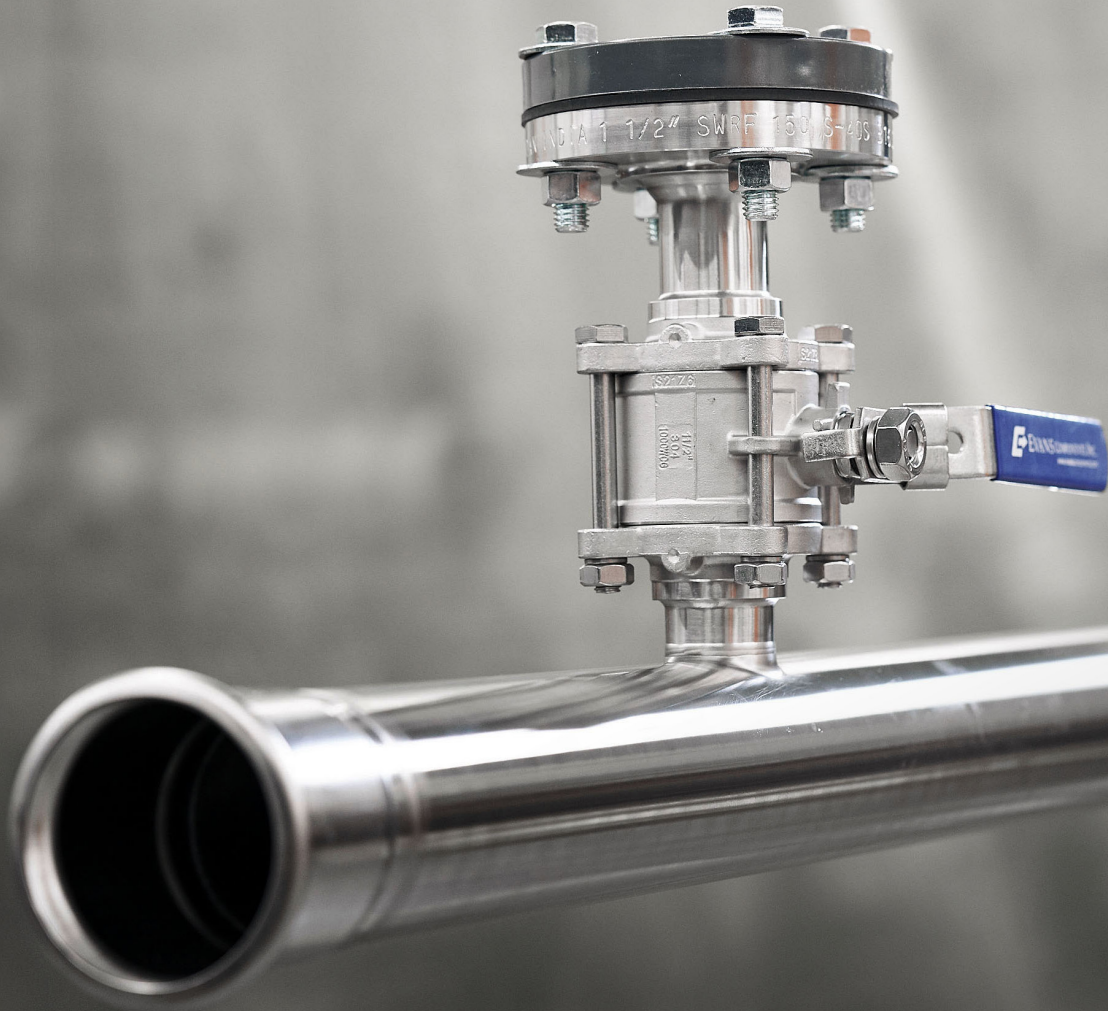




# Data Center Product/System Applications At A Glance

## Liquid Cooling Water Applications



### Features

- High Quality "Full Ported" 3-PC Stainless Ball Valves (1/2" - 4")
- Main Size Stainless SCH10S Pipe or Tube O.D. Dimensions up to 12" NPS
- Pre-fabricated Sections up to 24'
- Pulled-Tee Construction, Reduced Number of Welds, Higher Quality, Lower Cost Design
- 100% Helium Leak Tested to  $1 \times 10^{-7}$  scc/sec
- Weld Free Installation using Presslok Slip-couplings or ANSI Flanges





# Data Center Liquid Cooling Water

# (CW) System Overview

## History of Innovation

In 2000 Evans expanded its offering beyond inert gas products and introduced the Cooling Water line of products for the Semiconductor Industry. Initially consisting of Lateral Branch Valves and Lateral Manifolds, Evans has since expanded its innovative liquid cooling product offering to incorporate high-quality, robust integrated manifold systems that meet the needs of today's Hyper Scale Data Centers.

### 1. Lateral Manifolds

Evans first introduced the Liquid Cooling Water Manifold to our customers in 2000 by close-coupling Evans CW Valves with a short stretch of pipe. Today Evans offers Manifolds of up to 24' (7.3 m) in length, with multiple close coupled valves, or valve Tee assemblies, attached along the pipe at customer designated intervals. Pipe diameters ranging from one inch up to twelve inch are all available. Designed as sections of Laterals, Evans CW Manifolds are shipped leaked tested and ready for direct installation within the customer's CW system. Our unique valve design and testing capabilities, as well as direct shipment of CW Manifolds from Evans factories, has significantly reduced the cost, installation time, and unnecessary cutting, facing, and the field fit-up of Liquid Cooling Water Laterals for our Customers.

### 2. Evans Presslok System for Tool Hook Up

In 2010 Evans introduced the Presslok line of products for Liquid Cooling Water. A totally weld-free system for plumbing CW Supply and Return Hook-Up lines, the Evans' group of products provides the strength of stainless steel for close to the cost of PVC. Our unique coupling and piping products have greatly reduced the installed cost vs. welded Supply and Return systems, while at the same time providing the leak integrity and reliability you would expect with a welded system. From 1/2" - 4", every imaginable fitting and component needed is available for running Hook-Up lines. Presslok is ideally suited for "fast track" construction of leading edge Data Center facilities. Installation of stainless systems can be done in a fraction of the time vs. welding. Reduced installed costs, time to market and the potential of finding enough skilled labor are all critical challenges in today's environment.

### 3. Integrated Rack Stick Assemblies

- Integrated (Supply/Return) Rack Hook-up Stick Assemblies
- Optional Pressure/Temperature & Flow Indication
- Quarter-turn Locking Ball Valves
- Multi-turn Globe Valves for Flow Control
- Custom Lengths Available

### 4. Evans SN Series Sanitary Valves & Fittings

- 1/2" - 4", DN/ISO 8 thru ISO 100 Sizes
- True Bore Design
- Cavity Free PTFE Seats
- Live Loaded Stem Seal
- ASME/BPE Compliant
- SF1 Standard Surface Finish

### 5. Evans PW Series Valves

- Full Port 3-PC Stainless Design
- 1/2" - 4" Size Range
- One-Piece ANSI Flange Outlet Design
- Short Tube/Pipe (Inlet) Designed for Automated Orbital Welding to the Pre-fabricated Manifold
- Locking Lever Handle

### 6. Spool Connections

- Evans Presslok Slip Couplings
  - Only 2 press joints every spool
  - Field Proven Technology
  - O-ring guaranteed for lifetime of installation
  - Guaranteed to 1x10<sup>-7</sup> scc/sec He
- ANSI Flanges

### 7. Hose Barb Fittings

- Full Range of Hose Barb Fittings
- ANSI Flange to Hose Barb
- Hose Barb Tee's, Adapter Fittings
- Sizes from 1/2" - 2"

### 8. Quick Connect Fittings

- High Performance Double End Shut-off Quick Connect
- Flush Valve Design, Spill Free
- Stainless Construction
- Sizes 1/2" - 2"

### 9. POC Server Hookup Manifolds

- Hose Barb, Quick Connect, or other end connections
- Customizable number of valves
- Can adapt from any POC connection type

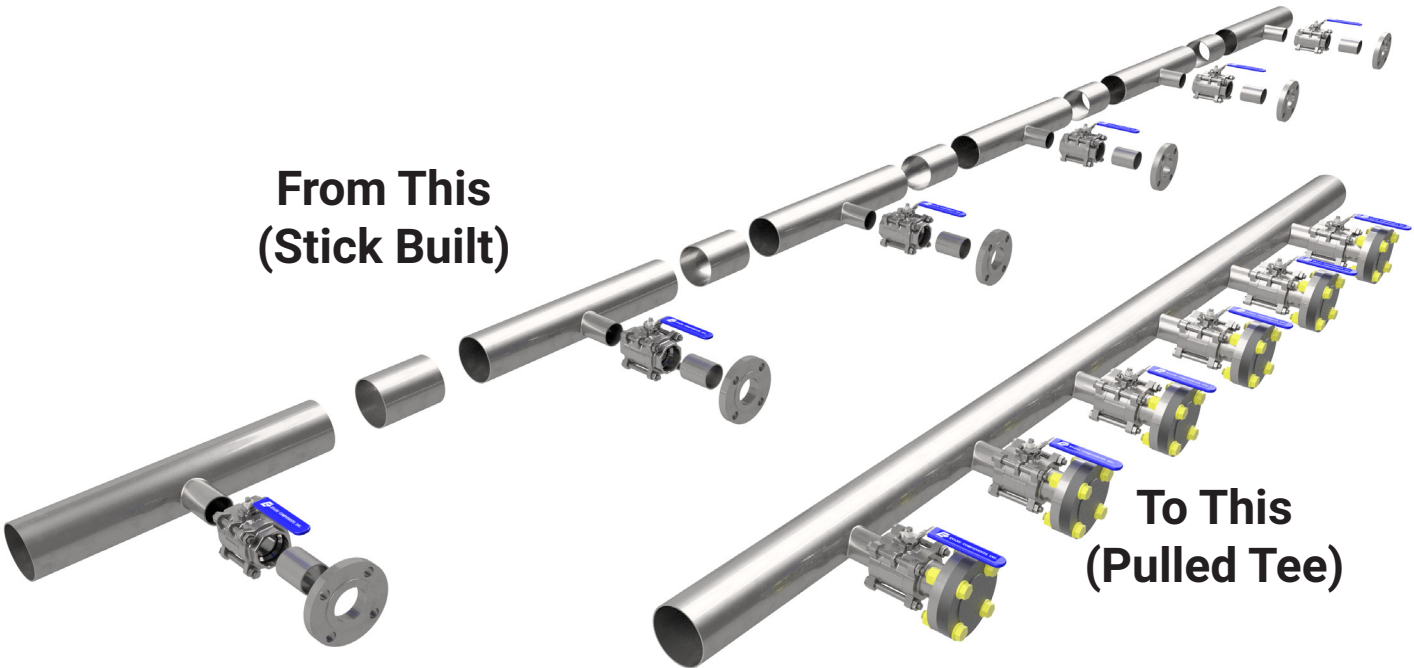
## Evans Components

Evans Components offers a complete selection of products for Liquid Cooling Water systems to serve our Customers. Whether it's discrete valves, Lateral Manifolds, or solutions for Tool Hook-Up, we have the products that fit. So whether you're in the early stages of planning, preparing for a plant build-out or retro-fit, or simply adding a tool, contact your local Evans Components representative for assistance, they stand ready to help you achieve your goals.

# Connecting the Data Center Industry

Traditional air-cooling systems are no longer sufficient for today's industry. More advanced technologies are entering the market stage, demanding more efficient and powerful data centers. The fast-moving evolution driven by Artificial Intelligence, Machine Learning along with integration with the internet and cloud computing adds considerable stress to the thermal management systems.

To address these challenges, liquid cooling has emerged as the preferred data center solution. Next generation data racks necessitate increased cooling capacity, higher flow and lower pressure. Stainless steel liquid cooling piping has emerged as the preferred solution due to its cleanliness, robustness and long-term reliability.



Do away with traditional stick-built laterals using Evans innovative "pulled tee" manifolds. Eliminate up to 3 welds per POC (point of connection) vs. using traditional reducing tees. Reduce costs in excess of 30-40% when using Evans one-piece ANSI Flange valve vs. pipe socket valves for CW manifolds.

## Improved Quality

- More robust design, reduced number of weld seams (3-per valve)
- Manufactured in a controlled environment
- Helium leak tested and certified to  $1 \times 10^{-7}$  scc/sec
- Complete QA/QC documentation package

## Reduced Costs

- Eliminate 70% of welds
- Overhead reductions in QA/QC, cutting, facing, and prep activities
- Eliminate disassembly/reassembly of 3-PC valves for welding purposes
- Reduced material handling
- Reduction of weld Argon gas consumption

# Liquid Cooling Water



## Benefits & Features

- Built using Evans "full ported" high quality PW Series valves
- Manifolds are 100% helium leak tested to  $1 \times 10^{-7}$  atm scc/sec
- Minimized "dead leg" volume between main pipe and branch connection
- Complete QA/QC documentation package
- Pipe is solution annealed and meets ASTM A312-15 & ASME SA312-13, pipe is pickled & passivated per ASTM A380-06
- Fully welded, assembled & tested manifold assemblies conform to ANSI B31.1 & B31.3
- Quality production is assured by following stringent work procedures and processes developed for all aspects of the manufacturing processes
- 30% - 40% Cost Savings vs. traditional stick-built systems

## Spool/Manifold Configurations

- Main run lengths up to 24ft (7m), and diameters up to NPS 12 (300mm)
- Manifold assemblies fully traceable and individually marked with customer specified markings and standard part number
- Branch valve (POC) sizes up to 6"
- Available with 304L or 316L stainless ASTM tube or SCH 10S pipe (JEA)
- Custom EOL (end of line) assemblies inclusive of butterfly valves, high point vent & drain connections, & loop line with flowmeter

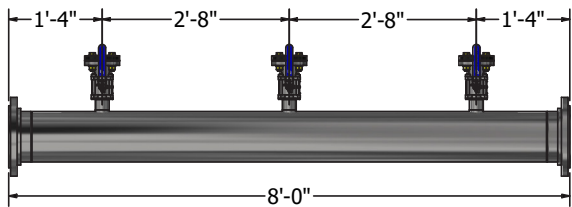
## Specifications & Design Rules

- Maximum Valve Pressure Rating: 1000 psi (68 bar) @ 100° F (38° C)
- Maximum Pressure Rating ANSI 150lb. Flange Connection : 275 psi (19 bar)
- Temperature Rating: -20° F (-29° C) to 375° F ( 190° C)
- POC (point of connection) / valve alignment +/- 1 degree
- Minimum valve spacing between POC's 12" (300mm)
- Minimum POC distance from end of pipe is 12" (300mm)
- Dimensional tolerance +/- 0.25" (6.35mm)

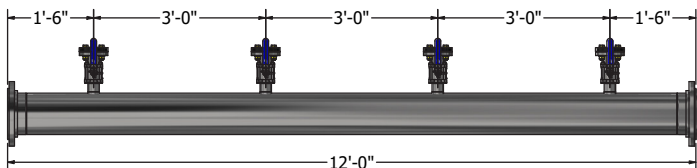


# Spool Dimensions

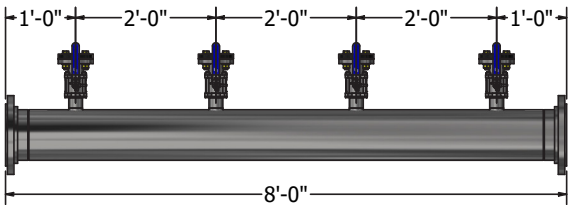
8' Long SHC3



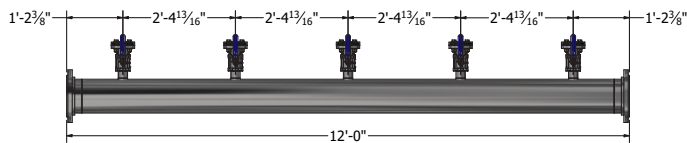
12' Long SHC4



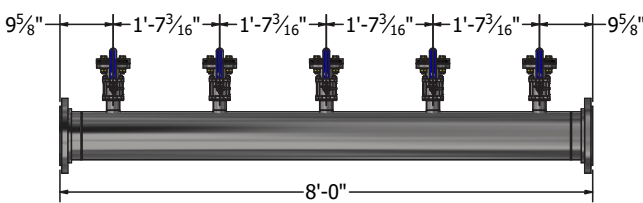
8' Long SHC4



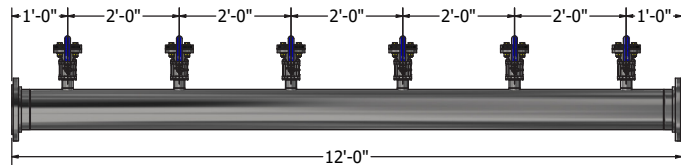
12' Long SHC5



8' Long SHC5

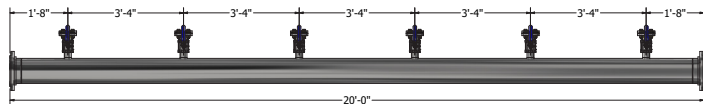


12' Long SHC6

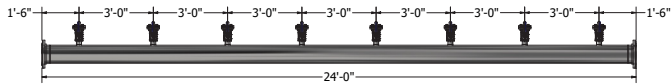


# Spool Dimensions

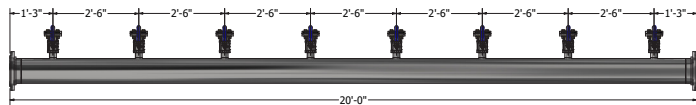
20' Long SHC6



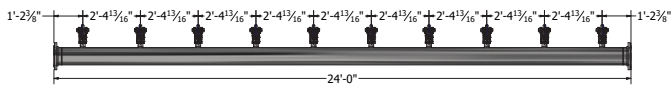
24' Long SHC8



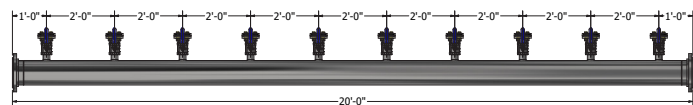
20' Long SHC8



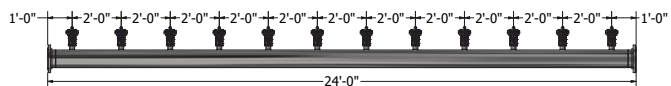
24' Long SHC10



20' Long SHC10



24' Long SHC12



# CW Series Lateral Part Number Matrix

EXAMPLE: CW - 32 - 128 SHC 6 G U - 12 - 144 - U  
1 - 2 - 3 4 5 6 7 - 8 - 9 - 10

Above part number describes a CW Lateral 8" 304L main pipe with ANSI flange end connections, 144 ft. long with 12' long spools, 6 each 2" stainless ball valves, 2" ANSI 150# flange valve outlet connection.

1. System Type Designator

Example: CWR, CWS

2. Valve Size

08 - 1/2"	24 - 1-1/2"	48 - 3"
12 - 3/4"	32 - 2"	64 - 4"
16 - 1"	40 - 2-1/2"	96 - 6"

3. Main Size Designator

24 - 1-1/2"	64 - 4"	192 - 12"
32 - 2"	96 - 6"	224 - 14"
40 - 2-1/2"	128 - 8"	256 - 16"
48 - 3"	160 - 10"	

4. Valve Assembly Pattern Designator

SHC - Single Horizontal Cross  
SHC90 - Single Horizontal Cross with Rotated Valve  
DHC - Double Horizontal Cross  
DEHT - Double Horizontal Tee  
DEVT - Double Vertical Tee

5. Valve Quantity

\*\* - Insert number indicating total quantity of valves required for manifold. (Example: DHC6, Double Horizontal Cross pattern, 6 valves)

6. Main Pipe/Tube Designator

G - 304L SCH10 Pipe Main  
L - 316L SCH10 Pipe Main  
W - 304L Tube Main  
M - 316L Tube Main

7. Valve Outlet Connection Designator

D - Capped Compression  
U - 304L ANSI 150# Flange  
UP - 304L ANSI 150# Flange w/ PVC Blind Flange  
US - 304L ANSI 150# Flange w/ SS Blind Flange  
PLE - Presslok Tube Size Fitting  
PLTEP - Removeable Presslok Cap (1-1/2" & 2" size options)  
RAB - Union Fitting with SS Blind Cap  
TC - Sanitary Tri-Clamp Connection

8. Individual Manifold Length

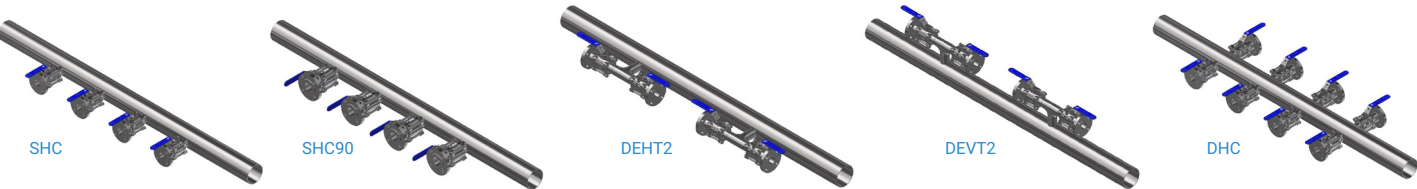
6 - 6 FT Long Spools  
8 - 8 FT Long Spools  
10 - 10 FT Long Spools  
12 - 12 FT Long Spools  
20 - 20 FT Long Spools  
24 - 24 FT Long Spools  
(Other manifold lengths available upon request)

9. Length of Lateral in Feet

\* - Insert number designator indicating total length of lateral in feet. (Example: CPWR-32-64SHC6GU-12-144-BV, lateral assembly 144' long, beveled spool ends)

10. End Connection (Main Pipe/Tube)

U - 304L ANSI 150# Flange  
PLESC - Presslok Slip Coupling (4" Size Tube & Smaller)



# Optional POC Server Hookup Manifolds

## Union Connection



(Supply)

## ANSI Connection



(Supply)

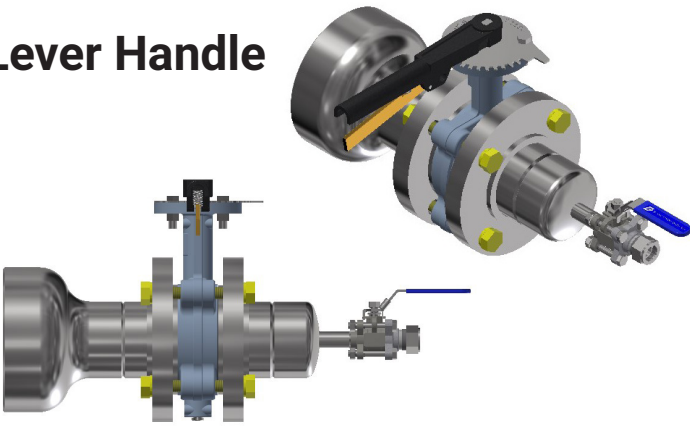
## Presslok Connection



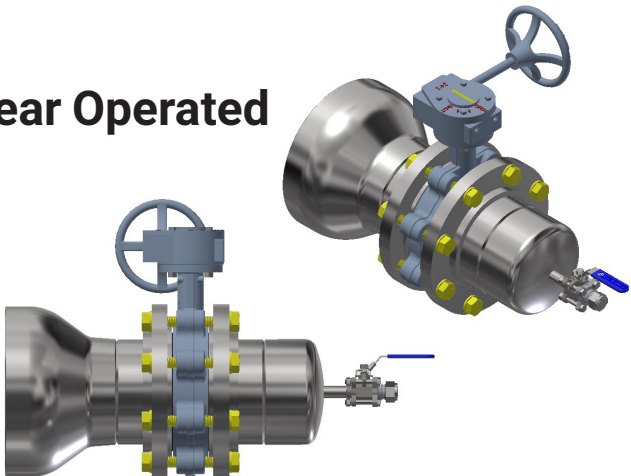
(Return)

# Optional EOL Butterfly Valve

## Lever Handle



## Gear Operated



# Presslok



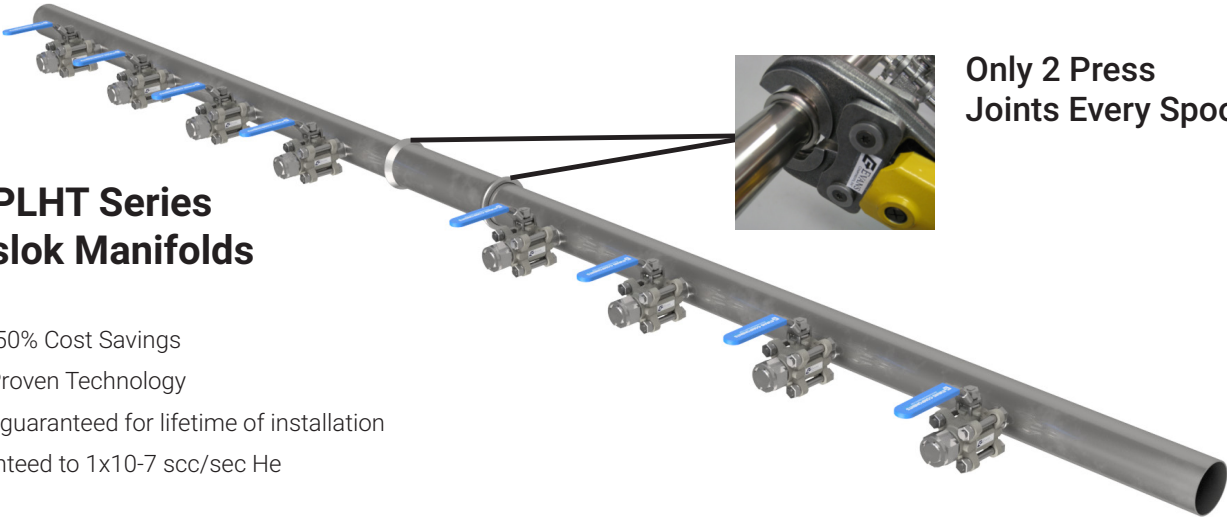
Evans PLT Series Presslok® , is an innovative tube size press system offering economy, speed, and reliability for joining 304/316L tube for high purity/general industrial air, inert gas, Liquid Cooling Water, vacuum exhaust and other low pressure general service installations.

The Evans PLT Series Presslok® system eliminates welding when joining 1/2” – 4” (15 – 100 mm) components through newly developed tube sized Presslok® couplings, elbows, tees, reducers, adapters and valves.

## “Weld Free Installation”

### PLT/PLHT Series Presslok Manifolds

- Fast
- 40% - 50% Cost Savings
- Field Proven Technology
- O-ring guaranteed for lifetime of installation
- Guaranteed to 1x10-7 scc/sec He



Only 2 Press Joints Every Spool

### Features

- Compact lightweight hand-held Lithium battery operated pressing tool
- Rigid, permanent, uniform engagement of fitting into tube
- Only gaugable Press fitting on the market, assures proper 100% press quality check of the fitting
- Pressure rating: 1/2” to 1-1/2” 300 psi (20 Bar), 2” to 4” 200 psi (13 Bar)
- Maximum test pressure: 1/2” to 1-1/2” 350 psi (24 Bar), 2” to 4” 250 psi (17 Bar)
- Vacuum Rating: 1/2” to 4” -29.9” Hg
- Fittings meet ASME B31.1 & B31.3 and are guaranteed to a helium leak rate of 1 X 10-7 scc/sec
- O-rings come standard Pre-lubed with Evans 111high purity Oxygen compatible lubrication
- All Presslok fittings go through a proprietary solution annealing process that results in a passivated stainless product that is in its most corrosion resistant condition.
- Presslok Valves and Fittings have a 25 Ra µin ID finish

# Integrated Rack stick Assemblies

## Advantages of Evans PW Sticks

- Standard design with union end connections/fitting options
- Standard longer lengths with approximately 26” clearance for ease of mounting under raised floor or sub-fab utility rails
- Optional flow meter indicator
- Optional constant control valve (CD 900)
- Larger 3.5” Bidicator (pressure/temperature) gauge, improved scale and readability
- Standard locking handles for both ball valve and globe valves



## Specifications: Evans PW Stick

Temperature Rating: 10F(-12C) to 208F (98C)  
Pressure Rating: 160 psig (11 bar) @ 70F (21C)  
Regulator Outlet Range: 10 psig (.5bar) to 110 psig (7.6 bar)



## Learn more about related Evans Products

**EVANS COMPONENTS** | Evans PLT Series Presslok® Stainless Tube Fittings/Valves  
Tube Size Range: 1/2" thru 4"



**PRESSLOK® GO/NO-GO GAUGES**  
If Presslok® Go/No-Go Gauge slips over pressed section of fitting, press is acceptable.  
If gauge does not slip over pressed section, press is unacceptable.



**EVANS COMPONENTS** | Evans Ball Valves  
PW "Industrial" Series



**PW Series**

- Full Port Design
- 1/4" - 6" Size Range
- Integrated Valve Assemblies
- Spool Manifolds up to 24' (7m) Lengths
- One-piece ANSI 150lb Flange Optional
- 100% Pressure Tested



**EVANS COMPONENTS** | Evans PW Series  
1/2" thru 4" PCWS/R Hook-Up Sticks



**Evans Custom Water Stick**  
Supply and Return Manifolds



[www.evanscomponents.com](http://www.evanscomponents.com)

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