



TECHNICAL BULLETIN

Durco® SleeveLine® Valves

For Alkylation Service

FCD DVENTB0025-01-AQ 08/15

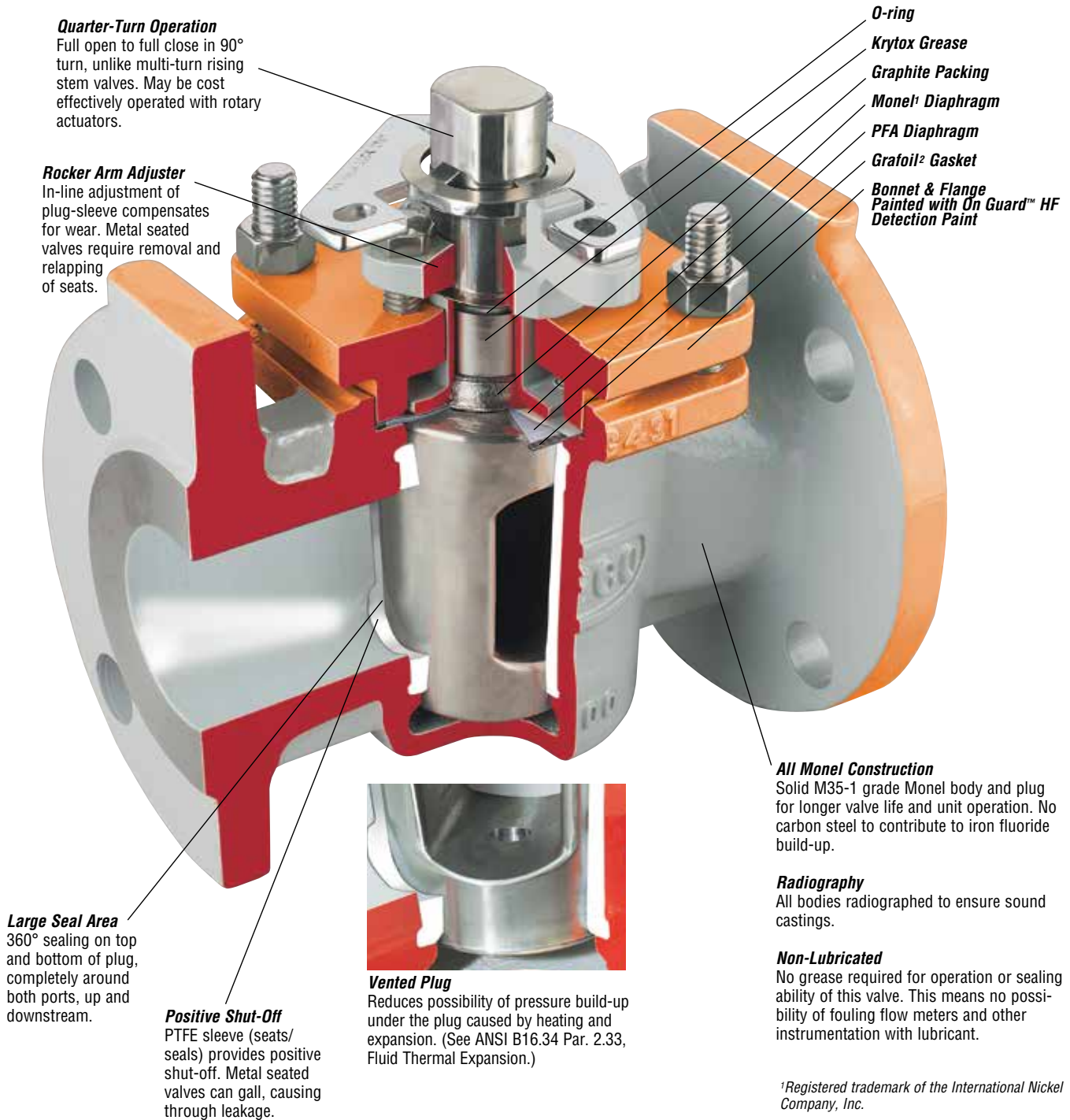


Quality
System
Certificate

Experience In Motion

Durco G4Z-HF Alkylation Valves

Phillips Licensing Listed and UOP Process Division Approved, Flowserve's Flow Control Division has provided thousands of Durco HF Alkylation valves to refineries throughout the world. They are a best choice where drop-tight shutoff is an absolute requirement.



Quarter-Turn Operation

Full open to full close in 90° turn, unlike multi-turn rising stem valves. May be cost effectively operated with rotary actuators.

Rocker Arm Adjuster

In-line adjustment of plug-sleeve compensates for wear. Metal seated valves require removal and relapping of seats.

O-ring

Krytox Grease

Graphite Packing

Monel¹ Diaphragm

PFA Diaphragm

Grafoil² Gasket

Bonnet & Flange Painted with On Guard™ HF Detection Paint

Large Seal Area

360° sealing on top and bottom of plug, completely around both ports, up and downstream.

Positive Shut-Off

PTFE sleeve (seats/seals) provides positive shut-off. Metal seated valves can gall, causing through leakage.



Vented Plug

Reduces possibility of pressure build-up under the plug caused by heating and expansion. (See ANSI B16.34 Par. 2.33, Fluid Thermal Expansion.)

All Monel Construction

Solid M35-1 grade Monel body and plug for longer valve life and unit operation. No carbon steel to contribute to iron fluoride build-up.

Radiography

All bodies radiographed to ensure sound castings.

Non-Lubricated

No grease required for operation or sealing ability of this valve. This means no possibility of fouling flow meters and other instrumentation with lubricant.

¹Registered trademark of the International Nickel Company, Inc.

²Registered trademark of Union Carbide



G4BZ-HF Marathon™

High cycle/low emission valve offers an extra measure of positive stem sealing reliability. See pages 4 and 5.

Special End Connections

In addition to ANSI and DIN flanged designs, Durco HF alkylation valves are available with screwed end connections. See page 6.



EG4Z-HF Control Valves

Characterized plug available for modulating applications. See page 5.

Durco G4Z-HF valves are refinery proven and recommended for:

- HF Alkylation
- H₂SO₄ Alkylation
- Caustic & Salt Slurries
- Light Ends
- Flare Gas
- Fuel Oil
- Propane/Butane
- Gasoline
- Jet Fuel
- Heavy Sour Crude
- Utilities

Durco G4Z-HF Alkylation Valves are available in the following sizes and end configurations:

<i>G4Z32-HF: 300 lb Screwed End</i>
1/2 in (15 mm)
3/4 in (20 mm)
1 in (25 mm)
1-1/2 in (40 mm)
2 in (50 mm)
<i>G4Z31-HF: 300 lb Flanged End</i>
1/2 in (15 mm)
3/4 in (20 mm)
1 in (25 mm)
1-1/2 in (40 mm)
2 in (50 mm)
3 in (80 mm)
4 in (100 mm)
6 in (150 mm)
8 in (200 mm)
10 in (250 mm)
12 in (300 mm)
14 in (350 mm)
16 in (405 mm)
18 in (455 mm)
<i>G4Z61-HF: 300 lb (Class 600 lb Flanges And Face-To-Face)</i>
2 in (50 mm)
<i>G4Z35-HF: 300 lb Screwed/Socket End</i>
1/2 in (15 mm)
3/4 in (20 mm)
1 in (25 mm)
1-1/2 in (40 mm)
2 in (50 mm)

Durco G4BZ-HF Marathon™ Valves

The G4BZ-HF Marathon Valve can be used with confidence in applications where tight shutoff and emissions containment are priority requirements. Its very design also assures long-lived, high cycle performance.

Durco G4BZ-HF Alkylation Valves are available in the following sizes and end configurations:

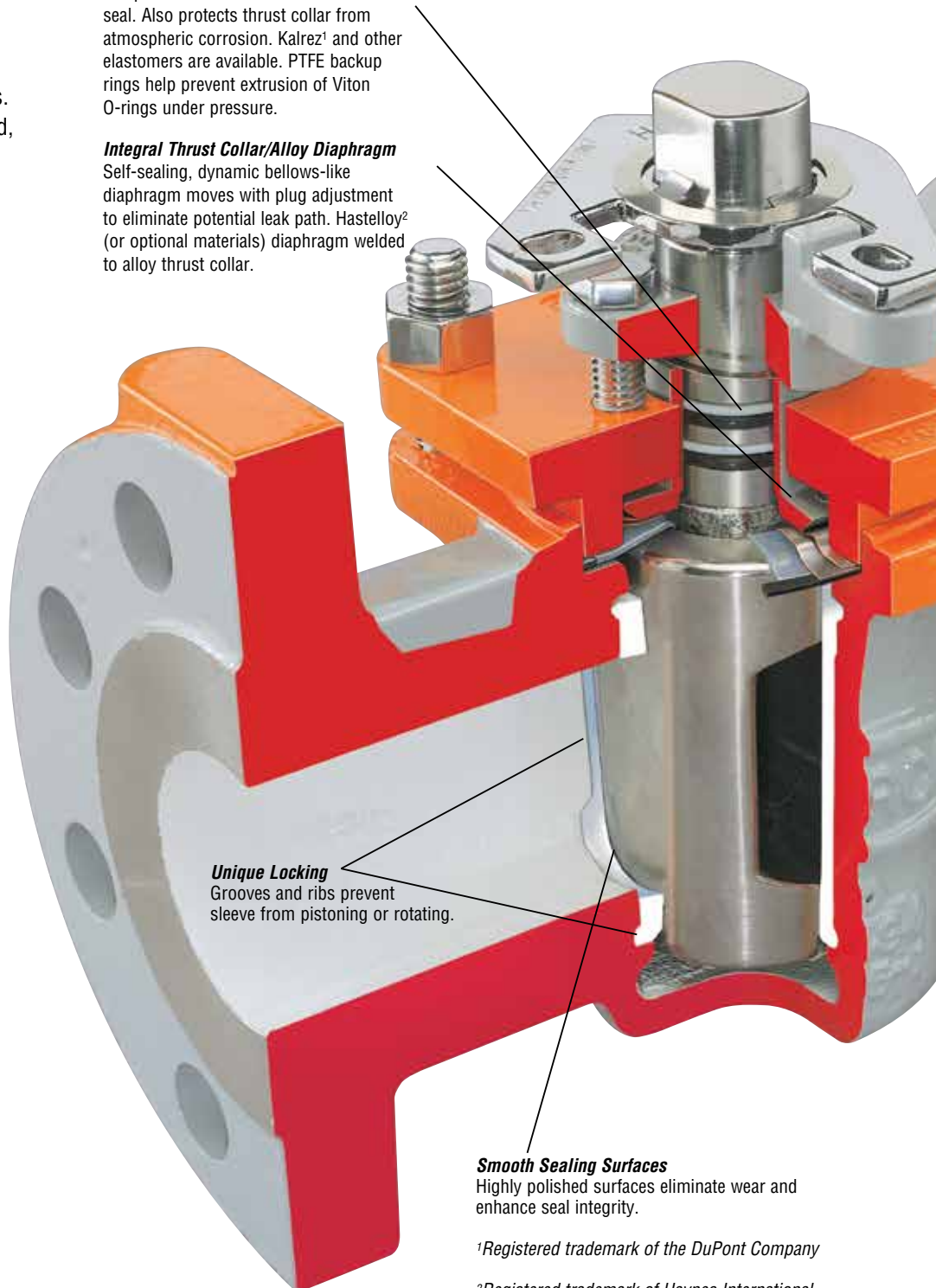
<i>G4BZ32-HF: 300 lb Screwed End</i>	
1/2 in (15 mm)	
3/4 in (20 mm)	
1 in (25 mm)	
1-1/2 in (40 mm)	
2 in (50 mm)	
<i>G4BZ31-HF: 300 lb Flanged End</i>	
1/2 in (15 mm)	
3/4 in (20 mm)	
1 in (25 mm)	
1-1/2 in (40 mm)	
2 in (50 mm)	
3 in (80 mm)	
4 in (100 mm)	
6 in (150 mm)	
8 in (200 mm)	

Viton¹ O-rings

Full pressure containment stem seal. Also protects thrust collar from atmospheric corrosion. Kalrez¹ and other elastomers are available. PTFE backup rings help prevent extrusion of Viton O-rings under pressure.

Integral Thrust Collar/Alloy Diaphragm

Self-sealing, dynamic bellows-like diaphragm moves with plug adjustment to eliminate potential leak path. Hastelloy² (or optional materials) diaphragm welded to alloy thrust collar.



Unique Locking
Grooves and ribs prevent sleeve from pistoning or rotating.

Smooth Sealing Surfaces
Highly polished surfaces eliminate wear and enhance seal integrity.

¹Registered trademark of the DuPont Company

²Registered trademark of Haynes International



Unique Stem Sealing Design

A pair of Viton O-rings prevents stem leakage while containing line pressure. Fugitive emission containment is often equal to more expensive severe or toxic service valves.

Positive Stem Sealing Assurance

- Graphite Packing
- Integral Thrust Collar/
- Alloy Diaphragm
- Monel Diaphragm
- PFA Diaphragm
- Grafoil Gasket

3-Year Performance Guarantee

If the G4BZ-HF Marathon stem seal fails within three years after installation, it will be repaired or replaced free-of-charge.

Durco Alkylation Valves may be fitted with V-port plugs for precise modulating control services.

Durco V-Port Control Valves

Durco EG4Z V-port control valves are available in a variety of trim configurations to satisfy your exact flow control needs. Specially trimmed EG4 V-port SoundTrim® control valves reduce noise, cavitation and flashing while improving flow and pressure performance. Unique self-cleaning design prevents particulate build-up and clogging.

Characterized V-port HF-Alkylation control valves are available as follows:

- G4Z-1/2 in (15 mm) through 6 in (150 mm)
- G4BZ-1/2 in (15 mm) through 6 in (150 mm)

C_v values of 3.0 to 400 with full open port



Technical Data: Durco G4Z-HF Alkylation Valves Phillips Listed

Dimensions And Flow Rates									
	Size		Face to Face		Weight		Port Area		C _v
	in	(mm)	in	(mm)	lbs	(kg)	sq in	(sq cm)	—
G4Z32	1/2	(15)	3 1/2	(89)	3 3/4	(1.7)	.248	(1.59)	7.4
G4Z32	3/4	(20)	3 1/2	(89)	3 1/2	(1.6)	.248	(1.59)	19.6
G4Z32	1	(25)	4 5/8	(117)	7	(3.2)	.785	(5.1)	48.8
G4Z31	2	(50)	8 1/2	(216)	29 1/2	(13.3)	2.0	(13.0)	153.4
G4Z31	3	(80)	11 1/8	(283)	69	(31.0)	4.6	(30.0)	322
G4Z31	4	(100)	12	(305)	164 1/2	(74.0)	7.4	(48.0)	555
G4Z31	6	(150)	15 7/8	(403)	231 1/2	(104.2)	16.1	(104.0)	955
G4Z31	8	(200)	16 1/2	(419)	328	(147.6)	27.7	(179.0)	1859
G4Z31	10	(250)	18	(457)	455	(204.8)	44.6	(288.0)	2361
G4Z31	12	(300)	19 3/4	(502)	736	(331.2)	57.8	(373.0)	3400 ¹
G4Z31	14	(350)	30	(762)	916	(412.2)	57.8	(373.0)	3430 ¹
G4Z31	16	(405)	33	(838)	2097	(951.2)	121.0	(784.8)	7000 ¹
G4Z31	18	(455)	36	(914)	2183	(990.2)	121.0	(784.8)	7000 ¹
G4Z61	2	(50)	11 1/2	(292)			2.0	(13.0)	

*For complete dimensional information refer to Durco Bulletin V-24

¹Calculated Value

Phillips Licensing Listed Order By These Drawing Numbers		
Size	Valve Number	Drawing Number*
0.50 inch	G4Z32-HF.50	CY77644A
0.75 inch	G4Z32-HF.75	CY77643A
1 inch	G4Z32HF-1	CY77646A
2 inch	G4Z31HFB-2	DY77648A
3 inch	G4Z31HFB-3	DY78272A
4 inch	G4Z31HFA-4	DY78273A
6 inch	G4Z31HFA-6	DY78274A
8 inch	G4Z31HFA-8	DY78275A
10 inch	G4Z31HFA-10	DY78276A
12 inch	G4Z31HF-12	DY78277A
14 inch	G4Z31HF-14	DY79037A
16 inch	G4Z31HF-16	DY82071A
18 inch	G4Z31HF-18	DY82072A
2 inch	G4Z61HF (Class 600# Flanges and face-to-face)	DY81807A

*Refer to Phillips licensing for current revision number

Applicable Standards	
ANSI B16.10	Face-to-face dimension
ANSI B16.34	Steel valves, flanged & butt weld
ANSI B16.5	Flange & flange fitting
ANSI B1.20.1	Screwed ends
API 607	Fire safe valve testing
API 598	Valve inspection & test
M.S.S. SP-54	Radiographic
M.S.S. SP-55	Visual quality
M.S.S. SP-61	Hydrostatic testing

Durco G4Z-HF Alkylation Valves UOP Listed

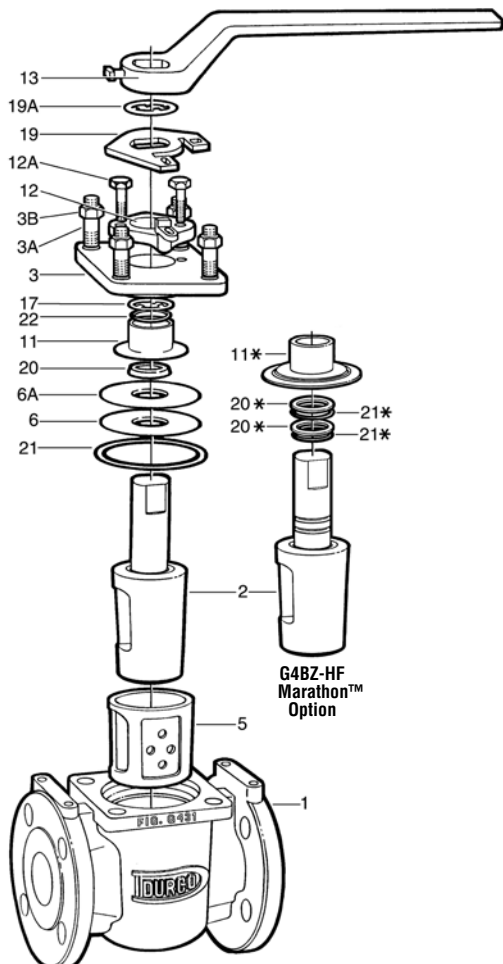
Dimensions And Flow Rates									
	Size		Face to Face		Weight		Port Area		C _v
	in	(mm)	in	(mm)	lbs	(kg)	sq in	(sq cm)	—
G4Z31	1/2	(15)	5 1/2	(140)	7 3/4	(3.5)	.248	(1.59)	7.4
G4Z31	3/4	(20)	6	(152)	10	(4.5)	.248	(1.59)	19.6
G4Z31	1	(25)	6 1/2	(165)	17 3/4	(7.8)	.785	(5.1)	48.8
G4Z31	1 1/2	(40)	7 1/2	(190)	26	(11.7)	1.21	(7.8)	83.5
G4Z31	2	(50)	8 1/2	(216)	29 1/2	(13.3)	2.0	(13.0)	153.4
G4Z31	3	(80)	11 1/8	(283)	69	(31.0)	4.6	(30.0)	322
G4Z31	4	(100)	12	(305)	164 1/2	(74.0)	7.4	(48.0)	555
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G4Z31	12	(300)	19 3/4	(502)	736	(331.2)	57.8	(373.0)	3400 ¹
G4Z31	14	(350)	30	(762)	916	(412.2)	57.8	(373.0)	3430 ¹
G4Z31	16	(405)	33	(838)	2097	(951.2)	121.0	(784.8)	7000 ¹
G4Z31	18	(455)	36	(914)	2183	(990.2)	121.0	(784.8)	7000 ¹

UOP Listed – Order By These Drawing Numbers and Valve Size for Pipe Class HF2		
Size	Valve Number	Drawing Number*
1/2 inch	G4Z31-HF	CY82500A
3/4 inch	G4Z31-HF	CY82500A
1 inch	G4Z31-HF	CY82500A
1 1/2 inch	G4Z31-HF	CY82500A
2 inch	G4Z31-HF	CY82500A
3 inch	G4Z31-HF	CY82500A
4 inch	G4Z31-HF	CY82500A
6 inch	G4Z31-HF	CY82500A
8 inch	G4Z31-HF	CY82500A
10 inch	G4Z31-HF	CY82500A
12 inch	G4Z31-HF	CY82500A
14 inch	G4Z31-HF	CY82500A
16 inch	G4Z31-HF	CY82500A
18 inch	G4Z31-HF	CY82500A

*For complete dimensional information refer to Durco Bulletin V-24

¹Calculated Value

*Refer to UOP licensing for current revision number



Materials of Construction				
1	Body	ASTM Grade	A494 M35-1	Monel®
2	Plug	ASTM Grade	A494 M35-1	Monel®
3	Top Cap	ASTM Grade	A744 CD-4MCu	
3A	Top Cap Studs		B7M	
3B	Top Cap Nuts		7M	
5	Sleeve		PTFE	
6	Diaphragm		PFA	
6A	Diaphragm		Monel® 400	
21A	O-ring*		Viton (Kalrez opt.)	
11A	Integral Thrust* Collar/ Diaphragm		CD-4MCu/ Hastelloy	
11	Thrust Collar	ASTM Grade	A744 CD-4MCu	
12	Adjuster	ASTM Grade	A744 CD-4MCu	
12A	Adjuster Bolts		B7M	
17	Grounding Spring		302 S.S.	
19	Stop Collar		CAD Plated Steel	
19A	Stop Collar Retainer		302 S.S.	
20	Packing		Graphite	
21	Gasket		Graphite	
22	O-ring			
20A	Back-up Ring*		PTFE	

*G4BZ-HF only



Additional Durco G4Z-HF Valves* and Accessories

Durco G4Z3-HFT Try-Cock

This sampling valve consists of a 3/4 in (20 mm) valve with screwed end connections. The plug utilizes a characterized or V-port with a C_v of 3.8. The valve is built and tested in accordance with the same specifications and procedures as our standard HF valves.



Special HF Alkylation Valves

Upon request, Flowserve can provide special valves, such as 3-way (transflow) mixing valves, relief valve isolation valves, and either fire sealed or metal seated Big Max® high performance butterfly valves.



Actuation

Flowserve's Automax® operation is a specialist in valve automation systems offering rack and pinion, heavy-duty and electric actuators along with positioners, limit switches, engineered special control circuits and related accessories.

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