

EXPLOSION ISOLATION, DUAL-FLAP ISOLATION (DFI™) VALVE

The DFI valve's operation is passive (flow actuated), meaning that no external energy is required to close the valve flaps when a deflagration occurs. When the process air is flowing during regular operation, the air pulls or pushes the valve flaps open, allowing air to flow from the process to the protected equipment. If a deflagration occurs in the protected equipment, the explosion pressure created causes the process air to reverse flow, closing the valve flaps, and preventing the deflagration flame front from proceeding upstream past the valve.

The DFI valve is designed in accordance with the requirements of NFPA 69 and EN 16447. The primary valve components include a heavy-duty steel spool weldment, two isolation flaps, removable inspection hatches, flap latch assemblies, and latched position indicator sensors for process shutdown.



United States and foreign patents pending.



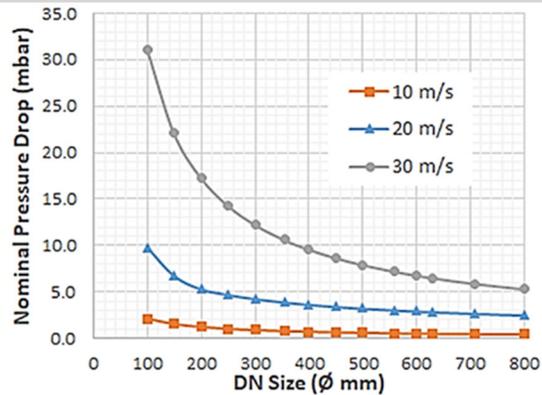
COMPLIANT

SPECIFICATIONS

DUAL-FLAP ISOLATION VALVE		
CERTIFICATIONS		ATEX -  II D, according to EN 16447
SIZE		DN100 – DN800 (4" – 32")
INSTALLATION DIRECTION		Horizontal / Vertical (flaps down); refer to E06-162 for installation instructions
MATERIALS OF CONSTRUCTION	Body	Coated Carbon Steel 1.0044 (A1011)
	Wetted Parts	Coated Carbon Steel 1.0044 (A1011) 1.4548 (17-4 PH SST) 1.4401 (316 SST) EPDM
PROCESS CONNECTION		DIN 24154-R11 flanges
OPERATING PRESSURE		±0.5 bar (± 7.3 psig); approved for PUSH or PULL systems
TEMPERATURE RANGE ^{[1][2]}	Operating	-20°C – 120°C (-4°F – 248°F)
	Ambient	-40°C – 70°C (-40°F – 160°F)
FUEL MIE / MIT LIMITS ^[3]		MIE ≥ 1.4 mJ / 380°C MIT
FUEL TYPE		Organic and metal dust, including light metal dusts such as Aluminum
MAXIMUM EXPERIMENTAL SAFETY GAP ^[3]		≥ 1.23 mm MESG
MAX DUST LOAD		Product loading larger than 1 kg/m ³ requires factory review.
PROCESS FLOW VELOCITY		≤ 40 m/s

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PRESSURE DROP ^[4]
(as a function of DN size
and average process velocity)



LATCHED POSITION INDICATOR

SENSING RANGE	12 mm, flush mount
APPROVALS ^[5]	IEC/IECEX – CSA
ELECTRICAL DESIGN	Connected to Ex-NAMUR rated intrinsically safe circuits
MAXIMUM SWITCHING VOLTAGE	175 Vdc
NOMINAL SWITCHING VOLTAGE	8.2 Vdc
MAXIMUM SWITCHING CURRENT	0.25 A dc
TYPICAL RESISTANCE	0.2 Ω
AMBIENT TEMPERATURE	-40°C to 105°C (-40°F to 221°F)
WIRING	Two conductors, 24 AWG 7/32 PVC cable 105°C, 1000 mm, tinned leads
HOUSING	SS M8 dia x 1.25 mm pitch thread, 36 mm body, two retaining nuts

- ^[1] Temperature limits are provided for the base valve. See optional component limits.
- ^[2] Temperature limits are based on mechanical and electrical properties. The DFI functionality cannot be guaranteed in conditions where ice is allowed to form on the interior of the valve. To reduce heat loss or risk of ice formation at low temperatures, the exterior of the valve can be insulated or heat traced without risk of restricting the movement of the flaps or latching mechanisms. When applying heat trace or insulation locate it in contact with the DFI body and flanges but under the LPI switch box conduit so as not to stress the LPI switch wiring or LPI switch box structure.
- ^[3] Minimum ignition temperature of the dust cloud according ASTM E 1491, EN 80079-20-2 or VDI 2263, Blatt 1, 2.6. DFI has been tested with several dust fuels. The fuel with the lowest MIE was an MIE of 1.4 mJ. The MIE was measured with inductance (L=1mH); The fuel with the lowest MIT was an MIT of 380°C. DFI application is not limited by MIE of MIT, but by MESG, which is calculated in function of MIE and MIT for the same dust as follows: **MESG (mm) = 1.01 * (MIE(mJ)) * (MIT(°C)+273)/273)^0.157.**
- ^[4] Pressure drop data is based on clean air steady-state CFD analysis where the DFI size is equal to the nominal process pipeline diameter. Pressure drop can be reduced by installing larger DFI size via conical transition spools. Consult factory for pressure drops of non- standard valve to pipeline size combinations via expansion or contraction spools.
- ^[5] This is a simple device not covered by the ATEX product directive 2014/34/EG. When installed in an ATEX zoned area, indicators can only be applied in circuits of type protection “I” per ATEX product directive 2014/34/EU Article 1, paragraph (2) and EN 60079-11:2012, clause 5.7.

VALVE EXPLOSION HAZARD APPLICATION RATINGS

Nominal Size Range DN [in]	Kst bar-m/s	P _{MAX} bar	Minimum Application Volume m ³	Application P _{RED,MAX} bar-g	Minimum Installation Distance ft [m]	Maximum Installation Distance ft [m]	Explosion Pressure Resistance of DFI bar-g
100 [4]	479	10	0.34	1.39	5.58 [1.70]	42 [12.80]	6.07
150-400 [6-16]	479	10	0.34		5.58 [1.70]	42 [12.80]	4.61
450-600 [18-24]	479	10	1.26	0.71	9 [2.74]	60 [18.29]	2.05
				0.97		20 [6.10]	
630-800 [25-32]	389	10	5.11	0.71	9 [2.74]	20 [6.10]	0.85
	479	10		0.48			

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OPTIONS

INSTALL KIT	Flange Install kit, includes counter flanges and mounting hardware.
CLEANING / DUST BUILD UP	Air-Pulse Cleaning Valve (APCV)* – Refer to data sheet X.1.105.01
	Dust Layer Accumulation (DLA) Sensor – Refer to data sheet X.1.106.01
VISUAL STATUS INDICATION	DFI Interface Module – Refer to data sheet X.1.104.01

* If no operational history is available, Fike recommends installing the Air-Pulse Cleaning Valve (APCV) to the DFI valve if the dust concentration in the dust aspiration line exceeds 70 g/m³ during normal operation, unless proven otherwise by actual operational history.

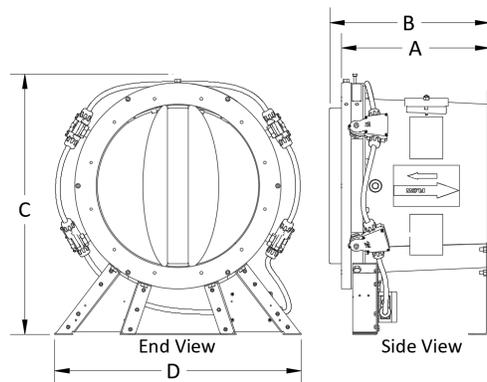
DIMENSIONS

Nominal Size DN [in]	DIMENSIONS in MM [in]				BOLTS			MASS in KG [lbs]
	A	B	C	D	SIZE	QTY	TORQUE in Nm [ft-lb]	
100 [4]	255.3 [10.05]	272.1 [10.71]	348.4 [13.72]	385.1 [15.16]	M8	4	20 [15]	20.4 [45]
150 [6]	280.2 [11.03]	297.0 [11.69]	397.2 [15.64]	444.1 [17.48]	M10	8	40 [30]	29.5 [65]
200 [8]	305.5 [12.03]	322.4 [12.69]	464.4 [18.28]	475.2 [18.71]	M10	8	40 [30]	38.6 [85]
250 [10]	330.2 [13.00]	347.1 [13.66]	509.4 [20.05]	505.7 [19.91]	M10	8	40 [30]	45.4 [100]
300 [12]	355.4 [13.99]	372.3 [14.66]	545.6 [21.48]	522.7 [20.58]	M10	8	40 [30]	59.0 [130]
355 [14]	382.9 [15.08]	399.8 [15.74]	607.7 [23.93]	575.5 [22.66]	M10	8	40 [30]	68.0 [150]
400 [16]	405.1 [15.95]	422.0 [16.61]	708.2 [27.88]	719.3 [28.32]	M10	12	40 [30]	81.6 [180]
450 [18]	430.4 [16.94]	466.3 [18.36]	752.5 [29.63]	726.3 [28.59]	M10	12	40 [30]	99.8 [220]
500 [20]	455.3 [17.93]	491.3 [19.34]	797.9 [31.41]	755.3 [29.73]	M10	12	40 [30]	108.9 [240]
560 [22]	485.3 [19.11]	521.3 [20.52]	859.6 [33.84]	803.9 [31.65]	M12	16	40 [30]	136.1 [300]
600 [24]	505.1 [19.89]	541.0 [21.30]	896.5 [35.29]	828.9 [32.63]	M12	16	40 [30]	147.4 [325]
630 [25]	521.0 [20.51]	556.9 [21.93]	922.5 [36.32]	846.5 [33.33]	M12	16	40 [30]	156.5 [345]
710 [28]	560.3 [22.06]	596.2 [23.47]	994.2 [39.14]	895.3 [35.25]	M12	16	40 [30]	176.9 [390]
800 [32]	605.1 [23.82]	641.0 [25.24]	1074.9 [42.32]	948.9 [37.36]	M12	24	40 [30]	201.8 [445]

Notes:

All sizes listed conform with NFPA 69 and EN 16447

All sizes listed utilize DN 24152-R2, T2 flanges for process mounting.



DFI Valve Dimensions
(Shown without DLA or APCV)

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ORDERING

PART NUMBER	DESCRIPTION
E30 – 067 – A – B – C – D – E	Dual-flap isolation valve assembly
A (VALVE SIZE)	0100 0250 0400 0560 0710
	0150 0300 0450 0600 0800
	0200 0355 0500 0630
B (MATERIAL / COATING)	CS = Carbon Steel, ISO 12944 C3 coating C5M = Carbon Steel, ISO 12944 coating SST = Stainless Steel (SST) ⁽¹⁾
C (INSTALL KIT)	0 = None 1 = Carbon Steel (CS) Flanges ⁽²⁾ 2 = Stainless Steel (SST) Flanges ⁽²⁾
D (DLA)	0 = None 1 = Dust layer accumulation sensor included – refer to data sheet X.1.106.01 ⁽³⁾
E (APCV)	0 = None 1 = Air pulse cleaning valve included, ATEX / IECEx – refer to data sheet X.1.105.01 ⁽³⁾ 2 = Air pulse cleaning valve included; CSA / IECEx – refer to data sheet X.1.105.01 ⁽³⁾
02 – 15293	Dual-channel intrinsic safety barrier ⁽⁴⁾
E10 – 080 – X – X – X – X	Interface Module – refer to data sheet X.1.104.01 ⁽⁵⁾

(1) Not yet for sale. Coming soon.

(2) Kit includes companion mounting flanges, gaskets and mounting hardware.

(3) Component is field installed to the isolation valve.

(4) Required for connection of the valve's latched position indicator and optional dust layer accumulation sensor to the facilities programmable logic controller (PLC) when installed in a hazardous area. The barrier is ordered separately. An ISB is not required if the optional interface module is used.

(5) Optional item that can be installed to provide monitoring of the isolation valve.

Example:

E30-067-0200-C5M-1-1-1 = DN200 valve with ISO 12944 C5M coating, CS flange install kit, optional dust accumulation sensor included, and optional air pulse cleaning valve (ATEX) included.

INSTALLATION

The DFI valve mounts to the inlet duct upstream from the protected equipment using counter flanges that are welded to the process line. The required counter flanges and mounting hardware can be ordered with the valve or separately as a kit (P/N E30-066-XXXX-XX). The install kit includes white EPDM gaskets, counter flanges (CS or SST), and SST mounting hardware. The mounting components must be provided by others if not ordered from Fike.

A water-tight (IP66 rated) field junction box is provided on DFI valve flange stand to facilitate the field connection of the valve's Locked Position Indicator (LPI) circuit and the optional Dust Layer Accumulation (DLA) sensor to the monitoring entity (i.e., programmable logic controller, Fike Interface Module, etc.).