

# 3500

MODELS

Ideal for :

- Furnaces
- Environmental chambers
- Autoclaves
- Fermenters
- Reactors
- Melt pressure
- Process applications

Features :

- 2 PID loops
- 50 Programs
- Precision PV input
- Carbon potential
- Maths/logic/timers
- Custom user interface
- Recipes
- Modbus RTU
- Ethernet Modbus TCP
- Profibus DP
- DeviceNet



## Advanced Controller/Programmer Specification Sheet

Eurotherm's latest range of advanced process controllers 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.

### 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 fifteen 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**

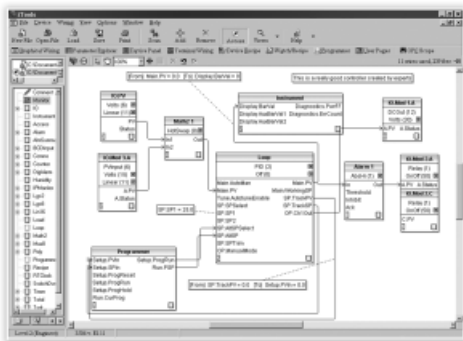
Communications to the 3500 can be achieved by using an infrared adaptor. Clipping onto the front fascia it provides iTools communications allowing configuration and commissioning to be performed without the need to access the rear terminals of the controller.



**Infrared clip connected to the 3504**

**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.



**TECHNICAL SPECIFICATION**

**General**

<b>Environmental performance</b>		
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
<b>INSTALLATION CATEGORY II</b> The rated impulse voltage for equipment on nominal 230V mains is 2500V.	
<b>POLLUTION DEGREE 2</b> 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)
Inrush current	High Voltage (VH): 30A duration <100µs Low Voltage (VL): 15A duration <100µs

**Approvals**

	CE, cUL listed (file E57766), Gost
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**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 (1 parameter) I/O Expander
Isolation	264Vac, double insulated

Transmission standard	EIA232, EIA485, CAN (DeviceNet), Profibus
<b>Ethernet communications option</b>	
Protocol	Modbus TCP, 10baseT
Isolation	264Vac, double insulated
Transmission standard	802.3
Features	DHCP client, 4 simultaneous masters, preferred master

### 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	<±0.033% (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	<0.033% (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	<0.033% (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	100MΩ

### 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

### Transmitter PSU (LA and LB)

Rating	24Vdc, 20mA with LA/LB connected in parallel
Isolation	264Vac double insulation from the PSU and communication

### 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 @ 15mA (min 9mA)
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
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### 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	<0.000085°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	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	<10nA
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)	<300μV with 1.6sec filter
Effective resolution	15.4 bits
Linearity error	<0.033% (best fit straight line)
Calibration error	<±(0.4°C + 0.15% of reading in °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

**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 @ 24mA, source Triple: 12Vdc @ 9mA, source
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

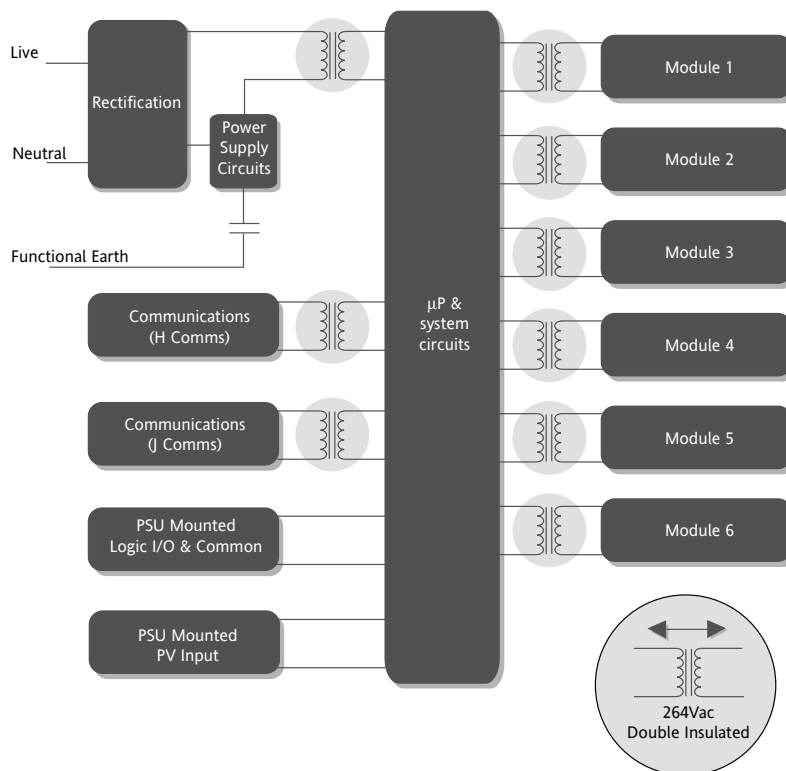
**Software Features**

<b>Control</b>	
Number of loops	2
Control types	PID, OnOff, VP, Dual SP
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, MMICarbon, AACC, Accucarb, SSI, MacDhui, Bosch02, 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.
	24 blocks, AND, OR, XOR, latch, equal, not equal, greater than, less than, greater than or equal to, less
2 Input logic:	2 blocks. AND, OR, XOR
8 Input logic:	4 blocks. 8 sets of 8 values selected by input parameter
8 Input multiplexor:	3 blocks, average, min, max sum
8 Input multiple input	2 blocks, 2 Decades
BCD Input:	2 blocks, max, min, time above threshold
Input monitor:	2 blocks, 16-point linearisation fit
16 Point linearisation:	2 blocks, characterisation by Poly Fit table
Polynomial fit:	1 block, smooth transition between two values
Switchover:	4 blocks, OnPulse, OnDelay, OneShot, MinOn Time
Timer blocks:	2 blocks, Up or down, directional flag
Counter blocks:	2 blocks, alarm at threshold value
Totaliser blocks:	1 block, day & time, 2 time based alarms
Real time clock:	

## 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

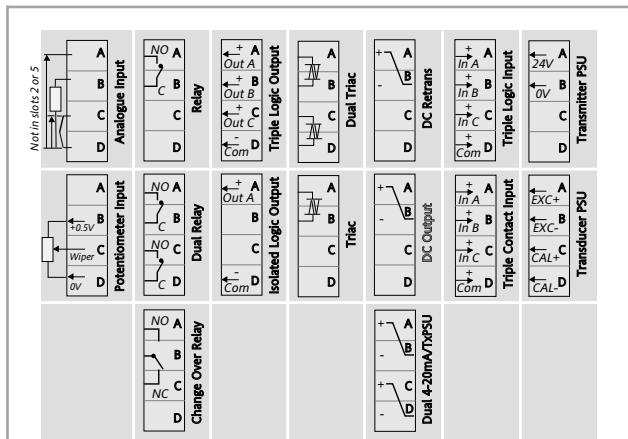
Model Number	Application	Recipes	I/O Slots	H Comms Slot	Config. Tools
3504 1/4 DIN unit 3508 1/8 DIN unit	XX Standard ZC Zirconia VP Dual Valve <sup>(1)</sup> Positioning	X No recipes 1 1 recipe 4 4 Recipes 8 8 recipes	1, 2, 3, 4 <sup>(2)</sup> , 5 <sup>(2)</sup> , 6 <sup>(2)</sup>	XX Not fitted A2 EIA232 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	XX None IT Standard iTools (CD only)
Function	Programs	Toolkit Wires	J Comms Slot	Product Language	Manual Language
CC Standard F Profibus	X No Programs 1 1 Program - 20 Segments 10 10 Programs - 500 Segments 25 25 Programs - 500 Segments 50 50 Programs - 500 Segments	XXX 30 Wires 60 60 Wires 120 120 Wires 250 250 Wires	XX Not fitted A2 EIA232 Modbus Y2 2-wire EIA485 Modbus F2 4-wire EIA485 Modbus EX IO Expander module	ENG English FRA French GER German SPA Spanish ITA Italian	ENG English FRA French GER German SPA Spanish ITA Italian
Supply Voltage	Fascia	Fascia	Warranty	Calibration Certificates	
VH 85 - 264Vac VL 20-29Vac/dc	G Eurotherm Green S Silver	G Eurotherm Green S Silver	XXXXX Standard WL005 Extended	CERT1 None Certificate of Conformity CERT2 Factory input calibration per input	
Loops					
1 One loop 2 Two loops					

### Example (order code)

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

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

## REAR TERMINAL CONNECTIONS

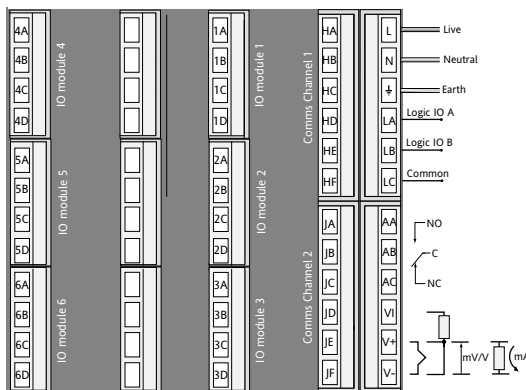


1. Only available with the Profibus Controller
2. I/O slots 4, 5 and 6 are only available on the 3504
3. Provides Valve Position option in Heat/Cool applications. Single channel VP included as standard.

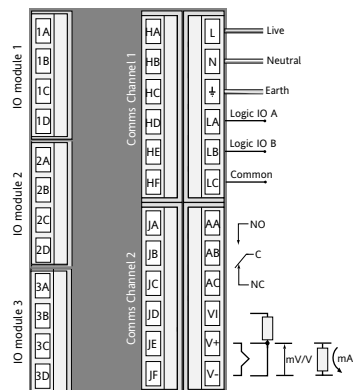
## 3500 ACCESSORIES

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

### 3504



### 3508



# 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>(4)</sup>	I/O Slot 5 <sup>(5)</sup>	I/O Slot 6 <sup>(6)</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

Loop 1 Units	Loop 2 Units
<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>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

Loop 1 Range Low	Loop 1 Range High	Loop 2 Range Low	Loop 2 Range High
XXXXX Enter value with decimal point	XXXXX Enter value with decimal point	XXXXX Enter value with decimal point	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>(4)</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

Triple Logic Input	DC Control	DC Retransmission *	Analogue Input *	Potentiometer Input
<b>---</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> <b>---</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	<b>_H</b> Ch1 OP <b>_C</b> Ch2 OP	<b>_T</b> PV Retransmission <b>_S</b> SP Retransmission	<b>_R</b> Remote SP <b>_RS</b> Remote SP	<b>_VP</b> VP Feedback Ch1 <b>_VF</b> VP Feedback Ch2

Table 1
<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

**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**

