

# PFC & PFC/CR

## ELECTRO-HYDRAULIC VALVE DRIVER BOARD

### PROPORTIONAL FEATHERING CONTROL / CURRENT REGULATED

#### Application:

**PFC & PFC/CR** - Precise Proportional Control for Electro-Hydraulic valves for material handling equipment and in-plant industrial machinery.

**PFC/CR** - Regulated driver cards are utilized to control Electro-Hydraulic Proportional Valves for mobile equipment in applications where output fluctuations due to supply voltage or valve coil resistance changes must be kept to a minimum.

**PFC** - Unregulated driver boards are economical and utilized for controlling Electro-Hydraulic valves for mobile and in-plant equipment where a variance in output is not critical to the equipments performance.

#### Features for PFC and PFC/CR:

- **Pulse Width Modulation:** The power to the valve coil is switched on and off at a fixed optimum rate (dither frequency) to overcome factors that detract from smooth valve performance such as stiction, hysteresis and mechanical tolerances. The "on" time versus the "off" time at this optimum frequency is varied to provide a proportional output.
- **Threshold Adjust:** Valve deadband at the beginning of spool travel can be eliminated or set to the desired level.
- **Full Output Adjust:** Usually set so that the maximum output of the valve is achieved when the controlling device (joystick handle) reaches the point of maximum travel. Also used to limit maximum output when necessary.
- **Auxiliary Output:** Provides a switched source of power at the supply voltage, whenever the PFC/CR is switched on. (3 amps, max.)
- **Reverse Polarity Protection:** On board diodes prevent damage due to reversed wiring.

#### Features for PFC/CR only:

- **Current Regulation:** The output current is constantly monitored, and adjustments are made automatically, so that the current to the valve coil remains constant when the supply voltage fluctuates as much as  $\pm 20\%$  or the valve coil resistance changes due to coil temperature changes.
- **Short Circuit Protection:** The current limiting feature of the board protect the board from failure due to short circuits of the output.



PRO-4 with  
PFC/CR

# PFC ORDERING INFORMATION

## Options:

- **Ramp (R):** This feature allows the user to limit the rate of change of the output of the control valve regardless of how rapidly the handle is moved. The duration of the rate change from off to full output can be adjusted from 0 to 2.5 seconds. The valve will also ramp down unless the handle is instantly returned to the "off" position, which will terminate valve output.
- **Dual Threshold Adjust (DTA):** Provides an independent adjustment of the valve dead band at the beginning of handle travel in each direction.
- **Dual Adjust Output (DAO):** (Independent Bi-Directional Full Output) Provides an independent maximum output at full handle travel in each direction. Typical application would be to provide a faster forward maximum
- **Hi / Lo Range Adjust (HLRA):** The user can change the output at full handle travel from High or Maximum mode to a pre-selected Low output mode by de-energizing the High Output terminal on the Valve Drive Board. If the Ramp Option is included on the board, the output will ramp from one mode to the other.
- **Diagnostics:** An LED on the valve drive board is used to display the variable output. It can indicate: If the joystick is powered and the on / off switch is working, if the output of the board is being modulated, and if the valve coil is connected, open or shorted.

Valve Manufacturer: \_\_\_\_\_

Part Number: \_\_\_\_\_

Number of Coils: \_\_\_\_\_

Operating voltage: \_\_\_\_\_

Operating current range: from: \_\_\_\_\_  
to: \_\_\_\_\_

Coil Resistance: Cold: \_\_\_\_\_ ohms  
Hot: \_\_\_\_\_ ohms

Dither Frequency: \_\_\_\_\_ Hz  None

- Printed Circuit Board mounted to controller (standard)
- Remote Mounting with 10" pigtail (CS1 & MO)
- P.C.B. remote mounting with 10" pigtail and universal angle bracket (consult factory).

## Options:

- Ramp
- DAO
- HLRA

## TECHNICAL DATA

### PFC & PFC/CR Mechanical:

- **Operating Temperature:** -25°-+70°C
- **Material:** Type .093 FR4 to 94V-0 printed circuit board with matte green solder mask on both sides. Multilayer, double and single sided designs.

### PFC Electrical:

- **Supply Voltage:**  
Type PFC voltage type driver card power requirements:  
12V model 12-14VDC operating range  
24V Model 24-28VDC operating range
- **Maximum output current:**  
1 Amp at 24VDC  
2 Amps at 12VDC  
High current models available - Consult Factory
- **Dither:** Frequency range set to valve manufacturer's recommendation 35-1000 Hz.
- **Auxiliary Output Terminal:** 3 amps max.
- **Moisture Protection:** Urethane conformal coating furnished standard. Silicone encapsulation on request for wet locations.

### PFC/CR Electrical:

- **Supply Voltage:**  
Type PFC/CR current regulated type driver card power requirements:  
12V model 9-15VDC operating range  
24V Model 18-30VDC operating range
- **Maximum output current:**  
1.5 Amps at 24VDC  
3 Amps at 12VDC
- **Dither:** Frequency range set to valve manufacturer's recommendation 35-1000 Hz.
- **Auxiliary Output Terminal:** 3 amps max.
- **Moisture Protection:** Silicone encapsulation furnished standard.