

Introduction

Sanitary electromagnetic flowmeter LF490/LF400 or LF490/LF420 is designed for applications handling food and beverages. Sanitary flowmeters must be structured in such a way that operation and handling is simple, easy and thorough for the purpose of sanitary control such as cleaning, sterilization and drying. The sanitary flowmeter has features provided with normal electromagnetic flowmeters and by using sanitary fittings for pipeline connections fluid does not remain in any place along the detector pipeline. Thus, it is fit for flowrate measurement for food and beverages.

The electromagnetic flowmeter uses Faraday's Law of electromagnetic induction to measure the process flow. The device consists of two units: a detector, through which the fluid to be measured flows and in which low-level signals proportional to flow rates are obtained; and a converter, which supplies excitation current to the detector, and amplifies the signals from the detector and then processes and converts the signals into the 4–20 mA dc current signal. The LF490/LF400 is a detector-converter combined type and the LF490/LF420 is a flowmeter with its detector LF490 and converter LF420 separately mounted. The LF490 detector can also be used with a separate type converter Model LF230, which provides high performance such as Digital Inputs (two points) along with Digital Outputs (four points), and multi-functions.

The LF490 is approved for 3A standard and its teflon PFA lining conforms FDA requirement.

The AF100 hand-held terminal or Model 275 HART communicator can be used to communicate with the flowmeter from remote places. See the following page for the HART protocol specifications.



Figure 2. Separate type LF490 and LF420

Specifications



Overall Specifications

Measurement range in terms of flow velocity:

0–0.3 m/s to 0–10 m/s (0–1.0 ft/s to 0–32.8 ft/s).
0–0.1 m/s to 0–0.3 m/s (0–0.3 ft/s to 0–1.0 ft/s)
range is available optionally.

Accuracy: See the following table.

Flow rate as a percent of range	Accuracy		
	0.1–0.3 m/s (0.3–1.0 ft/s)	0.3–1.0 m/s (1.0–3.3 ft/s)	1.0–10 m/s (3.3–32.8 ft/s)
0–20%	—	—	±0.1% FS
20–100%	—	—	±0.5% of rate
0–50%	±0.25% FS	—	—
50–100%	±0.5% of rate	—	—

Note: The accuracy above is measured under standard operating conditions at Toshiba's calibration facility.

Fluid conductivity: 5µS/cm minimum

Fluid temperature: –10 to +120 °C (14 to 248 °F)

Ambient temperature: –10 to +60 °C (14 to 140 °F)

Structure: NEMA 4 (IP 67) Watertight

Power consumption: approximately 10 W(17VA)

Model LF490 Detector

Fluid pressure: –0.1 to 2.0 MPa (–15 to 300 psi, or –1.0 to 20 bar)

Note: This pressure is the allowable pressure for the detector. The actual pressure will be restricted by the type of connection method. For example, in the case of sanitary clamp type, the maximum pressure is 1.0 MPa (150 psi or 10 bar).

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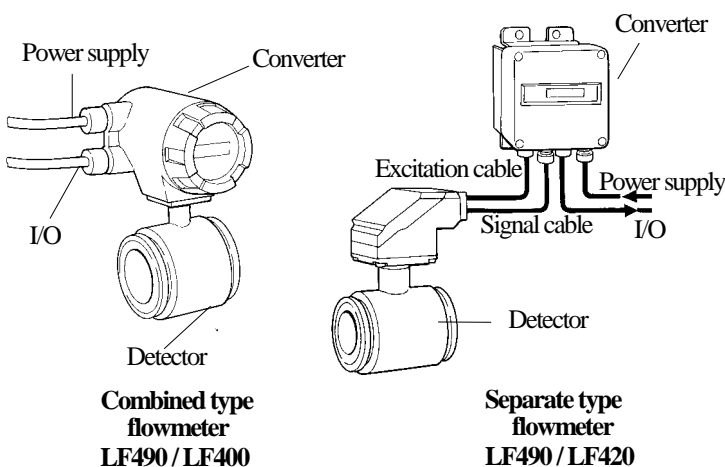


Figure 1. Configuration

Connection method:

Sanitary clamp type (ISO 2852) or
Sanitary screw type (ISO 2853)

Note:

Tri-clamp® can connect except meter size 100 mm (4").
Tri-clamp® is a registered trademark for Tri-Clover Inc.

Principal materials:

Case — stainless steel

Linings — Teflon PFA

Electrodes — 316L stainless steel (standard)

Sanitary fittings — 304 stainless steel (standard)

Seal gaskets — Silicon rubber

Note: See Table 2 for optional materials and other related information.

Measuring tube material

304 stainless steel

Coating: no coating (standard)

Cable connection port (only in separate units):

R(PT) 1/2 male screw for both signal cable and excitation cable.

■ **Model LF400 (combined type) and Model LF420 (separate type) Converter**

Input signals

Analog signal — the voltage signal from detector, proportional to process flow rate (for LF420 separate type converter).

Digital input DI (option)

Signal type: 20 to 30 V dc voltage signal

Input resistance: 2.7 kΩ

Number of inputs: one point

DI function — One of the following functions can be assigned to the optional DI signal.

Range switching — Selects either the higher or lower range in the unidirectional or bidirectional 2-range setting.

Totalizer control — Starts and stops the built-in totalizer.

Fixed-value outputs — Outputs fixed-values for current and pulse outputs.

Zero adjustment — Executes zero adjustment (on-stream at zero flow rate).

Output signals

Current output:

4–20 mA dc (load resistance 0 to 1 kΩ)

Digital outputs — One point (standard) and one more point is optionally available as follows.

Digital output DO1 (standard):

Output type: Transistor open collector

Number of outputs: One point

Output capacity: 30 V dc, 200 mA maximum

Digital output DO2 (option):

Output type: Solidstate relay output (non polarity)

Number of outputs: One point

Output capacity:

150 V dc, 150 mA maximum or

150 V ac (peak to peak), 100 mA maximum

DO1 and DO2 functions — One of the following functions can be assigned to DO1 (standard) and/or DO2 (option)

• **Pulse output (available only for DO1)**

Pulse rate: 3.6 to 3600000 pulses/hr

Pulse width: 0.5 to 100 ms (but less than half of the period for 100% flow rate)

• **Multi-range selection outputs**

Note: Two outputs (DO1 and DO2) are needed for 4-range switching and forward/reverse 2-range switching.

• **High and/or low limit alarm outputs**

• **Empty pipe alarm output**

• **Preset count output**

• **Converter failure alarm output**

Communications output — Digital signal is superimposed on 4–20 mA dc current signal (conforms to HART protocol)

Load resistance: 240 to 1 kΩ

Load capacitance: 0.25 μF maximum

Load inductance: 4 mH maximum

Note: HART protocol (Highway Addressable Remote Transducer) is a communications protocol for industrial sensors recommended by HCF (HART Communication Foundation).

LCD display (option): 2-line, 16-character dot-matrix LCD display (back-light provided)

The LCD inside the converter can rotate to 90, 180, 270 degrees by removing 4 screws.

Parameter settings — Parameters can be set as follows depending on whether the LCD display is provided or not.

Converter with LCD display: Three key switches are provided to set configuration parameters.

Converter without LCD display: The AF100 hand-held terminal or the Model 275 HART communicator is needed to set parameters.

Zero adjustment: Zero point adjustment can be started by pressing the switch in the converter.

Damping: 0.5 to 60 seconds (selectable in 1 second increments)

Zero and span calibration:

Built-in calibration signal source allows converter unit check.

Conditions when power fails:

The outputs and display will remain as follows when power fails. Parameter setting values are stored in non-volatile memory and the values will be restored when the power returns to normal condition.

• Current output: 0 mA dc

• Digital output: OFF

• LCD display: No display

Power supply:

- One of the following can be selected:
 - 100 to 240 V ac, 50/60 Hz (standard) (allowable voltage 80 to 264 V ac)
 - 24 V dc (allowable voltage 20.4 to 28.8 V dc)
 - 110 V dc (allowable voltage 98 to 121 V dc)

Surge protection: Arresters are installed in the power supply, and current signal output circuit.

Case: Aluminum alloy

Coating: Acrylic resin-baked coating, pearl-gray colored

Cable connection ports — Cable gland with a cap nut is provided for each port.

Applicable cable diameter: 11 to 13 mm

Cable gland material: Nylon 66

Port holes in housing: G(PF) 1/2 female screw

Vibration resistance:

No resonance to the following levels of vibration:

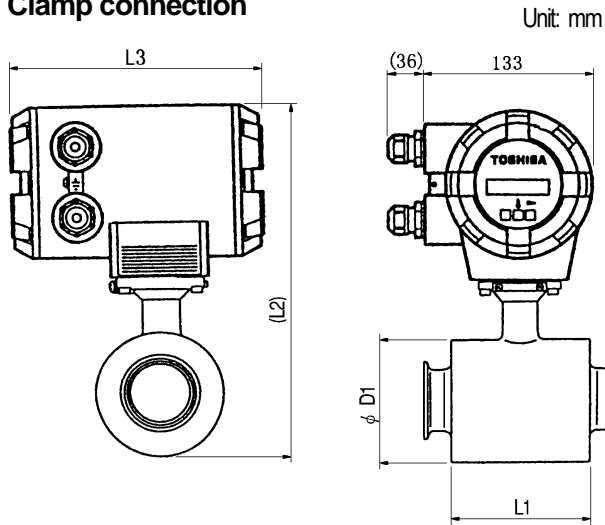
- 10 to 60 Hz, amplitude 0.07 mm
- 60 to 150 Hz with acceleration of 9.8 m/s²

Note: Avoid to use the flowmeter in an environment with constant vibration.

Installation

■ **Dimensions**

Clamp connection



Note: Clamp (Joint) size is different from meter size of LF490. See the following table.

For SI unit

Meter size mm (inch)	Joint size (ISO2852)	L1 (mm)	L2 (mm)	D1 (mm)	Weight (kg)
25 (1S)	2 S	110	247	73	approx. 5
40 (1 1/2S)	2 1/2 S	125	264	90	approx. 6
50 (2S)	3 S	140	278	104	approx. 7
80 (3S)	4 S	140	304	130	approx. 9
100 (4S)	5 1/2 S	160	336	162	approx. 12

Note: Above weights include LCD display. Tri-clamp® is available to use the same joint size instead of ISO2852 clamp except meter size 100 mm (4”).

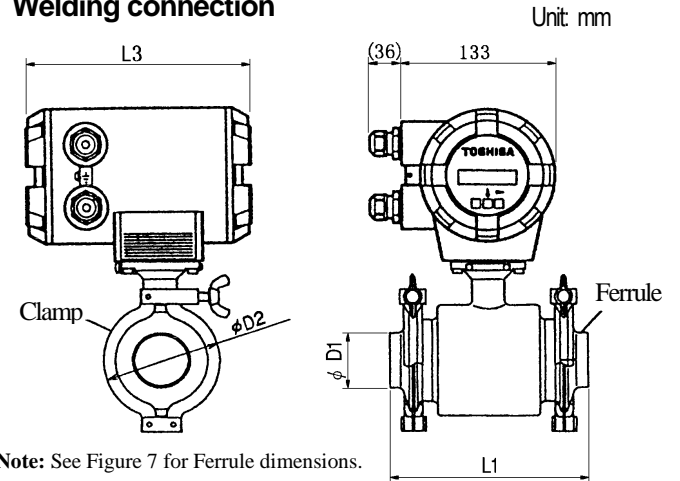
For English unit

Meter size (inch)	Joint size (ISO2852)	L1 (inch)	L2 (inch)	D1 (inch)	Weight (lb)
1 (1S)	2 S	4 3/8	9 3/4	2 7/8	approx. 11
1 1/2 (1 1/2S)	2 1/2 S	4 7/8	10 3/8	3 1/2	approx. 13.2
2 (2S)	3 S	5 1/2	11	4 1/8	approx. 15.4
3 (3S)	4 S	5 1/2	12	5 1/8	approx. 19.8
4 (4S)	5 1/2 S	6 1/4	13 1/4	6 3/8	approx. 26.5

Note: Above weights include LCD display. Tri-clamp® is available to use the same joint size instead of ISO2852 clamp except meter size 100 mm (4”).

Figure 3. LF490/LF400 Flowmeter (Ferrules and Clamps not attached.)

Welding connection



Note: See Figure 7 for Ferrule dimensions.

For SI unit

Meter size mm (inch)	Joint size (ISO2852)	L1 (mm)	D1 (mm)	D2 (mm)	Weight (kg)
25 (1S)	2 S	156.4	25.4	79	approx. 6
40 (1 1/2S)	2 1/2 S	171.4	38.1	93	approx. 8
50 (2S)	3 S	186.4	50.8	106	approx. 9
80 (3S)	4 S	199.4	76.3	134	approx. 12.
100 (4S)	5 1/2 S	219.4	101.6	173	approx. 16

Note: Above weights include LCD display. Tri-clamp® is available to use the same joint size instead of ISO2852 clamp except meter size 100mm (4”).

For English unit

Meter size (inch)	Joint size (ISO2852)	L1 (inch)	D1 (inch)	D2 (inch)	Weight (lb)
1 (1S)	2 S	6 1/8	1	3 1/8	approx. 13.2
1 1/2 (1 1/2S)	2 1/2 S	6 3/4	1 1/2	3 5/8	approx. 17.6
2 (2S)	3 S	7 3/8	2	4 1/8	approx. 19.8
3 (3S)	4 S	7 7/8	3	5 1/4	approx. 26.5
4 (4S)	5 1/2 S	8 5/8	4	6 3/4	approx. 35.3

Note: Above weights include LCD display. Tri-clamp® is available to use the same joint size instead of ISO2852 clamp except meter size 100 mm (4”).

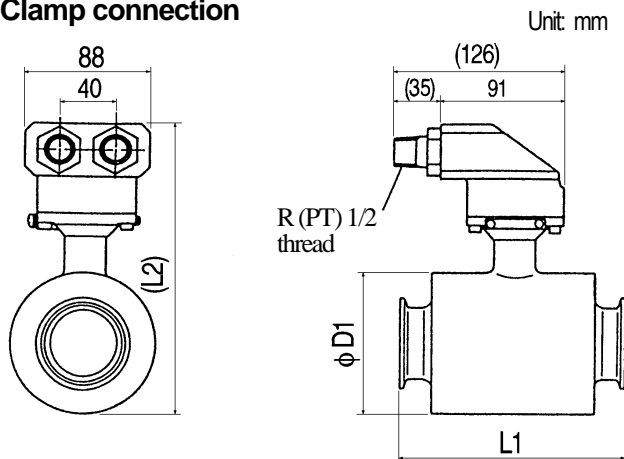
Figure 4. LF490/LF400 Flowmeter (Ferrules and Clamps attached.)

See the following table for the dimension of L3 indicated in Figures 3 and 4. This length depends on the type of converter whether it has LCD display or not.

Converter type	L3	
	(mm)	(inch)
Without display	190	7 1/2
With display	212	8 3/8

Note: 1 inch = 25.4 mm

Clamp connection



Note: Clamp (Joint) size is different from meter size of LF490. See the following table.

For SI unit

Meter size mm (inch)	Joint size (ISO2852)	L1 (mm)	L2 (mm)	D1 (mm)	Weight (kg)
25 (1S)	2 S	110	179	73	approx. 4
40 (1 1/2S)	2 1/2 S	125	196	90	approx. 5
50 (2S)	3 S	140	210	104	approx. 6
80 (3S)	4 S	140	236	130	approx. 8
100 (4S)	5 1/2 S	160	268	162	approx. 11

Note: Above weights include LCD display.
Tri-clamp® is available to use the same joint size instead of ISO2852 clamp except meter size 100 mm (4").

For English unit

Meter size (inch)	Joint size (ISO2852)	L1 (inch)	D1 (inch)	D2 (inch)	Weight (lb)
1 (1S)	2 S	4 3/8	7	2 7/8	approx. 8.8
1 1/2 (1 1/2S)	2 1/2 S	4 7/8	7 3/4	3 1/2	approx. 11
2 (2S)	3 S	5 1/2	8 1/4	4 1/8	approx. 13.2
3 (3S)	4 S	5 1/2	9 1/4	5 1/8	approx. 17.6
4 (4S)	5 1/2 S	6 1/4	10 1/2	6 3/8	approx. 24.3

Note: Above weights include LCD display.
Tri-clamp® is available to use the same joint size instead of ISO2852 clamp except meter size 100 mm (4").

Figure 5. Separate type detector LF490 (Ferrules and Clamps not attached.)

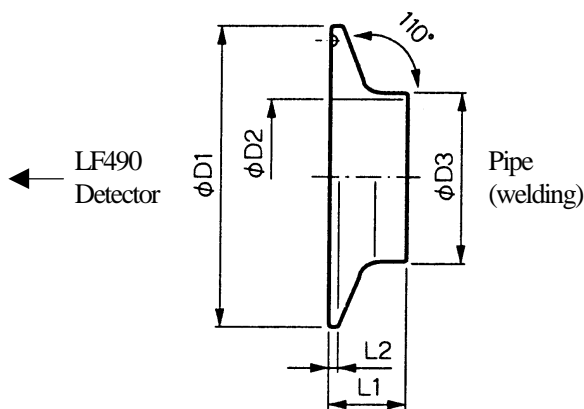
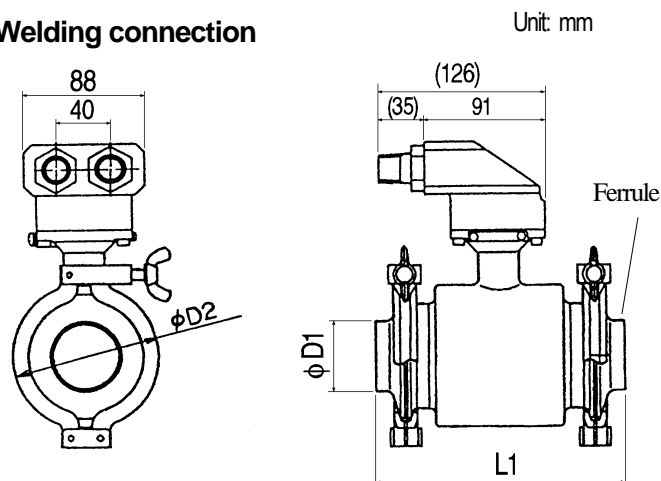


Figure 7. Ferrule dimensions

Welding connection



Note: See Figure 7 below for Ferrule dimensions.

For SI unit

Meter size mm (inch)	Joint size (ISO2852)	L1 (mm)	D1 (mm)	D2 (mm)	Weight (kg)
25 (1S)	2 S	156.4	25.4	79	approx. 5
40 (1 1/2S)	2 1/2 S	171.4	38.1	93	approx. 7
50 (2S)	3 S	186.4	50.8	106	approx. 8
80 (3S)	4 S	199.4	76.3	134	approx. 11
100 (4S)	5 1/2 S	219.4	101.6	173	approx. 15

Note: Above weights include LCD display.
Tri-clamp® is available to use the same joint size instead of ISO2852 clamp except meter size 100 mm (4").

For English unit

Meter size (inch)	Joint size (ISO2852)	L1 (inch)	D1 (inch)	D2 (inch)	Weight (lb)
1 (1S)	2 S	6 1/8	1	3 1/8	approx. 11
1 1/2 (1 1/2S)	2 1/2 S	6 3/4	1 1/2	3 5/8	approx. 15.4
2 (2S)	3 S	7 3/8	2	4 1/8	approx. 17.6
3 (3S)	4 S	7 7/8	3	5 1/4	approx. 24.3
4 (4S)	5 1/2 S	8 5/8	4	6 3/4	approx. 33.1

Note: Above weights include LCD display.
Tri-clamp® is available to use the same joint size instead of ISO2852 clamp except meter size 100 mm (4").

Figure 6. Separate type detector LF490 (Ferrules and Clamps attached.)

For SI unit

Meter size mm (inch)	Joint size (ISO2852)	L1 (mm)	L2 (mm)	D1 (mm)	D2 (mm)	D3 (mm)	Weight (kg)
25 (1S)	2 S	21.5	2.85	64.0	23.0	25.4	approx. 0.2
40 (1 1/2S)	2 1/2 S	21.5	2.85	77.5	35.7	38.1	approx. 0.2
50 (2S)	3 S	21.5	2.85	91.0	47.8	50.8	approx. 0.3
80 (3S)	4 S	28.0	2.85	119.0	72.3	76.3	approx. 0.5
100 (4S)	5 1/2 S	28.0	5.6	155.0	97.6	101.6	approx. 1.0

For English unit

Meter size (inch)	Joint size (ISO2852)	L1 (mm)	L2 (mm)	D1 (mm)	D2 (mm)	D3 (mm)	Weight (lb)
1 (1S)	2 S	7/8	1/8	2 1/2	7/8	1	approx. 0.4
1 1/2 (1 1/2S)	2 1/2 S	7/8	1/8	3	1 3/8	1 1/2	approx. 0.4
2 (2S)	3 S	7/8	1/8	3 5/8	1 7/8	2	approx. 0.7
3 (3S)	4 S	1 1/8	1/8	4 5/8	2 7/8	3	approx. 1.1
4 (4S)	5 1/2 S	1 1/8	1/4	6 1/8	3 7/8	4	approx. 2.2

Note: This special Ferrules, which fit on TOSHIBA LF490, can be fastened on ISO2852 clamp.
Tri-clamp® is available to use the same joint size instead of ISO2852 clamp except meter size 100mm (4").

Note: 1 inch = 25.4 mm

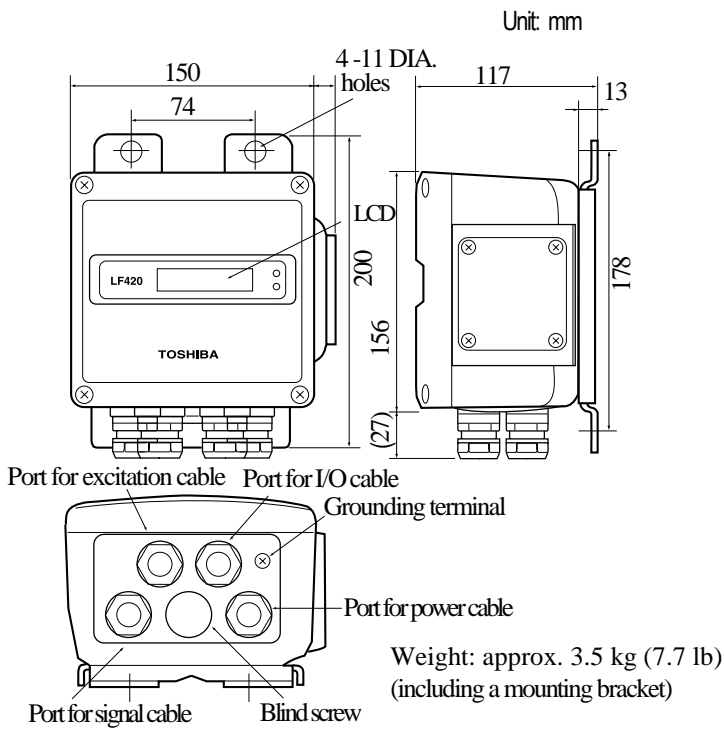


Figure 8. Separate type converter LF420

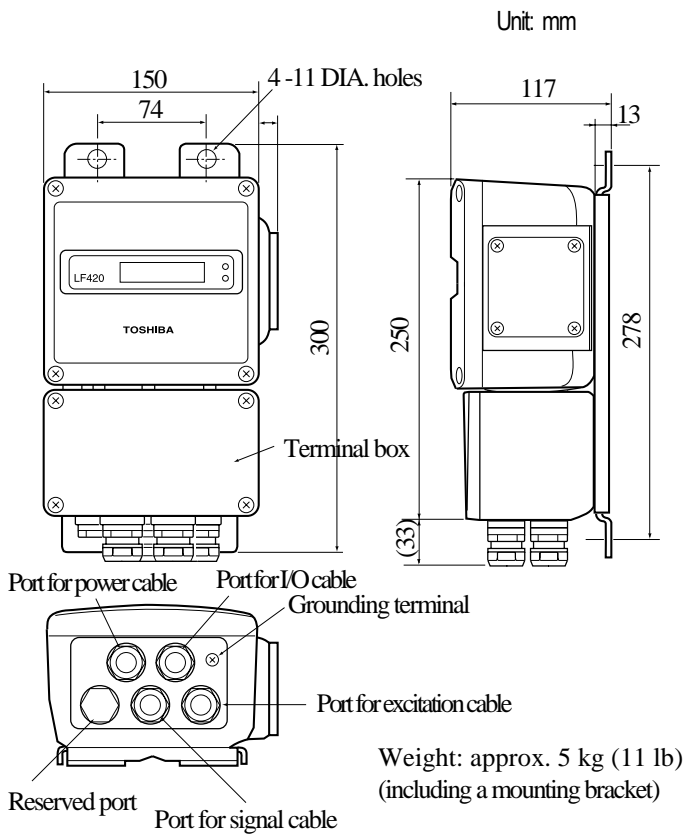
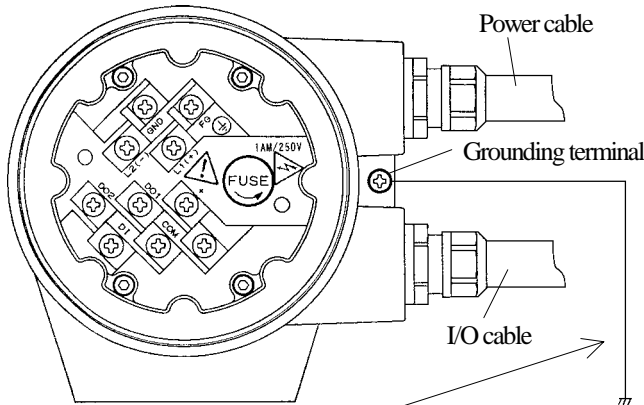


Figure 9. Separate type converter LF420

Note: 1 inch = 25.4 mm

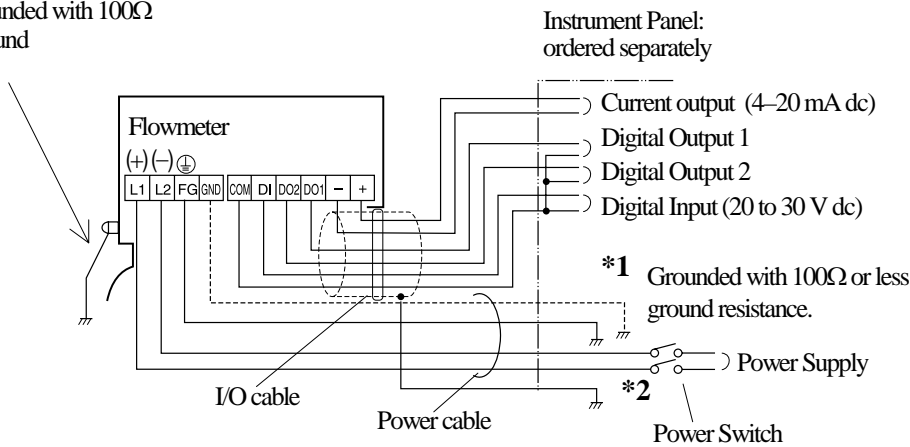
■ External Connections

• Combined type LF490/LF400 flowmeter



Symbol	Description	Cable
L1 (+)	Power Supply	Power cable
L2 (-)		
FG		
GND	Ground	
DI	Digital Input (20–30 V dc)	I/O cable
DO1	Digital Output 1	
DO2	Digital Output 2	
COM	Signal Common for DI, DO1, DO2	
+ -	Current Output (4–20 mA dc)	

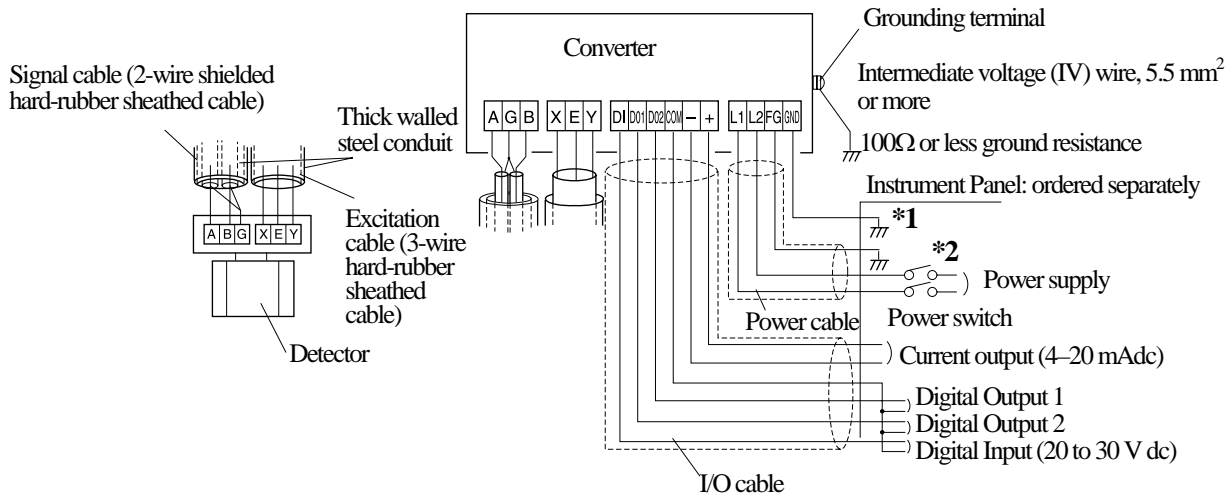
Intermediate voltage (IV) wire, 5.5 mm² or more. To be grounded with 100Ω or less ground



- *1 To use the arresters, ground the GND terminal using the wire shown in broken line.
- *2 Locate an external double-pole power switch on the power line near the flowmeter within easy reach of operation. Use an appropriate switch of the rating shown below:
 Switch rating: 250 V ac, 6A or more
 Inrush current: 15 A or more

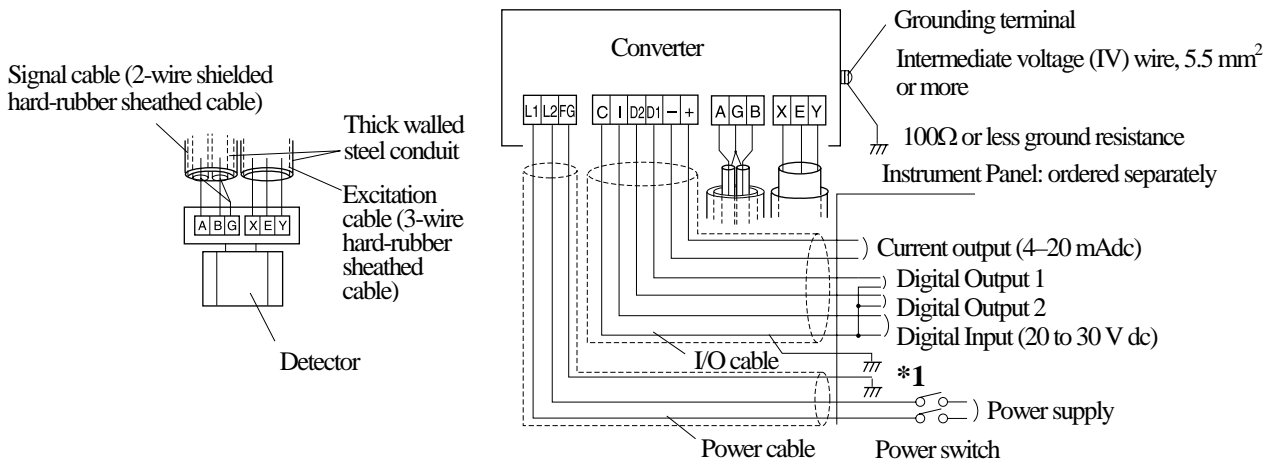
Figure 10. Combined type LF490/LF400 Flowmeter Wiring Diagram

Separated Detector LF490 and Converter LF420



- *1 To use the arresters, ground the GND terminal using the wire shown in broken line.
- *2 Locate an external double-pole power switch on the power line near the flowmeter within easy reach of operation. Use an appropriate switch of the rating shown below:
 Switch rating: 250 V ac, 6A or more
 Inrush current: 15 A or more

Figure 11. Separate type Detector LF490 and Converter LF420 Wiring Diagram



- *1 Locate an external double-pole power switch on the power line near the flowmeter within easy reach of operation. Use an appropriate switch of the rating shown below:
 Switch rating: 250 V ac, 6A or more
 Inrush current: 15 A or more

Figure 12. Separate type Detector LF490 and Converter LF420 with Terminal Box Wiring Diagram

■ **Wiring Precautions**

- (1) In the case of separate type flowmeter, be sure to use thick walled steel conduit (22 mm) for signal and excitation cable wiring between the detector and converter. The conduit connection port on the detector side is R(PT) 1/2 male screw. Use flexible conduits at the cable outlets of the detector.
- (2) Connect the grounding wire (IV wire 5.5 mm² or more) to a good earth ground (100Ω or less ground resistance). Make the wire as short as possible. Do not use a common ground shared with other equipment where earth current may flow. An independent earth ground is recommended.
- (3) The allowable cable lengths between the detector and converter for the separate type flowmeter depend on the electrical conductivity of the object fluid. See Figure 13 below.

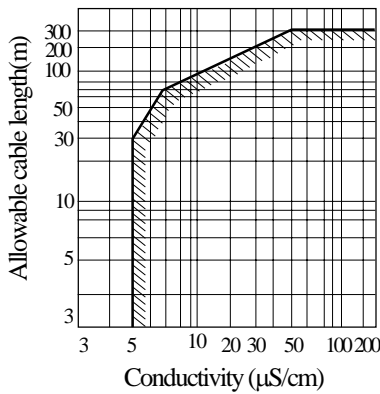


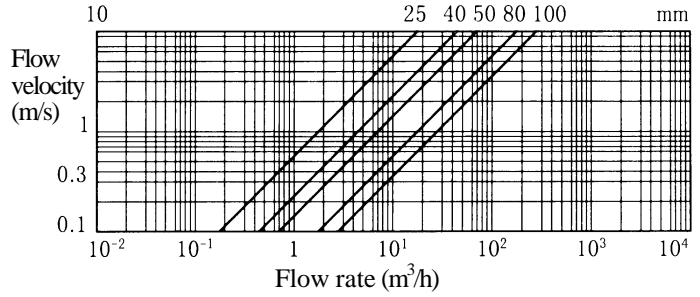
Figure 13. Electrical Conductivity and Cable Length

■ **Meter Size**

To select the meter size:

See Figure 14 and find meter sizes within the velocity of 0.1 to 10 m/s, (vertical scale) for a specified full-scale (measuring range high limit) flow rate (horizontal scale). Select one meter size that is less or equal to the pipe size. When more than one meter size fits, select one that has its full-scale velocity between 1 and 3 m/s.

Note: Make sure the full-scale flow rate used for the final planning stage stays within 10 m/s in terms of flow velocity.



For SI unit Unit: m³/h

Meter size mm (inch)	Flow rate			
	0.1 m/s	0.3 m/s	1 m/s	10 m/s
25 (1S)	0.1767	0.5301	1.767	17.67
40 (1 1/2S)	0.4523	1.357	4.523	45.23
50 (2S)	0.7067	2.120	7.067	70.67
80 (3S)	1.809	5.428	18.09	180.9
100 (4S)	2.827	8.482	28.27	282.7

For English unit Unit: gal/min

Meter size mm (inch)	Flow rate		
	0.33 ft/s	0.98 ft/s	32.8 ft/s
1 (1S)	0.78189	2.3220	77.717
1 1/2 (1 1/2S)	2.0016	5.9443	198.95
2 (2S)	3.1128	9.2879	310.86
3 (3S)	8.0065	23.777	795.80
4 (4S)	12.510	37.152	1243.4

Figure 14. Flow Rate and Flow Velocity

■ **Calibration Range**

If the calibration range is not specified, the standard range as shown below will be used. If the range is specified, we will use the specified range for calibration.

Table 1. Standard Flow Range

Meter size mm (inch)	Standard flow range		
	Flow rate (m ³ /h)	Flow rate (gal/min)	Flow velocity (m/s)
25 (1S)	6	75	3.395
40 (1 1/2S)	15	175	3.315
50 (2S)	25	300	3.535
80 (3S)	60	650	3.315
100 (4S)	100	1000	3.535

Ordering Information

1. When ordering the flowmeter, refer to Tables 2 to 4 (Type Specification Codes). An entry must be made for each of the columns in each of these tables. In case of ordering accessories as maintenance parts, refer to Table 5 (Type Specification code for Maintenance Parts).
2. Fluid characteristics:
 - (1) Type of fluid to be measured and its characteristics
 - (2) Fluid temperature
 - (3) Fluid pressure
 - (4) Electrical conductivity of the fluid
3. Measuring range

- 4. I/O function setting
- 5. Ordering scope:
Flow calibration data: (required or not)
- 6. Other items
Specifications other than standard items

Table 2. Type Specification Code (Model LF490 Detector)

Model	Specification Code													Description	Use		
	6	7	8	9	10	11	12	13	14								
LF490																LF490 Detector	
	E															Meter size	
	F															25 mm (1")	
	G															40 mm (1 1/2")	
	H															50 mm (2")	
	J															80 mm (3")	
																100 mm (4")	
		L														Mounting style	
		M														Detector / Converter combined type	●
																Detector / Converter separate type	●
			A													Connection method	
			B													Sanitary clamp type (ISO 2852)	○
			Z													Sanitary screw type (ISO 2853)	○
																other	○
				B												Electrode Material	
				Z												316L stainless steel	●
																other	○
					C											Lining and Sealing Materials (gaskets)	●
																Teflon PFA and Silicon rubber	●
						A										Piping connection part (ferrule) (Note 1)	●
						B										No ferrule and no clamp	○
						C										Ferrule (304 stainless steel) with no clamp	○
						Z										Ferrule (304 stainless steel) with clamp	○
																other	○
							A									Flow and calibration velocity range	●
							B									0.3 to 10 m/s (standard range calibration)	○
							C									0.3 to 10 m/s (specified range calibration)	○
							Z									0.1 to 10 m/s (specified range calibration)	○
																other	○
							A									Dedicated Preformed Cable	●
							B									not provided	○
							C									30-m cable, provided (Note 2)	○
																other lengths, provided (Note 2)	○
							A									Coating	●
							Z									no coating	○
																other	○

Size code explanation:

- Standard ○ Option

Note 1: Ferrule is required in case of choosing sanitary clamp type (ISO2852) because the connection between the joint and ferrule is Toshiba's original dimension.

Note 2: Applies to the separate type flowmeter only. Specifying the code C, indicate the length of cable from 1 to 300m in 1 meter increments.

Table 3. Type Specification Code (Combined type Converter LF400)

Model	Specification Code													Description			
	6	7	8	9	10	11	12	13	14								
LF400																	Electromagnetic flowmeter converter LF400 Converter
		A															Usage
																	General-purpose
			A														Mounting structure
																	Detector/Converter combined type
																	Display
																	Display not provided (standard)
																	LCD display provided
																	Output
																	4-20mAdc output and pulse output (standard)
																	with digital I/O provided
																	Communications function provided (HART protocol)
																	Power supply
																	100 to 240 Vac, 50/60 Hz
																	24 Vdc
																	110 Vdc
																	Coating
																	Acrylic resin-baked coating, pearl-gray colored
																	other
																	Standard

Table 4. Type Specification Code (Separate type Converter LF420)

Model	Specification Code													Description			
	6	7	8	9	10	11	12	13	14								
LF420																	Electromagnetic flowmeter converter LF420 Converter
		A															Usage
																	General-purpose
			B														Mounting structure
			C														Separate type (standard)
																	Separate type with terminal box
																	Display
																	Display not provided (standard)
																	LCD display provided
																	Output
																	4-20mAdc output and pulse output (standard)
																	with digital I/O provided
																	Communications function provided (HART protocol)
																	Power supply
																	100 to 240 Vac, 50/60 Hz
																	24 Vdc
																	110 Vdc
																	Coating
																	Acrylic resin-baked coating, pearl-gray colored
																	other
																	Attachment
																	Wall-mounting bracket provided
																	Pipe-mounting bracket provided
																	Standard

Table 5. Type Specification Code for Maintenance Parts

Meter size mm (inch)	Joint size (ISO2852)	Specification code for maintenance parts		
		Gasket	Ferrule	ISO2852 Clamp
25 (1S)	2S	3L8A0355P001	3A8A7164P001	4A8A2957P002
40 (1 1/2S)	2-1/2S	3L8A0355P002	3A8A7164P002	4A8A2957P003
50 (2S)	3S	3L8A0355P003	3A8A7164P003	4A8A2957P004
80 (3S)	4S	3L8A0355P004	3A8A7164P004	4A8A2957P006
100 (4S)	5-1/2S	3L8A0355P005	3A8A7164P005	4A8A2957P008

Note: Tri-clamp® is available to use the same joint size instead of ISO2852 clamp except meter size 100mm (4”).

■ Year 2000 Compliance:

This equipment does not have any clock in itself. Thus, there is no problem in the year 2000 compliance.



Misuse of this product can result in damage to property or human injury.
Read related manuals carefully before using this product.

Specifications are subject to change without notice
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