

GENERAL

MATHESON FLOWMETERS COMBINE CONSTRUCTION AND PERFORMANCE FEATURES ESSENTIAL TO ACCURATE LOW FLOW MEASUREMENT. THIS INFORMATION IS INTENDED AS A GUIDE TO EFFICIENT USE; CAREFUL COMPLIANCE SHOULD RESULT IN LONG AND USEFUL SERVICE.

INSTALLATION

1. Immediately after unpacking, inspect unit for any damage incurred during shipment. Follow instructions on "Damage or Shortage" slip in packing container.
2. If a unit is supplied with an integral valve then ensure that the valve is open.
3. Check for free movement of float (s). Place meter horizontally on a flat surface with the ball float (s) at the maximum flow end of the tube (outlet). Incline this end of the meter approximately 10°. The float (s) should descend at a constant rate. As the float (s) approach the zero reference mark, they may slow down or hesitate. This is due to the close fit between the float and the tube. Foreign particles occasionally prevent the continuous motion of the float. Repeat the above operation several times. If the float sticks then see the "CLEANING PROCEDURE" shown below.
4. A 25 micron filter is recommended to be installed immediately upstream for meters where dirt can interfere with operation.

MOUNTING

1. The meter must be mounted in a vertical position with the inlet (lowest end of the scale reading) at the bottom. Attitude of more than 5° from the vertical will affect the accuracy of the meter. Panel mounted meters should be installed in position prior to connection to process piping. General good piping practice should be observed to prevent trapped fluid up or down stream of the meters. Connectors/adapters on the meter are supplied with wrench flats which must be held firmly when threading mating connections. Teflon tape should be used on pipe thread connections. NOTE: Care must be taken to avoid the shredding of Teflon tape which can foul meter operation.
2. Leak test final joints prior to operation. Leaks are often the cause of misleading flow indication.

OPERATION

1. START-UP CAUTION. Avoid sudden pressure surges. The impact of the float at the top of the tube can damage the meter if it is exposed directly to full line pressure. Avoid shock by closing the valve before start-up. Introduce pressure by slowly opening the valve.
2. FLOW READING. Flow indication is read at the center of the ball floats. Units of flow (SCCM, SCFH, etc.) are noted on the side of the tube. Tubes with millimeter, percent of maximum flow or linear scales require a calibration chart that corresponds to the metered fluid.

DISASSEMBLY & REASSEMBLY

- A. A 5/32" hex wrench fits the recessed seal screw located at one end of the meter. Turn the hex wrench counter-clockwise until the seal screw is flush with the inside surface of the end fitting. NOTE: If the meter does not have a tube enclosure then the tube must be held to prevent it from falling from the meter frame.
- B. Remove the Tube Cube from the frame by sliding it forward.
- C. Remove the tube from the cube.
  1. Remove the center seals from the Tube Cube and inspect for damage. The flowmeter tube can be easily removed from the Tube Cube. NOTE: NO FURTHER DISASSEMBLY SHOULD BE NECESSARY FOR MAINTENANCE.
  2. Clean tube assembly (see CLEANING PROCEDURE).
- D. If complete disassembly is necessary then continue as follows.
  1. Remove the retaining ring from the compression plug jack screw. (Do not over stretch the ring)
  2. Push the jack screw and compression plug through the end fitting.
  3. Complete the disassembly of the o-rings and parts.
  4. Remove piping connectors/adapters.
  5. Clean all parts (see CLEANING PROCEDURE).
  6. Lubricate left hand thread on the jack screw and reassemble.
  7. Examine the o-rings for damage, lubricate and reassemble.
  8. Replace connector into seal fitting.
  9. Replace compression plug assembly so that the milled flat is toward the piping connector.
  10. Replace retaining ring. NOTE: It is occasionally necessary to turn the jack screw clockwise to lift the retaining ring groove sufficiently to insert the retaining ring. Spread the retaining ring only enough to fit over the jack screw.
  11. Replace the Tube Cube into the frame until the rear of the Tube Cube is flush with the rear surface of the end fittings and tab stops.
  12. Tighten the compression plug. CAUTION: DO NOT OVER TIGHTEN. See torque specifications listed below.
  13. Check meter for leaks.

**Torque Specifications for compression plug:**

Seal	Torque	Min	Max
Viton	18 in-lb	16 in-lb	20 in-lb
EPR	10 in-lb	8 in-lb	12 in-lb
Buna	16 in-lb	14 in-lb	18 in-lb
Teflon	24 in-lb	22 in-lb	26 in-lb

CLEANING PROCEDURE (Please notify the factory if cleaning for oxygen service is required)

A. TUBE AND FLOAT CLEANING

1. Remove the float stops. Take care to avoid chipping the inside edges of the tube.
2. Flush the inside of the tube with solvent (without wax or inhibitors, i.e. glycols). Isopropyl alcohol 90% is recommended. All parts should be ultrasonically cleaned if possible.
3. Clean the inside of the tube with a pipe cleaner, flush with solvent (see step A. 2.), and then blow dry.
4. Clean the float with a lint free cloth. Floats should always be handled using clean tweezers with soft holding surfaces.
5. Clean and replace the inlet float stop. Be sure that it is firm in the tube.
6. Replace the float with tweezers.
7. Replace the outlet float stop.
8. Invert the tube as described under INSTALLATION #3.
9. If the float sticks in the tube then repeat the cleaning procedure.
10. Reassemble the Tube Cube in reverse to DISASSEMBLY & REASSEMBLY step C. Note: position the scale behind the lens of the Tube Cube.

B. METAL PARTS CLEANING

Ultrasonic immersion cleaning with Solvon PB is preferred; however any industrial solvent which does not attack the metal or influence the process performance is acceptable.

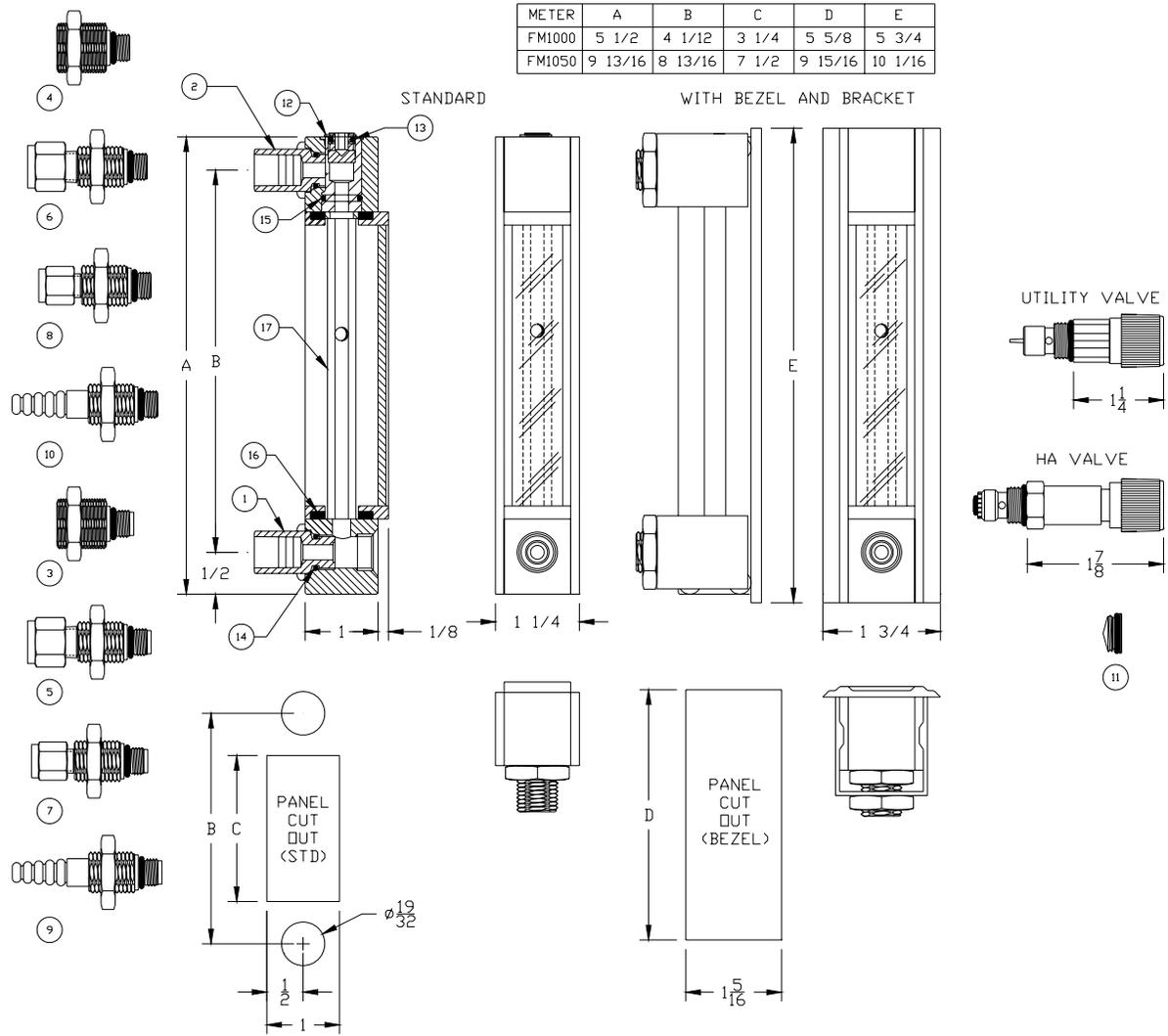
C. O-RINGS AND SEALS CLEANING

1. Wash thoroughly with detergent and rinse with water.
2. Lubricate and reapply to metal parts. Halocarbon grease is recommended.

VALVE REMOVAL AND INSTALLATION

- 1) Turn the valve handle clockwise so that the valve stem engages the orifice (about 3 turns from full open).
- 2) Remove the valve cartridge from the flowmeter by using a 9/16" open end wrench. The valve cartridge will screw completely out of the flowmeter body.
- 3) Take the replacement valve cartridge and screw it into the valve cartridge cavity and then tighten with the 9/16" wrench.

Note: Be certain that the orifice and the orifice o-ring have been removed prior to replacing the valve cartridge with another size.



The parts listed below are applicable to Matheson FM-1000 and FM-1050 flowmeters. Recommended spare parts are indicated by\*.

#	Qty	Part Number	Description
1	1	MAAT-0202-__	ADAPTOR, VALVE, 1/8" NPT**
2	1	MAAT-0201-__	ADAPTOR, SEAL, 1/8" NPT**
3	1	MAAT-0204-__	ADAPTOR, VALVE, 1/4" NPT**
4	1	MAAT-0203-__	ADAPTOR, SEAL, 1/4" NPT**
5	1	MATT-0202-__	ADAPTOR, VALVE, 1/4" TUBING**
6	1	MATT-0201-__	ADAPTOR, SEAL, 1/4" TUBING**
7	1	MATT-0204-__	ADAPTOR, VALVE, 1/8" TUBING**
8	1	MATT-0203-__	ADAPTOR, SEAL, 1/8" TUBING**
9	1	MAHA-0202-__	ADAPTOR, VALVE, HOSE**
10	1	MAHA-0201-__	ADAPTOR, SEAL, HOSE**
11	1	MPLU-0101-__	PLUG, VALVE WITH O-RING
12*	1	MRNS-0905-SD	RING, RETAINING
13*	1	MRNS-0009-__	O-RING
14*	2	MRNS-0011-__	O-RING
15*	1	MRNS-0013-__	O-RING
16*	2	MPAC-0011-__	SEAL, CENTERING, ID MARK B
	2	MPAC-0012-__	SEAL, CENTERING, ID MARK C
	2	MPAC-0013-__	SEAL, CENTERING, ID MARK ●●
	2	MPAC-0014-__	SEAL, CENTERING, ID MARK ●
17*	1	MHCJ-0XXX-XX	TUBE CUBE ASSY, 65MM***
	1	MHCE-0XXX-XX	TUBE CUBE ASSY, 150MM***

ID MARK	65 MM TUBES	150 MM TUBES
B	J000-J099	E100-E199
	J100-J199	E200-E299
	J200-J299	E300-E399
	J600-J649	E400-E499
C	J700-J799	E500-E599
	J400-J499	E600-E699
	J800-J899	E910
●●	J500-J599	E800-E899
●		E700-E799

\_\_ = MATERIAL CODES AA=ALUMINUM BA=BRASS SA=316 SS BU=BUNA N VA=VITON EB=EPR

\*\*Includes PAL nut and o-ring

\*\*\*Specify Flow Rate Required