**Installation and Setup Instructions**

**PC200 Dual Output Ramping Proportional Controller**

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### SPECIFICATIONS

<table>
<thead>
<tr>
<th><strong>General:</strong></th>
<th><strong>Power requirement</strong></th>
<th>9-30Vdc, 250mA nominal + power to external loads</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Fuse</strong></td>
<td>15-Amp Fuse; total load must not exceed 15-amps</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Digital Outputs:</strong></th>
<th><strong>Type</strong></th>
<th>Sourcing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Output</strong></td>
<td>Same as supply voltage, 5 Amps max. each</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>PWM Outputs:</strong></th>
<th><strong>Frequency</strong></th>
<th>1000Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Dither</strong></td>
<td>100Hz, 0-10% of maximum current</td>
</tr>
<tr>
<td></td>
<td><strong>Output</strong></td>
<td>Same as supply voltage, 0-5Amps max.</td>
</tr>
<tr>
<td></td>
<td><strong>Adjustments</strong></td>
<td>Minimum/Maximum: 0-5A (Can be adjusted for min&gt;max)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ramp Up/Dn: 0.1-5 Seconds</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Joystick Input:</strong></th>
<th><strong>+5V OUT</strong></th>
<th>Joystick power; 50mA max (1k ohm pot recommended)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>+2.5V OUT</strong></td>
<td>Tap reference; 50mA max (1k hom pot recommended)</td>
</tr>
<tr>
<td></td>
<td><strong>SIGNAL IN</strong></td>
<td>0-5Vdc or 0.5 to 4.5Vdc jumper selectable; 2.5Vdc center</td>
</tr>
<tr>
<td></td>
<td><strong>Adjustments</strong></td>
<td>Threshold: 0 to +/-2Vdc</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Switch Input:</strong></th>
<th><strong>FWD</strong></th>
<th>Dry contact</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>REV</strong></td>
<td>Dry contact</td>
</tr>
<tr>
<td></td>
<td><strong>DISABLE</strong></td>
<td>Connect to system power to disable control*</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Mounting:</strong></th>
<th>(4) #6 x 3/4” self-tapping screws (included)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Environmental:</strong></th>
<th><strong>Storage</strong></th>
<th>-40degC to 85degC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Operating</strong></td>
<td>-10degC to 60degC</td>
</tr>
</tbody>
</table>

* DO NOT USE THIS INPUT FOR SAFETY CONTROL. When using 2 controllers with 2-axis joystick, AB(+) terminal of one controller can be connected to DISABLE terminal of a second controller to prevent simultaneous operation of X and Y axis.
WIRING
INPUT WIRING

POWER INPUT IS REVERSE POLARITY PROTECTED AND FUSED TO 15-AMPS. FOR NORMAL OPERATION, LEAVE DISABLE TERMINAL OPEN. DISABLE TERMINAL NOT FOR SAFETY CONTROL APPLICATIONS.

POWER ○
GROUND ○
DISABLE ○

JOYSTICK or POTENTIOMETER:

MAX/CW

MIN/CCW

POTENTIOMETER (FRONT)

(1) COMMON ○
(3) +5V OUT ○
+2.5V OUT ○
(2) SIGNAL IN ○

GROUND (1)
POWER (3)
TAP (OPTIONAL)
OUTPUT (2)

OUT 1
MIN
OUT 1
MAX

STHRESHOLD
OUT 1
MAX
OUT 1
MIN
OUT 2
MIN
OUT 2
MAX

COMMON ○
+5V OUT ○
+2.5V OUT ○
SIGNAL IN ○

COMMON ○

+5V OUT ○
+2.5V OUT ○
SIGNAL IN ○

DUAL COIL CONTROL - POTENTIOMETER:

Full range of potentiometer rotation controls only OUT 1.

DUAL COIL CONTROL-INDEPENDENT ADJUSTMENT:

Independent potentiometers for OUT 1 and OUT2.

SWITCH CONTROL - OUT 1 and/or OUT2:

Independent switch inputs for OUT 1 and OUT2.

SW1+ ○
INCREASE OUT 1
SW1- ○
DECREASE OUT 1
SW2+ ○
INCREASE OUT 2
SW2- ○
DECREASE OUT 2
WIRING

OUTPUT WIRING

PROPORTIONAL and DIGITAL VALVE OUTPUTS:

2-WIRE SOLENOIDS

![Diagram of 2-Wire Solenoids]

1-WIRE GROUNDED SOLENOIDS

![Diagram of 1-Wire Grounded Solenoids]

NOTE: Wiring diagram applies to all solenoid valve outputs.

ALTERNATE PROPORTIONAL OUTPUT WIRING:
Combined *OUT1+2* (See table)

![Diagram of Alternate Proportional Wiring]

NOTE: Connect one side of coil to OUT1-, OUT2-, or Ground

CASCADE CONNECTION FOR 2-AXIS JOYSTICK (4-OUTPUTS):

![Diagram of Cascade Connection]

NOTE: When using 2 controllers with 2-axis joystick, AB(+) terminal of one controller can be connected to DISABLE terminal of a second controller to prevent simultaneous operation of X and Y axis.
*NOTE: OUT1+2 Created by connecting both OUT+ terminals to one side of solenoid and connecting one or both OUT- terminals to other side of solenoid. (See OUTPUT WIRING diagram.)
#1: COMBINED PROPORTIONAL AND DIGITAL OUTPUTS WITH TAPPED POTENTIOMETER JOYSTICK

![Diagram of #1 application]

#2: COMBINED PROPORTIONAL AND DIGITAL OUTPUTS WITH HALL-EFFECT JOYSTICK

![Diagram of #2 application]

#3: PROPORTIONAL OUTPUT WITH SWITCHES OR DIGITAL JOYSTICK

![Diagram of #3 application]

#4: DIGITAL LATCHING OUTPUT WITH POTENTIOMETER JOYSTICK

![Diagram of #4 application]

**NOTE:** APPLICATIONS SHOWN ARE EXAMPLES ONLY. MANY OTHER HYDRAULIC CIRCUITS AND CONTROL COMBINATIONS ARE POSSIBLE.
**SETUP**

Step 1  Apply power to controller.

Step 2  Move JP13 to appropriate input signal range. Use 0.5 to 4.5v for hall-effect joystick applications. Use 0 to 5v for potentiometer applications.

Step 3  Press SELECT UP or SELECT DOWN buttons to choose which parameter to adjust. LED's indicate selected parameter.

Step 4  Press INC or DEC buttons to adjust value of selected parameter. Display indicates value from 0-99% of adjustment range.

Step 5  Repeat steps 3 and 4 until all parameters have been adjusted to desired values.

**DESCRIPTION OF PARAMETERS:**

**PWM OUT 1 and PWM OUT 2**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN:</td>
<td>Minimum value for proportional output</td>
<td>0 = Off; 99 = full power</td>
</tr>
<tr>
<td>MAX:</td>
<td>Maximum value for proportional output</td>
<td>0 = Off; 99 = full power</td>
</tr>
<tr>
<td>RAMP UP:</td>
<td>Time for output to reach maximum value</td>
<td>0 = 0.1 seconds; 99 = 5 seconds</td>
</tr>
<tr>
<td>RAMP DN:</td>
<td>Time for output to reach maximum value</td>
<td>0 = 0.1 seconds; 99 = 5 seconds</td>
</tr>
<tr>
<td>THRESHOLD:</td>
<td>Adjusts how far the joystick/potentiometer must be moved from center before output begins to change. Increase this value to make the joystick/potentiometer less &quot;touchy.&quot;</td>
<td>0 = 0 volts (0%); 99 = +/-2 volt (25%)</td>
</tr>
<tr>
<td>DITHER:</td>
<td>Adjusts the amount of high-frequency signal applied to the proportional outputs. This enables fine control of the solenoid by preventing sticking.</td>
<td>0 = none; 99 = +/-10% of max output</td>
</tr>
</tbody>
</table>

**INPUT JUMPER SETTING:**

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PWR</td>
<td>0-5vdc INPUT</td>
</tr>
<tr>
<td>HI</td>
<td>0.5-4.5vdc INPUT</td>
</tr>
</tbody>
</table>

**SETUP NOTES:**