# 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_RevR_0426

5800 PRODUCT SPEC

WARREN CONTROLS

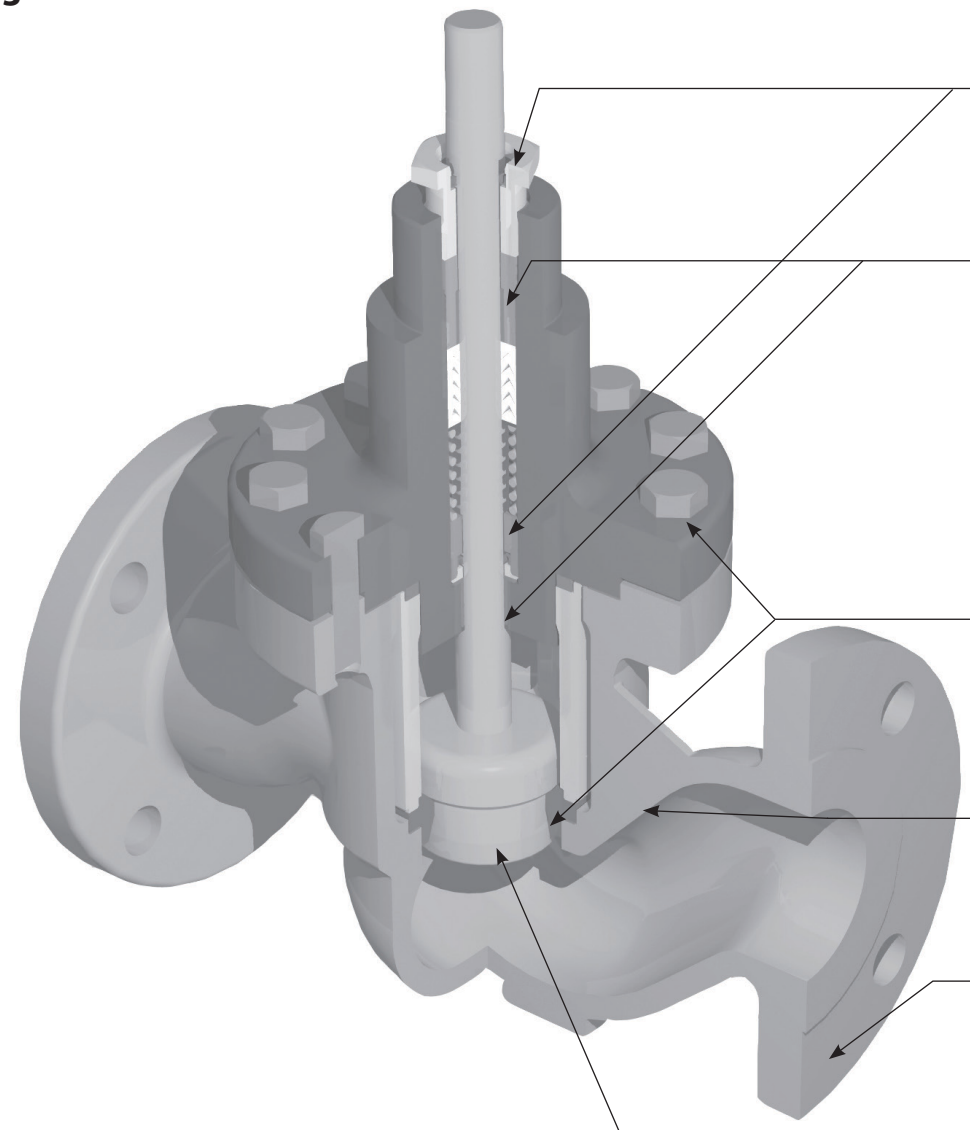
A company of the ARI-Armaturen Group

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.

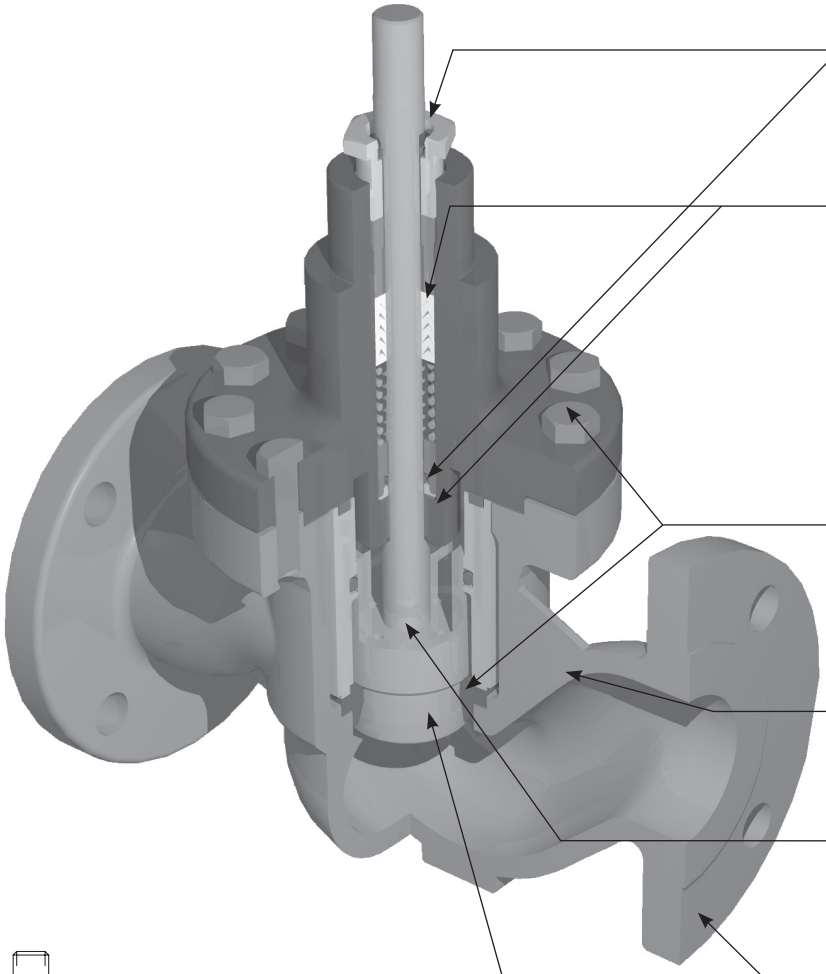
**Low Profile Design**
offers footprint minimizing valuable space consumption, yet conforms to ANSI/ISA standards for NPT, Flanged and Socket Weld ends.

**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.

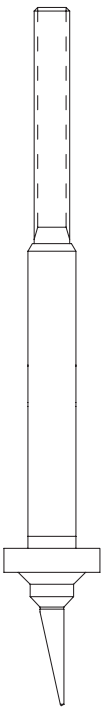
**Bolted Bonnet and Cage-Retained Seat**
make the 5800 ideal for easy access, maintenance and trim inspection.

**Rugged Body**
with a selection of port reductions.

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

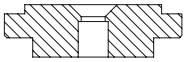
**Low Profile and Reduced Face to Face Design**
offers footprint minimizing valuable space consumption, yet conforms to ANSI/ISA standards for NPT, Flanged at Socket Weld ends.

**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.<br>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<br>300 NPT or 300 Socketweld (1/2 thru 2),<br>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),<br>Warren Class IV+ (Stainless Steel and Alloy 6 Trim, SPECIAL ORDER - Consult Factory)<br>ANSI Class VI (TFE and PEEK Trim) |
| **Packing, Type & Bonnet Construction:** | **LS** EPDM Lip w/ PEEK Bearings<br>**L8** EPDM Lip w/ Z PEEK Bearings<br>**TS** TFE V-Ring, Spring Loaded, w/ PEEK Bearings<br>**T8** TFE V-Ring, Spring Loaded, w/ Z PEEK Bearings<br>**GS** Adjustable Graphite w/ PEEK Bearings<br>**G8** Adjustable Graphite w/ Z PEEK Bearings<br>**GG** Adjustable Graphite w/ Graphite Gaskets, ***Copper Based*** Graphalloy Bearings & Extension Bonnet (*For NON-Oxidizing Media ONLY, Best Suited for Hot Water & Steam*)<br>**GL** Adjustable Graphite w/ Graphite Gaskets, ***Nickel Based*** Graphalloy Bearings & Extension Bonnet (*For NON-Oxidizing Media ONLY, Best Suited for Heat Transfer Oils*)<br>**G7** Adjustable Graphite w/ Graphite Gaskets, ***Oxidation Resistant*** Graphalloy Bearings & Extension Bonnet (*For Oxidizing Media ONLY*)<br>***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<br>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)<br>ANSI Class III (Metal Seal, 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<br>**L8** EPDM Lip w/ Z PEEK Bearings and Fluoraz Seal<br>**TS** TFE V-Ring, Spring Loaded, w/ PEEK Bearings and Fluoraz Seal<br>**T8** TFE V-Ring, Spring Loaded, w/ Z PEEK Bearings and Fluoraz Seal<br>**GS** Adjustable Graphite w/ PEEK Bearings and Fluoraz Seal<br>**G8** Adjustable Graphite w/ Z PEEK Bearings and Fluoraz Seal<br>**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<br>**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)<br>**G7 (*Special Order*)** Adjustable Graphite w/ Graphite Gaskets, ***Oxidation Resistant*** Graphalloy Bearings, Metal Seal, & Extension Bonnet (*For Oxidizing Media ONLY* - Consult Factory)<br>***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<br>300 NPT, 300 Socketweld, 150LB Flange or<br>300LB Flange |
| **Trim:** | Modified Linear: 316 Stainless Steel; TFE or PEEK |
| **Leakage Rating:** | ANSI Class IV (Stainless Steel Trim),<br>ANSI Class VI (TFE and PEEK Trim) |
| **Packing, Type & Bonnet Construction:** | **LS** EPDM Lip w/ PEEK Bearings<br>**L8** EPDM Lip w/ Z PEEK Bearings<br>**TS** TFE V-Ring, Spring Loaded, w/ PEEK Bearings<br>**T8** TFE V-Ring, Spring Loaded, w/ Z PEEK Bearings<br>**GS** Adjustable Graphite w/ PEEK Bearings<br>**G8** Adjustable Graphite w/ Z PEEK Bearings<br>**GG** Adjustable Graphite w/ Graphite Gaskets, ***Copper Based*** Graphalloy Bearings & Extension Bonnet (*For NON-Oxidizing Media ONLY, Best Suited for Hot Water and Steam*)<br>**GL** Adjustable Graphite w/ Graphite Gaskets, ***Nickel Based*** Graphalloy Bearings & Extension Bonnet (*For NON-Oxidizing Media ONLY, Best Suited for Heat Transfer Oils*)<br>**G7** Adjustable Graphite w/ Graphite Gaskets, ***Oxidation Resistant*** Graphalloy Bearings & Extension Bonnet (*For Oxidizing Media ONLY*)<br>***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<br>30:1 for Cv 0. 50<br>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 ON BEARINGS:*** PEEK or Z PEEK Bearings should not be used for temperatures above 450ºF or flowing differential pressure above 300 PSIG.

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

| 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.

Class IV+ requires special factory set up and as such there is an up charge. Contact Warren Controls Sales Department for pricing and ordering instructions.

## 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 450°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 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 |
| 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 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 |
| 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 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 |
| 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***

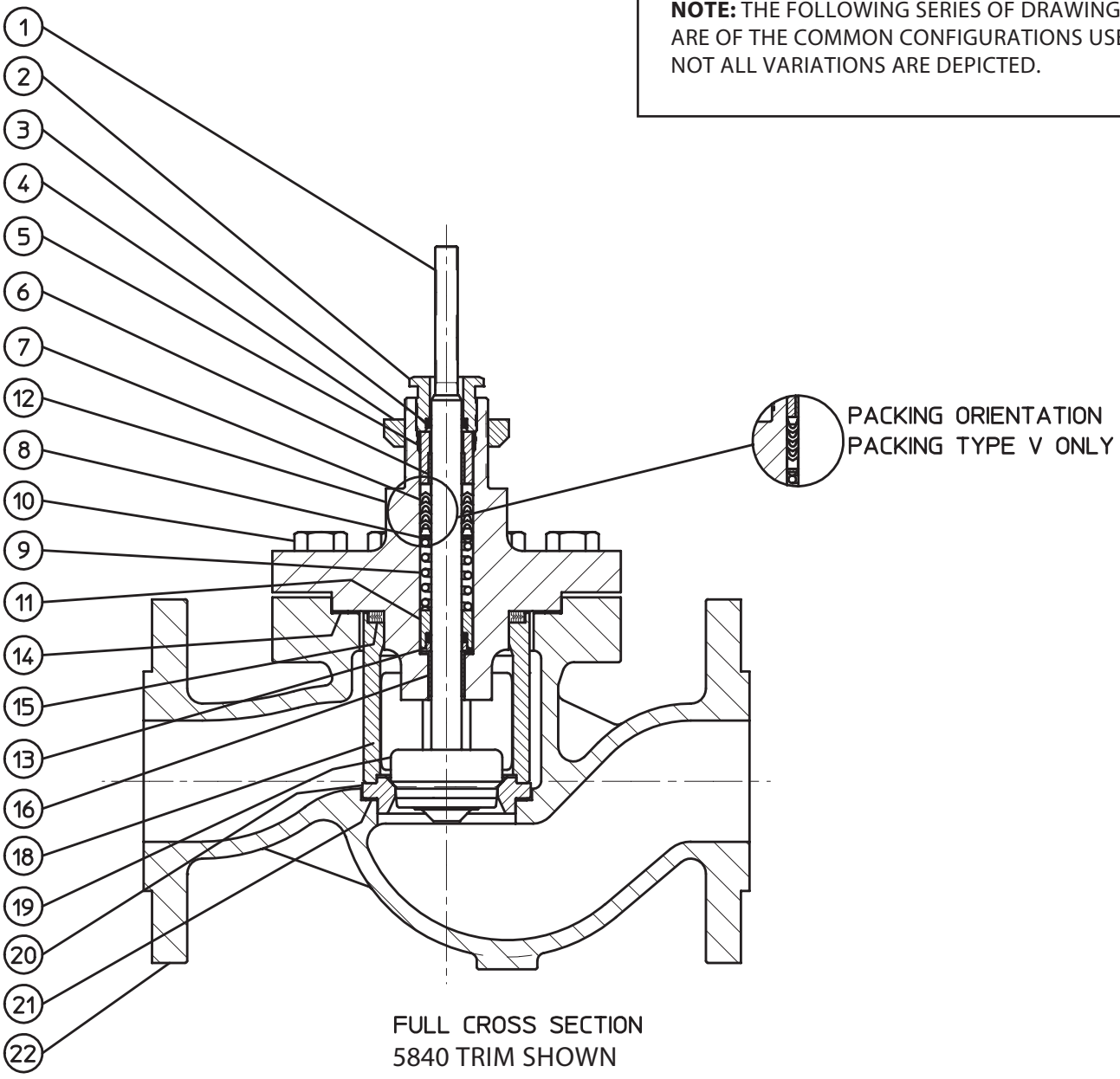
| Item | Part Nomenclature | Materials |
|---|---|---|
| 2 | PACKING NUT | 316 SST |
| 11 | BOX RING | 316 SST |
| 12 | EXTENSION BONNET | AS SPECIFIED |
| 14 | BONNET GASKET | GRAPHITE |
| 15 | CAGE SPRING | INCONEL/ GRAPHITE |
| 21 | SEAT GASKET | GRAPHITE |
| 23 | BEARING | GRAPHALLOY GRADE GM 111.3 |
| 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.

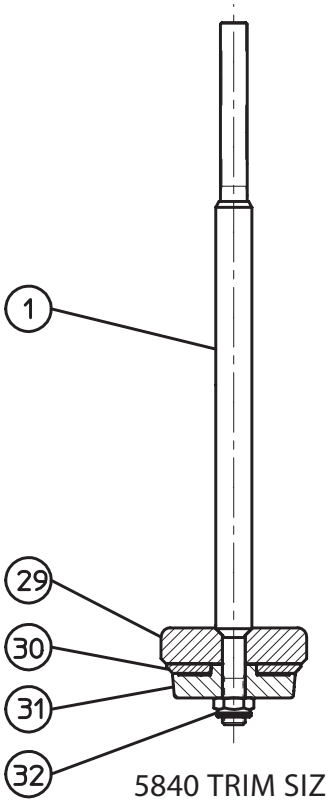



FULL CROSS SECTION
5840 TRIM SHOWN

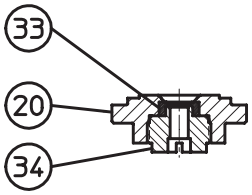
BODY MATERIAL CODE W & F
TRIM MATERIALS CODE S, 6, 7, 8 (5840) & S (5848)
PACKING TYPE & BONNET CONSTRUCTION CODES TS, VS, T8 & V8

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

## CONSTRUCTION DETAILS

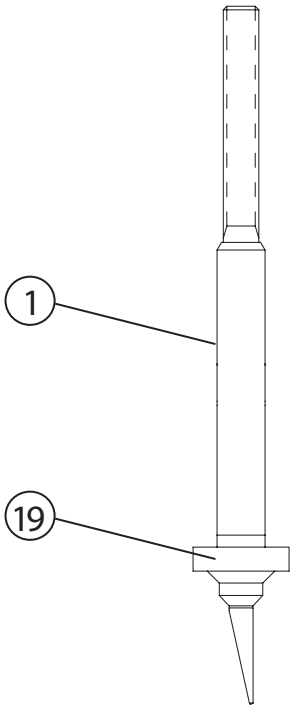


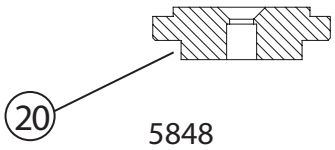

5840 TRIM SIZE
0.876 – 3.376




5840 TRIM SIZE
0.251 – 0.501
& 5848

TRIM MATERIALS
CODES T & P



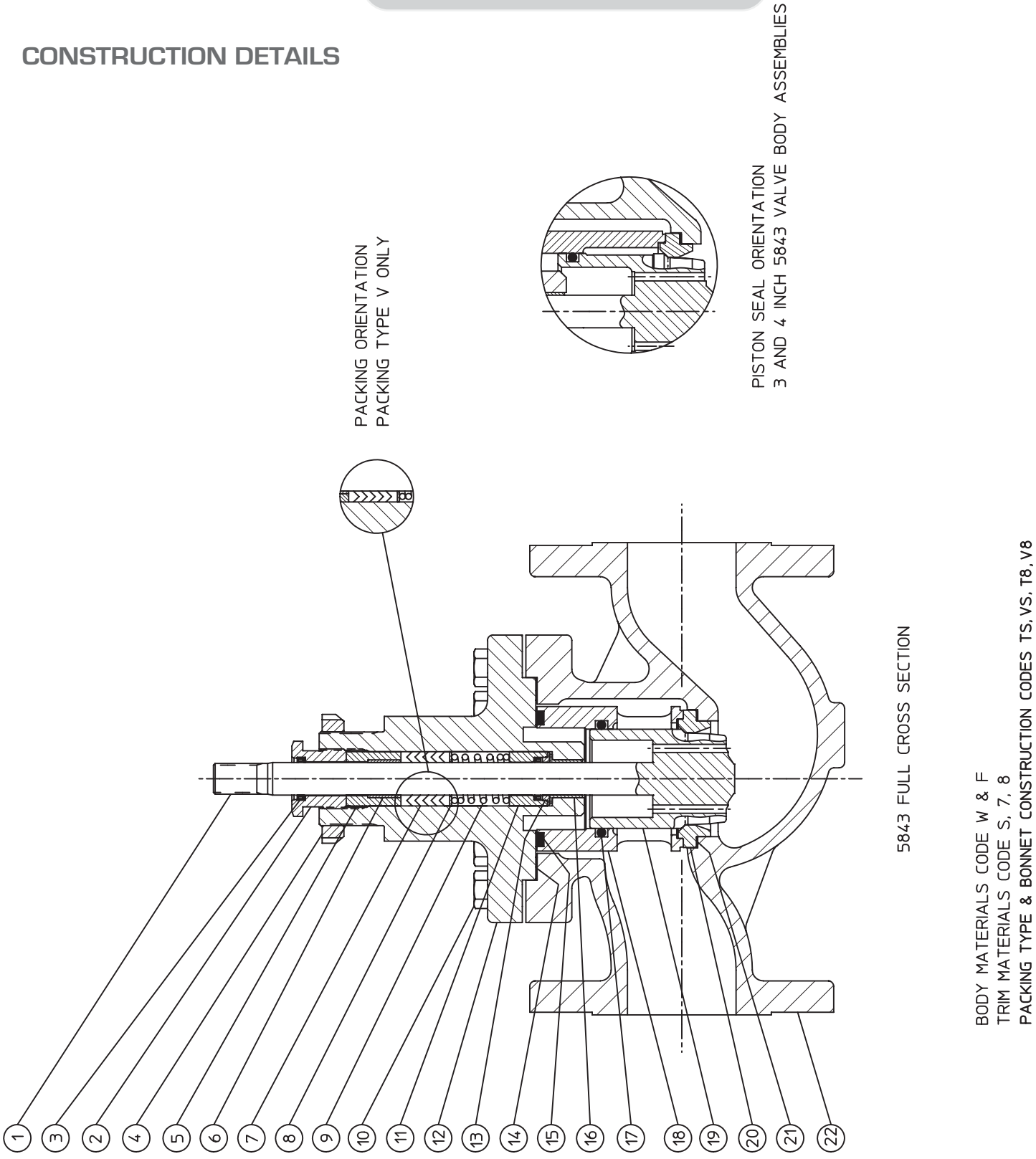




5848

TRIM MATERIALS
CODE S

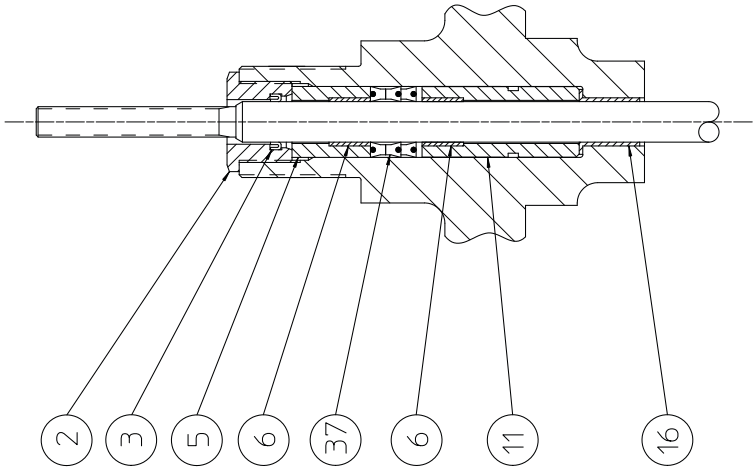
**SEE PAGE 10 & 11 FOR 5840 AND PAGE 14 & 15 FOR 5848 PART NOMENCLATURE AND MATERIALS**

## CONSTRUCTION DETAILS

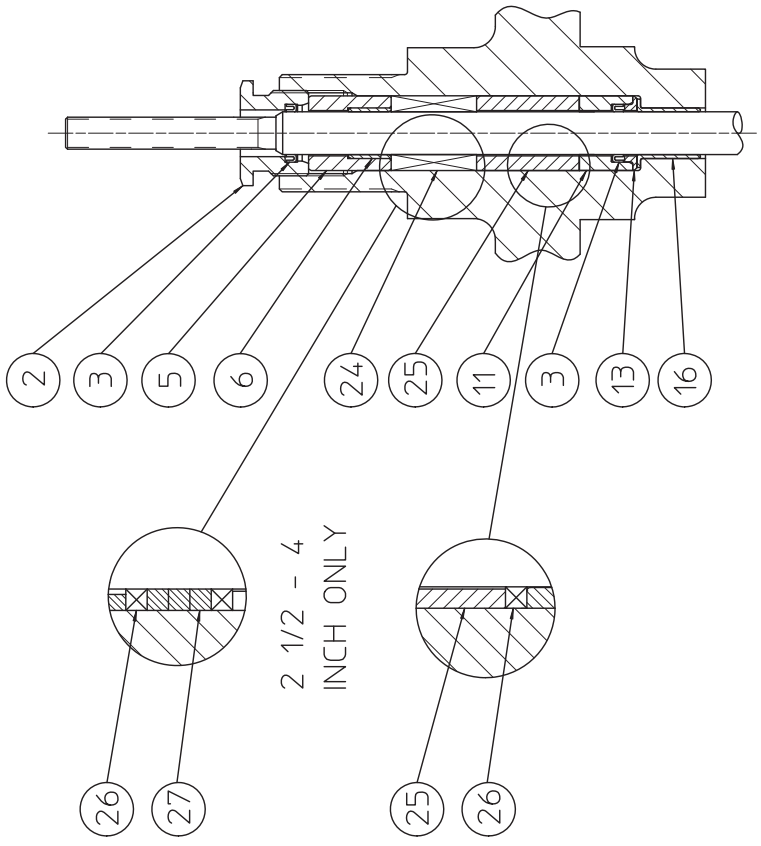



**SEE PAGE 12 & 13 FOR 5843 PART NOMENCLATURE AND MATERIALS**

## CONSTRUCTION DETAILS



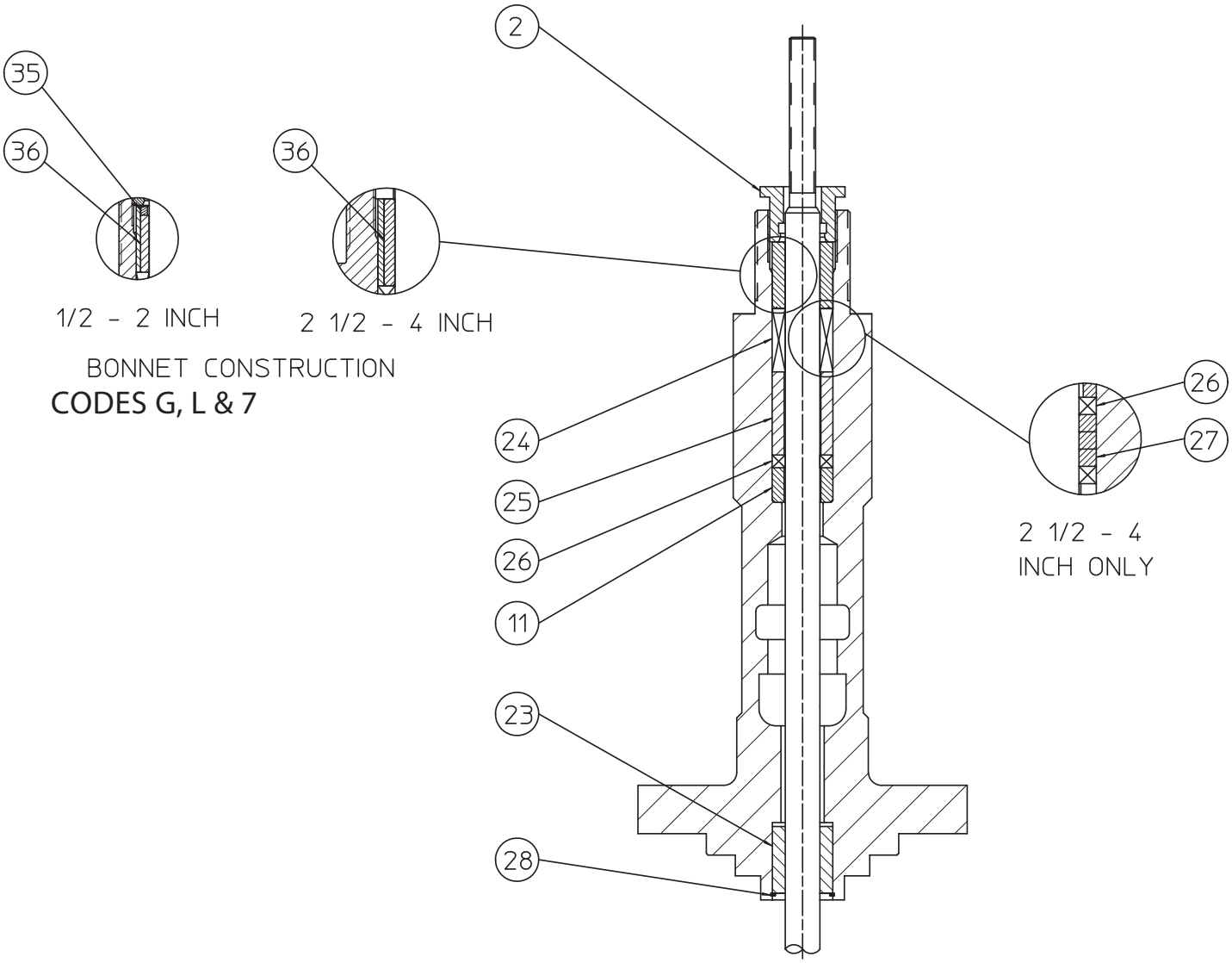

PACKING TYPE AND BONNET CONSTRUCTION
CODES LS & L8




PACKING TYPE AND BONNET CONSTRUCTION
CODES GS & G8

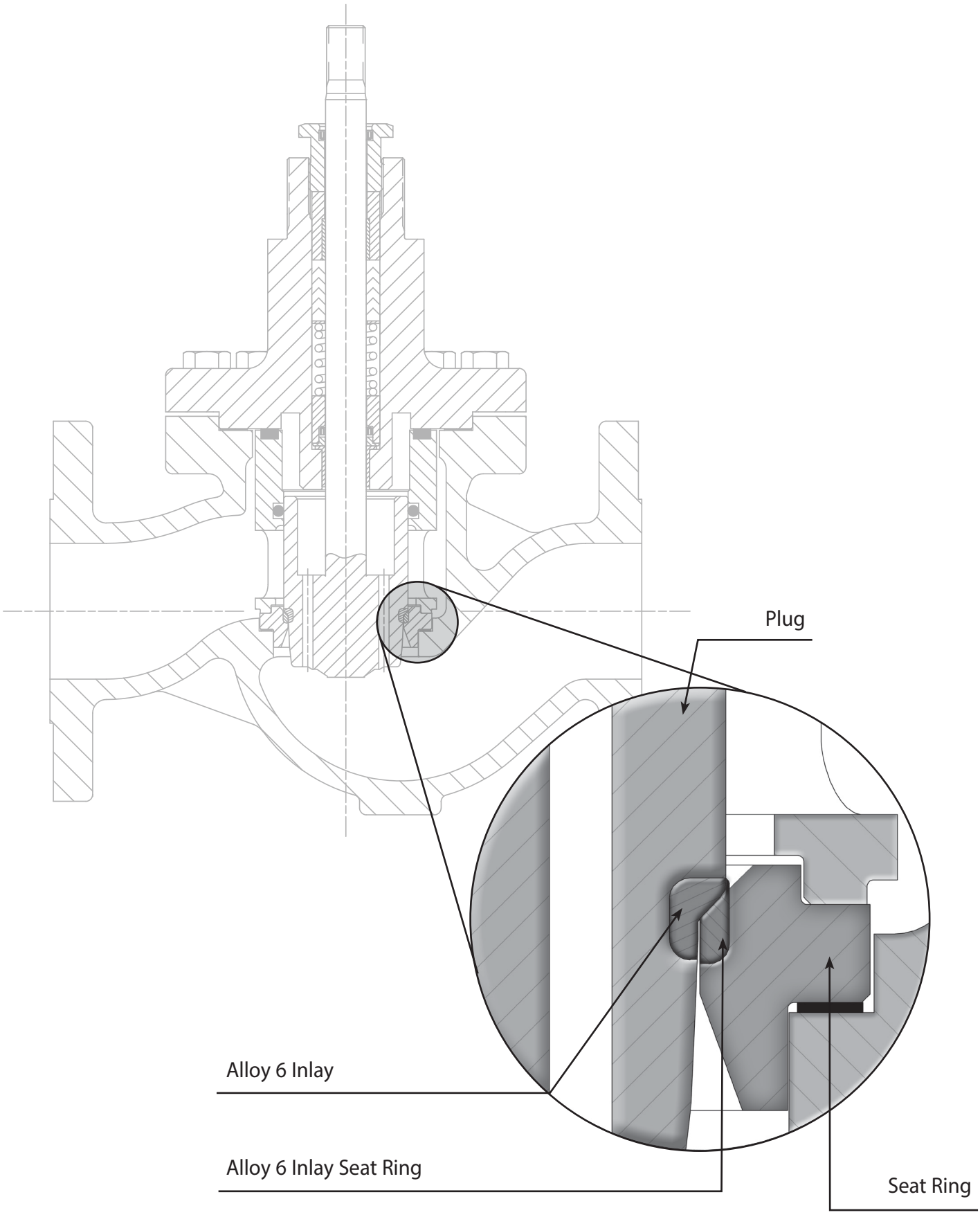
**SEE PAGE 10 & 11 FOR 5840; 11 FOR 5843; AND 14 & 15 FOR 5848 PART NOMENCLATURE AND MATERIALS**

## CONSTRUCTION DETAILS




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

# ALLOY 6 WRAPPING

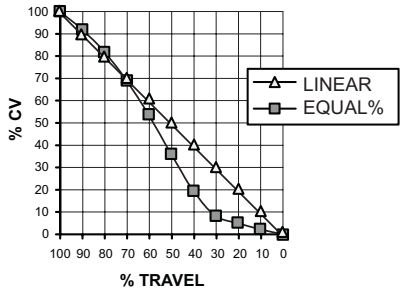


# FLOW COEFFICIENTS (CV) VERSUS TRAVEL

| 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 |

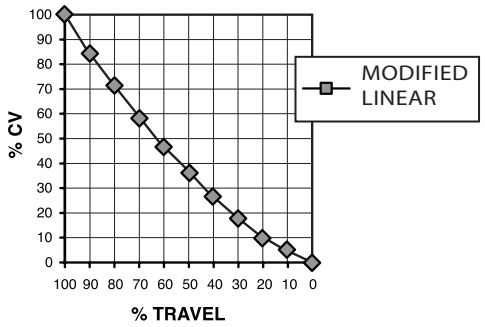
**5840 & 5843**

**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*

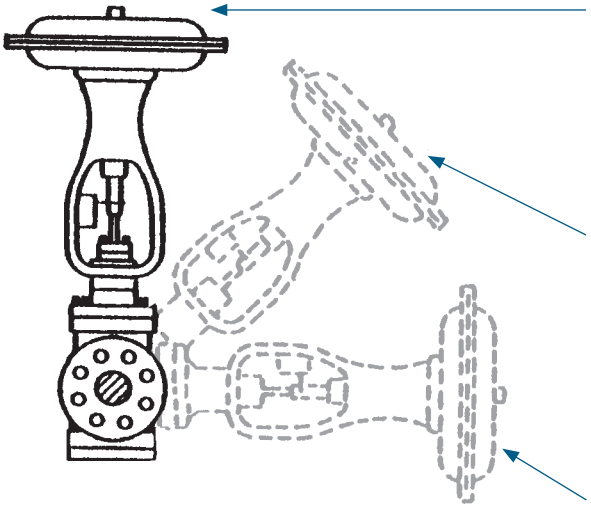
When working with higher fluid temperatures thermal insulating blankets can ***dramatically reduce surface temperatures on pipes, valves and other fixtures*** in a fluid control system such that the ambient room temperatures in these environments are dramatically reduced as well. This is often required 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.***

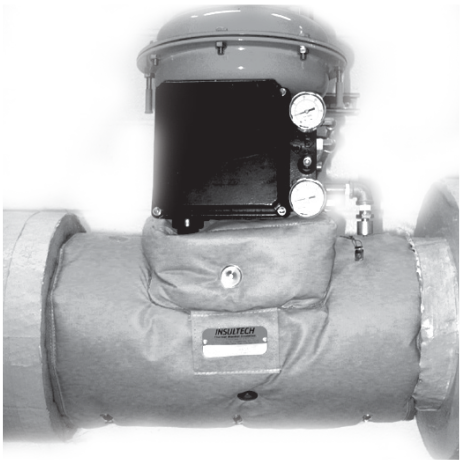
**90º TO PIPING HORIZONTAL ON EITHER SIDE**

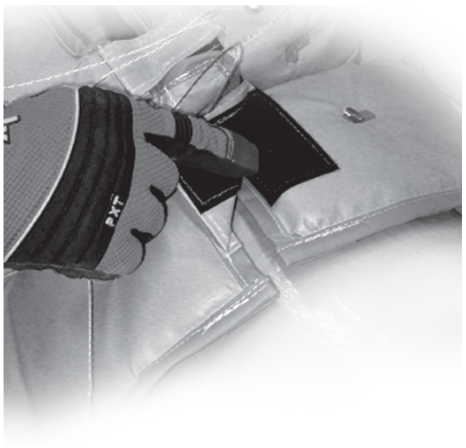
This is the worst possible position and creates great strain and limits the life of the internal components of the valve.

***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 PRESSURE 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.

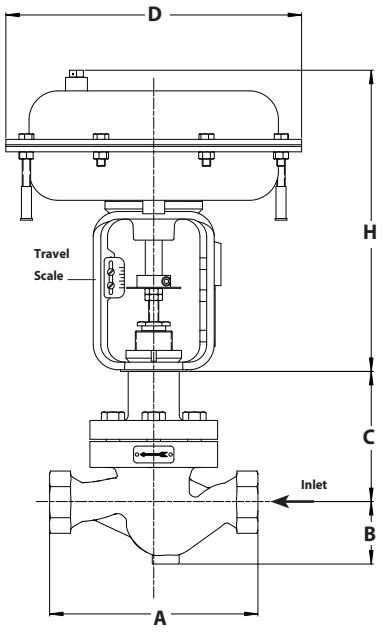
# DIMENSIONS & WEIGHTS

| 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 |

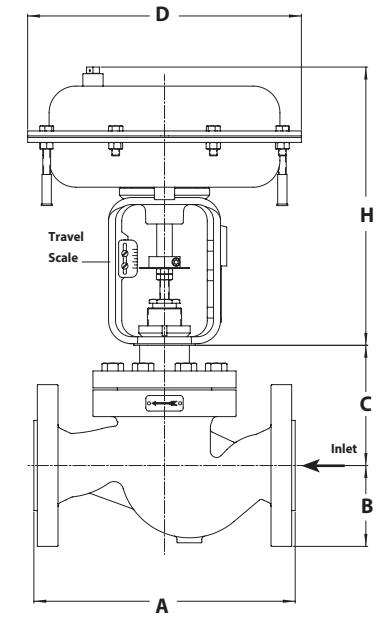
| VALVE SIZE (IN) | WEIGHT (LB) | | | |
|---|---|---|---|---|
| | Standard | | With Extension Bonnet | |
| | 150FLG | 300FLG | 150FLG | 300FLG |
| 2-1/2 | 65 | 75 | 75 | 85 |
| 3 | 79 | 92 | 89 | 102 |
| 4 | 123 | 143 | 133 | 153 |

| 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

**Default Actuator Orientation Shown**

| 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

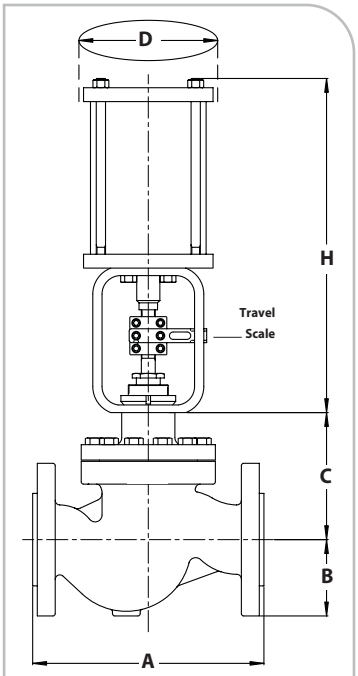
Face to face dimensions for NPT & SWE conform to ANSI/ISA S75.03 300# (Sizes 1/2 and 3/4 inch) and S75.12 Short 300# (Sizes 1 thru 2 inch) 150 & 300FLG conform to ANSI/ISA S75.03

**Actuator Removal Clearance**

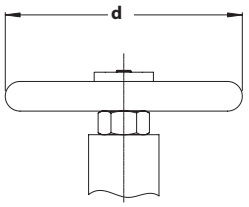
Above Actuator on 1/2 thru 2 inch valve allow 4-7/8 inches

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

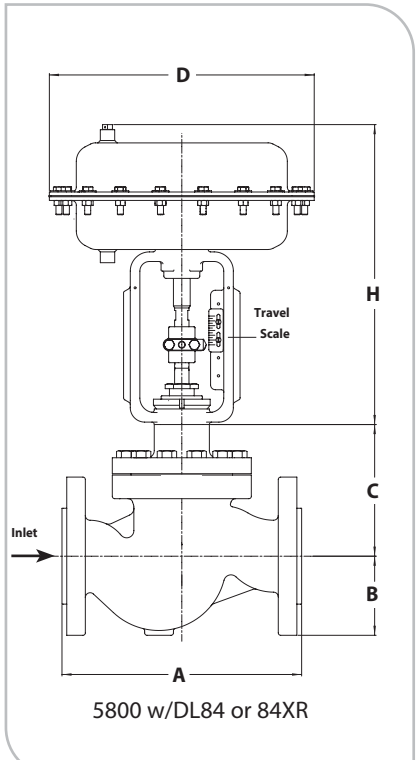
Actual shipping weights may vary.



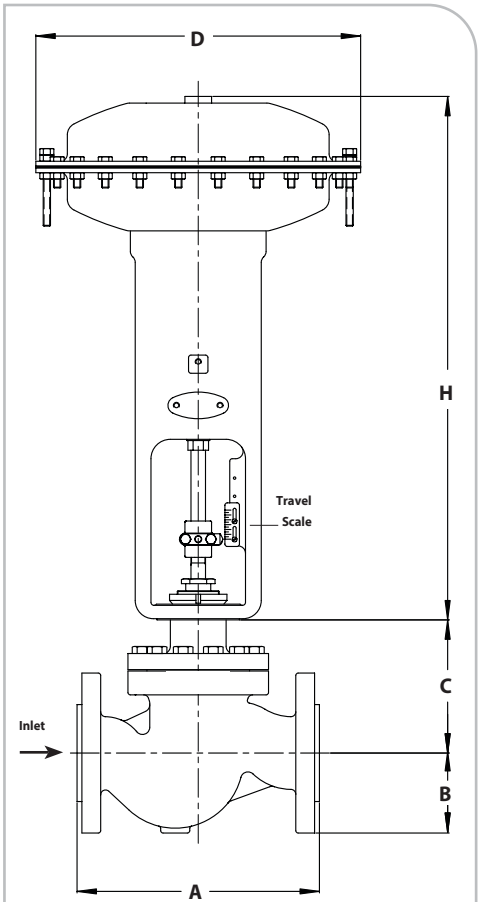
5800 w/CL4, 6, or 8



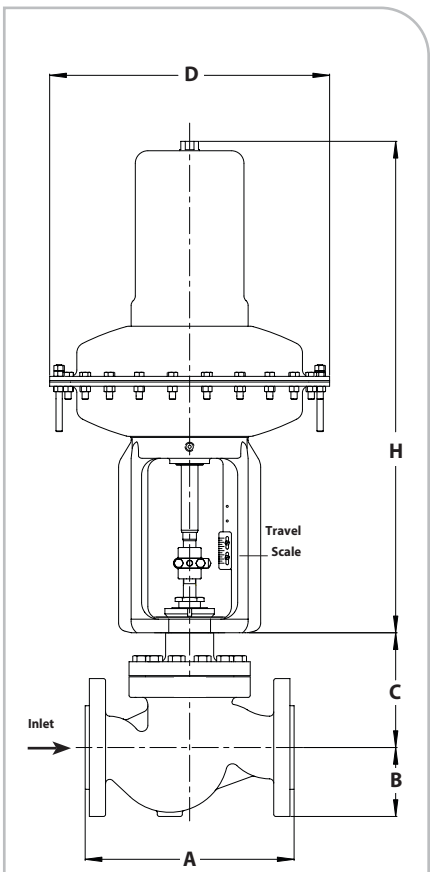
Top mounted handwheel



5800 w/DL84 or 84XR



5800 w/DL115 Direct



5800 w/DL115 or 115XR Reverse

**Default Actuator Orientation Shown**

## 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.

## ARI-STEVI-POS Models:

**Electro-Pneumatic: Model AxSF**

## Technical Data

| | |
|---|---|
| Stroke range (linear actuator) | 10 up to 120 mm |
| Rotation angle range (rotary actuator) | 25° up to 100° |
| Pneumatics | single-acting |
| Auxiliary energy | Supply air: 1,4 up to 7 bar (20 up to 105 psi) |
| Air connection | G1/4 |
| Manometer connection | G1/8 |
| Operation | 4...20 mA: max. load voltage: 9,5 V (475 Ω) |
| Behavior in case of control signal failure | Valve is vented |
| Behavior in case of air pressure failure | Valve is vented |
| Max. cable cross section | Operation: 2,5 $mm^2$ |
| Cable diameter for cable glands | M20x1,5: clamping range Ø8 - 13 mm |
| Linearity | ±1.5 % F.S. [1] |
| Hysteresis | 1.4 % F.S. [1] |
| Resolution | 0.5 % F.S. [1] |
| max. permissible ambient temperature | -20 °C... +80 °C (-4 °F... +176 °F) |
| max. storage temperature | -25°C...+80 °C (-13 °F... +176 °F) |
| Body material | PA |
| Hood material | PC |
| Protection class EN 60529 | IP66 |
| Corrosion class | C3 according to EN ISO 12944-2 |
| Pneumatic operating medium<br>• Oil content<br>• Solid impurities<br>• Pressure dew point | Compressed air according to ISO 8573-1<br>• Class 4<br>• Class 4 permanent<br>• Class 4 (min. 10 K below ambient temperature) |
| Ventilate actuator<br>• Supply air pressure 2 bar (29 psi)<br>• Supply air pressure 4 bar (58 psi)<br>• Supply air pressure 6 bar (87 psi) | <br>6,36 $m^3$/h (28 USgpm)<br>11,76 $m^3$/h (51,8 USgpm)<br>15,72 $m^3$/h (69,2 USgpm) |
| Vent actuator<br>• Signal pressure 2 bar (29 psi)<br>• Signal pressure 4 bar (58 psi)<br>• Signal pressure 6 bar (87 psi) | <br>7,68 $m^3$/h (33,8 USgpm)<br>14,76 $m^3$/h (65,0 USgpm)<br>15,72 $m^3$/h (69,2 USgpm) |
| Air consumption in controlled condition | ≤ 0,024 m3/h (≤ 0,11 USqpm) (at 25 °C) |
| Mounting position | Any, restriction: air connections and silencers not upwards |
| Weight | 0,7 kg |

[1] F.S.: full scale (20 mA)

**Accessories**

| | |
|---|---|
| NPT-air connection | 1/4-18 NPT (with NPT-Adapter) |
| NPT-cable gland | Adapter M20x1,5 x 1/2-14 NPT<br>Cable gland 1/2-14NPT |
| Analog output card | 4...20 mA passive for current loop 9...32 V galvanically isolated<br>max. conductor cross-section for connection terminal: 2,5 $mm^2$ |
| Manometer | 2 pieces: 0 - 10 bar / 0 - 140 psi<br>for supply air and working pressure |

## VAC V200 Models:

### VAC V200 Pneumatic

Models: 2FP_: Full Range Signal (3-15 PSIG)
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

### VAC V200 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

### VAC V200 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

### VAC V200 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

### VAC V200 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

### VAC 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
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

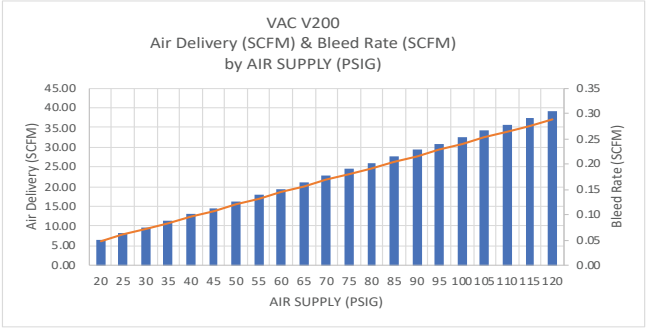
Limit Switches and Feedback Options are NEMA 4X, IP66 only, and are not suitable for hazardous locations.

** For positioner code 2xF_, the VAC V200 Positioner with the Fail Freeze module, check first with the factory for approval due to the space considerations on certain valve assembly combinations.*

| APPROVALS - VAC V200 POSITIONERS ONLY | | |
|---|---|---|
| Ratings for hazardous locations: | **V200-EX** - Explosion Proof | |
| | **ATEX** - Explosion Protection 1487X, instrinsically safe EEx ia IIC 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 Circuit | 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 IIcT4/T6 | | |
| **FM**: CL1 Div1 Grp A B C D | | |
| **CSA**: EX ia CL1 Grp A B C D<br>EX ia CL 1 Div2 Grp A B C D | | |

| VAC V200 | | |
|---|---|---|
| **AIR SUPPLY (PSIG)** | **Bleed Rate (SCFM)** | **Air Delivery (SCFM)** |
| 20 | 0.05 | 6.50 |
| 25 | 0.06 | 8.13 |
| 30 | 0.07 | 9.75 |
| 35 | 0.08 | 11.38 |
| 40 | 0.10 | 13.00 |
| 45 | 0.11 | 14.63 |
| 50 | 0.12 | 16.25 |
| 55 | 0.13 | 17.88 |
| 60 | 0.14 | 19.50 |
| 65 | 0.16 | 21.13 |
| 70 | 0.17 | 22.75 |
| 75 | 0.18 | 24.38 |
| 80 | 0.19 | 26.00 |
| 85 | 0.20 | 27.63 |
| 90 | 0.22 | 29.25 |
| 95 | 0.23 | 30.88 |
| 100 | 0.24 | 32.50 |
| 105 | 0.25 | 34.13 |
| 110 | 0.26 | 35.75 |
| 115 | 0.28 | 37.38 |
| 120 | 0.29 | 39.00 |

Bleed: 0.0024 scfm per psig
Delivery: 0.325 scfm per psig



## 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.

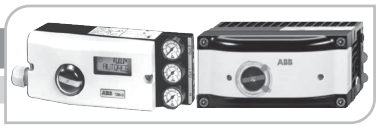
Non-Incendive: Class I, Div 2, Groups A,B,C,D.
Suitable for: Class II, Div 2, Groups F,G.
Class III, Div 2.

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 Act.)
Output 0-100 PSIG (Cylinder Act.)
Ambient Temperature: 760P -40 to 180°F, 760E - 40 to 167°F
Mounting: Yoke Mounted

## VAC D400 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

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

### APPROVALS & RATINGS: D400 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: D400 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<br>Class II; Div 1; Grp. E-F-G<br>Class III |
| Temperature range: | -40 … 85 °C<br>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,<br>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 |
| Mounting: | Yoke Mounted |
| Available as Specials: | ***(Contact Factory for Details and Available Models)***<br>Fail Freeze Function<br>Safety Integrity Level SIL2<br>ATEX, GOST, IECEx Approvals<br>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)

| ACCEPTABLE OPTION COMBINATIONS | | | | |
|---|---|---|---|---|
| w/ | F* | K* | L‡ | P |
| F* | | Yes | Yes | Yes |
| K* | Yes | | Yes | Yes |
| L‡ | Yes | Yes | | No |
| P | Yes | Yes | 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)

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 (IP65) |
| 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<br>Maximum 100 PSIG<br>**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<br>Maximum 100 PSIG<br>**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<br>Maximum 100 PSIG<br>**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<br>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<br>Type 350SS, 0-100 PSIG |
| Supply Pressure: | Type 300, 250 PSIG Maximum<br>Type 350SS, 290 PSIG Maximum |
| Construction: | Type 300, Die-Cast Aluminum with Irridite and Baked Epoxy Paint<br>Type 350SS, 316 Stainless Steel |
| Gauge: | Type 300, Output, Housing Steel Painted<br>Type 350SS,Output, Housing Stainless Steel |
| Air Connections: | 1/4 NPT |
| Filter: | Type 300, 5 micron<br>(D400 Positioners Require 5 micron Filter).<br>Type 350SS, 25 micron |
| Mounting: | Chamber Mounted (Diagram Actuator)<br>Remote Mounted (Cylinder Actuator) |

## SOLENOIDS

| | |
|---|---|
| Models: | <u>For use with Diaphragm Actuators or Positioners with Cylinder Actuators</u><br>8320G184, EF8320G184, 8320G202, EF8320G202<br><u>For use with Cylinder Actuators without Positioners</u><br>8342G1, EF8342G1, 8342G701, EF8342G701 |
| Construction: | (EF)8320G184, 3-Way Brass<br>(EF)8320G202, 3-Way Stainless Steel<br>(EF)8342G1, 4-Way Brass<br>(EF)8342G701, 4-Way Stainless Steel |
| Locations: | 83206G184, 8320G202, 8342G1, & 8342G701<br>Watertight, Types 1, 2, 3, 3S, 4, and 4X<br>EF8320G184, EF8320G202, EF8342G1 &<br>EF8342G701 Explosion proof and Watertight,<br>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.

**58□ - □□ □□□ □ □ □ □ □ □ □**

| Model | Valve Type | Size | Body Mat'l. | End Conn. | Trim Style | Trim Material | Trim Cv | Packing Type | Bonnet Construction |
|---|---|---|---|---|---|---|---|---|---|
| **58N** 1/2"-2" Bodies Diaphragm: 49" or 84" 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" 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** EDPM | **L** Nickel Based Graphalloy 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 amd 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:

| SIZE | TRIM MATERIAL | | | | | |
|---|---|---|---|---|---|---|
| | **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 Connection & 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** | 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** | 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** | 450°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** | 450°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** | 450°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** | 450°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.

- □□ | □ | □ | □ — □□□□ — □ | □ — □ — □

### ACTUATOR

**Actuator Series**

| | |
|---|---|
| **00** | None |
| | **DIAPHRAGMS:** |
| **49** | DL49 (49 Sq. In.) |
| **4X** | DL49XR |
| **84** | DL84 (84 Sq. In.) |
| **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 |

**Action**

| | |
|---|---|
| **0** | None |
| **R** | Reverse Stem Fail Down |
| **D** | Direct Stem Fail Up |

**Spring Range**

| | |
|---|---|
| **0** | None or Cylinder |
| **L** | Low 3-9 psi 49D; 84; & 115 4-10 psi 49R |
| **F** | Full 3-15 psi 84;115 5-14 psi 49R 4-13 psi 49D |
| **H** | High 9-15 psi 85; 115 10-14 psi 49R 8-12 psi 49D |
| **X** | Xtra-High DL49XR, DL84XR & DL115XR* |

**Only available in Reverse Acting*

**Hand-wheel**

| | |
|---|---|
| **0** | None |
| **R** | Reverse |
| **D** | Direct |

*Note: DL84; DL84XR; DL115 & DL115XR only- Must match action.*

### FAILURE MODES:

| MODE | ACTUATOR ACTION |
|---|---|
| Closed | Reverse |
| Open | Direct |

### 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.**

### ACCESSORIES

**Positioners, I/P's & Limit Switches**

| | |
|---|---|
| **0000** | None |
| | **POSITIONERS:** |
| **AxSF** | ARI STEVI POS Digital Electro Pneumatic w 4-20mA Feedback |
| **2xP_** | VAC V200 Pneumatic |
| **2xE_** | VAC V200 ElectroPneumatic |
| **2xI_** | VAC V200 ElectroPneu. Intrn. Safe |
| **2xX_** | VAC V200 ElectroPneu. Exp. Proof |
| **2xF_** | VAC V200 ElectroPneu. Fail Freeze |
| **76P_** | Siemens 760 Pneumatic |
| **76E_** | Siemens 760 Electro-Pneumatic |
| **T0Z0** | VAC D400 4-20mA * |
| **THN_** | VAC D400 4-20mA w/HART Intrn. Safe & Non-Incend * |
| **THX_** | VAC D400 4-20mA w/HART 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 |
| | **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 |

**x digit spec.**

| | |
|---|---|
| **F** | Full Range Signal, 3-15 PSI or 4-20mA (Factory Default) |
| **L** | Low of Split Range, 3-9 PSI or 4-12mA |
| **H** | High of Split Range, 9-15 PSI or -20mA |

**V200 / 760 4th digit spec.**

| | |
|---|---|
| **0** | 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 2xI, 2xX.*

**D400 4th digit spec.**

**Individual Options**

| | |
|---|---|
| **0** | 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 Combination** (For 4-20mA w/HART Models ONLY)

| | |
|---|---|
| **A** | = **F** & **K** |
| **B** | = **F** & **L** (Exp. Proof Mod. ONLY) |
| **C** | = **F** & **P** |
| **E** | = **K** & **L** (Exp. Proof Mod. ONLY) |
| **G** | = **K** & **P** |
| **J** | = **F** & **K** & **L** (Exp. Proof Mod. ONLY) |
| **M** | = **F** & **K** & **P** |

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

**Air Filter Regulators**

| | |
|---|---|
| **0** | None |
| **A** | Type 300 0-30 PSI |
| **B** | Type 300 0-60 PSI |
| **C** | Type 300 0-120 PSI |
| **D** | Type 350SS 0-100 PSI |

**ASCO Solenoids**

| | |
|---|---|
| **0** | 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:** |
| **Y** | EF8320G184 Explosion-Proof 3-Way Brass |
| **Z** | 8320G184 3-Way Brass |
| **4** | EF8320G202 24VDC Coil 3-Way EXP SS |
| | **24 Vac Coils:** |
| **3** | 8320G184 24 VAC Coil 3-Way Brass |

**Special Options**

| | |
|---|---|
| **0** | 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.

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

‡ For positioner code 2xF_, the VAC V200 Positioner with the Fail Freeze module, check first with the factory for approval due to space considerations on certain valve assembly combinations.

## 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