



# HVAC & Refrigeration Tubing

## Flexible Lines and Linesets

Installation and Servicing Instructions  
SD-405/12015



### 1.0 GENERAL INSTRUCTIONS

- 1.1 **Scope:** This safety guide provides instructions for selecting and using (including assembling, installing and maintaining) the ZoomLine product.
- 1.2 **Fail-Safe:** ZoomLine can fail without warning for many reasons. Design all systems and equipment in a manner so that failure of the ZoomLine assembly will not endanger persons or property.
- 1.3 **User Responsibility:** Due to the wide variety of operating conditions and applications Parker does not represent or warrant that any particular ZoomLine assembly is suitable for any specific end use system. This guide does not analyze all technical parameters that must be considered in selecting a product. The user, through its own analysis and testing, is solely responsible for:
  - Making the final selection of the products
  - Assuring the user requirements are met and the application presents no health or safety hazards
  - Assuring compliance with all applicable government and industry standards

### 2.0 ZOOMLINE SELECTION & INSTALLATION INSTRUCTIONS

- 2.1 **Sizing:** Size ZoomLine in accordance with system manufacturer's guidelines. For field designed/built systems follow existing copper line sizing guidelines.
- 2.2 **Minimum Bend Radius:** Installation of ZoomLine at less than the minimum listed bend radius may significantly reduce the product life and restrict flow. Particular attention must be given to avoid sharp bending at the coupling / connection ends.

### ZOOMLINE TUBING DIMENSIONS

Nominal Size	I.D.	Tubing O.D.	Maximum O.D.	Minimal Bend Radius
3/8" (10mm)	0.33" (8mm)	0.68" (17mm)	0.83" (21mm)	2.72" (69mm)
1/2" (13mm)	0.43" (11mm)	0.81" (21mm)	0.96" (24mm)	3.25" (83mm)
5/8" (16mm)	0.95" (24mm)	0.95" (24mm)	1.10" (28mm)	3.88" (98mm)
3/4" (19mm)	0.69" (18mm)	1.05" (27mm)	1.20" (30mm)	4.20" (107mm)
7/8" (22mm)	0.82" (21mm)	1.25" (32mm)	1.44" (36mm)	5.00" (127mm)

- 2.3 **Copper Stub Ends:** Do not cut the copper stub ends shorter. These were selected to be the proper length to prevent overheating of the ZoomLine end couplings during wet-rag brazing.
- 2.4 **Brazing Copper Stubs:** When using a torch, wet ragging must be used. Improper wet ragging could result in overheating the ZoomLine end fittings above 450°F (232°C) causing damage and emission of harmful gases.
- 2.5 **Electrical Conductivity:** ZoomLine is not conductive. Ensure no electricity is applied to the product to avoid potential electrical sparking or arcing and product, property, or personnel damage or injury.

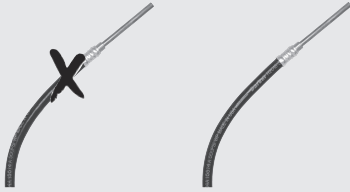
- 2.6 **Pressure:** After determining the system pressure, ZoomLine selection must be made so the recommended maximum operating pressure on label is equal or greater than the maximum system pressure. Surge pressures or peak transient pressures in the system must be below the published maximum working pressure for the tubing. Surge pressures and peak pressures can usually only be determined by sensitive electrical instrumentation that measures and indicates pressures at millisecond time intervals. Mechanical pressure gauges indicate only average pressures. Published burst pressure ratings for ZoomLine are for manufacturing test purposes only and are no indication that the product can be used in applications at the burst pressure or otherwise above the maximum recommended working pressure. Continuous use at maximum temperatures together with maximum pressures should always be avoided.
- 2.7 **Suction and Liquid Line Use:** ZoomLine is approved for all HVAC suction line and liquid line use as long as the system working pressures and temperatures are equal or less than the ZoomLine working pressure and temperature.
- 2.8 **Discharge Line Limitation:** ZoomLine is approved for use on heat pump gas lines (.i.e. suction in cooling mode/discharge in heating mode). **ZoomLine cannot be attached to the compressor discharge.** A high risk exists for exceeding the ZoomLine maximum temperature rating if a compressor fails or has abnormal operation.
- 2.9 **Temperature:** Be certain that fluid and ambient temperatures, both steady and transient, do not exceed -25°F to 200°F (-32°C to 93°C). Temperatures below and above the recommended limits can degrade the product to a point where a failure may occur and release refrigerant. Special care must be taken when routing near hot manifolds or other hot surfaces. Continuous use at or near the maximum temperature rating will cause deterioration of physical properties of ZoomLine and reduce the service life.
- 2.10 **Insulation:** Although ZoomLine has natural insulating advantages to copper, it is still recommended to use ZoomLine with insulation.
- 2.11 **Refrigerant and Oil Compatibility:** ZoomLine is designed to be used with the refrigerant/oil combinations defined in the specifications.
- 2.12 **Permeation:** Permeation (that is, seepage through the tubing material) will occur from the inside to the outside. ZoomLine has been designed such that permeation is negligible and cannot be reliably measured even using Helium mass spectrometry methods.
- 2.13 **Moisture Ingression:** All ZoomLine products are dehydrated before shipping, capped and placed in a heatsealed bag to prevent moisture absorption. Take care to keep the shipping caps on the copper stubs when not in use.
- 2.14 **Routing:** Attention must be given to optimum routing to minimize inherent problems (kinking, twisting or flow restrictions due to tubing collapse, proximity to hot objects or heat sources). Satisfactory performance and appearance depend upon proper tubing installation. Excessive length, exceeding minimum bend radius or allowing inadequate room for flexing will shorten the life of the line. See page 3 for diagrams offering suggestions for proper tubing installations.
- 2.15 **Length:** When establishing proper length, motion absorption, line length changes due to pressure, as well as tubing and machine tolerances must be considered. Determine ZoomLine lengths and configurations that will result in the proper routing and protection from abrasion, snagging or kinking. In many applications, it may be necessary to restrain, protect or guide ZoomLine to protect it from damage by unnecessary flexing, pressure surges or contact with other mechanical components.
- 2.16 **Restraints:** Care must be taken to ensure restraints do not introduce additional stress or wear points. Straps with widths of at least 1 inch (25mm) is recommended to provide adequate support. Follow system manufacturer's recommendations.
- 2.17 **Environment:** ZoomLine has been designed to be resistant to typical materials and environmental conditions for indoor and outdoor use. This includes traditional cleaning products, ozone, UV, rain, etc.
- 2.18 **Mechanical Loads:** External forces can significantly reduce ZoomLine life or cause failure. Mechanical loads which must be considered include flexing, twist, kinking, tensile or side loads, bend radius, and vibration. Unusual applications may require special testing prior to ZoomLine product selection.
- 2.19 **Physical Damage:** Care must be taken to protect ZoomLine from wear, snagging, kinking, bending smaller than the minimum bend radius and cutting, any of which can cause premature failure. Any ZoomLine that has been kinked or bent to a radius smaller than the minimum bend



Provide sufficient slack for expansion and contraction, since ZoomLine may change in length under the surge of high pressure.



ZoomLine should not be bent close to the fitting. Approximately 2 inches (51mm) of straight tubing is necessary to prevent damage. The minimum bend radius must not be exceeded to avoid kinking of the tubing and flow restriction.



Install ZoomLine without twist. ZoomLine is weakened when installed twisted. Pressure pulses in twisted tubing tends to fatigue it and loosen fitting connections.

radius should be removed and discarded.

- 2.20 **ZoomLine Cleanliness:** Components may vary in cleanliness levels. Care must be taken to ensure the ZoomLine product has an adequate level of cleanliness for the application.
- 2.21 **Radiant Heat:** The ZoomLine product can be heated to destruction without contact by such nearby items as hot manifolds or molten metal. The same heat source may then initiate a fire. This can occur despite the presence of cool air around the product.
- 2.22 **Visual Inspection of Tubing/Fitting:** As good practice, check before and after installation for external damage such as severe abrasion, holes, tensile loads, side loads, kinking, and flattening. Any of the following conditions require immediate shut down and replacement of ZoomLine:
- Fitting slippage at the tubing ends;
  - Damaged, cracked, cut or abraded cover (any reinforcement exposed);
  - Hard, stiff, heat cracked, or charred tubing;
  - Cracked, damaged, or badly corroded fittings;
  - Leaks at fitting or in tubing;
  - Kinked, crushed, flattened or twisted tubing; and
  - Blistered, soft, degraded, or loose cover.
- 2.23 **Repair:** ZoomLine is currently not repairable and the entire line will need to be replaced. It is not approved for any field crimp repair or patching.
- 2.24 **Storage:** Parker recommends keeping the ZoomLine product contained in its heatsealed bag with the caps on the ends of the copper stubs. It is recommended that all ZoomLine assemblies at a minimum be inspected and retested before use after 2 years. Stored ZoomLine must not be subjected to damage that could reduce their expected service life and must be placed in a cool, dark and dry area with the ends capped. Stored product must not be exposed to temperature extremes, ozone, oils, corrosive liquids or fumes, solvents or high humidity.
- 2.25 **Cold Temperature Flexibility:** ZoomLine becomes less flexible at colder temperatures. It is recommended to maintain ZoomLine warm prior to installation to maximize ease of installation. Do not warm ZoomLine by exposing it to open flames or by direct contact with heat sources above specification temperature. See note 2.9.
- 2.26 **Recommended Accessory Equipment Sizing:** The table on page 4 provides recommended drill hole sizing and wall duct sizing when using ZoomLine. These recommendations assumes adding a 1/2" (13mm) condensate line and ensuring at least 1/2" clearance. Adjust appropriately if using other condensate line sizes.

## LINESET ACCESSORY SIZING

Parker Model Description	Liquid Line Size In (mm)	Suction Line Size In (mm)	Suction Line Installation Thickness In (mm)	Combined ZoomLine Tubing OD In (mm)	Minimum Recommended In (mm)	
					Drill Hole Size In (mm)	Wall Duct Size In (mm)
ZL-LS-6-10-5-06-01	3/8" (10mm)	5/8" (16mm)	3/8" (10mm)	2.38" (60mm)	3" (76mm)	3.5" (89mm)
ZL-LS-6-12-5-06-01		3/4" (19mm)		2.47" (63mm)		
ZL-LS-6-14-5-06-01		7/8" (22mm)	3/4" (19mm)	2.70" (69mm)	4" (102mm)	4.5" (114mm)
ZL-LS-6-10-5-12-01		5/8" (16mm)		3.13" (80mm)		
ZL-LS-6-12-5-12-01		3/4" (19mm)		3.22" (82mm)		
ZL-LS-6-14-5-12-01		7/8" (22mm)	3.45" (88mm)			

### WARNING – USER RESPONSIBILITY

**Failure or improper selection or improper use of the products described herein or related items can cause death, personal injury and property damage.**

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise.

The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors.

To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

