



TCH has been making connectors, expansion joints, flexible metal hose and custom products for 30 years. We have a reputation for quality, reliability, and fast response.

TCH sales team has nearly 100 years of combined experience, giving you superior product and industry knowledge.

TCH brings confidence, consistency and satisfaction with every product we manufacture and distribute.



What will be covered:

- **METAL HOSE**
- **BRAIDED PUMP CONNECTORS**
- **REDUCING PUMP CONNECTORS**
- **ACCESSORY ADAPTORS**
- **“V” CONNECTORS**
- **METALLIC EXPANSION JOINTS**
- **TEFLON EXPANSION JOINTS**
- **RUBBER EXPANSION JOINTS**
- **EXPANSION COMPENSATORS**
- **EXTERNALLY PRESSURIZED EXPANSION JOINTS**
- **MULTI-PLY BELLOWS PUMP CONNECTORS**
- **PIPE GUIDES**
- **CUSTOM FABRICATION**



What is metal hose?

“Metal hose is a length of tubing made flexible by means of convolutions, so that it may be readily bent but remain liquid and gas tight”.

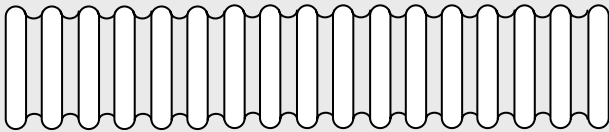
Functions of metal hose

- 1. Reductions of piping stress and forces on:**
 - Structures**
 - Anchors**
 - Pumps**
 - Other equipment within the piping system**
- 2. Compensate for misalignment of pipes or equipment**
- 3. Vibration absorption**
- 4. Noise control**

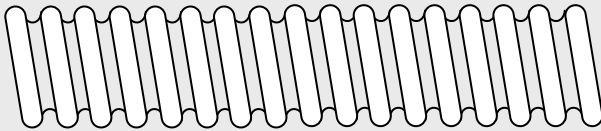


Metal Hose Form

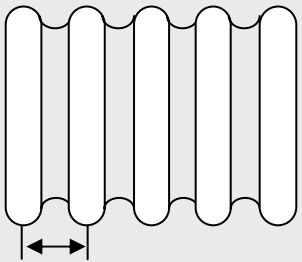
Annular



Helical

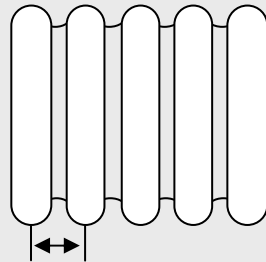


Metal Hose Convolution



Open Pitch

Not as Flexible



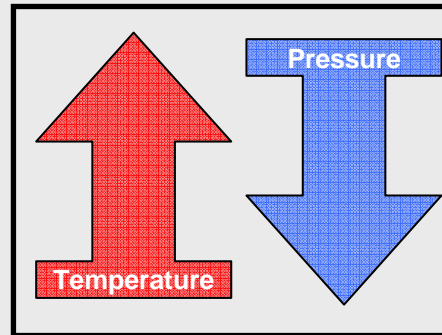
Closed Pitch

Very Flexible

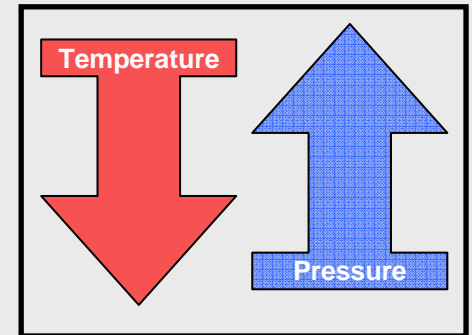
Types of Pressure:

- **Static** Constant pressure
- **Pulsating** Cyclic pressure
- **Shock** Sudden increases or decreases in pressure
- **Working** Pressure that the hose should be subjected to on a continuous basis
- **Test** Pressure the hose should be subjected to during proof pressure or system testing.

Pressure and the direct correlation to Temperature



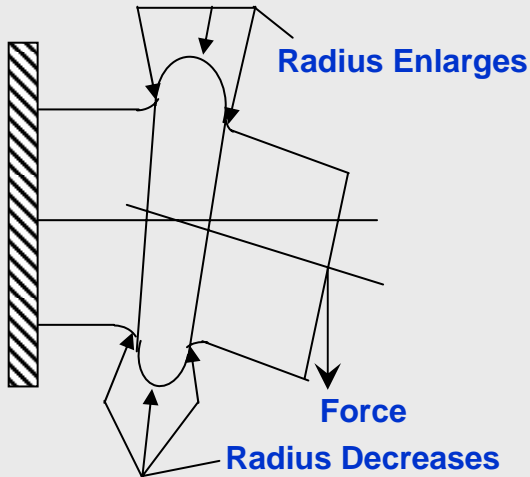
Pressure capabilities decrease as the temperature increases.



Pressure capabilities increase as the temperature decreases.



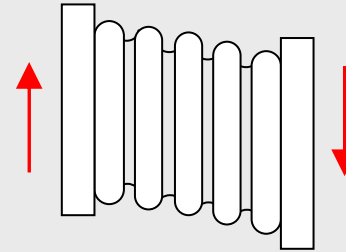
How a Hose Bends - A single convolution is able to elastically distort itself



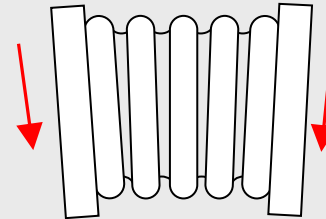
Motion Classifications:

Random: Occurs from handling hose when used in temporary connections.

Offset / Lateral:



Angular:



Metal Hose Materials:

- Bronze
- SS 304
- SS 321
- SS 316
- Monel
- Inconel

| Hose Material | Max Temperature |
|----------------------------|-----------------|
| <i>Bronze</i> | 450 |
| <i>Monel</i> | 800 |
| <i>Stainless Steel 304</i> | 850 |
| <i>Stainless Steel 321</i> | 1500 |
| <i>Stainless Steel 316</i> | 1500 |
| <i>Inconel</i> | 1800 |

| Hose Material | Max Pressure |
|----------------------------|--------------|
| <i>Inconel</i> | |
| <i>Stainless Steel 316</i> | |
| <i>Monel</i> | |
| <i>Stainless Steel 321</i> | |
| <i>Stainless Steel 304</i> | |
| <i>Bronze</i> | |

• Other materials available upon request

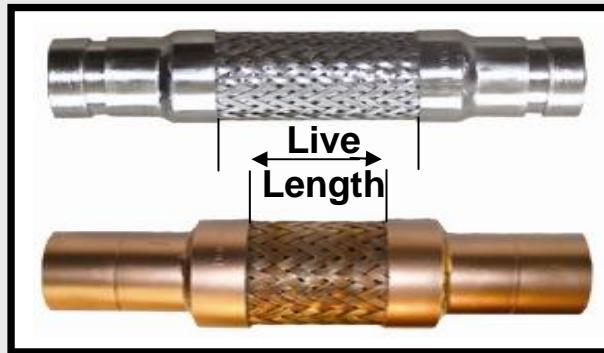


Pump connectors are very useful in high heat and high pressure applications because of the unique properties of the metal used in the assemblies.

TCH Pump Connectors are designed to fulfill these needs in a piping system:

- Dampen noise
- Absorb vibration
- Compensate for stresses
- Accommodate misalignment

Live Length: Should be determined by the amount of lateral offset needed.

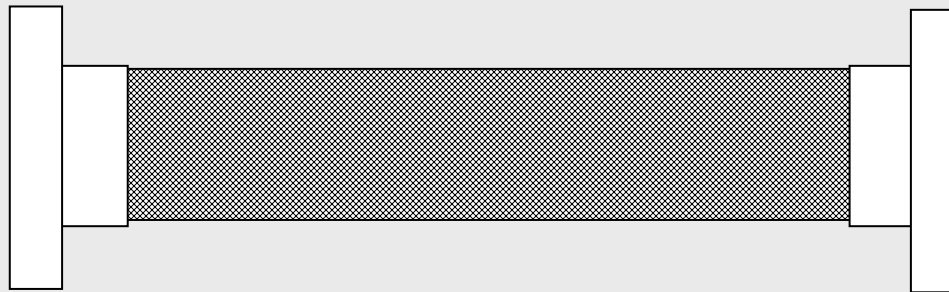


Pump connectors CAN NOT be used for thermal expansion applications.



Fabricating the Pump Connector Assembly

1. A length of corrugated metal hose is selected.
2. Metal braid is stretched tightly over the hose (similar to a Chinese finger trap).
3. Then Collars are cap welded on (it is now a pressure vessel).
4. Finally end fittings are welded on completing the pump connector assembly.





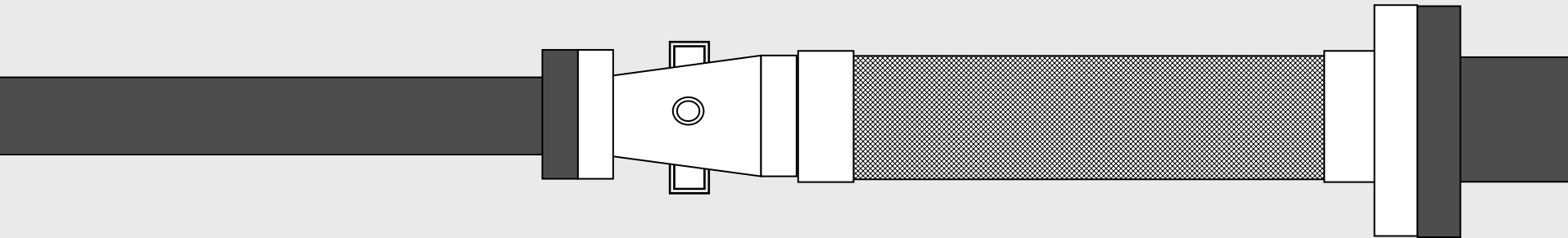
Sizes: 1-1/4" - 12" & custom PSIG & Temperature: Varies with Materials

Model - RC

Fabricating the Reducing Pump Connector Assembly

Constructed the same way a standard pump connector is, with exception of:

- The addition of a reducing piece between the collar and the end fitting.
- Accessory adaptor ports that can be included on your reducer, allowing up to four ports for:
 - Drains
 - P/T ports
 - Gauge cocks
 - Thermo wells






Materials Hose and Braid:

- Bronze
- SS 304
- SS 321
- SS 316
- Monel
- Inconel
- Other materials available upon request

End Fittings:

- Flange 
- Grooved 
- Sweat 
- Threaded 
- Weld 
- Custom or Combinations

Advantages:

- Excellent in high temperature & pressure applications
- The best in high corrosive media applications
- Shelf and service life is longer than rubber
- No control rods needed, braid is the growth restrictor
- Any type of end fittings possible

Disadvantages:

- Can not absorb thermal growth
- Sound absorption is not as good as rubber



Sizes: 2" – 8" & custom

Model – F & RF

Accessory adaptors are the piping solution to complicated piping arrangements found at larger air handlers and heating and cooling coils, even when the coil is larger than the coil connection itself.

Specifications:

1. Constructed from Sch. 40 Pipe
2. End fittings must be specified
3. Ports can be sized $\frac{1}{4}$ ", $\frac{1}{2}$ " and $\frac{3}{4}$ "
4. Port location & quantity must be specified



Reducing

Straight

Accessory adaptors ensure:

- Proper connection to piping system with the correct end fittings
- Ports are correctly located and sized
- No field guess work
- Necessary piping reductions
- System checks properly located



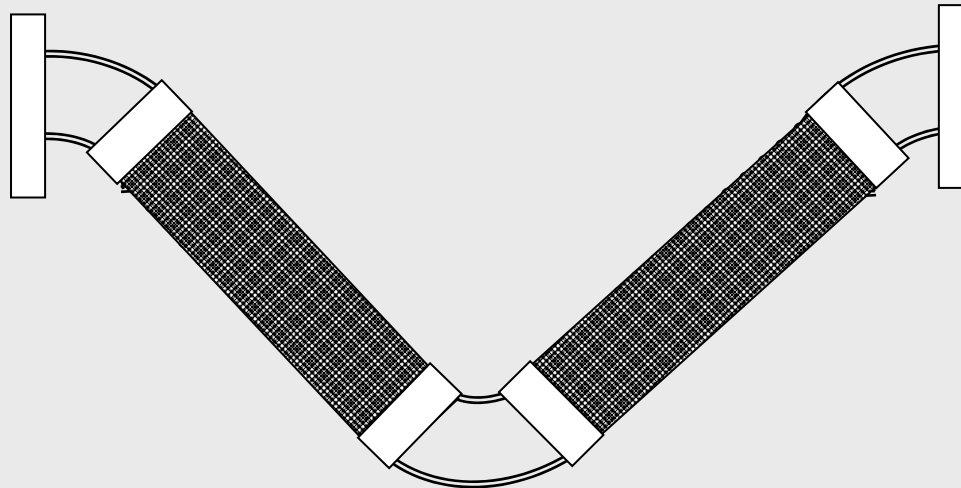
Sizes: Custom PSIG & Temperature: Varies with Materials

Model – V 90

Constructed of:

- (2) Pressure vessels
- (1) 90 Degree elbow
- (2) 45 Degree elbows
- Any end fitting needed

The TCH "V" Connector has 180 degrees of piping change as opposed to a loop that has 360 degrees of change.



"V" connectors CAN be used for thermal expansion applications.



Sizes: Custom PSIG & Temperature: Varies with Materials

Model – V 90

TCH "V" Connectors are the solution for:

- Random motion
- Thermal expansion
- Seismic movement
- Natural/man made disaster movement



"V" Connectors are able to absorb movement along three plains:

- Axial
- Horizontal
- Vertical



Moves in angular directions reducing weld attachment stress.



Model - M

Metal EJ (no control rods)

Sizes: 3" - 48"
PSI: 300 max
Temp: 850 max



Features:

- 0.5" to 3 inches of axial, lateral, and angular movement
- Deflects in any direction
- Most economical

Model - T

Teflon EJ

Sizes 1.5" - 24"
PSI: 200 max
Temp: 350F max



Features:

- Absorb vibration and allow for thermal movement and misalignment in piping
- Corrosion resistant & avoids build up of solids
- Integral steel limit control bolts
- Available in two , three, or five bellows style



Construction

- Tube: The inner lining of the EJ
- Cover: The exterior part of the EJ
- Tube and cover are typically made of the same elastomer
- Carcass/Body: Consist of fabric or metal wire reinforcement
- Control rods must be used in higher pressure applications
- End fittings can be carbon or stainless steel (150# or 300#)



Applications

- **Next to mechanical equipment**
- **Air conditioning and heating**
- **Power systems**
- **Pulp systems**
- **Waste water**
- **Marine**
- **Can not be used in petroleum based applications**

TCH Rubber Expansion Joints

- **Noise control**
- **Vibration absorbtion**
- **Misalignment**
- **Thermal growth**
- **Cost efficient**
- **Protects against surge forces**



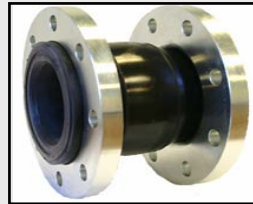
Model - MS1

Single Sphere Rubber EJ

Specifications:

- 1" compression and 3/8" extension

Sizes: 1-1/2" - 24"
PSIG : 225 max
Temp: 300F max



Model - MS2

Double Sphere Rubber EJ

Specifications:

- 2" compression and 1-1/8" extension

Sizes: 1-1/2" - 24"
PSIG : 225 max
Temp: 300F max



Model - MFUS

Female Union Rubber EJ

Specifications

- 7/8" compression and 1/4" extension

Sizes: 3/4" - 3"
PSIG : 225 max
Temp: 300F max



Model - MRCE

Reducing Rubber EJ

Specifications

- 1/2" compression and 3/8" extension

Sizes:
 Large end 3" - 10"
 Small end 2" - 8"
PSIG : 200 max
Temp: 225F max





Sizes: 3/4" - 4"

PSIG: 200 max

Temp: 750F max

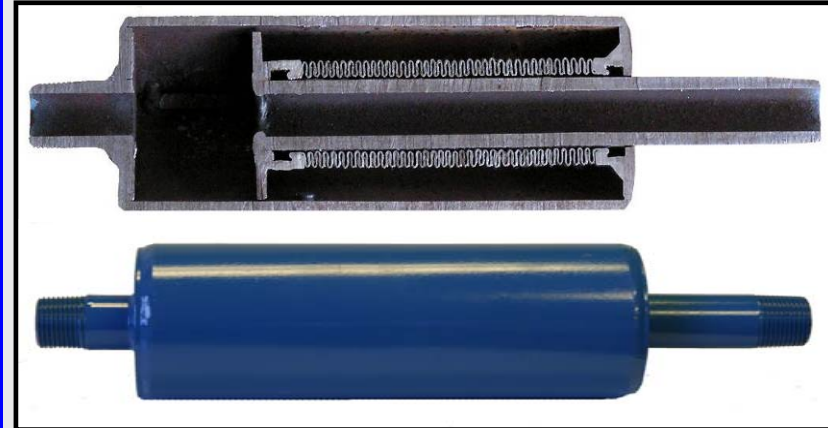
Model - EXC

TCH Expansion Compensators

- Expansion compensators absorb axial pipe motion in smaller diameter systems, like high-pressure risers and low-pressure baseboards
- Multiple compensators can be in line together for larger pipe movements
- Standard movement per compensator is 2 inches total axial movement
- Internal anti-torque device
- Take up limited space in tight mechanical areas

Construction:

1. Multi-Ply stainless steel bellows
2. Carbon steel shroud
3. Internal liner



4. End fittings to match system
 - Flange
 - Grooved
 - Sweat
 - Threaded
 - Weld
 - Custom



Sizes: 3" - 48"

PSIG: 300 max

Temp: 650F max

Model - TFEP

TCH Externally Pressurized EJ

- Externally Pressurized EJ's absorb axial pipe motion in larger diameter systems
- Take up less space than a pipe loop
- Standard movement:
 - 4" compression and 3/4" extension (short)
 - 8" compression and 1-1/2" extension (long)
- With internal anti-torque and limit stop device
- No packing = no maintenance at all

Construction:

1. Multi-Ply stainless steel bellows
2. Carbon steel shroud
3. Internal liner



4. End fittings to match system
 - Flange
 - Grooved
 - Threaded
 - Weld
 - Custom



Sizes: 3" - 16"

PSIG: 225 max

Temp: 360F max

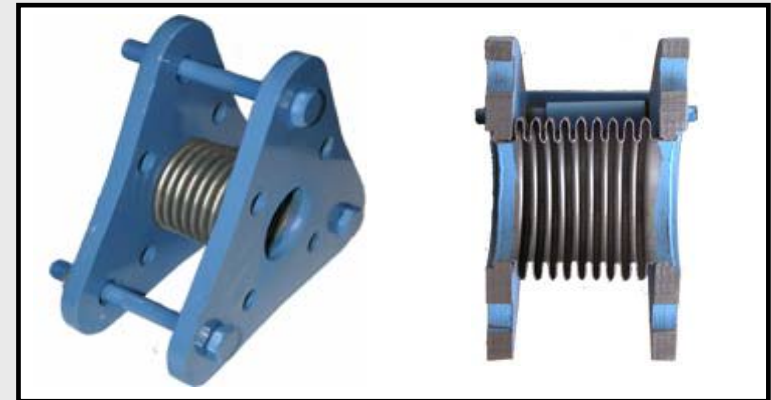
Model – MPB & MPBR

TCH Multi-Ply Bellow Pump Connector

- MPB and MPBR Pump Connectors are designed to protect the pump and piping system by absorb thermal growth and lateral motion
- Take up less space than a pipe loop
- Standard movement:
 - MPB – 1/2" compression, 1/8" extension & 1/8" offset
 - MPBR – 1" compression, 3/8" extension & 1/8" -1/4" offset
- MPBR is the metal version of the Single Sphere Rubber EJ (Same OAL)
- With internal anti-torque and limit stop device

Construction:

1. Multi-Ply stainless steel bellows
2. Carbon steel flanges, limit rods, nuts and cotter pins
3. Rubber washer



4. End Fittings

- Flange only

5. Size

- Larger sizes are available (special order)



Pipe Sizes: 1/2" - 20"

Model – Pipe Guide

Types of Pipe Guides:

- **Spider**
 - Designed to guide pipe to expansion joint
 - Not designed to handle support loads
- **Baseboard**
 - Designed for base board tube enclosures
 - Designed for 3/4" to 1-1/4"
- **Pipe Slides**
 - Designed for 1" to 8" diameter pipe
 - Designed to handle support loads
- **Insulated**
 - Designed to guide pipe to expansion joint
 - Not designed to handle support loads



TCH Pipe Guides:

- Designed to facilitate the thermal expansion of a pipeline so that the movement is properly directed to the expansion joint.
- Prevent buckling or squirming of the piping system

Proper guiding and anchoring are essential to the proper installation of expansion joints.



TWIN CITY HOSE offers custom fabricated parts, providing specialized part needs and variations of our existing product line. It can be done.

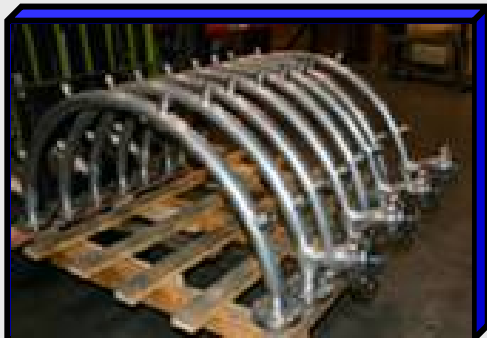
TCH Product Line Customability:

- Compensators
- Rubber EJ
- Metal EJ
- “V” Connectors
- Pump Connectors
- Reducing Pump Connectors
- Accessory Adaptors
- Flexible Braided Metal Hose



Custom Fabricated:

- End Fittings
- Over All Length (OAL)
- Pressure Capabilites
- Temperature Capabilites
- Overall Diameters (OD)
- Media Capabilities





TWIN CITY HOSE INC.

Make **TWIN CITY HOSE** your choice for:

- **Quality**
- **Reliability**
- **Responsiveness**
- **Industry leadership**
- **Experience**

TWIN CITY HOSE is a one stop shop:

- **Materials Warehouse**
- **Stock Warehouse**
- **Welding Shop**
- **Fabrication Shop**
- **Product Testing Shop**
- **Product Cleaning Shop**

TCH: The Manufacturer for Engineered Piping Systems Solutions.