Installation Instructions

The Original Flame-Free Refrigerant Press Fittings



⚠ WARNING

Failing to follow the instructions, guidelines and warnings contained in this booklet can lead to property damage, serious injury or death.

SAFETY INSTRUCTIONS

The installer/user must make every effort to read and understand this booklet in its entirety before beginning installation.

Compatible with Drawn and Annealed Copper Tubing made to ASTM B88 (Types L & K), ASTM B280 and ASTM B1003. Type-K tubing above 7/8" installed with Klauke® 19kN or RIDGID® compatible jaws only!

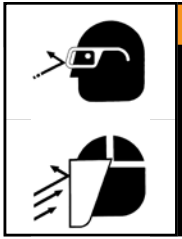
SAFETY INSTRUCTIONS

RLS fittings are only to be installed with RLS approved press tools and jaws. These are commercial and industrial tool and jaw sets — please read the tool manual in its entirety. Proper training is required to operate.



⚠ WARNING

- Follow all instructions.
- Failure to follow all instructions may result in property damage, serious injury or death.
- Installation should only be done by a certified/ qualified person.
- Do not perform any work on a pressurised system.



⚠ WARNING

- Users must use personal protection during the installation of RLS fittings.
- Wear safety glasses or face shield when installing RLS fittings.
- Failing to use safety glasses or face shield may result in serious personal injury or death.



⚠ WARNING

- Only use RLS fittings with compatible refrigerants.
- Using incompatible refrigerants may damage the system and/or result in serious injury or death.

Figure 1



Figure 2



Prepare Tool and Installation Aids

1. Assure that all the tools and installation aids are available prior to beginning installation. The following list is to be used as a reference:
   - RLS fitting (Figure 1)
   - RLS approved press tool and jaws – sized appropriately (Figure 2)
   - RLS installation aids (Figure 3)
     - Deburring tool
     - Tube cutter
     - RLS depth gauge
     - Brush
     - Permanent marker
     - RLS crimp gauge
     - Abrasive pad

Figure 3



Inspect Fitting and Tube

2. To ensure the integrity of the joint, visually determine if the O-rings are present and visually inspect the O-rings for obvious damage such as nicks or tears. Caution: If an O-ring appears to be damaged, is out of position, or is missing, DISCARD OLD FITTING AND USE A NEW ONE.
3. Perform a visual and tactile inspection of the tubing for surface imperfections referenced in ASTM B280, B88, or B1003 and the Copper Tube Handbook published by the Copper Development Association (CDA). Imperfections in and adjacent to the crimp or seal area could inhibit the joint integrity. These imperfections may include, but are not limited to:
   - Surface scratches
   - Incise marks (a required permanent mark of the tube manufacturer's name or logo)
   - Out of round (oval) on the cut ends
   - Dirt or debris
   - Items that may interfere with the O-ring

Should any of the above situations be identified, select a different area of the tubing. If necessary, cut off the portion with the imperfections.

Cut Tube

4. Cut the copper tube using the supplied or similar tube cutter (Figure 4). Ensure tube section to be crimped is straight. Caution: Do not proceed if the tube is cut at any visible angle other than 90 degrees or if the tube is not straight. Do not use a worn or damaged tube cutter, which can damage the tube and compromise the installation. This may lead to injury, equipment damage or failure of the system.

Figure 4



Prepare Tube

5. Use the deburring tool to remove any residual burrs from the outside and inside of the tube (Figure 5). Visual and tactile inspection should indicate no sharp edges or burrs remain. This is critical to avoid damaging the O-ring.

6. Use the included abrasive pad or adequate substitute (e.g. sand paper or sand cloth) to clean the end of the tubes to be joined (Figure 6). Tube ends should be free and clear of oxidation, dirt and debris. The surface should appear bright and shiny. Do not drop the tube, as this may cause damage and lead to improper installation. If the tube has been dropped, inspect it carefully and discard the tube if any damage is found.

Figure 5



Figure 6



Connect Tube

7. Use the supplied depth gauge (Figure 7) or table below to mark inserted tube for insertion depth. Each tube must be marked to the correct insertion depth every time.
8. Push fitting onto tube and continue until a hard stop is felt or the insertion marks are aligned with the end of the fitting. Make sure the tube is completely inserted into the fitting using the marks made in Step 7 (Figures 8 & 9).

Minimum Insertion Depth

Fitting Size	1/4" – 3/8"	1/2" – 1-1/8"	1-1/4" – 1-3/8"
Depth (in)	1	1-1/4	1-1/2
Depth (mm)	25.4	31.8	38.1

Note:
It is possible that the tube may be fully inserted and the marks may still be slightly visible as a result of the dimple or accuracy of marks.

Note:
Fitting installation should be relatively easy with little resistance felt. If it seems overly difficult to install the fitting, remove from tube and check to make sure the O-ring hasn't been unseated. If this is the case, discard the fitting and use a new, replacement fitting.

⚠ WARNING

- **Only RLS approved tools and jaws should be used to install RLS fittings.**
- **Failing to use the RLS approved jaws may result in property damage, serious injury or death.**

Figure 7



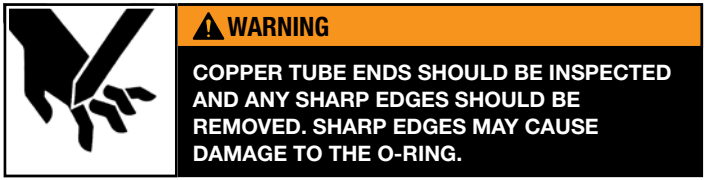
Figure 8



Figure 9



9. Press the tool locking pin (Figure 10), then rotate 45° to release (Figure 11).
10. Slide the appropriate size jaw over the tool head (Figure 12), then depress the locking pin until it clicks (Figure 13).
11. Slide the charged battery onto the base of the tool (Figure 14). Press and hold the trigger on the tool until the cycle is completed to calibrate (Figure 15). Calibration is recommended every time a jaw is changed, prior to use.



⚠ WARNING

COPPER TUBE ENDS SHOULD BE INSPECTED AND ANY SHARP EDGES SHOULD BE REMOVED. SHARP EDGES MAY CAUSE DAMAGE TO THE O-RING.

Note:
Refer to the manufacturer's instructions for specific tool and jaw operation.

Figure 10



Figure 11



Figure 12



Figure 13



Figure 14

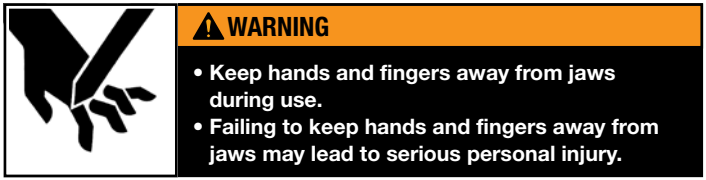


Figure 15



12. Press at the base of the jaws to open (Figure 16) and place the jaws onto the fitting as shown (Figure 17). Grooves in the jaw should line up and seat onto a groove located on the fitting. Ensure the tool is positioned between the flare and groove (Figure 18), NOT over the groove (Figure 19). Align the bottom portion of the jaw and the top portion will follow. Special attention should be given to the correct seating of the jaw.

13. Visually verify the inserted tube has remained in place and is still at the correct insertion depth as indicated by the mark (Figure 18).



⚠ WARNING

- **Keep hands and fingers away from jaws during use.**
- **Failing to keep hands and fingers away from jaws may lead to serious personal injury.**

Note:
Refer to the manufacturer's instructions for specific tool and jaw operation.

Figure 16



Figure 17



Figure 18

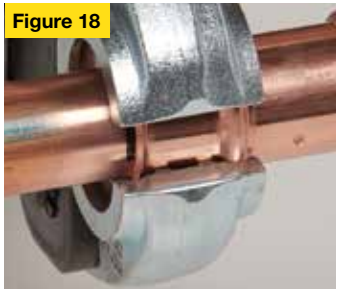
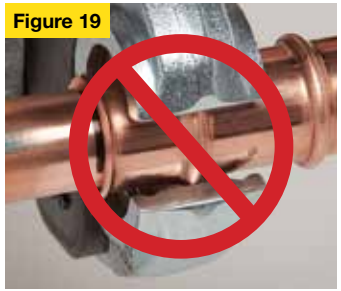


Figure 19



14. Press and hold the trigger on the tool to begin the pressing process. Continue to hold the trigger until the tool completes its cycle (Figure 20). The jaws will not open until the cycle is completed without manual override. Repeat the process for the remaining fitting ends where appropriate.

For 1-3/8" fittings only: After the 1st crimp, a 2nd crimp must be made with the 2nd crimp rotated at least 60° (approximate) from the 1st (Figure 21).

15. Open the jaws and remove from the fitting. If the jaws do not open, the pressing cycle was not completed. For manual override, slide the manual release button down to open the jaw.

Verify Connection

16. To verify the press cycle was completed properly, a witness mark (RLS) will appear within the crimp bands (Figure 22). The mark will be more pronounced when crimped on hard tube vs. ACR tube but will be visible. Failure to create the witness mark either means an unauthorised jaw or the wrong sized jaw was used. If a fitting is incorrectly pressed, then it must be removed and the procedure restarted with a new fitting.

Figure 20

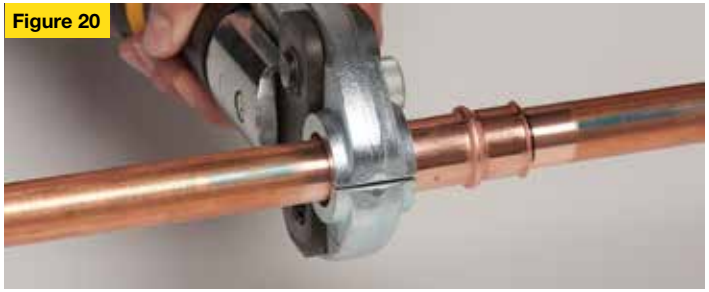
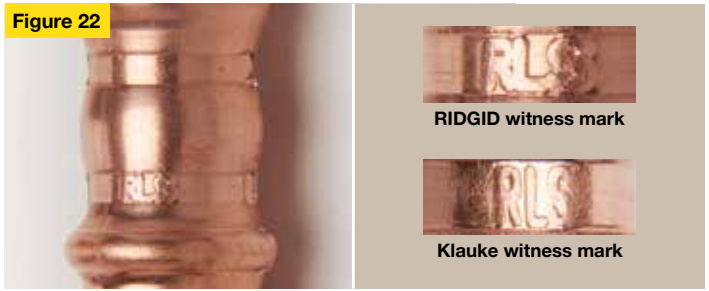


Figure 21



Figure 22



17. The RLS crimp gauge will confirm the finished crimp band diameter. The gauge is marked to align with the proper size fitting and crimp required. When the fitting is properly pressed, the RLS crimp gauge allows the marked slot to fit snug on the crimp band (Figure 23). If the crimp band is unable to fit within the marked slot on the gauge, it is under-crimped and will need to be re-crimped starting with Step 12.

Note:
Flashing may be left over from the pressing process on hard tube. If so, rotate the gauge so that the flashing is in line with the size marking when placed over the crimp bands. This will allow the diameter to be checked without interference from the flashing.

Use caution – flashing may be sharp.

Minimum Distance From Braze to Nearest Fitting End

Tube Diameter	1/4" – 1/2"	5/8"	3/4"	7/8" – 1"	1-1/8"	1-1/4" – 1-3/8"
Distance (in)	5	7	8	9	12	14
Distance (mm)	127	177.8	203.2	228.6	304.8	355.6

Figure 23



SAFETY INSTRUCTIONS

- **Do not rest the weight of the tool on the tube or fitting.**
- **Periodically check to ensure the jaws are meeting and aligned.**
- **Do not leave battery on charger unattended or overnight.**
- **Use brush to ensure jaws are debris free.**
- **Do not braze or solder within distance indicated in the chart to the left.**

Note:
For specific tool and jaw care and maintenance, refer to the manufacturer's instructions.

RLS Product Specifications

Applications
High-pressure HVAC/R, glycol, non-potable water

Approved Copper Tubing Types
For Use with Klauke® 19 kN and RIDGID® Compatible Jaws:
- Hard Copper (Drawn): 1/4" – 1-3/8" Type ACR, M, L, K
- Soft Copper (Annealed): 1/4" – 1-3/8" Type ACR, L, K

For Use with Klauke® 15 kN Compatible Jaws:
- Hard Copper (Drawn): 1/4" – 1-1/8" Type ACR, M, L
- Hard Copper (Drawn): Type K Only Up to 7/8"
- Soft Copper (Annealed): 1/4" – 1-1/8" Type ACR, L
- Soft Copper (Annealed): Type K Only Up to 7/8"

Application Parameters
Temperature Range: -40°C to +149°C (-40°F to +300°F)

Continuous Operating Temperature: 121°C (250°F)

Maximum Rated Pressure: 48 bar (700 psi)

Agency Certifications and Approvals
- UL Listed: 207, SA#33958, SDTW (7) (Except where noted)
- UL Listed: Approved Use For Field & Factory Installations
- ISO 5149-2: Part 2 Compliant
- ASHRAE-15, ANSI 15, ASME B31.5 (504.7)
- ICC-ES, PMG-1296
- 2021, 2018, 2015, 2012, 2009, 2006 International Mechanical Code (IMC)
- 2021, 2018, 2015, 2012, 2009, 2006 International Residential Code (IRC)
- 2021, 2018, 2015, 2012, 2009, 2006 Uniform Mechanical Code (UMC)
- CRN Approved (#0A22551)

Approved Refrigerants
For a list of approved refrigerants, visit rls-europe.com

Warnings

- Use only with approved refrigerants. Review product specifications for more details.
- Periodically check to ensure the jaws are meeting and aligned.
- Wear proper eye protection during installation.
- Keep hands and fingers away from the jaws during use.
- Use supplied brush to ensure jaws are debris free.
- If brazing or soldering nearby, ensure proper sealing of the fitting by maintaining a minimum braze distance from connections. Refer to the table on page 9 for minimum distance from a fitting to a braze joint per tube size. The installer should take the conventional precautions to keep the fitting cool by providing a heat sink (wet ragging, heat block, etc). This will ensure that the O-ring is not damaged during the brazing process.

Troubleshooting

Recommended steps if a coupling leaks after it is crimped:

- Inspect tubing for scratches, incise marks and dents prior to tube cutting. Be careful when using a knife to cut off plastic shipping caps on tubes.
- Take time to cut the tubing properly using a tubing cutter. Rushing through the cutting process may cause dents or oval tubing, which can create leaks.
- Verify proper deburring and sanding/ cleaning of tube surface per steps 5 and 6.
- Verify proper tube insertion depth using the insertion gauge. One gauge is provided with the tool kit and can also be ordered separately. Refer to the “Minimum Insertion Depth” table on page 5 if you do not have a gauge.
- Verify the proper crimp diameter using the provided crimp gauge.
- Verify correct jaw is installed for the fitting you are trying to crimp.
- If jaw is sticking during crimp, try applying a light coating of spray lubricant such as WD-40 directly to the jaws.
- Let jaw and tool do the work. If the fitting is in a hard-to-reach place, it is important to let the tool body move freely.
- Avoid applying any sort of pulling or twisting of the tool during the crimp process.
- If the fitting was recently crimped (15–20 minutes) prior to pressurisation, it is possible the bubbles are a result of trapped air in the double crimp area that can leak out over time and IS NOT a fitting leak. This is more likely to occur on smaller fittings.

If a fitting does leak, do not braze it.

- Trying to braze the fitting will very likely melt the O-ring material and thus introduce contaminants into the system that could cause other system issues. **THE FITTINGS SHOULD NEVER BE BRAZED.**

Patents

RLS designs, develops and manufactures the original, patented press-to-connect fittings engineered for high-pressure refrigeration lines used in the air conditioning and refrigeration industries. This page is intended to serve as notice, including notice under 35 U.S.C. § 287(a).

RLS Fitting Patents:

- U.S. Patent No. 9,145,992
- U.S. Patent No. 9,638,361
- U.S. Patent No. D730,494
- Australian Patent No. 2012362443
- Canadian Patent No. 2,800,360
- Canadian Design Registration No. 149228
- EUIPO Registered Community Design No. 002218636-0001
- Japanese Patent No. 6051468
- Other pending patent applications



For technical questions or replacement information for any of the RLS installation aids, send an email to **enquiries-europe@rapidlockingsystem.com**