



DESCRIPTION

ONICON FT-3000 Series Inline Electromagnetic Flow Meters are suitable for measuring electrically conductive liquids in a wide variety of applications. The FT-3200 provides analog and digital outputs for flow rate and programmable pulse outputs for flow totalization and/or alarms.

APPLICATIONS

- HVAC hydronic applications including chilled water, heating hot water and condenser water
- Bi-directional flow for primary/secondary bypass and thermal storage applications
- Domestic cold and hot water applications
- Clean process flow applications with conductivities greater than 5 $\mu\text{S}/\text{cm}$

CALIBRATION

All FT-3000 series flow meters are wet calibrated in a flow laboratory accordance with ISO 9104:1991 and ISO 17025:2005 that are directly traceable to international standards. A certificate of calibration accompanies every meter.

GENERAL SPECIFICATIONS

PERFORMANCE	
Accuracy	$\pm 0.2\%$ of reading from 1.6 to 33 ft/s ± 0.0033 ft/s at flow rates < 1.6 ft/s
Sensing Method	Electromagnetic sensing (no moving parts)
Minimum Conductivity	5 $\mu\text{S}/\text{cm}$
Fluid Temperature	0°F to 266°F - Based on liner material (Refer to Liner Selection Table)
Fluid Pressure	580 psi - Based on flow body and liner material (Refer to Liner Selection Table)
ELECTRONICS ENCLOSURE	IP67 (NEMA 4X) painted aluminum enclosure with display
Display	16-character, 8-line, 128x64 graphic backlit LCD
Ambient Condition	Transmitter: -4°F to 140°F
PROGRAMMING	Menu driven user interface via three (3) programming keys PC user interface via micro USB and downloadable software
ELECTRICAL CONNECTIONS	
Input Power	Removable terminal blocks for use with 14 - 22 gauge wire
I/O Signals	Removable terminal blocks for use with 18 - 24 gauge wire
FLOW SENSOR DESIGN	
Flow Tube	304 SS
Flow Body	Carbon Steel, Stainless Steel or Polypropylene (Refer to Option Selection for additional information)
Electrodes	Qty: Three (3), round, 316 SS
APPROVALS	
CE	Transmitter: 2014/30/EU and 2014/35/EU LVD EMC Directive Flow Body: E97/23/CE PED Directive
NSF	Flow Body: 61

OPTION SELECTION

INPUT POWER Available Options	Low Power, 24 VAC/DC, 50/60 Hz, 12 VA High Power, 120 - 240 VAC, 50/60 Hz, 12 VA
I/O SIGNAL Available Options	Two (2) digital outputs, one (1) digital input, and one (1) analog output Two (2) digital outputs, one (1) digital input, and two (2) analog output w/ MODBUS RTU (RS485)
ELECTRONICS ENCLOSURE Available Options	Integral mount Remote (wall) mount with 16ft of remote cable* Remote (wall) mount with 32ft of remote cable* Remote (wall) mount with 49ft of remote cable* Remote (wall) mount with 65ft of remote cable* Remote (wall) mount with 100ft of remote cable* *Up to 325 ft in fluids with conductivity $\geq 200 \mu\text{s/cm}$
FLOW BODY Available Options	Carbon Steel Stainless Steel Polypropylene
FLOW LINER Available Options	PTFE Ebonite Polypropylene See Liner Selection Table Below
PROCESS CONNECTIONS Available Options	ANSI Class 150 flanged connections Wafer mount ANSI Class 300 flanged connections

LINER SELECTION TABLE

Material	Line Size Flanged and Wafer	Grade	Color	Temperature Range	Pressure Range Based on Liner	Abrasion Resistance (Carbon Steel = 100)
Ebonite	8 - 48"	Food	Amber	32°F - 175°F	580 psi (1)	90 - 118
Polypropylene	1 - 6"	Food	Gray	32°F - 140°F	232 psi	122
PTFE	1 - 48"	Food	White	0°F - 266°F (3)	580 psi (1,2)	78
Notes	Description					
1	Flanged meter pressure rating is the lesser of 580 psi or the flange rating.					
2	Wafer style meters above 6" are limited to 232 psi.					
3	Remote mount electronics option required for application temperature above 212°F.					

METER ORDERING INFORMATION

GG H I JK L BC D E SPC

Model FT-32

FLOW SENSOR CONFIGURATION INFORMATION

GG = Meter Size (inches)				
Flanged and Wafer Models				
01 = 1"	15 = 1½"	02 = 2"	25 = 2½"	03 = 3"
04 = 4"	05 = 5"	06 = 6"	08 = 8"	10 = 10"
nn = Meter Size, 12 - 48"				

H = Liner Material
1 = PTFE
2 = Polypropylene ¹
3 = Ebonite ²

I = Process Connection
0 = Wafer connection ³
1 = ANSI 150 flanges
3 = ANSI 300 flanges

JK = Body Material
11 = Carbon Steel w/ SS Electrodes
41 = 304 SS w/ SS Electrodes
51 = 316 SS w/ SS Electrodes

L = Electronics Enclosure Mounting Configuration
1 = Integral
2 = Remote

TRANSMITTER CONFIGURATION INFORMATION

BC = Outputs
10 = One (1) AO, two (2) DO and one (1) DI
21 = Two (2) AO, two (2) DO and one (1) DI w/ MODBUS RTU (RS485)

D = Electronics Enclosure
2 = IP67 (NEMA4X) painted Al enclosure w/display

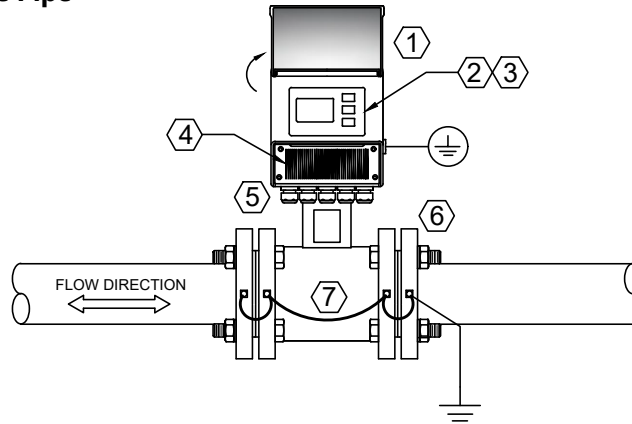
E = Input Power
1 = Low power, 24 VAC/VDC
2 = High power, 120 - 240 VAC

SPC = Special Configurations
101 = 4GB SD Memory, RTC

1. Polypropylene liner available through 6"
2. Ebonite liner available in sizes 8" and larger
3. Wafer connection available for meter sizes 1" – 4"

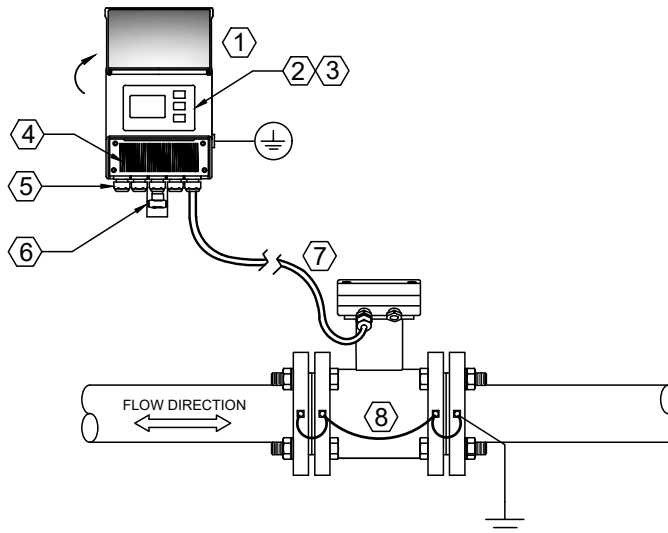
INSTALLATION DETAILS

A. Integral Mount in Conductive Pipe



1. IP67 (NEMA 4X) enclosure with protection cover available in integral or remote mount version
2. 16-Character, 8-Line graphic backlit LCD display
3. Menu driven user interface via three (3) programming keys
4. Wiring connections via pluggable terminal blocks located beneath the front access cover
5. Five (5) threaded conduit/ strain relief openings located at the bottom of the enclosure
6. Process connection available in flanged (ANSI 150 or ANSI 300) or wafer models
7. Flange grounding kit for flanged or wafer versions

B. Remote Mount in Conductive Pipe

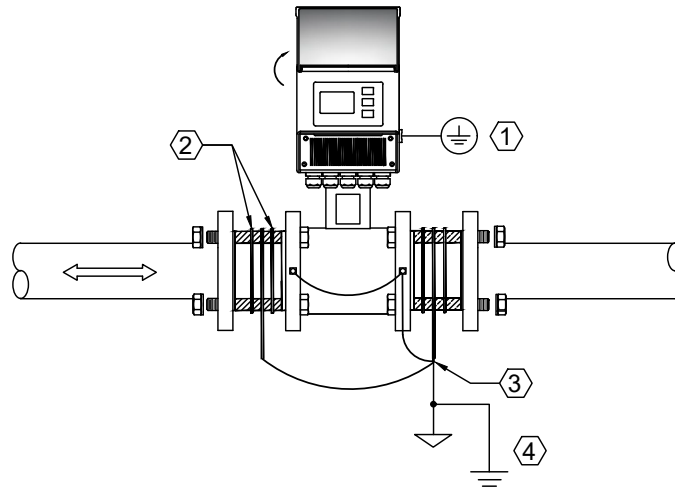


1. IP67 (NEMA 4X) enclosure with protection cover available in integral or remote mount version
2. 16-Character, 8-Line graphic backlit LCD display
3. Menu driven user interface via three (3) programming keys
4. Wiring connections via pluggable terminal blocks located beneath the front access cover
5. Five (5) threaded conduit/ strain relief opening located at the bottom of the enclosure
6. Remote mount hardware kit
7. Remote mount cable
8. Flange grounding kit for flanged or wafer versions

INSTALLATION DETAILS (CONTINUED)

C. Optional Grounding Rings Accessory in Non-Conductive Pipe

Grounding rings are required whenever meters are installed in non-metallic or lined pipes. Grounding rings placed before and after the meter eliminate electrical noise that will interfere with the proper operation of the meter. ONICON provides grounding rings as an optional accessory.



1. Protection ground connection
2. Required gaskets (4pl) to be provided by installing contractor
3. Grounding rings required for non-conductive (non-metallic) or lined pipes (2pl)
4. Earth ground connection

MINIMUM STRAIGHT RUN REQUIREMENTS

The straight run requirements presented below represent the minimum requirements for accurate flow measurement. For optimum performance, provide as much additional straight run as possible.

RECOMMENDED INSTALLATION

①

Flow direction

3 Pipe Dia Minimum Upstream Straight Pipe Run

2 Pipe Dia Minimum Downstream Straight Pipe Run

Locate flow meter in a straight run of pipe, free of bends, tees, valves and other obstructions.

②

Flow direction

Installation of flow meter in vertical pipe runs with upward or downward flow is acceptable, provided the system is pressurized (closed loop).

③

Electrode Location

Locate flow meter in horizontal pipe run with electrodes at the 3 and 9 o'clock position.

INSTALLATION TO BE AVOIDED

④

Flow direction

Avoid locating flow meter in vertical pipe run with downward flow ending in discharge to atmosphere.

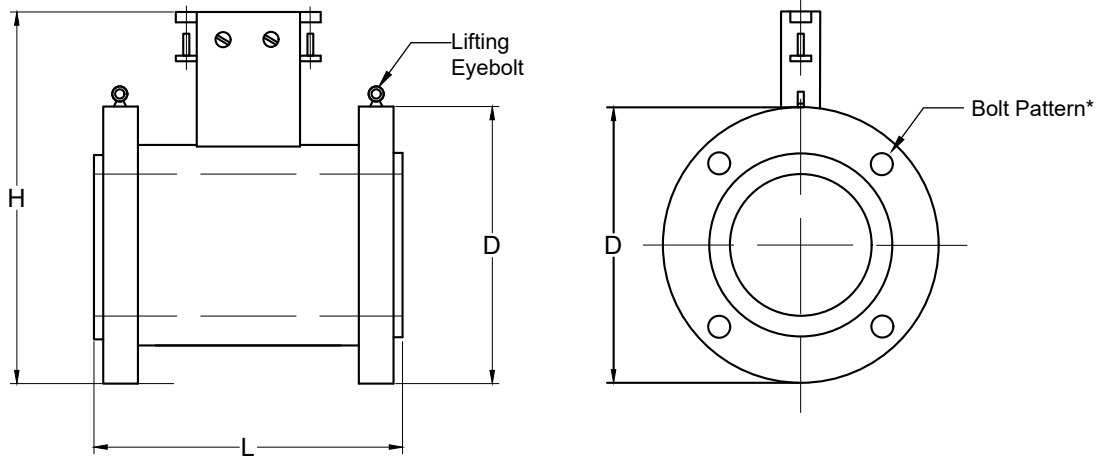
⑤

Electrode Location

Sediment or entrained air can affect the electrodes in the 12 and 6 o'clock position.

DIMENSIONS

A. Flanged Sensor Dimensions and Weights



*Bolt pattern is dependent on the type and size of the flanges

ANSI Class 150 Flanged Sensor Size												
Nominal Diameter	1"	1.25"	1.5"	2"	2.5"	3"	4"	5"	6"	8"	10"	12"
Length (L above)	7.87	7.87	7.87	7.87	7.87	7.87	9.84	9.84	11.81	13.78	17.72	19.68
Height (H above)	7.13	7.55	8.15	8.74	9.64	10.2	11.34	12.4	13.43	15.79	18.15	20.75
Flange Dia (D above)	4.24	4.64	5	5.98	7	7.52	9.02	10	10.98	13.5	15.98	19.02
Weight in lbs	6.6	6.6	7.7	13.2	17.6	24.2	35.2	39.6	57.2	88	132	220

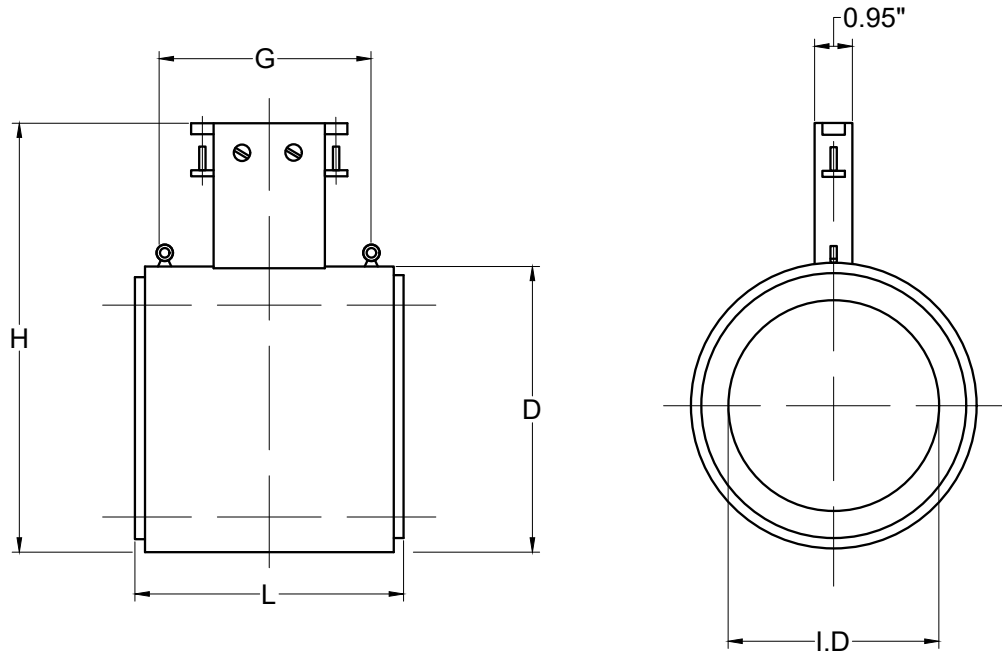
ANSI Class 150 Flanged Sensor Size											
Nominal Diameter	14"	16"	18"	20"	24"	26"	30"	34"	36"	42"	48"
Length (L above)	21.65	23.62	23.62	23.62	23.62	25.59	29.53	33.46	35.43	41.33	47.24
Height (H above)	22.91	25.16	27.08	29.57	34.09	36.26	40.63	45.24	47.48	53.34	60.23
Flange Dia (D above)	20.98	23.5	25	27.52	32.01	34.25	38.74	43.74	45.98	53	59.49
Weight in lbs	275	396	484	550	650	726	990	1276	1320	2112	2500

ANSI Class 300 Flanged Sensor Size												
Nominal Diameter	1"	1.25"	1.5"	2"	2.5"	3"	4"	5"	6"	8"	10"	12"
Length (L above)	7.87	7.87	7.87	7.87	7.87	7.87	9.84	9.84	11.81	13.78	17.72	19.68
Height (H above)	7.48	7.83	8.7	8.98	9.88	10.55	11.81	12.91	14.17	16.54	18.9	21.5
Flange Dia (D above)	4.88	5.24	6.14	6.5	7.52	8.27	10	10.98	12.52	15	17.52	20.51
Weight in lbs	11	11	15.4	19.8	24.2	28.6	44	52.8	66	154	220	286

ANSI Class 300 Flanged Sensor Size									
Nominal Diameter	14"	16"	18"	20"	24"	26"	30"	34"	36"
Length (L above)	21.65	23.62	23.62	23.62	23.62	25.59	29.53	33.46	35.43
Height (H above)	23.9	26.14	28.58	30.31	36.06	39.45	44.13	48.43	50.87
Flange Dia (D above)	22.99	25.51	27.99	30.51	35.98	38.27	42.99	47.52	50
Weight in lbs	396	528	805	970	1489	1712	Inquire	Inquire	Inquire

DIMENSIONS (CONTINUED)

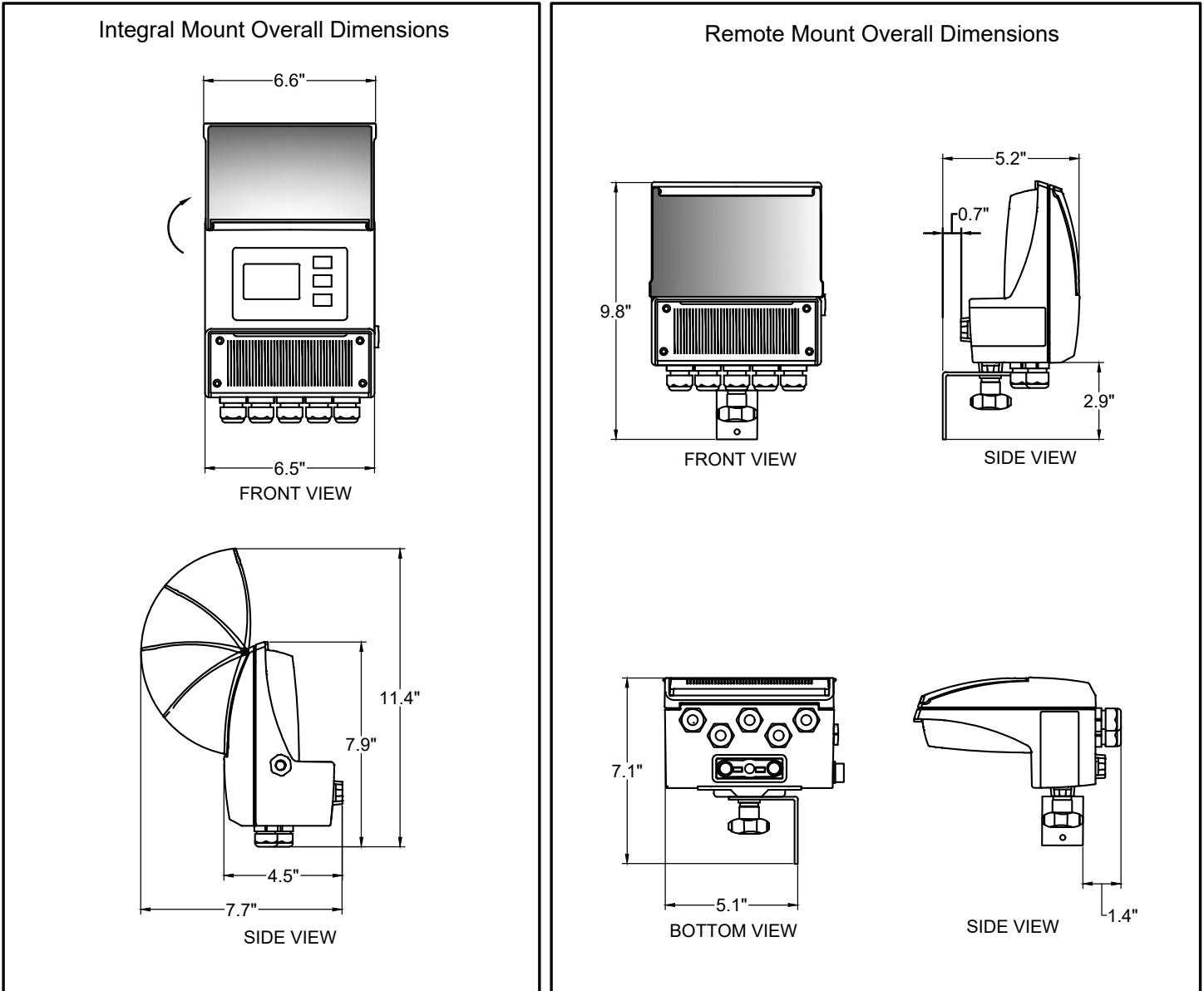
B. Wafer Style Sensor Dimensions and Weights



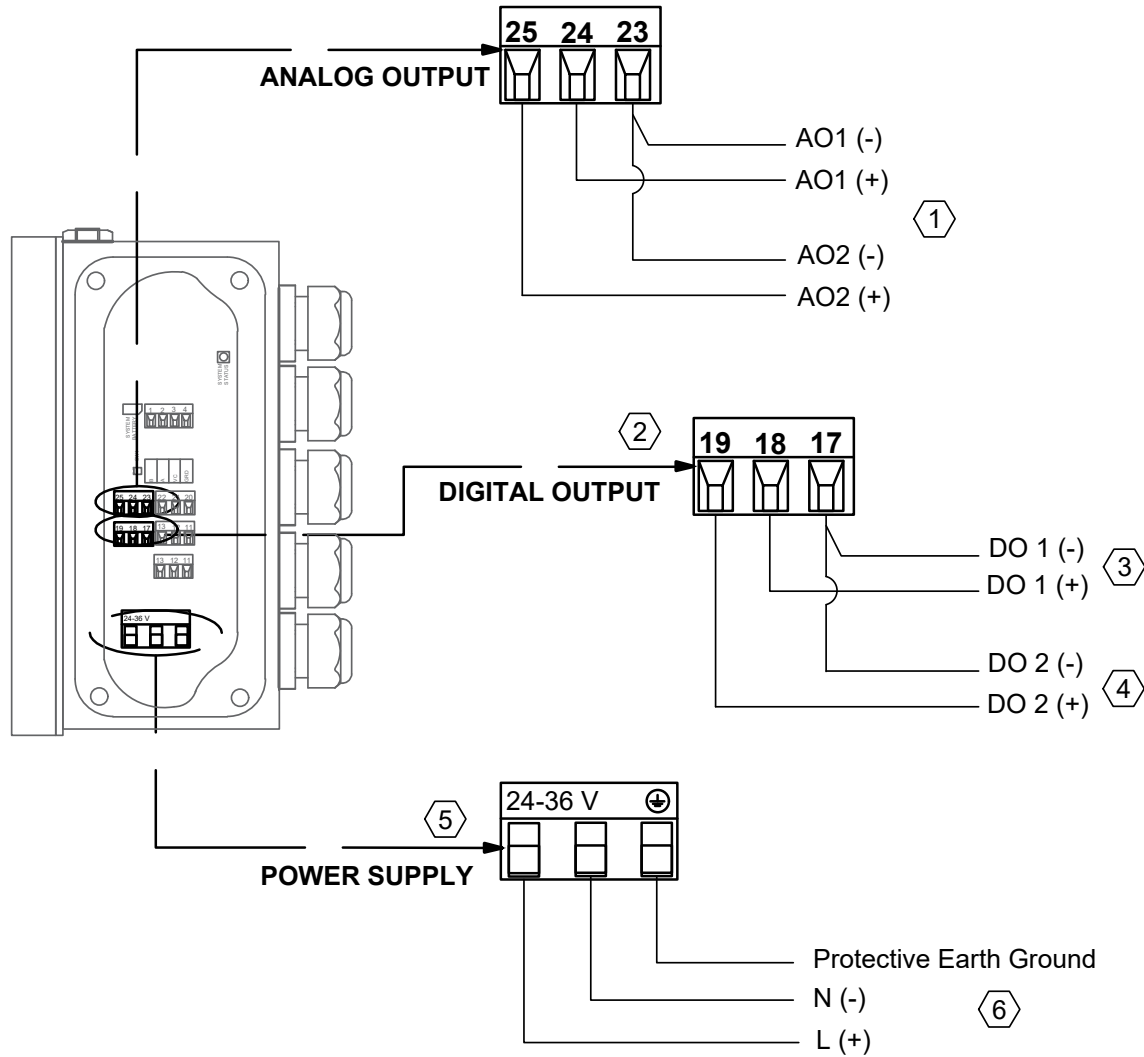
Wafer Style Sensor Size						
Nominal Dia	1"	1.5"	2"	2.5"	3"	4"
Length (L)	3.94	3.94	3.94	5.90	5.90	5.90
Height (H)	5.79	6.34	6.97	7.83	8.23	9.25
Wafer Dia (D)	2.20	2.76	3.39	4.25	4.65	5.67
Net Weight in lbs	2.60	4	4.40	7.90	8.40	11

DIMENSIONS (CONTINUED)

C. Overall Dimensions



WIRING CONNECTIONS



1. Provide two (2) wires for use with one (1) or two (2) 4-20mA active analog output
2. Open collector switch output with 1250 Hz, 100 mA, 30 VDC max
3. Provide two (2) wires for use with DO 1, typically configured as a frequency output for use with ONICON peripheral equipment
4. Provide two (2) wires for use with DO 2, configured as a scaled pulse for totalizing flow or as a flow direction switch
5. Power supply voltage must be selected at time of order, it cannot be changed in the field. Input power options:
 - Low power, 24 VAC/DC, 50/60 Hz, 12 VA
 - High power, 120-240 VAC, 50/60 Hz, 12 VA
6. Provide a three (3) wire service including one (1) dedicated conductor for protective earth grounding

FT-3200 SUBMITTAL AND DATA SHEET



ITEM	TAG/QTY	APPLICATION	LIQUID TYPE	DESIGN FLOW	METER MODEL SELECTION	GROUNDING RINGS	REFERENCE SHEET	ASSOCIATED PERIPHERAL	NOTES
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									

FT-3200 SUBMITTAL AND DATA SHEET

TO:

DATE:

PROJECT NAME:

CONTRACTOR:

ENGINEER:

ONICON REP:

SUBMITTAL FOR:

RECORD

APPROVAL

APPROVED BY:

RELEASED FOR:

MANUFACTURING AND SHIPMENT

HOLD FOR RELEASE

APPROVED

APPROVED AS NOTED

DISAPPROVED

EXPLANATION:

PLEASE RETURN APPROVED DRAWINGS TO:

ATTENTION:

SUBMITTED BY:

