

# Controls

## 6040/8040/4040

### Temperature & Process Controllers

- Universal Input
- Jumperless Configuration
- Auto Detected Hardware
- Process & Loop Alarms
- ModBus Communications
- Auto or Manual Tuning
- Heat/Cool Operation
- Up to 3 Outputs
- Optional 24 VDC Transmitter Power Supply
- Ramping Setpoint
- Adjustable Hysteresis
- Valve Motor Drive Position
- Heater Break Alarm Function
- Remote/Dual Setpoint Options
- Security Options
- Available in 1/16, 1/8 & 1/4 DIN Sizes
- Optional Configuration Software
- UL, cUL, CE & CSA
- 3 Year Warranty



#### Description

Whether you have to manage temperature, flow, valve positioning or pressure, the Chromalox 40 Series Temperature & Process Controllers provide you with a comprehensive feature list and the flexibility to meet your most demanding process needs.

Application needs change over time, but that doesn't mean that you'll need to change your controller. The Chromalox 40 series modular card design provides the owner with the flexibility to alter the functionality with ease. Expansion from 1 to 3 outputs, as well as communications and remote setpoint is easily accomplished and automatically recognized by the firmware.

The optional ChromaWare™ configuration software allows the owner to program multiple units efficiently and store parameter settings for later use.

The 40 Series Controllers are an ideal complement in both design and esthetics to its cousin, the Chromalox 50 Series Limit Controllers.

#### Features

- Universal Input
- Full PID with Pre-tune, Self-tune, Manual tuning, or On-Off control. Heat only or Heat & Cool
- Auto Detected Hardware

- Process & Loop Alarms
- ModBus Communications
- Auto or Manual Tuning
- Heat/Cool Operation
- Ramping Setpoint
- Valve Motor Drive Position Option
- Heater Break Alarm Function Option
- Alarm 1 & 2 Types:
  - Process high/Process low
  - SP deviation, Band
  - Logical OR / AND
  - Also 1 loop alarm for process control security.
  - Process alarms have adjustable hysteresis.
- 24 VDC Output for loop power
- PC Configuration Software
- Remote Setpoint Input:
  - 0 to 20mA, 4 to 20mA, 0 to 5V, 1 to 5V, 0 to 10V or 2 to 10V.
  - Scaleable -1999 to 9999.
  - Local/Remote setpoint selected from front panel
- Output Configuration:
  - Up to 3 possible, for control, alarm, 24 VDC transmitter power supply or retransmit of process value or Setpoint

#### Accessories

| Models         | Description                       | Part Number |
|----------------|-----------------------------------|-------------|
| 40 & 50 Series | ChromaWare Configuration Software | 0149-50060  |
|                | Cable for Configuration Software  | 0149-50062  |
|                | Snubber                           | 0149-01305  |

#### Stocked Items

| DIN Size | Part Number | PCN    | DIN Size | Part Number | PCN    |
|----------|-------------|--------|----------|-------------|--------|
| 1/16     | 6040-R00000 | 314616 | 1/16     | 6040-RRR001 | 314659 |
| 1/16     | 6040-S00000 | 314720 | 1/8      | 8040-R00000 | 314544 |
| 1/16     | 6040-RR0000 | 314624 | 1/4      | 4040-ARR000 | 314528 |
| 1/16     | 6040-SR0000 | 314632 | 1/4      | 4040-R00000 | 314704 |
| 1/16     | 6040-RRR000 | 314640 | 1/4      | 4040-RRR000 | 314510 |

# Controls

## 6040/8040/4040 Temperature & Process Controllers *(cont'd.)*

### Specifications

#### FEATURES

- Control Types .....Full PID with Pre-tune, Self-tune, manual tuning, or On-Off control. Heat only or heat & cool
- Auto/Manual .....Selectable from front panel or via digital input, with bumpless transfer
- Output Configuration .....Up to 3 possible, for control, alarm, 24 VDC transmitter power supply or retransmit of process value or setpoint
- Alarm 1 & 2 Types .....Process high, process low, SP deviation, band, logical OR / AND. Also 1 loop alarm for process control security. Process alarms have adjustable hysteresis.
- Human Interface .....4 button operation, dual 4 digit 10mm & 8mm high (6040, 8040) and 13mm & 10mm high (4040) LED displays, plus 5 LED indicators
- PC Configuration .....Off-line configuration from PC serial port to dedicated config socket (comms option not required). ChromaWare Configuration Software for Windows 98 or higher.

#### INPUT

- Thermocouple .....J, K, C, R, S, T, B, E, N & PtRh20%vsPtRh40%.
- RTD .....3 Wire PT100, 50Ω per lead maximum (balanced)
- DC Linear .....0 to 20mA, 4 to 20mA, 0 to 50mV, 10 to 50mV, 0 to 5V, 1 to 5V, 0 to 10V, 2 to 10V. Scaleable -1999 to 9999, with adjustable decimal point
- Impedance .....>10MΩ for Thermocouple and mV ranges, 47KΩ for V ranges and 5Ω for mA ranges
- Accuracy .....±0.1% of input range ±1 LSD (T/C CJC better than 1°C)
- Sampling .....4 per second, 14 bit resolution approximately
- Sensor Break Detection .....<2 seconds (except zero based DC ranges), control O/P's turn off, high alarms activate for T/C and mV ranges, low alarms activate for RTD, mA or V ranges

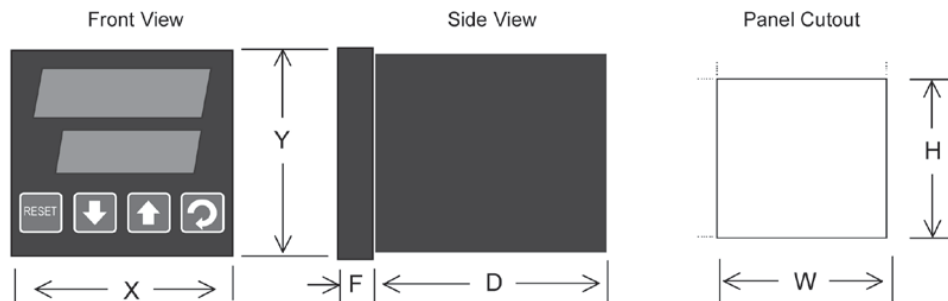
#### OUTPUTS & OPERATIONS

- Control & Alarm Relays .....Contacts SPDT 2 Amp resistive at 240V AC, >500,000 operations
- Control SSR Driver Outputs .....Drive capability >10V DC in 500Ω minimum
- Triac Outputs .....0.01 to 1 Amp AC, 20 to 280Vrms, 47 to 63Hz
- DC Linear Outputs .....0 to 20mA, 4 to 20mA into 500Ω max, 0 to 10V, 2 to 10V, 0 to 5V into 500Ω min. Control outputs have 2% over/under drive applied. Accuracy ±0.25% at 250Ω (degrades linearly to 0.5% for increasing burden to specified limits)
- Transmitter Power Supply .....Output 24 VDC (nominal) into 910Ω minimum to power external devices
- Communications .....2 Wire RS485, 1200 to 19200 Baud, Modbus protocol
- Digital Input .....Selects between 2 setpoints or Auto/Manual control. Volt free or TTL input
- Remote Setpoint Input .....0 to 20mA, 4 to 20mA, 0 to 5V, 1 to 5V, 0 to 10V or 2 to 10V. Scaleable -1999 to 9999. Local/Remote setpoint selected from front panel

#### OPERATING & ENVIRONMENTAL

- Temperature & RH .....0 to 55°C (-20 to 80°C storage), 20% to 95% RH non-condensing
- Power Supply .....100to240V50/60Hz7.5VA(optional20to48VAC7.5VA/22to65VDC5 watts) Front Panel Protection .....NEMA 4X, IEC IP66 (Behind panel protection is IP20)
- Standards .....CE,CSA,UL&cULrecognized

| Model | X            | Y            | F            | D             | W            | H            |
|-------|--------------|--------------|--------------|---------------|--------------|--------------|
| 6040  | 1.89" (48mm) | 1.89" (48mm) | 0.35" (9mm)  | 4.33" (110mm) | 1.77" (45mm) | 1.77" (45mm) |
| 8040  | 1.89" (48mm) | 3.78" (96mm) | 0.39" (10mm) | 3.94" (100mm) | 1.77" (45mm) | 3.62" (92mm) |
| 4040  | 3.78" (96mm) | 3.78" (96mm) | 0.43" (11mm) | 3.94" (100mm) | 3.62" (92mm) | 3.62" (92mm) |



SINGLE CHANNEL

# Controls

## 6040/8040/4040

### Temperature & Process Controllers *(cont'd.)*

| Model  | 40 Series Temperature & Process Controller |  |  |  |  |  |
|--|--|--|--|--|--|--|
| <b>6040</b><br><b>8040</b><br><b>4040</b>  | 1/16 DIN<br>1/8 DIN<br>1/4 DIN             | Dual 4-Digit Display, Universal Input, Auto-Detect Hardware, Up to 3 or 5 Outputs, Auto or Manual Tuning, Heat/Cool Operation, Ramp to Setpoint. Optional Features: Valve Motor Drive Position, Heater Break Alarm, Remote/Dual Setpoint, Modbus RTU/RS485 Communications, 0 to 55°C Operating Temperature, IP66. Three Year Warranty. |  |  |  |  |
| <b>Code Output 1</b>   |  |  |  |  |  |  |
| <b>O</b> None  |  |  |  |  |  |  |
| <b>R</b> Relay (2 Amp resistive at 240 VAC)  |  |  |  |  |  |  |
| <b>S</b> SSR (0/10 VDC, 500Ω Minimum load)   |  |  |  |  |  |  |
| <b>A</b> Analog (0-10V, 0-20mA, 0-5V, 2-10V, 4-20mA)   |  |  |  |  |  |  |
| <b>T</b> Triac (1 Amp AC)  |  |  |  |  |  |  |
| <b>Code Output 2</b>   |  |  |  |  |  |  |
| <b>O</b> None  |  |  |  |  |  |  |
| <b>R</b> Relay (2 Amp resistive at 240 VAC)  |  |  |  |  |  |  |
| <b>S</b> SSR (0/10 VDC, 500Ω Minimum load)   |  |  |  |  |  |  |
| <b>A</b> Analog (0-10V, 0-20mA, 0-5V, 2-10V, 4-20mA)   |  |  |  |  |  |  |
| <b>T</b> Triac (1 Amp AC)  |  |  |  |  |  |  |
| <b>M</b> <sup>4</sup> Dual Relay Output - 2 Amp, Form A  |  |  |  |  |  |  |
| <b>Code Output 3</b>   |  |  |  |  |  |  |
| <b>O</b> None  |  |  |  |  |  |  |
| <b>R</b> Relay (2 Amp resistive at 240 VAC)  |  |  |  |  |  |  |
| <b>S</b> SSR (0/10 VDC, 500Ω Minimum load)   |  |  |  |  |  |  |
| <b>A</b> Analog (0-10V, 0-20mA, 0-5V, 2-10V, 4-20mA)   |  |  |  |  |  |  |
| <b>P</b> Isolated Power Supply 24 VDC (910Ω min )  |  |  |  |  |  |  |
| <b>M</b> <sup>4</sup> Dual Relay Output - 2 Amp, Form A (Not available on the 6040 model)                |  |  |  |  |  |  |
| <b>Code Feature Option A</b>   |  |  |  |  |  |  |
| <b>0</b> None  |  |  |  |  |  |  |
| <b>1</b> RS485 Digital Communications  |  |  |  |  |  |  |
| <b>2</b> Digital Input (Voltage Free or TTL Input)   |  |  |  |  |  |  |
| <b>3</b> <sup>3</sup> Remote Setpoint - Manual Set (Not available if H is selected in Feature Option B)  |  |  |  |  |  |  |
| <b>Code Feature Option B</b>   |  |  |  |  |  |  |
| <b>0</b> None  |  |  |  |  |  |  |
| <b>1</b> <sup>3</sup> Enhanced Remote Setpoint Input & Digital Input - (Not available on the 6040 model) |  |  |  |  |  |  |
| <b>V</b> <sup>1</sup> Valve Motor Drive Position   |  |  |  |  |  |  |
| <b>W</b> <sup>1,3</sup> Valve Motor Drive Position & Remote Setpoint - (Not available on the 6040 model) |  |  |  |  |  |  |
| <b>H</b> <sup>2</sup> Heater Break Alarm Function (Available ONLY on 6040 model)                         |  |  |  |  |  |  |
| <b>9</b> Other Special Firmware  |  |  |  |  |  |  |
| <b>Code Power Supply</b>   |  |  |  |  |  |  |
| <b>0</b> 100 - 240V AC   |  |  |  |  |  |  |
| <b>1</b> 24 - 48V AC/DC  |  |  |  |  |  |  |
| <b>4040- S R A 0 0 0 Typical Model Number</b>  |  |  |  |  |  |  |

**Order Table Notes:**

- <sup>1</sup>Requires 2 Identical On/Off Outputs from above (2X R, S, T or 1X M)
- <sup>2</sup>Requires 1 On/Off Output from above (R, S or T) & a Current Transformer
- <sup>3</sup>Between Feature Options A&B, only one Remote Setpoint may be selected
- <sup>4</sup>Only available when V or W is selected in Feature Option B.

**Current Transformers for HBA Function**

| Current Rating | Part Number |
|----------------|-------------|
| 0 - 25 Amp     | 0149-50071  |
| 0 - 50 Amp     | 0149-50072  |
| 0 - 100 Amp    | 0149-50073  |