PNEUMATIC ACTUATED INDUSTRIAL VALVES

COMPACT GLOBE CONTROL VALVES

PRODUCT SPECIFICATION

SERIES

5800

SIZES: 1/2 TO 4 INCHES

Two-Way, Linear, Steel or Stainless Steel Body Valves for Process and Utility Applications

5800_PS_RevP_0418

5800 PRODUCT SPEC

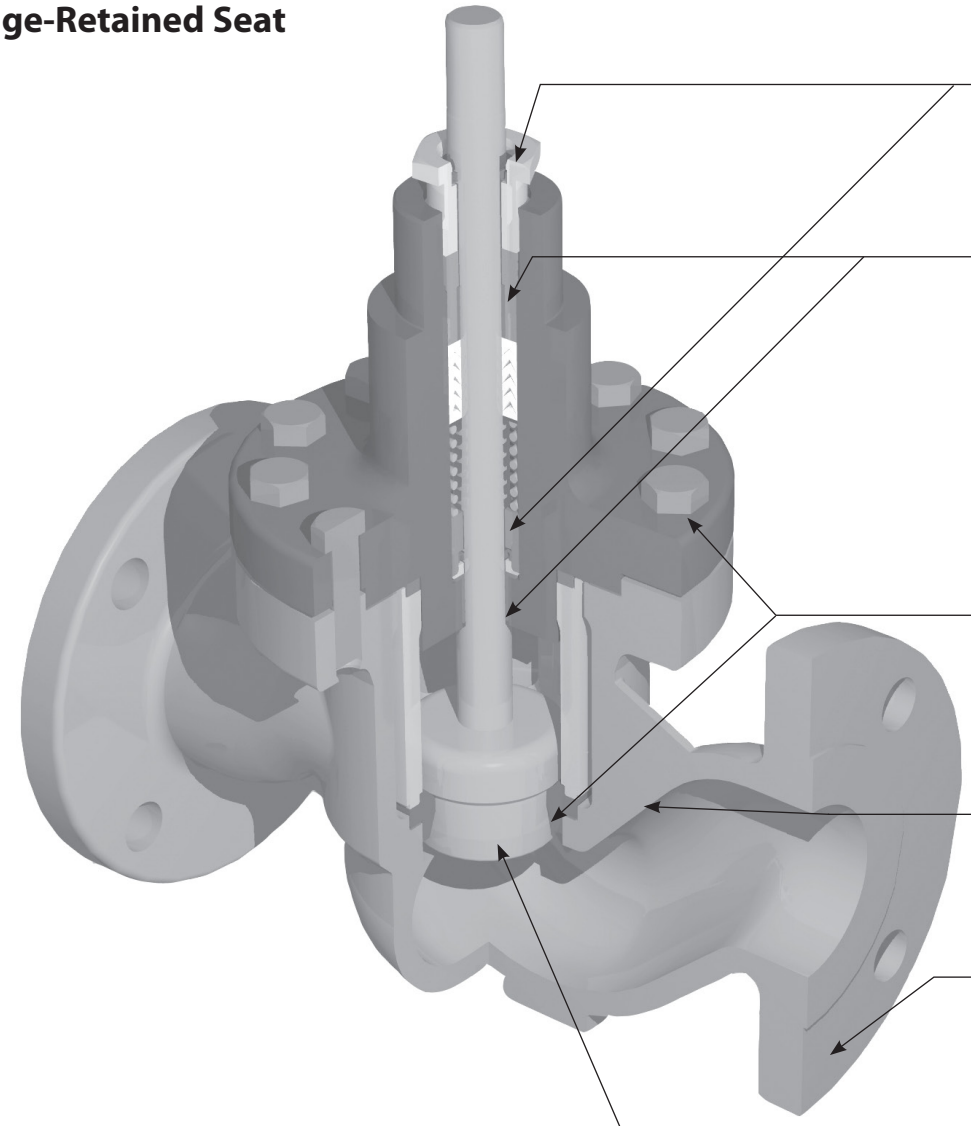
WARREN CONTROLS

2600 EMRICK BLVD • BETHLEHEM, PA 18020 • USA •800-922-0085 • WWW.WARRENCONTROLS.COM

DEPENDABLE, RUGGED, PRECISION CONTROL VALVES AND ACCESSORIES

5840

Two-Way Single Seat Unbalanced Valve with Cage-Retained Seat



Stem Wipers
provide outstanding packing protection and stem stability.

Dual Point PEEK or Z PEEK Bearing Plug Guiding
provides both stability and low friction, resulting in lowest hysteresis and precision control. Graphalloy Bearings are available for added durability in high temperature applications.

Bolted Bonnet and Cage-Retained Seat
make the 5800 ideal for easy access, maintenance, and trim inspection.

Rugged Body
with a selection of port reductions.

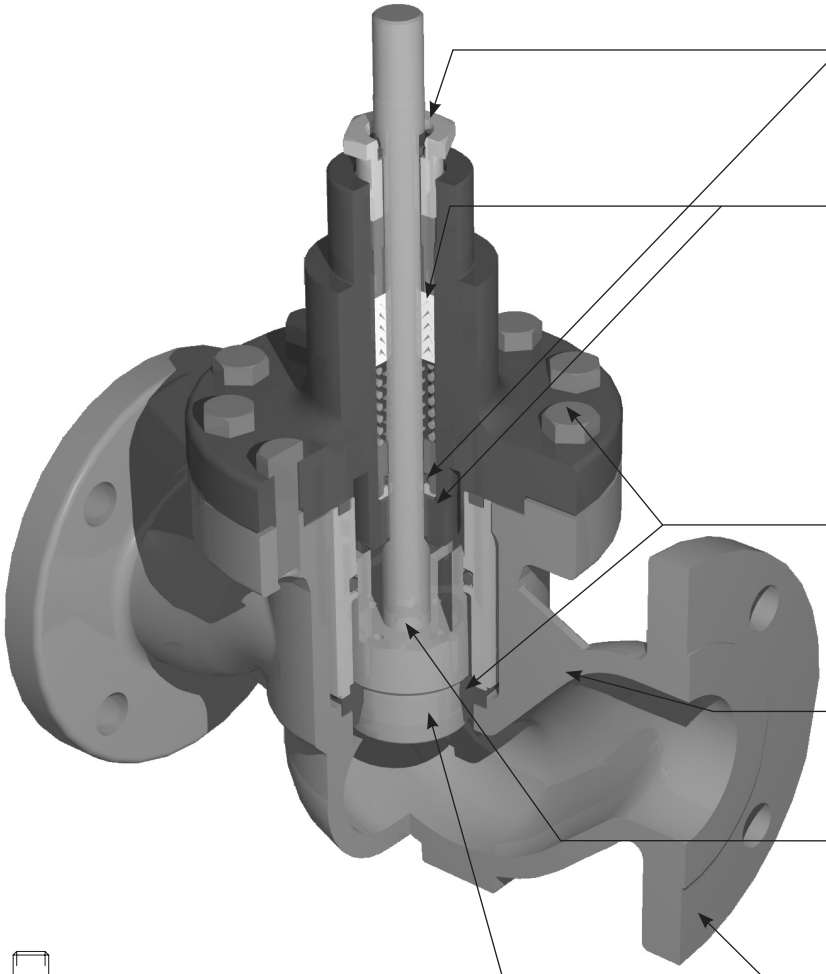
Low Profile Design
offers footprint minimizing valuable space consumption, yet conforms to ANSI/ISA standards for NPT, Flanged and Socket Weld ends.

Std. Trim Choices Available
include 316SS, 400SS, Alloy 6, PEEK and PTFE.

Description
Warren Controls Series 5800 Compact Globe Control Valves feature rugged high efficiency bodies of steel or stainless steel, with cage-retained seats for ease of maintenance, and a variety of trim materials and port sizes. The equal percentage, linear and modified linear plugs provide excellent modulating control of a wide variety of fluids. The Series 5800 is ideally suited where value and long life are important objectives for applications including but not limited to the Chemical, Food & Beverage, General Service, Marine, Pulp & Paper, Refining, District Energy and Pharmaceutical Industries with temperatures from -20 to 800°F, severe service, dirty fluids (5840 only), high pressure drops, and corrosive fluids.

5843

Two-Way Single Seat Cage Balanced Valve with Cage-Retained Seat



Stem Wipers
provide outstanding packing protection and stem stability.

Dual Point PEEK or Z PEEK Bearing Plug Guiding
provides both stability and low friction, resulting in lowest hysteresis and precision control. Graphalloy Bearings are available for added durability in high temperature applications.

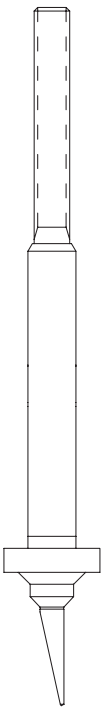
Bolted Bonnet and Cage-Retained Seat
make the 5800 ideal for easy access, maintenance and trim inspection.

Rugged Body
with a selection of port reductions.

Cage-Balanced Plug
provides higher shut-offs with smaller actuators.

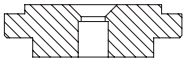
Low Profile and Reduced Face to Face Design
offers footprint minimizing valuable space consumption, yet conforms to ANSI/ISA standards for NPT, Flanged at Socket Weld ends.

Std. Trim Choices Available
include 316SS, 400SS, and Alloy 6.



5848

Low Flow Trim Choices Available Include 316SS, PEEK and PTFE



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RUGGEDNESS AND HIGH PERFORMANCE	
Features	**Advantages**
Compact rugged valve body	Reduces envelope size and weight without sacrificing pressure boundary integrity or high Cv's.
Precision manufactured valve components	Valve bodies machined in single operation in 4 axis computer numerical controlled horizontal machining centers. Bodies and trim components held to exacting geometric tolerances ensuring smooth reliable operation of finished valve.
Body materials	Standard body materials are WCB steel and CF8M stainless steel. Bodies available custom cast in other specialized alloys.
Trim components	Durable rugged plug and seat construction shuts off tightly.
Equal % or Linear plug	Provides exceptional modulating control with 50:1 rangeability.
Modified Linear plug	Provides exceptional modulating control with up to 40:1 rangeability.
Reduced ports	Match valve size to line size and capacity to flow requirements. Maximizes performance. Prevents oversized valves. Simplifies piping. Reduces need for reducers or expanders. 1, 2, & 3 sizes reduced trim available.
Trim materials	Alloy 6 wrapped stainless steel trim promotes long dependable service life in applications controlling hard to handle fluids. 316 & 400 stainless steel trim, PEEK & TFE soft seat trim available for ANSI Class VI shut-off in non-corrosive non-erosive service.
Oversized bearings and shafts	Ideal for high pressure drops.
Valve stem to plug connection	Rigid connection provides zero backlash. Assures minimum dead band and hysteresis.
Threaded valve stem connection and split stem connector	Solid actuator interface. Provides zero backlash. Assures minimum dead band and hysteresis.
Factory lubricated packing and valve stem	Minimizes hysteresis from packing friction .
Extension bonnet	Allows for wide range of temperature applications.

INCREASED SERVICEABILITY AND REDUCED MAINTENANCE	
Features	**Advantages**
Integral valve body flanges	Promote secure valve installations and piping integrity. Easy installation. Eliminate exposed line flange bolting. Shorten alignment and installation time. Many different classes of pipe flanges.
ANSI Standard valve body face to face dimensions and bolt patterns	Simplifies piping designs and layouts for new installations. Minimizes need to change piping in existing installations.
Easy actuator and accessory mounting	Facilitates removal and installation for service and maintenance.
Roller burnished valve stem	Ultra smooth finish minimizes packing wear and maximizes life. Smooth function and minimum stick/slip.
Bonnet and packing nut bearings and stem wiper	Prevent external particles from infiltrating and damaging packing.
Bolted bonnet and cage retained seat	Provides fast easy access to trim. Speeds inspection and maintenance.

ESTABLISHED FEATURES & QUALITY	
Features	**Advantages**
Linear Control Valve	Combines reciprocating globe valve ruggedness with linear actuators to produce heavy duty automatic throttling control valve which dependably controls fluids in process industries.
Quality valve design & engineering	Components and materials designed and selected to meet or exceed demanding applications, specifications, functional and chemical and temperature compatibility requirements. Product quality built on tried and tested designs and engineering.
Pneumatic diaphragm actuators	Powerful direct or reverse acting spring and diaphragm actuators. Top mounted handwheels available for manual override. Supply pressures to 40 PSIG. Combine actuators with pneumatic accessories to allow for wide variety of control actions.
Pneumatic cylinder actuators	Powerful direct or reverse acting spring and piston actuators. Supply pressures to 120 PSIG. Combine actuators with pneumatic accessories to allow for wide variety of control actions.
Wide variety of accessories	Pneumatic and electro-pneumatic positioners for intrinsically safe, explosion proof, or fail freeze operation. Hart, Profibus PA, and foundation fieldbus inputs available. Position indication switches, I/P's, air filter regulators, and solenoids also available.
Factory testing and set-up	Each control valve undergoes careful set-up and thorough testing by our highly skilled and experienced factory assembly personnel to ensure it is pre-set for its specified service.

2-WAY VALVES
(Control Of Liquids, Gases, And Steam)

5840 2-Way Single Seat Unbalanced Valve with Cage Retained Seat

The 5840 Valve is particularly effective for the control of liquids, gases, and steam. It is a suitable solution for applications with dirty fluids and high pressure drops. ANSI Class IV and VI leakage ratings standard. Available with Warren Class IV+ leakage rating for less leakage than ANSI Class IV (See Allowable Seat Leakage Class table on page 7).
See Table on page 41 for Fluid Temperature Limits

Sizes:	1/2, 3/4, 1, 1-1/2, 2, 2-1/2, 3, 4 inch
Body:	WCB Steel or CF8M Stainless Steel 300 NPT or 300 Socketweld (1/2 thru 2), 150LB Flange or 300LB Flange (1/2 thru 4)
Trim:	EQ% or Linear: 316 Stainless Steel, Alloy 6 Wrapped 316 SS, 400 Stainless Steel, or Alloy 6 Wrapped 400 SS; TFE or PEEK
Leakage Ratings:	ANSI Class IV (Stainless Steel and Alloy 6 Trim), Warren Class IV+ (Stainless Steel and Alloy 6 Trim, SPECIAL ORDER - Consult Factory) ANSI Class VI (TFE and PEEK Trim)
Packing, Type & Bonnet Construction:	LS EPDM Lip w/ PEEK Bearings L8 EPDM Lip w/ Z PEEK Bearings TS TFE V-Ring, Spring Loaded, w/ PEEK Bearings T8 TFE V-Ring, Spring Loaded, w/ Z PEEK Bearings GS Adjustable Graphite w/ PEEK Bearings G8 Adjustable Graphite w/ Z PEEK Bearings GG Adjustable Graphite w/ Graphite Gaskets, ***Copper Based*** Graphalloy Bearings & Extension Bonnet (*For NON-Oxidizing Media ONLY, Best Suited for Hot Water & Steam*) GL Adjustable Graphite w/ Graphite Gaskets, ***Nickel Based*** Graphalloy Bearings & Extension Bonnet (*For NON-Oxidizing Media ONLY, Best Suited for Heat Transfer Oils*) G7 Adjustable Graphite w/ Graphite Gaskets, ***Oxidation Resistant*** Graphalloy Bearings & Extension Bonnet (*For Oxidizing Media ONLY*) ***Note: PEEK Bearings are best suited for water and chemical applications. Z-PEEK Bearings are best suited for steam applications.***
Rangeability:	50:1

Flow direction is reversed when used with Cylinder Actuator Failed Closed

5843 2-Way Single Seat Caged Balanced Valve with Cage Retained Seat

The 5843 is a balanced valve that is an effective solution for the control of liquids, gases, and steam at higher pressures. It requires less force to operate than unbalanced valves so smaller actuators can be used. Its single seat O-ring seal design facilitates ANSI Class IV leakage rating standard. It is limited to cleaner fluids. Available with Warren Class IV+ leakage rating for less leakage than ANSI Class IV. (See Allowable Seat Leakage Classes table on page 7).
See Table on page 41 for Fluid Temperature Limits

Sizes:	2-1/2, 3, 4 inch
Body:	WCB Steel, CF8M Stainless Steel 150LB Flange or 300LB Flange
Trim:	EQ% or Linear: 316 Stainless Steel, 400 Stainless Steel, or Alloy 6 Wrapped 400 SS
Leakage Ratings:	ANSI Class IV (Fluoraz Seal) ANSI Class III (SPECIAL ORDER - Consult Factory) Warren Class IV+ (Fluoraz Seal, SPECIAL ORDER - Consult Factory)
Packing Type & Bonnet Construction:	LS EPDM Lip w/ PEEK Bearings and Fluoraz Seal **L8** EPDM Lip w/ Z PEEK Bearings and Fluoraz Seal TS TFE V-Ring, Spring Loaded, w/ PEEK Bearings and Fluoraz Seal T8 TFE V-Ring, Spring Loaded, w/ Z PEEK Bearings and Fluoraz Seal GS Adjustable Graphite w/ PEEK Bearings and Fluoraz Seal G8 Adjustable Graphite w/ Z PEEK Bearings and Fluoraz Seal GG (***Special Order***) Adjustable Graphite w/ Graphite Gaskets, ***Copper Based*** Graphalloy Bearings, Metal Seal, & Extension Bonnet (*For NON-Oxidizing Media ONLY, Best Suited for Hot Water and Steam* - Consult Factory GL (***Special Order***) Adjustable Graphite w/ Graphite Gaskets, ***Nickel Based*** Graphalloy Bearings, Metal Seal, & Extension Bonnet (F*or NON-Oxidizing Media ONLY, Best Suited for Heat Transfer Oils* - Consult Factory) G7 (***Special Order***) Adjustable Graphite w/ Graphite Gaskets, ***Oxidation Resistant*** Graphalloy Bearings, Metal Seal, & Extension Bonnet (*For Oxidizing Media ONLY* - Consult Factory) ***Note: PEEK Bearings are best suited for water and chemical applications. Z-PEEK Bearings are best suited for steam applications.***
Rangeability:	50:1

Note: Fluoraz Seal in Type 5843 is not compatible with the following solvents: acetates, acetone, benzene, carbon tetrachloride, ethers, Freons, ketones, lacquers, methyl ethyl ketone, and toluene - Consult Factory with service conditions for alternate seal selection.

2-WAY VALVES
(Control of Liquids, Gases, and Steam)

5848 2-Way Single Seat Low-Flow Unbalanced Valve with Cage Retained Seat

The 5848 Valve is particularly effective for the control of clean, very low flow liquids, gases, and steam. ANSI Class IV and VI leakage ratings standard.
See Table on page 41 for Fluid Temperature Limits

Sizes:	1/2, 3/4, 1 inch
Body:	WCB Steel or CF8M Stainless Steel 300 NPT, 300 Socketweld, 150LB Flange or 300LB Flange
Trim:	Modified Linear: 316 Stainless Steel; TFE or PEEK
Leakage Rating:	ANSI Class IV (Stainless Steel Trim), ANSI Class VI (TFE and PEEK Trim)
Packing, Type & Bonnet Construction:	LS EPDM Lip w/ PEEK Bearings L8 EPDM Lip w/ Z PEEK Bearings TS TFE V-Ring, Spring Loaded, w/ PEEK Bearings T8 TFE V-Ring, Spring Loaded, w/ Z PEEK Bearings GS Adjustable Graphite w/ PEEK Bearings G8 Adjustable Graphite w/ Z PEEK Bearings GG Adjustable Graphite w/ Graphite Gaskets, ***Copper Based*** Graphalloy Bearings & Extension Bonnet (*For NON-Oxidizing Media ONLY, Best Suited for Hot Water and Steam*) GL Adjustable Graphite w/ Graphite Gaskets, ***Nickel Based*** Graphalloy Bearings & Extension Bonnet (*For NON-Oxidizing Media ONLY, Best Suited for Heat Transfer Oils*) G7 Adjustable Graphite w/ Graphite Gaskets, ***Oxidation Resistant*** Graphalloy Bearings & Extension Bonnet (*For Oxidizing Media ONLY*) ***Note: PEEK Bearings are best suited for water and chemical applications. Z-PEEK Bearings are best suited for steam applications.***
Rangeability:	40:1 for Cv 0.75 30:1 for Cv 0. 50 20:1 for Cv 0.25

Flow direction is reversed when used with Cylinder Actuator Failed Closed

BODY PRESSURE-TEMPERATURE RATINGS:				
Temperature (F)	**150 FLG Steel**	**300 NPT, SWE, or FLG Steel**	**150 FLG St Steel**	**300 NPT, SWE, or FLG St Steel**
-20° To 100°F	285	740	275	720
150°	272	710	255	670
175°	266	695	245	645
200°	260	680	235	620
225°	252	673	230	605
250°	245	667	225	590
275°	237	661	220	575
300°	230	655	215	560
325°	222	650	210	548
350°	215	645	205	537
375°	207	640	200	526
400°	200	635	195	515
450°	185	620	182	497
500°	170	605	170	480
550°	155	587	155	465
600°	140	570	140	450
650°	125	550	125	440
700°	110	530	110	435
750°	95	505	95	425
800°	80	410	80	420

Pressure ratings are PSIG
For applications below 32° consult factory

Body Pressure - Temperature Ratings conform to ANSI based on body flange rating and body material. As the fluid temperature increases, the maximum allowable internal pressure decreases. Verify maximum pressures and temperatures prior to selecting body material and body/ flange rating.

TRIM MATERIALS	FLOWING DIFFERENTIAL PRESSURE LIMIT
316 Stainless Steel	100 PSID
TFE	15 PSID
PEEK	100 PSID
400 Stainless Steel	200 PSID
Alloy 6	300 PSID

NOTE: Approaching limits for continuous use will reduce trim life. For continuous use, stay within half of rated maximum.

NOTE ON BEARINGS: PEEK or Z PEEK Bearings should not be used for temperatures above 450ºF or flowing differential pressure above 300 PSIG.

ALLOWABLE SEAT LEAKAGE CLASSES				
Leakage Class	**Maximum Seat Leakage**	**Test Fluid**	**Test Pressure**	**Relative Seat Tightness**
ANSI Class II**	0.5% of rated CV	Water	45 to 60 PSI	1
ANSI Class III	0.1% of rated CV	Water	45 to 60 PSI	5
ANSI Class IV	0.01% of rated CV	Water	45 to 60 PSI	50
Warren Class IV+ (linear)	0.02 ml /min/inch of trim size/ ΔP(PSI)	Water	Max Operating ΔP	6,000
Warren Class IV + (rotary)**	0.005 ml /min/inch of trim size/ ΔP(PSI)	Water	Max Operating ΔP	30,000
ANSI Class V**	0.0005 ml /min/inch of trim size/ ΔP(PSI)	Water	Max Operating ΔP	300,000
ANSI Class VI	Class VI about 0.9 ml/min *	Air	50 PSI	600,000

ANSI Class V is a standard reserved for metal seated valves. Warren Controls does not offer this class.
ANSI Class VI is reserved for soft seated valves, available with PTFE or PEEK seat inserts on Series 2800, 3800 & 5800 Valves.
**NOT AVAILABLE IN THE 5800 SERIES.

* Leakage rate varies by valve size, Refer to the ANSI/FCI Standard 70.2.

Class IV + is not an ANSI/FCI Designation, but a proprietary classification invented and used by Warren Controls, achievable with Metal or Ceramic seats. It is available as a SPECIAL ORDER. Consult Factory with fluid, shut-off pressure, and temperature.

TRIM STYLE:

EQUAL % VS. LINEAR
Trim style describes how the plug's shape (style) changes a valve's capacity as the plug moves (travels) inside it. With the Equal % Trim Style, the shape of the plug produces an equal percentage change in capacity for each equal incremental change in travel. As a typical case this results in 3% of capacity at 10% of travel, 4.4% of capacity at 20% of travel, 6.7% of capacity at 30% of travel, on up to 100% of capacity at 100% of travel. With the Linear Trim Style, the shape of the plug produces a linear incremental change in capacity for each incremental change in travel. This results in 10% of capacity at 10% of travel, 20% of capacity at 20% of travel, 30% of capacity at 30% of travel, on up to 100% of capacity at 100% of travel. Compared to the Linear Trim Style, the Equal % Trim Style produces smaller capacities for equal travels. This makes the Equal % Trim Style better suited for flows that are a small percentage of its total capacity, which may occur if the valve is not operating near full capacity, or when flows vary widely over time. The Linear Trim Style is better suited for flows that are a larger percentage of its total capacity which may occur if the valve is operating near full capacity and flows are more steady over time.

MODIFIED LINEAR
Trim style describes how the plug's shape (style) changes a valve's capacity as the plug moves (travels) inside it. With the Modified Linear Trim Style, the shape of the plug produces an incremental change in capacity that falls between that of the EQ% and Linear Trim Styles. This results in 5% of capacity at 10% of travel, 11% of capacity at 20% of travel, 17% of capacity at 30% of travel, on up to 100% of capacity at 100% of travel. This makes the Modified Linear Trim Style suitable for flows ranging from a small to large a percentage of its total capacity.

TRIM MATERIAL

316 STAINLESS STEEL
316 stainless steel is our most common and lowest cost trim material choice. 316 stainless steel trim is suitable for flowing differential pressures up to 100 psig, is capable of tight Class IV and Class IV+ leakage ratings, is corrosion resistant to many fluids, but is less erosion resistant than Alloy 6 wrapped trims. It contains nickel and molybdenum, and a greater amount of chromium, making it more corrosion resistant than 400 series stainless steel

TFE SOFT SEAT
TFE is our most common choice for a resilient trim material. TFE soft seat trim is suitable for flowing differential pressures up to 15 PSIG and temperatures to 250ºF, is capable of our tightest Class VI leakage rating, is corrosion resistant to many fluids, but is much less erosion resistant than other trim materials. TFE soft seat trim is not recommended for use in valves with socket weld end connections. When the valve is being installed in the piping, the heat generated by the welding process may damage the soft seat. Consult the factory if the application requires a soft seat in a valve with a socket weld end connection.

PEEK SOFT SEAT
PEEK remains harder than TFE at higher temperatures making it our most durable choice for a resilient trim material. PEEK soft seat trim is suitable for flowing differential pressures up to 100 PSIG and temperatures to 450F, is capable of our tightest Class VI leakage rating, is corrosion resistant to many fluids, but is much less erosion resistant than other trim materials. PEEK soft seat trim is not recommended for use in valves with socket weld end connections. When the valve is being installed in the piping, the heat generated by the welding process may damage the soft seat. Consult the factory if the application requires a soft seat in a valve with a socket weld end connection.

ALLOY 6 WRAPPED 316 STAINLESS STEEL
Alloy 6 wrapped 316 stainless steel is an extremely durable choice for trim material. Alloy 6 wrapped trim is suitable for flowing differential pressures up to 300 psig, is capable of tight Class IV leakage rating. While somewhat corrosion resistant, Alloy 6 wrapped trim is particularly well suited to wear longer in a cavitation prone environment. Alloy 6 wrapped 316 stainless steel is more corrosion resistant, but less erosion resistant, than Alloy 6 wrapped 400 stainless steel trim.

400 STAINLESS STEEL
400 stainless steel is our most durable stainless steel trim material choice. 400 stainless steel trim is suitable for flowing differential pressures up to 200 PSIG, is capable of tight Class IV and Class IV+ leakage ratings, is corrosion resistant to many fluids, but is less erosion resistant than Alloy 6 wrapped trims. 400 stainless steel contains a greater amount of carbon, so it can be heat treated, making it harder and more erosion resistant than 316 stainless steel.

ALLOY 6 WRAPPED 400 STAINLESS STEEL
Alloy 6 wrapped 400 stainless steel is an extremely durable choice for trim material. Alloy 6 wrapped trim is suitable for flowing differential pressures up to 300 PSIG, is capable of tight Class IV and Class IV+ leakage ratings. While somewhat corrosion resistant, Alloy 6 wrapped trim is particularly well suited to wear longer in a cavitation prone environment. Alloy 6 wrapped 400 stainless steel is more erosion resistant, but less corrosion resistant, than alloy 6 wrapped 316 stainless steel trim.

PACKING TYPE:

TEFLON V-RING
Teflon v-ring packing is the most common choice for steam and most chemical applications. Teflon v-ring packing is good from 60°F to 450°F. TFE v-ring packing is not suitable for service below 60°F.

EPDM LIP
EPDM lip packing is commonly used for water packing. EPDM lip packing is good from -20°F to 350°F. EPDM lip packing is not suitable for fluids containing or contaminated with oil. For applications from 32°F to -20°F when condensation on the stem can turn to ice (consult factory) an optional stem heater is also recommended.

GRAPHITE
Graphite packing is our most durable packing material choice. Graphite packing is good from -20°F to 800°F and is required for temperatures above 450°F to the valve's limit of 800°F. For applications from 32°F to -20°F when condensation on the stem can turn to ice (consult factory) an optional stem heater is also recommended.

VACUUM SERVICE
Vacuum service packing is teflon v-ring packing that is designed for use when the pressure inside the valve is lower than the atmospheric pressure outside the valve. Like teflon v-ring packing, vacuum service packing is good from 60°F to 450°F. Vacuum service packing is not suitable for service below 60°F.

BONNET CONSTRUCTION

PEEK BEARINGS
Bonnet constructions using PEEK Bearings are our most common and lowest cost choices for water and chemical applications. PEEK bearings are good to 450ºF. PEEK Bearings are used with EPDM lip, teflon v-ring, graphite, or vacuum service packing.

Z PEEK BEARINGS
Bonnet constructions using Z PEEK Bearings are our most common and lowest cost choices for steam applications. Z PEEK bearings are good for temperatures up to 450°F. Z PEEK bearings are used with EPDM lip, teflon v-ring, graphite, or vacuum service packing.

GRAPHALLOY BEARINGS WITH EXTENSION BONNET
Bonnet constructions using Graphalloy bearings with an extension bonnet are the preferred choice for applications greater than 450°F. Three kinds of Graphalloy bearings are available. Copper based Graphalloy bearings are good from -20°F to 750°F for non-oxidizing media ONLY and are best suited for hot water and steam. Nickel based Graphalloy bearings are good from -20°F to 750°F for non-oxidizing media ONLY and are best suited for heat transfer oils. Oxidation resistant Graphalloy bearings are good from -20°F to 800°F for oxidizing media. Bonnet constructions using Graphalloy bearings with an extension bonnet are used with graphite packing and graphite gaskets. This construction is commonly selected for higher temperature applications where it is necessary to have space between the actuator and valve.

BODY MATERIALS

CODE W ***WCB BODY***

Item	Part Nomenclature	Materials
4	YOKE LOCKNUT	PLATED STEEL
10	HEX HEAD CAPSCREW	ALLOY STEEL GR B7
12	BONNET	STEEL A216 WCB
22	VALVE BODY	STEEL A216 WCB

CODE F ***CF8M BODY***

Item	Part Nomenclature	Materials
4	YOKE LOCKNUT	300 SERIES SST
10	HEX HEAD CAPSCREW	SST GR B8M CLASS 2
12	BONNET	SST A351 CF8M
22	VALVE BODY	SST A351 CF8M

TRIM MATERIALS

CODE S ***316 STAINLESS STEEL TRIM***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	316 SST
19	PLUG	316 SST
20	SEAT RING	316 SST

CODE T ***TFE SOFT SEATS***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	316 SST
20	SEAT RING	316 SST
29	DISC HOLDER	316 SST
30	DISC	REINFORCED PTFE
31	DISC RETAINER	316 SST
32	SELF-LOCKING NUT	18-8 SST
33	INSERT	REINFORCED PTFE
34	RETAINER	316 SST

CODE P ***PEEK SOFT SEATS***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	316 SST
20	SEAT RING	316 SST
29	DISC HOLDER	316 SST
30	DISC	REINFORCED PEEK
31	DISC RETAINER	316 SST
32	SELF-LOCKING NUT	18-8 SST
33	INSERT	REINFORCED PEEK
34	RETAINER	316 SST

CODE 6 ***ALLOY 6 WRAPPED 316 STAINLESS STEEL TRIM***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	316 SST
19	PLUG	316 SST/ ALLOY 6 INLAY
20	SEAT RING	316 SST/ ALLOY 6 INLAY

CODE 7 ***400 STAINLESS STEEL TRIM***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	316 SST
19	PLUG	400 SST
20	SEAT RING	400 SST

CODE 8 ***ALLOY 6 WRAPPED 400 STAINLESS STEEL TRIM***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	316 SST
19	PLUG	400 SST/ ALLOY 6 INLAY
20	SEAT RING	316 SST/ ALLOY 6 INLAY

PACKING TYPE

CODE T ***TEFLON V-RING PACKING &***
V ***TEFLON V-RING PACKING VACUUM SERVICE***

Item	Part Nomenclature	Materials
7	V-RING PACKING SET	PTFE
8	LOAD WASHER	316 SST
9	PACKING SPRING	316 SST

CODE L ***EPDM LIP PACKING***

Item	Part Nomenclature	Materials
37	LIP PACKING SET	EPDM

CODE G ***GRAPHITE PACKING***

Item	Part Nomenclature	Materials
24	PACKING CARTRIDGE	DIE-FORMED GRAPHITE
25	SPACER	316 SST
26	PACKING RING	BRAIDED GRAPHITE
27	PACKING RING	DIE-FORMED GRAPHITE

BONNET CONSTRUCTION

CODE S ***PEEK BEARINGS***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
3	STEM WIPER	GRAPHITE FILLED TFE/ SST
5	PACKING RETAINER	316 SST
6	SLEEVE BEARING	REINFORCED PEEK
11	BOX RING	316 SST
13	WIPER RETAINER	316 SST
14	BONNET GASKET	NONASBESTOS
15	CAGE SPRING	316 SST/ PTFE
16	FLANGED BEARING	REINFORCED PEEK
21	SEAT GASKET	NONASBESTOS

CODE 8 ***Z PEEK BEARINGS***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
3	STEM WIPER	GRAPHITE FILLED TFE/ SST
5	PACKING RETAINER	316 SST
6	SLEEVE BEARING	REINFORCED PEEK
11	BOX RING	316 SST
13	WIPER RETAINER	316 SST
14	BONNET GASKET	NONASBESTOS
15	CAGE SPRING	316 SST/ PTFE
16	FLANGED BEARING	Z PLASTIC (PEEK BASE)
21	SEAT GASKET	NONASBESTOS

CODE G ***COPPER BASED GRAPHALLOY BEARINGS W/ EXTENSION BONNET***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
11	BOX RING	316 SST
12	EXTENSION BONNET	AS SPECIFIED
14	BONNET GASKET	GRAPHITE
15	CAGE SPRING	INCONEL/ GRAPHITE
21	SEAT GASKET	GRAPHITE
23	BEARING	GRAPHALLOY GRADE GM 320.3
26	PACKING RING	BRAIDED GRAPHITE
28	RETAINING RING	316 SST
35	RETAINER WASHER	316 SST
36	UPPER BEARING AND RETAINER SUBASSY	316 SST/ GRAPHALLOY GRADE GM 320.3

CODE L ***NICKEL BASED GRAPHALLOY BEARINGS W/ EXTENSION BONNET***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
11	BOX RING	316 SST
12	EXTENSION BONNET	AS SPECIFIED
14	BONNET GASKET	GRAPHITE
15	CAGE SPRING	INCONEL/ GRAPHITE
21	SEAT GASKET	GRAPHITE
23	BEARING	GRAPHALLOY GRADE GM 111.3
26	PACKING RING	BRAIDED GRAPHITE
28	RETAINING RING	316 SST
35	RETAINER WASHER	316 SST
36	UPPER BEARING AND RETAINER SUBASSY	316 SST/ GRAPHALLOY GRADE GM 111.3

CODE 7 ***OXIDATION RESISTANT GRAPHALLOY BEARINGS W/ EXTENSION BONNET***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
11	BOX RING	316 SST
12	EXTENSION BONNET	AS SPECIFIED
14	BONNET GASKET	GRAPHITE
15	CAGE SPRING	INCONEL/ GRAPHITE
21	SEAT GASKET	GRAPHITE
23	BEARING	GRAPHALLOY GRADE GM GDG-2
26	PACKING RING	BRAIDED GRAPHITE
28	RETAINING RING	316 SST
35	RETAINER WASHER	316 SST
36	UPPER BEARING AND RETAINER SUBASSY	316 SST/ GRAPHALLOY GRADE GM GDG-2

BODY MATERIALS

CODE W ***WCB BODY***

Item	Part Nomenclature	Materials
4	YOKE LOCKNUT	PLATED STEEL
10	HEX HEAD CAPSCREW	ALLOY STEEL GR B7
12	BONNET	STEEL A216 WCB
22	VALVE BODY	STEEL A216 WCB

CODE F ***CF8M BODY***

Item	Part Nomenclature	Materials
4	YOKE LOCKNUT	300 SERIES SST
10	HEX HEAD CAPSCREW	SST GR B8M CLASS 2
12	BONNET	SST A351 CF8M
22	VALVE BODY	SST A351 CF8M

TRIM MATERIALS

CODE S ***316 STAINLESS STEEL TRIM***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	316 SST
19	PLUG	316 SST
20	SEAT RING	316 SST

CODE 7 ***400 STAINLESS STEEL TRIM***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	400 SST
19	PLUG	400 SST
20	SEAT RING	400 SST

CODE 8 ***ALLOY 6 WRAPPED 400 STAINLESS STEEL TRIM***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	400 SST
19	PLUG	400 SST/ALLOY 6 INLAY
20	SEAT RING	316 SST/ALLOY 6 INLAY

PACKING TYPE

CODE T ***TEFLON V-RING PACKING &***
V ***TEFLON V-RING PACKING VACUUM SERVICE***

Item	Part Nomenclature	Materials
7	V-RING PACKING SET	PTFE
8	LOAD WASHER	316 SST
9	PACKING SPRING	316 SST

CODE L ***EPDM LIP PACKING***

Item	Part Nomenclature	Materials
37	LIP PACKING SET	EPDM

CODE G ***GRAPHITE PACKING***

Item	Part Nomenclature	Materials
24	PACKING CARTRIDGE	DIE-FORMED GRAPHITE
25	SPACER	316 SST
26	PACKING RING	BRAIDED GRAPHITE
27	PACKING RING	DIE-FORMED GRAPHITE

BONNET CONSTRUCTION

CODE S ***PEEK BEARINGS***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
3	STEM WIPER	GRAPHITE FILLED TFE/ SST
5	PACKING RETAINER	316SST
6	SLEEVE BEARING	REINFORCED PEEK
11	BOX RING	316 SST
13	WIPER RETAINER	316 SST
14	BONNET GASKET	NONASBESTOS
15	CAGE SPRING	316 SST/ PTFE
16	FLANGED BEARING	REINFORCED PEEK
17	O-RING	FLUORAZ
21	SEAT GASKET	NONASBESTOS

CODE 8 ***Z PEEK BEARINGS***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
3	STEM WIPER	GRAPHITE FILLED TFE/ SST
5	PACKING RETAINER	316SST
6	SLEEVE BEARING	REINFORCED PEEK
11	BOX RING	316 SST
13	WIPER RETAINER	316 SST
14	BONNET GASKET	NONASBESTOS
15	CAGE SPRING	316 SST/ PTFE
16	FLANGED BEARING	Z PLASTIC (PEEK BASE)
17	O-RING	FLUORAZ
21	SEAT GASKET	NONASBESTOS

CODE * ***COPPER BASED GRAPHALLOY BEARINGS W/ EXTENSION BONNET***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
11	BOX RING	316 SST
12	EXTENSION BONNET	AS SPECIFIED
14	BONNET GASKET	GRAPHITE
15	CAGE SPRING	INCONEL/ GRAPHITE
17	PISTON RING	METAL
21	SEAT GASKET	GRAPHITE
23	BEARING	GRAPHALLOY GRADE GM 320.3
26	PACKING RING	BRAIDED GRAPHITE
28	RETAINING RING	316 SST
35	RETAINER WASHER	316 SST
36	UPPER BEARING AND RETAINER SUBASSY	316 SST/ GRAPHALLOY GRADE GM 320.3

** SPECIAL ORDER – CONSULT FACTORY*

CODE * ***NICKEL BASED GRAPHALLOY BEARINGS W/ EXTENSION BONNET***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
11	BOX RING	316 SST
12	EXTENSION BONNET	AS SPECIFIED
14	BONNET GASKET	GRAPHITE
15	CAGE SPRING	INCONEL/ GRAPHITE
17	PISTON RING	METAL
21	SEAT GASKET	GRAPHITE
23	BEARING	GRAPHALLOY GRADE GM 111.3
26	PACKING RING	BRAIDED GRAPHITE
28	RETAINING RING	316 SST
35	RETAINER WASHER	316 SST
36	UPPER BEARING AND RETAINER SUBASSY	316 SST/ GRAPHALLOY GRADE GM 111.3

** SPECIAL ORDER – CONSULT FACTORY*

CODE * ***OXIDATION RESISTANT GRAPHALLOY BEARINGS W/ EXTENSION BONNET***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
11	BOX RING	316 SST
12	EXTENSION BONNET	AS SPECIFIED
14	BONNET GASKET	GRAPHITE
15	CAGE SPRING	INCONEL/ GRAPHITE
17	PISTON RING	METAL
21	SEAT GASKET	GRAPHITE
23	BEARING	GRAPHALLOY GRADE GM GDG-2
26	PACKING RING	BRAIDED GRAPHITE
28	RETAINING RING	316 SST
35	RETAINER WASHER	316 SST
36	UPPER BEARING AND RETAINER SUBASSY	316 SST/ GRAPHALLOY GRADE GM GDG-2

** SPECIAL ORDER – CONSULT FACTORY*

BODY MATERIALS

CODE W ***WCB BODY***

Item	Part Nomenclature	Materials
4	YOKE LOCKNUT	PLATED STEEL
10	HEX HEAD CAPSCREW	ALLOY STEEL GR B7
12	BONNET	STEEL A216 WCB
22	VALVE BODY	STEEL A216 WCB

CODE F ***CF8M BODY***

Item	Part Nomenclature	Materials
4	YOKE LOCKNUT	300 SERIES SST
10	HEX HEAD CAPSCREW	SST GR B8M CLASS 2
12	BONNET	SST A351 CF8M
22	VALVE BODY	SST A351 CF8M

TRIM MATERIALS

CODE S ***316 STAINLESS STEEL TRIM***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	316 SST
19	PLUG	316 SST
20	SEAT RING	UNS S21800

CODE T ***TFE SOFT SEATS***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	316 SST
19	PLUG	316 SST
20	SEAT RING	316 SST
33	INSERT	REINFORCED PTFE
34	RETAINER	UNS S21800

CODE P ***PEEK SOFT SEATS***

Item	Part Nomenclature	Materials
1	VALVE STEM	316 SST
18	CAGE	316 SST
19	PLUG	316 SST
20	SEAT RING	316 SST
33	INSERT	REINFORCED PEEK
34	RETAINER	UNS S21800

PACKING TYPE

CODE T ***TEFLON V-RING PACKING &***
V ***TEFLON V-RING PACKING VACUUM SERVICE***

Item	Part Nomenclature	Materials
7	V-RING PACKING SET	PTFE
8	LOAD WASHER	316 SST
9	PACKING SPRING	316 SST

CODE L ***EPDM LIP PACKING***

Item	Part Nomenclature	Materials
37	LIP PACKING SET	EPDM

CODE G ***GRAPHITE PACKING***

Item	Part Nomenclature	Materials
24	PACKING CARTRIDGE	DIE-FORMED GRAPHITE
25	SPACER	316 SST
26	PACKING RING	BRAIDED GRAPHITE
27	PACKING RING	DIE-FORMED GRAPHITE

BONNET CONSTRUCTION

CODE S ***PEEK BEARINGS***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
3	STEM WIPER	GRAPHITE FILLED TFE/ SST
5	PACKING RETAINER	316 SST
6	SLEEVE BEARING	REINFORCED PEEK
11	BOX RING	316 SST
13	WIPER RETAINER	316 SST
14	BONNET GASKET	NONASBESTOS
15	CAGE SPRING	316 SST/ PTFE
16	FLANGED BEARING	REINFORCED PEEK
21	SEAT GASKET	NONASBESTOS

CODE 8 ***Z PEEK BEARINGS***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
3	STEM WIPER	GRAPHITE FILLED TFE/ SST
5	PACKING RETAINER	316 SST
6	SLEEVE BEARING	REINFORCED PEEK
11	BOX RING	316 SST
13	WIPER RETAINER	316 SST
14	BONNET GASKET	NONASBESTOS
15	CAGE SPRING	316 SST/ PTFE
16	FLANGED BEARING	Z PLASTIC (PEEK BASE)
21	SEAT GASKET	NONASBESTOS

CODE G ***COPPER BASED GRAPHALLOY BEARINGS W/ EXTENSION BONNET***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
11	BOX RING	316 SST
12	EXTENSION BONNET	AS SPECIFIED
14	BONNET GASKET	GRAPHITE
15	CAGE SPRING	INCONEL/ GRAPHITE
21	SEAT GASKET	GRAPHITE
23	BEARING	GRAPHALLOY GRADE GM 320.3
26	PACKING RING	BRAIDED GRAPHITE
28	RETAINING RING	316 SST
35	RETAINER WASHER	316 SST
36	UPPER BEARING AND RETAINER SUBASSY	316 SST/ GRAPHALLOY GRADE GM 320.3

CODE L ***NICKEL BASED GRAPHALLOY BEARINGS W/ EXTENSION BONNET***

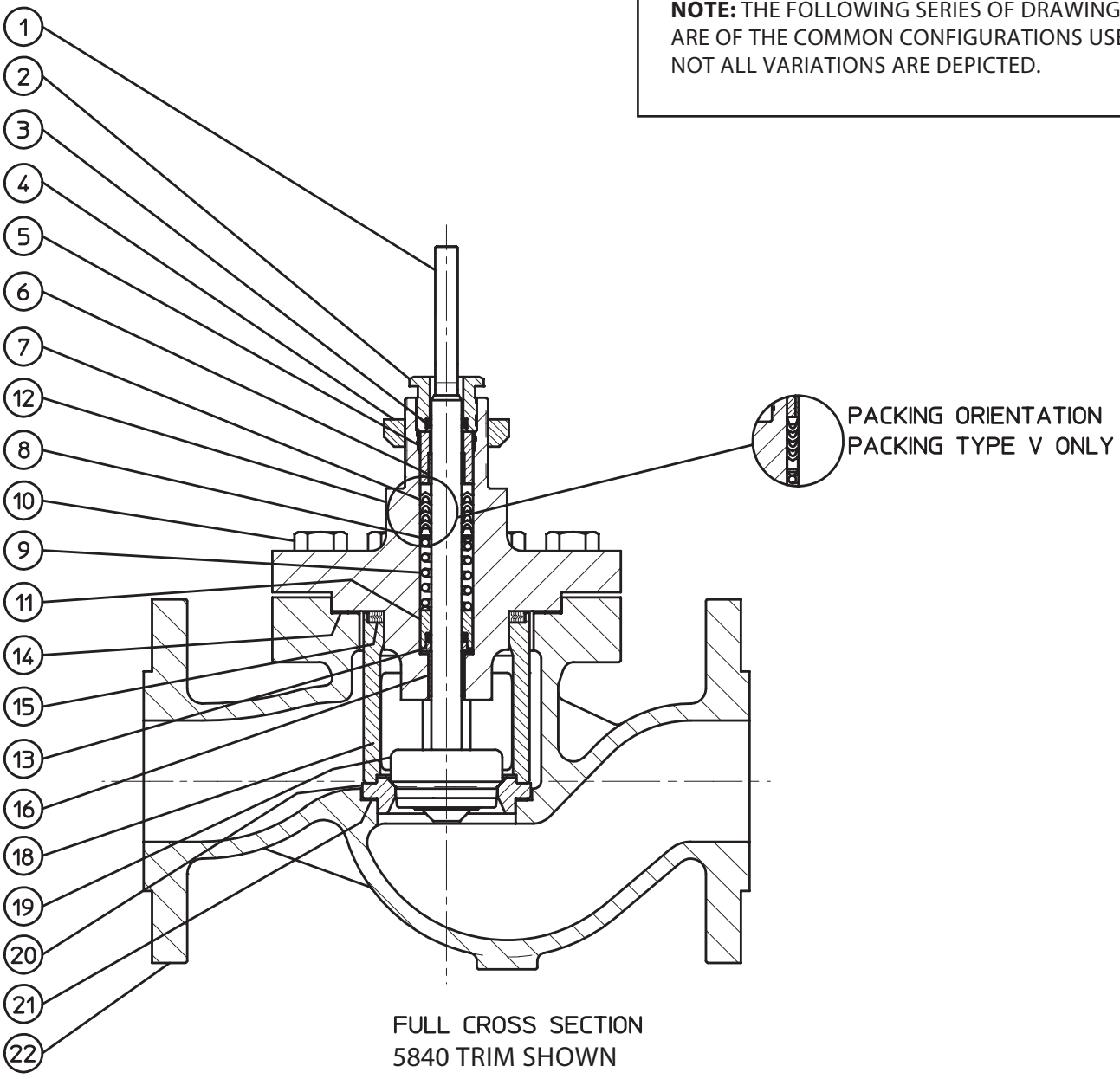
Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
11	BOX RING	316 SST
12	EXTENSION BONNET	AS SPECIFIED
14	BONNET GASKET	GRAPHITE
15	CAGE SPRING	INCONEL/ GRAPHITE
21	SEAT GASKET	GRAPHITE
23	BEARING	GRAPHALLOY GRADE GM 111.3
26	PACKING RING	BRAIDED GRAPHITE
28	RETAINING RING	316 SST
35	RETAINER WASHER	316 SST
36	UPPER BEARING AND RETAINER SUBASSY	316 SST/ GRAPHALLOY GRADE GM 111.3

CODE 7 ***OXIDATION RESISTANT GRAPHALLOY BEARINGS W/ EXTENSION BONNET***

Item	Part Nomenclature	Materials
2	PACKING NUT	316 SST
11	BOX RING	316 SST
12	EXTENSION BONNET	AS SPECIFIED
14	BONNET GASKET	GRAPHITE
15	CAGE SPRING	INCONEL/ GRAPHITE
21	SEAT GASKET	GRAPHITE
23	BEARING	GRAPHALLOY GRADE GM GDG-2
26	PACKING RING	BRAIDED GRAPHITE
28	RETAINING RING	316 SST
35	RETAINER WASHER	316 SST
36	UPPER BEARING AND RETAINER SUBASSY	316 SST/ GRAPHALLOY GRADE GM GDG-2

CONSTRUCTION DETAILS

NOTE: THE FOLLOWING SERIES OF DRAWINGS ARE OF THE COMMON CONFIGURATIONS USED. NOT ALL VARIATIONS ARE DEPICTED.

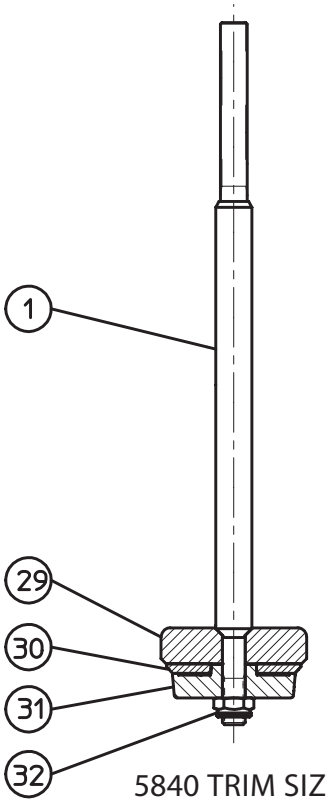


FULL CROSS SECTION
5840 TRIM SHOWN

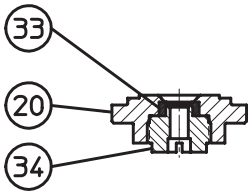
BODY MATERIAL CODE W & F
TRIM MATERIALS CODE S, 6, 7, 8 (5840) & S (5848)
PACKING TYPE & BONNET CONSTRUCTION CODES TS, VS, T8 & V8

SEE PAGES 10 & 11 FOR 5840 AND PAGE 14 & 15 FOR 5848 PART NOMENCLATURE AND MATERIALS

CONSTRUCTION DETAILS

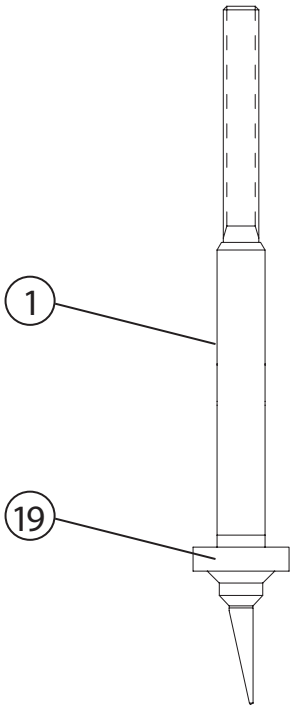


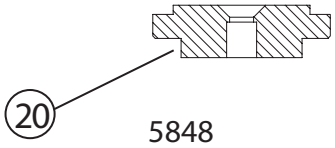
5840 TRIM SIZE
0.876 – 3.376



5840 TRIM SIZE
0.251 – 0.501
& 5848

TRIM MATERIALS
CODES T & P



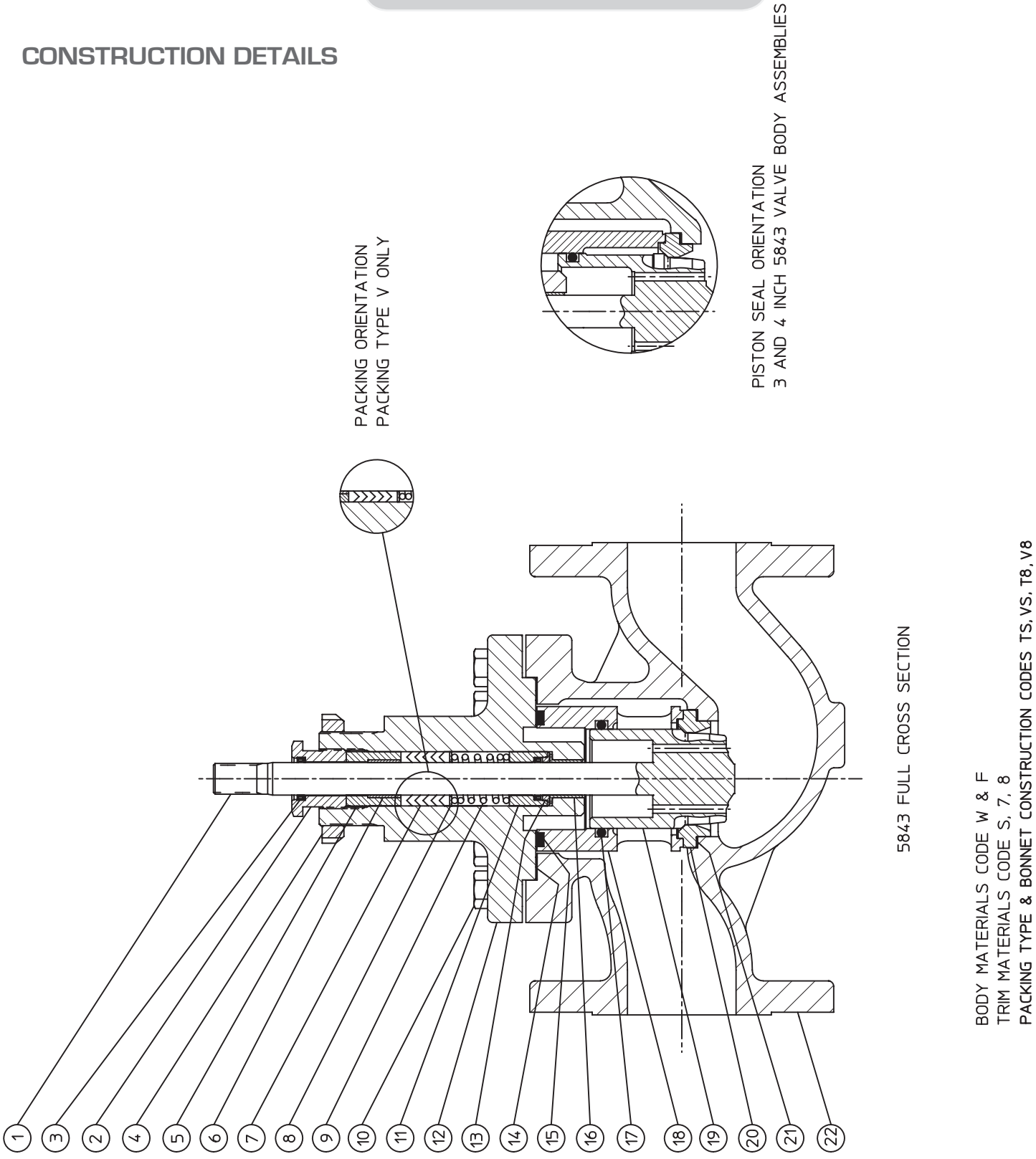


5848

TRIM MATERIALS
CODE S

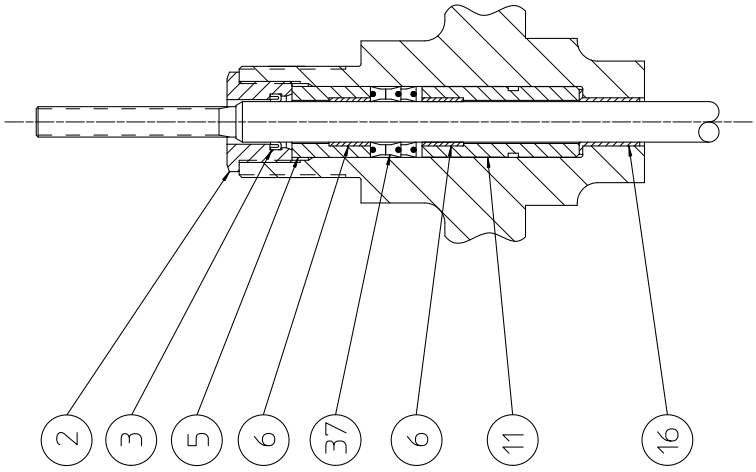
SEE PAGE 10 & 11 FOR 5840 AND PAGE 14 & 15 FOR 5848 PART NOMENCLATURE AND MATERIALS

CONSTRUCTION DETAILS

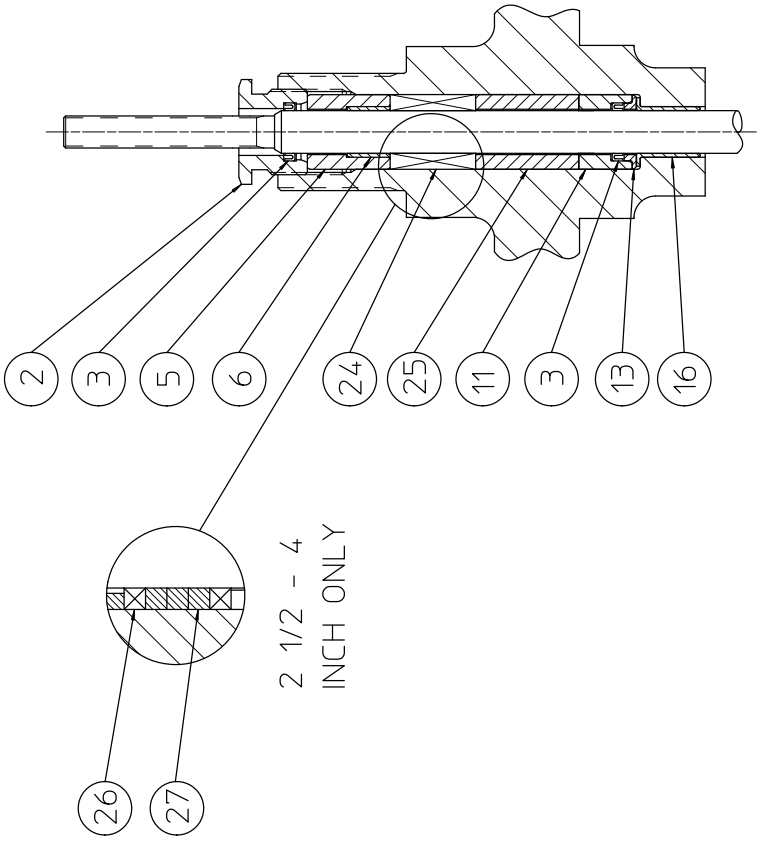


SEE PAGE 12 & 13 FOR 5843 PART NOMENCLATURE AND MATERIALS

CONSTRUCTION DETAILS



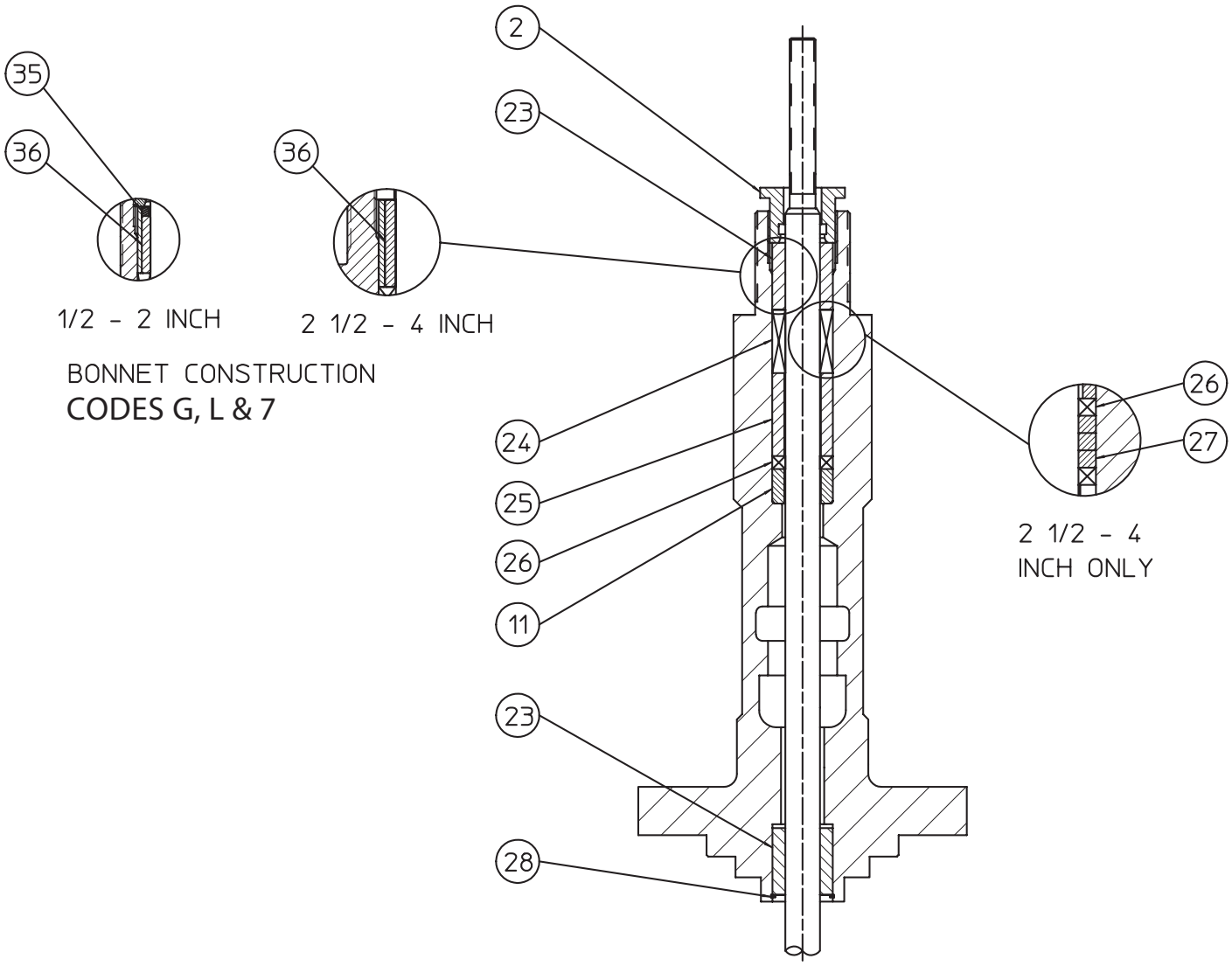
PACKING TYPE AND BONNET CONSTRUCTION
CODES LS & L8



PACKING TYPE AND BONNET CONSTRUCTION
CODES GS & G8

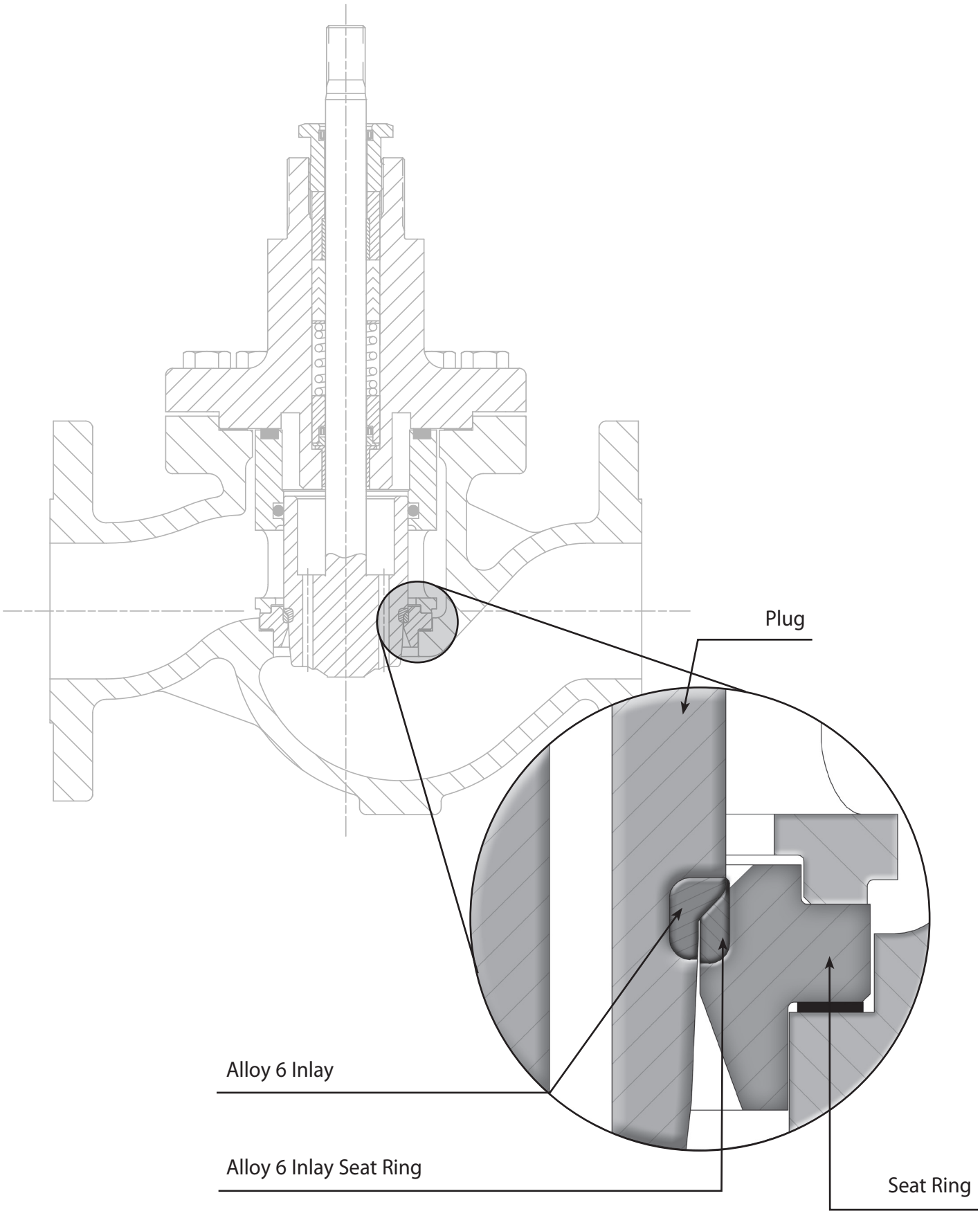
SEE PAGE 10 & 11 FOR 5840; 11 FOR 5843; AND 14 & 15 FOR 5848 PART NOMENCLATURE AND MATERIALS

CONSTRUCTION DETAILS



SEE PAGE 10 & 11 FOR 5840, 12 & 13 FOR 5843, & 14 & 15 FOR 5848 PART NOMENCLATURE AND MATERIALS

ALLOY 6 WRAPPING

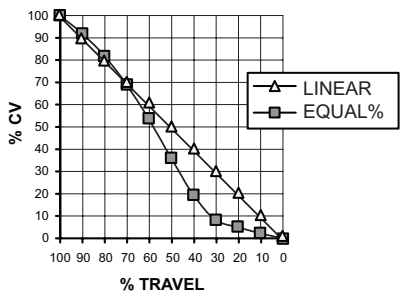


FLOW COEFFICIENTS (CV) VERSUS TRAVEL

VALVE				5840 FLOW COEFFICIENTS (Cv) 2-WAY SINGLE SEAT UNBALANCED VALVE WITH CAGE-RETAINED SEAT									
Valve Size (IN)	Trim Size(IN)	Trim Style	Port Size	%Travel									
				100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
1/2	0.501	EQ%	FULL	4.34	3.89	3.21	2.24	1.15	0.69	0.47	0.34	0.23	0.13
		LINEAR	FULL	4.34	3.91	3.47	3.04	2.60	2.17	1.74	1.30	0.87	0.43
	0.376	EQ%	1SR	2.50	2.24	1.85	1.29	0.66	0.40	0.27	0.20	0.14	0.07
		LINEAR	1SR	2.50	2.25	2.00	1.75	1.50	1.25	1.00	0.75	0.50	0.25
	0.251	EQ%	2SR	1.25	1.12	0.93	0.65	0.33	0.20	0.14	0.10	0.07	0.04
		LINEAR	2SR	1.25	1.13	1.00	0.88	0.75	0.63	0.50	0.38	0.25	0.13
3/4	0.876	EQ%	FULL	11.4	10.2	8.44	5.89	3.02	1.81	1.24	0.89	0.62	0.33
		LINEAR	FULL	11.4	10.3	9.12	7.98	6.84	5.70	4.56	3.42	2.28	1.14
	0.501	EQ%	1SR	5.00	4.48	3.70	2.59	1.33	0.80	0.55	0.39	0.27	0.15
		LINEAR	1SR	5.00	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00	0.50
	0.376	EQ%	2SR	2.50	2.24	1.85	1.29	0.66	0.40	0.27	0.20	0.14	0.07
		LINEAR	2SR	2.50	2.25	2.00	1.75	1.50	1.25	1.00	0.75	0.50	0.25
	0.251	EQ%	3SR	1.25	1.12	0.93	0.65	0.33	0.20	0.14	0.10	0.07	0.04
		LINEAR	3SR	1.25	1.13	1.00	0.88	0.75	0.63	0.50	0.38	0.25	0.13
1	0.876	EQ%	FULL	12.0	10.8	8.88	6.20	3.18	1.91	1.31	0.94	0.65	0.35
		LINEAR	FULL	12.0	10.8	9.60	8.40	7.20	6.00	4.80	3.60	2.40	1.20
	0.501	EQ%	1SR	5.00	4.48	3.70	2.59	1.33	0.80	0.55	0.39	0.27	0.15
		LINEAR	1SR	5.00	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00	0.50
	0.376	EQ%	2SR	2.50	2.24	1.85	1.29	0.66	0.40	0.27	0.20	0.14	0.07
		LINEAR	2SR	2.50	2.25	2.00	1.75	1.50	1.25	1.00	0.75	0.50	0.25
	0.251	EQ%	3SR	1.25	1.12	0.93	0.65	0.33	0.20	0.14	0.10	0.07	0.04
		LINEAR	3SR	1.25	1.13	1.00	0.88	0.75	0.63	0.50	0.38	0.25	0.13
1.5	1.251	EQ%	FULL	24.0	21.5	17.8	12.4	6.36	3.82	2.62	1.87	1.30	0.70
		LINEAR	FULL	24.0	21.6	19.2	16.8	14.4	12.0	9.60	7.20	4.80	2.40
	0.876	EQ%	1SR	12.0	10.8	8.88	6.20	3.18	1.91	1.31	0.94	0.65	0.35
		LINEAR	1SR	12.0	10.8	9.60	8.40	7.20	6.00	4.80	3.60	2.40	1.20
	0.501	EQ%	2SR	5.00	4.48	3.70	2.59	1.33	0.80	0.55	0.39	0.27	0.15
		LINEAR	2SR	5.00	4.50	4.00	3.50	3.00	2.50	2.00	1.50	1.00	0.50
2	1.688	EQ%	FULL	43.0	38.5	31.8	22.2	11.4	6.84	4.69	3.35	2.32	1.25
		LINEAR	FULL	43.0	38.7	34.4	30.1	25.8	21.5	17.2	12.9	8.60	4.30
	1.251	EQ%	1SR	24.0	21.5	17.8	12.4	6.36	3.82	2.62	1.87	1.30	0.70
		LINEAR	1SR	24.0	21.6	19.2	16.8	14.4	12.0	9.60	7.20	4.80	2.40
	0.876	EQ%	2SR	12.0	10.8	8.88	6.20	3.18	1.91	1.31	0.94	0.65	0.35
		LINEAR	2SR	12.0	10.8	9.60	8.40	7.20	6.00	4.80	3.60	2.40	1.20
2.5	2.126	EQ%	FULL	65.0	58.2	48.1	33.6	17.2	10.3	7.09	5.07	3.51	1.89
		LINEAR	FULL	65.0	58.5	52.0	45.5	39.0	32.5	26.0	19.5	13.0	6.50
	1.688	EQ%	1SR	43.0	38.5	31.8	22.2	11.4	6.84	4.69	3.35	2.32	1.25
		LINEAR	1SR	43.0	38.7	34.4	30.1	25.8	21.5	17.2	12.9	8.60	4.30
3	2.501	EQ%	FULL	100	89.6	74.0	51.7	26.5	15.9	10.9	7.80	5.40	2.90
		LINEAR	FULL	100	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0
	2.126	EQ%	1SR	65.0	58.2	48.1	33.6	17.2	10.3	7.09	5.07	3.51	1.89
		LINEAR	1SR	65.0	58.5	52.0	45.5	39.0	32.5	26.0	19.5	13.0	6.50
4	3.376	EQ%	FULL	170	152	126	87.9	45.1	27.0	18.5	13.3	9.18	4.93
		LINEAR	FULL	170	153	136	119	102	85.0	68.0	51.0	34.0	17.0
	2.501	EQ%	1SR	100	89.6	74.0	51.7	26.5	15.9	10.9	7.80	5.40	2.90
		LINEAR	1SR	100	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0

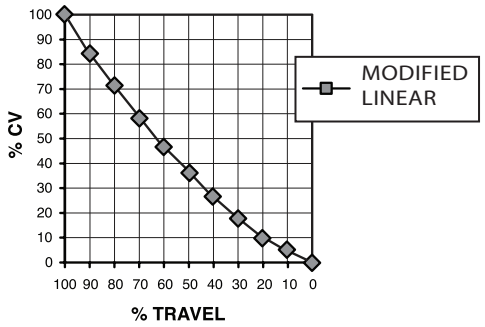
5840 & 5843

TYPICAL FLOW CURVES



VALVE				5843 FLOW COEFFICIENTS (Cv) 2-WAY SINGLE SEAT CAGED BALANCED VALVE WITH CAGE-RETAINED SEAT									
Valve Size (IN)	Trim Size(IN)	Trim Style	Port Size	%Travel									
				100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
2.5	2.126	EQ%	FULL	65.0	58.2	48.1	33.6	17.2	10.3	7.09	5.07	3.51	1.89
		LINEAR	FULL	65.0	58.5	52.0	45.5	39.0	32.5	26.0	19.5	13.0	6.50
		EQ%	1SR	43.0	38.5	31.8	22.2	11.4	6.84	4.69	3.35	2.32	1.25
3	2.501	EQ%	FULL	100	89.6	74.0	51.7	26.5	15.9	10.9	7.80	5.40	2.90
		LINEAR	FULL	100	90.0	80.0	70.0	60.0	50.0	40.0	30.0	20.0	10.0
		EQ%	1SR	65.0	58.2	48.1	33.6	17.2	10.3	7.09	5.07	3.51	1.89
4	3.376	EQ%	FULL	170	152	126	87.9	45.1	27.0	18.5	13.3	9.18	4.93
		LINEAR	FULL	170	153	136	119	102	85.0	68.0	51.0	34.0	17.0
		EQ%	1SR	100	89.6	74.0	51.7	26.5	15.9	10.9	7.80	5.40	2.90

5848 FLOW CURVE



VALVE				5848 FLOW COEFFICIENTS (Cv) 2-WAY SINGLE SEAT, LOW FLOW UNBALANCED VALVE WITH CAGE-RETAINED SEAT									
Valve Size (IN)	Trim Size(IN)	Trim Style	Port Size	%Travel									
				100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
1/2	0.250	MODIFIED LINEAR	FULL	0.75	0.64	0.54	0.44	0.35	0.27	0.20	0.13	0.08	0.04
			1SR	0.50	0.43	0.36	0.29	0.23	0.18	0.13	0.09	0.05	0.03
			2SR	0.25	0.21	0.18	0.15	0.12	0.09	0.07	0.04	0.03	0.01
3/4	0.250	MODIFIED LINEAR	FULL	0.75	0.64	0.54	0.44	0.35	0.27	0.20	0.13	0.08	0.04
			1SR	0.50	0.43	0.36	0.29	0.23	0.18	0.13	0.09	0.05	0.03
			2SR	0.25	0.21	0.18	0.15	0.12	0.09	0.07	0.04	0.03	0.01
1	0.250	MODIFIED LINEAR	FULL	0.75	0.64	0.54	0.44	0.35	0.27	0.20	0.13	0.08	0.04
			1SR	0.50	0.43	0.36	0.29	0.23	0.18	0.13	0.09	0.05	0.03
			2SR	0.25	0.21	0.18	0.15	0.12	0.09	0.07	0.04	0.03	0.01

SIZING REFERENCE

STEAM TABLE					
Steam Pressure PSIG	Temp. °F	Temp. °C	Sensible Heat BTU/Lb.	Latent Heat BTU/Lb.	Total Heat BTU/Lb.
0	212	100	180	971	1151
10	239	115	207	952	1159
25	266	130	236	934	1170
50	297	147	267	912	1179
75	320	160	290	896	1186
100	338	170	309	881	1190
125	353	178	325	868	1193
150	365	185	339	858	1197
200	387	197	362	838	1200
250	406	208	381	821	1202
300	422	217	399	805	1204
400	448	231	438	778	1216
500	470	243	453	752	1205
600	489	254	475	729	1204

Rectangular Tank Capacity in Gallons

$$\text{Gallons} = \frac{\text{Height x Width x Length (inches)}}{230}$$

or

Gallons = H x W x L (Ft.) x 7.5

Circular Tank Storage Capacity in Gallons

Storage = $6D^2$ x L (Gallons)

Where:
D = Tank Diameter in Feet
L = Length in Feet

LOAD SIZING CALCULATIONS

Glossary of Terms
t = Time in Hours
Cp = Specific Heat of Liquid
S = Specific Gravity of Fluid
W = Weight in Lbs.
ΔT = Temperature Rise or Fall in °F
h_{fg} = Latent Heat of Steam

Conversion Factors

1 Lb. Steam / Hr. =	1000 BTU / Hr.
1 Cubic Meter =	264 U.S. Gallons
1 Cubic Foot Water =	62.4 Lbs.
1 PSI =	2.04 Inches of Mercury
1 PSI =	2.3 Feet of Water
1 PSI =	27.7 Inches of Water
1 U.S. Gallon Water =	231 Cubic Inches
1 U.S. Gallon Water =	8.33 Lbs.

Heating Water with Steam

Quick Method

$$\text{Lbs./Hr.} = \frac{\text{GPM}}{2} \times \Delta T$$

Accurate Method

$$\text{Lbs./Hr.} = \frac{\text{GPM} \times 500 \times \Delta T}{h_{fg}}$$

Heating or Cooling Water with Water

$$GPM_1 = GPM_2 \times \frac{°F\ water_2\ temp.\ rise\ or\ drop}{°F\ water_1\ temp.\ rise\ or\ drop}$$

Heating or Cooling Water

$$GPM = \frac{BTU / Hr.}{(°F\ water\ temp.\ rise\ or\ drop\ ) \times 500}$$

Heating Oil with Steam

$$\text{Lbs./Hr.} = \frac{\text{GPM}}{4} \times (°F\ oil\ temp.\ rise)$$

Heating Air with Water

$$GPM = 2.16 \times \frac{CFM \times (°F\ air\ temp.\ rise)}{1000 \times (°F\ water\ temp.\ drop)}$$

Heating Liquids with Steam

$$\text{Lbs./Hr.} = \frac{\text{GPM} \times 60 \times Cp \times W}{h_{fg}} \times \Delta T$$

Heating Liquids in Steam Jacketed Kettles

$$\text{Lbs./Hr.} = \frac{\text{Gallons} \times Cp \times S \times 8.33}{h_{fg} \times t} \times \Delta T$$

General Liquid Heating

$$\text{Lbs./Hr.} = \frac{W \times Cp}{h_{fg} \times t} \times \Delta T$$

Heating Air with Steam

$$\text{Lbs./Hr.} = \frac{\text{CFM}}{900} \times \Delta T$$

VALVE			ACTUATOR		5840 SHUT-OFF ΔP 2-WAY, UNBALANCED WITH CAGE-RETAINED SEAT							
					Maximum Shut-off ΔP in PSI							
					Fail Closed Reverse Acting				Fail Open Direct Acting			
					Air Signal to Actuator See "Pneumatic Ranges"... bottom right				Air Signal to Actuator See "Pneumatic Ranges"... bottom right			
Trim Size (IN)	Valve Size (IN)	Plug Travel (IN)	Pneumatic Actuator	Spring Range	Range 1	Range 2	Range 3	Range 4	Range 1	Range 2	Range 3	Range 4
0.251	1/2 thru 1	3/4	DL49	Low	N/A	740	740	N/A	740	740	740	N/A
				Full	492	740	740	N/A	492	740	740	N/A
				High	740	740	740	N/A	740	740	740	N/A
			Cylinder 4"		N/A	N/A	N/A	N/A	740	740	740	740
0.376	1/2 thru 1	3/4	DL49	Low	N/A	554	740	N/A	740	740	740	N/A
				Full	113	740	740	N/A	113	740	740	N/A
				High	740	740	740	N/A	554	740	740	N/A
			Cylinder 4"		N/A	N/A	N/A	N/A	740	740	740	740
0.501	1/2 thru 1-1/2	3/4	DL49	Low	N/A	253	501	N/A	740	740	740	N/A
				Full	4	501	740	N/A	4	501	740	N/A
				High	740	740	740	N/A	253	740	740	N/A
			DL84	Low	N/A	N/A	N/A	N/A	740	740	740	N/A
				Full	N/A	N/A	N/A	N/A	N/A	359	740	N/A
				High	N/A	N/A	N/A	N/A	N/A	359	740	N/A
			Cylinder 4"		N/A	N/A	N/A	N/A	740	740	740	740
0.876	3/4 thru 2	3/4	DL49	Low	N/A	24	105	N/A	268	430	740	N/A
				Full	N/A	105	187	N/A	N/A	105	740	N/A
				High	349	512	593	N/A	24	187	740	N/A
			DL49XR	Xtra-High	N/A	N/A	740	N/A	N/A	N/A	N/A	N/A
			DL84	Low	N/A	59	198	N/A	616	740	740	N/A
				Full	N/A	59	198	N/A	N/A	59	740	N/A
				High	616	740	740	N/A	N/A	59	740	N/A
			Cylinder 4"		372	659	740	740	585	740	740	740
1.251	1-1/2 and 2	3/4	DL49	Low	N/A	N/A	23	N/A	103	182	701	N/A
				Full	N/A	23	63	N/A	N/A	23	541	N/A
				High	142	222	262	N/A	N/A	63	581	N/A
			DL49XR	Xtra-High	N/A	N/A	422	N/A	N/A	N/A	N/A	N/A
			DL84	Low	N/A	N/A	68	N/A	273	410	740	N/A
				Full	N/A	N/A	68	N/A	N/A	N/A	740	N/A
				High	273	410	478	N/A	N/A	N/A	740	N/A
			DL84XR	Xtra-High	N/A	N/A	683	N/A	N/A	N/A	N/A	N/A
			Cylinder 4"		147	323	399	473	258	463	667	740
			Cylinder 6"		570	N/A	N/A	N/A	740	740	N/A	N/A
1.688	2	3/4	DL49	Low	N/A	N/A	N/A	N/A	38	82	366	N/A
				Full	N/A	N/A	16	N/A	N/A	N/A	279	N/A
				High	60	104	126	N/A	N/A	16	201	N/A
			DL49XR	Xtra-High	N/A	N/A	213	N/A	N/A	N/A	N/A	N/A
			DL84	Low	N/A	N/A	19	N/A	132	207	695	N/A
				Full	N/A	N/A	19	N/A	N/A	N/A	470	N/A
				High	132	207	244	N/A	N/A	N/A	470	N/A
			DL84XR	Xtra-High	N/A	N/A	357	N/A	N/A	N/A	N/A	N/A
			Cylinder 4"		74	177	219	260	123	236	348	460
			Cylinder 6"		313	N/A	N/A	N/A	430	682	N/A	N/A

NOTES:

1) 5840 leakage ratings are ANSI Class IV (Stainless Steel or Alloy 6 Trim), ANSI Class VI (TFE or PEEK Trim.) Warren Class IV+ leakage rating is available for Stainless Steel or Alloy 6 Trim for less leakage than ANSI Class IV. (See Allowable Seat Leakage Classes table on page 7).

2) Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.

3) The 3-15 and 1-17 ranges apply to valves with diaphragm actuators and control signals coming directly from I/P transducers with matching ranges. The 0-30 and 0-40 ranges apply to valves with diaphragm actuators and a positioner or an I/P transducer of suitable range. The 0-60, 0-80, 0-100, and 0-120 ranges apply to valves with cylinder actuators and a positioner.

4) N/A indicates that the air signal is not capable of providing any shut-off or it exceeds the actuator's maximum air pressure.

   Maximum air pressure
   DL84 & 84XR…30PSIG

5) See Actuators, Positioners, and Accessories section for explanation of spring ranges.

   DL49 & 49XR…30PSIG
   CL4, 6, & 8 … 120PSIG

PNEUMATIC RANGES		
	Diaphragm	Cylinder
Range 1	3-15	0-60
Range 2	1-17	0-80
Range 3	0-30	0-100
Range 4	0-40	0-120

Shut-off values are for valves with TFE or EPDM packing.
For valves with graphite packing contact factory for shut-offs.

SHUT-OFF ΔP RATINGS

NOTES:

1) 5840 leakage ratings are ANSI Class IV (Stainless Steel or Alloy 6 Trim), ANSI Class VI (TFE or PEEK Trim.) Warren Class IV+ leakage rating is available for Stainless Steel or Alloy 6 Trim for less leakage than ANSI Class IV. (See Allowable Seat Leakage Classes table on page 7)

2) Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.

3) The 3-15 and 1-17 ranges apply to valves with diaphragm actuators and control signals coming directly from I/P transducers with matching ranges. The 0-30 and 0-40 ranges apply to valves with diaphragm actuators and a positioner or an I/P transducer of suitable range. The 0-60, 0-80, 0-100, and 0-120 ranges apply to valves with cylinder actuators and a positioner.

4) N/A indicates that the air signal is not capable of providing any shut-off or it exceeds the actuator's maximum air pressure.

   Maximum air pressure
   DL84…… 30 PSIG
   DL115 & 115XR…40 PSIG

5) See Actuators, Positioners, and Accessories section for explanation of spring ranges.

VALVE			ACTUATOR		5840 SHUT-OFF ΔP 2-WAY UNBALANCED WITH CAGE-RETAINED SEAT							
					Maximum Shut-off ΔP in PSI							
					Fail Closed Reverse Acting				Fail Open Direct Acting			
					Air Signal to Actuator See "Pneumatic Ranges"... bottom right				Air Signal to Actuator See "Pneumatic Ranges"... bottom right			
Trim Size (IN)	Valve Size (N)	Plug Travel (IN)	Pneumatic Actuator	Spring Range	Range 1	Range 2	Range 3	Range 4	Range 1	Range 2	Range 3	Range 4
1.688	2-1/2	1-1/2	DL84	Low	N/A	N/A	8	N/A	121	196	684	N/A
				Full	N/A	N/A	8	N/A	N/A	N/A	458	N/A
				High	121	196	233	N/A	N/A	N/A	458	N/A
			DL115	Low	N/A	N/A	50	50	204	307	740	740
				Full	N/A	N/A	50	50	N/A	N/A	666	740
				High	204	307	358	358	N/A	N/A	666	740
			DL115XR	Xtra-High	N/A	N/A	740	740	N/A	N/A	N/A	N/A
			Cylinder 6"		309	407	503	597	419	671	740	740
			Cylinder 8"		568	738	740	740	740	740	740	740
2.126	2-1/2 and 3	1-1/2	DL84	Low	N/A	N/A	N/A	N/A	64	112	419	N/A
				Full	N/A	N/A	N/A	N/A	N/A	N/A	277	N/A
				High	64	112	135	N/A	N/A	N/A	277	N/A
			DL115	Low	N/A	N/A	20	20	117	182	603	740
				Full	N/A	N/A	20	20	N/A	N/A	408	732
				High	117	182	214	214	N/A	N/A	408	732
			DL115XR	Xtra-High	N/A	N/A	473	473	N/A	N/A	N/A	N/A
			Cylinder 6"		179	257	317	376	252	411	571	730
			Cylinder 8"		358	466	575	682	568	740	740	740
2.501	3 and 4	1-1/2	DL84	Low	N/A	N/A	N/A	N/A	39	74	296	N/A
				Full	N/A	N/A	N/A	N/A	N/A	N/A	193	N/A
				High	39	74	91	N/A	N/A	N/A	193	N/A
			DL115	Low	N/A	N/A	7	7	77	124	428	662
				Full	N/A	N/A	7	7	N/A	N/A	288	522
				High	77	124	147	147	N/A	N/A	288	522
			DL115XR	Xtra-High	N/A	N/A	335	335	N/A	N/A	N/A	N/A
			Cylinder 6"		124	186	229	272	175	290	405	520
			Cylinder 8"		259	336	415	493	410	587	740	740
3.376	4	1-1/2	DL84	Low	N/A	N/A	N/A	N/A	12	31	153	N/A
				Full	N/A	N/A	N/A	N/A	N/A	N/A	97	N/A
				High	12	31	41	N/A	N/A	N/A	97	N/A
			DL115	Low	N/A	N/A	N/A	N/A	33	59	226	354
				Full	N/A	N/A	N/A	N/A	N/A	N/A	149	277
				High	33	59	72	72	N/A	N/A	149	277
			DL115XR	Xtra-High	N/A	N/A	174	174	N/A	N/A	N/A	N/A
			Cylinder 6"		65	102	126	149	87	150	213	276
			Cylinder 8"		142	185	228	271	225	322	419	517

Shut-off values are for valves with TFE or EPDM packing. For valves with graphite packing contact factory for shut-offs.

PNEUMATIC RANGES		
	Diaphragm	Cylinder
Range 1	3-15	0-60
Range 2	1-17	0-80
Range 3	0-30	0-100
Range 4	0-40	0-120

NOTES:

1) 5843 leakage ratings are ANSI Class IV (Stainless Steel or Alloy 6 Trim w/ Fluoraz Seal), ANSI Class III (Stainless Steel or Alloy 6 Trim w/Metal Seal). Warren Class IV+ leakage rating is available for Stainless Steel or Alloy 6 Trim w/Fluoraz Seal for less leakage than ANSI Class IV (See Allowable Seat Leakage Classes table on page 7).

2) Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.

3) The 3-15 and 1-17 ranges apply to valves with diaphragm actuators and control signals coming directly from I/P transducers with matching ranges. The 0-30 and 0-40 ranges apply to valves with diaphragm actuators and a positioner or an I/P transducer of suitable range.

4) N/A indicates that the air signal is not capable of providing any shut-off or it exceeds the actuator's maximum air pressure.

   Maximum air pressure
   DL84 …… 30PSIG
   DL115 & 115XR…40PSIG

5) See Actuators, Positioners, and Accessories section for explanation of spring ranges.

Shut-off values are for valves with TFE or EPDM packing. For valves with graphite packing contact factory for shut-offs.

5843 SHUT-OFF ΔP 2-WAY, CAGE BALANCED WITH CAGE-RETAINED SEAT

VALVE			ACTUATOR		Maximum Shut-off ΔP in PSI							
					Fail Closed Reverse Acting				Fail Open Direct Acting			
					Air Signal to Actuator See "Pneumatic Ranges"... bottom right				Air Signal to Actuator See "Pneumatic Ranges"... bottom right			
Trim Size (IN)	Valve Size (IN)	Plug Travel (IN)	Pneumatic Actuator	Spring Range	Range 1	Range 2	Range 3	Range 4	Range 1	Range 2	Range 3	Range 4
2.126	2-1/2	1-1/2	DL84	Low	N/A	N/A	N/A	N/A	190	360	740	N/A
				Full	N/A	N/A	N/A	N/A	N/A	N/A	740	N/A
				High	190	360	445	N/A	N/A	N/A	740	N/A
			DL115	Low	N/A	N/A	30	30	378	610	740	740
				Full	N/A	N/A	30	30	N/A	N/A	740	740
				High	378	610	726	726	N/A	N/A	740	740
			DL115XR	Xtra-High	N/A	N/A	740	740	N/A	N/A	N/A	N/A
2.501	3	1-1/2	DL84	Low	N/A	N/A	N/A	N/A	125	267	740	N/A
				Full	N/A	N/A	N/A	N/A	N/A	N/A	740	N/A
				High	125	267	338	N/A	N/A	N/A	740	N/A
			DL115	Low	N/A	N/A	N/A	N/A	283	477	740	740
				Full	N/A	N/A	N/A	N/A	N/A	N/A	740	740
				High	283	477	574	574	N/A	N/A	740	740
			DL115XR	Xtra-High	N/A	N/A	740	740	N/A	N/A	N/A	N/A
3.376	4	1-1/2	DL84	Low	N/A	N/A	N/A	N/A	41	178	740	N/A
				Full	N/A	N/A	N/A	N/A	N/A	N/A	658	N/A
				High	41	178	247	N/A	N/A	N/A	658	N/A
			DL115	Low	N/A	N/A	N/A	N/A	193	381	662	740
				Full	N/A	N/A	N/A	N/A	N/A	N/A	740	740
				High	193	381	474	474	N/A	N/A	740	740
			DL115XR	Xtra-High	N/A	N/A	740	740	N/A	N/A	N/A	N/A

5848 SHUT-OFF ΔP 2-WAY, LOW FLOW,UNBALANCED WITH CAGE-RETAINED SEAT

VALVE			ACTUATOR		Maximum Shut-off ΔP in PSI							
					Fail Closed Reverse Acting				Fail Open Direct Acting			
					Air Signal to Actuator See "Pneumatic Ranges"... bottom right				Air Signal to Actuator See "Pneumatic Ranges"... bottom right			
Trim Size (IN)	Valve Size (IN)	Plug Travel (IN)	Pneumatic Actuator	Spring Range	Range 1	Range 2	Range 3	Range 4	Range 1	Range 2	Range 3	Range 4
0.250	1/2 thru 1	3/4	DL49	Low	N/A	740	740	N/A	740	740	740	N/A
				Full	492	740	740	N/A	492	740	740	N/A
				High	740	740	740	N/A	740	740	740	N/A
			Cylinder 4"		N/A	N/A	N/A	N/A	740	740	740	740

NOTES:

1) 5848 leakage ratings are ANSI Class IV (Stainless Steel Trim), ANSI Class VI (TFE or PEEK Trim.)

2) Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.

3) The 3-15 and 1-17 ranges apply to valves with diaphragm actuators and control signals coming directly from I/P transducers with matching ranges. The 0-30 and 0-40 ranges apply to valves with diaphragm actuators and a positioner or an I/P transducer of suitable range. The 0-60, 0-80, 0-100, and 0-120 ranges apply to valves with cylinder actuators and a positioner.

4) N/A indicates that the air signal is not capable of providing any shut-off or it exceeds the actuator's maximum air pressure.
   Maximum air pressure
   DL49 . . . 30 PSIG CL4 . . . 120PSIG

5) See Actuators, Positioners, and Accessories section for explanation of spring ranges.

PNEUMATIC RANGES

	5843 & 5848 Diaphragm	5848 Cylinder
Range 1	3-15	0-60
Range 2	1-17	0-80
Range 3	0-30	0-100
Range 4	0-40	0-120

Fluid Temperature Limit Thresholds

The engineering data within our product specification will share information about MAX fluid temperature limits as if it is an absolute for any configurable valve assembly. It is not. The MAX fluid temperatures listed, sometimes as high as 800 Deg. F depending on the valve is only an absolute one for the valve body itself. It does not take into consideration the actuation or accessories. Actuators and accessories each have their own MAX ambient temperature limits that may be anywhere from 122 ºF to 250ºF depending on the items for the electronics or softs goods these items contain. ***It is nearly impossible to correlate JUST fluid temperature to determine when any of these actuators or accessories will have their ambient exceeded.***

THERE ARE SEVERAL FACTORS THAT INCLUDE BUT ARE NOT LIMITED TO:

- valve size
- actuator orientation
- room ambient temperature
- distance from the valve body to the components of interest
- bonnet style/size
- conducted heat versus radiated heat
- ventilation

With all of these variables it is a challenge to come up with some guidelines.

However, we have attempted to do that in the tables that follow on page 31. Realize these are only guidelines.

Actuator Mounting VS. *Insulating Blankets*

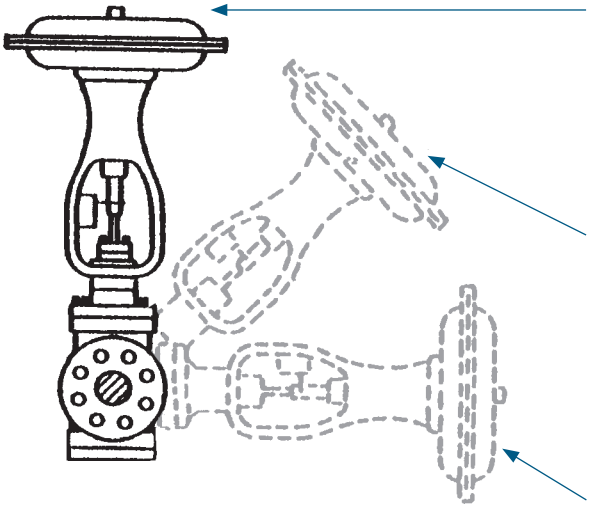
When working with higher fluid temperatures thermal insulating blankets can ***dramatically reduce surface temperatures on pipes, valves and other fixtures*** in a fluid control system such that the ambient room temperatures in these environments are dramatically reduced as well. This is often required in for valve actuators and accessories to reliably survive when fluid temperatures rise well above the safe ambient temperatures of the devices. Radiant heat and convected heat are the major sources for damage to these actuators and accessories. When a valve actuator is mounted to the side of a valve there is still radiant heat but convected heat is mostly eliminated. ***For globe control valves, having the actuator mounted vertically above the valve is best for optimum valve packing life but will then suffer the most with both radiant and convected heat to deal with.*** Alternatives to blankets and the mounting orientation listed include longer yoke actuators and extension bonnets on valves. These put distance between the heat sources and the components you are trying to protect from heat.

Choose the right blanket

ACOUSTIGUARD™ VS. THERMIGUARD™

At Warren Controls our ***AcoustiGuard™ & ThermiGuard™*** blankets are nearly identical. In fact they have identical thermal properties. The ***AcoustiGuard™*** has an additional layer of high density barium sulfate vinyl reflector for sound reflection. Each blanket is specifically designed in a one or two piece design that is made to be easily removable for valve servicing. When used in conjunction with high temperature fluids, significant energy savings, lower surface & ambient temperatures and a ***safer environment for employees are just some of the benefits***.

Predicting Safe Fluid Temperatures for Actuators & Accessories



VERTICAL ABOVE PIPING

This is the recommended position for mounting as it is the best position to ensure the service life of the equipment; however this is where it will encounter the most heat and sound vibrations.

45º FROM VERTICAL ABOVE PIPING ON EITHER SIDE

You may mount in this position to try to reduce the heat in high temperature applications; however this will reduce the life of the packing.

Actuators mounted in any position other than vertical MUST be supported independent of the valve.

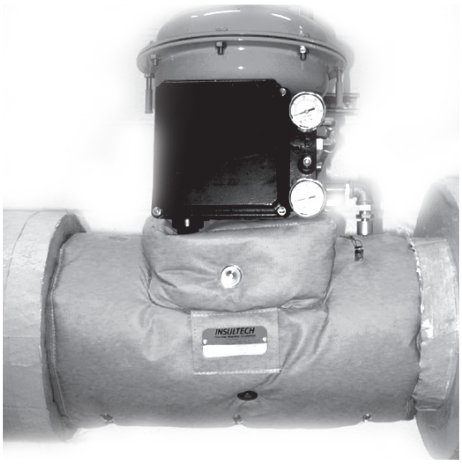
90º TO PIPING HORIZONTAL ON EITHER SIDE

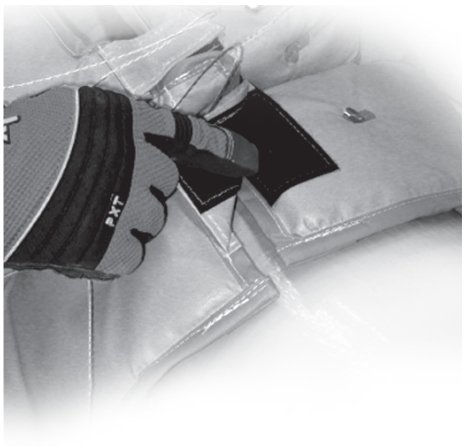
This is the worst possible position and creates great strain and limits the life of the internal components of the valve.

Actuators mounted in any position other than vertical MUST be supported independent of the valve.

The tables that follow on page 31 will identify temperature ranges, valve size ranges, actuator orientation and use of thermal blankets to determine what is required to get longevity out of your actuators and accessories.

HEAT/SOUND PRESURE LEVELS GUIDELINES





Whether you need to lower your mechanical room temperature, avoid getting burned, reduce harmful noise or save energy our blanket wraps are your solution!

AcoustiGuard™ & ThermiGuard™ are custom fit high quality insulation blanket systems pre-engineered to either reduce harmful noise, or save energy by retaining radiant heat. Both are designed to improve the surrounding work environment. While ***AcoustiGuard™*** is designed to act as a "sound attenuation" and thermal barrier, ***ThermiGuard™*** is capable of withstanding weather conditions and chemical environments. Both are capable of withstanding maximum service temperatures of 450°F (***AcoustiGuard™ & ThermiGuard™***) or up to 800°F with the High Temperature option. Any piece will not exceed 40 pounds. ***AcoustiGuard™*** comes with 2 fastening options: Lacing Pins & Metal "D" Ring Strap with Velcro Tab. In addition to these fastening options, ***ThermiGuard™*** comes with 2 additional fastening options: Velcro Flaps & Side Release Buckles. The ***AcoustiGuard™ & ThermiGuard™*** products are designed to be flexible and easier to install, easy to remove and reinstall, allowing quick access and easy equipment serviceability.

- ***EASY TO INSTALL & REINSTALL***
- ***CAN WITHSTAND UP TO 450°F OR 800°F***
- ***MULTIPLE FASTENING OPTIONS***

Sound Pressure Levels

107 dBA Source	A-Weighted Measurements	Linear Weighted Measurements
Test Frequency (In Hz)	1 1/2" Noise Reduction (In dBA)	1 1/2" Insertion Loss (In dBA)
100	13	13
125	14	13
160	13	13
200	13	13
250	13	12
315	15	15
400	19	19
500	25	25
630	26	33
800	39	39
1000	38	39
1250	42	42
1600	43	43
2000	43	43
2500	44	44
3150	45	44
4000	44	45
5000	46	45

Fluid Temperature Limit Guidelines

5800 DL 49 DIAPHRAGM ACTUATOR

Ensures reliable, long-term performance of diaphragm, seals and any included instrumentation.

STANDARD BONNET		
ACTUATOR ORIENTATION	Valves: 1/2" - 2"	Valves: 2.5" - 4"
	FLUID TEMPERATURE LIMIT	
Above the Valve	325°F	N/A
45° To the Side of the Valve	400°F	N/A
Either way w/ ThermiGuard*	450°F	N/A
EXTENSION BONNET		
ACTUATOR ORIENTATION	Valves: 1/2" - 2"	Valves: 2.5" - 4"
	FLUID TEMPERATURE LIMIT	
Above the Valve	650°F	N/A
45° To the Side of the Valve	750°F	N/A
Either way w/ ThermiGuard*	800°F	N/A

**Custom Fit Insulating Blankets, assumes pipes are insulated as well.*

5800 DL 84 DIAPHRAGM ACTUATOR

Ensures reliable, long-term performance of diaphragm, seals and any included instrumentation.

STANDARD BONNET		
ACTUATOR ORIENTATION	Valves: 1/2" - 2"	Valves: 2.5" - 4"
	FLUID TEMPERATURE LIMIT	
Above the Valve	375°F	350°F
45° To the Side of the Valve	425°F	400°F
Either way w/ ThermiGuard*	450°F	450°F
EXTENSION BONNET		
ACTUATOR ORIENTATION	Valves: 1/2" - 2"	Valves: 2.5" - 4"
	FLUID TEMPERATURE LIMIT	
Above the Valve	725°F	450°F
45° To the Side of the Valve	800°F	650°F
Either way w/ ThermiGuard*	800°F	800°F

**Custom Fit Insulating Blankets, assumes pipes are insulated as well.*

5800 DL 115 DIAPHRAGM ACTUATOR

Ensures reliable, long-term performance of diaphragm, seals and any included instrumentation.

STANDARD BONNET		
ACTUATOR ORIENTATION	Valves 1/2" - 2"	Valves: 2.5" - 4"
	FLUID TEMPERATURE LIMIT	
Above the Valve	N/A	450°F
45° To the Side of the Valve	N/A	N/A
Either way w/ ThermiGuard*	N/A	450°F
EXTENSION BONNET		
ACTUATOR ORIENTATION	Valves: 1/2" - 2"	Valves: 2.5" - 4"
	FLUID TEMPERATURE LIMIT	
Above the Valve	N/A	725°F
45° To the Side of the Valve	N/A	N/A
Either way w/ ThermiGuard*	N/A	800°F

**Custom Fit Insulating Blankets, assumes pipes are insulated as well.*

5800 ALL CYLINDER ACTUATORS

Ensures reliable, long-term performance of diaphragm, seals and any included instrumentation.

STANDARD BONNET		
ACTUATOR ORIENTATION	Valves: 1/2" - 2"	Valves: 2.5" - 4"
	FLUID TEMPERATURE LIMIT	
Above the Valve	325°F	300°F
45° To the Side of the Valve	375°F	350°F
Either way w/ ThermiGuard*	450°F	450°F
EXTENSION BONNET		
ACTUATOR ORIENTATION	Valves: 1/2" - 2"	Valves: 2.5" - 4"
	FLUID TEMPERATURE LIMIT	
Above the Valve	650°F	650°F
45° To the Side of the Valve	750°F	675°F
Either way w/ ThermiGuard*	800°F	800°F

**Custom Fit Insulating Blankets, assumes pipes are insulated as well.*

These are simply rough guidelines and not absolute thresholds.

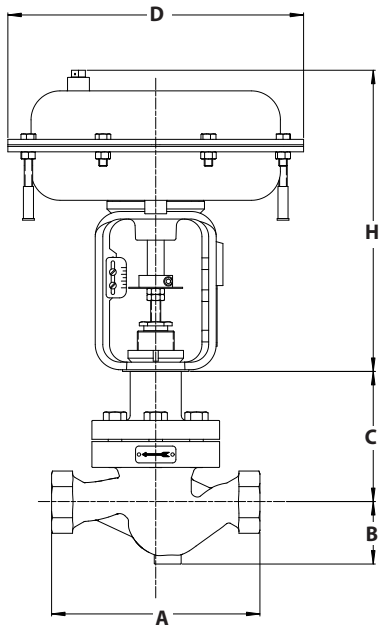
DIMENSIONS & WEIGHTS

DIMENSION (IN) 5840		VALVE SIZE (IN)							
		1/2	3/4	1	1-1/2	2	2-1/2	3	4
A	300THD	7-1/2	7-5/8	7-3/4	9-1/4	10-1/2	N/A	N/A	N/A
	300SWE	7-1/2	7-5/8	7-3/4	9-1/4	10-1/2	N/A	N/A	N/A
	150FLG	7-1/4	7-1/4	7-1/4	8-3/4	10	10-7/8	11-3/4	13-7/8
	300FLG	7-1/2	7-5/8	7-3/4	9-1/4	10-1/2	11-1/2	12-1/2	14-1/2
B		2	2-3/8	2-1/2	3-1/4	3-3/8	4	4-3/8	5-1/4
C	Standard	5	5	5	4-7/8	4-7/8	7	7	7
	Extension Bonnet	10	10	10	9-7/8	9-7/8	14	14	14

VALVE SIZE (IN)	WEIGHT (LB)							
	Standard				With Extension Bonnet			
	300THD	300SWE	150FLG	300FLG	300THD	300SWE	150FLG	300FLG
1/2	23	23	25	27	27	27	29	31
3/4	23	23	26	30	27	27	30	34
1	24	24	25	29	29	29	29	33
1-1/2	31	31	33	39	35	35	37	43
2	36	36	40	44	40	40	44	48
2-1/2	N/A	N/A	64	74	N/A	N/A	74	84
3	N/A	N/A	77	90	N/A	N/A	87	100
4	N/A	N/A	120	140	N/A	N/A	130	150

Consult factory for drawings, weights, and dimensions of configurations not shown.

Actual shipping weights may vary.



5840 THD/SWE w/DL49
or 49XR

DIMENSION (IN) 5843		VALVE SIZE (IN)		
		2-1/2	3	4
A	150FLG	10-7/8	11-3/4	13-7/8
	300FLG	11-1/2	12-1/2	14-1/2
B		4	4-3/8	5-1/4
C	Standard	7	7	7
	Extension Bonnet	14	14	14

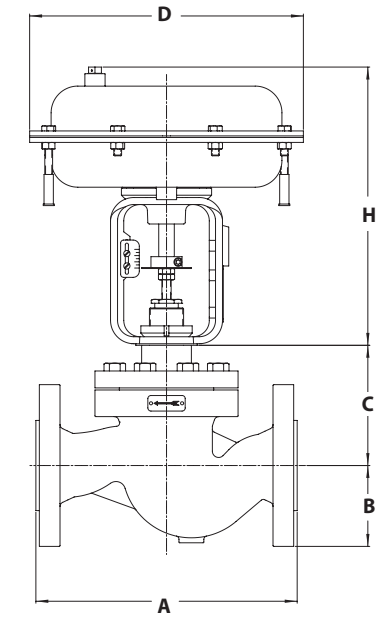
VALVE SIZE (IN)	WEIGHT (LB)			
	Standard		With Extension Bonnet	
	150FLG	300FLG	150FLG	300FLG
2-1/2	65	75	75	85
3	79	92	89	102
4	123	143	133	153

DIMENSION (IN) 5848		VALVE SIZE (IN)		
		1/2	3/4	1
A	300THD	7-1/2	7-5/8	7-3/4
	300SWE	7-1/2	7-5/8	7-3/4
	150FLG	7-1/4	7-1/4	7-1/4
	300FLG	7-1/2	7-5/8	7-3/4
B		2	2-3/8	2-1/2
C	Standard	5	5	5
	Extension Bonnet	10	10	10

VALVE SIZE (IN)	WEIGHT (LB)							
	Standard				With Extension Bonnet			
	300THD	300SWE	150FLG	300FLG	300THD	300SWE	150FLG	300FLG
1/2	23	23	25	27	27	27	29	31
3/4	23	23	26	30	27	27	30	34
1	24	24	25	29	29	29	29	33

Consult factory for drawings, weights, and dimensions of configurations not shown.

Actual shipping weights may vary.



5800 FLG w/DL49
or 49XR

Actuator	D (IN) Actuator	d (IN) Handwheel	H MAX (IN)		WEIGHT (LB)	
			STD*	With Handwheel	STD*	With Handwheel
DL49 Direct	11	6-3/8	12-1/4	16	25	CF
DL49 49XR Reverse	11	6-3/8	11-1/4	13-3/4	25	CF
DL84 Direct	13-7/8	8-1/8	16-3/4	24-1/8	48-1/2	CF
DL84 or 84XR Reverse	13-7/8	8-1/8	15-3/4	24	48-1/2	CF
DL115 Direct	16-3/4	10-1/8	28	37	105	CF
DL115 Reverse	16-3/4	10-1/8	30	45-1/2	CF	CF
DL115XR Reverse	16-3/4	10-1/8	30	45-1/2	CF	CF
4" Cylinder	7-1/8	N/A	14-1/2	N/A	20	N/A
6" Cylinder	10	N/A	18-1/8	N/A	28	N/A
8" Cylinder	12-3/4	N/A	18-1/4	N/A	41	N/A

*Includes 1-3/8 inch for air fitting on direct acting diaphragm actuators

CF = Consult Factory N/A = Not Available

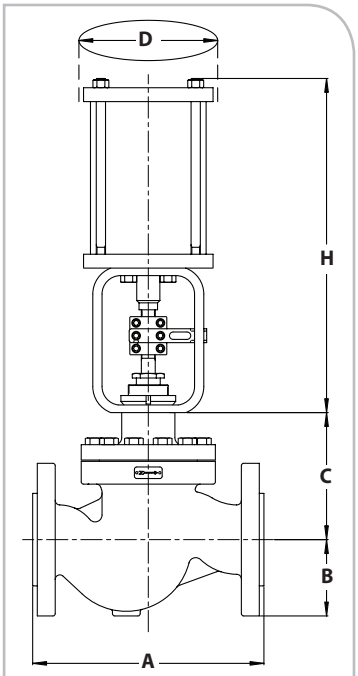
Face to face dimensions for NPT & SWE conform to ANSI/ISA S75.03 300# (Sizes 1/2 and 3/4 inch) and S75.12 Short 300# (Sizes 1 thru 2 inch) 150 & 300FLG conform to ANSI/ISA S75.03

Actuator Removal Clearance

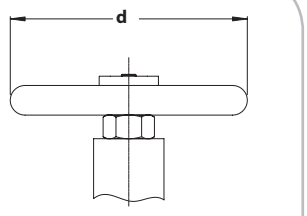
Above Actuator on 1/2 thru 2 inch valve allow 4-7/8 inches

Above Actuator on 2-1/2 thru 4 inch valve allow 5-5/8 inches

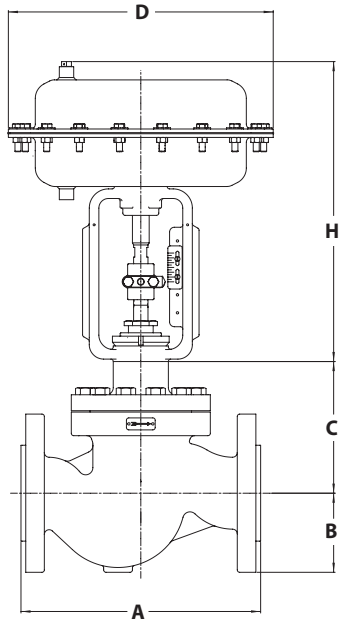
Actual shipping weights may vary.



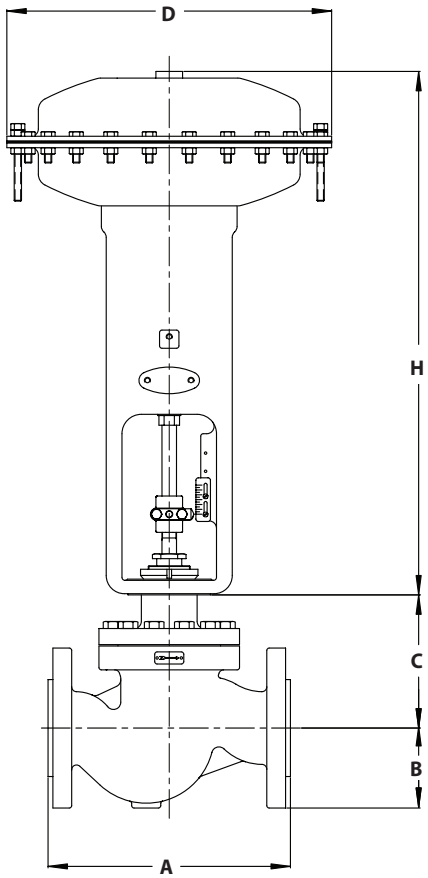
5800 w/CL4, 6, or 8



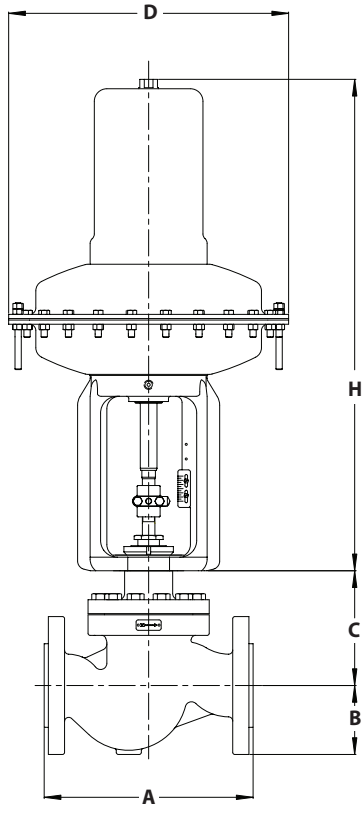
Top mounted handwheel



5800 w/DL84 or 84XR



5800 w/DL115 Direct



5800 w/DL115 or 115XR Reverse

DIAPHRAM ACTUATORS

Actuator		Spring Range (PSI)			
Size	Action	Low	Full	High	Xtra-High
DL49	Direct	3-9	4-13	8-12	N/A
DL49	Reverse	4-10	5-14	10-14	N/A
DL84 & DL115	Direct	3-9	3-15	9-15	N/A
DL84 & DL115	Reverse	3-9	3-15	9-15	N/A
DL49XR,DL84XR & DL115XR	Reverse	N/A	N/A	N/A	See Note
Note: The spring range of XR (eXtended Range) actuators varies with travel. These actuators require positioners or I/P's for modulating control					

Effective Area:	DL49, 49XR (49 Sq In), DL84 & 84XR (84 Sq In) DL115 & 115XR (115 Sq In)
Springs:	DL49, 49XR, 84 & 84XR Multiple DL115 Single DL115XR Dual
Max Air Supply:	DL49, 49XR, 84 & 84XR 30PSIG DL115 & 115XR 40PSIG
Air Connections:	1/4 NPT
Diaphragm:	Buna-N Fabric Reinforced
Diaphragm Chambers:	Steel
Yoke:	DL49, 49XR, 84, 84XR, DL115 & 115XR Ductile Iron
Stem:	300 Series Stainless Steel
Finish:	DL49, 49XR Epoxy-Coated DL84, 84XR, 115, & 115XR Acrylic Enamel
Ambient Temperature:	DL49, 49XR -20 to 160°F DL84, 84XR, 115 & 115XR -40 to 180°F
Mounting:	Vertical Above or Below Valve
Handwheel:	Available on DL49, 49XR, 84, 84XR, 115 & 115XR

CYLINDER ACTUATORS

Piston Diameter:	4, 6, & 8 Inch
Springs:	Single
Max Air Supply:	120PSIG
Air Connections:	1/4 NPT
Piston:	Aluminum
Cylinder:	Aluminum
Heads:	Aluminum, Black Anodized
Yoke:	Steel, Acrylic Painted
Stem:	416 Series Stainless Steel, Hard Chromate Plated
Ambient Temperature:	-25 to 250°F
Mounting:	Vertical Above or Below Valve

Note: Cylinder Actuators require a positioner for modulating control.

POSITIONERS

Split Ranging with Positioners

Positioners are sometimes used to "Split-Range" two control valves in a parallel configuration within a piping scheme. This technique is used to obtain higher rangeability than could otherwise be achieved with a single control valve. Typically one smaller valve supplying 15% to 35% of total flow is mated with a larger valve supplying 65% to 85% of total flow.

The best-matched pair will each be providing similar rangeability for each respective flow contribution to the manifold. Calculated as maximum flow /minimum controllable flow, the smaller valve should not be attempting to control flow below 5% of stroke. Estimate Cv from Cv tables vs.. stroke to calculate this.

The chosen positioners would then have a Low Range signal for the smaller valve and a High Range Signal for the larger valve. With this, a single control signal can be sequentially applied to each valve. At mid-signal range, the little valve is completely open while the larger valve is just starting to open. Controlability for wide process set point ranges is dramatically improved.

BLX Models:

BLX Pneumatic

Models:	2FP_: Full Range Signal (3-15 PSI 2LP_: Low Range Signal (3-9 PSIG) 2HP_: High Range Signal (9-15 PSIG)
Options:	2SPDT Limit Switches, 4-20 mA Feedback
Ingress & Corrosion Protection:	NEMA, 4X, IP66
Supply Pressure:	20 to145 PSIG Max **Not to exceed actuator rating**
Linearity error:	<0.7% f.s.
Hysteresis:	<0.4% f.s.
Repeatability:	<0.3% f.s.
Weight:	3.2 lbs

BLX Electro-Pneumatic

Models:	2FE_: Full Range Signal (4-20 mA) 2LE_: Low Range Signal (4-12 mA) 2HE_: High Range Signal (12-20 mA)
Options:	2SPDT Limit Switches, 4-20 mA Feedback
Ingress & Corrosion Protection:	NEMA, 4X, IP66
Supply Pressure:	20 to 145 PSIG **Not to exceed actuator rating**
Linearity error:	<1.0% f.s.
Hysteresis:	<0.6% f.s.
Repeatability:	<0.5% f.s.
Weight:	3.8 lbs

BLX Electro-Pneumatic Intrinsically Safe

Models:	2FI_: Full Range Signal (4-20 mA) 2LI_: Low Range Signal (4-12 mA) 2HI_: High Range Signal (12-20 mA)
Ingress & Corrosion Protection:	NEMA, 4X, IP66
Supply Pressure:	20 to 145 PSIG **Not to exceed actuator rating**
Linearity error:	<1.0% f.s.
Hysteresis:	<0.6% f.s.
Repeatability:	<0.5% f.s.
Weight:	3.8 lbs

BLX Electro-Pneumatic Explosion Proof

Models:	2FX_: Full Range Signal (4-20 mA) 2LX_: Low Range Signal (4-12 mA) 2HX_: High Range Signal (12-20 mA)
Ingress & Corrosion Protection:	NEMA, 4X, IP66
Supply Pressure:	20 to 145 PSIG **Not to exceed actuator rating**
Linearity error:	<0.8% f.s.
Hysteresis:	<0.5% f.s.
Repeatability:	<0.4% f.s.
Weight:	5.3 lbs

BLX Electro-Pneumatic Fail Freeze *

Models:	2FF_: Full Range Signal (4-20 mA) 2LF_: Low Range Signal (4-12 mA) 2HF_: High Range Signal (12-20 mA)
Options:	2SPDT Limit Switches, 4-20 mA Feedback
Ingress & Corrosion Protection:	NEMA, 4X, IP66
Supply Pressure:	20 to 100 PSIG **Not to exceed actuator rating**
Linearity error:	<1.2% f.s.
Hysteresis:	<0.9% f.s.
Repeatability:	<0.8% f.s.
Weight:	5.4 lbs

BLX All Models:

Construction:	Aluminum Housing with Polyester Coating
Action:	Direct or Reverse
Media:	Clean Dry Oil Free Air Filtered to 5 micron
Air Connections:	1/4 NPT
Flow Capacity:	
Electrical Connection:	1/2 NPT
Gauges:	Input 0-30 PSIG, Output 0-60 PSIG, Supply 0-60 PSIG, (Diaphragm Actuator), Output 0-100 PSIG, Supply 0-100PSIG (Cylinder Actuator), Housing Black Steel Case with Chrome Ring
Ambient Temperature:	-40 to 185°F (Except Fail Freeze - 20 to 158°F)
Mounting:	Yoke Mounted

Limit Switches and Feedback Options are NEMA 4X, IP66 only, and are not suitable for hazardous locations.

** For positioner code 2xF_, the BLX Positioner with the Fail Freeze module, check first with the factory for approval due to the space considerations on certain valve assembly combinations.*

Approvals - Positioners only

Ratings for hazardous locations:

V200-EX - Explosion Proof	
ATEX - Explosion Protection 1487X, instrinsically safe EEx ia llC T4/T5/T6	
FM and CSA Explosions Proof	CL I, II Div 1 Grp B-G
Intrinsically Safe FM CSA	 CL I-II-III Div 1 Grp A-G CL II Div 1&2 Grp E-G CL III
Non Incendive FM	CL 1 Div2 Grp A-C

Temperature Class

	Short Circut Current-max	Ambient Temp max
T6	50 mA	140 F (60 C)
T5	60 mA	158 F (70 C)
T4	60 mA	185 F (85 C)

Intrinsically Safe

V200-IS **ATEX** EEX ia llcT4/T6	
FM CL1 Div1 Grp A B C D	
CSA EX is CL1 Grp A B C D EX is CL 1 Div2 Grp A B C D	

Siemens 760 Models:

760P Pneumatic

Models: 76P_: Full Range Signal (3-15 PSIG)
Options Limit Switches, 4-20 mA Feedback *(Reduced feedback span for valves with less than 1 inch travel — Call factory for details.)*

760E Electro-Pneumatic

Models: 76E_: Full Range Signal (4-20 mA)
Options Limit Switches, 4-20 mA Feedback *(Reduced feedback span for valves with less than 1 inch travel — Call factory for details.)*

Approvals & Ratings:

FM Intrinsically Safe: Class I, Div 1, Groups A,B,C,D.
Class II, Div 1, Groups E,F,G.
Class III, Div 1.

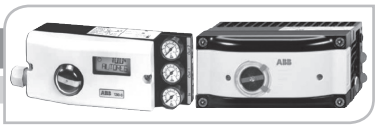
Non-Incendive: Class I, Div 2, Groups A,B,C,D.
Suitable for: Class II, Div 2, Groups F,G.
Class III, Div 2.

CSA Intrinsically Safe: Class I, Div 1, Groups A,B,C,D.
Class II, Div 1, Groups E,F,G.
Class III, Div 1.
Suitable for: Class I, Div 2, Groups A,B,C,D.
Class II, Div 2, Groups E,F,G.
Class III, Div 2.

All Models:

Construction: Aluminum Housing with Epoxy/Polyester Powder Coat
Ingress & Corrosion Protection: NEMA 4, 4X, IP65
Action: Direct or Reverse
Supply Pressure: 150 PSIG Max **Not to exceed actuator rating**
Media: Clean Dry Oil Free Air Filtered to 3 micron
Flow Capacity: 9.0 SCFM
Air Consumption: 0.5 SCFM Typical
Air Connections: 1/4 NPT
Electrical Connection: 3/4 NPT
Gauges: Input 0-30 PSIG,
Output 0-60 PSIG, (Diaphragm Actuator),
Output 0-100 PSIG (Cylinder Actuator),
Ambient Temperature: 760P -40 to 180°F, 760E - 40 to 167°F
Mounting: Yoke Mounted

ABB TZIDC Models:



4-20mA

Models: T0Z0: Full Range Signal (2-Wire, 4-20 mA), Explosion Protection: None
Calibration: Single-Button Auto-adjust Commissioning or Customized Auto-adjust
Operator Panel: 4 Push-Buttons and Two-Line LCD
Position Indicator: Mechanical
Options: None

4-20mA w/HART

Models: THN_: Full Range Signal (2-Wire, 4-20 mA), HART Protocol 5.1
Explosion Protection: Intrinsically Safe & Non-Incendive
Calibration: Single-Button Auto-adjust Commissioning or Customized Auto-adjust
Operator Panel: 4 Push-Buttons and Two-Line LCD
Position Indicator: Mechanical
Options: 4-20 mA Feedback Module, Digital Position Feedback Module, Proximity Switches NC, Proximity Switches NO.

Models: THX_: Full Range Signal (2-Wire, 4-20 mA), HART Protocol 5.1
Explosion Protection: Explosion Proof
Calibration: Single-Button Auto-adjust Commissioning or Customized Auto-adjust
Operator Panel: 4 Push-Buttons and Two-Line LCD
Position Indicator: Mechanical
Options: 4-20 mA Feedback Module, Digital Position Feedback Module, 24VDC/AC Micro-switches, Proximity Switches NC

PROFIBUS PA

Models: TPN_: Communication PROFIBUS PA Profile for Process Devices, Electro-Pneumatic Actuators, V3.0, In Compliance with IEC 61158-2
Explosion Protection: Intrinsically Safe & Non-Incendive
Calibration: Single-Button Auto-adjust Commissioning or Customized Auto-adjust
Operator Panel: 4 Push-Buttons and Two-Line LCD
Position Indicator: Mechanical
Options: Proximity Switches NC, Proximity Switches NO.

Models: TPX_: Communication PROFIBUS PA Profile for Process Devices, Electro-Pneumatic Actuators, V3.0, In Compliance with IEC 61158-2
Explosion Protection: Explosion Proof
Calibration: Single-Button Auto-adjust Commissioning or Customized Auto-adjust
Operator Panel: 4 Push-Buttons and Two-Line LCD
Position Indicator: Mechanical
Options: 24VDC/AC Microswitches, Proximity Switches NC.

FOUNDATION FIELDBUS ™

Models: TFN_:	Communication Foundation Fieldbus™ Version 1.4, In Compliance with IEC 61158-2
Explosion Protection:	Intrinsically Safe & Non-Incendive.
Calibration:	Single-Button Auto-adjust Commissioning or Customized Auto-adjust
Operator Panel:	4 Push-Buttons and Two-Line LCD
Position Indicator:	Mechanical
Options:	Proximity Switches NC.

Models: TFX_:	Communication Foundation Fieldbus™ Version 1.4, In Compliance with IEC 61158-2
Explosion Protection:	Explosion Proof
Calibration:	Single-Button Auto-adjust Commissioning or Customized Auto-adjust
Operator Panel:	4 Push-Buttons and Two-Line LCD
Position Indicator:	Mechanical
Options:	24VDC/AC Micro-switches, Proximity Switches NC.

APPROVALS & RATINGS: TZIDC Intrinsically Safe & Non-Incendive Models

FM

Intrinsically Safe:	Class I, II, III, Div. 1, Grp. A-B-C-D-E-F-G T6, T5, T4, Ta = 40 °C, 55 °C, 85 °C 96%1265 Entity, FISCO
Non-Incendive:	Class I, Div. 2, Grp. A-B-C-D T6, T5, T4, Ta = 40 °C, 55 °C, 96% °C
Suitable:	Class II, III, Div. 2, Grp. E-F-G T6, T5, T4, Ta = 40 °C, 55 °C, 85 °C

CSA

Intrinsically Safe:	Class I, Div. 1 Grp. A-B-C-D Class II, Div. 1 Grp. E-F-G Class III, Div. 1

APPROVALS & RATINGS: TZIDC Explosion Proof Models

FM

Explosion Proof:	Class I; Div 1; Grp. C-D T5, max. 82 °C
Dust Ignition-Proof:	Class II, III, Div 1 Grp. E-F-G T5; max. 82 °C

CSA

Explosion Proof:	Class I; Div 1; Grp. C-D Class II; Div 1; Grp. E-F-G Class III
Temperature range:	-40 … 85 °C T5, max. 85 °C ; T6, max. 70 °C

All Models:

Construction:	Aluminum Case with Electrostatic Dipping Varnish with Epoxy Resin Stove Hardened.
Ingress & Corrosion Protection:	IP65 / NEMA 4X
Action:	Direct or Reverse
Supply Pressure:	20 to 90PSIG **Not to exceed actuator rating**
Media:	Clean Dry Oil Free Air acc.to DIN / ISO 8573-1 Pollution and Oil Content According to Class 3 (Purity: Max. Particle Size: 5 µm, Max. Particle Density: 5 mg / m3; Oil Content: Max. Concentration: 1mg / m3; Pressure Dew Point: 10, K Below Operating Temperature
Output Flow Capacity:	2.3 SCFM at 20 PSIG, 6.0 SCFM at 90 PSIG
Air Consumption:	<0.015 SCFM (Independent of Supply Pressure)
Air Connections:	1/4-18 NPT
Electrical Connections:	1/2-14 NPT
Gauges:	Supply, Output
Ambient Temperature:	-40 to 185°F (Except with SJ2-S1N (NO) Proximity Switches -13 to 185°F)
Mounting:	Yoke Mounted
Available as Specials:	***(Contact Factory for Details and Available Models)*** Fail Freeze Function Safety Integrity Level SIL2 ATEX, GOST, IECEx Approvals Shutdown Module

OPTIONS:

F) 4-20 mA Feedback Module
Range 4-20mA (Configurable)Two-Wire circuitry, Power Supply 24VDC
NOTE: For 4-20mA w/HART Models ONLY

K) Digital Position Feedback Module
Two Switches For Digital Position Feedback (Position Adjustable Within The Range Of 0 … 100%, Ranges Cannot Overlap)
NOTE: For 4-20mA w/HART Models ONLY

L) 24VDC/AC Micro-switches
Two Micro-switches For Independent Position Signaling. Switching Points Adjustable Between 0 … 100%
NOTE: For Explosion Proof Models ONLY

P) Proximity Switches NC
Two Proximity Switches For Independent Position Signaling. Switching Points Adjustable Between 0 … 100%
Switch Type SJ2-SN (NC)

R) Proximity Switches NO
Two Proximity Switches For Independent Position Signaling. Switching Points Adjustable Between 0 … 100% Switch Type SJ2-S1N (NO)
NOTE: Ambient Temperature -13 to 185°F

ACCEPTABLE OPTION COMBINATIONS					
w/	F*	K*	L‡	P	R
F*		Yes	Yes	Yes	Yes
K*	Yes		Yes	Yes	Yes
L‡	Yes	Yes		No	No
P	Yes	Yes	No		No
R	Yes	Yes	No	No	

*** For 4-20mA w/ HART Models Only**

‡ For Explosion Proof Models ONLY

POSITION INDICATION SWITCHES

Proximity Mark 1

Models:
PX11: 2 SPDT Switches
Ambient Temperature: -58 to 176°F Continuous (Rated to 350°F for 600 hours)

PX12: 2 SPDT Switches w/ 2K Potentiometer
Ambient Temperature: -40 to 176°F
Power Rating: 1.5 Watt Maximum

PX13: 2 SPDT Switches w/ 4-20 mA Feedback w/2K OHM Pot
Ambient Temperature: -40 to 176°F
Power Requirement: 5 to 30 Vdc
Current Consumption: 50 mA

PX14: 4 SPDT Switches
Ambient Temperature: -58 to 176°F Continuous (Rated to 350°F for 600 hours)

PX15: 6 SPDT Switches
Ambient Temperature: -58 to 176°F Continuous (Rated to 350°F for 600 hours)

PX16: 4-20mA Transmitter, 2K OHM Pot, No Switches
Ambient Temperature: -40°F to 176°F
Power Requirements: 5 to 30 Vdc
Current Consumption: 50mA

All Models:
Locations: NEMA 1, 2, 3, 3R, 3S, 4, 4X, 6, 7, 9, 12, 13
Approvals: & Ratings:
UL: Class I, Div. 1 & 2, Groups B, C, D; Class II, Div. 1 & 2, Groups E, F, & G
CSA: Class I, Div. 1 & 2, Groups A, B, C, D; Class II, Div. 1 & 2, Groups E, F, & G

Construction: Aluminum Housing, Hard Anodized
Electrical Connection: Screw Terminal
Conduit Connection: 3/4 NPT
Mounting: Yoke Mounted

I/P's

Type 500X

Locations:	NEMA 4X
Construction:	Zinc Alloy Base with Aluminum Bonnet, Epoxy Painted
Ranges:	3-9, 9-15, 3-15, 1-17, or 6-30 PSI
Supply Pressure:	Minimum 3 PSIG Above Maximum Output Maximum 100 PSIG **Not to exceed actuator rating**
Flow Capacity:	4.5 SCFM at 25 PSIG,12 SCFM at 100 PSIG
Air Consumption:	0.05 SCFM Midrange Typical
Ambient Temperature:	-20 to 140°F

Type 550X

Locations:	NEMA 4X (IP65)
Construction:	Chromate-treated Aluminum with Epoxy Paint
Ranges:	0-30, or 0-60 PSI
Supply Pressure:	Minimum 5 PSIG Above Maximum Output Maximum 100 PSIG **Not to exceed actuator rating**
Flow Capacity:	12 SCFM at 100 PSIG
Air Consumption:	6.0 SCFH Midrange Typical
Ambient Temperature:	-20 to 150°F

Type 950X

Locations:	NEMA 4X (IP65), Explosion proof
Construction:	Chromate-treated Aluminum with Epoxy Paint
Ranges:	3-15 PSI
Supply Pressure:	Minimum 5 PSIG Above Maximum Output Maximum 100 PSIG **Not to exceed actuator rating**
Flow Capacity:	4.5 SCFM at 25 PSIG
Air Consumption:	3.0 SCFH Midrange Typical.
Ambient Temperature:	-40 to 160°F

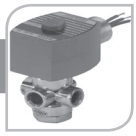
I/P's All Models:

Input:	4-20 mA Field Reversible
Air Connections:	1/4 NPT
Electrical Connection:	1/2 NPT, Pigtail Leads
Media:	Clean Dry Oil Free Air Filtered to 40 micron
Mounting:	Yoke Mounted

AIR FILTER REGULATORS

Models:	Type 300, Type 350SS
Output Ranges:	Type 300, 0-30, 0-60, or 0-120 PSIG Type 350SS, 0-100 PSIG
Supply Pressure:	Type 300, 250 PSIG Maximum Type 350SS, 290 PSIG Maximum
Construction:	Type 300, Die-Cast Aluminum with Irridite and Baked Epoxy Paint Type 350SS, 316 Stainless Steel
Gauge:	Type 300, Output, Housing Steel Painted Type 350SS,Output, Housing Stainless Steel
Air Connections:	1/4 NPT
Filter:	Type 300, 5 micron (TZIDC Positioners Require 5 micron Filter). Type 350SS, 25 micron
Mounting:	Chamber Mounted (Diagram Actuator) Remote Mounted (Cylinder Actuator)

SOLENOIDS



Models:	<u>For use with Diaphragm Actuators or Positioners with Cylinder Actuators</u> 8320G184, EF8320G184, 8320G202, EF8320G202 <u>For use with Cylinder Actuators without Positioners</u> 8342G1, EF8342G1, 8342G701, EF8342G701
Construction:	(EF)8320G184, 3-Way Brass (EF)8320G202, 3-Way Stainless Steel (EF)8342G1, 4-Way Brass (EF)8342G701, 4-Way Stainless Steel
Locations:	83206G184, 8320G202, 8342G1, & 8342G701 Watertight, Types 1, 2, 3, 3S, 4, and 4X EF8320G184, EF8320G202, EF8342G1 & EF8342G701 Explosion proof and Watertight, Types 3, 3S, 4, 4X 6, 6P, 7 & 9
Supply:	120VAC (All), 24Vdc (8320G184)
Ambient Temperature:	+32 to 125°F
Air Connections:	1/4 NPT
Electrical Connection:	1/2 NPT, Pigtail Leads
Approvals:	CSA, UL, CE
Mounting:	Chamber Mounted

AIR TUBING

Standard:	Copper
Optional:	Stainless Steel

CONFIGURATIONS

1. SELECTIONS Please make a selection from each table of OPTIONS below to make a complete model number string.

2. OPTIONS

58□-□□ □□□ □ □ □ □ □ □ □ □

VALVE BODY

Model	Valve Type	Size	Body Material	End Connection	Trim Style	Trim Material	Trim Cv	Packing Type	Bonnet Construction
58N 1/2"-2" Bodies Diaphragm: 49 or 84 Sq. In. Cylinder: 4" or 6"	**40** Single Seat 2-Way, Unbalanced w/Cage Retained Seat	**050** 1/2 inch	**W** WCB	**F** 150 lb. Flanged	**E** Equal %	**S** 316 Stainless Steel*	**F** Full Port	**T** Teflon	**S** PEEK Bearings
58H 2.5"-4" Bodies Diaphragm: 84 or 115 Sq. In. Cylinder: 6" or 8"	**43** Single Seat 2-Way, Cage Balanced w/Cage, Retained Seat	**075** 3/4 inch	**F** CF8M	**G** 300 lb. Flanged	**L** Linear	**T** TFE Soft Seats	**1** 1st Port Reduction	**G** Graphite	**8** Z PEEK Bearings
	48 Single Seat 2-Way, Low Flow Unbalanced w/cage Retained Seat (1/2"-1" sizes only)	**100** 1 inch		**S** NPT Screwed	**M** Mod. Lin.	**P** PEEK Soft Seats	**2** 2nd Port Reduction	**V** Vacuum Service	**G** Copper Based Graphalloy Bearings w/ Ext Bonnet
		150 1-1/2 inch		**W** Socket Weld		**6** Alloy 6 Wrapped 316SS	**3** 3rd Port Reduction	**L** EPDM	**L** Nickel Based Graphalloy Bearings w/ Ext Bonnet
		200 2 inch				**7** 400 Stainless Steel	**4** 4th Port Reduction		**7** Oxidation Resistant Graphalloy Bearings w/ Ext Bonnet
		250 2-1/2 inch				**8** Alloy 6 Wrapped 400SS			
		300 3 inch							
		400 4 inch							

***NOTE:** S and W only available in 1/2" - 2" sizes.*

***NOTE:** Type 48 Mod.Lin. Only*

**Type 48, 316 SS trim uses a harder Nitronic 60 seat.*

***NOTE:** Check Factory for Availability of Reduced Trims*

TS	***Teflon Packing, Peek Bearings***
GS	***Graphite Packing, Peek Bearings***
VS	***Teflon Packing, PEEK Bearings, Vacuum Service***
LS	***EPDM Packing, Peek Bearings***
T8	***Teflon Packing, Z Peek Bearings***
G8	***Graphite Packing, Z Peek Bearings***
V8	***Teflon Packing, Z PEEK Bearings, Vacuum Service***
L8	***EPDM Packing, Z Peek Bearings***
GG	***Graphite Packing and Gaskets, Copper Based Graphalloy Bearings , Extension Bonnet***
GL	***Graphite Packing and Gaskets, Nickel Based Graphalloy Bearings , Extension Bonnet***
G7	***Graphite Packing and Gaskets, Oxidation Resistant Graphalloy Bearings, Extension Bonnet***

APPLICATION SELECTION TIPS

PACKING

- Use Teflon for most fluids below 450°F except water.
- Use EPDM Packing for water service only. Do not use on oils, hydrocarbons and acids.
- Use Graphite Packing for fluids above 450°F.

BONNET CONSTRUCTION

- Use PEEK Bearings for most applications below 450°F that are not steam.
- Use Z PEEK for steam applications below 450°F.
- Use Graphalloy Bearings w/ext. bonnet above 450°F. See page 9 for further selection criteria on Graphalloy Type.

ACID SERVICE

For Acid Service , special rulon bearings are required. Consult Factory.

VALVE TYPE/TRIM MATERIAL COMBINATIONS:

TRIM MATERIAL						
SIZE	S 316 SS	T TFE Soft Seats	P PEEK Soft Seats	6 Alloy 6/316 SS	7 400 SS	8 Alloy 6/400 SS
050 1/2 inch	40, 48	40, 48	40, 48	40	40	40
075 3/4 inch	40, 48	40, 48	40, 48	40	40	40
100 1 inch	40, 48	40, 48	40, 48	40	40	40
150 1-1/2 in.	40	40	40	40	40	40
200 2 inch	40	40	40	40	40	40
250 2-1/2 in.	40, 43	40	40	40	40, 43	40,43
300 3 inch	40, 43	40	40	40	40,43	40,43
400 4 inch	40, 43	40	40	40	40,43	40, 43

VALVE TYPE/ACTUATOR COMPATIBILITY:

VALVE STYLE	VALVE SIZES	ACTUATORS
Type 5840	1/2"—2"	DL49, Cylinder 4"
Type 5840	1/2"—4"	DL84
Type 5840	3/4"—2"	DL49XR
Type 5840	1-1/2"—2"	DL84XR
Type 5840	1-1/2"—4"	Cylinder 6"
Type 5840	2-1/2"—4"	DL115, DL115XR & Cylinder 8"
Type 5843	2-1/2"—4"	DL84, DL115 & DL115XR
Type 5848	1/2"—1"	DL49, Cylinder 4"

See Shut-Off ΔP Ratings for details.

FLUID TEMPERATURE LIMITS

Valve Type	Body Material & Code	End Construction & Code	Trim Material & Code	Packing Type & Code	Bonnet Construction & Code	T MAX	T MIN
40 2-Way Single Seat	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**, Alloy 6 Wrapped 316 SS **6**, 400 SS **7**, Alloy 6 Wrapped 400 SS **8**	EPDM **L**	PEEK **S**, Z PEEK **8**	400°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**, Alloy 6 Wrapped 316 SS **6**, 400 SS **7**, Alloy 6 Wrapped 400 SS **8**	Teflon **T**, Vacuum Service **V**	PEEK **S**, Z PEEK **8**	450°F	60°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**, Alloy 6 Wrapped 316 SS **6**, 400 SS **7**, Alloy 6 Wrapped 400 SS **8**	Graphite **G**	PEEK **S**, Z PEEK **8**	450°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	Teflon **T**	EPDM **L**	PEEK **S**, Z PEEK **8**	250°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	Teflon **T**	Teflon **T**, Vacuum Service **V**	PEEK **S**, Z PEEK **8**	250°F	60°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	Teflon **T**	Graphite **G**	PEEK **S**, Z PEEK **8**	250°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	PEEK **P**	EPDM **L**	PEEK **S**, Z PEEK **8**	400°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	PEEK **P**	Teflon **T**, Vacuum Service **V**	PEEK **S**, Z PEEK **8**	450°F	60°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	PEEK **P**	Graphite **G**	PEEK **S**, Z PEEK **8**	450°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**, Alloy 6 Wrapped 316 SS **6**, 400 SS **7**, Alloy 6 Wrapped 400 SS **8**	Graphite **G**	Copper Based Graphalloy Bearings w/ Ext Bonnet **G**	750°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**, Alloy 6 Wrapped 316 SS **6**, 400 SS **7**, Alloy 6 Wrapped 400 SS **8**	Graphite **G**	Nickel Based Graphalloy Bearings w/ Ext Bonnet **L**	750°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**, Alloy 6 Wrapped 316 SS **6**, 400 SS **7**, Alloy 6 Wrapped 400 SS **8**	Graphite **G**	Oxidation Resistant Graphalloy Bearings w/ Ext Bonnet **7**	800°F	-20°F
43 2-Way Cage Balanced	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**	316 **S**, 400 SS **7**, Alloy 6 Wrapped 400 SS **8**	EPDM **L**	PEEK **S**, Z PEEK **8**	400°F	23°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**	316 **S**, 400 SS **7**, Alloy 6 Wrapped 400 SS **8**	Teflon **T**, Vacuum Service **V**	PEEK **S**, Z PEEK **8**	450°F	60°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**	316 **S**, 400 SS **7**, Alloy 6 Wrapped 400 SS **8**	Graphite **G**	PEEK **S**, Z PEEK **8**	450°F	23°F
	WCB **W**, CF8M **F**	For High Temperature Service w/ Balanced Trim, Various Special Seals are used. Call the Factory for Construction Details.			Copper Based Graphalloy Bearings w/ Ext Bonnet **G**	Temperatures Vary Call the Factory for Details.	
	WCB **W**, CF8M **F**				Nickel Based Graphalloy Bearings w/ Ext Bonnet **L**		
	WCB **W**, CF8M **F**				Oxidation Resistant Graphalloy Bearings w/ Ext Bonnet **7**		
48 2-Way Single Seat Low-Flow	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**	EPDM **L**	PEEK **S**, Z PEEK **8**	400°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**	Teflon **T**, Vacuum Service **V**	PEEK **S**, Z PEEK **8**	450°F	60°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**	Graphite **G**	PEEK **S**, Z PEEK **8**	450°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	Teflon **T**	EPDM **L**	PEEK **S**, Z PEEK **8**	250°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	Teflon **T**	Teflon **T**, Vacuum Service **V**	PEEK **S**, Z PEEK **8**	250°F	60°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	Teflon **T**	Graphite **G**	PEEK **S**, Z PEEK **8**	250°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	PEEK **P**	EPDM **L**	PEEK **S**, Z PEEK **8**	400°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	PEEK **P**	Teflon **T**, Vacuum Service **V**	PEEK **S**, Z PEEK **8**	450°F	60°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**	PEEK **P**	Graphite **G**	PEEK **S**, Z PEEK **8**	450°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**	Graphite **G**	Copper Based Graphalloy Bearings w/ Ext Bonnet **G**	750°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**	Graphite **G**	Nickel Based Graphalloy Bearings w/ Ext Bonnet **L**	750°F	-20°F
	WCB **W**, CF8M **F**	150 lb **F**, 300 lb **G**, NPT **S**, Socket Weld **W**	316 **S**	Graphite **G**	Oxidation Resistant Graphalloy Bearings w/ Ext Bonnet **7**	800°F	-20°F

NOTE: -20°F T MIN temperature limit is for indoor applications with low humidity where ice will not form on the valve stem.

ALL GRAPHALLOY BEARINGS ARE SPECIAL ORDER AT TIME OF ORDER AND MAY IMPACT DELIVERY TIMES.

CONFIGURATIONS CONT.

1. SELECTIONS Please make a selection from each table of OPTIONS below to make a complete model number string.

2. OPTIONS

- ☐☐ | ☐ | ☐ | ☐ — **ACTUATOR**
- ☐☐☐☐ | ☐ | ☐ | ☐ — **ACCESSORIES**

ACTUATOR

Actuator Series

00 None

DIAPHRAGMS:

49 DL49 (49 Sq.In.)
84 DL84 (84 Sq.In.)
4X DL49XR
8X DL84XR (84 Ext. Rng.) for 58N only
15 DL115 (115 Sq.In.)
5X DL115XR

CYLINDERS:

C1 4" Spring Fail
C2 6" Spring Fail
C3 8" Spring Fail

NOTE: *4X, 5X & 8X Only in Xtra-High Spring Range, Reverse Acting*

Action

O None
R Reverse Stem Fail Down
D Direct Stem Fail Up

Spring Range

O None
L Low 3-9psi 49D, 84 & 115 4-10psi 49R
F Full 3-15psi 84 & 115 5-14psi 49R; 4-13psi 49D
H High 9-15 psi 84 & 115 10-14psi 49R 8-12 psi 49D
X Xtra-High DL49XR DL84XR & DL115XR

Handwheel

O None
R Reverse
D Direct

NOTE: *Must match action.*

FAILURE MODES:

MODE	ACTUATOR ACTION
Closed	Reverse
Open	Direct

ACCESSORIES

Positioners, I/P's & Limit Switches

0000 None

POSITIONERS:

2xP_ BLX Pneumatic
2xE_ BLX ElectroPneumatic
2xI_ BLX ElectroPneu. Intrn. Safe
2xX_ BLX ElectroPneu. Exp. Proof
2xF_ BLX ElectroPneu. Fail Freeze ‡
76P_ Siemens 760 Pneumatic *
76E_ Siemens 760 Electro-Pneumatic *
TOZO ABB TZIDC 4-20mA. *
THN_ ABB TZIDC 4-20mA w/HART Intrn. Safe & Non-Incend *
TPN_ ABB TZIDC PROFIBUS PA Intrn. Safe & Non-Incend.
TFN_ ABB TZIDC FOUNDATION Fieldbus Intrn. Safe & Non-Incend.
THX_ ABB TZIDC 4-20mA w/HART Exp. Proof *
TPX_ ABB TZIDC PROFIBUS PA Exp. Proof
TFX_ ABB TZIDC FOUNDATION Fieldbus Exp. Proof

PROXIMITY SWITCHES:

PX11 Mark 1 Series - 2 ea. SPDT
PX12 Mark 1 Series - 2 ea. SPDT w/2k Pot.
PX13 Mark 1 Series - 2 ea. SPDT w/4-20 Feedback
PX14 Mark 1 Series - 4 ea. SPDT
PX15 Mark 1 Series - 6 ea. SPDT
PX16 Mark 1 Series - 4-20mA Feedback Only

I/P's Use with Diaphragm Only

MAP1 Type 500X I/P, 3-9 PSI
MAP2 Type 500X I/P, 9-15 PSI
MAP3 Type 500X I/P, 3-15 PSI
MAP4 Type 500X I/P, 1-17 PSI
MAP5 Type 500X I/P, 6-30 PSI
MAP6 Type 550X I/P, 0-30 PSI
MAP7 Type 550X I/P, 0-60 PSI- For 15 or 5X only
MAP9 Type 950X I/P, 3-15 EXP

4th digit spec.

O No Additions
L w/Mech. Lmt Swtch's
F w/4-20 Feedback
B w/Swtch's & Feedbck

Note: *L, F & B not available for BxI or BxX*

x digit spec.

F Full Range Signal, 3-15 PSI or 4-20mA
L Low of Split Range, 3-9 PSI or 4-12mA
H High of Split Range, 9-15 PSI or 12-20mA

4th digit spec.

INDIVIDUAL OPTIONS

O No Additions
F w/4-20 Feedback Module (4-20mA w/HART Models ONLY)
K w/Digital Position Feedback Module (4-20mA w/HART Models ONLY)
L w/ 24VDC/AC Micro-Switch's (Exp. Proof Models ONLY)
P w/Proximity Switch's NC

OPTION COMBINATIONS
(For 4-20mA w/HART Models ONLY)

A = F & K
B = F & L (EXP. PROOF MODELS ONLY)
C = F & P
E = K & L (EXP. PROOF MODELS ONLY)
G = K & P
J = F & K & L (EXP. PROOF MODELS ONLY)
M = F & K & P

See Actuators, Positioners, & Accessories Section of Product Specification for details.

* Available with Split Ranges, Select "**S**" in Special Options

‡ For positioner code 2xF_, the BLX Positioner with the Fail Freeze module, check first with the factory for approval due to space considerations on certain valve assembly combinations.

Air Filter Regulators

O None
A Type 300, 0-30 PSI, 5 micron Filter
B Type 300, 0-60 PSI 5 micron Filter
C Type 300, 0-120 PSI, 5 micron Filter
D Type 350SS, 0-100 PSI, 25 micron Filter

ASCO Solenoids

O None

120 VAC COILS

A 8320G184 3-Way Brass
B 8320G202 3-Way SS
J 8342G1 4-Way Brass
K 8342G701 4-Way SS
L EF8320G184 3-Way EXP Br.
M EF8320G202 3-Way EXP SS
V EF8342G1 4-Way EXP Br.
W EF8342G701 4-Way EXP SS

24 Vdc COILS

Z 8320G184 3-Way Brass

Special Options

O None
S Special Opts or Set-up
T SS Tubing
G SS Tagging
B SS Tubing and Tagging

Note: Standard pneumatic tubing is copper. SS tubing "**T**" is optional.
SS tagging "**G**" (Two lines, 24 characters/line) is optional.
SS tubing and tagging together "**B**" is optional.

ACTUATOR/BODY COMPATIBILITY:

DIAPHRAGM	BODY
49 49 Sq.In. (DL49)	For 58N Bodies
4X DL49XR	For 58N Body
84 84 Sq.In. (DL84)	All Bodies
8X DL84XR	For 58N Bodies
15 115 Sq.In. (DL115)	For 58H Bodies
5X DL115XR	For 58H Bodies
CYLINDERS	**BODY**
C1 4" Spring Fail	For 58N40 Only
C2 6" Spring Fail	For 58N40 & 58H40 Only
C3 8" Spring Fail	For 58H40 Only

Warren Controls does not assume responsibility for the selection, use, or maintenance of any product. Responsibility for proper selection, use, and maintenance of any Warren Controls product remains solely with the purchaser and end-user.

POSITIONERS

Valve Type	Actuator Action	Input Signal					Failure Modes		
		Pneumatic	Electro-Pneumatic	PROFIBUS PA	Foundation Fieldbus	Increasing Signal	Loss of Signal Valve Fails…[1]	Loss of Power Valve Fails…[2]	Loss of Air Supply Valve Fails…
5840, 43 & 48	Direct	3-15 PSI	4-20 mA	PROFIBUS Protocol	Fieldbus Protocol	Closes Valve	Open	Open	Open
	Reverse	3-15 PSI	4-20 mA	PROFIBUS Protocol	Fieldbus Protocol	Opens Valve	Closed	Closed	Closed

[1] Valves with Fail Freeze Positioners Fail in Last Position on Loss of Signal.

[2] PROFIBUS PA or Foundation Fieldbus ONLY

POSITIONER FEEDBACK

Valve Type	Actuator Action	Feedback Signal[3]	Signal Increases as
5840, 43 & 48	Direct	4-20 mA	Valve Closes
	Reverse	4-20 mA	Valve Opens

[3] Reduced feedback span for valves with 760 and less than 1 inch travel.

POSITIONER LIMIT SWITCHES

Valve Type	Position	Settings	
		Switch 1	Switch 2
5840, 43 & 48	Valve Closed	Closed	Open
	Valve Open	Open	Closed

I/P'S

Valve Type	Actuator Action	Input Signal	Increasing Signal	Failure Modes	
				Loss of Signal Valve Fails…	Loss of Air Supply Valve Fails…
5840, 43 & 48	Direct	As Required For Shut-off	Closes Valve	Open	Open
	Reverse	As Required For Shut-off	Opens Valve	Closed	Closed

SOLENOIDS (WITHOUT POSITIONERS OR I/P'S)

Valve Type	Actuator Action	Solenoid Energized	Failure Modes		
			Loss of Signal Valve Fails…	Loss of Air Supply Valve Fails…	Solenoid De-energized Valve Fails…
5840, 43 & 48	Direct	Closes Valve	Open	Open	Open
	Reverse	Opens Valve	Closed	Closed	Closed

If the Solenoid is used with a Positioner or an I/P, refer to the Positioner or I/P listings for factory default settings and failure modes with the solenoid not failed.

AIR FILTER REGULATORS

Actuator	Output Pressure
DL49, 49XR, 84 & 84XR	30PSIG
DL115 & 115XR	40PSIG
4", 6" & 8" Cylinder	100PSIG

PROXIMITY MARK 1 POSITION INDICATION SWITCHES FEEDBACK

Valve Type	Actuator Action	Feedback Signal		Feedback Signal Increases as
		Potentiometer[4]	mA	
5840, 43 & 48	Direct	0-350 ohm	4-20 mA	Valve Closes
	Reverse	0-350 ohm	4-20 mA	Valve Opens

[4]Span varies from approx 155 to 350 ohm depending on actuator and travel.

LIMIT SWITCHES

Valve Type	Position	Settings	
		Switch 1, 3, 5	Switch 2, 4, 6
5840, 43 & 48	Valve Closed	Closed	Open
	Valve Open	Open	Closed

5800 PRODUCT SPECIFICATION

1800 SERIES
Heavy Globe Control Valves

styles:

- 2-way balanced
- 2-way unbalanced
- 3-way mixing
- 3-way diverting

sizes	1/2 to 12 in.
class	250 & 300
ends	125 FF, 150, 250, 300 RF flg
body	Cast Iron, WCB,CF8M, Bronze (ASTM B61)
trim	316 SST, Alloy 6
Cv	up to 1649
temp.	-20° to 800°F
body limit	to 740 psi
leakage rates	class III, IV, IV+
rangeability	50:1

- Heavy Duty
- Severe Service
- High Pressure Differentials
- Corrosive Materials, Liquids, Gases & Steam
- Modulating or On/Off Control

2800 SERIES
Precision Globe Control Valves

styles:

- 2-way unbalanced
- 2-way low flow
- 3-way mixing
- 3-way diverting

sizes	1/2 to 2 in.
class	250 & 300
ends	Buttweld, NPT
body	Bronze, CF8M
trim	Bronze, 316 SST 17-4pH, Alloy 6, TFE, PEEK
Cv	up to 40
temp.	-20° to 500°F
body limit	to 720 psi
leakage rates	class III,IV, VI
rangeability	50:1

- Economical
- Precision Control
- Suited for Gases, Steam, or Liquids that are Not Viscous or Solids Bearing

2900 SERIES
High Capacity General Purpose Globe Control Valves

styles:

- 2-way balanced
- 2-way unbalanced
- 3-way mixing
- 3-way diverting

sizes	2-1/2 to 10 in.
class	125 & 250
ends	125 FF, 250 RF flg
body	Cast Iron
trim	Bronze, 300 SS, 17-4pH, Alloy 6
Cv	up to 960
temp.	-20° to 400°F
body limit	to 400 psi
leakage rates	class II, III, IV
rangeability	50:1

- High Capacity
- General Purpose
- Moderate Pressure Drops
- Compatible Liquids and Gas, Steam & Water
- Modulating or On/Off Control

3800 SERIES
E-Ball Rotary Control Valves

styles:

- 2-way rotary
  - flow to open
  - flow to close

sizes	1 to 8 in.
class	300
ends	150,300 RF flg
body	WCB, CF8M, Custom Alloys
trim	316 SST, Alloy 6, Ceramic, TFE, PEEK
Cv	up to 1420
temp.	-20° to 800°F
body limit	to 740 psi
leakage rates	class III, IV, IV+, VI
rangeability	100:1

- Eccentric, Segmented Ball
- Well Suited for Erosive Service
- Various Trim Options Include Ceramic for Slurries or Gritty Materials & Teflon® for Class VI Shutoff

5800 SERIES
Compact Globe Control Valves

styles:

- 2-way unbalanced cage retained seat
- 2-way low flow unbalanced cage retained seat
- 2-way cage balanced cage retained seat

sizes	1/2 to 4 in.
class	300
ends	150,300 RF flg, Socketweld, NPT
body	WCB, CF8M, Bronze (ASTM B61)
trim	316 SST, 400 SST, Alloy 6, TFE, PEEK
Cv	up to 170
temp.	-20° to 800°F
body limit	to 740 psi
leakage rates	class IV, IV+, VI
rangeability	50:1

- Highly Efficient, Compact Design
- High Pressure Drops
- Typically Suited for High Force Piston Actuators for Steam, Chemicals & Dirty Fluids