

# 1/16 DIN MICROMEGA® Autotune PID Temperature/ Process Controllers

Shown actual size

MANUFACTURED BY  
**NEWPORT**  
As seen at [www.newportUS.com](http://www.newportUS.com)

**MONOGRAM**  
SERIES



CN77500 Series IP65  
Square Cutout



CN77300 Series DP41 Style  
Square Cutout

CN77000 Series

£180  
Basic Unit

High accuracy, high quality MICROMEGA® controllers offer unparalleled flexibility in process control. Each unit allows the user to select the input type, from 10 thermocouple types (J, K, T, E, R, S, B, C, N and J DIN), Pt RTD's (100, 500 or 1000 Ω, with either 385 or 392 curve), or analogue voltage or current input. The voltage/current inputs are fully scalable to engineering units, with selectable decimal point, perfect for use with pressure, flow or other process input.

The MICROMEGA® controller features a large, dual LED display, front panel configuration, selectable temperature/process inputs and universal power supply that accepts 90 to 250 Vac or Vdc. Available in single and dual output configurations, the CN77000 Series is available with relay, SSR, dc pulse, analogue voltage or current outputs. A single alarm is standard. Options include a second alarm, RS-232, RS-485, analogue output or remote setpoint selection.

The "300" series controllers have many features of larger, ¼ DIN controllers in a compact, ⅙ DIN size. These controllers feature a 1/16 DIN cutout and bezel with a IP41 rating, dual LED displays, with different colours for the actual process and setpoint values. Individual indicators provide output and alarm status.

The "500" features a ⅙ DIN cutout, 53 mm square face with IP65 rating, large dual LED display, front panel configuration, and selectable temperature/process inputs. Available in single and dual output configurations, the CN77500 is available with relay, SSR, dc pulse, analogue voltage or current outputs. A single alarm is standard.

The R300 and R500 controllers feature a unique detachable display and adapter to allow mounting in a round, 44 mm cutout. This feature allows users to prepare the panel with a standard round hole saw. The 2-piece design snaps together, for quick, easy installation.

"R" Series - For easy-to-drill round holes

- ✓ High Accuracy  $\pm 0.5^{\circ}\text{C}$  (0.9°F), 0.03% Reading
- ✓ High Quality – Extended 5-Year Warranty at No Extra Charge
- ✓ Universal Inputs – Process Voltage/Current Thermocouple, RTD
- ✓ Dual 4-Digit LED Display and Indicators for Output and Alarm Status
- ✓ Optional RS-232, RS-485, OMEGA Protocol and MODBUS Protocol

- ✓ Relay, SSR, dc Pulse, 0 to 10 V and 0 to 20 mA Output Types
- ✓ Ramp up to Setpoint Feature Standard
- ✓ Universal Power Supply, 90-250 Vac or Vdc
- ✓ Dual Output and Dual Alarm Capability
- ✓ Isolated Analogue Output or Remote Setpoint Selection



## Specifications

### Accuracy:

$\pm 0.5^{\circ}\text{C}/0.9^{\circ}\text{F}$  temp; 0.03% rdg. process

**Resolution:**  $1^{\circ}/0.1^{\circ}$ ; 10  $\mu\text{V}$  process

### Temperature Stability:

0.08 $^{\circ}\text{C}/^{\circ}\text{C}$ ; 50 ppm/ $^{\circ}\text{C}$  process

**Thermocouple Cold End Tracking:**  
0.05 $^{\circ}\text{C}/^{\circ}\text{C}$

**NMRR:** 60 dB

**CMRR:** 120 dB

### Common Mode Voltage:

1500 V peak test, 350 V per IEC spacing

**A/D Conversion:** Dual slope

**Reading Rate:** 3 samples per second

**Digital Filter:** Programmable

**Display:** Dual 4-digit, 7-segment LED, 9.2 mm (0.36"); red process variable, green setpoint; indicators for output and alarm status; 7.6 mm (0.3") for IP41 units

**Warmup to Rated Accuracy:** 30 min

## Input

**Input Types:** Thermocouple, RTD, analogue voltage, analogue current

**Thermocouple Lead Resistance:**

100  $\Omega$  max

**RTD Input:** 2-, 3-, or 4-wire, 100, 500, and 1000  $\Omega$ , 0.00385 or 0.00392 Pt curve

### Voltage Input:

0 to 100 mV, 0 to 1 V, 0 to 10 Vdc

**Current Input:** 0 to 20 mA, 4 to 20 mA

**Configuration:** Single-ended

**Polarity:** Unipolar

**Step Response:** 0.7 sec for 99.9%

**Decimal Selection:** None, 0.1 or 0.01

**Span Adjustment:**

0.001 to 9999 counts

**Offset Adjustment:** -9999 to +9999

## Control

**Action:** Reverse (heat) or direct (cool)

**Modes:** Time proportioning and proportional control modes; selectable preset tune, auto-tune, PID, proportional, proportional with integral, proportional with derivative with anti-reset windup, on-off

**Rate:** 0 to 999.9 sec

**Reset:** 0 to 99 min 59 sec

**Cycle Time:** 1 to 199 seconds;

set to 0 for on/off operation

**Gain:** 0.5 to 100% of span; setpoints 1 or 2

**Damping:** 1 to 8 in unit steps

**Soak:** 00.00 to 99.59 (HH.MM)

**Ramp to Setpoint:**

00.00 to 99.59 (HH.MM)

**Autotune:**

Operator initiated from front panel

**Break Protection:**

Programmable up- or down-scale

## Control Output

**Relay:** 5 A @ 120 Vac, 3 A @ 240 Vac;

output 1: SPDT type; output 2: SPST type

**SSR:** Rated 1 A @ 120/240 Vac, continuous

**dc Pulse:** Non-isolated;

10 Vdc @ 20 mA

**Analogue Output:** Non-isolated 0 to 10 Vdc or 0 to 20 mA; 500  $\Omega$  max

## Options

### Remote Setpoint Selection:

Up to 3 setpoints stored in memory; contact closure selection

**Analogue Output:** Isolated 0 to 10 Vdc or 0 to 20 mA, programmable

## Communications

**RS-232 or RS-485:** OMEGA<sup>®</sup> Protocol and MODBUS Protocol 300 to 19.2 k baud; complete programmable set-up capability; program to transmit current display, alarm status, min/max, actual measured input value and status

**RS-485:** Addressable from 0 to 199

**Connection:** Screw terminals

## Alarms

**Type:** SPST relay, 5 A @ 120 Vac, 3 A @ 240 Vac

**Operation:** High/low, latching/non-latching, and process/deviation; front panel configurations

## Insulation

### Power to Input or Output:

2500 Vac or dc, except alarm 2 option has only 1500 Vac or dc between inputs 500 Vac or dc

## General

**Power:** 90 to 250 Vac/dc, 50 to 400 Hz;

**Operating Ambient:** 0 to 55 $^{\circ}\text{C}$

(32 to 131 $^{\circ}\text{F}$ ), 90% RH non-condensing

**Power Consumption:**

6 Va max @ 120 Vac

## Panel Cutout

**CN77R000 series:**

44.5 mm (1.75") dia. round cutout;

**CN77300 and CN77500 series:**

45 mm (1.772") square, 1/16 DIN

**Dimensions:**

**CN77R000 Series:**

48 H x 48 W x 144.7 mm D (1.89 x 1.89 x 5.70")

**CN77300 Series:**

48 H x 48 W x 123.3 mm D (1.89 x 1.89 x 4.85")

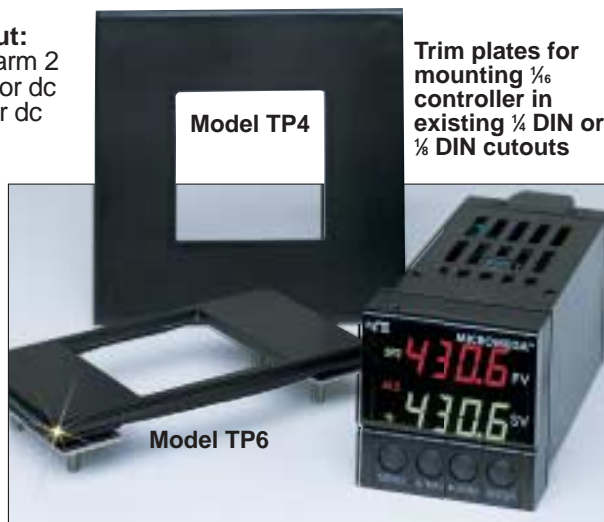
**CN77500 Series:**

53 H x 53 W x 123.3 mm D (2.1 x 2.1 x 4.85")

**Weight:** 227 g (0.5 lb)



Model SPC116-S  
Splash-Proof Cover for 1/6 DIN Controller

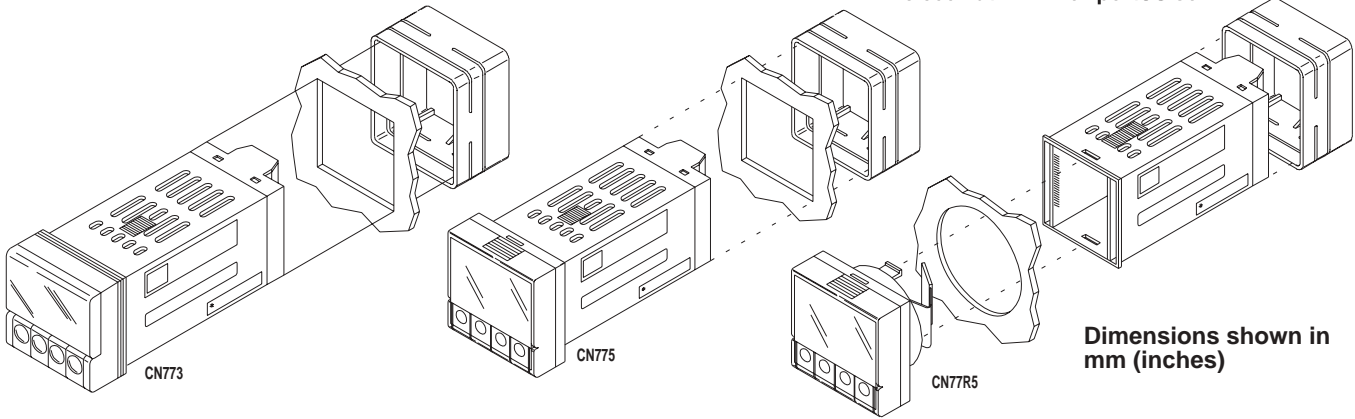


Trim plates for mounting 1/6 controller in existing 1/4 DIN or 1/2 DIN cutouts

	Input Type	Range	Accuracy
<b>J</b>	Iron-Constantan	-210 to 760 $^{\circ}\text{C}$ /-346 to 1400 $^{\circ}\text{F}$	0.4 $^{\circ}\text{C}$ /0.7 $^{\circ}\text{F}$
<b>K</b>	CHROME $\Omega$ <sup>™</sup> - ALOME $\Omega$ <sup>™</sup>	-270 to -160 $^{\circ}\text{C}$ /-160 to 1372 $^{\circ}\text{C}$ -454 to -256 $^{\circ}\text{F}$ /-256 to 2502 $^{\circ}\text{F}$	1.0 $^{\circ}\text{C}$ /0.4 $^{\circ}\text{C}$ 1.8 $^{\circ}\text{F}$ /0.7 $^{\circ}\text{F}$
<b>T</b>	Copper-Constantan	-270 to -190 $^{\circ}\text{C}$ /-190 to 400 $^{\circ}\text{C}$ -454 to -310 $^{\circ}\text{F}$ /-310 to 752 $^{\circ}\text{F}$	1.0 $^{\circ}\text{C}$ /0.4 $^{\circ}\text{C}$ 1.8 $^{\circ}\text{F}$ /0.7 $^{\circ}\text{F}$
<b>E</b>	CHROME $\Omega$ <sup>™</sup> - Constantan	-270 to -220 $^{\circ}\text{C}$ /-220 to 1000 $^{\circ}\text{C}$ -454 to -364 $^{\circ}\text{F}$ /-364 to 1832 $^{\circ}\text{F}$	1.0 $^{\circ}\text{C}$ /0.4 $^{\circ}\text{C}$ 1.8 $^{\circ}\text{F}$ /0.7 $^{\circ}\text{F}$
<b>R</b>	Pt/13%Rh-Pt	-50 to 40 $^{\circ}\text{C}$ /40 to 1768 $^{\circ}\text{C}$ -58 to 104 $^{\circ}\text{F}$ /104 to 3214 $^{\circ}\text{F}$	1.0 $^{\circ}\text{C}$ /0.5 $^{\circ}\text{C}$ 1.8 $^{\circ}\text{F}$ /0.9 $^{\circ}\text{F}$
<b>S</b>	Pt/10%Rh-Pt	-50 to 100 $^{\circ}\text{C}$ /100 to 1768 $^{\circ}\text{C}$ -58 to 212 $^{\circ}\text{F}$ /212 to 3214 $^{\circ}\text{F}$	1.0 $^{\circ}\text{C}$ /0.5 $^{\circ}\text{C}$ 1.8 $^{\circ}\text{F}$ /0.9 $^{\circ}\text{F}$
<b>B</b>	30%Rh-Pt/6%Rh-Pt	100 to 640 $^{\circ}\text{C}$ /640 to 1820 $^{\circ}\text{C}$ 212 to 1184 $^{\circ}\text{F}$ /1184 to 3308 $^{\circ}\text{F}$	1.0 $^{\circ}\text{C}$ /0.5 $^{\circ}\text{C}$ 1.8 $^{\circ}\text{F}$ /0.9 $^{\circ}\text{F}$
<b>C</b>	5%Re-W/26%Re-W	0 to 2320 $^{\circ}\text{C}$ /32 to 4208 $^{\circ}\text{F}$	0.4 $^{\circ}\text{C}$ /0.7 $^{\circ}$
<b>N</b>	Nicrosil-Nisil	-250 to -100 $^{\circ}\text{C}$ /-100 to 1300 $^{\circ}\text{C}$ -418 to -148 $^{\circ}\text{F}$ /-148 to 2372 $^{\circ}\text{F}$	1.0 $^{\circ}\text{C}$ /0.4 $^{\circ}\text{C}$ 1.8 $^{\circ}\text{F}$ /0.7 $^{\circ}\text{F}$
<b>L</b>	J DIN	-200 to 900 $^{\circ}\text{C}$ /-328 to 1652 $^{\circ}\text{F}$	0.4 $^{\circ}\text{C}$ /0.7 $^{\circ}\text{F}$
<b>RTD</b>	Pt, 0.00385, 100 $\Omega$ , 500 $\Omega$ , 1000 $\Omega$	-200 to 900 $^{\circ}\text{C}$ /-328 to 1652 $^{\circ}\text{F}$	0.4 $^{\circ}\text{C}$ /0.7 $^{\circ}\text{F}$
	Pt, 0.00392, 100 $\Omega$ , 500 $\Omega$ , 1000 $\Omega$	-200 to 850 $^{\circ}\text{C}$ /-328 to 1562 $^{\circ}\text{F}$	0.4 $^{\circ}\text{C}$ /0.7 $^{\circ}\text{F}$
	Process Voltage	0 to 100 mV, 0 to 1 V, 0 to 10 Vdc	0.03% rdg
	Process Current	0 to 20 mA, 4 to 20 mA	0.03% rdg

# 1/16 DIN MICROMEGA®

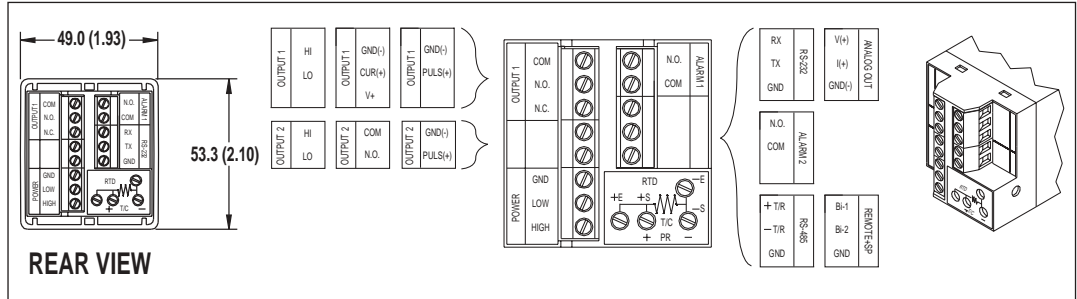
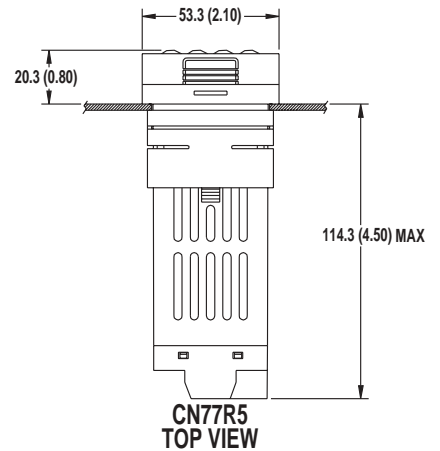
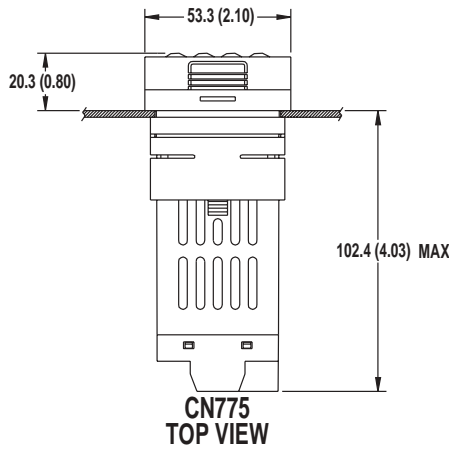
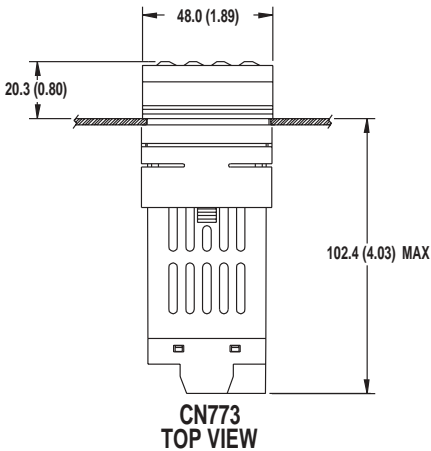
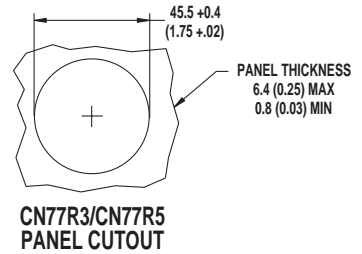
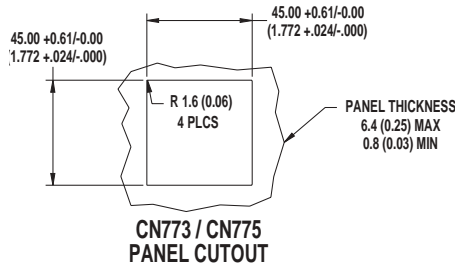
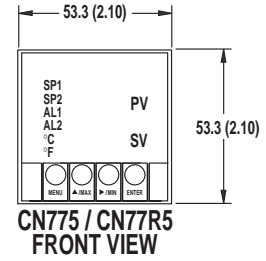
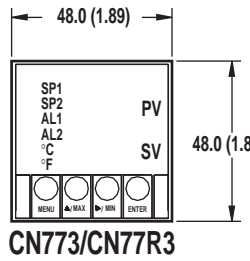
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**NEWPORT®**  
As seen at [www.newportUS.com](http://www.newportUS.com)



Dimensions shown in mm (inches)



**CN77500 Series  
IP65 face plate**





# CUSTOM CONFIGURATIONS

Custom firmware and hardware available in quantity.

Custom colour bezels and Enclosures are available for Original Equipment Manufacturers.

Enhance the appearance of your equipment design with custom colours.



**CUSTOM COLOURS**

Consult Sales



The following LVD (Low Voltage Directive/Safety) requirements have been met to comply with EN 61010-1, 1993 (Electrical equipment for measurement, control and laboratory use)

1. Pollution Degree 2    2. Installation Category II    3. Double Insulation

CN77XXX complies with the following EMC Immunity Standards as tested per EN 50082-2, 1995 (Industrial environment)

Phenomena	Test Specification	Basic Standard
Electrostatic Discharge	+/- 4 kV contact discharge +/- 8 kV air discharge	EN 1000-4-2 Perf. Criteria B
Radio Frequency electromagnetic field	27 - 1000 MHz 10 V/m 80% AM (1 KHz)	EN 1000-4-3 Perf. Criteria A
Fast Transients	+/- 2 kV (ac mains) +/- 1 kV (dc, signal I/O) 5/50 ns Tr/Th, 5 KHz repit.	EN 1000-4-4 Perf. Criteria B
Radio Frequency conducted	0.15 - 80 MHz 10 V/m 80% AM (1 KHz)	EN 1000-4-6 Perf. Criteria A
Surges	+/- 2 kV line to earth +/- 1 kV line to line 1.2/50 (8/20) µs Tr/Th	EN 1000-4-5 Perf. Criteria B
Voltage Dips	30% reduction 10 ms 60% reduction 100 ms	EN 1000-4-11 Perf. Criteria B
Voltage Interruption	>95% reduction 5000 ms	EN 1000-4-11 Perf. Criteria C

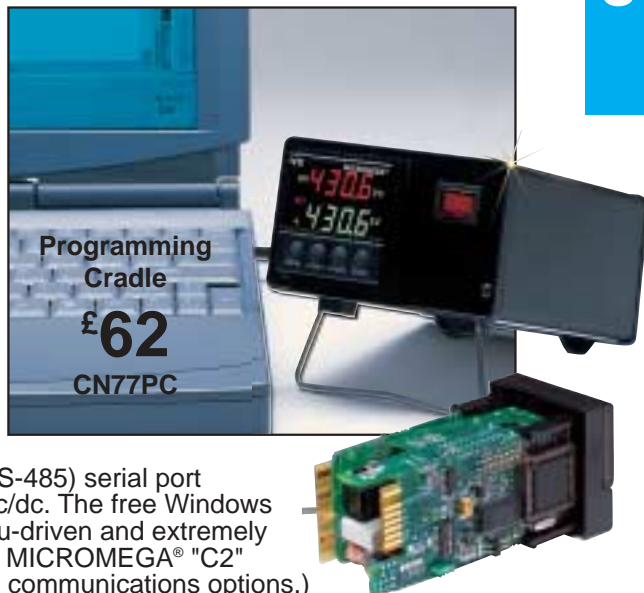
CN77XXX comply with the following EMC Emission Standards as tested per EN 50081-1, 1997 (Residential, Commercial and Light Industrial)

Phenomena	Frequency Range	Limits	Basic Standard
Radiated Emission	30 - 230 MHz	30 dB µV/m at 10 m	CISPR 22
	230 - 1000 MHz	37 dB µV/m at 10 m quasi peak	Class B
Conducted Emission	0.15-0.5 MHz	66-56 dB µV q.peak	CISPR 22
	0.5-5 MHz	56 dB µV quasi peak	Class B
	5-30 MHz	60 dB µV quasi peak	

Most Popular Models	Price
<b>CN77343</b>	<b>£188</b>
<b>CN77R333-PV</b>	<b>241</b>
<b>CN77543</b>	<b>196</b>
<b>CN77R544-C2</b>	<b>237</b>
<b>CN77544</b>	<b>196</b>

## Programming Cradle

With the MICROMEGA® Programming Cradle and our FREE SOFTWARE, setting up and configuring any quantity of MICROMEGA® controllers is fast and easy—especially valuable for OEM applications and systems integrators. Both the CN775 and CN773 front-removable MICROMEGA® controllers with serial communications are quickly and easily plugged in, programmed and removed from the cradle. The cradle includes a standard 9-pin mini DIN cable for connection to a computer's RS-232 (or RS-485) serial port and is powered by 90-250 Vac/dc. The free Windows configuration software is menu-driven and extremely user-friendly. (Requires either MICROMEGA® "C2" RS-232 or "C4" RS-485 serial communications options.)



## To Order (\* Complete Model No.)

Model Number	Description	Price
<b>CN77</b> ( * ) ( * ) ( * ) ( * ) ( * )		
<b>3</b>	IP41 face with 1/6 DIN cutout	<b>£180</b>
<b>R3</b>	IP30 DP41 Style face with 44mm (1 3/4") round cutout	<b>180</b>
<b>5</b>	IP65/NEMA-4 face with 1/6 DIN cutout	<b>188</b>
<b>R5</b>	IP30 face with 44mm (1 3/4") round cutout	<b>188</b>
<b>Add £8.20 for second output only</b>		
<b>0</b>	No second output	<b>N/C</b>
<b>2 2</b>	†SSR solid state relay (1 A @ 120/240 Vac)	<b>N/C 8.20</b>
<b>3 3</b>	Relay SPDT 5 A @ 120, 3 A @ 240 Vac	<b>N/C 8.20</b>
<b>4 4</b>	Pulsed 10 Vdc @ 20 mA max	<b>N/C 8.20</b>
<b>5</b>	Non-isolated 1 to 10 V or 0 to 20 mA	<b>N/C N/A</b>
<b>Additional options</b>		
<b>-A2</b>	Second alarm relay	<b>4.90</b>
<b>-C2</b>	Isolated RS-232	<b>41</b>
<b>-C4</b>	Isolated RS-485	<b>41</b>
<b>-PV</b>	Isolated analogue output (scaled from PV)	<b>53</b>
<b>-RSP</b>	Remote set point (alternate set point enable)	<b>20.50</b>

**Ordering Example: CN77533-PV**, dual output controller, 1/6 DIN cutout and bezel, NEMA-4/IP65 face, with 5 A form "C" relays and optional analogue output, £188 + 8.20 + 53 = **£249.50**

## Accessories

Model Number	Description	Price
<b>RHS43</b>	Arbored hole saw 43 mm (1.68") for CN77R	<b>£15.50</b>
<b>SPC116-S</b>	Splash-proof cover for 1/6 DIN controllers	<b>24.50</b>
<b>TP4</b>	Trim plate adapter to install 1/6 DIN meter in existing 1/4 DIN panel cutout	<b>15.50</b>
<b>TP6</b>	Trim plate adapter to install 1/6 DIN meter in existing 1/8 DIN panel cutout	<b>15.50</b>
<b>CN77PC</b>	Programming cradle	<b>62.00</b>