

Fisher™ Baumann™ 24000 Bronze Control Valve



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Section 1: Introduction

Fisher Baumann industrial control valves (Figure 1) are intended for general utility service in pressure, flow and temperature control applications.

Industrial grade control valves exhibit low hysteresis and deadband, good control characteristics, tight shutoff, rugged construction, high performance packing and easy maintainability. This translates into reduced maintenance costs, reduced process variability and increased process availability.

1.1 Scope of the Manual

This instruction manual includes installation, maintenance and parts information for the Fisher Baumann 24000 bronze control valve.

WARNING

 Do not install, operate or maintain Fisher Baumann 24000 control valves without being fully trained and qualified in valve, actuator and accessory installation, operation and maintenance. To avoid personal injury or property damage, it is important to carefully read, understand and follow all the contents of this manual, including all safety cautions and warnings. If you have any questions about these instructions, contact your [Emerson sales office](#) before proceeding.

Figure 1. Fisher Baumann 24000 Control Valve with Fisher Baumann 32 Actuator and Fisher FIELDVUE™ DVC2000 Digital Valve Controller



W9753-1

Table 1. Technical Specifications

VALVE TYPE	EN	ASME
NOMINAL SIZE	DN 15, 20, 25, 40 and 50	NPS 1/2, 3/4, 1, 1-1/2 and 2
END CONNECTIONS	Screwed NPT	
PRESSURE RATING	400 psi at 150°F / 250 psi at 400°F (ASME B16.15 CL250)	
SEAT PLUG SEALING	Metal-to-metal or PTFE soft seat	
CHARACTERISTIC	Equal Percentage or Linear	
TEMPERATURE LIMITS	-29 to +204°C	-20 to +400°F
ACTUATOR	See Fisher Baumann 16, 32, 54 and 70 Pneumatic Actuators Bulletin D104175X012	

1.2 Education Services

Emerson's Education Services
 Phone: 800-338-8158
 Email: education@emerson.com
emerson.com/en/final-control/services/valve-training

Section 2: Installation

WARNING

Always wear protective gloves, clothing and eyewear when performing any installation operations to avoid personal injury.

Personal injury or property damage caused by sudden release of pressure or bursting of pressure retaining parts may result if service conditions exceed those for which the product was intended. To avoid injury or damage, provide a relief valve for over pressure protection as required by government or accepted industry codes and good engineering practices.

Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

If installing into an existing application, also refer to the WARNING at the beginning of the Maintenance section in this instruction manual.

WARNING

When ordered, the valve configuration and construction materials were selected to meet particular pressure, temperature, pressure drop and controlled fluid conditions. Responsibility for the safety of process media and compatibility of valve materials with process media rests solely with the purchaser and end-user. Because some valve body/trim material combinations are limited in their pressure drop and temperature range capabilities, do not apply any other conditions to the valve without first contacting your [Emerson sales office](#).

NOTE

The acronym of CWP may appear on the nameplate. CWP (Cold Working Pressure) denotes the pressure rating at normal ambient temperature. A normal ambient temperature range being -4 to +100°F / -20 to +38°C.

⚠ WARNING

If you move or work on an actuator installed on a valve with loading pressure applied, keep your hands and tools away from the stem travel path to avoid personal injury. Be especially careful when removing the stem connector to release all loading on the actuator stem whether it be from air pressure on the diaphragm or compression in the actuator springs.

Likewise take similar care when adjusting or removing any optional travel stop. Refer to the relevant actuator Maintenance Instructions.

If hoisting the valve, take care to prevent people from being injured in case the hoist or rigging slips. Be sure to use adequate sized hoists and chains or slings to handle the valve.

Personal injury could result from packing leakage. Valve packing is tightened before shipment; however, the packing might require some readjustment to meet specific service conditions.

NOTICE

To avoid damaging valve seating surfaces, make sure the adjacent piping is free of pipe scale, welding slag and any other potentially damaging material.

1. Before installing the valve in the pipeline, inspect the valve body to be certain it is free of foreign material and thoroughly clean the line of all dirt, welding chips, scale, oil or grease and other foreign material.
2. Install the valve so the controlled fluid will flow through the valve body in the direction indicated by the arrow cast on the valve body.
3. A three-valve bypass must be used to permit removal of the control valve from the line without shutting down the system.
4. In case of a heat-insulated installation, insulate the valve body only, not the bonnet.

2.1 Air Piping

1. For an air-to-extend actuator (air-to-close action), connect the actuating air pressure line to the 1/4 NPT opening in the upper diaphragm case. For an air-to-retract actuator (air-to-open action) connect the actuating air pressure line to the 1/4 NPT to the lower diaphragm case.
2. Use 6.4 mm / 1/4 in. O.D. tubing or equivalent for all air lines. If air line exceeds 8 m / 25 ft in length, 9.5 mm / 3/8 in. tubing is preferred. Air pressure not to exceed 2.41 barg / 35 psig.

2.2 Disassembly

NOTICE

When assembling or disassembling the valve, do not turn the valve stem while the plug is in contact with the valve seat. This can damage the seating surface very quickly.

When adjusting the valve stem do not grip the stem directly with pliers or a wrench. This will damage the surface of the stem and cause damage to the packing in the valve. Instead, counter-tighten the two locknuts (key 27) on the stem (key 5) together. This will allow you to turn the stem by turning the locknuts (key 27) with a wrench.

When placing the valve in a vise, clamp the flat end faces of the valve. Do not try to clamp the rounded sides of the valve. This will ruin the valve.

Actuator Removal

Access to the internal components of the valve body can be accomplished with the actuator removed. For actuator maintenance see the Fisher Baumann Pneumatic Actuator Instruction Manual (D103352X012).

Air-to-Close Actuators

1. Disconnect air supply to the actuator and remove air tubing.
2. Loosen drive nut (key 9) and then remove plug and stem (keys 4 and 5) assembly by holding actuator stem still while unthreading plug and stem assembly counterclockwise.
3. Remove stem locknuts (key 27), travel indicator (key 58) and yoke drive nut (key 9).
4. Remove actuator from valve.
5. Disconnect air supply to actuator and remove air tubing.

Air-to-Open Actuators

1. Using flexible tubing, apply sufficient air pressure to the actuator to lift the plug off the seat.
2. Loosen drive nut (key 9) and then remove plug and stem (keys 4 and 5) assembly by holding actuator stem still while unthreading plug and stem assembly counterclockwise.
3. Remove stem locknuts (key 27), travel indicator (key 58) and yoke drive nut (key 9).
4. Remove actuator from valve.
5. Disconnect air supply to actuator and remove air tubing.

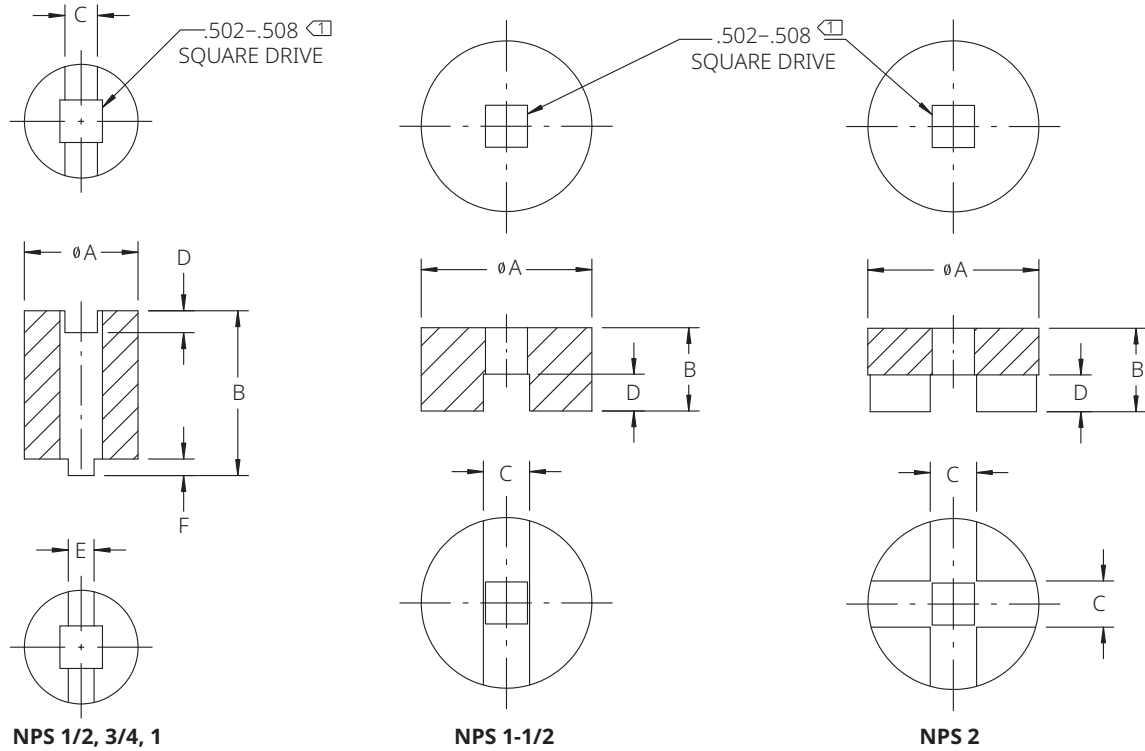
Valve Body Disassembly

1. After removing the actuator, unscrew bonnet (key 8) and plug and stem (keys 4 and 5) from valve body (key 1). A new body gasket (key 49) should be installed each time the valve is disassembled.
2. Loosen packing spring load by removing the packing follower (key 10).
3. Remove the plug and stem assembly by pulling it out through the bottom of the bonnet (key 8) while rotating the stem (key 5). This will help prevent damage to the packing components.

NOTE

Handle the parts carefully to avoid damaging the seating and guiding surfaces. Wipe the parts with a clean soft cloth and examine for signs of wear or damage.

4. Use a seat ring tool made according to the dimensions in Figure 2 and Table 2 to remove the seat ring (key 2) as follows:
 - a. Insert the tool into the valve body. Be certain the tool lugs are engaged in the corresponding recesses in the seat ring.
 - b. Use a 1/2-in. drive breaker bar or impact wrench having sufficient torque capability to remove the seat ring. Seat ring installation torque is provided in Table 3 for reference. Connect the breaker bar or impact wrench and if needed, a impact-rated extension bar, to the square drive of the seat ring tool.
 - c. Remove the seat ring (key 2) from the valve body. Make sure the seat ring tool is held at a right angle to the seat ring during removal to prevent the tool from disengaging from the lugs of the seat ring.
 - d. Inspect parts for wear or damage that would prevent proper operation of the valve body.

Figure 2. Seat Ring Tool Dimensions

NOTE:
1. MAX ALLOWABLE CENTER DRILL $\varnothing$ 0.532

Table 2. Seat Ring Tool Dimensions (See Figure 2)

PART NUMBER	DN	NPS	A	B	C	D	E	F
			in.					
GE96219X012	15 20	1/2 3/4	1.32	2.0	0.38	0.26	0.29	0.19
GE96219X022	25	1	1.52	2.3	0.40	0.25	0.35	0.20
GE96219X032	40	1-1/2	2.06	0.9	0.55	0.30	---	---
GE96219X042	50	2	2.74	1.0	0.55	0.44	---	---

Table 3. Seat Ring Assembly and Torque Tool

FISHER BAUMANN 24000 BRONZE CONTROL VALVE		VALVE SIZE NPS (IN.) / DN				
		1/2 / 15	3/4 / 20	1 / 25	1-1/2 / 40	2 / 50
Port Diameter	0.25 ⁽¹⁾	GE96219X012	GE96219X012	GE96219X022	---	---
	0.375 ⁽¹⁾	GE96219X012	GE96219X012	GE96219X022	---	---
	0.8125 ⁽²⁾	GE96219X012	GE96219X012	GE96219X022	---	---
	1.0625 ⁽²⁾	---	---	GE96219X022	---	---
	1.25	---	---	---	GE96219X032	---
	1.5	---	---	---	GE96219X032	GE96219X042
	2	---	---	---	---	GE96219X042
Installation Torque (lb-ft)		60	60	70	90	120
1. Male end used for trim 151,177 and port diameters .25 and .375 2. Female end used for port diameters .8125 and 1.0625						

2.3 Lapping the Valve Seat

If valve seat leakage becomes excessive, it may be necessary to lap the valve seat.

Lapping is the process of mating the valve plug to the seat ring, with an abrasive to produce a close fit. When valve seat leakage becomes excessive, lapping becomes necessary. The plug and seat ring seating surfaces should be free of large scratches or dents and the contact surface of the seats should be as narrow as possible.

1. Use a good quality lapping compound with a mixture that contains 280 to 600 grit. Apply at several spots around the plug seating surface. Replace the plug (key 4) in the bonnet (key 8).
2. Screw the bonnet (key 8) loosely into the valve body (key 1) to serve as a guide during the lapping operation.
3. Lap the valve by applying a slight pressure on the stem and rotate the stem in short oscillating strokes approximately 8 to 10 times or until you see an even and complete lap line. The plug should be intermittently lifted and turned 90 degrees while lapping to keep the plug and seat ring concentric.
4. Clean the valve seat (key 2) and plug (key 4) thoroughly when the lapping is complete, removing all traces of lapping compound.

2.4 Replacing Packing

Refer to the standard and optional packing constructions (Figures 4 and 5) to determine the packing that has been preinstalled in your valve.

1. Disassemble the valve as directed earlier. Remove the locknuts (key 27) and indicator disk (key 58) and turn the plug stem (key 5) out through the packing box. Remove the packing box and packing. Push out the old packing by working from the underside of the bonnet (key 8).
2. For Standard Spring Loaded PTFE V-Ring Packing (Figure 4): Carefully insert each piece in exact order shown in Figure 4. Tighten the follower (key 10) until it shoulders on the bonnet (key 8). This will compress the packing spring (key 6) to enable constant stem sealing throughout packing life.
3. For Optional Molded Graphite Ribbon Packing (Figure 5): Carefully insert each piece in exact order shown in Figure 5. Hand tighten packing follower (key 10). Use a wrench to increase tightness by turning the nut an additional 60 degrees.

2.5 Actuator and Valve Body Reassembly

Before installing seat ring in valve body, thoroughly clean the threads in the valve body port. Apply suitable lubricate to the threads and tighten to torque specified in Table 3. Remove all excess lubricant after tightening.

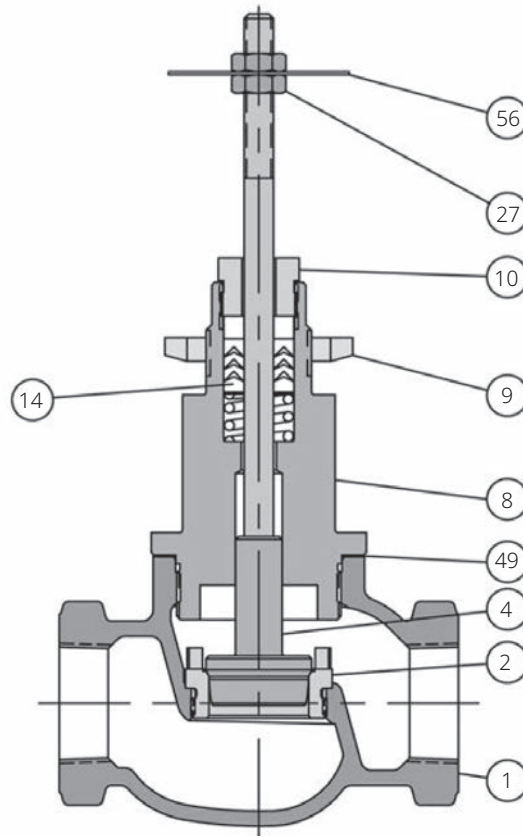
Insert a new valve body gasket (key 49) and install bonnet assembly (key 8). Place the actuator yoke over stem (key 5). While tilting actuator back, drop yoke drive nut (key 9) over stem (key 5). Run lock nuts (key 27) and travel indicator (key 58) down as far as possible and counter tighten locknuts (key 27) to lock.

Carefully position actuator over stem (key 5), lift plug stem and turn plug stem (key 5) into actuator stem as far as it will go before adjusting bench range. See the Fisher Baumann Pneumatic Actuator Instruction Manual (D103352X012).

NOTICE

When assembling or disassembling the valve, do not turn the valve stem while the plug is in contact with the valve seat. This can damage the seating surface very quickly.

Figure 3. Fisher Baumann 24000 Valve Body Assembly with Standard Bonnet and Standard PTFE Spring Loaded Packing



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⚠ WARNING

To avoid personal injury or equipment damage due to possible sudden shifting or falling of the valve assembly, do not lift the valve by the handwheel.

Section 3: Maintenance



WARNING

Avoid personal injury and property damage from sudden release of process pressure or bursting of parts. Before performing any maintenance operations:

- Do not remove the actuator from the valve while the valve is still pressurized.
- Always wear protective gloves, clothing and eyewear when performing any maintenance operations.
- Disconnect any operating lines providing air pressure, electric power or a control signal to the actuator. Be sure the actuator cannot suddenly open or close the valve.
- Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure on both sides of the valve. Drain the process media from both sides of the valve.
- Depending on the actuator construction, it will be necessary to manage the pneumatic actuator spring pre-compression. It is essential to refer to the relevant actuator instructions in this manual to perform safe removal of the actuator from the valve.
- Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.
- The valve packing box may contain process fluids that are pressurized, even when the valve has been removed from the pipeline. Process fluids may spray out under pressure when removing the packing hardware or packing rings or when loosening the packing box pipe plug.
- Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

NOTE

Whenever a gasket seal is disturbed by removing or shifting gasketed parts, install a new gasket during reassembly. This provides a good gasket seal because the used gasket may not seal properly.

Section 4: Parts Ordering

When corresponding with your [Emerson sales office](#) about this equipment, always mention the valve serial number. When ordering replacement parts, also specify the key number, part name and desired material using the following parts tables.

WARNING

Use only genuine Fisher replacement parts. Components that are not supplied by Emerson should not, under any circumstances, be used in any Fisher valve, because they may void your warranty, might adversely affect the performance of the valve and could cause personal injury and property damage.

Table 4. Fisher Baumann 24000 Common Parts

Key No.	Qty	Description
1	1	Valve body
6*	1	V-ring packing set (Std)
8	1	Bonnet, Standard
9	1	Drive nut (Yoke)
10	1	Packing follower
27	2	Locknuts
49*	1	Valve body gasket
58	1	Travel indicator

*Recommended spare parts

Table 5. Plug and Seat Ring for NPS 1/2, 3/4 and 1 Valves

KEY NO.	DESCRIPTION	PLUG TYPE	PLUG NO.	ORIFICE DIAMETER mm / in.	C _v	K _v
4*	Plug / Stem	Metal Seat, Micro Trim (Linear)	102	6.3 / 0.25	0.2 ⁽¹⁾	0.17 ⁽¹⁾
					1.0	0.86
		PTFE Seat (Equal %)	577	9.5 / 0.375	1.5	1.29
					2.5	2.15
					4	3.44
				20.6 / 0.8125	6	5.16
					7.5	6.45
					8.5	7.31
					13	11.18
		Metal Seat (Equal %)	548 (S41600)	6.3 / 0.25	0.2 ⁽¹⁾	0.17 ⁽¹⁾
					0.5 ⁽¹⁾	0.43 ⁽¹⁾
					1.0	0.86
				9.5 / 0.375	1.5	1.29
					2.5	2.15
					4	3.4
				20.6 / 0.8125	6	5.16
					8	6.88
					9	7.74
					13	11.18

- continued -

Table 5. Plug and Seat Ring for NPS 1/2, 3/4 and 1 Valves (continued)

KEY NO.	DESCRIPTION	PLUG TYPE	PLUG NO.	ORIFICE DIAMETER mm / in.	C _V	K _V
4	Plug / Stem	Metal Seat (Equal %)	588	6.3 / 0.25	0.2 ⁽¹⁾	0.17 ⁽¹⁾
					0.5 ⁽¹⁾	0.43 ⁽¹⁾
					1.0	0.86
				9.5 / 0.375	1.5	1.29
					2.5	2.15
					20.6 / 0.8125	4
				6		5.16
				8		6.88
				9		7.74
				26.9 / 1.0625	13	11.18
		PTFE Seat (Linear)	677	9.5 / 0.375	0.1	0.086
					0.2	0.172
					0.5	0.43
					1.0	0.86
				2.5	2.15	
		20.6 / 0.8125	5	4.3		
		Metal Seat (Linear)	648 (S41600)	6.3 / 0.25	0.5	0.43
					1.0	0.86
				9.5 / 0.375	1.5	1.29
					2.5	2.15
					20.6 / 0.8125	4
				6		5.16
				8		6.88
				9		7.74
		26.9 / 1.0625	13	11.18		
		Metal Seat (Linear)	688	6.3 / 0.25	0.5	0.43
					1.0	0.86
				9.5 / 0.375	1.5	1.29
2.5	2.15					
20.6 / 0.8125	4				3.4	
	6			5.16		
	8			6.88		
	9			7.74		
26.9 / 1.0625	13	11.18				
2*	Seat Ring	6.3 mm / 0.25 in. Orifice Diameter, S31600				
		9.5 mm / 0.375 in. Orifice Diameter, S31600				
		20.6 mm / 0.8125 in. Orifice Diameter, S31600				
		26.9 mm / 1.0625 in. Orifice Diameter, S31600				
		6.3 mm / 0.25 in. Orifice Diameter, S41600				
		9.5 mm / 0.375 in. Orifice Diameter, S41600				
		20.6 mm / 0.8125 in. Orifice Diameter, S41600				
		26.9 mm / 1.0625 in. Orifice Diameter, S41600				
*Recommended spare parts 1. A matching seat ring (key 2) must be furnished with replacement plug orders for Micro Trim plug number 102 and plug number 548 and 588, C _v 's 0.2 and 0.5.						

Table 6. Plug and Seat Ring for NPS 1-1/2 and 2 Valves

KEY NO.	DESCRIPTION	PLUG TYPE	PLUG NO.	ORIFICE DIAMETER mm / in.	C _v	K _v		
4*	Plug/Stem	PTFE Seat (Equal %)	577	31.8 / 1.25	20	17.2		
				38.1 / 1.50	10	8.6		
					17	14.62		
					28	24.08		
				50.8 / 2.0	30	25.8		
		PTFE Seat (Linear)	677	38.1 / 1.50	10	8.6		
					17	14.62		
				50.8 / 2.0	30	25.8		
					50	43		
		Metal Seat (Equal %)	548 (S41600)	31.8 / 1.25	10	8.6		
					20	17.2		
				38.1 / 1.50	10	8.6		
					17	14.62		
					28	24.08		
				50.8 / 2.0	30	25.8		
					50	43		
					Metal Seat (Equal %)	588	31.8 / 1.25	10
		20	17.2					
		38.1 / 1.50	10	8.6				
			17	14.62				
			28	24.08				
		50.8 / 2.0	30	25.8				
			50	43				
			Metal Seat (Linear)	648 (S41600)			31.8 / 1.25	20
		10			8.6			
		38.1 / 1.50			17	14.62		
					28	24.08		
					50.8 / 2.0	30	25.8	
		50				43		
		Metal Seat (Linear)				688	31.8 / 1.25	20
					10			8.6
			38.1 / 1.50	17	14.62			
				28	24.08			
				50.8 / 2.0	30		25.8	
			50		43			
2*	Seat Ring		38.1 mm / 1.25 in. Orifice Diameter, S31600					
			38.1 mm / 1.50 in. Orifice Diameter, S31600					
		50.8 mm / 2.0 in. Orifice Diameter, S31600						
		38.1 mm / 1.25 in. Orifice Diameter, S41600						
		38.1 mm / 1.50 in. Orifice Diameter, S41600						
		50.8 mm / 2.0 in. Orifice Diameter, S41600						
*Recommended spare parts								

Figure 4. Spring Loaded PTFE V-Ring Packing Kit, P/N 24494T001

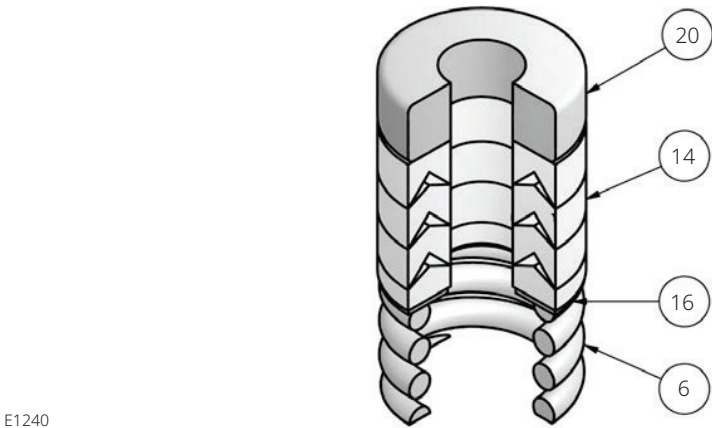


Table 7. Spring Loaded PTFE V-Ring Packing Kit, P/N 24494T001

Key No.	Description	Material
6	Spring	ASTM A313 S30200
14	Packing set	PTFE/Carbon-filled PTFE
16	Washer	ASTM A240 S31600
20	Spacer	J-2000 (filled (Polytetrafluoroethylene))

Figure 5. Molded Graphite (Flexible Graphite) Packing Kit, P/N 24492T001

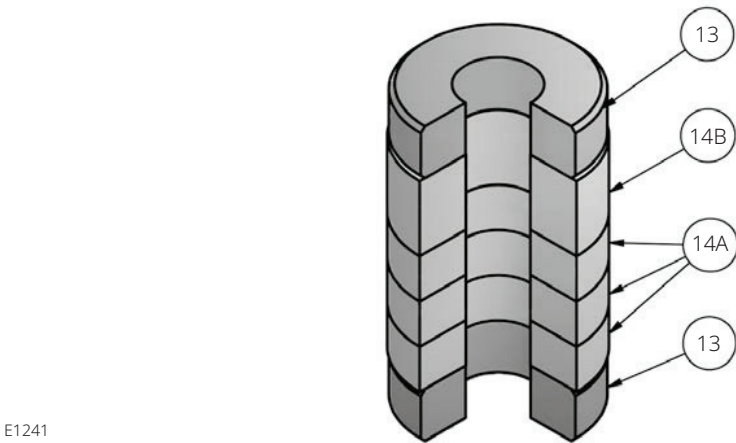
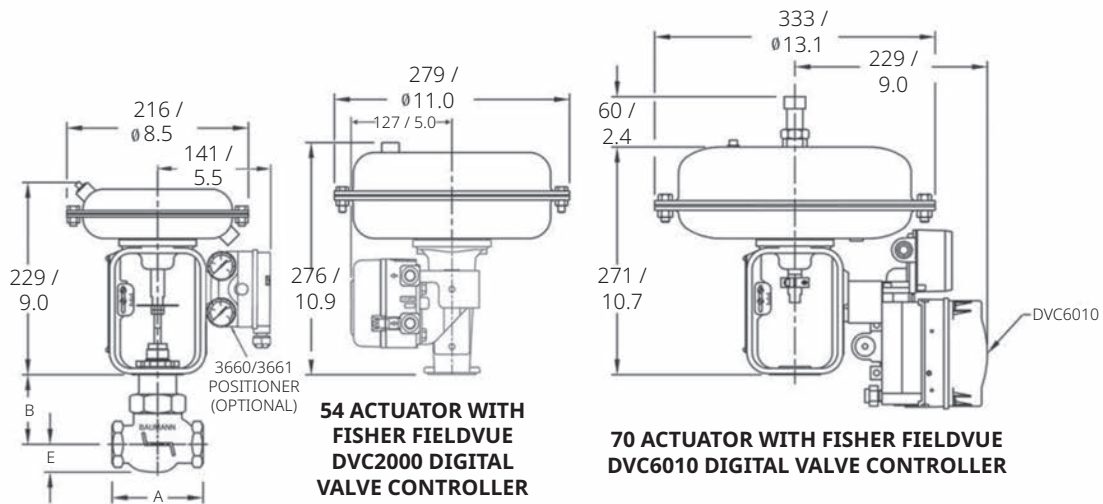


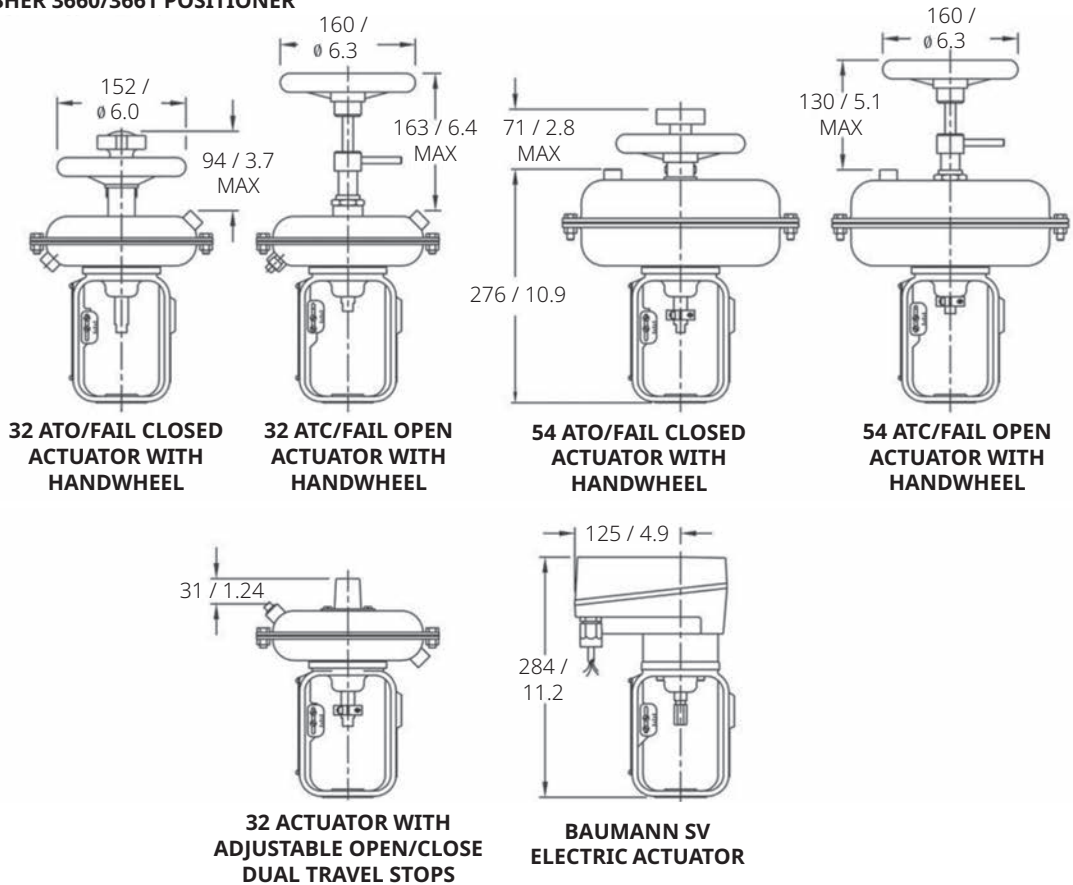
Table 8. Molded Graphite (Flexible Graphite) Packing Kit, P/N 24492T001

Key No.	Description	Material
13	Bushing, qty 2	Carbon-Graphite
14A	Packing rings, qty 3	Graphite
14B	Packing ring	Graphite

Figure 6. Dimensional Drawings



24000 WITH 32 ACTUATOR AND FISHER 3660/3661 POSITIONER



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MM / IN.

NOTE:
ACTUATOR REMOVAL REQUIRES 115 MM / 4.5 IN. VERTICAL CLEARANCE.

Table 9. Fisher Baumann 24000 Valve Dimensions

VALVE SIZE		A VALVE BODY		B BONNET		E	
DN	NPS	mm	in.	mm	in.	mm	in.
15	1/2	89	3.5	78	3.1	27	1.06
20	3/4	89	3.5	78	3.1	27	1.06
25	1	109	4.3	83	3.3	33	1.3
40	1-1/2	137	5.4	99	3.9	46	1.8
50	2	168	6.6	104	4.1	58	2.3

Table 10. Fisher Baumann 24000 Valve Assembly Weights

VALVE SIZE		WEIGHT	
DN	NPS	kg	lb
15	1/2	1.6	3.5
20	3/4	1.6	3.5
25	1	2.3	5.0
40	1-1/2	4.9	10.9
50	2	8.9	19.7

Table 11. Fisher Baumann Actuator Weights

ACTUATOR TYPE	WEIGHT	
	kg	lb
32	4.5	10
54	11.3	25
70	15.4	34
CML-250 ⁽¹⁾	8.3	18
CML-750 ⁽¹⁾	11.5	25
SVX-LIL (non spring return)	1.3	3
SVK-FO or SVK-FC ⁽¹⁾ (spring return)	1.6	4

1. Electric actuators, reference CML Electric Actuator for Fisher Baumann 24000 Series Bulletin 52.1:ECV ([D103347X012](#)) for additional information.

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