Directional Control Valves
Packed Spool 4-Way
- 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 Momentary Contact

control pressuR 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 l/min.)

Proportional Pressure Control System

Modular Iso-Lock Valve
- 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.

Accumulator Shut-off/Descaling
Capacities: 3000 psi (207 bar)
6000 psi (414 bar)
6000 gpm (22,710 l/min.)
Connection Sizes: 1-1/4" to 10"

A.S.O. Valves, Request Bulletin 102
Descaling Valves, Request Bulletin 396

Accumulator Control Panel
- Descaling
- Mill Systems
- Presses
- Controls
- Level
- Pressure
- Pump Sequencing
- Ballast Charging
- Designed to Your Specifications

REQUEST BULLETIN 82
REQUEST BULLETIN 104
REQUEST BULLETIN 105 & 380
REQUEST BULLETIN 250
REQUEST BULLETIN 395
REQUEST BULLETIN 396
A stem-guided, stainless steel, poppet-type disc (Item 1) closes against the stainless steel seat (Item 2). Closing force is normally supplied by accumulator pressure acting on the valve disc; at very low accumulator pressure, such as is experienced when starting up, a stainless steel spring (Item 3) supplies sufficient pressure on the disc to ensure closure.

As the disc nears the seat on closing, a cushion is formed through control of the air flow out of the air cylinder (Item 4) by adjusting the speed control valve (Item 5). This cushion prevents damage to the valve when the pressure differential across the seat is great.

Once the valve has closed, air pressure to the cylinder alone will not open it. The pumps must be used to create pressure in the system equal to that in the accumulator. Only when this balanced condition exists can the valve be opened by pilot pressure. This prevents accidental opening of the valve, which could prove disastrous. As a final safety feature, only one static seal is exposed to accumulator pressure.

Elwood Shut-off Valve used in a Typical Accumulator System

No two installations need be exactly alike with regard to arrangement of pressure and liquid level devices. Elwood recommends, however, that both pressure and liquid method of control be used. A proper relationship of pressures and levels must be maintained at all times or complications will result. In the illustration at the right, one type of pressure sensing device and two types of level sensing devices are shown. The simplest combination involves float switches (A) and pressure control (B). The upper float switch opens on rising level to close the shut-off valve (C). The level control (D) will have sufficient switch contacts to load and unload the pumps, thus maintaining levels between normal low and normal high.

The level control (D) is, in effect, a level sensing device which receives input signal from the height of the fluid in the bottle. A little more complicated than the float switch, it gives an output signal for all points of level within its range. This is necessary if remote indication or recording of level is required. Control of any components by means of switches can be arranged to suit the user’s requirements.

Due to the fact that many variations and combinations of controls can be arranged, we suggest contacting the Elwood Engineering Department when a system is being planned.

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.
### Accumulator Shut-Off Valve Ordering Data

<table>
<thead>
<tr>
<th>SIZE</th>
<th>MAX. FLOW GPM</th>
<th>FLANGE STYLE</th>
<th>MAXIMUM WORKING PRESSURE</th>
<th>SHOP AIR PRESSURE</th>
<th>CODE NUMBER EXAMPLE</th>
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<tbody>
<tr>
<td>4702 - 2&quot;</td>
<td>290</td>
<td>SR15, SR1500 FLANGE</td>
<td>3.6K 3600 PSI (248 BAR)</td>
<td>7 = 70 PSI</td>
<td>4702 - 2&quot; - 3.6K - SR15 - 21/7</td>
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<tr>
<td>4702 - 2.5&quot;</td>
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<td>4712 - 12&quot;</td>
<td>8000</td>
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</table>

**FLANGE STYLE**
- SR15, SR1500 FLANGE
- SR25, SR2500 FLANGE

**MAXIMUM WORKING PRESSURE**
- 3.6K 3600 PSI (248 BAR)
- 4.5K 4500 PSI (310 BAR)
- 6K 6000 PSI (414 BAR)

**SHOP AIR PRESSURE**
- 7 = 70 PSI

**EXAMPLE:** 21 = 2100 PSI

**INTEGRATED FLANGE ORIENTATION IS STANDARD. CONSULT FACTORY FOR OTHER TYPES.**

**ANSI B 16.5 SERIES FLANGE FACE IS STANDARD. OTHER TYPES AVAILABLE, CONSULT FACTORY.**

**ACTUAL MAX. SYSTEM PRESSURE AND SHOP AIR PRESSURE MUST BE SUPPLIED:** 21/7 SHOWN FOR EXAMPLE ONLY.

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

---

### Typical Installation of Elwood Shut-Off Valve

- **FLUSH-MOUNT INSTALLATION**
- **BACK-UP PRESSURE SWITCH**
- **NORMAL OPERATING RANGE**
- **RUPTURE DISC**
- **AIR RELIEF VALVE**
- **HIGH HIGH LEVEL SWITCH**
- **LOW LOW LEVEL SWITCH**

---

**ELWOOD CONTROL PANEL**

- **SYSTEM PRESSURE READING**
- **SYSTEM PRESSURE SETTING**
- **LOW PRESSURE SATURATION**
- **HIGH PRESSURE SATURATION**
- **HIGH HIGH PRESSURE SATURATION**
- **LOW LOW PRESSURE SATURATION**
- **LOW PRESSURE WARNING**
- **HIGH PRESSURE WARNING**
- **HIGH HIGH PRESSURE WARNING**
- **LOW LOW PRESSURE WARNING**
- **PUMP ON/OPEN**
- **PUMP LOAD**
- **PUMP NO. 1**
- **PUMP NO. 2**
- **PUMP NO. 3**
- **PUMP NO. 4**
- **PUMP NO. 5**
- **BANK A**
- **BANK B**
- **BANK C**
- **POWER ON CLOSE**
- **A.S.O. = Accumulator Shut-Off Valve**

---

**ELWOOD ACCUMULATOR SHUT-OFF VALVE WITH SPEED CONTROL**

- **LEVEL INDICATOR**
- **BACK-UP PRESSURE SWITCH**
- **HIGH PRESSURE WARNING**
- **LOW PRESSURE WARNING**
- **HIGH HIGH LEVEL SWITCH**
- **LOW LOW LEVEL SWITCH**
- **AIR COMPRESSOR**
- **ELWOOD CONTROL PANEL**
- **ELWOOD ACCUMULATOR**

---

**OPTIONAL SYSTEM DRIP TRAP WITH DRAIN**

**FILTERS AND DRIED AIR SUPPLY**

**TO WORK UNITS**

---

**AIR OR OTHER BALLAST**

**NORMAL HIGH LEVEL**

**MAX. ALLOWABLE LOW LEVEL**

**LOW LEVEL SWITCH**

**NORMALLY OPERATING RANGE**

---

**INTEGRATED FLANGE ORIENTATION IS STANDARD. CONSULT FACTORY FOR OTHER TYPES.**

**ANSI B 16.5 SERIES FLANGE FACE IS STANDARD. OTHER TYPES AVAILABLE, CONSULT FACTORY.**

**ACTUAL MAX. SYSTEM PRESSURE AND SHOP AIR PRESSURE MUST BE SUPPLIED:** 21/7 SHOWN FOR EXAMPLE ONLY.

**STANDARD:** NON-STANDARD ITEMS AVAILABLE AT EXTRA COST.
Dimensions are Subject to Change

Recommended spare parts. Black circle gives number of spares recommended.

NOTE: Sizes available from ongoing stock orders are 3, 4 and 6", with relative flow ratings at 20 PSI pressure drop of 500, 700 and 1900 GPM. Both larger and smaller sizes are available as specials, along with forged-steel body designs for higher pressured.

OPTIONAL: Limit Switch arrangement indicating valve is in open or closed position.

### Dimensions

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<thead>
<tr>
<th>SIZE</th>
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<th>2-1/2&quot;</th>
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<th>4&quot;</th>
<th>6&quot;</th>
<th>8&quot;</th>
<th>10&quot;</th>
<th>12&quot;</th>
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C.V. FACTOR
- 49
- 57
- 87
- 120
- 375
- 46
- 990
- 1100

### Valve No.

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<td>(5900)</td>
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<td>(24,600)</td>
<td>(30,000)</td>
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</tbody>
</table>

*Offset Accumulator / Pump Side Connection.

3 and 3.6K models with ASA Series 1500 flange faces. 6K models with ASA Series 2500 flange faces available, consult factory.

All Dimensions Are Subject To Change. Obtain Certified Drawing.

### Parts List

<table>
<thead>
<tr>
<th>No.</th>
<th>No.</th>
<th>Name of Parts</th>
<th>Material</th>
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<tr>
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<td>2</td>
<td>Seat</td>
<td>H. Stainless Steel</td>
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<td>1</td>
<td>3</td>
<td>Disc</td>
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<tr>
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<td>4</td>
<td>Stuffing box</td>
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<td>6</td>
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<td>Air Cylinder With Speed Control</td>
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Refer to part numbers on nameplate when ordering parts.
Dimensions are Subject to Change

- Recommended spare parts. Black circle gives number of spares recommended.

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C.V. FACTOR: 49 | 57 | 67 | 120 | 375 | 46 | 990 | 1100

MAX. FLOW:
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- (1100) | (1480) | (2350) | (3600) | (9500) | (17,820) | (24,600) | (30,000)

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</tr>
<tr>
<td>1</td>
<td>14</td>
<td>Bushing</td>
<td>Bronze</td>
</tr>
<tr>
<td>1</td>
<td>15</td>
<td>Spring</td>
<td>Stainless Steel</td>
</tr>
<tr>
<td>1</td>
<td>16</td>
<td>Stud</td>
<td>Steel</td>
</tr>
<tr>
<td>1</td>
<td>17</td>
<td>Hex Nut</td>
<td>Steel</td>
</tr>
<tr>
<td>1</td>
<td>18</td>
<td>Stop Nut</td>
<td>Steel</td>
</tr>
<tr>
<td>1</td>
<td>19</td>
<td>Bolt</td>
<td>Steel</td>
</tr>
<tr>
<td>1</td>
<td>20</td>
<td>Hex Nut</td>
<td>Steel</td>
</tr>
<tr>
<td>1</td>
<td>21</td>
<td>Taper Pipe Plug</td>
<td>Steel</td>
</tr>
<tr>
<td>1</td>
<td>22</td>
<td>Air Cylinder With Speed Control</td>
<td>Steel</td>
</tr>
</tbody>
</table>

*Refer to part numbers on nameplates when ordering parts.*
**Accumulator Shut-Off Valve Ordering Data**

<table>
<thead>
<tr>
<th>SIZE</th>
<th>MAX. FLOW GPM</th>
</tr>
</thead>
<tbody>
<tr>
<td>4702 - 2&quot;</td>
<td>290</td>
</tr>
<tr>
<td>4702 - 2.5&quot;</td>
<td>390</td>
</tr>
<tr>
<td>4703 - 3&quot;</td>
<td>620</td>
</tr>
<tr>
<td>4704 - 4&quot;</td>
<td>950</td>
</tr>
<tr>
<td>4706 - 6&quot;</td>
<td>2500</td>
</tr>
<tr>
<td>4708 - 8&quot;</td>
<td>4000</td>
</tr>
<tr>
<td>4710 - 10&quot;</td>
<td>6500</td>
</tr>
<tr>
<td>4712 - 12&quot;</td>
<td>8000</td>
</tr>
</tbody>
</table>

**FLANGE STYLE**
- SR15 SR1500 FLANGE
- SR25 SR2500 FLANGE

Alternate Flange Condult Factory

**MAXIMUM SYSTEM OPERATING PRESSURE**

<table>
<thead>
<tr>
<th>PRESSURE</th>
<th>EXAMPLE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6K</td>
<td>3600 PSI (248 BAR)</td>
</tr>
<tr>
<td>4.5K</td>
<td>4500 PSI (310 BAR)</td>
</tr>
<tr>
<td>6K</td>
<td>6000 PSI (414 BAR)</td>
</tr>
</tbody>
</table>

**MAXIMUM WORKING PRESSURE**

<table>
<thead>
<tr>
<th>PRESSURE</th>
<th>EXAMPLE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.6K</td>
<td>3600 PSI (248 BAR)</td>
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</tr>
<tr>
<td>6K</td>
<td>6000 PSI (414 BAR)</td>
</tr>
</tbody>
</table>

**SHOP AIR PRESSURE**

<table>
<thead>
<tr>
<th>PRESSURE</th>
<th>EXAMPLE:</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>70 PSI</td>
</tr>
</tbody>
</table>

**CODE NUMBER EXAMPLE:**
4702 - 2" - 3.6K - SR15 - 21/7

**INLINE FLANGE ORIENTATION IS STANDARD. CONSULT FACTORY FOR OTHER TYPES.**

**ANSI B 16.5 SERIES FLANGE FACE IS STANDARD. OTHER TYPES AVAILABLE, CONSULT FACTORY.**

**ACTUAL MAX. SYSTEM PRESSURE AND SHOP AIR PRESSURE MUST BE SUPPLIED:**
21/7 SHOWN FOR EXAMPLE ONLY.

**STANDARD:** NON-STANDARD ITEMS AVAILABLE AT EXTRA COST.
A stem-guided, stainless steel, poppet-type disc (Item 1) closes against the stainless steel seat (Item 2). Closing force is normally supplied by accumulator pressure acting on the valve disc; at very low accumulator pressure, such as is experienced when starting up, a stainless steel spring (Item 3) supplies sufficient pressure on the disc to ensure closure.

As the disc nears the seat on closing, a cushion is formed through control of the air flow out of the air cylinder (Item 4) by adjusting the speed control valve (Item 5). This cushion prevents damage to the valve when the pressure differential across the seat is great.

Once the valve has closed, air pressure to the cylinder alone will not open it. The pumps must be used to create pressure in the system equal to that in the accumulator. Only when this balanced condition exists can the valve be opened by pilot pressure. This prevents accidental opening of the valve, which could prove disastrous. As a final safety feature, only one static seal is exposed to accumulator pressure.

**Elwood Shut-off Valve used in a Typical Accumulator System**

No two installations need be exactly alike with regard to arrangement of pressure and liquid level devices. Elwood recommends, however, that both pressure and liquid method of control be used. A proper relationship of pressures and levels must be maintained at all times or complications will result. In the illustration at the right, one type of pressure sensing device and two types of level sensing devices are shown. The simplest combination involves float switches (A) and pressure control (B). The upper float switch opens on rising level to shut down pumps. The lower float switch opens on falling level to close the shut-off valve (C). The level control (D) will have sufficient switch contacts to load and unload the pumps, thus maintaining levels between normal low and normal high.

The level control (D) is, in effect, a level sensing device which receives input signal from the height of the fluid in the bottle. A little more complicated than the float switch, it gives an output signal for all points of level within its reach. This is necessary if remote indication or recording of level is required. Control of any components by means of switches can be arranged to suit the user’s requirements.

Due to the fact that many variations and combinations of controls can be arranged, we suggest contacting the Elwood Engineering Department when a system is being planned.

**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.
Directional Control Valves
Packed Spool 4-Way
- 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

Accumulator Shut-off/Descaling
Capacities: 3000 psi (207 bar)
6000 psi (414 bar)
6000 gpm (22,710 l/min.)
Connection Sizes: 1-1/4" to 10"

Accumulator Control Panel
- Descaling
- Mill Systems
- Presses
- Controls
- Level
- Pressure
- Pump Sequencing
- Ballast Charging
- Designed to Your Specifications

Directional Control Valves
DIN Poppet Series 2-, 3- and 4-Way
- Capacities to 1600 gpm (6057 l/min.)
  - 3000 psi (207 bar), 4500 psi (310 bar)
  - and 6000 psi (414 bar) Models Available
- Built-in Flow Control
- Manifold Mounted, NPT, Socket Weld or Flanged

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 l/min.)

Modular Iso-Lock Valve
- 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.

Accumulator Control Panel
Request Bulletins 155 & 380

REQUEST BULLETIN 82
REQUEST BULLETIN 395
REQUEST BULLETIN 104
REQUEST BULLETIN 250
REQUEST BULLETIN 102
REQUEST BULLETIN 396