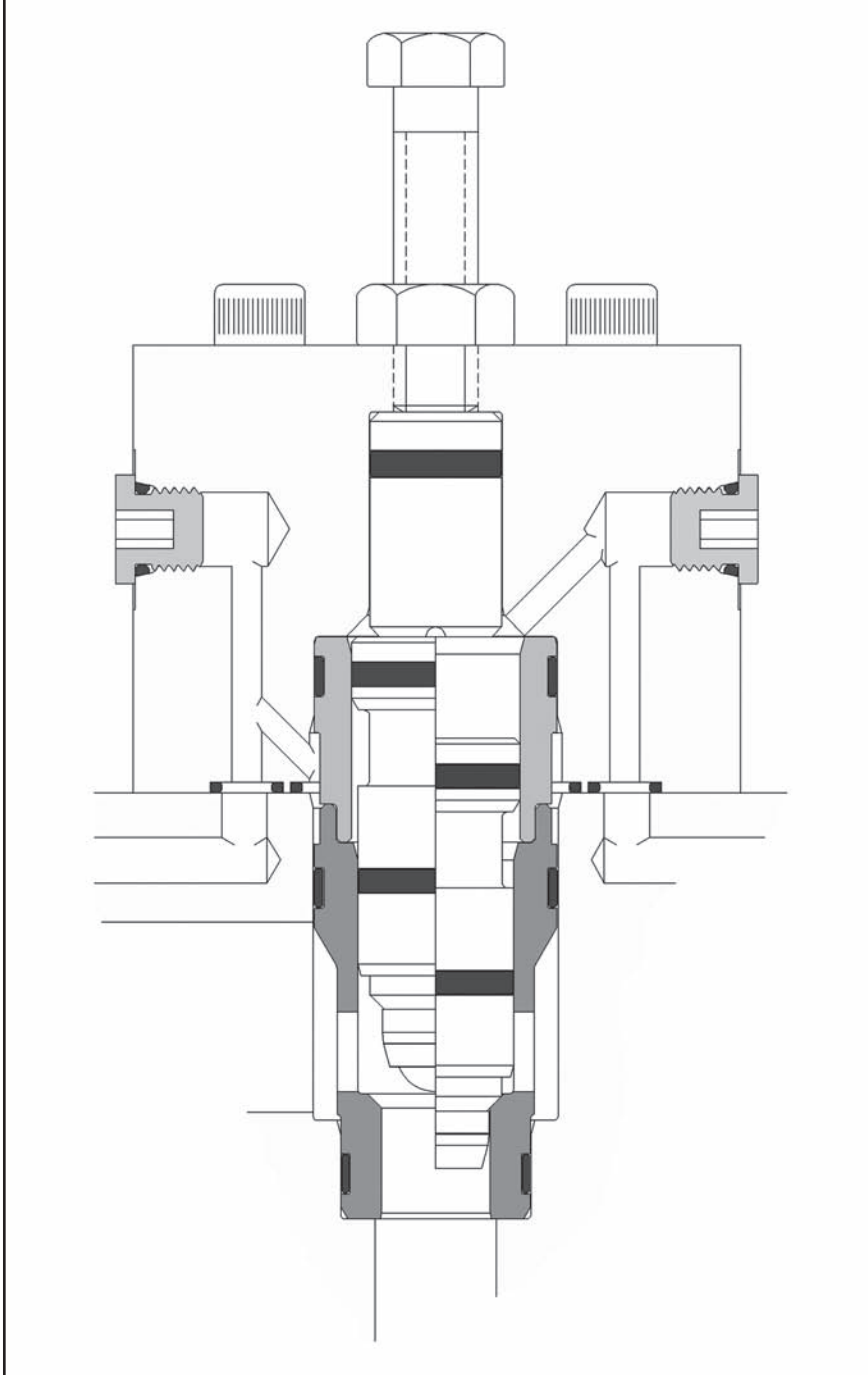
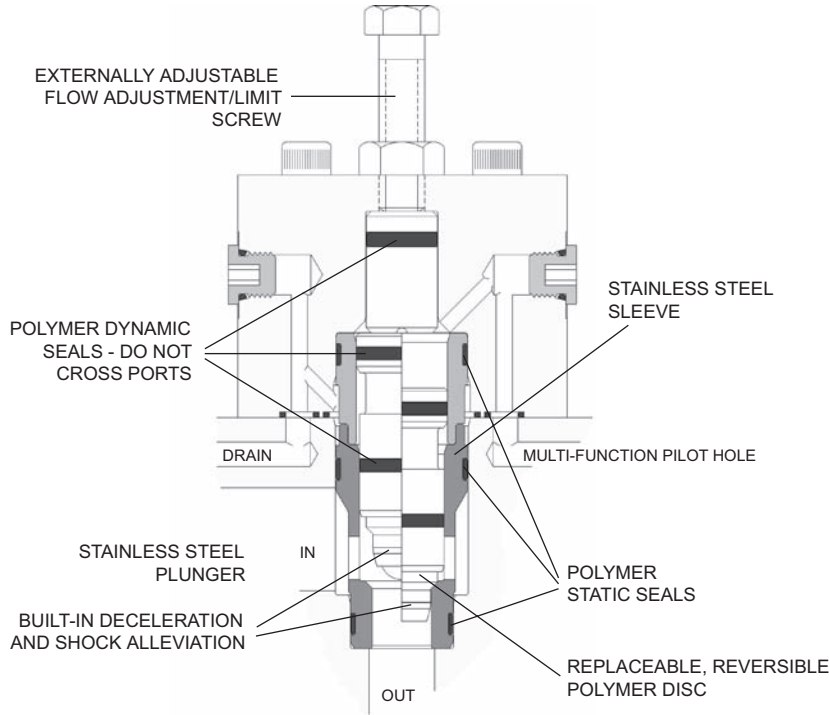


# CARTRIDGE VALVES - DIN SERIES

[www.elwood.com](http://www.elwood.com)



# Directional Control Valves



- Sizes 16 to 100 ISO 7368 / DIN 24342 & Sizes 150, 200 & 300 are Elwood Standard
- Working Pressures to 3000 psi (207 bar), 4500 psi (310 bar) and 6000 psi (414 bar)
- Flow Rates to 15,000 gpm (56,780 l/min.)
- Designed for drop tight sealing and includes All standard Elwood features.

Specific Applications to 10,000 psi (690 bar)

$$\Delta P = \left( \frac{\text{GPM}}{C_v} \right)^2$$

$$C_v = \sqrt{\frac{\text{GPM}^2}{\Delta P}}$$

$$\text{GPM} = C_v \sqrt{\Delta P}$$

P = Pressure drop (psi)  
 GPM = Flow (gpm)  
 Cv = Cv factor

CODE NO. DN - 32 - DCG - 21 -  
 EXAMPLE

CARTRIDGE SIZE	CV (1)/(2)	RECOMMENDED FLOW MAX.	
ELWOOD SIZE 10	3.0 / 4.0	45 gpm	10
ISO SIZE 16	6.6 / 7.8	110 gpm	16
ISO SIZE 25	10.5 / 15.1	210 gpm	25
ISO SIZE 32	19 / 25	310 gpm	32
ISO SIZE 40	30 / 39	500 gpm	40
ISO SIZE 50	40 / 50	680 gpm	50
ISO SIZE 63	65 / 85	1000 gpm	63
ISO SIZE 80	105 / 130	1600 gpm	80
ISO SIZE 100	180 / 230	2700 gpm	100
ELWOOD SIZE 150	330 / 435	5000 gpm	150
ELWOOD SIZE 200	605 / 780	9000 gpm	200
ELWOOD SIZE 300	950 / 1400	14,250 gpm	300

	PRODUCT
DCG	DIRECTIONAL CONTROL GROUP W/STANDARD CAP SIZES 16 THRU 300
DGA	DIRECTIONAL CONTROL GROUP W/FLOW ADJUSTING SCREW SIZES 16 THRU 50 (SHOWN ABOVE)
DGL	DIRECTIONAL CONTROL GROUP W/HYD. ASSISTED LOCK DOWN SIZES 63 THRU 300

MAXIMUM WORKING PRESSURE	
3000 psi (207 bar)	21
4500 psi (310 bar)	31
6000 psi (414 bar)	41

CV(1): CV OF CARTRIDGE IN STANDARD BORE

CV(2): CV OF CARTRIDGE IN BORE WITH INCREASED ANNULUS, SEE DATA SHEET

- DIN SIZES THRU 63 CAN BE MOUNTED IN ANY POSITION.  
 - DIN SIZES 80 & 100, RECOMMENDED TO BE MOUNTED SO THAT THE POPPET IS VERTICAL. FOR EXTENDED SEAL LIFE.  
 - SIZES 150 AND LARGER MUST BE INSTALLED IN VERTICAL POSITION.

# Water Hydraulics The First Fluid

## Elwood Fluid Power Group Description and Brief Company History

The science of modern hydraulics actually began with water hydraulics some 200 years ago and the Elwood Company is one of the few component manufacturers still in existence today which is able to trace its origins right back to those early days.

In 1803, less than a decade after Joseph Bramah ushered in the era of modern hydraulics by patenting the first hydrostatic press, the R D Wood & Griffin Pipe Companies were established, manufacturing water valves and pipes. The Charles Elmes Engineering Works, which became the Elmes Press & Valve Company, was founded in 1851 and manufactured water valves, systems and presses.

These two companies existed independently until the early 1960's when they were purchased by the Nordberg Heavy Machinery Group of Milwaukee. Nordberg combined and expanded both product lines. New developments centered around the, at that time, new poppet valve technology and the extension of the spindle valve range. In 1972, the company Rex Chainbelt bought Nordberg Machinery Group, changing its name to Rexnord. Finally, in 1983, the Elwood Electronics Company purchased the Hydraulic Products Division of Rexnord, which subsequently became the Fluid Power Group of the Elwood Corporation.

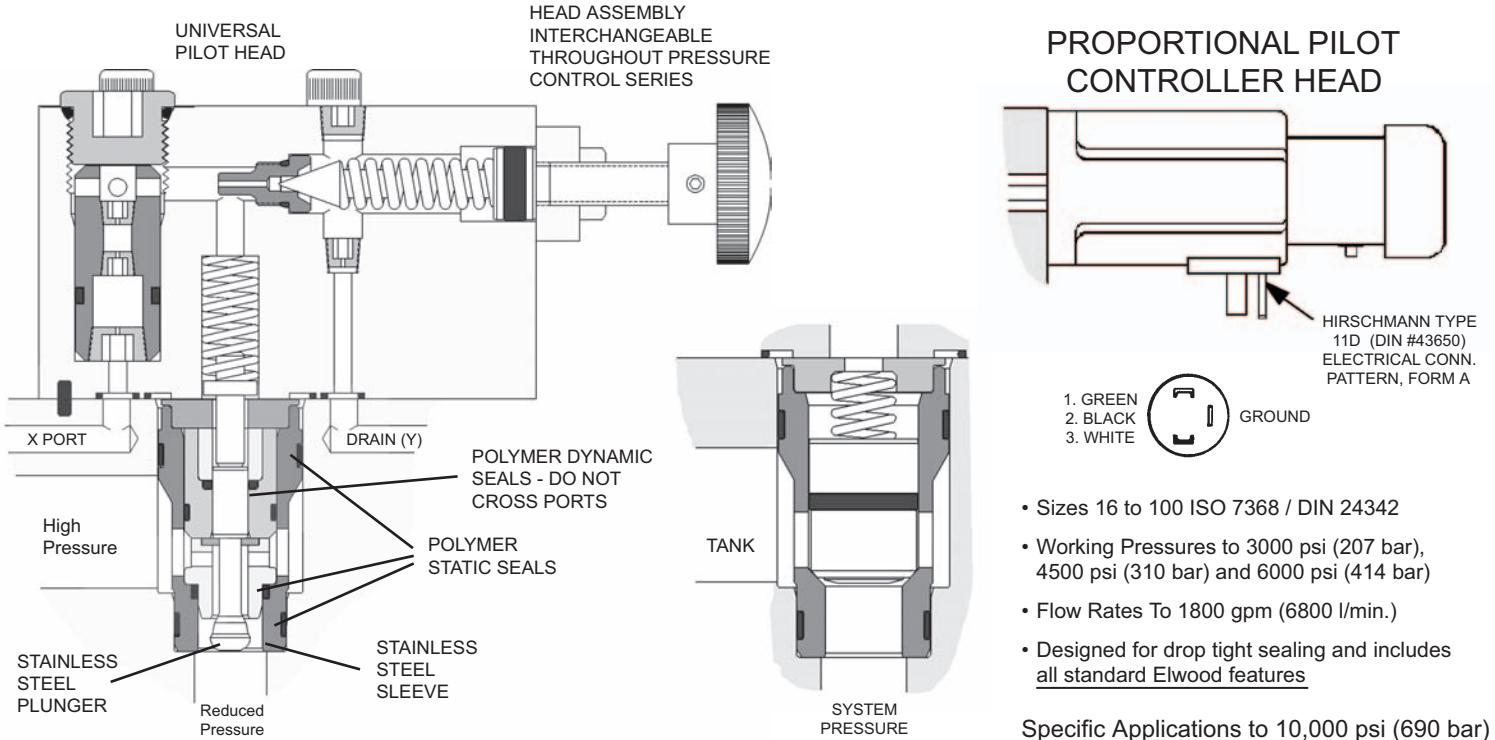
At Elwood, we are very conscious of our heritage. Even today there is an occasional repair or parts inquiry for one of the old R D Wood valves. Now, as then, quality and robustness, and attention to the customer's needs are prime considerations.

The Elwood Corporation is located south of Milwaukee, Wisconsin. Known as the Workshop of America, this area contains the heaviest concentration of specialist metal machining and processing industries in the United States, and provides almost all of the specialty needs of the Elwood product range right on our doorstep. Much of the American oil hydraulics industry can be found in this area too.

The Elwood Product line is designed for service on the HFA fluids (soluble oils, other water-based and low viscosity fluids) as well as water itself. The internal parts of valves are of stainless steel (heat treated where appropriate) and feature Viton seals and drop tight sealing designs. The key to increased performance and equipment reliability lies in this drop tight seal. The high flow velocities and contaminated fluids often found in water hydraulics systems are fatal for components with internal leaks. The resultant long service life is the main reason for our success in the harsh heavy industrial environment. Our success in the newer environmentally driven industries is due first of course to the fluid water itself, and secondly to the high level of control (for example 50 Hz servo technology) which we can offer for more sophisticated applications.

Elwood is a family owned business which continues to flourish and expand in the world market. Elwood's highly talented professional staff utilizes the latest in design technology to provide customers with the finest products available. Elwood products are world leaders and are covered by numerous US and foreign patents. Over the last 10 years, domestic and overseas sales have continued to grow on an annual basis, confirming our investment in modern water hydraulics.

# Pressure Control Cart



- Sizes 16 to 100 ISO 7368 / DIN 24342
  - Working Pressures to 3000 psi (207 bar), 4500 psi (310 bar) and 6000 psi (414 bar)
  - Flow Rates To 1800 gpm (6800 l/min.)
  - Designed for drop tight sealing and includes all standard Elwood features
- Specific Applications to 10,000 psi (690 bar)

CODE NO. EXAMPLE DN - 32 - RDG - 21

CARTRIDGE SIZE	RECOMMENDED FLOW MAX. GPM (L/MIN.)		
	RELIEF & SEQUENCE	REDUCER & UNLOADING RELIEF	
ISO SIZE 16	66 (250)	30 (114)	16
ISO SIZE 25	105 (397)	60 (227)	25
ISO SIZE 32	190 (719)	85 (322)	32
ISO SIZE 40	300 (1136)	130 (492)	40
ISO SIZE 50	400 (1514)	185 (700)	50
*ISO SIZE 63	650 (2460)	320 (1211)	63
*ISO SIZE 80	1050 (3974)	500 (1893)	80
*ISO SIZE 100	1800 (6813)	900 (3407)	100

PRODUCT	
RDG	REDUCER GROUP W/PILOT
RLG	RELIEF GROUP W/PILOT
URG	RELIEF, UNLOADING GROUP WITH PILOT HEAD
SQG	SEQUENCE GROUP W/PILOT
PRDG	PROPORTIONAL REDUCER GROUP W/PILOT
PRLG	PROPORTIONAL RELIEF GROUP W/PILOT

MAXIMUM WORKING PRESSURE	MINIMUM PRESSURE PSI (BAR)		
	RED.	REL.	
3000 psi (207 bar)	300 (21)	400 (28)	21
4500 psi (310 bar)	450 (31)	550 (38)	31
6000 psi (414 bar)	600 (41)	700 (48)	41

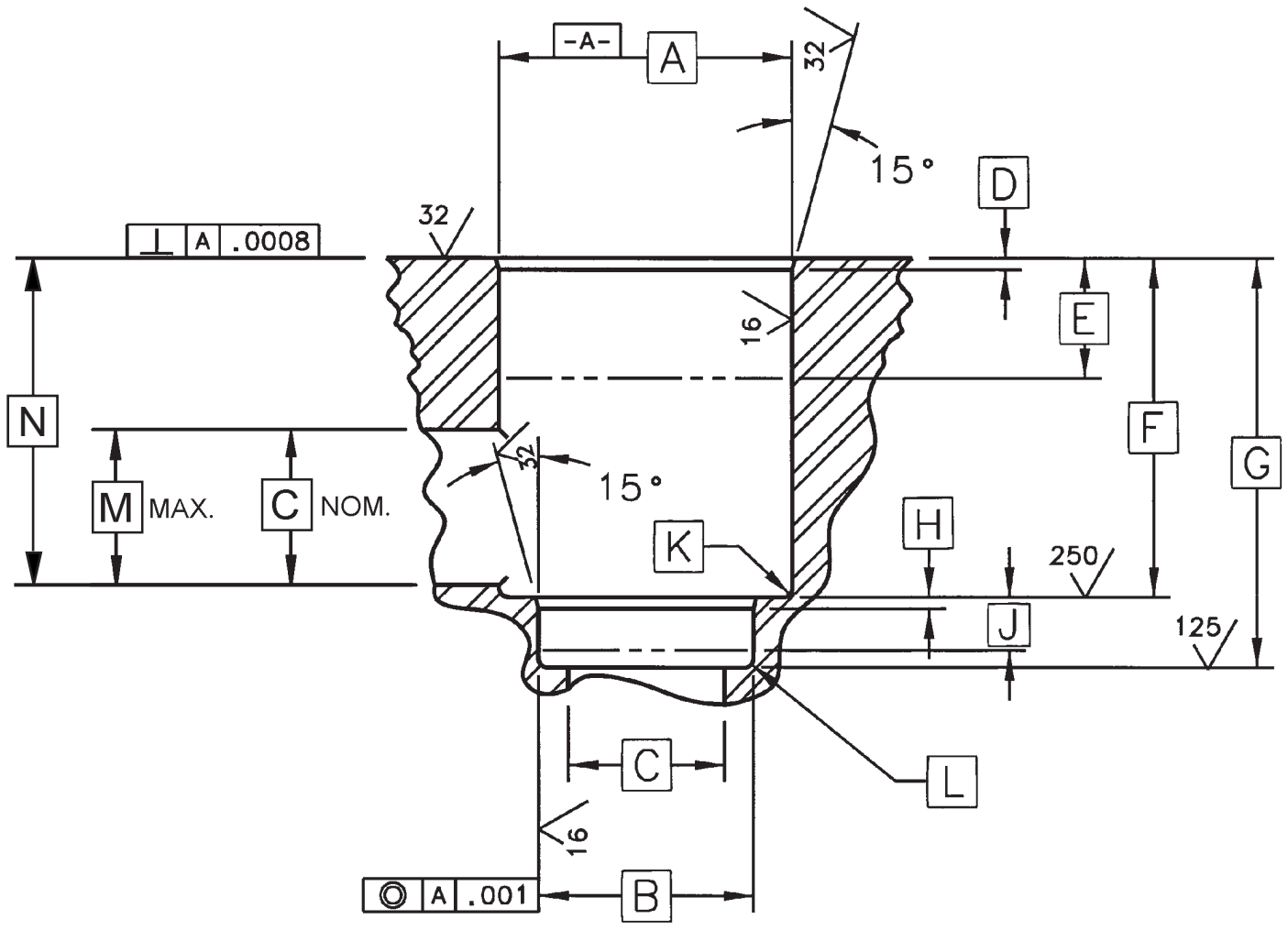
CONTROLLER AND MOUNTING RACK ARE ORDERED SEPARATELY.

\* NON-STOCK

- DIN SIZES THRU 63 CAN BE MOUNTED IN ANY POSITION.  
 - DIN SIZES 80 & 100, RECOMMENDED TO BE MOUNTED SO THAT THE POPPET IS VERTICAL. FOR EXTENDED SEAL LIFE.

SEE PAGE 7 FOR MOUNTING INFORMATION

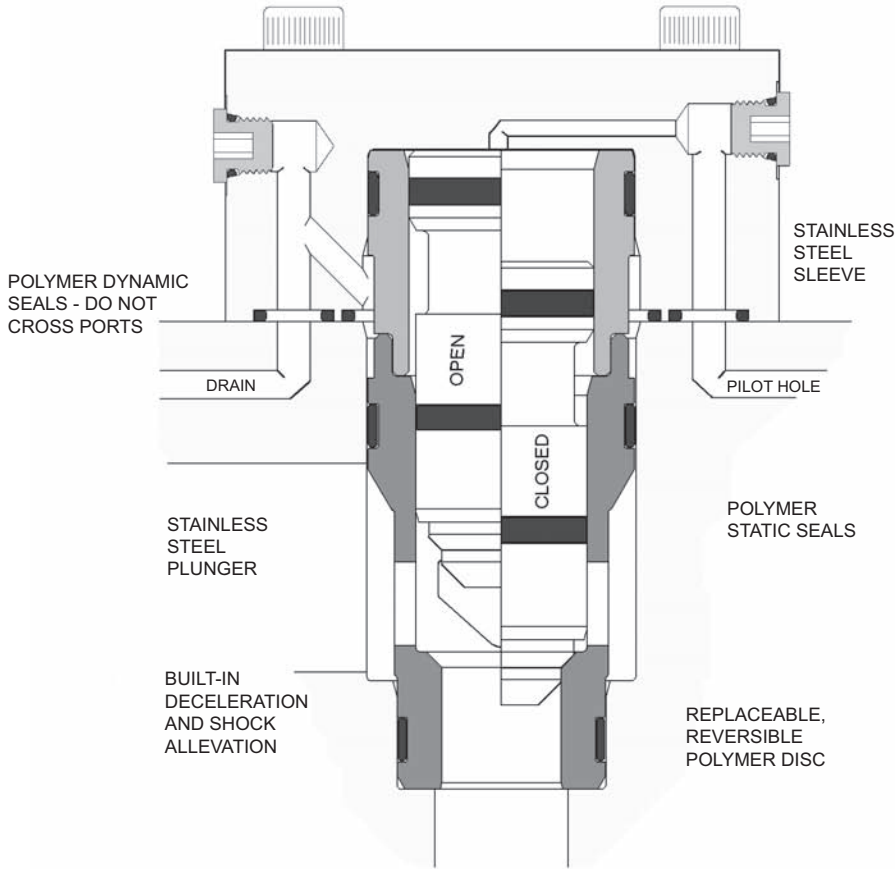
# Data Sheet - DN Cavity Dimensions



DN	A	B	C	D	E	F	G	H	J	K	L	M	N
10	.866 D.	.630 D.	.394 D.	.079	.531	1.201	1.654	.079	.380	.03 R.	.02 R.	.630	1.181
150	8.858 D.	7.874 D.	5.906 D.	.217	2.62	10.099	11.813	.276	1.220	.25 R.	.09 R.	7.10	10.019
200	11.811 D.	10.629 D.	7.874 D.	.217	3.38	14.549	16.734	.315	1.772	.09 R.	.09 R.	9.85	14.488

ABOVE CAVITY SIZES ARE IN ACCORDANCE WITH ELWOOD STANDARDS.  
 DATA SHOWN ABOVE IS FOR REFERENCE ONLY.  
 CONTACT ELWOOD FOR CERTIFIED DRAWING PRIOR TO MANUFACTURING.  
 DIMENSIONS SHOWN ARE IN INCHES.

# Descale 2-Way Cartridges



- Sizes 16 to 100 ISO 7368 / DIN 24342 & Sizes 150, 200 & 300 are Elwood Standard
- Working Pressures to 3000 psi (207 bar), 4500 psi (310 bar) and 6000 psi (414 bar)
- Flow Rates to 10,000 gpm (40,000 l/min.)
- Designed for drop tight sealing and includes all standard Elwood features

Specific Applications to 10,000 psi (680 bar)

$$\Delta P = \left( \frac{\text{GPM}}{C_v} \right)^2$$

$$C_v = \sqrt{\frac{\text{GPM}^2}{\Delta P}}$$

$$\text{GPM} = C_v \sqrt{\Delta P}$$

P = Pressure drop (psi)

GPM = Flow (gpm)

Cv = Cv factor

CODE NO. EXAMPLE DN - 32 - DSG - 21 -

CARTRIDGE SIZE	CV <sub>(1)</sub>	FLOW @ 15/60 DP GPM	CV <sub>(1)</sub>	FLOW @ 15/60 DP GPM	
ISO SIZE 32	20	77/155	24	98/186	32
ISO SIZE 40	36	140/279	44	170/341	40
ISO SIZE 50	50	194/387	63	244/488	50
ISO SIZE 63	82	318/635	98	380/759	63
ISO SIZE 80	115	445/891	144	558/1115	80
ISO SIZE 100	220	852/1704	265	1026/2053	100
ELWOOD SIZE 150	356	1379/2758	430	1665/3331	150
ELWOOD SIZE 200	770	2985/5964	924	3579/7157	200
*ELWOOD SIZE 300	1450	5620/11,230	1900	7360/14,700	300

\* NON-STOCK

PRODUCT	
SOG	DESCALE GROUP WITH CAP (SHOWN ABOVE)

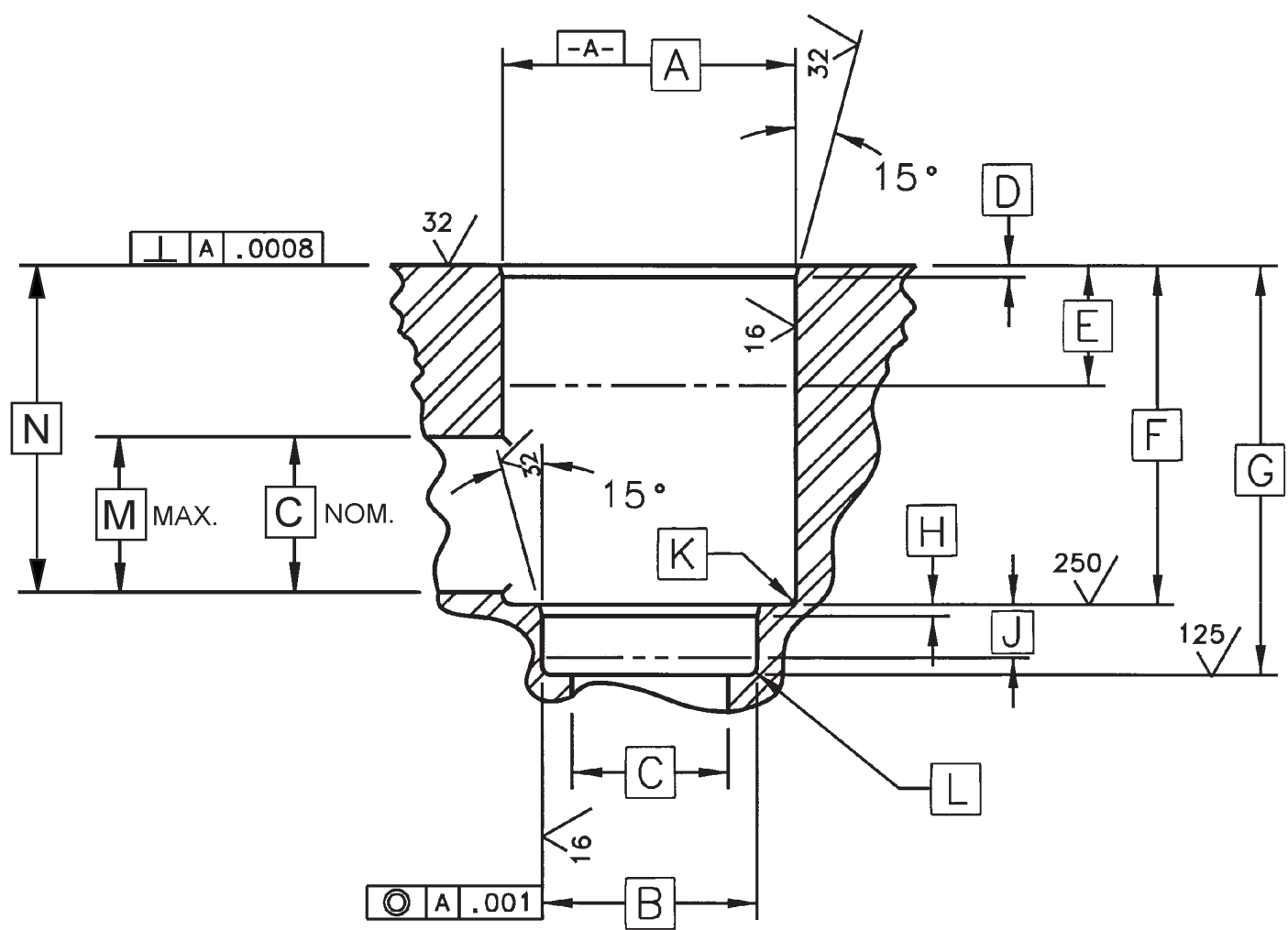
MAXIMUM WORKING PRESSURE	
21	3000 psi (207 bar)
31	4500 psi (310 bar)
41	6000 psi (414 bar)

CV<sub>(1)</sub>: CV OF CARTRIDGE IN STANDARD BORE

CV<sub>(2)</sub>: CV OF CARTRIDGE IN BORE WITH INCREASED ANNULUS, SEE DATA SHEET

- DIN SIZES THRU 63 CAN BE MOUNTED IN ANY POSITION.
- DIN SIZES 80 & 100, RECOMMENDED TO BE MOUNTED SO THAT THE POPPET IS VERTICAL. FOR EXTENDED SEAL LIFE.
- SIZES 150 AND LARGER MUST BE INSTALLED IN VERTICAL POSITION.

# Data Sheet - DIN Cavity Dimensions

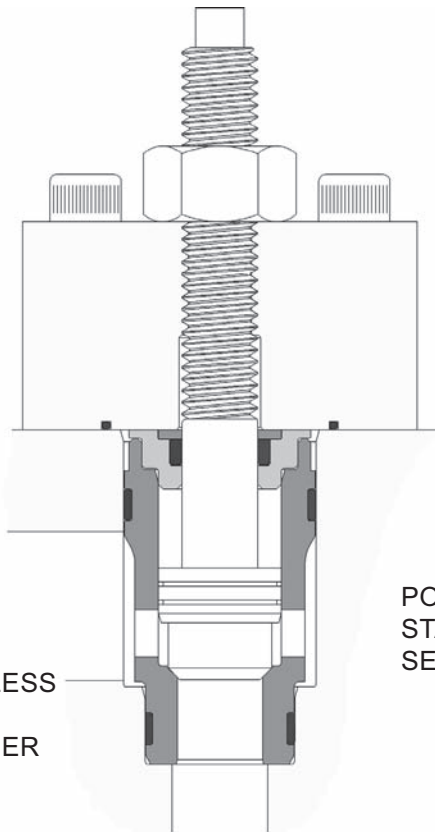


DN	A	B	C	D	E	F	G	H	J	K	L	M	N
16	1.260 D.	.984 D.	.630 D.	.079	.787	1.693	2.205	.079	.433	.06 R.	.06 R.	.985	1.673
25	1.772 D.	1.339 D.	.984 D.	.098	1.181	2.284	2.835	.098	.472	.06 R.	.06 R.	1.26	2.244
32	2.362 D.	1.772 D.	1.260 D.	.098	1.181	2.756	3.347	.098	.512	.06 R.	.06 R.	1.58	2.697
40	2.952 D.	2.164 D.	1.575 D.	.098	1.181	3.426	4.134	.098	.512	.09 R.	.09 R.	1.575	3.327
50	3.543 D.	2.677 D.	1.969 D.	.157	1.378	3.938	4.804	.118	.669	.09 R.	.09 R.	2.48	3.839
63	4.724 D.	3.544 D.	2.480 D.	.157	1.575	5.119	6.103	.157	.787	.09 R.	.09 R.	3.15	5.000
80	5.709 D.	4.331 D.	3.150 D.	.197	1.575	6.891	8.072	.197	.984	.09 R.	.09 R.	3.94	6.713
100	7.086 D.	5.315 D.	3.937 D.	.197	1.969	8.269	9.647	.197	1.142	.09 R.	.09 R.	5.91*	8.092

\*150mm (5.91") ELWOOD STANDARD; ISO/DIN IS 125mm (4.92")

ABOVE CAVITY SIZES ARE IN ACCORDANCE WITH ISO 7368/DIN 24 342 STANDARDS  
 DATA SHOWN ABOVE IS FOR REFERENCE ONLY.  
 DIMENSIONS SHOWN ARE IN INCHES.

# Stop and Throttle Valve Cartridges



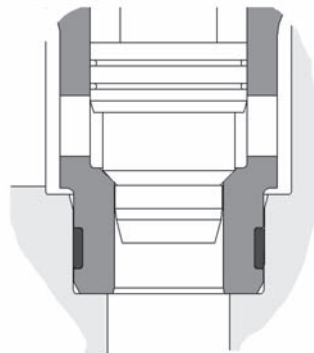
STAINLESS  
STEEL  
SLEEVE

STAINLESS  
STEEL  
PLUNGER

POLYMER  
STATIC  
SEALS

- Sizes 16 to 100 ISO 7368 / DIN 24342 and Sizes 150 & 200 are Elwood Standard
- Working Pressures to 3000 psi (207 bar), 4500 psi (310 bar) and 6000 psi (414 bar)
- Flow Rates To 8000 gpm (30,000 l/min.)
- Designed for drop tight sealing and includes all standard Elwood features.

Specific Applications to 10,000 psi (690 bar;)



THROTTLE

$$\Delta P = \left( \frac{\text{GPM}}{C_v} \right)^2$$

$$C_v = \sqrt{\frac{\text{GPM}^2}{\Delta P}}$$

$$\text{GPM} = C_v \sqrt{\Delta P}$$

P = Pressure drop (psi)

GPM = Flow (gpm)

Cv = Cv factor

CODE NO. DN - 32 - 21 - SOG -  
EXAMPLE

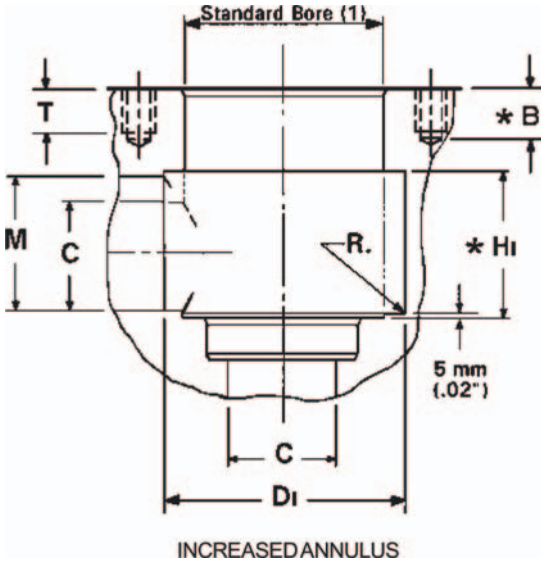
CARTRIDGE SIZE	CV		RECOMMENDED FLOW MAX.	
	STOP	THROTTLE		
ELWOOD SIZE 10	N.A.	1.4	40 / 50 gpm	10
ISO SIZE 16	8	6	90 / 110 gpm	16
ISO SIZE 25	15	11	170 / 210 gpm	25
ISO SIZE 32	25	19	250 / 310 gpm	32
ISO SIZE 40	39	30	400 / 500 gpm	40
ISO SIZE 50	50	40	550 / 680 gpm	50
ISO SIZE 63	80	72	800 / 1000 gpm	63

MAXIMUM WORKING PRESSURE	
21	3000 psi (207 bar)
31	4500 psi (310 bar)
41	6000 psi (414 bar)

PRODUCT	
SOG	SHUT OFF GROUP, WITH CAP (SHOWN ABOVE)
TRG	THROTTLE GROUP WITH CAP
TCG	THROTTLE CHECK GROUP, W/CAP



# Data Sheet - Increased Annulus




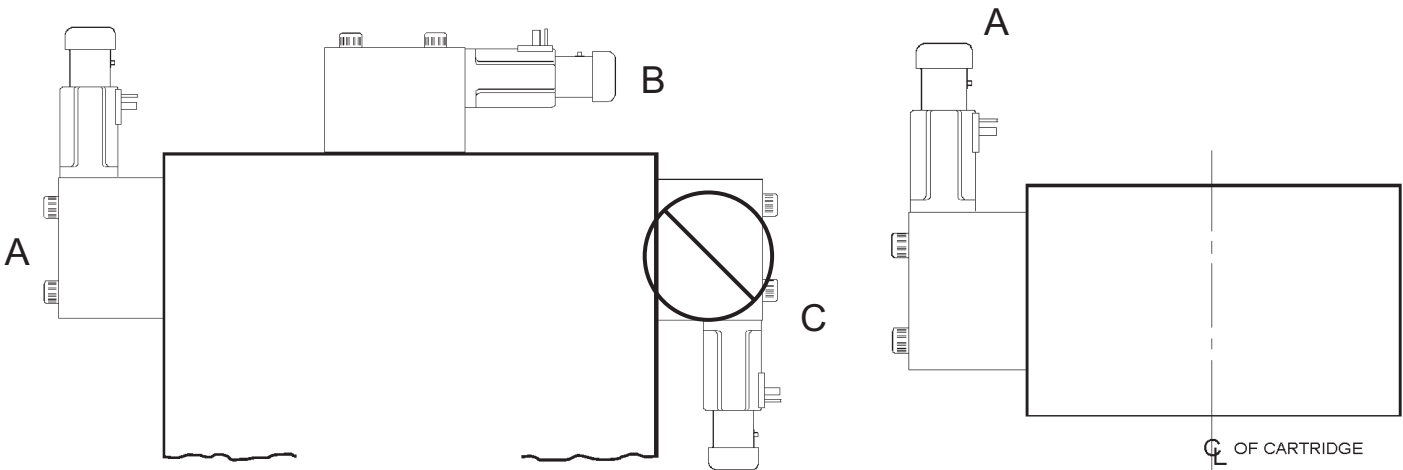
DN	C	M	DI	* HI	* B	T	STD. BORE (1) REF.
10	10 (.39)	16 (.63)	28 (1.12)	16 (.63)	---	---	22 (.87)
16	16 (.63)	25 (.98)	44 (1.73)	19 (.75)	---	---	32 (1.26)
25	25 (.98)	32 (1.26)	56 (2.21)	28 (1.10)	---	---	45 (1.77)
32	32 (1.26)	40 (1.58)	73 (2.87)	35 (1.38)	---	---	60 (2.37)
40	40 (1.58)	50 (1.97)	87 (3.43)	51 (2.00)	---	---	75 (2.95)
50	50 (1.97)	63 (2.48)	115 (5.54)	47 (1.85)	43.7 (1.72)	38 (1.50)	90 (3.54)
63	63 (2.48)	80 (3.15)	145 (5.72)	76 (3.00)	46 (1.81)	38 (1.50)	120 (4.72)
80*	80 (3.15)	100 (3.94)	183 (7.21)	101 (4.00)	57 (2.25)	51 (2.00)	145 (5.71)
100*	100 (3.94)	150 (5.91)	218 (8.58)	101 (4.00)	79 (3.12)	72 (2.81)	180 (7.08)
150*	150 (5.91)	180 (7.09)	262 (10.30)	165 (6.50)	73 (2.88)	63.5 (2.50)	225 (8.86)
200*	200 (7.88)	250 (9.84)	350 (13.80)	200 (7.88)	---	---	300 (11.81)

\* IF DIMENSION "B" EXCEEDS SPECIFIED DEPTH, DIM. "HI" MUST BE REDUCED TO AVOID MOUNTING HOLES BREAKING INTO INCREASED ANNULUS "DI".

DIMENSIONS mm (in.)

DATA SHOWN ABOVE IS FOR REFERENCE ONLY. CONTACT ELWOOD FOR DETAILED INFORMATION.

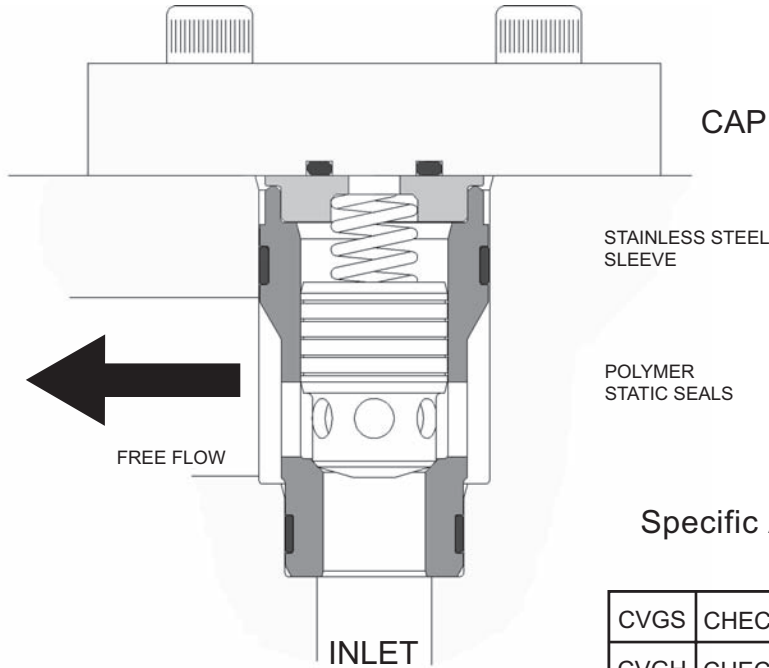
- A) RECOMMENDED MOUNTING POSITION FOR THE PROPORTIONAL SOLENOID IS VERTICAL, WITH THE SOLENOID ON TOP, TO MINIMIZE HYSTERISIS.
- B) ALTERNATE, THE PROPORTIONAL SOLENOID MAY BE MOUNTED HORIZONTAL.
- C)  THE PROPORTIONAL SOLENOID SHOULD NOT BE MOUNTED ON THE BOTTOM.



ABOVE ARE SUGGESTED DIMENSIONS TO PROVIDE AN INCREASED FLOW AREA AROUND THE ELWOOD CARTRIDGE. INCLUDING THIS INCREASED ANNULUS IN THE MANIFOLD SIGNIFICANTLY INCREASES THE FLOW CAPACITY AND REDUCES THE PRESSURE DROP THRU THE VALVE. HOUSING DESIGN NEEDS TO INCORPORATE CLEARANCE FOR THIS INCREASED ANNULUS AND OTHER MACHINED PASSAGES.

(1) SIZES 16 THRU 100 BORE CONFIGURATION PER ISO 7368/DIN 24 342  
SIZES 10, 150 & 200 TO ELWOOD STANDARD  
ABOVE DIMENSIONS ARE REFERENCE  
REFER TO STANDARD FOR PRECISE DIMENSIONS

# Check Valve Cartridges



- Sizes 16 to 100 ISO 7368 / DIN 24342 and Sizes 150 & 200 are Elwood Standard
- Working Pressures to 3000 psi (207 bar), 4500 psi (310 bar) and 6000 psi (414 bar)
- Flow Rates to 8000 gpm (30,000 l/min.)
- Designed for drop tight sealing and includes all standard Elwood features

Specific Applications to 10,000 psi (690 bar)

CVGS	CHECK VALVE GROUP, SOFT SEAT
CVGH	CHECK VALVE GROUP, HARD SEAT

CODE NO. EXAMPLE DN - 32 - CVGS - 21 - L

$$\Delta P = \left( \frac{\text{GPM}}{C_v} \right)^2$$

$$C_v = \sqrt{\frac{\text{GPM}^2}{\Delta P}}$$

$$\text{GPM} = C_v \sqrt{\Delta P}$$

P = Pressure drop (psi)

GPM = Flow (gpm)

Cv = Cv factor

CARTRIDGE SIZE	CV <sub>(1)/(2)</sub>	RECOMMENDED FLOW MAX.	
ELWOOD SIZE 10	5 / 6	40 / 50 gpm	10
ISO SIZE 16	7.5 / 9	90 / 110 gpm	16
ISO SIZE 25	15 / 18	170 / 210 gpm	25
ISO SIZE 32	22 / 26	250 / 310 gpm	32
ISO SIZE 40	36 / 44	400 / 500 gpm	40
ISO SIZE 50	50 / 63	550 / 680 gpm	50
ISO SIZE 63	80 / 100	800 / 1000 gpm	63
ISO SIZE 80	120 / 150	1280 / 1600 gpm	80
ISO SIZE 100	220 / 288	2200 / 2700 gpm	100
*ELWOOD SIZE 150	356 / 430	4000 / 5000 gpm	150
*ELWOOD SIZE 200	680 / 870	7200 / 9000 gpm	200

MAXIMUM WORKING PRESSURE	
21	210 BAR (3000 PSI)
31	310 BAR (4500 PSI)
41	410 BAR (6000 PSI)

CRACKING PRESSURE	
L	Low, 3-5 psi
M	Medium, 15-20 psi
H	High 60-70 psi
S	Special (State Requirement)

CVs STATED ARE FOR FLOW FROM INLET TO OUT AT 90°, NEGLECTING THE SPRING.

CV<sub>(1)</sub>: CV OF CARTRIDGE IN STANDARD BORE

CV<sub>(2)</sub>: CV OF CARTRIDGE IN BORE WITH INCREASED ANNULUS, SEE DATA SHEET

- DIN SIZES THRU 63 CAN BE MOUNTED IN ANY POSITION.

- DIN SIZES 80 & 100, RECOMMENDED TO BE MOUNTED SO THAT THE POPPET IS VERTICAL. FOR EXTENDED SEAL LIFE.

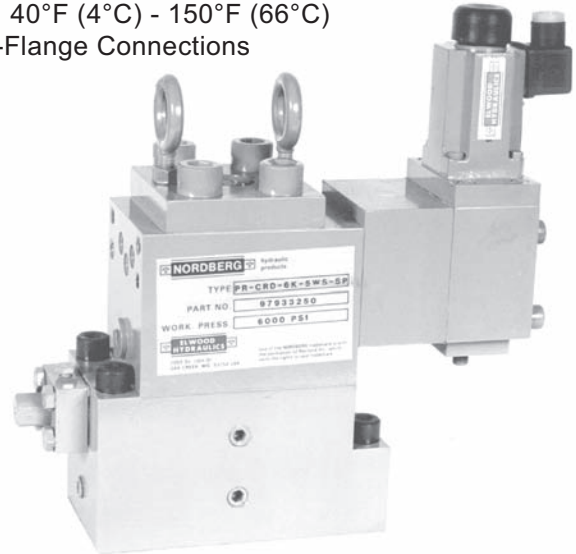
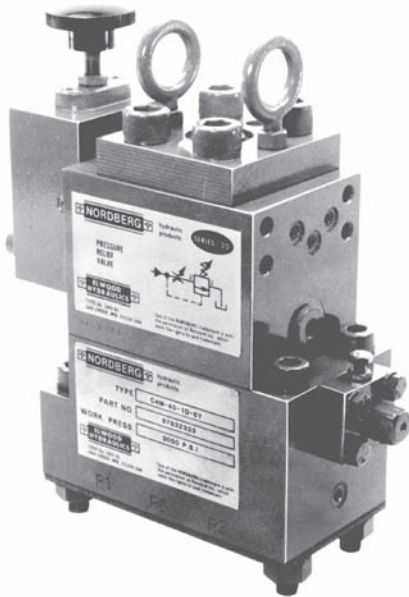
- \*SIZES 150 AND LARGER MUST BE INSTALLED IN VERTICAL POSITION.

# Pressure Control Valve

- Pressure Reducing Valve
- Pressure Relief Valve
- Unloading Relief Valve

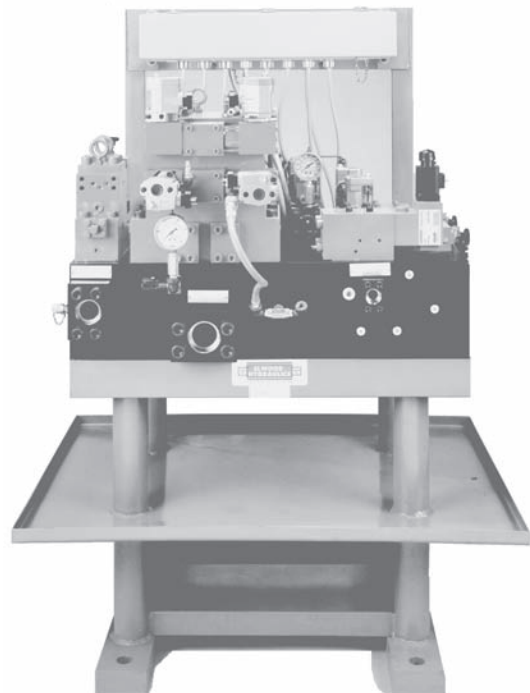
- Precision Proportional Pressure Control
- 300 psi (21 bar) - 6000 psi (414 bar)
- 10 gpm (38 l/min.) - 1000 gpm (3785 l/min.)
- Fluid Media: Water-Soluble Oil - Low Viscosity Fluids - Fire-Resistant Fluids
- Operating Temperature: 40°F (4°C) - 150°F (66°C)
- Manifold Mount or SAE-Flange Connections

- Request Bulletin 500



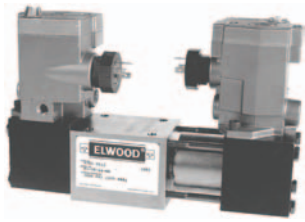
# Valve Stands, Manifolds and Systems

- Customized control valve packages including valve stand and forged steel manifold with SAE flange connections, wiring and common air line to all pilots.
- Designed to meet customer circuit requirements.
- Optional modular isolation valves for reduced maintenance time.
- Integrate Elwood valves and customized electronic controls with non-Elwood components for single source convenience.



## Packed Spool Directional Control Valves

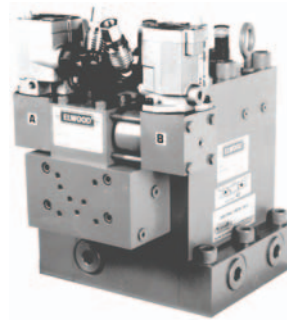
- Directional Valve for a range of applications
- Up to 46 GPM (32 GPM nominal)
- 3000 PSI (207 bar) and 6000 PSI (414 bar)



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

Brochure 82

## Poppet Type Directional Control Valves



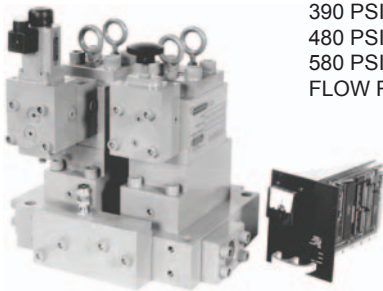
- Capacities to 1600 GPM (6057 LPM)
- 3000 PSI (207 bar), 4500 PSI (310 bar) and 6000 PSI (414 bar) models are available
- Built-in flow control
- Manifold mounted, NPT, socket weld or flanged

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

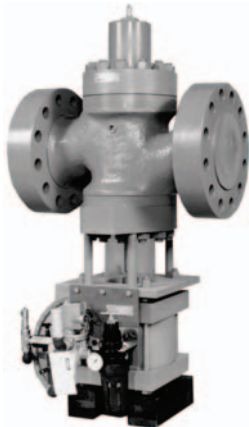
## Modular ISO-Lock

- Isolates manifold mounted directional control valves
- Reduces maintenance time - replace Directional Valves without depressurizing 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



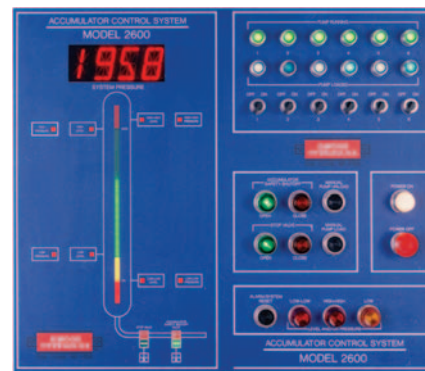
### Capacities:

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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3/06 - Brochure 200  
 Rev. A