

Field^{IT}
Electro-Magnetic Flowmeters
COPA-XM™
10DX3311(1/2" - 12")

- Long term stability of stated accuracy using DC magnetic field technology
- Absolute Zero point stability
- Integrally mounted microprocessor signal converter
- Two line liquid crystal display with background illumination
- Display flow in % or engineering units and totalization in engineering units
- Communications using HART® protocol, or serial interface RS-232C / RS-485
- Flow rate measurement is independent of viscosity, density, and temperature
- Obstructionless; no additional pressure loss when the meter tube and pipe are the same diameter.
- After manual data input of density, flow rate and totalization can be displayed in mass units (lbs, ton, etc.)



Magnetic Flowmeters
COPA-M™ (Sizes 1/2" to 12")
Series 3000

**Series 3000
Magnetic Flowmeter
COPA-X™ (Sizes 1/2" to 12")**

All liquids, even those containing solids, with a minimum electrical conductivity of 5µS/cm can be measured accurately with the COPA-X™ magnetic flowmeter.

The basis of the measurement is Faraday's law of induction. A conductive fluid flows through an insulated pipe and intersects a magnetic field. A voltage is induced within the fluid that is proportional to the average flow velocity and is measured by electrodes mounted on each side of the pipe. The induced voltage is processed by the signal converter to produce analog and digital output signals linearly proportional to the actual flow.

The 10DX3311 utilizes an integrally mounted 50XM1000 Converter. For remote mounted converter applications, see 10DX3111 specifications.

Engineering Specifications

Minimum Liquid Conductivity: 5 µS/cm

Pressure Limits:
All liners:
@ 104°F (40°C)
740 psi (5.1 MPa)
(Limited by flange rating)

Vacuum Limits:
Teflon® and Tefzel® Liners:
1/2" to 4" - Full Vacuum to 266°F (130°C)
6" to 12"- 3.0 psia @ 68°F (20°C)
5.8 psia @ 212°F (100°C)
6.7 psia @ 266°F (130°C)
Neoprene, Polyurethane, Rubber:
Full Vacuum to 190°F (88°C)

System Accuracy

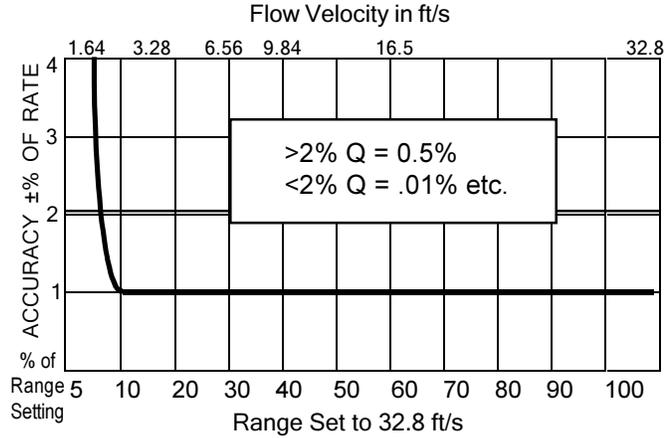


Figure 1. System Accuracy

Optional Accuracies: For higher accuracies than those in Figure 1, consult factory for details.

Meter Capacity Table: Full scale (20 mA) can be set to any value between the minimum and maximum values shown in Table 1.

SIZE		METER* CAPACITY	MINIMUM RANGE		MAXIMUM RANGE	
in.	mm	gpm	gpm	L/min	gpm	L/min
1/2	15	26.4	0.53	2	26.4	100
1	25	52.8	1.06	4	52.8	200
1.5	40	158.5	3.17	12	158	600
			gpm	m³/h	gpm	m³/h
2	50	264.1	5.28	1.2	264	60
3	80	792.5	15.9	3.6	792	180
4	100	1,056	21.1	4.8	1056	240
6	150	2,641	52.8	12	2641	600
8	200	4,755	95.1	21.6	4755	1080
10	250	7,925	159	36	7925	1800
12	300	10,567	212	48	10567	2400

*Meter Capacity = Volumetric flowrate @ 32.81 ft/sec.

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TEFLON® is a registered trademark of E.I. DuPont de Nemours & Co.
TEFZEL® is a registered trademark of E.I. DuPont de Nemours & Co.
HASTELLOY® is a registered trademark of Haynes International, inc.

Temperature Limits:

Process: -15°F (-26°C) to 266°F (130°C) for
TEFLON® & TEFZEL®
-15°F (-26°C) to 190°F (88°C) for
Polyurethane & Neoprene

Ambient: -15°F (-26°C) to 131°F (55°C) for all liners.

Any combination of process and ambient temperature adding up to 262°F (110°C) will require remote electronics; use Model 10DX3111E.

Temperature Effect: 0.15% of range setting for 18°F (10°C) temperature change within ambient limits.

Display: Back lit liquid crystal, 5x7 dot matrix display with two lines of 16 alphanumeric characters per line. Flow rate and total can be displayed in several user defined configurations.

Power Consumption: ≤ 23 VA

Power Requirements:

100/110/115/120/200/220/230/240 Vac + 10%-15%,
50/60 Hz ±6% is standard. 24 Vdc ±30% is optional.
For other power requirements, consult the factory.

Data Entry: Input of configuration data is by means of three push buttons.

Configuration Language: Configuration data can be displayed in English, Spanish and others upon request.

Configuration Protection: Software and/or hardware protection to restrict unauthorized adjustments of configuration data.

Bi-directional Flow: Indication and totalization in both forward and reverse direction. Flow direction for analog output is indicated by contact closure. The active pulse output option provides an output for each flow direction.

Output Signal: Analog current of 4-20 mA dc, 0-20 mA dc, configurable into 0-750 ohms load resistance.

Isolation: Inputs and outputs are fully isolated.

Optional Pulse Output: Pulse widths for the active and passive pulse output is configurable from 0.1 ms to 2000 ms. Scale factors and from 0.001 to 1000 pulses per selected units.

Active pulse is 24 Vdc ≥150 ohm load.

Passive pulse is Opto coupler:

Rated for <25 Vdc, <7.5 mA dc.

Standard pulse output is active 24 Vdc. When both pulse output and serial interface options are selected, the pulse must be passive.

Contact Output: Opto coupled: <25 Vdc, < 7.5 mA (N/A for bi-directional flow)

Damping: 1 to 99 seconds software configurable

Optional Serial Interface for Remote Communications:

RS-232 @ 110 to 9600 Baud up to 45 ft. (15m).

Number of Nodes: 1 instrument

RS-485 @ 110 to 28.8k Baud up to 4000 ft (1219m).

Number of Nodes: 32 instruments

Optional HART® Interface: 1200 bits/s (transmitting/receiving) using frequency shift key (FSK) as defined by Bell 202 Standard, 5000 ft. (1500m) limit.

Low Flow Cut-off: 0 to 10% of range software configurable.

Response Time: 0.5 second minimum.

Alarm Mode: Current output can be configured to go low (0%) or high (130%) when alarm condition is detected. Alarm contact opens to provide external indication of failure.

Zero Return: Provides constant zero output signal during conditions when false flow signals are possible. Activated by external non-powered contact.

Remote Totalizer Reset: Resets both forward and reverse totalizers from a remote location. Zero return feature is not available when remote totalizer reset option is selected. Activated by external non-powered contact.

Enclosure Classification:

Standard: Accidental Submergence in water to 33 feet (10m) for 48 hours; IEC529 IP67 and IP65 NEMA 4X

Certification:

Standard: FM Approved CII, Div. 2, Groups A, B, C, & D with intrinsically safety electrodes.

Vibration Limit: Maximum 1.5g (10-150 Hz)

Radio Frequency Interface Susceptibility (RFI):
Equivalent to SAMA Class 2 - abc - 0.1% (10 V/m - 20 to 1000 MHz).

Connections:

Process Flanges: ANSI Class 150 or 300.

Electrical Connections: 1/2" NPT

Materials of Construction

Meter Spool (pipe): 304 Stainless Steel

Flanges: Carbon Steel or 304 Stainless Steel

Liners: TEFLON® PTFE & TEFZEL®: Available in sizes 1/2" to 12". Neoprene or Polyurethane: Available in sizes 2" to 12".

Electrode Material: 316 SST, Hastelloy®C, Titanium, Tantalum, Platinum/Iridium.

Housing & Customer Connection Box:
Epoxy Coated Cast Aluminum

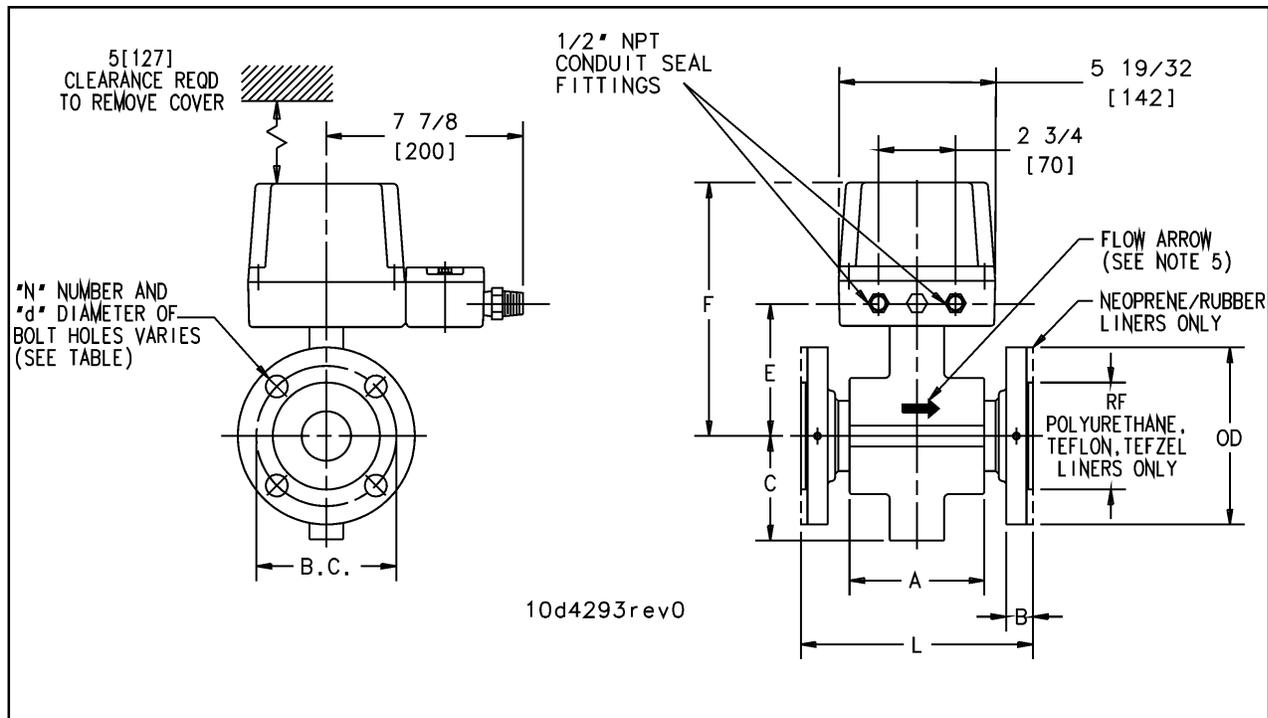
Liner Protectors & Grounding Rings:
316 / 304 Stainless Steel or Hastelloy®C

Approximate Shipping Weights

Meter Size		ANSI Class 150		ANSI Class 300	
in.	mm	lbs	kg	lbs	kg
1/2	15	12	5.5	15	6.5
1	25	12	5.5	15	6.5
1.5	40	19	8.5	21	9.5
2	50	25	11	29	13
3	80	40	18	48	22
4	100	42	19	51	23
6	150	105	47	140	64
8	200	155	70	210	95
10	250	220	100	295	134
12	300	275	125	365	166

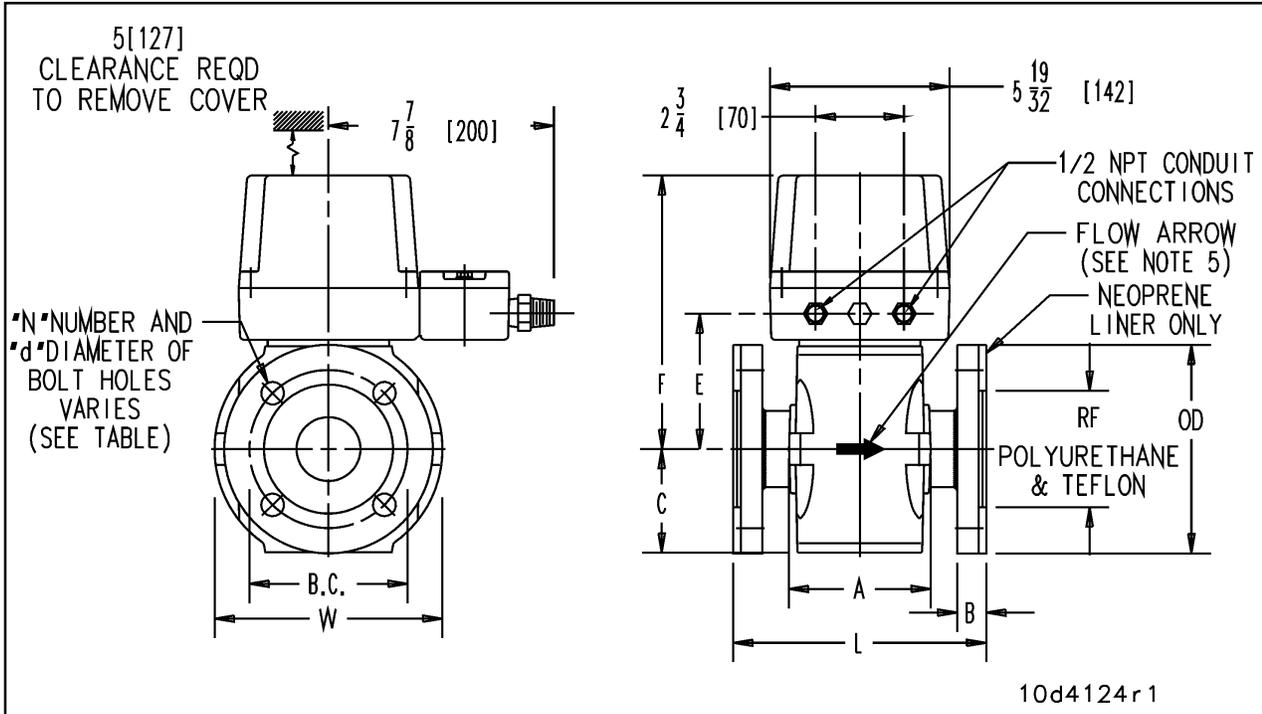
OUTLINE DIMENSIONS

DIM.	SIZE	1/2(15)		1(25)		1-1/2(40)		2(50)		3(80)		4(100)		6(150)		8(200)		10(250)		12(300)		
		FLANGE CLASS	150	300	150	300	150	300	150	300	150	300	150	300	150	300	150	300	150	300	150	300
L	10DX3311GD	7-7/8 (200)	9 (229)	7-7/8 (200)	9 (229)	7-7/8 (200)	9 (229)	7-7/8 (200)	9 (229)	7-7/8 (200)	9(229)	9-7/8 (250)	11(280)	11-13/16 (300)	13-25/32 (350)	17-23/32 (450)	19-11/16 (500)	21-21/32 (550)	24-13/32 (600)	19-11/16 (500)	21-21/32 (550)	24-13/32 (600)
L	10DX3311GE	14 (356)		14 (356)		16 (406)		16 (406)		12 (305)		12 (305)		17-23/32 (450)	19-11/16 (500)	21-21/32 (550)	24-13/32 (600)		17-23/32 (450)	19-11/16 (500)	21-21/32 (550)	24-13/32 (600)
RF		1-3/8 (35)		2 (51)		2-7/8 (73)		3-5/8 (92)		5 (127)		6-3/16 (157)		8-1/2 (216)	10-5/8 (270)	12-3/4 (324)	15 (381)		8-1/2 (216)	10-5/8 (270)	12-3/4 (324)	15 (381)
B	PolyNeoRubber Liner	NA		NA		NA		15/16 (24)	1-1/8 (27)	1-1/8 (29)	1-5/16 (33)	1-1/8 (29)	1-7/16 (33)	1-3/16 (30)	1-5/8 (41)	1-5/16 (33)	1-13/16 (46)	1-3/8 (35)	2-1/16 (52)	1-1/2 (38)	2-1/4 (57)	
	Teflon Liner	1/2 (13)	5/8 (16)	11/16 (17)	13/16 (21)	27/32 (21)	31/32 (21)	29/32 (23)	1-1/32 (26)	1-3/32 (27)	1-9/32 (32)	1-3/32 (27)	1-13/32 (35)	1-1/8 (29)	1-9/16 (40)	1-9/32 (33)	1-25/32 (45)	1-3/8 (35)	2-1/16 (52)	1-1/2 (38)	2-1/4 (57)	
	Tezel Liner			5/8 (16)	3/4 (19)	7/8 (22)	7/8 (22)	27/32 (21)	31/32 (25)	3/4 (19)	7/8 (22)	1-1/4 (32)	1-3/8 (27)	1-3/8 (27)	1-1/8 (29)	1-9/16 (40)	1-1/4 (32)	1-3/4 (44)	1-5/16 (33)	2 (51)	1-25/64 (35)	2-9/64 (54)
d		5/8 (16)		5/8 (16)	3/4 (19)	7/8 (22)	7/8 (22)	3/4 (19)	7/8 (22)	3/4 (19)	7/8 (22)	3/4 (19)	7/8 (22)	7/8 (22)	7/8 (22)	7/8 (22)	7/8 (22)	1 (25)	1 (25)	1-1/8 (29)	1 (25)	1-1/8 (29)
N		4		4		4		4	9	4	8	8	8	8	12	8	12	12	12	16	12	16
BC		2-3/8 (60)	2-5/8 (67)	3-1/8 (79)	3-1/2 (86)	3-7/8 (99)	4-1/2 (114)	4-3/4 (121)	5 (127)	6 (152)	6-5/8 (169)	7-1/2 (191)	7-7/8 (200)	9-1/2 (241)	10-5/8 (270)	11-3/4 (299)	13 (330)	14-1/4 (362)	15-1/4 (397)	17 (432)	17-3/4 (451)	
OD		3-1/2 (89)	3-3/4 (95)	4-1/4 (109)	4-7/8 (124)	5 (127)	6-1/8 (156)	6 (152)	6-1/2 (163)	7-1/2 (191)	8-1/4 (210)	9 (229)	10 (254)	11 (280)	12-1/2 (318)	13-1/2 (343)	15 (381)	16 (406)	17-1/2 (445)	19 (483)	20-1/2 (521)	
A		2-15/16 (75)		3-7/16 (87)		3-15/16 (100)		4-9/16 (119)		3-15/16 (100)		5-1/8 (130)		6-11/16 (179)		7-11/16 (189)		9-27/32 (250)		9-27/32 (250)		9-27/32 (250)
C		2-7/16 (69)		2-7/8 (73)		3-7/32 (82)		3-17/32 (93)		4-11/32 (110)		5-1/8 (130)		5-25/32 (147)		7-1/16 (179)		8-5/32 (207)		9-27/32 (250)		9-27/32 (250)
E		3-9/32 (83)		3-23/32 (94)		4-1/16 (103)		4-3/8 (111)		5-5/32 (131)		5-31/32 (152)		4-13/32 (173)		8-3/32 (205)		9-3/16 (233)		10-7/8 (278)		10-7/8 (278)
F		7-5/16 (188)		7-3/4 (197)		8-3/32 (206)		8-13/32 (214)		9-3/16 (233)		10 (254)		10-7/8 (278)		12-1/8 (308)		13-1/4 (338)		14-15/16 (370)		14-15/16 (370)
W		NR		NR		NR		NR		NR		NR		12-3/16 (310)		14-3/8 (365)		16-25/32 (426)		20-5/8 (510)		20-5/8 (510)



NOTES:

- 1) All dimensions are in inches. Dimensions in bracket [] are in millimeters (mm)
- 2) Dimensions are guaranteed only if this print is certified.
- 3) This drawing is third angle projection as shown.
- 4) Flange bolts straddle centerlines.
- 5) Flow must be in same direction as flow arrow.
- 6) Meter must be completely filled with liquid to insure accuracy.
- 7) All dimensions subject to manufacturing tolerances of +/- 1/8 (3).



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