QUOTE WORKSHEET		VENDOR INFORMATION	VENDOR 1		VENDOR 2		VENDOR 3	
		Vendor Name & Address:	Toshiba 13131 West Little York Rd. Houston, TX 77041		McCrometer 3255 West Stetson Ave. Hemet, CA 92545		MCR Technologies, Inc (ABB) P.O. Box 80640 RSM, CA 92688	
		Phone Number:	(800) 231-1412		(951) 652-6811		(949) 783-3100	
		Person Quoting:	Dennis Hampton		Cherish Stack		Kyle Finney	
		FOB or Shipping Cost:	$2,500.00		TBD		TBD	
QTY	**UNIT**	**Item Description**	**Unit Price**	**Extension**	**Unit Price**	**Extension**	**Unit Price**	**Extension**
4	ea	8"Electromagnetic Flowmeter	$2,200.50	$8,802.00	$4,704.00	$18,816.00	$4,045.00	$16,180.00
2	ea	10"Electromagnetic Flowmeter	$2,996.50	$5,993.00	$5,435.00	$10,870.00	$4,748.00	$9,496.00
4	ea	12"Electromagnetic Flowmeter	$3,457.00	$13,828.00	$6,205.00	$24,820.00	$5,451.00	$21,804.00
1	ea	14"Electromagnetic Flowmeter	$4,264.00	$4,264.00	$7,301.00	$7,301.00	$6,329.00	$6,329.00
11	ea	Converter Display	$1,176.50	$12,941.50		$0.00		$0.00
330	ft	Signal Cable 2AT	$2.44	$805.20		$0.00		$0.00
330	ft	Excitation Cable 3AT	$1.72	$567.60		$0.00		$0.00
		Warranty	10 Year		18 months		Not Specified	
								$0.00
		Subtotal		$47,201.30		$61,807.00		$53,809.00
		Sales Tax - 7.75%		$3,658.10		$4,790.04		$4,170.20
		Freight		$2,500.00		TBD		TBD
		Total		$53,359.40		$66,597.04		$57,979.20

Part#	Manufacturer ID/ Part#	Description	Size	Face to Face Measurement	Warranty Period	QTY	Unit Cost	Extended Cost	TIC Stock - Feb 23, 2023
	GF63220ANBA1/GFR20	Remote Type Detector/Grounding rings	8"	Data sheet/drawings supplied	10 warranty	4	$1904.50/$260.00	$2200.50/**$8,802.00**	10
	GF63225ANBA1/GFR25	Remote Type Detector/Grounding rings	10"	Data sheet/drawings supplied	10 warranty	2	$2613.00/$383.50	$2,996.50/**$5,993.00**	12
	GF63230ANBA1/GFR30	Remote Type Detector/Grounding rings	12"	Data sheet/drawings supplied	10 warranty	4	$2977.00/$480.00	$3457.00/**$13,828.00**	14
	GF63235ANBA1GFR35	Remote Type Detector/Grounding rings	14"	Data sheet/drawings supplied	10 warranty	1	$3666.00/$598.00	$4264.00/**$4,264.00**	9
Shipping	LF622FAC21E	120 vac, Remote Type Converter/Display		see data sheet	10 warranty	11	$1,176.50	$12,941.50	yes stock
Estimated Delivery	Signal Cable 2AT	Signal Cable 2AT				330 ft.	$2.44 per ft.	$805.20	yes stock
$2,500.00	Excitation Cable 3AT	Excitation Cable 3AT				330 ft.	$1.72 per ft.	$567.60	yes stock
	Potting Kit	Potting Kit-if required for temporary IP68		Installed on Site by Others			$208.00 ea.		
							Sub total, No Tax	$47,201.30	
							Estimated Shipping	$2,500.00	
							Sub Total	$49,701.30	

Special Instruction

Order to be placed and accepted per Toshiba Terms & Conditions.

Note: This quotation does not include any applicable taxes.

Quotation
TOSHIBA INTERNATIONAL CORPORATION
Automation Group
"Reliability in Motion"
Toshiba International Corporation's
'Standard Terms & Conditions of Sale'
(Dated: January 1, 2018) apply
Copy available from:
http://www.toshiba.com/tic/cms_files/TCofSale.pdf

Quotation expires March 31, 2023

TOSHIBA

Premium Value Series

Electromagnetic Flowmeter

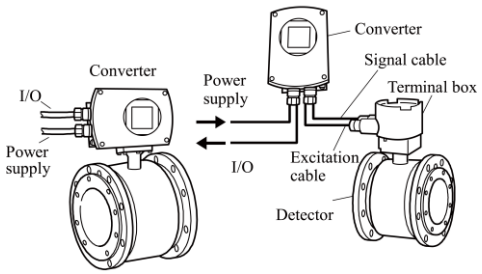
GF630 /LF620
GF632 /LF622
1/2" to 24" (15 to 600 mm)

Introduction

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 4–20mAdc current signal or communication*1&2 signal. Combined with a multi-functional converter LF620 (combined type) or LF622 (separate type) equipped with its original **Noise–Sentry** noise-suppression circuit and advanced algorithms. The GF630 has a very high tolerance to noise, giving the unit a very stable output even for slurry fluid measurement. IR (Infrared) switches enable the parameter setting of the converter without removing the cover. Flow direction can be set in either way, and its unique 128 x 128 dot matrix LCD display allows the LCD to be rotated electronically to 90, 180 and 270 degrees without opening the cover. The terminal block in LCD side make easy to wire in case of the combined type.

*1: HART protocol (Highway Addressable Remote Transducer) is a communication protocol for industrial sensors recommended by the HCF (HART Communication Foundation).

*2:Modbus is the communication protocol. Physical layer is RS485.



Combined type GF630/LF620F

Separate type GF632/LF622F

Figure 1. Configuration

GF630/LF620
GF630/LF620F

GF632

LF622
LF622F

Figure2. GF630 Premium Value series Flowmeters

Certification No.Z01207

Certified to NSF/ANSI/CAN 61

For certified products, please see Table 5 & 6

Cable gland openings have only dust caps which are not water tight. Water tight status is not met until properly wired and connected.

Specifications

■ Overall Specifications

Measurement range in terms of flow velocity:

1.0 ft/s to 32.8 ft/s (0.3 m/s to 10 m/s).

0.3 ft/s to 1.0 ft/s (0.1 m/s to 0.3 m/s)

range is available optionally for meter size 1/2" to 18" (15 to 450 mm).

Accuracy:

< 1/2" to 18" (15 mm to 450 mm) >

±0.2 % of Rate *1.

*1 This pulse output error result is established under standard operating conditions at Toshiba's flow calibration facility, Fuchu Japan (NIST Traceable).

*1 Individual meter measurement error may vary up to ±0.5% of Rate at 1.64 ft/s (0.5m/s) or more. Or it may vary up to ±0.3% of rate ±0.039 inch/s (1mm/s) at 1.64 ft/s (0.5m/s) or less.

*1 Current output: plus ± 8μA (0.05% of span).

*1 Refer to individual calibration data for each individual meter's measurement error.

< 20" and 24” (500 mm and 600 mm) >
±0.3 % of Rate *2**.**

*2 This pulse output error result is established under standard operating conditions at Toshiba's flow calibration facility, Fuchu Japan.

*2 Individual meter measurement error may vary up to ±0.5% of Rate at 3.28 ft/s (1.0 m/s) or more. Or it may vary up to ±0.3% of rate ±0.079 inch/s (2 mm/s) at 3.28 ft/s (1.0 m/s) or less.

*2 Current output: plus ± 8μA (0.05% of span).

*2 Refer to individual calibration data for each individual meter's measurement error.

Fluid conductivity: 3μS/cm minimum

Fluid temperature:

-4 to 212 °F (-20 to +100 °C): FEP lining

-4 to 248 °F (-20 to +120 °C): PTFE lining

-4 to 104 °F (-20 to + 40 °C): Polyurethane lining

* Consult Toshiba before using the meter at the high temperature, because the product lifetime may be shortened.

Ambient temperature: -4 to 140 °F (-20 to +60 °C)

Structure:

Standard — IP 67 and NEMA 4X Watertight

Option — IP68 and NEMA 6P Submersible type allows for accidental submergence up to 15m for 48 hours. Polyurethane lined detector tubes are NEMA 6P/IP68 compliant when a TOSHIBA approved Potting kit is properly Field or Factory installed.

Power consumption:

Without communication function

15W (22VA) or less

When standard is used;

10W(14VA) at 100Vac and Excitation current: 0.2A)

With communication function

17W (24VA) or less

Approved hazardous location certifications:

Model: GF630/LF620F and GF632/LF622F

cFMus Nonincendive for use in

hazardous (classified) locations:

Class I, II, III, Division 2, Groups A-G

Detector and converter combination:

GF630/LF620F: Combined type with Ex approval of Class I, II, III, Division 2 (cFMus).

GF632/LF622F: Separate type with Ex approval of Class I, II, III, Division 2 (cFMus).

Drinking water approvals:

NSF/ANSI standard 61

For certified products, please see Table1 5 & 6

■ Model GF630 and GF632 Detector

Mounting style:

Flange connection type,

18”(450mm)or less:

ISO13359 for direct replacement of existing ISO13359 magmeters.

More than 20”(500mm):

Toshiba original meter length

Fluid pressure:

0 psi or 0 bar (0 Pa) to the nominal pressure of the connection flange

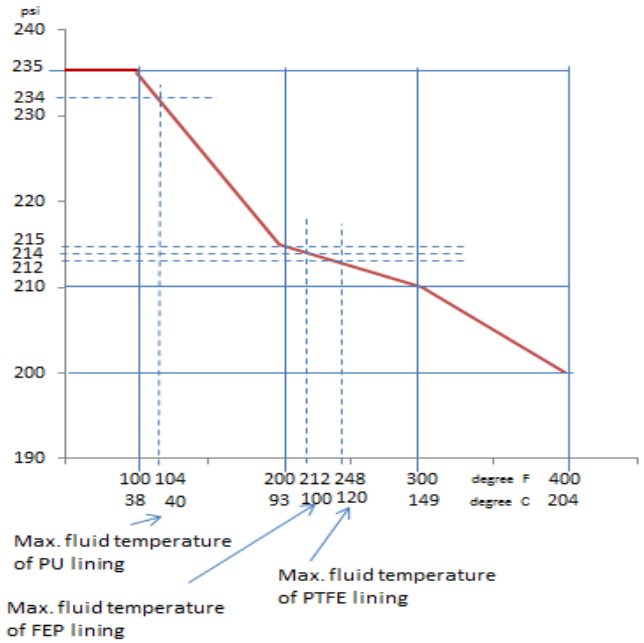


Figure 2 Nominal pressure and fluid temp

Connection flange standards:

ASME B 16.5 class 150 : 1/2” to 24” (15 to 600 mm)

JIS B 2220 10K : 1/2” to 24” (15 to 600 mm)

Principal materials:

Case — carbon steel

Flange material — carbon steel

Linings —

FEP with NSF approval: Meter sizes 1/2" to 10" (15 to 250mm)

PTFE with NSF approval: Meter sizes 12" to 24" (300 to 600mm)

Polyurethane (PU) without NSF approval:
Meter sizes 1/2" to 3" (15 to 80mm)

Polyurethane (NPU) with NSF approval:
Meter sizes 4" to 18" (100 to 450mm)

For NSF certified products, please see Table1 5 & 6.

Electrodes —

Type - Super smooth, polished with self cleaning finish, and non stick shape.

316L stainless steel (for PU lining).

Hastelloy C equivalent (for FEP, PTFE lining).

Measuring tube material — 304 stainless steel

Terminal box — Aluminum alloy (for separate type)

Grounding ring —

PU, FEP lining:
None (std.), 316 stainless steel (opt.)

PTFE lining: 316 stainless steel (std.)

Coating: Corrosion resistant resin coating (std.), gray colored

Dimensions and weights: See Figure 3 and 4.

Cable connection port: for separate type detectors.

Applicable diameter —
0.433 to 0.512 inch (11 to 13mm)

Cable glands —

GF632 with cFMus Approval:
Not provided, 1/2-14NPT male threads are required.

■ Model LF620 and LF622 converters

Input signals

Analog signal — the voltage signal from detector, proportional to process flow rate (for LF622 separate type converter).

Digital input DI

Signal type: 20 to 30Vdc voltage signal
Input resistance: 2.7kΩ
Number of inputs: one point
Note: DI cannot be used with the Modbus communication.

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/Stops' or 'Resets/Starts' operation in 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 mAdc (load resistance 0 to 750Ω)

Digital outputs — Two points are available as follows.

Digital output DO1:
Output type: Transistor open collector
Number of outputs: One point
Output capacity: 30Vdc, 200mA maximum
Note: DO1 cannot be used if Modbus communication connection is 3 lines. (Refer table 8 for details)

Digital output DO2:
Output type:
Solid-state relay output (non polarity)
Number of outputs: One point
Output capacity: 150Vdc, 150mA maximum or 150Vac (peak to peak), 100mA maximum
Note: DO2 cannot be used with the Modbus communication. (Refer table 8 for details)

DO1 and DO2 functions — One of the following functions can be assigned to DO1 and/or DO2.

- **Pulse output (available only for DO1,DO2)**

Pulse rate: Max 10kHz (10,000pps)(DO1)
Max 100Hz (100pps) (DO2)
(Over 1kpps, auto-setting)
Pulse width: 0.3 to 500ms (but it is 40% or less of the full scale cycle.)

Note: The same and simultaneous pulse is not available between DO1 and DO2.

- **Multi-range selection outputs (Note 1)**
- **High, High high, Low, and/or Low low alarm outputs (Note 2)**
- **Empty pipe alarm output (Note 2)**
- **Preset count output**
- **Converter failure alarm output**

Note 1: Two outputs (DO1 and DO2) are needed for 4-range switching and forward/reverse 2-range switching.

Note 2: Normal Open (default set) or Normal Close is selected for alarm outputs when programming.
When power failure occurs, unit will be fault to Normal Open.

Communications output:

- **HART (std.)** — Digital signal is superimposed on 4–20mAdc current signal as follows:

  Conforms to HART protocol

  Load resistance: 240 to 750Ω
  Load capacitance: 0.25μF maximum
  Load inductance: 4mH maximum

- **MODBUS (opt.)**

  Physical layer : RS485
  Protocol : Modbus
  Mode : RTU
  Baudrate : 4800, 9600, 19200bps
  Data length : 8bit
  Parity bit : None, Odd, Even
  Stop bit : 1bit, 2bit
  Error check : CRC-16
  Max. station number : 32(with Master device)
  Max. cable length : 1.2km (Note)

  Note: This length is specification of 3 line connection.

LCD display:

Full dot-matrix 128×128 dot LCD display (back–light provided)
A parameter change will rotate the display.

Parameter settings — Parameters can be set as follows:

- **IR Switches**: Three key switches are provided to set configuration parameters.
- **Digital communication**: HART, Modbus is needed to set parameters.

Counter control: If the digital input is set for counter control, counter control is available for the integrated value and the pulse output.

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

Damping: 0.1, 0.5 to 60 seconds (selectable in one second increments)

"Converter Field re-verification" Mag-Prover – Toshiba's Zero span verification tool allows unit to be re-verified using an internal software program. The meter's excitation current is a NIST traceable parameter. This parameter can be verified in the field through the converter to verify the meter is still within factory calibration. (For more information contact Toshiba International Corp.)

Conditions 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. The outputs and display will remain as follows when power fails.

- Current output: 0mAdc
- Digital output: OFF
- LCD display: No display
- HART: No communication
- Modbus: No communication

Power supply:

One of the following can be selected:

100 to 240Vac (allowable voltage range: 80 to 264Vac 50/60Hz)

24Vdc (allowable voltage range: 18 to 36Vdc) or

110Vdc (allowable voltage rangel:90 to 130Vdc)

Surge protection:

Arresters are installed in the power supply**, digital input / outputs circuit** and current signal output circuit to help protect the meter from lightning and improve personnel safety.

Confirmed by following tests

IEC 61000-4-2 Electro static discharge immunity test

IEC 61000-4- Electrical first transient/burst immunity test

IEC 61000-4-5 Serge immunity test

Case: Aluminum alloy (equal to IP 67)

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

Cable connection port:

Cable glands —

LF620F and LF622F with cFMus Approval:

Not provided, 1/2–14NPT male threads are required.

Vibration resistance:

No resonance to the following levels of vibration:

- 10 to 150Hz with acceleration of 9.8m/s^2
- Vibration of 30Hz with 29.4 m/s^2 in 4h in each direction will not cause any defect to unit.

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

Converter LF622 Dimensions and Weights:

See Figure 5 (for separate type)

MTBF:

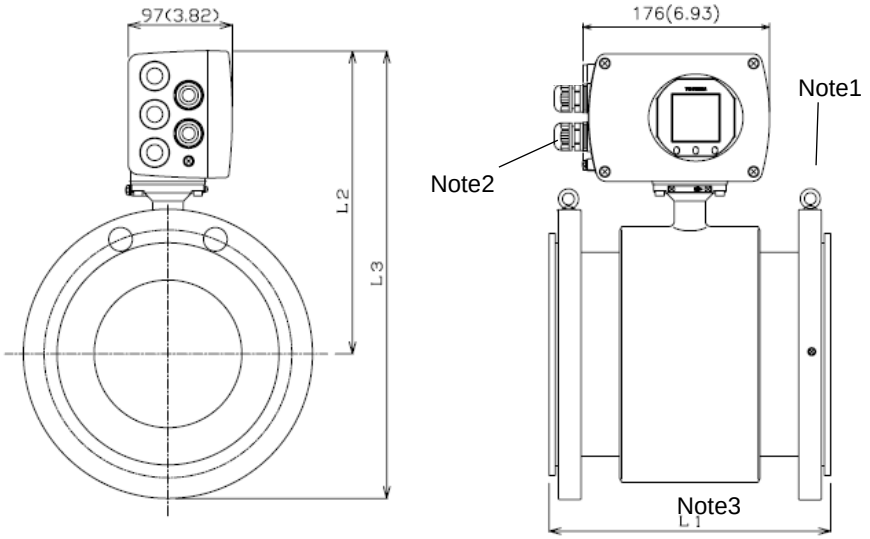
Converter: 220,000 hours (25 years) at 77 **°F** (25 **°C**) based on strict military specification MIL-HDBK-217F.

Detector: 350,000 hours (40 years) at 77 **°F** (25 **°C**) based on strict military specification MIL-HDBK-217F.

Installation

■ Dimensions

Combined type GF630/LF620F



Note1: Eye bolts are provided at the flange for flowmeters sized 8" (200mm) or above.

Note2: This drawing is the image when LF620 set with cable gland.

Cable glands are not provided for GF630/LF620F cFMus approved type. Refer to the part Cable connection port at detector.

Note3: L1 of PTFE lining contains the thickness of grounding rings.

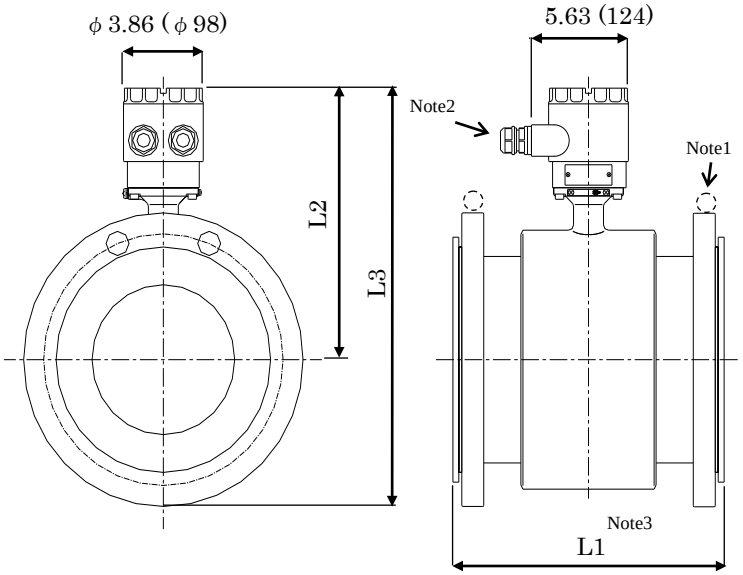
Note4: The weight of PTFE lining includes the weight of grounding rings.

Note5: 1 inch = 25.4mm

Size		L1		L2		L3		No. of	Weight approx.					
									FEP		PTFE		PU	
inch	mm	inch	mm	inch	mm	inch	mm	bolts	lbs	kg	lbs	kg	lbs	kg
1/2	15	8.11	200	8.06	220	9.93	268	4	16	7			16	7
1	25	8.11	200	8.46	230	10.92	293	4	18	8			18	8
1-1/4	32	8.11	200	8.65	235	11.31	303	4	20	10			20	10
1-1/2	40	8.11	200	8.85	240	11.61	310	4	23	11			23	11
2	50	8.11	200	9.24	250	12.30	328	4	29	12			29	12
2-1/2	65	8.11	200	9.80	263	13.20	350	4	34	15			34	15
3	80	8.11	200	9.93	268	13.57	360	4	42	16			42	16
4	100	10.08	250	10.37	279	14.50	384	8	56	23			56	23
5	125	10.08	250	11.15	299	16.07	424	8	71	29			71	29
6	150	12.05	300	11.74	314	17.26	454	8	84	34			84	34
8	200	14.02	350	12.73	339	19.22	504	8	128	48			128	48
10	250	17.95	450	13.52	359	21.39	559	12	188	70			188	70
12	300	19.69	500	14.50	384	23.26	606	12			292	101	274	93
14	350	21.65	550	15.39	406	25.03	651	12			349	137	327	127
16	400	23.62	600	16.49	434	27.51	714	16			430	149	402	136
18	450	23.62	600	17.35	456	29.56	766	16			468	468		
20	500	23.62	600	18.34	481	31.63	819	20			538	538		
24	600	23.62	600	20.50	536	36.15	934	20			741	741		

Figure 3. GF630/LF620F combined type flowmeters
Meter sizes 1/2" (15mm) to 24" (600mm)

Separate type GF632/LF622 and GF632/LF622F



Unit: inch (mm)

Note1: Eye bolts are provided at the flange for flowmeters sized 8" (200mm) or above.

Note2: This drawing is the image when LF620 set with cable gland.

Cable glands are not provided for GF632/LF622F cFMus approved type. Refer to the part Cable connection port at detector.

Note3: L1 of PTFE lining contains the thickness of grounding rings.

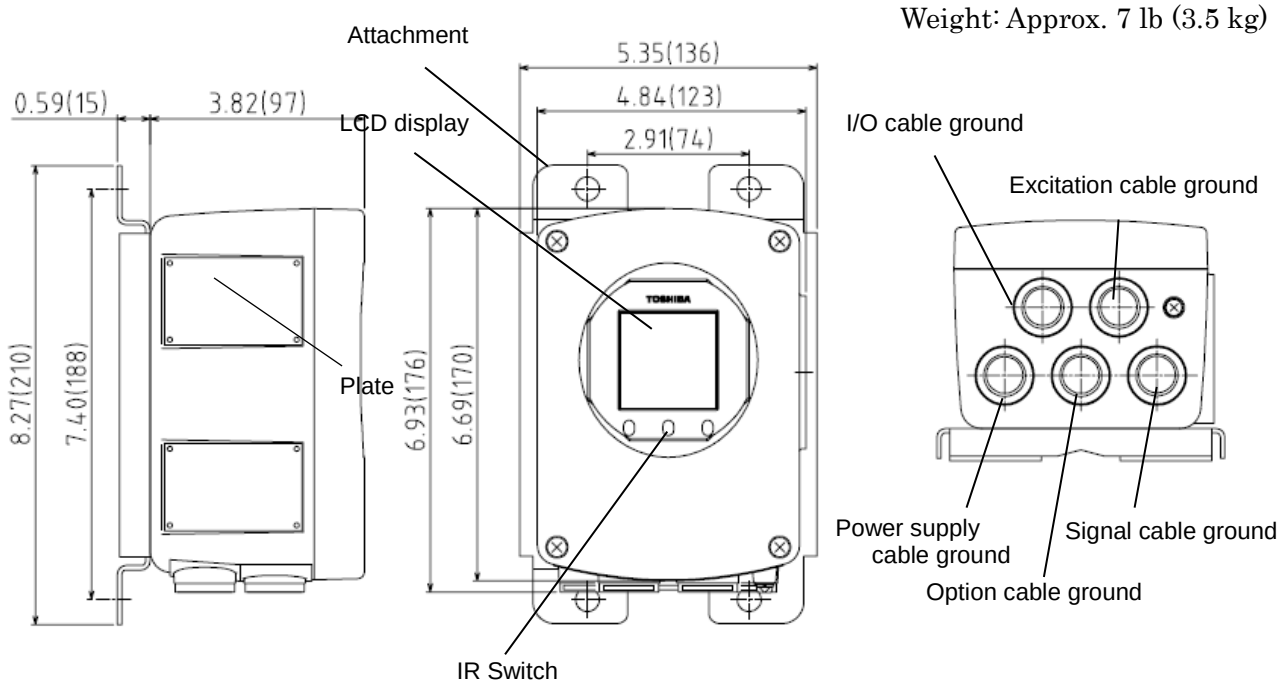
Note4: The weight of PTFE lining includes the weight of grounding rings.

Note5: 1 inch = 25.4mm

Size		L1		L2		L3		No. of	Weight approx.					
									FEP		PTFE		PU	
inch	mm	inch	mm	inch	mm	inch	mm	bolts	lbs	kg	lbs	kg	lbs	kg
1/2	15	8.11	200	6.77	172	8.64	220	4	12	5			12	5
1	25	8.11	200	7.17	182	9.63	245	4	14	6			14	6
1-1/4	32	8.11	200	7.36	187	10.02	255	4	16	8			16	8
1-1/2	40	8.11	200	7.56	192	10.31	262	4	18	9			18	9
2	50	8.11	200	7.95	202	11.00	280	4	25	10			25	10
2-1/2	65	8.11	200	8.44	215	11.89	302	4	29	13			29	13
3	80	8.11	200	8.64	220	12.28	312	4	38	14			38	14
4	100	10.08	250	9.07	231	13.21	336	8	51	21			51	21
5	125	10.08	250	9.86	251	14.78	376	8	67	27			67	27
6	150	12.05	300	10.45	266	15.96	406	8	80	32			80	32
8	200	14.02	350	11.44	291	17.93	456	8	124	46			124	46
10	250	17.95	450	12.22	311	20.10	511	12	183	68			183	68
12	300	19.69	500	13.21	336	21.97	558	12			287	99	269	91
14	350	21.65	550	14.09	358	23.74	603	12			344	135	322	125
16	400	23.62	600	15.20	386	26.22	667	16			426	147	397	134
18	450	23.62	600	16.06	408	28.27	718	16			463	169		
20	500	23.62	600	17.05	433	30.33	771	20			534	183		
24	600	23.62	600	19.21	488	34.86	886	20			737	251		

Figure 4. Separate type detectors GF632
Meter sizes 1/2" (15mm) to 24" (600mm)

Unit: inch (mm)
Weight: Approx. 7 lb (3.5 kg)

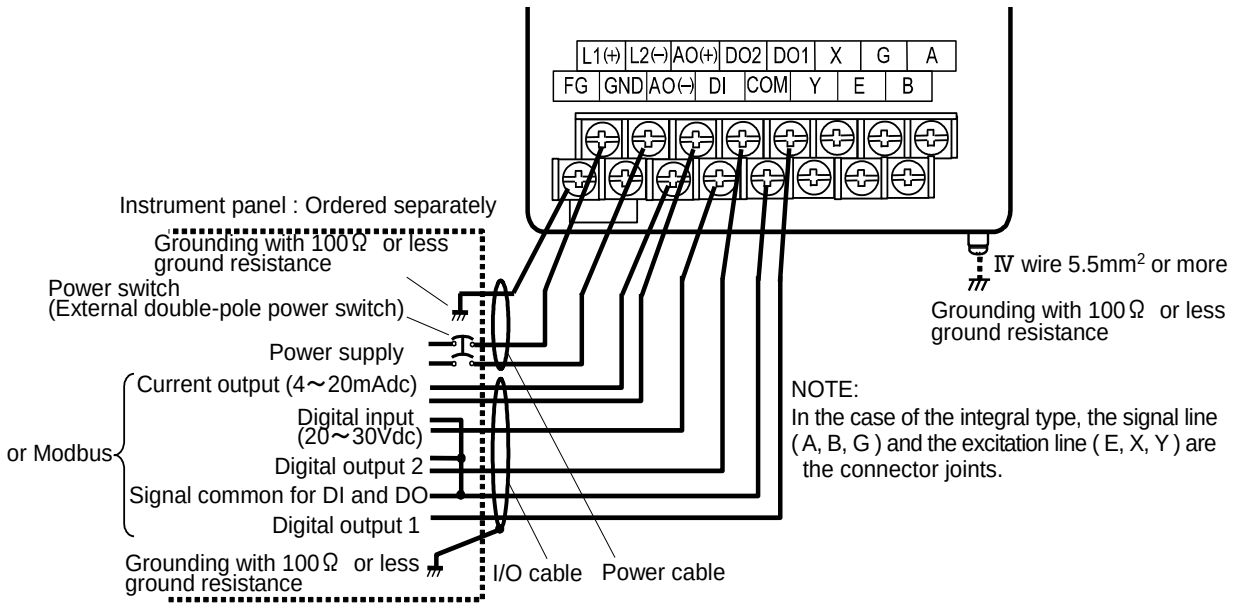


Note: Cable glands are not provided for LF622F cFMus approved type. Refer to the part Cable connection port at detector.
Note: 1 inch = 25.4 mm

Figure 5. Separate type converter LF622F

■ External Connections

Combined type GF630/LF620F flowmeters



***1** Locate an external double-pole power switch on the power line near the flowmeter within easy reach of operation. Use the appropriate switch rating as shown below:

Switch rating: 250Vac, 6A or more
In rush current: 15A or more

Figure 6. Combined type GF630/LF620 and GF630/LF620F flowmeters Wiring Diagram

Separate type GF632/LF622F flowmeters

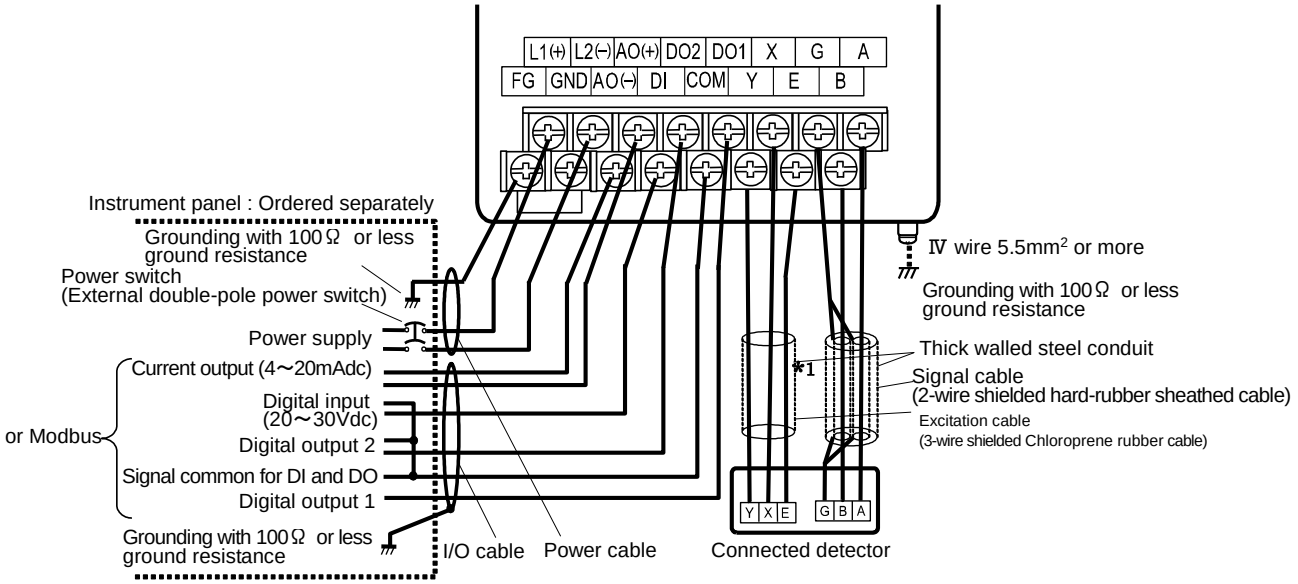


Figure 7. Separate GF632/LF622F type Converter Wiring Diagram

Table 1. LF620F and LF622F Converters Signal Table

Symbol	Description	Cable
L1 (+)	Power supply	Power cable
L2 (−)		
GND	Ground (for arrester)	
FG	Frame ground	
DI	Digital Input (20～30Vdc)	I/O cable
DO1	Digital Output 1	
DO2	Digital Output 2	
COM	Signal Common for DI, DO1, DO2	
+	Current Output (4～20mAdc)	
−		
X	Excitation Output	Excitation cable (for LF622F only)
Y		
E		
A	Signal Input	Signal cable (for LF622F only)
B		
G		
T+	Modbus(+)	Twisted-pair polyethylene insulated vinyl sheath cable (JKEV,AWG24(0.2mm²))
T-	Modbus(-)	
TG	Modbus(GND)	

Note: Symbol of the terminal is changed as follows for Modbus.
DO2 → T+, DI → T-, COM → TG

■ Wiring Precautions

(1) Explosion proof type flowmeters are not provided cable glands.
Refer to the part Cable connection port at detector and converter.

(2) Connect the grounding wire (IV wire 5.5mm² 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 8.

(4) DO1, DO2, and DI use the same common terminal (COM). This COM can not connect to other equipments which have their own ground terminal. (Power supply for connecting to DI or DO, etc…) Need to wire separately.

■ Wiring Precautions (Modbus)

(1)For wiring path, avoid places near electrical equipment that may cause electromagnetic induction or electrostatic induction interference (such as a motor, transformer and wireless transmitter).

(2) The electromagnetic flowmeter is not equipped with terminating resistors. Use the terminating resistor unit for Modbus or junction box, if necessary.

(3) Only one Modbus cable goes through a cable gland of the Electromagnetic Flowmeter. Use the junction box at system configuration.

(4) Install a terminator to flowmeter that connected to end of Modbus network.

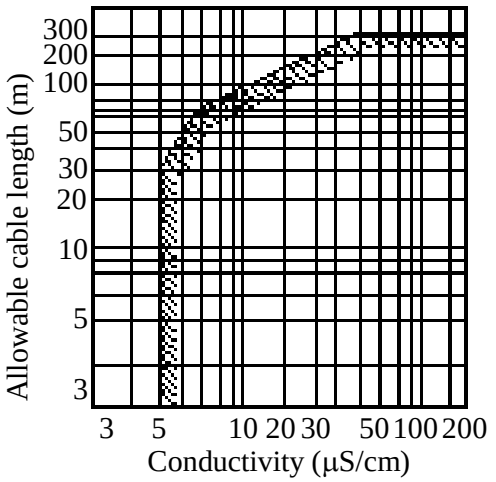


Figure 8. Electrical Conductivity and Cable Length

■ Meter Size

To select the meter size:

See Table 2 to 3 and find meter sizes within the velocity of 0.3 to 32.8 ft/s (0.1 to 10m/s) for a specified full-scale (measuring range high limit) flow. Select one that has its full-scale velocity between 3.0 and 10 ft/s (1 and 3m/s).

Note: Make sure the full-scale flow rate used for the final planning stage stays within 32.8 ft/s (10m/s) in terms of flow velocity.

Table 2. Flow Rate and Flow velocity

(English unit)

Unit: gal/min

Size (inch)	Flow rate				
	0.328 ft/s	0.98 ft/s	3.0ft/s	10 ft/s	32.8 ft/s
1/2'	0.2801	0.8403	2.561	8.532	28.01
1	0.7781	2.334	7.115	23.72	77.81
1 ¼	1.275	3.824	11.66	38.86	127.5
1 ½	1.992	5.975	18.21	60.71	199.2
2	3.112	9.337	28.46	94.86	311.2
2 ½	5.260	15.78	48.09	160.3	526.0
3	7.967	23.90	72.85	242.8	796.7
4	12.45	37.35	113.8	379.4	1,245
5	19.45	58.35	177.9	592.9	1,945
6	28.01	84.03	256.1	853.8	2,801
8	49.80	149.4	455.3	1,518	4,980
10	77.81	233.4	711.5	2,372	7,781
12	112.0	336.1	1,025	3,415	11,200
14	152.5	457.5	1,394	4,648	15,200
16	199.2	597.5	1,821	6,071	19,920
18	252.1	756.3	2,305	7,684	25,210
20	–	933.7	2,846	9,486	31,120
24	–	1,344	4,098	13,660	44,820

Table 3. Flow Rate and Flow velocity (SI unit)

Unit: m^3/h

Size (mm)	Flow rate				
	0.1 m/s	0.3 m/s	1.0 m/s	3.0 m/s	10 m/s
15	0.06362	0.1908	0.6361	1.908	6.361
25	0.1767	0.5301	1.767	5.301	17.67
32	0.2895	0.8686	2.895	8.686	28.95
40	0.4523	1.357	4.523	13.57	45.23
50	0.7067	2.120	7.067	21.20	70.67
65	1.195	3.583	11.95	35.83	119.5
80	1.809	5.428	18.09	54.28	180.9
100	2.827	8.482	28.27	84.82	282.7
125	4.417	13.25	44.17	132.5	441.7
150	6.361	19.08	63.61	190.8	636.1
200	11.31	33.93	113.1	229.3	1,131
250	17.67	53.01	176.7	530.1	1,767
300	25.45	76.34	254.5	763.4	2,545
350	34.64	103.9	346.4	1,039	3,464
400	45.23	135.7	452.3	1,357	4,523
450	57.25	171.7	572.5	1,717	5,725
500	–	212.1	706.9	2,121	7,069
600	–	305.4	1,018	3,054	10,180

■ Piping Precautions

(1) Design piping so that the flowmeter detector pipe is always filled with the fluid being measured, whether the fluid is flowing or not.

(2) The detector has no adjustable piping mechanism. Install an adjustable short pipe where needed.

(3) The required straight pipe length should comply with the requirements as follows.

(4) Be sure to ground the flowmeter according to the flow meter instruction manual.

Required straight pipe length

Upstream side	When using 90-dgree bend, tee, diffuser or fully opened valve	L ≥ 5D
	When using other types of valves	L ≥ 10D
Downstream side	When no valve plate protrudes into the detector pipe	L ≥ 0

L: Required straight pipe length, D: Meter size

■ Piping materials (to be ordered separately)

Mating flanges:

The flowmeter must be mounted with its detector pipe connected between the flanges in the pipeline. If no flanges are used where the flowmeter is to be mounted, mating flanges are required.

Adjustable short pipe:

When both the upstream and downstream pipe sections cannot be adjusted laterally along the pipeline, an adjustable short pipe may be required.

Reducers:

When the flowmeter with its Meter size smaller than that of the pipeline should be installed, reducers are required on both ends of the flowmeter detector.

Reducers with pipe extensions:

Reducers with adjustable piping mechanism.

■ About establishment environment

Do not store or install the flowmeter :

- Where there is direct sunlight.
- Where excessive vibration or mechanical shock occurs.
- Where high temperature or high humidity conditions exist.
- Where corrosive atmospheres exist.
- Places that can be submerged under water.
- Where there is a sloped floor. To put the flowmeter temporarily on the floor, place it carefully with something, such as a block, to support it so that the flowmeter will not topple over.

In areas like the following, there may be the case that infrared switches do not function correctly. (If these are unavoidable, use an appropriate cover.)

(1) Where unit (operation panel) is exposed to direct sunlight, reflection of light onto window pane and diffused light reflection.

(2) Where smoke and steam may occur.

(3) Where exposed to direct snow, ice or mud.

Ordering Information

1. When ordering the GF630Teries flowmeters, refer to Tables 5 to 7 (Type Specification Codes). An entry must be made for each of the columns in each of these tables.
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

Consult a Toshiba representative when choosing materials for lining, electrodes, and grounding rings.

Toshiba International Corp. (Houston) stocks Hazardous location certification type flowmeters as standard inventory.

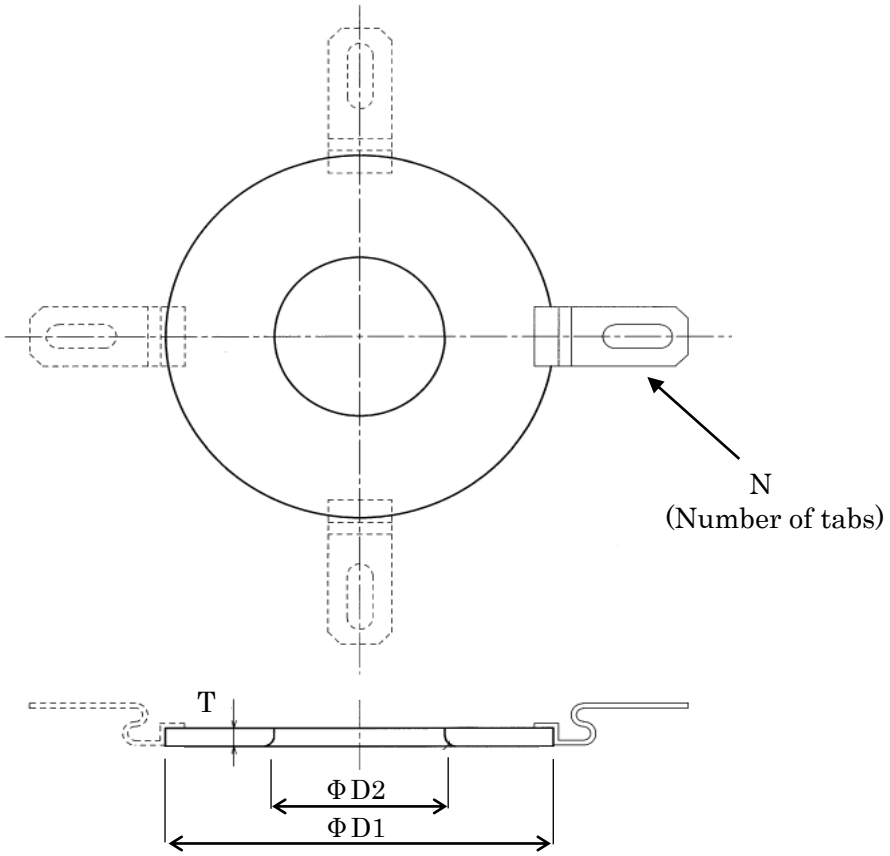
Ordering Grounding rings

When you purchase the grounding ring, refer to Table 4.

Note: The grounding ring ordering code includes 2-metal grounding rings.

Table 4. Ordering code of the Grounding ring

Meter size		ASME B 16.5 class 150 flange
inch	mm	
1/2	15	GFR01
1	25	GFR02
1-1/4	32	GFR03
1-1/2	40	GFR04
2	50	GFR05
2-1/2	65	GFR06
3	80	GFR08
4	100	GFR10
5	125	GFR12
6	150	GFR15
8	200	GFR20
10	250	GFR25
12	300	GFR30
14	350	GFR35
16	400	GFR40
18	450	GFR45



Meter size		ΦD1		ΦD2		T		N
inch	mm	inch	mm	inch	mm	inch	mm	N
1/2	15	1.65	42	0.63	16	0.16	3	2
1	25	2.36	60	1.06	27	0.16	3	2
1-1/4	32	2.76	70	1.34	34	0.16	3	2
1-1/2	40	3.03	77	1.65	42	0.12	3	2
2	50	3.74	95	2.05	52	0.12	3	2
2-1-2	65	4.69	115	2.44	67	0.12	3	2
3	80	5.08	125	3.03	82	0.12	3	2
4	100	5.91	150	4.09	104	0.12	3	2
5	125	7.28	185	5.08	129	0.12	3	2
6	150	8.46	215	6.06	154	0.12	3	2
8	200	10.43	265	8.03	204	0.12	3	4
10	250	13.11	325	10.04	255	0.12	3	4
12	300	15.59	372	12.01	305	0.12	3	4
14	350	17.32	416	13.11	333	0.12	3	4
16	400	19.8	479	15.12	384	0.12	3	4
18	450	21.34	534	17.05	433	0.12	3	4

Figure 9. Grounding ring Meter sizes 1/2" (15mm) to 18" (450mm)

Table 5. Specification Code (Flange type detector GF630 (Combined type))

Model					Specification Code									Description	Lining		
1	2	3	4	5	6	7	8	9	10	11	12	13	14		PU	FEP	PTFE
G	F	6	3	0										Combined (Integral) type	●	●	●
														Meter size			
					0	1								½" (15 mm)	●	●	-
					0	2								1" (25 mm)	●	●	-
					0	3								1-¼" (32 mm)	●	●	-
					0	4								1-½" (40 mm)	●	●	-
					0	5								2" (50 mm)	●	●	-
					0	6								2-½" (65 mm)	●	●	-
					0	8								3" (80 mm)	●	●	-
					1	0								4" (100 mm)	●	●	-
					1	2								5" (125 mm)	●	●	-
					1	5								6" (150 mm)	●	●	-
					2	0								8" (200 mm)	●	●	-
					2	5								10" (250 mm)	●	●	-
					3	0								12" (300 mm)	●	-	●
					3	5								14" (350 mm)	●	-	●
					4	0								16" (400 mm)	●	-	●
					4	5								18" (450 mm)	●	-	●
					5	0								20" (500 mm)	-	-	●
					6	0								24" (600 mm)	-	-	●
														Connection flange standard			
							A							ASME B 16.5 class 150	●	●	●
							J							JIS B 2220 10K	●	●	●
														Lining			
								N						Polyurethane(PU) with NSF approval (Note 2, 3, & 4)	●	-	-
								U						Polyurethane(PU) (Note 2, 3, & 4)	●	-	-
								F						FEP (Note 1, 2, & 4)	-	●	-
								E						FEP with NSF approval (Note 1, 2, & 4)	-	●	-
								P						PTFE (Note1 & 2)	-	-	●
								T						PTFE with NSF approval (Note1, 2, & 4)	-	-	●
														Electrode Material			
									B					316L stainless steel	●	-	-
									F					Hastelloy C (Equivalent)	-	●	●
														Flow and calibration velocity range			
										A				1.0 to 32.8 ft/s (standard range calibration)	●	●	●
											1			PU coating pearl-gray colored	●	●	●
														*Direct burial detector coating Contact Toshiba International Corp. (Houston)			

Code explanation…●: Standard ○: Option —: Not available

Note1: FEP lined 1/2" (15mm) to 10" (250mm) & PTFE lined, 12" (300mm) to 24" (600mm) meters are NSF approved. PTFE Lined detectors are provided with 316 stainless steel grounding rings.

Note2: Potting kit is available for IP68/NEMA6P submersible option when selecting separate (remote) type PU lining. Potting kit is **Not** available for Combined or Remote GF Teflon lined meters.

Note3: Non-NSF Polyurethane (PU) sizes 1/2" (15mm) to 3" (80mm), NSF approved Polyurethane 4" (100mm) to 18" (450mm).

Note 4: In case of JIS10K flange, only 'U' , 'F' or 'P' is available to be selected at 9th code.

Table 6. Specification Code (Flange type detector GF632 (Separate type))

Model					Specification Code									Description	Lining		
1	2	3	4	5	6	7	8	9	10	11	12	13	14		PU	FEP	PTFE
G	F	6	3	2										Separate (Remote) type (Note 3)	●	●	●
														Meter size			
					0	1								½"(15mm)	●	●	-
					0	2								1"(25mm)	●	●	-
					0	3								1-¼"(32mm)	●	●	-
					0	4								1-½"(40mm)	●	●	-
					0	5								2"(50mm)	●	●	-
					0	6								2-½"(65mm)	●	●	-
					0	8								3"(80mm)	●	●	-
					1	0								4"(100mm)	●	●	-
					1	2								5"(125mm)	●	●	-
					1	5								6"(150mm)	●	●	-
					2	0								8"(200mm)	●	●	-
					2	5								10"(250mm)	●	●	-
					3	0								12"(300mm)	●	-	●
					3	5								14"(350mm)	●	-	●
					4	0								16"(400mm)	●	-	●
					4	5								18"(450mm)	●	-	●
					5	0								20"(500mm)	-	-	●
					6	0								24"(600mm)	-	-	●
							A							Connection flange standard ASME B 16.5 class 150	●	●	●
							J							JIS B 2220 10K	●	●	●
								N						Lining Polyurethane(PU) with NSF approval (Note 2, 3, & 4)	●	-	-
								U						Polyurethane(PU) (Note 2, 3, & 4)	●	-	-
								F						FEP (Note 1, 2, & 4)	-	●	-
								E						FEP with NSF approval (Note 1, 2, & 4)	-	●	-
								P						PTFE (Note 1, 2, & 4)	-	-	●
								T						PTFE with NSF approval (Note1, 2, & 4)	-	-	●
									B					Electrode Material 316L stainless steel	●	-	-
									F					Hastelloy C (Equivalent)	-	●	●
										A				Flow and calibration velocity range 1.0 to 32.8 ft/s(standard range calibration) / Cable glands and cFMus 1/2-14NPT connection port without cable glands With cFMus logo.	●	●	●
											1			PU coating pearl-gray colored *Direct burial detector coating Contact Toshiba International Corp. (Houston)	●	●	●

Code explanation…●: Standard ○: Option —: Not available

Note1: FEP lined 1/2" (15mm) to 10" (250mm) & PTFE lined, 12" (300mm) to 24" (600mm) meters are NSF approved. PTFE Lined detectors are provided with 316 stainless steel grounding rings.

Note2: Potting kit is available for IP68/NEMA6P submersible option when selecting separate (remote) type PU lining. Potting kit is **Not** available for Combined or Remote GF Teflon lined meters.

Note3: Non-NSF Polyurethane (PU) sizes 1/2" (15mm) to 3" (80mm), NSF approved Polyurethane 4" (100mm) to 18" (450mm).

Note 4: In case of JIS10K flange, only 'U' , 'F' or 'P' is available to be selected at 9th code.

Table 7. Specification Code for converters

Model					Specification Code									Contents	LF620 type	LF622 type
1	2	3	4	5	6	7	8	9	10	11	12	13	14			
L	F	6	2											Electromagnetic flowmeter converter		
				0										Combined (Integral) type	●	—
				2										Separate (Remote) type	—	●
					F									Purpose cFMus class I, Division 2 approved	●	●
						A								Shape Standard type with case	●	●
							A							Converter mounting fitting None	●	○
							C							Panel, Accessory for wall mounting (BNP material: SUS304)	—	●
							E							Accessory for pipe installation (BNP material: SUS304)	—	○
								2						Digital input/output Digital output points 2 (DO1+DO2) +Digital input point 1 (DI)	●	●
									1					Current output and Communication function(Note1) Current output + HART communication	●	●
									3					Current output + Modbus (RS485) communication	○	○
										1				Power supply(Note2) 100Vac-240Vac 50/60Hz , 110Vdc	●	●
										2				24Vdc	○	○
										3				110Vdc	○	○
											E			Instruction manual English	●	●

Code explanation…●: Standard ○: Option —: Not available

Note 1:When Modbus communication is provided, digital output points 1(DO1) and digital output points(DO2), digital input point 1(DI), HART communication cannot be used.
Refer Table 8 for more details.

Note2: Select 110Vdc for test report inspected under the condition of 110Vdc.

Table8. Communication functions and output selection table

Selection of Function		Availability of outputs			
Code (10^{th} digit)	Selected Communication	4-20mAdc	DO1	DO2	DI
1	HART	✓	✓	✓	✓
3	Modbus	✓	✓ (Note)	X	X

Code explanation: ✓:Available X:Not Available

Note: When digital output 1 function and Modbus communication function are used at one time, TG (signal ground) of the Modbus communication function cannot be connected (2 line connection).

ISO9001 and ISO14001 are certified.

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

Specifications are subject to change without notice.
Printed in Japan 2021-11 (TBLS)

TOSHIBA

Field Intelligent Device Series

Electromagnetic Flowmeter Converter

LF620,LF622

Introduction

Combined with a multi-functional converter LF620 (combined type) or LF622 (separate type) equipped with its original noise-suppression circuit and advanced algorithms. IR (Infrared) switches enable parameter setting of the converter without removing the cover. Flow direction can be set in either way, and its 128 x 128 dot matrix LCD display allows the LCD to be rotated electronically to 90, 180 and 270 degrees without opening the cover. The terminal block in LCD side make easy to wire in case of the combined type.

*1: HART protocol (Highway Addressable Remote Transducer) is a communication protocol for industrial sensors recommended by the HCF (HART Communication Foundation).
** DevComm2000 Smart Device Communicator available through TIC for performing HART device configurations on PC or laptop.

*2: PROFIBUS is the communication protocol for factory automation and process automation that the PROFIBUS Organization recommends. Instead of analog control with a conventional analog signal (4-20mA), it is one kind of the fieldbus which digitizes all signals. Flowmeters support PROFIBUS-PA.

*3: Modbus is the communication protocol that Modicon Inc. developed. Physical layer is RS485.

LF620 **LF622**
LF620F **LF622F**

Figure1. LF620 series Flowmeter Converters

Certification number
Z01207

Specifications

■ Model LF620 and LF622 converters

Input signals

Analog signal — the voltage signal from detector, proportional to process flow rate (For LF622 separate type converter).

Digital input DI
Signal type: 20 to 30Vdc voltage signal
Input resistance: 2.7kΩ
Number of inputs: one point

Note: DI cannot be used with the Modbus communication.

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:
4–20mAdc (load resistance 0 to 750Ω)

Note: The current output cannot be used with the PROFIBUS-PA communication.

Digital outputs — Two points are available as follows.

Digital output DO1 :
Output type: Transistor open collector
Number of outputs: One point
Output capacity: 30Vdc, 200mA maximum

Note: DO1 cannot be used if Modbus communication connection is 3 lines.

Digital output DO2 :
Output type: Solidstate relay output (non polarity)
Number of outputs: One point
Output capacity: 150Vdc, 150mA maximum or 150 V ac (peak to peak), 100mA maximum

Note: DO2 cannot be used with the Modbus communication.

DO1 and DO2 functions — One of the following functions can be assigned to DO1 and/or DO2

- **Pulse output (available only for DO1,DO2)**
  Pulse rate: Max 10kHz (10,000pps) (DO1)
  Max 100Hz (100pps) (DO2)
  (Over 1kpps, auto-setting)
  Pulse width: 0.3 to 500ms (but less than half of the period for 100% flow rate)
  Note: The same and simultaneous pulse is not available between DO1 and DO2.)
- **Multi-range selection outputs (Note 1)**
- **High, High high, Low, and/or Low low alarm outputs (Note 2)**
- **Empty pipe alarm output (Note 2)**
- **Preset count output**
- **Converter failure alarm output(Note 2)**

Note 1: Two outputs (DO1 and DO2) are needed for 4-range switching and forward/reverse 2-range switching.

Note 2: Normal Open (default set) or Normal Close is selected for alarm outputs when programming.
When power failure occurs, unit will be fault to Normal Open.

Communications output :

- **HART(std.)**

Digital signal is superimposed on 4–20mAdc current signal as follows:

- Conforms to HART protocol
  Load resistance: 240 to 750Ω
  Load capacitance: 0.25μF maximum
  Load inductance: 4mH maximum

- **PROFIBUS (opt.)**

Protocol : PROFIBUS-PA
Baurate : 31.25kbps
Bus voltage : 9-30VDC
Consumption electric current of bus:less than 16mA
Manufacture Ident-No. : $093B_{HEX}$
Standard Ident-No. : 9740_{HEX}
Slave address : 0-126 (Default address is 126)
Profile : Profile Ver.3.01 for Process Control Devices
Function blocks : AI(Flow)×1 , Totalizer×1

- **Modbus(opt.)**

Physical layer : RS485
Protocol : Modbus
Mode : RTU
Baudrate : 4800, 9600, 19200bps
Data length : 8bit
Parity bit : None, Odd, Even
Stop bit : 1bit, 2bit
Error check : CRC-16
Max. station number : 32(with Master device)
Max. cable length : 1.2km (Note)

Note: This length is specification of 3 line connection.

LCD display: Full dot-matrix 128×128 dot LCD display (back-light provided)
A parameter change will rotate the display.

Parameter settings — Parameters can be set as follows:

- **IR Switches**: Three key switches are provided to set configuration parameters.
- **Digital communication**: HART, PROFIBUS or Modbus 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 one second increments)

Zero and span calibration: Built-in calibration signal source allows converter unit check.

Conditions 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. The outputs and display will remain as follows when power fails.

- Current output: 0mAdc
- Digital output: OFF
- LCD display: No display
- PROFIBUS: No communication

Power supply:

One of the following can be selected:

- 100 to 240Vac, 50/60Hz
  (allowable voltage 80 to 264Vac)
  110Vdc
  (allowable voltage 90 to 130Vdc)
- 24Vdc (allowable voltage 18 to 36Vdc)

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

Structure:

IP 67 and NEMA 4X Watertight

Case: Aluminum alloy (equivalent of IP 67)

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

Cable connection ports:
Cable glands —

LF620 and LF622 without cFMus Approval:
Provided as standard
OD of cable ϕ 11~13mm
Material Nylon 66
G (PF) 1/2 male threads..

Note: When PROFIBUS or Modbus option is specified , cable gland size is ϕ 6～8mm for signal cable, ϕ 11～13mm for power cable

LF620F and LF622F with cFMus Approval:
Not provided, 1/2-14NPT male threads are required.

Applicable diameter — 11 to 13mm
(0.433 to 0.512 inch)

Vibration resistance:

No resonance to the following levels of vibration:
- 10 to 150Hz with acceleration of 9.8m/s^2
- Vibration of 30Hz with 29.4 m/s^2 in 4h in each direction will not cause any defect to unit.

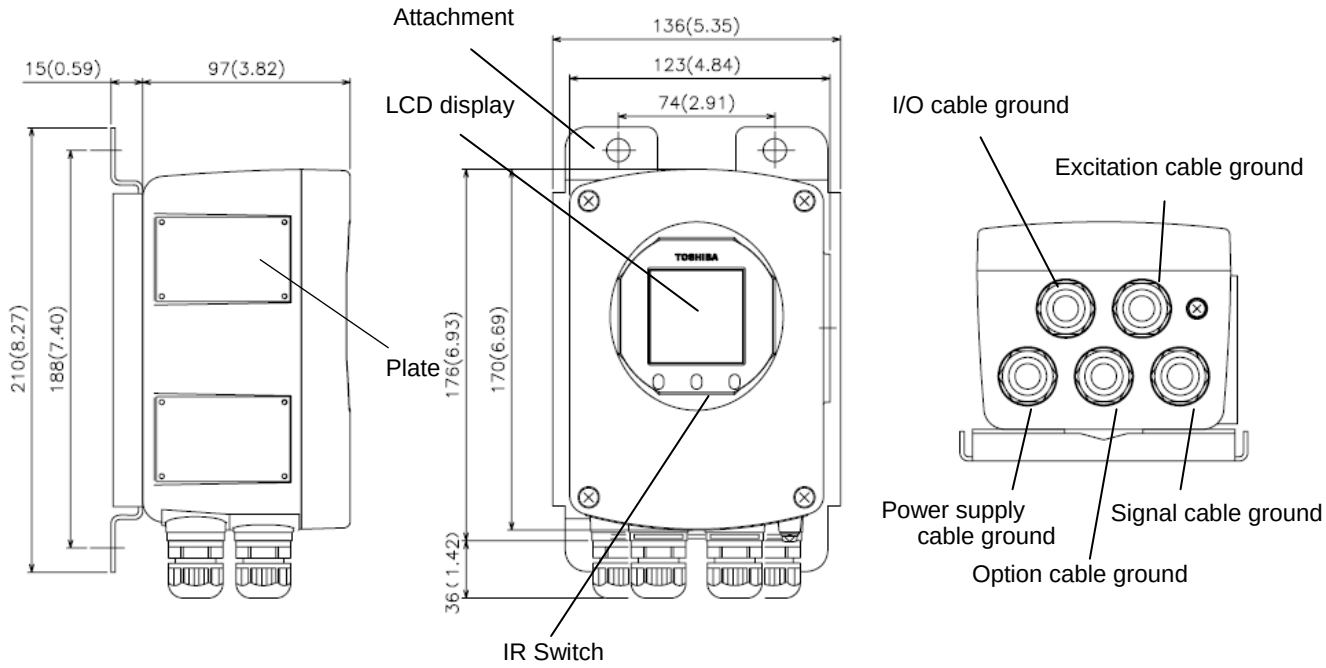
Note: Avoid using the flowmeter in an environment with constant vibration.

Converter LF622 dimensions and weights:
See Figure 2 (for Separate type)

MTBF:220,000 hours at 25 deg.C (77 deg.F) based on MIL-HDBK-217F

■ Installation

- **Dimension**

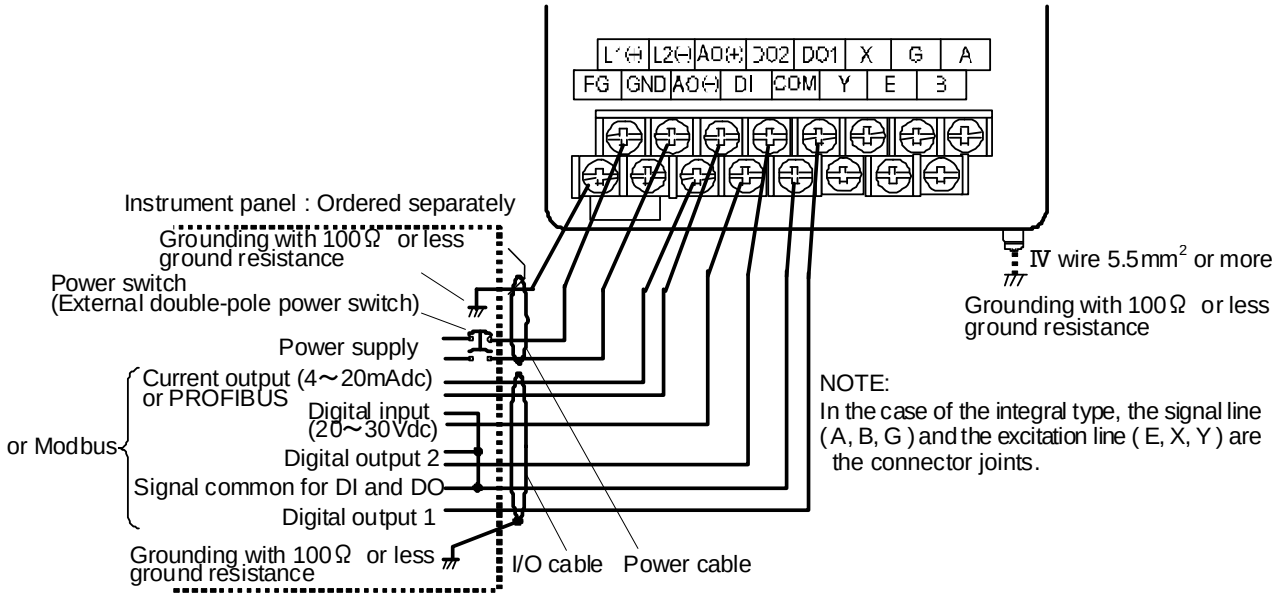


Note: Cable glands are not provided for LF622F cFMus approved type. Refer to the part Cable connection port at detector.

Figure 2. Separate type converter LF622 and LF622F

■ External Connections

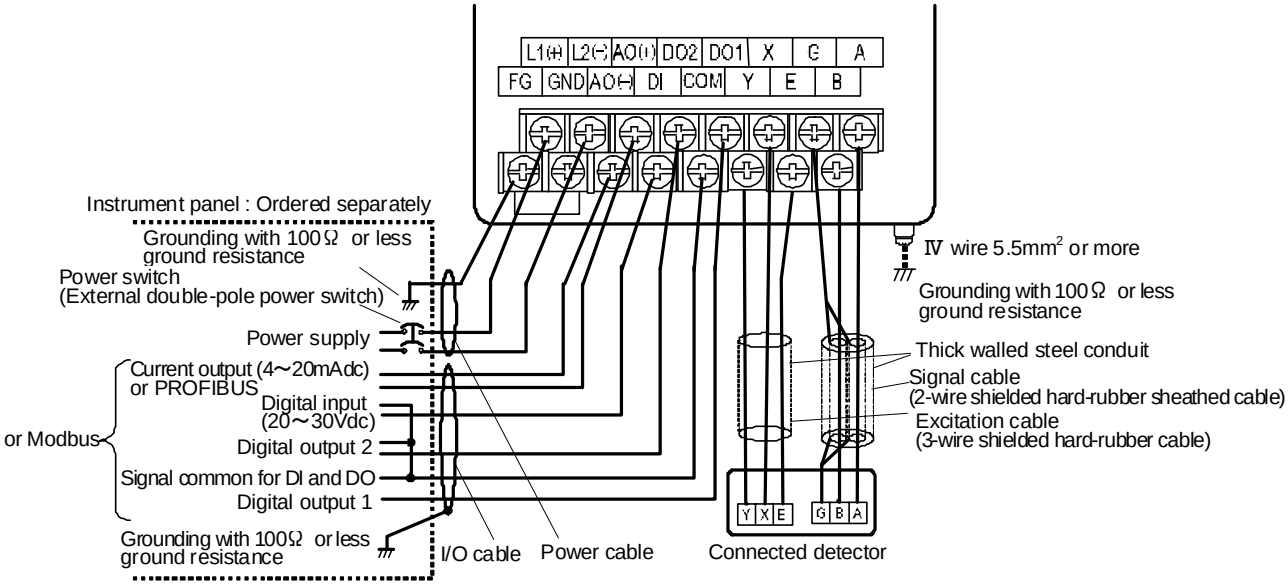
- **Combined type Converter LF620**



***1** Locate an external double-pole power switch on the power line near the flowmeter within easy reach of operation. Use the appropriate switch rating as shown below:

Switch rating: 250Vac, 6A or more
In rush current: 15A or more

Figure 3. Combined type LF620 and LF620F converters Wiring Diagram



Symbol	Description	Cable
L1 (+)	Power supply	Power cable
L2 (−)		
GND	Ground (for arrester)	
FG	Frame ground	
DI	Digital Input (20～30Vdc)	I/O cable
DO1	Digital Output 1	
DO2	Digital Output 2	
COM	Signal Common for DI, DO1, DO2	
+	Current Output (4～20mAdc) or PROFIBUS	
−		Shielded cable for PROFIBUS-PA
X	Excitation Output	Excitation cable (for LF622,LF622F only)
Y		
E		
A	Signal Input	Signal cable (for LF622,LF622F only)
B		
G		
T+	Modbus(+)	Twisted-pair polyethylene insulated vinyl sheath cable (JKEV,AWG24(0.2mm²))
T-	Modbus(-)	
TG	Modbus(GND)	

Note: Symbol of the terminal is changed as follows for Modbus.
DO2 → T+, DI → T-, COM → TG

Figure 4. Separate type LF622 and LF622F converters wiring Diagram

■ Wiring Precautions

(1) Connect the grounding wire (IV wire 5.5mm² 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.

(2) The allowable cable lengths between Toshiba detector and Toshiba converter for the separate type flowmeter depend on the electrical conductivity of the object fluid. Refer to each specification sheet.

(3) DO1, DO2, and DI use the same common terminal (COM). This COM can not connect to other equipments which have their own ground terminal.
(Power supply for connecting to DI or DO, etc…) Need to wire separately.

■ Wiring Precautions (PROFIBUS or Modbus)

(1) For wiring path, avoid places near electrical equipment that may cause electromagnetic induction or electrostatic induction interference (such as a motor, transformer and wireless transmitter).

(2) Use a PROFIBUS-PA cable or a RS485 twist-pair cable for signal cable. In addition, make sure to use a shielded cable to improve noise resistance. Furthermore, installation of signal cable in metal conduit is recommended.

(3) General cables are designed for indoor use where cables are not exposed to humidity, rain, etc. When you install cables, make sure to check the operating conditions such as the operating temperature range of the cable by contacting its manufacturer.

(4)When you carry out cable end treatment of cable, use a dedicated cable stripper etc. so that the core wire of the cable will not be nicked or damaged. In addition, for cables, be careful of allowable maximum bend diameter etc. (Basically, do not install cables in a way cables are twisted or bent.)

(5)Consider installing a PROFIBUS-PA arrester in the communication path of PROFBUS-PA so that the electromagnetic flowmeter will not be affected by lightning etc.

(6) The electromagnetic flowmeter is not equipped with terminating resistors. Use the terminating resistor unit for PROFIBUS-PA or junction box, if necessary.

(7) Only one PROFIBUS-PA cable goes through a cable gland of the Electromagnetic Flowmeter. Please use the junction box at system configuration.

(8) Install a terminator to flowmeter that connected to end of Modbus network.

Table 1. Specification Code for converters

Model					Specification Code									Contents	LF620 type	LF622 type
1	2	3	4	5	6	7	8	9	10	11	12	13	14			
L	F	6	2											Electromagnetic flowmeter converter		
				0										Combined (Integral) type	●	—
				2										Separate (Remote) type	—	●
					A									Purpose		
					F									cFMus class I, Division 2 non-approved	○	○
														cFMus class I, Division 2 approved	●	●
						A								Shape		
														Standard type with case	●	●
							A							Converter mounting fitting		
														None	●	○
							C							Panel, Accessory for wall mounting (BNP material: SUS304)	—	●
							E							Accessory for pipe installation (BNP material: SUS304)	—	○
								2						Digital input/output		
														Digital output points 2 (DO1+DO2) +Digital input point 1 (DI)	●	●
									1					Current output and Communication function(Note1)		
														Current output + HART communication	●	●
									2					PROFIBUS communication	○	○
									3					Current output + Modbus (RS485) communication	○	○
										1				Power supply(Note 2)		
														100Vac-240Vac 50/60Hz, 110Vdc	●	●
										2				24Vdc	○	○
										3				110Vdc	○	○
														Instruction manual		
											E			English	●	●

Code explanation: ●: Standard ○: Option —: Not available

Note 1: When PROFIBUS communication is provided, current output(4-20mA) and HART communication cannot be used. When Modbus communication is provided, digital output points 1(DO1) and digital output points(DO2), digital input point 1(DI), HART communication cannot be used. Refer Table 2 for more details.

Note2: Select 110Vdc for test report inspected under the condition of 110Vdc.

Table2. Communication functions and output selection table

Selection of Function		Availability of outputs			
Code (10^{th} digit)	Selected Communication	4-20mAdc	DO1	DO2	DI
1	HART	✓	✓	✓	✓
2	PROFIBUS	X	✓	✓	✓
3	Modbus	✓	✓ (Note)	X	X

Code explanation: ✓:Available X:Not Available

Note: When digital output 1 function and Modbus communication function are used at one time, TG (signal ground) of the Modbus communication function cannot be connected (2 line connection).

ISO9001 and ISO14001 are certified.

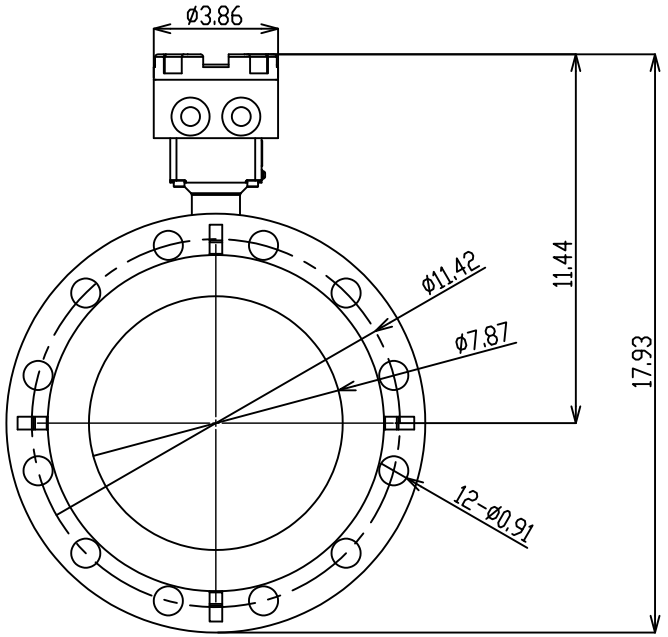
Misuse of this product can result in damages to property or human injury.
Read related manuals carefully before using this product.

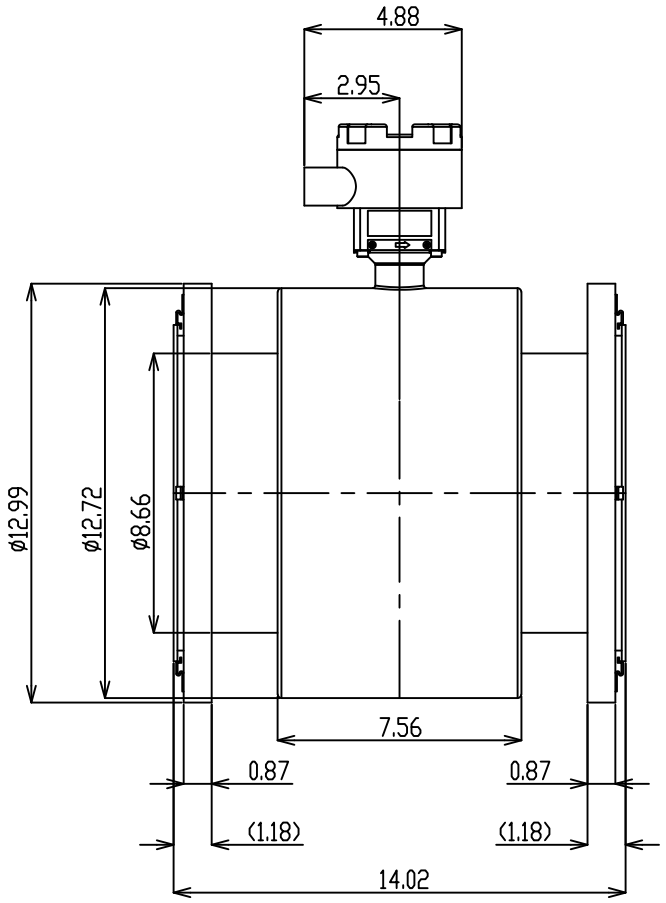
Specifications are subject to change without notice.

Printed in Japan 2011-6 (TDOC)

ELECTROMAGNETIC FLOWMETER FOR HAZARDOUS LOCATIONS	
USAGE	FM APPROVAL
AREA OF USE	CLASS I, II, III, DIVISION 2, GROUPS A-G
FLANGE RATING	ASME B 16.5 CLASS 150
LINING	PU, FEP, PTFE

WEIGHT APPROXIMATE					
FEP		PTFE		PU	
lbs	kg	lbs	kg	lbs	kg
124	46	N/A	N/A	124	46





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REV	DATE	DESCRIPTION	BY	CHK	APPR
4					
3					
2					
1					
0	6/11/21	FIRST ISSUE	JC	CR	JL

TOSHIBA
TOSHIBA INTERNATIONAL CORPORATION
MADE IN HOUSTON, TEXAS U.S.A.

TITLE: 8″ FLA REM + GR

REVISION: 0

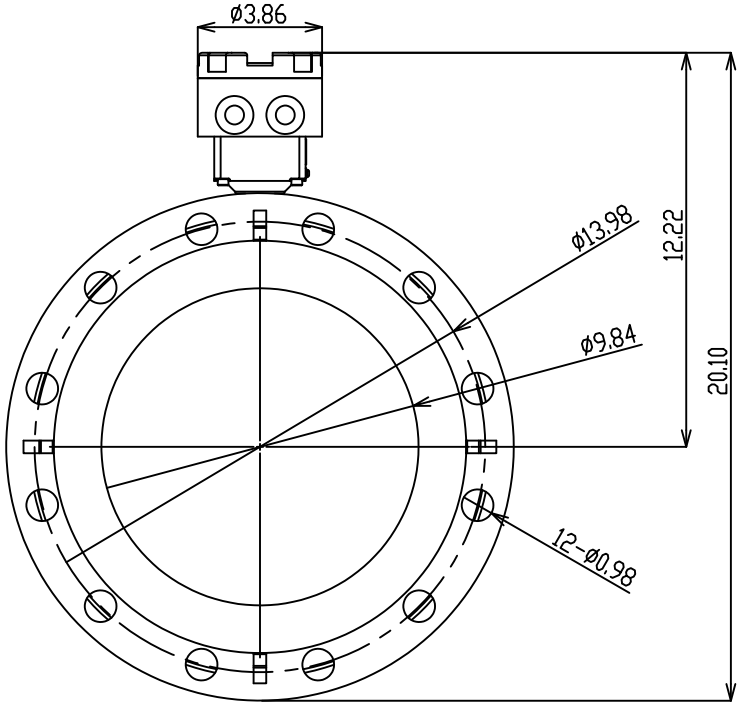
SCALE: 1:4

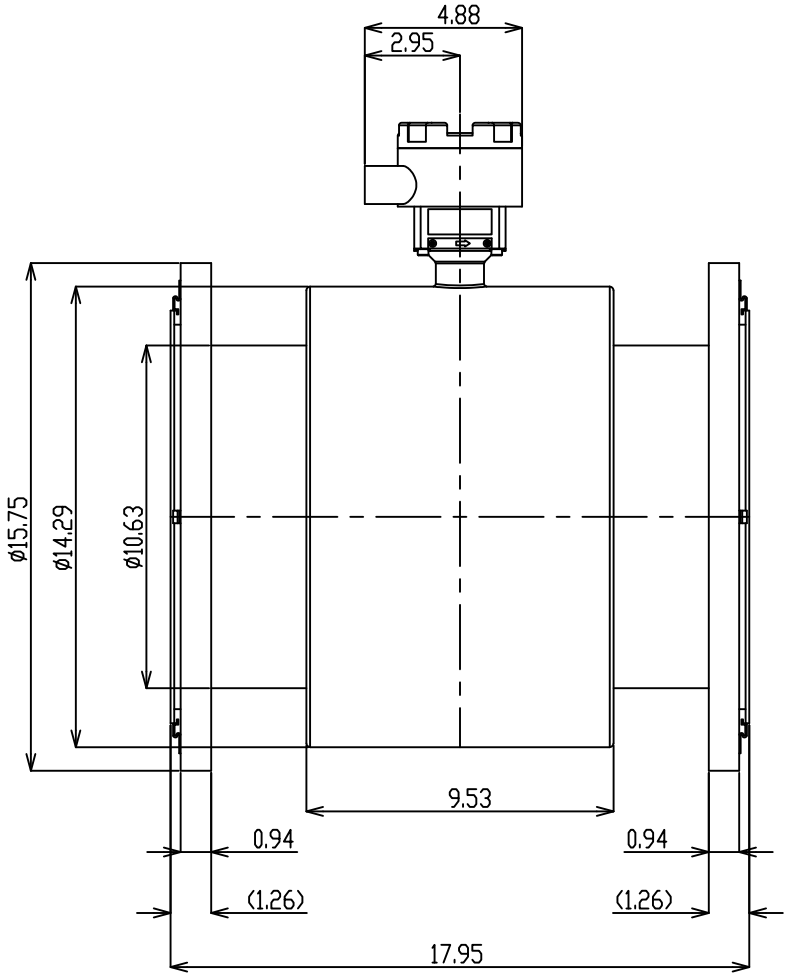
PART NO.: GF63220

DRAWING NO.: GF63220-200mm-REM

ELECTROMAGNETIC FLOWMETER FOR HAZARDOUS LOCATIONS	
USAGE	FM APPROVAL
AREA OF USE	CLASS I, II, III, DIVISION 2, GROUPS A-G
FLANGE RATING	ASME B 16.5 CLASS 150
LINING	PU, FEP, PTFE

WEIGHT APPROXIMATE					
FEP		PTFE		PU	
lbs	kg	lbs	kg	lbs	kg
183	68	N/A	N/A	183	68





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2					
1					
0	6/11/21	FIRST ISSUE	JC	CR	JL

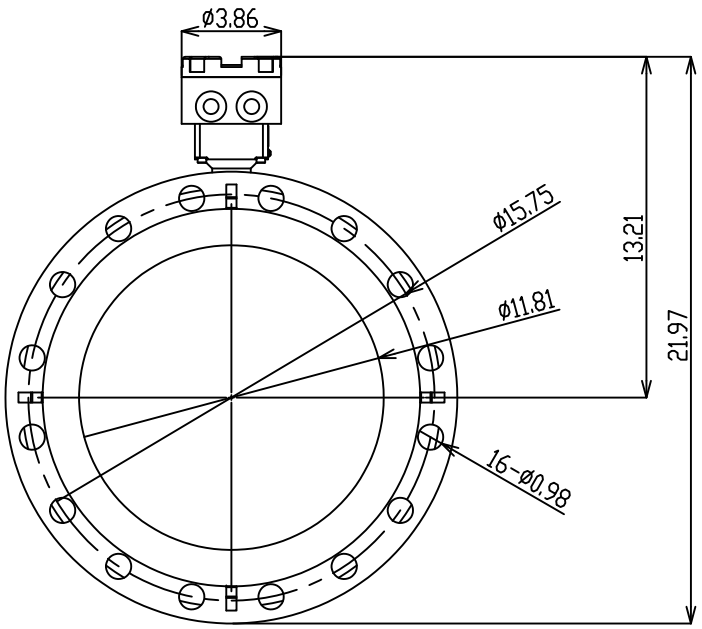
TOSHIBA
TOSHIBA INTERNATIONAL CORPORATION
MADE IN HOUSTON, TEXAS U.S.A.

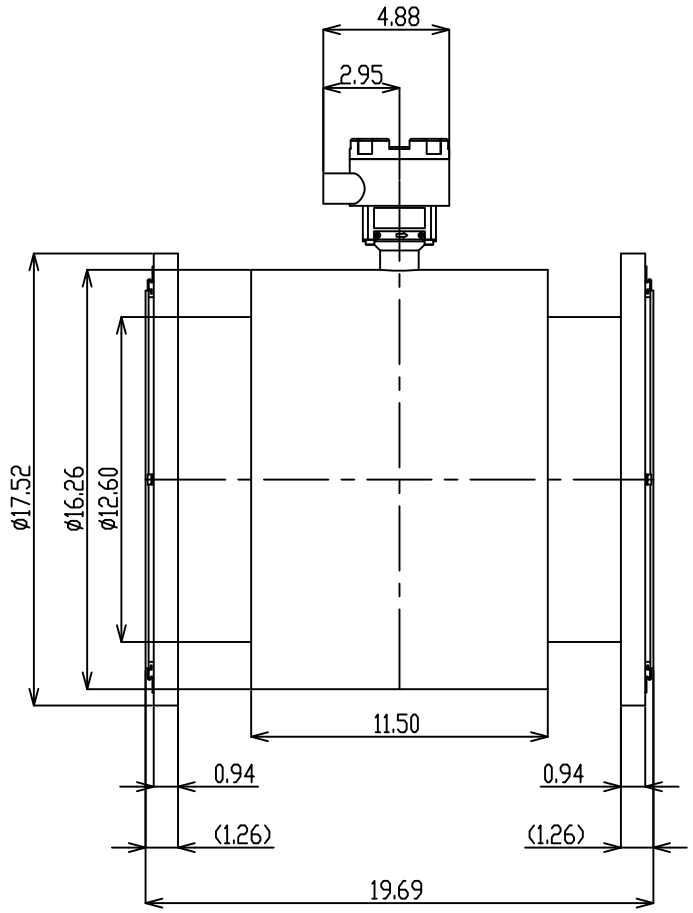
TITLE: 10″ FLA REM + GR

REVISION: 0
SCALE: 1:4
PART NO.: GF63225
DRAWING NO.: GF63225-250mm-REM

ELECTROMAGNETIC FLOWMETER FOR HAZARDOUS LOCATIONS	
USAGE	FM APPROVAL
AREA OF USE	CLASS I, II, III, DIVISION 2, GROUPS A-G
FLANGE RATING	ASME B 16.5 CLASS 150
LINING	PU, FEP, PTFE

WEIGHT APPROXIMATE					
FEP		PTFE		PU	
lbs	kg	lbs	kg	lbs	kg
N/A	N/A	287	99	269	91





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TITLE: 12″ FLA REM + GR

REVISION: 0

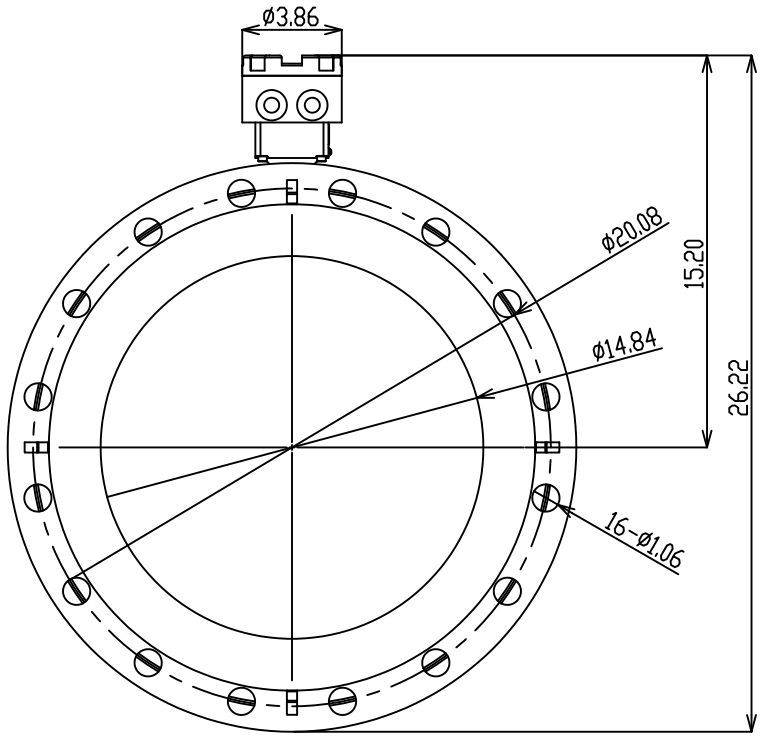
SCALE: 1:5

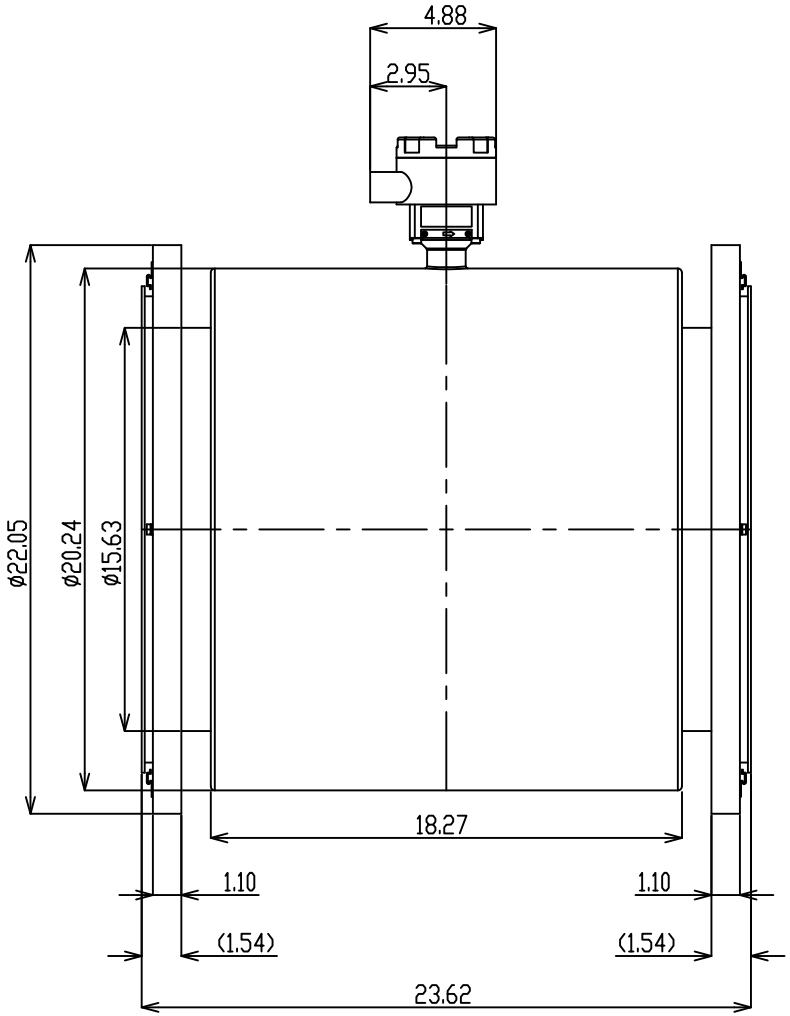
PART NO.: GF63230

DRAWING NO.: GF63230-300mm-REM

ELECTROMAGNETIC FLOWMETER FOR HAZARDOUS LOCATIONS	
USAGE	FM APPROVAL
AREA OF USE	CLASS I, II, III, DIVISION 2, GROUPS A-G
FLANGE RATING	ASME B 16.5 CLASS 150
LINING	PU, FEP, PTFE

WEIGHT APPROXIMATE					
FEP		PTFE		PU	
lbs	kg	lbs	kg	lbs	kg
N/A	N/A	426	147	397	134





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1					
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TITLE: 16″ FLA REM + GR

REVISION: 0

SCALE: 1:5

PART NO.: GF63240

DRAWING NO.: GF63240-400mm-REM

McCROMETER Quotation

Quote Number: 162053 Rev 1

Codes: / /

Company: Beaumont City of
Address: 550 East 6th Street
City: Beaumont
State: CA Postal Code: 92223

Contact: Grace Wichert
Phone #: (951) 769-8520 x 380
E-Mail: gwichert@beaumontca.gov

Quoted By: Cherish Stack
Date Quoted: Feb-21 2023 **Expires:** Mar-23 2023
Payment Terms: TO BE ADVISED (TBA)
Shipping Terms: FCA SELLER'S PREMISES (FCA)

Est. Lead Time: 5 Weeks

*Actual lead time will be confirmed upon order acceptance.

Following is the information requested

Line #:	Item Number:	Description:	Qty:	UM:	Price:	Ext. Price:
1.000	UM08-1SR025A1	8" ULTRAMAG PROCOMM AC 150# AWWA Class D Flanges 2 Grounding Rings 25' Remote Mount Cable AC ProComm Converter	4	EA	$4,704.00	$18,816.00
2.000	UM10-1SR025A1	10" ULTRAMAG PROCOMM AC 150# AWWA Class D Flanges 2 Grounding Rings 25' Remote Mount Cable AC ProComm Converter	2	EA	$5,435.00	$10,870.00
3.000	UM12-1SR025A1	12" ULTRAMAG PROCOMM AC 150# AWWA Class D Flanges 2 Grounding Rings 25' Remote Mount Cable AC ProComm Converter	4	EA	$6,205.00	$24,820.00
4.000	UM14-1SR025A1	14" ULTRAMAG PROCOMM AC 150# AWWA Class D Flanges 2 Grounding Rings 25' Remote Mount Cable AC ProComm Converter	1	EA	$7,301.00	$7,301.00

All Prices are in US Dollars (USD) Total Quoted: **$61,807.00**

****Above price does not include tax or shipping cost****

This quotation applies to equipment cost and does not include freight, site visits for pipe measurement, cable run evaluations, equipment start-up, end user training or submittals. These value added services will be quoted separately through your local McCrometer Factory Representative.

McCROMETER, INC.'S STANDARD TERMS AND CONDITIONS OF SALE FOR PRODUCTS AND SERVICES
REV. 1.4 04/17

SECTION 1: PRODUCT SALES AND FIELD SERVICES

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Tel (951) 652-6811 • Fax (951) 652-3078 • Website: http://www.mccrometer.com

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ARTICLE 1: THE CONTRACT

ANY PREPRINTED TERMS AND/OR CONDITIONS ON BUYER'S PURCHASE ORDER OR INVOICE SHALL NOT APPLY AND MCCROMETER GIVES NOTICE OF REJECTION OF SUCH TERMS AND/OR CONDITIONS IN THEIR ENTIRETY.

This document sets forth the Terms & Conditions of Sale for goods manufactured and/or supplied, and services provided, by McCrometer, Inc. of Hemet, California ("McCrometer") and sold to the original purchaser thereof ("Buyer"). Unless otherwise specifically stated herein, the term "McCrometer" includes only McCrometer, Inc. and none of its affiliates. The Contract shall be comprised of the following terms, together with such terms and conditions set forth in McCrometer's written proposal or quotation (the "Quotation"), including any documents, drawing or specifications incorporated by reference, and any additional or different terms proposed in Buyer's purchase order (the "Purchase Order") that are accepted by McCrometer in writing, which together shall constitute the entire agreement between the parties and supersede all previous communications, representations or agreements, either oral or written, with respect to the subject matter hereof. These terms and conditions are subject to change without notice.

ARTICLE 2: APPLICABLE TERMS AND CONDITIONS:

An offer by McCrometer in its Quotation that does not stipulate an acceptance date is not binding. These Terms & Conditions of Sale are contained directly and/or by reference in McCrometer's quote, order acknowledgment, and invoice documents. The first of the following acts constitutes an acceptance of McCrometer's offer and not a counteroffer, and creates a contract of sale ("Contract") in accordance with these Terms & Conditions: (i) Buyer's issuance of a purchase order document against McCrometer's offer or quote; (ii) acknowledgement of Buyer's order by McCrometer; or (iii) commencement of any performance by McCrometer pursuant to Buyer's order. Provisions contained in Buyer's purchase documents (including electronic commerce interfaces) that materially alter, add to or subtract from the provisions of these Terms & Conditions of Sale are expressly not a part of the Contract. The Contract shall be deemed to have been entered into upon written acknowledgement of the Purchase Order by an officer or authorized representative of the party to be bound. In the event of a conflict or inconsistency between the provisions of these standard terms and conditions, on the one hand, and specific provisions of Purchase Orders which are accepted by McCrometer in writing, on the other hand, the provisions of these terms and conditions shall govern the resolution of any such conflict or inconsistency, unless expressly agreed to otherwise in writing and signed by McCrometer. No representations or statements of any kind made by any representative of McCrometer, which are not stated herein, shall be binding on McCrometer. No course of dealing or usage of trade or course of performance shall be relevant to explain, supplement, or determine the meaning of any term or provision expressed in these terms and conditions or any Purchase Order.

ARTICLE 3: PRICE

Unless requested by Buyer, and included in the Quotation prices or stated in the Purchase Order accepted by McCrometer, prices do not include: packing for storage, freight charges, insurance, taxes (federal, local, or otherwise), customs duties and import/export fees, or any other item not specified in the Quotation, and shall be paid by Buyer. Buyer shall pay any sales, use or other taxes and duties imposed on the transaction or equipment. Prices are subject to change pursuant to Articles 4, 8 and 9 below. The terms of any Purchase Order and pricing information disclosed to Buyer shall remain confidential and shall not be disclosed to any third party without the prior written consent of authorized officer or representative of McCrometer (see Articles 14 & 18 for details).

ARTICLE 4: PAYMENT TERMS

Terms of payment will be determined after a review of Buyer's credit history, unless Buyer already has an account with McCrometer. Payment shall be due within 30 days of the date of McCrometer's invoice in U.S. funds. The parties agree that in the event of any breach of this ARTICLE, McCrometer's damages suffered would be difficult to calculate. Therefore, at the sole option of McCrometer, Buyer shall be charged a late fee payable upon McCrometer's demand on amounts not paid by Buyer when due, including, without limitation, any and all amounts as to which due dates for payment thereof have been accelerated by McCrometer upon Buyer's default, or for any other reason, which shall be equivalent to the interest rate on any and all such amounts at the lower of: (1) one and one-half percent (1.5%) per month, or (2) the highest rate of interest then permitted by applicable law as liquidated damages and not as a penalty, which is the parties' reasonable estimate of fair compensation for the foreseeable losses that might result from the breach. If payment from Buyer is not received in a reasonable time, other Purchase Orders placed by Buyer shall be subject to hold, and will release McCrometer of any further obligation of performance or timely delivery. Orders that exceed $50,000 U.S. Dollars are subject to 30% down payment; the remaining balance is contingent on credit review. Buyer hereby grants McCrometer a security interest in and to all products, parts, accessories, tools, equipment and materials which may be sold and/or furnished by McCrometer to Buyer, and in all proceeds and products of the foregoing. Buyer authorizes McCrometer to file any financing or continuation statements to perfect such security interest without the signature of Buyer to the extent permitted by applicable law. Such security interest is in addition to any rights McCrometer might have pursuant to applicable Materialmen's Lien, Mechanic's Lien, Construction Lien or comparable statutes.

ARTICLE 5: TITLE, DELIVERY AND INSURANCE

All products sold or licensed, including all equipment, parts, manuals, and related materials required for installation and/or use thereof, shall be FCA Seller's Premises, Hemet, California USA (Incoterms 2010) and all repair or replacement parts may, at McCrometer's option, be FCA McCrometer's designated repair/manufacturing facilities (Incoterms 2010). International deliveries shall be ExWorks Seller's Premises (Incoterms 2010), unless specified otherwise at the time of Quotation and is included in the Quotation/Purchase Order amount. Full risk of loss (including transportation delays and losses) shall pass to Buyer, regardless of whether title has been passed to Buyer, transport is arranged or supervised by McCrometer, or start-up is carried out under the direction or supervision of McCrometer. Loss or destruction of

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the equipment or injury or damage to the equipment that occurs while risk of such loss or damage is born by Buyer does not relieve Buyer of its obligation to pay McCrometer for the equipment.

MCCROMETER SHALL NOT BE LIABLE FOR ANY LOSS, DAMAGES OR EXPENSE, INCLUDING, WITHOUT LIMITATION, CONSEQUENTIAL OR INCIDENTAL DAMAGES, LOSS OF PROFITS OR REVENUES LOSS OF USE, OR OTHERWISE, WHATSOEVER INCURRED OR SUFFERED BY BUYER OR BUYER'S CUSTOMERS IF MCCROMETER FAILS TO MEET ANY SPECIFIED DELIVERY SCHEDULE.

Without limiting the generality of the foregoing, McCrometer shall not be responsible for any such delay, damages, expenses, or losses caused by circumstances outside McCrometer's control. To the extent that any cause beyond the reasonable control of McCrometer results in an actual delay in deliveries or the performance of services on the part of McCrometer as herein provided, the time for performance by McCrometer shall be extended for a period of time at least equal to the period of delay plus a reasonable period of time thereafter in order to permit McCrometer to take steps which McCrometer deems to be necessary or appropriate to complete performance.

ARTICLE 6: LATE RELEASE FOR DELIVERY; PRICE ADJUSTMENT

All quotations and resulting Purchase Order/Agreements are based upon the Buyer's release for delivery of Goods on the Delivery Date as stated on the quotation and/or Purchase Order. If the Buyer delays the release for delivery beyond the agreed Delivery Date through no fault of McCrometer, such delay shall be deemed a change order to the quotation and/or Purchase Order by Buyer and will result in a price adjustment to the Purchase Order. Such price adjustment shall be in an amount to compensate McCrometer for the storage, safety and insurance of the Goods for the duration of the delayed delivery acceptance by Buyer. Such price adjustment shall be agreed to by both Parties prior to shipment.

ARTICLE 7: PATENT OR TRADEMARK INFORMATION

If the equipment sold hereunder is to be prepared or manufactured according to Buyer's specifications,
Buyer shall indemnify and hold McCrometer harmless from any claims or liability for patent or trademark infringement on account of the sale of such goods.

Subject to all limitations of liability provided herein, McCrometer will, with respect to any Products of McCrometer's design or manufacture, indemnify Buyer from any and all damages and costs as finally determined by a court of competent jurisdiction in any suit for infringement of any U.S. patent (or European patent for Products that McCrometer sells to Buyer for end use in a member state of the E.U.) that has issued as of the delivery date, solely by reason of the sale or normal use of any Products sold to Buyer hereunder and from reasonable expenses incurred by Buyer in defense of such suit if McCrometer does not undertake the defense thereof, provided that Buyer promptly notifies McCrometer of such suit and offers McCrometer either (i) full and exclusive control of the defense of such suit when Products of McCrometer only are involved, or (ii) the right to participate in the defense of such suit when products other than those of McCrometer are also involved. McCrometer's warranty as to use patents only applies to infringement arising solely out of the inherent operation of the Products according to their applications as envisioned by McCrometer's specifications. In case the Products are in such suit held to constitute infringement and the use of the Products is enjoined, McCrometer will, at its own expense and at its option, either procure for Buyer the right to continue using such Products or replace them with non-infringing products, or modify them so they become non-infringing, or remove the Products and refund the purchase price (prorated for depreciation) and the transportation costs thereof. The foregoing states the entire liability of McCrometer for patent infringement by the Products. Further, to the same extent as set forth in McCrometer's above obligation to Buyer, Buyer agrees to defend, indemnify and hold harmless McCrometer for patent infringement related to (1) any goods manufactured to the Buyer's design, (2) services provided in accordance with the Buyer's instructions, or (3) McCrometer's Products when used in combination with any other devices, parts or software not provided by McCrometer hereunder.

Buyer agrees not to remove or alter any indicia of manufacturing origin or patent numbers contained on or within the Products, including without limitation the serial numbers or trademarks on nameplates or cast, molded or machined components.

ARTICLE 8: CHANGES

Buyer may request, in writing, changes in the design, drawings, specifications, shipping instructions and schedules of the equipment. Charges for change requests will be quoted to and paid by Buyer on an item-by-item basis, with a minimum charge of $550.00 (five hundred fifty dollars) for any change request. Such changes will be implemented only upon receipt of a new or amended Purchase Order, acceptance of which by McCrometer will constitute Buyer's agreement to pay all such additional charges and Buyer shall be solely responsible and liable for all consequences which may result from such changes, including, without limitation, delays in completing delivery.

ARTICLE 9: CANCELLATION OR TERMINATION

Buyer has the right to cancel the Contract upon fifteen (15) days written notice to McCrometer; and such cancellation is effective only upon the written acknowledgement and authorization of McCrometer. Cancellation of a Purchase Order shall not relieve Buyer of payment under the Contract. McCrometer's receipt of the cancellation notice shall be given to Buyer in writing, and Buyer shall pay McCrometer upon the following schedule: 20% of total Purchase Price if the order has entered Engineering; 75% of the total Purchase Price if McCrometer has ordered/received materials to produce Buyers equipment; 100% of the total Purchase Price if cancellation occurs after completion of the order.

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ARTICLE 10: PED DOCUMENT TRANSLATION

For orders requiring PED certification, the importer is responsible for providing the translation of documentation into the local language of the final destination per PED 2014\68\EU. Mccrometer is not responsible for the translation of documentation into languages other than English unless specifically included as a line item on the purchase order, and the purchaser agrees to make such translations available whenever required/requested.

ARTICLE 11: PRICES

All prices are in U.S. dollars and are based on Delivery as stated above. Prices do not include any charges for services such as insurance; brokerage fees; sales, use, inventory or excise taxes; import or export duties; special financing fees; VAT, income or royalty taxes imposed outside the U.S.; consular fees; special permits or licenses; or other charges imposed upon the production, sale, distribution, or delivery of Products. Buyer will either pay any and all such charges or provide McCrometer with acceptable exemption certificates, which obligation survives performance under this Contract. Buyer is prohibited from setting off any and all monies owed under this from any other sums, whether liquidated or not, that are or may be due Buyer, which arise out of a different transaction with McCrometer or any of its affiliates

ARTICLE 12: FORCE MAJEURE

McCrometer is excused from performance of obligations under this Contract to the extent caused by acts or omissions that are beyond its control, including but not limited to Government embargoes, blockages, seizures or freeze of assets, delays or refusals to grant an export or import license or the suspension or revocation thereof, or any other acts of any Government; fires, floods, severe weather conditions, or any other acts of God; quarantines; labor strikes or lockouts; riots; strife; insurrections; civil disobedience or acts of criminals or terrorists; war; material shortages or delays in deliveries to McCrometer by third parties. In the event of the existence of any force majeure circumstances, the period of time for delivery, payment terms and payments under any letters of credit will be extended for a period of time equal to the period of delay. If the force majeure circumstances extend for six months, McCrometer may, at its option, terminate this Contract without penalty and without being deemed in default or in breach thereof.

ARTICLE 13: STANDARD WARRANTY; WARRANTY PERIOD

Unless a particular product has a different Warranty Period in its documentation, McCrometer warrants that the equipment or services supplied will be free from defects in material, and workmanship for a period 12 months from the date the equipment was first installed, but in no event longer than 18 months from the date the equipment was first shipped by McCrometer. Repairs shall be warranted for 12 months or, if the repair is performed under this warranty, for the remainder of the original warranty period, whichever is less. Buyer shall report any claimed defect in writing to McCrometer immediately upon discovery and in any event, within the warranty period. McCrometer shall, at its sole option, repair the equipment or furnish replacement equipment or parts thereof, at the original delivery point. McCrometer shall not be liable for costs of removal, reinstallation, or gaining access. If Buyer or others repair, replace, or adjust equipment or parts without McCrometer prior written approval, McCrometer is relieved of any further obligation to Buyer under this Article with respect to such equipment.

No equipment furnished by McCrometer shall be deemed to be defective by reason of normal wear and tear, failure to resist erosive or corrosive action of any fluid or gas (unless otherwise specified in Quotations/ Purchase Order Specifications), Buyer's direct or indirect failure (or the failure of its agents or contractors) to properly store, install, operate, or maintain the equipment in accordance with good industry practices or specific recommendations of McCrometer, or Buyer's failure to provide complete and accurate information to McCrometer concerning the operational application of the equipment.

THE FOREGOING LIMITED WARRANTIES WITH RESPECT TO EQUIPMENT AND PRODUCTS ARE EXCLUSIVE AND IN LIEU OF ANY AND ALL OTHER WARRANTIES OF QUALITY OR PERFORMANCE, EXPRESS, IMPLIED OR STATUTORY, INCLUDING, WITHOUT LIMITATION, ANY AND ALL WARRANTIES OF MERCHANTABILITY OR FITNESS OF SAID EQUIPMENT AND PRODUCTS FOR ANY PARTICULAR PURPOSE. MCCROMETER DISCLAIMS ANY WARRANTY, WHETHER EXPRESS OR IMPLIED, REGARDING THE SUITABILITY OF PRODUCTS AND EQUIPMENT SUPPLIED PURSUANT TO ANY PURCHASE ORDER FOR INSTALLATION IN ANY PARTICULAR SYSTEM OF SYSTEMS. MCCROMETER MAKES NO WARRANTY OF ANY KIND WITH RESPECT TO ANY SERVICES PERFORMED BY MCCROMETER OR ITS AGENTS PURSUANT TO ANY QUOTATION.

McCrometer does not authorize any person or entity (including, without limitation, McCrometer agents and employees) to make any representations (verbal or written) contrary to the terms of this limited warranty or its exclusions. Such terms of this limited warranty and its exclusions can only be effectively modified in writing and only by the President of McCrometer.

ARTICLE 14: TECHNICAL DOCUMENTS; RESPONSIBILITIES OF PARTIES

Technical documents furnished to Buyer, such as drawings, descriptions, designs and the like, shall be deemed provided on a confidential basis, shall remain McCrometer's exclusive property, shall not be provided in any way to third parties, and shall only be used by Buyer for purposes of installation, operation and maintenance of the products sold by McCrometer. Technical documents submitted in connection with a Quotation that does not result in Purchase Order shall be returned to McCrometer if requested.

Documentation Approvals: As documentation approvals (drawings, procedures, etc.) are critical in McCrometer's ability to meet the Delivery Date, each party agrees to the dates below. Delays by Buyer in the return of documentation approvals will result in an equitable

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extension of the Delivery Date.

McCrometer to Provide to Buyer: McCrometer shall provide to Buyer Key Engineering Documents that affect the design and manufacturing of the Goods, such as: general arrangement drawings; flow sizings/calculations; inspection test plans; welding procedures, etc. Seller is to provide Key Engineering Documents to Buyer within two (2) calendar weeks from the acceptance of a valid Purchase Order.

Buyer to provide to McCrometer: Buyer is to comment and/or approve the Key Engineering Documents within two (2) calendar weeks of submission to Buyer by McCrometer. If the Key Engineering Documents are commented on by Buyer, McCrometer is to provide revised (incorporating Buyers comments) Key Engineering Documents to Buyer within five (5) business days. All further comment/approvals and resubmissions are to be completed within five (5) business days of submission by the other Party.

Witnessed Tests: If witnessed testing is required, the Buyer shall provide such witnesses in a timely manner so as not to cause a delay in the Delivery Date. Buyer shall provide their witness within ten (10) business days of Seller's notice of inspection.

ARTICLE 15: INDEMNIFICATION

Indemnification applies to a party and to such party's successors-in-interest, assignees, affiliates, directors, officers, and employees ("Indemnified Parties"). McCrometer is responsible for and will defend, indemnify and hold harmless the Buyer Indemnified Parties against all losses, claims, expenses or damages which may result from accident, injury, damage, or death due to McCrometer's breach of the Warranty herein, or its negligence or willful misconduct. This indemnification is provided on the condition that the Buyer is likewise responsible for and will defend, indemnify and hold harmless the McCrometer Indemnified Parties against all losses, claims, expenses or damages which may result from accident, injury, damage, or death due to the negligence, omissions, or willful misconduct of the Buyer, or the misuse or misapplication of any goods or services sold by McCrometer to by the Buyer or any third party affiliated or in privity with Buyer.

ARTICLE 16: LIMITATION OF LIABILITY

McCrometer's only liability under any purchase order shall be to repair or replace equipment and parts which are found to be defective within the applicable warranty period, or, at McCrometer's option, refund the purchase price of such equipment or parts. Mccrometer's maximum liability shall not exceed the purchase order amount of such defective equipment or part, and any liability of McCrometer shall terminate upon the expiration of the warranty period, if not sooner terminated. In no event shall McCrometer be liable to buyer for any incidental, consequential, indirect, special or punitive damages, whether pursuant to contract, in tort, or based upon negligence or strict liability, including but not limited to, damages for loss of profits or revenue, loss of use of the equipment or any associated equipment used by buyer in connection therewith, lost goodwill, costs of substitution or replacement, costs of any delay or inability to operate the equipment, work stoppage, environmental damage, nuclear incident, loss by reason of shutdown or non-operation, increased expenses of operation, cost of purchase of replacement power or claims of buyer or BUYER's customers for service interruption or other damages suffered by buyer or its customers. In no event shall McCrometer be liable to buyer for any damages whatsoever resulting from the failure of any system or systems in which McCrometer's products are installed.

Buyer shall defend, indemnify, release and hold harmless McCrometer, its directors, officers, employees, agents, representatives, successors and assigns, whether acting in the course of their employment or otherwise, against any and all suits, actions, or proceedings, at law or in equity, and from any and all claims, demands, losses, judgments, fines, penalties, damages, costs, expenses, or liabilities (including, without limitation, claims for personal injury or property or environmental damage) arising from any act or omission of McCrometer, its agents, employees, or subcontractors, or from McCrometer's participation in any legal proceeding alleging the failure or in-operation of a system in which McCrometer's products were installed, in either case except to the extent attributable to the sole negligence of McCrometer. Buyer further agrees to indemnify McCrometer for any reasonable attorneys' fees or other costs that McCrometer incurs in the event that McCrometer has to take legal action to enforce any indemnity provision hereunder.

ARTICLE 17: SITE ACCESS; PREPARATION; WORKER SAFETY; ENVIRONMENTAL COMPLIANCE

In connection with services provided by McCrometer, Buyer agrees to permit prompt access to equipment. Buyer assumes full responsibility to back-up or otherwise protect its data against loss, damage or destruction before services are performed. Buyer is the operator and in full control of its premises, including those areas where McCrometer employees or contractors are performing service, repair and maintenance activities. Buyer will ensure that all necessary measures are taken for safety and security of working conditions, sites and installations during the performance of services. Buyer is the generator of any resulting wastes, including without limitation hazardous wastes. Buyer is solely responsible to arrange for the disposal of any wastes at its own expense. Buyer will, at its own expense, provide McCrometer employees and contractors working on Buyer's premises with all Personal Protective Equipment (PPE) and information and training required under applicable safety compliance regulations and Buyer's policies. In the event that a Buyer requires McCrometer employees or contractors to attend safety or compliance training programs provided by Buyer, Buyer will pay McCrometer the standard hourly rate and expense reimbursement for such training attended. The attendance at or completion of such training does not create or expand any warranty or obligation of McCrometer and does not serve to alter, amend, limit or supersede any part of this Contract.

If the instrument to be serviced is in a Confined Space, as that term is defined under OSHA regulations, Buyer is solely responsible to insure that the all safety and emergency services are available and in place prior to a McCrometer technician entering the confined space. Safety requirement for confined spaces shall include testing for gas and toxins in the confided space, as well as proper ventilation.

ARTICLE 18: PROPRIETARY INFORMATION

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"Proprietary Information" means any information, technical data or know-how in whatever form, whether documented, contained in machine readable or physical components, mask works or artwork, or otherwise, which McCrometer considers proprietary, including but not limited to service and maintenance manuals. Buyer and its customers, employees and agents will keep confidential all such Proprietary Information obtained directly or indirectly from McCrometer and will not transfer or disclose it without McCrometer's prior written consent, or use it for the manufacture, procurement, servicing or calibration of Products or any similar products, or cause such products to be manufactured, serviced or calibrated by or procured from any other source, or reproduce or otherwise appropriate it. All such Proprietary Information remains McCrometer's property. No right or license is granted to Buyer or its customers, employees or agents, expressly or by implication, with respect to the Proprietary Information or any patent right or other proprietary right of McCrometer, except for the limited use licenses implied by law.

ARTICLE 19: INSOLVENCY

McCrometer may immediately cancel all or part of any Purchase Order, without any liability, in the event of: (a) Buyer's insolvency; (b) Buyer's filing of a voluntary petition in bankruptcy; © the filing of an involuntary petition to have Buyer declared bankrupt provided it is not vacated within ninety (90) days from the filing date; (d) the appointment of a receiver or trustee for Buyer provided such appointment is not vacated within ninety (90) days from the appointment date; or € Buyer's assignment for the benefit of creditors.

ARTICLE 20: LAW AND ARBITRATION

The law of the State of California shall govern the Contract. The Company, in its sole and absolute discretion, shall have the right to decide whether any disputes arising out of this Contract shall be resolved by binding arbitration in Riverside County, California, U.S.A., administered by the American Arbitration Association in accordance with its Commercial Arbitration Rules, including the Option Rules for Emergency Measure of Protection, and judgment on the award rendered by the arbitrator(s) shall be final and binding upon the parties and may be entered in any court having jurisdiction thereof. The language of the arbitration shall be English. The arbitrators are not entitled to award damages in excess of original Purchase Order price as said above in Articles 13 and 16.

Subject to the Company's discretion regarding arbitration set forth above, the parties agree that all actions or proceedings arising in connection with this Agreement shall be tried and litigated only in the courts of the State of California or courts of the United States of America sitting within the State of California. Each party irrevocably accepts for itself and in respect of its or his property, generally and unconditionally, the jurisdiction of such courts. Each party irrevocably consents to the service of process out of any such courts in any such action or proceeding by the mailing of copies thereof in accordance with this Agreement, such service to become effective ten (10) days after such mailing. Nothing in this Agreement shall affect the right of any party to service of process in any other manner permitted by law. Each party irrevocably waives any right it or he may have to assert the doctrine of forum non conveniens or to object to venue to the extent any proceeding is brought in accordance with the provisions of this Article 20.

ARTICLE 21: WAIVER

Any failure of McCrometer to enforce at any time any of the provisions, rights or remedies of this agreement, to exercise any election or option provided herein, or to require at any time performance by Buyer of any of the provisions hereof, shall in no way be construed to be a waiver of such provisions, rights or remedies, nor in any way construed to affect the validity or enforceability of this agreement, or any part thereof, or the right of McCrometer thereafter to enforce each and every such provision, right or remedy.

ARTICLE 22: SEVERABILITY

In the event that any of the provisions of the Purchase Order or these standard terms and conditions shall be held by a court or other tribunal of competent jurisdiction to be invalid or unenforceable, the remaining portions of such Purchase Order and these standard terms and conditions shall remain in full force and effect, provided that in such event the parties agree to negotiate in good faith substitute enforceable provisions which most nearly affect the intent of the parties in entering into the Purchase Order and these standard terms and conditions. Provided, however, that if the parties are unable to agree upon a replacement provision which most nearly reflects the intent of the parties in entering into the Purchase Order and these standard terms and conditions, any provision of the Purchase Order or these standard terms and conditions prohibited by law or otherwise held invalid or unenforceable shall be ineffective only to the extent of such prohibition, invalidity, or unenforceability, and shall not invalidate or otherwise render ineffective or unenforceable any other terms, conditions, provisions or covenants of the Purchase Order and these standard terms and conditions.

ARTICLE 23: FURTHER ASSURANCES

Each of the parties, without further consideration, shall perform in good faith such other acts, execute and deliver such other documents, and take such other action as may be reasonably required by the parties hereto to carry out the purpose or subject matter hereof. Nothing herein shall be deemed to render McCrometer and Buyer joint venturers or partners of any sort.

ARTICLE 24: EXPENSES

If the Company shall commence legal proceedings against Buyer with respect to the terms, conditions or provisions hereof, including, without limitation, McCrometer's collection of any sums arising or due hereunder or under any agreement between McCrometer and Buyer, Buyer, if Buyer is the nonprevailing party, shall pay to the Company all expenses of said proceedings, including, without limitation,

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reasonable attorneys' fees and related costs, including costs of enforcement of any judgment rendered in said proceedings. In no event shall the Company be liable to Buyer for any expenses of any proceedings, including, without limitation, reasonable attorneys' fees and related costs, including costs of enforcement of any judgment rendered in said proceedings, whether the Company is the nonprevailing party or otherwise. In addition, Buyer shall pay to McCrometer all costs and expenses, including reasonable attorneys' fees, incurred by McCrometer in connection with responding or participating in discovery in any legal proceeding, whether or not McCrometer is a party to such action.

ARTICLE 25: SUCCESSORS AND ASSIGNS

This agreement shall inure to the benefit of and be binding upon the parties hereto and their respective successors and assigns; provided, however, that Buyer shall not transfer, sell, assign, pledge or encumber any of its rights, interests, or obligations hereunder without the prior consent of McCrometer. For purposes of the foregoing, a transfer of Buyer's rights, duties and obligations hereunder shall be deemed to have occurred if (1) Buyer is party to a merger in which it is not the surviving entity, or (2) 50% or more of Buyer's voting securities are transferred in one transaction or a series of related transactions.

ARTICLE 26: NOTICE

Any notice required or permitted under this Agreement shall be given in writing and shall be deemed effectively given upon personal delivery to the party to be notified (or upon the date of attempted delivery where delivery is refused) or, if sent by telecopier, telex, telegram, or other facsimile means, upon receipt of appropriate electronic confirmation of successful transmission, or five days after deposit with the United States Postal Service, by registered or certified mail, or one day after deposit with next day air courier, with postage and fees prepaid and addressed to the party entitled to such notice at the address of the receiving party as designated in the applicable Purchase Order which is the subject of such notice or demand, or at such other address as such party may designate by ten days advance written notice to the other parties to this Agreement.

ARTICLE 27: ANTI-CORRUPTION

Buyer will comply with all local, national, and other laws of all jurisdictions globally relating to anti-corruption, bribery, extortion, kickbacks, or similar matters which are applicable to Buyer's business activities in connection with this Agreement, including but not limited to the U.S. Foreign Corrupt Practices Act of 1977, as amended (the "FCPA"). Buyer agrees that no payment of money or provision of anything of value will be offered, promised, paid or transferred, directly or indirectly, by any person or entity, to any government official, government employee, or employee of any company owned in part by a government, political party, political party official, or candidate for any government office or political party office to induce such organizations or persons to use their authority or influence to obtain or retain an improper business advantage for Buyer or for McCrometer, or which otherwise constitute or have the purpose or effect of public or commercial bribery, acceptance of or acquiescence in extortion, kickbacks or other unlawful or improper means of obtaining business or any improper advantage, with respect to any of Buyer's activities related to this Agreement.

SECTION II: TERMS OF CONDITIONS FOR SUBSCRIBER LICENSE AND DATA DELIVERY SERVICES
(All prior Articles are incorporated herein by reference to the extent they are applicable)

ARTICLE 28: TERMS AND CONDITIONS

These "Terms and Conditions" mean collectively, the terms and conditions contained herein. Any Terms and Conditions originating with Customer are superseded by these Terms and Conditions and shall not be or become part of the contract between McCrometer and Customer unless specifically accepted in a writing signed by a duly authorized officer of McCrometer. McCrometer's commencement of work shall not be construed as acceptance of an order from Customer containing additional or different terms and conditions. McCrometer shall have no liability to Customer of any nature until Customer signs and delivers to the McCrometer the Service Order Form.

ARTICLE 29: LIMITED LICENSE

McCrometer grants to Customer during the term hereof a non-exclusive, non-transferable, non-sublicensable, limited, revocable license to access Customer's Web Page when hosted through McCrometer's network, solely for (a) Customer's internal business operations and (b) accessing Customer Data retrieved from Customer's Monitoring Sites. McCrometer grants no rights other than those granted explicitly herein and reserves and retains for itself and/or its licensors all title, copyright and other proprietary rights in the Data Delivery Services and Customer's Web Page, including all updates, custom modifications and derivatives, all of which shall become the property of McCrometer.

ARTICLE 30: FEES; PAYMENTS; TAXES

Customer shall pay all Fees specified in US dollars. Except as provided below, Fees are non-refundable.

Data delivery and hosting services may be invoiced in the following manner:

Monthly Plan: invoiced in advance;
Annual Plan: invoiced in advance;
Satellite Plans: invoiced in arrears based on actual usage; or
Any other terms specifically stated in the Order.

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McCrometer shall invoice Customer as per above and Customer shall pay McCrometer fees for the Services in the amount and on the following terms, free and clear of, and without any reduction for, any and all taxes (the "Fees"). Fees are due thirty (30) days from the invoice date. Delinquent payments shall bear interest at the rate of one and one half percent (1.5%) per month (or the highest rate permitted by law, if less) from the payment due date until paid in full. Payments may be applied first against interest and collection costs and then Fees. Customer agrees to pay all late charges imposed and all reasonable expenses (including attorneys' fees) incurred by McCrometer in collecting unpaid or delinquent amounts.

If Customer's account is thirty (30) or more days overdue, in additional to any of its other rights and remedies, McCrometer may suspend Customer's access to the Data Delivery Services without liability to Customer. Customer shall pay any taxes, including sales, use, personal property, value-added, excise, customs fees, import duties or stamp duties or other taxes and duties imposed by governmental agencies of whatever kind with respect to the Services, including penalties and interest, but specifically excluding taxes based upon McCrometer's net income. When McCrometer has the legal obligation to pay or collect such taxes, the appropriate amount shall be invoiced to and paid by Customer unless Customer provides McCrometer original or certified copies of all tax payments or other evidence of payment of taxes by Customer.

ARTICLE 31: ACCEPTABLE USE

McCrometer may, in its sole discretion, restrict, suspend, refuse access and/or terminate the access should McCrometer learn of any violation. Customer shall conform to and comply with all applicable laws, rules, regulations, orders and other governmental requirements, now or hereafter in force, related to the Services.

ARTICLE 32: TERM AND TERMINATION

This Agreement is effective on the date set forth in the Proposal, and shall continue for the term set forth therein. After the initial term, this Agreement shall continue on a month-to-month basis at McCrometer's then current applicable rates unless terminated by either party upon thirty (30) days written notice to the other party given prior to the expiration of the applicable term. Either party may terminate this Agreement in the event the Data Delivery Services are not accessible by Customer at least ninety-five (95%) percent of the time during three (3) consecutive months of any term. Should McCrometer contract with third parties for the provision of Services to Customer, the term shall continue for the length of any such third party contracts. Except as otherwise provided for herein, either party may terminate this Agreement upon the material breach of the other party, if such breach remains uncured for thirty (30) days following written notice to the breaching party. The foregoing notwithstanding, McCrometer may terminate immediately upon Customer's breach of Sections 28, 29, 30, 33 or 34.

Upon any termination of this Agreement, all rights to access the Data Delivery Services and Customer's Web Page terminate. McCrometer shall have no obligation to refund to Customer any Fees and any unpaid Fees shall immediately be due and payable upon termination. The foregoing notwithstanding, should either party terminate due to the unavailability of the Data Delivery Services as provided in this Section 5 above, Customer shall not be obligated to pay Fees for the pertinent months and if already paid, McCrometer agrees to refund to Customer Fees paid during the period of unavailability. The foregoing shall be McCrometer's sole obligation and Customer's exclusive remedy. McCrometer may destroy all backup and stored Customer Data within thirty (30) days of the expiration or termination of this Agreement. Termination of this Agreement for cause shall not limit McCrometer from pursuing other remedies available to it, including equitable relief, nor shall such termination relieve Customer of its payment obligations hereunder.

ARTICLE 33: OWNERSHIP OF WEBPAGE, DATA DELIVERY SERVICES AND INTELLECTUAL PROPERTY

The Customer's Web Page (when hosted by McCrometer), Data Delivery Services, including all Intellectual Property Rights therein, created or developed under this Agreement are, will be and remain the sole and exclusive property of McCrometer and/or its licensors or suppliers. For purposes herein, "Intellectual Property Rights" shall mean any and all now known or hereafter known tangible and intangible (A) rights associated with works of authorship throughout the universe, including but not limited to copyrights, moral rights, and mask-works; (B) trademark and trade name rights and similar rights; © trade secret rights; (D) all Data Delivery Services data, content, software, text, typefaces, graphics, logos, button icons, images, interfaces, audio and video chips/files, designs, illustrations, photographs, configurations, displays, screens, concepts and other materials or information appearing on, displayed in connection with, embodied in, contained within or relating to Data Delivery Services and Customer's Web Page including selection and arrangement of materials therein and "look and feel" thereof (but excluding Customer Data); € patents, designs, algorithms and other industrial property rights; and (F) all other intellectual and industrial property rights, whether arising by operation of law, contract, license, or otherwise. Neither Customer, its employees, Administrator, Authorized Users nor agents shall assert or claim any ownership interest in the Services, the Flowmeter Equipment, Data Delivery Services, or Customer's Web Page. Customer further agrees to assist McCrometer in every reasonable way to obtain and enforce all Intellectual Property Rights relating to the Flowmeter Equipment, Data Delivery Services or Customer's Web Page.

ARTICLE 34: NON-DISCLOSURE OF INFORMATION

Customer Data is confidential and proprietary information to Customer. McCrometer acknowledges that it will have access to Customer Data in the course of providing the Services and agrees to hold Customer Data in confidence and not to release or give access to Customer Data to any third party unless such individual or entity has a need for such knowledge to perform Services in the furtherance of this Agreement. McCrometer further agrees not to make use of Customer Data for its own benefit or for the benefit of any third parties, other than for the performance of this Agreement. Notwithstanding the foregoing, McCrometer may retain Customer Data for the purpose of

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analysis and research and to aggregate it with that of other McCrometer customers for statistical analysis, trends or other industry-related purposes so long as such use does not result in the identification of Customer.

The flow meter equipment and all components thereof, such as data transmitting registers, antennae, related software and documentation, Data Delivery Services technology and architecture, terms of this Agreement, Service Order Form including pricing, and any information that comes into Customer's possession of knowledge in connection with McCrometer's processes, methods, equipment, architecture, formulae, financial information, forecasts or marketing and sales information (collectively "McCrometer Confidential Information") consists of confidential and proprietary information of McCrometer, its affiliates, licensors, or third parties. Customer agrees to hold McCrometer Confidential Information in confidence and agrees not to release such information to any individual whether employee, subcontractor or subcontractor employee, customer unless such individual has a need for such knowledge either during the term or after the termination of this Agreement. Customer further agrees not to make use of McCrometer Confidential Information for its own benefit or for the benefit of any third parties other than as specifically required in the performance of this Agreement.

The above limits on disclosure do not include information which (A) is or becomes known publicly through no fault of a party; (B) is learned by a party from a third party entitled to disclose it; © is already known to a party before receipt from the disclosure; or (D) is independently developed by a party.

In the event of any breach of these confidentiality obligations, each party acknowledges that the non-breaching party would be irreparably injured and shall be entitled to seek equitable relief, including injunctive relief and specific performance, in any court of competent jurisdiction. Such remedies shall not be deemed to be the exclusive remedies for a breach of this Agreement.

Upon termination of this Agreement, such Confidential Information shall, upon request of the party who disclosed the information, be returned thereto. The party receiving and returning such Confidential Information may make one copy for its own files before returning the information to the disclosing party. The terms of this Section shall survive the termination of this Agreement.

ARTICLE 35: REPRESENTATIONS AND WARRANTIES

McCrometer warrants that the Services will be performed in a professional and workmanlike manner and will be of a quality conforming to general standards of care.

CUSTOMER'S EXCLUSIVE REMEDY AND MCCROMETER'S ENTIRE LIABILITY FOR ANY BREACH OF THIS WARRANTY SHALL BE RE-PERFORMANCE OF THE SPECIFIC NONCONFORMING SERVICE. MCCROMETER MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Customer for itself and on behalf of its Administrator and each Authorized Customer User represents and warrants to McCrometer that:
(A) It owns or has the right to permit McCrometer to access its Monitoring Sites and surrounding areas for installation, maintenance and retrieval of the Data Delivery Equipment.
(B) Customer, its Administrator and Authorized Customer Users shall comply with all terms and conditions and policies for use of the Data Delivery Services. Customer shall and hereby does defend, indemnify and hold McCrometer and its suppliers and licensors harmless from and against any and all claims, losses, damages, liabilities, obligations, judgments, causes of action, costs, charges and expenses (including without limitation, reasonable attorneys' and consultants' fees and such fees and penalties as any third party licensors may impose) arising out of or in connection with: (i) any breach of this Agreement by Customer and/or its Authorized Customer Users; (ii) any civil and/or criminal suit alleging that McCrometer had no right or authority to access the Monitoring Sites; (iii) any Customer and/or Authorized User negligence, recklessness or willful misconduct; or (iv) any violation of, or non-compliance with laws. Customer's obligations under this Section do not apply to the extent that claims are directly caused by the gross negligence of McCrometer.

ARTICLE 36: LIMITATION OF LIABILITY

IN NO EVENT SHALL MCCROMETER, ITS SUPPLIERS, LICENSORS OR SUBCONTRACTORS BE LIABLE TO CUSTOMER OR ANY THIRD PARTY FOR ANY INDIRECT, INCIDENTAL, SPECIAL, PUNITIVE OR CONSEQUENTIAL DAMAGES, OR DAMAGES FOR LOSS OF PROFITS, REVENUE, CORRUPT DATA OR USE, LOSS OF CUSTOMER DATA, CORRUPT OR UNAVAILABLE CUSTOMER DATA, LOSS OF USE OF CUSTOMER DATA, LOST OPPORTUNITY, TRANSACTION LOSSES, OPPORTUNITY COSTS, INTERRUPTION OF BUSINESS OR COSTS OF PROCURING SUBSTITUTE GOODS OR SERVICES OR FOR INTERRUPTED COMMUNICATIONS ARISING OUT OF OR IN CONNECTION WITH THIS AGREEMENT, THE SERVICES, THE FLOWMETER EQUIPMENT, DATA DELIVERY SERVICES OR CUSTOMER'S WEB PAGE AND INCURRED BY CUSTOMER OR ANY THIRD PARTY, WHETHER IN AN ACTION IN CONTRACT, WARRANTY, TORT OR STRICT LIABILITY, EVEN IF MCCROMETER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.THE FOREGOING NOTWITHSTANDING, IN NO EVENT SHALL MCCROMETER'S LIABILITY FOR DAMAGES HEREUNDER TO CUSTOMER EXCEED THE AMOUNT OF FEES ACTUALLY PAID BY CUSTOMER PURSUANT TO THE APPLICABLE SERVICE ORDER UNDER THIS AGREEMENT FOR THE SIX (6) MONTH PERIOD PRIOR TO THE CLAIM GIVING RISE TO THE LIABILITY. CUSTOMER HEREBY INDEMNIFIES, HOLDS HARMLESS AND AGREES TO DEFEND McCrometer AGAINST ANY THIRD PARTY CLAIM.

THE FOREGOING LIMITATION OF LIABILITY SHALL BE ENFORCEABLE TO THE MAXIMUM EXTENT PERMITTED BY LAW. THE FOREGOING DISCLAIMERS AND LIMITATIONS SHALL SURVIVE TERMINATION OR EXPIRATION OF THIS AGREEMENT.

ARTICLE 37: GENERAL

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a. As between themselves, the parties are independent contractors with no authority to contract for or in any way to bind or to commit the other to any agreement of any kind or to assume any liabilities of any nature in the name of or on behalf of the other.

B. Neither this Agreement nor any license granted hereunder may be assigned by Customer without the prior written consent of McCrometer which may be withheld for any reason and any such assignment is void.

C. The captions are for convenience and in no way define, limit or enlarge the scope of this Agreement or any of its Sections.

D. Customer agrees to comply fully with all relevant export laws and regulations of the United States to assure that neither the McCrometer Intellectual Property Rights nor any direct product thereof are (a) exported directly or indirectly, in violation thereof; or (b) are intended to be used for any purposes prohibited thereby.

E. Any claim by a Customer arising out of or in connection with this Agreement shall be brought within one (1) year of the date on which the claim first arose. In the event any legal action is taken by either party to enforce the terms of this Agreement, the non-prevailing party shall pay all related court costs and expenses, including without limitation, the prevailing party's reasonable consultants' and attorneys' fees.

F. In dealings between McCrometer and Customer, McCrometer shall be entitled to rely upon any assent by a person using its assigned Password and User ID.

END OF DOCUMENT.

162053 McCrometer, Inc. • 3255 West Stetson Avenue, Hemet, CA 92545, USA
Tel (951) 652-6811 • Fax (951) 652-3078 • Website: http://www.mccrometer.com

MCR Technologies, Inc.
Measurement, Control & Recording

ABB

Account Name	City of Beaumont	Quote Number	00002402
Contact Name	Grace Wichert	Reference	ABB Mag Meters
Prepared By	Kyle Finney	Created Date	3/6/2023
Phone	(949) 333-9277	Expiration Date	4/28/2023
Email	kylef@mcrt.com	F.O.B.	Factory
		Lead Time	15+ weeks
		Freight Terms	Prepay & Add
		Manufacturer	ABB

Product	Product Description	Quantity	Sales Price	Total Price
FEW325.200.A.1.S.4.A1. B.1.A.1.A.4.P.2.B. 3.A.1-.JB..M5V3.. T3	ABB WaterMaster FEW325 Electromagnetic Flowmeter system, full bore, remote mount. - Bore Diameter 200 DN 200 (8 in.) - Liner Material A PTFE - Electrode Design 1 Standard - Measuring Electrodes Material S Stainless steel 316 - Grounding Accessories 4 2x Potential Equalizing Rings (Stainless Steel - Process Connection Type A1 Flanges ANSI / ASME B16.5 / 16.47 series B Class 150 - Process Connection Material B Carbon steel - Usage Certifications 1 Standard (without PED) - Calibration Type A Standard factory calibration - Temperature Range of Installation / Ambient 1 Standard design / -20 ... 60 ° (-4 ... 140 °) Temperature Range - Name Plate A Adhesive label - Signal Cable Length and Type 4 30 m (approx. 100 ft) cable - Explosion Protection Certification P usFMc Div. 2 - Protection Class Transmitter / Protection Class Sensor 2 IP 67 (NEMA 4X) / IP 68 (NEMA 6P), cable not fitted and not potted, sensor is IP67 with PTFE liner - Cable Conduits B NPT 1/2 in. - Power Supply 3 100 ... 230 V AC, 60 Hz - Input and Output Signal Type A HART + 20 mA + Pulse + Contact output - Configuration Type / Diagnostics Type 1 Parameters set to factory defaults / Standard diagnostic functions activated - Lay Length JB ISO Lay Length - Documentation Language M5 English (standard) - Verification Type V3 VeriMaster - Number of Testpoints T3 3 Points	4.00	$4,045.00	$16,180.00
	ABB WaterMaster FEW325 Electromagnetic Flowmeter system, full bore, remote mount. - Bore Diameter 250 DN 250 (10 in.) - Liner Material A PTFE - Electrode Design 1 Standard - Measuring Electrodes Material S Stainless steel 316 - Grounding Accessories 4 2x Potential Equalizing Rings (Stainless Steel			

FEW325.250.A.1.S.4.A1. B.1.A.1.A.4.P.2.B. 3.A.1-.JB..M5V3..T3	- Process Connection Type A1 Flanges ANSI / ASME B16.5 / 16.47 series B Class 150 - Process Connection Material B Carbon steel - Usage Certifications 1 Standard (without PED) - Calibration Type A Standard factory calibration - Temperature Range of Installation / Ambient 1 Standard design / -20 ... 60 ° (-4 ... 140 °) Temperature Range - Name Plate A Adhesive label - Signal Cable Length and Type 4 30 m (approx. 100 ft) cable - Explosion Protection Certification P usFMc Div. 2 - Protection Class Transmitter / Protection Class Sensor 2 IP 67 (NEMA 4X) / IP 68 (NEMA 6P), cable not fitted and not potted, sensor is IP67 with PTFE liner - Cable Conduits B NPT 1/2 in. - Power Supply 3 100 ... 230 V AC, 60 Hz - Input and Output Signal Type A HART + 20 mA + Pulse + Contact output - Configuration Type / Diagnostics Type 1 Parameters set to factory defaults / Standard diagnostic functions activated - Lay Length JB ISO Lay Length - Documentation Language M5 English (standard) - Verification Type V3 VeriMaster - Number of Testpoints T3 3 Points	2.00	$4,748.00	$9,496.00
FEW325.300.A.1.S.4.A1. B.1.A.1.A.4.P.2. B.3.A.1-.JB..M5V3..T3	ABB WaterMaster FEW325 Electromagnetic Flowmeter system, full bore, remote mount. - Bore Diameter 300 DN 300 (12 in.) - Liner Material A PTFE - Electrode Design 1 Standard - Measuring Electrodes Material S Stainless steel 316 - Grounding Accessories 4 2x Potential Equalizing Rings (Stainless Steel - Process Connection Type A1 Flanges ANSI / ASME B16.5 / 16.47 series B Class 150 - Process Connection Material B Carbon steel - Usage Certifications 1 Standard (without PED) - Calibration Type A Standard factory calibration - Temperature Range of Installation / Ambient 1 Standard design / -20 ... 60 ° (-4 ... 140 °) Temperature Range - Name Plate A Adhesive label - Signal Cable Length and Type 4 30 m (approx. 100 ft) cable - Explosion Protection Certification P usFMc Div. 2 - Protection Class Transmitter / Protection Class Sensor 2 IP 67 (NEMA 4X) / IP 68 (NEMA 6P), cable not fitted and not potted, sensor is IP67 with PTFE liner - Cable Conduits B NPT 1/2 in. - Power Supply 3 100 ... 230 V AC, 60 Hz - Input and Output Signal Type A HART + 20 mA + Pulse + Contact output - Configuration Type / Diagnostics Type 1 Parameters set to factory defaults / Standard diagnostic functions activated - Lay Length JB ISO Lay Length - Documentation Language M5 English (standard)	4.00	$5,451.00	$21,804.00

	- Verification Type V3 VeriMaster - Number of Testpoints T3 3 Points			
FEW325.350.A.1.S.4.A1. B.1.A.1.A.4.P.2.B.3 .A.1-.JB..M5V3..T3	ABB WaterMaster FEW325 Electromagnetic Flowmeter system, full bore, remote mount. - Bore Diameter 350 DN 350 (14 in.) - Liner Material A PTFE - Electrode Design 1 Standard - Measuring Electrodes Material S Stainless steel 316 - Grounding Accessories 4 2x Potential Equalizing Rings (Stainless Steel - Process Connection Type A1 Flanges ANSI / ASME B16.5 / 16.47 series B Class 150 - Process Connection Material B Carbon steel - Usage Certifications 1 Standard (without PED) - Calibration Type A Standard factory calibration - Temperature Range of Installation / Ambient 1 Standard design / -20 ... 60 ° (-4 ... 140 °) Temperature Range - Name Plate A Adhesive label - Signal Cable Length and Type 4 30 m (approx. 100 ft) cable - Explosion Protection Certification P usFMc Div. 2 - Protection Class Transmitter / Protection Class Sensor 2 IP 67 (NEMA 4X) / IP 68 (NEMA 6P), cable not fitted and not potted, sensor is IP67 with PTFE liner - Cable Conduits B NPT 1/2 in. - Power Supply 3 100 ... 230 V AC, 60 Hz - Input and Output Signal Type A HART + 20 mA + Pulse + Contact output - Configuration Type / Diagnostics Type 1 Parameters set to factory defaults / Standard diagnostic functions activated - Lay Length JB ISO Lay Length - Documentation Language M5 English (standard) - Verification Type V3 VeriMaster - Number of Testpoints T3 3 Points	1.00	$6,329.00	$6,329.00

Additional Info	Sales tax, freight, and start up not included.
Subtotal	$53,809.00
Grand Total	$53,809.00

Please issue your purchase order to:

MCR Technologies, Inc.
P.O. Box 80640
RSM, CA 92688-0640

E-mail your purchase order to: orders@mcrt.com or Fax to (949) 783-3101

This quotation is for the products and services listed above only. Any additional products required will be provided at additional cost. Freight charges are an estimate only. Actual freight cost may vary.

Terms included by reference

This quotation is offered subject to ours and the manufacturers terms and conditions. A copy of these conditions is available upon request. MCR Technologies, Inc. is an independent manufacturers representative and distributor.

Delivery

Delivery is based on current lead times and on the longest lead time of all equipment quoted. Actual delivery may vary based on the lead times in effect when the equipment is released for production.

Materials of Construction

We offer a variety of material selections and configurations to suite process conditions. Although we have quoted the materials which were specified, or if not specified, which we believe to be satisfactory, we do not warrant that they are compatible with the chemicals, concentrations and operating conditions which will be encountered in the application. The final selection of the appropriate material is the responsibility of the customer.