



REVO RT LOOP



powered by innovation

REVO RT LOOP Multi Zone Controller



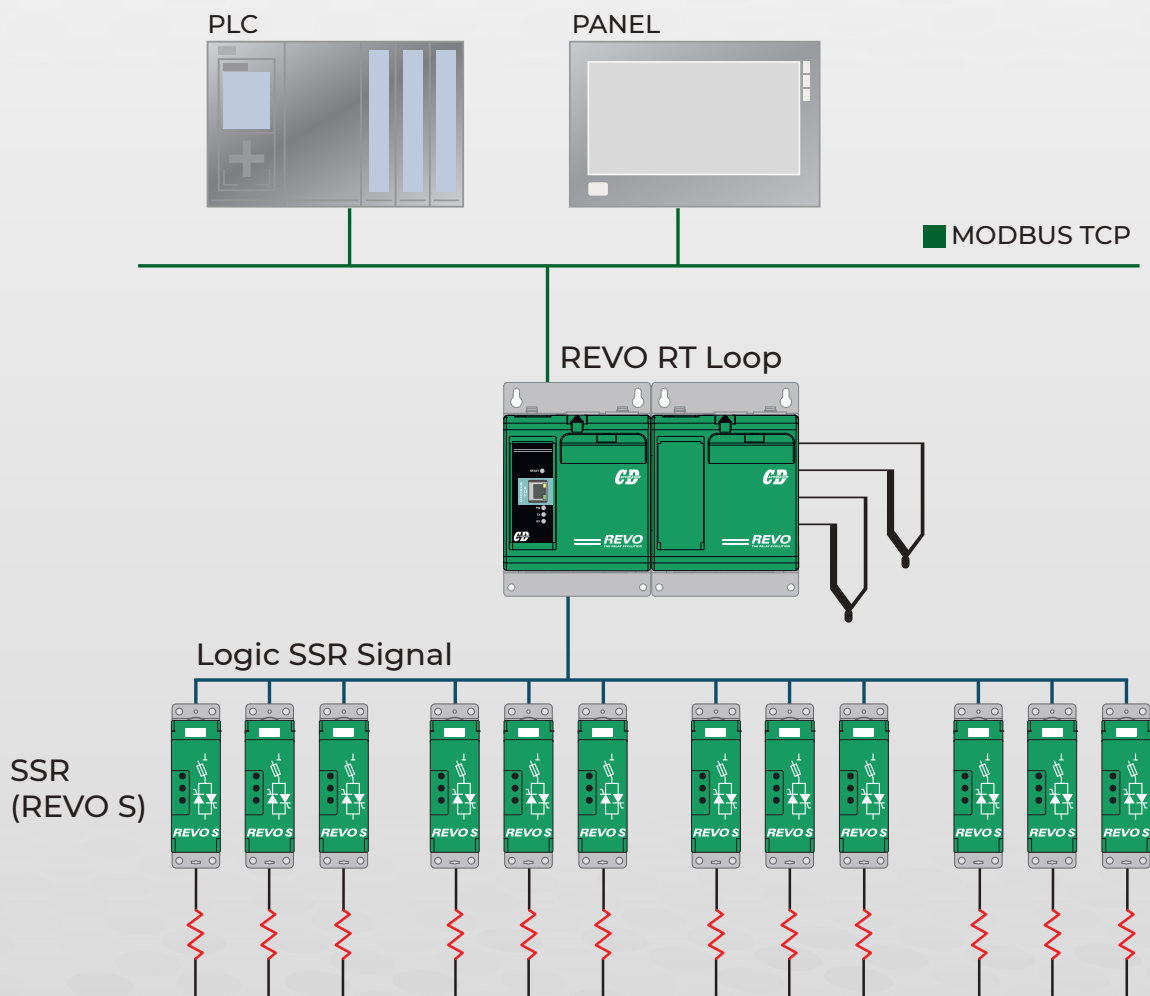
REVO RT Loop is a multi-zone PID controller

Each basic module is capable of managing three single (heat) or dual (heat/cool) zones. Heating is managed via logic outputs connected to external drive units, that allow the **control of electric heaters**.

- RT Loop can work independently or connected with a PLC. It has been designed to replace traditional panel-mount controllers or to replace PLC PID loops.
- RT Loop consists of one or more control modules, each equipped with communication ports. Each module can manage 3 to 9 loops, depending on the number of control cards contained within it, with the possibility of combining different types of modules.
- With RT Loop, 24 loops takes up only 348mm in width.
- Via integrated communication ports or external termination modules, the most popular communication protocols are supported: ModBus RTU, ProfiNet, ModBus TCP, Ethernet IP.
- EMC compliant.
- Up to 24 zones per branch with Fieldbus or 90 zones with Modbus RTU communication.

This series is suitable for industrial applications in the following areas:

- Packaging machines
- Plastic industry applications (extruders and extrusion lines, extrusion heads and control units for hot runner dies)
- Multi-zone ovens
- Furnaces with medium and long wave infrared lamps
- Drying processes with infrared lamps

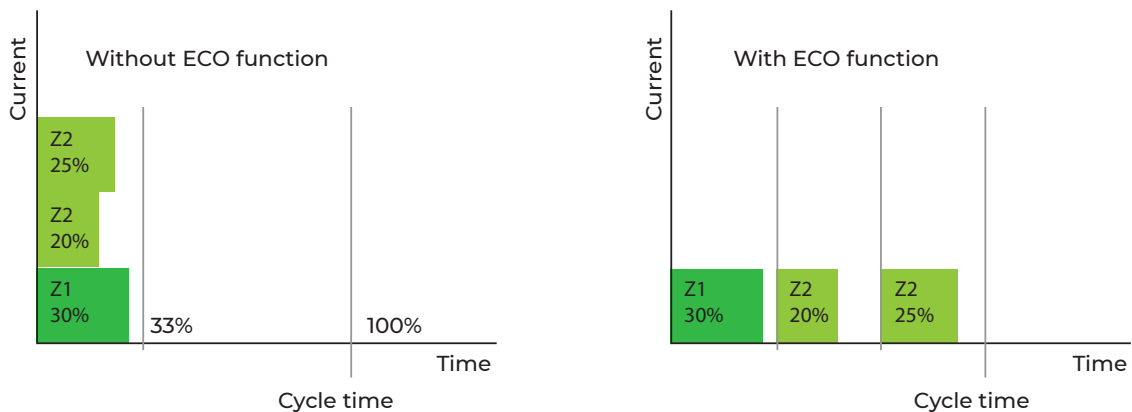


Special Functions

ECO Function

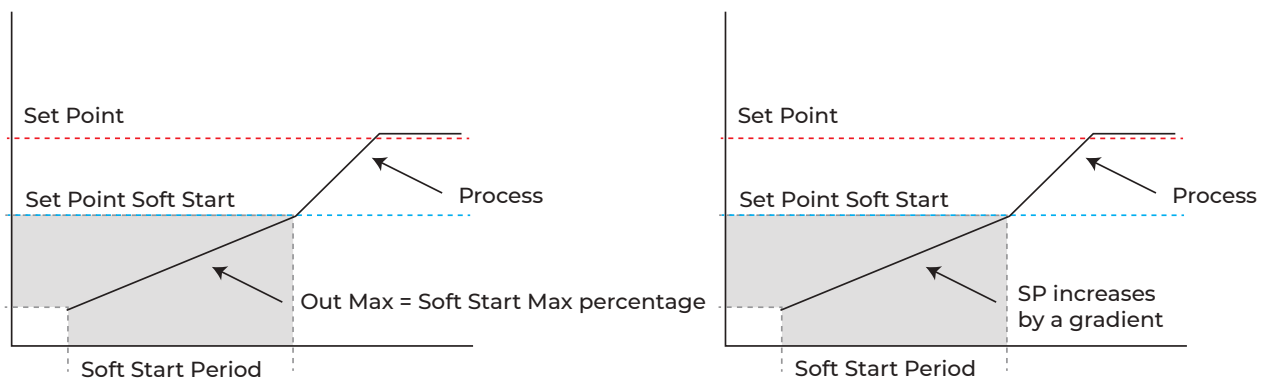


The ECO function distribute power during regulation and within the preset cycle time. It delays the switching on of the second output with respect to the first, and of the third output with respect to the second, but always within the operating cycle time. In this way, the power of the 3 zones does not exceed 33% utilisation when the ECO function is activated, and by shifting the three ignitions avoids overlapping and therefore limits the total current peaks.



Soft Start

By limiting the output power on startup, soft start reduces the risk of thermal shock to the heating elements.



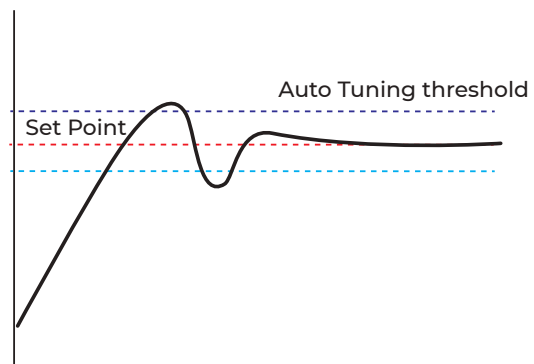
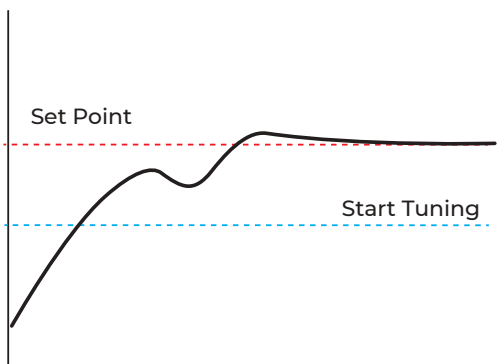
Auto Tuning

Automatic calculation of the Tuning parameters, with adaptive or single tune mode can help achieve stable control, without expert knowledge PID control.

Different types of tuning are provided depending on the process requirements.

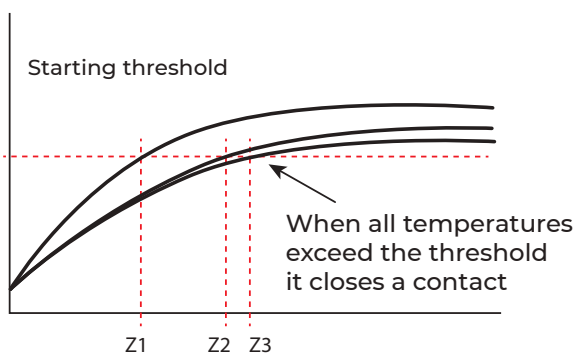
The single-mode Tuning procedure is performed only once at REVO RT startup or restart.

The Adaptive Tuning function is used to automatically optimize the PID terms once at setpoint if it sees any changes in environmental conditions.

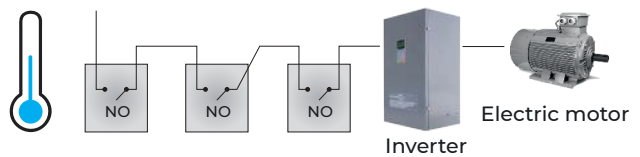


Enable to start

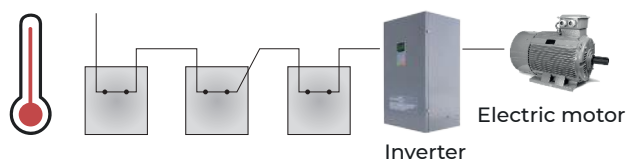
When all temperatures reach a predefined absolute threshold, a contact is closed to enable the unit (i.e. extruder) to start.



Temperature too cold



Right temperature



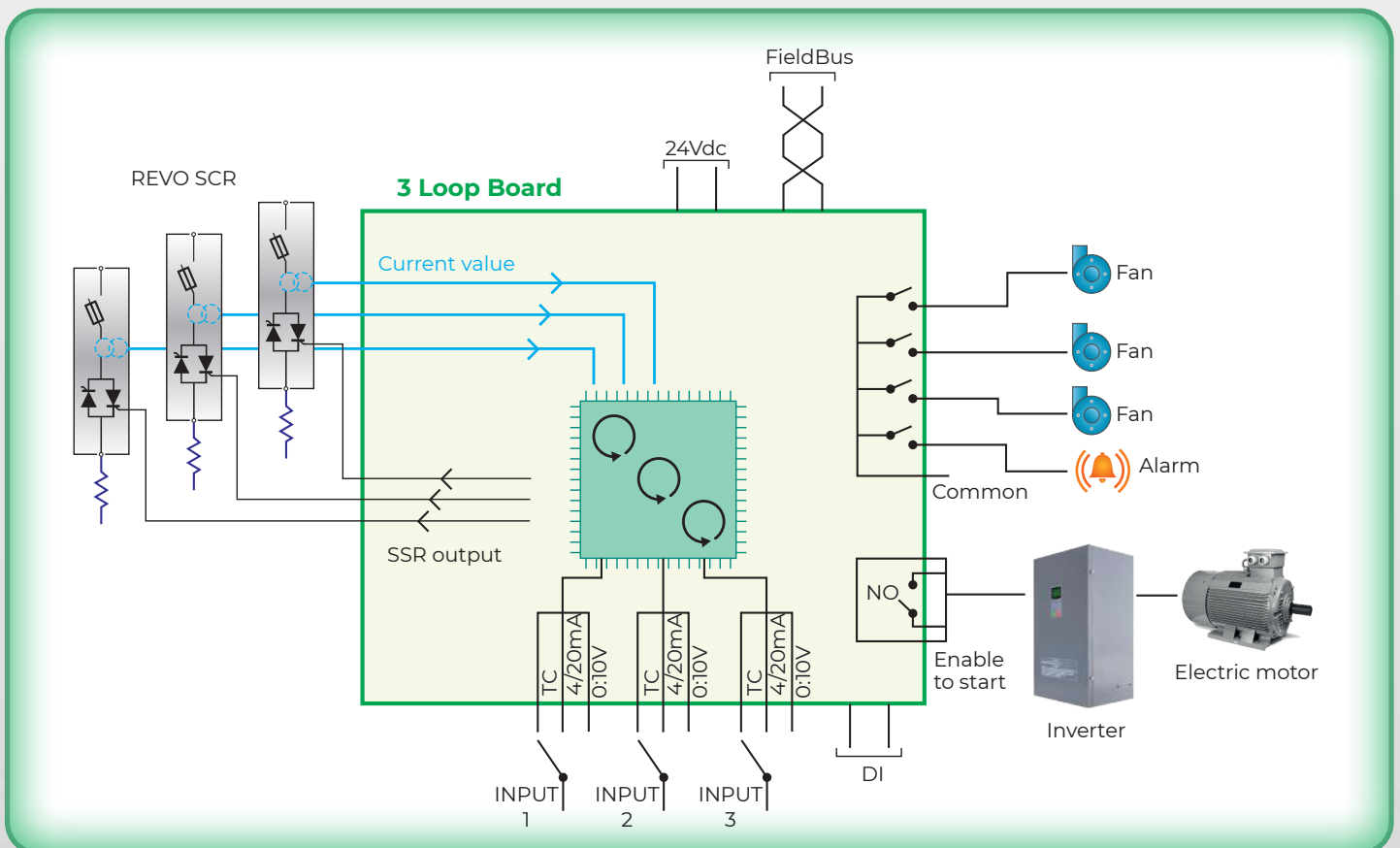
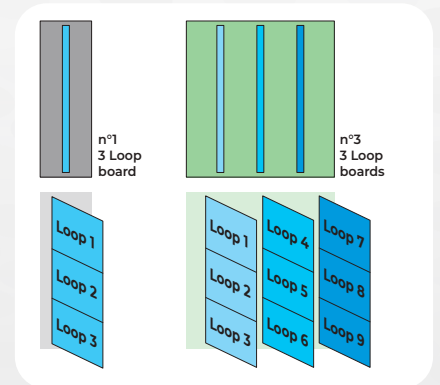
Main features of the control board

The multi-zone RT Loop system has been developed specifically for temperature control using electric heating elements.

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

Each control 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



In addition to the standard control functions, each board has advanced functions such as:

- Soft start
- Energy optimisation function, called “ECO”
- Load break diagnostics
- WatchDog on serial communication
- Autotuning
- 100ms sampling time
- Several types of process alarms available

Display

LED Diagnostic	LED diagnostics provides clear alarm notification
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Fully Software Configurable	REVO RT Loop is fully Software configurable
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Input

Cod. Input	The std analog inputs 0-IV, 0-5V, 0-10V, 0-20mA, 4-20mA, 0-60mV and thermocouple K, S, R, J, T, E, N, B Configurable via Software
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Sampling rate	100ms
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Output

Digital output	SSR output to drive REVO S static units
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4 Relay Outputs NO	Relay Output Normally Open with Common for alarms or cooling
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1 Relay Output NO	Relay Output Normally Open contact that can be used for process start
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Communication

Modbus® RTU	Standard
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USB device on front unit for configuration	Allows the user to easily and safely configure the REVO RT unit by powering through the USB connection only, without connecting a standard voltage line supply
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Features and approvals

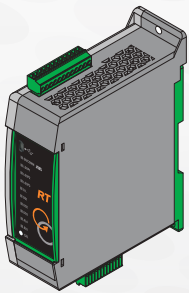
HB and Sc Alarm	Alarm for Partial or Total Load Failure and Short Circuit on SCR with Electromechanical Relay output 5A at 30Vdc
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Free configuration Software	Easy to use and powerful Configurator Software, available free of charge from www.cdautomation.com
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Approvals	CE-EMC 480-600V versions is available on request
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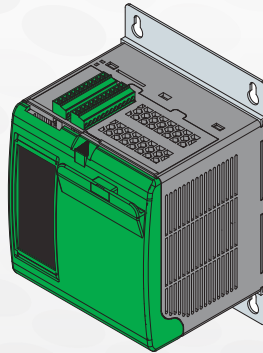
Control modules with Modbus RTU communication

All control boards are equipped with a Modbus RTU port. The control modules can contain between 1 and 3 cards. Within a Modbus RTU system, each module can be freely selected and positioned.



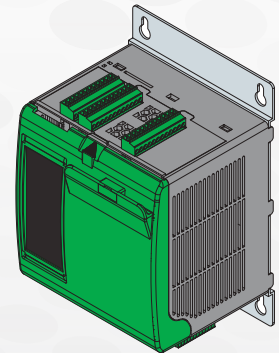
RTL03RS-0

- Contains one board of three loops
- For a total of three loops
- DIN Rail mount
- Display LED and USB on front unit
- Modbus RTU



RTL06RS-0

- Contains two boards of three loops
- For a total of six loops
- Panel mount
- LED and USB back door
- Modbus RTU



RTL09RS-0

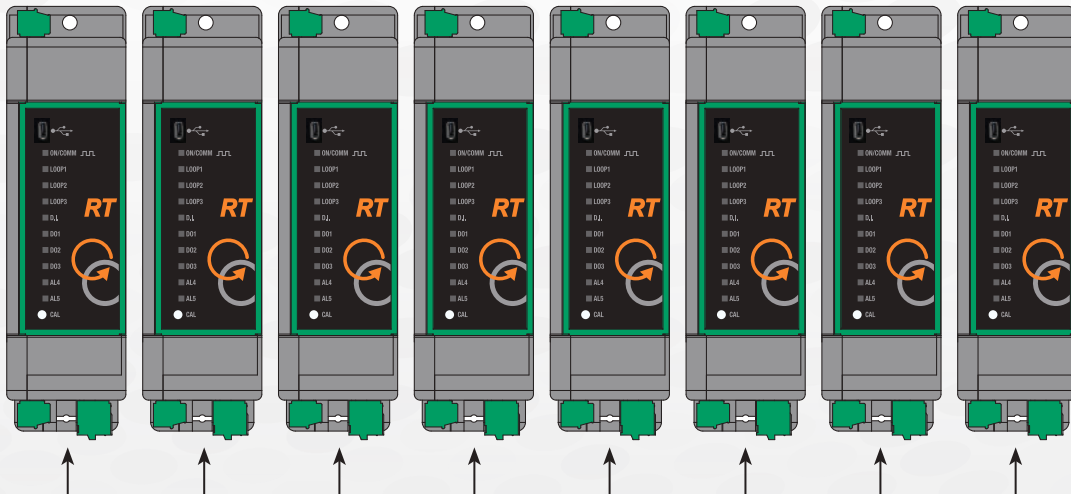
- Contains three boards of three loops
- For a total of nine loops
- Panel mount
- LED and USB back door
- Modbus RTU

Order Code

	1	2	3	4	5	6	7		8	9	10	11	12	13	14	15	16
ORDER CODE	R	T	L	0	-	R	S	-	0	0	0	0	0	0	0	-	1
N° LOOP			4	5													
description			cod.														
3 Loop			0	3													
6 Loop			0	6													
9 Loop			0	9													
TYPE			6														
description			cod.														
Regulator				R													
SSR Output, CT Input, Relay output																	
DIMENSIONS			7														
description			cod.														
Standard Size				S													
COMMUNICATION			8														
description			cod.														
Modbus RTU Slave				0													
OTHER			9 10 11 12 13														
description			cod.														
PID Regulator, temperature controller				0													
APPROVALS			14														
description			cod.														
CE EMC for European market				0													
MANUAL			15														
description			cod.														
None				0													
Italian				1													
English				2													
German				3													
French				4													
VERSION			16														
description			cod.														
Standard version				1													

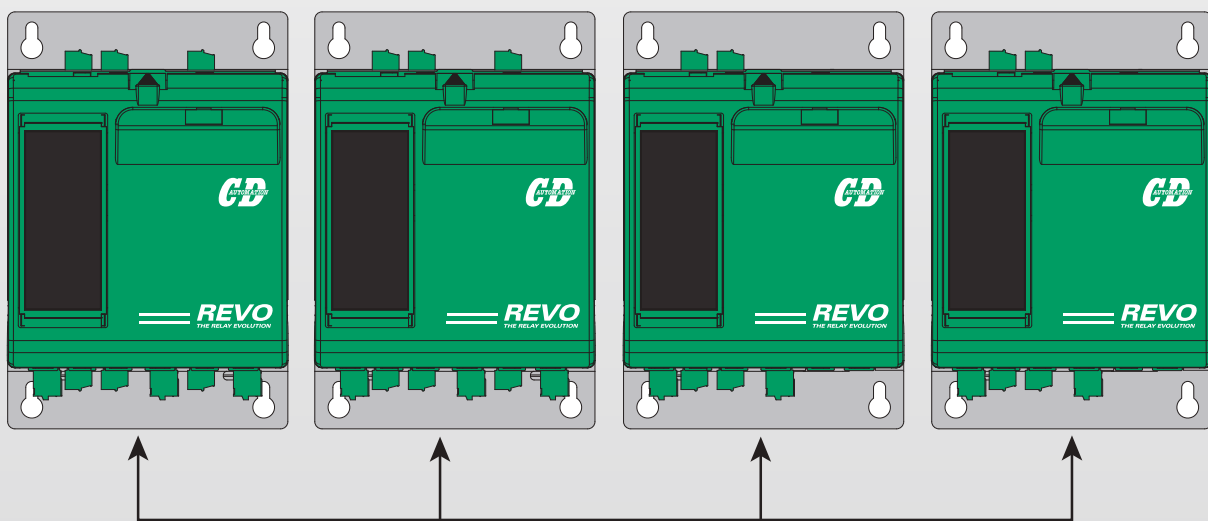
Examples of Modbus RTU systems

N°24 zones - Modbus RTU



N°8 RTL03RS-0
3 loop units

N°30 zones - Modbus RTU



N°2 RTL09RS-0 + N°2 RTL06RS-0
9 loop units + 6 loop units

FieldBus & Communication Terminal Unit module

A system with the most popular fieldbuses can be realised by adding a termination module from the TU series. Each of these modules can manage a maximum number of 24 zones. The control modules to be connected are shown on pages 8 and 9.

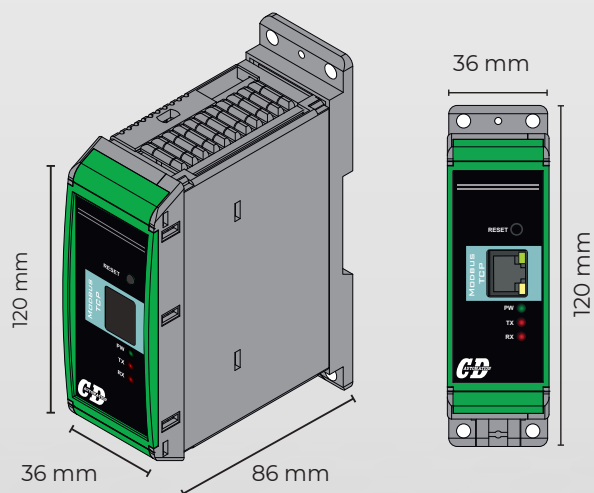
Order Code

	1	2		3	4	5	6	7		8	9	10		11	12	13	14	15	16
ORDER CODE	T	U	-	R	S	4	8	5	-	-	-	-	-	-	-	-	-	-	-

COMMUNICATION				3	4	5	6	7
Modbus RTU				R	S	4	8	5

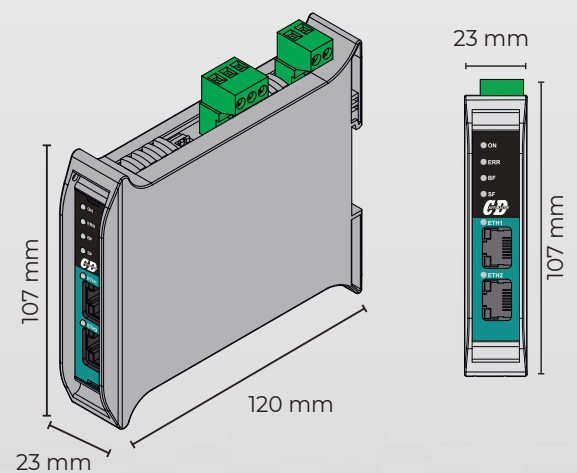
FIELDBUS, COMMUNICATION OR OTHER FUNCTIONS		8	9	10		11	12	13	14	15	16
Modbus TCP Protocol Converter	-	T	C	P	-	3	5	8	0	M	B
Profinet	-	P	N	T	-	0	6	7	6	0	2
Ethernet IP	-	E	I	P	-	0	6	7	5	9	1
RS232	-	2	3	2	-	3	5	8	0	2	W

TU-RS485-TCP-3580MB



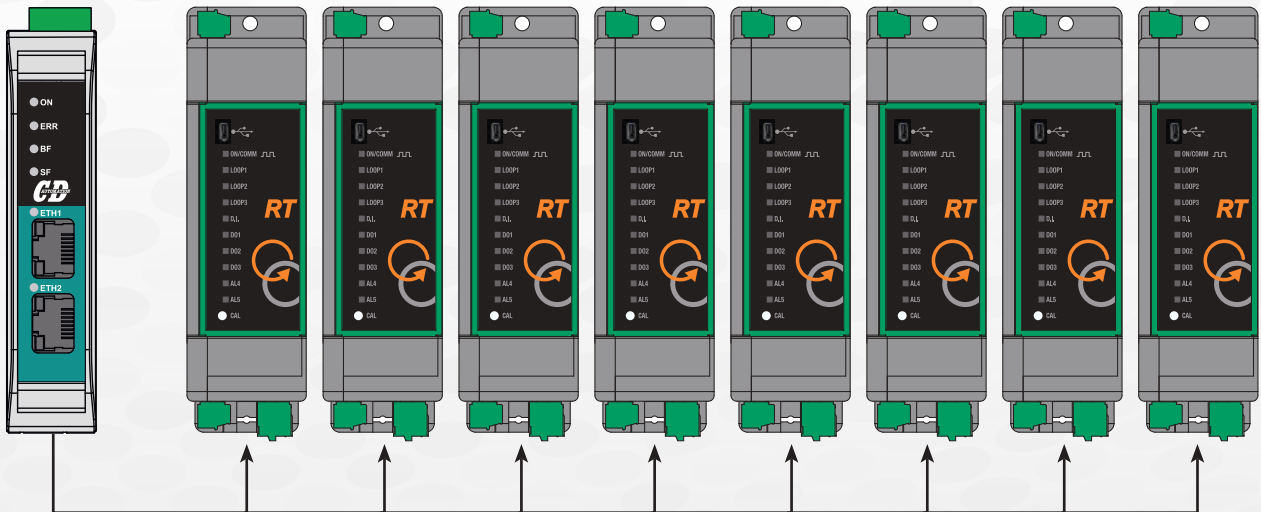
TU-RS485-PNT-067602

TU-RS485-EIP-067591



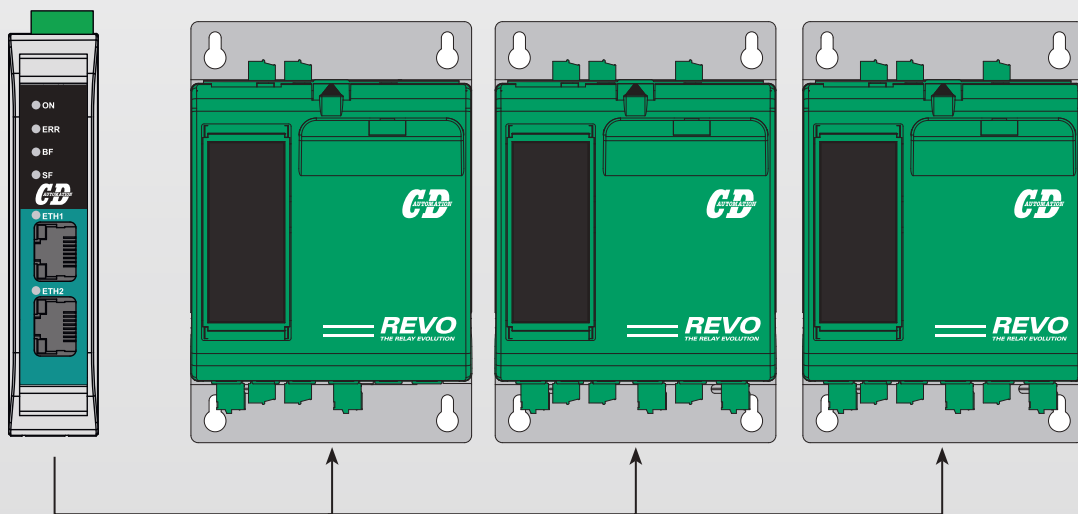
Examples of Fieldbus Systems

N°24 zone Profinet



TU-RS485-PNT-067602 Profinet Terminal Unit + N°8 RTL03RS-0 3 loop unit

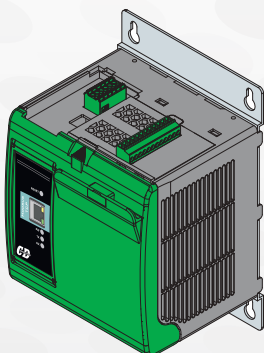
N°24 zone Profinet



TU-RS485-PNT-067602 Profinet Terminal Unit + N°1 RTL06RS-0 6 loop unit + N°2 RTL09RS-0 9 loop unit

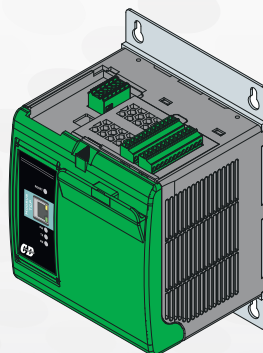
Control modules with integrated Ethernet port

In the RT Loop family there are control modules with integrated Ethernet port. This saves space and allows the units to be accessed/configured via an Ethernet Modbus TCP port. The modules described below can be connected to the expansion modules via Modbus RTU port (see page 8-9).



RTL03RS-1

- Contains one board of three loops
- For a total of three loops
- Integrated Ethernet port
- Panel mount
- LED and USB
- Configuration via Ethernet



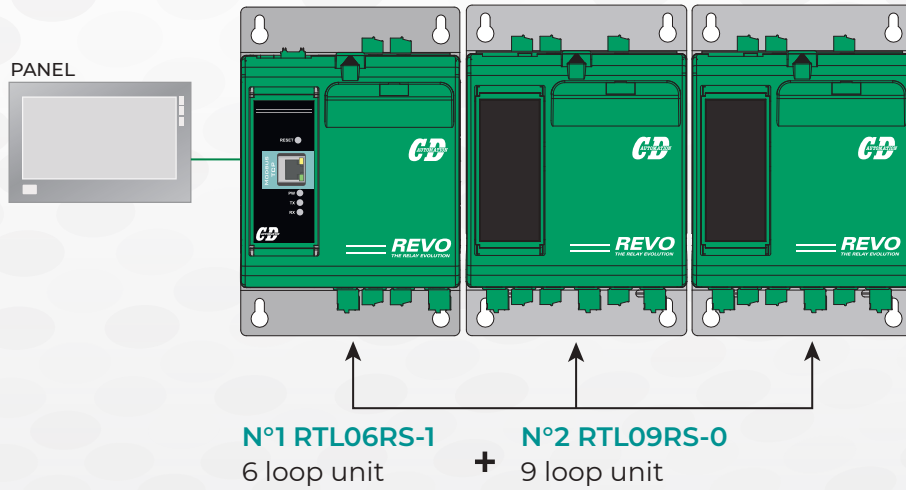
RTL06RS-1

- Contains two board of three loops
- For a total of six loops
- Integrated Ethernet port
- Panel mount
- LED and USB
- Configuration via Ethernet

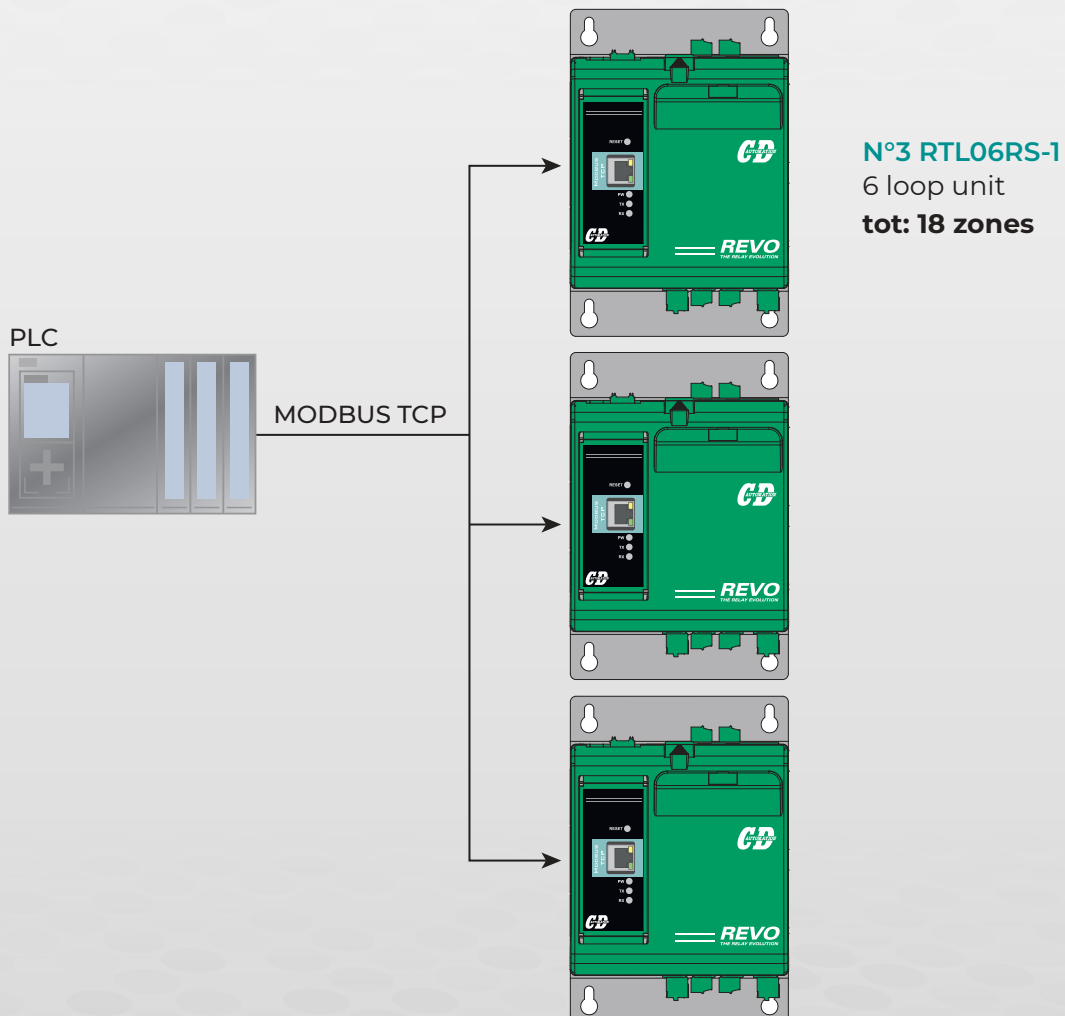
Order Code

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
ORDER CODE	R	T	L	0	-	R	S	-	-	0	0	0	0	0	0	1	
N° LOOP			4	5													
description			cod.														
3 Loop			0	3													
6 Loop			0	6													
TYPE			6														
description			cod.														
Regulator			R														
SSR Output, CT Input, Relay output																	
DIMENSIONS			7														
description			cod.														
Standard Size			S														
COMMUNICATION			8														
description			cod.														
Ethernet Modbus TCP			1														
Ethernet IP (available for existing projects, for new project will be available in 2023)			4														
OTHER			9 10 11 12 13														
description			cod.														
PID Regulator, temperature controller				0													
APPROVALS			14														
description			cod.														
CE EMC for European market				0													
MANUAL			15														
description			cod.														
None				0													
Italian				1													
English				2													
German				3													
French				4													
VERSION			16														
description			cod.														
Standard version				1													

24 zones example with Modbus TCP connection



18 zones example with Modbus TCP connection



REVO S selection used with REVO RT Loop

REVO S 1ph: size and dimensions



SR6

H 121 x W 36 x D 185 - 0,61kg.



SR12

H 269 x W 93 x D 170 - 3,4kg.

SR15

H 273 x W 93 x D 170 - 3,6kg.

Technical Specifications

- Load type: Normal resistance, Infrared lamps short and medium waveform
- Input: Standard SSR
- Firing: Zero Crossing
- Operating temperature: 0 to 40°C without derating
- Comply with EMC and cUL® as an option
- 100 KA: Short Circuit Current rating (SCCR) up to 600V

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ORDER CODE	R	S	1	-	-	-	-	-	-	-	-	-	-	-	-	-

CURRENT	4	5	6	
description	cod.			
30A	0	3	0	SR3-SR6
35A	0	3	5	SR3-SR6
40A	0	4	0	SR3-SR6
60A	0	6	0	SR12
90A	0	9	0	SR15
120A	1	2	0	SR15
150A	1	5	0	SR15
180A	1	8	0	SR15
210A	2	1	0	SR15

MAX VOLTAGE	7	
description	cod.	
480V	4	
600V	6	

VOLTAGE SUPPLY AUX	8	
description	cod.	
≤ 210A		
No Aux.	0	

INPUT	9	
description	cod.	
SSR	S	

FIRING MODE	10	
description	cod.	
Zero Crossing	Z	To get single cycle

CONTROL MODE	11	
description	cod.	
Open Loop	0	

FUSES & OPTIONS	12	
description	cod.	
≤ 40A		
Fuse + Fuse Holder + CT	Y	
> 40A		
Fixed fuses + CT	Y	

FAN VOLTAGE	13	
description	cod.	
No Fan < 90A	0	
Fan 115V ≥ 90A	1	
Fan 230V ≥ 90A standard	2	
Fan 24Vdc ≥ 90A	3	

APPROVALS	14	
description	cod.	
CE EMC for European market	0	
CE EMC + cUL® listed & cULus 508® listed	L	

MANUAL	15	
description	cod.	
None	0	
Italian	1	
English	2	
German	3	
French	4	

VERSION	16	
description	cod.	
Standard unit	1	

Configurator Software

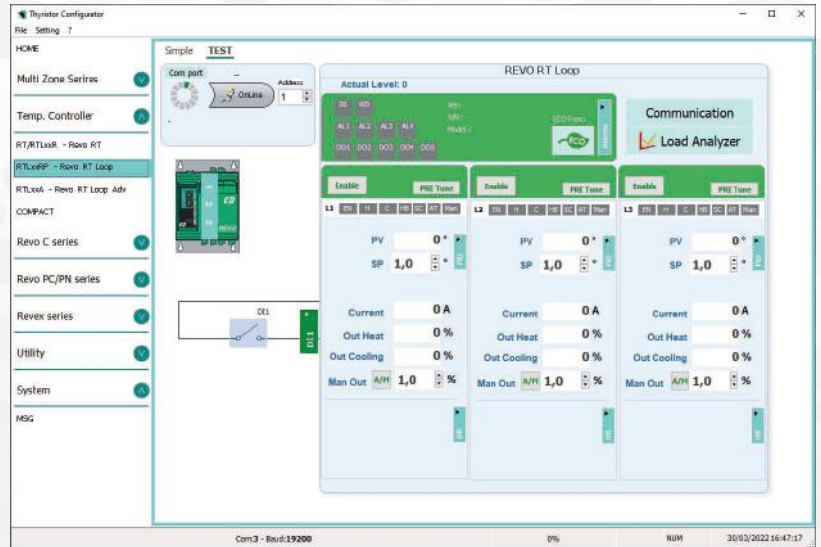
Thyristor configurator software is free and can be downloaded from our site.

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 correct serial port number by menu setting-serial com – port number.



Configuration cable for field bus inbuilt module

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

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



Configuration through Modbus TCP Port via TelNet/Browser

The settings of the ethernet port with Modbus TCP are configurable through the interface with Telnet protocol.





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