

- Multi Channel Power Control
- Suitable to communicate with PLC & Multiloop
- Dedicated to solve applications
- Space & wiring reduction
- Most popular Field Bus available
- CE EMC and cUL® listed
- Elimination of power overshoot
- Power factor maintained close to 1

CD AUTOMATION

POWERED BY INNOVATION

REVO PC

POWER CONTROLLER



Multi-Channel SCR Power Controller

Suitable to control Electric Heaters
and IR Lamps in Industrial Heating Systems



www.cdautomation.com

Revo PC Catalog 2018

Release n.2

HAVE YOU CONSIDERED HOW POWER PEAKS COULD BE A PROBLEM TO YOUR BUSINESS?

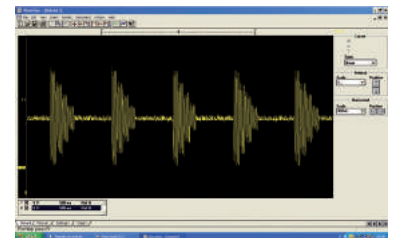
The REVO PC unit is designed to handle applications with multiple zones. This enhanced unit, thanks to a particular algorithm, minimizes your energy costs through the synchronization and the power limit for each zone.

Revo PC keeps your instantaneous power within the limits of your electricity supply contract.



REVO PC POWER CONTROLLER

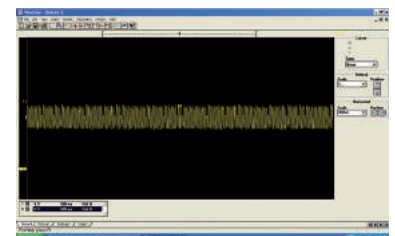
Created specifically for industrial multi-zone applications, REVO PC can be configured to control up to 24 channels/zones. Each zone can be sized from 30A up to 800A (REVO S Family with SSR input and Random Firing).



WITHOUT POWER CONTROL OPTIMISATION

IMPORTANT POWER CONTROL FUNCTIONALITY IS OFFERED BY REVO PC INCLUDING:

- Elimination of power overshoot.
- Power factor maintained close to 1.
- Stay connected with the most popular Field Bus protocols.
- Eliminate use of PLC output modules by using comms for Power to CPU connections.
- Alarm notification per zone of heater break and thyristor short circuit.
- Product footprint for 24 zone package 50% less than using standard thyristor stacks.
- Dramatic savings with less wiring & smaller cabinet enclosures.
- REVO PC's considered design not only helps you save start-up costs but ensures you keep on saving money throughout the products lifetime.



WITH POWER CONTROL OPTIMISATION



REVO PC POWER CONTROLLER

REVO PC system is based on an intelligent unit that manages one or more basic SCR power controller. All currents are measured with an external current transformer. REVO PC acquires the power setpoint from different sources including: single or multi zone temperature controller, PLC or HMI.



Control Unit

REVO PC up to 24 channels

SSR outputs to control up to n° 24 REVO S 1PH
Current transformer input to detect all the current

This Unit transform a simple SCR Power Switch
into an Intelligent Unit able to communicate
and to have HB Alarm (See page 5)

Power Unit

REVO S 1PH

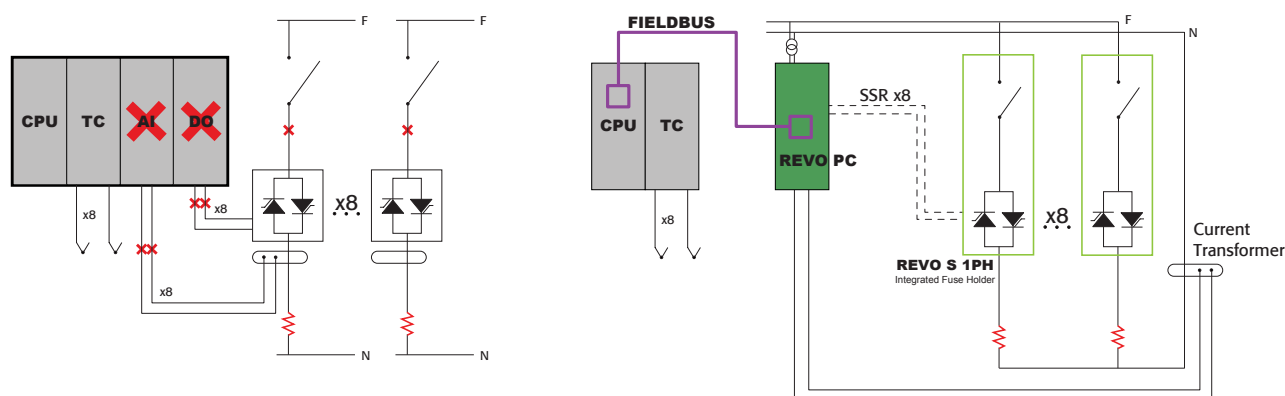
- SCR power switches from 30 to 800A
- Internal Fuse
- Max Voltage 480-600-690V

DRAMATIC REDUCTION AND SIMPLIFICATION IN CABLE WIRING

COMPARE THE NEW **REVO PC** TO A **TRADITIONAL PLC SYSTEM** AND YOU SAVE:

- 22 wires every 8 channels.
- Each wire takes 11 minutes (see diagram shown).
- For each group of 8 channels you save 22 wires x 11 minutes = 242 minutes in total.

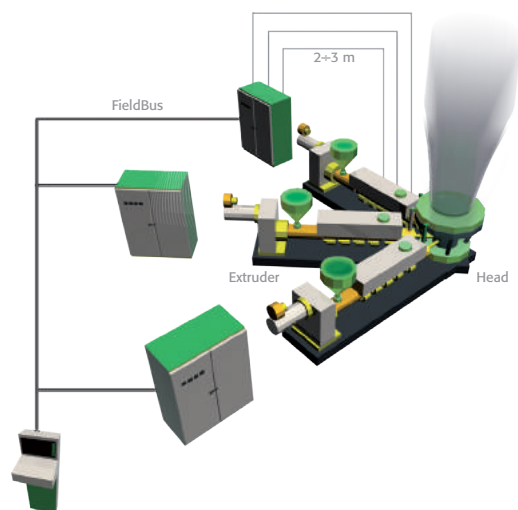
**TOTAL TIME SAVED OF 4 HOURS FOR 8 CHANNELS
AND 12 HOURS FOR 24 CHANNELS!**



REVO PC DISTRIBUTED SOLUTION

As shown, the new REVO PC distributed hardware solution will give crucial saving such as:

- Number of wires (cable and labour cost)
- Errors in wiring the machine
- No wire channels to support cables
- Cable length reduced by 80%
- Cabinet's space reduced
Consider that each cabinet section saves 500 Euro.
- The cabinet space used is a key factor.
If the space of components used is doubled then the cabinet size is doubled.

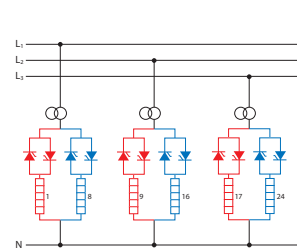
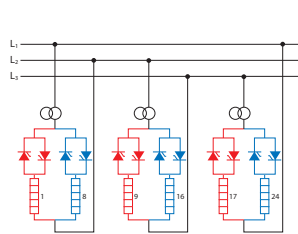


CONNECTIVITY AND CONFIGURATION



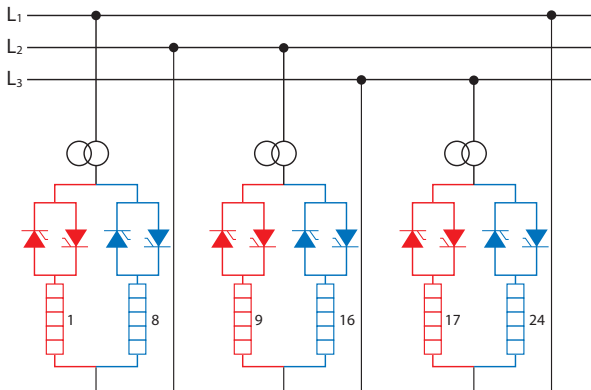
READ for each zone	WRITE for each zone
Set Point	Set Point
Alarm	One by one Configuration Parameters
Voltage	
Power	
Current	
Heater Break Alarm	
SCR Short Circuit Alarm	

REVO PC FEATURES

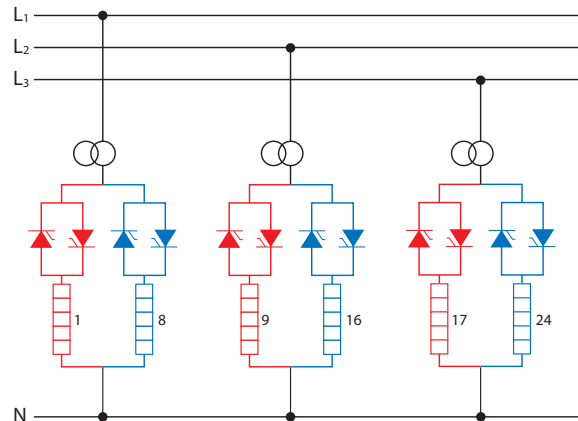


CODE		REVO PC48	REVO PC48
DRAW DESCRIPTION		Phase to Phase	Phase to neutral
CHANNELS		24	24
N° of REVO S 1PH for each Channel		1	1
FIRING	Half Cycle at 50% power demand	●	●
	One Cycle at 50% power demand	●	●
	Three Cycle at 50% power demand	●	●
CONTROL	Open loop	●	●
	Power Feedback	●	●
FEATURES	Heater break + thyristor short circuit	●	●
	Current measurement on communication	●	●
	Current measurement with external indicator	○	○
	Three phases balancement	●	●
TEMPERATURE CONTROL	Temperature control is not included inside REVO PC modules but can be easily added with some external modules (see page ...)	○	○
APPROVAL	cUL® 508	○	○
COMMUNICATION	N° 1 Modbus® TCP and N° 1 Modbus® RTU Slave	○	○
	Modbus® RTU Slave	●	●
	Modbus® RTU Master and N° 1 Modbus® RTU Slave	○	○
	Profibus® DP and N° 1 Modbus® RTU Slave	○	○
	Profinet® Protocol and N° 1 Modbus® RTU Slave	○	○
	Ethernet IP® Protocol and N° 1 Modbus® RTU Slave	○	○
DIGITAL INPUT	N° of Digital Input	4	4
	Enable / Disable Function	●	●
	Fix Power Function	●	●
RELAY OUTPUT	Relay Output	●	●
OPTION	Revo KP2-PC (HMI 7", 10")	○	○

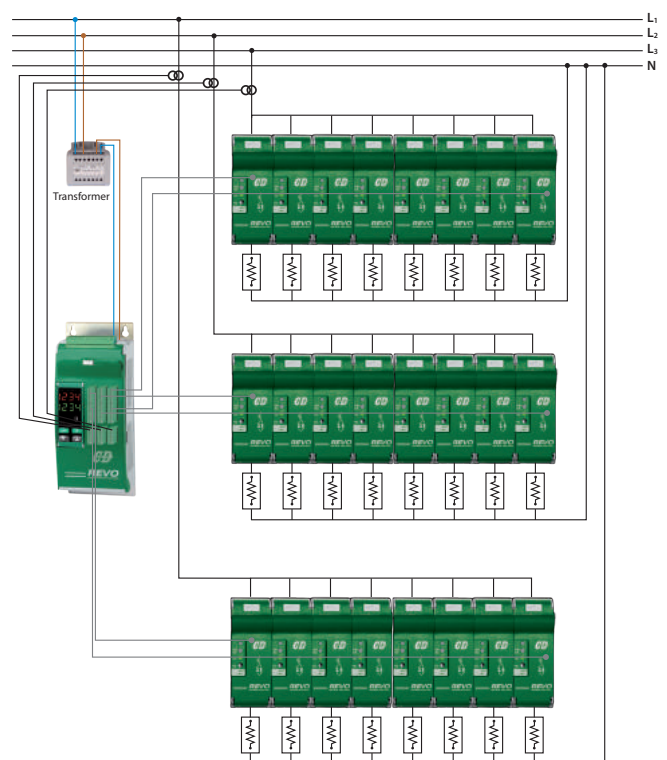
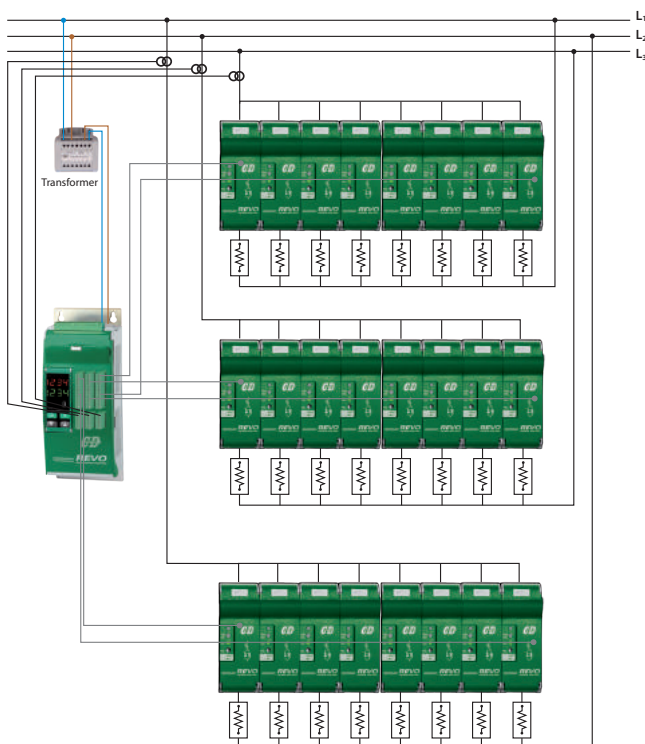
HOW TO BALANCE THE THREE PHASES



PHASE TO PHASE CONNECTION REVO PC48 24 Channels Max



PHASE TO NEUTRAL CONNECTION REVO PC48 24 Channels Max



HOW TO SIZE YOUR SYSTEM WITH REVO PC48

Example for Phase to Phase Connection 400V:

- Distribute your elementary Loads on 3 Phase System to have the best balanced current on the three phases L1, L2, L3 (Ex. 24 Elementary Loads 6000W each connect 8 of them on each Phase to Phase).
- Each Elementary Load need 1 of REVO S-1PH Thyristor unit (See page 8 REVO S 1PH 30A).
- For each group of 8 channels you need 1 of current transformer (see on page 9 in ordering Code and select current transformer 150/0,05 ... 15A x 8 = 120A).
- External transformer for synchronisation in our example TRA05 300:530/21V.
- All above parts are included in order shipment from CD Automation and customer have to declare power, number and connection of elementary loads.
- Each load can be set in independent mode from 0 to 100% of power.

REVO S 1PH SIZE AND DIMENSIONS



SR3 H 121 x W 36 x D 125 - 0,44kg.



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.



S11 H 440 x W 137x D 270 - 10,5kg.



S12 H 520 x W 137 x D 270 - 15kg.



S15 H 560 x W 137x D 270 - 10,5kg.

Technical Specification: REVO S 1PH to be coupled with REVO PC

- **Load type:** Normal resistance, infrared short and medium waveform
- **Inputs:** SSR Standard
- **Firing mode:** Zero Crossing (to get single cycle or Burst Firing 3 cycles) or Random (to get half cycle)
- **Operating temperature:** 0 to 40°C without derating
- **Comply with EMC** and cUL® up to 700A as an option
- **100 KA:** Short Circuit Current rating (SCCR) up to 600V
- **Data sheet:** More details on "REVO S 1PH" Manual

ORDERING CODE				1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16	
				R	S	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
CURRENT	4	5	6																		
description	code			Size 480-600V			Size 690V			note											
30A	0	3	0	SR3-SR6																	
35A	0	3	5	SR3-SR6																	
40A	0	4	0	SR3-SR6																	
60A	0	6	0	SR12			S11														
90A	0	9	0	SR15			S11														
120A	1	2	0	SR15			S11														
150A	1	5	0	SR15			S11														
180A	1	8	0	SR15			S11														
210A	2	1	0	SR15			S11														
300A	3	0	0	S12			S12														
400A	4	0	0	S12			S12														
500A	5	0	0	S12			S12														
600A	6	0	0	S12			S12														
700A	7	0	0	S12			S12														
800A	8	0	0	S15			S15			4											
MAX VOLTAGE	7																				
description	code								note												
480V	4																				
600V	6																				
690V	7																		2,3,4		
VOLTAGE SUPPLY AUX	8																				
≤ 210A	code								note												
No Aux.	0																				
> 210A																					
90:130V	1																		1		
170:265V	2																		1		
230:345V	3																		1		
300:530V	5																		1		
510:690V	6																		1		
600:760V	7																		1		
INPUT	9																				
description	code								note												
SSR	S																				
FIRING	10																				
description	code																		note		
Zero Crossing	Z																		To get single cycle with REVO PC 8/16/24/48 2		
Random Firing	R																		To get half cycle with REVO PC 8/16/24/48 2		
CONTROL MODE	11																				
description	code																		note		
Open Loop	0																				
FUSES & OPTION	12																				
≤ 40A	code																		note		
No Fuse for all Units ≤ 40A	0																				
Fuse + Fuse Holder	F																				
> 40A																					
Fixed Fuses Std for all Units > 40A	F																				
FAN VOLTAGE	13																				
description	code																		note		
No Fan < 90A	0																				
Fan 110V ≥ 90A	1																				
Fan 220V ≥ 90A Std Version	2																				
APPROVALS	14																				
description	code																		note		
CE EMC For European Market	0																				
cUL® us listed and cULus 508	L																				
MANUAL	15																				
description	code																		note		
None	0																				
Italian	1																				
English	2																				
German	3																				
French	4																				
VERSION	16																				
description	code																		note		
Std unit	1																				

■ CE standard + cUL® as an option

CE Only

Note (1) Load voltage must be included in Selected Auxiliary Voltage Range for units >210A

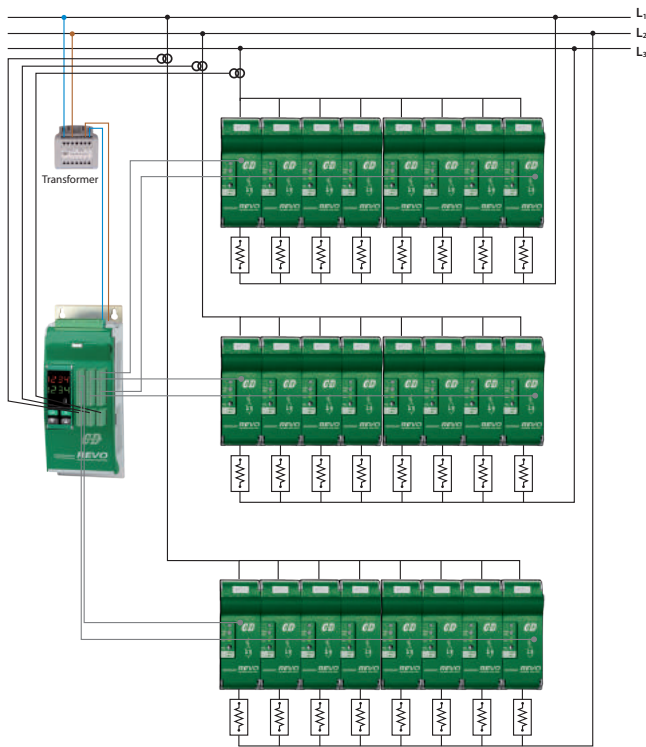
Note (2) With 690V the firing is random

Note (3) Available on unit $\geq 60A$

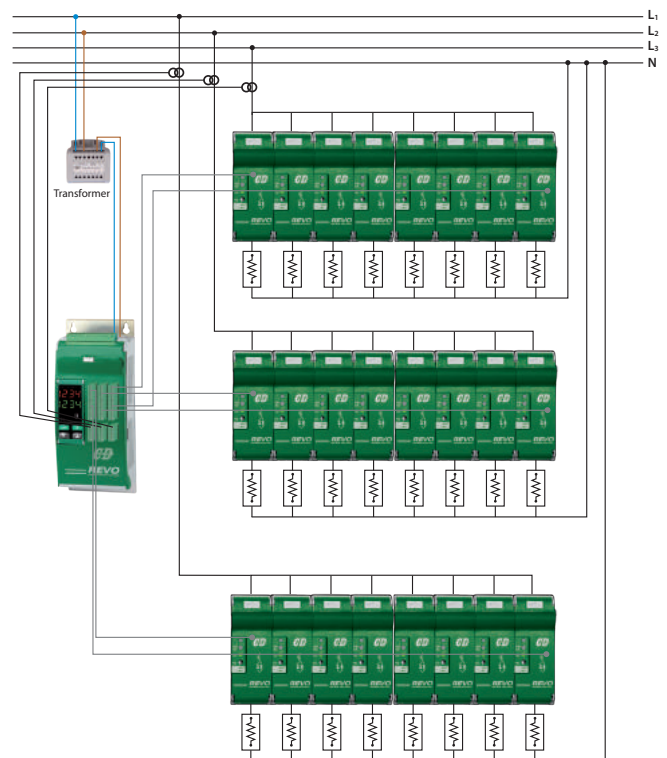
Note (4) This unit is available with CE only

REVO PC48 (up to n° 24 independent channels)

PHASE TO PHASE CONNECTION



PHASE TO NEUTRAL CONNECTION



ORDERING CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	R	P	C	0	4	8	-	-	-	-	-	-	-	-	-	-

CHANNEL	4	5	6
description	code		note
REVO PC to drive Max n°24 REVO S 1PH shared on the 3 phases:			
-24 Zone Phase to Phase connection	0	4	8
-24 Zone Phase to Neutral connection	0	4	8

Current Sensor for each REVO PC	7	8	9
description	code		note
All Current Sensor 50/0,05	0	0	0
All Current Sensor 100/0,05	0	0	1
All Current Sensor 150/0,05	0	0	2
All Current Sensor 200/0,05	0	0	3
All Current Sensor 250/0,05	0	0	4
All Current Sensor 400/0,05	0	0	5
All Current Sensor 800/0,05	0	0	6
All Current Sensor 1000/0,05	0	0	7
All Current Sensor 1500/0,05	0	0	8
All Current Sensor 2000/0,05	0	0	9

COMMUNICATION	10
description	code
Modbus® TCP and Modbus® RTU Slave	1
Modbus® RTU Slave	2
Modbus® RTU Master and Modbus® RTU Slave	3
Profibus® DP	4
Profinet® Protocol	5
Ethernet IP® Protocol	7

Aux Voltage to be coupled with an external transformer	11
description	code
21Vac	1

FIRING	12
description	code
Half Cycle at 50% power demand	1
One Cycle at 50% power demand	2

FEED BACK (Control Mode)	13
description	code
No Feed Back	1
Power	2

APPROVALS	14
description	code
CE EMC	1
CE + cUL	L

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

VERSION	16
description	code
Version 1	1

Note(1): Example: System with REVO PC48 24 zones shared on the 3 phases, there are n° 3 current sensors.

Note(2): These current sensors are CE Only

Note(3): For each REVO PC provide 1 Aux Voltage Transformer

Note(4): Other Field Bus are available with external module on request.

Note(5): Primary of Current Transformer ≥ Total of sum of elementary Current of each Load Connected to one of the 3 terminal block on front unit

Note(6): Half Cycle Firing available only for 1 phase Thyristor unit with Random input

External Transformer

Additional Units to be ordered with REVO PC		
description	code	note
Transformer 110V ±10% / 21V - 50VA	TRA2	7
Transformer 220V ±10% / 21V - 50VA	TRA3	7
Transformer 240V ±10% / 21V - 50VA	TRA4	7
Transformer 400V ±10% / 21V - 50VA	TRA5	7
Transformer 480V ±10% / 21V - 50VA	TRA6	7
Transformer 690V ±10% / 21V - 50VA	TRA7	7

Note(7): The standard transformer TRA series are 50VA and are able to supply only one REVO PC Module. Is possible to order special transformer not managed on stock to supply more than one REVO PC. Ask a quotation depending by the total number of REVO PC in your system.

REVO KP2-PC

GRAPHIC OPERATING TERMINAL FOR REVO PC48

The intuitive interface allows the operator to easily configure the system and to manage the day to day work.

On one page you can view all the main parameters for 24 zones.

Any unused zones will not show on the display.

Each panel can communicate with REVO PC through Ethernet, Modbus® TCP or Modbus® RTU communication.



APPLICATION WITH 1 REVO PC48 OF 24 ZONES

The page is divided in three groups of 8 channels.

24 Channels are displayed on the same page.

For each channel it's possible to read and write the power set.

For each channel it's possible to read:

- Current
- Power
- Alarm Status

For each group of 8 channels it's possible to set Power Limit and read the total power consumption.

Example

Phase R 8 zone				Phase S 8 zone				Phase T 8 zone			
SP%	A	kW	AL	SP%	A	kW	AL	SP%	A	kW	AL
R1	80.0	8.0	3.20	S1	80.0	8.0	3.20	T1	80.0	8.0	3.20
R2	95.0	9.5	3.80	S2	95.0	9.5	3.80	T2	95.0	9.5	3.80
R3	80.0	8.0	3.20	S3	80.0	8.0	3.20	T3	80.0	8.0	3.20
R4	80.0	8.0	3.20	S4	80.0	8.0	3.20	T4	80.0	8.0	3.20
R5	95.0	9.5	3.80	S5	80.0	8.0	3.20	T5	95.0	9.5	3.80
R6	80.0	8.0	3.20	S6	95.0	9.5	3.80	T6	80.0	8.0	3.20
R7	80.0	8.0	3.20	S7	80.0	8.0	3.20	T7	80.0	8.0	3.20
R8	80.0	8.0	3.20	S8	80.0	8.0	3.20	T8	80.0	8.0	3.20
Voltage		400	26,80 kW	Voltage		400	26,80 kW	Voltage		400	26,80 kW
Pw Limit		0.0		Pw Limit		0.0		Pw Limit		0.0	

ORDERING CODE				1	2	3	4	5	6	7	8	9	10
				R	K	P	C	-	-	-	-	-	0
SCREEN DIMENSION				5	6			VERSION				9	
description				code	note			description				code	note
7.0"				0	7			With Ethernet port + Modbus® RTU				EL	
10.0"				1	0								
COMMUNICATION				7	8								
description				code	note								
For 1 RPC48 24 channels CE + cUL				4	8								

REVO PC GENERAL FEATURES

GENERAL FEATURES	
Cover and Socket material:	PolymericV2
IP Code	20
Auxiliary voltage:	12 ÷ 24 ac (max 200mA)
INPUT FEATURES	
Current Transformer Input	max 50mA
Configurable Digital Input calib.	12 ÷ 24V dc/ac (max 4mA)
OUTPUT FEATURES (power device)	
Open collector	max 50mA

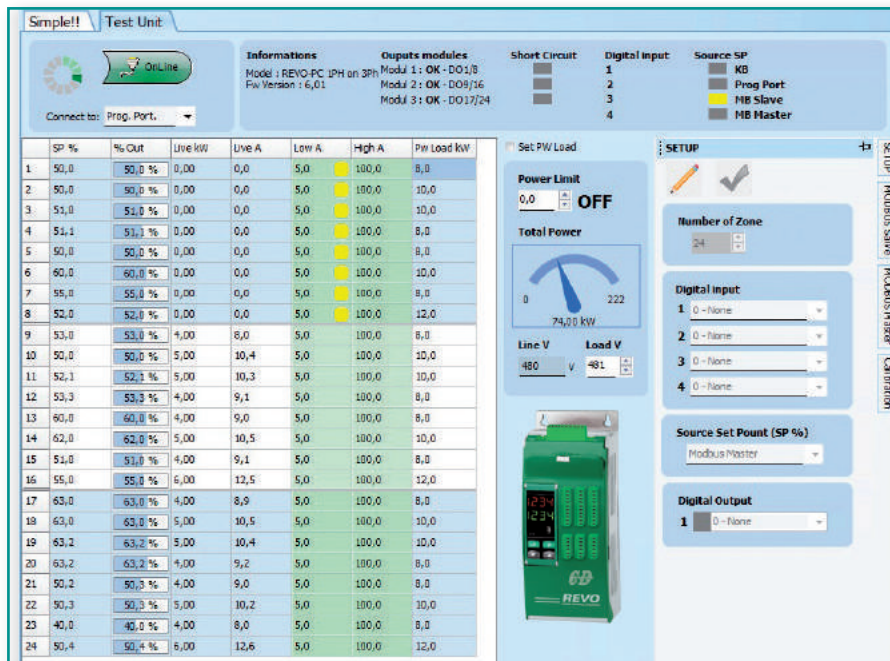
For REVO S 1PH output features see the Data Sheet.

CONFIGURATOR SOFTWARE

CDA Thyristor configurator software is free and available to download from our site www.cdautomation.com.

If the Order Code is in line with requirement, then REVO PC has been already configured in Factory and it's ready to use. You need the software only to modify the ordered configuration. Anyway we suggest to check the unit on the machine with the "Test unit" section.

To install the software, launch the program and follow the instructions on the screen. Run the software configurator and set the serial port of the PC with baudrate.



TEST VIEW

This page can be used to monitor and adjust the operation of the REVO PC while communicating with it in real time.

Main features available are:

- Set the total number of zones
- Select the source for Power Set Point
- Configure and Monitor the Digital Inputs
- Detect if an alarm is activated
- Set the power of each load
- Set minimum current threshold for each channel
- Main process variable display
- Source power set point display
- Total power limit setting
- Voltage and current calibration

MODBUS Master			
	ID	Par Num	Err sts
1	1	3	
2	1	3	
3	1	3	
4	1	3	
5	1	3	
6	1	3	
7	1	3	
8	2	3	
9	2	3	

MODBUS MASTER

REVO PC can have Modbus master port as an option. With this feature it's possible to acquire external set point from different temperature controller with Modbus slave port. See the architecture at page 14.

Each temperature control set can be associated to one or more channel. See page 12.

In the example picture on the left the channel 5 is associated with the temperature controller with address 1. The parameter 3 is dedicated in this controller for the set point. Instead of using the main output of the controller to set the power, we use the value of power set point available for the communication.

CONFIGURATION CABLE

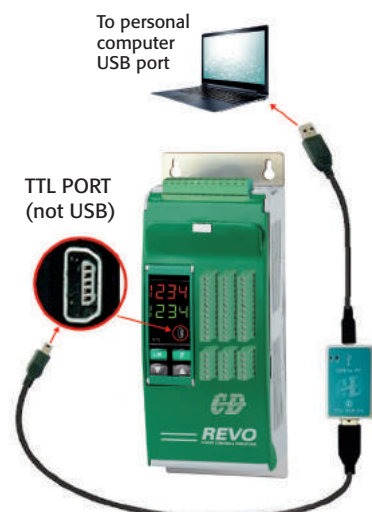
The cable kit is for use on CD Automation Thyristor unit REVO PC and REVO PN.

The components of the Kit are:

- 2 USB cable
- 1 USB/TTL converter

To connect the unit at the PC, it's necessary to use the USB\TTL converter connected between the unit and the USB port of the PC. USB\TTL converter needs a driver to work properly downloadable on www.cdautomation.com.

ORDERING CODE	1	2	3
description	C	C	A
	Universal Cable kit for Thyristor unit		



INFRARED OVEN AND THERMOFORMING

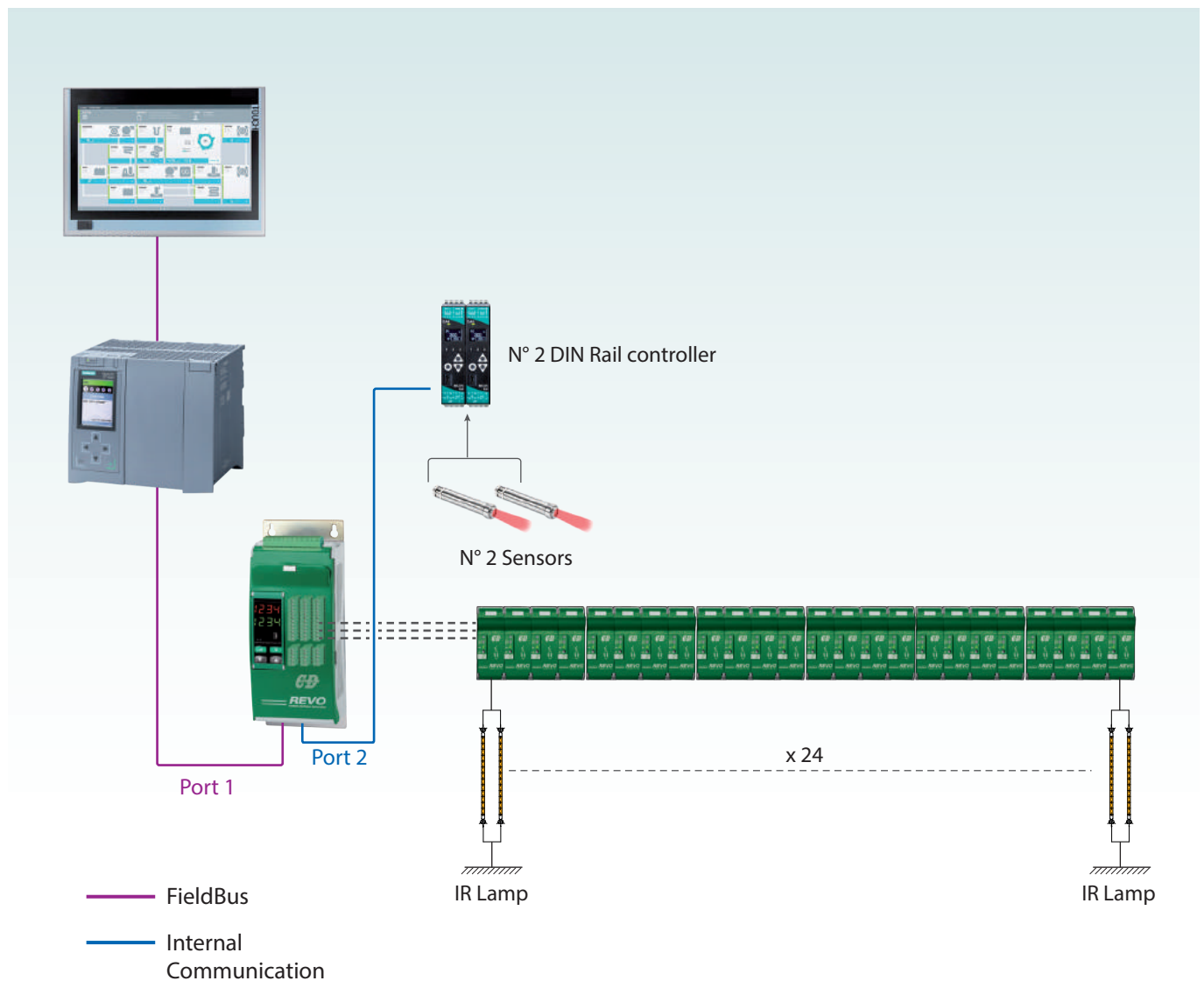
INFRARED LAMPS WITH MEDIUM AND SHORT WAVE FORM

REVO PC is the best solution to control all types of infrared lamps.

The robust junction with high I²t allows it to drive short-wave IR lamps. There are several types of soft start, which reduce much of the flickering phenomenon.

The synchronization makes the power factor close to one.

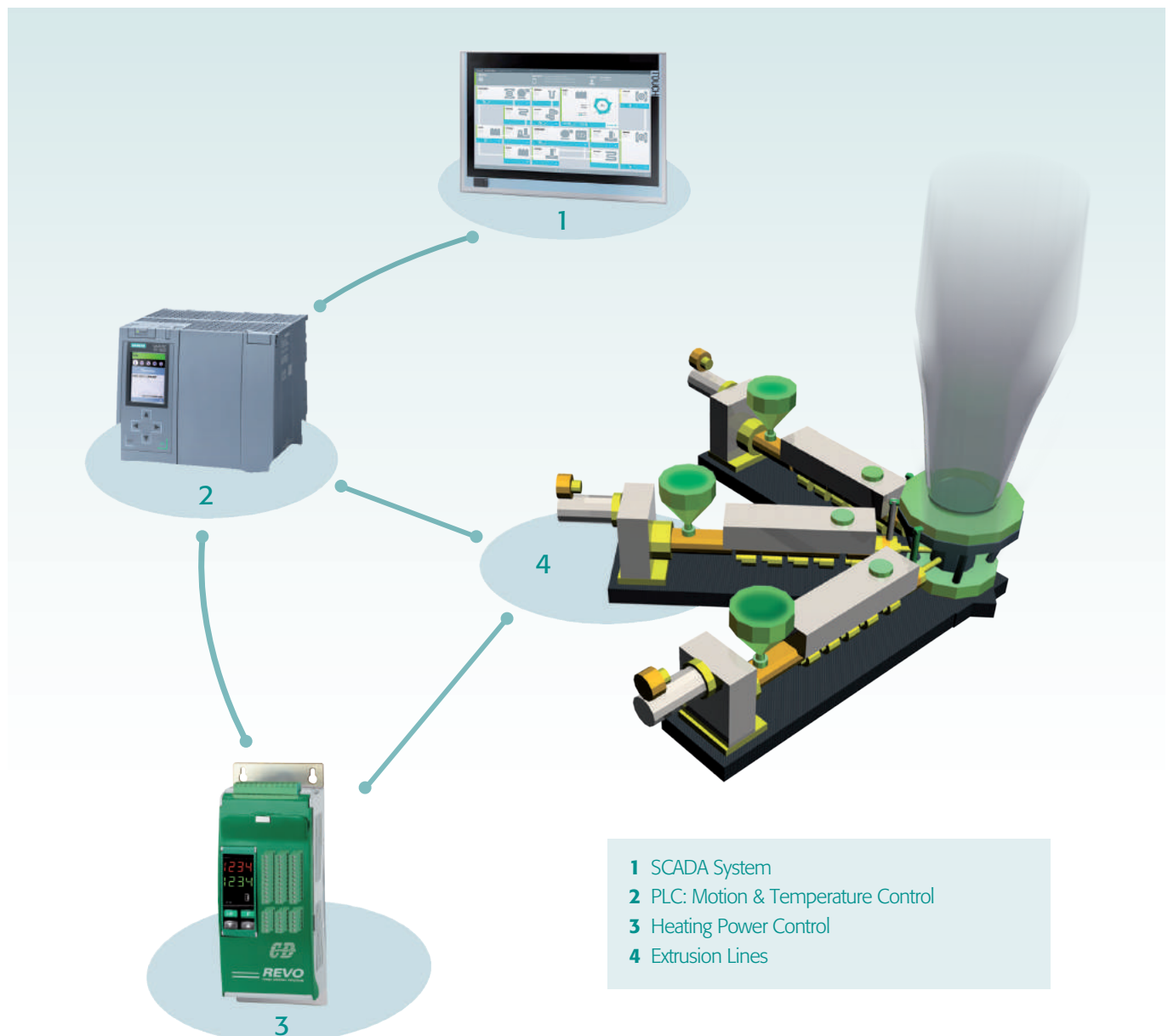
Power Network voltage fluctuations are compensated instantly via the feedback in the unit.



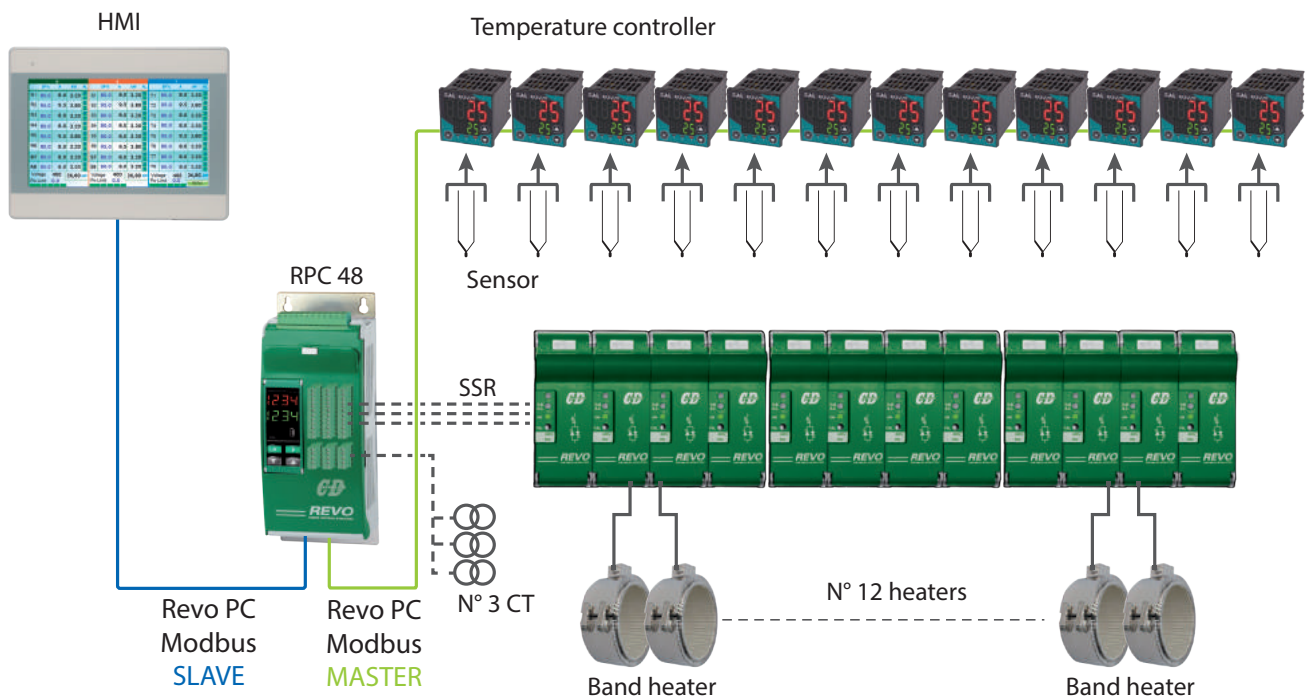
PLASTIC EXTRUSION MACHINE

AUTOMATION SOLUTION FOR EXTRUSION LINES

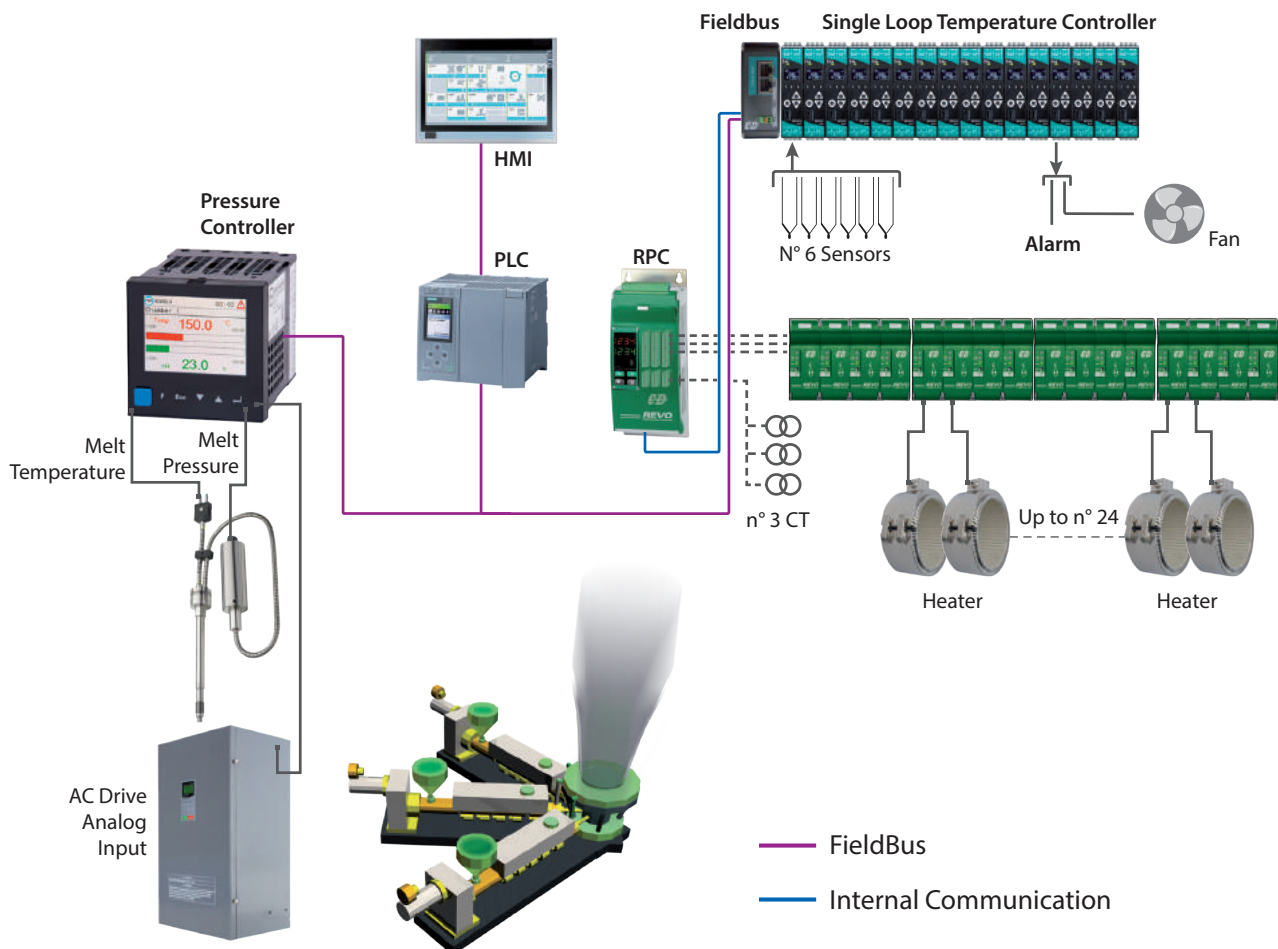
- Scalable power management, single extruder or full line.
- Cyclic reading and writing of process variables.
- Short circuit SCR and load brake diagnostics.
- Reduced power consumption due to power grid fluctuations through live control.
- Maintains instantaneous power in the contractual limits with a power factor close to one.
- Strong bulk reduction and cabling for co-extrusion systems that can pass 100 zones.
- Distributed solutions with cable and labour cost reduction.



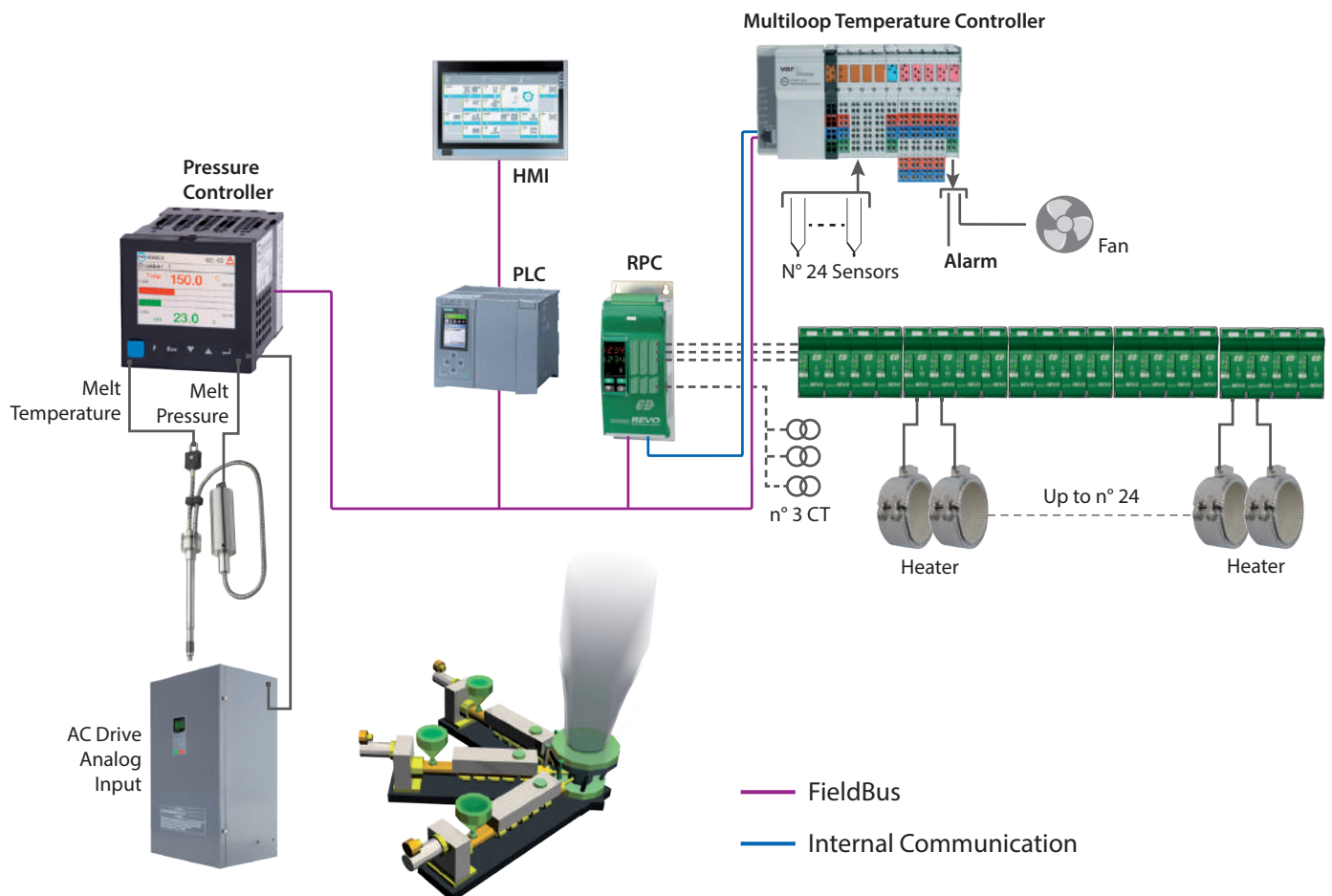
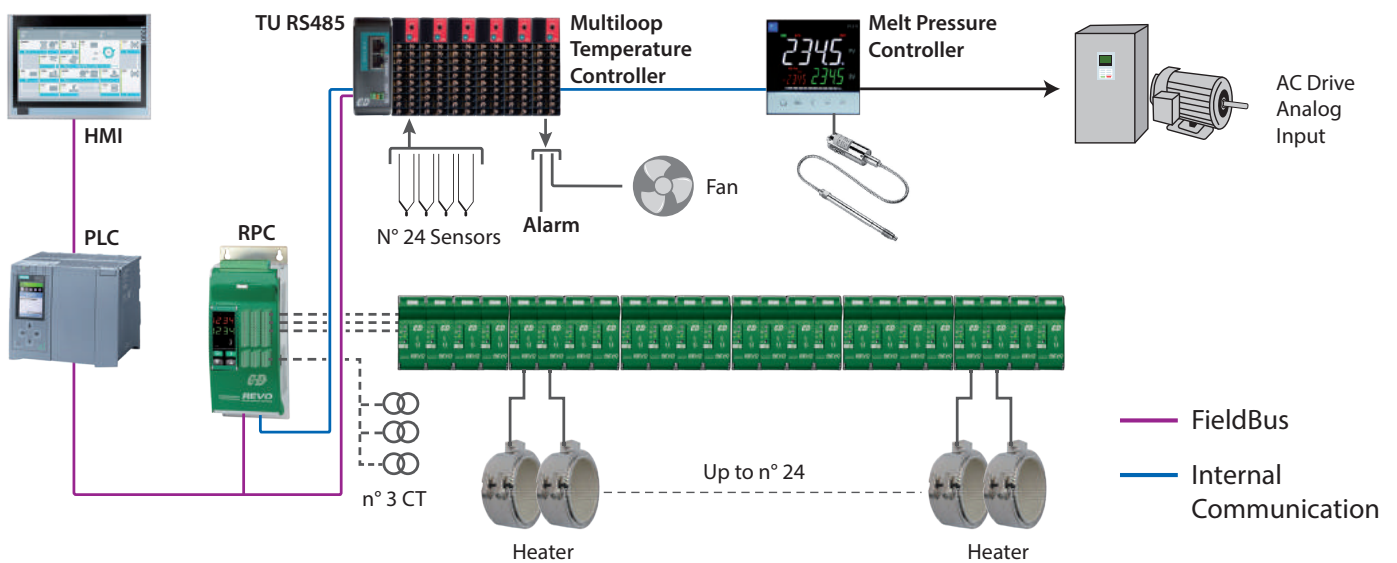
PANEL TEMPERATURE CONTROLLER AND HMI



FIELDBUS ARCHITECTURE WITH DIN RAIL CONTROLLER



FIELDBUS ARCHITECTURE WITH MULTILoop CONTROLLER





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