



Purchase Specification

Model No. 131-01/631-01 ELECTRONIC CONTROL VALVE

Sizes 1 1/4" - 24"

Function

The Electronic Control Valve shall control flow, pressure, tank level or valve position. The optional 131VC Electronic Controller enables remote computer control over valve operations.

"Tying" of equipment into packages for the purpose of thwarting competition shall be considered to be in non-compliance with these specifications. Manufacturers shall price items under different subsections or sections separately.

Main Valve

The valve shall be hydraulically operated, single diaphragm-actuated, globe or angle pattern. The valve shall consist of three major components: the body with seat installed, the cover with bearing installed, and the diaphragm assembly. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the main valve or pilot controls.

Main Valve Body

No separate chambers shall be allowed between the main valve cover and body. Valve body and cover shall be of cast material. Ductile Iron is standard and other materials shall be available. No fabrication or welding shall be used in the manufacturing process. Total shipping weight shall be equal or greater in all respects to the Hytrol 100-01/100-20 body.

The valve shall contain a resilient, synthetic rubber disc with a rectangular cross-section contained on three and one-half sides by a disc retainer and forming a tight seal against a single removable seat insert. No O-ring type discs (circular, square, or quad type) shall be permitted as the seating surface. The disc guide shall be of the contoured type to permit smooth transition of flow and shall hold the disc firmly in place. The disc retainer shall be of a sturdy one-piece design capable of withstanding opening and closing shocks. It must have straight edge sides and a radius at the top edge to prevent excessive diaphragm wear as the diaphragm flexes across this surface. No hour-glass shaped disc retainers shall be permitted and no V-type or slotted type disc guides shall be used.

The diaphragm assembly containing a non-magnetic 303 stainless steel stem; of sufficient diameter to withstand high hydraulic pressures, shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. The seat shall be a solid, one-piece design and shall have a minimum of a five-degree taper on the seating surface for a positive, drip-tight shut off. No center guides shall be permitted. The stem shall be drilled and tapped in the cover end to receive and affix such accessories as may be deemed necessary. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure.

The flexible, non-wicking, FDA approved diaphragm shall consist of nylon fabric bonded with synthetic rubber compatible with the operating fluid. The center hole for the main valve stem must be sealed by the vulcanized process or a rubber grommet sealing the center stem hole from the operating pressure. The diaphragm must withstand a Mullins Burst Test of a minimum of 600 x per layer of nylon fabric and shall be cycle tested 100,000 times to insure longevity. The diaphragm shall not be used as the seating surface. The diaphragm shall be fully supported in the valve body and cover by machined surfaces which support no less than one-half of the total surface area of the diaphragm in either the fully opened or fully closed position.



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The main valve seat and the stem bearing in the valve cover shall be removable. The cover bearing and seat in 6" and smaller size valves shall be threaded into the cover and body. The valve seat in 8" and larger size valves shall be retained by flat head machine screws for ease of maintenance. The lower bearing of the valve stem shall be contained concentrically within the seat and shall be exposed to the flow on all sides to avoid deposits. To insure proper alignment of the valve stem, the valve body and cover shall be machined with a locating lip. No "pinned" covers to the valve body shall be permitted. Cover bearing, disc retainer, and seat shall be made of the same material. All necessary repairs and/or modifications other than replacement of the main valve body shall be possible without removing the valve from the pipeline. Packing glands and/or stuffing boxes shall not be permitted and components including cast material shall be of North American manufacture.

The valve manufacturer shall warrant the valve to be free of defects in material and workmanship for a period of three years from date of shipment, provided the valve is installed and used in accordance with all applicable instructions. Electrical components shall have a one-year warranty.

The valve manufacturer shall be able to supply a complete line of equipment from 1 1/4" through 24" sizes and a complete selection of complementary equipment. The valve manufacturer shall also provide a computerized cavitation chart which shows flow rate, differential pressure, percentage of valve opening, Cv factor, system velocity, and if there will be cavitation damage.

Material Specification

Valve Size:
Main Valve Body and Cover:
Main Valve Trim:
End Detail:
Pressure Rating:
Temperature Range:
Rubber Material:
Coating:
Desired Options:

Pilot Control System

The 131/631-01 hydraulic control valve pilot system shall consist of dual solenoids which alternately apply or relieve pressure to the diaphragm chamber to position the main valve. They shall be normally closed (energized to open), 120 or 240 volt AC with Nema type 4 enclosure. A manual system to by-pass the solenoids shall also be provided.

Optional Electronic Valve Controller

The Model 131VC controller shall provide the interface between a remote computer system and the hydraulic control valve. It shall have remote communication capability in both the analog or digital format. Local manual set-point and emergency manual control shall also be provided. The controller shall accept an analog 4-20 mA feedback signal.

Upon receiving the remote set-point command from the computer system or local command from the operator, the controller will provide proper signals to modulate and maintain the valve as the desired set-point value.

A fluorescent display of current feedback status and set-point in scaleable engineering units shall be provided as an integral part of the controller.

When the feedback signal deviates from the set-point, the appropriate opening or closing solenoid on the valve will pulse. As the feedback signal approaches the set-point, this on/off pulse time will gradually lessen to smoothly modulate the valve to the set-point. The total cycle time between each pulse shall be programmable between 1 and 60 seconds. A programmable time proportional output feature shall also



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function to aid in tuning valve response. When the feedback signal is within a programmable dead band zone, the opening and closing solenoids will not activate and the valve will maintain position.

The operator keypad shall consist of two rows of alphanumeric characters to display numeric values and units. Color-coded alarm, status and mode indicators will display operating conditions. Security key codes shall protect against unauthorized changes to the controller. All programming shall include key words and prompts to aid in set-up and timing the controller.

The controller shall be solid-state construction with an internal chassis capable of being removed for inspection and repair. All program memory including set-point and timing parameters shall be protected by an internal lithium battery rated for 10 year life.

When optional remote digital communications are provided, the controller shall be capable of direct linkage to a computer or other instrumentation which has RS232C or RS422 communications. When RS422 data highway communications is specified, up to 64 controllers may be addressed from a single computer port and shall operate up to 5000' from the computer. RS232C shall operate up to 50' distance between the computer or RTU and the valve controller. All set-point, tuning, and auto-manual operation shall be adjustable remotely from the computer. All commands shall consist of ASCII mnemonic commands sent from the computer. Each transmission shall include the individual controller address. Communication baud rates shall be 300, 1200, or 2400 baud.

Controller Specifications

Control Input:	4-20 mA full scale (others optional)
Control Parameters:	
Proportional Bands:	1-200% adjustable in 1% increments independently for opening and closing.
Deadband:	Adjustable 0.00 to 25.5% of span.
Cycle Time:	1 to 60 seconds in 1 sec. increments.

Environmental Parameters:

Temperature:	5 C to 55 C (40 F to 130 F)
Humidity:	90% RH, non-condensing.
Power Input:	13.5 watts max. at 117 VAC, 50/60 Hz.
Memory Protection:	10 yr. type. life lithium battery
Housing:	Flame retardant UL rated ABS plastic. Fits 1/4 DIN cutout.

A direct factory representative shall be made available for start-up service, inspection and necessary adjustments.

Material Specification for Pilot Control:

Pressure Rating:	
Trim:	
Rubber Material:	
Tubing and Fittings:	
Adjustment Range:	
Operating Fluids:	
Voltage:	
Enclosure Type:	
Desired Options:	

This valve shall be a Cla-Val Co. Model No. 131-01/631-01 Electronic Control Valve as manufactured by Cla-Val Co., Newport Beach, CA 92659-0325.