

# Fisher™ Digital Isolation™ Solutions Selection Guide



Fisher Digital Isolation Solutions are fully engineered intelligent solutions with comprehensive product support and lifecycle services for critical safety and ESD valve assets leveraging Emerson's automation expertise with time-tested products.

The following products make up the core of the Digital Isolation offering. The purpose of this bulletin is to provide the necessary technical information of the individual components to help with selection of the optimal solution.

## Fisher 30,000 - Triple Offset Valve (TOV)

Figure 1. Fisher 30,000 Triple Offset Valve, G Series Actuator and FIELDVUE™ DVC6200 SIS Digital Valve Controller with 775 THUM Adapter



Features	
Torque assisted elastic metal seal provides zero leakage performance, ensures continuous bi-directional, zero leakage performance	
Stellite® hardfaced standard integral seat results in broader applications, longer valve life and less maintenance	
Single-piece cast body, with F-F dimensions in accordance to ISO 5752, ANSI B16.10 and API 609	
All metal construction and sealing and zero leakage performance translate into an inherently firesafe valve	
Long-length hardened bearings, incorporating a standard reinforced, die-formed, flexible graphite bearing protector ensure additional reliability	
Internally and externally retained, three times blowout proof stem is safer to operate and provides complete compliance with API 609	
Integral position indicators on the stem and the top mounting flange ensure positive disk position indication	
Applications	
Oil and Gas Processing, Offshore Platforms, Refineries	
Hydrocarbon Storage and Transportation. Liquid Natural Gas (LNG) Storage and Transportation	
Steam (Saturated and Superheated), Hydrocarbons, Hydrogen, Oxygen	
Cryogenic Fluids, Hot Gases, Sulfur, Chlorinated solvents, Flare Gas	
Specifications	
Body Style: Double Flanged (ISO 5752), Lugged (API 609)	
Pressure Class/Size	
CL150, CL300: 3"-24"	
EN PN10-16-40: (80mm - 600mm)	
Referenced Standards	
Design standards: ANSI B16.34, API 609, EN 12516-1	
Flange Drilling: ANSI B16.5, DIN PN16-25-40	
Face-to-Face: Double Flanged - ISO 5752, Lugged - API 609	
Fire Safety Test: API 607, ISO 10497	
Pressure, Temperature and Shutoff Capability	
Maximum Inlet Pressures: Full class rating per ASME B16.34/EN 1092-1	
Temperature Range:	
CF8M/1.4408: -46°C to 427°C (-50°F to 800°F)	
WCC/1.0619: -28°C to 427°C (-20°F to 800°F)	
Shutoff Class: Leakage in accordance with ISO 5208/EN 12516-1 (leakage rate A) and API 598 (resilient seated valves)	

## Fisher 30,000 - Triple Offset Valve (TOV) (continued)

Standard Materials of Construction				
Size Range	NPS3-24		DN80-600	
Pressure Class	CL150, CL300		PN16, PN25, PN40	
Body	WCC	CF8M	EN 10213-2 1.0619	EN 10213-4 1.4408
Disk	WCC	CF8M	EN 10213-2 1.0619	EN 10213-4 1.4408
Shaft	S41000	S20910	S41000	S20910
Packing	Graphite	Graphite	Graphite	Graphite
Seal Ring	S31803 + Graphite or S17400 Hard Faced	S31803 + Graphite or S20910 Hard Faced	S31803 + Graphite or S17400 Hard Faced	S31803 + Graphite or S20910 Hard Faced
Bearings	S31600 hard faced			

## Actuation

Figure 2. Fisher Scotch Yoke Type Actuator for Mounting to Fisher Rotary Valves



Fisher CBB	Fisher CBA-300	Fisher G
<b>Style</b>		
Double-acting or spring-return pneumatic piston	Double-acting or spring-return pneumatic piston	Double-acting or spring-return series single power
<b>Size Range</b>		
315-725	730 to 1030	G01 to G8
<b>Torque Range</b>		
Double Acting: 673 in • lb to 12,992 in • lb	Double Acting: 7,388 in • lb to 20,377 in • lb	Double Acting: 7,765 in • lb to 1,424,420 in • lb
Spring Return: 194 in • lb to 4,972 in • lb (spring end)	Spring Return: 2,532 in • lb to 10,457 in • lb (spring end)	Spring Return: 9,626 in • lb to 499,438 in • lb (spring end)
<b>Temperature Range</b>		
Standard: -29°C to +93°C (-20°F to +200°F)	Standard: -29°C to +93°C (-20°F to +200°F)	Standard: -29°C to +93°C (-20°F to +200°F)
Optional High Temp: -18°C to +177°C (0°F to +350°F)	Optional High Temp: -18°C to +177°C (0°F to +350°F)	Optional High Temp: -18°C to +177°C (0°F to +350°F)
Optional Low Temp: -40°C to +66°C (-40°F to +150°F)	Optional Low Temp: -40°C to +66°C (-40°F to +150°F)	Optional Low Temp: -40°C to +66°C (40°F to +150°F)
<b>Manual Override Options</b>		
M3 Jack Screw	M3 Jack Screw, M11 Hydraulic Override	M3 Jack Screw, M11 Hydraulic Override
<b>Safety Integrity Level</b>		
SIL 3 Capable	SIL 3 Capable	SIL 3 Capable

## Digital Valve Controllers

Figure 3. FIELDVUE Digital Valve Controllers



DVC6200	DVC6200f	DVC6200f PST	DVC6200 SIS
<b>Construction</b>			
Aluminum or Stainless Steel			
<b>Temperature Limits</b>			
-40 to 85°C (-40 to 185°F)			-52 to 85°C (-62 to 185°F)
<b>Communication</b>			
4 - 20 mA with HART 5 or 7 Communications	Foundation Fieldbus Communication	Foundation Fieldbus Communication	4 - 20 mA with HART 5 or 7 Communications
<b>Feedback</b>			
Linkageless, Non-Contact			
<b>Enclosure Rating</b>			
See Bulletin 62.1:DVC6200 <a href="#">D103415X012</a>	See Bulletin 62.1:DVC6200f <a href="#">D103399X012</a>	See Bulletin 62.1:DVC6200f PST <a href="#">D104160X012</a>	See Bulletin 62.1:DVC6200 SIS <a href="#">D103555X012</a>
<b>Diagnostics</b>			
AC, HC, AD, PD	FD, AD, PD	PST, FST	PST, FST, Spurious Trip Protection, Solenoid Health monitoring
<b>Safety Integrity Level</b>			
NA	NA	NA	SIL3 Capable

## Boosters, Regulators and Filters

Figure 4. Volume Boosters



X0648



W4727



X0206

VBL		2625		SS-263	
<b>Material of Construction</b>					
Aluminum		Aluminum or 316 SST		Aluminum or 316 SST	
<b>Cv</b>					
Supply: 2.5	Exhaust Port: 1.1 to 1.8	Supply: 3.74 to 4.98	Exhaust: 0.23 to 3.40	Supply: 9.5	Exhaust: 9.5
<b>Temperature Limits</b>					
-40 to 93°C (-40 to 200°F)		Standard: -40 to 71°C (-40 to 160°F) High Temperature: 0 to 121°C (32 to 250°F)		-40 to 71°C (40 to 160°F)	
<b>Maximum Input Signal Pressure</b>					
VBL-1 and VBL-3: 5.5 bar (80 psig) VBL-2 and VBL-4: 10.3 bar (150 psig)		10.3 bar (150 psig)		10.3 bar (150 psig)	
<b>Connections</b>					
Input: 1/4 NPT Supply and Output: 1/2 NPT		Input Signal: 1/4 NPT Supply and Output: 3/4 NPT		Input Signal: 1/4 NPT Supply: 1 NPT Output: 1 NPT or 1-1/4 NPT	
<b>Safety Integrity Level</b>					
SIL 3 Capable		SIL 3 Capable		SIL 3 Capable	
<b>Additional Information</b>					
Bulletin 62.3:VBL <a href="#">D103393X012</a>		Bulletin 62.3:2625 <a href="#">D200071X012</a>		Bulletin 62.3:SS-263 <a href="#">D103592X012</a>	

## Boosters, Regulators and Filters (continued)

Figure 5. Regulators



67CFR	67DFR	MR95H
<b>Material of Construction</b>		
Aluminum, Stainless Steel	Aluminum, Stainless Steel	Cast Iron, Steel, Stainless Steel
<b>Cv</b>		
0.36	1.33	0.8 to 12.5
<b>Maximum Inlet Pressure</b>		
17.2 bar (250 psig)	17.2 bar (250 psig)	17.2 bar (250 psig)
<b>Outlet Pressure range</b>		
15 to 150 psig	20 to 150 psig	5 to 150 psig
<b>Temperature Limits*</b>		
-29 to 82°C (-20 to 180°F)	-29 to 82°C (-20 to 180°F)	-29 to 82°C (-20 to 180°F)
<b>Connections</b>		
1/4 NPT	1/2 NPT	1/4 NPT to 2 NPT
<b>Filter</b>		
5 micron	5 micron	None
<b>Additional Information</b>		
Bulletin 71.1:67C <a href="#">D102656X012</a>	Bulletin 71.1:67D <a href="#">D103152X012</a>	Bulletin 71.1 <a href="#">D103742X012</a>
* Nitrile Diaphragm		

## Boosters, Regulators and Filters (continued)

Figure 6. Filters



X0648

262K	Headline 365A, 25-64-70C	Headline 383, 38-152-70C
<b>Material of Construction</b>		
Cast Iron, Stainless Steel	Aluminum	Aluminum
<b>Cv/Flow Rate</b>		
3.96	58 SCFM @ 150 psig	167 SCFM @ 150 psig
<b>Maximum Inlet Pressure</b>		
28 bar at 65°C (400 psig at 150°F)	150 psig	150 psig
<b>Temperature Limits</b>		
-28 to 208°C (-20 to 406°F)	49°C (120°F)	49°C (120°F)
<b>Connections</b>		
3/4 NPT	3/4 NPT	1 NPT
<b>Filter</b>		
40 microns	0.1 microns	0.1 microns
<b>Additional Information</b>		
Bulletin 90.1:262K <a href="#">D100205X012</a>	---	---



## Trip and Switching Valves

Figure 7. Trip Valves



W4292-1

377 Trip Valve	167D 2 Way Switching Valve	167DA 3 Way Switching Valve
<b>Material of Construction</b>		
Aluminum or Stainless Steel	Aluminum or Stainless Steel	
<b>Uses</b>		
With Piston actuators: Fail Up, Fail Down or Lock-in-Last on loss of supply pressure	Initiate safety function upon loss of supply pressure	
<b>Cv</b>		
0.5 to 0.6	0.96 to 1.81	
<b>Supply Pressure</b>		
3.8 bar (55 psig) to 10.3 bar (150 psig)	27.6 bar (400 psig)	8.6 bar (125 psig)
<b>Outlet Pressure</b>		
Normal Operation: Pressure from control device Fail-Up or Fail-Down Mode: Maximum volume tank pressure Lock-In-Last-Position: Respective cylinder pressure	0.21 to 10.3 bar (3 to 150 psig)	0.97 to 8.6 bar (14 to 125 psig)
<b>Trip Point</b>		
Minimum of 2.8 bar (40 psig) to a maximum of 72 percent of supply pressure	14 psig to 90 psig	
<b>Temperature Limits*</b>		
-40 to 82°C (-40 to 180°F)*	-29 to 82°C (-20 to 180°F)	
<b>Connection</b>		
1/4 NPT	1/4 NPT or 1/2 NPT	
<b>Safety Integrity Level</b>		
SIL 3 Capable	NA	
<b>Additional Information</b>		
Bulletin 62.3:377 <a href="#">D200318X012</a>	Bulletin 71.7:167D <a href="#">D103235X012</a>	
* Nitrile Diaphragm		

# Solenoid

Figure 8. ASCO™ Solenoids



8327	8316	8362
<b>Certification</b>		
ATEX / IEC Ex,UL/CSA Approved	ATEX / IEC Ex,UL/CSA Approved	ATEX / IEC Ex,UL/CSA Approved
<b>Port Size</b>		
1/4 NPT	1/4 , 3/8, 1/2 NPT	1/4 , 3/8, 1/2 , 3/4, 1 NPT
<b>Style (ports/positions)</b>		
3/2	3/2*	3/2*
<b>Valve type</b>		
Poppet	Poppet	Spool
<b>Cv range</b>		
0.49/0.56	1.5, 1.8, 4	2, 4, 4.8, 5, 5.6, 13, 15.5
<b>Body Material</b>		
Brass or 316 SST	Brass or 316 SST	Brass or 316 SST
<b>Mounting</b>		
Hard Piped	Hard Piped	Hard Piped
<b>Operation</b>		
Universal	Normally closed	Normally Closed
<b>No. Coils</b>		
Single	Single	Single
<b>Voltage</b>		
120/60 VAC or 24 VDC	120/60 VAC or 24 VDC	120/60 VAC or 24 VDC
<b>Power</b>		
12.0W / 11.6W	1.4W / 10.1W / 11.6W	1.4W / 10.1W
<b>Temperature range</b>		
-40 to 131 °F	-20 to 140 °F	-40 to 140 °F
<b>Direct/Pilot</b>		
Direct Acting	Pilot Operated	Internal Pilot Operated
<b>Safety Integrity Level</b>		
SIL 3 Capable	SIL 3 Capable	SIL 3 Capable
*Others available upon request		

## DXP

Figure 9. TopWorx™ Discrete Valve Controller



D-ESD	DXP-Controller	DXP-L2 Switchbox
<b>Enclosure</b>		
Tropicalized Aluminum, SST or Resin	Tropicalized Aluminum	Tropicalized Aluminum
<b>Enclosure Rating</b>		
Explosion Proof, Cl I Div 1, Grps C-D; Cl I Div 2, Grps A-D; Type 4X; T4 -50°C ≤ Ta ≤ 60°C	Explosion Proof, Class 1 Div 1 Groups C,D Class 1 Div 2 Groups A,B,C,D	Explosion Proof, Class 1 Div 1 Groups C,D Class 1 Div 2 Groups A,B,C,D
Ex d IIB + H <sub>2</sub> T6/T5/T4/T3 Gb; -50°C ≤ Ta ≤ 60°C/75°C/110°C/175°C	ATEX/IECx Zone 1 II2G,II2GD T6/T4/T3	ATEX/IECx Zone 1 II2G,II2GD T6/T4/T3
IP66	Ex d IIB + H2, Ex tb IIIC IP66/67	Ex d IIB + H2, Ex tb IIIC IP66/67
<b>Communication</b>		
Discrete	FOUNDATION Fieldbus, DeviceNet, AS-Interface, Profibus, HART protocols	HART optional with transmitter
<b>Switches (Number and Type)</b>		
(2) SPDT Reed Switches for ESD Module (1) SPDT GO Switch for PST	(2) GO Switches, SPDT hermetic seal (2) "L" GO Switches, SPDT hermetic seal* *Standard for DeviceNet, Profibus and AS-I; optional for HART and Foundation Fieldbus	(2) GO Switches, SPDT hermetic seal or (2) GO Switches, DPDT hermetic seal (2) "L" GO switches option
<b>Analog Output</b>		
NA	NA	optional 4-20mA transmitter (HART option)
<b>Visual Display</b>		
90 degree , Green/Open, Red/Close	90 degree , Green/Open, Red/Close	90 degree , Green/Open, Red/Close
<b>Conduit Connection</b>		
(2) 3/4 NPT	(2) 3/4 NPT	(2) 3/4 NPT
<b>Temperature Range</b>		
-40 to +80°C	-60 to 105°C (-75 to 221°F)	-60 to 105°C (-75 to 221°) -40 to 80°C (-40 to 176°F) w/transmitter
<b>Pilot</b>		
(1) 24VDC pilot, Fail Open/Closed (1) 110VAC pilot, Fail Open/Closed	(1) 24 VDC pilot, fail open/closed 0.5 W (non-I.S.)	NA
<b>Spool Valve</b>		
Aluminum Hard coat anodized (IP65) or SST	Aluminum Hard coat anodized (IP65)	NA
<b>Spool Valve Cv</b>		
1.2 Cv (1/4 NPT Ports) or 3.0 Cv (1/2 NPT Ports)	0.86 Cv (1/4 NPT Ports) or 3.7 Cv (1/2 NPT Ports)	NA
<b>Safety Integrity Level</b>		
SIL 3 Capable	SIL 2 Capable	SIL 2 Capable

## Factory Acceptance Testing

Factory Acceptance Testing (FAT) is available in three classes to allow for customer selection to meet needs for a variety of applications for safety applications. Every Fisher Digital Isolation Solution assembly is subjected to product and performance testing in the factory prior to shipment.

- Class A** Assemblies will meet all functional performance and tests offered. This level should be selected only when superior performance is required in both valve stroking directions, or if an additional test is required
- Class B** Offers the optimum level of functional performance testing and documentation for a SIS or ESD application. This includes the basic functional requirement testing as well as proper setup of partial stroke testing (PST) with signature series documentation.
- Class C** Provides the most basic level of functional requirement testing, as listed in table 1. This includes valve stroke time under trip and supply droop. Hydrostatic and seat leak certificates for the valve will be provided.

**Table 1. Factory Acceptance Testing Requirements**

Requirement	Requirement Description	Class A	Class B	Class C
1	Stroking Time Open Under Command Signal	x		
2	Stroking Time Closed Under Command Signal	x		
3	Valve Stroke Time Under Trip	x	x	x
4	Supply Droop	x	x	x
5	Partial Stroke Test	x	x	
6	Solenoid Valve Health Monitoring/Test	x		
7	Witness Factory Hydrostatic Test	x		
8	Witness Factory Seat Leak Test	x		
9	Double Block and Bleed Seat Leak Test	x		
10	Factory Hydrostatic Test	x	x	x
11	Factory Seat Leak Test	x	x	x
12	Signature Series Documentation	x	x	

### Testing Definitions

**Stroking Time Under Command Signal:** Time for full stroke under instrument signal

**Valve Stroke Time Under Trip:** Time to reach desired position under a simulated trip condition

**Supply Droop:** Test to verify proper air supply flow rates

**Partial Stroke Test:** Diagnostic test to ensure valve operation and track wear

**Solenoid Valve Health Monitoring/Test:** Diagnostic test to ensure solenoid valve operation

**Hydrostatic Test:** Test to ensure valve shell integrity

**Seat Leak Test:** Test to measure leakage in the closed position

**Double Block and Bleed Seat Leak Test:** Test to ensure sealing capability against pressure for valves with multiple internal seats

**Signature Series Documentation:** Factory birth certificate of assembly performance to allow comparison with future valve signatures

## Hookups

Hookup drawings for pneumatic and electrical accessories are available for the following standard configurations. Others are available upon request.

Option	Accessories Included*
1	Fisher Regulator/Filter + Fisher DVC6200 SIS Digital Valve Controller
2	Fisher Regulator/Filter + Fisher DVC6200 SIS Digital Valve Controller + ASCO Solenoid Valve
3	Fisher Regulator/Filter + Fisher DVC6200 SIS Digital Valve Controller + Fisher Volume Booster
4	Fisher Regulator/Filter + ASCO Solenoid Valve
5	Fisher Regulator/Filter + TopWorx DXP/D-ESD
6	Fisher Regulator/Filter + ASCO Solenoid Valve + TopWorx DXP Switchbox or D-ESD
7	Fisher Regulator/Filter + Fisher DVC6200 SIS Digital Valve Controller + ASCO Solenoid Valve + Fisher Volume Booster (SIS)





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