2800 IOM

Installation Instructions & Maintenance Document

Series 2800

PRECISION GLOBE CONTROL VALVES

WARREN CONTROLS

TABLE OF CONTENTS

2800_IOM_RevCb_0523

PRODUCT OVERVIEW

This document covers the installation, operation and maintenance of the Series 2800 Precision Globe Control Valves presented in the "Series 2800 Product Specification", including the 2820 Two-Way Single Seat Valve, the 2828 Two-Way Single Seat Low Flow Valve, the 2830 Three-Way Mixing Valve, and the 2832 Three-Way Diverting/ Mixing Valve. Warren Controls Series 2800 Precision Globe Control Valves feature rugged bronze or stainless steel bodies with a variety of trim materials and port sizes. The equal percentage and linear plugs in the 2-way valves and linear plugs in the 3-way valves provide excellent modulating control of a wide variety of fluids for pressure, temperature, level, and flow applications from –20 to 500ºF (dependent on contruction). The Series 2800 is ideally suited where value and long life are important objectives for applications including but not limited to the Chemical, Food & Beverage, General Service, Refining, District Energy, and ideal for Pharmaceutical Industries.

GENERAL INFORMATION

The instructions given herein cover generally the operation and maintenance of subject equipment. Should any questions arise which may not be answered specifically by these instructions, they should be referred to Warren Controls Inc. for further detailed information and technical assistance. This manual cannot possibly cover every situation connected with the operation, adjustment, inspection, test, overhaul and maintenance of the equipment furnished. Every effort is made to prepare the text of this manual so that engineering and design data is transformed into the most easily understood wording. Warren Controls Inc., in furnishing this equipment and this manual, must presume that the operation and maintenance personnel assigned thereto have sufficient technical knowledge and experience to apply sound safety and operational practices which may not be covered herein. In applications where Warren Controls Inc. furnished equipment is to be integrated with a process or other machinery, these instructions should be thoroughly reviewed to determine the proper integration of the equipment into the overall plant operational procedures. 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.

ACTUATORS AND ACCESSORIES

Series 2800 Precision Globe Control Valves are available with a variety of actuators and accessories. These actuators and accessories have separate instructions. For complete control valve installation, operation, and maintenance instructions see also the instructions for the actuator and accessories in use.

VALVE IDENTIFICATION

To use these instructions it is necessary to identify the configuration of the valve. Factory assembled control valves have a nameplate mounted on the actuator. The valve's part number (P/N) is present on the plate. The part number represents the configuration of the control valve. To identify the valve's type, size, actuator, accessories, and other characteristics decode the part number using configuration table. If the information is incomplete, incorrect, or not present contact the factory with the valve serial number listed on the plate. (See Information Present on Control Valves section for location of part number, serial number, and other important information on valve.)

VALVE BODY

Model	Valve Type	Size	Body Material	End Connection	Trim Style	Trim Material	Trim Cv	Packing Type
N Type 20, 30 & 32	**20** 2-Way, Single Seat	**050** 1/2 inch	**B** Bronze	**S** Screwed	**E** Equal %	**S** 316 SS*	**F** Full Port	**T** Teflon
L Type 28	**28** 2-Way, Lo-Flow	**075** 3/4 inch	**F** CF8M	**B** Buttweld End	**L** Linear	**B** Bronze	**1** 1st Port Reduction	**G** Graphite
	30 3-Way Mixing	**100** 1 inch			**M** Mod Lin	**6** Alloy 6	**2** 2nd Port Reduction	**V** Vacuum Service
	32 3-Way Diverting	**125** 1-1/4 inch			*Types 30/32, Linear Only. Type 28, Mod Lin Only*	**H** 17-4 PH	**3** 3rd Port Reduction	**L** EP Lip
		150 1-1/2 inch				**T** Teflon	**4** 4th Port Reduction	*Stainless Steel, Type 20 Bodies come standard with PEEK bearings. Used for Temp. up to 500F.*
		200 2 inch				**P** PEEK	*NOTE: Port reductions only available to Type 20/28/30. Check factory for availability.*	
						*NOTE: *Type 28, 316SS trim uses a harder Nitronic 60 seat.*		

TEMPERATURE LIMITS

Valve Type	Body Material & Code	Trim Material & Code	Packing Type & Code	T MAX	T MIN
20 2-Way Single Seat	Bronze **B**	316 **S**, Alloy 6 **6**, 17-4 PH **H**, Teflon **T**, PEEK **P**	EPDM **L**	350ºF	-20ºF
	Bronze **B**	316 **S**, Alloy 6 **6**, 17-4 PH **H**, Teflon **T**, PEEK **P**	Teflon **T**, Vacuum Service **V**	400ºF	32ºF
	Bronze **B**	316 **S**, Alloy 6 **6**, 17-4 PH **H**, Teflon **T**, PEEK **P**	Graphite **G**	400ºF	-20ºF
	CF8M **F**	316 **S**, Alloy 6 **6**, 17-4 PH **H**, Teflon **T**, PEEK **P**	EPDM **L**	350ºF	-20ºF
	CF8M **F**	316 **S**, Alloy 6 **6**, 17-4 PH **H**, Teflon **T**, PEEK **P**	Teflon **T**, Vacuum Service **V**	450ºF	32ºF
	CF8M **F**	Teflon **T**, PEEK **P**	Graphite **G**	450ºF	-20ºF
	CF8M **F**	316 **S**, 17-4 PH **H**, Alloy 6 **6**	Graphite **G**	500ºF	-20ºF
28 2-Way Low Flow	Bronze **B**	316 **S**, Teflon **T**, PEEK **P**	EPDM **L**	350ºF	-20ºF
	Bronze **B**	316 **S**, Teflon **T**, PEEK **P**	Teflon **T**, Vacuum Service **V**	400ºF	32ºF
	Bronze **B**	316 **S**, Teflon **T**, PEEK **P**	Graphite **G**	400ºF	-20ºF
	CF8M **F**	316 **S**, Teflon **T**, PEEK **P**	EPDM **L**	350ºF	-20ºF
	CF8M **F**	316 **S**, Teflon **T**, PEEK **P**	Teflon **T**, Vacuum Service **V**	450ºF	32ºF
	CF8M **F**	Teflon **T**, PEEK **P**	Graphite **G**	450ºF	-20ºF
	CF8M **F**	316 **S**	Graphite **G**	500ºF	-20ºF
30 3-Way Mixing	Bronze **B**	316 **S**	EPDM **L**	350ºF	-20ºF
	Bronze **B**	316 **S**	Teflon **T**, Vacuum Service **V**	400ºF	32ºF
	Bronze **B**	316 **S**	Graphite **G**	400ºF	-20ºF
	CF8M **F**	316 **S**	EPDM **L**	350ºF	-20ºF
	CF8M **F**	316 **S**	Teflon **T**, Vacuum Service **V**	450ºF	32ºF
	CF8M **F**	316 **S**	Graphite **G**	500ºF	-20ºF
32 3-Way Diverting	Bronze **B**	Bronze **B**	Teflon **T**, Vacuum Service **V**	300ºF	32ºF
	Bronze **B**	Bronze **B**	Graphite **G**, EPDM **L**	300ºF	-20ºF
	CF8M **F**	316 **S**	EPDM **L**	350ºF	-20ºF
	CF8M **F**	316 **S**	Teflon **T**, Vacuum Service **V**	450ºF	32ºF
	CF8M **F**	316 **S**	Graphite **G**	500ºF	-20ºF

ACTUATOR

Actuator Series

- **00** None
- **DIAPHRAGMS:**
- **49** DL49 (49 Sq. In.)
- **4X** DL49XR
- **84** DL84 (84 Sq. In.)
- **8X** DL84XR (84 Ext. Ring.)

Action

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

Spring Range

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

Hand-wheel

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

Note: Must match action.

BKIT
PKIT
7KIT
WCI parts only positioner mounting kits.

ACCESSORIES

Positioners, I/P's & Limit Switches

- **0000** None
- **POSITIONERS:**
- **2xP_** BLX Pneumatic
- **2xE_** BLX ElectroPneumatic
- **2xI_** BLX ElectroPneu. Intrn. Safe
- **2xX_** BLX ElectroPneu. Exp. Proof
- **2xF_** BLX ElectroPneu. Fail Freeze
- **76P_** Moore760 Pneumatic
- **76E_** Moore 760 Electro-Pneumatic
- **TOZO** ABB TZIDC 4-20mA *
- **THN_** ABB TZIDC 4-20mA w/HART Intrn. Safe & Non-Incend *
- **TPN_** ABB TZIDC PROFIBUS PA Intrn. Safe & Non-Incend.
- **TFN_** ABB TZIDC FOUNDATION Field-bus Intrn. Safe & Non-Incend.
- **THX_** ABB TZIDC 4-20mA w/HART Exp. Proof *
- **TPX_** ABB TZIDC PROFIBUS PA Exp. Proof
- **TFX_** ABB TZIDC FOUNDATION Fieldbus Exp. Proof
- **PROXIMITY SWITCHES:**
- **PX11** Mark 1 Series-2 ea. SPDT
- **PX12** Mark 1 Series-2 ea. SPDT w/2k Pot.
- **PX13** Mark 1 Series-2 ea. SPDT w/4-20 Feedback
- **PX14** Mark 1 Series-4 ea. SPDT
- **PX15** Mark 1 Series-6 ea. SPDT
- **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 SX 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

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.

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 Combinations (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
- **D** Type 350SS 0-100 PSI

ASCO Solenoids

- **0** None
- **120 Vac Coils:**
- **A** 8320G184 3-Way Brass
- **B** 8320G202 3-Way SS
- **L** EF8320G184 3-Way EXP Br.
- **M** EF8320G202 3-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.

FAILURE MODES:

MODE	VALVE TYPE	ACTUATOR ACTION
Closed	20/28	Reverse
Open	20/28	Direct
Upper Closed*	30/32	Direct
Upper Open	30/32	Reverse

*Standard

ACTUATOR/BODY COMPATIBILITY:

DIAPHRAGMS	BODY
49 49 Sq. In. (DL49)	for 28N Bodies
4X (DL49XR)	for 28N Bodies
84 84 Sq. In. (DL84)	for 28N Bodies
8X (DL84XR)	for 28N Bodies

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

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

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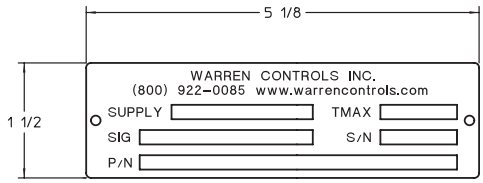
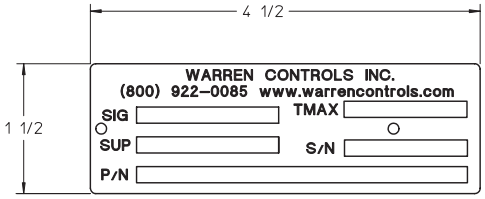
INFORMATION PRESENT ON CONTROL VALVES

There is a great deal of information present on each control valve ranging in importance from the part number and serial number to the color of the paint and casting numbers. This information is important for identifying the valve, installing it correctly, and obtaining parts. Examples of the current factory nameplates and flow arrow plates used on Series 2800 control valves are shown here. The accompanying table identifies the information present and where to find it on the control valve. There may also be other casting numbers and foundry marks present that do not provide useful information. Customer specific tagging may also present. The plates used, and information present, on Warren Controls other product lines or older valves may be different, contact the factory for details.

ACTUATOR NAMEPLATES

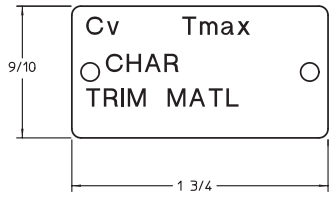


DL84

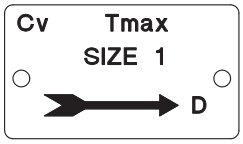


DL49

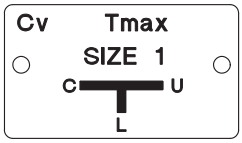
VBA NAMEPLATES



INDUSTRIAL VBA



2-WAY 1/2 THRU 1 INCH • 2800 S/S VBA



3-WAY MIXING 1/2 THRU 1 INCH • 2800 S/S VBA

PART NUMBER & SERIAL NUMBER			
Information	**Symbol(s)**	**Location**	**Notes**
Part number (Configuration)	**P/N**	On actuator	• On **Actuator Nameplate** attached to leg(s) of actuator.
Serial number	**S/N**	On actuator and valve body	• On **Actuator Nameplate** attached to leg(s) of actuator. • Sales order Number only stamped on valve body end connection (2800).* *Number stamped using approximately 1/8 inch tall characters
FLOW DIRECTION(S)			
Information	**Symbol(s)**	**Location**	**Notes**
Flow direction through valve		On valve body	• On **2800 S/S VBA Nameplate** attached to mounting boss on valve body between the end conections (2800 S/S valves ½ thru 1 inch except S/S 2832). • Arrow cast on valve body between the end connections (2800 S/S 2-way 1-1/4 thru 2 inch).
Inlet location	**INLET**	On valve body	• Stamped on valve body inlet end connection (2-way 2800 bronze valves ½ thru 2 inch & S/S valves 1-1/4 thru 2 inch).
Port locations for 3-way valves	**U** upper port, **L** lower port, **C** common port	On valve body	• U, L, & C stamped on valve body end connections (3-way 2800 bronze valves ½ thru 2 inch & 3-way 2800 S/S valves 1-1/4 thru 2 inch & 1 inch S/S 2832).
INPUT SIGNAL & SUPPLY			
Information	**Symbol(s)**	**Location**	**Notes**
Input signal	**SIG**	On actuator	• On **Actuator Nameplate** attached to leg(s) of actuator.
Supply pressure	**SUP** or **SUPPLY**	On actuator	• On **Actuator Nameplate** attached to leg(s) of actuator.
VALVE ATTRIBUTES			
Information	**Symbol(s)**	**Location**	**Notes**
Maximum temperature rating of valve body	**TMAX** or **Tmax**	On actuator and valve body	• On **Actuator Nameplate** attached to leg(s) of actuator. • On **Industrial VBA Nameplate** wired to valve body between the end connections on side opposite flow arrow plate (2800 bronze valves ½ thru 2 inch & 2800 S/S valves 1-1/4 thru 2 inch, & 1 inch except S/S 2832). • On **2800 S/S VBA Nameplate** attached to mounting boss on valve body between the end connections on side opposite flow arrow plate (2800 S/S valves ½ thru 1 inch except 1 inch S/S 2832).
Trim Cv (Flow coefficient)	**Cv**	On valve body	• On **Industrial VBA Nameplate** wired to valve body between the end connections on side opposite flow arrow plate (2800 bronze valves ½ thru 2 inch & 2800 S/S valves 1-1/4 thru 2 inch, & 1 inch S/S 2832). • On **2800 S/S VBA Nameplate** attached to valve body between the end connections on side opposite flow arrow plate (2800 S/S valves ½ thru 1 inch except 1 inch S/S 2832).
Trim style (Characteristic)	**CHAR**	On valve body	• On **Industrial VBA Nameplate** wired to valve body between the end connections on side opposite flow arrow plate. (2800 bronze valves ½ thru 2 inch & 2800 S/S valves 1-1/4 thru 2, & 1 inch S/S 2832).
Trim material	**TRIM MATL**	On valve body	• On **Industrial VBA Nameplate** wired to valve body between the end connections on side opposite flow arrow plate. (2800 bronze valves ½ thru 2 inch & 2800 S/S valves 1-1/4 thru 2 inch, & 1 inch S/S 2832).
Valve size	**SIZE**	On valve body	• On **2800 S/S VBA Nameplate** attached to mounting boss on valve body between the end connections on side opposite flow arrow plate (2800 S/S valves ½ thru 1 inch except 1 inch S/S 2832).
Valve body material		On valve body	• If CF8M is cast on the valve the valve body material is 316 stainless steel.

BODY STYLE VERSUS APPLICATION

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

2820 2-Way Single Seat Unbalanced Valve

The most commonly applied solution with ANSI Class IV and VI leakage rates.

Sizes:	1/2, 3/4, 1, 1-1/4, 1-1/2, 2 inch
Body:	ANSI B16.15 Bronze 250LB Threaded (NPT), or 316 Stainless Steel 300LB Threaded (NPT), or 316 Stainless Steel 300LB SCH 40 Buttweld (BWE) Stainless Steel body valves contain Fluoraz 797 O-Ring upper and lower body seals.*
Trim:	EQ% or Linear, 316 Stainless Steel, Alloy 6, TFE, PEEK, or 17-4 PH Hardened Stainless Steel
Leakage Rates:	ANSI Class IV (Stainless Steel and Alloy 6 Trim), ANSI Class VI (TFE and PEEK Trim)
Packing:	Long-Life Multi-Stack EPDM Lip Packing (-20 to 350°F) Guided Low-Friction TFE V-Ring, Spring Loaded (+32 to 450°F), Adjustable Graphite Packing (-20 to 500°F)
Temperature:	-20 to 400°F (Bronze 250LB Threaded Body) -20 to 450°F (316 Stainless Steel 300LB Threaded or Buttweld Body w/ TFE or PEEK Trim) -20 to 500°F (316 Stainless Steel 300LB Threaded or Buttweld Body w/ Stainless Steel or Alloy 6 Trim)
Rangeability:	50:1

The valve closes — The valve opens

2828 2-Way Single Seat Low Flow Unbalanced Valve

Low Flow Trim with ANSI Class IV and VI leakage rates.

Sizes:	1/2, 3/4, 1 inch
Body:	ANSI B16.15 Bronze 250LB Threaded (NPT), 316 Stainless Steel 300LB Threaded (NPT), or 316 Stainless Steel 300LB SCH 40 Buttweld (BWE) Stainless Steel body valves contain Fluoraz 797 O-Ring upper and lower body seals.*
Trim:	Modified Linear, 316 Stainless Steel, TFE, or PEEK
Leakage Rates:	ANSI Class IV (Stainless Steel Trim), ANSI Class VI (TFE and PEEK Trim)
Packing:	Long-Life Multi-Stack EPDM Lip Packing (-20 to 350°F) Guided Low-Friction TFE V-Ring, Spring Loaded (+32 to 450°F), Adjustable Graphite Packing (-20 to 500°F)
Temperature:	-20 to 400°F (Bronze 250LB Threaded Body) -20 to 450°F (316 Stainless Steel 300LB Threaded or Buttweld Body w/ TFE or PEEK Trim) -20 to 500°F (316 Stainless Steel 300LB Threaded Body or Buttweld Body w/ Stainless Steel Trim)
Rangeability:	40:1 for Cv 1.00 and 0.50. 20:1 for Cv 0.25

The valve closes — The valve opens

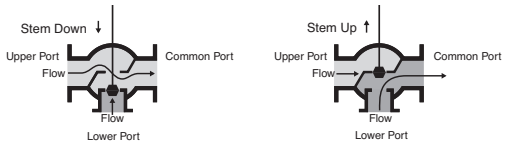
*__NOTE__: Fluoraz is **NOT** compatible with the following solvents: acetates, acetone, benzene, carbon tetrachloride, ethers, Freons, ketons, lacquers, methyl ethyl ketone, toluene.

3-WAY VALVES
(Control of Liquids)

2830 3-Way Mixing Valve

This valve has two inlets and one outlet, and is the simplest solution for mixing or bypass applications with an ANSI Class IV leakage rate. In normal applications the inlet pressures are near equal and control is possible from 5% to 95% of travel with inlet pressures up to 100 PSI.

Sizes:	1/2, 3/4, 1, 1-1/4, 1-1/2, 2 inch
Body:	ANSI B16.15 Bronze 250LB Threaded (NPT), or 316 Stainless Steel 300LB Threaded (NPT), or 316 Stainless Steel 300LB SCH 40 Buttweld (BWE) Stainless Steel body valves contain Fluoraz 797 O-Ring upper and lower body seals.*
Trim:	Linear, 316 Stainless Steel
Packing:	Long-Life Multi-Stack EPDM Lip Packing (-20 to 350°F) Guided Low-Friction TFE V-Ring, Spring Loaded (+32 to 450°F), Adjustable Graphite Packing (-20 to 500°F)
Temperature:	-20 to 400°F (Bronze 250LB Threaded) -20 to 500°F (316 Stainless Steel 300LB Threaded or Buttweld)
Rangeability:	50:1

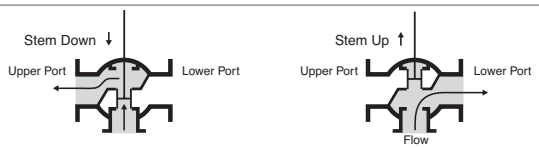


The upper port opens and the lower port closes — The upper port closes and the lower port opens

2832 3-Way Diverting/Mixing Valve

Designed as a diverting valve with one inlet and two outlets with ANSI Class III leakage rate. However, flow can be reversed for mixing if this port configuration is desirable. The difference between the upper port and lower port pressure must not exceed 50 PSID.

Sizes:	1, 1-1/2, 2 inch
Body:	ANSI B16.15 Bronze 250LB Threaded (NPT), or 316 Stainless Steel 300LB Threaded (NPT), or 316 Stainless Steel 300LB SCH 40 Buttweld (BWE) Stainless Steel body valves contain Fluoraz 797 O-Ring upper and lower body seals.*
Trim:	Linear, Bronze (Bronze 250LB Threaded), or 316 Stainless Steel (316 Stainless Steel 300LB Threaded or Buttweld)
Packing:	Long-Life Multi-Stack EPDM Lip Packing (-20 to 350°F) Guided Low-Friction TFE V-Ring, Spring Loaded (+32 to 450°F), Adjustable Graphite Packing (-20 to 500°F)
O-Ring:	EPR (Bronze 250LB Threaded), Fluoraz 797 (316 Stainless Steel 300LB Threaded or Buttweld)
Temperature:	-20 to 300°F (Bronze 250LB Threaded) -20 to 500°F (316 Stainless Steel 300LB Threaded or Buttweld)
Rangeability:	50:1



The upper port opens and the lower port closes — The upper port closes and the lower port opens

DIMENSION (IN) 2820		VALVE SIZE (IN)		
		1/2, 3/4, 1	1-1/4 & 1-1/2	2
A	250THD	4-7/8	5-3/4	6-1/2
	300THD	5	6-1/8	6-1/2
	300BWE	15-3/8	16-7/8	17
B	250THD	2-3/4	3-1/4	3-5/8
	300THD & BWE	3	3-1/2	3-7/8
C	250THD	2-7/8	3-1/2	3-3/4
	300THD & BWE	2-7/8	3-1/2	3-3/4
Weight (LB)	250THD	8-1/2	14-1/2	18-1/2
	300THD	8	15-1/2	19
	300BWE	9-1/2	18	22-1/2

DIMENSION (IN) 2830		VALVE SIZE (IN)		
		1/2, 3/4, 1	1-1/4 & 1-1/2	2
A	250THD	4-7/8	5-3/4	6-1/2
	300THD	5	6-1/8	6-1/2
	300BWE	15-3/8	16-7/8	17
B	250THD	2-23/32	3-13/16	4
	300THD	2-23/32	3-3/8	3-3/4
	300BWE	8	8-3/4	9
C	250THD	2-7/8	3-1/2	3-3/4
	300THD & BWE	2-7/8	3-1/2	3-3/4
Weight (LB)	250THD	9	15-1/2	20
	300THD	8	15	18-1/2
	300BWE	10-1/2	19	23-1/2

DIMENSION (IN) 2828		VALVE SIZE (IN)
		1/2, 3/4, 1
A	250THD	4-7/8
	300THD	5
	300BWE	15-3/8
B	250THD	2-3/4
	300THD & BWE	3
C	250THD	2-7/8
	300THD & BWE	2-7/8
Weight (LB)	250THD	8-1/2
	300THD	8
	300BWE	9-1/2

DIMENSION (IN) 2832		VALVE SIZE (IN)		
		1	1-1/2	2
A	250THD	4-7/8	5-3/4	6-1/2
	300THD	5	6-1/8	6-1/2
	300BWE	15-3/8	16-7/8	17
B	250THD	3-15/32	3-13/16	4
	300THD	2-23/32	3-3/8	3-3/4
	300BWE	8	8-3/4	9
C	250THD	2-7/8	3-1/2	3-3/4
	300THD & BWE	2-7/8	3-1/2	3-3/4
Weight (LB)	250THD	9	16-1/2	21
	300THD	8	16	19-1/2
	300BWE	10-1/2	20	24-1/2

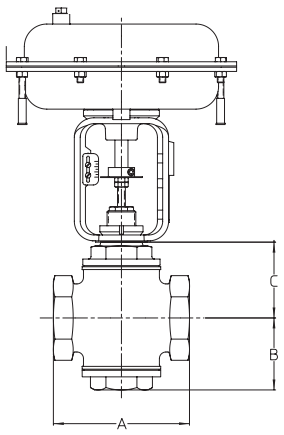
Face to face dimensions conform to Historical Warren Controls standard and are **NOT** ANSI/ISA compatible.

Actual shipping weights may vary.

Pressure reatings are PSIG
For applications below 32° consult factory.
For applications above 375°, 300THD Stainless Steel Body is recommended.

TRIM MATERIALS	FLOWING DIFFERENTIAL PRESSURE LIMIT
Bronze	50 PSID
316 Stainless Steel	100 PSID
TFE	15 PSID
PEEK	100 PSID
17-4 pH Hardened Steel	200 PSID
Alloy 6	300 PSID

BODY PRESSURE-TEMPERATURE RATINGS:		
Temperature (F)	250 THD Bronze	300 THD& BWE SS
+32° To 100°F	400	720
150°	400	670
175°	392	645
200°	385	620
225°	375	605
250°	365	590
275°	350	575
300°	335	560
325°	317	548
350°	300	537
375°	275	526
400°	250	515
450°	-	497
500°	-	480



2-Way or 3-Way
w/ DL49 or 49XR

Valve shown with DL49 Actuator as typical.

For additional actuator information see Series 2800 Product Specification and the Installation Operation and Maintenance Instructions for the actuator in use.

INSTALLATION

See also separate actuator and accessory instructions for additional installation guidelines.

- Be sure that the flow medium, ambient temperature and the selected location will not exceed the maximum temperature of the valve, actuator, or accessories. Information can be found in the product specifications and on the nameplate(s) regarding these limits (See Information Present on Control Valves section for location of important information on valve).
- Follow good piping practices. Install a bypass around the valve. Install stop valves in inlet and outlet piping to provide means to isolate valve.
- A straight run of pipe is recommended for 10 pipe diameters upstream of the valve and 20 pipe diameters downstream of the valve.
- Protect valve and downstream equipment with a self-cleaning strainer.
- Provide proper inlet and outlet drainage in steam service to prevent water hammer or possible erosion in equipment.
- Install gauges in inlet and outlet piping to provide means for checking adjustment and operation.
- For maximum efficiency and minimum wear install valve in vertical position with the stem pointing upward.
- Actuators mounted in any position other than vertical must be supported independent of the valve.
- Be sure to leave clearance to allow for actuator removal (See Dimensions & Weights section of Product Specification for actuator removal clearance).
- Before installing, be sure valve and piping are clean inside and free of scale, chips, welding spatter, and foreign material. Thoroughly blow out or flush pipe lines.
- The valve must be installed with the fluid flowing in the correct direction(s). For proper operation in all applications, control valves must be piped according to the corresponding flow arrows, inlet markings, and port markings present on each valve (See Information Present on Control Valves section for location of important information on valve).
- Pipes must be aligned squarely with the valve at each connection.
- If the valve has screwed ends, do not apply pipe dope to the threads of the valve body or to the first two threads of the pipe.
- If the valve has flanged ends, tighten flange bolts evenly to prevent excessive stress and the possibility of cracking.
- If the valve has welded ends, prevent plug and cage distortion by keeping excess heat from the body.

Check valve for any damage due to improper storage or transportation. Immediately notify your sales organization of any damaged goods upon receipt. Do not attempt to move or disturb the valve further so photos may be taken. If the shipping container is noticeably damaged refuse receipt, as the shipping company should be held liable until a shipping representative is available to take photos.

- The valve, actuator, and accessories (if so equipped) are assembled, tested, and calibrated at the factory. The actuator nameplate specifies set-up parameters used (See Information Present on Control Valves section for location of important information on valve). Do **not** exceed the supply pressure listed on the actuator nameplate or you will damage the valve and void the warranty.
- Supply air or voltage, instrument signal, and accessories should be connected to ports or terminals as indicated on the control valve.
- Final tuning may be required under actual operating conditions.
- On critical or dangerous equipment, provide suitable safety and emergency systems to protect personnel and property from injury due to a valve malfunction. If the valve handles flammable, toxic, corrosive or explosive fluids, provide for safety in the event of valve leakage or malfunction.
- Do not obscure flow arrow plates or nameplates with paint. If flow arrow plates or nameplates will be covered with insulation, it is recommended the information on the plates be transcribed on the outside of the insulation in the same location as the plate.

OPERATION

- Close inlet and outlet stop valves.
- Check that valve responds through rated travel in relation to changes in input signal. Rated travel is shown by position of travel indicator on valve stem relative to travel indicator on yoke.
- For valves fitted with a handwheel, manually operate valve using handwheel through rated travel to check freedom of movement. Return handwheeel to its standby position.
- Place valve in operation.

MAINTENANCE

Series 2800 Precision Globe Control Valves are for the most part maintenance free when properly selected and installed. Rebuilding of these valves should not be necessary under normal operating conditions. For best operation follow installation guidelines (See Installation section); maintain the fluid pressure, temperature, flow, flowing differential pressure, and shut-off differential pressure within the limits of the valve (See Series 2800 Product Specification for details). In installations where high vibration exists, pneumatic and/or electrical connections should periodically be checked for integrity. In water or water and glycol applications, good water quality must be maintained or the service life of the valve may be reduced (See Water Quality Guidelines). The valve stem must be kept free of debris, deposits, dirt, dust, and scratches or the packing parts may be damaged resulting in a packing leak. Control valve hunting will cause excessive stroking of the valve stem and result in premature failure of the packing seal. The system must be stabilized to prevent hunting to ensure reasonable packing life and optimal control performance. Oversizing of a control valve will result in an unstable condition, which can cause noise, vibration, and premature trim and packing seal failure. The use of Warren Controls ValveWorks sizing program will facilitate the selection of the optimum valve.

PACKING ADJUSTMENT

Series 2800 Precision Globe Control Valves have either self-adjusting packing or adjustable packing. Valves with Body Material **B** Bronze and Packing Type **T** V-ring, **V** Vacuum Service, or **L** Lip Packing have self-adjusting packing and require no external adjustment. If the valve has self-adjusting packing and a packing leak is observed replace the packing and if necessary the stem and plug assembly.

Valves with Body Material **B** Bronze and Packing Type **G** Graphite have adjustable packing. Valves with Body Material **S** CF8M and Packing Type **T** V-ring, **G** Graphite, or **V** Vacuum Service Packing also have adjustable packing. If the valve has adjustable packing and a packing leak is observed, tighten the packing nut ¼ turn and observe. If the leak continues tighten the packing nut another ¼ turn and observe. Repeat as necessary. If the leak continues and the packing nut cannot be tightened further with reasonable force replace the packing and if necessary the stem and plug assembly.

PARTS/OVERHAUL

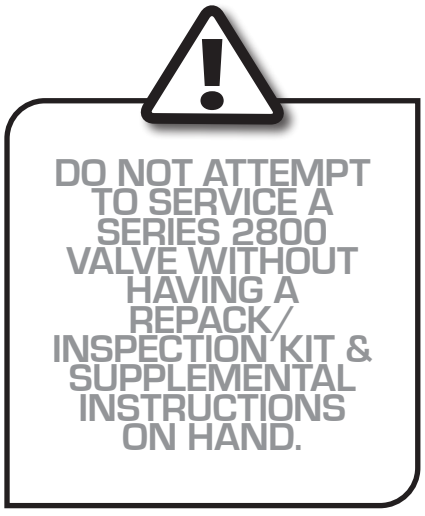
Damaged or worn parts can decrease performance and shorten valve life.

Damaged or worn packing parts including the packing, bearings, spring, and other bonnet parts can cause a packing leak resulting in damage to the actuator, accessories, and surrounding equipment. Damaged or worn packing parts can also cause increased hysteresis resulting in poor control.

Damaged or worn trim parts including the plug, stem, seat ring, piston, and o-ring can cause increased hysteresis, poor control, excessive internal leakage, and poor shut-off. Damaged or worn trim parts can also cause damage to the packing parts resulting in a packing leak.

Damaged or worn body gaskets or o-ring seals can cause external leakage resulting in damage to the actuator, accessories, and surrounding equipment.

Should parts become worn or damaged, parts kits are available. Repack Kits are available to replace the packing. Repack/Inspection Kits are available to allow the valve to be opened for inspection of its internal parts. Rebuild/Repack Kits are available to completely rebuild/ overhaul the valve. Parts kits come with complete step-by-step instructions. Each kit has its own part number. Please provide the valve's serial number to ensure getting the correct kit part number and correct parts.



PARTS KITS

REPACK KIT
FOR 28N MODELS WITH BODY MATERIAL B BRONZE & PACKING TYPE T V-RING
SEE DWG C3769950

ITEM	QTY	DESCRIPTION	ITEM	OTY	DESCRIPTION
2	1	RETAINER BEARING	7	1	PACKING SPRING
3	1	PACKING RETAINER	8	1	O-RING RETAINER
5	1	V-RING PACKING SET	9	1	O-RING
6	1	MALE ADAPTER	12	1	TUBE STEM LUBE

REPACK KIT
FOR 28N MODELS WITH BODY MATERIAL F CF8M & PACKING TYPE T V-RING
SEE DWG C3760953

ITEM	QTY	DESCRIPTION	ITEM	OTY	DESCRIPTION
3	1	O-RING	7	1	V-RING PACKING SET
4	1	O-RING RETAINER	9	1	RETAINER BEARING
5	1	SPRING	10	1	PACKING RETAINER
6	1	MALE ADAPTER	12	1	TUBE STEM LUBE

REPACK KIT
FOR 28N MODELS WITH BODY MATERIAL B BRONZE & PACKING TYPE G GRAPHITE
SEE DWG C3769952

ITEM	QTY	DESCRIPTION	ITEM	OTY	DESCRIPTION
2	1	PACKING RETAINER	5	1	PACKING CARTRIDGE
3	1	RETAINER BEARING	8	1	TUBE STEM LUBE

REPACK KIT
FOR 28N MODELS WITH BODY MATERIAL F CF8M & PACKING TYPE G GRAPHITE
SEE DWG C3760955

ITEM	QTY	DESCRIPTION	ITEM	OTY	DESCRIPTION
3	1	PACKING CARTRIDGE	6	1	PACKING RETAINER
5	1	RETAINER BEARING	8	1	TUBE STEM LUBE

REPACK KIT
FOR 28N MODELS WITH BODY MATERIAL B BRONZE & PACKING TYPE V VACUUM SERVICE
SEE DWG C3761956

ITEM	QTY	DESCRIPTION	ITEM	OTY	DESCRIPTION
2	1	PACKING RETAINER	8	1	PACKING SPRING
3	1	RETAINER BEARING	9	1	O-RING RETAINER
5	1	MALE ADAPTER	10	1	O-RING
6	1	V-RING PACKING SET	13	1	TUBE STEM LUBE
7	1	FEMALE ADAPTER			

REPACK KIT
FOR 28N MODELS WITH BODY MATERIAL F CF8M & PACKING TYPE V VACUUM SERVICE
SEE DWG C3760961

ITEM	QTY	DESCRIPTION	ITEM	OTY	DESCRIPTION
2	1	Packing Retainer	8	1	Spring
3	1	Retainer Bearing	9	1	O-Ring Retainer
5	1	Male Adapter	10	1	O-Ring
6	1	V-Ring Packing Set	13	1	Tube Stem Lube
7	1	Female Adapter			

REPACK KIT
FOR 28N MODELS WITH BODY MATERIAL B BRONZE & TYPE L LIP PACKING
SEE DWG C3769956

ITEM	QTY	DESCRIPTION	ITEM	OTY	DESCRIPTION
2	1	RETAINER BEARING	5	3	LIP PACKING
3	1	PACKING RETAINER	8	1	TUBE STEM LUBE

PARTS KITS

REPACK / INSPECTION KIT FOR MODEL 28N VALVE TYPE 20 BODY MATERIAL B BRONZE SEE DWG D3210959					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
13	1	TUBE PERMATEX #2		1	REPACK KIT

REBUILD / REPACK KIT FOR MODEL 28N VALVE TYPE 20 BODY MATERIAL B BRONZE SEE DWG D3210959					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
1	1	VALVE STEM (Trim Material **S**, **6**, or **H**)	13	1	TUBE PERMATEX #2
4	1	GROOVE PIN (Valve size 1-1/4, 1-1/2, & 2 in)	16	1	PLUG & STEM ASSEMBLY (Valve size ½, ¾, & 1 in, Trim Material **T** or **P**)
5	1	PLUG (Trim Material **S**, **6**, or **H**)	17	1	PLUG ASSEMBLY (Valve size 1-1/4, 1-1/2, & 2 in, Trim Material **T** or **P**)
6	1	SEAT RING		1	ADDITIONAL BONNET SUBASSEMBLY PARTS (SEE TABLE)
9	1	SELF LOCKING NUT (Valve size ½, ¾, & 1 in, (Trim Material **S**, **6**, or **H**)		1	REPACK KIT
12	1	TRAVEL STOP (Valve size ½, ¾, & 1 in)			

REPACK / INSPECTION KIT FOR MODEL 28N VALVE TYPE 20 BODY MATERIAL F CF8M SEE DWG D3210961					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
9	2	O-RING			
15	1	TUBE PST SEALANT		1	REPACK KIT
16	1	O-RING LUBE			

PARTS KITS

REBUILD / REPACK KIT FOR MODEL 28N VALVE TYPE 20 BODY MATERIAL F CF8M SEE DWG D3210691					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
1	1	VALVE STEM (Trim Material **S**, **6**, or **H**)	14	1	TRAVEL STOP (Valve size ½, ¾, & 1 in)
5	1	GROOVE PIN (Valve size 1-1/4, 1-1/2, & 2 in)	15	1	TUBE PST SEALANT
6		PLUG (Trim Material **S**, **6**, or **H**)	16	1	O-RING LUBE
7	1	SEAT RING	19	1	PLUG & STEM ASSEMBLY (Valve size ½, ¾, & 1 in, (Trim Material **T** or **P**)
9	2	O-RING	20	1	PLUG ASSEMBLY Valve size 1-1/4, 1-1/2, & 2 in, (Trim Material T OR P)
10	1	BOTTOM PLUG			ADDITIONAL BONNET SUBASSEMBLY PARTS (SEE TABLE)
11	1	SELF LOCKING NUT (Valve size ½, ¾, & 1 in, (Trim Material **S**, **6**, or **H**)		1	REPACK KIT

REPACK / INSPECTION KIT FOR MODEL 28L VALVE TYPE 28 BODY MATERIAL B BRONZE SEE DWG D3210959					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
13	1	TUBE PERMATEX #2		1	REPACK KIT

REBUILD / REPACK KIT FOR MODEL 28L VALVE TYPE 28 BODY MATERIAL B BRONZE SEE DWG D3210959					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
6	1	SEAT RING	19	1	SEAT RING ASSEMBLY (Trim Material T OR P)
13	1	TUBE PERMATEX #2		1	ADDITIONAL BONNET SUBASSEMBLY PARTS (SEE TABLE)
18	1	PLUG, TRAVEL STOP, & STEM ASSEMBLY		1	REPACK KIT

REPACK / INSPECTION KIT FOR MODEL 28L VALVE TYPE 28 BODY MATERIAL F CF8M SEE DWG D3210961					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
9	2	O-RING			
15	1	TUBE PST SEALANT		1	REPACK KIT
16	1	O-RING LUBE			

PARTS KITS

REBUILD / REPACK KIT FOR MODEL 28L VALVE TYPE 28 BODY MATERIAL F CF8M SEE DWG D3210961					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
7	1	SEAT RING	21	1	PLUG, TRAVEL STOP, & STEM ASSEMBLY
9	2	O-RING	22	1	SEAT RING ASSEMBLY (Trim Material T or P)
10	1	BOTTOM PLUG		1	ADDITIONAL BONNET SUBASSEMBLY PARTS (SEE TABLE)
15	1	TUBE PST SEALANT		1	REPACK KIT
16	1	O-RING LUBE			

REPACK / INSPECTION KIT FOR MODEL 28N VALVE TYPE 30 BODY MATERIAL B BRONZE SEE DWG D3270957					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
12	1	TUBE PERMATEX #2		1	REPACK KIT

REBUILD / REPACK KIT FOR MODEL 28N VALVE TYPE 30 BODY MATERIAL B BRONZE SEE DWG D3270957					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
1	1	VALVE STEM	9	1	SELF LOCKING NUT (Valve size ½, ¾, & 1 in)
7	2	SEAT RING	12	1	TUBE PERMATEX #2
5	1	GROOVE PIN (Valve size 1-1/4, 1-1/2, & 2 in)		1	ADDITIONAL BONNET SUBASSEMBLY PARTS (SEE TABLE)
6	1	PLUG		1	REACK KIT

REPACK / INSPECTION KIT FOR MODEL 28N VALVE TYPE 30 BODY MATERIAL F CF8M SEE DWG D3270958					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
4	2	O-RING			
14	1	TUBE PST SEALANT		1	REPACK KIT
15	1	O-RING LUBE			

REBUILD / REPACK KIT FOR MODEL 28N VALVE TYPE 30 BODY MATERIAL F CF8M SEE DWG D3270958					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
1	1	VALVE STEM	11	1	SELF LOCKING NUT (Valve size ½, ¾, & 1 in)
4	2	O-RING	14	1	TUBE PST SEALANT
6	1	GROOVE PIN (Valve size 1-1/4, 1-1/2, & 2 in)	15	1	O-RING LUBE
7	1	PLUG		1	ADDITIONAL BONNET SUBASSEMBLY PARTS (SEE TABLE)
8	2	SEAT RING		1	REACK KIT
10	1	BOTTOM PORT			

REPACK / INSPECTION KIT FOR MODEL 28N VALVE TYPE 32 BODY MATERIAL B BRONZE SEE DWG C3270959					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
9	1	TUBE PERMATEX #2		1	REPACK KIT

REBUILD / REPACK KIT FOR MODEL 28N VALVE TYPE 32 BODY MATERIAL B BRONZE SEE DWG C3270959					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
1	1	VALVE STEM	9	1	TUBE PERMATEX #2
5	4	JAMNUT	10	1	O-RING LUBE
6	1	O-RING		1	ADDITIONAL BONNET SUBASSEMBLY PARTS (SEE TABLE)
7	1	PISTON		1	REPACK KIT
8	1	BOTTOM PORT			

REPACK / INSPECTION KIT FOR MODEL 28N VALVE TYPE 32 BODY MATERIAL F CF8M SEE DWG D3270963					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
3	2	O-RING			
10	1	O-RING LUBE		1	REPACK KIT
11	1	TUBE PST SEALANT			

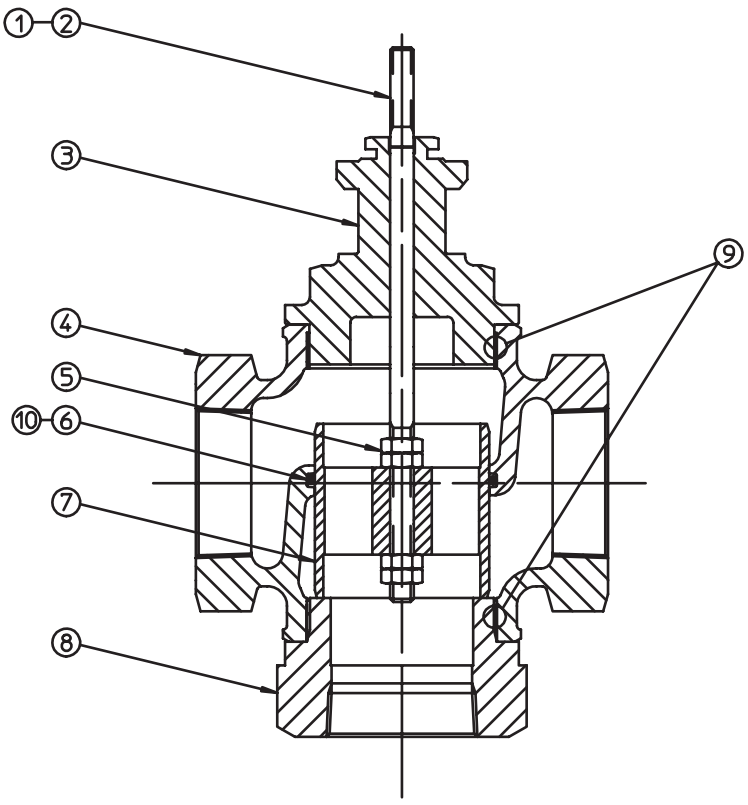
PARTS KITS

REBUILD / REPACK KIT FOR MODEL 28N VALVE TYPE 32 BODY MATERIAL F CF8M SEE DWG D3270963					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
1	1	VALVE STEM	8	1	BOTTOM PORT
3	2	O-RING	10	1	O-RING LUBE
5	1	PISTON	11	1	TUBE PST SEALANT
6	1	O-RING		1	ADDITIONAL BONNET SUBASSEMBLY PARTS (SEE TABLE)
7	4	JAMNUT		1	REPACK KIT

ADDITIONAL BONNET SUBASSEMBLY PARTS IN REPACK/INSPECTION KIT FOR 28N MODELS WITH BODY MATERIAL B BRONZE & PACKING TYPE T V-RING SEE DWG C3769950					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
			10	1	BONNET BEARING
			11	1	BONNET
FOR 28N MODELS WITH BODY MATERIAL F CF8M & PACKING TYPE T V-RING SEE DWG C3760953					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
1	1	BONNET			
2	1	BONNET BEARING			
FOR 28N MODELS WITH BODY MATERIAL B BRONZE & TYPE G GRAPHITE SEE DWG C3769952					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
6	1	BONNET	7	1	BONNET BEARING
FOR 28N MODELS WITH BODY MATERIAL F CF8M & TYPE G GRAPHITE SEE DWG C3760955					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
1	1	BONNET	2	1	BONNET BEARING
FOR 28N MODELS WITH BODY MATERIAL B BRONZE & PACKING TYPE V VACUUM SERVICE SEE DWG C3761956					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
			11	1	BONNET BEARING
			12	1	BONNET
FOR 28N MODELS WITH BODY MATERIAL F CF8M & TYPE V VACUUM SERVICE SEE DWG C3760961					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
			11	1	BONNET BEARING
			12	1	BONNET
FOR 28N MODELS WITH BODY MATERIAL B BRONZE & PACKING TYPE L LIP PACKING SEE DWG C3769956					
ITEM	**QTY**	**DESCRIPTION**	**ITEM**	**QTY**	**DESCRIPTION**
6	1	BONNET	7	1	BONNET BEARING

NOTES:

1) STAMP CHARACTERS PER FLOW ARROW PLATES SHOWN ON D3100018 ON 2 FLATS 180° APART ON EACH HEX END CONNECTION.



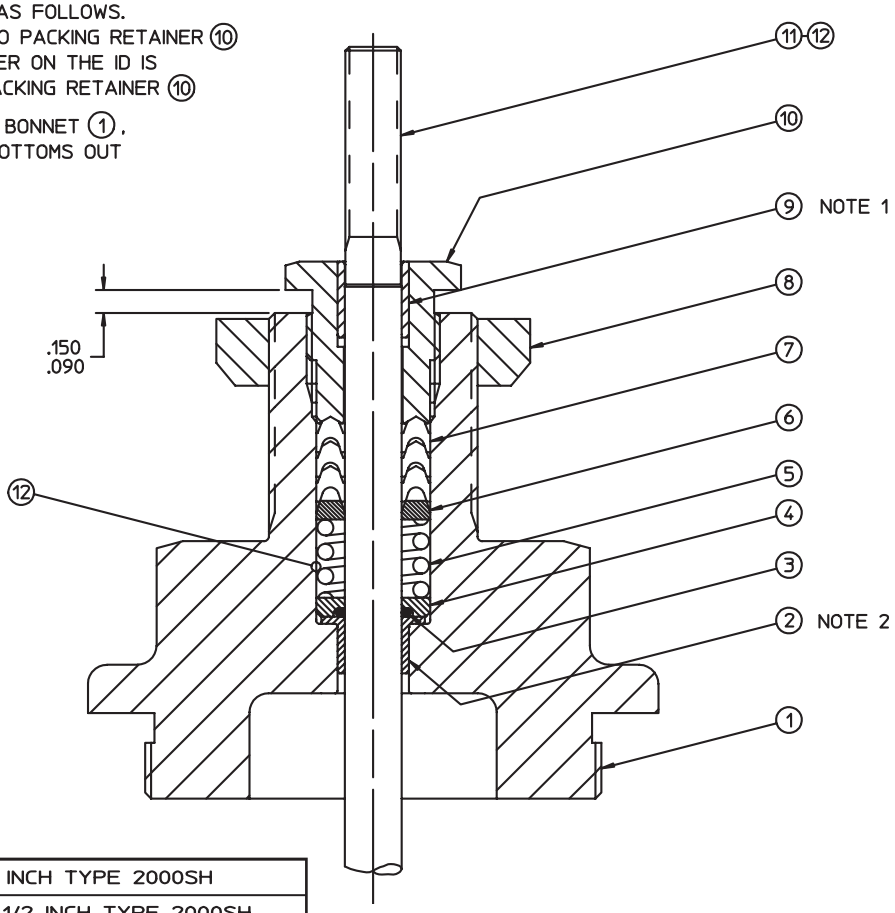
ITEM	QTY	DESCRIPTION
10	A/R	O-RING LUBE
9	A/R	PERMATEX #2
8	1	BOTTOM PORT
7	1	PISTON
6	1	O-RING
5	4	JAMNUT
4	1	VALVE BODY
3	1	BONNET SUBASSEMBLY SEE SEPARATE DWG
2	A/R	STEM LUBE
1	1	VALVE STEM

UNLESS OTHERWISE NOTED TOLERANCES ON DECIMAL .XX ± DECIMAL .XXX ± FRACTION ± ANGLE ± REMOVE ALL SHARP EDGES AND BURRS	MATERIAL	DRAWN J.MARTOCCI	DATE 11/18/96	WARREN CONTROLS CORPORATION BROADWAY, NEW JERSEY 08808
		CHECKED		
	TREATMENT	APPROVED		1-2 INCH TYPE 32 BRONZE VBA
NEXT ASSEMBLY	FINISH		SIZE C / FSCM NO 03847 / DWG NO C3270959	REV

NOTES:

1) RETAINER BEARING (9) IS NOT A SYMMETRICAL PART & SHOULD ONLY BE ASSEMBLED AS FOLLOWS. PRESS RETAINER BEARING (9) INTO PACKING RETAINER (10) UNTIL THE END WITH THE CHAMFER ON THE ID IS FLUSH WITH THE TOP OF THE PACKING RETAINER (10)

2) PRESS BONNET BEARING (2) INTO BONNET (1), ORIENTED AS SHOWN, UNTIL IT BOTTOMS OUT IN PACKING GLAND



PART NO	BONNET NO	USED ON
-03	C1180971-01	2 INCH TYPE 2000SH
-02	C1180867-01	1 1/2 INCH TYPE 2000SH
C3760953-01	C1180668-01	1/2 - 1 INCH TYPE 2000SH

ITEM	QTY	PART NO	DESCRIPTION	MATL SPEC
12	A/R	A0940021	DCIII LUBE	
11	1	AS REQD	VALVE STEM	ST STL TYPE 316
10	1	C1720057-02	PACKING RETAINER	ST STL 300 SERIES
9	1	B1060056	RETAINER BEARING	FIBER REINFORCED POLYETHERETHERKETONE
8	1	B1640034-01	YOKE LOCKNUT	STL PLTD
7	1	A1700054	V-RING PACKING SET	TEFLON
6	1	B1010050-04	MALE ADAPTER	ST STL 300 SERIES
5	1	B1820059	SPRING	ST STL TYPE 302
4	1	B1800050-03	O-RING RETAINER	ST STL 300 SERIES
3	1	04910012	O-RING -012	TEFLON
2	1	B1060055	BONNET BEARING	FIBER REINFORCED POLYETHERETHERKETONE
1	1	SEE OTHER TABLE	BONNET	CAST ST STL ASTM A351 CF8M

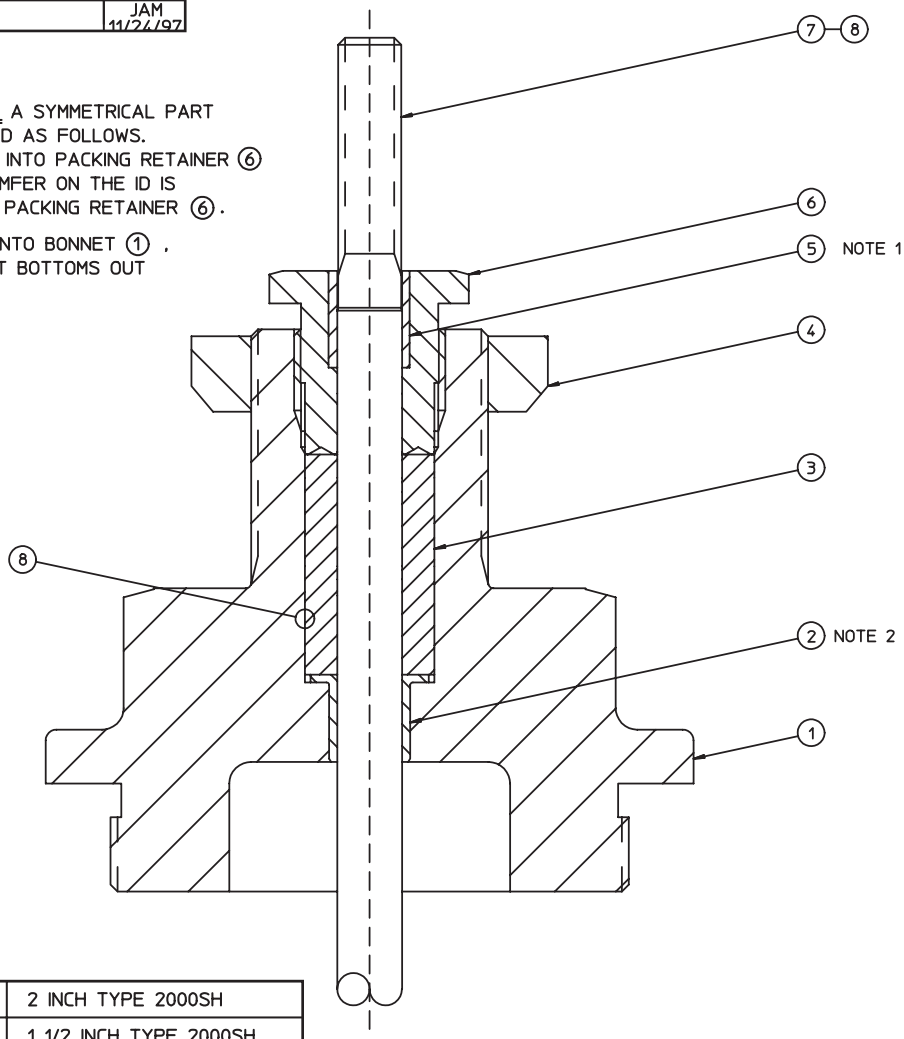
UNLESS OTHERWISE SPECIFIED: DECIMAL .XX ± DECIMAL .XXX ± FRACTION ± ANGLE ± ALL FILLET RADII 1/32 MAX 125 FINISH ON ALL MACHINED SURFACES	MATERIAL: SEE TABLE	DRAWN: J.MARTOCCI	DATE: 7/2/97	WARREN CONTROLS CORPORATION BROADWAY, NEW JERSEY 08808	
	TREATMENT	CHECKED		BONNET SUBASSEMBLY ADJUSTABLE V-RING PACKING 1/2 THRU 2 INCH TYPE 2000SH	
	FINISH	APPROVED		SIZE: C	FSCM NO: 03847
				DWG NO: C3760953-	REV

REV	DESCRIPTION	DATE
A	ECN 1492	JAM 11/24/97

NOTES:

1) RETAINER BEARING ⑤ IS NOT A SYMMETRICAL PART & SHOULD ONLY BE ASSEMBLED AS FOLLOWS. PRESS RETAINER BEARING ⑤ INTO PACKING RETAINER ⑥ UNTIL THE END WITH THE CHAMFER ON THE ID IS FLUSH WITH THE TOP OF THE PACKING RETAINER ⑥.

2) PRESS BONNET BEARING ② INTO BONNET ① , ORIENTED AS SHOWN, UNTIL IT BOTTOMS OUT IN PACKING GLAND.



-03	C1180971-01	2 INCH TYPE 2000SH
-02	C1180867-01	1 1/2 INCH TYPE 2000SH
C3760955-01	C1180668-01	1/2 - 1 INCH TYPE 2000SH
PART NO	BONNET NO	USED ON

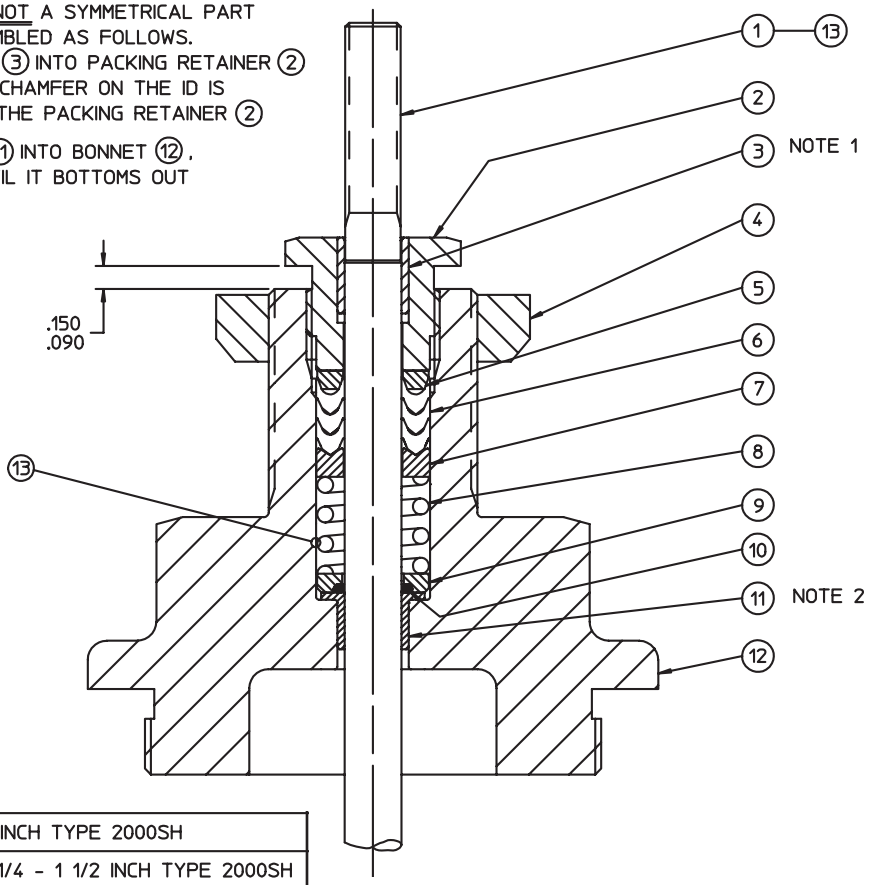
ITEM	QTY	PART NO	DESCRIPTION	MATL SPEC
8	A/R	A0940021	DC111 LUBE	
7	1	AS REQD	VALVE STEM	ST STL TYPE 316
6	1	C1720057-02	PACKING RETAINER	ST STL 300 SERIES
5	1	B1060056	RETAINER BEARING	FIBER REINFORCED POLYETHERETHERKETONE
4	1	B1640034-01	YOKE LOCKNUT	STL PLTD
3	1	B1700056	PACKING CARTRIDGE	GRAPHITE
2	1	B1060055	BONNET BEARING	FIBER REINFORCED POLYETHERETHERKETONE
1	1	SEE OTHER TABLE	BONNET	CAST ST STL ASTM A351 CF8M

UNLESS OTHERWISE SPECIFIED: DECIMAL .XX ± DECIMAL .XXX ± FRACTION ± ANGLE ± ALL FILLET RADII 1/32 MAX 125 FINISH ON ALL MACHINED SURFACES	MATERIAL SEE TABLE	DRAWN J.MARTOCCI	DATE 10/15/97	WARREN CONTROLS CORPORATION BROADWAY, NEW JERSEY 08808
	TREATMENT	CHECKED		SUBASSEMBLY 1/2-2 INCH TYPE SH BONNET & LOCKNUT W/AGP
	FINISH	APPROVED		SIZE C · FSCM NO 03847 · DWG NO C3760955- · REV A

NOTES:

1) RETAINER BEARING (3) IS NOT A SYMMETRICAL PART & SHOULD ONLY BE ASSEMBLED AS FOLLOWS. PRESS RETAINER BEARING (3) INTO PACKING RETAINER (2) UNTIL THE END WITH THE CHAMFER ON THE ID IS FLUSH WITH THE TOP OF THE PACKING RETAINER (2)

2) PRESS BONNET BEARING (11) INTO BONNET (12), ORIENTED AS SHOWN, UNTIL IT BOTTOMS OUT IN PACKING GLAND



PART NO	BONNET NO	USED ON
-03	C1180971-01	2 INCH TYPE 2000SH
-02	C1180867-01	1 1/4 - 1 1/2 INCH TYPE 2000SH
C3760961-01	C1180668-01	1/2 - 1 INCH TYPE 2000SH

ITEM	QTY	PART NO	DESCRIPTION	MATL SPEC
13	A/R	A0940021	DC111 LUBE	
12	1	SEE TABLE	BONNET	CAST ST STL ASTM A351 CF8M
11	1	B1060055	BONNET BEARING	FIBER REINFORCED POLYETHERETHERKETONE
10	1	04910012	O-RING -012	TEFLON
9	1	B1800050-03	O-RING RETAINER	ST STL 300 SERIES
8	1	B1820059	SPRING	ST STL TYPE 302
7	1	B1010066-02	FEMALE ADAPTER	ST STL 300 SERIES
6	1	A1700054	V-RING PACKING SET	TEFLON
5	1	B1010050-04	MALE ADAPTER	ST STL 300 SERIES
4	1	B1640034-01	YOKE LOCKNUT	STEEL PLATED
3	1	B1060056	RETAINER BEARING	FIBER REINFORCED POLYETHERETHERKETONE
2	1	C1720063-02	PACKING RETAINER	ST STL 300 SERIES
1	1	AS REQD	VALVE STEM	ST STL TYPE 316

UNLESS OTHERWISE SPECIFIED:
DECIMAL .XX ±
DECIMAL .XXX ±
FRACTION ±
ANGLE ±
ALL FILLET RADII 1/32 MAX
125 FINISH ON ALL MACHINED SURFACES

MATERIAL: SEE TABLE
TREATMENT:
FINISH:

DRAWN: BLB 6/5/03
CHECKED:
APPROVED:

WARREN CONTROLS INCORPORATED
BROADWAY, NEW JERSEY 08808

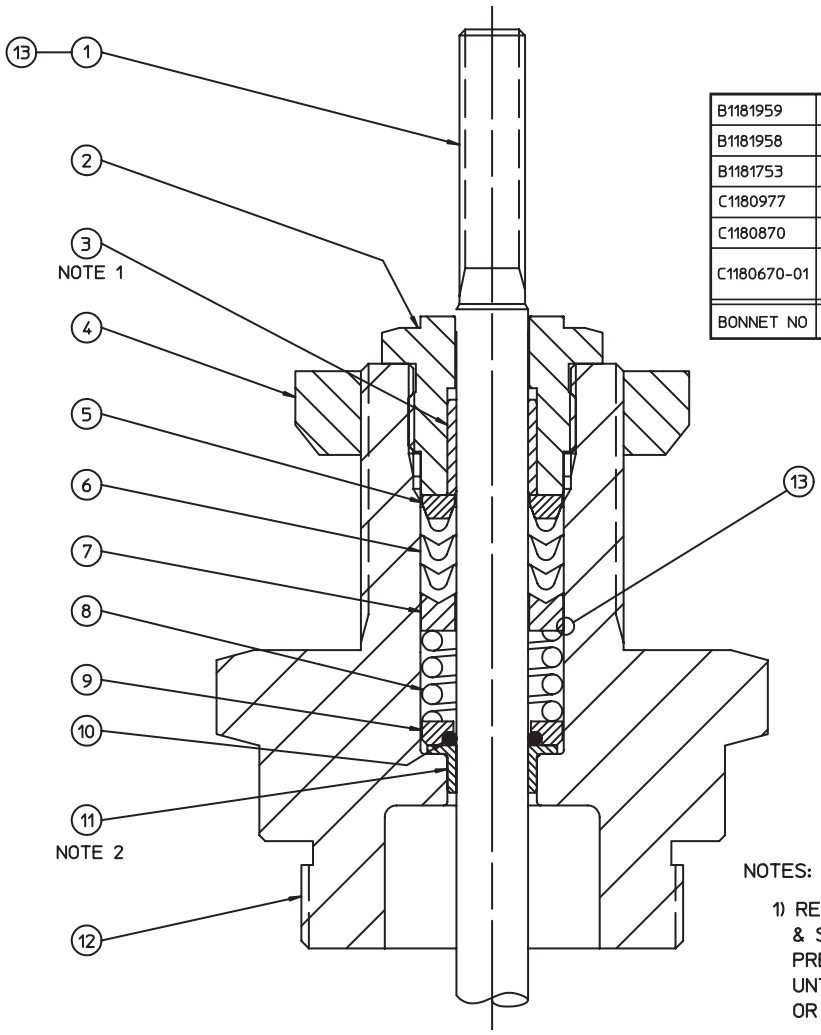
BONNET SUBASSEMBLY AVP VACUUM SERVICE 1/2 -2 INCH TYPE 2000SH

SIZE C | FSCM NO 03847 | DWG NO C3760961- | REV

C3761956

REV	DESCRIPTION	DATE
A	REDRAWN WITH CHANGE ECN 2161	BLB 11/11/05

B1181959	B1060057	10 INCH TYPE 22/72 250# FLG
B1181958	B1060057	10 INCH TYPE 22/72 125# FLG
B1181753	B1060057	8 INCH TYPE 22/72
C1180977	B1060055	2 INCH TYPE 20/70, 30
C1180870	B1060055	1 1/2 INCH TYPE 20/70, 30
C1180670-01	B1060057	1/2 - 1 & 2 1/2 - 10 INCH TYPE 20/70, 30, 32 1 1/2 - 6 INCH TYPE 22/72
BONNET NO	BONNET BEARING NO	USED ON



NOTES:

1) RETAINER BEARING (3) IS NOT A SYMMETRICAL PART & SHOULD ONLY BE ASSEMBLED AS FOLLOWS. PRESS RETAINER BEARING (3) INTO PACKING RETAINER (2) UNTIL THE END WITH THE CHAMFER ON THE ID IS ABOVE OR FLUSH WITH THE BOTTOM OF THE PACKING RETAINER (2)

2) PRESS BONNET BEARING (11) INTO BONNET (12), ORIENTED AS SHOWN, UNTIL IT BOTTOMS OUT IN PACKING GLAND

ITEM	QTY	PART NO	DESCRIPTION	MATL SPEC
13	A/R	A0940021	DC111 LUBE	
12	1	SEE TABLE	BONNET	BRASS OR BRONZE
11	1	SEE TABLE	BONNET BEARING	FIBER REINFORCED POLYETHERETHERKETONE
10	1	04910012	O-RING -012	TEFLON
9	1	B1800050-01	O-RING RETAINER	BRASS
8	1	B1820059	SPRING	ST STL TYPE 302
7	1	B1010066-01	FEMALE ADAPTER	BRASS
6	1	A1700054	V-RING PACKING SET	TEFLON
5	1	B1010050-03	MALE ADAPTER	BRASS
4	1	B1640034-01	YOKE LOCKNUT	STEEL PLATED
3	1	B1060056	RETAINER BEARING	FIBER REINFORCED POLYETHERETHERKETONE
2	1	C1720062-03	PACKING RETAINER	BRASS
1	1	AS REQD	VALVE STEM	ST STL TYPE 316

UNLESS OTHERWISE SPECIFIED: DECIMAL .XX ±.010, DECIMAL .XXX ±.005, FRACTION ± 1/64, ANGLE ± 1°, ALL FILLET RADII 1/32 MAX, 125 FINISH ON ALL MACHINED SURFACES, ALL DIMENSIONS ARE IN INCHES

MATERIAL: SEE TABLE
TREATMENT:
FINISH:

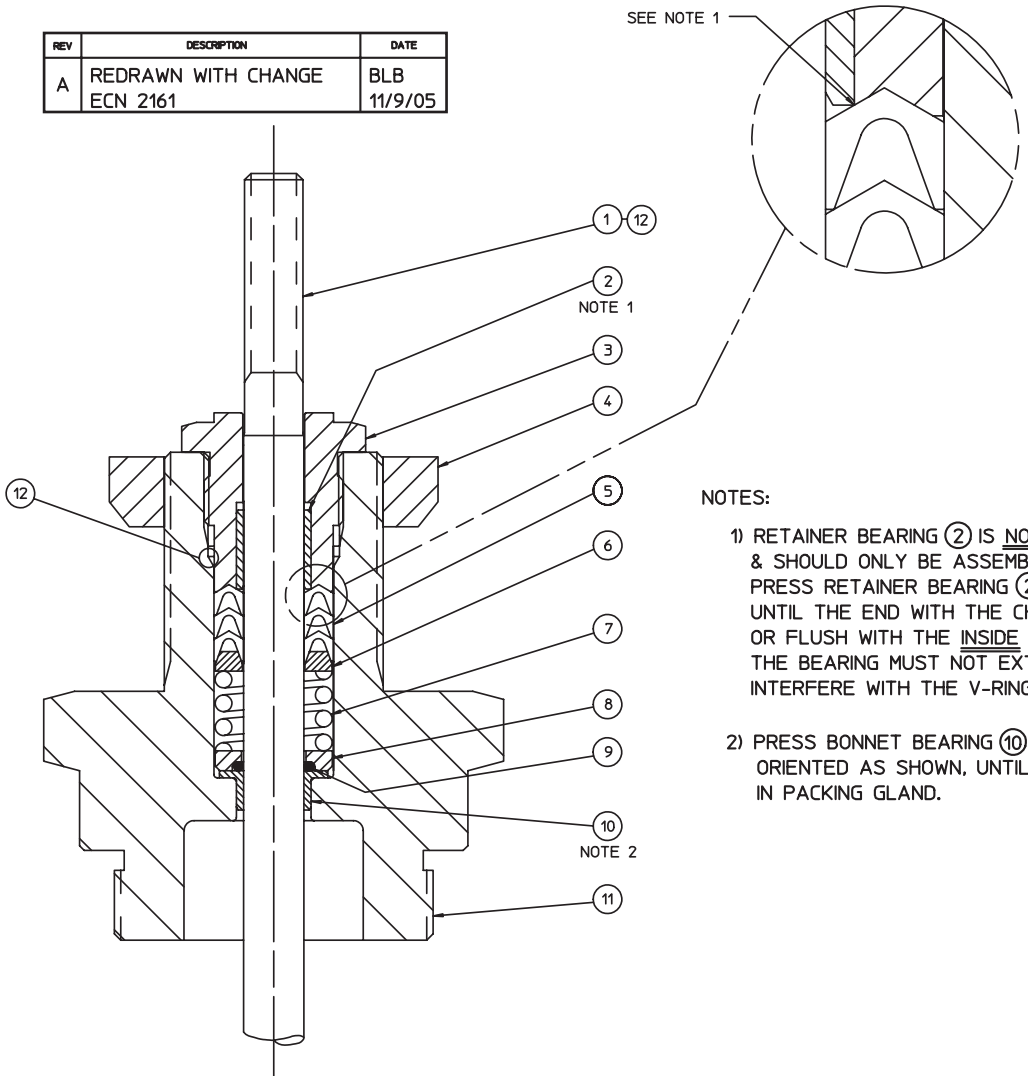
DRAWN: BLB 11/11/05
CHECKED:
APPROVED:

WARREN CONTROLS INCORPORATED
BETHLEHEM, PENNSYLVANIA 18020-8010

BONNET SUBASSY VACUUM SERVICE
GLFVP 1.376-18 W/ BEARINGS

SIZE C | FSCM NO 03847 | DWG NO C3761956- | REV A

REV	DESCRIPTION	DATE
A	REDRAWN WITH CHANGE ECN 2161	BLB 11/9/05



NOTES:

1) RETAINER BEARING (2) IS NOT A SYMMETRICAL PART & SHOULD ONLY BE ASSEMBLED AS FOLLOWS. PRESS RETAINER BEARING (2) INTO PACKING RETAINER (3) UNTIL THE END WITH THE CHAMFER ON THE ID IS ABOVE OR FLUSH WITH THE INSIDE EDGE OF THE V-NOTCH. THE BEARING MUST NOT EXTEND PAST THE V-NOTCH AND INTERFERE WITH THE V-RING PACKING.

2) PRESS BONNET BEARING (10) INTO BONNET (11), ORIENTED AS SHOWN, UNTIL IT BOTTOMS OUT IN PACKING GLAND.

ITEM	QTY	PART NO	DESCRIPTION	MATL SPEC
12	A/R	A0940021	DC111 LUBE	
11	1	C1180670-01	BONNET	BRASS
10	1	B1060057	BONNET BEARING	FIBER REINFORCED POLYETHERETHERKETONE
9	1	04910012	O-RING -012	TEFLON
8	1	B1800050-01	O-RING RETAINER	BRASS
7	1	B1820059	PACKING SPRING	ST STL TYPE 302
6	1	B1010050-03	MALE ADAPTER	BRASS
5	1	A1700054	V-RING PACKING SET	TEFLON
4	1	B1640034-01	YOKE LOCKNUT	STEEL PLATED
3	1	C1720060-03	PACKING RETAINER	BRASS
2	1	B1060056	RETAINER BEARING	FIBER REINFORCED POLYETHERETHERKETONE
1	1	AS REQD	VALVE STEM	ST STL TYPE 316

REMOVE ALL SHARP EDGES AND BURRS
DIMENSIONED PER ASME Y14.5M-1994
THIRD ANGLE PROJECTION
NEXT ASSEMBLY

UNLESS OTHERWISE SPECIFIED:
DECIMAL .XX ±.010 | DECIMAL .XXX ±.005
FRACTION ± 1/64 | ANGLE ± 1°
ALL FILLET RADII 1/32 MAX
125 FINISH ON ALL MACHINED SURFACES
ALL DIMENSIONS ARE IN INCHES

MATERIAL: SEE TABLE
TREATMENT:
FINISH:

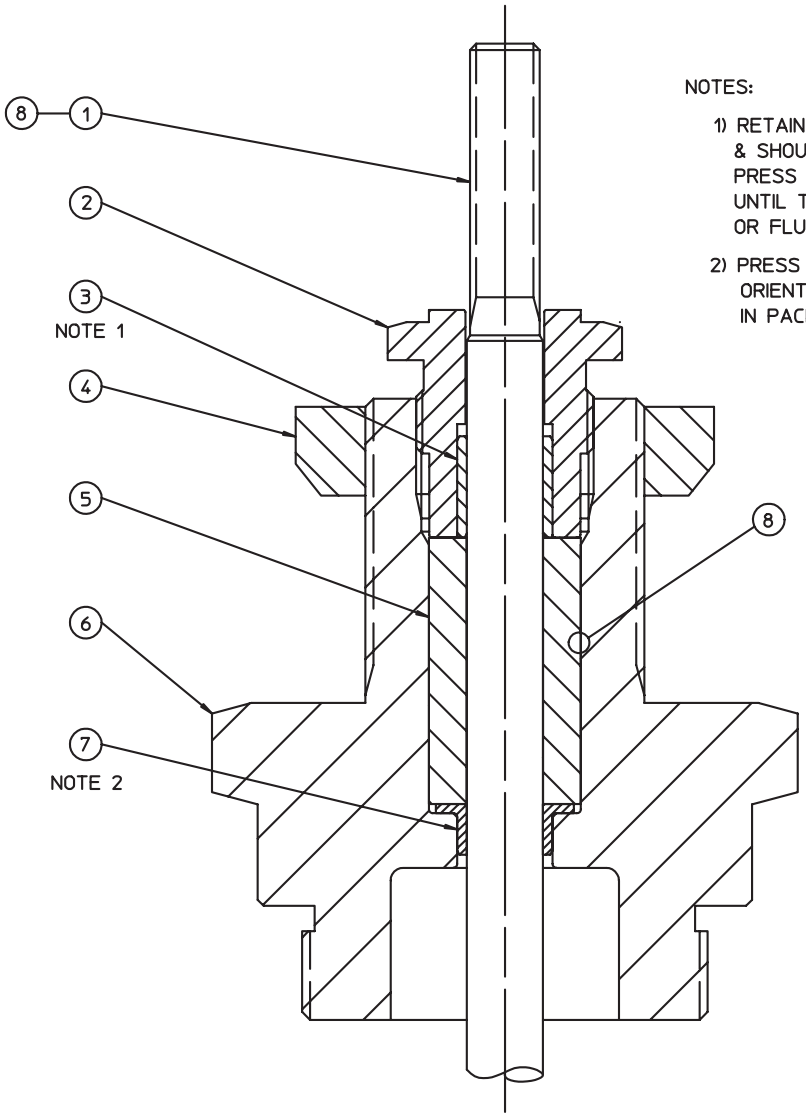
DRAWN: BLB 4/15/03
CHECKED:
APPROVED:

WARREN CONTROLS INCORPORATED
BETHLEHEM, PENNSYLVANIA 18020-8010

NONADJUSTABLE V-RING PACKING SUBASSY
BONNET 1.376-18, 2-18 W/BEARINGS

SIZE	FSCM NO	DWG NO	REV
C	03847	C3769950	A

REV	DESCRIPTION	DATE
A	REDRAWN WITH CHANGE ECN 2161	BLB 11/10/05



NOTES:

1) RETAINER BEARING (3) IS NOT A SYMMETRICAL PART & SHOULD ONLY BE ASSEMBLED AS FOLLOWS. PRESS RETAINER BEARING (3) INTO PACKING RETAINER (2) UNTIL THE END WITH THE CHAMFER ON THE ID IS ABOVE OR FLUSH WITH THE BOTTOM OF THE PACKING RETAINER (2)

2) PRESS BONNET BEARING (7) INTO BONNET (6), ORIENTED AS SHOWN, UNTIL IT BOTTOMS OUT IN PACKING GLAND

ITEM	QTY	PART NO	DESCRIPTION	MATL SPEC
8	A/R	A0940021	DC111 LUBE	
7	1	B1060057	BONNET BEARING	FIBER REINFORCED POLYETHERETHERKETONE
6	1	C1180670-01	BONNET	BRASS
5	1	B1700056	PACKING CARTRIDGE	GRAPHITE
4	1	B1640034-01	YOKE LOCKNUT	STEEL PLATED
3	1	B1060056	RETAINER BEARING	FIBER REINFORCED POLYETHERETHERKETONE
2	1	C1720061-03	PACKING RETAINER	BRASS
1	1	AS REQD	VALVE STEM	ST STL TYPE 316

REMOVE ALL SHARP EDGES AND BURRS
DIMENSIONED PER ASME Y14.5M-1994
THIRD ANGLE PROJECTION
NEXT ASSEMBLY

UNLESS OTHERWISE SPECIFIED:
DECIMAL .XX ±.010
DECIMAL .XXX ±.005
FRACTION ± 1/64
ANGLE ± 1°
ALL FILLET RADII 1/32 MAX
125 FINISH ON ALL MACHINED SURFACES
ALL DIMENSIONS ARE IN INCHES

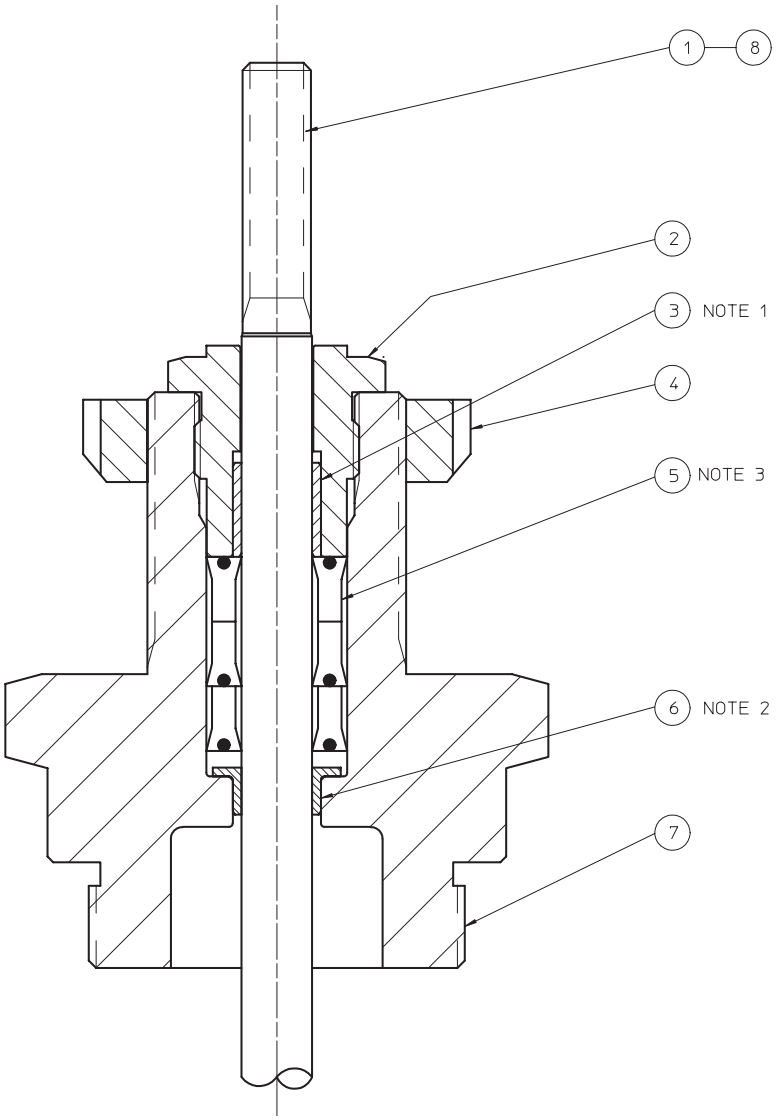
MATERIAL: SEE TABLE
TREATMENT:
FINISH:

DRAWN: BLB 11/10/05
CHECKED:
APPROVED:

WARREN CONTROLS INCORPORATED
BETHLEHEM, PENNSYLVANIA 18020-8010

BONNET SUBASSY ADJUSTABLE GRAPHITE PACKING 1.376-18 2-18 W/ BEARINGS

SIZE	FSCM NO	DWG NO	REV
C	03847	C3769952	A



REV	DESCRIPTION	DATE
A	REDRAWN WITH CHANGE ECN 2161	BLB 11/10/05

NOTES:

1) RETAINER BEARING (3) IS NOT A SYMMETRICAL PART & SHOULD ONLY BE ASSEMBLED AS FOLLOWS. PRESS RETAINER BEARING (3) INTO PACKING RETAINER (2) UNTIL THE END WITH THE CHAMFER ON THE ID IS ABOVE OR FLUSH WITH THE BOTTOM OF THE PACKING RETAINER (2).

2) PRESS BONNET BEARING (6) INTO BONNET (7), ORIENTED AS SHOWN, UNTIL IT BOTTOMS OUT IN PACKING GLAND.

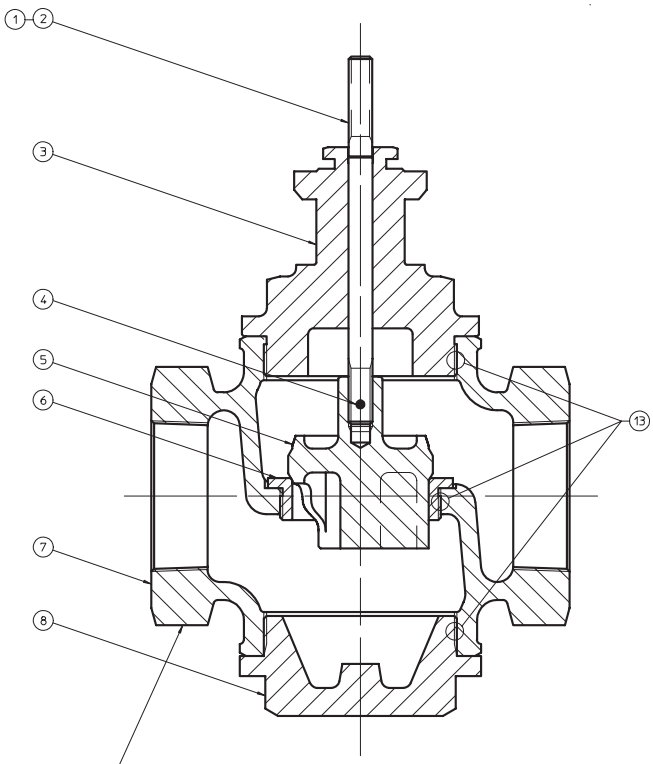
3) PROTECT ID & OD SEALING LIPS OF PACKING FROM CUTS, NICKS OR SCRAPES DURING INSTALLATION. DO NOT FORCE SEALING LIPS PAST BONNET THREADS OR STEM THREADS. USE OF INSTALLATION SLEEVE IS RECOMMENDED. LUBRICATE PACKING ID & OD AND STEM BEFORE INSTALLATION. PACKING MUST BE ORIENTED AS SHOWN.

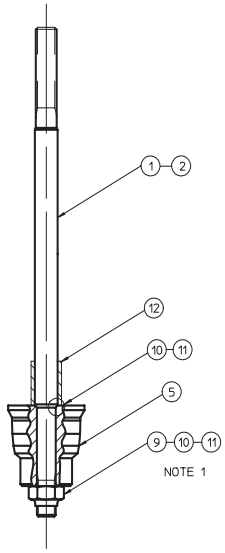
ITEM	QTY	PART NO	DESCRIPTION	MATL SPEC
8	A/R	A0940021	DC111 LUBE	
7	1	C1180670-01	BONNET	BRASS ASTM B16 H02
6	1	B1060057	BONNET BEARING	FIBER REINFORCED POLYETHERETHERKETONE
5	3	4207-18700375-312	LIP PACKING	HIGH TEMP ETHYLENE PROPYLENE 90 DURO
4	1	B1640034-01	YOKE LOCKNUT	STL PLTD
3	1	B1060056	RETAINER BEARING	FIBER REINFORCED POLYETHERETHERKETONE
2	1	C1720061-03	PACKING RETAINER	BRASS ASTM B16
1	1	AS REQD	VALVE STEM	ST STL TYPE 316

E SPECIFIED: DECIMAL .XXX ±.005; ANGLE ± 1°; ADD 1/32 MAX ALL MACHINED; ARE IN INCHES	MATERIAL: SEE TABLE	DRAWN: BLB	DATE: 11/10/05	WARREN CONTROLS INCORPORATED BETHLEHEM, PENNSYLVANIA 18020-8010		
		CHECKED		BONNET SUBASSEMBLY NLP PACKING 400°F EPDM 1.376-18 2-18 W/ BEARINGS		
	TREATMENT	APPROVED				
	FINISH			SIZE: C	FSCM NO: 03847	DWG NO: C3769956	REV: A

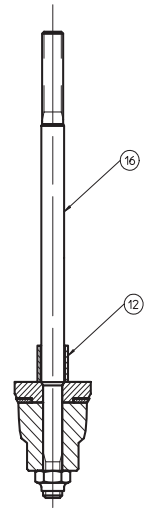
D3210959

REV	DESCRIPTION	DATE
A	REDRAWN WITH CHANGE ECN 2284	BLB 6/29/07

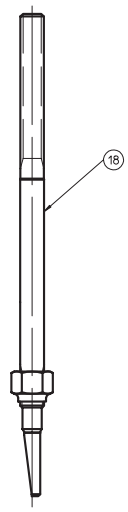




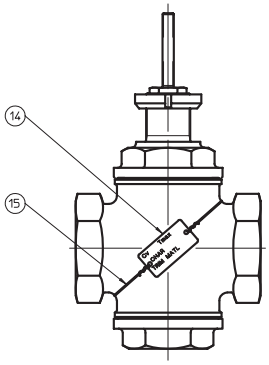
1/2 - 1 INCH PORT PLUG CONSTRUCTION

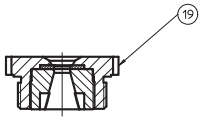


1/2 - 1 INCH PORT SOFT SEAT PLUG CONSTRUCTION

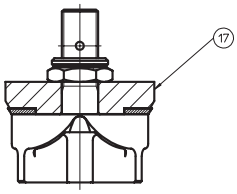


TYPE 2828 PLUG CONSTRUCTION





TYPE 2828 SOFT SEAT SEAT CONSTRUCTION



1 1/4 - 2 INCH PORT SOFT SEAT PLUG CONSTRUCTION

2) ITEMS 16, 17, 18 & 19 ARE ONLY AVAILABLE AS INSEPARABLE ASSEMBLIES.
1) TORQUE ITEM 11 TO 120 INCH LBS.
NOTES:

ITEM	QTY	DESCRIPTION
19	A/R	TYPE 2828 SOFT SEAT SEAT RING ASSEMBLY - SEE NOTE 2
18	A/R	TYPE 2828 PLUG, TRAVEL STOP AND STEM ASSEMBLY - SEE NOTE 2
17	A/R	1 1/4 - 2 INCH PORT SOFT SEAT PLUG ASSEMBLY - SEE NOTE 2
16	A/R	1/2 - 1 INCH PORT SOFT SEAT PLUG & STEM ASSEMBLY - SEE NOTE 2
15	A/R	NAMEPLATE WIRE
14	A/R	NAMEPLATE
13	A/R	THD SEALANT
12	A/R	TRAVEL STOP
11	A/R	LOCTITE PRIMER T
10	A/R	LOCTITE 272
9	A/R	5/16-24 ALL METAL SELF LOCKING NUT
8	1	BOTTOM PLUG
7	1	VALVE BODY
6	1	SEAT RING
5	1	PLUG
4	A/R	GROOVE PIN
3	1	BONNET SUBASSEMBLY SEE SEPARATE DWG
2	A/R	STEM LUBE
1	1	VALVE STEM

REMOVE ALL SHARP EDGES AND BURRS
DIMENSIONED PER ASME Y14.5M-1994
THIRD ANGLE PROJECTION
NEXT ASSEMBLY
UNLESS OTHERWISE SPECIFIED:
DECIMAL .XX ±.010
DECIMAL .XXX ±.005
FRACTION ± 1/64
ANGLE ± 1°
ALL FILLET RAD 1/32 MAX
FINISH ON ALL MACHINED SURFACES
ALL DIMENSIONS ARE IN INCHES
MATERIAL
TREATMENT
FINISH
DRAWN BLB 6/29/07
CHECKED
APPROVED

WARREN CONTROLS INCORPORATED
BETHLEHEM, PENNSYLVANIA 18020-8010

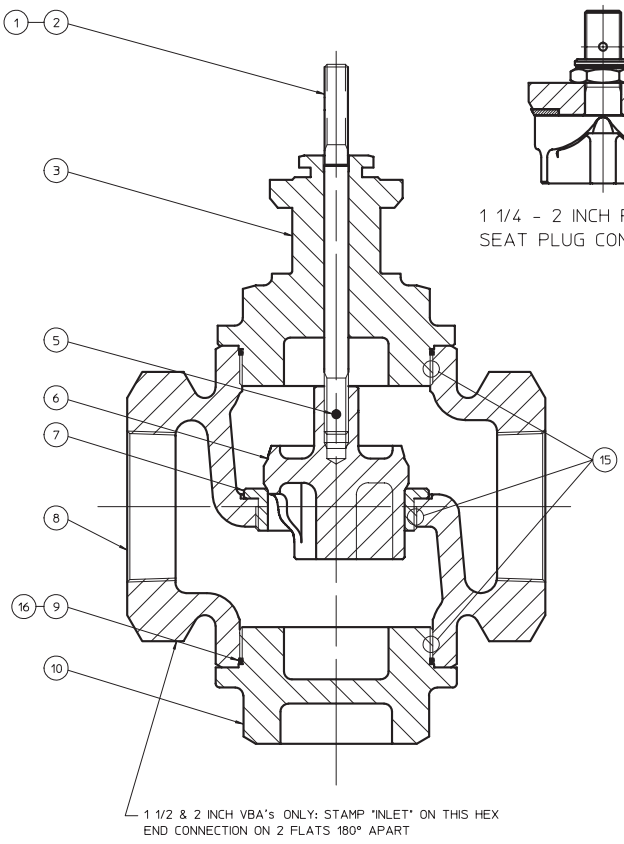
1/2 THRU 2 INCH TYPE 2820 & 2828 BRONZE VBA

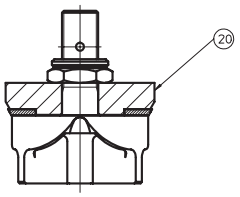
SIZE D | FSCM NO 03847 | DWG NO D3210959 | REV A

D3210961

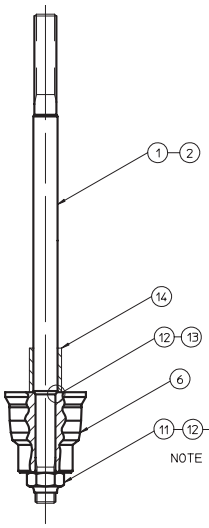
REV	DESCRIPTION	DATE
B	REDRAWN WITH CHANGE ECN 2284	BLB 6/29/07

NOTES:
1) TORQUE ITEM 11 TO 120 INCH LBS.
2) 1/2-1 INCH VBA's ONLY: SECURE FLOW ARROW PLATE (ITEM 17) TO PAD ON SIDE OF VALVE BODY USING 2 DRIVE SCREWS (ITEM 18).
3) ITEMS 19, 20, 21 & 22 ARE ONLY AVAILABLE AS INSEPARABLE ASSEMBLIES.

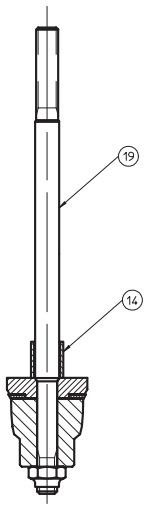


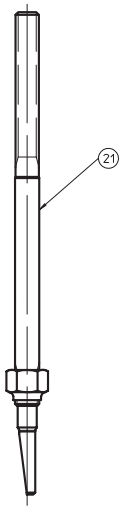


1 1/4 - 2 INCH PORT SOFT SEAT PLUG CONSTRUCTION



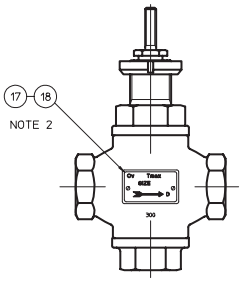
1/2 - 1 INCH PORT PLUG CONSTRUCTION



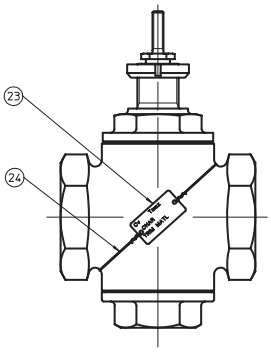


TYPE 2828 PLUG CONSTRUCTION

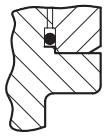
1/2 - 1 INCH PORT SOFT SEAT PLUG CONSTRUCTION



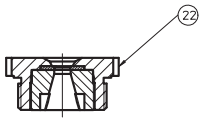
1/2-1 INCH VBA FLOW ARROW PLATE



1 1/4-2 INCH VBA NAMEPLATE



O-RING ASSY DETAIL TYP 2 PLACES



TYPE 2828 SOFT SEAT SEAT CONSTRUCTION

ITEM	QTY	DESCRIPTION
24	A/R	NAMEPLATE WIRE
23	A/R	NAMEPLATE
22	A/R	TYPE 2828 SOFT SEAT SEAT RING ASSEMBLY - SEE NOTE 3
21	A/R	TYPE 2828 PLUG, TRAVEL STOP AND STEM ASSEMBLY - SEE NOTE 3
20	A/R	1 1/4 - 2 INCH PORT SOFT SEAT PLUG ASSEMBLY - SEE NOTE 3
19	A/R	1/2 - 1 INCH PORT SOFT SEAT PLUG & STEM ASSEMBLY - SEE NOTE 3
18	A/R	DRIVE SCREW NO 4 x 1/4
17	A/R	FLOW ARROW PLATE
16	A/R	O-RING LUBE
15	A/R	THD SEALANT
14	A/R	TRAVEL STOP
13	A/R	LOCTITE PRIMER T
12	A/R	LOCTITE 272
11	A/R	5/16-24 ALL METAL SELF LOCKING NUT
10	1	BOTTOM PLUG
9	2	O-RING
8	1	VALVE BODY
7	1	SEAT RING
6	1	PLUG
5	A/R	GROOVE PIN
3	1	BONNET SUBASSEMBLY SEE SEPARATE DWG
2	A/R	STEM LUBE
1	1	VALVE STEM

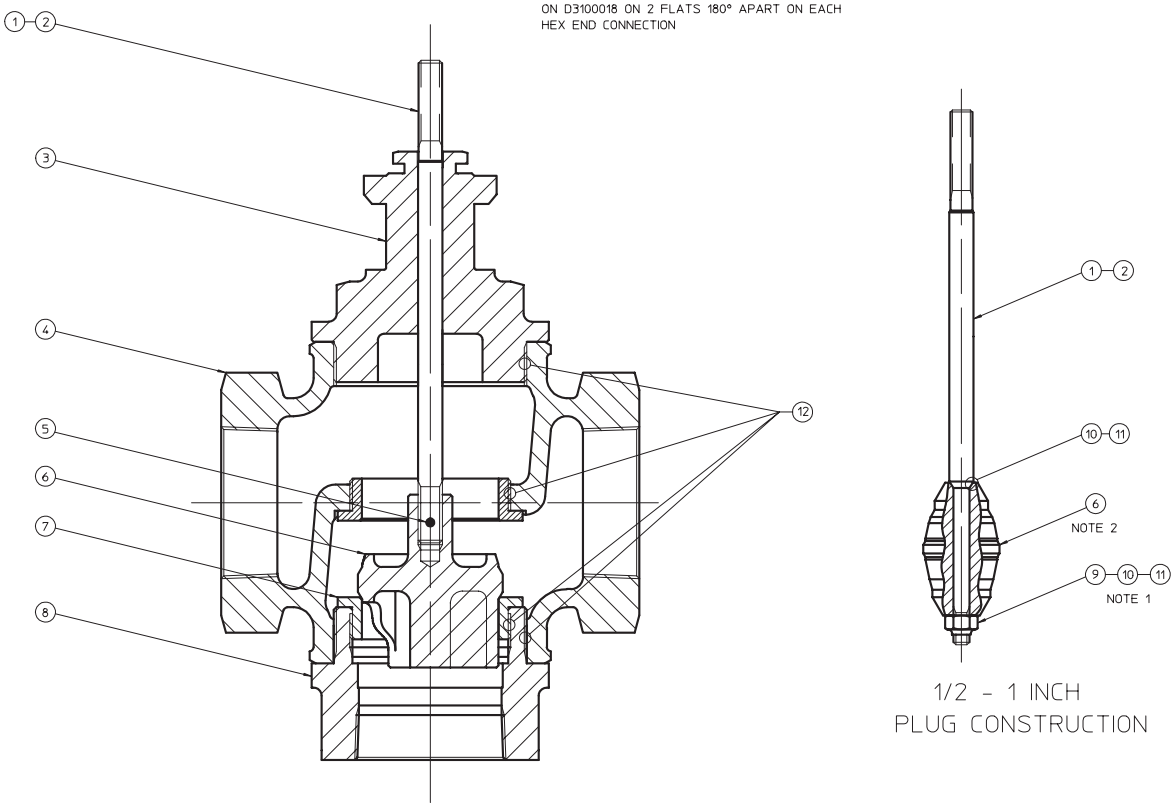
REMOVE ALL SHARP EDGES AND BURRS
DIMENSIONED PER ASME Y14.5M-1994
THIRD ANGLE PROJECTION
NEXT ASSEMBLY
UNLESS OTHERWISE SPECIFIED
DECIMAL .XX ±.010
DECIMAL .XXX ±.005
FRACTION ± 1/64
ANGLE ± 1°
ALL FILLET RADII 1/32 MAX
FINISH ON ALL MACHINED SURFACES
ALL DIMENSIONS ARE IN INCHES
MATERIAL
TREATMENT
FINISH
DRAWN BLB 6/29/07
CHECKED
APPROVED

WARREN CONTROLS INCORPORATED
BETHLEHEM, PENNSYLVANIA 18020-8010

1/2 THRU 2 INCH TYPE TYPE 2820 & 2828 STAINLESS STEEL VBA WITH BODY SEALS

SIZE D | PROD NO 03847 | DWG NO D3210961 | REV B

NOTES:
1) TORQUE ITEM 9 TO 80 INCH LBS
2) CONTOURED PLUGS ARE NOT SYMMETRICAL AND MUST BE ASSEMBLED SO .289 DIA x 60° COUNTERSINK ON PLUG SEALS ON 64° ANGLE ON VALVE STEM
3) STAMP CHARACTERS PER FLOW ARROW PLATES SHOWN ON D3100018 ON 2 FLATS 180° APART ON EACH HEX END CONNECTION



1/2 - 1 INCH
PLUG CONSTRUCTION

ITEM	QTY	DESCRIPTION
12	A/R	PERMATEX #2
11	A/R	LOCTITE PRIMER T
10	A/R	LOCTITE 272
9	A/R	1/4-28 ALL METAL SELF LOCKING NUT
8	1	BOTTOM PORT
7	2	SEAT RING
6	1	PLUG
5	A/R	GROOVE PIN
4	1	VALVE BODY
3	1	BONNET SUBASSEMBLY SEE SEPARATE DWG
2	A/R	STEM LUBE
1	1	VALVE STEM

UNLESS OTHERWISE NOTED TOLERANCES ON	MATERIAL	DRAWN J.MARTOCCI	DATE 10/24/96	WARREN CONTROLS CORPORATION BROADWAY, NEW JERSEY 08808	
DECIMAL .XX ±		CHECKED			
DECIMAL .XXX ±	TREATMENT	APPROVED		1/2 THRU 2 INCH TYPE 30 BRONZE VBA	
FRACTION ± ANGLE ±					
REMOVE ALL SHARP EDGES AND BURRS					
NEXT ASSEMBLY	FINISH			SIZE D / PRCH NO 03847 / DWG NO D3270957	REV

D3270958

REV	DESCRIPTION	DATE
A	REDRAWN WITH CHANGE ECN 1938	BLB 3/11/03

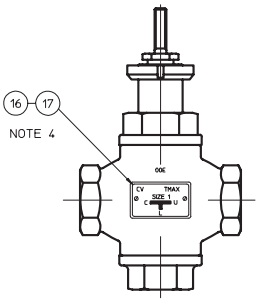
4 1/2-1 INCH VBA's ONLY: SECURE FLOW ARROW PLATE (16) TO PAD ON SIDE OF VALVE BODY USING 2 DRIVE SCREWS (17).

3) 1 1/2 & 2 INCH VBA's ONLY: STAMP CHARACTERS PER FLOW ARROW PLATES SHOWN ON D3100018 ON 2 FLATS 180° APART ON EACH HEX END CONNECTION.

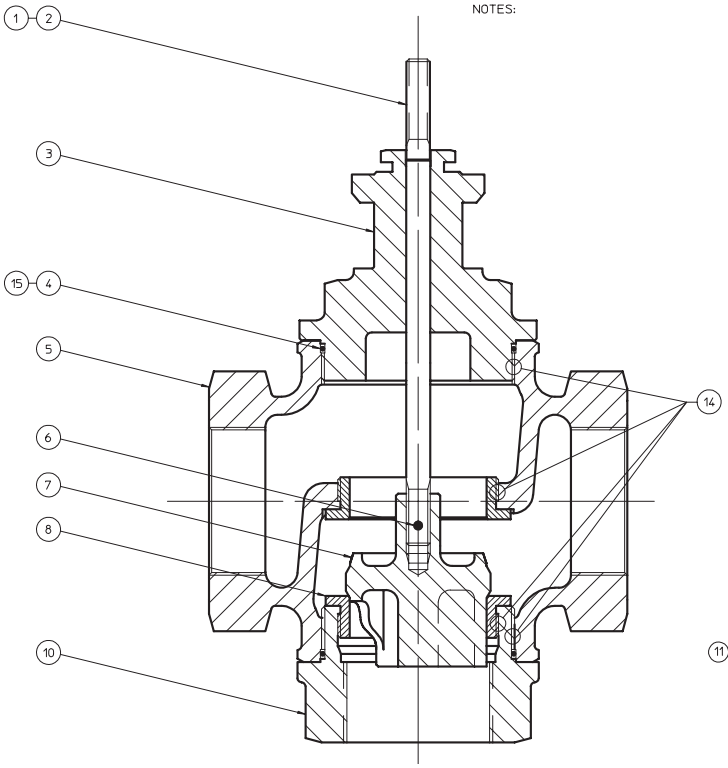
2) CONTOURED PLUGS ARE NOT SYMMETRICAL AND MUST BE ASSEMBLED SO .289 DIA x 60° COUNTERSINK ON PLUG SEALS ON 64° ANGLE ON VAVLE STEM.

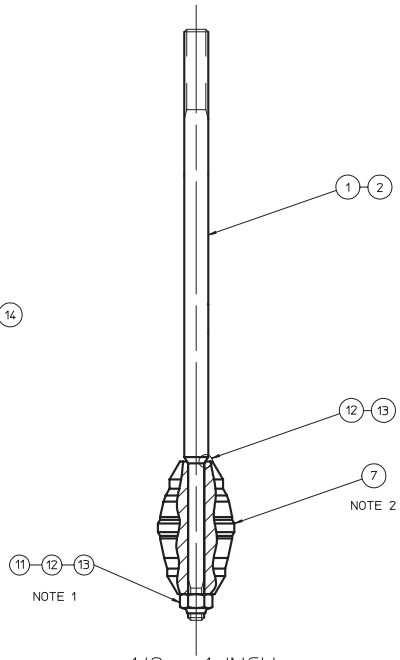
1) TORQUE ITEM 11 TO 80 INCH LBS.

NOTES:

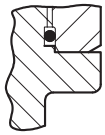


1/2-1 INCH VBA





1/2 - 1 INCH
PLUG CONSTRUCTION



O-RING ASSY DETAIL
TYP 2 PLACES

ITEM	QTY	DESCRIPTION
17	A/R	DRIVE SCREW NO 4 x 1/4
16	A/R	FLOW ARROW PLATE
15	A/R	O-RING LUBE
14	A/R	PST SEALANT
13	A/R	LOCTITE PRIMER T
12	A/R	LOCTITE 272
11	A/R	1/4-28 ALL METAL SELF LOCKING NUT
10	1	BOTTOM PORT
8	2	SEAT RING
7	1	PLUG
6	A/R	GROOVE PIN
5	1	VALVE BODY
4	2	O-RING
3	1	BONNET SUBASSEMBLY SEE SEPARATE DWG
2	A/R	STEM LUBE
1	1	VALVE STEM

UNLESS OTHERWISE SPECIFIED
DECIMAL .XX ±.010
DECIMAL .XXX ±.005
FRACTION ± 1/64
ANGLE ± 1°
ALL FILLET RADII 1/32 MAX
FINISH ON ALL MACHINED SURFACES

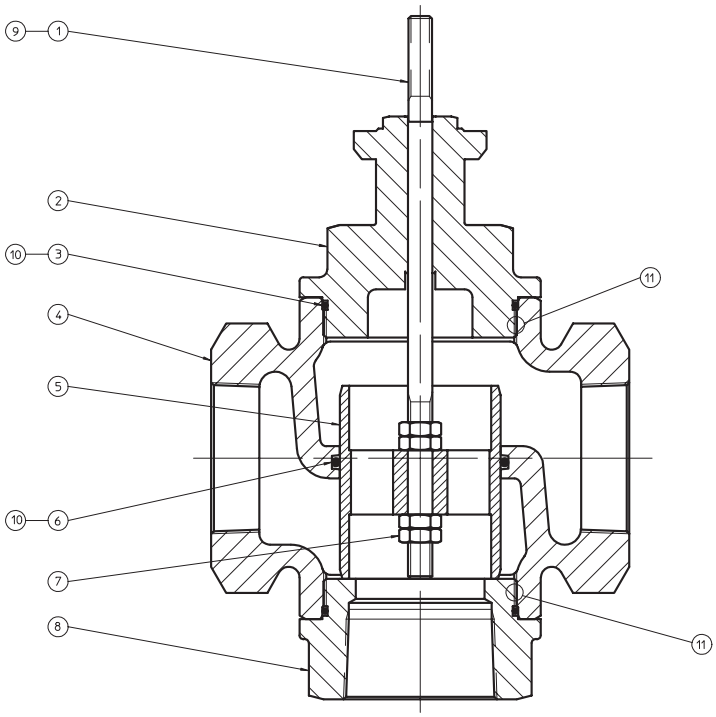
MATERIAL
TREATMENT
FINISH

DRAWN BLB DATE 3/11/03
CHECKED
APPROVED

WARREN CONTROLS INCORPORATED
BROADWAY, NEW JERSEY 08808

1/2 THRU 2 INCH TYPE 30SH VBA

SIZE D | PATH NO 03847 | DWG NO D3270958 | REV A



1) STAMP CHARACTERS PER FLOW ARROW PLATES SHOWN ON D3100018 ON 2 FLATS 180° APART ON EACH HEX END CONNECTION.

NOTES:

ITEM	QTY	DESCRIPTION
11	A/R	PST SEALANT
10	A/R	O-RING LUBE
9	A/R	STEM LUBE
8	1	BOTTOM PORT
7	4	HEX JAMNUT
6	1	O-RING
5	1	PISTON
4	1	VALVE BODY
3	2	O-RING
2	1	BONNET SUBASSEMBLY SEE SEPARATE DRAWING
1	1	VALVE STEM

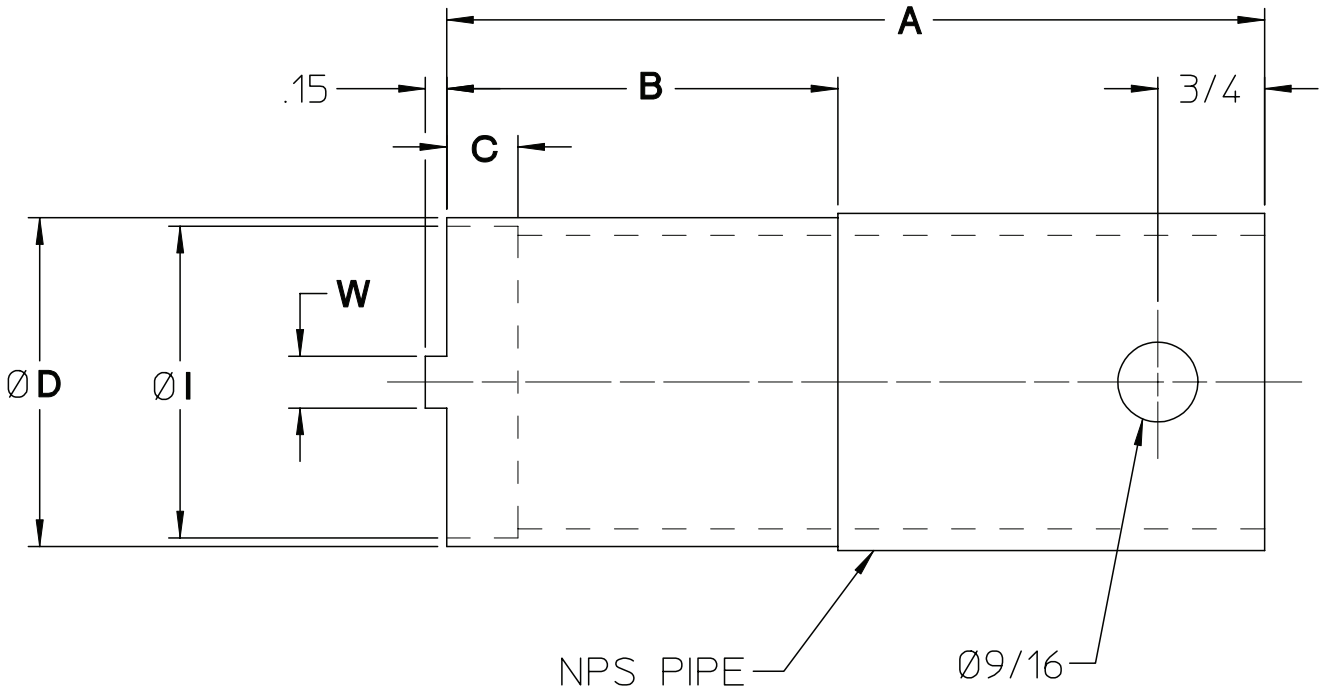
REMOVE ALL SHARP EDGES AND BURRS
DIMENSIONED PER ASME Y14.5M-1994
THIRD ANGLE PROJECTION
NEXT ASSEMBLY
UNLESS OTHERWISE SPECIFIED:
DECIMAL .XX ±.010
DECIMAL .XXX ±.005
FRACTION ± 1/64
ANGLE ± 1°
ALL FILLET RADII 1/32 MAX
FINISH ON ALL MACHINED SURFACES
MATERIAL
TREATMENT
FINISH
DRAWN BLB
DATE 8/11/03
CHECKED
APPROVED

WARREN CONTROLS INCORPORATED
BETHLEHEM, PENNSYLVANIA 18020-8010

1/2 THRU 2 INCH TYPE 32SH
VALVE BODY ASSEMBLY

SIZE	PSCH NO	DWG NO	REV
D	03847	D3270963	

SEAT WRENCH FOR SLOTTED SEAT RINGS
0.5 TO 2.0 INCH TYPES 20, 70, 30 AND 26



SIZE	NPS	SCH	A	B	C	D	I	W
0.50-1.00	1 1/2	80	5 1/4	2 1/4	1/2	1.900	1.595	0.295
1.25-1.50	2	40	5 3/4	2 3/4	1/2	2.375	2.285	0.365
2.00	2 1/2	40	6	3	1/2	2.875	2.725	0.365

NOTES

WARREN CONTROLS INC.

A VETERAN OWNED, PRIVATELY HELD, SMALL BUSINESS

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