MULTICHANNEL
POWER CONTROLLER

CD AUTOMATION

powered by innovation

REVO MULTICHANNEL

Presentation of the

Through every stage; from planning, operation, to service and maintenance, REVO saves up to 70% in time and money compared to a multiple, single component heating solution. REVO will improve your heating process, the quality of the product and guarantee shorter downtimes.

All in One unit:

Total integration of all components and functionality for the control of electric heating elements in a modular system.

Less overhead

More than 70% less wiring in the control cabinet.

Entry into service

Up to 20% faster, on site.

Reduced footprint

Up to 80% space saving in the control cabinet.

Intelligent diagnostics

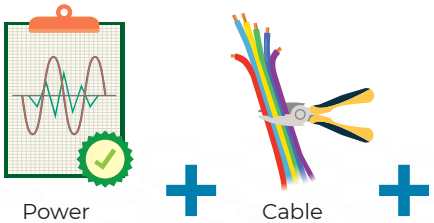
Detect and locate errors in the load circuit with the support of the TIA system.

Simple integration of the heating process

Utilize existing libraries, templates and project examples for simple process integration of your heating system to Siemens or Rockwell PLC's. The TIA Portal guarantees the complete integration of all components with a shared database.

Integrated load management

Software algorithm's optimise performance by distributing the load over the network.



POWER CONTROLLER

REVO multichannel family

Choose the optimal solution for your application

Choose between different heating control systems and select if the temperature regulation is managed within the REVO system or the PLC.
Every system has different characteristics in terms of number of managed channels and maximum output power for each channel.

REVO POWER NETWORK

Multi-zoned solution with firing synchronization based on the algorithm "**Dynamic Burst Firing**".

REVO PN: up to 24 power zones of 25A, 480Vmax for each module.

REVO PB: up to 3 power zones from 35A to 90A for each module.

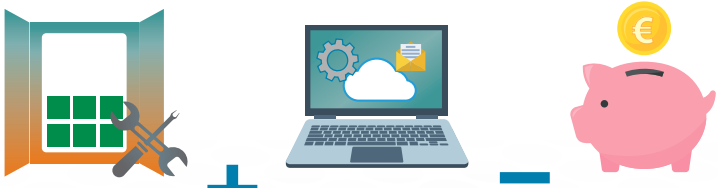
REVO PC: 24 outputs unit that can be used for the SSR input and TA for current detection.

REVO TH

Up to 3 single phase zones of 35A to 90A power for each module with Phase Angle, Soft Start and Current Limit switching plus communication or fieldbus modules.

REVO RTL Advanced

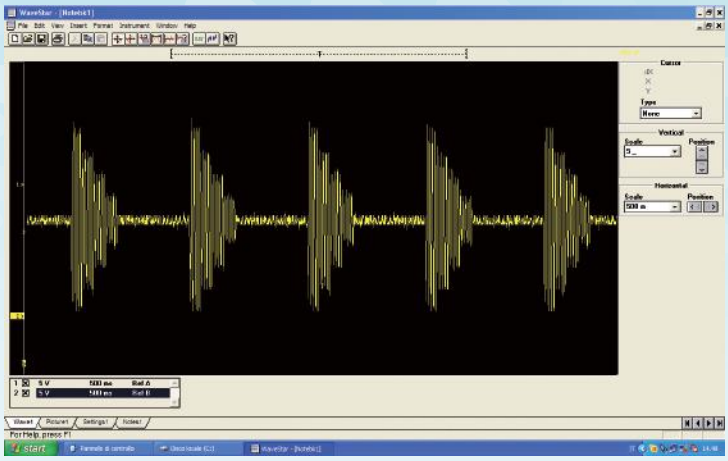
Multi-zone temperature control unit, combined with Power Network and REVO TH series modules, or with REVEX 1-2-3PH, or REVEX PA single-zone modules.



Space savings + System integration = Price reduction

POWER

The optimisation algorithm, distributes the required keeping the line current

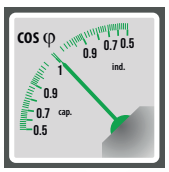


Without power control optimization

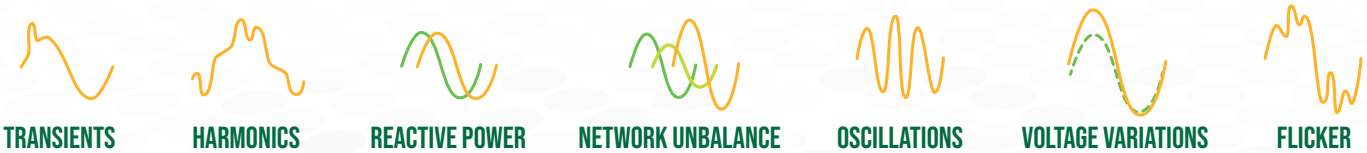
Power Quality

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

These disturbances are generally caused by flickering, harmonics due to the insertion of unsynchronised loads with a negative impact on power quality.

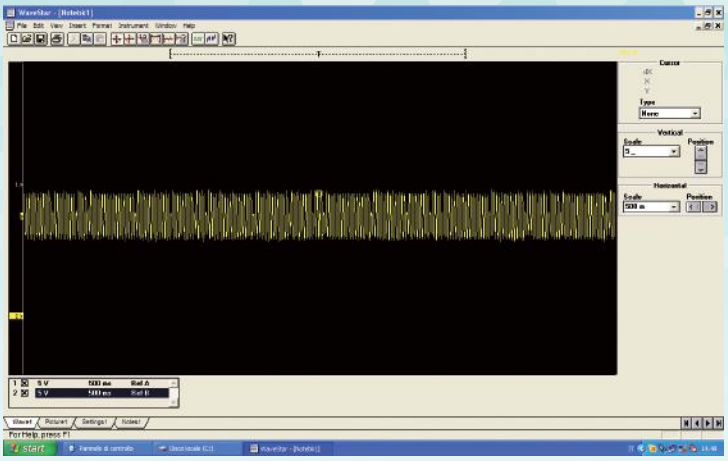


Thanks to the new **REVO POWER NETWORK control system** and **Dynamic Burst Firing technology** for optimised load control, the Power Factor value is maintined close to 1, minimising energy cost penalties and disturbances to the grid.



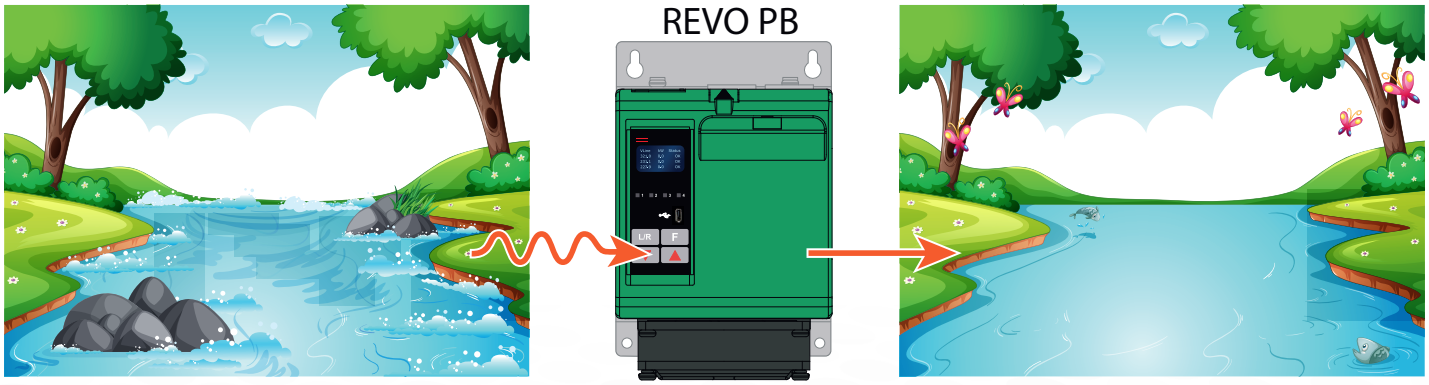
QUALITY OBJECTIVE

like a conductor, power to the individual zones as constant as possible

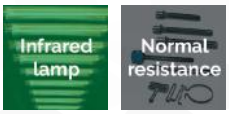


With power control optimization

The power fed into the grid without synchronization looks a lot like a raging river.
REVO PB distributes the power demand of individual zones while keeping the current draw as constant as possible and eliminating problematic unwanted peaks.

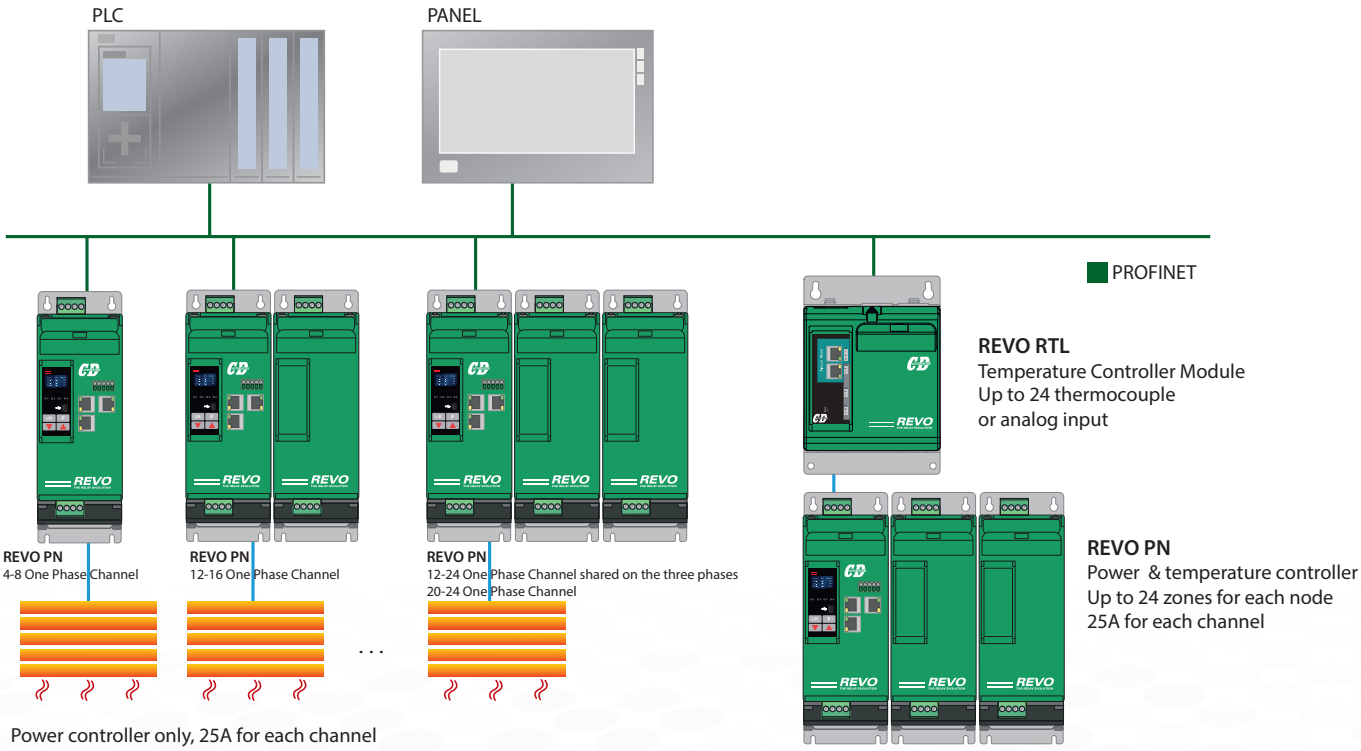


REVO PN Power Network



A compact and flexible solution with synchronized switching. Robust SCR junctions allow control of the most complex loads such as IR lamps with high current peaks.

- For the control of 480V heating elements.
- Can be used as a distributed solution with installation in small panels integrated within the plant.
- Ideal for controlling IR lamps for heating processes in PET bottle production, extruders and co-extrusion systems, ovens with IR lamps and multi-zone ovens.
- Exceptionally space-saving and cost-effective heating solution with various output modules from 4 to 24 zones at 25A per fieldbus node, optional I/O modules and temperature control cards.
- Engineering Tools for TIA Portal and Rockwell PLC examples.
- Profinet, Profibus, Ethernet IP and Modbus TCP integrated in the unit depending on the code selected.

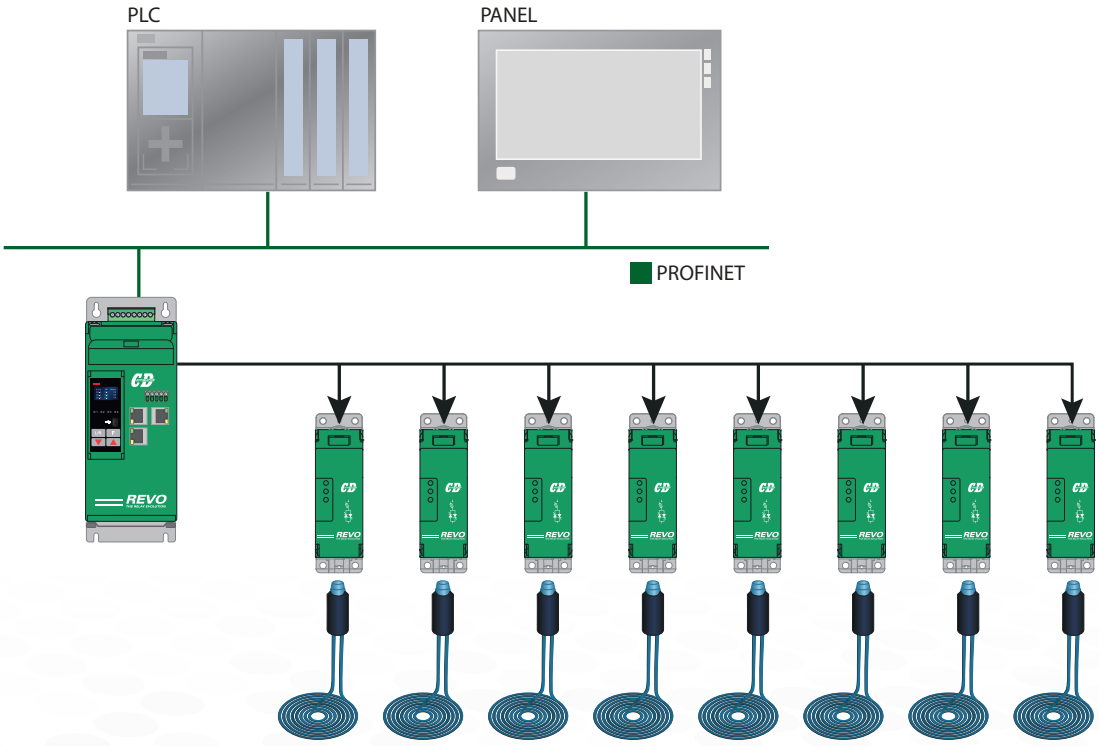


QUALITY OBJECTIVE

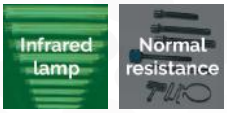
REVO PC Power Controller

Total flexiblility with synchronized switching and single loop integrity. REVO PC uses the same control technology as the REVO PN series, but keeps the synchronisation and communication unit separate from the thyristor power management of the individual channels, which is handled by the REVO S 1PH or multiple REVO Sx series units.

- To control heating elements with maximum voltages of 480V, 600V or 690V.
- Current ratings from 3A to 800A, three-phase and single-phase connections complete with extra fast fuses.
- Ideal for the control of IR lamps, Resistors for Extrusion and Injection Lines for plastics and elastomers. Furnaces with IR lamps and multi-zone furnaces for glass, steel and ceramics.
- REVO PC control modules for 8 to 24 channel control of each fieldbus node, a dedicated current sensor input for each SSR for maximum accuracy, optional I/O modules and temperature control boards.
- Engineering Tools for TIA Portal and examples for Rockwell PLCs.
- Profinet, Profibus, Ethernet IP and Modbus TCP integrated in the unit depending on the code selected.



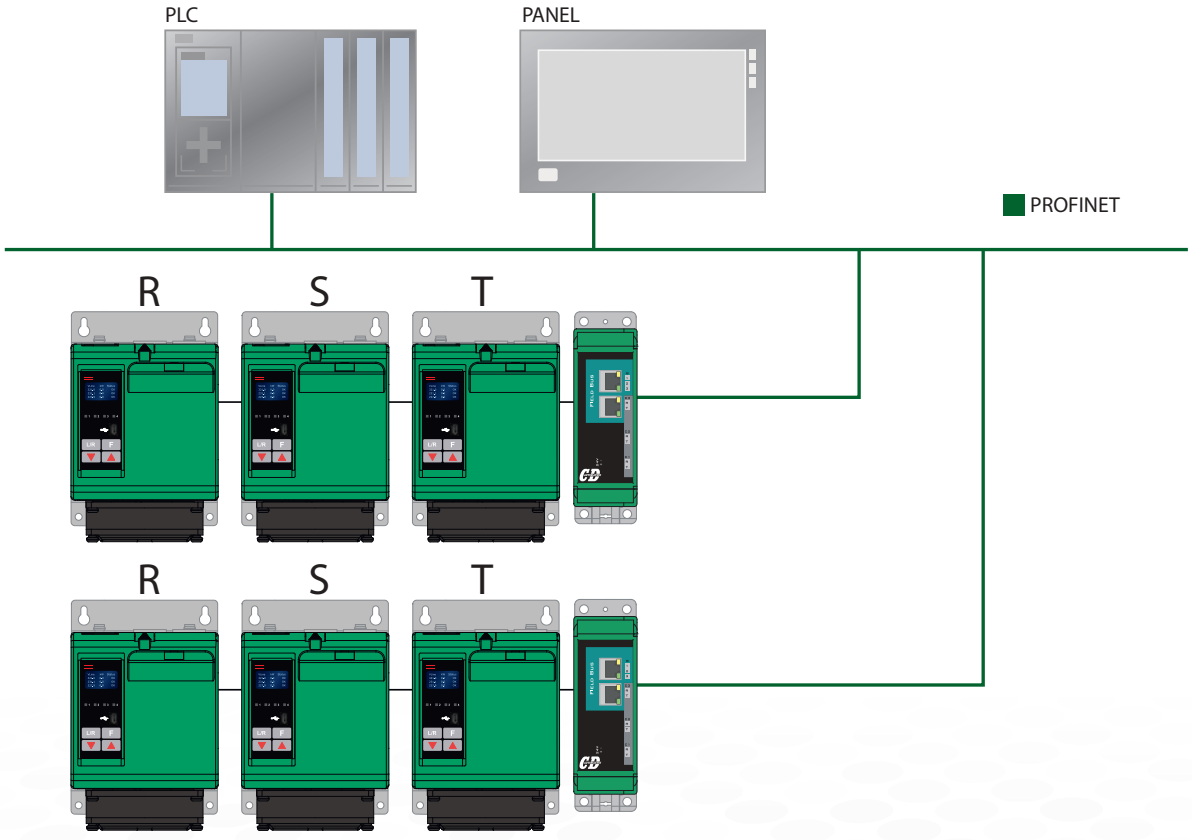
REVO PB Power Network



A compact and powerful solution for controlling resistors and lamps up to 90A per channel at 480V or 600V.

The basic REVO PB Power Network enables the economical management of loads in a synchronized manner with rapid switch-on at zero crossing. Suitable for systems ranging from three to twelve zones with currents of 35A, 50A, 75A and 90A per channel single-phase.

- Integrated fuses for each channel and optional temperature control with RTL modules.
- External termination modules for management of 9-zone branches in Profibus, Profinet, Modbus TCP and Ethernet IP.
- Standard integrated diagnostics for load monitoring and junction faults.
- Integrated display and keypad as standard.



QUALITY OBJECTIVE

Power optimization

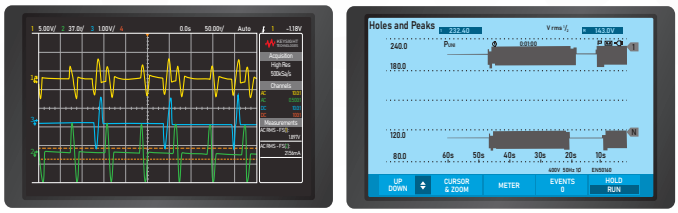
Without REVO PB

With REVO PB

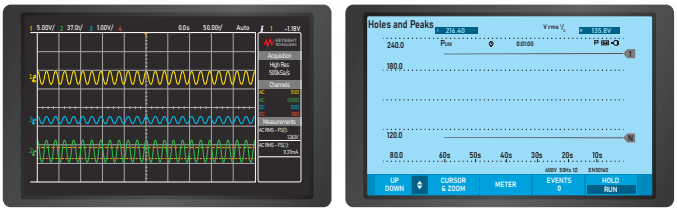
In multi-zone applications, the addition of multiple non-synchronized loads can generate a peak current that produces disturbances on the power line.
REVO PB distributes the power demand of the individual zones keeping the line current as constant as possible.

Network disturbance

Without REVO PB



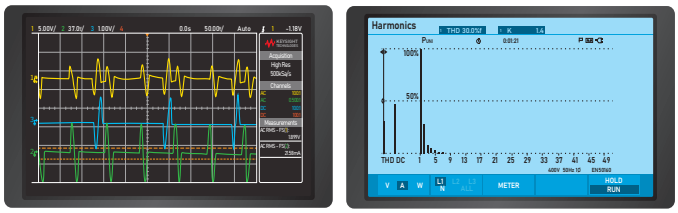
With REVO PB



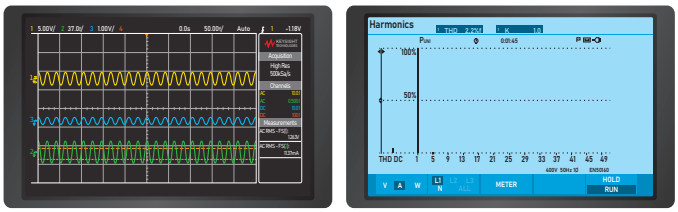
The addition of unsynchronized loads on the power line can cause disturbances, such as fluctuations in the mains voltage (Flickering) and network holes/losses on power cables.

Harmonic component

Without REVO PB



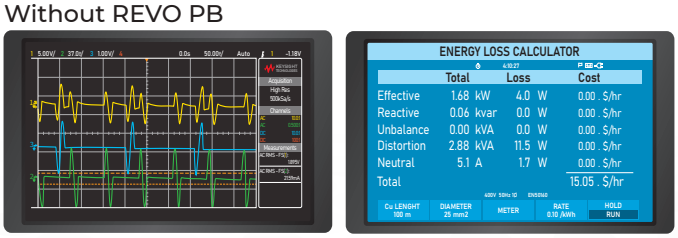
With REVO PB



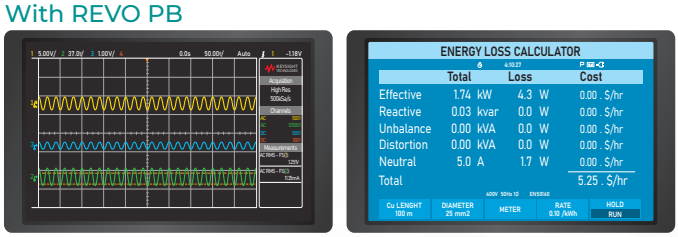
The management and addition of unsynchronized loads can lead to an increase in the harmonic component generated (THD). This effect increases losses, generates noise and can generate overheating of the power cables.

Optimization of energy cost

Without REVO PB



With REVO PB



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

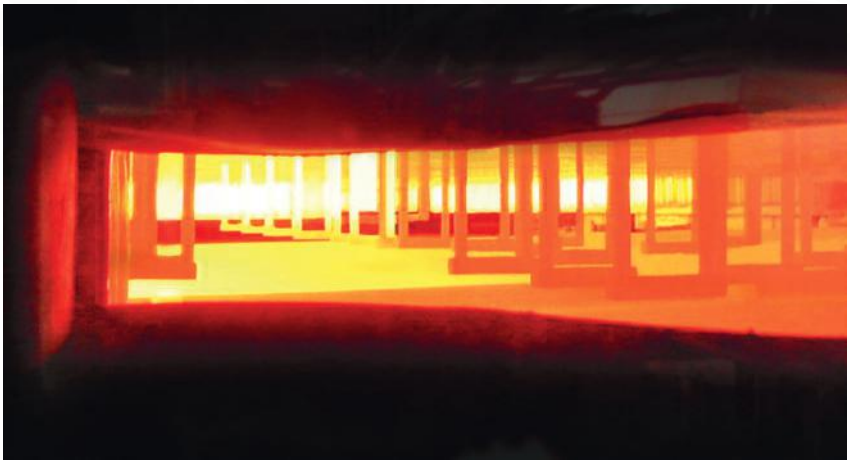
Special loads

$MoSi_2$ Heating elements (KANTHAL SUPER®)

This type of heater increases its resistivity significantly with temperature but does not change with age.
The initial current with cold elements can be 16 times the rated current.
For this type of application use phase angle firing with soft start (3 sec.) and current limit.

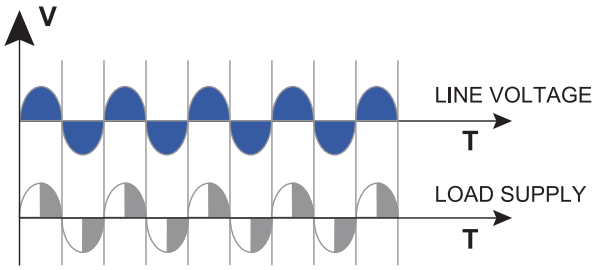
Silicon Carbide elements (Inductive loads)

This type of heater increases its resistivity significantly with temperature but does not change with age.
The initial current with cold elements can be 16 times the rated current.



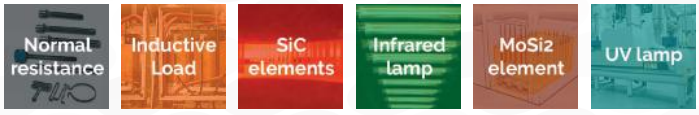
Phase Angle

With Phase Angle it is possible to control the power at the load by allowing the thyristor to be in conduction for a variable part of the half-wave of the supply voltage. The power at the load can be set from 0 to 100% as a function of the analogue input signal, normally from a regulator or potentiometer. It is a function usually used with inductive type loads.



REQUIRING PHASE ANGLE FIRING

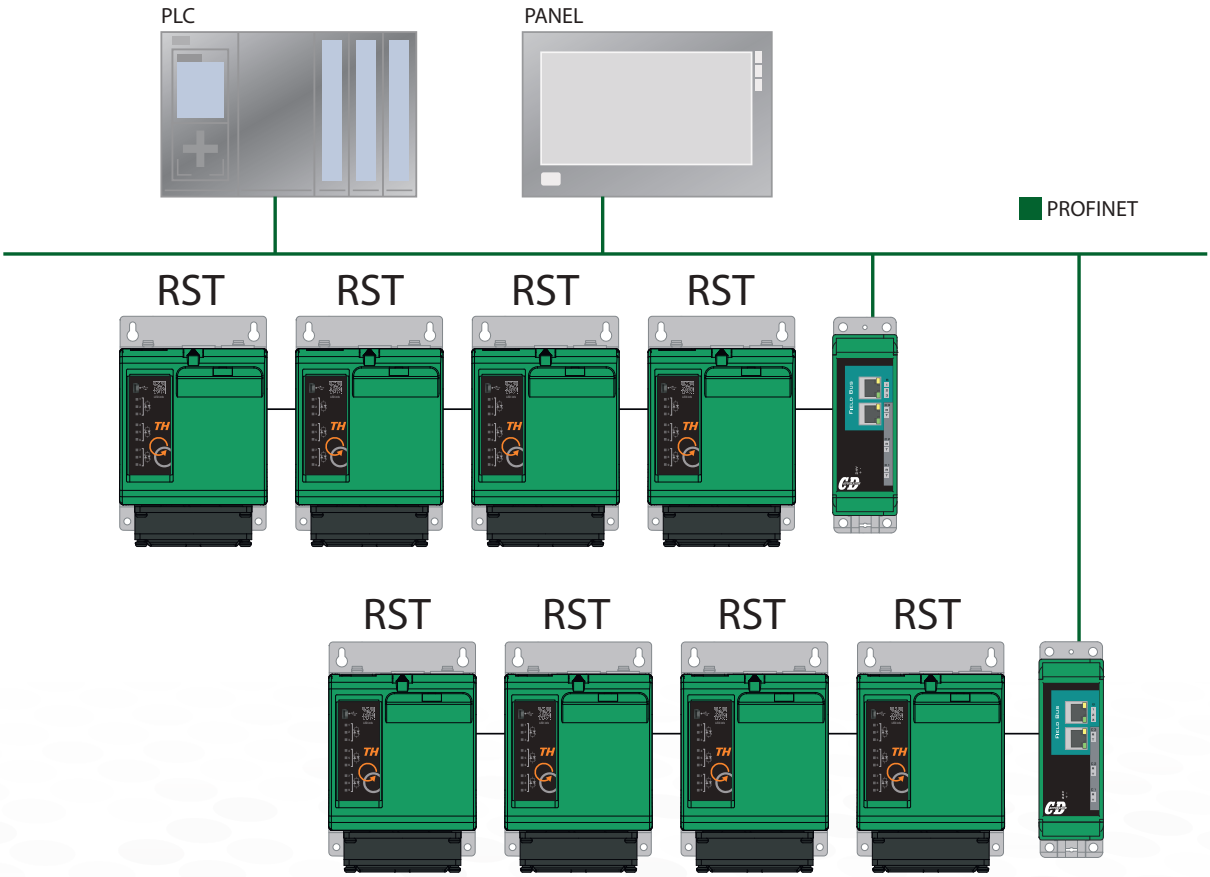
REVO TH
Multi Channel Power Controller



Complex loads with phase angle and current limit

REVO TH is a compact and powerful solution to control special resistors, transformers and lamps up to 90A per channel at 480V or 600V.

- REVO TH is a three channel unit with phase angle firing, soft start and current limit used for inductive and special loads to half and single cycle for controlling low inertia loads such as IR lamps, MoSi2 resistors and special loads such as SiC.
- Integrated fuses for each channel and optional temperature control with RTL modules.
- External termination modules for management of 9-zone branches in Profibus, Profinet, Modbus TCP and Ethernet IP.



Family	REVO PN 104 - 108 - 112 - 116 - 120 - 124	REVO PB	REVO TH
Max. output current per output	25A	35, 50, 75 or 90A	35, 50, 75 or 90A
Max Load Voltage	480V	480V or 600V	480V or 600V
Number of output for each module	4, 8, 12, 16, 20 o 24	3	3
Fieldbus and communication	Integrated	with Terminal Unit	with Terminal Unit
Modbus TCP	Standard	Optional	Optional
Modbus RTU	Standard	Standard	Standard
CD BUS for REVO RTL	Standard	Standard	Standard
Profinet	Optional	Optional	Optional
Profibus	Optional	Optional	Optional
Ethernet IP	Optional	Optional	Optional
Heater Break Alarm	Optional	Optional	Optional
Integrated Fuses and Current Sensor	Standard	Standard	Standard
Temperature Controller Features RT or RTL option	Optional	Optional	Optional
Main PID Heating Control Out	Optional	Optional	Optional
Secondary PID Relay Output for Cooling or Alarm	Optional	Optional	Optional
Digital Input	Standard	Standard	Standard
Relay Output for Alarm or Start	With HB option	With HB option	With HB option
Aux. Power Supply	24Vdc	24Vdc	24Vdc
Load type	Resistive Loads	Resistive Loads	Resistive Loads or Inductive Loads
Connection	1 wire	1 wire	1, 4 or 6 wires
1PH Phase-Phase. All the output share the same connection	YES	YES	NO
1PH Phase-Neutral. All the output share the same connection	YES	YES	NO
2PH Delta or star without neutral	NO	NO	NO
3PH Delta or star without neutral	NO	NO	NO
3PH star with neutral	NO	NO	NO
1PH Loads distribuited on the three phases (Phase-Phase) in the same unit	NO	NO	YES
1PH Loads distribuited on the three phases (Phase-Neutral) in the same unit	NO	NO	YES
Control Mode	V, V2, I, I2, VxI	V, V2, I, I2, VxI	V, V2, I, I2, VxI
Simple Burst firing without Synchronization	Standard	Standard	Standard
Half Cycle or Single Cycle without Synchronization	Standard	Standard	Standard
Dynamic Burst firing with Synchronization	Standard	Standard	Standard
Dynamic Half Cycle or Single Cycle with Synchronization	Standard	Standard	Standard
Phase Angle firing with or without Soft Start	NO	NO	Standard
Phase Angle firing + Current Limit with or without Soft Start	NO	NO	Standard

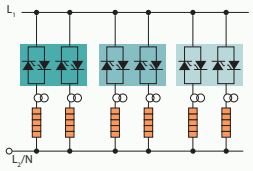
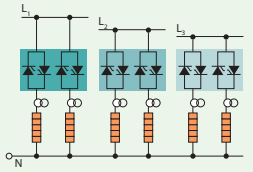
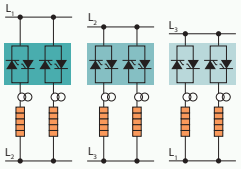
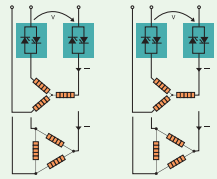
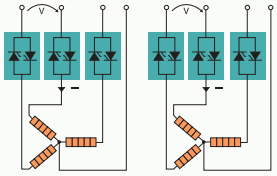
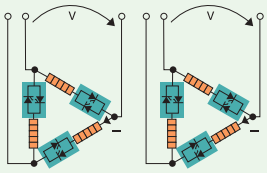
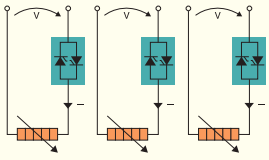
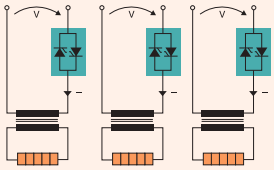
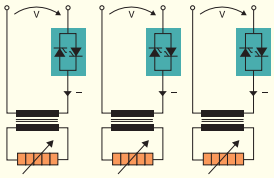
* For non controlled phases, it's necessary to use an external current sensor (only for two legs control).

FEATURES

					
REVO PN 412 - 424	**REVO PC 412 - 424**	**REVO PN 612 - 624**	**REVO PC 612 - 624**	**REVO PC 204 - 208**	**REVO PC 304 - 308**
25A	From 3 to 800A REVO S 1PH	25A	From 3 to 800A REVO S 1PH	From 3 to 800A REVO S 1PH	From 3 to 800A REVO S 1PH
480V	480V, 600V or 690V	480V	480V, 600V or 690V	480V, 600V or 690V	480V, 600V or 690V
12 or 24	12 or 24	12 or 24	12 or 24	8 or 16 to control 4 or 8 x two legs 3 phase loads	12 or 24 to control 4 or 8 x 3 legs 3 phase loads
Integrated	Integrated	Integrated	Integrated	Integrated	Integrated
Standard	Standard	Standard	Standard	Standard	Standard
Standard	Standard	Standard	Standard	Standard	Standard
Standard	Standard	Standard	Standard	Standard	Standard
Optional	Optional	Optional	Optional	Optional	Optional
Optional	Optional	Optional	Optional	Optional	Optional
Optional	Optional	Optional	Optional	Optional	Optional
Optional	Optional	Optional	Optional	Optional	Optional
Standard	Standard ("Y" option on REVO S)	Standard	Standard ("Y" option on REVO S)	Standard ("Y" option on REVO S*)	Standard ("Y" option on REVO S)
Optional	Optional	Optional	Optional	Optional	Optional
Optional	Optional	Optional	Optional	Optional	Optional
Optional	Optional	Optional	Optional	Optional	Optional
Standard	Standard	Standard	Standard	Standard	Standard
With HB option	With HB option	With HB option	With HB option	With HB option	With HB option
24Vdc	24Vdc	24Vdc	24Vdc	24Vdc	24Vdc
Resistive Loads	Resistive Loads	Resistive Loads	Resistive Loads	Resistive Loads	Resistive Loads
4 wires	4 wires	6 wires	6 wires	3 wires, 2 legs control	3 wires, 3 legs control
NO	NO	YES	YES	NO	NO
YES	YES	NO	NO	NO	NO
NO	NO	NO	NO	YES	YES
NO	NO	NO	NO	YES	YES
YES	YES	NO	NO	NO	YES
NO	NO	YES	YES	NO	NO
YES	YES	NO	NO	NO	NO
V, V2, I, I2, VxI	V, V2, I, I2, VxI	V, V2, I, I2, VxI	V, V2, I, I2, VxI	V, V2, I, I2, VxI	V, V2, I, I2, VxI
Standard	Standard	Standard	Standard	Standard	Standard
Standard	Standard	Standard	Standard	NO	NO
Standard	Standard	Standard	Standard	Standard	Standard
Standard	Standard	Standard	Standard	NO	NO
NO	NO	NO	NO	NO	NO
NO	NO	NO	NO	NO	NO

** Synchronization firing is available only if all the three zone have the same wiring connection.

Application guide for multichannel

Load type	Application guide	Modell	Voltage range	Number of channels per unit and modularity	Controlled phases per channel
	1PH loads sharing same phase connection, Normal Resistance, Infrared Lamp Medium and Short Waveform	REVO PB	35A-90A	3	1
		REVO PN 1	25A	4, 8, 12, 16, 20 or 24	1
		REVO PC 1 + REVO S	3.5A-2100A	24	1
	1PH loads shared on the three phases (Phase - Neutral), Normal Resistance, Infrared Lamp Medium and Short Waveform	N°3 of REVO PB	35A - 90A	3	1
		REVO PN 4	25A	12 or 24	1
		REVO PC 4 + REVO S	3.5A-2100A	24	1
	1PH loads sharing same phase connection (Phase - Phase), Normal Resistance, Infrared Lamp Medium and Short Waveform	N°3 of REVO PB	35A - 90A	3	1
		REVO PN 6	25A	12 or 24	1
		REVO PC 6 + REVO S	3.5A-2100A	24	1
	Star without neutral or Close Delta connections, Normal Resistance, Infrared Lamp Medium and Short Waveform	REVO PC 2 + REVO S	3.5A-2100A	8	2
	Star plus neutral, Normal Resistance, Infrared Lamp Medium and Short Waveform	REVO PN 4	25A	8	3
		REVO PC 3 + REVO S	3.5A-2100A	8	3
	Open Delta connections, Normal Resistance, Infrared Lamp Medium and Short Waveform	REVO TH	35A - 90A	3	1
		REVO PN 6	25A	12 or 24	3
		REVO PC 6 + REVO S	3.5A-2100A	8	3
	1PH loads Molibdenum, Tungstenum, Kanthal Super, Platinum.	REVO TH	35A - 90A	3	1
	1PH loads Silicon Carbide Elements	REVO TH	35A - 90A	3	1
	1PH Transformer coupled with normal resistances	REVO TH	35A - 90A	3	1
	1PH Transformer coupled with Silicon Carbide Elements	REVO TH	35A - 90A	3	1
	1PH Transformer coupled with Kanthal Super	REVO TH	35A - 90A	3	1
	Other Loads and other connections	REVO S, REVEX or REVO C	3.5A-2100A	1	1

Thyristor control units

Suggested Firing mode				
Dynamic Burst Firing	Standard Burst Firing	Phase Angle + Soft Start + Current Limit	Delayed Triggering	
+				For application with multiple resistive loads, with low variations in temperature and age or Low inertia like Infrared IRSW, Dynamic Burst Firing is recommended with power synchronization. For infrared lamp is also available Phase Angle (PA) firing
+				
+				
+				
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	+	+		
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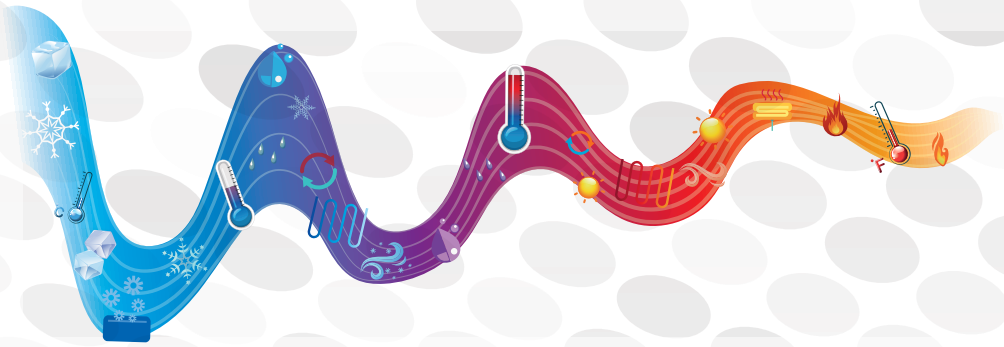
+				
		+		These resistances change with temperature but have low variations with age. Starting current with cold elements can be 16 times nominal current (Kanthal® super). Infrared lamp short waveform can reach 8 time nominal current
		+		These resistances change value with temperature and age and value at the end of element life is 4 times the initial value. Constant power regulation is necessary with V to VxI Transfer.
		+	+	Transformers and inductors have inrush current on start up. Phase Angle plus Soft Start and current limit are required. To switch the transformer ON-OFF, use DT firing that will automatically switch ON-OFF when current value is at zero.
		+		These resistances change value with temperature and age and value at the end of element life is 4 times the initial value. Constant power regulation is necessary with V to VxI Transfer.
		+		Use Phase Angle + Current Limit
				See the general thyristor catalogue



TEMPERATURE

REVO RT Loop Advanced

The RT Loop ADVANCED multi-controller system was specifically developed for temperature control, through electric heaters and infrared lamps.
In its basic configuration, it comprises a three loop controller and a field bus communication module.
By adding one or more integrated three loops cards, the system can be expanded up to 24 heating & cooling control loops.
Each control loop can be linked with one or more external power channels via dedicated communication.

RT Loop Advanced is equipped with multiple master communication ports, capable of controlling up to 24 power control channels, sending power sets and acquiring process data.
A subnet is then created, with the data available in the data table of the field bus module of the REVO RT Loop.

Each three-loop temperature controller card includes:

- 3 process inputs configurable as thermocouple or analog;
- 5 configurable Relay Outputs configurable as process alarms, cooling, diagnostic alarms, one of which for cumulative alarms (eg: enable to start motor).

Relay outputs freely associable to one or more zones

- 1 configurable digital input;
- 1 Micro USB port for PC connection;
- Modbus RTU port.

REVO TH or REVO PB

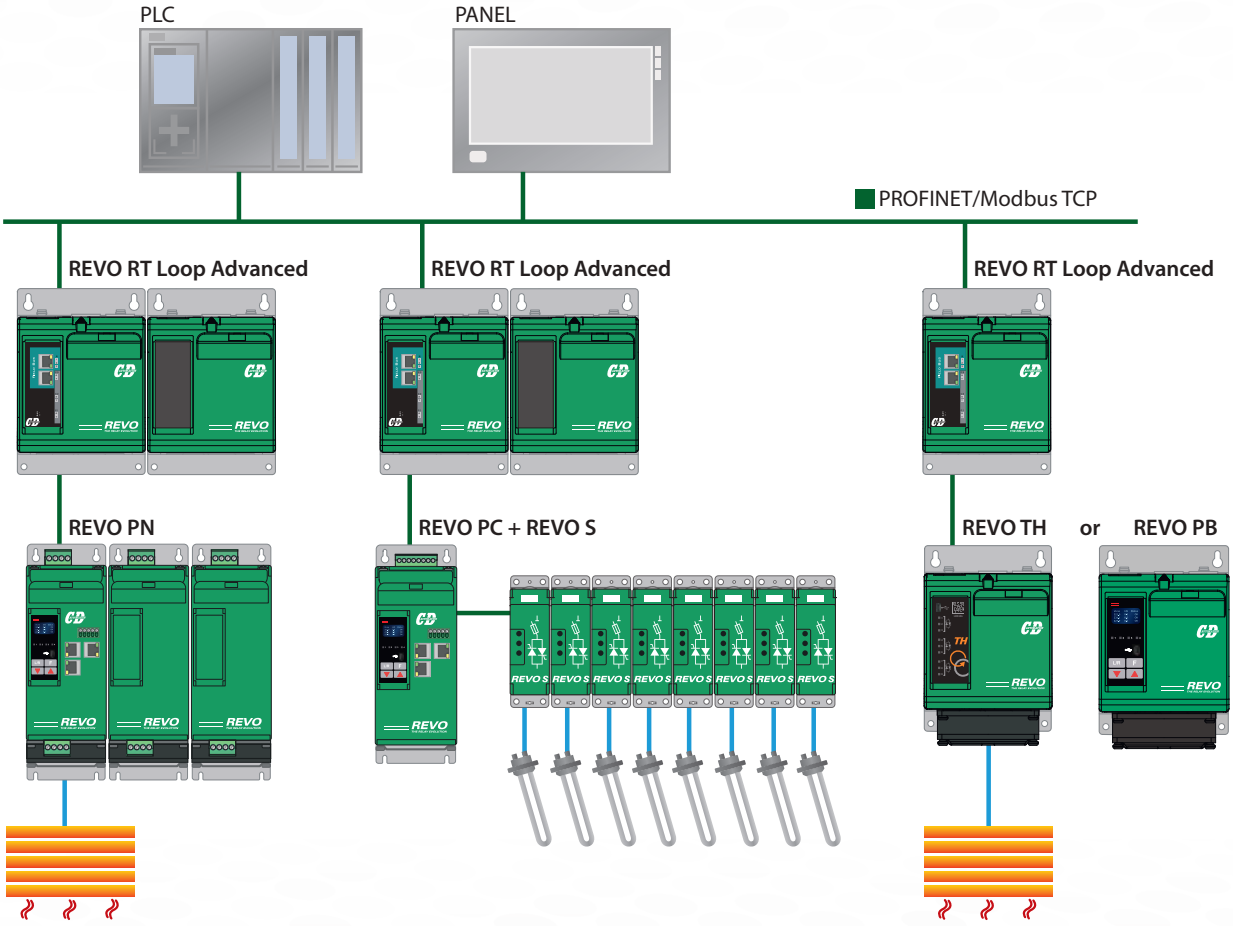
CONTROLLER

Up to 24 thermocouple or analogue inputs and 40 relay outputs per field bus node can be configured.
The individual control boards are positioned within one or more modules depending on the required order code.
If you order with the system configuration code, you get one or two modules with boards already inserted, addressed and wired.

The fieldbus communication circuitry also takes care of other functions:

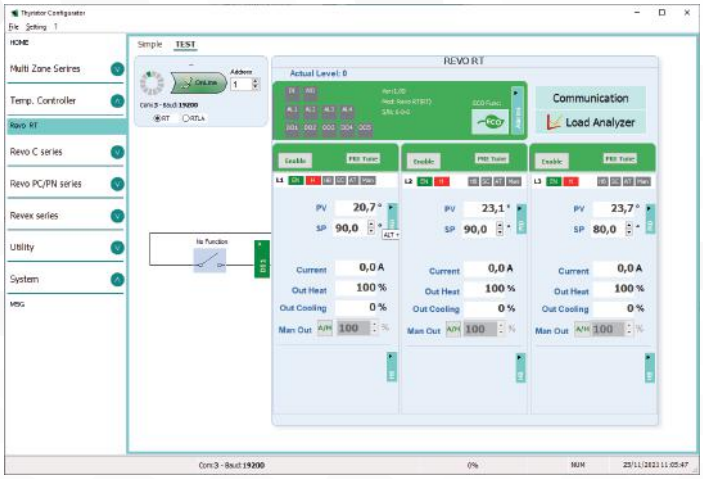
- Contains a micro USB port for PC programming of all zones.
- It can contain a copy of the zone configurations and manuals in PDF format.

In addition to Profinet, Ethernet IP, Modbus TCP, classic field buses such as Profibus DP or Modbus RTU communication are also supported.



CONFIGURATION

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.

Configuration cable

To connect the unit to the computer it's necessary use a standard micro USB cable (our code CCX).

The windows driver for USB connection is installed by thyristor configurator software installer.

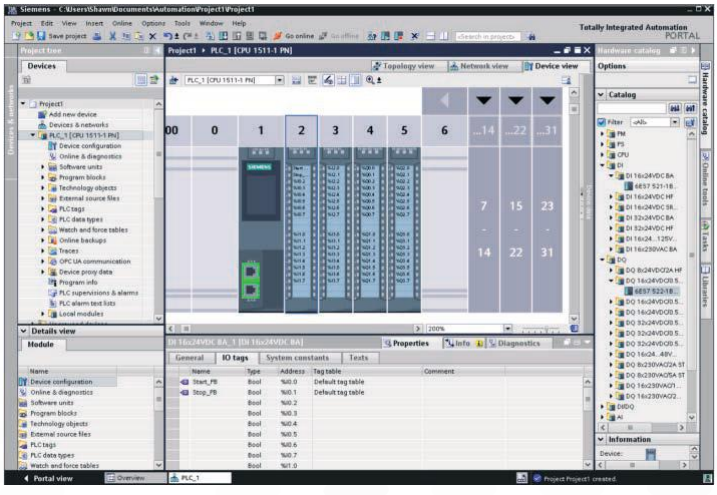
Libraries For Siemens TIA Portal

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.



REVO PN / PC program library for Rockwell Systems:

Easy integration of heating processes.

Using the REVO PN / PC program library and a detailed project example, the heating processes can be easily integrated into the automation system. The individual program blocks only need to be adapted to the respective application.

& ACCESSORIES

REVO KPC

Graphic operating terminals for REVO PC

- 7” or 10” colour display.
- Multi Language Interface.
- For 3 REVO PC.
- Makes the configuration of Thyristor units easier and more intuitive.
- 3 access levels available.
- REVO KPC can be connected to 24 zones.

What our Customers want?

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

CD Automation is sure to achieve this with ...

Competent Sales Team

- We have a team of commercial technicians focused only on our products.
- You will have a no-cost expert not one who will offer you a myriad of products with a rough knowledge of them.
- You will have easy access to our Design Engineers for advice or a special product that meets your application needs.

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.

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