3200
SERIES

Temperature/Process Controllers

Specification Sheet

- **8 Segment programmer**
- **Heater failure detection**
- **Current monitoring**
- **Internal timer**
- **Scrolling text messages**
- **Recipes**
- **Modbus comms**
- **Modbus SP retransmission**
- **Analogue retransmission**
- **Remote setpoint**
- **Help text**

The innovative range of 3200 controllers offer precision control of temperature and other process variables together with a host of advanced features not normally found in this class of controller.

The emphasis is on ease of use. A simple 'Quick Start' code is used to configure all the functions essential for controlling your process. This includes input sensor type, measurement range, control options, and alarms, making 'Out the Box' operation truly achievable. In operator mode every parameter has a scrolling text message describing its function and is available in English, German, French, Spanish or Italian. More advanced features are configured using iTools, a PC based configuration wizard which is an easy to use and instructive guide to all the functions in the controller.

Heater current monitoring

A current transformer input provides display of the heater current and a health check on the load. Partial load failure, heater open circuit and SSR faults are detected and displayed as scrolling alarm messages as well as providing an alarm output. On the 3208 and 3204 a front panel ammeter displays the heater current.

Setpoint programmer

Heat treatment profiles can be programmed using the 8-segment programmer. Holdback, at the beginning of each segment can be used to guarantee the soak periods. A digital event output can be triggered in any segment to initiate actions within the process.

Custom text messaging

Custom messages can be created with iTools and downloaded to the 3200 to display when an event, alarm or process condition occurs. This provides the operator with good visibility of the status of the process.

Remote setpoint

An option exists for the 3200 to have a Remote Analogue Input. This can be either volts or mA and is used to allow the setpoint to be generated by a master controller or PLC.

Recipes
Using iTools, recipes can be created that may be used to change the operating parameters of the 3200 simply by selecting a new recipe using the 3200 HMI. This is very useful where multiple products are processed using the same controller but require different parameters to be set.

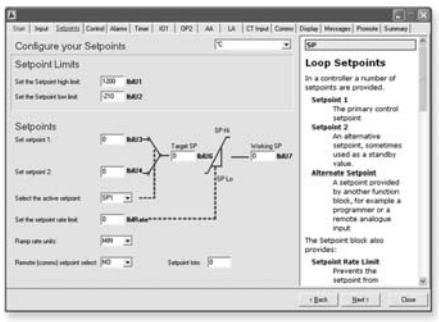
Timer
An internal timer is configurable as an interval timer, delay timer or to provide a soft start for hot runner control.

Setpoint retransmission
Sending the setpoint or other parameters from the 3200 to slave devices can be achieved either using conventional analogue communications or using Master Modbus communications. Master Modbus in the 3200 allows a broadcast of a single parameter to the network.
A typical application is a setpoint being retransmitted to a number of slave controllers in a multi-zone furnace.

Modbus communications
All units support both EIA232 and 2-wire EIA485 communications using the Modbus protocol. The 3216 supports 4-wire EIA485.

Configuration adaptor
iTools configuration to all 3200 controllers can be achieved by using a configuration adaptor. It provides iTools with the ability to communicate with and configure devices without the need for any power being connected.

iTools wizard
Used to simplify the set up of 3200 series controllers. The wizard guides the user through the configuration process with interactive help and graphical demonstrations of features.



SPECIFICATION

General

Environmental performance

Temperature limits	Operation:	0 to 55°C
	Storage:	-10 to 70°C
Humidity limits	Operation:	5 to 90% RH non condensing
	Storage:	5 to 90% RH non condensing
Panel sealing:		IP65, Nema 4X
Shock:		BS EN61010
Vibration:		2g peak, 10 to 150Hz
Altitude:		<2000 metres
Atmospheres:		Not suitable for use in explosive or corrosive atmosphere

Electromagnetic compatibility (EMC)

Emissions and immunity:	BS EN61326

Electrical safety

(BS EN61010):	Installation cat. II; Pollution degree 2

INSTALLATION CATEGORY II
The rated impulse voltage for equipment on nominal 230V mains is 2500V.

POLLUTION DEGREE 2
Normally, only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation shall be expected

Physical

Panel mounting	3216:	1/16 DIN
	3208:	1/8 DIN
	3204:	1/4 DIN
	32h8:	1/8 DIN, horizontal
Weight	3216:	250g
	3208:	350g
	3204:	420g
	32h8:	350g
Panel cut-out dimensions	3216:	45W x 45Hmm
	3208:	45W x 92Hmm
	3204:	92W x 92Hmm
	32h8:	92W x 45Hmm
Panel depth	All:	90mm

Operator interface

Type:		LCD TN with backlight
Main PV display:		4 digits, green
Lower display	3216, 3208, 3204:	5 character starburst, green
	32h8:	9 character starburst, green
Status beacons:		Units, outputs, alarms, active setpoint

Power requirements

3216:	100 to 240Vac, –15%, +10%, 48 to 62 Hz, max 6W 24Vac, -15%, +10%. 24Vdc, -15% +20% ±5% ripple voltage max 6W
3208/h8/04:	100 to 240Vac, –15%, +10%, 48 to 62 Hz, max 8W 24Vac, -15%, +10%. 24Vdc -15% +20% ±5% ripple voltage max 8W

Approvals

CE, cUL listed (file E57766), Gost, DIN 3440 (3216 only)
Suitable for use in Nadcap and AMS2750D applications under Systems Accuracy Test calibration conditions

Transmitter PSU (not 3216)

Rating:	24Vdc, >28mA, <33mA
Isolation:	264Vac double insulated

Communications

Serial communications option:

Protocol:	Modbus RTU slave Modbus RTU Master broadcast (1 parameter)
Isolation:	264Vac, double insulated
Transmission standard:	EIA232 or EIA485 (2 wire) EIA485(4 wire) on 3216 only

Process variable input

Calibration accuracy:	<±0.25% of reading ±1LSD [1]
Sample rate:	4Hz(250ms)
Isolation:	264Vac double insulation from the PSU and communication
Resolution (µV):	<0.5µV with 1.6sec filter
Resolution (effective bits):	>17 bits
Linearisation accuracy:	< 0.1% of reading
Drift with temperature:	<50ppm (typical) <100ppm (worst case)
Common mode rejection:	48-62Hz, >-120db
Series mode rejection:	48-62Hz, >-93dB
Input impedance:	100MΩ
Cold junction compensation:	>30:1 rejection of ambient change
External cold junction:	Reference of 0°C
Cold junction accuracy:	<±1°C at 25°C ambient
Linear(process) input range:	-10 to 80mV, 0 to 10V with 100KΩ/806Ω external divider module
Thermocouple types:	K, J, N, R, S, B, L, T, C, custom download [2]
Resistance thermometer types:	3-wire Pt100 DIN 43760
Bulb current:	0.2mA
Lead compensation:	No error for 22 ohms in all leads
Input filter:	Off to 59.9s
Zero offset:	User adjustable over full range
User calibration:	2-point gain & offset

Notes

(1) Calibration accuracy quoted over full ambient operating range and for all input linearisation types

(2) Contact Eurotherm® for details of availability of custom downloads for alternative sensors

AA relay

Type:	Form C (changeover)
Rating:	Min 100mA@12Vdc, max 2A@264Vac resistive
Functions:	Control outputs, alarms, events

Current transformer input

Input range:	0-50mA rms, 48/62Hz. 10Ω burden resistor fitted inside module
Calibration accuracy:	<1% of reading (Typical), <4% of reading (Worst case)
Isolation:	By using external CT
Input impedance:	<20Ω
Measurement scaling:	10, 25, 50 or 100 Amps
Functions:	Partial load failure, SSR fault

Digital input (DigIn A/B, B not on 3216)

Contact closure:	Open >600Ω, closed <300Ω
Input current:	<13mA
Isolation:	None from PV or system 264Vac double insulated from PSU and communications
Functions:	Includes alarm acknowledge, SP2 select, manual keylock, timer functions, standby select, RSP select

Logic I/O module

Output

Rating:	ON 12Vdc@<44mA, OFF <300mV@100µA
Isolation:	None from PV or system. 264Vac double insulated from PSU and communications
Functions:	Control outputs, alarms, events

Digital input

Contact closure:	Open >500Ω, closed <150Ω
Isolation:	None from PV or system 264Vac double insulated from PSU and communications
Functions:	Includes alarm acknowledge, SP2 select, manual, keylock, timer functions, standby select, RSP select

Relay output channels

Type:	Form A (normally open)
Rating:	Min 100mA@12vdc, max 2A@264Vac resistive
Functions:	Control outputs, alarms, events

Triac output

Rating:	0.75A (rms) 30 to 264V(rms) resistive load
Isolation:	264Vac double insulated
Functions:	Control outputs, alarms, events

Analogue output [3]

OP1, OP2

Rating:	0-20mA into <500Ω
Accuracy:	± (<1% of Reading + <100µA)
Resolution:	13.5 bits
Isolation:	264Vac double insulated from PSU and communications Module code C provides full 264Vac double isolated
Functions:	Control outputs, retransmission

OP 3 (not on 3216)

Rating:	0-20mA into <500Ω
Accuracy:	±(<0.25% of Reading + <50µA)
Resolution:	13.6 bits
Isolation:	264Vac double insulated
Functions:	Control outputs, retransmission

Remote setpoint input

Calibration accuracy:	<±0.25% or reading ±1LSD
Sample rate:	4Hz (250ms)
Isolation:	264Vac double insulation from instrument
Resolution:	<0.5mV (for 0-10V) or <2µA (for 4-20mA)
Resolution (effective bits):	>14bits
Drift with temperature:	<50ppm (typical) <150ppm (worst case)
Common mode refection:	48-62Hz, >-120dB
Series mode rejection:	48-62Hz, >-90dB
Input impedance:	Voltage: 223KOhm and Current: 2R49
Normal input range:	0 to 10V and 4 to 20mA
Max input range:	-1V to 11V and 3.36mA to 20.96mA

Software features

Control

Number of loops:	1
Loop update	250ms
Control types:	PID, ON/OFF, VP
Cooling types:	Linear, fan, oil, water
Modes:	Auto, manual, standby, forced manual
Overshoot inhibition:	High, low

Alarms

Number:	4
Type:	Absolute high & low, deviation high, low or band, rate of change
Latching:	Auto or manual latching, non-latching, event only
Output assignment:	Up to four conditions can be assigned to one output

Other status outputs

Functions:	Including sensor break, manual mode, timer status, loop break, heater diagnostics, program event
Output assignment:	Up to four conditions can be assigned to one output

Setpoint programmer

Program function:	1 program x 8 segments with 1 event output [4]
Start mode:	Servo from PV or SP
Power fail recovery:	Continue at SP or Ramp back from PV
Guaranteed soak:	Inhibits dwell timing until PV within limits

Timer

Modes	Dwell when setpoint reached Delayed control action, Soft start limits power below PV threshold

Current monitor

Alarm types:	Partial load failure, over current, SSR short circuit, SSR open circuit
Indication type:	Numerical or ammeter

Custom messages

Number:	15 scrolling text messages
No of characters:	127 characters per message max
Languages:	English, German, French, Spanish, Italian
Selection:	Active on any parameter status using conditional command

Recipes

Number:	5 recipes with 38 parameters
Selection:	HMI interface, communications or digital IO

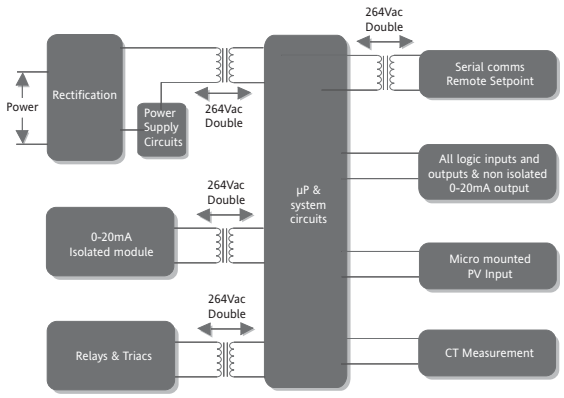
Notes

(3) Voltage output can be achieved by external adaptor

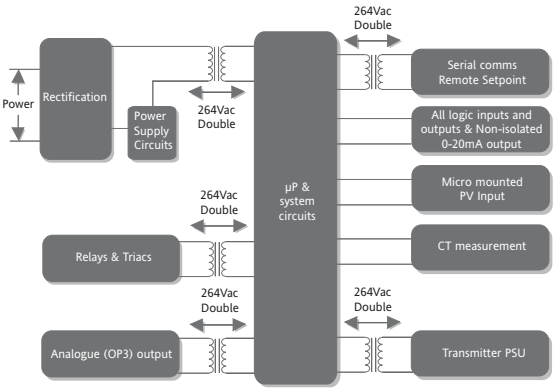
(4) By using recipes five SP programs can be stored

Isolation diagrams

3216

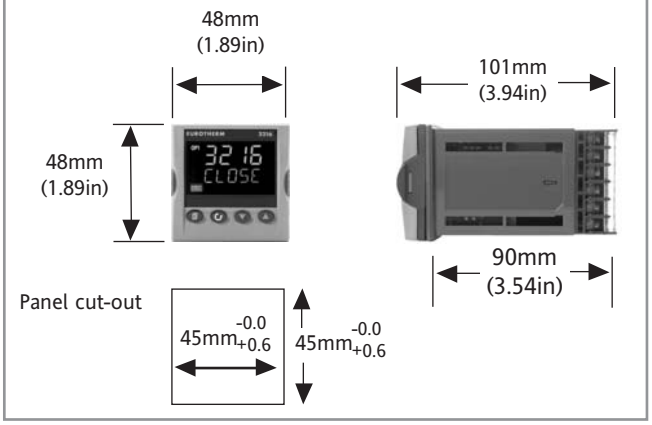


3208/h8/04



Dimensional details

3216



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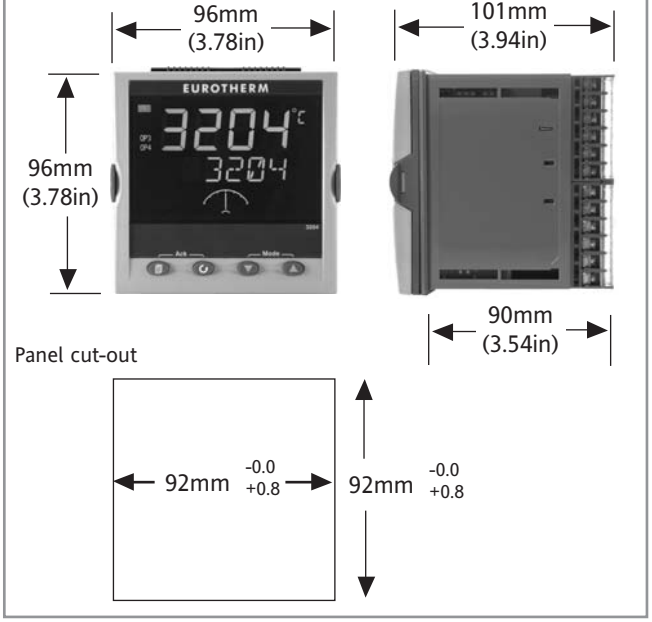
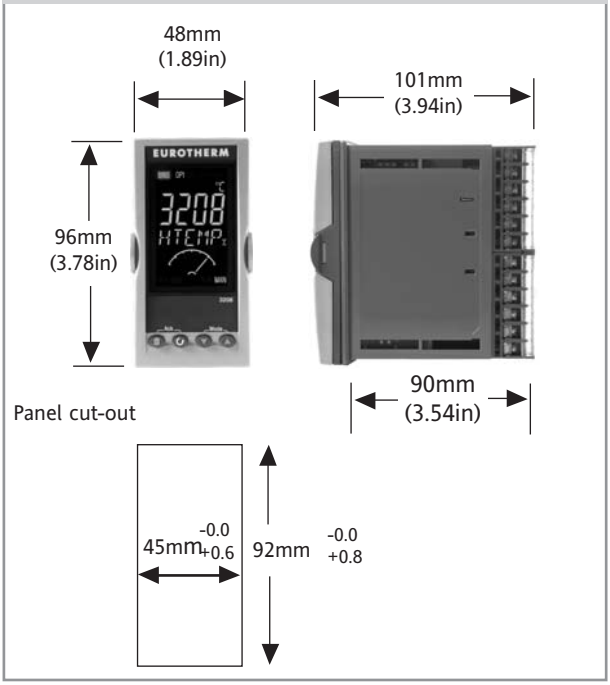
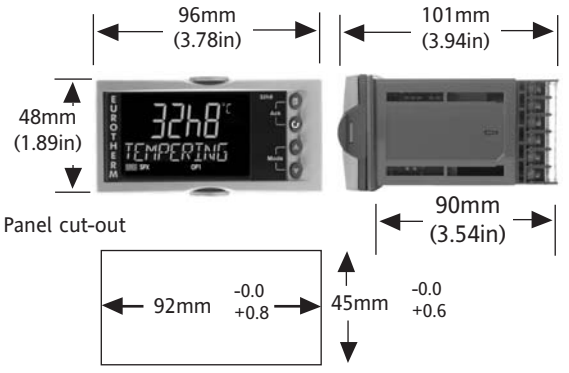


3208



32h8



Ordering code

1	2	3	4	5	6	7	8	9	10	11	12

Basic Product

3216	48 x 48mm unit
3208	48 x 96mm vertical unit
32h8	96 x 48mm horizontal unit
3204	96 x 96mm unit

1 Function

CC	PID controller
CP	Programmer
VC	Valve controller
VP	Valve programmer

2 Supply Voltage

VH	85-264Vac
VL	24V ac or dc

3 Outputs

3216

OP1	OP2		
L	X	X	X
L	R	X	X
R	R	X	X
L	L	X	X
L	D	X	X
D	D	X	X
D	R	X	X
R	C	X	X
L	C	X	X
D	C	X	X
Not available with Low Voltage PSU			
L	T	X	X
T	T	X	X

3208/h8/04

OP1	OP2	OP3	
L	R	R	X
R	R	R	X
L	L	R	X
L	R	D	X
R	R	D	X
D	D	D	X
L	L	D	X
L	D	D	X
D	R	D	X
Not available with Low Voltage PSU			
L	T	R	X
T	T	R	X
L	T	D	X
T	T	D	X

4 AA Relay

X	Disabled
R	Relay

5 Options

XXX	Not fitted
RCL	Remote SP, CT & Dig in A
XCL	CT & Dig in A
2CL	RS232, CT & Dig in A
4CL	RS485, CT & Dig in A
3216 only	
2XL	RS232 Dig in A
4XL	RS485 Dig in A
6XX	4-wire RS485
XXL	Dig in A

Where
L = Logic
R = Relay
D = 0-20mA
C = Isolated 0-20mA
T = Triac
X = Not fitted

6 Fascia Colour

G	Green
S	Silver
W	Washdown (not 32h8/04)

7 Product Language

ENG	English
FRA	French
GER	German
SPA	Spanish
ITA	Italian

8 Manual Language

ENG	English
FRA	French
GER	German
SPA	Spanish
ITA	Italian

9 Warranty

XXXXX	None
WL005	Extended

10 Calibration Certificates

XXXXX	None
CERT1	Certificate of conformity
CERT2	Factory input calibration per input

11 Custom Label

XXXXX	None

12 Specials and Accessories

XXXXX	None
RES250	250R resistor for 0-5Vdc OP
RES500	500R resistor for 0-10Vdc OP

Example ordering code

3216 - CP - VH - LDXX - R - 4CL - S - ENG - ENG - WL005 - XXXXX - XXXXX - RES250

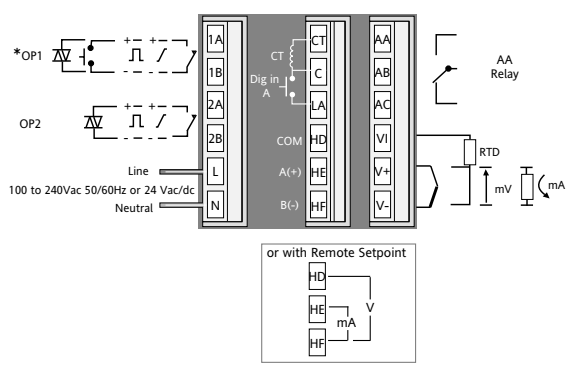
3216 controller with setpoint programmer, OP1 as Logic, OP2 as 0-20mA, AA Relay, RS485 Comms, CT Input, Dig In A, English language, 5 year warranty, resistor for 0-5V output

3200 Accessories

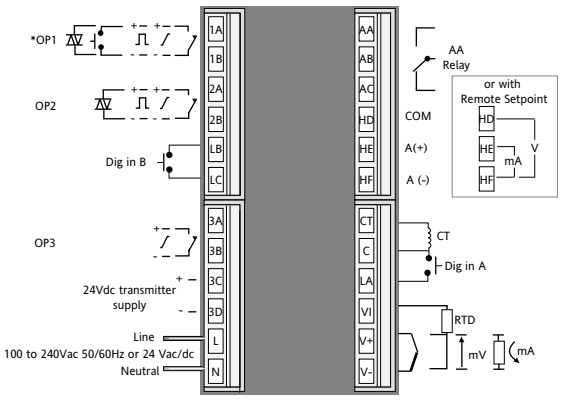
HA029714	Installation guide
HA027986	Engineering manual
SUB35/ACCESS/249R.1	2.49R Precision resistor
CTR100000/000	10A Current transformer
CTR200000/000	25A Current transformer
CTR400000/000	50A Current transformer
CTR500000/000	100A Current transformer
iTools/None/3000CK	Configuration clip
SUB21/IV10	0-10V input adaptor

Rear terminals

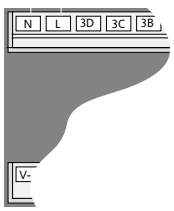
3216



3208/h8/04



32h8 orientation



Optional quick start code (Optional)

1	2	3	4	5	6	7	8	9	10
						3208/h8/ 04 only	3208/h8/ 04 only		

1 Input Type

Thermocouple	
B	Type B
J	Type J
K	Type K
L	Type L
N	Type N
R	Type R
S	Type S
T	Type T
C	Custom/Type C
RTD	
P	Pt100
Linear	
M	0-80mV
2	0-20mA
4	4-20mA
X	Unconfigured

2 Setpoint Limits

Temperature	
H	Heat (PID)
C	Cool (PID)
Centigrade	
0	0 to 100 deg C
1	0 to 200 deg C
2	0 to 400 deg C
3	0 to 600 deg C
4	0 to 800 deg C
5	0 to 1000 deg C
6	0 to 1200 deg C
7	0 to 1400 deg C
8	0 to 1600 deg C
9	0 to 1800 deg C
Fahrenheit	
G	32 to 212 deg F
H	32 to 392 deg F
J	32 to 752 deg F
K	32 to 1112 deg F
L	32 to 1472 deg F
M	32 to 1832 deg F
N	32 to 2192 deg F
P	32 to 2552 deg F
R	32 to 2912 deg F
T	32 to 3272 deg F
X	Unconfigured

3 4 5 OP1, OP2, AA Relay, OP3

XX	Not fitted
Relay, Triac or Logic outputs	
Control	
H	Heat (PID)
C	Cool (PID)
J	Heat (On/off)
K	Cool (On/off)
Alarm output	
Energised in alarm	
0	High alarm
1	Low alarm
2	Deviation high
3	Deviation low
4	Deviation band
Alarm output	
De-energised in alarm	
5	High alarm
6	Low alarm
7	Deviation high
8	Deviation low
9	Deviation band
DC outputs	
Control	
H	4-20mA heating
C	4-20mA cooling
J	0-20mA heating
K	0-20mA cooling
Retransmission	
D	4-20mA setpoint
E	4-20mA Process value
F	4-20mA output
N	0-20mA setpoint
Y	0-20mA Process value
Z	0-20mA output
Logic input	
W	Alarm acknowledge
M	Manual select
R	Timer/Prog Run
L	Keylock
P	Setpoint 2 select
T	Timer/prog reset
U	Remote SP select
V	Recipe 2/1 select
A	Remote up button
B	Remote down button
G	Time/prog run/reset
I	Timer/prog hold
Q	Standby select

6 CT Input

XX	Not fitted
1	10 Amps
2	25 Amps
5	50 Amps
6	100 Amps

7 8 Dig in A, Dig in B, OP1

X	Unconfigured
W	Alarm acknowledge
M	Manual select
R	Timer/Prog Run
L	Keylock
P	Setpoint 2 select
T	Timer/prog reset
U	Remote SP select
V	Recipe 2/1 select
A	Remote up button
B	Remote down button
G	Time/prog run/reset
I	Timer/prog hold
Q	Standby select

10 Lower Display

T	Working setpoint
S	Target setpoint
P	Output demand
R	Time to run
E	Elapsed time
1	Alarm setpoint
A	Load amps
D	Dwell/ramp - time/target
C	WSP with output meter
M	WSP with ammeter
N	None

Example ordering code (Quick Start)

K - 6 - H - E - 5 - 5 - P - X - X - T

This code will provide a controller configured as 0-1200 °C, Type K, Heat Output, 4-20mA PV retrans, High Alarm, 50A CT measurement, SP select via Dig In A, Lower display showing working setpoint

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