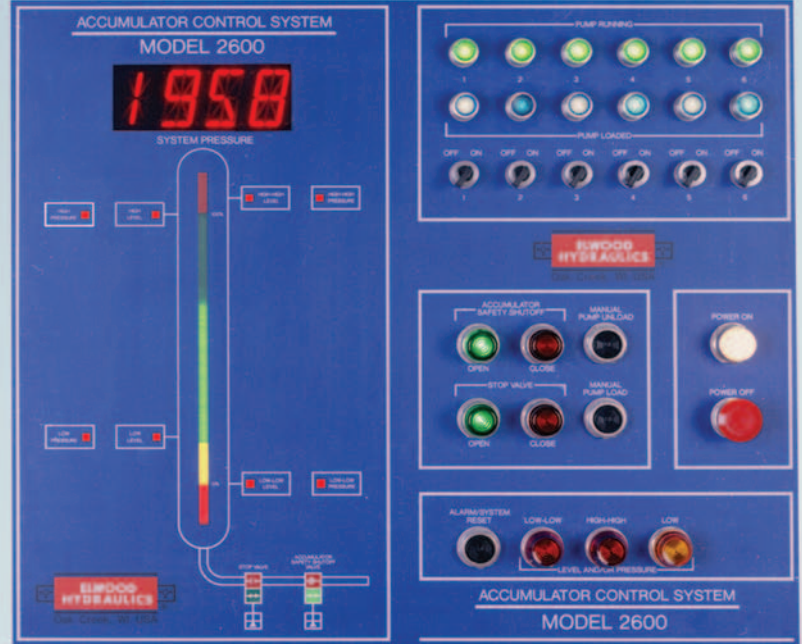


# ACCUMULATOR CONTROL SYSTEM

www.elwood.com



# Elwood Accumulator Control

The Elwood Accumulator Level Control System, Model 2600, is designed to provide all of the control features required for the efficient operation of Air or Gas ballasted accumulator bottles. In addition to the microprocessor control of the pumps and valves, the 2600 incorporates discrete level and pressure switches acting directly in the pump and the valve circuits to provide redundant safeties. The 2600 is equipped with the following features:

## LEVEL CONTROL

The primary function of the 2600 is to control the liquid level in the bottle based on the level transducer. Fluid level will control the loading and unloading of up to 6 pumps to maintain the proper level in the bottle. Fluid level will actuate an alarm if the level penetrates the low or high level boundaries.

The linear level circuit uses either discrete level switches or a level transducer as input. Where discrete level switches are used, the microprocessor uses the relationship of each level point to the pressure at that point to calculate a theoretical level based on pressure for points between level switches. Where a level transducer is used as the input, the signal from the transducer is interpreted directly as the level.

Pump loading is determined by the rate of change of the level in the bottle. As the out flow rate increases, more pumps are loaded. This procedure maintains a higher level, and therefore provides a more constant pressure and more available fluid.

## PRESSURE CONTROL

In addition to monitoring level, the 2600 monitors pressure in the bottle. If the pressure falls below the low pressure set point, or if the pressure rises above the high-high pressure set point, an alarm will be actuated.

## BALLAST CONTROL

If the accumulator system incorporates an automatic ballast charge system, the pressure signal is used by the 2600 to actuate the ballast fill valve when the relationship of level to pressure is too high. The valve will remain actuated until the relationship is correct.

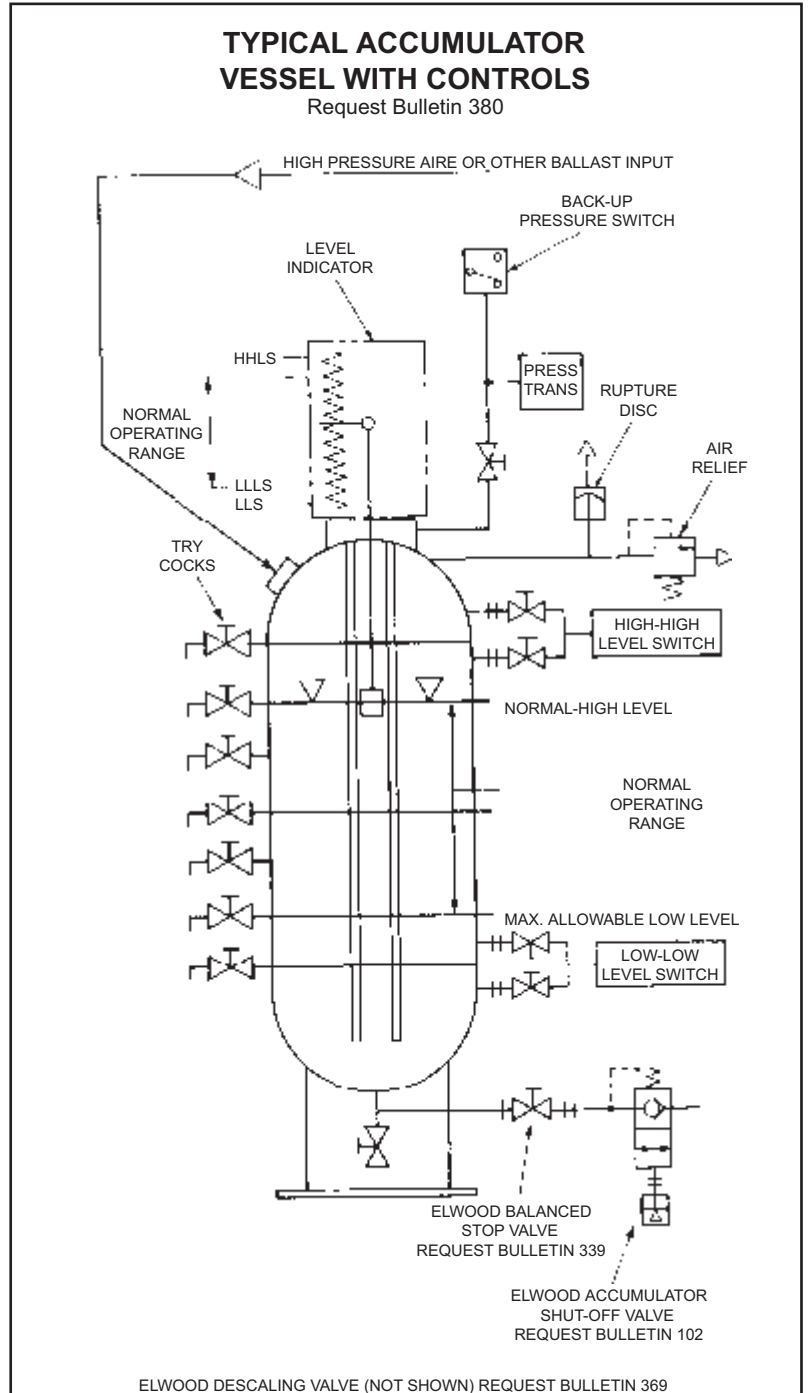
## PUMP SEQUENCING

Pump sequencing allows any of the 6 pumps to be the lead pump. The lead pump is the first pump to load when the level begins to drop. Any other pump can be set to load second and so on through the 6 pumps. If any pump is shut down, the next pump in the schedule will load.

This feature allows the user to distribute wear equally on all pumps or if one or more pumps are marginally operative, these can be set to run the least.

## LEVEL INDICATOR

The LED level indicator indicates liquid level in the bottle in 1% increments. Over high level is indicated by red LED's as is under low level.



## PRESSURE INDICATOR

The pressure indicator uses 2" high numerals and displays pressure in psi, bar and kPa.

## HIGH-HIGH PRESSURE INDICATOR

The high-high pressure indicator indicates that the pressure in the system has tripped the pump shut down circuit, the audible alarm, and the high-high red warning lamp.

# Elwood Accumulator Control Systems Specification

## HIGH PRESSURE INDICATOR

The high pressure indicator indicates that the pressure in the system is at normal high pressure.

## LOW PRESSURE INDICATOR

The low pressure indicator indicates that the pressure in the system is below the normal and has tripped the flashing amber indicator lamp.

## LOW-LOW PRESSURE INDICATOR

The low-low pressure indicator indicates that the pressure in the system has tripped the A.S.O. close circuit.

## HIGH-HIGH LEVEL INDICATOR

The high-high level indicator indicates that the level in the system has tripped the pump shut down circuit, the audible alarm, and the high-high red warning lamp.

## HIGH LEVEL INDICATOR

The high level indicator indicates that the level in the system is at normal high level and trips the pump unload circuit.

## LOW LEVEL INDICATOR

The low level indicator indicates that the level in the system, is below the normal low level and has tripped the flashing amber light.

## LOW-LOW LEVEL INDICATOR

The low-low level indicator indicates that the level in the system has tripped the A.S.O. close circuit, the audible alarm, and the low-low red warning lamp.

## COMPUTER PORT

The 2600 is equipped with a serial computer port which the user may use to obtain status reports on the operation of the accumulator.

By issuing an interrogation command, the 2600 will respond with the current level in %, the current pressure in psi, bar, or kPa, the status of the 6 pumps and the alarm status.

In addition, the computer can request total hours on each pump, and total hours 1 pump was loaded, total hours 2 pumps were loaded, etc.

## CHART RECORDER OUTPUTS

The 2600 is equipped with 2, 0-10 volt outputs which represent the level and the pressure. These ports may be used to drive chart recorders, etc.

## PUMP STATUS INDICATORS

Each of the 6 pumps has 2 indicators. One indicates the pump is running, and the other indicates the pump is loaded.

## PUMP ENABLE SWITCHES

Each of the 6 pumps has a selector switch to enable that pump and put it into the loading sequence.

## SHUT-OFF CONTROL

The 2600 is equipped with lighted push-buttons for manual control of the shut-off valve. The lights indicate the status of the valve.

## STOP VALVE CONTROL

The 2600 is equipped with lighted push-buttons for manual control of the stop valve. The lights indicate the status of the stop valve.

## ELECTRICAL

The 2600 operates from 120/240 volts AC, 50/60 Hz.

## PHYSICAL

The 2600 can be furnished in a NEMA 12 cabinet or can be furnished for mounting in the customer's cabinet.

## INPUTS

Analog level input 0-10 volts, 4-20 mA

Analog pressure 0-30 mV

Discrete level input 1 through 6

Contact closure 120 volts, 10 mA. AC

Discrete low-low pressure

Contact closure 120 volts, 10 mA. AC

Discrete low pressure

Contact closure 120 volts, 10 mA. AC

Discrete high pressure

Contact closure 120 volts, 10 mA. AC

Discrete high-high pressure

Contact closure 120 volts, 10 mA. AC

Pump Number 1 through 6 running

Contact closure 120 volts, 10 mA. AC

## OUTPUTS

Analog pressure 0-10 volts, 10 mA. DC

Analog level 0-10 volts, 10 mA. DC

Pump Number 1 through 6 load

Contact closure 240 volts, 3 amps. AC

A.S.O. Valve 120 volts, 3 amps. AC

Stop Valve 120 volts, 3 amps. AC

Ballast Valve 120 volts, 3 amps. AC

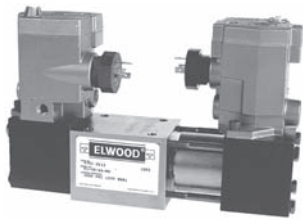
Alarm 120 volts, 3 amps. AC

Serial Port

RS232C and RS422 300-9600 Baud

## Packed Spool Directional Control Valves

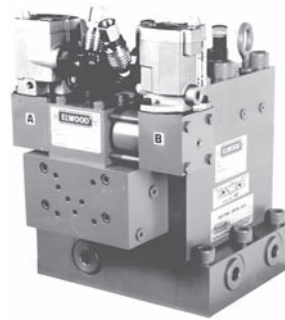
- Directional Valve for a range of applications
- Up to 46 GPM (32 GPM nominal)
- 3000 PSI (207 bar) and 6000 PSI (414 bar)



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

Brochure 82

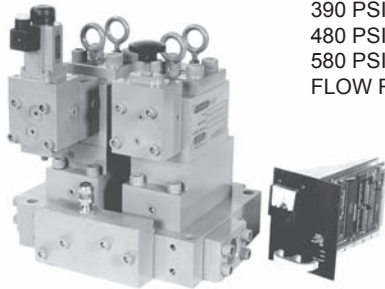
## Poppet Type Directional Control Valves



- 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



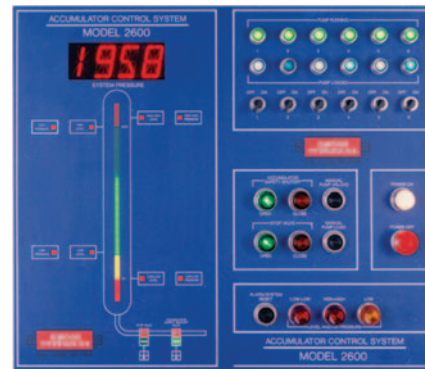
### Capacities:

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

## 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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