



Vortex flow meters detect the frequency of alternating low pressure vortices that are formed as flow is diverted around a bluff body. These swirling low pressure zones apply lateral pressure first to one side, then to the other side of the bluff body, which in turn causes the body to vibrate. The frequency of vibration is directly proportional to the flow velocity.

DESCRIPTION

The ONICON F-2500 Series Vortex Flow Meter is a flexible design that provides accurate, reliable flow measurement in a wide variety of demanding applications. A unique two stage bluff body/sensor design enhances signal sensitivity and extends the operating range of the meter while protecting the sensors from pressure shocks and solids suspended in the flow stream. The integral temperature sensor and optional pressure sensor allow for accurate direct mass flow measurement in steam and compensated flow measurement in compressed air and gases.

Operating as a loop powered device, each meter provides a 4 - 20 mA output signal for flow rate and a scalable pulse output for totalization. A built-in display provides flow rate and total data, instantaneous temperature, operating status and diagnostic data. Instantaneous pressure data is also provided for meters equipped with the optional pressure sensor. Digital data is available via Hart®.

APPLICATIONS

- Saturated steam
- Hot water to 464°F (240°C)

Applications with optional pressure sensor

- Superheated steam to 464°F (240°C)
- Compressed air
- Industrial gases

CALIBRATION

Each meter undergoes a 5-point calibration from 0 - 250 ft/sec (0 - 76 m/s). In addition, each meter is individually programmed using application specific data provided by the customer and arrives ready to install without the need for field programming.

FEATURES

- Mass flow measurement from a single instrument
- Steam energy flow measurement from a single instrument
- Integral 1,000Ω platinum RTD for precise temperature measurement
- Optional pressure transducer for accurate pressure readings at the meter location
- Loop powered operation
- Maintenance free non-moving parts design
- Wear resistant bluff body/sensor design
- Advanced signal processing algorithms ensure stable flow readings and reject noise.
- Easy-to-install meter arrives fully programmed and ready to use.

GENERAL SPECIFICATIONS

ACCURACY

Percent of reading accuracy to within:

- ± 0.75% for liquids (volumetric)
- ± 1% for steam and gases (volumetric)
- ± 1.5% for steam and gases (mass)

Re ≥ 20,000

Repeatability: ± 0.1%

Long term stability: ±0.1% over a period of 1 year

SENSING METHOD

- Vortex shedding with integral piezoelectric sensors.
- Integral 1,000Ω platinum RTD for instantaneous temperature.
- Pressure transducer (optional) provides instantaneous pressure.

GENERAL SPECIFICATIONS (cont.)



OPERATING TEMPERATURE RANGE

Ambient: -40°F (-40°C) to +185°F (+85°C)
 Medium: -40°F (-40°C) to 464°F (+240°C)

MAXIMUM OPERATING PRESSURE

≤ Flange rating or 1400psi (100 bar)

PRESSURE LOSS

Pressure loss varies with meter size and flow rate.
 Please contact ONICON for detailed information.

CONNECTION TYPE

- ANSI Class 150 Flange
- ANSI Class 300 Flange
- ANSI Class 600 Flange
- Wafer style

MATERIALS

- Sensor Body: 316L Stainless Steel
- Bluff/Sensor Body: 316L Stainless Steel
- Electronics Enclosure: Epoxy Painted Aluminum

ENCLOSURE

NEMA 6 (IP67)

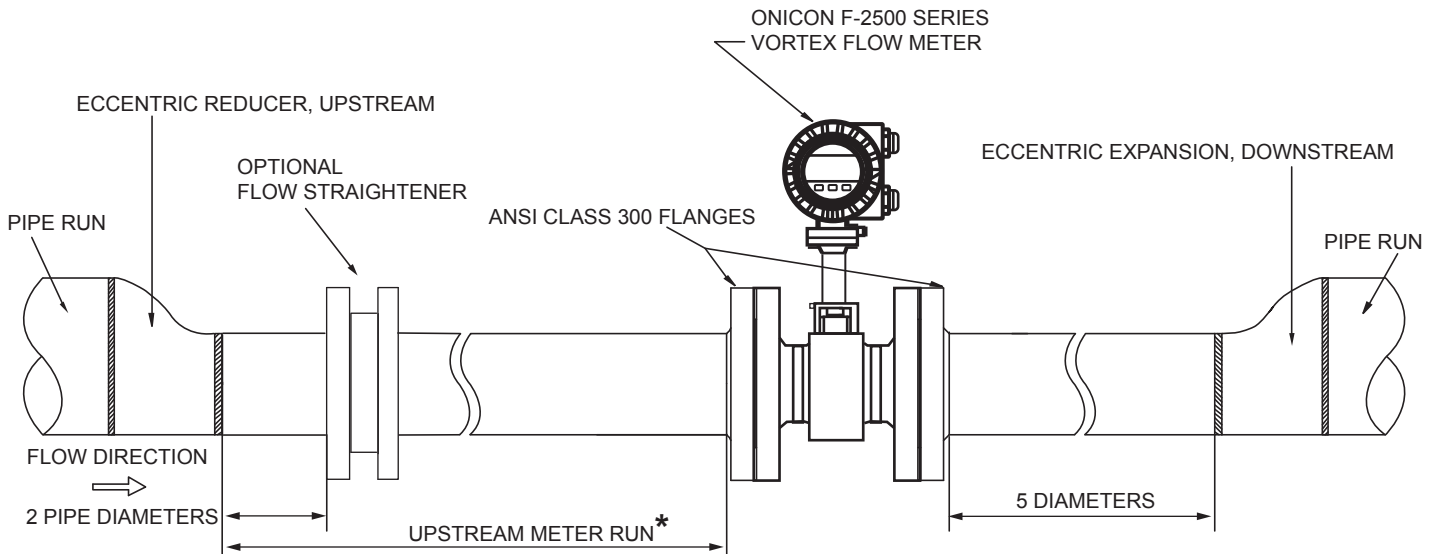
DISPLAY

2 line, 10 character alphanumeric LCD
 (Optional) Remote mount transmitter version available; includes a fixed length 32 ft cable. The cable length cannot be altered.

Note: meters provided with integral pressure compensation cannot use the remote mount transmitter option.

OUTPUT SIGNALS PROVIDED

- Rate: 2-wire, 4 - 20 mA, 14 - 36 VDC, maximum resistance: $R \leq ((V_{supply} - 14V) / 22 \text{ mA})$
- Totalization: 2-wire, scaled pulse, 0.5Hz, 30VDC and 100 mA maximum
- Digital: Hart, FSK



Model # Codification = F-25AA - BCD

F = Flow Meter

B = Wafer or Flange Connection

25 = In-line Vortex Meter

- 0 = Wafer
- 1 = ANSI Class 150 Flange
- 3 = ANSI Class 300 Flange
- 6 = ANSI Class 600 Flange

AA = Diameter in Inches

- 05 = 1/2" 04 = 4"
- 01 = 1" 06 = 6"
- 15 = 1.5" 08 = 8"
- 02 = 2" 10 = 10"
- 03 = 3" 12 = 12"

C = Compact or Remote Mount

- 1 = Compact Mount
- 2 = Remote Mount

D = Pressure Compensation

- 0 = None
- 1 = Pressure Compensation

Obstruction	* Minimum upstream pipe run required		** Minimum downstream run required
	Without flow straightener	With flow straightener	
Single 90	20 Dia	12 Dia	≥ 5 diameters
Tee	20 Dia	12 Dia	
RDCR/EXPNDR	20 Dia	12 Dia	
Two 90's Same Plane	30 Dia	17 Dia	
Ball/Gate Valve Fully Open	30 Dia	17 Dia	
Two 90's Out of Plane	40 Dia	22 Dia	
Control Valve	50 Dia	27 Dia	≥ 5 diameters
P.R.V.	50 Dia	27 Dia	

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Operating Range for Saturated Steam

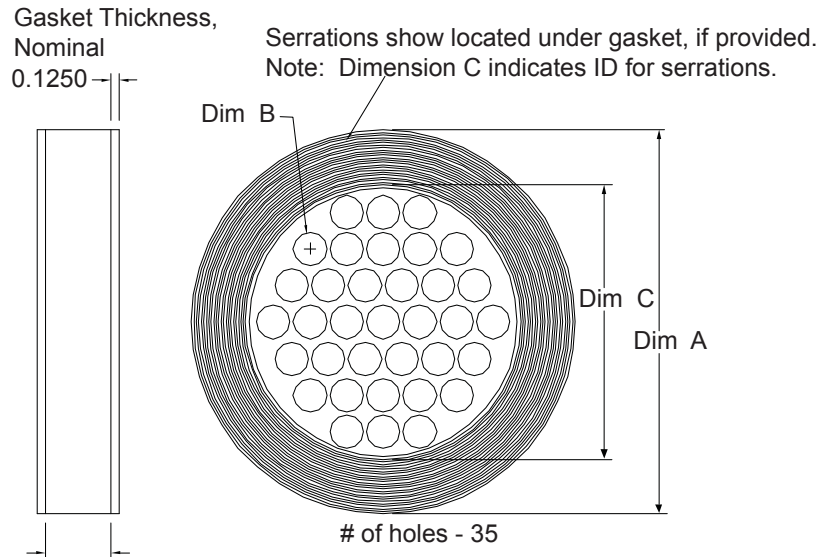


	Pressure (psig)	5	15	50	75	100	150	200	300
Nominal diameter in inches	Density (lb/ft³)	0.0479	0.071	0.1497	0.2042	0.2578	0.3633	0.4680	0.6784
		lbs / hr							
1/2 " (DN15)	Minimum Maximum	12 53	13 81	16 168	19 228	22 289	27 407	35 525	51 761
1" (DN25)	Minimum Maximum	21 193	26 286	38 602	44 822	49 1,037	59 1,462	67 1,877	81 2,285
1 1/2" (DN40)	Minimum Maximum	54 552	65 819	95 1,727	110 2,355	124 2,973	147 4,115	167 4,705	202 5,729
2" (DN50)	Minimum Maximum	93 956	113 1,418	164 2,989	192 4,078	215 5,147	256 7,124	290 8,147	350 9,919
3" (DN80)	Minimum Maximum	204 2,095	248 3,107	360 6,547	420 8,932	472 11,275	561 15,604	635 17,845	766 21,726
4" (DN100)	Minimum Maximum	350 3,600	426 5,338	619 11,250	722 15,347	812 19,373	964 26,812	1,094 30,663	1,317 37,331
6" (DN150)	Minimum Maximum	793 8,154	966 12,094	1,402 25,486	1,638 34,767	1,840 43,889	2,184 60,742	2,479 69,466	2,984 84,574
8" (DN200)	Minimum Maximum	1,490 15,316	1,814 22,717	2,634 47,873	3,076 65,307	3,456 82,441	4,103 114,098	4,657 130,485	5,607 158,863
10" (DN250)	Minimum Maximum	2,381 24,484	2,900 36,316	4,210 76,532	4,917 104,401	5,525 131,792	6,559 182,399	7,444 208,597	8,963 253,963
12" (DN300)	Minimum Maximum	3,459 35,560	4,212 52,744	6,115 111,151	7,141 151,629	8,024 191,409	9,526 264,909	10,811 302,958	13,017 368,845

F-2500 Flow Table Flow Rate	Water in gpm		Air in cfm*	
	Minimum	Maximum	Minimum	Maximum
Nominal Diameter in Inches (Diameter in mm)				
1/2" (DN15)	1.58	22.3	2.55	34.1
1" (DN25)	3.56	50.2	5.75	76.7
1 1/2" (DN40)	8.98	126	14.4	192
2" (DN50)	15.5	218	24.9	333
3" (DN80)	34.1	477	54.7	729
4" (DN100)	58.6	820	93.9	1,252
6" (DN150)	132	1,858	213	2,838
8" (DN200)	232	3,246	372	4,959
10" (DN250)	359	5,019	575	7,668
12" (DN300)	506	7,078	811	10,813

*Values based on air at 68°F and 14.7 psia

FLOW STRAIGHTENER
(All dimensions shown in inches.)

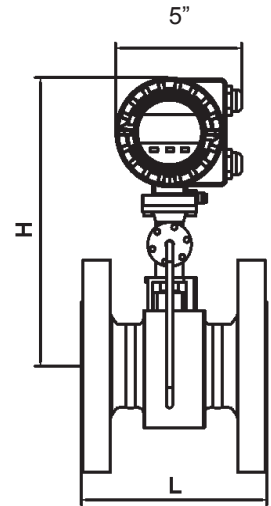


Diameter	Dim A	Dim B	Dim C	Part # Ea
2"	3.93	.28	2.14	14382
3"	5.31	.43	3.24	14383
4"	6.26	.55	4.22	14384
6"	8.50	.78	6.07	14385
8"	10.62	1.02	7.98	14386
10"	13.23	1.30	10.02	16570
12"	15.00	1.53	12.00	16577

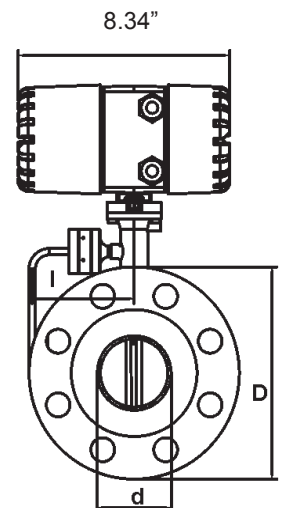
F-2500 Flanged Dimensions and Weights

Size	Pressure Rating	Dimensions (inches)					Weight (lbs)	
		Nom Dia	ANSI Class	d	D	L	H	I
1/2	150	0.6	3.5	7.9	10.4	5.7	11.2	9.9
1/2	300	0.6	3.7	7.9	10.4	5.7	12.1	10.8
1/2	600	0.5	3.7	7.9	10.4	5.7	12.6	11.2
1	150	1.1	4.3	7.9	10.4	5.7	15.0	13.7
1	300	1.1	4.9	7.9	10.4	5.7	17.2	15.9
1	600	1.0	4.9	7.9	10.4	5.7	17.9	16.5
1 1/2	150	1.6	4.9	7.9	10.6	5.7	19.6	18.3
1 1/2	300	1.6	6.1	7.9	10.6	5.7	24.3	22.9
1 1/2	600	1.5	6.1	7.9	10.6	5.7	26.5	25.1
2	150	2.1	5.9	7.9	10.8	5.7	25.6	24.3
2	300	2.1	6.5	7.9	10.8	5.7	28.7	27.3
2	600	1.9	6.5	7.9	10.8	5.7	32.0	30.6
3	150	3.1	7.5	7.9	11.4	6.1	45.0	43.7
3	300	3.1	8.3	7.9	11.4	6.1	51.6	50.3
3	600	2.9	8.3	7.9	11.4	6.1	52.8	52.5
4	150	4.0	9.1	9.8	12.2	6.5	52.9	51.6
4	300	4.0	10.0	9.8	12.2	6.5	70.6	69.2
4	600	3.8	10.8	9.8	12.2	6.5	90.4	89.1
6	150	6.1	11.0	11.8	12.8	6.9	81.1	79.8
6	300	6.1	12.6	11.8	12.8	6.9	114.2	112.9
6	600	5.8	14.0	11.8	12.8	6.9	169.3	101.9
8	150	8.0	13.6	11.8	13.8	7.6	146.4	145.7
8	300	8.0	15.0	11.8	13.8	7.6	190.3	189.7
8	600	7.6	16.5	11.8	13.8	7.6	331.6	330.3
10	150	10.0	15.5	15.0	14.6	8.8	197.1	195.8
10	300	10.0	17.9	15.0	14.6	8.8	252.2	239.9
10	600	9.6	20.1	15.0	14.6	8.8	419.8	418.4
12	150	12.0	19.1	17.7	15.5	9.6	318.3	317.0
12	300	12.0	20.5	17.7	15.5	9.6	415.4	414.0
12	600	11.4	22.1	17.7	15.5	9.6	543.2	541.9

Front View

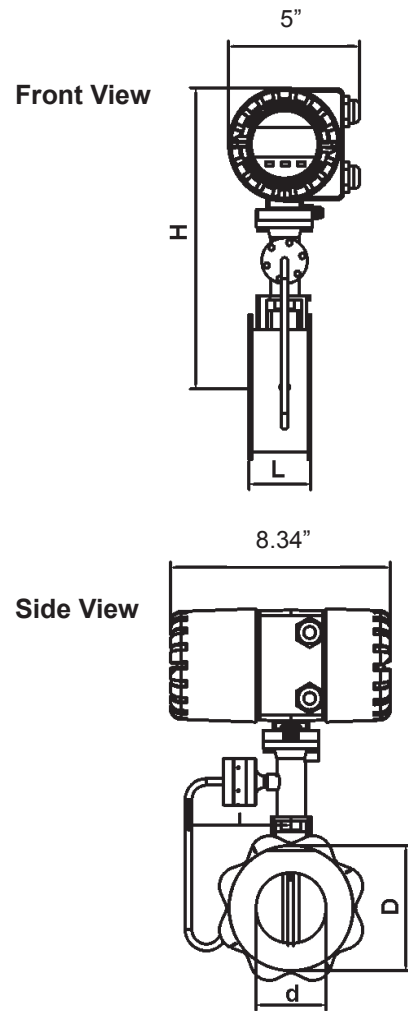


Side View

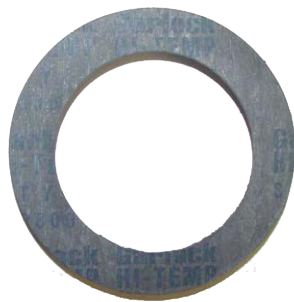


F-2500 Wafer Style Dimensions and Weights

Size	Pressure Rating	Dimension (inches)				Weight (lbs)	
Nom Dia	ANSI Class	d	D	L	H	With pressure sensor	Without pressure sensor
1/2	150	0.6	1.8	2.6	5.7	9.0	7.7
1/2	300	0.6	1.8	2.6	5.7	9.0	7.7
1/2	600	0.6	1.8	2.6	5.7	9.0	7.7
1	150	0.9	2.6	2.6	5.7	10.8	9.5
1	300	0.9	2.6	2.6	5.7	10.8	9.5
1	600	0.9	2.6	2.6	5.7	10.8	9.5
1 1/2	150	1.5	3.2	2.6	5.7	12.1	10.8
1 1/2	300	1.5	3.2	2.6	5.7	12.1	10.8
1 1/2	600	1.5	3.2	2.6	5.7	12.1	10.8
2	150	2.0	4.0	2.6	5.7	14.6	13.2
2	300	2.0	4.0	2.6	5.7	14.6	13.2
2	600	2.0	4.0	2.6	5.7	14.6	13.2
3	150	2.9	5.3	2.6	6.1	19.4	18.1
3	300	2.9	5.3	2.6	6.1	19.4	18.1
3	600	2.9	5.3	2.6	6.1	19.4	18.1
4	150	3.8	6.2	2.6	6.5	22.3	20.9
4	300	3.8	6.2	2.6	6.5	22.3	20.9
4	600	3.8	6.2	2.6	6.5	22.3	20.9



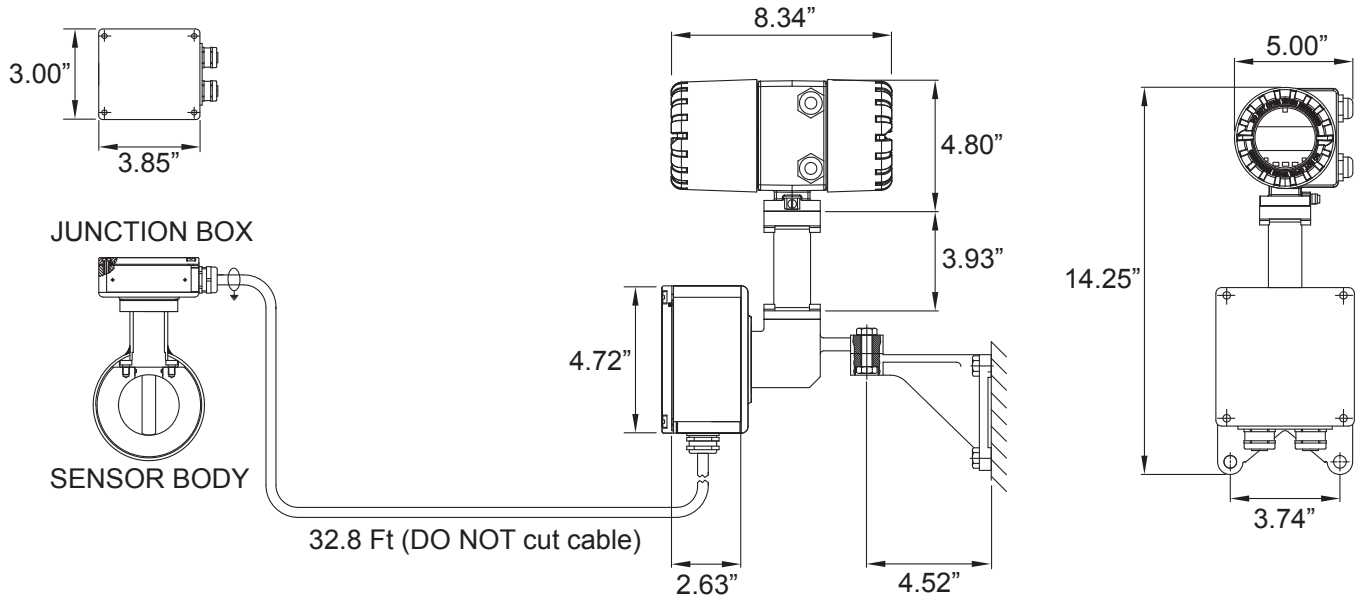
RING GASKET



Pre-cut 1/8" gaskets for use with class 300 raised face flanges. Gaskets are suitable for use with water, inert gases and saturated steam up to 150 psig. For saturated steam applications above 150 psig, contact ONICON for assistance.

Diameter	Part # Ea
1"	16811
1.5"	16812
2"	16813
3"	16814
4"	16815
6"	13816
8"	16817
10"	16818
12"	16819

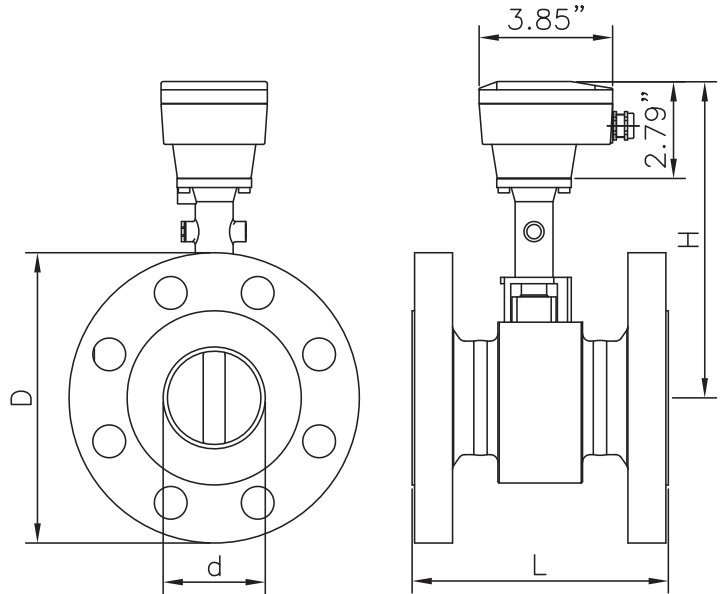
Remote Mount Installation Drawings



IMPORTANT NOTE
Meters provided with integral pressure compensation cannot use the remote mount transmitter option.

F-2500 Flange Style Remote Mount Dimensions

Size	Pressure Rating	Dimension (inches)			
Nom Dia	ANSI Class	d	D	L	H
1/2	150	0.63	3.54	7.87	10.59
1/2	300	0.63	3.74	7.87	10.59
1/2	600	0.63	3.74	7.87	10.59
1	150	1.04	4.33	7.87	10.55
1	300	1.04	4.92	7.87	10.55
1	600	0.94	4.92	7.87	10.55
1 1/2	150	1.61	4.92	7.87	10.78
1 1/2	300	1.61	6.1	7.87	10.78
1 1/2	600	1.61	6.1	7.87	10.78
2	150	2.06	5.9	7.87	10.94
2	300	2.06	6.5	7.87	10.94
2	600	1.92	6.5	7.87	10.94
3	150	3.06	7.48	7.87	11.49
3	300	3.06	8.26	7.87	11.49
3	600	2.91	8.26	7.87	11.49
4	150	4.02	9.05	9.84	12.12
4	300	4.02	10.03	9.84	12.12
4	600	3.81	10.82	9.84	12.12
6	150	6.06	11.02	11.81	12.87
6	300	6.06	12.6	11.81	12.87
6	600	146	13.97	11.81	12.87
8	150	7.98	13.58	11.81	12.87
8	300	7.98	14.96	11.81	12.87
10	150	10.02	15.94	14.96	15.74
10	300	10.02	17.91	14.96	15.74
12	150	12	19.09	17.71	16.77
12	300	12	20.47	17.71	16.77



F-2500 Wafer Style Remote Mount Dimensions

Size NB"	Dimension (inches)			
	d	D	L	H
1/2	0.63	1.74	2.56	10.60
1	0.94	2.54	2.56	10.55
1 1/2	1.49	3.22	2.56	10.78
2	1.96	4.01	2.56	10.94
3	2.91	4.92	2.56	11.5
4	3.81	6.22	2.56	12.12

