CP350/CP370 series is CHINO new digital indicating controller. It is Global Strategic Model for the 21st century. High function and more optional programmed control mode are provided.

**FEATURES**
- Universal power supply (100 to 240V AC)
- Multi input signal, high accuracy
- More programmed control mode
- Can select the PID mode from total PID type or differential type
- EVENT Output (DO): 2 points (standard), max. 7 points (option); External Input (DI): max. 6 points (OP)
- Various options such as double control output, communication function, and transmission signal output, external input, heater snapping alarm and panel sealing.

**MEASURING RANGES**

<table>
<thead>
<tr>
<th>Input type</th>
<th>Input range</th>
<th>Rating accuracy</th>
<th>Exceptionally-Specified Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>0 to 1820°C</td>
<td>±0.25%±1digit</td>
<td>0 to 400°C: Out of specifications</td>
</tr>
<tr>
<td>R</td>
<td>0 to 1760°C</td>
<td>±0.25%±1digit</td>
<td>400 to 800°C: ±0.5%±1digit</td>
</tr>
<tr>
<td>S</td>
<td>0 to 1760°C</td>
<td>±0.25%±1digit</td>
<td>0 to 400°C: Out of specifications</td>
</tr>
<tr>
<td>N</td>
<td>0 to 1300°C</td>
<td>±0.25%±1digit</td>
<td>400 to 800°C: ±0.5%±1digit</td>
</tr>
<tr>
<td>K1</td>
<td>-200 to 1370°C</td>
<td>±0.25%±1digit</td>
<td>0°C is ±0.5%±1digit</td>
</tr>
<tr>
<td>K2</td>
<td>-199.9 to 500.0°C</td>
<td>±0.25%±1digit</td>
<td>However, more than 200°C or less than 0°C is ±0.5%±1digit</td>
</tr>
<tr>
<td>E</td>
<td>-199.9 to 700.0°C</td>
<td>±0.25%±1digit</td>
<td>0°C is ±0.5%±1digit</td>
</tr>
<tr>
<td>J</td>
<td>-199.9 to 900.0°C</td>
<td>±0.25%±1digit</td>
<td>0°C is ±0.5%±1digit</td>
</tr>
<tr>
<td>T</td>
<td>-199.9 to 400.0°C</td>
<td>±0.25%±1digit</td>
<td>0°C is ±0.5%±1digit</td>
</tr>
<tr>
<td>U</td>
<td>-199.9 to 400.0°C</td>
<td>±0.25%±1digit</td>
<td>0°C is ±0.5%±1digit</td>
</tr>
<tr>
<td>L</td>
<td>-199.9 to 900.0°C</td>
<td>±0.25%±1digit</td>
<td>0°C is ±0.5%±1digit</td>
</tr>
<tr>
<td>WRs5-WRe26</td>
<td>0 to 2310°C</td>
<td>±0.25%±1digit</td>
<td>0 to 400°C: Out of specifications</td>
</tr>
<tr>
<td>W-WRe26</td>
<td>0 to 2310°C</td>
<td>±0.25%±1digit</td>
<td>400 to 800°C: ±0.5%±1digit</td>
</tr>
<tr>
<td>PtRh40-PtRh20</td>
<td>0 to 1880°C</td>
<td>±0.25%±1digit</td>
<td>0 to 400°C: Out of specifications</td>
</tr>
<tr>
<td>Pt100</td>
<td>0 to 1390°C</td>
<td>±0.25%±1digit</td>
<td>400 to 800°C: ±1.5%±1digit</td>
</tr>
<tr>
<td>Platinel</td>
<td>*</td>
<td>±0.25%±1digit</td>
<td>0 to 1390°C: ±0.25%±1digit</td>
</tr>
<tr>
<td>RTD</td>
<td>*</td>
<td>±0.25%±1digit</td>
<td>0 to 1390°C: ±0.25%±1digit</td>
</tr>
<tr>
<td>5V</td>
<td>0 to 5V</td>
<td>±0.25%±1digit</td>
<td>0.000 to 5.000: ±0.25%±1digit</td>
</tr>
<tr>
<td>DC Current</td>
<td>4 to 20mA</td>
<td>±0.25%±1digit</td>
<td>(equivalent to 1.00 to 5.00 V)</td>
</tr>
</tbody>
</table>

* To measuring DC Current, range is converted to DC Voltage by optional shunt resistor (250 Ω).
### SPECIFICATIONS

#### Input specifications

**Input signal:** Thermocouple, B, R, S, N, K, E, J, T, U, L, WRe5-WRe26, W-WRe26, PtRh40-PtRh20, Platinel II

- **DC voltage:** 0 to 5V
- **DC current:** 4 to 20mA
- **Resistance thermometer:** Pt100, JPt100

**Measuring range:**
- Thermocouple: 15 ranges
- DC voltage: 1 type
- DC current: 1 range
- Resistance thermometer: 4 type

**Accuracy rating:** ±0.25% of measurement range ±1 digit

*For details, refer to [Detailed specifications of accuracy things].

**Resolution:** Approximately 1/100,000

**Sampling rate:** Approximately 0.5 seconds

**Burnout:** Upper limit burnout is equipped as standard only for thermocouple and resistance thermometer

**Input impedance:**
- Thermocouple: 1MΩ or more
- DC voltage: 500kΩ or more
- DC current: Approximately 250Ω (external)

**Allowable signal source resistance:**
- Thermocouple: 100Ω or less
- DC voltage: 300Ω or less

**Allowable wire resistance (resistance thermometer):** 5Ω or less (Same resistance for all wires)

**Rated current (resistance thermometer):** Approximately 125μA

**Maximum allowable input:**
- Thermocouple: ±10V or less
- DC voltage: ±10V or less
- DC current: ±30mA or less, ±7.5V or less
- Resistance thermometer: 500Ω or less, ±5V or less

**Maximum common mode voltage:** 30VAC or less

**Common mode rejection ratio:**
- Temperature: 130dB or more (50/60Hz)
- Normal mode rejection ratio: 50dB or more (50/60Hz)

#### Program specifications

**Step & pattern number:**
- 4 patterns and 12 steps or 1 pattern and 48 steps

**Setting parameter:**
- Step setting, Time setting, control parameter

**Time setting:**
- 00 hr: 00 min to 99 hr: 59 min or
- 00 min: 00 sec to 99min:59 sec

**Program pattern repeat:** 0 to 9999 times

**Control parameter:** 8 groups, select for each step, PID, EV1/EV2/EV3/EV4

**Output limiter, Output preset**

**Operation switching:**
- Program drive
- (RUN, STOP, ADVANCE, RESET)

**Pattern select (1/2/3/4), Automatic output/Manual Output, Constant-value control/Program control

#### Control specifications

**Control cycle:** Approximately 0.5 seconds

**Output type:**
- ON-OFF pulse type, Current output type, SSR drive pulse type, Voltage output type

**On-off pulse type:**
- Output signal ON-OFF pulse conductive signal
- Contact capacity: Resistance load 100 to 240VAC Max 3A, 30VDC Max 3A
- Inductive load 100 to 240VAC Max 1.5A, 30VDC Max 1.5A
- Minimum load: 5VDC, 10mA or less
- Pulse cycle: Approx. 1 sec to 180 sec adjustable

**Current output type:**
- Output signal: 4 to 20mA DC
- Load resistance: 600Ω or less

**SSR drive pulse type:**
- Output signal: On-off pulse voltage signal
- ON voltage: 12VDC ±20%
- OFF voltage: 0.8VDC or less
- Pulse cycle: Approx. 1 sec to 180 sec adjustable

**Voltage output type:**
- Output signal: 0 to 10V
- Load resistance: 50kΩ or more

**Insulation:**
- Insulated with internal circuit (20MΩ or more/500VDC)

**Control type:**
- Multi control output PID type
- (On-off pulse type, Current output type, SSR drive pulse type, Voltage output type)
- Fixed command setting or program setting selectable

**Fixed command control setting value:**
- 8 pairs (parameter pairs) select

**Set point ramp function:**
- Set point ramp unit...ºC/minute (common to rising/falling)
- Set point rising ramp: 0 to 9999
- (0 = no operation)
- Set point falling ramp:
- 0 to -9999 (0 = no operation)
- PV start function... At SV change, power-on, Run/Ready

**Control set point accuracy ratings:**
- Relative error to displayed value ... ±1 digit

**Auto-tuning:**
- Standard
- PID constants:
  - P ... 0.1 (0.0) to 999.9% (0= 2-position)
  - I ... 0 to 9999 seconds
  - D ... 0 to 9999 seconds

**Anti-reset windup:**
- Upper limit ... 0.0 to 100.0%
- Lower limit ... -100.0 to 0.0%

**Overshoot suppression function:**
- ON/OFF selectable

**Control operation:**
- With direct/reverse action switchable

**Output limiter:**
- 8 set

**Output variation limiter:**
- Upper limit ... 0.0 to 105.0%, Lower limit ... -5.0 to 100.0%

**Run/Ready:**
- Run/ready (cont stop, output: preset output value) switchable

**Preset output:**
- -5.0 to 105.0%

**Control at power recovery:**
- Continuous/ready switchable

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**Measuring value (PV)**

(Parameter item in setting mode)
**Event specifications**

**Event output points:**
- Relay output 2 points (EV1, EV2) standard
- Max. 2 points relay output (EV3/EV4) option
- Max. 3 points open collector output (EV5/EV6/EV7) option
- Alarm type: (available EV1 to EV4)

**Event output (EV1 to EV4):**
- Output signal: non-voltage contact
- Contact rating:
  - Resistance load: 100 to 240V AC Max 3A, 30VDC, Max 3A
  - Inductive load: 100 to 240V AC Max 1.5A, 30VDC Max 1.5A
- Minimum load: 10mA, 5VDC or more
- Electrical life of relay: a hundred thousand times or more
- Protect element of contact: Non internal: enable to set other elements

**Event output (EV5 to EV7):**
- Output signal: Transistor open collector output
- Output rating: 24V DC, 50mA or less
- Insulation: Insulated with internal circuit (20MΩ or more /500VDC)
- Insulated with relay output
- Non-insulated with transmitter open collector output

**Event dead band:** Can be set by the resolution being 0.1 times the setting resolution of SV.

**Event output phase:** Normal/reverse switchable event output at Ready/Off calculation switchable

**Event output points:**
- Insulation: Insulated with relay output
- Insulation: Not insulated with outputs

**Display specifications**

**Display type:** 4-digit LED display, two lines

**Display contents:**
- First LED (yellow-green) display
  - At setting mode: Parameter item
  - At setting mode: Parameter item
  - At setting mode: Parameter item
  - At setting mode: Parameter item
- Second LED (red) display
  - At operation mode: Process value (PV)
- Second LED (red) display
  - Control output value (OUT)
- Status (red) display
  - EV1: Lights when EV1 or status 1 is activated
  - EV2: Lights when EV2 or status 2 is activated
  - AT: Lights when auto-adjustment
  - RUN: Lights when auto-operation
  - OUT: Lights when the control output value
  - MAN: Lights when manual operation
  - SV: Lights when the SV value displayed in second display

**Automatic return:**
- Returns to operation mode if any key is not pressed
- for more than approx 3 minute in setting mode

**Key lock:**
- Exist

**General specifications**

**Rated power voltage:** General power supply specifications 100 to 240VAC (50/60Hz)

**Ambient temperature:** -10 to 50°C (max. 40°C for closed-installation)

**Ambient humidity:** 10 to 90% (no dew condensation)

**Maximum power consumption:**
- Approx. 10V A without option
- Approx. 16V A with option

**Front material:**
- Nonflammable ABS

**Gasing:**
- Nonflammable polycarbonate

**Color:**
- Gray

**Mounting method:**
- Panel mounting

**Weight:**
- CP350: Approx. 240g without option
- CP370: Approx. 330g without option

<table>
<thead>
<tr>
<th>Name</th>
<th>Model</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shunt resistor (250Ω)</td>
<td>EZ-RX250</td>
<td>For DC 4 to 20mA current</td>
</tr>
<tr>
<td>Contact protection element for relay output</td>
<td>CX-CR1</td>
<td>For light load</td>
</tr>
<tr>
<td>External CT</td>
<td>CTL-6-S-H</td>
<td>For heavy load</td>
</tr>
</tbody>
</table>

**Available accessory**

**Option**

**Name**
- Control output 2
- Transmission signal output
- Additional events output
- External input
- Communication interface
- Heater disconnection detection
- Panel sealing specification

**Content**
- Control calculation: SPLIT system/PID system
- The setting range of SPLIT system
- Direct: 0 to 100.0%
- Reverse: -100.0 to 0.0%
- Insulation: Not insulated with outputs
- Insulated with internal circuit
- Output signal proportionate by SV, MV, etc.
- Output signal: 4 to 20mA DC
- Load resistance 600Ω or less
- Selected 0 to 1V DC or 0 to 10V DC.
- Load impedance approx. 10Ω
- Load resistance 50kΩ or more
- Accuracy rating: ±0.3% of FS
- Resolution: Approx. 1/30,000
- Output update period: Approx. 0.5 second
- Insulated with internal circuit (20MΩ or more /500VDC)
- Input points: Six points (max.)
- Input signal:
- No-voltage contact, open-collector signal
- Function:
  1. RUN/READY selectable by external input
  2. Remote/Local selectable by external input
  3. Auto/Manual selectable
  4. Start Timer
  5. Alarm event RESET
  7. Program operation
  8. Select program pattern No.
- Insulation: Insulated with internal circuit (20MΩ or more for 500VDC)

**Communications type:** RS485

**Protocol:** MODBUS (RTU), MODBUS (ASCII), PRIVATE

**Communication function:** Select transmission setting/data or digital transmission or digital remote transmission

**Heater disconnection detection**
- Input signal: ±5.0 to 50.0A AC
- Accuracy rating: 5.0% of FS ±1 digit

**External CT**
- “CTL-6-S-H” made by U-RD

**Panel sealing specification & Terminal cover**
- Front panel protection: Equivalent to IEC60529 IP65 (self-declaration)
- *Not possible during closed instrumentation*
- Terminal cover protects terminal box

**Weight:**
- CP370: Approx. 330g without option
- CP370: Approx. 420g with option

**Ambient humidity:** 10 to 90% (no dew condensation)

**Ambient temperature:** -10 to 50ºC (max. 40ºC for closed-installation)

**Appearance:**
- CP350: Approx. 240g without option
- CP370: Approx. 330g without option
## Terminal board

<table>
<thead>
<tr>
<th></th>
<th>A line</th>
<th>B line</th>
<th>C line</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Measurement input</td>
<td>NC</td>
<td>A</td>
</tr>
<tr>
<td>2</td>
<td>Thermocouple DC/AC</td>
<td>+ RTD</td>
<td>B</td>
</tr>
<tr>
<td>3</td>
<td>Event output</td>
<td>-</td>
<td>B</td>
</tr>
<tr>
<td>4</td>
<td>EV1</td>
<td>Relay output</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>EV2</td>
<td>15</td>
<td>Di2</td>
</tr>
<tr>
<td>6</td>
<td>COM</td>
<td>16</td>
<td>Di3</td>
</tr>
<tr>
<td>7</td>
<td>Output 1 (Control output)</td>
<td>On-off pulse type (Relay output)</td>
<td>N.O</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td>Others</td>
</tr>
<tr>
<td>9</td>
<td>Power supply</td>
<td>L</td>
<td>19</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>N</td>
<td>20</td>
</tr>
</tbody>
</table>

### Dimensions and panel cutout

#### Front

**CP350**

- **CP370**

#### Side

- **CP350**
- **CP370**

*Water proof not applicable

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