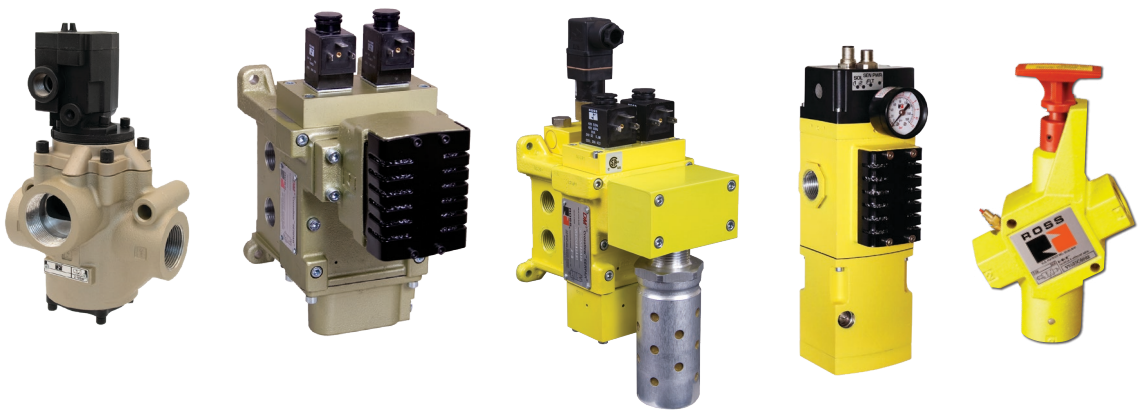




FLUID POWER PRODUCTS WITH CANADIAN REGISTRATION NUMBER



PRODUCT CATALOG

Canadian Registration Number (CRN)

The Canadian Registration Number (CRN) is a number issued by each province or territory of Canada to the design of a boiler, pressure vessel or fitting as defined by CSA B51 Clause 4.3. The CRN identifies the design has been accepted and registered for use in that province or territory.

The province or territory is represented by numeric digits following the decimal point within the CRN as shown in the list below. The first registering province or territory is the first digit after the decimal. Additional digits indicate other provinces that have also accepted the design.

1 – British Columbia
2 – Alberta
3 – Saskatchewan
4 – Manitoba
5 – Ontario

6 – Quebec
7 – New Brunswick
8 – Nova Scotia
9 – Prince Edward Island
0 (zero) – Newfoundland

T – Northwest Territories
Y – Yukon Territory
N – Nunavut

The letter C may follow the designation of first registration if a design is registered in all jurisdictions.

No jurisdiction issues the letter C; it is a convenience for stamping once the manufacturer has received all the registrations.

The letters CL may follow the designation of first registration if a design is registered in all jurisdictions that require registration and is not registered in the jurisdictions that do not require registration.

Products with Canadian Registration Number

CRN VALVES		ACTUATION/FUNCTION		AVAILABLE PORT SIZES		PILOT SUPPLY		TEMPERATURE		Page
TYPE/SERIES	ILLUSTRATION EXAMPLE					INTERNAL	EXTERNAL	HIGH	LOW	
DIRECTIONAL CONTROL	27		Solenoid Pilot	2/2	1/4 to 2-1/2	■	■	■		4 – 19
				3/2	1/4 to 2-1/2					
				4/2	1/4 to 1-1/2					
			Air Pilot	2/2	1/4 to 2-1/2		■	■		
				3/2	1/4 to 2-1/2					
				4/2	1/4 to 1-1/2					
	21		Solenoid Pilot	2/2	1/4 to 2-1/2	■	■	■	■	20 – 35
				3/2	1/4 to 2-1/2					
				4/2	1/4 to 1-1/2					
			Air Pilot	2/2	1/4 to 1-1/2		■	■	■	
				3/2	1/4 to 1-1/2					
				4/2	1/4 to 1-1/2					
FLOW CONTROL	19		2/2 High-Capacity	1/4 to 2-1/2					36 – 39	
ACCESSORIES										83 – 97

CRN VALVES			ACTUATION/TYPE		AVAILABLE PORT SIZES	PILOT SUPPLY		MONITORING		RESET			Page
TYPE/SERIES	ILLUSTRATION EXAMPLE					INTERNAL	EXTERNAL	INTERNAL	EXTERNAL	REMOTE AIR	SOLENOID	MANUAL	
ENERGY ISOLATION	L-O-X® 15		Manual	3/2	3/4 to 2								40 – 45
					1/4 to 2								
	L-O-X® 27		Piloted Valves	3/2	1-1/2 to 2-1/2	■	■						46 – 51
			Piloted Valves	3/2	1-1/2 to 2-1/2	■	■						
	EEZ-ON® 27		Solenoid Pilot	3/2	1 to 1-1/2	■	■		■				52 – 57
			Air Pilot	3/2	1 to 1-1/2		■		■				
SAFE EXHAUST	M35 with EEZ-ON®		Solenoid Pilot	3/2	3/4								58 – 65
	M35 without EEZ-ON®		Solenoid Pilot	3/2					■				
	DM²® C		Solenoid Pilot	3/2	1/4 to 1-1/2				■		■		66 – 73
	DM²® D		Solenoid Pilot	3/2	1/2 to 1-1/2				■	■	■	■	74 – 81
ACCESSORIES													83 – 97

Inline Poppet Valves 27 Series

Product Overview

Registered in Canada to the ASME B31.3, Process Piping, in the following jurisdictions:

Internal Pilot Supply Valves
CRN
0C1409.53469087YTN

British Columbia
Manitoba
New Brunswick

Newfoundland
Northwest Territories
Nova Scotia

Nunavut
Ontario
Quebec

Prince Edward Island
Yukon Territory

External Pilot Supply Valves
CRN
0C1409.5

Ontario

Solenoid Pilot Controlled	Pressure Controlled	Pressure Controlled 20 Bar
		

Illustration examples.

Directional Control Function

Directional control valves function is to control the direction of flow in the pneumatic circuit. Directional control valves are able to control the way the air passes. These valves can regulate the airflow being capable to stop fluid flow, allow fluid flow, and change the direction of fluid flow. These three functions usually operate in combination.

VALVE FEATURES

Poppet Design	Poppet construction for high dirt tolerance
Mounting Options	Can be mounted close to actuator, reducing length of pipe to be pressurized/exhausted on each cycle
Pilot Supply	Solenoid pilot controlled – Internal or External Pressure controlled valves – External
High Velocity	Near zero leakage
Positive Sealing	No sliding action to prevent damage and wear
Reliability	Consistent response times over the life of the valve

Valve Actuation	Available Inlet Port Sizes									Functions			Maximum Flow C _v (NI/min)	Page
	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	2/2	3/2	4/2		
Solenoid Pilot Controlled	●	●	●	●	●	●	●	●	●	●	●	●	71 (70000)	6 – 11
Pressure Controlled	●	●	●	●	●	●	●			●	●	●	71 (70000)	12 – 17
Pressure Controlled - 20 Bar				●						●			71 (70000)	18 – 19
Accessories														83 – 97

STANDARD SPECIFICATIONS					
GENERAL	Function		2/2 Valve	Normally Closed	
				Normally Open	
			3/2 Valve	Normally Closed	
				Normally Open	
			4/2 Valve		
	Construction Design		Poppet		
	Actuation		Electrical	Solenoid Pilot Controlled	
				Direct Double Solenoid Pilot Controlled	
			Pneumatic	Pressure Controlled	
	Mounting	Type	Inline		
Orientation		Any, preferably vertical			
Connection		Threaded Port	NPT		
			G		
Manual Override (Solenoid Controlled valves)		Flush; rubber, non-locking			
OPERATING CONDITIONS	Temperature	Solenoid Pilot Controlled	Ambient	40° to 120°F (4° to 50°C)	
			Media	40° to 175°F (4° to 80°C)	
		Pressure Controlled	Ambient	40° to 175°F (4° to 80°C)	
			Media		
		Maximum Design Proof Temperature		120°F (50°C)	
	Flow Media		Filtered air		
	Operating Pressure	Standard Valves	Body Size	3/8 through 1-1/4	15 to 150 psig (1 to 10 bar)
				2	30 to 150 psig (2 to 10 bar)
			Maximum Design Proof Pressure		150 psig (10 bar)
		20 Bar Valves	Body Size	3/4	15 to 300 psig (1 to 20 bar)
			Maximum Design Proof Pressure		300 psig (20 bar)
	Pilot Supply Pressure		Internal	Must meet minimum operating pressure	
			External	Must be equal to or greater than inlet pressure, and meet minimum operating pressure	
ELECTRICAL DATA FOR SOLENOID PILOT VALVES	Solenoids		Current Flow	Operating Voltage	Power Consumption (each solenoid)
			DC	24 volts	14 watts
			AC	110-120 volts, 50/60 Hz	87 VA inrush, 30 VA holding
				230-240 volts, 60 Hz	
			Rated for continuous duty		
CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum		
	Poppet		Acetal and Stainless Steel		
	Seals		Nitrile Rubber	Buna-N	
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 d in redundant application with HFT≥1, for details see certificate.			
PRODUCT CREDENTIALS					
Canadian Registration Number (CRN)		Certificate of Compliance		Safety Integrity Level Per IEC 2061:2001	
OC1409.53469087YTN OC1409.5					
				Declaration of Conformity	
					

2/2 Solenoid Pilot Controlled Valves

MODEL NUMBER CONFIGURATOR

2-Way 2-Position Valves

Examples: T2771B2001W, TD2771B9061Z.

T

27

7

1

B

2001

W

CRN Certified

Port Thread	
NPT	
Leave Blank	
G	D

Series

Actuation

Solenoid Pilot

Valve Function	
2/2 Normally Closed	1
2/2 Normally Open	2

Revision Level

Body Size	Port Size	Internal Pilot Supply	External Pilot Supply
	In-Out		
3/8	1/4	2001	2051
	3/8	3001	3051
	1/2	4011	4061
3/4	1/2	4001	4051
	3/4	5001	5051
	1	6011	6061
1-1/4	1	6001	6051
	1-1/4	7001	7051
	1-1/2	8011	8061
2	1-1/2	8001	8051
	2	9001	9051
	2-1/2	9011	9061

Current	Voltage*	
DC	24 V	W
AC	110-120 V, 50/60 Hz	Z
	230-250 V, 60 Hz	Y

* For other voltages consult ROSS.

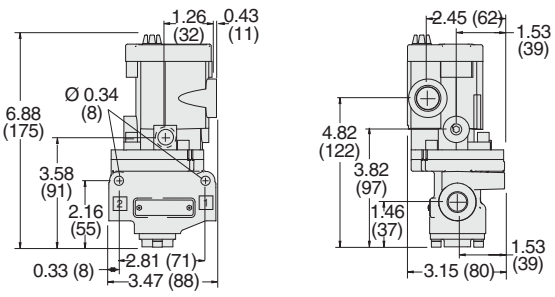
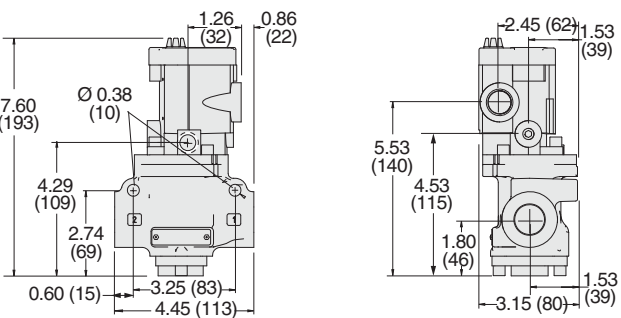
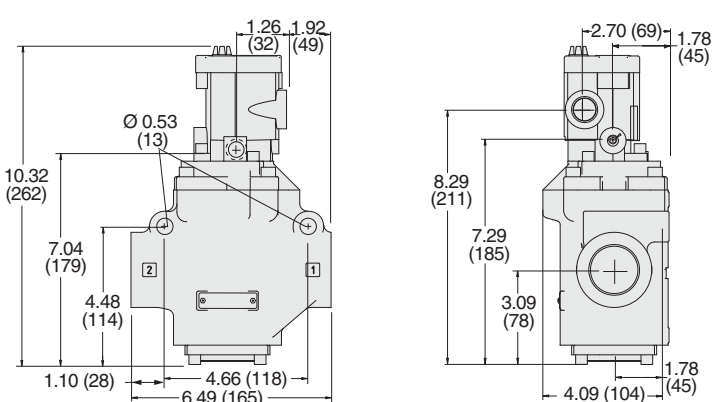
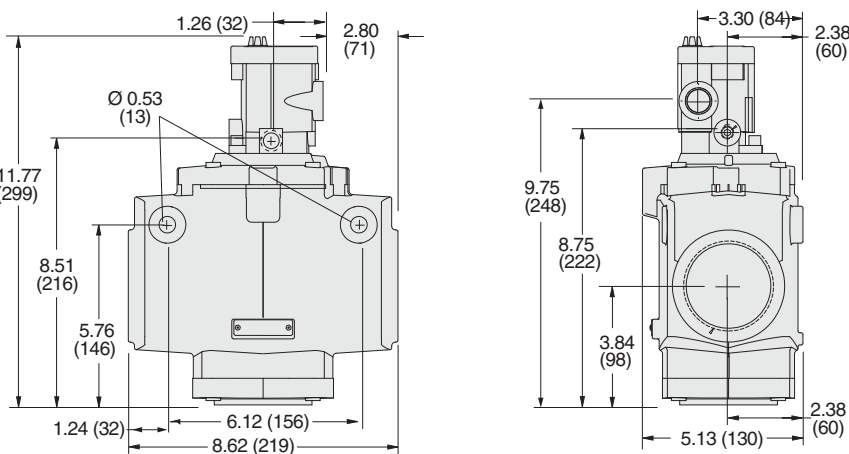
Size		Flow C _v (NI/min)		Average Response Constants*			≈ Weight lb (kg)
Body	Port 1, 2	Normally Closed (NC)	Normally Open (NO)	M	F		
		1-2	1-2		NC	NO	
3/8	1/4	1.8 (1800)	1.8 (1800)	10	0.91	0.91	2.5 (1.2)
	3/8	3.2 (3100)	2.9 (2800)	10	0.70	0.76	
	1/2	3.9 (3800)	3.4 (3300)	10	0.64	0.72	
3/4	1/2	7.2 (7100)	6.5 (6400)	14	0.37	0.43	3.3 (1.5)
	3/4	9.1 (9000)	8.2 (8100)	14	0.34	0.39	
	1	9.9 (9700)	8.2 (8100)	14	0.34	0.37	
1-1/4	1	21 (21000)	21 (21000)	26	0.17	0.17	7.0 (3.2)
	1-1/4	30 (31000)	22 (22000)	26	0.15	0.19	
	1-1/2	32 (31000)	24 (24000)	26	0.15	0.18	
2	1-1/2	46 (45000)	46 (45000)	41	0.09	0.09	15.5 (6.9)
	2	59 (58000)	58 (57000)	41	0.07	0.07	
	2-1/2	66 (65000)	60 (59000)	41	0.07	0.06	

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

Normally Closed

Normally Open

DIMENSIONS	Inches (mm)
Body Size 3/8	 Technical drawing of Body Size 3/8 valve showing front and side views with dimensions. Front view dimensions: 6.88 (175), Ø 0.34 (8), 3.58 (91), 2.16 (55), 0.33 (8), 2.81 (71), 3.47 (88), 1.26 (32), 0.43 (11). Side view dimensions: 4.82 (122), 3.82 (97), 1.46 (37), 3.15 (80), 1.53 (39), 2.45 (62).
Body Size 3/4	 Technical drawing of Body Size 3/4 valve showing front and side views with dimensions. Front view dimensions: 7.60 (193), Ø 0.38 (10), 4.29 (109), 2.74 (69), 0.60 (15), 3.25 (83), 4.45 (113), 1.26 (32), 0.86 (22). Side view dimensions: 5.53 (140), 4.53 (115), 1.80 (46), 3.15 (80), 1.53 (39), 2.45 (62).
Body Size 1-1/4	 Technical drawing of Body Size 1-1/4 valve showing front and side views with dimensions. Front view dimensions: 10.32 (262), Ø 0.53 (13), 7.04 (179), 4.48 (114), 1.10 (28), 4.66 (118), 6.49 (165), 1.26 (32), 1.92 (49). Side view dimensions: 8.29 (211), 7.29 (185), 3.09 (78), 4.09 (104), 1.78 (45), 2.70 (69), 1.78 (45).
Body Size 2	 Technical drawing of Body Size 2 valve showing front and side views with dimensions. Front view dimensions: 11.77 (299), Ø 0.53 (13), 8.51 (216), 5.76 (146), 1.24 (32), 6.12 (156), 8.62 (219), 1.26 (32), 2.80 (71). Side view dimensions: 9.75 (248), 8.75 (222), 3.84 (98), 5.13 (130), 2.38 (60), 3.30 (84), 2.38 (60).
Downloadable CAD models available.	

3/2 Solenoid Pilot Controlled Valves

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

Examples: T2773B2001W, TD2774B6061Z.

T

27

7

3

B

2001

W

CRN Certified

Port Thread	
NPT	
Leave Blank	
G	D

Series

Actuation

Solenoid Pilot

Valve Function	
3/2 Normally Closed	3
3/2 Normally Open	4

Revision Level

Body Size	Port Size		Internal Pilot Supply	External Pilot Supply
	In-Out	Exhaust		
3/8	1/4	1/2	2001	2051
	3/8	1/2	3001	3051
	1/2	1/2	4011	4061
3/4	1/2	1	4001	4051
	3/4	1	5001	5051
	1	1	6011	6061
1-1/4	1	1-1/2	6001	6051
	1-1/4	1-1/2	7001	7051
	1-1/2	1-1/2	8011	8061
2	1-1/2	2-1/2	8001	8051
	2	2-1/2	9001	9051
	2-1/2	2-1/2	9011	9061

Current	Voltage*	
DC	24 V	W
AC	110-120 V, 50/60 Hz	Z
	230-250 V, 60 Hz	Y

* For other voltages consult ROSS.

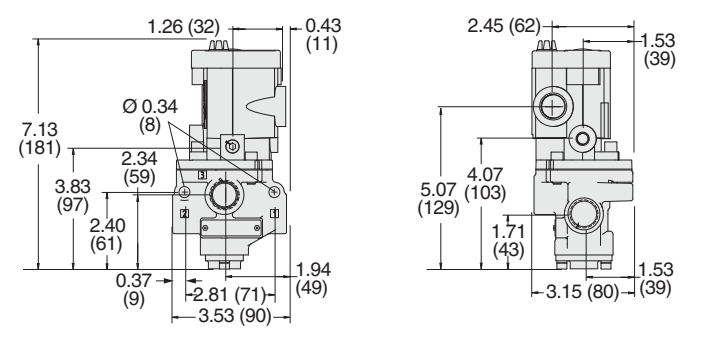
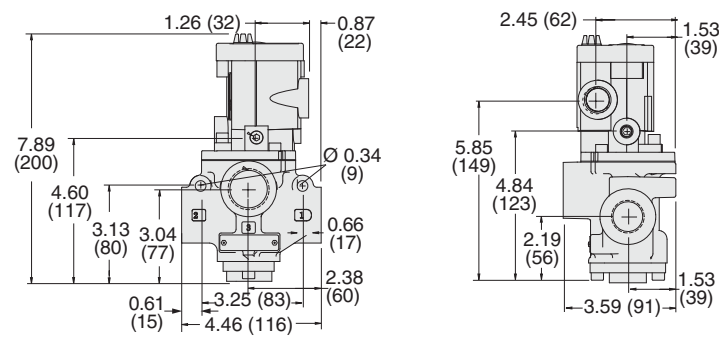
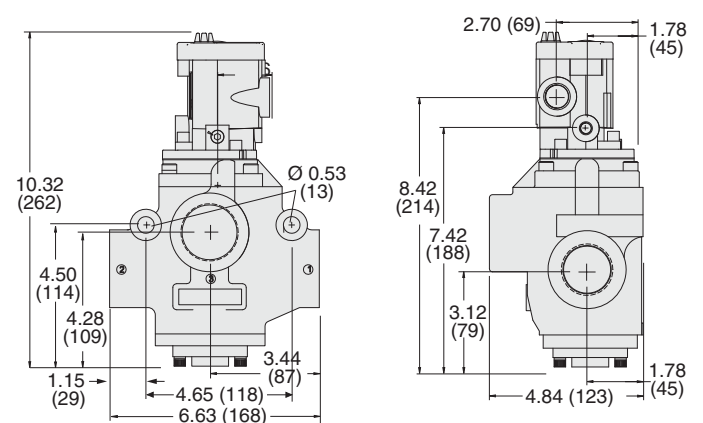
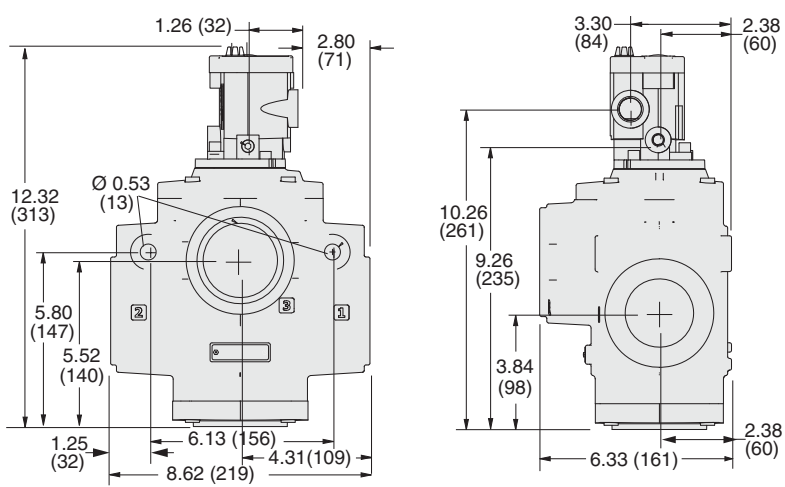
Size			Flow C _v (NI/min)				Average Response Constants*					≈ Weight lb (kg)
Body	Port 1, 2	Port 3	Normally Closed (NC)		Normally Open (NO)		M	F				
								NC		NO		
			1-2	2-3	1-2	2-3		1-2	2-3	1-2	2-3	
3/8	1/4	1/2	1.9 (1900)	3.3 (3200)	1.7 (1700)	3.0 (3000)	10	0.90	0.80	0.99	0.88	2.5 (1.2)
	3/8	1/2	2.9 (2800)	4.4 (4300)	2.8 (2800)	3.0 (3000)	10	0.70	0.50	0.90	0.77	
	1/2	1/2	3.8 (3800)	5.0 (4900)	3.0 (3000)	3.0 (3000)	10	0.75	0.50	0.90	0.76	
3/4	1/2	1	6.2 (6100)	9.4 (9300)	6.1 (6000)	8.0 (7900)	11	0.43	0.27	0.46	0.60	3.3 (1.5)
	3/4	1	8.2 (8100)	10 (9800)	7.7 (7600)	8.0 (7900)	11	0.36	0.26	0.45	0.60	
	1	1	9.1 (9000)	12 (12000)	8.3 (8200)	8.0 (7900)	11	0.34	0.25	0.40	0.59	
1-1/4	1	1-1/2	21 (21000)	27 (27000)	18 (18000)	20 (20000)	28	0.17	0.14	0.20	0.17	7.0 (3.2)
	1-1/4	1-1/2	29 (29000)	29 (29000)	21 (21000)	22 (22000)	28	0.15	0.15	0.19	0.17	
	1-1/2	1-1/2	30 (30000)	30 (30000)	21 (21000)	25 (25000)	28	0.15	0.15	0.19	0.16	
2	1-1/2	2-1/2	45 (44000)	75 (74000)	45 (44000)	53 (52000)	76	0.05	0.04	0.07	0.04	16.5 (7.4)
	2	2-1/2	57 (56000)	78 (77000)	55 (54000)	61 (60000)	76	0.05	0.04	0.05	0.04	
	2-1/2	2-1/2	66 (65000)	82 (81000)	61 (60000)	71 (70000)	76	0.05	0.04	0.50	0.04	

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

Normally Closed

Normally Open

DIMENSIONS	Inches (mm)
Body Size 3/8	 Technical drawings of Body Size 3/8 valve showing front and side views with dimensions in inches and mm.
Body Size 3/4	 Technical drawings of Body Size 3/4 valve showing front and side views with dimensions in inches and mm.
Body Size 1-1/4	 Technical drawings of Body Size 1-1/4 valve showing front and side views with dimensions in inches and mm.
Body Size 2	 Technical drawings of Body Size 2 valve showing front and side views with dimensions in inches and mm.
Downloadable CAD models available.	

4/2 Solenoid Pilot Controlled Valves

MODEL NUMBER CONFIGURATOR

4-Way 2-Position Valves

Examples: T2776B2001W, TD2776B6011Z.

T		27	7	6	B	2001	W
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CRN Certified

Port Thread

NPT

Leave Blank

G

D

Series

Actuation

Solenoid Pilot

Valve Function

4/2

Revision Level

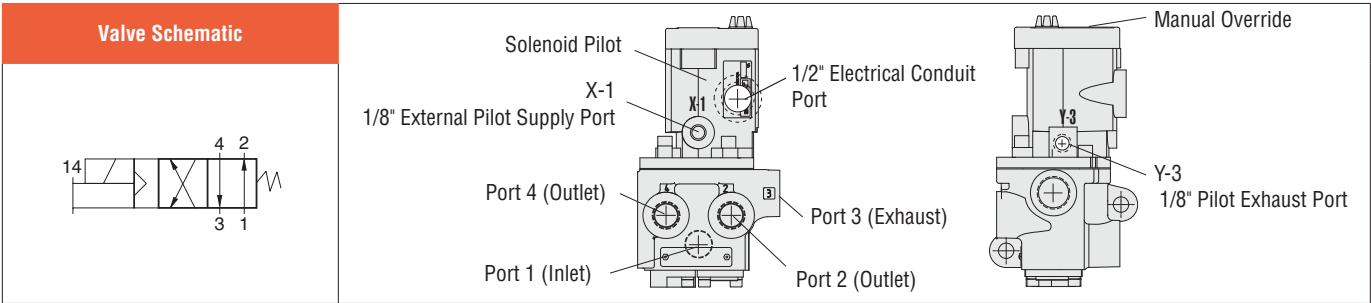
Current	Voltage*	
DC	24 V	W
AC	110-120 V, 50/60 Hz	Z
	230-250 V, 60 Hz	Y

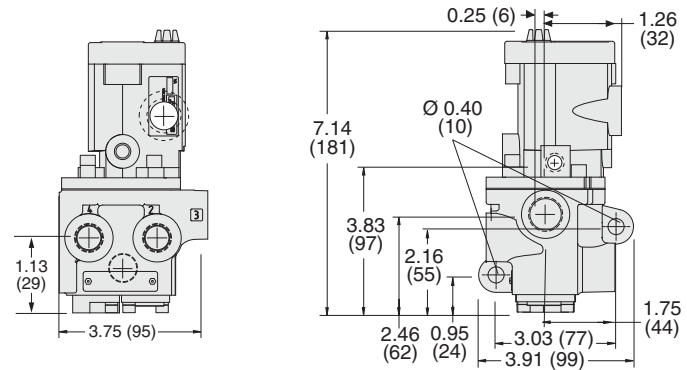
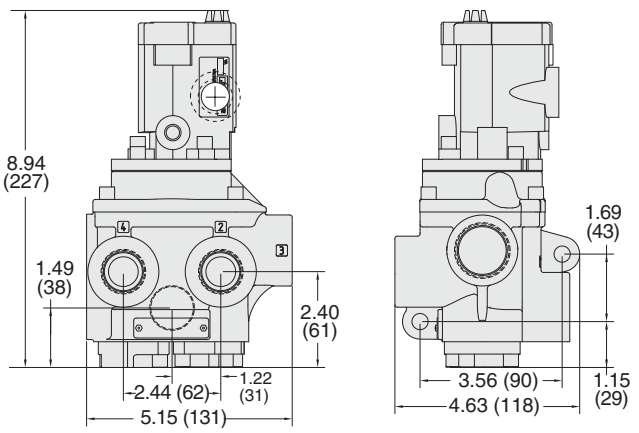
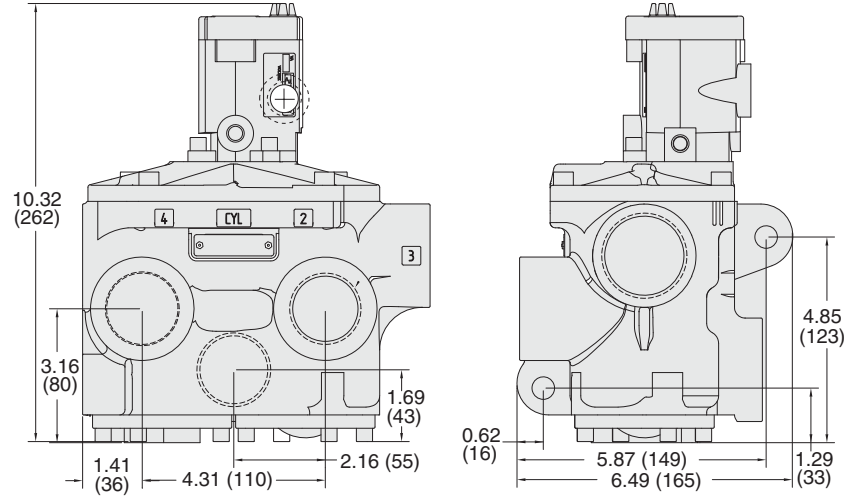
* For other voltages consult ROSS.

Body Size	Port Size		Internal Pilot Supply	External Pilot Supply
	In-Out	Exhaust		
3/8	1/4	1/2	2001	2051
	3/8	1/2	3001	3051
	1/2	1/2	4011	4061
3/4	1/2	1	4001	4051
	3/4	1	5001	5051
	1	1	6011	6061
1-1/4	1	1-1/2	6001	6051
	1-1/4	1-1/2	7001	7051
	1-1/2	1-1/2	8011	8061

Size			Flow C _v (NI/min)				Average Response Constants*			≈ Weight lb (kg)
Body	Port 1, 2, 4	Port 3					M	F		
			1-2	2-3	1-4	4-3		1-2, 1-4	4-3, 2-3	
3/8	1/4	1/2	1.7 (1700)	2.3 (2300)	1.8 (1800)	2.8 (2800)	10	0.92	0.92	3.0 (1.4)
	3/8	1/2	2.6 (2600)	3.3 (3200)	2.9 (2900)	3.9 (3800)	10	0.90	0.90	
	1/2	1/2	3.1 (3100)	4.2 (4100)	4.2 (4100)	5.2 (5100)	10	0.89	0.73	
3/4	1/2	1	5.7 (5600)	7.0 (6900)	5.5 (5400)	7.3 (7200)	26	0.50	0.66	5.3 (2.4)
	3/4	1	7.4 (7300)	7.0 (6900)	7.3 (7200)	9.5 (9300)	26	0.36	0.55	
	1	1	7.9 (7800)	8.0 (7900)	8.0 (7900)	11 (11000)	26	0.35	0.50	
1-1/4	1	1-1/2	13 (13000)	21 (21000)	18 (18000)	22 (22000)	79	0.17	0.22	11.3 (5.1)
	1-1/4	1-1/2	16 (16000)	22 (22000)	25 (25000)	26 (26000)	79	0.16	0.18	
	1-1/2	1-1/2	16 (16000)	22 (22000)	26 (26000)	27 (27000)	79	0.15	0.15	

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.



DIMENSIONS	Inches (mm)
Body Size 3/8	 Technical drawings of the Body Size 3/8 valve. The front view shows a width of 3.75 (95) and a height of 1.13 (29). The side view shows a total height of 7.14 (181), a top width of 1.26 (32), and a mounting hole diameter of Ø 0.40 (10). Other dimensions include 0.25 (6), 3.83 (97), 2.16 (55), 2.46 (62), 0.95 (24), 3.03 (77), 3.91 (99), and 1.75 (44).
Body Size 3/4	 Technical drawings of the Body Size 3/4 valve. The front view shows a total height of 8.94 (227), a width of 5.15 (131), and a mounting hole diameter of Ø 0.40 (10). Other dimensions include 1.49 (38), 2.44 (62), 1.22 (31), 2.40 (61), and 1.69 (43). The side view shows a total height of 4.63 (118) and a width of 3.56 (90).
Body Size 1-1/4	 Technical drawings of the Body Size 1-1/4 valve. The front view shows a total height of 10.32 (262), a width of 6.49 (165), and a mounting hole diameter of Ø 0.40 (10). Other dimensions include 3.16 (80), 1.41 (36), 4.31 (110), 2.16 (55), 1.69 (43), and 0.62 (16). The side view shows a total height of 4.85 (123) and a width of 5.87 (149).
Downloadable CAD models available.	

2/2 Pressure Controlled Valves

MODEL NUMBER CONFIGURATOR

2-Way 2-Position Valves

Examples: T2751A2001, TD2751A8001.

T

27

5

1

A

2001

CRN Certified

Port Thread

NPT

Leave Blank

G

D

Series

Actuation

Pressure Controlled

Valve Function

2/2 Normally Closed

1

2/2 Normally Open

2

Revision Level

Body Size	Port Size	
	In-Out	
3/8	1/4	2001
	3/8	3001
	1/2	4011
3/4	1/2	4001
	3/4	5001
	1	6011
1-1/4	1	6001
	1-1/4	7001
	1-1/2	8011
2	1-1/2	8001
	2	9001
	2-1/2	9011

Size		Flow Cv (NI/min)		Average Response Constants*			≈ Weight lb (kg)
Body	Port 1, 2	Normally Closed (NC)	Normally Open (NO)	M	F		
		1-2	1-2		NC	NO	
3/8	1/4	1.8 (1800)	1.8 (1800)	10	0.91	0.91	2.5 (1.2)
	3/8	3.2 (3100)	2.9 (2800)	10	0.70	0.76	
	1/2	3.9 (3800)	3.4 (3300)	10	0.64	0.72	
3/4	1/2	7.2 (7100)	6.5 (6400)	14	0.37	0.43	3.3 (1.5)
	3/4	9.1 (9000)	8.2 (8100)	14	0.34	0.39	
	1	9.9 (9700)	8.2 (8100)	14	0.34	0.37	
1-1/4	1	21 (21000)	21 (21000)	26	0.17	0.17	7.0 (3.2)
	1-1/4	30 (31000)	22 (22000)	26	0.15	0.19	
	1-1/2	32 (31000)	24 (24000)	26	0.15	0.18	
2	1-1/2	46 (45000)	46 (45000)	41	0.09	0.09	15.5 (6.9)
	2	59 (58000)	58 (57000)	41	0.07	0.07	
	2-1/2	66 (65000)	60 (59000)	41	0.07	0.06	

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

Normally Closed

12

2

1

Normally Open

10

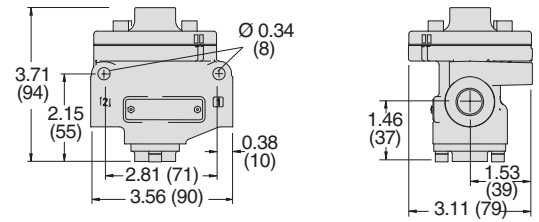
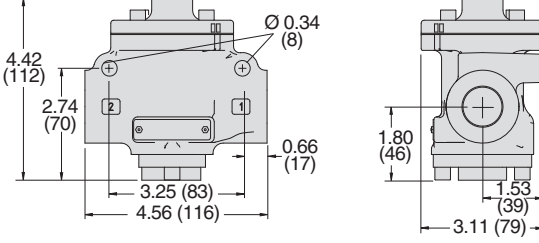
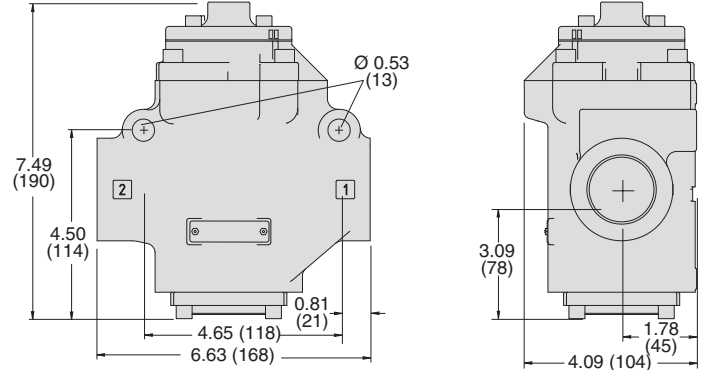
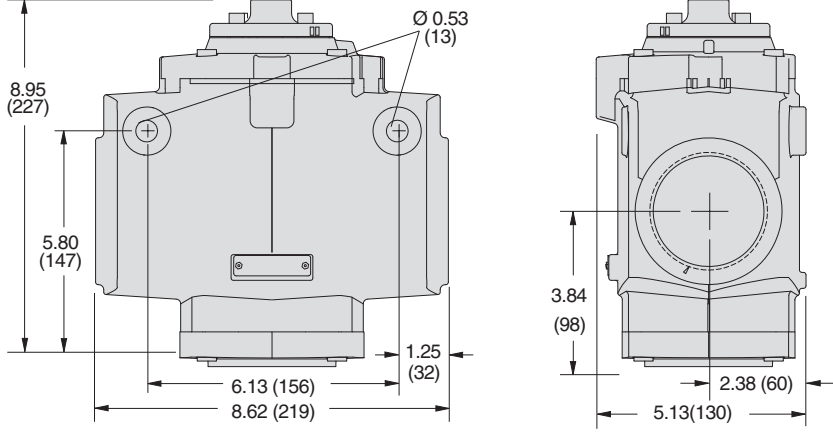
2

1

1/4" Signal Port

Port 2 (Outlet)

Port 1 (Inlet)

DIMENSIONS	Inches (mm)
Body Size 3/8	 Technical drawings of the Body Size 3/8 valve. The front view shows a height of 3.71 (94) inches, a distance from the top to the mounting flange of 2.15 (55) inches, a width of 2.81 (71) inches, and a total width of 3.56 (90) inches. The mounting flange has a diameter of 0.34 (8) inches and a thickness of 0.38 (10) inches. The side view shows a height of 1.46 (37) inches and a width of 3.11 (79) inches, with a mounting flange diameter of 1.53 (39) inches.
Body Size 3/4	 Technical drawings of the Body Size 3/4 valve. The front view shows a height of 4.42 (112) inches, a distance from the top to the mounting flange of 2.74 (70) inches, a width of 3.25 (83) inches, and a total width of 4.56 (116) inches. The mounting flange has a diameter of 0.34 (8) inches and a thickness of 0.66 (17) inches. The side view shows a height of 1.80 (46) inches and a width of 3.11 (79) inches, with a mounting flange diameter of 1.53 (39) inches.
Body Size 1-1/4	 Technical drawings of the Body Size 1-1/4 valve. The front view shows a height of 7.49 (190) inches, a distance from the top to the mounting flange of 4.50 (114) inches, a width of 4.65 (118) inches, and a total width of 6.63 (168) inches. The mounting flange has a diameter of 0.53 (13) inches and a thickness of 0.81 (21) inches. The side view shows a height of 3.09 (78) inches and a width of 4.09 (104) inches, with a mounting flange diameter of 1.78 (45) inches.
Body Size 2	 Technical drawings of the Body Size 2 valve. The front view shows a height of 8.95 (227) inches, a distance from the top to the mounting flange of 5.80 (147) inches, a width of 6.13 (156) inches, and a total width of 8.62 (219) inches. The mounting flange has a diameter of 0.53 (13) inches and a thickness of 1.25 (32) inches. The side view shows a height of 3.84 (98) inches and a width of 5.13 (130) inches, with a mounting flange diameter of 2.38 (60) inches.
Downloadable CAD models available.	

3/2 Pressure Controlled Valves

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

Examples: 2753A2001, D2754A6001.

T

27

5

3

A

2001

CRN Certified

Port Thread	
NPT	
Leave Blank	
G	D

Series

Actuation

Pressure Controlled

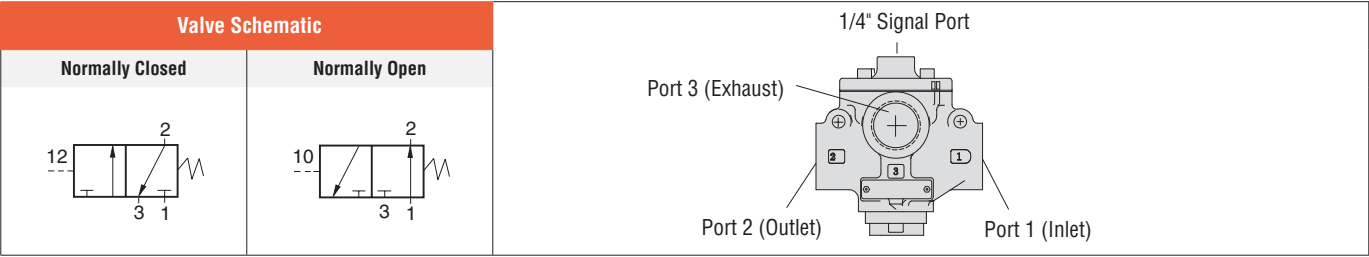
Valve Function	
3/2 Normally Closed	3
3/2 Normally Open	4

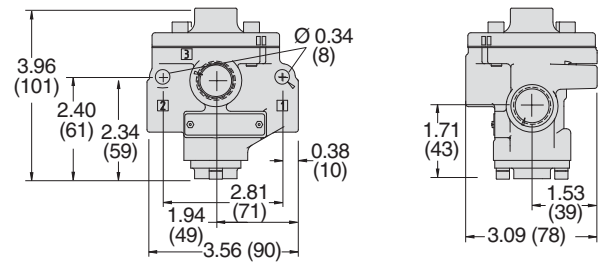
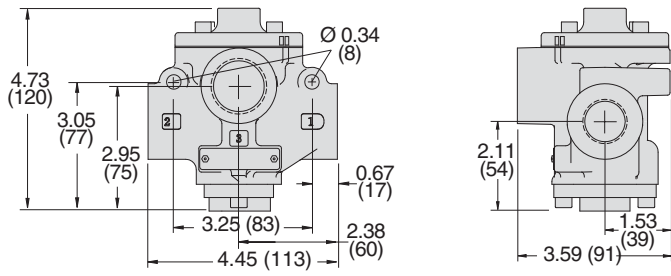
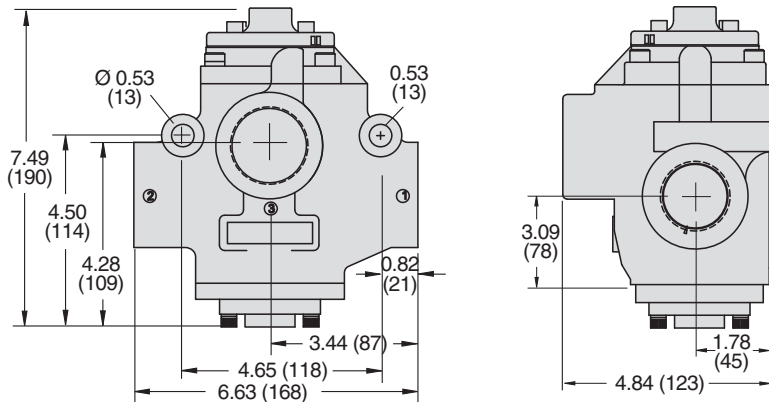
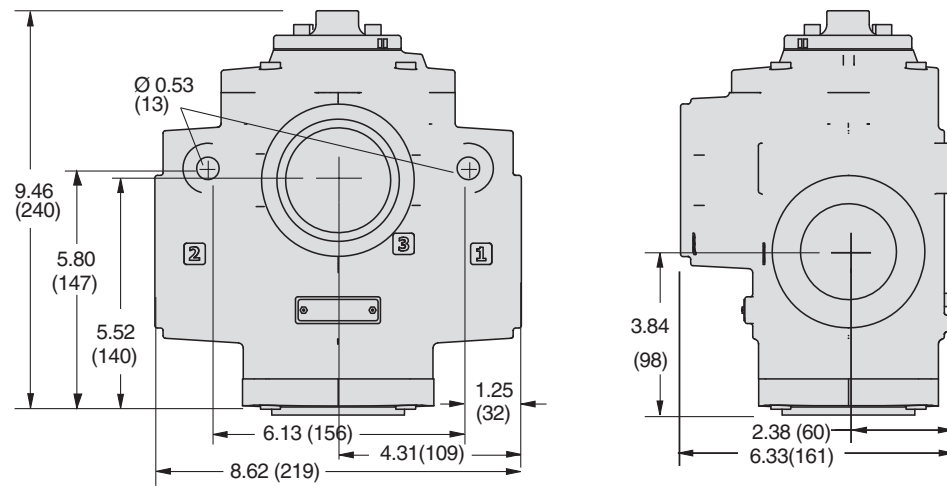
Revision Level

Body Size	Port Size		
	In-Out	Exhaust	
3/8	1/4	1/2	2001
	3/8	1/2	3001
	1/2	1/2	4011
3/4	1/2	1	4001
	3/4	1	5001
	1	1	6011
1-1/4	1	1-1/2	6001
	1-1/4	1-1/2	7001
	1-1/2	1-1/2	8011
2	1-1/2	2-1/2	8001
	2	2-1/2	9001
	2-1/2	2-1/2	9011

Size			Flow C _V (NI/min)				Average Response Constants*						≈ Weight lb (kg)
Body	Port 1, 2	Port 3	Normally Closed (NC)		Normally Open (NO)		M	F					
								NC		NO			
			1-2	2-3	1-2	2-3		1-2	2-3	1-2	2-3		
3/8	1/4	1/2	1.9 (1900)	3.3 (3200)	1.7 (1700)	3.0 (3000)	10	0.90	0.80	0.99	0.88	1.3 (0.6)	
	3/8	1/2	2.9 (2800)	4.4 (4300)	2.8 (2800)	3.0 (3000)	10	0.70	0.50	0.90	0.77		
	1/2	1/2	3.8 (3800)	5.0 (4900)	3.0 (3000)	3.0 (3000)	10	0.75	0.50	0.90	0.76		
3/4	1/2	1	6.2 (6100)	9.4 (9300)	6.1 (6000)	8.0 (7900)	12	0.43	0.17	0.46	0.60	2.0 (0.9)	
	3/4	1	8.2 (8100)	10 (9800)	7.7 (7600)	8.0 (7900)	12	0.36	0.26	0.45	0.60		
	1	1	9.1 (9000)	12 (12000)	8.3 (8200)	8.0 (7900)	12	0.34	0.25	0.40	0.59		
1-1/4	1	1-1/2	21 (21000)	27 (27000)	18 (18000)	20 (20000)	32	0.17	0.14	0.20	0.17	6.0 (2.7)	
	1-1/4	1-1/2	29 (29000)	29 (29000)	21 (21000)	22 (22000)	32	0.15	0.15	0.19	0.17		
	1-1/2	1-1/2	30 (30000)	30 (30000)	21 (21000)	25 (25000)	32	0.15	0.15	0.19	0.16		
2	1-1/2	2-1/2	45 (44000)	75 (74000)	45 (44000)	53 (52000)	76	0.05	0.04	0.07	0.04	15.3 (6.9)	
	2	2-1/2	57 (56000)	78 (77000)	55 (54000)	61 (60000)	76	0.05	0.04	0.05	0.04		
	2-1/2	2-1/2	66 (65000)	82 (81000)	61 (60000)	71 (70000)	76	0.05	0.04	0.05	0.04		

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.



DIMENSIONS	Inches (mm)
Body Size 3/8	 Technical drawings of the Body Size 3/8 valve. The front view shows a central port with a diameter of 0.34 inches (8 mm). Dimensions include a total height of 3.96 inches (101 mm), a mounting flange diameter of 2.40 inches (61 mm), a distance from the flange to the center of the port of 2.34 inches (59 mm), a distance from the center of the port to the bottom of the valve of 1.94 inches (49 mm), a total width of 3.56 inches (90 mm), a distance from the center of the port to the side of the valve of 2.81 inches (71 mm), a distance from the center of the port to the bottom of the valve of 0.38 inches (10 mm), a side view height of 1.71 inches (43 mm), and a side view width of 3.09 inches (78 mm).
Body Size 3/4	 Technical drawings of the Body Size 3/4 valve. The front view shows a central port with a diameter of 0.34 inches (8 mm). Dimensions include a total height of 4.73 inches (120 mm), a mounting flange diameter of 3.05 inches (77 mm), a distance from the flange to the center of the port of 2.95 inches (75 mm), a distance from the center of the port to the bottom of the valve of 3.25 inches (83 mm), a total width of 4.45 inches (113 mm), a distance from the center of the port to the side of the valve of 0.67 inches (17 mm), a distance from the center of the port to the bottom of the valve of 2.38 inches (60 mm), a side view height of 2.11 inches (54 mm), and a side view width of 3.59 inches (91 mm).
Body Size 1-1/4	 Technical drawings of the Body Size 1-1/4 valve. The front view shows a central port with a diameter of 0.53 inches (13 mm). Dimensions include a total height of 7.49 inches (190 mm), a mounting flange diameter of 4.50 inches (114 mm), a distance from the flange to the center of the port of 4.28 inches (109 mm), a distance from the center of the port to the bottom of the valve of 3.44 inches (87 mm), a total width of 6.63 inches (168 mm), a distance from the center of the port to the side of the valve of 0.82 inches (21 mm), a distance from the center of the port to the bottom of the valve of 4.65 inches (118 mm), a side view height of 3.09 inches (78 mm), and a side view width of 4.84 inches (123 mm).
Body Size 2	 Technical drawings of the Body Size 2 valve. The front view shows a central port with a diameter of 0.53 inches (13 mm). Dimensions include a total height of 9.46 inches (240 mm), a mounting flange diameter of 5.80 inches (147 mm), a distance from the flange to the center of the port of 5.52 inches (140 mm), a distance from the center of the port to the bottom of the valve of 1.25 inches (32 mm), a total width of 8.62 inches (219 mm), a distance from the center of the port to the side of the valve of 4.31 inches (109 mm), a distance from the center of the port to the bottom of the valve of 6.13 inches (156 mm), a side view height of 3.84 inches (98 mm), and a side view width of 6.33 inches (161 mm).
Downloadable CAD models available.	

4/2 Pressure Controlled Valves

MODEL NUMBER CONFIGURATOR

4-Way 2-Position Valves

Examples: 2756A2001, D2756A4011.

CRN Certified

Port Thread

NPT

Leave Blank

G

D

Series

Actuation

Pressure Controlled

Valve Function

4/2

Revision Level

T

27

5

6

A

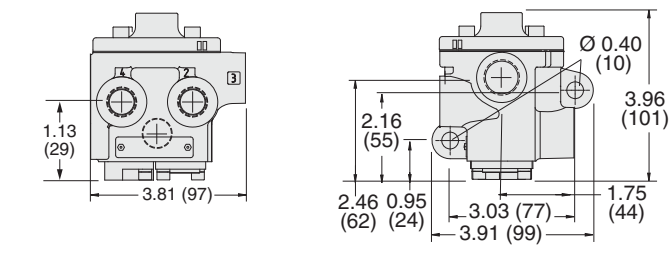
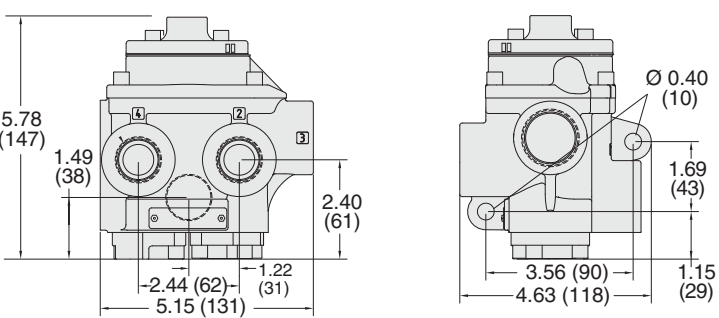
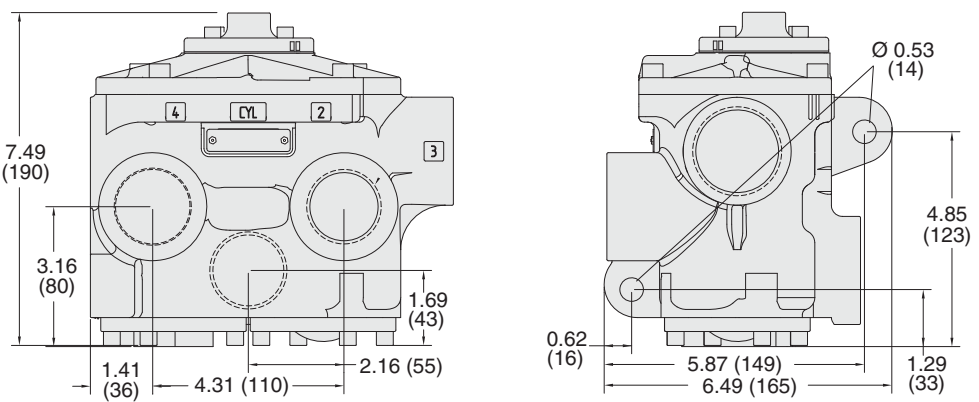
2001

Body Size	Port Size		
	In-Out	Exhaust	
3/8	1/4	1/2	2001
	3/8	1/2	3001
	1/2	1/2	4011
3/4	1/2	1	4001
	3/4	1	5001
	1	1	6011
1-1/4	1	1-1/2	6001
	1-1/4	1-1/2	7001
	1-1/2	1-1/2	8011

Size			Flow C _V (NI/min)		Average Response Constants*			≈ Weight lb (kg)
Body	Port 1, 2, 4	Port 3			M	F		
			1-2, 1-4	4-3, 2-3		1-2, 1-4	4-3, 2-3	
3/8	1/4	1/2	2.1 (2100)	2.9 (2900)	10	0.92	0.92	1.8 (0.8)
	3/8	1/2	2.9 (2900)	4.2 (4100)	10	0.90	0.90	
	1/2	1/2	3.1 (3100)	4.3 (4200)	10	0.89	0.73	
3/4	1/2	1	5.6 (5500)	8.1 (8000)	26	0.50	0.66	4.3 (1.9)
	3/4	1	7.0 (6900)	9.3 (9200)	26	0.36	0.55	
	1	1	7.8 (7700)	10 (9800)	26	0.35	0.50	
1-1/4	1	1-1/2	19 (19000)	26 (26000)	79	0.22	0.22	10.3 (4.6)
	1-1/4	1-1/2	21 (21000)	27 (27000)	79	0.18	0.18	
	1-1/2	1-1/2	22 (22000)	27 (27000)	79	0.15	0.15	

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

DIMENSIONS	Inches (mm)
Body Size 3/8	 Technical drawings of the Body Size 3/8 valve. The front view shows a width of 3.81 (97) and a height of 1.13 (29). The side view shows a total height of 3.96 (101), a mounting hole diameter of Ø 0.40 (10), and various other dimensions: 2.16 (55), 2.46 (62), 0.95 (24), 3.03 (77), 3.91 (99), and 1.75 (44).
Body Size 3/4	 Technical drawings of the Body Size 3/4 valve. The front view shows a width of 5.15 (131) and a height of 5.78 (147). The side view shows a total height of 4.63 (118) and a mounting hole diameter of Ø 0.40 (10). Other dimensions include 1.49 (38), 2.40 (61), 1.22 (31), 2.44 (62), 3.56 (90), and 1.15 (29).
Body Size 1-1/4	 Technical drawings of the Body Size 1-1/4 valve. The front view shows a width of 6.49 (165) and a height of 7.49 (190). The side view shows a total height of 4.85 (123) and a mounting hole diameter of Ø 0.53 (14). Other dimensions include 3.16 (80), 1.69 (43), 1.41 (36), 4.31 (110), 2.16 (55), 0.62 (16), 5.87 (149), and 1.29 (33).
Downloadable CAD models available.	

2/2 High-Pressure (20 Bar) Single Pressure Controlled Valves

MODEL NUMBER CONFIGURATOR

2-Way 2-Position Valves

Examples: T2751A5001, TD2751A5001.

CRN Certified

Port Thread

Series

Actuation

T

27

5

1

A

5001

Port Size

In-Out

3/4

Revision Level

Valve Function

2/2 Normally Closed

1

2/2 Normally Open

2

NPT

Leave Blank

G

D

Pressure Controlled

Size		Flow C _v (NI/min)		Average Response Constants*			≈ Weight lb (kg)
Body	Port 1, 2	Normally Closed (NC)	Normally Open (NO)	M	F		
		1-2	1-2		NC	NO	
3/4	3/4	9.1 (9000)	8.2 (8100)	14	0.34	0.39	3.3 (1.5)

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

Normally Closed

Normally Open

12

2

1

10

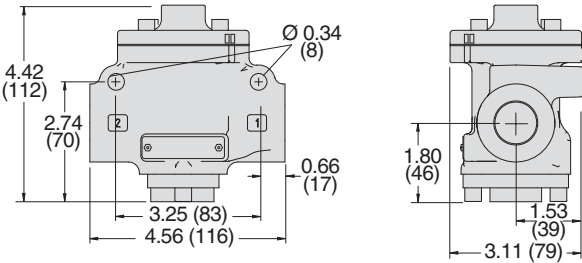
2

1

1/4" Signal Port

Port 2 (Outlet)

Port 1 (Inlet)

DIMENSIONS	Inches (mm)
Body Size 3/4	 Technical drawing of a Ross valve body showing front and side views with dimensions. The front view (left) shows a square body with a central port. Dimensions include a total height of 4.42 (112), a mounting flange height of 2.74 (70), a central port diameter of 0.34 (8), a side port diameter of 0.66 (17), a central port width of 3.25 (83), and a total width of 4.56 (116). The side view (right) shows a circular port with a diameter of 1.80 (46), a central port width of 1.53 (39), and a total width of 3.11 (79).
	Downloadable CAD models available.

Inline Poppet Valves 21 Series – High Temperature and Low Temperature Applications

Product Overview

Registered in Canada to the ASME B31.3, Process Piping, in the following jurisdictions:

Internal Pilot Supply Valves
CRN
0C1409.53469087YTN

British Columbia
Manitoba
New Brunswick

Newfoundland
Northwest Territories
Nova Scotia

Nunavut
Ontario
Quebec

Prince Edward Island
Yukon Territory

External Pilot Supply Valves
CRN
0C1409.5

Ontario

Solenoid Pilot Controlled	Pressure Controlled
	

Illustration examples.

Directional Control Function

Directional control valves function is to control the direction of flow in the pneumatic circuit. Directional control valves are able to control the way the air passes. These valves can regulate the airflow being capable to stop fluid flow, allow fluid flow, and change the direction of fluid flow. These three functions usually operate in combination.

VALVE FEATURES

Poppet Design	Poppet construction for high dirt tolerance Valves are designed with metal internals and special seals appropriate for use in more extreme temperatures
Mounting Options	Can be mounted close to actuator, reducing length of pipe to be pressurized/exhausted on each cycle
Pilot Supply	Internal or external
High Velocity	Near zero leakage
Positive Sealing	No sliding action to prevent damage and wear
Reliability	Consistent response times over the life of the valve

PRODUCT CREDENTIALS

Canadian Registration Number (CRN) 0C1409.53469087YTN 0C1409.5	Certificate of Compliance 	Safety Integrity Level Per IEC 2061:2001 	Declaration of Conformity  
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Valve Actuation	Available Inlet Port Sizes							Functions			Maximum Flow C _v (NI/min)	Page
	1/4	3/8	1/2	3/4	1	1-1/4	1-1/2	2/2	3/2	4/2		
Solenoid Pilot Controlled	●	●	●	●	●	●	●	●	●	●	33 (32000)	22 – 27
Pressure Controlled	●	●	●	●	●	●	●	●	●	●	33 (32000)	28 – 33
Pressure Controlled with Pres- sure Booster Adaptor		●		●	●			●			33 (32000)	34 – 35
Accessories and Options												83 – 97

STANDARD SPECIFICATIONS						
GENERAL	Function		2/2 Valve	Normally Closed		
				Normally Open		
			3/2 Valve	Normally Closed		
				Normally Open		
			4/2 Valve			
	Construction Design		Poppet			
	Actuation		Electrical	Solenoid Pilot Controlled		
			Pneumatic	Pressure Controlled		
	Mounting	Type	Inline			
Orientation		Any, preferably vertical				
Connection		Threaded Port	NPT			
			G			
Manual Override (Solenoid Controlled valves)		Non-locking metal button, standard				
OPERATING CONDITIONS	Temperature	Solenoid Pilot Controlled	High Temperature	Ambient	0° to 250°F (-17° to 122°C)	
				Media	0° to 300°F (-17° to 150°C)	
			Low Temperature	Ambient	-40° to 120°F (-40° to 50°C)	
				Media	-40° to 175°F (-40° to 80°C)	
			For temperatures below 40° F (4° C) air must be free of water vapor to prevent formation of ice			
			Pressure Controlled	High Temperature	Ambient	0° to 300°F (-17° to 150°C)
		Media				
		Low Temperature		Ambient	-40° to 175°F (-40° to 80°C)	
				Media		
		For temperatures below 40° F (4° C) air must be free of water vapor to prevent formation of ice				
		Maximum Design Proof Temperature		High Temperature	250°F (122°C)	
				Low Temperature	120°F (50°C)	
	Flow Media		Filtered air			
	Operating Pressure		30 to 150 psig (2 to 10 bar)			
	Maximum Design Proof Pressure		150 psig (10 bar)			
	Pilot Supply Pressure		Internal	Must meet minimum operating pressure		
			External	Must be equal to or greater than inlet pressure		
ELECTRICAL DATA FOR SOLENOID PILOT VALVES	Solenoids		Current Flow	Operating Voltage	Power Consumption (each solenoid)	
			DC	24 volts DC	14 watts	
			AC	110-120 volts, 50/60 Hz	87 VA inrush, 30 VA holding	
				230-240 volts, 60 Hz		
			Rated for continuous duty			
CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum			
	Poppet		Aluminum and Stainless Steel			
	Seals	High Temperature	Fluorocarbon	Viton		
		Low Temperature	Nitrile Rubber	Buna-N		
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 d 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.						



2/2 Solenoid Pilot Controlled Valves

MODEL NUMBER CONFIGURATOR

2-Way 2-Position Valves

Examples: T2171B2001W, TD2171B4012Z.

T		21	7	1	B	200	1	W
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CRN Certified

Port Thread

NPT

Leave Blank

G

D

Series

Actuation

Solenoid Pilot

Valve Function

2/2 Normally Closed

1

2/2 Normally Open

2

Revision Level

Current	Voltage*	
DC	24 V	W
AC	110-120 V, 50/60 Hz	Z
	230-250 V, 60 Hz	Y

* For other voltages consult ROSS.

Body Size	Port Size	Internal Pilot Supply	External Pilot Supply
	In-Out		
3/8	1/4	200	205
	3/8	300	305
	1/2	401	406
3/4	1/2	400	405
	3/4	500	505
	1	601	606
1-1/4	1	600	605
	1-1/4	700	705
	1-1/2	801	806

Application		
High Temperature	0° to 250°F (-17° to 122°C)	1
Fluorocarbon Seals		
Low Temperature	-40° to 120°F (-40° to 50°C)	2
Buna-N Seals		

Size		Flow C _v (NI/min)		Average Response Constants *			≈ Weight lb (kg)
Body	Port 1, 2	Normally Closed (NC)	Normally Open (NO)	M	F		
		1-2	1-2		NC	NO	
3/8	1/4	1.7 (1700)	1.6 (1600)	10	0.96	0.96	3.0 (1.4)
	3/8	2.2 (2200)	2.5 (2500)	10	0.90	0.93	
	1/2	2.6 (2600)	2.8 (2800)	10	0.82	0.88	
3/4	1/2	6.6 (6500)	6.3 (6200)	14	0.39	0.50	3.3 (1.5)
	3/4	7.7 (7600)	7.4 (7300)	14	0.32	0.37	
	1	8.3 (8200)	7.6 (7500)	14	0.31	0.36	
1-1/4	1	20 (20000)	19 (19000)	26	0.19	0.20	7.5 (3.4)
	1-1/4	29 (29000)	23 (23000)	26	0.14	0.18	
	1-1/2	31 (31000)	23 (23000)	26	0.13	0.17	

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

Normally Closed

Normally Open

Manual Override

Solenoid Pilot

Y-3

1/8" Pilot Exhaust Port

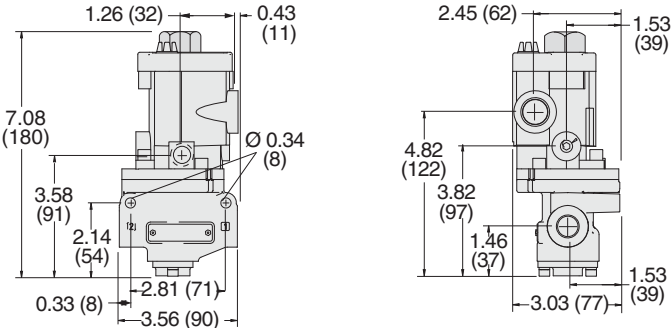
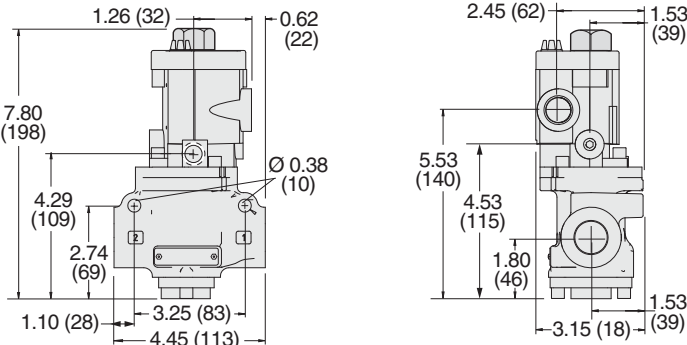
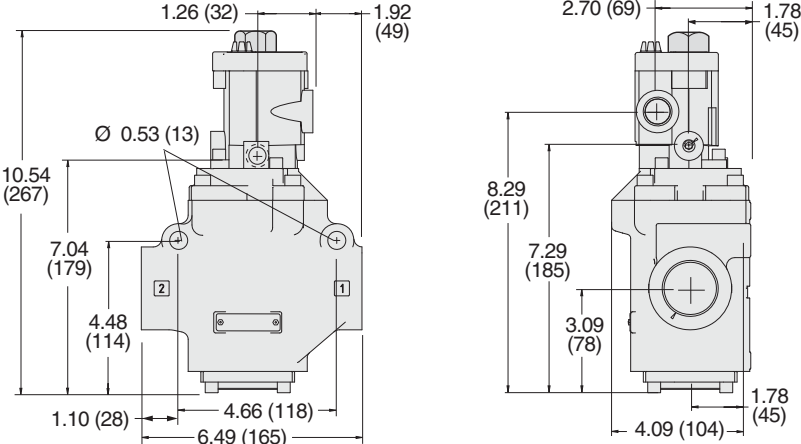
Port 2 (Outlet)

Port 1 (Inlet)

1/2 Electrical Conduit Port

X-1

1/8" External Pilot Supply

DIMENSIONS	Inches (mm)
Body Size 3/8	 Technical drawings of the Body Size 3/8 valve. The front view (left) shows dimensions: 1.26 (32) for top width, 0.43 (11) for top thickness, 7.08 (180) for total height, 3.58 (91) for mounting flange height, 2.14 (54) for mounting flange thickness, 0.33 (8) for base width, 2.81 (71) for base thickness, and 3.56 (90) for base width. A port diameter of Ø 0.34 (8) is indicated. The side view (right) shows dimensions: 2.45 (62) for top width, 1.53 (39) for top thickness, 4.82 (122) for total height, 3.82 (97) for mounting flange height, 1.46 (37) for mounting flange thickness, 3.03 (77) for base width, and 1.53 (39) for base thickness.
Body Size 3/4	 Technical drawings of the Body Size 3/4 valve. The front view (left) shows dimensions: 1.26 (32) for top width, 0.62 (22) for top thickness, 7.80 (198) for total height, 4.29 (109) for mounting flange height, 2.74 (69) for mounting flange thickness, 1.10 (28) for base width, 3.25 (83) for base thickness, and 4.45 (113) for base width. A port diameter of Ø 0.38 (10) is indicated. The side view (right) shows dimensions: 2.45 (62) for top width, 1.53 (39) for top thickness, 5.53 (140) for total height, 4.53 (115) for mounting flange height, 1.80 (46) for mounting flange thickness, 3.15 (81) for base width, and 1.53 (39) for base thickness.
Body Size 1-1/4	 Technical drawings of the Body Size 1-1/4 valve. The front view (left) shows dimensions: 1.26 (32) for top width, 1.92 (49) for top thickness, 10.54 (267) for total height, Ø 0.53 (13) for port diameter, 7.04 (179) for mounting flange height, 4.48 (114) for mounting flange thickness, 1.10 (28) for base width, 4.66 (118) for base thickness, and 6.49 (165) for base width. The side view (right) shows dimensions: 2.70 (69) for top width, 1.78 (45) for top thickness, 8.29 (211) for total height, 7.29 (185) for mounting flange height, 3.09 (78) for mounting flange thickness, 4.09 (104) for base width, and 1.78 (45) for base thickness.
Downloadable CAD models available.	

3/2 Solenoid Pilot Controlled Valves

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

Examples: T2173B2001W, TD2174B4012Z.

T		21	7	3	B	200	1	W
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CRN Certified

Port Thread
NPT
Leave Blank
G

Series

Actuation
Solenoid Pilot

Valve Function
3/2 Normally Closed
3/2 Normally Open

Revision Level

Current	Voltage *	
DC	24 V	W
AC	110-120 V, 50/60 Hz	Z
	230-250 V, 60 Hz	Y

* For other voltages consult ROSS.

Body Size	Port Size		Internal Pilot Supply	External Pilot Supply
	In-Out	Exhaust		
3/8	1/4	1/2	200	205
	3/8	1/2	300	305
	1/2	1/2	401	406
3/4	1/2	1	400	405
	3/4	1	500	505
	1	1	601	606
1-1/4	1	1-1/2	600	605
	1-1/4	1-1/2	700	705
	1-1/2	1-1/2	801	806

Application		
High Temperature 0° to 250°F (-17° to 122°C) Fluorocarbon Seals		1
Low Temperature -40° to 120°F (-40° to 50°C) Buna-N Seals		2

Size			Flow C _v (NI/min)				Average Response Constants *				≈ Weight lb (kg)	
Body	Port 1, 2	Port 3	Normally Closed (NC)		Normally Open (NO)		M	F				
								NC		NO		
			1-2	2-3	1-2	2-3		1-2	2-3	1-2		2-3
3/8	1/4	1/2	1.7 (1700)	3.2 (3100)	1.7 (1700)	2.4 (2400)	10	1.76	2.08	1.60	2.30	3.0 (1.4)
	3/8	1/2	2.5 (2500)	4.4 (4300)	2.7 (2700)	2.6 (2600)	10	0.95	1.07	1.03	1.60	
	1/2	1/2	2.6 (2600)	4.6 (4600)	3.0 (3000)	2.8 (2800)	10	0.94	0.98	11.00	2.00	
3/4	1/2	1	6.0 (5900)	8.8 (8700)	5.9 (5800)	7.6 (7500)	11	0.58	0.64	0.50	0.70	3.3 (1.5)
	3/4	1	7.5 (7400)	11 (11000)	7.5 (7400)	8.0 (7900)	11	0.38	0.41	0.43	0.67	
	1	1	7.9 (7800)	12 (12000)	8.3 (8200)	8.4 (8300)	11	0.24	0.36	0.42	0.60	
1-1/4	1	1-1/2	20 (20000)	27 (27000)	19 (19000)	23 (23000)	28	0.16	0.18	0.17	0.20	7.5 (3.4)
	1-1/4	1-1/2	28 (28000)	33 (32000)	22 (22000)	25 (25000)	28	0.12	0.17	0.15	0.19	
	1-1/2	1-1/2	29 (29000)	33 (32000)	22 (22000)	26 (26000)	28	0.12	0.16	0.13	0.18	

* Valve Response Time – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

Normally Closed

Normally Open

Manual Override

Solenoid Pilot

Y-3

1/8" Pilot Exhaust Port

Port 3 (Exhaust)

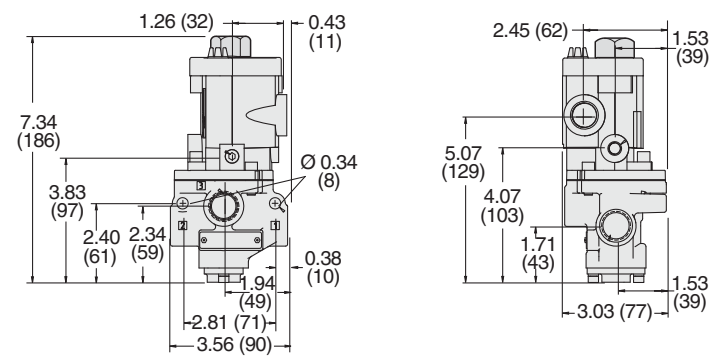
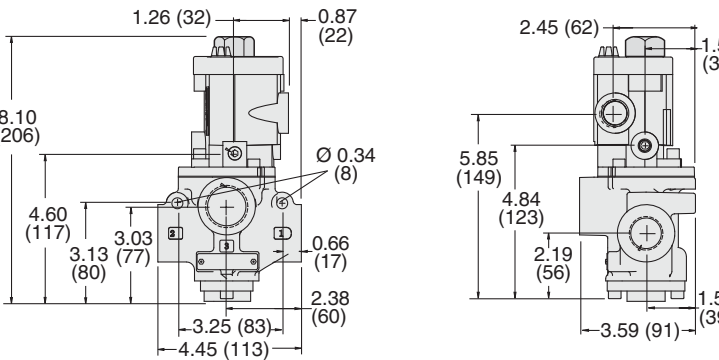
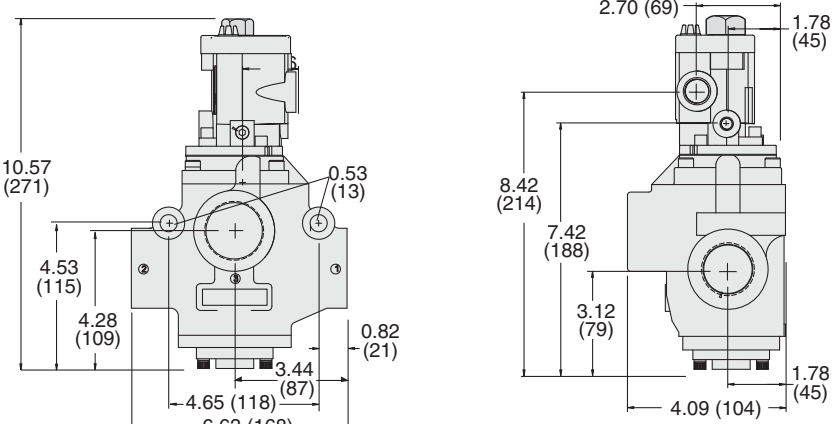
Port 2 (Outlet)

Port 1 (Inlet)

1/2" Electrical Conduit Port

X-1

1/8" External Pilot Supply Port

DIMENSIONS	Inches (mm)
Body Size 3/8	 Technical drawings of the Body Size 3/8 valve. The front view (left) shows dimensions: 1.26 (32) for top width, 0.43 (11) for top thickness, 7.34 (186) for total height, 3.83 (97) for mounting flange height, 2.40 (61) for mounting flange width, 2.34 (59) for mounting flange thickness, 0.38 (10) for bottom flange thickness, 1.94 (49) for bottom flange width, 2.81 (71) for bottom flange width, and 3.56 (90) for bottom flange width. The side view (right) shows dimensions: 2.45 (62) for top width, 1.53 (39) for top thickness, 5.07 (129) for total height, 4.07 (103) for mounting flange height, 1.71 (43) for mounting flange width, 1.53 (39) for bottom flange thickness, and 3.03 (77) for bottom flange width. A central port diameter of Ø 0.34 (8) is indicated.
Body Size 3/4	 Technical drawings of the Body Size 3/4 valve. The front view (left) shows dimensions: 1.26 (32) for top width, 0.87 (22) for top thickness, 8.10 (206) for total height, 4.60 (117) for mounting flange height, 3.03 (77) for mounting flange width, 3.13 (80) for mounting flange thickness, 0.66 (17) for bottom flange thickness, 2.38 (60) for bottom flange width, 3.25 (83) for bottom flange width, and 4.45 (113) for bottom flange width. The side view (right) shows dimensions: 2.45 (62) for top width, 1.53 (39) for top thickness, 5.85 (149) for total height, 4.84 (123) for mounting flange height, 2.19 (56) for mounting flange width, 1.53 (39) for bottom flange thickness, and 3.59 (91) for bottom flange width. A central port diameter of Ø 0.34 (8) is indicated.
Body Size 1-1/4	 Technical drawings of the Body Size 1-1/4 valve. The front view (left) shows dimensions: 10.57 (271) for total height, 4.53 (115) for mounting flange height, 4.28 (109) for mounting flange thickness, 0.53 (13) for bottom flange thickness, 0.82 (21) for bottom flange width, 3.44 (87) for bottom flange width, 4.65 (118) for bottom flange width, and 6.63 (168) for bottom flange width. The side view (right) shows dimensions: 2.70 (69) for top width, 1.78 (45) for top thickness, 8.42 (214) for total height, 7.42 (188) for mounting flange height, 3.12 (79) for mounting flange width, 1.78 (45) for bottom flange thickness, and 4.09 (104) for bottom flange width. A central port diameter of Ø 0.53 (13) is indicated.
Downloadable CAD models available.	

4/2 Solenoid Pilot Controlled Valves

MODEL NUMBER CONFIGURATOR

4-Way 2-Position Valves

Examples: T2176B2001W, TD2176B4012Z.

T		21	7	6	B	200	1	W
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CRN Certified

Port Thread

NPT

Leave Blank

G

D

Series

Actuation

Solenoid Pilot

Valve Function

4/2

Revision Level

Current	Voltage*	
DC	24 V	W
AC	110-120 V, 50/60 Hz	Z
	230-250 V, 60 Hz	Y

* For other voltages consult ROSS.

Body Size	Port Size		Internal Pilot Supply	External Pilot Supply
	In-Out	Exhaust		
3/8	1/4	1/2	200	205
	3/8	1/2	300	305
	1/2	1/2	401	406
3/4	1/2	1	400	405
	3/4	1	500	505
	1	1	601	606
1-1/4	1	1-1/2	600	605
	1-1/4	1-1/2	700	705
	1-1/2	1-1/2	801	806

Application		
High Temperature 0° to 250°F (-17° to 122°C) Fluorocarbon Seals		1
Low Temperature -40° to 120°F (-40° to 50°C) Buna-N Seals		2

Size			Flow C _V (NL/min)				Average Response Constants *			≈ Weight lb (kg)
Body	Port 1, 2, 4	Port 3					M	F		
			1-2	2-3	1-4	4-3		1-2, 1-4	2-3, 4-3	
3/8	1/4	1/2	1.6 (1600)	2.3 (2300)	1.7 (1700)	2.7 (2700)	30	1.70	2.28	3.0 (1.4)
	3/8	1/2	2.6 (2600)	3.1 (3100)	2.8 (2800)	3.6 (3500)	30	1.13	1.33	
	1/2	1/2	3.1 (3100)	3.8 (3700)	2.9 (2900)	4.6 (4500)	30	1.00	1.22	
3/4	1/2	1	5.3 (5200)	6.4 (6300)	4.5 (4400)	6.9 (6800)	46	0.50	0.76	5.8 (2.6)
	3/4	1	7.0 (6900)	7.7 (7600)	6.3 (6200)	10 (9800)	46	0.36	0.55	
	1	1	7.6 (7500)	7.7 (7600)	6.4 (6300)	11 (11000)	46	0.36	0.50	
1-1/4	1	1-1/2	14 (14000)	22 (22000)	18 (18000)	24 (24000)	99	0.19	0.22	12.0 (5.4)
	1-1/4	1-1/2	17 (17000)	24 (24000)	25 (25000)	28 (28000)	99	0.19	0.22	
	1-1/2	1-1/2	19 (19000)	24 (24000)	26 (20000)	28 (28000)	99	0.16	0.22	

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

Manual Override

Solenoid Pilot

X-1

1/8" External Pilot Supply Port

Port 3 (Exhaust)

1/2" Electrical Conduit Port

Y-3

1/8" Pilot Exhaust Port

Port 4 (Outlet)

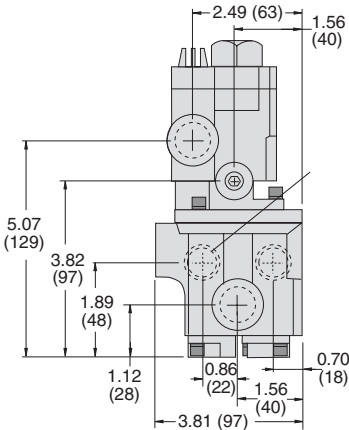
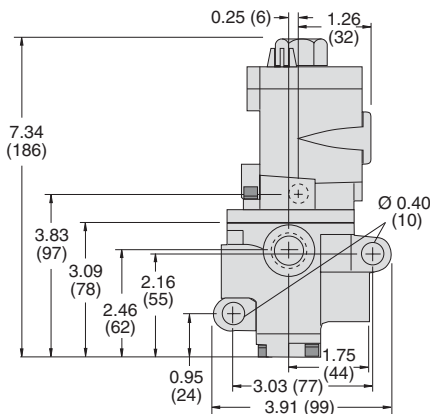
Port 2 (Outlet)

Port 1 (Inlet)

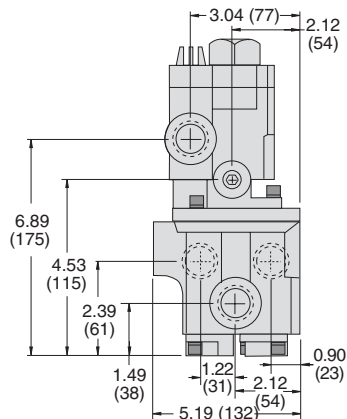
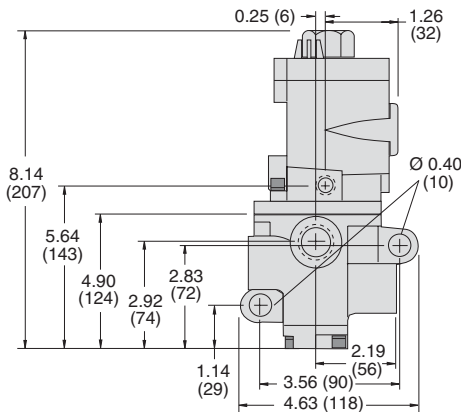
DIMENSIONS

Inches (mm)

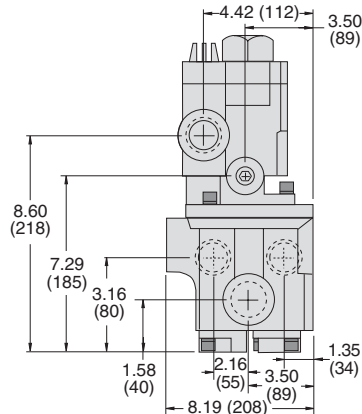
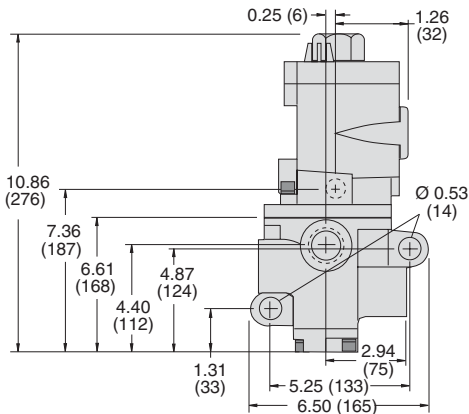
Body Size 3/8



Body Size 3/4



Body Size 1-1/4



Downloadable CAD models available.

2/2 Pressure Controlled Valves

MODEL NUMBER CONFIGURATOR

2-Way 2-Position Valves

Examples: T2171B2001, TD2172B4012.

T

21

7

1

B

200

1

CRN Certified

Port Thread

NPT

Leave Blank

G

D

Series

Actuation

Pressure Controlled

Valve Function

2/2 Normally Closed

1

2/2 Normally Open

2

Revision Level

Application

High Temperature

0° to 300°F (-17° to 150°C)

Low Temperature

-40° to 175°F (-40° to 80°C)

Valve Seals

Fluorocarbon

1

Buna-N

2

Body Size

3/8

3/4

1-1/4

Port Size

In-Out

1/4

3/8

1/2

1/2

3/4

1

1

1-1/4

1-1/2

200

300

401

400

500

601

600

700

801

Size		Flow C _v (NI/min)		Average Response Constants *			≈ Weight lb (kg)	
Body	Port 1,2	Normally Closed (NC)	Normally Open (NO)	M	F			
		1-2	1-2		NC	NO		
3/8	1/4	1.7 (1700)	1.6 (1600)	10	0.91	0.91	1.8 (0.8)	
	3/8	2.2 (2200)	2.5 (2500)	10	0.70	0.76		
	1/2	2.6 (2600)	2.8 (2800)	10	0.64	0.72		
3/4	1/2	6.6 (6500)	6.3 (6200)	16	0.37	0.43	4.2 (2.0)	
	3/4	7.7 (7600)	7.4 (7300)	16	0.34	0.39		
	1	8.3 (8200)	7.6 (7500)	16	0.34	0.37		
1-1/4	1	20 (20000)	19 (19000)	27	0.17	0.17	11.0 (5.0)	
	1-1/4	29 (29000)	23 (23000)	27	0.19	0.19		
	1-1/2	31 (31000)	23 (23000)	27	0.18	0.18		

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

Normally Closed

Normally Open

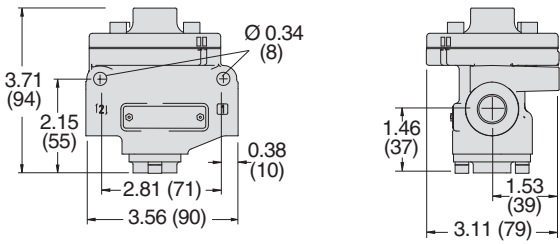
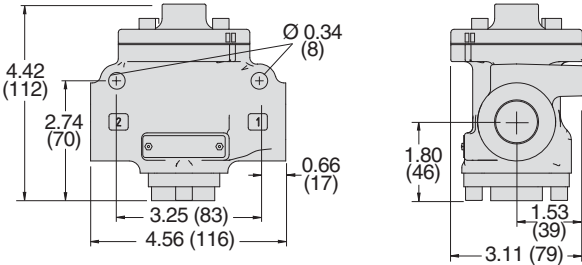
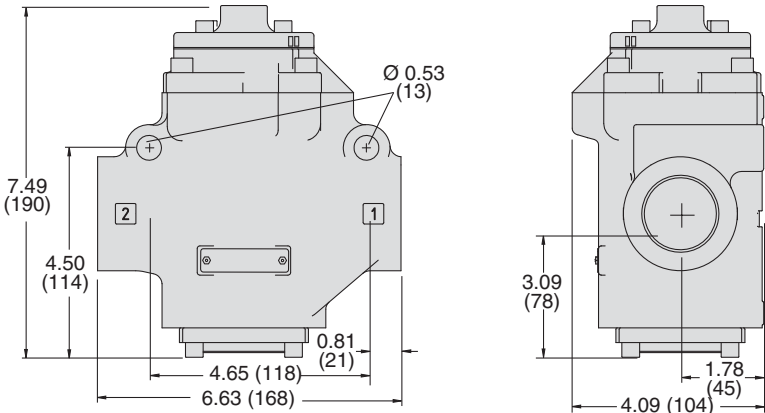
1/4" Signal Port

Port 2 (Outlet)

Port 1 (Inlet)

28

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DIMENSIONS	Inches (mm)
Body Size 3/8	 Technical drawings of the Body Size 3/8 valve. The front view shows a total height of 3.71 (94), a mounting hole diameter of Ø 0.34 (8), a distance of 2.15 (55) from the base to the mounting holes, a base width of 2.81 (71), a side flange width of 0.38 (10), and a total base width of 3.56 (90). The side view shows a height of 1.46 (37) and a base width of 3.11 (79).
Body Size 3/4	 Technical drawings of the Body Size 3/4 valve. The front view shows a total height of 4.42 (112), a mounting hole diameter of Ø 0.34 (8), a distance of 2.74 (70) from the base to the mounting holes, a base width of 3.25 (83), a side flange width of 0.66 (17), and a total base width of 4.56 (116). The side view shows a height of 1.80 (46) and a base width of 3.11 (79).
Body Size 1-1/4	 Technical drawings of the Body Size 1-1/4 valve. The front view shows a total height of 7.49 (190), a mounting hole diameter of Ø 0.53 (13), a distance of 4.50 (114) from the base to the mounting holes, a base width of 4.65 (118), a side flange width of 0.81 (21), and a total base width of 6.63 (168). The side view shows a height of 3.09 (78) and a base width of 4.09 (104).
Downloadable CAD models available.	

3/2 Pressure Controlled Valves

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

Examples: T2173B2001W, TD2174B4012Z.

T

21

7

3

B

200

1

CRN Certified

Port Thread	
NPT	
Leave Blank	
G	D

Series

Actuation

Pressure Controlled

Valve Function	
3/2 Normally Closed	3
3/2 Normally Open	4

Revision Level

Application	Valve Seals	
High Temperature 0° to 300°F (-17° to 150°C)	Fluorocarbon	1
Low Temperature -40° to 175°F (-40° to 80°C)	Buna-N	2

Body Size	Port Size		
	In-Out	Exhaust	
3/8	1/4	1/2	200
	3/8	1/2	300
	1/2	1/2	401
3/4	1/2	1	400
	3/4	1	500
	1	1	601
1-1/4	1	1-1/2	600
	1-1/4	1-1/2	700
	1-1/2	1-1/2	801

Size				Flow C _v (NI/min)				Average Response Constants *				≈ Weight lb (kg)	
Body	Port 1	Port 2	Port 3	Normally Closed (NC)		Normally Open (NO)		M	F				
									NC		NO		
				1-2	2-3	1-2	2-3		1-2	2-3	1-2		2-3
3/8	1/4	1/4	1/2	1.7 (1700)	3.2 (3100)	1.7 (1700)	2.4 (2400)	10	1.76	2.08	1.60	2.30	1.8 (0.8)
	3/8	3/8	1/2	2.5 (2500)	4.4 (4300)	2.7 (2700)	2.6 (2600)	10	0.95	1.07	1.03	1.60	
	1/2	1/2	1/2	2.6 (2600)	4.6 (4600)	3.0 (3000)	2.8 (2800)	10	0.94	0.98	11.00	2.00	
3/4	1/2	1/2	1	6.0 (5900)	8.8 (8700)	5.9 (5800)	7.6 (7500)	11	0.58	0.64	0.50	0.70	4.5 (2.1)
	3/4	3/4	1	7.5 (7400)	11 (11000)	7.5 (7400)	8.0 (7900)	11	0.38	0.41	0.43	0.67	
	1	1	1	7.9 (7800)	12 (12000)	8.3 (8200)	8.4 (8300)	11	0.24	0.36	0.42	0.60	
1-1/4	1	1	1-1/2	20 (20000)	27 (27000)	19 (19000)	23 (23000)	28	0.16	0.18	0.17	0.20	11.0 (5.0)
	1-1/4	1-1/4	1-1/2	28 (28000)	33 (32000)	22 (22000)	25 (25000)	28	0.12	0.17	0.15	0.19	
	1-1/2	1-1/2	1-1/2	29 (29000)	33 (32000)	22 (22000)	26 (26000)	28	0.12	0.16	0.13	0.18	

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

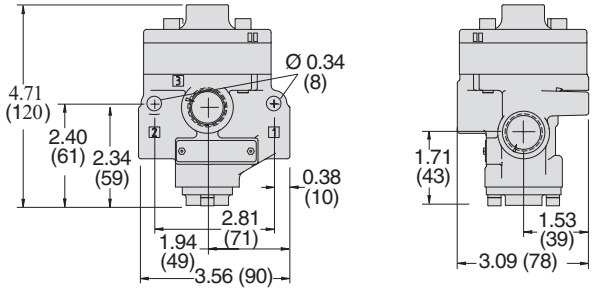
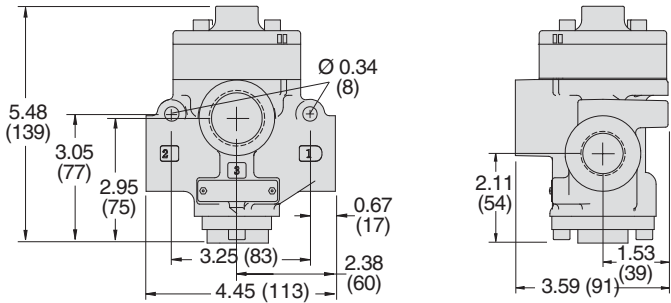
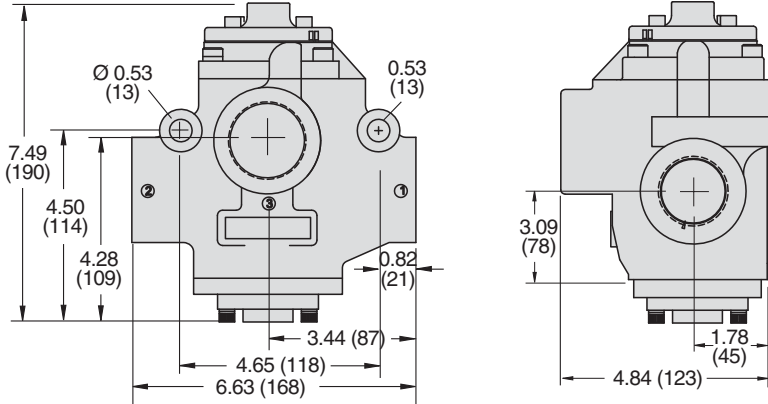
Normally Closed	Normally Open

1/4" Signal Port

Port 3 (Exhaust)

Port 2 (Outlet)

Port 1 (Inlet)

DIMENSIONS	Inches (mm)
Body Size 3/8	 Technical drawings of the Body Size 3/8 valve. The front view shows a central port with a diameter of 0.34 inches (8 mm). Dimensions include a total height of 4.71 inches (120 mm), a mounting flange diameter of 3.56 inches (90 mm), and a base width of 1.94 inches (49 mm). The side view shows a total width of 3.09 inches (78 mm) and a mounting flange diameter of 1.53 inches (39 mm).
Body Size 3/4	 Technical drawings of the Body Size 3/4 valve. The front view shows a central port with a diameter of 0.34 inches (8 mm). Dimensions include a total height of 5.48 inches (139 mm), a mounting flange diameter of 4.45 inches (113 mm), and a base width of 3.25 inches (83 mm). The side view shows a total width of 3.59 inches (91 mm) and a mounting flange diameter of 1.53 inches (39 mm).
Body Size 1-1/4	 Technical drawings of the Body Size 1-1/4 valve. The front view shows a central port with a diameter of 0.53 inches (13 mm). Dimensions include a total height of 7.49 inches (190 mm), a mounting flange diameter of 6.63 inches (168 mm), and a base width of 4.65 inches (118 mm). The side view shows a total width of 4.84 inches (123 mm) and a mounting flange diameter of 1.78 inches (45 mm).
Downloadable CAD models available.	

4/2 Pressure Controlled Valves

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

Examples: T2173B2001W, TD2174B4012Z.

T		21	7	6	B	200	1
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CRN Certified

Port Thread
NPT
Leave Blank
G

D

Series

Actuation
Pressure Controlled

Valve Function
4/2

Revision Level

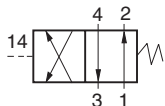
Application	Valve Seals	
High Temperature 0° to 300°F (-17° to 150°C)	Fluorocarbon	1
Low Temperature -40° to 175°F (-40° to 80°C)	Buna-N	2

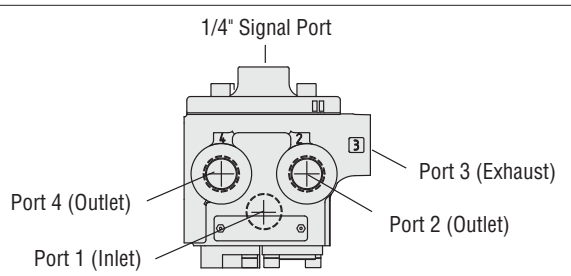
Body Size	Port Size		
	In-Out	Exhaust	
3/8	1/4	1/2	200
	3/8	1/2	300
	1/2	1/2	401
3/4	1/2	1	400
	3/4	1	500
	1	1	601
1-1/4	1	1-1/2	600
	1-1/4	1-1/2	700
	1-1/2	1-1/2	801

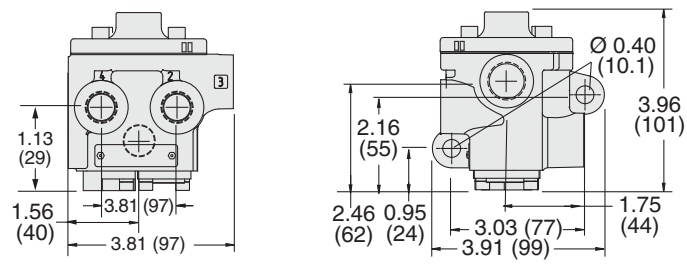
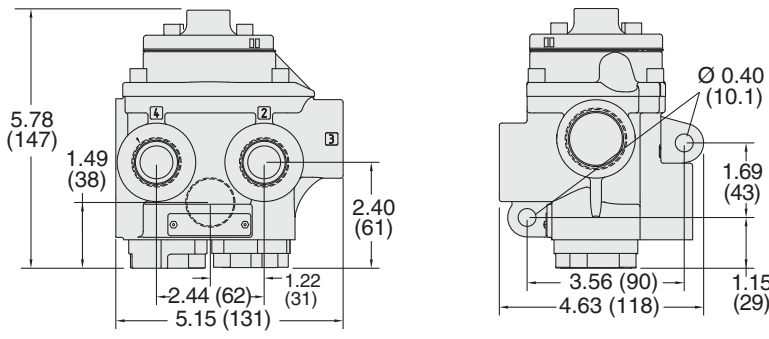
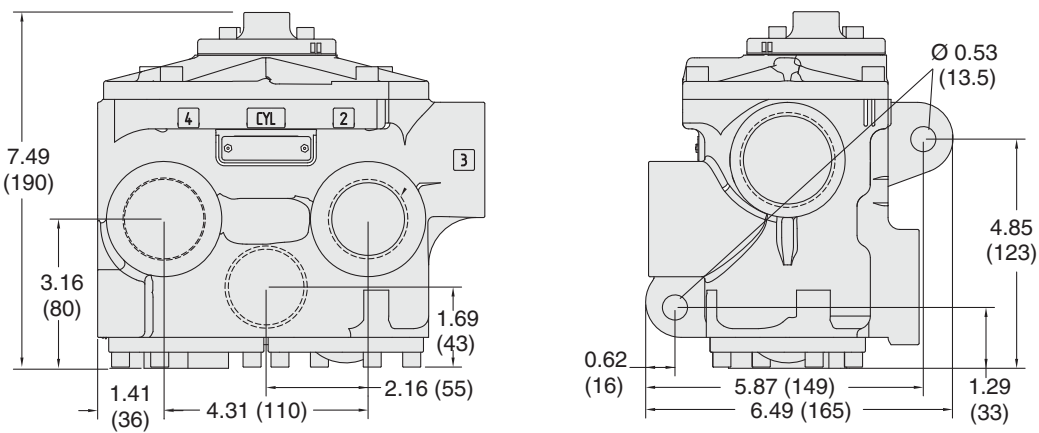
Size			Flow C _v (NI/min)				Average Response Constants *			≈ Weight lb (kg)
Body	Port 1, 2, 4	Port 3	1-2	2-3	1-4	4-3	M	F		
								1-2, 1-4	2-3, 4-3	
3/8	1/4	1/2	1.6 (1600)	2.3 (2300)	1.7 (1700)	2.7 (2700)	30	1.70	2.28	3.0 (1.4)
	3/8	1/2	2.6 (2600)	3.1 (3100)	2.8 (2800)	3.6 (3500)	30	1.13	1.33	
	1/2	1/2	3.1 (3100)	3.8 (3700)	2.9 (2900)	4.6 (4500)	30	1.00	1.22	
3/4	1/2	1	5.3 (5200)	6.4 (6300)	4.5 (4400)	6.9 (6800)	46	0.50	0.76	5.8 (2.6)
	3/4	1	7.0 (6900)	7.7 (7600)	6.3 (6200)	10 (9800)	46	0.36	0.55	
	1	1	7.6 (7500)	7.7 (7600)	6.4 (6300)	11 (11000)	46	0.36	0.50	
1-1/4	1	1-1/2	14 (14000)	22 (22000)	18 (18000)	24 (24000)	99	0.19	0.22	12.0 (5.4)
	1-1/4	1-1/2	17 (17000)	24 (24000)	25 (25000)	28 (28000)	99	0.19	0.18	
	1-1/2	1-1/2	19 (19000)	24 (24000)	26 (20000)	28 (28000)	99	0.16	0.15	

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic





DIMENSIONS	Inches (mm)
Body Size 3/8	 Technical drawings of the Body Size 3/8 valve. The front view shows a width of 3.81 (97) and a height of 1.56 (40). The side view shows a total width of 3.91 (99) and a total height of 3.96 (101). Other dimensions include 1.13 (29), 3.81 (97), 2.16 (55), 2.46 (62), 0.95 (24), 3.03 (77), 1.75 (44), and a port diameter of Ø 0.40 (10.1).
Body Size 3/4	 Technical drawings of the Body Size 3/4 valve. The front view shows a width of 5.15 (131) and a height of 5.78 (147). The side view shows a total width of 4.63 (118) and a total height of 1.69 (43). Other dimensions include 1.49 (38), 2.44 (62), 1.22 (31), 2.40 (61), 3.56 (90), 1.15 (29), and a port diameter of Ø 0.40 (10.1).
Body Size 1-1/4	 Technical drawings of the Body Size 1-1/4 valve. The front view shows a width of 4.31 (110) and a height of 7.49 (190). The side view shows a total width of 6.49 (165) and a total height of 4.85 (123). Other dimensions include 3.16 (80), 1.41 (36), 2.16 (55), 1.69 (43), 0.62 (16), 5.87 (149), 1.29 (33), and a port diameter of Ø 0.53 (13.5).
Downloadable CAD models available.	

3/2 Pressure Controlled Valves with Pressure Booster Adaptor

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

Examples: T2153B3901, TD2153B6907.

T

21

5

3

B

3901

CRN Certified

Port Thread	
NPT	
Leave Blank	
G	D

Series

Actuation
Pressure Controlled

Valve Function
3/2 Normally Closed

Body Size	Port Size		Revision Level	Internal Pilot Supply
	In-Out	Exhaust		
3/8	3/8	1/2	B	3901
3/4	3/4	1	A	5909
	1	1	A	6907

Application	Valve Seals
Low Temperature -40° to 175°F (-40° to 80°C)	Buna-N

Pressure Booster Adaptor

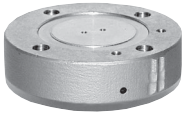


Illustration example.

Size			Flow C _v (NI/min)		Average Response Constants*			≈ Weight lb (kg)
Body	Port 1, 2	Port 3	Normally Closed (NC)		M	F		
						NC		
			1-2	2-3		1-2	2-3	
3/8	3/8	1/2	2.9 (2800)	4.4 (4300)	10	0.70	0.50	3.5 (1.6)
3/4	3/4	1	8.2 (8100)	10 (9800)	11	0.36	0.26	4.3 (2.0)
	1	1	9.1 (9000)	12 (1200)	11	0.34	0.25	

* **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Schematic

Normally Closed

1/4" Signal Port

Port 1 (Inlet)

Port 2 (Outlet)

Port 3 (Exhaust)

Downloadable CAD models available.

Pressure Booster Adaptor

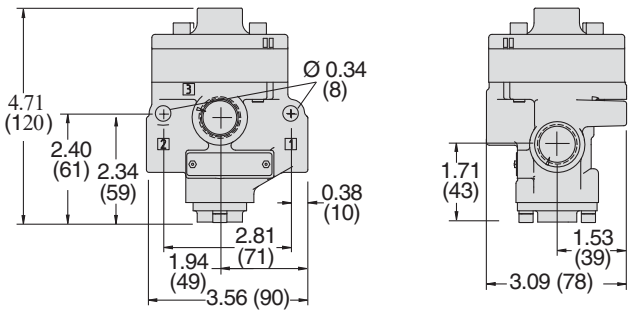
Increases the actuating force on the valve piston. It should be used when the inlet pressure exceeds the available signal pressure, or when the signal pressure is less than 15 psig (1 bar).

The valve's signal pressure is applied to a piston in the pressure booster adaptor that has a larger area than the piston in the valve. The force on the piston in the adaptor is thereby larger than that which could be produced by the piston in the valve. This larger force is applied to the valve's piston directly so that there is then sufficient force to shift the valve properly.

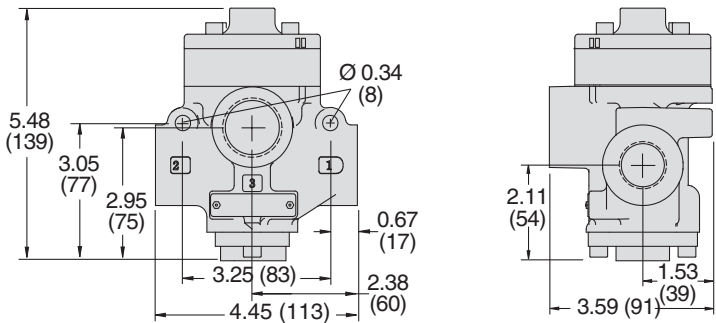
DIMENSIONS

Inches (mm)

Body Size 3/8



Body Size 3/4



Downloadable CAD models available.



Flow Control Valves High-Capacity 19 Series

Product Overview

CRN
0C9483.C

Registered in Canada to the ASME B31.3, Process Piping



Illustration example.

Flow Control Function

Flow control valves provide high air flow rates into a cylinder, and precisely controlled flow rates out of the cylinder. The adjustable flow can range from near zero to full flow.

Selecting flow control valves with sufficient flow capacity is important so that they do not become the limiting factor in the cylinder control system. Full flow capacity should match that of the control valve to keep cylinder motion smooth and predictable in both directions.

VALVE FEATURES

Poppet Design	Dirt-tolerant poppet design; available in alternate materials for extreme temperature applications
High Flow	High flow capacity in free-flow direction (port 1 to 2), same high flow available in reverse direction
Visible Indication	Low-Profile High-Capacity valves – Brass stem gives visible indication of flow rate in controlled direction (port 2 to 1)
Positive Locking	Low-Profile High-Capacity valves – Prevents change of adjustment knob due to vibration or tampering
Adjustable Flow	Knob hand or screwdriver slot adjustment to control flow

Operation

To Increase Flow: Turn adjustment screw out.
To Decrease Flow: Turn adjustment screw in.

Flow Adjustment

From 0 to Maximum Flow.

Numbers of Slot/Knob Turns

Port sizes 1/4 and 3/8: 14
Port sizes 1/2, 3/4: 12
Port sizes 1, 1¼, 1½, 2½: 24

STANDARD SPECIFICATIONS			
GENERAL	Function		2/2 Valve
	Construction Design		Poppet
	Actuation		Pneumatic
	Mounting	Type	Inline
		Orientation	Inline, Offset
	Connection	Threaded Port	NPT
G			
	Temperature	Ambient	-40° to 175°F (-40° to 80°C)
		Media	
		For temperatures below 40°F (4°C) air must be free of water vapor to prevent formation of ice.	
		For temperatures below -40°F (-40°C), consult ROSS.	
		Maximum Design Proof Temperature	175°F (80°C)
	Flow Media		Filtered air
	Operating Pressure		5 to 150 psig (0.3 to 10 bar)
	Maximum Design Proof Pressure		150 psig (10 bar)
CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum
	Poppet		Acetal and Stainless Steel
	Seals		Buna-N
IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.			

PRODUCT CREDENTIALS	
Canadian Registration Number (CRN) 0C9483.C	Declaration of Conformity EAC

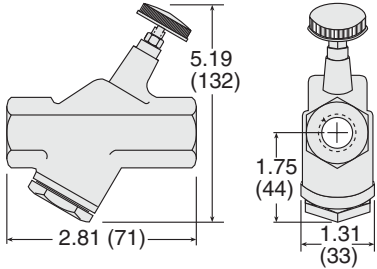
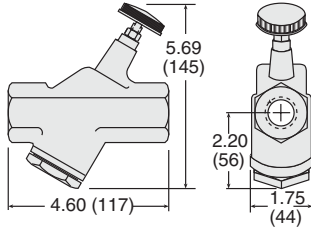
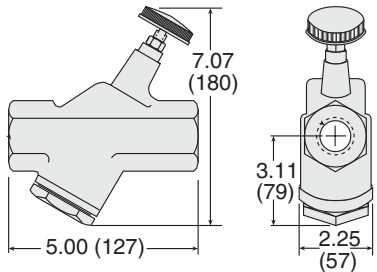
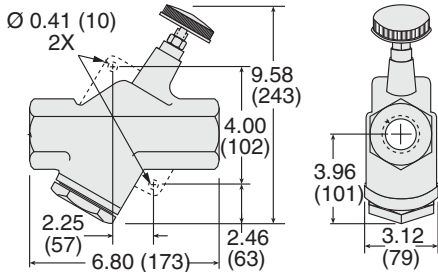
Ordering Information

Flow Control Valves				2-Way Valves	
Valve Style	Body Size	Port Size	Valve Model Number		
		In-Out	NPT Thread	G Thread	
HIGH-CAPACITY	3/8	1/4	T1968B2007		TD1968B2007
		3/8	T1968B3007		TD1968B3007
		1/2	T1968B4017		TD1968B4017
	3/4	1/2	T1968B4007		TD1968B4007
		3/4	T1968B5007		TD1968B5007
		1	T1968B6017		TD1968B6017
	1-1/4	1	T1968B6007		TD1968B6007
		1-1/4	T1968B7007		TD1968B7007
		1-1/2	T1968B8017		TD1968B8017
	2	1-1/2	T1968B8007		TD1968B8007
		2	T1968B9007		TD1968B9007
		2-1/2	T1968B9017		TD1968B9017

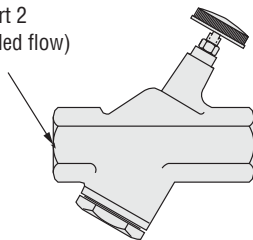
Size		Flow C _v (NI/min)	Weight ≈ lb (kg)
Body	Port 1, 2	1-2	
3/8	1/4	2.3 (2300)	0.5 (0.2)
	3/8	2.6 (2600)	
	1/2		
3/4	1/2	7.5 (7400)	0.8 (0.4)
	3/4	8.3 (8200)	
	1		
1-1/4	1	17 (17000)	2.2 (1.0)
	1-1/4	22 (22000)	
	1-1/2	23 (22000)	
2	1-1/2	50 (49000)	4.3 (1.9)
	2		
	2-1/2		

Valve Schematic



DIMENSIONS		Inches (mm)
High-Capacity	Body Size 3/8	
	Body Size 3/4	
	Body Size 1-1/4	
	Body Size 2	
Downloadable CAD models available.		

Port 2
(controlled flow)



Adjusting Knob



Port 1



Manual Lockout L-O-X® Valves 15 Series

Product Overview

External Pilot Supply Valves

CRN
0C9406.C

Registered in Canada to the ASME B31.3, Process Piping

Internal Pilot Supply Valves

CRN
0C1409.53469087YTN

Registered in Canada to the ASME B31.3, Process Piping, in the following jurisdictions:

British Columbia	Newfoundland	Nunavut	Prince Edward Island
Manitoba	Northwest Territories	Ontario	Saskatchewan
New Brunswick	Nova Scotia	Quebec	Yukon Territory

Classic	High-Capacity	Stainless Steel
		

Illustration examples.

Energy Isolation for Lockout/Tagout (LOTO)

The Lockout L-O-X® valve is used to block the supply and remove the downstream pressure from the circuit or machine and allow the employee to lockout the pneumatic energy for safe machine access.

ROSS manual L-O-X® (lockout & exhaust) valves are energy isolation valves and are generally used as the first valve in a line supplying compressed air to equipment. OSHA and ISO 14118 compliance requires that the valve be padlocked in the closed position to prevent the handle from being pulled out inadvertently during maintenance and/or servicing.

VALVE FEATURES

Unique Appearance	Easily identifiable with a yellow body and a red handle to control ON/OFF positions (non-Stainless Steel)
Quick Energy Dump	Full size exhaust ports (equal to or larger than supply) provide rapid exhaust of downstream air and are threaded for silencers or remote exhaust lines
Locking Protection	Design only allows the valve to be lockable in the OFF (closed) position
PTFE Seals	Fluorocarbon slipper seals for easy shifting, even after long periods of inactivity
Visible Pressure Indication Option	Includes integrated sensing port for pressure verification with either a visual pop-up indicator or electrical pressure switch
Mounting	Inline or Surface

NOTE: Per specifications and regulations, these products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

STANDARD SPECIFICATIONS					
GENERAL	Function			3/2 Valve	
	Construction Design			Spool	
	Actuation			Pneumatic	Manual
	Mounting	Valve Type	Classic High-Capacity Stainless Steel	Inline or Surface	
		Orientation	Any, preferably vertical; easy access to the handle		
	Connection			Threaded Port	NPT G
	Minimum Operation Frequency			Once per month, to ensure proper function	
OPERATING CONDITIONS	Temperature	Valve Type	Classic High-Capacity	Ambient	40° to 175°F (4° to 80°C)
				Media	
			Stainless Steel	Ambient	30° to 175°F (-1° to 80°C)
				Media	
	Maximum Design Proof Temperature			200°F (93°C)	
	Flow Media			Filtered air	
	Operating Pressure	Valve Type	Classic High Capacity Stainless Steel		0 to 300 psig (0 to 20.7 bar)
Maximum Design Proof Pressure			300 psig (20.7 bar)		
LOCK HOLE MEASURES	Valve Type	Classic High-Capacity	Diameter	All Sizes	0.27 inch (7.0 mm)
			Length of Hole	All Sizes	0.43 inch (10.9 mm)
		Stainless Steel	Diameter	All Sizes	0.34 inch (8.64 mm)
			Length of Hole	Port Size 1/4	0.44 inch (11.17 mm)
				Port Size 1/2	0.47 inch (11.93 mm)
				Port Size 1 and 2	0.55 inch (13.97 mm)
CONSTRUCTION MATERIAL	Valve Body	Valve Type	Classic High-Capacity	Cast Aluminum	
			Stainless Steel	316 Stainless Steel	
	Spool			Stainless Steel	
	Seals			Fluorocarbon	
IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.					

PRODUCT CREDENTIALS		
Canadian Registration Number (CRN) OC9406.C OC154670.54639870YTN	Performance Level Per ISO 13849-1:2015 	Declaration of Conformity

Ordering Information

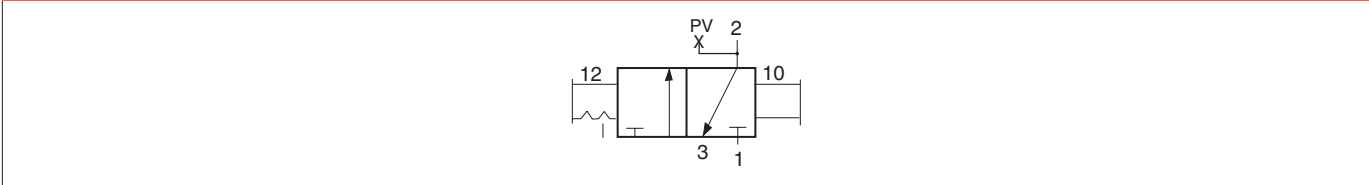
MANUAL LOCKOUT L-O-X® VALVES

3-Way 2-Position Valves

Valve Style	Body Size	Port Size		Valve Model Number	
		In-Out	Exhaust	NPT Thread	G Thread
Classic	1/2	3/8	3/4	TY1523C3002	TYD1523C3002
		1/2	3/4	TY1523C4002	TYD1523C4002
		3/4	3/4	TY1523C5012	TYD1523C5012
	1	3/4	1-1/4	TY1523C5002	TYD1523C5002
		1	1-1/4	TY1523C6002	TYD1523C6002
		1-1/4	1-1/4	TY1523C7012	TYD1523C7012
High-Capacity	2	1-1/2	2	TY1523C8002	TYD1523C8002
		2	2	TY1523C9012	TYD1523C9012
Stainless Steel	1/4	1/4	1/4	T1523B2004	TD1523B2004
	1/2	3/8	1/2	T1523B3004	TD1523B3004
		1/2	1/2	T1523B4004	TD1523B4004
	1	3/4	1	T1523B5004	TD1523B5004
		1	1	T1523B6004	TD1523B6004
	2	1-1/2	2	T1523B8004	TD1523B8004
		2	2	T1523B9004	TD1523B9004

Valve Style	Size			Flow Cv (NI/min)		Weight ≈ lb (kg)
	Body	Port 1, 2	Port 3	1-2	2-3	
Classic	1/2	3/8	3/4	4.7 (4600)	3.6 (3500)	2 (0.9)
		1/2	3/4	7.1 (7000)	4.0 (3900)	
		3/4	3/4	8.3 (8200)	4.1 (4000)	
	1	3/4	1-1/4	13 (13000)	9.0 (8900)	3 (1.4)
		1	1-1/4	17 (17000)	9.5 (9300)	
		1-1/4	1-1/4	19 (19000)	9.7 (9600)	
High-Capacity	2	1-1/2	2	36 (35000)	51 (50000)	8.3 (3.7)
		2	2	40 (39000)	52 (51000)	
Stainless Steel	1/4	1/4	1/4	2.1 (2100)	2.1 (2100)	3.8 (1.7)
	1/2	3/8	1/2	5.8 (5700)	6.2 (6100)	6 (2.7)
		1/2	1/2	5.8 (5700)	6.2 (6100)	
	1	3/4	1	14 (14000)	17 (17000)	13 (5.9)
		1	1	14 (14000)	17 (17000)	
	2	1-1/2	2	39 (38000)	45 (44000)	35 (15.9)
		2	2	39 (38000)	45 (44000)	

Valve Schematic

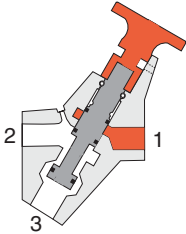
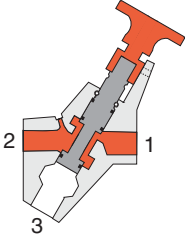
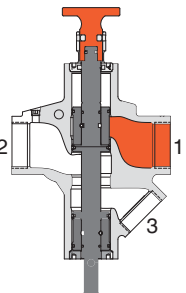
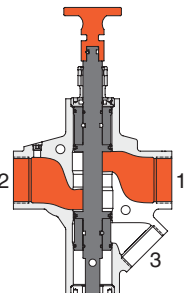
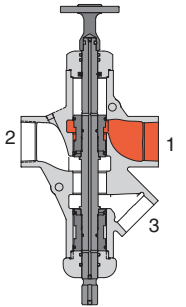
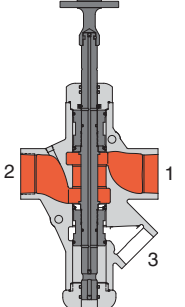


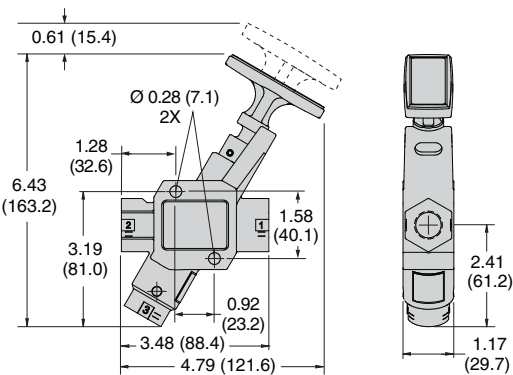
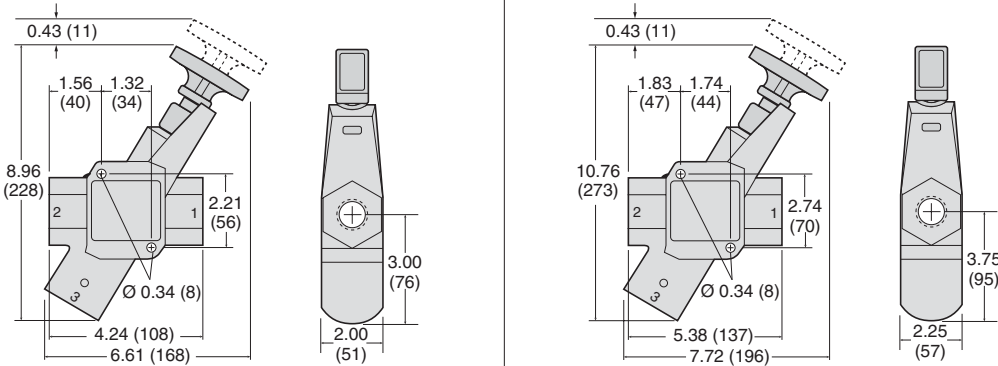
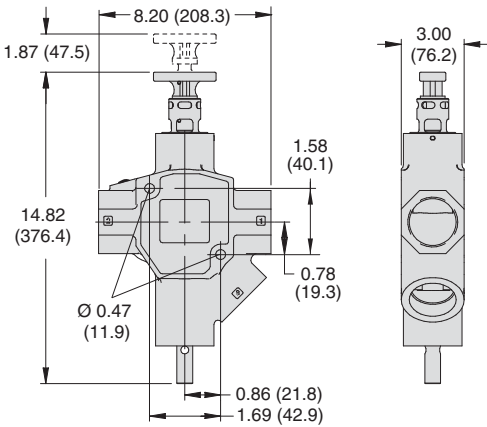
Valve Closed

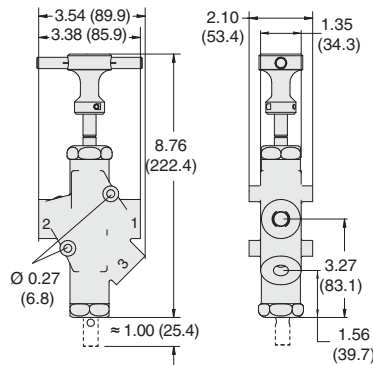
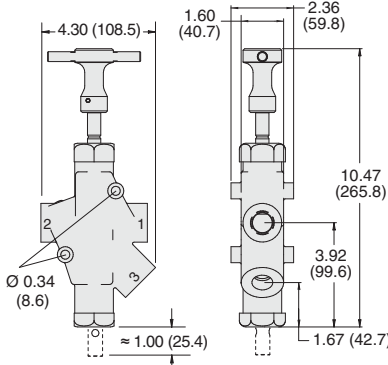
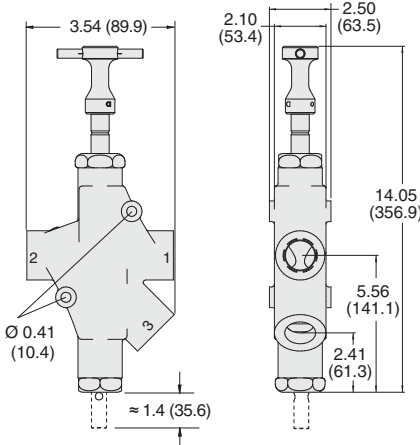
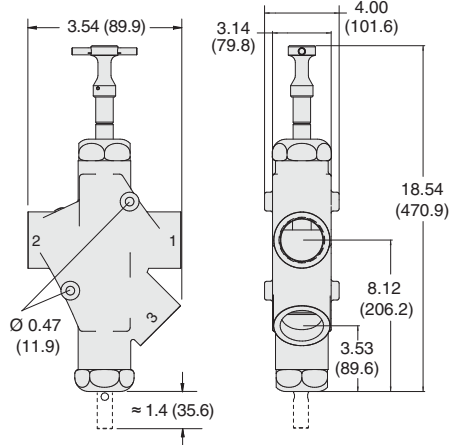
With a short push of the red handle inward, the flow of supply air is blocked and downstream air is exhausted via the exhaust port at the bottom of the valve. The L-O-X® valve should be padlocked in this position to prevent the handle from being pulled outward inadvertently where potential for human injury exists or while servicing machinery.

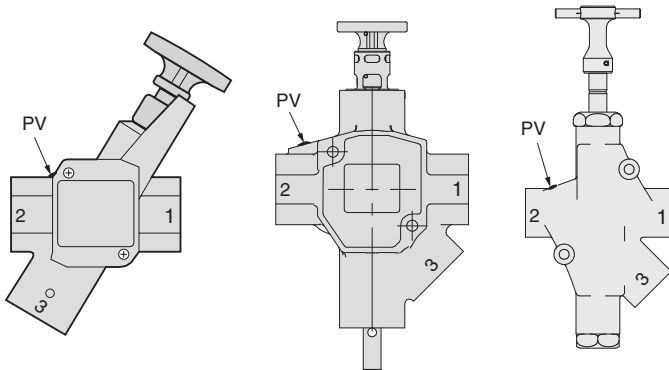
Valve Open

When the red handle is pulled out, supply air flows freely from inlet to outlet and flow to exhaust is blocked. A detent keeps the handle in the open position. The handle is not designed to be locked in this position, thereby providing for ready shut-off when necessary.

Valve Style		Valve Closed	Valve Open
Classic			
High-Capacity			
Stainless Steel			

DIMENSIONS		Inches (mm)
Classic	Body Size 3/8	 Technical drawing of Classic Body Size 3/8 valve. Front view dimensions: 0.61 (15.4), 6.43 (163.2), 1.28 (32.6), 3.19 (81.0), 1.58 (40.1), 0.92 (23.2), 3.48 (88.4), 4.79 (121.6). Hole dimensions: Ø 0.28 (7.1) 2X. Side view dimensions: 2.41 (61.2), 1.17 (29.7).
	Body Size 1/2 Body Size 1	 Technical drawing of Classic Body Size 1/2 and 1 valves. Body Size 1/2 front view dimensions: 0.43 (11), 1.56 (40), 1.32 (34), 8.96 (228), 2.21 (56), 4.24 (108), 6.61 (168), Ø 0.34 (8). Body Size 1/2 side view dimensions: 3.00 (76), 2.00 (51). Body Size 1 front view dimensions: 0.43 (11), 1.83 (47), 1.74 (44), 10.76 (273), 2.74 (70), 5.38 (137), 7.72 (196), Ø 0.34 (8). Body Size 1 side view dimensions: 3.75 (95), 2.25 (57).
High-Capacity		 Technical drawing of High-Capacity valve. Front view dimensions: 8.20 (208.3), 1.87 (47.5), 14.82 (376.4), 1.58 (40.1), 0.78 (19.3), Ø 0.47 (11.9), 0.86 (21.8), 1.69 (42.9). Side view dimensions: 3.00 (76.2).
Downloadable CAD models available.		

DIMENSIONS		Inches (mm)	
Stainless Steel	Body Size 1/4		
	Body Size 1/2		
	Body Size 1		
	Body Size 2		
Downloadable CAD models available.			



PV = 1/8" Pressure Verification Port
Port 1 (Inlet)
Port 2 (Outlet)
Port 3 (Exhaust)

3/2 Piloted Valves with Manual Lockout L-O-X® Control 27 Series

Product Overview

CRN
0C13861.5

Registered in the province of Ontario, Canada, Ontario to the ASME B31.3, Process Piping

Solenoid Pilot Controlled	Pressure Controlled
	

Illustration example.

Energy Isolation for Lockout/Tagout (LOTO)

The **Lockout L-O-X®** valve is used to block the supply and remove the downstream pressure from the circuit or machine and allow the employee to lockout the pneumatic energy for safe machine access. The shut-off function of the solenoid pilot controlled L-O-X® valve is the same as that of the manual L-O-X® valves.

The solenoid pilot and manual lockout controlled valve allows the air supply to be turned on or off by remote electrical control whenever the L-O-X® handle is in the outward position. Air flows only if the L-O-X® handle is outward and the solenoid pilot is energized. When the L-O-X® handle is pushed in, air will not flow regardless of the pilot being energized or not.

Because of the poppet construction of the main valve body, air pressure provides the forces both to open the valve and to close it. These are large forces so that quick response is ensured even after the valve has been on standby for a long time.

VALVE FEATURES

Poppet Design	Dirt tolerant, wear compensating for quick response and high flow capacity
Manual Lockout Control	Operated like the manual lockout L-O-X® valve, the position of the red handle indicates instantaneous full flow pressurizing or exhausting capability
Solenoid Pilot	Allows the air supply to be turned on or off by remote electrical control when valve is not in the lockout position
Quick Energy Dump	Full size exhaust ports (equal to or larger than supply) provide rapid exhaust of downstream air and are threaded for silencers or remote exhaust lines
Locking Protection	Design only allows the valve to be lockable in the OFF position
PTFE Seals	Fluorocarbon slipper seals for easy shifting, even after long periods of inactivity
Visible Pressure Indication Option	Includes integrated sensing port for pressure verification with either a visual pop-up indicator or electrical pressure switch

NOTE: Per specifications and regulations, these products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

STANDARD SPECIFICATIONS					
GENERAL	Function		3/2 Valve		Normally Closed
	Construction Design		Poppet and Spool		
	Actuation	Electrical	Solenoid Manual Lockout Controlled		
		Pneumatic	Internal Pressure Manual Lockout Controlled		
	Mounting	Type	Inline		
		Orientation	Any, preferably vertical; easy access to the handle		
	Connection		Threaded Port		NPT G
Minimum Operation Frequency		Once per month, to ensure proper function			
OPERATING CONDITIONS	Temperature	Solenoid Pilot/Manual Lockout Controlled Valves	Ambient		40° to 120°F (4° to 50°C)
			Media		40° to 175°F (4° to 80°C)
		Manual Lockout Controlled Valves	Ambient		40° to 175°F (4° to 80°C)
			Media		
		Maximum Design Proof Temperature		200°F (94°C)	
	Flow Media		Filtered air		
	Operating Pressure	Valve Body Size	3/8 through 1-1/2		15 to 150 psig (1 to 10 bar)
			2 & 3		30 to 150 psig (2 to 10 bar)
		Maximum Design Proof Pressure		300 psig (20.7 bar)	
Pilot Supply Pressure (Solenoid Manual Lockout Controlled valves only)		Internal	Must meet minimum operating pressure		
		External	Must be equal to or greater than inlet pressure, and meet minimum operating pressure		
ELECTRICAL DATA FOR SOLENOID PILOT VALVES	Solenoids	Current Flow	Operating Voltage		Power Consumption (each solenoid)
		DC	24 volts		14 watts
		AC	110-120 volts, 50/60 Hz		87 VA inrush, 30 VA holding
			230 volts, 50/60 Hz		
		Rated for continuous duty			
CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum		
	Poppet		Acetal and Stainless Steel		
	Spool (Lockout Valve)		Stainless Steel		
	Seals	Valve Body Size	3/8 through 2		Buna-N
			3		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.			

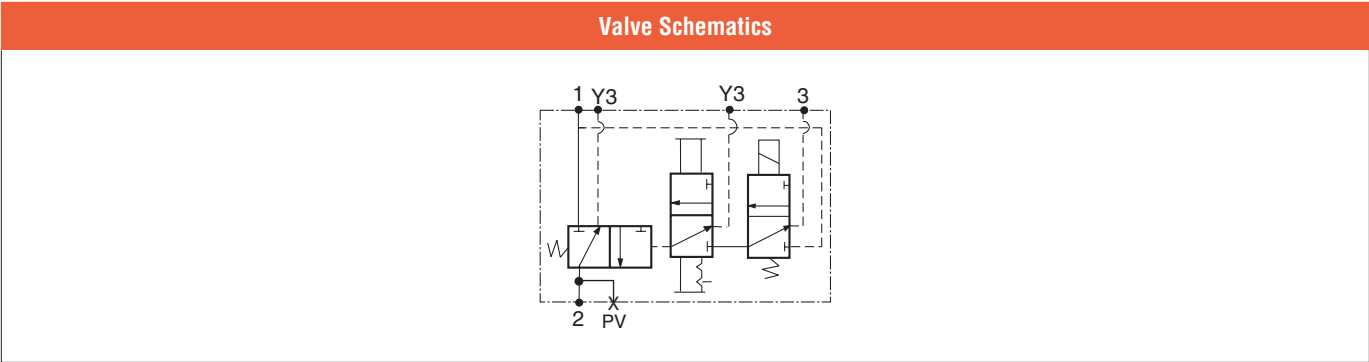
IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

PRODUCT CREDENTIALS				
Canadian Registration Number (CRN)	Certificate of Compliance	Performance Level Per	Safety Integrity Level Per IEC 2061:2001	Declaration of Conformity
OC13861.5	Solenoid Pilot Valves			

Ordering Information

SOLENOID PILOT AND MANUAL LOCKOUT CONTROLLED VALVES							3-Way 2-Position Valves
Port Size		Valve Model Number					
		NPT Thread			G Thread		
In-Out	Exhaust	24 V DC	110-120 V AC	230 V AC	24 V DC	110-120 V AC	230 V AC
1-1/2	2-1/2	TY2773A8072W	TY2773A8072Z	TY2773A8072Y	TYD2773A8072W	TYD2773A8072Z	TYD2773A8072Y
2	2-1/2	TY2773A9072W	TY2773A9072Z	TY2773A9072Y	TYD2773A9072W	TYD2773A9072Z	TYD2773A9072Y
2-1/2	2-1/2	TY2773A9082W	TY2773A9082Z	TY2773A9082Y	TYD2773A9082W	TYD2773A9082Z	TYD2773A9082Y
For other voltages, consult ROSS.							

Size		Flow Cv (NI/min)		Weight ≈ lb (kg)
Port 1, 2	Port 3	1-2	2-3	
1-1/2	2-1/2	45 (44000)	75 (74000)	17.5 (7.9)
2	2-1/2	57 (56000)	78 (77000)	
2-1/2	2-1/2	70 (69000)	71 (70000)	

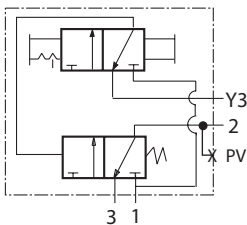


DIMENSIONS	Inches (mm)
Downloadable CAD models available.	

MANUAL LOCKOUT CONTROLLED VALVES				3-Way 2-Position Valves
Port Size		Valve Model Number		
In-Out	Exhaust	NPT Thread	G Thread	
1-1/2	2-1/2	TY2783A8006	TYD2783A8006	
2	2-1/2	TY2783A9006	TYD2783A9006	
2-1/2	2-1/2	TY2783A9016	TYD2783A9016	

Size		Flow Cv (NI/min)		Weight ≈ lb (kg)
Port 1, 2	Port 3	1-2	2-3	
1-1/2	2-1/2	45 (44000)	75 (74000)	15.3 (6.9)
2	2-1/2	57 (56000)	78 (77000)	
2-1/2	2-1/2	70 (69000)	71 (70000)	

Valve Schematics



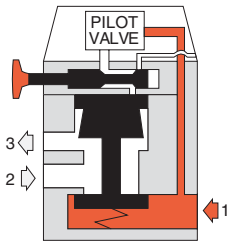
DIMENSIONS	Inches (mm)
Downloadable CAD models available.	

Valve Operation

Solenoid and Manual Lockout Controlled Valves

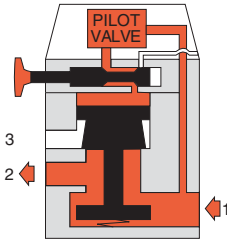
Pilot De-energized

With the solenoid pilot de-energized (regardless of the position of the L-O-X® handle) the inlet poppet remains closed. The outlet port is connected to the exhaust port so that pressure in the downstream lines is vented to atmosphere.



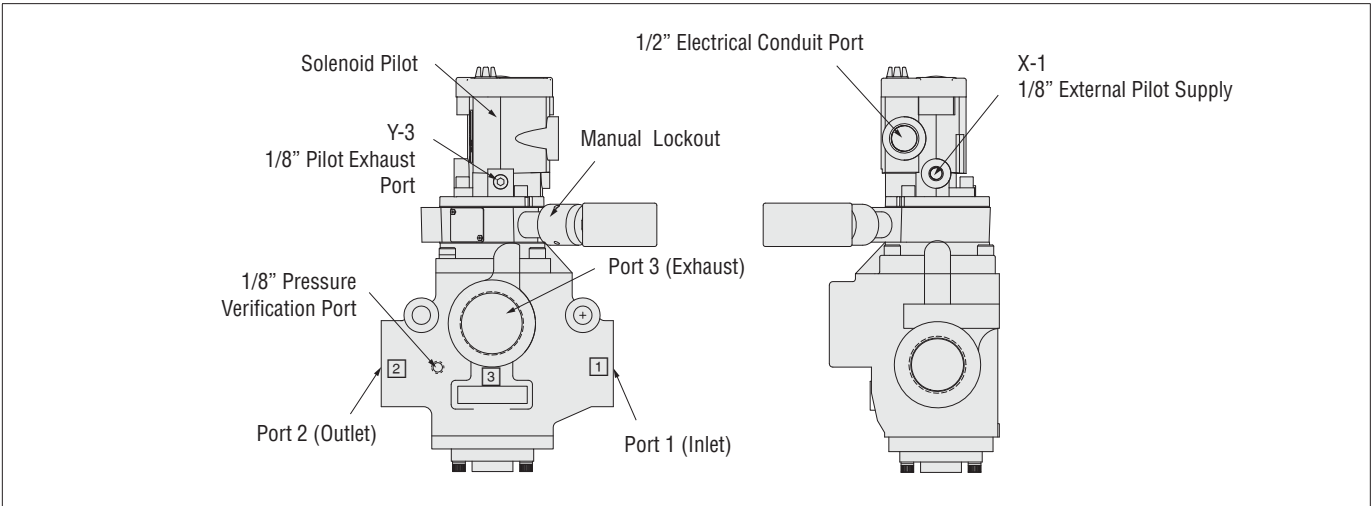
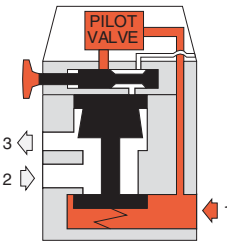
Pilot Energized

With the solenoid pilot energized and the L-O-X® control in the open position, air can flow from inlet to outlet port. The exhaust port is closed.



L-O-X® Valve Closed

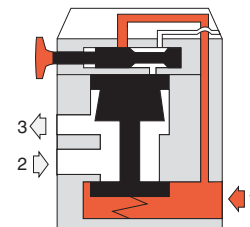
With the handle pushed inward, the L-O-X® control is closed, and air to the valve piston is cut off. This allows the inlet poppet to be closed by its spring and the pressure of the inlet air. The outlet is connected to exhaust so downstream pressure is vented.



Manual Lockout Controlled Valves

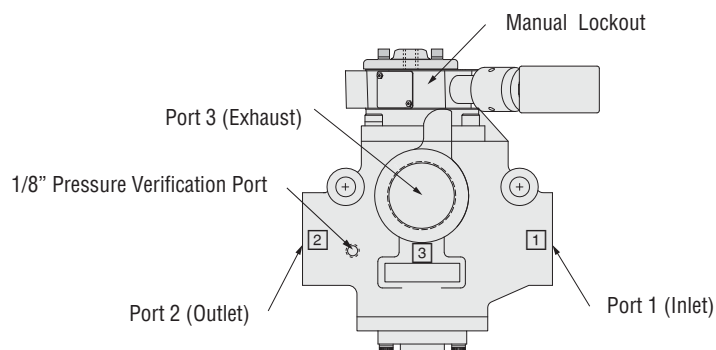
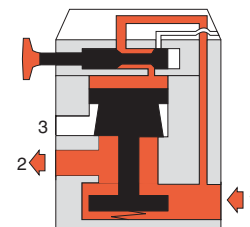
Valve Closed

With a short push of the red handle inward the flow of supply air is blocked and downstream air is exhausted via the exhaust port. Air pressure on the inlet and exhaust poppets produces a large closing force. The L-O-X® valve should be padlocked in this position to prevent the handle from being pulled outward inadvertently when potential for human injury exists or servicing machinery.



Valve Open

With the red handle pulled out, pilot air flows to the top of the actuating piston, causing it to open the inlet poppet. Supply air then flows freely from inlet to outlet, and the exhaust port is blocked. A detent keeps the L-O-X® handle in the open position. The handle is designed not to be locked in the open position, thereby allowing for quick shut-off when necessary.



3/2 Soft-Start EEZ-ON® Valves 27 Series

Product Overview

Registered in Canada to the ASME B31.3, Process Piping, in the following jurisdictions:

Internal Pilot Supply Valves
CRN
0C13850.54639087YTN

Manitoba
New Brunswick
Newfoundland

Northwest Territories
Nova Scotia
Nunavut

Ontario
Quebec
Prince Edward Island

Saskatchewan
Yukon Territory

Solenoid Pilot Controlled Valve	Internal Pressure Controlled Valve
	

Illustration examples.

Soft-Start

The EEZ-ON® valve is designed to allow a gradual buildup of downstream air pressure before opening to full air flow. This gradual pressure buildup allows cylinders and other work elements to move slowly and more safely into their normal working positions before full line pressure is applied.

The 3/2 valves have an exhaust port so that downstream air is exhausted when the valve is de-energized. At the same time, supply air is positively shut off so that a separate shut-off valve is not required.

VALVE FEATURES

Poppet Design	Dirt tolerant, wear compensating for quick response and high flow capacity
Soft-Start Function	Gradual re-application of pneumatic pressure prevents rapid equipment movement at startup
Pressure Buildup Control	An adjustable restriction within the EEZ-ON® valve determines the rate of downstream pressure buildup, and consequently the time delay for the full opening of the EEZ-ON® valve
Quick Energy Dump	Full size exhaust ports (equal to or larger than supply) provide rapid exhaust of downstream air and are threaded for silencers or remote exhaust lines
Manual Override	Flush flexible, non-locking manual overrides are standard on single solenoid models

NOTE: Per specifications and regulations, these products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

STANDARD SPECIFICATIONS

GENERAL	Function		2/2 Valve	Normally Closed
			3/2 Valve	
	Construction Design		Poppet	
	Actuation		Electrical	Solenoid Pilot Controlled
			Pneumatic	Pressure Controlled
	Mounting	Type	Inline	
		Orientation	Any, preferably vertical	
	Connection		Threaded Port	NPT
				G
	Minimum Operation Frequency		Once per month, to ensure proper function	
Manual Override (Solenoid Pilot Controlled valves)		Flush; rubber, non-locking		

OPERATING CONDITIONS	Temperature	Solenoid Pilot Controlled	Ambient		40° to 120°F (4° to 50°C)		
			Media		40° to 175°F (4° to 80°C)		
		Internal Pressure Controlled	Ambient		40° to 175°F (4° to 80°C)		
			Media				
		Maximum Design Proof Temperature				200°F (94°C)	
	Flow Media			Filtered air			
	Operating Pressure			15 to 150 psig (1 to 10 bar)			
				Maximum Design Proof Pressure		150 psig (10 bar)	
	Pilot Supply Pressure			Internal	Must meet minimum operating pressure		
				External	Must be equal to or greater than inlet pressure, and meet minimum operating pressure		

ELECTRICAL DATA FOR SOLENOID PILOT VALVES	Solenoids	Current Flow	Operating Voltage	Power Consumption (each solenoid)
		DC	24 volts	14 watts
		AC	110-120 volts, 50/60 Hz	87 VA inrush, 30 VA holding
			230 volts, 50/60 Hz	
	Rated for continuous duty			

CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum	
	Poppet		Acetal and Stainless Steel	
	Seals		Buna-N	

SAFETY DATA	Safety Integrity Level (SIL)	Certified by TÜV Rheinland in accordance with 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.
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IMPORTANT NOTE: Please read carefully and thoroughly all of the **CAUTIONS, WARNINGS** on the inside back cover.

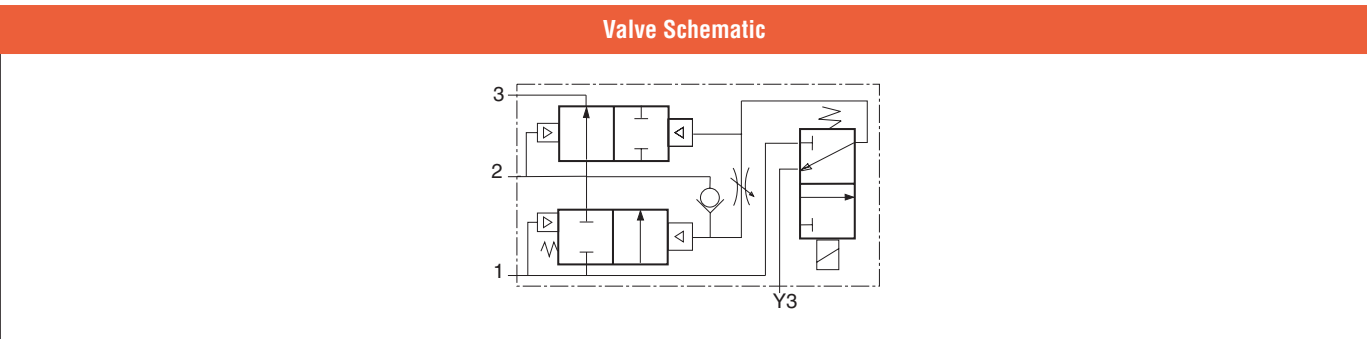
PRODUCT CREDENTIALS

Canadian Registration Number (CRN)	Certificate of Compliance	Performance Level Per ISO 13849-1:2015	Safety Integrity Level Per IEC 2061:2001	Declaration of Conformity
OC13850.54639087YTN	 Solenoid Pilot Valves			

Ordering Information

SOLENOID PILOT CONTROLLED					3-Way 2-Position Valves		
Port Size		Valve Model Number					
In-Out	Exhaust	NPT Thread			G Thread		
		24 V DC	110-120 V AC	230 V AC	24 V DC	110-120 V AC	230 V AC
1	1-1/2	2773A6037W	2773A6037Z	2773A6037Y	D2773A6037W	D2773A6037Z	D2773A6037Y
1-1/4	1-1/2	2773A7037W	2773A7037Z	2773A7037Y	D2773A7037W	D2773A7037Z	D2773A7037Y
1-1/2	1-1/2	2773A8047W	2773A8047Z	2773A8047Y	D2773A8047W	D2773A8047Z	D2773A8047Y
For other voltages, consult ROSS.							

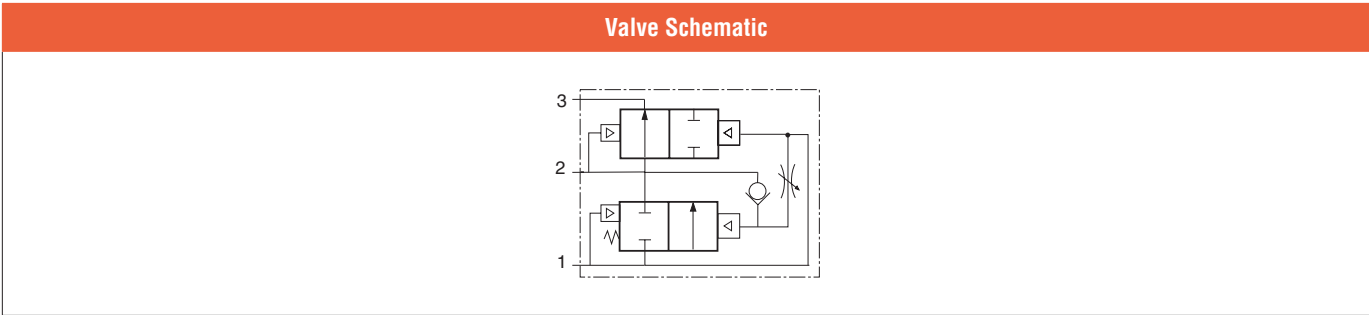
Size		Flow Cv (NI/min)		Weight ≈ lb (kg)
Port 1, 2	Port 3	1-2	2-3	
1	1-1/2	21 (21000)	27 (27000)	8.8 (4.0)
1-1/4	1-1/2	29 (29000)	29 (29000)	
1-1/2	1-1/2	30 (30000)	30 (30000)	



DIMENSIONS	Inches (mm)
Body Size 1-1/4	
Downloadable CAD models available.	

INTERNAL PRESSURE CONTROLLED				3-Way 2-Position Valves
Port Size		Valve Model Number		
In-Out	Exhaust	NPT Thread	G Thread	
1	1-1/2	2783B6037	D2783B6037	
1-1/4	1-1/2	2783B7037	D2783B7037	
1-1/2	1-1/2	2783B8047	D2783B8047	

Size		Flow Cv (NI/min)		Weight ≈ lb (kg)
Port 1, 2	Port 3	1-2	2-3	
1	1-1/2	21 (2100)	27 (27000)	8.8 (4.0)
1-1/4	1-1/2	29 (29000)	29 (29000)	
1-1/2	1-1/2	30 (30000)	30 (30000)	

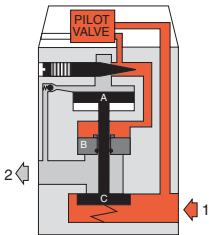


DIMENSIONS	Inches (mm)
Body Size 1-1/4	
Downloadable CAD models available.	

Solenoid Pilot Controlled Valves

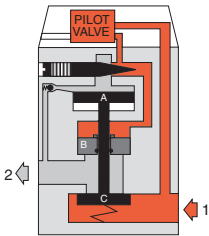
Pilot Not Energized

Pilot air is blocked by the pilot. Any downstream pressure forces piston B (which slides on the valve stem) upward. This opens the exhaust port and vents the downstream line.



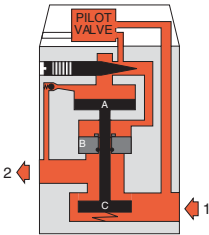
Pilot Energized

Pilot air forces piston B downward to close the exhaust port. Pilot air also flows past the adjusting needle, opens the ball check and begins slowly to pressurize the outlet line. At the same time, pressure is building up on piston A.



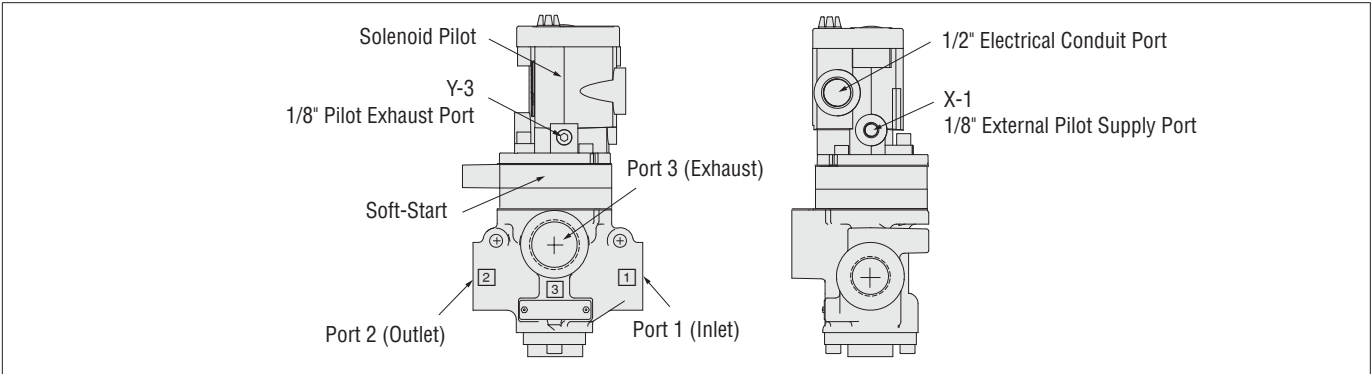
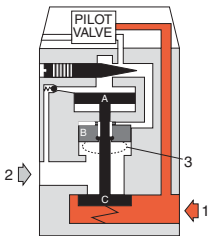
Full Pressure

When the pressure on piston A reaches approximately 50 percent of inlet pressure, it is forced downward and opens inlet poppet C. Full inlet pressure now flows freely to the outlet port.



Pilot De-energized

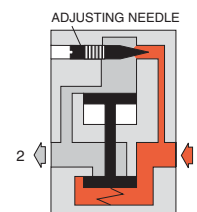
Air above pistons A and B is exhausted through the exhaust port of the pilot valve. Air above poppet C forces sliding piston B upward so that the main exhaust port is opened and the pressurized air is exhausted.



Internal Pressure Controlled Valves

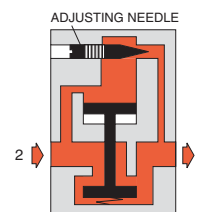
Air Pressure to Inlet

When air pressure is first applied to the inlet, air flow to the piston is restricted by the adjustable needle in the delay orifice. Downstream air pressure gradually builds up at a rate determined by the setting of the adjustable needle.



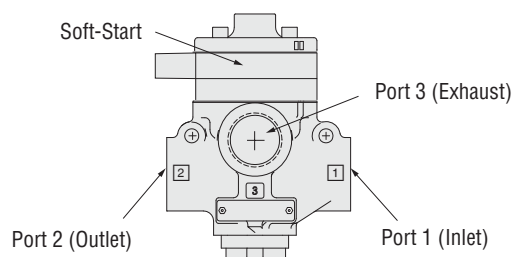
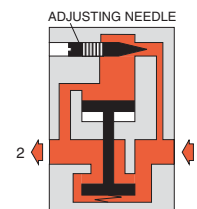
Inlet Pressure Removed

When inlet pressure is removed, the exhausting downstream air pressure keeps the inlet poppet open until the downstream pressure drops by approximately 90 percent. The remaining pressure is exhausted via the delay orifice.



Valve Opens to Full Flow

When downstream air pressure reaches approximately 40 to 60 percent of inlet pressure, the valve element shifts to the full open position and there is full air flow to the downstream components. This condition continues as long as inlet air pressure is present.



Safe Exhaust Double Valves M35 Series

Product Overview

CRN
0C20480.C

Registered in the province of Ontario, Canada, Ontario to the ASME B31.3, Power Piping

Model with Soft-Start EEZ-ON® Module	Model without Soft-Start EEZ-ON® Module
	

Illustration examples.

Safe Exhaust Safety Function

The M35 Series valve safety function is to shut off supply or pneumatic energy and to exhaust any pneumatic energy from downstream of the valve.

The M35 Series valve is designed to supply air to a zone or entire machine/system until signaled to shut off and exhaust residual downstream pneumatic energy from the machine. Thus, reducing the hazards associated with the presence of residual energy during employee access and/or minor servicing.

VALVE FEATURES

Redundant Control	Redundant control can achieve Category 4, PL e, when used with proper safety controls
External Monitoring	Each valve element in the M35 Series is equipped with a solid state pressure sensor. Monitoring both of these sensors on each actuation and de-actuation of the M35 Series valve provides a diagnostic coverage up to 99%.
Poppet Design	Dirt tolerant, wear compensating for quick response and high flow capacity
PTFE Backup Piston Rings	Enhances valve endurance enabling operation with or without in-line lubrication
Optional Soft-Start Module	On energization, the Soft-Start (EEZ-ON®) module allows outlet pressure to increase at a slower rate until it reaches approximately 50% of inlet pressure, at which point the valve will then open fully to finish filling the system at full rate
Threaded or Modular Port Connection	Modular port connection allows modular connection to Air Entry System (Lockout Valve, FRLs)
LED Indicators	Provides visual display of valve status and aids troubleshooting
Silencer Option	Include built-in module or threaded flange for remote exhaust
SISTEMA Library	Available for download

These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses, see DM²® Series D double valves for mechanical power press applications.

STANDARD SPECIFICATIONS

GENERAL	Function		3/2 Valve	Normally Closed
	Construction Design		Dual Poppet	
	Actuation	Electrical	Solenoid Pilot Controlled	
			Solenoid pilot operated with air assisted spring return; one solenoid per valve element (2 total), both to be operated synchronously	
	Mounting	Type	Inline mounted - modular/threaded	
		Orientation	Any, preferably vertical	
	Connection		Threaded Port	NPT G
Monitoring		Dynamic, cyclical, external with customer supplied equipment Monitoring should check state of both valve pressure sensors with any and all changes in state of valve control signals		
Minimum Operation Frequency		Once per month, to ensure proper function		

OPERATING CONDITIONS	Temperature	Ambient	40° to 120°F (4° to 50°C)	
		Media	40° to 175°F (4° to 80°C)	
		Maximum Design Proof Temperature	175°F (80°C)	
	Flow Media		Compressed air according to ISO 8573-1 Class 7:4:4	
	Operating Pressure	30 to 150 psig (2 to 10 bar)		
		Maximum Design Proof Pressure	150 psig (10 bar)	
	Pressure Sensors (2 per valve)		PNP solid state	
	Pressure Sensors Current Consumption (each sensor)		<23mA (each without contacts)	

ELECTRICAL DATA	Solenoids	Current Flow	Operating Voltage	Power Consumption (each solenoid)
		DC	24 volts	2.0 watts
		Rated for continuous duty		
	Enclosure Rating		DIN 400 50 IP 65, IEC 60529	
	Electrical Connection		Two 5-pin M12 connectors	
	Pressure Switch (Status Indicator) Rating		Contacts - 5 amps at 250 volts AC, or 5 amps at 30 volts DC	

CONSTRUCTION MATERIAL	Valve Body		Cast Aluminum	
	Poppet		Acetal and Stainless Steel	
	Seals		Buna-N	

SAFETY DATA	Functional Safety Data	Category	CAT 4, PL e	
		B ₁₀₀	10,000,000	
		PFH _D	6.44x10 ⁻⁹	
		MTTF _D	377.4 (n _{op} : 662400)	
	Vibration/Impact Resistance		Tested to DIN EN 60068-2-6	

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

PRODUCT CREDENTIALS

Canadian Registration Number (CRN)	Certificate of Compliance	Performance Level Per ISO 13849-1:2015	Safety Integrity Level Per IEC 2061:2001	DGUV	Declaration of Conformity	
OC20480.C						

Ordering Information

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

Examples: TM35S40NAEXABGA, TM35X46GAEXAAXA.

T **M35** **S** **40** **N** **A** **E** **X** **AA** **G** **A**

CRN Certified

Series

Soft-Start Function	
With Soft-Start	S
No Soft-Start	X

Port Size		Exhaust Type	
In-Out	Exhaust		
3/4"	-	Built-in Silencer	50
	1	Threaded Exhaust Flange*	56

* Silencer not included but recommended, see accessories.

Port Thread	
NPT	N
G	G

Voltage
24 V DC

Revision Level

Pressure Measuring Device	
None	X
With Gauge	G
With Digital Transducer	T

Pin Configuration Combination		
Solenoid	Sensor	
A	A	AA
	B	AB
	C	AC
C	C	CC
D	B	DB
	C	DC

Communication

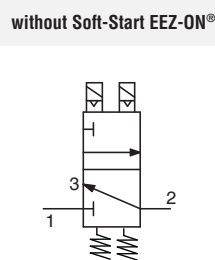
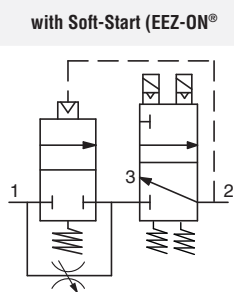
None

Monitoring

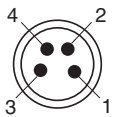
External

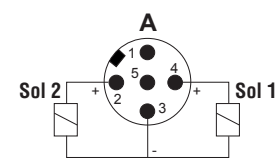
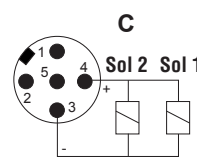
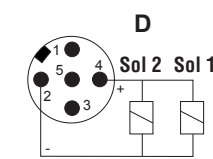
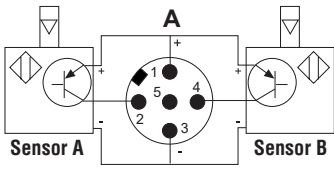
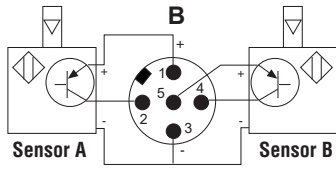
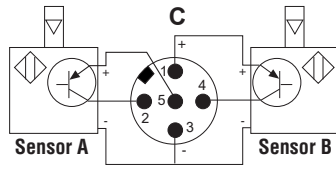
Size			Soft-Start	Valve with Built-in Silencer			Valve with Threaded Exhaust Flange		
Basic	Port 1, 2	Port 3		Flow C _V (NI/min)		Weight lb (kg)	Flow C _V (NI/min)		≈ Weight lb (kg)
				1-2	2-3		1-2	2-3	
8	1/2	–	With	4.1 (4000)	7.6 (7400)	6.5 (2.9)	4.1 (4000)	7.6 (7400)	6.6 (3.0)
		1	Without	4.3 (4200)	7.6 (7400)	4.2 (1.9)	4.3 (4200)	7.6 (7400)	4.3 (2.0)
	3/4	–	With	4.1 (4000)	7.6 (7400)	6.5 (2.9)	4.1 (4000)	7.6 (7400)	6.6 (3.0)
		1	Without	4.3 (4200)	7.6 (7400)	4.2 (1.9)	4.3 (4200)	7.6 (7400)	4.3 (2.0)

Simplified Schematics



These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses, see DM® Series D double valves for mechanical power press applications.

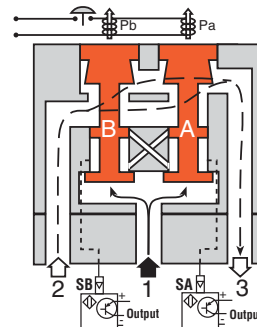
Digital Pressure Transducer Specifications				
Pressure Range psig (bar)	Electrical Output	Electrical Connection	Pressure Port Size/Type	Weight lb (kg)
0 (0) to 145 (10)	(1) PNP with (1) 4-20ma	M8, 4 Pin	1/8 Male	0.099 (0.045)
Pinout				
Sensor Pinout with Analog Output				
 1 - Brown - 24 VDC 2 - White - 4 to 20mA 3 - Blue - 0 VDC 4 - Black PNP Open Collector Output 1				

Valve Connector Pinouts	
Solenoid	A  C  D 
Pressure Sensor	A  B  C 

Valve Operation

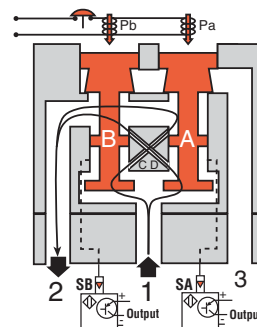
Conditions at Start

Inlet 1 is closed to outlet 2 by both valve elements A and B. Outlet 2 is open to exhaust 3. Pressure signals at both sensors SA and SB are exhausted. Sensors outputs SA and SB are ON.



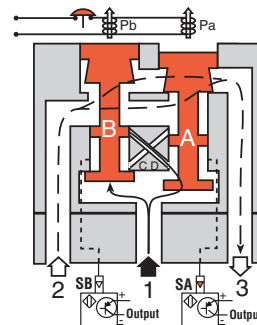
Normal Operation

Simultaneously energizing both solenoids actuates both pilots and causes valve elements A and B to shift. Inlet 1 is then connected to outlet 2 via crossflow passages C and D. Exhaust 3 is closed. Sensing pressure signals go to each pressure sensor and become equal to inlet pressure. Sensors outputs SA and SB are OFF.



Detecting a Malfunction

A malfunction in the system or the valve itself could cause one valve element to be open and the other closed. Air then flows past the inlet poppet on valve element A, into crossflow passage D, but is substantially blocked by the spool portion of element B. The large size of the open exhaust passage past element B keeps the pressure at the outlet port below 2 % of inlet pressure. Full sensing air pressure from side A goes to sensor SA, and a reduced pressure goes to sensor SB. This full pressure signal causes sensor outputs SA to turn OFF. Sensor outputs SB, with a reduced pressure signal, does not turn OFF. An external monitoring system can detect the malfunction by monitoring the condition of the sensors SA and SB. The external monitoring system may then react accordingly by shutting down the power to the valve solenoids and any other components deemed necessary to stop the machine.

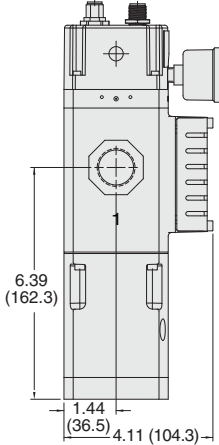
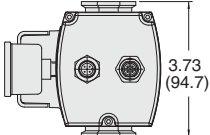
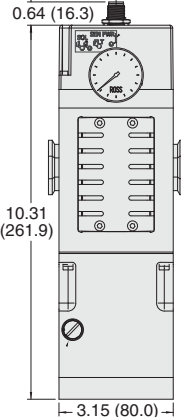
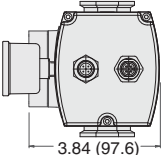
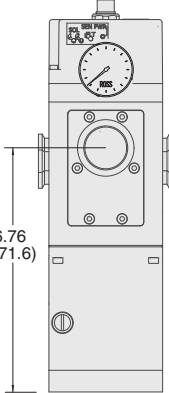
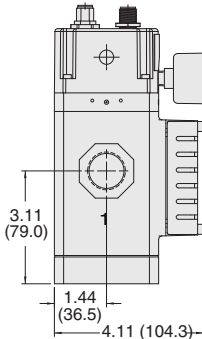
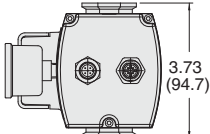
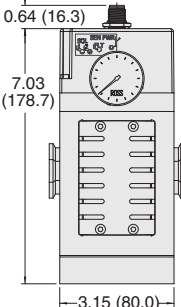
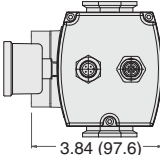
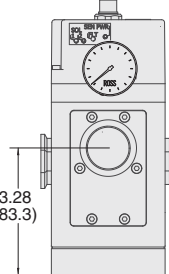


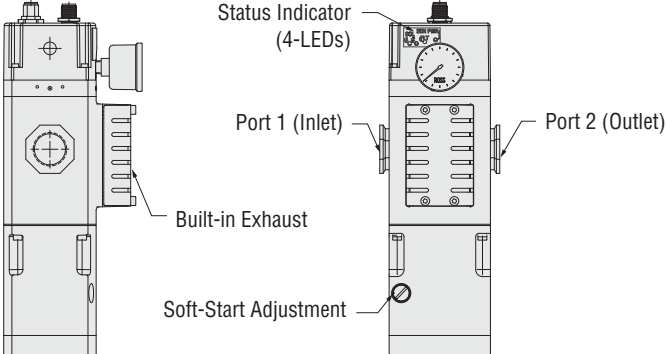
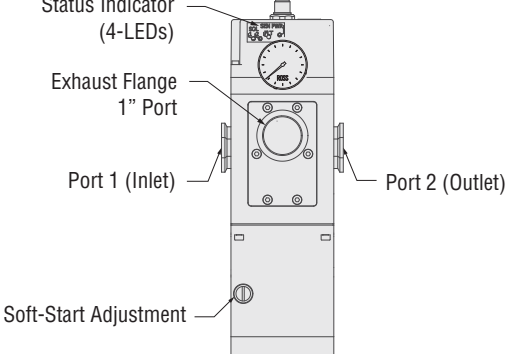
Valve Reset

Automatic reset by de-energizing the solenoids.

An Integration Guide for the M35 Series valves is available from ROSS to provide information such as operation & monitoring, and validation test procedure for valve operation and external monitoring logic.

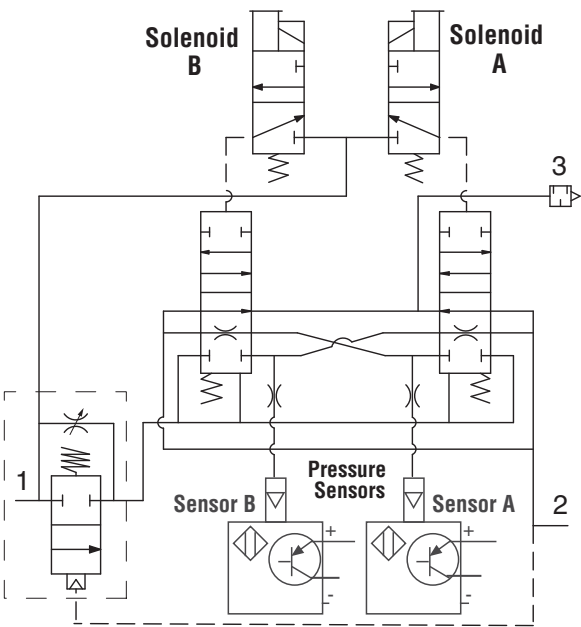
Integration Guide - M35 Series Safe Exhaust Double Valves

DIMENSIONS		Inches (mm)	
Model with Built-In Exhaust		Model with Threaded Exhaust Flange	
Model with Soft-Start EEZ-ON® Module	 6.39 (162.3) 1.44 (36.5) 4.11 (104.3)	 3.73 (94.7) 0.64 (16.3)  10.31 (261.9) 3.15 (80.0)	 3.84 (97.6)  6.76 (171.6)
	 3.11 (79.0) 1.44 (36.5) 4.11 (104.3)	 3.73 (94.7) 0.64 (16.3)  7.03 (178.7) 3.15 (80.0)	 3.84 (97.6)  3.28 (83.3)
Downloadable CAD models available.			

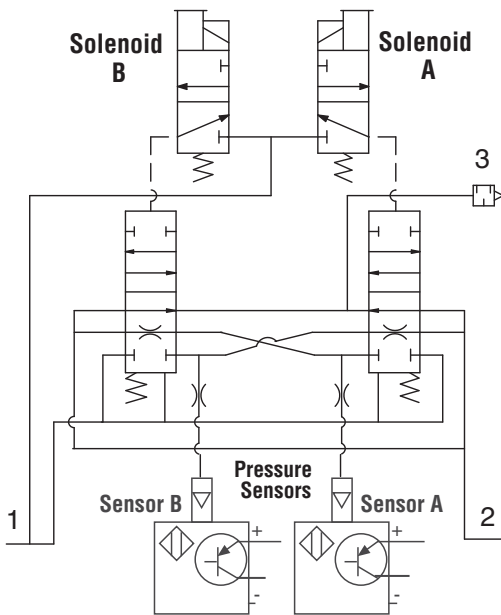
Model with Built-In Exhaust	Model with Threaded Exhaust Flange
	

Valve Schematics

with Soft-Start EEZ-ON® Module



without Soft-Start EEZ-ON® Module



EXHAUST TIME

Normal and Faulted Condition (s)								
M35 Valve	Volume ft ³ (L)	Condition	Operating Pressure psig (bar)					
			30 (2)		90 (6)		145 (10)	
			to 15 (1)	to 7 (0.5)	to 15 (1)	to 7 (0.5)	to 15 (1)	to 7 (0.5)
Valve with Built-in Silencer	0.071 (2)	Normal	0.055	0.071	0.094	0.112	0.120	0.135
		Faulted	0.072	0.098	0.147	0.183	0.200	0.247
	0.35 (10)	Normal	0.131	0.208	0.317	0.393	0.424	0.507
		Faulted	0.185	0.301	0.533	0.710	0.789	1.024
	0.71 (20)	Normal	0.226	0.379	0.597	0.746	0.804	0.971
		Faulted	0.326	0.555	1.016	1.368	1.526	1.997
	1.41 (40)	Normal	0.416	0.721	1.155	1.451	1.564	1.899
		Faulted	0.608	1.063	1.983	2.685	3.000	3.941
	5.30 (150)	Normal	1.462	2.604	4.227	5.326	5.743	7.006
		Faulted	2.160	3.855	7.298	9.929	11.107	14.635
Valve with Threaded Exhaust Flange	0.071 (2)	Normal	0.052	0.070	0.093	0.113	0.123	0.142
		Faulted	0.065	0.091	0.137	0.175	0.203	0.272
	0.35 (10)	Normal	0.120	0.191	0.308	0.409	0.437	0.520
		Faulted	0.163	0.300	0.503	0.697	0.805	1.048
	0.71 (20)	Normal	0.204	0.342	0.577	0.779	0.829	0.992
		Faulted	0.285	0.562	0.961	1.349	1.558	2.017
	1.41 (40)	Normal	0.373	0.645	1.115	1.519	1.615	1.937
		Faulted	0.530	1.086	1.878	2.655	3.064	3.957
	5.30 (150)	Normal	1.301	2.310	4.071	5.588	5.934	7.130
		Faulted	1.874	3.968	6.919	9.834	11.345	14.622

Safe Exhaust Double Valves DM^{2®} Series C

Product Overview

Registered in Canada to the ASME B31.3, Process Piping, in the following jurisdictions:

Internal Pilot Supply Valves
CRN
0C13864.145369870YTN

British Columbia
Manitoba
New Brunswick

Newfoundland
Northwest Territories
Nova Scotia

Nunavut
Ontario
Quebec

Prince Edward Island
Saskatchewan
Yukon Territory



Illustration examples.

Safe Exhaust Safety Function

The DM^{2®} Series C valve safety function is to shut off supply or pneumatic energy and to exhaust any pneumatic energy from downstream of the valve.

The DM^{2®} Series C Safe Exhaust valves are dual valves used to block the supply and remove the downstream pressure from the circuit or machine. It is integrated into the electrical safety system to remove potentially hazardous energy in order to provide employees safe access to a machine or zone. By quickly removing the pneumatic energy with a safety valve, determined by the risk assessment, the safety system integrity is maintained allowing the employee to complete their tasks and safely and rapidly.

VALVE FEATURES

Redundant Control	Redundant control can achieve Category 4, PL e, when used with proper safety controls
Dynamic Monitoring	Monitoring, and air flow control functions are simply integrated into two identical valve elements
Dynamic Memory	Asynchronous movement of valve elements is detected by the dynamic monitoring and the valve latches in the safe condition, resulting in a residual outlet pressure of less than 1% of supply
Valve Reset	Can only be accomplished by the integrated electrical (solenoid) reset; the valve cannot be reset by removing and re-applying supply pressure
Poppet Design	Dirt tolerant, wear compensating for quick response and high flow capacity
PTFE Backup Piston Rings	Enhances valve endurance enabling operation with or without in-line lubrication
Status Indicator	Includes a pressure switch with both normally open (NO) and normally closed (NC) contacts to provide status feedback to the control system indicating whether the valve is in the lockout or ready-to-run condition
Silencer	High flow, clog resistant silencer included
Mounting	Base mounted for ease of valve replacement, captive valve-to-base mounting screws
Flexible Piping	Inlet and outlet ports on both sides (plugs for unused ports included)
Intermediate Pilots (Basic Size 12 & 30 valves only)	Increases pilot air flow for fast valve response, making it possible to use the same size solenoids as valve sizes 2, 4 & 8, thereby reducing electrical power requirements for these larger valves
SISTEMA Library	Available for download

These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses, see DM^{2®} Series D double valves for mechanical power press applications.

PRODUCT CREDENTIALS

Canadian Registration Number (CRN)	Certificate of Compliance	Performance Level Per ISO 13849-1:2015	Safety Integrity Level Per IEC 2061:2001	DGUV	Declaration of Conformity
0C13864.145369870YTN					 

STANDARD SPECIFICATIONS						
GENERAL	Function	3/2 Valve		Normally Closed		
	Construction Design	Dual Poppet				
	Actuation	Electrical		Solenoid Pilot Controlled		
	Mounting	Type		Base		
		Orientation		Vertically with pilot solenoids on top		
	Connection	Threaded Port		NPT		
				G		
	Monitoring	Dynamically, cyclically, internally during each actuating and de-actuating movement Monitoring function has memory and requires an overt act to reset unit after lockout				
Minimum Operation Frequency	Once per month, to ensure proper function					
OPERATING CONDITIONS	Temperature	Ambient		15° to 122°F (-10° to 50°C)		
		Media		40° to 175°F (4° to 80°C)		
		Maximum Design Proof Temperature		200°F (94°C)		
	Flow Media	Filtered, lubricated or unlubricated (mineral oils according to DIN 51519, viscosity classes 32-46)				
	Operating Pressure	Valve Basic Size		2	45 to 150 psig (3.1 to 10.3 bar)	
				4, 8, 12, 30	30 to 120 psig (2.1 to 8.3 bar)	
	Pilot Supply Pressure	Must meet minimum operating pressure			150 psig (10 bar)	
ELECTRICAL DATA	Solenoids		Current Flow	Operating Voltage	Valve Basic Size	Power Consumption (each solenoid)
	Primary Solenoids	DC	24 volts	2, 4, 12, 30	5.8 watts nominal, 6.5 watts maximum	
				8	15 watts	
		AC	110 volts, 50 Hz; 120 volts, 50/60 Hz	2, 4, 12, 30	5.8 watts nominal, 6.5 watts maximum	
				8	36 VA inrush and 24.6 VA holding	
			230 volts AC, 50/60 Hz	2, 4, 12, 30	5.8 watts nominal, 6.5 watts maximum	
				8	32 VA inrush and 22 VA holding	
		Rated for continuous duty				
	Design according to VDE 0580					
	Reset Solenoids	Current Flow	Operating Voltage	Valve Basic Size	Power Consumption (each solenoid)	
		DC	24 volts	2, 4, 8, 12, 30	5.8 watts nominal, 6.5 watts maximum	
		AC	110 volts, 50 Hz; 120 volts, 50/60 Hz			
			230 volts, 50/60 Hz			
		Rated for continuous duty				
	Design according to VDE 0580					
	Enclosure Rating	DIN 40050, IP65, IEC 60529				
	Electrical Connection	DIN EN 175301-803			Form A	
M12						
Mechanical Pressure Switch (Status Indicator) Rating	NO/NC Contacts			0.1 A, 125/250 volts AC; 0.1 A, 30 volts DC; 0.3 A, 60 volts DC		
Solid State Pressure Sensor (Status Indicator) Rating	Supply Voltage			8-30 volts DC		
	Current Consumption			<4mA		
CONSTRUCTION MATERIAL	Valve Body	Cast Aluminum				
	Poppet	Acetal and Stainless Steel				
	Seals	Buna-N				
SAFETY DATA	Functional Safety Data	Category		CAT 4, PL e		
		B _{10D}		20,000,000		
		PFH _D		7.71x10 ⁻⁹		
		MTTF _D		301.9 (n _{op} : 662400)		
	Vibration/Impact Resistance	Tested to DIN EN 60068-2-6				
IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.						



Ordering Information

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

Examples: TDM2CNB21A21, TDM2CDB42A1005.

T

DM2C

N

B21

A

2

1

CRN Certified

Series

Port Thread

NPT

N

G

D

Basic Size

Port Size

In

Out

Exhaust

2

1/4

1/4

3/4

B20

3/8

3/8

3/4

B21

4

1/2

1/2

1

B42

8

3/4

3/4

1

A54

1

1

1

A55

12

1

1

1-1/2

A66

30

1-1/2

2

2-1/2

A88

Current

Voltage *

DC

24 V

A

AC

110 V, 50 Hz

120 V, 50/60 Hz

B

230 V, 50/60 Hz

C

* For other voltages consult ROSS.

Solenoid Connection Type *

Voltage

DIN EN 175301-803
(connectors sold separately)

AC or DC

Leave Blank

M12

DC only

005

* See accessories for connectors or wiring kits options.

Status Indicator Type *

Connection

Voltage

Mechanical Pressure Switch
(connector included)

DIN EN 175301-803

AC or DC

M12

DC only

1

Solid State Pressure Sensor
(built-in connector)

M12 only

DC only

2

None

X

* See accessories for wiring kits options.

Reset Type

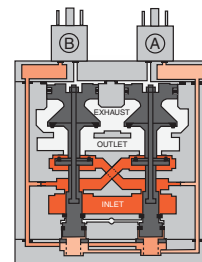
Solenoid

Size				Flow Cv (NI/min)		≈ Weight # lb (kg)	Simplified Schematic
Basic	Port 1	Port 2	Port 3	1-2	2-3		
2	1/4	1/4	3/4	1.7 (1700)	2.6 (2600)	5.3 (2.4)	
	3/8	3/8	3/4	2.2 (2200)	3.6 (3500)		
4	1/2	1/2	1	3.0 (3000)	6.5 (6400)	5.9 (2.6)	
8	3/4	3/4	1	4.2 (4100)	9.4 (9300)	8.4 (3.7)	
	1	1	1	4.3 (4200)	9.4 (9300)		
12	1	1	1-1/2	9.0 (8900)	17 (17000)	15.3 (3.7)	
30	1-1/2	2	2-1/2	20 (20000)	55 (54000)	34.7 (15.1)	
# Valve and base assembly with status indicator.							

These valves are not designed for controlling clutch/brake mechanisms on mechanical power presses, see DM[®] Series D double valves for mechanical power press applications.

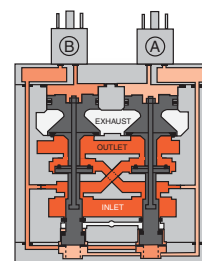
Valve De-actuated (ready-to-run)

The flow of inlet air pressure into the crossover passages is restricted by the size of the passage between the stem and the valve body opening. Flow is sufficient to quickly pressurize pilot supply/timing chambers A and B. The inlet poppets prevent air flow from crossover passages into the outlet chamber. Air pressure acting on the inlet poppets and return pistons securely hold the valve elements in the closed position. (Air passages shown out of position and reset adapter omitted for clarity.)



Valve Actuated

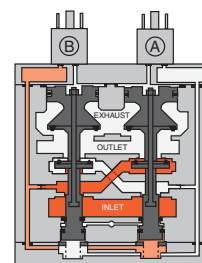
Energizing the pilot valves simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated (open) position, where inlet air flow to crossover passages is fully open, inlet poppets are fully open and exhaust poppets are fully closed. The outlet is then quickly pressurized, and pressure in the inlet, crossovers, outlet, and timing chambers are quickly equalized. De-energizing the pilots quickly causes the valve elements to return to the ready-to-run position.



Valve Locked-out

Whenever the valve elements operate in a sufficiently asynchronous manner, either on actuation or de-actuation, the valve will move to a locked-out position. In the locked-out position, one crossover and its related timing chamber will be exhausted, and the other crossover and its related timing chamber will be fully pressurized.

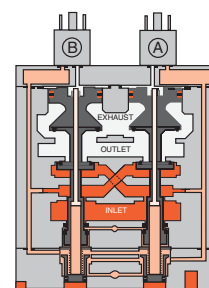
The valve element (side B) that is partially actuated has pilot air available to fully actuate it, but no air pressure on the return piston to fully de-actuate the valve element. Air pressure in the crossover acts on the differential of side B stem diameters creating a latching force. Side A is in a fully closed position, and has no pilot air available to actuate, but has full pressure on the inlet poppet and return piston to hold the element in the fully closed position. Inlet air flow on side A into its crossover is restricted, and flows through the open inlet poppet on side B, through the outlet into the exhaust port, and from the exhaust port to atmosphere. Residual pressure in the outlet is less than 1% of inlet pressure. The return springs are limited in travel, and can only return the valve elements to the intermediate (locked-out) position. Sufficient air pressure acting on the return pistons is needed to return the valve elements to a fully closed position.



Resetting the Valve

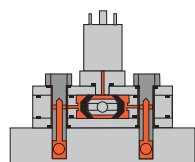
The valve will remain in the locked-out position, even if the inlet air supply is removed and re-applied.

A remote reset signal must be applied to reset the valve. Reset is accomplished by momentarily pressurizing the reset port. Actuation of the reset piston physically pushes the main valve elements to their closed position. Inlet air fully pressurizes the crossovers and holds the inlet poppets on seat. Actuation of the reset piston opens the reset poppet, thereby, immediately exhausting pilot supply air, thus, preventing valve operation during reset (Reset adapter added to illustration.). De-actuation of reset pistons causes the reset poppets to close and pilot supply to fully pressurize. Reset pressure can be applied by a remote 3/2 normally closed valve, or from an optional 3/2 normally closed solenoid mounted on the reset adapter. De-actuation of reset pistons causes the reset poppets to close and pilot supply to fully pressurize. Reset air pressure can be applied by a remote 3/2 normally closed valve, or from an optional 3/2 normally closed solenoid, or a manual push button mounted on the reset adapter.



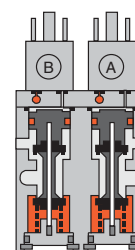
Status Indicator

The status indicator pressure switch will actuate when the main valve is operating normally, and will de-actuate when the main valve is in the locked-out position or inlet pressure is removed. This device is not part of the valve lockout function, but, rather, only reports the status of the main valve.

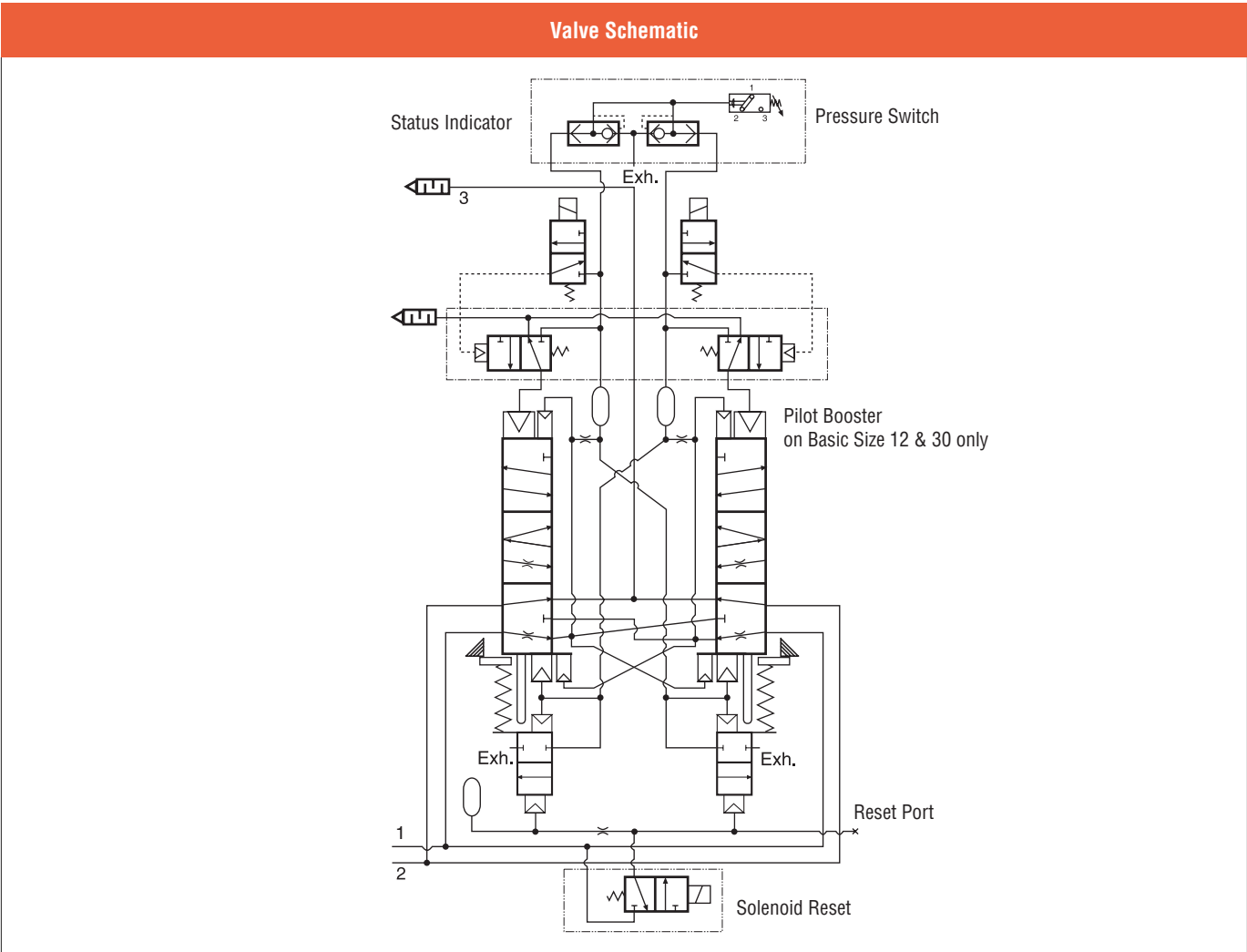


Status Indicator in normal ready-to-run position

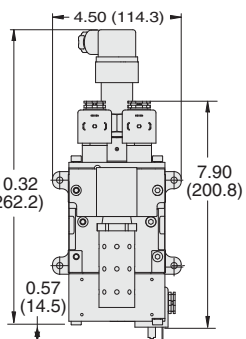
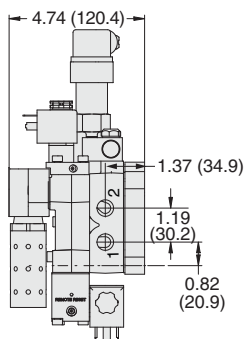
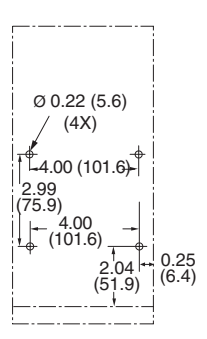
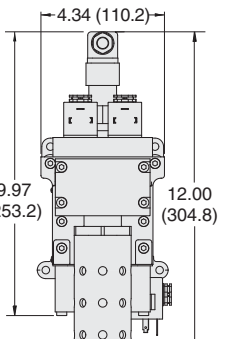
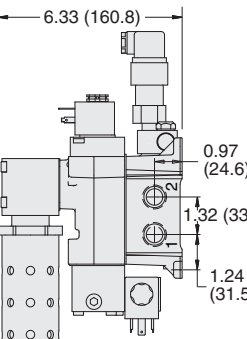
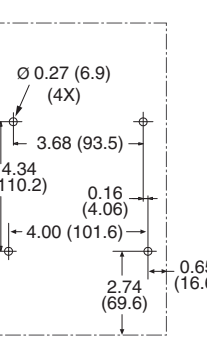
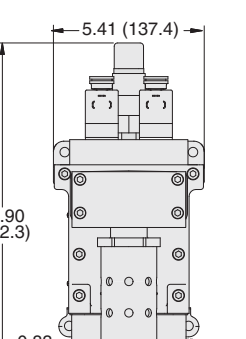
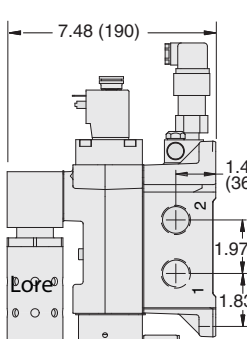
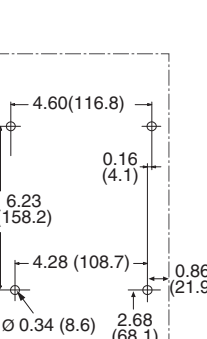
Basic Size 12 and 30 valves require relatively large pilots to actuate and de-actuate the main valve elements. In order to achieve extremely quick valve response for such large pilots, a 2-stage solenoid pilot system is incorporated into the design. This keeps the required electrical current to operate the pilots to a minimum.

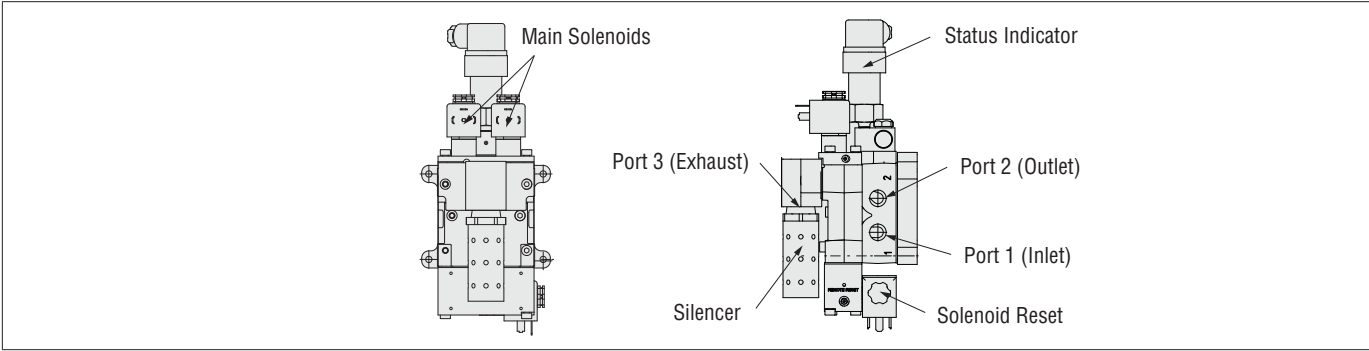


Valve Basic Size 12 & 30 Pilots

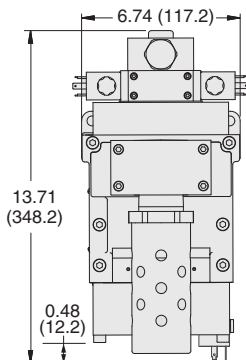
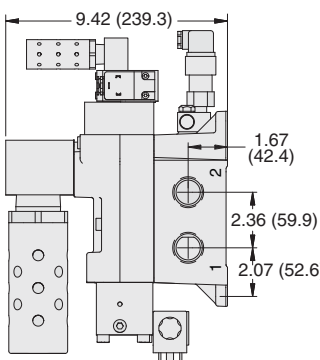
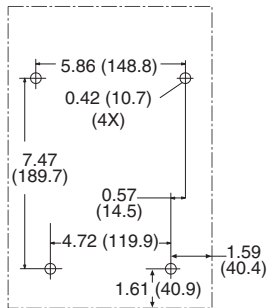
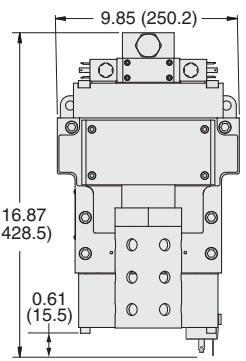
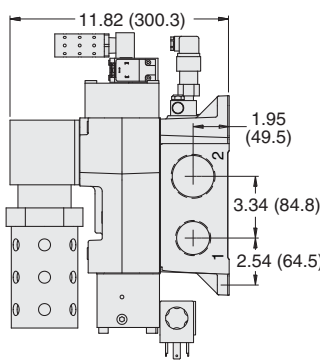
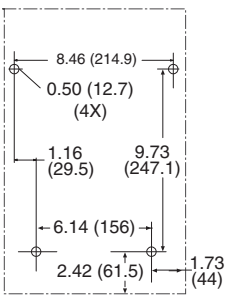


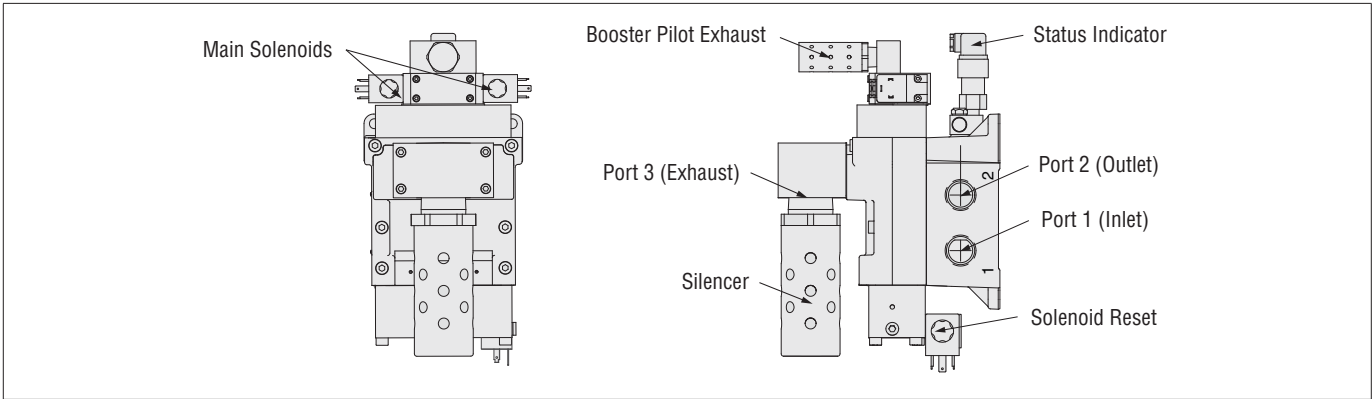
Solenoid & Pressure Switch for Status Indicator Pinouts			
Solenoid	DIN EN 175301-803 Form A		M12
	1 - Positive 2 - Negative 4 - Ground		3 - Positive 4 - Negative
Pressure Switch			
Mechanical Pressure Switch		Solid State Pressure Sensor	
DIN EN 175301-803 Form A	M12	M12	
1 - Common 2 - Normally Closed 3 - Normally Open 4 - Ground (Not Used)	1 - Common 2 - Normally Closed 3 - Not Used 4 - Normally Open	1, 2, 3, 4 - Pin PNP - Switched Positive NO - Normally Open NC - Normally Closed	

DIMENSIONS		Inches (mm)		
Size		View X (base mounting hole pattern)		
Basic	Port			
2	1/4 & 3/8			
				
				
Downloadable CAD models available.				



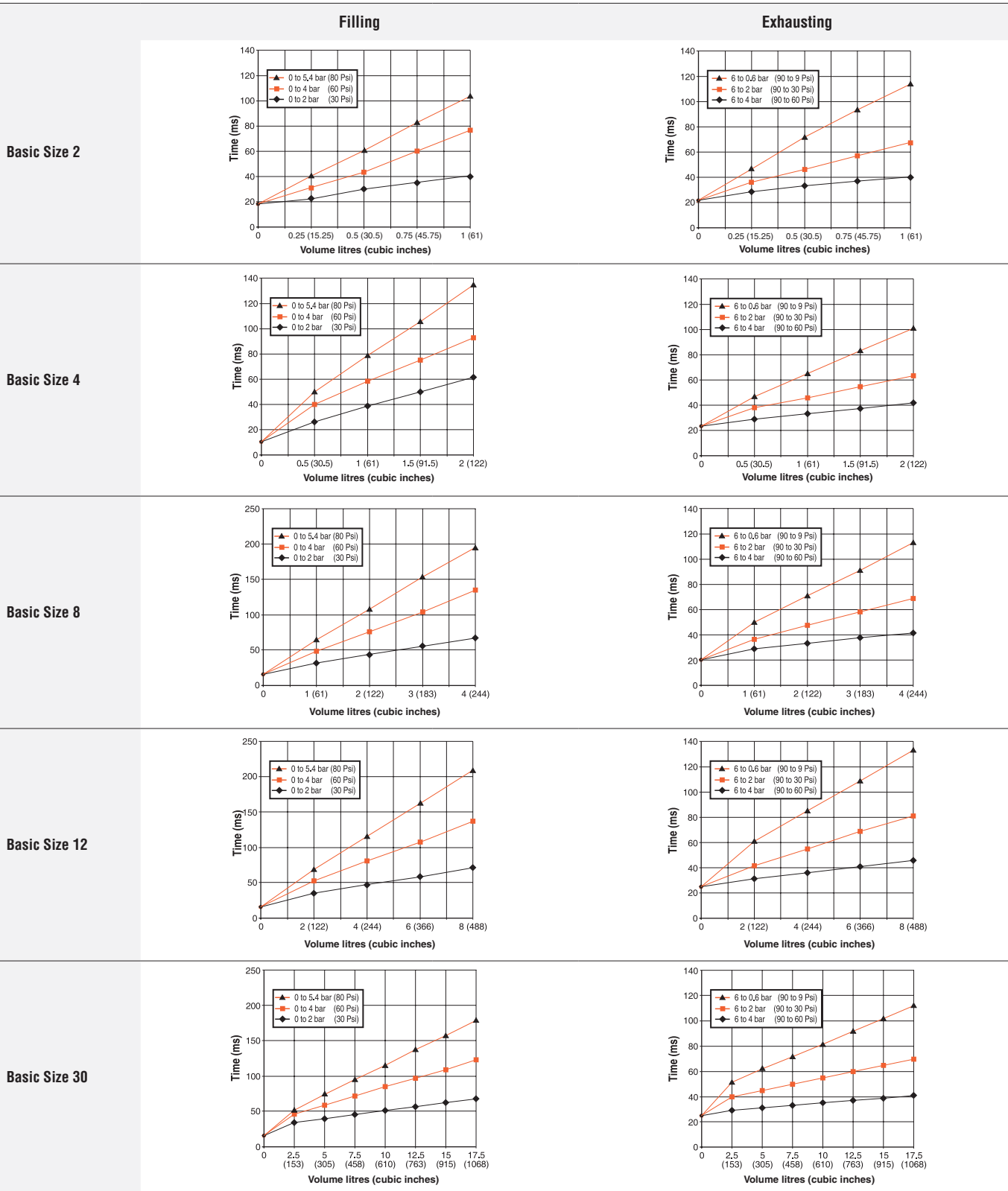
Technical Data

DIMENSIONS		Inches (mm)		
Size		View X (base mounting hole pattern)		
Basic	Port			
12	1			
30	2			
Downloadable CAD models available.				



VALVE RESPONSE CHARTS

The charts below represent the fill and exhaust times for each of the various sizes of DM²⁰ Series C double valves. The "fill" times were measured while raising (filling) the pressure in a volume from 0 to 30, 60, & 80 psi (0 to 2.1, 4.1, & 5.5 bar) with a 90 psi (6.2 bar) inlet pressure. Conversely, the "exhaust" times were measured while lowering the pressure (exhausting) in a volume from 90 psi (6.2 bar) down to 90 to 60, 30, & 9 psi (4.1, 2.1, & 0.6 bar). Exhausting tests performed with silencer installed.



DM²® Series D Clutch/Brake Control Double Valves

Product Overview

Registered in Canada to the ASME B31.3, Process Piping, in the following jurisdictions:

Internal Pilot Supply Valves
CRN
0C13864.145369870YTN

British Columbia
Manitoba
New Brunswick

Newfoundland
Northwest Territories
Nova Scotia

Nunavut
Ontario
Quebec

Prince Edward Island
Saskatchewan
Yukon Territory

Size 2	Basic Size 4, 8	Basic Size 12, 30
		

Illustration examples.

Clutch/Brake Control Function

The DM²® Series D double valve is designed to provide SAFETY for the operators and maintenance personnel working on presses. The DM²® Series D double valve is a patented 3/2 normally closed valve (with an intermediate, lockout position) distinguished by SERPAR® Crossflow passages with poppet and spool valving on the main valve stems. This arrangement provides the valve's outstanding flow characteristics and an integrated monitoring capability with total memory. The valve provides dynamic monitoring and dynamic memory.

Dynamic Monitoring means that all monitoring components change state on every valve cycle. Should the valve elements cycle asynchronously, the valve will exhaust downstream air and lock-out, prohibiting further operation.

Dynamic Memory within a monitoring system indicates that when a valve lock-out occurs, the valve will retain the fault information regardless of air or electrical changes. The DM²® system can only be reset by a defined operation/procedure, and will not self-reset (turning the valve off and on) or reset when inlet air supply is removed and re-applied. Such automatic resetting would conceal potential hazards from the operator.

VALVE FEATURES

Redundant Control	Redundant control can achieve Category 4, PL e, when used with proper safety controls
Dynamic Monitoring with Complete Memory	Memory, monitoring, and air flow control functions are simply integrated into two identical valve elements. Valves lock-out due to asynchronous movement of valve elements during actuation or de-actuation, resulting in a residual outlet pressure of less than 1% of supply.
Valve Reset	Can only be accomplished by remote air signal, electrical solenoid reset signal, or manual pushbutton reset. The valve cannot be reset by removing and re-applying supply pressure.
Poppet Design	Dirt tolerant, wear compensating for quick response and high flow capacity
PTFE Backup Piston Rings	Enhances valve endurance enabling operation with or without in-line lubrication
Status Indicator	Includes a pressure switch with both normally open (NO) and normally closed (NC) contacts to provide status feedback to the control system indicating whether the valve is in the lockout or ready-to-run condition.
Silencer	High flow, clog resistant built-in silencer
Mounting	Base mounted for ease of valve replacement. Captive valve-to-base mounting screws.
Flexible Piping	Inlet and outlet ports on both sides (plugs for unused ports included)
Intermediate Pilots (Basic Size 12 & 30 valves only)	Increases pilot air flow for fast valve response, making it possible to use the same size solenoids as valve sizes 2, 4 & 8, thereby reducing electrical power requirements for these larger valves.
SISTEMA Library	Available for download

PRODUCT CREDENTIALS

Canadian Registration Number (CRN)	Certificate of Compliance	Performance Level Per ISO 13849-1:2015	Safety Integrity Level Per IEC 2061:2001	DGUV	Declaration of Conformity
0C13864.145369870YTN					 

STANDARD SPECIFICATIONS					
GENERAL	Function	3/2 Valve		Normally Closed	
	Construction Design	Dual Poppet			
	Actuation	Electrical	Solenoid Pilot Controlled		
	Mounting	Type	Base		
		Orientation	Vertically with pilot solenoids on top		
	Connection	Threaded Port	NPT		
			G		
Monitoring	Dynamically, cyclically, internally during each actuating and de-actuating movement Monitoring function has memory and requires an overt act to reset unit after lockout				
Minimum Operation Frequency	Once per month, to ensure proper function				
OPERATING CONDITIONS	Temperature	Ambient	15° to 122°F (-10° to 50°C)		
		Media	40° to 175°F (4° to 80°C)		
		Maximum Design Proof Temperature		200°F (94°C)	
	Flow Media	Filtered, lubricated or unlubricated (mineral oils according to DIN 51519, viscosity classes 32-46)			
	Operating Pressure	Valve Basic Size	2	45 to 150 psig (3.1 to 10.3 bar)	
			4, 8, 12, 30	30 to 120 psig (2.1 to 8.3 bar)	
		Maximum Design Proof Pressure		150 psig (10.3 bar)	
		Remote Air Reset Pressure		For remote air reset option – must be equal to inlet pressure	
		Manual Pressure		Encapsulated, push button actuation	
ELECTRICAL DATA	Solenoids	Current Flow	Operating Voltage	Valve Basic Size	Power Consumption (each solenoid)
	Primary Solenoids	DC	24 volts	2, 4, 12, 30	5.8 watts nominal, 6.5 watts maximum
				8	15 watts
		AC	110 volts, 50 Hz; 120 volts, 50/60 Hz	2, 4, 12, 30	5.8 watts nominal, 6.5 watts maximum
				8	36 VA inrush and 24.6 VA holding
			230 volts, 50/60 Hz	2, 4, 12, 30	5.8 watts nominal, 6.5 watts maximum
		8	32 VA inrush and 22 VA holding		
	Rated for continuous duty				
	Design according to VDE 0580				
	Reset Solenoids	Current Flow	Operating Voltage		Power Consumption (each solenoid)
		DC	24 volts		5.8 watts nominal, 6.5 watts maximum
		AC	110 volts, 50 Hz; 120 volts, 50/60 Hz		
			230 volts, 50/60 Hz		
	Enclosure Rating	DIN 40050, IP65, IEC 60529			
	Electrical Connection	DIN EN 175301-803		Form A	
		M12			
Mechanical Pressure Switch (Status Indicator) Rating	NO/NC Contacts - 0.1 A, 125/250 volts AC; 0.1 A, 30 volts DC; 0.3 A, 60 volts DC				
Solid State Pressure Sensor (Status Indicator) Rating	Supply Voltage - 8-30 volts DC Current Consumption <4mA				
CONSTRUCTION MATERIAL	Valve Body	Cast Aluminum			
	Poppet	Acetal and Stainless Steel			
	Seals	Buna-N			
SAFETY DATA	Functional Safety Data	Category	CAT 4, PL e		
		B _{10D}	20,000,000		
		PFH _D	7.71x10 ⁻⁹		
		MTTF _D	301.9 (n _{op} : 662400)		
	Vibration/Impact Resistance	Tested to DIN EN 60068-2-6			
IMPORTANT NOTE: Please read carefully and thoroughly all of the CAUTIONS, WARNINGS on the inside back cover.					

Ordering Information

MODEL NUMBER CONFIGURATOR

3-Way 2-Position Valves

Examples: TDM2DNB21A11, TDM2DDA54A22005

T	DM2D	N	B21	A	1	1	
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CRN Certified

Series

Port Thread

NPT

G

N

D

Basic Size	Port Size		
	In	Out	
2	1/4	1/4	B20
	3/8	3/8	B21
4	1/2	1/2	B42
	1/2	3/4	B43
8	3/4	3/4	A54
	1	1	A55
12	1	1	A66
	1	1-1/2	A67
30	1-1/2	2	A88

Current	Voltage*	
DC	24 V	A
AC	110 V, 50 Hz 120 V, 50/60 Hz	B
	230 V, 50/60 Hz **	C

* For other voltages consult ROSS.
 ** 230 V AC (OSHA regulations limit press control voltage to no more than 120 V AC in the US).

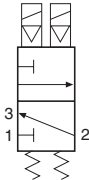
Solenoid Connection Type *	Voltage	
DIN EN 175301-803 Form A (connectors sold separately)	AC or DC	
Leave Blank		
M12	DC only	005

* See accessories for connectors or wiring kits options.

Status Indicator Type *	Connection	Voltage	
Mechanical Pressure Switch (connector included)	DIN EN 175301-803 Form A	AC or DC	1
	M12	DC only	
Solid State Pressure Sensor (built-in connector)	M12 only	DC only	2
None			X

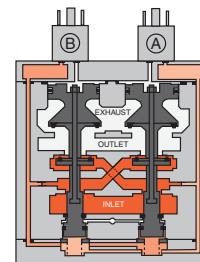
* See accessories for wiring kits options.

Reset Type	
Remote Air	1
Solenoid	2
Manual	4

Size			Flow C _v (NL/min)		≈ Weight lb (kg)	Simplified Schematic
Basic	Port 1	Port 2	1-2	2-3		
2	1/4	1/4	2.2 (2100)	3.7 (3600)	5.0 (2.3)	
	3/8	3/8				
4	1/2	1/2	2.8 (2800)	6.7 (6600)	6.0 (2.8)	
	1/2	3/4				
8	3/4	3/4	4.6 (4600)	13 (12000)	9.1 (4.2)	
	1	1				
12	1	1	8.9 (8700)	21 (20000)	15.5 (7.1)	
	1	1-1/2				
30	1-1/2	2	20 (20000)	54 (53000)	32.6 (14.8)	
# Valve and base assembly with status indicator and solenoid reset.						

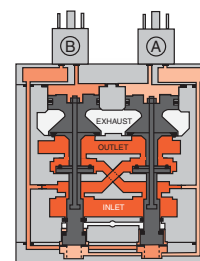
Valve De-actuated (ready-to-run)

The flow of inlet air pressure into the crossover passages is restricted by the size of the passage between the stem and the valve body opening. Flow is sufficient to quickly pressurize pilot supply/timing chambers A and B. The inlet poppets prevent air flow from crossover passages into the outlet chamber. Air pressure acting on the inlet poppets and return pistons securely hold the valve elements in the closed position. (Air passages shown out of position and reset adapter omitted for clarity.)



Valve Actuated

Energizing the pilot valves simultaneously applies pressure to both pistons, forcing the internal parts to move to their actuated (open) position, where inlet air flow to crossover passages is fully open, inlet poppets are fully open and exhaust poppets are fully closed. The outlet is then quickly pressurized, and pressure in the inlet, crossovers, outlet, and timing chambers are quickly equalized. De-energizing the pilots quickly causes the valve elements to return to the ready-to-run position.



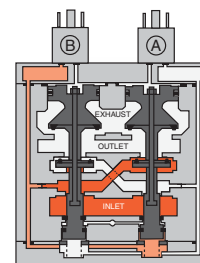
Valve Locked-out

Whenever the valve elements operate in a sufficiently asynchronous manner, either on actuation or de-actuation, the valve will move to a locked-out position. In the locked-out position, one crossover and its related timing chamber will be exhausted, and the other crossover and its related timing chamber will be fully pressurized. The valve element (side B) that is partially actuated has pilot air available to hold the element in the fully closed position. Air pressure in the crossover acts on the differential of side B stem diameters creating a latching force.

Side A is in a fully closed position, and has no pilot air available to actuate, but has full pressure on the inlet poppet and return piston to hold the element in the fully closed position.

Inlet air flow on side A into its crossover is restricted, and flows through the open inlet poppet on side B, through the outlet into the exhaust port, and from the exhaust port to atmosphere. Residual pressure in the outlet is less than 1% of inlet pressure.

The return springs are limited in travel, and can only return the valve elements to the intermediate (locked-out) position. Sufficient air pressure acting on the return pistons is needed to return the valve elements to a fully closed position.



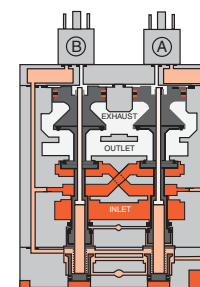
Resetting the Valve

The valve will remain in the locked-out position, even if the inlet air supply is removed and re-applied. A remote reset signal (air or electric), or a manual push button actuation must be applied to reset the valve.

Reset is accomplished by momentarily pressurizing the reset port. Actuation of the reset piston physically pushes the main valve elements to their closed position. Inlet air fully pressurizes the crossovers and holds the inlet poppets on seat. Actuation of the reset piston opens the reset poppet, thereby, immediately exhausting pilot supply air, thus, preventing valve operation during reset. (Reset adapter added to illustration.)

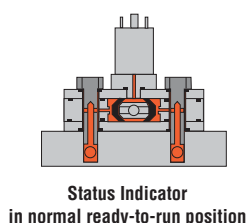
De-actuation of reset pistons causes the reset poppets to close and pilot supply to fully pressurize.

Reset air pressure can be applied by a remote 3/2 normally closed valve, or from an optional 3/2 normally closed solenoid, or a manual push button mounted on the reset adapter.

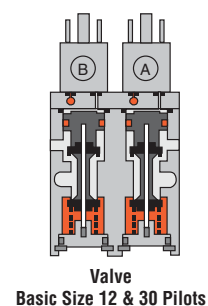


Status Indicator

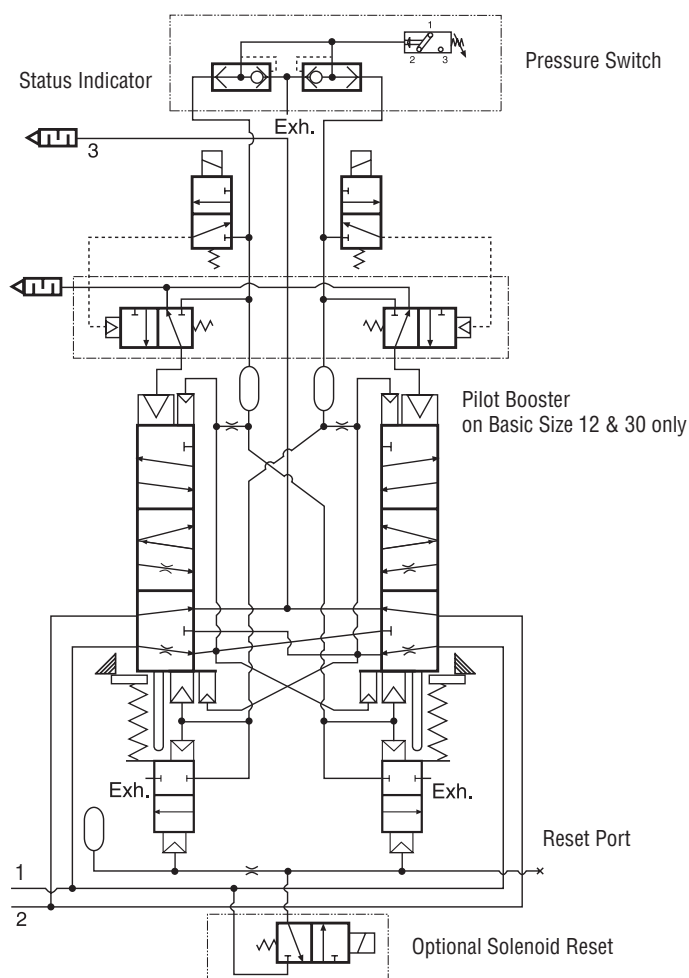
The status indicator pressure switch will actuate when the main valve is operating normally, and will de-actuate when the main valve is in the locked-out position or inlet pressure is removed. This device is not part of the valve lockout function, but, rather, only reports the status of the main valve.



Basic Size 12 and 30 valves require relatively large pilots to actuate and de-actuate the main valve elements. In order to achieve extremely quick valve response for such large pilots, a 2-stage solenoid pilot system is incorporated into the design. This keeps the required electrical current to operate the pilots to a minimum.



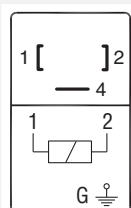
Valve Schematic



Solenoid & Pressure Switch for Status Indicator Pinouts

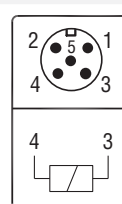
DIN EN 175301-803 Form A

Solenoid



1 - Positive
2 - Negative
4 - Ground

M12

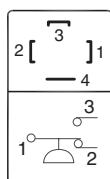


3 - Positive
4 - Negative

Pressure Switch

Mechanical Pressure Switch

DIN EN 175301-803



1 - Common
2 - Normally Closed
3 - Normally Open
4 - Ground (Not Used)

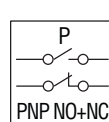
M12



1 - Common
2 - Normally Closed
3 - Not Used
4 - Normally Open

Solid State Pressure Sensor

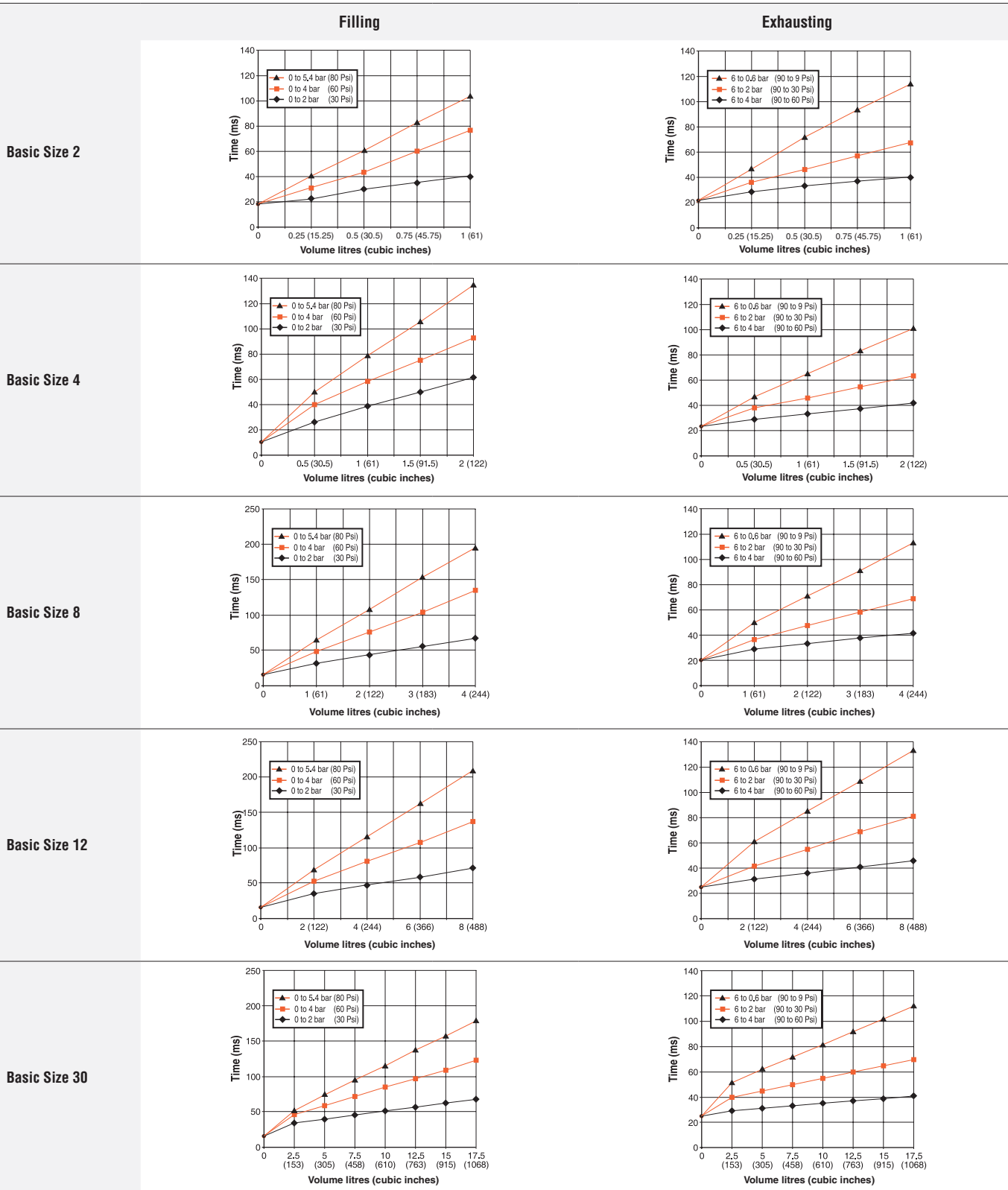
M12



1, 2, 3, 4 - Pin
PNP - Switched Positive
NO - Normally Open
NC - Normally Closed

VALVE RESPONSE CHARTS

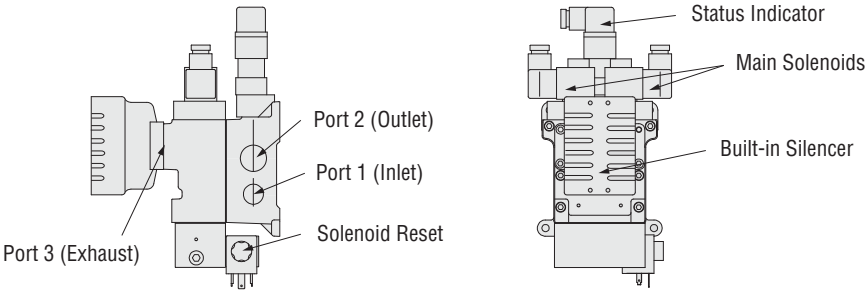
The charts below represent the fill and exhaust times for each of the various sizes of DM²⁰ Series D double valves. The "fill" times were measured while raising (filling) the pressure in a volume from 0 to 30, 60, & 80 psi (0 to 2.1, 4.1, & 5.5 bar) with a 90 psi (6.2 bar) inlet pressure. Conversely, the "exhaust" times were measured while lowering the pressure (exhausting) in a volume from 90 psi (6.2 bar) down to 90 to 60, 30, & 9 psi (4.1, 2.1, & 0.6 bar). Exhausting tests performed with silencer installed.



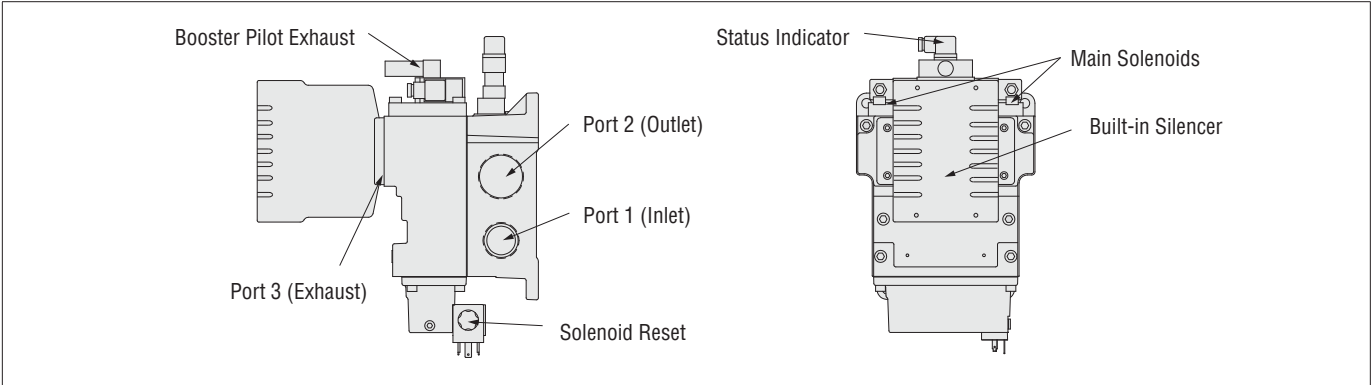
Technical Data

DIMENSIONS		Inches (mm)		
Size		View X (base mounting hole pattern)		
Basic	Port			
2	1/4 & 3/8			

Downloadable CAD models available.



DIMENSIONS		Inches (mm)	
Size		View X (base mounting hole pattern)	
Basic	Port		
12	1		
30	2		
Downloadable CAD models available.			



ACCESSORIES



Accessories – Indicator Light and Manual Override Kits for Single Solenoid Valves

SOLENOID PILOT INDICATOR LIGHT KITS

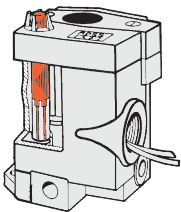


Illustration example.

Indicator Light Kits	Kit Number		
	24 V DC	110-120 V AC, 50-60 Hz	230 V AC, 50-60 Hz
	862K87-W	862K87-Z	862K87-Y
	To visually verify valve operation, indicator light kits are available for single solenoid models. Indicator lights are standard on double solenoid valves. The indicator light is illuminated when the solenoid is energized.		

SOLENOID PILOT MANUAL OVERRIDE KITS

Flush Button	Extended Button	Extended Button with Palm
		

Illustration examples.

Manual Override Kits	Manual Override Type	Kit Number	
		Locking Type	Non-Locking Type
	Flush Button	792K87	–
	Extended Button	–	791K87
	Extended Button with Palm	–	984H87
	Flush rubber button, non-locking manual override is standard on single solenoid models. Flush metal-button, non-locking manual overrides are standard on direct double solenoid models. Each of the buttons in the override kits is made of metal and is spring-returned. The locking type button, however, can be kept in the actuated position by turning the slot in the top of the button with a screwdriver.		

NOISE REDUCTION EXHAUST SILENCERS

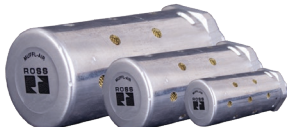
Aluminum		Stainless Steel	316 Stainless Steel Sintered Element
Port Size 1/8 through 2	Port Size 2-1/2		
			

Illustration examples.

Silencers	Silencer Material	Pressure Range psig (bar)	Schematic
	Aluminum	0-290 (0-20) maximum	
	Stainless Steel	0-175 (0-12.3) maximum	
	316 Stainless Steel Sintered Element	0-125 (0-8.6)	

Silencer Material	Port Size	Thread Type	Flow C _v (NI/min)	Model Number		Dimensions inches (mm)		Weight ≈ lb (kg)
				NPT Thread	R/Rp Thread	Length	Hex Size (D)	
Aluminum	3/8	Male	2.9 (2900)	5500A3013	D5500A3013	2.2 (6)	0.81 (21)	0.07 (0.03)
			4.9 (4800)	5500A3003	D5500A3003	3.5 (9)	1.25 (32)	0.2 (0.1)
	1/2	Male	6.8 (6700)	5500A4003	D5500A4003	3.6 (9)	1.25 (32)	0.2 (0.1)
	3/4	Male	7.2 (7100)	5500A5013	D5500A5013	3.6 (9)	1.25 (32)	0.2 (0.1)
			15 (15000)	5500A5003	D5500A5003	5.3 (14)	2.0 (51)	0.9 (0.4)
	1	Male	18 (18000)	5500A6003	D5500A6003	5.4 (14)	2.0 (51)	0.9 (0.4)
	1-1/4	Male	24 (23000)	5500A7013	D5500A7013	5.5 (14)	2.0 (51)	0.9 (0.4)
		Female	42 (41000)	5500A7001	D5500A7001	5.7 (14)	2.5 (64)	1.4 (0.6)
	1-1/2	Female	39 (38000)	5500A8001	D5500A8001	5.7 (14)	2.5 (64)	1.3 (0.6)
Stainless Steel	2	Female	59 (58000)	5500B9001	D5500B9001	6.6 (17)	3.0 (76)	1.7 (0.8)
	2-1/2	Female	104 (100000)	5500A9002	D5500A9002	4.0 (102)	5.7 (145)	2.9 (1.4)
	1/4	Male	1.4 (1400)	5500B2004	D5500B2004	1.8 (45)	0.56 (14)	0.05 (0.2)
	1/2	Male	3.0 (3000)	5500B4004	D5500B4004	2.8 (70)	0.87 (22)	0.3 (0.1)
316 Stainless Steel Sintered Element	1	Male	10 (9800)	5500B6004	D5500B6004	3.9 (98)	1.31 (33)	0.5 (0.2)
	2	Male	28 (28000)	5500A9004	D5500A9004	5.5 (140)	2.37 (60)	1.5 (0.7)
	1/4	Male	2.3 (2300)	5500A2005	D5500A2005	2.2 (6)	0.81 (21)	0.07 (0.03)
	1/2	Male	6.8 (6700)	5500A4005	D5500A4005	3.6 (9)	1.25 (32)	0.2 (0.1)
	1	Male	18 (18000)	5500A6005	D5500A6005	5.4 (14)	2.0 (51)	0.9 (0.4)

FEMALE SILENCER CONNECTORS

Hex Nipples	Material	Fitting Pipe Size	Thread Type	Model Number		
	Steel	1-1/4	Male - Male	NPT Thread	BSPT Thread	
				491J27	106J39	
				488J27	122J39	
	Stainless Steel	2	Male - Male	489J27	108J39	
				490J27	123J39	

Exhaust Silencers

HIGH FLOW NOISE REDUCTION SILENCER KITS For DM²® VALVES

Silencers	Pressure Range psig (bar)	
	0-125 (0-8.6) maximum	
	Reduces the Exponentially Perceived Noise (EPNdB), impact noise reduction in the 17–25 dB range. Kits include all plumbing required for installation.	

Silencers for DM ² ® Series C Valves	Valve Basic Size	Model Number		Flow scfm (NL/s)
		NPT Thread	R/Rp Thread	
	2	2323H77	2328H77	800 (380)
	4	2324H77	2329H77	800 (380)
	8	2325H77	2329H77	800 (380)
	12	2326H77	2330H77	2100 (980)
	30	2327H77	2331H77	7200 (3400)
* Dimensions reflect valve with installed silencer.				

Silencers for DM ² ® Series D Valves	Valve Basic Size	Model Number #		Flow scfm (NL/s)
		NPT Thread	R/Rp Thread	
	4	2324H77	2329H77	800 (380)
	8	2325H77	2329H77	800 (380)
	12	2326H77	2330H77	2100 (980)
	30	2327H77	2331H77	7200 (3400)
* Dimensions reflect valve with installed silencer.				
# Kits include all plumbing required for installation. Exhaust Flange Kit required , see below ordering information.				

Exhaust Flange Kits For Noise Reduction Silencers	Valve Basic Size	Valve Port Size	Kit Number	
			NPT Thread	G Thread
	4	1	726B25	D276B25
	8	1	617B25	D617B25
	12	1-1/2	619B25	D619B25
	30	2-1/2	621B25	D621B25

DM Valve Basic Size	Model Number		Flow scfm (NL/s)	≈ Dimensions * inches (mm)			
	NPT Thread	R/Rp Thread		Width	Height (NPT)	Height (R/Rp)	Depth
2	2323H77	2328H77	800 (380)	4.96 (126.1)	14.24 (361.7)	16.05 (407.7)	5.73 (145.5)
4	2324H77	2329H77	800 (380)	4.34 (110.2)	19.06 (484.1)	21.40 (543.6)	7.27 (184.7)
8	2325H77	2329H77	800 (380)	5.41 (137.4)	21.18 (538.0)	23.52 (597.4)	8.41 (213.6)
12	2326H77	2330H77	2100 (980)	6.74 (117.2)	25.85 (656.6)	28.20 (716.3)	10.66 (270.8)
30	2327H77	2331H77	7200 (3400)	9.85 (250.2)	41.55 (1055.4)	41.55 (1055.4)	13.47 (342.1)

* Dimensions reflect valve with installed silencer.

ENERGY RELEASE VERIFICATION For LOCKOUT VALVES

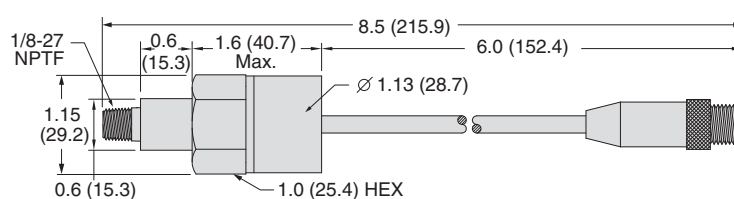
Visual Pressure Indicator		Pressure Switch	
Visual Pop-up Pin	Visual Pop-up	DIN EN 175301-803 Form A	M12
			

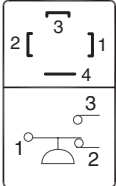
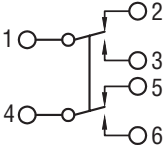
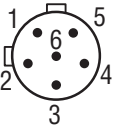
Illustration examples.

Visual Pressure Indicators	Verification Type	Valve Type	Indicator Type	Model Number	Port Thread
	Pneumatic	Lockout L-O-X®	Visual Pop-up Pin	988A30	1/8 NPT
		Stainless Steel L-O-X®	Visual Pop-up	1155H30	

Pressure Switches	Verification Type	Valve Type	Connector Type	Model Number	Factory Preset psi (bar)	Port Thread
	Electrical	Lockout L-O-X®	DIN EN 175301-803 Form A	586A86	5 (0.3) falling	1/8 NPT
		Stainless Steel L-O-X®	M12	1162A30		

M12 Pressure Switch Dimensions– Inches (mm)



Pinout		
DIN EN 175301-803 Form A	M12	
 1 - Common 2 - Normally Closed 3 - Normally Open 4 - Ground (Not Used)	 1 - Circuit 1, Red/White 2 - All Red 3 - Green 4 - Circuit 2, Red/Yellow 5 - Red/Black 6 - Red Blue	 1 - Common 2 - Normally Closed 3 - Normally Open 4 - Common 5 - Normally Closed 6 - Normally Open

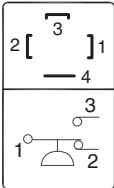
Accessories – Status Indicators

ENERGY RELEASE VERIFICATION For DOWNSTREAM PRESSURE

Pressure Switch	Redundant Pressure Switch Assembly
	

Illustration examples.

Pressure Switch	Verification Type	Installation Location	Connector Type	Model Number	Port Thread	Factory Preset psi (bar)
	Electrical	Pressure Sensing Port or Downstream	DIN EN 175301-803 Form A	586A86	1/8 NPT	5 (0.3) falling
Redundant Pressure Switch Assembly	Verification Type	Installation Location	Connector Type	Model Number	Port Thread	Factory Preset psi (bar)
	Electrical (Dual)	Downstream	DIN EN 175301-803 Form A	RC026-13	3/8 NPT	5 (0.3) falling

Pinout	
DIN EN 175301-803 Form A	
	1 - Common 2 - Normally Closed 3 - Normally Open 4 - Ground (Not Used)

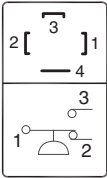
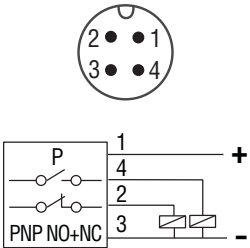
ELECTRICAL STATUS INDICATION For DM²® SERIES VALVES

Pressure Switch	Pressure Sensor
	

Illustration examples.

Pressure Switches for Status Indicator	Indicator Type	Connector Type	Model Number	Port Thread	Factory Preset psi (bar)
	Mechanical Pressure Switch	DIN EN 175301-803 Form A	1104A30	M10x1	22 (1.5) falling
		M12	1153A30		
	Solid State Pressure Sensor	M12	1335B30W	M10x1	17 (1.2) falling

Status Indicator Assemblies	Indicator Type	Connector Type	Model Number	Factory Preset psi (bar)
	Mechanical Pressure Switch	DIN EN 175301-803 Form A	670B94	22 (1.5) falling
	Solid State Pressure Sensor	M12	766B94	17 (1.2) falling

Pinouts		
Mechanical Pressure Switch		Solid State Pressure Sensor
DIN EN 175301-803	M12	M12
 1 - Common 2 - Normally Closed 3 - Normally Open 4 - Ground (Not Used)	 1 - Common 2 - Normally Closed 3 - Not Used 4 - Normally Open	 1, 2, 3, 4 - Pin PNP - Switched Positive NO - Normally Open NC - Normally Closed

Accessories – Electrical Connectivity

PREWIRED ELECTRICAL CONNECTORS For DM^{2®} SERIES VALVES

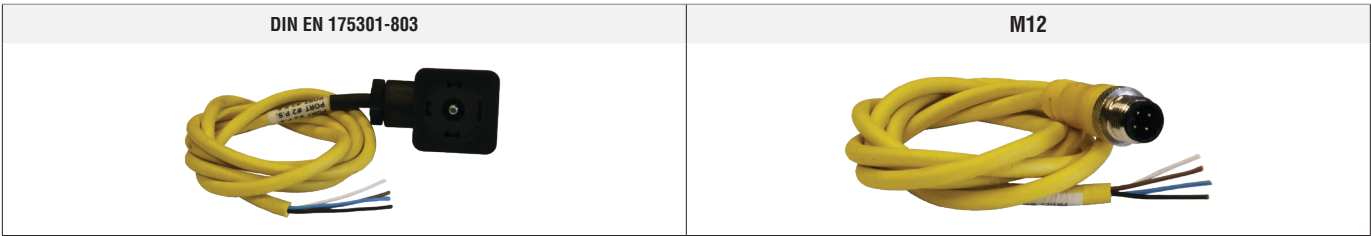
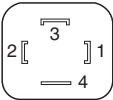
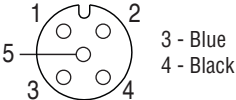
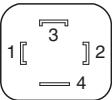
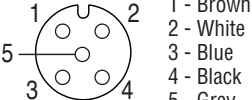


Illustration examples.

Prewired Connector Kits	Cable						Kit Number			
	End 1	End 2	Length meters (feet)	Connection	Quantity Included	Cord Diameter mm	Without Light	Lighted Connector *		
	Connector	Cord						24 V DC	120 V AC	230 V AC
	DIN EN 175301-803 Form A	Flying leads	5 (16.4)	Solenoid	3	6	2283H77	2532H77-W	2532H77-Z	2532H77-Y
				Status Indicator	1					
			10 (32.8)	Solenoid	3	6	2284H77	2533H77-W	2533H77-Z	2533H77-Y
				Status Indicator	1					
M12 5-pin, Female	Flying leads	5 (16.4)	Solenoid	3	6	2288H77	—	—	—	
			Status Indicator	1						
		10 (32.8)	Solenoid	3	6	2289H77	—	—	—	
			Status Indicator	1						

Prewired Connectors	Cable						Model Number			
	End 1	End 2	Connection	Quantity Included	Length feet (meters)	Cord Diameter mm	Without Light	Lighted Connector		
	Connector	Cord						24 V DC	120 V AC	230 V AC
	DIN EN 175301-803 Form A	Flying leads	Solenoid	1	6.5 (2)	6	721K77	720K77-W	720K77-Z	720K77-Y
				1	6.5 (2)	10	371K77	383K77-W	383K77-Z	383K77-Y
		Flying leads	Status Indicator	1	16.4 (5)	6	2247H77	—	—	—
				1	32.8 (10)	6	2248H77	—	—	—
	M12 5-pin, Female	Flying leads	Status Indicator	1	16.4 (5)	6	2241H77	—	—	—
				1	32.8 (10)	6	2242H77	—	—	—

Connector Pinouts			
Solenoid		Status Indicator	
DIN EN 175301-803	M12	DIN EN 175301-803	M12
 1 - Black 2 - Black 3 - Green/Yellow 4 - (Ground)	 1 - Blue 2 - Black 3 - Blue 4 - Black 5 - (Ground)	 1 - Brown 2 - Grey 3 - Black 4 - Green/Yellow 5 - (Ground)	 1 - Brown 2 - White 3 - Blue 4 - Black 5 - Grey

* Lights in connectors with a translucent housing can be used as indicator lights to show when solenoids are energized.

PREWIRED ELECTRICAL CONNECTORS For M35 SERIES VALVES



Illustration example.

Prewired Connector Kits	Cable						Kit Number
	End 1	End 2	Length meters (feet)	Connection	Quantity Included	Cord Diameter mm	Without Light
	Connector	Cord / Connector					
	M12, Female 5-pin straight A-coded	Flying Leads	5 (16.4)	Solenoid	1	6	2644B77
				Sensor	1	6	
			10 (32.8)	Solenoid	1	6	2370B77
				Sensor	1	6	
		Male Connector	5 (16.4)	Solenoid	1	6	2645B77
				Sensor	1	6	
			10 (32.8)	Solenoid	1	6	2371B77
				Sensor	1	6	

Connector Pinout	
	1 - Brown 2 - White 3 - Blue 4 - Black 5 - Grey

Accessories – Preassembled Wiring Kits

JUNCTION BOX OPTIONS

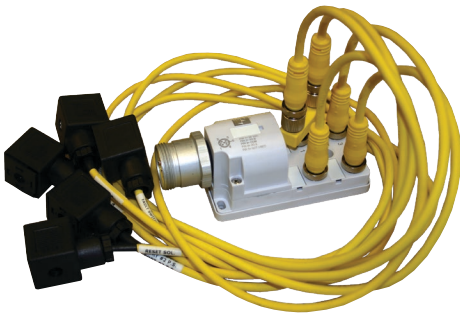
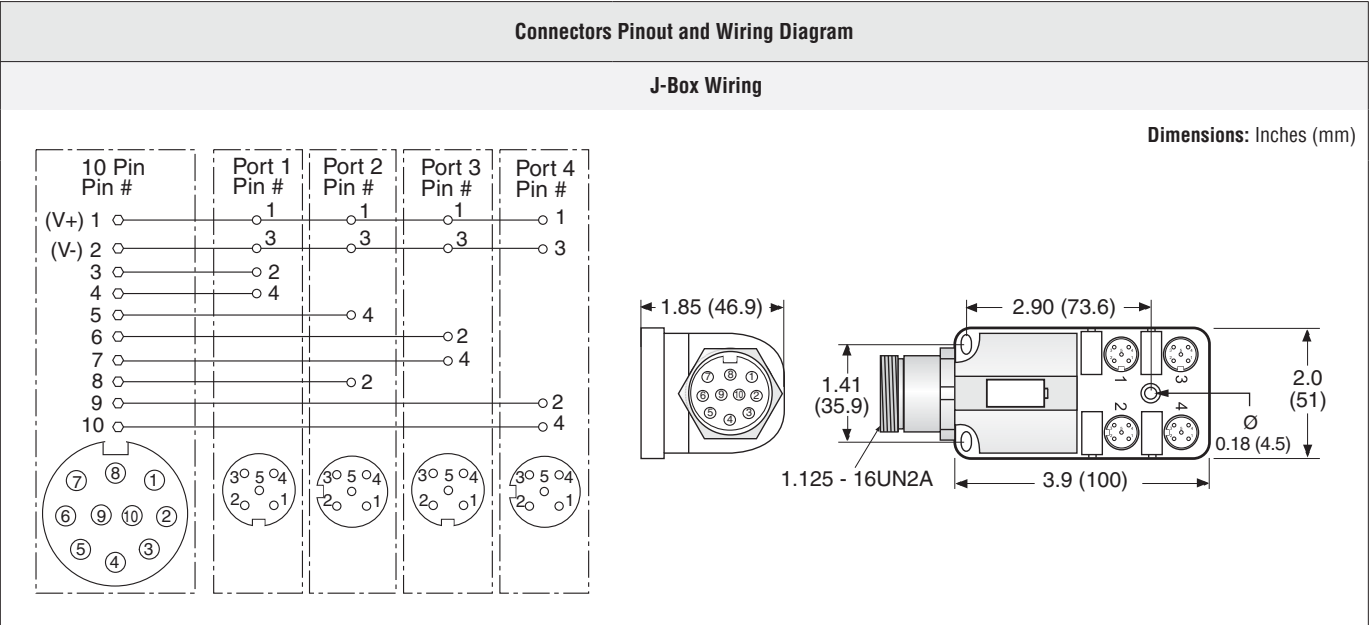


Illustration example.

Wiring Kits with J-Box	J-Box			Cable				Kit Number	
	Connection		J-Box Quantity	Connector Type		Quantity Included	Length feet (meters)		
	Control System	Solenoids / Status Indicator		End 1	End 2				
	10-pin Mini	M12 (5-pin)	1	M12	DIN EN 175301-803 Form A	4	3.3 (1)		2249H77
			1	M12	M12	4	3.3 (1)		2250H77



JUNCTION BOX OPTIONS

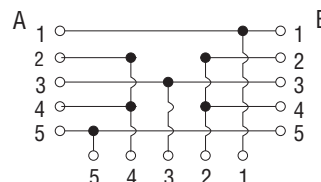
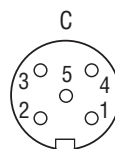
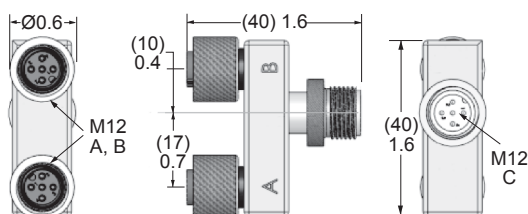
10-Pin MINI Cables	Connection	Cable					Kit Number
		End 1	End 2	Conductors Type	Quantity Included	Length feet (meters)	
	J-Box to Control System	10-pin Mini	Flying leads	18-gauge wire	1	12 (3.7)	2253H77
					1	20 (6.1)	2254H77
					1	30 (9.1)	2255H77
					1	50 (15.2)	2256H77

Outlet Port Pressure Monitoring Wiring Kit	Port Splitter			Cable				Kit Number
	Port Connectors	Number of Ports	Splitter Quantity	End 1	End 2	Quantity Included	Length feet (meters)	
				Connector	Connector			
	M12	3	1	M12	DIN EN 175301-803 Form A	1	3.3 (1)	

10-Pin MINI Cable				
PIN #	Wire Colors	PIN #	Wire Colors	
1 +24 V DC	Orange	6 -	Orange w/Black	
2 Common V DC	Blue	7 Remote Reset	Red	
3 -	White w/Black	8 -	Green/Yellow	
4 Solenoid A	Red w/Black	9 Remote Valve Fault Light	Black	
5 Solenoid B	Green w/Black	10 Remote System OK Light	White	

Outlet Port Pressure Monitoring – Port Splitter

Dimensions: Inches (mm)



A & B Female
C Male

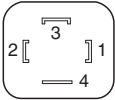
Accessories – Electrical Connectors

CABLE GRIP ELECTRICAL CONNECTORS

Without Light	With Light
	

Illustration examples.

Connectors	Connector					Model Number			
	Type	Connection	Fitting Connection	Quantity Included	Cord Diameter mm	Without Light	Lighted Connector *		
							24 V DC	120 V AC	230 V AC
DIN EN 175301-803 Form A	Solenoid		Cable grip	1	8 to 10	937K87	936K87-W	936K87-Z	936K87-Y
			1/2" NPT conduit	1	—	723K77	724K77-W	724K77-Z	724K77-Y

Connector Pinout	
DIN EN 175301-803	
	1 - Black 2 - Black 4 - Green/Yellow (Ground)

* Lights in connectors with a translucent housing can be used as indicator lights to show when solenoids are energized.

PRESSURE GAUGE For M35 SERIES VALVES



Illustration example.

Analog Pressure Gauge	Mounting	Port Size	Thread Type	Model Number	Pressure Range psig (bar)	Case Diameter inches (mm)
	Center Back	1/8	Male	5400A1002	0-160 (0-11)	1.5 (38)

PRESSURE TRANSDUCERS For M35 SERIES VALVES

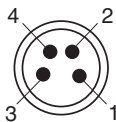


Illustration example.

Digital Pressure Transducers	Monitoring Type	Electrical Connection	Electrical Output	Model Number		Pressure Port Size	Pressure Range psig (bar)	≈ Weight lb (kg)
				NPT Thread	G Thread			
	Electrical	M8, 4 Pin	(1) PNP with (1) 4-20ma	760B94	D760B94	1/8	0 to 145 (0 to 10)	0.099 (0.045)
For Digital Pressure Readout, Analog 4-20mA Output, and Transistor Switching Output.								

Pinout

Sensor Pinout with Analog Output



- 1 - Brown - 24 VDC
- 2 - White - 4 to 20mA
- 3 - Blue - 0 VDC
- 4 - Black PNP Open Collector Output 1

Accessories – Modular Connection

MODULAR CONNECTION For M35 SERIES VALVES

M35 Series valves have both modular receptacles for piping and female threaded ports inside receptacles, which allows either modular connection or direct piping. Mounting accessories listed below are used for modular connection to ROSS MD Series filter-regulator units.

Clamp		Bracket, Screw, and Clamp	
			
Extra Port Blocks	Female End Ports	Male End Ports	
			

Illustration examples.

Mounting Brackets & Clamp for Module Connections	Options		Model Number	
	Clamp only		R-A118-105	
	Bracket, Screw, and Clamp		R-A118-105M	
Port Block and End Ports	Options	Port Size	Model Number	
			NPTF Thread	G Thread
	Extra Port Blocks	1/4	R-118-106-2	R-118-106-2W
		3/8	R-118-106-3	R-118-106-3W
		1/2	R-118-106-4	R-118-106-4W
	Female End Ports	1/2	R-118-100-4	R-118-100-4W
		3/4	R-118-100-6	R-118-100-6W
	Male End Ports	1/2	R-118-109-4F	R-118-109-4FW
		3/4	R-118-109-6F	R-118-109-6FW

RESET VALVES FOR DOUBLE VALVES WITH REMOTE RESET

Valves with the remote reset option require a small 3/2 reset valve and the installation of a 1/8 inch air line from the reset valve to the reset port of the double valve. ROSS offers 3/2 normally closed valves with either manual or electric control that are suitable for this purpose.

Compact Valves for Line Mounting	Miniature Valve for Base Mounting	Manual Palm Button Valves	Mushroom Valves
			

Direct Solenoid Pilot Control – Compact Valves for Line Mounting

Normally-Closed Valve	Valve Model Number*						Flow C _V (NI/min)	Average Response Constants**	
	NPT Thread			G Thread					
	Port Size 1, 2, 3	24 V DC	110-120 V AC 50/60 Hz	230 V AC 50/60 Hz	24 V DC	110-120 V AC 50/60 Hz		230 V AC 50/60 Hz	M
1/8	1613B1020W	1613B1020Z	1613B1020Y	D1613B1020W	D1613B1020Z	D1613B1020Y	0.3 (295)	5	2.90

* For other voltages, consult ROSS.

**Valve Response Time	The constants above, designated M and F, can be used to determine the amount of time required to fill or exhaust a volume of any size using the formula on the right: Vlv. Resp. Time (msec) = M + F * V M = avg. time for parts movement F = msec. per cubic inch of volume V = volume in cubic inches
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Direct Solenoid Pilot Control – Miniature Valve for Base Mounting

Valve Type	Override Type	Valve Model Number*			Flow C_v (NI/min)
		24 V DC	110-120 V AC 50/60 Hz	230 V AC 50/60 Hz	
Normally-Closed	Non-Locking	W1413A1409W	W1413A1409Z	W1413A1409Y	0.1 (98)

* For other voltages, consult ROSS.

Sub-Base for Direct Solenoid Control Valves	Sub-Base Model Number	
	NPT Thread	G Thread
	516B91	D516B91

Manual Palm Button Valves

Valve Operator Type	Port Size	Button Color	Valve Model Number		Flow C_v (NI/min)
			NPT Thread	G Thread	
Heavy Duty Palm Button	1/4	Green	1223B2001	D1223B2001	0.8 (790)
		Red	1223B2003	D1223B2003	
Flush Pushbutton	1/4	Green	1223B2FPG	D1223B2FPG	0.9 (890)
		Red	1223B2FPR	D1223B2FPR	
Mushroom Button	1/4	Green	1223B2MBG	D1223B2MBG	
		Red	1223B2MBR	D1223B2MBR	

ROSS OPERATING VALVE, ROSS CONTROLS®, ROSS DECCO®, AUTOMATIC VALVE INDUSTRIAL, and MASTER PNEUMATIC, collectively the “ROSS Global Family”.

PRE-INSTALLATION or SERVICE

1. Before servicing a valve or other pneumatic component, be sure all sources of energy are turned off, the entire pneumatic system is shut down and exhausted, and all power sources are locked out (ref: OSHA 1910.147, EN 1037).
2. All ROSS Global Family Products, including service kits and parts, should be installed and/or serviced only by persons having training and experience with pneumatic equipment. Because any product can be tampered with and/or need servicing after installation, persons responsible for the safety of others or the care of equipment must check ROSS Global Family Products on a regular basis and perform all necessary maintenance to ensure safe operating conditions.
3. All applicable instructions should be read and complied with before using any fluid power system to prevent harm to persons or equipment. In addition, overhauled or serviced valves must be functionally tested prior to installation and use. If you have any questions, call your nearest ROSS Global Family location.
4. Each ROSS Global Family Product should be used within its specification limits. In addition, use only ROSS Global Family components to repair ROSS Global Family Products.

WARNINGS:

Failure to follow these instructions can result in personal injury and/or property damage.

FILTRATION and LUBRICATION

1. Dirt, scale, moisture, etc., are present in virtually every air system. Although some valves are more tolerant of these contaminants than others, best performance will be realized if a filter is installed to clean the air supply, thus preventing contaminants from interfering with the proper performance of the equipment. The ROSS Global Family recommends a filter with a 5-micron rating for normal applications.
2. All standard ROSS Global Family filters and lubricators with polycarbonate plastic bowls are designed for compressed air applications only. Use the metal bowl guard, where provided, to minimize danger from high pressure fragmentation in the event of bowl failure. Do not expose these products to certain fluids, such as alcohol or liquefied petroleum gas, as they can cause bowls to rupture, creating a combustible condition and hazardous leakage. Immediately replace crazed, cracked, or deteriorated bowls.
3. Only use lubricants which are compatible with materials used in the valves and other components in the system. Normally, compatible lubricants are petroleum base oils with oxidation inhibitors, an aniline point between 180°F (82°C) and

220°F (104°C), and an ISO 32, or lighter, viscosity. Avoid oils with phosphate type additives which can harm polyurethane components, potentially leading to valve failure which risks personal injury, and/or damage to property.

WARNINGS:

Failure to follow these instructions can result in personal injury and/or property damage.

AVOID INTAKE/EXHAUST RESTRICTION

1. Do not restrict air flow in the supply line. To do so could reduce the pressure of the supply air below minimum requirements for the valve and thereby causing erratic action.
2. Do not restrict a valve's exhaust port as this can adversely affect its operation. Exhaust silencers must be resistant to clogging and must have flow capacities at least as great as the exhaust capacities of the valves. Contamination of the silencer can result in reduced flow and increased back pressure.

WARNINGS:

Failure to follow these instructions can result in personal injury and/or property damage.

SAFETY APPLICATIONS

1. Mechanical Power Presses and other potentially hazardous machinery using a pneumatically controlled clutch and brake mechanism must use a press control double valve with a monitoring device. A double valve without a self-contained monitoring device should be used only in conjunction with a control system which assures monitoring of the valve. All double valve installations involving hazardous applications should incorporate a monitoring system which inhibits further operation of the valve and machine in the event of a failure within the valve mechanism.
2. Safe Exhaust (dump) valves without a self-contained monitoring device should be used only in conjunction with a control system which assures monitoring of the valve. All Safe Exhaust valve installations should incorporate a monitoring system which inhibits further operation of the valve and machine in the event of a failure within the valve mechanism.
3. Per specifications and regulations, the ROSS L-O-X® and L-O-X® with EEZ-ON®, N06 and N16 Series operation products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

WARNINGS: *Failure to follow these instructions can result in personal injury and/or property damage.*

STANDARD WARRANTY

All products sold by the ROSS Global Family are warranted for a one-year period [with the exception of Air Preparation products which are warranted for a period of seven (7) years] from the date of purchase. All products are, during their respective warranty periods, warranted to be free of defects in material and workmanship. The ROSS Global Family's obligation under this warranty is limited to repair, replacement or refund of the purchase price paid for products which the ROSS Global Family has determined, in its sole discretion, are defective. All warranties become void if a product has been subject to misuse, misapplication, improper maintenance, modification or tampering. Products for which warranty protection is sought must be returned to the ROSS Global Family freight prepaid.

THE WARRANTY EXPRESSED ABOVE IS IN LIEU OF AND EXCLUSIVE OF ALL OTHER WARRANTIES AND THE ROSS GLOBAL FAMILY EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES EITHER EXPRESSED OR IMPLIED WITH RESPECT TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE ROSS GLOBAL FAMILY MAKES NO WARRANTY WITH RESPECT TO ITS PRODUCTS MEETING THE PROVISIONS OF ANY GOVERNMENTAL OCCUPATIONAL SAFETY AND/OR HEALTH LAWS OR REGULATIONS. IN NO EVENT IS THE ROSS GLOBAL FAMILY LIABLE TO PURCHASER, USER, THEIR EMPLOYEES OR OTHERS FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES WHICH MAY RESULT FROM A BREACH OF THE WARRANTY DESCRIBED ABOVE OR THE USE OR MISUSE OF THE PRODUCTS. NO STATEMENT OF ANY REPRESENTATIVE OR EMPLOYEE OF THE ROSS GLOBAL FAMILY MAY EXTEND THE LIABILITY OF THE ROSS GLOBAL FAMILY AS SET FORTH HEREIN.



GLOBAL LOCATIONS

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