

# 504 508 3504 3508

MODELS



## Dual Loop Controller/Programmer Specification Sheet

- **2 PID loops**
- **50 Programs**
- **Precision PV input**
- **Carbon potential**
- **Maths/logic/timers**
- **Custom user interface**
- **Recipes**
- **Digital communications**
  - Modbus RTU
  - Ethernet Modbus TCP
  - Profibus DP network
  - DeviceNet® network
- **OEM Security**

The latest range of advanced process controllers from Eurotherm® provide precision control of temperature and a host of other process variables together with an abundance of advanced options making it the most adaptable product in its class.

The emphasis is on flexibility yet the 3500 controllers still maintain ease of use. A simple 'Quick Start' code is used to configure all the basic functions essential to controlling your process. This includes input sensor type, measurement range, control options and alarms making 'Out the Box' operation truly achievable. More advanced features are configured using a PC based graphical configuration tool enabling users to pick function blocks from a library then connect them together using soft wiring.

The large 5-digit display provides a clear and unambiguous indication of the process value. A four-line message centre provides custom or standard views of important information to the user while vertical and horizontal bargraphs provide at a glance visual indication of the process.

OEM Security enables a user to protect their intellectual property by preventing unauthorised cloning of the configuration.

### Dual loop

Two independent PID loops make the 3500 ideal for interactive processes such as those found in carburising furnaces, environmental chambers and autoclaves. The loops may also be 'soft' wired together in creative ways to create cascade, ratio or other intelligent control strategies

### Setpoint programmer

Heat treatment and other processes often require the ability to change setpoints with time. The dual loop 3500 has two programmers which can be configured as synchronised or independent programs. 50 programs with up to two channels can be stored with a total of 500 segments.

### Input/output flexibility

A range of plug-in I/O modules caters for individual application requirements minimising stock and spares holding. A total of sixteen module types, including relay, logic, triac and analogue, are available to fit into either three slots on 3508 or six slots on 3504.

### Carbon potential

The 3500 calculates carbon potential from measuring both the oxygen concentration and temperature of a furnace using a zirconia probe. This enables a dual loop 3500 to be used to control both carbon potential and temperature in an atmosphere controlled furnace.

## Customised solutions

The 3500 is more than just a process controller. It also provides a selection of application blocks including maths, logic and timing functions offering the ability to develop custom solutions and create cost effective machine controllers. The custom User Page feature allows an operator to view current information in a style most suitable to the process and terminology of the industry.

## Communications

The 3500 is designed to integrate seamlessly with programmable logic controllers and other supervisory systems. A wide range of serial communication options are catered for including EIA232 and EIA485 using the Modbus RTU protocol along with Profibus DP and DeviceNet. Ethernet connectivity is achieved using the Modbus TCP protocol.

## Recipes

Using a PC tool recipes can be created that can be used to change the operating parameters of the 3500 simply by selecting a new recipe via the HMI. This is very useful where multiple products are processed using the same controller but require different parameters to be set.

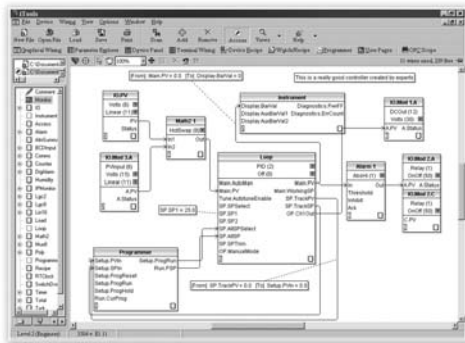
## Infrared configuration adaptor

Communications to the 3500 can be achieved by using an infrared adaptor. Clipping onto the front fascia it provides iTools communications allowing configuration and commissioning to be performed without the need to access the rear terminals of the controller.



## iTools Graphical Wiring Editor

The GWE is an extremely easy way to create applications. It allows users to select the function blocks they wish to use in their application then connect them together using 'Soft Wiring'. The GWE gives the user a pictorial view of exactly what he has configured and can also be used to monitor runtime conditions.



## IO Expander

Extra IO can be provided by the IO Expander. Options are available for 10in 10out and 20in 20out.

## SPECIFICATION

### General

#### Environmental performance

Temperature limits	Operation:	0 to 50°C
	Storage:	-10 to 70°C
Humidity limits	Operation:	5 to 95% RH non condensing
	Storage:	5 to 95% RH non condensing
Panel sealing:		IP65, Nema 4X
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

Suitable for domestic, commercial and light industrial as well as heavy industrial. (Domestic/light (Class B) emissions. Industrial (Class A) environmental immunity emissions.

With Ethernet module fitted product only suitable for Class A emissions.

#### 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	3508:	1/8 DIN
	3504:	1/4 DIN
Weight	3508:	400g
	3504:	600g
Panel cut-out dimensions:	3508:	45W x 92Hmm
	3504:	92W x 92Hmm
Panel depth	Both	148mm

#### Operator interface

Type:		STN LCD with backlight
Main PV display	3508:	4 1/2 digits, green
	3504:	5 digits, green
Message display	3508:	8 character header and 3 lines of 10 characters
	3504:	16 character header and 3 lines of 20 characters
Status beacons:		Units, outputs, alarms, program status, program events, active setpoint, manual, remote SP
Access levels:		3 operator plus config. Password protected

#### User pages

Number:	8
Parameters:	64 total
Functions:	Text, conditional text, values, bargraph
Access level:	User selectable (level 1, 2 or 3)

#### Power requirements

Supply voltage:	85 to 264Vac, -15%, +10%, 48 to 62 Hz, max 20W (3508 15W) 24Vac, -15%, +10%, 24Vdc, -15% +20% ±5% ripple voltage max 20W (3508 15W)
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#### Inrush current

High Voltage (VH):	30A duration <100µS
Low Voltage (VL):	15A duration <100µS

#### Approvals

CE, cUL listed (file E57766), Gost  
Suitable for use in Nadcap and  
AMS2750D applications under System  
Accuracy Test calibration conditions

#### Communications

No of ports:	2 modules can be fitted
Slot allocation:	Modbus RTU or I/O expander only in J comms port

## Serial communications option

Protocols:	Modbus RTU Slave Profibus DP DeviceNet EI-Bisync (818 style mnemonics) Modbus RTU master broadcast (1parameter) I/O Expander
Isolation:	264Vac, double insulated
Transmission standard:	EIA232, EIA485, CAN (DeviceNet), Profibus

## Ethernet communications option

Protocol:	Modbus TCP, 10baseT
Isolation:	264Vac, double insulated
Transmission standard:	802.3
Features:	DHCP client, 4 simultaneous masters,

## Main process variable input

Calibration accuracy:	<±0.1% of reading ±1LSD <sup>(1)</sup>
Sample rate:	9Hz(110ms)
Isolation:	264Vac double insulation from the PSU and communication
Input filter:	Off to 59.9s. Default 1.6s
Zero offset:	User adjustable over full range
User calibration:	2-point gain & offset

## Thermocouple

Range:	Uses 40mV and 80mV ranges dependent on type
Types:	K, J, N, R, S, B, L, T, C, PL2, custom download x 2
Resolution:	16 bits
Linearisation accuracy:	<0.2% of reading
Cold junction compensation:	>40:1 rejection of ambient change External reference of 0°C, 45°C and 50°C
Cold junction accuracy:	<±1°C at 25°C ambient

## Resistance thermometer

Range:	0-400Ω (-200°C to +850°C)
Resistance thermometer types:	3-wire Pt100 DIN 43760
Resolution (°C):	<0.050°C with 1.6sec filter
Resolution:	16 bits
Linearity error:	<±0.03% (best fit straight line)
Calibration error:	<±0.310°C/°C, ±0.023% of measurement at 25°C
Drift with temperature:	<±0.010°C/°C, ±25ppm/C of measurement from 25°C
Common mode rejection:	<0.000085°C/V (maximum of 264Vrms)
Series mode rejection:	<0.240°C/V (maximum of 280mV pk-pk)
Lead resistance:	0Ω to 22Ω, matched lead resistance
Input impedance:	100MΩ
Bulb current:	200µA

## 40mV Range

Range:	-40mV to +40mV
Resolution (µV):	<1.0µV with 1.6sec filter
Resolution:	16 bits
Linearity error:	<0.003% (best fit straight line)
Calibration error:	<±4.6µV, ±0.053% of measurement at 25°C
Drift with temperature:	<±0.2µV/°C, ±28ppm/C of measurement from 25°C
Common mode rejection:	>175dB (maximum of 264Vrms)
Series mode rejection:	>101dB (maximum of 280mV pk-pk)
Input leakage current:	±14nA
Input impedance:	100MΩ

## 80mV Range

Range:	-80mV to +80mV
Resolution (µV):	<3.3µV with 1.6sec filter
Resolution:	16 bits
Linearity error:	<0.003% (best fit straight line)
Calibration error:	<±7.5µV, ±0.052% of measurement at 25°C
Drift with temperature:	<±0.2µV/°C, ±28ppm/C of measurement from 25°C
Common mode rejection:	>175dB (maximum of 264Vrms)
Series mode rejection:	>101dB (maximum of 280mV pk-pk)
Input leakage current:	±14nA
Input impedance:	100MΩ

## 2V Range

Range:	-1.4V to +2.0V
Resolution (mV):	<90µV with 1.6sec filter
Resolution:	16 bits
Linearity error:	<0.015% (best fit straight line)
Calibration error:	<±420µV, ±0.044% of measurement at 25°C
Drift with temperature:	<±125µV/°C, ±28ppm/C of measurement from 25°C
Common mode rejection:	>155dB (maximum of 264Vrms)
Series mode rejection:	>101dB (maximum of 4.5V pk-pk)
Input leakage current:	±14nA
Input impedance:	100M

## 10V Range

Range:	-3.0V to +10.0V
Resolution (mV):	<550µV with 1.6sec filter
Resolution:	16 bits
Linearity error:	<0.007% of reading for zero source resistance. Add 0.003% for each 10Ω of source plus lead resistance
Calibration error:	<±1.5mV, ±0.063% of measurement at 25°C
Drift with temperature:	<±66µV/°C, ±60ppm/C of measurement from 25°C
Common mode rejection:	>145dB (maximum of 264Vrms allowed)
Series mode rejection:	>92dB (maximum of 5V pk-pk allowed)
Input impedance:	62.5kΩ to 667kΩ depending on input voltage

## 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

## Digital IO (LA and LB)

Isolation:	Not isolated from each other. 264Vac double insulation from the PSU and communication
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## Input

Rating:	Voltage level: Closed 0 to 7.3Vdc Open 10.8 to 24Vdc
Contact closure:	Open >1200Ω Closed <480Ω
Functions:	Includes program control, alarm acknowledge, SP2 select, manual, keylock, RSP select, standby

## Output

Rating:	18Vdc >9mA <15mA
Functions:	Includes control outputs, alarms, events, status

## AA Relay

Type:	Form C (changeover)
Rating:	Min 1mA @ 1Vdc, Max 2A @ 264Vac resistive 1,000,000 operations with external snubber
Isolation:	264Vac double insulation
Functions:	Includes control outputs, alarms, events, status

## Input / Output modules

IO Modules	3508: 3 modules can be fitted
	3504: 6 modules can be fitted
IO Expander:	20 Digital inputs, 20 relay outputs

## Analogue input module

Calibration accuracy:	±0.2% of reading ±1LSD
Sample rate:	9Hz (110ms)
Isolation:	264Vac double insulation
Input filter:	Off to 59.9s. Default 1.6s
Zero offset:	User adjustable over full range
User calibration:	2-point gain & offset
Functions:	Includes process input, remote setpoint, power limit

## Thermocouple

Range:	-100mV to +100mV
Types:	K, J, N, R, S, B, L, T, C, PL2, custom
Resolution (µV):	<3.3µV @ 1.6s filter time
Effective resolution:	15.9 bits
Linearisation accuracy:	<0.2% of reading
Cold junction compensation:	>25:1 rejection of ambient change External reference of 0°C, 45°C and 50°C
Cold junction accuracy:	<±1°C at 25°C ambient

### Resistance thermometer

Range:	0-400Ω (-200°C to +850°C)
Resistance thermometer types:	3-wire Pt100 DIN 43760
Resolution (°C):	<±0.08°C with 1.6sec filter
Effective resolution:	13.7 bits
Linearity error:	<0.033% (best fit straight line)
Calibration error:	<±(0.4°C + 0.15% of reading in °C)
Drift with temperature:	<±(0.015°C + 0.005% of reading in °C) per °C
Common mode rejection:	<0.00085°C/V (maximum of 264Vrms)
Series mode rejection:	<0.240°C/V (maximum of 280mV pk-pk)
Lead resistance:	0Ω to 22Ω, matched lead resistance
Bulb current:	300µA

### 100mV Range

Range:	-100mV to +100mV
Resolution (µV):	<3.3µV with 1.6s filter time
Effective resolution:	15.9 bits
Linearity error:	<0.033% (best fit straight line)
Calibration error:	<±10µV, ± 0.2% of measurement at 25°C
Drift with temperature:	<±0.2µV + 0.004% of reading per °C
Common mode rejection:	>146dB (maximum of 264Vrms)
Series mode rejection:	>90dB (maximum of 280mV pk-pk)
Input leakage current:	<1nA
Input impedance:	>100MΩ

### 2V Range

Range:	-0.2V to +2.0V
Resolution (µV):	30µV with 1.6s filter time
Effective resolution:	16.2bits
Linearity error:	<0.033% (best fit straight line)
Calibration error:	<±2mV + 0.2% of reading
Drift with temperature:	<±0.1mV + 0.004% of reading per °C
Common mode rejection:	>155dB (maximum of 264Vrms)
Series mode rejection:	>101dB (maximum of 4.5V pk-pk)
Input leakage current:	<10nA
Input impedance:	>100MΩ

### 10V Range

Range:	-3.0V to +10.0V
Resolution (µV):	<200µV with 1.6sec filter
Effective resolution:	15.4 bits
Linearity error:	<0.033% (best fit straight line)
Calibration error:	<±0.1mV + 0.02% of reading per °C
Drift with temperature:	<± 0.1mV + 0.02% of reading per °C
Common mode rejection:	>145dB (maximum of 264Vrms)
Series mode rejection:	>92dB (maximum of 5V pk-pk)
Input impedance:	>69kΩ

### Potentiometer input

Type:	Single channel
Resistance:	100Ω to 15kΩ
Excitation:	0.5Vdc supplied by module
Isolation:	264Vac double insulation
Functions:	Includes valve position and remote setpoint

### Analogue control output

Type:	Single channel
Rating:	0-20mA <600Ω 0-10Vdc >500Ω
Accuracy:	<±2.5%
Resolution:	10 bits
Isolation:	264Vac double insulation

### Analogue retransmission output

Type:	Single channel
Rating:	0-20mA <600Ω 0-10Vdc >500Ω
Accuracy:	<±0.5%
Resolution:	11 bits
Isolation:	264Vac double insulation

### Dual 4-20mA OP/24Vdc TxPSU

Type:	Dual channel
Rating:	Output: 4-20mAdc, <1KΩ TxPSU: 24Vdc, 22mA
Isolation:	264Vac double insulation between channels
Functions:	Either channel can be control output or TxPSU
Accuracy:	<±1%
Resolution:	11 bits

### Logic input modules

Module types:	Triple contact closure, triple logic level
Isolation:	No channel isolation. 264Vac double insulation from other modules and system
Rating	Voltage level: Open -3 to 5Vdc @ <-0.4mA Closed 10.8 to 30Vdc @ 2.5mA
	Contact closure: Open >28kΩ Closed <100Ω
Functions:	Includes program control, alarm acknowledge, SP2 select, manual, keylock, RSP select, standby

### Logic output modules

Module types:	Single channel, triple channel
Isolation:	No channel isolation. 264Vac double insulation from other modules and system
Rating	Single: 12Vdc >20mA <29mA Triple: 12Vdc >9mA <12mA
Functions:	Includes control outputs, alarms, events, status

### Relay modules

Module types:	Single channel Form A, Single channel Form C, dual channel Form A
Isolation:	264Vac double insulation
Rating:	Min 100mA @ 12Vdc, Max 2A @ 264Vac resistive Min 400,000 (max load) operations with external snubber
Functions:	Includes control outputs, alarms, events, status

### Triac modules

Module types:	Single channel, dual channel
Isolation:	264Vac double insulation
Rating:	<0.75A @ 264Vac resistive
Functions:	Includes control outputs, alarms, events, status

### Transmitter PSU module

Type:	Single channel
Isolation:	264Vac double insulation
Rating:	24Vdc @ 20mA

### Transducer PSU module

Type:	Single channel
Isolation:	264Vac double insulation
Bridge voltage:	Software selectable 5Vdc or 10Vdc
Bridge resistance:	300Ω to 15kΩ
Internal shunt resistor:	30.1Ω @0.25%, used for calibration of 350Ω bridge at 80%

### I/O Expander

Type	20 I/O: 4 Form C relays, 6 Form A relays, 10 logic inputs
	40 I/O: 4 Form C relays, 16 Form A relays, 20 logic inputs
Isolation:	264Vac double insulation between channels
Ratings	Relay: Min 100mA @ 12Vdc, Max 2A @ 264Vac resistive Logic Input: Open -3 to 5Vdc @ <-0.4mA Closed 10.8 to 30Vdc @ 2.5mA
Communications:	Using EX comms module in comms slot J

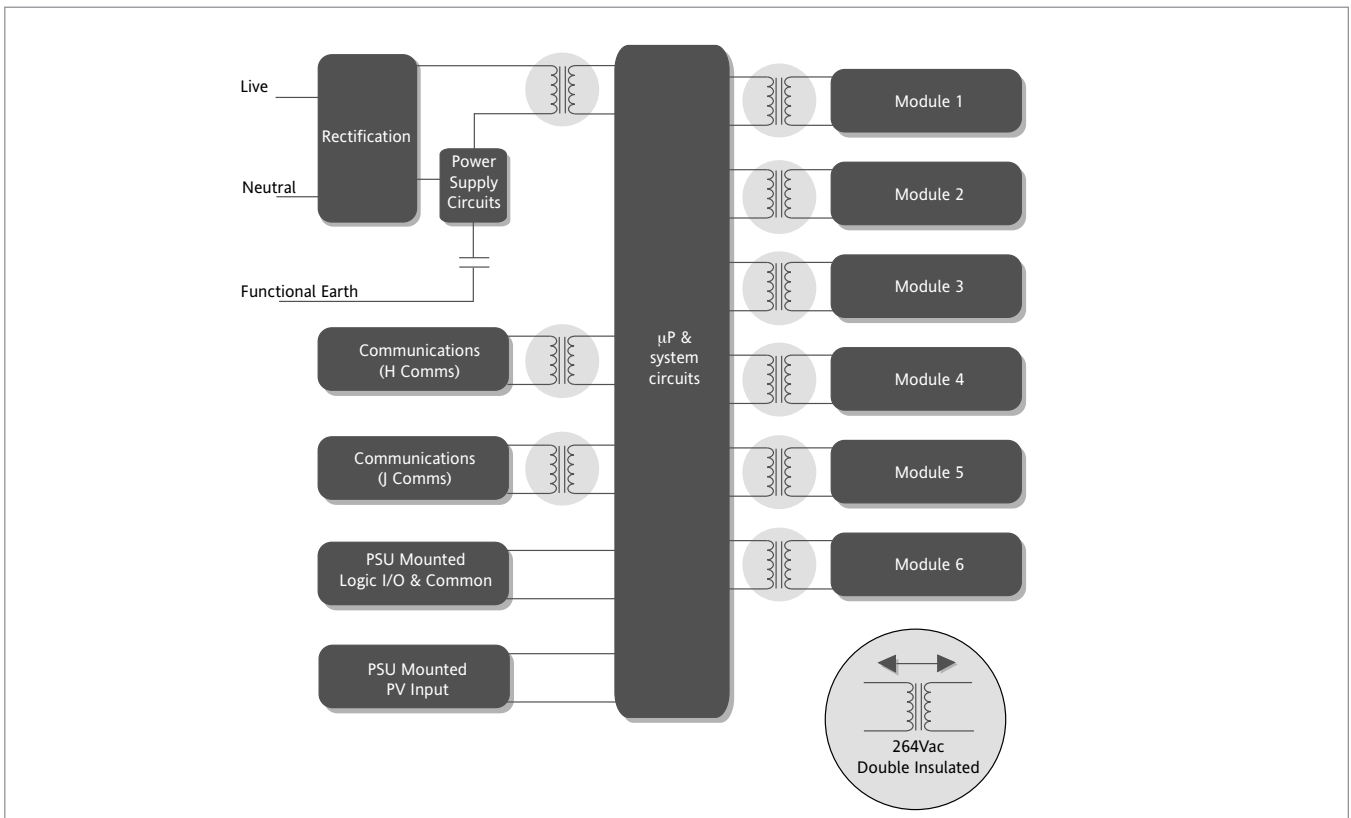
### Software features

Control	
Number of loops:	2
Loop update:	110ms
Control types:	PID, OnOff, VP, Dual VP
Cooling types:	Linear, fan, oil, water
Modes:	Auto, manual, forced manual, control inhibit
Overshoot inhibition:	High and low cutbacks
Number of PID sets:	3, selectable on PV, SP, OP, On Demand, program segment and remote input
Control options:	Supply voltage compensation, feedforward, output tracking, OP power limiting, SBR safe output
Setpoint options:	Remote SP with trim, SP rate limit, 2nd Setpoint, tracking modes

<b>Setpoint programmer</b>	
Program function:	50 programs, max 500 segments
Program names:	User defined up to 16 characters
No of profile channels:	2 (1 if single loop)
Operation:	Full or partially synchronised
Events:	8 per channel (8 when fully synchronised) 1 timed event, 1 PV event
Segment types:	Rate, dwell, time, call, goback and wait
Digital inputs:	Run, Hold, Reset, RunHold, RunReset, Adv Seg, Skip Seg
Servo action:	Process value, setpoint
Power failure modes:	Continue, ramp, reset
Other functions:	Guaranteed soak, holdback, segment user values, wait inputs, PV hot start
<b>Process alarms</b>	
Number:	8
Type:	High, low, devhi, devlo, devband
Latching:	None, auto, manual, event
Other features:	Delay, inhibit, blocking, display message, 3 priority levels
<b>Digital alarms</b>	
Number:	8
Type:	PosEdge, negEdge, edge, high, low
Latching:	None, auto, manual, event
Other features:	Delay, blocking, inhibit, display message, 3 priority levels
<b>Zirconia</b>	
Number:	1
Functions:	Carbon potential, dewpoint, %O <sub>2</sub> LogO <sub>2</sub> , probe mV
Supported probes:	Barber Colman, Drayton, MMCarbon, AACC, Accucarb, SSI, MacDhui, BoschO <sub>2</sub> , BoschCarbon
Gas reference:	Internal or remote analogue input
Probe diagnostics:	Clean recovery time, impedance measurement
Probe burn-off:	Automatic or manual
Other features:	Sooting alarm with tolerance setting, PV offsets

<b>Humidity</b>	
Number:	1
Functions:	Relative humidity, dewpoint
Measurement:	Psychrometric (wet & dry) inputs
Atmosphere compensation:	Internal or remote analogue input
Other features:	Psychrometric constant adjust
<b>Recipes</b>	
Number:	8
Parameters:	24 per recipe
Length of name:	8 Characters
Selection:	HMI, comms, strategy
<b>Transducer calibration</b>	
Number:	2
Type:	Shunt, load cell, comparison
Other features:	Autotare
<b>Communication tables</b>	
Number:	250
Function:	Modbus remapping (indirection)
Data formats:	Integer, IEEE (full resolution)
<b>Application blocks</b>	
Soft wiring	Orderable options of 30, 60 120 or 250
User values:	16 real numbers with decimal point.
2 Input maths:	24 blocks, add, subtract, multiply, divide, absolute difference, maximum, minimum, hot swap, sample and hold, power, square root, Log, Ln, exponential, switch.
2 Input logic:	24 blocks, AND, OR, XOR, latch, equal, not equal, greater than, less than, greater than or equal to, less
8 Input logic:	2 blocks. AND, OR, XOR
8 Input multiplexor:	4 blocks. 8 sets of 8 values selected by input parameter
8 Input multiple input	3 blocks, average, min, max sum
BCD Input:	2 blocks, 2 Decades
Input monitor:	2 blocks, max, min, time above threshold
16 Point linearisation:	2 blocks, 16-point linearisation fit
Polynomial fit:	2 blocks, characterisation by Poly Fit table
Switchover:	1 block, smooth transition between two values
Timer blocks:	4 blocks, OnPulse, OnDelay, OneShot, MinOn Time
Counter blocks:	2 blocks, Up or down, directional flag
Totaliser blocks:	2 blocks, alarm at threshold value
Real time clock:	1 block, day & time, 2 time based alarms

## Isolation diagram



# Hardware/options ordering code

Model Number	Function	Supply Voltage	Loops	Application	Programs	Recipes	Toolkit Wires	Fascia	I/O Slot 1	I/O Slot 2	I/O Slot 3	I/O Slot 4 <sup>(2)</sup>
I/O Slot 5 <sup>(2)</sup>	I/O Slot 6 <sup>(2)</sup>	H Comms Slot	J Comms Slot	Config Tools	Product Language	Manuals Language	Warranty	Calibration Certificate	Special			

Model Number	3504 1/4 DIN unit 3508 1/8 DIN unit
Function	CC Standard F Profibus
Supply Voltage	VH 85 - 264Vac VL 20-29Vac/dc
Loops	1 One loop 2 Two loops

Application	XX Standard ZC Zirconia VP Dual Valve <sup>(3)</sup> Positioning
Programs	X No Programs 1 1 Program - 20 Segments 10 10 Programs - 500 Segments 25 25 Programs - 500 Segments 50 50 Programs - 500 Segments

Recipes	X No recipes 1 1 recipe 4 4 Recipes 8 8 recipes
Toolkit Wires	XXX 30 Wires 60 60 Wires 120 120 Wires 250 250 Wires
Fascia	G Eurotherm Green S Silver

I/O Slots	1, 2, 3, 4 <sup>(2)</sup> , 5 <sup>(2)</sup> , 6 <sup>(2)</sup>
XX No module fitted R4 Change over relay R2 2 Pin relay RR Dual relay T2 Triac TT Dual triac D4 Analogue control output AM Analogue input (not slot 2 or 5) D6 Analogue retransmission output TK Triple contact input TL Triple logic input TP Triple logic output VU Potentiometer input MS 24Vdc Transmitter PSU G3 Transducer PSU 5 or 10Vdc LO Isolated single logic OP DO Dual 4-20mA OP/24Vdc TxPSU (not slot 3, 5 or 6)	

H Comms Slot	XX Not fitted A2 EIA232 Modbus Y2 2-wire EIA485 Modbus F2 4-wire EIA485 Modbus AE 232 El-Bisynch YE 2-wire EIA485 El-Bisynch FE 4-wire EIA485 El-Bisynch ET Ethernet Modbus 10base T TCP IP (incl RJ45 Assy) PB Profibus DP <sup>(1)</sup> PD Profibus with D <sup>(1)</sup> type connector fitted DN DeviceNet
J Comms Slot	XX Not fitted A2 EIA232 Modbus Y2 2-wire EIA485 Modbus F2 4-wire EIA485 Modbus EX IO Expander module

Config. Tools	XX None IT Standard iTools (CD only)
Product Language	ENG English FRA French GER German SPA Spanish ITA Italian
Manual Language	ENG English FRA French GER German SPA Spanish ITA Italian

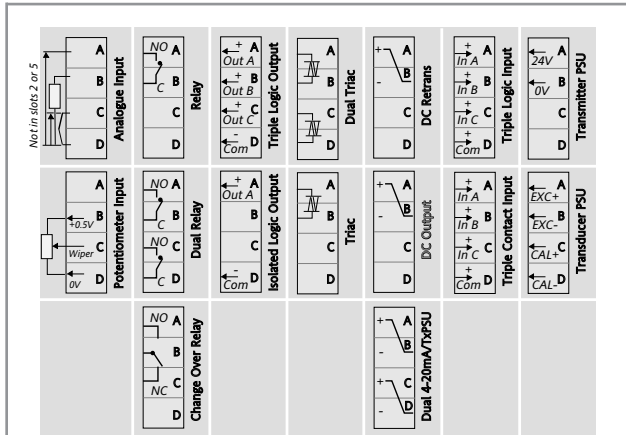
Warranty	XXXXX Standard WL005 Extended
Calibration Certificates	XXXXX None CERT1 Certificate of Conformity CERT2 Factory input calibration per input

### Example (order code)

3504/CC/VH/2/XX/50/X/60/S/R2/D4/AM/XX/XX/XX/A2/XX/XX/ENG/ENG/XXXXX/XXXXX

This code describes a two loop 3504 with 50 programs and 60 wires. Additional modules for dual relay, analogue control, analogue input and EIA232 communications. English language and manuals with silver fascia.

### Rear terminal connections

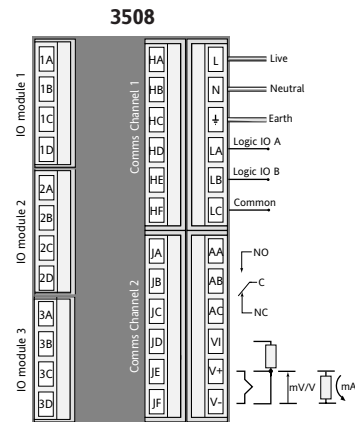
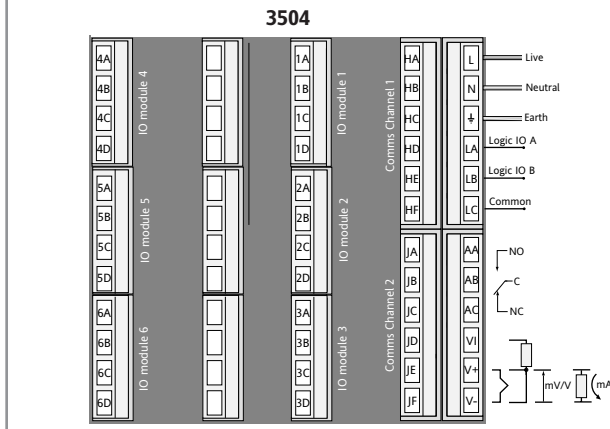


1. Only available with the Profibus Controller
2. I/O slots 4, 5 and 6 are only available on the 3504
3. Provides Valve Position option in Heat/Cool applications. Single channel VP included as standard.
4. OEM Security enables a user to protect their configuration from unauthorised cloning.

### 3500 Accessories

User guide	HA027987
Engineering manual	HA027988
2.49R Precision resistor	SUB35/ACCESS/249R.1
Configuration IR clip	iTools/None/3000IR
Configuration clip	iTools/None/3000CK
10IN,10OUT Expander	2000IO/VL/10LR/XXXX
20IN,20OUT Expander	2000IO/VL/20LR/20LR

Special	XXXXXX Standard EU0722 OEM Security
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# Configuration code

Config.	Loop 1 Units	Loop 1 Function	Loop 1 PV	Loop 1 Range Low	Loop 1 Range High	Loop 2 Units	Loop 2 Function	Loop 2 PV	Loop 2 Range Low	Loop 2 Range High	Alarm 1	Alarm 2	Alarm 3
Alarm 4	Logic LA	Logic LB	Relay AA	I/O Slot 1	I/O Slot 2	I/O Slot 3	I/O Slot 4 <sup>(a)</sup>	I/O Slot 5 <sup>(a)</sup>	I/O Slot 6 <sup>(a)</sup>				

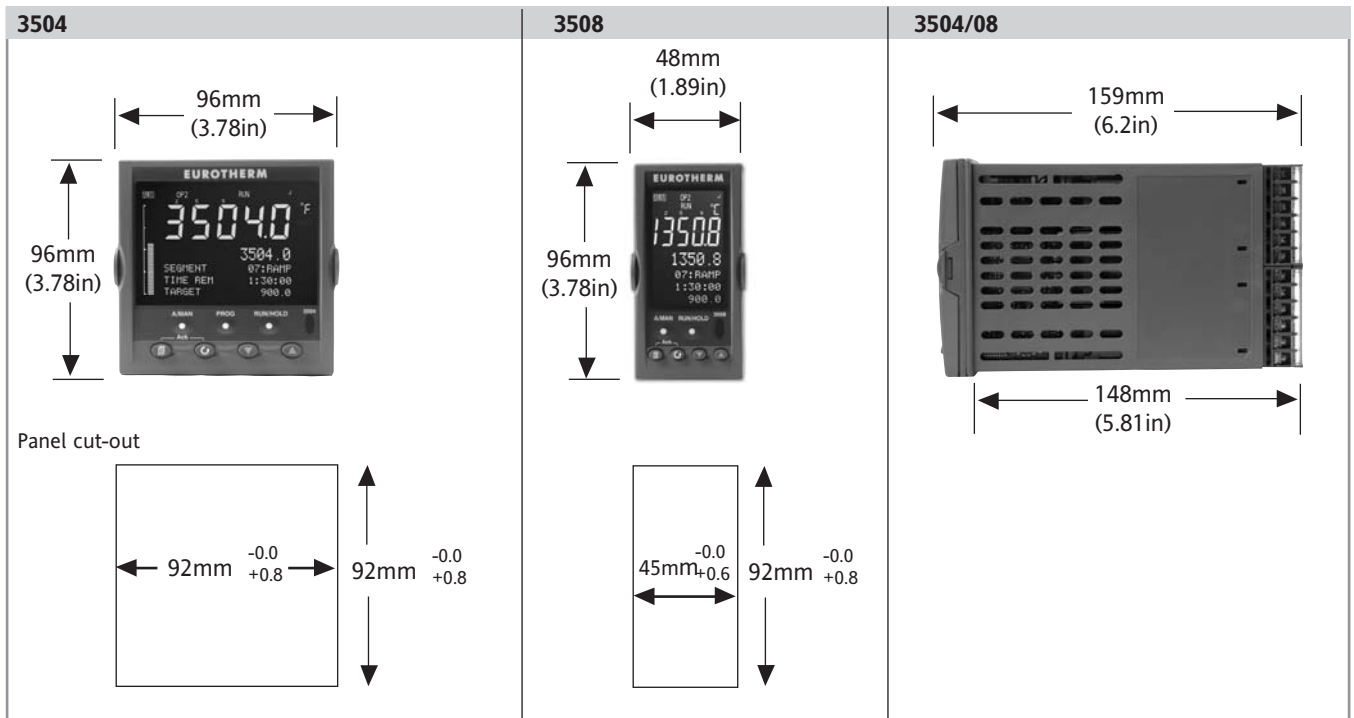
Config.	Loop 1 Function	Loop 1 PV	Loop 2 Function	Loop 2 PV
<b>STD</b> Standard config <sup>(1)</sup> <b>CFG</b> Factory configured	<b>PX</b> Single Chan. PID <b>FX</b> Single Chan. VP with Feedback <b>VX</b> Single Chan. VP without Feedback <b>NX</b> Single Chan. On/Off <b>PP</b> Dual Chan. PID <b>PN</b> Dual Chan. PID/OnOff <b>FF</b> Dual Chan. VP with Feedback <b>VV</b> Dual Chan. VP without Feedback <b>PF</b> Dual Chan. PID/VP with Feedback <b>PV</b> Dual Chan. PID/VP without Feedback	<b>X</b> Unconfigured <b>J</b> J Thermocouple <b>K</b> K Thermocouple <b>T</b> T Thermocouple <b>L</b> L Thermocouple <b>N</b> N Thermocouple <b>R</b> R Thermocouple <b>S</b> S Thermocouple <b>B</b> B Thermocouple <b>P</b> Platinell II <b>C</b> C Thermocouple <b>Z</b> Pt 100 <b>A</b> 4-20mA Linear <b>Y</b> 0-20mA Linear <b>W</b> 0-5Vdc Linear <b>G</b> 1-5Vdc Linear <b>V</b> 0-10Vdc Linear <b>Q</b> Custom Curve	<b>XX</b> Single Loop Only <b>PX</b> Single Chan. PID <b>FX</b> Single Chan. VP with Feedback <b>VX</b> Single Chan. VP without Feedback <b>NX</b> Single Chan. On/Off <b>PP</b> Dual Chan. PID <b>PN</b> Dual Chan. PID/OnOff <b>FF</b> Dual Chan. VP with Feedback <b>VV</b> Dual Chan. VP without Feedback <b>PF</b> Dual Chan. PID/VP with Feedback <b>PV</b> Dual Chan. PID/VP without Feedback	<b>X</b> Unconfigured <b>J</b> J Thermocouple <b>K</b> K Thermocouple <b>T</b> T Thermocouple <b>L</b> L Thermocouple <b>N</b> N Thermocouple <b>R</b> R Thermocouple <b>S</b> S Thermocouple <b>B</b> B Thermocouple <b>P</b> Platinell II <b>C</b> C Thermocouple <b>Z</b> Pt 100 <b>A</b> 4-20mA Linear <b>Y</b> 0-20mA Linear <b>W</b> 0-5Vdc Linear <b>G</b> 1-5Vdc Linear <b>V</b> 0-10Vdc Linear <b>Q</b> Custom Curve
<b>Loop 1 Units</b> <b>C</b> Centigrade <b>F</b> Fahrenheit <b>%</b> Percent <b>H</b> %RH <b>P</b> PSI <b>B</b> Bar <b>M</b> mBar <b>X</b> None		<b>Loop 1 Range Low</b> XXXXX Enter value with decimal point	<b>Loop 2 Units</b> <b>C</b> Centigrade <sup>(2)</sup> <b>F</b> Fahrenheit <sup>(2)</sup> <b>%</b> Percent <b>H</b> %RH <b>P</b> PSI <b>B</b> Bar <b>M</b> mBar <b>X</b> None	<b>Loop 2 Range Low</b> XXXXX Enter value with decimal point
		<b>Loop 1 Range High</b> XXXXX Enter value with decimal point		<b>Loop 2 Range High</b> XXXXX Enter value with decimal point

- If standard config is selected an instrument without configuration will be supplied.
- If C or F units are selected they must be the same for both loops. If C or F are not selected for Loop 1 they cannot be selected for Loop 2
- I/O slots 4, 5 and 6 are only available on the 3504.
- CH1 = Heat, CH2 = Cool

Alarm 1	Alarm 2	Alarm 3	Alarm 4	Logic LA	Logic LB	Relay AA	Slot functions 1 - 6 <sup>(a)</sup>	
<b>XXX</b> Unconfigured <b>1_</b> Loop 1 <b>2_</b> Loop 2 <b>_FH</b> Full scale high <b>_FL</b> Full scale low <b>_DH</b> Deviation high <b>_DL</b> Deviation low <b>_DB</b> Deviation band	<b>XXX</b> Unconfigured <b>1_</b> Loop 1 <b>2_</b> Loop 2 <b>_FH</b> Full scale high <b>_FL</b> Full scale low <b>_DH</b> Deviation high <b>_DL</b> Deviation low <b>_DB</b> Deviation band	<b>XXX</b> Unconfigured <b>1_</b> Loop 1 <b>2_</b> Loop 2 <b>_FH</b> Full scale high <b>_FL</b> Full scale low <b>_DH</b> Deviation high <b>_DL</b> Deviation low <b>_DB</b> Deviation band	<b>XXX</b> Unconfigured <b>1_</b> Loop 1 <b>2_</b> Loop 2 <b>_FH</b> Full scale high <b>_FL</b> Full scale low <b>_DH</b> Deviation high <b>_DL</b> Deviation low <b>_DB</b> Deviation band	<b>XX</b> Unconfigured <b>1_</b> Loop 1 <b>2_</b> Loop 2 <b>_B</b> Sensor Break <b>_M</b> Manual Select <b>_H</b> Control Ch1 OP <b>_C</b> Control Ch2 OP <b>_R</b> Remote SP <b>_S</b> Setpoint 2 Enable <b>A_</b> Alarm <b>_A</b> Acknowledge All Alarms <b>_1</b> Alarm 1 OP <b>_2</b> Alarm 2 OP <b>P_</b> Programmer <b>_R</b> Run <b>_H</b> Hold <b>_A</b> Reset <b>_1</b> Prg Ch1 Event 1 <b>_2</b> Prg Ch1 Event 2	<b>XX</b> Unconfigured <b>1_</b> Loop 1 <b>2_</b> Loop 2 <b>_B</b> Sensor Break <b>_M</b> Manual Select <b>_H</b> Ch1 OP <b>_C</b> Ch2 OP <b>_R</b> Remote SP <b>_S</b> Setpoint 2 Enable <b>A_</b> Alarm <b>_A</b> Acknowledge All Alarms <b>_1</b> Alarm 1 OP <b>_2</b> Alarm 2 OP <b>P_</b> Programmer <b>_R</b> Run <b>_H</b> Hold <b>_A</b> Reset <b>_1</b> Prg Event 1 <b>_2</b> Prg Event 2	<b>XX</b> Unconfigured <b>1_</b> Loop 1 <b>2_</b> Loop 2 <b>_H</b> Control Ch1 OP <b>_C</b> Control Ch2 OP <b>_B</b> Sensor Break <b>SB</b> Sensor Break (any loop) <b>A_</b> Alarm <b>_A</b> Any Alarm Active <b>_N</b> New Alarm Active <b>_1</b> Alarm 1 OP <b>_2</b> Alarm 2 OP <b>P_</b> Programmer <b>_1</b> Prg Event 1 <b>_2</b> Prg Event 2	<b>XXX</b> Unconfigured <b>1_</b> Loop 1 <b>2_</b> Loop 2 <b>Changeover Relay</b> <b>_HX</b> Control Ch1 OP <b>_CX</b> Control Ch2 OP <b>_BX</b> Sensor Break <b>2-Pin Relay</b> <b>_HX</b> Control Ch1 OP <b>_CX</b> Control Ch2 OP <b>_BX</b> Sensor Break <b>Single Logic</b> <b>_HX</b> Control Ch1 OP <b>_CX</b> Control Ch2 OP <b>Single Triac</b> <b>_HX</b> Control Ch1 OP <b>_CX</b> Control Ch2 OP <b>Dual Relay</b> <b>_HC</b> Ch1 OP & Ch2 <b>_VT</b> VP Ch1 <b>_VR</b> VP Ch2 <b>P12</b> Prg Event 1 & 2 <b>P34</b> Prg Event 3 & 3 <b>P56</b> Prg Event 5 & 6 <b>P78</b> Prg Event 7 & 8 <b>A12</b> Alarm 1 & 2 OP <b>A34</b> Alarm 3 & 4 OP <b>HHX</b> Ch1 OP for loops 1 & 2 <b>CCX</b> Ch2 OP for loops 1 & 2 <b>SBR</b> Sensor Break both loops <b>Dual 4-20mA/TxPSU</b> <b>XXX</b> Unconfigured * For range select third digit from Table 1	<b>Dual Triac</b> <b>_HC</b> Ch1 OP & Ch2 <b>_VT</b> VP Ch1 <b>_VR</b> VP Ch2 <b>P12</b> Prg Ch1 Event 1 & 2 <b>P34</b> Prg Ch1 Event 3 & 3 <b>P56</b> Prg Ch1 Event 5 & 6 <b>P78</b> Prg Ch1 Event 7 & 8 <b>A12</b> Alarm 1 & 2 OP <b>A34</b> Alarm 3 & 4 OP <b>HHX</b> Ch1 OP for loops 1 & 2 <b>CCX</b> Ch2 OP for loops 1 & 2 <b>DC Control</b> <b>_H</b> Ch1 OP <b>_C</b> Ch2 OP <b>DC Retransmission *</b> <b>_T</b> PV Retransmission <b>_S</b> SP Retransmission <b>Analogue Input *</b> <b>2PV</b> Loop 2 PV <b>_R</b> Remote SP <b>Potentiometer Input</b> <b>_RS</b> Remote SP <b>_VF</b> VP Feedback Ch1 <b>_VG</b> VP Feedback Ch2 <b>Table 1</b> <b>A</b> 4-20mA Linear <b>Y</b> 0-20mA Linear <b>W</b> 0-5Vdc Linear <b>G</b> 1-5Vdc Linear <b>V</b> 0-10Vdc Linear
							<b>Triple Logic Input</b> --- Select function below for each channel <b>X</b> Unconfigured <b>M</b> Loop 1 Manual <b>N</b> Loop 2 Manual <b>Q</b> Loop 1 Remote SP <b>V</b> Loop 2 Remote SP <b>S</b> Loop 1 Setpoint 2 <b>T</b> Loop 2 Setpoint 2 <b>E</b> Acknowledge All Alarms <b>P</b> Program Run <b>R</b> Program Reset <b>H</b> Program Hold <b>Triple Logic OP</b> --- Select function below for each channel <b>X</b> Unconfigured <b>F</b> Loop 1 Ch1 OP <b>G</b> Loop 1 Ch2 OP <b>K</b> Loop 2 Ch1 OP <b>L</b> Loop 2 Control Ch2 OP <b>A</b> Alarm 1 OP <b>B</b> Alarm 2 OP <b>C</b> Alarm 3 OP <b>D</b> Alarm 4 OP <b>1</b> Program Event 1 <b>2</b> Program Event 2 <b>3</b> Program Event 3 <b>4</b> Program Event 4 <b>5</b> Program Event 5 <b>6</b> Program Event 6 <b>7</b> Program Event 7 <b>8</b> Program Event 8	

**Example**  
**CFG/C/PX/PX/K/1200/H/0.0/100.0/1FH/1FL/XXX/XXX/A1/A2/SB/2HC/1HA/2PV/XXX/XXX/XXX**  
 This code configures the example hardware code as  
 Loop1, 0-1200°C type K with heat/cool relays. High and low alarms on logic LA and LB  
 Loop2, 4-20mA input ranged 0.0-100.0 %RH. 4-20mA control output  
 Sensor (any) break alarm on AA relay

## Dimensional details



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