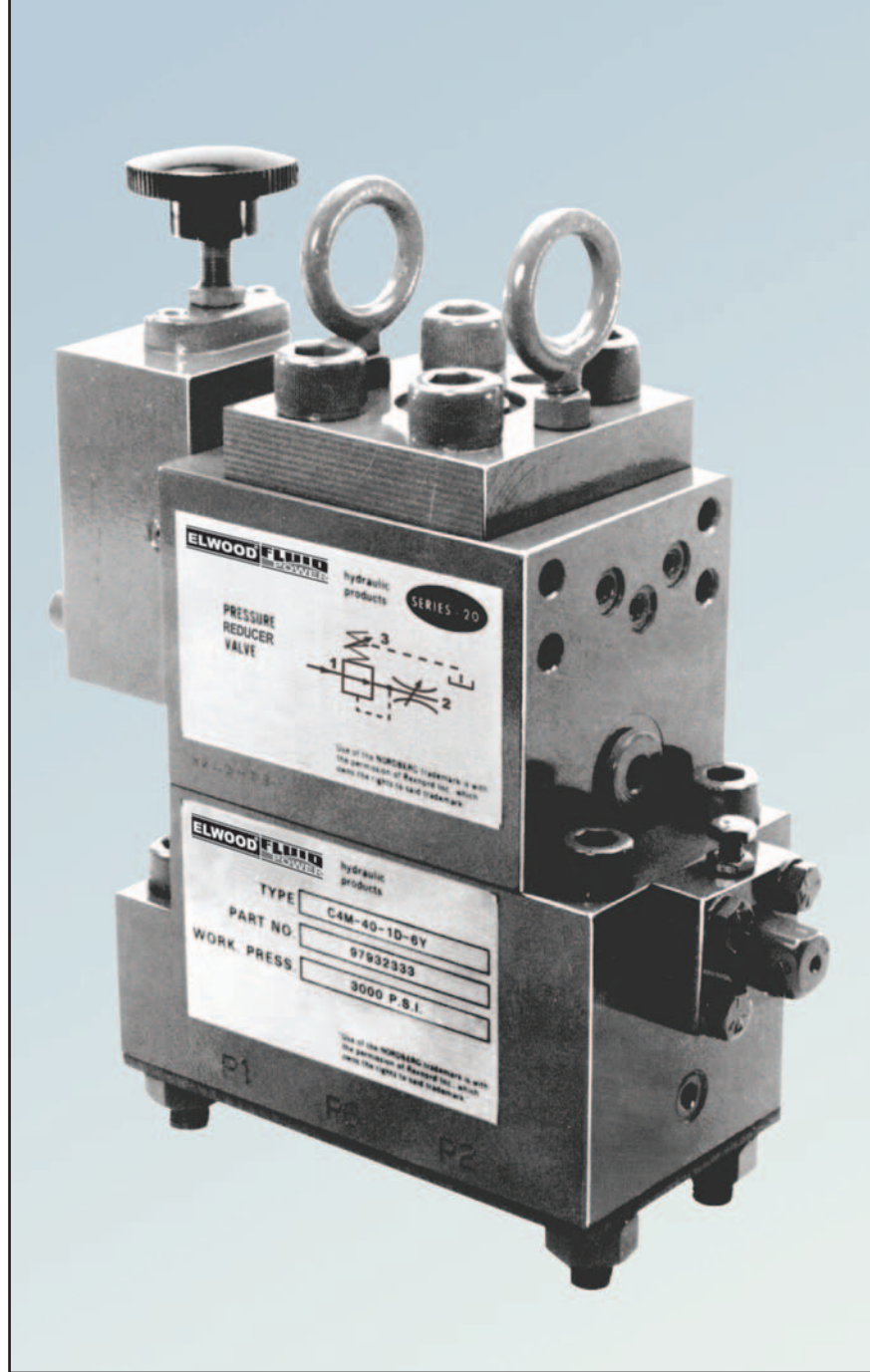


PRESSURE CONTROL VALVES

www.elwood.com

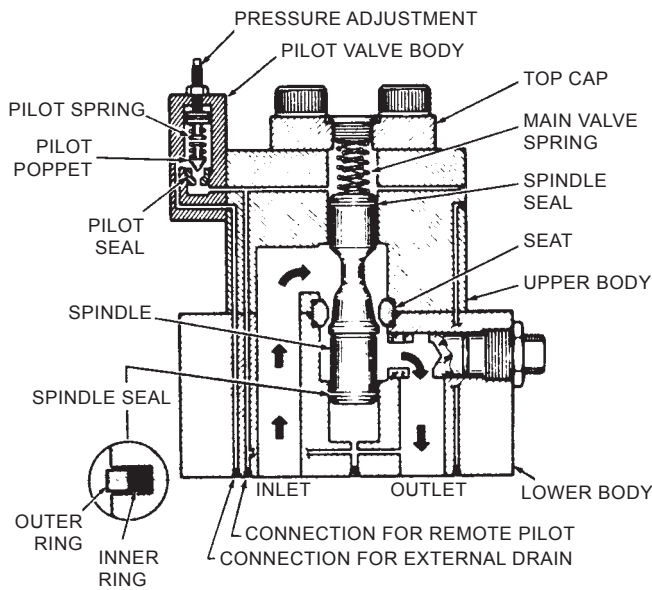


ISO 9001:2000
CERTIFIED COMPANY

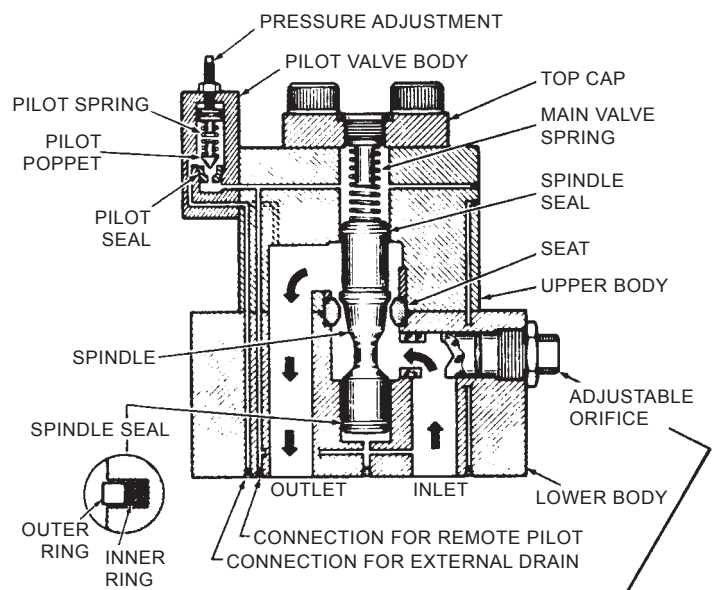
Pressure Control Valves (Water / Soluble Oil)

FEATURES:

- Simple design that is compact in size.
- Easily convertible from relief to reducer or vice versa.
- Valves are designed for either SAE flange or manifold mounting (see ordering data).
- All working internals are heat treated stainless steel.
- All parts are replaceable, plus the seat is reversible, for additional service life.
- The adjustable orifice restrictor is standard on all valves. This adds considerable life to the component.
- Internal and external pilot feeds and drains, as well as, gauge connections located for flexibility and easy maintenance.

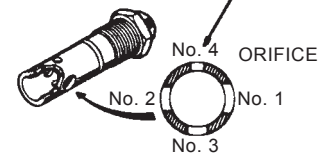


Reducing Valve



Relief Valve

TYPICAL CROSS SECTIONS OF VALVES



Pressure Relief or Reducing Valve

System pressure is set by adjusting the pilot relief control valve. For the valve's pressure setting, a pressure balance on the main spindle allows the spring to hold the valve in a closed position (relief valve) or an open position (reducing valve) - refer to valve cut a ways above.

When system pressure working on the pilot poppet exceeds set pilot relief adjustment, a pilot flow is established to the external drain. This pilot flow

creates a differential force on the main spindle because of a pressure drop through the orifices installed in the pilot control line.

NOTE: The adjustable orifice plug allows a pre-pressure drop to occur in the valve allowing the main spindle to create a larger opening in the sealing area, adding to the life of the valve.

Technical Data

HYDRAULIC Maximum Operating Pressure	REDUCER	RELIEF
	6,000 PSI (414 Bar)	
Hydraulic Media	HWCF, 97/3 Soluble Oil in Water, Synthetics, Mineral Oils and Kerosene	
Viscosity Range at 100° F (38° C)	20 SSU (1.2 Cst.) to 1800 SSU (385 Cst.)	
Maximum Pressure Rating	3 Ranges 1500 PSI (103 Bar), 3000 PSI (207 Bar), 5000 PSI (345 Bar)	
Minimum Set Pressure at Pressure Rating 1500 PSI (103 Bar) 3000 PSI (207 Bar) 6000 PSI (141 Bar)	250 PSI (17 Bar) 250 PSI (17 Bar) 500 PSI (34 Bar)	300 PSI (21 Bar) 450 PSI (31 Bar) 550 PSI (38 Bar)

SIZES

Valve Size	Nominal Inch Size	Flow Rate GPM (LPM)	
P	1 / 4"		
A	1 / 2"	0 - 15 (57)	0 - 2 (8)
C	3 / 4"	10 - 50 (190)	0 - 20 (75)
D	1 - 1 / 4"	40 - 120 (455)	10 - 85 (320)
E	2"	80 - 202 (760)	40 - 190 (720)
F	3"	180 - 500 (760)	180 - 600 (2,500)
G	4"	350 - 800 (3,000)	350 - 1000 (3,800)

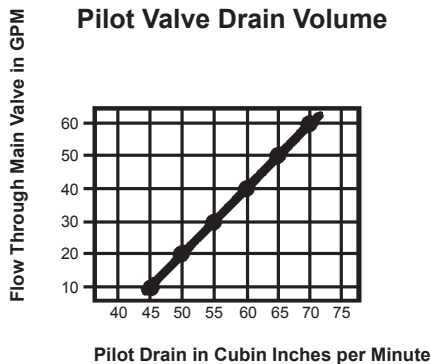
Fluid Temperature Range	HWFC 35° to 150° F (2° to 65° C) Mineral Oil 5° to 150° F (-15° to 65° C)
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Recommended Filtration	50 Micro - 60 Micron Pilot Filter
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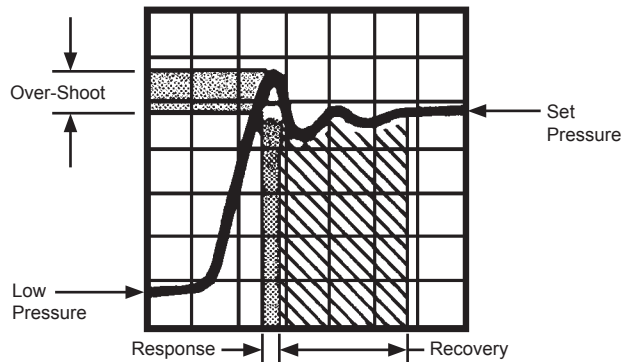
Available Valve Finishes		
Finish	Corrosion Resistance	Description
Carbon Steel	N / A	Standard Valve (Painted Surface)
Black Oxide	Good	Conversion coating by chemical reaction to form a protective surface for corrosion resistance
Black "T"	Better	Elwood's Black "T" surface treatment is as good as 18-8 stainless steel against salt solution spray. Corrosion resistance according to ASTM B117, which is a salt spray test, shows that it is significantly better than hard chrome and electroless nickel.
Stainless Steel	Best	

* It should be noted that other water characteristics also have an affect on the surface, and it will have a reduced protection level when sulfur-reducing and iron-reducing bacteria exists.

Information:



This graph illustrates the pilot valve drain volume that is typical of an Elwood Pressure Control Valve operating at a constant inlet pressure of 5000 PSI.



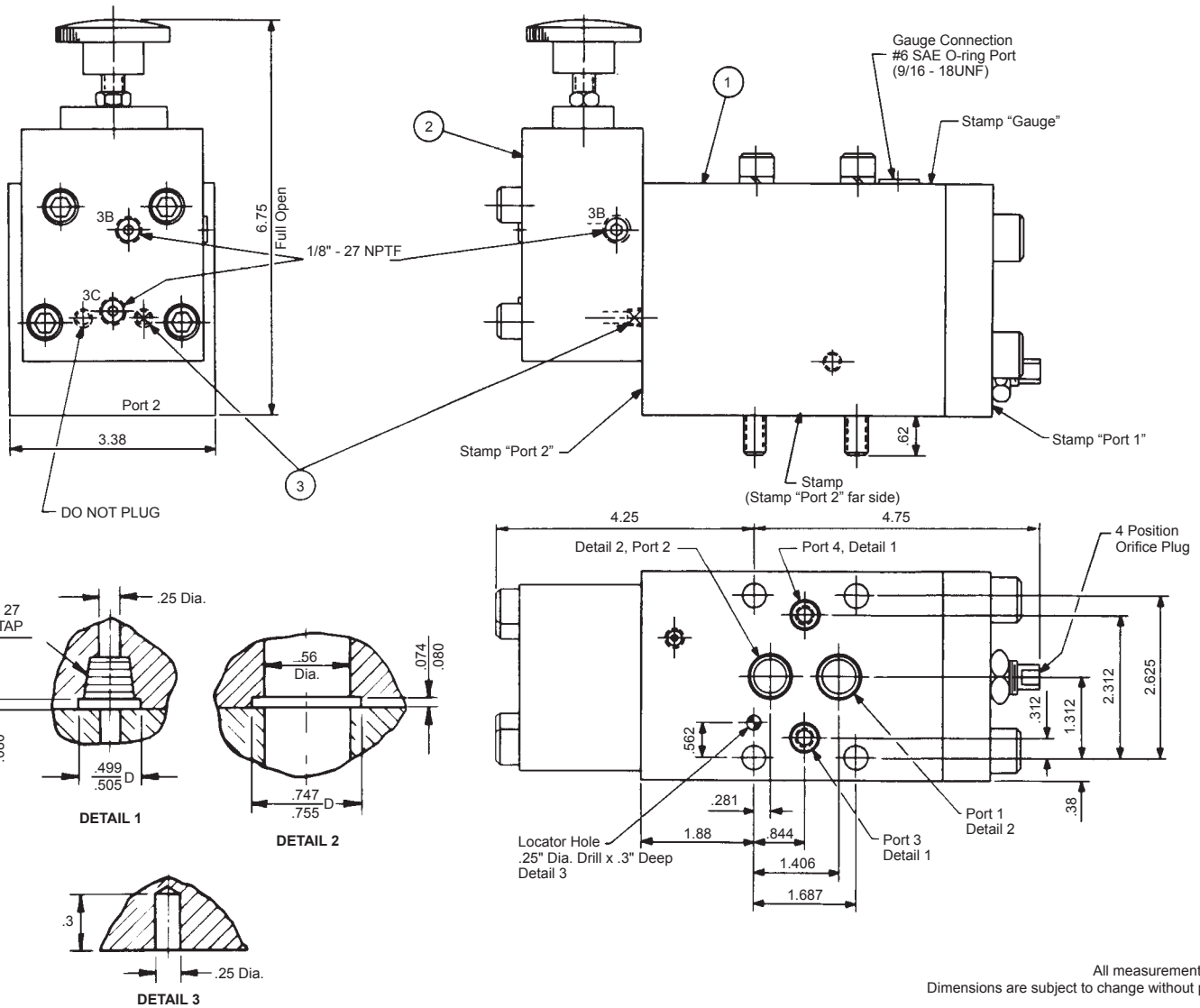
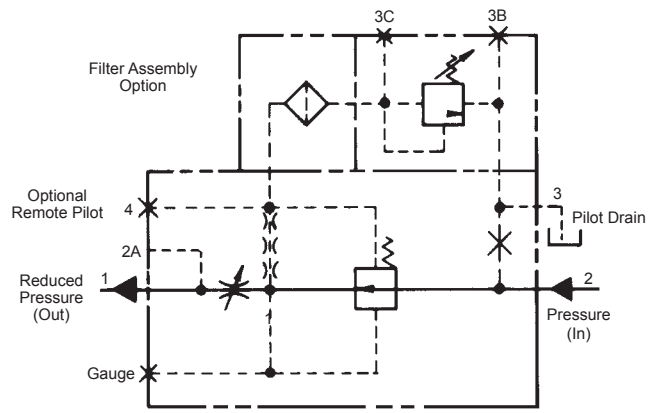
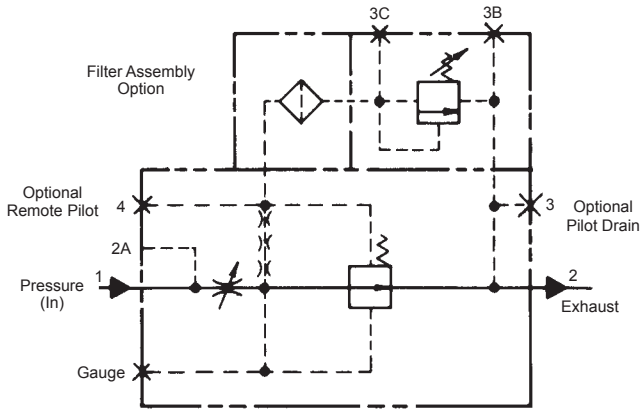
Shown above is a typical oscilloscope graph read-out of a relief valve. During tests, the Elwood Pressure Control Valves revealed the following:

- OVER-SHOOT is approximately 10% greater than set pressure.
- RESPONSE ranges between 50 and 100 milliseconds.
- RECOVERY is normally within 150 milliseconds.
- CRACKING PRESSURE is approximately 10-12% below set pressure.

DEFINITIONS:

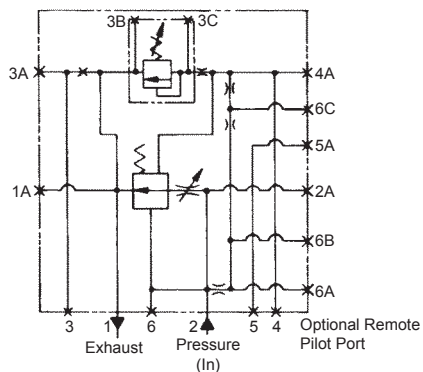
1. CRACKING PRESSUREDefined as the point the main spindle first begins to open.
2. RESPONSE TIME.....Defined as the duration of time from the point the set pressure is first met as the pressure increases, until it is again met as the pressure is falling.
3. PRESSURE OVER-SHOOTDefined as the amplitude of the peak pressure over the set pressure of the valve.
4. RECOVERYIs defined as the amount of time, from the end of the response time, until the valve has stabilized at the set pressure.
5. PRESSURE OVERRIDE.....The difference between full flow and cracking pressure.
6. COMPOUND RELIEF VALVEIs defined as a Relief Valve that operates in two (2) stages. The pilot stage contains the pressure-limiting valve; wherein, a poppet is held against the seat by an adjustable spring. The work port connections are made to the main body, and diversions of the full flow volume is accomplished by the balanced spindle in the main body.
7. BALANCED SPINDLEIs so-named because during normal operations, it is in hydraulic balance.

Data Model 'A'

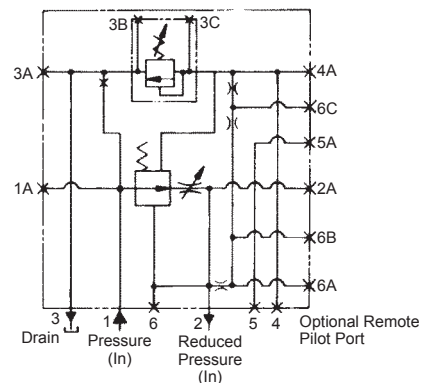


All measurements in inches.
Dimensions are subject to change without prior notice.

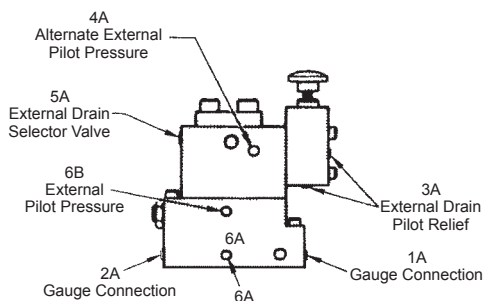
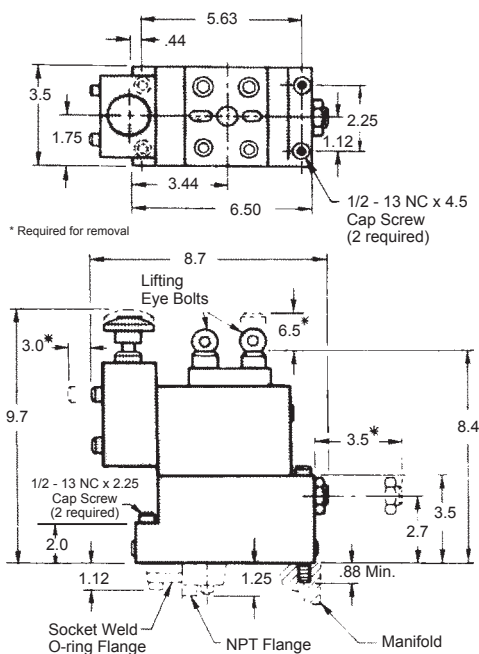
Data Model 'C'



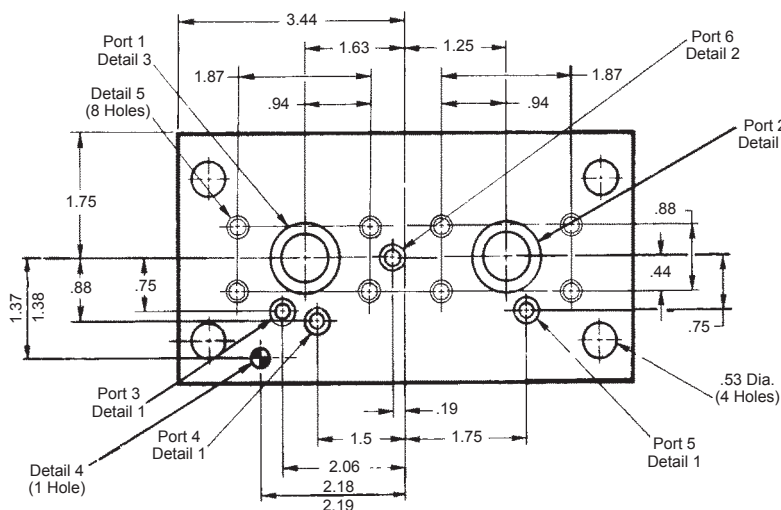
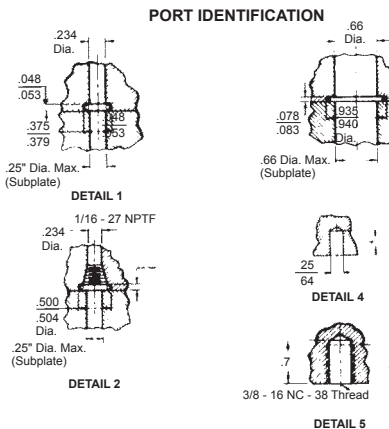
RELIEF VALVE SCHEMATIC



REDUCING VALVE SCHEMATIC



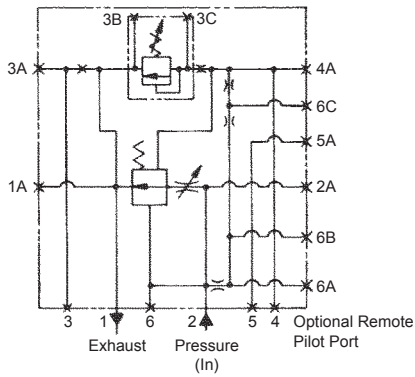
PORT IDENTIFICATION



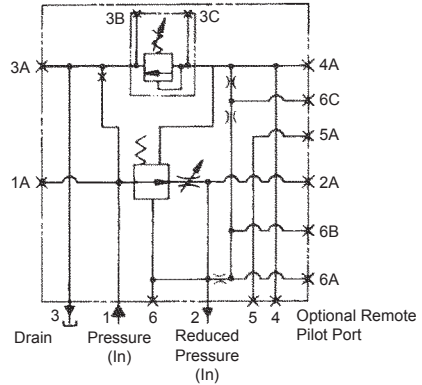
NOTE: Valve designed for manifold mounting (cap screws included) or for inline flange installation. For flange installation, use 3/4" SAE 4 bolt, 61 series companion style (flat face) with clearance holes for cap screws.

All measurements in inches. Dimensions are subject to change without prior notice.

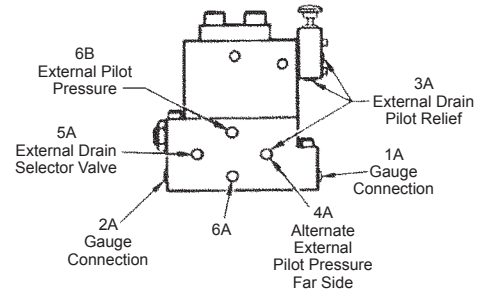
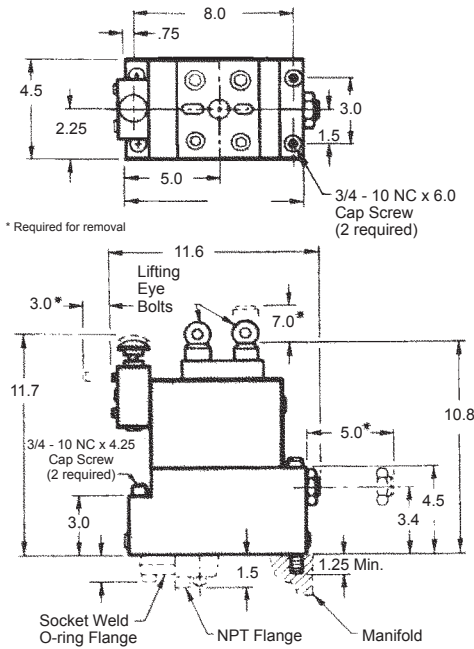
Data Model 'D'



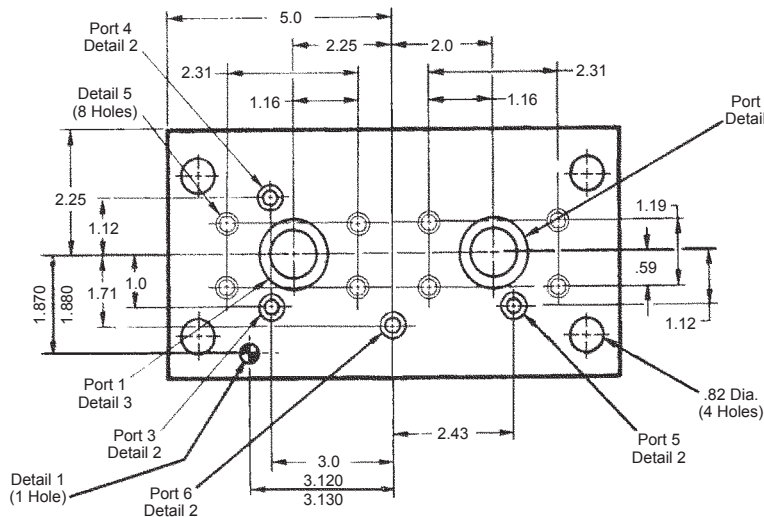
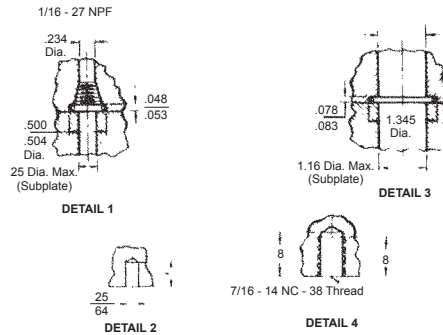
RELIEF VALVE SCHEMATIC



REDUCING VALVE SCHEMATIC



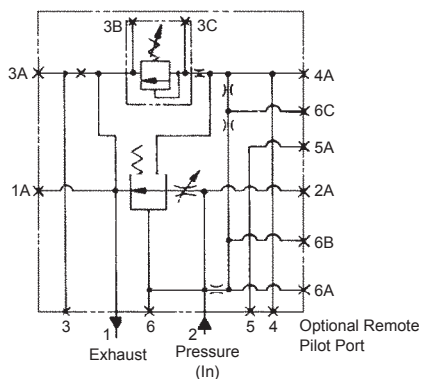
PORT IDENTIFICATION



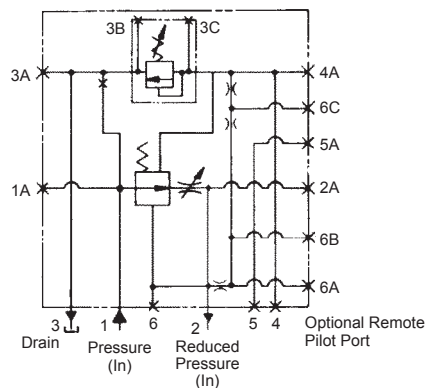
NOTE: Valve designed for manifold mounting (cap screws included) or for inline flange installation. For flange installation, use 3/4" SAE 4 bolt, 61 series companion style (flat face) with clearance holes for cap screws.

All measurements in inches.
Dimensions are subject to change without prior notice.

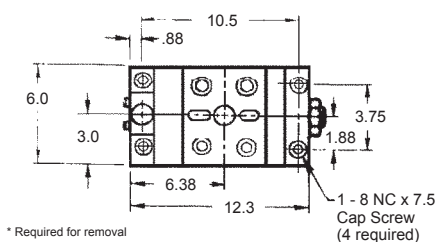
Data Model 'E'



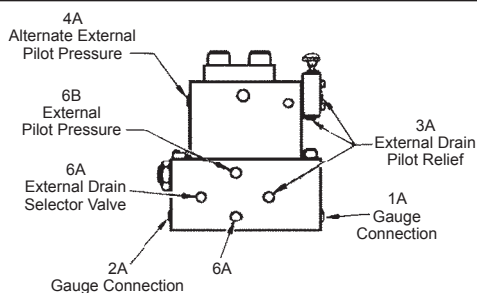
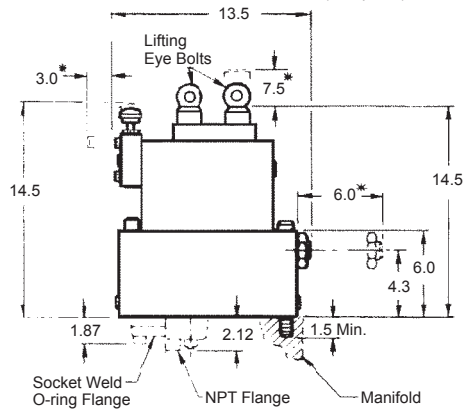
RELIEF VALVE SCHEMATIC



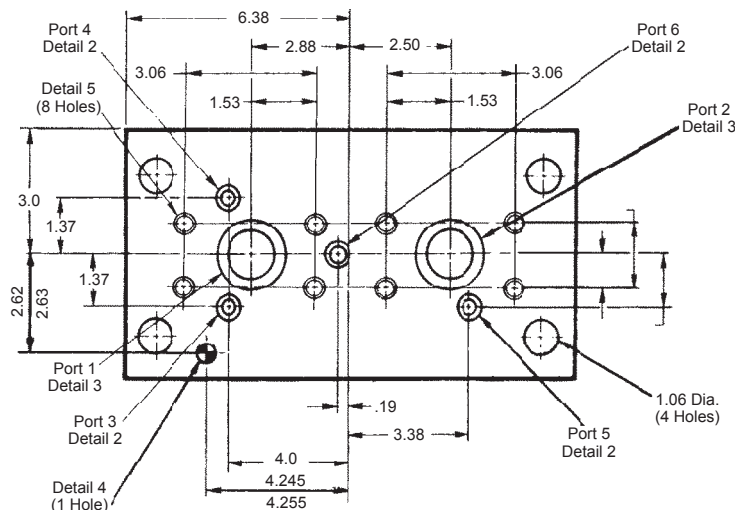
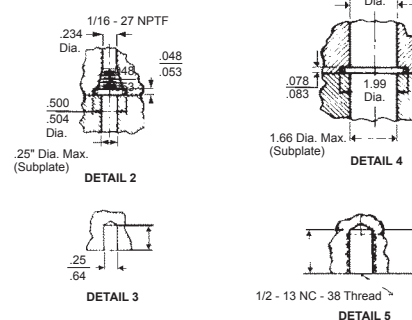
REDUCING VALVE SCHEMATIC



* Required for removal



PORT IDENTIFICATION

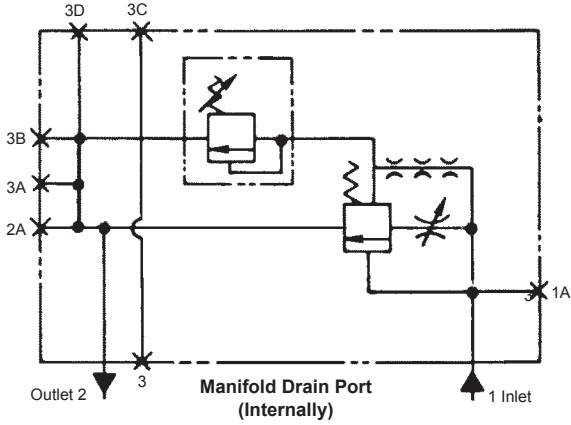


NOTE: Valve designed for manifold mounting (cap screws included) or for inline flange installation. For flange installation, use 2" SAE 4 bolt, 61 series companion style (flat face) with clearance holes for cap screws.

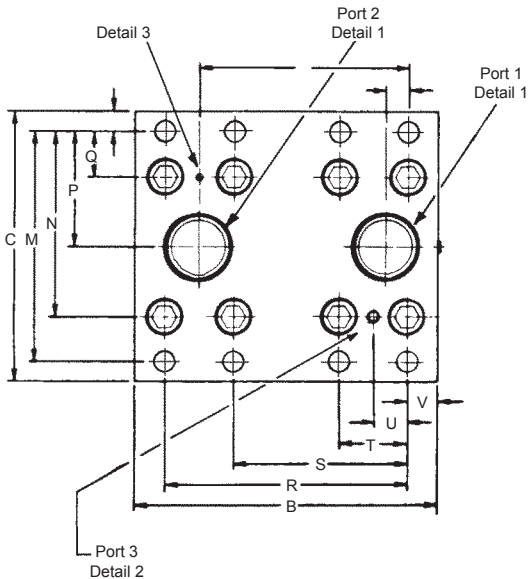
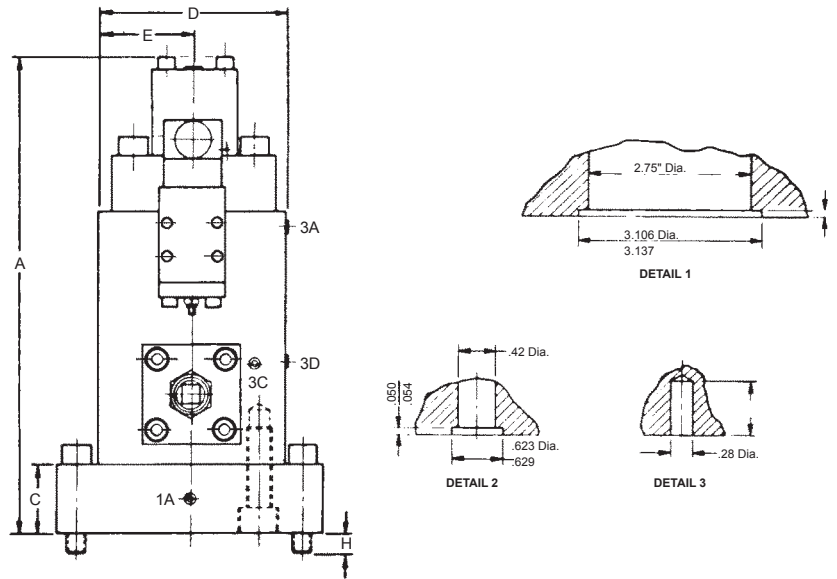
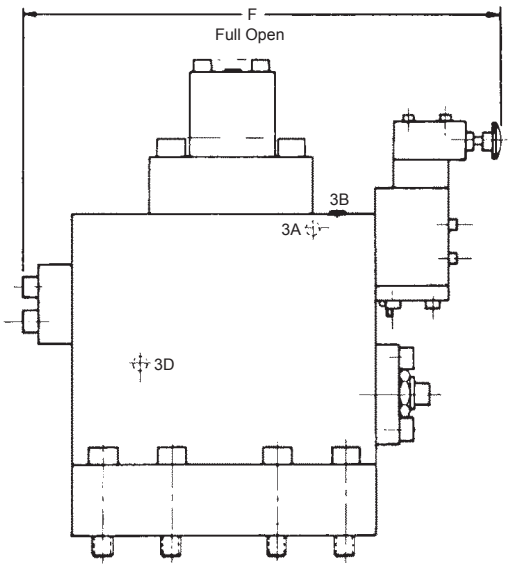
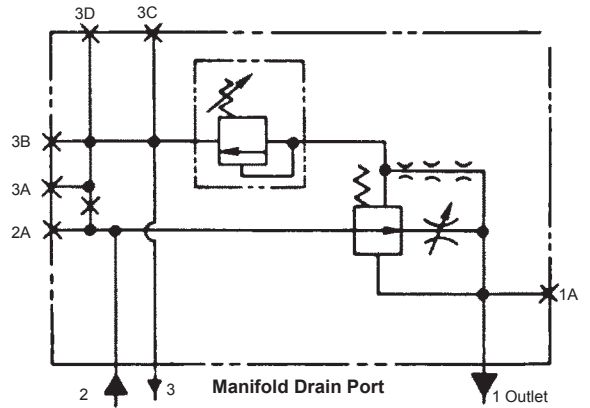
All measurements in inches. Dimensions are subject to change without prior notice.

Data Model 'F' & 'G'

RELIEF



REDUCER



Overall Dimensional Data (A-L)

VALVE MODEL	A	B	C	D	E	F	G	H	J	K	L
F	20.0	12.5	12.0	8.5	4.25	21.5	2.0	1.5	.875	8.5	.88
G	23.7	15.4	13.5	9.5	4.75	24.6	3.4	1.6	1.12	10.6	1.0

Overall Dimensional Data (M-W)

VALVE MODEL	M	N	P	Q	R	S	T	U	V	W
F	10.3	7.13	5.13	2.13	9.5	6.25	3.25	.875	1.50	8.63
G	11.5	9.25	5.75	2.25	12.4	8.88	3.5	1.75	1.5	10.6

All measurements in inches.
Dimensions are subject to change without prior notice.

Ordering Data - Pressure Control Valves

VALVE SIZE			
Flow Range		Type	Code
GPM	LPM		
0-2	8	Relief	PRL
0-20	75	Relief	ARL
0-15	57	Reducer	ARD
10-85	320	Relief	CRL
10-50	190	Unloading Relief	CURL
10-50	190	Reducer	CRD
40-120	720	Relief	DRL
40-120	455	Unloading Relief	DURL
40-120	455	Reducer	DRD
80-300	1140	Relief	ERL
80-200	760	Unloading Relief	EURL
80-200	760	Reducer	ERD
180-660	2500	Relief	FRL
180-550	1900	Unloading Relief	FURL
180-500	1900	Reducer	FRD
350-1000	3800	Relief	GRL
350-800	3000	Unloading Relief	GURL
350-800	3000	Reducer	GRD

PRESSURE RATING	
Code	Description
1.5K	1500 PSI (103 bar)
3K	3000 PSI (207 bar)
6K	6000 PSI (414 bar)

PORT CONNECTION SIZE			
Model Size	Nominal In. Size	Code	Connection Type
P	.25"	1M	Manifold Mounting
A	.5"	2M	Manifold Mounting NFPA P-06 Pattern
C	.75"	3M	Manifold Mounting
D	1.25"	5M	
E	2"	8M	
F	3"	12M	
G	4"	16M	

VALVE ACCESSORIES	
Code	Description
26	Pilot Filter
81	Black "T" Finish
84	Black Oxide Finish
86	Complete Stainless Steel

ELECTRICAL SOLENOIDS (Unloading Relief Models Only)	
Code	Voltage
3	24V D.C.
6	110/120V 50/60Hz A.C.
8	220/240V 50/60Hz A.C.

Other voltages available, consult factory.

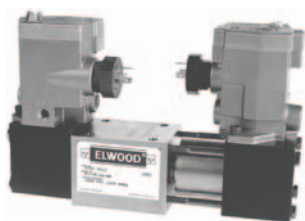
NOTE: For "C", "D" and "E" sizes flanges and screws are included when flanges are specified. Flanges are companion type, flat face, with clearance holes for screws.

• = Standard

CURL - 3K - 3M - 84 - 8

Packed Spool Directional Control Valves

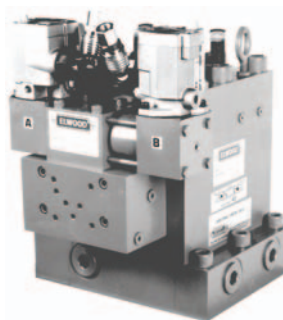
- Directional Valve for a range of applications
- Up to 46 GPM (32 GPM nominal)
- 3000 PSI (207 bar) and 6000 PSI (414 bar)



- Air Solenoid Operated
- 3-position spring centered
- 2-position spring offset
- 2-position momentary contact

Brochure 82

Poppet Type Directional Control Valves



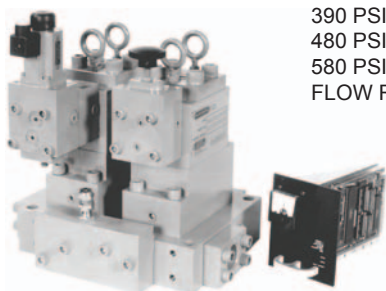
- Capacities to 1600 GPM (6057 LPM)
- 3000 PSI (207 bar), 4500 PSI (310 bar) and 6000 PSI (414 bar) models are available
- Built-in flow control
- Manifold mounted, NPT, socket weld or flanged

Brochure 395

Proportional Pressure Control System

Controlled Pressure Ranges:

390 PSI (27 bar) to 1500 PSI (103 bar)
 480 PSI (33 bar) to 3000 PSI (207 bar)
 580 PSI (40 bar) to 6000 PSI (414 bar)
 FLOW RATE: To 1000 GPM (3785 LPM)



Brochure 104

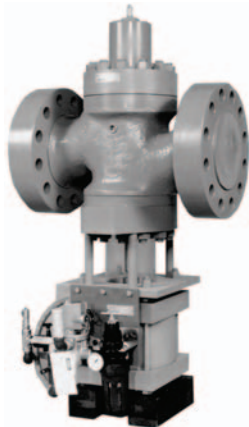
Modular ISO-Lock

- Isolates manifold mounted directional control valves
- Reduces maintenance time - replace Directional Valves without depressureizing and draining hydraulic system.
- Single lever operation to close all four ports (P, T, A, B). Cylinders can remain under the external load without having to be blocked.
- Lockable per OSHA safety standard
- NFPA "DO"/CETOP and special mounting patterns available



Brochure 250

Descaling & Pump Unloading Valves



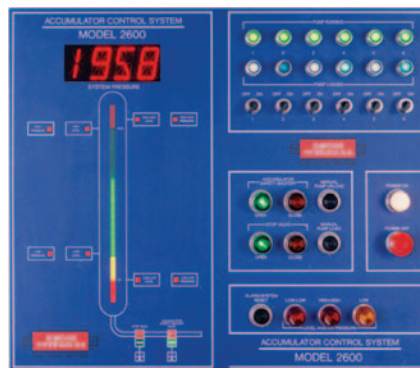
Capacities:

3000 PSI (207 bar)
 6000 PSI (414 bar)
 6000 GPM (22710 LPM)

Connection Sizes: 1-1/4" to 10"

Descaling Valves - Spindle – Brochure 2218
 DIN – Brochure 2219
 Pump Unloading Valves – Brochure 2213

Accumulator Systems



- Descaling
- Mill Systems
- Presses
- Controls
 - Level
 - Pressure
 - Pump Sequencing
 - Ballast Charging
- Designed to your specifications

Brochures 105, 380 & 102



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