COSASCO®

CHEMICAL INJECTION SYSTEM ACCESS FITTING ASSEMBLIES

Model 56 RJ FLANGE CI

Request A Quote

Cosasco high pressure chemical injection fittings allow safe, controlled, and easy injection under full operating pressure, dramatically reducing downtime. Cosasco offers a wide range of delivery options from standard NPT to robust flanged side tees for chemical injection into high pressure systems.

A variety of injection tubes, quills, and nozzles can be used to provide the most efficient delivery and dispersion for a given application. A Cosasco Retriever and Service Valve are used to safely install and retrieve injection and sampling components under operating conditions that need to be replaced due to a change in injection requirements or if maintenance is necessary.

Chemical Injection Access Fitting

- Mounting — 2" ASME (ANSI) B16.5 Flange RJ
- For Mating with Standard Flanges, no Welding, Less Compact than Model 50
- NPT (std.), Socketweld, Buttweld, and Flanged Tee Connections

Robust Design

- Access Under Pressure — Maintenance or removal under full operating pressure
- Injection/Sampling Components available in highly corrosion resistant alloys
- Safely inject a wide variety of chemicals

ACCESS UNDER PRESSURE SAFR with COSASCO

Temperature and Pressure Ratings

- Standard Temperature Rating with Viton/Teflon Seals: — From -15° F (-26° C) Up To +400° F (+204° C)
- Available Temperature Rating with Optional Seals: — From -70° F (-56° C) Up To +450° F (+232°C)
- Pressure Rating — As Flange Size

Options

- Available with ACME Threaded Internal Configurations
- Various injection tubes, quills, and nozzles available

Standards

- Meets NACE MR0175 and MR0103
- Canadian Registration (CRN) and Conformity to Pressure Equipment Directive (PED)

COSASCO®

Ordering Information for a Typical Access Fitting Arrangement

A complete chemical injection monitoring point consists of several parts. Depending on your particular requirements, one option should be chosen from each ordering table to make up a complete arrangement.

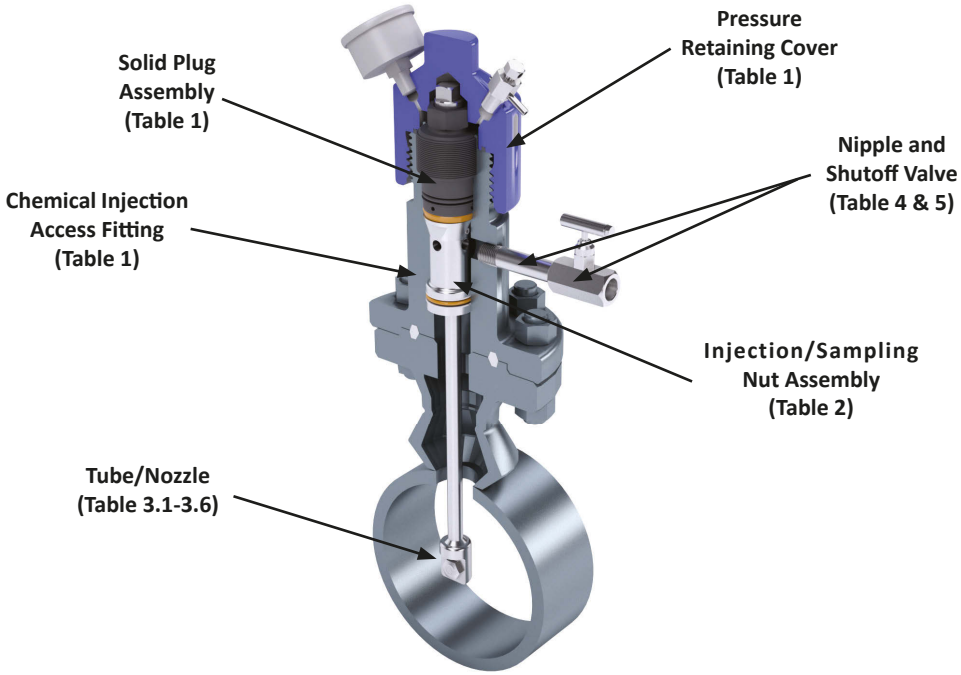
Table 1: Chemical Injection Access Fitting Assembly Consists of:

1. Access Fitting with Side Tee for Injection Line
2. Solid Plug Assembly
3. Pressure Retaining Cover

Table 2: Injection/Sampling Nut Assembly

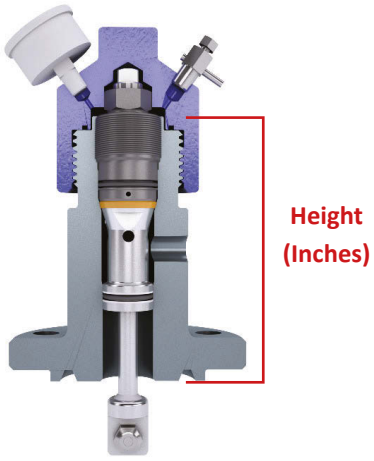
Table 3.1 - 3.6: Injection/Sampling Tubes/Nozzles

Table 4 & 5: Nipples & Shut-Off Valves



Chemical Injection Access Fitting Weights and Dimensions

Style	Flange Size	Height "	Weight Lbs.
¼" TEE	150 300 4/600 9/1500 2500	5.25 5.25 6.25 6.25 6.25	9.5 11.5 12.75 25.75 40.2
½" TEE	150 300 4/600 9/1500 2500	7.25 7.25 7.25 8.25 8.25	10.0 11.75 13.00 26.00 40.50
¾" TEE	150 300 4/600 9/1500 2500	7.25 7.25 7.25 8.25 8.25	10.0 12.0 13.0 26.25 40.50
1" TEE	150 300 4/600 9/1500 2500	7.25 7.25 7.25 8.25 8.25	10.5 12.0 13.0 26.5 40.75

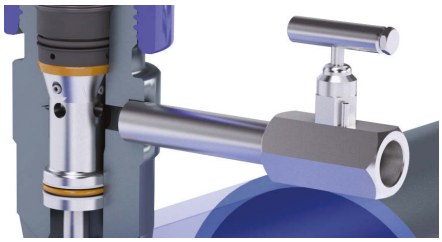


*Weight provided for NPT/Socketweld Side Tee Options

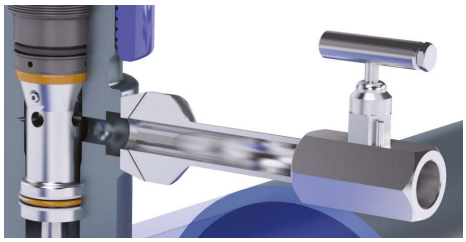
The addition of a tee adds between 1 and 3 inches to the height of the standard access fitting according to the tee size and type.

Access Fitting Options

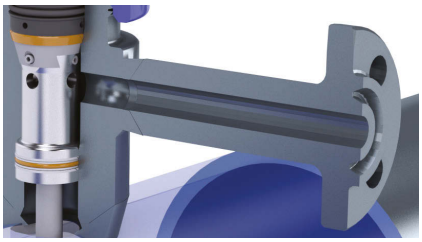
Side Tee Connection Options (standard NPT, shown on previous page)



Socketweld Side Tee



Buttweld Side Tee



Flanged Side Tee

Internal ACME Threaded (AT) Access Fittings Assemblies

Cosasco ACME Threaded (AT) access fittings have internal female ACME threads that receive either a solid or hollow male ACME threaded plug. The ACME Threaded access fittings are advantageous in applications where the process contains solids and debris. Access Fittings that are mounted bottom-of-line are especially susceptible to solids getting lodged in the threads of the plug assembly. ACME threads have courser threads with a larger pitch and a narrower angle than standard v-threads. See individual data sheet for more details and ordering information.

Access Fitting with Internal Acme Threads

High Pressure Retaining Covers and Protective Sleeves (highly recommended for all Access Fitting Assemblies)

Cosasco high pressure retaining covers with pressure gauge and bleed plug offer a secondary pressure isolation with a pressure rating of up to 10,000 PSI. A viton o-ring creates a tight seal retaining any pressure that may build up. The bleed plug allows pressure accumulation verification prior to the cover being backed off. The pressure gauge is used to indicate if there is any pressure build up.

High Pressure Retaining Cover

Service Kits

Routine servicing of access fittings is integral to ensure safe installation and retrieval of corrosion monitoring and chemical injection devices. Cosasco highly recommends the solid carrier plug to be replaced after three insertions or if damaged. A primary packing should be replaced after every service, and for a solid carrier plug, the secondary O' ring seal; for an injection nut, the injection nut seals, if they are excessively worn or damaged. Cosasco Care Service kits provide the necessary replacement parts for routine maintenance of each access fitting location.

1. Chemical Injection Access Fitting Assembly

Chemical Injection Fittings have a side tee that incorporates a ¼", ½", ¾", or 1" NPT threaded inlet on the side of the fitting body, with optional Socketweld, Buttweld, and Flanged inlet to suit the type of injection connection.

Table 1 – Ordering Information

Model	High Pressure Access Fitting Assembly
56	2" ASME (ANSI) RJ Flange
56AT	2" ASME (ANSI) RJ Flange – ACME Threaded

Code	Plug Assembly- Enter Code For Plug Type From Options Below					
	Type (1st Digit)		Alloy Mat'l (2nd Digit)		Packing Seal (3rd Digit)	
XXX	0	Not Req.	0	Not Req.	0	Not Required
	1	Solid	1	316/316L S.S.	1	Viton O-Ring Teflon Primary Packing * -15 to 400° F (-26 to 204°C)
			3	Hastelloy C-276	2	Ethylene Propylene O-Ring Vespel Primary Packing *-70 to 250°F (-56 to 121°C)
			4	Nitronic 60	3	Kalrez O-Ring Vespel Primary Packing * -15 to 450°F (-26 to 232°C)
			5	Carbon Steel	4	No O-Ring Nitronic 60 Primary Packing * -50 to 450°F (-45 to 232°C)
			6	Inconel 625	5	Hydrin O-Ring Teflon Primary Packing * -40 to 275°F (-40 to 135°C)
			7	2205 Duplex S.S.	6	Nitrile O-Ring Teflon Primary Packing * -30 to 250°F (-35 to 121°C)
					7	Ethylene Propylene O-Ring, Teflon Primary Packing * -70 to 250°F (-56 to 121°C)
					8	EDR Viton O-Ring Teflon Primary Packing *-15 to 400° F (-26 to 204°C)
					9	Kalrez O-Ring Teflon Primary Packing *-15 to 450° F (-26 to 232°C)
					A	HNBR EOL 101 O-Ring Teflon Primary Packing - * -13 to 320°F (-25 to 160°C)
					B	HNBR EOL 985 O-Ring Teflon Primary Packing - * -67 to 302°F (-55 to 150°C)
					C	AFLAS 69/90 O-Ring Teflon Primary Packing * 32 to 392°F (0 to 200°C)
					D	Viton "B" (VB185-70) Teflon Primary Packing - * - 15 to 400°F (-26 to 204°C)

Code	Side Tee Size
1	1/4" Tee (Not available for Flanged (FL) Side Tee)
2	1/2" Tee
3	3/4" Tee
4	1" Tee

Code	Optional Side Tee Configuration (omit for standard NPT)
SW	Socketweld Tee
FL71	150# RF
FL72	300# RF
FL73	4/600# RF
FL74	9/1500# RF
FL75	2500# RF
FL41	300# RJ
FL42	4/600# RJ
FL43	9/1500# RJ
FL44	2500# RJ
	Flanged Side Tee configurations available for ½", ¾" & 1 sizes only.
BW40	Schedule 40 (Standard) Buttweld Tee
BW80	Schedule 80 (Extra Strong) Buttweld Tee
BW160	Schedule 160 (Not applicable for ¼") Buttweld Tee
BWXX	Schedule XX (Double Extra Strong) (Not applicable for ¼") Buttweld Tee
	Required for 6000 PSI locations.

Code	Flange Size
40	2" 150# RJ
41	2" 300# RJ
42	2" 4/600# RJ
43	2" 9/1500# RJ
44	2" 2500#

Code	Body Material
K03504	ASTM A105 Carbon Steel
K03011	ASTM A350 LF2 Carbon Steel
S31600	AISI 316 Stainless Steel
S31803	Duplex Stainless Steel

Code	Secondary Pressure Retaining Covers**
10	Pressure Retaining Cover With Bleed Plug and Pressure Gauge P/N 740090 10,000 PSI Max.

56 — 111 — 2 — FL71 — 40 — K03504 — 10 ← Example

*Nominal Temperature Range

**Optional materials, seals, and pressure gauges are available. See ordering information on next page for details.

Pressure Retaining Covers

Material, Seal, and Pressure Gauge Ordering Options for Pressure Retaining Cover

Model	Pressure Retaining Cover
740090	Pressure Retaining Cover With Bleed Plug, Pressure Gauge

Code	Body Material
XXXXXX	Enter UNS Number (omit for standard A350-LF2 Carbon Steel)

Code	Seal Material Option (omit for standard Viton)
1	Viton
2	Ethylene Propylene
3	Kalrez
5	Epchlorohydrin
6	Nitrile
8	EDR Viton
A	HNBR EOL 101 O-Ring Teflon Primary Packing - * -13 to 320˚F (-25 to 160˚C)
B	HNBR EOL 985 O-Ring Teflon Primary Packing - * -13 to 320˚F (-25 to 160˚C)
C	AFLAS 36/90 O-Ring Teflon Primary Packing - * 32 to 392˚F (0 to 200˚C)

Code	Pressure Gauge Range
YYYY	Enter Pressure (psi) (omit for standard 6000 psi gauge on 740090)

740090 — S31600 — 1 — 4000 ← Example

Ordering Options as Part of an Access Fitting Assembly

Pressure Retaining Covers:

-10/XXXXXX/Y/YYYY

- Pressure Gauge Range
- Seal Material Option
- Cover Material UNS Number

2. Injection/Sampling Nut Assembly

An injection nut assembly is required to connect the injection tube to the solid plug assembly of the access fitting. The part number and length of the injection nut assembly is determined by the access fitting body height. This is, depending upon application, a multiple-use nut that replaces the nut of the Solid Plug Assembly in the Access Fitting Assembly. Its function is to direct the injection product to the Injection Tube or directly to the atomization device. The Injection/Sampling Nut has bleed ports in the side wall above an access fitting body bore o-ring seal; and is drilled and tapped with 1/4", 1/2", 3/4 NPT threads to enable attachment of different size Injection/Sampling Tubes or Nozzle Assemblies.

Table 2 – Ordering Information

Select Part Number from first table and then options from second table for complete part number.

Nut Size		Access Fitting Body Height				
NPT	**Length**	**5.25”**	**6.25”**	**7.25”**	**8.25”**	
1/4”	1.75	**120603**				
1/4”	2.75		**204728**			
1/4”	3.75			**122217**		
1/4”	5.50				**120556**	
1/2”	1.75	**120604**				
1/2”	2.75		**204899**			
1/2”	3.75			**122219**		
1/2”	5.50				**120552**	
3/4”	1.75	N/A				
3/4”	2.75		**N/A**			
3/4”	3.75			**122220**		
3/4”	5.50				**120406**	

Part Number

Code	Material* (Omit for 316/316L S.S.)
S31803	Duplex Stainless Steel
S32760	Super Duplex Stainless Steel

Code	O-Ring Material (Omit for standard Viton O-Ring Material (V894-90))
2	Ethylene Propylene O-Ring (E540-80)
3	Kalrez O-Ring (3018)
5	Hydrin O-Ring (Z4)
6	Nitrile O-Ring (N674-70)
8	Viton (EDR) O-Ring (V1238-95)
A	HNBR EOL 101 O-Ring
B	HNBR EOL 985 O-Ring
C	AFLAS 69/90 O-Ring
D	Viton “B” O-Ring (VB185-70)

Code	Integral Check Valve (not available for PN 120603 or 120604, 1.75” length)
CV	Integral Check Valve included **(omit for no CV)**

122217 — S31803 — 2 — CV ← Example

*Consult Factory for materials not specified above.

Injection Nut Accessories

Part Number	Description
209871-W	Injection Nut Seal Kit (1 O-ring, 2 Back-Up Rings (Teflon))
209871-W-CV	Injection Nut Seal Kit (1 O-ring, 2 Back-Up Rings (Teflon), and Check Valve Seals)
124900	Set Screw (316 S.S.)

3. Injection/Nozzles/Sampling Tubes (For sizing information see last page)

Depending upon the application an Injection Tube or Sampling Tube may be selected. The Injection Tube is the pathway for the injected product flowing from the Injection Nut to the process. Standard Cosasco Injection Tubes are offered in 1/4", 1/2", and 3/4" NPT sizes to mate with like size NPT Injection Nuts.

Note: For high velocity process conditions it is recommended that Wake Frequency Calculations be performed – please contact a Cosasco representative for further details.

Scarf and Quill Injection Tube (1/4",1/2", 3/4" NPT)

This style is similar to the open NPT Injection Tube but has a scarf and quill cut instead of a plain open end. It utilizes the turbulence created by its design, in conjunction with the natural turbulence within the pipe or vessel, to accomplish distribution of the injected product into the product process flow. Its injection is oblique or parallel (depending upon ID placement) to the pipeline product flow.

Features and Benefits

- Typically used for moderate to fast flow
- 1/4", 1/2", 3/4" NPT connection
- Reliable and even chemical dispersion when center-of-line
- No restricting orifice and consequently no backpressure nor pressure differential is experienced at the injection tube orifice.
- Virtually clog proof even for unscreened inhibitors
- Easy maintenance

Table 3.1 – Ordering Information

Part Number	Description
6300	2" Injection Tube 1/4 NPT x Quill (316 S.S. only)
630002	2" Injection Tube 1/4 NPT x Quill
630021	2" Injection Tube 1/2 NPT Sch 160 x Quill (316 S.S. only)
630023	2" Injection Tube 1/2 NPT x Quill
630024	2" Injection Tube 1/2 NPT Sch XXS x Quill (316/L S.S. only)
630020	2" Injection Tube 3/4 NPT x Quill

Code	Material*
S31600/S31603	316/L Stainless Steel
S31803	Duplex Stainless Steel
S32760	Super Duplex Stainless Steel

Code	Order Length
LL.LL	Length in 1/4" increments from 1.25 to 36.00 inches.

630002 — S31803 — 10.00 ← Example

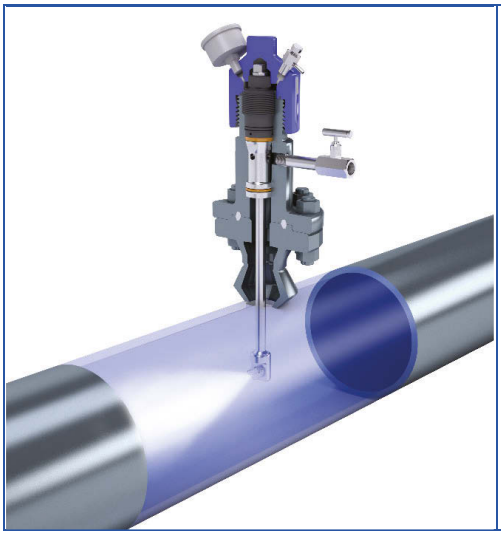
*Consult Factory for materials not specified above.

Injection Tube x Head with Atomization Nozzle (9/16” Head)

This Injection Tube has 9/16” male NPT end which accommodates a selection of 9/16” female NPT nozzles for perpendicular Injection/Atomization. The injection dispersion is always parallel with the product flow and is the usual style used for center-of-line injection. For ordering select Injection Tube from Table 3.2a and Atomization Nozzle from Table 3.2b below.

Features and Benefits

- 1/4” and 1/2” NPT connection
- Injection dispersion always parallel to product flow
- Typically used for center-of-line injection
- Spray angle 80 psi –35° to 300 psi – 91°
- Gallons per hour capacity: 0.3 gal at 40 psi to 130 gal at 1000 psi.



Injection Tube x Head with Atomization Nozzle

Table 3.2a – Ordering Information

Part Number	Description
6304	2” Injection Tube 1/4 NPT x Head (9/16”)
630570	2” Injection Tube 1/2 NPT x Head (9/16”)

Code	O-ring Material (omit for standard Viton (V894-90))
2	Ethylene Propylene O-Ring (E540-80)
3	Kalrez O-Ring (3018)
5	Hydrin O-Ring (Z4)
6	Nitrile O-Ring (N674-70)
8	Viton (EDR) O-Ring (V1238-95)
A	HNBR EOL 101 O-Ring
B	HNBR EOL 985 O-Ring
C	AFLAS 69/90 O-Ring
D	Viton “B” O-Ring (VB185-70)

Code	Material* (Omit for 316/316L S.S.)
S31803	Duplex Stainless Steel
S32760	Super Duplex Stainless Steel

Code	Order Length
LL.LL	Length in 1/4” increments from 1.25 to 36.00 inches.

6304 — 2 — S31803 — 10.00 ← Example

*Consult Factory for materials not specified above.

Atomization Nozzle (Cap with Core (9/16"))

A male Cap with Core is typically threaded into the head. Cap with Core selection is made based on the combination of desired flow rate and differential pressure (pressure difference between the process pipeline pressure and the injection pipeline pressure). See chart below for selection.

Table 3.2b – Ordering Information

Cap with Core (9/16")													
Part Number	Orifice Nom. Dia. (in.)	GPH Capacity* @ PSI Differential									Spray Angle (°)		
		40 psi	60 psi	80 psi	100 psi	200 psi	300 psi	500 psi	700 psi	1000 psi	40 psi	80 psi	300 psi
*129490	0.016	0.3	0.36	0.42	0.48	0.67	0.82	1.1	1.3	1.5			51
*129473	0.016	0.4	0.48	0.56	0.64	0.9	1.1	1.4	1.7	2.0			58
743036	0.016	0.5	0.63	0.72	0.81	1.1	1.4	1.8	2.1	2.5			63
*129472	0.016	0.6	0.72	0.84	0.95	1.3	1.6	2.1	2.5	3.0		35	65
129475	0.020	1.0	1.2	1.4	1.6	2.2	2.7	3.5	4.2	5.0	45	62	72
129483	0.020	1.5	1.8	2.1	2.4	3.4	4.1	5.3	6.3	7.5	65	70	72
129474	0.028	2.0	2.4	2.8	3.2	4.5	5.5	7.1	8.4	10.0	70	75	77
200865	0.039	2.0	2.4	2.8	3.2	4.5	5.5	7.1	8.4	10.0	165	158	
129381	0.028	3.0	3.7	4.2	4.7	6.7	8.2	10.6	12.5	15.0	65	70	73
200866	0.039	3.0	3.7	4.2	4.7	6.7	8.2	10.6	12.5	15.0	157	152	
200867	0.042	4.0	4.9	5.8	6.3	8.9	11.0	14.1	16.7	20.0	72	81	84
200868	0.060	4.0	4.9	5.8	6.3	8.9	11.0	14.1	16.7	20.0	156	155	
128330	0.042	6.0	7.3	8.6	9.5	13.4	16.4	21.0	25.0	30.0	73	79	81
200869	0.060	8.0	9.8	11.3	12.6	17.9	22.0	28.0	33.0	40.0	85	89	91
200870	0.060	8.0	9.8	11.3	12.6	17.9	22.0	28.0	33.0	40.0	152	153	
200871	0.064	10.0	12.2	14.4	15.8	22.0	27.0	35.0	42.0	50.0	82	84	86
200215	0.076	12	14.7	17.4	19.0	27.0	33.0	42.0	50.0	60.0	78	82	85
128333	0.076	14.0	17.1	20.0	22.0	31.0	38.0	49.0	59.0	70.0	85	88	90
743037	0.086	16.0	19.6	22.7	25.0	36.0	44.0	57.0	67.0	80.0	83	86	88
200872	0.076	18.0	22.0	26.0	28.0	40.0	49.0	64.0	75.0	90.0	81	84	86
743038	0.081	20.0	24.0	28.4	32.0	45.0	55.0	71.0	84.0	100.0	75	78	80
200873	0.076	22.0	27.0	31.0	35.0	49.0	60.0	78.0	92.0	110.0	70	72	75
128395	0.086	26.0	32.0	36.5	41.0	58.0	71.0	92.0	109.0	130.0	73	74	77

* Those grayed out flow options mean that the flow rate will be achieved, however the flow performance (hollow cone spray pattern and angle) are not guaranteed, nor can they be estimated.

** Those grayed out angle options mean that the flow performance (hollow cone spray pattern and angle) are not guaranteed, nor can they be estimated.

Flow Rate Determination

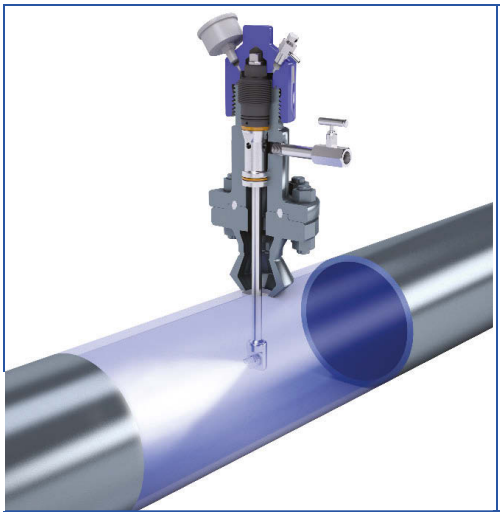
For approximate flow rate determination with a differential pressure not stated above (and over 40 psi) see equation on last page.

Injection Tube x Head with Atomization Nozzle (1/4” Head)

This Injection Tube has 1/4” male NPT end which accommodates a selection of 1/4” female NPT nozzles for perpendicular Injection/ Atomization. The injection dispersion is always parallel with the product flow and is the usual style used for center-of-line injection. For ordering select Injection Tube from Table 3.3a and PJ Atomization Nozzle from Table 3.3b below.

Features and Benefits

- 1/2” NPT connection
- Finest fog of any direct pressure nozzle
- Cone-shaped fog spray pattern
- 90° spray pattern. For best 90° pattern operate nozzle at or above 60 psi
- Flow rates from 0.013 to 1.4 gpm



Injection Tube with PJ Atomization Nozzle

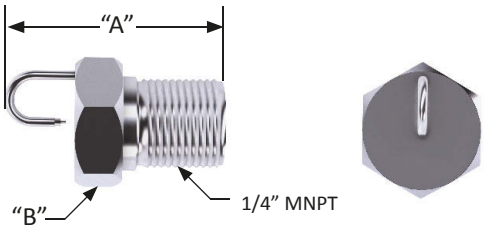
Table 3.3a – Ordering Information

Part Number			
630573			
	Code	**Material**	
	S31600/S31603 S31803 S32760	316/L Stainless Steel Duplex Stainless Steel Super Duplex Stainless Steel	
		Code	**Order Length**
		LL.LL	Length in 1/4” increments from 1.25 to 36.00 inches.
630573 —	S31600 —	10.00	← Example

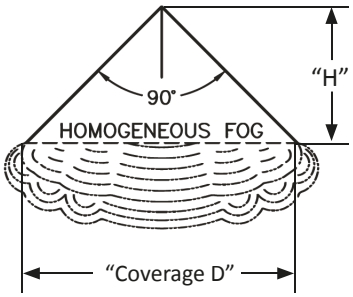
PJ Atomization Nozzle

A PJ atomization nozzle is typically threaded into the head. PJ atomization nozzle selection is made based on the combination of desired flow rate and coverage area. See chart below for selection.

Fog



PJ with polypropylene filter



Fog Pattern

Table 3.3b – Ordering Information

PJ Atomization PJ Flow Rates and Dimensions*
Impingement, 90° Spray Angle, 1/8" OR 1/4" Sizes, BSP or NPT**

Part Number	Male Pipe Size (-Y)	Nozzle No. (-Z)	Nozzle No. (Desc)	K Factor	Gallons per Minute @ PSI Differential									Approx. Orifice Dia. (in.)	Approx. Coverage (inches) D	Approx. Spray Height H (in.)	Pipe Size	Approx. Dim. (in.) A	B
					10 psi	30 psi	40 psi	50 psi	60 psi	80 psi	100 psi	200 psi	400 psi						
632906	1/4 (-2)	1	PJ6	0.00095				0.006	0.007	0.008	0.010	0.013	0.019	0.006	10	5	1/4	0.97	0.56
		2	PJ8	0.00180				0.013	0.014	0.016	0.018	0.025	0.036	0.008	10	5			
		3	PJ10	0.00269			0.017	0.019	0.021	0.024	0.027	0.038	0.054	0.010	10	5			
		4	PJ12	0.00364			0.023	0.026	0.028	0.033	0.036	0.051	0.073	0.012	10	5			
		5	PJ15	0.00585		0.032	0.037	0.041	0.045	0.052	0.059	0.083	0.117	0.015	10	5			
		6	PJ20	0.0106	0.034	0.058	0.067	0.075	0.082	0.095	0.11	0.15	0.21	0.020	12	6			
		7	PJ24	0.0158	0.050	0.087	0.10	0.11	0.12	0.14	0.16	0.22	0.32	0.024	16	8			
		8	PJ28	0.0206	0.065	0.11	0.13	0.15	0.16	0.18	0.21	0.29	0.41	0.028	18	9			
		9	PJ32	0.0285	0.090	0.16	0.18	0.20	0.22	0.25	0.28	0.40	0.57	0.032	22	11			
		10	PJ40	0.0443	0.14	0.24	0.28	0.31	0.34	0.40	0.44	0.63	0.89	0.040	24	12			
632906	— 2	— 4																Example	

* Dimensions are approximate. Check with Cosasco for critical dimension applications.
**Spray angle performance varies with pressure. Contact Cosasco for specific data on critical applications.

Fine Spray Nozzles (Injection Tube with Nozzle (Female))

This Injection Tube has 1/4" male NPT end which accommodates a selection of 1/4" female NPT nozzles for perpendicular Injection/ Atomization. For ordering select Injection Tube from Table 3.4a and Fine Spray Nozzle from Table 3.4b below.

Features and Benefits

- 1/4", 1/2", 3/4" NPT connection
- Spray angle 80 psi –35° to 300 psi – 91°
- Gallons per hour capacity: 0.3 gal at 40 psi to 130 gal at 1000 psi.
- Produce very small drops and delivers a very fine spray using liquid pressure only – no compressed air required
- Choice of spray angles and spray patterns

Injection Tube with Atomization Nozzle

Table 3.4a – Ordering Information

Part Number	Description		
6302	2" Injection Tube 1/4 NPT x 1/4 NPT (316 S.S.)		
	Code	**Material***	
	S31600/S31603 S31803 S32760	316/L Stainless Steel Duplex Stainless Steel Super Duplex Stainless Steel	
		Code	**Order Length**
		LL.LL	Length in 1/4" increments from 1.25 to 36.00 inches.
6302 —	S31600 —	10.00	← Example

*Consult Factory for materials not specified above.

1/4” Nozzle (Female)

A nozzle is typically connected to the injection tube opposite the end connected to the injection nut. Nozzle selection is made based on the combination of desired flow rate and differential pressure*. See chart below for selection. Injection is perpendicular to the pipeline product flow.

* This is the pressure difference between the process pipeline pressure and the injection pipeline pressure.

Table 3.4b – Ordering Information

1/4” Nozzle (Female)													
Part Number	Orifice Nom. Dia. (in.)	GPH Capacity* @ PSI Differential									Spray Angle (°)**		
		40 psi	60 psi	80 psi	100 psi	200 psi	300 psi	500 psi	700 psi	1000 psi	40 psi	80 psi	300 psi
200904	0.016	0.3	0.36	0.42	0.48	0.67	0.82	1.1	1.3	1.5			51
200905	0.016	0.4	0.48	0.56	0.64	0.9	1.1	1.4	1.7	2.0			58
743039	0.016	0.5	0.63	0.72	0.81	1.1	1.4	1.8	2.1	2.5			63
200906	0.016	0.6	0.72	0.84	0.95	1.3	1.6	2.1	2.5	3.0		35	65
200907	0.020	1.0	1.2	1.4	1.6	2.2	2.7	3.5	4.2	5.0	45	62	72
200908	0.020	1.5	1.8	2.1	2.4	3.4	4.1	5.3	6.3	7.5	65	70	72
200909	0.028	2.0	2.4	2.8	3.2	4.5	5.5	7.1	8.4	10.0	70	75	77
200910	0.039	2.0	2.4	2.8	3.2	4.5	5.5	7.1	8.4	10.0	165	158	
200911	0.028	3.0	3.7	4.2	4.7	6.7	8.2	10.6	12.5	15.0	65	70	73
200912	0.039	3.0	3.7	4.2	4.7	6.7	8.2	10.6	12.5	15.0	157	152	
200913	0.042	4.0	4.9	5.8	6.3	8.9	11.0	14.1	16.7	20.0	72	81	84
200914	0.060	4.0	4.9	5.8	6.3	8.9	11.0	14.1	16.7	20.0	156	155	
200915	0.042	6.0	7.3	8.6	9.5	13.4	16.4	21.0	25.0	30.0	73	79	81
200916	0.060	8.0	9.8	11.3	12.6	17.9	22.0	28.0	33.0	40.0	85	89	91
200917	0.060	8.0	9.8	11.3	12.6	17.9	22.0	28.0	33.0	40.0	152	153	
200918	0.064	10.0	12.2	14.4	15.8	22.0	27.0	35.0	42.0	50.0	82	84	86
200919	0.076	12	14.7	17.4	19.0	27.0	33.0	42.0	50.0	60.0	78	82	85
200920	0.076	14.0	17.1	20.0	22.0	31.0	38.0	49.0	59.0	70.0	85	88	90
743040	0.086	16.0	19.6	22.7	25.0	36.0	44.0	57.0	67.0	80.0	83	86	88
200921	0.076	18.0	22.0	26.0	28.0	40.0	49.0	64.0	75.0	90.0	81	84	86
743041	0.081	20.0	24.0	28.4	32.0	45.0	55.0	71.0	84.0	100.0	75	78	80
200922	0.076	22.0	27.0	31.0	35.0	49.0	60.0	78.0	92.0	110.0	70	72	75
200923	0.086	26.0	32.0	36.5	41.0	58.0	71.0	92.0	109.0	130.0	73	74	77

* Those grayed out flow options mean that the flow rate will be achieved, however the flow performance (hollow cone spray pattern and angle) are not guaranteed, nor can they be estimated.
** Those grayed out angle options mean that the flow performance (hollow cone spray pattern and angle) are not guaranteed, nor can they be estimated.

Flow Rate Determination

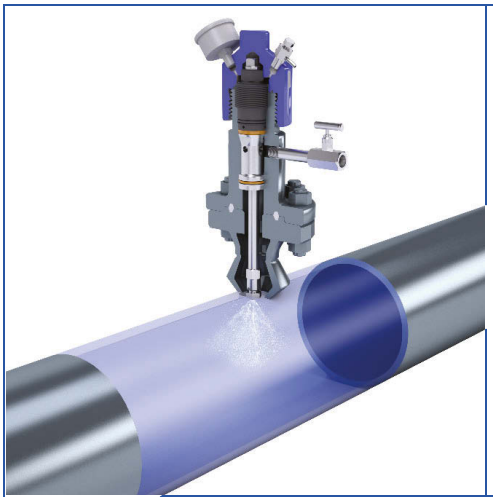
For approximate flow rate determination with a differential pressure not stated above (and over 40 psi) see equation on last page.

Flush Spray Nozzle (Male)

This nozzle threads directly into the Injection Nut Assembly to provide spray injection flush with the pipe wall when the correct injection nut is used.

Features and Benefits

- 1/4” NPT connection
- Hollow cone spray pattern
- Allows for pigging operations without removing any system component parts
- Spray angle 80 psi –35° to 300 psi – 91°
- Gallons per hour capacity: 0.3 gal at 40 psi to 130 gal at 1000 psi.



Injection Nut with Flush Nozzle

Table 3.5 – Ordering Information

1/4” NPT Flush Nozzle (Male)													
Part Number	Orifice Nom. Dia. (in.)	GPH Capacity* @ PSI Differential									Spray Angle (°)**		
		40 psi	60 psi	80 psi	100 psi	200 psi	300 psi	500 psi	700 psi	1000 psi	40 psi	80 psi	300 psi
129183	0.016	0.3	0.36	0.42	0.48	0.67	0.82	1.1	1.3	1.5			51
201020	0.016	0.4	0.48	0.56	0.64	0.9	1.1	1.4	1.7	2.0			58
743042	0.016	0.5	0.63	0.72	0.81	1.1	1.4	1.8	2.1	2.5			63
201021	0.016	0.6	0.72	0.84	0.95	1.3	1.6	2.1	2.5	3.0		35	65
201022	0.020	1.0	1.2	1.4	1.6	2.2	2.7	3.5	4.2	5.0	45	62	72
201023	0.020	1.5	1.8	2.1	2.4	3.4	4.1	5.3	6.3	7.5	65	70	72
201024	0.028	2.0	2.4	2.8	3.2	4.5	5.5	7.1	8.4	10.0	70	75	77
201025	0.039	2.0	2.4	2.8	3.2	4.5	5.5	7.1	8.4	10.0	165	158	
201026	0.028	3.0	3.7	4.2	4.7	6.7	8.2	10.6	12.5	15.0	65	70	73
201027	0.039	3.0	3.7	4.2	4.7	6.7	8.2	10.6	12.5	15.0	157	152	
201028	0.042	4.0	4.9	5.8	6.3	8.9	11.0	14.1	16.7	20.0	72	81	84
201029	0.060	4.0	4.9	5.8	6.3	8.9	11.0	14.1	16.7	20.0	156	155	
201030	0.042	6.0	7.3	8.6	9.5	13.4	16.4	21.0	25.0	30.0	73	79	81
201031	0.060	8.0	9.8	11.3	12.6	17.9	22.0	28.0	33.0	40.0	85	89	91
201032	0.060	8.0	9.8	11.3	12.6	17.9	22.0	28.0	33.0	40.0	152	153	
201033	0.064	10.0	12.2	14.4	15.8	22.0	27.0	35.0	42.0	50.0	82	84	86
201034	0.076	12	14.7	17.4	19.0	27.0	33.0	42.0	50.0	60.0	78	82	85
201035	0.076	14.0	17.1	20.0	22.0	31.0	38.0	49.0	59.0	70.0	85	88	90
743043	0.086	16.0	19.6	22.7	25.0	36.0	44.0	57.0	67.0	80.0	83	86	88
201036	0.076	18.0	22.0	26.0	28.0	40.0	49.0	64.0	75.0	90.0	81	84	86
743044	0.081	20.0	24.0	28.4	32.0	45.0	55.0	71.0	84.0	100.0	75	78	80
201037	0.076	22.0	27.0	31.0	35.0	49.0	60.0	78.0	92.0	110.0	70	72	75
201038	0.086	26.0	32.0	36.5	41.0	58.0	71.0	92.0	109.0	130.0	73	74	77

* Those grayed out flow options mean that the flow rate will be achieved, however the flow performance (hollow cone spray pattern and angle) are not guaranteed, nor can they be estimated.

** Those grayed out angle options mean that the flow performance (hollow cone spray pattern and angle) are not guaranteed, nor can they be estimated.

Flow Rate Determination

For approximate flow rate determination with a differential pressure not stated above (and over 40 psi) see equation on last page.

Sampling Tube

A multiple use tube allowing for either injection or sampling; no atomization or dispersion device is attached. The natural turbulence within the pipeline or vessel is relied upon to accomplish even distribution. Standard sampling tubes are offered in 1/4”, 1/2”, and 3/4” NPT sizes to mate with like size NPT injection nuts.

Features and Benefits

- Perpendicular injection
- 1/4”, 1/2”, 3/4” NPT connection
- No restricting orifice, therefore no pressure differential is experienced at the orifice
- Supports basic chemical feed and sampling services
- Easy maintenance

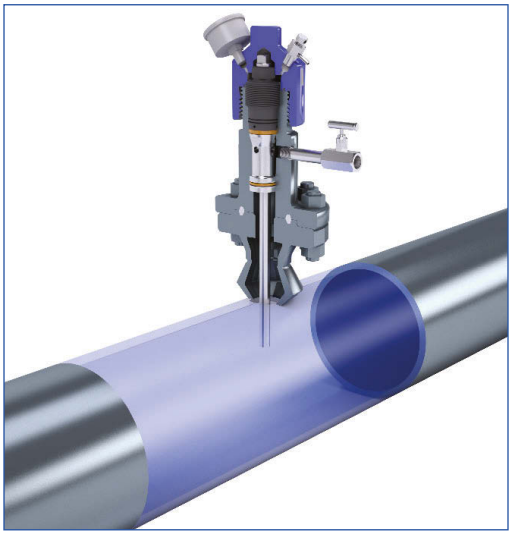


Table 3.6 – Ordering Information

Part Number	Description
6301	2” Injection Tube 1/4 NPT Sch 160 x Open (316/L S.S. only)
630121	2” Injection Tube 1/4 NPT x Open (316/L S.S. only)
630123	2” Injection Tube 1/2 NPT x Open
630130	2” Injection Tube 3/4 NPT x Open (316 S.S. only)

Code	Material*
S31600/S31603	316/L Stainless Steel
S31803	Duplex Stainless Steel
S32760	Super Duplex Stainless Steel

Code	Order Length
LL.LL	Length in 1/4” increments from 1.25 to 36.00 inches

6301	—		10.00	Example
630121	—	S31600	— 10.00	Example

*Consult Factory for materials not specified above.

4. & 5. Nipples & Shut-Off Valves

Short nipples and shut-off valves are available to interface the Tee Access Fitting Assembly with the Injection/Sampling System.

Nipple*

The nipple is typically a MNPT x MNPT connection between a side-tee access fitting and a shut-off valve.

Table 4 – Ordering Information – Nipple Size 1/4”, 1/2”, 3/4”

Part Number	Description
128993	Nipple Size - 1/4” – Pipe Schedule 80
127472	Nipple Size - 1/2” – Pipe Schedule 80
000738	Nipple Size - 1/2” – Pipe Schedule 160
000857	Nipple Size - 1/2” – Pipe Schedule XXS
125504	Nipple Size - 3/4” – Pipe Schedule 160
000969	Nipple Size - 3/4” – Pipe Schedule XXS

Code	Material** (Omit for 316/316L S.S.)
S31803	Duplex Stainless Steel

Code	Order Length (omit for standard 4.00 inches)
5.00”	5 Inches
6.00”	6 Inches

128993	—	5.00”	← Example

*Nipples used in conjunction with a Double Block and Bleed Valve (DBBV) should be sized at a minimum length of 5.00” to allow adequate space for operation of both valve handles.
**Consult Factory for materials not specified above.

Shut-Off Valve*

The shut-off valve is typically a FNPT x FNPT connection between a nipple and customer’s inlet/outlet connection.

Table 5 – Ordering Information – 1/4”, 1/2”, 3/4”, & 1” Shut-Off Valves

Part Number	Size	Material**	Valve Type
200022	1/4” FNPT x 1/4” FNPT	316 SS	Needle
200022-X9	1/4” FNPT x 1/4” FNPT	316 SS	DBBV
200022-X6	1/4” FNPT x 1/4” FNPT	Duplex SS	Needle
200022-X7	1/4” FNPT x 1/4” FNPT	Hastelloy C-276	Needle
200023	1/2” FNPT x 1/2” FNPT	316 SS	Needle
200023-X11	1/2” FNPT x 1/2” FNPT	316 SS	DBBV
200023-X24	1/2” FNPT x 1/2” FNPT	316L SS	DBBV
200023-X2	1/2” FNPT x 1/2” FNPT	Duplex SS	Needle
200023-X21	1/2” FNPT x 1/2” FNPT	Duplex SS	DBBV
200023-X19	1/2” FNPT x 1/2” FNPT	Monel	Needle
200023-X13	1/2” FNPT x 1/2” FNPT	Hastelloy C-276	Needle
200024	3/4” FNPT x 3/4” FNPT	316 SS	Needle
200024-X9	3/4” FNPT x 3/4” FNPT	316L SS	DBBV
200024-X8	3/4” FNPT x 3/4” FNPT	Duplex SS	Needle
200025	1” FNPT x 1” FNPT	316 SS	Needle
200025-X3	1” FNPT x 1” FNPT	316L SS	DBBV
200025-X2	1” FNPT x 1” FNPT	Duplex SS	Needle

Needle Shut-Off Valve

Double Block & Bleed Shut-Off Valve (DBBV)

* The following valve details are applicable unless stated otherwise: - Working Criteria: 6000psi @ 200°F (93°C), Seat / Seals: Teflon
**Consult Factory for materials not specified above.

Flow Rate Determination

For approximate flow rate determination with a differential pressure not stated above (and over 40 psi) use the following equation:

$$\frac{Q_1}{P_1^{0.5} / P_2^{0.5}} = \text{Desired Flow Rate } (Q_2)$$

P1 = Pressure Differential from the table above
P2 = Desired Pressure Differential
Q1 = Flow Rate from the table corresponding to P1
Q2 = Desired Flow Rate

Sizing Formulas

Center of the line

Our recommended injection location is the center of pipe. Thus the following sizing formula is applicable for Flanged Access Fitting Assemblies.

A + FG + MF + 1/2 PD - 2.25 - N = Length*

A = Access Fitting Assembly length
FG = Flange Gap - 1/16th Inch (0.0625 or 1.6mm) is normal
MF = Mating Flange Height root/base-to-face dimension
PD = Pipe outside diameter
N = Injection/Sampling Nut length

Bottom of the line

Sampling locations may vary. If sampling from the center of pipe or vessel, the above listed sizing formula applies. If bottom of line sampling is required with the access fitting assembly in the 12:00 O'clock position, the following sizing formula applies for Flanged Access Fitting Assemblies.

A + FG + MF + PD - 2.50 - N - PW = Length*

A = Access Fitting Assembly length
FG = Flange Gap - 1/16th Inch (0.0625 or 1.6mm) is normal
MF = Mating Flange Height root/base-to-face dimension
PD = Pipe outside diameter
N = Injection/Sampling Nut length
PW = Pipe Wall thickness

*Ordering Lengths should be rounded down to nearest 1/4" increments.

Ordering Example

You want to inject into a 14" oil line and your injection line is 1/2" pipe. The mating flange dimensions from face to flange to OD of pipe is 4". Your complete system would consist of the following:

Quantity	Part Number	Description
1	56-111-2-42-K03504-10	2" ANSI 4/600# RJ Flange Access Fitting Assembly, 7.25" height, 1/2" Tee body in ASTM A105 Carbon Steel with Solid Plug Assembly in 316 SS material with Teflon Primary Packing, Viton O-ring, and a 6,000 psi rated heavy pressure-retaining cover with bleed plug and pressure gauge.
1	122217	Injection Nut Assembly 1/4 NPT x 3.75" Inj. Nut was chosen since the access fitting body height is 7.25"
1	6304-12.25	2" Injection Tube 1/4 NPT x Head (9/16"), Length 12.25-316 (7.25 (A) + .0625 (WG) + 4.0(MF)+ 7.0(1/2(14)(PD) -2.25 -3.75 (N) = 12.25 (Length)
1	129490	Cap & Core
1	127472	Nipple 1/2" x 4.00 - 316
1	200023	Shut-Off Valve 1/2" NPT - 316

Maintenance & Services

Service Kits

Cosasco highly recommends the solid carrier plug to be replaced after three insertions or if damaged. A primary packing should be replaced after every service, and for a solid carrier plug, the secondary O' ring seal; for an injection nut, the injection nut seals, if they are excessively worn or damaged.

	Injection Location	
Replacement Part Included	**Stage 1**	**Stage 2**
Solid Plug		●
Primary Packing	●	●
Plug O-ring	●	●
PRC O-ring	●	●
Set Screw(s)	●	●
Injection Nut Seal Kit	●	●

Service Kit Ordering Information

Model						
740138	Access Fitting Service Kit					
	Code	Maintenance Level*				
	1	Stage 1				
	2	Stage 2				
		Code	**Type of Monitoring Location**			
		INJ	Chemical Injection			
			Code	**Plug Assembly – Enter code for plug type from options below**		
			XXX	Type (1st Digit)	Alloy Mat'l (2nd Digit)	Packing Seal (3rd Digit)
				0 Not Req.	0 Not Req.	0 Not Req.
				1 Solid	1 316/316L S.S.	1 Viton O-Ring Teflon Primary Packing - ** -15 to 400° F (-26 to 204°C)
					3 Hastelloy C-276	2 Ethylene Propylene O-Ring Vespel Primary Packing - * -70 to 250°F (-56 to 121°C)
					4 Nitronic 60	3 Kalrez O-Ring Vespel Primary Packing - ** -15 to 450°F (-26 to 232°C)
					5 Carbon Steel	4 No O-Ring Nitronic 60 Primary Packing - ** -50 to 450°F (-45 to 232°C)
					6 Inconel 625	5 Hydrin O-Ring Teflon Primary Packing - ** -40 to 275°F (-40 to 135°C)
					7 2205 Duplex S.S.	6 Nitrile O-Ring Teflon Primary Packing - ** -30 to 250°F (-35 to 121°C)
						7 Ethylene Propylene O-Ring, Teflon Primary Packing - ** -70 to 250°F (-56 to 121°C)
						8 EDR Viton O-Ring Teflon Primary Packing - ** -15 to 400° F (-26 to 204°C)
						9 Kalrez O-Ring Teflon Primary Packing - ** -15 to 450° F (-26 to 232°C)
						A HNBR EOL 101 O-Ring Teflon Primary Packing - ** -13 to 320° F (-25 to 160° C)
						B HNBR EOL 985 O-Ring Teflon Primary Packing - ** -67 to 302° F (-55 to 150° C)
						C AFLAS 69/90 O-Ring Teflon Primary Packing ** 32 to 392° F (0 to 200° C)
						D Viton "B" (VB185-70) Teflon Primary Packing ** 15 to 400° F (-26 to 204°C)
			Code	**Seal Material Option for Pressure Retaining Cover**		
			1	Viton		
			2	Ethylene Propylene		
			3	Kalrez		
			5	Epchlorohydrin		
			6	Nitrile		
			8	EDR Viton		
			A	HNBR EOL 101 O-Ring Teflon Primary Packing - * -13 to 320˚F (-25 to 160˚C)		
			B	HNBR EOL 985 O-Ring Teflon Primary Packing - * -13 to 320˚F (-25 to 160˚C)		
			C	AFLAS 36/90 O-Ring Teflon Primary Packing - * 32 to 392˚F (0 to 200˚C)		

740138 — 1 — INJ — 111 — 1 ← Example

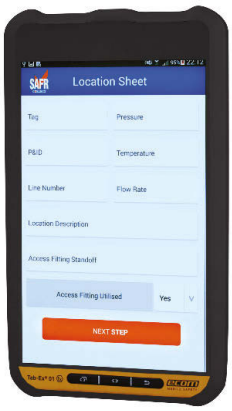
* Stage 1 Service Kit includes basic replacement parts and is recommended for every pull/change out. Stage 2 Service Kit is for a complete overhaul and recommended for every 3rd pull/change out. Note, this is a minimum recommended maintenance requirement, Stage 2 may be required at more frequent intervals based on exposure time and type of process media.

** Nominal Temperature Range

SAFR Services

The Cosasco SAFR (Surveyed Access Fitting Register) program is designed to assist in the short and long term maintenance of access fittings. The program can be used solely to audit systems, or in tandem with service campaigns such as coupon and data retrieval. With life extension of assets and the general increase in number of monitoring systems, it's increasingly important that systems are surveyed to ensure that material selection is fit for purpose as well as the overall physical condition of the fitting.

Non-OEM parts exist in facilities where third part or competing contractors carry out maintenance and monitoring. This can lead to serious consequences as often times materials installed do not match the material retrieved. Simple errors can lead to unmanaged risk. Correct device selection and orientation is extremely important to achieving reliable data and ensuring plant integrity.



SAFR Tablet

Cosasco Care Service Plans & Extended Warranty

Cosasco Care Service Plans and Extended Warranty offer a broad spectrum of services to make sure your assets and plant operations are running at their peak performance and under the safest conditions. Cosasco Care Extended Warranty comes as standard with Cosasco Care Essential, Plus, and Premium Service Plans. All Service plans include access to the Cosasco SAFR (Surveyed Access Fitting Register) maintenance program; offline installation, retrieval and maintenance of coupons and probes; coupon analysis and reporting; technical support; Cosasco Data Offline software support; data management and reporting; and safety awareness training. Contact our Cosasco Care team for more details and pricing.

Cosasco Care Services

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