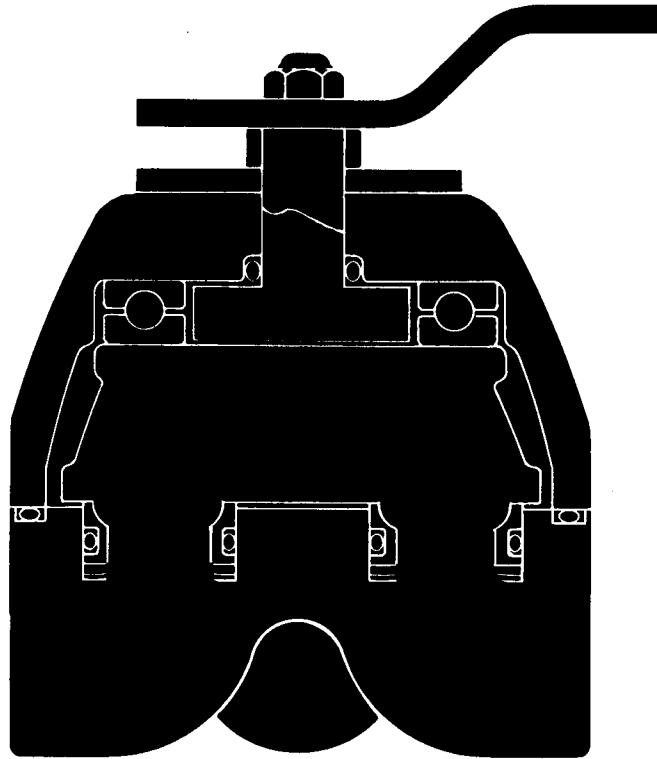


**DIRECTIONAL CONTROL
VALVES**



BARKSDALE

To ensure a long, trouble-free life for your Shear Seal™ valve, it can be customized to meet your needs. In addition to the is important to check that materials of construction are standard products shown in this catalog, Barksdale provides compatible with the process fluid and local environment. The custom engineered valves. Whatever your requirements, give us a call and we will provide you a feasibility statement, a test and of construction. Remember that Barksdale Shear Seal™ valves evaluation unit, and volume pricing.

Standard Materials of Construction

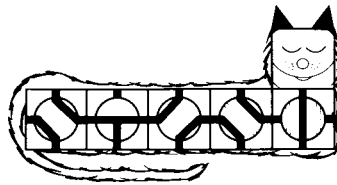
Basic Series	Catalog Page Number	Body	Housing	Thrust Bearing	Wetted Materials		
					Shaft	Rotor	Pressure Seals
Low Pressure	9000			Stainless Steel	Aluminum		Copper
	9040			Teflon & Stainless Steel			
	6140, 8140		Aluminum			Aluminum	Carbon Steel
	9080, 6180, 8180			Carbon Steel			
	6900, 6940						
OEM	140						
	3760						
	200		Ductile Iron			Stainless Steel	Copper
	4140			Stainless Steel			Stainless Steel
	130 (Oil)		Aluminum		Carbon Steel		Carbon Steel
Heavy Duty	130 (Air & Water)		Aluminum		Stainless Steel		Stainless Steel
	190		Ductile Iron		Stainless Steel		Carbon Steel
			Bronze				
			Bronze				
			Bronze				

Standard 'O' Ring Material is Buna N (Wetted)
 External Trim (Hardware & Fasteners) is Carbon Steel Zinc Plated

INDEX

TABLE OF CONTENTS		PAGE NUMBER
MANUALLY OPERATED		
0 to 150 } 0 to 250 } 0 to 350 }	Air, Oil — 4 Way and Manipulator	4
0 to 500 } 0 to 2000 } 0 to 3000 }	Air, Oil — 4 Way ('O.E.M. Line')	5-6
0 to 3000	Oil — Manipulator ('O.E.M. Line')	7
0 to 2000 } 0 to 3000 }	Air, Oil, Lubricated Water — 4 Way (Heavy Duty Line)	8
0 to 3000 } 0 to 4500 }	Oil, Lubricated Water — 4 Way (Subplate Mounted)	9
0 to 4000 } 0 to 6000 }	Air, Oil, Lubricated Water — 4 Way (Heavy Duty Line)	10
0 to 10,000	Air, Oil, Lubricated Water — 4 Way	11
0 to 2000 } 0 to 3000 } 0 to 4000 } 0 to 6000 }	Air, Oil, Lubricated Water — Shut-off	12
AIR OPERATED		
2 Position Actuators for Shut-off and 4 Way Valves		13
3 Position Actuators for 4 Way and Manipulator Valves		14
Pilot Valves and Pilot Valve Arrangements		15
How to Order Valve — Actuator — Pilot Valve Arrangements		15
SOLENOID VALVES		
0 to 1500 0 to 3000	Air, Oil, Lubricated Water (4 Way — 3 Way, Diverter, Shut-off) (‘Universal Line’)	16
SOLENOID CONTROLLED PILOT OPERATED POPPET VALVES		
(Cross Section and Operating Features)		17
15 to 150	Air, 4 Way (Subbase Mounted)	18
15 to 150	Air, 3 Way (Subbase Mounted)	19
Special Purpose Solenoid Configurations		20
OPERATING AND SAFETY		21
TROUBLE SHOOTING AND MAINTENANCE		22-23
REQUEST FOR SPECIAL OR MODIFIED VALVES		24
SALES AND SERVICE	INSIDE BACK COVER	
BARKSDALE CONTROLS LITERATURE AVAILABLE		
	Ask For Bulletin No	
Pressure Switch - Electromechanical		S87042-M
Pressure Switch - Solid State		S0007-R
Pressure Switch Solutions for Hazardous Locations		S0002-C
Temperature Switches - Electromechanical		T0003-R
Pressure Transducer		R0011-R
Level Switches		L0001-C
LevelSite		L0004-R

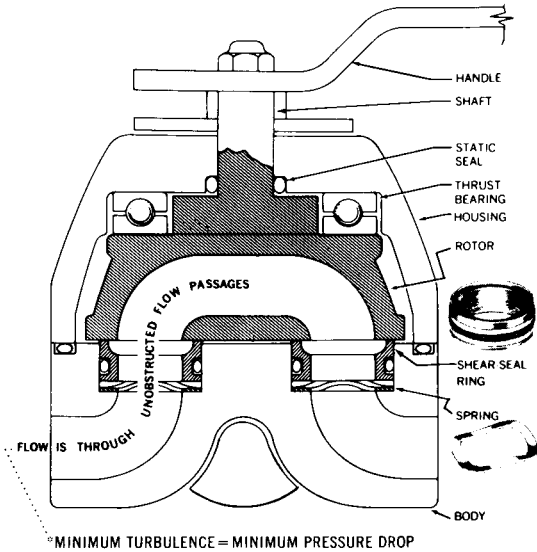
A DIFFERENT BREED OF CAT



Even what we have come to call our standard models might be regarded as specials, since Shear-Seal valves are a different breed of cat. Standard in the usual sense of the word means spool, poppet, ball or plug type valves, each with its own areas of application, strengths and weaknesses, advantages and disadvantages.

The Shear-Seal Principle is different from all standard valve designs and as such offers many capabilities which are special or non-standard in relation to the other types. Used to advantage, these capabilities result in money savings and operational benefits, which is why the term 'Shear-Seal' valve has become synonymous with "Good Idea" valve.

Some Shear-Seal valve models are in frequent demand and, for this reason, are cataloged as standard valves; minor departures from the norm are listed on each standard valve page as "special modifications". Others are "special purpose" — designed for specific customer applica-



tions. Either way, there are certain features and/or benefits offered, which, if properly understood, lead the designer to better problem solving solutions. Although many good application ideas for Shear-Seal benefits have come out of the fluid power field, alert engineers from other fields involved in fluid handling are fast catching up, a point well illustrated by the far ranging examples on the following page. A better understanding of this different breed of cat, the 'Shear-Seal' valve, will give new scope to your design imagination in just about any fluid handling situation.

COMPLETE CONTROL — WITH FEELING . . .

The gradual overlapping of round flow passages, smooth shearing action of the shear-seals and rotary travel of the handle give the operator a "feel" of the action:

★ Fluid Motor Control is precise (forward or reverse) through the complete speed range.

★ Cylinder or Ram position and/or speed is more accurately controlled.

NO LEAKAGE vs LOW LEAKAGE — THE TRUTH OF THE MATTER . . .

There is always a question of how to express leakage. When new, many valves leak up to 1% of their flow rates, while others, with soft seats, have zero leakage.

All Barksdale products are 100% tested before shipment and most hydraulic 'Shear-Seal' valves which pass inspection will show zero leakage during a 10 minute test period.

However, the amount a valve leaks when it leaves the factory is only part of the story . . . probably a small part. **The important factor is how it performs under conditions of use.** Shear-Seal Valves resist damage by dirt and foreign material in the system because flow is through Shear-Seal rings rather than across the sealing surface. High pressure is confined to flow passages, so external leakage is eliminated. Springs compensate for wear on the shear-seals, and this, coupled with a strong tendency for the rotor and Shear-Seals to continue to lap in with use, makes it possible for the valve to "heal" small scratches in the sealing surfaces.

These are the reasons why, in most applications, the Shear-Seal valve **leaks less and lasts longer** than other types . . . it is inherent in the design.

This is why Shear-Seal Valves are used to block critical cylinders such as outriggers on cranes . . . to avoid draining down accumulators . . . overheating hydraulic systems . . . unnecessary pump or compressor operation . . . pilot operated check valves . . . fire and safety hazards due to external leakage and all the other associated problems. Unless conditions are very favorable, it is next to impossible to predetermine the leakage rate of any valve in long term use — regardless of manufacturers test claims. Experience is the best test.

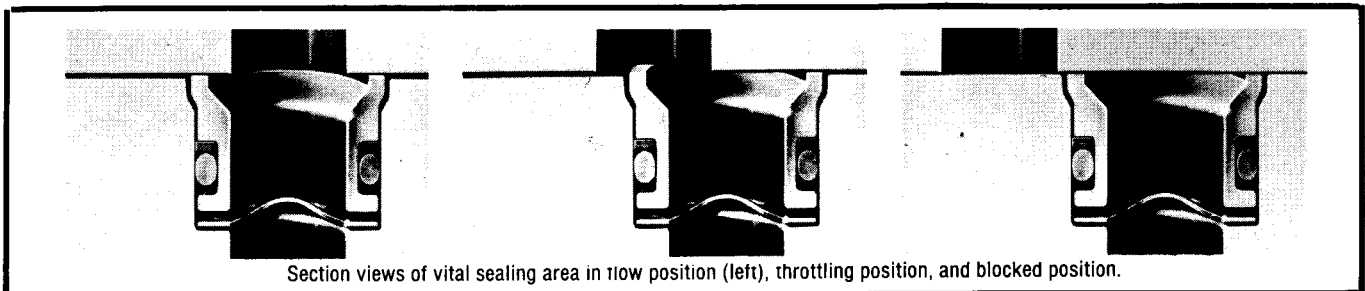
FIVE AIDS TO SAVINGS — MONEY AND SPACE . . .

- SIZE
- HIGH PRESSURE CAPABILITY
- HIGH FLOW CAPABILITY
- LOW PRESSURE DROP
- CUSTOM DESIGNS

One or more of these can provide money and/or space savings, both of which are important to designers. Pressures or Vacuum to 10,000 psi and flow rates to 171 GPM. Velocity tolerance to 60 fps. Standard Pressure drop of 14 psi at 20 fps, 58 psi at 40 fps and 100 at 60 fps are exceptional. A 3,000 psi 10 GPM Valve weighs 1½ pounds and is 2½" x 5½" overall. A 3,000 psi 28 GPM Valve weighs 3 pounds and is 3½" x 6½".

MULTI-DIRECTIONAL FLOW PATTERN — REAL FLEXIBILITY . . .

is probably the one single feature (usually coupled with one or more of



Section views of vital sealing area in flow position (left), throttling position, and blocked position.

the others) that separates the Shear-Seal from other valves, and allows designers to accomplish a function, for a lower cost, in a smaller space. This flexibility is inherent in the design to an extent which no other design offers. And Barksdale has made a business of supplying this type of flexibility.

PRICE vs PERFORMANCE — SHEAR-SEAL SAVES IN THE LONG RUN . . .

Shear-Seal valves are not noted for low price, yet every day designers specify them, and buyers buy them because, in the long haul, they RESULT in the lowest price. It may be the panel mounting feature which may save \$10.00-\$20.00 of manufacturing costs. It may be that a Pilot Operated Check Valve is saved, or that only a small space is available to mount the valve. It may be one or many of the capabilities that finally

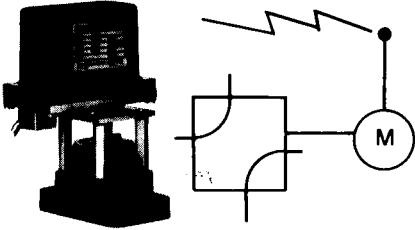
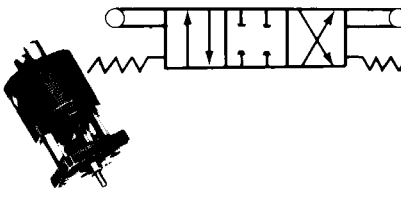
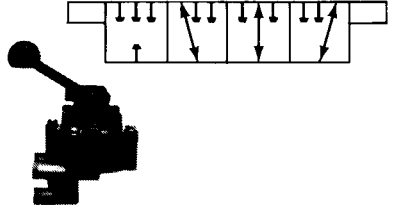
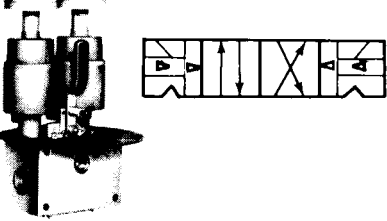
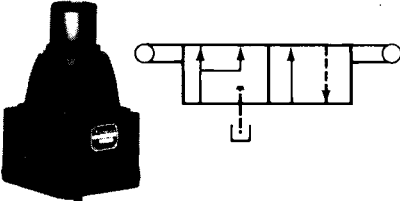
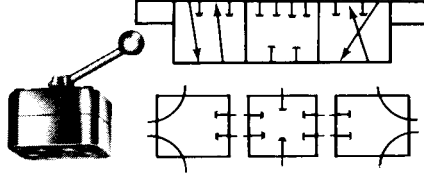
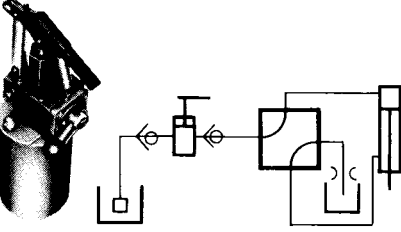
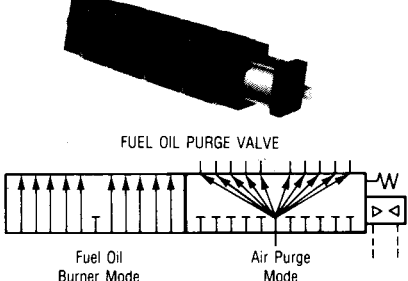
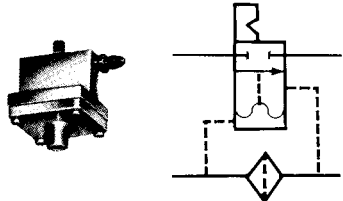

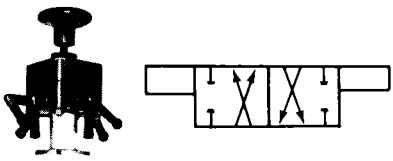
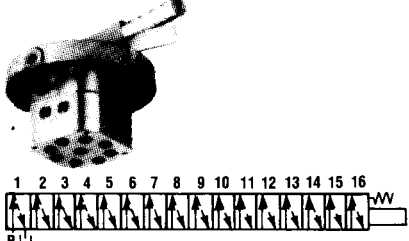
result in a lower cost, compared to alternative methods. It may be the Barksdale Sales Policy, which allows a combination of all Barksdale products to obtain the best price thru maximum discounts. It may be that the Shear-Seal valve is the only apparent way to do the job, or it improves the performance of the equipment.

BARKSDALE IS COOPERATIVE — YOU GET MORE THAN A PRODUCT . . .

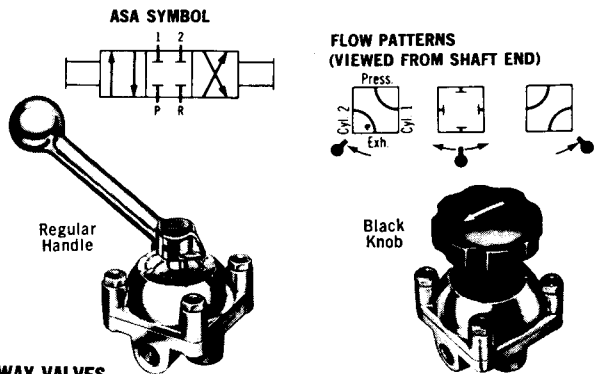
Our attitude is a major benefit.

We want to help people work out their problems with something specific to do their job. We are not hung up on standards because we don't really have any. If one of our more repetitive specials will do the job, it probably will **cost less to buy than a standard!** We are not dedicated to selling arbitrary catalog standards. We will listen. We will design and manufacture valves to meet **YOUR** requirements.

The unusual valves on this page represent a small selection of adaptations of the basic Shear-Seal design to meet specific customer requirements. If quantity warrants, we will be pleased to develop a Shear-Seal unit to help make your design ideas good ideas.

 <p>A 2-position 4-way motor operated 'Shear-Seal®' valve - motor, remotely controlled by means of a radio signal.</p>	 <p>A "Standard" 4-way closed center 'Shear-Seal®' valve was adapted to meet the precise dimensional tolerances and exacting military specs needed for this artillery loading mechanism application.</p>	 <p>Used for either mixing or sampling, this 4-position selector valve is constructed of 20% glass filled poly-propylene.</p>
 <p>A dual solenoid Poppet valve for air service at 1500 psi rated pressure. Unit has air pilot or manual override capability.</p>	 <p>10 millisecond response to operate a hydraulic circuit breaker was the requirement for this custom designed manifold mounted 'Shear-Seal®' valve, which works on 4,500 psi system pressure with 140 GPM flow.</p>	 <p>This 6-way configuration directs hot liquid through a pipe in one valve position, cold liquid in the other.</p>
 <p>Four-in-one package embodies a 'Shear-Seal®' control valve, pump, reservoir and pressure compensated flow control.</p>	 <p>FUEL OIL PURGE VALVE</p> <p>Fuel Oil Burner Mode Air Purge Mode</p>	 <p>This special dump valve can be reset manually - senses differential pressure across a filter. When Delta P becomes too high, valve trips and remains open until manually reset.</p>
 <p>This 6-way 'Shear-Seal®' unit was entirely custom designed . . . Incorporates a double acting pump discharging 11.5 cubic inches @ 200 psi (low side) and 4.5 cubic inches @ 1,100 psi (high side). Valve working pressure is 2,000 psi.</p>	 <p>Constructed of all PVC, this 6-way 'Shear-Seal®' design gives trouble-free service circulating water in one mode, nitric acid in the cell regeneration mode.</p>	 <p>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16</p> <p>All Stainless 16-way Selector valve featuring Deadman Control, Pressure Activated Position Latch & Unidirectional Rotation.</p>

MANUAL 4-WAY VALVES • AIR and OIL (150, 250 and 350 psi)



4-WAY VALVES

Min. Flow Passage Dia.	Cv Factor	PORT SIZE npt	Approx. Shipping Weight lbs.	AIR and OIL		MANUAL ALL POSITIONS	SPRING RETURN TO CENTER
				Rated Pressure psi	Valve Number Closed Center	Rated Pressure psi	Valve Number Closed Center
3/8	.52	1/4	2	150	9001-M	150	9001-MC
3/8	.52	3/8	2	150	9002-M	150	9002-MC
3/8	2.30	1/4	2	350	9021-M	250	9021-MC
3/8	2.30	3/8	2	350	9022-M	250	9022-MC
3/8	2.30	1/2	2	350	9023-M	250	9023-MC

*NOTE: All 9001 + 9002 Series Valves are NON-INTERFLOW.

STANDARD VALVES — Consult your local Barksdale representative for prices and delivery.

OPERATING DATA — 4-WAY and MANIPULATOR

Fluid temperature range from -40° to +250°F.
 Standard 'O' ring compound is Buna N.
 Three position detent is provided.
 Handle rotates 90°; 45° to each side of the center detent.
 Proof pressure (without damage to the valve) is 1½ times rated pressure.

SPECIAL MODIFICATIONS

Available where quantity warrants. Consult factory for prices and delivery.

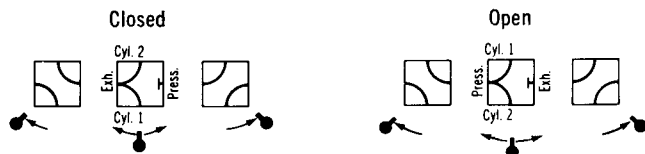
- 2-position detent disc, 90° (4-way models only).
- Special 'O' rings (all sizes listed this page)
- Spring return to reverse
- Open center manipulator

ORDERING INSTRUCTIONS — OPTIONAL ITEMS

BLACK KNOB: (not available with spring return). To order, add suffix -E to valve number. Example: 9001-M-E.

MANIPULATOR VALVES • AIR and OIL (150, 250 psi)

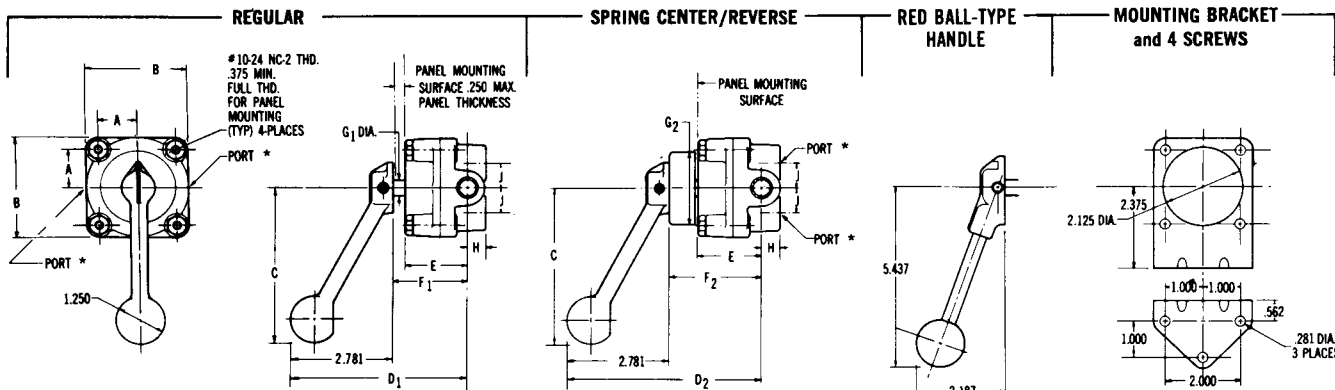
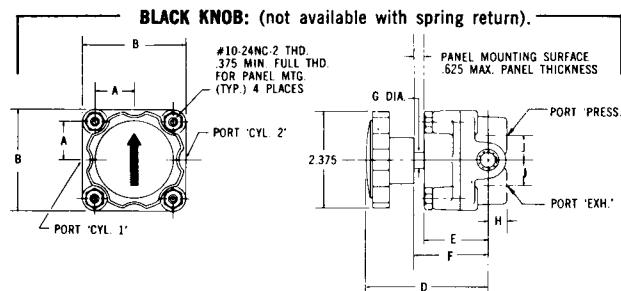
FLOW PATTERNS (VIEWED FROM SHAFT END)



MANIPULATOR VALVES

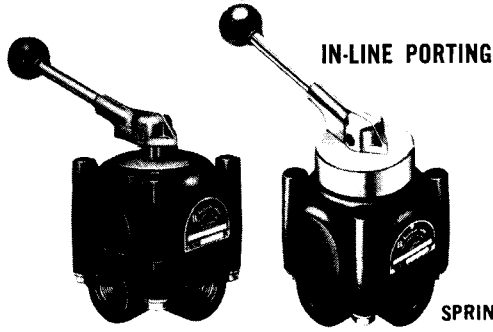
Min. Flow Passage Dia.	Cv Factor	PORT SIZE npt	Approx. Shipping Weight lbs.	AIR and OIL		MANUAL ALL POSITIONS	SPRING RETURN TO CENTER
				Rated Pressure psi	Valve Number Closed Center	Rated Pressure psi	Valve Number Closed Center
3/8	.52	1/4	2	150	9001-M-A	150	9001-MC-A
3/8	.52	3/8	2	150	9002-M-A	150	9002-MC-A
3/8	2.30	1/4	2	250	9021-M-A	250	9021-MC-A
3/8	2.30	3/8	2	250	9022-M-A	250	9022-MC-A
3/8	2.30	1/2	2	250	9023-M-A	250	9023-MC-A

RED BALL-TYPE HANDLE: (available all models). To order, add suffix -D to valve number. Example: 9001-M-D.
MOUNTING BRACKET and 4 SCREWS: To order, add suffix -C to valve number. Example: 9001-M-C.
RED BALL-TYPE HANDLE and MOUNTING BRACKET: To order, add suffix -CD to valve number. Example: 9001-M-CD.

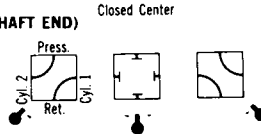


DIMENSIONS

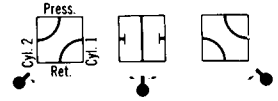
PORT SIZE npt	A	B	C	Black Knob D	Regular D-1	Spring Center & Reverse D-2	E	Black Knob F	Regular F-1	Spring Center & Reverse F-2	Black Knob G Regular G-1	Spring Center & Reverse G-2	H	J
1/4 & 3/8	1.000	2.625	4.125	3.656	4.781	5.188	1.688	2.062	2.000	2.406	.437	1.906	.531	.656
1/2	1.000	3.125	4.125	3.718	4.843	5.250	1.750	2.125	2.062	2.468	.437	1.906	.625	.937



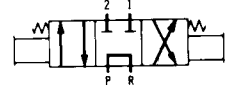
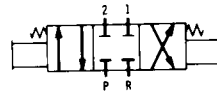
FLOW PATTERNS
(VIEWED FROM SHAFT END)



Open Center



ASA SYMBOL



9040 SERIES

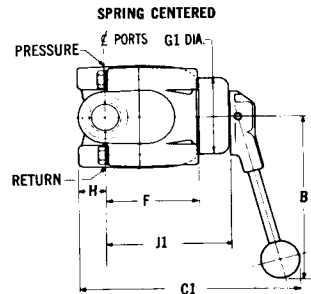
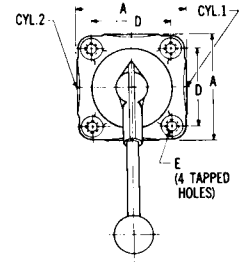
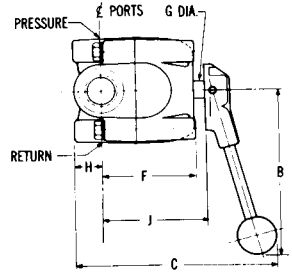
FLOW CAPACITY (Approx.)			Min. Flow Pass. Dia.	Cv Factor	PORT SIZE npt	Shipp. Weight lbs.	500 psi OIL and AIR	
OIL							Valve Numbers	
20 ft/sec gpm	40 ft/sec gpm	60 ft/sec gpm					Closed Center	Open Center
14	28	Use 140 Series Valves	1/32	4.80	1/2	3	9043R0AC3	9043R0AO3
14	28		1/32	4.80	3/4	3	9044R0AC3	9044R0AO3
25	51		23/32	9.20	1	10 1/2	9045R0AC3	9045R0AO3
62	124		1 1/8	24.00	1 1/2	20	9047R0AC3	9047R0AO3

8140 SERIES

							2000 psi OIL	
5	10	Use 140 Series Valves	5/16	1.56	1/4	1 1/2	8141R1HC3	8141R1H03
5	10		5/16	1.56	3/8	1 1/2	8142R1HC3	8142R1H03
14	28		1 1/32	4.80	1/2	3	8143R1HC3	8143R1H03
14	28		1 1/32	4.80	3/4	3	8144R1HC3	8144R1H03
25	51		23/32	9.20	1	10 1/2	8145R1HC3	8145R1H03
62	124		1 1/8	24.00	1 1/2	20	8147R1HC3	8147R1H03

6140 SERIES

							3000 psi OIL	
5	10	Use 140 Series Valves	5/16	1.56	1/4	1 1/2	6141R3HC3	6141R3H03
5	10		5/16	1.56	3/8	1 1/2	6142R3HC3	6142R3H03
14	28		1 1/32	4.80	1/2	3	6143R3HC3	6143R3H03
14	28		1 1/32	4.80	3/4	3	6144R3HC3	6144R3H03
25	51		23/32	9.20	1	10 1/2	6145R3HC3	6145R3H03
62	124		1 1/8	24.00	1 1/2	20	6147R3HC3	6147R3H03



STANDARD VALVES — Consult your local Barksdale representative for prices and delivery.
 SPRING CENTERED MODELS: To order, add suffix -MC to valve number. Example: 8141R1HC3-MC. (Maximum size for spring centered version is 1").

OPERATING DATA

Working Pressure: See tabulations.
Back Pressure: At return port should not exceed 250 psi for satisfactory operation.
Proof Pressure: 1 1/2 times working press. except when applied to return port.
Burst Pressure: 2 1/2 times working press. except when applied to return port.
 Return port burst ratings: 3000 psi — 1/4 thru 3/4 port sizes.
 2000 psi — 1 port size.
 1500 psi — 1 1/2 port size.

Pressure Drop: All valves 14 psi at 20 ft/sec., 58 psi at 40 ft/sec. velocity (approx.).

Fluid Temperature Range: From -40°F to +250°F.

Standard 'O' Ring Material: Buna N.

Detents: Three-position detents are provided.

Handle Rotation: 90° — 45° to each side of center detent.

SPECIAL MODIFICATIONS

Available where quantity warrants. Consult factory for prices and delivery.

Other than listed port sizes: 1 1/4.

AND (10050) porting.

MS (16142) porting.

2-position detent disc, 90°.

2-position detent disc, 45°. Specify which 45° position is required; ie: pressure to cyl. 1 or pressure to cyl. 2.

Special 'O' rings.

ALL SIZES LISTED THIS PAGE

Air actuators: 1/2, 3/4, 1, 1 1/2 sizes, 8140 and 6140 models only.

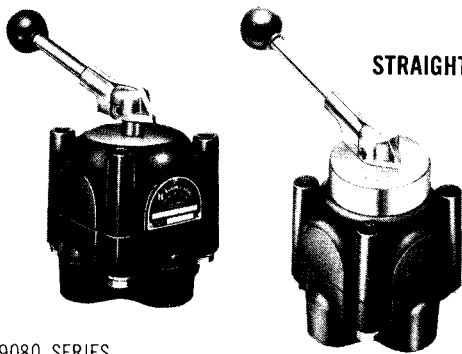
Non-interflow: 1/4 and 3/8 sizes.

Manifold porting: 3/8 and 3/4.

Air service to 1500 psi.

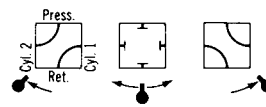
DIMENSIONS

PORT SIZE npt	A	B	C	C-1	D	E	F	G	G-1	H	J	J-1
1/4 & 3/8	2.625	5.438	5.406	5.781	1.812	5/16 — 18 NC	2.312	.437	1.906	.562	2.656	3.032
1/2 & 3/4	3.500	5.438	6.438	7.000	2.562	3/8 — 16 NC	3.031	.562	2.562	.875	3.375	3.937
1	4.500	8.438	8.156		3.312	1/2 — 13 NC	3.594	.750		1.062	3.938	
1 1/2	6.375	10.344	9.656		4.750	3/4 — 10 NC		.875		1.375	5.031	

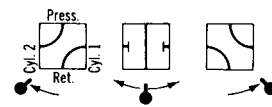


STRAIGHT PORTING

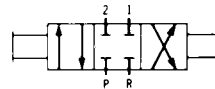
FLOW PATTERNS (VIEWED FROM SHAFT END)



Open Center



ASA SYMBOL

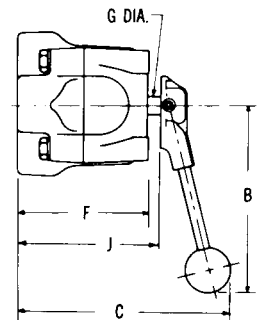
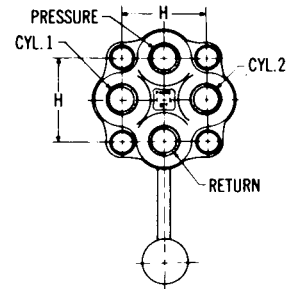


SPRING CENTERED



9080 SERIES

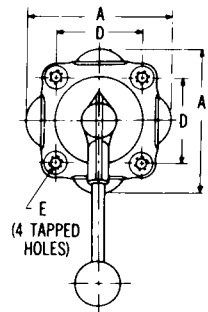
FLOW CAPACITY (Approx.)			Min. Flow Pass. Dia.	Cv Factor	PORT SIZE npt	Shipp. Weight lbs.	500 psi OIL and AIR	
OIL							Valve Numbers	
20 ft/sec gpm	40 ft/sec gpm	60 ft/sec gpm					Closed Center	Open Center
14	28	Use 140 Series Valves	1/32	4.80	1/2	3	9083SOAC3	9083SOA03
14	28		1/32	4.80	3/4	3	9084SOAC3	9084SOA03
8180 SERIES							2000 psi OIL	
5	10	Use 140 Series Valves	5/16	1.56	1/4	1 1/2	8181S1HC3	8181S1H03
5	10		5/16	1.56	3/8	1 1/2	8182S1HC3	8182S1H03
14	28		1/32	4.80	1/2	3	8183S1HC3	8183S1H03
14	28		1/32	4.80	3/4	3	8184S1HC3	8184S1H03
6180 SERIES							3000 psi OIL	
5	10	Use 140 Series Valves	5/16	1.56	1/4	1 1/2	6181S3HC3	6181S3H03
5	10		5/16	1.56	3/8	1 1/2	6182S3HC3	6182S3H03
14	28		1/32	4.80	1/2	3	6183S3HC3	6183S3H03
14	28		1/32	4.80	3/4	3	6184S3HC3	6184S3H03



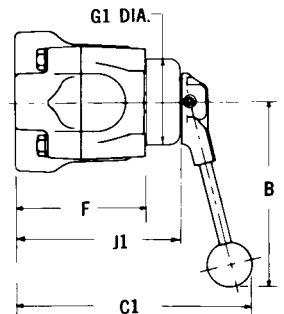
STANDARD VALVES — Consult your local Barksdale representative for prices and delivery.
SPRING CENTERED MODELS. To order, add -MC to Valve Number. Example: 9083SOAC3-MC.

OPERATING DATA

- Working Pressure:** See tabulations.
- Back Pressure:** At return port should not exceed 250 psi for satisfactory operation.
- Proof Pressure:** 1 1/2 times working pressure except when applied to return port.
- Burst Pressure:** 2 1/2 times working pressure except when applied to return port.
- Return port burst rating: 3000 psi.
- Pressure Drop:** All valves 14 psi at 20 ft./sec., 58 psi at 40 ft./sec. velocity (approx.).
- Fluid Temperature Range:** From -40°F to +250°F.
- Standard 'O' Ring Material:** Buna N.
- Detents:** Three-position detents provided.
- Handle Rotation:** 90° — 45° to each side of center detent.



SPRING CENTERED



SPECIAL MODIFICATIONS

Available where quantity warrants. Consult factory for prices and delivery.

- AND (10050) porting.
- MS (16142) porting.
- 2-position detent disc, 90°.
- 2-position detent disc, 45°. Specify which 45° position is required; ie: Pressure to cyl. 1 or pressure to cyl. 2.
- Special 'O' rings.

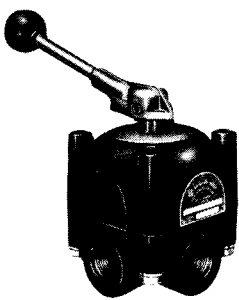
ALL SIZES LISTED THIS PAGE

Air actuators: 1/2 and 3/4 sizes, 8140 and 6140 models only.
 Non-interflow: 1/4 and 3/8 sizes.
 Air service to 1500 psi.

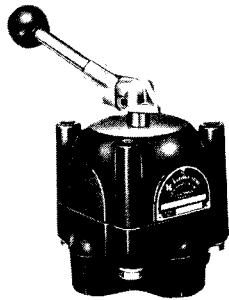
DIMENSIONS

PORT SIZE npt	A	B	C	C-1	D	E	F	G	G-1	H	J	J-1
1/4 & 3/8	2.625	5.438	5.187	5.562	1.812	5/16 - 18 NC	2.656	.437	1.906	1.500	3.000	3.375
1/2 & 3/4	4.187	5.438	6.406	6.968	2.562	3/8 - 16 NC	3.875	.562	2.562	2.500	4.219	4.781

MANIPULATOR VALVES (O.E.M. LINE) • OIL (3000 PSI) • SPRING CENTERED MODELS OPTIONAL



IN-LINE PORTING

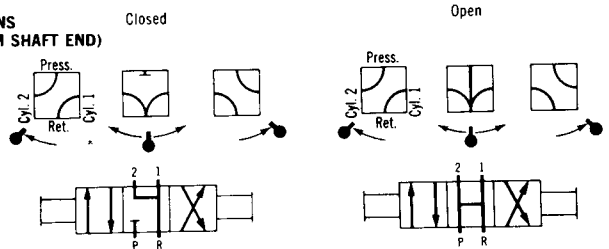


STRAIGHT PORTING

FLOW PATTERNS (VIEWED FROM SHAFT END)

All others

ASA SYMBOL



6900 SERIES (IN-LINE PORTING)						OIL	
FLOW CAPACITY (Approx.)						3000 psi	
OIL			Min. Flow Pass. Dia.	PORT SIZE npt	Approx. Shipping Weight lbs	Valve Numbers	
20 ft/sec gpm	40 ft/sec gpm	60 ft/sec gpm				Closed	Open
5	10	use 921,	5/16	1/4	1 1/2	6901R3HC3	6901R3HO3
5	10	703	5/16	3/8	1 1/2	6902R3HC3	6902R3HO3
14	28	or	17/32	1/2	3	6903R3HC3	6903R3HO3
14	28	705 Valves	17/32	3/4	3	6904R3HC3	6904R3HO3

6940 SERIES (STRAIGHT PORTING)						OIL	
FLOW CAPACITY (Approx.)						3000 psi	
OIL			Min. Flow Pass. Dia.	PORT SIZE npt	Approx. Shipping Weight lbs	Valve Numbers	
20 ft/sec gpm	40 ft/sec gpm	60 ft/sec gpm				Closed	Open
5	10		5/16	1/4	1 1/2	6941S3HC3	6941S3HO3
5	10		5/16	3/8	1 1/2	6942S3HC3	6942S3HO3
14	28		17/32	1/2	3	6943S3HC3	6943S3HO3
14	28		17/32	3/4	3	6944S3HC3	6944S3HO3

STANDARD VALVES — Consult your local Barksdale representative for prices and delivery.
 SPRING CENTERED MODELS: To order, add MC to valve number. Example: 6901R3HC3-MC.

DIMENSIONS In-Line Porting

PORT SIZE npt	A	B	C-1 Regular	C-2 Spring Centering	D	E	F	G-1 Regular	G-2 Spring Centering	H	J-1 Regular	J-2 Spring Centering
1/4 & 3/8	2.625	5.438	5.407	5.781	1.812	5/16 - 18 NC	2.312	.437	1.906	562	2.656	3.031
1/2 & 3/4	3.500	5.438	6.438	7.000	2.562	3/8 - 16 NC	3.031	.562	2.562	875	3.375	3.938

OPERATING DATA

Working Pressure: See tabulations.
Back Pressure: At return port should not exceed 250 psi for satisfactory operation.
Proof Pressure: 1 1/2 times working press. except when applied to return port.
Burst Pressure: 2 1/2 times working press. except when applied to return port.
 Return port burst rating: 3000 psi.
Pressure Drop: All valves 14 psi at 20 ft/sec., 58 psi at 40 ft/sec. velocity (approx.).
Fluid Temperature Range: From -40°F to +250°F.
Standard 'O' Ring Material: Buna N.
Detents: Three-position detents are provided.
Handle Rotation: 90° — 45° to each side of center detent.

SPECIAL MODIFICATIONS

Available where quantity warrants. Consult factory for prices and delivery.

Other than listed port sizes:
 In-line porting: 1, 1 1/4, 1 1/2.
 Manifold porting: 3/8, 3/4.

AND (10050) porting (in-line & straight).
 MS (16142) porting (in-line & straight).

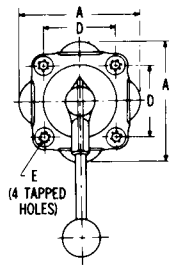
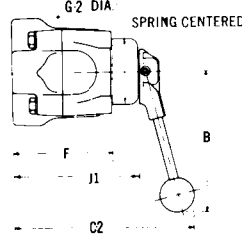
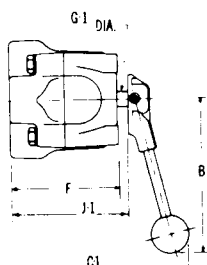
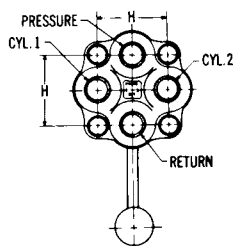
2-position detent disc, 90°.
 2-position detent disc, 45°. Specify which 45° position is required; ie: pressure to cyl. 1 or pressure to cyl. 2.
 Special 'O' rings.

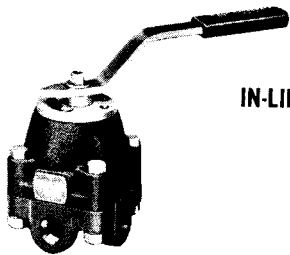
Air actuators: 1/2 and 3/4.
 Air service to 1500 psi.

ALL SIZES LISTED THIS PAGE

DIMENSIONS Straight Porting

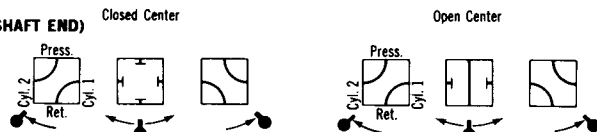
PORT SIZE npt	A	B	C-1 Regular	C-2 Spring Centering	D	E	F	G-1 Regular	G-2 Spring Centering	H	J-1 Regular	J-2 Spring Centering
1/4 & 3/8	2.625	5.438	5.187	5.562	1.812	5/16 - 18 NC	2.656	.437	1.906	1.500	3.000	3.375
1/2 & 3/4	4.187	5.438	6.406	6.968	2.562	3/8 - 16 NC	3.875	.562	2.562	2.500	4.219	4.781





IN-LINE PORTING

FLOW PATTERNS (VIEWED FROM SHAFT END)



ASA SYMBOL



140 SERIES

FLOW CAPACITY (Approx.)			Min. Flow Pass. Dia.	Cv Factor	PORT SIZE npt	Approx. Shipp. Weight lbs.	OIL AND WATER		AIR	
OIL							3000 P.S.I.	2000 P.S.I.		
20 ft/sec gpm	40 ft/sec gpm	60 ft/sec gpm	Valve Numbers		Valve Numbers		Closed Center	Open Center	Closed Center	Open Center
3	6	9	1/4	.95	1/4	4 1/2	141R3WC3	141R3W03	141R3AC3	141R3A03
9	19	28	3/16	3.20	3/8	8 1/2	142R3WC3	142R3W03	142R3AC3	142R3A03
9	19	28	3/16	3.20	1/2	8 1/2	143R3WC3	143R3W03	143R3AC3	143R3A03
25	50	75	23/32	9.20	3/4	21 1/2	144R3WC3	144R3W03	144R3AC3	144R3A03
25	50	75	23/32	9.20	1	21 1/2	145R3WC3	145R3W03	145R3AC3	145R3A03
57	114	171	1 3/32	21.00	1 1/2	48 1/2	147R3WC3	147R3W03	147R3AC3	147R3A03

STANDARD VALVES — Consult your local Barksdale representative for prices and delivery.
 SPRING CENTERED MODELS: To order, add -MC to valve number. Example: 141R3WC3-MC** †.

OPERATING DATA

Working Pressure: See tabulations.

△ Back Pressure: At return port should not exceed 250 psi for satisfactory operation.

Proof Pressure: 1 1/2 times working press. except when applied to return port.

Burst Pressure: 2 1/2 times working press. except when applied to return port.

Return port burst ratings: 3000 psi.

Pressure Drop: All valves 14 psi at 20 ft/sec., 58 psi at 40 ft/sec., and 130 psi at 60 ft/sec. velocity (approx.).

Fluid Temperature Range: From -40°F to +250°F.

Standard 'O' Ring Material: Buna N.

Detents: Three-position detents provided.

Handle Rotation: 90°-45° to each side of center detent.

△ For full rated pressure at return port, specify valve with 4 Shear-Seals and 'case drain'.

SPECIAL MODIFICATIONS

Available where quantity warrants. Consult factory for prices and delivery.

Other than listed port sizes:

AND (10050) porting:

MS (16142) porting:

Manifold porting:

Straight porting:

2-position detent disc, 90°:

2-position detent disc, 45°:

Specify which 45° position is required; ie: pressure to cyl. 1 or pressure to cyl. 2.

Special 'O' Rings:

N.I.F.:

△△ 4-Shear-Seals and 'case drain':

Panel mounting (replace "R" with "P" in valve No.

Example: 141P3HC3).

Air actuators:

Manipulator flow pattern:

(Closed Center)

(Open Center)

△△ Back Pressure: At 'case drain' port should not exceed 250 psi for satisfactory operation.

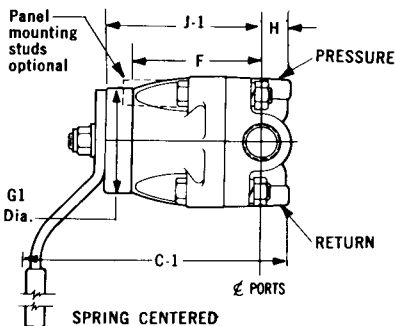
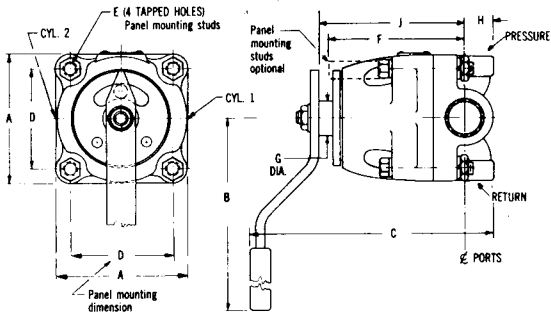
Proof Pressure: 1 1/2 times working pressure except when applied to case drain port.

Burst Pressure: 2 1/2 times working pressure except when applied to case drain port.

Case drain port burst rating: 3000 psi.

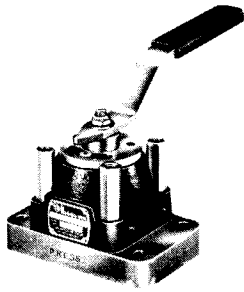
**Max. pressure for spring return: 1500 psi, 3/4 and 1" sizes.

†Max. pressure for spring return: 1000 psi, 1/4 and 1/2" sizes.

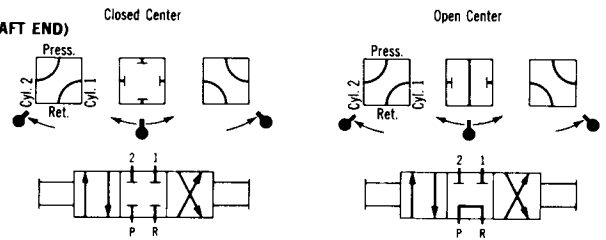


DIMENSIONS

Port Size npt	A	B	C	C-1	D	E	F	G Dia.	G-1 Dia.	H	J	J-1
1/4	2.625	5.000	4.688	4.688	1.875	3/8 - 16 NC	2.625	.688	1.937	.563	2.938	2.938
3/8 & 1/2	3.250	7.000	6.500	6.500	2.375	3/8 - 16 NC	3.500	1.063	2.625	.688	3.938	3.938
3/4 & 1	4.625	10.000	8.656	9.875	3.625	1/2 - 13 NC	4.813	1.250	3.562	1.000	5.156	6.375
1 1/2	6.750	12.000	10.500	11.75	5.313	3/4 - 10 NC	6.188	1.250	3.562	1.500	6.500	7.750



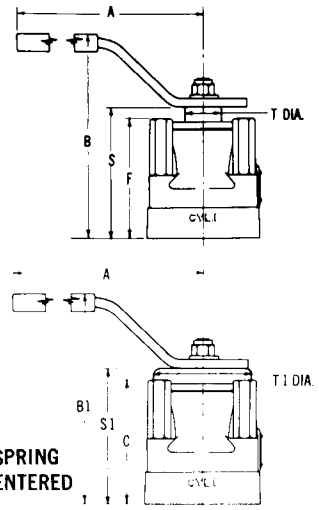
FLOW PATTERNS (VIEWED FROM SHAFT END)



ASA SYMBOL

3760 SERIES

FLOW CAPACITY			Min. Flow Pass. Dia.	C _v Factor	VALVE SIZE	Approx. Shippg. Weight lbs	OIL AND WATER		SUBPLATE to be used	
OIL & WATER							Valve Numbers			
20 ft/ sec gpm	40 ft/ sec gpm	60 ft/ sec gpm				3-Position		npt	Socket Weld	
						Closed Center	Open Center			
9	19	28	7/16	3.2	3/8 & 1/2	10 1/2	3763M3WC3	3763M3W03	C34013	C34011
25	50	75	23/32	9.2	3/4 & 1	24	3765M3WC3	3765M3W03	C34015	C34012
57	114	171	1 3/32	21.0	1 1/4 & 1 1/2	53	3767M3WC3	3767M3W03	C34016 or C34018	C34014 or C34017
							4500 psi			
							3-Position			
9	19	28	7/16	3.2	3/8 & 1/2	10 1/2	3763M3WC3-H	3763M3W03-H	C34013	C34011
25	50	75	23/32	9.2	3/4 & 1	24	3765M3WC3-H	3765M3W03-H	C34015	C34012
57	114	171	1 3/32	21.0	1 1/4 & 1 1/2	53	3767M3WC3-H	3767M3W03-H	C34016 or C34018	C34014 or C34017



SPRING CENTERED

STANDARD VALVES — Consult your local Barksdale representative for prices and delivery.
 SPRING CENTERED MODELS: To order, add -MC to valve number. Example: 3763M3WC3-MC. * † †
 (Available only on 3000 psi series valve)

OPERATING DATA

- Working Pressure: See tabulations.
- Back Pressure: At return port should not exceed 250 psi for satisfactory operation.
- Proof Pressure: 1 1/2 times working pressure except when applied to return port.
- Burst Pressure: 2 1/2 times working pressure except when applied to return port.
- Return port burst rating: 3000 psi.
- Pressure Drop: All valves 14 psi at 20 ft/sec., 58 psi at 40 ft/sec. and 130 psi at 60 ft/sec. velocity (approx.).
- Fluid Temperature Range: From -40° to +250°F.
- Standard 'O' Ring Material: Buna N.
- Detents: Provided in all positions except on spring centered models which are not detented.
- Handle Rotation: 90°-45° to each side of center.

Δ For full rated pressure at return port, specify valve with 4 Shear-Seals and 'case drain'.

SPECIAL MODIFICATIONS

Available where quantity warrants. Consult factory for prices and delivery.

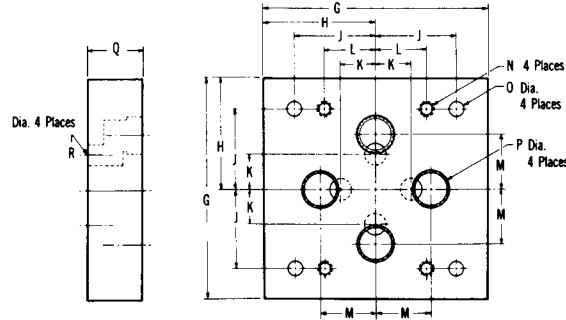
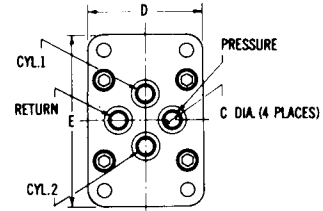
- 2-position detent disc, 90°. For 2-position rotation add: -K to corresponding valve number.
- 2-position detent disc, 45°. Specify which 45° position is required; ie: pressure to cyl. 1 or pressure to cyl. 2.

Manipulator flow pattern:

For the following valve sizes						
(Closed Center)	3/8	1/2	3/4	1	1 1/4	1 1/2
(Open Center)	3/8	1/2	3/4	1		
Special 'O' rings:	3/8	1/2	3/4	1	1 1/4	1 1/2
N.I.F.:	3/8	1/2	3/4	1		
Δ Δ 4 Shear-Seals and 'case drain':	3/8	1/2	3/4	1	1 1/4	1 1/2
Air actuators:	3/8	1/2	3/4	1	1 1/4	1 1/2

- Δ Δ Back Pressure: At 'case drain' port should not exceed 250 psi for satisfactory operation.
- Proof Pressure: 1 1/2 times working pressure except when applied to 'case drain' port.
- Burst Pressure: 2 1/2 times working pressure except when applied to 'case drain' port.
- 'Case drain' port burst rating: 3000 psi.

**Max. pressure for spring return: 1500 psi, 3/8 and 1" sizes.
 †Max. pressure for spring return: 1000 psi, 1/4 and 1 1/2" sizes.



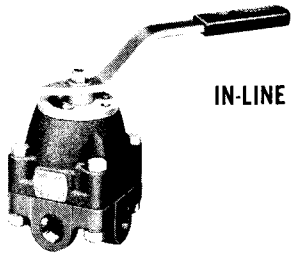
VALVE DIMENSIONS

Valve Size	A	B	B-1	C	D	E	F	S	S-1	T	T-1
3/8 & 1/2	7.000	5.812	5.812	.468	3.437	5.437	3.562	3.938	3.938	1.063	2.625
3/4 & 1	10.000*	7.625	8.812	.750	4.750	6.875	4.812	5.125	6.312	1.250	3.562
1 1/4 & 1 1/2	12.000	8.750	10.000	1.250	6.812	9.375	5.937	6.250	7.500	1.250	3.562

*3000 psi rated valves have 10 inch handle. 4500 psi rated valves have 12 inch handle. All other dimensions are identical for both.

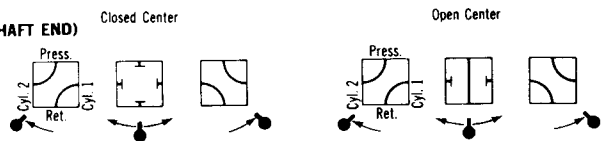
SUBPLATE DIMENSIONS (For special sub-plates or "sandwich" plates, consult factory)

Porting Pipe Size	Type of Fitting	Subplate Number	G	H	J	K	L	M	N	O	P	Q	R	Approx. Shippg. Weight lbs
1/2	npt	C34013	6.000	3.000	2.188	.781	1.188	1.406	3/8 N.C.	.406	1/2 npt	1.250	.468	11 3/4
	Socket Weld	C34011	6.000	3.000	2.188	.781	1.188	1.406	3/8 N.C.	.406	.855 C'Bore	1.250	.468	
1	npt	C34015	8.000	4.000	2.875	1.250	1.813	1.968	1/2 N.C.	.531	1 npt	2.000	.750	32 1/2
	Socket Weld	C34012	8.000	4.000	2.875	1.250	1.813	1.968	1/2 N.C.	.531	1.330 C'Bore	2.000	.750	
1 1/2	npt	C34016	10.00	5.000	4.000	1.937	2.688	2.688	5/8 N.C.	.531	1 1/2 npt	2.000	1.250	49
	Socket Weld	C34014	10.00	5.000	4.000	1.937	2.688	2.688	5/8 N.C.	.531	1.915 C'Bore	2.000	1.250	
2	npt	C34018	10.00	5.000	4.000	1.937	2.688	2.688	5/8 N.C.	.531	2 npt	2.000	1.250	49
	Socket Weld	C34017	10.00	5.000	4.000	1.937	2.688	2.688	5/8 N.C.	.531	2.406 C'Bore	2.000	1.250	



IN-LINE PORTING

FLOW PATTERNS (VIEWED FROM SHAFT END)



ASA SYMBOL



200 SERIES

FLOW CAPACITY (Approx.)			Min. Flow Pass. Dia.	Cv Factor	PORT SIZE npt	Approx. Shipp. Weight lbs.	OIL and WATER		AIR	
OIL							6000 P.S.I.		4000 P.S.I.	
20 ft/sec gpm	40 ft/sec gpm	60 ft/sec gpm					Valve Numbers		Valve Numbers	
							Closed Center	Open Center	Closed Center	Open Center
3	6	9	1/4	.95	1/4	4 1/2	201R6WC3	201R6W03	201R6AC3	201R6A03
5	10	14	3/16	1.56	1/2	8 1/2	203R6WC3	203R6W03	203R6AC3	203R6A03
9	19	28	1/8	3.20	1	21 1/2	205R6WC3	205R6W03	205R6AC3	205R6A03

STANDARD VALVES — Consult your local Barksdale representative for prices and delivery.
 SPRING CENTERED MODELS: To order, add .MC to valve number. Example: 201R6WC3-MC**†.

OPERATING DATA

Working Pressure: See tabulations.

Δ **Back Pressure:** At return port should not exceed 250 psi for satisfactory operation.

Proof Pressure: 1 1/2 times working press. except when applied to return port.

Burst Pressure: 2 1/2 times working press. except when applied to return port.

Return port burst ratings: 3000 psi.

Pressure Drop: All valves 14 psi at 20 ft/sec., 58 psi at 40 ft/sec., and 130 psi at 60 ft/sec. velocity (approx.).

Fluid Temperature Range: From -40°F to +250°F.

Standard 'O' Ring Material: Buna N.

Detents: Three-position detents provided.

Handle Rotation: 90°-45° to each side of center detent.

Δ For full rated pressure at 'return' port, specify valve with 4 Shear-Seals and case drain.

SPECIAL MODIFICATIONS

Available where quantity warrants. Consult factory for prices and delivery.

Other than listed port sizes:

AND (10050) porting:

MS (16142) porting:

Manifold porting:

Straight porting:

2-position detent disc, 90°:

2-position detent disc, 45°:

Specify which 45° position is required; ie: pressure to cyl.

1 or pressure to cyl. 2.

Special 'O' rings:

N.I.F.:

ΔΔ 4 Shear-Seals and 'case drain':

Panel mounting (replace "R"

with "P" in valve No.

Example: 201P6HC3).

Air actuators:

Manipulator flow pattern:

(Closed Center)

(Open Center)

For the following valve sizes

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

1/4 3/8 1/2 3/4 1 1 1/4 1 1/2

ΔΔ **Back Pressure:** At 'case drain' port should not exceed 250 psi for satisfactory operation.

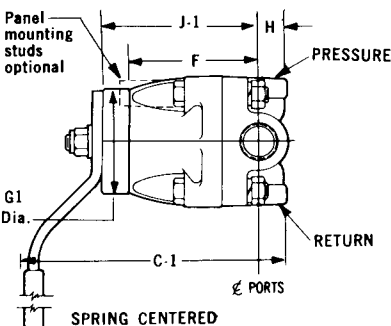
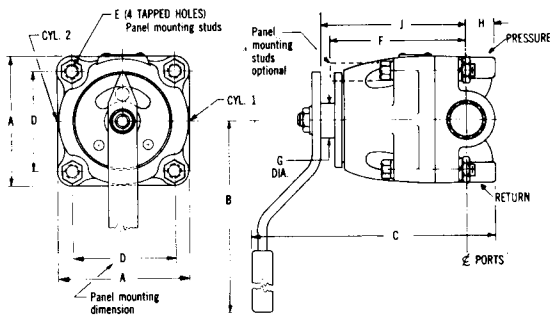
Proof Pressure: 1 1/2 times working pressure except when applied to 'case drain' port.

Burst Pressure: 2 1/2 times working pressure except when applied to 'case drain' port.

'Case drain' port burst rating: 3000 psi.

**Max. pressure for spring return: 3000 psi, 1/4, 1/2, 3/4 and 1" sizes.

†Max. pressure for spring return: 1500 psi, 1/4 and 1/2" sizes.



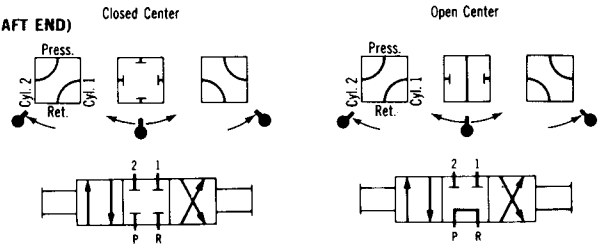
DIMENSIONS

Port Size npt	A	B	C	C-1	D	E	F	G Dia.	G-1 Dia.	H	J	J-1
1/4	2.625	5.000	4.688	4.688	1.875	3/8 - 16 NC	2.625	.688	1.937	.563	2.938	2.938
3/8 & 1/2	3.250	7.000	6.625	6.625	2.375	3/8 - 16 NC	3.438	1.063	2.615	.750	4.000	4.000
3/4 & 1	4.625	12.000	8.844	10.063	3.625	1/2 - 13 NC	1.250	1.250	3.562	1.188	5.156	6.375



IN-LINE PORTING

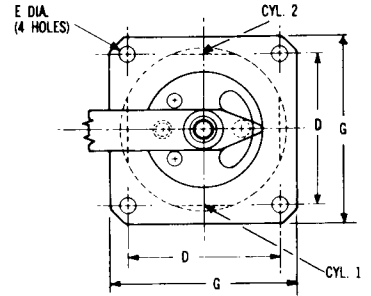
FLOW PATTERNS (VIEWED FROM SHAFT END)



4140 SERIES

FLOW CAPACITY			Min. Flow Pass. Dia.	Cv Factor	PORT SIZE npt	Shippg. Weight lbs	OIL, WATER & AIR	
OIL & WATER							Valve Numbers	
20 ft/sec gpm	40 ft/sec gpm	60 ft/sec gpm				Closed Center	Open Center	
4	8	12	3/32	1.25	1/4	13 1/2	4141R9AC3	4141R9AO3
4	8	12	3/32	1.25	1/2	13 1/2	4143R9AC3	4143R9AO3
9	19	28	3/16	3.20	1	29 1/2	4145R9AC3	4145R9AO3

STANDARD VALVES — Consult your local Barksdale representative for prices and delivery.



SPECIAL MODIFICATIONS

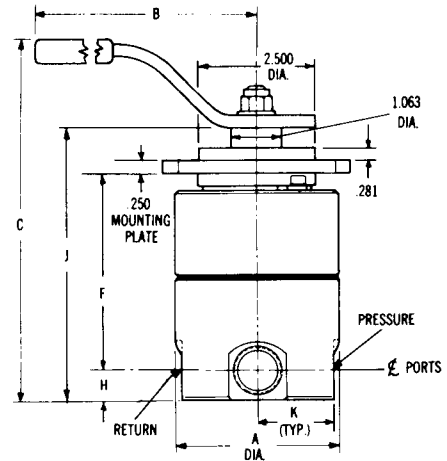
Available where quantity warrants. Consult factory for prices and delivery.

- Other than listed port sizes:
- AND (10050) porting:
- MS (16142) porting:
- AMINCO fitting:
- Spring centering:
- 2-position detent disc, 90°:
- 2-position detent disc, 45°. Specify which 45° position is required; ie: pressure to cyl. 1 or pressure to cyl. 2.
- Special 'O' Rings:
- 4 Shear-Seals and case drain:
- Air actuators:
- Manipulator flow pattern: (Open Center)
- (Closed Center)
- Solenoid Operators:

For the following valve sizes

	3/8	1/2	3/4	1
1/4	3/8	1/2	3/4	1
1/4	3/8	1/2	3/4	1
1/4	3/8	1/2	3/4	1
1/4	3/8	1/2	3/4	1
1/4	3/8	1/2	3/4	1
1/4	3/8	1/2	3/4	1
1/4	3/8	1/2	3/4	1
1/4	3/8	1/2	3/4	1
1/4	3/8	1/2	3/4	1

- Back Pressure: At case drain port should not exceed 250 psi for satisfactory operation.
- Proof Pressure: 1 1/2 times working pressure except when applied to case drain port.
- Burst Pressure: 2 1/2 times working pressure.



OPERATING DATA

- Working Pressure: See tabulations.
- Back Pressure: At return port should not exceed 250 psi for satisfactory operation.
- Proof Pressure: 1 1/2 times working pressure except when applied to return port.
- Burst Pressure: 2 1/2 times working pressure.
- Pressure Drop: All valves 14 psi at 20 ft/sec., 58 psi at 40 ft/sec., and 130 psi at 60 ft/sec. velocity (approx.).
- Fluid Temperature Range: From -40°F to +250°F.
- Standard 'O' Ring Material: Buna N.
- Detents: Three-position detents provided.
- Handle Rotation: 90°-45° to each side of center detent.
- For full rated pressure at return port, specify valve with 4 Shear-Seals and case drain.

DIMENSIONS

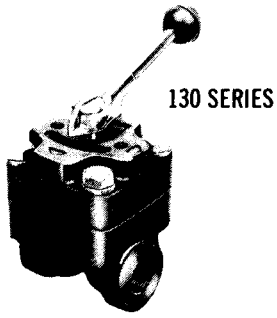
PORT SIZE npt	A Dia.	B	C	D	E Dia.	F	G	H	J	K
1/4	3.500	7.000	7.688	3.250	.281	4.219	4.000	.625	5.813	1.625
1/2	3.500	7.000	7.688	3.250	.281	4.219	4.000	.625	5.813	1.625
1	4.500	9.000	10.688	4.000	.344	5.844	5.000	1.000	8.813	2.032

MANUAL SHUT-OFF VALVES

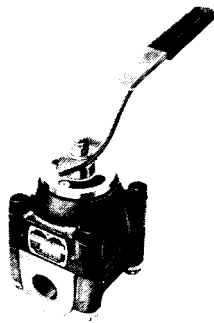
AIR (4000 PSI)

OIL (3000 PSI)

OIL and Lubricated WATER (6000 PSI)

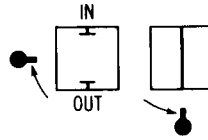


130 SERIES

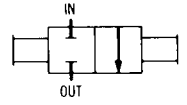


190 SERIES

FLOW PATTERNS
(Viewed from shaft end)



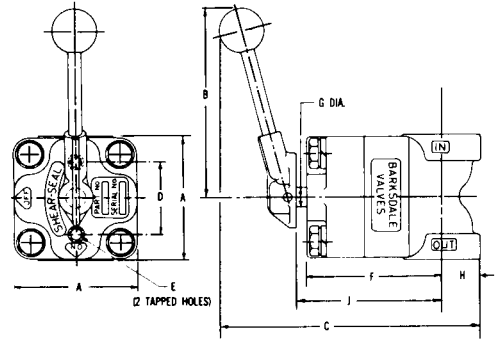
ASA DIAGRAM



130 SERIES

FLOW CAPACITY			Min. Flow Pass. Dia.	Cv Factor	PORT SIZE npt	Shippg. Weight lbs	OIL	WATER
OIL & WATER							3000 psi	3000 psi
20 ft/sec gpm	40 ft/sec gpm	60 ft/sec gpm					Valve Number	Valve Number
3	6	9	1/4	.95	1/4	3	131R3HM2	131R3WM2
9	19	28	5/16	3.20	1/2	4 1/2	133R3HM2	133R3WM2
28	55	83	3/4	10.00	1	8 1/2	135R3HM2	135R3WM2

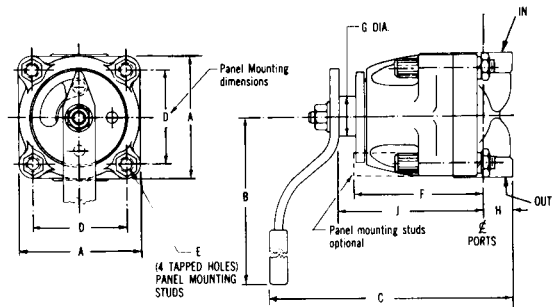
DIMENSIONS: 130 SERIES



190 SERIES

FLOW CAPACITY			Min. Flow Pass. Dia.	Cv Factor	PORT SIZE npt	Shippg. Weight lbs	OIL & WATER	AIR
OIL & WATER							6000 psi	4000 psi
20 ft/sec gpm	40 ft/sec gpm	60 ft/sec gpm					Valve Number	Valve Number
3	6	9	1/4	.95	1/4	4	191R6WM2	191R6AM2
5	10	14	5/16	1.56	1/2	8 1/2	193R6WM2	193R6AM2
12	25	37	1/2	4.25	1	12 1/2	195R6WM2	195R6AM2

DIMENSIONS: 190 SERIES



STANDARD VALVES — Consult your local Barksdale representative for prices and delivery.

OPERATING DATA: 130 and 190 SERIES

Working Pressure: See tabulations.
Proof Pressure: 1 1/2 times working pressure.
Burst Pressure: 2 1/2 times working pressure.
Pressure Drop: All shut-off valves 7 psi at 20 ft/sec., 29 psi at 40 ft/sec. and 65 psi at 60 ft/sec. velocity (approx.).
Fluid Temperature Range: From -40°F to +250°F.
Standard 'O' Ring Material: Buna N.
Detents: Two-position detents provided.
Handle Rotation: 90°.

SPECIAL MODIFICATIONS: 130 SERIES

Available where quantity warrants. Consult factory for prices and delivery.

Other than listed port sizes:
 AND (10050) porting:
 MS (16142) porting:
 Spring return:
 Manifold porting:
 Special 'O' Rings:
 Air actuators:

For the following valve sizes

	3/8	1/2	3/4	1
AND (10050) porting:	1/4	3/8	1/2	3/4
MS (16142) porting:	1/4	3/8	1/2	3/4
Spring return:	1/4	3/8	1/2	3/4
Manifold porting:	1/4	3/8	1/2	3/4
Special 'O' Rings:	1/4	3/8	1/2	3/4
Air actuators:	1/4	3/8	1/2	3/4

SPECIAL MODIFICATIONS: 190 SERIES

Available where quantity warrants. Consult factory for prices and delivery.

Other than listed port sizes:
 AND (10050) porting:
 MS (16142) porting:
 Spring return:
 Manifold porting:
 Panel mounting: (replace "R" with "P" in valve No. Example: 195P6WM2).
 Air actuators:
 10,000 psi models: Manual
 Solenoid Operators

For the following valve sizes

	3/8	1/2	3/4	1	1 1/2
AND (10050) porting:	1/4	3/8	1/2	3/4	1
MS (16142) porting:	1/4	3/8	1/2	3/4	1
Spring return:	1/4	3/8	1/2	3/4	1
Manifold porting:	1/4	3/8	1/2	3/4	1
Panel mounting:	1/4	3/8	1/2	3/4	1
Air actuators:	1/4	3/8	1/2	3/4	1
10,000 psi models:	1/4	3/8	1/2	3/4	1

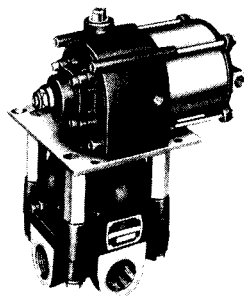
DIMENSIONS: 130 SERIES

PORT SIZE npt	A	B	C	D	E	F	G	H	J
1/4	2.813	5.438	5.781	1.625	5/16 - 18 NC	2.719	.437	.562	3.031
1/2	2.813	5.438	6.063	1.625	5/16 - 18 NC	2.844	.437	.719	3.156
1	3.500	5.438	7.313	2.125	3/8 - 16 NC	3.750	.562	1.063	4.063

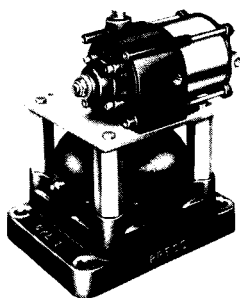
DIMENSIONS: 190 SERIES

PORT SIZE npt	A	B	C	D	E	F	G	H	J
1/4	2.625	5.000	4.688	1.875	3/8 - 16 NC	2.625	.688	.563	2.938
1/2	3.250	7.000	6.625	2.375	3/8 - 16 NC	3.500	1.063	.750	4.000
1	3.750	9.000	7.188	2.813	1/2 - 13 NC	3.750	1.063	1.188	4.125

2-POSITION AIR PILOT OPERATED ACTUATORS FOR SHUT-OFF AND 4-WAY VALVES

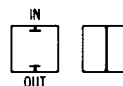


96234-1 Actuator
(shown on 145R3HC3
4-way valve).

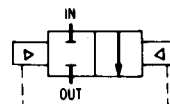


Actuator shown on
3767M3WC3 valve.

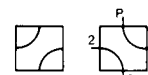
SHUT-OFF FLOW PATTERNS
(VIEWED FROM SHAFT END)



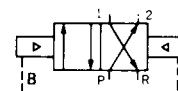
ASA SYMBOL



4-WAY FLOW PATTERN
(VIEWED FROM ACTUATOR END)



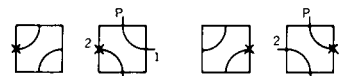
ASA SYMBOL



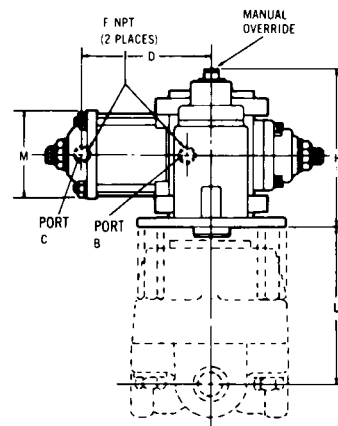
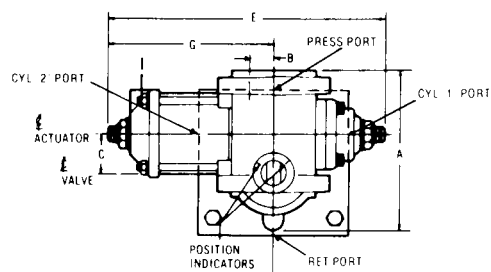
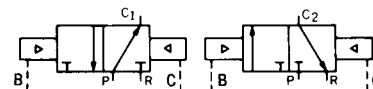
2-POSITION ACTUATOR AND VALVE COMBINATIONS

Valve Type	Basic Manual Valve Series	Valve Port Size NPT	Cat. Page for Valve Data	Actuator Number	Actuator Code Number on Dim. Table	H + L Dim. Inches	Approx. Shipping Weight Valve and Actuator
SHUT-OFF	131	1/4	18	96233-4	1	9.50	16 3/4
	133	1/2	18	96233-4	1	9.63	16 3/4
	135	1	18	96233-5	1	10.69	20 3/4
SHUT-OFF	193	1/2	19	96233-6	1	9.19	20 3/4
	195	1	19	96233-7	1	9.44	24 3/4
	4-WAY (AND 3-WAY)	142	3/8	10	96233-1	1	9.19
143		1/2	10	96233-1	1	9.19	20 3/4
144		3/4	10	96234-1	2	10.62	30 3/4
145		1	10	96234-1	2	10.25	30 3/4
*147		1 1/2	10	96235-1	3	12.00	63 3/4
203		1/2	11	96233-1	1	9.13	20 3/4
205		1	11	96234-1	2	10.62	36 1/4
3763		—	16	96233-1	1	8.94	18
3765		—	16	96234-1	2	10.25	32 1/2
*3767		—	16	96235-1	3	11.75	63 3/4
4-WAY (AND 3-WAY)	4141	1/4	14	96233-10	1	10.47	25 3/4
	4143	1/2	14	96233-10	1	10.47	25 3/4
	4145	1	14	96234-11	2	11.75	39 1/4
4-WAY (AND 3-WAY)	6143	1/2	3	96233-3	1	8.81	15 1/4
	6144	3/4	3	96233-3	1	8.81	15 1/4
	6145	1	3	96234-4	2	12.16	23 3/4
6147	1 1/2	3	96235-4	3	11.60	34 3/4	
4-WAY (AND 3-WAY)	6183	1/2	5	96233-3	1	10.66	15 1/4
	6184	3/4	5	96233-3	1	10.66	15 1/4

3-WAY FLOW PATTERN
(VIEWED FROM ACTUATOR END)



ASA SYMBOL



OPERATING DATA — ACTUATOR

Service: Air and Oil.

Seals: Buna N.

Rated Operating Pressure: 250 psi max.

MINIMUM PILOT PRESSURE 80 PSI to operate valves at rated pressure on hydraulic oil, lubricated water, or air service.

FOR OTHER PILOT PRESSURES or services, contact factory, giving valve number, main line hydraulic valve pressure, main line fluid, and available pilot pressure.

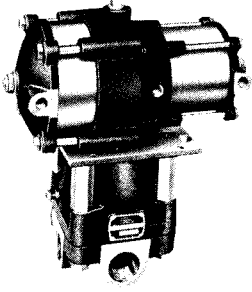
* MAXIMUM OPERATING PRESSURE FOR 1-1/2" VALVES in lubricated water service is 2000 psi. For higher pressure, consult factory.

DIMENSION TABLE (2-POSITION ACTUATORS)

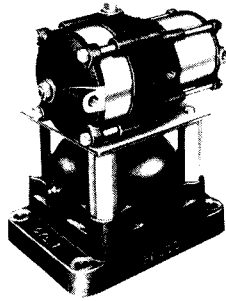
Actuator Code No.	A	B	C	D	E	F	G	H	J	K	L	M Dia.
96233 (1)	5.06	.750	1.26	4.00	8.31	1/4 NPT	5.06	4.94	2.31	4.63	See H + L dimension for specific valve and actuator combination selected (from table above)	3.31
96234 (2)	5.06	.750	1.26	4.44	8.88	1/4 NPT	5.63	4.94	2.75	5.50		4.00
96235 (3)	5.06	.750	1.26	4.44	8.88	1/4 NPT	5.63	4.94	3.38	6.75		4.00

NOTE: Overall Height of Actuator and Valve = H + L

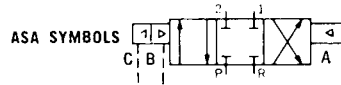
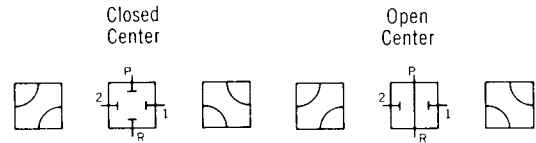
3-POSITION AIR PILOT OPERATED ACTUATORS FOR 4-WAY (3-WAY) AND MANIPULATOR VALVES



96244-1 Actuator
(shown on 145R3HC3
4-way valve).



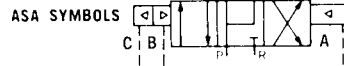
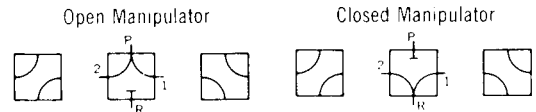
Actuator shown on
3767M3WC3 valve.



4-WAY FLOW PATTERNS
(viewed from actuator end)

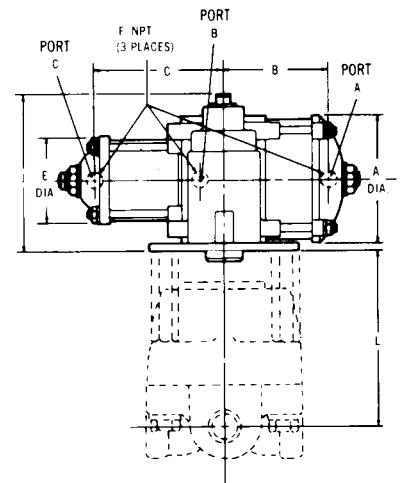
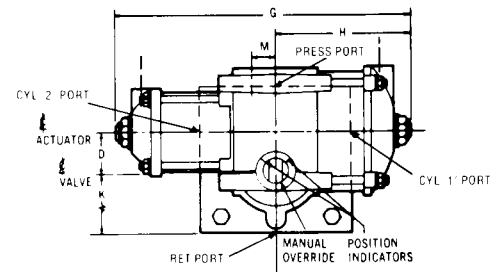
3-WAY FLOW PATTERN
Plug one of the cylinder ports
of 4-way valve.

MANIPULATOR FLOW PATTERNS
(viewed from actuator end)



3-POSITION ACTUATOR AND VALVE COMBINATIONS

Valve Type	Basic Manual Valve Series	Valve Port Size NPT	Cat. Page for Valve Data	Actuator Number	Actuator Code Number on Dim. Table	J + L Dim. Inches	Approx. Shipping Weight Valve and Actuator
4-WAY VALVES	142	3/8	10	96243-1	1	8.88	17 1/2
	143	1/2	10	96243-1	1	8.88	17 1/2
	144	3/4	10	96244-1	2	11.94	34 1/2
	145	1	10	96244-1	2	11.94	34 1/2
	*147	1 1/2	10	96245-1	3	14.82	63 1/2
	203	1/2	11	96243-1	1	9.48	17 1/2
	205	1	11	96244-1	2	11.94	34 1/2
	3763	—	16	96243-1	1	9.60	19
	3765	—	16	96244-1	2	11.19	37
	*3767	—	16	96245-1	3	12.19	64
	4141	1/4	14	96243-8	1	10.82	23
	4143	1/2	14	96243-8	1	10.82	23
	4145	1	14	96244-9	2	13.41	43
	6145	1	3	96244-3	2	12.43	19 1/2
	6147	1 1/2	3	96245-3	3	12.92	35



OPERATING DATA — ACTUATOR

Service: Air and Oil.

Rated Operating Pressure: 250 psi max.

MINIMUM PILOT PRESSURE 80 PSI to operate valves at rated pressure on hydraulic oil, lubricated water, or air service.

FOR OTHER PILOT PRESSURES or services, contact factory, giving valve number, main line hydraulic valve pressure, main line fluid, and available pilot pressure.

Seals: Buna N.

* MAXIMUM OPERATING PRESSURE FOR 1-1/2" VALVES in lubricated water service is 2000 psi. For higher pressure, consult factory.

DIMENSION TABLE (3-POSITION ACTUATORS)

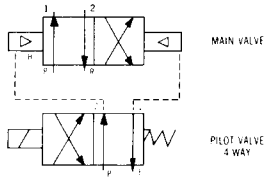
Actuator Code No.	A Dia.	B	C	D	E Dia.	F	G	H	J	K	L	M
96243 (1)	4.00	3.25	3.94	1.31	2.75	1/4 NPT	9.13	4.19	4.94	1.75	See J + L dimension for specific valve and actuator combination selected (from table above)	.750
96244 (2)	5.00	3.81	4.50	1.38	4.00	1/4 NPT	10.38	4.94	5.88	3.38		.750
96245 (3)	5.00	3.81	4.50	1.38	4.00	1/4 NPT	10.38	4.94	5.88	3.38		.750

NOTE: Overall Height of Actuator and Valve = J + L

PILOT VALVE ARRANGEMENTS • 3-WAY OR 4-WAY MAIN VALVE OPERATION

DIAGRAM I

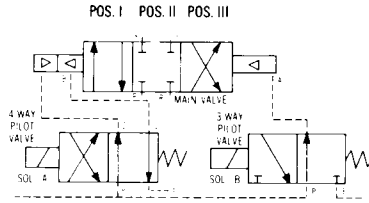
For 2-POSITION air pilot operated main valves use one 4-way valve.



Note: For 3-Way operation of main valve plug one cylinder port. With pilot valve connected as shown and solenoid de-energized, plug cylinder port 2 to achieve "Cylinder 1 Normally Open" condition; plug cylinder port 1 to achieve "Cylinder 2 Normally Closed" condition. To reverse the conditions, reverse pilot valve connections to main valve ports B and C.

DIAGRAM II

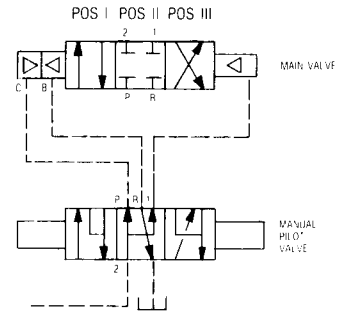
For 3-POSITION air pilot operated main valves use one 4-way valve and one 3-way valve.



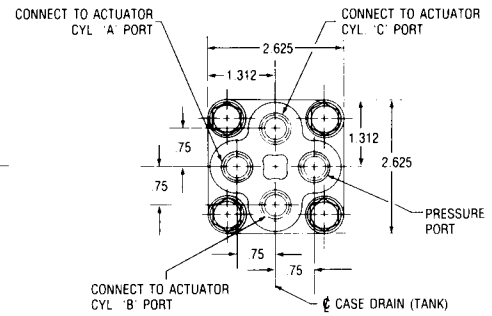
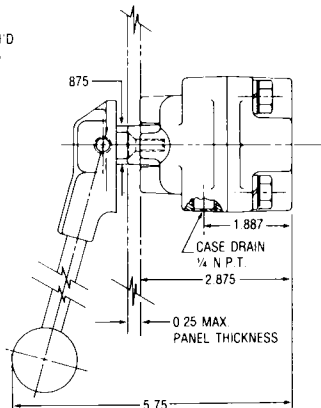
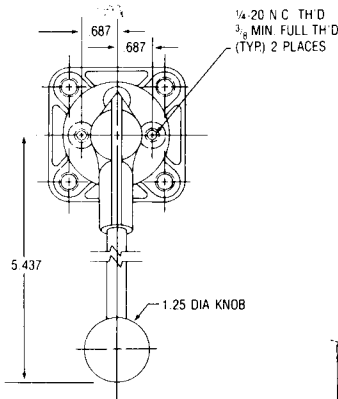
Note: Both Solenoids de-energized - Neutral (center) position (shown). Solenoid B energized - Pressure to Cyl. 2, Cyl. 1 to Ret. Solenoid A energized and Solenoid B de-energized. — Pressure to Cyl. 1, Cyl. 2 to Ret. Note 2: For 3-way operation, plug one of main valve cylinder ports.

DIAGRAM III

For 5-way manual pilot valve.

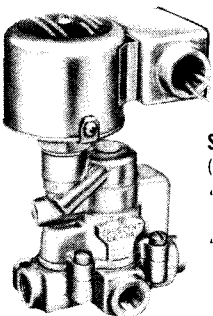


Main Valve Position	Pressure Conditions Required at Actuator Ports		
	Port A	Port B	Port C
I	Exhaust	Exhaust	Pressure
II	Pressure	Exhaust	Pressure
III	Pressure	Pressure	Exhaust



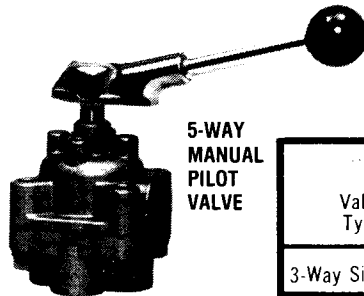
BARKSDALE PILOT VALVES (See above diagrams for proper pilot valve selection)

Note: Pilot valves are supplied with speed controls on the exhaust ports.



SINGLE SOLENOID (2-POSITION)

"Mach 2" Solenoid-Pilot 3-Way N.O.
"Mach 2" Solenoid-Pilot 4-Way



5-WAY MANUAL PILOT VALVE

VALVE CHARACTERISTICS AND ORDERING DATA

Important — when ordering specify: Size, Ordering Number, Pressure Range, Voltage and Frequency.

Valve Type	Pipe Size NPT	Cv Factor	Press Range	Ordering Number	Approx. Ship. Weight Lbs.
3-Way Single Sol.	3/8"	2.88	80-150	113431F	3 1/4
4-Way Single Sol.	3/8"	2.76	80-150	12443F	4
5-Way Manual	1/4"	.95	80-250	7081S1A03	2 1/2

Consult factory for Pilot Valve Mounting Kits.

STANDARD VOLTAGES: 115, 230 or 460 AC, 60 cycles;

For other voltages and/or frequencies, consult Factory.

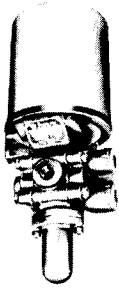
HOW TO ORDER VALVE, ACTUATOR, AND PILOT VALVE COMBINATIONS

- Select a manual valve to perform the function you want. Specify your choice by valve number. Example: 143R3WC3.
Note: Actuators cannot be applied to spring centered valves.
- On preceding pages consult tables headed "2-position actuator and valve combinations" or "3-position actuator and valve combinations" and check under "Basic Manual Valve Series" whether an actuator is available for the valve number you have picked. In our example the basic manual valve series number is 143; both 2-position and 3-position actuators are available for the 143 series valves.

- Take the complete valve number and add the actuator number to it to obtain the ordering number for the valve-actuator combination. To continue our example: Manual valve 143R3WC3 (selected from catalog page 8) with 3-position actuator 96243-1 (from tabulation page 14) become 143R3WC3-96243-1.
- Valves, Subplates, Actuators, etc., should be listed individually. Example: Valve Less Pilot Valves
1 ea. 3763M3WC3-96233-1, 2-position Air Pilot Operated Valve
1 ea. 34013 Subplate (available only on 3760 series)
1 ea. 2-position Actuator
Note: Valve with Pilot Valve Factory Installed (Consult Factory).

SOLENOID VALVES (UNIVERSAL LINE) • AIR (1500 PSI) • OIL and Lubricated WATER (3000 PSI)

The following FLOW PATTERNS are obtainable from a single Standard Valve. Each valve is shipped with the necessary plugs.
TO ACHIEVE THE DESIRED FLOW PATTERN, PLUG PORTS AS SHOWN

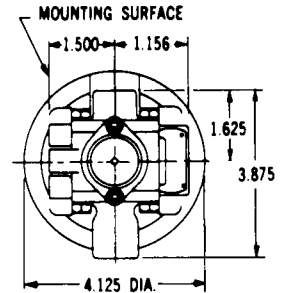


FLOW PATTERN	4-WAY	3-WAY		SHUT-OFF		DIVERTER
		Norm. Open	Norm. Closed	Norm. Open	Norm. Closed	
PLUG PORT MARKED "X"	NONE	CYL. 2	CYL. 1	RET. & CYL. 2	RET. & CYL. 1	RET.
NORMAL POSITION SPRING LOADED						
ENERGIZED POSITION						
ASA SYMBOL						

420 SERIES

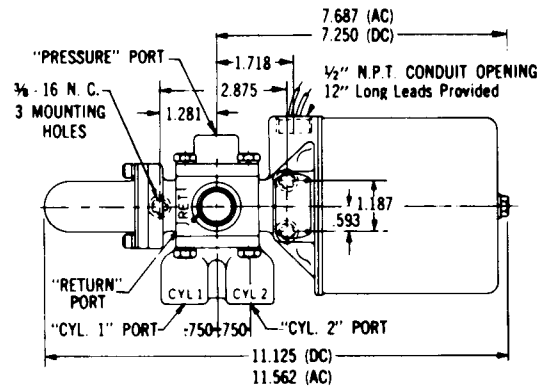
FLOW CAPACITY				Min. Flow Pass. Dia.	Cv Factor	PORT SIZE npt	Volts AC	OIL & LUB. WATER	AIR
OIL & WATER		AIR						3000 psi	1500 psi
At 1500 psi gpm	At 3000 psi gpm	At 1000 psi scf/m	At 1500 psi scf/m					Valve Number	Valve Number
4	2.5	450	675	3/32	.7	3/8	115	422S3W S2A1	422S3AS2A1

Approx. shipping weight: 11 lbs.



Electrical Ratings:

Volts AC 60.Cycles	Current Drain (Amperes) Standard	
	Inrush	Holding
115	16.8	1.52



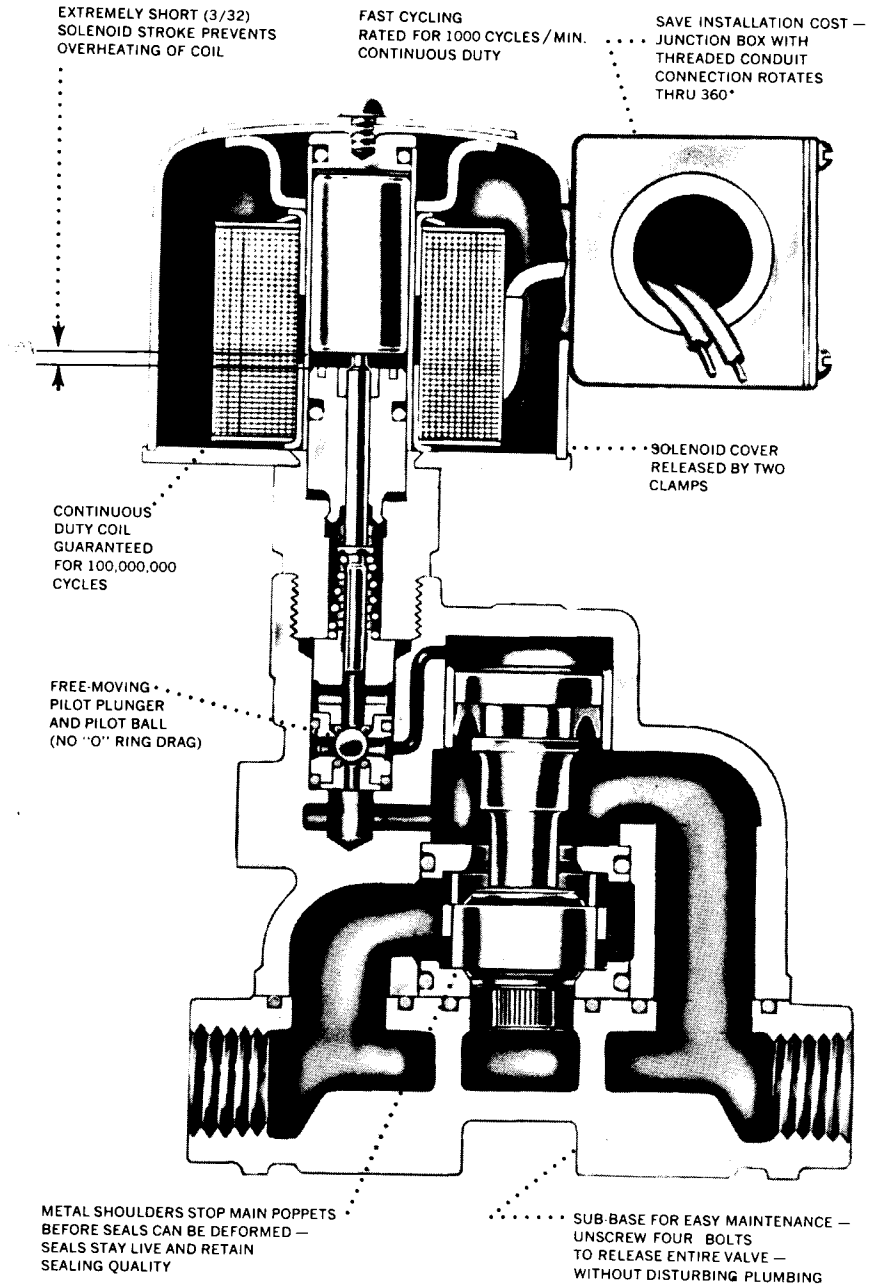
SPECIAL MODIFICATIONS

Available where quantity warrants. Consult factory for prices and delivery.
 Special electrical requirements (ie: voltage and frequency).
 AND (10050) porting. Manual reset.
 MS (16142) porting. Manual override.
 Special 'O' Rings. Terminal block connector.
 Explosion proof. DC Solenoids.
 Other voltages and frequencies.

OPERATING DATA

Working Pressure: See tabulations.
 Proof Pressure: 1 1/2 times working pressure.
 Pressure Drop: 9 psi at 2.5 gpm, 32 psi at 4 gpm.
 Fluid Temp. Range: -40°F to +165°F.
 Ambient Temperature: Not to exceed -20° to +120°F.
 Standard 'O' Ring Compound: Buna N.
 Solenoid Rating: For continuous duty.
 Voltage Tolerance: Valves will operate at ± 10% of rated voltage.

SOLENOID CONTROLLED PILOT OPERATED POPPET VALVES



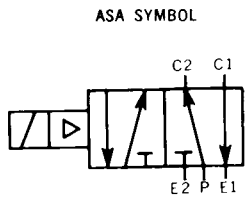
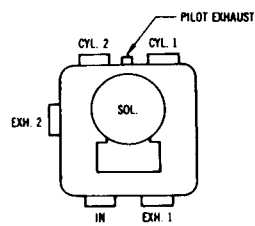
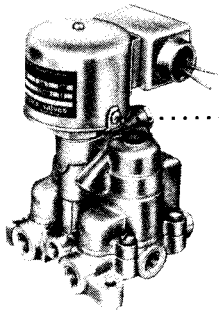
FOUR-WAY SOLENOID-PILOT VALVES

SUBBASE MOUNTED

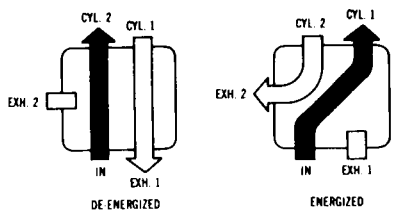
AIR 15 to 150 PSI

1244 SERIES

SOLENOID WITH JUNCTION BOX
 Removable Cover and 1/2" npt Conduit Connection.
 Enclosure: NEMA 2.
Loosen screws to rotate conduit connector 360°



FLOW PATTERNS OF 4-WAY VALVES (viewed from solenoid end)



NOTE: The dual exhaust permits independent speed control of cylinder directions (slow forward, fast return) by metering (restricting) the respective main exhaust port.

INTERNAL PILOT SUPPLY

The pressure supply to operate the pilot section is directed through internal channels leading from the main line pressure inlet.

The pilot valve exhausts into the subbase independent of the main valve exhaust. **CAUTION! NEVER PLUG OR RESTRICT PILOT EXHAUST.**

VALVE CHARACTERISTICS AND ORDERING DATA:

IMPORTANT — When ordering please specify: Size, Ordering Number, Pressure Range, Voltage and Frequency.*

Pipe Size (NPT)	Cv Factor	Press. Range	Ordering Number *	Approx. Ship. Weight (Lbs.)
1/2"	4.88	15-150	12445	4 3/4
3/4"	7.68	15-150	12446	6 1/2

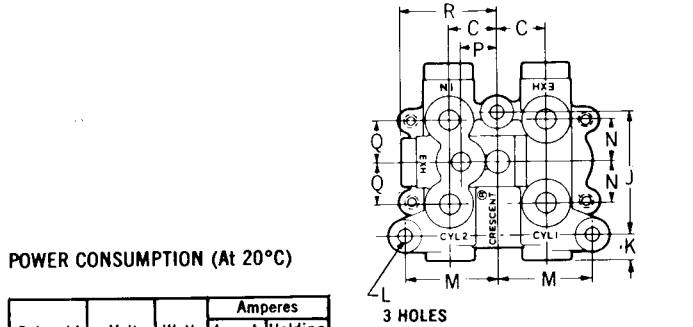
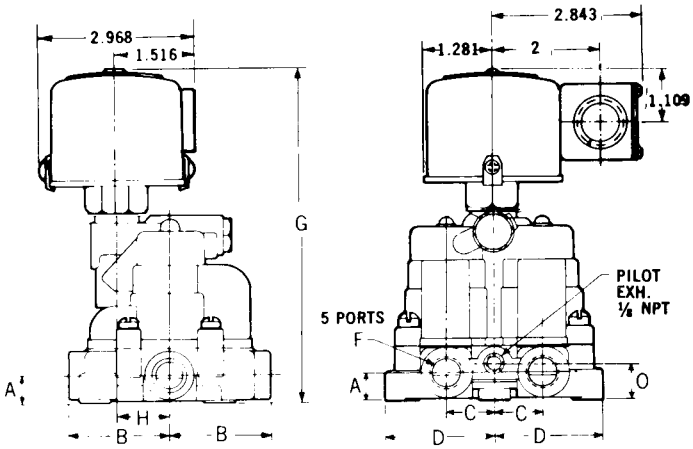
STANDARD VOLTAGES: 115, 230 AC, 60 cycles. For other voltages and/or frequencies, consult factory.

*Add "F" (ie 12443F) for speed controls in exhaust ports.

SPECIAL MODIFICATIONS

Available where quantity warrants. Consult factory for price and delivery.

- 1/4" subbase
- Less subbase
- NEMA 4 enclosures.
- Pushbutton manual override non-locking.
- Lever manual override non-locking.
- Explosion proof solenoid.
- Seals other than standard Buna N.
- Class H coils.
- 500 psi models.
- J.I.C. Solenoids.
- Circuit Holder Solenoids.
- Impulse Valves (Dual Solenoid).



POWER CONSUMPTION (At 20°C)

Solenoid	Volts	Watts	Amperes	
			Inrush	Holding
2002	115-60	14	.440	.223
2002	230-60	14	.225	.112

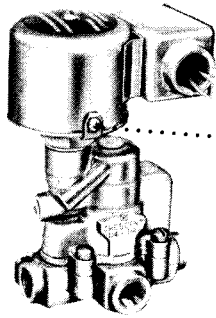
1244 SERIES DIMENSIONS (inches)

VALVE SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R
1/2"	.640	2.437	1.046	2.343	.671	1/2 NPT	7.062	1.078	2.656	.859	.265	2.031	.984	.921	.921	1.046	2.250
3/4"	.750	3.078	1.156	2.656	.781	3/4 NPT	8.125	1.203	3.625	1.203	.328	2.312	1.218	1.140	1.156	1.296	2.812

THREE-WAY SOLENOID-PILOT VALVES • SUBBASE MOUNTED

AIR 15 to 150 PSI

1134 SERIES

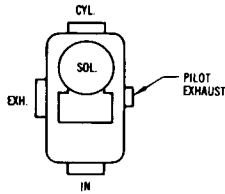


SOLENOID WITH JUNCTION BOX

Removable Cover and 1/2" npt Conduit Connection.

Enclosure: NEMA 2.

Loosen screws to rotate conduit connector 360°



INTERNAL PILOT SUPPLY

The pressure supply to operate the pilot section is directed through internal channels leading from the main line pressure inlet.

The pilot valve exhausts into the subbase independent of the main valve exhaust. **CAUTION! NEVER PLUG OR RESTRICT PILOT EXHAUST.**

VALVE CHARACTERISTICS AND ORDERING DATA:

IMPORTANT — When ordering please specify: Size, Ordering Number, Pressure Range, Voltage and Frequency.*

Pipe Size (NPT)	Cv Factor	Press. Range	* ORDERING NUMBERS		Approx. Ship. Weight (Lbs.)
			Normally Open	Normally Closed	
3/8"	2.88	15-150	113431	113432	3 1/4
1/2"	5.04	15-150	113451	113452	3 1/2
3/4"	8.08	15-150	113461	113462	4 1/2

STANDARD VOLTAGES: 115, 230 AC, 60 cycles. For other voltages and/or frequencies, consult factory.

*Add "F" (ie 113431F) for speed controls in exhaust ports.

SPECIAL MODIFICATIONS

Available where quantity warrants. Consult factory for price and delivery.

1/4" subbase

Less subbase

NEMA 4 enclosures

Pushbutton manual override non-locking.

Lever manual override non-locking.

Explosion proof solenoid.

Seals other than standard Buna N.

Class H coils.

500 psi models.

J.I.C. Solenoids.

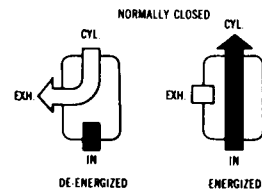
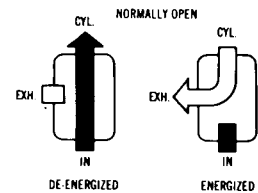
Circuit Holder Solenoids.

Impulse Valves (Dual Solenoid).

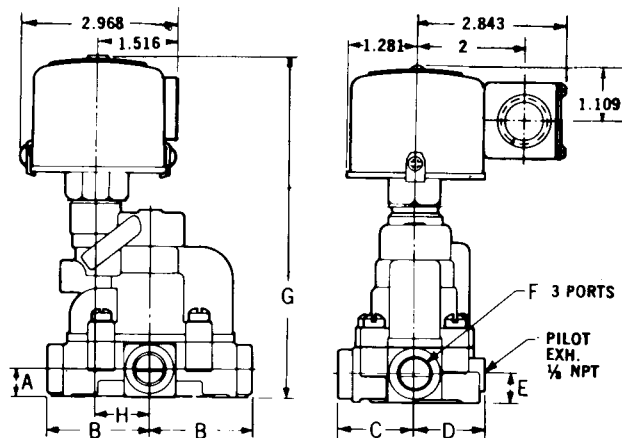
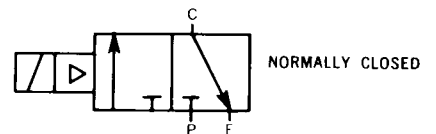
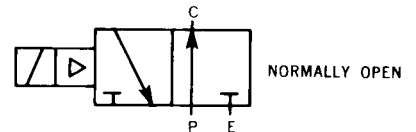
POWER CONSUMPTION (At 20°C)

Solenoid	Volts	Watts	Amperes	
			Inrush	Holding
2002	115-60	14	.440	.223
2002	230-60	14	.225	.112

FLOW PATTERNS OF 3-WAY VALVES (viewed from solenoid end)

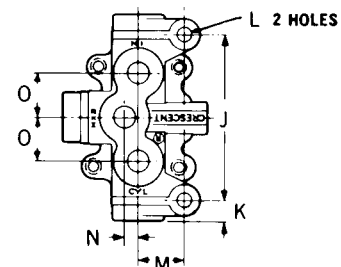


ASA SYMBOLS



1134 SERIES DIMENSIONS (inches)

VALVE SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	O
3/8"	.531	1.968	1.406	1.312	.562	3/8 NPT	6.625	1.046	3.125	.406	.265	.875	.265	.828
1/2"	.640	2.437	1.843	1.468	.671	1/2 NPT	7.062	1.078	3.437	.718	.265	.984	.390	.984
3/4"	.750	3.078	2.437	1.578	.781	3/4 NPT	8.125	1.203	3.750	1.203	.328	1.156	.578	1.218



SPECIAL PURPOSE SOLENOID CONFIGURATIONS

AVAILABLE WHERE QUANTITY WARRANTS

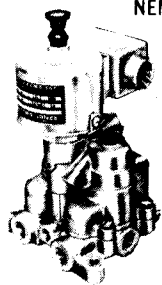
MANUAL OVERRIDE, CIRCUIT HOLDER and
IMPULSE 4-WAY SOLENOID-PILOT VALVES,
SUBBASE MOUNTED. AIR: 15 to 150 PSI

MANUAL OVERRIDE and CIRCUIT HOLDER
3-WAY SOLENOID-PILOT VALVES, SUBBASE
MOUNTED. AIR: 15 to 150 PSI

NEMA 2

1244M SERIES

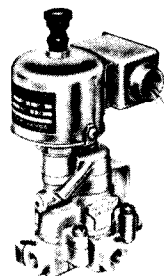
1244M with Junction Box Solenoid (removable cover and 1/2" npt conduit connector) has a push button manual actuator which will not override the energized solenoid and is non-locking; when pushed down it actuates the de-energized valve and returns to normal when released.



NEMA 2

1134M SERIES

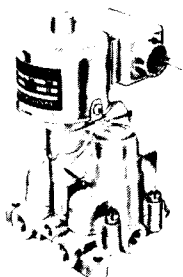
1134M with Junction Box Solenoid (removable cover and 1/2" npt conduit connector) has a push button manual actuator which will not override the energized solenoid and is non-locking. When pushed down it actuates the de-energized valve and returns to normal when released.



NEMA 2

1244J SERIES

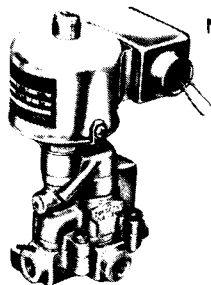
1244J has a solenoid designed to JIC specifications, with a flush push button which cannot be accidentally actuated.



NEMA 2

1134J SERIES

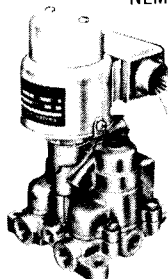
1134J has a solenoid designed to JIC specifications, with a flush push-button which cannot be accidentally actuated.



NEMA 2

1244R SERIES

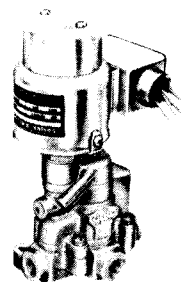
1244R has a Circuit Holder Solenoid (with junction box) designed for cycling operations. It eliminates holding relays and relay circuits.



NEMA 2

1134R SERIES

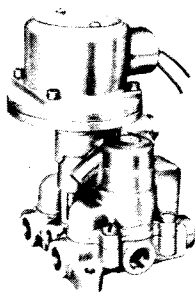
1134R has a Circuit Holder Solenoid (with junction box) designed for cycling operations. It eliminates holding relays and relay circuits.



NEMA 7, 9

1245 SERIES

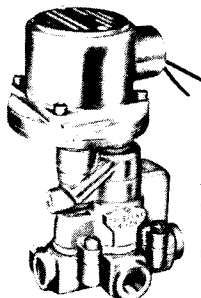
Explosion Proof Solenoid Enclosures, designed to the requirements of hazardous locations Class I Groups C & D, and Class II Groups E, F, & G.



NEMA 7, 9

1135 SERIES

Explosion Proof Solenoid Enclosures, designed to the requirements of hazardous locations Class I Groups C & D, and Class II Groups E, F, & G.



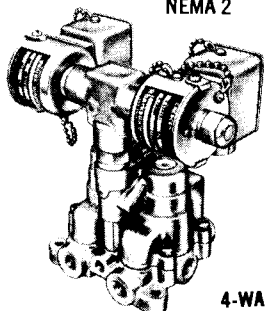
NEMA 2

IMPULSE VALVES

Current is required only momentarily to change positions of the Impulse Valve.

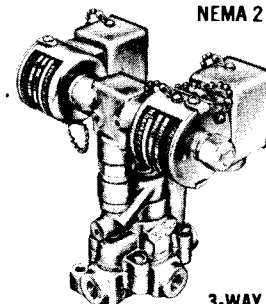
Dual Solenoid: To prevent valve from getting out of phase in automatic systems, the position of the valve will not be changed if the same solenoid is energized twice in succession (the opposite solenoid must be energized to reverse the valve).

If circuit requires that current be applied continuously, the ambient temperature should not exceed 100°F.



4-WAY

NEMA 2



3-WAY

OPERATION AND SAFETY

WARNING:

Product **MUST** be installed in accordance with applicable NEC, ASME and local regulations as applicable including those that apply to installations in hazardous locations requiring explosion proof enclosures or similar construction.

CAUTION:

THE PRESSURE LIMITATIONS SHOWN ON THE INDIVIDUAL CATALOG PAGES OR SALES DRAWINGS FOR THE SPECIFIC VALVE INVOLVED, MUST NOT BE **EXCEEDED**. These pressures must take into consideration possible system surge pressures and their frequencies. The pressure limitations at the return or drain ports must not be exceeded.

The fluid used **MUST** be compatible with the materials of construction. Special cleaning and packaging may be required for special media such as oxygen. **CONSULT FACTORY.**

The flow rate, fluid temperature and ambient temperature **MUST** be within the ranges specified for the individual valve in the applicable catalog page or sales drawing.

Always maintain adequate lubrication in accordance with instructions in the catalog.

An operating characteristic of the Shear Seal valve is “interflow.” Interflow is cross port connection during handle transition from one position to another. During this time, backloaded cylinders may temporarily reverse. The effect of interflow must be considered during machine operation.

TROUBLESHOOTING AND MAINTENANCE—Troubleshooting and repair of valves must be in strict compliance with the procedure set forth on the **Troubleshooting and Maintenance section** of this catalog.

Barksdale, Inc. Components must not be used in life support applications of any kind.

FAILURE TO OBSERVE THESE WARNINGS COULD RESULT IN SERIOUS INJURY.

TROUBLE SHOOTING AND MAINTENANCE • BARKSDALE SOLENOID VALVES

A. TROUBLE: EXTERNAL LEAKAGE BETWEEN FITTINGS AND BODY

Possible Causes

1. Loose fittings.
2. Damaged gasket.
3. Damaged body or fitting.
4. Bending stress due to plumbing and mounting.

Remedy

1. Tighten fitting bolts.
2. Replace (may be made from $\frac{1}{32}$ " thick vellumoid).
3. Replace (if scratches or nicks are not excessive, part may be dressed up by sanding with #300 grit).
4. Check pipes and mounting for normality.

B. TROUBLE: EXTERNAL LEAKAGE AT SHAFT ENDS

Bear in mind that an infinitely thin film of oil must adhere to the slide shaft ends as it passes through the 'O' ring and a part of this is then wiped off on the return stroke. In time (50 to 100,000 cycles) this will appear as drops of oil.

1. Worn or broken 'O' rings.
2. Damaged slide.
3. Damaged groove in body or gland.
4. Foreign matter dislodging 'O' ring seal.

1. Replace.
2. Replace (if scratches or nicks are not excessive, slide ends may be polished with #600 grit paper).
3. Replace.
4. Clean parts of all foreign elements.

C. TROUBLE: INTERNAL LEAKAGE IN EXCESS OF GUARANTEED AMOUNT

1. Damaged or worn 'O' rings around shear seal.
2. Damaged bore in fittings (where 'O' ring is contained on shear seal).
3. Damaged 'O' ring groove in fitting.
4. Scratch on shear seal lapped face.
5. Scratch on slide lapped faces.

1. Replace.
2. Replace.
3. Replace.
4. Replace (if scratches or nicks are not excessive they may be dressed out by lapping on #600 grit paper taped to a flat surface such as glass). OIL VALVES ONLY.
5. Replace or follow directions outlined above.

D. TROUBLE: VALVE FAILS TO ENERGIZE COMPLETELY

1. Voltage drop.
2. Excessive pressure.
3. Excessive flow.
4. Solenoid plunger sticking (mechanical bind).
5. Excessive galling (worn areas) on solenoid plunger.
6. Over voltage (loss of dielectric strength with subsequent loss of power).
7. Frictional increase.
 - a. Excessive 'O' ring swell.
 - b. Sedimentary deposits on rubbing members from fluid media.

1. Check line voltage at solenoid and correct if low (consider all electrical equipment that may cause a momentary voltage drop at time of valve energization).
2. Reduce pressure to insure rated pressure at all times.
3. Reduce to insure rated flow max.
4. Remove solenoid plunger and wipe or blow frame and plunger clean of any foreign matter. Check plunger in frame to insure its being loose and free.
5. Replace solenoid.
6. Replace coil.
7.
 - a. Consult factory for proper compound for fluid media and replace.
 - b. Remove slide and shear seals and clean and polish faces and shaft ends.

E. TROUBLE: VALVE DOES NOT RETURN

1. Excessive pressure.
2. Excessive flow.
3. Solenoid plunger sticking (mechanical bind).
4. Frictional increase.
 - a. Excessive 'O' ring swell.
 - b. Sedimentary deposits on rubbing members from fluid media.

1. Reduce to insure max. rated pressure.
2. Reduce to insure max. rated flow.
3. Follow procedure in D, 4.
4.
 - a. See D, 7a.
 - b. See D, 7b.

Note: Additional washers may be added under spring to increase its load when energization is satisfactory.

WARNING:

Reverse assembly of any valve parts may result in high case pressure and possible injury. Assembly drawings, sales drawings and parts lists MUST be consulted.

MAINTENANCE

1. Disassemble and inspect. Replace or repair damaged or worn parts and 'O' rings; clean all parts including solenoid and plunger. Grease valve parts before assembly. The solenoid should be cleaned at least every 1,000,000 cycles or every six months. The valve should be checked every 2,000,000 or once a year.
2. At the first sign of excessive internal leakage the valve should be disassembled and the source of leakage repaired. Allowing valve to continue in operation may cause damage to other components, as the escaping fluid is generally in the form of a jet stream.

TROUBLE SHOOTING AND MAINTENANCE • BARKSDALE MANUAL VALVES

TROUBLE: HIGH HANDLE LOAD

Possible Causes

1. Restriction "return" port or pressure on the return port due to valve being installed in system incorrectly.
2. Bent detent disc gouging into top of housing.
3. Dirt under thrust washer which lifts and cocks rotor.
4. Worn or missing pin on shaft which allows rotor to gouge into housing.
5. Worn, or brinelled, or corroded groove in rotor and thrust washer causing balls to bind.
6. Pressure in excess of valve rating.
7. Lip worn off "Shear-Seal" which would increase friction load.
8. Galling between the "Shear-Seal" and rotor.

Remedy

1. Remove restriction or install valve properly.
2. Remove and flatten detent disc.
3. Disassemble and clean valve.
4. Disassemble and replace shaft pin. As an emergency measure a dowel pin or a piece of drill rod can be pressed into the shaft and pack body cavity with grease to resist pin corroding.
5. Turn thrust washer over and surface grind worn side of rotor. Put shim under thrust washer equal to material ground off of rotor.
6. Put a relief valve or other pressure regulating device in the system.
7. Replace "Shear-Seal." As an emergency measure the "Shear-Seal" can be chamfered to reduce the area of sealing face.
8. Grind and lap face of rotor and "Shear-Seal." Put shim under thrust washer equal to material ground off rotor.

TROUBLE: EXTERNAL LEAKAGE AROUND SHAFT

1. Worn shaft 'O' ring.
2. Enlarged shaft hold caused by side load on shaft (occurs only when shaft actuated by some mechanical linkage).

1. Replace shaft 'O' ring. In an emergency a seal can be made from string packing.
2. Replace housing. For temporary service string packing can be used for seal.

TROUBLE: INTERNAL LEAKAGE AROUND "SHEAR-SEALS"

1. Worn Shear-Seal 'O' ring.

1. Replace Shear-Seal 'O' ring and leather back-up ring. A seal can be made with string packing as a temporary measure.

TROUBLE: LEAKAGE ACROSS FACE OF "SHEAR-SEALS"

1. Scratch or other damage to lip of Shear-Seal.
2. Scratch or other damage on rotor.
3. Incorrect positioning of rotor in relation to Shear-Seal. This in turn can be caused by worn shaft pins or worn detent disc.
4. Extreme wear on face of Shear-Seal which will normally occur only after millions of cycles. Such wear reduces spring tension in Shear-Seal and may thus cause leakage.
5. Shear-Seal spring fails by breaking or taking a permanent set which in turn may allow fluid to pass between Shear-Seal and rotor.

1. Either replace Shear-Seal or lap face on No. 600 grit Carborundum paper which has been taped to a surface plate or a piece of plate glass. As a temporary measure if scratch is deep the Shear-Seal can be lapped on the back face and turned over in the Shear-Seal cavity.
2. Lap out scratch on 600 paper or if too deep surface grind rotor then lap as outlined above.
3. Replace detent disc or shaft pins, whichever is causing the trouble.
4. Replace Shear-Seal. As a temporary measure a small washer or shim can be put behind the Shear-Seal spring to compensate for wear.
5. Replace spring. For temporary service a rubber washer can be put behind the Shear-Seal. This will act as a spring until part can be installed.

TROUBLE: EXTERNAL LEAKAGE AROUND PORTS

1. Scratches or other physical damage to the threads.

1. If thread compound fails to effect a solder so that when the pipe is screwed back into the valve it will in effect re-cut the threads. Use Litharge and Glycerine for a thread seal any time the piping is changed.

TROUBLE: EXTERNAL LEAKAGE BETWEEN BODY AND HOUSING

1. Improperly installed body 'O' ring.
2. Excessive back pressure in the housing caused by restricted return flow or valve being connected with pressure on return port. This back pressure may cause bolts to stretch and allow fluid to leak out between body and housing.
3. High velocity caused by extreme volume of fluid being forced thru valve, with fluid velocities greater than 30 feet per second, a jet of fluid hits the body 'O' ring when the valve is in an intermediate or interflow position. This extremely high velocity jet goes right past the 'O' ring and thru crack between body and housing castings.

1. Replace body 'O' ring and install properly.
2. Check return pressure with pressure gauge and remove restriction.
 - a. Install valve according to port markings.
3. Install velocity shield ring which will correct this condition, or replace old style housing with new one which has a fully contained 'O' ring groove.

WARNING:

Reverse assembly of any valve parts may result in high case pressure and possible injury. Assembly drawings, sales drawings and parts lists MUST be consulted.

MAINTENANCE

1. All Barksdale manual selector valves for water service are equipped with a grease fitting in the housing. On Untreated water, valve should be lubricated through this fitting. Frequency of lubrication depends entirely on duty cycle of valve. An increase in handle load will indicate exactly what lubrication schedule should be followed. Use water resistant lubricant such as Socony-Vacuum "Sovarex 2W", Shell "Alvania" or equivalent. Preceding operation may be disregarded if valve is used on water treated with soluble oil.
2. Disassemble and inspect. Replace or rework damaged or worn parts and 'O' rings. This service should be performed every two years or every 2,000,000 cycles, whichever occurs first.
3. At the first sign of excessive internal leakage the valve should be disassembled and the source of leakage repaired. Allowing valve to continue in operation may cause damage to other components, as the escaping fluid is generally in the form of a jet stream.

GOOD IDEA VALVE REQUEST

Our catalog contains many valves currently in production.
If your requirements are not met by the models illustrated, please complete this form.
Fax it to (323) 589-3463, and it will receive our immediate attention.

1. TYPE OF ACTUATION: Manual Electric AC Mechanical Other _____
 DC Describe
2. FLOW CONFIGURATION: Shut-off (2-way) 3-way 4-way
 Other _____
Describe
3. PORT SIZE: _____ TYPE: NPT Other _____
Describe
4. SYSTEM PRESSURE: Normal _____ psi Surge _____ psi
5. A. MEDIA: _____
B. MEDIA TEMP.: _____ °F AMBIENT TEMP.: _____ °F
6. FLOW: _____ GPM _____ SCFM
7. A. ACCEPTABLE WETTED MATERIALS: Aluminum Brass Carbon Steel Ductile Iron
 Stainless Steel Structural Synthetics
B. UNACCEPTABLE WETTED MATERIALS: _____
Specify
8. CYCLES: _____ Per minute _____ Per day Total cycles expected _____
9. OTHER SPECIAL REQUIREMENTS: (Attach separate sheet if necessary) _____

10. SYSTEM: New Design Re-design
11. APPLICATION: What will valve control? (Attach circuit diagrams if available) _____

12. PROTOTYPE(S) REQUIRED BY: _____ (Date)
13. ESTIMATED ANNUAL USAGE _____ TARGET NET PRICE _____
FIRM _____
ADDRESS _____

NAME & TITLE _____ PHONE # _____