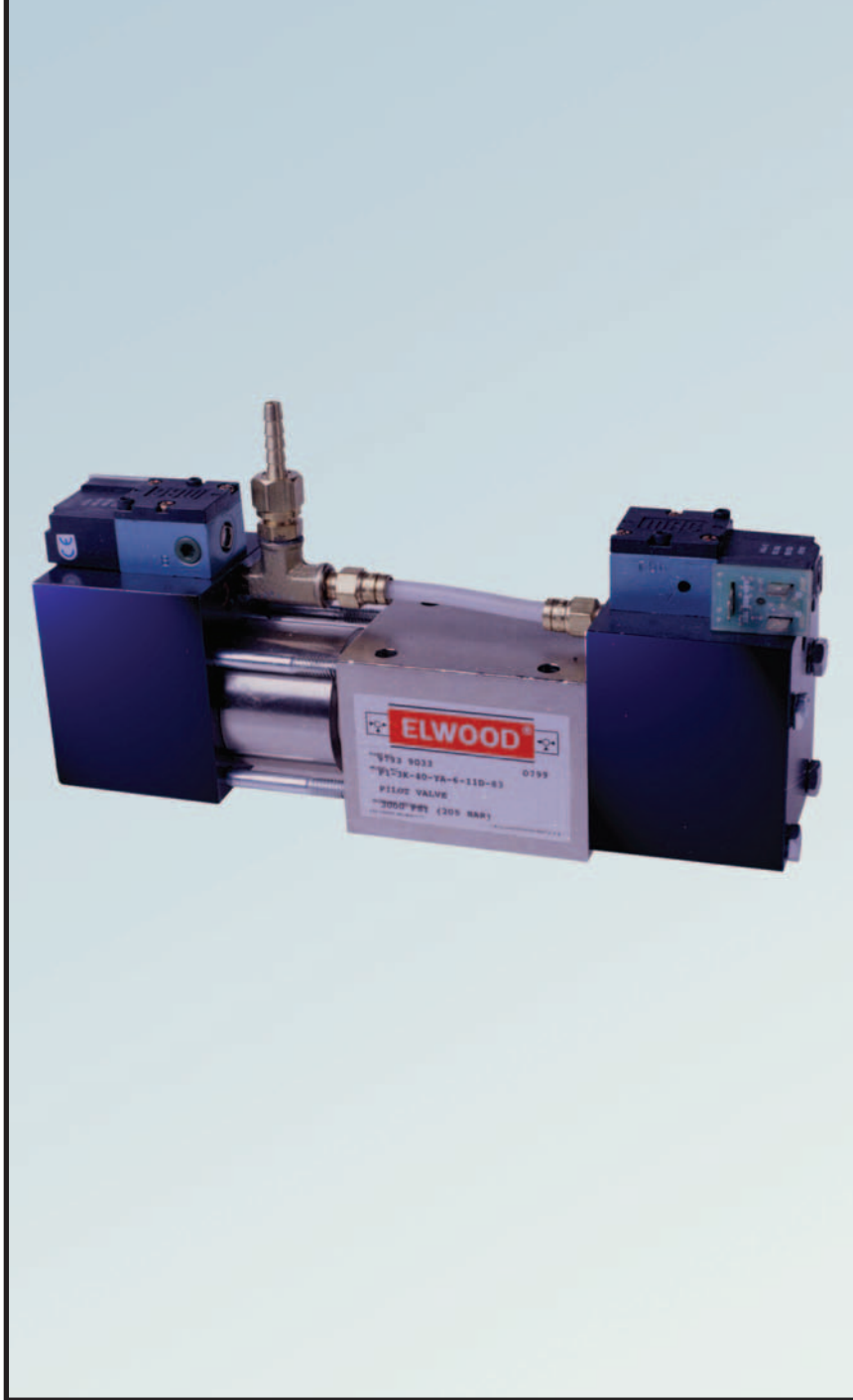


PACKED SPOOL 4-WAY DIRECTIONAL CONTROL VALVE

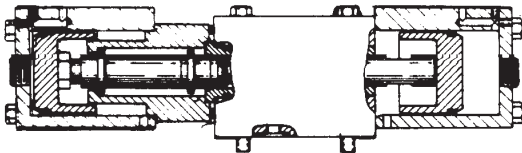
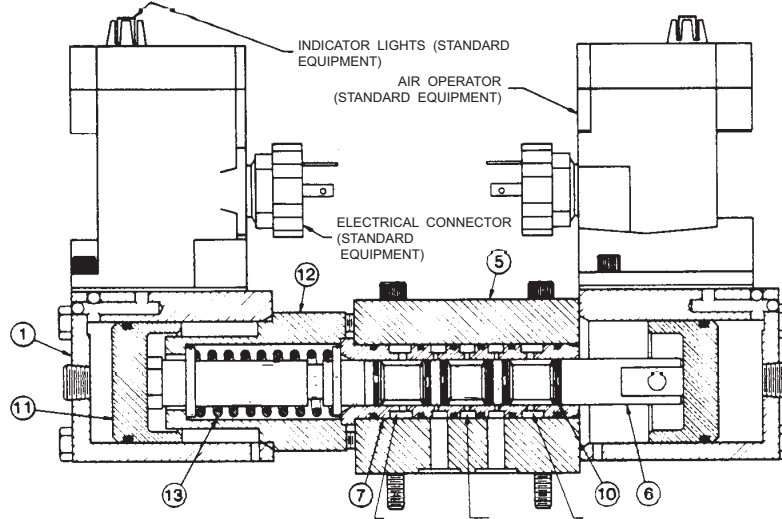
www.elwood.com



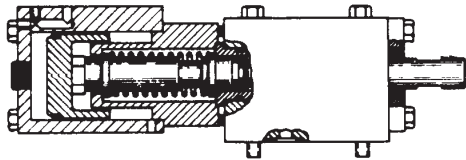
ISO 9001:2000
CERTIFIED COMPANY

4-Way 3-Position Valve

4-WAY, 3-POSITION DIRECTIONAL VALVE, AIR SOLENOID OPERATED SHOWN; DIRECT HYDRAULIC AVAILABLE.

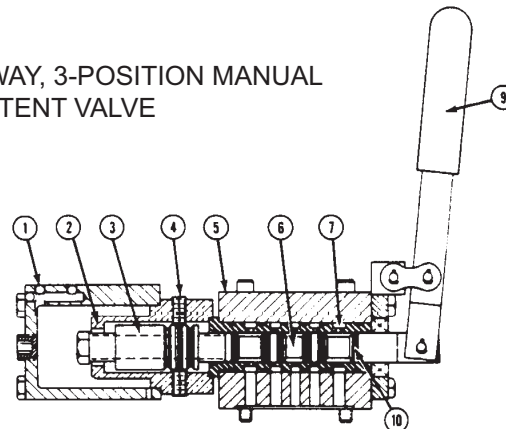


4-WAY, 2 POSITION VALVE, MOMENTARY CONTACT



4-WAY, 2-POSITION VALVE, SPRING OFFSET

4-WAY, 3-POSITION MANUAL DETENT VALVE



- | | |
|----------------------------|--|
| 1. GAir Cylinder Body | 7. Sleeve (Heat Treated Stainless Steel) |
| 2. Detent Housing | 9. Hand Lever |
| 3. Detent (3 Position) | 10. Piston Seal Assembly |
| 4. Ball Plungers | 11. Air Piston |
| 5. Body/Sleeve Assembly | 12. Spring Housing |
| 6. Spool (Stainless Steel) | 13. Return Spring |

OPERATING DATA

- | | |
|---|---------------------|
| • 7 gpm (26 l/min.), 3600 psi (248 bar) | P1-3K Model - 0.7 |
| • 7 gpm (26 l/min.), 4500 psi (310 bar) | P1-4.5K Model - 0.7 |
| • 6 gpm (23 l/min.), 6000 psi (414 bar) | P1-6K Model - 0.4 |
| • 12 gpm (45 l/min.), 3000 psi (207 bar) | P2-3K Model - 1.2 |
| • 16 gpm (60 l/min.), 3000 psi (207 bar) | P3-3K Model - 1.5 |
| • 32 gpm (120 l/min.), 2000 psi (138 bar) | P4-2K Model - 3.0 |
| • 22 gpm (83 l/min.), 3000 psi (207 bar) | P4-3K Model - 2.5 |
| • 20 gpm (76 l/min.), 4500 psi (310 bar) | P4-4.5K Model - 1.6 |

$$DP = \left(\frac{\text{gpm}}{Cv} \right)^2$$

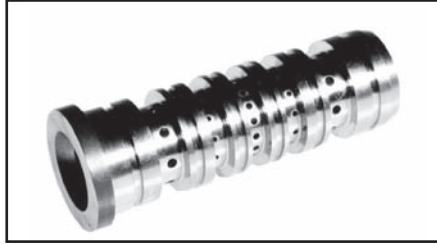
gpm = US gpm

D05, CETOP 5 Mounting Pattern - 2K & 3K Model uses 1/4" or 6 mm mounting bolts; 4.5K and 6K uses 5/16" or 8 mm mounting bolts. Operating Temperature 34° - 140°F (1-60°C); 150°F (65°C) maximum

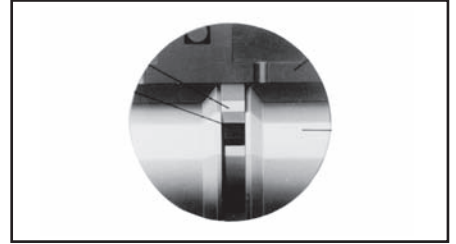
Design Features



Spool: Stainless steel - resists scoring, pitting and corrosion.



Sleeve: Stainless steel - heat treated.



Seal assembly: 2-piece assembly - pressure and wear compensating.

LONG LASTING PARTS: Spool is hydraulically balanced to assure uniform wear

HEAVY DUTY DESIGN: Corrosion resistant materials, self compensating seals

INTERCHANGEABILITY: Same size seal rings throughout
 No lap fitted parts
 To change function, just change spool
 3 spool configurations used to achieve all functions

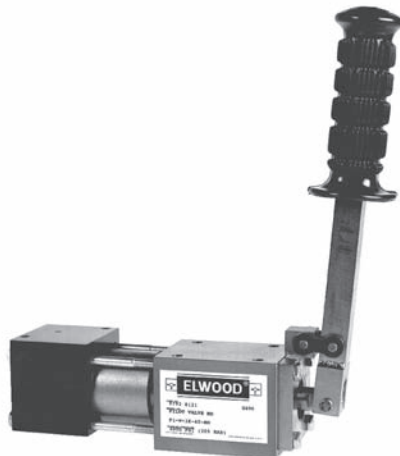
INDICATOR LIGHTS: Standard: Located on Ross Air Solenoid Operator
 Standard: Located on Direct Hydraulic Solenoid Connector

FLUID MEDIA

- Water/water soluble oil content of 3%
- Low Viscosity fluid, kerosene, etc.
- Raw Water
- Nonflammable fluids
- For other fluid media, consult factory

Air Actuator Specifications

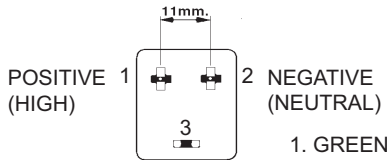
- Recommended air pressure: P1-, P2-, P3-3K & P4-2K & 3K; 72 psi (5 bar) minimum, 120 psi (8 bar) maximum.
 P1-, P4-4.5K; 81 psi (6 bar) minimum
 120 psi (8 bar) maximum.
- Minimum air pressure to actuate: 61 psi (4 bar) for 98/2 HWCF
- Air volume required to shift: 1.25 cubic inch (20ML)
- Solenoid Actuator
- Manual override
- Indicator light
- Mac: 120 Volt 50/60 Hz, 11 VA inrush, 8 VA holding, 24 VDC - 13 to 2 watts nominal
- Ross: 120/240 Volt 50/60 Hz, 87 VA inrush, 30 VA holding, 24 VDC - 14 watts nominal



Electrical Cord Ordering Data

(electrical cord to be ordered separately - it is not supplied with value assembly)

TYPE 11B



- 1. GREEN
- 2. BLACK
- 3. WHITE

HIRSCHMANN TYPE INDUSTRIAL ELECTRICAL CONN. PATTERN, FORM B, STANDARD FOR MAC, CODE 11B

FACE VIEW OF PATTERN CONFIGURATION

TYPE 11D



- 1. GREEN
- 2. BLACK
- 3. WHITE

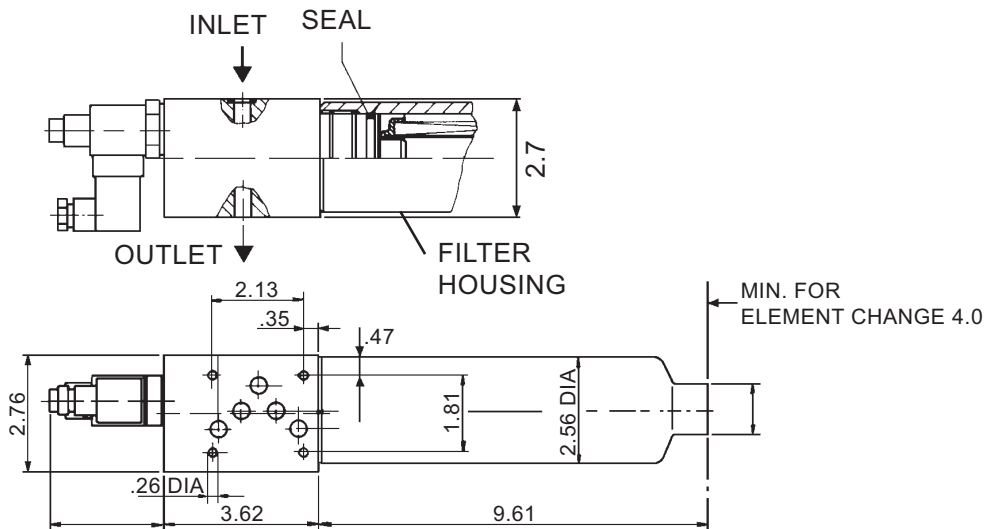
HIRSCHMANN TYPE (DIN#43650) ELECTRICAL CONN. PATTERN, FORM A, STANDARD FOR ROSS, CODE 11D

Part No.	STD. CORDS AVAILABLE ^②
8712 0100	Type 11D with 6 ft. long molded cord
^① 8712 0103	Type 11D with indicator light and 18" length of shielded cable with 3 ft. of extended wire - 1/2" NPT conn.
8712 0150	Type 11B with 6 ft. long cord

NOTES:

- ^① When ordering cord that requires indicator light other than 110/220V, 50/60Hz, please specify voltage.
- ^② Longer cord lengths and electrical connector patterns other than listed above can be supplied at additional cost. Consult factory.

Pressure Filter / Sandwich Type With Electrical Clogging Indicator

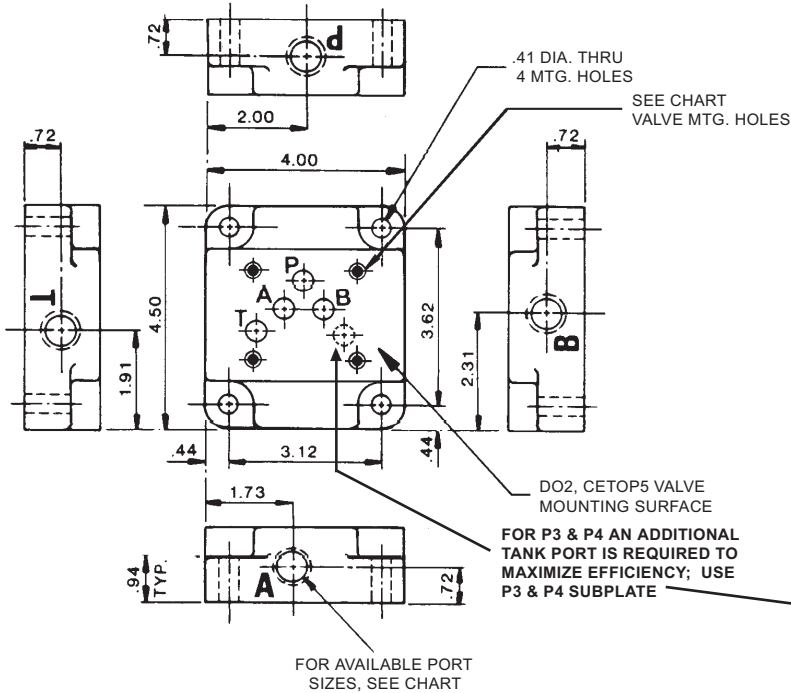


PART NUMBER 387 3060 FOR P1, 02 & P3-3K & P4-2K FLOW TO 30 GPM NOMINAL HWFC. FOR RAW WATER SERVICE CONSULT FACTORY.

SS WIRE MESH ELEMENT, CLEANABLE 80 MICRON, ELEMENT COLLAPSE RATING 2300 PSI Δ P WITH VISUAL AND ELECTRICAL CLOGGING INDICATOR. REPLACEMENT ELEMENT 387 3061.

Packed Spool Pilot Accessories

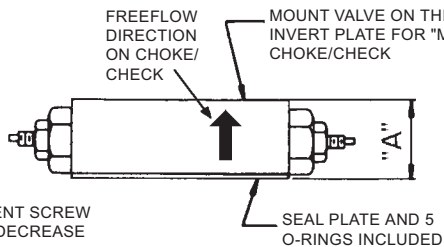
(order required items separately)



PORTED SUBPLATES

P1 & P2 (210 bar)		
TYPE OF PORT	PART NO.	VALVE MTG. HOLES
1/2" NPT	5549 0031	1/4-20 UNC
#8 SAE O-RING PORT	5549 2100	1/4-20 UNC
P1-6K (410 bar)		
1/2" NPT	5549 2112	5/16-18 UNC
#8 SAE	5549 2113	5/16-18 UNC
P1-6K (410 bar)		
#12 SAE (BOTTOM)	8458 1055 5549 2167	1/4-20 UNC

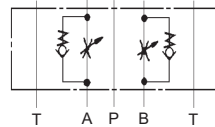
Flow Control Sandwich Plate



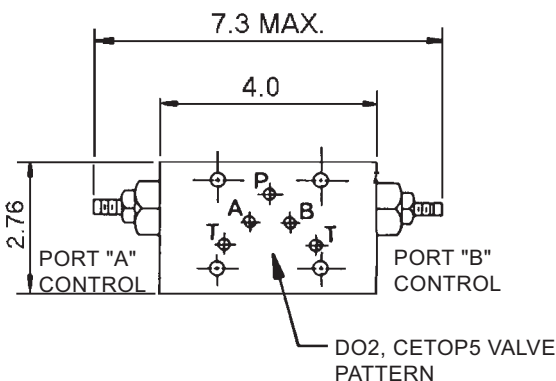
TURN ADJUSTMENT SCREW CLOCKWISE TO DECREASE FLOW

SEAL PLATE AND 5 O-RINGS INCLUDED

"CHECK/CHOKE" FLOW CONTROL "CC"



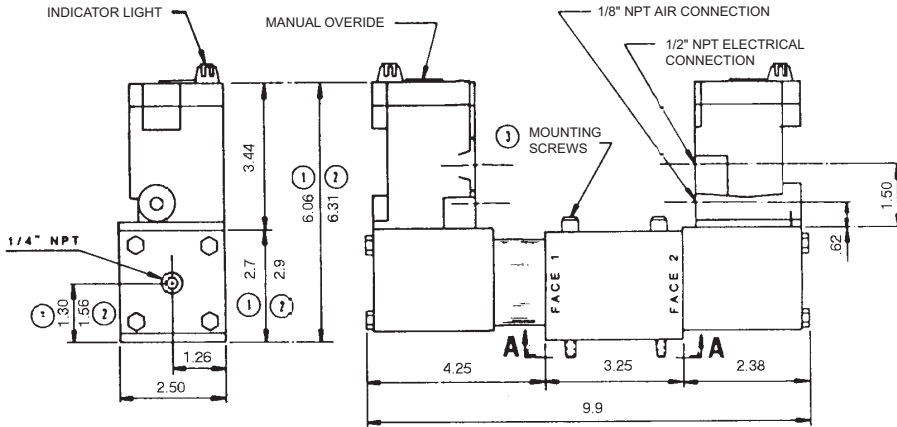
B1-DIRECTIONAL THROTTLE "TH"



Valve Model	Elwood Part No.	Flow Control Type	Full Open Cv	"A" INCH	For Service
P1 & P2-3K	9793 7798	CC	1.1	1.56	HWCF OR WATER
P1-6K	9793 8046	CC	1.1	1.56	HWCF OR WATER
P3 & P4-3K	9793 9440	CC	3.9	2.0	HWCF OR WATER
P4-4.45K	9793 9533	CC	3.9	2.0	HWCF OR WATER
P1- & P2-3K	9793 5280	TH	1.0	1.7	HWCF OR WATER
P1-6K	9793 7800	TH	1.0	1.7	HWCF OR WATER

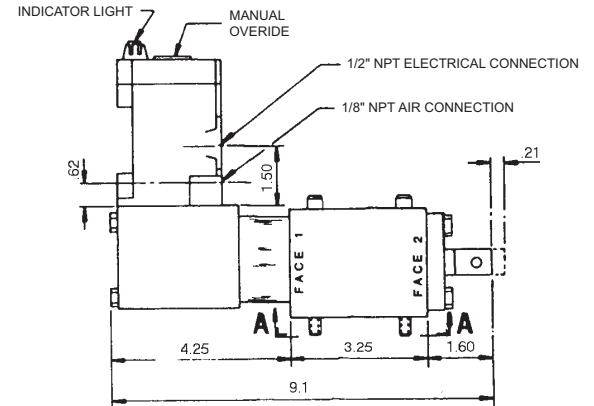
Dimensional Data

DOUBLE SOLENOID VALVE
L.H. ACTUATOR SHOWN
R.H. ACTUATOR OPPOSITE



WEIGHT DOUBLE VALUE = 13.5 LBS.

SINGLE SOLENOID VALVE
L.H. ACTUATOR SHOWN
R.H. ACTUATOR OPPOSITE



WEIGHT DOUBLE VALUE = 10.5 LBS.

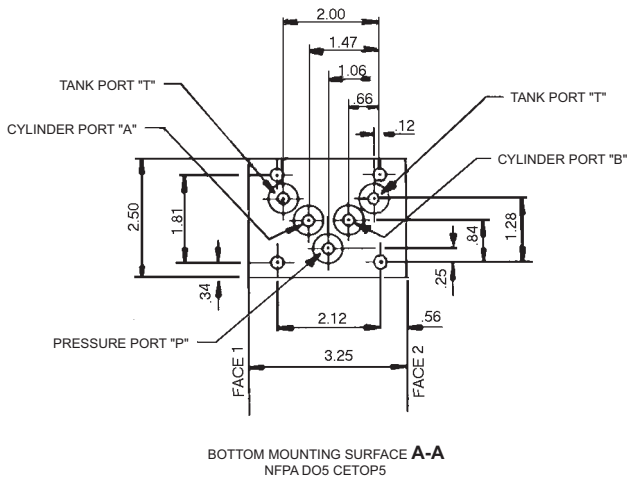
- ① P1-3K & P1-6K
- ② P3-3K

③	MOUNTING SCREWS
	P2-3K, P3-3K, P4-2K & P4-3K 1/4" OR 6mm
	P1-6K, P1-4K, P4-4.5K 5/16" OR 8mm

ROSS AIR ACTUATOR SHOWN
NOTE : AIR CYLINDER CAN BE ROTATED IN 90° INCREMENTS.

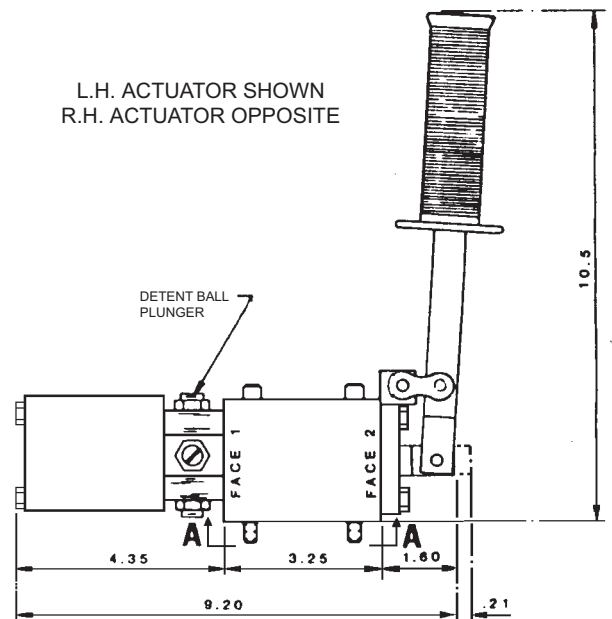
NOTE: FOR P3 AND P4 SERIES VALVES THE SUBPLATE OR MANIFOLD USE OF BOTH "T" (TANK) PORTING IS REQUIRED TO MAXIMIZE EFFICIENCY.

MANUAL & MANUAL DETENT VALVE SHOWN; LOCKABLE VERSION AVAILABLE, CONSULT ELWOOD.



BOTTOM MOUNTING SURFACE **A-A**
NFPA D05 CETOPS

L.H. ACTUATOR SHOWN
R.H. ACTUATOR OPPOSITE



NOTE: Dimensions in Inches

Ordering Data - Packed Spool Directional Control Valve

• STANDARD : NON-STANDARD ITEMS AVAILABLE AT EXTRA COST.

MODEL ①					
CODE	Recommended Flow		Maximum Working Pressure		CV
	Nominal gpm (l/min.)	MAX gpm (L/Min.)	psi	bar	
P1-3K	7 (26)	10 (38)	3600	248	.7
P1-4.5K	7 (26)	10 (38)	4500	310	.7 ⑧
P1-6K	6 (22)	8 (32)	6000	414	.4 ⑧
P2-3K	12 (45)	17 (64)	3600	248	1.2 ⑨
P3-3K	16 (60)	22 (83)	3600	248	1.5 ⑨
P4-2K	32 (120)	46 (174)	2000	138	3.0 ⑨
P4-3K	22 (83)	31 (140)	3600	248	2.5 ⑨
P4-4.5K	20 (76)	28 (106)	4500	310	1.6 ⑨ ⑧

VALVE ACTUATOR	
YAM	AIR ACTUATED VALVE WITH MAC SOLENOID ② ⑦
YA	AIR ACTUATED VALVE WITH ROSS SOLENOID ② ⑦
NAM	AIR ACTUATED VALVE WITHOUT MAC SOLENOID ② ⑦
NA	AIR ACTUATED VALVE WITHOUT ROSS SOLENOID ② ⑦
MO	MANUAL HAND LEVER OPERATOR
MD	MANUAL HAND LEVER OPERATOR WITH DETENT
YH	DIRECT HYDRAULIC SOLENOID

SOLENOID COILS ⑤	
1	6 VDC
2	12 VDC
3	24 VDC
5	110 VDC
6	110/120VAC 50/60Hz
8	220/240VAC 50/60Hz
9	410/460VAC 50/60Hz
10	200VAC 50/60Hz
11	440/480VAC 60Hz
12	24VAC 50/60Hz

CODE	WATER SERVICE
omit	STD. 98/2 HWCF & SOLUBLE OIL, WATER WITH INHIBITORS
W	WATER SERVICE, NO ADDITIVES
WHC	WATER, HIGH CORROSIVE RESISTANCE SERVICE

PILOT VALVE ACCESSORIES ⑦	
CODE NO.	DESCRIPTION
10	AIR QUICK DISCONNECT
11B	HIRSCHMANN TYPE ELECTRICAL CONN.; INDUSTRIAL FORM B, 1MM ④ FOR -YAM
11D	HIRSCHMANN TYPE ELECTRICAL CONNECTOR, DIN #43650, FORM A ④ FOR -YA
13	SOLENOID INDICATOR LIGHT ⑦
30A	LIMIT SWITCH SINGLE SOLENOID ⑩
30B	LIMIT SWITCH DOUBLE SOLENOID ⑩

CODE NUMBER EXAMPLE

: **P1 - * - 3K - 40 - YAM - 6 - 10 - 11B**

Valve Functions

40		501*		601* B		701*		A
44		502*		602*		702*		
45		503*		603*		703*		
80		51		61		71		
81		52		62		72		
82		53		63		73		
83		54		64		74		
		55		65		75		
		56		66		76		

*CROSS OVER FOR FUNCTION

501, 601 & 701

502, 602 & 702

503, 603 & 703

YAM ACTUATORS SHOWN SCHEMATICALLY

Functions 80, 81, 82 & 83 available in P1-3K, P1-4.5K and P1-6K only.

- ② UNLESS OTHERWISE SPECIFIED, ROSS AIR OPERATOR IS FURNISHED W/ CONN, DIN#43650 PATTERN FORM A. MAC AIR OPERATOR IS FURNISHED W/ CONN, INDUSTRIAL PATTERN FORM B.
- ③ FILTRATION REQUIREMENTS:
- 149 MICRON (100 MESH) MARGINAL, NOT RECOMMENDED
- 74 MICRON (200 MESH) RECOMMENDED MINIMUM
- 40 MICRON OPTIMAL
- ④ ELECTRICAL CORD ASSEMBLY IS NOT SUPPLIED WITH VALVE & MUST BE ORDERED SEPARATELY, IF REQUIRED.
- ⑤ 110/120VAC 50/60Hz COILS ARE STANDARD. FOR ALTERNATES, CONTACT ELWOOD.

- ⑥ FOR AVAILABLE SUBPLATES FOR EXTERNAL CONNECTIONS, SEE PAGE 5.
- ⑦ INDICATOR LIGHTS ARE SUPPLIED AS STANDARD EQUIPMENT.
- ⑧ ANSI D02-315 MOUNTING PATTERN.
- ⑨ NOTE: FOR P3 AND P4 SERIES VALVES USE OF BOTH "T" (TANK) PORTING IN THE SUBPLATE OR MANIFOLD IS REQUIRED TO MAXIMIZE EFFICIENCY.
- ⑩ AIR VERSION ONLY. CONNECTOR INCLUDED WITH SOLENOID INDICATOR LIGHT.

Isolation Valve (Lock-Out)

- Isolates Manifold Mounted Directional Control Valves.
- Reduces maintenance time - replace Directional Valves without depressurizing and draining hydraulic system.
- Single lever operation to close all four ports (P, T, A, B). Cylinders can remain under external load without having to be blocked.
- Lockable per OSHA safety standards.
- NFPA "DO"/CETOP and special mounting patterns available. Request NFPA D05 pattern for compatibility with Elwood Packed Spool Series. Specify whether 2K, 3K, 4.5K or 6K models to assure mounting bolt compatibility.
- Contact factory to identify appropriate P/N for your application.



Water and Low Viscosity Hydraulics

COMPLETE RANGE FROM ONE SOURCE

Hydraulic System Components

Directional Control Valves
Pressure Control Valves
Isolation Valves
Cartridge Valves
Proportional Valves
Servo Control Valves
Valve Stands & Manifolds

Descaling System Components

2-Way Descaling Valves & Stop Valves
Accumulator Shut-off Valves
Accumulator Control System