

Rosemount 485 Annubar[®] Primary Element



Rosemount 485 Annubar Primary Element utilizes a T-shaped sensor design that offers best in class accuracy and performance.

- Up to 0.75% Flow Rate Accuracy
- Lowest permanent pressure loss of any DP Flowmeter
- Available in 2 to 96-in. (50 - 2400 mm) line sizes

Additional Information

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Installation and Flowmeter Orientation: [page 181](#)

Ordering information

Table 1. Rosemount 485 Annubar Primary Ordering Information

★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Model	DP Flow primary type	
485	Annubar Primary Element	
Fluid type		
L	Liquid	★
G	Gas	★
S	Steam	★
Line size		
020	2-in. (50 mm)	★
025	2 ¹ / ₂ -in. (63.5 mm)	★
030	3-in. (80 mm)	★
035	3 ¹ / ₂ -in. (89 mm)	★
040	4-in. (100 mm)	★
050	5-in. (125 mm)	★
060	6-in. (150 mm)	★
070	7-in. (175 mm)	★
080	8-in. (200 mm)	★
100	10-in. (250 mm)	★
120	12-in. (300 mm)	★
140	14-in. (350 mm)	
160	16-in. (400 mm)	
180	18-in. (450 mm)	
200	20-in. (500 mm)	
240	24-in. (600 mm)	
300	30-in. (750 mm)	
360	36-in. (900 mm)	
420	42-in. (1066 mm)	
480	48-in. (1210 mm)	
600	60-in. (1520 mm)	
720	72-in. (1820 mm)	

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Line size		
780	78-in. (1950 mm)	
840	84-in. (2100 mm)	
900	90-in. (2250 mm)	
960	96-in. (2400 mm)	
Pipe I.D. range (see “Pipe I.D. Range Code” on page 141)		
C	Range C from the Pipe I.D. table	★
D	Range D from the Pipe I.D. table	★
A	Range A from the Pipe I.D. table	
B	Range B from the Pipe I.D. table	
E	Range E from the Pipe I.D. table	
Z	Non-standard Pipe I.D. Range or Above 12-in. Line Size	
Pipe material/assembly material		
C	Carbon steel (A105)	★
S	316 Stainless Steel	★
0 ⁽¹⁾	No mounting (customer supplied)	★
G	Chrome-Moly Grade F-11	
N	Chrome-Moly Grade F-22	
J	Chrome-Moly Grade F-91	
Piping orientation		
H	Horizontal Piping	★
D	Vertical Piping with Downwards Flow	★
U	Vertical Piping with Upwards Flow	★
Annubar type		
P	Pak-Lok	★
F	Flanged with opposite side support	★
L	Flange-Lok	
G	Gear-Drive Flo-Tap	
M	Manual Flo-Tap	
Sensor material		
S	316 Stainless Steel	★
H	Alloy C-276	
Sensor size		
1	Sensor size 1 — Line sizes 2-in. (50 mm) to 8-in. (200 mm)	★
2	Sensor size 2 — Line sizes 6-in. (150 mm) to 96-in. (2400 mm)	★
3	Sensor size 3 — Line sizes greater than 12-in. (300 mm)	
Mounting type		
T1	Compression/Threaded Connection	★
A1	150# RF ANSI	★
A3	300# RF ANSI	★
A6	600# RF ANSI	★
D1	DN PN16 Flange	★
D3	DN PN40 Flange	★
D6	DN PN100 Flange	★

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AG ⁽²⁾	900# RF ANSI		
AF ⁽²⁾	1500# RF ANSI		
AT ⁽²⁾	2500 # RF ANSI		
R1	150# RTJ Flange		
R3	300# RTJ Flange		
R6	600# RTJ Flange		
R9 ⁽²⁾	900# RTJ Flange		
RF ⁽²⁾	1500# RTJ Flange		
RT ⁽²⁾	2500# RTJ Flange		
Opposite side support or packing gland			
0	No opposite side support or Packing Gland (required for Pak-Lok and Flange-Lok models)		★
Opposite side support – required for Flanged models			
C	NPT Threaded Opposite Support Assembly – Extended Tip		★
D	Welded Opposite Support Assembly – Extended Tip		★
Packing gland – required for Flo-Tap models			
	<i>Packing Gland Material</i>	<i>Rod Material</i>	<i>Packing Material</i>
J ⁽³⁾	Stainless Steel Packing Gland/Cage Nipple	Carbon Steel	PTFE
K ⁽³⁾	Stainless Steel Packing Gland/Cage Nipple	Stainless Steel	PTFE
L ⁽³⁾	Stainless Steel Packing Gland/Cage Nipple	Carbon Steel	Graphite
N ⁽³⁾	Stainless Steel Packing Gland/Cage Nipple	Stainless Steel	Graphite
R	Alloy C-276 Packing Gland/Cage Nipple	Stainless Steel	Graphite
Isolation valve for Flo-Tap models			
0 ⁽¹⁾	Not Applicable or Customer Supplied		★
1	Gate Valve, Carbon Steel		
2	Gate Valve, Stainless Steel		
5	Ball Valve, Carbon Steel		
6	Ball Valve, Stainless Steel		
Temperature measurement			
T	Integral RTD – not available with Flanged model greater than class 600#		★
0	No Temperature Sensor		★
R	Remote Thermowell and RTD		
Transmitter connection platform			
3	Direct-mount, Integral 3-valve manifold– not available with Flanged model greater than class 600		★
5	Direct -mount, 5-valve Manifold– not available with Flanged model greater than class 600		★
7	Remote-mount NPT Connections		★
6	Direct-mount, High Temperature 5-valve Manifold– not available with Flanged model greater than class 600		
8	Remote-mount SW Connections		

Options (include with selected model number)

Extended product warranty			
WR3	3-year limited warranty		★
WR5	5-year limited warranty		★

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Pressure testing		
P1 ⁽⁴⁾	Hydrostatic Testing with Certificate	
PX ⁽⁴⁾	Extended Hydrostatic Testing	
Special cleaning		
P2	Cleaning for Special Services	
PA	Cleaning per ASTM G93 level D (section 11.4)	
Material testing		
V1	Dye Penetrant Exam	
Material examination		
V2	Radiographic Examination	
Flow calibration		
W1	Flow Calibration (Average K)	
WZ	Special Calibration	
Special inspection		
QC1	Visual & Dimensional Inspection with Certificate	★
QC7	Inspection & Performance Certificate	★
Surface finish		
RL	Surface finish for Low Pipe Reynolds Number in Gas & Steam	★
RH	Surface finish for High Pipe Reynolds Number in Liquid	★
Material traceability certification		
Q8 ⁽⁵⁾	Material Traceability Certificate per EN 10204:2004 3.1	★
Code conformance		
J2 ⁽⁶⁾	ANSI/ASME B31.1	
J3 ⁽⁶⁾	ANSI/ASME B31.3	
Materials conformance		
J5 ⁽⁷⁾	NACE MR-0175 / ISO 15156	
Country certification		
J6	European Pressure Directive (PED)	★
J1	Canadian Registration	
Installed in flanged pipe spool section		
H3	150# Flanged Connection with Rosemount Standard Length and Schedule	
H4	300# Flanged Connection with Rosemount Standard Length and Schedule	
H5	600# Flanged Connection with Rosemount Standard Length and Schedule	
Instrument connections for remote mount option		
G2	Needle Valves, Stainless Steel	★
G6	OS&Y Gate Valve, Stainless Steel	★
G1	Needle Valves, Carbon Steel	
G3	Needle Valves, Alloy C-276	
G5	OS&Y Gate Valve, Carbon Steel	
G7	OS&Y Gate Valve, Alloy C-276	

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★ The Standard offering represents the most common options. The starred options (★) should be selected for best delivery. The Expanded offering is subject to additional delivery lead time.

Special shipment		
Y1	Mounting Hardware Shipped Separately	★
Attach to		
H1	Attach to Transmitter	
Special dimensions		
VM	Variable Mounting	
VT	Variable Tip	
VS	Variable length Spool Section	
V9	Special Dimension	
Typical model number: 485 L 060 D C H P S 2 T1 0 0 0 3		

- (1) Provide the "A" dimension for Flanged (page 209), Flange-Lok (page 208), and Threaded Flo-Tap models (page 211). Provide the "B" dimension for Flange Flo-Tap models (page 210).
- (2) Available in remote mount applications only.
- (3) The cage nipple is constructed of 304SST.
- (4) Applies to flow element only, mounting hardware not tested.
- (5) Instrument Connections for Remote Mount Options and Isolation Valves for Flo-tap Models are not included in the Material Traceability Certification.
- (6) Not available with Transmitter Connection Platform 6.
- (7) Materials of Construction comply with metallurgical requirements within NACE MR0175/ISO 15156 for sour oil field production environments. Environmental limits apply to certain materials. Consult latest standard for details. Selected materials also conform to NACE MR0103 for sour refining environments.

Specifications

Performance specifications

Performance statement assumptions

Measured pipe I.D. (or Measured pipe cross sectional area)

Discharge coefficient factor

±0.75% of flow rate

Repeatability

±0.1%

Line sizes

- Sensor Size 1: 2-in. to 8-in. (50 to 200 mm)
- Sensor Size 2: 6-in. to 96-in. (150 to 2400 mm)
- Sensor Size 3: 12-in. to 96-in. (300 to 2400 mm)

Note

Some mounting types are not available in larger line sizes.

Table 2. Reynolds Number and Probe Width

Sensor size	Minimum rod Reynolds Number (R_d)	Probe width (d) (inches)
1	6500	0.590-in. (14.99 mm)
2	12500	1.060-in. (26.92 mm)
3	25000	1.935-in. (49.15 mm)

Where

$$R_d = \frac{d \times v \times \rho}{\mu}$$

d = Probe width (feet)
 v = Velocity of fluid (ft/sec)
 ρ = Density of fluid (lbm/ft³)
 μ = Viscosity of the fluid (lbm/ft-sec)

Sizing

Contact an Emerson Process Management representative for assistance. A Configuration Data Sheet is required prior to order for application verification. To complete the Configuration Data Sheet go to:

http://www3.emersonprocess.com/Rosemount/DP_Flow/Application/Pages/PCDefault.aspx

Flow turndown

10:1 or better

Annubar sensor surface finish

The front surface of the Annubar primary is textured for high Reynolds number applications (typically gas and steam). The surface texture creates a more turbulent boundary layer on the front surface of the sensor. The increased turbulence produces a more predictable and repeatable separation of flow at the edge of the sensor. The appropriate surface finish will be determined for each application by the Emerson Process Management sizing program, Instrument Toolkit software.

Functional specifications

Service

- Liquid
- Gas
- Steam

Process temperature limits

Direct Mount Transmitter

- 500 °F (260 °C)
- 750 °F (398 °C) when used with a direct mount, high temperature 5-valve manifold (Transmitter Connection Platform code 6). Maximum temperature limit for steam processes is 650 °F (343 °C).
- 400 °F (204 °C) when top mounted in steam service

Remote Mount Transmitter

- 1250 °F (677 °C) – Alloy C-276 Sensor Material (For superheated steam applications above 1000 °F (538 °C), it is recommended that the Rosemount 585 with Alloy 800H sensor material is used.)
- 850 °F (454 °C) – Stainless Steel Sensor Material

Pressure and temperature limits ⁽¹⁾

Direct Mount Transmitter

- Up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C))
- Integral temperature measurement is not available with Flanged mounting type greater than class 600

Remote Mount Transmitter

- Up to 2500# ANSI (6000 psig at 100 °F (416 bar at 38 °C)).

(1) Static pressure selection may effect pressure limitations.

Physical specifications

Temperature measurement

Integral RTD

- 100 Ohm platinum RTD
- 4-wire RTD ($\alpha = 0.00385$)

Remote RTD

- 100 Ohm platinum RTD, spring loaded with 1/2-in. NPT nipple and union (078 series with Rosemount 644 housing)
- Thermowell
- 1/2-in. x 1/2-in NPT, 316 Stainless Steel with 1/2-in. weld couplet (same as specified pipe material).

Annubar sensor material

- 316 Stainless Steel
- Alloy C-276

Mounting material

- Carbon Steel (A105)
- 316 Stainless Steel
- Chrome-Moly Grade F-11
- Chrome-Moly Grade F-22
- Chrome-Moly Grade F-91

Annubar type

See “485 dimensional drawings” on page 207.

Pak-Lok mode (Option P)

- Provided with a compression sealing mechanism rated up to 600# ANSI [1440 psig at 100 °F (99 bar at 38 °C)]
- -150 to 850 °F (-101 to 454 °C)
- Not available for steam above 600 °F (315 °C)

Flanged with opposite side support model (Option F)

- Provided with opposite side support, which is the same material as the pipe and requires a second pipe penetration
- Sensor flange is the same material as the Annubar sensor and the mounting flange is the same material as the pipe material.
- Flanged mounting hardware: nuts, studs and gaskets (DIN units supplied without nuts, studs and gaskets). Standard bolting provided is Carbon Steel (A193 B7/A194 2H).

Standard gaskets provided are spiral wound 304SST flexible graphite filled.

- SST: [-300 to 850 °F (-184 to 454 °C)]
- Alloy C-276: [-150 to 1250 °F (-101 to 677 °C)]

Flange-Lok model (Option L)

- Flange-Lok assembly is supplied in 316 SST material.
- Flange-Lok mounting hardware: nuts, studs and gaskets (DIN units supplied without nuts, studs and gaskets). Standard bolting provided is Carbon Steel (A193 B7/A194 2H). Standard gaskets provided are spiral wound 304SST flexible graphite filled.
- -150 to 850 °F (-101 to 454 °C)
- Not available for steam above 600 °F (315 °C)

Flo-Tap models (Options G and M)

- Opposite side support is not available
- Threaded connection is not available with Sensor Size 3
- Gear Drive is not available with Sensor Size 1
- Packing gland required
- Packing Gland Material Temperature Limits
 - PTFE: -40 to 400 °F (-40 to 204 °C)
 - Graphite: -150 to 850 °F (-101 to 454 °C)
- Isolation valve included
 - The isolation valve will carry the same pressure rating as the sensor flange and mounting flange specified in the mounting type
 - Isolation valves are not supplied with DIN flanges and must be customer supplied
- For threaded Flo-Tap models, the isolation valve NPT size is 1 1/4-in. (Sensor Size 1) and 2-in. (Sensor Size 2).

Annubar type specification chart

Option code	Description	Pak-Lok ⁽¹⁾	Flange-Lok	Flange	Manual and gear drive Flo-Tap
T1 ⁽¹⁾	Pak-Lok Body	X			
	Threaded connection				X
A1	150# RF ANSI		X	X	X
A3	300# RF ANSI		X	X	X
A6	600# RF ANSI		X	X	X
A9 ⁽²⁾	900# RF ANSI			X	
AF ⁽²⁾	1500# RF ANSI			X	
AT ⁽²⁾	2500# RF ANSI			X	
D1	DN PN 16		X	X	X
D3	DN PN 40		X	X	X
D6	DN PN 100		X	X	X
R1	150# RTJ Flange		X	X	X
R3	300# RTJ Flange		X	X	X
R6	600# RTJ Flange		X	X	X
R9 ⁽²⁾	900# RTJ Flange			X	
RF ⁽²⁾	1500# RTJ Flange			X	
RT ⁽²⁾	2500# RTJ Flange			X	

(1) Available up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)) rating.

(2) Remote mount only.

RTD temperature limits

Integral and Remote Mounted Thermowell:
-100 to 900 °F (-73 to 482 °C)

Instrument connections temperature ranges

Table 3. Minimum/Maximum Temperature Range

Code	Description	Temperature
G1	Needle Valves, Carbon Steel	-20 to 500 °F (-29 to 260 °C)
G2	Needle Valves, Stainless Steel	-40 to 600 °F (-40 to 316 °C)
G3	Needle Valves, Alloy C-276	-40 to 600 °F (-40 to 316 °C)
G5	OS&Y Gate Valve, Carbon Steel	-20 to 775 °F (-29 to 413 °C)
G6	OS&Y Gate Valve, Stainless Steel	-40 to 850 °F (-40 to 454 °C)
G7	OS&Y Gate Valve, Alloy C-276	-40 to 1250 °F (-40 to 677 °C)

Flowmeter installed in flanged pipe spool section (Option Codes H3, H4, and H5)

- All pipe spool sections are flanged pipe sections.
- The flanged pipe spool section is constructed from the same material as the Pipe Material/Mounting Assembly Material.
- Consult the factory for remote temperature measurement and ANSI ratings above 600# and DIN flanges.
- Available in carbon steel (A105) and 316 stainless steel

Table 4. Flanged Pipe Spool Section Schedule

ANSI	Schedule
150# ANSI	40
300# ANSI	40
600# ANSI	80

Table 5. Flange Pipe Spool Section Length

Nominal pipe size	Length
2-in. (50 mm)	10.52-in. (267.2 mm)
3-in. (80 mm)	11.37-in. (288.8 mm)
4-in. (100 mm)	12.74-in. (323.6 mm)
6-in. (150 mm)	14.33-in. (364.0 mm)
8-in. (200 mm)	16.58-in. (421.1 mm)

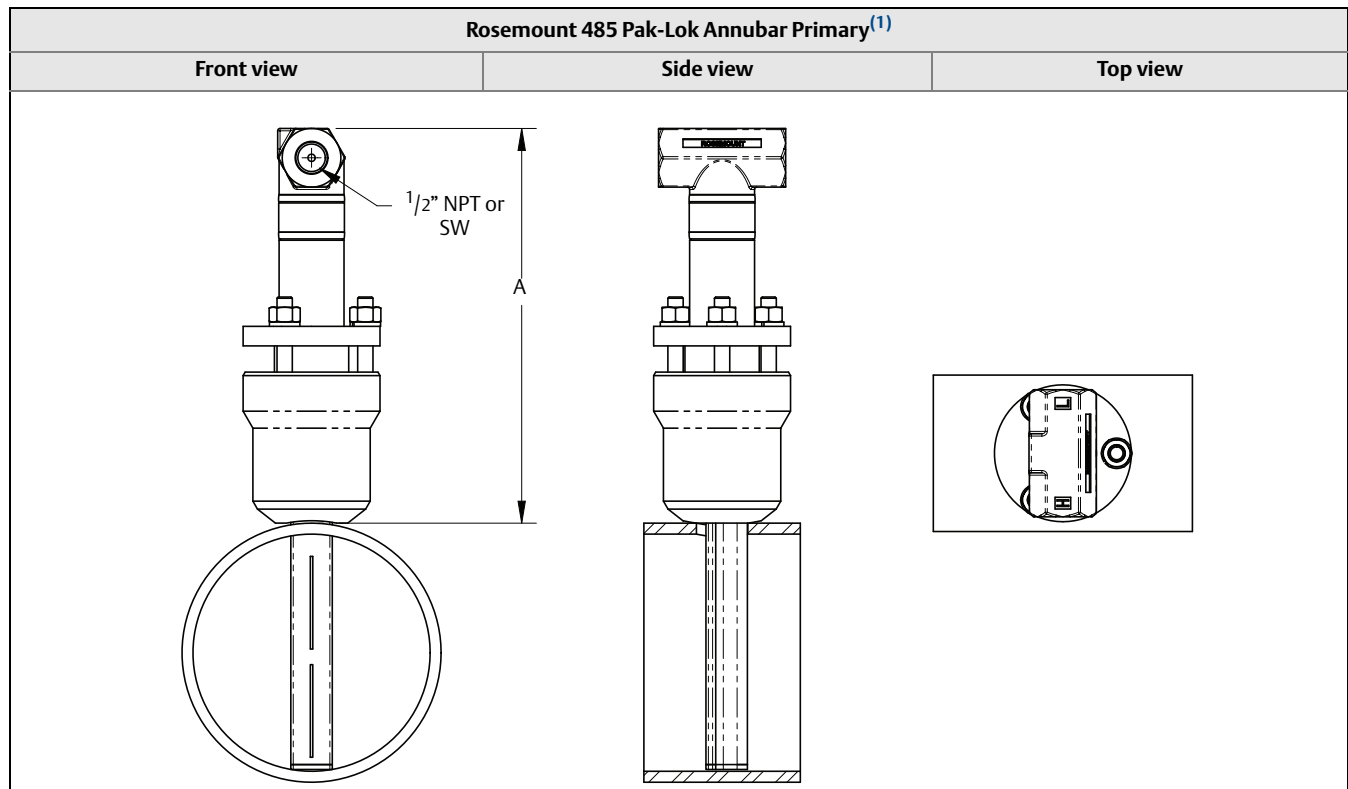
Pipe I.D. Range Code

For pipes with an Inner Diameter (I.D.) Range/Pipe Wall Thickness not found in this table or with a line size greater than 12-in. (300 mm), choose Option Code Z and specify the exact pipe dimensions (I.D. and Pipe Wall Thickness) on the Configuration Data Sheet (see document 00806-0100-4010). The Emerson Process Management sizing program will determine this code, based on the application piping.

	Line size			Inner diameter (I.D.) range	Pipe wall thickness		I.D. range code
	Nominal	Max. O.D.	Option code		ANSI pipes	Non-ANSI pipes	
	2-in. (50 mm)	2.625-in. (66.68 mm)	020	1.784 to 1.841-in. (45.31 to 46.76 mm)	0.065 to 0.545-in. (1.7 to 13.8 mm)	0.065 to 0.488-in. (1.7 to 12.4 mm)	A
				1.842 to 1.938-in. (46.79 to 49.23 mm)		0.065 to 0.449-in. (1.7 to 11.4 mm)	B
				1.939 to 2.067-in. (49.25 to 52.50 mm)		0.065 to 0.417-in. (1.7 to 10.6 mm)	C
				2.068 to 2.206-in. (52.53 to 56.03 mm)		0.065 to 0.407-in. (1.7 to 10.3 mm)	D
	2 ¹ / ₂ -in. (63.5 mm)	3.188-in. (80.98 mm)	025	2.207 to 2.322-in. (56.06 to 58.98 mm)	0.083 to 0.563-in. (2.1 to 14.3 mm)	0.083 to 0.448-in. (2.1 to 11.4 mm)	B
				2.323 to 2.469-in. (59.00 to 62.71 mm)		0.083 to 0.417-in. (2.1 to 10.6 mm)	C
				2.470 to 2.598-in. (62.74 to 65.99 mm)		0.083 to 0.435-in. (2.1 to 11.0 mm)	D
				2.599 to 2.647-in. (66.01 to 67.23 mm)		0.083 to 0.515-in. (2.1 to 13.1 mm)	E
	3-in. (80 mm)	3.75-in. (95.25 mm)	030	2.648 to 2.751-in. (67.26 to 69.88 mm)	0.083 to 0.563-in. (2.1 to 14.3 mm)	0.083 to 0.460-in. (2.1 to 11.7 mm)	A
				2.752 to 2.899-in. (69.90 to 73.63 mm)		0.083 to 0.416-in. (2.1 to 10.6 mm)	B
				2.900 to 3.068-in. (73.66 to 77.93 mm)		0.083 to 0.395-in. (2.1 to 10.0 mm)	C
				3.069 to 3.228-in. (77.95 to 81.99 mm)		0.083 to 0.404-in. (2.1 to 10.3 mm)	D
	3 ¹ / ₂ -in. (89 mm)	4.25-in. (107.95 mm)	035	3.229 to 3.333-in. (82.02 to 84.66 mm)	0.120 to 0.600-in. (3.0 to 15.2 mm)	0.120 to 0.496-in. (3.0 to 12.6 mm)	B
				3.334 to 3.548-in. (84.68 to 90.12 mm)		0.120 to 0.386-in. (3.0 to 9.8 mm)	C
				3.549 to 3.734-in. (90.14 to 94.84 mm)		0.120 to 0.415-in. (3.0 to 10.5 mm)	D
	4-in. (100 mm)	5.032-in. (127.81 mm)	040	3.735 to 3.825-in. (94.87 to 97.16 mm)	0.120 to 0.600-in. (3.0 to 15.2 mm)	0.120 to 0.510-in. (3.0 to 13.0 mm)	B
				3.826 to 4.026-in. (97.18 to 102.26 mm)		0.120 to 0.400-in. (3.0 to 10.2 mm)	C
				4.027 to 4.237-in. (102.29 to 107.62 mm)		0.120 to 0.390-in. (3.0 to 9.9 mm)	D
				4.238 to 4.437-in. (107.65 to 112.70 mm)		0.120 to 0.401-in. (3.0 to 10.2 mm)	E
	5-in. (125 mm)	6.094-in. (154.79 mm)	050	4.438 to 4.571-in. (112.73 to 116.10 mm)	0.134 to 0.614-in. (3.4 to 15.6 mm)	0.134 to 0.481-in. (3.4 to 12.2 mm)	A
4.572 to 4.812-in. (116.13 to 122.22 mm)				0.134 to 0.374-in. (3.4 to 9.5 mm)		B	
4.813 to 5.047-in. (122.25 to 128.19 mm)				0.134 to 0.380-in. (3.4 to 9.7 mm)		C	
5.048 to 5.249-in. (128.22 to 133.32 mm)				0.134 to 0.413-in. (3.4 to 10.5 mm)		D	
Sensor Size 1 6-in. (150 mm)	6.93-in. (176.02 mm)	060	5.250 to 5.472-in. (133.35 to 138.99 mm)	0.134 to 0.614-in. (3.4 to 15.6 mm)	0.134 to 0.3919-in. (3.4 to 9.9 mm)	A	
			5.473 to 5.760-in. (139.01 to 146.30 mm)		0.134 to 0.327-in. (3.4 to 8.3 mm)	B	
			5.761 to 6.065-in. (146.33 to 154.05 mm)		0.134 to 0.31-in. (3.4 to 7.9 mm)	C	
			6.066 to 6.383-in. (154.08 to 162.13 mm)		0.134 to 0.297-in. (3.4 to 7.5 mm)	D	

	Line size			Inner diameter (I.D.) range	Pipe wall thickness		I.D. range code
	Nominal	Max. O.D.	Option code		ANSI pipes	Non-ANSI pipes	
Sensor Size 2	6-in. (150 mm)	6.93-in. (176.02 mm)	060	5.250 to 5.472-in. (133.35 to 139.99 mm)	0.134 to 1.354-in. (3.4 to 34.4 mm)	0.134 to 1.132-in. (3.4 to 28.7 mm)	A
				5.473 to 5.760-in. (139.01 to 146.30 mm)		0.134 to 1.067-in. (3.4 to 27.1 mm)	B
				5.761 to 6.065-in. (146.33 to 154.05 mm)		0.134 to 1.05-in. (3.4 to 26.7 mm)	C
				6.066 to 6.383-in. (154.08 to 162.13 mm)		0.134 to 1.037-in. (3.4 to 26.3 mm)	D
Sensor Size 1	7-in. (180 mm)	7.93-in. (201.42 mm)	070	6.384 to 6.624-in. (162.15 to 168.25 mm)	0.134 to 0.614-in. (3.4 to 15.6 mm)	0.134 to 0.374-in. (3.4 to 9.5 mm)	B
				6.625 to 7.023-in. (168.28 to 178.38 mm)		0.134 to 0.216-in. (3.4 to 5.5 mm)	C
				7.024 to 7.392-in. (178.41 to 187.76 mm)		0.134 to 0.246-in. (3.4 to 6.2 mm)	D
Sensor Size 2	7-in. (180 mm)	7.93-in. (201.42 mm)	070	6.384 to 6.624-in. (162.15 to 168.25 mm)	0.134 to 1.354-in. (3.4 to 34.4 mm)	0.134 to 1.114-in. (3.4 to 28.3 mm)	B
				6.625 to 7.023-in. (168.28 to 178.38 mm)		0.134 to 0.956-in. (3.4 to 24.3 mm)	C
				7.024 to 7.392-in. (178.41 to 187.76 mm)		0.134 to 0.986-in. (3.4 to 25.0 mm)	D
Sensor Size 1	8-in. (200 mm)	9.688-in. (246.08 mm)	080	7.393 to 7.624-in. (187.78 to 193.65 mm)	0.250 to 0.73-in. (6.4 to 18.5 mm)	0.250 to 0.499-in. (6.4 to 12.6 mm)	B
				7.625 to 7.981-in. (193.68 to 202.72 mm)		0.250 to 0.374-in. (6.4 to 9.5 mm)	C
				7.982 to 8.400-in. (202.74 to 213.36 mm)		0.250 to 0.312-in. (6.4 to 7.9 mm)	D
				8.401 to 8.766-in. (213.39 to 222.66 mm)		0.250 to 0.364-in. (6.4 to 9.2 mm)	E
Sensor Size 2	8-in. (200 mm)	9.688-in. (246.08 mm)	080	7.393 to 7.624-in. (187.78 to 193.65 mm)	0.250 to 1.47-in. (6.4 to 37.3 mm)	0.250 to 1.239-in. (6.4 to 31.4 mm)	B
				7.625 to 7.981-in. (193.68 to 202.72 mm)		0.250 to 1.114-in. (6.4 to 28.3 mm)	C
				7.982 to 8.400-in. (202.74 to 213.36 mm)		0.250 to 1.052-in. (6.4 to 26.7 mm)	D
				8.401 to 8.766-in. (213.39 to 222.66 mm)		0.250 to 1.104-in. (6.4 to 28.0 mm)	E
	10-in. (250 mm)	11.75-in. (298.45 mm)	100	8.767 to 9.172-in. (222.68 to 232.97 mm)	0.250 to 1.470-in. (6.4 to 37.3 mm)	0.250 to 1.065-in. (6.4 to 27.1 mm)	A
				9.173 to 9.561-in. (232.99 to 242.85 mm)		0.250 to 1.082-in. (6.4 to 27.5 mm)	B
				9.562 to 10.020-in. (242.87 to 254.51 mm)		0.250 to 1.012-in. (6.4 to 25.7 mm)	C
				10.021 to 10.546-in. (254.53 to 267.87 mm)		0.250 to 0.945-in. (6.4 to 24.0 mm)	D
				10.547 to 10.999-in. (267.89 to 279.37 mm)		0.250 to 1.018-in. (6.4 to 25.9 mm)	E
	12-in. (300 mm)	13.0375-in. (331.15 mm)	120	11.000 to 11.373-in. (279.40 to 288.87 mm)	0.250 to 1.470-in. (6.4 to 37.3 mm)	0.250 to 1.097-in. (6.4 to 27.9 mm)	B
				11.374 to 11.938-in. (288.90 to 303.23 mm)		0.250 to 0.906-in. (6.4 to 23.0 mm)	C
				11.939 to 12.250-in. (303.25 to 311.15 mm)		0.250 to 1.159-in. (6.4 to 29.4 mm)	D

485 dimensional drawings

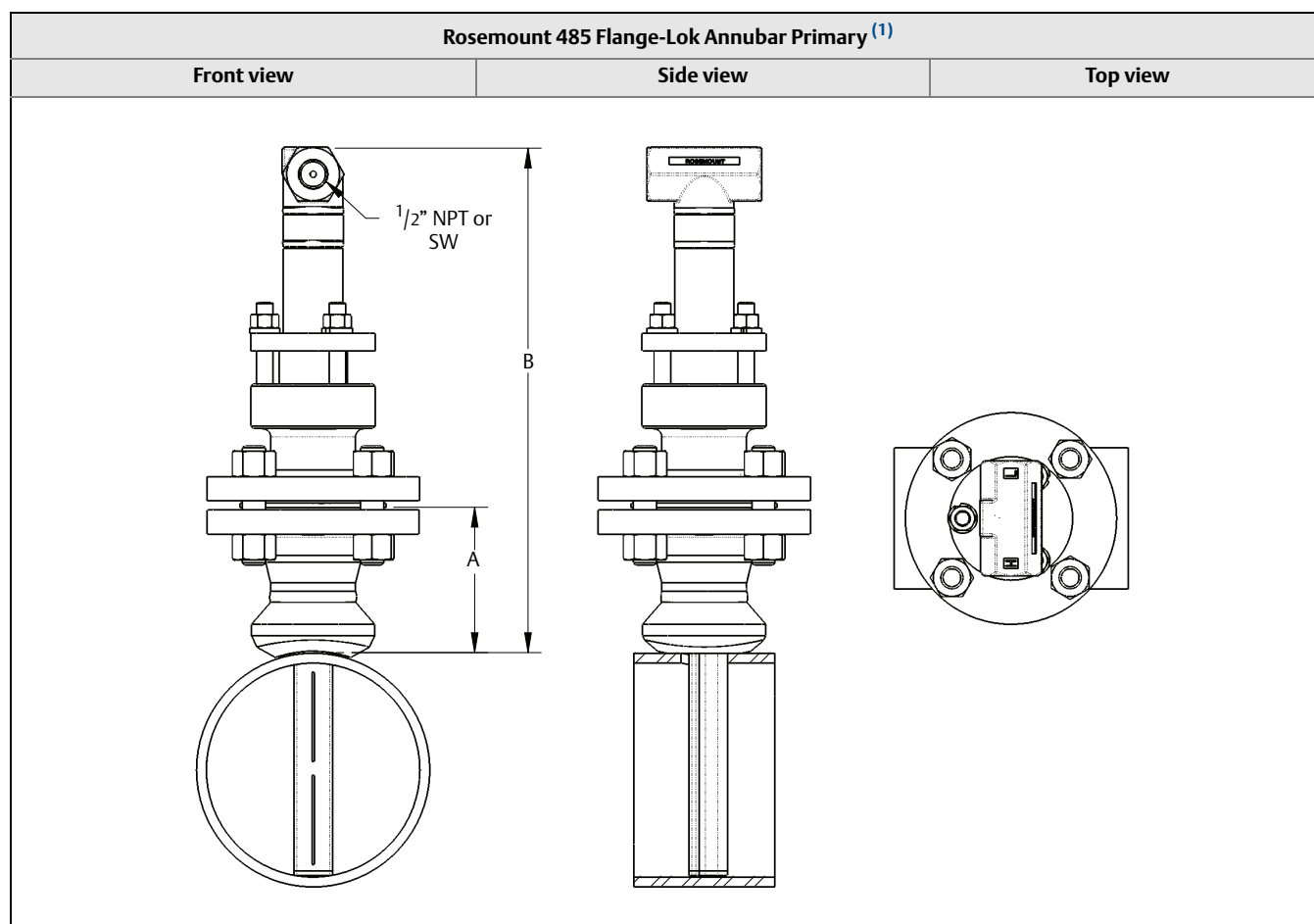


(1) The Pak-Lok Annubar model is available up to 600# ANSI [1440 psig at 100 °F (99 bar at 38 °C)].

Table 25. 485 Pak-Lok Annubar Primary Dimensional Data

Sensor size	A (Max)
1	8.50 (215.9)
2	11.00 (279.4)
3	12.00 (304.8)

Dimensions are in inches (millimeters).



(1) The Flange-Lok Annubar model can be direct mounted up to 600# ANSI (1440 psig at 100 °F (99 bar at 38 °C)).

Table 26. 485 Flange-Lok Annubar Primary Dimensional Data

Sensor size	Flange size and rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)
1	1 1/2 – 150#	3.88 (98.6)	12.25 (311.2)
1	1 1/2 – 300#	4.13 (104.9)	12.25 (311.2)
1	1 1/2 – 600#	4.44 (112.8)	12.25 (311.2)
1	DN40/PN16	3.09 (78.5)	12.25 (311.2)
1	DN40/PN40	3.21 (81.5)	12.25 (311.2)
1	DN40/PN100	3.88 (98.6)	12.25 (311.2)
2	2 – 150#	4.13 (104.9)	14.25 (362.0)
2	2 – 300#	4.38 (111.3)	14.25 (362.0)
2	2 – 600#	4.75 (120.7)	14.25 (362.0)
2	DN50/PN16	3.40 (86.4)	14.25 (362.0)
2	DN50/PN40	3.52 (89.4)	14.25 (362.0)
2	DN50/ PN100	4.30 (109.2)	14.25 (362.0)
3	3 – 150#	4.63 (117.6)	17.50 (444.5)
3	3 – 300#	5.00 (127.0)	17.50 (444.5)
3	3 – 600#	5.38 (136.7)	17.50 (444.5)
3	DN80/PN16	3.85 (97.8)	17.50 (444.5)
3	DN80/PN40	4.16 (105.7)	17.50 (444.5)
3	DN80/ PN100	4.95 (125.7)	17.50 (444.5)

Dimensions are in inches (millimeters).

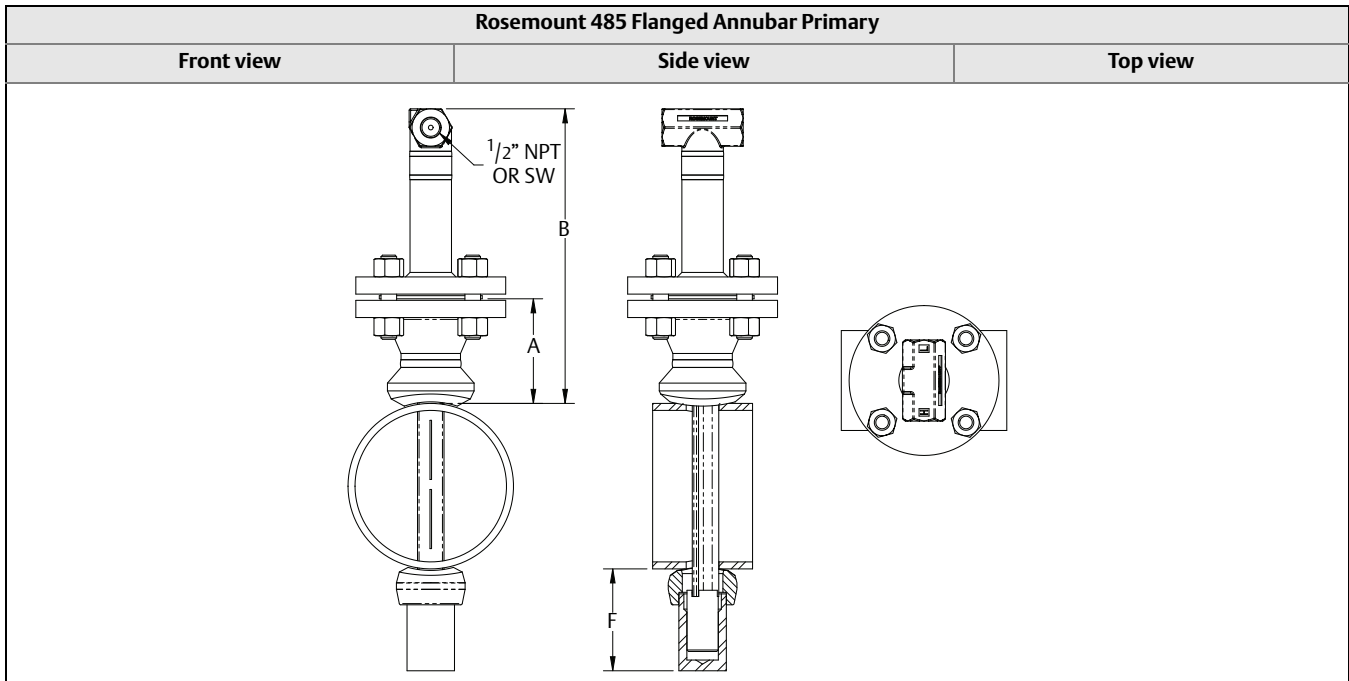


Table 27. 485 Flanged Annubar Primary Dimensional Data

Sensor size	Flange size and rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	F (Max)
1	1 1/2 - 150#	3.88 (98.6)	11.00 (279.4)	3.50 (88.9)
1	1 1/2 - 300#	4.13 (104.9)	11.00 (279.4)	3.50 (88.9)
1	1 1/2 - 600#	4.44 (112.8)	11.00 (279.4)	3.50 (88.9)
1	DN40/PN16	3.09 (78.5)	11.00 (279.4)	3.50 (88.9)
1	DN40/PN40	3.21 (81.5)	11.00 (279.4)	3.50 (88.9)
1	DN40/ PN100	3.88 (98.6)	11.00 (279.4)	3.50 (88.9)
1	1 1/2 - 900#	4.94 (125.5)	9.31 (236.5)	3.50 (88.9)
1	1 1/2 - 1500#	4.94 (125.5)	9.31 (236.5)	3.50 (88.9)
1	1 1/2 - 2500#	6.76 (171.7)	11.63 (295.4)	4.00 (101.6)
2	2 - 150#	4.13 (104.9)	12.00 (304.8)	5.00 (127.0)
2	2 - 300#	4.38 (111.3)	12.00 (304.8)	5.00 (127.0)
2	2 - 600#	4.75 (120.7)	12.00 (304.8)	5.00 (127.0)
2	DN50/PN16	3.40 (86.4)	12.00 (304.8)	5.00 (127.0)
2	DN50/PN40	3.52 (89.4)	12.00 (304.8)	5.00 (127.0)
2	DN50/ PN100	4.30 (109.2)	12.00 (304.8)	5.00 (127.0)
2	2 - 900#	5.88 (149.4)	10.50 (266.7)	5.00 (127.0)
2	2 - 1500#	5.88 (149.4)	10.50 (266.7)	5.00 (127.0)
2	3 - 2500#	9.88 (251.0)	15.63 (397.0)	4.50 (114.3)
3	3 - 150#	4.63 (117.6)	13.50 (342.9)	4.00 (101.6)
3	3 - 300#	5.00 (127.0)	13.50 (342.9)	4.00 (101.6)
3	3 - 600#	5.38 (136.7)	13.50 (342.9)	4.00 (101.6)
3	DN80/PN16	3.85 (97.8)	13.50 (342.9)	4.00 (101.6)
3	DN80/PN40	4.16 (105.7)	13.50 (342.9)	4.00 (101.6)
3	DN80/ PN100	4.95 (125.7)	13.50 (342.9)	4.00 (101.6)
3	4 - 900#	8.19 (208.0)	13.06 (331.7)	7.00 (177.8)
3	4 - 1500#	8.56 (217.4)	13.81 (350.8)	7.00 (177.8)
3	4 - 2500#	11.19 (284.2)	17.31 (439.7)	7.00 (177.8)

Dimensions are in inches (millimeters).

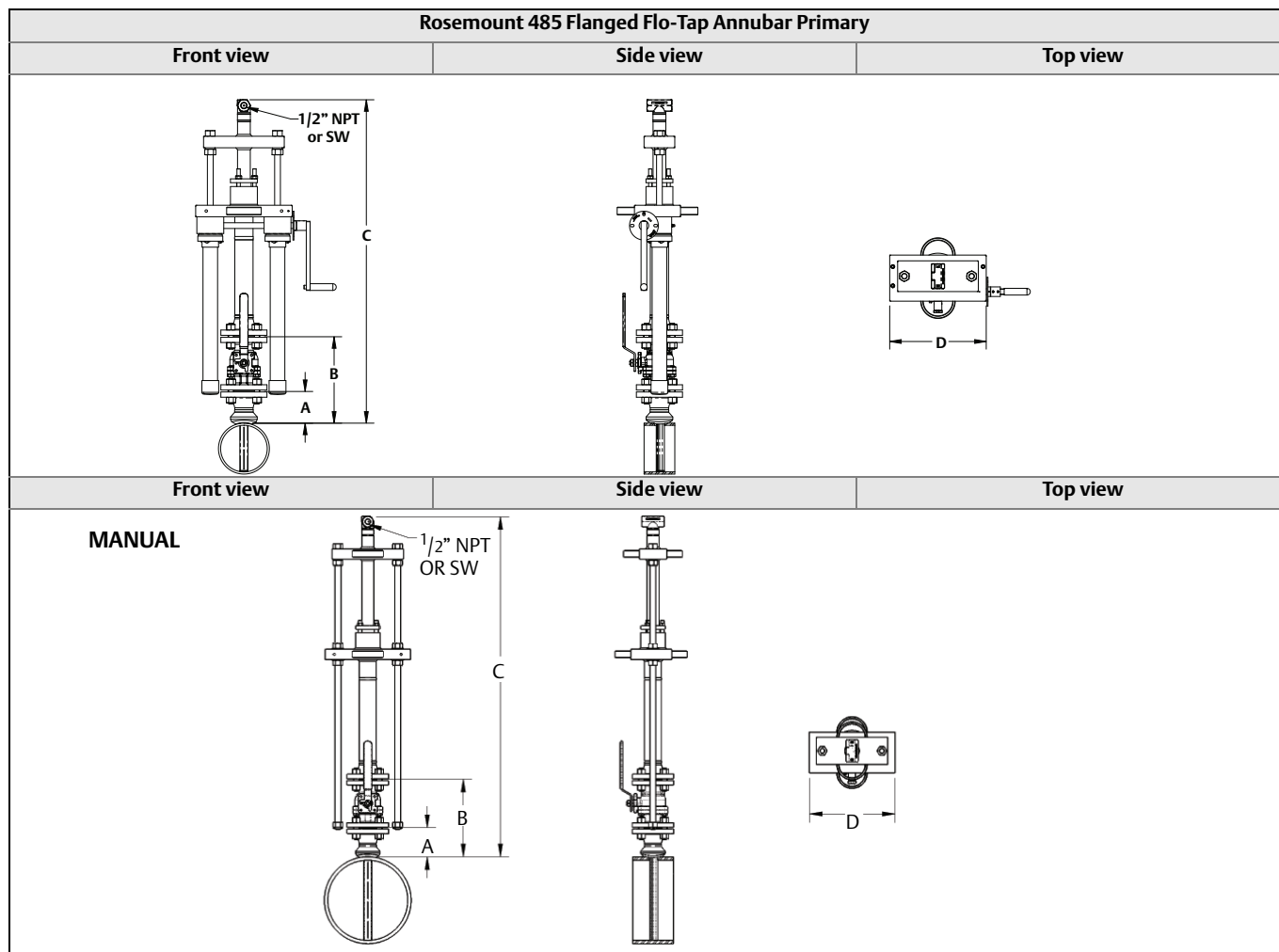


Table 28. 485 Flanged Flo-Tap Annubar Primary Dimensional Data

Sensor size	Flange size and rating	A ± 0.125 (3.2)	B ± 0.25 (6.4)	C ¹ (Max) (gear drive)	C ¹ (Max) (manual)	D (Max)
1	1 1/2 - 150#	3.88 (98.6)	10.50 (266.7)	N/A	17.77 (451.4)	10.50 (266.7)
1	1 1/2 - 300#	4.13 (104.9)	11.75 (298.5)	N/A	17.77 (451.4)	10.50 (266.7)
1	1 1/2 - 600#	4.44 (112.8)	14.06 (357.2)	N/A	17.77 (451.4)	10.50 (266.7)
1	DN40/PN16	3.09 (78.5)	(1)	N/A	17.77 (451.4)	10.50 (266.7)
1	DN40/PN40	3.21 (81.5)	(3)	N/A	17.77 (451.4)	10.50 (266.7)
1	DN40/PN100	3.88 (98.6)	(3)	N/A	17.77 (451.4)	10.50 (266.7)
2	2 - 150#	4.13 (104.9)	11.25 (285.8)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	2 - 300#	4.38 (111.3)	13.00 (330.2)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	2 - 600#	4.75 (120.7)	16.38 (416.0)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	DN50/PN16	3.40 (86.4)	(3)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	DN50/PN40	3.52 (89.4)	(3)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
2	DN50/PN100	4.30 (109.2)	(3)	24.44 (620.8)	21.20 (538.5)	12.56 (319.0)
3	3 - 150#	4.63 (117.6)	12.75 (323.9)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	3 - 300#	5.00 (127.0)	16.25 (412.8)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	3 - 600#	5.38 (136.7)	19.50 (495.4)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	DN80/PN16	3.85 (97.8)	(3)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	DN80/PN40	4.16 (105.7)	(3)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)
3	DN80/PN100	4.95 (125.7)	(3)	26.37 (669.8)	23.14 (587.8)	14.13 (358.9)

Use the appropriate formula to determine C value:

Inserted formula: Pipe I.D. + Wall Thickness + Value B + C¹ (use the Manual Drive or Gear drive values for C¹)

Retracted formula: [2 x (Pipe I.D. + Wall Thickness + Value B)] + C¹ (use the Manual Drive or Gear drive values for C¹)

Dimensions are in inches (millimeters).

(1) DIN Valves are not offered.

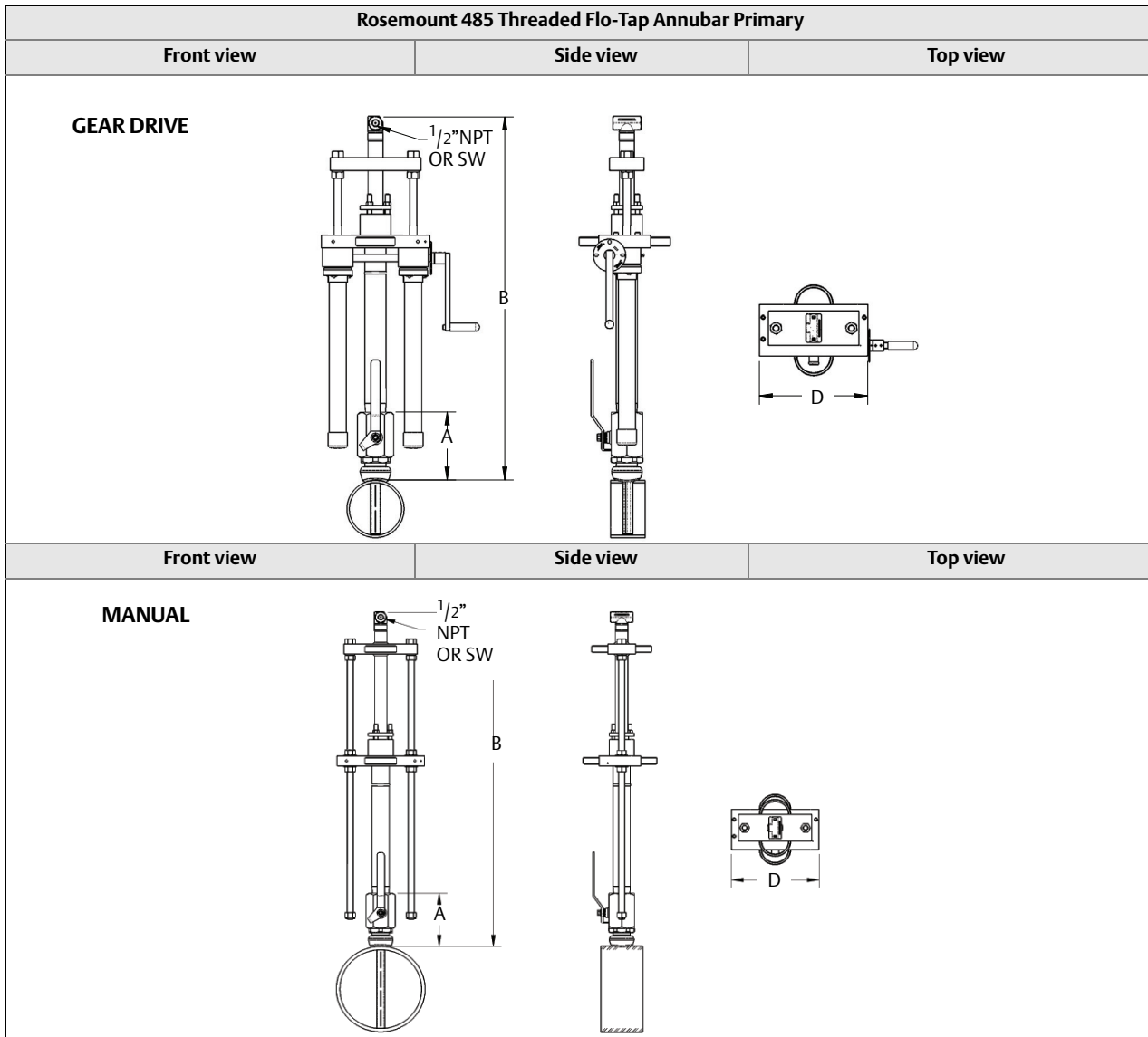


Table 29. 485 Threaded Flo-Tap Annubar Primary Dimensional Data⁽¹⁾⁽²⁾

Sensor size	A ± 0.50 (12.7)	B ¹ (Max) (gear drive)	B ¹ (Max) (manual)	D (Max)
1	7.51 (190.9)	N/A	16.96 (430.8)	10.50 (266.7)
2	8.17 (207.5)	23.62 (599.9)	20.39 (517.9)	12.56 (319.0)
3 ⁽³⁾	N/A	N/A	N/A	N/A

(1) Inserted, B Dimension = Pipe I.D. + Wall Thickness + A + B¹

(2) Retracted, B Dimension = 2 x (Pipe I.D. + Wall Thickness + A) + B¹

(3) Sensor Size 3 is not available in a Threaded Flo-Tap.