



# User's Guide



This Remote Kit Assembly is Factory Mutual Approved for Intrinsically Safe Class I, II, III, Division 1, Groups ABCDEFG and Nonincendive for Class I, II, III, Division 1, Groups ABCD FG.



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## **FTB790-RK-FM Remote Kit Assembly**

**For use with FTB790 Series Turbine Meters**



|  |   |
|--|---|
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The information contained in this document is believed to be correct, but OMEGA Engineering, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

**WARNING:** These products are not designed for use in, and should not be used for, patient-connected applications.

## TABLE OF CONTENTS

|                                 |   |
|---------------------------------|---|
| General Information .....       | 1 |
| Installation .....              | 1 |
| Operation & Maintenance .....   | 3 |
| Troubleshooting .....           | 3 |
| Illustrated Parts Drawing ..... | 4 |
| Specifications .....            | 5 |
| Dimensions .....                | 6 |
| Warranty/Disclaimer .....       | 9 |
| Return Requests/Inquiries ..... | 9 |

## GENERAL INFORMATION

This Remote Kit Assembly allows FTB790 Series turbine meters to be used in a wide range of specialized environments. It allows the turbine meter to be separated from the display electronics while maintaining FM Approval for hazardous locations. It also can be used to measure high and low temperature fluids.

**NOTE:** To maintain the Factory Mutual Approval of this kit it must be installed in accordance with instructions given in this manual. It must also be used with a FTB790 Series Factory Mutual Approved meter. When installation is complete the Factory Mutual decal should appear on the turbine, sensor, and dustcover.

Installation should be in accordance with ANSI/ISA RP12.6 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code (ANSI/NFPA 70).

**CAUTION:** Follow the facility's recommended practice for installation of equipment in hazardous locations.

### Purpose of this Manual

This manual will assist you in installing, operating, and maintaining your Remote Kit Assembly. It gives information which will help you achieve years of dependable performance and trouble-free operation.

This manual provides support only for the FTB790-RK-FM Remote Kit Assembly. Please refer to the appropriate owner's manuals for instructions on the use and maintenance of meters or other equipment.

Please take a few moments to read through this manual before installing and operating your kit. If you need assistance, please contact the dealer from who you received your kit or the factory.

### Read Me!

Use caution when handling hazardous substances or working in potentially dangerous environments. Follow appropriate safety practices and manufacturer's recommendations.

### Damage Inspection

Upon receipt of your kit, inspect all parts and components. If any items are damaged or missing, please contact your dealer or distributor. Please note that this kit is a meter accessory and does not include the meter itself.

Use the following instructions to install the Remote Kit Assembly to a FTB790 Series meter.

## INSTALLATION

You will need the following tools for installation:

- a small Phillips screwdriver
- a drill with a #18 (4.3mm) drill bit
- a wire stripper
- a wire cutter
- a wire crimper
- a saw
- electrical tape

### Mounting Preparation

Before installing the Remote Kit, consider the mounting of the meter's computer and dustcover carefully. Select the location for mounting the computer. Using the provided template, make sure the dustcover will fit in the desired location.

Check the route of the cable from the sensor to the display. Ten feet (3m) of cable is provided with the kit. If a longer cable is required, make sure it does not exceed the maximum recommended length of 100 feet (30.5m).

NOTE: To retain Factory Mutual Approval of this kit, use only Belden Cable #9501.

If more than 10 feet of cable is needed, remove the old cable by loosening the strain relief and terminal block connections on the sensor. Connect the new cable in similar manner.

A template is supplied with the remote kit to aid in installing the dustcover. Position the template in the desired location and cut the hole. Drill the screw holes at each corner using a #18 (4.3mm) drill bit.

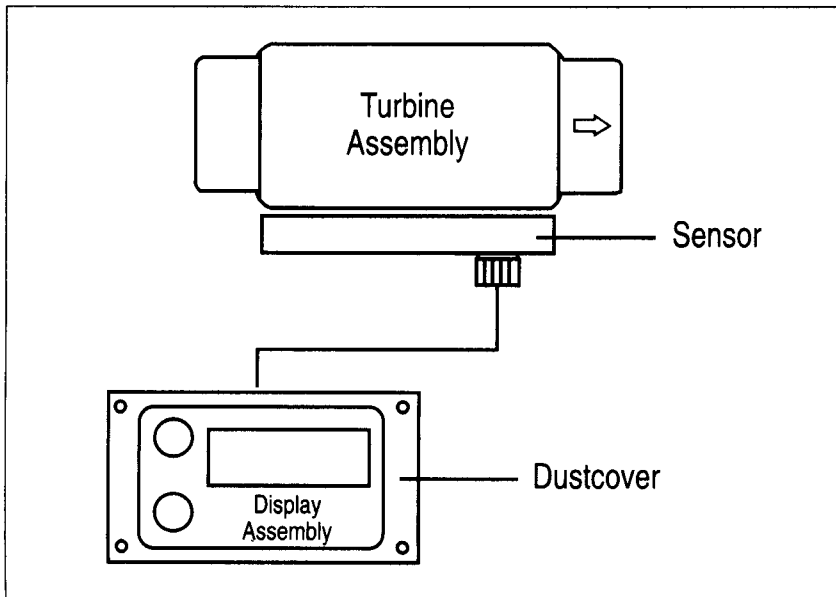
Prepare the meter for installation of the Remote Kit. Remove the four screws from the corners of the computer's face. Gently separate the computer from the turbine. Make careful note of connections from the computer to the turbine. Your sensor will connect to the turbine in a very similar manner.

## Mounting the Sensor and Turbine

NOTE: Certain styles of two-inch turbines require a slight modification of these instructions. If your two-inch model has a wire coming from the turbine assembly, the coil on the sensor must be removed. To remove the sensor's coil, gently pull the white coil from the center back of the sensor and clip the wires. Tape the bare ends of the wires to avoid shorting out the sensor's input. In addition, remove the foam spacer and adhesive to expose the two female sockets.

1. Using the four screws provided, mount the sensor to the turbine. Use the long, course thread screws, identified as Item 3 on the Illustrated Parts Drawing, to mount the sensor to a plastic turbine. Use the fine thread metal screws to mount the sensor to a metal housing.

NOTE: To retain Factory Mutual Approval, a Factory Mutual Approved turbine must be used. No additional options can be used with the turbine meter.



2. Install the turbine in the flow path. Wrap all threads with 3 to 4 turns of Teflon® tape. Make sure the tape does not impair the flow path. Hand tighten the turbine to the fittings. Use of a wrench could damage the turbine.
  3. Route the cable from the sensor to the dustcover location and, allowing an extra 5 to 8 inches (12 to 20 cm), cut it to length.
  4. Prepare the end of the cable for connection to the dustcover by stripping 1-1/2 inches (4 cm) of outer insulation. Strip an additional 1/4 inch (0.5 cm) of inner insulation from each wire. Crimp the solder-less connectors, identified as Item 5 in the Illustrated Parts Drawing, to the ends.
4. Insert the two pin connectors, identified as Item 6D on the Illustrated Parts Drawing, from the dustcover into the female sockets on the back of the computer.
  5. Make sure the foam pad is positioned correctly and that the batteries and two pin connectors are securely connected.
  6. Screw the computer assembly to the dustcover using the short, course thread screws, identified as Item 9 on the Illustrated Parts Drawing.

### Mounting the Display Electronics and Dustcover

1. Connect the cable to the dustcover by loosening the lower nuts, identified as Item 6A on the Illustrated Parts Drawing, and slipping in the connectors. Tighten the nuts.
2. Insert the dustcover into the cutout and attach with the four self-tapping screws, identified as Item 7 on the Illustrated Parts Drawing.

NOTE: If you removed the sensor's coil as detailed at the beginning to these instructions, skip Step 3.

3. Remove the coil from the display electronics. Gently pull the white coil from

the back of the computer and clip the wires. Tape the bare ends of the wires to avoid shorting. Remove the foam spacer and adhesive to expose the two female sockets.

### OPERATION AND MAINTENANCE

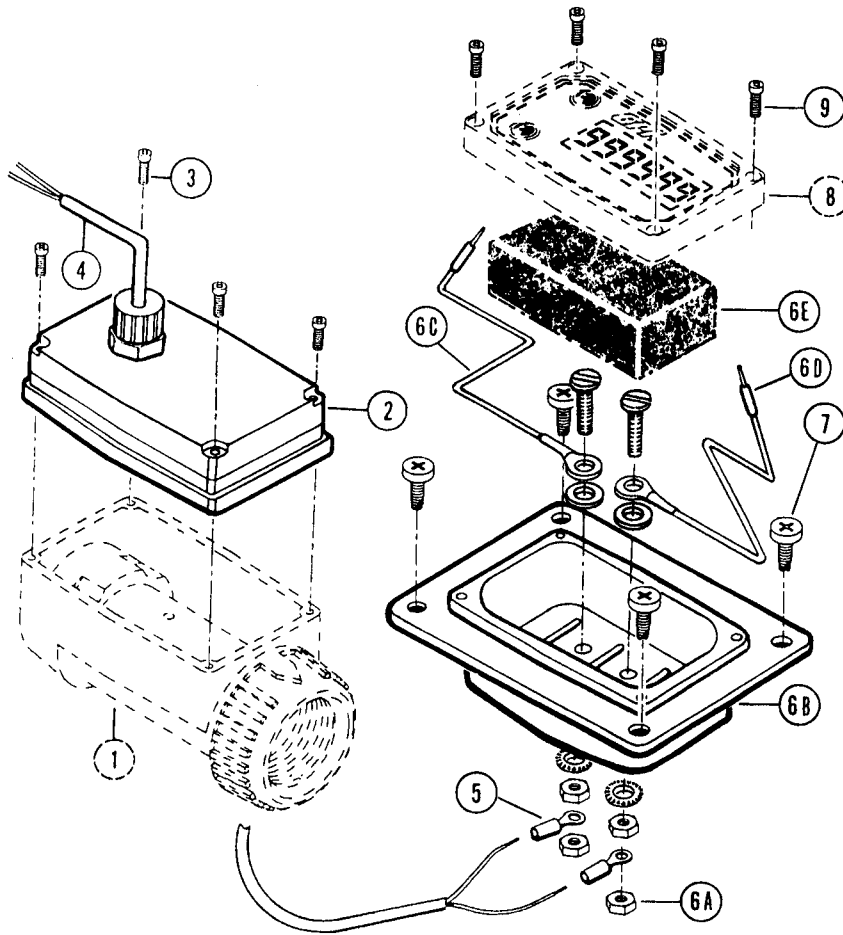
During daily use, FTB790 Series meters and the Remote Kit Assembly are maintenance-free. It is important, however, that the turbine's rotor moves freely. Refer to the meter owner's manual or other instructions on use, maintenance, and calibration. Remote Kit Assembly installation should not affect meter calibration.

NOTE: To maintain Factory Mutual Approval, order replacement batteries from the factory and specify Battery Replacement Kit FLSC790-BATT.

### TROUBLESHOOTING

| SYMPTOM                      | PROBABLE CAUSE   | CORRECTIVE ACTION   |
|------------------------------|--|---|
| READOUT ON, BUT NOT COUNTING | <ol style="list-style-type: none"> <li>1. Cable too long.</li> <li>2. Wiring broken or not connected.</li> </ol> | <p>Shorten cable to 100 feet or less.</p> <p>Inspect all wires and connections. Repair or connect as necessary.</p> |

# ILLUSTRATED PARTS DRAWING



| Item No. | Part No.  | Description  | No. Req'd. |
|----------|-----------|--|------------|
| 1*       |           | FTB790 Series Turbine                                    | 1          |
| 2        | 113273-1  | Sensor Module  | 1          |
| 3        | 904005-18 | Machine Screw, Fine thread (4-40 x 1 in.)                | 4          |
|          | 904005-17 | Plastite Screw, Coarse thread (4-20 x 1 in.) (not shown) | 4          |
| 4        | 113257-1  | 10-ft. 2-conductor cable                                 | 1          |
| 5        | 902004-51 | Belden #9501   | 1          |
| 6        | 113264-2  | Dustcover Assembly                                       | 1          |
| 6-A      | 904004-50 | Hex Nut (#6)   | 4          |
|          | 904004-51 | Lock Washer  | 2          |
| 6-B      | 113260-1  | Dustcover housing  | 1          |

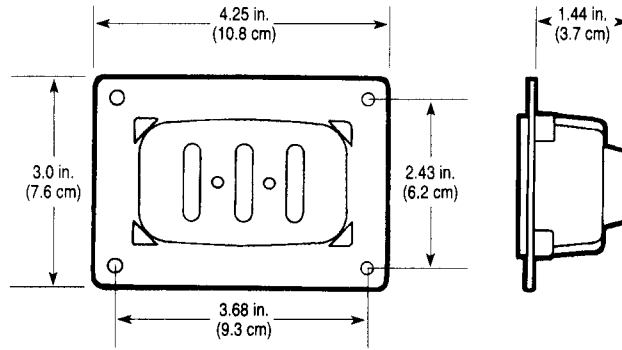
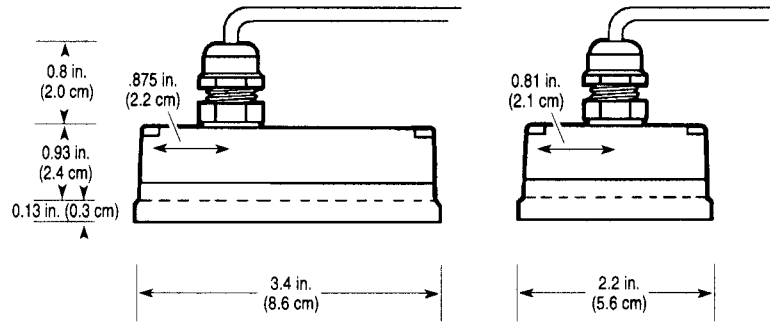
| Item No. | Part No.  | Description                                | No. Req'd. |
|----------|-----------|--|------------|
|          | 904004-52 | Flat Washer (#6)                           | 2          |
|          | 902004-51 | Ring terminals                             | 2          |
| 6-C      | 113262-1  | Jumper wires (22 AWG-7/30)                 | 2          |
| 6-D      | 902004-27 | Pin connectors                             | 2          |
|          | 904004-49 | Machine Screw (6-32 x .375 in.)            | 2          |
| 6-E      | 113259-2  | Foam pad                                   | 1          |
| 7        | 904001-82 | Self-tapping Screw (10-24 x 1/2 in.)       | 4          |
| 8*       |           | Display Electronics                        | 1          |
| 9        | 904003-88 | Plastite Screw, Coarse thread (4-20 x 7/8) | 4          |

\*These components are associated with the FTB790 Series Turbine Meter and are not part of the Remote Kit Assembly.

## SPECIFICATIONS

|                                 |  |
|---------------------------------|--|
| <b>Dustcover:</b>               | Molded plastic with terminal block connection.                                     |
| <b>Sensor:</b>                  | Cast aluminum/burnished finish and amorphous nylon inner housing.                  |
| <b>Magnetic Pickoff:</b>        | 1.3 k Ohm, 90 mH.  |
| <b>Cable:</b>                   | 10 ft. (3m), 2-conductor shielded, Belden #9501.<br>Max. temperature 220°F (104°C) |
| <b>Transmission Distance:</b>   | Up to 100 ft. (30.5m)  |
| <b>Signal Type:</b>             | Sine Wave  |
| <b>Peak to Peak Voltage:</b>    | 10 to 500 mV   |
| <b>Frequency:</b>               | 11 to 608 Hz   |
| <b>Fluid Temperature Range:</b> | -40° to +250°F (-40° to +121°C)  |
| <b>Operational Range:</b>       | +14° to +140°F (-10° to +60°C)   |

# DIMENSIONS



Turbine mounts to dotted line shown.









## WARRANTY / DISCLAIMER

OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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## RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence. The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** RETURNS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:

1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

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