Recordall® Fire Series Meter (FSMA)

Cold Water Turbine Meter & Integral Strainer, Sizes 3, 4, 6, 8 & 10 inch

UL Certified & FM 1044 Standard Approved for Fire Service Applications

NSF/ANSI/CAN Standards 61 and 372 Certified

This manual contains information concerning the installation, operation and maintenance of Badger Meter® Fire Series Meters. To ensure efficient operation, the instructions in this manual should be thoroughly read and understood. Retain this manual for reference.

DESCRIPTION

Model FSMA Fire Series Meter

Model FSMA Fire Series Meter consists of at least a six times open area strainer and a 3, 4, 6, 8 or 10 inch Recordall® Turbo Series Meter with AWWA class II measuring chamber (depending on assembly size). The Fire Series Meter Assembly is designed to measure high volume usage, such as when a building's fire sprinklers are activated, through a single water supply line.

Strainer

Strainer is at least six times open area and is used exclusively in fire series systems to prevent clogging. The strainer is equipped with a 2-inch or 3-inch flushing outlet valve for flushing debris from the upstream side of the strainer screen.

Turbine Meter

Water flows into the meter's measuring element contacting the multi-vaned rotor. Flow readings are obtained by rotor revolutions transmitted by magnetic drive coupling through the meter's cover plate to the sealed register. Magnetic drive is achieved by a right angle worm drive, coupling the rotor to a vertical transmission spindle, driving a gear set rotating the magnet carrier. A ceramic magnet in a carrier rotates around a vertical axis. Rotor rotation is transmitted to the register gearing through this magnetic coupling.

The turbo measuring element is designed to greatly reduce wear by reducing friction potential between the moving parts of the rotor and bearing system. Less wear, in this critical area of the design, provides the utility manager with a lower life cycle cost for meter application. Throughout the normal operating range of the meter, the rotor floats between the thrust bearing system.

UNPACKING & INSPECTION

Upon opening the shipping container, visually inspect the product and applicable accessories for any physical damage such as scratches, loose or broken parts, or any other sign of damage that may have occurred during shipment.

NOTE: If damage is found, request an inspection by the carrier's agent within 48 hours of delivery and file a claim with the carrier. A claim for equipment damage in transit is the sole responsibility of the purchaser.

OPERATING RANGES FOR FIRE SERIES METERS

Fire Series Meter (FSMA)	
Turbo Bypass Meter	
Sizes	**GPM**
3 in.	6…550
4 in.	10…1250
6 in.	20…2500
8 in.	30…4500
10 in.	50…7000

Registration Options

- US gallons
- Cubic feet
- Cubic meters

INSTALLATION

⚠CAUTION

- ***DO NOT ATTEMPT TO USE ANY METER AS A LEVER OR CROWBAR TO STRAIGHTEN A MISALIGNED METER POSITION. THIS COULD DAMAGE THE METER.***
- ***TO AVOID POTENTIAL PROBLEMS, CORRECT ANY IRREGULARITIES IN PIPE SPACING AND MISALIGNMENT BEFORE PLACING THE METER INTO ITS POSITION.***

Installation is made similar to placing a length of flanged end pipe in the line. The AWWA Class "D" steel flanged end design permits use in a wide range of applications. The meter must have a full flow of liquid for proper accuracy. It must be installed in horizontal applications only.

Overall dimensions and laying lengths of each meter size are shown on the Product Data Sheets. After reviewing the applicable dimensional requirements, choose an appropriate installation point in the piping and proceed as follows:

1. Measure precisely the overall length of the Fire Series Assembly with gaskets attached to the inlet and outlet flange connections.
2. Provide proper gap length in series piping.
3. Install meter in the pipeline so that the flow arrow on the meter housing points in the same direction as water flow.
4. With the Assembly and gaskets in place, tighten flange connection bolts. A cross star torque pattern is recommended.
5. To relieve possible strain on the piping, using a support under the meter assembly is recommended, where appropriate.

⚠CAUTION

TURBINE METERS MUST OPERATE IN A COMPLETELY FILLED LINE AT ALL TIMES. THE DOWNSTREAM PIPING MUST ALWAYS BE ARRANGED TO PROVIDE SUFFICIENT BACK PRESSURE TO MAINTAIN A FULL LINE AT THE METER. BY ELIMINATING AIR IN THE LINE, AS WELL AS SUDDEN FLOW SURGES, INACCURATE REGISTRATION AND DAMAGE TO THE TURBINE MECHANISM CAN BE AVOIDED.

MAINTENANCE

This section contains information about general maintenance and servicing. Instructions for disassembling the Recordall Turbo Series meters for servicing can be found in the *Recordall Turbo Series Meters User Manual.* A parts list, exploded views and illustrations can be found in the *Recordall Fire Series Meter Parts List*.

NOTE: The User Manual and Parts List documents are available at *badgermeter.com*.

When the performance of the Fire Series Meter indicates a need for servicing of the Recordall Turbo Series meter, refer to the following instructions pertaining to removal, inspection and installation of service parts and assemblies. With the Recordall Turbo Series unitized construction, service is simplified with a reduction in required product maintenance training. Also refer to the *Recordall Fire Series Meter Parts List* document for part numbers of replaceable components for ordering information. If satisfactory repair cannot be achieved, contact Badger Meter.

Badger Meter products have been carefully designed to be as maintenance free as possible. However, depending upon installation location and condition of the water being metered, maintenance may occasionally be required. The maintenance and inspection procedure can also be used as a guide to locating a problem in the unit that may be the cause of abnormal meter operation.

Meters can be serviced without removing them from the line. A typical installation would be equipped with drain and piping valves. To inspect or replace components of the head assembly, close the upstream and downstream valves. However, if the installation does not have a drain valve, proceed as follows to relieve pressure.

⚠ WARNING

UPSTREAM AND DOWNSTREAM VALVES MUST BE CLOSED BEFORE ATTEMPTING TO REMOVE METER HEAD FROM HOUSING OR PERFORMING ANY SERVICE/MAINTENANCE REQUIRING DISASSEMBLY. FAILURE TO DO SO CAN LEAD TO HEAD BEING EJECTED FROM THE HOUSING, CAUSING PERSONAL INJURY AND/OR PROPERTY DAMAGE!

1. Loosen each of the head bolts about 1-1/2 turns. Do not completely remove the bolts.
2. If the O-ring between the meter head and the housing is secure and not leaking, pry the measuring element assembly loose by inserting a screwdriver blade where the head and housing join together.

⚠ CAUTION

BE SURE THAT ANY WATER COMING OUT OF THE METER HEAD DOES NOT SPRAY ONTO ELECTRICAL EQUIPMENT TO CREATE A SHOCK HAZARD.

3. Allow the meter to drain and relieve internal pressure.
4. When pressure is relieved, remove the head bolts. Lift the measuring element assembly from the housing.

Periodic preventive check valve maintenance is highly recommended and should be practiced according to schedule to assure continuous accuracy and trouble-free performance of your check valve. The valve is water lubricated and should be regularly inspected for corrosion, obstructions in the water-ways and for freedom of movement for all working parts. The frequency of the inspections is dependent upon the quality of the water supply and authority having jurisdiction. Assure all equipment is adequately protected to prevent freezing and physical damage. Repair all leaks.

⚠ WARNING

PERIODIC PREVENTIVE CHECK VALVE MAINTENANCE IS HIGHLY RECOMMENDED AND SHOULD BE PRACTICED ACCORDING TO SCHEDULE TO ASSURE CONTINUOUS ACCURACY AND TROUBLE-FREE PERFORMANCE OF YOUR CHECK VALVE. THE VALVE IS WATER LUBRICATED AND SHOULD BE REGULARLY INSPECTED FOR CORROSION, OBSTRUCTIONS IN THE WATER-WAYS AND FOR FREEDOM OF MOVEMENT FOR ALL WORKING PARTS. THE FREQUENCY OF THE INSPECTIONS IS DEPENDENT UPON THE QUALITY OF THE WATER SUPPLY AND AUTHORITY HAVING JURISDICTION. ASSURE ALL EQUIPMENT IS ADEQUATELY PROTECTED TO PREVENT FREEZING AND PHYSICAL DAMAGE. REPAIR ALL LEAKS.

Any inspection or maintenance that involves putting a control valve out of service may eliminate the fire protection of that system. Prior to proceeding, notify all authorities having jurisdiction. Consideration should be given to employment of a Fire Patrol in the affected area.

1. STRAINER in the Fire Series Meter protects the meter and other components in the line from debris. The strainer is sized to provide maximum protection with minimal head loss. Yearly inspection of the strainer screen, and/or flushing and cleaning the strainer screen is recommended. Cleaning or flushing should be performed more frequently for meters installed in water with high levels of debris or contaminates.

2. YEARLY INSPECTION is advised for meters installed in water with high levels of debris or contaminates. The measuring chamber should be cleaned and inspected.

CALIBRATION CHECK AND ADJUSTMENT

For calibration check and adjustment of the Turbo Series meters, see the *Recordall® Turbo Series User Manual* available at *badgermeter.com*.

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