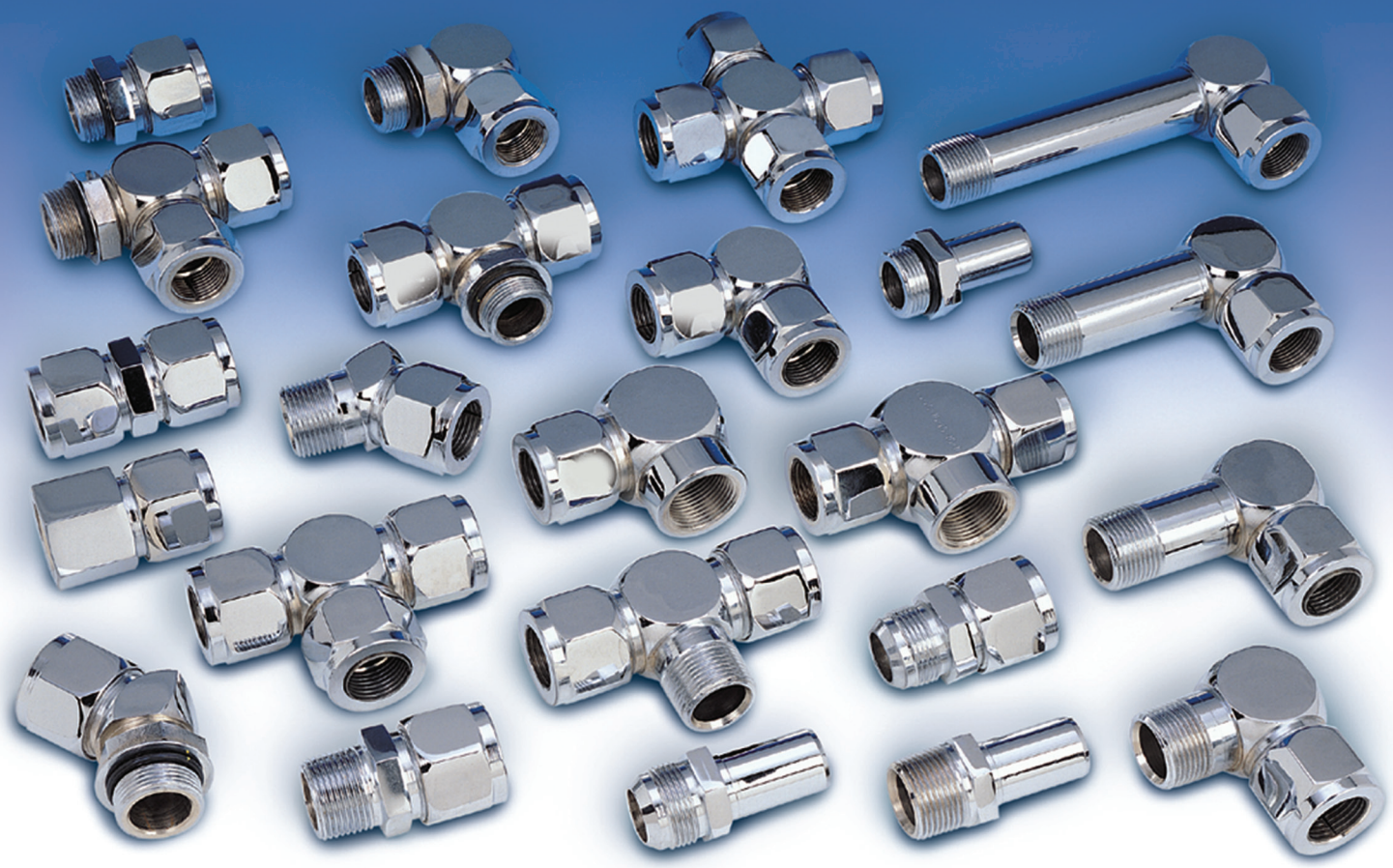
O-RING SEAL TUBE FITTINGS

CATALOG NO. LORS-16



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HYDRAULICS
WITH A GLOBAL REPUTATION

The goal of Lenz is to help our Distributors, OEM's and customers succeed by providing the best hydraulic engineered products. Building upon this determination, we've enhanced the Lenz catalogs and our website to feature even more detailed information for ease of specifying and ordering. We at Lenz feel our new catalog and website are easier to navigate, read and understand our products. We will continue to add new innovative hydraulic products to our product line. We hope you'll agree we have succeeded in these pursuits.

Lenz

Hydraulics with a Global Reputation

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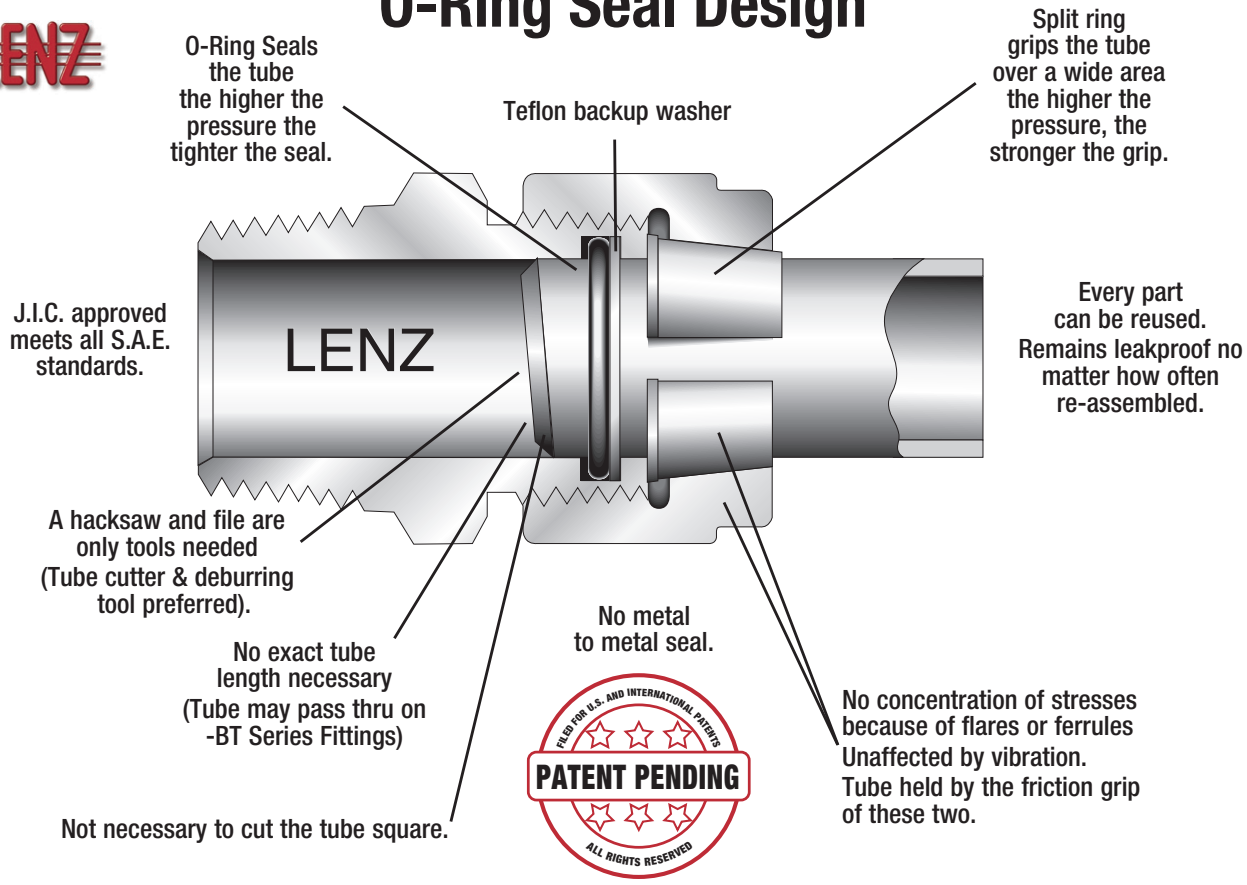
O-Ring Seal Design

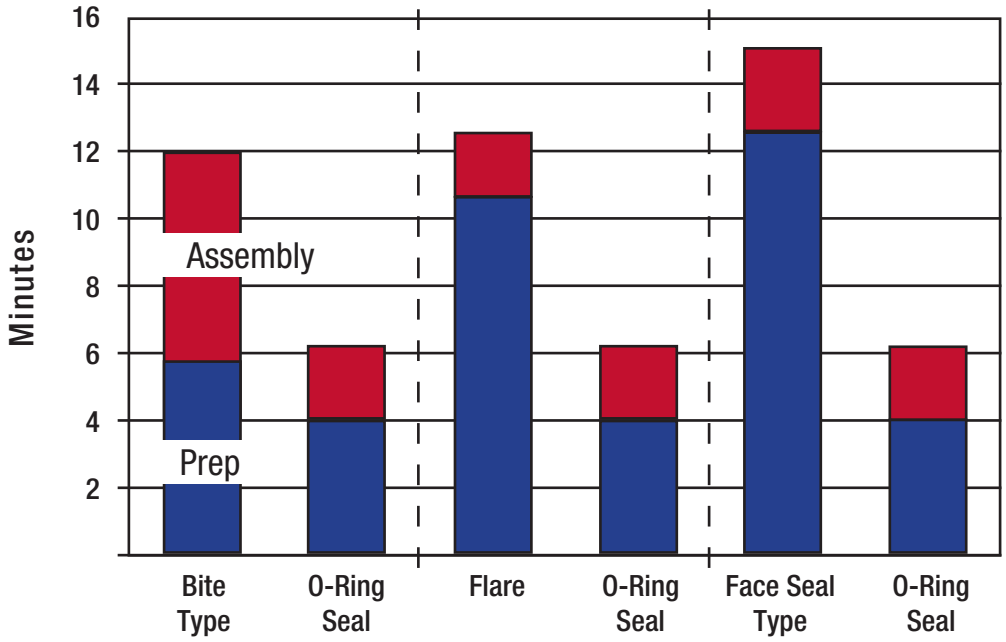


Cuts Installation Time In Half

Lenz O-Ring Seal Tube Fitting users slash their normal installation time – including preparation and assembly by using O-ring Seal instead of traditional tube fittings.

Saving labor time increases productivity, reduces cost, and job overruns, and keeps projects on or ahead of schedule, and enables users to complete more jobs.

Source: Distributor Labor Calculator



"O-Ring Seal Tube Fitting cuts my time in half!"
— Mechanical Contractor

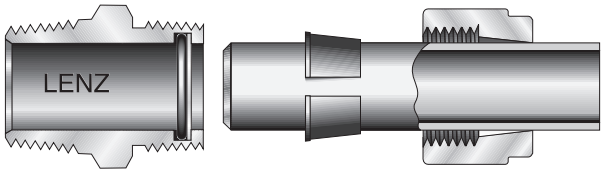
We have used Lenz O-ring Seal Fittings on several applications and really like it. It has been a great labor saving fitting, and great in vibration applications. Easy to install, great to use when doing service work on tubing Installations.
— Pipe fitter Field Service

O-Ring Seal Tube Fittings

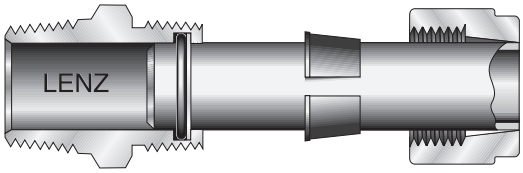
The Pressure Is The Sealing Force

• The Only Tube Fittings of Their Kind • Why They Are Exclusively Different
• How They Save You Time and Costs • How They Perform • How to Assemble

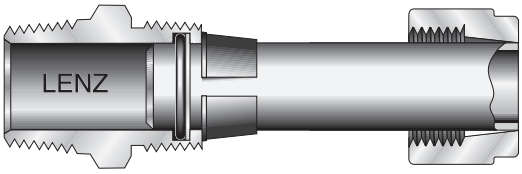
A. DEBURR THE TUBE - Prevents cutting the O-Ring. Not necessary to cut the tube square.



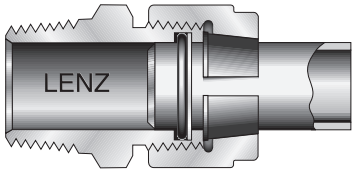
B. SLIDE NUT and TAPERED SPLIT RING ON TUBE. The large end of the tapered ring should face the fitting.



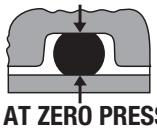
C. OIL THE O-RING - Then insert the tube past the O-Ring.



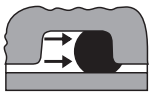
D. SLIDE TAPERED SPLIT RING - Slide up to the fitting.



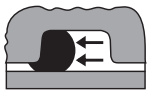
E. TIGHTEN NUT HAND TIGHT - then with wrench tighten one turn or until the rear of the tapered ring is flush with the nut.



AT ZERO PRESSURE. When the tube is inserted in the fitting past the O-Ring there is a slight compression and the resiliency of the O-Ring makes a secure, lasting seal!



UNDER PRESSURE. The pressure is the sealing force, pushing the O-Ring to the edge of the groove. As pressure increases the O-Ring "knows" making the seal tighter!



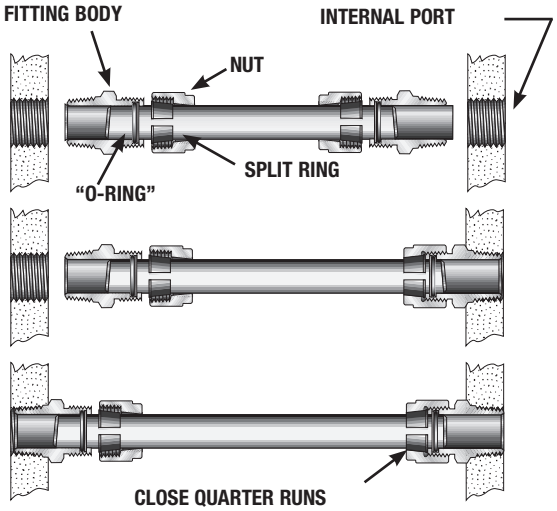
UNDER VACUUM OR SUCTION. If vacuum or suction is applied the O-Ring "Intelligence" recognizes the condition and reverses its action to seal just as tightly!

Stainless Steel Tubing

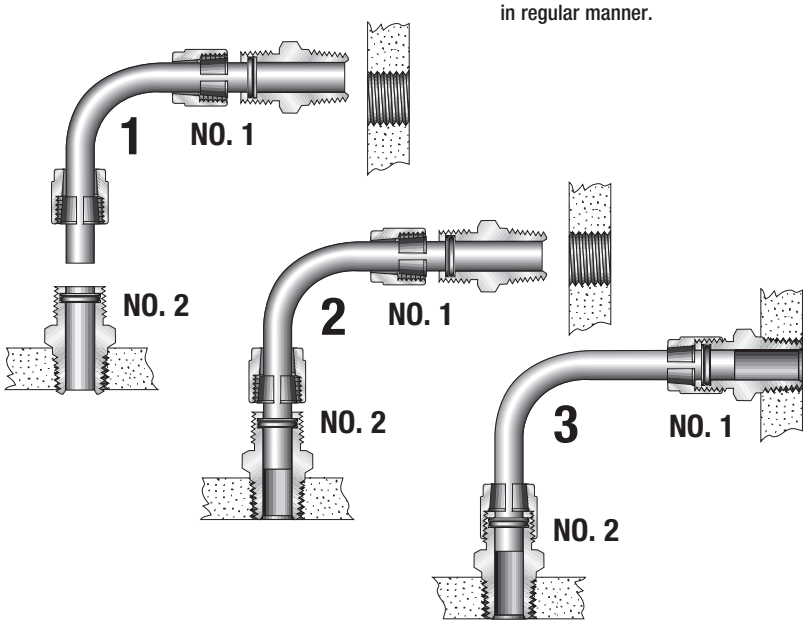
Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

O-Ring Seal Tube Fittings

Only Lenz "O-ring" Seal Fittings can solve these difficult installations



1. Cut tube maximum length allowable. Deburr tube end so that it does not cut O-Ring.
2. Slide nut, tapered split ring and body on each end of tube.
3. Insert and tighten one fitting in port. Slide tapered split ring up to fitting body and tighten nut.
4. Slide remaining fitting to port, insert and tighten in regular manner.

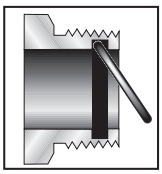


SHORT BENDS

1. Deburr tube end. Slide nut, tapered split ring and fitting body No. 1 on end of tube.
2. Slide only the nut and tapered split ring on other end. Insert fitting body No. 2 into port.
3. Push tube into installed fitting body No. 2 until other end of tube is aligned with the other port.
4. Install fitting body No. 1 into port. Slide both split rings up to fitting bodies and tighten in regular manner.

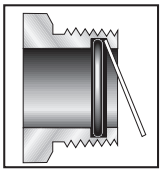
When ordering Lenz fittings in all stainless steel add SS to the part number. Example: 100-12-12-ss
The Lenz fitting comes to you with the O-Ring and teflon back-up washer installed complete.

Proper Installation Of O-ring & Teflon Back-up Washer

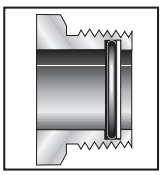


"O-RING"

Install "O-ring" First



Then work in Teflon back-up washer on the side of the "O-Ring" toward the opening.
OIL the "O-Ring"



"O-ring" And Teflon Back-up Washer In Place

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Pressure Ratings of O Ring Seal Tube

The pressure rating for fittings depends upon the size and the safety factor desired. In tube fittings from size 2 thru size 32, it has been generally found that the fitting itself is stronger than the tubing. Thus the safety factor of the tubing governs the limiting factor for the assembly. Typical recommended maximum static working pressure for the tube fittings with SAE J525 (1010) steel tubing with a 4:1 safety factor are:

SIZE	PRESSURE
4	4,500 PSI
5	4,000 PSI
6	4,000 PSI
8	4,000 PSI
10	3,000 PSI
12	3,000 PSI
14	2,500 PSI
16	2,500 PSI
20	2,000 PSI
24	1,500 PSI
32	1,125 PSI

HOW THE SPLIT RING GRIPS - Note the taper. As nut is tightened the ring is wrapped around the tube, gripping it in like manner to a locking collet in a chuck. This principle grips and locks tighter and stronger as the pressure increases. Note that the nut has nothing to do with the seal . . . It is separate!

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings.
Example, when ordering: 100-12-12 with ss sleeves.

Hydraulic Steel Tubing

Dead Soft • Fully Annealed • Bright Finish

Superior grade tubing selected for excellence of bending and flaring. The formula given below is determined with the flow calculated to give nominal pressure drop through tubing having the diameter and wall thickness as indicated in the table to left. This flow is based on a velocity of 15 feet per second and fluids having a maximum viscosity of 315 S.S.U.

Formula

$$GPM = \frac{\pi D^2 \times 15}{1.283} = 36.69 \times D^2$$

*D = Inside Diameter of Tubing

Lenz Hydraulic Steel Tubing Recommendation

O.D.	I.D.	Wall Thickness	G.P.M. Flow	Working Pressure
1/4"	.180	.035	1.2	2800
1/4"	.152	.049	.85	3920
5/16"	.242	.035	2.15	2240
5/16"	.214	.049	1.68	3136
3/8"	.305	.035	3.45	1867
3/8"	.277	.049	2.82	2613
3/8"	.245	.065	2.2	3467
1/2"	.430	.035	6.79	1400
1/2"	.402	.049	5.92	1960
1/2"	.370	.065	5.03	2600
5/8"	.527	.049	10.2	1568
5/8"	.495	.065	9.0	2080
5/8"	.435	.095	6.94	3040
3/4"	.652	.049	15.6	1307
3/4"	.620	.065	14.1	1733
3/4"	.560	.095	11.5	2533
3/4"	.532	.109	10.4	2907
7/8"	.777	.049	22.1	1120
7/8"	.745	.065	20.4	1486
7/8"	.685	.095	17.2	2171
1"	.870	.065	27.8	1300
1"	.810	.095	24.1	1900
1"	.760	.120	21.2	2400
1 1/4"	1.120	.065	46.0	1040
1 1/4"	1.060	.095	41.2	1520
1 1/4"	1.010	.120	37.4	1920
1 1/2"	1.310	.095	63.0	1267
1 1/2"	1.260	.120	58.1	1600

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

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100 • Male Connector

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

100 Number#	Male Tube O.D.	Connector Male Pipe Thread	Overall Length
100-2-2	1/8"	1/8"	1.12"
100-4-2	1/4"	1/8"	1.34"
100-4-4*	1/4"	1/4"	1.50"
100-5-2	5/16"	1/8"	1.34"
100-5-4*	5/16"	1/4"	1.50"
100-6-4	3/8"	1/4"	1.59"
100-6-2	3/8"	1/8"	1.43"
100-6-6*	3/8"	3/8"	1.62"
100-6-8*	3/8"	1/2"	1.81"
100-8-6	1/2"	3/8"	1.87"
100-8-4	1/2"	1/4"	1.87"
100-8-8*	1/2"	1/2"	2.06"
100-8-12*	1/2"	3/4"	2.06"
100-10-8	5/8"	1/2"	2.18"
100-10-4	5/8"	1/4"	2.00"
100-10-6	5/8"	3/8"	2.00"
100-10-12*	5/8"	3/4"	2.21"
100-12-12*	3/4"	3/4"	2.37"
100-12-8	3/4"	1/2"	2.37"
100-14-12	7/8"	3/4"	2.40"
100-16-16**	1"	1"	2.75"
100-16-12	1"	3/4"	2.56"
100-18-16	1 1/8"	1"	2.87"
100-20-20*	1 1/4"	1 1/4"	3.06"
100-20-16	1 1/4"	1"	3.06"
100-20-24*	1 1/4"	1 1/2"	3.12"
100-24-24*	1 1/2"	1 1/2"	3.25"
100-24-20	1 1/2"	1 1/4"	3.25"
100-28-24	1 3/4"	1 1/2"	3.25"
100-28-32	1 3/4"	2"	3.90"
100-32-32	2"	2"	3.90"
100-32-20	2"	1 1/4"	3.84"
100-32-24	2"	1 1/2"	3.84"

** Fittings with tube diameter bored through **Tube diameter bored through, optional*

Tubing may be pushed all the way through the male connectors marked with an asterisk*. This exclusive feature has many uses in hydraulic or air circuitry. For other fittings with this feature see Series 250 (opposite page) and Series A100.

100-L • Long Male Connector

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

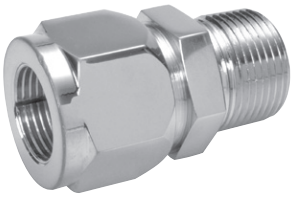
100-L NUMBER#	MALE TUBE O.D.	CONNECTOR MALE PIPE THREAD	OVERALL LENGTH
100L-4-2	1/4"	1/8"	2.00"
100L-5-2	5/16"	1/8"	2.12"
100L-6-4	3 3/8"	1/4"	2.46"
100L-8-6	1/2"	3/8"	3.15"
100L-10-8	5/8"	1/2"	3.50"
100L-12-12	3/4"	3/4"	3.90"
100L-14-12	7/8"	3/4"	4.15"
100L-16-16	1"	1"	4.50"
100L-20-20	1 1/4"	1 1/4"	5.22"
100L-24-24	1 1/2"	1 1/2"	5.59"

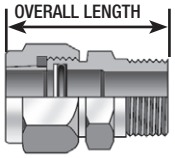
100-LL • Long Male Connector

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

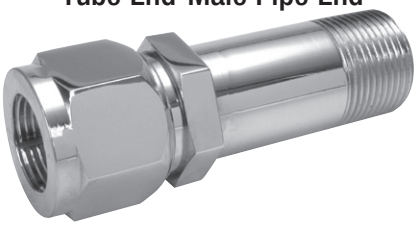
100-L NUMBER#	MALE TUBE O.D.	CONNECTOR MALE PIPE THREAD	OVERALL LENGTH
100LL-4-2	1/4"	1/8"	2.75"
100LL-5-2	5/16"	1/8"	3.00"
100LL-6-4	3/8"	1/4"	3.46"
100LL-8-6	1/2"	3/8"	4.34"
100LL-10-8	5/8"	1/2"	4.75"
100LL-12-12	3/4"	3/4"	5.40"
100LL-14-12	7/8"	3/4"	5.78"
100LL-16-16	1"	1"	6.25"
100LL-20-20	1 1/4"	1 1/4"	7.21"
100LL-24-24	1 1/2"	1 1/2"	7.84"

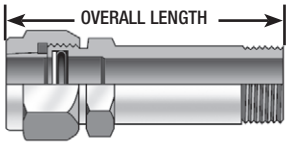
100
Extra Long Male Connector Tube End-Male Pipe End



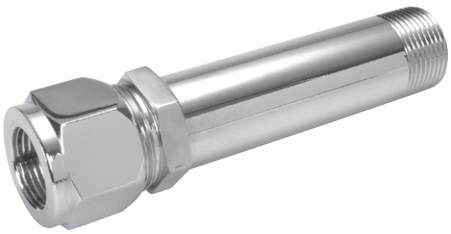


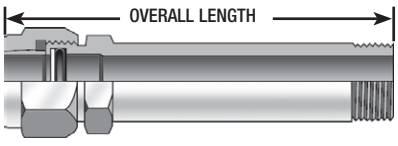
100-L
Long Male Connector Tube End-Male Pipe End





100-LL
Extra Long Male Connector Tube End-Male Pipe End

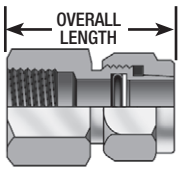




Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

250
FEMALE CONNECTOR
Tube End-Female Pipe End



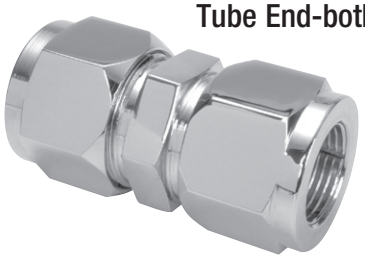
250 • Female Connector

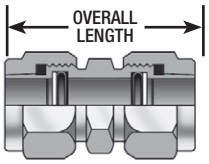
Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Female Pipe	Overall
250-4-2*	1/4"	1/8"	1.34"
250-4-4*	1/4"	1/4"	1.47"
250-5-2*	5/16"	1/8"	1.34"
250-5-4*	5/16"	1/4"	1.47"
250-6-4*	3/8"	1/4"	1.53"
250-6-2	3/8"	1/8"	1.21"
250-6-6*	3/8"	3/8"	1.65"
250-8-6*	1/2"	3/8"	1.87"
250-8-4	1/2"	1/4"	1.59"
250-8-8*	1/2"	1/2"	2.06"
250-10-8*	5/8"	1/2"	1.72"
250-10-4	5/8"	1/4"	1.72"
250-10-6	5/8"	3/8"	2.16"
250-12-12*	3/4"	3/4"	2.31"
250-12-8	3/4"	1/2"	2.06"
250-14-12*	7/8"	3/4"	2.31"
250-14-20*	7/8"	1 1/4"	2.69"
250-16-16*	1"	1"	2.72"
250-16-12	1"	3/4"	2.22"
250-16-24*	1"	1 1/2"	2.91"
250-18-16*	1 1/8"	1"	2.69"
250-20-20*	1 1/4"	1 1/4"	3.00"
250-24-24*	1 1/2"	1 1/2"	3.16"
250-24-20*	1 1/2"	1 1/4"	2.78"
250-32-32*	2"	2"	3.59"

** Fittings with tube diameter bored through **Tube diameter bored through, optional*
Tubing may be pushed all the way through the male connectors marked with an asterisk*. This exclusive feature has many uses in hydraulic or air circuitry.

300
UNION
Tube End-both Ends



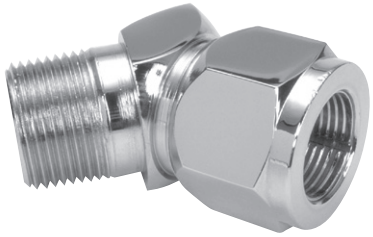


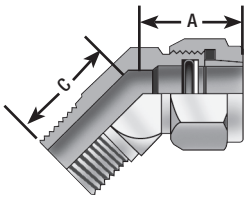
300 • Union

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Overall
300-2	1/8"	1.31"
300-4	1/4"	1.69"
300-5	5/16"	1.69"
300-6	3/8"	1.81"
300-8	1/2"	2.28"
300-10	5/8"	2.56"
300-12	3/4"	2.88"
300-14	7/8"	2.94"
300-16	1"	3.19"
300-20	1 1/4"	3.75
300-24	1 1/2"	4.06"
300-32	2"	4.94"

350
MALE 45° ELBOW - TUBE END
Male Pipe End





350 • Male 45° Elbow

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male Pipe Thread	"A" (Tube Leg)	"C" (Male Pipe Leg)
350-4-2	1/4"	1/8"	.78"	.62"
350-5-2	5/16"	1/8"	.88"	.62"
350-6-4	3/8"	1/4"	1"	.84"
350-6-6	3/8"	3/8"	1"	.94"
350-8-4	1/2"	1/4"	1.22"	.94"
350-8-6	1/2"	3/8"	1.22"	.94"
350-8-8	1/2"	1/2"	1.47"	1.16"
350-10-8	5/8"	1/2"	1.47"	1.16"
350-12-12	3/4"	3/4"	1.62"	1.18"
350-12-8	3/4"	1/2"	1.62"	1.16"
350-14-12	7/8"	3/4"	1.56"	1.25"
350-16-16	1"	1"	1.81"	1.47"
350-16-12	1"	3/4"	1.81"	1.28"
350-20-20	1 1/4""	1 1/4"	2.22"	1.66"
350-24-24	1 1/2"	1 1/2"	2.41"	1.75"
350-32-32	2"	2"	2.94"	2.03"

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

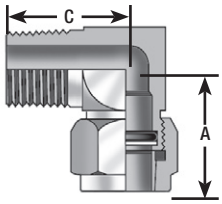
Phone: 937/277-9364 FAX: 937/277-6516 www.lenzinc.com

400 • Male Elbow

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male Pipe Thread	A Tube Leg	C Male Pipe
400-2-2	1/8"	1/8"	.78"	.78"
400-4-2	1/4"	1/8"	1"	.78"
400-4-4	1/4"	1/4"	1.06"	1.09"
400-5-2	5/16"	1/8"	1.03"	.78"
400-5-4	5/16"	1/4"	1.03"	1.09"
400-6-4	3/8"	1/4"	1.13"	1.09"
400-6-2	3/8"	1/8"	1.13"	0.87"
400-6-6	3/8"	3/8"	1.19"	1.22"
400-6-8	3/8"	1/2"	1.25"	1.47"
400-8-6	1/2"	3/8"	1.47"	1.22"
400-8-4	1/2"	1/4"	1.47"	1.16"
400-8-8	1/2"	1/2"	1.47"	1.16"
400-8-12	1/2"	3/4"	1.59"	1.56"
400-10-8	5/8"	1/2"	1.66"	1.47"
400-10-4	5/8"	1/4"	1.66"	1.31"
400-10-6	5/8"	3/8"	1.66"	1.38"
400-10-12	5/8"	3/4"	1.72"	1.59"
400-12-12	3/4"	3/4"	1.72"	1.59"
400-12-8	3/4"	1/2"	1.84"	1.56"
400-14-12	7/8"	3/4"	1.94"	1.69"
400-16-16	1"	1"	2.22"	1.97"
400-16-12	1"	3/4"	2.22"	1.72"
400-18-16	1 1/8"	3/4"	2.41"	2.12"
400-20-20	1 1/4"	1 1/4"	2.59"	2.38"
400-20-16	1 1/4"	1"	2.59"	2.38"
400-20-24	1 1/4"	1 1/2"	2.72"	2.62"
400-24-24	1 1/2"	1 1/2"	2.91"	2.62"
400-24-20	1 1/2"	1 1/4"	2.91"	2.62"
400-32-32	2"	2"	3.59"	3.0"
400-32-24	2"	1 1/2"	3.59"	3.0"

400
Male Elbow • Tube End - Male Pipe End

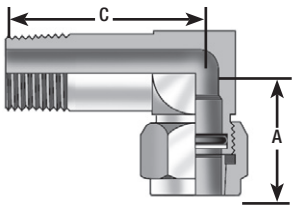


400-L • Long Male Elbow

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male Pipe Thread	A Tube Leg	C Male Pipe
400L-4-2	1/4"	1/8"	1.0"	1.19"
400L-5-2	5/16"	1/8"	1.03"	1.25"
400L-6-4	3/8"	1/4"	1.13"	1.66"
400L-8-6	1/2"	3/8"	1.47"	1.84"
400L-10-8	5/8"	1/2"	1.66"	2.22"
400L-12-12	3/4"	3/4"	1.84"	2.47"
400L-14-12	7/8"	3/4"	1.94"	2.72"
400L-16-16	1"	1"	2.22"	3.06"
400L-20-20	1 1/4"	1 1/4"	2.59"	3.68"

400-L
Long Male Elbow
Tube End - Male Pipe End



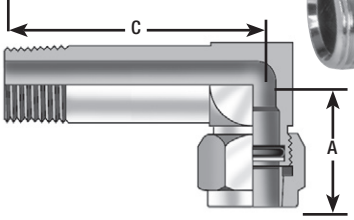
400-LL • Extra Long Male Elbow

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male Pipe Thread	A Tube Leg	C Male Pipe
400LL-4-2	1/4"	1/8"	1.0"	1.53"
400LL-5-2	5/16"	1/8"	1.03"	1.62"
400LL-6-4	3/8"	1/4"	1.13"	2.09"
400LL-8-6	1/2"	3/8"	1.47"	2.50"
400LL-10-8	5/8"	1/2"	1.66"	3.0"
400LL-12-12	3/4"	3/4"	1.84"	3.34"
400LL-14-12	7/8"	3/4"	1.94"	3.62"
400LL-16-16	1"	1"	2.22"	4.19"
400LL-20-20	1 1/4"	1 1/4"	2.59"	4.87"

Note: 400LL Elbows will turn above 400 Elbows

400-LL
Extra Long Male Elbow
Tube End - Male Pipe End

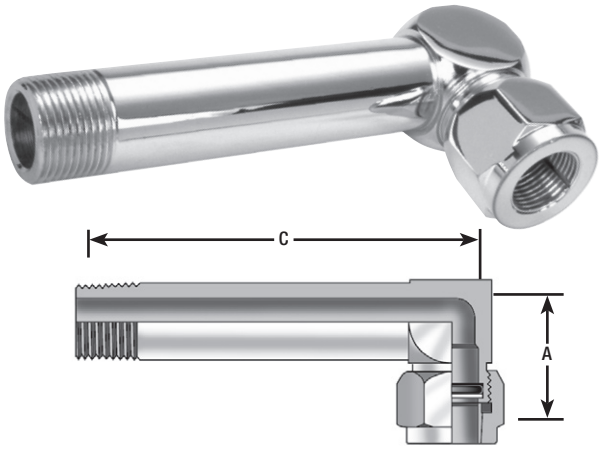


Note: 400LL Elbows will turn above 400 Elbows & 400LLL Elbows will turn above 400LL Elbows

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

400-LLL
EXTRA LONG LONG MALE ELBOW
Tube End-Male Pipe End

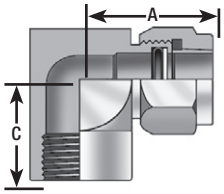


400-LLL • Extra Long, Long Male Elbow

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male Pipe	A Tube Leg	C Pipe Leg
400LLL-4-2	1/4"	1/8"	1"	2.31"
400LLL-5-2	5/16"	1/8"	1.03"	2.56"
400LLL-6-4	3/8"	1/4"	1.12"	3.06"
400LLL-8-6	1/2"	3/8"	1.47"	3.75"
400LLL-10-8	5/8"	1/2"	1.65"	4.50"
400LLL-12-12	3/4"	3/4"	1.84"	5.03"
400LLL-14-12	7/8"	3/4"	1.94"	5.56"
400LLL-16-16	1"	1"	2.21"	6.38"
400LLL-20-20	1 1/4"	1 1/4"	2.59"	7.38"

450
FEMALE ELBOW • TUBE END
Female Pipe End

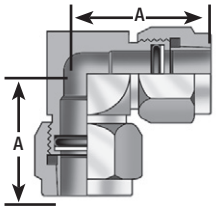


450 • Female Elbow

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Female Pipe Thread	A Tube Leg	C Female Pipe Leg
450-2-2	1/8"	1/8"	.84"	.66"
450-4-2	1/4"	1/8"	1.1"	.66"
450-4-4	1/4"	1/4"	1.19"	.91"
450-5-2	5/16"	1/8"	1.03"	.66"
450-5-4	5/16"	1/4"	1.16"	.91"
450-6-4	3/8"	1/4"	1.25"	.91"
450-6-2	3/8"	1/8"	1.13"	.66"
450-6-6	3/8"	3/8"	1.31"	.97"
450-6-8	3/8"	1/2"	1.38"	1.25"
450-8-6	1/2"	1/2"	1.53"	.97"
450-8-4	1/2"	1/4"	1.47"	.91"
450-8-8	1/2"	1/2"	1.59"	1.25"
450-10-8	5/8"	1/2"	1.72"	1.25"
450-10-4	5/8"	1/4"	1.66"	.97"
450-10-6	5/8"	3/8"	1.66"	.97"
450-12-12	3/4"	3/4"	1.97"	1.34"
450-12-8	3/4"	1/2"	1.84"	1.25"
450-14-12	7/8"	3/4"	2.0"	1.34"
450-16-16	1"	1"	2.34"	1.62"
450-16-12	1"	3/4"	2.22"	1.47"
450-20-20	1 1/4"	1 1/4"	2.78"	1.69"
450-20-16	1 1/4"	1"	2.59"	1.62"
450-24-24	1 1/2"	1 1/2"	3.09"	2.06"
450-32-32	2"	2"	3.78"	2.39"

500
ELBOW UNION
Tube End - Both Openings



500 • Elbow Union

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	A Tube Leg
500-2	1/8"	.78"
500-4	1/4"	1.0"
500-5	5/16"	1.03"
500-6	3/8"	1.13"
500-8	1/2"	1.47"
500-10	5/8"	1.66"
500-12	3/4"	1.84"
500-14	7/8"	1.94"
500-16	1"	2.22"
500-20	1 1/4"	2.59"
500-24	1 1/2"	2.91"
500-32	2"	3.59"

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

600 • Male Branch Tee

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male Pipe Thread	A Tube Leg	C Male Pipe Leg
600-2-2-2	1/8"	1/8"	.78"	.78"
600-4-4-2	1/4"	1/8"	1.0"	.78"
600-4-4-4	1/4"	1/4"	1.06"	1.09"
600-5-5-2	5/16"	1/8"	1.03"	1.78"
600-5-5-4	5/16"	1/4"	1.03"	1.09"
600-6-6-4	3/8"	1/4"	1.13"	1.09"
600-6-6-2	3/8"	1/8"	1.13"	1.09"
600-6-6-6	3/8"	3/8"	1.18"	1.22"
600-6-6-8	3/8"	1/2"	1.25"	1.47"
600-8-8-6	1/2"	3/8"	1.47"	1.22"
600-8-8-4	1/2"	1/4"	1.47"	1.16"
600-8-8-8	1/2"	1/2"	1.47"	1.47"
600-10-10-8	5/8"	1/2"	1.66"	1.47"
600-10-10-6	5/8"	3/8"	1.66"	1.39"
600-10-10-12	5/8"	3/4"	1.71"	1.59"
600-12-12-12	3/4"	3/4"	1.84"	1.59"
600-12-12-8	3/4"	1/2"	1.84"	1.56"
600-14-14-12	7/8"	3/4"	1.94"	1.63"
600-16-16-16	1"	1"	2.22"	1.97"
600-16-16-12	1"	3/4"	2.22"	1.72"
600-20-20-20	1 1/4"	1 1/4"	2.59"	2.38"
600-20-20-16	1 1/4"	1"	2.59"	2.38"
600-24-24-24	1 1/2"	1 1/2"	2.91"	2.63"
600-24-24-20	1 1/2"	1 1/4"	2.91"	2.63"
600-32-32-32	2"	2"	3.59"	3.00"

650 • Female Branch Tee

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

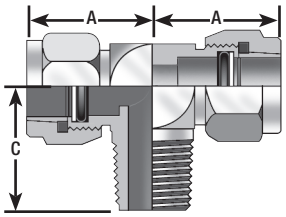
Part No.	Tube O.D.	Female Pipe Thread	A Tube Leg	C Female Pipe Leg
650-2-2-2	1/8"	1/8"	.84"	.66"
650-4-4-2	1/4"	1/8"	1.06"	.66"
650-4-4-4	1/4"	1/4"	1.19"	.91"
650-5-5-2	5/16"	1/8"	1.06"	.66"
650-5-5-4	5/16"	1/4"	1.16"	.91"
650-6-6-4	3/8"	1/4"	1.25"	.91"
650-6-6-2	3/8"	1/8"	1..13"	.66"
650-8-8-6	1/2"	3/8"	1.53"	.97"
650-8-8-4	1/2"	1/4"	1.47"	.91"
650-8-8-8	1/2"	1/2"	1.59"	1.25"
650-10-10-8	5/8"	1/2"	1.72"	1.25"
650-10-10-4	5/8"	1/4"	1.66"	.97"
650-12-12-12	3/4"	3/4"	1.97"	1.34"
650-12-12-8	3/4"	1/2"	1.84"	1.25"
650-14-14-12	7/8"	3/4"	2.00"	1.34"
650-16-16-16	1"	1"	2.34"	1.63"
650-20-20-20	1 1/4"	1 1/4"	2.78"	1.69"
650-24-24-24	1 1/2"	1 1/2"	3.09"	2.06"
650-32-32-32	2"	2"	3.78"	2.38"

700 • Tee Union Tube End

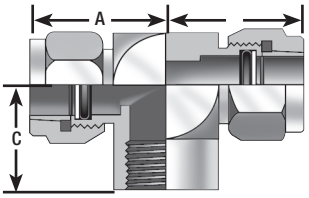
Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	A Tube End
700-2	1/8"	.78"
700-4	1/4"	1.0"
700-5	5/16"	1.03"
700-6	3/8"	1.13"
700-8	1/2"	1.47"
700-10	5/8"	1.66"
700-12	3/4"	1.84"
700-14	7/8"	1.94"
700-16	1"	2.22"
700-20	1 1/4"	2.59"
700-24	1 1/2"	2.91"
700-32	2"	3.59"

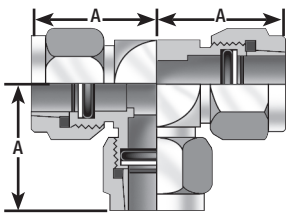
600
Male Branch Tee • Tube End - Tube End-Male Pipe Side Outlet



650
Female Branch Tee • Tube End - Tube End - Female Pipe Side Outlet



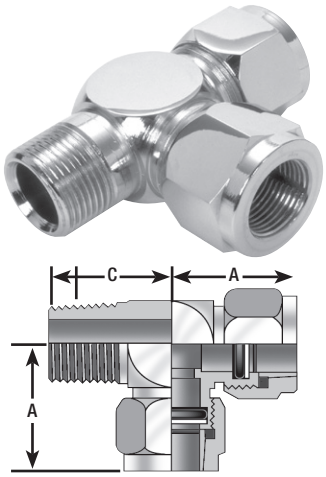
700
Tee Union Tube End - All Openings



Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

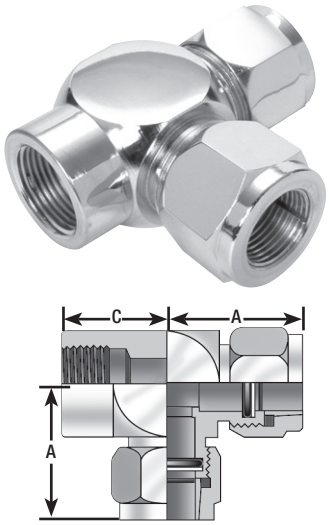
750
MALE RUN TEE • TUBE END - Male Pipe End - Tube Side Outlet



750 • Male Run Tee
Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male Pipe Thread	A Tube Leg	C Male Pipe Leg
750-2-2-2	1/8"	1/8"	.78"	.78"
750-4-2-4	1/4"	1/8"	1.0"	.78"
750-5-2-5	5/16"	1/8"	1.03"	.78"
750-6-4-6	3/8"	1/4"	1.13"	1.09"
750-6-2-6	3/8"	1/8"	1.13"	.88"
750-8-6-8	1/2"	3/8"	1.47"	1.22"
750-10-8-10	5/8"	1/2"	1.66"	1.47"
750-12-12-12	3/4"	3/4"	1.84"	1.59"
750-14-12-14	7/8"	3/4"	1.94"	1.63"
750-16-16-16	1"	1"	2.22"	1.97"
750-20-20-20	1 1/4"	1 1/4"	1.59"	2.38"
750-24-24-24	1 1/2"	1 1/2"	2.90"	2.63"
750-32-32-32	2"	2"	3.59"	3.00"

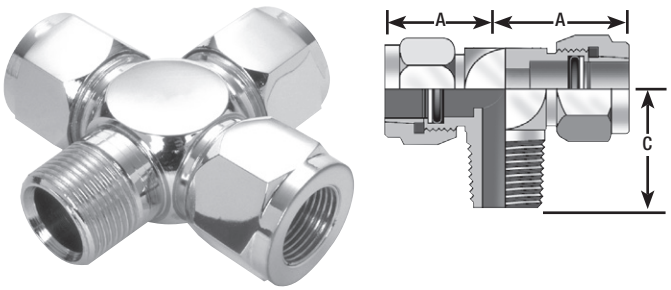
800
FEMALE RUN TEE • TUBE END - Female Pipe End - Tube Side Outlet



800 • Female Run Tee
Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male Pipe Thread	A Tube Leg	C Male Pipe Leg
800-2-2-2	1/8"	1/8"	.84"	.66"
800-4-2-4	1/4"	1/8"	1.06"	.66"
800-5-2-5	5/16"	1/8"	1.03"	.66"
800-6-4-6	3/8"	1/4"	1.25"	.91"
800-6-2-6	3/8"	1/8"	1.13"	.66"
800-8-6-8	1/2"	3/8"	1.53"	.97"
800-8-8-8	1/2"	1/2"	1.59"	1.25"
800-10-8-10	5/8"	1/2"	1.72"	1.25"
800-12-12-12	3/4"	3/4"	1.97"	1.34"
800-14-12-14	7/8"	3/4"	2.00"	1.34"
800-16-16-16	1"	1"	2.34"	1.63"
800-20-20-20	1 1/4"	1 1/4"	2.78"	1.69"
800-24-24-24	1 1/2"	1 1/2"	3.09"	2.06"
800-32-32-32	2"	2"	3.78"	2.38"

810
MALE CROSS • TUBE END - TUBE END - Tube End - Male Pipe End



810 • Male Cross
Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male Pipe Thread	A Tube Leg	C Male Pipe Leg
810-4-4-4-2	1/4"	1/8"	1.00"	.78"
810-5-5-5-2	5/16"	1/8"	1.03"	.78"
810-6-6-6-4	3/8"	1/4"	1.13"	1.09"
810-8-8-8-6	1/2"	3/8"	1.47"	1.22"
810-10-10-10-8	5/8"	1/2"	1.66"	1.47"
810-12-12-12-12	3/4"	3/4"	1.84"	1.59"
810-14-14-14-14	7/8"	3/4"	1.94"	1.63"
810-16-16-16-16	1"	1"	2.21"	1.97"
810-20-20-20-20	1 1/4"	1 1/4"	2.59"	2.38"
810-24-24-24-24	1 1/2"	1 1/2"	2.91"	2.63"
810-32-32-32-32	2"	2"	3.59"	3.00"

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

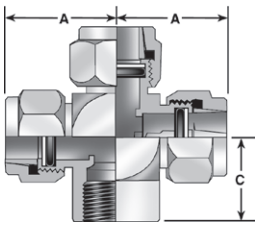
Phone: 937/277-9364 FAX: 937/277-6516 www.lenzinc.com

820 • Female Cross

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male Pipe Thread	A Tube Leg	C FEMALE PIPE LEG
820-4-4-4-2	1/4"	1/8"	1.06"	.66"
820-5-5-5-2	5/16"	1/8"	1.03"	.66"
820-6-6-6-4	3/8"	1/4"	1.25"	.91"
820-8-8-8-6	1/2"	3/8"	1.53"	.97"
820-10-10-10-8	5/8"	1/2"	1.72"	1.25"
820-12-12-12-12	3/4"	3/4"	1.97"	1.34"
820-14-14-14-14	7/8"	3/4"	2.00"	1.34"
820-16-16-16-16	1"	1"	2.34"	1.63"
820-20-20-20-20	1 1/4"	1 1/4"	2.78"	1.69"
820-24-24-24-24	1 1/2"	1 1/2"	3.09"	2.06"
820-32-32-32-32	2"	2"	3.78"	2.38"

820
Female Cross • Tube End - Tube End - Tube End - Female Pipe End

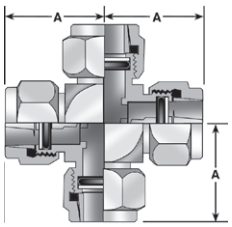


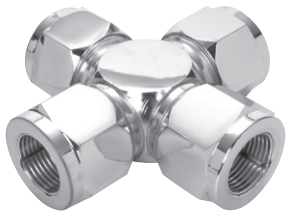
850 • Tube Cross

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	A Tube Leg
850-4	1/4"	1.00"
850-5	5/16"	1.03"
850-6	3/8"	1.13"
850-8	1/2"	1.47"
850-10	5/8"	1.66"
850-12	3/4"	1.84"
850-14	7/8"	1.94"
850-16	1"	2.22"
850-20	1 1/4"	2.59"
850-24	1 1/2"	2.91"
850-32	2"	3.59"

850
Tube Cross
Tube End - All Openings



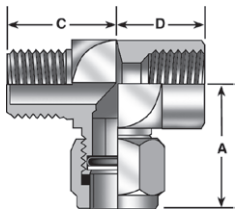


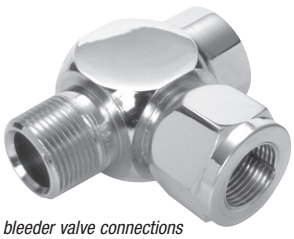
860 • Gauge Tee

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male Pipe & Female Pipe Thread	A Tube Leg	C Male Pipe Leg	D Female Pipe Leg
860-4-2-2	1/4"	1/8"	1.06"	.78"	.66"
860-6-4-4	3/8"	1/4"	1.25"	1.09"	.91"
860-8-6-6	1/2"	3/8"	1.53"	1.22"	.97"
860-10-8-8	5/8"	1/2"	1.72"	1.47"	1.25"
860-12-12-12	3/4"	3/4"	1.97"	1.47"	1.34"
860-14-12-12	7/8"	3/4"	2.00"	1.63"	1.34"
860-16-16-16	1"	1"	2.34"	1.97"	1.63"

860
Gauge Tee • Female Pipe End - Male Pipe End - Tube Side Outlet





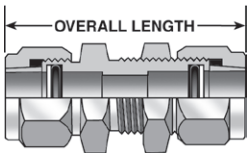
Particularly suited for gauge & air bleeder valve connections

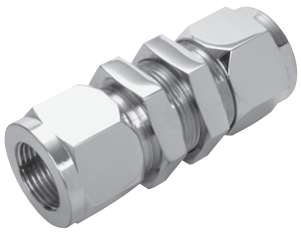
900 • Bulkhead Union

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Bulkhead Hole Dia.	Overall Length
900-4-4	1/4"	.53"	2.44"
900-5-5	5/16"	.59"	2.44"
900-6-6	3/8"	.66"	2.63"
900-8-8	1/2"	.91"	3.16"
900-10-10	5/8"	1.03"	3.50"
900-10-8	5/8" to 1/2" BH	.91"	3.28"
900-12-12	3/4"	1.16"	3.81"
900-14-14	7/8"	1.28"	3.88"
900-16-16	1"	1.53"	4.13"
900-20-20	1 1/4"	1.78"	4.63"
900-20-16	1 1/4" to 1" BH	1.53"	4.41"
900-24-24	1 1/2"	2.03"	4.88"
900-32-32	2"	2.66"	5.75"

900
Bulkhead Union • Tube Both Ends



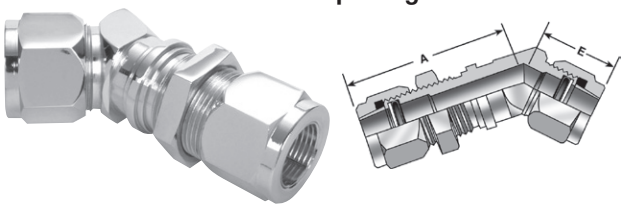


Maximum Bulkhead Thickness 1/2"

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

940
BULKHEAD 45° UNION ELBOW
Tube Both Openings

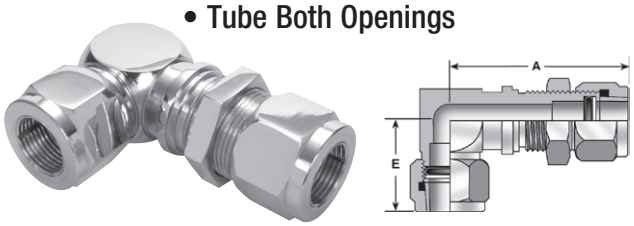


Max. Bulkhead Thickness ½"

940 • Bulkhead 45° Union Elbow
Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Bulkhead Hole Dia.	Overall Length	E Tube Leg
940-4	¼"	.53"	2.13"	.91"
940-5	5⁄16"	.59"	2.16"	.88"
940-6	⅜"	.66"	2.28"	1.00"
940-8	½"	.91"	2.59"	1.22"
940-10	⅝"	1.03"	2.84"	1.44"
940-12	¾"	1.16"	3.09"	1.59"
940-16	1"	1.53"	3.28"	1.81"
940-20	1¼"	1.78"	3.72"	2.22"

950
BULKHEAD UNION ELBOW
• Tube Both Openings

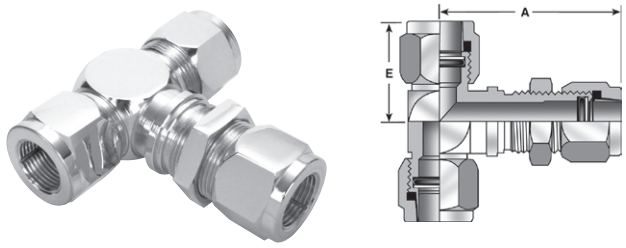


Max. Bulkhead Thickness ½"

950 • Bulkhead Union Elbow
Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part no.	Tube O.D	Bulkhead Hole Dia.	A Bulkhead Leg	E Tube Leg
950-4	¼"	.53"	2.16"	1.00"
950-5	5⁄16"	.59"	2.22"	1.03"
950-6	⅜"	.66"	2.41"	1.13"
950-8	½"	.91"	2.75"	1.47"
950-10	⅝"	1.03"	3.09"	1.66"
950-12	¾"	1.16"	3.34"	1.84"
950-14	⅞"	1.28"	3.44"	1.94"
950-16	1"	1.53"	3.75"	2.22"
950-20	1¼"	1.78"	4.19"	2.59"
950-24	1½"	2.03"	4.47"	2.91"

960
BULKHEAD TEE
Tube End All Openings

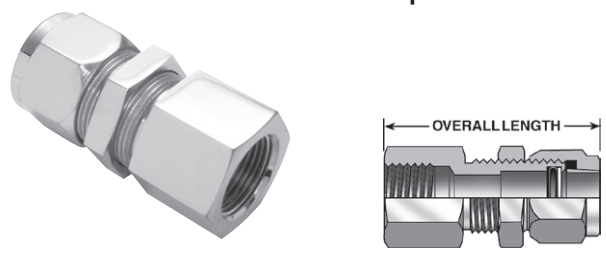


Maximum Bulkhead Thickness ½"

960 • Bulkhead Tee
Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Bulkhead Hole Dia.	A Bulkhead Leg	E Tube Leg
960-4	¼"	.53"	2.16"	1.00"
960-5	5⁄16"	.59"	2.22"	1.03"
960-6	⅜"	.66"	2.41"	1.13"
960-8	½"	.91"	2.75"	1.47"
960-10	⅝"	1.03"	3.09"	1.66"
960-12	¾"	1.16"	3.34"	1.84"
960-16	1"	1.53"	3.75"	2.22"
960-20	1¼"	1.78"	4.19"	2.59"

980
FEMALE BULKHEAD
Tube End to Female Pipe End



Maximum Bulkhead Thickness ½"

980 • Female Bulkhead Connector
Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part no.	Tube O.D.	Bulkhead Hole Dia.	Female Pipe Thread	Overall Length
980-4-2	¼"	.53"	⅛"	2.09"
980-4-4	¼"	.53"	¼"	2.25"
980-5-2	5⁄16"	.59"	⅛"	2.09"
980-6-4	⅜"	.66"	¼"	2.38"
980-6-6	⅜"	.66"	⅜"	2.38"
980-8-6	½"	.91"	⅜"	2.69"
980-8-8	½"	.91"	½"	2.88"
980-10-8	⅝"	1.03"	½"	3.03"
980-12-12	¾"	1.16"	¾"	3.28"
980-14-12	⅞"	1.28"	¾"	3.31"
980-16-16	1"	1.53"	1"	3.69"
980-20-20	1¼"	1.78"	1¼"	3.94"
980-24-24	1½"	2.03"	1½"	4.06"
980-32-32	2"	2.66"	2"	4.53"

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

Lenz Special Shapes

Price and delivery for these fitting shapes depend on the quantity involved. Please review our fitting outlets on pages 17–19.

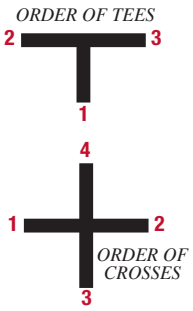
Crosses – Indicate part number followed by the tube end size FIRST then the other ends in the order shown in the diagrams.

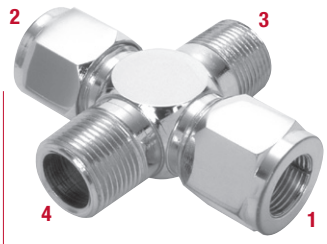
Tees – Indicate part number , specify size of tube end FIRST, opposite end SECOND and side outlet THIRD. If there two tube outlets, specify largest size FIRST> If both female and male outlet on the run, show female size FIRST. This would apply to our 860 tees.

When ordering Lenz stainless steel O-Ring tube fittings to work with stainless steel tubing add –SS to the part number. To order use this example 100-12-SS.

You can also use also use Lenz carbon steel fitting with stainless tubing using 165-XX-SS stainless sleeve and stainless steel buffer washer 195-XX-SS.
To order use this example 100-12-with SS sleeves.

All Lenz Fittings Conform to J.I.C. Hydraulic Standards





760 • Cross
Tube End-Tube End-
Male Pipe End-
Male Pipe End

770 • Cross
Tube End-Tube End-
Female Pipe End-
Female Pipe End

780 • Cross
Tube End-Male Pipe End-
Male Pipe End-
Male Pipe End

790 • Cross
Tube End-Female Pipe End-
Female Pipe End-
Female Pipe End

870 • Tee
Male Pipe End-
Male Pipe End-
Tube Side Outlet

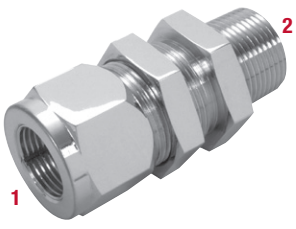
880 • Tee
Tube End-
Female Pipe End-
Male Pipe Side Outlet

890 • Tee
Tube End-
Male Pipe End-
Male Pipe Side Outlet

910 • Tee
Tube End-
Male Pipe End-
Female Pipe Side Outlet

920 • Tee
Female Pipe End-
Female Pipe End-
Tube Side Outlet

930 • Tee
Tube End-
Female Pipe End-
Female Pipe Side Outlet



990 • Male Bulkhead
Tube End-
Male Pipe End

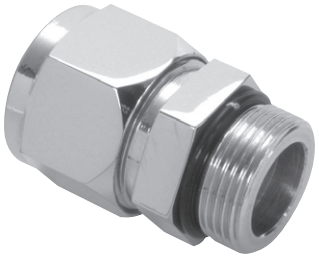
Maximum Bulkhead Thickness ½"

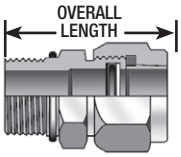
Note: Price and delivery of non-stock items furnished on request and will depend on quantity ordered.

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

A-100
MALE CONNECTOR • TUBE END-
S.A.E. Straight Thread End





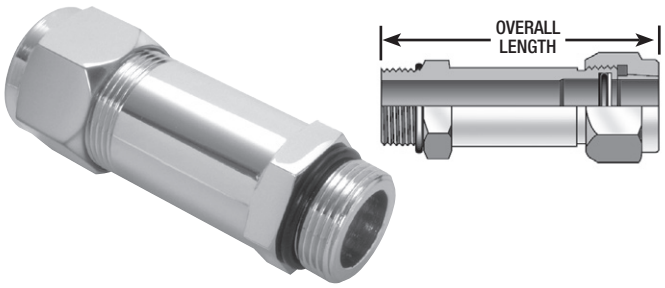
A-100 • Male Connector

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part no.	Tube O.D.	S.A.E. Male Thread	Overall Length
A100-2-2*	1/8"	5/16"-24	1.03"
A100-4-4	1/4"	7/16"-20	1.28"
A100-4-5*	1/4"	1/2"-20	1.28"
A100-4-6*	1/4"	9/16"-18	1.34"
A100-5-5	5/16"	1/2"-20	1.28"
A100-6-6	3/8"	9/16"-18	1.41"
A100-6-8*	3/8"	3/4"-16	1.47"
A100-8-8	1/2"	3/4"-16	1.69"
A100-8-6	1/2"	9/16"-18	1.66'
A100-8-10*	1/2"	7/8"-14	1.78"
A100-8-12*	1/2"	1 1/16"-12	1.94"
A100-10-10	5/8"	7/8"-12	1.94"
A100-10-8	5/8"	3/4"-16	1.88"
A100-10-12*	5/8"	1 1/16"-12	2.09"
A100-12-12	3/4"	1 1/16"-12	2.22"
A100-12-8	3/4"	3/4"-16	2.00"
A100-12-10	3/4"	7/8"-14	2.13"
A100-12-14*	3/4"	1 3/16"-12	2.22"
A100-12-16*	3/4"	1 5/16"-12	2.22"
A100-14-14	7/8"	1 3/16"-12	2.25"
A100-14-16*	7/8"	1 5/16"-12	2.25"
A100-16-16	1"	1 5/16"-12	2.38"
A100-16-12	1"	1 1/16"-12	2.38"
A100-16-20*	1"	1 5/8"-12	2.38"
A100-20-20	1 1/4"	1 5/8"-12	2.63"
A100-20-16	1 1/4"	1 5/16"-12	2.69"
A100-20-24*	1 1/4"	1 7/8"-12	2.63"
A100-24-24	1 1/2"	1 7/8"-12	2.75"
A100-24-20	1 1/2"	1 5/8"-12	2.78"
A100-32-32	2"	2 1/2"-12	3.16"

**Fittings with tube diameter bored through **Tube diameter bored through, optional*
Tubing may be pushed all the way through the male connectors marked with an asterisk*. This exclusive feature has many uses in hydraulic or air circuitry.

A-100-L
LONG MALE CONNECTOR • TUBE END
S.A.E. Straight Thread End

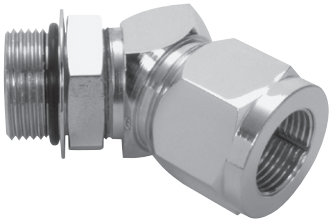


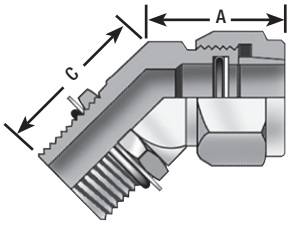
A-100-L • Long Male Connector

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part no.	Tube O.D.	S.A.E. Male Thread	Overall Length
A100L-2-2	1/8"	5/16"-24	2.03"
A100L-4-4	1/4"	7/16"-20	2.25"
A100L-5-5	5/16"	1/2"-20	2.31"
A100L-6-6	3/8"	9/16"-18	2.59"
A100L-8-8	1/2"	3/4"-16	3.03"
A100L-10-10	5/8"	7/8"-14	3.47"
A100L-12-12	3/4"	1 1/16"-12	4.03"
A100L-14-14	7/8"	1 3/16"-12	4.22"
A100L-16-16	1"	1 5/16"-12	4.69"
A100L-20-20	1 1/4"	1 5/8"-12	5.22"
A100L-24-24	1 1/2"	1 7/8"-12	5.75"
A100L-32-32	2"	2 1/2"-12	6.97"
A100-24-20	1 1/2"	1 5/8"-12	2.78"
A100-32-32	2"	2 1/2"-12	3.16"

A-350
MALE 45° ELBOW TUBE END
S.A.E. Straight Thread End





A-350 • Male 45° Elbow

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part no.	Tube O.D.	S.A.E. Male Thread	Overall Length
A350-4	1/4"	7/16"-20	1.03"
A350-5	5/16"	1/2"-20	1.03"
A350-6	3/8"	9/16"-18	1.09"
A350-8	1/2"	3/4"-16	1.28"
A350-10	5/8"	7/8"-14	1.50"
A350-12	3/4"	1 1/16"-12	1.72"
A350-14	7/8"	1 3/16"-12	1.78"
A350-16	1"	1 5/16"-12	1.84"
A350-20	1 1/4"	1 5/8"-12	1.88"
A350-24	1 1/2"	1 7/8"-12	1.88"
A350-32	2"	2 1/2"-12	1.88"

Stainless Steel Tubing

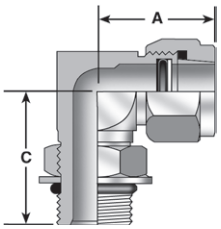
Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

A-400 • Male Elbow

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part no.	Tube o.D.	S.A.E. Male Thread	A Tube Leg	C S.A.E. Thread Leg
A400-4-4	1/4"	7/16"-20	1.00"	1.02"
A400-4-6	1/4"	9/16"-18	1.02"	1.23"
A400-5-5	5/16"	1/2"-20	1.03"	1.08"
A400-6-6	3/8"	9/16"-18	1.13"	1.23"
A400-6-8	3/8"	3/4"-16	1.18"	1.44"
A400-8-8	1/2"	3/4"-16	1.47"	1.44"
A400-8-6	1/2"	9/16"-18	1.47"	1.36"
A400-8-10	1/2"	7/8"-14	1.47"	1.66"
A400-10-10	5/8"	7/8"-14	1.66"	1.69"
A400-10-8	5/8"	3/4"-16	1.66"	1.50"
A400-10-12	5/8"	1 1/16"-12	1.72"	1.92"
A400-12-12	3/4"	1 1/16"-12	1.84"	1.92"
A400-12-8	3/4"	3/4"-16	1.84"	1.56"
A400-12-10	3/4"	7/8"-14	1.84"	1.78"
A400-12-16	3/4"	1 5/16"-12	2.06"	2.03"
A400-14-14	7/8"	1 3/16"-12	1.94"	1.98"
A400-16-16	1"	1 5/16"-12	2.22"	2.03"
A400-16-12	1"	1 1/16"-12	2.22"	2.09"
A400-16-20	1"	1 5/8"-12	2.34"	2.23"
A400-20-20	1 1/4"	1 5/8"-12	2.59"	2.23"
A400-20-16	1 1/4"	1 5/16"-12	2.59"	2.16"
A400-20-24	1 1/4"	1 7/8"-12	2.72"	2.38"
A400-24-24	1 1/2"	1 7/8"-12	2.91"	2.38"
A400-32-32	2"	2 1/2"-12	3.59"	2.88"

A-400
Male Elbow • Tube End S.A.E. Straight Thread End

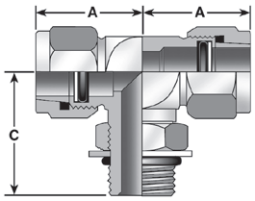


A-600 • Male Branch Tee

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part no.	Tube O.D.	S.A.E. Male Thread	A Tube Leg	C S.A.E. Thread Leg
A600-4	1/4"	7/16"-20	1.00"	1.02"
A600-5	5/16"	1/2"-20	1.03"	1.08"
A600-6	3/8"	9/16"-18	1.13"	1.23"
A600-8	1/2"	3/4"-16	1.47"	1.44"
A600-10	5/8"	7/8"-14	1.66"	1.69"
A600-12	3/4"	1 1/16"-12	1.84"	1.92"
A600-14	7/8"	1 3/16"-12	1.94"	1.98"
A600-16	1"	1 5/16"-12	2.22"	2.03"
A600-20	1 1/4"	1 5/8"-12	2.59"	2.23"
A600-24	1 1/2"	1 7/8"-12	2.91"	2.38"
A600-32	2"	2 1/2"-12	2.88"	2.88"

A-600
Male Branch Tee - Tube End-Tube End- S.A.E. Straight Thread Side Outlet

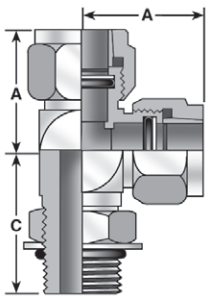


A-750 • Male Run Tee

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part no.	Tube O.D.	S.A.E. Male Thread	A Tube Leg	C S.A.E. Thread Leg
A750-4	1/4"	7/16"-20	1.00"	1.02"
A750-5	5/16"	1/2"-20	1.03"	1.08"
A750-6	3/8"	9/16"-18	1.13"	1.23"
A750-8	1/2"	3/4"-16	1.47"	1.44"
A750-10	5/8"	7/8"-14	1.66"	1.69"
A750-12	3/4"	1 1/16"-12	1.84"	1.92"
A750-14	7/8"	1 3/16"-12	1.94"	1.98"
A750-16	1"	1 5/16"-12	2.22"	2.03"
A750-20	1 1/4"	1 5/8"-12	2.59"	2.23"
A750-24	1 1/2"	1 7/8"-12	2.91"	2.38"
A750-32	2"	2 1/2"-12	2.88"	2.88"

A-750
Male Run Tee • Tube End - S.A.E. Straight Thread End-Tube Side Outlet



Stainless Steel Tubing

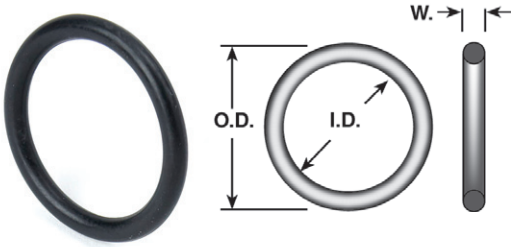
Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

Compounds for "O-Ring Seal" Fittings

185 BUNA O-RINGS	185V Viton	185L Ethylene Propylene
-40 F to + 250 F	-20 F to +400 F	-65 F to +300 F
Hydraulic Fluids	Petroleum	Phosphate Ester Fluids
Lubrication oils	Silicate Ester	Lyndrol
MIL-5606	Diester	Pydraul
UCON	Halogenated Hydrocarbons	Skydrol
HYDROLUBE	Phosphate Esters	Cellulube 90, 150, 300, 550
Brine Water		Nyvac- Extra Heavy, Nyvac A
Glycol		Houghton Safe 1000 series
Anti-Freeze		Oxygen and Acetone
Alcohol		

185
O-Ring for Lenz "O-Ring Seal" Tube Ends

185 "O-Ring" For Lenz "O-Ring Seal" Tube Ends

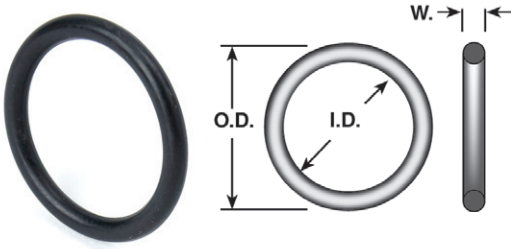


185 • O-Ring for Lenz "O-Ring Seal" Tube Ends

Buna Part Number	Viton Part Number	EPR Part Number	Tube O.D.	O.D.	I.D.	W Cross Section
185-2	185V-2	185L-2	1/8"	.25"	.13"	.06"
185-4	185V-4	185L-4	1/4"	.38"	.25"	.06"
185-5	185V-5	185L-5	5/16"	.44"	.31"	.06"
185-6	185V-6	185L-6	3/8"	.50"	.38"	.06"
185-8	185V-8	185L-8	1/2"	.69"	.50"	.09"
185-10	185V-10	185L-10	5/8"	.81"	.63"	.09"
185-12	185V-12	185L-12	3/4"	.94"	.75"	.09"
185-14	185V-14	185L-14	7/8"	1.06"	.88"	.09"
185-16	185V-16	185L-16	1"	1.25"	1.00"	.13"
185-20	185V-20	185L-20	1 1/4"	1.50"	1.25"	.13"
185-24	185V-24	185L-24	1 1/2"	1.75"	1.50"	.13"
185-32	185V-32	185L-32	2"	2.25"	2.00"	.13"

A-185
"O-Rings" For Male S.A.E. Straight Th'D Fitting Ends

A-185 & A-185L "O-Rings"



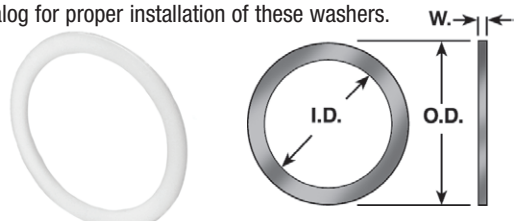
A-185 • "O-Rings" For Male S.A.E. Straight Th'D Fitting Ends

Buna Part Number	Viton Part Number	EPR Part Number	Tube O.D.	S.A.E. Thread	I.D.	W Cross Section
A185-2	A185V-2	A185L-2	1/8"	5/16"-24	.239"	.064"
A185-4	A185V-4	A185L-4	1/4"	7/16"-20	.351"	.072"
A185-5	A185V-5	A185L-5	5/16"	1/2"-20	.414"	.072"
A185-6	A185V-6	A185L-6	3/8"	9/16"-18	.468"	.078"
A185-8	A185V-8	A185L-8	1/2"	3/4"-16	.644"	.087"
A185-10	A185V-10	A185L-10	5/8"	7/8"-14	.755"	0.97"
A185-12	A185V-12	A185L-12	3/4"	1 1/16"-12	.924"	.116"
A185-14	A185V-14	A185L-14	7/8"	1 3/16"-12	1.048"	.116"
A185-16	A185V-16	A185L-16	1"	1 5/16"-12	1.171"	.116"
A185-20	A185V-20	A185L-20	1 1/4"	1 5/8"-12	.1475"	.118"
A185-24	A185V-24	A185L-24	1 1/2"	1 7/8"-12	1.720"	.118"
A185-32	A185V-32	A185L-32	2"	2 1/2"-12	2.337"	.118"
A185-48			—	3 3/8"-12	3.18"	.11"

Note: Add "L" To Above Part Numbers For 185-L "O-Rings"

175
Anti-Extrusion Teflon Back-Up Washers

In the exclusive, patented design of Lenz "O-Ring Seal" Tube fittings, the Teflon Back-Up Washer prevents extrusion of the O-Ring and adds to the performance and service of the fittings. See page iv of this catalog for proper installation of these washers.



175 • Teflon Back-Up Washers

PART NUMBER	TUBE O.D.	I.D.	O.D.	W CROSS SECTION
175-6	3/8"	.38"	.50"	.03"
175-8	1/2"	.50"	.69"	.03"
175-10	5/8"	.63"	.81"	.03"
175-12	3/4"	.75"	.94"	.03"
175-14	7/8"	.88"	1.06"	.03"
175-16	1"	1.00"	1.25"	.03"
175-20	1 1/4"	1.25"	1.50"	.03"
175-24	1 1/2"	1.50"	1.75"	.03"
175-32	2"	2.00"	2.25"	.03"

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

205 • Tube Nut Used With 165 Sleeve

PART NUMBER	SS PART NUMBER	TUBE O.D.	THREAD SIZE	OVERALL LENGTH
205-2	205-2-SS	1/8"	3/8"-24	.47"
205-4	205-4-SS	1/4"	1/2"-20	.64"
205-5	205-5-SS	1/4"	9/16"-18	.64"
205-6	205-6-SS	5/16"	5/8"-18	.69"
205-8	205-8-SS	5/16"	7/8"-14	.91"
205-10	205-10-SS	3/8"	1"-14	1.00"
205-12	205-12-SS	3/8"	1 1/8"-12	1.09"
205-14	205-14-SS	3/8"	1 1/4"-12	1.13"
205-16	205-16-SS	3/8"	1 1/2"-12	1.25"
205-20	205-20-SS	1/2"	1 3/4"-12	1.44"
205-24	205-24-SS	1/2"	2"-12	1.63"
205-32	205-32-SS	1/2"	2 5/8"-12	2.03"

205
Tube Nut Used With 165 Sleeve

165 • Split Ring Used With 205 Nut

PART NUMBER	SS PART NUMBER	TUBE O.D.	OVERALL LENGTH
165-2	165-2-SS	1/8"	.25"
165-4	165-4-SS	1/4"	.31"
165-5	165-5-SS	5/16"	.31"
165-6	165-6-SS	3/8"	.31"
165-8	165-8-SS	1/2"	.47"
165-10	165-10-SS	5/8"	.53"
165-12	165-12-SS	3/4"	.56"
165-14	165-14-SS	7/8"	.59"
165-16	165-16-SS	1"	.66"
165-20	165-20-SS	1 1/4"	.78"
165-24	165-24-SS	1 1/2"	.91"
165-32	165-32-SS	2"	1.13"

165
Split Ring Used With 205 Nut
**Sleeves having flange at large end*

208 • Lenz "O-Ring" Bulkhead Lock Nut

PART NUMBER	TUBE O.D.	THREAD SIZE	HEX SIZE	OVERALL LENGTH
208-4	1/4"	1/2"-20	.75"	.25"
208-5	5/16"	9/16"-18	.81"	.27"
208-6	3/8"	5/8"-18	.88"	.28"
208-8	1/2"	7/8"-14	1.13"	.36"
208-10	5/8"	1"-14	1.25"	.38"
208-12	3/4"	1 1/8"-12	1.38"	.41"
208-14	7/8"	1 1/4"-12	1.50"	.41"
208-16	1"	1 1/2"-12	1.75"	.41"
208-20	1 1/4"	1 3/4"-12	2.00"	.41"
208-24	1 1/2"	2"-12	2.25"	.41"
208-32	2"	2 5/8"-12	2.88"	.41"

208
Lenz "O-Ring" Bulkhead Lock Nut

100C • Tube Cap Used To Cap Tubing

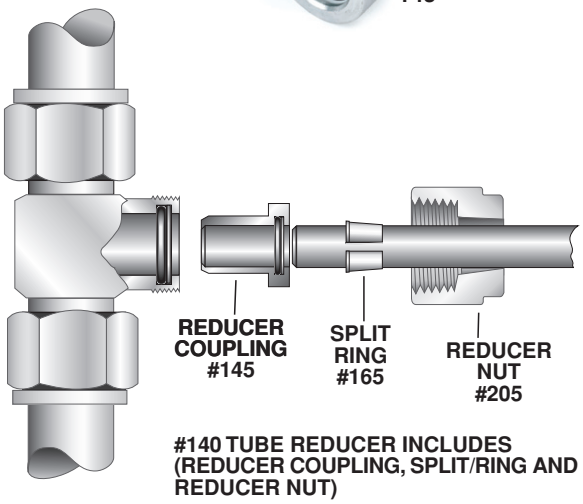
Part No.	Tube O.D.	Overall Length
100C-4	1/4"	.94"
100C-5	5/16"	.94"
100C-6	3/8"	1.03"
100C-8	1/2"	1.31"
100C-10	5/8"	1.44"
100C-12	3/4"	1.59"
100C-14	7/8"	1.66"
100C-16	1"	1.81"
100C-20	1 1/4"	2.09"
100C-24	1 1/2"	2.31"
100C-32	2"	2.78"

100C
Tube Cap Used To Cap Tubing

Stainless Steel Tubing

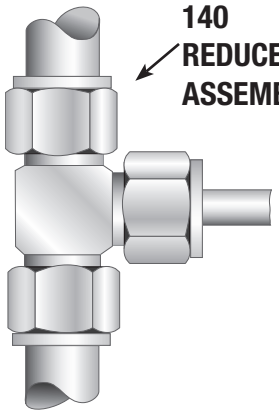
Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

140
"O-RING SEAL"
TUBE REDUCER ADAPTERS



#140 TUBE REDUCER INCLUDES (REDUCER COUPLING, SPLIT/RING AND REDUCER NUT)

The Lenz exclusive Tube Reducer Adapter makes possible line reductions on any leg by the use of standard adapters and adapter nuts.



A-100 • Male Connector

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube End Reduction	Nut Hex	Increase In Fitting Length
140-6-4	3/8"–1/4"	.75"	.28"
140-6-5	3/8"–5/16"	.75"	.28"
140-8-4	1/2"– 1/4"	1.00"	No Change
140-8-5	1/2"–5/16"	1.00"	.19"
140-8-6	1/2"–3/8"	1.00"	.19"
140-10-4	5/8"–1/4"	1.13"	.06" Shorter
140-10-5	5/8"–5/16"	1.13"	.06" Shorter
140-10-6	5/8"–3/8"	1.13"	.06" Shorter
140-10-8	5/8"–1/2"	1.13"	.31"
140-12-4	3/4"–1/4"	1.25"	.06" Shorter
140-12-5	3/4"–5/16"	1.25"	.06" Shorter
140-12-6	3/4"–3/8"	1.25"	.06" Shorter
140-12-8	3/4"–1/2"	1.25"	.28"
140-12-10	3/4"–5/8""	1.25"	.34"
140-14-6	7/8"–3/8"	1.38"	.09" Shorter
140-14-8	7/8"–1/2"	1.38"	.03"
140-14-10	7/8"–5/8"	1.38"	.31"
140-14-12	7/8"–3/4"	1.38"	.34"
1440-16-6	1"–5/16"	1.63"	.19" Shorter
140-16-8	1"–1/2"	1.63"	.06" Shorter
140-16-10	1"–5/8"	1.63"	No Change
140-16-12	1"–3/4"	1.63"	.25"
140-16-14	1"–7/8"	1.63"	.28"
140-20-6	1 1/4"–3/8"	2.00"	.31" Shorter
140-20-8	1 1/4"–1/2"	2.00"	.19" Shorter
140-20-10	1 1/4"–5/8"	2.00"	.13" Shorter
140-20-12	1 1/4"–3/4"	2.00"	.09" Shorter
140-20-14	1 1/4"–7/8"	2.00"	.06" Shorter
140-20-16	1 1/4"–1"	2.00"	.34"
140-24-8	1 1/4"–1/2"	2.25"	.31" Shorter
140-24-10	1 1/2"–5/8"	2.25"	.25" Shorter
140-24-12	1 1/2"–3/4"	2.25"	.22" Shorter
140-24-14	1 1/2"–7/8"	2.25"	.19" Shorter
140-24-16	1 1/2"–1"	2.25"	.09" Shoter
140-24-20	1 1/2"–1 1/4"	2.25"	.34"
140-32-8	2"–1/2"	3.00"	.50" Shorter
140-32-10	2"–5/8"	3.00"	.44" Shorter
140-32-12	2"–3/4"	3.00"	.41" Shoter
140-32-14	2"–7/8"	3.00"	.38" Shorter
140-32-16	2"–1"	3.00"	.31" Shorter
140-32-20	2"–1 1/4"	3.00"	.19" Shorter
140-32-24	2"–1 1/2"	3.00"	.06" Shorter

205P Plug
TO PLUG O-RING FITTING END
Used With 205 Nut

205P Plug • To Plug O-Ring Fitting End Used With 205 Nut

Part No.	Tube O.D.	Overall Length
205P-2	1/8"	.39"
205P-4	1/4"	.50"
205P-5	5/16"	.50"
205P-6	3/8"	.56"
205P-8	1/2"	.56"
205P-10	5/8"	.56"
205P-12	3/4"	.59"
205P-14	7/8"	.59"
205P-16	1"	.72"
205P-20	1 1/4"	.72"
205P-24	1 1/2"	.84"
205P-32	2"	.88"

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

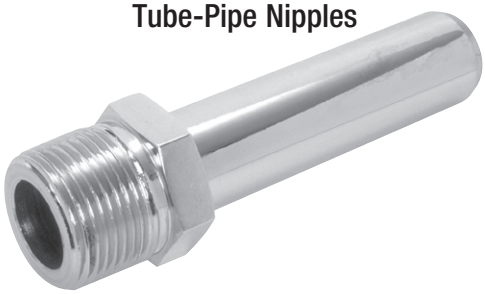
TPN • Tube Pipe Nipples

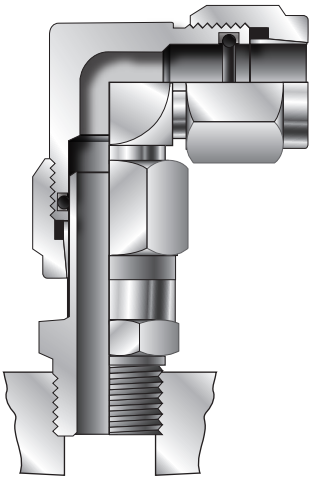
Part No.	Tube O.D.	Male Pipe Thread	Standard Length	L Length	X Long LL Length	X-L-Long LLL Length
4TPN	1/4"	1/8"	1.63"	3.63"	5.63"	7.63"
5TPN	5/16"	1/8"	1.63"	3.63"	5.63"	7.63"
6TPN	3/8"	1/4"	1.91"	3.91"	5.91"	7.91"
8TPN	1/2"	3/8"	2.16"	4.16"	6.16"	8.16"
10TPN	5/8"	1/2"	2.44"	4.44"	6.44"	8.44"
12TPN	3/4"	3/4"	2.56"	4.56"	6.56"	8.56"
14TPN	7/8"	3/4"	2.56"	4.56"	6.56"	8.56"
16TPN	1"	1"	2.94"	4.94"	6.94"	8.94"
20TPN	1 1/4"	1 1/4"	3.28"	5.28"	7.28"	9.28"
24TPN	1 1/2"	1 1/2"	3.63"	5.28"	7.63"	9.93"
32TPN	2"	2"	4.22"	6.22"	8.22"	10.22"

L, LL, LLL are sepcial order items

TPN
Tube-Pipe Nipples

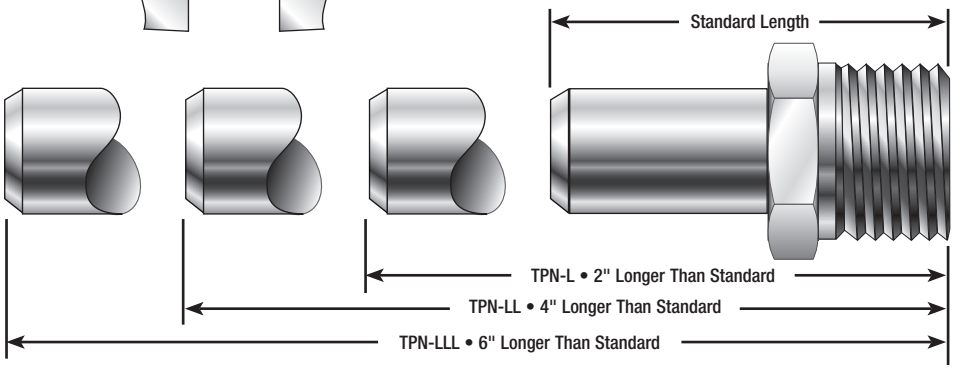
TPN-LL
Tube-Pipe Nipples





Lenz TPN's, TAN's and TFN's Permit Easy Postioning In Any Direction

TPN's, TAN's and TFN's are used with elbows or tees for easy positioning in any desired direction including up and down. Shown to the left is a TPN with a 500 series elbow. For other practical uses of these fittings see page 23.



TAN* • Tube S.A.E. Nipples

Part No.	Tube O.D.	Male Pipe Thread	Standard Length	L Length	X Long LL Length	X-L-Long LLL Length
4TAN	1/4"	7/16"-20	1.63"	3.63"	5.63"	7.63"
5TAN	5/16"	1/2"-20	1.63"	3.63"	5.63"	7.63"
6TAN	3/8"	9/16"-18	1.75"	3.75"	5.75"	7.75"
8TAN	1/2"	3/4"-16	2.03"	4.03"	6.03"	8.03"
10TAN	5/8"	7/8"-14	2.19"	4.19"	6.19"	8.19"
12TAN	3/4"	1 1/16"-12	2.47"	4.47"	6.47"	8.47"
14TAN	7/8"	1 3/16"-12	2.50"	4.50"	6.50"	8.50"
16TAN	1"	1 5/16"-12	2.66"	4.66"	6.66"	8.66"
20TAN	1 1/4"	1 5/8"-12	2.91"	4.91"	6.91"	8.91"
24TAN	1 1/2"	1 7/8"-12	3.19"	5.19"	7.19"	9.19"
32TAN	2"	2 1/2"-12	3.72"	5.72"	7.72"	9.72"

L, LL, LLL are sepcial order items

TAN*
Tube- "A" Nipples
For Use With S.A.E. Straight Thread Fittings

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

TFN*
TUBE-FLARE NIPPLES
For Use with 37 J.I.C. Swivel Flare Hose or Tube Fittings

TFN* • Standard Sizes

Part No.	Tube O.D.	Male Pipe Thread	Standard Length	L Length	X Long LL Length	X-L-Long LLL Length
4TFN	1/4"	7/16"-20	1.78"	3.78"	5.78"	7.78"
5TFN	5/16"	1/2"-20	1.81"	3.81"	5.81"	7.81"
6TFN	3/8"	9/16"-18	1.91"	3.91"	5.91"	7.91"
8TFN	1/2"	3/4"-16	2.25"	4.25"	6.25"	8.25"
10TFN	5/8"	7/8"-14	2.47"	4.47"	6.44"	8.44"
12TFN	3/4"	1 1/16"-12	2.78"	4.78"	6.78"	8.78"
14TFN	7/8"	1 3/16"-12	2.81"	4.81"	6.81"	8.81"
16TFN	1"	1 5/16"-12	2.94"	4.94"	6.94"	8.94"
20TFN	1 1/4"	1 5/8"-12	3.28"	5.28"	7.28"	9.28"
24TFN	1 1/2"	1 7/8"-12	3.78"	5.78"	7.78"	9.78"

L, LL, LLL are sepcial order items

Lenz 100-F
STRAIGHT ADAPTER
Lenz "O-Ring Seal" Tube End To J.I.C. Thread

Useful in making swivel hose end connections to tube outlets, utilizing the patented features of "O-Ring Seal" on the tube end.

Lenz 100-F • Straight Adapter
Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	Male SAE Thread	Overall Length
100-4-F4	1/4"	7/16"–20	1.50"
100-5-F5	5/16"	1/2"–20	1.50"
100-6-F6	3/8"	9/16"–18	1.59"
100-8-F8	1/2"	3/4"–16	1.94"
100-10-F10	5/8"	7/8"–14	2.17"
100-12-F12	3/4"	1 1/16"–12	2.44"
100-14-F14	7/8"	1 3/16"–12	2.50"
100-16-F16	1"	1 5/16"–12	2.72"
100-20-F20	1 1/4"	1 5/8"-12	3.00"
100-24-F24	1 1/2"	1 7/8"-12	3.41"
100-32-F32	2"	2 1/2"-12	4.16"

OFTN
TUBE O-RING FACE NIPPLES
"O-Ring" Face Seal to Tube Nipple

OFTN • Tube O-Ring Face Nipples

Part No.	Tube O.D.	JIC THREAD	OVERALL LENGTH
40FTN	1/4"	9/16"-18	1.61"
60FTN	3/8"	11/16"-16	1.81"
80FTN	1/2"	13/16"-16	2.13"
100FTN	5/8"	1"-14	2.19"
120FTN	3/4"	1 13/16"-12	2.56"
160FTN	1"	1 7/16"-12	2.75"
200FTN	1 1/4"	1 11/16"-12	3.00"
240FTN	1 1/2"	2"-12	3.28"

100-OF
STRAIGHT ADAPTERS
"O-Ring Seal" Tube End To O-Ring Face Seal

100-OF • Straight Adapters
Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Part No.	Tube O.D.	JIC THREAD	OVERALL LENGTH
100-40F-4	1/4"	9/16"-18	1.39"
100-60-F6	3/8"	11/16"-16	1.52"
100-80-F8	1/2"	13/16"-16	1.91"
100-120F-12	3/4"	1 3/16"-12	2.45"
100-160F-16	1"	1 7/16"-12	2.52'
100-200F-20	1 1/4"	1 11/16"-12	2.81"
100-240F-24	1 1/2"	2"-12	3.03"
240FTN	1 1/2"	2"-12	3.28"

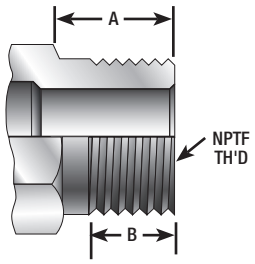
Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

Male Pipe Thread End

Size	Thread NPTF	A	B Min. Full Thread
2	1/8"	.39"	.31"
4	1/4"	.56"	.47"
6	3/8"	.56"	.50"
8	1/2"	.75"	.66"
12	3/4"	.75"	.66"
16	1"	.94"	.78"
20	1 1/4"	.97"	.81"
24	1 1/2"	1.00"	.81"
32	2"	1.03"	.81"

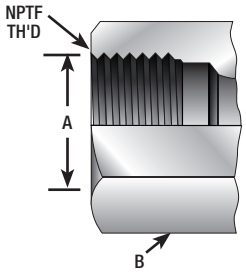
Male Pipe Thread End (Dry Seal)



Female Pipe Thread End

Size	Thread NPTF	A	B Hex Size (Str. Connector)	B Dia. (Elbows, Tees, Crosses)
2	1/8"	.41"	.56", .63"	.63"
4	1/4"	.55"	.75"	.88"
6	3/8"	.67"	.88"	1.00"
8	1/2"	.84"	1.13"	1.13"
12	3/4"	1.05"	1.38"	1.38"
16	1"	1.31"	1.63"	1.75"
20	1 1/4"	1.66"	2.00"	2.13"
24	1 1/2"	1.91"	2.38"	2.38"
32	2"	2.38"	3.00"	3.00"

Female Pipe Thread End (Dry Seal)



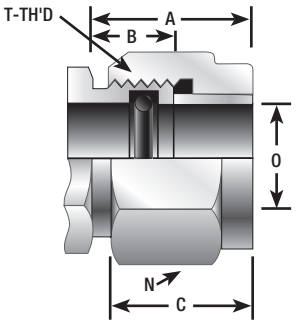
Lenz "O-Ring Seal" End

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Size	T Thread	A	B	C	N HEX	O Bore
2	3/8"-24	.56"	.28"	.94"	.50"	.13"
4	1/2"-20	.72"	.41"	.64"	.63"	.25"
5	9/16"-18	.72"	.41"	.64"	.69"	.31"
6	5/8"-18	.78"	.47"	.69"	.75"	.38"
8	7/8"-14	.97"	.53"	.91"	1.00"	.50"
10	1"-14	1.09"	.59"	.97"	1.13"	.63"
12	1 1/8"-12	1.22"	.69"	1.09"	1.25"	.75"
14	1 1/4"-12	1.25"	.69"	1.13"	1.38"	.88"
16	1 1/2"-12	1.41"	.75"	1.22"	1.63"	1.00"
20	1 3/4"-12	1.66"	.88"	1.44"	2.00"	1.25"
24	2"-12	1.78"	.88"	1.63"	2.25"	1.50"
32	2 5/8"-12	2.16"	1.00"	2.06"	3.00"	2.00"

Lenz "O-Ring Seal" End

Tube End with "O-Ring" seal, and tapered split-ring sleeve and nut for gripping the tubing.



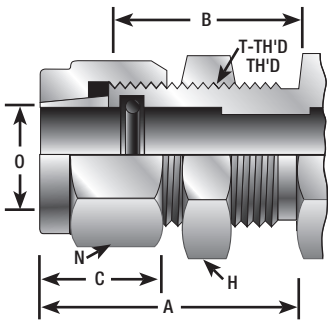
Lenz "O-Ring Seal" Bulkhead End

Part Numbers Include body nuts, sleeves, "O-Rings" and Back-Up Washers.

Size	T Thread	A	B	H Hex	N HEX	O Bore
4	1/2"-20	1.47"	1.16"	.75"	.63"	.25"
5	9/16"-18	1.47"	1.16"	.81"	.69"	.31"
6	5/8"-18	1.56"	1.25"	.88"	.75"	.38"
8	7/8"-14	1.78"	1.34"	1.13"	1.00"	.50"
10	1"-14	1.97"	1.47"	1.25"	1.13"	.63"
12	1 1/8"-12	2.13"	1.59"	1.38"	1.25"	.75"
14	1 1/4"-12	2.16"	1.59"	1.50"	1.38"	.88"
16	1 1/2"-12	1.66"	1.66"	1.75"	1.63"	1.00"
20	1 3/4"-12	2.56"	1.78"	2.00"	2.00"	1.25"
24	2"-12	2.69"	1.78"	2.25"	2.25"	1.50"
32	2 5/8"-12	3.09"	1.94"	3.00"	2.88"	2.00"

Lenz "O-Ring Seal" Bulkhead End

Same features as Lenz "O-Ring Seal" except has provisions for passing through a Bulkhead and is held in Bulkhead by a lock nut. (1/2" Maximum Bulkhead Thickness.)

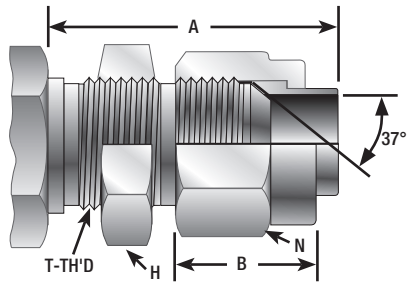


Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

J.I.C. 37° FLARE MALE BULKHEAD END

Has same uses as J.I.C. 37° Flare Male except has provisions for passing through a Bulkhead and is held in Bulkhead with a Lock Nut. (3/8" Maximum Bulkhead Thickness.)



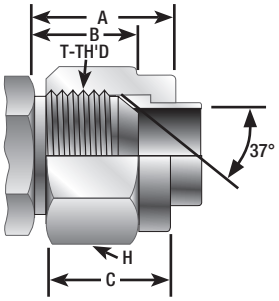
J.I.C. 37° • Flare Male Bulkhead End

SIZE	Thread	Str. Fttg.	B	H hex	N hex
4	7/16"-20	1.63"	.63"	.69"	.56"
5	1/2"-20	1.63"	.69"	.75"	.63"
6	9/16"-18	1.72"	.72"	.81"	.81"
8	3/4"-16	2.00"	.84"	1.00"	.88"
10	7/8"-14	2.25"	.97"	1.13"	1.00"
12	1 1/16"-12	2.38"	1.03"	1.38"	1.25"
14	1 3/16"-12	2.50"	1.09"	1.50"	]1.38"
16	1 5/16"-12	2.56"	1.13"	1.63"	1.50"
20	1 5/8"-12	2.69"	1.22"	1.88"	2.00"
24	1 7/8"-12	2.94"	1.41"	2.13"	2.25"
32	2 1/2"-12	3.25"	1.75"	2.75"	2.88"

J.I.C. 37° Flare Male End

May Be Used With 3205 Tube Nut, 3165 Tube Sleeve, 2205 Tube Nut, 2205-S Tube Nut or 2205-C Cap.

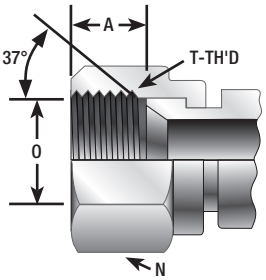
May also be joined directly to the Female J.I.C. 37° Swivel Fitting as an Adapter.



J.I.C. 37° • Flare Male End

Size	Thread	A	B	C	H Hex
2	5/16"-24	.75"	.44"	.53"	.38"
3	3/8"-24	.78"	.47"	.59"	.44"
4	7/16"-20	.94"	.56"	.56"	.56"
5	1/2"-20	.97"	.56"	.69"	.63"
6	9/16"-18	1.03"	.56"	.72"	.81"
8	3/4"-16	1.19"	.66"	.85"	.88"
10	7/8"-14	1.41"	.75"	.97"	1.00"
12	1 1/16"-12	1.47"	.88"	1.03"	1.25"
14	1 3/16"-12	1.63"	.91"	1.09"	1.38"
16	1 5/16"-12	1.69"	.91"	1.13"	1.50"
20	1 5/8"-12	1.81"	.97"	1.22"	2.00"
24	1 7/8"-12	2.19"	1.09"	1.41"	2.25"
32	2 1/2"-12	2.47"	1.75"	1.34"	2.88"

Female J.I.C. 37° Swivel End



Used With Male J.I.C. 37° Fittings

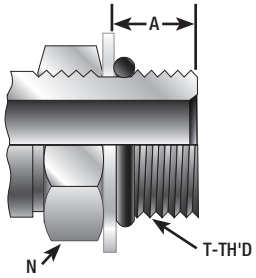
S.A.E Adjustable Straight Thread "O-Ring" Type End

Size	Thread	A	N HEX	O BORE
4	7/16"-20	.34"	.56"	.56"
5	1/2"-20	.38"	.63"	.63"
6	9/16"-18	.38"	.69"	.30"
8	3/4"-16	.42"	.88"	.39"
10	7/8"-14	.50"	1.00"	.48"
12	1 1/16"-12	.56"	1.25"	.61"
14	1 3/16"-12	.58"	1.38"	.72"
16	1 5/16"-12	.59"	1.50"	.84"
20	1 5/8"-12	.63"	2.00"	1.08"
24	1 7/8"-12	.73"	2.25"	1.31"
32	2 1/2"-12	.94"	2.88"	1.78"

S.A.E. Adjustable Straight Thread "O-Ring" Type End

(Elbows & Tees)

For same use as S.A.E. Straight Thread "O-Ring" Type but provides for 360° positioning for Tees and Elbows with Lock Nut.



S.A.E. Adjustable Straight Thread "O-Ring" Type End

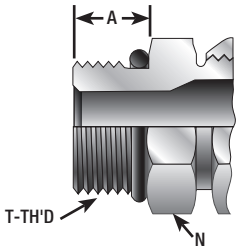
Size	T Thread	A	N HEX
2	5/16"-24	.30"	.44"
4	7/16"-20	.36"	.56"
5	1/2"-20	.36"	.63"
6	9/16"-18	.39"	.69"
8	3/4"-16	.44"	.88"
10	7/8"-14	.50"	1.00"
12	1 1/16"-12	.59"	1.25"
14	1 3/16"-12	.59"	1.38"
16	1 5/16"-12	.59"	1.50"
20	1 5/8"-12	.59"	1.88"
24	1 7/8"-12	.59"	2.13"
32	2 1/2"-12	.59"	2.75"

S.A.E. Adjustable Straight Thread "O-Ring" Type End

Size	T Thread	A	N HEX
2	5/16"-24	.30"	.44"
4	7/16"-20	.36"	.56"
5	1/2"-20	.36"	.63"
6	9/16"-18	.39"	.69"
8	3/4"-16	.44"	.88"
10	7/8"-14	.50"	1.00"
12	1 1/16"-12	.59"	1.25"
14	1 3/16"-12	.59"	1.38"
16	1 5/16"-12	.59"	1.50"
20	1 5/8"-12	.59"	1.88"
24	1 7/8"-12	.59"	2.13"
32	2 1/2"-12	.59"	2.75"

S.A.E. Straight Thread "O-Ring" Type End

(Connectors)



For Use With S.A.E. Internal Thread O-Ring Boss

Model FT 573 / Model FT 673 Flaring Tool

Model	For Flares O.D.
FT-573	1/2" thru 1"
FT-573	3/16" to 5/8"

This advanced design Lenz Flaring Tool gives absolutely smooth, uniform flares every time, with a minimum amount of effort and faster, too. The large feed screw handle turns easily. The precision ground hardened steel flaring cone, eccentrically mounted in precision bearings, produces a rolling action for even metal flow which provides uniform flare walls without galling. Feed releases automatically when flare is fully formed.

Model FT 573 / Model FT 673

Flaring Tools Integrated unit
. . . parts can't get lost

No. 1763 • Lenz Hand Tube Benders

Part Number	Size O.D. of Tubing	Center Radius
1763-4	1/4"	9/16"
1763-5	5/16"	11/16"
1763-6	3/8"	15/16"
1763-8	1/2"	1 1/2"
1763-10	5/8"	3"
1763-12	3/4"	3 1/4"
1763-14	7/8"	3 3/4"

These fine quality Lenz Hand Tube Benders make quick and accurate bends that are smooth and without kinking. They work with steel, aluminum, copper, or stainless tubing. This is one of the most useful, time-saving tools you can own. Sizes 10, 12 & 14 are geared ratchet models.

No. 1763
Lenz Hand Tube Benders

Air Bleeder Valves

Model ABV

- Zinc plated steel bodies & cap (Rohs)
- Maximum operating temperature 350 F
- Maximum working pressure 3000 PSI
- 1/4", 3/8", 1/2" NPT
- Vent port

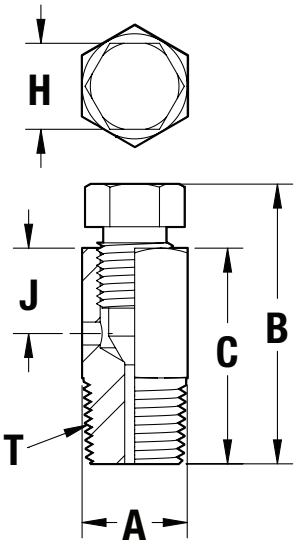
Options

- Stainless steel add “SS” to model number (304 SS)
- “T” handle
- 1/4", 3/8", 1/2" S.A.E. ports available (consult factory)
- Viton Seals

"T" Handle

Tapered Pipe Thread

SAE Straight Thread



The Lenz Air Bleed Valve is an exclusive design, extremely compact and consisting of only two metal parts. There are no internal seals used. It is a known fact that it is necessary to eliminate all air from hydraulic lines and equipment in order to maintain maximum operating efficiency makes this valve an important and vital component of the hydraulic system. It needs to be installed at the highest point in the circuit where the air accumulates. It is especially needed when starting up a hydraulic system.

It is easily installed. Please make sure when installing Lenz bleed valve to position the vent opening away from operating personnel. Always open the bleed valve slowly, some weepage will occur when the valve is opened.

ABV Dimensional Detail

MODEL	T PORT THREAD		BODY HEX A	OVERALL HEIGHT CLOSED B	BODY HEIGHT C	CAP HEX H	CENTER TO VENT J	OPEN HEIGHT	T HANDLE WIDTH	HANDLE DIA.
2-ABV	1/8" NPT	IN	0.68	1.66	1.26	0.56	0.56	1.79	1.79	0.25
		MM	17.2	42.1	32.0	14.0	14.0	45.4	45.4	6.4
4-ABV	1/4" NPT	IN	0.68	1.80	1.40	0.56	0.56	2.05	1.79	0.25
		MM	17.2	46	35.5	14.0	14.0	52.0	45.4	6.4
6-ABV	3/8" NPT	IN	0.68	1.80	1.41	0.56	0.56	2.05	1.79	0.25
		MM	17.2	45.7	35.8	14.0	14.2	52.0	45.4	6.4
8-ABV	1/2" NPT	IN	0.88	1.86	1.44	0.56	0.57	2.05	1.79	0.25
		MM	22.3	47.2	36.5	14	14.4	52	45.4	6.4
A-4ABV	7/16"-20 SAE	IN	0.69	1.82	1.31	0.56	0.5	1.84	1.79	0.25
		MM	17.5	46	33.3	14.0	12.7	46.7	45.4	6.4
A-6ABV	9/16"-18 SAE	IN	0.69	1.66	1.24	0.56	0.55	1.97	1.79	0.25
		MM	17.5	42	32	14	13.9	50	45.4	6.4
A-8ABV	3/4"-16 SAE	IN	0.88	1.86	1.13	0.56	0.54	1.76	1.79	0.25
		MM	22.3	46	28.7	14	13.7	44.7	45.4	6.4

Ordering Code

A — 4ABV — SS

SERIES	
OMIT	NPT
A	SAE

PORT SIZE
2ABV
4ABV
6ABV
8ABV

MATERIAL	
OMIT	STEEL
SS	STAINLESS STEEL
T	TEE HAN DLE
V	VITON SEALS

2ABV not available in SAE

380 RK

Conforming dimensionally to AS-568A Universal Series as well as the AN 6227 sizes.

Now 380 rings in the 30 most popular sizes ranging from 006 to 327 (70 shore A hardness) is ready for use... instantly. Includes all popular Lenz O-Ring seal tube fitting sizes.

- 25% more rings than any other kit
- Special BUNA-N compound for oil and fuel resistance - suitable for temperatures from -40 to +300 F.
- Popular ring sizes fit valves, pumps, small cylinders, etc.
- Color coded storage posts provide instant size identification
- Built-in gauges automatically indicate size of rings for replacement

Molded into the O-Ring Kit itself are accurately calibrated cross section slots. These color coded slots assure precision measurement of rings to be replaced.

INDISPENSABLE FOR SERVICING HYDRAULIC SYSTEMS & COMPONENTS.

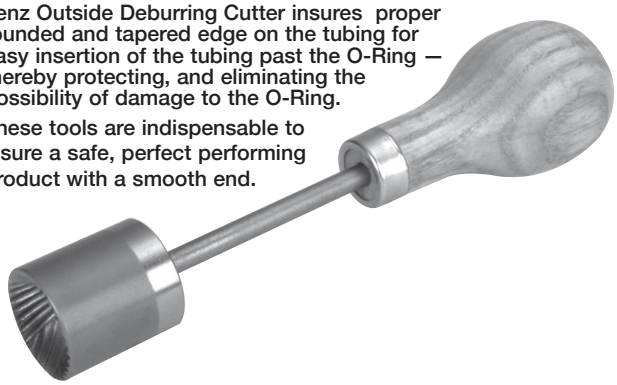
ODC • Outside Deburring Cutters

Part No.	Tube O.D.
ODC-4	1/4"
ODC-5	5/16"
ODC-6	3/8"
ODC-8	1/2"
ODC-10	5/8"
ODC-12	3/4"
OCD-14	7/8"
ODC-16	1"
ODC-20	1 1/4"
ODC-24	1 1/2"
ODC-32	2"

ODC
Outside Deburring Cutters

Lenz Outside Deburring Cutter insures proper rounded and tapered edge on the tubing for easy insertion of the tubing past the O-Ring — thereby protecting, and eliminating the possibility of damage to the O-Ring.

These tools are indispensable to insure a safe, perfect performing product with a smooth end.



Has detachable Handle to allow use of Cutter in drill chucks, etc.

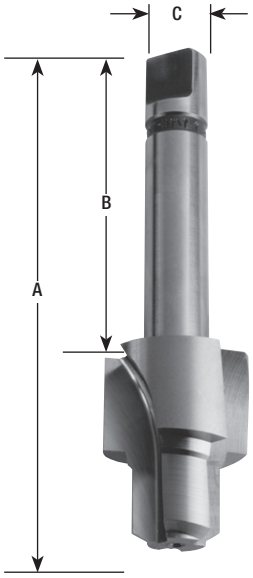
216 & 834 Tube Cutters

Part No.	For Tube O.D.
216	1/8" to 1" inclusive
834	1/2" to 2 1/8" inclusive

Rugged, adjustable cutting tool for producing clean, square ends on steel, stainless steel, and softer metal tubing. Ball handle feeds cutting wheel with even pressure as cutter is rotated around tube. Replacement cutter wheels available.

216 & 834
Tube Cuters

PCC
Lenz S.A.E. Port Contour Cutters



PCT
Lenz Precision S.A.E. Port Thread Taps

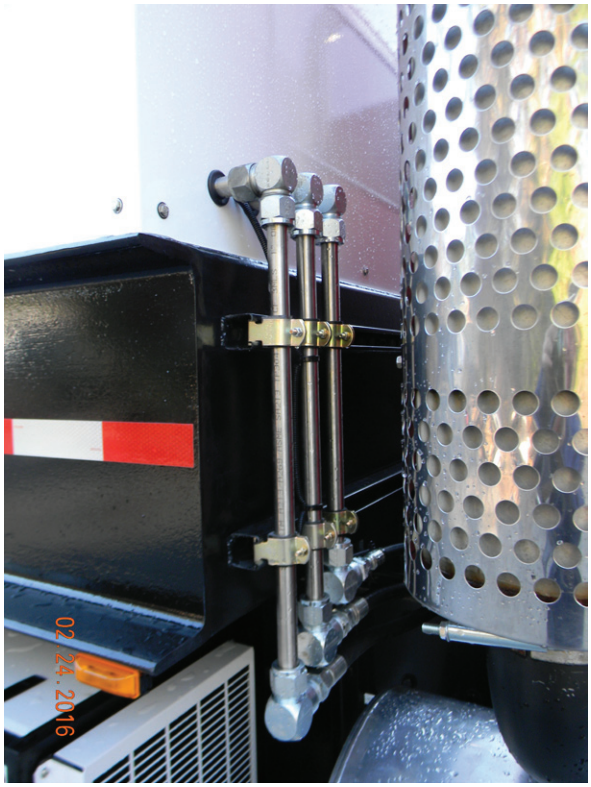
These tools have three flutes which form the standard internal O-Ring Boss for straight thread tube fittings. Standard in high-speed steel. Carbide tipped available on special order. Four flute cutters available on special order.

PCC-LENZ S.A.E. Port Contour Cutter

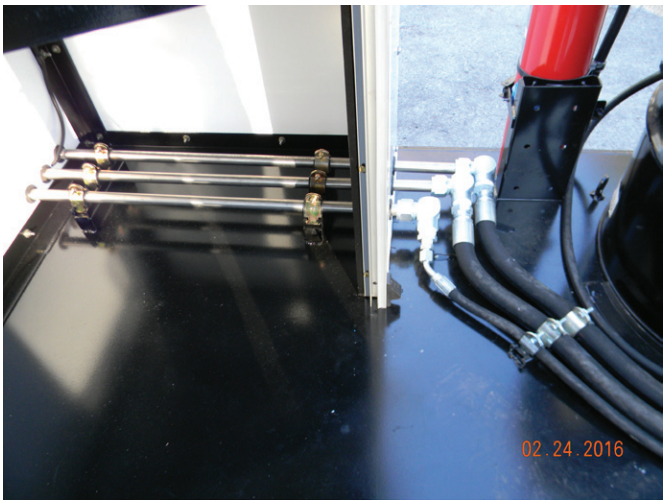
Contour Cutter	Tube O.D.	Thread Size	A Overall Length	B Shank Length	C Shank Dia.
PCC-2	1/8"	5/16"-24	3.72"	2.17"	.50"
PCC-4	1/4"	7/16"-20	3.78"	2.16"	.50"
PCC-5	5/16"	1/2"-20	3.84"	2.22"	.50"
PCC-6	3/8"	9/16"-18	3.91"	2.08"	.50"
PCC-8	1/2"	3/4"-16	3.97"	2.06"	.50"
PCC-10	5/8"	7/8"-14	3.97"	1.83"	.75"
PCC-12	3/4"	1 1/16"-12	4.13"	1.85"	.75"
PCC-14	7/8"	1 3/16"-12	4.13"	1.84"	.75"
PCC--16	1"	1 5/16"-12	4.13"	1.84"	.75"
PCC-20	1 1/4"	1 5/8"-12	4.13"	1.83"	1.00"
PCC-24	1 1/2"	1 7/8"-12	4.13"	1.81"	1.00"
PCC-32	2"	2 1/2"-12	4.25"	1.91"	1.00"
32	2 1/2"-12	2.47"	1.75"	1.34"	2.88"

PCT • LENZ Precision S.A.E. Port Thread Taps

S.A.E. Tap	Tube O.D.	Thread Size
PCT-2	1/8"	5/16"-24
PCT-4	1/4"	7/16"-20
PCT-5	5/16"	1/2"-20
PCT-6	3/8"	9/16"-18
PCT-8	1/2"	3/4"-16
PCT-10	5/8"	7/8"-14
PCT-12	3/4"	1 1/16"-12
PCT-14	7/8"	1 3/16"-12
PCT--16	1"	1 5/16"-12
PCT-20	1 1/4"	1 5/8"-12
PCT-24	1 1/2"	1 7/8"-12
PCT-32	2"	2 1/2"-12



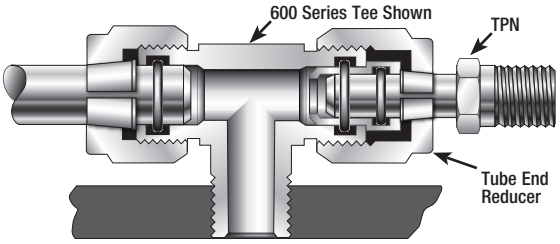
500 Series Elbow Unions



450 Series Female Elbow

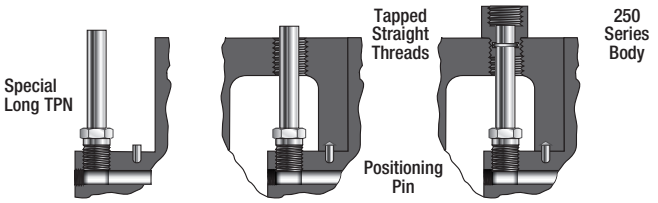
SPECIAL USES

TPN Used to Convert Standard Tee To Special TEE



TPN's, TFN's or TAN's may be used with a tee or cross to change an outlet from tube to male, eliminating a more expensive special fitting. By using tube end reducers, smaller TPN's or TAN's may be fitted. See pages 15 and 16 for reducers. TPN's, TFN's & TAN's.

For Ease Of Assembly & Disassembly



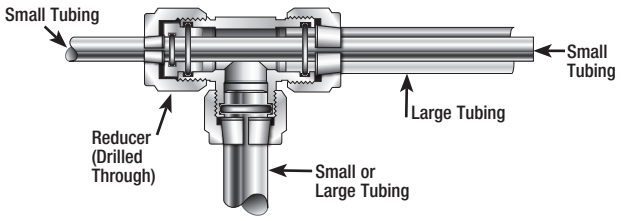
Step 1 TPN is tightened into position

Step 2 St. Th'd casting is dropped into position.

Step 3 Female connector body is screwed into St. Th'd, at the same time sealing on the stem of the TPN.

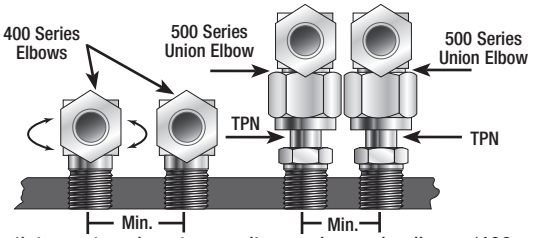
The three steps show the unusual use of a special long TPN and female connector (250 series). Lenz manufactures in lengths up to 8 inches over standard length. See page 15 for TPN information.

Concentric Line For Two Fluids

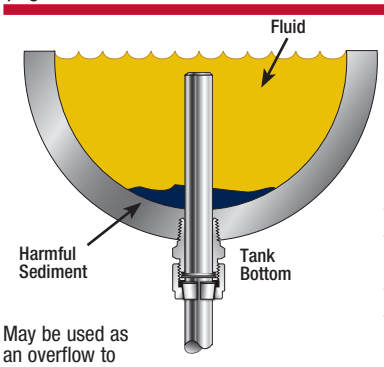


Tees having a reducer on one end can serve as ends of a cooling jacket fabricated from hydraulic tubing . . . can also be used for concentric line for two fluids. The only modification needed is the removal of the tube stop in the reducer with a drill. See page 14 for Reducers.

Outlets Too Close To Permit Screwing On Of Male Elbows



Where outlets are too close to permit screwing male elbows (400 series) into ports, TPN's and union elbows (500 series) may permit installation. TAN's would similarly replace A400 series straight thread male elbows, see page 15.



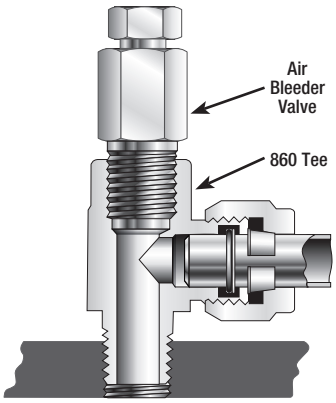
May be used as an overflow to keep fluid at a specific level.

Removing fluid from a point above tank bottom

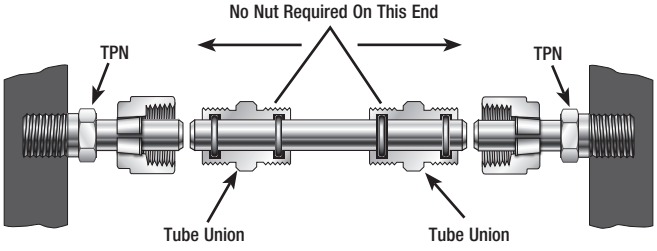
Many of the male connectors (100 series) and female connectors (250 series) allow tubing to be inserted through the fitting. Drawing shows how fluid may be removed from a point above tank bottom, using a 100 series male connector. See pages 1 & 2 for connectors.

Typical installation of an ABV bleeder valve at the high point of a hydraulic system

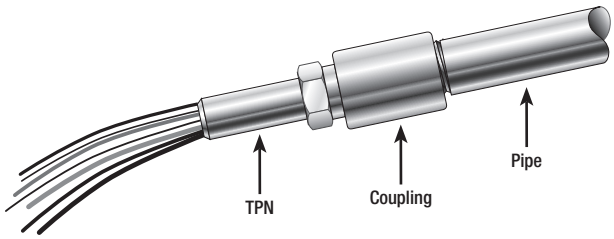
With the use of a 860 series tee the bleeder valve can quickly and easily be installed at the highest point where air accumulates in hydraulic circuits. See page 20 for Bleeder Valves and page 7 for 860 series Tees.



TPN's used where a straight line must be removed occasionally without disturbing pipe threads



TPN used as a nozzle-such as directing coolant onto the work in an automatic screw machine



Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

WHY SELECT THE O-RING SEAL TUBE FITTING

The design simplicity , efficiency, ease of application, performance under shock and vibration , have increased the use of the Lenz O ring seal tube fitting on all types of applications. The Lenz fitting seals with a standard locally available o ring. O rings are excellent for sealing on tubing. At zero pressure and low pressure, the natural resilience of the o ring furnishes the necessary sealing force; at higher pressures, the distortion of the cross section, by the pressure augments this sealing force.

The hydraulic fluid even provides lubrication, to the o-ring and a leak-free connection can be expected for the life of the installation. The Lenz fitting makes a dependable dynamic and static seal through the wide ranges of pressure, temperatures, and sizes. Wall thickness of tubing need not be taken into consideration, as the O ring does the sealing on the OD of the tube making a perfect seal every time. The tubing is chamfered to provide a shoe horn for the o-ring and for easy assembly.

The tube is held onto to the fitting by means of a tempered, serrated, tapered collet and nut. The nut fits loosely on the tube for assembly. It is not necessary to cut the tubing to exact length, nor is it necessary to cut the tubing exactly square. No special care is needed in tightening nut uniformly. No periodic tightening of the nut is necessary to maintain a tight joint. There is nothing to shear off and thereby cause trouble in strainers or pumps. For field expediency, a hacksaw and file are the only tools required for preparation of the tubing. However a Tube cutter and Outside Deburring Tool are preferable (See Lenz Catalog for more details) can be disassembled and reassembled any number of times – all parts reusable each time.

In addition to hydraulic applications, the fitting is being used for air and vacuum, having been tested on a mass spectrometer at 3X 10-6 without the slightest trace of leakage. The Lenz fitting conforms to or exceeds JIC, SAE, and many Military specifications, available in tees, ells, etc., and is stocked and sold by distributors throughout the US and Canada.

F.A.Q.

Question: Will the men damage the o-rings?

Answer: O-Rings are commonly used today, and you are using O-rings on other applications where your men are aware that at least a little care needs to be taken with the O-ring rotating shafts, over threaded ends, etc.

Question: Do the o-rings wear out?

Answer: Lenz has fittings in the field that were installed years ago and are still in operation. O-ring designs and compounds are being constantly improved with respect to durability, heat resistance.

Question: What if the tubing is damaged, scratched, or out of round?

Answer: Tubing is normally supplied with the ends plugged to protect the ends and keep dirt out. It takes at least a .016" in depth scratch to affect the sealing of the O-ring. The O-ring tends to conform and seal any scratches – even more so under pressure. If the tubing is out of round, when the nut is tightened, the collet with its wrap around affect tends to bring the tubing back into round.

Question: Would a variance in the OD of the tubing affect the o-ring?

Answer: Tubing is held to amazingly close tolerance – 1/2" to 1 1/2" OD having a tolerance of .005" minus .000". Our fittings are designed around the standard tolerances of tubing.

Comment: Our maintenance men will never remember to chamfer the tubing.

Answer: A machine repairman spends a lot of time learning their trade and their men are as good as those in other plants. Maintenance men are always under pressure to keep the machines working and will welcome anything that will save them time and trouble.

Comment: We are all standardized and having no trouble.

Answer: A customer will say they are standardized, and still be using 3 to 4 different types and brands of fittings. They usually do not know what standardization is. This is probably just another way of saying that he does not want to give it any thought right now.

As for "having no trouble," remember that often times as an engineering department or purchasing department are so far removed from the production or maintenance departments that they do not hear of the trouble they are having.

At a customer plant which we recently standardized on the Lenz fitting, the Plant Engineer told machine repairmen replacing a hydraulic line on a machine which he had remembered seeing him replace about 2 days before. An Ermerto

Stainless Steel Tubing

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pressure type fitting was being used that crushes the tube for a seal. The Engineer asked why that type of fitting was being used. The maintenance man replied that he "liked that type of fitting because when the tubing broke off from vibration, it broke off clean". This is just an example of how customers will sometime take trouble for granted, and not even mention it to the engineering department.

Comment: It is too difficult to change the prints.

Answer: Tell them to order by competitor number, and Lenz will do the transposing or get a list of what they are using, and make them a cross- reference. When the above is a definite obstacle, sell the purchasing and production departments, with the inference that engineering departments are always afraid of doing a little work ….. such as changing a few numbers on prints.

Comment: Hard to install the fitting in confined places.

Answer: Show how the fitting can first be installed on tube, and then pipe thread installed. Demonstrate this using straight tube connection and bent tube connection.

Comment: Collets too hard to get off the tube.

Answer: It is actually an advantage that collet stays in place, as it is in exact position for reassembly. Furthermore, if one wishes to remove it, it is no trouble to spread it and slide it off the tube. The collet is reusable, whereas in other fittings all the parts are not reusable.

Comment: Collet hard to get on the tube

Answer: This should be pointed out as an advantage rather than a disadvantage. The collets are tight for a purpose. If you forget to tighten the nut, the tube will not whip out like a garden hose when the pressure is turned on. It does not take much effort with a coin or screw driver to gently spread the collet as one slides it onto the tube.

Comment: The O-Ring will leak at zero pressure.

Answer: This opinion probably stems from an experience where the O-Ring was damaged at installation, but sealed under pressure.

Question: Will over tightening deform the tube?

Answer: This is not likely to happen except on some very thin–walled tubing. However a slight deformity in the tubing would merely tend to give it added pull out strength; the taper is so slight that even if the nut is over tightened or bottomed, the indentation is very small. The Lenz collet tends to straighten the tube, if it is deformed, rather than deform it.

Question: Does over tightening the nut deform the O-ring?

Answer: The nut has no connection with the sealing. It does not compress the o-ring.

Comment: The fitting we are using are inexpensive and do the job.

Answer: The labor saving with the Lenz fitting can be as high as 40% and the labor cost and is just as tangible as material cost. Our fittings are in line with other domestically produced fittings, but taking into consideration the labor, in addition to the superior performance of the fitting, it is the most inexpensive fitting on the market.

The Lenz fitting is being widely used in maintance departments, replacing flares that break from fatigue, and replacing ferrules which have been broached off the tube, or causing the tube to fail. The time required to replace a bad fitting is not worth the price of several fittings. A poor fitting is the weakest link in the chain.

Comment: Sometimes our the fittings are inventoried and not used right away – what is the affect on the O-ring

Answer: The O-ring is lubricated when assembled in the fitting; therefore a long shelf life can be expected.

Comment: We have been using the same fitting for years and are getting along.

Answer: It is safe to assume that any operation which is still being done the same as it was 10 years ago is being done wrong… product changes, product design, diversification of product, etc. The complacent person who has been getting by for years is hesitant to try anything new.

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

Ferrule Bite Type vs O-Ring Seal Fitting Installation Instructions

1) Cut the tube square
   (Angle of cut makes no difference with the Lenz fitting)

2) Must be free of burrs
   (Therefore chamfering of the tube for Lenz fitting is not an extra operation)

3) Be sure ferrule cutting edge is towards end of tube. It is possible to install ferrule backwards. *(If Lenz collet is put on backwards, nut will not engage thread in body of fitting)*

4) Must hold the tube end tight against the body shoulder; that is, tubing has to bottom. *(The collet on Lenz fitting will hold tubing in place while tightening)*

5) Bring nut and ferrule forward to body and turn till hand tight, continuing to hold tube firmly against body shoulder.

6) Tighten until ferrule bites well into tube. If in doubt about the extent of bite, disassemble and examine. If bite is not sufficient, reassemble and tighten further.

7) In cases where exact tube length is known it may not be desirable to preset the ferrule onto the tube.

The following are 4 causes of leaks encountered with the ferule bite in type fitting which are not present with the Lenz fitting.

- Insufficient bite
- No bite
- Tube not seated against shoulder of fitting
- Sleeve can be put on backwards

In other words, you are not sure of a good connection until you turn the power on.

To reassemble a ferrule bite-in fitting joint that has been disassembled, turn the nut with wrench until a sharp increase in torque is noted. From this point turn from 1/4 to 1/2 turn. This is also required after a presetting operation.

LENZ Advantage

In performance, especially under vibration and shock, the Lenz fitting with its O-ring seal, is superior to the metal-to-metal seal of the ferrule bite in type fitting, which must crush into the tube to make a seal. You will find cases where the ferrule bite-in type fitting will broach right off the tube from vibration and shock and whip out like a garden hose. Also, a wrench happy plumber will often crush the ferrule right through the tubing, especially on thin-walled tubing. This ferrule which bites a ring around the tube sets up a weak point quite similar to the cutting of a piece of plate glass—you put a scratch across the plate where you want to break it off, and then give it a snap. If you use hard tubing other than dead soft, failure, of course, will be much more noticeable.

Stainless Steel Tubing

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Disadvantages of the Self-Flaring Type Fitting as Compared with the Lenz O-Ring Fitting

The main disadvantage with this type of fitting is that one requires a fitting with the proper size wedge insert to match the different thicknesses of the tubing. The tubing must butt tightly against the wedge insert. The ID of the tubing must always be greater than the ID of the wedge. Therefore, if a man is using only 2 different thicknesses of tubing, he actually must carry (and be able to identify) 2 sets of fittings—one to accommodate heavy walled tubing, and one for thin-walled tubing. If a plant were using a wide range of tubing , from low pressure to extremely high pressure, you can imagine the job a plumber would have matching up the difference by just looking at the fittings, and whether or not it could be done is doubtful. Could you tell the difference by just looking at the fittings? Neither can a man in the shop. On very heavy—walled tubing, it is doubtful if this type fitting can even be satisfactorily used. With the Lenz fitting, the ID need not be taken into consideration, and since the OD is standard and held to very close tolerance, there is no problem here.

Almost impossible to use on stainless steel tubing—unless you are a weight lifter with a 36” wrench.

Excessive torque strength necessary on any tubing. The Lenz fitting takes only about a turn with a wrench.

Tubing must be cut exactly square. Tubing may be cut at any angle with the Lenz fitting,

Inside an outside of tubing need deburring, Of course, the Lenz fitting requires that the tube be deburred, too, but we mention this because a prospect will often think that is an additional operation with the Lenz fitting, whereas all fittings require the tube to be deburred.

On each reassembly, one must exert extra pressure on torque to seal. After fitting is disassembled a number of times, no extra torque can be exerted. The torque does the sealing here, whereas the O-ring does the sealing on the Lenz fitting.

Exact tube length most essential. No exact tube length necessary with the Lenz fitting.

Must hold tube with one hand against the wedge insert prior and while tightening the nut. This not necessary on the Lenz fitting as the collet holds the tubing in place while tightening the nut.

Tubing must be be free from damage and perfectly round. This is pretty much the case with the Lenz fitting, also, but if the tubing is not perfectly round the collet on the Lenz fitting (with its wrap-around effect) will tend to bring tubing back into round.

These are just a few of the disadvantages of the self –flaring fitting installation wise. In performance after it is installed, it is about the same as the ferrule bite-in type fitting. For the advantages of the Lenz fitting over this type fitting performance-wise, see letter on the ferrule bite-in type fitting.

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Flared fitting Installation Instructions

The following instructions for the installation of a flared fitting were published by one of the largest flared fitting manufacturers. After reviewing these instructions, we are sure you will agree that the Lenz fitting is the easiest, by far, to assemble.

Tube must be square. (This is not necessary with the Lenz fitting).

Remove all filings, chips, burrs, and grit from inside tube to avoid pock marks or scratches on the inside of the flare.

Remove all filings, chips, burrs, and grit from the inside tube to avoid pock marks or scratches on inside surface of flare. If available, compressed air blown through tube affords best method of cleaning.

Tube end should be flared so that the angle, radius, length and diameter of flare conform to same dimensions of flare seat of fitting. This can be accomplished in all cases by using flaring tools furnished by manufacturers of fittings being installed. (This is something you need not worry about when using Lenz fittings).

Flare cannot be made where bend is extremely close to end of tube.

Procedures for making a flare.

1) Slide flaring pin yoke back

2) Spread flaring jaws

3) Insert tube to proper level.

4) Slide yoke over tube.

5) Clamp tightly in place.

6) Lower flaring pin to tube.

7) Tap the hammer until flared.

8) Loosen yoke.

9) Slide back to original position.

Note – For stainless steel, strike the pin sharply so a few blows as possible will be required inasmuch as stainless steel work-hardens readily.

With the foregoing instructions are a few interesting comments and precautions when using a flare:

On incorrectly formed flares, they may seem to make up satisfactorily and pass initial pressure tests, but they are not to be depended upon for continuous service.

On tubes flared too short, full clamping area of fitting is not utilized and flare may be squeezed thin due to small area of tube that is clamped. Such joints do not offer maximum security against leakage, breakage at the flare, or pull-out strains. If flare is too short, correct by reflaring.

Flare must be square and concentric with tube and fitting sleeve to seat properly. Flares may be out of square and concentric because tube has not been cut off square and flare has been unevenly formed in flaring tool. Such flares are impossible to correct and should be cut off and done over. After flare has been made, it should be inspected for such markings. If chips, filings, or burrs have not been removed before flaring, they will be pounded into flare and cause pock marks. Pock marks, scratches, draw marks make tight sealing uncertain and should be guarded against as much as possible. Split flares may be caused by tube being too hard, of uneven texture, or by opening up of scratches or draw marks.

Tubes flared too long will stick and jam on threads of nut when assembling fitting.

From the beginning, you can see the definite advantages the Lenz fitting has to offer over a flare—tubing need not be cut off square; tubing does not need to be cut to exact length; only tools required are tube cutter and deburring tool ; (no chance of various size tools being mixed up with different size fittings); no special skill required.

Also, with heavy walled tubing, it is almost impossible to flare, and stainless steel is even more difficult.

When competing against the flare and ferrule bite-in type fittings, it is sometimes advisable to sell the advantage of the flared fitting over the ferrule bite-in type (and there are several), and then point out the excessive labor involved in making the flared connection as compared with the Lenz fitting.

Stainless Steel Tubing

Lenz O-ring Seal tube fitting performs equally well on stainless steel tubing as with carbon steel tubing, but requires the use of stainless steel sleeves (#165-xxSS) and stainless steel buffer washers (#195-xx-SS), even when used with steel fittings. Example, when ordering: 100-12-12 with SS Sleeves.
When Ordering Lenz Fittings in all Stainless Steel Add SS To The Part Number. Example: 100-12-12-SS

Sales Presentation & Demonstration

Step 1

1. Here is a fitting that uses an “O-Ring" for a seal and a collet for a grip
   a. Point to “O-Ring"
   b. Point to collet

2. There are only two simple steps required to use Lenz fittings.
   a. Chamfer the tubing to prevent damage of the “O-Ring"

b. Place a drop or two of oil on the “O-Ring" so the tube will go in easier: however, Lenz fittings are shipped with oil on the “O-Ring".

The above statements are made with a demonstration of how the fitting is assembled. This should create the desire in the customer to handle it. Allow the customer to handle the fitting.

Note: Do not present literature first, for your prospect’s attention will be divided.

Step 2 Demonstration

The handling of the fitting by the customer will produce one of two inquiries:

1. Won’t the tube pull out under pressure?

2. What about the pressure? (He has doubts that it will pull out even though he doesn’t say so in so many words.)

The reply: “That’s a very fine question and I am prepared to answer it with this demonstration.”

Here is the same thing (referring to fitting on pump end of tubing.)
The oil is in the tube; the “O-Ring” is under this thread. (Point to thread.)
Here is the collet. (Point to the collet.)

Now I practically tighten the nut head hand tight; and run it up to 5000 PSI.

Note: Tighten the nut hand tight; then tighten it a little more by turning the gauge. This is the same as tightening nut 1/4 to 1/2 turn with a wrench.

Apply pressure by holding reservoir of pump against leg and be certain pump is level or gauge end is pointing down, Ask them to watch this pointer(and point to red indicator on the gauge). If you don’t call their attention to the gauge and pointer the customer will likely be looking somewhere else and miss the demonstration. Then release the pressure; back off nut by turning gauge a turn; rap gauge on floor to break friction grip of nut and collet; back off nut by hand; point to thread where “O-Ring" is and then to collet and say, “The reason we can do the job so simply is that the seal and the grip are separate and we do not have to mash steel against steel like a flare or ferrule, or thread joint.

Step 3

After the high point of the demonstration drops off, you can go into the reducer demonstration which you can get into like this: “Here is another thing you will be interested in. It is a reducer. Say you wanted to reduce a tee from 3/4 “(point to 3/4 “outlet) to 3/8” (point to 3/8” tube). All you have to do is to insert this reducer past the “O-Ring” in the tee (point to the “O-Ring” in tee). The reducer has an “O-Ring” of its own (point to “o” ring in the reducer). Now, isn’t this much simpler than using a tee with a female pipe thread and a hex pipe bushing?”

Advantages of the Lenz Tube Fitting over Pipe

1) Tubing has strong but relatively thin wall, easy to bend.

2) Tubing is relatively stronger. No weakened sections from the reduction of wall thickness by threading. About 40 % less.

3) No dead weight in extra wall thickness for threading: tube fittings, being smaller, weigh less; fewer tube fittings needed per installation.

4) Tubing, having better bending qualities and smaller outside diameter, saves space and permits working in closer quarters.

5) Tubing, being less rigid, has less tendency to transmit vibration from one connection to another.

6) Fewer fittings — Tubing bends substitute for elbows. Fewer fittings mean fewer joints and fewer possible leaks.

7) Streamlined flow passages of tubing system means less turbulence of fluid.

8) Tubing permits smoother contours is more adaptable to space limitations.

9) Cleaner fabrication — No sealing compounds on the tube connections, no threading or welding; minimum chance of scale, metal chips, foreign particles in system.

10) Every tube connection serves as a union, can be reassembled repeatedly; trouble free installations.

11) Foregoing advantages of tubing and tube fittings add up to dependable, trouble-free installations.

The publication of the JIC Hydraulic Standards for Industrial Equipment, which became effective in 1949, and the more recent SAE standards, have given considerable impetus to the use of this low carbon steel tubing. In fact, both specifications recommend the use of such tubing in all pressure ranges up to 3000 PSI.

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Notes

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