TOSHIBA

Toshiba GF632 Instruction Manual

Electromagnetic flowmeter detector

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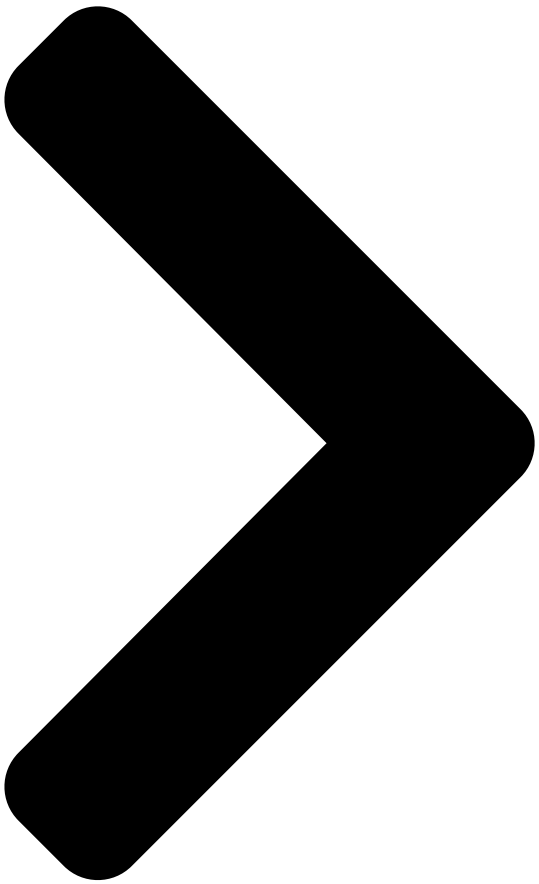

ELECTROMAGNETIC FLOWMETER DETECTOR

TOSHIBA

for FM Approval and CSA Certification

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.

• 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 GF630, GF632

INSTRUCTION MANUAL

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Troubleshooting

Related Manuals for Toshiba GF632

Security Sensors Toshiba GF630 Instruction Manual

Electromagnetic flowmeter detector (63 pages)

Measuring Instruments Toshiba GF630 Manual

Electromagnetic flowmeter (18 pages)

Measuring Instruments Toshiba LF622 Quick Start Manual

Magmeter (13 pages)

Plumbing Product Toshiba LF404 Instruction Manual

Electromagnetic flowmeter (158 pages)

Plumbing Product Toshiba LF400 Series Operation Manual

Electromagnetic flowmeter (2 pages)

Plumbing Product Toshiba LF602F Instruction Manual

Electromagnetic flowmeter (162 pages)

Plumbing Product Toshiba LF610 Series Operation Manual

Electromagnetic flowmeter (2 pages)

Plumbing Product Toshiba LF600 Series Operation Manual

Electromagnetic flowmeter (2 pages)

Plumbing Product Toshiba LF494 Instruction Manual

Electromagnetic flowmeter (157 pages)

Plumbing Product Toshiba LF470 Instruction Manual

Electromagnetic flowmeter detector (40 pages)

Plumbing Product Toshiba LF502 Instruction Manual

Electromagnetic flowmeter for partially filled pipes (111 pages)

Plumbing Product Toshiba LF414 Instruction Manual

Electromagnetic flowmeter detector (58 pages)

Summary of Contents for Toshiba GF632

Page 1 ELECTROMAGNETIC FLOWMETER DETECTOR MODEL GF630, GF632 INSTRUCTION MANUAL for FM Approval and CSA Certification 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 Integral type GF630/LF600F and GF630/LF610F: Separate type detector GF632: Toshiba GF63* electromagnetic flowmeter detectors can be used in combination with various types of electromagnetic flowmeter converters (LF600F, LF610F, LF602F and LF612F). For the notes on usage, connecting, wiring, installation, configuration and maintenance of the combined converter, check the model number of the combined converter and read the instruction manual of the relevant 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 Safety Precautions for Installation and Wiring Do not disconnect while circuit is live unless location is known to be nonhazardous. Live part of electric circuit or a high temperature department can cause explosion. DON'T Do not modify or disassemble the enclosure. Strength degradation and defects of enclosure can cause explosion.

Page 5 DON'T CAUTION Use an appropriate device to carry and install the GF630/LF600F, GF630/LF610F and GF632. If this product falls to the ground, injury, or malfunction of or damage to the product, can be caused. Do not modify or disassemble the GF630/LF600F, GF630/LF610F and GF632 unnecessarily.

Page 6 Warranty and Limitation of Liability 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 7: Handling Precautions

Handling Precautions To obtain the optimum performance from the GF630/LF600F, GF630/LF610F and GF632 for years of continuous operation, observe the following precautions. (1) Do not store or install the flowmeter in: □Where there is direct sunlight. □Where there is snow and ice Infrared switches may not function correctly.

Page 8 Handling Precautions (continued) (6) If the inside of the converter and detector's terminal box are wetted or humidified, it may cause insulation deterioration, which can result in fault or noise occurrence. So do not conduct wiring in the open air on rainy days. Also, be careful not to wet down the converter and detector's terminal box even in the case of indoor wiring, and complete wiring work in a short period of time.

Page 9: Table Of Contents

9.1 Flowmeter Specifications ····· 41 9.2 Type Specification Code ····· 46 10. Outline Dimensions ····· 47 Appendix 1 1-1 A system diagram for GF630/LF600F and GF630/LF610F ····· 52 1-2 A system diagram for GF632 ····· 53
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Page 10: Product Inspection And Storage

Make sure the type and specifications of the flowmeter are in accordance with the ordered specifications. If you cannot find the items listed above or any problem exists, contact your nearest Toshiba representative. 1.2 Strage To store the electromagnetic flowmeter after opening the package, select a storing place as follows and...

Page 11: Overview

Faraday's Law of electromagnetic induction. The device consists of two units: the GF630 and GF632 detector, through which the fluid to be measured flows, and the converter, which receives the electromotive force signals from the detector, then converts the signals into the 4–20 mA dc signal.

Page 12: Names Of Parts

3. Names of Parts 3.1 Appearance 3.1.1 Appearance of GF630/LF600F and GF630/LF610F Integral for Power cable 1/2-14NPT for I/Ol cable Terminal block cover 1/2-14NPT Ground terminal for converter Ground terminal for detector Figure 3.1.1 Appearance of GF630/LF600F and GF630/LF610F Note: The ground cables are included in the package, so install them to flanges as shown in the Fig.4.5 as needed.

Page 13 1/2 – 14 NPT Ground terminal for detector Figure 3.1.2 Appearance of Detector GF632 Note: The ground cables are included in the package, so install them to flanges as shown in the Fig.4.5 as needed. (The screws are equipped to detector flanges.)

Page 14: Construction Of The Terminal Blocks

3.2.1 Terminal Block Construction of GF630/LF600F and GF630/LF610F Type For the detail of the converter, check the converter LF600F and LF610F instruction manual. Integral 3.2.2 Terminal Block Construction of GF632 Type Separate To signal cable terminal (A,B and G) To excitation cable terminal(X,Y and E) Don’t connect wiring to this terminal.

Page 15: Installation

4. Installation Safety Precautions for Installation Do not active live circuits under environment of explosive atmospheres. Live part of electric circuit or a high temperature department can cause explosion. DON’T Do not use parts of other products. Protective performance degradation for hazardous location can cause explosion. DON’T Do not active live circuits While assembly of all components is not over.

Page 16 Stopper, etc. to prevent from toppling over it. CAUTION Use an appropriate device to carry and install the GF630/LF600F, GF630/LF610F and GF632 . If his product falls to the ground, injury, or malfunction of or damage to the product, can be caused.

Page 17: Notes On Selecting The Installation Location

4.1 Notes on Selecting the Installation Location Avoid places within the immediate proximity of equipment producing electrical interference (such as motors, transformers, radio transmitters, electrolytic cells, or other equipment causing electromagnetic or electrostatic interference). Avoid places where excessive pipe vibration occurs. Avoid places where fluid is pumped in a pulsating manner Avoid places where there is direct sunlight.

Page 18 □□□□□□□□ (2) Preventing an Empty Pipe Condition Fix the relevant pipes installed on both sides of the detector by attaching fittings, etc. to support the pipe. By supporting the pipes, not only the pipe vibration is reduced but also the damage to the pipes by the electromagnetic flowmeter's weight and the fluid mass (see Figures 4.2 and 4.3).

Page 19: Installation Procedure

4.2.2 Installation Procedure In the case that the piping is non-conductive material, make sure to install the grounding rings(option) to each flange of detector using the M4 screw before piping . The M4 screws are prepared to each flange. In addition, in the case of detector with FEP lining, make sure to install the gaskets between grounding ring and lining.

Page 20 (2) To put the flowmeter temporarily on the floor, place it carefully with something, such as stopper, to support it so that GF630 and GF632 will not topple over. □ □□ □...

Page 21 Table 4.1 Bolt length and Nut tightening torque Meter size 15mm 1/2” 25mm 1” 32mm 1 1/4” 40mm 1 1/2” 50mm 2” 65mm 2 1/2” 80mm 3” 100mm 4” 125mm 5” 150mm 6” 200mm 8” 250mm 10” 300mm 12” 350mm 14”...

Page 22 GF630/LF600F, GF630/LF610F and GF632 will not topple over. * The lifting work should be executed by those qualified for crane work or slinging work Wire or cloth belt 90°or less...

Page 23: Piping Connections

4.3 Piping Connections (1) Required Upstream Straight Pipe Length If various joints are used upstream of the detector outlet, the straight pipe length as shown in Table 4.3 is required. Table 4.3 Required straight pipe length on the upstream side L=5D (1) 90°bent (2) Tee...

Page 24 (2) Pipe Orientation The detector may be installed in horizontal, vertical or sloping pipe runs as shown in Figure 4.6. 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 25 (3) Flow Direction Install the detector in accordance with the flow direction arrow on the detector. See Figure 4.8. Figure 4.9 Flow direction arrow on the detector (4) Preventing an Empty Pipe Condition Design an upright pipe run (Figure 4.9) or sufficient head pressure (Fig. 4.10) at the downstream detector outlet if there is a possibility of the detector pipe becoming emptied.

Page 26: Grounding

4.4 Grounding Do not wire cables and replace parts when power is supplied. Wiring work and replacing parts in the power-on state DON’T may cause electric shock. (1) Grounding of the GF630/LF600F and GF630/LF610F type Ground as shown in Figure 4.12. Make the grounding wire as short as possible. Use grounding Integral wire material of IV wire 5.5mm instruments where grounding current may flow.

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Grounding terminal (100 ohm or less ground resistance) • In the case that the piping is non-conductive material, use grounding rings. Figure 4.15 Grounding the GF632 Type Detector □ □□ □ □□□□□□□□ or more. Do not share a grounding wire with...

Page 28: Wiring

5. Wiring Safety Precautions for Wiring DO NOT DISCONNECT WHILE CIRCUIT IS LIVE UNLESS LOCATION IS KNOWN TO BE NONHAZARDOUS. Live part of electric circuit or a high temperature department can cause explosion. DON’T Do not active live circuits While assembly of all components is not over. Protective performance degradation for hazardous location can cause explosion.

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Install a switch and fuse to isolate the GF630/LF600F, GF630/LF610F and GF632 from mains power. Power supply from mains power can cause electric shock or circuit break-down. Do not work on piping and wiring with wet hands. Wet hands may result in electric shock DON’T...

Page 30: Cables

Notes on wiring CAUTION (1) The apparatus does not be provided with the cable connections. Please prepare yourself for the cable connections which could be used in Division2 hazardous locations. The cable lead –in section must be tightened securely to keep air tightness. (2) Select the cable runs away from electrical equipment (motors, transformers, or radio transmitters) which causes electromagnetic or electrostatic interference.

Page 31: External Device Connections And Grounding

When replacing the flow rate signal cable and excitation cable, also refer to the instruction manual of the relevant detector. Order the detector terminal box cover packing from Toshiba or a Toshiba distributor. or more. The size of the external grounding terminal screws is M4.

Page 32: Wiring

5.4 Wiring 5.4.1 Terminal Treatment of Cables Follow the procedures below to treat the terminals (at the converter side) of various cables and install the cables to the terminal block. Use appropriate cables based on the description in Section 5.1 "Cables." Crimp a round type insulated crimp-type terminal to the end of the cables.

Page 33

(3) Connecting the input signal cable Separate Strip the sheath from the end of each conductor of a 2-core individually shielded cable as shown in Figure 5.4. Twist those shields and cover them with a thermal contraction tube or vinyl tube not to make contact with the case or core wires.

Page 34: Cable Connection

□□□□□□□□ 5.4.2 Cable Connection Separate Connect and install the terminal-treated cables to the terminal block. *Connect the cables to the terminal block securely. A loose connection may cause incorrect measurement. After connecting a cable, try to pull it to check whether it has been connected securely. (1)Referring to combined converter's manuals of "Connections and Grounding", connect each cable to the terminal block.

Page 35: Operation

6. Operation Do not touch the terminal board when power is supplied. Touching the terminal board when power is supplied can DON’T cause electric shock. Preparatory check Follow the procedure described below to prepare before starting the flow measurement (described with regard to the entire flowmeter).

Page 36: Maintenance And Troubleshooting

Wiring while power is applied can cause electric shock. DON’T WARNING CAUTION Do not touch

the GF630/LF600F, GF630/LF610F and GF632 main body when high temperature fluid is being measured. The fluid raises the main body temperature and can cause burns. DON'T □...

Page 37: Maintenance

7.1 Maintenance Cleaning Adhesion might be created in the detector over a long period of time when used on certain materials. Try to confirm whether to cause the adhesion in the detector pipe when the phenomenon is seen, and and an abnormality (ex.

Page 38: Troubleshooting

7.2 Troubleshooting If a problem occurs while using the GF630/LF600F, GF630/LF610F and GF632, follow the flowcharts described below. You may find a way to solve the problem. The flowcharts are based on three symptoms (1) to (3). If you cannot solve the problem, contact your nearest Toshiba representative.

Page 39

Is accuracy calculated as follows? (Measured flow rate)-(Actual flow rate) Actual flow rate Contact your nearest Toshiba representative. Set correctly. Refer to combined converter's manual. Perform the zero adjustment. Refer to combined converter's manual.

Page 40: Flow Rate Indication Is Not Stable

Is the fluid carrying bubbles? Is there high-voltage or large current cable or equipment near the flowmeter? Contact your nearest Toshiba representative. Use a power supply within the specified range. Connect each cable securely to the terminal board.

Page 41: Principle Of Operation

π × D Therefore, volumetric flow rate is directly proportional to the induced voltage. The GF630/LF600F, GF630/LF610F and GF632 use the square-wave excitation method, which provides long-term stable operation. With square-wave excitation, the GF630/LF600F, GF630/LF610F and GF632 offers reliable measurement without being affected by electrostatic or electromagnetic interference, or electrochemical polarization between the electrodes and the fluid to be measured.

Page 42: Specifications

< 1/2" to 18"(15mm to 450 mm) > ±0.2 % of Rate * This pulse output error result is established under standard operating conditions at Toshiba's flow calibration facility, Fuchu Japan. (NIST Traceable). Individual meter measurement error may vary up to ±0.5% of Rate at 1.64 ft/s (0.5m/s) or more and ±0.3% of rate ±0.039 inch/s (1mm/s) at 1.64 ft/s or less.

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Connection flange standard: See Table 9.2 Type Specification Code. Principal materials Case Lining Electrodes Grounding rings None (standard for Polyurethane, FEP and CR) (Option: See chapter 10.3) See Table 9.2 Type Specification Code for optional materials and other related information. Coating: Corrosion resistant resin coating (std.), pearl-gray colored Structure: IP67 and NEMA 4X Cable connection port: 1/2-14NPT male screw for both signal cable and exciting cable...

Page 44

Calibration range : It calibration by standard Range shown in the table below when Range is not It calibration when there is specification by flowing quantity Range in which the customer is specified. Is this specification Range flowing quantity of Figure 9.1. Please confirm becoming in the upper bound value from the flow velocity chart.

Page 45

To select the meter size: See Figure 9.2 and find meter sizes within the velocity of 0.1 to 10 m/s for a specified full-scale (measuring range high limit) flow. Select one that has its full-scale velocity between 1 and 3 m/s. Make sure the full-scale flow rate used for the final planning stage stays within 10 m/s in terms of flow velocity.

Page 46

US Unit Flow volume Meter size 0.328ft/s 1/2 inch 0.2801 gal/min 0.8403 gal/min 1 inch 0.7781 gal/min 1 1/4 inch 1.275 gal/min 1 1/2 inch 1.992 gal/min 2 inch 3.112 gal/min 2 1/2 inch 5.260 gal/min 3 inch 7.967 gal/min 4 inch 12.45 gal/min 5 inch...

Page 47: Type Specification Code

9.2 Type Specification Code Table 9.2 Type Specification Code Model number Specification code 9 10 11 12 NOTE 1) The grounding rings are provided to PTFE Lining, which material is 316 stainless steel. Contents Flanged connection electromagnetic flowmeter detector Integral type

Separate type Meter size 15mm...

Page 48: Outline Dimensions

10. Outline Dimensions 10.1 Outline dimensions of GF630/LF600F and GF630/LF610F (1) Meter size of 1/2 inch to 6 inch (15mm to 150mm) Integral (1) Meter size of 1/2 inch to 8 inch (15mm to 200mm) Meter Size 15mm 1/2" 25mm 1"...

Page 49 (2) Meter size of 8 inch to 24 inch (200mm to 600mm) L1±6 L2±5 Meter Size (mm) (mm) 200mm 8" 250mm 10" 300mm 12" 350mm 14" 400mm 16" 450mm 18" 500mm 20" 600mm 24" NOTES *1) L1 of PTEF Lining contains the thickness of grounding rings. *2) Mass of PTFE Lining contains the mass of grounding rings.

Page 50 10.2 Outline dimensions of GF632 (1) Meter size of 1/2 inch to 6 inch (15mm to 150mm) Separate Meter Size 15mm 1/2" 25mm 1" 32mm 1 1/4" 40mm 1 1/2" 50mm 2" 65mm 2 1/2" 80mm 3" 100mm 4" 125mm 5"...

Page 51 (2) Meter size of 8 inch to 24 inch (200mm to 600mm) Grounding ring (PTFE Lining only) L1±6 L2±5 Meter Size (mm) (mm) 200m 8" 250m 10" 300m 12" 350m 14" 400m 16" 450m 18" 500m 20" 600m 24" *1) L1 of PTEF Lining contains the thickness of grounding rings.

Page 52 10.3 Outline dimensions of Grounding ring Option for Polyurethan, CR and FEP Material : SUS316 Meter size ANSI 150 (Unit: inch) inch ΦD1 1.65 2.36 1-1/4 2.76 1-1/2 3.03 3.74 2-1/2 4.69 5.08 5.91 7.28 8.46 10.43 13.11 15.59 17.32 19.80 21.34 23.58...

Page 53: Appendix 1

□□□□□□□□ Appendix 1 1-1 A system block diagram for GF630/LF600F and GF630/LF610F □ □□ □...

Page 54: A System Diagram For Gf632

□□□□□□□□ 1-2 A system block diagram for GF632 □ □□ □...

Page 55 USER'S FORM NOTES 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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This manual is also suitable for:

Gf630