



2016 CATALOG



**PROFESSIONAL TOOLS FOR
HVAC/R SERVICE AND TUBE WORKING**



Imperial

DEPENDABLE UNDER PRESSURE®

PROFESSIONAL TOOLS FOR HVAC/R SERVICE AND TUBE WORKING

Imperial® Tools - Excellence and Innovation for Over 100 Years

ABOUT US

The Imperial® brand was founded over 100 years ago on the south side of Chicago with the formation of the Imperial Brass Manufacturing Company. Quickly establishing a reputation as specialists in brass, Imperial designers developed the non-soldering "flared fitting", followed by the first patents for flaring tools and tube cutters. Over the years the Imperial name came to stand for excellence and innovation, and the product list grew to include tube fittings, tube working tools, refrigeration and air conditioning service accessories, and associated products in the fluid connector field.

In September of 1996 the Imperial® brand tools and accessories division was sold to Stride Tool Inc. of Ellicottville, New York. Under Stride Tool's leadership, the Imperial brand has been strengthened and expanded to include not just specialty tools for HVACR service and tube working, but also for electrical, automotive and industrial applications. In 2004 a new facility was completed in northeast Ohio to centralize all manufacturing and administrative operations.

Thermal Engineering

In 2012 Stride Tool acquired Thermal Engineering Company of Mentor, Ohio and their line of HVACR service tools. The best of the Thermal Engineering offerings are now sold under the Imperial-Thermal name and are included in this catalog.

*Our goal is simple - to always exceed the expectations
of our professional customers.*

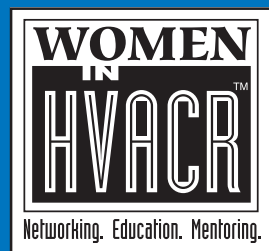


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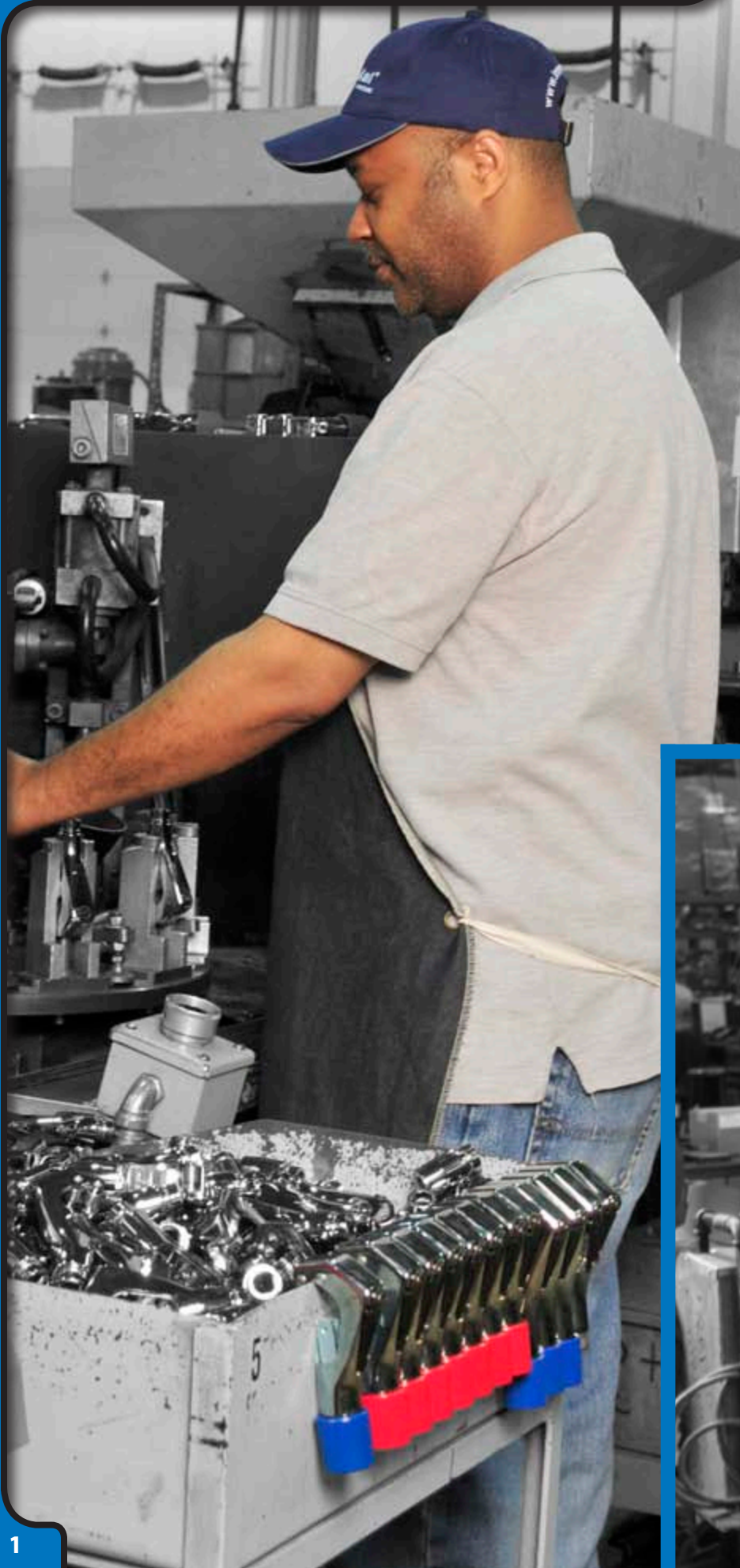
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TUBE WORKING TOOLS





METAL TUBING

TC-1550 HI-DUTY® TUBE CUTTER

For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing.

- Lower profile swing radius — 4-1/4" max.
- Retractable rotary style reamer — can be used right- or left-handed, and with a clockwise or counterclockwise motion for better ergonomic control.
- Rollers feature flare cut-off groove to reduce tube loss when damaged flare is removed.
- Lightweight die-cast solid aluminum body — lighter than similar cutters.
- Durable low gloss black wrinkle finish for improved wear resistance.
- Enclosed hardened steel, thrust bearing feed mechanism for smoothest cutting action and trouble-free operation.
- Unique design eliminates spiraling for clean right angle cuts.
- Our high precision machining and construction method permits one-piece screw-type axle for easy access to cutter wheel — no clip to lose or replace.
- Imperial® cutter wheels are made of the highest quality wear and abrasion-resistant chromium steel and precision machined to exacting specifications for accurate cutting and long life. Each tool is supplied with a spare cutter wheel.
- All Imperial tube cutters are 100% factory tested to ensure accurate spiral-free cutting.
- Available in "Try Me" clamshell packaging.



TC-1550 For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. Includes (2) S75015 general purpose cutter wheels. Length 5". Wt. 8.0 oz.

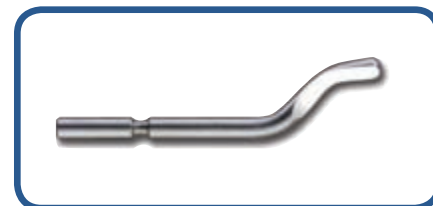
TC-1560 For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. Includes (2) S75046 cutter wheels for continuous cutting of stainless steel, monel and other hard temper tubing. Length 5". Wt. 8.0 oz.

S75015 General purpose cutter wheel.

S75046 Wheel for continuous cutting of stainless steel, monel and other hard temper tubing.

S10001087 Deburr replacement blade.

S74844 Screw for extra cutter wheel in knob.



S10001087 -Deburr Replacement Blade



TC-1550C

METAL TUBING

HI-DUTY® TUBE CUTTERS

For 1/8" to 1-1/8" and 1/4" to 1-5/8" O.D. tubing.

- Enclosed hardened steel, thrust bearing feed mechanism for smoothest cutting action and trouble free operation.
- Unique design eliminates spiraling for clean right angle cuts. Our high precision machining and construction method permits one-piece screw-type axle for easy access to cutter wheel — no clip to lose or replace.
- Rugged aluminum alloy body designed for handling ease. Body is hand buffed and nickel chrome plated to a high-luster finish.
- Foldaway hardened steel reamer with turned cutting edge removes inside burrs cleanly. Filing surface removes outside burrs.
- Rollers feature flare cut-off groove to reduce tube loss when damaged flare is removed.
- Imperial® cutter wheels are made of the highest quality wear and abrasion-resistant chromium steel and precision machined to exacting specifications for accurate cutting and long life. Each tool is supplied with a spare cutter wheel.
- All Imperial tube cutters are 100% factory tested to ensure accurate spiral-free cutting.



TC-1000

TC-1000 For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. Includes (2) S75015 general purpose cutter wheels. Length 5". Wt. 8.8 oz.

TC-1010 For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. Includes (2) S75046 cutter wheels for continuous cutting of stainless steel, monel and other hard-temper tubing. Length 5". Wt. 8.8 oz.

TC-1020 Combination tube constrictor & tube cutter. For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. Includes S76637 constrictor wheel and S75015 general purpose cutter wheel. Length 5-1/2". Wt. 8.8 oz.

312-FC For 1/4" to 1-5/8" (7 mm to 41 mm) O.D. tubing. Includes (2) S75015 general purpose cutter wheels. Length 5-1/2". Wt. 10.4 oz.

Conforms to Federal Specification GGG-C-771d, Type II, Class I.

S75015 General purpose cutter wheel.

S75046 Wheel for continuous cutting of stainless steel, monel and other hard temper tubing. For cutters TC-1000, TC-1010, TC-1550, TC-1560, 312-FC, 174-F, TC-2050 and TC-3050.

S16003162 Replacement cutter wheel for soft copper & aluminum tubing is extra sharp to minimize burr buildup.

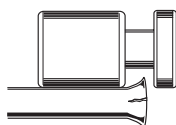
S76637 Constrictor wheel for producing sweat joints.



TC-1010

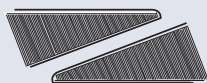


312-FC



FLARE CUT-OFF GROOVE

Groove in rollers reduces tube loss when cracked flare is removed.



FOLDAWAY REAMER

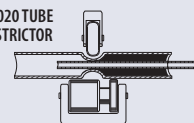
Hardened steel reamer with turned cutting edge removes inside burrs cleanly. Filing surface removes outside burrs.



SPARE CUTTING WHEEL

Spare cutter wheel carried under foldaway locking reamer.

TC-1020 TUBE CONSTRICTOR



FILL WITH SOLDER

Joint is ready for sweating when constricted tube contacts smaller tube. Can be used for crimping applications.

JUNIOR TUBE CUTTER

For 1/8" to 3/4" (4 mm to 19 mm) O.D. tubing.

227-FA Includes S32633 general purpose cutter wheel. Swing radius 2". Length 3-1/2". Wt. 5.0 oz.



227-FA

METAL TUBING

"IMP"® MINI TUBE CUTTERS

For 1/8" to 5/8", 3/16" to 7/8" and 1/8" to 1-1/8" O.D. tubing.

- Big capacity, small size tube cutters designed for use in tight quarters where other cutters won't fit.
- Enclosed feed screw minimizes contamination assuring continued smooth operation.
- Corrosion-resistant steel rollers positioned at bottom of cutter allow for easier cutter engagement on tubing and smoother cutting action.
- All Imperial® tube cutters are 100% factory tested to ensure accurate spiral-free cutting.

TC-1050 For 1/8" to 5/8" (4 mm to 15 mm) O.D. tubing. Includes (1) S32633 general purpose cutter wheel. Swing radius 1-1/4" (1-3/8" swing radius with 5/8" tube). Length 1-3/4". Wt. 2.5 oz.

S32633 General purpose cutter wheel for TC-1050.

S26883 Screw for TC-1050 cutter wheel.

TC-2050 For 3/16" to 7/8" (5 mm to 22 mm) O.D. tubing. Includes (1) S75015 general purpose cutter wheel. Swing radius 1-11/16". Length 2-1/4". Wt. 4.0 oz.

TC-3050 For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. Includes (1) S75015 general purpose cutter wheel. Swing radius 2-1/2" (2-1/16" swing radius with 1-1/8" tube). Length 3". Wt. 7.0 oz.

S75015 General purpose cutter wheel.

S74762 Screw for TC-3050 cutter wheel.

RATCHETING TUBE CUTTERS

For 1/8" to 5/8" and 1/8" to 1-1/8" O.D. tubing.

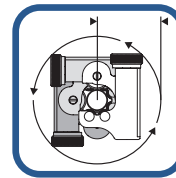
- Easily completes a full revolution, maximizing leverage.
- Cutter can easily be removed from the handle.
- Ergonomic handle with non-slip grip.
- 100% factory tested to ensure accurate spiral-free cutting.
- Six independent drive pawls provide 15° arc-swing.
- Includes (1) general purpose cutter wheel.

TC-1050RH For 1/8" to 5/8" (4 mm to 15 mm) O.D. tubing. 2-Pc. set includes TC-1050 "IMP"® mini tube cutter and ratcheting handle in clamshell packaging. Length 5". Wt. 6.0 oz.

TC-1051 Ratcheting handle only. Length 5". Wt. 1.5 oz.

TC-3050RH For 1/8" to 1-1/8" (4 mm to 28 mm) O.D. tubing. 3-Pc. set includes TC-3050 "IMP"® tube cutter, removable deburr tool and ratcheting handle in clamshell packaging. Length 7". Wt. 11.5 oz.

TC-3051 Ratcheting handle and deburr tool. Length 7". Wt. 4.0 oz.



Swing Radius
1-1/4"



TC-1050

Our Newest "IMP"® tube cutter can cut 1/8" to 1-1/8" O.D. tubing in tight quarters

Taller knob height for easier torque



TC-3050

Use cutter with or without patented ratcheting handle - snaps into place in seconds

Handle completes revolutions with ease

TC-3050RH includes a removable deburr tool



PATENTED

Ergonomic handle with non-slip grip

Ideal for tight spaces

Spiral-free cutting

TC-3050RH

Six independent drive pawls give small, 15° arc-swing

Removable Deburr Tool
(TC-3050RH and TC-3051)



TC-1050RH



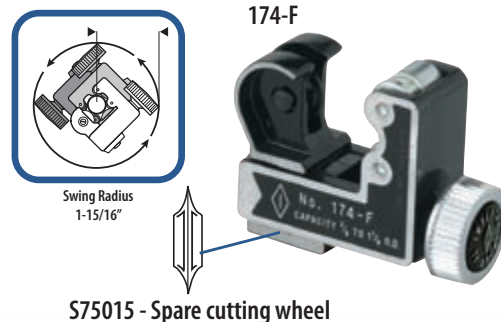
TC-3050RH

METAL TUBING

BIG "IMP"® TUBE CUTTER - "Big capacity in small size"

For 3/8" to 1-1/8" (10 mm to 28 mm) O.D. tubing.

- 174-F** Includes (2) S75015 general purpose cutter wheels. Swing radius 1-15/16" (2-1/4" swing radius with 1-1/8" tube). Length 2-11/16". Wt. 5.0 oz.



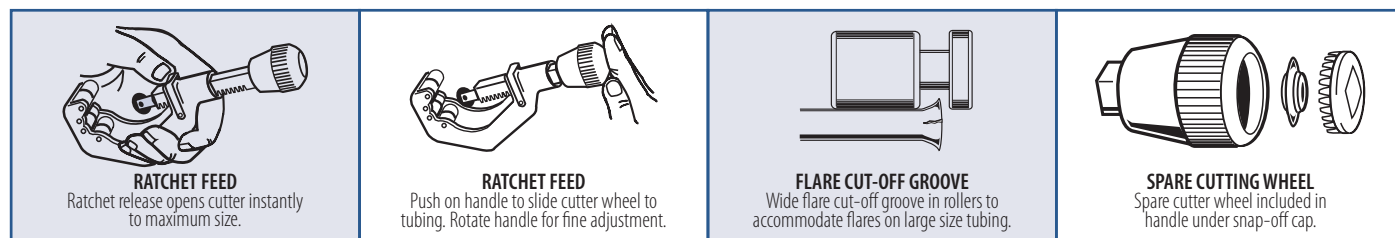
ADJUST-O-MATIC™ TUBE CUTTERS

For 3/8" to 2-5/8" and 2" to 4-1/8" O.D. tubing.

- Ratchet feed mechanism speeds up cutting operation.
- Extra wide rollers with flare cut-off groove stabilize tubing.
- Spare cutting wheel included under handle cap.
- Enclosed screw-type feed mechanism; lightweight aluminum alloy body.

- 206-FB** For 3/8" to 2-5/8" (10 mm to 66 mm) O.D. tubing. Includes (2) S74761 general purpose cutter wheels. Length closed 7-3/4". Wt. 2.0 lbs.
- 206-FBP** Cuts schedule 40 PVC pipe up to 2". Includes one cutter wheel for PVC S10000770 and one general purpose cutter wheel S74761.
- 406-FA** For 2" to 4-1/8" (51 mm to 104 mm) O.D. tubing. Includes (2) S74833 general purpose cutter wheels. Length closed 11-1/4". Wt. 3.5 lbs.

Conforms to Federal Specification GGG-C-771d, Type II, Class I.

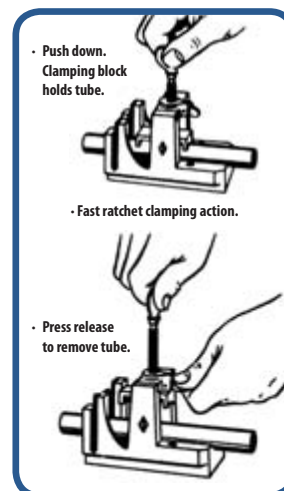


TUBE SAWING VISE

For 1/8" to 1-1/2" (4 mm to 38 mm) O.D. tubing.

- 384-FA** Grips tube or hose securely for perfect right angle cuts. Designed for stainless steel tubing that requires flaring. Excellent for holding stainless steel tubing and wire braided hose when cutting with a hacksaw. Quick clamp adjustment with instant tube release. Replaceable hardened steel hacksaw guides. Fastens on bench or clamp in vise. Size: 5" x 3-1/8" x 5-1/8". Wt. 2.5 lbs.

Conforms to Federal Specification GGG-V-436d.



PVC, PLASTIC AND NON-METAL REINFORCED TUBING

PLASTIC TUBE AND HOSE SHEARS

For 1/16" to 13/16" (1 mm to 20 mm) O.D. hose* or tubing.

307-FP **Snimp™** Compact shear for 1/16" to 1/2" (1 mm to 13 mm) O.D. plastic tubing and non-metal reinforced hose. Spring loaded for safety - closes automatically. Includes S8115601 replaceable hardened steel blade. Length 2-7/8". Wt. 1.0 oz. each. Comes in 12-pc. pop-up counter display. 9"D x 12"W x 12"H.



307-FP

327-FP For 1/8" to 13/16" (4 mm to 20 mm) O.D. plastic tubing and non-metal reinforced hose. Can be wall- or bench-mounted for production, or carried in a toolbox. Includes S77615 replaceable hardened steel blade. Length 9-3/4". Wt. 1.0 lb.

* Not for use with metal reinforced hose.



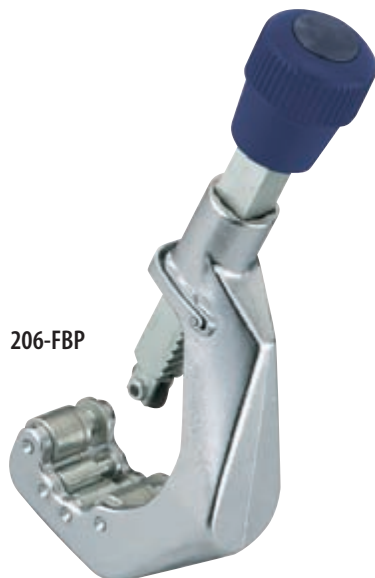
327-FP



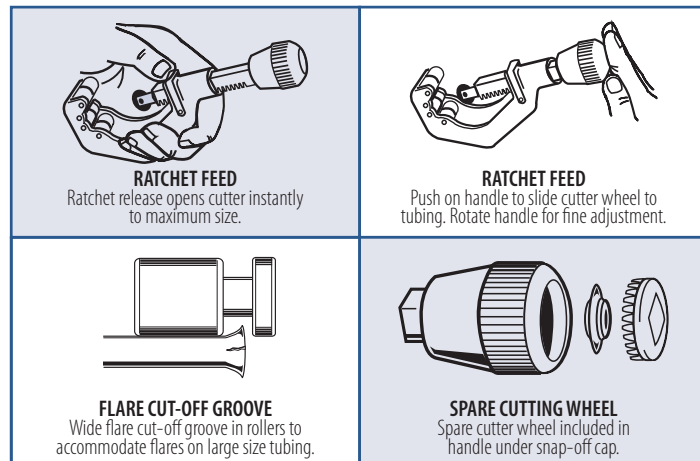
307-FP POP-UP DISPLAY

ADJUST-O-MATIC™ PVC PIPE CUTTER

206-FBP Cuts schedule 40 PVC pipe up to 2". Ratchet feed mechanism speeds up cutting operation. Includes one cutter wheel for PVC S10000770 and one general purpose cutter wheel S74761.



206-FBP



METAL TUBING

144-F IMPERIAL® TUBE CUTTER SERVICE CENTER

For 1/8" to 4-1/8" O.D. tubing.

Selling Imperial® replacement cutter wheels, reamer blades and fasteners is easy. Our Service Center organizes a popular selection of replacement parts for Imperial cutters. Display on the counter or bring it with you when making sales calls.

- 15 most common replacement parts stocked in one handy container.
- Includes a visual replacement chart for quick and easy identification.



144-F

144-F SERVICE CENTER INCLUDES:

PART NO.	QUANTITY	DESCRIPTION	CUTTER
S75015	10	General Purpose Cutter Wheel	TC-1000, TC-1010, TC-1550, TC-1560, 312-FC, 174-F, TC-2050, TC-3050
S75046	5	Cutter Wheel for Stainless Steel	TC-1000, TC-1010, TC-1550, TC-1560, 312-FC, 174-F, TC-2050, TC-3050
S32633	10	Cutter Wheel	TC-1050, 227-FA
S74761	5	Cutter Wheel	206-FB, 206-FBP
S74762	5	Cutter Wheel Retaining Screw	TC-1000, TC-1010, TC-1550, TC-1560, 312-FC, 174-F, TC-2050, TC-3050
S74833	3	Cutter Wheel	406-FA
S26883	3	Cutter Wheel Retaining Screw	TC-1050
S77511	3	Cutter Wheel Retaining Screw	206-FB, 206-FBP
S74834	3	Cutter Wheel Retaining Screw	406-FA
S76637	3	Constrictor Roller Wheel	TC-1000, TC-1010, TC-1020, 312-FC
S16003162	5	Cutter Wheel for Soft Copper Only	TC-1000, TC-1010, TC-1550, TC-1560, 312-FC, 174-F, TC-2050, TC-3050
S10000770	3	Cutter Wheel for PVC	206-FB, 206-FBP
S7931801	3	Reamer Blade	TC-1000, TC-1010, 312-FC
S8201501	3	Retaining Screw for Reamer Blade	TC-1000, TC-1010, 312-FC
S74197	3	Spring Washer for Reamer Blade	TC-1000, TC-1010, 312-FC
144-FB	1	Container only	

PARTS CONTENTS CHART:

CUTTER WHEEL Part# S74833 for Cutter # 406-FA 	CUTTER WHEEL FOR PVC Part# S10000770 for Cutters # 206-FB, 206-FBP 	CUTTER WHEEL Part# S74761 for Cutters # 206-FB, 206-FBP 	GENERAL PURPOSE CUTTER WHEEL Part# S75015 for Cutters # TC-1000, TC-1010, TC-1550, TC-1560, 312-FC, 174-F, TC-2050, TC-3050 	CUTTER WHEEL FOR SOFT COPPER ONLY Part# S16003162 for Cutters # TC-1000, TC-1010, TC-1550, TC-1560, 312-FC, 174-F, TC-2050, TC-3050 	CONSTRICTOR ROLLER WHEEL Part# S76637 for Cutters # TC-1000, TC-1010, TC-1020, 312-FC
CUTTER WHEEL FOR STAINLESS STEEL Part# S75046 for Cutters # TC-1000, TC-1010, TC-1550, TC-1560, 312-FC, 174-F, TC-2050, TC-3050 	CUTTER WHEEL Part# S32633 for Cutters # TC-1050, 227-FA 	SPRING WASHER FOR REAMER BLADE Part# S74197 for Cutters # TC-1000, TC-1010, TC-1020, 312-FC 	REAMER BLADE Part# S7931801 for Cutters # TC-1000, TC-1010, TC-1020, 312-FC 	CUTTER WHEEL RETAINING SCREW Part# S26883 for Cutter # TC-1050 	CUTTER WHEEL RETAINING SCREW Part# S74834 for Cutter # 406-FA
CUTTER WHEEL RETAINING SCREW Part# S77511 for Cutters # 206-FB, 206-FBP 	CUTTER WHEEL RETAINING SCREW Part# S74762 for Cutters # TC-1000, TC-1010, TC-1550, TC-1560, 312-FC, 174-F, TC-2050, TC-3050 	RETAINING SCREW FOR REAMER BLADE Part# S8201501 for Cutters # TC-1000, TC-1010, TC-1020, 312-FC 			

TRIPLE HEAD LEVER TYPE

470-FH TRIPLE HEAD 180° TUBE BENDER WITH ROTO-LOK™ INDEXING HANDLE

- Bends 3/16", 1/4", 5/16" and 3/8" O.D. tubing.
- Patented, quick-action indexing lever repositions two-stage handle midway through bend when both handles begin to meet. This feature allows easy fabrication of bends up to 180° with reduced effort, better control and no crossing of handles!
- Optimum bending radius – for each tubing size.
- Calibrated markings – for making accurate left-hand, right-hand and offset bends.
- Compact design for working in tight spaces.
- Cushion grips – for comfort and stability.
- Made of lightweight, die-cast aluminum.
- Clamshell packaging available.

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)
3/16	9/16
1/4	9/16
5/16	11/16
3/8	15/16

Patented Roto-Lok™ Indexing Lever - Smooth, tight 180° bends with less effort and improved control

Lightweight die-cast aluminum

Bends 3/16", 1/4", 5/16" and 3/8" O.D. tubing

Deluxe cushion grips for comfort and stability

PATENTED

Fixed tube hook

470-FH



TRIPLE HEAD LEVER TYPE

370-FH TRIPLE HEAD 180° TUBE BENDER

- Bends 3/16", 1/4", 3/8" and 1/2" tubing.
- Makes smooth, tight-radius 180° bends.
- Calibrated markings – for making accurate left-hand, right-hand and offset bends.
- Adjustable hook.
- Optimum bending radius – for each tubing size.
- Cushion grips – for extreme comfort.
- Made of lightweight die-cast aluminum.
- Clamshell packaging available.



370-FH

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)
3/16	11/16
1/4	11/16
3/8	1-1/8
1/2	1-1/2

Bend 3 of the most popular sizes of soft copper, aluminum and thin wall steel tubing with one rugged, precise tool!



Easy 180° bends in one swift motion



IMP™ TRIPLE HEAD BENDERS

For soft copper, aluminum and thin wall steel tubing.
For 1/8", 3/16", 1/4", 5/16" and 3/8" O.D. tubing.
Makes up to 90° bends.

Calibrated markings for making accurate left-hand, right-hand and offset bends.
90° start requires less effort – making bending fast and easy.

- 367-FH** For 1/8", 3/16" and 1/4" (3 mm, 4 mm and 6 mm) O.D. tubing. Wt. 0.5 lbs.
368-FH For 3/16", 1/4", 5/16" and 3/8" (6 mm and 8 mm) O.D. tubing. Wt. 1.0 lbs.

367-FH

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)	RADIUS TO CENTER OF TUBE (mm)
1/8	5/8	16
3/16	19/32	15
1/4	9/16	14

368-FH

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)	RADIUS TO CENTER OF TUBE (mm)
3/16	1-1/64	26
1/4	1-1/64	26
5/16	1	25
3/8	15/16	24



367-FH



368-FH

SPRING TYPE TUBE BENDERS

For soft copper and aluminum tubing.
For 1/4" to 7/8" O.D. tubing.

Tools allow hand bending of soft tubing to any shape without collapsing walls. Special spring steel, zinc finish. End belled for quick tube removal.

- 201-F** Set of 8 benders for 1/4", 5/16", 3/8", 7/16", 1/2", 5/8", 3/4" and 7/8" O.D. tubing.
101-F Set of 6 benders for 1/4", 5/16", 3/8", 7/16", 1/2" and 5/8" O.D. tubing.
163-F Set of 4 benders for 1/4", 3/8", 1/2" and 5/8" O.D. tubing.
112-F Set of 3 benders for 1/4", 5/16" and 3/8" O.D. tubing.



102-F-08

PART NO.	TUBE O.D. (in.)	LENGTH (in.)	WEIGHT EACH (oz.)
102-F-04	1/4	10	3
102-F-05	5/16	10	3
102-F-06	3/8	10	4
102-F-07	7/16	12	6.25
102-F-08	1/2	12	6.5
102-F-10	5/8	12	8
102-F-12	3/4	12	10
102-F-14	7/8	12	10

Each tool bends only one size.

LEVER TYPE

364-FHA LEVER TYPE TUBE BENDERS

For 1/8" to 1" and 6 mm to 12 mm O.D. tubing.

Each tool bends one size. Open-side type which slips over tube at any point. Makes smooth, tight radius bends up to 180° with minimum effort. No scoring or flattening of tubing. Calibrated to show angle of bend. Wide hook grips tubing securely.

PART NO.	TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)	WEIGHT EACH (lbs.)
364-FH-02	1/8	3/8	0.5
364-FH-03	3/16	7/16	0.5
364-FHA-04	1/4	9/16	1.0
364-FHA-05	5/16	11/16	1.0
364-FHA-06	3/8	15/16	1.75
364-FHA-07	7/16	1-1/2	3.5
364-FHA-08	1/2	1-1/2	3.5
364-FHA-10*	5/8	2-1/4	5.5
364-FHA-12*	3/4	3	7.0
364-FHA-14*	7/8	3	10.5
364-FHA-16*	1	3-1/2	10.5

Each tool bends only one size.

Conforms to Federal Specification GGG-B-191a Type III, Class 2.

*For bending annealed copper and aluminum tubing only.

364-FHA-14

Features telescopic handles for increased leverage.

Expandable style furnished for 7/8" and 1" O.D. tubing.



364-FHA-06

Style for 1/4" through 1/2" and 6 mm to 12 mm O.D. tubing.



364-FH-02

Style for 1/8" and 3/16" O.D. tubing.



364-FHA-10

Style for 5/8" and 3/4" O.D. tubing.

METRIC SIZE BENDING TOOLS

PART NO.	TUBE O.D. (mm)	RADIUS TO CENTER OF TUBE		WEIGHT EACH	
		(mm)	(inches)	(kg.)	(lbs.)
364-FHAM-6MM	6	14.2	9/16	0.45	1.0
364-FHAM-8MM	8	17.5	11/16	0.45	1.0
364-FHAM-10MM	10	24.0	15/16	0.79	1.75
364-FHAM-12MM	12	38.1	1-1/2	1.6	3.5

Each tool bends only one size.

364-FHB SWIVEL HANDLE TUBE BENDERS

For 1/4" to 1/2" and 6 mm to 12 mm O.D. tubing.

The 364-FHB series has a swivel handle that can be repositioned midway through a bend when both handles begin to meet. This simple feature allows easy fabrication of bends up to 180° with reduced effort, better control and without the crossing of handles, typical of most other lever type benders.

PART NO.	TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)	WEIGHT EACH (lbs.)
364-FHB-04	1/4	9/16	1.0
364-FHB-05	5/16	11/16	1.0
364-FHB-06	3/8	15/16	1.75
364-FHB-07	7/16	1-1/2	3.5
364-FHB-08	1/2	1-1/2	3.5

Each tool bends only one size.

Conforms to Federal Specification GGG-B-191a Type III, Class 2.

METRIC SIZE BENDING TOOLS

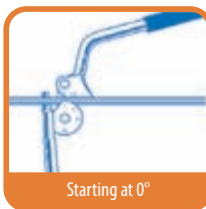
PART NO.	TUBE O.D. (mm)	RADIUS TO CENTER OF TUBE		WEIGHT EACH	
		(mm)	(inches)	(kg.)	(lbs.)
364-FHBM-6MM	6	14.2	9/16	0.45	1.0
364-FHBM-8MM	8	17.5	11/16	0.45	1.0
364-FHBM-10MM	10	24.0	15/16	0.79	1.75
364-FHBM-12MM	12	38.1	1-1/2	1.6	3.5

Each tool bends only one size.

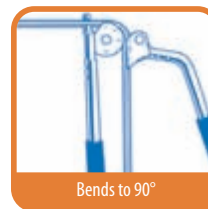


364-FHB-06

Style for 1/4" through 1/2" and 6 mm to 12 mm O.D. tubing.



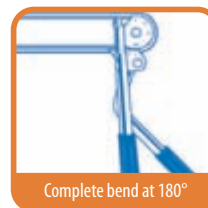
Starting at 0°



Bends to 90°



Handle swivels at 90°



Complete bend at 180°

HEAVY DUTY LEVER TYPE

664-FH HEAVY-DUTY 180° TUBE BENDER WITH ROTO-LOK™ INDEXING HANDLE FOR TIGHT RADIUS BENDS

For 1/4" to 1/2" and 6 mm to 12 mm O.D. tubing.

- New design for accurate and tight bends up to 180° in stainless steel and other tough metals.
- Patented, quick action trigger release repositions two-stage handle midway through a bend when both handles begin to meet. This feature allows easy fabrication of optimized bends up to 180° with reduced effort, better control and no crossing of handles!
- Rollers in bending handle reduce friction and bending effort; eliminate scoring of tubing.
- Patented ergonomic grips.
- Durable nickel finish.
- Vise lug for mounting in vise.
- Clamshell packaging available for 1/4" and 3/8" O.D. models.

PART NO.	TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)	WEIGHT EACH (lbs.)
664-FH-04	1/4	9/16	1.2
664-FH-06	3/8	15/16	3.7
664-FH-08	1/2	1-1/2	7.6

PART NO.	TUBE O.D. (mm)	RADIUS TO CENTER OF TUBE (mm)	WEIGHT EACH (lbs.)
664-FH-6MM	6	15	1.2
664-FH-8MM	8	24	3.7
664-FH-10MM	10	24	3.7
664-FH-12MM	12	38	7.6

Rollers reduce effort and eliminate scoring marks

Quick Release Collar

Roto-Lok™ Indexing Lever

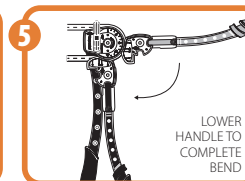
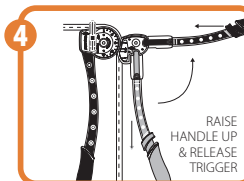
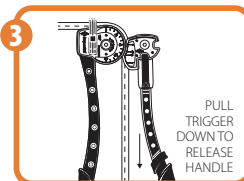
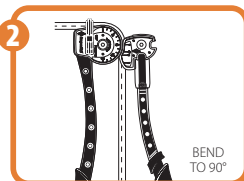
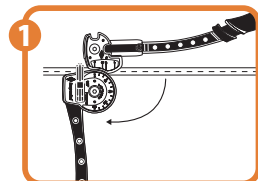
PATENTED

Pivoting Tube Lock Hook

664-FH-04

Ergonomically molded cushion grips

Optimized Tight Bend Radius



HEAVY DUTY LEVER TYPE

564-FH AND 564-FHT LEVER TYPE HEAVY-DUTY TUBE BENDERS

For 3/8" and 1/2" O.D. tubing.

These heavy-duty tube benders feature high-strength tool steel construction on all components subjected to stress during the bending process — including forming rollers, form wheel, stop pins, hook and cam adjustment shaft. Unique offset handle design assures maximum power transfer between worker and bender. Bender will not "gyrate" as handles are brought to closed position.

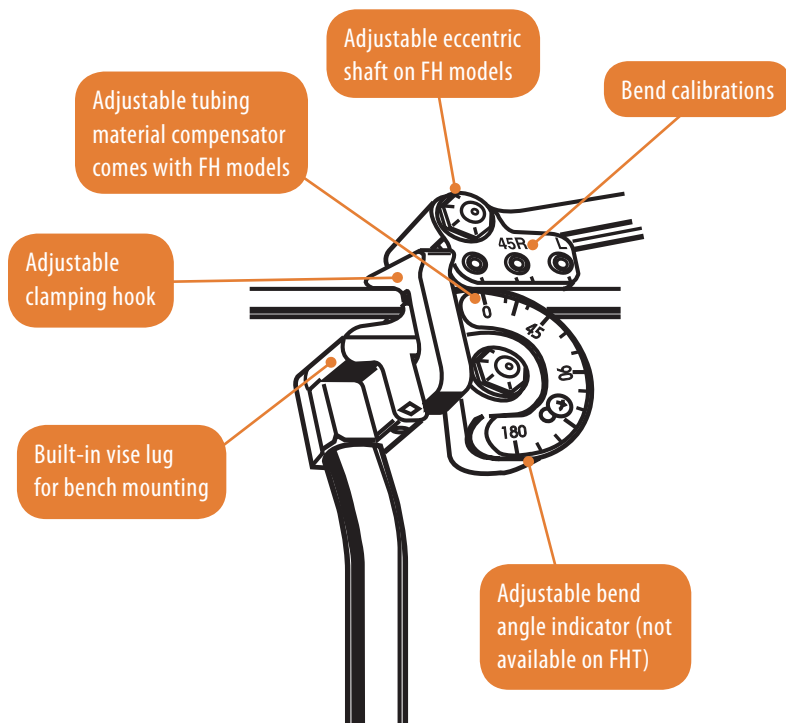
- Meets ANSI B31.1/ASME Sec. 3 Boiler/Power requirements (FH Models only).
- Vise mountable.
- Prevents slippage and flattening.
- Fully adjustable to compensate for variances in tube tolerance.
- Starts with handles at 90° angle.
- Built for rugged day-in and day-out use.
- Precise bends!
- Self-aligning rollers eliminate scoring and reduce bending effort.



564-FH-06

PART NO.	TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)	WEIGHT EACH (lbs.)
564-FHT-06	3/8	15/16	5.0
564-FH-06	3/8	1-1/8	5.5
564-FH-08	1/2	1-1/2	7.0

Each tool bends only one size.



LEVER TYPE KITS

WIDE RANGE TUBE BENDER KITS

For 1/4" to 7/8" O.D. tubing.

Each tool quickly adapts to all sizes in its range by changing forming wheel and block. Telescopic handles reposition during bend for best leverage. Calibrations show precise bend angle. One-piece benders furnished for 1/4" and 5/16" O.D. sizes. Includes metal tool case with space for other tools needed on the job.

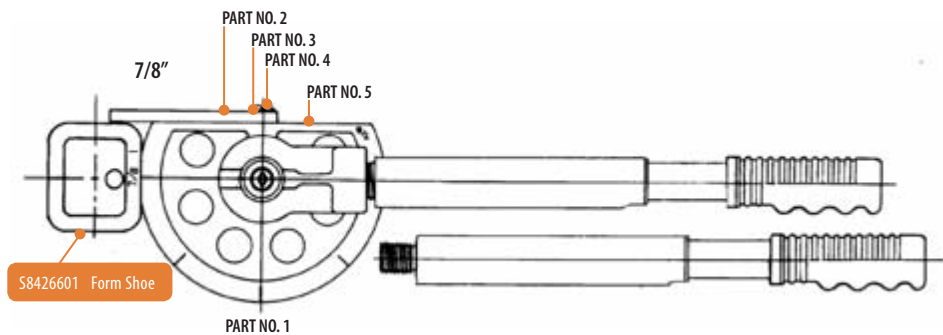
Conforms to Federal Specification GGG-B-191a Type III, Class 1.



260-FHA

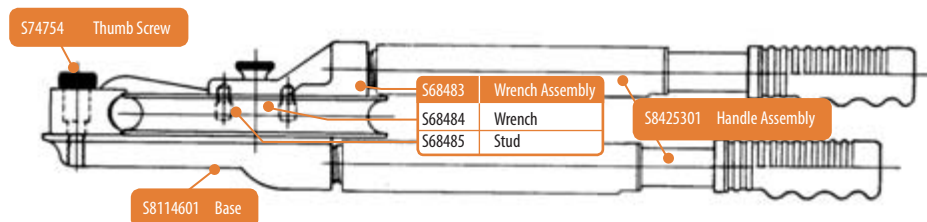
260-FHA for 7 sizes. Wt. 23 lbs.

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)
1/4	9/16
5/16	11/16
3/8*	1-5/8
1/2*	1-5/8
5/8*	2-1/4
3/4*	3
7/8*	3



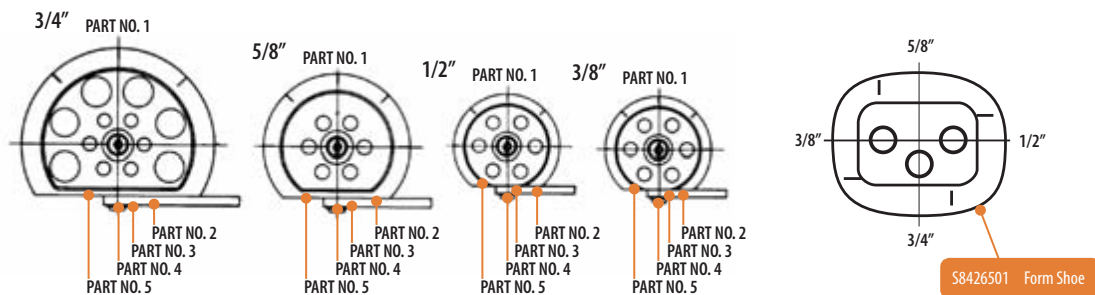
350-FHA for 6 sizes. Wt. 20 lbs.

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)
1/4	9/16
5/16	11/16
3/8*	1-5/8
1/2*	1-5/8
5/8*	2-1/4
3/4*	3



360-FHA for 4 sizes. Wt. 20 lbs.

TUBE O.D. (in.)	RADIUS TO CENTER OF TUBE (in.)
3/8*	1-5/8
1/2*	1-5/8
5/8*	2-1/4
3/4*	3



* Recommended for bending annealed copper and aluminum tubing only.

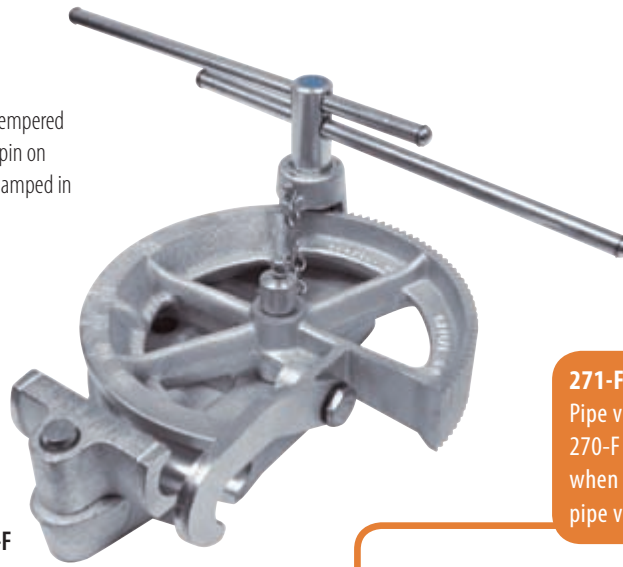
Size (in.)	PART NO. 1 (Wheel Assembly)	PART NO. 2 (Hook)	PART NO. 3 (Spring Washer)	PART NO. 4 (Hook Screw)	PART NO. 5 (Form Wheel)
3/8	S68478	S68480	S68481	S66914	S68479
1/2	S68492	S62156	S68481	S66914	S68493
5/8	S68496	S8058801	S68481	S66914	S68497
3/4	S8487001	S8058901	S68481	S66914	S8442401
7/8	S8485201	S68502	S68481	S66914	S8422701

GEAR TYPE

270-F GEAR TYPE TUBE BENDER

For 3/8" to 1-1/8" O.D. tubing.

For all bending work. Spur-gear type with 10-to-1 ratio for easy bending of tempered tubing. Floating shoe aligns tube perfectly on calibrated forming wheel. Pull-pin on wheel speeds repositioning for bends over 90°. Portable. Can be hand held, clamped in vise or bolted to bench. Adapts to pipe vise with handle 271-F.



270-F

271-F

Pipe vise extension (fits all 270-F Benders). For use when clamping bender in pipe vise.



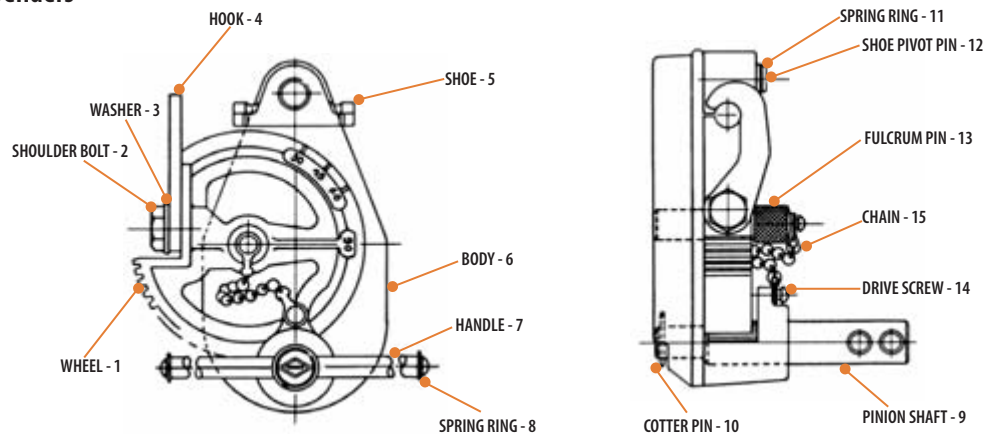
Each tool bends only one size.

PART NO.	TUBE O.D. (in.)	RADIUS FROM CTR. TO CENTER OF TUBE (in.)	MIN. RETURN FROM CENTER TO CENTER OF TUBE (in.)	WEIGHT EACH (lbs.)	WALL THICKNESS (in.)
270-F-06	3/8	1-3/4	4-1/2	3	.030 to .060
270-F-08	1/2	2-1/2	6	4.75	.035 to .065
270-F-10	5/8	3	7-1/2	8.5	.040 to .072
270-F-12	3/4	4	9-1/2	15	.042 to .083
270-F-14	7/8	4	9-1/2	14.75	.045 to .083
270-F-16	1	4	9-1/2	14.75	.065 to .095*
270-F-18	1-1/8	4	9-1/2	14.25	.065 to .095*
271-F				1.75	

* Not recommended for Type L Hard and Type M copper tubing with wall thickness over .065".

REPLACEMENT PARTS

For 270-F Gear Type Tube Benders



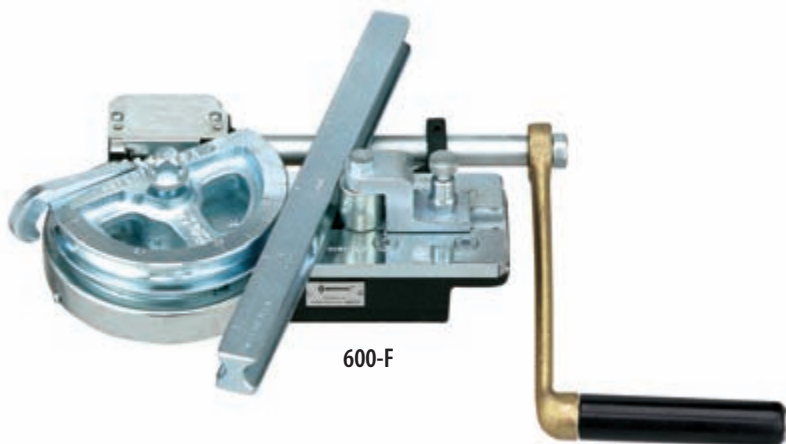
TUBE BENDER	Size (in.)	PART NO. 1	PART NO. 2	PART NO. 3	PART NO. 4	PART NO. 5	PART NO. 6	PART NO. 7	PART NO. 8	PART NO. 9	PART NO. 10	PART NO. 11	PART NO. 12	PART NO. 13	PART NO. 14	PART NO. 15
270-F-06	3/8	S62244	S62245	S62246	S62247	S62250	S62251	S62252	S62253	S62254	S62255	S62257	S62258	S62838	S62836	S62839
270-F-08	1/2	S62261	S62264	S62246	S62263	S62262	S62260	S62269	S62253	S62268	S62255	S62266	S62265	S62840	S62836	S62839
270-F-10	5/8	S62275	S62280	S62279	S62278	S62277	S62276	S62284	S62285	S62283	S62255	S62281	S62282	S62841	S62836	S62842
270-F-12	3/4	S62305	S62294	S62298	S62307	S62306	S62288	S62292	S62297	S62291	S62255	S62296	S62295	S62835	S62836	S62837
270-F-14	7/8	S62302	S62294	S62298	S62304	S62303	S62288	S62292	S62297	S62291	S62255	S62296	S62295	S62835	S62836	S62837
270-F-16	1	S62299	S62294	S62298	S62301	S62300	S62288	S62292	S62297	S62291	S62255	S62296	S62295	S62835	S62836	S62837
270-F-18	1-1/8	S62287	S62294	S62298	S62290	S62289	S62288	S62292	S62297	S62291	S62255	S62296	S62295	S62835	S62869	S62837

GEAR TYPE

WORM GEAR TUBE BENDER

For 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.

600-F Precision tool for highest quality work. 50-to-1 gear ratio and crank with revolving hand grip keeps effort at a minimum. Follow bar eliminates drawing action and keeps tube in virtually perfect round. Adjustable pressure roller positions quickly in index holes. Enclosed gears. Includes metal tool case. Can be clamped in vise or bolted to bench or tripod. Size of kit: 14" x 9" x 6". Wt. 35.0 lbs.



600-F



Tube Wall Thickness and Bend Radius

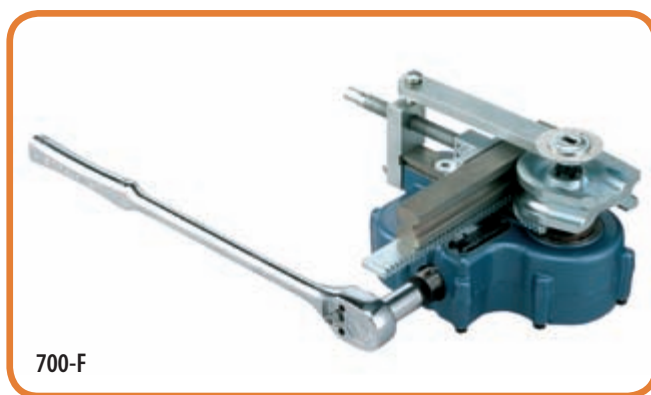
TUBE O.D. (in.)	WALL THICKNESS (in.)	RADIUS TO CENTER OF TUBE (in.)
1/4	.016 to .049	3/4
5/16	.020 to .065	1
3/8	.028 to .083	1-1/4
1/2	.035 to .083	2
5/8	.042 to .083	2-1/2
3/4	.049 to .083	3

Conforms to Federal Specification GGG-B-191b, Type I, Class 2.
Meets ANSI Specification (B31.1) and ASME Section III Nuclear Code.

PRECISION GEAR TUBE BENDER

For 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.

700-F Makes bends up to 180° in stainless steel tubing conforming to Specification MIL-T-6845. Precision construction maintains original diameter of tube within 5% at cross section of bend. Also bends copper, aluminum and other types of tubing. Includes metal tool case. Size of kit 16" x 7" x 6-1/2". Wt. 32.0 lbs.



700-F

Tube Wall Thickness and Bend Radius

TUBE O.D. (in.)	* WALL THICKNESS (in.)	RADIUS TO CENTER OF TUBE (in.)
1/4	.016 to .049	9/16
5/16	.020 to .065	11/16
3/8	.028 to .083	15/16
1/2	.035 to .083	1-1/4
5/8	.042 to .083	1-1/2
3/4	.049 to .083	1-3/4

* In some cases these wall thicknesses can be exceeded for copper and aluminum tubing. Consult factory.

Conforms to Federal Specification GGG-B-191a,
and Interim Amendment No. 2, Type I, Class 1.

Calibration
dial indicates
angle of bend.



45° FLARING TOOLS

45° FLARING TOOLS

For 3/16", 1/4", 5/16", 3/8", 7/16", 1/2" and 5/8" O.D. tubing.

195-FC Flares 7 sizes of tubing. Rugged forged steel slip-on yoke and hardened flaring bar. Positive clamping action of bars prevents tube slippage. Self-centering yoke with swivel-type, hardened steel, chrome finished flaring cone forms better flares with less effort. Design of yoke permits flaring where there is little space between nut and tube end. Satin finish nickel chrome plated. Wt. 2.0 lbs.

296-FC Flares 7 sizes of tubing. Economical, fast-operating tool. Quick slip-on yoke. Easy operating swivel-type, hardened steel, chrome finished cone assures smooth flares. Chrome and black finish. Wt. 1.75 lbs.

195-FC, 296-FC

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	7/16	1/2	5/8
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035	.035

395-FAM

Outside Tube Diameter	(mm)	4	6	8	10	12	15	16
Wall Thickness	(mm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0

45° LARGE SIZE FLARING TOOLS

Flares larger tube sizes. Quick slip-on yoke with hardened steel, chrome finished swivel flaring cone reduces effort. Positive clamping action of flaring bar eliminates tube movement. Nickel chrome finish.

Conforms to Federal Specification GGG-F-451a Type 1, Class 2. Style A.

103-FS For sizes 3/4", 7/8" and 1" O.D. tubing. Wt. 3.75 lbs.

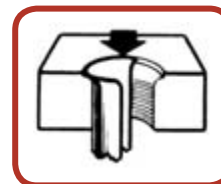
203-FA For sizes 5/8", 3/4", 7/8" and 1-1/8" O.D. tubing. Wt. 3.75 lbs.

375-FS For sizes 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" O.D. tubing. Includes tool case. Wt. 3.75 lbs.

376-FS For sizes 1/2", 5/8", and 3/4" O.D. tubing. Wt. 2.0 lbs.



SELF GAUGING- Just insert tube flush with top of die for accurate flare size.



FORMS STRONGER FLARES- Stronger flares assured by smooth, even radius formed at base of every flare by engineered chamfer.

Outside Tube Diameter	(in.)	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4	7/8	1	1-1/8
Wall Thickness	(in.)	.025	.028	.035	.035	.035	.035	.035	.049	.049	.049	.058	.058

HI-DUTY® 45° FLARING TOOL

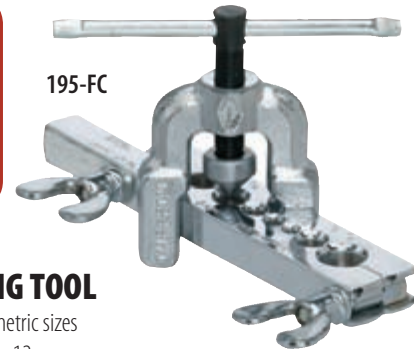
For 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing.

300-FB Hardened steel, chrome finished cone makes exceptionally smooth, high strength flares with a radius at base of flare – instead of the sharp angle formed by ordinary tools. Slip-on yoke permits use in tight quarters, allows flaring where there is little space between nut and tube end. New feed screw design provides smoother, easier operation. Positive gripping and self-gauging of tube for exact flare size. Sliding die blocks lock in place by lever clamp action to ensure even dispersal of force around full diameter of tube for superior grip. Wt. 1.6 lbs.

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035



296-FC



195-FC

45° METRIC SIZE FLARING TOOL

395-FAM Same as 195-FC except for metric sizes 4 mm, 6 mm, 8 mm, 10 mm, 12 mm, 15 mm and 16 mm O.D. tubing.



103-FS



SELF GAUGING- Just insert tube flush with top of die for accurate flare size.



FORMS STRONGER FLARES- Stronger flares assured by smooth, even radius formed at base of every flare by engineered chamfer.

45° ROL-AIR™ FLARING TOOLS

45° ROL-AIR™ FLARING TOOL

Flares and burnishes 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing.

500-FC Faceted, hardened steel, chrome finished cone rolls out perfect 45° flares above die block, and automatically burnishes flare face reducing the need for deburring. Original wall thickness is maintained at base of flare. Slip-on yoke permits use in tight quarters, where there is little space between nut and tube end. Larger handle, with better leverage, and precision threads on feed screw make flaring effortless. Heat treated dies grip tubing without scoring. Satin chrome and black finish. Wt. 1.5 lbs.

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035



500-FC

METRIC SIZE 45° ROL-AIR™ FLARING TOOL

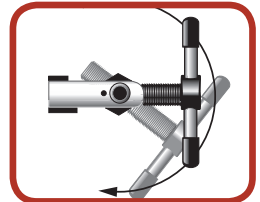
500-FCM Same as 500-FC except for metric size tubing 6 mm, 8 mm, 10 mm, 12 mm, 15 mm and 16 mm O.D.

Outside Tube Diameter	(mm)	6	8	10	12	15	16
Wall Thickness	(mm)	1.0	1.0	1.0	1.0	1.0	1.0

WORKS WITH
R-410A



Flares rolled out above die bar by super-smooth faceted cone. Makes stronger flares.



Unique detention mechanism for rapid engagement and release of die blocks.

"GRABBER"™ ROL-AIR™ 45° FLARING TOOL

Universal application. Adjustable opening holds all sizes.

Flares and burnishes 3/16" to 5/8" (4.75 mm to 16 mm) O.D. tubing.

525-F Unique, self-adjusting, tube holding mechanism permits flaring any size tubing within the range of 3/16" to 5/8" (4.75 mm to 16 mm) O.D. Innovative, single-opening design is more compact and easier to use than conventional multi-opening flaring bars. Faceted, hardened steel, chrome finished cone rolls out and burnishes perfect 45° flare above the tube-holding mechanism reducing need for deburring. Original wall thickness is maintained at base of flare. Slip-on self-centering yoke permits use in tight quarters. Large handle, with better leverage, and precision threads on feed screw make flaring effortless. High quality construction with satin chrome and black finish. Wt. 1.75 lbs.



Flares rolled out above die bar by super-smooth faceted cone. Makes stronger, highly polished flares.

WORKS WITH
R-410A



525-F

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035

Outside Tube Diameter	(mm)	4.75	6	8	10	12	15	16
Wall Thickness	(mm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0

- (1) Insert tubing into adjustable opening of tube-holding assembly. Position end of tubing approximately 1/8" above the surface of holder.
- (2) Tighten clamp screw approximately 1/2 to 3/4 of a turn beyond free travel position to secure tubing.
- (3) Be certain flaring cone surface is oiled. Slip yoke over tube-holding assembly centering on tubing. Twist yoke clockwise to lock in position. Turn yoke handle clockwise to flare.



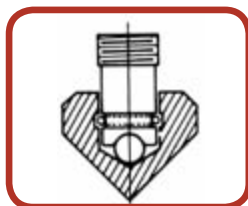
45° DOUBLE FLARING TOOLS

45° DOUBLE FLARING TOOL

For 3/16", 1/4", 5/16", 3/8" and 1/2" O.D. tubing.

93-FB Recommended for Bundy and other annealed soft steel tubing (wall thickness to .035"). Also makes single or double flares in soft copper or aluminum tubing. Small, lightweight, easy to handle. Steel yoke; swivel-type hardened steel, chrome finished flaring cone. Bar provides positive grip of tubing. Includes tool case. Wt. 3.0 lbs.

Conforms to Federal Specification GGG-F-451a, Type 1, Class 2, Style A.



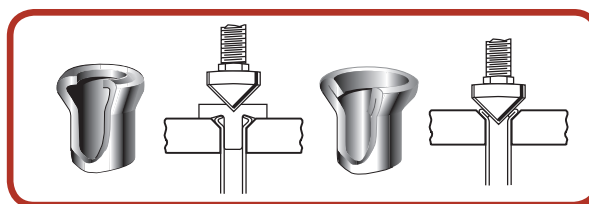
SWIVEL-TYPE BALL BEARING CONE -
Ball thrust bearing in flaring cone minimizes friction, makes operation easier.



93-FB



93-FB

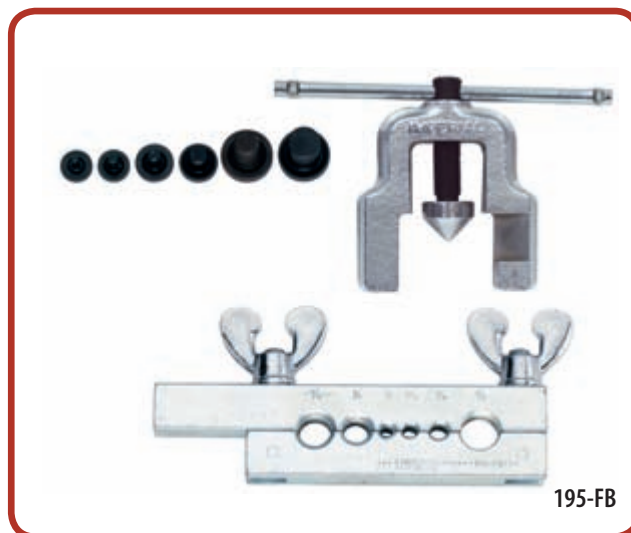


DOUBLE FLARING ADAPTERS-
Screw down flaring cone with proper size adapter in tube. Retract cone, remove adapter, complete flare.

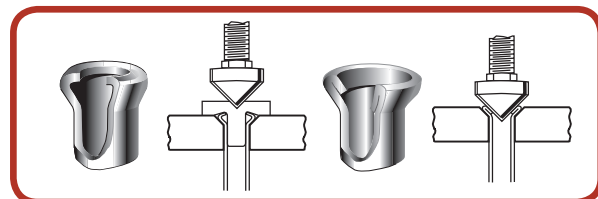
45° DOUBLE FLARING TOOL

For 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.

195-FB Designed for automotive air-conditioning service. Makes double flares in soft copper or aluminum tubing (wall thickness to .035"). Easy operating, ball bearing swivel-type hardened steel flaring cone with chrome finish. Quick slip-on yoke. Flaring bar offers positive grip of tubing. Also makes single flares. Includes metal tool case. Wt. 5.5 lbs.

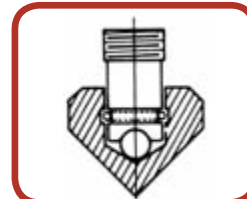


195-FB



DOUBLE FLARING ADAPTERS-
Screw down flaring cone with proper size adapter in tube. Retract cone, remove adapter, complete flare.

SWIVEL-TYPE BALL BEARING CONE -
Ball thrust bearing in flaring cone minimizes friction, makes operation easier.



37° FLARING TOOLS

37° FLARING TOOL

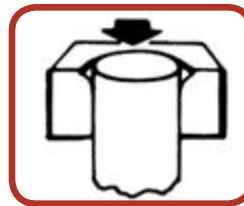
For 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing.

437-FB For use with soft copper, aluminum and brass tubing. Hardened steel, chrome finished cone makes exceptionally smooth, high-strength flares with a radius at base of flare – instead of the sharp angle formed by ordinary tools. Slip-on yoke permits use in tight quarters, allows flaring where there is little space between nut and tube end. New feed screw design provides smooth, easier operation. Positive gripping and self-gauging of tube for exact flare size. Sliding die blocks lock in place by clamp action. Satin chrome and black finish. Wt. 1.75 lbs.

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.032	.032	.032	.032	.035	.035



FORMS STRONGER FLARES-
Stronger flares assured by smooth, even radius formed at base of every flare by engineered chamfer.



437-FB

SELF GAUGING- Just insert tube flush with top of die for accurate flare size.

37° ROL-AIR™ FLARING TOOL

For 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing.

507-FB For use with soft copper, aluminum and brass tubing. Faceted, hardened steel chrome finished cone rolls out perfect 37° flares above die block – then automatically burnishes flare face. Original wall thickness is maintained at base of flare. Slip-on yoke permits use in tight quarters where there is little space between nut and tube end. Larger handle, with better leverage, and precision threads on feed screw make flaring effortless. Heat treated dies firmly grip tubing. Satin chrome and black finish. Wt. 1.75 lbs.

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.032	.032	.032	.032	.035	.035



507-FB



Flares rolled out above die bar by super-smooth faceted cone. Makes stronger, highly polished flares.

METRIC SIZE 37° ROL-AIR™ FLARING TOOL

507-FBM Same as 507-FB except for metric sizes
6 mm, 8 mm, 10 mm, 12 mm, 15 mm and 16 mm O.D. tubing.

Outside Tube Diameter	(mm)	6	8	10	12	15	16
Wall Thickness	(mm)	1.0	1.0	1.0	1.0	1.0	1.0

37° FLARING TOOLS

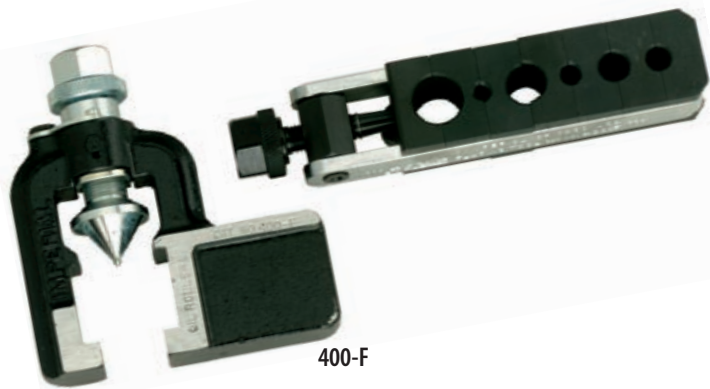
37° ROL-AIR™ FLARING TOOLS

For 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing.

400-F Forms 37° flares to government specifications in steel, stainless steel (including MIL-T-6845), titanium and other metal tubing. Positive stop gauge assures correct size of flare. Special burnishing action polishes flare face. Three rollers in flaring cone roll out 37° flare above die block. Roller action cuts effort required; maintains original wall thickness - eliminates stress concentration. Extension on yoke for clamping in vise. Satin chrome and black finish. Includes tool case. Wt. 2.5 lbs.

401-FA Reaming yoke for 1/4" to 5/8" O.D. tubing. Recommended for use with steel and stainless steel tubing for proper flaring. Wt. 0.7 lbs.

402-FA Flaring and reaming kit. Contains No. 400-F Flaring Tool and No. 401-FA Reaming Yoke for 1/4" to 5/8" O.D. tubing. Includes tool case. Wt. 3.2 lbs. Conforms to Federal Specification GGG-F-451a. Type 1, Class 1, Style A.



400-F

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.035	.049	.049	.065	.065	.065



Feed release and burnishing mechanism. Flare control gauge.



3 rollers in flaring cone. Flare formed above die block.



401-FA

Feed screw controls depth of reaming.



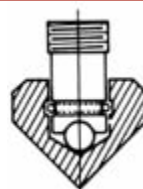
402-FA

37° HEAVY-DUTY FLARING TOOL

For 1/8", 3/16", 1/4", 5/16", 3/8" and 1/2" O.D. tubing.

447-F Forms 37° flares in annealed stainless steel (MIL-T-6345 or AMS5566), cold drawn stainless steel and annealed copper or aluminum tubing. Built to withstand continuous rugged service. Ball thrust bearing mechanism reduces effort required. Hardened tool steel die features non-slip grip of tubing, even after repetitive flaring. Bar has vise extension. Wt. 3.25 lbs.

Outside Tube Diameter	(in.)	1/8	3/16	1/4	5/16	3/8	1/2
Wall Thickness	(in.)	.032	.032	.035	.049	.049	.049



SWIVEL-TYPE BALL BEARING CONE - Ball thrust bearing in flaring cone minimizes friction, makes operation easier.



447-F

37° FLARING TOOLS

LARGE SIZE 37° ROL-AIR™ FLARING TOOLS

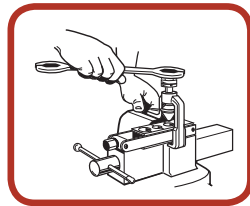
For 3/4", 7/8", 1", 1-1/4", 1-1/2" and 2" O.D. tubing.

Three cylinders in flaring cone roll out 37° flare above die block. Flares soft steel, copper, aluminum and fully annealed stainless steel tubing. Roller action reduces effort required; maintains original wall thickness; eliminates stress concentration. Feed release and burnishing action. Vise clamp extension on yoke. Heat treated dies clamp tubing without marking it. Satin chrome and black finish. Includes metal tool case.

537-F Flares and burnishes 3/4", 7/8", 1" and 1-1/4" O.D. tubing.
Wt. 13.0 lbs.

637-F Flares and burnishes 1-1/4", 1-1/2" and 2" O.D. tubing.
Wt. 13.0 lbs.

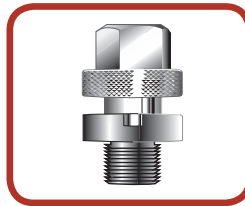
* Conforms to Federal Specification GGG-F-451a, Type 1, Class 1, Style B.



Vise clamp extension.



Flares rolled out above die bar.



Feed release and burnishing mechanism.



537-F

Outside Tube Diameter (in.)	3/4	7/8	1	1-1/4	1-1/2	2
Wall Thickness (in.)	.065	.065	.065	.083	.083	.083

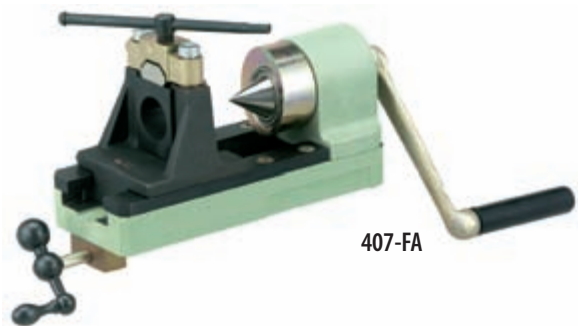
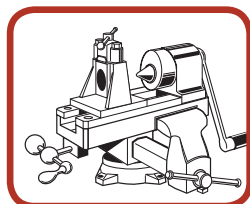
37° PRECISION FLARING TOOL

For 1/8", 3/16", 1/4", 5/16", 3/8", 1/2", 5/8", 3/4", 1", 1-1/4" and 1-1/2" O.D. tubing.

407-FA Precision tool flares (37°) 1/8 hard stainless steel and other tubing to extremely close tolerances. Swivel-head clamp locks tubing in smooth-bore die blocks. Lathe-type tube feed. Flares rolled out by ball-bearing mounted concentric flaring cone. Tool must be clamped in vise. Includes metal tool case.

Facing and deburring attachments not included with 407-FA.

407-F Includes the 407-FA, plus these facing and deburring attachments:
S74460 Internal deburring tool for 1/8" to 1/2" O.D. tubing.
S74455 Internal deburring tool for 5/8" to 1-1/2" O.D. tubing.
S74447 External deburring tool.
S74462 Facing tool.



407-FA

TUBE O.D. (in.)	* WALL THICKNESS (in.)
1/8	.020, .028
3/16	.010, .028
1/4	.016, .028, .035
5/16	.035
3/8	.028, .035
1/2	.035, .049
5/8	.035, .049
3/4	.028, .035, .049
1	.028, .035
1-1/4	.035, .049
1-1/2	.035, .049, .065

* In some cases these wall thicknesses can be exceeded when flaring aluminum, copper or soft steel tubing. Consult factory.

FLARING & SWAGING TOOLS

45° & 37° PRODUCTION FLARING AND SWAGING TOOL

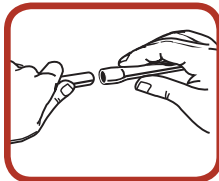
For 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing.

555-FS Flares and swages 6 sizes of soft copper, aluminum or brass tubing. Makes both 45° and 37° single flares. Fast cam lever operation. Portable. Can be clamped in vise or bolted to bench. Change sizes quickly. Built in gauge for accurate flare size or swage depth. Unique jaws provide a positive non-slip grip on tubing. Wt. 6.5 lbs.

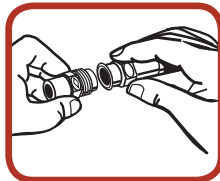
Replacement parts:

- 560-S-03** 3/16" Swaging adapter.
- 560-S-04** 1/4" Swaging adapter.
- 560-S-05** 5/16" Swaging adapter.
- 560-S-06** 3/8" Swaging adapter.
- 560-S-08** 1/2" Swaging adapter.
- 560-S-10** 5/8" Swaging adapter.
- S70348** 45° Flaring cone.
- S70349** 37° Flaring cone.
- S8711201** Set of replacement dies.

Outside Tube Diameter	(in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness	(in.)	.028	.035	.035	.035	.035	.035



Swages 6 sizes.



Makes 45° & 37° flares.



555-FS

METRIC BUBBLE FLARING TOOL

For soft steel or Bundy tubing 4.75 mm (3/16"), 6 mm, 8 mm and 10 mm O.D.

293-F Forms international standard bubble flare in one fast operation. Flares metric hydraulic brake lines used on European, Japanese and American automobiles and light trucks. This unique design makes flares on 4 sizes of tubing: 4.75 mm (3/16"), 6 mm, 8 mm and 10 mm O.D. Will flare soft double-wall steel tubing with a wall thickness up to .028". Can also be used with soft copper and aluminum tubing. Includes tool case.

Replacement parts:

- S8771801** 4.75 mm (3/16") adapter.
- S8771701** 6 mm adapter.
- S8771601** 8 mm adapter.
- S8771301** 10 mm adapter.
- S8694401** Wing nut.



293-F



METRIC BUBBLE FLARING -
Just insert tube flush with top of die for accurate flare. With proper adapter size attached, screw down flaring cone until adapter strikes flaring bar surface. Bubble flare is complete.

FLARING & SWAGING TOOLS

FLARING (45°) & SWAGING TOOL

For 1/8" to 3/4" (4 mm to 22 mm) O.D. tubing.

275-FS Flares and swages. Converts quickly. Screw-type feed. Ideal for use in close quarters. Two bars included cover 9 sizes. Swivel-type swaging adapters and flaring cone are hardened steel, chrome finished for easy operation. Self-centering, slip-on forged steel yoke. Includes tool case. Wt. 3.5 lbs. Flares 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" O.D. Includes 5 swage adapters for 7 tube sizes: 3/16", 1/4", 5/16", 3/8", 1/2", 5/8", 3/4" O.D.

Replacement parts: **278-FS-03X04X06** Adapter 3/16", 1/4", 3/8".
278-FS-05 Adapter 5/16".
278-FS-08 Adapter 1/2".

278-FS-10 Adapter 5/8".
278-FS-12 Adapter 3/4".
S38600 Flaring Cone.



275-FS

275-FSM Metric flaring and swaging tool. Same as 275-FS except for metric sizes 4 mm, 6 mm, 8 mm, 10 mm, 12 mm, 14 mm, 15 mm, 16 mm, 18 mm and 22 mm O.D. tubing. Includes tool case. Wt. 3.5 lbs.

Replacement parts: **278-FSM-4-6-10** Adapter 4 mm, 6 mm, 10 mm.
278-FSM-8 Adapter 8 mm.
278-FSM-12 Adapter 12 mm.
278-FSM-14 Adapter 14 mm.

278-FSM-15 Adapter 15 mm.
278-FSM-16 Adapter 16 mm.
278-FSM-18 Adapter 18 mm.
278-FSM-22 Adapter 22 mm.
S38600 Flaring Cone.



275-FS

Outside Tube Diameter	(in.)	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4
Wall Thickness	(in.)	.020	.028	.035	.035	.035	.035	.035	.035	.035

Outside Tube Diameter	(mm)	4	6	8	10	12	14	15	16	18	22
Wall Thickness	(mm)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

45° FLARING, SWAGING AND CUTTING KIT

For soft copper, aluminum, steel, stainless steel and brass tubing.

275-FSC Kit contains a TC-1000 tube cutter for 1/8" to 1-1/8" O.D. tubing and 275-FS 45° flaring and swaging tool. Includes tool case. Wt. 3.0 lbs.

Flares: 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" O.D. tubing.

Swages: 3/16", 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.

45° DOUBLE FLARING, SWAGING AND CUTTING KIT

275-FSCD Kit contains 275-FS, TC-1000, and double flaring adapters for 3/16", 1/4", 5/16", 3/8" and 1/2" O.D. tubing. Includes tool case.



275-FSC

FLARING & SWAGING TOOLS

175-EX XPANDR™ SWAGING/EXPANDING KIT

- Easily expands tube for braze or soldered joints in seconds.
- Floating jaw head design is self-centering for fast, accurate alignment.
- Re-rounds deformed tube ends.
- Accurate joints in seconds without using fittings.
- For soft copper and soft thin wall steel and stainless steel tubing.
- Save 60-70% of time over conventional swaging tools.
- Reduces soldering by 50% over standard fittings.
- Meets ARI tube insertion recommendations.
- Long life with high alloy hardened steel jaw segments.
- XpandR™ Tool comes with non-slip, ergonomically designed grips.
- Includes 5 heads: 3/8", 1/2", 5/8", 3/4" and 7/8".
- Includes metal tool case.

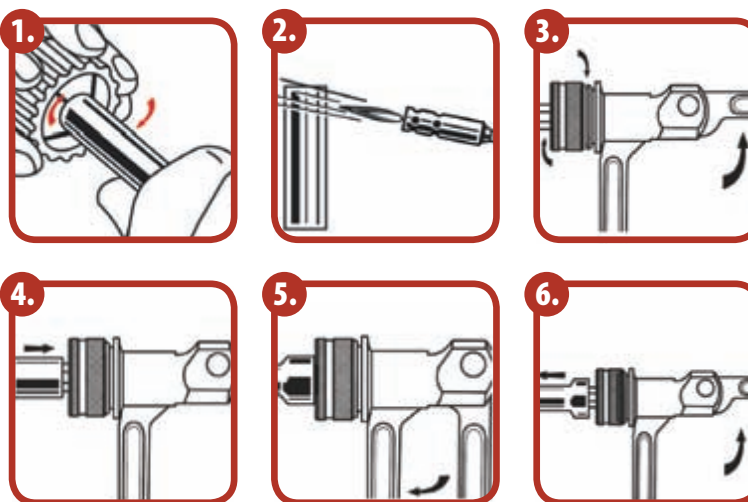


175-EX



SIX EASY STEPS:

1. Deburr inside of tube.
2. To create perfectly centered capillary sockets for soldering or brazing, you must use soft copper or fully anneal end of tube to be expanded.
3. Pull XpandR™ handle up to 90-degree position. Maintain this position as you screw the appropriate size head over the center-punch and tighten.
4. Insert the end of the tube over the XpandR™ head completely.
5. Pull the lever completely down.
6. Return the lever to the 90-degree position. Remove expanded tube.



175-EX KIT INCLUDES

175EXP	XpandR™ Pliers
175EXC	XpandR™ Case
175EX06	3/8" head
175EX08	1/2" head
175EX10	5/8" head
175EX12	3/4" head
175EX14	7/8" head

You may order kit items separately. Kit wt. 20 lbs.

ADDITIONAL HEAD SIZES AVAILABLE:

175EX16	1" head
175EX18	1-1/8" head
175EX22	1-3/8" head
175EX26	1-5/8" head

TO RE-ROUND SLIGHTLY DEFORMED TUBE ENDS:

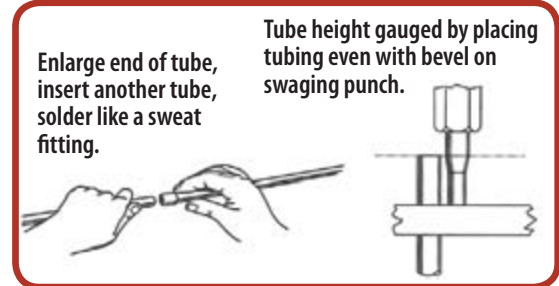
1. Insert deformed tube end to the first groove of head.
2. Pull the lever completely down.
3. Return the lever to the 90-degree position. Remove expanded tube.

SWAGING TOOLS

PUNCH TYPE SWAGING TOOLS

Use these tools for making tubing connections without fittings. Enlarge end of tube, insert another tube of original O.D. size and solder together like a sweat fitting.

- 94-SSP** 3-in-1 swaging tool for 1/2", 5/8" and 7/8" tubing. Wt. 1.0 lbs.
- 95-S** 6-in-1 swaging tool for 3/16", 1/4", 5/16", 3/8", 1/2" and 5/8" O.D. tubing. Hi-alloy steel, heat-treated for rugged use. Hex design for ease of extraction. Precision machined surface for ease of forming.
- 193-S** Vinyl case contains 4 swaging punches for 1/4", 3/8", 1/2" and 5/8" O.D. tubing. Wt. 1.0 lbs.
- 195-SA** Vise-mountable flaring bar and 4 swaging punches for 1/4", 3/8", 1/2" and 5/8" O.D. tubing. Includes metal tool case. Wt. 2.0 lbs.
- S75531** Flaring bar only. Wt. 1.0 lb.



95-S 6 IN 1 SWAGING TOOL

Outside Tube Diameter (in.)	3/16	1/4	5/16	3/8	1/2	5/8
Wall Thickness (in.)	.028	.035	.035	.035	.035	.035

INDIVIDUAL SWAGING TOOLS

PART NO.	TUBE O.D. (in.)	WALL THICKNESS (in.)	WEIGHT (lbs.)
93-S-03	3/16	.028	.20
93-S-04	1/4	.035	.20
93-S-05	5/16	.035	.25
93-S-06	3/8	.035	.25
93-S-08	1/2	.035	.50
93-S-10	5/8	.035	.50
93-S-12	3/4	.035	.75
93-S-14	7/8	.045	1.0

45° SWAGING TOOL

For 1/2", 5/8" and 7/8" O.D. tubing.

- 194-S** Screw-type flaring and swaging tool. Far easier to work with in close quarters than punch type tools. Perfect swaging alignment of tube every time. Hardened steel chrome finished adapters change quickly. Includes tool case. Wt. 2.0 lbs.

Replacement parts: 278-FS-08 Adapter 1/2"
278-FS-10 Adapter 5/8"
278-FS-14 Adapter 7/8"



TUBE WORKING KITS

CUTTING AND FLARING KITS

Each kit contains a TC-1000 tube cutter for 1/8" to 1-1/8" O.D. tubing and a 45° or 37° flaring tool. Includes tool case.

PART NO.	TUBE CUTTER	FLARING TOOL	RANGE OF FLARING TOOL (in.)	WEIGHT (lbs.)
120-F	TC-1000	375-FS (45°)	1/8, 3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 5/8, 3/4 O.D.	2.75
122-FA	TC-1000	437-FB (37°)	3/16, 1/4, 5/16, 3/8, 1/2, 5/8 O.D.	2.75
123-FA	TC-1000	300-FB (45°)	3/16, 1/4, 5/16, 3/8, 1/2, 5/8 O.D.	2.75
124-FA	TC-1000	500-FC (45° Rol-Air™)	3/16, 1/4, 5/16, 3/8, 1/2, 5/8 O.D.	2.75
1226-FA	TC-1000	195-FC (45°)	3/16, 1/4, 5/16, 3/8, 7/16, 1/2, 5/8 O.D.	3.0



120-F



TUBE WORKING KITS

45° FLARING, SWAGING AND CUTTING KIT

For soft copper, aluminum, steel, stainless steel and brass tubing.

275-FSC Kit contains a TC-1000 tube cutter for 1/8" to 1-1/8" O.D. tubing and 275-FS 45° flaring and swaging tool. Includes tool case. Wt. 3.0 lbs.

Flares: 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" O.D. tubing.

Swages: 3/16", 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.

45° DOUBLE FLARING, SWAGING AND CUTTING KIT

275-FSCD Kit contains 275-FS, TC-1000, and double flaring adapters for 3/16", 1/4", 5/16", 3/8" and 1/2" O.D. tubing. Includes tool case.



275-FSC

FLAREPRO™ FOUR-IN-ONE FLARING & SWAGING KIT

For copper, aluminum, steel, stainless steel and other metal tubing.

2000-FS Individual size jaw sets are used for positive clamping compactness and operating convenience.

Socket head screws are provided for clamping the jaws to the yoke and feeding the tube forming components. The screws are hand turned for all free travel movement when advancing or retracting.

A hex socket and 3/8" square drive ratchet are furnished for easy operation of the threaded members under load. Tube forming components (flaring cones, double flaring adapters and swaging adapters) are retained on the feed screw by a ball detent mechanism and can be snapped on and off for quick change as required.

The tool is designed to permit hand-held or vise-mounted operation. Includes tool case. Wt. 7.0 lbs.

Flaring - 37° and 45°: Flares soft copper, brass, aluminum, steel and stainless steel in nine tube sizes: 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2", 5/8" and 3/4" O.D. tubing.

Double Flaring - 45° Only: Double flares soft copper, aluminum and steel (Bundy or G.M. to .035 wall) in seven tube sizes: 3/16", 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.

Swaging: Swages soft copper, aluminum and brass in seven tube sizes: 3/16", 1/4", 5/16", 3/8", 1/2", 5/8" and 3/4" O.D. tubing.



2000-FS

Flaring

Outside Tube Diameter (in.)	1/8	3/16	1/4	5/16	3/8	7/16	1/2	5/8	3/4
Wall Thickness (in.)	.020	.028	.035	.035	.035	.035	.035	.049	.049

Swaging

Outside Tube Diameter (in.)	3/16	1/4	5/16	3/8	1/2	5/8	3/4
Wall Thickness (in.)	.028	.035	.035	.035	.035	.035	.035

TUBING TOOL SELECTOR

TUBING TOOL SELECTOR				TUBE MATERIAL							
TOOL	PART NO.	PAGE NO.	SIZE RANGE TUBE O.D. (in.)	ANNEALED GENERAL PURPOSE	COPPER						
					SOFT	TYPE K BENDING TEMPER-HARD	HARD	SOFT	TYPE L BENDING TEMPER-HARD	HARD	TYPE M
Tube Cutters	TC-1000	4	1/8 - 1-1/8	●	●	●	●	●	●	●	●
Metal Tubing	TC-1050	5	1/8 - 5/8	●	●	●	●	●	●	●	●
	TC-1550	3	1/8 - 1-1/8	●	●	●	●	●	●	●	●
	TC-2050	5	3/16 - 7/8	●	●	●	●	●	●	●	●
	TC-3050	5	1/8 - 1-1/8	●	●	●	●	●	●	●	●
	174-F	6	3/8 - 1-1/8	●	●	●	●	●	●	●	●
	206-FB	6	3/8 - 2-5/8	●	●	●	●	●	●	●	●
	227-FA	4	1/8 - 3/4	●	●	●	●	●	●	●	●
	312-FC	4	1/4 - 1-5/8	●	●	●	●	●	●	●	●
	406-FA	6	2 - 4-1/8	●	●	●	●	●	●	●	●
Tube Cutters	206-FBP	6	3/8 - 2-5/8	● (5)	● (5)	● (5)	● (5)	● (5)	● (5)	● (5)	● (5)
Thermoplastic	307-FP	7	1/16 - 1/2 (4)								
Rubber Hose	327-FP	7	1/8 - 13/16 (4)								
Saw Vise	384-FA	6	1/4 - 1-1/2	●	●	●	●	●	●	●	●
Bending Tools	101-F	10	1/4 - 5/8	●	●	●	●	●	●	●	●
	102-F	10	1/4 - 7/8	●	●	●	●	●	●	●	●
	112-F	10	1/4 - 3/8	●	●	●	●	●	●	●	●
	163-F	10	1/4 - 5/8	●	●	●	●	●	●	●	●
	201-F	10	1/4 - 7/8	●	●	●	●	●	●	●	●
	260-FHA	14	1/4 - 7/8	●	●	●	●	●	●	●	●
	270-F	15	3/8 - 1-1/8	●	●	●	●	●	●	●	●
	350-FHA	14	1/4 - 3/4	●	●	●	●	●	●	●	●
	360-FHA	14	3/8 - 3/4	●	●	●	●	●	●	●	●
	364-FH	11	1/8 - 3/16	●	●	●	●	●	●	●	●
	364-FHA	11	1/4 - 1 (3)	●	●	●	●	●	●	●	●
	364-FHAM	11	6 - 12 mm	●	●	●	●	●	●	●	●
	364-FHB	11	1/4 - 1/2	●	●	●	●	●	●	●	●
	364-FHBM	11	6 - 12 mm	●	●	●	●	●	●	●	●
	367-FH	10	1/8, 3/16, 1/4	●	●	●	●	●	●	●	●
	368-FH	10	3/16, 1/4, 5/16, 3/8	●	●	●	●	●	●	●	●
	370-FH	10	3/16, 1/4, 3/8, 1/2	●	●	●	●	●	●	●	●
	470-FH	9	3/16, 1/4, 5/16, 3/8	●	●	●	●	●	●	●	●
	564-FH	13	3/8, 1/2	●	●	●	●	●	●	●	●
	600-F	16	1/4 - 3/4	●	●	●	●	●	●	●	●
	664-FH	12	1/4, 3/8, 1/2	●	●	●	●	●	●	●	●
	664-FH(Metric)	12	6 - 12 mm	●	●	●	●	●	●	●	●
	700-F	16	1/4 - 3/4	●	●	●	●	●	●	●	●
37° Flaring Tool	400-F	21	3/16 - 5/8	●	●	●	●	●	●	●	(2)
	407-FA	22	1/8 - 1-1/2	●	●	●	●	●	●	●	(2)
	437-FB	20	3/16 - 5/8	●	●	●	●	●	●	●	(2)
	447-F	21	1/8 - 1/2	●	●	●	●	●	●	●	(2)
	507-FB	20	3/16 - 5/8	●	●	●	●	●	●	●	(2)
	507-FBM	20	6 - 16 mm	●	●	●	●	●	●	●	(2)
	555-FS	23	3/16 - 5/8	●	●	●	●	●	●	●	(2)
	537-F	22	3/4 - 1-1/4	●	●	●	●	●	●	●	(2)
	637-F	22	1-1/4 - 2	●	●	●	●	●	●	●	(2)
	2000-FS	28	1/8 - 3/4	●	●	●	●	●	●	●	(2)
45° Flaring Tool	103-FS	17	3/4 - 1	●	●	●	●	●	●	●	(2)
	195-FC	17	3/16 - 5/8	●	●	●	●	●	●	●	(2)
	203-FA	17	5/8 - 1-1/8	●	●	●	●	●	●	●	(2)
	275-FS	24	1/8 - 3/4	●	●	●	●	●	●	●	(2)
	275-FSM	24	4 - 22 mm	●	●	●	●	●	●	●	(2)
	296-FC	17	3/16 - 5/8	●	●	●	●	●	●	●	(2)
	300-FB	17	3/16 - 5/8	●	●	●	●	●	●	●	(2)
	375-FS	17	1/8 - 3/4	●	●	●	●	●	●	●	(2)
	376-FS	17	1/2 - 3/4	●	●	●	●	●	●	●	(2)
	395-FAM	17	4 - 16 mm	●	●	●	●	●	●	●	(2)
	500-FC	18	3/16 - 5/8	●	●	●	●	●	●	●	(2)
	500-FCM	18	6 - 16 mm	●	●	●	●	●	●	●	(2)
	525-F	18	3/16 - 5/8	●	●	●	●	●	●	●	(2)
			4.75 - 16 mm	●	●	●	●	●	●	●	(2)
	555-FS	23	3/16 - 5/8	●	●	●	●	●	●	●	(2)
	2000-FS	28	1/8 - 3/4	●	●	●	●	●	●	●	(2)
45° Double Flaring Tools	93-FB	19	3/16 - 1/2	●	●	●	●	●	●	●	●
	195-FB	19	1/4 - 3/4	●	●	●	●	●	●	●	●
	2000-FS	28	3/16 - 3/4	●	●	●	●	●	●	●	●
Reaming and Deburring Tools	208-F	32	3/16 - 1-1/2	●	●	●	●	●	●	●	●
	208-FSS	32	3/16 - 1-1/2	●	●	●	●	●	●	●	●
	210-F	32		●	●	●	●	●	●	●	●
Tube Constrictor	TC-1020	4	1/8 - 1-1/8	●	●	●	●	●	●	●	●
Swaging Tools	93-S	26	3/16 - 7/8	●	●	●	●	●	●	●	●
	94-SSP	26	1/2, 5/8, 7/8	●	●	●	●	●	●	●	●
	95-S	26	3/16 - 5/8	●	●	●	●	●	●	●	●
	193-S	26	1/4 - 5/8	●	●	●	●	●	●	●	●
	194-S	26	1/2 - 7/8	●	●	●	●	●	●	●	●
	195-SA	26	1/4 - 5/8	●	●	●	●	●	●	●	●
	275-FS	24	3/16 - 3/4	●	●	●	●	●	●	●	●
	555-FS	23	3/16 - 5/8	●	●	●	●	●	●	●	●
	2000-FS	28	3/16 - 3/4	●	●	●	●	●	●	●	●
Metric Bubble Flaring Tool	293-F	23	4.75 - 10 mm	●	●	●	●	●	●	●	●

(1) Heavy duty cutting wheel No. S75046 is recommended for continuous service with steel, stainless steel, monel, titanium and hard temper copper tubing.

(2) Type M tubing should be torch annealed before flaring.

(3) No.364-FHA, 5/8" - 1" size should be used only with annealed (softened) non-ferrous tubing.

(4) Not to be used with metal reinforced hose.

(5) When cutting metallic tubing you must switch to standard wheel furnished.

TUBING TOOL SELECTOR

TUBING TOOL SELECTOR				TUBE MATERIAL						
TOOL	PART NO.	PAGE NO.	SIZE RANGE TUBE O.D. (in.)	ANNEALED ALUMINUM (SOFT)	ANNEALED BRASS (SOFT)	SAE 1020 STEEL (SOFT)	BRAZED- BUNDY WELD GM STEEL	STAINLESS STEEL ANNEALED (SOFT)	STAINLESS STEEL (1/8 HARD)	TITANIUM
Tube Cutters	TC-1000	4	1/8 - 1-1/8	●	●	●	●	(1)	(1)	(1)
Metal Tubing	TC-1050	5	1/8 - 5/8	●	●	●	●			
	TC-1550	3	1/8 - 1-1/8	●	●	●	●	(1)	(1)	(1)
	TC-2050	5	3/16 - 7/8	●	●	●	●	(1)	(1)	(1)
	TC-3050	5	1/8 - 1-1/8	●	●	●	●	(1)	(1)	(1)
	174-F	6	3/8 - 1-1/8	●	●	●	●	●	●	●
	206-FB	6	3/8 - 2-5/8	●	●	●	●			
	227-FA	4	1/8 - 3/4	●	●	●	●	(1)	(1)	(1)
	312-FC	4	1/4 - 1-5/8	●	●	●	●	●	●	●
	406-FA	6	2 - 4-1/8	●	●	●	●	●	●	●
Tube Cutters	206-FBP	6	3/8 - 2-5/8	●(5)	●(5)	●(5)	●(5)	●(5)	●(5)	●(5)
Thermoplastic	307-FP	7	1/16 - 1/2 (4)							
Rubber Hose	327-FP	7	1/8 - 13/16 (4)							
Saw Vise	384-FA	6	1/8 - 1-1/2	●	●	●	●	●	●	●
Bending Tools	101-F	10	1/4 - 5/8	●	●					
	102-F	10	1/4 - 7/8	●	●					
	112-F	10	1/4 - 3/8	●	●					
	163-F	10	1/4 - 5/8	●	●					
	201-F	10	1/4 - 7/8	●	●					
	260-FHA	14	1/4 - 7/8	●	●	●	●			
	270-F	15	3/8 - 1-1/8	●	●	●	●	●	●	●
	350-FHA	14	1/4 - 3/4	●	●	●	●			
	360-FHA	14	3/8 - 3/4	●	●					
	364-FH	11	1/8 - 3/16	●	●	●	●	●		
	364-FHA	11	1/4 - 1 (3)	●	●	●	●	●		
	364-FHAM	11	6 - 12 mm	●	●	●	●	●		
	364-FHB	11	1/4 - 1/2	●	●	●	●	●		
	364-FHBM	11	6 - 12 mm	●	●	●	●	●		
	367-FH	10	1/8, 3/16, 1/4	●	●	●	●			
	368-FH	10	3/16, 1/4, 5/16, 3/8	●	●	●	●			
	370-FH	10	3/16, 1/4, 3/8, 1/2	●	●	●	●			
	470-FH	9	3/16, 1/4, 5/16, 3/8	●	●	●	●			
	564-FH	13	3/8, 1/2	●	●	●	●	●	●	●
	600-F	16	1/4 - 3/4	●	●	●	●	●	●	●
	664-FH	12	1/4, 3/8, 1/2	●	●	●	●	●	●	●
	664-FH(Metric)	12	6 - 12 mm	●	●	●	●	●	●	●
	700-F	16	1/4 - 3/4	●	●	●	●	●	●	●
37° Flaring Tool	400-F	21	3/16 - 5/8	●	●	●	●	●	●	●
	407-FA	22	1/8 - 1-1/2	●	●	●	●	●	●	●
	437-FB	20	3/16 - 5/8	●	●					
	447-F	21	1/8 - 1/2	●	●	●	●	●	●	●
	507-FB	20	3/16 - 5/8	●	●					
	507-FBM	20	6 - 16 mm	●	●					
	555-FS	23	3/16 - 5/8	●	●					
	537-F	22	3/4 - 1-1/4	●	●	●	●	●	●	●
	637-F	22	1-1/4 - 2	●	●	●	●	●	●	●
	2000-FS	28	1/8 - 3/4	●	●	●	●	●	●	●
45° Flaring Tool	103-FS	17	3/4 - 1	●	●					
	195-FC	17	3/16 - 5/8	●	●					
	203-FA	17	5/8 - 1-1/8	●	●					
	275-FS	24	1/8 - 3/4	●	●					
	275-FSM	24	4 - 22 mm	●	●					
	296-FC	17	3/16 - 5/8	●	●					
	300-FB	17	3/16 - 5/8	●	●					
	375-FS	17	1/8 - 3/4	●	●					
	376-FS	17	1/2 - 3/4	●	●					
	395-FAM	17	4 - 16 mm	●	●					
	500-FC	18	3/16 - 5/8	●	●					
	500-FCM	18	6 - 16 mm	●	●					
	525-F	18	3/16 - 5/8 4.75 - 16 mm	●	●					
	555-F	23	3/16 - 5/8	●	●					
	2000-FS	28	1/8 - 3/4	●	●	●	●	●	●	●
45° Double	93-FB	19	3/16 - 1/2	●	●	●	●			
Flaring Tools	195-FB	19	1/4 - 3/4	●	●					
	2000-FS	28	3/16 - 3/4	●	●	●	●			
Reaming and	208-F	32	3/16 - 1-1/2	●	●					
Deburring Tools	208-FSS	32	3/16 - 1-1/2	●	●	●	●	●	●	●
	210-F	32		●	●	●	●	●	●	●
Tube Constrictor	TC-1020	4	1/8 - 1-1/8	●	●					
Swaging Tools	93-S	26	3/16 - 7/8	●	●					
	94-SSP	26	1/2, 5/8, 7/8	●	●					
	95-S	26	3/16 - 5/8	●	●					
	193-S	26	1/4 - 5/8	●	●					
	194-S	26	1/2 - 7/8	●	●					
	195-SA	26	1/4 - 5/8	●	●					
	275-FS	24	3/16 - 3/4	●	●					
	555-FS	23	3/16 - 5/8	●	●					
	2000-FS	28	3/16 - 3/4	●	●					
Metric Bubble	293-F	23	4.75 - 10 mm	●	●	●	●			
Flaring Tool										

(1) Heavy duty cutting wheel No. S75046 is recommended for continuous service with steel, stainless steel, monel, titanium and hard temper copper tubing.

(2) Type M tubing should be torch annealed before flaring.

(3) No.364-FHA, 5/8" - 1" size should be used only with annealed (softened) non-ferrous tubing.

(4) Not to be used with metal reinforced hose.

(5) When cutting metallic tubing you must switch to standard wheel furnished.

TESTING AND SERVICE TOOLS

PINCH-OFF TOOL

For 1/4" to 1/2" O.D. tubing.

Temporarily closes soft copper, aluminum or steel tubing so no liquid or gas passes sealed part. Lets you disconnect line while making repairs without loss of liquid or gas. Forming holes for 1/4", 5/16", 3/8" and 1/2" O.D. tubing.

105-FF Pinch-Off Tool for 1/4", 5/16", 3/8" and 1/2" O.D. tubing. Wt. .75 lbs.



105-FF

TUBING TEST PLUGS

For 1/4" to 1-5/8" O.D. tubing.

For temporary shut-off of tubing without pinching it off or installing a valve. Especially handy for plumbing, heating, refrigeration and instrumentation when troubleshooting for leaks. Lightweight, fast acting, dependable. Insert plug in tube end and tighten wing nut. Expander seals tube and holds pressures to 100 PSI.

142-F 3-Pc. test plug kit for 1/2", 5/8" and 7/8" O.D. tubing. Wt. .5 lbs.



140-F-06

INDIVIDUAL TEST PLUGS

PART NO.	TUBE O.D. (in.)	MIN I.D. DIA. (in.)	MAX I.D. DIA. (in.)	WEIGHT EACH (oz.)	REPLACEMENT SLEEVE
140-F-04	1/4	.171	.190	.5	S62641
140-F-06	3/8	.265	.315	.75	S62648
140-F-08	1/2	.390	.436	1.0	S62655
140-F-10	5/8	.515	.545	1.5	S62661
140-F-12	3/4	.640	.745	2.0	S62666
140-F-14	7/8	.734	.995	3.0	S66434
140-F-18	1-1/8	.984	1.245	4.0	S66435
140-F-22	1-3/8	1.218	1.270	4.0	S71174
140-F-26	1-5/8	1.453	1.505	5.0	S71177



142-F

45° REFACING TOOL

For 1/4", 5/16", 3/8" and 1/2" SAE 45° flare fittings.

Makes nicked or marred seats on brass and other nonferrous fittings and valves as good as new. Precision feed. Replaceable cutter.

345-FA With cutter and adapters for 1/4", 5/16", 3/8", 1/2" and 5/8" fittings. Includes metal tool case. Wt. 2.0 lbs.

Replacement Parts:

- 346-F-04** Adapter 1/4"
- 346-F-05** Adapter 5/16"
- 346-F-06** Adapter 3/8"
- 346-F-08** Adapter 1/2"
- 346-F-10** Adapter 5/8"
- S63412** Cutter

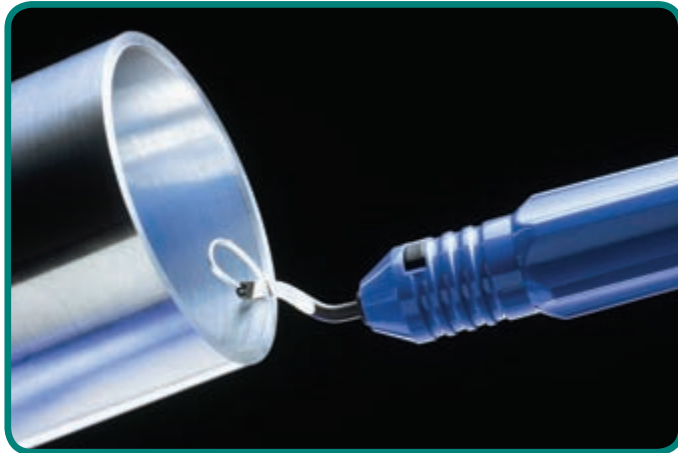


345-FA

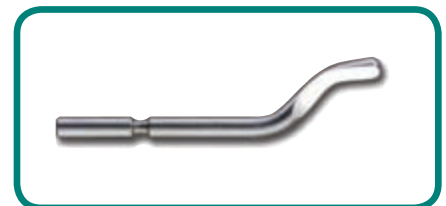
TUBE DEBURRING

DEBURRING TOOL

210-F The rotary style blade is perfect for removing burrs from holes and edges. Large ergonomic handle reduces user fatigue. Ships complete with two heavy duty blades - extra blade stores inside the handle. For copper, steel, aluminum, zinc, cast iron, brass and plastic tubing. Length 5-3/4". Wt. 1.5 oz.



210-F



S10001087 -Deburr Replacement Blade

INNER-OUTER REAMING AND DEBURRING TOOLS

For 3/16" to 1-1/2" (5 mm to 38 mm) O.D. tubing.

Reams both inside and outside edges of tube at a 60° included angle with 3 hardened cutting blades. Tough die cast body. Deburrs both clockwise and counterclockwise. Fluted body is shaped to fit comfortably in palm.

208-F Reamer for copper, aluminum and brass tubing. Hardened steel cutter blades. Blue finish. Wt. .63 lbs.

208-FSS Reamer for aircraft grade stainless steel tubing, hard or soft copper, aluminum, brass and steel tubing. Tungsten hardened tool steel cutter blades. Black finish. Wt. .63 lbs.



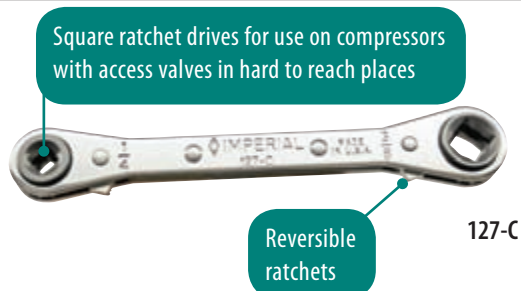
208-F

WRENCHES

WRENCHES

For Refrigeration and Air Conditioning Service.

- 127-C** Compressor access valve wrench. Chrome plated. Has 1/4", 3/8", 3/16" and 5/16" square drive ratchets and is specially designed for use on compressors with access valves in hard to reach places. Reversible ratchets.
- 127-C0** Same as 127-C except with unique 25° offset that provides additional convenience in hard to reach places.
- 124-C** Combination wrench with the four sizes most needed for servicing air-conditioning and refrigerator equipment:
- 9/16" hex for dust cap on access valves and plug oil check on compressor.
 - 1/2" hex for compressor mounting bolts.
 - 1/4" square for valve stem and service valves and old style compressor valves.
 - 3/16" square for valve refrigerant charging tanks.
- 125-C** Rugged, steel forged wrench with four sizes covering almost any application. Ratchet has 1/4" square drive on one end; other end has 3/16" and 5/16" square openings, plus 9/16" hex opening.
- 126-C** Economy compressor access valve wrench. Chrome plated. Has 1/4", 3/8", 3/16" and 5/16" square drive ratchets and is specially designed for use on compressors with access valves in hard to reach places. Reversible ratchets.



127-C



127-C0



124-C



125-C



126-C

IMPERIAL® TOOL BAG

15-POCKET PROFESSIONAL TOOL BAG

TB-52 Tool Bag

- 8"W x 16"L x 11"D.
- Double layered ballistic nylon.
- Wide opening mouth.
- Padded handles and 48" shoulder strap.
- Designed to hold tools.
- Tools not included!



TB-52

RATCHET WRENCHES

195-F KWIK-TITE® RATCHET WRENCHES

For 5/16" to 2-1/4" and 7 mm to 32 mm hex sizes.

The Kwik-Tite ratchet wrench speeds installation of tube fittings and valves, hex nuts, bolts and fasteners. This unique wrench, with its open jaw design, makes it easy to slip onto fittings and fasteners, even in tight quarters. Flips quickly into tightening position with a sure grip on all hex surfaces.

12-point contact distributes torque pressures evenly on the flats of the hex, not at the corners. Eliminates warping and distorting of fittings and fasteners. Because of the Kwik-Tite ratchet action, tightening jobs are easier and faster.

Kwik-Tite wrenches are constructed for rugged use. Jaws are hardened steel. Handles are made of heavy gauge alloy steel, with a black oxide finish.

SAE

PART NO.	HEX SIZE (in.)	OVERALL LENGTH (in.)
195-F 05	5/16	5-1/2
195-F 06	3/8	5-1/2
195-F 07	7/16	5-3/8
195-F 08	1/2	5-1/2
195-F 09	9/16	7-1/4
195-F 10	5/8	7-5/32
195-F 11	11/16	7-1/4
195-F 12	3/4	7-5/16
195-F 13	13/16	9-1/8
195-F 14	7/8	9-3/32
195-F 15	15/16	9-1/4
195-F 16	1	9-9/32
195-F 17	1-1/16	13.59
195-F 18	1-1/8	13.59
195-F 19	1-3/16	13.59
195-F 20	1-1/4	13.59
195-F 22	1-3/8	13.84
195-F 24	1-1/2	13.84
195-F 26	1-5/8	13.84
195-F 28	1-3/4	14.21
195-F 30	1-7/8	14.21
195-F 32	2	14.21
195-F 34	2-1/8	14.53
195-F 36	2-1/4	14.53

(1) 5/16" - 3/4" sizes have two-tone grips as shown.

(2) 13/16" - 1" sizes do not have grips.

(3) 1-1/16" - 2-1/4" sizes have foam grips (not shown).

METRIC

PART NO.	HEX SIZE (mm)	OVERALL LENGTH (mm)	OVERALL LENGTH (in.)
195-F 07 mm	7	140.72	5.54
195-F 08 mm	8	140.72	5.54
195-F 09 mm	9	140.72	5.54
195-F 10 mm	10	140.72	5.54
195-F 11 mm	11	140.72	5.54
195-F 12 mm	12	140.72	5.54
195-F 13 mm	13	140.72	5.54
195-F 14 mm	14	187.45	7.38
195-F 15 mm	15	187.45	7.38
195-F 16 mm	16	187.45	7.38
195-F 17 mm	17	187.45	7.38
195-F 18 mm	18	187.45	7.38
195-F 19 mm	19	187.45	7.38
195-F 21 mm	21	237.50	9.35
195-F 22 mm	22	237.50	9.35
195-F 23 mm	23	237.50	9.35
195-F 24 mm	24	237.50	9.35
195-F 27 mm	27	345.19	13.59
195-F 30 mm	30	345.19	13.59
195-F 32 mm	32	345.19	13.59

(1) 7 mm - 19 mm sizes have two-tone grips as shown.

(2) 21 mm - 24 mm sizes do not have grips.

(3) 27 mm - 32 mm sizes have foam grips (not shown).



Ratcheting of wrench requires only 30° of movement.



195-F 12



195-F 22 mm



195-5STD KIT



195-7STD KIT

KWIK-TITE® RATCHET WRENCH KITS

PART NO.	DESCRIPTION	WEIGHT (lbs.)
195-4STD KIT	4-Pc. SAE kit for refrigeration in pouch. Contains 5/8", 13/16", 15/16", and 1-1/16" wrenches. (Not shown).	2.3
195-5STD KIT	5-Pc. metric kit in pouch. Contains 10 mm, 11 mm, 12 mm, 13 mm and 14 mm wrenches.	2
195-7STD KIT	7-Pc. SAE kit in pouch. Contains 3/8", 7/16", 1/2", 9/16", 5/8", 11/16" and 3/4" wrenches.	2.5

REFRIGERATION AND AIR-CONDITIONING PRODUCTS

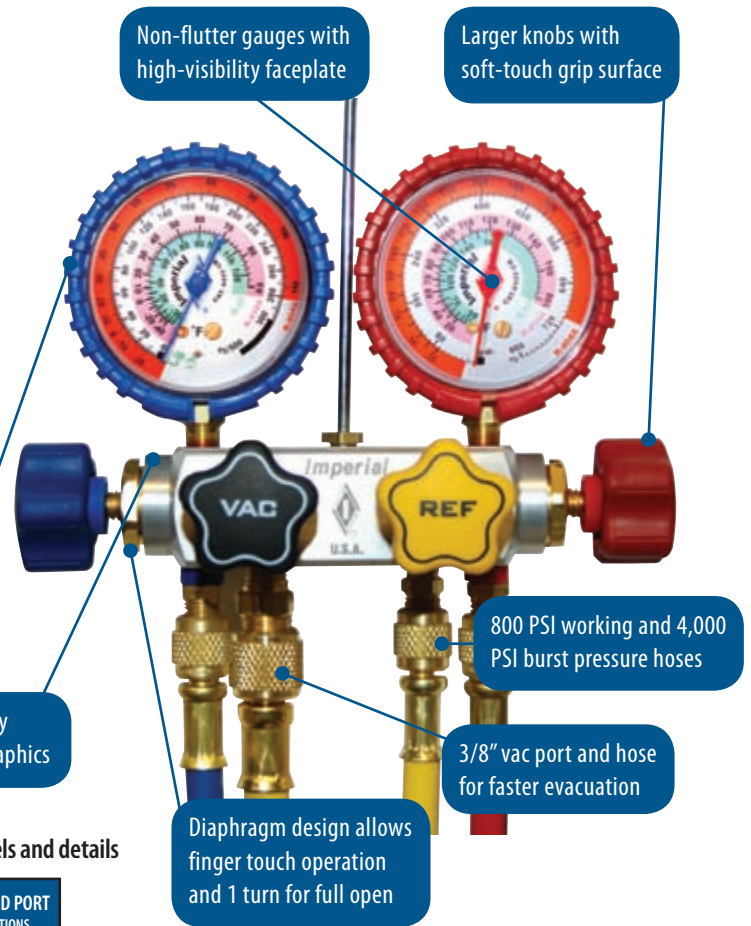




SERVICE MANIFOLDS

800 SERIES DEEP DRAW 4-VALVE MANIFOLD

- **4-Valve Efficiency** - Vacuum, low side, high side, and refrigerant lines are individually connected and controlled. No need to switch charging lines.
- **4 Times Faster Evacuation** - 3/8" vacuum port and oversize internal passages evacuate systems four times faster than ordinary manifolds. 3/8" port has greater area than combined inlets of high and low side lines.
- **Unique Deep Draw Vacuum Valve Design** - Proven diaphragm-type, soft-seat valves require only fingertip pressure to close completely. One turn to full open/close. Superior for deep vacuum service.
- **Precision Gauges & Protective Boots** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration and pulsation for superior performance and extended gauge life.
- **PolarShield® Hi-Performance Hoses** - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**

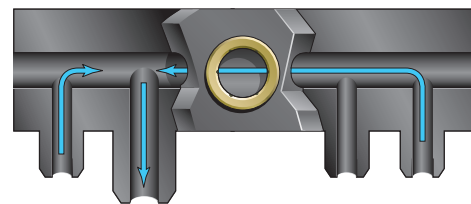
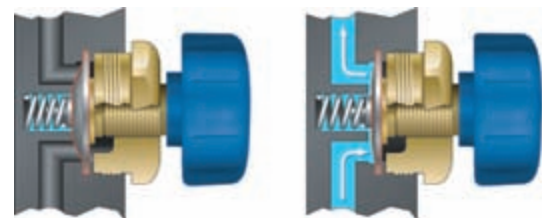


800 SERIES DEEP DRAW 4-VALVE MANIFOLD - See page 44 for additional models and details

PART NO.	REFRIGERANT	CHARGING LINES	MANIFOLD PORT CONNECTIONS
820-C*	R-12, R-22, R-502		1/4" & 3/8" SAE
820-CS* (w/Sight Glass)	R-12, R-22, R-502		1/4" & 3/8" SAE
821-C*	R-12, R-22, R-502	4-60" (3/8" VAC)	1/4" & 3/8" SAE
821-CS* (w/Sight Glass)	R-12, R-22, R-502	4-60" (3/8" VAC)	1/4" & 3/8" SAE
822-C (w/Carrying Case)	R-12, R-22, R-502	4-60" (3/8" VAC)	1/4" & 3/8" SAE
829-C*	R-12, R-22, R-502	3-60" w/Low Loss Shut-Off Couplers, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
830-CKP*	R-134a		1/4" & 3/8" SAE
830-CKPS* (w/Sight Glass)	R-134a		1/4" & 3/8" SAE
831-CKP*	R-134a	4-60" (3/8" VAC)	1/4" & 3/8" SAE
831-CKPS* (w/Sight Glass)	R-134a	4-60" (3/8" VAC)	1/4" & 3/8" SAE
840-C*	R-410A		1/4" & 3/8" SAE
841-C*	R-410A	4-60" (3/8" VAC)	1/4" & 3/8" SAE
841-CM	R-410A	4-60" (B, R: 1/4" x 5/16" SAE, Y: 1/4" x 1/4", 3/8" VAC Line)	1/4" & 3/8" SAE
842-C*	R-410A	3-60" w/Low Loss Ball Valve Shut-Off, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
844-C*	R-410A, R-22, R-404A	4-60" (3/8" VAC)	1/4" & 3/8" SAE
844-CS* (w/Sight Glass)	R-410A, R-22, R-404A	4-60" (3/8" VAC)	1/4" & 3/8" SAE
845-C*	R-410A, R-22, R-404A		1/4" & 3/8" SAE
846-C*	R-410A, R-22, R-404A	3-60" w/Low Loss Ball Valve Shut-Off, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
850-C*	R-404A, R-507, R-134a		1/4" & 3/8" SAE
851-C*	R-404A, R-507, R-134a	4-60" (3/8" VAC)	1/4" & 3/8" SAE
852-C*	R-404A, R-507, R-134a	3-60" w/Low Loss Shut-Off Couplers, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
853-C (w/Carrying Case)	R-404A, R-507, R-134a	4-60" (3/8" VAC)	1/4" & 3/8" SAE

* Add "C" suffix for clamshell packaging

DIAPHRAGM TYPE SOFT SEAT VALVES



3/8" vacuum port and oversized passages evacuate system 4 times faster than ordinary manifolds

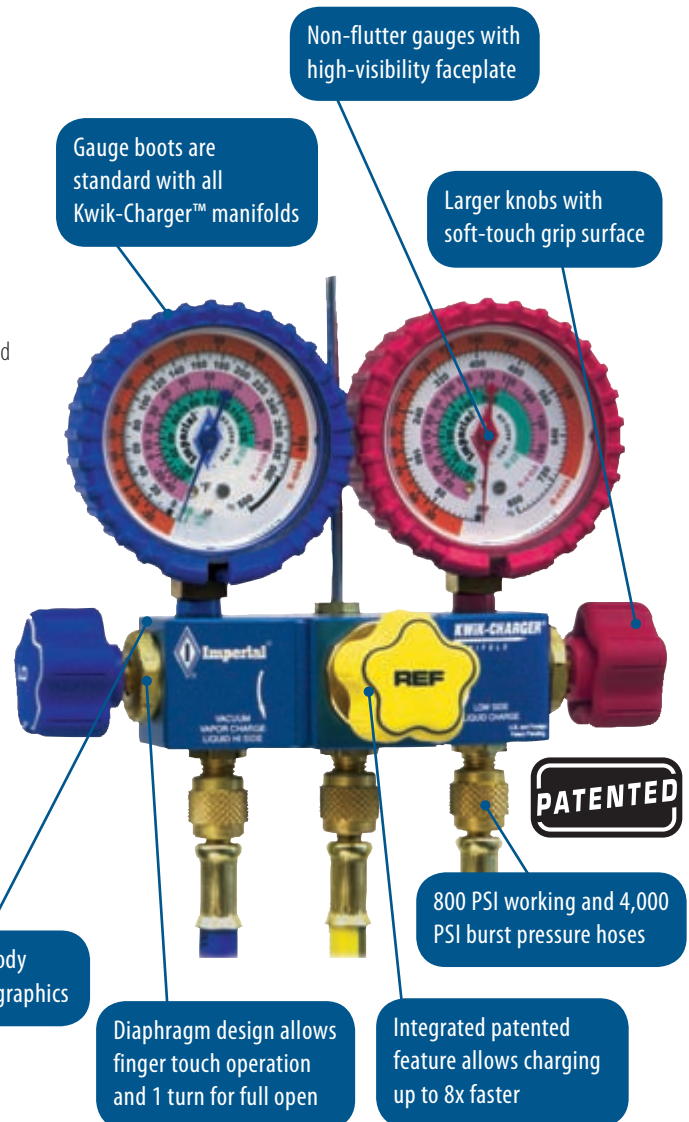


SERVICE MANIFOLDS

700 SERIES KWIK-CHARGER™ MANIFOLD

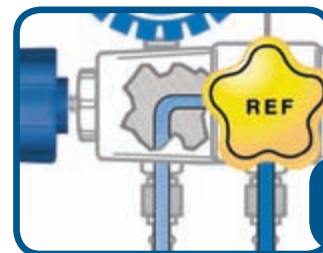
Charging the system is faster and easier than ever using Imperial® manifolds with built-in liquid low side charger.

- **Dual Action Valve** - Operates as a conventional manifold, or engage the special control valve and the manifold accepts liquid refrigerant from cylinder and discharges into the low side of the system. Charging rate is up to eight times faster than vapor charging.
- **Safe** - Internal metering element reduces liquid flow to a level below capacity of the compressor. Assures a safe, fast charge without endangering the compressor.
- **All-In-One** - No connecting or disconnecting special adapters for charging new blended refrigerants.
- **No Pressure Drop-In Cylinder** - No need to heat refrigerant cylinder.
- **Works With All Refrigerants** - CFC, HFC, HCFC, Zeotropic and Azeotropic.
- **Filters In All Manifold Port Fittings** - To keep out particulate material that may be present during recovery or reclaim or in recovered refrigerant. Filters are easily serviceable.
- **Deep Vacuum Valve Design** - Proven diaphragm-type, soft-seat valves require only fingertip pressure to close completely. One turn to full open/close. Superior for deep vacuum service.
- **Precision Gauges & Protective Boots** - Unique gauges provide superior resistance to shock, vibration & pulsation for accurate performance and extended gauge life.
- **PolarShield® Hi-Performance Hoses** - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**



700 SERIES KWIK-CHARGER™ MANIFOLD - See page 44 for details

PART NO.	REFRIGERANT	CHARGING LINES	MANIFOLD PORT CONNECTIONS
715-CC	R-410A, R-22, R-404A		1/4" SAE
717-CC	R-410A, R-22, R-404A	3-60"	1/4" SAE
718-CC	R-410A, R-22, R-404A	3-60" w/Low Loss Ball Valve Shut-Off	1/4" SAE
720-CC	R-12, R-22, R-502		1/4" SAE
721-CC	R-12, R-22, R-502	3-60"	1/4" SAE
725-CC	R-12, R-22, R-502	3-60" w/Low Loss Shut-Off Couplers	1/4" SAE
740-CBC	R-404A, R-407C, R-134a		1/4" SAE
745-CBC	R-410A		1/4" SAE
745-CKPC	R-410A	3-60" (1/4" x 5/16")	1/4" SAE
750-CC	R-404A, R-507, R-134a		1/4" SAE
751-CC	R-404A, R-507, R-134a	3-60"	1/4" SAE
755-CC	R-404A, R-507, R-134a	3-60" w/Low Loss Shut-Off Couplers	1/4" SAE
762-CKPC	R-404A, R-507, R-22	3-60"	1/4" SAE

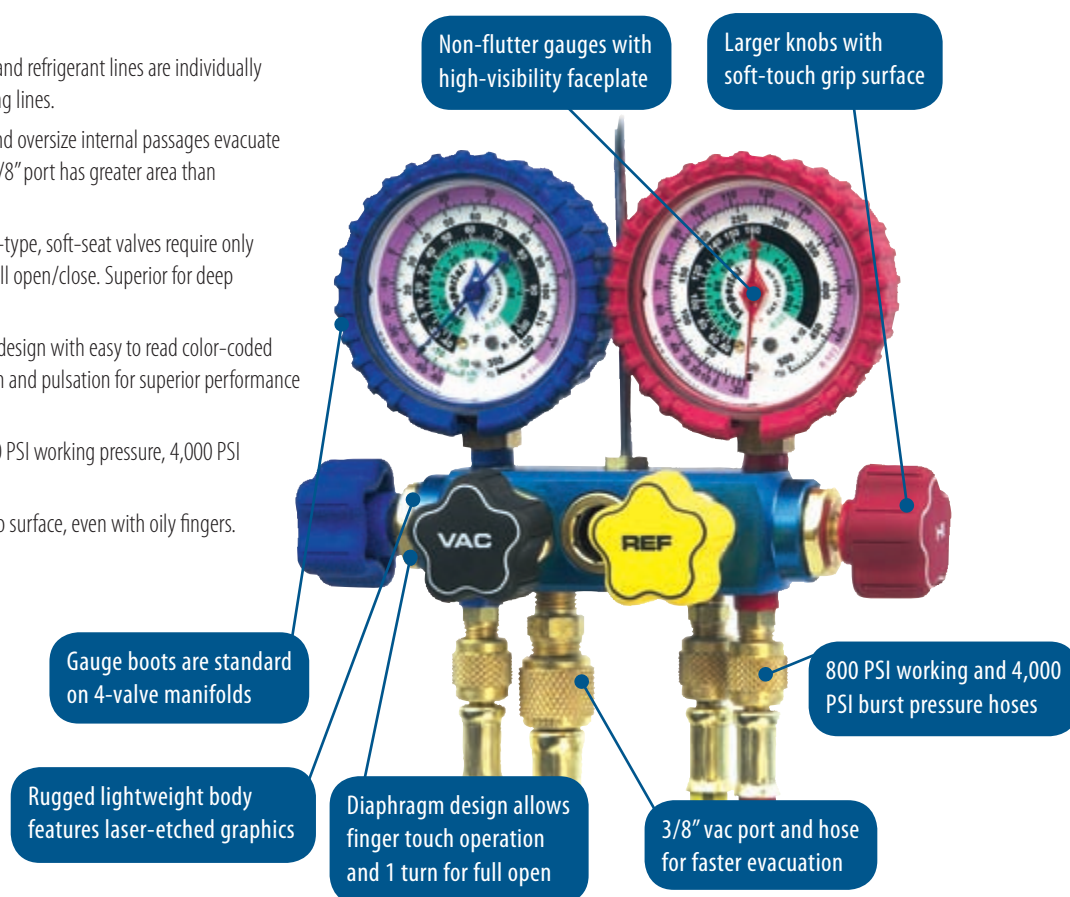


All Kwik-Charger™ manifolds are in clamshell packaging

SERVICE MANIFOLDS

600 SERIES 4-VALVE MANIFOLD

- **4-Valve Efficiency** - Vacuum, low side, high side, and refrigerant lines are individually connected and controlled. No need to switch charging lines.
- **4 Times Faster Evacuation** - 3/8" vacuum port and oversize internal passages evacuate systems four times faster than ordinary manifolds. 3/8" port has greater area than combined inlets of high and low side lines.
- **Deep Vacuum Valve Design** - Proven diaphragm-type, soft-seat valves require only fingertip pressure to close completely. One turn to full open/close. Superior for deep vacuum service.
- **Precision Gauges & Protective Boots** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration and pulsation for superior performance and extended gauge life.
- **PolarShield® Hi-Performance Hoses** - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**



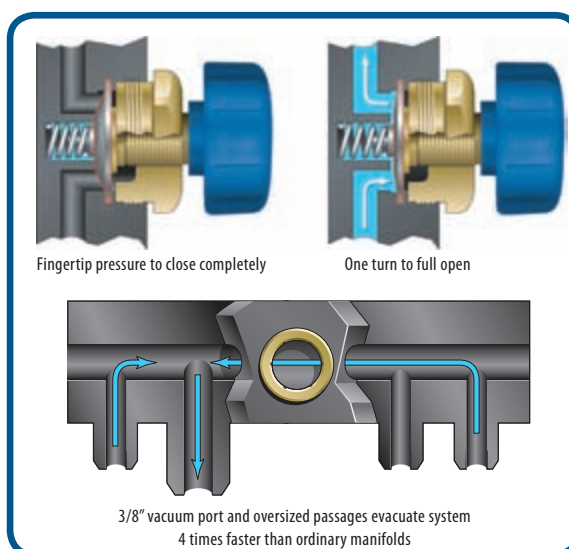
600 SERIES 4-VALVE MANIFOLD - See page 44-45 for additional models and details

PART NO.	REFRIGERANT	CHARGING LINES	MANIFOLD PORT CONNECTIONS
620-C*	R-12, R-22, R-502		1/4" & 3/8" SAE
620-CS* (w/Sight Glass)	R-12, R-22, R-502		1/4" & 3/8" SAE
621-C*	R-12, R-22, R-502	4-60" (3/8" VAC)	1/4" & 3/8" SAE
621-CS* (w/Sight Glass)	R-12, R-22, R-502	4-60" (3/8" VAC)	1/4" & 3/8" SAE
622-C (w/Carrying Case)	R-12, R-22, R-502	4-60" (3/8" VAC)	1/4" & 3/8" SAE
629-C*	R-12, R-22, R-502	3-60" w/Low Loss Shut-Off Couplers, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
630-CKP*	R-134a		1/4" & 3/8" SAE
630-CKPS* (w/Sight Glass)	R-134a		1/4" & 3/8" SAE
631-CKP*	R-134a	4-60" (3/8" VAC)	1/4" & 3/8" SAE
631-CKPS* (w/Sight Glass)	R-134a	4-60" (3/8" VAC)	1/4" & 3/8" SAE
640-C*	R-410A		1/4" & 3/8" SAE
641-C*	R-410A	4-60" (3/8" VAC)	1/4" & 3/8" SAE
642-C*	R-410A	3-60" w/Low Loss Ball Valve Shut-Off, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
644-C*	R-410A, R-22, R-404A	4-60" (3/8" VAC)	1/4" & 3/8" SAE
644-CS* (w/Sight Glass)	R-410A, R-22, R-404A	4-60" (3/8" VAC)	1/4" & 3/8" SAE
645-C*	R-410A, R-22, R-404A		1/4" & 3/8" SAE
646-C*	R-410A, R-22, R-404A	3-60" w/Low Loss Ball Valve Shut-Off, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
650-C*	R-404A, R-507, R-134a		1/4" & 3/8" SAE
651-C*	R-404A, R-507, R-134a	4-60" (3/8" VAC)	1/4" & 3/8" SAE
652-C*	R-404A, R-507, R-134a	3-60" w/Low Loss Shut-Off Couplers, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
653-C (w/Carrying Case)	R-404A, R-507, R-134a	4-60" (3/8" VAC)	1/4" & 3/8" SAE

* Add "C" suffix for clamshell packaging

Recognized Component. is a registered trademark of Underwriters Laboratories Inc.

DIAPHRAGM TYPE SOFT SEAT VALVES



SERVICE MANIFOLDS

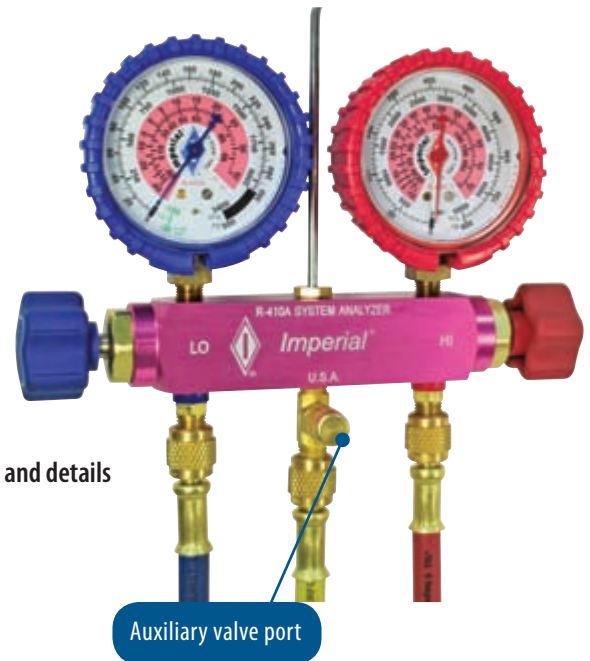
510 SERIES 2-VALVE / 4-PORT R-410A MANIFOLDS

- **Auxiliary Valve Port** - Allows multiple hookups for vacuum gauge, vacuum pump, recovery unit and add-ons.
- **Dual O-Ring Seal** - For high-pressure valve use. Electroless nickel plate stem to reduce wear and gauling.
- **Precision Gauges & Protective Boots** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration & pulsation for superior performance and extended gauge life.
- **PolarShield® Hi-Performance Hoses**  - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**

510 SERIES 2-VALVE/4-PORT R-410A MANIFOLDS - See page 45 for additional models and details

PART NO.	REFRIGERANT	CHARGING LINES	MANIFOLD PORT CONNECTIONS
510-C*	R-410A		1/4" SAE
510-CM*	R-410A		1/4" SAE
511-C*	R-410A	3-60"	1/4" SAE
511-CM*	R-410A	3-60"	1/4" SAE
512-C*	R-410A	3-60" w/Low Loss Ball Valve Shut-Off	1/4" SAE
513-C*	R-410A		5/16" SAE

* Add "C" suffix for clamshell packaging



520 SERIES 2-VALVE / 4- OR 5-PORT MANIFOLDS

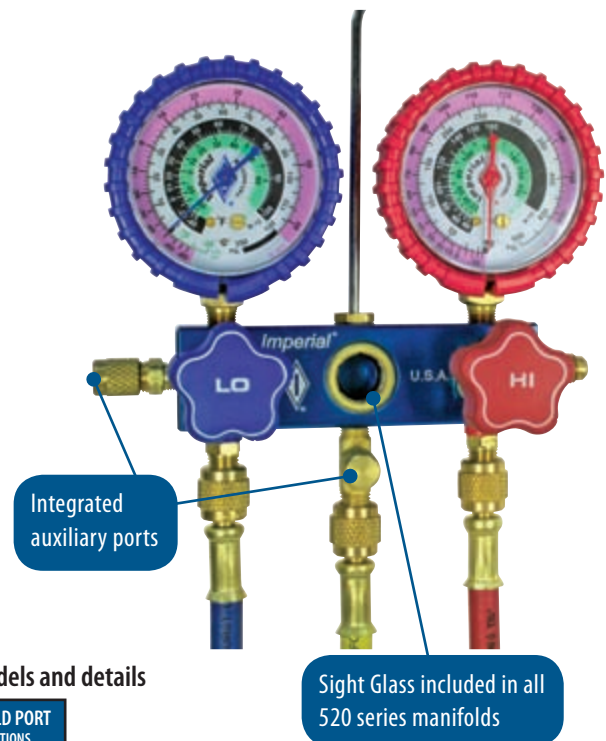
- **Two Integrated Auxiliary Ports** - Provide additional hookups for use with a micron (vacuum) gauge, vacuum pump, adding tracer dye, adding oil, purging non-condensables.
- **Deep Vacuum Valve Design** - Proven diaphragm-type, soft-seat valves require only fingertip pressure to close completely. One turn to full open/close. Superior for deep vacuum service.
- **Precision Gauges & Protective Boots** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration and pulsation for superior performance and extended gauge life.
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **PolarShield® Hi-Performance Hoses**  - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Swivel Hanger**

520-CA and 521-CA Combination R-134a & R-12 manifolds for automotive service. See page 39.

520 SERIES 2-VALVE/ 4- OR 5-PORT MANIFOLDS - See page 45 for additional models and details

PART NO.	# OF PORTS	REFRIGERANT	CHARGING LINES	MANIFOLD PORT CONNECTIONS
520-C* (w/Sight Glass)	5	R-12, R-22, R-502		1/4" SAE
520-CA* (w/Sight Glass)	4	R-134a, R-12		1/4" SAE
520-CAM* (w/Sight Glass)	4	R-134a, R-12		1/4" SAE
521-C* (w/Sight Glass)	5	R-12, R-22, R-502	3-60"	1/4" SAE
521-CA* (w/Sight Glass)	4	R-134a, R-12	3-60" w/Auto Service Couplers	1/4" SAE
521-CAM* (w/Sight Glass)	4	R-134a, R-12	3-60" w/Auto Service Couplers	1/4" SAE

* Add "C" suffix for clamshell packaging



SERVICE MANIFOLDS

400 SERIES DELUXE 2-VALVE BRASS MANIFOLD

- **Dual O-Ring Valves** - Precision engineered with dynamic full-flow design for faster trouble-free evacuation and charging.
- **Precision Gauges & Protective Boots** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration and pulsation for superior performance and extended gauge life.
- **Soft-Seat Valves** - Seat tightly with fingertip pressure.
- **PolarShield® Hi-Performance Hoses** - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**

Non-flutter gauges with high-visibility faceplate

Gauge boots are standard on 400 and 500 Series

Larger knobs with soft-touch grip surface

Built-in hose hangers on back of manifold

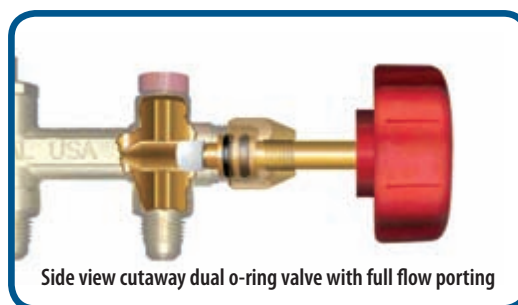
Needle valve design with full-flow porting

800 PSI working and 4,000 PSI burst pressure hoses

400 SERIES DELUXE 2-VALVE BRASS MANIFOLD - See page 46 for additional models and details

PART NO.	REFRIGERANT	CHARGING LINES	MANIFOLD PORT CONNECTIONS
415-C*	R-410A		1/4" SAE
416-C*	R-410A	3-36"	1/4" SAE
417-C*	R-410A	3-60"	1/4" SAE
418-C*	R-410A	3-60" w/Low Loss Ball Valve Shut-Off	1/4" SAE
420-C*	R-410A, R-22, R-404A		1/4" SAE
421-C*	R-410A, R-22, R-404A	3-60"	1/4" SAE
422-C*	R-410A, R-22, R-404A	3-60" w/Low Loss Ball Valve Shut-Off	1/4" SAE
435-CKP*	R-134a		1/4" SAE
436-CKP*	R-134a	3-36"	1/4" SAE
450-C*	R-404A, R-507, R-134a		1/4" SAE
451-C*	R-404A, R-507, R-134a	3-36"	1/4" SAE
452-C*	R-404A, R-507, R-134a	3-60"	1/4" SAE
481-CKPC	R-22, R-134a, R-404A		1/4" SAE
482-CKP*	R-22, R-134a, R-404A	3-36"	1/4" SAE
494-C (body only)			1/4" SAE
495-C*	R-12, R-22, R-502		1/4" SAE
496-C*	R-12, R-22, R-502	3-36"	1/4" SAE
498-C*	R-12, R-22, R-502	2-36", 1-60"	1/4" SAE
500-C*	R-12, R-22, R-502	3-60"	1/4" SAE
505-C*	R-12, R-22, R-502	3-60" w/Low Loss Shut-Off Couplers	1/4" SAE

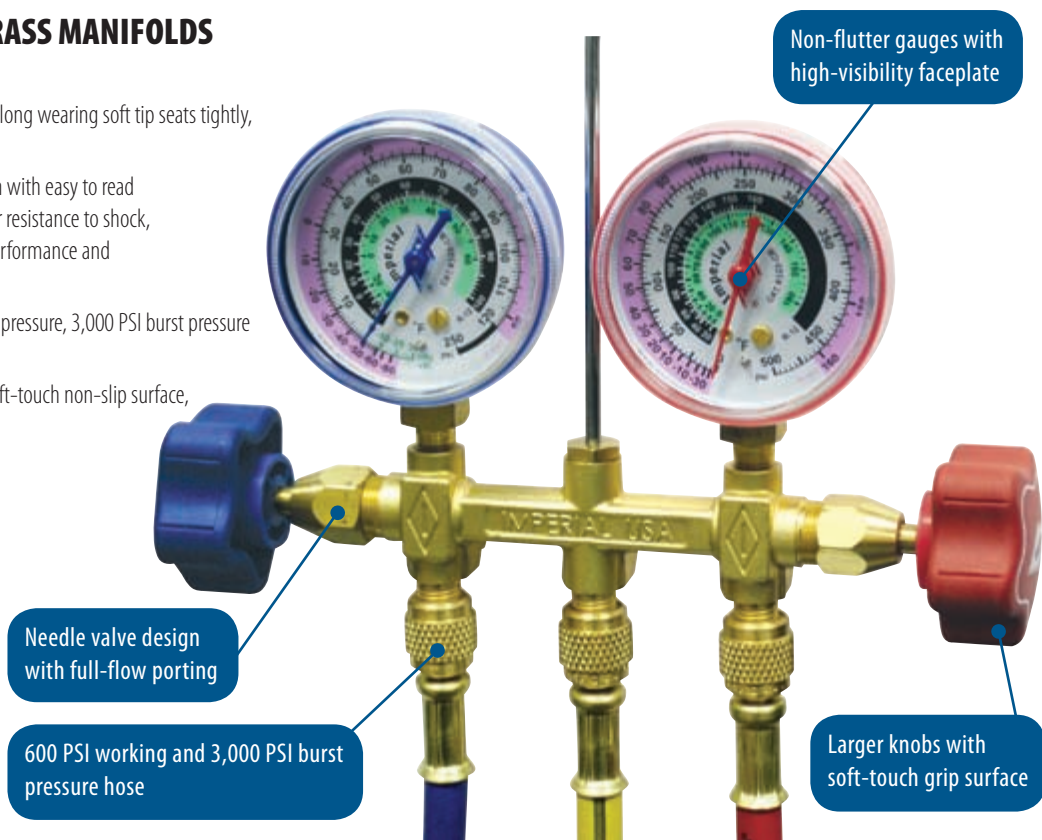
* Add "C" suffix for clamshell packaging



SERVICE MANIFOLDS

300 SERIES ECONOMY BRASS MANIFOLDS

- **Soft Seat Valve** - Brass stem with long wearing soft tip seats tightly, with fingertip pressure.
- **Precision Gauges** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration & pulsation for superior performance and extended gauge life.
- **Premium Hose** - 600 PSI working pressure, 3,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Dual O-Ring Seal Valves**
- **Swivel Hanger**



300 SERIES ECONOMY BRASS MANIFOLD - See page 46 for additional models and details

PART NO.	REFRIGERANT	CHARGING LINES	MANIFOLD PORT CONNECTIONS
335-CKP*	R-134a		1/4" SAE
336-CKP*	R-134a	3-36"	1/4" SAE
395-C*	R-12, R-22, R-502		1/4" SAE
395-CD*	R-12, R-22, R-502		1/4" SAE
395-CKP*	R-12, R-22, R-502		1/4" SAE
396-C*	R-12, R-22, R-502	3-36"	1/4" SAE
396-CD*	R-12, R-22, R-502	3-36"	1/4" SAE
396-CKP*	R-12, R-22, R-502	3-36"	1/4" SAE
397-CD	R-12, R-22, R-502	3-72"	1/4" SAE
398-CC	R-12, R-22, R-502	3-60"	1/4" SAE
398-CD	R-12, R-22, R-502	3-60"	1/4" SAE
398-CKP*	R-22, R-134a, R-404A	3-36"	1/4" SAE

* Add "C" suffix for clamshell packaging



SINGLE GAUGE CHARGING AND TESTING UNIT

A compact, single gauge unit which will perform a variety of charging and testing operations. Body is forged brass, with 1/4" SAE port flare connections.

- **Soft-Seat Valve** - Brass stem with long wearing soft tip seats tightly, with fingertip pressure.
- **Ergonomic Handle** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**

- 466-C Charging and Testing Unit with 425-CB, 2-1/2" compound gauge. 0 -30" vacuum, 0-120 lbs. pressure.
- 401-C Charging and Testing Unit without gauge.



AUTOMOTIVE SERVICE MANIFOLDS & ACCESSORIES

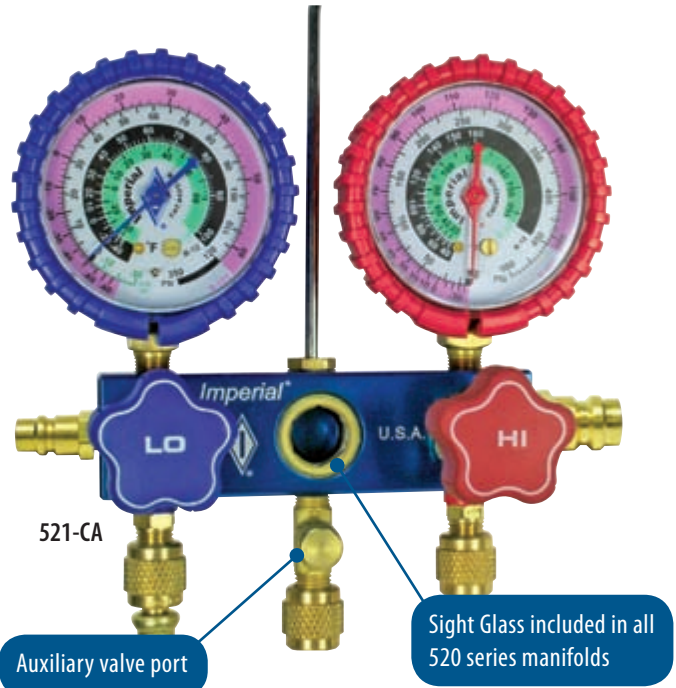
520 SERIES 2-VALVE 4-PORT SERVICE MANIFOLDS

- **Deep Vacuum Valve Design** - Proven diaphragm-type, soft-seat valves require only fingertip pressure to close completely. One turn to full open/close. Superior for deep vacuum service.
- **Precision Gauges & Protective Boots** - Unique design with easy to read color-coded scales provides superior resistance to shock, vibration and pulsation for superior performance and extended gauge life.
- **PolarShield® Hi-Performance Hoses** - 800 PSI working pressure, 4,000 PSI burst pressure (not all models include hose).
- **Ergonomic Handles** - Durable, soft-touch non-slip surface, even with oily fingers.
- **Swivel Hanger**

520 SERIES 2-VALVE 4-PORT MANIFOLD - See page 45 for details

PART NO.	REFRIGERANT	CHARGING LINES	MANIFOLD PORT CONNECTIONS
520-CA* (w/Sight Glass)	R-134a, R-12		1/4" SAE
520-CAM* (w/Sight Glass)	R-134a, R-12		1/4" SAE
521-CA* (w/Sight Glass)	R-134a, R-12	3-60" w/R-134a Auto Service Couplers	1/4" SAE
521-CAM* (w/Sight Glass)	R-134a, R-12	3-60" w/R-134a Auto Service Couplers	1/4" SAE

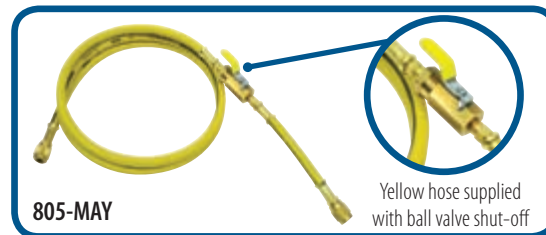
* Add "C" suffix for clamshell packaging



AUTOMOTIVE R-134a HOSE FOR USE WITH CONVENTIONAL MANIFOLDS EQUIPPED WITH 1/4" SAE PORTS

Red and blue hose supplied with 1/4" SAE FFL x 14 mm male connections. Yellow hose supplied with 1/4" SAE FFL x 1/2" ACME female with ball valve (BV) shut-off.

LENGTH	BLUE	YELLOW W/BV	RED	SET OF THREE (B,Y,R)
3' (36")	803-MAB	803-MAY	803-MAR	803-MAS
5' (60")	805-MAB	805-MAY	805-MAR	805-MAS
6' (72")	806-MAB	806-MAY	806-MAR	806-MAS



AUTOMOTIVE R-134a HOSE FOR USE WITH MANIFOLDS EQUIPPED WITH 1/2" ACME PORTS

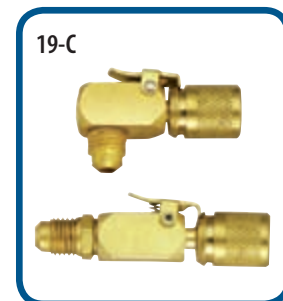
Red and blue hose supplied with 1/2" ACME female x 14 mm male connections. Yellow hose supplied with 1/2" ACME x 1/2" ACME female with ball valve (BV) shut-off.

LENGTH	BLUE	YELLOW W/BV	RED	SET OF THREE (B,Y,R)
3' (36")	803-AB	803-AY	803-AR	803-AS
6' (72")	806-AB	806-AY	806-AR	806-AS



AUTOMOTIVE KWIK-COUPLER™ ADAPTER FOR R-12

19-C (Set) Includes special female coupler for use on 3/16" automotive high side access valves, 1/4" low side coupler, straight and 90° male couplers.

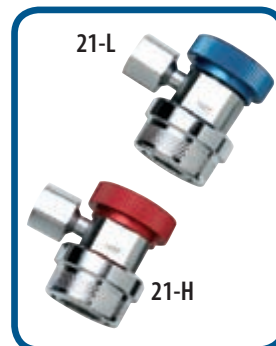


PREMIUM R-134a HI-FLOW AUTO SERVICE COUPLERS

14 mm thread connection. Quick connect/disconnect valve actuation eliminates venting. Color-coded knobs for high/low connections.

- Integral safety sleeve prevents accidental refrigerant venting under all operating conditions.
- Provides maximum flow without damaging service port.
- Meets current SAE-J639 specifications.

21-L Low side service coupler.
21-H High side service coupler.



20-A High side adapter. Converts 3/16" system access valve to 1/4" access valve for use with standard 1/4" charging hose.



SERVICE MANIFOLDS REFERENCE GUIDE

PART NO.	REFRIGERANT	GAUGE CALIBRATION**					TEMP		CHARGING LINES (BV = Low Loss Ball Valve Shut-Off)	MANIFOLD PORT CONNECTIONS
		PSI	BAR	Kg/cm ²	kPa	MPa	°F	°C		
800 SERIES DEEP DRAW 4-VALVE MANIFOLD										
R-12, R-22, R-502										
820-C*	R-12, R-22, R-502	●					●			1/4" & 3/8" SAE
820-CB	R-12, R-22, R-502	●	●					●		1/4" & 3/8" SAE
820-CK*	R-12, R-22, R-502				●			●		1/4" & 3/8" SAE
820-CKP*	R-12, R-22, R-502	●			●			●		1/4" & 3/8" SAE
820-CM*	R-12, R-22, R-502			●				●		1/4" & 3/8" SAE
820-CS* (w/Sight Glass)	R-12, R-22, R-502	●					●			1/4" & 3/8" SAE
821-C*	R-12, R-22, R-502	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
821-C-6	R-12, R-22, R-502	●							4-72" (3/8" VAC)	1/4" & 3/8" SAE
821-CD*	R-12, R-22, R-502	●		●			●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
821-CK*	R-12, R-22, R-502				●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
821-CKP*	R-12, R-22, R-502	●			●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
821-CM*	R-12, R-22, R-502			●				●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
821-CS* (w/Sight Glass)	R-12, R-22, R-502	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
822-C (w/Carrying Case)	R-12, R-22, R-502	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
822-CKP (w/Carrying Case)	R-12, R-22, R-502	●			●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
829-C*	R-12, R-22, R-502	●					●		3-60" w/Low Loss Fittings, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
R-134a										
830-CKP*	R-134a	●				●		●		1/4" & 3/8" SAE
830-CKPS* (w/Sight Glass)	R-134a				●		●	●		1/4" & 3/8" SAE
831-CKP*	R-134a	●				●		●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
831-CKPS* (w/Sight Glass)	R-134a	●				●		●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
R-410A										
840-C*	R-410A	●			●		●	●		1/4" & 3/8" SAE
840-CB	R-410A	●	●					●		1/4" & 3/8" SAE
840-CKPSC † (w/Sight Glass)	R-410A				●		●	●		5/16" & 3/8" SAE
841-C*	R-410A	●			●		●	●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
841-CKPSC † (w/Sight Glass)	R-410A	●			●		●	●	4-60" (B, R, Y 5/16"; 3/8" VAC)	5/16" & 3/8" SAE
841-CM	R-410A	●			●		●	●	4-60" (B, R 1/4" x 5/16"; Y 1/4" x 1/4"; 3/8" VAC)	1/4" & 3/8" SAE
842-C*	R-410A	●			●		●		3-60" w/BV, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
R-22, R-134a, R-404A										
843-CS (w/Sight Glass)	R-22, R134a, R-410A	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
R-410A, R-22, R-404A										
844-C*	R-410A, R-22, R-404A	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
844-CS* (w/Sight Glass)	R-410A, R-22, R-404A	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
845-C*	R-410A, R-22, R-404A	●					●			1/4" & 3/8" SAE
846-C*	R-410A, R-22, R-404A	●					●		3-60" w/BV, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
846-CS (w/Sight Glass)	R-410A, R-22, R-404A	●					●		3-60" w/BV, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
R-404A, R-507, R-134a										
850-C*	R-404A, R-507, R-134a	●					●			1/4" & 3/8" SAE
851-C*	R-404A, R-507, R-134a	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
852-C*	R-404A, R-507, R-134a	●					●		3-60" w/Low Loss Fittings, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
853-C (w/Carrying Case)	R-404A, R-507, R-134a	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
700 SERIES KWIK-CHARGER™ MANIFOLD										
R-410A, R-22, R-404A										
715-CC †	R-410A, R-22, R-404A	●					●			1/4" SAE
717-CC †	R-410A, R-22, R-404A	●					●		3-60"	1/4" SAE
718-CC †	R-410A, R-22, R-404A	●					●		3-60" w/BV	1/4" SAE
R-12, R-22, R-502										
720-CC †	R-12, R-22, R-502	●					●			1/4" SAE
721-CC †	R-12, R-22, R-502	●					●		3-60"	1/4" SAE
725-CC †	R-12, R-22, R-502	●					●		3-60" w/Low Loss Fittings	1/4" SAE
R-22, R-407C, R-410A										
726-CC †	R-22, R-407C, R-410A	●						●	5-36" (B, R, Y 1/4" x 1/4"; B, R 1/4" x 5/16")	1/4" SAE
R-404A, R-407C, R-134a										
740-CBC †	R-404A, R-407C, R-134a	●	●					●		1/4" SAE
741-CBC †	R-404A, R-407C, R-134a	●	●					●	3-60"	1/4" SAE
R-404A, R-507, R-134a										
750-CC †	R-404A, R-507, R-134a	●					●			1/4" SAE
751-CC †	R-404A, R-507, R-134a	●					●		3-60"	1/4" SAE
755-CC †	R-404A, R-507, R-134a	●					●		3-60" w/Low Loss Fittings	1/4" SAE
R-410A										
745-CBC †	R-410A	●	●					●		1/4" SAE
745-CKPC †	R-410A	●			●		●	●	3-60" (1/4" x 5/16")	1/4" SAE
R-22, R-404A, R-507										
762-CKPC †	R-22, R-404A, R-507	●			●			●	3-60"	1/4" SAE
600 SERIES 4-VALVE MANIFOLD										
R-12, R-22, R-502										
620-C*	R-12, R-22, R-502	●					●			1/4" & 3/8" SAE
620-CB	R-12, R-22, R-502	●	●					●		1/4" & 3/8" SAE
620-CK*	R-12, R-22, R-502				●			●		1/4" & 3/8" SAE
620-CKP*	R-12, R-22, R-502	●			●			●		1/4" & 3/8" SAE
620-CM*	R-12, R-22, R-502			●				●		1/4" & 3/8" SAE
620-CS* (w/Sight Glass)	R-12, R-22, R-502	●					●			1/4" & 3/8" SAE
621-C*	R-12, R-22, R-502	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
621-C-6	R-12, R-22, R-502	●					●		4-72" (3/8" VAC)	1/4" & 3/8" SAE

* Add "C" suffix for clamshell packaging. † Clamshell packaging only. ** All gauges available with MPa, kPa, Bar, etc.

SERVICE MANIFOLDS REFERENCE GUIDE

PART NO.	REFRIGERANT	GAUGE CALIBRATION**					TEMP		CHARGING LINES (BV = Low Loss Ball Valve Shut-Off)	MANIFOLD PORT CONNECTIONS
		PSI	BAR	Kg/cm ²	kPa	MPa	°F	°C		
600 SERIES 4-VALVE MANIFOLD (CONT.)										
R-12, R-22, R-502										
621-CD*	R-12, R-22, R-502	●		●			●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
621-CK*	R-12, R-22, R-502				●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
621-CKP*	R-12, R-22, R-502	●			●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
621-CM*	R-12, R-22, R-502			●				●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
621-CS* (w/Sight Glass)	R-12, R-22, R-502	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
622-C (w/Carrying Case)	R-12, R-22, R-502	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
622-CKP (w/Carrying Case)	R-12, R-22, R-502	●			●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
629-C*	R-12, R-22, R-502	●					●		3-60" w/Low Loss Fittings, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
R-22, R-407C, R-410A										
626-CSC †	R-22, R-407C, R-410A	●						●	6-36" (B, R, Y 1/4" x 1/4"; B, R 1/4" x 5/16"; 3/8" VAC)	1/4" & 3/8" SAE
R-134a										
630-CKP*	R-134a	●			●		●	●		1/4" & 3/8" SAE
630-CKPS* (w/Sight Glass)	R-134a	●			●		●	●		1/4" & 3/8" SAE
631-CKP*	R-134a	●			●		●	●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
631-CKP-6	R-134a	●			●		●	●	4-72" (3/8" VAC)	1/4" & 3/8" SAE
631-CKPS* (w/Sight Glass)	R-134a	●			●		●	●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
R-410A										
640-C*	R-410A	●			●		●	●		1/4" & 3/8" SAE
640-CB	R-410A	●	●					●		1/4" & 3/8" SAE
641-C*	R-410A	●			●		●	●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
641-CM	R-410A	●			●		●	●	4-60" (B, R 1/4" x 5/16"; Y 1/4" x 1/4"; 3/8" VAC)	1/4" & 3/8" SAE
642-C*	R-410A	●			●		●		3-60" w/BV, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
R-410A, R-22, R-404A										
644-C*	R-410A, R-22, R-404A	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
644-CS* (w/Sight Glass)	R-410A, R-22, R-404A	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
645-C*	R-410A, R-22, R-404A	●					●			1/4" & 3/8" SAE
646-C*	R-410A, R-22, R-404A	●					●		3-60" w/BV, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
R-404A, R-407C, R-134a										
660-CB	R-404A, R-407C, R-134a	●	●					●		1/4" & 3/8" SAE
R-404A, R-507, R-134a										
650-C*	R-404A, R-507, R-134a	●					●			1/4" & 3/8" SAE
651-C*	R-404A, R-507, R-134a	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
651-CKPSC † (w/Sight Glass)	R-404A, R-507, R-134a			●	●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
652-C*	R-404A, R-507, R-134a	●					●		3-60" w/Low Loss Fittings, 1-60" 3/8" VAC Line	1/4" & 3/8" SAE
653-C (w/Carrying Case)	R-404A, R-507, R-134a	●					●		4-60" (3/8" VAC)	1/4" & 3/8" SAE
R-22, R-134a, R-404A										
680-CKPSC † (w/Sight Glass)	R-22, R-134a, R-404A	●			●			●		1/4" & 3/8" SAE
681-CKPSC † (w/Sight Glass)	R-22, R-134a, R-404A	●			●			●	4-60" (3/8" VAC)	1/4" & 3/8" SAE
520 SERIES 2-VALVE 4- OR 5-PORT MANIFOLD										
R-134a, R-12										
520-CA* (w/Sight Glass)	R-134a, R-12	●					●			1/4" SAE
520-CAM* (w/Sight Glass)	R-134a, R-12			●	●			●		1/4" SAE
521-CA* (w/Sight Glass)	R-134a, R-12	●					●		3-60" w/Service Couplers	1/4" SAE
521-CAM* (w/Sight Glass)	R-134a, R-12			●	●			●	3-60" w/Service Couplers	1/4" SAE
R-12, R-22, R-502										
520-C* (w/Sight Glass)	R-12, R-22, R-502	●					●			1/4" SAE
520-CB (w/Sight Glass)	R-12, R-22, R-502	●	●					●		1/4" SAE
521-C* (w/Sight Glass)	R-12, R-22, R-502	●			●		●		3-60"	1/4" SAE
523-C (w/Sight Glass)	R-12, R-22, R-502	●					●		3-36"	1/4" SAE
R-404A, R-407C, R-134a										
560-CB (w/Sight Glass)	R-404A, R-407C, R-134a	●	●					●		1/4" SAE
R-22, R-407C, R-410A										
566-CC †	R-22, R-407C, R-410A	●						●	5-36" (B, R, Y 1/4" x 1/4"; B, R 1/4" x 5/16")	1/4" SAE
R-404A, R-507, R-134a										
525-CKPC † (w/Sight Glass)	R-404A, R-507, R-134a			●	●			●	3-36"	1/4" SAE
R-22, R-134a, R-404A										
526-CAC † (w/Sight Glass)	R-22, R-134a, R-404A	●			●			●	3-60" w/Service Couplers	1/4" SAE
580-CKPSC † (w/Sight Glass)	R-22, R-134a, R-404A	●			●			●		1/4" SAE
581-CKPSC † (w/Sight Glass)	R-22, R-134a, R-404A	●			●			●	3-60"	1/4" SAE
510 SERIES 2-VALVE 4-PORT MANIFOLD										
R-410A										
510-C*	R-410A	●			●		●	●		1/4" SAE
510-CM*	R-410A					●		●		1/4" SAE
511-C*	R-410A	●			●		●	●	3-60"	1/4" SAE
511-CM*	R-410A					●		●	3-60"	1/4" SAE
512-C*	R-410A	●			●		●	●	3-60" w/BV	1/4" SAE
513-C*	R-410A				●		●	●		5/16" SAE
514-CC †	R-410A	●			●		●	●	3-36" (5/16" x 5/16")	5/16" SAE
515-C*	R-410A	●			●		●	●	3-60" (5/16" x 5/16")	5/16" SAE
522-C*	R-410A				●		●	●	3-60" (B, R 1/4" x 5/16" w/BV; Y 1/4" x 1/4")	1/4" SAE
540-CB	R-410A	●	●					●		1/4" SAE
570-CKPC † (w/Sight Glass)	R-410A	●			●		●	●		5/16" SAE
572-CKPC † (w/Sight Glass)	R-410A	●			●		●	●	3-60" (5/16" x 5/16")	5/16" SAE
R-410A, R-22, R-407C										
582-CKPC † (w/Sight Glass)	R-410A, R-22, R-407C	●			●			●	3-36" (1/4" x 5/16")	1/4" SAE

* Add "C" suffix for clamshell packaging. † Clamshell packaging only. ** All gauges available with MPa, kPa, Bar, etc.

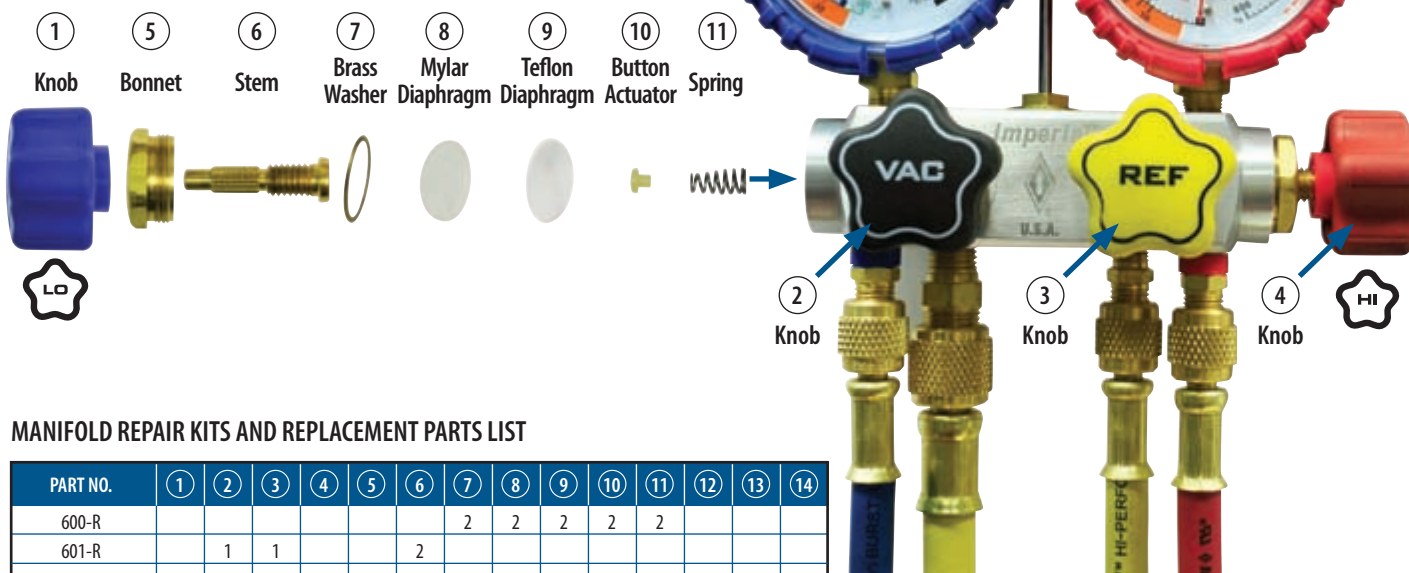
SERVICE MANIFOLDS REFERENCE GUIDE

PART NO.	REFRIGERANT	GAUGE CALIBRATION**					TEMP		CHARGING LINES (BV = Low Loss Ball Valve Shut-Off)	MANIFOLD PORT CONNECTIONS
		PSI	BAR	Kg/cm ²	kPa	MPa	°F	°C		
400 & 500 SERIES DELUXE 2-VALVE BRASS MANIFOLD										
R-410A										
415-C*	R-410A	●			●		●	●		1/4" SAE
416-C*	R-410A	●			●		●	●	3-36"	1/4" SAE
417-C*	R-410A	●			●		●	●	3-60"	1/4" SAE
417-C-6	R-410A	●			●		●	●	3-72"	1/4" SAE
418-C*	R-410A	●			●		●	●	3-60" w/BV	1/4" SAE
419-C	R-410A	●			●		●	●	2-36" w/BV (B, R 1/4" x 5/16"); 1-60" / BV (Y 1/4" x 1/4")	1/4" SAE
454-C	R-410A	●			●		●	●	3-36" (B, R 1/4" x 5/16"; Y 1/4" x 1/4")	1/4" SAE
455-C	R-410A	●			●		●	●	3-36" w/BV (B, R 1/4" x 5/16"; Y 1/4" x 1/4")	1/4" SAE
456-C	R-410A	●			●				3-60" (B, R 1/4" x 5/16"; Y 1/4" x 1/4")	1/4" SAE
R-410A, R-22, R-404A										
420-C*	R-410A, R-22, R-404A	●					●			1/4" SAE
421-C*	R-410A, R-22, R-404A	●					●		3-60"	1/4" SAE
421-CM	R-410A, R-22, R-404A	●					●		3-60" (B, R 1/4" x 5/16"; Y 1/4" x 1/4")	1/4" SAE
422-C*	R-410A, R-22, R-404A	●					●		3-60" w/BV	1/4" SAE
R-134a										
435-CKP*	R-134a	●			●		●	●		1/4" SAE
436-CKP*	R-134a	●			●		●	●	3-36"	1/4" SAE
439-CA*	R-134a, R-12	●					●		3-60" (Y w/BV) & Service Couplers	1/4" SAE
R-22, R-134a, R-404A										
443-C	R-22, R-134a, R-404A	●					●		3-60"	1/4" SAE
R-404A, R-507, 134a										
450-C*	R-404A, R-507, R-134a	●					●			1/4" SAE
450-CM	R-404A, R-507, R-134a			●	●			●		1/4" SAE
451-C*	R-404A, R-507, R-134a	●					●		3-36"	1/4" SAE
451-CM*	R-404A, R-507, R-134a			●	●			●	3-36"	1/4" SAE
452-C*	R-404A, R-507, R-134a	●					●		3-60"	1/4" SAE
452-C-6	R-404A, R-507, R-134a	●					●		3-72"	1/4" SAE
R-12, R-22, R-502										
494-C	Manifold body only									1/4" SAE
495-C*	R-12, R-22, R-502	●					●			1/4" SAE
495-CB	R-12, R-22, R-502	●	●					●		1/4" SAE
495-CD*	R-12, R-22, R-502	●		●			●			1/4" SAE
495-CKP*	R-12, R-22, R-502	●			●			●		1/4" SAE
496-C*	R-12, R-22, R-502	●					●		3-36"	1/4" SAE
496-CD*	R-12, R-22, R-502	●		●			●		3-36"	1/4" SAE
496-CKP*	R-12, R-22, R-502	●			●			●	3-36"	1/4" SAE
498-C*	R-12, R-22, R-502	●					●		2-36" (B, R), 1-60" (Y)	1/4" SAE
500-C*	R-12, R-22, R-502	●					●		3-60"	1/4" SAE
500-CD*	R-12, R-22, R-502	●		●			●		3-60"	1/4" SAE
500-CD-6	R-12, R-22, R-502	●		●			●		3-72"	1/4" SAE
505-C*	R-12, R-22, R-502	●					●		3-60" w/Low Loss Fittings	1/4" SAE
R-22, R-134a, R-404A										
481-CKPC †	R-22, R-134a, R-404A	●			●			●		1/4" SAE
482-CKP*	R-22, R-134a, R-404A	●			●			●	3-36"	1/4" SAE
300 SERIES ECONOMY 2-VALVE BRASS MANIFOLD										
R-134a										
335-CKP*	R-134a	●			●		●	●		1/4" SAE
336-CKP*	R-134a	●			●		●	●	3-36"	1/4" SAE
R-12, R-22, R-502										
395-C*	R-12, R-22, R-502	●					●			1/4" SAE
395-CD*	R-12, R-22, R-502	●		●			●			1/4" SAE
395-CKP*	R-12, R-22, R-502	●			●			●		1/4" SAE
396-C*	R-12, R-22, R-502	●					●		3-36"	1/4" SAE
396-CD*	R-12, R-22, R-502	●		●			●		3-36"	1/4" SAE
396-CKP*	R-12, R-22, R-502	●			●			●	3-36"	1/4" SAE
397-CD	R-12, R-22, R-502	●		●			●		3-72"	1/4" SAE
398-CC †	R-12, R-22, R-502	●					●		3-60"	1/4" SAE
398-CD	R-12, R-22, R-502	●		●			●		3-60"	1/4" SAE
R-22, R-134a, R-404A										
398-CKP*	R-22, R-134a, R-404A	●			●			●	3-36"	1/4" SAE
MANIFOLD ACCESSORIES & SERVICE PARTS (see pages 47-48 for details)										
10SG	Sight Glass Repair Kit									
400-RB	Set: Red & Blue Protective Gauge Boots									
405-RH	High Side Repair Kit w/soft touch knob for 300 & 400 Series "Imperial USA" brass manifold									
405-RL	Low Side Repair Kit w/soft touch knob for 300 & 400 Series "Imperial USA" brass manifold									
500-RH	High Side Repair Kit for 510 & 511 Series R-410A manifold									
500-RL	Low Side Repair Kit for 510 & 511 Series R-410A manifold									
600-R	Diaphragm Replacement Seal Kit for all 600 Series manifolds									
601-R	Replacement VAC & REF Knobs w/stems for all 600 Series manifolds									
602-R	Replacement HI & LO Knobs w/stems for all 600 Series manifolds									
700-CV	Control Valve Repair Kit for 700 Series manifold									
800-R	Repair Kit for 800 Series manifold									

* Add "C" suffix for clamshell packaging. † Clamshell packaging only. ** All gauges available with MPa, kPa, Bar, etc.

SERVICE MANIFOLDS PARTS ILLUSTRATIONS

800 AND 600 SERIES 4-VALVE MANIFOLD



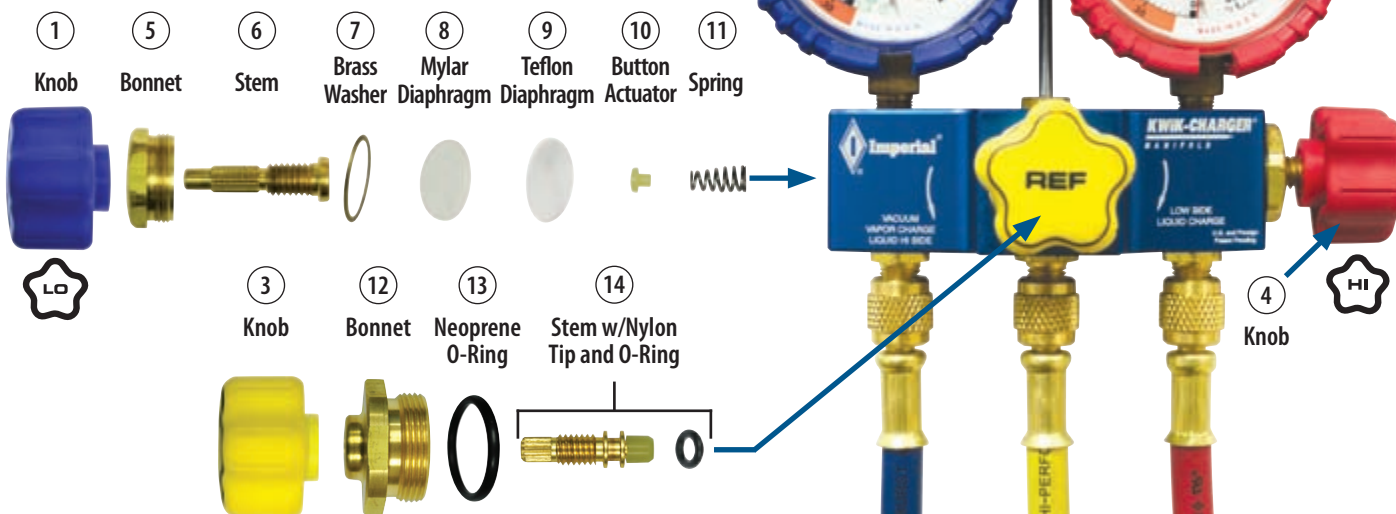
MANIFOLD REPAIR KITS AND REPLACEMENT PARTS LIST

PART NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
600-R							2	2	2	2	2			
601-R		1	1			2								
602-R	1			1	2									
700-CV †			1									1	1	1
800-R *	1	1	1	1		4	4	4	4	4	4			
S64104								10						
S64108							10							
S64870									10	10				
S69021								10						
S76548					2									

* 800-R repair kit also contains (4) pcs Stainless Steel Washer (Not Shown).

† 700-CV is shipped completely assembled for quick & easy replacement.

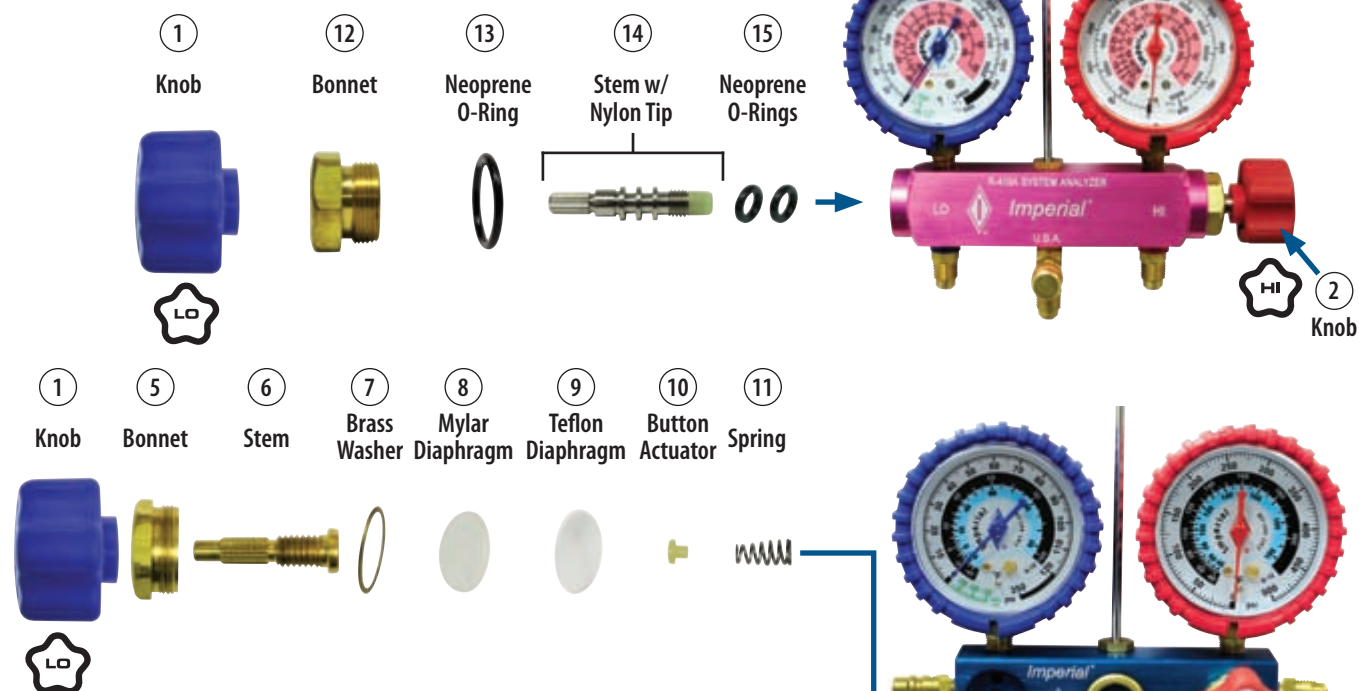
700 SERIES KWIK-CHARGER™ MANIFOLD



† 700-CV is shipped completely assembled for quick & easy replacement.

SERVICE MANIFOLDS

510 AND 520 SERIES 2-VALVE MANIFOLD

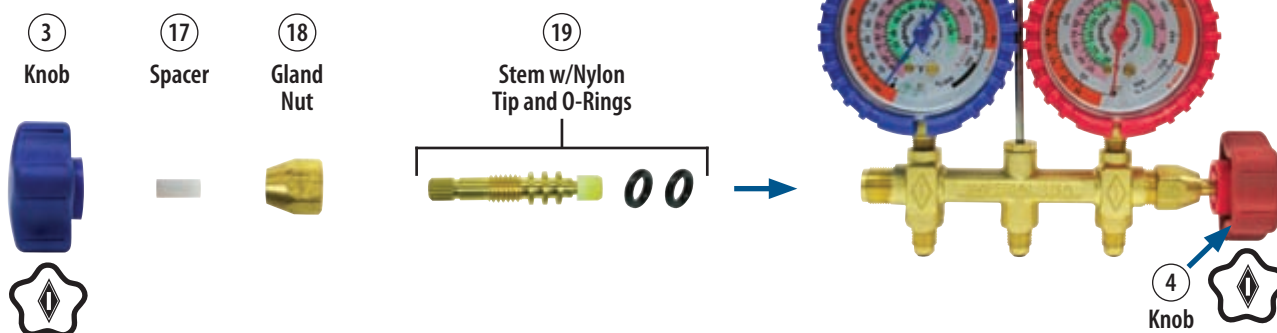


MANIFOLD REPAIR KITS AND REPLACEMENT PARTS LIST

PART NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
10SG																1			
405-RH *				1													1	1	1
405-RL *			1														1	1	1
500-RH *		1										1	1	1	2				
500-RL *	1											1	1	1	2				
600-R							2	2	2	2	2								
602-R	1	1				2													
S64104										10									
S64108							10												
S64870										10	10								
S69021								10											
S76548					2														

* These kits are shipped completely assembled for quick & easy replacement.

400 AND 300 SERIES 2-VALVE BRASS MANIFOLD



PRECISION REFRIGERANT GAUGES

WITH HI-VISIBILITY COLOR-CODED REFRIGERANT SCALES

- **Superior Shock Resistance** - Our unique design isolates the movement from the socket, reducing the effects of shock.
- **Superior Vibration Resistance** - Our enhanced vibration dampening design cushions the movement for flutter-free performance and extended gauge service life.
- **Superior Pulsation Resistance** - After 10 million cycles, these gauges show three times less wear than conventional gauges. The result is a longer lasting, more reliable gauge.
- **Replacement Screw-on Lens Set**- S8230301
- **Protective Red & Blue Rubber Boot Set** - 400-RB



Protective rubber boots for gauges sold separately.

PART NO.	DESCRIPTION	GAUGE CALIBRATION					TEMP	
		PSI	BAR	Kg/cm ²	kPa	MPa	°F	°C
R-12, R-134a								
441-CB	Blue Compound	●					●	
441-CBM	Blue Compound			●	●			●
441-CR	Red Pressure	●					●	
441-CRM	Red Pressure			●	●			●
R-12, R-22, R-502								
323-CR	Red Pressure	●					●	
325-CB	Blue Compound	●					●	
405-CB	Blue Compound	●	●					●
405-CR	Red Pressure	●	●					●
423-CAM	Red Pressure			●				●
423-CAPD	Red Pressure					●		●
423-CK	Red Pressure				●			●
423-CKP	Red Pressure	●			●			●
423-CR	Red Pressure	●					●	
425-CAM	Blue Compound			●				●
425-CAPD	Blue Compound					●		●
425-CB	Blue Compound	●					●	
425-CK	Blue Compound				●			●
425-CKP	Blue Compound	●			●			●
431-CM	Red Pressure	●		●			●	
432-CM	Blue Compound	●		●			●	
R-22, R-404A, R-410A								
422-CB	Blue Compound	●					●	
422-CR	Red Pressure	●					●	
R-22, R-407C, R-410A								
406-CB	Blue Compound	●						●
406-CR	Red Pressure	●						●
428-CKP	Blue Compound	●			●			●
429-CKP	Red Pressure	●			●			●

PART NO.	DESCRIPTION	GAUGE CALIBRATION					TEMP	
		PSI	BAR	Kg/cm ²	kPa	MPa	°F	°C
R-22, R-404A, R-507								
426-CKP	Blue Compound	●			●			●
427-CKP	Red Pressure	●			●			●
R-22, R-134a, R-404A								
420-BCKP	Blue Compound	●			●			●
420-RCKP	Red Pressure	●			●			●
424-CB	Blue Compound	●					●	
424-CR	Red Pressure	●					●	
R-134a								
434-BKP	Blue Compound	●			●		●	●
434-RKP	Red Pressure	●			●		●	●
R-134a, R-404A, R-407C								
407-CB	Blue Compound	●	●					●
407-CR	Red Pressure	●	●					●
R-134a, R-404A, R-507								
451-CB	Blue Compound	●					●	
451-CBM	Blue Compound			●	●			●
451-CR	Red Pressure	●					●	
451-CRM	Red Pressure			●	●			●
R-410A								
2423-P	Red Pressure			●		●		●
2425-CP	Blue Compound			●		●		●
408-CB	Blue Compound	●	●					●
408-CR	Red Pressure	●	●					●
452-CB	Blue Compound	●			●		●	●
452-CR	Red Pressure	●			●		●	●

VAK-CHECK

For proper evacuation and dehydration of refrigeration and air-conditioning systems, an electronic vacuum gauge is an indispensable companion to a vacuum pump. Significant dehydration does not occur until a vacuum of 1000 microns or greater has been achieved. Use of electronic vacuum gauges is the only way to determine when dehydration is occurring and when it is complete.

Imperial-Thermal Engineering Vak-Checks are precision thermistor vacuum gauges designed especially for refrigeration and air-conditioning service. They automatically compensate for changes in ambient temperature and permit continuous monitoring during evacuation. These instruments are compact, lightweight, easy to use, and read directly in microns on a large easy-to-read meter.

VAK-CHECK

4501

Features

- Atmosphere to 10 microns.
- Ambient temperature compensated.
- Accuracy: 200-1000 microns: $\pm 5\%$.
- Comes complete with Model 4510 Sensor.
- Battery powered, no searching for outlets (2 "D" cell batteries not included).



SUPER VAK-CHECK II

14571

This analog thermistor vacuum gauge allows you to choose between 110AC and battery as your power source with the same features as the Model 4501.

Features

- AC/battery operated.
- Range: Atmosphere to 10 microns.
- Ambient temperature compensated.
- Complete with Model 4510 Sensor.
- Accuracy: 200-1000 microns $\pm 5\%$.
- Power: 110AC or 2 "D" cell batteries (Batteries not included).



REPLACEMENT VACUUM SENSORS

4510

Features

- Vacuum Sensor for Vak-Check and Super Vak-Check II.
- Models 4501 and 14571 with 0 to 50 calibration scale.



VAC-SCALE

Saving the service technician time and money, Imperial-Thermal Engineering provides the ability to combine digital hand held vacuum gauge technology with strain gauge technology for refrigerant charging.

HANDHELD DIGITAL MICRON GAUGE

4775

Imperial-Thermal Engineering is pleased to introduce the 4775 handheld digital micron gauge. Backed by Thermal's 45 years of vacuum technology the 4775 borrows from the old while incorporating advanced new features including (7) units of measure, an LCD backlight, LCD contrast control, and a vacuum minimum/maximum function that stores the last vacuum reading in memory. Lightweight and easy to use, the 4775 will provide the discriminating service technician with a dependable instrument for accurately measuring vacuum in an air-conditioning or refrigeration system.

Features

- Ergonomic durable case.
- Auto shutoff.
- LCD backlight and contrast.
- Multiple units of measure.



HI-PERFORMANCE CHARGING HOSE

PolarShield® CHARGING HOSE 950, 900, 850 & 800 SERIES



- **All Imperial® PolarShield® charging hoses are UL recognized** and meet UL-1963, SAE-J2196 & EPA requirements for strength, pressure and refrigerant permeation.
- **Rugged, Multi-Refrigerant Nylon Barrier Construction** - PolarShield hoses are compatible with all CFC, HFC & HCFC refrigerants (R-410A, R-404A, R-407C, R-134a).
- **High-Pressure** - PolarShield hoses feature 800 PSI working pressure and 4,000 PSI burst pressure with a 5-to-1 safety factor.
- **Selection** - PolarShield hoses are available with a variety of end connections, in yellow, red or blue, individually or in sets of three. Consult factory for lengths and end connections not listed below. (For Automotive R-134a hoses, see page 43.)

950 SERIES HOSES WITH LOW LOSS BALL VALVE SHUT-OFF AND 1/4" FFL* CONNECTIONS

LENGTH	BLUE	YELLOW	RED	SET OF THREE (B,Y,R)
3' (36")	953-MRB	953-MRY	953-MRR	953-MRS
5' (60")	955-MRB	955-MRY	955-MRR	955-MRS
6' (72")	956-MRB	956-MRY	956-MRR	956-MRS

*5/16" fittings available-contact factory for part numbers

900 SERIES PolarShield® HOSES WITH AUTOMATIC SHUT-OFF VALVE

Precision engineered automatic low loss 1/4" FFL* shut-off valve traps refrigerant within the hose to eliminate venting and finger burn.

900 SERIES HOSES - (1/4" FFL* CONNECTIONS WITH AUTOMATIC SHUT-OFF ON ONE END)

LENGTH	BLUE	YELLOW	RED	SET OF THREE (B,Y,R)
3' (36")	903-MRB	903-MRY	903-MRR	903-MRS
5' (60")	905-MRB	905-MRY	905-MRR	905-MRS
6' (72")	906-MRB	906-MRY	906-MRR	906-MRS

*5/16" fittings available-contact factory for part numbers

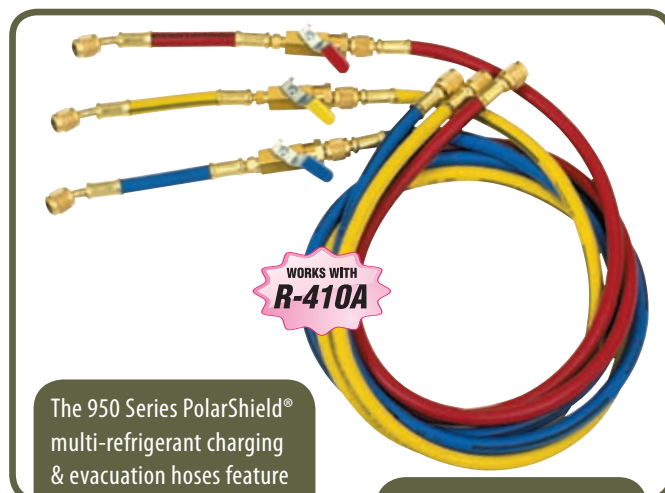
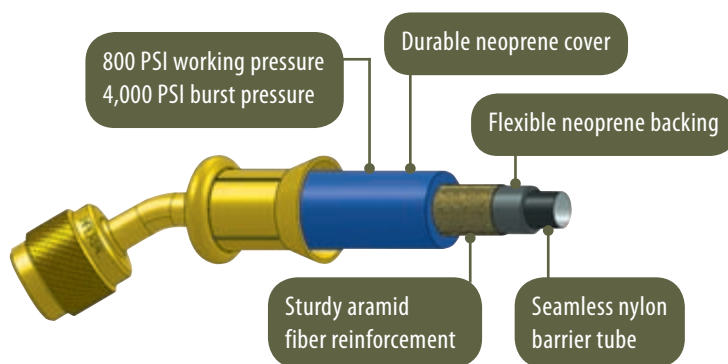
850 SERIES PolarShield® HOSES FOR R-410A SYSTEMS WITH 5/16" ACCESS FITTINGS (1/4" x 5/16" hose connections)

LENGTH	BLUE	YELLOW	RED	SET OF THREE (B,Y,R)
3' (36")	853-MRB	853-MRY	853-MRR	853-MRS
4' (48")	854-MRB	854-MRY	854-MRR	854-MRS
5' (60")	855-MRB	855-MRY	855-MRR	855-MRS
6' (72")	856-MRB	856-MRY	856-MRR	856-MRS

800 SERIES PolarShield® HOSES - WITH STANDARD 1/4" FITTING*

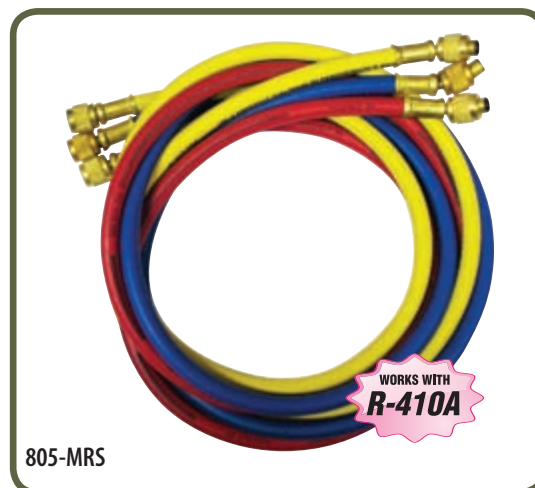
LENGTH	BLUE	YELLOW	RED	SET OF THREE (B,Y,R)
3' (36")	803-MRB	803-MRY	803-MRR	803-MRS
4' (48")	804-MRB	804-MRY	804-MRR	804-MRS
5' (60")	805-MRB	805-MRY	805-MRR	805-MRS
6' (72")	806-MRB	806-MRY	806-MRR	806-MRS
8' (96")	808-MRB	808-MRY	808-MRR	808-MRS
12' (144")	812-MRB	812-MRY	812-MRR	812-MRS

*5/16" fittings available-contact factory for part numbers



The 950 Series PolarShield® multi-refrigerant charging & evacuation hoses feature low loss ball valve shut-off and durable hi-pressure barrier construction.

- UL recognized
- 800 PSI working pressure, 4,000 PSI burst pressure
- Works with all refrigerant gases including R-410A



HI-PERFORMANCE CHARGING HOSE

3/8" EVACUATION HOSE WITH 3/8" SAE SWIVEL CONNECTION

For faster evacuation and charging

3/8" hose in four lengths for larger jobs or applications where reduced service time is desired. 3/8" swivel ends. Eight-crimp ferrules. Available in yellow.

LENGTH	YELLOW
3' (36")	536-FTY
4' (48")	548-FTY
5' (60")	560-FTY
6' (72")	572-FTY

HOSE REPLACEMENT PARTS

- S7958301** 1/4" Hose Seal Gasket.
S7958302 3/8" Hose Seal Gasket.
S8921626 Brass Core Depressor.
S10000265 1/2" ACME & 5/16" Hose Seal Gasket.

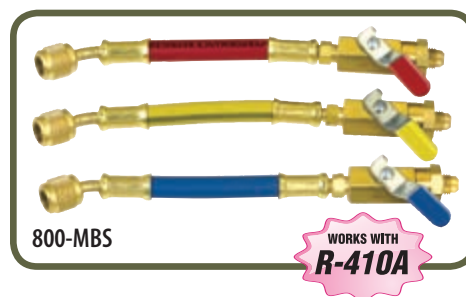
6" LOW LOSS BALL VALVE ADAPTER HOSES

1/4" SAE 45° female x 1/4" SAE male straight fittings

Connects to any 1/4" SAE charging line. Non-restrictive for maximum flow. UL recognized – environmentally safe.



LENGTH	BLUE	YELLOW	RED	SET OF THREE (B,Y,R)
6"	800-MBB	800-MBY	800-MBR	800-MBS



200 SERIES HOSE SETS FOR R-410A

(5/16" x 5/16" hose connections)

LENGTH	SET OF THREE (B,Y,R)
3' (36")	203-MRS
5' (60")	205-MRS
6' (72")	206-MRS

800 PSI Working Pressure; 4,000 PSI Burst Pressure

200 SERIES HOSE SETS FOR R-410A

B, R - 1/4" x 5/16" hose connections
Y - 1/4" x 1/4" hose connection

LENGTH	SET OF THREE (B,Y,R)
3' (36")	213-MRS
4' (48")	214-MRS
5' (60")	215-MRS
6' (72")	216-MRS

800 PSI Working Pressure; 4,000 PSI Burst Pressure

600 SERIES PREMIUM CHARGING HOSE

(1/4" x 1/4" hose connections)

LENGTH	SET OF THREE (B,Y,R)
3' (36")	603-MRS
5' (60")	605-MRS
6' (72")	606-MRS
12' (144")	612-MRS

600 PSI Working Pressure; 3,000 PSI Burst Pressure

HOSE CONVERSION ADAPTERS

The Imperial-Thermal Engineering conversion adapter consists of a compact ball valve that is ideal for retrofitting standard refrigerant hoses, providing instant refrigerant shut off capabilities. Available in standard 1/4" and 5/16" sizes for R-410A.



PART NO.	DESCRIPTION
TE-BV01R	1/4 SAE X 1/4 F SAE
TE-BV01Y	1/4 SAE X 1/4 F SAE
TE-BV01B	1/4 SAE X 1/4 F SAE
TE-BV01-3	1/4 SAE X 1/4 F SAE, SET OF 3
TE-BV02R	1/4 SAE X 5/16 F SAE
TE-BV02Y	1/4 SAE X 5/16 F SAE
TE-BV02B	1/4 SAE X 5/16 F SAE
TE-BV02-3	1/4 SAE X 5/16 F SAE, SET OF 3



KWIK-COUPLER™ ADAPTERS

HOSE SHUT-OFF ADAPTERS

The Kwik-Coupler™ adapter set is intended for use with refrigeration and air-conditioning service hoses when connecting to core valve type access fittings. Conventional threaded connecting is converted to push-pull operation which is faster, easier and positive sealing at all times. Valve cores are depressed automatically without adjustments or loss of refrigerant. Disconnecting is also accomplished without loss of refrigerant.

An automatic shut-off valve retains refrigerant pressure in a disconnected hose. This feature permits transferring high side hose refrigerant through the service manifold into the low side, thereby eliminating waste and hazardous high pressure discharge and atmospheric damage.

Features

- Automatic full depression of core valves without adjustment, regardless of core position.
- Coupler halves separately connect to access fitting and hose end, then easy push/pull operation automatically opens or closes system without loss of refrigerant.
- Automatic shut-off of hose ends permits discharging high side hose through manifold into low side.
- Eliminates hazardous discharge of refrigerant and oil from system when disconnecting hose.
- Simplifies operation of charging critical amount of refrigerant into small systems.
- Prevents finger burn when disconnecting – especially servicing heat pumps in cold weather.
- Core depressors in hose ends no longer necessary – speeds servicing of systems with hand valves.

16-C Straight Coupler (45° Flare) 1/4" female x 1/4" male.

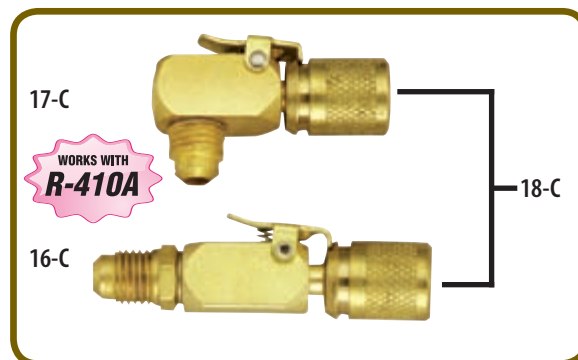
17-C 90° Elbow Coupler (45° Flare) 1/4" female x 1/4" male.

18-C (Set) includes 16-C and 17-C.

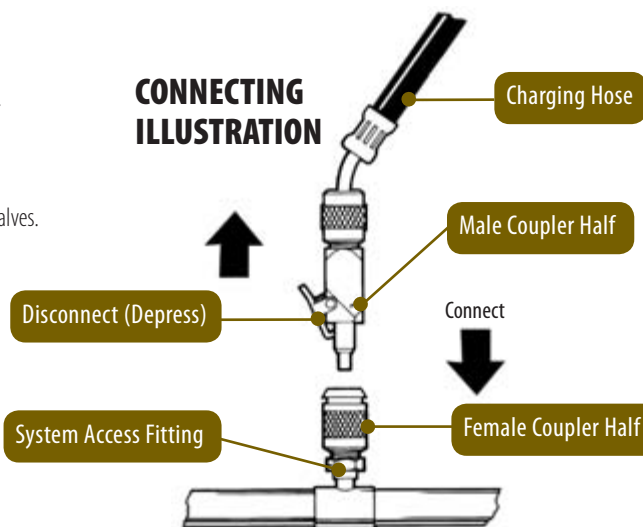
26-C Straight Coupler (45° Flare) 5/16" female x 5/16" male.

27-C 90° Elbow Coupler (45° Flare) 5/16" female x 5/16" male.
26-C and 27-C. NOT UL APPROVED

**WORKS WITH
R-410A**



CONNECTING ILLUSTRATION



WARNING: Do not allow any refrigerant cylinder, connected for charging, to be exposed to system high side pressure cylinder - explosion could result!

AUTOMOTIVE KWIK-COUPLER™ ADAPTER FOR R-12

19-C (Set) Same as 18-C except with special female coupler for use on 3/16" high side automotive access valves.

20-A High side adapter. Converts 3/16" system access valve to 1/4" access valve for use with standard 1/4" charging hose.



20-A



23-C



24-C

23-C & 24-C HI-DUTY® SHUT-OFF COUPLERS

- Coupler captures refrigerant within hose, eliminating refrigerant loss, atmospheric damage and finger burns.
- Connects quickly & easily to any standard 1/4" SAE refrigerant hose.
- Solid brass construction for years of dependable service.
- Innovative modular design permits easy field repairs.

SHUT-OFF COUPLERS

PART NO.	DESCRIPTION
23-C	Straight 1/4" SAE Shut-Off Coupler
24-C	90 Degree 1/4" SAE Shut-Off Coupler
25-K	Coupler Service Kit

KWIK-COUPLER™ ADAPTERS

KWIK-COUPLER™ REPAIR KITS

The Kwik-Coupler™ adapter repair kit is intended for use with Imperial® brand 16-C, 17-C, 18-C and 19-C Kwik-Coupler™ adapters and PolarShield® KC-Series hose. The male repair kit includes a threaded hex sleeve for replacement on straight coupler assemblies.

KCK-M Male Kwik-Coupler™ Adapter Repair Kit - Repairs 2 Male Couplers

Includes: Hex Sleeve (2), Spring (2), Stem Assembly (2) and Sealant

REPAIR INSTRUCTIONS

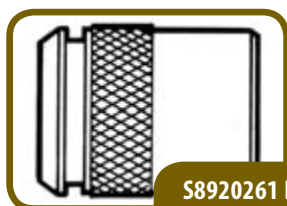
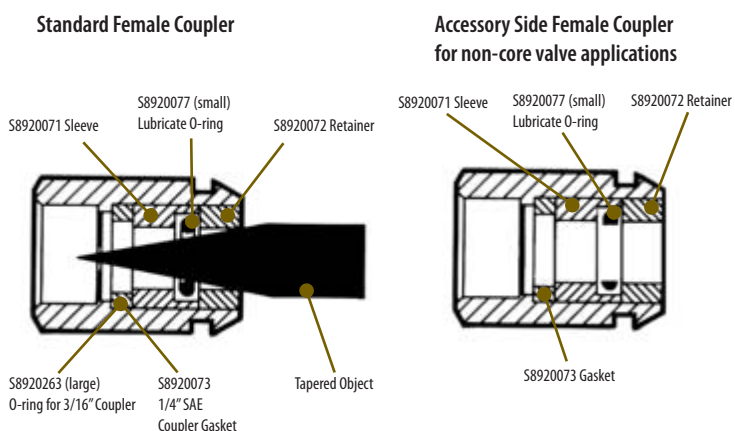
1. Remove threaded sleeve on end of Kwik-Coupler™ adapter. A vise may be necessary to remove old straight sleeve - the 90° has a screwdriver slot on back for removal.
2. Discard old stem and spring.
3. Use a wire brush to clean sealant residue from disassembled parts.
4. Insert new stem and spring.
5. Apply one bead of thread sealant completely around the thread. Do not apply an excessive amount of sealant - this may damage o-ring seal and cause leakage. Assemble to length at right (Fig. 1 & 2). For 90° style, engage threads until the bottom of the slot is even with the back of the coupler (Fig. 4).
6. Allow sealant to cure at least 30 minutes. The Kwik-Coupler™ adapter is now ready to use.

KCK-F Female Kwik-Coupler™ Adapter Repair Kit - Repairs 5 Standard and 5 Automotive Female Couplers (Not for 26-C and 27-C)

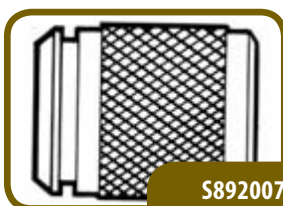
Includes: Retainer (2), Gasket (5), O-Ring (10) and O-Ring 3/16" for Automotive (5)

REPAIR INSTRUCTIONS

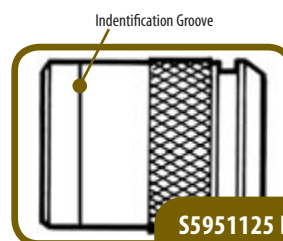
1. Insert tapered object (pen or pencil) and press against threaded retainer. Unscrew and remove retainer, sleeve and rubber seals.
2. Lubricate new seals and reassemble. Tighten retainer to zero clearance plus 1/8" turn. The Kwik-Coupler™ adapter is now ready for use.



S8920261 Female Coupler
(3/16" high side automotive)



S8920074 1/4"
Female Coupler



S5951125 Female
Coupler (accessory side)

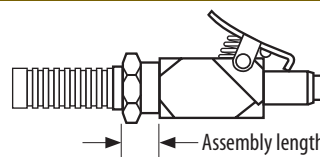


Figure 1

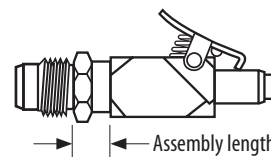


Figure 2

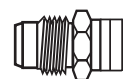


Figure 3
Hex sleeve

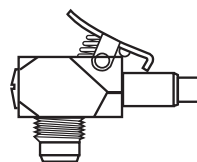


Figure 4
90° assembly

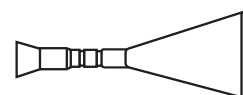


Figure 5
Sealant



Figure 6
Spring

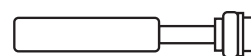


Figure 7
Stem assembly

KCK-M Male Kwik-Coupler™ Adapter Repair Kit

KWIK-COUPLER™ ADAPTER REPLACEMENT PARTS

PART NO.	DESCRIPTION	USED ON
S8920069	Male Coupler 1/4"-Straight	16-C, 17-C, 18-C, 19-C
S8920071	Female Coupler 1/4" & 3/16"-Sleeve	16-C, 17-C, 18-C, 19-C
S8920072	Female Coupler 1/4" & 3/16"-Retainer	16-C, 17-C, 18-C, 19-C
S8920073	Female Coupler 1/4"-Gasket	16-C, 17-C, 18-C, 19-C
S8920074	Female Coupler 1/4"-Low Side	16-C, 17-C, 18-C, 19-C
S8920077	Female Coupler 1/4", 3/16" & 5/16"-O-Ring	16-C, 17-C, 18-C, 19-C
S8920082	Male Coupler 1/4"-90°	16-C, 17-C, 18-C, 19-C
S8920261	Female Coupler 3/16"-High Side	19-C
S8920263	Female Coupler 3/16"-O-Ring	19-C
S5951125	Female Coupler 1/4" -for Non-Core Valve Application	16-C, 17-C, 18-C, 19-C
KCK-F	Repair Kit For All Female Couplers	
KCK-M	Repair Kit For All Male Couplers	

REFRIGERANT CHARGING & RECOVERY

KWIK-VISE™

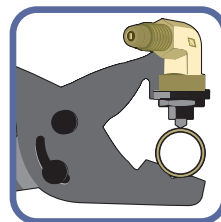
Refrigerant Recovery Tool

- PT-109** Line piercing/refrigerant recovery tool pierces, seals and locks on to copper lines in one swift motion.
- Self-adjusting! No need to adjust the tool for different sizes of tubing. The tension system automatically locks pliers on copper tubing 1/4" to 1/2" (6 mm–12 mm) O.D.
- To use, simply position the PT-109 on the tubing to be pierced. Close the pliers quickly and firmly. The pliers will automatically adjust and lock into a tightly sealed, secure position.

Features

- Replaceable hardened, stainless steel pierce and brass valve assembly (S16002045).
- Capacity: 1/4" thru 1/2" O.D. refrigerant copper tubing.
- Durable: made with high-carbon, heat treated steel jaws.
- Works with all refrigerants CFC, HFC, HCFC and Zeotropic, Azeotropic.
- 90° elbow valve eliminates tangling and interference problems.

S16002045 Replacement pierce and brass valve assembly.



PT-109



KWIK CHARGE®

Liquid Low Side Charger

Provides fast, safe charge - essential for today's blended refrigerants!

The Kwik Charge® charging unit accepts liquid refrigerant from the cylinder and discharges into low side of the system. Charging rate is up to eight times faster than vapor charging. In addition, liquid charging is required when using R-410A and other blended refrigerants. Attach the Kwik Charge device to the low side of the charging manifold. Charging hose is connected from Kwik Charge device outlet to low side of refrigeration system. Internal metering element reduces liquid flow to a level below capacity of compressor. This assures a safe, fast charge without endangering the compressor. A built-in ball check valve automatically opens when drawing a vacuum to assure rapid, unrestricted evacuation. Can be used with all fluorinated hydrocarbon refrigerant systems.

Features

- Up to 8 times faster than vapor charging.
- No need to heat refrigerant cylinder.
- Built-in check valve opens for drawing unrestricted vacuum.
- No pressure drop in cylinder.
- One charger services all units 1/2 ton or larger.

535-C Kwik Charge® charging unit 1/4" female SAE flare inlet, 1/4" male SAE flare outlet.

545-C Kwik Charge® charging unit 5/16" female SAE flare inlet, 5/16" male SAE flare outlet.

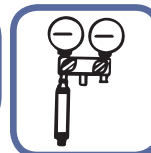
WORKS WITH
R-410A



535-C

CONNECTION TO MANIFOLDS (connect all hoses as usual)

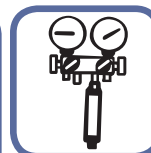
2-Valve Connect Kwik Charge® charger to low side fitting. Arrow downward.



Can be connected to refrigerant cylinder rather than manifold.



4-Valve Unscrew end fitting & reverse, then connect to refrigerant fitting as shown (flow arrow on body points upward).



REFRIGERANT CHARGING & RECOVERY

VIZI-VAPR CHARGER

7701

Many problems can arise from improper charging of any type of refrigeration system. Vizi-Vapr makes it possible to correctly charge a system every time. Liquid refrigerant being charged is transformed into a saturated vapor through a small orifice which thereafter can be viewed to ensure the system gets charged properly.

The Vizi-Vapr eliminates the problem of slow vapor charging by removing the refrigerant from the cylinder as a liquid and injecting it into the system as a saturated vapor. Since the liquid refrigerant is removed from the cylinder by its own pressure, no heat is removed from it and the cylinder does not get cold. Refrigerant blends must be removed from their containers as liquid. Using the Vizi-Vapr, the blend can be charged into the system as a saturated vapor without any composition change. Vizi-Vapr is adjustable from 1/8hp up to 50hp. The operation is completely visible so there is little danger of liquid entering the system.



WORKS WITH
R-410A

7701

VIZI-VAPR REPAIR KIT

7701RK

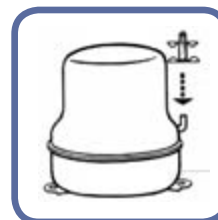
Complete set of gaskets, "O" rings, and back-up rings required for repairing the 7701 Vizi-Vapr.

PROCESS TUBE ADAPTER FOR CHARGING & TESTING

Offers a convenient method of making a service connection to a hermetic unit. Also ideal for providing a connection in testing coils and tubing installations. Handles pressure to 100 PSI. To connect to a hermetic system, pinch-off tube is cut off and adapter is slipped over cut end of tube and tightened. Synthetic rubber seal of adapter grips and seals outside of tube. This gives a 1/4" SAE male flare connection to the system for evacuating, charging or testing. After system is recharged, tube is pinched off next to adapter. Adapter is then removed and tube is cut off and sealed with solder. Adapter can be reused repeatedly.

PART NO.	TUBE O.D. (in.)	SAE FLARE END (in.)
241-F-03	3/16	1/4
241-F-04	1/4	1/4

Pinch-off tube on hermetic compressor is cut off and 241-F is placed on tube. Charging line is connected to flare end of 241-F.



241-F-03



PIERCING VALVES

3-IN-1 PIERCING VALVE

Fast, easy, secure installation. Provides access to line at any point for charging, testing or evacuation. Two valves cover 3/16" to 5/8" O.D. tubing. Has depressor valve and needle valve shut-off.

Valve clamps on tubing line with two captive slotted-head screws: positive built-in mechanical stop for each tube size eliminates tightening guesswork. To pierce tube, thread down the combination 1/4" flare port, stem and needle using knob furnished or a suitable wrench, back off stem and connect depressor-type hose for testing or charging. After service is completed valve is closed and left on line for future service. Dust cap provided.

Three-point sealing [in Fig. 1: (1) needle-type valve, (2) gasket and (3) check valve] prevents leakage. Neoprene seal withstands temperatures near 300°F.

541-C Fits 3/16", 1/4" and 5/16" O.D. tubing.

542-C Fits 3/8", 1/2" and 5/8" O.D. tubing.

FITS THREE SIZES

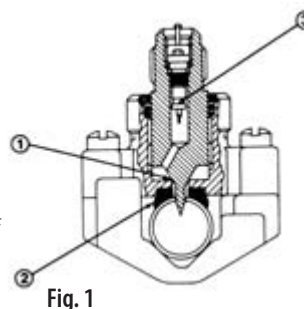
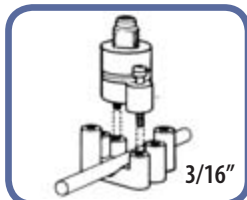
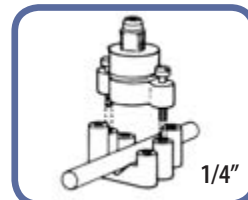


Fig. 1

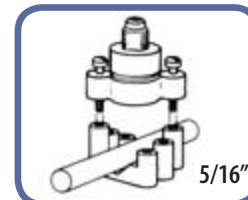
541-C



3/16"



1/4"



5/16"

ACCESS VALVES & ADAPTERS

ACCESS FITTINGS/SWIVEL ADAPTERS

- 9-C** Straight adapter, 1/8" female pipe by 1/4" SAE female swivel connection.
- 10-C** 90° swivel adapter, 1/4" SAE male flare by 1/4" SAE female flare swivel connection with core depressor.



9-C



10-C

ACCESS VALVES

These valves are designed to facilitate charging and testing of refrigeration systems. Furnished with flare cap on valve end.



Half Union Access Valves

PART NO.	TUBE O.D. (in.)	PIPE THREAD (in.)
GU1-4A	1/4	1/8
GU1-4B	1/4	1/4



Replacement Valve Cores

PART NO. G6400



Wrench Caps

PART NO. G6600



Flare Caps

PART NO.	FOR FLARE SIZE
640-FC-04	1/4"
640-FC-06	3/8"

VALVE CORE DEPRESSOR

For 1/4" male flares.



7025

PART NO.	DESCRIPTION
7025	FOR 1/4" MALE FLARES

R-410A BRASS ADAPTER

Convert new R-410A system ports with 5/16" SAE connections to 1/4" SAE.

WORKS WITH
R-410A



TE-BA01

PART NO.	MALE	FEMALE	OTHER	APPLICATION
TE-BA01	1/4" SAE	5/16" SAE	W/ CORE AND DEPRESSOR	R-410A INTERNATIONAL

R-410A 45° BRASS ADAPTER

Convert new R-410A system ports with 5/16" SAE connections to 1/4" SAE at 45°.

WORKS WITH
R-410A



TE-BA0145

PART NO.	MALE	FEMALE	OTHER	APPLICATION
TE-BA0145	1/4" SAE	5/16" SAE	W/ CORE AND DEPRESSOR	R-410A INTERNATIONAL

ADDITIONAL END FITTING OPTIONS

Imperial-Thermal Engineering understands that no two jobs are alike. In keeping with our commitment to serve the HVAC/R professional we offer a multitude of end fitting options custom tailored for your application. Listed below is a sample of the end fittings available in any combination. Please call customer service for your inquiries, (888) 467-8665.

1/4 Anti-blow back	1/2 Acme FFL 90°	1/4 FFL 90°	1/4 Hex Nut
1/2 Acme Anti-blow back	1/2 Acme 14mm	1/2 Acme Hex Nut	1/4 Hex Nut 45°
1/2 Acme FFL	1/4 FFL	1/2 Acme Hex Nut 45°	1/4 Hex Nut 90°
1/2 Acme FFL 45°	1/4 FFL 45°	1/2 Acme Hex Nut 90°	In-line filter element (10 microns)

CAP-CHECK

The Cap-Check is a Imperial-Thermal Engineering innovation that has made cap tube cleaning possible and practical. It is designed to pump a high rate of oil into the cap tube to build up pressures needed to open any plugged cap tube, and will clean partially plugged cap tubes when used with the Imperial-Thermal Engineering Chaser Kit.

CAP-CHECK

1003

Cap-Check is a portable, self contained hydraulic power unit with auxiliary equipment especially adapted to cleaning refrigeration capillary tubes. A 0-5000 PSI gauge shows pressure build-up if cap tube is restricted and also shows when chaser has passed through the tube. A trigger operated gauge shutoff is provided so the gauge will not be damaged if pressures greater than 5000 PSI are desired. A 30" high pressure hydraulic hose with a 1/4" SAE male flare outlet connects the cap tube to the Cap-Check for simple handling. An adapter is supplied to connect the cap tube directly to the hose outlet without a flared fitting.



1003

CAP-CHECK CHASER KIT

1101

Chaser Kit is the only means available to clean partially plugged cap tubes. It must be used with the Imperial-Thermal Engineering Cap-Check since no other cap tube cleaning tool provides a rate of oil flow large enough to remove partial restrictions even from the smallest cap tubes. The Chaser Kit consists of 10 spools of lead alloy wire which can be used as a chaser for the 10 most popular sizes of cap tubes (.028, .031, .036, .039, .042, .046, .050, .055, .064, .070). In addition to the wire, a cap tube gauge, a set of sizing tools, and a combination file/reamer are all included in a durable metal case.



1101

CAP-CHECK OUTFIT

5101

Cap-Check Outfit includes both the Cap-Check and Chaser Kit in one compact case along with an extended base that holds the Cap-Check. The Cap-Check can be operated with one hand, allowing high pressures to be easily pumped. Carrying case has clips to hold Cap-Check, Chaser Kit, hose, handle, and extended base.



5101

CAP-CHECK ACCESSORIES

A capillary tube is the most likely place a blockage in a system can occur and can cause a system to operate very inefficiently. Therefore it is essential to have the proper tools on hand to fix this very common problem. Below are accessories that we recommend for the Cap-Check and your service arsenal.

PART NO.	NAME	DESCRIPTION
1003RK	Cap-Check Repair Kit	Complete set of gaskets, "O" rings, springs and balls for Part No. 1003 Cap-Check, with instructions
1011	0-5000 PSI Gauge	High pressure gauge for Part No. 1003 Cap-Check with a pressure range from 0-5000 PSI
1012	30" Hydraulic Hose Replacement	30" high pressure hydraulic hose with a 1/4" SAE male flare outlet
1102	Cap-Gauge	Pocket knife type cap tube gauge with 10 stainless steel gauges to measure the most popular sizes of cap tubes (.028", .031", .036", .039", .042", .046", .050", .055", .064", .070")
1201	Carrying Case	Heavy duty case provides maximum protection from wear and tear when not in use
1301	Extended Base	Extension for the base of the Cap-Check providing better accessibility in certain situations

CAPILLARY TUBING

Imperial-Thermal Engineering quality capillary tubing - available in 100ft. coils.

PART NO.	SIZE
CT-31-100	.031" ID X 100 FT
CT-36-100	.036" ID X 100 FT
CT-42-100	.042" ID X 100 FT
CT-49-100	.049" ID X 100 FT
CT-54-100	.054" ID X 100 FT
CT-59-100	.059" ID X 100 FT
CT-64-100	.064" ID X 100 FT
CT-70-100	.070" ID X 100 FT

CALCULATORS

Reference points on a variety of topics and scales to make even the most technically demanding jobs a breeze.

ROOM AIR CONDITIONER CALCULATOR

5100

Used to determine size of air conditioner unit with allowances for:

- Exposed and unexposed walls.
- Exposed and unexposed windows.
- Roof and ceiling insulation.
- Heat gain from number of people.
- Location.

This calculator selects amount of capacity needed in a cooling load of 5000-24000 BTUs per hour, and indicates the size of unit required in BTU ratings. The calculator not only simplifies the job of specifying window air conditioners, but also eliminates misapplication and paper work. An ideal service and sales tool for the estimator and service engineer, the calculator is imprinted with full directions.



5100

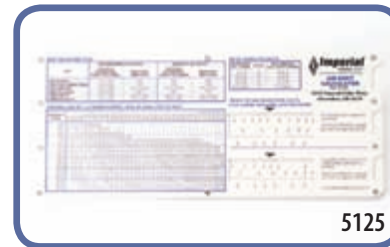
AIR DUCT CALCULATOR

5125

This ingenious, pocket-size Air Duct Calculator uses only three slides to give all of the information needed when figuring the sizes of air ducts. Convenient tables printed on the back of the calculator supply additional data in a handy, easy-to-use form. The few words of instruction needed to understand and use the different slides are printed on the calculator face, where they cannot be lost or mislaid.

Used to determine:

- Size of air ducts by the equal pressure loss method.
- Size of round ducts vs. rectangular ducts.
- Weight per foot of round ducts by U.S.S. gauge.
- Weight per foot of rectangular ducts by U.S.S. gauge.
- Recommended duct velocities.
- Friction loss of 1-1/2 radius elbows.
- Gauge of metal for size of ducts.

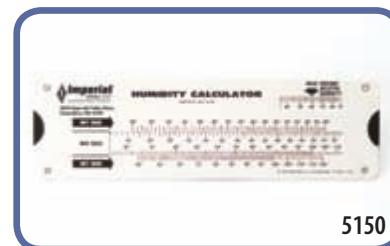


5125

HUMIDITY CALCULATOR

5150

Designed for determining the percent of relative humidity when using any standard sling psychrometer, this calculator eliminates the use of psychrometric charts from 60° to 100°F. The reverse side of the calculator has a chart of recommended humidities according to industry application and temperature.



5150

TROUBLESHOOTING CALCULATOR

5175

This calculator simplifies the job of diagnosing cooling system troubles. Ideally suited to the needs of the expert as well as the needs of the trainee, it provides immediate reference, from COMPLAINT to POSSIBLE CAUSE to REPAIR.

Features

- 19 major 'Complaint' sections.
- 32-part 'Trouble Shooting' Index.
- 127 'Possible Cause' items.
- All items keyed to 'Repair' window.



5175

CALCULATORS

On-the-fly calculations can be made very easily to help troubleshoot a system, saving you valuable time!

CAPILLARY TUBE AND TROUBLESHOOTING CALCULATOR

5180

TWO SLIDE CHARTS IN ONE

This is a dual-purpose slide chart. One side is a new, scientific approach for selecting readily available standard capillary tubing sizes to replace the hard-to-get sizes that original manufacturers often recommend. The other side is a troubleshooting calculator that simplifies the job of diagnosing cooling system trouble where the capillary tube is suspect.



5180

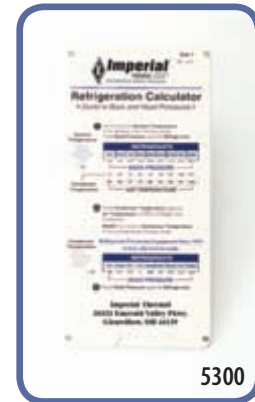
REFRIGERATION CALCULATOR

5300

A time-saving and easy-to-use calculator to supply technical refrigeration data:

- Hermetic terminal colors.
- Thermostatic control settings.
- Pressure control settings.
- Head and back pressures.
- Hermetic motor diagrams.
- Temperature pressure chart.

The calculator graphically shows vital refrigeration data and provides service information not available in any other form.



5300

BOOKS

REVIEW OF VACUUM FOR SERVICE ENGINEERS

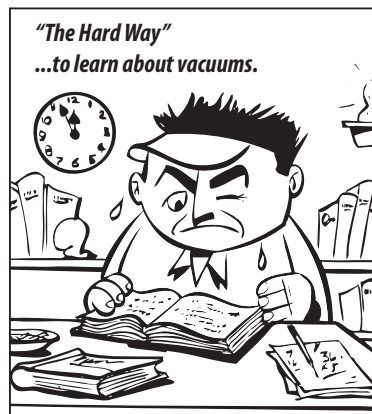
5225

The story of how vacuum is used as a tool to dehydrate and degas a refrigeration system. This text is the only publication that clearly and non-technically explains vacuum fundamentals for the service man or engineer.

Illustrated with charts, photographs, and diagrams, this authoritative handbook describes and explores vacuum terms, properties, uses, activities, advantages, limitations, and techniques.

Features

- Covers key service-related topics.
- Vital for processing engineer, serviceman.
- What vacuum means.
- How a pump works.
- Sizing high vacuum pumps and lines.
- Vacuum gauges procedure for dehydration, degassing, leak detection.

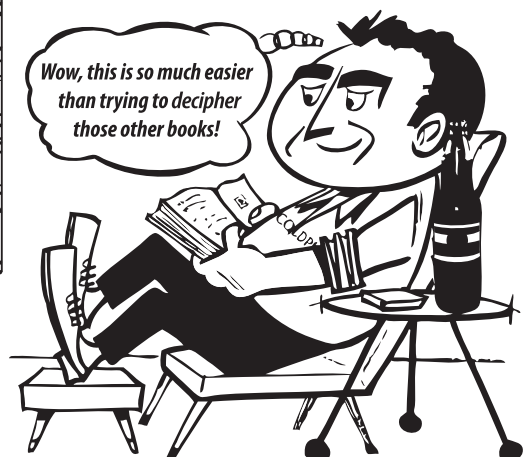


Take "The Easy Way" with
 "Review of Vacuum for Service Engineers"
 by
 Saunders & Williams



5225

"The Easy Way"



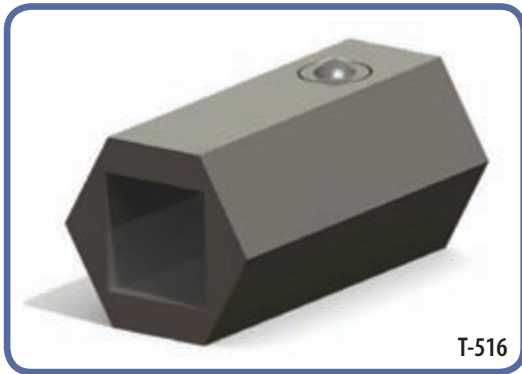
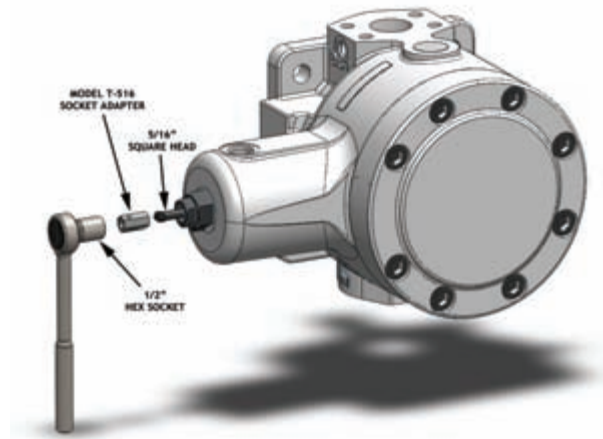
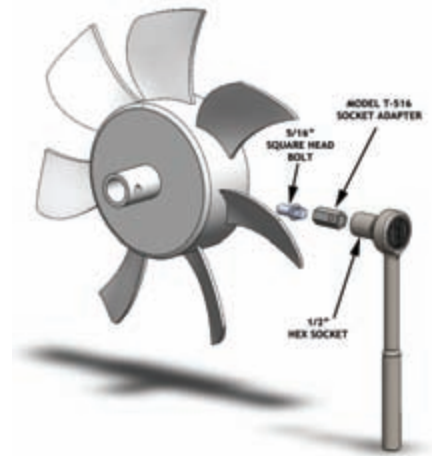
SQUARE HEAD BOLT SOCKET ADAPTER

THE SQUARE WONDER™ SQUARE HEAD BOLT SOCKET ADAPTER T-516

This incredible tool fits into 1/2" hex sockets and enables the technician to easily remove 5/16" square head locking bolts. It allows easy access to places where valve wrenches will not work or when more leverage is required.

COMMON APPLICATIONS INCLUDE:

- Refrigeration & A/C service valves.
- Condenser fan blades with bottom side and right side up hubs.
- Small and large concave blower wheels.
- Beam clamps for hanging all-thread rods (used in electrical, plumbing and A/C applications).
- Square head lag screws.
- Pipe plugs, pump heads for gauge ports, water and pneumatic plugs, gas furnace manifold plugs.
- Adjustment screws for pressure switches.
- Great for Carrier, York, Addison, Rheem, Aaon, Bard, Trane and many more.



T-516

HEATERS

Quick and easy process of pressurizing a refrigerant supply cylinder to move any refrigerant to another vessel.

CYLINDER HEATER 3054

A quick, convenient, easy-to-use means to pressurize refrigerant supply cylinders to move any refrigerant to another vessel or charging dispenser, the 3054 Cylinder Heater is designed to fit 30lb. and 50lb. containers. It also can be used on 125lb. cylinders and fits the refrigerant cylinders in many recovery units. The device consists of a 6" x 28" flexible silicone rubber heating element with extra-long Velcro straps, built-in molded thermostat, and power cord. The heater draws 200 watts at 120 VAC and has a 135° preset thermostat.

3054-230V

230 Volt model available for European market.



3054

CHARGING SCALES

CHARGING SCALE

4900

The 4900 refrigerant charge scale is the ideal choice for field service work. With a high resolution LCD screen that reads in both lbs. and kg., this scale comes packaged in a convenient carrying case and is powered by (1) 9 volt battery (included).

Features

- Battery operated (9V) for ease of portability.
- 220lbs. (100kg.) capacity.
- High resolution LCD screen with backlight capability.
- Automatically powers off.
- 5g, 0.25oz. resolution.
- Readout in lbs. or kg.
- Zero/Tare capable.
- Weight 6.5lbs.
- Extra sturdy aluminum bound case.

Convenient solution for refrigerant charging. Easy to use, even easier to carry around.



OIL PUMPS & ACCESSORIES

OIL PUMPS & ADAPTERS KITS

Precisely and exactly the right amount of oil in the cleanest and most efficient manner. Allow for all popular sizes of oil cans and bottles to fit with our oil pumps.

CHARGE-OIL PUMP

It charges without pumping the compressor down thus reducing charging time by over 70%. Also avoids the embarrassment of spilling oil on the customer's premises. Provides the professional touch since oil can be accurately measured into the compressor without having to pour it from the can. Fits all popular brands of refrigeration oil.

Complete Adapter Kit supplied to accommodate most containers. The Charge-Oil Pump cap seals the can so pump need not be removed until can is empty. Thermal Charge-Oil Pump is a piston type high pressure pump designed to operate at pressures to 250 PSI. It pumps one quart in 20 full strokes of the piston. Pump is connected to compressor by refrigerant charging line or copper tubing from 1/4" male fitting.

Suitable for use with alkylbenzene and POE oils.

PART NO.	DESCRIPTION
1702	Imperial-Thermal Charge-Oil Pump
1703	Imperial-Thermal Charge-Oil Pump for 5 Gallon Can



CHANGE-OIL PUMP

1751

1751 Change-Oil Pump is a companion to the famous Imperial-Thermal Engineering 1700 Charge-Oil Pump. It has been designed for use in pumping oil from refrigeration compressors, marine engines, and other equipment where it is impossible to drain oil in the conventional manner. Removing oil from refrigeration compressors before dehydrating with vacuum is a necessity. Suction tube is 5/16" OD semi-rigid plastic, 15" long. Suction tubes up to 60" long can be used if necessary. Will not pump under pressure. Pumping capacity about 10 strokes per quart.

ADAPTERS & REPAIR KITS		
PART NO.	NAME	DESCRIPTION
1705	1702 & 1703 Repair Kit	Complete set of gaskets, bearings, rings, springs and washers for the repair of Imperial-Thermal oil pumps
1751RK	1751 Repair Kit	Complete set of gaskets, bearings, rings, springs and washers for the repair of Imperial-Thermal oil pumps
1768	Adapter Kit	Adapter kit for all popular cans and bottles of refrigerant oil. Kit contains 5 rings and one spacer to accommodate most oil containers
1770	Adapter Kit	Suction adapter for aluminum Charge-Oil Pump. Converts part no. 1702 Charge-Oil Pump into suction pump for refrigeration, marine and other similar applications where it is impossible to draw oil in the normal manner

VACUUM PUMP ACCESSORIES

These vacuum accessories will help you make easy vacuum connections in many types of systems.

MINI-VAC

1833

Mini-Vac is a compact High Vacuum Manifold which provides a 3/8" flare yoke and an electronic vacuum gauge sensor port (sensor not included). Features a 3/8" packless diaphragm valve to isolate the vacuum pump from the system. The Mini-Vac mounts on the pump with a 3/8" quick coupler.



Pictured with optional digital vacuum gauge.

MANIFOLD GASKET SET

1843

Gasket set for Part No. 1833 Mini-Vac.

MINI-VAC MANIFOLD AND 0-30" VACUUM GAUGE COMBO

1834

Combination of Part No. 1833 Mini-Vac Manifold and 0-30" mechanical vacuum gauge which attaches to the sensor port.



VACUUM TEE

1832

Vacuum Tee for evacuating from two ports with one vacuum source. (2) 3/8" MFL x 3/8" quick coupler. Includes (2) 3/8" x 1/4" x 6' (72") high vacuum hoses.



3/8" EVACUATION HOSE WITH 3/8" SAE SWIVEL CONNECTION

For faster evacuation and charging

3/8" hose in four lengths for larger jobs or applications where reduced service time is desired. 3/8" swivel ends. Eight-crimp ferrules. Available in yellow.

LENGTH	YELLOW
3' (36")	536-FTY
4' (48")	548-FTY
5' (60")	560-FTY
6' (72")	572-FTY

VACUUM PUMP ACCESSORIES

High quality vacuum pump oil and sealants help maintain your vacuum pumps and prolong their life.

VACUUM PUMP OIL

1813

Imperial-Thermal Engineering Vacuum Pump Oil keeps any high vacuum pump at maximum performance. No pump can deliver a lower pressure than its sealing oil's vapor pressure. This oil must have the viscosity to lubricate and seal clearances in the pump's moving parts at the extreme temperatures developed during continuous use.

- Premium quality mineral oil formulated to tolerate exposure to vacuums of 5 microns.
- Resists the formation of deposits and maintains its original lubricating properties over a long life.
- Offers very high vacuums, excellent lubrication, and long oil life.
- Available in 1qt. bottles, 6 per case.

PART NO.	CASE SIZE	GRAVITY, API	VISCOSITY	FLASH POINT	PRESSURE, MICRONS, HG, MAX
1813	(6) Quart Containers	29.2	SUS AT 100°F, 335	450°F	5



LIQUI-VAC

4036 & 4036-Q

Features

- Sets up quickly.
- Seals to 1 micron.
- Remains flexible.
- Ready to use.

A real time-saver in servicing cooling systems, Liqui-Vac is the only liquid sealant with the capacity of sealing high vacuum connections. It will positively seal high vacuum leaks around threads, through flared connections, face joints, wherever metal joins metal. Liqui-Vac sets up quickly, but remains flexible for easy disconnection. Liqui-Vac is resistant to most solvents, can seal to 1 micron, and withstands temperatures from -100°F to +325°F.

4036 4 oz. brush-in-cap can (Sold 12 per case)

4036-Q 1 qt. can



EASY BRUSH ON APPLICATOR FOR:



THREAD CONNECTIONS



SOLDERED OR WELDED CONNECTIONS



MACHINE SURFACE CONNECTIONS

CHARG-CHECK

Accurately charge your refrigeration system with Charg-Check, available in a number of sizes to suit your needs.

CHARG-CHECK

Features

- Comes in three sizes to suit any application, 1lb. (16oz.), 5lb. (80oz.), and 10lb. (160oz.) sizes cover the field from light domestic to heavy commercial.
- Allows you to measure out precise quantities of refrigerant.
- Helps speed up the charging process by letting you charge with heat. All cylinders except the 16oz. model will hold a Model 7020 Heater Assembly (See page 68).
- Allows you to carry small quantities of refrigerant to the job, yet buy refrigerant in large quantities and keep the drum back at your shop.
- Is available in a steel carrying case to completely protect them from tough use. Cylinder need not be removed from the case as all connections and valves are accessible from front. Case forms a stand to set on the floor or bench. Case sold separately (See page 68).
- Easily used in the field. They hang onto system being charged by means of a top-mounted bail.
- Can be calibrated for ambient temperature variations by means of temperature correction chart on the side of the scale. This is required only if better than 2% accuracy is needed.
- Safety relief valve for protection.
- Plastic liquid level indicators.



Shown with optional carrying case

R-12, R-22, R-502 MODELS

PART NO.	CAPACITY	GRADUATION
7001	16 oz.	1/2 oz.
7002*	16 oz.	1/2 oz.
7005	80 oz.	1 oz.
7006*	80 oz.	1 oz.
7009	160 oz.	2 oz.
7010	160 oz.	2 oz.

*CARRYING CASE INCLUDED

HFC-134A MODELS WITH 1/4" SAE FITTINGS

PART NO.	CAPACITY	GRADUATION
U7001	16 oz. (450 G)	1/8 oz. (5 G)
U7002*	16 oz. (450 G)	1/8 oz. (5 G)
U7005	80 oz. (450 G)	1 oz. (25 G)
U7006*	80 oz. (450 G)	1 oz. (25 G)
U7009	160 oz. (900 G)	2 oz. (50 G)
U7010	160 oz. (900 G)	2 oz. (50 G)

*CARRYING CASE INCLUDED

GASKET SETS AND REPAIR KITS

Charg-Check Repair kits contain a complete gasket set and replacement gauge.

PART NO.	DESCRIPTION
7001GS	Gasket set for 16 oz. CHARG-CHECK
7001RK	Repair kit for 16 oz. CHARG-CHECK
7003GS	Gasket set for 2-1/2 lb. CHARG-CHECK
7003RK	Repair kit for 2-1/2 lb. CHARG-CHECK
7005GS	Gasket set for 5 lb. CHARG-CHECK
7005RK	Repair kit for 5 lb. CHARG-CHECK
7009GS	Gasket set for 10 lb. CHARG-CHECK
7009RK	Repair kit for 10 lb. CHARG-CHECK

CHARG-CHECK ACCESSORIES

Optional accessories for the Charg-Check Series charging cylinders

CARRYING CASES FOR THE CHARG-CHECK SERIES

An ideal way to protect the Charg-Check cylinder from various damage including a broken sight glass. The carrying cases are constructed of 20 gauge steel and supplied with a durable powder coat finish.

PART NO.	DIMENSIONS	USED WITH
7007	4.25"W x 16.75"H x 3.625"D	7001 / U7001
7008	4.75"W x 23.5"H x 5"D	7005 / U7005
7013	6"W x 25"H x 7"D	7009 / U7009



Shown with optional carrying case

CHARG-CHECK HEATER ASSEMBLIES

7020 & 7024

- 7020** The 120 Volt heater assembly is threaded into the bottom of the cylinder to increase the speed of the charge.
- 7024** The 240 Volt heater assembly is threaded into the bottom of the cylinder to increase the speed of the charge.



7024, 7020

HERMETI-CHECK

Hermetic compressors are permanently sealed which means there is little you can do to fix one that is broken on the inside. However with the following tools brought to you by Imperial-Thermal Engineering, you can test the compressor for any electrical problems it may have which can help determine the appropriate actions to take.

HERMETI-CHECK

2001

Hermeti-Check tests all single phase compressors up to 5 HP, 110, 220 or 277 volts.

Features

- Tied-up compressors may be freed by reversing motor rotations.
- Tests windings for opens, continuity, and grounds.
- Tests start and run capacitors and system relays by substitution.
- Measures running amps, 0-10, 50A range.
- Measures start and run volts, 0-150, 600V AC ranges.
- Compressors are tested in the manner in which they were designed to operate: split-phase, capacitor start, or PSC.
- Has provisions for connecting external run capacitor. (1) 30A breaker protected to allow high starting current with adequate overload protection.
- Complete with 220V adapter cord and capacitor leads.

WEIGHT	POWER	DIMENSIONS
3 LBS	110, 220, OR 277 VAC 50/60 HZ	12-1/8" x 8" x 3-3/8"

PROFESSIONAL SERIES DIGITAL HERMETIC ANALYZER

12501A

Features

- Easy to read digital LCD display.
- Tests and runs 110, 220 or 277 volt 50/60 Hz single phase compressors up to 5 HP.
- Tied-up compressors may be freed by reversing motor rotation.
- Tests windings for opens, continuity, and grounds.
- Checks capacitors for leaks, opens, and shorts.
- Measures capacitor values, 0-200, 0-2000 MFD ranges.
- Automatic capacitor discharge.
- Measures compressor amps, 0-30A.
- Measures start and run volts, 0-600VAC.
- Measures winding resistance, 0-2000 ohm.
- 500V megger for testing compressor windings for grounds.
- Compressors are tested in the manner in which they were designed to operate: split-phase, capacitor start, or PSC.
- Multiple internal starting capacitors: 100, 200 and 400 MFD values.
- Has provisions for connecting external run capacitor.
- 30A breaker protected.
- Complete with 220V adapter leads and capacitor leads.

Upgraded Features

- Combined run and start information onto single screen.
- Each screen describes what it is measuring.
- New safety features prevent switching from high voltage to low voltage measurement until charge has dissipated.
- Compressor cannot be started unless selector switch is in a run mode.

WEIGHT	POWER	DIMENSIONS
9.5 LBS	110, 220, OR 277 VAC 50/60 HZ	15-1/2" x 13-3/8" x 6"

Annie®



**Remember
the
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Annie®



ACCESSORIES

A compressor may just have a bad electrical part. These accessories will help determine exactly what is going on.

QUIK-START

2601

Quik-Start starts all single phase compressors up to 5 HP 110, 200, 277V AC. A trouble-shooting aid for determining whether fault lies with compressor or component parts. Fusetron protects against shorts and overloads, but allows high starting load. Capacitor leads provide means of starting split phase, capacitor start, or permanent split capacitor compressors.



2601

TEST LEAD KIT

2605

Test Lead Kit consists of 4 leads 30" long with insulated test clips in each end for temporarily connecting relays, capacitors, etc., into a system for test purposes and has a 6ft. heavy duty power cord with a male plug on one end and insulated test clips on the other. Also has a 12" power cord with a female socket on one end and insulated clips on the other.



2605

QUIK-START + TEST LEAD KIT COMBO

2602

Combination of Model 2601 Quik-Start and Model 2605 Test Lead Kit.

ADAPTER CORD

2136

Provides a 12" 3-wire grounded power cord with standard female plug on one end and insulated clips on the other end. This cord is supplied as standard equipment with Models 2001, 2605, and 12501A.

COMPRESSOR TERMINAL REPAIR KIT

GL-1000

The GL-1000 Gator-Lok is designed to repair burnt terminals on compressors up to 5 tons. Gator-Lok's unique design makes installation a snap and requires no special tools.

Gator-Lok is made from high quality materials. Once installed properly, it provides multiple points of contact on the burnt terminal.

Gator-Lok can be easily installed in minutes, therefore giving the technician the ability to restore power to the unit, and eliminates the need to replace the compressor.

Each Gator-Lok Kit includes a set of three Gator-Loks (1 red, 1 blue and 1 black 10 gauge wire with 30" leads).



GL-1000

LEAK DETECTION

REFRIGERANT LEAK DETECTOR HLD-1201

Building on their successful line of leak detection products, Imperial-Thermal Engineering introduces the HLD-1201 refrigerant leak detector. This durable hand held detector has increased sensitivity of up to 3 grams/0.105 ounces per year and a pump for faster response time. Utilizing newly developed semi-conductor gas sensing technology, the HLD-1201 is ideal for diagnosing leaks on air-conditioning and cooling systems utilizing a wide variety of common refrigerants.

Features

- Heated semiconductor gas sensor.
- High low leak sensitivity selector, 3 levels of sensitivity.
- Bright LED display.
- Ambient concentration reset.
- Includes durable carrying case and reference source.
- Optional DC adapter 3.3V 0.5A.

Specifications

- Alarm method: Buzzer, Tri-color LED Bar Indicator.
- Power usage: (4) AAA size (6V DC) Alkaline batteries.
- Snake tube length: 15.5" (40cm).
- Dimensions / Weight: 173mm x 66mm x 56mm (400 grams)
6.8" x 2.6" x 2.2" (14.1 oz).
- Accessories: Alkaline batteries (4 pieces), user manual, leak check bottle, carrying case.
- Battery Life: 7 hours normal usage.
- Auto Power off: 10 minutes.
- Disable Auto Power off: Press and hold (HI) button then power on the meter.



HLD-1201

LEAK DETECTION SENSITIVITY			
SENSITIVITY	HI	MEDIUM	LO
R-22, R-134a	0.105 OZ (3G) /YEAR	0.529 OZ (15G) /YEAR	1.05 OZ (30G) /YEAR
R-404A, R-407C, R-410A	0.141 OZ (4G) /YEAR	0.705 OZ (20G) /YEAR	1.41 OZ (40G) /YEAR

ULTRASONIC LEAK DETECTOR TYPE VPE 9997

The VPE Leak Detector represents state-of-the-art technology for pin-pointing leaks in air conditioning/refrigeration systems. Able to detect both vacuum and pressure leaks, the VPE overcomes the disadvantages inherent in other types of leak detectors. No ultraviolet dyes or tracer gases are necessary, and the VPE can detect any gas, even in a gas-saturated environment. The VPE offers both visual and sound identification via the LED display and the included headset. Lightweight and easy to use, the VPE is a tool every technician should have.

Features

- Detects any type of refrigerant gas.
- Battery-powered for cordless operation.
- Does not require tracer gases.
- Detects vacuum and pressure leaks.
- Headset and padded carrying case included.
- Adjustable sensitivity.

Specifications

- Nominal sensitivity: -80db / V / uBar.
- Frequency response: 38 to 42 kHz.
- Display: 10-bar element graph audio output.
- Power: 9V cell.
- Battery life: 15 hrs. continuous.
- Headset: dynamic 32 ohm.
- Size: 4.56" x 2.40" x 0.866".
- Weight: 1/2lb.
- Housing: durable PVC/aluminum.



9997

LEAK DETECTION

LEAK-TEC 4014

Leak-Tec is a non-toxic, nonflammable liquid that produces a white foam of live bubbles at the point of leakage. The high viscosity enables the liquid to cling to surfaces long enough to pinpoint leaks as small as .05oz. per year. The liquid spreads quickly and penetrates oil and grease films common on metal surfaces. Used in small amounts, the mass of bubbles will continue to foam as long as pressure is maintained on the equipment being tested. Leak-Tec is stocked in 4oz., 8oz. and 1 gallon containers in two different formulas to fit most applications. Additional formulas and container sizes are also available as special order.

Features

- Fast- quickly finds and pinpoints the smallest of leaks.
- Safe- does not affect metal or rubber and is nonflammable.
- Economical- a few drops do the job.
- Convenient- unbreakable dispenser bottle.
- Stocked in 4oz. and 8oz. squeeze bottles, and 1 gallon jugs.



Specifications

No.4014 Formula 372E.

Application: compressed air and stable gases.

Sensitivity: 1×10^{-5} std. cc of air per sec.

Temperature Range: +35°F to +160°F.

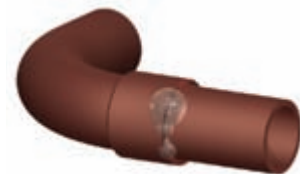
AVAILABLE SIZES	
PART NO.	CONTAINER
4014	4 OZ
4014-8OZ	8 OZ
4014-G	GALLON



THREAD CONNECTIONS



MACHINE SURFACE CONNECTIONS



SOLDERED OR WELDED CONNECTIONS

Specifications

No.4015 Formula 372G.

Application: Refrigerants, low temp.

Sensitivity: 1×10^{-4} std. cc of air per sec.

Temperature Range: -35°F to +180°F.

AVAILABLE SIZES	
PART NO.	CONTAINER
4015	4 OZ
4015-8OZ	8 OZ
4015-G	GALLON

OTHER SIZES AVAILABLE AND SPECIAL FORMULAS AVAILABLE.



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LIFETIME WARRANTY

Any product manufactured by Stride Tool Inc. that fails to render service due to defect in workmanship or materials will be replaced or repaired at no charge. Product failures due to misuse, abuse, normal wear and tear or alterations are not covered by the Lifetime Warranty. Wear items (such as cutter wheels, seals, gaskets, o-rings and gauges) will need to be replaced over time, and are not included. Stride Tool makes no other warranty, expressed or implied. Tools should be returned to the buyer's place of purchase.



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