

Design GX Control Valve and Actuator System

The Fisher Design GX is a compact, state-of-the-art control valve and actuator system, designed to control a wide range of process liquids, gases, and vapors.

The Design GX is rugged, reliable, and easy to select. It requires no actuator sizing -- the actuator selection is automatic once the valve body construction is selected.

The optimized design results in reduced complexity and parts count. As a result, the cost of maintenance is reduced.

The Design GX meets the requirements of both EN and ANSI standards. It is available with a complete accessory package, including the FIELDVUE® DVC2000 Series integrated digital valve controller.

Features

- Simple to size and select
- No actuator sizing required--selection is automatic
- Simple and easy to maintain
- Maximum part commonality across sizes
- Replaceable trim
- Low lifetime costs
- Robust, low-profile design
- Compact field-reversible multi-spring pneumatic actuator
- Available with integrated, easy-to-calibrate DVC2000 Series Digital Valve Controller
- Valve body sizes DN 25 to DN 100 (1-inch through 4-inch)

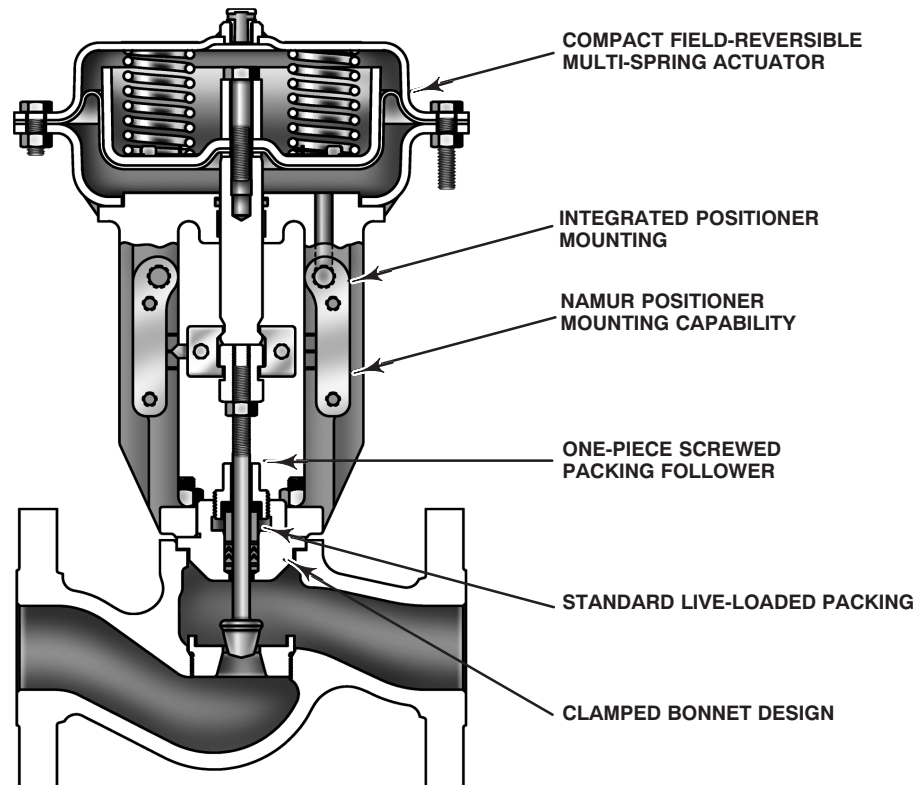


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Figure 1. Design GX Control Valve, Actuator, and DVC2000 Series Digital Valve Controller

- Pressure Classes PN 10-40 (Class 150 and 300)
- High capacity design
- Valve body flow passage optimized for flow stability
- Full range of materials, including alloys
- Shutoff capabilities: Class IV, V, and VI





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Figure 2. Design GX Control Valve Assembly with Stem-Guided Contoured Plug (Size DN 25/1-Inch)

Simple, optimized valve and actuator system.

Product simplicity and ease of selection provide the foundation of the GX. Mounted with a digital or analog positioner, the Design GX provides high performance control across a wide range of process applications.

Compact actuator design. The multi-spring GX actuator is compact and field-reversible. (No extra parts are required to reverse the fail-action). Its design has been optimized to eliminate complicated actuator sizing procedures - once the valve body and port size are selected, the actuator size is fixed.

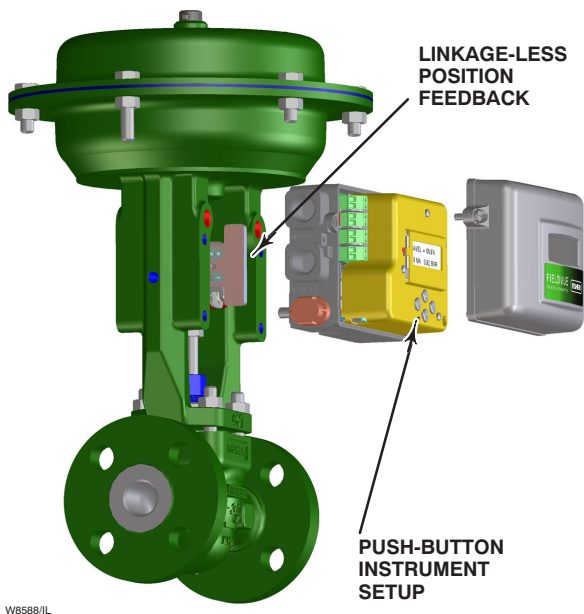
Modular design. The design architecture has been optimized to maximize the use of common parts across sizes. Only one set of springs is used in each of the three actuator sizes. The actuator stem and stem connector are used across all sizes, and the plug/stem assemblies and packing sets are common across several sizes, as well.

Lower lifetime costs. Reduced product complexity, low parts count, and part commonality all contribute to reduced inventory and maintenance costs.

Stable flow control. The flow cavity of the Design GX valve body has been engineered to provide stable flow and reduce process variability.

Live-loaded packing. The Design GX comes with live-loaded PTFE V-ring packing as standard. The live-loaded design helps to seal your process to conserve valuable process fluid, while reducing emissions to the environment. The long-life and high reliability of the live-loaded system also reduces maintenance costs and process downtime. For applications exceeding 232°C (450°F), live-loaded ULF (Ultra Low Friction) graphite packing and extension bonnets are available.

Easy maintenance. The simple screwed seat-ring and one-piece plug and stem design provide easy maintenance. Design simplicity and parts commonality contribute to reduced spares inventory. The integrated DVC2000 digital valve controller allows easy instrument removal, without a requirement for tubing disconnection or replacement (air-to-open construction).



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Figure 3. Design GX and DVC2000 Series Digital Valve Controller

Longer life. A variety of alloys and hardened trim materials are available in the design GX to increase valve body, bonnet, and trim life.

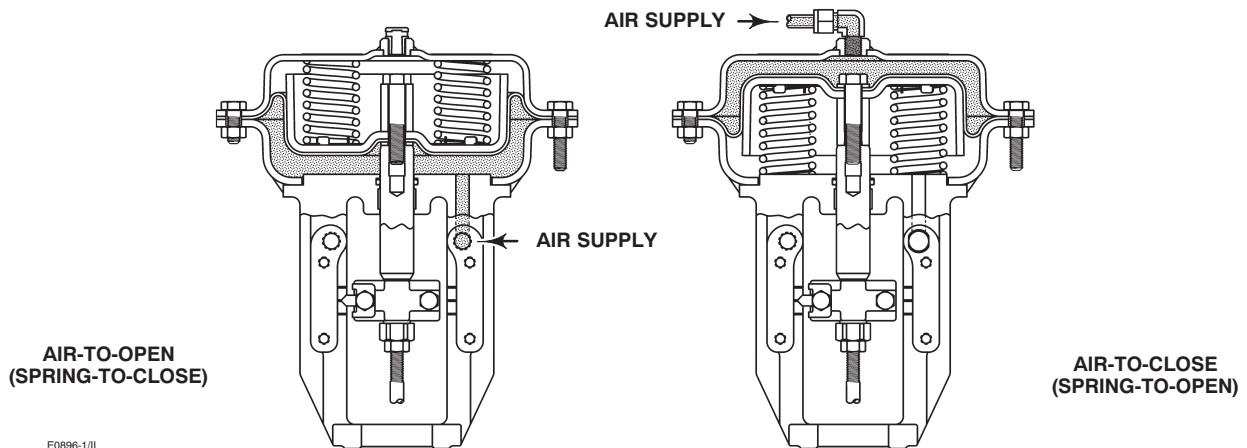
Digital valve controller. The Design GX is available with the DVC2000 Series digital valve controller. The DVC2000 is designed to be intrinsically safe and non-incendive. It features an easy-to-use local interface for instrument setup and linkage-less position feedback for simplified mounting. An optional module provides integrated limit switches and a position transmitter.

Integrated mounting. The DVC2000 digital valve controller mounts integrally to the Design GX actuator, eliminating the need for mounting brackets. The DVC2000 transmits a pneumatic signal to the actuator casing via an air passage in the yoke leg, causing the valve to stroke (see figure 4). This eliminates the need for positioner-to-actuator tubing in the air-to-open (spring-to-close) configuration.

Linkage-less feedback. The DVC2000 digital valve controller offers as standard a non-contacting valve position feedback system. This is a true linkage-less design, which uses no levers and no touching parts between the valve stem and the positioner.

Additional Accessory selection. The Design GX is available with a variety of digital or analog positioners besides the DVC2000 Series, as well as solenoid and limit switches. The actuator is also compatible with the IEC 60534-6-1 (NAMUR) positioner mounting standard.

Principle of Operation



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Figure 4. Design GX Principle of Operation -- Actuator Air Supply

Integrated Air Supply. When mounted with the DVC2000 Series digital valve controller, the Design GX uses an integrated actuator air supply system. In the air-to-open construction, air is supplied to the

lower actuator casing via a port on the actuator yoke face -- no tubing is required. In the air-to-close configuration, air is supplied to the upper casing via tubing.

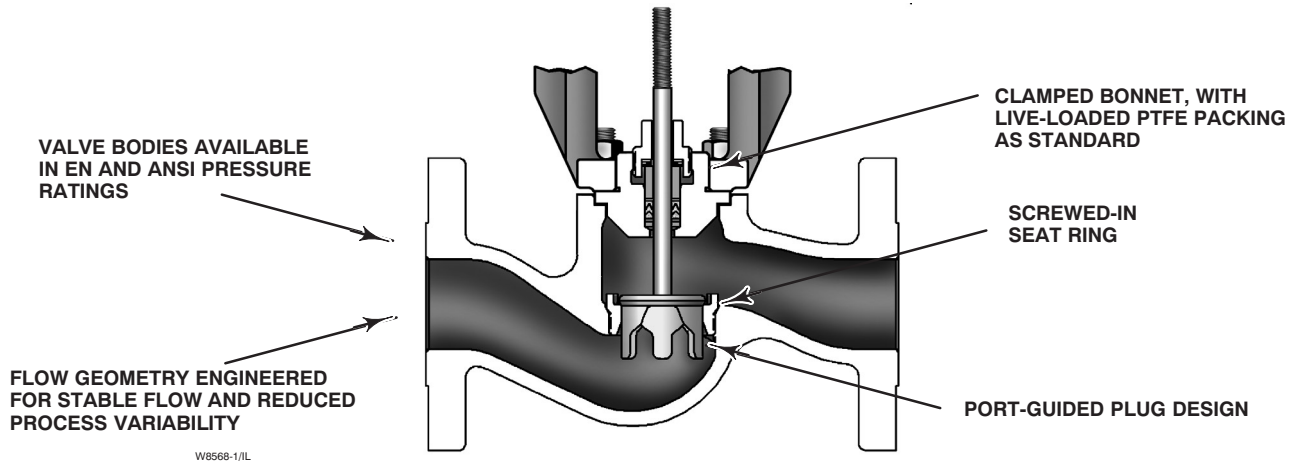


Figure 5. Design GX Control Valve with Port-Guided Plug (Sizes DN 40 to 100/1.5 to 4-Inch)

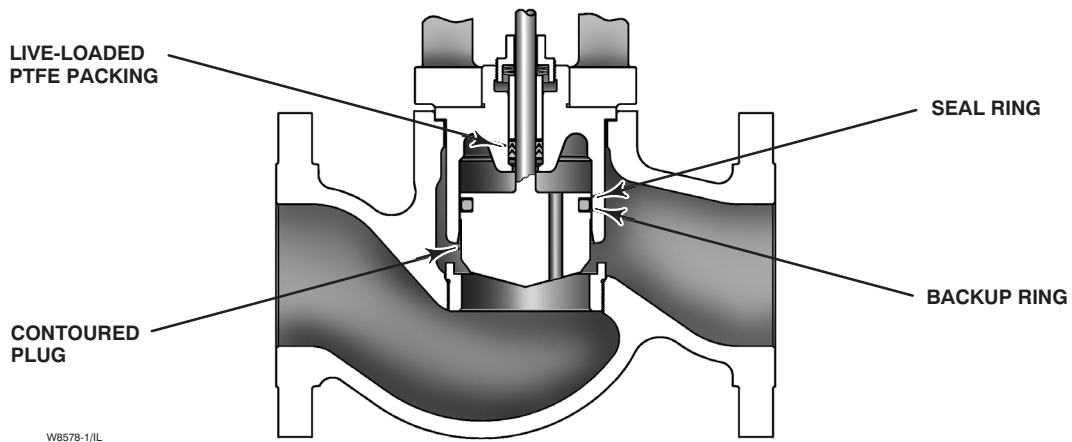


Figure 6. Design GX Control Valve with Balanced Trim (Sizes DN 80 and 100 [3- and 4-Inch] Only)

The Design GX Control Valve

The Design GX is a single port, flow-up globe style valve that offers stem-guided, port-guided, and balanced trim and a screwed-in seat ring (see table 1 for trim style by size). Each valve size offers an unbalanced plug design, which eliminates dead spaces where fluid polymerization might occur.

The Design GX incorporates a clamped bonnet, as well as a simple, easy-to-adjust screwed packing follower. The plug and stem are a rugged, one-piece welded assembly.

The standard construction incorporates metal-to-metal seating, with a PTFE soft seat option

for Class VI shutoff. Hardened trim with stellite overlay is available, as well.

PTFE V-ring stem packing is standard within the GX. The live-loaded system provides superior stem sealing and extended service life. An extension bonnet with graphite-based packing is available for temperatures above 232°C (450°F).

Both linear and equal percentage flow characteristics are available in full port and restricted trim.

Standard valve body materials are carbon steel and stainless steel, with several alloy materials available for highly corrosive applications.

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Design GX Control Valve Specifications and Materials of Construction

See tables 1 and 2.

Table 1. Design GX Valve Specifications

Specifications	EN	ANSI
Valve Body Size	DN 25, 40, 50, 80, 100	1, 1.5, 2, 3, 4-inch
Pressure Rating	PN 10 / 16 / 25 / 40 per EN 1092-1	Class 150 / 300 per ASME B16.34
End Connections	Flanged raised face per EN 1092-1	Flanged raised face per ASME B16.5
Valve Body/Bonnet Materials	1.0619 steel	ASME SA216 WCC steel
	1.4409 stainless steel	ASME SA351 CF3M stainless steel
	Hastelloy C (CW2M)	Hastelloy C (CW2M)
	304L (CF3) SST	304L (CF3) SST
	Alloy 20 (CN7M)	Alloy 20 (CN7M)
	Duplex SST (CD3MN)	Duplex SST (CD3MN)
Face-to-Face Dimensions	Consistent with EN 558-1	Consistent with EN 558-2 (same as ISA S75.03)
Shutoff per IEC 60534-4 and ANSI/FCI 70-2	Metal seat - Class IV (standard)	
	Metal seat - Class V (optional)	
	PTFE seat - Class VI (standard)	
Flow Direction	Flow-up only	
Flow Control Characteristics	Equal Percentage and Linear	
Trim Style	DN 25 (1-inch) - Stem-Guided, Contoured Plug (unbalanced)	
	DN 40 to 50 (1.5 to 2-inch) - Port-Guided Plug (unbalanced)	
	DN 80 to 100 (3 to 4-inch) - Balanced Trim with Contoured plug (standard) or Unbalanced Port-Guided Plug (optional)	

Table 2. Materials (Other Valve Components)

Component	Material	
Packing Follower	Nitronic 60 screwed follower	
Body/Bonnet Bolting and Nuts	SA193-B7 studs / SA194-2H nuts with NCF2 coating for carbon steel and stainless steel constructions	
	Nitronic 50 (XM19) for alloy (standard) and stainless steel assemblies (optional)	
Packing	Live-loaded PTFE V-ring (standard) with Inconel 718 Belleville springs	
	Graphite ULF (available only with extension bonnet)	
Bonnet Gasket	Graphite laminate (Graphoil)	
	PTFE encapsulated Hastelloy C (optional) Applicable from -46 to 232°C (-50 to 450°F) (May be preferable when the standard graphoil gasket material is not compatible with the process fluid)	
NACE MR0103 Construction	Stainless steel, or heat-treated carbon steel valve bodies and bonnets	
	Nitronic 50 body/bonnet bolting	
	Standard live-loaded PTFE packing	
	Trim (see tables 3, 4, and 5)	
Balanced Trim (Sizes DN 80 and 100 / 3- and 4-Inch)	Carbon-Filled PTFE Seal Ring	
	Back-up Rings	Nitrile (Standard) -46 to 82°C (-50 to 180°F)
		Ethylene Propylene [EPDM] (Optional): -46 to 232°C (-50 to 450°F) in steam and hot water; -46 to 121°C (-50 to 250°F) in air (EPDM is not recommended for use in hydrocarbons)
		Viton (Fluoroelastomer): -18 to 204°C (0 to 400°F) (Applicable in a wide variety of solvents, chemicals, and hydrocarbons. Avoid use with steam, ammonia, or hot water over 82°C [180°F])

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Table 3. Trim Materials - Contoured Plugs (Sizes DN 25 [1-inch])

Valve Body Material	Trim Type	Stem	Plug	Seat
Carbon steel (WCC)	Metal to metal	316L strain hardened	S31603	SA351 CF3M
	Soft seat	316L strain hardened	S31603	SA351 CF3M / PTFE seat
	Hard-faced	Nitronic 50	S31603 / CoCr-A seat	SA351 CF3M / CoCr-A seat
Carbon steel (WCC) / NACE MR0103	Metal to metal	Nitronic 50	S31603 / CoCr-A seat	SA351 CF3M / CoCr-A seat
Stainless steel (CF3M)	Metal to metal	316L strain hardened	S31603	SA351 CF3M
	Soft seat	316L strain hardened	S31603	SA351 CF3M / PTFE seat
	Hard-faced	Nitronic 50	S31603/CoCr-A seat	SA351 CF3M / CoCr-A seat
Stainless steel (CF3M) / NACE MR0103	Metal to metal	Nitronic 50	S31603/CoCr-A seat	SA351 CF3M / CoCr-A seat
Duplex SST (CD3MN)	Metal to metal	S31803 (Duplex SST)	S31803 (Duplex SST)	CD3MN (Duplex SST)
	Soft seat	S31803 (Duplex SST)	S31803 (Duplex SST)	CD3MN (Duplex SST) / PTFE seat
304L SST (CF3)	Metal to metal	S31803 (Duplex SST)	S30403 (304L SST)	CF3 (304L SST)
	Soft seat	S31803 (Duplex SST)	S30403 (304L SST)	CF3 (304L SST) / PTFE seat
Alloy 20 (CN7M)	Metal to metal	N06022 (Hastelloy C)	N06022 (Hastelloy C)	CX2MW (Hastelloy C)
	Soft seat	N06022 (Hastelloy C)	N06022 (Hastelloy C)	CX2MW (Hastelloy C) / PTFE seat
Hastelloy C (CW2M)	Metal to metal	N06022 (Hastelloy C)	N06022 (Hastelloy C)	CX2MW (Hastelloy C)
	Soft seat	N06022 (Hastelloy C)	N06022 (Hastelloy C)	CX2MW (Hastelloy C) / PTFE seat

Table 4. Trim Materials - Unbalanced Port-Guided Plugs (Sizes DN 40 to 100 [1.5 to 4-inch])

Valve Body Material	Trim Type	Stem	Plug	Seat
Carbon steel (WCC)	Metal to metal	316L strain hardened	SA217 CA15 (cast S41000)	SA217 CA15 (cast S41000)
	Soft seat	316L strain hardened	SA351 CF3M	SA351 CF3M / CoCr-A guide / PTFE seat
	Hard-faced	Nitronic 50	SA351 CF3M / CoCr-A seat	SA351 CF3M / CoCr-A seat and guide
Carbon steel (WCC) / NACE MR0103	Metal to metal	Nitronic 50	SA351 CF3M / CoCr-A seat	SA351 CF3M / CoCr-A seat and guide
Stainless steel (CF3M)	Metal to metal	316L strain hardened	SA351 CF3M	SA351 CF3M / CoCr-A guide
	Soft seat	316L strain hardened	SA351 CF3M	SA351 CF3M / CoCr-A guide / PTFE seat
	Hard-faced	Nitronic 50	SA351 CF3M / CoCr-A seat	SA351 CF3M / CoCr-A seat and guide
Stainless steel (CF3M) / NACE MR0103	Metal to metal	Nitronic 50	SA351 CF3M / CoCr-A seat	SA351 CF3M / CoCr-A seat and guide
Duplex SST (CD3MN)	Metal to metal	S31803 (Duplex SST)	CD3MN (Duplex SST) / CoCr-A seat	CD3MN (Duplex SST) / CoCr-A guide
	Soft seat	S31803 (Duplex SST)	CD3MN (Duplex SST) / CoCr-A seat	CD3MN (Duplex SST) / CoCr-A guide / PTFE seat
304L SST (CF3)	Metal to metal	S31803 (Duplex SST)	CF3 (304L SST)	CF3 (304L SST) / Ultimet guide
	Soft seat	S31803 (Duplex SST)	CF3 (304L SST)	CF3 (304L SST) / Ultimet guide / PTFE seat
Alloy 20 (CN7M)	Metal to metal	N06022 (Hastelloy C)	CX2MW (Hastelloy C) / Ultimet seat	CX2MW (Hastelloy C) / Ultimet guide
	Soft seat	N06022 (Hastelloy C)	CX2MW (Hastelloy C) / Ultimet seat	CX2MW (Hastelloy C) / Ultimet guide / PTFE seat
Hastelloy C (CW2M)	Metal to metal	N06022 (Hastelloy C)	CX2MW (Hastelloy C) / Ultimet seat	CX2MW (Hastelloy C) / Ultimet guide
	Soft seat	N06022 (Hastelloy C)	CX2MW (Hastelloy C) / Ultimet seat	CX2MW (Hastelloy C) / Ultimet guide / PTFE seat

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Table 5. Trim Materials - Balanced Plugs (Sizes DN 80 and 100 [3- and 4-inch])

Valve Body Material	Trim Type	Bonnet Material (Guide)	Stem	Plug	Seat
Carbon steel (WCC)	Metal to metal	SA351 CF3M	316L strain hardened	S31603 / CoCr-A guide	SA351 CF3M
	Hard-faced	SA351 CF3M	Nitronic 50	S31603 / CoCr-A guide and seat	SA351 CF3M / CoCr-A seat
Carbon steel (WCC) / NACE MR0103	Metal to metal	SA351 CF3M	Nitronic 50	S31603 / CoCr-A guide and seat	SA351 CF3M / CoCr-A seat
Stainless steel (CF3M)	Metal to metal	SA351 CF3M	316L strain hardened	S31603 / CoCr-A guide	SA351 CF3M
	Hard-faced	SA351 CF3M	Nitronic 50	S31603/CoCr-A guide and seat	SA351 CF3M / CoCr-A seat
Stainless steel (CF3M) / NACE MR0103	Metal to metal	SA351 CF3M	Nitronic 50	S31603/CoCr-A guide and seat	SA351 CF3M / CoCr-A seat
Duplex SST (CD3MN)	Metal to metal	CD3MN (Duplex SST)	S31803 (Duplex SST)	S31803 (Duplex SST) / CoCr-A guide	CD3MN (Duplex SST)
304L SST (CF3)	Metal to metal	CF3 (304L SST)	S31803 (Duplex SST)	S30403 (304L SST) / Ultimet guide	CF3 (304L SST)
Alloy 20 (CN7M)	Metal to metal	CN7M (Alloy 20)	N06022 (Hastelloy C)	N06022 (Hastelloy C) / Ultimet guide	CX2MW (Hastelloy C)
Hastelloy C (CW2M)	Metal to metal	CW2M (Hastelloy C)	N06022 (Hastelloy C)	N06022 (Hastelloy C) / Ultimet guide	CX2MW (Hastelloy C)

Table 6. Allowable Temperature Ranges for Valve Body, Bonnet and Trim^(1, 2)

VALVE BODY / BONNET MATERIAL	BONNET STYLE	PACKING	GASKET	TRIM STYLE	TEMPERATURE			
					°C		°F	
					Min	Max	Min	Max
1.0619/SA216 WCC Steel	Standard	PTFE	Graphoil or PTFE / Hastelloy C	Metal to metal; hard-faced; soft seat	-29	232	-20	450
	Extension	ULF Graphite	Graphoil	Metal to metal; hard-faced	-29	371	-20	700
1.4409/SA351 CF3M SST	Standard	PTFE	Graphoil or PTFE / Hastelloy C	Metal to metal; hard-faced; soft seat	-46	232	-50	450
	Extension	ULF Graphite	Graphoil	Metal to metal; hard-faced	-46	371	-50	700
Hastelloy C (CW2M) Alloy 20 (CN7M) 304L (CF3M) SST	Standard	PTFE	Graphoil or PTFE / Hastelloy C	Metal to metal; soft seat	-46	232	-50	450
Duplex SST (CD3MN)	Standard	PTFE	Graphoil or PTFE / Hastelloy C	Metal to metal; soft seat	-46	232	-50	450

1. Applies to all bolting combinations.

2. Back-up ring materials used in Sizes DN 80 and 100 (3- and 4-inch) with balanced trim may be limited by temperature and application. See table 2.

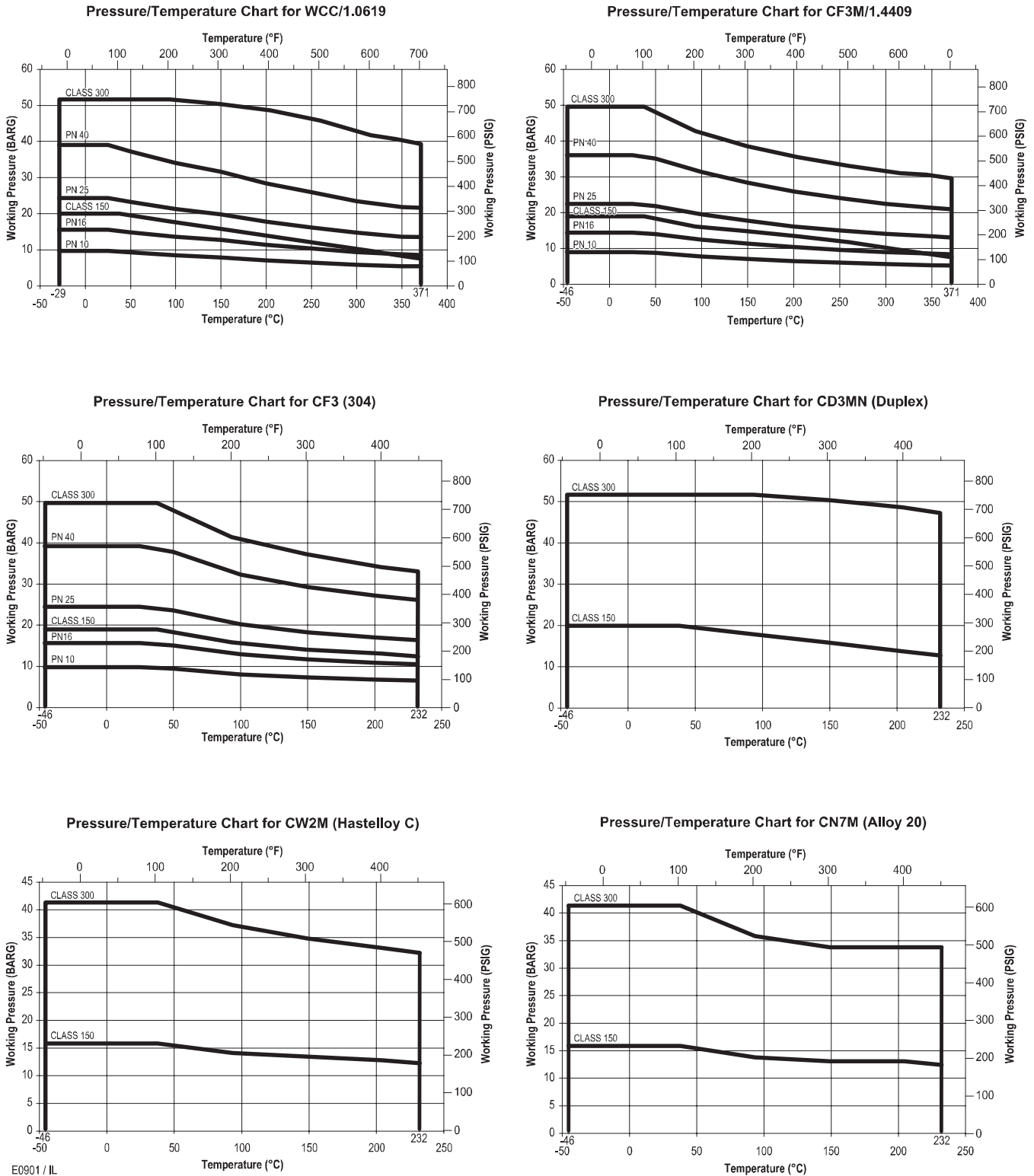


Figure 7. Material Pressure/Temperature Curves

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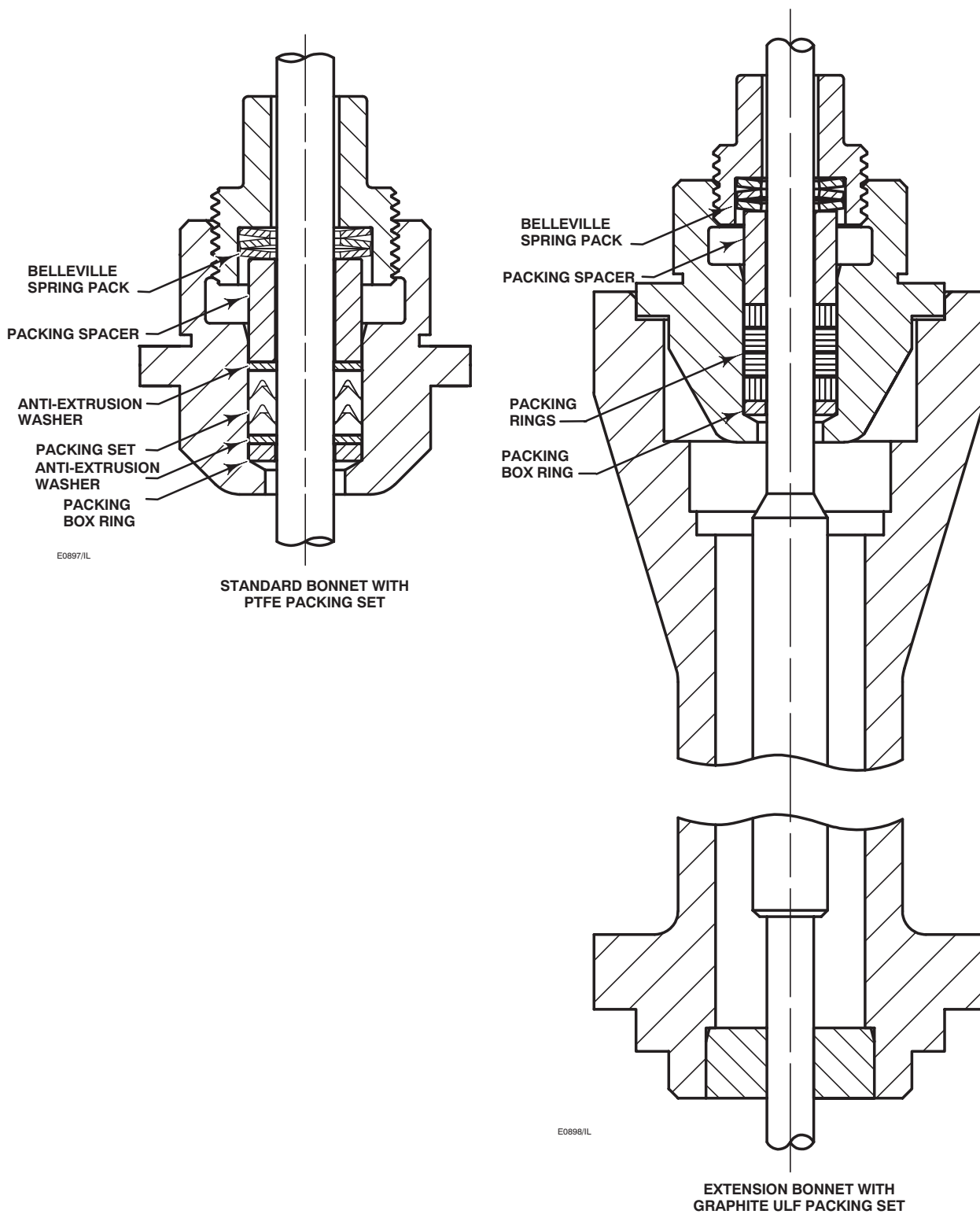
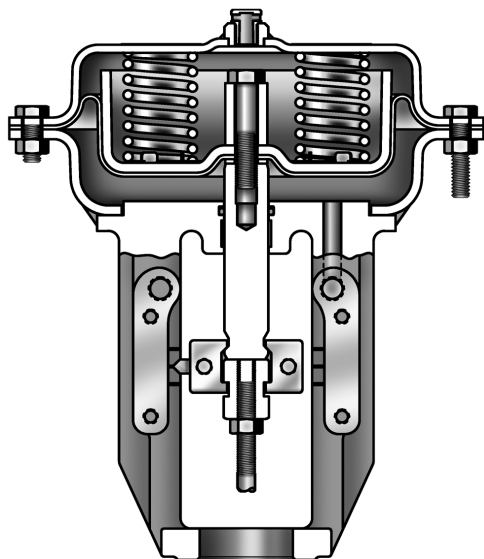


Figure 8. Design GX Packing

The Design GX Diaphragm Actuator



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Figure 9. Design GX Actuator

The Design GX uses a multi-spring, pneumatic diaphragm actuator (see figure 9). It is capable of air supply pressures to 6.0 barg (87 psig), allowing valve shutoff at high pressure drops.

The Design GX product selection system automatically matches the actuator to the valve, eliminating the need for complex actuator sizing procedures.

The multiple spring design provides the preload, eliminating the need for bench set adjustment. The actuator is available in spring-open and spring-close configurations (air-to-close and air-to-open) and is field-reversible.

The GX actuator can be used for throttling or on-off service, with or without a positioner.

The Design GX is available with the integrated DVC2000 Series digital valve controller. Other digital and analog positioners are available, as well as optional solenoids and limit switches.

Table 7. Actuator Specifications

Description	Pneumatic spring-return diaphragm actuator
Operating Principle	Direct action: Air-to-close (spring-to-open) Reverse action: Air-to-open (spring-to-close)
Operating Pressure Ranges	4.0 to 6.0 barg (58 to 87 psig) ⁽¹⁾
Ambient Temperature	-40 to 82°C (-40 to 180°F)
Pressure Connection (Air-to-Close Construction)	G 1/4 female casing connection
Finish	Powder coat polyester

1. May vary depending on construction (see tables 9 and 10)

Table 8. Materials of Construction

Part	Material
Upper and Lower Casings	AISI G10100 stamped carbon steel
Springs	Oil tempered steel
Diaphragm	Nitrile and nylon
Diaphragm Plate	AISI G10100 stamped carbon steel
Yoke	SA216 WCC carbon steel
Casing Fasteners	A2-70 stainless steel bolts and nuts
Actuator Rod	S30403 (304L)
Stem Connector	CF3M
Stem Connector Fasteners	SA193-B7 bolts with NCF2 coating
Stem Bushing	High-density polyethylene (HDPE)
Stem Seal	Nitrile

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Table 9. Maximum Allowable Valve Pressure Drops (1.6019/WCC and 1.4409/CF3M with Graphite ULF Packing)

VALVE SIZE		MAXIMUM TRAVEL	PORT DIAMETER	ACTUATOR SIZE	SUPPLY PRESSURE OF 4 BARG (58 PSIG) ⁽⁵⁾			
DN	Inches				Air-to-Open		Air-to-Close	
		mm	mm		Bar	psi	Bar	psi
25	1	20	9.5	225	51.7	750	51.7	750
			14	225	51.7	750	51.7	750
			22	225	51.7	750	51.7	750
40	1-1/2	20	14	225	51.7	750	51.7	750
			22	225	51.7	750	51.7	750
			36	750 ⁽³⁾	51.7	750	51.7	750
50	2	20	22	225	51.7	750	51.7	750
			36	750 ⁽³⁾	51.7	750	51.7	750
			46	750 ⁽³⁾	51.7	750	51.7	750
80	3	20	36	750	51.7	750	51.7	750
			46	750	50.6	734	51.7	750
			70 ⁽¹⁾	750	51.7	750	51.7	750
100	4	20	40	750	36.2	525	42.6	618
			70	1200 ⁽⁴⁾	36.2	525	42.6	618
		40	20	750	51.7	750	51.7	750
			90 ⁽²⁾	750	51.7	750	51.7	750
		90 ⁽¹⁾	750	51.7	750	51.7	750	
			40	90	1200 ⁽⁴⁾	21.9	318	25.8

1. Balanced trim design.
2. Balanced trim with restricted capacity plug.
3. Supply pressure limited to 4 to 4.8 barg (58 to 70 psig) for air-to-close (spring-to-open) actuator action.
4. Supply pressure limited to 4 to 5.6 barg (58 to 81 psig) for air-to-close (spring-to-open) actuator action.
5. Maximum supply pressure of 6.0 barg (87 psig) unless otherwise noted.

Table 10. Maximum Allowable Valve Pressure Drops (Alloy Constructions with PTFE Packing)

VALVE SIZE		MAXIMUM TRAVEL	PORT DIAMETER	ACTUATOR SIZE	SUPPLY PRESSURE OF 4 BARG (58 PSIG) UNLESS OTHERWISE NOTED ⁽⁶⁾			
DN	Inches				Air-to-Open		Air-to-Close	
		mm	mm		Bar	psi	Bar	psi
25	1	20	9.5	225	51.7	750	51.7	750
			14	225	51.7	750	51.7	750
			22	225	51.7	750	51.7	750
40	1-1/2	20	14	225	51.7	750	51.7	750
			22	225	51.7	750	51.7	750
			36	750 ⁽³⁾	32.3	468	51.7	750
50	2	20	22	225	51.7	750	51.7	750
			36	750 ⁽³⁾	32.3	468	51.7	750
			46	750 ⁽³⁾	19.8	287	40.8	592
80	3	20	36	750 ⁽⁵⁾	29.4	426	51.7	750
			46	750 ⁽⁵⁾	18.0	261	40.8	592
			70 ⁽¹⁾	750 ⁽⁵⁾	51.7	750	51.7	750
100	4	40	70	1200 ⁽⁴⁾	19.1	277	41.5	602
			20	750 ⁽⁵⁾	18.0	261	40.8	592
		20	40	1200 ⁽⁴⁾	19.1	277	41.5	602
			90 ⁽²⁾	750 ⁽⁵⁾	51.7	750	51.7	750
		90 ⁽¹⁾	750 ⁽⁵⁾	51.7	750	51.7	750	
			40	90	1200 ⁽⁴⁾	11.6	168	25.1

1. Balanced trim design.
2. Balanced trim with restricted capacity plug.
3. Supply pressure limited to 1.5 to 2 barg (22 to 29 psig) for air-to-close (spring-to-open) actuator action.
4. Supply pressure limited to 2.1 to 2.8 barg (30 to 40 psig) for air-to-close (spring-to-open) actuator action.
5. Supply pressure limited to 1.5 to 3.2 barg (22 to 46 psig) for air-to-close (spring-to-open) actuator action.
6. Maximum supply pressure of 6.0 barg (87 psig) unless otherwise noted.

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Table 11. Maximum Allowable Valve Pressure Drops When Using the Type 3582i I/P Positioner (1.6019/WCC and 1.4409/CF3M with Graphite ULF Packing)

VALVE SIZE		MAXIMUM TRAVEL	PORT DIAMETER	ACTUATOR SIZE	SUPPLY PRESSURE OF 3.44 BARG (50 PSIG) ⁽³⁾			
DN	Inches				Air-to-Open		Air-to-Close	
		mm	mm		Bar	psi	Bar	psi
25	1	20	9.5	225	51.7	750	51.7	750
			14	225	51.7	750	51.7	750
			22	225	51.7	750	30.9	448
40	1-1/2	20	14	225	51.7	750	51.7	750
			22	225	51.7	750	30.9	448
			36	750	51.7	750	51.7	750
50	2	20	22	225	51.7	750	30.9	448
			36	750	51.7	750	51.7	750
			46	750	51.7	750	35.9	521
80	3	20	36	750	51.7	750	51.7	750
			46	750	50.6	734	34.8	505
			70 ⁽¹⁾	750	51.7	750	25.4	368
100	4	20	40	1200	36.2	525	42.6	618
			46	750	51.7	750	34.8	505
			70	1200	36.2	525	25.4	368
100	4	40	90 ⁽²⁾	750	51.7	750	51.7	750
			90 ⁽¹⁾	750	51.7	750	51.7	750
			90	1200	21.9	318	15.4	223

1. Balanced trim design.
2. Balanced trim with restricted capacity plug.
3. Maximum supply pressure of 3.44 barg (50 psig).

Table 12. Maximum Allowable Valve Pressure Drops When Using the Type 3582i I/P Positioner (Alloy Constructions with PTFE Packing)

VALVE SIZE		MAXIMUM TRAVEL	PORT DIAMETER	ACTUATOR SIZE	SUPPLY PRESSURE OF 3.44 BARG (50 PSIG) UNLESS OTHERWISE NOTED ⁽⁶⁾			
DN	Inches				Air-to-Open		Air-to-Close	
		mm	mm		Bar	psi	Bar	psi
25	1	20	9.5	225	51.7	750	51.7	750
			14	225	51.7	750	51.7	750
			22	225	51.7	750	39.7	576
40	1-1/2	20	14	225	51.7	750	51.7	750
			22	225	51.7	750	39.7	576
			36	750 ⁽³⁾	32.3	468	51.7	750
50	2	20	22	225	51.7	750	39.7	576
			36	750 ⁽³⁾	32.3	468	51.7	750
			46	750 ⁽³⁾	19.8	287	40.8	592
80	3	20	36	750 ⁽⁵⁾	29.4	426	51.7	750
			46	750 ⁽⁵⁾	18.0	261	51.7	750
			70 ⁽¹⁾	750 ⁽⁵⁾	51.7	750	51.7	750
100	4	40	70	1200 ⁽⁴⁾	19.1	277	41.5	602
			46	750 ⁽⁵⁾	18.0	261	51.7	750
			70	1200 ⁽⁴⁾	19.1	277	41.5	602
100	4	20	90 ⁽²⁾	750 ⁽⁵⁾	51.7	750	51.7	750
			90 ⁽¹⁾	750 ⁽⁵⁾	51.7	750	51.7	750
			90	1200 ⁽⁴⁾	11.6	168	25.1	364

1. Balanced trim design.
2. Balanced trim with restricted capacity plug.
3. Supply pressure limited to 1.5 to 2 barg (22 to 29 psig) for air-to-close (spring-to-open) actuator action.
4. Supply pressure limited to 2.1 to 2.8 barg (30 to 40 psig) for air-to-close (spring-to-open) actuator action.
5. Supply pressure limited to 1.5 to 3.2 barg (22 to 46 psig) for air-to-close (spring-to-open) actuator action.
6. Maximum supply pressure of 3.44 barg (50 psig) unless otherwise noted.

Valve-Actuator Dimensions and Weights

See figure 10 and table 13.

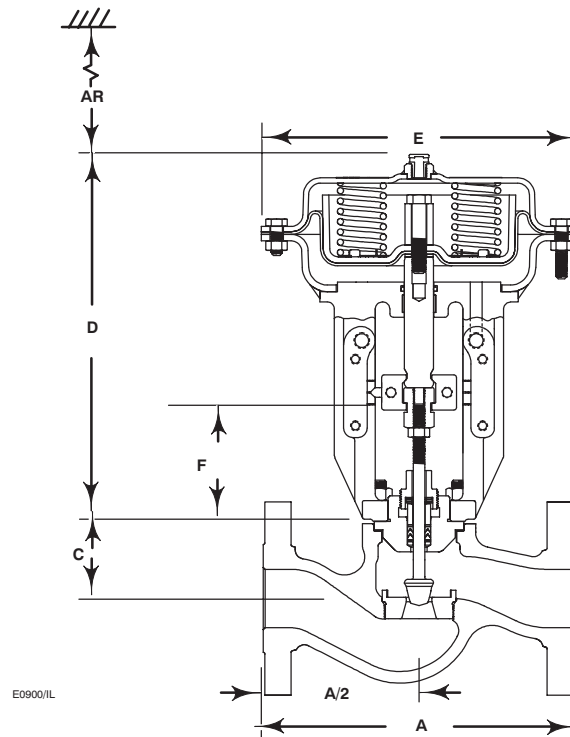


Figure 10. Design GX Dimensions (also see table 13)

Table 13. Design GX Dimensions and Weights

VALVE SIZE			ACTUATOR SIZE	A			C		D Actuator Height	E Casing Dia	F (AR) Removal Height ⁽³⁾	TOTAL WEIGHT	
EN	ANSI	PORT DIA		EN	ANSI Class 150	ANSI Class 300	Std Bonnet	Ext Bonnet				With Standard Bonnet	With Extension Bonnet
	Inches	mm											
DN 25	1	4.8	225	160	184	197	58	296	313	270	115	22	26
		9.5	225	160	184	197	58	296	313	270	115	22	26
		14	225	160	184	197	58	296	313	270	115	22	26
		22	225	160	184	197	58	296	313	270	115	22	26
DN 40	1-1/2	14	225	200	222	235	62	300	313	270	115	25	29
		22	225	200	222	235	62	300	313	270	115	25	29
		36	750	200	222	235	62	300	342	430	115	52	56
DN 50	2	22	225	230	254	267	68	306	313	270	115	29	33
		36	750	230	254	267	68	306	342	430	115	56	60
		46	750	230	254	267	68	306	342	430	115	56	60
DN 80	3	36	750	310	298	318	105	363	375	430	125	79	88
		46	750	310	298	318	105	363	375	430	125	79	88
		70 ⁽¹⁾	750	310	298	318	105	NA ⁽⁴⁾	375	430	125	81	NA ⁽⁴⁾
		70	1200	310	298	318	105	363	458	566	125	131	140
DN 100	4	46	750	350	352	368	121	383	379	430	130	98	109
		70	1200	350	352	368	121	383	462	566	130	150	161
		90 ⁽²⁾	750	350	352	368	121	NA ⁽⁴⁾	379	430	130	105	NA ⁽⁴⁾
		90 ⁽¹⁾	750	350	352	368	121	NA ⁽⁴⁾	379	430	130	105	NA ⁽⁴⁾
		90	1200	350	352	368	121	383	462	566	130	150	161

1. Balanced trim design.
 2. Balanced trim with reduced-capacity plug.
 3. Clearance required for removing actuator from installed valve body.
 4. Extension bonnets not available with balanced trim due to temperature limitations of trim seals.

GX Control Valve and Actuator

Table 14. Positioner Selection Guidelines

Type	Digital I/P ⁽¹⁾	I/P ⁽²⁾	P/P ⁽³⁾	EEx ia	EEx d	EEx n Zone 2 (Non- Incendive)	Integral Design GX Mounting	IEC 60534-6-1 Mounting ⁽⁴⁾
DVC2000	X			X		X	X	
DVC6030	X				X			X
3582i		X			X			X
3661		X		X		X		X
3660			X					X

1. Digital I/P - microprocessor based electro-pneumatic with HART communication.
 2. I/P - electro-pneumatic
 3. P/P - pneumatic
 4. NAMUR mounting

Design GX Actuator Accessories

The Design GX is available with a variety of pneumatic (P/P), electro-pneumatic (I/P), and digital valve positioners, as well as limit switches and solenoids. Table 14 provides the basic features of the positioners offered with the Design GX actuator.

The FIELDVUE DVC2000 Series Digital Valve Controller

The DVC2000 Series digital valve controller (figure 11) is simple to use, compact, and designed for the GX control valve. It converts a 4-20mA input signal into a pneumatic output signal, which feeds the control valve actuator. Instrument setup is performed with a pushbutton and liquid crystal display (LCD) interface. This interface is protected from the environment within an IP66 enclosure. Multiple languages are supported with the local interface including German, French, Italian, Spanish, Chinese, Japanese, and English. Additionally, HART® communication is supported over the twisted pair of wires.

The DVC2000 is designed to be integrally mounted to the Design GX actuator, avoiding the need for mounting brackets. The DVC2000 mounts directly to an interface pad on the actuator yoke leg with a secure 3-point mounting. An internal passage inside the yoke leg transmits the pneumatic signal to the actuator casing, eliminating the need for external tubing (in the air-to-open configuration).



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Figure 11. FIELDVUE DVC2000 Series Digital Valve Controller

The high-performance linkage-less position feedback system eliminates physical contact between the valve stem and the positioner. There are no wearing parts so cycle life is maximized. Additionally, the elimination of levers and linkages reduces the number of mounting parts and the mounting complexity. Positioner replacement and maintenance is simplified because the feedback parts stay connected to the actuator.

The DVC2000 Series is available with an optional module which includes two (2) integral limit switches and a stem position transmitter. The limit switches are configurable for open and closed valve indication. The position transmitter provides a 4-20mA signal for valve position feedback verification. As an integral component to the instrument, this option module avoids the need for difficult to mount external switches and transmitters.

Designed to meet intrinsically safe and non-incendive requirements, this instrument delivers scalable functionality and high performance in a small package.

Optional Positioners and Instruments

Type 3660 and 3661 Valve Positioners

The Type 3660 pneumatic and 3661 electro-pneumatic positioners are rugged, accurate, and feature low steady-state air consumption. Designed to meet intrinsically safe requirements (EEx ia), these positioners offer simple functionality in a small package. See figure 12.

Type DVC6030 Digital Valve Controller

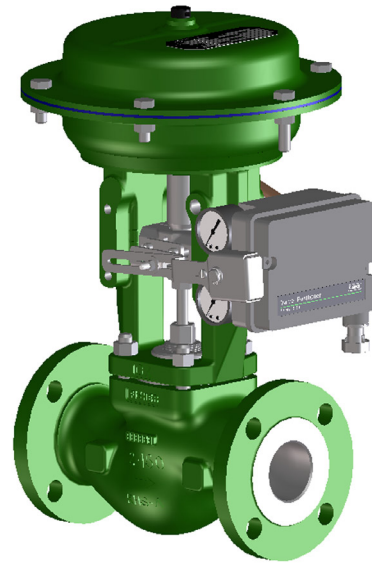
The Type DVC6030 digital valve controller is a communicating, microprocessor-based positioner. Using HART or FOUNDATION® fieldbus communication protocol, access to critical instrument, valve, and process conditions is provided. When used with AMS ValveLink® Software, valve diagnostic tests can be run while the valve is in service to advise you of the performance of the entire control valve assembly. Designed to meet flame-proof requirements (EEx d), this positioner offers maximum functionality to improve your process performance. See figure 13.

Type 3582i Valve Positioner

The Type 3582i electro-pneumatic positioner is accurate and efficient. It is a robust design that demonstrates fast response to input signal changes. This positioner proves highly-resistant to the vibration that is prevalent throughout most process plants. Designed to meet flame-proof requirements (EEx d), this positioner combines simple functionality with high performance. See figure 14.

Note

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



W8590/IL

Figure 12. Design GX Valve with Type 3660 or 3661 Positioner, NAMUR Mounting (IEC 60534-6-1)



W7963-1/IL

Figure 13. Type DVC6030



W5502-2/IL

Figure 14. Type 3582i

GX Control Valve and Actuator

Coefficients

Table 15. Design GX, Equal Percentage Valve Plug, Flow Up Through the Port

Equal Percentage - Flow Up													Equal Percentage Characteristic	
Valve Size	Port Diameter mm	Maximum Travel mm	Flow Coefficient	Valve Opening—Percent of Total Travel										F _L ⁽¹⁾
				10	20	30	40	50	60	70	80	90	100	
DN 25 (1-Inch)	22	20	C _V	0.673	0.937	1.32	1.89	2.25	3.13	5.05	7.39	10.5	13.8	0.93
			K _V	0.582	0.810	1.14	1.63	1.94	2.71	4.36	6.39	9.05	11.9	---
			X _T	0.61	0.59	0.58	0.57	0.73	0.82	0.64	0.59	0.73	0.76	---
			F _d	0.09	0.11	0.13	0.15	0.18	0.21	0.25	0.31	0.39	0.49	---
	14 ⁽²⁾	20	C _V	0.139	0.186	0.315	0.511	0.776	1.23	1.97	3.28	5.35	6.89	0.97
			K _V	0.120	0.161	0.272	0.442	0.671	1.07	1.70	2.84	4.63	5.96	---
			X _T	0.78	0.71	0.59	0.59	0.58	0.51	0.57	0.51	0.67	0.81	---
			F _d	0.08	0.08	0.10	0.13	0.16	0.20	0.26	0.33	0.47	0.59	---
	9.5 ⁽²⁾	20	C _V	0.133	0.222	0.347	0.501	0.699	1.04	1.50	2.15	2.98	3.57	0.95
			K _V	0.115	0.192	0.300	0.433	0.605	0.900	1.29	1.86	2.58	3.09	---
			X _T	0.77	0.68	0.65	0.61	0.55	0.55	0.58	0.54	0.59	0.68	---
			F _d	0.11	0.13	0.16	0.19	0.22	0.28	0.34	0.44	0.58	0.80	---
DN 40 (1-1/2 Inch)	36	20	C _V	1.03	1.69	2.52	4.31	6.60	9.59	14.0	19.5	23.7	25.9	0.92
			K _V	0.889	1.46	2.18	3.72	5.71	8.29	12.1	16.9	20.5	22.4	---
			X _T	0.69	0.65	0.60	0.58	0.55	0.54	0.60	0.71	0.76	0.80	---
			F _d	0.64	0.80	0.87	0.54	0.55	0.50	0.41	0.40	0.43	0.45	---
	22 ⁽²⁾	20	C _V	0.673	0.937	1.32	1.89	2.25	3.13	5.05	7.39	10.5	13.8	0.93
			K _V	0.582	0.810	1.14	1.63	1.94	2.71	4.36	6.39	9.05	11.9	---
			X _T	0.61	0.59	0.58	0.57	0.73	0.82	0.64	0.59	0.73	0.76	---
			F _d	0.09	0.11	0.13	0.15	0.18	0.21	0.25	0.31	0.39	0.49	---
	14 ⁽²⁾	20	C _V	0.139	0.186	0.315	0.511	0.776	1.23	1.97	3.28	5.35	6.89	0.97
			K _V	0.120	0.161	0.272	0.442	0.671	1.07	1.70	2.84	4.63	5.96	---
			X _T	0.78	0.71	0.59	0.59	0.58	0.51	0.57	0.51	0.67	0.81	---
			F _d	0.08	0.08	0.10	0.13	0.16	0.20	0.26	0.33	0.47	0.59	---
DN 50 (2-Inch)	46	20	C _V	0.964	1.82	3.78	6.56	11.0	16.6	24.5	31.3	38.2	43.5	0.88
			K _V	0.834	1.57	3.27	5.68	9.51	14.3	21.2	27.0	33.0	37.6	---
			X _T	0.62	0.61	0.60	0.55	0.49	0.47	0.49	0.57	0.67	0.74	---
			F _d	0.70	0.84	0.47	0.48	0.40	0.36	0.37	0.40	0.43	0.45	---
	36 ⁽²⁾	20	C _V	1.03	1.69	2.52	4.31	6.60	9.59	14.0	19.5	23.7	25.9	0.92
			K _V	0.889	1.46	2.18	3.72	5.71	8.29	12.1	16.9	20.5	22.4	---
			X _T	0.69	0.65	0.60	0.58	0.55	0.54	0.60	0.71	0.76	0.80	---
			F _d	0.64	0.80	0.87	0.54	0.55	0.50	0.41	0.40	0.43	0.45	---
	22 ⁽²⁾	20	C _V	0.673	0.937	1.32	1.89	2.25	3.13	5.05	7.39	10.5	13.8	0.93
			K _V	0.582	0.810	1.14	1.63	1.94	2.71	4.36	6.39	9.05	11.9	---
			X _T	0.61	0.59	0.58	0.57	0.73	0.82	0.64	0.59	0.73	0.76	---
			F _d	0.09	0.11	0.13	0.15	0.18	0.21	0.25	0.31	0.39	0.49	---

1. At 100% travel.
 2. Restricted trim.
 3. Balanced trim.
 4. Balanced, restricted trim.

-continued-

Table 15. Design GX, Equal Percentage Valve Plug, Flow Up Through the Port (continued)

Equal Percentage - Flow Up													Equal Percentage Characteristic	
Valve Size	Port Diameter mm	Maximum Travel mm	Flow Coefficient	Valve Opening—Percent of Total Travel										F _L ⁽¹⁾
				10	20	30	40	50	60	70	80	90	100	
DN 80 (3-Inch)	70	40	C _V	3.04	6.08	11.8	17.5	25.0	32.5	48.8	65.1	77.8	90.5	0.86
			K _V	2.63	5.26	10.19	15.1	21.6	28.1	42.2	56.3	67.3	78.3	---
			X _T	0.63	0.57	0.64	0.67	0.60	0.51	0.47	0.50	0.62	0.73	---
			F _d	0.82	0.50	0.53	0.53	0.47	0.42	0.40	0.40	0.43	0.45	---
	70 ⁽³⁾	20	C _V	5.58	7.08	9.43	12.7	17.5	24.7	34.5	49.1	67.0	87.2	0.86
			K _V	4.83	6.12	8.16	10.95	15.2	21.4	29.8	42.5	57.9	75.4	---
			X _T	0.63	0.57	0.64	0.67	0.60	0.51	0.47	0.50	0.62	0.73	---
			F _d	0.05	0.07	0.09	0.11	0.14	0.22	0.29	0.36	0.44	0.50	---
	46 ⁽²⁾	20	C _V	0.964	1.82	3.78	6.56	11.0	16.6	24.5	31.3	38.2	43.5	0.88
			K _V	0.834	1.57	3.27	5.68	9.51	14.3	21.2	27.0	33.0	37.6	---
			X _T	0.62	0.61	0.60	0.55	0.49	0.47	0.49	0.57	0.67	0.74	---
			F _d	0.70	0.84	0.47	0.48	0.40	0.36	0.37	0.40	0.43	0.45	---
	36 ⁽²⁾	20	C _V	1.03	1.69	2.52	4.31	6.60	9.59	14.0	19.5	23.7	25.9	0.92
			K _V	0.889	1.46	2.18	3.72	5.71	8.29	12.1	16.9	20.5	22.4	---
			X _T	0.69	0.65	0.60	0.58	0.55	0.54	0.60	0.71	0.76	0.80	---
			F _d	0.64	0.80	0.87	0.54	0.55	0.50	0.41	0.40	0.43	0.45	---
DN 100 (4-Inch)	90	40	C _V	7.76	14.1	20.3	29.1	43.0	62.9	92.8	124	148	167	0.876
			K _V	6.71	12.2	17.6	25.2	37.2	54.4	80.2	108	128	144	---
			X _T	0.72	0.55	0.58	0.60	0.54	0.47	0.50	0.62	0.67	0.74	---
			F _d	0.39	0.49	0.52	0.48	0.45	0.44	0.33	0.36	0.39	0.41	---
	90 ⁽³⁾	20	C _V	6.38	9.13	12.9	16.9	27.1	42.6	63.0	83.6	105	122	0.86
			K _V	5.52	7.90	11.1	14.6	23.5	36.8	54.5	72.3	90.4	106	---
			X _T	0.72	0.55	0.58	0.60	0.54	0.47	0.50	0.62	0.67	0.74	---
			F _d	0.06	0.08	0.10	0.13	0.20	0.27	0.34	0.41	0.48	0.54	---
	90 ⁽⁴⁾	20	C _V	2.19	3.56	5.47	8.36	12.2	17.7	25.8	38.9	56.3	71.9	0.86
			K _V	1.89	3.08	4.7	7.2	10.5	15.3	22.3	33.6	48.7	62	---
			X _T	0.72	0.55	0.58	0.60	0.54	0.47	0.50	0.62	0.67	0.74	---
			F _d	0.06	0.08	0.10	0.13	0.20	0.27	0.34	0.41	0.48	0.54	---
	70 ⁽²⁾	40	C _V	3.04	6.08	11.8	17.5	25.0	32.5	48.8	65.1	77.8	90.5	0.86
			K _V	2.63	5.26	10.19	15.1	21.6	28.1	42.2	56.3	67.3	78.3	---
			X _T	0.63	0.57	0.64	0.67	0.60	0.51	0.47	0.50	0.62	0.73	---
			F _d	0.82	0.50	0.53	0.53	0.47	0.42	0.40	0.40	0.43	0.45	---
	46 ⁽²⁾	20	C _V	0.964	1.82	3.78	6.56	11.0	16.6	24.5	31.3	38.2	43.5	0.88
			K _V	0.834	1.57	3.27	5.68	9.51	14.3	21.2	27.0	33.0	37.6	---
			X _T	0.62	0.61	0.60	0.55	0.49	0.47	0.49	0.57	0.67	0.74	---
			F _d	0.70	0.84	0.47	0.48	0.40	0.36	0.37	0.40	0.43	0.45	---

1. At 100% travel.
2. Restricted trim.
3. Balanced trim.
4. Balanced, restricted trim.

GX Control Valve and Actuator

Table 16. Design GX, Linear Valve Plug, Flow Up Through the Port

Linear - Flow Up														Linear Characteristic
Valve Size	Port Diameter mm	Maximum Travel mm	Flow Coefficient	Valve Opening—Percent of Total Travel										F _L ⁽¹⁾
				10	20	30	40	50	60	70	80	90	100	
DN 25 (1-Inch)	22	20	C _V	1.72	3.06	4.50	7.04	8.52	9.74	11.1	12.7	14.6	15.7	0.94
			K _V	1.49	2.64	3.90	6.09	7.37	8.43	9.58	10.9	12.6	13.6	---
			X _T	0.51	0.58	0.60	0.44	0.47	0.52	0.56	0.68	0.74	0.80	---
			F _d	0.14	0.19	0.24	0.29	0.33	0.37	0.42	0.46	0.53	0.61	---
	14 ⁽²⁾	20	C _V	0.685	1.46	2.28	3.05	3.81	4.56	5.42	6.34	7.21	7.80	0.96
			K _V	0.592	1.26	1.97	2.64	3.29	3.95	4.69	5.48	6.24	6.75	---
			X _T	0.53	0.51	0.53	0.54	0.58	0.61	0.63	0.64	0.69	0.71	---
			F _d	0.16	0.24	0.30	0.35	0.39	0.45	0.52	0.60	0.71	0.79	---
	9.5 ⁽²⁾	20	C _V	0.187	0.453	0.769	1.10	1.42	1.79	2.22	2.73	3.29	3.70	0.95
			K _V	0.161	0.392	0.665	0.952	1.23	1.55	1.92	2.36	2.85	3.20	---
			X _T	0.59	0.56	0.55	0.53	0.58	0.57	0.60	0.58	0.62	0.63	---
			F _d	0.12	0.18	0.24	0.29	0.34	0.39	0.45	0.53	0.65	0.80	---
DN 40 (1-1/2 Inch)	36	20	C _V	3.65	6.66	9.85	13.4	16.5	19.5	23.3	27.3	29.9	29.8	0.93
			K _V	3.15	5.76	8.52	11.6	14.3	16.9	20.2	23.6	25.9	25.7	---
			X _T	0.59	0.61	0.61	0.62	0.55	0.49	0.54	0.69	0.79	0.82	---
			F _d	0.30	0.42	0.47	0.49	0.51	0.52	0.50	0.48	0.47	0.48	---
	22 ⁽²⁾	20	C _V	1.72	3.06	4.50	7.04	8.52	9.74	11.1	12.7	14.6	15.7	0.94
			K _V	1.49	2.64	3.90	6.09	7.37	8.43	9.58	10.9	12.6	13.6	---
			X _T	0.51	0.58	0.60	0.44	0.47	0.52	0.56	0.68	0.74	0.80	---
			F _d	0.14	0.19	0.24	0.29	0.33	0.37	0.42	0.46	0.53	0.61	---
	14 ⁽²⁾	20	C _V	0.685	1.46	2.28	3.05	3.81	4.56	5.42	6.34	7.21	7.80	0.96
			K _V	0.592	1.26	1.97	2.64	3.29	3.95	4.69	5.48	6.24	6.75	---
			X _T	0.53	0.51	0.53	0.54	0.58	0.61	0.63	0.64	0.69	0.71	---
			F _d	0.16	0.24	0.30	0.35	0.39	0.45	0.52	0.60	0.71	0.79	---
DN 50 (2-Inch)	46	20	C _V	4.04	7.78	11.8	15.9	20.1	24.6	29.8	36.3	43.3	47.4	0.89
			K _V	3.49	6.73	10.2	13.8	17.4	21.2	25.8	31.4	37.5	41.0	---
			X _T	0.96	0.83	0.79	0.69	0.70	0.71	0.74	0.80	0.66	0.41	---
			F _d	0.25	0.36	0.42	0.46	0.47	0.46	0.46	0.47	0.48	0.50	---
	36 ⁽²⁾	20	C _V	3.65	6.66	9.85	13.4	16.5	19.5	23.3	27.3	29.9	29.8	0.93
			K _V	3.15	5.76	8.52	11.6	14.3	16.9	20.2	23.6	25.9	25.7	---
			X _T	0.59	0.61	0.61	0.62	0.55	0.49	0.54	0.69	0.79	0.82	---
			F _d	0.30	0.42	0.47	0.49	0.51	0.52	0.50	0.48	0.47	0.48	---
	22 ⁽²⁾	20	C _V	1.72	3.06	4.50	7.04	8.52	9.74	11.1	12.7	14.6	15.7	0.94
			K _V	1.49	2.64	3.90	6.09	7.37	8.43	9.58	10.9	12.6	13.6	---
			X _T	0.51	0.58	0.60	0.44	0.47	0.52	0.56	0.68	0.74	0.80	---
			F _d	0.14	0.19	0.24	0.29	0.33	0.37	0.42	0.46	0.53	0.61	---

1. At 100% travel.
 2. Restricted trim.
 3. Balanced trim.
 4. Balanced, restricted trim.

-continued-

Table 16. Design GX, Linear Valve Plug, Flow Up Through the Port (continued)

Linear - Flow Up													Linear Characteristic	
Valve Size	Port Diameter mm	Maximum Travel mm	Flow Coefficient	Valve Opening—Percent of Total Travel										F _L ⁽¹⁾
				10	20	30	40	50	60	70	80	90	100	
DN 80 (3-Inch)	70	40	C _V	11.0	25.3	41.1	56.8	66.3	75.8	87.6	99.4	103.2	107	0.89
			K _V	9.52	21.9	35.5	49.1	57.3	65.6	75.8	86.0	89.3	92.6	---
			X _T	0.62	0.65	0.65	0.61	0.60	0.62	0.67	0.71	0.75	0.79	---
			F _d	0.33	0.43	0.47	0.48	0.49	0.50	0.50	0.51	0.51	0.51	---
	70 ⁽³⁾	20	C _V	12.3	25.1	36.0	46.8	56.5	66.1	75.9	85.6	92.8	100	0.89
			K _V	10.64	21.7	31.1	40.5	48.8	57.2	65.6	74.0	80.3	86.5	---
			X _T	0.62	0.65	0.65	0.61	0.60	0.62	0.67	0.71	0.75	0.79	---
			F _d	0.11	0.17	0.23	0.28	0.32	0.38	0.43	0.48	0.53	0.59	---
	46 ⁽²⁾	20	C _V	4.04	7.78	11.8	15.9	20.1	24.6	29.8	36.3	43.3	47.4	0.89
			K _V	3.49	6.73	10.2	13.8	17.4	21.2	25.8	31.4	37.5	41.0	---
			X _T	0.96	0.83	0.79	0.69	0.70	0.71	0.74	0.80	0.66	0.41	---
			F _d	0.25	0.36	0.42	0.46	0.47	0.46	0.46	0.47	0.48	0.50	---
	36 ⁽²⁾	20	C _V	3.65	6.66	9.85	13.4	16.5	19.5	23.3	27.3	29.9	29.8	0.93
			K _V	3.15	5.76	8.52	11.6	14.3	16.9	20.2	23.6	25.9	25.7	---
			X _T	0.59	0.61	0.61	0.62	0.55	0.49	0.54	0.69	0.79	0.82	---
			F _d	0.30	0.42	0.47	0.49	0.51	0.52	0.50	0.48	0.47	0.48	---
DN 100 (4-Inch)	90	40	C _V	20.73	39.81	58.12	80.26	103	127	150	170	182	188	0.88
			K _V	17.93	34.4	50.3	69.4	88.9	110	130	147	157	163	---
			X _T	0.60	0.66	0.65	0.65	0.66	0.64	0.64	0.67	0.75	0.78	---
			F _d	0.26	0.36	0.41	0.43	0.45	0.46	0.47	0.48	0.48	0.48	---
	90 ⁽³⁾	20	C _V	15.7	30.3	44.1	54.8	72.2	87.8	106.9	126	141	153	0.88
			K _V	13.54	26.2	38.1	47.4	62.4	75.8	94.1	109	122	133	---
			X _T	0.60	0.66	0.65	0.65	0.66	0.64	0.64	0.67	0.75	0.78	---
			F _d	0.13	0.19	0.24	0.29	0.33	0.37	0.42	0.46	0.50	0.59	---
	90 ⁽⁴⁾	20	C _V	7.50	15.7	24.1	33.4	43.1	52.8	62.4	72.1	82.9	94.0	0.88
			K _V	6.48	13.6	20.8	28.9	37.3	45.7	53.9	62.4	71.7	81.3	---
			X _T	0.60	0.66	0.65	0.65	0.66	0.64	0.64	0.67	0.75	0.78	---
			F _d	0.13	0.19	0.24	0.29	0.33	0.37	0.42	0.46	0.50	0.59	---
	70 ⁽²⁾	40	C _V	11.0	25.3	41.1	56.8	66.3	75.8	87.6	99.4	103.2	107	0.89
			K _V	9.52	21.9	35.5	49.1	57.3	65.6	75.8	86.0	89.3	92.6	---
			X _T	0.62	0.65	0.65	0.61	0.60	0.62	0.67	0.71	0.75	0.79	---
			F _d	0.33	0.43	0.47	0.48	0.49	0.50	0.50	0.51	0.51	0.51	---
	46 ⁽²⁾	20	C _V	4.04	7.78	11.8	15.9	20.1	24.6	29.8	36.3	43.3	47.4	0.89
			K _V	3.49	6.73	10.2	13.8	17.4	21.2	25.8	31.4	37.5	41.0	---
			X _T	0.96	0.83	0.79	0.69	0.70	0.71	0.74	0.80	0.66	0.41	---
			F _d	0.25	0.36	0.42	0.46	0.47	0.46	0.46	0.47	0.48	0.50	---

1. At 100% travel.
2. Restricted trim.
3. Balanced trim.
4. Balanced, restricted trim.

GX Control Valve and Actuator

Table 17. Design GX, Micro-Flow™ Valve Plug

Micro-Flow Linear - Flow Up														Linear Characteristic	
Valve Size, Inches	Port Diameter mm	Maximum Travel mm	Angle of Flat	Flow Coefficient	Valve Opening—Percent of Total Travel										F _L ⁽¹⁾
					10	20	30	40	50	60	70	80	90	100	
DN 25 (1-Inch)	4.8	19	1°8'	C _v	0.00365	0.00546	0.00845	0.0121	0.0163	0.0205	0.0246	0.0284	0.0326	0.0389	0.97
				K _v	0.00316	0.00472	0.00731	0.0105	0.0141	0.0177	0.0213	0.0246	0.0282	0.0337	---
				X _T	0.998	0.936	0.813	0.759	0.694	0.638	0.596	0.587	0.595	0.582	---
				F _d	0.050	0.055	0.060	0.066	0.073	0.079	0.086	0.092	0.10	0.11	---
			2°15'	C _v	0.0437	0.0512	0.0597	0.0694	0.0806	0.0929	0.105	0.116	0.126	0.139	0.86
				K _v	0.0378	0.0443	0.0516	0.0600	0.0697	0.0804	0.0908	0.100	0.109	0.120	---
				X _T	0.543	0.536	0.537	0.541	0.538	0.534	0.541	0.556	0.572	0.561	---
				F _d	0.076	0.084	0.094	0.11	0.12	0.13	0.14	0.15	0.16	0.17	---
			4°39'	C _v	0.0356	0.0524	0.0736	0.0984	0.127	0.158	0.191	0.224	0.257	0.294	0.93
				K _v	0.0308	0.0453	0.0637	0.0851	0.110	0.137	0.165	0.194	0.222	0.254	---
				X _T	0.550	0.539	0.570	0.580	0.566	0.553	0.546	0.558	0.572	0.554	---
				F _d	0.080	0.10	0.13	0.15	0.17	0.19	0.22	0.24	0.26	0.28	---

1. At 100% travel.

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