

RIIFO



Multilayer Gas Piping System

Installation Guidelines

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CONTENT

1

GENERAL DESCRIPTION	04
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2

LIMITING CONDITIONS	04
---------------------	----

3

SYSTEM DESIGN CONDITIONS	05
--------------------------	----

4

RIIFO FITTINGS AND TOOLS	05
4.1 Cutting tools	06
4.2 Reamers	06
4.3 Pipe bending tools	07
4.4 Manual Pressing Tools	07
4.5 Battery Powered Pressing Tool	07

5

PREPARATON FOR MANUAL PRESSING TOOLS	08
5.1 Choose the correct pressing jaws	08
5.2 Install the pressing jaw on the clamp	08
5.3 Check the Calibration of the Tool	09
5.4 Adjustment of Crimping Force of the Manual Tool	09
5.5 Manual Tools – Cautionary Notes for Operation	09

6

PREPARATON FOR ELECTRIC PRESSING TOOLS	10
6.1 Charging	10
6.2 OLED display interface description	11
6.3 Standard Jaws Types	11
6.4 Jaw cleaning and maintenance	11
6.5 Electric Pressing Tools – Cautionary Notes for Operation	12

7

INSTALLATION PROCEDURE	12
7.1 Pipe cutting	12
7.2 Rounding and beveling	12
7.3 Pipe Bending	13
7.4 Connecting Pipes and Fittings	13
7.5 Pressing Procedure Manual Pressing Tools	14
7.6 Pressing Procedure Electric Pressing Tools	15
7.7 Checking	16



1 | GENERAL DESCRIPTION

The RIIFO PE-AL-PE & PEX-AL-PEX gas pipes combine the benefits of both metal and plastic pipes. The inline welded aluminium layer provides a total barrier against oxygen penetration. The structure of the pipe compensates for the snap-back forces and the linear expansion caused by temperature changes.

The basis of the system is simple, safe and fast pipe installation: simply bend by hand or a bending spring, cut to length, ream and bevel, join together, press, done.

2 | LIMITING CONDITIONS

Multilayer gas piping installations must be installed by a licensed gas plumber in strict accordance with the gas installation standards. In addition the plumber must have successfully completed the gas product training course and have received certification for this.

Multilayer gas piping systems must not be exposed to direct UV light. If they are exposed to direct UV light then they must be covered. Corrugated UV resistant conduit is available within the gas range of product for this purpose.

Multilayer gas piping system must not be used to make the final connection to any appliance.

DISCLAIMER

This manual contains recommended installation instructions for the RIIFO multilayer gas piping system. Failure to observe these installation instructions may result in substandard performance of the system. RIIFO expressly disclaim any responsibility or liability for substandard performance resulting from failure to comply with the installation instructions.

3 | SYSTEM DESIGN CONDITIONS

Application conditions and classifications of the pipes. The multilayer piping system can be used in the areas of gas applications.

Pipe Material	Applications	Service temperatures	Maximum Working Pressure
PE-AL-PE	Gas Supply	-20 +60	0.5MPa
PEX-L-PEX	Gas Supply	-20 -95	1.0MPa

Typical burst pressures of multilayer gas piping system

At 25 Deg C Room temp, typical bursting pressures for multilayer gas pipe are:
12mm-25mm>6.0MPa
32mm-75mm>4.8MPa

Minimum distance between pipe fixings

- 16mm pipe size-fixings to be not more than 0.90 metres apart
- 20mm pipe size-fixings to be not more than 1.25 metres apart
- 25mm pipe size-fixings to be not more than 1.50 metres apart
- 32mm pipe size and above-fixings to be not more than 2.00 metres apart

4 | RIIFO FITTINGS AND TOOLS

The RIIFO piping system consists of multilayer pipes, fittings and brass valves. It is applicable to conduction of Natural Gas (GN) and Liquefied Petroleum Gas (LPG), offering perfect solution for the conveying of gas for residential, commercial, and industrial use.

The RIIFO multilayer gas piping system is a complete system that has been independently tested for compliance to ISO 17484-1:2014 requirements. The system is comprised of PE-AL-PE pipes, PEX-AL-PEX pipes, brass fittings and brass valves.

We provides a wide range of fittings to ensure installation is as simple as possible. The gas fittings are forged from nickel plated brass. When buried below ground they must be wrapped in a water proof material such as denso tape.

The RIIFO fittings have a double o-ring system for improving security of connecting as shown below:

A full listing of the fittings is available at www.riifo.com. The list of fittings is regularly updated so please check back periodically to keep up to date with the latest information.



4.1 Cutting tools

Designed for smooth, even cutting, the tool's jaw should fit firmly over the pipe to allow a square, burr-free cut.

Pipe cutter IV



Instructions

Used for cutting Multilayer pipes 16-32mm

Pipe cutter QGQ-75



Instructions

Used for cutting Multilayer pipes 25-75mm

4.2 Reamers

2 styles of reamers are available dependent on user preferences. The reamers perform the function of rounding the pipe after cutting and beveling the inner lip to allow easy insertion of the fitting for connecting.Triangular plastic reamers (see below) are frequently used where a small number of connections are needed. There are 2 sizes of reamer available being ZYD2-1216-1620-2025 for 16,20,25 mm systems or the ZYD2-1620-2025-2632 for 20, 25, 32mm piping.



In addition, we offer metal reamers combined manual and electric functions for each individual size of pipe. The advantage of this kind of reamer is that the handle can be removed and the reamer head can be fitted to a cordless drill /screwdriver for easy operation. This is particularly useful for large size pipes to make the job easy, or for smaller size pipe where there are many joints connections to be prepared. Product specifications are as follows:



Product specifications: Metal Reamer 1216/1620/2025/2632/3240/4150/5163/6075

4.3 Pipe bending tools

The Multilayer Gas Pipe can be bent with a maximum bending radius of 5 times the pipe Outside Diameter (OD). For example, a length of 20mm pipe has a bending radius of not less than 100mm (5 x 20 = 100) or a 32mm pipe has a bending radius of not less than 160mm (5 x 32 = 160).

A range of internal and external bending springs is available. Product codes are listed below:

External Bending Spring

	Product Code	Product Description
	WH-1216 II	1216mm
	WH-1620 II	1620mm
	WH-2025 II	2025mm
	WH-2632 II	2632mm

Internal Bending Spring

	Product Code	Product Description
	WH-1216	1216mm
	WH-1620	1620mm
	WH-2025	2025mm
	WH-2632	2632mm

4.4 Manual pressing tools

RIIFO supplies a range of high quality but inexpensive manual pressing tools for 16-32mm piping systems.

The manual pressing tools come in kit form and include all jaws required to get the job done.

The SYQ14-32B KIT has a lengthened handle to make the pressing easier. The kit includes jaws and go-no-go gauge of sizes 16, 20, 25 and 32mm and is shown below.

Note: All the jaws for the Multilayer Gas Pipe Systems are “U”-profile. Spare jaws can be purchased for both tools as required.

4.5 Battery Powered Pressing Tool

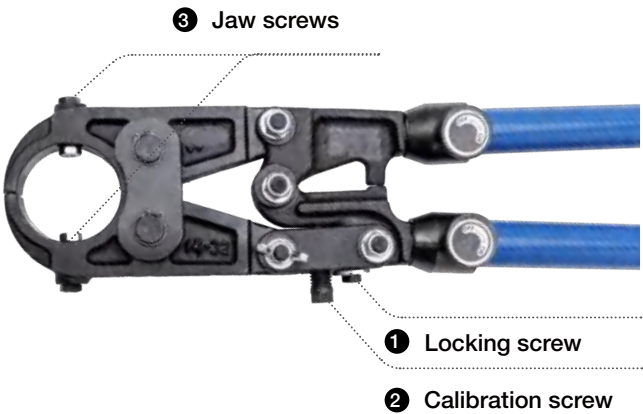
It is a tool for pressing XPAP, PEX,copper pipe and stainless steel pipe with fittings. It is powered by Li-ion, actuated by motor and controlled by MCU. With a high pressure hydraulic system, it is safer and more efficient, and is one of the best tools for piping system installation.



5 | PREPARATON FOR MANUAL PRESSING TOOLS

Both of the Pressing Tool kits are very similar in set up and operation. Both have individual pressing jaws for each size of pipe to be pressed. The method of changing jaws is similar on both tools. In addition both tools need to be calibrated before being used and calibration is performed by the same method in both cases.

The lengthened manual pressing tool for sizes 16-32mm is shown below.



5.1 Choose the correct pressing jaws

The correct jaws must be chosen according to the size of the pipe. For example, chosing the 16mm jaws for the 16mm pipes, etc.

The applicable outer diameter of the pipes are engraved on the face of the jaws. And the jaw is composed of two parts.



5.2 Install the pressing jaw on the clamp

Open the handles of the pressing tool and undo the “3. Jaw screws” so that the jaws can be inserted into the clamp head.

Position the two parts of the jaw in the clamp head ensuring that each part of the jaw is evenly positioned and the specification number on each half of the jaw is facing up. Then retighten the screws to fix the jaw.

It is important to pay attention to the jaw direction ensuring that the centre of the pressing hole is adjacent to the jaw opening direction.



5.3 Check the calibration of the tool

Try to press the clamp without a fitting or pipe in place. The appropriate Trial-Clamping-Force required to fully close the clamp jaws should be about 20Kg. This will require firm pressure to close the jaws and handles entirely.

*If the trial pressing of the clamp only requires light pressure then the clamp will need adjustment before use, please refer to next step for how to adjust.

5.4 Adjustment of crimping force of the manual tool

Open the clamp and loosen the"1. locking screw"anti-clockwise for about 3 turns.

If the Trial-Clamping-Force was too small, you should turn the "2. calibration screw"clock-wise for about 1/4 turn. If the Trial-Clamping-Force is too large, then you should turn the "calibration screw" anti-clockwise. You should repeat this process until the Trial-Clamping-Force is around 20kg – requires firm force to close.

Note: The calibration screw should not be touched again when the Trial-Clamping-Force reaches 20Kg, the clamp should be immediately locked by the"1. locking screw". Close the clamp and tighten the"1. locking screw".

5.5 Manual tools – cautionary notes for operation

It is not necessary to use lengthened handles when pressing fittings no bigger than 25mm.Lengthened handles are necessary for pressing fittings 32mm.

When pressing fittings, the contact points on right and left handles (see main part name No. 10 and 11) must contact.

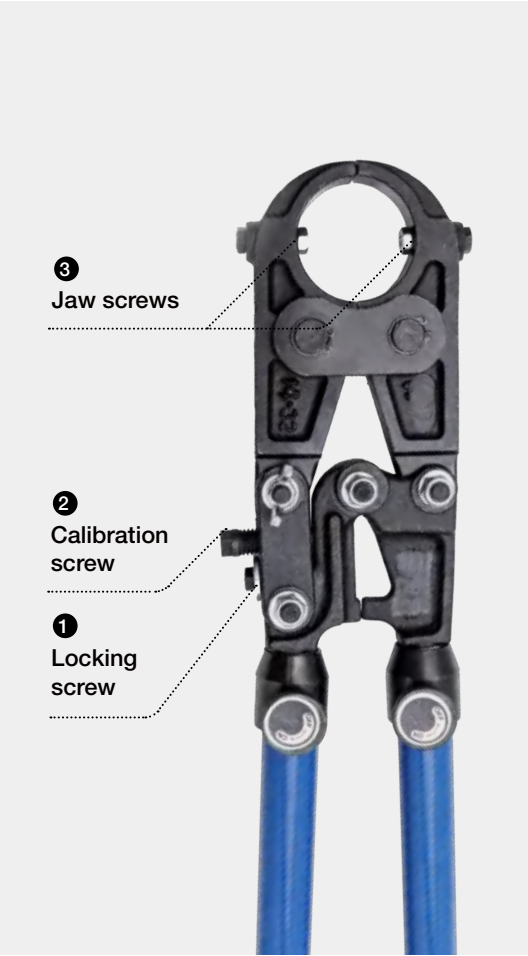
Adjustment should be made on following occasions:

- 1st use of the tool
- Every time heads are changed
- Every 60 times of pressing
- Each day prior to use
- The closed clamp handles can be opened freely with little or no force

The clamp should be maintained periodically by cleaning and adding lubrication oil to pins (key part No. 3, 5,6,7). As a minimum this should be done once every month.

After adjustment, the nominal operating force applied for crimping the fittings is shown in the following table:

Specification	16mm	20mm	25mm	32mm
Operation Force(Kg)	20	32	40	45



6 | PREPARATON FOR ELECTRIC PRESSING TOOLS

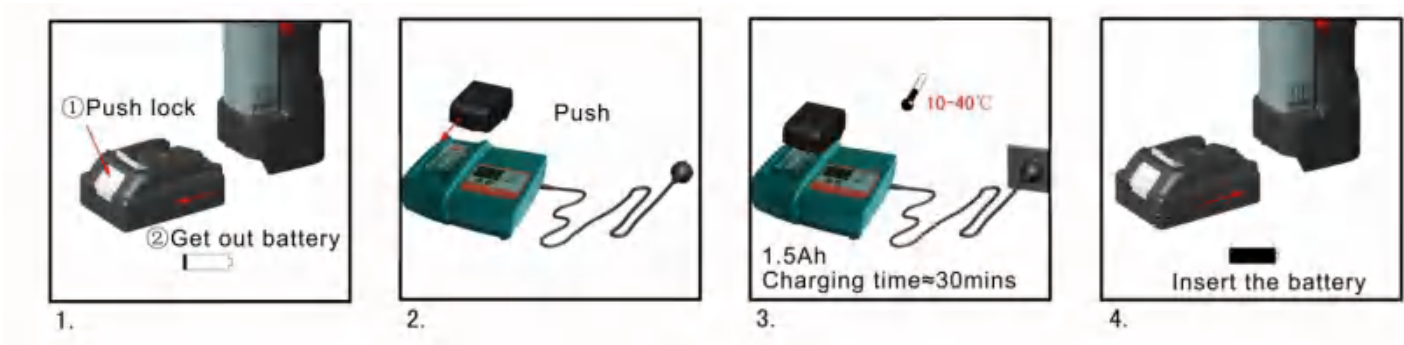
The components of the tool are shown in the figure and diagram below:



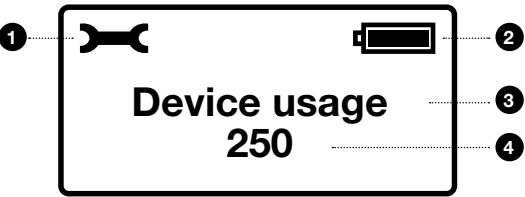
6.1 Charging

Push battery into charger and connect the plug with the plug seat. Make sure the room temperature is between 10 -40 The charging time is around 30mins. Please see the illustration below.

The detail of the charging and battery information and cautions, please refer the manual (MANUAL FOR CHARGER).



6.2 OLED display interface description



- ① Maintenance reminding
- ② Battery status
- ③ Information display area
- ④ Cumulative working times

6.3 Standard jaws types



Pressing Jaws

The size of the jaw must be selected according to the size of the pipe. And choose the right U profile of the jaw according to the fittings

6.4 Jaw cleaning and maintenance

- 1) Clean the residue accumulated in the pressing jaws in time. Cleaning the residue can be done with a scouring pad or a steel wool, but it can't be cleaned with something harder (such as sandpaper, file, etc.), which will accelerate the wear on the edge of the cavity.
- 2) After each pressing is completed, remove the impurities and dust on the surface of the jaws, especially the gap at the bottom of the jaws; then rub the lubricant on the surface of the jaw, especially the pin and jaws, and then put it into the dedicated toolbox.
- 3) It is strictly forbidden to collide with any metal. It is strictly forbidden to contact any jaws with any sharp object.
- 4) Check the jaw return spring before each use. Normally, the jaw can be easily opened and closed by applying a finger.
- 5) It is recommended to check the wear of the jaw once a year by the dealer or manufacturer.

6.5 Electric pressing tools – cautionary notes for operation

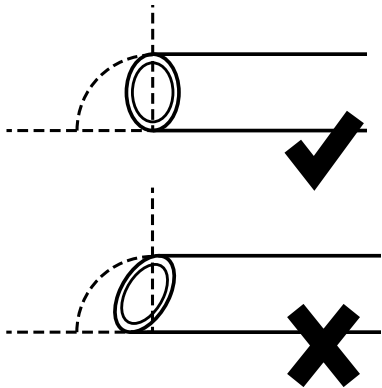
- 1) The jaw is a consumable part. When it is often used for pressing, the material will be fatigued and cracks will occur. A heavily worn jaw is prone to breakage, especially if it is used improperly (such as over-sized fittings, skewed presses, etc.) or illegal operation.
- 2) Check the jaw for any breakage, cracks, or component jams and any other unfavorable factors that compromise safety and normal operation, either periodically or before each use. If you find any problems, please stop using them immediately, and return them to the professional repairing manufacturer or return to the factory for repair until the problem is solved.
- 3) Once you find the following phenomenon, please stop using it and replace it with a new one! a. the board is cracked b. the jaw arm is cracked and deformed c. the jaw is cracked, scratched, sunken or severely worn d. other anomalies.
- 4) It is forbidden to disassemble the tools by yourself. It is strictly forbidden to weld, polish, drill or other changes to the die accessories!
- 5) Do not put any part of the human body, such as your fingers, into the jaw ring use!
- 6) This tool is a high-strength, heavy-duty appliance. Please strictly follow the instructions and precautions!

7 | INSTALLATION PROCEDURE

7.1 Pipe cutting

Cut the pipe to the required length ensuring that the cut is square (perpendicular to the length). Use the Pipe cutter or equivalent for 16 to 32mm pipe. The Pipe cutter QGQ-75 is easiest when working with larger piping systems

It is important for you to check that the pipe end profile has been cut square as shown below.

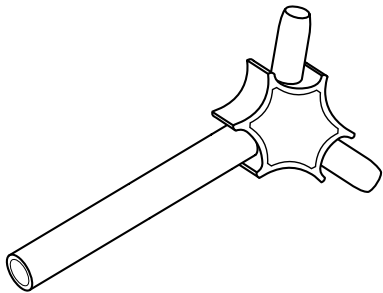


7.2 Rounding and beveling

The reamer tools have the dual purpose of “rounding” the pipe after cutting and then “beveling” the inner lip of the pipe to allow easy insertion of the fitting to prevent damage of the o-ring during insertion into the pipe.

Using either the plastic or metal reamer, insert the correct sized reamer into the pipe, turning as you go. This will round the pipe. Push the reamer down and continue to turn so that the reamer bevels the inner lip of the pipe. You should see pex swarf being generated at the shoulder of the reamer. Continue to ream for 3-4 turns.

It is important that you check that the pipe has been rounded by the reamer and has been beveled smoothly. Also ensure that the swarf has been removed from the pipe to ensure that it does not interfere with pressing of the connection.



7.3 Pipe bending

Bending of the pipe may be accomplished by hand, with an internal or external bending spring or copper tube benders. Bending springs are available within our range of products.

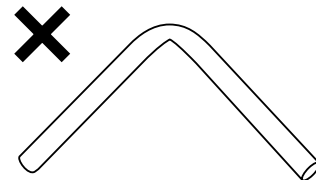
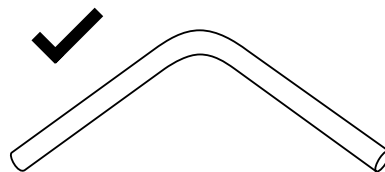
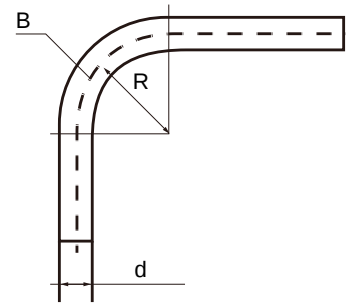
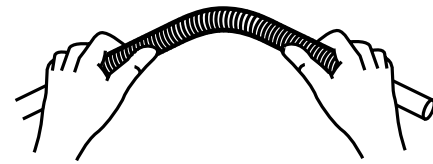
It is very important to note that the minimum bending radius for pipe is $5 \times D$ where D is the nominal outside diameter of the pipe.

If you want to bend the pipe by hand then this is possible although not the recommended method. A bending spring is preferred.

If bending the pipe by hand it is recommended that you keep your hands 40cm (16 inches) apart during the bending process. Create the bend slowly and take care not to kink the pipe or exceed the minimum bend requirements.

If bending with an internal bending spring, insert the bending spring inside the pipe leaving a minimum of 2 inches of the spring extruding from the pipe – this is necessary so that you are able to easily remove the spring after creating the bend. Create the bend ensuring that the bending radius is not less than $5 \times$ the outer diameter of the pipe. Remove the bending spring when completed.

Where an external bending spring is to be used to create the bend, insert the pipe into the bending spring and move the spring so that it centres on the point at which you require a bend. Create the bend ensuring that the bending radius is not less than $5 \times$ the outer diameter of the pipe. Remove the bending spring when completed.



7.4 Connecting pipes and fittings

IMPORTANT NOTICE:

RIIFO markets and sells a range of Gas and Water piping systems. Such systems comprise both pipes and fittings. Our components and systems are certified by SAI Global to the required standards. The certifications apply to genuine RIIFO products.

The Gas piping system has not been tested, certified or guaranteed for use in combination with the product of ANY other company/brand. Similarly for our fittings.

It is CRITICAL to note that using RIIFO multilayer gas pipes or RIIFO fittings in combination with other suppliers' pipes or fittings or use of incorrect tools or other components may cause leakage or other defects in the system and voids any warranties applicable to the complete Gas system. Users should consult RIIFO if using suitable fittings or tools for any installation with doubt.

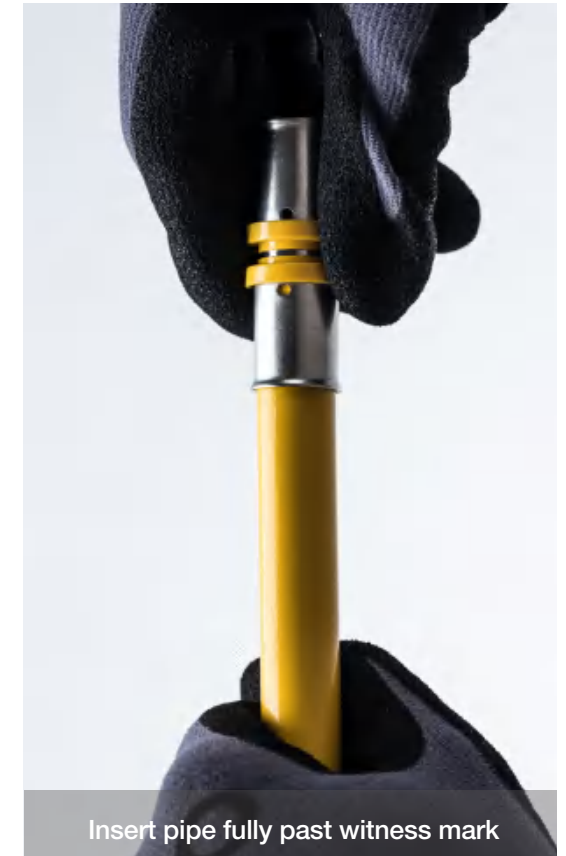
Check the fitting and pipe - the pipe end should be rounded and beveled as previously described and the size of the fitting and pipe to be connected must be identical. e.g. 20mm fitting joined to 20mm pipe.

Push the pipe into the fitting up to the shoulder (do not "screw/turn" the pipe on to the fitting) Check the inserting depth by looking through the inspection holes on the sleeve shoulder, to ensure that the pipe is completely inserted, then the fitting is prepared for pressing.

Warning: RIIFO disclaim any responsibility or liability failures due to the use of any unauthorized tools or mixing and matching the pipe and/or fittings with RIIFO systems.

Ensure that your pressing tool has been adjusted as recommended. Verification/calibration of the tool is required:

- At the 1st use of the tool
- Every time heads are changed
- Every 60 times of pressing
- Each day prior to use
- The closed clamp handles can be opened freely with little or no force



7.5 Pressing procedure (manual pressing tools)

Ensure that the correct sized jaw has been fitted to the tool.



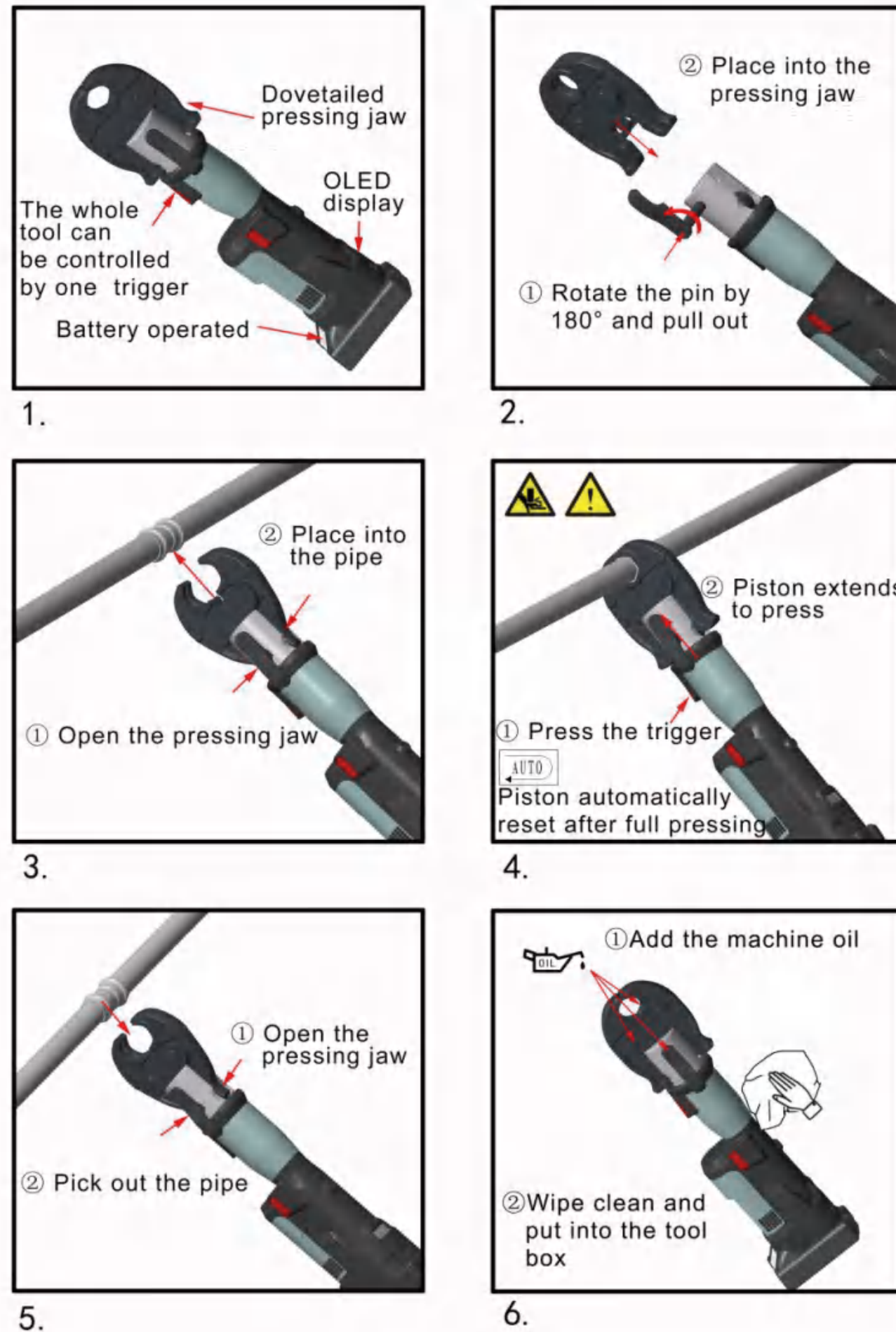
Position the jaws so that the face of the jaw adheres to the plastic gasket as shown below.



Fully close the handles of the pressing tool until the handles lock into their final position. Open the handles and remove the pressing tool from the fitting.



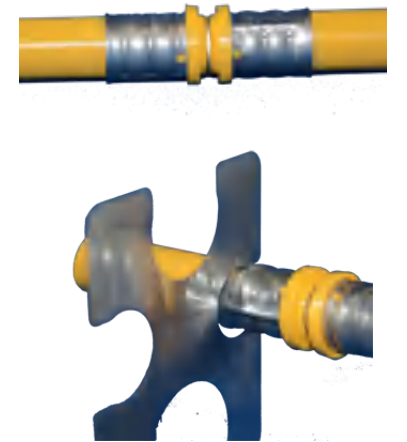
7.6 Pressing procedure (electric pressing tools)



7.7 Checking

With the preliminary adjustment of the tool now complete, it is important to confirm that the crimping is sufficient by completing a connection using the required sized pipe and fitting and testing with a gauging tool supplied in the tool kit. The gauging tool is pictured below.

The go-no-go gauge should slip over the grooves in the sleeve of the crimped fitting without touching the sides. If the tool scrapes the stainless steel sleeve, needs force, or simply will not go over the pressed sleeve then the fitting has not been fully pressed. In these cases the tool must be recalibrated and the connection re-pressed. Checking the press using the go-no-go gauge and if ok the installation is complete. The fittings that have been pressed are shown in the following.



For more systematic operational and installation guidance, please refer to ISO 17484-2 Plastic Piping Systems - Multilayer pipe systems for indoor gas installations Part 2 Code of practice

These Installation Guidelines outline common installation situations. Situations not covered in this document should be referred to RIIFO for further information.

If Users meet any new case or have any questions on the above guidelines, please do not hesitate to contact us via messages on www.riifo.com.