

ZoomLock MAX

Press-to-Connect Refrigerant Fittings

TECHNICAL DATA

Product Parameters

- **Continuous Operating Temperature:**
-40°F to 284°F / -40°C to 140°C
- **O-ring Temperature Range:**
-40°F to 284°F / -40°C to 140°C
- **Maximum Rated Operating and Abnormal Pressure:**
700 psi / 48 bar / 4800 kPa
- **Burst Pressure:**
> 3X Maximum operating and abnormal pressure
> 2,100 psig / >14400 kPa / >144 bar
- **Vacuum Pressure Capability:**
200 Microns
- **Leak Tightness:**
Helium $\leq 7.5 \times 10^{-7}$ Pa.m³/s at +20°C, 10 bar
- **Size Availability (Inches):**
1/4, 3/8, 1/2, 5/8, 3/4, 7/8, 1, 1-1/8

Fitting Materials

- **Fitting Body:**
Refrigerant Grade Copper (UNS C12200 min 99.9% pure)
- **O-Ring:**
HNBR

Fitting Warranty

- Read page 29 for more details.

Compatibility

- **Approved Oils:** POE, PAO, PVE, AB and MO
- **Approved Connections:**
Copper to Copper
- **Approved Tube:**
Copper tube conforming to* ASTM B280 or ASTM-B88
- **Approved Copper Tubing:**
Type K or L

Approved Refrigerants

32**	422D	454A**
125	427A	454B**
134a	438A	454C**
290**	444A**	457A**
404A	447A**	459A**
407A	447B**	507A
407C	448A	513A
407F	449A	513B
407H	450A	600A**
410A	452A	718
417A	452B**	1234yf**
421A	452C	1234ze**
422B	HYCOOL 20	

Agency Approvals and Certifications

- UL Listed Refrigerant fitting SA7511
- UL Listed: Approved use for field and factory installations
- UL 109 - 7 Pull test, compliant.
- UL 109 - 8 Vibration test, compliant.
- UL 1963 - 79 Tests of gaskets and seals used in refrigerant systems, compliant.
- ISO 5149-2:2014, Refrigerating systems and heat pumps - Safety and environmental requirements - Part 2: Design, construction, testing, marking and documentation compliant.
- ISO 5149-2, 5.3.2.2.3 Strength pressure test, compliant.
- ISO 14903 - 7.4 Tightness test, compliant.
- ISO 14903 - 7.6 Pressure temperature vibration tests (PTV), compliant.
- ISO 14903 - 7.8 Freezing test, compliant.
- ASTM G85 salt spray (fog) compliant.
- ASHRAE 15 - 2016 Safety Standard for Refrigeration Systems, compliant.
- ASME B31.5 - 2016 Refrigeration Piping and Heat Transfer Components, compliant.
- 2018, 2015, 2012, 2009 and 2006 International Mechanical Code (IMC), certified, ICC-ES, PMG-1440.
- 2018, 2015, 2012, 2009 and 2006 International Residential Code (IRC), certified, ICC-ES, PMG-1440.
- 2018, 2015, 2012, 2009 and 2006 Uniform Mechanical Code (UMC), certified, ICC-ES, PMG-1440.

Mechanical joints shall not be used on annealed temper copper tube in sizes larger than 7/8 inch (22.2 mm) OD size per International Mechanical Code (IMC) and 3/4 inch nominal size per Uniform Mechanical Code (UMC).

Quality Assurance

ZoomLock MAX is manufactured in a ISO 9001 certified facility committed to providing quality products and support.

* Please refer to ZoomLock MAX Tube Compatibility Table, page 10.

** When using refrigerants classified A2L (lower flammability), A2 (flammable) and A3 (higher flammability) additional/specific standards, local rules and regulations, codes of practice and by-laws may be applicable.

ZoomLock MAX fittings are NOT suitable for R-717, R-723, R-764, R-744 refrigerants.

Refer to ZoomLockMAX.com for the latest approved refrigerants list.

ZoomLock MAX

Press-to-Connect Refrigerant Fittings

FITTING STORAGE

ZoomLock MAX fittings do not require special storage conditions. However to protect the HNBR O-ring a few simple precautions should be taken.

The O-rings should be protected from light sources, in particular direct sunlight or intense artificial light having a high ultra-violet content.

As the ozone is particularly harmful to rubber, storage rooms should not contain any equipment that is capable of generating ozone, such as mercury vapor lamps or high-voltage electrical equipment giving rise to electric sparks or silent electrical discharges.

Combustion gases and organic vapors should be excluded from storage rooms, as they may give rise to ozone via photochemical processes. Precautions should also be taken to protect stored products from all sources of ionizing radiation.

ZoomLock MAX fittings should be kept in their sealed bags to protect them from contamination.

MARKINGS and CLEANLINESS

Each fitting is marked ZoomLock MAX, size and 48 bar (on a pink background) and are cleaned, bagged and labeled to fully comply with the cleanliness requirements of ASTM-B280 and ASTM-B88 type K or L. Keep the ziplock bag sealed to protect fittings from contamination.

DESIGN CONSIDERATIONS

All refrigeration pipelines must be designed so that the number of joints is kept to a practical minimum. Refrigeration pipelines should be designed in compliance with the following key standards and in line with federal, state and local regulations, codes of practice and by-laws governing the installation. All applicable health and safety practices must be adhered to.

- ASHRAE 15 - 2016 Safety Standard for Refrigeration Systems.
- ASME B31.5 - 2016 Refrigeration Piping and Heat Transfer Components.
- 2018, 2015, 2012, 2009 and 2006 International Mechanical Code (IMC).
- 2018, 2015, 2012, 2009 and 2006 International Residential Code (IRC).
- 2018, 2015, 2012, 2009 and 2006 Uniform Mechanical Code (UMC).

Pipework Support

All pipework should be supported by the use of appropriate clips, brackets or supports. Please refer to:

- ASHRAE 15 - 2016 Safety Standard for Refrigeration Systems.
- ASME B31.5 - 2016 Refrigeration Piping and Heat Transfer Components.
- 2018, 2015, 2012, 2009 and 2006 International Mechanical Code (IMC).
- 2018, 2015, 2012, 2009 and 2006 International Residential Code (IRC).
- 2018, 2015, 2012, 2009 and 2006 Uniform Mechanical Code (UMC).

Federal, state and local regulations, codes of practice and by-laws governing the installation must also be adhered to. Supports should be placed near to fittings when possible and additional supports may be required when using soft copper tubes or where vibration occurs.

Pipework Protection

Tubing and fittings shall be protected as far as possible against adverse environmental or other external effects. Refer to:

- ASHRAE 15 - 2016 Safety Standard for Refrigeration Systems.
- ASME B31.5 - 2016 Refrigeration Piping and Heat Transfer Components.
- 2018, 2015, 2012, 2009 and 2006 International Mechanical Code (IMC).
- 2018, 2015, 2012, 2009 and 2006 International Residential Code (IRC).
- 2018, 2015, 2012, 2009 and 2006 Uniform Mechanical Code (UMC).

Federal, state and local regulations, codes of practice and by-laws governing the installation must also be adhered to.

Pipework Identification and Insulation

All pipework must be installed in accordance with:

- ASHRAE 15 - 2016 Safety Standard for Refrigeration Systems.

Electrical Continuity

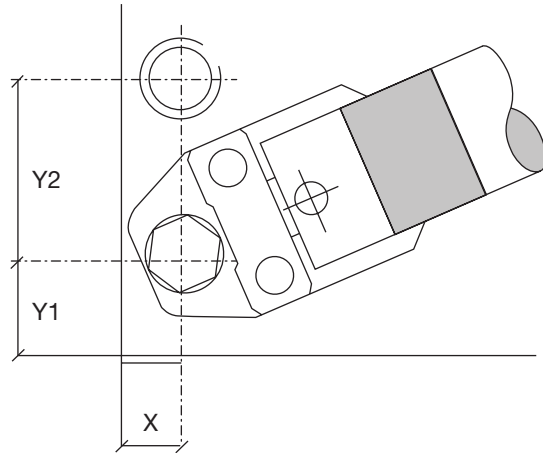
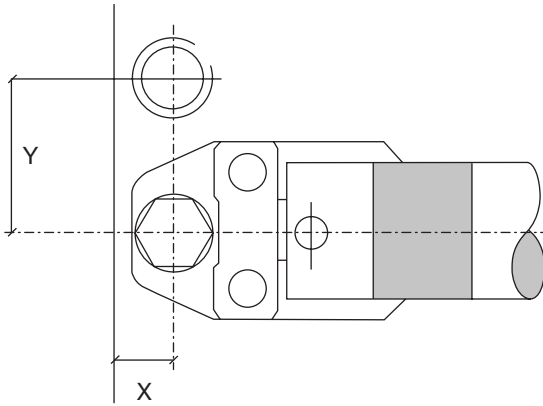
ZoomLock MAX fittings maintain ground continuity without the need for additional ground continuity straps.

ZoomLock MAX

Press-to-Connect Refrigerant Fittings

DESIGN CONSIDERATIONS (Continued)

Space Required for the Pressing Process



Space Required to Complete a Pressing Between Tubes and Wall ROTHENBERGER ROMAX 400				
Tube Size - OD (Inches)	X		Y	
	Inches	mm	Inches	mm
1/4	1-1/4	30	2-3/8	60
3/8	1-1/4	30	2-3/8	60
1/2	1-1/4	30	2-3/8	60
5/8	1-1/4	30	2-3/8	60
3/4	1-1/4	30	2-3/8	60
7/8	1-3/8	35	2-3/8	60
1	1-3/8	35	2-3/8	60
1-1/8	1-3/8	35	2-3/8	60

Space Required to Complete a Pressing Between Tubes and Wall Corner ROTHENBERGER ROMAX 400						
Tube Size - OD (Inches)	X		Y1		Y2	
	Inches	mm	Inches	mm	Inches	mm
1/4	2	50	2	50	4	100
3/8	2	50	2	50	4	100
1/2	2	50	2	50	4-3/8	110
5/8	2	50	2	50	4-3/8	110
3/4	2	50	2	50	4-3/8	110
7/8	2-3/8	60	2-3/8	60	4-3/4	120
1	2-3/8	60	2-3/8	60	4-3/4	120
1-1/8	2-3/8	60	2-3/8	60	4-3/4	120

Space Required to Complete a Pressing Between Tubes and Wall ROTHENBERGER ROMAX TT US				
Tube Size - OD (Inches)	X		Y	
	Inches	mm	Inches	mm
1/4	1-1/4	30	2-3/16	55
3/8	1-1/4	30	2-3/16	55
1/2	1	25	2-3/16	55
5/8	1	25	2-3/16	55
3/4	1	25	2-3/16	55
7/8	1-1/4	30	2-3/16	55
1	1-1/4	30	2-3/16	55
1-1/8	1-3/8	35	2-3/16	55

Space Required to Complete a Pressing Between Tubes and Wall Corner ROTHENBERGER ROMAX TT US						
Tube Size - OD (Inches)	X		Y1		Y2	
	Inches	mm	Inches	mm	Inches	mm
1/4	1-5/8	40	1-5/8	40	4	100
3/8	1-5/8	40	1-5/8	40	4-1/4	105
1/2	1-5/8	40	1-5/8	40	4-1/4	105
5/8	1-5/8	40	1-5/8	40	4-1/4	105
3/4	1-5/8	40	1-5/8	40	4-1/4	105
7/8	2-3/16	55	2-3/16	55	4-3/8	110
1	2-3/8	60	2-3/8	60	4-9/16	115
1-1/8	2-3/8	60	2-3/8	60	4-9/16	115

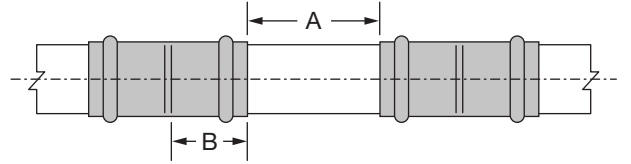
ZoomLock MAX

Press-to-Connect Refrigerant Fittings

DESIGN CONSIDERATIONS (Continued)

Insertion Depth and Minimum Distances Between Pressings

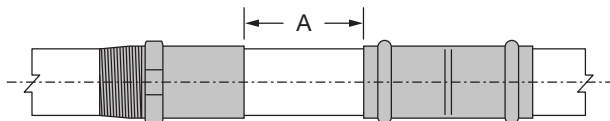
Due to the reforming of the tube profile when pressed, it is advised that a minimum distance is allowed between each fitting.



Nominal Size	Minimum Distance A		Insertions Depth B	
	Inches	mm	Inches	mm
1/4	1/2	10	0.71	18.0
3/8	1/2	10	0.71	18.0
1/2	5/8	15	0.75	19.0
5/8	5/8	15	0.87	22.0
3/4	7/8	20	0.91	23.0
7/8	7/8	20	0.98	25.0
1	1	25	0.94	24.0
1-1/8	1	25	1.04	26.5

Minimum Distance for Press Fittings from an Existing Brazed Joint

To ensure proper sealing of both the brazed and ZoomLock MAX fitting the following minimum distances must be maintained between the two fittings.



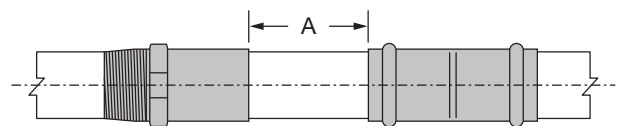
Minimum Distance from a Brazed Joint		
Nominal Size Tube - OD	Minimum Distance A	
Inches	Inches	mm
1/4	1/2	10
3/8	1/2	10
1/2	5/8	15
5/8	5/8	15
3/4	7/8	20
7/8	7/8	20
1	1	25
1-1/8	1	25

Note: A - clearance between fitting ends.

It is important that there is no residual brazing or other foreign debris on the tubing to be inserted into the ZoomLock MAX fitting. The surface condition on the area of press joint should be clean and free from debris and comply with ASTM-B280 or ASTM-B88 type K or L.

Minimum Brazing Distance to an Existing Pressed Fitting

Caution – Brazing near to ZoomLock MAX joints should be avoided as this may cause the seal to degrade due to heat transfer. The table below states the minimum distance away from the press joint which is acceptable to braze. If this distance cannot be maintained then adequate precautions must be taken such as fabricating the brazed section prior to assembly with the press fittings, wrapping in a wet rag or applying a heat barrier spray, gel or putty, to prevent heat transfer to the press fitting during brazing.



Minimum Distance Brazing		
Nominal Size Tube - OD	Minimum Distance A	
Inches	Inches	mm
1/4	10	250
3/8	12	300
1/2	13-3/4	350
5/8	17-3/4	450
3/4	19-3/4	500
7/8	23-3/4	600
1	24-1/2	650
1-1/8	27-1/2	700

Note: A - clearance between fitting ends.

ZoomLock MAX

Press-to-Connect Refrigerant Fittings

DESIGN CONSIDERATIONS (Continued)

Testing and Commissioning of Air Conditioning and Refrigeration Systems

Testing and commissioning of air conditioning and refrigeration systems should be in accordance with the requirements specified in:

- ASHRAE 15 - 2016 Safety Standard for Refrigeration Systems.
- ASME B31.5 - 2016 Refrigeration Piping and Heat Transfer Components.
- 2018, 2015, 2012, 2009 and 2006 International Mechanical Code (IMC).
- 2018, 2015, 2012, 2009 and 2006 Uniform Mechanical Code (UMC).

Federal state and local regulations, codes of practice and by-laws governing the installation must also be adhered to.

General

- Dry oxygen free nitrogen (OFN) should be used for tightness and strength testing as it is inert. Do not use oxygen for pressure testing, under pressure it can react violently with hydrocarbons (oil and grease) resulting in explosions and fire.
- The maximum test pressure to be identified by the installer. This will be calculated from the system pressure and the test parameters.
- To ensure ZoomLock MAX fittings are tested safely, during the strength pressure and / or tightness test, the pressure should be raised gradually up to the desired test pressure of the system as established by the installer.

- If you are going to leave the pipework pressurized for 24 hours or longer to check for leaks, measure the system pressure and the ambient temperature at the start and finish of the tightness test. A rise in ambient temperature can mask a leak if this is not taken into account. There will be a pressure change of approximately 10 psi with a temperature change of 9 °F.
- Care must be taken to ensure a ZoomLock MAX joint will not be close enough to the liquid charging point that the temperature of the joint drops below -40 °F when breaking a vacuum by liquid charging the system.

Problem Solving Vacuum Evacuation

Vacuum evacuation removes air, moisture, and non-condensable gases prior to system charging.

Failure to achieve a vacuum:

- A leak or moisture in the system (see below).
- Vacuum pump not working correctly.
- Vacuum pump does not have sufficient capacity.

Failure to hold a vacuum:

- A leak in the system or the connections to the system – find all leaks and repair them.
 - An ultrasonic leak detector can help pinpoint leaks on a system under vacuum.
- Moisture or refrigerant still in the system – continue evacuation.

No remedial action e.g. cutting out fittings from the system should be taken until a proper fault finding exercise has been completed.

ZoomLock MAX Tube Compatibility Table

ZoomLock MAX Fitting Size Inches	Tube Size Nominal OD		ASTM B280 - ASTM B88											
			Wall Thickness - Inches (mm)											
			0.025" (0.64)	0.030" (0.76)	0.031" (0.81)	0.035" (0.89)	0.040" (1.02)	0.042" (1.07)	0.045" (1.14)	0.049" (1.24)	0.050" (1.27)	0.065" (1.65)		
1/4	0.250	6.35	● ■	● ■										
3/8	0.375	9.53		● ■	● ■	● ■								
1/2	0.500	12.70			● ■	● ■					● ■			
5/8	0.625	15.88				● ■	● ■			■	● ■			
3/4	0.750	19.05				● ■			● ■		● ■			
7/8	0.875	22.23				●				● ■			● ■	
1-1/8	1.125	28.58				●	●					● ■	■	

● Annealed coil

■ Straight tube Half Hard / Hard

Notes:

Hardness tolerance as per approved standards in the table above.

Ensure coil tubes are in round condition. Oval tubes should be re-rounded.

It is the engineer's responsibility to ensure that the tube selected is compatible with ZoomLock MAX and meets the operating pressure requirements of the system.