flowrate is low.	1. Open valves gradually
	2. Insufficient pump pressure or head pressure.	2. Taking pressure loss of entire piping assembly into consideration, correct pump pressure or head pressure.
	3. Power line voltage is out of specification or current carrying capacity of power source is inadequate.	3. Provide a 12 to 45 VDC power to the register. (12 to 24 VDC for open collector or voltage pulse output.) Current carrying capacity 30mA min. is required for power. (With analog output, 24VDC, 60mA min. is required.)
	4. Battery runs out.	4. Replace battery pack.
	5. Oval rotors jammed with foreign matter; rotors locked; metered liquid fails to run.	5. Refer to DISASSEMBLY AND INSPECTION. Disassemble the main body and wash parts as rotors thoroughly.
	6. Sensor installed out of position.	6. Refer to HOW TO CHANGE FLOW DIRECTIONS. Install the sensor in the proper position.
2. Unusual noise.	1. Air is entrapped.	1. Decrease flowrate and eliminate air in the piping assembly.
	2. Vaporized metered liquid in the piping assembly.	2. Decrease flowrate and control fluid temperature and pressure to prevent vaporization.
	3. Oval rotors revolving in contact with measuring chamber.	3. Refer to DISASSEMBLY AND INSPECTION. Perform disassembly and inspection.
3. "Battery Mark" flickers.	1. Battery voltage is low.	1. Replace the battery pack.
4. Liquid leaks.	1. Incomplete seal of the pipeline.	1. Retighten bolts at pipeline connections or replace gaskets.
	2. Incomplete seal on rear cover of meter body.	2. Inspect rear cover fitting bolts for tightness and replace O-rings.
5. Counts while valves remain closed.	1. Valve and pipeline leaks.	1. Inspect valves and piping assembly.
	2. Air pockets between valve and ULTRA OVAL; rotors in rocking motion in response to pump's pulsating pressure.	2. Vent air. Provide a check valve and accumulator.
	3. Supply power voltage fluctuates.	3. Eliminate voltage fluctuation.
6. Analog output unusual.	1. Load resistance too great.	1. Refer to the instruction manual of the register, check load resistance to power supply voltage relationship. Adjust the load resistance within the specified range.
7. Accumulated total too high.	1. Rotors in rocking motion in response to a pulsating flow.	1. Add a check valve and accumulator.
	2. Influenced by external magnetic fields (Meter sensor picks up external magnetic fields created by a motor, generator, etc.)	2. Keep out external magnetic fields.
	3. Air entrapped.	3. Provide an air vent.
8. Accumulated total too low.	1. Influenced by external magnetic fields.	1. Keep out external magnetic fields.

10. EXPLODED VIEWS AND PARTS LIST

- Make sure to specify meter model, serial number (written in the name plate), instruction manual number, parts symbol number, parts name and quantity when ordering replacement parts.

Parts which are assembled as units may need to be ordered in an assembly unit.

<Exploded View>



11. GENERAL SPECIFICATIONS

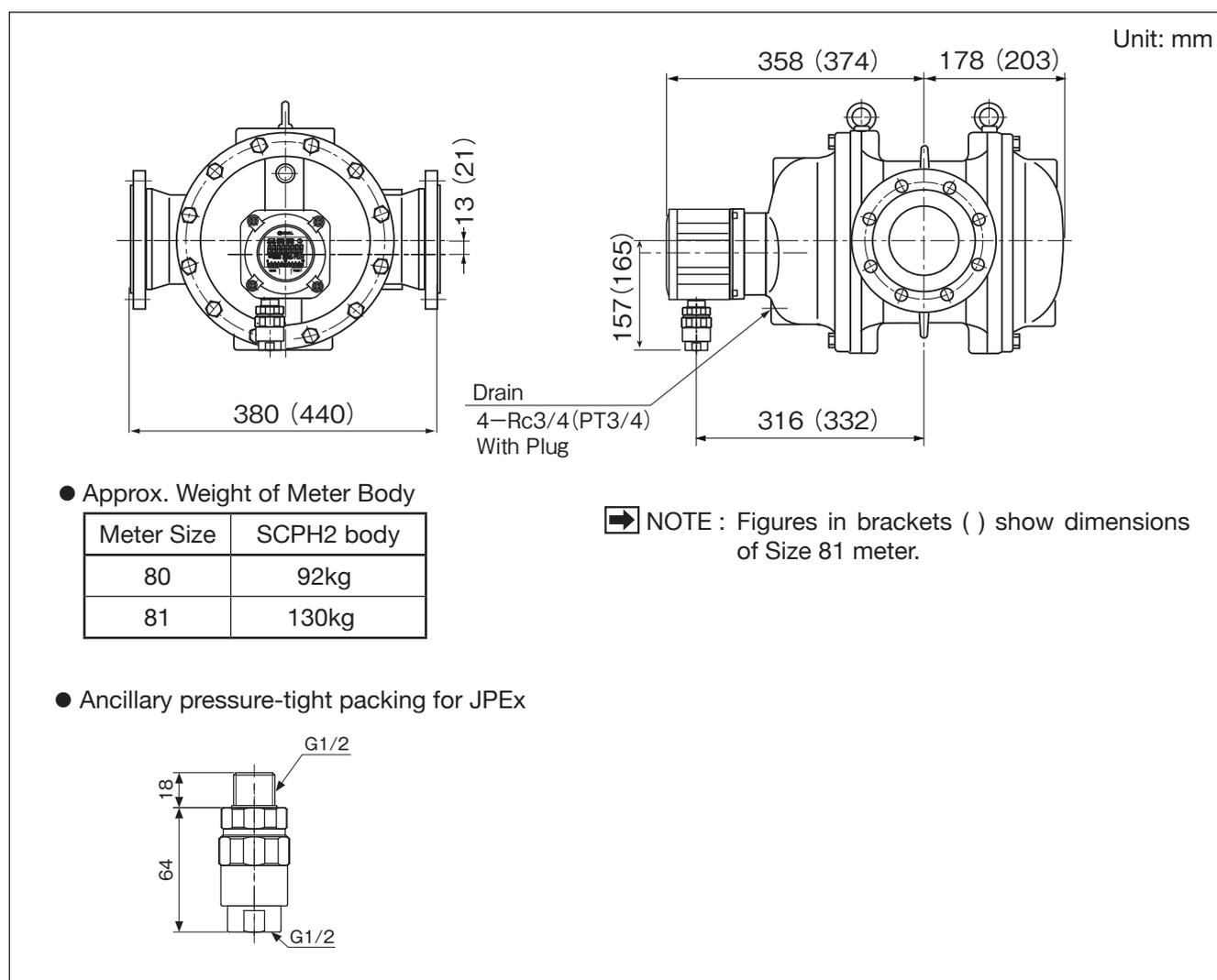
● Measurement Resolution and Display Units

Item			Description
Meter Size			80, 81
Local Indicator (LCD)	Accumulated total, (8-digits)	Total unit	0.01m ³ (standard), 0.01m ³ , 0.1m ³
	Resettable counter (7-digits)	C mode	The unit of total flow is the same as that of grand total.
	Instantaneous flowrate (5-digit)	b1 mode	0.1 m ³ /h (standard)
b2 mode		0.001 m ³ /min (standard)	

● Nominal Meter Factor

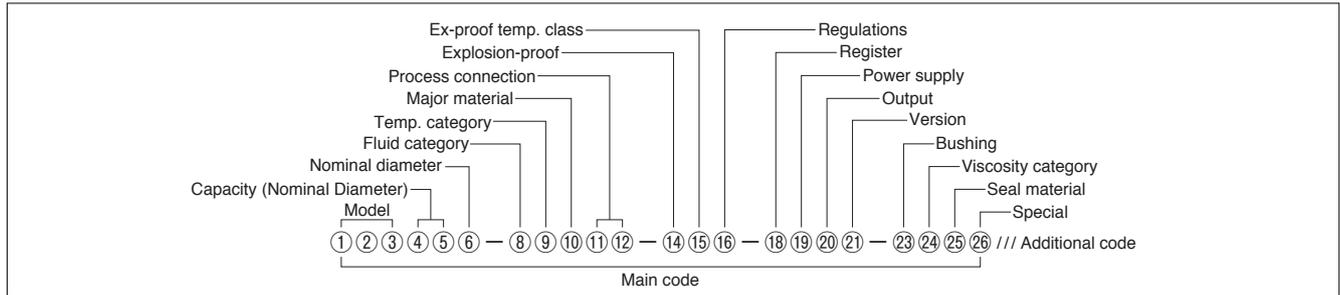
Meter Size	No. of Pulses, P/r	Nominal Meter Factor
80	6	250.6 mL/P
81	10	279.0 mL/P

12. OUTLINE DIMENSIONS



☞ NOTE : For outline dimensions and pipe connection dimensions, refer to the approval drawing.

13. PRODUCT CODE EXPLANATION

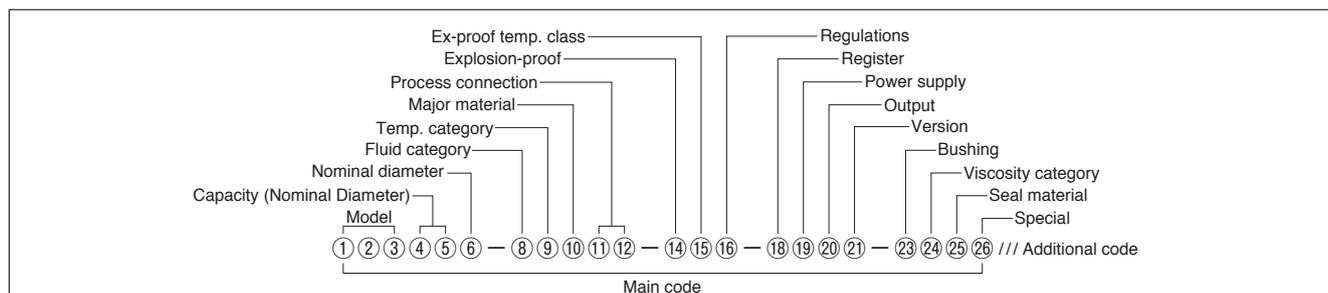


●Main code (Meter Size: 80, 81)

①	②	③	Model
L	R	S	UF II Element: cast iron + surface treatment
④	⑤	Capacity (Nominal Diameter)	
8	0	80mm or 100mm (3" or 4") ND (Small (special) or Large)	
8	1	100mm (4") ND (Large)	
⑥	Nominal diameter		
3	Nominal diameter (Small)		
4	Nominal diameter (Large)		
⑦	—		
⑧	Fluid category		
L	Liquid		
⑨	Temp. category		
1	120°C and lower		
⑩	Major material		
F	SCPH2		
Z	Special		
⑪	⑫	Process connection	
J	1	JIS10K RF	
A	1	ASME150 RF	
P	1	JPI150 RF	
Z	9	Special	
⑬	—		
⑭	Explosion-proof		
0	Non-explosionproof		
4	TIIS or JPEX		
5	ATEX ※1		
7	NEPSI ※2		
8	KCs ※1		
T	ITRI, TAIWAN ※2		
⑮	Ex-proof temp. class		
0	Non-explosionproof		
3	T3		
4	T4		
⑯	Regulations		
0	Standard		
T	Fire Service Act ※ w/Material test certificate		
F	w/Material test certificate ※ w/Material test certificate		
Z	Special		

⑰	—		
⑱	Register		
S	Type S ULTRA register		
B	Batch controller equipped ULTRA register ※3		
D	Auto temp. compensator equipped ULTRA register ※4		
⑲	Power supply		
0	External power supply (standard)		
V	Battery drive		
⑳	Output		
G	Standard output (open collector pulse output)		
A	Analog		
D	Current pulse		
B	Voltage pulse		
T	Current pulse + analog		
N	No output		
1	Pneumatic 1 step open and close (w/LW74E register) ※ 5		
2	Pneumatic 2 step open and close (w/LW76E register) ※ 5		
Z	Special		
㉑	Version		
B	Version B		
㉒	—		
㉓	Bushing		
0	Standard (carbon bushing)		
㉔	Viscosity category		
U	Always "U"		
㉕	Seal material		
F	O-ring (FPM), gasket (T#1120)		
C	O-ring (IIR), gasket (T#1120)		
Z	Special		
㉖	Special		
0	Standard		
Z	Special		

※ 1: Selectable when register code ⑱ is "S".
 ※ 2: Selectable when register code ⑱ is "S, B".
 ※ 3: See General Specification Sheet No. GBC201 for detail.
 ※ 4: See General Specification Sheet No. GBC202 for detail.
 ※ 5: Selectable when register code ⑱ is "B".



•Additional code

Category of High Pressure Gas			
H	P	0	Other than High Pressure Gas
H	P	1	Toxic gas and flammable gas
H	P	2	Toxic gas
H	P	3	Flammable gas
H	P	4	Other than toxic or flammable gas
Accuracy			
R	0	5	±0.50% ACCURACY
L	0	1	±0.15% LINEARITY ※Only for export
L	0	3	±0.35% LINEARITY ※Only for export
R	0	2	±0.20% ACCURACY
R	9	9	Special
Operating condition			
F	C	0	Continuous
F	M	0	Intermittent
Special test (instrumental error)			
A	1	0	Taxed custody transfer
A	2	0	By certified measurer
A	6	0	Standard oil meter According to JMIF standard (Bore size 80mm and over)
A	7	0	Std. fuel oil meter, std. water meter
A	8	0	Std. fuel oil meter, std. water meter
A	9	9	Designation of instrumental error test method Addition of one (1) test point, etc.
Flow direction			
F	R	0	R→L
F	L	0	L→R
F	U	0	T→B: Electric conduit at the bottom
F	D	0	B→T: Electric conduit at the bottom
Designated special paint on body			
B	C	0	Corrosion proof
B	A	0	Salinity and acid tolerance 120°C and lower
B	X	0	Customer designation
Designated special paint on transmitter			
S	F	0	Corrosion proof Special treatment
S	D	0	Salinity tolerance
S	E	0	Acid tolerance Special treatment
S	X	0	Customer designated paint Special treatment
Name plate			
N	P	J	Name plate (Japanese)
N	P	E	Name plate (English)

Document			
D	S	J	SPEC. & DWG (Approval Drawing) (Japanese)
D	S	E	SPEC. & DWG (Approval Drawing) (English)
D	R	0	Re-submission of SPEC. & DWG
D	C	J	Final DWG (Japanese)
D	C	E	Final DWG (English)
D	P	J	Strength calculation sheet (Japanese)
D	P	E	Strength calculation sheet (English)
S	E	J	Inspection certificate (Calibration report) (Japanese)
S	E	E	Inspection certificate (Calibration report) (English)
S	T	J	Pressure test report (Japanese)
S	T	E	Pressure test report (English)
S	A	J	Airtight test report (Japanese)
S	A	E	Airtight test report (English)
D	D	J	Dimensional check record (Japanese)
D	D	E	Dimensional check record (English)
S	P	J	Penetrant test report (Japanese) Welded part of pressure resistant vessel
S	P	E	Penetrant test report (English) Welded part of pressure resistant vessel
S	M	J	Magnetic particle inspection (Japanese) Welded part of pressure resistant vessel
S	M	E	Magnetic particle inspection (English) Welded part of pressure resistant vessel
S	R	J	Radiographic inspection (Japanese) Welded part of pressure resistant vessel
S	R	E	Radiographic inspection (English) Welded part of pressure resistant vessel
S	U	J	Ultrasonic inspection (Japanese) Welded part of pressure resistant vessel
S	U	E	Ultrasonic inspection (English) Welded part of pressure resistant vessel
S	X	J	PMI test report (Japanese)
S	X	E	PMI test report (English)
S	S	J	Impact test report (Japanese)
S	S	E	Impact test report (English)
D	Y	J	WPS/PQR (Japanese)
D	Y	E	WPS/PQR (English)
D	9	J	Photo (Japanese)
D	9	E	Photo (English)
D	T	J	Inspection procedure (Japanese)
D	T	E	Inspection procedure (English)
C	A	J	Traceability certificate: A set Only available in Japanese
C	B	J	Traceability certificate: B set Only available in Japanese
C	C	J	Traceability certificate: C set Only available in Japanese
C	D	J	Traceability certificate: D set Only available in Japanese
Witness Test			
V	1	0	Required

All specifications are subject to change without notice for improvement.

2022.10 Released
B-791-1-E



OVAL Corporation

Head Office : 10-8, Kamiochiai 3-chome, Shinjuku-ku, Tokyo, Japan

Phone: 81-3-3360-5121

FAX: 81-3-3365-8605
