

# **BALL VALVES CFOS Manifolds**

### Size

1/4" - 4" (Branch Valve) 1/4" - 12" (Main Line) 1000 WOG

### **End Connections**

Tube Butt Weld Pipe Butt Weld Female NPT Clamp Ends Face Seal Compression Fitting Vacuum Fitting

### **Materials**

316L Stainless Steel

# **Configurations**

Single Horizontal Cross (SHC)
Double Horizontal Cross (DHC)
Double Vertical Tee (DVT)
Double Horizontal Tee (DHT)

### **Features**

Mechanical Polish to 25 Ra Helium Leak Tested Locking Handles

# **Options**

Purge Ports Electropolished to 10 Ra Color Handles

# **Service Applications**

Biotech
Clean Steam
Cleaning Solutions
Detergents
Gas and Air Delivery
High Purity Gases
High Purity Water/Oils
Pharmaceutical
Vacuum
Waxes

# **Applicable Standards**

ASME BPE



# BALL VALVES CFOS Manifolds

### **Features**

AVCO Prefabricated CFOS (Cleaned for Oxygen Service) Manifold sections are designed to reduce plant assembly costs and time whilst maintaining the demands for high quality systems. Our CFOS Manifolds can be supplied in lengths up to 24 feet and a variety of configurations to compliment the plant layout. The Manifolds are built around the popular industry proven 2100 series ball valves.

The AVCO Manifold system provides a number of benefits and features to the customer such as:

#### **Condensed Schedule**

- Parallel fabrication with plant construction
- · Reduction in on-site welding time
- · Reduction in on-site construction time
- · Reduced risk of weld leakage during on-site testing
- No requirement for valve disassembly

### **Reduced Costs**

- Significant reduction in on-site labor
- Reduced QA/QC weld inspection time
- Reduced material handling charges

### **Enhanced Quality**

- Lower risk of metal particle contamination as on-site cutting reduced
- Manifolds are fabricated in a controlled environment
- 100% Helium leak tested to 1 x 10<sup>-7</sup> scc/sec
- QA/QC documentation provided
- Cleaned & Bagged



# BALL VALVES CFOS Manifolds



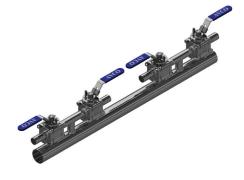
**Single Horizontal Cross (SHC)** 



**Double Horizontal Cross (DHC)** 



**Double Horizontal Tee (DHT)** 



**Double Vertical Tee (DVT)** 



# **BALL VALVES CFOS Manifolds**

# **HOW TO ORDER**

SHC   Stainless   Steel CPOS   Manifold   SHC   Single Horizontal Cross   DHC   Duble Horizontal Tee   DVT   Double Horizontal Tee   DVT	SS SHC4		050	ETO		200	
DHC* - Double Horizontal Cross   DHC* - Double Horizontal Tee   DVT - State Test Test Test Test Test Test Test Te	Series	Configu	ration	Valve Size	Valve Ends		Line Size
DHC* - Double Horizontal Tee   DS* - 200   DS* - 3/8"   TR* - Clamp Ends   CTF - Compression Fitting   DF* - 3/4"   CTF - Compression Fitting   DF* - 3/4"   CTF - Compression Fitting   DF* - 3/4"   DO - 1/2"   CTF - Compression Fitting   DF* - 3/4"   DO - 1/2"   DO -	316L Stainless Steel CFOS Manifold	SHC* - Single Horizontal Cross		025 - 1/4"	ETO - Extended Tube OD		025 - 1/4"
DVT - Double Horizontal Tee		DHC* - Double Horizontal Cross		038 - 3/8"	TR - Clamp Ends		038 - 3/8"
# Insert number to indicate total number of valves (For example SHC4 = SHC configuration with 4 valves   100 - 1"   125 - 1 1/4"   150 - 1 1/2"   200 - 2"   NPT - Threaded NPT   200 - 2"   250 - 2 1/2"   300 - 3"   150 - 150# Flanged   300 - 3"   150 - 150# Flanged   300 - 3"   1600 - 10"   1200 - 12"		DHT* - Double Horizontal Tee		050 - 1/2"	CTF - Compression Fitting		050 - 1/2"
*Insert number to indicate total number of valves (For example SHC4 = SHC configuration with 4 valves)  *Insert number to indicate total number of valves (For example SHC4 = SHC configuration with 4 valves)  *Insert number of valves (For example SHC4 = S		DVT - Double Horizontal Tee		075 - 3/4"	CTFC - Compression Fitting with	Сар	075 - 3/4"
BWO X/ETO 200  Line Ends Purge Port Manifold Length (For example SHC To-Compression Fitting CTFC - Compression Fitting CTFC - Compression Fitting CTFC - Compression Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Capped Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF - Male Face Seal MF - Vacuum Fitting MF				100 - 1"	KF - Vacuum Fitting		100 - 1"
SHC configuration with 4 valves				125 - 1 1/4"	BW5 - Butt Weld Pipe, SCH 5		125 - 1 1/4"
BWO X/ETO 200  Line Ends Purge Port Manifold Length 1200 - 12"  BWO - Extended Tube OD TR - Clamp Ends CTF - Compression Fitting CTFC - Compression Fitting With Cap KF - Vacuum Fitting MF - Male Face Seal WFC - Capped Male Face Seal WFC - Capped Male Face Seal Sed Side Avo - Valves Weld Pipe, SCH 5 MFC - Capped Male Face Seal WFC - Capped Male Face Seal WFC - Socket Weld Upstream and downstream purge ports (for example X/ETO = No upstream purge ports (for example X/E				150 - 1 1/2"	BW10 - Butt Weld Pipe, SCH 10		150 - 1 1/2"
BWO X/ETO 200  Line Ends Purge Port Manifold Length Options  BWO STR - Clamp Ends CTF - Compression Fitting CTFC - Compression Fitting With Cap KF - Vacuum Fitting With Cap Seal WFC - Capped Male Face Seal WFC - Capped Male Face Seal Seal WFC - Capped Male Face Seal WFC - Capped Male Face Seal WFC - Capped Male Face Seal WFC - Capped Male Face Seal WFC - Sex Weld Pipe, SCH 10 WFC - Sex Weld Pipe, SCH 10 WFC - Sex Weld Indicate both upstream and downstream purge ports (for example XETO = No upstream purge ports (for example XETO = No upstream purge port and extended tube with the sex will be with th				200 - 2"	NPT - Threaded NPT		200 - 2"
### Add - 4"  ##				250 - 2 1/2"	SW - Socket Weld		250 - 2 1/2"
BWO X/ETO 200  Line Ends Purge Port Manifold Length Options  BWO - Butt Weld Tube OD TR - Clamp Ends CTF - Compression Fitting CTFC - Compression Fitting CTFC - Compression Fitting WF - Male Face Seal WF - Vacuum Fitting WF - Male Face Seal BWT - Butt Weld Pipe, SCH 5 BWT - Butt Weld Pipe, SCH 10 WF - Threaded NPT SW - Socket Weld Indicate both upstream and downstream purge ports and extended tube  MFC - Capped Male Face Seal S00 - 5" 600 - 6" 800 - 8" 1000 - 10" 1220 - 12"  Manifold Length Options RA10 - Electropolished to 10 Ra Blank - No Options  RA10 - Electropolished to 10 Ra Blank - No Options  RA10 - Electropolished to 10 Ra Blank - No Options  Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge ports and extended tube				300 - 3"	150 - 150# Flanged		300 - 3"
BWO X/ETO 200  Line Ends Purge Port Manifold Length Options  BWO - 8" 1000 - 10" 1200 - 12"  BWO BWO - Butt Weld Tube OD TR - Clamp Ends CTF - Compression Fitting CTFC - Compression Fitting CTFC - Compression Fitting MF - Male Face Seal BW10 - Butt Weld Pipe, SCH 5 BW10 - Butt Weld Pipe, SCH 10 MF - Threaded NPT SW - Socket Weld Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge port and extended tube  D200  Manifold Length Options RA10 - Electropolished to 10 Ra Blank - No Options  RA10 - Electropolished to 10 Ra Blank - No Options  RA10 - Electropolished to 10 Ra Blank - No Options				400 - 4"	MF - Male Face Seal		400 - 4"
BWO X/ETO 200  Line Ends Purge Port Manifold Length Options  BWO - Butt Weld Tube OD TR - Clamp Ends CTF - Compression Fitting CTFC - Compression Fitting with Cap KF - Vacuum Fitting MF - Male Face Seal BW10 - Butt Weld Pipe, SCH 5 BW10 - Butt Weld Pipe, SCH 10 MF - Male Face Seal BW10 - Butt We					MFC - Capped Male Face Seal		500 - 5"
BWO X/ETO 200  Line Ends Purge Port Manifold Length Options  BWO - Butt Weld Tube OD TR - Clamp Ends CTF - Compression Fitting CTFC - Compression Fitting with Cap KF - Vacuum Fitting BWS - Butt Weld Pipe, SCH 5 BWY - Butt Weld Pipe, SCH 10 NPT - Threaded NPT SW - Socket Weld Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge port and extended tube)  AMAIGOL Agon Manifold Length Description Manifold Length Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be dictated by number of valves  RA10 - Electropolished to 10 Ra Blank - No Options  RA10 - Electropolished to 10 Ra Blank - No Options							600 - 6"
BWO X/ETO 200  Line Ends Purge Port Manifold Length Options  BWO - Butt Weld Tube OD TR - Clamp Ends CTF - Compression Fitting CTFC - Compression Fitting CTFC - Compression Fitting with Cap KF - Vacuum Fitting BWS - Butt Weld Pipe, SCH 5 BWHO - Butt Weld Pipe, SCH 10 NPT - Threaded NPT SW - Socket Weld Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge port and extended tube)  TX/ETO  Manifold Length Options RA10 - Electropolished to 10 Ra Blank - No Options  RA10 - Electropolished to 10 Ra Blank - No Options  RA10 - Electropolished to 10 Ra Blank - No Options							800 - 8"
BWO X/ETO 200  Line Ends Purge Port Manifold Length Options  BWO - Butt Weld Tube OD TR - Clamp Ends CTF - Compression Fitting CTFC - Compression Fitting with Cap KF - Vacuum Fitting BW5 - Butt Weld Pipe, SCH 5 BW10 - Butt Weld Pipe, SCH 10 NPT - Threaded NPT SW - Socket Weld Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be dictated by number of valves  RA10 - Electropolished to 10 Ra Blank - No Options  RA10 - Electropolished to 10 Ra Blank - No Options  RA10 - Butt weld via unimportant and to be dictated by number of valves  RA10 - Butt weld via unimportant and to be dictated by number of valves  RA10 - Butt weld via unimportant and to be dictated by number of valves  RA10 - Butt via via unimportant and to be dictated by number of valves  Blank - No Options  RA10 - Blectropolished to 10 Ra  Blank - No Options  Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge ports (for example X/ETO = No upstream purge port and extended tube							1000 - 10"
Line Ends Purge Port Manifold Length  Options  BWO - Butt Weld Tube OD TR - Clamp Ends CTF - Compression Fitting CTF - Compression Fitting CTF - Compression Fitting with Cap KF - Vacuum Fitting BW5 - Butt Weld Pipe, SCH 5 BW10 - Butt Weld Pipe, SCH 10 NPT - Threaded NPT SW - Socket Weld Indicate both upstream and downstream purge ports ( for example X/ETO = No upstream purge port and extended tube							1200 - 12"
BWO - Butt Weld Tube OD TR - Clamp Ends CTF - Compression Fitting CTFC - Compression Fitting CTFC - Compression Fitting MF - Male Face Seal BWS - Butt Weld Pipe, SCH 5 BWW - Socket Weld Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge port and extended tube  ETO - Extended Tube OD TR - Clamp Ends The total Endth in inches up to 288 inches maximum or XX if length in inches up to 288 inches maximum or XX if length in inches up to 288 inches maximum or XX if length in inches up to 288 inches maximum or XX if length in inches up to 288 inches maximum or XX if length in inches up to 288 inches maximum or XX if length in inches up to 288 inches maximum or XX if length in inches up to 288 inches maximum or XX if length is unimportant and to be dictated by number of valves  Blank - No Options  TR - Clamp Ends TR - Clam	RWO						
TR - Clamp Ends  CTF - Compression Fitting  CTFC - Compression Fitting with Cap  KF - Vacuum Fitting  MF - Male Face Seal  BW10 - Butt Weld Pipe, SCH 10  NPT - Threaded NPT  SW - Socket Weld  Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge port and extended tube	В	WO	2	(/ETO	200		
TR - Clamp Ends  CTF - Compression Fitting  CTF - Compression Fitting  CTFC - Compression Fitting  CTFC - Compression Fitting with Cap  KF - Vacuum Fitting  MF - Male Face Seal  BW5 - Butt Weld Pipe, SCH 5  BW10 - Butt Weld Pipe, SCH 10  NPT - Threaded NPT  SW - Socket Weld  Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge port and extended tube							Options
CTFC - Compression Fitting with Cap  CTFC - Compression Fitting with Cap  KF - Vacuum Fitting  MF - Male Face Seal  BW5 - Butt Weld Pipe, SCH 5  MFC - Capped Male Face Seal  X - No Purge Port  NPT - Threaded NPT  SW - Socket Weld  Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge port and extended tube	Line	e Ends	Pu	rge Port	Manifold Length  Insert overall length in inches up	RA10 - Ele	· ·
MF - Male Face Seal  BW5 - Butt Weld Pipe, SCH 5  BW10 - Butt Weld Pipe, SCH 10  NPT - Threaded NPT  SW - Socket Weld  Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge port and extended tube	Line	e Ends	Pu ETO - Extended	rge Port Tube OD	Manifold Length  Insert overall length in inches up to 288 inches maximum or XX if		ectropolished to 10 Ra
BW5 - Butt Weld Pipe, SCH 5  BW10 - Butt Weld Pipe, SCH 10  X - No Purge Port  X - No Purge Port  SW - Socket Weld  Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge port and extended tube	Line BWO - Butt Weld 7 TR - Clamp Ends	e Ends Tube OD	Pu ETO - Extended TR - Clamp Ends	rge Port Tube OD	Manifold Length  Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be		ectropolished to 10 Ra
BW10 - Butt Weld Pipe, SCH 10	Line BWO - Butt Weld TR - Clamp Ends CTF - Compression	E Ends Tube OD on Fitting	Pu ETO - Extended TR - Clamp Ends CTF - Compress	rge Port Tube OD s ion Fitting	Manifold Length  Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be		ectropolished to 10 Ra
NPT - Threaded NPT  SW - Socket Weld  Indicate both upstream and downstream purge ports (for example X/ETO = No upstream purge port and extended tube	Line BWO - Butt Weld <sup>1</sup> TR - Clamp Ends CTF - Compressio	De Ends Tube OD on Fitting sion Fitting with Cap	Pu ETO - Extended TR - Clamp Ends CTF - Compress CTFC - Compres	rge Port Tube OD S sion Fitting ssion Fitting with Cap	Manifold Length  Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be		ectropolished to 10 Ra
SW - Socket Weld Indicate both upstream and downstream purge ports ( for example X/ETO = No upstream purge port and extended tube	Line BWO - Butt Weld TR - Clamp Ends CTF - Compressio CTFC - Compress KF - Vacuum Fittin	De Ends Tube OD On Fitting Sion Fitting with Cap	Pu ETO - Extended TR - Clamp Ends CTF - Compress CTFC - Compres MF - Male Face	rge Port Tube OD sion Fitting sion Fitting with Cap Seal	Manifold Length  Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be		ectropolished to 10 Ra
purge ports ( for example X/ETO = No upstream purge port and extended tube	Line BWO - Butt Weld <sup>1</sup> TR - Clamp Ends CTF - Compressio CTFC - Compress KF - Vacuum Fittin BW5 - Butt Weld F	e Ends Tube OD on Fitting sion Fitting with Cap	Pu ETO - Extended TR - Clamp Ends CTF - Compress CTFC - Compress MF - Male Face : MFC - Capped M	rge Port Tube OD Signor Fitting Signor Fitting with Cap Seal Iale Face Seal	Manifold Length  Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be		ectropolished to 10 Ra
150 - 150# Flanged upstream purge port and extended tube	Line BWO - Butt Weld TR - Clamp Ends CTF - Compressio CTFC - Compress KF - Vacuum Fittin BW5 - Butt Weld F	e Ends Tube OD on Fitting sion Fitting with Cap ng Pipe, SCH 5 Pipe, SCH 10	Pu ETO - Extended TR - Clamp Ends CTF - Compress CTFC - Compress MF - Male Face : MFC - Capped M	rge Port Tube OD Signor Fitting Signor Fitting with Cap Seal Iale Face Seal	Manifold Length  Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be		ectropolished to 10 Ra
	Line BWO - Butt Weld TR - Clamp Ends CTF - Compressio CTFC - Compress KF - Vacuum Fittin BW5 - Butt Weld F BW10 - Butt Weld NPT - Threaded N	e Ends Tube OD on Fitting oion Fitting with Cap ong Pipe, SCH 5 Pipe, SCH 10	Pu ETO - Extended TR - Clamp Ends CTF - Compress CTFC - Compres MF - Male Face : MFC - Capped M X - No Purge Pol	rge Port Tube OD Signor Fitting Signor Fitting with Cap Seal Italiale Face Seal Stream and downstream	Manifold Length  Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be		ectropolished to 10 Ra
	BWO - Butt Weld TR - Clamp Ends CTF - Compressio CTFC - Compress KF - Vacuum Fittin BW5 - Butt Weld F BW10 - Butt Weld NPT - Threaded N SW - Socket Weld	De Ends Tube OD On Fitting Sion Fitting with Cap Ong Pipe, SCH 5 Pipe, SCH 10 IPT	Pu ETO - Extended TR - Clamp Ends CTF - Compress CTFC - Compres MF - Male Face : MFC - Capped M X - No Purge Poi	rge Port Tube OD Solon Fitting Seion Fitting with Cap Seal Iale Face Seal It Stream and downstream example X/ETO = No boort and extended tube	Manifold Length  Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be		ectropolished to 10 Ra
	Line BWO - Butt Weld TR - Clamp Ends CTF - Compressio CTFC - Compress KF - Vacuum Fittin BW5 - Butt Weld BW10 - Butt Weld NPT - Threaded N SW - Socket Weld	De Ends Tube OD On Fitting Sion Fitting with Cap Ong Pipe, SCH 5 Pipe, SCH 10 IPT	Pu ETO - Extended TR - Clamp Ends CTF - Compress CTFC - Compres MF - Male Face : MFC - Capped M X - No Purge Poi	rge Port Tube OD Solon Fitting Seion Fitting with Cap Seal Iale Face Seal It Stream and downstream example X/ETO = No boort and extended tube	Manifold Length  Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be		ectropolished to 10 Ra
	Line BWO - Butt Weld TR - Clamp Ends CTF - Compressio CTFC - Compress KF - Vacuum Fittin BW5 - Butt Weld BW10 - Butt Weld NPT - Threaded N SW - Socket Weld	De Ends Tube OD On Fitting Sion Fitting with Cap Ong Pipe, SCH 5 Pipe, SCH 10 IPT	Pu ETO - Extended TR - Clamp Ends CTF - Compress CTFC - Compres MF - Male Face : MFC - Capped M X - No Purge Poi	rge Port Tube OD Solon Fitting Seion Fitting with Cap Seal Iale Face Seal It Stream and downstream example X/ETO = No boort and extended tube	Manifold Length  Insert overall length in inches up to 288 inches maximum or XX if length is unimportant and to be		ectropolished to 10 Ra

### Example ordering code:

SS-SHC4-050-ETO-200-BWO-X/ETO-200 = 2" Tube OD single horizontal cross manifold with square cut weld ends, 200 inches long, four 1/2" extended tube OD ball valves with no upstream purge port and an extended tube OD downstream purge port, no options

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