invensys
Eurotherm

EPower™

Controller

PLM
Predictive Load Management

imagine making the impossible possible

EPower™ controller – extraordinary power control

Our formidable range of power products cover all types of load and voltage but **imagine** having the power to save energy. With many features like high performance alarm strategy and advanced diagnostic load fault detection, Eurotherm is the only choice for your power control applications. Add to this, a strong sales team comprised entirely of degree qualified engineers who understand your process, an absolute commitment to innovation, and 5% of our total sales continuously re-invested in research and development; we can and do **imagine** making the impossible possible for our customers.

The EPower controller is the latest product in the Eurotherm range of power controllers. It uses the newest technologies and innovations to manage your process and reduce your energy costs. On every level it brings you the flexibility you need to best meet your requirements now and in the future. Let us look after your power control for you with EPower controllers and give you the peace of mind that you have the best for your process – even as it changes.

Eurotherm has a significant R&D capability and a policy of continuous development, improvement and innovation. Investing in EPower controllers will keep options and new developments within your reach as you can upgrade to meet your changing requirements at any point.

- **Flexibility** – advanced technologies in harmony with modularity and ease of use to deliver your power control needs
- **Efficiency** – world class power control with innovative features to minimise your energy costs with exceptional process performance
- **Peace of mind** – a power controller that will bring you return on investment and can be adapted in the future if your requirements change - one product for all solutions

www.eurotherm.com/EPower

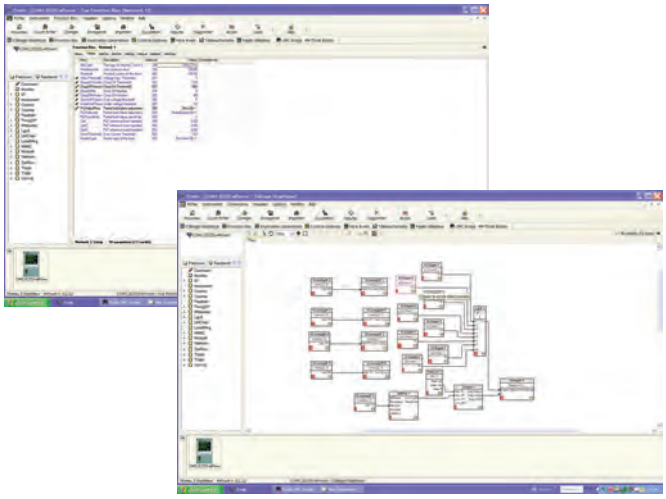
imagine having the power to save energy

invensys Eurotherm

EPower™ controller – total flexibility from precision power control

Easy configuration to save you engineering costs ...

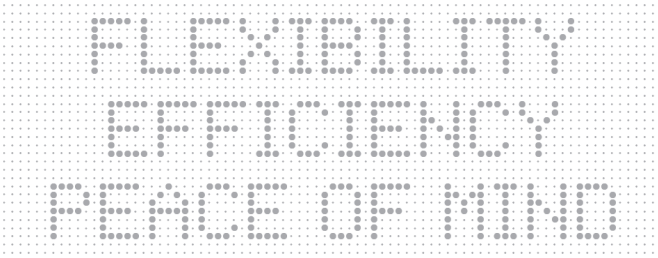
The EPower controller has been designed for easy configuration and modification. The front, integral display has a "QuickStart" facility that leads the user through initial set up in a series of simple steps. To further save engineering this QuickStart code can be specified with your order and the instrument shipped pre-configured.



More advanced configuration can be achieved utilising iTools PC configuration software – which provides the significant assistance of graphical wiring tools and downloadable function blocks to minimise engineering time and cost.

Once you have created your application you can easily save and clone your work – either as a back-up or to download to multiple instruments that need the same or similar configuration – keeping your work safe and save repeat engineering costs.

- "QuickStart" for easy commissioning
- Easy save and clone of configuration
- Advanced graphical wiring configuration tools
- Integral front panel operator interface
- Remote display option – can also be used as independent policeman



Efficiency through advanced technologies...

EPower controllers have measurement accuracy, functionality and innovation that will deliver you extraordinary power control to help your process, environment and budget.

- Measurement accuracy (better than 1%) to help save energy
- Load management for better distribution of energy and to minimise peak energy usage costs
- Reduce energy bills and other costs with a selection of advanced firing modes to best suit your load type:
  - Minimise electrical disturbance
  - Increase lifetime of heater elements

Revolutionary modularity and configurability to meet your needs...

- Easy ordering, configuration and maintenance through modular design
- If your requirements change EPower controller can be easily adapted to your needs
- Minimum spares holding – many options configurable through a common driver module e.g. firing mode, load phases, control etc.
- Up to four power modules provide single and multi-phase control
- Software configurable options to bring you flexibility:

You no longer need to be restricted to the options that you order – EPower controller provides you with configurable options and modular hardware to give you the flexibility to match your process now and in the future. Combine this with an instrument that provides easy configuration via the integral display and full graphical configuration via iTools PC configuration tool as standard – you have a power controller that makes life that bit easier.

Control Type	Firing Modes	Load Type	Load Configuration	Feedback
Single phase	Phase angle	Standard Resistive	Single phase	V^2
2 x single phase	Half cycle	Complex Resistive	Star	I^2
3 x single phase	Burst firing	Inductive e.g. Transformer	Delta	True power
4 x single phase	Fix modulation period	Short Wave Infrared	Star with neutral	RMS load voltage
Two phase	Logic mode		Open Delta	RMS load current
2 x two phase				Open loop
True three phase				

Success stories commercial benefits

Case Study

Typical saving case – power factor improvement with burst firing

- Significant reduction of fixed rate costs
- Reduction of reactive power by almost two thirds
- Reduced annual cost for same power consumption
- Return on investment within 18 months

BUSHING 100 ZONES	30 KW EACH	BUSHING USE	80%
COMPARATIVE ANALYSIS	SCR NORMAL TRANSFORMER	EPOWER LTC 2 TAPS	
Firing mode	Phase angle	Burst firing	
Power factor	0.71	0.92	
Consumption for one month / 720h	720 h	720 h	
Active energy	3,000 kW	3,000 kW	
Reactive energy	3,001 KVAR	1,264 KVAR	
Installed power	4,243 KVA	3,256 KVA	
Cost for one month			
Active power	73,781 €	73,781 €	
Reactive power	30,595 €	12,891 €	
TOTAL	104,376 €	186,672 €	
MONTHLY SAVING		17,704 €	
ANNUAL VARIABLE SAVING		212,450 €	
Installed power fixed rate	512,758 €	393,402 €	
ANNUAL TOTAL SAVING		331,806 €	
PRICE LIST Edf GREEN A5			
EPower/transformers investment + installation	500,000€	ROI	18 months

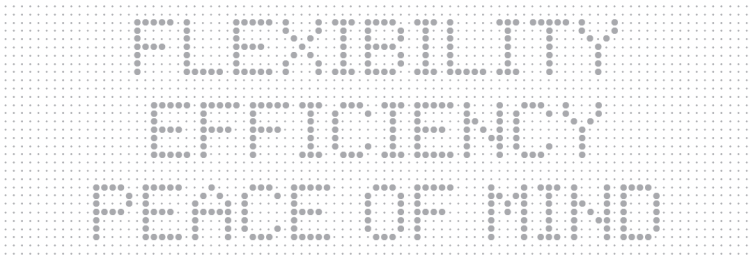
For the full stories and all our successes go to www.eurotherm.com/success

invensys
Eurotherm

The EPower controller – the best solution for your power control

With EPower controllers you are not only buying one of the best power controllers in the world, you are supported by a global network of application and control specialists from Eurotherm. While we are a truly global company, we have not forgotten that you still need local support and understanding. Our team will bring you technical expertise along with in depth experience and understanding in numerous application areas – from glass furnaces, to semiconductor manufacture, to the heat treatment of metals and many more. The EPower controller is one product for all your solution needs.

We can provide you with a range of services to suit your needs – from training to commissioning and maintenance contracts for your installation.

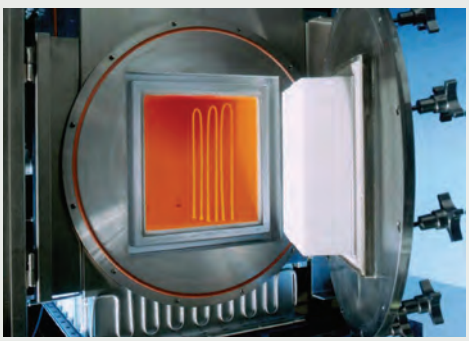


Easy Maintenance

- Modular design for easy management of spare parts and quick mean time to repair (MTTR)
- Fast and easy configuration
- Easy wiring, installation and commissioning
- Remote Display option

Case Study

New technology to advance heater control and prevent all future overheating



Our client successfully tested a feature of the EPower controller in a new way alongside their world leading brand of (MoSi2) heaters known as Kanthal Super. A key feature of MOSi2 heaters is the relationship between impedance and heater temperature.

Customer Challenge

Our customer's goals were to protect their heaters from over temperature, so extending the heater lifetime and to achieve maximum and consistent power.

Solution

- Power controller installed in conjunction with Kanthal Super heaters.
- EPower feature used to supply information about heater impedance
- EPower unit controlled by a 2704 over Master Comms

Customer Benefits – using EPower controller

- Significantly helps prevent overheating and ultimately extends lifetime of the heater
- Enables use of minimum margins for power demand while still preventing overheating. This keeps the process time and costs down
- Reports actual number of kWh or mWh used or saved; vital for precise analysis.
- Can ensure the heat treatment process is running at optimum performance at all times
- Predictive Load Management leads to energy savings and possible cost savings

The option that you need ...

A single driver module can support up to four power modules – and hence four independent control loops. Power modules are available in current ratings covering a range from 50A to 630A in compact version and up to 4000A in high current version. The driver module itself supports option boards to give you additional flexibility in your solution:

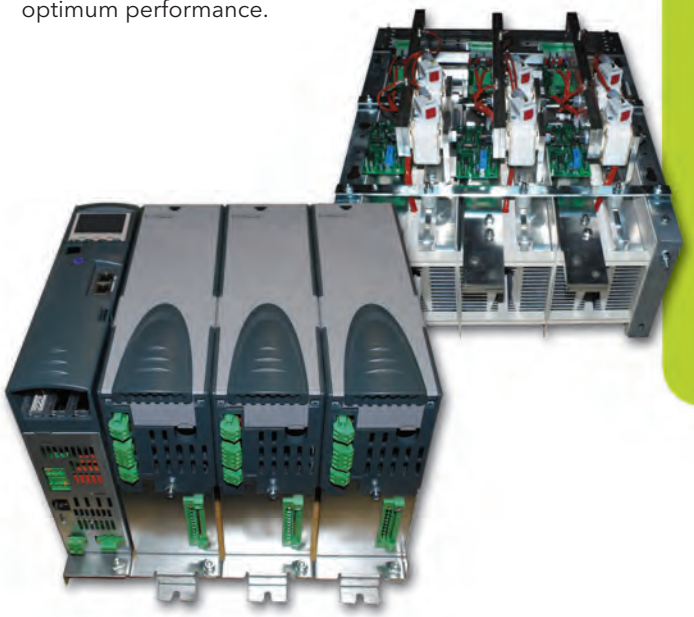
- **Communications** – RS485 Modbus RTU, Profibus, DeviceNet®, Modbus TCP network protocols, CC-Link, EtherNet/IP and ProfiNet
- **Predictive Load Management (PLM)** – A powerful feature to effectively manage your power requirements across multiple machines to save on your energy costs
- **Flexible I/O** – The driver module supports standard I/O and up to three additional I/O boards with analogue inputs, analogue outputs, digital I/O and relay outputs
- **LTC** – The Load Tap changer option for single phase unit applications only, allows for managing multi-tap transformers, preventing both increased harmonics and the reduction of power factor
- **Energy Counter** – Available over communications and for display on user screens, customers can access up to 5 scalable counters, one per individual phases and a global energy usage counter

The high current version (decentralised) of EPower will be able to manage current ratings from 800A to 4000A and support from 1 to 4 phases. To make the integration easy, the product is divided in two parts:

- The driver module providing all firing interfaces (MC : Module of Control)
- The power stack(s) cooled by air (800A to 2000A) or water (2000A and 4000A)

All the functionalities of the compact version remain available on the high current version (Quick start configuration, IO boards, PLM, comms capabilities etc.), providing all the benefits of flexibility, efficiency and peace of mind.

Providing a total solution for your application, the MC EPower is supplied with all the necessary accessories (e.g. cable, current transformer, fuses etc.) to ensure optimum performance.



Success stories commercial benefits

Case Study

Success for renewable energy wafer technology

An exciting collaboration resulted in outstanding solution for our client, a world leader and pioneer in the design and development of wafer technologies used for the manufacture of solar panels.

Customer Challenge

Our client needed to control immense power with absolutely no loss of stability or accuracy.

Solution

- Power control panel for reactor control
- New Load Tap Changing block application with EPower controller
- All enable manufacture of thin film solar modules and the result is best in class

Customer Benefits

- Unmatched accuracy, stability and quality of power control
- Perfect continuity of power during the transformer tap switches. The Load Tap Changing application vastly improves power factor.
- Huge savings expected to exceed future government energy cost saving target
- Reduced energy bills
- Unaffected high quality production
- One of best power solutions in industry today

For the full stories and all our successes go to www.eurotherm.com/success

invensys
Eurotherm

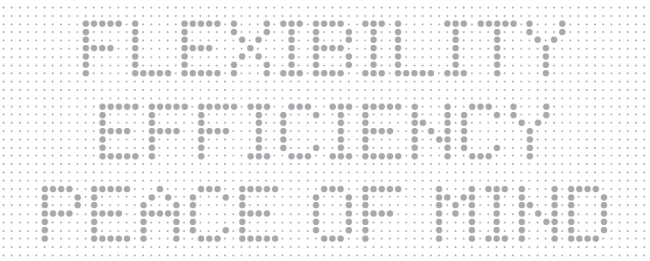
A product to integrate into a complete solution

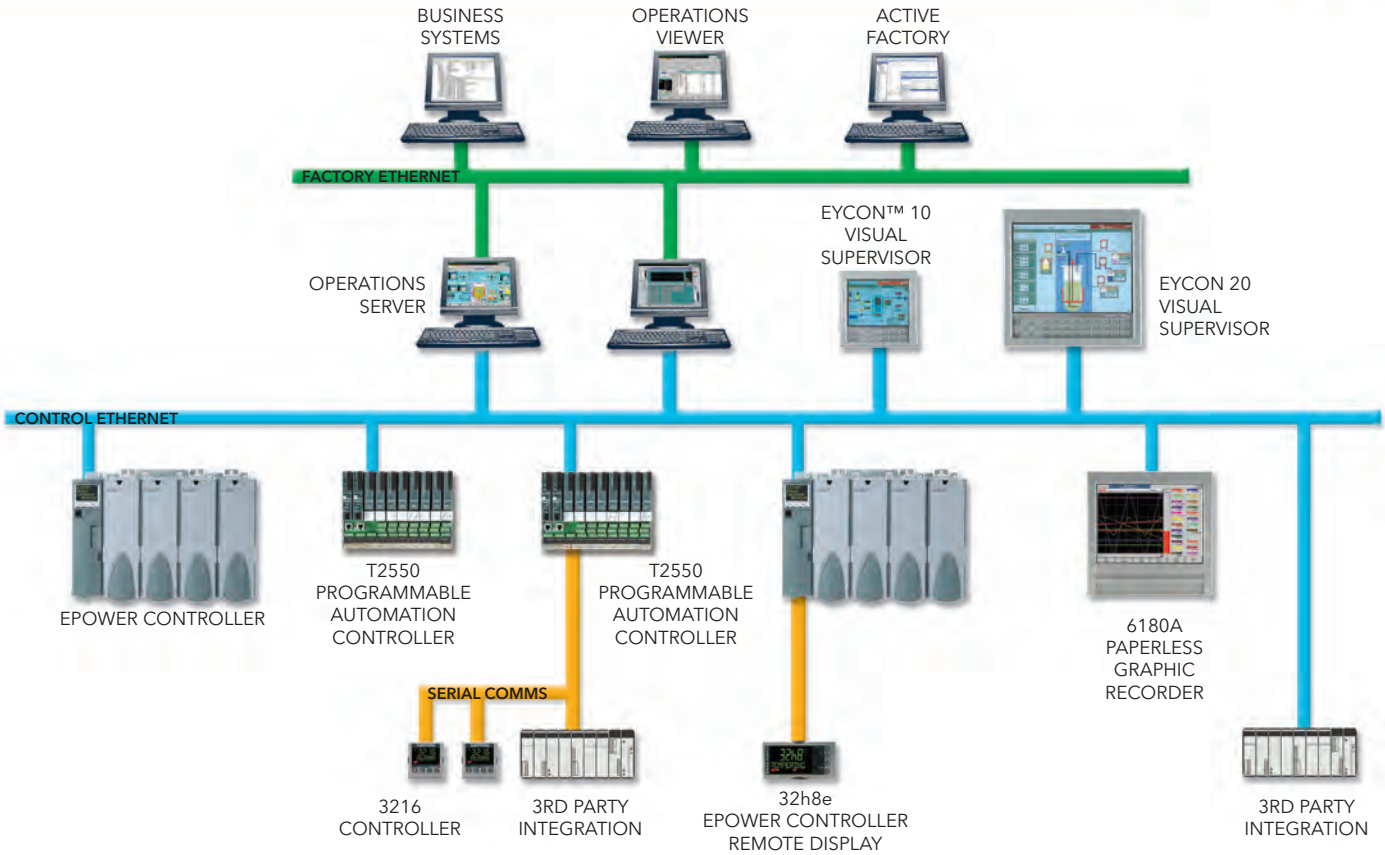
EPower controllers have not only been designed to be world-class power controllers that you can rely on, they have been designed to integrate perfectly into a wider control system.

Whatever your system communication preferences are – Modbus RTU, Profibus, DeviceNet, Modbus TCP/IP, CC-Link, EtherNet/IP, ProfiNet – EPower controllers can easily be integrated into your system and send the information you need about your load (current, voltage, alarms etc) so that you stay in control of your process.

Whether you need this latest power controller in a new system or to upgrade an existing system – Eurotherm can help you. Our expertise is not limited to power control – the full benefit of EPower controllers can be optimised using our engineers as experts in creating complete solutions and total, plant-wide DCS.

Throughout our product ranges – controllers, recorders, power controllers, signal conditioning, automation solutions and DCS – you will get expert knowledge, support and world class solutions. We can assist you with small and large applications and offer complete life cycle support and partnership engineering teams – whatever you need, we are there to work with you.





www.eurotherm.com/EPower

Predictive Load Management

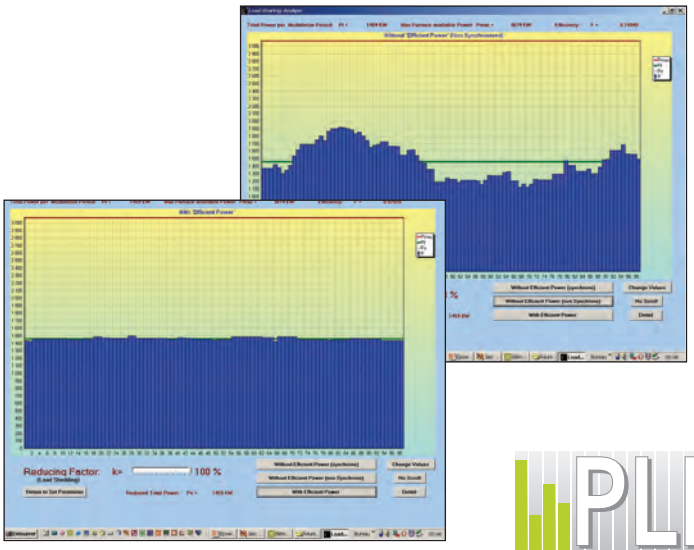
– the best innovation for energy management

You can reduce your energy costs across your plant by utilising the Predictive Load Management (patent pending) functionality within the EPower controller. This new feature provides a better distribution of energy across different loads in your installation, by managing the priority and, if necessary, load shedding.

The EPower controller prevents overshoot of the nominal power. This will keep you within the limits of your electrical contract for your installation and prevent increases in energy tariffs imposed by your supplier. Unlike other software offering this type of feature, Predictive Load Management from Eurotherm anticipates your energy usage rather than just reacting when you have already exceeded your tariff peak.

Using EPower controllers with Predictive Load Management could well be one of the best value decisions you could make for your plant!

Power consumed without "Predictive Load Management"



Power consumed with "Predictive Load Management"

PLM
Predictive Load Management

Success stories commercial benefits

Case Study

Typical savings case with Predictive Load Management at peak rate

- Reduced KW Power
- Reduced energy usage
- Reduced annual cost on electricity bill
- Return on investment within 4 months

TOTAL POWER OF FURNACES KW			
AVERAGE POWER DEMAND KW	15000	20 ZONES	145
SUPPLY SUBSCRIPTION KW	3000	FURNACE USE	85%
Type	Hours	Power *without* PLM	Power *with* PLM
Peak (TTE)	309	1,500	1,300
Winter peak hours (HPH)	1762	1,500	1,400
Winter off -peak hours (HCH)	1553	1,500	1,500
Summer peak hours (HPE)	2953	1,500	1,400
Summer off-peak hours (HCE)	2201	1,500	1,500
PRICE LIST Edf GREEN A5	Fix rate calculation	*without* PLM	*with* PLM
	Reduced power KW	3,000	1,398
	Fix rate cost €	362,520	168,934
	ANNUAL SAVING €		193,568
	Variable rate calculation	*without* PLM	*with* PLM
	Variable rate cost €	334,317	318,021
	ANNUAL SAVING €		16,296
	TOTAL SAVINGS €		209,881
EPower investment + installation £	70,000€	ROI	4 months

For the full stories and all our successes go to www.eurotherm.com/success

invensys
Eurotherm

With EPower controllers, you will obtain an excellent return on your investment

Case Study

Energy efficiency for electricity generation with EPower controller Predictive Load Management (PLM)

In today's economy, energy efficiency or, more accurately, the lack of it, is a hotly debated topic. One point that often evades the spotlight is the amount of energy required to actually produce the world's electricity supplies.

Customer Challenge
Our client needed to control power usage across the whole process to comply with strict emissions tolerance legislation to meet efficiency targets for 2020 which detail reduction in greenhouse gasses by 20% and an increase in usable energy efficiency by 20%.

Solution
- EPower controller installed on heat treatment furnace
- Using Predictive Load Management to regulate power input

Customer Benefits
- Use of PLM means the EPower controller meets industrial demands for energy efficiency and can reduce energy bills by 9%.
- Reduced energy costs by providing more efficient distribution across a variety of loads and conditions.
- Enables customer to stay within emissions tolerance limits – better for the environment
- Accurate record keeping that provides proof of the provider's compliance
- More efficient energy production and distribution for the customer.
- Company executives estimate that the solution will reduce energy costs by improving overall process efficiency by as much as 10%"

Case Study

Greater energy efficiency in buildings using the EPower controller to improve power factor

Our prestigious client had the same problem that most companies have, keeping employees comfortable while they are at work.

Customer Challenge
Our client needed to improve effective climate management in a very large but older office building to ensure a comfortable environment for all employees while avoiding huge energy bills.

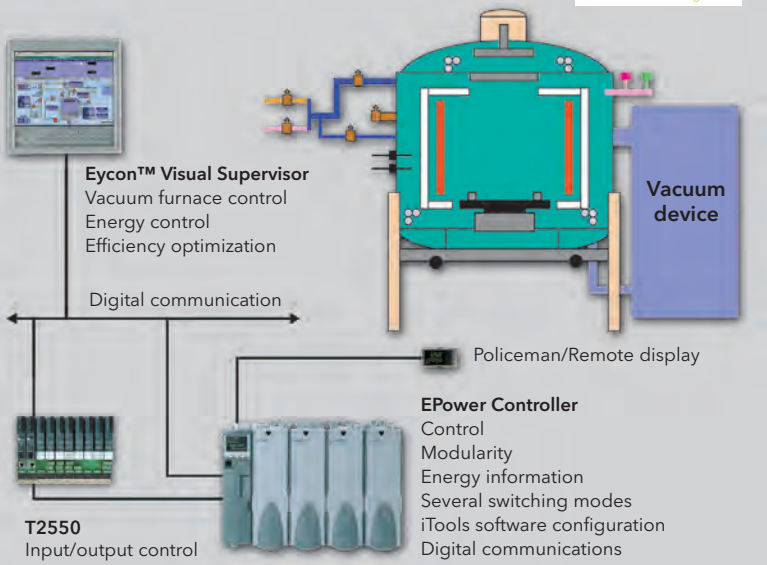
Solution
- The Eurotherm solution included EPower three-phase modules, receiving set point values via Modbus to a Field Controller, and driving Vulcan Radiator electric baseboard heaters
- Using the Predictive Load Management feature
- Using Zero Cross firing – replacing phase angle SCRs

Customer Benefits
- Improved energy savings
- Reduced previous noise interference
- Power factor improvements
- Created a more comfortable and efficient working environment

Real-world applications

Vacuum furnace in heat treatment

- Heater element control
- Power repartition in heating elements providing energy saving
- Alarm strategy
- Digital communication allowing supervisory control
- Use Predictive Load Management across multiple furnaces to reduce energy costs



Semiconductor manufacturing

Silicon was discovered in 1823 and is used in the manufacture of today's semiconductors.

Semiconductors need a silicon of a very high purity and, therefore, the silicon is transformed by successive stages (crystal growing, epitaxy) that need very slow and accurate heating.

The EPower Controller will provide many solutions to this specific and expensive process:

- Precise and steady control of the heater elements
- Advanced and configurable strategy enables the EPower Controller to adapt to the load state
- Secure your process utilising a comprehensive alarm strategy and by transferring process information to a supervisor

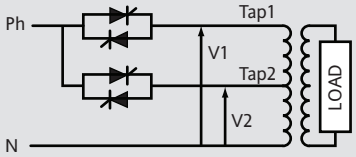
Load tap changer

The load tap changer (LTC) is a method of improving the perceived power factor and harmonic distortion when controlling a load that is required to be driven in phase angle firing mode.

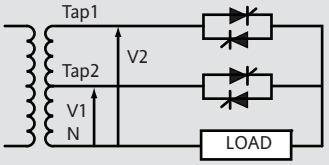
This is achieved by automatically switching a number of taps on the load transformer. This control can be performed on the primary of the transformer where the maximum tap voltage is the limiting factor or the secondary of the transformer where the maximum current is the limiting factor.

The Load Tap Changer requires the External Feedback option.

Primary connection

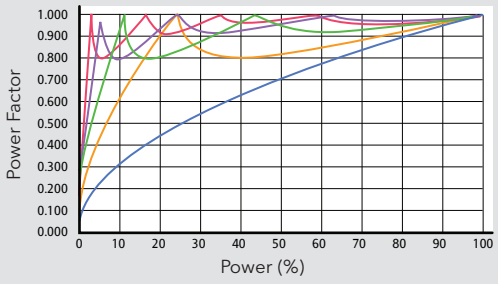


Secondary connection



The operating region of control will determine the number of taps required but a maximum of 4 is usually sufficient.

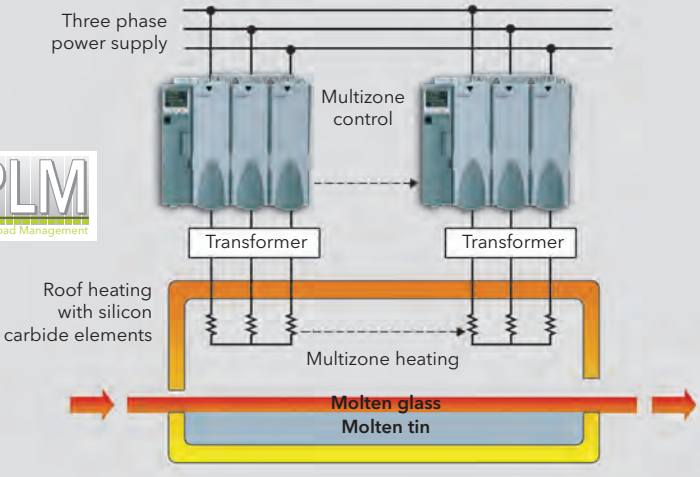
Power Factor Curves for different numbers of taps.



Tin Bath furnace in float manufacturing

Melting is one of the first steps in the 'float' process'. At this stage glass is in liquid state in a molten furnace at around 1550°C. Roof heating is made by silicon carbide heaters. EPower Controller controllers provide all the solutions to the multizone control of this specific heater elements.

- Ageing compensation of the silicon carbide heaters with power control
- Power distribution control in the heater elements providing cost savings: suppression of inrush current for a better energy management and a minimum stress on the power transformers
- Digital communication with standard protocols for an efficient process monitoring
- Use Predictive Load Management across the glass plant to reduce energy costs



Selection guide and technical specifications

invensys Eurotherm

DRIVER MODULE

SUPPLY VOLTAGE	85 to 264V ac
SUPPLY FREQUENCY	47 to 63Hz
POWER CONSUMPTION	120W
TEMPERATURE LIMITS	0 to 50°C operating, -25 to 70°C Storage
DISPLAY	4 lines dot LCD matrix array
COMMUNICATIONS	Modbus RTU 2 wire EIA485 Modbus TCP/IP 10baseT Ethernet Profibus DPv1 DeviceNet network protocol CC-Link EtherNet/IP ProfiNet
INPUTS AND OUTPUTS Standard	2 Analogue inputs 1 Analogue output 2 Digital inputs/outputs 2 Relay SPDT (1= Watchdog)
Optional modules (max 3)	Per module - 1 Analogue input 1 Analogue output 2 Digital inputs 1 Relay
MEASUREMENT ACCURACY	Better than 1%
REMOTE PANEL	Dedicated remote panel port 32h8e panel indicator
QUICKSTART	Configurable by order code or on start up via dedicated front panel HMI
PREDICTIVE LOAD MANAGEMENT (PLM)	Optional module connecting up to 63 instruments over dedicated communications (CAN based). Configurable PLM (optimises energy usage
SOFTWARE OPTIONS	Load Tap Changer (single phase) Energy Counter
APPROVALS	CE (EN 60947-4-3), UL 508

POWER MODULES (UP TO 4*)

FREQUENCY	47 to 63Hz
OPERATING TEMPERATURE	Nominally 40°C, Operation 0 to 50°C de-rating applied over 40°C
COOLING FANS/TURBINES	≥160A
FAN/TURBINE SUPPLY	115V or 230V
FIRING MODES	Phase angle Half Cycle Burst Firing Fixed Modulation Logic
LOAD TYPES	Standard Resistive Complex Resistive Inductive loads e.g. Transformer
LOAD CONFIGURATION	Single phase Ph/Ph or Ph/N Two leg control 3 wire star or delta Three phase control 3 or 4 wire star, 3 or 6 wire delta
POWER MODULE COMBINATIONS	1, 2, 3 or 4 single phase (1, 2, 3 or 4 modules) 1, or 2 x two leg (2 or 4* modules) 1 x 3 phase (3 modules)
FEEDBACK TYPES	Open Loop V^2 I^2 True Power Vrms Irms

COMPACT POWER MODULE	VOLTAGE RANGES	100 to 600V ac, 100 to 690V ac
	CURRENT RANGES in compact version	50A, 100A, 160A, 250A, 400A, 500A, 630A
	Nominal current range	16 to 630A
	FEEDBACK	Internal voltage and current Order option – External voltage and current
	APPROVALS	CE (EN 60947-4-3), UL 508
MC POWER MODULE	VOLTAGE RANGES	100 to 690V ac
	CURRENT RANGES in high current version	
	Air cooled	800A, 1000A, 1300A, 1700A, 2000A
	Water cooled	2000A, 3000A, 4000A
	TURBINE SUPPLY	115W or 230W
	FEEDBACK	External voltage and current
	APPROVALS	CE (EN 60947-4-3)

Eurotherm:
International sales and service

www.eurotherm.com

AUSTRALIA *Melbourne*
Invensys Process Systems
Australia Pty. Ltd.
T (+61 0) 8562 9800
F (+61 0) 8562 9801
E *info.eurotherm.au@invensys.com*

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

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

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

CHINA
Eurotherm China
T (+86 21) 61451188
F (+86 21) 61452602
E *info.eurotherm.cn@invensys.com*

Beijing Office
T (+86 10) 5909 5700
F (+86 10) 5909 5709/10
E *info.eurotherm.cn@invensys.com*

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

GERMANY *Limburg*
Invensys Systems GmbH
T (+49 6431) 2980
F (+49 6431) 298119
E *info.eurotherm.de@invensys.com*

INDIA *Mumbai*
Invensys India Pvt. Ltd.
T (+91 22) 67579800
F (+91 22) 67579999
E *info.eurotherm.in@invensys.com*

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

ITALY *Como*
Eurotherm S.r.l
T (+39 031) 975111
F (+39 031) 977512
E *info.eurotherm.it@invensys.com*

KOREA *Seoul*
Invensys Operations Management
Korea
T (+82 2) 2090 0900
F (+82 2) 2090 0800
E *info.eurotherm.kr@invensys.com*

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

POLAND *Katowice*
Invensys Eurotherm Sp z o.o.
T (+48 32) 7839500
F (+48 32) 7843608/7843609
E *info.eurotherm.pl@invensys.com*

Warsaw
Invensys Systems Sp z o.o.
T *(+48 22) 8556010*
F *(+48 22) 8556011*
E *biuro@invensys-systems.pl*

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

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

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

UAE Dubai
Invensys Middle East FZE
T (+971 4) 8074700
F (+971 4) 8074777
E *marketing.mena@invensys.com*

UNITED KINGDOM *Worthing*
Eurotherm Limited
T (+44 1903) 268500
F (+44 1903) 265982
E *info.eurotherm.uk@invensys.com*

U.S.A. *Ashburn VA*
Invensys Eurotherm
T (+1 703) 724 7300
F (+1 703) 724 7301
E *info.eurotherm.us@invensys.com*

ED66

Eurotherm is also represented in the following countries:

Afghanistan
Albania
Algeria
Angola
Argentina
Armenia
Azerbaijan
Bahrain
Bangladesh
Barbados
Belarus
Bermuda
Bolivia
Bosnia and Herzegovina
Botswana
Brazil
Brunei Darussalam
Bulgaria
Cambodia
Cameroon
Canada
Central African Republic
Chad
Chile
Colombia
Congo
Costa Rica
Côte d'Ivoire
Croatia
Cyprus
Czech Republic
Djibouti
Ecuador
Egypt
El Salvador
Eritrea
Estonia
Ethiopia
Fiji
Finland
Georgia
Ghana
Greece
Greenland
Guinea
Hungary
Iceland
Indonesia
Iraq
Israel
Jamaica
Japan
Jordan
Kazakhstan
Kenya
Kuwait
Kyrgyzstan
Laos
Latvia
Lesotho
Libya
Lithuania
Macedonia
Madagascar
Malaysia
Malta
Micronesia
Moldova
Morocco
Mozambique
Myanmar
Namibia
Nicaragua
Niger
Nigeria
Oman
Pakistan
Palestinian Territory
Papua New Guinea
Paraguay
Peru
Philippines
Poland
Qatar
Romania
Russia
Rwanda
Saudi Arabia
Senegal
Serbia and Montenegro
Sierra Leone
Singapore
Slovakia
Slovenia
Somalia
South Africa
Sri Lanka
Sudan
Swaziland
Syria
Tajikistan
Tanzania
Thailand
The Gambia
Tunisia
Turkey
Turkmenistan
Uganda
Ukraine
United Arab Emirates
Uruguay
Uzbekistan
Venezuela
Vietnam
Yemen
Zambia
Zimbabwe

Represented by:

© Copyright Eurotherm Limited 2012

Invensys, Eurotherm, the Eurotherm logo, Chessell, EurothermSuite, Mini8, Eycon, 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.

Part No. HA029668 Issue 6

Printed in England on recycled paper 01.12

invensys
Operations Management