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Eurotherm® flexible solutions



2604 and 2704 controllers

With Unique Levels of Control and Flexibility

eurotherm.co.uk/2704

Life Is On

Eurotherm
by Schneider Electric

Unique levels of flexibility

Uncompromising design and a willingness to listen to their customers has allowed Eurotherm to tailor the 2604 and 2704 multi-loop controllers to provide a highly adapted solution to meet the needs of many different applications.

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 controllers 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

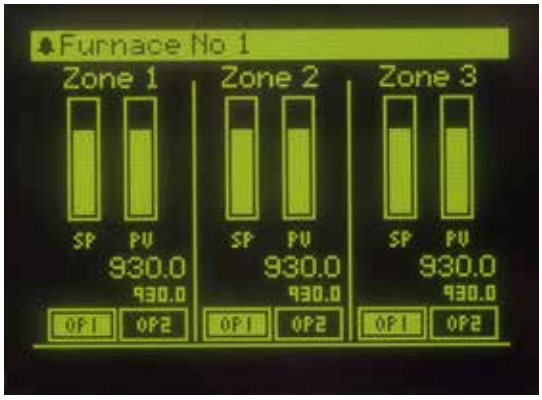
Multi-loop controller

Maths and logic functions

Precision measurements

Expandable I/O option

Open communications



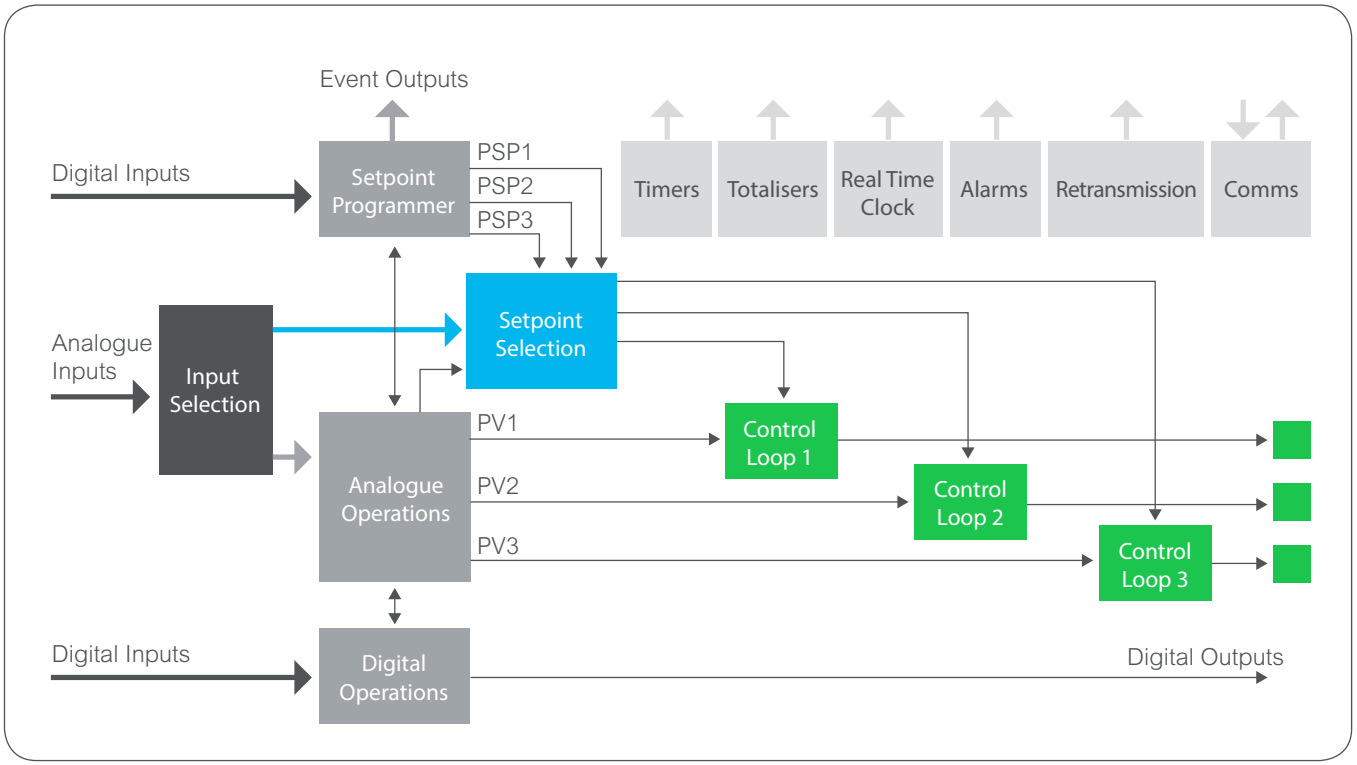


Features	2704	2604
Control	3 Loops, Cascade, Override, Ratio	3 Loops, Cascade, Override, Ratio
SP Programs	60 Synchronous, 20 Asynchronous	50 Synchronous
Maths + Logic	32 Analogue, 32 Logic, 50 User Values	24 Analogue, 32 Logic, 12 User Values
Timer Functions	4 Timers, 4 Totalisers, Real Time Clock	4 Timers, 4 Totalisers, Real Time Clock
Communications	Modbus RTU, Profibus DP, DeviceNet®, Ethernet/Modbus TCP	Modbus RTU, Profibus DP, DeviceNet®
IO Expander	20 Digital Inputs, 20 Digital Outputs	20 Digital Inputs, 20 Digital Outputs
Master Modbus	100 Parameters, Broadcast Mode	25 Parameters, Broadcast Mode
Melt Pressure	Available	Available
Humidity	Available	Available
Carbon Potential	Available	Available
Vacuum	Available	Not Available
Boiler TDS	Available	Not Available



Controlled variables

- Temperature
- Pressure
- Flow
- Level
- Relative humidity
- Dewpoint
- Carbon potential
- Oxygen concentration
- Total dissolved solids
- Melt pressure
- pH



Optimised control performance

The 2604 and 2704 controllers are highly versatile products capable of operating a number of control strategies.

Eurotherm's control algorithm is based on more than 50 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 0.25µV 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.

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 controller 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.

Measurement resolution <0.25µV

3 control loops

Cascade, ratio, and override control options

Modular I/O options

Specific application blocks

Multiple PID sets

PV/SP trending

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 controller 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.



Setpoint programmer

- 60 stored programs
- 600 segments capacity
- 3 profiled setpoints/program
- 16 digital event outputs
- Synchronous or asynchronous timebase
- Digital input functions

Custom solutions

The 2604 and 2704 controllers 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.

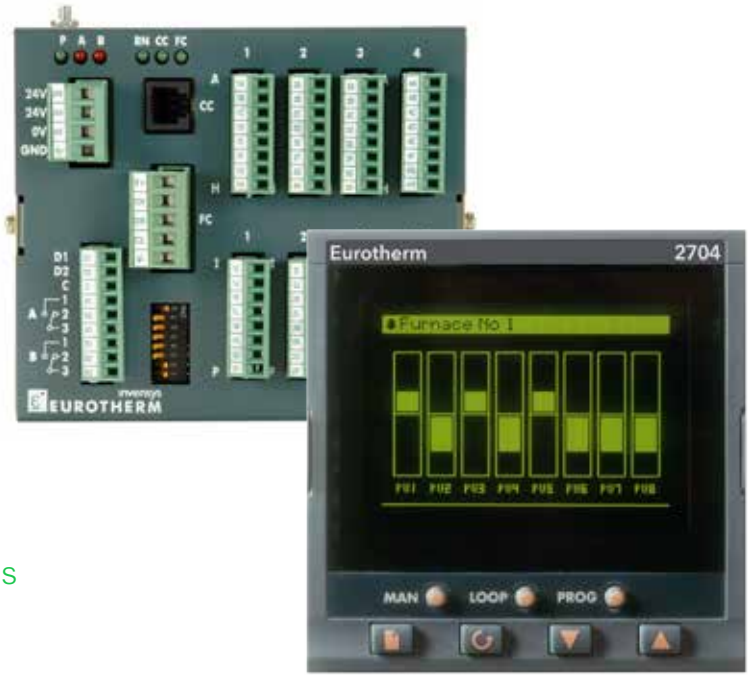
Flexible user pages in the 2704 controller provide the user with the option of defining how the process is viewed, therefore simplifying plant operation.

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 controllers by increasing its I/O flexibility. In particular, integration with the Eurotherm Mini8™ controller allows systems of greater complexity to be controlled.

Communications

- Modbus RTU
- Profibus DP
- DeviceNet®
- Ethernet/Modbus TCP
- EI-Bisync
- Master Modbus



Transducer scaling

Real Time clock

Timer functions

Combinational logic

Mathematical calculations

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.

Configuration tools

- Configuration
- Cloning
- Data logging
- Process monitoring
- OPC connectivity

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, PII, 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

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	Potentiometer resistance	330Ω to 150Kohms
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, PII, 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, PII, 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, PII, C, plus others
	Cold junction	Ext 0°C, 45°C, or 50°C

SETPOINT PROGRAMMER	
No. of 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

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Discover More About Eurotherm Controllers

eurotherm.co.uk/2704

Eurotherm Limited
Faraday Close, Durrington, Worthing,
West Sussex BN13 3PL, United Kingdom
Phone: +44 (0) 1903 268500
eurotherm.co.uk

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