

Accessories

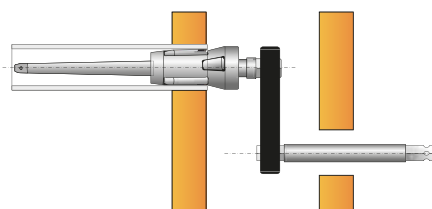




Joins and Extensions

Verbindungsstückes und Erweiterung | Przedłużki i złączki

Parallel Gear Drive

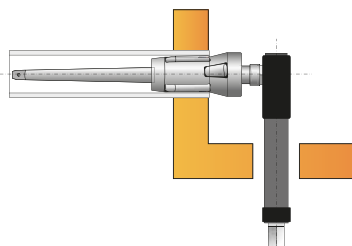


Parallel Gear Drive - designed for use inside the header boxes where hand holes are not in line with tube centerline.

Parallelzahnradgetriebe – entworfen zur Anwendung an schwer zugänglichen Stellen sowie wenn Rohre nicht mittig mit der Kammeröffnung liegen.

Przekładnia zębata równoległa - zaprojektowana do użycia w trudno dostępnych miejscach oraz kiedy rury nie są w osi z otworem komory.

Right Angle Gear Drive



Right Angle Gear Drive - designed for use inside header boxes where handholds are at right angle to the tube centerline. For hand and power use.

Kegelradgetriebe – entworfen zur Anwendung an schwer zugänglichen Stellen, wenn Rohre senkrecht zur Kammerachse angebracht sind.

Przekładnia kątowna - zaprojektowana do użycia w trudno dostępnych miejscach, kiedy rury są umieszczone prostopadle do osi komory.

URH-1925 Universal Ratchet Handle



Manual drive for tube expanders. One side 3/4" square drive, other side 1" square drive. Allows rotation transmitted by a ratched mechanism.

Manueller Antrieb der Rohraufweiter. Auf der einen Seite ein Quadrat 3/4", auf der anderen Seite ein Quadrat 1". Dies ermöglicht eine Übertragung der Umdrehungen über die Klinkensperre.

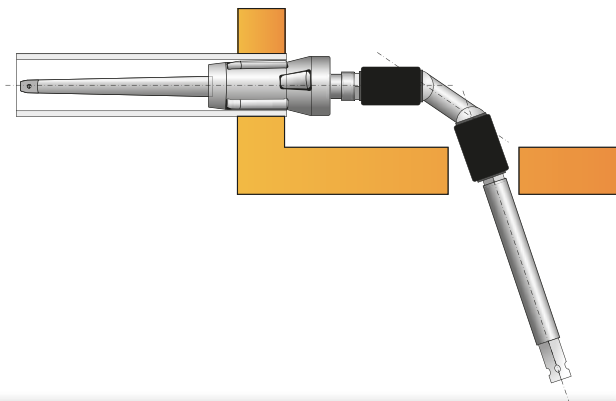
Ręczny napęd rozwałcówek. Z jednej strony kwadrat 3/4", z drugiej strony kwadrat 1". Pozwala na transmisję obrotów poprzez mechanizm zapadkowy.



KRAIS Tube Expanders

Accessories

Double Universal Joint



SQUARE DRIVE	TOOL	CHUCK
Vierkant Kwadrat	Werkzeuge Nerzędzie	Halter Uchwyt
[inch]		
3/8"	KS-DUJ-3/8	-
	KS-DUJ-3/8-QCC	QCC
1/2"	KS-DUJ-1/2	-
	KS-DUJ-1/2-QCC	QCC
3/4"	KS-DUJ-3/4	FxF; FxM; MxM
1"	KS-DUJ-1	FxF; FxM; MxM

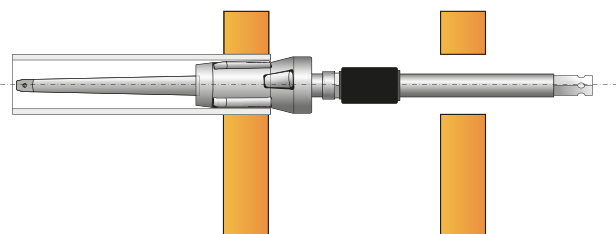


Double Universal Joint and Double Universal Joint with Quick Change Chuck.

Doppeluniversalgelenke, einfach und schnellanschiessbar (QCC).

Przeguby uniwersalne podwójne, zwykłe oraz szybkozłączne (QCC).

Extensions



SQUARE DRIVE	TOOL	LENGTHS		QCC
Vierkant Kwadrat	Werkzeuge Nerzędzie	Länge Długości		
[inch]		[inch]	[mm]	
3/8"	KS-EXT-3/8	8; 12; 24; 36	200; 300; 600; 900	-
	KS-EXT-3/8-QCC	8; 12; 24; 36	200; 300; 600; 900	1
	KS-EXT-3/8-2QCC	8; 12; 24; 36	200; 300; 600; 900	2
1/2"	KS-EXT-1/2	8; 12; 24; 36	200; 300; 600; 900	-
	KS-EXT-1/2-QCC	8; 12; 24; 36	200; 300; 600; 900	1
	KS-EXT-1/2-2QCC	8; 12; 24; 36	200; 300; 600; 900	2
3/4"	KS-EXT-3/4	8; 12; 24; 36	200; 300; 600; 900	-
1"	KS-EXT-1	8; 12; 24; 36	200; 300; 600; 900	-



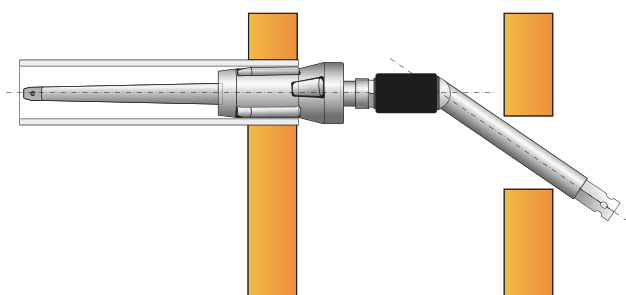
Extensions and Extensions with Quick Change Chuck (QCC), Single and Double.

Verlängerungsstücke sowie schnellanschiessbare Verlängerungsstücke, einzeln und verdoppelt.

Przedłużki oraz przedłużki szybkozłączne, pojedyncze oraz podwójne.



Single Universal Joint



SQUARE Vielkant Kwadrat [inch]	TOOL Werkzeuge Narzędzie	AVAILABLE LENGTHS Länge Dostępne długości		QCC
		[inch]	[mm]	
3/8	KS-SUJ-3/8	8;12;24;36	200; 300; 600; 900	-
	KS-SUJ-3/8-QCC	8;12;24;36	200; 300; 600; 900	+
1/2	KS-SUJ-1/2	8;12;24;36	200; 300; 600; 900	-
	KS-SUJ-1/2-QCC	8;12;24;36	200; 300; 600; 900	+
3/4	KS-SUJ-3/4	8;12;24	200; 300; 600	-
1	KS-SUJ-1	8;12;24	200; 300; 600	-

Single Universal Joint and Single Universal joint with Quick Change Chuck (QCC).

Einzeluniversalgelenke, einfach und schnellanschiessbar (QCC).

Przeguby uniwersalne pojedyncze zwykłe i szybkozłączne (QCC).

Motor Coupling



Motor coupling and **Motor coupling** with Quick Change Chuck (QCC)

Morsekegel mit Schnellanschluss (QCC) bzw. Anschluss für Aufweitewerkzeuge.

Stożek Morse'a z szybkozłączem (QCC) lub złączem do rozwałcówek.

MT-2x3/8"; MT-2x3/8"-QCC; MT-2x1/2"; MT-2x1/2"-QCC; MT-2x3/8"; MT-3x1/2"; MT-3x3/4"; MT-4x1"



Tube Guide

Rohr-Pilot | Pilot do rur



TUBE O.D. / AUSSEN Ø / Śred. zewnętrzna		TUBE GAUGE Stärke Grubość ścianki	TUBE GUIDE Führung Prowadnica
[inch]	[mm]		
1/2	12,7	16-18	TG-1
		19-20	TG-2
		21-23	TG-3
5/8	15,88	12-13	TG-4
		14-16	TG-5
		17-20	TG-6
		22-24	TG-7
3/4	19,05	10-12	TG-8
		13-16	TG-9
		17-20	TG-10
		21-22	TG-11
7/8	22,2	10-12	TG-12
		13-16	TG-13
		17-20	TG-14
		22-24	TG-15
1	25,4	8-9	TG-16
		10-12	TG-17
		13-16	TG-18
		17-20	TG-19
		21-23	TG-20
1-1/4"	31,7	15.	TG-21
		16-	TG-22
1-1/2"	38,1	15.	TG-23
		16-	TG-24

The **Tube Guide** consist of a steel or aluminium or plastic tapered head and an replaceable nylon brush, and it's used to guide tubes through the sheets and the tube support plates during tube bundles assembling. The nylon brush fits in the tube end, holding pilot firmly in place.

Dieser Rohr-Pilot hat eine kleine kegelförmige Spitze aus Stahl, Aluminium, Nylon, und einem austauschbaren Nylon-Ausputzer. Damit können Rohre durch Stützplatten in Kondensatoren und Wärmetauschern eingeführt werden. Die schräge Bohrung in der konischen Kopfsteite erleichtert das Herausziehen des Rohr-Piloten.

Pilot do rur. Składa się ze stożka wykonanego ze stali, aluminium lub plastiku oraz nylonowej szczotki. Służy do wkładania rur do den sitowych, w szczególności do ich przepychania przez ściany grodziowe.



Tube plugs

Zapfen für Rohren | Zaślepki do rur



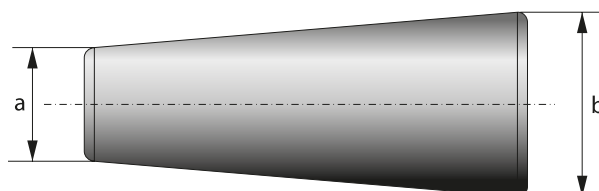
Ideal for sealing leaky tubes in condenser and heat exchangers. It is recommended to use our ORTC - one revolution tube cutter to puncture the tube to ensure that pressure can not build up in the tube and cause the plug loosen or blow out.

Kegelstifte dienen zur Verblenden von undichten Rohren an Wärmeaustauschern und Kondensatoren. Vor dem Rohrverblenden soll man das undichte Rohr mit den ORTC-Meißeln durchschneiden, um den Luftdruckanstieg im Rohr sowie das Herausfallen bzw. Abschießen der Stifte aus den Rohren zu vermeiden.

Kółki stożkowe służą do zaślepiania nieszczelnych rur w wymiennikach ciepła i kondensatorach. Przed zaślepieniem rur należy przeciąć nieszczelną rurę przy pomocy przeciąnków ORTC w celu uniknięcia wzrostu ciśnienia w rurze i spowodowania wypadnięcia lub wyrzucenia kółka z rur.

One Piece Tube Plugs

Einteiliger Rohrkegelstift | Kółek jednoczęściowy do rur



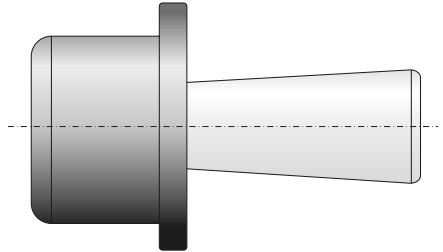
TUBE O.D. Aussen ϕ Śred. zewnętrzna		TUBE GAUGE Stärke Grubość ścianki	A		B		TUBE PLUGE Stopfen Zatyczka
[inch]	[mm]		[inch]	[mm]	[inch]	[mm]	
3/8"	9,5	15-22	0,176	4,47	0,388	9,86	TP-1-**
1/2"	12,7	11-14	0,176	4,48	0,388	9,87	TP-1-**
		15-22	0,301	7,65	0,513	13,00	TP-2-**
5/8"	15,8	11-14	0,301	7,66	0,513	13,01	TP-2-**
		15-22	0,426	10,82	0,638	16,20	TP-3-**
3/4"	19,05	11-14	0,426	10,83	0,638	16,21	TP-3-**
		15-22	0,551	14,00	0,763	19,38	TP-4-**
7/8"	22,22	11-14	0,551	14,01	0,763	19,39	TP-4-**
		15-22	0,676	17,17	0,888	22,56	TP-5-**
1	25,4	11-14	0,676	17,18	0,888	22,57	TP-5-**
		15-22	0,801	20,35	1,013	25,73	TP-6-**
1-1/8"	28,6	11-14	0,801	20,36	1,013	25,74	TP-6-**
		15-22	0,926	23,52	1,138	28,9	TP-7-**
1-1/4"	31,7	11-14	0,926	23,53	1,138	28,10	TP-7-**
		15-22	1,015	25,78	1,263	32,08	TP-8-**
1-3/8"	34,9	11-14	1,015	25,79	1,263	32,09	TP-8-**
		15-22	1,176	29,87	1,388	35,87	TP-9-**
1-1/2"	38,1	11-14	1,176	29,88	1,388	35,88	TP-9-**
		15-22	1,301	32,66	1,513	38,93	TP-10-**

** - Specify Material: Al.- Aluminium, S= Steel, Ss= Stainless Steel, B= Brass, M= Monel



Two Piece Tube Plugs

Zweiteiliger Rohrkegelstift | Kołek dwuczęściowy do rur



TUBE SIZE			BRASS		CARBON STEEL		STAINLESS STEEL	
O.D.	BWG	I.D.	Ring	Pin	Ring	Pin	Ring	Pin
5/8"	13	0,44	T8TP445BR	TP3BP	T8TP445CS	TP3CSP	T8TP445SS	TP3SSP
	14	0,46	T8TP469BR	TP3BP	T8TP469CS	TP3CSP	T8TP469SS	TP3SSP
	15	0,48	T8TP491BR	TP3BP	T8TP491CS	TP3CSP	T8TP491SS	TP3SSP
	16	0,5	T8TP505BR	TP4BP	T8TP505CS	TP4CSP	T8TP505SS	TP4SSP
	17	0,51	T8TP519BR	TP4BP	T8TP519CS	TP4CSP	T8TP519SS	TP4SSP
	18	0,53	T8TP537BR	TP4BP	T8TP537CS	TP4CSP	T8TP537SS	TP4SSP
	19	0,54	T8TP551BR	TP4BP	T8TP551CS	TP4CSP	T8TP551SS	TP4SSP
	20	0,56	T8TP571BR	TP4BP	T8TP571CS	TP4CSP	T8TP571SS	TP4SSP
	21	0,56	T8TP571BR	TP4BP	T8TP571CS	TP4CSP	T8TP571SS	TP4SSP
	22	0,57	T8TP571BR	TP4BP	T8TP571CS	TP4CSP	T8TP571SS	TP4SSP
3/4"	12	0,53	T8TP537BR	TP4BP	T8TP537CS	TP4CSP	T8TP537SS	TP4SSP
	13	0,56	T8TP571BR	TP4BP	T8TP571CS	TP4CSP	T8TP571SS	TP4SSP
	14	0,58	T8TP594BR	TP5BP	T8TP594CS	TP5CSP	T8TP594SS	TP5SSP
	15	0,61	T8TP616BR	TP5BP	T8TP616CS	TP5CSP	T8TP616SS	TP5SSP
	16	0,62	T8TP630BR	TP5BP	T8TP630CS	TP5CSP	T8TP630SS	TP5SSP
	17	0,63	T8TP644BR	TP5BP	T8TP644CS	TP5CSP	T8TP644SS	TP5SSP
	18	0,65	T8TP662BR	TP5BP	T8TP662CS	TP5CSP	T8TP662SS	TP5SSP
	19	0,67	T8TP676BR	TP5BP	T8TP676CS	TP5CSP	T8TP676SS	TP5SSP
	20	0,68	T8TP696BR	TP6BP	T8TP696CS	TP6CSP	T8TP696SS	TP6SSP
	21	0,69	T8TP696BR	TP6BP	T8TP696CS	TP6CSP	T8TP696SS	TP6SSP
7/8"	12	0,66	T8TP662BR	TP6BP	T8TP662CS	TP6CSP	T8TP662SS	TP6SSP
	13	0,69	T8TP696BR	TP6BP	T8TP696CS	TP6CSP	T8TP696SS	TP6SSP
	14	0,71	T8TP719BR	TP6BP	T8TP719CS	TP6CSP	T8TP719SS	TP6SSP
	15	0,73	T8TP741BR	TP6BP	T8TP741CS	TP6CSP	T8TP741SS	TP6SSP
	16	0,75	T8TP755BR	TP6BP	T8TP755CS	TP6CSP	T8TP755SS	TP6SSP
	17	0,76	T8TP769BR	TP6BP	T8TP769CS	TP6CSP	T8TP769SS	TP6SSP
	18	0,78	T8TP787BR	TP7BP	T8TP787CS	TP7CSP	T8TP787SS	TP7SSP
	19	0,79	T8TP801BR	TP7BP	T8TP801CS	TP7CSP	T8TP801SS	TP7SSP
	20	0,81	T8TP821BR	TP7BP	T8TP821CS	TP7CSP	T8TP821SS	TP7SSP
	21	0,81	T8TP821BR	TP7BP	T8TP821CS	TP7CSP	T8TP821SS	TP7SSP
1"	12	0,78	T8TP787BR	TP7BP	T8TP787CS	TP7CSP	T8TP787SS	TP7SSP
	13	0,81	T8TP821BR	TP7BP	T8TP844CS	TP7CSP	T8TP844SS	TP7SSP
	14	0,83	T8TP844BR	TP7BP	T8TP844CS	TP7CSP	T8TP844SS	TP7SSP
	15	0,86	T8TP866BR	TP7BP	T8TP866CS	TP7CSP	T8TP866SS	TP7SSP
	16	0,87	T8TP880BR	TP8BP	T8TP880CS	TP8CSP	T8TP880SS	TP8SSP
	17	0,88	T8TP894BR	TP8BP	T8TP894CS	TP8CSP	T8TP894SS	TP8SSP
	18	0,9	T8TP912BR	TP8BP	T8TP912CS	TP8CSP	T8TP912SS	TP8SSP
	19	0,92	T8TP926BR	TP8BP	T8TP926CS	TP8CSP	T8TP926SS	TP8SSP
	20	0,93	T8TP946BR	TP8BP	T8TP946CS	TP8CSP	T8TP946SS	TP8SSP
	21	0,94	T8TP946BR	TP8BP	T8TP946CS	TP8CSP	T8TP946SS	TP8SSP
1"	22	0,94	T8TP946BR	TP8BP	T8TP946CS	TP8CSP	T8TP946SS	TP8SSP



Pop-A-Plug II

Heat Exchanger and Condenser Tube Plugs



Proven performance and cost savings at super critical pressures up to 7,000 psi (482.6 Bar)

- ▶ US patent number 5,437,310
- ▶ The only plugs manufactured under a QA program certified to ISO-9001
- ▶ Quick and easy installation
- ▶ Used by 85% of US nuclear generating stations
- ▶ Can be supplied under ANSI N45.2, 10CFR50 Appendix B
- ▶ Suitability and type tested by TUV
- ▶ Helium leak tight to 1x10⁻¹⁰ cc/sec

A proven long-term performer in fossil and nuclear stations, the Pop-A-Plug® II (P2) heat exchanger tube plugging system is the only plug that features patented internally serrated rings designed to maintain a leak-tight seal under extreme thermal and pressure cycling. Beware of imitations.

Installation is simple: prepare the tube using the brush and size the tube with the Go/No-Go gauge supplied; install the correct size plug with the hydraulic ram. The ram pulls the tapered pin through the ring, expanding it into the tube. When the proper installation force is reached, the breakaway “pops”.

This controlled installation force protects surrounding tubes and ligaments, and will not damage your heater.

Tube preparation and plug sizing are essential for successful installations. Producer removes all uncertainty by supplying a Go/No-Go gauge and a tube preparation brush with each kit of 10 plugs.

Ordering Information: when ordering please supply the following information:

- ▶ Tube O.D. and wall thickness or measured tube I.D.
- ▶ Tube material
- ▶ Tubesheet material is required if plug will be installed directly into tubesheet
- ▶ Maximum pressure and temperature
- ▶ Type of tube to tubesheet joint (rolled, welded, etc.)
- ▶ Condition of tubes and age of heat exchanger

Standard Materials:

Brass, Carbon Steel, 316 Stainless Steel, Monel, Copper Nickel.

To use these tube plugs you need additional equipment. Please consult us to get more information.



KRAIS Tube Expanders

Accessories

RAM PACKAGE	P2 KIT PART NUMBER	SIZE RANGE [INCH (MM)]
PAP-6600	P2-400-Q	0.401 - 0.420 (10.19 - 10.68)
PAP-6600	P2-420-Q	0.421 - 0.440 (10.69 - 11.19)
PAP-6600	P2-440-Q	0.441 - 0.460 (11.20 - 11.70)
PAP-6600	P2-460-Q	0.461 - 0.480 (11.71 - 12.21)
PAP-6600	P2-480-Q	0.481 - 0.500 (12.22 - 12.72)
PAP-6600	P2-500-Q	0.501 - 0.520 (12.73 - 13.22)
PAP-6600	P2-520-Q	0.521 - 0.540 (13.23 - 13.73)
PAP-6600	P2-540-Q	0.541 - 0.560 (13.74 - 14.24)
PAP-6600	P2-560-Q	0.561 - 0.580 (14.25 - 14.75)
PAP-6600	P2-580-Q	0.581 - 0.600 (14.76 - 15.26)
PAP-6600	P2-600-Q	0.601 - 0.620 (15.27 - 15.76)
PAP-6600	P2-620-Q	0.621 - 0.640 (15.77 - 16.27)
PAP-6600	P2-640-Q	0.641 - 0.660 (16.28 - 16.78)
PAP-6600	P2-660-Q	0.661 - 0.680 (16.79 - 17.29)
PAP-6600	P2-680-Q	0.681 - 0.700 (17.30 - 17.80)
PAP-6600	P2-700-Q	0.701 - 0.720 (17.81 - 18.30)
PAP-6600	P2-720-Q	0.721 - 0.740 (18.31 - 18.81)
PAP-6600	P2-740-Q	0.741 - 0.760 (18.82 - 19.32)
PAP-6600	P2-760-Q	0.761 - 0.780 (19.33 - 19.83)
PAP-6600	P2-780-Q	0.781 - 0.800 (19.84 - 20.34)
PAP-6600	P2-800-Q	0.801 - 0.820 (20.35 - 20.84)
PAP-6600	P2-820-Q	0.821 - 0.840 (20.85 - 21.35)
PAP-6600	P2-840-Q	0.841 - 0.860 (21.36 - 21.86)
PAP-6600	P2-860-Q	0.861 - 0.880 (21.87 - 22.37)
PAP-6600	P2-880-Q	0.881 - 0.900 (22.38 - 22.88)
PAP-6600	P2-900-Q	0.901 - 0.920 (22.89 - 23.38)
PAP-6600	P2-920-Q	0.921 - 0.940 (23.39 - 23.89)
PAP-6600	P2-940-Q	0.941 - 0.960 (23.90 - 24.40)
PAP-6600	P2-960-Q	0.961 - 0.980 (24.41 - 24.91)
PAP-6600	P2-980-Q	0.981 - 1.000 (24.92 - 25.42)
PAP-6600	P2-1000-Q	1.001 - 1.020 (25.43 - 25.92)
PAP-6600	P2-1020-Q	1.021 - 1.040 (25.93 - 26.43)
PAP-6600	P2-1040-Q	1.041 - 1.060 (26.44 - 26.94)
PAP-6600	P2-1060-Q	1.061 - 1.080 (26.95 - 27.45)
PAP-6600	P2-1080-Q	1.081 - 1.100 (27.46 - 27.96)
PAP-6600	P2-1100-Q	1.101 - 1.120 (27.97 - 28.46)
PAP-6600	P2-1120-Q	1.121 - 1.140 (28.47 - 28.97)
PAP-6600	P2-1140-Q	1.141 - 1.160 (28.98 - 29.48)
PAP-6600	P2-1160-Q	1.161 - 1.180 (29.49 - 29.99)
PAP-1750	P2-1180-Q	1.181 - 1.200 (30.00 - 30.50)
PAP-1750	P2-1200-Q	1.201 - 1.220 (30.51 - 31.00)
PAP-1750	P2-1220-Q	1.221 - 1.240 (31.01 - 31.51)
PAP-1750	P2-1240-Q	1.241 - 1.260 (31.52 - 32.02)
PAP-1750	P2-1260-Q	1.261 - 1.280 (32.03 - 32.53)
PAP-1750	P2-1280-Q	1.281 - 1.300 (32.54 - 33.04)

RAM PACKAGE	P2 KIT PART NUMBER	SIZE RANGE [INCH (MM)]
PAP-1750	P2-1300-Q	1.301 - 1.320 (33.05 - 33.54)
PAP-1750	P2-1320-Q	1.321 - 1.340 (33.55 - 34.05)
PAP-1750	P2-1340-Q	1.341 - 1.360 (34.06 - 34.56)
PAP-1750	P2-1360-Q	1.361 - 1.380 (34.57 - 35.07)
PAP-1750	P2-1380-Q	1.381 - 1.400 (35.08 - 35.58)
PAP-1750	P2-1400-Q	1.401 - 1.420 (35.59 - 36.08)
PAP-1750	P2-1420-Q	1.421 - 1.440 (36.09 - 36.59)
PAP-1750	P2-1440-Q	1.441 - 1.460 (36.60 - 37.10)



CPI / Perma Plug

Heat Exchanger and Condenser Tube Plugs



The fast and safe way to seal leaking heat exchanger and condenser tubes in refineries and chemical plants

- ▶ Rated up to 1,000 psi (68.9 Bar)
- ▶ US patent number 5,437,310
- ▶ Suitability and type tested by TUV
- ▶ Safer alternative to tapered pins and elastomer plugs
- ▶ Helium leak-tight to 1x10⁻¹⁰ cc/sec

Tapered pins can turn into lethal projectiles that can pose a real safety hazard for your workers. You can eliminate this danger with CPI / Perma Plug™ heat exchanger and condenser tube plugs. Resistant to thermal cycling and able to provide a seal that's helium-leak tight, CPI / Perma Plug™ tube plugs are installed using a controlled force. This protects against damage to tubesheet ligaments and the adjacent tubesheet joints, extending the life of your heat exchanger and reducing costs when you need to retube. What's more, CPI / Perma Plug™ heat exchanger tube plugs take only seconds to install. Its broad expansion range fits multiple tube sizes, so you need to keep fewer plugs on hand; reducing inventory and cutting costs.

Stocked in carbon steel, stainless steel, brass, titanium, 4142 alloy, monel and copper nickel. Consult KRAIS Tub Expanders for other materials.

To use these tube plugs you need additional equipment. Please consult us to get more information.



PART NUMBER	PLUG SIZE / O.D. (INCHES (MM))	TUBE I.D. RANGE (INCHES (MM))	PIN LENGTH (INCHES (MM))	BRUSH KITS (HARD ALLOYS)	BRUSH KITS (SOFT ALLOYS)	POSITIONER	PULL ROD ASSEMBLY	CHANNEL HEAD PULL ROD ASSEMBLY
V-471-Q	0.471 (11.96)	0.472 - 0.515 (11.99 - 13.08)	1.630 (41.40)	BSH-471-HT	BSH-471	P-471	PA-471	CPA-471-LL
V-491-Q	0.491 (12.47)	0.492 - 0.540 (12.50 - 13.72)	1.670 (42.42)	BSH-491-HT	BSH-491	P-491	PA-491	CPA-491-LL
V-512-Q	0.512 (13.00)	0.513 - 0.562 (13.03 - 14.27)	1.590 (40.39)	BSH-512-HT	BSH-512	P-512	PA-512	CPA-512-LL
V-524-Q	0.524 (13.31)	0.525 - 0.585 (13.34 - 14.86)	1.280 (32.51)	BSH-524-HT	BSH-524	P-524	PA-524	CPA-524-LL
V-555-Q	0.555 (14.10)	0.556 - 0.616 (14.12 - 15.65)	1.400 (35.56)	BSH-555-HT	BSH-555	P-555	PA-555	CPA-555-LL
V-584-Q	0.584 (14.83)	0.585 - 0.649 (14.86 - 16.48)	1.320 (33.53)	BSH-584-HT	BSH-584	P-584	PA-584	CPA-584-LL
V-621-Q	0.621 (15.77)	0.622 - 0.689 (15.80 - 17.50)	1.570 (39.88)	BSH-621-HT	BSH-621	P-621	PA-621	CPA-621-LL
V-649-Q	0.649 (16.48)	0.650 - 0.713 (16.51 - 18.11)	1.320 (33.53)	BSH-649-HT	BSH-649	P-649	PA-649	CPA-649-LL
V-670-Q	0.670 (17.02)	0.671 - 0.740 (17.04 - 18.80)	1.660 (42.16)	BSH-670-HT	BSH-670	P-670	PA-670	CPA-670-LL
V-712-Q	0.712 (18.08)	0.713 - 0.777 (18.11 - 19.74)	1.320 (33.53)	BSH-712-HT	BSH-712	P-712	PA-712	CPA-712-LL
V-735-Q	0.735 (18.67)	0.736 - 0.810 (18.69 - 20.57)	1.680 (42.67)	BSH-735-HT	BSH-735	P-735	PA-735	CPA-735-LL
V-774-Q	0.774 (19.66)	0.775 - 0.838 (19.69 - 21.29)	1.320 (33.53)	BSH-774-HT	BSH-774	P-774	PA-774	CPA-774-LL
V-804-Q	0.804 (20.42)	0.805 - 0.890 (20.45 - 22.61)	1.700 (43.18)	BSH-804-HT	BSH-804	P-804	PA-804	CPA-804-LL
V-837-Q	0.837 (21.26)	0.838 - 0.902 (21.29 - 22.91)	1.320 (33.53)	BSH-837-HT	BSH-837	P-837	PA-837	CPA-837-LL
V-853-Q	0.853 (21.67)	0.854 - 0.949 (21.69 - 24.10)	1.720 (43.69)	BSH-853-HT	BSH-853	P-853	PA-853	CPA-853-LL
V-899-Q	0.899 (22.83)	0.900 - 0.963 (22.86 - 24.46)	1.320 (33.53)	BSH-899-HT	BSH-899	P-899	PA-899	CPA-899-LL
V-919-Q	0.919 (23.34)	0.920 - 1.019 (23.37 - 25.88)	1.760 (44.70)	BSH-919-HT	BSH-919	P-919	PA-919	CPA-919-LL
V-962-Q	0.962 (24.43)	0.963 - 1.027 (24.46 - 26.09)	1.320 (33.53)	BSH-962-HT	BSH-962	P-962	PA-962	CPA-962-LL
V-979-Q	0.979 (24.87)	0.980 - 1.079 (24.89 - 27.41)	1.820 (46.23)	BSH-979-HT	BSH-979	P-979	PA-979	CPA-979-LL
V-1024-Q	1.024 (26.01)	1.025 - 1.088 (26.04 - 27.64)	1.320 (33.53)	BSH-1024-NY	BSH-1024-NY	P-1024	PA-1024	CPA-1024-LL
V-1054-Q	1.054 (26.77)	1.055 - 1.154 (26.80 - 29.31)	1.900 (48.26)	BSH-1054-NY	BSH-1054-NY	P-1054	PA-1054	CPA-1054-LL
V-1087-Q	1.087 (27.61)	1.088 - 1.152 (27.64 - 29.26)	1.320 (33.53)	BSH-1087-NY	BSH-1087-NY	P-1087	PA-1087	CPA-1087-LL
V-1103-Q	1.103 (28.03)	1.104 - 1.203 (28.04 - 30.56)	1.900 (48.26)	BSH-1103-NY	BSH-1103-NY	P-1103	PA-1103	CPA-1103-LL
V-1149-Q	1.149 (29.18)	1.150 - 1.213 (29.21 - 30.81)	1.320 (33.53)	BSH-1149-NY	BSH-1149-NY	P-1149	PA-1149	CPA-1149-LL
V-1171-Q	1.171 (29.74)	1.172 - 1.270 (29.77 - 32.26)	2.000 (50.80)	BSH-1171-NY	BSH-1171-NY	P-1171	PA-1171	CPA-1171-LL
V-1212-Q	1.212 (30.78)	1.213 - 1.336 (30.81 - 33.93)	2.000 (50.80)	BSH-1212-NY	BSH-1212-NY	P-1212	PA-1212	CPA-1212-LL

Specifications subject to change without notice.

Notes:

- ▶ The suffix Q in the Part Number column is a plug material designator.
 - ▶ Replace Q with one of the following: C for Carbon, S for 316 Stainless Steel, E for 304 Stainless Steel, B for Brass, T for Titanium, H for 70/30 Copper Nickel, N for 90/10 Copper Nickel, A for 4142 Alloy, M for Monel.
 - ▶ Titanium plugs do not have the same tube I.D. range. Please consult factory for ranges.
 - ▶ The suffix LL in the Pull Rod Assembly column signifies the length, in feet, of the channel head extension. These parts are available in 1, 2, 3, 4, and 6 feet lengths.
- Add -01, -02, -03, etc. for the respective channel head extension length required.

Delivery: Substantial quantities of V-524-Q through V-1149-Q in the five materials listed above are normally in stock for immediate shipment. For details on delivery, larger sizes, higher pressure ratings, or alternate materials, contact EST Group directly.

Please supply the following information when ordering:

- ▶ Tube O.D. and wall thickness or measured tube I.D.
 - ▶ Tube material and/or tubesheet material
 - ▶ Maximum pressure and temperature
 - ▶ The type of tube-to-tubesheet joint (rolled, welded, etc.)
- Each kit includes a Go/ No-Go Gauge for ensuring proper plug size (Brush kits and installation equipment sold separately.)



Vacuum Leak Tester KVLD-3000

Vakuum-Rohrdichtigkeitsdetektor KVLD-3000 | Próźniowy detektor szczelności rur KVLD-3000

The vacuum leak tester KVLD-3000 is a simple, precise method of testing tubes in boilers, condensers, and heat exchangers. It is the fastest, most accurate means of locating leaky tubes for plugging or replacement.

Powered by compressed air the vacuum leak detector pulls a vacuum in a tube to a desired reading on a gauge. A steady reading on the gauge would indicate that the tube doesn't leak. If the reading on the gauge drops you have pinpointed the leaking tube.

Der Vakuum-Rohrdichtigkeitsdetektor KVLD-3000 ist ein einfaches und sehr präzises Gerät zur Prüfung der Rohrdichtigkeit in Wärmetauschern, Kondensatoren und Kesseln. Die Vakuumprüfung ist die schnellste und genaueste Methode der Lokalisierung von undichten, leckenden Röhren.

Das Gerät KVLD-3000 wird mit Pressluft angetrieben, die in dem zu prüfenden Rohrabschnitt einen entsprechenden Unterdruck erzeugt. Der stets gleich bleibende Unterdruck bedeutet, dass das Rohr im guten Zustand ist. Fällt der Unterdruck, ist das Rohr auszuwechseln oder zu verstopfen.

Próźniowy detektor szczelności rur KVLD-3000 jest prostym, i bardzo precyzyjnym narzędziem do badania szczelności rur w wymiennikach ciepła, kondensatorach i kotłach. Badanie próźniowe jest najszybszą i najdokładniejszą metodą lokalizacji nieszczelnych, przeciekających rur.

Urządzenie KVLD-3000 jest napędzane sprężonym powietrzem, które wytwarza określone podciśnienie w badanej rurze. Utrzymujące się na stałym poziomie podciśnienie oznacza, że rura jest w dobrym stanie, jeżeli podciśnienie spada rurę należy wymienić lub zakorkować.



FEATURES

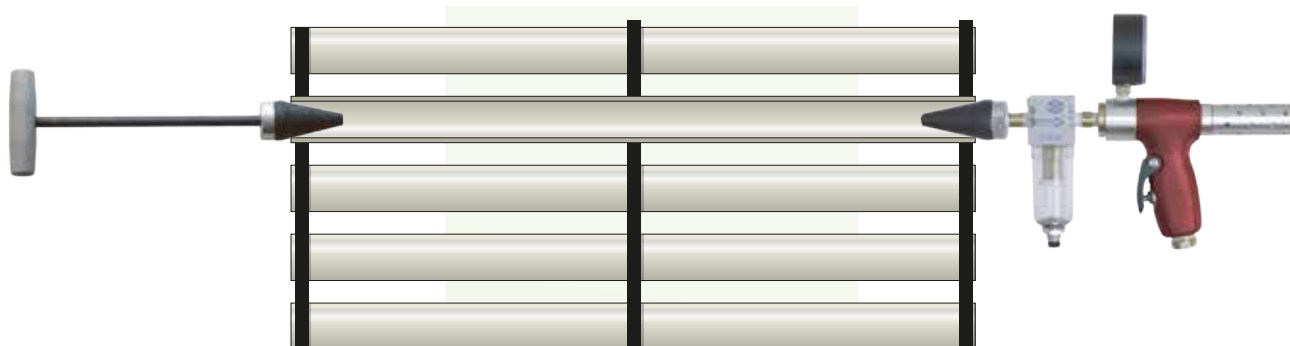
- Only one tool necessary for testing multiple tube sizes.
- Built-in easy to read vacuum gauge.
- Muffled exhaust for quiet operation.
- Lightweight, easy to use.

VORTEILE VON KVLD-3000

- Ein einziges Gerät kann zur Prüfung von verschiedenen Rohrdurchmessern verwendet werden.
- Eingebauter Vakuummeter.
- Das Gerät ist mit einem Auspuffdämpfer zur Schallreduzierung ausgestattet.
- Leichtes Gewicht und einfache Bedienung.

ZALETY KVLD-3000

- jedno narzędzie może być stosowane do testów wielu rozmiarów rur.
- wbudowany wakuometr.
- urządzenie posiada tłumik wydechowy w celu zmniejszenia hałasu.
- lekki i łatwy w obsłudze.

**OPERATING INSTRUCTIONS**

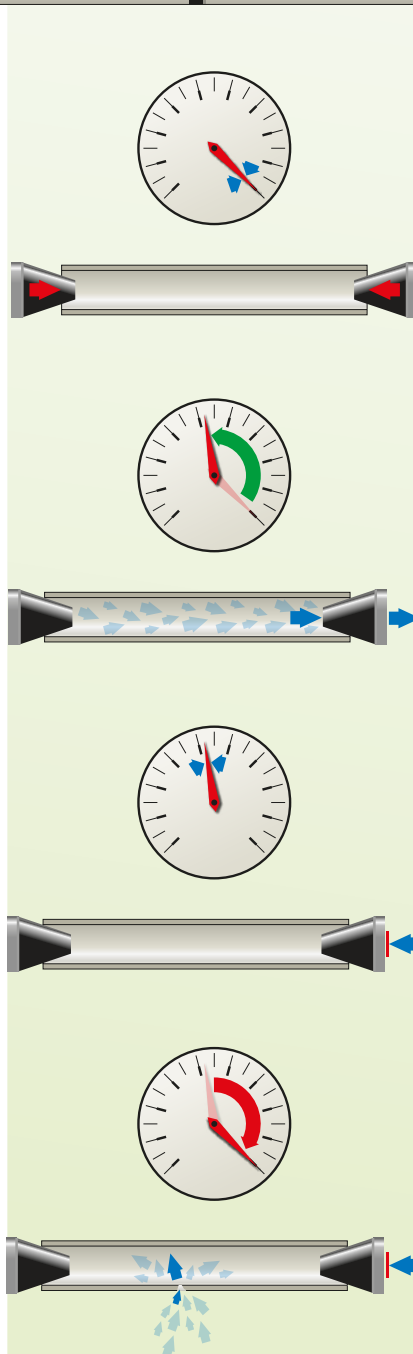
1. Seal far end of tube to be tested with "t" handle type tube plug or optional snap type tube plug.
2. Place nozzle of tester into near end of tube.
3. Squeeze trigger of test unit until gauge reaches desired reading.
4. Release trigger and observe gauge.
5. A steady reading on gauge indicates no leaks.
6. Move to next tube and repeat.

FUNKTIONSBESCHREIBUNG VON KVLD-3000

1. Ein Rohrende mit Hilfe eines Verschlusspropfens abschließen.
2. Das Prüfstück in das andere Rohrende stecken.
3. Die Luftzufuhr mit einem Hebel einschalten. Das betätigte Prüfstück so lange halten, bis der gewünschte Unterdruck erreicht wird.
4. Den Hebel auslösen (die Luftzufuhr stoppen) und den Vakuummeter beobachten.
5. Stabiler Unterdruck bedeutet dichtes Rohr.

OPIS DZIAŁANIA KVLD-3000

1. Przy pomocy rękojści zaślepiającej należy zatkać jeden koniec rury.
2. Do drugiego końca włożyć tester.
3. Za pomocą dźwigni włączyć dopływ powietrza. Uruchomiony tester trzymać włączony do momentu osiągnięciażądanego podciśnienia.
4. Zwolnić dźwignię (zatrzymać dopływ powietrza) i obserwować wakuometr.
5. Stabilne podciśnienie oznacza że rura jest szczelna.

**SPECIFICATIONS**

- ▶ Cover wide range of tubes with one unit (tube sizes: 1/4" (6,3) to 3" (76,2 mm)).
- ▶ Requires 90 PSI (6,2 bar) compressed air.
- ▶ Air consumption: 26 C.F.M. (720 l/min).
- ▶ Carrying case measures: 16" x 12" x 4" (410 x 300 x 85 mm).
- ▶ Tool weight: 4,4 lbs (1,2 kg).
- ▶ Approximate shipping weight: 6,6 lbs (3,0 kg).

TECHNISCHE DATEN VON KVLD-3000

- ▶ Anwendungsbereich von 6,3 mm bis 76 mm.
- ▶ Betriebsdruck 6 atm.
- ▶ Luftverbrauch 760 l/min.
- ▶ Lieferung in einem 410x300x80 mm großen Kunststoffkoffer.
- ▶ Gewicht 1,2 kg.
- ▶ Gewicht mit Verpackung 3 kg.

DANE TECHNICZNE KVLD-3000

- ▶ Zakres działania od 6,3 mm to 76 mm.
- ▶ Ciśnienie robocze 6 atm.
- ▶ Zużycie powietrza 720 litrów/min.
- ▶ Dostarczany w plastikowej walizce o wymiarach 410x300x80 mm.
- ▶ Waga urządzenia 1,2 kg.
- ▶ Waga z opakowaniem 3 kg.

**NOZZLES AVAILABLE
LIEFERBARE DÜSEN
DOSTĘPNE CZĘŚCI**

PART NUMBER	TUBE OD SIZE
K-1002	1/4" (6,3 mm) - 3/4" (19 mm)
K-1003	5/8" (15,9 mm) - 1 1/4" (31,7 mm)
K-1004	1 1/8" (28,6 mm) - 2" (50,8 mm)
K-1005	1 7/8" (47,6 mm) - 3" (76,2 mm)



G-650 Testing Gun

Heat exchanger tube tester - find tube joint leaks fast with unique vacuum tester.

G-650 Vacuum Joint Testing Gun uses air pressure to generate a vacuum around the tube-to-tubesheet joint to pinpoint leaking connections. Just insert the test gun into the tube end and press the air control valve to fill the cylinder with air. This expands a seal inside the tube, pulling a second seal firmly against the tubesheet surrounding the tube end. Next press the vacuum control valve to divert air through a venturi, creating a vacuum around the tube joint area. Any reduction in vacuum shown on the integral gauge indicates a faulty tube joint.

Interchangeable manifolds: allows the G-650 to test tube OD's from 3/8 " to 1-1/4" (9.52 to 31.75 mm). The G-650A is used for tube OD's from 1-1/2" to 2-1/2" (38.1 to 63.5 mm).

Light weight: weighs less than 2.7 lbs (1.2 kg), when equipped with a 3/4" manifold.

Uses standard plant air supplies from 40 to 125 psi. Standard seal material: Neoprene, Viton® optional.

Quality Assurance System: Meets requirements of ANSI N45.2, 10CFR50 Appendix B, 10CFR21, and is certified to ISO-9001



**G650 Testing Gun**

NOMINAL TUBE SIZE	TUBE ID SIZE RANGE	GUN PART NUMBER	MANIFOLD PART NUMBER	SQUARE RING PART NUMBER
3/8 in (9.5 mm)	0.28 - 0.33 in (7.1 - 8.4 mm)	GSC-6506	GSC-6606	GSC-6706
1/2 in (12.7 mm)	0.28 - 0.45 in (7.1 - 11.4 mm)	GSC-6508	GSC-6608	GSC-6708
5/8 in (15.9 mm)	0.49 - 0.58 in (12.4 - 14.7 mm)	GSC-6510	GSC-6610	GSC-6700
3/4 in (19.1 mm)	0.50 - 0.70 in (12.7 - 17.8 mm)	GSC-6512	GSC-6612	GSC-6712
7/8 in (22.2 mm)	0.57 - 0.83 in (14.5 - 21.1 mm)	GSC-6514	GSC-6614	GSC-6714
1 in (25.4 mm)	0.70 - 0.95 in (17.8 - 24.1 mm)	GSC-6516	GSC-6616	GSC-6716
1 1/8 in (28.6 mm)	0.83 - 1.08 in (21.1 - 27.4 mm)	GSC-6518	GSC-6618	GSC-6718
1 1/4 in (31.8 mm)	0.95 - 1.20 in (24.1 - 30.5 mm)	GSC-6520	GSC-6620	GSC-6720

G650A Testing Gun

NOMINAL TUBE SIZE	TUBE ID SIZE RANGE	GUN PART NUMBER	MANIFOLD PART NUMBER	SQUARE RING PART NUMBER
1 1/2 in (38.1 mm)	1.20 - 1.45 in (30.5 - 36.8 mm)	GSC-6524	GSC-6624	GSC-6724
1 3/4 in (44.5 mm)	1.45 - 1.70 in (36.8 - 1.70 mm)	GSC-6528	GSC-6628	GSC-6728
2 in (50.8 mm)	1.70 - 1.95 in (43.2 - 49.5 mm)	GSC-6532	GSC-6632	GSC-6732
2 1/4 in (57.2 mm)	1.95 - 2.15 in (49.5 - 54.6 mm)	GSC-6536	GSC-6636	GSC-6736
2 1/2 in (63.5 mm)	2.20 - 2.40 in (55.9 - 61.0 mm)	GSC-6540	GSC-6640	GSC-6740

G-650 Manifold Extensions

For easier testing when a channel head or water box is present

LENGTH	PART NUMBER
1 ft (304.8 mm)	GSC-6700-01
2 ft (609.6 mm)	GSC-6700-02
3 ft (914.4 mm)	GSC-6700-03
4 ft (1,219.2 mm)	GSC-6700-04

G-650 / G-650A Neoprene Seal and Washer Sets

Part number, GSC-XXXX-N, where XXXX is the number listed in the chart for the appropriate tube OD and BWG

TUBE OD BWG	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"	1 1/2"	1 5/8"	1 3/4"	2"	2 1/4"	2 1/2"
8 - 9	—	0030	0043	0056	0068	0081	0093	0106	0118	0131	0143	0168	0193	0218
10 - 11	—	0037	0047	0062	0072	0087	0097	0112	0122	0137	0147	0173	0198	0223
12 - 13	0028	0040	0053	0065	0078	0090	0103	0115	0128	0140	0153	0178	0203	0228
14 - 15	0033	0047	0056	0072	0083	0097	0110	0122	0134	0147	0158	0183	0208	0232
16 - 17	0037	0050	0062	0075	0087	0100	0112	0126	0137	0150	0162	0187	0212	0237
18 - 19	0040	0053	0065	0078	0090	0103	0115	0128	0140	0153	0165	0190	0215	0240
20 - 24	0042	0056	0068	0081	0093	0106	0118	0131	0143	0156	0168	0193	0218	0243

Notes:

1. G-650 seal and washer sets contain two seals and four washers.
2. For seal sizing and part numbers in SWG, metric or other tube sizes, contact KRAIS Tube Expanders.
3. Optional seal material: Viton®
4. Caution: G-650 guns cannot be used where the tubesheet is extremely corroded/eroded; where tube ends are flared and flares overlap; or where tube-to-tubesheet joints are welded.

Ordering Information: please provide tube OD and wall thickness.



G-150 Testing Gun

Heat exchanger tube tester. Test individual tubes for pin hole leaks using air pressure.



- ▶ Interchangeable seal and washer sets
- ▶ Light weight: each gun weighs less than 2.1 lbs (1 kg)
- ▶ Uses standard plant air supplies from 40 to 125 psi (2.7 to 8.5 Bar)
- ▶ Standard seal material: Neoprene, Viton® *optional
- ▶ Quality assurance system certified to ISO-9001
- ▶ Quality assurance system that meets requirements of ANSI N45.2, 10CFR50 Appendix B, 10CFR21

Find leaking heat exchanger tubes quickly and easily, with the G-150 tube testing gun set. Just connect to plant air, insert the air injection gun in one end of the tube, the plugging gun into the other, and press an air control valve. Air expands the seals on both guns and pressurizes the tube. When the pressure in the tube stabilizes, release the air control valve. Any reduction of pressure will be indicated on the integral pressure gauge to reveal even the smallest tube leak. With the G-150 tube testing gun set, you can pneumatically test from three to ten tubes per minute — all with significantly less operator fatigue and greater operator safety. The set comes complete with three rod and tube assemblies to test tubes from 0.28" to 1.23" (7.1mm to 31.2mm) I.D.



Gun Sets

PART NUMBER	DESCRIPTION	TUBE I.D. RANGE (INCHES (MM))
GSA-1500	G-150 test gun package (with support tubes and regulator)	0.28 - 1.23 (7.1 - 31.2)
GSA-1504	G-150 air injection gun (with support tubes and regulator)	0.28 - 1.23 (7.1 - 31.2)
GSA-1506	G-150 plugging gun (with support tubes)	0.28 - 1.23 (7.1 - 31.2)

Neoprene Seal and Washer Sets

Part number, GSA-XXXX-N, where XXXX is the number listed in the chart for the appropriate tube O.D. and BWG

TUBE O.D. BWG	1/2"	5/8"	3/4"	7/8"	1"	1 1/8"	1 1/4"	1 3/8"
8 - 9	-	0030	0043	0056	0068	0081	0093	0106
10 - 11	-	0037	0047	0062	0072	0087	0097	0112
12 - 13	0028	0040	0053	0065	0078	0090	0103	0115
14 - 15	0033	0047	0056	0072	0083	0097	0110	0122
16 - 17	0037	0050	0062	0075	0087	0100	0112	-
18 - 19	0040	0053	0065	0078	0090	0103	0115	-
20 - 24	0043	0056	0068	0081	0093	0106	0118	-

Notes:

- Seal and washer sets for tube I.D.s 0.28" - 0.48" (7.1 mm - 31.2 mm) contain (4) seals and (4) washers.
All other seal and washer sets contain (2) seals and (4) washers.
- For seal sizing and part numbers for applications in SWG, metric, or other tube sizes, contact EST Group customer service directly.
- Optional seal material: Viton®

Support Tube Assemblies

Longer lengths (1ft - 4ft) can be used for easier testing when a channel head or water box is present.

LENGTH (FEET (MM))	TUBE I.D. RANGE (INCHES (MM))	PART NUMBER
Standard	0.28 - 0.48 (7.1 - 12.3) 0.49 - 0.83 (12.4 - 21.2) 0.84 - 1.23 (21.3 - 31.2)	GSA-1510 GSA-1511 GSA-1512
1 (304.8)	0.28 - 0.48 (7.1 - 12.3) 0.49 - 0.83 (12.4 - 21.2) 0.84 - 1.23 (21.3 - 31.2)	GSA-1510-01 GSA-1511-01 GSA-1512-01
2 (609.6)	0.28 - 0.48 (7.1 - 12.3) 0.49 - 0.83 (12.4 - 21.2) 0.84 - 1.23 (21.3 - 31.2)	GSA-1510-02 GSA-1511-02 GSA-1512-02
3 (914.4)	0.28 - 0.48 (7.1 - 12.3) 0.49 - 0.83 (12.4 - 21.2) 0.84 - 1.23 (21.3 - 31.2)	GSA-1510-03 GSA-1511-03 GSA-1512-03
4 (1,219.2)	0.28 - 0.48 (7.1 - 12.3) 0.49 - 0.83 (12.4 - 21.2) 0.84 - 1.23 (21.3 - 31.2)	GSA-1510-04 GSA-1511-04 GSA-1512-04

Note:

The 0.28"-0.48" (7.1 mm - 31.2 mm) size support tube is limited to 60 psi. A regulator is supplied with the set for this purpose.



Testing pumps

Handbediente Testpumpen | Pompy testujące



PEM hand operated testing pumps



LE-PTP Electric testing pumps



PTP1201 Pneumatic testing pumps

MODEL	DRIVEN	SERVICE PRESSURE Betriebsdruck Ciśnienie pracy		DIAMETER Durchmesser Średnica	STROKE Vorschub Posuw	VOLUME PER STROKE Volumen pro Schub Objętość na suw		TANK CAPACITY Behälterkapazität Poj. zbiornika		WEIGHT Gewicht Waga	
		bar	psi	mm	mm	cm ³	in ³	litres	U.S.G	kg	lbs
PEM 30	HAND	30	400	14	400	61	3,7	-	-	4,2	9,3
PEM 40		60	850	20	34	10	0,6	14	3,7	6,3	14
PEM 50		50	700	30	40	28	1,7	45	11,9	13	29
PEM 100		100	1400	22	40	15	0,9	45	11,9	13	29
PEM 200		200	2800	50x16	40	78x8	48x0,5	45	11,9	18	40
PEM 600		600	8500	32x12	40	32x4	2x0,25	60	15,9	35	77,8
PEM 1000		1000	14000	32x8	40	32x2	2x0,12	60	15,9	35	77,8
LE-PTP 180	ELECTRIC	180	2548	-	-	-	-	100	26,45	60	132,3
PTP 1201	PNEUMATIC	720*	10200*	-	-	-	-	10	2,64	21	46,3

* depends on air pressure

All our testing pumps are delivered „ready for use” and equipped with:

- ▶ Tank (Except PEM 30)
- ▶ Pressure gauge
- ▶ Drain valve
- ▶ Flexible hose. 16” long. (3” for PEM 30 / 6” for PEM 40)

The seals used are made for usage with water, fluid oil or gas-oil.
Please call us any other liquids.

Alle Testpumpen werden als einsatzfertig geliefert und sind ausgerüstet mit:

- ▶ Behälter (außer PEM 30)
- ▶ Druckanzeige
- ▶ Ablassventil
- ▶ Elastischem 16” langem Schlauch (3” für PEM / 6” für PEM 40)

Die Dichtungen sind bestimmt für die Anwendung in der Wasser- und Ölumgebung. Wir bitten um Kontakt, falls andere Flüssigkeiten verwendet werden sollten.

Wszystkie nasze pompy testujące są dostarczane jako gotowe do użycia oraz wyposażone w:

- ▶ zbiornik (oprócz PEM 30)
- ▶ wskaźnik ciśnienia
- ▶ zawór spustowy
- ▶ elastyczny przewód, 16” długość (3” dla PEM30 / 6” dla PEM40)

Uszczelki są przeznaczone do użytkowania z wodą lub olejem.
Prosimy kontaktować się z nami w przypadku używania innych cieczy.