

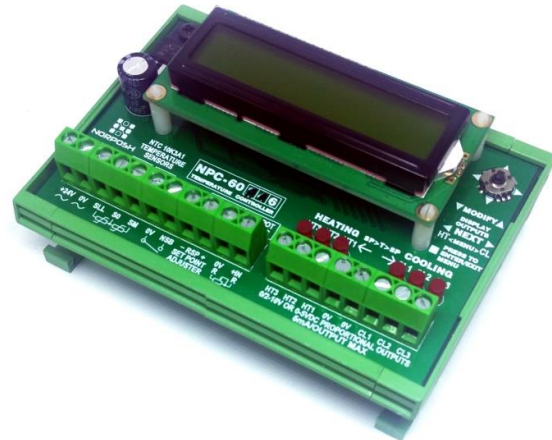
NPC-60X

TEMPERATURE CONTROLLER



DESCRIPTION

The NPC-60X is a Proportional/Integral Temperature Controller with Lo-Limit and other advanced features. Setpoint can be adjusted remotely by using Digital Remote, External Pot or 0-10VDC source. The controller has separate analogue 0-10VDC proportional outputs for heating and cooling so requires no configuration for outputs prior to use. The unit offers individual Proportional band and Deadband adjustment of each output and separate adjustment of Heating and Cooling Integral Time. The controller is designed specifically to control Damper Actuators, Thyristor Controllers, Relay Modules etc.



FEATURES

- Four or Six (NPC-604/NPC-606) Analogue outputs, 2/3 Heating outputs and 2/3 Cooling outputs
- Digitally calibrated 0-10VDC proportional outputs
- Separate outputs for Heating and Cooling, i.e., Plug n Play, no configuration required
- Full Proportional + Integral action with Lo-Limit. Integral action can be switch off if not required while Lo-Limit is auto disabled when Lo-Limit sensor not connected
- Separate Integral Time for Heating and Cooling allowing it to be used for Heating and Cooling with or without Integral.
- Analogue output value in (%) is displayed on LCD. All Proportional outputs have Blinking LEDs with a Blinking rate directly proportional to Analogue output. e.g. output with 0% is completely off while for 100% solid lit
- User friendly Back-lit 16X2 LCD Display with 5Way Navigation Switch
- Temperature and Setpoint range from -5°C to +95°C with a resolution of 0.1°C. Min and Max Setpoint range is user adjustable
- Temperature Sensors offset feature. With this feature, individual offset of $\pm 5^{\circ}\text{C}$ with a resolution of 0.1°C can be adjusted to eliminate error for Main and Lo-Limit Temperature Sensors.
- Night Set-back option. Indication is provided on LCD when Night Set-back is activated
- Choice of Remote Setpoint input, i.e. two-wire Digital and Analogue:

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- Digital Remote requires no external power therefore Power and Data is Transmitted/Received simultaneously over a pair of wires with NORPOSH Intelligent Communication Protocol with CRC (checksum) on both side for error free Temperature and Setpoint Display
- Analogue input is user selectable for Resistance and Voltage (0-10VDC) input to control Setpoint externally.
 - ◆ Resistance input can be selected from menu for 0-10K Ω , 1-11K Ω , 0-5K Ω and 560-10560 Ω . Variety of pre-defined External Pot ranges gives an option to use different available POTs in the market.
 - ◆ 0-10VDC Analogue Setpoint input range can be selected anywhere between -5°C to +95°C. So this feature gives option to control the Setpoint via BMS or BACnet I/O Modules with 0-10VDC output
- 24VAC/DC Power input
- Din-rail PCB Holder

SPECIFICATIONS

Power Supply	24VAC/DC, -15/+10% 130mA max
Temperature and Setpoint Range	-5°C to 95°C, 0.1°C Resolution
Main and Lo-Limit Sensors	NTC 10K3A1, Offset is user adjustable $\pm 5^\circ\text{C}$, 0.1°C Resolution
Integral Time (Heating & Cooling)	0 to 500seconds
Proportional Band (Prop band)	0-50°C, 1°C Resolution
Deadband	0-10°C, 1°C Resolution
Night Set-back	-5°C to 95°C, 0.1°C Resolution
External Setpoint Input	Digital Remote, Ext. Pot/0-10VDC
External Pot Resistance	User selectable from Menu: 0-10K Ω , 1-11K Ω , 0-5K Ω and 560 Ω -10560 Ω
External Pot Setpoint Range	User selectable: $\pm 4^\circ\text{C}$, $\pm 5^\circ\text{C}$, $\pm 10^\circ\text{C}$, $\pm 20^\circ\text{C}$, 5/35°C, -5/45°C, 0/50°C, -10/50°C, 30/90°C, 40/90°C, 25/95°C, -5/95°C
External 0-10VDC Setpoint Range	User adjustable: anywhere between -5°C to 95°C with minimum difference of 1°C
Lo-Limit Range	0°C to 30°C, 0.1°C Resolution
Digital Remote Range (Setpoint Adjuster)	User adjustable: anywhere between -5°C to 95°C with minimum difference of 1°C
Proportional Outputs (Heating and Cooling)	Digitally Calibrated 0-10VDC, 5mA per output max at 10VDC
Dimensions	113 x 82 x 47 (W x H x D)

ORDERING INFORMATION

NPC-604	4 x 0-10VDC analogue outputs. 2 Heating & 2 Cooling
NPC-606	6 x 0-10VDC analogue outputs. 3 Heating & 3 Cooling
NSP-100	Digital Remote (Setpoint Adjuster) compatible with NPC-604 and NPC-606

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INSTRUCTIONS

1. From the Main Temperature Screen as shown below, navigate to display heating or cooling analogue outputs in percentage (%) or press the navigation switch to enter Menu.

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TEMPMAIN N 20.0°C
SETPOINT 20.0°C
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2. Navigate to select Menu and if the Menu has sub-menu, it will be shown with ■■■ mark. Press the navigation switch again to enter sub-menu.
3. Navigate to modify selected menu parameters. The modification can only be made if the displayed parameter is shown with ⚡ mark.
4. While on last Menu, pressing navigation switch at any time or if navigation switch is not used for more than 10 seconds, will cause exit to Main Temperature Screen.

OPERATION

The NPC-60X Temperature Controller has 4 or 6 analogue 0-10VDC proportional outputs. As the controller has separate heating and cooling proportional outputs, no configuration is required prior to use. The Main Sensor must be connected to the controller however the Lo-Limit Sensor is optional and Lo-Limit operation is automatically disabled if the Lo-Limit not connected. Lo-Limit sensor will override the main sensor if the Lo-Limit temperature falls below the Lo-Limit value and the Main Temperature Screen will show ■■■, however only heating stage 1 (HT1) output gives proportional output with respect to Lo-Limit Temperature and Lo-Limit PROP BAND. During the Lo-Limit operation, integral is off regardless of the set value. In order to safety, if the Main Sensor is not connected, all proportional outputs are shut-down to zero volts regardless the value of Setpoint. The Main and Lo-Limit sensor error can easily be compensated by adjusting the sensor offset from Sensor Offset Menu. Avoid running sensor cable with the mains as this will cause fluctuation in temperature value. Adjust the appropriate PROP BAND. Too small value will cause high fluctuation at the analogue outputs. PROP BAND of each output and DEADBAND between any stages can be adjusted individually. The Controller offers separate Integral Time for heating and cooling. If the integral function is not required, set it to 0s. Night Set-back offers full range of the controller. Closing the 0V and NSB contacts, will take the controller in Set-back mode. When the night mode is activated, ■■■ appears on Main Temperature Screen. Setpoint can be adjusted or trimmed externally either by using Digital Remote Setpoint Adjuster or External Pot. Choice of external Pot resistance is available. User can easily select these values from R_{Pot} Menu. Setpoint can also be adjusted by external 0-10VDC signal. In the Setpoint Setup, when the 0-10VDC is selected, the EXT POT input is automatically configured to 0-10VDC input. The minimum and maximum range of Remote Setpoint Adjuster and external 0-10VDC Setpoint is user adjustable.

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WIRING INSTRUCTIONS

The controller operates at 24VAC/DC. Main Sensor is connected between S0 and SM while Lo-Limit Sensor (if required) must be connected between SLL and S0. Always use shielded cable for sensors. All 0V terminals are connected internally and potential at sensor terminal S0 is also zero-volt and is internally connected to 0V. Avoid short circuiting the DIGITAL REMOTE terminals for a long time. However these terminals are internally current limited. The maximum recommended load at any analogue proportional output at 10VDC is 5mA. Do not apply power at these outputs as this will cause permanent damage to the controller.

DIMENSIONS

