



HEAT TREATMENT FURNACES FOR METAL

Advanced control for maximum efficiency



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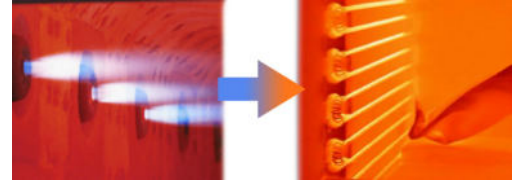
Electrifying Your Furnace Line

Managing the complex transition from Gas to Electric

Steel and light-alloy manufacturers are facing a major transformation: the shift from gas-fired to electric furnaces. This transition is driven by a mix of environmental, regulatory, and economic pressures:

- Reduced CO₂ emissions and lower environmental impact
- Stable energy costs, less affected by volatile gas markets
- Compliance with increasingly strict environmental regulations

But this transition is not a simple energy source swap. It requires a fundamental rethinking of how heat is generated, managed, and controlled in the furnace process.



Key Challenges in Electrification

New technical skills



Electric heating at high temperatures demands advanced electrical power management and precise control strategies. Traditional control approaches are no longer sufficient to ensure furnace stability and efficiency.

Cross-functional coordination



The success of this transition depends on tight collaboration between OEMs, system integrators, and end users. Alignment from the earliest design stages is essential to avoid costly integration errors or inefficiencies.

Sensitive heating elements



Modern heating technologies like SiC (Silicon Carbide) and MoSi₂ (Molybdenum Disilicide) are highly efficient but require exact power regulation to prevent damage and ensure long-term reliability.

With over 30 years of experience in temperature and power control:

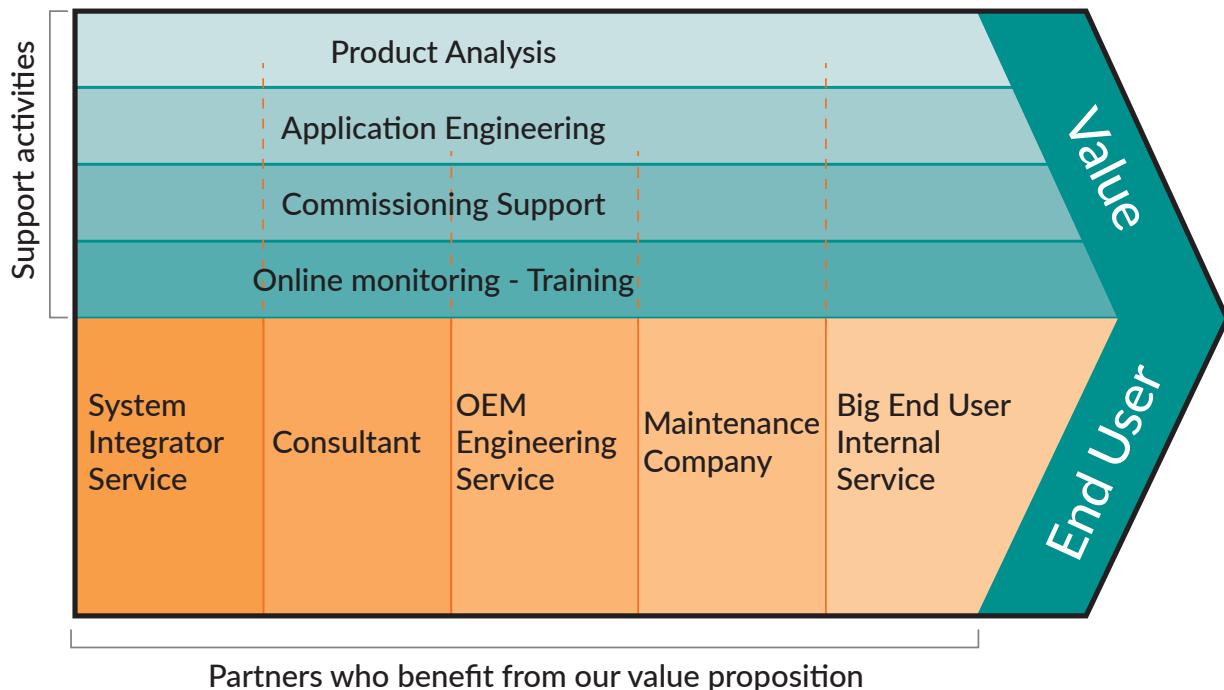
- We provide a positive customer experience built on expert support, fast service, and intuitive solutions.
- Our team specialises in power control, providing you with direct access to our engineers for tailored, application-specific technical support.
- We guarantee rapid response times, clear documentation, remote assistance, and a product range designed to match your application's complexity—without adding unnecessary complexity, while simplifying implementation and maintenance.

Powering the Future of Electric Heating with CD Automation's Partner Ecosystem



CD Automation works as a unified technical partner within a strong ecosystem of distributors, OEMs, and system integrators.

Together, we simplify electrification by offering **advanced SCR power controllers, deep fieldbus expertise, engineering support, and remote technical assistance** - helping customers transition to electric heating with lower risk, faster commissioning, and reduced system costs.

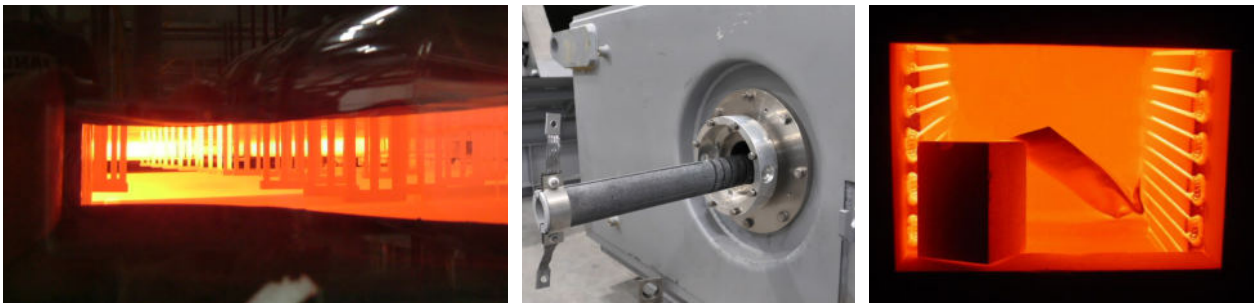


Advanced Electric Control Solutions for Heat Treatment

Reliable control solutions for heat treatment processes, optimised for SiC/MoSi₂ elements and transformers. Designed for precision and easy integration, they support applications from autoclaves to vacuum furnaces—fully compatible with Industry 4.0.

SiC & MoSi₂ Heating Elements

Advanced power control for SiC and MoSi₂ elements SiC and MoSi₂ heating elements enable high-efficiency heat treatment up to 1800°C, offering excellent thermal performance and oxidation resistance. Their use requires precise power regulation to manage resistance drift (SiC) and thermal shock sensitivity (MoSi₂).



REVO C: Precision power without compromise

To meet these challenges, CD Automation offers the REVO C series: digital SCR power controllers engineered for advanced heat-treatment applications.

Each REVO C unit delivers:

- True Soft-Start & Ramp-to-Setpoint – protects MoSi₂ elements from thermal shock
- Automatic Voltage Compensation – stabilises power output as SiC resistance changes over time
- Flexible Firing Modes – zero crossing, phase angle or single cycle, selectable per channel
- Built-in Protections – against overcurrent, overtemperature and short circuits
- By ensuring stable, precise power delivery, REVO C helps extend SiC element life by up to 30% and protects MoSi₂ elements during the most critical heating phases.

Deep Process Insight & Energy Accountability

REVO C supports advanced process monitoring and full Industry 4.0 integration, with native support for Modbus RTU/TCP, Profinet, EtherNet/IP, EtherCAT. This enables:

- Real-time logging of voltage, current, resistance, and true power
- Trend-based maintenance alerts for element wear or wiring issues
- Accurate kWh measurement for energy reporting and resistance value
- Seamless data access through the Configurator Software or your existing SCADA/historian.

Control in the Palm of Your Hand

Configuration and diagnostics are now easier than ever, thanks to CD Automation's free Thyristor Configurator Software and dedicated mobile app for iOS and Android.

Whether you're at your desk or on the shop floor, these tools provide fast, intuitive control:

- Bluetooth® auto-discovery of all REVO C units within range
- Live dashboards to monitor real-time electrical parameters and energy usage
- Upload recipes, clone configurations, or enable/disable outputs in seconds
- Remote expert support available instantly from CD Automation engineers.

The result: faster commissioning, simplified troubleshooting, and a lower total cost of ownership.



With REVO C you will never be alone

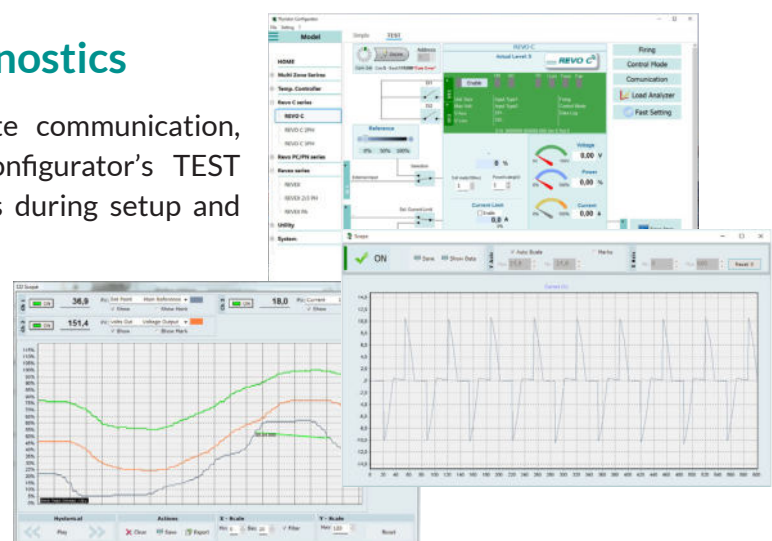
CD Automation offers remote service support from anywhere in the world via smartphone App.

REVO C can stay connected to the outside world using a wide range of communication protocols, including Modbus® RTU, Ethernet TCP, Profibus®, and Profinet®, as well as Bluetooth and a USB port for local data transfer.



Smart Tools for Setup and Diagnostics

Our field-ready tools, supported by remote communication, allow technical support anywhere. The configurator's TEST mode enables full control of key parameters during setup and troubleshooting. It includes access to the **Load Analyzer** (real-time waveforms and up to 10 variables) and **Process Variable Logging** with long-term data storage on REVO C (16GB SD card, up to 10 years). Other models offer fixed-interval logging.



Managing Inductive Loads and Transformer

CD Automation supplies SCR-based power controllers that limit the high inrush current that appears when single- or three-phase transformers are first energized, preventing blown fuses and protecting both thyristors and the transformer itself.

- Single-phase loads: REVO C 1PH or for the smaller-current REVEX 1PH
- Three-phase loads: REVO C 3PH or for the smaller-current REVEX PA



Key features

- Built-in selection of Phase-Angle or Delay-Trigger (burst) firing directly from the unit's software/keypad.
- Soft start and current limit minimize peak current and prevent magnetic-circuit saturation.

Recommended firing strategies

Phase angle with soft start & current limit – for normal resistive heaters, cold-resistance elements (e.g., Kanthal Super MoSi₂), or transformer-coupled loads (use current feedback with cold resistances).

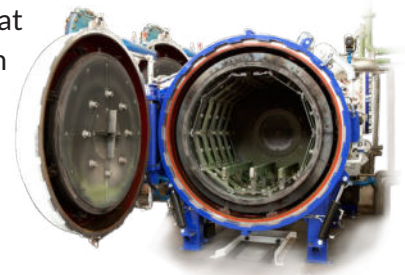
Delay Trigger with burst firing – turns OFF at negative load voltage and ON just after the next positive zero crossing, ideal for purely resistive loads whose resistance stays constant with temperature.

By matching the correct controller and firing mode to the application, CD Automation ensures safe start-up, protects power components, and delivers reliable, efficient operation for transformer-secondary loads.

Precision Power Control for Vacuum Furnaces

Vacuum furnaces rely on exceptionally stable thermal profiles because heat is transferred by radiation through graphite, molybdenum or tungsten elements.

REVO C gives furnace builders in aerospace, medical, energy, defence and additive-manufacturing sectors the power stability they need.



Why REVO C fits vacuum applications?

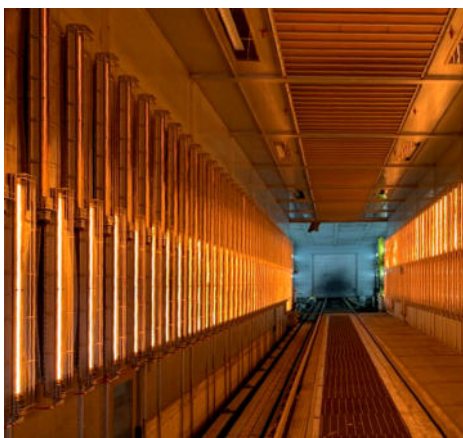
- Soft Start & Ramp-to-Setpoint – avoids thermal shock to the heating elements.
- Automatic voltage compensation – keeps power constant as element resistance drifts over time.
- Closed loop PLC control – native support for PROFINET, Modbus TCP, EtherNet/IP and EtherCAT.
- Real-time electrical diagnostics – live voltage, current, resistance and batch-level kWh monitoring.
- Quick configuration tools – Bluetooth® mobile app and PC 'Thyristor Configurator' speed setup and troubleshooting.
- Benefits for OEMs & integrators
- Rapid, precise ramp-up and tighter temperature uniformity.
- Higher energy efficiency and lower operating costs.
- Reduced metallurgical distortion of parts.
- Full traceability of every thermal cycle.
- Fast technical support, including remote assistance.

Developed in close collaboration with OEMs and system integrators, REVO C delivers tailored, integrated solutions for the most demanding vacuum-furnace applications.

Resistive Loads and Infrared Lamp

In **resistive load applications**, choosing the right connection and power control strategy is essential to ensure long-term efficiency and reliability.

CD Automation offers a complete range of tailormade solutions, with power controllers designed to perfectly match your load characteristics and wiring setup—because we understand that every system, from simple heating processes to complex multi-zone installations, has its own specific needs.



Infrared (IR) lamps deliver fast, energy-efficient industrial heating. Control: Medium- and long-wave lamps behave like standard resistive loads, whereas short- and ultra-short-wave emitters generate inrush currents up to $16 \times$ nominal current and must be managed with advanced thyristor controllers. Recommended firing modes include Single-Cycle, Burst-Firing, and Phase-Angle with current limit.

Key applications

Paint drying: Rapid, uniform curing with precise power modulation reduces defects and improves energy efficiency.

Steel heat treatment: IR lamps enable quick, localized surface hardening—useful for continuous strip/wire hardening, press-hardening

and hot stamping of boron steels, localized or partial hardening, and pre-heating prior to forging.

CD Automation's SCR power controllers suppress the high inrush current that occurs when single- or three-phase IR-SW loads are first energised, protecting the thyristors and extending their service life.

Recommended models

Load type	Standard current	Lower current
Single-phase	REVO C-1PH	REVEX-1PH
Three-phase	REVO C-2PH / REVO C-3PH	REVEX 2-3PH or REVEX PA

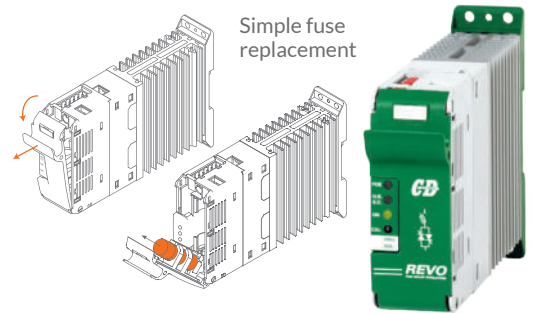
For installations with multiple lamps, the REVO PN multi-channel unit offers built-in load management to optimise power distribution and simplify wiring.

Key features

- Built-in selection of Phase-Angle, Half or Single Cycle (burst) firing directly from the unit's software/ keypad.
- Strong I²t Junction to absorb peak of current, load synchronization to avoid peak of power and increase power quality.
- Diagnostic for total or partial load brake (HB Alarm) and SCR Short Circuit detection.
- Field bus and all the main electric parameters available

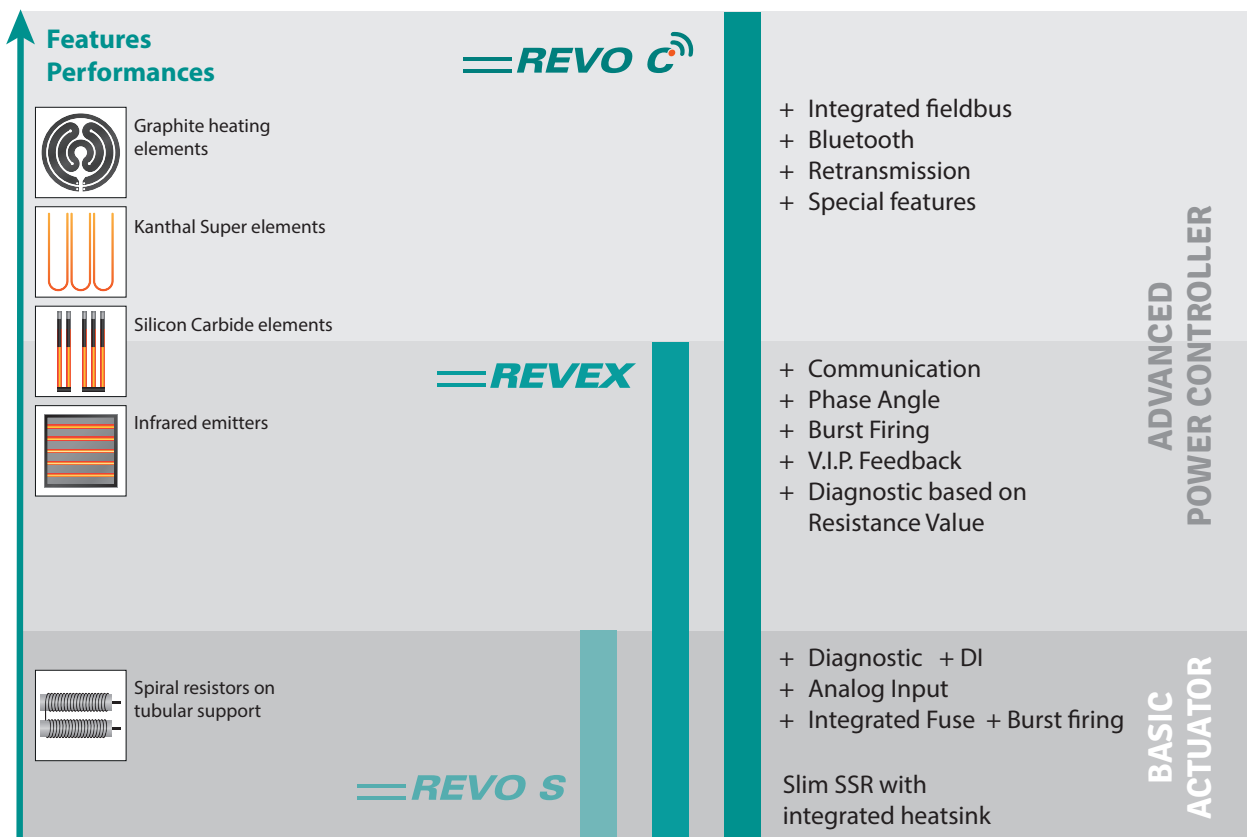
Single loop solutions

REVO S compact static units



REVO S static relays are characterised by high precision and reliability in power control, ensuring optimal operation in all situations. The compact and robust design allows for quick and easy installation, while the wide range of available voltages and currents enables adaptation to different application requirements. With the advanced features of the Power Network series, these power units ensure system control and energy efficiency by synchronising and limiting power for cost reduction.

- Integrated fuse and fuse holder, 50% space saved.
- Integrated current sensor.
- Current auto-tuning and load diagnostics with alarm relays.
- SCR diagnostic in short circuit.
- Digital input for auto-tuning calibration
- Current from 30A to 800A.
- Up to 40°C in continuous service with side-by-side mounting without derating.



REVO C the connecting unit



CD Automation's REVO C power controllers provide advanced and precise temperature control for demanding industrial applications. Featuring state-of-the-art technology and full software configurability via an integrated microprocessor, REVO C units ensure high reliability, flexibility, and optimal performance across a wide range of heating processes.

- Internal Fuses on complete range from 30 to 2100A
- 100 kA Short Circuit Current (SCCR) up to 600V
- Voltage Supply 480-600-690V
- OLED Display for easy Diagnostic & Configuration
- All Firing & Control Mode available
- Bluetooth and all popular Field Bus available
- APP for communication via Apple or Android™
- Remote Service
- Comply with EMC, cULus® 508 listed and cUL® listed

REVEX advanced units



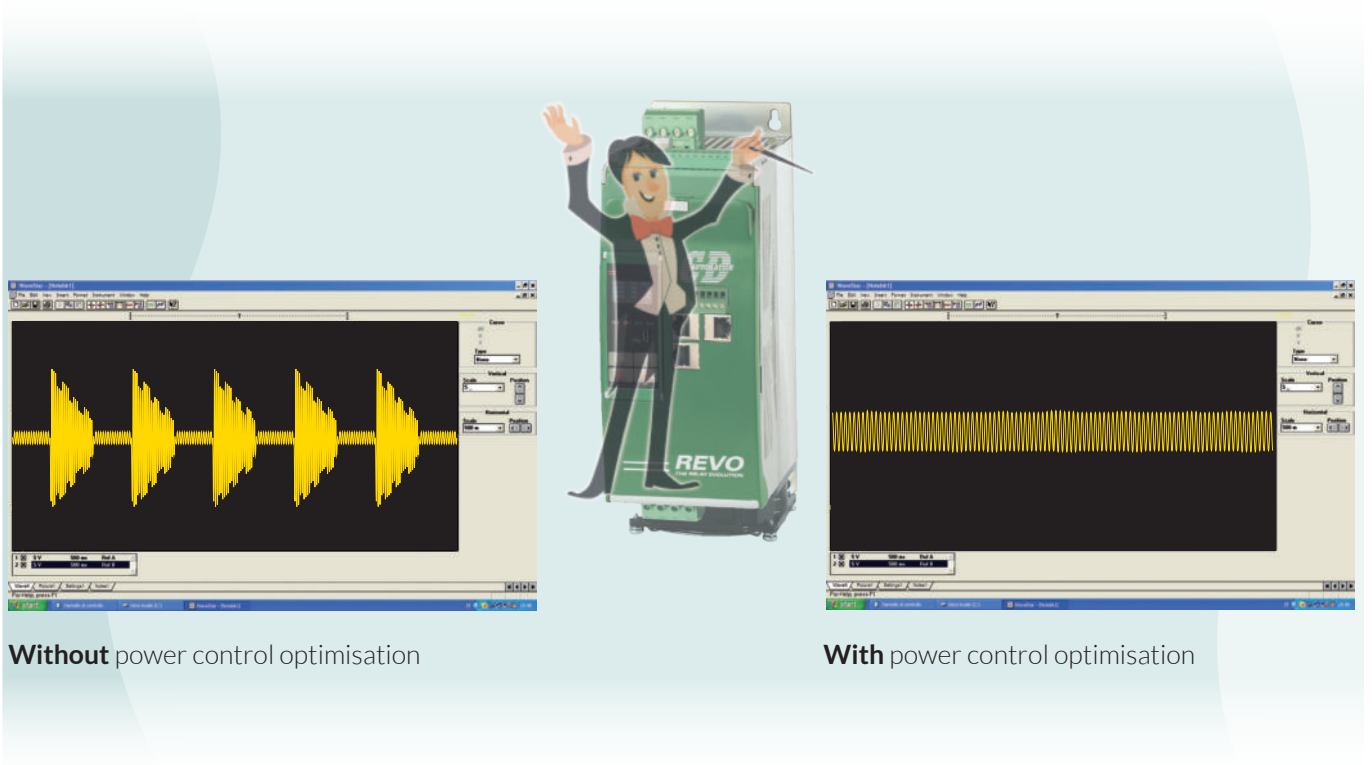
REVEX solid state relays are universal, high-performance control units with flexible configurations. The main feature of these products is that they can be configured according to project requirements, eliminating unwanted options. This type of 'on-demand' solution makes it possible to optimise purchase costs.

REVEX power controllers can be configured in 13 different solutions with the following features:

- Front panel OLED display.
- USB port for configuration.
- Integrated CT for current reading.
- Configurable Heater Break alarm.
- 2 configurable digital inputs (es: ENABLE function).
- 2 software-adjustable inputs without internal jumpers.
- Firing: Single cycle, Half cycle, Burst Firing, Phase Angle, Delayed Triggering, different types of adjustable ramps.
- Configurable feedback modes (V, V2, I, I2, VxI).
- Standard communication RS485 with Modbus RTU.
- Free CD Automation software for configuration.

Power Quality objective

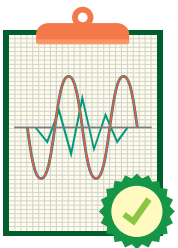
The optimisation algorithm, like a conductor, distributes the required power to the individual zones keeping the line current as constant as possible



Without power control optimisation

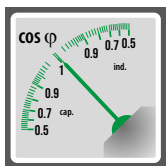
With power control optimisation

Power Quality



- Reduction of disturbances on the power supply line.
- Reduction in heating of electrical cables.
- Reduction in power loss.

These disturbances are typically caused by flickering and harmonics resulting from the connection of unsynchronised loads, which negatively affect power quality.



Thanks to the new **REVO POWER NETWORK** control system and **Dynamic Burst Firing technology** for optimised load control, the Power Factor value is maintained close to 1, minimising energy cost penalties and disturbances to the grid.



TRANSIENTS



HARMONICS



REACTIVE POWER



NETWORK UNBALANCE



OSCILLATIONS



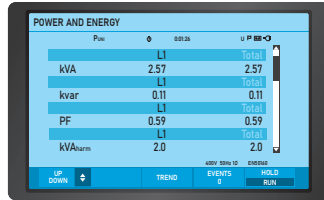
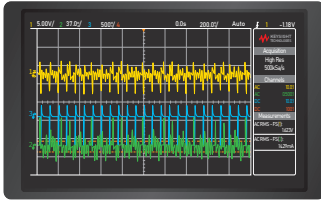
VOLTAGE VARIATIONS



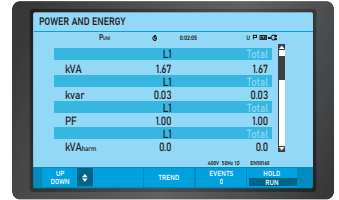
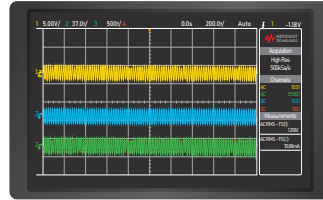
FLICKER

Power optimization

Without REVO



With REVO

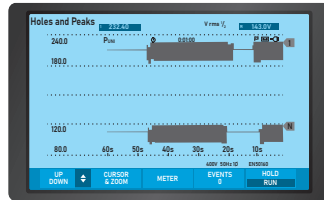


In multi-zone applications, the addition of multiple non-synchronised loads can generate a peak current that produces disturbances on the power line.

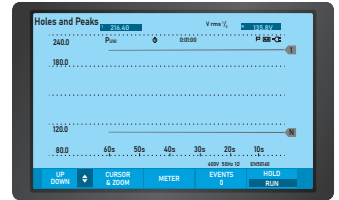
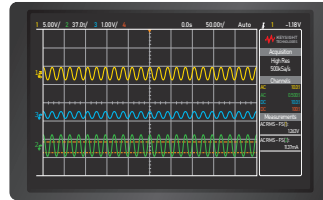
REVO distributes the power demand of the individual zones keeping the line current as constant as possible.

Network disturbance

Without REVO



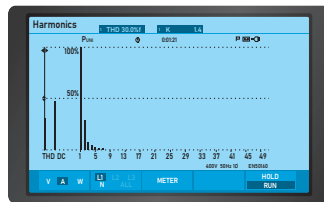
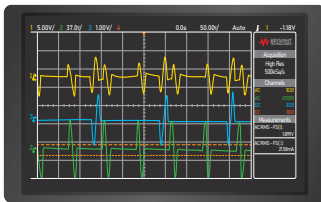
With REVO



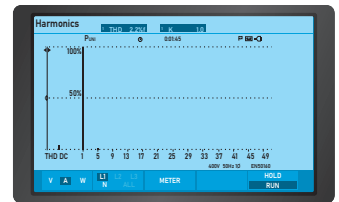
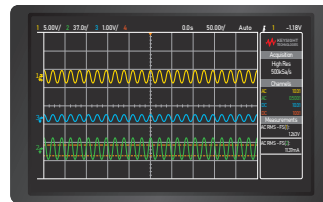
The addition of unsynchronised loads on the power line can cause disturbances, such as fluctuations in the mains voltage (Flickering) and network holes/losses on power cables.

Harmonic component

Without REVO



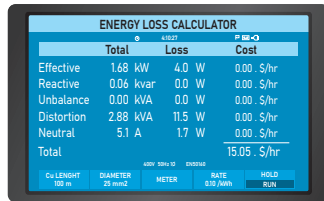
With REVO



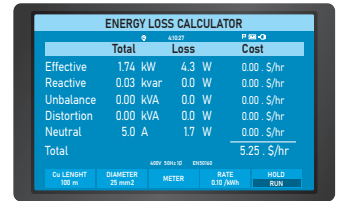
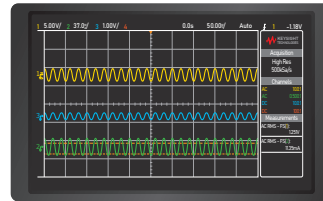
The integration and operation of unsynchronised loads can lead to an increase in total harmonic distortion (THD), resulting in higher losses, increased noise, and potential overheating of power cables

Optimization of energy cost

Without REVO



With REVO



Thanks to its control strategy and the distribution of the power required in the management of multizone loads, REVO POWER NETWORK keeps the Power Factor value close to 1.

Power Quality objective

REVO PN Power Network

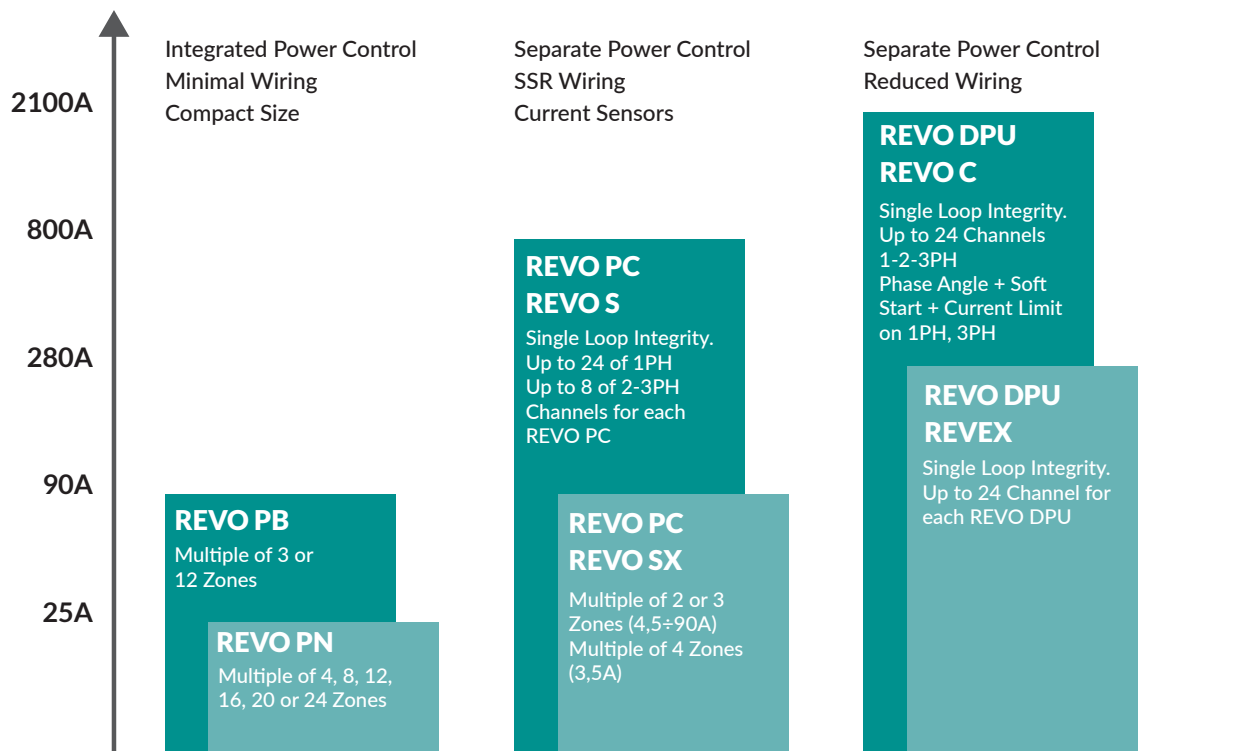


The **most compact and flexible solution** with synchronised firing (max. 25A).

High-performance SCR junctions for controlling complex loads such as short-wave IR emitters (IRSW) with high peak currents.

- For the control of 480V heating elements.
- Distributed solution with wiring contained in small integrated cabinets (plant/board).
- Ideal for controlling emitters/IR lamps in heating processes.
- Space-saving solution with 4 to 24 zones 25A output modules per fieldbus node, I/O modules and optional temperature control boards.
- Engineering Tools for TIA Portal® and Rockwell® PLC examples.
- Possible communication systems integrated in the unit: Profinet, EtherCAT, Ethernet IP and Modbus TCP.
- Free CD Automation software for configuration.

Also available REVO PB: with this unit, you can extend the REVO PN series up to 90A per channel.

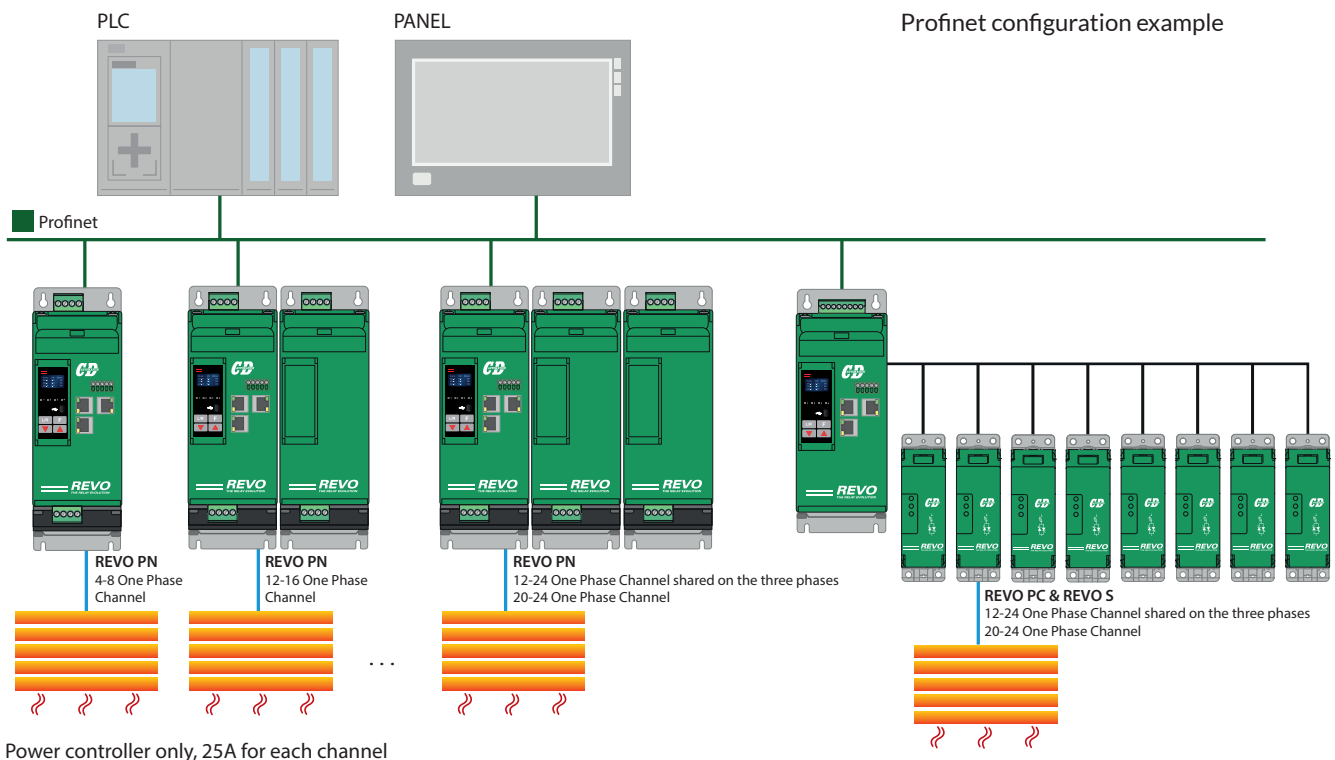


REVO PC Power Controller



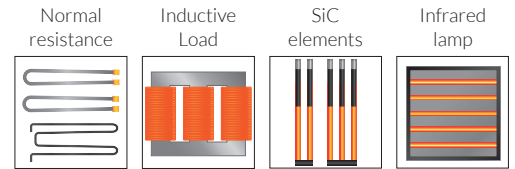
The **most flexible** solution with synchronised firing (max 800A), the REVO PC uses the same control technology as the Power Network series. However, it does not include the thyristor power section; instead, this is provided by the REVO S / REVO Sx series units, which are managed through the REVO PC's synchronisation and communication functions.

- To control heating elements with maximum voltages of 480V, 600V or 690V, single-phase and three-phase connections.
- Current ratings from 3A to 800A, with extra rapid fuses protection.
- Ideal for controlling resistive loads, IR lamps, resistors for extrusion and injection lines for plastics and elastomers; ovens with IR lamps, multi-zone ovens for glass, steel and ceramics.
- Control of 8 to 24 channels per fieldbus node, including current sensor input for each channel and output for SCR control, I/O modules and optional temperature control boards.
- Engineering Tools for TIA Portal® and Rockwell® PLC examples.
- Possible communication systems integrated in the unit: Profinet, EtherCAT, Ethernet IP and Modbus TCP.
- Power management for optimising consumption (power factor close to 1).
- Free CD Automation software for configuration.



Power Quality objective

REVO DPU

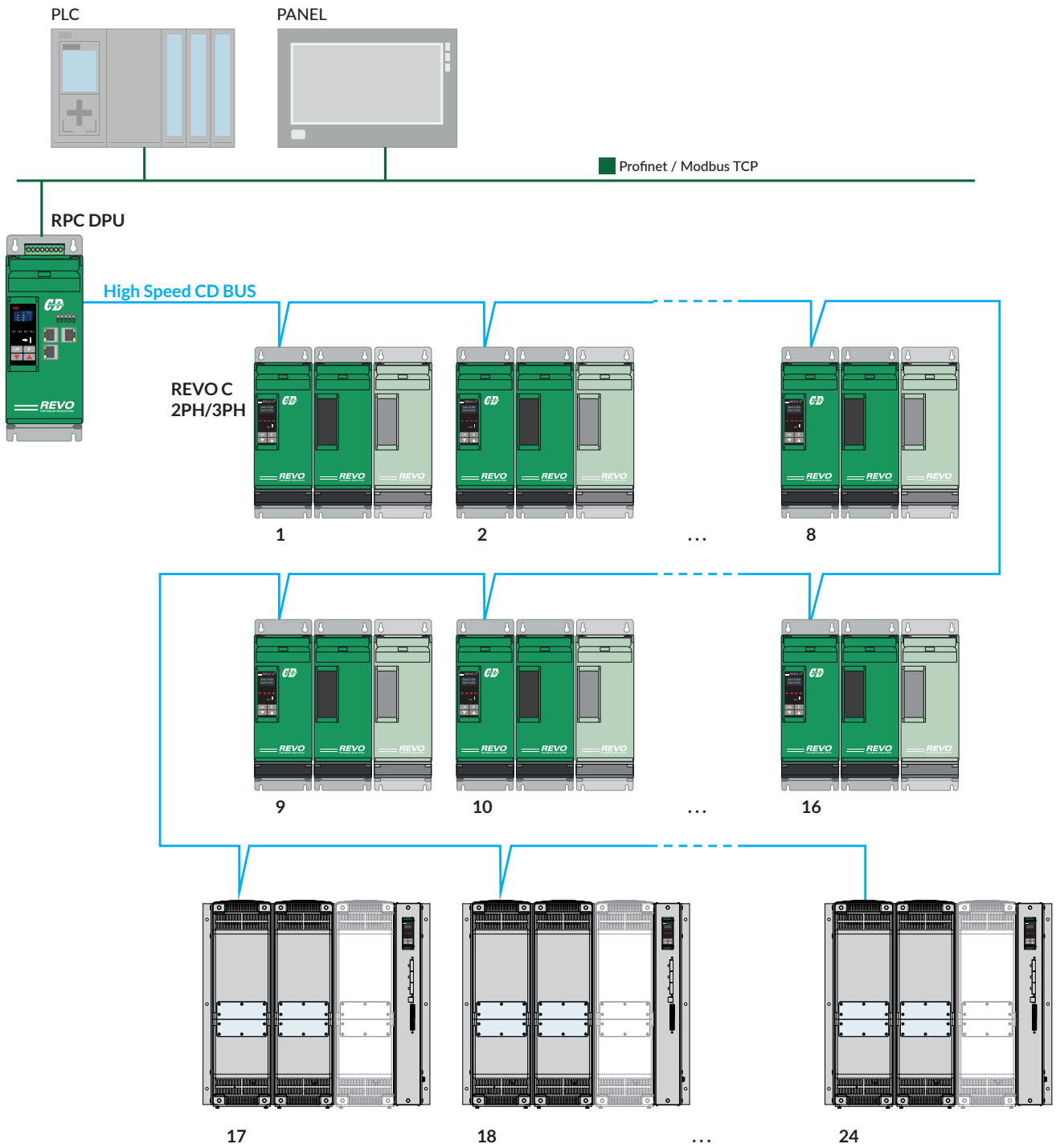


The **most advanced solution** offered by CD Automation for controlling **special loads**, which allows a synchronisation module to be combined with intelligent power regulators from the REVEX and REVO C series, increasing their operational functions.

- In particular, single-phase and three-phase units can have a phase angle firing, with soft start and current limit, to protect the load and reduce initial surges in certain special loads. Once the firing phase is complete, the system automatically switches to synchronised pulse mode, ensuring stable and efficient operation.
- The system maintains single loop integrity, as the synchronisation module is separate from the individual power regulators, which can be replaced with a single spare part.
- It manages up to 24 single-phase or three-phase loads via a dedicated bus and is compatible with REVO C / REVEX 1-2-3PH units from 30 to 2100A.
- It includes a standard Modbus TCP port, with Profnet, EtherCAT or Ethernet IP options, allowing control of the power setpoint and reading of the main electrical variables.
- The units retain an analogue input and/or a second communication port as an option, which can be used as a backup.
- Also suitable for distributed solutions: the synchronisation bus can manage units installed in separate panels.



Example of a structure REVO DPU - 24 channels with REVO C 2PH/3PH up to 2100A



Industrial PID thermoregulators

With decades of experience in manufacturing complete electrical power control solutions, CD Automation can supply a wide range of industrial temperature controllers for controlling and regulating industrial plants. These can be single loop, multi-loop, programmable, universal and multi-zone. Here are some solutions.

Single Loop: COMPACT

COMPACT, a compact DIN-rail controller, is the ideal solution for devices with few temperature control loops. It has 3 outputs (1 analogue and 2 logic/SSR) and RS485 Modbus RTU serial communication. Let's look at the main features in detail:

- Three outputs: SSR, 0-10V & 4-20mA.
- Optional 6A back-up relays to be connected to the logic outputs.
- Modbus RTU or fieldbus communication via termination module in Profinet or Modbus TCP.
- USB programming port at front of unit for PC connection.
- Free CD Automation software for configuration.



REVO RT Loop

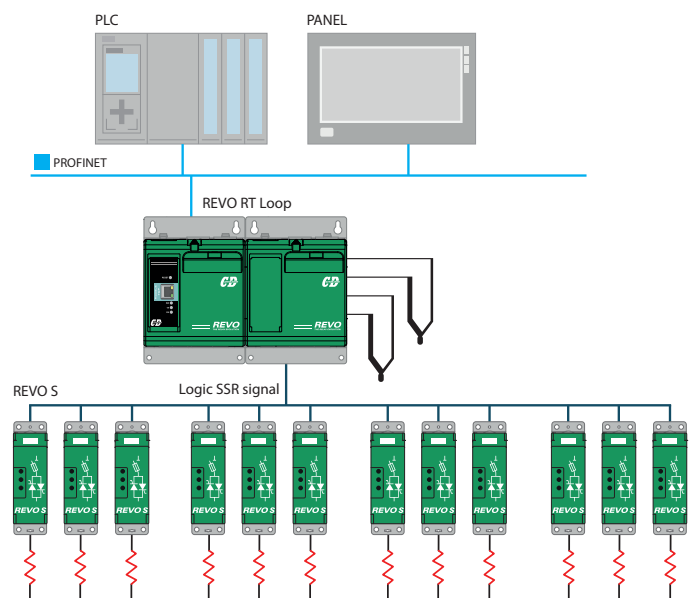
REVO RT Loop is a multi-zone PID controller in a modular rear panel capable of managing single- or dual-trip zones. Heating management is via logic outputs to be connected to external static units, which allow the control of electric heaters.

RT Loop can operate independently or dialogue with a PLC; it is designed to replace single-loop controllers on systems with many zones or to take the temperature control part away from the PLC.

It is a modular system, where each module contains one or more 3-loop controller boards.

Each controller board includes:

- 3 process inputs configurable as thermocouple or analogue.
- 3 SSR outputs for controlling external REVO S static units, for heating control.
- 3 Current sensor inputs for heater break alarm.
- 4 Relays used for alarm or cooling output.
- 1 Relay used for start function.
- 1 Digital input.
- Energy optimisation function, called "ECO"
- Soft start.
- WatchDog on serial communication
- Autotuning.
- 100ms sampling time.
- Several types of process alarms available.
- Up to 24 zones per branch with Fieldbus or 90 zones with Modbus RTU communication.



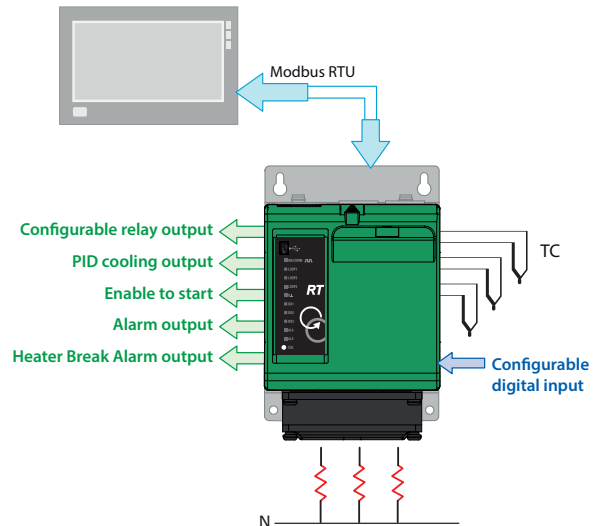
Multi Loop Systems with Integrated Power

Multi Loop: REVO RT

Multi-loop controllers are used to control different types of plastics machines in systems that require more than one control loop within a single system.

REVO RT offers temperature and power regulation integrated in a single package and includes:

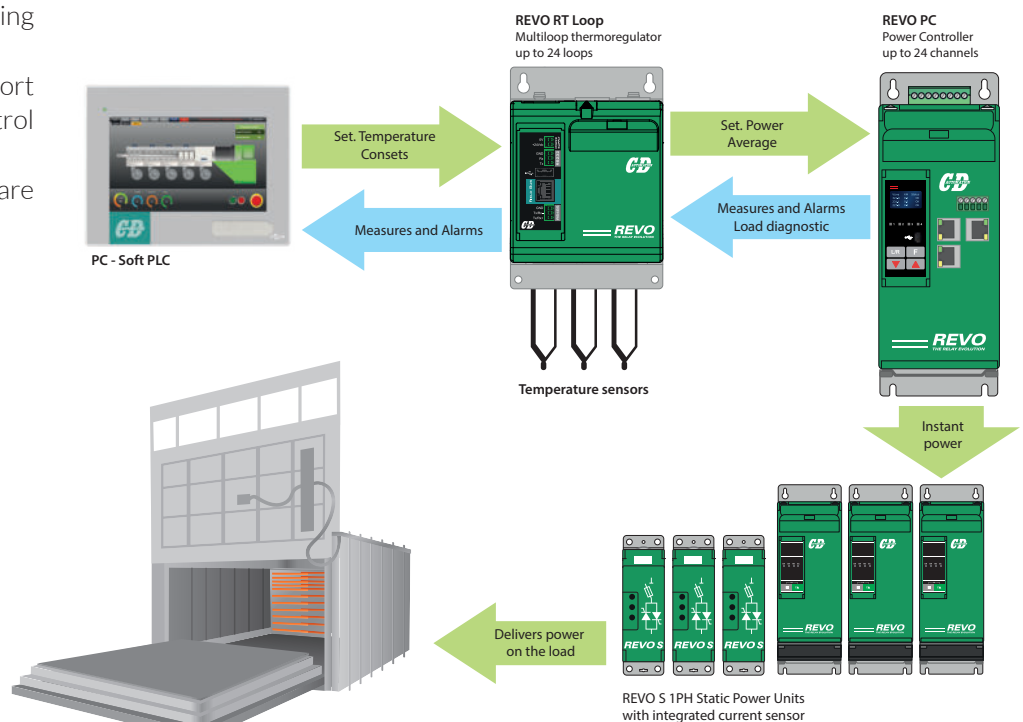
- Two to three single/double action control loops.
- Two to three SSR static units configurable in single-phase or three-phase.
- Integrated fuse holder with extrarapid fuses.
- Current transformers.
- Load and SCR diagnostic.
- Outputs for alarms/fan.
- Modbus RTU communication.
- Free CD Automation software for configuration.



REVO Power network

REVO RT Power Network is a high-end solution for integrated control of multi-loop heating systems, combining precise temperature regulation with energy optimization to add value to your process. It consists of a temperature control area managed by the REVO RTL system, which communicates via a dedicated bus with the power control area based on REVO PN/PC, creating a single communication node that brings together the advantages of each individual component.

- 2 to 24 single or double tripping controllers per node.
- A single communication port for controlling the main control and power parameters.
- Free CD Automation software for configuration.



Configuration and accessories

Configurator Software

CDA Thyristor configurator software is free and can be downloaded from our site www.cdautomation.com. If the Order Code is in line with your requirement, and already configured in the Factory, then it's ready to use.

You need the software only to modify the ordered configuration, although we suggest to check the unit on the machine with the "Test unit" section. To install the software, load the program and follow the instructions on the screen.

Run the software configurator and set the serial port of the PC with baudrate.

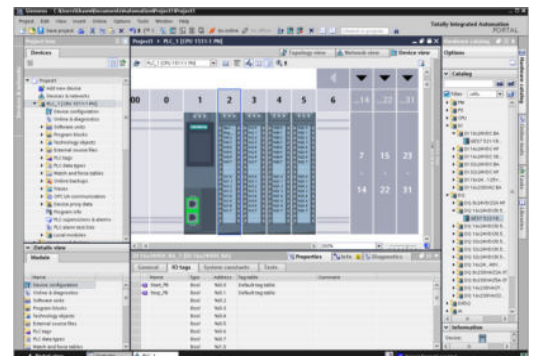


Libraries For Siemens TIA Portal

Listening to the needs of our customers, CD Automation has developed libraries for Siemens PLC, to aid simplicity, speed of implementation and replicability of stored profiles.

There are many benefits from these libraries and include:

- Specialized function blocks for each protocol.
- Variables already named, the same for all blocks and with the same data formatting.
- Sample projects ready for use.



To obtain them, simply go to our website www.cdautomation.com and request on the dedicated web page.

Ready-to-Use Connectivity Projects for Rockwell, Beckhoff & CODESYS PLCs

We provide ready-made example projects for seamless integration of our units with Rockwell PLCs over Ethernet/IP, Beckhoff PLCs within TwinCAT via EtherCAT, and PLCs programmed in the CODESYS development environment using EtherCAT, accelerating set-up and reducing engineering time and effort.

What our Customers want?

They want a positive experience with our total solution, not just a low price!

CD Automation is confident in achieving this through ...

A Competent Sales Team

- Our dedicated team of commercial technicians specializes exclusively in CD Automation products.
- You'll benefit from expert guidance at no additional cost – not from someone offering a wide range of unfamiliar products.
- Additionally, you'll have direct access to our Design Engineers for technical advice or to develop customized solutions tailored to your specific application requirements.



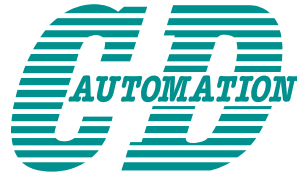
Fast service

- Excellent pre-sales and post-sales assistance.
- Remote assistance through “team viewer” or other applications on our thyristor units.

Ease of doing business with us

- Fast reaction to your quotation requests, fast deliveries and accounting documentation in a very short time.
- Catalogs and manuals of all our products available on the site with the addition of free configuration software.

Our products are quick to install and maintain, backed by easy manuals. We add complexity only when the application demands it – simple tasks stay managed by simple units, while advanced modes deliver granular control in advanced series. A broad product range lets you specify exactly what you need, free of superfluous features.



Controllers, Drives & Automation

 Products made in Italy

Worldwide distribution and service

CD Automation Country Locations



CD Automation, a leader in the control of heating elements, has been offering top quality solutions in the field of industrial temperature control for over thirty years. The company supplies thyristor power units and SCR power controllers, making it the leading partner in the industry.

CD Automation offers a support service for the development, optimisation, sustainability and energy efficiency of thermal processes, improving plant power quality.

Our team will be at your disposal to deepen, analyse and optimise your applications.

Headquarter: Italy

CD Automation Srl
Via Picasso, 34/36
20025 Legnano MI - Italy
T +39 0331 577479
F +39 0331 579479
sales@cdautomation.com
www.cdautomation.com

United Kingdom

CD Automation UK Ltd
Unit 9 Harvington Business Park
Brampton Road, Eastbourne
East Sussex, BN22 9BN - England
T +44 1323 811100
info@cdautomation.co.uk
www.cdautomation.co.uk

India

M/s Toshcon CD Automation Pvt. Ltd.
H1 - 75 Gegal Industrial Area
Ajmer - 305023 (Raj.) - India
T +91 145 2791112
T +91 145 6450601/2/3
sales.cd@toshcon.com
www.cdautomation.in