

# 6100E

MODEL


invenys  
Eurotherm



## Paperless Graphic Recorders Specification Sheet

- 5.5" Colour TFT touchscreen display
- USB 'plug & play'
- 8MB non-volatile flash memory
- 125ms parallel sampling/ 1s update
- Compact Flash
- Ethernet TCP/IP
- Web server
- Multi-language support (French, Dutch, German, Italian, Japanese, Korean, Portuguese, Russian and Simplified Chinese)

The 6100E offers unrivalled input accuracy with a 125ms total sample rate for up to 6 input channels. Input channels are freely configurable to suit your process requirements. Each instrument has an intuitive, touch screen display to enable operators to clearly view process data in varying formats, 8MB of onboard Flash data storage capability, Ethernet communication and a Compact Flash drive. Data is stored in a tamper-resistant binary format that can be used for secure, long term records of your process. The 6100E is truly designed for today's networked world and can be accessed via a Local Area Network, dial-up connection, Intranet or Internet.

Available features	 6100E
Display	5.5" 1/4 VGA
Channels	3 standard, 6 optional
Groups	1
Removable media	CF, USB
Communications	Modbus TCP (slave), Ethernet FTP (server & client)
Timers	6
Alarms	4 per channel
Events	3
Custom messages	3
CSV files	Standard
Operator notes	Standard
Bezel	Black
Standard views	Vertical and horizontal trends, vertical and horizontal bar graphs, numeric values
Relays	3 CO optional
Virtual channels	12 optional
Onboard, non-volatile Flash memory	8MB
Environmental protection	IP66
Approvals	CE, CUL
Display update	1s max.
Trend update	1s max.
Web server	Standard
Ethernet (10/100baseT)	Standard
USB Port	1
DHCP	Standard

\* Virtual channels can be configured as maths, totalisers, counters or comms

imagine absolute data records forever

## Data logging and archiving

The 6100E Series recorder has internal Flash memory for secure data storage. It is also able to accept various removable media types (Compact Flash or USB memory stick). Data stored within the internal memory can be archived to the removable media on demand or at preset intervals. The 6100E will give indication of how long its internal memory and that of the removable media installed will last according to the configuration of the recorder.

Ethernet capability is standard on all 6000 Series. The 6100E can be configured to archive to the removable media and/or over Ethernet. Archiving files over Ethernet effectively gives a secure, infinite archiving capacity.

Approximate duration for continuous recording of one group of six channels, high compression:

Archive media	Sample rate				
	1s	5s	10s	30s	60s
8Mb Internal Flash (approx. 1 million samples)	5.65 days	28.25 days	56.5 days	1.68 yrs	3.40 yrs
64Mb CF Card or USB memory stick (approx. 8 million samples)	45.3 days	226 days	1.2 yrs	3.7 yrs	7.4 yrs
256Mb CF Card or USB memory stick (approx. 32 million samples)	181 days	2.4 yrs	4.9 yrs	14.8 yrs	20 yrs
1Gb CF Card or USB memory stick (approx. 125 million samples)	1.9 yrs	9.6 yrs	19 yrs	58 yrs	116 yrs
Ethernet (FTP Server)		Infinite			

## Time synchronisation (SNTP)

The 6000 Series support Simple Network Time Protocol which, when enabled, updates the instrument time every 15 minutes from the configured SNTP server. The unit can also act as a Unicast SNTP server on the network, allowing client instruments to synchronise with the 6100E to a resolution of one millisecond.

## Virtual channels

The 6100E virtual channel option provides 12 channels to which can be assigned any of the following math functions: add, subtract, multiply, divide, constant, group, max, channel min, channel max, channel average and rolling average.

Additionally, any virtual channel can be assigned as a totaliser or counter.

The 12 virtual channels can be made up from a mixed combination of math functions, totalisers and counters.

## Language support

The 6100E supports, as standard, the following languages: English, Spanish, German, French, Italian, Portugese, Japanese and Dutch.

## Specification

### Recorder

#### Environmental performance

Temperature limits	Operation: 0 to +50°C Storage: -20 to 60°C
Humidity limits	Operation: 5% to 80% RH Storage: 5% to 90% RH

#### Protection

Bezel and display:	IP66
Sleeve:	IP20
Shock:	BS EN61010
Vibration (10 to 150Hz):	BSEN60873, Section 9,18
Altitude:	<2000 metres

#### Approvals

Electromagnetic compatibility	CE, cUL (EMC)
UL file number:	e57766
Emissions and immunity:	BS EN61326

#### Electrical safety

(BS EN61010): Installation cat. II; Pollution degree 2

#### INSTALLATION CATEGORY II

The rate 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:	DIN43700
Panel mounting angle:	±45°
Bezel size:	144 x 144mm
Panel cutout dimensions:	138 x 138mm (both -0/+1mm)
Depth behind bezel rear face:	246.5mm (284 LTC)
Weight:	3kg max. (5kg if fitted in portable case)

#### Operator interface

Type:	Colour TFT LCD with cold cathode backlight, fitted with resistive, analogue, Touch-Panel
Size and resolution:	1/4VGA (320 x 240 pixels) 5.5"

#### Power requirements

Supply voltage	Standard: 100 to 230V ac ±15%; 47 to 63Hz or 110 to 370V dc
Power (Max):	60VA (Inrush current 36A)
Fuse type:	None
Interrupt protection	Standard: Holdup >200msec, at 240V ac, with full load

#### Back-up battery

Type:	Poly-carbonmonofluoride/lithium (BR2330) Part No. PA261095
Support time (RTC):	1 year min. with recorder unpowered
Replacement period:	3 years
Stored data:	Time; date; values for totalisers, counters and timers; batch data; F value, Rolling average, Stopwatch etc.

#### Ethernet communications

Type:	10/100baseT Ethernet (IEEE802.3)
Protocols:	TCP/IP, FTP, DHCP, BOOTP, SNTP, Modbus, ICMIP
Cable	Type: CAT5
	Maximum length: 100 metres
	Termination: RJ45

### Input board

#### General

Input types:	dc Volts, dc millivolts, dc milliamps (with shunt), Thermocouple, 2/3-wire RTD Contact closure (not Channel 1) >60 ms Freely configurable.
Input type mix:	6 per board
Max. number of inputs:	>16 bits, 2nd order delta sigma
A/D conversion method:	See Table1 and Table 2
Input ranges:	Edge connector / terminal block
Termination:	Common mode: >140dB (channel to channel and channel to ground). Series mode: >60dB
Noise rejection (48 to 62Hz):	250 Volts continuous Max common mode voltage: 45mV at lowest range; Max series mode voltage: 23.74 Volts peak at highest range

### Isolation

Channel to channel: 300V RMS or dc (double insulation)  
 Channel to common electronics: 300V RMS or dc (double insulation)  
 Channel to ground: 300V RMS or dc (basic insulation)

### Dielectric strength

(BS EN61010)  
 Channel to channel: 2500V ac  
 Channel to ground: 1500V ac

### Insulation resistance:

>10MΩ at 500V dc  
 Input impedance: 38mV, 150mV, 1 V ranges: >10MΩ;  
 20V range: 65.3kΩ

### Over voltage protection:

50 Volts peak (150V with attenuator)

### Open circuit detection:

± 57nA max.

### Recognition time:

500msec

### Minimum break resistance:

10MΩ

### Update/archive rates

#### Input/Relay-output

sample rate: 8Hz  
 Trend update: 1Hz maximum  
 Archive sample-value: Latest value at archive time  
 Display value: Latest value at display update time (8Hz)

### DC Input ranges

Shunt: Externally mounted resistor modules  
 Additional error due to shunt: 0.1% of input  
 Additional error due to attenuator: 0.2% of input  
 Performance: See Table 1

Low Range	High Range	Resolution	Typical error (instrument at 20°C) Range	Maximum error (instrument at 20°C) Range	Worst case temp Performance Input per °C
-38mV	38mV	1.4μV	0.013% I/P + 0.031%	0.030% I/P + 0.052%	25ppm
-150mV	150mV	5.5μV	0.013% I/P + 0.028%	0.029% I/P + 0.039%	25ppm
-1V	1V	37μV	0.013% I/P + 0.024%	0.029% I/P + 0.029%	25ppm
-20V	20V	720μV	0.075% I/P + 0.027%	0.393% I/P + 0.033%	388ppm

Table 1 Voltage ranges - accuracy and resolution

Low Range	High Range	Resolution	Typical error (instrument at 20°C) Range	Maximum error (instrument at 20°C) Range	Worst case temp Performance Input per °C
0Ω	150Ω	5mΩ	0.027% I/P + 0.034%	0.037% I/P + 0.077%	30ppm
0Ω	600Ω	22mΩ	0.027% I/P + 0.035%	0.037% I/P + 0.057%	30ppm
0Ω	5KΩ	148mΩ	0.030% I/P + 0.034%	0.040% I/P + 0.041%	30ppm

Table 2 Resistance ranges - accuracy and resolution

### Thermocouple data

Temperature scale: ITS 90  
 Bias current: 0.05nA  
 Cold junction types: Off, internal, external, remote  
 CJ error: 1°C max with inst. at 25°C  
 CJ rejection ratio: 50:1 minimum  
 Upscale/downscale drive: High, low or none selectable for each thermocouple channel  
 Additional error: 0.01°C (typ.) if high or low selected  
 Types and ranges: See Table 3

T/C Type	Overall range (°C)	Standard	Max linearisation error
B	0 to +1820	IEC 584.1	0 to 400°C = 1.7°C 400 to 1820°C = 0.03°C
C	0 to +2300	Hoskins	0.12°C
D	0 to +2495	Hoskins	0.08°C
E	-270 to +1000	IEC 584.1	0.03°C
G2	0 to +2315	Hoskins	0.07°C
J	-210 to +1200	IEC 584.1	0.02°C
K	-270 to +1372	IEC 584.1	0.04°C
L	-200 to +900	DIN43710:1985 (To IPTS68)	0.02°C
N	-270 to +1300	IEC 584.1	0.04°C
R	-50 to +1768	IEC 584.1	0.04°C
S	-50 to +1768	IEC 584.1	0.04°C
T	-270 to +400	IEC 584.1	0.02°C
U	-200 to +600	DIN43710:1985	0.08°C
NiMo/NiCo	-50 to +1410	ASTM E1751-95	0.06°C
Ni/NiMo	0 to +1406	Ipsen	0.14°C
Platinel	0 to +1370	Engelhard	0.02°C
Pt20%Rh/ Pt40%Rh	0 to +1888	ASTM E1751-95	0.07°C

Table 3 Thermocouple types and ranges

### Resistance inputs

Ranges (including lead resistance): 0 to 150Ω, 0 to 600Ω, 0 to 6kΩ  
 Influence of lead resistance Error: Negligible  
 Mismatch: 1Ω/Ω  
 Temperature scale: ITS90  
 Accuracy and resolution: See Table 2  
 RTD types and ranges: See Table 4

RTD Type	Overall range (°C)	Standard	Max linearisation error
Cu10	-20 to +400	General Electric Co.	0.02 °C
Cu53	-70 to ± 200	RC21-4-1966	<0.01°C
JPT100	-220 to +630	JIS C1604:1989	0.01 °C
Ni100	-60 to +250	DIN43760:1987	0.01 °C
Ni120	-50 to +170	DIN43760:1987	0.01 °C
Pt100	-200 to +850	IEC 751	0.01 °C
Pt100A	-200 to +600	Eurotherm Recorders SA	0.09 °C
Pt1000	-200 to +850	IEC 751	0.01 °C

Table 4 RTD types and ranges

### Transmitter PSU

Number of outputs: Three, isolated  
 Output voltage: 25V nominal  
 Maximum current: 20mA per output  
 Isolation (dc to 65Hz BS61010): Installation category II;  
 Pollution degree 2  
 Channel to channel: 100V RMS or DC (double insulation)  
 Channel to ground: 100V RMS or dc (basic insulation)  
 Fuse (20mm Type T)  
 Supply voltage = 110/120V ac: 100mA

### Relay output board

#### General

Maximum number of relay boards: 1  
 Number of relays per board: 3 per C/O  
 Estimated mechanical life: 30,000,000 operations  
 Update rate: See 'Update rates' in 'Recorder Specification' above

#### AC load ratings

##### Derating

The figures give below are for resistive loads. for reactive or inductive loads, de-rate in accordance with Graph 1, in which:

- F1 = Actually measured results on representative samples
- F2 = Typical values according to experience
- Contact life = Resistive contact life x reduction factor

Maximum switching power: 500VA  
 Maximum contact voltage: 250V providing this does not cause the maximum switching power (above) to be exceeded

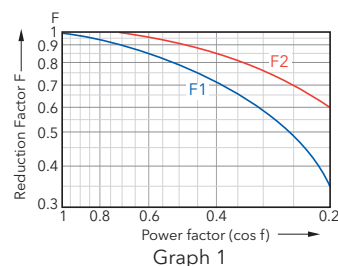
Maximum contact current: 2 Amps providing this does not cause the maximum switching power (above) to be exceeded

#### DC load ratings

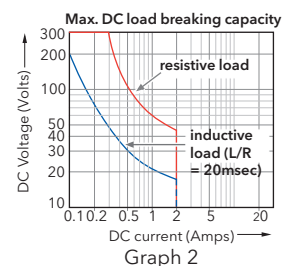
Maximum switching power: See Graph 2 for operating volt/amp envelope  
 Maximum contact voltage/ current: See Graph 2 for examples

#### Safety isolation

Isolation (dc to 65Hz; BS EN61010): Installation category II;  
 Pollution degree 2  
 Relay to relay: 300V RMS or dc (double insulation)  
 Relay to ground: 300V RMS or dc (basic insulation)

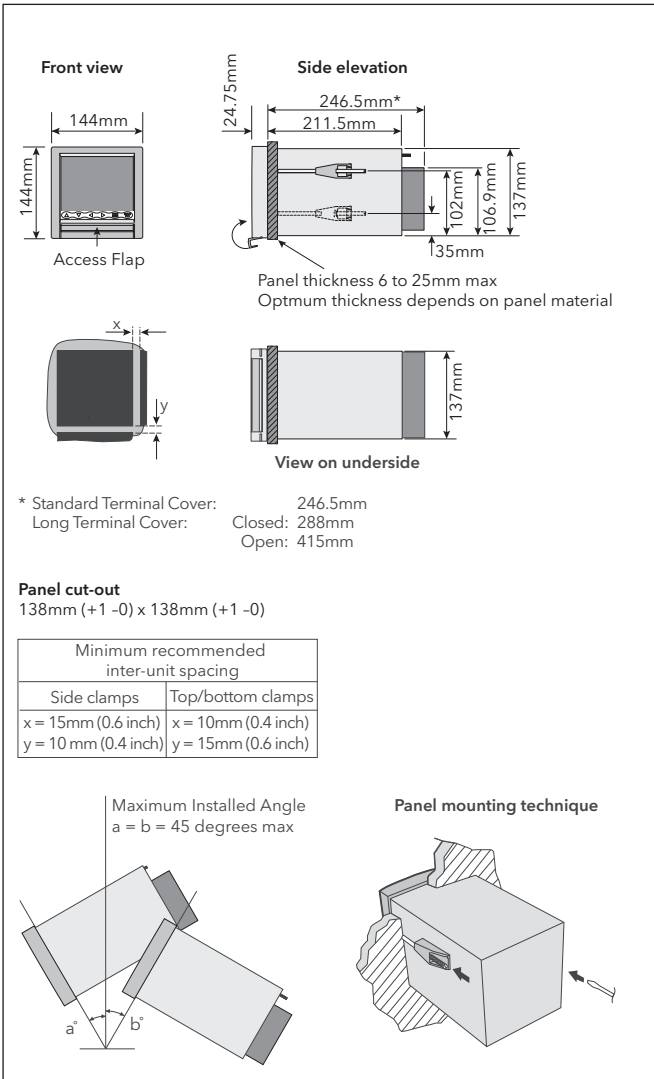


Graph 1

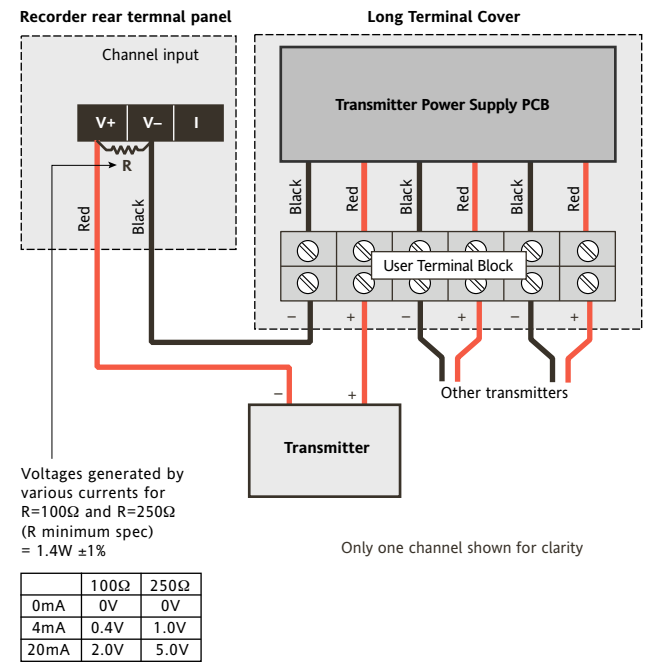


Graph 2

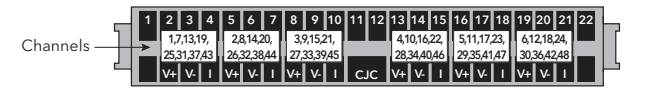
## Mechanical details



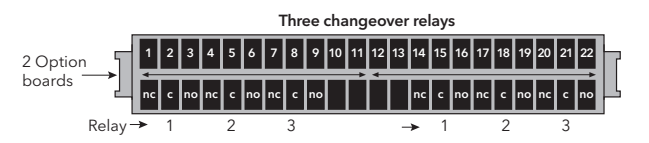
## Isolated transmitter power supply wiring



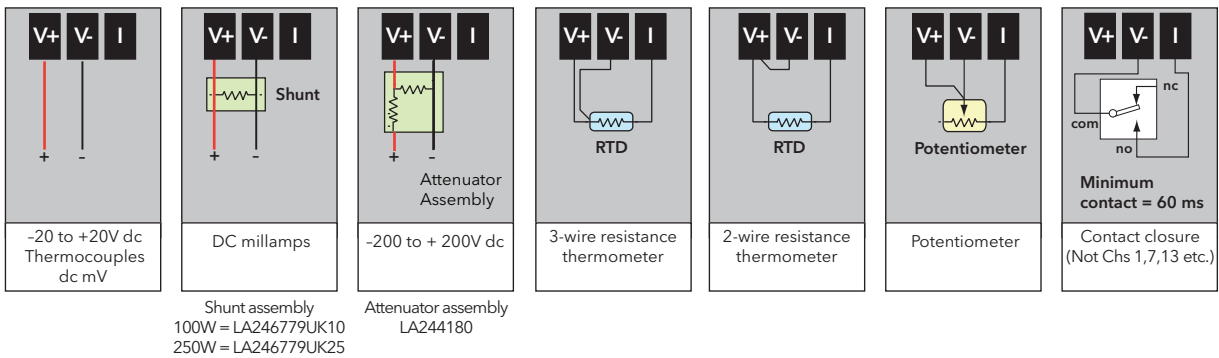
## Input board wiring



## Relay board wiring



## Input board signal wiring



## Order codes

6100E	1	2	3	4	5	6	7	8	9	10	11	12
-------	---	---	---	---	---	---	---	---	---	----	----	----

### Basic Product

6100E	Data Acquisition Unit
-------	-----------------------

### 1 Number of Channels

U03	3 Input channels
U06	6 Input channels

### 2 Power Supply

VH	90-264V ac 110-370V dc 45-65Hz
----	--------------------------------

### 3 24V Isolated Transmitter Power Supply

N0ITPS	None
115TPS	110-120V 3 channel TPS
230TPS	220-240V 3 channel TPS

### 4 Memory Card Size

NOMC	None
512M	512 Mbyte card (CF)
001G	1 Gbyte card (CF)
002G	2 Gbyte card (CF)
004G	4 Gbyte card (CF)
008G	8 Gbyte card (CF)

### 5 USB Memory Stick Size

NOMS	None
001GMS	1 Gbyte USB memory stick
002G	2 Gbyte USB memory stick
004G	4 Gbyte USB memory stick
008G	8 Gbyte USB memory stick

### 6 Calibration Certificates

NOCAL	None
STCAL	Standard calibration certificate (all channels at 0-1V dc)
CMCAL	Custom calibration of each ch as specified on purchase order

### 7 Changeover Relays

00	None
03	3 (1 Option brd)

### 8 Quantity of Shunts

00	Qty of shunts
----	---------------

### 9 Shunt Value

NOS	No shunts
100	100 ohm shunts
250	250 ohm shunts

### 10 Quantity of 100:1 Attenuators

00	Qty of attenuators
----	--------------------

### 11 Warranty

XXXXX	Standard
1WL005	5 year

### 12 Maths, Totalisers & Counters

MTC00	None
MTC12	12 virtual channels

### 13 Custom Label

XXXXX	None
-------	------

### 14 Special

XXXXX	None
-------	------

### 15 Bridge

XXXXXX	None
BLITE	Lite
BFULL	Full

### Standard Accessories

Installation and safety data sheet  
 Panel mounting clamps  
 Panel seal  
 User manual - via internet download from [www.eurotherm.com/6100E](http://www.eurotherm.com/6100E)

### Optional Accessories

Via internet download from <http://my.eurotherm.co.uk>  
 6000 Tools including Review Lite (history viewing software and C-Edit (off line configuration software).  
 Review Full - all the functionality of Review Lite plus ability to run as a service spreadsheet mode and auto archive the database.

**AUSTRALIA** Melbourne  
**T** (+61 0) 8562 9800  
**E** [info.eurotherm.au@invensys.com](mailto:info.eurotherm.au@invensys.com)

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

**BELGIUM & LUXEMBOURG** Moha  
**T** (+32) 85 274080  
**E** [info.eurotherm.be@invensys.com](mailto:info.eurotherm.be@invensys.com)

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

**CHINA**  
**T** (+86 21) 61451188  
**E** [info.eurotherm.cn@invensys.com](mailto:info.eurotherm.cn@invensys.com)

Beijing Office  
**T** (+86 10) 5909 5700  
**E** [info.eurotherm.cn@invensys.com](mailto:info.eurotherm.cn@invensys.com)

**FRANCE** Lyon  
**T** (+33 478) 664500  
**E** [info.eurotherm.fr@invensys.com](mailto:info.eurotherm.fr@invensys.com)

**GERMANY** Limburg  
**T** (+49 6431) 2980  
**E** [info.eurotherm.de@invensys.com](mailto:info.eurotherm.de@invensys.com)

**INDIA** Mumbai  
**T** (+91 22) 67579800  
**E** [info.eurotherm.in@invensys.com](mailto:info.eurotherm.in@invensys.com)

**IRELAND** Dublin  
**T** (+353 1) 4691800  
**E** [info.eurotherm.ie@invensys.com](mailto:info.eurotherm.ie@invensys.com)

**ITALY** Como  
**T** (+39 031) 975111  
**E** [info.eurotherm.it@invensys.com](mailto:info.eurotherm.it@invensys.com)

**KOREA** Seoul  
**T** (+82 2) 2090 0900  
**E** [info.eurotherm.kr@invensys.com](mailto:info.eurotherm.kr@invensys.com)

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

**POLAND** Katowice  
**T** (+48 32) 78395000  
**E** [info.eurotherm.pl@invensys.com](mailto:info.eurotherm.pl@invensys.com)

Warsaw  
**T** (+48 22) 8556010  
**E** [biuro@invensys-systems.pl](mailto:biuro@invensys-systems.pl)

**SPAIN** Madrid  
**T** (+34 91) 6616001  
**E** [info.eurotherm.es@invensys.com](mailto:info.eurotherm.es@invensys.com)

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

**SWITZERLAND** Wollerau  
**T** (+41 44) 7871040  
**E** [info.eurotherm.ch@invensys.com](mailto:info.eurotherm.ch@invensys.com)

**UAE Dubai**  
**T** (+971 4) 8074700  
**E** [marketing.mena@invensys.com](mailto:marketing.mena@invensys.com)

**UNITED KINGDOM** Worthing  
**T** (+44 1903) 268500  
**E** [info.eurotherm.uk@invensys.com](mailto:info.eurotherm.uk@invensys.com)

**U.S.A.** Ashburn VA  
**T** (+1 703) 724 7300  
**E** [info.eurotherm.us@invensys.com](mailto:info.eurotherm.us@invensys.com)

ED66

© Copyright Eurotherm Limited 2012

Invensys, Eurotherm, the Eurotherm logo, Chessell, EurothermSuite, Mini8, Eycan, Eyris, EPower nanodac, Foxboro and Wonderware are trademarks of Invensys plc, its subsidiaries and affiliates. All other brands may be trademarks of their respective owners.

All rights are strictly reserved. No part of this document may be reproduced, modified, or transmitted in any form by any means nor may it be stored in a retrieval system other than for the purpose to act as an aid in operating the equipment to which the document relates, without the prior written permission of Eurotherm Limited.

Eurotherm Limited pursues a policy of continuous development and product improvement. The specifications in this document may therefore be changed without notice. The information in this document is given in good faith, but is intended for guidance only.

Eurotherm Limited will accept no responsibility for any losses arising from errors in this document.

**i n v e n s y s**  
 Operations Management