Series 2700A, 2700E and 2720 Control Valves

Flexible Designs:

Configurations, trims and actuators to suit your application

Series 2700A

Series 2720

The Series 2700 family of control valves *offers the flexibility to select the most effective design and features for a specific application. The Series 2700 family includes three valve/actuator configurations: 2700A Standard, 2700E Extended Bonnet* and 2720 Close-Coupled.**

Each configuration includes a single-ported valve body with either balanced, unbalanced, full port or restricted port trims to suit a variety of flow requirements. Both plug-control and cage-control trims are available in metal-to-metal or metal-to-composition seating material for Class VI shut-off. All trims are interchangeable within the valve body.

*Not available in all sizes. Please consult factory.

Features

2700A Control Valve

- Balanced trims 1 inch and larger
- Unbalanced trims 1 inch and smaller
- Plug-control trims (modified percentage, quick opening)
- Cage-control trims (linear, equal percentage, cavitation control, noise reduction)
- 17-4PH SST standard trim, other materials available
- Available with direct- or reverse-acting, yoke-mounted pneumatic diaphragm actuators
- Trim options include erosion-resistant, soft-seat ring, noise abatement and cavitation control
- Cage-control trim features dwell protected seat area
- TFE V-ring packing (non-adjustable, spring-loaded)
- Bolted closure bonnet

Series 2700E Extended Bonnet Control Valve

- Includes all 2700A features
- High and low temperature services
- Special trim and seal materials

Direct- or Reverse-Acting Actuators (2700A, 2700E)

- Available for a wide range of applications
- Broad selection of accessories, including side- or top-mounted manual handwheel overrides, travel stops and spring ranges for all applications
- Molded diaphragm design gives precise positioning of the valve plug throughout valve travel
- Computer-designed, ductile iron yoke adds stability and strength to resist fatigue from vibration and high-frequency service or over-pressurization of the diaphragm housing
- Steel diaphragm housing helps prevent excessive deflection in over-pressure conditions
- Standard 3 to 15 psig and 6 to 30 psig spring ranges

Series 2720 Control Valve with Close-Coupled Actuator

- Includes all 2700A valve features
- Space saving, economical design
- Reverse, close-coupled (yokeless) actuator
- Non-adjustable, spring-loaded packing
- Interchangeable trim variations
- Visual travel indicator on the actuator housing
- Body sizes from 1 inch (25 mm) through 4 inch (100 mm)

Contents

NORRISEAL™
A DOVER COMPANY

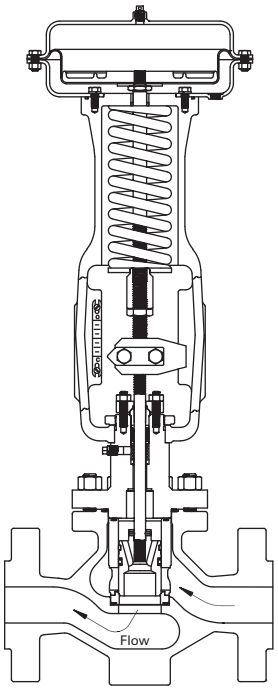
Engineered Performance

Configurations

Series 2700A

Applications: general control service for a wide range of pressures, temperatures and fluids.

Operating temperatures from –50°F (–46°C) to 600°F (316°C). **See Valve Material Temperature Limits, page 3.**

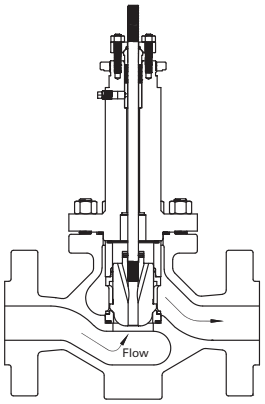


SERIES 2700A VALVE/YOKE-MOUNTED ACTUATOR ASSEMBLY

As shown: Cage-control trim, TFE V-ring spring-loaded packing, reverse-acting (fail-closed) actuator

Series 2700E

Applications: used for low-temperature service down to –150°F (–101°C) or high-temperature service up to 800°F (427°C). **See Valve Material Temperature Limits, page 3.**

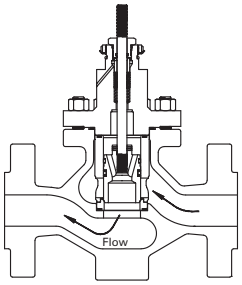


SERIES 2700E EXTENDED BONNET BODY ASSEMBLY FOR YOKE-MOUNTED ACTUATOR

As shown: Plug-control trim, graphite packing

Series 2720

Applications: provides features of the Series 2700A valve, but with a close-coupled, space-saving, economical design. Standard operating temperature up to 200°F (93°C).



SERIES 2720 BODY ASSEMBLY FOR CLOSE-COUPLED ACTUATOR

As shown: Cage-control trim, spring-loaded TFE V-ring packing

Design Specifications

Norriseal valves are designed in accordance with ANSI B16.34, ANSI B16.5 and ISA S75.03, S75.16.

NACE Conformance

Norriseal manufacturing procedures and material selection meet the requirements of NACE Standard Recommended Practice MR0175-2002 for metallic materials used in sour service applications. Refer to **Materials of Construction** on page 3 for body/bonnet and trim materials used specifically for sour gas service to meet NACE requirements.

Quality Assurance

Norriseal is an ISO 9001:2008 certified manufacturer. Norriseal's Quality Assurance department maintains strict control of material certificates and traceability of parts used in Norriseal control valves. The quality assurance program monitors all phases of manufacturing, finished parts and assembly to ensure conformance to all requirements.

Options

- Reduced port trims
- DB II noise abatement trims
- CAV II cavitation control valve trim
- Composition seating materials for Class VI shut-off
- Alloy 6 facing for plug and seat
- Tungsten-carbide trim*
- Graphite high-temperature packing
- Adjustable packing
- Fugitive emissions packings
- Lubricator and isolating valve
- Drain plug in valve body
- Additional corrosion- and erosion-resistant materials

*Limited to plug control trims

Accessories

- Manual override handwheels (side- or top-mounted)
- Manual actuator
- Electric actuator
- Travel stops
- Pressure controllers
- Pressure reducing air filter regulator
- Electric position transmitter
- I/P transducers
- Electric limit switches
- Solenoid valves
- All stainless steel accessory mounting hardware
- Positioners
  - Pneumatic
  - Electro-pneumatic
  - Digital

Valve Specifications

VALVE MATERIAL TEMPERATURE LIMITS

Body/Bonnet		
Body/Bonnet Material	Limits*	
	F	C
ASTM A216 Gr WCC	–20° to 800°	–29° to 427°
ASTM A352 Gr LCC	–50° to 650°	–46° to 343°
ASTM A351 Gr CF8M	–100°(1) to 800°	–73°(1) to 427°

(1) –300°F (–184°C) with special impact testing.
Allowable pressures per ANSI B16.34.

Packing		
Packing Material	Limits*	
	F	C
TFE V-Ring	–120° to 400°	–84° to 204°
Graphite	–300° to 800°	–184° to 427°
Kalrez®/TFE	0° to 500°	–18° to 260°

Other packing materials available on application.

Trim				
Plug Material	Cage Material	Seat Material	Limits*	
			F	C
316 SST(2)	316 SST	316 SST(2)	–300° to 400°	–184° to 204°
316 SST/Alloy 6	316 SST(4)	316 SST/Alloy 6	–300° to 800°	–184° to 427°
17-4PH SST	17-4PH SST	17-4PH SST	–50° to 800°	–46° to 427°
17-4PH SST/Carbide(5)	17-4PH SST	316 SST/Carbide	–50° to 600°	–46° to 316°
Duplex SST	Duplex SST(4)	Duplex SST	–20° to 750°	–29° to 399°

(2) Shutoff pressure drop of 316 SST seat is 750 psi (51 Bar) maximum.
(4) Chrome plate for service above 400°F (204°C).
(5) Plug control trims only
*All temperature limits are determined by the limits of the least component

BODY/BONNET MATERIALS OF CONSTRUCTION

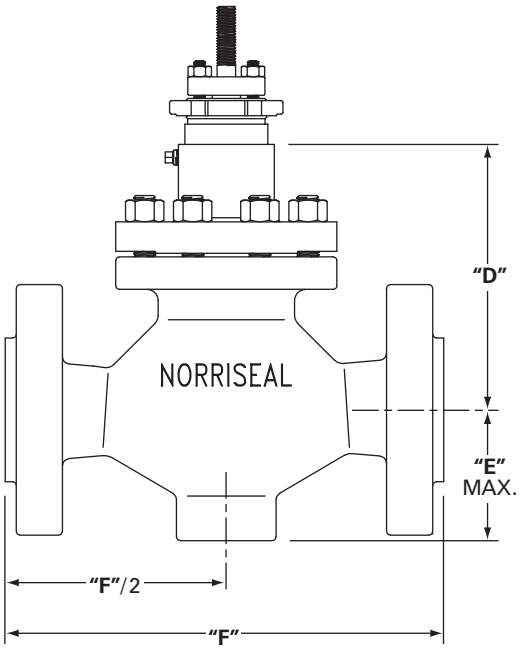
Valve Component		
Body and Bonnet	ASTM A216 Gr. WCC ASTM A351 Gr. CF8M ASTM A352 Gr. LCC	Duplex Stainless Steel Other materials available - Consult factory
Closure Studs	ASTM A193 Gr B7 ASTM A193 Gr B7M ASTM A193 Gr B8M	ASTM A320 Gr L7 ASTM A193 Gr B16
Closure Nuts	ASTM A194 Gr 2H ASTM A194 Gr 2HM ASTM A194 Gr 8M	ASTM A194 Gr 7 ASTM A194 Gr 16
Packing	TFE Graphite	KalrezT/TFE Elastomeric/TFE (various)
Packing Spring	Inconel X-750	
Bonnet Gasket	316L SST/Graphite	Inconel/Graphite
Valve Stem	17-4PH SST Nitronic 50	316 SST
Compressor Bar	316 SST	
Packing Retainer	316 SST	
Packing Studs	ASTM A193 Gr B7	
Packing Nuts	ASTM A194 Gr 2H	
Lantern Ring	316 SST	
Packing Washer	304 SST	
Bonnet Lock Nut	ASTM A536 Ductile Iron	

Valve Specifications (CONTINUED)

BODY FACE TO FACE "F" DIMENSIONS

Body End Connection Type		Body Size, Inches (mm)								
		1.0 (25)	1.5 (40)	2.0 (50)	3.0 (80)	4.0 (100)	6.0 (150)	8.0 (200)	10.0 (254)	12.0 (305)
NPT Female		■	■	11.25 (286)	N/A	N/A	N/A	N/A	N/A	N/A
Butt Weld		■	■	■	■	■	■	■	N/A	N/A
Socket Weld		■	■	■	N/A	N/A	N/A	N/A	N/A	N/A
ANSI Flanged Raised Face	150	7.25 (184)	8.75 (222)	10.00 (254)	11.75 (299)	13.88 (353)	17.75 (451)	21.38 (543	26.5 (673)	29.0 (737)
	300	7.75 (197)	9.25 (235)	10.50 (267)	12.50 (318)	14.50 (368)	18.62 (473)	22.38 (568)	27.88 (708)	30.5 (775)
	600	8.25 (210)	9.88 (251)	11.25 (286)	13.25 (337)	15.50 (394)	20.00 (508)	24.00 (610)	29.62 (752)	32.25 (819)
	900	10.75 (273)	12.25 (311)	14.75 (375)	15.50 (394)	17.00 (432)	24.00 (610)	29.00 (737)	N/A	N/A
	1500	10.75 (273)	12.25 (311)	14.75 (375)	18.12 (460)	20.88 (530)	27.75 (705)	32.75 (832)	N/A	N/A
	2500	N/A	N/A	16.88 (429)	22.75 (578)	26.50 (673)	34.00 (864)	40.25 (1022)	N/A	N/A
ANSI Flanged Ring-Type Joint	150	7.75 (197)	9.25 (235)	10.50 (267)	12.25 (311)	14.38 (365)	18.25 (464)	21.88 (556)	27.00 (686)	29.5 (749)
	300	8.25 (210)	9.75 (248)	11.12 (282)	13.12 (333)	15.12 (384)	19.25 (489)	23.00 (584)	28.5 (724)	31.12 (790)
	600	8.25 (210)	9.88 (251)	11.38 (289)	13.38 (340)	15.62 (397)	20.12 (511)	24.12 (613)	29.75 (756)	32.38 (822)
	900	10.75 (273)	12.25 (311)	14.88 (378)	15.62 (397)	17.12 (435)	24.12 (613)	29.12 (740)	N/A	N/A
	1500	10.75 (273)	12.25 (311)	14.88 (378)	18.25 (464)	21.00 (533)	28.00 (711)	33.12 (841)	N/A	N/A
	2500	N/A	N/A	17.00 (432)	23.00 (584)	26.88 (683)	34.50 (876)	40.88 (1038)	N/A	N/A

■ Dimension depends on body rating; consult factory.



BODY HEIGHT

Body Size, Inches (mm)	"D," Inches (mm)		"E" Max., Inches (mm)
	2700A/2720	2700E	
1.0 (25)	6.56 (167)	10.56 (268)	3.50 (89)
1.5 (40)	7.29 (185)	11.29 (287)	4.06 (103)
2.0 (50)	9.00 (229)	13.75 (349)	4.56 (116)
3.0 (80)	9.25 (235)	14.00 (356)	6.38 (162)
4.0 (100)	10.19 (259)	14.94 (379)	7.62 (194)
6.0 (150)	12.44 (316)	17.44 (443)	7.62 (194)
8.0 (200)	16.00 (406)	21.00 (533)	10.50 (267)
10.0 (254)	20.82 (525)	N/A	11.71 (297)
12.0 (305)	23.18 (589)	N/A	12.75 (324)

Dimensions are approximate for 1" to 4" 150 to 1500 class and 6" to 8" 150 to 600 class. Consult factory for other body size/pressure class combinations.

AVAILABLE BODY END CONNECTIONS

Body Size, Inches (mm)	NPT	Butt Weld	Socket Weld	ANSI Flanged RF and RTJ					
				150	300	600	900	1500	2500
1.0 (25)	■	■	■	■	■	■	■	■	N/A
1.5 (40)	■	■	■	■	■	■	■	■	N/A
2.0 (50)	■	■	■	■	■	■	■	■	■
3.0 (80)		■		■	■	■	■	■	■
4.0 (100)		■		■	■	■	■	■	■
6.0 (150)		■		■	■	■	■	■	■
8.0 (200)		■		■	■	■	■	■	
10.0 (254)				■	■	■	N/A		
12.0 (305)				■	■	■			

BODY AND TRIM SIZE COMBINATIONS

Body Size, Inches (mm)	Nominal Trim Size, Inches (mm)									
	Unbalanced	Balanced								
	0.19–1.00 (4.8–25)	1.0 (25)	1.5 (40)	2.0 (50)	3.0 (80)	4.0 (100)	6.0 (150)	8.0 (200)	10.0 (254)	12.0 (305)
1.0 (25)	■	■								
1.5 (40)	■	■	■							
2.0 (50)	■	■	■	■						
3.0 (80)	■	■	■	■	■					
4.0 (100)	■	■	■	■	■	■				
6.0 (150)				■[1]	■[1]	■	■			
8.0 (200)						■[1]	■	■		
10.0 (254)								■	■	
12.0 (305)									■	■

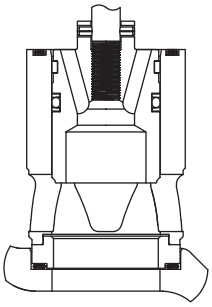
[1] Only plug control

Cage-Control Trim

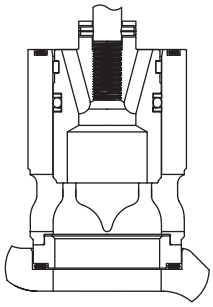
Cage-control trim is designed primarily for process applications. These pressure-balanced, precision-guided trims feature proprietary Norriseal seating surface with Protection Geometry. This design redirects erosive forces of the fluid stream away from critical surfaces of the plug and seat to extend service life.

Characteristics:

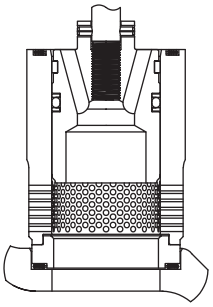
- Linear
- Equal percentage
- Quick opening
- DB II noise abatement
- CAV II cavitation control



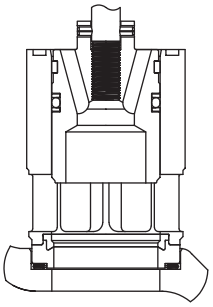
Linear
Flow Down



Equal Percentage
Flow Down



CAV II – Flow Down
DB II – Flow Up



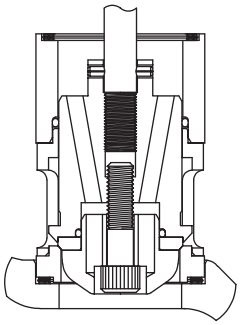
Quick Opening
with Soft Insert
Flow Down

Plug-Control Trim

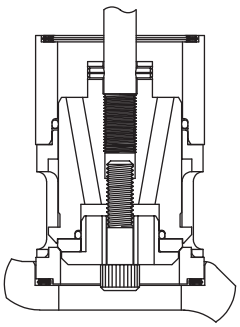
Plug-control trim is a rugged, field-proven trim best suited for slurries and other "dirty" fluids. Norriseal offers a wide selection of pressure-balanced, top-guided, contoured plug-control trims.

Characteristics:

- Modified percentage
- Equal percentage
- Quick opening



Modified Percentage
Hard or Soft Plug
Insert – Flow Up



Quick Opening
Hard or Soft Plug
Insert – Flow Up

Valve Trim (CONTINUED)

TRIM MATERIALS OF CONSTRUCTION

Trim Component	Material		
	Standard	NACE	Optional
Balanced Cage-Control Trim			
Plug	17-4PH SST H1150M	316 SST	316 SST/Alloy 6 Monel® or Duplex SST
Cage	17-4PH SST H1150M/Chrome	316 SST	316 SST/Chrome Monel® or Duplex SST
Plug Seal	Fluoroelastomer	Fluoroelastomer	Nitrile Ryton® Fluoroloy-K® Kalrez® Carbon-Graphite
Seat Ring	17-4PH SST H1150M	316 SST	316 SST/Alloy 6 Monel® or Duplex SST
Soft Seat Insert	Carbon-Graphite-filled TFE	Carbon-Graphite-filled TFE	Kynar® Fluoroloy-K®
Bearing Ring	Carbon-Graphite-filled TFE	Carbon-Graphite-filled TFE	Ryton® Carbon-Graphite
Trim Gaskets	316L SST/Graphite	Inconel®/Graphite	As Required to Suit Specific Application
Plug/Stem Pin	420 SST	316 SST	
Reduced Trim Adapter	316 SST	316 SST	
Valve Stem	17-4PH SST H1150M	316 SST	316 SST/Chrome Nitronic 50®
Balanced Plug-Control Trim			
Plug	17-4PH SST H1150M	316 SST	316 SST/Alloy 6 316 SST/Tungsten-Carbide
Soft Plug Insert	Glass-Filled TFE	Glass-Filled TFE	As Required to Suit Specific Application
Guide	316 SST	316 SST	
Cage	17-4PH SST H1150M	316 SST	
Plug Seal	TFE (1"– 4" sizes) TFE/Elgiloy® (6" and 8" sizes)	TFE (1"– 4" sizes) TFE/Elgiloy® (6" and 8" sizes)	Fluoroloy-K®/Elgiloy® Carbon-Graphite
Seat Ring	17-4PH SST H1150M	316 SST	316 SST/Alloy 6 316 SST/Tungsten-Carbide
Trim Gaskets	316L SST/Graphite	Inconel®/Graphite	As Required to Suit Specific Application
Plug/Stem Pin	420 SST	316 SST	
Valve Stem	17-4PH SST H1150M	316 SST	316 SST/Chrome Nitronic 50®
Unbalanced Plug-Control Reduced C_v Trim			
Plug	17-4PH SST H1150M	316 SST	316 SST/Alloy 6 316 SST/Tungsten-Carbide
Seat/Cage	17-4PH SST H1150M	316 SST	316 SST/Alloy 6 316 SST/Tungsten-Carbide
Seat/Cage Seal	Fiberglass/Graphite (1" & 1.5" Valves) Fluoroelastomer (2"–4" Valves)	Fiberglass/Graphite (1" & 1.5" Valves) Fluoroelastomer (2"–4" Valves)	Nitrile EPDM Aflas® Perfluoroelastomer
Plug/Stem Pin	420 SST	Titanium	As Required to Suit Specific Application
Reduced Trim Adapter(s)	316 SST	316 SST	
Valve Stem	17- 4PH SST H1150M	316 SST	316 SST/Chrome Nitronic 50®

Typical Trim Characteristics

- Linear — flow capacity is directly proportional to valve plug travel
- Equal Percentage — changes in flow rate will be small in comparison to plug travel when the plug is near the seat and large when the plug exceeds 50% travel
- Modified Percentage — provides low-end throttling capability combined with linear, mid-range gain to achieve both precise control and maximum top-end flow capacity
- Quick Opening — generally applicable to On/Off control, it provides maximum increase in flow rate at low valve plug travel
- CAV II — controls cavitation damage and reduces flow noise; has a linear characteristic
- DB II — attenuates compressible flow noise from gas turbulence; has a linear characteristic

NOTES

Seat Leakage (ANSI/FCI 70-2). Norriseal trims provide Class II, IV or V tightness with metal seats and class VI tightness with composition seats.

Flow Coefficients. The following page displays flow coefficients (C_v) for commonly used trim sizes and characteristics. Refer to Norriseal Valve Sizing Program for balanced reduced-port, noise abatement and cavitation control C_v data.

Caution: Pressure Drop Ratings. The rated pressure drop may be less than the body's rated working pressure. The rated shutoff pressure drop is dependent on the actuator's size, spring range, air pressure and seat leakage class. For a chart containing actual pressure drops, please refer to the Norriseal Valve Sizing Manual or our actuator sizing spread sheet available online, or contact your Norriseal representative.

FLOW COEFFICIENTS (C_V) FOR BALANCED CAGE-CONTROL TRIMS (LINEAR & EQUAL PERCENTAGE)

Body Size Inches (mm)	Trim Size Inches (mm)	Characteristic	Valve Opening — Percent Total Travel									
			10	20	30	40	50	60	70	80	90	100
1.0 (25)	1.0 (25)	Linear	.355	1.01	2.48	5.46	8.43	11.3	14.3	16.9	18.6	19.6
		E.P.	.308	.565	1.21	2.63	4.83	8.16	12.4	15.5	17.8	18.9
1.5 (40)	1.5 (40)	Linear	.906	3.26	7.35	13.1	20.2	27.7	34.5	39.8	43.5	45.5
		E.P.	.400	.813	2.36	4.86	8.49	15.1	22.7	30.3	35.5	39.2
2.0 (50)	2.0 (50)	Linear	1.51	4.87	11.0	20.3	30.9	41.5	50.2	57.0	61.4	64.8
		E.P.	.643	2.20	4.82	9.29	15.6	25.9	39.5	53.0	58.5	62.0
3.0 (80)	3.0 (80)	Linear	3.23	8.30	19.6	37.6	55.8	73.7	88.9	101	110	117
		E.P.	.906	3.31	7.72	15.4	27.7	46.8	70.1	93.7	108	116
4.0 (100)	4.0 (100)	Linear	8.57	21.2	42.7	68.5	94.0	120	145	168	184	195
		E.P.	2.83	9.09	19.5	33.9	52.0	79.8	119	159	185	195
6.0 (150)	6.0 (150)	Linear	19.6	55.8	104	152	200	248	296	339	369	391
		E.P.	6.84	19.6	40.1	69.6	107	163	244	325	360	378
8.0 (200)	8.0 (200)	Linear	55.3	125	224	324	422	521	618	705	752	790
		E.P.	18.1	44.1	86.9	143	221	346	494	642	728	756
10.0 (254)	10.0 (254)	Linear	59.6	122.3	220.5	361	585	835	995	1023	1030	1054
		E.P.	35.7	74.6	137.0	233	398	627	829	948	1000	1014
12.0 (305)	12.0 (305)	Linear	92.7	178.3	303.2	497	810	1159	1341	1365	1362	1389
		E.P.	55.5	108.7	188.3	320	551	871	1118	1264	1323	1336

Valve Trim (CONTINUED)

FLOW COEFFICIENTS (C_v) FOR BALANCED PLUG-CONTROL TRIMS (QUICK OPENING, MODIFIED PERCENTAGE)

Body Size Inches (mm)	Trim Size Inches (mm)	Charac-teristic	Valve Opening — Percent Total Travel									
			10	20	30	40	50	60	70	80	90	100
1.0 (25)	1.0 (25)	Q.O.	8.83	14.0	17.4	19.2	20.2	20.9	21.2	21.5	21.7	21.9
		M.P.	1.17	2.29	3.82	6.65	10.9	15.2	17.7	19.3	20.2	20.5
1.5 (40)	1.5 (40)	Q.O.	13.2	26.4	37.2	44.3	49.1	52.4	54.2	54.8	55.3	55.9
		M.P.	3.13	6.06	9.68	17.7	28.8	40.0	47.2	51.6	54.0	54.8
2.0 (50)	2.0 (50)	Q.O.	19.6	38.7	55.2	62.7	65.6	67.5	68.8	70.0	71.3	72.8
		M.P.	5.01	11.0	20.3	33.8	48.9	61.4	67.2	69.5	70.8	71.6
3.0 (80)	3.0 (80)	Q.O.	27.5	54.5	81.8	102	115	122	126	127	129	130
		M.P.	6.15	14.9	27.7	52.5	80.3	104	118	124	128	129
4.0 (100)	4.0 (100)	Q.O.	30.4	64.5	103	142	175	195	204	210	212	213
		M.P.	8.42	21.6	38.3	71.5	114	148	177	196	207	211
6.0 (150)	6.0 (150)	Q.O.	55.2	117	189	271	333	374	406	427	440	444
		M.P.	19.8	40.1	76.7	128	192	252	312	352	378	400
8.0 (200)	8.0 (200)	Q.O.	90.3	217	354	505	631	725	797	841	872	885
		M.P.	36.3	75.2	138	242	375	522	641	723	780	805

FLOW COEFFICIENTS (C_v) FOR UNBALANCED PLUG-CONTROL TRIMS (MODIFIED PERCENTAGE AND EQUAL PERCENTAGE)

Body Size Inches (mm)	Trim Size Inches (mm)	Charac-teristic	Valve Opening — Percent Total Travel									
			10	20	30	40	50	60	70	80	90	100
1.0 (25) 1.5 (40) 2.0 (50)	0.19 (5)	E.P.	.002	.007	.016	.027	.040	.057	.101	.191	.320	.561
	0.25 (6)	M.P.	.284	.506	.657	.767	.875	.989	1.10	1.20	1.32	1.43
		E.P.	.043	.061	.095	.146	.229	.338	.477	.717	1.19	1.42
	0.38 (10)	M.P.	.311	.621	.942	1.28	1.64	2.07	2.51	2.93	3.35	3.70
		E.P.	.092	.140	.220	.341	.495	.717	1.14	2.06	2.91	3.13
	0.50 (13)	M.P.	.557	1.11	1.68	2.26	2.92	3.62	4.30	4.98	5.43	5.60
		E.P.	.098	.162	.265	.442	.740	1.52	2.58	3.64	4.68	5.20
1.0 (25)	0.75 (19)	M.P.	.752	1.57	2.43	3.42	4.58	6.08	7.93	9.71	10.6	11.0
		E.P.	.185	.334	.481	.835	2.17	3.98	5.79	7.61	8.82	9.25
	1.00 (25)	M.P.	.983	2.01	3.40	6.12	8.90	11.7	13.5	14.4	15.1	15.4
1.5 (40)	0.75 (19)	M.P.	.882	1.76	2.76	3.82	5.05	6.57	8.49	10.8	12.2	12.9
		E.P.	.185	.334	.481	.835	2.17	3.98	6.20	8.46	10.1	10.9
	1.00 (25)	M.P.	.964	1.92	3.08	4.67	6.96	10.0	13.0	14.7	15.5	16.3
2.0 (50)	0.75 (19)	M.P.	.882	1.76	2.76	3.82	5.53	7.78	10.2	12.6	15.0	16.2
		E.P.	.185	.334	.481	.835	2.17	3.98	6.20	8.46	10.1	10.9
	1.00 (25)	M.P.	1.01	2.02	3.14	5.07	9.68	11.9	14.9	17.2	19.3	20.9

APPROXIMATE SHIPPING WEIGHTS IN POUNDS FOR 2700A

Valve Size	Threaded (NPT) Connection	ANSI FLANGED				
		150 RF	300 RF	600 RF	900 RTJ	1500 RTJ
1.0″	70[2]	75[2]	90[2]	95[2]	155[2]	162[2]
1.5″	90[2]	110[2]	125[2]	130[2]	205[2]	210[2]
2.0″	140[2]	155[2]	175[2]	180[2]	240[3]	250[3]
3.0″	N/A	190[2]	215[2]	225[2]	425[3]	455[3]
4.0″	N/A	260[2]	300[2]	320[2]	650[4]	680[4]
6.0″	N/A	885[4]	940[4]	970[4]	1370[4]	1600[4]
8.0″	N/A	1195[4]	1260[4]	1310[4]	1910[4]	N/A
10.0″	N/A	2015	2125	2293	N/A	N/A
12.0″	N/A	2489	2599	2780	N/A	N/A

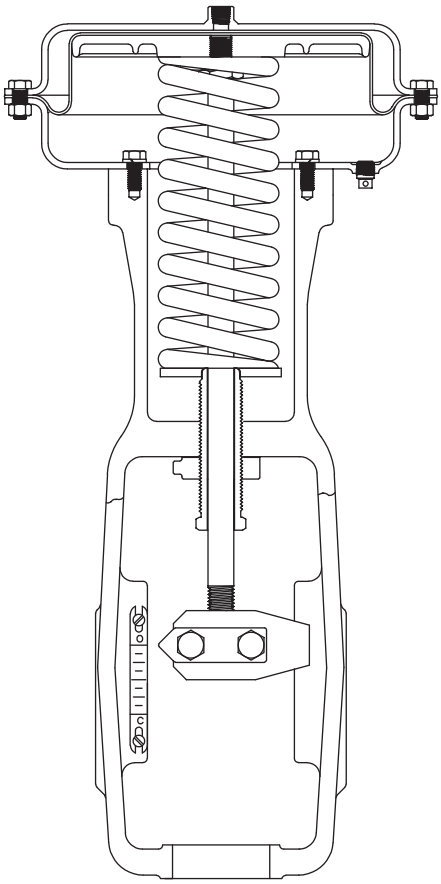
(2) with #12 Actuator
(3) with #16 Actuator
(4) with #18 Actuator
When #16 actuator is used in place of #12 actuator, add 55 lbs to #12 actuator weight in chart

Series 2700A and 2700E Yoke-Mounted

Norriseal direct- or reverse-acting, pneumatic diaphragm, spring-return actuators are integral to Series 2700A and 2700E assemblies. Using a pneumatic input signal from a positioner, pressure controller, liquid level controller, temperature controller, transducer or other control device, these actuators move the valve plug to the required position for both throttling or On/Off service. The yoke provides a means for mounting accessories requiring valve motion take-off.

Direct-Acting

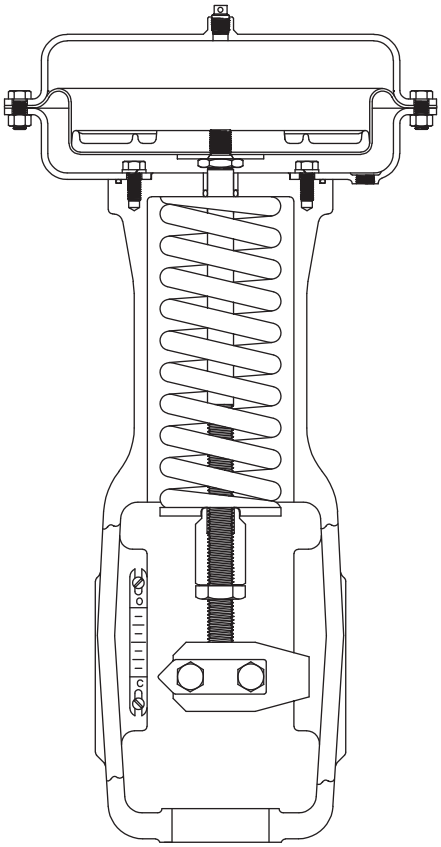
This is a fail-open, push-down-to-close style actuator. Applying pneumatic pressure to the upper diaphragm housing forces the valve plug downward to engage the valve seat. Reducing the pressure on the diaphragm enables the opposing spring force to raise the valve plug upward, opening the valve.



Direct-Acting (Fail-Open)

Reverse-Acting

This is a fail-closed, push-up-to-open style actuator. Applying pneumatic pressure to the lower diaphragm housing raises the valve plug upward against the opposing spring force, which opens the valve. Reducing pneumatic pressure to the diaphragm causes the spring to move the valve plug downward, closing the valve.



Reverse-Acting (Fail-Closed)

Actuators (CONTINUED)

BODY AND ACTUATOR COMBINATIONS

Body Size Inches (mm)	Actuator Size and Effective Area (sq. in.)				Maximum Stem Travel	
	No. 12 70 in.²	No. 16 120 in.²	No. 18 180 in.²	No. 22 267 in.²	Inches	mm
1.0 (25)	■	■			0.75	19
1.5 (40)	■	■	■		1.00	25
2.0 (50)	■	■	■		1.25	32
3.0 (80)	■	■	■		1.50	38
4.0 (100)	■	■	■		2.00	51
6.0 (150)			■		2.75	70
8.0 (200)			■	■	4.00	102
10.0 (254)				■	4.00	102
12.0 (305)				■	4.00	102

ACTUATOR MATERIALS

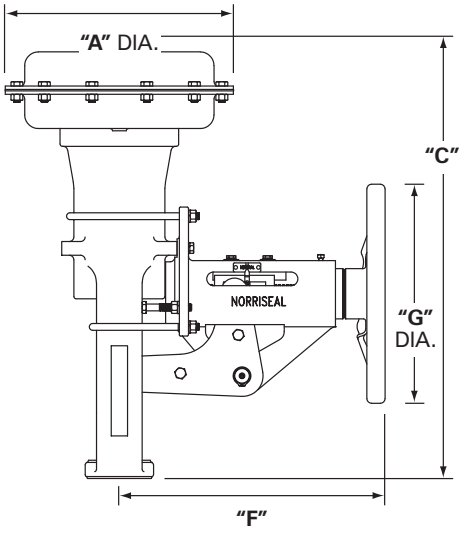
Actuator Component	Material
Yoke	Ductile iron
Diaphragm	Nitrile with nylon fabric*
Diaphragm housings	Carbon steel
Diaphragm plate	Carbon steel
Stem	303 SST
Stem connector	316 SST
Spring	AISI 5160
Adjusting screw	AISI 1215/Zinc Plated

*Other materials available.

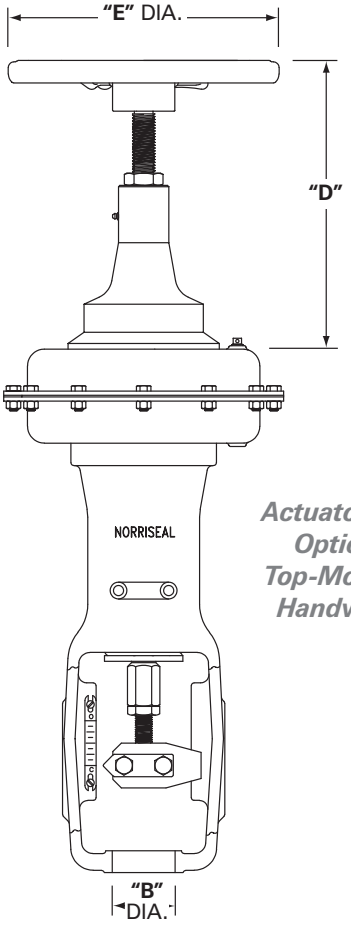
DIRECT- AND REVERSE-ACTING YOKE-MOUNTED ACTUATOR DIMENSIONS

Actuator Size (Applicable Valve Sizes)	A Inches (mm)	B Inches (mm)	C, Inches (mm)		D* Inches (mm)	E* Inches (mm)	F Inches (mm)	G Inches (mm)
			Direct	Reverse				
No. 12 MU (1–4)	12.50 (318)	2.81 (71)	25.25 (641)	24.25 (616)	13.12 (333)	12.00 (305)	15.00 (381)	12.00 (305)
No. 16 HU (1–4)	16.75 (425)	2.81 (71)	29.50 (749)	31.75 (806)	13.12 (333)	12.00 (305)	17.00 (432)	18.00 (457)
No. 18 HU (1.5–4)	20.50 (521)	2.81 (71)	30.62 (778)	33.05 (839)	16.50 (419)	18.00 (457)	17.00 (432)	18.00 (457)
No. 18 KU (6)	20.50 (521)	3.19 (81)	30.62 (778)	33.05 (839)	17.38 (441)	18.00 (457)	17.00 (432)	18.00 (457)
No. 18 LU (6 & 8)	20.50 (521)	3.56 (90)	46.22 (1174)	50.81 (1291)	18.62 (473)	18.00 (457)	17.00 (432)	18.00 (457)
No. 22 LU (8, 10 & 12)	25.01 (635)	3.56 (90)	54.64 (1388)+	52.2 (1326)	18.62 (473)	18.00 (457)	17.00 (432)	18.00 (457)

*Dimensions shown for Style 17 top-mounted limit stop. +Includes eyebolts



Actuator with Optional Side-Mounted Handwheel



Actuator with Optional Top-Mounted Handwheel

Handwheels

Norriseal offers a range of handwheels for manual assistance in regulating stem travel or positioning the control valve plug to override the actuator in case of pneumatic pressure failure.

Top-Mounted. Normally used as a manual or adjustable travel stop.

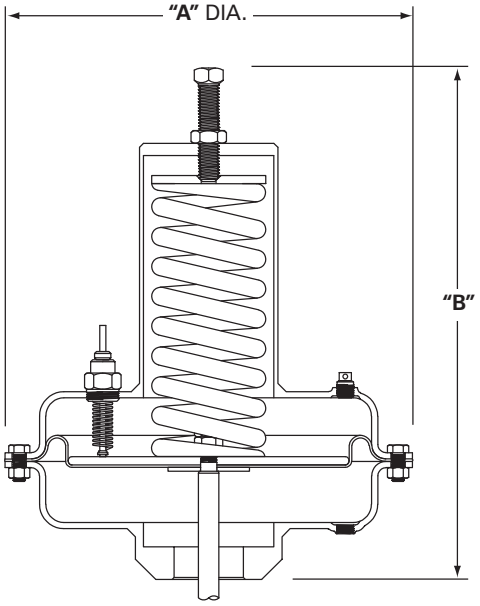
Side-Mounted. Limits travel by moving the actuator/valve stem in the direction opposite the actuator spring to any point within the valve travel. Automatic pneumatic operation throughout valve travel is possible with the handwheel in neutral position. A spring-loaded ball detent is furnished to stabilize the handwheel setting in vibration service.

Travel stops are also available.

Series 2720 Close-Coupled

A yokeless space-saving arrangement, close-coupled Series 2720 actuators mount directly to the valve bonnet with the adjustable spring positioned above the diaphragm. Operation is identical to that of the yoke-mounted actuators and available as either direct-acting (fail-open, push-down-to-close) or reverse-acting (fail-closed, push-up-to-open).

Reverse-Acting



ACTUATOR DIMENSIONS CLOSE-COUPLED

Actuator Size (Applicable valve sizes)	A Inches (mm)	B, Inches (mm)	
		Direct	Reverse
No. 12 (1, 1.5, 2, 3 & 4)	12.50 (318)	20.06 (510)	16.50 (419)
No. 16 (1, 1.5, 2, 3 & 4)	16.75 (425)	N/A	24.50 (622)
No. 18 (1.5, 2, 3 & 4)	20.50 (521)	23.75 (603)	26.50 (673)

ACTUATOR MATERIALS

Actuator Component	Material
Diaphragm	Nitrile with nylon fabric
Diaphragm housings	Carbon steel
Stem	316 SST
Spring	AISI 5160

How to Order

If known, specify:

1. Body size, series/style and material (Example: 4-inch body in Series 2700A = 4-2700A)
2. Trim size and material
3. Throttling or On/Off service
4. Actuator size, action and spring range
5. Optional equipment/accessories required

If not known, specify:

1. Type of application
   a. Throttling or On/Off
   b. Back pressure (relief) or pressure reducing
2. Controlled fluid (include chemical analysis when available)
3. Specific gravity of controlled fluid
4. Fluid temperature
5. Range of flowing inlet pressure
6. Pressure drops
   a. Range of pressure drops
   b. Maximum at shutoff
7. Flow rates
   a. Minimum controlled flow
   b. Normal flow
   c. Maximum flow
8. Maximum permissible noise level (if critical)
9. Shutoff classification required
10. Line size and schedule
11. Optional equipment

Series definition:

2700A — Standard bonnet with open-yoke actuator

2700E — Extended bonnet with open-yoke actuator

2720 — Valve with close-coupled actuator

Model Code[1]

BODY PRESSURE RATING

ANSI Class	Code
150	02
300	07
600	14
900+	21
1500+	36
2500+	60

+Consult factory for valve sizes 10" and above

BODY END CONNECTION

Type	Code
Flanged Raised Face	RF
Flanged Ring Type Joint	RJ
Threaded (Female) NPT+	S
Beveled Buttweld+	B*
Socketweld+	W*

*Specify pipe schedule.
+Consult factory for valve sizes 10" and above

BODY/BONNET MATERIAL

Material	Code
ASTM A216 Gr WCC (Std.)	–
ASTM A216 Gr WCC (NACE)	N
ASTM A351 Gr CF8M (Std.)	S
ASTM A351 Gr CF8M (NACE)	R
ASTM A352 Gr LCC (Std.)	P
ASTM A352 Gr LCC (NACE)	L

ACTUATOR ACTION

Mode	Code
Direct (Fail-Open)	B
Reverse (Fail-Closed)	T
Manual (Handwheel)	M

BODY STYLE

Type	Code
Globe, 2-way	G

RF-14TGS-12NX__

GASKET MATERIAL

Material	Code
316L/Graphite	S
Inconel/Graphite (NACE)	N

ACTUATOR SIZE

Effective Area	Code
No. 12 (70 in.^{2})	12
No. 16 (120 in.^{2})	16
No. 18 (180 in.^{2})	18
No. 22 (267 in.^{2})	22

OPTIONS

Description	Code
Handwheel, Side Mount	S–
Handwheel, Top Mount (Up stop-limit opening)	–B
Handwheel, Top Mount (Down stop-limit closing)	–T

ACTUATOR TYPE

Source/Range	Code
Pneumatic, 3–15 psi	NX
Pneumatic, 3–27/6–30 psi	WX
Electric, 4–20 mAdc	E2
Electric, on-off	EO+

+Consult factory for valve sizes 10" and above

PACKING

Material	Load Type	Code
Single TFE	Spring-loaded	–
Single TFE	Adjustable	A
Graphite	Adjustable	G

FUGITIVE EMISSION PACKING

Material	Load Type	Code
FES-II	Non-adjustable	K

*Application dependent; consult factory.

Accessories

Positioners (electro-pneumatic, pneumatic, digital), airlock, limit switches, solenoid valve, booster relay, filter regulators, I/P transducers, pressure controllers, temperature controllers, etc.

[1]Example is for the purpose of displaying Model Code structure and not intended to identify all available materials and configurations.

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