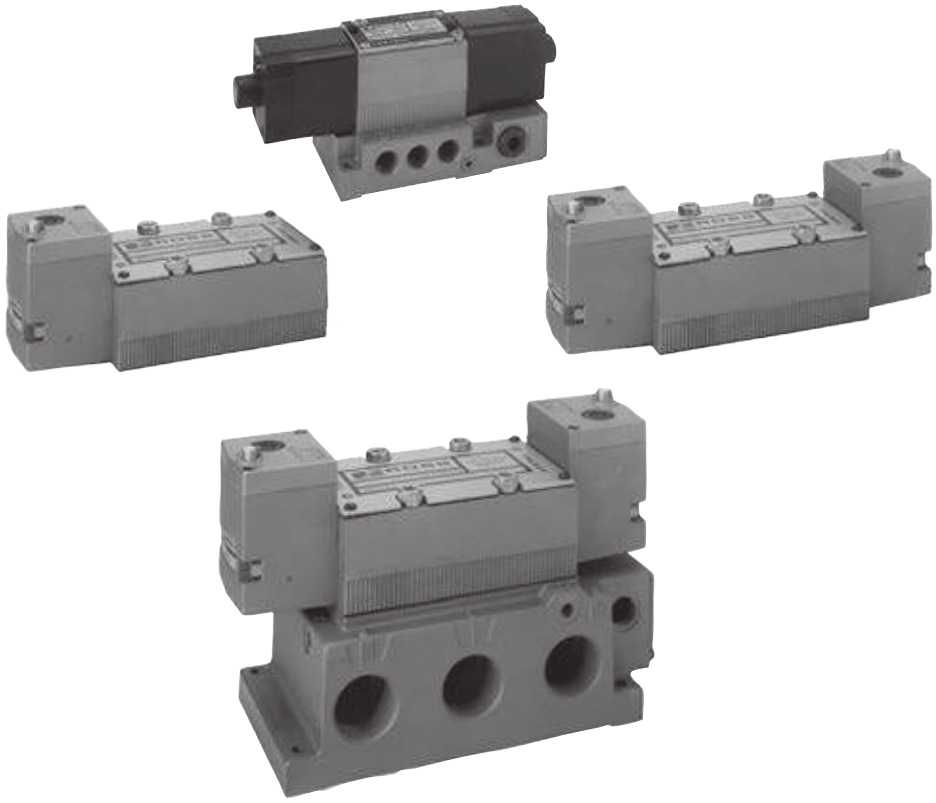
ROSS CONTROLS®

ANSI VALVES W70 & W74 SERIES



ANSI SERIES VALVES – KEY FEATURES

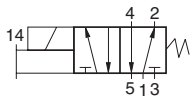
- ANSI Sizes 1, 2.5, 4, 10 and 20
- 5/2- and 5/3 way direct and pilot solenoid options
- Spool & Sleeve construction
- 24 volts DC or 110 volts AC solenoid control
- Available with 1/4 – 1½ ports
- Lube or non-lube service
- Manual overrides
- Interpose pressure regulators
- Single sub-base mounting
- Micro-thin air bearing between spool and sleeve assures quick valve response
- W70 Series - Suitable for vacuum service with or without external pilot supply
- W74 Series - Suitable for vacuum service (with external pilot supply)

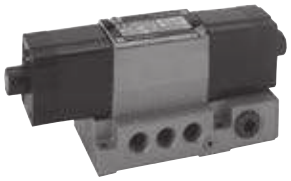
VALVE TYPE	VALVE SERIES	DESCRIPTION			AVAILABLE PORT SIZES								FUNCTIONS										Page
		ANSI Size	Spool & Sleeve	Poppet	1/8	1/4	3/8	1/2	3/4	1	1¼	1½	3/2 Single	5/2 Single	5/2 Double	5/3 Closed Center	5/3 Open Center	5/3 Pressure Center	Max Flow (Cv)	Solenoid Control	Direct Solenoid Control	Pressure Control	
ANSI	W70	1																	1.0				A5.3 - A5.9
ANSI	W70	2.5																	2.5				A5.3 - A5.9
ANSI	W70	4																	4.2				A5.3 - A5.9
ANSI	W70	10																	10.0				A5.3 - A5.9
ANSI	W70	20																	22.0				A5.3 - A5.9
ANSI	W74	1																	1.0				A5.11 - A5.13
ANSI	W74	2.5																	2.5				A5.11 - A5.13
ANSI	W74	4																	4.2				A5.11 - A5.13
ANSI	W74	10																	10.0				A5.11 - A5.13
ANSI	W74	20																	22.0				A5.11 - A5.13
Sub-Bases & Manifolds																							A5.14 - A5.18
Accessories																							A5.19

Direct Solenoid Controlled Valves

5-Way 2-Position Valves, Single Direct Solenoid, Spring Return

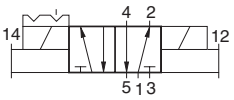
ANSI Size	Port Size	Valve Model Number*	Avg. C_v	Average Response Constants#			Weight lb (kg)
				M	F		
					In-Out	Out-Exh.	
1	1/4 - 3/8	W7016B2331**	1.0	20	3.5	4.9	3.5 (1.6)
2.5	3/8 - 1/2	W7016A3331**	2.5	17	1.6	2.7	3.3 (1.5)
4	3/8 - 3/4	W7016C4331**	4.2	–	–	–	4.3 (1.9)





5-Way 2-Position Valves, Double Direct Solenoid, Detented

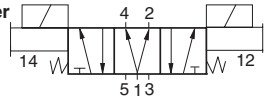
ANSI Size	Port Size	Valve Model Number*	Avg. C_v	Average Response Constants#			Weight lb (kg)
				M	F		
					In-Out	Out-Exh.	
1	1/4 - 3/8	W7016B2332**	1.0	20	3.5	4.9	3.5 (1.6)
2.5	3/8 - 1/2	W7016A3332**	2.5	10	1.3	1.8	3.3 (1.5)
4	3/8 - 3/4	W7016C4332**	4.2	–	–	–	4.3 (1.9)



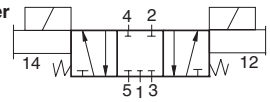
5-Way 3-Position Valves, Double Direct Solenoid

ANSI Size	Port Size	Valve Model Number*			Avg. C_v	Average Response Constants#			Weight lb (kg)
		Power Center	Closed Center	Open Center		M	F		
							In-Out	Out-Exh.	
1	1/8 - 3/8	W7017B2905**	W7017B2331**	W7017B2332**	1.0	20	3.5	4.9	4.5 (2.0)
2.5	3/8 - 1/2	–	W7017A3331**	W7017A3332**	1.9	10	1.3	1.8	5.0 (2.3)
4	1/2 - 3/4	–	W7017C4331**	W7017C4332**	3.8	–	–	–	5.8 (2.6)

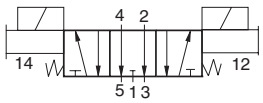
Power Center



Closed Center



Open Center



Sub-bases and sub-base manifolds ordered separately, refer to page A5.14-A5.18.

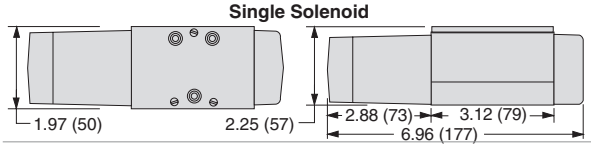
Insert voltage code: " " = 24 volts DC; " " = 110-120 volts AC, 50/60 Hz; e.g., W7016B2331 . For other voltages, consult ROSS.

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.

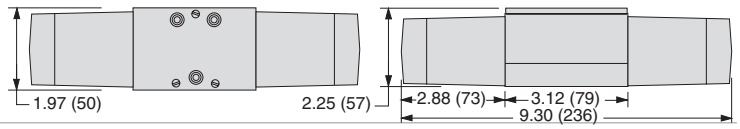
Valve Dimensions – inches (mm)

ANSI Size 1

Single Solenoid

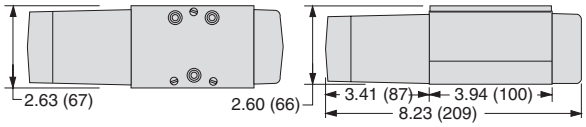


Double Solenoid

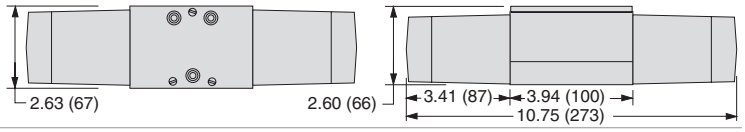


ANSI Size 2.5

Single Solenoid

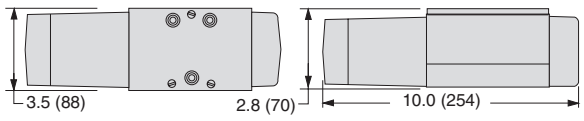


Double Solenoid

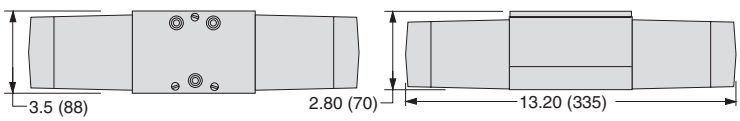


ANSI Size 4

Single Solenoid



Double Solenoid



Options: Indicator Light (in Base/Manifold), refer to page A5.17-A5.18. Accessories ordered separately, refer to page A5.19.

STANDARD SPECIFICATIONS (for valves on this page):

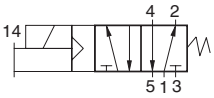
Construction: Spool and sleeve.
Mounting Type: Base.
Solenoid Pilot: Rated for continuous duty.
Solenoids: AC power; *DC for ANSI size 1 models only.*
Standard Voltages: 24 volts DC; 110-120 volts AC, 50/60 Hz.
Power Consumption (each solenoid**):**
ANSI Size 1: 140 VA inrush, 30 VA holding on 50 or 60 Hz; 20 watts on DC.
ANSI Size 2.5 and 4: 380 VA inrush, 79 VA holding.
Ambient Temperature: 40° to 120°F (4° to 50°C).
Media Temperature: 40° to 175°F (4° to 80°C).
For other temperature ranges, consult ROSS.
Flow Media: Filtered air.
Inlet Pressure: Vacuum to 150 psig (10 bar).
Manual Override: Flush; rubber non-locking.

Please read carefully and thoroughly all of the on the inside back cover.

Single Solenoid Pilot Controlled Valves

5-Way 2-Position Valves, Spring Return

ANSI Size	Port Size	Valve Model Number*	Avg. C_v	Average Response Constants#			Weight lb (kg)
				M	F		
					In-Out	Out-Exh.	
1	1/4 - 3/8	W7076B2331**	1.0	20	3.6	4.9	3.0 (1.4)
2.5	3/8 - 1/2	W7076A3331**	2.5	17	1.6	2.7	3.0 (1.4)
4	3/8 - 3/4	W7076D4331**	4.2	20	0.6	0.6	5.3 (2.4)
10	3/4 - 1¼	W7076C6331**	10	30	0.3	0.3	7.3 (3.3)
20	1¼ - 1½	W7076C8331**	22	50	0.1	0.2	14.5 (6.5)

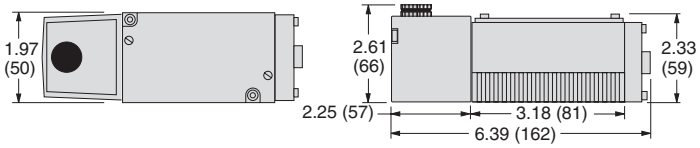




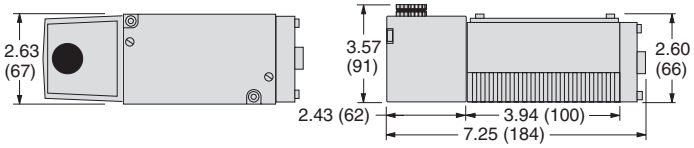
* **Sub-bases and sub-base manifolds ordered separately, refer to page A5.14-A5.18.**
** Insert voltage code: "W" = 24 volts DC; "Z" = 100-110/50, 100-130/60 volts AC/Hz; e.g., W7076B2331W.
For other voltages, consult ROSS.
Valve Response Time – Response Time (msec) = M + (F • V). This is the average 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 Dimensions – inches (mm)

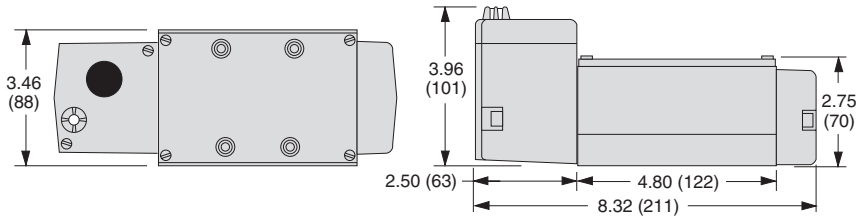
ANSI Size 1



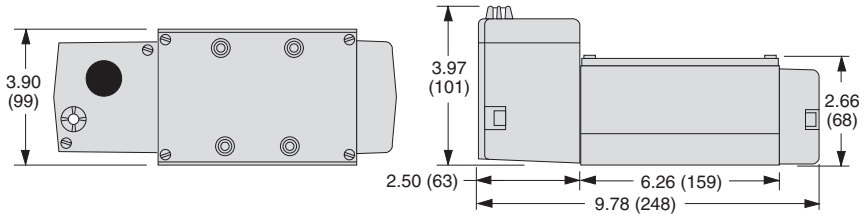
ANSI Size 2.5



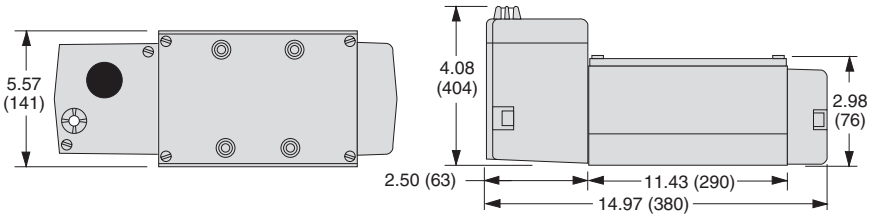
ANSI Size 4



ANSI Size 10



ANSI Size 20



Options: Indicator Light (in Base/Manifold), refer to page A5.17-A5.18. Accessories ordered separately, refer to page A5.19.

STANDARD SPECIFICATIONS (for valves on this page):

Construction: Spool and sleeve.
Mounting Type: Base.
Solenoid Pilot: Rated for continuous duty.
Standard Voltages: 24 volts DC; 100-110/50, 100-130/60 volts AC/Hz.
Power Consumption (each solenoid**):**
ANSI Size 1: 10 VA inrush, 24 VA holding on 50 or 60 Hz; 5 watts on DC.
ANSI Size 2.5, 4, 10 & 20: 87 VA inrush, 55 VA holding on 50 or 60 Hz; 14 watts on DC.
Ambient Temperature: 40° to 120°F (4°C to 50°C).
Media Temperature: 40° to 175°F (4° to 80°C).
For other temperature ranges, consult ROSS.
Flow Media: Filtered air.
Inlet Pressure: Vacuum to 150 psig (10 bar).
Pilot Pressure:
ANSI Size 1 & 20: At least 30 psig (2 bar).
ANSI Size 2.5, 4 &10: At least 15 psig (1 bar).
Indicator Light: Size 4, 10 & 20 models only.
Manual Override: Flush; rubber, non-locking.

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

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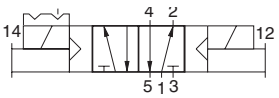
Double Solenoid Pilot Controlled Valves

5-Way 2-Position Valves, Detented

ANSI Size	Port Size	Valve Model Number*	Avg. C_v	Average Response Constants#			Weight lb (kg)
				M	F		
					In-Out	Out-Exh.	
1	1/4 - 3/8	W7076B2332**	1.0	20	3.5	4.9	4.0 (1.8)
2.5	3/8 - 1/2	W7076A3332**	2.5	10	1.3	1.8	4.0 (1.8)
4	3/8 - 3/4	W7076D4332**	4.2	12	0.6	0.7	6.5 (2.9)
10	3/4 - 1¼	W7076C6332**	10	20	0.3	0.3	9.0 (4.1)
20	1¼ - 1½	W7076C8332**	22	30	0.1	0.2	15.8 (6.8)



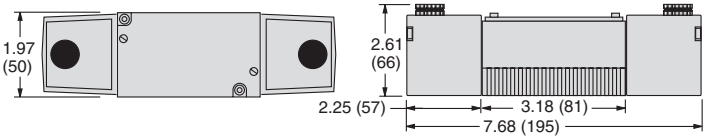
* **Sub-bases and sub-base manifolds ordered separately, refer to page A5.14-A5.18.**

** Insert voltage code: "W" = 24 volts DC; "Z" = 100-110/50, 100-130/60 volts AC/Hz; e.g., W7076B2332W. For other voltages, consult ROSS.

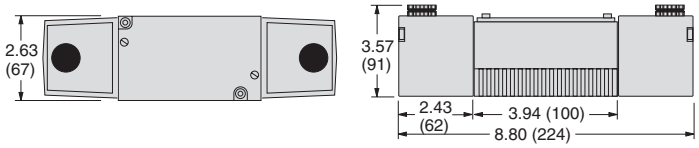
\# **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Dimensions – inches (mm)

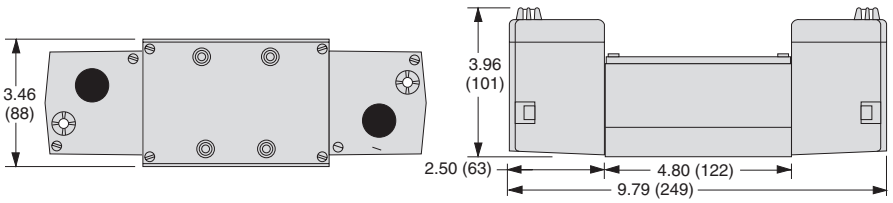
ANSI Size 1



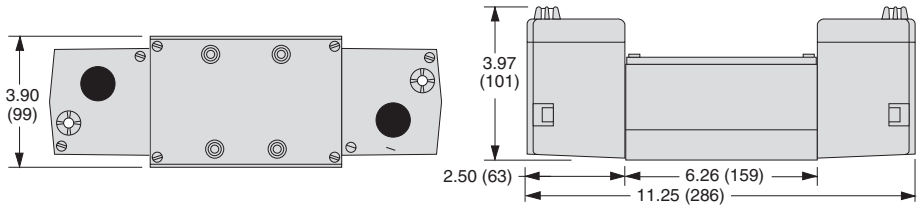
ANSI Size 2.5



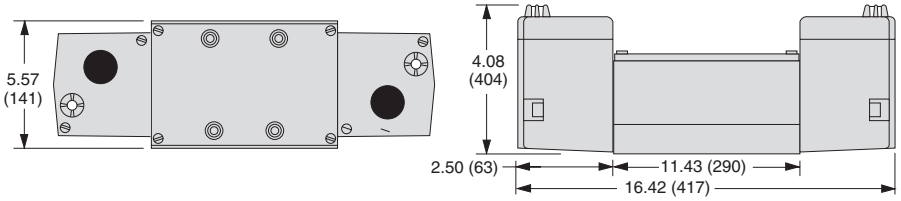
ANSI Size 4



ANSI Size 10



ANSI Size 20



Options: Indicator Light (in Base/Manifold), refer to page A5.17-A5.18. Accessories ordered separately, refer to page A5.19.

STANDARD SPECIFICATIONS (for valves on this page):

Construction: Spool and sleeve.
Mounting Type: Base.
Solenoid Pilot: Rated for continuous duty.
Standard Voltages: 24 volts DC; 100-110/50, 100-130/60 volts AC/Hz.
Power Consumption (each solenoid**):**
ANSI Size 1: 10 VA inrush, 24 VA holding on 50 or 60 Hz; 5 watts on DC.
ANSI Size 2.5, 4, 10 & 20: 87 VA inrush, 55 VA holding on 50 or 60 Hz; 14 watts on DC.
Ambient Temperature: 40° to 120°F (4°C to 50°C).
Media Temperature: 40° to 175°F (4° to 80°C). For other temperature ranges, consult ROSS.
Flow Media: Filtered air.
Inlet Pressure: Vacuum to 150 psig (10 bar).
Pilot Pressure:
ANSI Size 1 & 20: At least 30 psig (2 bar).
ANSI Size 2.5, 4 &10: At least 15 psig (1 bar).
Indicator Light: Size 4, 10 & 20 models only.
Manual Override: Flush; rubber, non-locking.

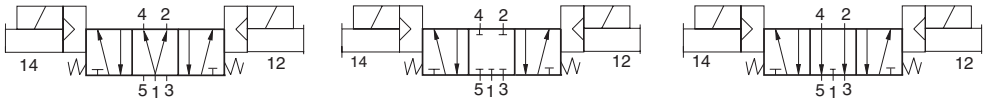
A5

Double Solenoid Pilot Controlled Valves

ANSI W70 Series

5-Way 3-Position Valves

ANSI Size	Port Size	Valve Model Number*			Avg. C_v	Average Response Constants#			Weight lb (kg)
		Power Center	Closed Center	Open Center		M	F		
							In-Out	Out-Exh.	
1	1/8 - 3/8	W7077B2906**	W7077B2331**	W7077B2332**	1.0	20	3.5	4.9	4.0 (1.8)
2.5	3/8 - 1/2	W7077A3904**	W7077A3331**	W7077A3332**	2.5	10	1.6	2.6	4.0 (1.8)
4	1/2 - 3/4	W7077C4939**	W7077D4331**	W7077D4332**	4.2	12	0.6	0.7	6.5 (2.9)
10	3/4 - 1¼	W7077A6920**	W7077C6331**	W7077C6332**	10	20	0.3	0.3	8.5 (3.8)
20	1¼ - 1½	W7077A8901**	W7077C8331**	W7077C8332**	22	30	0.1	0.2	15.3 (6.9)



Power Center | Closed Center | Open Center

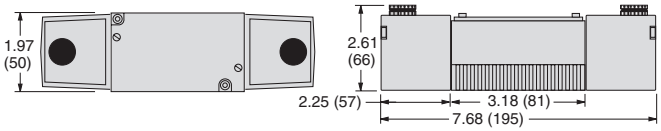
*** Sub-bases and sub-base manifolds ordered separately, refer to page A5.14-A5.18.**

** Insert voltage code: "W" = 24 volts DC; "Z" = 100-110/50, 100-130/60 volts AC/Hz; e.g., W7077B2906W. For other voltages, consult ROSS.

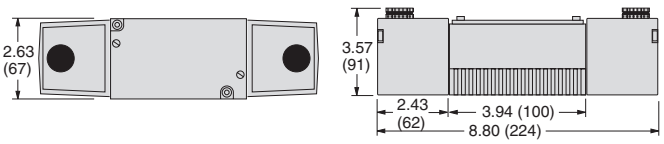
Valve Response Time – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Dimensions – inches (mm)

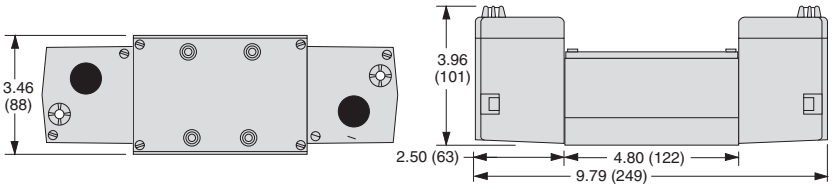
ANSI Size 1



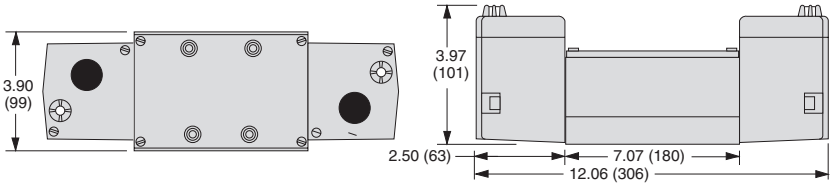
ANSI Size 2.5



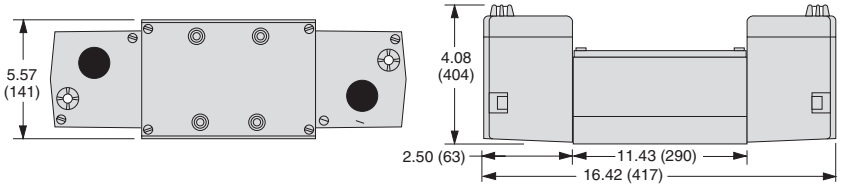
ANSI Size 4



ANSI Size 10



ANSI Size 20



Options: Indicator Light (in Base/Manifold), refer to page A5.17-A5.18. Accessories ordered separately, refer to page A5.19.

STANDARD SPECIFICATIONS (for valves on this page):

Construction: Spool and sleeve.
Mounting Type: Base.
Solenoid Pilot: Rated for continuous duty.
Standard Voltages: 24 volts DC; 100-110/50, 100-130/60 volts AC/Hz.
Power Consumption (each solenoid)**:**
ANSI Size 1: 10 VA inrush, 24 VA holding on 50 or 60 Hz; 5 watts on DC.
ANSI Size 2.5, 4, 10 & 20: 87 VA inrush, 55 VA holding on 50 or 60 Hz; 14 watts on DC.
Ambient Temperature: 40° to 120°F (4°C to 50°C).
Media Temperature: 40° to 175°F (4° to 80°C). For other temperature ranges, consult ROSS.
Flow Media: Filtered air.
Inlet Pressure: Vacuum to 150 psig (10 bar).
Pilot Pressure:
ANSI Size 1 & 20: At least 30 psig (2 bar).
ANSI Size 2.5, 4 &10: At least 15 psig (1 bar).
Indicator Light: ANSI Size 4, 10 & 20 models only.
Manual Override: Flush; rubber, non-locking.

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

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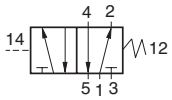
Online Version
Rev. 11/14/16

Single Pressure Controlled Valves

5-Way 2-Position Valves, Spring Return

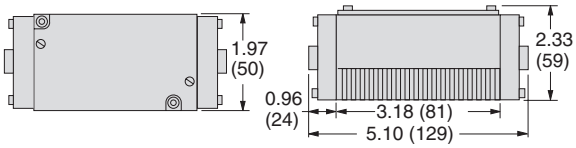
ANSI Size	Port Size	Valve Model Number*	Avg. C_v	Average Response Constants#			Weight lb (kg)
				M	F		
					In-Out	Out-Exh.	
1	1/4 - 3/8	W7056B2331	1.0	20	3.6	4.9	2.5 (1.1)
2.5	3/8 - 1/2	W7056A3331	2.5	17	1.5	2.6	2.0 (0.9)
4	3/8 - 3/4	W7056B4331	4.2	12	0.6	0.7	4.3 (1.9)
10	3/4 - 1¼	W7056A6331	10	20	0.3	0.3	6.3 (2.8)
20	1¼ - 1½	W7056A8331	22	30	0.1	0.2	13.0 (5.9)



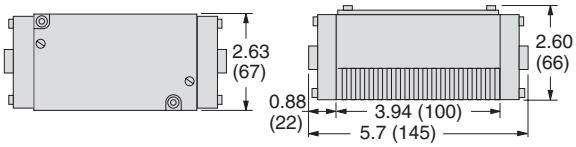
* **Sub-bases and sub-base manifolds ordered separately, refer to page A5.14-A5.18.**
\# **Valve Response Time –** Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Dimensions – inches (mm)

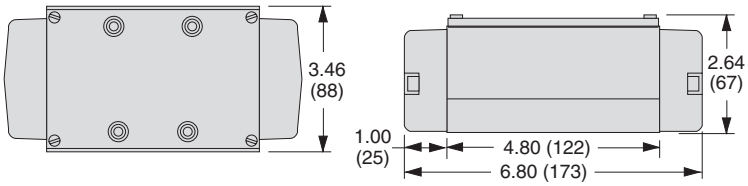
ANSI Size 1



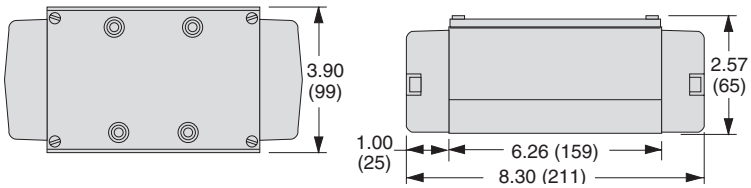
ANSI Size 2.5



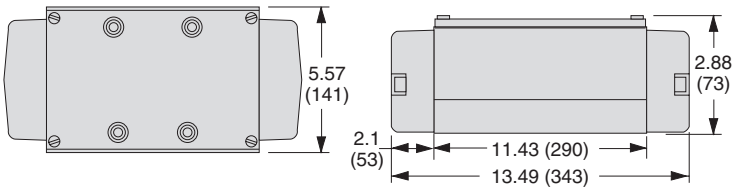
ANSI Size 4



ANSI Size 10



ANSI Size 20



Accessories ordered separately, refer to page A5.19.

STANDARD SPECIFICATIONS (for valves on this page):

Construction: Spool and sleeve.
Mounting Type: Base.
Ambient/Media Temperature: 40° to 175°F (4° to 80°C).
For other temperature ranges, consult ROSS.
Flow Media: Filtered air.

Inlet Pressure: Vacuum to 150 psig (10 bar).
Pilot Pressure:
ANSI Size 1 & 20: At least 30 psig (2 bar).
ANSI Size 2.5, 4 & 10: At least 15 psig (1 bar).

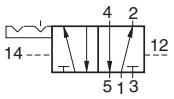
Please read carefully and thoroughly all of the on the inside back cover.

Double Pressure Controlled Valves

ANSI W70 Series

5-Way 2-Position Valves, Detented

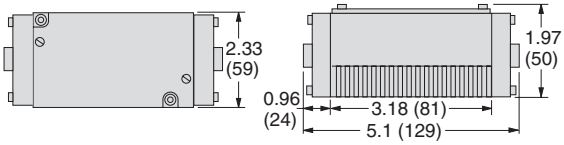
ANSI Size	Port Size	Valve Model Number*	Avg. C_v	Average Response Constants#			Weight lb (kg)
				M	F		
					In-Out	Out-Exh.	
1	1/4 - 3/8	W7056B2332	1.0	20	3.5	4.9	2.5 (1.1)
2.5	3/8 - 1/2	W7056A3332	2.5	17	1.5	2.6	2.0 (0.9)
4	3/8 - 3/4	W7056B4332	4.2	12	0.6	0.7	4.3 (1.9)
10	3/4 - 1¼	W705A6332	10	20	0.3	0.3	6.3 (2.8)
20	1¼ - 1½	W7056A8332	22	30	0.1	0.2	13.8 (6.2)



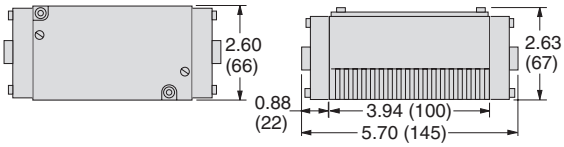
* **Sub-bases and sub-base manifolds ordered separately, refer to page A5.14-A5.18.**
\# **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Dimensions – inches (mm)

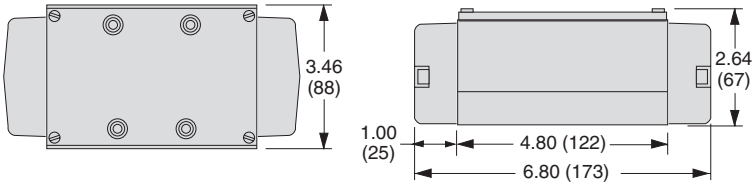
ANSI Size 1



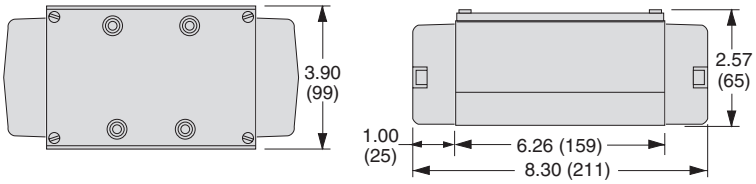
ANSI Size 2.5



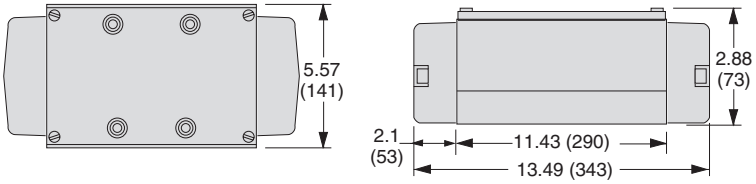
ANSI Size 4



ANSI Size 10



ANSI Size 20



Accessories ordered separately, refer to page A5.19.

STANDARD SPECIFICATIONS (for valves on this page):

Construction: Spool and sleeve.
Mounting Type: Base.
Ambient/Media Temperature:: 40° to 175°F (4° to 80°C).
For other temperature ranges, consult ROSS.
Flow Media: Filtered air.

Inlet Pressure: Vacuum to 150 psig (10 bar).
Pilot Pressure:
ANSI Size 1 & 20: At least 30 psig (2 bar).
ANSI Size 2.5, 4 & 10: At least 15 psig (1 bar).

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

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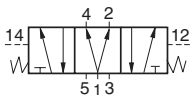
Online Version
Rev. 11/14/16

Double Pressure Controlled Valves

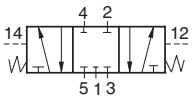
5-Way 3-Position Valves

ANSI Size	Port Size	Valve Model Number*			Avg. C_v	Average Response Constants#			Weight lb (kg)
		Power Center	Closed Center	Open Center		M	F In-Out	F Out-Exh.	
1	1/8 - 3/8	–	W7057B2331	W7057B2332	1.0	20	3.5	4.9	2.5 (1.1)
2.5	3/8 - 1/2	–	W7057A3331	W7057A3332	2.5	17	1.5	2.6	2.0 (0.9)
4	1/2 - 3/4	–	W7057B4331	W7057B4332	4.2	12	0.6	0.7	4.3 (1.9)
10	3/4 - 1¼	W7057A6902	W7057A6331	W7057A6332	10	20	0.3	0.3	6.3 (2.8)
20	1¼ - 1½	–	W7057A8331	W7057A8332	22	30	0.1	0.2	13.8 (6.2)

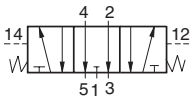
Power Center



Closed Center



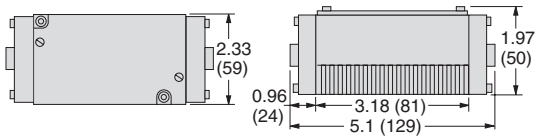
Open Center



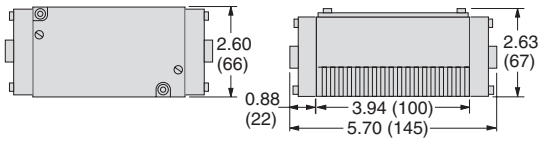
* **Sub-bases and sub-base manifolds ordered separately, refer to page A5.14-A5.18.**
\# **Valve Response Time –** Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Dimensions – inches (mm)

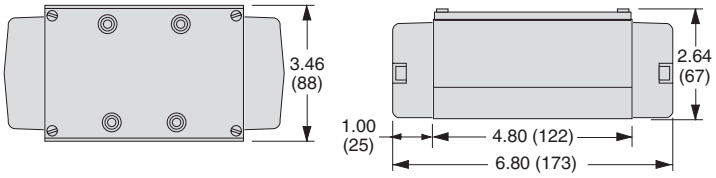
ANSI Size 1



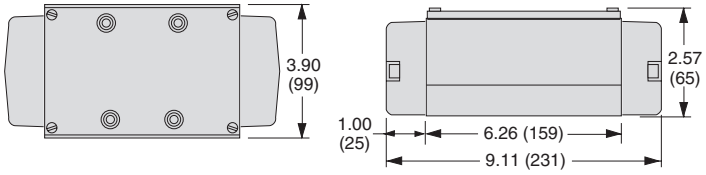
ANSI Size 2.5



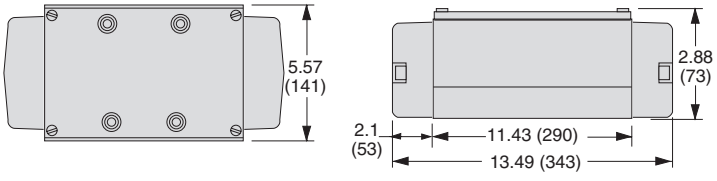
ANSI Size 4



ANSI Size 10



ANSI Size 20



Accessories ordered separately, refer to page A5.19.

STANDARD SPECIFICATIONS (for valves on this page):

Construction: Spool and sleeve.
Mounting Type: Base.
Ambient/Media Temperature: 40° to 175°F (4° to 80°C).
For other temperature ranges, consult ROSS.
Flow Media: Filtered air.

Inlet Pressure: Vacuum to 150 psig (10 bar).
Pilot Pressure:
ANSI Size 1 & 20: At least 30 psig (2 bar).
ANSI Size 2.5, 4 & 10: At least 15 psig (1 bar).

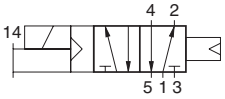
Please read carefully and thoroughly all of the on the inside back cover.

Single Solenoid Pilot Controlled Valves

ANSI W74 Series

5-Way 2-Position Valves, Air Return

ANSI Size	Port Size	Valve Model Number*		Avg. C_v	Average Response Constants#			Weight lb (kg)
		Standard Temp.	High Temp.		M	F		
						In-Out	Out-Exh.	
1	1/4 - 3/8	W7476B2331**	W7476B2336**	0.9	30	2.7	5.6	3.0 (1.4)
2.5	3/8 - 1/2	W7476A3331**	W7476A3336**	2.0	25	1.5	2.9	3.0 (1.4)
4	1/2 - 3/4	W7476C4331**	W7476C4336**	4.2	27	0.6	1.0	5.0 (2.3)
10	3/4 - 1¼	W7476A6331**	W7476A6336**	11	30	0.3	0.5	6.1 (2.8)
20	1¼ - 1½	W7476A8331**	W7476A8336**	22	50	0.1	0.2	18.5 (8.3)

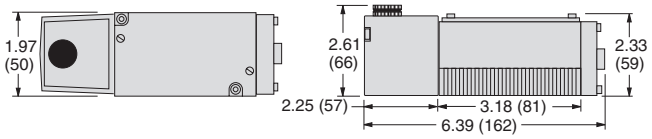




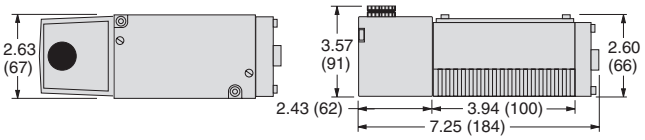
* **Sub-bases and sub-base manifolds ordered separately, refer to page A5.14-A5.18.**
** Insert voltage code: "W" = 24 volts DC; "Z" = 100-110/50, 100-130/60 volts AC/Hz; e.g., W7476B2331W.
For other voltages, consult ROSS.
Valve Response Time – Response Time (msec) = M + (F • V). This is the average 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 Dimensions – inches (mm)

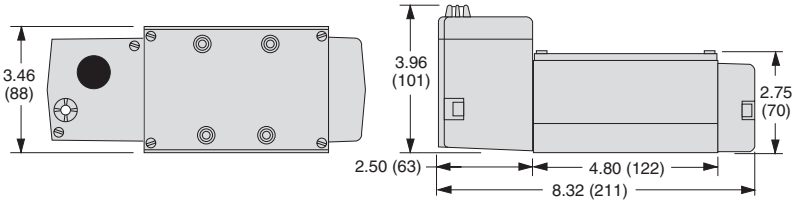
ANSI Size 1



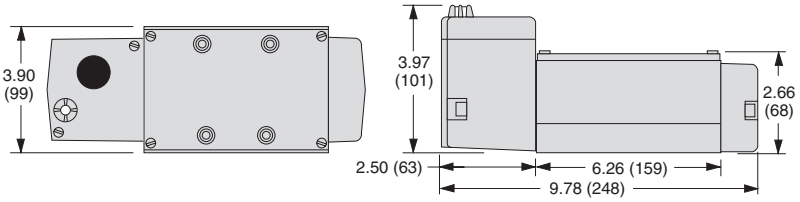
ANSI Size 2.5



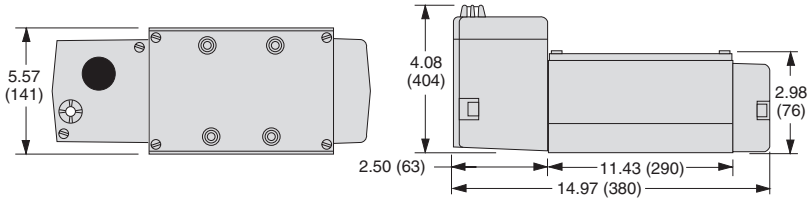
ANSI Size 4



ANSI Size 10



ANSI Size 20



Options: Indicator Light (in Base/Manifold), refer to page A5.17-A5.18. Accessories ordered separately, refer to page A5.19.

STANDARD SPECIFICATIONS (for valves on this page):

Construction: Poppet.
Mounting Type: Base.
Solenoid Pilot: Rated for continuous duty.
Standard Voltages: 24 volts DC; 110/50, 110-120/60 volts AC/Hz.
Power Consumption (each solenoid):
ANSI Size 1: 10 VA inrush, 24 VA holding on 50 or 60 Hz; 5 watts on DC.
ANSI Size 2.5, 4, 10 & 20: 87 VA inrush, 55 VA holding on 50 or 60 Hz; 15 watts on DC.
Ambient Temperature: 40° to 120°F (4° to 50°C); extended to 175°F (80°C) for High Temperature models.
Media Temperature: 40° to 175°F (4° to 80°C); extended to 220°F (105°C) for High Temperature models.
Flow Media: Filtered air.
Inlet Pressure: 30 to 150 psig (2 to 10 bar).
Pilot Pressure: Must be equal to or greater than inlet pressure.
Indicator Light: *ANSI Size 4, 10 & 20 models only:* Included, one per solenoid.
Manual Override: Flush; rubber, non-locking.

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

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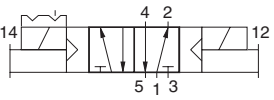
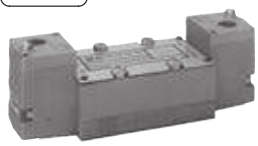
Double Solenoid Pilot Controlled Valves

5-Way 2-Position Valves, Double Solenoid Pilot Controlled, Detented

ANSI Size	Port Size	Valve Model Number*		Avg. C_v	Average Response Constants#			Weight lb (kg)
		Standard Temp.	High Temp.		M	F		
						In-Out	Out-Exh.	
1	1/4 - 3/8	W7476B2332**	W7476B2337**	0.9	30	2.7	5.6	3.0 (1.4)
2.5	3/8 - 1/2	W7476A3332**	W7476A3337**	2.0	25	1.5	2.9	3.0 (1.4)
4	1/2 - 3/4	W7476C4332**	W7476C4337**	4.2	27	0.6	1.0	5.0 (2.3)
10	3/4 - 1¼	W7476A6332**	W7476A6337**	11	30	0.3	0.5	6.1 (2.8)
20	1¼ - 1½	W7476A8332**	W7476A8337**	22	50	0.1	0.2	18.5 (8.3)

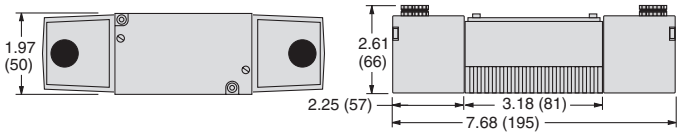




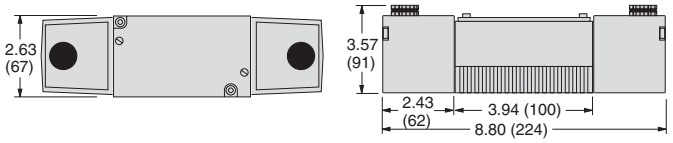
* **Sub-bases and sub-base manifolds ordered separately, refer to page A5.14-A5.18.**
** Insert voltage code: "W" = 24 volts DC; "Z" = 100-110/50, 100-130/60 volts AC/Hz; e.g., W7476B2332W.
For other voltages, consult ROSS.
Valve Response Time – Response Time (msec) = M + (F • V). This is the average 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 Dimensions – inches (mm)

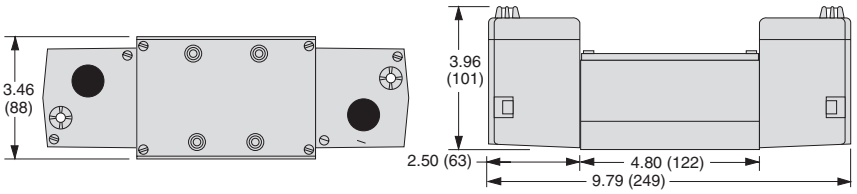
ANSI Size 1



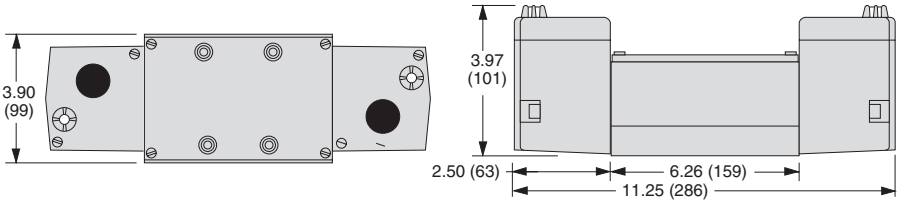
ANSI Size 2.5



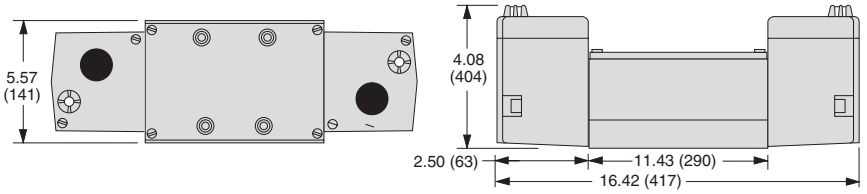
ANSI Size 4



ANSI Size 10



ANSI Size 20



A5

Options: Indicator Light (in Base/Manifold), refer to page A5.17-A5.18. Accessories ordered separately, refer to page A5.19.

STANDARD SPECIFICATIONS (for valves on this page):

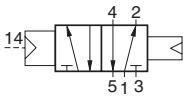
Construction: Poppet.
Mounting Type: Base.
Solenoid Pilot: Rated for continuous duty.
Standard Voltages: 24 volts DC; 110/50, 110-120/60 volts AC/Hz.
Power Consumption (each solenoid):
ANSI Size 1: 10 VA inrush, 24 VA holding on 50 or 60 Hz; 5 watts on DC.
ANSI Size 2.5, 4, 10 & 20: 87 VA inrush, 55 VA holding on 50 or 60 Hz; 15 watts on DC.
Ambient Temperature: 40° to 120°F (4° to 50°C); extended to 175°F (80°C) for High Temperature models.
Media Temperature: 40° to 175°F (4° to 80°C); extended to 220°F (105°C) for High Temperature models.
Flow Media: Filtered air.
Inlet Pressure: 30 to 150 psig (2 to 10 bar).
Pilot Pressure: Must be equal to or greater than inlet pressure.
Indicator Light: *ANSI Size 4, 10 & 20 models only:* Included, one per solenoid.
Manual Override: Flush; rubber, non-locking.

Please read carefully and thoroughly all of the on the inside back cover.

Single Pressure Controlled Valves

5-Way 2-Position Valves, Air Return

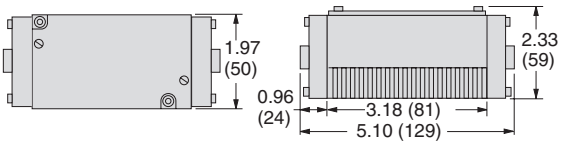
ANSI Size	Port Size	Valve Model Number*		Avg. C_v	Average Response Constants#			Weight lb (kg)
		Standard Temp.	High Temp.		M	F		
						In-Out	Out-Exh.	
1	1/4 - 3/8	W7456B2331	W7456B2336	0.9	30	2.7	5.6	2.5 (1.1)
2.5	3/8 - 1/2	W7456A3331	W7456A3336	2.0	25	1.4	2.9	2.0 (0.9)
4	1/2 - 3/4	W7456C4331	W7456C4336	4.2	16	0.5	1.1	3.3 (1.5)
10	3/4 - 1¼	W7456A6331	W7456A6336	11	14	0.3	0.5	7.3 (3.3)
20	1¼ - 1½	W7456A8331	W7456A8336	22	32	0.1	0.2	17.5 (7.9)



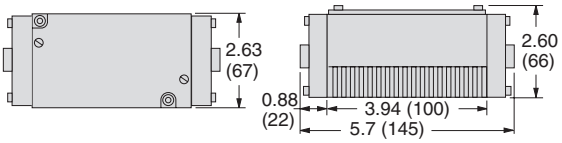
* **Sub-bases and sub-base manifolds ordered separately, refer to page A5.14-A5.18.**
\# **Valve Response Time –** Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Dimensions – inches (mm)

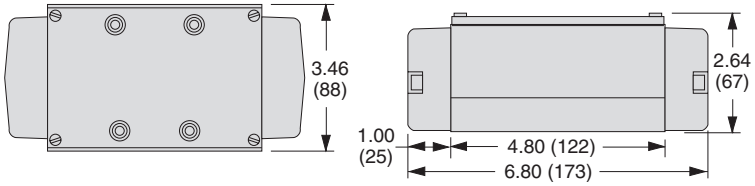
ANSI Size 1



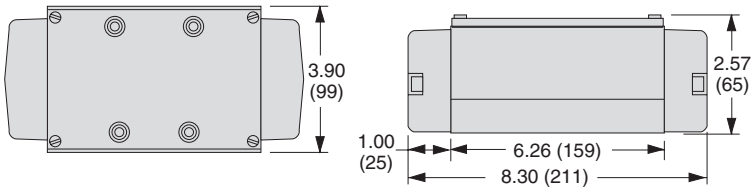
ANSI Size 2.5



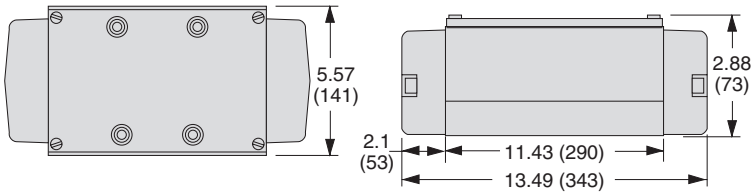
ANSI Size 4



ANSI Size 10



ANSI Size 20



Accessories ordered separately, refer to page A5.19.

STANDARD SPECIFICATIONS (for valves on this page):

Construction: Poppet.
Mounting Type: Base.
Ambient Temperature: 40° to 175°F (4° to 80°C).
Media Temperature: 40° to 175°F (4° to 80°C); extended to 220°F (105°C) for High Temperature models.
Flow Media: Filtered air.
Inlet Pressure: 30 to 150 psig (2 to 10 bar).
Pilot Pressure: Must be equal to or greater than inlet pressure.

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

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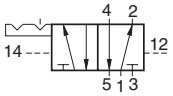
Double Pressure Controlled Valves

5-Way 2-Position Valves, Detented

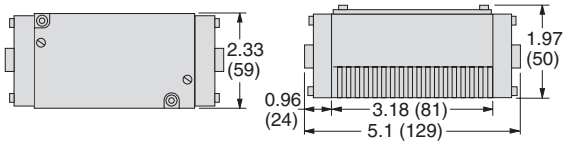
ANSI Size	Port Size	Valve Model Number*		Avg. C_V	Average Response Constants#			Weight lb (kg)
		Standard Temp.	High Temp.		M	F		
						In-Out	Out-Exh.	
1	1/4 - 3/8	W7456B2332	W7456B2337	0.9	30	2.7	5.6	2.5 (1.1)
2.5	3/8 - 1/2	W7456A3332	W7456A3337	2.0	25	1.4	2.9	2.0 (0.9)
4	1/2 - 3/4	W7456C4332	W7456C4337	4.2	16	0.5	1.1	3.3 (1.5)
10	3/4 - 1¼	W7456A6332	W7456A6337	11	14	0.3	0.5	7.3 (3.3)
20	1¼ - 1½	W7456A8332	W7456A8337	22	32	0.1	0.2	17.5 (7.9)



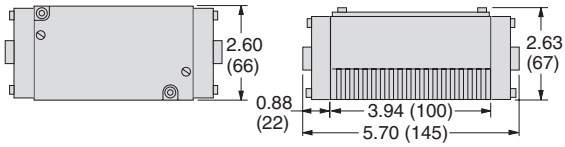
* **Sub-bases and sub-base manifolds ordered separately, refer to page A5.14-A5.18.**
\# **Valve Response Time** – Response Time (msec) = M + (F • V). This is the average time required to fill a volume V (cubic inches) to 90% of supply pressure or to exhaust it to 10% of supply pressure. M and F values are shown above.

Valve Dimensions – inches (mm)

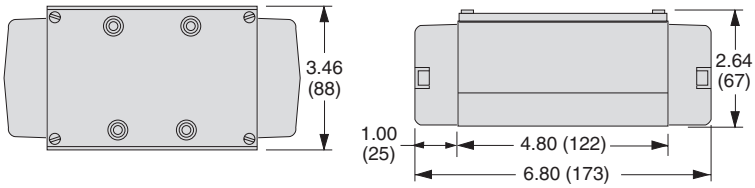
ANSI Size 1



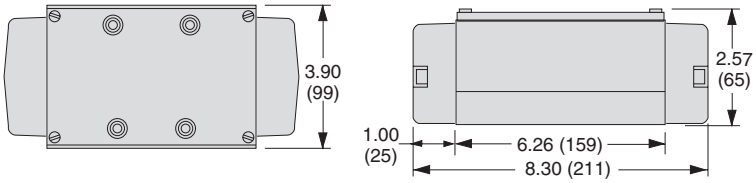
ANSI Size 2.5



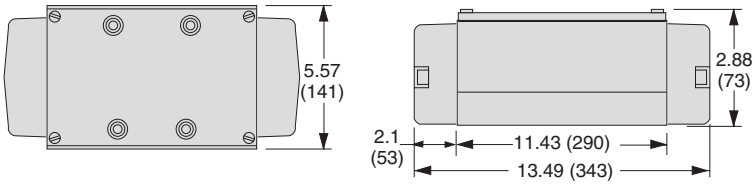
ANSI Size 4



ANSI Size 10



ANSI Size 20



Accessories ordered separately, refer to page A5.19.

STANDARD SPECIFICATIONS (for valves on this page):

Construction: Poppet.
Mounting Type: Base.
Ambient Temperature: 40° to 175°F (4° to 80°C).
Media Temperature: 40° to 175°F (4° to 80°C); extended to 220°F (105°C) for High Temperature models.
Flow Media: Filtered air.
Inlet Pressure: 30 to 150 psig (2 to 10 bar).
Pilot Pressure: Must be equal to or greater than inlet pressure.

Please read carefully and thoroughly all of the on the inside back cover.



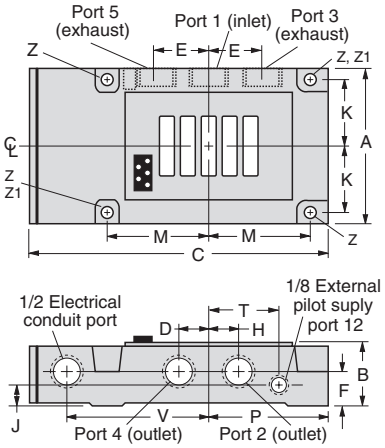
Sub-base for ANSI Size 4 valve illustrated

The sub-base numbers shown in the chart on the right specify pressure ports with NPT threads, and electrical openings with 1/2 NPT threads.

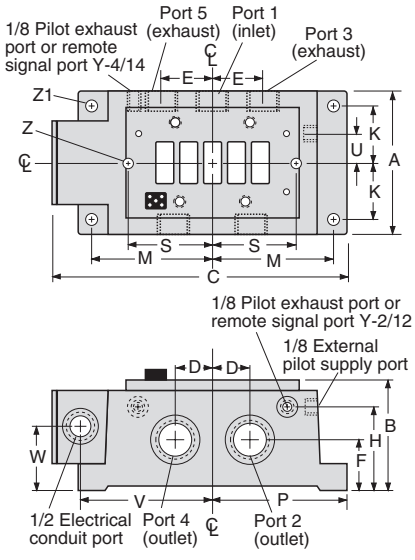
ANSI Size	Outlet Port	Indicator Lights in Base*			Avg. C_v
		None	One	Two	
		Model Number			
1	1/4	500B91	525K91**	526K91**	0.9 to 1.0
	3/8	501B91	527K91**	528K91**	0.9 to 1.0
2.5	3/8	474K91	482K91**	484K91**	2.0 to 2.5
	1/2	475K91	483K91**	485K91**	2.0 to 2.5
4	3/8	361B91	—	—	4.2
	1/2	362B91	—	—	4.2
	3/4	363B91	—	—	4.2
10	3/4	364B91	—	—	10 to 11
	1	365B91	—	—	10 to 11
	1¼	366B91	—	—	10 to 11
20	1¼	367B91	—	—	22
	1½	368B91	—	—	22

*NPT port threads. For BSPP threads, add a "D" prefix to the model number, e.g., D502B91.
** Insert voltage code: "–W" = 24 volts DC; "–Z" = 110-120 volts AC, 50/60 Hz; e.g., 525K91–W. For other voltages, consult ROSS.

ANSI Size 1 & 2.5



ANSI Size 4, 10 & 20



Sub-Base Dimensions inches (mm)					
	ANSI 1	ANSI 2.5	ANSI 4	ANSI 10	ANSI 20
A	2.80 (71)	3.56 (90)	3.36 (85)	5.08 (129)	6.64 (169)
B	1.44 (37)	1.61 (41)	2.64 (67)	3.78 (96)	3.70 (94)
C	6.15 (156)	7.09 (180)	7.21 (183)	10.45 (266)	12.34 (313)
D	0.51 (13)	0.63 (16)	0.75 (19)	1.38 (35)	1.38 (35)
E	0.88 (22)	1.25 (32)	1.50 (38)	2.76 (70)	2.76 (70)
F	0.78 (20)	0.93 (23)	1.23 (31)	1.75 (44)	1.59 (40)
H	0.58 (15)	0.63 (16)	2.21 (56)	3.01 (76)	2.85 (72)
J	0.38 (10)	0.50 (13)	–	–	–
K	1.13 (29)	1.50 (38)	–	2.05 (52)	2.38 (60)
M	1.88 (48)	2.31 (59)	–	4.33 (110)	5.35 (136)
P	2.43 (62)	2.97 (75)	2.86 (73)	4.76 (121)	5.86 (149)
S	–	–	2.36 (60)	–	–
T	1.35 (34)	1.78 (45)	–	–	–
U	–	–	0.83 (21)	1.97 (50)	1.54 (39)
V	2.75 (70)	3.29 (83)	3.07 (78)	4.65 (118)	5.60 (142)
W	–	–	1.23 (31)	2.50 (64)	2.15 (55)
Z	0.27 (7)	–	0.30 (7)	–	–
Z1	–	0.28 (7)	–	0.34 (9)	0.37 (9)

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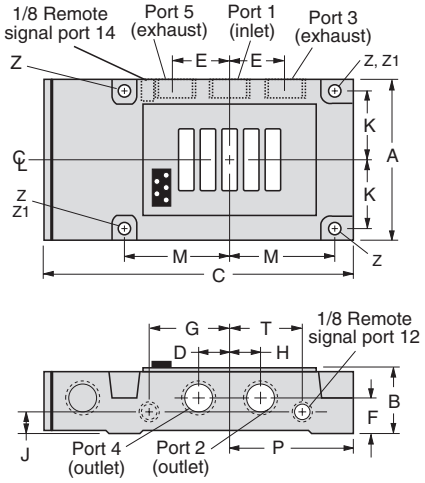
Sub-base for ANSI Size 4 valve illustrated

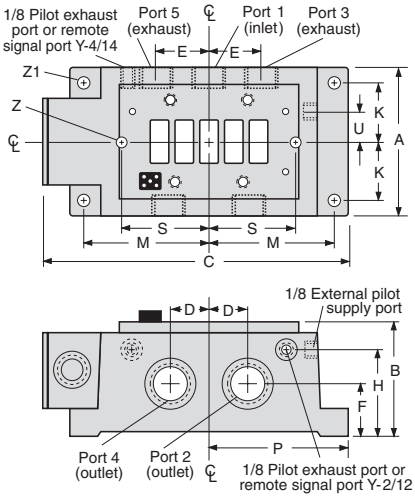
ANSI Size	Outlet Port	Model Number	Avg. C_v
1	1/4	500B91	0.9 to 1.0
	3/8	501B91	0.9 to 1.0
2.5	3/8	474K91	2.0 to 2.5
	1/2	475K91	2.0 to 2.5
4	3/8	361B91	4.2
	1/2	362B91	4.2
	3/4	363B91	4.2
10	3/4	364B91	10 to 11
	1	365B91	10 to 11
	1¼	366B91	10 to 11
20	1¼	367B91	22
	1½	368B91	22

*NPT port threads. For BSPP threads, add a "D" prefix to the model number, e.g., D502B91.

ANSI Size 1 & 2.5



ANSI Size 4, 10 & 20



Sub-Base Dimensions inches (mm)					
	ANSI 1	ANSI 2.5	ANSI 4	ANSI 10	ANSI 20
A	2.80 (71)	3.56 (90)	3.36 (85)	5.08 (129)	6.64 (169)
B	1.44 (37)	1.61 (41)	2.64 (67)	3.78 (96)	3.70 (94)
C	6.15 (156)	7.09 (180)	7.21 (183)	10.45 (266)	12.34 (313)
D	0.51 (13)	0.63 (16)	0.75 (19)	1.38 (35)	1.38 (35)
E	0.88 (22)	1.25 (32)	1.50 (38)	2.76 (70)	2.76 (70)
F	0.78 (20)	0.93 (23)	1.23 (31)	1.75 (44)	1.59 (40)
H	0.58 (15)	0.63 (16)	2.21 (56)	3.01 (76)	2.85 (72)
J	0.38 (10)	0.50 (13)	–	–	–
K	1.13 (29)	1.50 (38)	–	2.05 (52)	2.38 (60)
M	1.88 (48)	2.31 (59)	–	4.33 (110)	5.35 (136)
P	2.43 (62)	2.97 (75)	2.86 (73)	4.76 (121)	5.86 (149)
S	–	–	2.36 (60)	–	–
T	1.35 (34)	1.78 (45)	–	–	–
U	–	–	0.83 (21)	1.97 (50)	1.54 (39)
V	–	–	–	–	–
Z	0.27 (7)	–	0.30 (7)	–	–
Z1	–	0.28 (7)	–	0.34 (9)	0.37 (9)

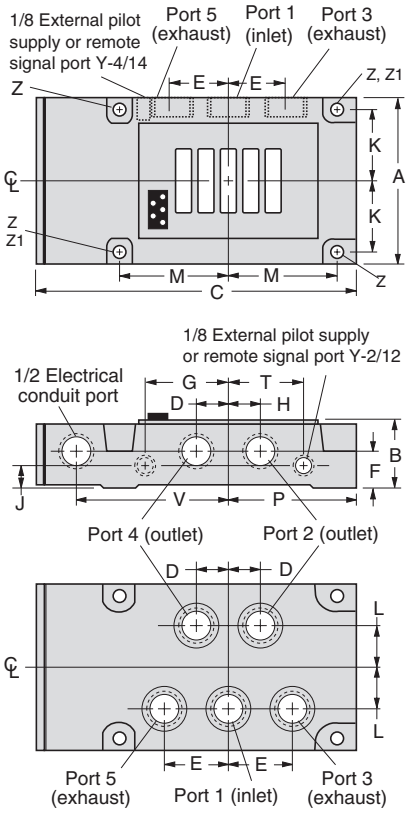
Side & Bottom Ported Sub-Bases

ANSI Size	Outlet Port	Indicator Lights in Base*			Avg. C_v
		None	One	Two	
		Model Number			
1	1/4	499B91	529K91**	530K91**	0.9 to 1.0
2.5	3/8	476K91	477K91**	486K91**	2.0 to 2.5
4	3/8	369B91	—	—	4.2
	1/2	370B91	—	—	4.2
	3/4	371B91	—	—	4.2

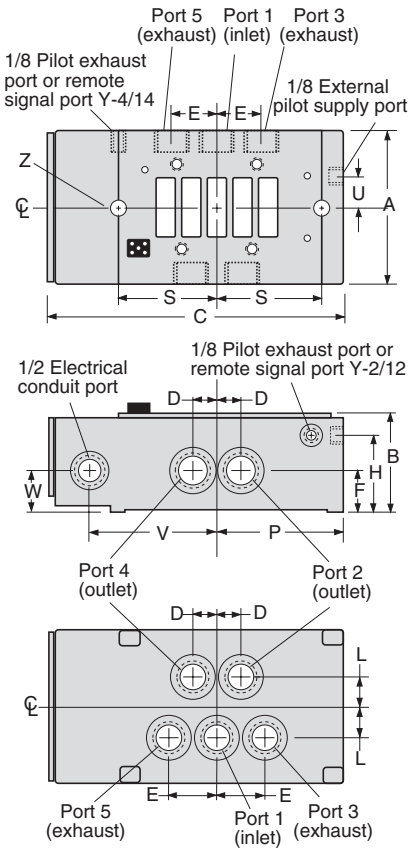
*NPT port threads. For BSPP threads, add a "D" prefix to the model number, e.g., D502B91.
** Insert voltage code: "–W" = 24 volts DC; "–Z" = 110-120 volts AC, 50/60 Hz; e.g., 529K91–W.
For other voltages, consult ROSS.

Sub-Base Dimensions inches (mm)			
	ANSI 1	ANSI 2.5	ANSI 4
A	2.80 (71)	3.56 (90)	3.36 (85)
B	1.44 (37)	1.61 (41)	2.64 (67)
C	6.15 (156)	7.09 (180)	7.21 (183)
D	0.51 (13)	0.63 (16)	0.75 (19)
E	0.88 (22)	1.25 (32)	1.50 (38)
F	0.78 (20)	0.93 (23)	1.23 (31)
G	1.46 (37)	2.41 (61)	–
H	0.58 (15)	0.63 (16)	2.21 (56)
J	0.38 (10)	0.50 (13)	–
K	1.13 (29)	1.50 (38)	–
L	0.63 (16)	0.81 (21)	–
M	1.88 (48)	2.31 (59)	–
P	2.43 (62)	2.97 (75)	2.86 (73)
S	–	–	2.36 (60)
T	1.35 (34)	1.78 (45)	–
U	–	–	0.83 (21)
V	2.75 (70)	3.29 (83)	–
Z	0.27 (7)	–	0.30 (7)
Z1	–	0.28 (7)	–

ANSI Size 1 & 2.5



ANSI Size 4

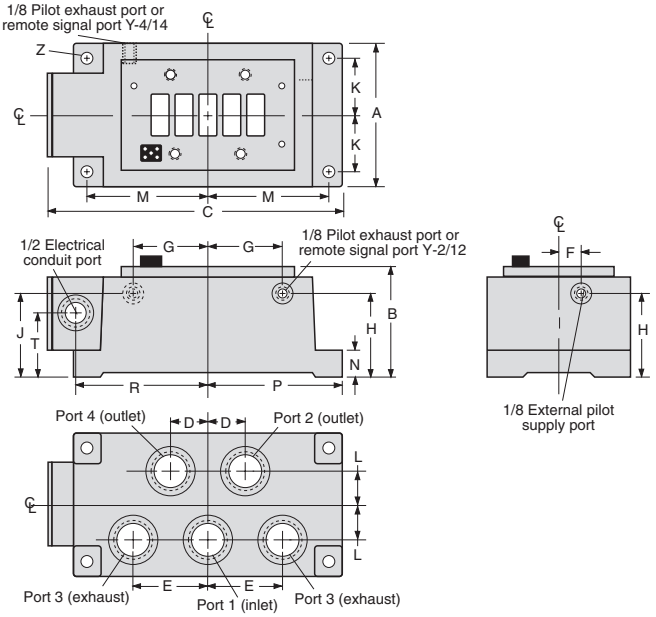


Bottom Ported Sub-Bases

ANSI Size	Outlet Port	Model Number	Avg. C_v
10	3/4	372B91	10 to 11
	1	373B91	10 to 11
	1¼	374B91	10 to 11
20	1¼	375B91	22
	1½	376B91	22

*NPT port threads. For BSPP threads, add a "D" prefix to the model number, e.g., D502B91.

Dimensions inches (mm)					
	ANSI 10	ANSI 20		ANSI 10	ANSI 20
A	5.8 (129)	6.64 (169)	K	2.05 (52)	2.38 (60)
B	3.78 (96)	3.70 (94)	L	1.22 (31)	1.22 (31)
C	10.45 (266)	12.34 (313)	M	4.33 (110)	5.36 (136)
D	1.38 (35)	1.38 (35)	N	0.88 (22)	1.00 (25)
E	2.76 (70)	2.76 (76)	P	4.76 (121)	5.82 (148)
F	1.03 (26)	1.54 (39)	R	4.65 (118)	5.60 (142)
G	2.60 (66)	3.90 (99)	T	2.50 (64)	2.15 (55)
H	3.01 (76)	2.85 (72)	Z	0.34 (8)	0.37 (9)
J	3.25 (83)	2.85 (72)			



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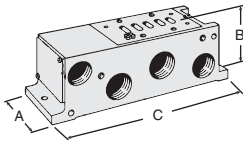
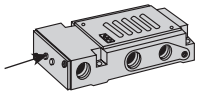


Typical Manifold Station

The numbers of the manifold stations shown in the chart on the right specify pressure ports with NPT threads and electrical openings with 1¼ NPT threads. All necessary hardware and seals for manifold assembly are included with each manifold station.

As shown in the chart the smaller sizes of manifolds are available with indicator lights. These lights are located in the end plate covering the electrical cavity.

Lights are mounted in bases, on the valves, or on solenoids, depending on the particular type of valve.



Manifold Note: The port positions of the solenoid controlled and the pressure controlled manifolds are not the same. For this reason these stations cannot be mixed in the same installation. If both types of valves *must* be used in the same installation, *use only manifold stations for solenoid controlled valves.*

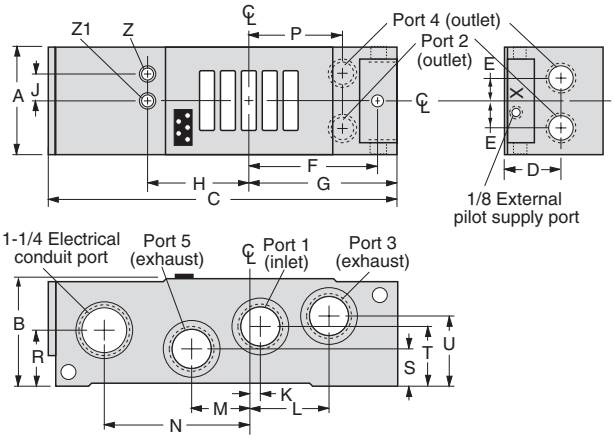
ANSI Size	Outlet Port	Indicator Lights in Manifold*			Avg. C_v
		None	One	Two	
		Model Number			
1	1/4	502B91	531K91**	532K91**	0.9 to 1.0
	3/8	503B91	533K91**	534K91**	0.9 to 1.0
2.5	3/8	472K91	478K91**	480K91**	2.0 to 2.5
	1/2	473K91	479K91**	481K91**	2.0 to 2.5
4	3/8	377B91	—	—	4.2
	1/2	378B91	—	—	4.2
	3/4	379B91	—	—	4.2
10	3/4	380B91	—	—	10 to 11
	1	381B91	—	—	10 to 11
	1¼	382B91	—	—	10 to 11

*NPT port threads. For BSPP threads, add a "D" prefix to the model number, e.g., D502B91.
** Insert voltage code: "–W" = 24 volts DC; "–Z" = 110-120 volts AC, 50/60 Hz; e.g., 531K91–W. For other voltages, consult ROSS.

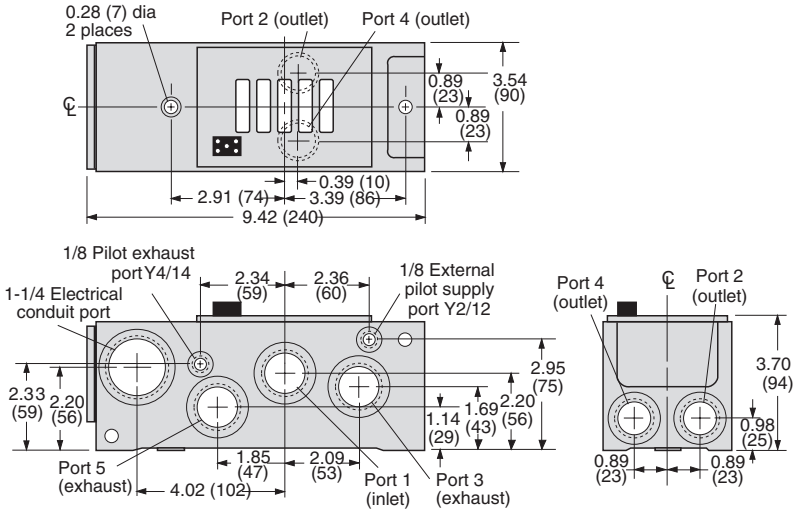
Manifold Dimensions – inches (mm)

ANSI Size 1 & 2.5

	Dimensions inches (mm)				
	ANSI 1	ANSI 2.5		ANSI 1	ANSI 2.5
A	2.26 (57)	2.80 (71)	L	1.62 (41)	1.81 (46)
B	2.26 (57)	2.66 (68)	M	1.00 (25)	1.46 (37)
C	7.89 (201)	8.50 (216)	N	2.88 (73)	3.46 (88)
D	1.38 (35)	1.48 (38)	P	2.16 (55)	2.21 (56)
E	0.56 (14)	0.70 (18)	R	1.17 (30)	1.36 (35)
F	2.76 (70)	2.99 (76)	S	0.64 (16)	0.78 (20)
G	3.14 (80)	3.43 (87)	T	1.07 (27)	1.40 (36)
H	1.80 (46)	2.24 (87)	U	1.57 (40)	1.76 (45)
J	0.50 (13)	–	Z	0.28 (7)	–
K	0.31 (8)	0.18 (6)	Z1	–	0.28 (7)



ANSI Size 4



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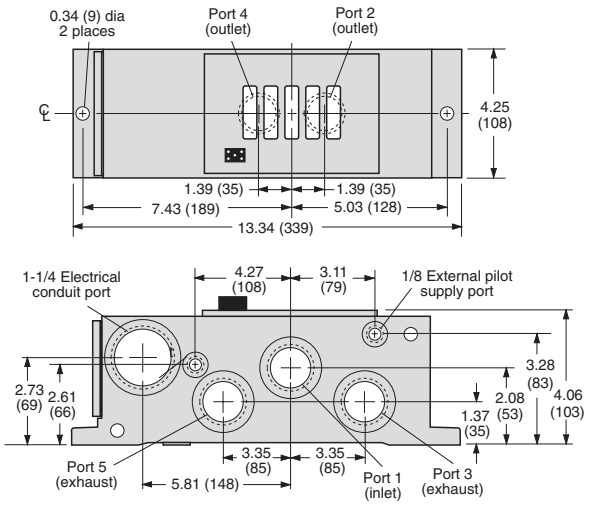
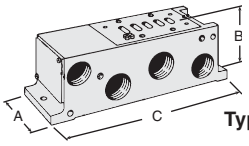


ASSEMBLED MANIFOLDS

Valves and manifold stations can be assembled by ROSS to precise specifications. The assembly is then ready for integration into your system.

For detailed information about such assemblies, consult your ROSS Distributor or call ROSS in the U.S.A. at 1-888-TEK-ROSS (835-7677) or 1-706-356-3708.

Please read carefully and thoroughly all of the on the inside back cover.



Typical Manifold Station

ANSI Size	Outlet Port	Model Number	Avg. C_v
1	1/4	359B91	0.9 to 1.0
	3/8	360B91	0.9 to 1.0
2.5	3/8	468B91	2.0 to 2.5
	1/2	469B91	2.0 to 2.5
4	3/8	383B91	4.2
	1/2	384B91	4.2
	3/4	385B91	4.2
10	3/4	386B91	10 to 11
	1	387B91	10 to 11
	1¼	388B91	10 to 11

*NPT port threads. For BSPP threads, add a "D" prefix to the model number, e.g., D502B91.

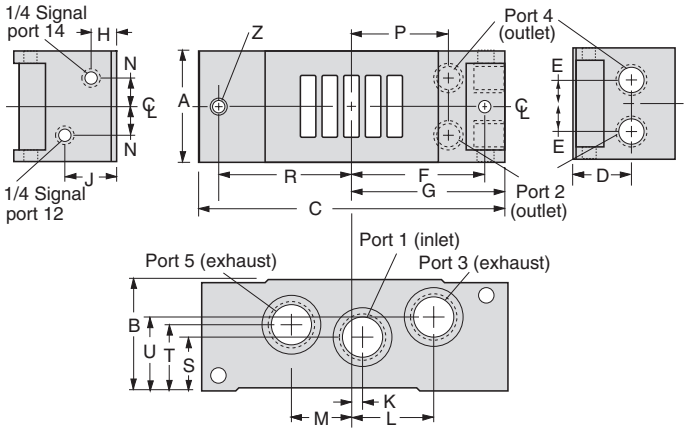
The numbers of the manifold stations shown in the chart on the right specify pressure ports with NPT threads. All necessary hardware and seals for manifold assembly are included with each manifold station.

Manifold Note: The port positions of the solenoid controlled and the pressure controlled manifolds are not the same. For this reason these stations cannot be mixed in the same installation. If both types of valves *must* be used in the same installation, *use only manifold stations for solenoid controlled valves.*

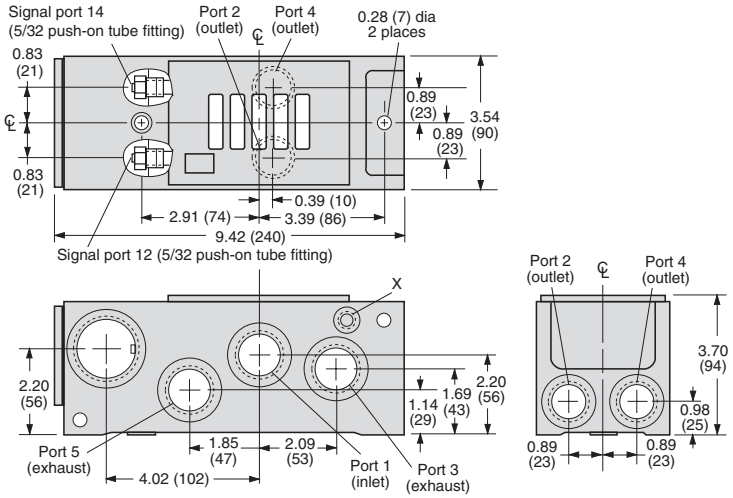
Manifold Dimensions – inches (mm)

ANSI Size 1 & 2.5

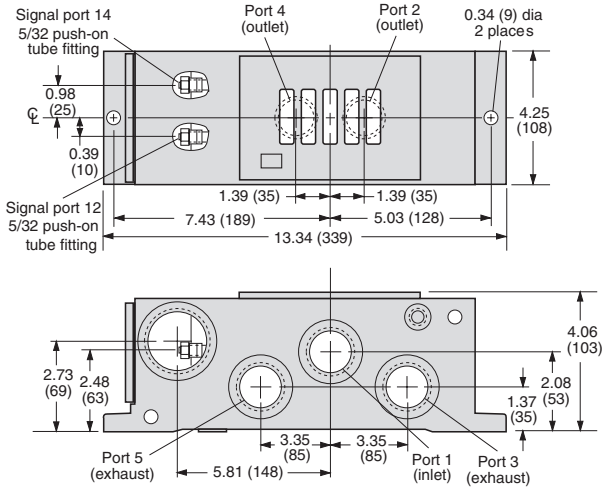
	Dimensions inches (mm)				
	ANSI 1	ANSI 2.5		ANSI 1	ANSI 2.5
A	2.26 (57)	2.80 (71)	L	1.47 (37)	1.80 (46)
B	2.26 (57)	2.66 (68)	M	1.36 (35)	1.46 (37)
C	6.25 (159)	6.86 (174)	N	0.56 (14)	0.70 (18)
D	1.32 (34)	1.48 (38)	P	2.37 (60)	2.21 (56)
E	0.56 (14)	0.70 (18)	R	2.50 (64)	2.99 (76)
F	2.88 (73)	2.99 (76)	S	1.14 (29)	1.40 (36)
G	3.31 (84)	3.40 (86)	T	1.14 (29)	1.76 (45)
H	0.56 (14)	0.74 (19)	U	1.26 (32)	1.76 (45)
J	0.88 (22)	1.26 (32)	Z	0.28 (7)	0.28 (7)
K	0.00 (00)	0.18 (6)			



ANSI Size 4



ANSI Size 10



ASSEMBLED MANIFOLDS

Valves and manifold stations can be assembled by ROSS to precise specifications. The assembly is then ready for integration into your system.

For detailed information about such assemblies, consult your ROSS Distributor or call ROSS in the U.S.A. at 1-888-TEK-ROSS (835-7677) or 1-706-356-3708.

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

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Interposed Pressure Regulators

Both single and double interposed regulators are available for valves with C_v ratings up to 4.2. A regulator is bolted to the valve's sub-base or manifold station, and the valve is then bolted to the regulator. This mounting method allows the valve to be removed and replaced without disturbing the regulator.

Single pressure regulators provide the same regulated pressure at both outlet ports. Double pressure regulators allow the pressure at each outlet port to be set independently.

A locking type knob is used to set the regulated pressure at any point in the range of:

5 to 100 psig (0.3 to 7 bar) for size 1 and 2 models;
5 to 125 psig (0.3 to 8.5 bar) for size = 4.2 models.

Maximum inlet pressure is 150 psig (10 bar).
Pressure gauge(s) included.

ANSI Size	Interposed Regulator – Model Number		
	Single	Double*	
		Solenoid	Remote Air
1	840C91	841C91	713C91
2.5	626C91	627C91	714C91
4	632C91	633C91	715C91

* Double regulator only for W70 spool valves.

WARNING: Double interposed regulators will reverse output ports - the 12 solenoid will pressurize the 4 port, the 14 solenoid will pressurize the 2 port - which may cause unexpected, potentially dangerous cylinder movement at valve pressurization.

Manual Override Kits

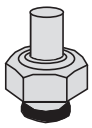
Flush flexible manual overrides are standard on solenoid pilot controlled valves with C_v ratings of 2.0 or larger. Both locking and non-locking metal override buttons are also available for these models.

Each of the override buttons in the kits at the right 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.

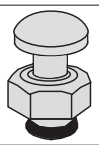
Flush Button	
Locking Type	Kit Number
Non-Locking	790K87
Locking	792K87



Extended Button	
Locking Type	Kit Number
Non-Locking	791K87

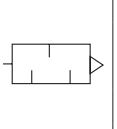


Extended Button with Palm	
Locking Type	Kit Number
Non-Locking	984H87



Silencers

Port Size	Thread Type	Model Number		Avg. C_v	Dimensions inches (mm)		Weight lb (kg)
		NPT Threads	BSPT Threads		A	B	
1/4	Male	5500A2003	D5500A2003	2.1	0.9 (21)	2.2 (55)	0.1 (0.1)
3/8	Male	5500A3013	D5500A3013	2.7	0.9 (21)	2.2 (55)	0.1 (0.1)
3/8	Male	5500A3003	D5500A3003	4.3	1.3 (32)	3.5 (88)	0.2 (0.1)
1/2	Male	5500A4003	D5500A4003	4.7	1.3 (32)	3.6 (91)	0.2 (0.1)
3/4	Male	5500A5013	D5500A5013	5.1	1.3 (32)	3.6 (92)	0.2 (0.1)
3/4	Male	5500A5003	D5500A5003	11.5	2.0 (51)	5.3 (135)	0.6 (0.3)
1	Male	5500A6003	D5500A6003	14.6	2.0 (51)	5.4 (138)	0.6 (0.3)
1¼	Male	5500A7013	D5500A7013	16.4	2.0 (51)	5.5 (140)	0.6 (0.3)





Pressure Range: 0 to 150 psig (0 to 10.3 bar) maximum. **Flow Media:** Filtered air.

General Information

Standard Specifications

The standard specifications for the products on each page of this catalog are given on the same page or referenced. For solenoid pilot valves, models with internal pilot supply are listed. Most models are also available for use with external pilot supply or have a built-in pilot supply selector valve.

The products in this catalog are intended for use in industrial pneumatic systems. Most products are adaptable to other uses and conditions not covered by the standard specifications given in this catalog. Weights shown are approximate and are subject to change. Dimensions given, unless otherwise noted, are envelope dimensions (not for mounting). Consult ROSS for further information.

Port Threads

Ports of valves and bases described in this catalog have NPT (ANSI B2.1) threads. Other thread types can be specified by putting an appropriate prefix letter on the model or part number when ordering.

Thread Types by Model Prefix Letter

Pneumatic Port Threads	Prefix Letter	Threaded Electrical Opening
NPT (ANSI B2.1)	None	NPT
ISO 228 - DIN 259 Parallel, BSPP#	**C***	—
ISO 228 - DIN 259 Parallel, BSPP#	**D**	G
ISO 228 - JIS B0203 Tapered#	**J**	ISO
SAE 1926- ISO 11926	**S**	NPT

* Used only for filters, regulators, lubricators.

ISO 228 threads superseds BSPP, G and JIS thread types.

Flow Ratings

Flow ratings are expressed as C_V where C_V = 1 corresponds to a steady state air flow of approximately 32 scfm under the following conditions:

Inlet pressure = 100 psig (6.7 bar)
Pressure drop = 10 psi (0.69 bar)
Air temperature = 68°F (20°C)
Relative humidity = 36%

Note: *Because widely differing test standards are used to measure C_V values, the figures given in this catalog should not be used to compare ROSS valves with those of other makers. The C_V ratings given here are intended only for use with performance charts published by ROSS. The C_V ratings are averages for the various flow paths through the valve and are for steady flow conditions.*

Approvals and Certifications

ROSS products are designed to meet a number of industrial standards, including the Canadian Standards Association (C.S.A.) guidelines.

For more information on specific product approvals, contact your local distributor or ROSS.

Solenoids

All ROSS standard solenoids are rated for continuous duty (unless noted otherwise) and will operate the valve within the air pressure range specified in this catalog.

Explosion-Proof Solenoid Pilot available, for more information consult ROSS.

When ordering a solenoid valve, also specify the desired solenoid voltage and hertz.

Voltage Types by Model Suffix Letter

Voltage	Suffix Letter
120 volts AC	**Z**
220 volts AC	**Y**
12 volts DC	**H**
24 volts DC	**W**
48 volts DC	**M**
90 volts DC	**K**
110 volts DC	**P**
125 volts DC	**C**

In addition, the following voltages are available:

200, 220 volts AC, 50 Hz
200, 240, 480 volts AC, 60 Hz

24, 48, 220 volts AC, 50 Hz
240 volts AC, 60 Hz

200, 220 volts AC, 50 Hz
200, 240 volts AC, 60 Hz.

For example: Model 2773B5001, 120 volts AC, 60 Hz.
Model W6076B2401, 220 volts AC, 50 Hz.

Please note that not all configurations are available for all models.

Port Identification

Valve symbols in this catalog conform to the ISO 1219-1:1991 standard of the International Organization for Standardization (ISO) and the SAE J2051 standard of the Society of Automotive Engineers (SAE) respectively.

Order Placement

For order placement, consult ROSS or your local ROSS distributor.

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CAUTIONS, WARNINGS and STANDARD WARRANTY

PRE-INSTALLATION or SERVICE

1. Before servicing a valve or other pneumatic component, be sure that all sources of energy are turned off, the entire pneumatic system is shut off and exhausted, and all power sources are locked out (ref: OSHA 1910.147, EN 1037).

2. All ROSS products, including service kits and parts, should be installed and/or serviced only by persons having training and experience with pneumatic equipment. Because any installation can be tampered with or need servicing after installation, persons responsible for the safety of others or the care of equipment must check every installation on a regular basis and perform all necessary maintenance.

3. All applicable instructions should be read and complied with before using any fluid power system in order 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 location listed on the cover of this document.

4. Each ROSS product should be used within its specification limits. In addition, use only ROSS parts to repair ROSS products.

WARNING: Failure to follow these directions can adversely affect the performance of the product or result in the potential for human injury or damage to property.

FILTRATION and LUBRICATION

5. 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. ROSS recommends a filter with a 5-micron rating for normal applications.

6. All standard ROSS filters and lubricators with polycarbonate plastic bowls are designed for compressed air applications only. Do *not* fail to 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, hazardous leakage, and the potential for human injury or damage to property. Immediately replace a crazed, cracked, or deteriorated bowl. When bowl gets dirty, replace it or wipe it with a clean dry cloth.

7. Only use lubricants which are compatible with materials used in the valves and other components in the system. Normally, compatible lubricants are petroleum based 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 human injury, and/or damage to property.

AVOID INTAKE/EXHAUST RESTRICTION

8. Do not restrict the air flow in the supply line. To do so could reduce the pressure of the supply air below the minimum requirements for the valve and thereby cause erratic action.

9. 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.

WARNING: ROSS expressly disclaims all warranties and responsibility for any unsatisfactory performance or injuries caused by the use of the wrong type, wrong size, or an inadequately maintained silencer installed with a ROSS product.

POWER PRESSES

10. 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.

ENERGY ISOLATION/EMERGENCY STOP

11. Per specifications and regulations, ROSS **L-O-X®** and **L-O-X®** with **EEZ-ON®** operation products are defined as energy isolation devices, NOT AS EMERGENCY STOP DEVICES.

STANDARD WARRANTY

All products sold by ROSS CONTROLS are warranted for a one-year period [with the exception of all Filters, Regulators and Lubricators ("FRLs") which are warranted for a period of seven years] from the date of purchase to be free of defects in material and workmanship. ROSS' obligation under this warranty is limited to repair or replacement of the product or refund of the purchase price paid solely at the discretion of ROSS and provided such product is returned to ROSS freight prepaid and upon examination by ROSS is found to be defective. This warranty becomes void in the event that product has been subject to misuse, misapplication, improper maintenance, modification or tampering.

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