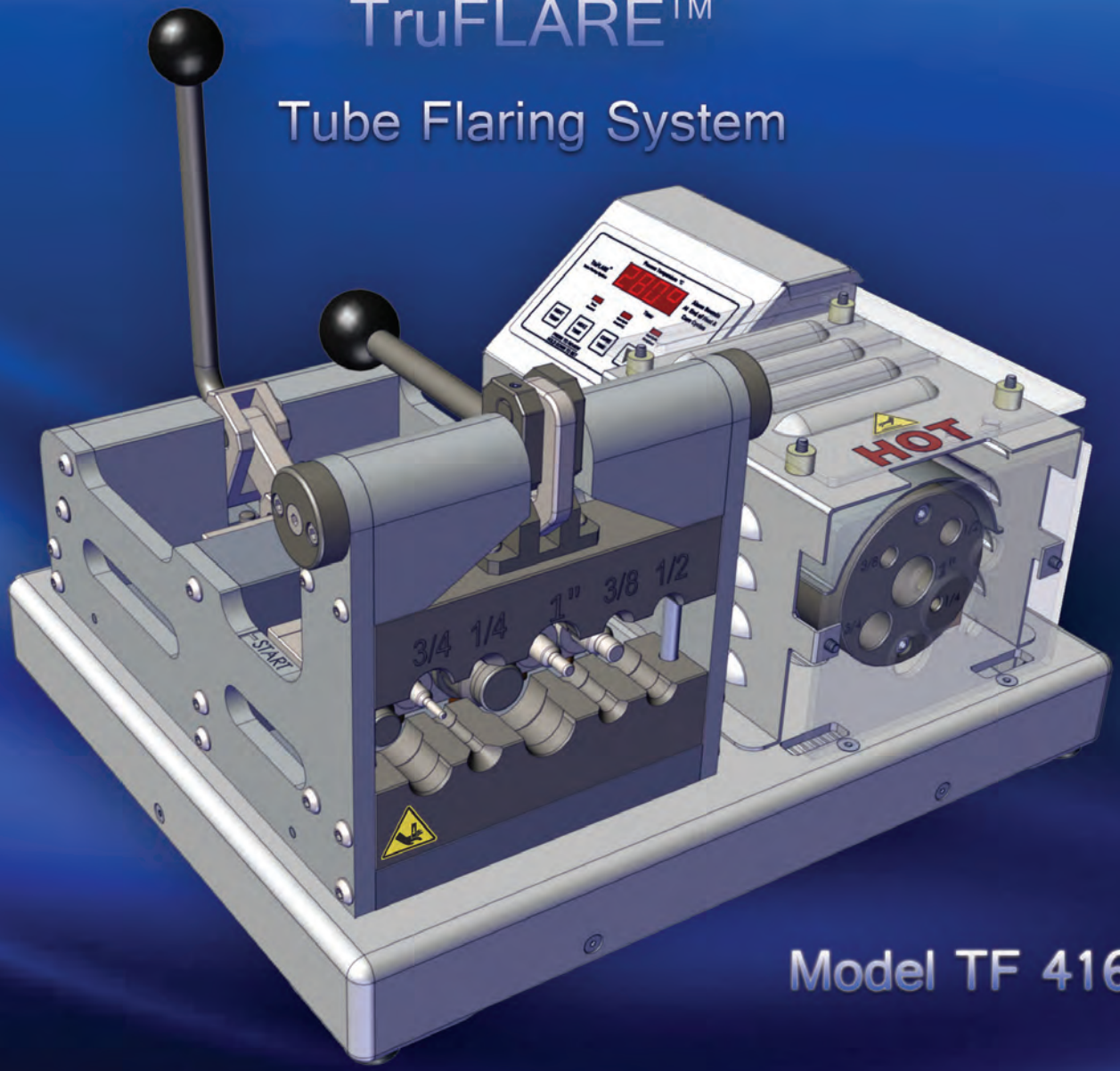
Fit-LINE

TruFLARE™

Tube Flaring System



Model TF 416

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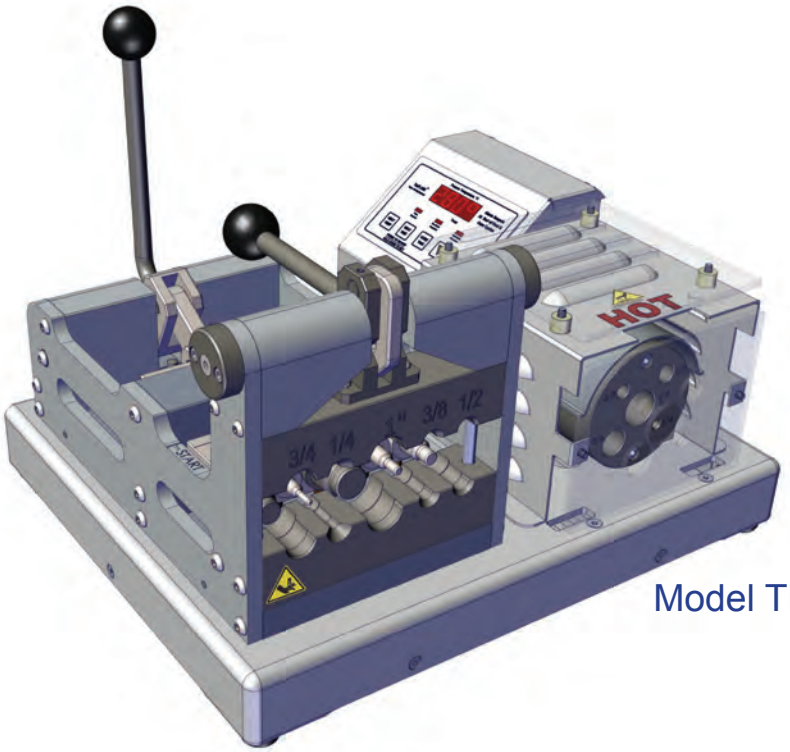
TruFLARE™

Fluoropolymer Tube Flaring System



Model TF 416

Operation Manual

Safety Instructions

READ THIS MANUAL BEFORE USING TUBE FLARING SYSTEM.

This device is electrically powered and must be operated in a safe environment to avoid risk of fire, explosion, or electric shock.

STATEMENTS

CAUTION
Statements that identify conditions or practices that could result in damage to the equipment or other property.

WARNING
Statements that identify conditions or practices that could result in personal injuries or loss of life.

SYMBOLS

PINCH POINTS
Keep hands, loose clothing, and long hair away from moving parts. Serious injury can occur.

EYE PROTECTION
Eye protection must be worn while operating or working near equipment.

HOT SURFACE
Heating unit of flaring system and tubing will be very hot during flaring operation.

General Information

The TF 416 Fluoropolymer Tube Flaring System contains no user-serviceable parts. Contact Fit-LINE Inc. at www.fitlineinc.com.

TECHNICAL DATA

Power Requirements:	110V or 220V (AC), 50 or 60 Hz
Maximum Current:	TF 416-110 FLA 4.0A
	TF 416-220 FLA 2.0A

GROUND AND EXTENSION CORD INFORMATION

The TF 416 Fluoropolymer Tube Flaring System MUST be grounded against electrical shock. It is equipped with a three-wire conductor and three prong plug to fit a grounded receptacle.

NEVER CONNECT THE GREEN OR GREEN/YELLOW WIRE TO A LIVE TERMINAL

Use only three-wire extension cords that have three-prong, grounding-type plugs and three-pole receptacles. The extension cord wire size must meet the following specifications:

For 0 to 25 ft (0 to 7.5 m), the recommended minimum wire guage is 14 AWG (2.5 mm).

For 25 to 50 ft (7.5 to 15m), the recommended minimum wire guage is 12 AWG (4.0 mm).

Setup

1. Select an appropriate location that is clean and well lit, well ventilated, and away from fumes and flammable materials.

2. Set the machine on a flat, stable surface.

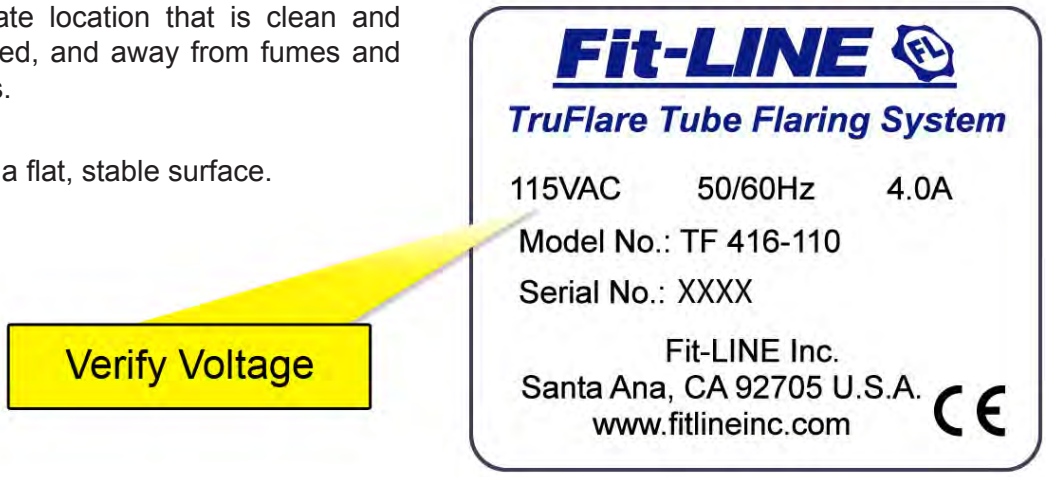


Fig. 1. Verify Voltage

3. Insert the power cord into the side of the control unit. (Verify voltage) See Fig. 1/1A.

4. Plug the other end of the power cord into a power supply appropriate for the voltage of the machine.

5. Turn on the unit using the On / Off Switch just above the power cord on the control unit. See Fig. 1A.

Fig. 1A. On / Off Switch and Power Input

6. To set the heat temperature, heating time, and cure (cool down) time press and hold down the appropriate button on the control panel, “HEAT TEMP”, “HEAT TIME” or “CURE TIME”. Use the arrow buttons to reach the desired setting according to the guidelines in Table 1 for the selected tubing. See Fig. 2.

7. The tubing heater block begins to heat up when the unit is turned On. The Temp Reached LED will illuminate once the preset Heat Temp set point is reached. Ref. Fig. 2.

Note: If the Flaring System is not operated for a period of approximately 2 1/2 hours, the system will automatically enter a standby mode with the heater shutting off and the system cooling. Press any button on the control panel to reactivate unit.

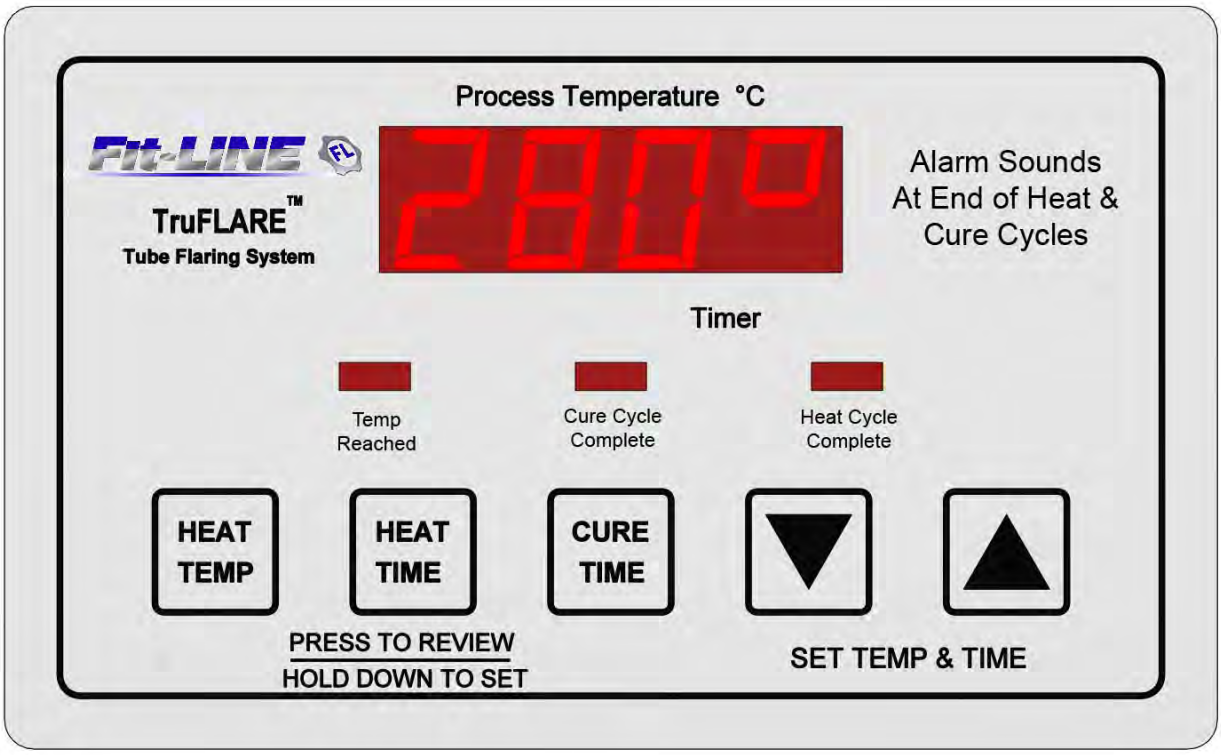


Fig. 2. Settings

Process Guide

The TruFLARE TF 416 Fluoropolymer tube flaring system is designed to flare tubing for use with assemblies requiring flare fittings and flared tube ends. The following tubing sizes can be flared on this machine:

Tubing Size (in)	Heat Temperture (°C)	Heat Time (s)	Cure Time (s)
1/4 in. OD x 5/32 in. ID	280°	20 to 30	35 to 40
3/8 in. OD x 1/4 in. ID	280°	30 to 40	45 to 50
1/2 in. OD x 3/8 in. ID	280°	30 to 40	45 to 50
3/4 in. OD x 5/8 in. ID	280°	35 to 45	50 to 55
1 in. OD x 7/8 in. ID	280°	45 to 55	55 to 60

Note: Guidelines are based on using HP PFA tubing. Temperature adjustments may be required due to material variation and/or type of tubing being used.

Table 1. Setting guidelines

Operation

HOT SURFACE.
Surface of heater block will be extremely hot.

DO NOT TOUCH HEATER BLOCK.

1. Retract upper tube clamp by rotating the Clamp Arm to the fully open position by moving the Clamp Arm in the direction shown. See Fig. 3.

2. Activate the Ram Arm forward to the “START” position marked on the frame. In addition to the visual indication of the line reaching the start position, the Ram Arm will snap to the proper alignment. See Fig. 4.

3. Each hole in the heater block is marked with the tubing OD size (see Fig. 5). Insert prepared tubing through the clear shield into the appropriate tube size port, until the tubing bottoms out. See Fig. 6.

Note: Display will show the letter “H” and the preset Heat Cycle time will begin counting down.

4. After the Heat Cycle Complete LED illuminates (Ref. Fig. 2) and the audible sound begins, then remove the tubing. If necessary, twist the tubing slightly to help with the tubing removal.

HOT SURFACE.
The end of the tube removed from heating block will be hot.

5. The tubing must be quickly placed on the appropriate flare mandrel upon removal as the tubing will begin to cool. Ref. Fig. 7.

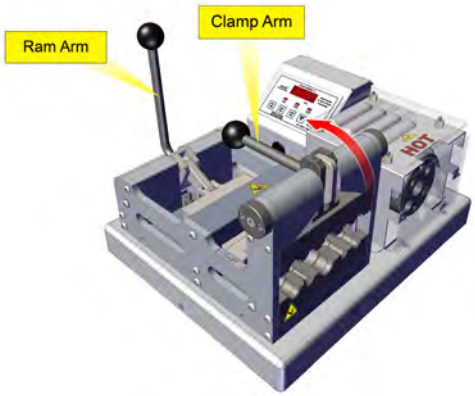


Fig. 3. Clamp Open

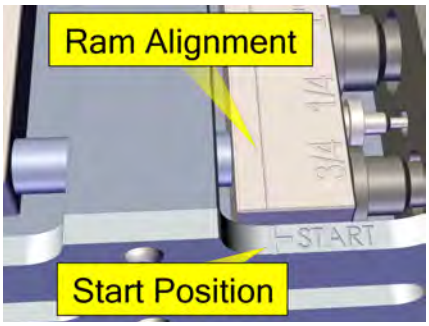


Fig. 4. Ram to Start Position

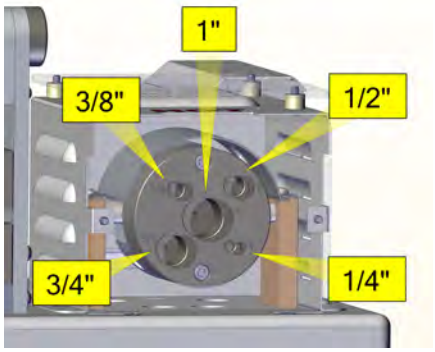


Fig. 5. Tube Size Ports

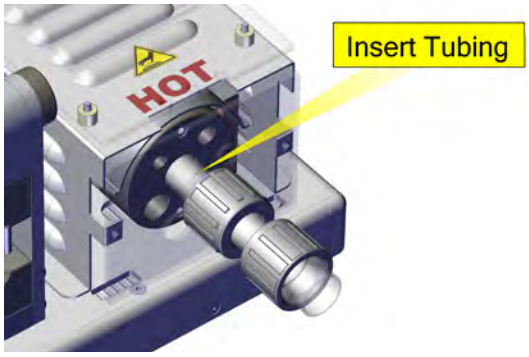


Fig. 6. Insert Tubing

6. Slide the heated tubing onto the appropriate size of flaring mandrel to the beginning of the chamfer. See Fig. 7. Do not push tubing onto flaring mandrel beyond the beginning of the chamfer.

Note: Each flaring mandrel is marked with its size on the ram position above the mandrel.

PINCH POINTS
Be careful not to pinch fingers when locking the Clamp Arm and moving the Ram Arm forward.

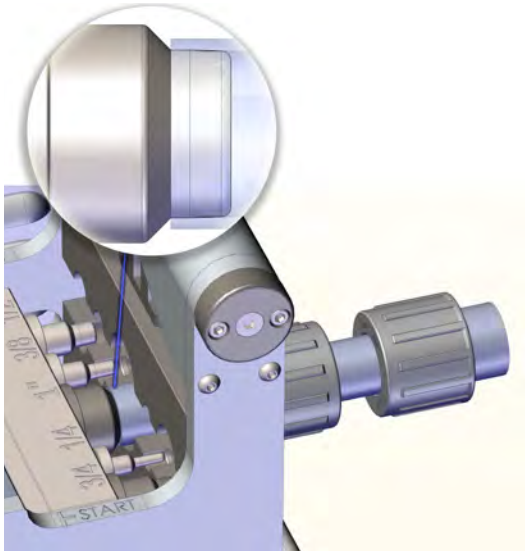


Fig. 7. Insert tube to the beginning of the chamfer

7. Activate Clamp Arm completely forward to a locking position. See Fig. 8.

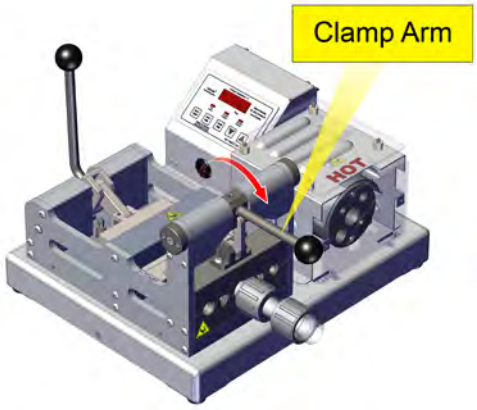


Fig. 8. Clamp Arm locked into position

8. Move the Ram Arm forward in a smooth and even motion to a locking position to activate the “CURE TIME” cycle. See Fig. 9.

Note: Display will show the letter “C” and the preset Cure Cycle time will begin counting down.

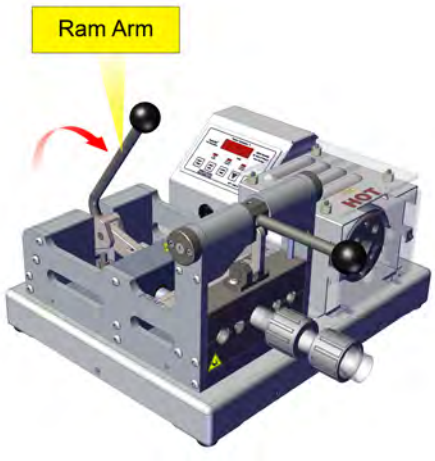


Fig. 9. Ram Arm locked into position

9. Retract the Ram Arm fully after the Cure Cycle Complete LED (Ref. Fig. 2) illuminates and the audible sound begins. See Fig. 10.

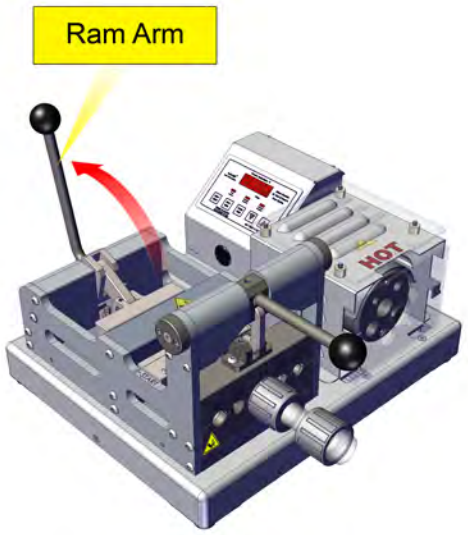


Fig. 10. Ram Arm fully retracted

10. Return the Clamp Arm back to the fully open position. See Fig. 11.

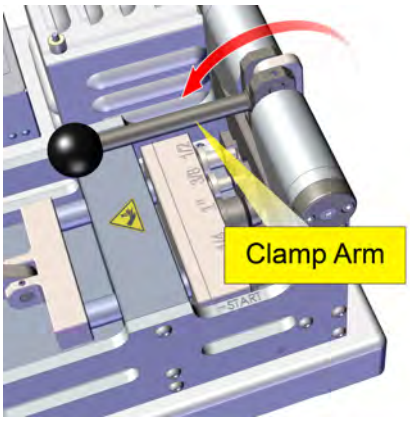


Fig. 11. Clamp Arm fully retracted

11. Remove the flared tubing. The flared tubing is now ready for installation or future use.

12. Return the Ram Arm back to the “START” line position marked on the frame. See Fig 12.

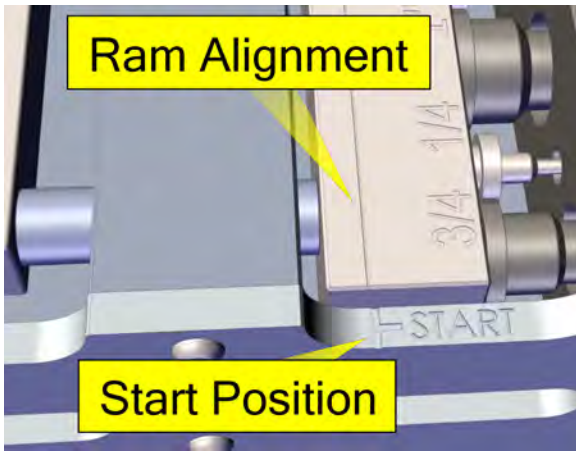
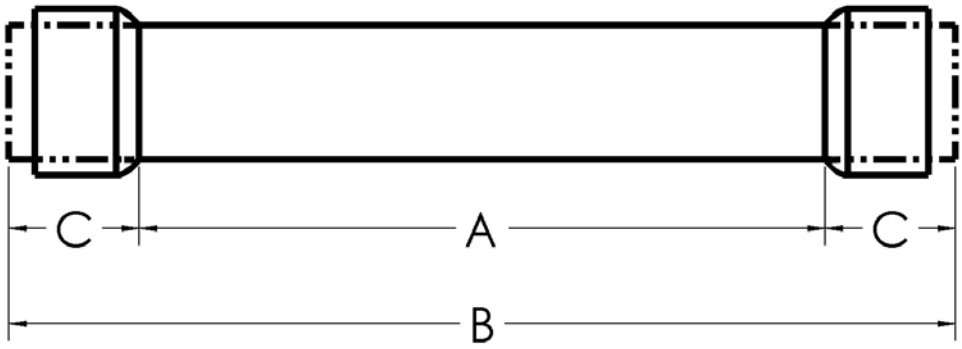


Fig. 12. Ram to Start Position

TruFLARE Tube Flaring Length Guide

To determine the original length of tubing "B"
needed to result in the desired length "A",
add factor "C" or "2C" to "A"
B = C + A for one end flared
B = 2C + A for both ends flared



TUBE ILLUSTRATION ONLY

A = Final desired length from fitting nose to fitting nose
B = Original length of tubing required to obtain A

Size	"C"	"2C"
1/4 in.	0.55	1.1
3/8 in.	0.6	1.2
1/2 in.	0.6	1.2
3/4 in.	0.6	1.2
1 in.	0.7	1.4

"C" & "2C" factors

Troubleshooting

EXAMPLES OF GOOD FLARES

To determine if the flares made are acceptable, see Fig. 13. The tubing should be free of damage or burrs, and the flare should be consistent around the circumference of the tubing. All angles should be sharp and consistent, with no deformed areas.

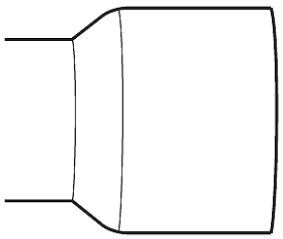


Fig. 13. Good Flare

EXAMPLES OF BAD FLARES

See Fig. 14. The temperature was set too high and/or for too long of a time. Decrease the temperature and/or the heat time.

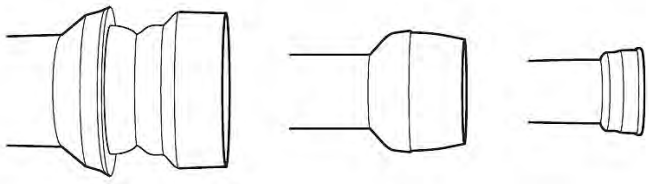


Fig. 14. Overheated Tubing

See Fig. 15. The temperature was set too low and/or for too short a time. Increase the temperature and/or the heat time.

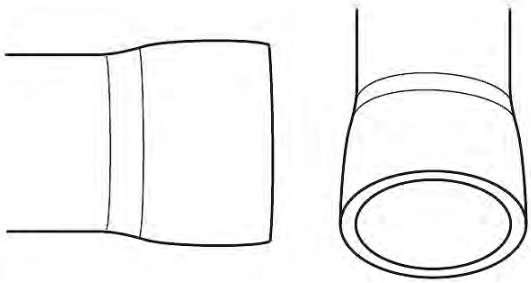


Fig. 15. Underheated Tubing

See Fig. 16. The ram arm was too far back from the start position alignment mark, causing the flaring mandrel to overtravel and deform the tubing. Ensure that the start position alignment marks are properly aligned.

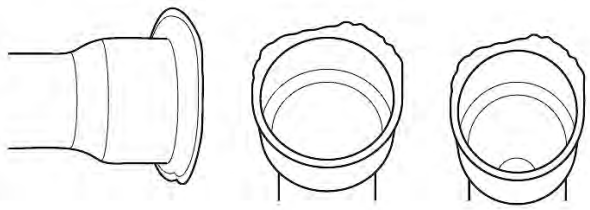


Fig. 16. Ram Arm was too far back from Start Postion or tubing was placed beyond chamfer location

See Fig. 17. The tubing was not positioned at the beginning of the flaring mandrel chamfer. Ensure that the tubing is pushed all the way to the beginning of the chamfer.

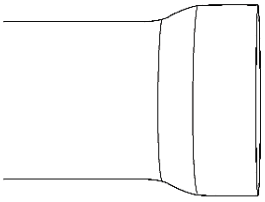


Fig. 17. Tubing was not fully placed to chamfer location

Adjusting the Photoeye Sensors

If the unit does not respond to the tubing being inserted into the heater block, one or both photoeye sensors may require adjustment.

1. Turn the unit off and ensure that it has cooled completely.
2. Lift the unit from the front and allow it to rest on end.
3. Locate the two slotted access holes on the underside of the unit. See Fig. 18.
4. Turn the unit on.
5. Adjust each photoeye sensor adjustment screw using a small, flat blade screwdriver. Turn the screw(s) clockwise so that the LED turns orange, then counter clockwise until the LED first turns green.
6. Turn the unit off again and lower the unit onto its base.

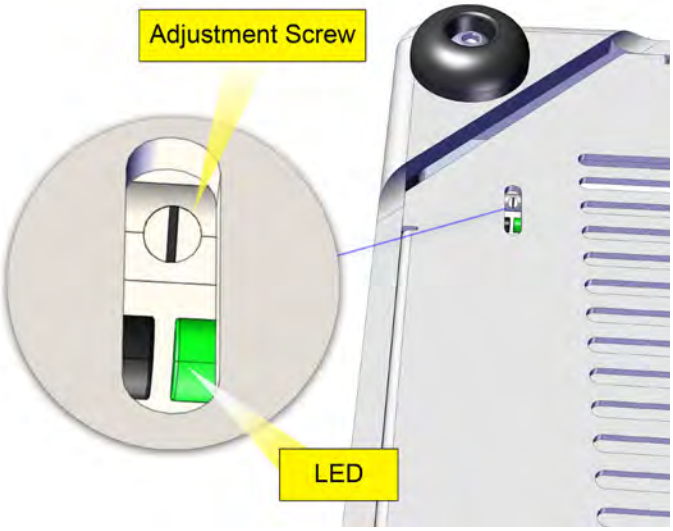


Fig. 18. Adjustment of Photoeye Sensors

Replacing the Fuses

The tube flaring system is protected by two 10A, 250V, 5 mm x 20 mm fast blow fuses. If the tube flaring system fails to power on, check both fuses for continuity. Ensure that the tube flaring system is turned off and unplugged. Locate the fuse holder, which is integrated with the power input module.
Using a small, flat-blade screwdriver, gently pry open the fuse holder cover. Gently pry the fuse holder from the power input module. Remove both fuses from the fuse holder and check for continuity. If either fuse has no continuity, the fuse has blown and must be replaced. Replace fuses with only the same type and rating. Reinstall the fuses, taking care that the fuses are fully seated against the positive stops on the fuse holder.

CAUTION
The fuses must be properly installed and fully seated against the positive stops on the fuse holder. Reinsert the fuse holder into the power input module and close the fuse the holder cover

Shutdown and Storage

To shut down the unit, turn off the power using the On / Off Switch. The unit will remain hot for 2 1/2 hours after the power is turned off. For storage, remove the power cord and place it in the designated area inside the case.

HOT SURFACE
The unit will remain hot for 2 1/2 hours after the power is turned off. Do not place unit back into case until it is fully cooled.

The Fit-LINE Inc. Limited Lifetime Warranty

Fit-LINE Inc. hereby warrants to the purchaser of this Product that the nonelectrical components of the Product shall be free from defects in material and workmanship for the life of the Product. All electrical components installed in or on the Product are warranted to be free from defects in material and workmanship for twelve months from the date of purchase. Adjustments under this warranty will be made only after complete inspection and confirmation of defects by Fit-LINE. Liability under the warranty shall extend only to the replacement or correction of the product not conforming to the warranty as determined by Fit-LINE. All materials must be returned freight prepaid.

The purchaser's remedies shall be limited to replacement and installation of any parts that fail through a defect in material or workmanship.

This warranty shall not apply to any product that has been repaired or altered by the customer without the manufacturer's knowledge and consent. This warranty shall not apply to products which have been subjected to misuse, improper maintenance, or damage through accident or negligence.

No other warranty, written or oral, is authorized by Fit-LINE. No responsibility is assumed for any special, incidental, or consequential damages. Implied warranties of merchantability and fitness for a particular purpose are specifically disclaimed.

Manufacturer specifically diavows any other representation, express or implied, warranty, or liability relating to the condition or use of the product, and in no event shall Fit-LINE Inc. be liable to purchaser, or any third party, for any direct or indirect consequential or incidental damages.

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