

EUROTHERM® FLEXIBLE SOLUTIONS

# 2604 2704

CONTROLLERS



Invensys®  
EUROTHERM®



... WITH UNIQUE LEVELS OF CONTROL AND FLEXIBILITY

# Eurotherm® 2604 – 2704

## Unique levels of flexibility

The Eurotherm® uncompromising design and willingness to listen to their customers has ensured the 2604 and 2704 provide an ideal solution, tailored to meet the needs of many markets. Unique levels of functionality are key to their unmatched versatility - features that Eurotherm has identified as essential requirements in a number of application areas, including furnaces, test chambers and autoclaves. The 2604 and 2704 combine Eurotherm's proven PID control with functionality previously only found in PLCs. These controllers not only provide unsurpassed capabilities in highly compact units, but also offer the potential to reduce total hardware system costs by replacing several discrete pieces of control equipment.

**Setpoint Programmer**

**Multi-loop Controller**

**Maths and Logic Functions**

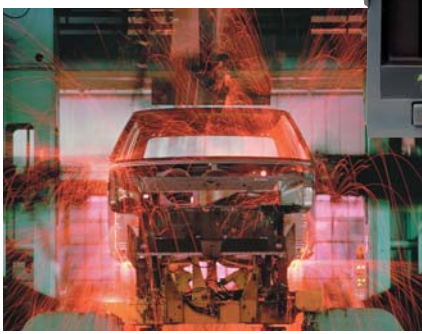
**Precision Measurements**

**Expandable I/O Option**

**Open Communications**

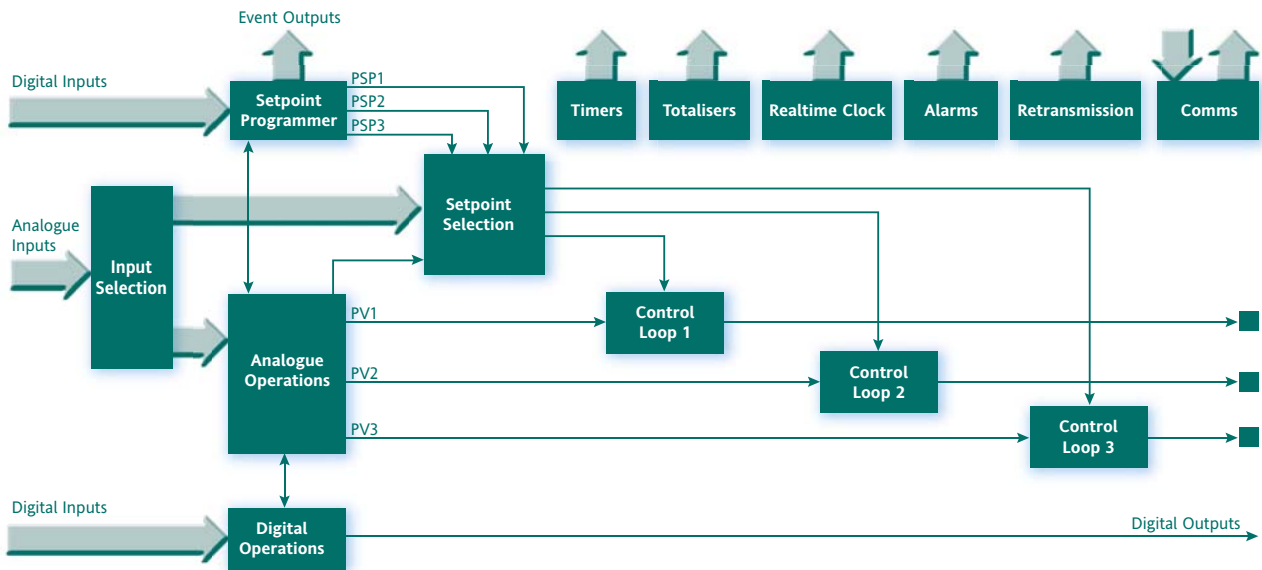


	Control	SP Programs	Maths + Logic	Timer Functions	Communications
<b>2704</b>	3 Loops Cascade Override Ratio	60 Synchronous 20 Asynchronous	32 Analogue 32 Logic 50 User Values	4 Timers 4 Totalisers Real Time Clock	Modbus RTU Profibus DP Devicenet® Ethernet/Modbus TCP
<b>2604</b>	3 Loops Cascade Override Ratio	50 Synchronous	24 Analogue 32 Logic 12 User Values	4 Timers 4 Totalisers Real Time Clock	Modbus RTU Profibus DP Devicenet®



## CONTROLLED VARIABLES

- Temperature
- Pressure
- Flow
- Level
- Relative Humidity
- Dewpoint
- Carbon Potential
- Oxygen Concentration
- Total Dissolved Solids
- Melt Pressure
- pH



IO Expander	Master Modbus	Melt Pressure	Humidity	Carbon Potential	Vacuum	Boiler TDS
20 Digital Inputs 20 Digital Outputs	100 Parameters Broadcast Mode	Available	Available	Available	Available	Available
20 Digital Inputs 20 Digital Outputs	25 Parameters Broadcast Mode	Available	Available	Available	Not Available	Not Available



# Eurotherm 2604 - 2704

## Optimised Control Performance

The 26/2704 are highly versatile products capable of operating a number of control strategies. Eurotherm's control algorithm is based on more than 30 years of temperature and process control market leadership. A comprehensive range of modular I/O capability and functionality, including remote I/O, is available making them ideal for a wide range of applications.

Process measurement resolution to better than  $0.25\mu\text{V}$  delivers unprecedented performance in applications demanding high accuracy and stability, such as semiconductor, materials testing and research. The three control loops can be totally independent or interactive, allowing difficult control solutions to be satisfied. Standard options allow classic control strategies such as Cascade, Ratio or Override to be implemented without the need for complex user configuration.

**Measurement Resolution  $<0.25\mu\text{V}$**

**3 Control Loops**

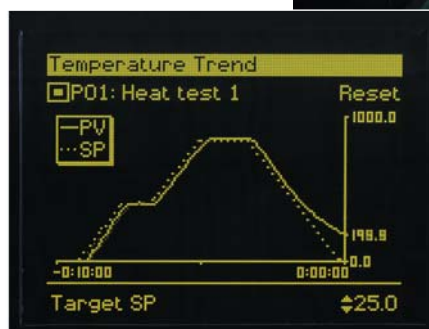
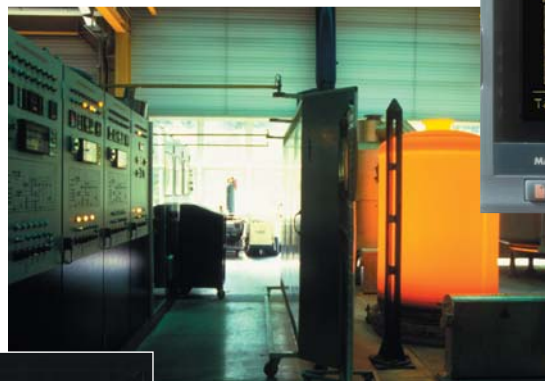
**Cascade, Ratio and Override Control Options**

**Modular I/O Options**

**Specific Application Blocks**

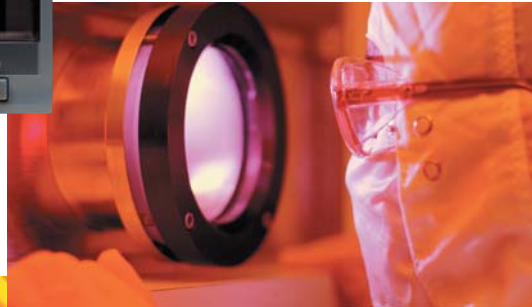
**Multiple PID Sets**

**PV/SP Trending**



Multiple sets of tuning parameters can be used to optimise control performance over a wide range of process conditions. The real time trending facility in the 2704 provides the user with a graphical view of how the process is performing.

Dedicated application blocks have been created to allow easy implementation in a variety of key markets including atmosphere and vacuum heat treating, climatic control chambers and packaged boilers.

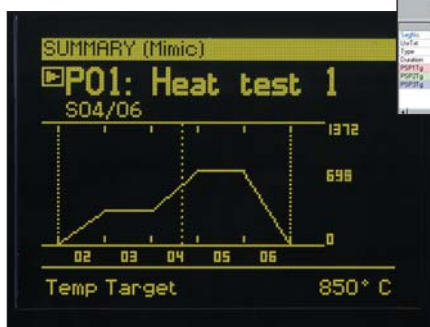


## SETPOINT PROGRAMMER

- 60 Stored programs
- 600 Segments Capacity
- 3 Profiled Setpoints/Program
- 16 Digital Event Outputs
- Synchronous or Asynchronous Timebase
- Digital Input Functions



The setpoint programmer features are unmatched in a product of this size, allowing control loop setpoints to follow predetermined series of ramp and dwell segments. Coupled with its excellent user interface, the 2704 is ideal for applications such as heat treatment furnaces and environmental chambers where more than one process value needs to be profiled. Programmes can be created using the operator interface or via a user friendly software tool.

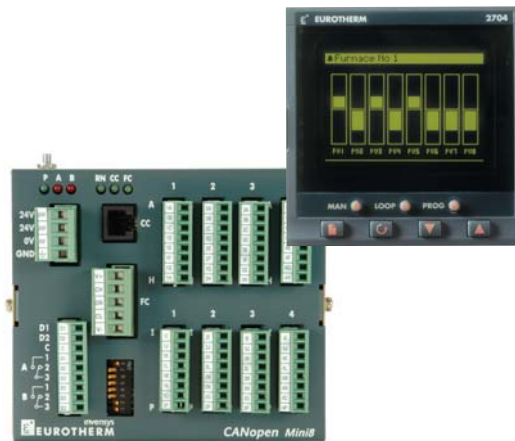


# Eurotherm 2604 - 2704

## Custom Solutions

The 2604 and 2704 provide a range of application blocks offering the ability to create custom solutions creating highly cost effective machine controllers, able to satisfy control applications which to date have not been possible in the 1/4 DIN format.

Flexible user pages in the 2704 provide the user with the option of defining how the process is viewed, therefore simplifying plant operation.



### COMMUNICATIONS

- Modbus RTU
- Profibus DP
- Devicenet®
- Ethernet/Modbus TCP
- El-Bisync
- Master Modbus

Two communication ports are available. The modular build provides the user with a selection of slave communication protocols allowing easy integration into both PLC and PC supervisory systems.

Master Modbus communications significantly increases the applications open to the 2604 and 2704 by increasing its I/O flexibility. In particular, integration with Eurotherm's Mini8™ controller allows systems of greater complexity to be controlled.



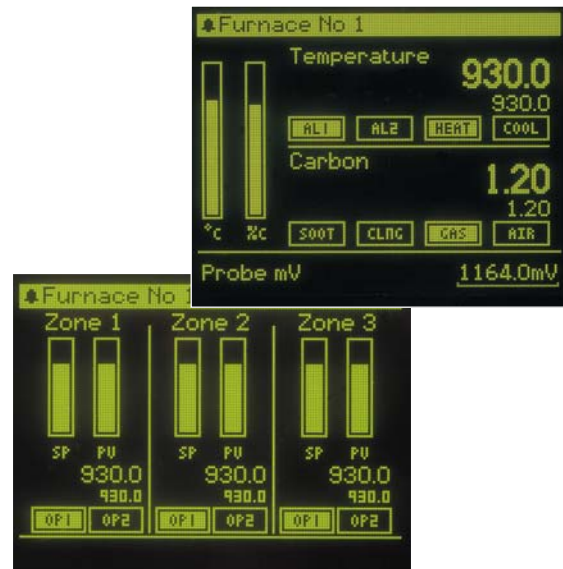
**Transducer Scaling**

**Realtime Clock**

**Timer Functions**

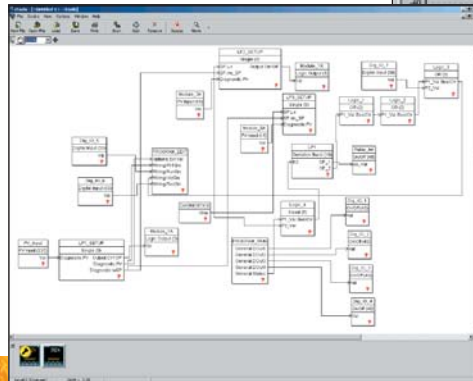
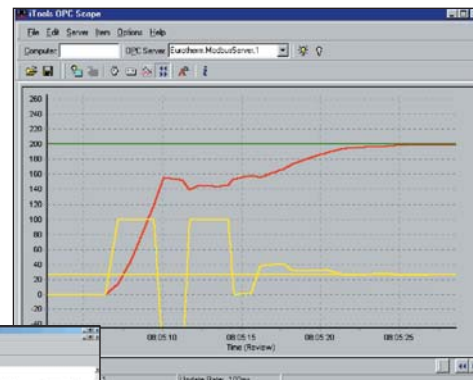
**Combinational Logic**

**Mathematical Calculations**



## CONFIGURATION TOOLS

- Configuration
- Cloning
- Data Logging
- Process Monitoring
- OPC Connectivity



iTools is a complete configuration and monitoring package for the series 2000 controllers. It allows users to create configurations in a friendly, easy to use environment. In addition, a Setpoint programmer editor and real time trend plots of process values are provided.

iTools employs an OPC server which uses Modbus to communicate with the controllers. The server connects to the controllers via serial communications, Ethernet or a telephone modem. The OPC server may also be used by third party "client" software such as Wonderware and Labview.

# Technical specifications Quoted at 0 to 50°C unless otherwise stated

## CONTROL OPTIONS

No. of loops	1, 2 or 3 loops
Options	Cascade, Ratio or Override
Modes	PID, ON/OFF or Valve Position
Applications	Carbon Potential, Humidity, Vacuum and Boiler TDS

## STANDARD I/O

Precision PV Input Accuracy	±0.1%
Ranges	mV, mA, volts or RTD (PT100)
Thermocouple types	J,K,L,N,R,S,B,Pt,C, plus others
Cold junction	Ext 0°C, 45°C or 50°C

## Analogue input

Accuracy	±0.1%
Ranges	-10V to 10V or 0 to 20mA

## Digital I/O

Types	2 digital inputs 7 Bi-directional input/outputs 1 Changeover relay
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## MODULES - 5 PER INSTRUMENT

### Digital Outputs

Types	Single relay, Dual Relay, Single Triac, Dual Triac, Single Logic and Triple Logic module
Allocation	Slot 1, 3, 4, 5 or 6 (Max 3 Triacs per unit)

### Digital inputs

Types	Triple contact input, Triple logic input
Allocation	Slot 1, 3, 4, 5 or 6

### Analogue Outputs

Types	DC Control or DC Retransmission (5 Max)
Allocation	Slot 1, 3, 4, 5 or 6
Range	0 to 20mA or 0 to 10V dc

### Dual Analogue Outputs

Allocation	Slot 1, 4 or 5
Range	4-20mA or 24V dc transmitter PSU

## High Resolution Analogue output

Allocation	Slot 1, 4 or 5
Range	4-20mA and 24Vdc transmitter PSU

## Transmitter PSU

Allocation	Slot 1, 3, 4, 5 or 6
Transmitter	24Vdc @ 20mA

## Transducer Supply

Bridge voltage	5 or 10Vdc
Bridge resistance	300Ω to 15Kohms

## Potentiometer input

Potent. resistance	330Ω to 150Kohms
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## Precision PV input (Module)

Allocation	Slot 3 or 6
Accuracy	±0.1%
Ranges	mV, mA, volts or RTD (PT100)
Thermocouple types	J, K, T, L, N, R, S, B, Pt, C, plus others
Cold junction	Ext 0°C, 45°C or 50°C

## 4-Wire RTD (Module)

Allocation	Slot 3 or 6
Accuracy	0.01%
Range	PT100

## Total Dissolved Solids (TDS) input

Excitation:	0.4Vpp @ 1KHz
Conductivity Range:	0 - 500mS

## Dual Analogue input

Allocation	Slot 3 or 6
Accuracy	±0.1%
Ranges	mV, mA, volts or RTD (PT100)
Thermocouple types	J, K, T, L, N, R, S, B, Pt, C, plus others
Cold junction	Ext 0°C, 45°C or 50°C

## Analogue input (module)

Allocation	Slot 1, 3, 4 or 6
Accuracy	±0.2%
Ranges	mV, mA, volts or RTD (PT100)
Thermocouple types	J, K, T, L, N, R, S, B, Pt, C, plus others
Cold junction	Ext 0°C, 45°C, or 50°C

## SETPOINT PROGRAMMER

No profiles	1, 2 or 3 profiles
No. of programs	60 programs max.
No. of segments	600 time to target segments (Max) or 450 ramp rate segments (max.)
Event outputs	Up to 16

## I/O EXPANDER

10 I/O Version	4 Changeover and 6 normally open relay contacts
	10 Logic inputs
20 I/O Version	4 Changeover and 16 normally open contacts
	20 Logic inputs

## ADVANCED FUNCTIONS

Application blocks	32 digital operations 32 analogue operations 50 user values
Timers	4 ON pulse, OFF delay, one shot and min-ON
Totalisers	4, trigger level and reset input
Pattern generators	16 patterns each with 16 bits
Real time clock	Day of week and time
Customisable screens	8 user screens
User switches	8, toggle and momentary

## SLAVE COMMUNICATIONS

Allocation	Slot H or J
Types	Modbus RS485 (2-wire) RS485 (4 wire) or RS232 EI-Bisyc (subset of parameters) Profibus (Slot H only) DeviceNet® (Slot H only) Ethernet Modbus/TCP (Slot H only)

## MASTER COMMUNICATIONS

Allocation	Slot J
Types	Modbus RS485 (2 wire), RS485 (4 wire) or RS232
Parameters	100 read/write

# Eurotherm: International sales and service

Understanding and providing local support is a key part of Eurotherm's business. Complementing worldwide Eurotherm offices are a whole range of partners and a comprehensive technical support team... to ensure you get a service you will want to go back to.

**AUSTRALIA** Sydney  
Eurotherm Pty. Ltd.  
T (+61 2) 9838 0099  
F (+61 2) 9838 9288  
E [info.au@eurotherm.com](mailto:info.au@eurotherm.com)

**AUSTRIA** Vienna  
Eurotherm GmbH  
T (+43 1) 7987601  
F (+43 1) 7987605  
E [info.at@eurotherm.com](mailto:info.at@eurotherm.com)

**BELGIUM & LUXEMBOURG** Moha  
Eurotherm S.A./N.V.  
T (+32) 85 274080  
F (+32) 85 274081  
E [info.be@eurotherm.com](mailto:info.be@eurotherm.com)

**BRAZIL** Campinas-SP  
Eurotherm Ltda.  
T (+5519) 3707 5333  
F (+5519) 3707 5345  
E [info.br@eurotherm.com](mailto:info.br@eurotherm.com)

**DENMARK** Copenhagen  
Eurotherm Danmark AS  
T (+45 70) 234670  
F (+45 70) 234660  
E [info.dk@eurotherm.com](mailto:info.dk@eurotherm.com)

**FINLAND** Abo  
Eurotherm Finland  
T (+358) 22506030  
F (+358) 22503201  
E [info.fi@eurotherm.com](mailto:info.fi@eurotherm.com)

**FRANCE** Lyon  
Eurotherm Automation SA  
T (+33 478) 664500  
F (+33 478) 352490  
E [info.fr@eurotherm.com](mailto:info.fr@eurotherm.com)

**GERMANY** Limburg  
Eurotherm Deutschland GmbH  
T (+49 6431) 2980  
F (+49 6431) 298119  
E [info.de@eurotherm.com](mailto:info.de@eurotherm.com)

**HONG KONG & CHINA**  
Eurotherm Limited North Point  
T (+85 2) 28733826  
F (+85 2) 28700148  
E [info.hk@eurotherm.com](mailto:info.hk@eurotherm.com)

Guangzhou Office  
T (+86 20) 8755 5099  
F (+86 20) 8755 5831  
E [info.cn@eurotherm.com](mailto:info.cn@eurotherm.com)

Beijing Office  
T (+86 10) 6567 8506  
F (+86 10) 6567 8509  
E [info.cn@eurotherm.com](mailto:info.cn@eurotherm.com)

Shanghai Office  
T (+86 21) 6145 1188  
F (+86 21) 6145 1187  
E [info.cn@eurotherm.com](mailto:info.cn@eurotherm.com)

**INDIA** Chennai  
Eurotherm India Limited  
T (+91 44) 24961129  
F (+91 44) 24961831  
E [info.in@eurotherm.com](mailto:info.in@eurotherm.com)

**IRELAND** Dublin  
Eurotherm Ireland Limited  
T (+353 1) 4691800  
F (+353 1) 4691300  
E [info.ie@eurotherm.com](mailto:info.ie@eurotherm.com)

**ITALY** Como  
Eurotherm S.r.l.  
T (+39 31) 975111  
F (+39 31) 977512  
E [info.it@eurotherm.com](mailto:info.it@eurotherm.com)

**KOREA** Seoul  
Eurotherm Korea Limited  
T (+82 31) 2738507  
F (+82 31) 2738508  
E [info.kr@eurotherm.com](mailto:info.kr@eurotherm.com)

**NETHERLANDS** Alphen a/d Rijn  
Eurotherm B.V.  
T (+31 172) 411752  
F (+31 172) 417260  
E [info.nl@eurotherm.com](mailto:info.nl@eurotherm.com)

**NORWAY** Oslo  
Eurotherm A/S  
T (+47 67) 592170  
F (+47 67) 118301  
E [info.no@eurotherm.com](mailto:info.no@eurotherm.com)

**POLAND** Katowice  
Invensys Eurotherm Sp z o.o.  
T (+48 32) 2185100  
F (+48 32) 2177171  
E [info.pl@eurotherm.com](mailto:info.pl@eurotherm.com)

**SPAIN** Madrid  
Eurotherm España SA  
T (+34 91) 6616001  
F (+34 91) 6619093  
E [info.es@eurotherm.com](mailto:info.es@eurotherm.com)

**SWEDEN** Malmo  
Eurotherm AB  
T (+46 40) 384500  
F (+46 40) 384545  
E [info.se@eurotherm.com](mailto:info.se@eurotherm.com)

**SWITZERLAND** Wollerau  
Eurotherm Produkte (Schweiz) AG  
T (+41 44) 7871040  
F (+41 44) 7871044  
E [info.ch@eurotherm.com](mailto:info.ch@eurotherm.com)

**UNITED KINGDOM** Worthing  
Eurotherm Limited  
T (+44 1903) 268500  
F (+44 1903) 265982  
E [info.uk@eurotherm.com](mailto:info.uk@eurotherm.com)  
[www.eurotherm.co.uk](http://www.eurotherm.co.uk)

**U.S.A.** Leesburg VA  
Eurotherm Inc.  
T (+1 703) 443 0000  
F (+1 703) 669 1300  
E [info.us@eurotherm.com](mailto:info.us@eurotherm.com)  
[www.eurotherm.com](http://www.eurotherm.com)

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