



HAZARDOUS LOCATIONS DIRECTIONAL CONTROL VALVES 21 SERIES

PRODUCT CATALOG



Explosion-Proof Directional Control Valves 21 Series For Low Temperature Applications – Product Overview



Explosion-Proof Safety Function

Valves are equipped with explosion-proof coils for use in hazardous locations to prevent potentially explosive situations.

Valve Schematics		
Valve Type	Normally Closed	Normally Open
2/2		
3/2		
4/2		

The 21 Series explosion-proof solenoid pilot controlled valves are ideal for low temperature applications in a wide range of industries and environments where safety from electrical ignition of flammable gases, vapors, flammable liquids, combustible dust, or easily ignitable fibers is a concern.

Applicable Requirements	C22.2 No. 0-10 - General Requirements - Canadian Electrical Code, Part II; CSA C22.2 No. 25-1966 - Enclosures for use in Class II Groups E, F and G Hazardous Locations; CSA C22.2 No. 142-M1987 - Process Control Equipment; C22.2 No. 213-M1987 - Nonincendive Electrical Equipment for Use in Class I, Division 2 Hazardous Locations; CAN/CSA E79-0-95 - Electrical apparatus for explosive atmospheres, Part 0: General requirements; CAN/CSA E79-18-95 - Electrical apparatus for explosive atmospheres, Part 18: Encapsulation "m".
APPROVED for use in the following Hazardous Locations	Ex m II T4 and Division 1 – Specifications in accordance to CSA certificate: Class I, Division 1, Groups A, B, C and D; Class II, Groups E, F and G; Class III; Class I, Division 2, Groups A, B, C, D
Specifications in accordance to FM certificate	Explosion-proof Class I, Division 1, Groups A, B, C, D, T4, Ta = 60 °C (encapsulation/explosion-proof Class I, Zone 1, AEx m II T4, Ta = 60 °C; dust-ignition-proof for Class II/III, Division 1, Groups E, F and G, T4, Ta = 60 °C); Nonincendive Class I, Division 2, Groups A, B, C, D, T4, Ta = 60 °C; Suitable for Class II, III, Division 2, Groups E, F, G, T4, Ta = 60 °C CSA CLASS 2258 02 – process control equipment – for hazardous locations FM CLASS 3600, 3611, 3615, 3810 – hazardous (classified) location electrical equipment

VALVE FEATURES

Poppet Design	Poppet construction for high dirt tolerance
High Velocity	Near zero leakage
Positive Sealing	No sliding action to prevent damage and wear
Explosion-proof Coils	Contain any spark originating from within the coil or housing preventing the ignition of any flammable material in the surrounding environment, resulting in a larger explosion
Flexible Pilot	Pilot can rotate, giving the ability to change orientation

STANDARD SPECIFICATIONS

GENERAL	Function		Directional Control; Explosion-Proof	
	Construction Design		2/2, 3/2, and 4/2 Valve; Poppet	
	Actuation		Electrical	
	Mounting	Type	Inline	
		Orientation	Vertically with pilot solenoids on top	
	Connection		Threaded; G, NPT	
Minimum Operation Frequency		Once per month, to ensure proper function		
OPERATING CONDITIONS	Temperature	Ambient	-4° to 140°F (-20° to 60°C)	For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice
		Media	-4° to 175°F (-20° to 80°C)	
	Flow Media		Filtered air	
	Operating Pressure		30 to 150 psig (2.1 to 10 bar)	
External Pilot Supply		Must be equal to or greater than inlet pressure		
ELECTRICAL DATA	Solenoids		Rated for continuous duty	
	Operating Voltage		24 volts DC 120 volts AC, 60 Hz	
	Power Consumption	Primary & Reset Solenoids	4.6 watts on DC 6.8 volt amps on 60 Hz	
	Enclosure Rating		IP65, IEC 60529	
	Electrical Connection		Three lead wires with 1/2" NPT conduit connection	
CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum	
	Poppet		Stainless Steel	
	Seals		Fluorocarbon	
SAFETY DATA	Safety Integrity Level (SIL)		Certified by TÜV Rheinland in accordance to IEC 61508 and IEC 61511 safety integrity level 2 (SIL 2) and EN ISO 13849-1, PL c (with application specific diagnosis) in singular application with HFT = 0 and SIL 3 and PL e in redundant application with HFT≥1, for details see certificate.	

IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.

PRODUCT CREDENTIALS

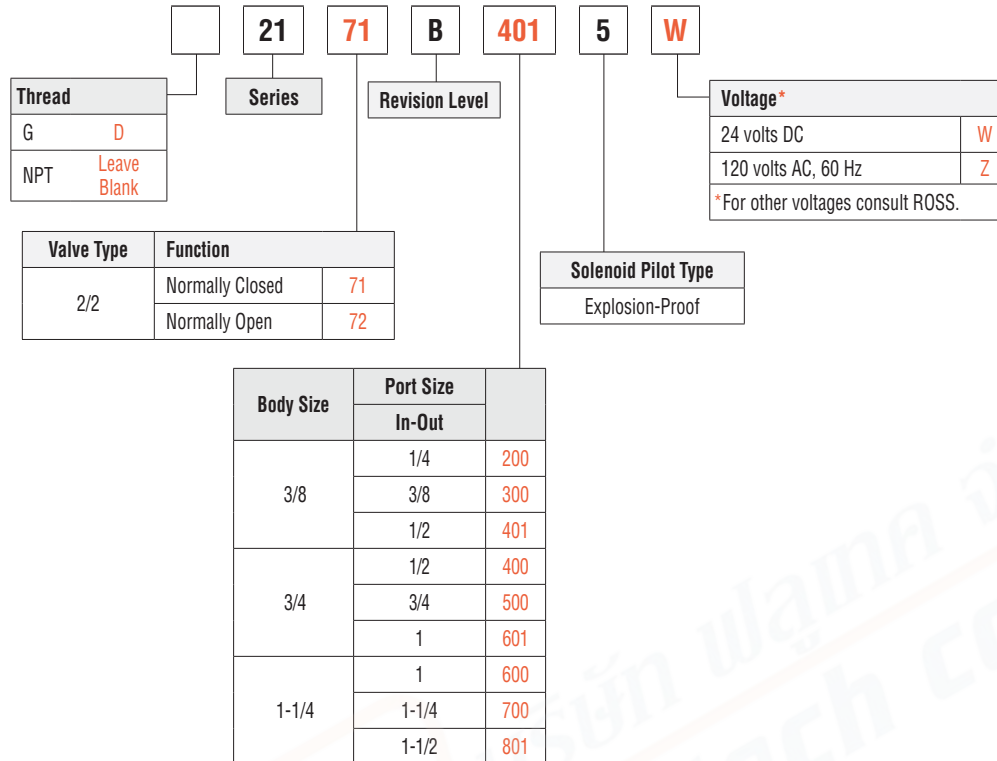
Safety Category	ATEX Certified	Factory Mutual Certification	CE Conformity Declaration	EAC Conformity Declaration	CSA Certificate of Compliance	CRN Certification
Cat 1						Available for appropriately tested valves



Ordering Information

MODEL NUMBER CONFIGURATOR

2-Way 2-Position Valves



For ATEX certified valves order placement, consult ROSS.

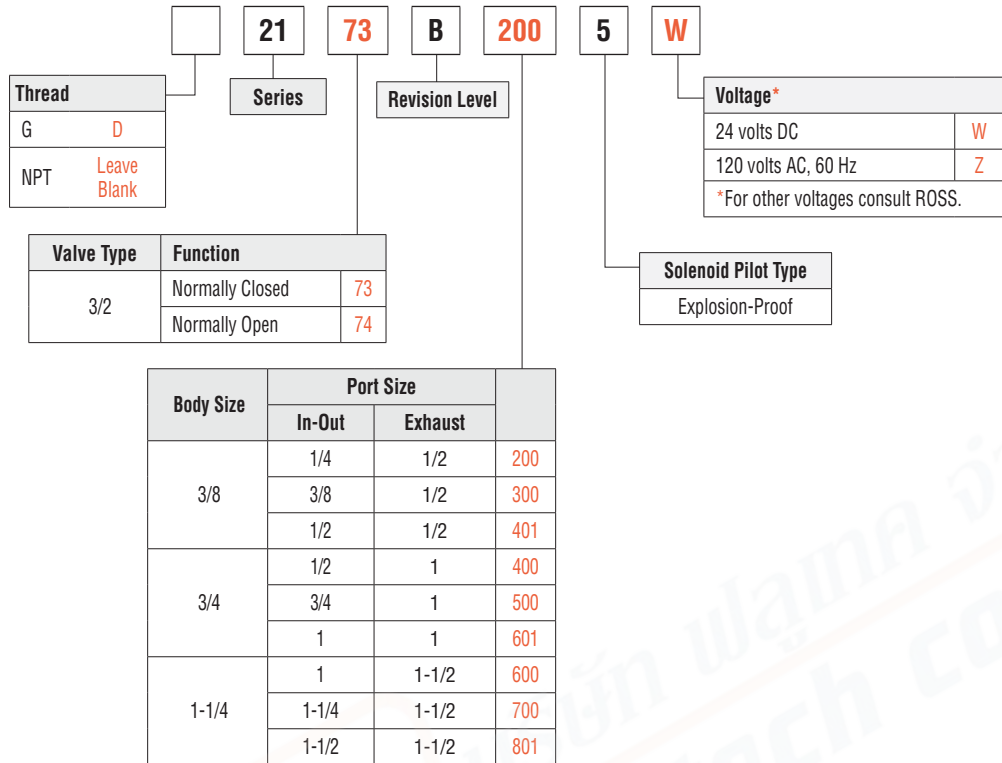
Body Size	Port Size	Flow Cv		Weight lb (kg)
		Normally Closed	Normally Open	
		1-2	1-2	
3/8	1/4	2.3	2.3	3.0 (1.4)
	3/8	3.8	3.3	
	1/2	4.0	3.5	
3/4	1/2	7.7	6.5	3.6 (1.6)
	3/4	9.0	7.3	
	1	9.0	7.9	
1-1/4	1	24	21	7.5 (3.4)
	1-1/4	29	20	
	1-1/2	29	21	



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MODEL NUMBER CONFIGURATOR 3-Way 2-Position Valves



For ATEX certified valves order placement, consult ROSS.

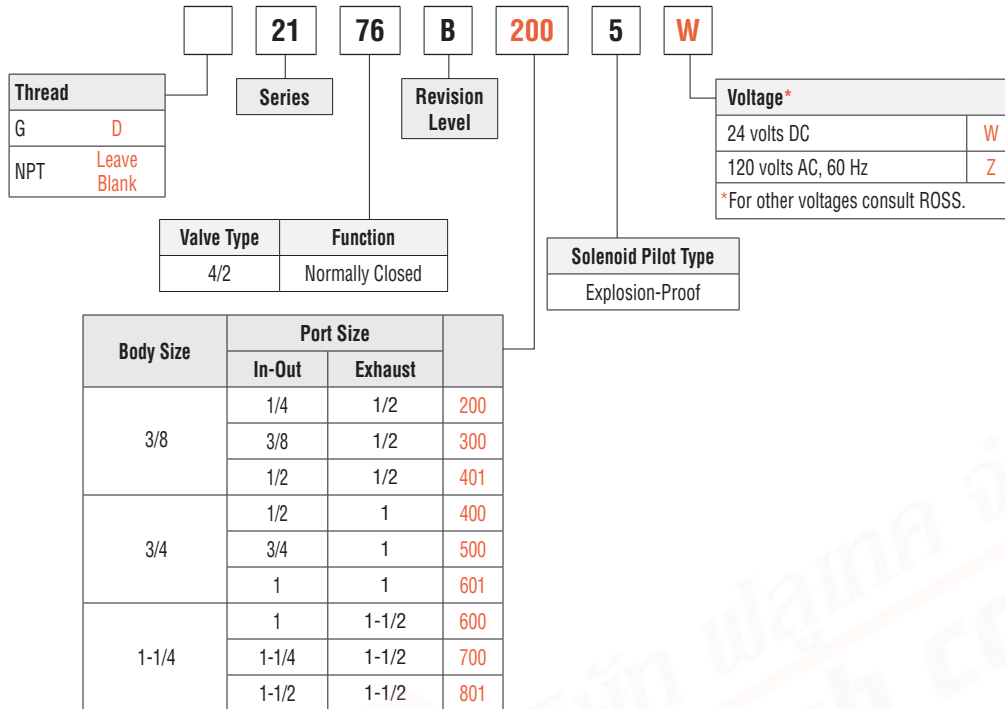
Body Size	Port Size		Flow C _v				Weight lb (kg)
			Normally Closed		Normally Open		
	1, 2	3	1-2	2-3	1-2	2-3	
3/8	1/4	1/2	2.5	3.1	2.3	2.7	2.5 (1.2)
	3/8	1/2	3.6	5.3	2.8	3.2	
	1/2	1/2	3.3	5.3	2.8	3.2	
3/4	1/2	1	6.3	9.2	6.3	8.0	3.3 (1.5)
	3/4	1	7.7	11	6.9	7.4	
	1	1	8.0	12	6.8	7.5	
1-1/4	1	1-1/2	23	34	17	24	7.0 (3.2)
	1-1/4	1-1/2	30	32	19	24	
	1-1/2	1-1/2	30	31	19	23	



Ordering Information

MODEL NUMBER CONFIGURATOR

4-Way 2-Position Valves



For ATEX certified valves order placement, consult ROSS.

Body Size	Port Size		Flow C _v		Weight lb (kg)
	1, 2, 4	3	1-2, 1-4	4-3, 2-3	
3/8	1/4	1/2	2.1	2.2	3.0 (1.4)
	3/8	1/2	2.5	3.1	
	1/2	1/2	2.9	3.8	
3/4	1/2	1	5.7	6.5	5.8 (2.6)
	3/4	1	7.1	8.7	
	1	1	7.7	10	
1-1/4	1	1-1/2	18	23	12.0 (5.4)
	1-1/4	1-1/2	20	28	
	1-1/2	1-1/2	21	29	



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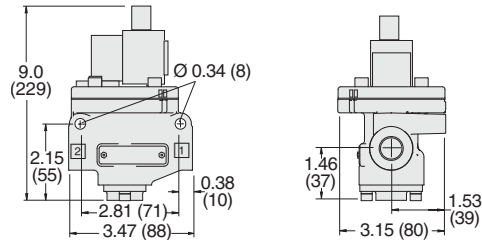
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2/2-Way Valves

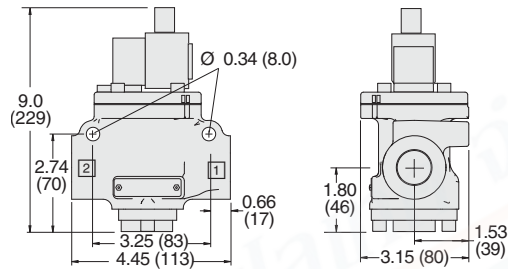
DIMENSIONS

Inches (mm)

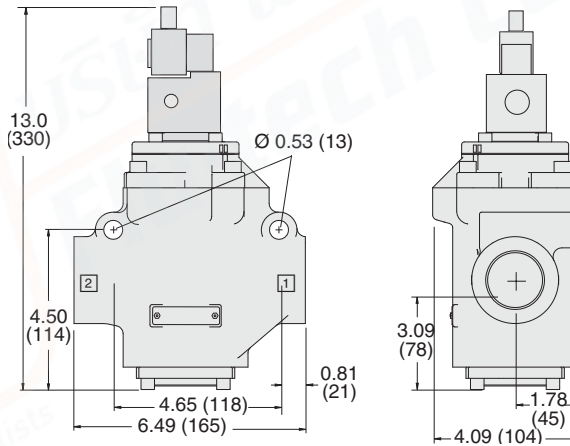
Body Size 3/8



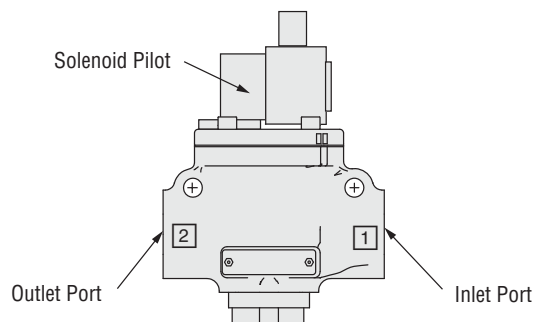
Body Size 3/4



Body Size 1-1/4



For additional information, and to assist you with piping and connectivity designs, our products are available in downloadable 2D drawings and 3D CAD models in a wide range of options including native formats, visit www.rosscontrols.com.



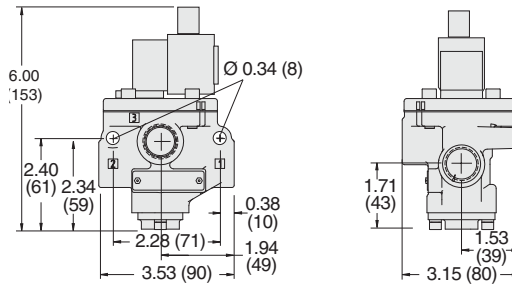
Valve Technical Data

3/2-Way Valves

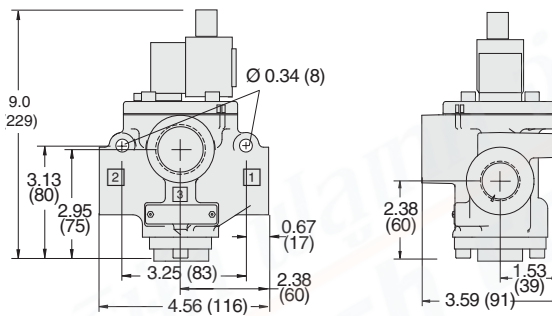
DIMENSIONS

Inches (mm)

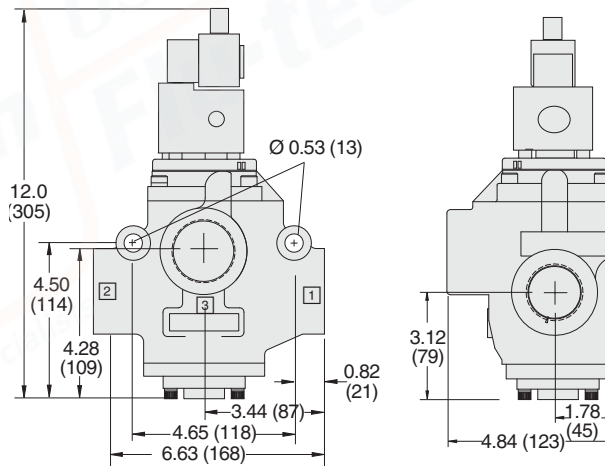
Body Size 3/8



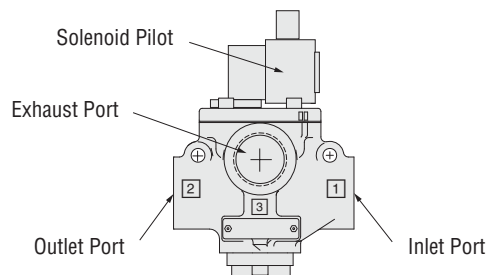
Body Size 3/4



Body Size 1-1/4



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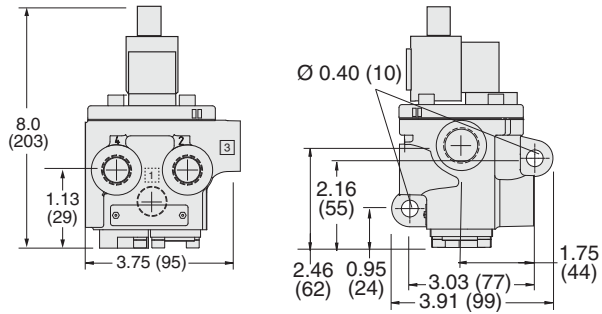
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4/2-Way Valves

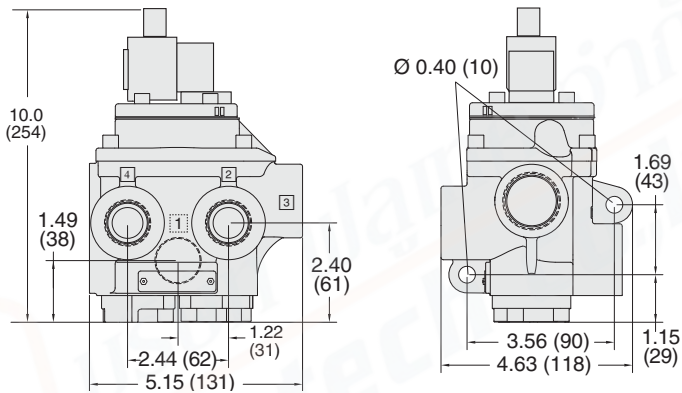
DIMENSIONS

Inches (mm)

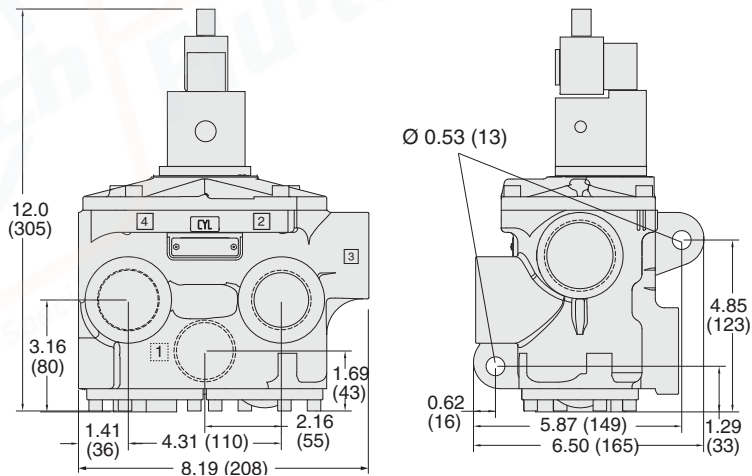
Body Size 3/8



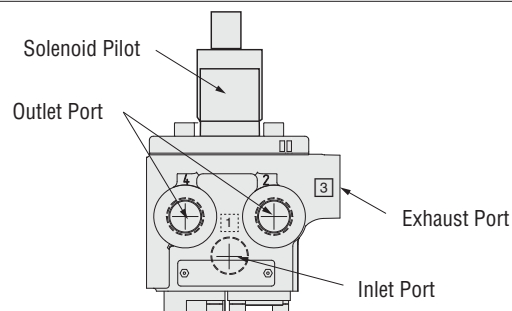
Body Size 3/4



Body Size 1-1/4



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Accessories & Options

SILENCERS

Silencers	Port Size	Thread Type	Model Number		Flow Avg. C _v	Pressure Range psig (bar)
			R/Rp Thread	NPT Thread		
	1/2	Male	D5500A4003	5500A4003	4.7	0-290 (0-20) maximum
	1	Male	D5500A6003	5500A6003	15	
	1-1/2	Female	D5500A8001	5500A8001	30	

SOLENOID PILOT CONVERSION KITS

Conversion Kits	Description	Valve Body Size	Kit Number
	ROSS Controls standard poppet solenoid pilot controlled valves for line mounting can be easily field-converted into an explosion-proof solenoid pilot poppet valve. Listed on the right are the conversion kit numbers to replace the obsolete ROSS explosion proof pilot, or to convert a standard inline valve to an explosion-proof valve.		1/4" - 1" (C _v up to 10)
		1" (C _v up to 29) - 2-1/2"	2371K77W



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