

3508 3504 MODELS



Ideal for:

- furnaces
- autoclaves
- environmental chambers
- pharmaceutical reactors

Features:

- 0.1% accuracy
- setpoint programmer
- maths & logic functions
- user recipes
- custom pages
- Modbus RTU
- Profibus DP
- DeviceNet
- Ethernet Modbus
- infrared configuration port

Advanced process controller/programmer

The **3508 and 3504** are Eurotherm's new family of advanced process controllers. Combining the advantages of the latest LCD display and microprocessor technology to produce truly impressive performance.

Utilising **cuPID**, the latest PID based control algorithm from Eurotherm. It uses calculations to provide your process with optimum control. Powerful strategies, incorporating maths and logic computation, can be implemented without compromising Eurotherm's guaranteed control performance.

A setpoint programmer, enabling a process to change its setpoint automatically with time, has storage for up to 50 programs.

The large five-digit display provides a clear and unambiguous indication of the process value. The four-line message centre provides custom or standard views of information important to the user. Vertical and horizontal bargraphs provide at a glance visual indication of the process.

Plug-in I/O modules cater for individual requirements minimising your stock and spares holding.

Eurotherm's approach to open communications, offering standard fieldbus networks such as Profibus DP and DeviceNet, make integration into PLC's and other supervisory systems easy to accomplish.

The iTools software package enables users to easily create and document controller configurations. Additionally its View Builder and Trending features can be used to generate custom views of your process providing mini SCADA functionality. Using an Infrared communication clip iTools can communicate to the controller without the need to connect wires or open cubicle doors.

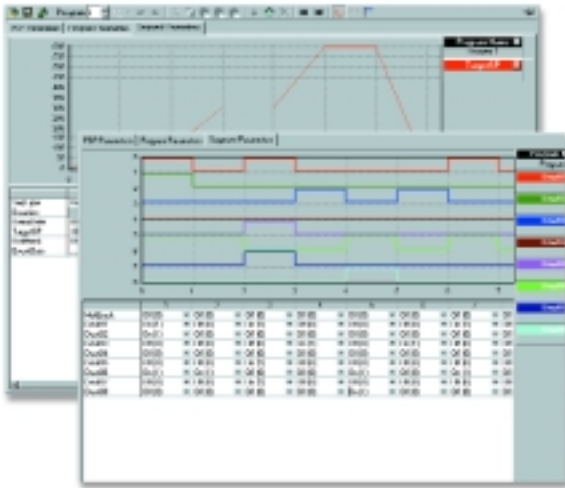
Eurotherm's 'cuPID' Control

Eurotherm's **cuPID** provides outstanding control performance. Honed to perfection with the help of our customers in their quest to achieve repeatable processes, yielding consistently high product quality.

- **constant ripple time proportioning**
 - **unique performance**
 - **Power feedback**
 - **Intelligent response to process disturbances**
 - **Deterministic cycle time**
- lengthens heater life
it controls and keeps controlling compensation for supply variations more than conventional PID
Guaranteed operation

Setpoint programmer

Setpoint programming, a feature used in many applications including Furnaces and Environmental Chambers, is available in both the 3508 and 3504. 50 programs can easily be created, stored and selected using the initiative user interface.



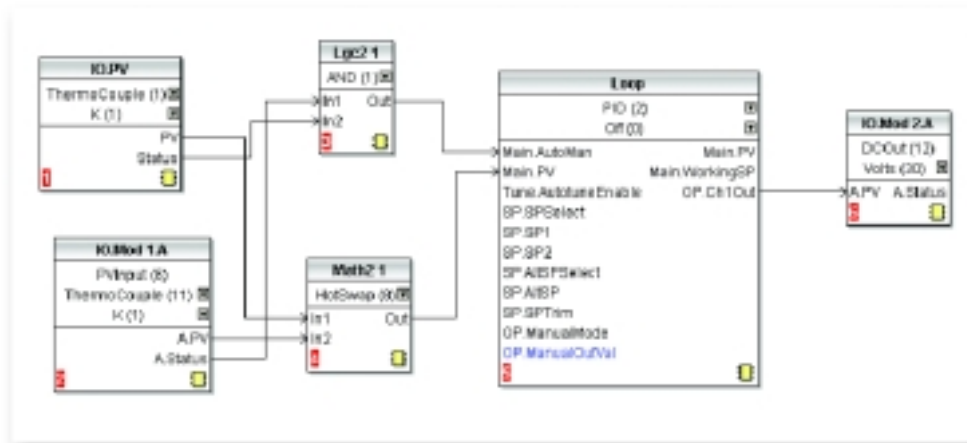
Quick start HMI

Both **3508** and **3504** are highly flexible controllers often requiring configurations by the itools Graphical Wiring Editor. Simple configurations can be achieved by using a "Quick Start HMI". This will lead you through a series of questions about your process and configure the instrument by enabling function blocks, making connections and setting parameters according to the answers given.



Customised solutions

Both 3508 and 3504 are more than just process controllers. They provide a range of application blocks including maths, logic and timing functions, offering the ability to develop custom solutions and create cost effective machine controllers.



Create your own Control strategy using iTools

- easy creation of 3500 strategies using Graphical Wiring Editor
- reduced configuration time
- easy to understand and diagnose
- embedded help on demand
- use monitor functions to optimise process

Using the iTools Graphical Wiring Editor you can arrange the 3500 function blocks to easily achieve the control strategy that your process requires. Using Graphical Wiring, configurations that used to take hours to achieve, can be completed in a fraction of the time. Simply select Function Blocks from a template library and drag them into a page. Use click and point to connect blocks together then download it to the controller and run your process.

The image displays a central 'Graphical Wiring' diagram with five surrounding windows:

- Trending & Logging:** A window showing a multi-line graph with a red line peaking and a yellow line with spikes.
- Parameter Help:** A window titled 'Parameter Help' showing details for an 'Alarm Hysteresis' block, including a small waveform diagram and a link to 'More Analog Alarm Block parameters'.
- Graphical Wiring:** The central workspace showing a complex network of interconnected function blocks like 'PID', 'Filter', and 'Alarm'.
- Setpoint Program Editing:** A window with a graph showing a setpoint profile and a table below it with columns for 'Log/Use', 'Duration', 'Start/Stop', 'Target/Level', and 'Holdback'.

Log/Use	Duration	Start/Stop	Target/Level	Holdback
Set	10	0.00	100.0	0.00
Hold	10	0.00	100.0	0.00
Set	10	0.00	100.0	0.00
Hold	10	0.00	100.0	0.00
- User Pages:** A window titled 'User Page Editor' showing a digital display of '500' and a table of parameters.

Unit	SP	Parameter	Unit/Text
Setpoint	500.0	TargetSP	SPH 1
Level	1.000	TargetL	
Level	1.000	AlarmOut	

3508

H and J - Communications
Flashes to indicate remote communications

OP1 & OP2 - Output Beacons
Two output beacons are provided to clearly indicate whenever the output is active

RUN - HOLD
A steady RUN light indicates that a program is running. A flashing RUN beacon indicates that a program has completed. HOLD indicates that a program has been placed on hold, a flashing beacon indicates holdback.

ALM - Bright Red Alarm Beacon
Red alarm beacons clearly show the status of alarms. A flashing beacon indicates that an alarm has been acknowledged but the alarm remains active.

Large 4 1/2 Digit Display
Select the value to be displayed on the large 12mm high 4 1/2 digit display. The decimal point can be positioned to benefit from the precision analogue circuitry or mathematical calculation.

Infrared Talk Point
The perfect way to communicate. Check or reconfigure any parameter without disturbing the controller. The closed link maintains the integrity of the controller and IP65 panel sealing.

Automatic or Manual Key
A single button press to Manually control the process. This function can be inhibited to prevent operators inadvertently affecting the controller.

Program Run or Hold Key
A control Program can be started or temporarily put into Hold. The RUN and HOLD beacons clearly display the status of the Program.

Page Key
Instant access to the main configuration headings.

Scroll Key
Scroll to select the Operator or configuration value under the Page heading

Lower and Raise Keys
Alters the displayed value. Eurotherm smart scroll algorithm speeds value changes for large or small changes.



3504

51 Point Bargraph Indicator

A dynamic 51 point bar graph indicator can be used to graphically indicate key values such as output power. It can be configured with a centre zero to indicate deviation.

Large 15mm High Bar Digit Display

Select the value to be displayed on the large 15mm high 5 digit display. The decimal point can be positioned to benefit from the precision analogue circuitry or mathematical calculation.

Status Indicators

10 beacons that can be used to indicate the current status of a sequence logic state or action. Fully configurable.

Second line display

16 character 6 1/2 mm high display provides clear indication of any parameter.

Message Centre Display

Fully configurable 60 character display provides clear operator information. Each line can be set to display a horizontal bar graph for key values or valve position.

Program Key

Press to display the Programmer menu to select the particular program required.

Acknowledge

Press Page and Scroll to acknowledge an alarm. The beacon action will depend upon the type of alarm that has been configured.



Technical specification

Quoted at 50°C unless otherwise stated

CONTROL OPTIONS

No. of Loops	1
Control Loops	On/Off, single PID
Control Outputs	Analogue, Time proportioned or Motorised Valve control with or without feedback.
Cooling Algorithms	Linear, Water, Fan, Oil
Auto/Manual Control	Bumpless transfer or forced manual output.
Setpoint rate Limit	Ramp in units per min
Motorised Valve Control	Valve Position bounded or unbounded. Individual Valve Positions for heat and cool
Tuning	One-shot Auto tune or Manual.
Alarms	High absolute, Low absolute, Deviation high, Deviation low, Deviation band All with separate hysteresis.
Application Specific	Humidity control

Setpoint Programmer

No. of programs	Up to 50 user named
No. of segments	Up to 200
Event outputs	Up to 8

Segment types	Rate, time to target, dwell, step, call. Power fail strategy, synchronise inputs
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DISPLAY

3504 Primary	Large 5 digit display, Information centre
3508 Primary	Large 41/2 digit display, Information centre
Technology	LCD Red alarm beacons

ADVANCED FUNCTIONS

Application blocks	24 digital operations 24 analogue operations 16 user values Real Time Clock BCD input Linearisations Multiplex blocks
Calculation Functions	Add, Subtract, Multiply, Divide, Constant Absolute difference, Maximum, Minimum, Hot swap, Sample and Hold, Input 1 to the power of input 2, Square root, $\text{Log}_{(10)}$, Ln, 10 to the power of input 1, e to the power of input 1
Mathematical	AND, OR, XOR, Latch, Equal, Not Equal, Greater than, Less than, Greater than or equal to, Less than or equal to.
Logical	4 ON pulse, OFF delay, one shot and min-ON 4, trigger level and reset input
Timers	Up down overflow 32 bit and Ripple carry
Totalisers	Wet and dry bulb technique
Counter	
Humidity	

Software Tools

iTools	Configuration Tool
OPC Scope	Trending and Data logging
iClone Lite	Lightweight configuration cloning
Graphical Wiring Editor	Drag and drop wiring tool, self-documenting
View Builder	Custom Animation Screens
iTools Wizard	Question and Answer configuration screens

STANDARD I/O

High Accuracy PV input

Accuracy	±0.1%
Ranges	mV, mA, volts -2V to +10V or RTD (pt100), pyrometer inputs
Thermocouple types	J,K,L,N,R,S,B,PlI,C custom via downloadable tables
Cold Junction	External 0°C, 45°C or 50°C or internal

Digital IO

Logic	2 off Bi-directional input/outputs Logic or Contact closure input Logic output 24V at 15mA
Changeover relay	Contact rating 2A at 264Vac resistive

PROCESS MODULES - 6 per instrument (3 on the 3508)

DIGITAL OUTPUT

Relay	Single relay, Dual relay, 2A, 264Vac resistive (100mA, 12V minimum)
Single Logic	12V, 24mA
Triple Logic	12V, 9mA per output
Triac	0.75A, 264Vac resistive

DIGITAL INPUT

Module types	Triple contact input, Triple logic input
Contact closure	Active <100ohms inactive>28kohms
Logic inputs	Current sinking: active 10.8Vdc to 30Vdc at 2.5mA inactive -3 to 5Vdc at <-0.4mA

ANALOGUE OUTPUT

Module types	1 channel DC control, 1 channel DC retransmission
Range	0-20mA, 0-10Vdc
Resolution	1 part in 10,000 (2,000-noise free) 0.5% accurate for retransmission 1 part in 10,000 2.5% accurate for control

TRANSMITTER PSU

Transmitter	24Vdc at 20mA
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TRANSDUCER PSU

Bridge voltage	Software selectable 5 or 10Vdc
Bridge resistance	300Ω to 15KΩ
Bridge calibration	30.1kΩ, 0.25%, resistor provided for calibration of 350 ohm bridge at 80% Switch provided to use integral bridge calibration resistor

POTENTIOMETER INPUT

Potentiometer	330Ω to 15KΩ, excitation of 0.5 volts resistance
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Analogue input (module)

Accuracy	±0.2%
Ranges	mV, mA, volts -2V to 10V or RTD (PT100), pyrometer inputs
Thermocouple types	J, K, T, L, N, R, S, B, PlI, C, Plus others via downloadable tables
Cold junction	Ext 0°C, 45°C or 50°C, internal

COMMUNICATIONS MODULES (2 slots)

Slave communications

Allocation	Slot H or J (DeviceNet/Profibus/EI Bisync slot H only) Profibus RS485 (1.5MHz) EI Bisync Modbus RS485 (2 wire) RS485(4 wire) or RS232 DeviceNet Ethernet Modbus
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I/O Expander

10 I/O version	Via IO expander module 4 Changeover relays 6 normally open relay contacts 10 Logic inputs
20 I/O version	4 Changeover relays 16 normally open relay contacts 20 Logic inputs

GENERAL SPECIFICATION

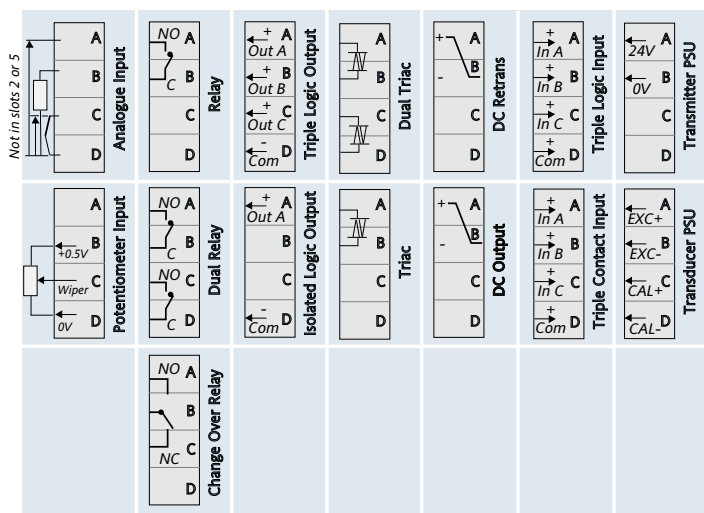
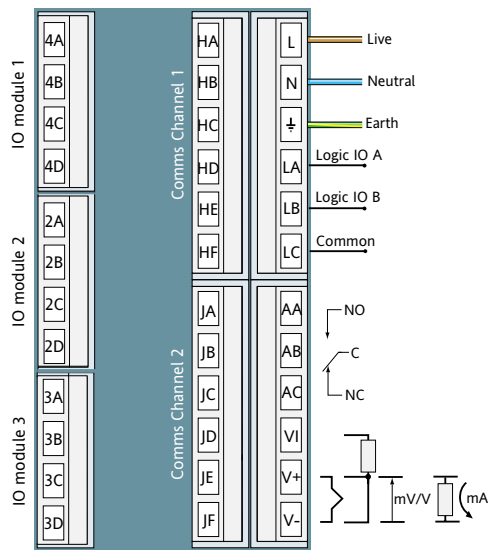
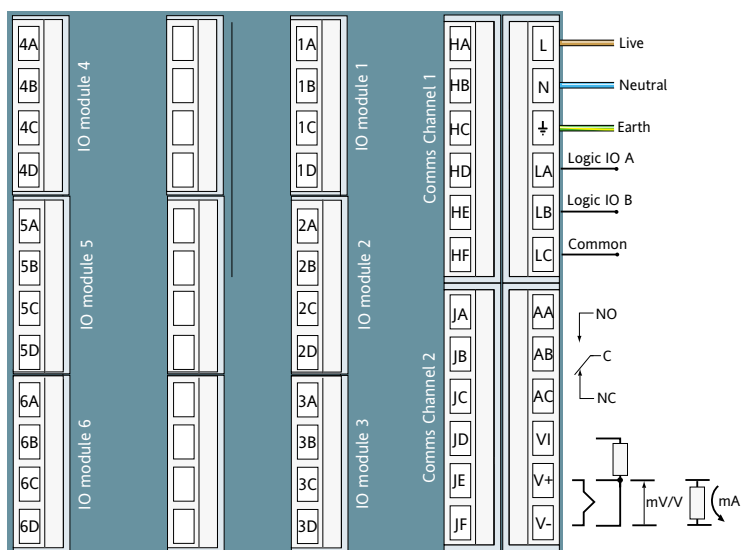
Operating voltage	85 to 264Vac. 20 watts (max)
Display range	5 digits up to 3 decimal places (3504)
Operating ambient	0 to 50°C and 5 to 95%RH non condensing
Storage temperature	-10 to 70°C
Panel seal	IP65, NEMA 4

EMC standards	EN50081-1 and EN50082-2 generic standards - suitable for domestic, commercial and light industrial as well as heavy industrial environments
Safety standards	Meets EN61010 installation category II, pollution degree 2
Atmospheres	Not suitable for use above 2000m or in explosive or corrosive atmospheres

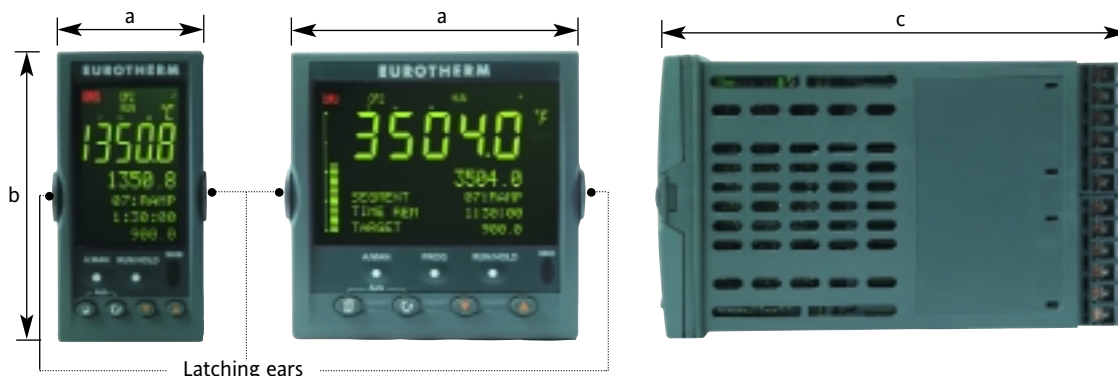
Rear terminal connections

3504

3508



Dimensional details



Controller Type	a	b	c
3508	48mm (1.89in)	96mm (3.78in)	150mm (5.91in)
3504	96mm (3.78in)	96mm (3.78in)	150mm (5.91in)

3508 and 3504 Coding

Hardware coding

Model Number	Function	Supply Voltage		Application	Programs	Recipes	Toolkit Wires	Colour
			X					

Model Number	Application	Recipes
3508 3508 standard	XX Standard	1 1 Recipe
3504 3504 standard	VP Dual Valve Positioning	4 4 Recipes
		8 8 Recipes

Function	Programs	Toolkit Wires
CC Controller only	1 1 Progs - 20 Segments	XXX 30 Wires
F Profibus controller	10 10 Progs - 50 Segments	60 60 Wires
	25 25 Progs - 100 Segments	120 120 Wires
	50 50 Progs - 200 Segments	250 250 Wires

Supply Voltage	Colour
VH 85-264Vac	G Eurotherm Green
	S Silver

Input and Output Modules

I/O Slot 1	I/O Slot 2	I/O Slot 3	I/O Slot 4 ⁽²⁾	I/O Slot 5 ⁽²⁾	I/O Slot 6 ⁽²⁾	Comms H	Comms J

Config Tools	Product Language	Manual Language	Certificate

IO Slots 1, 2, 3, 4⁽²⁾, 5⁽²⁾, 6⁽²⁾

XX	No module fitted
R4	Change over relay
R2	2 Pin relay
RR	Dual Relay
T2	Triac
TT	Dual triac
D4	DC Control
AM	Analogue input (not slot 2 or 5)
D6	DC retransmission
TL	Triple logic input
TK	Triple contact I/P
TP	Triple logic output
VU	Potentiometer I/P
MS	24Vdc Transmitter PSU
G3	Transducer PSU 5 or 10Vdc
LO	Isolated single logic OP

H Comms Slot

XX	Not fitted
A2	232 Modbus
Y2	2 W 485 Modbus
F2	4 W 485 Modbus
PB	Profibus (note 1)
DN	DeviceNet
AE	232 Bisynch
YE	2 wire, 485 Bisynch
FE	4 wire, 485 Bisynch
ET	Ethernet Modbus

J Comms Slot

XX	Not fitted
A2	232 Modbus
Y2	2 W 485 Modbus
F2	4 W 485 Modbus
EX	IO Expander comms

Configuration Tools

XX	None
IT	Standard iTools (CD only)
CK	iTools + Config. kit
IR	iTools + IR Cable

Product Language

ENG	English
FRA	French
GER	German
SPA	Spanish
ITA	Italian

Manuals Language

ENG	English
FRA	French
GER	German
SPA	Spanish
ITA	Italian
XXX	None

Certificate

XXXXX	None
CERT1	Cert of Conformity
CERT2	Factory Calibration Cert (per input)
CERT3	Custom Calibration Cert (per input)

Notes

1. Only available with the Profibus Controller.
2. I/O slots 4, 5 and 6 are only available on the 3504.

Example ordering code

3508/CC/VH/X/XX/10/4/XXX/S/TT/XX/XX/XX/XX/XX/1/2/XX/IT/ENG/ENG/XXXXX

3508 controller, 85-264Vac, 10 programs, 4 recipes, 60 wires, dual triac output, 2 wire 485 comms, iTools, English manual

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