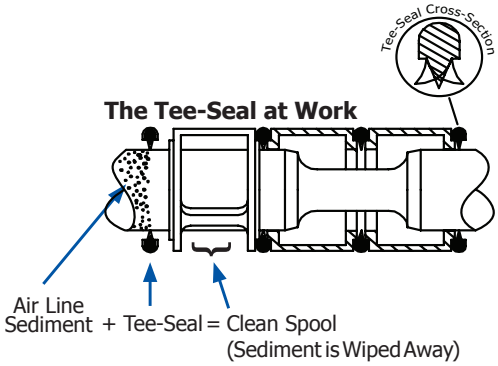
3 Way Compact Spool Valves - Design Features



Valves

- Compact size, high flow.
- Inline or manifold mount (L21 only): flexible, efficient.
- Wide variety of options and operators available.
- Lockout tested and approved to SAE specifications.
- Specific application needs? Consult the factory. We will build it for you.

Tapered Tee-Seal ..... Eats Dirt

- Bidirectional tapered Tee-Seal eliminates sticking problems.
  - Flexes to clean spool
  - Mechanically Locked
  - No Spiral Twist
  - No Extrusion
  - Air Line Sediment is Wiped Away.
- Tested tough and proven reliable according to SAE specifications: Rust and water injected every 864,000 cycles for 20 million cycles.

Solenoid ... Guaranteed Against Burnout

- Three-way pilot uses full air line pressure to shift the valve.
- Pilot is internally supplied when the pressure at port one is 35 to 150 PSIG (240 to 1030 kPa).
- Coil is hermetically sealed as an integral watertight molded unit.
- Intrinsically-safe and explosion-proof versions available.
- Push Non-Locking Override is standard. (Extended Turn and Turn-Locking available)


Certificate of Compliance

Products Certified To:

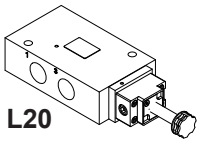
- CSA - (C22.2 and UL STD 429)
- Factory Mutual - Explosion Proof Environments
- ATEX - Explosion Proof Environments
- CE - EMF and Low Voltage Directives

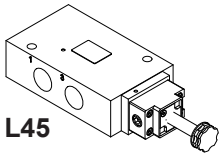
3/2

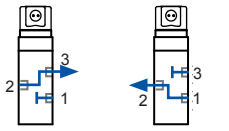
3 Way Compact Spool Valves - Specs & Model Numbers

Specifications

Valve Operation





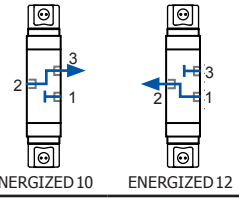


3/2 Normally Closed

De-Energized:
Exhausts Pressure from Port 2 to Port 3
Blocks Pressure at Port 1

Energized:
Pressure from Port 1 to Port 2

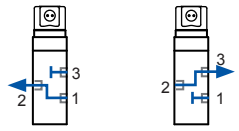
Valve Operation



3/2 DOUBLE

Momentarily Energized 10:
Exhausts Pressure from Port 2 to Port 3
Blocks Pressure at Port 1

Momentarily Energized 12:
Pressure from Port 1 to Port 2



3/2 Normally Open

De-Energized:
Pressure from Port 1 to Port 2

Energized:
Exhausts Pressure from Port 2 to Port 3
Blocks Pressure at Port 1

Operating Temperatures	Solenoid Pilot Operated	Treated Buna-N Seals (Treated NBR, Standard)	Fluoroelastomer Seals (FPM (FKM), Option A)
	Standard	-18°C to +50°C (0°F to +123°F)	-18°C to +50°C (0°F to +123°F)
	High Temp Coil (Option CT)	-18°C to +82°C (0°F to +180°F)	-18°C to +82°C (0°F to +180°F)

Operating Pressures	Solenoid Pilot Operated	Inlet Port	External Pilot Port
	Standard 2 Position	240 - 1030 kPa (35 - 150 PSIG)	-
	External Pilot (Option B)	Vacuum - 240 kPa (Vacuum - 35 PSIG)	240 - 1030 kPA (35 - 150 PSIG)

Filtration & Lubrication

Media - Air Or Inert Gas

Air Line Lubrication of Automatic Valve products is not required, but is recommended to maximize service life. Oils should be compatible with seal material, have an ISO 32 viscosity, and have an aniline range between 82°C (180°F) and 99°C (210°F). Filter to 50 microns or better. For temperatures below 40°F, air must be dry to prevent formation of ice. Refer to the Maintenance section of this catalog for recommended lubricants.

Model Numbers

Series	Body Type		Port Size		Function		Body Design		Operator 1		Operator 2		Voltage [2]		Options*	
L20	0	Inline	3	1/4	G	3 WAY NC	A	Single	A	Air Pilot	A	Air Pilot	-AA	110/50, 120/60	B	External Pilot Connection
			4	3/8	H	3 WAY NO	B	Double	F	Hand Lever - Line	M	2 Position Detent Manual	-AB	220/50, 240/60, 125VDC	C	Conduit Coil
									I	Palm Button	R	2 Position Spring			CT	Conduit Coil High Temperature
									K	Foot Pedal	V	Intrinsically-Safe Solenoid [1] (24VDC only)	-DA	22/50, 24/60, 12VDC	D	Dustproof
									V	Intrinsically-Safe Solenoid [1] (24VDC only)	W	Weather-Proof Solenoid	-DB	24VDC	G	18" Flying Leads
									W	Weather-Proof Solenoid					L	Low Watt Coil (2.5 Watts)
L45	0	Inline	5	1/2											LL	Lowest Watt Coil (0.7 Watts) with Type 2 override only (24VDC only)
L21	0	Inline, Manifold	3	1/4					V	Intrinsically-Safe Solenoid [1] (24VDC only)	V	Intrinsically-Safe Solenoid [1] (24VDC only)			W	G (BSPP) Threads
			4	3/8					W	Weather-Proof Solenoid	W	Weather-Proof Solenoid			Y	Explosion-Proof Coil (CSA,FM)
															Z	Explosion-Proof Coil (ATEX)
															1	Push Turn-Locking Override
															2	Extended Turn-Locking Override
															4	No Override

Series	Body Type		Port Size		Function		Body Design		Operator 1		Operator 2		Voltage		Options*	
L45 Lockout	0	Inline	5	1/2	H	3 WAY NO	A	Single	L	Lockout	M	Detent - Lockout			A	Fluoroelastomer Seals
			6	3/4												

*Not all Options are available for all models. Refer to "Options" at the end of this Section for additional information.
[1] Can not be used on a manifold. [2] Consult the Factory for additional voltages.

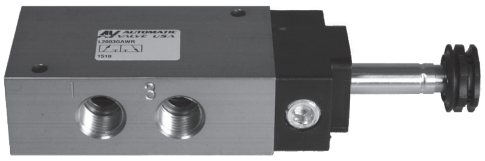
How to Read the Model Number Chart

The model number digits are in the shaded columns, descriptions of each digit are in the white columns.
Example of L2003GAWR-AAB: L20 Series inline valve (body type) with 1/4" ports, 3 way normally closed (function) single body with a weather-proof solenoid, 2 position spring return, 110 volt din coil, and an external pilot connection.

Series	Body Type		Port Size		Function		Body Design		Operator 1		Operartor 2		Voltage*		Options*	
L20	0	Inline	3	1/4	G	3 WAY NC	A	Single	W	Weather-Proof Solenoid	R	2 Position Spring	-AA	110/50, 120/60	B	External Pilot Connection

3 Way Compact Spool Valves - Standard Solenoid

Single



L2003GAWR

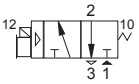
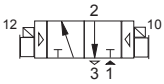
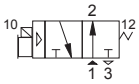
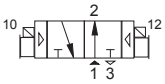
L2003GAVR-DB
Intrinsically-Safe, 24 VDC only
(connector included, not shown)

Double

L4505GBWW

L4505GBVV-DB
Intrinsically-Safe, 24 VDC only
(connector included, not shown)

Model Numbers

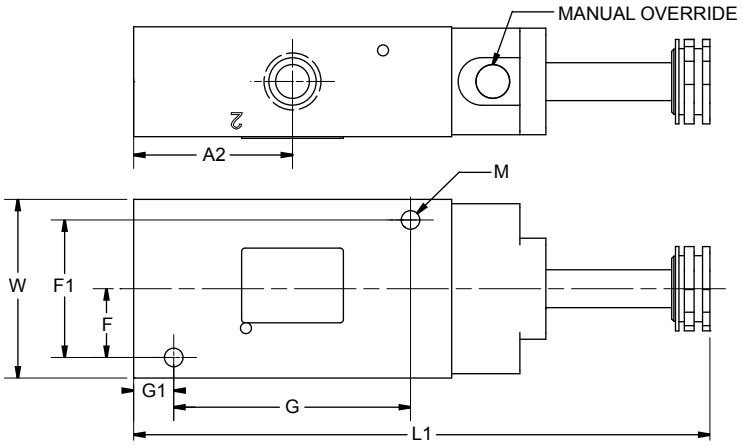
Series	Operator	Port Size	Flow l/min (C_V)	3 Way Normally Closed		3 Way Normally Open		Mat'l		Wt Kg (lb)
				Single	Double	Single	Double	Body	Seal	
										
L20	Weather-Proof and Explosion-Proof	1/4	1770 (1.8)	L2003GAWR-**	L2003GBWW-**	L2003HAWR-**	L2003HBWW-**	Aluminum	NBR	0,27 (0.6)
		3/8		L2004GAWR-**	L2004GBWW-**	L2004HAWR-**	L2004HBWW-**			
	Intrinsically-Safe	1/4		L2003GAVR-DB	L2003GBVV-DB	L2003HAVR-DB	L2003HBVV-DB			0,4 (0.9)
		3/8		L2004GAVR-DB	L2004GBVV-DB	L2004HAVR-DB	L2004HBVV-DB			
L45	Weather-Proof and Explosion-Proof	1/2	3940 (4.0)	L4505GAWR-**	L4505GBWW-**	L4505HAWR-**	L4505HBWW-**			0.68 (1.5)
	Intrinsically-Safe			L4505GAVR-DB	L4505GBVV-DB	L4505HAVR-DB	L4505HBVV-DB			0,86 (1.9)

** = Coil Voltage Code. Coils also sold separately. Refer to "Electrical Information" at the end of this Section for additional information.

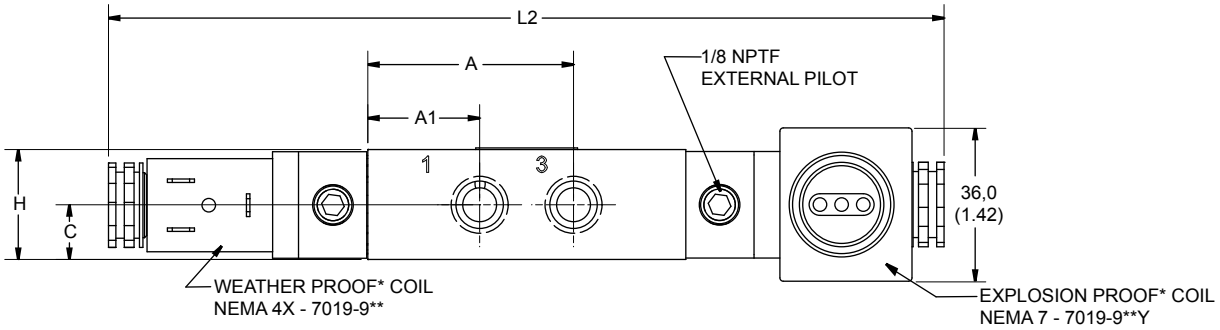
3 Way Compact Spool Valves - Standard Solenoid

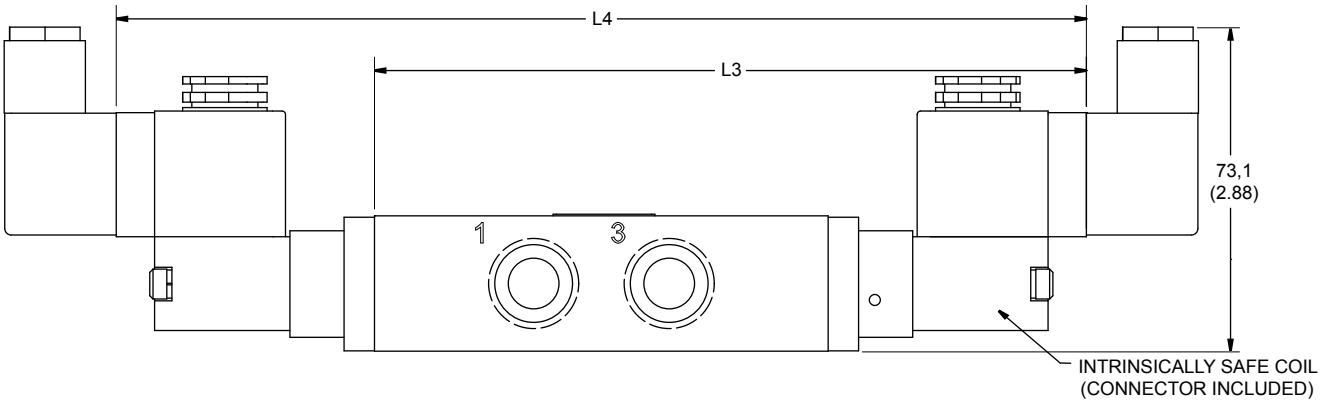
Dimensional Information

Single



Double





Series	A	A1	A2	C	F	F1	G	G1	H	L1	L2	L3	L4	M	W
L20	48,2 1.90	26,2 1.03	37,3 1.47	12,7 0.50	16,1 0.64	32,3 1.27	55,6 2.19	9,7 0.38	25,4 1.00	135 5.32	196 7.70	127 5.00	179 7.06	4,3 0.17	41,9 1.65
L45	69,1 2.72	37,3 1.47	53,1 2.09	16,0 0.63	23,9 0.94	47,8 1.88	69,8 2.75	18,3 0.72	31,8 1.25	174 6.87	241 9.49	166 6.54	225 8.88	6,6 0.26	63,5 2.50

Units of Measure: Top - mm, Bottom - inches

3/2

3 Way Compact Spool Valves - Air Pilot

Single

L2003GAAR

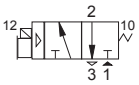
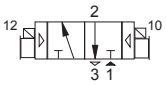
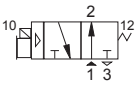
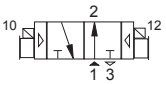
L4505GAAR

Double

L2003GBAA

L4505GBAA

Model Numbers

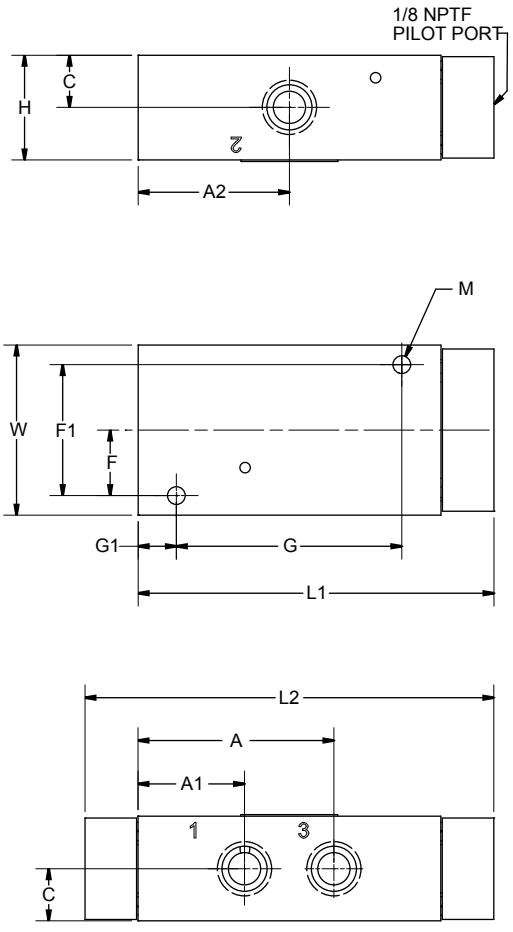
Series	Port Size	Flow l/min (C_V)	3 Way Normally Closed		3 Way Normally Open		Materials		Wt Kg (lb)
			Single	Double	Single	Double	Body	Seal	
									
L20	1/4	1770 (1.8)	L2003GAAR	L2003GBAA	L2003HAAR	L2003HBAA	Aluminum	NBR	0,4 (0.9)
	3/8		L2004GAAR	L2004GBAA	L2004HAAR	L2004HBAA			
L45	1/2	3940 (4.0)	L4505GAAR	L4505GBAA	L4505HAAR	L4505HBAA			0,9 (1.9)

3/2

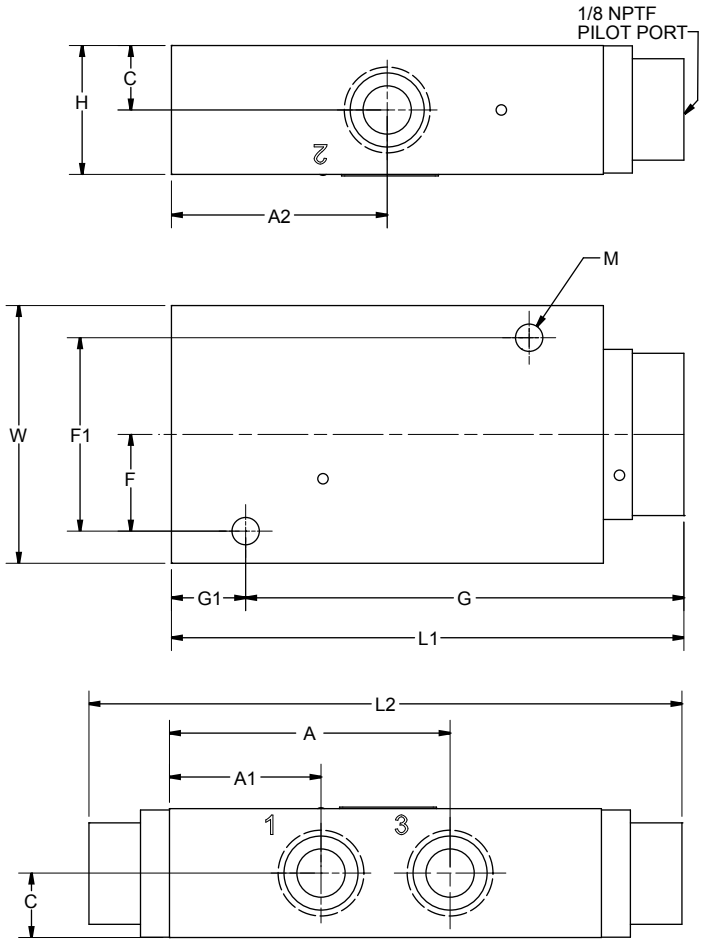
3 Way Compact Spool Valves - Air Pilot

Dimensional Information

Single



Double



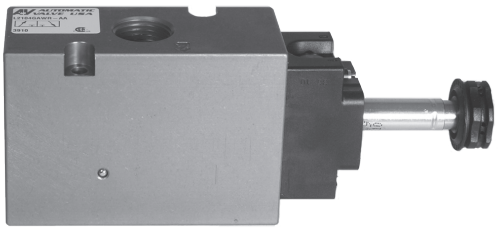
Series	A	A1	A2	C	F	F1	G	G1	H	L1	L2	M	W
L20	48,3 1.90	26,2 1.03	37,3 1.47	12,7 0.50	16,1 0.64	32,3 1.27	55,5 2.19	9,7 0.38	25,4 1.00	87,7 3.45	101 3.97	4,4 0.17	41,9 1.65
L45	69,1 2.72	37,3 1.47	53,1 2.09	16,0 0.63	23,9 0.94	47,8 1.88	69,8 2.75	18,3 0.72	31,8 1.25	126 4.97	146 5.75	6,6 0.26	63,5 2.50

Units of Measure: Top - mm, Bottom - inches

3/2 

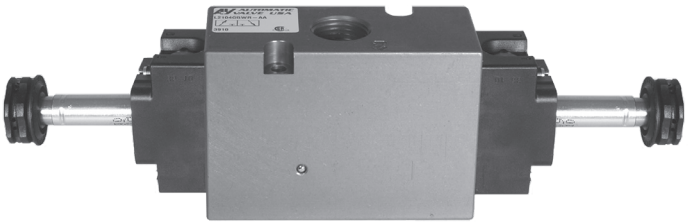
3 Way Compact Spool Valves - Top Mount & Manifold

L21 Single



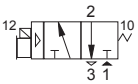
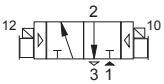
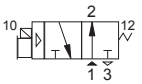
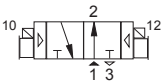
L2104GAWR-AA

L21 Double



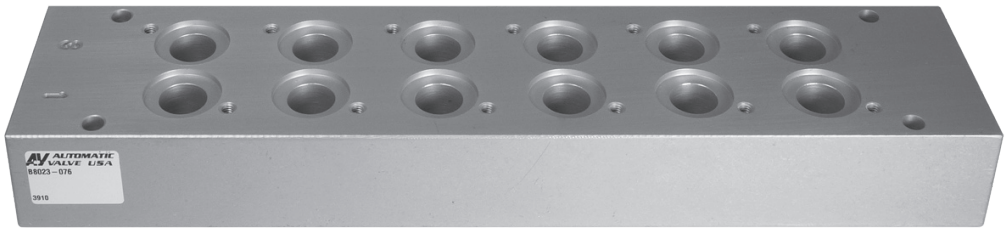
L2104GBWR-AA

Model Numbers

Series	Operator	Port Size	Flow l/min (C_V)	3 Way Normally Closed		3 Way Normally Open		Mat'l		Wt Kg (lb)
				Single	Double	Single	Double	Body	Seal	
										
L21	Weather-Proof and Explosion-Proof	1/4	1770 (1.8)	L2103GAWR-**	L2103GBWW-**	L2103HAWR-**	L2103HBWW-**	Aluminum	NBR	0,4 (0.9)
		3/8		L2104GAWR-**	L2104GBWW-**	L2104HAWR-**	L2104HBWW-**			
	Intrinsically-Safe[1]	1/4		L2103GAVR-DB	L2103GBVV-DB	L2103HAVR-DB	L2103HBVV-DB			0,5 (1.2)
		3/8		L2104GAVR-DB	L2104GBVV-DB	L2104HAVR-DB	L2104HBVV-DB			

** = Coil Voltage Code. Coils also sold separately. Refer to "Electrical Information" at the end of this Section for additional information.
[1] Intrinsically-Safe coils can not be used on manifolds

Manifold



B8023-076

Model Numbers

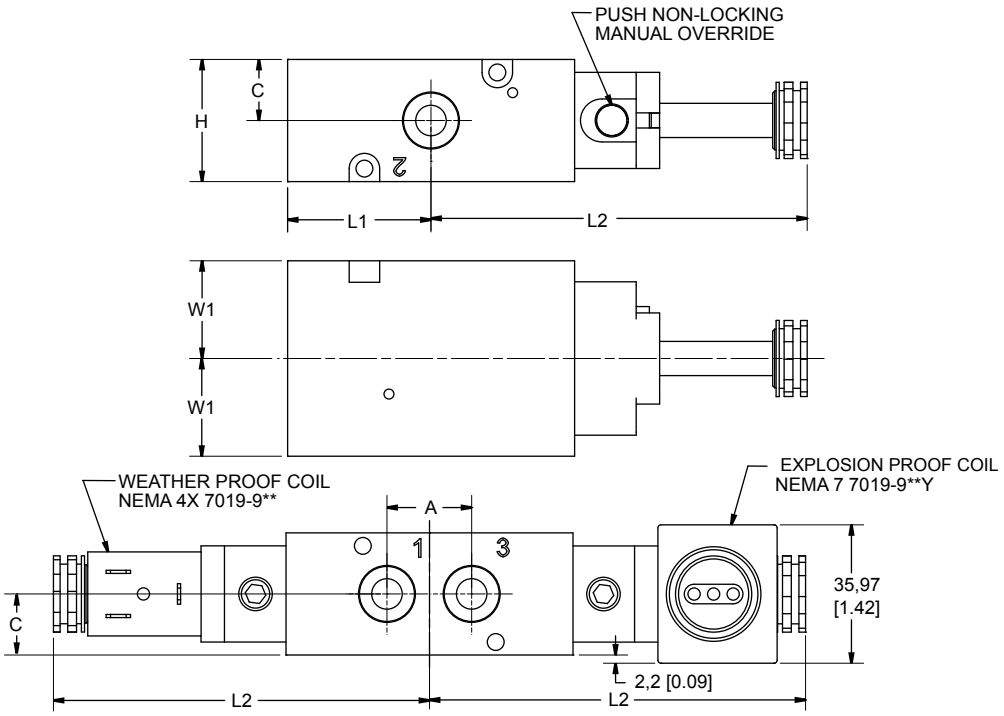
Series	Manifold[2]				Accessories	
	No. of Stations	Model Number	Ports 3, 1 & 5	Weight kg (lb)	Blocking Disk	Blank Station Cover
L21	2	B8023-072	3/8	0,45 (1.0)	A8020-202	L21-006
	4	B8023-074		0,82 (1.8)		
	6	B8023-076		1,0 (2.2)		
	8	B8023-078		1,1 (2.5)		
	10	B8023-080		1,3 (2.8)		

[2] Seals and Mounting Hardware included.

3 Way Compact Spool Valves - Manifolds

Dimensional Information

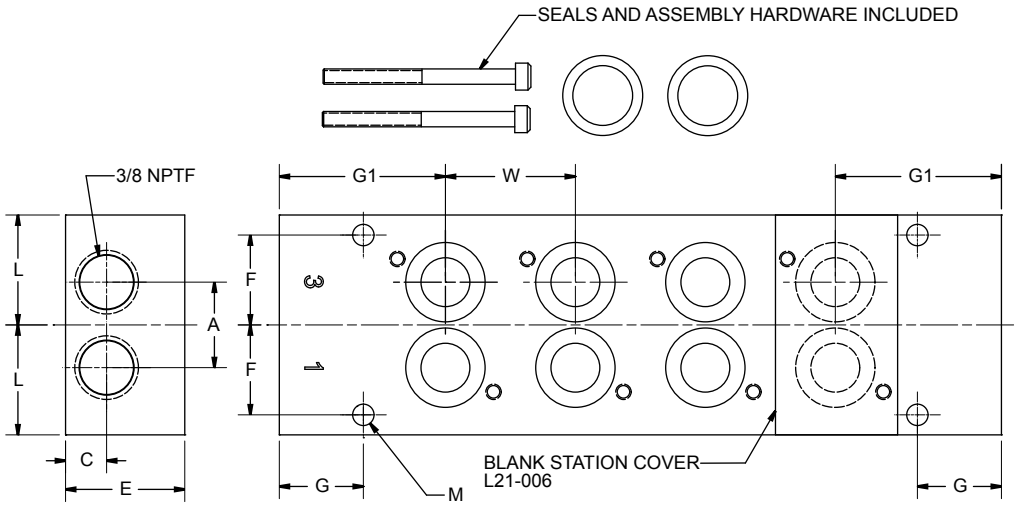
L21



Series	A	C	H	L1	L2	W1
L21	22,02 0.87	15,88 0.63	31,75 1.25	37,26 1.47	97,79 3.85	25,4 1.00

Units of Measure: Top - mm, Bottom - inches

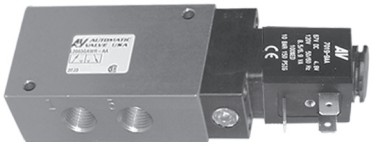
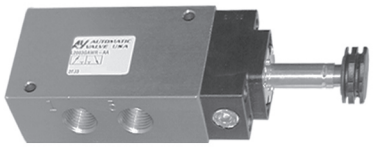
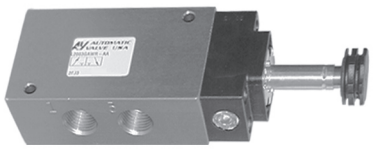
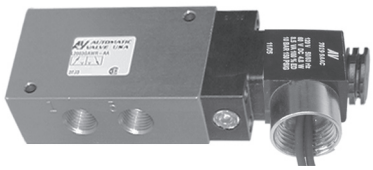
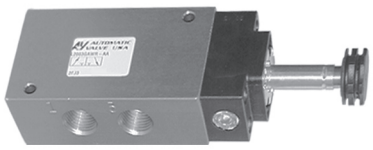
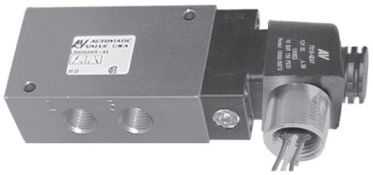
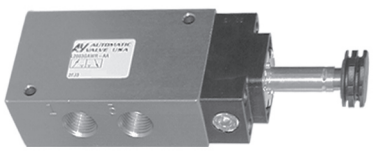
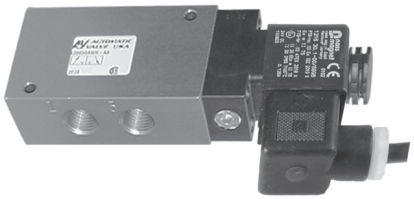
Manifold



Series	A	C	E	F	G	G1	L	M	W
L21	22,23 0.88	10,67 0.42	30,99 1.22	23,37 0.92	21,84 0.86	43,18 1.70	28,58 1.13	5,56 0.22	33,78 1.33

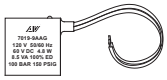
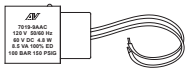
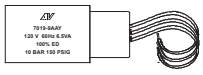
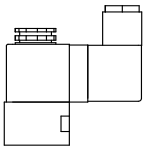
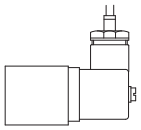
Units of Measure: Top - mm, Bottom - inches

3 Way Compact Spool Valves - Configuration Example

Valve With W-Solenoid Cap	+	Coil	=	Valve With Coil
	+	 NEMA 4x with DIN 43650 Form B Connection	=	
L2003GAWR		**7019-9****		**L2003GAWR-****
	+	 NEMA 4x with 18" Leads	=	
L2003GAWR		**7019-9**G**		**L2003GAWR-**G**
	+	 NEMA 4x 1/2" Conduit with 30" Leads	=	
L2003GAWR		**7019-9**C**		**L2003GAWR-**C**
	+	 Explosion-Proof 1/2" Conduit with 24" Leads	=	
L2003GAWR		**7019-9**Y**		**L2003GAWR-**Y**
	+	 ATEX Explosion-Proof with 39" Cable	=	
L2003GAWR		**7152-9****		**L2003GAWR-**Z**

3 Way Compact Spool Valves - Electrical Information

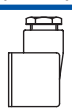
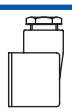
Part Numbers

Description		Operator Type	Instructions	Wt. Kg(lb)	Coil Part Number **=Voltage
Weather-Proof DIN 43650 Industrial Form B Connection NEMA 4X		**W**	Order coil separately (specify voltage code from below)	0,05 (0.12)	**7019-9****
Weather-Proof 18" Leads NEMA 4X		**W**	Order coil separately (specify voltage code from below)	0,05 (0.12)	**7019-9**G**
Weather-Proof 1/2" Conduit with 30" Leads NEMA 4X		**W**	Order coil separately (specify voltage code from below)	0,05 (0.12)	**7019-9**C** **7019-9**CT** (high temp 82°C max)
Explosion-Proof 1/2" Conduit with 24" Leads CSA & FM Approved CL. I; Zone1 Ex m II T4; AEx m II CL. I; Div.1; GR. A, B, C, D CL. II; GR. E, F, G CL. III T4 Ta=-20°C to +60°C NEMA 4, 4X, 7C, 7D, 9		**W**	Order coil separately (specify voltage code from below)	0,20 (0.44)	**7019-9**Y**
Intrinsically-Safe Strain Relief Ex ia CL. I; GR. A,B,C,D CL. II; GR. E,F,G CL. III; Div.1; T5		**V**	Coil and Connector included with valve (24VDC only)	0,21 (0.46)	**A7106-374-DB**
		A7106-374 Must be Used with an Intrinsically-Safe Barrier For more information refer to "Intrinsic Safety" insert on Page D7.			
Explosion-Proof 3m Cable & Strain Relief Ex m II T5 PTB 03 ATEX 2018 X Ex II 2 G EEx m II T5 Ex II 2 D IP65 T95°C		**Z**	Order coil separately (specify voltage code from below)	0,36 (0.78)	**7152-9****

Voltage Codes (Lower wattage options available, consult factory)

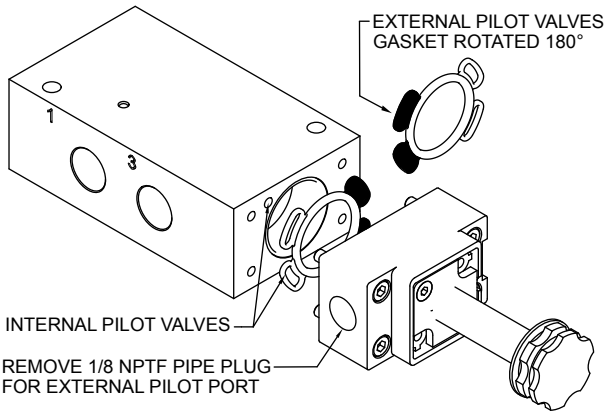
** Code	Voltage +/-10%		Current (Amps)								Resistance (OHMS @ 25°C)				Power (AC=VA, DC=Watts)			
			Inrush				Holding											
	Operator Type:		W		V	Z	W		V	Z	W		V	Z	W		V	Z
	NEMA 4	NEMA 7,9 & ATEX	NEMA		ATEX		NEMA		ATEX		NEMA		ATEX		NEMA		ATEX	
			4, 4x	7, 9	Exia	Exm	4, 4x	7, 9	Exia	Exm	4, 4x	7, 9	Exia	Exm	4, 4x	7, 9	Exia	Exm
DA	24/50 24/60	-	.36	-	-	-	.24	-	-	-	32	-	-	-	6.9	-	-	-
AA	120/50 120/60	120/60	.08	.10	-	.04	.05	.05	-	.03	840	530	-	1664	6.9	6.5	-	3.4
AB	230/50 230/60	240/60	.04	.05	-	.02	.03	.03	-	.01	3310	2345	-	6730	6.4	6.8	-	3.3
DA	12 VDC	12VDC	.38	.38	-	.27	.38	.38	-	.27	32	32	-	45	4.8	4.5	-	3.5
DB	24 VDC	24VDC	.20	.19	.05	.14	.20	.19	.05	.14	121	128	275	177	4.8	4.5	1.6	3.5
AB	125 VDC	-	.04	-	-	-	.04	-	-	-	3310	-	-	-	5.9	-	-	-

Connectors (Not polarity dependent)

DIN 43650 Industrial Form B							
	Maximum Cable Diameter: 9mm (0.35")						
Type	Strain Relief without Cord	Strain Relief with Light		1/2" Conduit without Cord	Molded with 6' Cord	Strain Relief with Light & 6' Cord	
		100-240 AC 48-120 DC	6-48 AC/DC			100-240 AC 48-120 DC	6-48 AC/DC
Part Number	**7020-001**	**7020-AA**	**7020-DB**	**7039-001**	**7020-006**	**7094-006**	**7094-007**

3 Way Compact Spool Valves - Options

Options (Add the Suffix to the end of the Model Number in alpha-numeric order)

Suffix	Option	Description
A	**Fluoroelastomer Seals**	For applications where fluid media or ambient conditions are not compatible with nitrile seals. (Lockout Valve only) *Note: Fluorocarbon seals do not increase the effective temperature range of the valve. For high temperature applications, consult the factory.*
B	**External Pilot**	For solenoid applications where the pressure to port one is less than 2 BAR (35 PSIG). See example below for field conversion. **Field Conversion** • Remove solenoid and cap from the valve body. • Rotate the gasket 180° so that the internal pilot hole in the valve body is covered by the gasket. • Refasten the gasket, cap and solenoid to the valve body. Make sure the gasket completely covers the internal pilot hole before tightening the M3 screws. Torque to 1,02 N-m (9 in-lbs) ±10%. • Remove the 1/8 NPTF pipe plug from the cap and make the external pilot connection. 
C	**Conduit Coil**	Refer to the "Electrical Information" page in this section for details.
CT	**Conduit Coil High Temperature**	Refer to the "Electrical Information" page in this section for details.
D	**Dustproof**	For applications in extremely dusty and contaminated environments. Vent ports are plugged and spring pad breather vent is eliminated.
G	**Coil With 18" Leads**	Refer to the "Electrical Information" page in this section for details.
L	**Low Watt Coil**	Power Consumption = 2.5 Watts. Standard as Push Non-Locking Override. Also available with Option 2, Extended Turn-Locking Override.
LL	**Lowest Watt Coil**	Power Consumption = 0.7 Watts. Standard as Extended Turn-Locking Override.
W	**G Threads**	All ports tapped to metric "G" standard.
Y	**Explosion-Proof Coil (CSA, FM)**	Refer to the "Electrical Information" page in this section for details.
Z	**Explosion-Proof Coil (Atex, PTB)**	Refer to the "Electrical Information" page in this section for details.
1	**Push Turn-Locking Override**	Solenoid cap provides an override that is pushed in and turned to actuate & lock in the "on" position.
2	**Extended Turn-Locking Override**	Solenoid cap provides an extended override that is turned to lock in the "on" position.
4	**No Override**	Solenoid cap does not provide a manual override.