

THREADED CLOSURES

For access to Filter
Vessels, Strainers, Pig
Launchers & Receivers



HISTORY

Tube Turns was founded in 1927 in Louisville, Kentucky, USA. We were the first American manufacturer of forged seamless pipe elbows and returns. Over the years, our products have evolved to exceed the ever changing market demands of the industries that we serve.

In 1959, we developed Yoke Style Hinged Closures. We then added T-Bolt Closures, Threaded Closures and Tool-less® Closures in order to satisfy customer requirements.

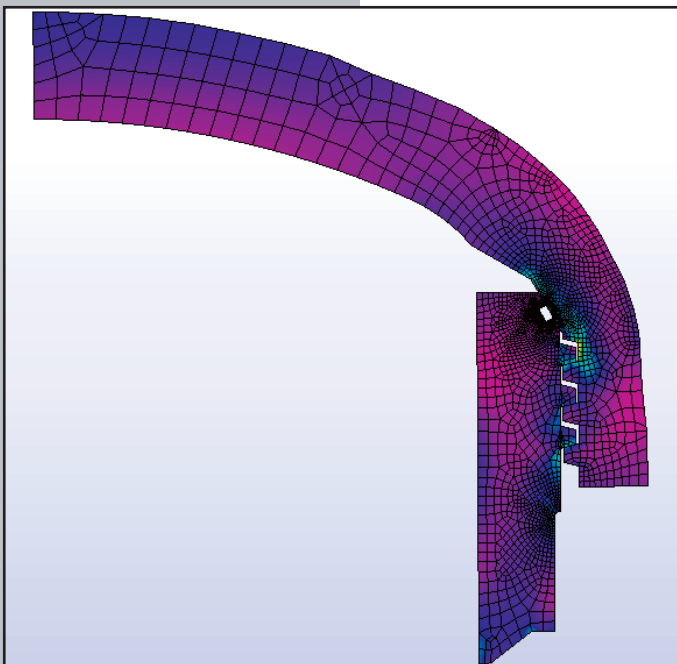
Applications include scraper traps, filters, strainers, separators/ coalescers, terminal manifolds, meter provers, distillation towers, storage tanks or any pressure vessel requiring frequent access.

Tube Turns Threaded Closures are available in sizes 2" thru 24" in Class 150 thru 900 and 26" thru 36" in Classes 150 thru 600. These closures are specified by many piping engineers and designers for their economy and simple design that consists of only a Head, Welding Hub and hinging hardware.

DESIGN & CODE COMPLIANCE

All Tube Turns Threaded Closures are designed in accordance with Section VIII, Division 1 of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. Prototype testing utilizing strain gages was conducted to prove the design basis and strength requirements of the closure geometry. The strain gage results were compared to finite element analysis for theoretical agreement to meet the allowable stresses prescribed in the ASME Pressure Vessel Code. The hydrostatic testing and strain gage testing were witnessed by an independent authorized inspection agency.

ASME Code Stamping and Partial Data Reports are available at the time of order at a nominal extra cost, verifying shop inspection of the unit by a commissioned inspector of the National Board of Boiler and Pressure Vessel Inspectors. Alternatively, we can supply, at no extra charge, our Manufacturer's Statement of Code Compliance to ASME Section VIII, Division 1. We can certify D.O.T. Title 49 Part 192 or Part 195, ASME B31.3, ASME B31.4 or ASME B31.8.



Design of the Threaded Closure has been verified using the latest finite element analysis software.



24" CL900V Closure under 3350 psi Hydrostatic Test

SAFETY

Each Threaded Closure 6" and larger has a Pressure Warning Device to alert the operator of any internal pressure in the pipe or vessel before opening the Head. The Pressure Warning Device is manufactured from stainless steel to provide

corrosion protection for this safety item. The Pressure Warning Device is optional on the 2" through 4" sizes and must be added if the closure requires an ASME Code Stamp. The Pressure Warning Device meets the requirements of UG-35 of ASME

Section VIII, Division 1.

The Threaded Closure is designed to alert the operator of residual pressure in the event the closure is opened inadvertently.

CLOSURE MATERIALS

Threaded Closure Hubs and Heads are made from the materials listed below:

Hubs

2" - 8": SA-106 Grade C X46

10" - 36": SA-105/SA-350 LF2 Cl. 1 / A694-F52

Heads

2" - 6": SA-352 Grade LCB

8" - 12": SA-105/SA-350 LF2 Cl. 1

14" - 36": SA-516 Grade 70N

All closure hubs have high specified yield strengths to facilitate mating

to higher pipe yield strengths as provided by Figure I5 of ASME B31.8 and Figure 434.8.6(a)-(2) of ASME B31.4. Higher yield weld hub materials and hub and head materials conforming to the latest NACE Standard MR0175/ISO 15156 are available upon request.

Minimum Design Metal Temperature (MDMT) of -20 °F (-29 °C) is standard up to extra heavy walls for 2" thru 8" sizes. Lower MDMT's or MDMT on heavier walls can be developed upon request.

MDMT of -50 °F (-46 °C) is standard for 10" thru 36" sizes.

Elastomeric o-ring seals are used in Tube Turns Threaded Closures. The standard seal is 70 Durometer Buna-N which has a temperature range of -30° F to +250° F (-34 °C to 121 °C). For the higher pressure Class 900 closures a 90 Durometer Buna-N seal is standard. Other seal materials are available as described on page 5.

WALL THICKNESS

Stock can currently match the following maximum walls:

2" - Schedule 80	10" - 0.750" (19.1 mm)	20" - 1.031" (26.2 mm)	30" - 1.375" (34.9 mm)
3" - Schedule 80	12" - 0.843" (21.4 mm)	22" - 1.125" (28.6 mm)	32" - 1.406" (35.7 mm)
4" - Schedule 80	14" - 0.843" (21.4 mm)	24" - 1.218" (30.9 mm)	34" - 1.438" (36.5 mm)
6" - Schedule 80	16" - 0.843" (21.4 mm)	26" - 1.250" (31.8 mm)	36" - 1.500" (38.1 mm)
8" - 0.625" (15.9 mm)	18" - 0.937" (23.8 mm)	28" - 1.312" (33.3 mm)	

Closure Hub I. D. is taper bored to match lighter walls such as standard weight. Heavier wall thicknesses are available at an extra cost.

PRESSURE RATINGS

ALLOWABLE WORKING PRESSURE RATINGS: The maximum allowable working pressures refer to those established for ANSI/ASME B16.5 Flange Ratings for carbon steel materials.

Closure Pressure Class	PRESSURE RATINGS (to 450 °F)*				
	150	300	400	600	900
Maximum Working Pressure PSI (BARS)	285 (19.6)	740 (51.1)	990 (68.1)	1,480 (102.1)	2,220 (153.2)
Hydrostatic Test Pressure PSI (BARS)	450 (30)	1125 (77)	1500 (103)	2225 (154)	3350 (230)

*ASME rating will depend on the closure weld hub thickness required to meet ASME Code design requirements. Note: Maximum service temperature for the above ratings is determined by elastomer o-rings used for seal.

QUALITY CONTROL

The Threaded Closure is manufactured in Louisville, KY, USA. The Tube Turns Products quality system meets the ASME Boiler and Pressure Vessel Code, Section VIII, Division 1, Appendix 10. The quality system is audited by an independent authorized inspection agency.

The quality system controls order analysis, calibration, drawings, documents, materials, processes, welding, nondestructive examination and inspection.

Raw materials are inspected for dimensional acceptability and proper heat code identification. Mill test reports are checked to ensure proper physical and chemical properties of all pressure retaining components. Certified material test reports are shipped with each closure.

A serial number is assigned to each Threaded Closure at order entry and is permanently stamped on the closure.

The actual heats of material used for the individual closures are permanently recorded and stamped on all pressure retaining components. This provides traceability to the material test reports for every closure.

The Tube Turns Products can meet the most stringent customer material and testing requirements. Special customer requirements are evaluated by the Engineering Department.

The Tube Turns Products offers optional hydrotest and helium leak test of closures. Non-destructive examination per ASME Section V is available in-house and includes radiography, ultrasound, magnetic particle, and liquid penetrant.

When specified, the following documents are furnished for each closure

- * Hydrostatic test certification
- * Nondestructive test reports
- * ASME code stamping available upon request

UNIVERSITY OF KY. QUALITY CONTROL REPORT

ITEM NO. 26359

DATE 5-5-08

TEST PRESSURE 2220 PSI

TEST MEDIUM 1) STEAM (2) TEST WATER

TEST TIME - HELD FOR 15 MIN.

WORKING PRESSURE DATE NO. TTTP003 CAL. DATE 5-6-08

TEST ACCEPTED (X) TEST FAILED ()

INSPECTED BY David M. Bailey DATE 5-5-08

WITNESSED BY [Signature] DATE 5-5-08

REPRESENTING ABCT, AI

MAGNETIC PARTICLE EXAMINATION REPORT

DATE 5-5-08

TEST PRESSURE 2220 PSI

TEST MEDIUM 1) STEAM (2) TEST WATER

TEST TIME - HELD FOR 15 MIN.

WORKING PRESSURE DATE NO. TTTP003 CAL. DATE 5-6-08

TEST ACCEPTED (X) TEST FAILED ()

INSPECTED BY David M. Bailey DATE 5-5-08

WITNESSED BY [Signature] DATE 5-5-08

REPRESENTING ABCT, AI

FORM U-2A MANUFACTURER'S PARTIAL DATA REPORT (ALTERNATIVE FORM)

1. Manufacturer and location: Tube Turns Products, Inc., Louisville, KY 40211

2. Location of examination: [Blank]

3. Name of ASME Authorized Inspection Agency: [Blank]

4. Name of ASME Code Case or Addendum: [Blank]

5. Serial No. of component: [Blank]

6. Material: [Blank]

7. Heat No.: [Blank]

8. Heat Treatment: [Blank]

9. Heat Treatment Temperature: [Blank]

10. Heat Treatment Time: [Blank]

11. Material Specification and Lot or Heat Number: [Blank]

12. Identification of Parts: [Blank]

13. Signature of Inspector: [Blank]

14. Signature of Manufacturer: [Blank]

15. Date of Examination: [Blank]

SYPRIS PRESSURE TEST CERTIFICATION

TUBE TURNS ORDER NO. 26359 ITEM NO. 1

SERIAL NO. D340 DRAWING NO. [Blank]

TEST PRESSURE 2220 PSI

TEST MEDIUM 1) STEAM (2) TEST WATER

TEST TIME - HELD FOR 15 MIN.

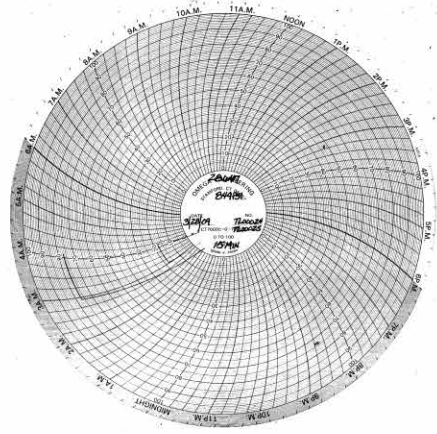
WORKING PRESSURE DATE NO. TTTP003 CAL. DATE 5-6-08

TEST ACCEPTED (X) TEST FAILED ()

INSPECTED BY David M. Bailey DATE 5-5-08

WITNESSED BY [Signature] DATE 5-5-08

REPRESENTING ABCT, AI



O-RING MATERIALS

The materials most often used for closure O-rings are discussed below. Technical information as to properties and usages of gasket material are based on data and recommendations of the manufacturers of the materials.

Determination of the compatibility of the O-ring material is the responsibility of the purchaser.

COMMON O-RING MATERIALS

Buna-N

General service. Resistant to petroleum base hydraulic and lubricating oils; animal and vegetable oils; gases such as butane, propane, acetylene and natural gas, aromatic and nonaromatic fuels such as gasoline, kerosene, diesel fuel and

fuel oils, anhydrous ammonia and water. Temperature limits -30 °F to 250 °F; (-34 °C to 121 °C) special compounds suitable to -65 °F (-54 °C).

Fluoroelastomer (FKM)

Generally used for high temperature services. Resistant to synthetic lubricants, petroleum base products, some chlorinated solvents, benzene, toluene and many acids and alkalis. FKM is also used for sour gas and oil service. Temperature limits -15°F to 400°F (-26 °C to 204 °C).

Ethylene Propylene

Superior resistance to phosphate-ester type fluids, Skydrol,

Pydrol, Cellulubes and glycol type coolants. Excellent resistance to mild acids and alkalis. Can be used in steam service. Replacing butyl rubber in most applications. Temperature limits -70 °F to 250 °F. (-57 °C to 121 °C)

Silicone Rubber

Good resistance to high and low temperature dry gases, air, oxygen and ozone. May be satisfactory in high-aniline oils, but not recommended for use with most petroleum base products and steam. Temperature limits -65 °F to 450 °F. (-54 °C to 232 °C)

ORDER /INQUIRY

In order to reply promptly to inquiries and service orders, the following basic order data requirements are needed:

1. Size
2. Maximum wall thickness of pipe and yield strength
3. Maximum design pressure
4. Maximum and minimum design temperature
5. Corrosion allowance
6. Code requirements (stamp, certifications, etc)
7. Quantity
8. Maximum test pressure
9. O-ring material (Buna-N is standard)
10. Installation position: Closure centerline either horizontal or vertical
 - a. Horizontal hinge requirement either left hand (standard) or right hand. See Closure Dimension table for details on hinging.

SPARE PARTS

Recommended Spare Parts

Two closure o-ring seals and two PWD o-ring seals should be stocked for each closure. If several identical closures are in operation in a given area, one closure o-ring and one PWD o-ring per closure may be stocked.

Frequency of replacement will depend upon such factors as operating pressure and temperature, shrinkage and swelling caused by product absorption, the corrosiveness

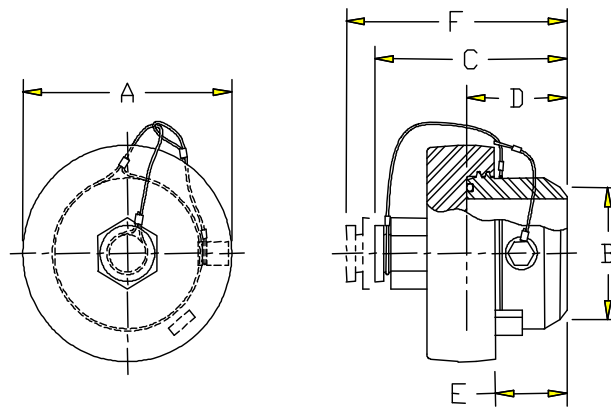
of the product in the system and frequency of operation.

OPERATING TOOL

An Operating Tool is available for easier final closing and initial opening of the 6" and larger Threaded Closure.

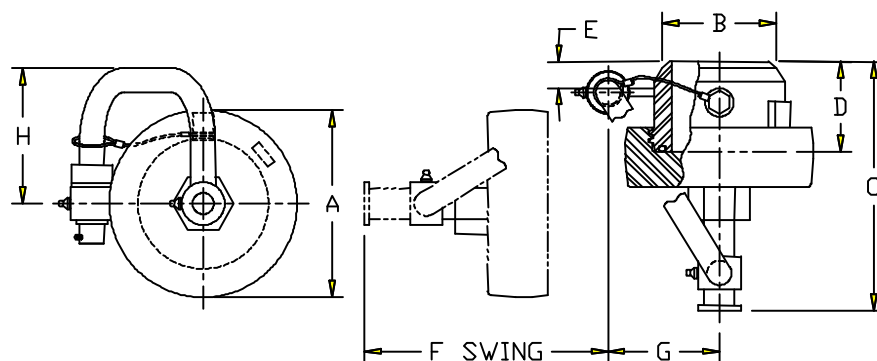


CLOSURE DIMENSIONS



SIZES 2"-4" CLASS 150-900 HORIZONTAL OR VERTICAL							
Nominal Size	A	B	C	D	E	F	Approx. Weight
In (DN)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	Lbs (Kg)
2 (50)	4 ³ / ₄ (12.07)	2 ³ / ₈ (6.03)	5 ¹ / ₁₆ (12.86)	2 ³ / ₄ (6.99)	2 (5.08)	5 ¹³ / ₁₆ (14.76)	9 (4)
3 (80)	5 ³ / ₄ (14.61)	3 ¹ / ₂ (8.89)	5 ¹ / ₁₆ (13.49)	2 ³ / ₄ (6.99)	2 (5.08)	6 ¹ / ₁₆ (15.40)	15 (7)
4 (100)	6 ³ / ₄ (17.15)	4 ¹ / ₂ (11.43)	5 ¹³ / ₁₆ (14.76)	3 ¹ / ₈ (7.94)	2 ¹ / ₈ (5.40)	6 ¹³ / ₁₆ (17.30)	22 (10)

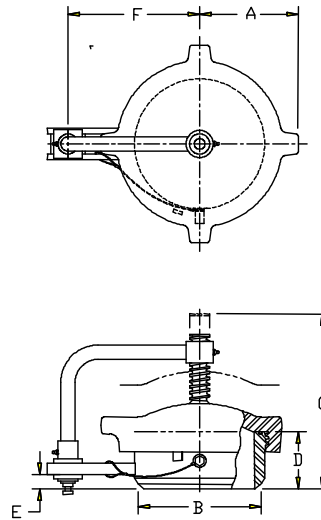
Note – Shown with optional Pressure Warning Device



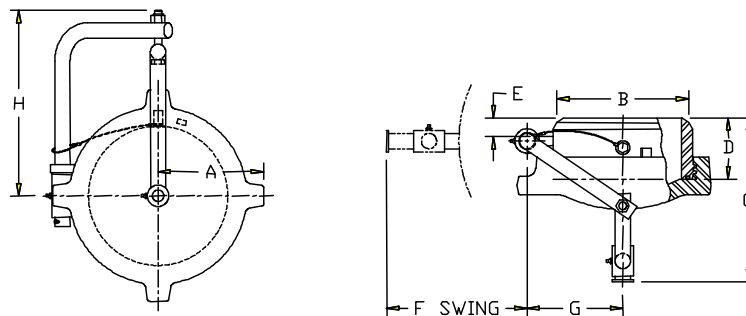
SIZES 2"-4" CLASS 150-900 HORIZONTAL WITH HINGE									
Nominal Size	A	B	C	D	E	F	G	H	Approx. Weight
In (DN)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	Lbs (Kg)
2 (50)	4 ³ / ₄ (12.07)	2 ³ / ₈ (6.03)	7 ³ / ₈ (18.73)	2 ³ / ₄ (6.99)	¹³ / ₁₆ (2.06)	7 ³ / ₁₆ (18.26)	2 ¹⁵ / ₁₆ (7.46)	4 ³ / ₁₆ (10.64)	11 (5)
3 (80)	5 ³ / ₄ (14.61)	3 ¹ / ₂ (8.89)	7 ⁵ / ₈ (19.37)	2 ³ / ₄ (6.99)	¹³ / ₁₆ (2.06)	7 ⁷ / ₁₆ (18.89)	3 ⁷ / ₁₆ (8.73)	4 ³ / ₁₆ (10.64)	17 (8)
4 (100)	6 ³ / ₄ (17.15)	4 ¹ / ₂ (11.43)	8 ¹ / ₈ (20.64)	3 ¹ / ₈ (7.94)	¹⁵ / ₁₆ (2.38)	8 ¹ / ₈ (20.64)	3 ⁷ / ₈ (9.84)	4 ¹¹ / ₁₆ (11.91)	25 (11)

Hinging installed at left when facing the closure
 Note – Shown with optional Pressure Warning Device

CLOSURE DIMENSIONS



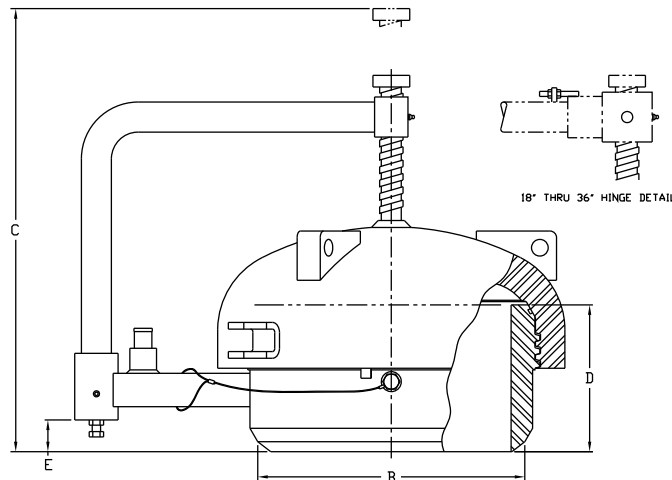
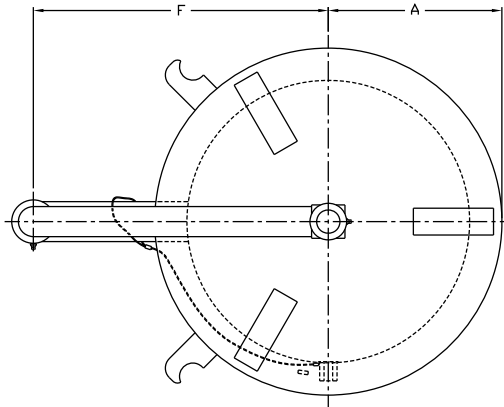
SIZES 6"-12" CLASS 150-900TV VERTICAL WITH HINGE							
Nominal Size	A	B	C	D	E	F	Approx. Weight
In (DN)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	Lbs (Kg)
6 (150)	5 ¹⁵ / ₁₆ (15.08)	6 ⁵ / ₈ (16.83)	12 ³ / ₄ (32.39)	4 (10.16)	1 ¹ / ₈ (2.86)	9 ¹ / ₁₆ (23.03)	55 (25)
8 (200)	7 ⁵ / ₁₆ (18.57)	8 ⁵ / ₈ (21.90)	15 (38.10)	4 ¹ / ₂ (11.43)	1 ¹ / ₈ (2.86)	10 ³ / ₈ (26.35)	95 (43)
10 (250)	8 ⁵ / ₈ (21.91)	10 ³ / ₄ (27.31)	16 ¹ / ₄ (41.28)	5 (12.70)	1 ¹ / ₄ (3.18)	11 ¹ / ₂ (29.21)	150 (68)
12 (300)	10 (25.40)	12 ³ / ₄ (32.39)	17 ¹ / ₂ (44.45)	5 ¹ / ₂ (13.97)	1 ⁵ / ₁₆ (3.33)	12 ¹³ / ₁₆ (32.54)	240 (109)



SIZES 6"-12" CLASS 150-900 TH HORIZONTAL WITH HINGE									
Nominal Size	A	B	C	D	E	F	G	H	Approx. Weight
In (DN)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	Lbs (Kg)
6 (150)	5 ¹⁵ / ₁₆ (15.08)	6 ⁵ / ₈ (16.83)	10 ¹ / ₈ (25.72)	4 (10.16)	1 ³ / ₈ (3.49)	9 ³ / ₄ (24.77)	5 ⁷ / ₁₆ (13.81)	14 ³ / ₈ (36.51)	55 (25)
8 (200)	7 ⁵ / ₁₆ (18.57)	8 ⁵ / ₈ (21.90)	11 (27.94)	4 ¹ / ₂ (11.43)	1 ⁷ / ₁₆ (3.65)	11 (27.94)	6 ⁷ / ₁₆ (16.35)	14 ³ / ₈ (36.51)	95 (43)
10 (250)	8 ⁵ / ₈ (21.91)	10 ³ / ₄ (27.31)	13 ³ / ₈ (33.97)	5 (12.70)	1 ¹ / ₂ (3.81)	13 ¹ / ₄ (33.66)	7 ¹³ / ₁₆ (19.84)	17 ¹ / ₈ (43.50)	155 (70)
12 (300)	10 (25.40)	12 ³ / ₄ (32.39)	14 ³ / ₈ (36.51)	5 ¹ / ₂ (13.97)	1 ⁵ / ₈ (4.13)	14 ¹ / ₂ (36.83)	8 ¹³ / ₁₆ (22.38)	17 ¹ / ₈ (43.50)	250 (113)

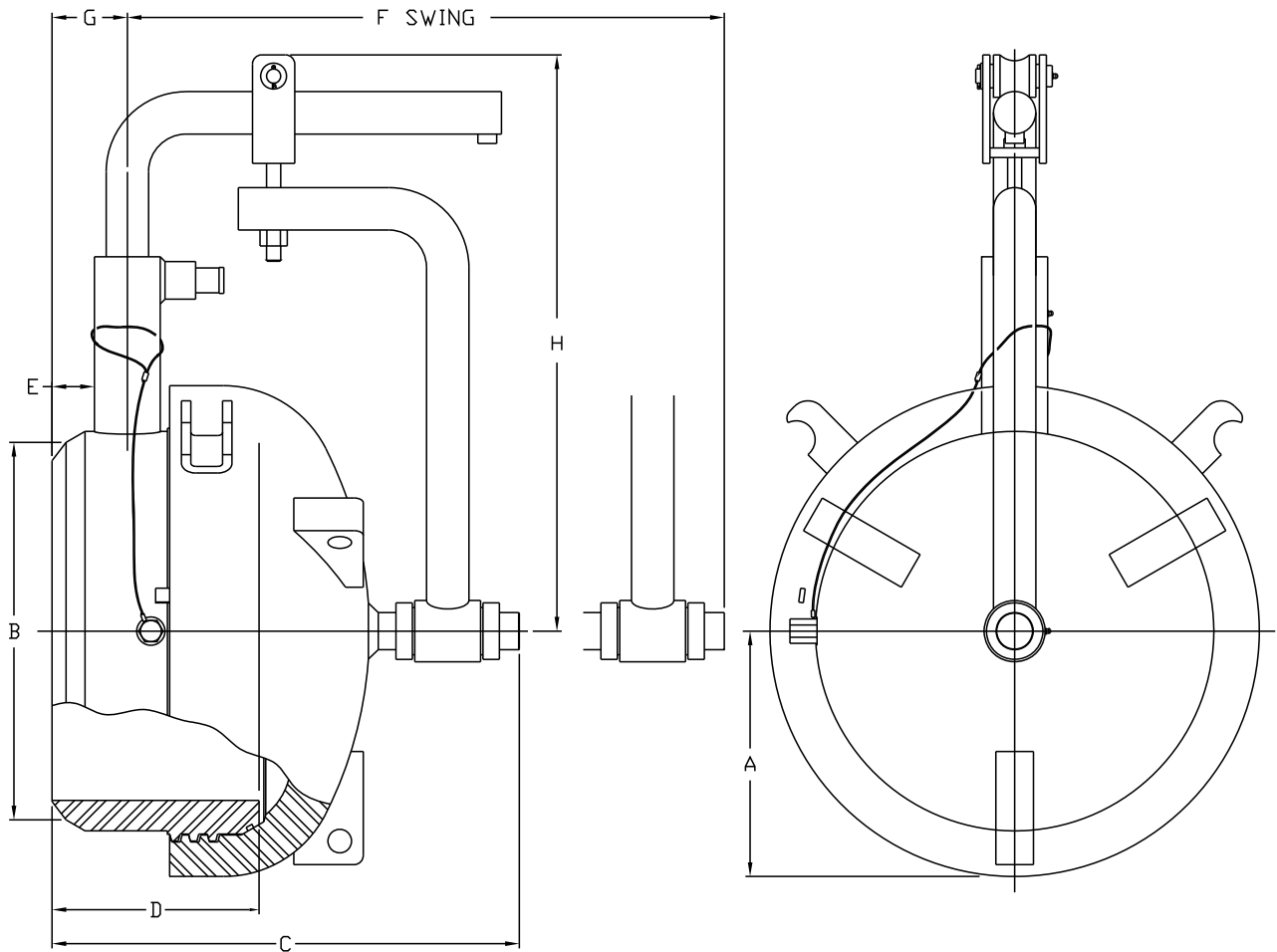
Hinging installed at left when facing the closure

CLOSURE DIMENSIONS



SIZES 14"-24" CLASS 150-900, SIZES 26"-36" CLASS 150-600 TV VERTICAL WITH HINGE							
Nominal Size	A	B	C	D	E	F	Approximate Weight
In (DN)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	Lbs (Kg)
14 (350)	8 ⁷ / ₈ (22.56)	14 (35.56)	30 (76.20)	9 ³ / ₄ (24.77)	1 ⁵ / ₈ (4.14)	18 ¹³ / ₁₆ (47.85)	480 (218)
16 (400)	10 ³ / ₈ (26.37)	16 (40.64)	31 ³ / ₁₆ (79.22)	10 ¹ / ₄ (26.04)	2 ¹ / ₈ (5.41)	20 (50.80)	655 (297)
18 (450)	11 ³ / ₈ (28.91)	18 (45.72)	32 ³ / ₁₆ (81.76)	10 ¹ / ₂ (26.67)	2 ³ / ₈ (6.05)	20 ¹³ / ₁₆ (52.91)	780 (354)
20 (500)	12 ⁷ / ₈ (32.72)	20 (50.80)	33 ⁵ / ₁₆ (84.61)	11 (27.94)	2 ³ / ₈ (6.05)	22 ¹ / ₁₆ (56.08)	1030 (467)
22 (550)	13 ⁷ / ₈ (35.26)	22 (55.88)	33 ¹⁵ / ₁₆ (86.21)	11 ¹ / ₄ (28.58)	2 ⁵ / ₈ (6.68)	23 ¹ / ₁₆ (58.62)	1170 (531)
24 (600)	14 ⁷ / ₈ (37.80)	24 (60.96)	34 ¹¹ / ₁₆ (88.11)	11 ¹ / ₂ (29.21)	2 ⁷ / ₈ (7.32)	24 ¹ / ₁₆ (61.16)	1305 (592)
26 (650)	15.81 (40.16)	26 (66.04)	40 ¹³ / ₁₆ (103.68)	13 (33.02)	3 ¹ / ₂ (8.89)	26 ¹¹ / ₁₆ (67.79)	1663 (755)
28 (700)	16.81 (42.70)	28 (71.12)	41 ⁵ / ₁₆ (104.95)	13 (33.02)	3 ¹ / ₂ (8.89)	27 ¹¹ / ₁₆ (70.31)	1783 (809)
30 (750)	17.81 (45.24)	30 (76.20)	42 ⁵ / ₁₆ (107.49)	13 ¹ / ₂ (34.29)	4 (10.16)	28 ¹⁵ / ₁₆ (73.50)	1947 (883)
32 (800)	18.81 (47.78)	32 (81.28)	42 ¹³ / ₁₆ (108.74)	13 ¹ / ₂ (34.29)	4 (10.16)	29 ¹⁵ / ₁₆ (76.04)	2127 (965)
34 (850)	19.81 (50.32)	34 (86.36)	43 ⁵ / ₁₆ (110.03)	13 ¹ / ₂ (34.29)	4 (10.16)	30 ¹⁵ / ₁₆ (78.58)	2299 (1043)
36 (900)	20.81 (52.86)	36 (91.44)	43 ¹³ / ₁₆ (111.30)	13 ¹ / ₂ (34.29)	4 (10.16)	31 ¹⁵ / ₁₆ (81.12)	2480 (1125)

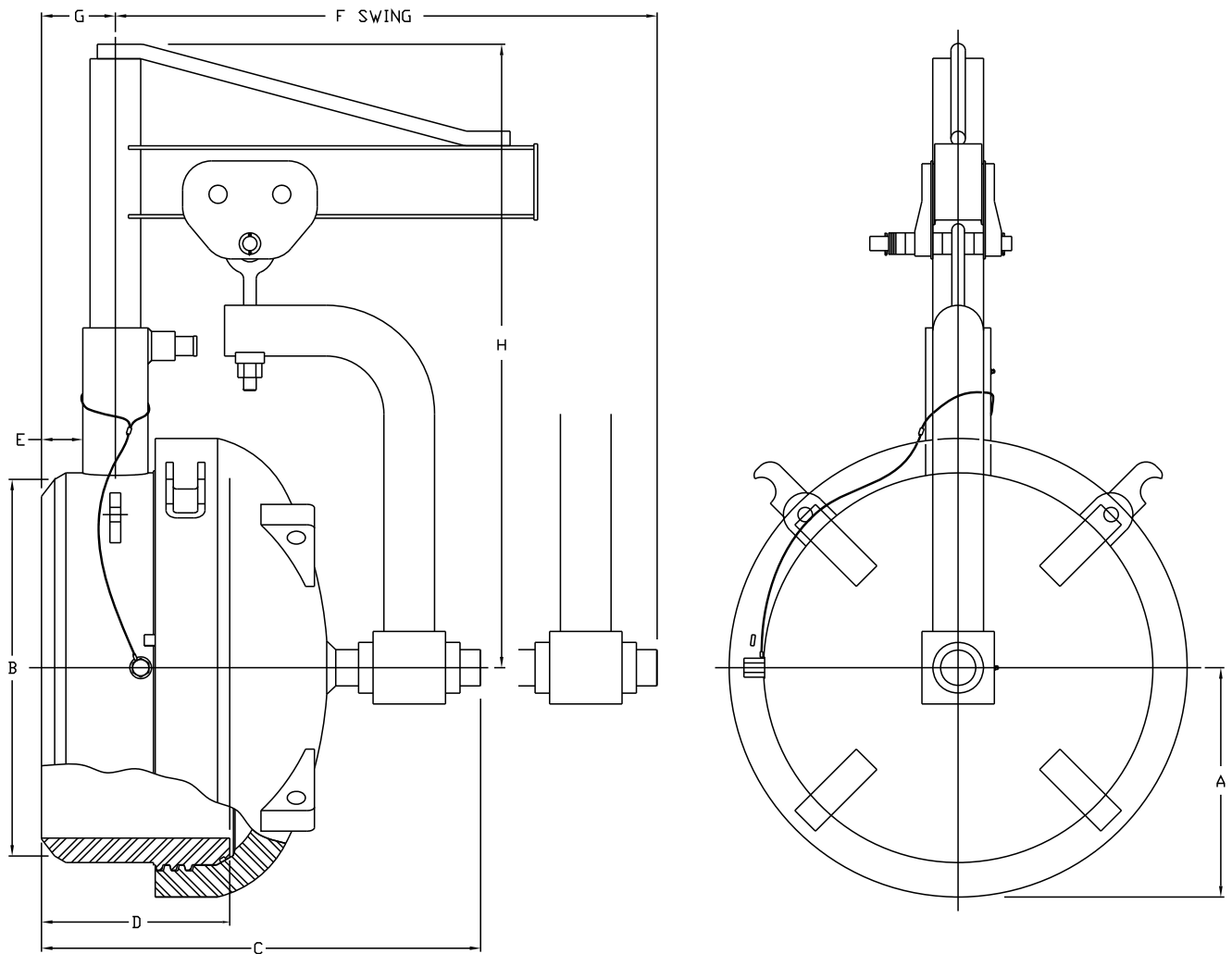
CLOSURE DIMENSIONS



SIZES 14"-22" CLASS 150-900 TH HORIZONTAL WITH HINGE

Nominal Size	A	B	C	D	E	F	G	H	Approx. Weight
In (DN)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	Lbs (Kg)
14 (350)	8 ⁷ / ₈ (22.56)	14 (35.56)	21 ¹ / ₂ (54.61)	9 ³ / ₄ (24.77)	1 ¹ / ₂ (3.81)	25 ³ / ₁₆ (64.06)	3 (7.62)	27 ¹ / ₄ (69.29)	460 (209)
16 (400)	10 ³ / ₈ (26.37)	16 (40.64)	22 ¹¹ / ₁₆ (57.63)	10 ¹ / ₄ (26.04)	2 (5.08)	27 ⁵ / ₁₆ (69.39)	3 ¹ / ₂ (8.89)	28 ⁷ / ₁₆ (72.16)	635 (288)
18 (450)	11 ³ / ₈ (28.91)	18 (45.72)	23 ¹¹ / ₁₆ (60.17)	10 ¹ / ₂ (26.67)	2 ¹ / ₄ (5.72)	28 ⁷ / ₈ (73.28)	3 ³ / ₄ (9.53)	29 ¹ / ₄ (74.37)	760 (345)
20 (500)	12 ⁷ / ₈ (32.72)	20 (50.80)	24 ¹³ / ₁₆ (63.04)	11 (27.94)	2 ¹ / ₄ (5.72)	30 ¹¹ / ₁₆ (77.98)	3 ⁷ / ₈ (9.86)	30 ¹ / ₂ (77.55)	1020 (463)
22 (500)	13 ⁷ / ₈ (35.26)	22 (55.88)	25 ⁷ / ₁₆ (64.47)	11 ¹ / ₄ (28.58)	2 ¹ / ₂ (6.35)	32 ¹ / ₁₆ (81.48)	4 ¹ / ₄ (10.80)	31 ¹ / ₂ (80.09)	1150 (522)

CLOSURE DIMENSIONS



SIZE 24" CLASS 150-900, 26" -36" CLASS 150-600 TH HORIZONTAL WITH HINGE

Nominal Size	A	B	C	D	E	F	G	H	Approx. Weight
In (DN)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	In (cm)	Lbs (Kg)
24 (600)	14 ⁷ / ₈ (37.78)	24 (60.96)	26 ³ / ₁₆ (66.52)	11 ¹ / ₂ (29.21)	2 ³ / ₄ (6.99)	33 ⁹ / ₁₆ (85.24)	4 ¹ / ₂ (11.43)	40 ¹ / ₄ (102.24)	1330 603
26 (650)	15 ¹³ / ₁₆ (40.16)	26 (66.04)	30 ⁵ / ₁₆ (76.99)	13 (33.02)	2 ⁷ / ₈ (7.30)	37 ⁷ / ₁₆ (97.07)	5 ³ / ₃₂ (12.95)	43 (109.22)	1685 764
28 (700)	16 ¹³ / ₁₆ (42.70)	28 (71.12)	30 ¹³ / ₁₆ (78.26)	13 (33.02)	2 ¹³ / ₁₆ (7.14)	38 ¹⁵ / ₁₆ (98.88)	5 ³ / ₃₂ (12.95)	44 (111.76)	1808 820
30 (750)	17 ¹³ / ₁₆ (45.24)	30 (76.20)	31 ¹³ / ₁₆ (80.80)	13 ¹ / ₂ (34.29)	2 ¹³ / ₁₆ (7.14)	40 ⁷ / ₁₆ (102.69)	5 ¹¹ / ₃₂ (13.59)	46 ⁵ / ₁₆ (117.65)	1998 906
32 (800)	18 ¹³ / ₁₆ (47.78)	32 (81.28)	32 ⁵ / ₁₆ (82.07)	13 ¹ / ₂ (34.29)	2 ¹³ / ₁₆ (7.14)	41 ¹⁵ / ₁₆ (106.50)	5 ¹¹ / ₃₂ (13.59)	47 ⁵ / ₁₆ (120.19)	2179 988
34 (850)	19 ¹³ / ₁₆ (50.32)	34 (86.36)	32 ¹³ / ₁₆ (83.34)	13 ¹ / ₂ (34.29)	2 ¹³ / ₁₆ (7.14)	43 ⁷ / ₁₆ (110.31)	5 ¹¹ / ₃₂ (13.59)	48 ⁵ / ₁₆ (122.73)	2351 1066
36 (900)	20 ¹³ / ₁₆ (52.86)	36 (91.44)	33 ⁵ / ₁₆ (84.61)	13 ¹ / ₂ (34.29)	2 ¹³ / ₁₆ (7.14)	45 ¹⁵ / ₁₆ (114.12)	5 ¹¹ / ₃₂ (13.59)	49 ⁵ / ₁₆ (125.27)	2632 1194

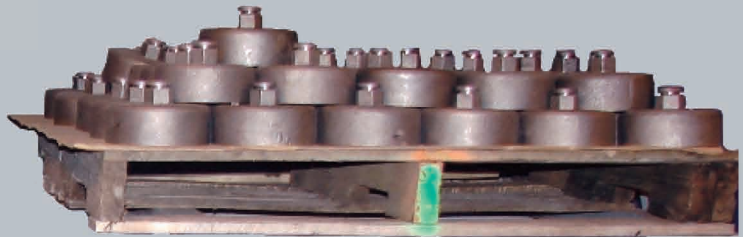
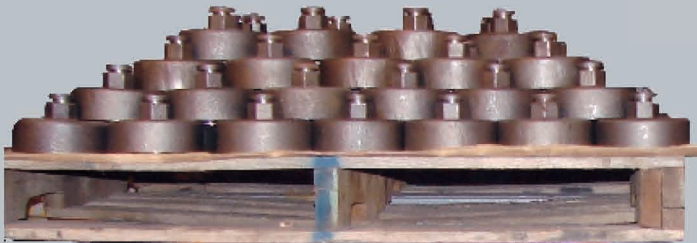


FOR GENERAL INQUIRIES:

louisilletweb@sypris.com
2612 Howard Street
Louisville, Kentucky 40211 USA
Tel: +1 502.774.6011
Fax: +1 502.774.6300

FOR AFTERMARKET AND SERVICE:

ttaftermarket@sypris.com
2612 Howard Street
Louisville, Kentucky 40211 USA
Tel: +1 502.774.6011
Fax: +1 502.774.6300



The information contained herein is based on data and information developed in the Laboratories of Sypris Technologies ("Seller"), but is presented without guarantee or warranty, and the seller disclaims any liability incurred from the use thereof. Nothing contained herein is to be construed as a recommendation for any use, including without limitation, any use in a commercial process not controlled by seller, nor for a use which is in violation of any existing patent, foreign or domestic or of applicable laws and regulations.

Sypris Technologies, Inc. - Tube Turns Products Standard Terms & Conditions of sale apply to all Quotations and Sales as outlined at <https://www.tubeturns.com/about-us/sales-terms/>.