

TOSHIBA

Toshiba LF150 Instruction Manual

Electromagnetic flowmeter detector

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ELECTROMAGNETIC FLOWMETER DETECTOR

NOTES

TOSHIBA

Before using the equipment, please read this manual carefully and understand the contents, and then use the equipment correctly.

- NEVER attempt to operate the equipment in any ways that are not described in this instruction manual.
- After reading this manual, store it with care in a place where it can be referred to whenever needed.
- Please be sure that this manual is delivered to the personnel who will use this product.

MODEL LF150

INSTRUCTION MANUAL



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Related Manuals for Toshiba LF150

[Security Sensors Toshiba GF630 Instruction Manual](#)

Electromagnetic flowmeter detector (63 pages)

[Security Sensors Toshiba TCB-LD1UPE Installation & Operation Manual](#)

Leak detector (22 pages)

[Security Sensors Toshiba TCB-LDS Series Installation Manual](#)

(2 pages)

[Security Sensors Toshiba TCB-IFDES1001P-UL Installation Manual](#)

Optional sensor (2 pages)

[Security Sensors Toshiba LF664 Instruction Manual](#)

Electromagnetic flowmeter detector (50 pages)

[Security Sensors Toshiba RBC-RD1-PE Owner's Manual](#)

Refrigerant detector, hfc r407c (44 pages)

[Security Sensors Toshiba RBC-AIP1 Installation Manual](#)

Leak detection panel (23 pages)

[Security Sensors Toshiba TCB-LDS1 Product Installation Manual](#)

(2 pages)

Summary of Contents for Toshiba LF150

[Page 1](#) □□□□□□□□ ELECTROMAGNETIC FLOWMETER DETECTOR MODEL LF150 INSTRUCTION MANUAL NOTES Before using the equipment, please read this manual carefully and understand the contents, and then use the equipment correctly. • NEVER attempt to operate the equipment in any ways that are not described in this instruction manual.

[Page 2](#) □□□□□□□□ NOTICE This manual is designed to assist in installing, operating, and maintaining the LF150 flange-type electromagnetic flowmeter detector. For safety reasons, and to obtain the optimum performance of the flowmeter detector, read this manual thoroughly before working with the product. For a converter to be used with this detector, read the instruction manual prepared for each converter.

[Page 3: Safety Precautions](#)

□□□□□□□□ SAFETY PRECAUTIONS Safety signs and labels affixed to the product and/or described in this manual give important information for using the product safely. They help prevent damage to property and obviate hazards for persons using the product. Make yourself familiar with signal words and symbols used for safety signs and labels. Then read the safety precautions that follow to prevent an accident involving personal injury, death or damage to property.

[Page 4](#) □□□□□□□□ SAFETY PRECAUTIONS (continued) Safety Precautions for Installation and Wiring WARNING Do not use the LF150 in an explosive atmosphere. Using this product in an explosive atmosphere can cause explosion. DON'T CAUTION Turn off mains power before Use an appropriate device to carry working on pipes.

[Page 5](#) Disclaimer Toshiba does not accept liability for any damage or loss, material or personal, caused as a direct or indirect result of the operation of this product in connection with, or due to, the occurrence of any event of force majeure (including fire or earthquake) or the misuse of this product, whether intentional or accidental.

[Page 6: Safety And Handling Precautions](#)

Therefore, wear nonconductive gloves whenever you work on piping or wiring. (2) Do not use the LF150 detector in a way other than those specified in this manual. It may cause malfunction or damage to this product.

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[Page 8: Product Inspection And Storage](#)

1.2 Storage To store the LF150 detector after opening the package but you will install it at a later date, select a storing place as follows and keep it under the conditions as described: (1) Avoid the place where there is direct sunlight, rain or wind.

[Page 9: Overview](#)

The detector and converter can be mounted separately as independent units. Features The LF150 flange-type electromagnetic flowmeter has the following features: There is no pressure loss even if a flowmeter detector is installed in the pipeline. It is possible to measure the flow of the fluid containing solid materials such as sludge or slurries.

[Page 10: Names Of Parts](#)

3. Names of Parts The outline drawing of the LF150 detector is shown in Figures 3.1. For exciting cable Terminal housing For signal cable Cable connecting R(PT)1/2 Terminal housing cover Flow direction arrow Hanging hook Detector nameplate Detector main body...

[Page 11: Installation](#)

4.1 Piping Connections The LF150 detector has flanges on both ends of detector main body. To mount the LF150, refer to Figure 4.1 and follow the procedure below: Place one of the flange packing next to the upstream(or downstream) pipe flange.

[Page 12](#) 28 ×M30 ×140 310□350 900 mm 28 ×M30 ×150 400□440 1000 mm 28 ×M36 ×160 600□640 Upstream flange Hanging hook Downstream flange Connection bolt Packing Flow direction Detector Safety against overturning Figure 4.1 The LF150 detector piping connections — —...

[Page 13](#) Design piping so that the detector pipe is always filled with fluid, whether the fluid is flowing or not. The LF150 detector has no adjustable piping mechanism. Install an adjustable short pipe where needed. Chemical injections should be conducted on the downstream side of the detector.

[Page 14](#) 4.1.2 Precautions on Piping (1a) Ideal Upstream Straight Pipe Length Installation Requirements If various joints are used upstream of the detector outlet, the straight pipe length as shown in Table 4.2 is required. Table 4.1 Ideal straight pipe length on the upstream side L=5D L=10D (1) 90°bent...

[Page 15](#) A minimum of 3D (diameter) length of upstream straight pipe from the flange is required to maintain the performance specification. NOTE The test results were obtained and demonstrated at Toshiba's flow calibration facility, Fuchu Japan. — —...

[Page 16](#) (2) Pipe Orientation The detector may be installed in horizontal, vertical or sloping pipe runs as shown in Figure 4.2. However, except for horizontal installation, fluid should flow from lower to upper directions. If no air bubble, Vertical down flow application are acceptable under pressured piping conditions.

[Page 17](#) (3) Flow Direction Install the detector in accordance with the flow direction arrow on the detector. (4) Full Pipe Condition Design an upright pipe run (Figure 4.4) or enough

water head (Fig. 4.5) at the downstream detector outlet if there is a possibility of the detector pipe being emptied. Upright pipe run Detector Figure 4.4 Detector with an upright pipe run at the downstream outlet...

[Page 18: Wiring](#)

4.2 Wiring IMPORTANT The grounding terminal of the LF150 detector must be grounded with less than 100 ohm ground resistance. A grounding wire should be as short as possible. Avoid a common ground used with other equipment where earth current may flow. An independent ground is preferable.

[Page 19](#) 4.2.2 Wiring Procedure IMPORTANT For the detector whose cables are already wired at the time of shipment, the following wiring procedure is not needed. Therefore, do not open the terminal housing cover. Signal Cable Termination Use a signal cable specified in Table 4.3 and follow the procedure below referring to Figure 4.6.

[Page 20](#) Exciting Cable Use an exciting cable specified in Table 4.3 and follow the procedure below referring to Figure 4.7. (1) Strip the cable sheath about 40 mm to expose black, white and red wires. (2) Strip each end of wire about 5 mm to expose stranded copper wire and attach an M4-size ring lug terminal on each end of wire.

[Page 21](#) Then tighten the cable connection with a wrench. Tightening torque should be limited to that which is sufficient to produce a positive seal for the cable connection. (5) Repeat (2) to (4) to wire the exciting cable. (6) Making sure both cables are wired correctly, close the terminal housing cover with the four retaining screws.

[Page 22: Operation](#)

5. Operation Follow the procedure described below to prepare before starting the flow measurement. System Check Check the wiring between the detector and converter. Check the wiring between the converter and related instruments. Make sure all the bolts of connection flanges to mount the detector are securely tightened.

[Page 23: Maintenance And Troubleshooting](#)

6. Maintenance and Troubleshooting If a problem occurs while using the LF150, follow the flowcharts described below. You may find a way to solve the problem. The flowcharts are based on five symptoms 6.1 to 6.3. If you cannot solve the problem, contact your nearest Toshiba representative.

[Page 24](#) Connect the two load resistors in series, if necessary. Is accuracy calculated as follows? Calculate as shown on the (Measured flow rate) - (Actual flow rate) left. $\times 100\%$ Actual flow rate Contact your nearest Toshiba representative. — —...

[Page 25](#) Is the fluid carrying fluid does not carry bubbles. bubbles? Install the flowmeter away from the equipment producing current cable or equipment electromagnetic or electrostatic interference near the flowmeter? static interference. Contact your nearest Toshiba representative. — —...

[Page 26: Principle Of Operation](#)

Figure 7.1 Principle of Operation The LF150 flange-type electromagnetic flowmeter uses square-wave excitation method, which provides a long-term stable operation. With square-wave excitation, the LF150 offers reliable measurement without being affected by electrostatic or electromagnetic interference, or electrochemical polarization between the electrode and the fluid to be measured.

[Page 27: Specifications](#)

8. Specifications Overall specifications of the LF150 detector and type specification code tables to specify each item of the detector specifications are described in the following sections. 8.1 Specifications Meter size: 28", 32", 36", 40", 44", 48", 54", 60", 64", 72", 80", 88", 96", 104", 112", 120"...

[Page 28](#) Cable connection port: R (PT 1/2) male screw for both signal cable and exciting cable NOTE Allowable cable length between the converter and the detector varies with

the electrical conductivity of fluid. See Figure 8.1 □ □ □ □ □...

[Page 29: Type Specification Code](#)

□ □ □ □ □ □ □ □ 8.2 Type Specification Code Table 8.2 Type Specification Code (Model LF150 Detector) Model Specification Code Size 12345 6 7 8 9 10 11 12 13 14 LF150 LF150 Detector Meter size 28" (700 mm) 32" (800 mm) 36" (900 mm) 40"...

[Page 30](#) □ □ □ □ □ □ □ □ Table 8.3 Type Specification Code (Bolts, Nuts and Packings) Model Specification Code Description 1 2 3 B N P Bolts, Nuts and Packings Flange type Meter size 20" (500mm) 24" (600mm) 28" (700mm) 32" (800mm) 36" (900mm) 40"...

[Page 31](#) □ □ □ □ □ □ □ □ Table 8.4 Type Specification Code (Exciting Cable and Signal Cable) Model Specification Code Description 1 2 3 A C C Dedicated preformed cable Nominal cross-sectional area of Exciting cable (Note 1) 1.25 mm² 2 mm² Nominal cross-sectional area of Signal cable (Note 2) 0.75 mm²...

[Page 32: Outline Dimensions](#)

□ □ □ □ □ □ □ □ 9. Outline Dimensions ■ Meter size 28" to 40" (700 to 1000mm) JIS 10K and AWWA class D dimensions: Meter size Weight inch (mm) inch (mm) inch (mm) inch (mm) lb(kg) 28 (700) 27-1/2 (700) 17-7/8 (453) 38 (966) 772 (350) 32 (800) 31-1/2 (800)

[Page 33](#) □ □ □ □ □ □ □ □ ■ Meter size 44" to 60" (1100 to 1500mm) JIS 10K and AWWA class D dimensions: Meter size Weight inch (mm) inch (mm) inch (mm) inch (mm) lb(kg) 44 (1100) 63 (1600) 29-1/2 (750) 58-1/2 (1487) 3307 (1500) 48 (1200) 66-7/8 (1700) 31-1/2 (800) 62-1/2 (1586)

[Page 34](#) □ □ □ □ □ □ □ □ ■ Meter size 64" to 80" (1600 to 2000mm) JIS 10K and AWWA class D dimensions: Meter size Weight inch (mm) inch (mm) inch (mm) inch (mm) lb(kg) 64 (1600) 86-5/8 (2200) 47-1/4 (1200) 86-5/8 (2201) 9260 (4200) 72 (1800) 94-1/2 (2400) 51-1/8 (1300) 94-1/2 (2401)

[Page 35](#) □ □ □ □ □ □ □ □ Write down the address and phone number of the distributor from which you purchased this product, the product code, SER.NO. and so on. Distributor Address Name Phone number □ □ □ Product code SER.NO. — —...

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