≡ REVO

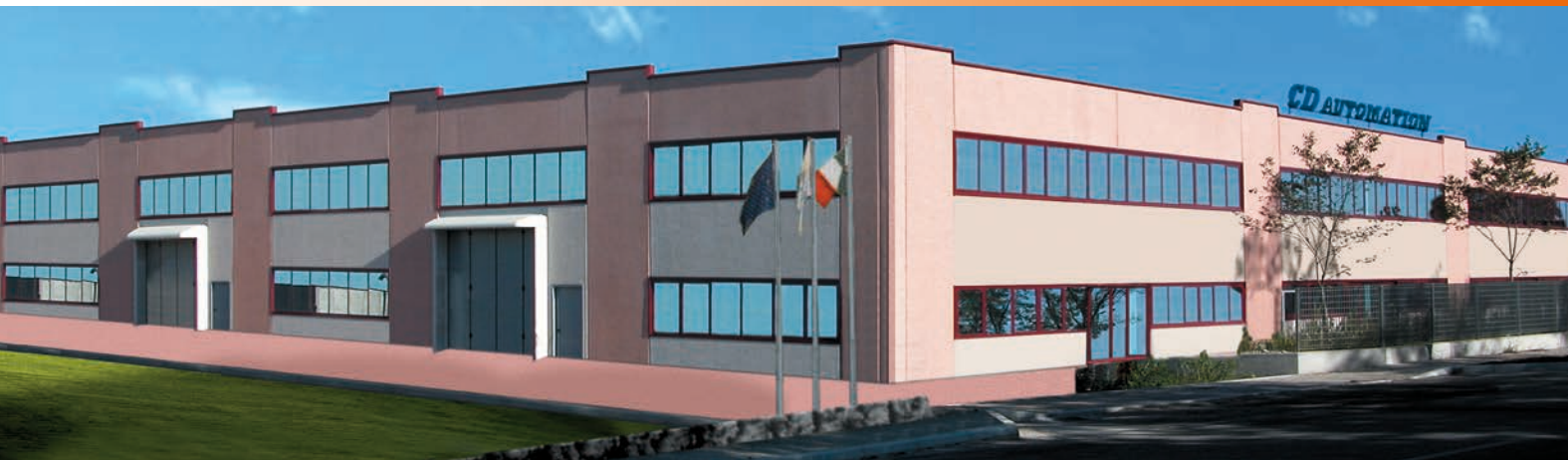## THE THYRISTOR EVOLUTION

From 3,5 to 2400A

- Intelligent thyristor units
- EMC and CE marked
- RS485 Comm. STD
- Custom series cUL approved
- Diagnostic and configuration via key pad or RS485

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We are delivering Real Cost Benefits

www.cdautomation.com

Catalog 2015 REV1

Our facility in Legnano for thyristor unit production

Our facility in Cantalupo for IGBT unit production and motor soft starters

CD Automation was founded in 1987 with the clear strategy of becoming a leading supplier of quality industrial automation products to the Italian market.
Key to this success was the formation of a sales team educated from a strong technical background.
The philosophy was simple; provide product & application experts able to work in partnership with the customer to find the right solution.

In 1990 CD Automation began its development of thyristor power controllers and quickly became the world wide market leader in using microprocessor based technology including RS485 communication.

CD Automation now boasts the most comprehensive power control device range on the market today.
The extensive range is capable of accurately controlling a wide spectrum of electrical loads up to 3000 kW, from simple single-phase heaters up to complex high temperature-coefficient three-phase load.

Technical Service
CD Automation has invested heavily in computerised testing equipment & state-of-the-art production equipment.
All products are individually testing including full functional, to improve quality and product reliability.
Our help desk service is available 10 hours per day with ex-stock delivery for spare parts.
Remote service via Internet is also available for thyristor units with RS485 communications.

Our facility in Ajmer, for production dedicated to India and fareast.

Our facility in East Sussex, England.

Index

REVO
THE THYRISTOR EVOLUTION

Is it now time for innovation?

The industrial world has changed beyond recognition yet the temperature control zone has been left almost un-touched, using the same wiring and mounting methods for the controller, solid state relay, fuse & fuse holder, current transformer etc.
Our idea is bring the temperature control the 21st Century.
The new REVO is THE solution for today's modern industrial sector.

What REVO offers?

- Modularity of its components.
- Configurability that allows increased product performance.
- REVO's 'value-add' capable of saving 50% of labour and space.
- Innovation based on knowledge of process.
- International assistance from around the world via trained distributors and joint venture multi-national companies.
- Dynamic organization with total customer flexibility at the core of its philosophy.

REVO is a system not a simple product.

- Includes all key components of a typical temperature control zone.
- Modular system that is fully configurable satisifying the most complex applications.
- Wiring & mounting accessories included.
- Designed as a total block of automation.
- Touch panel or PC communications capability as standard.
- Multi power management (MPM) to reduce total peak current, optimising power factor & saving costs.

Why choose REVO?

We designed a superior product
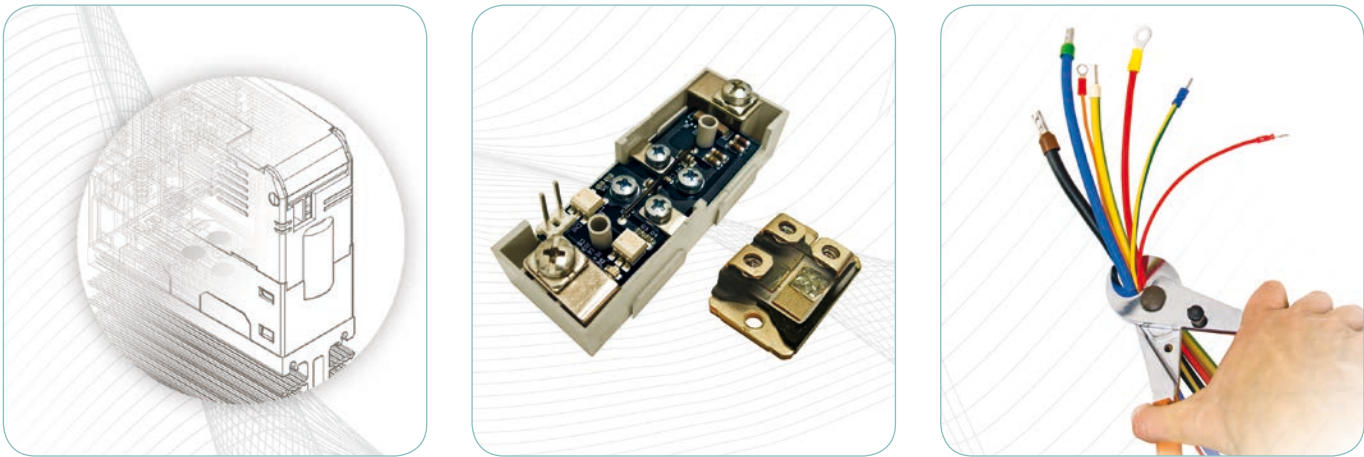
With the market place becoming more competitive we had a choice to make. Design a product a little cheaper but possibly not as good, or design a new innovative product where its added value is clear for all to see. We chose the latter, in line with our long-term philosophy.

No compromise

Heatsink and thyristor junctions generously sized to guarantee a long life for the thyristor unit
• Units working at low junction thyristor temperature with 20% margin on max temperature
• Strong connection design between the block terminal and thyristor semiconductor connection allows for generous sizing
• All the copper connections treated against oxidation
• Rugged construction for electronic and plastic parts
• Protection against over voltage

Have a closer look

Open a CD Automation thyristor unit and any of our competitors, you will discover the difference and see why we can offer a longer life warranty (see below tab).

Estimated Powercycles of AL wire bonded dies

dT	Tj max \°C 100°C	110°C	120°C	130°C	140°C
Tj start \°C 80°C	248.000				
70°C	320.200	110.000			
60°C	464.000	145.500	51.100		
50°C	782.000	216.000	69.100	24.800	
40°C	1.600.000	372.000	105.000	34.100	12.500
SSR 30°C	4.800.000	793.000	184.000	52.500	17.500
Single Cycle 20°C	25.400.000	2.400.000	400.000	94.000	27.500
		12.800.000	1.200.000	209.000	50.000
			6.700.000	645.000	112.000
				3.600.000	353.000
					2.000.000

CD Automation	CD Automation	COMPETITORS
CD predicted life working in Single Cycle.	CD predicted life whith SSR Input and ZC Firing.	Predicted life of majority of competitors working at 130°C with SSR Input and ZC firing.

Save space = Save money

An innovative process solution that will dramatically save wiring & labour

With a reduction of 50% space, it's easy to save hundreds off the cabinet price.

Left Side (Traditional)
Mounted on the baseplate are a Fuse & Fuseholder, 40A Solid State Relay and a Current Transformer.

Right Side (Innovative)
Mounted on the same baseplate are two Relay 40A units, each having the same components as the traditional unit.
This simple example demonstrates a 50% saving of panel space.
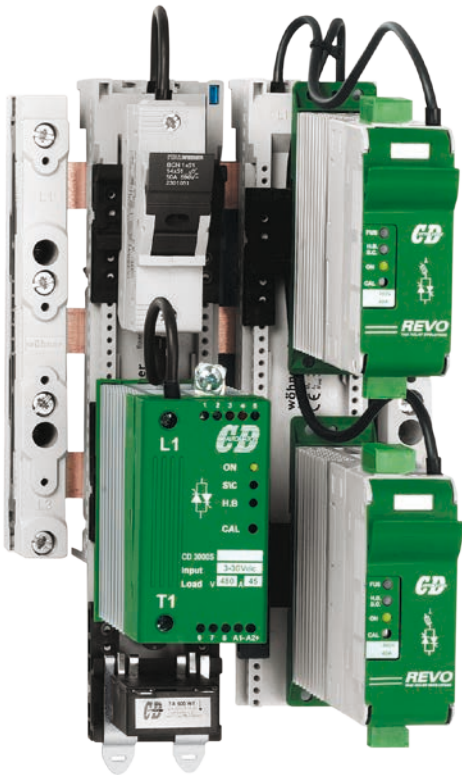
Traditional   Innovative

The new Revo S family
Can be put together with little technical knowledge
• SSR Solid State Relay with Zero Crossing
• SSR Solid State Relay + Fuse & Fuse Holder
• SSR Solid State Relay + Fuse & Fuse Holder + Current Transformer
• Different versions with or without heatsink
• Single and three phase thyristor units

The new Revo M = Revo S + Drive M
The addition of Drive M transforms a simple unit into a sophisticated unit capable of the following additional features
• Universal inputs accepting all standard signals
• Universal firing including Zero Crossing, Burst Firing
• Single Cycle, Delayed Triggering and Phase Angle
• Universal Feed Back (Voltage, Current and Power)
• RS485 Communication standard field bus available as options

OPTIONS
• Heater Break Alarm for partial or total load failure
• Thyristor short circuit failure

Key benefits include:
• Space reduction of 50%, labour reduction of 1 hour per control zone, high reliability
• If one zone fails a non-technical user can substitute a second within minutes

Glossary

Zero Crossing ZC

ZC firing mode is used with the logic output from a temperature controller and so the thyristor operates like a contactor.
The cycle time is performed by the temperature controller.
Zero Crossing minimizes interferences as the thyristor unit switches ON-OFF at zero voltage.
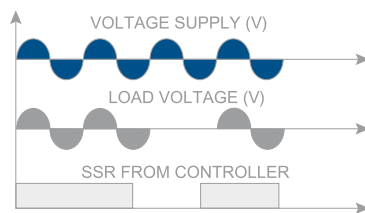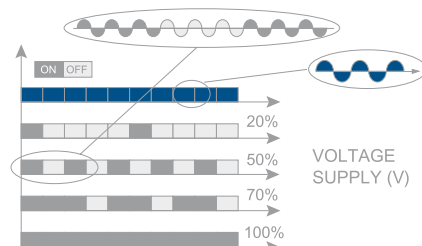

Burst Firing BF

This firing is performed digitally within the thyristor unit at zero volts, producing no EMC interference. Analogue input is necessary for BF and the number of complete cycles must be specified for 50% power demand. This value can be between 1 and 255 complete cycles, determining the speed of firing. When 1 is specified, the firing mode becomes Single Cycle (SC).

Soft Start + Burst Firing now availabe as an option.

Single Cycle SC

SC is the fastest zero crossing switching method. At 50% input signal, one cycle is ON and one cycle is OFF. At 75%, 3 cycles are ON and one cycle is OFF. If power demand is 76% the unit performs the same as for 75% but every time the unit switches ON the microprocessor divides 76/75 and memorises the ratio.
When the sum is one the unit delivers one cycle more to the load.
With this firing it is necessary to have analogue input.
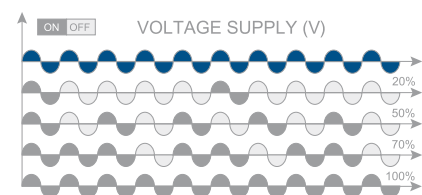
Delayed Triggering DT

Used to switch the primary coil of transformers when coupled with normal resistive loads (not cold resistance) on the secondary, DT prevents the inrush current when zero voltage (ON-OFF) is used to switch the primary. The thyristor unit switches OFF when the load voltage is negative and switches ON only when positive with a pre-set delay for the first half cycle.
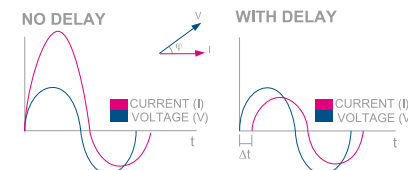
Phase Angle PA

PA controls the power to the load by allowing the thyristor to conduct for part of the AC supply cycle only. The more power required, the more the conduction angle is advanced until virtually the whole cycle is conducting for 100% power. The load power can be adjusted from 0 to 100% as a function of the analogue input signal, normally determined by a temperature controller or potentiometer, PA is normally used with inductive loads.
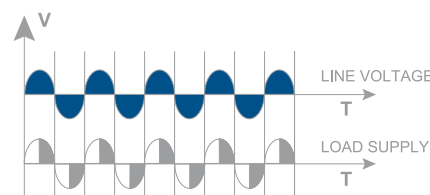
Feedback/Control Mode

Supply voltage fluctuations changes the power to the load.
To overcome this effect the voltage supplied to the load is measured and compared with the power demand from the controller.
The error signal is used to automatically hold the power at the value requested.

Three types of control mode are available:
• Voltage Control Mode, where the input signal is proportional to the voltage output (voltage f/b).
• Current Control Mode, where the input signal is proportional to the current output (current f/b).Power Control Mode, where the input signal is proportional to the power output (power f/b).
• As an option it is possible to transfer control mode from voltage to power via a simple digital command.

What our customers want?

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

Knowledgeable Sales Team

We have a team of sales engineers focused on core business products only. An expert at no cost, not an engineer with a big catalogue and little product knowledge, will welcome customers. Easy access to engineers when you need a special performance project.

Fast Service

Excellent pre sales and after sales service including engineering support.

Easy to do business with us

Fast reaction to your enquiry, short lead times, timely production of order acknowledgement, invoices etc.
Catalogues & manuals of all our products plus configuration software, available free of charge from our web-site.
Our people are always welcoming to our customers.

Digital Documentation on www.cdautomation.com

• Bulletins
• Manuals
• Applications
• Help desk
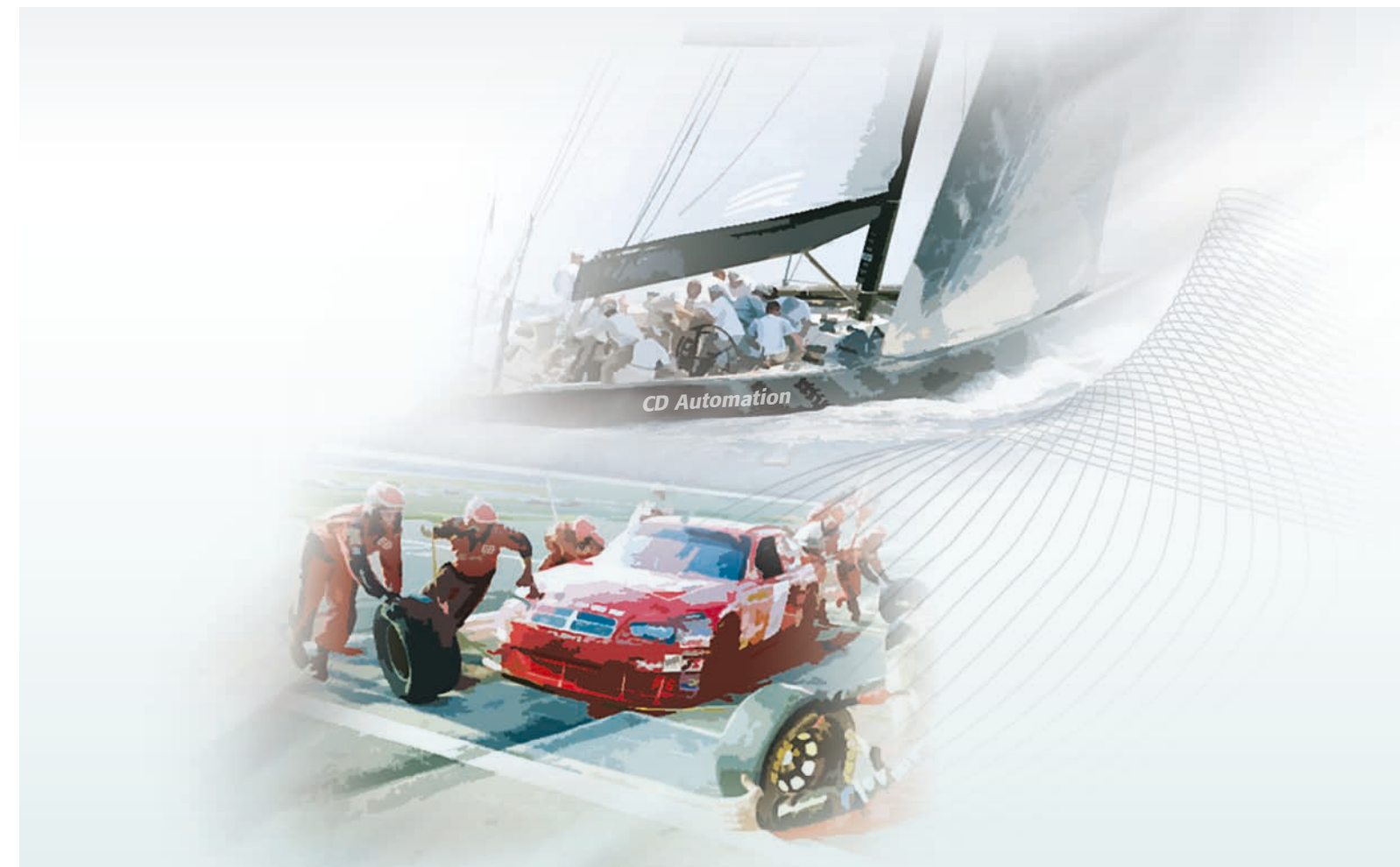
Guide to family model as function of price
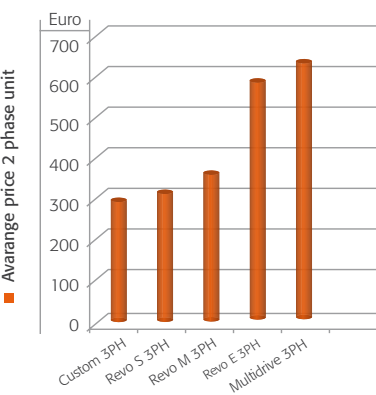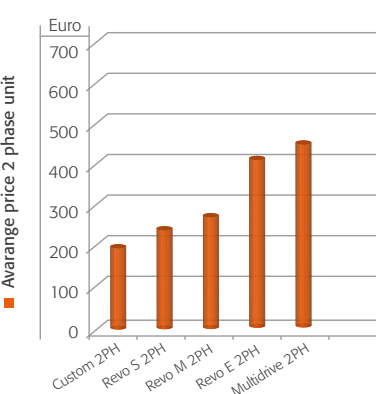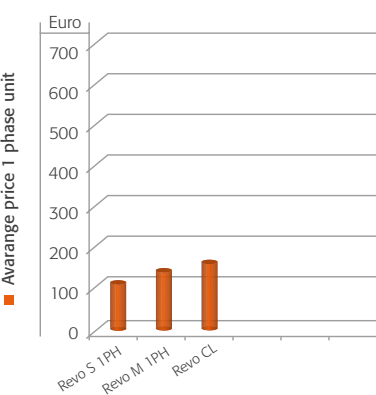
MODEL	INPUT	FIRING	CURRENT LIMIT	COMMU_ NICATION	CONTROL MODE	MAX VOLTAGE	MAX CURRENT	MAIN OPTION
REVO S 1PH	SSR ANALOG	0-CROSSING BURST-FIRING	NO	NO	NO	600V	700A	HB ALARM ANALOG
REVO M 1PH	SSR ANALOG RS485	0-CROSSING BURST-FIRING PHASE ANGLE	NO	YES	V, I, VxI	600V	700A	HB ALARM ANALOG Std
REVO CL	SSR ANALOG RS485	0-CROSSING BURST-FIRING PHASE ANGLE	YES	YES	V, I, VxI	600V	700A	HB ALARM ANALOG Std

MODEL	INPUT	FIRING	CURRENT LIMIT	COMMU_ NICATION	CONTROL MODE	MAX VOLTAGE	MAX CURRENT	MAIN OPTION
CUSTOM 2PH	SSR ANALOG	0-CROSSING BURST-FIRING	NO	NO	NO	690V	2400A	HB ALARM ANALOG
REVO S 2PH	SSR ANALOG	0-CROSSING BURST-FIRING	NO	NO	NO	600V	700A	HB ALARM ANALOG
REVO M 2PH	SSR ANALOG RS485	0-CROSSING BURST-FIRING	NO	YES	V, I, VxI	600V	700A	HB ALARM ANALOG Std
REVO E 2PH MULTIDRIVE 2PH	SSR ANALOG RS485	0-CROSSING BURST-FIRING DELAYED TRIGGERING	NO	YES	V, I, VxI	600V 690V	700A 2400A	HB ALARM ANALOG Std

MODEL	INPUT	FIRING	CURRENT LIMIT	COMMU_ NICATION	CONTROL MODE	MAX VOLTAGE	MAX CURRENT	MAIN OPTION
CUSTOM 3PH	SSR ANALOG	0-CROSSING BURST-FIRING	NO	NO	NO	690V	2400A	HB ALARM ANALOG
REVO S 3PH	SSR ANALOG	0-CROSSING BURST-FIRING	NO	NO	NO	600V	500A	HB ALARM ANALOG
REVOO M 3PH	SSR ANALOG RS485	0-CROSSING BURST-FIRING	NO	YES	V, I, VxI	600V	500A	HB ALARM ANALOG Std
REVO E 3PH MULTIDRIVE 2PH	SSR ANALOG RS485	0-CROSSING BURST-FIRING PHASE ANGLE DELAYED TRIGGERING	YES	YES	V, I, VxI	600V 690V	700A 2400A	HB ALARM ANALOG Std

Note: On graphic above it's possible to see the comparison in term of prices between the different families and the different models.
As a reference has been taken the price of Revo S 1PH and we have assigned to it a conventional value of 100 al the other prices are multiple of it and value of a model is the average value of different current rating.
HB Alarm for partial or total load failure.

REVO family model from 30 to 2400A

Universal Firing
Possibility to configure all the possible firing
Phase Angle
Soft Start + Phase Angle
Zero Crossing
Burst Firing, Single Cycle

Construction
Aluminium
Treated copper bars
Easy access to circuit board, fuse and thyristor just opening the frontal door

Universal Input
Analog Inputs
Potentiometer
Communication via different FieldBus

Programming / Tuning Facility
Friendly to be done:
RS485 Communication port
Frontal Key Pad
Reading of Current, Voltage, Power and all parameter

Universal Control Mode
Voltage Feedback
Current Feedback
Square Current and Power Feedback

Custom family model from 10 to 2400A

Rugged and realiable
Easy to be customized
with customer LOGO

Firing
Zero Crossing
Burst Firing

Front Key Pad to read:
Current
Voltage
Power and all parameter

Basic product
Able to satisfy OEM needs and easy to be used

Application guide for Thyristor unit selection

APPLICATION GUIDE	LOAD TYPE	MODEL	CURRENT RANGE	N. OF UNITS	PHASE CTRL
	Normal resistance infrared medium and long waveform	Revo SSR	It depends on heat sink	1	1
		Revo S 1PH	30-700A	1	1
		Custom 1PH	300-2400A	1	1
	Quartz lamp infrared waveform	Revo M 1PH	35-700A	1	1
		Revo CL	35-700A	1	1
	Molibdenum, Tungstenum, Superkanthal, Platinum,	Revo CL	35-700A	1	1
	Silicon carbide elements	Revo M 1PH	35-700A	1	1
		Revo CL	35-700A	1	1
	Transformers coupled with normal resistance	Revo M 1PH	35-700A	1	1
	Transformers coupled with cold resistances (kanthal super)	Revo CL	35-700A	1	1
	Normal Resistance	Revo S 2PH	30-700A	1	2
		Revo M 2PH Multidrive 2PH	30-700A 1000-2400	1	2
	Normal Resistance	Revo S 3PH	30-500A	1	3
		Revo M 3PH	30-500A	1	3
		Custom 3PH	150-2400A	2-3	3
	Silicon carbide elements	CD 3000E 3PH Multidrive 3PH	35-500A 35-2400A	1	3
		Revo M 3PH	30-500A	1	3
	Molibdenum, Tungstenum Super Kantal Platinum, Quartz lamp infrared short waveform	CD3000E 3PH	35-500A	1	3
		Multidrive 3PH	25-2400A	1	3
	Three phase transformer	CD3000E 3PH	25-500A	1	3
		Multidrive 3PH	25-2400A	1	3
	Three phase normal load resistance with open delta connection	Revo S 3PH	30-500A	1	3
		Revo M 3PH	30-500A	1	3
		Custom 3PH	150-2400A	1	3
	Cold resistance	Revo CL	30-700A	3	3
		CD3000E Multidrive 3PH	35-500A 35-2400A	1	3

CONTROL MODE: V = Voltage feedback   V² = Square voltage feedback   VxI = Power feedback   I = Current feedback

SUGGESTED FIRING MODE FOR YOUR APPLICATIONS					OTHER FEATURES				SIZING		NOTE
ZC	SC	BF	BF Simply	S+BF	DT	PA	CL	Control	V	I	
•									V	$\frac{P}{V}$	For general resistance applications with low variations in temperature and age. For low inertia loads use Single Cycle (SC) or Phase Angle (PA).
•		•									
•		•									
	•	•					•	V²	V		
							•	VxI			
						•	•	I²	V	$\frac{P}{V}$	These resistances change with temperature but have low variations with age. Starting current with cold elements can be 16 times nominal current (superkanthal). Infrared lamp short waveform can reach 8 time nominal current.
		•						V to VxI	V	$\frac{P}{V}$	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.
							•				
					•			VxI	V	$\frac{P}{Vco\varnothing}$	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.
						•	•	I²	V	$\frac{P}{Vco\varnothing}$	Use Phase Angle + Current Limit
•		•							V	$\frac{P}{1.73V}$	Revo M 2PH is suitable to control resistive loads with delta or star connection without neutral.
		•						VxI	V	$\frac{P}{1.73V}$	
•		•									Three phase load with star plus neutral connection must be controlled on the three phases.
		•						VxI	$\frac{V}{1.73}$	$\frac{P}{1.73V}$	
•		•									
						•		V to VxI	V	$\frac{P}{1.73V}$	On three phase silicon carbide elements VxI feedback is suggested to have a constant power control. This is necessary to compensate resistance change with temperature and age. Resistance value at the end of element life is 4 times the original value. With Revo M use BF firing and Power Limit.
		•									
						•	•	I²			These resistances change with temperature but have low variations with age. Start up current with cold elements can be many times the nominal current value. In this case it is necessary to use Phase Angle + Current Limit.
						•	•	I²			
						•	•	I²	V	$\frac{P}{1.73Vco\varnothing}$	Three phase Multidrive and CD3000E are specially designed to drive three phase transformers coupled on secondary with normal or special resistive loads.
						•	•	I²			
•		•							V	$\frac{P}{3V}$	Open delta can be driven by three phase unit.
		•						VxI			
•		•									
						•	•	I²	V	$\frac{P}{3V}$	

REVO feature comparison

Left table (Revo CL / SSR / S)

Section	Description	Revo CL	Revo SSR	Revo S 1PH	Revo S 2PH	Revo S 3PH
	CODE	RCL	SSR	RS1	RS2	RS3
LOAD TYPE	Max voltage 480V	●	●	●	●	●
	Max voltage 600V	●	●	●	●	●
	Max voltage 690V	● >280A		● >280A	● >280A	● >225A
	Single phase	●	●	●		
	3 phase load star no neutral or delta				●	●
	3 phase load star with neutral					●
	3 phase load open delta	●				●
INPUT TYPE	SSR 4:30VDC	●	●	●	●	●
	4:20 mA	●	○	○	○	○
	0:10 Vdc	●	○	○	○	○
	10K potentiometer	●				
	Communication command	●				
FIRING	Zero crossing		●	●	●	●
	Single cycle					
	Burst firing			○ (3)	○ (3)	○ (3)
	Soft start + burst firing	●				
	Phase angle	●				
	Soft start + phase angle	●				
	Delayed triggering + burst firing	●				
CONTROL MODE	Voltage	●				
	Square Current	●				
	Current	●				
	Voltage X current (power)	●				
	Voltage to power transfer	●				
	External control mode	●				
OPTION	Internal current limit	● (1)				
	Heater break + thyristor short circuit	○	○	○	○	○
	Integrated fixed fuses	● >40A		● >40A	● >40A	● >40A
	Fuse & fuse holder	≤40A	≤40A	≤40A	≤40A	≤40A
	Flat wiring terminal		○ (2)	○ (2)	○ (2)	○ (2)
COMM.	RS485 with modbus protocol	●				
	Profibus DP, ethernet	○				
	Frontal key pad	●				
	PC programmable + USB\TTL conv.	●				
	Easy Download					
I/O	Analogue input/output (4)	1/1				
	Digital input/output	2/1				

Left current / size table

CURRENT	SIZE (CL)	SIZE (SSR)	SIZE (RS1)	SIZE (RS2)	SIZE (RS3)
30		SR0.SR1	SR3.SR6	SR4.SR7	SR5.SR8
35	SR9		SR3.SR6	SR4.SR7	SR5.SR8
40	SR9		SR3.SR6	SR4.SR7	SR5.SR8
45					
60	SR12		SR12	SR15	SR16
75					
90	SR12		SR12	SR15	SR16
100					
120	SR15		SR15	SR16	SR17
125					
150	SR15		SR15	SR16	SR17
180	SR15		SR15	SR16	SR17
200					
210	SR15		SR15	SR16	SR17
225					S13
280	S9		S9	S10	
300					S14
350					S14
400	S12		S12	S14	S14
450				S14	S14
500	S12		S12	S14	S14
600	S12		S12	S14	
700	S12		S12	S14	
850					
1100					
1400					
1700					
1900					
2100					
2700					

Right table (Revo M / CD3000E / Multidrive)

Section	Description	Revo M 1PH	Revo M 2PH	Revo M 3PH	CD3000E 2PH	CD3000E 3PH	Multidrive 1PH	Multidrive 2PH	Multidrive 3PH
	CODE	RM1	RM2	RM3	RE2	RE3	M1	M2	M3
LOAD TYPE	Max voltage 480V	●	●	●	●	●	●	●	●
	Max voltage 600V	●	●		●	●	●	●	●
	Max voltage 690V	● ≥400A	● ≥400A	● >250A				●	●
	Single phase	●					●		
	3 phase load star no neutral or delta		●	●	●	●		●	●
	3 phase load star with neutral			●		●			●
	3 phase load open delta			●		●			●
INPUT TYPE	SSR 4:30VDC	●	●	●	●	●	●	●	●
	4:20 mA	●	●	●	●	●	●	●	●
	0:10 Vdc	●	●	●	●	●	●	●	●
	10K potentiometer	●	●	●	●	●	●	●	●
	Communication command	●	●	●	●	●	●	●	●
FIRING	Zero crossing						●		
	Single cycle						●		
	Burst firing	●	●	●	●	●	●	●	●
	Soft start + burst firing	●					●	●	●
	Phase angle	●					●	●	●
	Soft start + phase angle	●					●	●	●
	Delayed triggering + burst firing	●			●	●	●		●
CONTROL MODE	Voltage	●	●	●	●	●		●	●
	Square Current	●	●	●	●	●		●	●
	Current	●	●	●	●	●		●	●
	Voltage X current (power)	●	●	●	●	●		●	●
	Voltage to power transfer	●	●	●	●	●		●	●
	External control mode	●							
OPTION	Internal current limit				● (1)	● (1)			● (1)
	Heater break + thyristor short circuit	○	○	○	●	●	●	●	●
	Integrated fixed fuses	● >40A	● >40A	● >40A	●	●	●	●	●
	Fuse & fuse holder	≤40A	≤40A	≤40A					
	Flat wiring terminal								
COMM.	RS485 with modbus protocol	●	●	●	●	●	●	●	●
	Profibus DP, ethernet	○	○	○	○	○	○	○	○
	Frontal key pad	●	●	●	●	●	●	●	●
	PC programmable + USB\TTL conv.	●	●	●	●	●	●	●	●
	Easy Download				●	●	●	●	●
I/O	Analogue input/output (4)	0/1	0/1	0/1	0/1	1/1	2/4	2/4	2/4
	Digital input/output	2/1	2/1	2/1	4/3	4/3	6/4	6/4	6/4

Right current / size table

SIZE (RM1)	SIZE (RM2)	SIZE (RM3)	SIZE (RE2)	SIZE (RE3)	SIZE (M1)	SIZE (M2)	SIZE (M3)	CURRENT
	SR10	SR11						30
SR9	SR10	SR11				S13	S13	35
SR9	SR10	SR11						40
			S9	S9		S13	S13	45
SR12	SR13	SR16						60
			S9	S9		S13	S13	75
SR12	SR13	SR16						90
			S9	S11		S13	S13	100
SR15	SR16	SR17						120
			S9	S11		S13	S13	125
SR15	SR16	SR17	S9	S11		S13	S13	150
SR15	SR16	SR17						180
			S9					200
SR15	SR16	SR17						210
	S13			S13		S13	S13	225
S9	S10		S14			S14		280
	S14			S14			S14	300
	S14		S14	S14			S14	350
S12	S14	S14	S14	S14		S14	S14	400
	S14	S14	S14	S14		S14	S14	450
S12	S14	S14	S14	S14		S14	S14	500
S12	S14		S14			S14	S14	600
S12	S14		S14			S14	S14	700
					S14	S14	S15	850
					SR18	SR19	SR20	1100
					SR18	SR19	SR20	1400
					SR21	SR22	SR23	1700
					SR21	SR22	SR23	1900
					SR21	SR22	SR23	2100
					SR21	SR22	SR23	2700

● Standard   ○ Option   (1) Phase Angle only   (2) Flat wiring available as option ≤ 40A   (3) 4-8-16 Cycles Simplified Burst Firing available with Analog Input only   (4) Main Analog Input not included

For CD 3000 and Custom Family see pages 38-39

Size and dimensions of REVO family

SR0 H 97 x W 36 x D 32 - 0,12kg.

SR1 H 97 x W 36 x D 92 - 0,29kg.

SR2 H 121 x W 36 x D 87 - 0,27kg.

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

SR4 H 121 x W 72 x D 125 - 0,88kg.

SR5 H 121 x W 108 x D 125 - 1,32kg.

SR6 H 121 x W 36 x D 185 - 0,61kg.

SR7 H 121 x W 72 x D 185 - 1,22kg.

SR8 H 121 x W 108 x D 185 - 1,83kg.

SR9 H 121 x W 72 x D 185 - 1,15kg.

SR10 H 121 x W 108 x D 185 - 1,76kg.

SR11 H 121 x W 144 x D 185 - 2,4kg.

SR12 H 269 x W 93 x D 170 - 3,4kg.

SR13 H 269 x W 186 x D 170 - 6,8kg.

SR14 H 269 x W 279 x D 170 - 10,2kg.

SR15 H 273 x W 93 x D 170 - 3,6kg.

SR16 H 273 x W 186 x D 170 - 7kg.

SR17 H 273 x W 279 x D 170 - 10,6kg.

S9 H 350 x W 116 x D 244 - 5,1kg

S10 H 350 x W 240 x D 244 - 11kg.

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

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

S13/S14 H 440/520 x W 262 x D 270 - 18kg.

S15 H 520 x W 400 x D 270 - 43kg.

SR18 H 550 x W 329 x D 347 - 27kg.

SR19 H 550 x W 523 x D 347 - 49kg.

SR20 H 550 x W 717 x D 347 - 72kg.

SR21 H 640 x W 329 x D 347 - 32/40kg.

SR22 H 640 x W 523 x D 347 - 59/75kg.

SR23 H 640 x W 717 x D 347 - 86/110kg.

REVO CL 1PH

SIZE SR9   SIZE S12

INPUT
RS485
POT 10K
0-10V
4-20mA
SSR

OPTIONS
HB
SCR cc
HB+SCR cc

Std Config Digital Input
Alarm Relay Output
MODBUS Std RS485

FIRING
Delay Trig.
Phase Angle
Soft Start + Phase Angle

CONTROL MODE
V
I
VxI
I²

Current Limit

see note 1

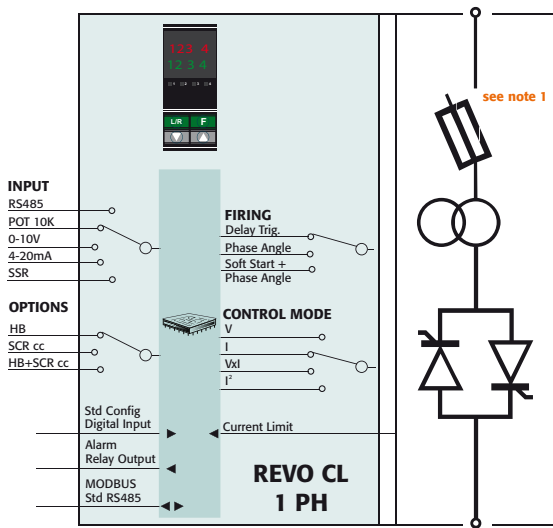**REVO CL 1 PH**

Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistance, infrared long, short and medium waveform, Silicon Carbide, cold resistance coupled with transformer
- **Inputs:** 0-10V dc, 4-20mA, 10kpot, SSR, RS485
- **Firing mode:** Burst Firing, Single Cycle, Soft Start + Phase Angle, Delayed Triggering
- **Operating temperature:** 0 to 40°C without derating
- **Control mode:** Voltage, VxI Power and current I and I²
- **RS485 port. RTU Modbus Protocol**
- **Comply with EMC**
- **Data sheet:** More details on "Revo CL" bulletin

Option

- Heater break alarm
- Configuration software code: CCA (cable + converter + configuration software)

ORDERING CODE

	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16 (Note 2)
ORDERING CODE	R	C	L	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT		4	5	6	
description			code		note
35A		0	3	5	
40A		0	4	0	
60A		0	6	0	
90A		0	9	0	
120A		1	2	0	
150A		1	5	0	
180A		1	8	0	
210A		2	1	0	
280A		2	8	0	
400A		4	0	0	
500A		5	0	0	
600A		6	0	0	
700A		7	0	0	

MAX VOLTAGE	7	
description	code	note
480 V	4	
600 V	6	
690V Available on units > 280A	7	

VOLTAGE SUPPLY AUX.	8	
description	code	note
90:130V	1	3
170:265V	2	3
230:345V	3	3
300:530V	5	3
510:690V	6	3
600:760V	7	3

INPUT	9	
description	code	note
0:10V dc	V	
4:20 mA	A	
10 K Pot	K	
RS 485	R	

FIRING	10	
description	code	note
Delayed Triggering + Burst Firing DT+BF (8 cycles at 50% power demand)	D	
Phase Angle PA	P	
Soft Start + Phase Angle S+PA	E	

CONTROL MODE	11	
description	code	Note
Open Loop	O	
Voltage Feed Back V	U	
Power Feed Back VxI	W	
Voltage Square V2	Q	
Current Feed Back I	I	

FUSES & OPTION	12	
description	code	Note
For Units =< 40A Fuse + Fuse Holder + CT Standard	Y	
Fuse + Fuse Holder + CT + HB with screw Terminal	H	
For Units > 40A Fixed Fuse + CT	Y	
Fixed Fuse + CT + HB	H	

FAN VOLTAGE	13	
description	code	Note
No Fan < 120A	0	
Fan 110V >= 120A	1	
Fan 220V >= 120A Std Version	2	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	

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

VERSION	16	
description	code	Note
Std with fuse + fuse holder up to 40A	1	
Second fuse normally used with phase to phase	2	4
Second fuse with an additional safety elettromechanical relay to open in alarm conditions	3	4

Note (1) Fuse & fuse holder are included as Std. up to 40A. Fixed fuses for all other rating.
Note (2) After 16th digit, write current and voltage of load inside brackets Ex (190A-400V)
Note (3) Load voltage must be included in Selected Auxiliary Voltage Range.
Note (4) This option is possible with unit up to 40A. Dimension equal Revo M 2PH of same rating.

Thyristor unit connected with Transformers

Revo CL has been specifically designed to drive transformers and has all the drive capability & techniques required, configurable from the front panel display.
Close examination of the transformer application needs to be made as the typical inrush current, when switched on.
This over-current will have the result of fuse or thyristor failure.

To avoid this peak current two techniques can be used:

- Phase angle firing with soft start and current limit. This type of firing can be used with all types of loads.
- Normal resistance
- Cold resistance (Example: Kanthall Super elements)
- Transformer coupled with normal or cold resistance

- Burst firing using the Delay Triggering (DT) technique. To avoid magnetic circuit saturation, the thyristor unit will switch OFF when the load voltage is negative and switch ON again when positive. The unit also has an adjustable delay on voltage zero crossing. In this way it is possible to switch ON when current is zero. This Firing technique can only be used with normal resistance, where its resistive value remains constant with temperature variations.
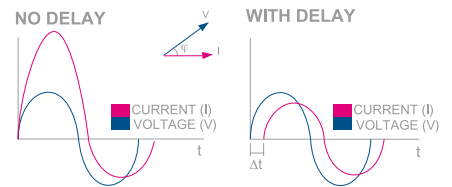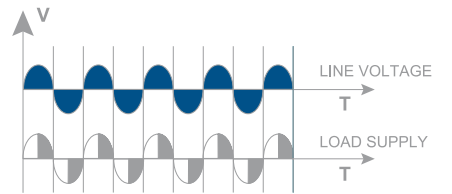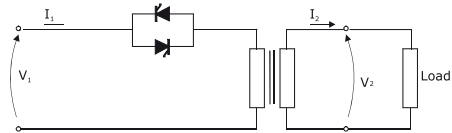
The BIG advantage with Revo CL

Buy one unit and you remove all application risks, selecting Phase Angle or Delayed Triggering as required via frontal Key Pad.

V_1 I_1 I_2 V_2 Load

V
LINE VOLTAGE
LOAD SUPPLY
T

NO DELAY
CURRENT (I) VOLTAGE (V)

WITH DELAY
CURRENT (I) VOLTAGE (V)

Ω mm² m⁻¹

Resistivity of some typical cold resistance

REVO SSR

SIZE SR0
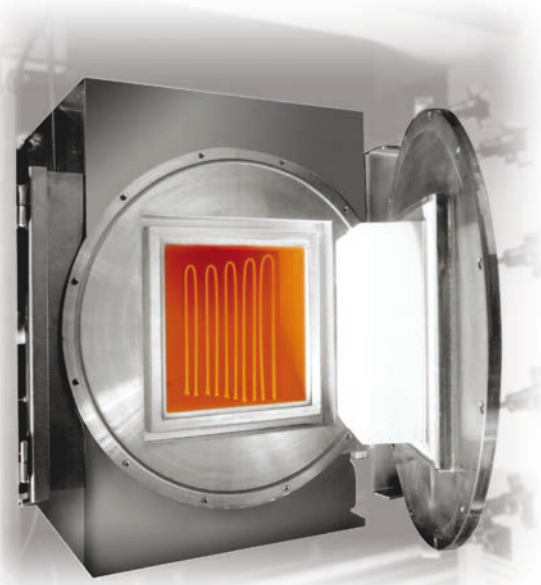
Technical Specification
- **Dimensions:** SR0, SR1, (see page18)
- **Load type:** Normal resistance, infrared long and medium waveform
- **Inputs:** SSR
- **Firing mode:** Zero Crossing
- **Operating temperature:** See graph on right page
- **Comply with EMC**
- **Data sheet:** More details on "Revo SSR" Bulletin

Option
Total load faillure without latching
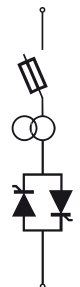All options below are available with fuse + fuse holder only
- Current Transformer
- Current Transformer + HB (heater break)
- Current Transformer + HB (heater break) + flat wiring system

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

CURRENT	4	5	6	
description		code		note
62A	0	6	2	
74A	0	7	4	
90A	0	9	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	

VOLTAGE SUPPLY AUX.	8	
description	code	note
Without HB no auxiliary voltage supply	0	
With HB 12:24V ac-dc opt. Available only with fuse + fuse holder	4	1

INPUT	9	
description	code	note
SSR	S	

FIRING	10	
description	code	note
ZC Zero Crossing	Z	
Random	R	

CONTROL MODE	11	
description	code	note
Open Loop	0	

FUSES & OPTION	12	
description	code	Note
No Fuse	0	
Fuse + Fuse Holder	F	
Fuse + Fuse Holder + CT	Y	
Fuse + Fuse Holder + CT + HB	H	2
Fuse + Fuse Holder + CT + HB + Flat Cable	X	2
Total Load Faillure	N	

FAN VOLTAGE	13	
description	code	Note
No Fan	0	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	

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

VERSION	16	
description	code	Note
Std version	1	

Note (1) Auxiliary voltage supply used only with HB option   **Note (2)** Option available only with fuse + fuse holder

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REVO SSR Analog

SIZE SR1

Technical Specification
- **Dimensions:** SR1 (see page18)
- **Load type:** Normal resistance, infrared long and medium waveform
- **Inputs:** 0:10V; 4-20mA - SSR
- **Firing mode:** Zero Crossing
- **Operating temperature:** See graph on right page
- **Comply with EMC**
- **Data sheet:** More details on "Revo SSR Analog" Bulletin

Option
All options below are available with fuse + fuse holder only
- Current Transformer
- Current Transformer + HB (heater break)
- Current Transformer + HB (heater break) + flat wiring system

	1	2	3	4	5	6	-	7	8	9	10	11	12	13	14	15	16
ORDERING CODE (Note3)	S	S	R	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT	4	5	6	
description		code		note
62A	0	6	2	
74A	0	7	4	
90A	0	9	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	

VOLTAGE SUPPLY AUX.	8	
description	code	note
12:24V ac-dc	4	

INPUT	9	
description	code	note
0:10V Analog Input	V	2
4:20 mA Analog Input	A	2

FIRING	10	
description	code	note
Burst Firing 4 Cycles on at 50% Power Demand	4	
Burst Firing 8 Cycles on at 50% Power Demand	8	
Burst Firing 16 Cycles on at 50% Power Demand	6	

CONTROL MODE	11	
description	code	note
Open Loop	0	

FUSES & OPTION	12	
description	code	Note
Fuse + Fuse Holder	F	
Fuse + Fuse Holder + CT	Y	
Fuse + Fuse Holder + CT + HB	H	2
Fuse + Fuse Holder + CT + HB + Flat Cable	X	2

FAN VOLTAGE	13	
description	code	Note
No Fan	0	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	

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

VERSION	16	
description	code	Note
Std version	1	

Note (2) Option available only with fuse + fuse holder
Note (3) All the Revo Analog version have fuse + fuse holder
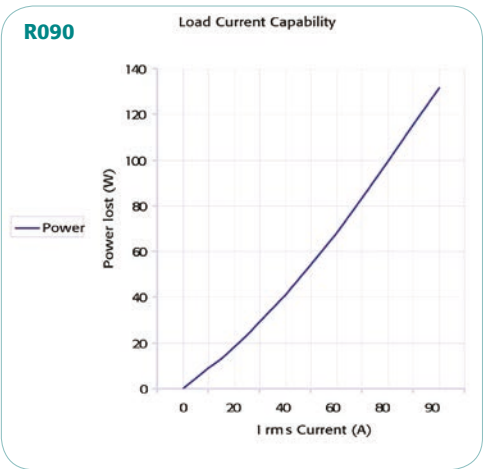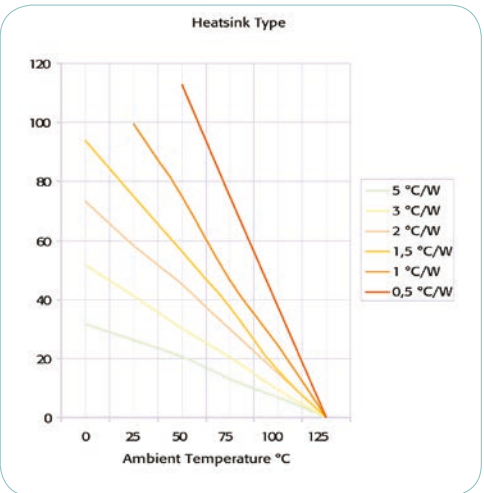

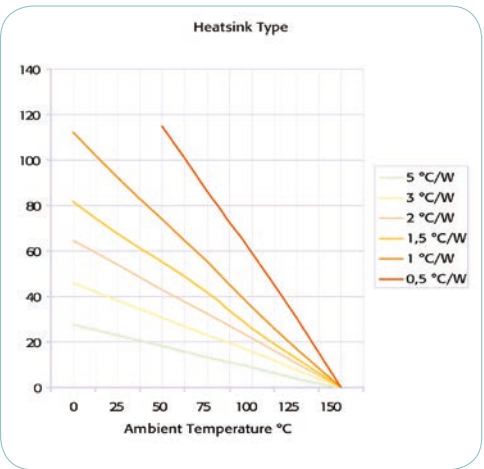# Current sizing for REVO SSR/SSR Analog
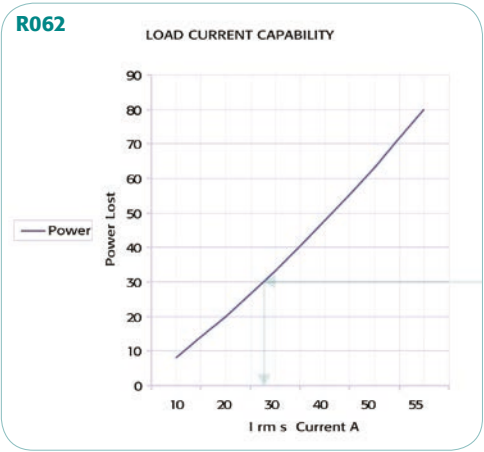
R062

R062 MODULE   Power Dissipation versus on state Current and ambient Temperature
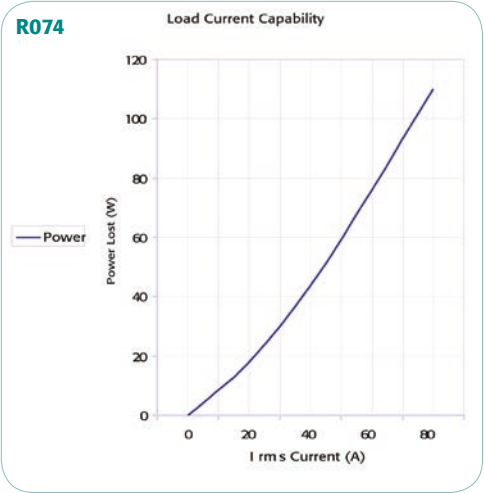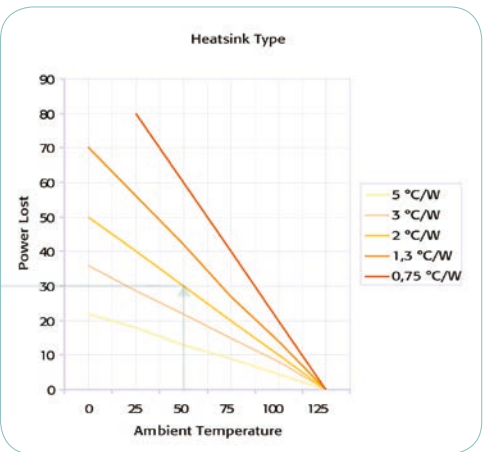
R074

R074 MODULE   Power Dissipation versus on state Current and ambient Temperature

R090

R090 MODULE   Power Dissipation versus on state Current and ambient Temperature

REVO SX

SIZE SR2 - 230V / 480V

Specification

- This unit is available in three version as is drawing below
- Each unit includes Fuse and Fuse Holder, thyristor and heat sink with its own Firing circuit
- Zero Crossing Firing
- Insulated input
- LED for On Off Status indication
- LED for fuse failure indication
- Plug in connection for auxiliary and power terminations
- Small dimensions Width: 36 Depth: 86 Height:121
- Din rail mounting or screw mounting
- Can be used in applications with many zones and low power as thermoforming, blow Moulding and Hot Runners
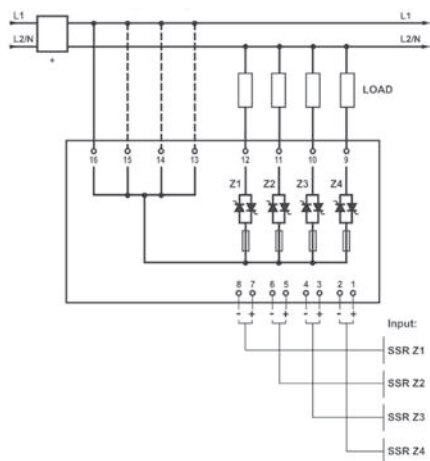
Diagram of control connection 4x3,5A

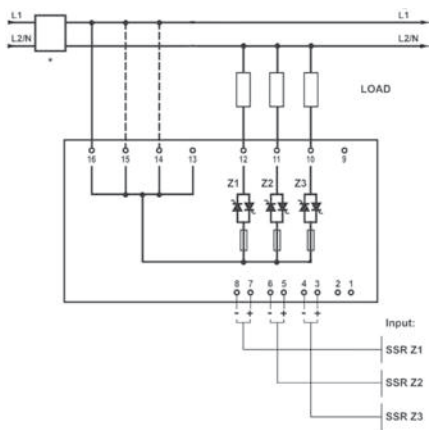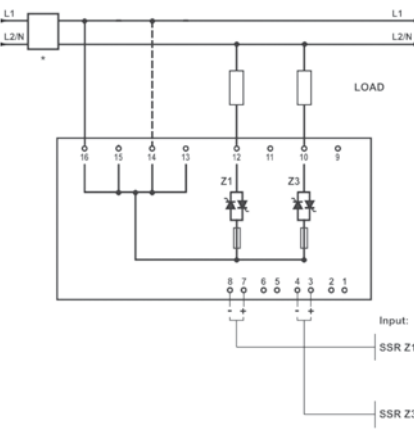### Diagram of control connection 3x4,5A

Diagram of control connection 2x7A

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

NUMBER OF ZONES X CURRENT RATING	4	5	6	
description	code			note
4 zones 3,5A each	4	0	3	
3 zones 4,5A each	3	0	4	
2 zones 7A each	2	0	7	

MAX VOLTAGE	7	
description	code	note
230 V	2	
480 V	4	2

VOLTAGE SUPPLY AUX.	8	
description	code	note
No auxiliary voltage with 230V	0	
12-24V ac-dc with 480V	4	

INPUT	9	
description	code	note
SSR	S	

FIRING	10	
description	code	note
Zero Crossing	Z	
Random (used with Revo-PC)	R	

CONTROL MODE	11	
description	code	note
Open Loop	0	

FUSES & OPTION	12	
description	code	Note
Fuse + Fuse Holder	F	
Total Load Faillure with Latching	L	1

FAN VOLTAGE	13	
description	code	Note
No Fan Voltage	0	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	

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

VERSION	16	
description	code	Note
Version 1	1	

Note (1) This option is available only on 480V version.
Note (2) The 480V version have dimension W=48 H=121 D=86

REVO S 1PH

SIZE SR6

SIZE S12

see note 3

Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistance, infrared long and medium waveform
- **Inputs:** SSR Standard, 0:10V, 4:20mA and Heather Break alarm are options
- **Firing mode:** Zero Crossing, Burst Firing available with analogue input only
- **Operating temperature:** 0 to 40°C without derating
- **Comply with EMC**
- **Data sheet:** More details on "Revo S 1PH" bulletin

Option

- Analog input: 4/20 mA or 0/10V
- Heather Break Alarm + Current Transformer
- Current Transformer only mounted inside

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

CURRENT	4	5	6	
description	code			note
30A	0	3	0	
35A	0	3	5	
40A	0	4	0	
60A	0	6	0	
90A	0	9	0	
120A	1	2	0	
150A	1	5	0	
180A	1	8	0	
210A	2	1	0	
280A	2	8	0	
400A	4	0	0	
500A	5	0	0	
600A	6	0	0	
700A	7	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	7

VOLTAGE SUPPLY AUX.	8	
description	code	note
No Aux. Voltage without HB and/or Analog Input up to 210A included	0	
With HB and/or Analog Input on all unit =<210A Aux Volt 12:24V ac-dc	4	
For all Units > 210A with whichever options and inputs		
90:130V	1	5
170:265V	2	5
230:345V	3	5
300:530V	5	5
510:690V	6	5
600:760V	7	5

INPUT	9	
description	code	note
SSR	S	
0:10V dc	V	
4:20mA	A	

FIRING	10	
description	code	Note
ZC Zero Crossing	Z	6
Burst Firing 4 Cycles On at 50% Power Demand	4	4
Burst Firing 8 Cycles On at 50% Power Demand	8	4
Burst Firing 16 Cycles On at 50% Power Demand	6	4

CONTROL MODE	11	
description	code	Note
Open Loop	0	

FUSES & OPTION	12	
description	code	Note
No Fuse for all Units =< 40A	0	
Fuse + Fuse Holder	F	
Fuse + Fuse Holder + CT	Y	
Fuse + Fuse Holder + CT + HB	H	
Fuse + Fuse Holder + CT + HB with flat cable connection	X	
Fixed Fuses Std for all Units > 40A	F	3
Fixed Fuses Std + CT	Y	
Fixed Fuses Std + CT + HB	H	

FAN VOLTAGE	13	
description	code	Note
No Fan < 120A	0	
Fan 110V >= 120A	1	
Fan 220V >= 120A Std Version	2	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	

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

VERSION	16	
description	code	Note
Std unit with one fuse only	1	
Units with 2 Fuses + fuse Holder =< 40A	2	1
Units with 2 Fuses + fuse Holder + safety relay + fuse =< 40A	3	2

Note (1) If you need one Revo S 1PH with 2 Fuse & Fuse Holder. For dimensions see Revo S 2PH. This solution can be used up to 40A max.
Note (2) If you need one Revo S 1PH with 2 Fuse & Fuse Holder + safety relay. For dimensions see Revo S 2PH. This solution can be used up to 40A max.
Note (3) Fixed Fuses over 40A
Note (4) Available only with Analog input.
Note (5) Load voltage must be included in Selected Auxiliary Voltage Range for units >210A

Note (6) With 690V the firing is random.
Note (7) Available on unit >280A
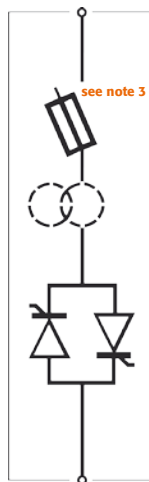
REVO S 2PH

SIZE SR7   SIZE S14

Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistance, infrared long and medium waveform
- **Inputs:** SSR Standard, 0:10V, 4:20mA and Heather Break alarm are options
- **Firing mode:** Zero Crossing, Burst Firing available with analogue input only
- **Operating temperature:** 0 to 40°C without derating
- **Comply with EMC**
- **Data sheet:** More details on "Revo S 2PH" bulletin

Option

- Analog input: 4/20 mA or 0/10V
- Current Transformer only mounted inside
- Current Transformer + HB Alarm

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

CURRENT	4	5	6	
description		code		note
30A	0	3	0	
35A	0	3	5	
40A	0	4	0	
60A	0	6	0	
90A	0	9	0	
120A	1	2	0	
150A	1	5	0	
180A	1	8	0	
210A	2	1	0	
280A	2	8	0	
400A	4	0	0	
450A	4	5	0	
500A	5	0	0	
600A	6	0	0	
700A	7	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	5

VOLTAGE SUPPLY AUX.	8	
description	code	note
No Aux. Voltage without HB and/or Analog Input up to 210A included	0	
With HB and/or Analog Input on all unit =<210A Aux Volt 12:24V ac-dc	4	
For all Units > 210A with whichever options and inputs		
90:130V	1	3
170:265V	2	3
230:345V	3	3
300:530V	5	3
510:690V	6	3
600:760V	7	3

INPUT	9	
description	code	note
SSR	S	
0:10V dc	V	
4:20mA	A	

FIRING	10	
description	code	Note
ZC Zero Crossing	Z	
Burst Firing 4 Cycles On at 50% Power Demand	4	2
Burst Firing 8 Cycles On at 50% Power Demand	8	2
Burst Firing 16 Cycles On at 50% Power Demand	6	2

CONTROL MODE	11	
description	code	Note
Open Loop	0	

FUSES & OPTION	12	
description	code	Note
No Fuse for all Units =< 40A	0	
Fuse + Fuse Holder	F	
Fuse + Fuse Holder + CT	Y	
Fuse + Fuse Holder + CT + HB with Terminals	H	
Fuse + Fuse Holder + CT + HB with Flat Cable Connection	X	
Fixed Fuses Std for all Units > 40A	F	4
Fixed Fuses Std + CT	Y	
Fixed Fuses Std + CT + HB	H	

FAN VOLTAGE	13	
description	code	Note
Fan < 60A	0	
Fan 110V => 60A	1	
Fan 220V => 60A Std Version	2	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	

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

VERSION	16	
description	code	Note
Std unit with 2 fuses + fuses Holder =< 40A	1	
Std Units with 2 fixed fuses > 40A	2	
Units with 3 fuses + fuses Holder =< 40A	3	1

Note (1) If you need one Revo S 2PH with 3 Fuse & Fuse Holder For dimensions see Revo S 3PH.
This solution can be used up to 40A max.
Note (2) Available with Analog input only
Note (3) Load voltage must be included in Selected Auxiliary Voltage Range for unit > 210A
Note (4) Fixed Fuses over 40A
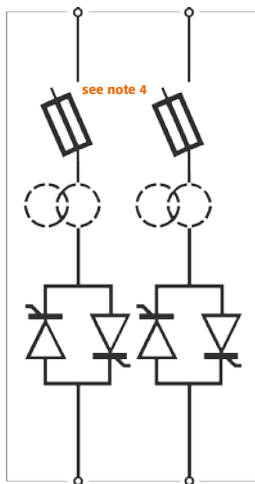**Note (5)** Available on unit >280A

REVO S 3PH

SIZE SR8   SIZE S13

Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistance, infrared long and medium waveform
- **Inputs:** SSR Standard, 0:10V, 4:20mA and Heather Break alarm are options
- **Firing mode:** Zero Crossing, Burst Firing available with analogue input only
- **Operating temperature:** 0 to 40°C without derating
- **Comply with EMC**
- **Data sheet:** More details on "Revo S 3PH" bulletin

Option

- Analog input: 4/20 mA or 0/10V
- Heather Break Alarm + Current Transformer
- Current Transformer + HB Alarm

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

CURRENT	4	5	6	
description		code		note
30A	0	3	0	
35A	0	3	5	
40A	0	4	0	
60A	0	6	0	
90A	0	9	0	
120A	1	2	0	
150A	1	5	0	
180A	1	8	0	
210A	2	1	0	
225A	2	2	5	
300A	3	0	0	
350A	3	5	0	
400A	4	0	0	
450A	4	5	0	
500A	5	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	5

VOLTAGE SUPPLY AUX.	8	
description	code	note
No Aux. Voltage without HB and/or Analog Input up to 210A included	0	
With HB and/or Analog Input on all unit =<210A Aux Volt 12:24V ac-dc	4	
For all Units > 210A with whichever options and inputs 90:130V		
90:130V	1	4
170:265V	2	4
230:345V	3	4
300:530V	5	4
510:690V	6	4
600:760V	7	4

INPUT	9	
description	code	note
SSR	S	
0:10V dc	V	
4:20mA	A	

FIRING	10	
description	code	Note
ZC Zero Crossing	Z	
Burst Firing 4 Cycles On at 50% Power Demand	4	2
Burst Firing 8 Cycles On at 50% Power Demand	8	2
Burst Firing 16 Cycles On at 50% Power Demand	6	2

CONTROL MODE	11	
description	code	Note
Open Loop	0	

FUSES & OPTION	12	
description	code	Note
No Fuse for all Units =< 40A	0	
Fuse + Fuse Holder	F	
Fuse + Fuse Holder + CT	Y	
Fuse + Fuse Holder + CT + HB with terminals	H	
Fuse + Fuse Holder + CT + HB + Flat cable connection	X	3
Fixed Fuses Std for all Units > 40A	F	1
Fixed Fuses Std + CT	Y	
Fixed Fuses Std + CT + HB	H	

FAN VOLTAGE	13	
description	code	Note
No Fan < 60A	0	
Fan 110V => 60A	1	
Fan 220V > 60A Std Version	2	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	

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

VERSION	16	
description	code	Note
Std Version	1	

Note (1) Fixed Fuses over 40A
Note (2) Available with Analog input only
Note (3) Available up to 40A only flat Cable Connection
Note (4) Load Voltage must be included in selected Auxiliary Voltage Range for unit > 210A
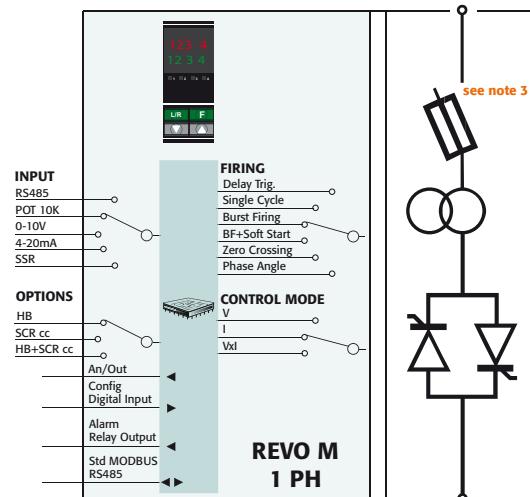**Note (5)** Available on unit = > 225A

REVO M 1PH

SIZE SR9   SIZE S12

REVO M 1 PH

Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistance, infrared short long and medium waveform, Silicon Carbide
- **Inputs:** 0:10V dc, 4:20mA, 10kpot, SSR, RS485
- **Firing mode:** Zero Crossing, Burst Firing, Single Cicle, Soft Start + Phase Angle, Delayed Triggering
- **Operating temperature:** 0 to 40°C without derating
- **Control mode:** Voltage, VxI Power, I and I2
- **RS485 port. RTU Modbus Protocol**
- **Comply with EMC**
- **Data sheet:** More details on "Revo M 1PH" bulletin

Option

- HB + CT : Current transformer plus HB Alarm
- Configuration software + CCA (cable + converter)
- Control mode retransmission

	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	Note 5 16
ORDERING CODE	R	M	1	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT		4	5	6	
description			code		note
35A		0	3	5	
40A		0	4	0	
60A		0	6	0	
90A		0	9	0	
120A		1	2	0	
150A		1	5	0	
180A		1	8	0	
210A		2	1	0	
280A		2	8	0	
400A		4	0	0	
500A		5	0	0	
600A		6	0	0	
700A		7	0	0	

MAX VOLTAGE	7	
description	code	note
480 V	4	
600 V	6	
690V	7	4

VOLTAGE SUPPLY AUX.	8	
description	code	note
90:130V	1	6
170:265V	2	6
230:345V	3	6
300:530V	5	6
510:690V	6	6
600:760V	7	6

INPUT	9	
description	code	note
SSR	S	
0:10V dc	V	
4:20V mA	A	
10KPot	K	
RS485	R	

FIRING	10	
description	code	note
Zero Crossing ZC	Z	
Single Cycle SC	C	
Burst Firing BF	B	
Soft Start + Burst Firing S+BF	J	
Delayed Triggering + Burst Firing DT+BF	D	
Phase Angle PA	P	
Soft Start + Phase Angle S+PA	E	

CONTROL MODE	11	
description	code	Note
Open Loop	O	
Voltage Feed Back	U	
Power Feed Back	W	
Current Feed Back	I	
Volage to Power Feed Back Transfer	T	

FUSES & OPTION	12	
description	code	Note
For Units =< 40A Fuse + Fuse Holder + CT	Y	
Fuse + Fuse Holder + CT + HB with Terminal	H	
For Units > 40A Fixed Fuse Std + CT	Y	3
Fixed Fuse Std + CT + HB	H	
Control Mode Retransmission 4:20mA	A	
Control Mode Retransmission 0:10mV	V	

FAN VOLTAGE	13	
description	code	Note
No Fan < 120A	0	
Fan 110V >= 120A	1	
Fan 220V >= 120A Std Version	2	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	

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

VERSION	16	
description	code	Note
Std unit with 1 fuse	1	
Unit with 2 fuses + Fuse Holder =< 40A	2	1
Unit with 2 fuses + Fuse Holder + Safety Relay =< 40A	3	2
Unit with 2 fuses + Fuse Holder + Safety Relay =< 40A	3	2

Note (1) If you need one Revo M 1PH with 2 Fuse & Fuse Holder.
For dimensions see Revo M 2PH. This solution can be used up to 40A max.
Note (2) If you need one Revo M 1PH with 2 Fuse & Fuse Holder + safety relay.
For dimensions see Relvo M 2PH. This solution can be used up to 40A max.
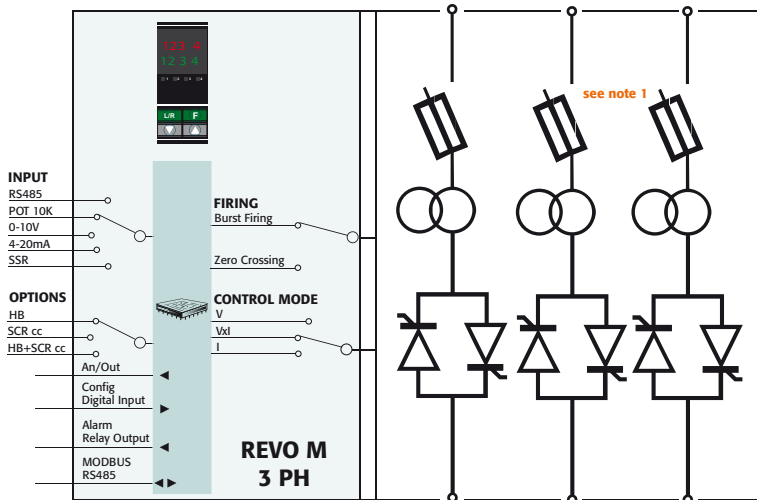**Note (3)** Fixed Fuse over 40A
Note (4) Available on units => 400A
Note (5) After 16th digit write current and voltage of load inside brackets Ex (190A-400V)
Note (6) Load voltage must be included in Selected Auxiliary Voltage Range.

REVO M 2PH

SIZE S14

REVO M 2 PH

Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistance, infrared long and medium waveform, Silicon Carbide
- **Inputs:** 0-10V dc, 4-20mA, 10kpot, SSR, RS485
- **Firing mode:** Zero Crossing, Burst Firing
- **Operating temperature:** 0 to 40°C without derating
- **Control mode:** V Voltage, VxI Power
- **RS485 port. RTU Modbus Protocol Std.**
- **Comply with EMC**
- **Data sheet:** More details on "Revo M 2PH" bulletin

Option

- HB + CT : Current transformer plus HB Alarm
- Control Mode Retransmission
- Configuration software code: CCA (cable + converter + configuration software)
- Profibus DP, Modbus TCP from 60A to 700A

	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	Note 4 16
ORDERING CODE	R	M	2	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT		4	5	6	
description			code		note
30A		0	3	0	
35A		0	3	5	
40A		0	4	0	
60A		0	6	0	
90A		0	9	0	
120A		1	2	0	
150A		1	5	0	
180A		1	8	0	
210A		2	1	0	
280A		2	8	0	
400A		4	0	0	
450A		4	5	0	
500A		5	0	0	
600A		6	0	0	
700A		7	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V Available on Units >= 400A	7	2

VOLTAGE SUPPLY AUX.	8	
description	code	note
90:130V	1	5
170:265V	2	5
230:345V	3	5
300:530V	5	5
510:690V	6	5
600:760V	7	5

INPUT	9	
description	code	note
SSR	S	
0:10V dc	V	
4:20V mA	A	
10KPot	K	
RS485	R	

FIRING	10	
description	code	note
Zero Crossing ZC	Z	
Burst Firing BF	B	

CONTROL MODE	11	
description	code	Note
Open Loop	O	
Voltage Feed Back V	U	
Power Feed Back VxI	W	
Current Feed Back I	I	

FUSES & OPTION	12	
description	code	Note
For Units =< 40A Fuse & Fuse Holder + CT	Y	1
Fuse & Fuse Holder + CT + HB with Terminal	H	
For Units => 40A Fixed Fuse Std + CT	Y	3
Fixed Fuse Std + CT + HB	H	
Control Mode Retransmission 4:20mA	A	
Control Mode Retransmission 0:10mV	V	

FAN VOLTAGE	13	
description	code	Note
No Fan < 120A	0	
Fan 110V >= 120A	1	
Fan 220V >= 120A Std Version	2	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	

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

VERSION	16	
description	code	Note
Std unit with 2 fuses + Fuse Holder =< 40A	1	1
Std Unit > 40A with 2 Fixed Fuses	2	
Unit with 3 fuses & Fuse Holder =< 40A	3	1

Note (1) If you need one Revo M 2PH with 3 Fuse & Fuse Holder
For dimensions see Revo M 3PH. This solution can be used up to 40A max
Note (2) Available on units => 400A
Note (3) Fixed Fuses over 40A
Note (4) After 16th digit write current and voltage of load inside brackets Ex (190A-400V)
Note (5) Load voltage must be included in Selected Auxiliary Voltage Range

REVO M 3PH

SIZE S13

Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistive, infrared long and medium waveform, Silicon Carbide
- **Inputs:** 0-10V dc, 4-20mA, 10kpot, SSR, RS485
- **Firing mode:** Zero Crossing, Burst Firing
- **Operating temperature:** 0 to 40°C without derating
- **Control mode:** Voltage, VxI Power I and I2
- **RS485 port. RTU Modbus Protocol Std.**
- **Comply with EMC**
- **Data sheet:** More details on "Revo M 3PH" bulletin

Option

- HB + CT : Current transformer plus HB Alarm
- Control Mode Retransmission
- Configuration software code: CCA (cable + converter + configuration software)
- Profibus DP, Modbus TCP for unit > 300A

	1	2	3	4	5	6	-	7	8	9	10	11	12	13	14	15	Note 2 16
ORDERING CODE	R	M	3	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT	4	5	6	
description		code		note
30A	0	3	0	
35A	0	3	5	
40A	0	4	0	
60A	0	6	0	
90A	0	9	0	
120A	1	2	0	
150A	1	5	0	
180A	1	8	0	
210A	2	1	0	
225A	2	2	5	
300A	3	0	0	
350A	3	5	0	
400A	4	0	0	
450A	4	5	0	
500A	5	0	0	

MAX VOLTAGE	7	
description	code	note
480 V	4	
600 V	6	
690V Available on Units => 225A	7	

VOLTAGE SUPPLY AUX.	8	
description	code	note
90:130V	1	3
170:265V	2	3
230:345V	3	3
300:530V	5	3
510:690V	6	3
600:760V	7	3

INPUT	9	
description	code	note
SSR	S	
0:10V dc	V	
4:20V mA	A	
10KPot	K	
RS485	R	

FIRING	10	
description	code	note
Zero Crossing ZC	Z	
Burst Firing BF	B	

CONTROL MODE	11	
description	code	Note
Open Loop	O	
Voltage Feed Back V	U	
Power Feed Back VxI	W	
Current Feed Back I	I	

FUSES & OPTION	12	
description	code	Note
For Units =< 40A Fuse & Fuse Holder + CT	Y	
Fuse & Fuse Holder + CT + HB with Terminal	H	
For Units => 40A Fixed Fuse Std + CT	Y	1
Fixed Fuse Std + CT + HB	H	
Control Mode Retransmission 4:20mA	A	
Control Mode Retransmission 0:10mV	V	

FAN VOLTAGE	13	
description	code	Note
No Fan <= 120A	0	
Fan 110V >= 120A	1	
Fan 220V >= 120A Std Version	2	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	

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

VERSION	16	
description	code	Note
Version Std with 3 fuses	1	

Note (1) Fixed Fuses over 40A
Note (2) After 16th digit write current and voltage of load inside brackets Ex (190A-400V)
Note (3) Load voltage must be included in Selected Auxiliary Voltage Range.

CD 3000E 2PH

SIZE S9
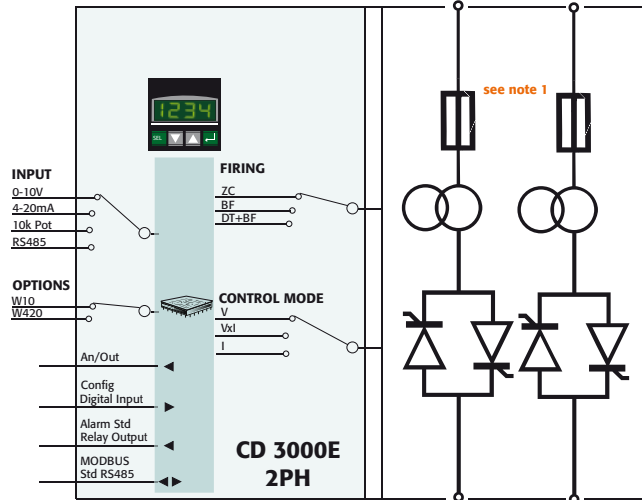
Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistance, three phase transformer, coupled with normal resistance
- **Inputs:** 0-10V dc, 4-20mA, 10k Pot, SR485
- **Firing mode:** Zero Crossing, Burst Firing, DT+BF (not with cold resistance)
- **Operating temperature:** 0° to 40°C without derating
- **Control mode:** V Voltage, VxI Power, Open Loop
- **RS485 port. RTU Modbus Protocol**
- **Comply with EMC**
- **Data sheet:** More details on "CD 3000E 2PH" bulletin

Option

- Configuration software code: CCA (cable converter + configuration software)
- Profibus DP Modbus TCP for unit > 280A

	1	2	3	4	5	6	-	7	8	9	10	11	12	13	14	15	Note 2 16
ORDERING CODE	R	E	2	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT	4	5	6	
description		code		note
35A	0	3	5	
45A	0	4	5	
75A	0	7	5	
100A	1	0	0	
125A	1	2	5	
150A	1	5	0	
200A	2	0	0	
280A	2	8	0	
400A	4	0	0	
450A	4	5	0	
500A	5	0	0	
600A	6	0	0	
700A	7	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	

VOLTAGE SUPPLY AUX.	8	
description	code	note
110V	1	
230V	2	

INPUT	9	
description	code	note
SSR 3:30V dc	S	
0:10V dc	V	
4:20V mA	A	
10KPot	K	
RS485	R	

FIRING	10	
description	code	note
Zero Crossing ZC	Z	
Burst Firing BF	B	
Delayed Triggering + Burst Firing DT + BF	D	3

CONTROL MODE	11	
description	code	Note
Open Loop	O	
Voltage Feed Back V	U	
Power Feed Back VxI	W	
Current Feed Back I	I	

OPTION	12	
description	code	Note
Control Mode Retransmission 4:20mA	A	
Control Mode Retransmission 0:10mV	V	

FAN VOLTAGE	13	
description	code	Note
Fan Voltage equal to Aux. Voltage	3	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	
cUL For American Market	L	

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

VERSION		16
description	code	Note
Resistive Load/Delta Connection	1	
Resistive Load/Star Connection	2	
Transformer Load/Delta Connection	3	
Transformer Load/Star Connection	4	

Note (1) Internal Fixed Fuses.
Note (2) After 16th digit write current and voltage of load inside brackets Ex (190A-400V). Required if units are to be tuned to load.
Note (3) DT + BF can be used to drive transformers coupled with normal resistance.

CD 3000E 3PH

SIZE S13

Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistance, three phase transformer coupled with normal or cold resistance
- **Inputs:** None, SSR, 0-10V, 4-20mA, 10kpot, RS485 communication
- **Firing mode:** Zero Crossing, Single Cycle, Burst Firing, Soft Start + Burst Firing, Delayed Triggering + Burst Firing, Phase Angle, Soft Start + Phase Angle
- **Operating temperature:** 0° to 40°C without derating
- **Control mode:** V, VxI, I
- **RS485 port. RTU Modbus Protocol**
- **Comply with EMC and cUL**
- **Data sheet:** More details on "CD 3000E 3PH" bulletin

Option

- Configuration software code: CCA (cableconverter + configuration software)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 (Note 1)
ORDERING CODE	R	E	3	_	_	_	-	_	_	_	_	_	_	_	_	_

CURRENT		4	5	6	
description		code			note
35A		0	3	5	
45A		0	4	5	
75A		0	7	5	
100A		1	0	0	
125A		1	2	5	
150A		1	5	0	
225A		2	2	5	
300A		3	0	0	
350A		3	5	0	
400A		4	0	0	
450A		4	5	0	
500A		5	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	

VOLTAGE SUPPLY AUX.	8	
description	code	note
110V	1	
230V	2	

INPUT	9	
description	code	note
SSR 3:30V dc	S	
0:10V dc	V	
4:20V mA	A	
10KPot	K	
RS485	R	

FIRING	10	
description	code	note
Zero Crossing ZC	Z	
Single Cycles SC	C	
Burst Firing BF	B	
Soft Start + Burst Firing S + BF	J	
Delayed Triggering + Burst Firing DT + BF	D	2
Phase Angle PA	P	
Soft Start + Phase Angle S + PA	E	

CONTROL MODE	11	
description	code	Note
Open Loop	O	
Voltage Feedback V	U	
Power Feedback VxI	W	
Current Feedback I	I	
Square I Feedback	Q	

OPTION	12	
description	code	Note
Control Mode Retransmission 4:20mA	A	
Control Mode Retransmission 0:10mV	V	

FAN VOLTAGE	13	
description	code	Note
Fan Voltage equal to Aux. Voltage	3	

APPROVALS	14	
description	code	Note
CE EMC For European Market	0	
cUL For American Market	L	

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

VERSION	16	
description	code	Note
Resistive Load/Delta Connection	1	
Resistive Load/Star Connection	2	
Resistive Load/Star Connection + Neutral	7	
Transformer Load/Delta Connection	3	
Transformer Load/Star Connection	4	
Transformer Load/Star Connection + Neutral	5	
Resistive Load/Open Delta	6	

Note (1) After 16th digit write current and voltage of load inside brackets Ex (190A-400V). Required if units are to be tuned to load.
Note (2) DT + BF can be used to drive transformers coupled with normal resistance.
Note (3) Internal Fixed Fuses.

Multidrive 1PH

SIZE SR18

Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistance, one phase transformer coupled with normal or cold resistance
- **Inputs:** 0-10V, 4-20mA, 10kpot, RS485 communication, SSR
- **Firing mode:** Burst Firing, Soft Start + Burst Firing, Delayed Triggering + Burst Firing, Phase Angle, Soft Start + Phase Angle
- **Operating temperature:** 0° to 40°C without derating
- **Control mode:** Voltage, Current Power, External signal, Current square
- **RS485 port. RTU Modbus Protocol Std.** for other Fieldbus see option
- **Comply with EMC**
- **Data sheet:** More details on "Multidrive 1PH" bulletin

Option

- Configuration software code: CCA (cable converter + configuration software)
- Profibus DP, ProfiNet and Modbus TCP

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16 (Note 1)
ORDERING CODE	M	1	_	_	_	_	-	_	_	_	_	_	_	_	_	_

CURRENT	3	4	5	6	
description	code				note
850A	0	8	5	0	
1000A	1	0	0	0	
1300A	1	3	0	0	
1600A	1	6	0	0	
1800A	1	8	0	0	
2000A	2	0	0	0	
2200A	2	2	0	0	
2400A	2	4	0	0	2

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	

VOLTAGE SUPPLY AUX.	8	
description	code	note
110V	1	
230V	2	

INPUT	9	
description	code	note
0:10V dc	V	
4:20 mA	A	
10KPot	K	
RS485	R	

FIRING	10	
description	code	note
Burst Firing BF	B	
Soft Start + Burst Firing S + BF	J	
Delayed Triggering + Burst Firing DT + BF	D	
Phase Angle PA	P	
Soft Start + Phase Angle S + PA	E	

CONTROL MODE	11	
description	code	Note
Open Loop	O	
Voltage Feed Back V	U	
Power Feed Back VxI	W	
Current Feed Back I	I	
External Feed Back	E	

OPTION	12	
description	code	Note
4:20mA Retransmission	A	3
0:10V Retransmission	V	3

FAN VOLTAGE	13	
description	code	Note
Fan Voltage equal to Aux. Voltage	3	

APPROVALS	14	
description	code	Note
CE EMC For European Market	E	

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

VERSION	16	
description	code	Note
Resistive Load	8	
Transformer	9	

Note (1) After 16th digit write current and voltage of load inside brackets Ex (190A-400V). This is to receive the Thyristor unit already tuned from CD Automation.
Note (2) Rating not available at 690V
Note (3) In total are available 4 Analog Output. One dedicated to Control Mode and the other 3 dedicated to Current, Voltage etc.

Multidrive 2PH

SIZE SR19

Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistance, three phase transformer coupled with normal resistance
- **Inputs:** 0-10V, 4-20mA, 10kpot, RS485 communication, SSR
- **Firing mode:** Zero Crossing, Burst Firing, Delayed Triggering + Burst Firing (not with cold resistance)
- **Operating temperature:** 0° to 40°C without derating
- **Control mode:** V Voltage, VxI Power and Current
- **RS485 RTU port. Modbus Protocol Std.** for other Fieldbus see option
- **Comply with EMC and cUL up to 700A**
- **Data sheet:** More details on "Multidrive 2PH" bulletin

Option

- Configuration software code: CCA (cable + converter + configuration software)
- Profibus DP, ProfiNet and Modbus TCP

	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	Note 1 16
ORDERING CODE	M	2	_	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT		3	4	5	6	
description			code			note
35A		0	0	3	5	
45A		0	0	4	5	
75A		0	0	7	5	
100A		0	1	0	0	
125A		0	1	2	5	
150A		0	1	5	0	
225A		0	2	2	5	
280A		0	2	8	0	
400A		0	4	0	0	
450A		0	4	5	0	
500A		0	5	0	0	
600A		0	6	0	0	
700A		0	7	0	0	
850A		0	8	5	0	
1000A		1	0	0	0	
1300A		1	3	0	0	
1600A		1	6	0	0	
1800A		1	8	0	0	
2000A		2	0	0	0	
2200A		2	2	0	0	
2400A		2	4	0	0	2

MAX VOLTAGE		7
description	code	note
480V	4	
600V	6	
690V	7	

VOLTAGE SUPPLY AUX.		8
description	code	note
110V	1	
230V	2	

INPUT		9
description	code	note
0:10V	V	
4:20 mA	A	
10KPot	K	
RS485	R	

FIRING		10
description	code	note
Burst Firing BF	B	
Delayed Triggering + Burst Firing DT + BF	D	

CONTROL MODE		11
description	code	Note
Open Loop	O	
Voltage Feed Back V	U	
Power Feed Back VxI	W	
Current Feed Back I	I	

OPTION		12
description	code	Note
4:20mA Retransmission Load Current and Control Mode	A	3
0:10V Retransmission Load Current and Control Mode	V	3

FAN VOLTAGE		13
description	code	Note
Fan Voltage equal to Aux. Voltage	3	

APPROVALS		14
description	code	Note
CE EMC For European Market	O	
cUL For American Market up to 700A	L	4

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

VERSION		16
description	code	Note
Resistive Load/Delta Connection	1	
Resistive Load/Star Connection	2	
Transformer Load/Delta Connection	3	
Transformer Load/Star Connection	4	

Note (1) After 16th digit write current and voltage of load inside brackets Ex. (190A-400V). This is to receive the Thyristor unit already tuned from CD Automation.
Note (2) Rating not available at 690V
Note (3) In total are available 4 Analog output. One dedicated to control mode and the other 3 for current on phases 1-2-3
Note (4) cUL Approval up to 700A included.

Multidrive 3PH

SIZE SR20

Technical Specification

- **Dimensions:** See size and dimensions from page 16 to 19
- **Load type:** Normal resistance, Three phase transformer coupled with normal or cold resistance
- **Inputs:** 0-10V, 4-20mA, 10kpot, RS485 communication, SSR
- **Firing mode:** Zero Crossing, Burst Firing, Soft Start + Burst Firing, Phase Angle, Soft Start + Phase Angle and Delayed Triggering
- **Operating temperature:** 0° to 40°C without derating
- **Control mode:** Voltage, Power, Current, Current Square, External Profiling 0:10V
- **RS485 port. RTU Modbus Protocol Std.** for other Fieldbus see option
- **Comply with EMC and cUL up to 500A**
- **Data sheet:** More details on "Multidrive 3PH" bulletin

Option

- Configuration software code: CCA (cable + converter + configuration software)
- Profibus DP, ProfiNet and Modbus TCP

	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	Note 1 16
ORDERING CODE	M	3	_	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT		3	4	5	6	
description			code			note
35A		0	0	3	5	
45A		0	0	4	5	
75A		0	0	7	5	
100A		0	1	0	0	
125A		0	1	2	5	
150A		0	1	5	0	
225A		0	2	2	5	
300A		0	3	0	0	
350A		0	3	5	0	
400A		0	4	0	0	
450A		0	4	5	0	
500A		0	5	0	0	
600A		0	6	0	0	
850A		0	8	5	0	
1000A		1	0	0	0	
1300A		1	3	0	0	
1600A		1	6	0	0	
1800A		1	8	0	0	
2000A		2	0	0	0	
2200A		2	2	0	0	
2400A		2	4	0	0	2

MAX VOLTAGE		7
description	code	note
480V	4	
600V	6	
690V	7	

VOLTAGE SUPPLY AUX.		8
description	code	note
110V	1	
230V	2	

INPUT		9
description	code	note
0:10V	V	
4:20 mA	A	
10KPot	K	
RS485	R	

FIRING		10
description	code	note
Single Cycles SC	C	
Burst Firing BF	B	
Soft Start + Burst Firing S + BF	J	
Delayed Triggering + Burst Firing DT + BF	D	
Phase Angle PA	P	
Soft Start + Phase Angle S + PA	E	

CONTROL MODE		11
description	code	Note
Open Loop	O	
Voltage Feed Back V	U	
Power Feed Back VxI	W	
Current Feed Back I	I	
External Feed Back	E	

OPTION		12
description	code	Note
4:20mA Retransmission	A	3
0:10V Retransmission	V	3

		13
description	code	Note
Fan Voltage equal to Aux. Voltage	3	

APPROVALS		14
description	code	Note
CE EMC For European Market	E	
cUL For American Market up to 500A Included	L	4

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

VERSION		16
description	code	Note
Resistive Load/Delta Connection	1	
Resistive Load/Star Connection	2	
Resistive Load/Star Connection + Neutral	7	
Transformer Load/Delta Connection	3	
Transformer Load/Star Connection	4	
Transformer Load/Star Connection + Neutral	5	
Resistive Load/Open Delta	6	

Note (1) After 16th digit write current and voltage of load inside brackets Ex (190A-400V).
This is to receive the Thyristor unit already tuned from CD Automation.
Note (2) Rating not available at 690V
Note (3) In total are available 4 Analog output. One dedicated to control mode and the other 3 for current on phases 1-2-3
Note (4) cUL approval up to 500A included.

Dedicated to owners and managing directors

Buy REVO TC and you save money and space!

REVO TC Control and power in one unit

REVO TC SSR + Temperature Controller
The most compact integrated solution

- Temperature controller with 4 Output and PID
- Fuse & Fuse holder
- Solid state relay
- Current Transformer
- Single loop Integrity
- Dramatic reduction for wiring
  using multiple cable with connector
- Reduction of use space saving cabinet cost

REVO TC family

The new REVO TC is an integrated solution that offers the following advantages:

Wiring & Labour Savings.
An immediate cost saving in reduced labour of 2 hours
by not connecting 11 wires per zone.
Each wire takes 11 mins when considering the following:
- Schematic reading and understanding
- Distance and path measuring
- Wire cutting
- Wire strapping
- Wire labelling on two terminations
- Wire crimping
- Terminals block wiring
- Panel drilling
Plus the actual material cost of 11 wires.

How much is the cost of one labour
hour plus over-heads in your company?

How many control zones do you use in one year?

Make your calculation and see
how much you save in one year
Is there really a decision to be made!

A smaller system solution means less cabinet space
required both on the front cabinet area and internally.
Again you save money.
Take the advantage of the single loop integrity,
high fault tolerability and very easy maintenance.

DRIVE TC

INPUT
TC
PT100-RTD
0-10Vdc
4-20mA

TUNE
PRETUNE
SELFTUNE
MANUAL

Config
Digital Input

MODBUS
RS485

FIRING CIRCUIT

POWER

OUT1 Heating

Internal Current
Transformer

OUT2

OUT4

OUT4

ALARMS   COOLING
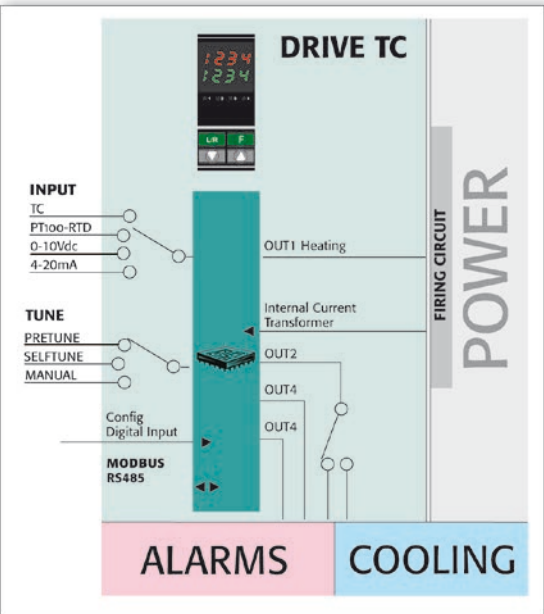
REVO TC 1PH 35/40A

This integrated solution includes all you need
for a complete control zone at 240-480-600V AC
to drive a single phase load.
- Fuse & fuse holder
- Solid state relay
- Current transformer
- Heater Break Alarm
- Temperature Controller

REVO TC 2PH 30/35/40A

This integrated solution includes all you need for a complete
control zone at 480-600V AC to drive a three phase load
in delta and star without neutral connection.
- 2 Off Fuse & fuse holder
- 2 Off Solid state relay
- 2 Off Current transformers
- 1 Off Heater Break Alarm
- 1 Off Temperature Controller

REVO TC 3PH 30/35/40A

This integrated solution includes all you need for a complete
control zone at 480-600V AC to drive a three phase load
in delta and star with neutral connection.
- 3 Off Fuse & fuse holder
- 3 Off Solid state relay
- 3 Off Current transformers
- 1 Off Heater Break Alarm
- 1 Off Temperature Controller

REVO TC 1PH 60/90/120/150/180/210A

This integrated solution includes all you need
for a complete control zone at 240-480-600V AC
to drive a single phase load.
- Internal fixed fuse
- Solid state relay
- Current transformer
- Heater Break Alarm
- Temperature Controller

REVO TC 2PH 60/90/120/150/180/210A

This integrated solution includes all you need for a complete
control zone at 480-600V AC to drive a three phase load
in delta and star without neutral connection.
- 2 Off Internal fixed fuse
- 2 Off Solid state relay
- 2 Off Current transformers
- 1 Off Heater Break Alarm
- 1 Off Temperature Controller

REVO TC 3PH 60/90/120/150/180/210A

This integrated solution includes all you need for a complete
control zone at 480-600V AC to drive a three phase load
in delta and star with neutral connection.
- 3 Off Internal fixed fuse
- 3 Off Solid state relay
- 3 Off Current transformers
- 1 Off Heater Break Alarm
- 1 Off Temperature Controller

REVO TC philosophy

- Labour for wiring reduced dramatically using multiple cable with connector
- Reduction of used space, saving cabinet cost
- Single loop integrity with easy local identification of the faulty zone
- REVO TC up to 40A is normally used for plastics machinery
- REVO TC over 60A in one, two and three phase versions is normally used in Furnaces

PID temperature controller with Pre Tune, Self Tune and Manual tuning

- 3 Off PID pallets to be enabled at programmed temperature
- RS485 communication from 19200 to 57600 Baud Modbus RTU protocol
- Dual Display to read PV, Set Point and load current
- Auto/Manual bump less balances
- Universal input for Thermocouples, RTD and linear Signal
- Four configurable outputs Relay, SSR, 4:20mA and 0:10V
- Cooling Output selection for Water, Oil or Ventilation
- Programming port USB with CD Automation programming cable

REVO Thyristor unit

- The temperature controller can be connected with different sized REVO Thyristor units
- If using SSR output from the controller use REVO S family
- If using Analogue output from the controller use REVO M family

REVO TU Module

The REVO TU is a termination unit with the following capabilities:
- Provides the power supply & RS485 comms (Modbus RTU) for up to a max 14 REVO TC units
- Collects alarm & digital input status from all connected REVO TC units
- Can switch on all REVO TC units at the same time using the internal Clock-Relay (date & time), ideal for a pre-heat warm-up function

TU-PB Gateway RS485 to ProfibusDP

- TU PB is a Gateway able to connect Profibus DP Masters (Multiloop, PLC, DCS) to max 30 REVO TC.
- For more information see the documentation available on www.cdautomation.com

System architecture with REVO TC

Ethernet

Inverter

Modbus RTU
Profibus DP
Ethernet IP
CAN Open
Device NET...

Modbus

Revo TC
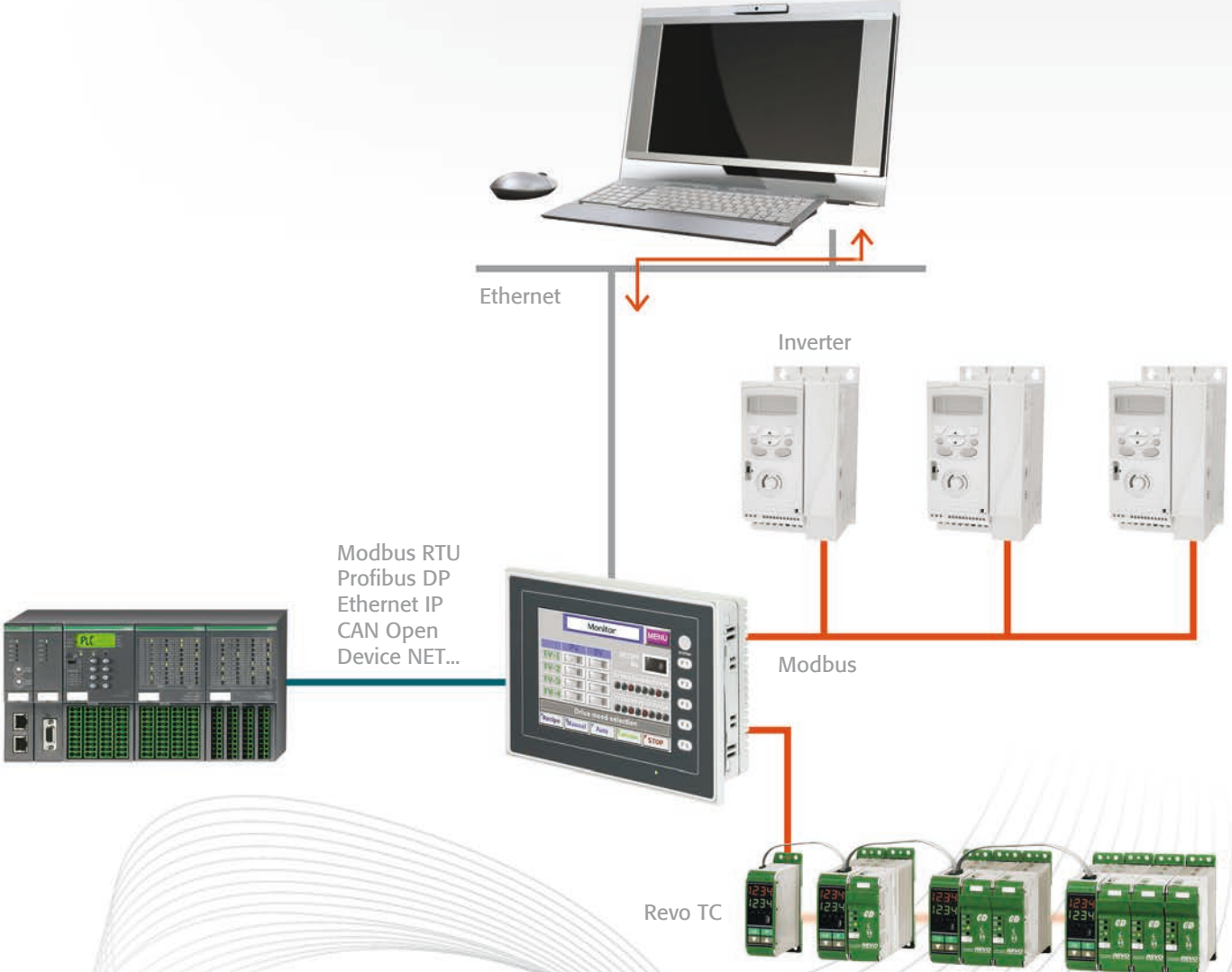
OPERATOR INTERFACES

Monitouch
CD Automation offers a wide range of touch panels from 5 to 15".
Each panel size has the option of different application software:
- Managing temperature control
- Profiling temperature control
- Thermoforming and more
- Datalogger

All panels can be used as a gateway between different bus systems, for example:
Modbus, Profibus DP, Can OPEN, Modbus TCP / Ethernet.
Specific models also support memory cards & a USB port for external memory & printer.

Dramatic reduction for wiring cables

Compare the new REVO TC to a traditional system and you save:

• 11 wires for each zone
• Each zone takes 11 minutes (see the diagram)
• For each zone you save 11 wires x 11 minutes = 121 minutes in total
• If you use descrete controllers you also avoid the panel cutting/drilling
Thats another 15 minutes per controller.

Thats a total time saved of 136 minutes for zone.
So how many zones/loops do you sell in one year?
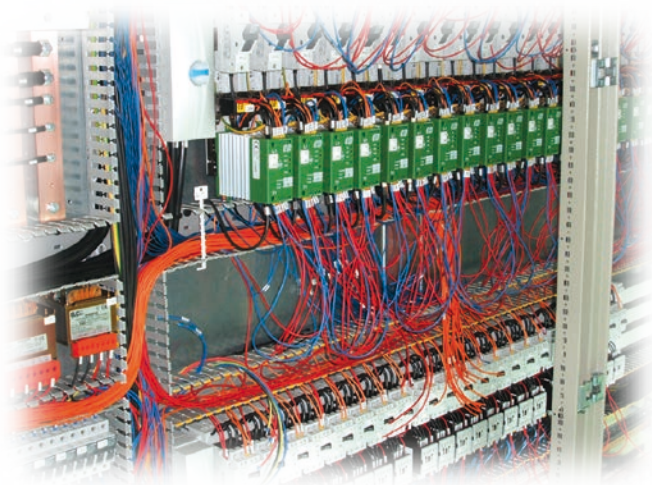
WHY 11 MIN. FOR EACH WIRE?
Schematics reading and understanding, distances and path measuring.
Wire cutting - Wire stripping - Wire labeling
Crimpling the lug with the copper
Terminal block wiring - Panel drilling
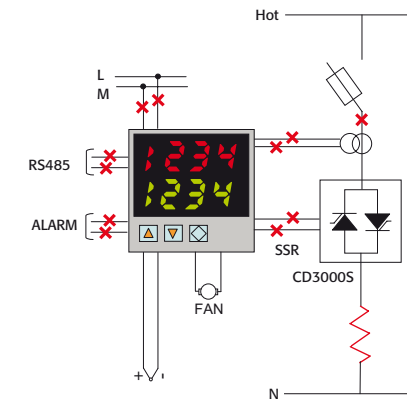
Traditional system

Same system REVO TC
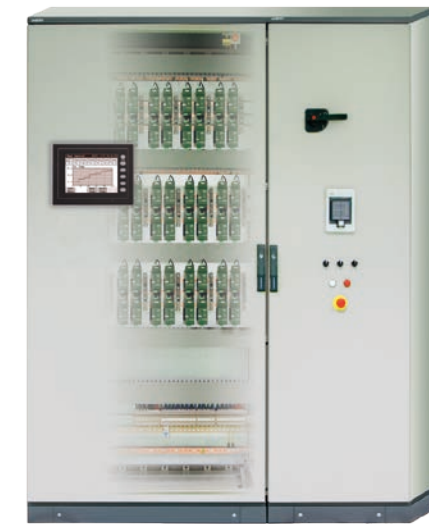
REVO TC system

Traditional system

Today many machines adopt the traditional system layout as shown below:

Fan control
Heating control
Extruder
Head
Fan power cable
Heating power cable
Thermocouple
Cable 20-30 mt long
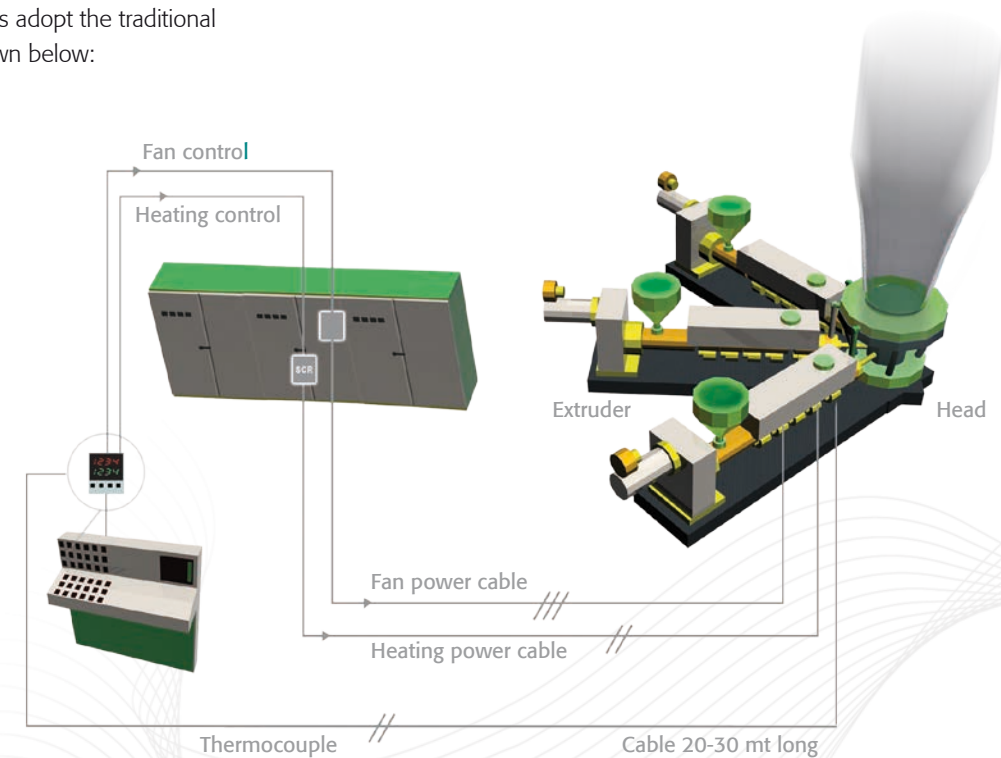
REVO TC system

As can be seen, the new REVO TC distribuited hardware solution, will give crucial saving such as:
• Number of wires (cable and labour cost)
• Errors in wiring the machine
• No wire channels
• Cable lenght 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.

2÷3 m
FieldBus
Extruder
Head
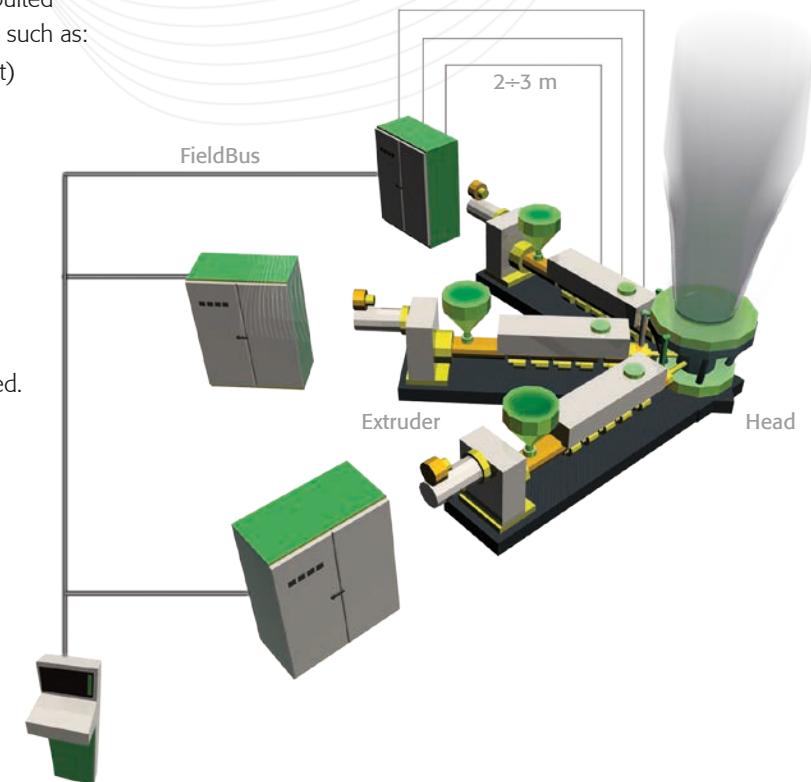
REVO TC controller + thyristor

SIZE SR9

SIZE SR15 Depth: 200 mm
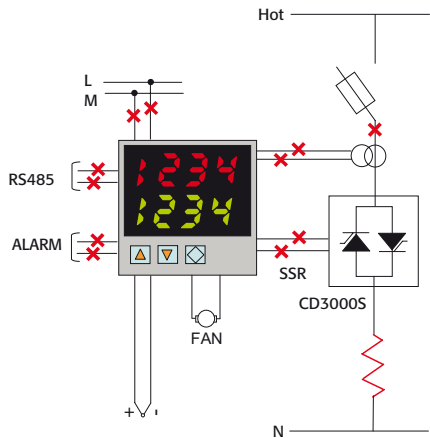
Technical Specification

- **Dimensions:** SR9 | SR10 | SR11 | SR15 | SR16 | SR17 See size and dimensions at page 18-19
- **Load type:** Normal resistance with one or three phase loads
- **Inputs:** Thermocouple, PT100, 0:10V, 4-20mA
- **Firing mode:** Zero Crossing
- **Operating temperature:** 40°C without derating
- **Control mode:** PID temperature controller
- **Two outputs std and configurable. Output 3 see code. Output 4 Std no relay contact**
- **RS485 port. RTU Modbus Protocol**
- **Comply with EMC**
- **Data sheet:** More details on "REVO TC" bulletin

Option

- HB heater break alarm including internal current transformer

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

PHASE CONTROLLED		3	
description		code	note
1 Phase Unit 1PH		1	
2 Phase Unit 2PH		2	
3 Phase Unit 3PH		3	

CURRENT 1PH - 2PH - 3PH		4	5	6	
description			code		note
30A		0	3	0	3
35A		0	3	5	
40A		0	4	0	
60A		0	6	0	
90A		0	9	0	
120A		1	2	0	
150A		1	5	0	
180A		1	8	0	
210A		2	1	0	2

MAX VOLTAGE		7	
description		code	note
480V		4	
600V		6	

VOLTAGE SUPPLY AUX.		8	
description		code	note
12:24V ac dc		4	

INPUT		9	
description		code	note
Thermocouple		T	
PT 100		N	
0:10V dc		V	
4:20mA		A	

INPUT 2		9	
description		code	note
Relay output 2		R	
Heating only		0	

OUTPUT 3		10	
description		code	Note
1 off D/I 24v d.c.		1	
1 off D/O relay contact		2	

FUSES & OPTION		12	
description		code	Note
Fuse + Fuse Holder for all Units =< 40A		F	
Fuse + Fuse Holder + CT		Y	
Fuse + Fuse Holder + CT + HB with screw terminals		H	
Fuse + Fuse Holder + CT + HB with flat cable connection		X	
Fixed Fuses Std for all Units > 40A		F	1
Fixed Fuses Std + CT		Y	
Fixed Fuses Std + CT + HB		H	

FAN VOLTAGE		13	
description		code	Note
No Fan =< 90A		0	
Fan 110V > 90A		1	
Fan 220V > 90A		2	

APPROVALS		14	
description		code	Note
CE EMC For European Market		0	

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

VERSION		16	
description		code	Note
Std unit with a single fuse		1	

Note (1) Fixed fuses over 40A
Note (2) The temperature controller can be mounted as an option on all CD Automation Thyristor unit
Note (3) Available on 2 - 3 PH only

TMC temperature controller

SIZE SR11

121mm

36mm 86mm
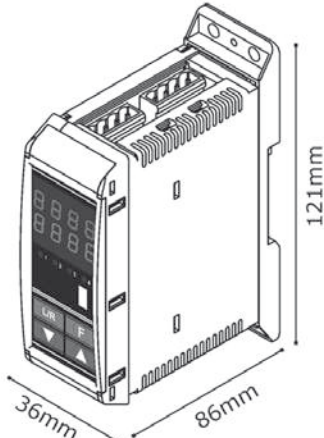
Technical Specification

- PID Temperature controller
- Automatic Tuning of PID parameters with Self Tune or Pretune procedure
- Manual setting when requested of PID parameters
- Three pallets of PID parameters can be enabled at programmed PV value
- Dual Display to read PV,Set Point ,Load current and all parameters
- Universal input for Thermocouple ,RTD and linear input
- Four configurable outputs as Relay,SSR,and 4:20mA
- Heating and Cooling controller with possibility to select the type of cooling for fan, water and oil
- RS485 communication from 19200 to 57600 Bauds Modbus RTU protocol
- The controller can be configured from front push button or via RS485 comm. or via USB port on front controller using CD Automation programming cable
- Auto/Manual with Bumpless Transfer facility
- Screw terminals as standard
- DIN rail mounting
- Dimensions Width: 36 Height: 121 Depth: 86

Option

- Flat cable and connectors for multiple controller system

	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16
ORDERING CODE	T	C	M	_	_	_	-	_	_	_	_	_	_	_	_	_	_

INPUT		4	
description		code	note
Thermocouple		T	
PT100 – RTD		N	
0:10V dc		V	
4:20 mA		A	

INPUT 1 MAIN CONTROL		5	
description		code	note
SSR		S	
Relay		R	
0-10V dc		V	
4-20 mA		A	

INPUT 2 PID COOLING OR ALARM		6	
description		code	note
None		0	
SSR		R	
Relay		S	
0-10V dc		V	
4-20 mA		A	

OUTPUT 3		7	
description		code	note
None		0	
Relay output		R	
Digital input		1	
0-10V dc retransmission		V	
4-20 mA retransmission		A	

OUTPUT 4		8	
description		code	note
None		0	
Relay output		R	
Digital input		1	
0-10V dc retransmission		V	
4-20 mA retransmission		A	

COMMUNICATION		9	
description		code	Note
None		O	
Communication Modbus RTU		M	

WIRING SYSTEM		10	
description		code	Note
Screw terminal		0	
RJ45 (RS485 – 1 DI; need TU flat module)		1	
RJ45 (RS485 – 1 DI; need TU flat module)		2	

OPTIONS		11	
description		code	Note
None		0	
Input CT for HB alarm		H	

AUXILIARY VOLTAGE		12	
description		code	Note
12-24V ac dc		4	

APPROVALS		13	
description		code	Note
CE EMC		1	

APPROVALS		14	
description		code	Note
None		0	
Italian		1	
English		2	
German		3	
French		4	

VERSION		15	
description		code	Note
Version 1		1	

Why to use REVO PC

BENEFITS:

• Reduce the cost of your energy bill

• Reduce the size of your cable and remove the flikering on lights

• Improve the power factor close to 1

• Reduction of harmonics on main supply

• Reduce the electrodynamic forces between coils of transformer on

main supply increasing its life

Transform a simple solid state Relay in advanced thyristor unit adding these features:

• Communication RS485.

• Heater break Alarm for partial or total load failure

• Power scaling for each zone

• Power Load Management

• Intelligent unit with communication cost more than Revo PC + solid state Relay

In addition you have the Power Load Management free of charge.
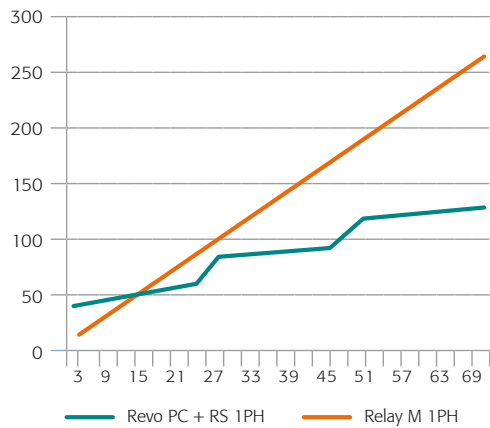
Easy for responsible of software to manage the communication.
These is because he has to write software from PLC or Multiloop Controller to one device like Revo PC that provide itself to communicate up to 24 solid state relay. In addiction you save the cost of output module.
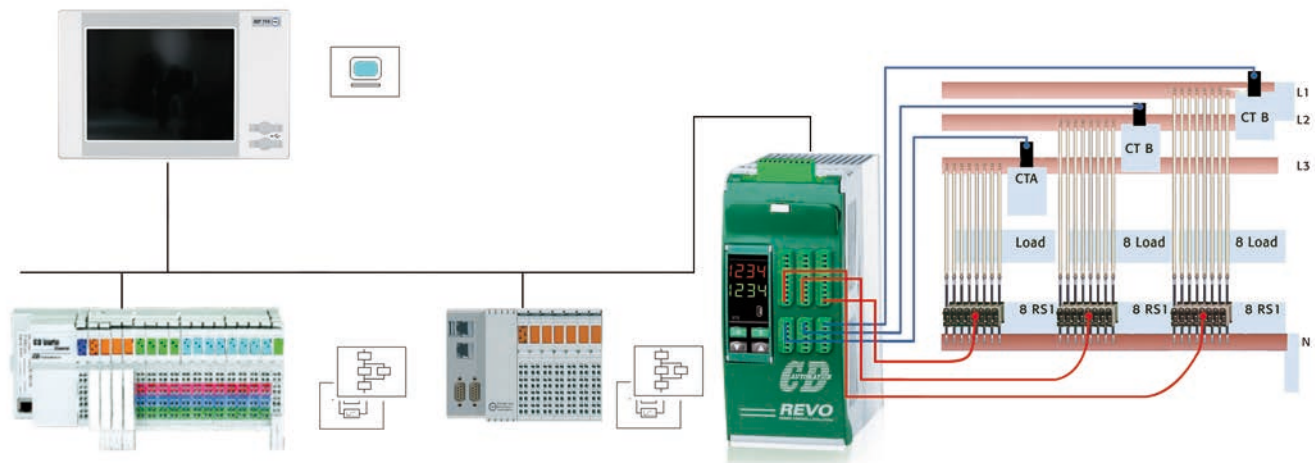
REVO PC
Revolution in power control

Revo PC was designed specifically to manage multizone systems. This powerful unit, with its unique algorithm, will minimize your energy costs by controlling sychronization and power limit.
Benefits include:
• Elimination of power overshoot (see graph below)
• Power factor close to one due to zero crossing firing
• Relay PC keeps your instantaneous power within the limit of your electricity supply contract
• Prevents increases in energy supply tariffs imposed by your electricity supplier
• Quick return on your investment

This powerful unit with high performance micro can drive simple thyristor unit like Relay S with zero crossing firing.
By using the PC, simple thyristor units can be used reducing the overall financial investment.

• Simultaneous fast full wave control of:
  - 8-16-24 Revo S 1PH single phase units
  - 8 Revo S 2PH/3PH for 3 phase loads
• Each loop's process information is managed in independent mode with:
  - Calculation of instant current and RMS Current
  - Power calculation of load resistance with Heater Break Alarm
  - Modbus Master, Modbus slave, Profilbus DP, Modbus/TCP and other fieldbus available

— Revo PC + RS 1PH   — Relay M 1PH
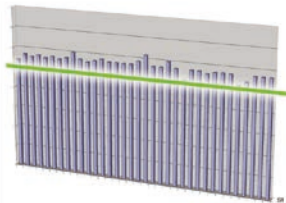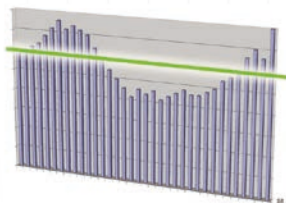
Easy to start REVO PC

Only few parameter are requested to start with Revo PC:
• Set the operative current of the heater zone
• Set the Total Power Limit
• Set the Power of each zone
The Revo PC strategy is easy to implement.
Do the same operation with a competitor's load management system and the operator must learn up to 15 pages of the manual and understand up to five models of synchronization.

Synchronization

On all controlled zones, the Live Predictive Synchronization is automatic resulting in superior performance:
• Total current is equal to a sinusoidal wave form
• Power factor > 0,9
• Instantaneous current close to average value
• Cancellation of harmonics
• Power saving by harmonic reduction
• Flickering effect removed
Synchronization selection is available for normal resistive loads or short infrared.

Smart Power limitation

• Smart power limitation works together with synchronization
  If this function is enabled, Revo PC makes a live calculation of power at
  each period and generates the output values for the next period.
• If the calculated power is below the power limit value, the previous values remain
  with each channel using full power
• If the power is above the power limit value, the setpoint of each channel is
  reduced proportionally to restrict power overshoot
  This function significantly reduces disturbances on the main network compared
  to a full power system, preventing any increase in energy tariffs imposed by the
  electricity supplier.
• This function can be activated/deactivated and the limit value changed at any time

General Rules to size a REVO PC System

• Each Revo PC Suitable to drive 1 Phase Loads can have up to 24 Channels
  - RPC08 : Can drive up to 8 Revo S 1PH with Random Firing
  - RPC16 : Can drive up to 16 Revo S 1PH with Random Firing
  - RPC24 : Can drive up to 24 Revo S 1PH with Random Firing
  - The zero crossing is performed inside Revo PC
• Each Revo PC Suitable to drive 3 Phase Loads controlled on 2 Phases have 16 Channels
  - RPC28 : Can drive up to 16 Revo S 1PH with Zero Crossing Firing
  - We use 2 Off Revo S 1PH for each 3 Phase Load so in total we control 8 three phase loads
• Each Revo PC Suitable to drive 3 Phase Loads controlled on 3 Phases have 24 Channels
  - RPC38 : Can drive up to 24 Revo S 1PH with Zero Crossing Firing
  - We use 3 Off Revo S 1PH for each 3 Phase Load so in total we control 8 three phase loads
• For each Revo PC it's necessary
  - 1 Off Auxiliary Voltage Transformer Ex. Between L1 and L2
  - This is necessary to syncronize Revo PC with the loads wired below same voltage
• For each 8 Channels of one Revo PC it's necessary one Current Transformer
  - The Current Transformer must have a primary with current > Totale power connected L1 and L2 /Voltage L1 and L2
• For RPC-28 are necessary 3 Off Current Sensor on incoming L1 ; L2 ; L3
  - The Current Transformer must have a primary with current > Totale power connected on L1 ; L2 and L3 (Voltage Supply x 1,73)
• For RPC-38 are necessary 3 Off Current Sensor on incoming L1 ; L2 ; L3
  - The Current Transformer must have a primary with current > Totale power connected on L1 ; L2 and L3 (Voltage Supply x 1,73)
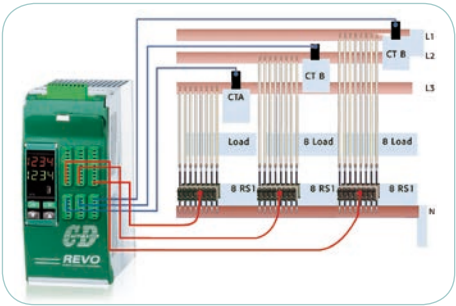
Application with 8, 16 or 24 single phase loads
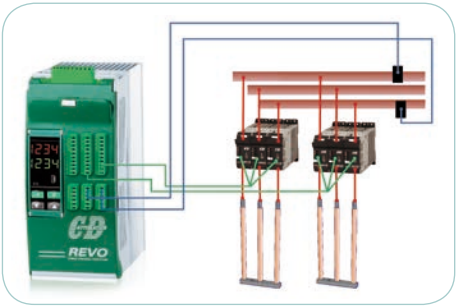
Application with 8 three phase loads
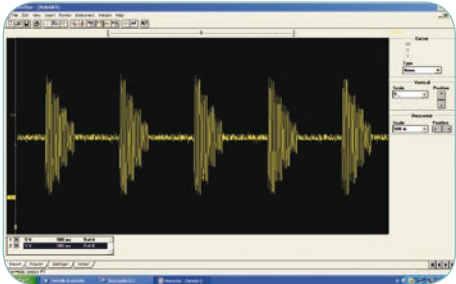
Without power control optimisation
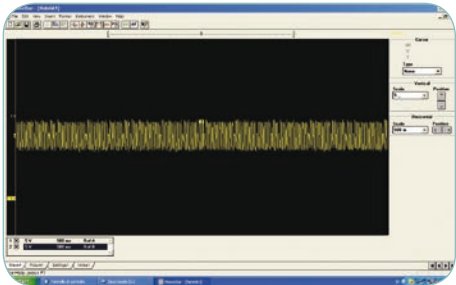
With power control optimisation

REVO PC

POWER CONTROL CODE

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

CHANNEL	4	5	6	
description		code		note
8 channel for 8 off 1 phase units max	0	0	8	
16 channel for 16 off 1 phase units max	0	1	6	
24 channel for 24 off 1 phase units max	0	2	4	
16 channel for 8 off 3 phase loads controlled on 2 phase	0	2	8	
24 channel for 8 off 3 phase units controlled on 3 phase	0	3	8	

CURRENT SENSOR FOR REVO PC	7	
description	code	note
For current sensor see tab below "Current sensor for Revo PC"	0	

COMMUNICATION	8	
description	code	note
1 port ethernet Modbus TCP internal aux voltage	1	
1 Modbus slave port	2	
1 Modbus master port + 1 Modbus slave	3	
1 profibus DP port aux voltage 24 v DC	4	
1 Ethernet port, profiNET protocol 24 v DC	5	
2 Ethernet port, TCP protocol for client-server	6	
2 Ethernet port, multi protocol port (ethernet IP, ETHER CAT, TCP, profinet) 24vDC	7	

PRIMARY/SECONDARY/AUXILIARY VOLTAGE TRANSFORMER	9	
description	code	note
Transformer 90:130V / 24v	2	
Transformer 170:265V / 24v	3	
Transformer 230:245V / 24v	4	
Transformer 300:530V / 24v	5	
Transformer 510:690V / 24v	6	
Transformer 600:760V / 24v	7	

FIRING	10	
description	code	Note
Half cycle at 50% power demand for 1 phase loads	1	
Half cycle at 50% power demand for 3 phase loads	2	

FEED BACK (CONTROL MODE)	11	
description	code	Note
No feed back	1	
Power	2	

APPROVALS	12	
description	code	Note
CE EMC 1	1	

MANUAL	13	
description	code	Note
None	0	
Italian	1	
English	2	
German	3	
French	4	

VERSION	14	
description	code	Note
Version 1	1	

ADDITIONAL UNITS TO BE ORDERED WITH REVO PC

	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16
ORDERING CODE	C	T	S	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT SENSOR FOR REVO PC	4	5	6	
Description		code		note
Current 50/0,05	0	0	0	1-2-3
Current 100/0,05	0	0	1	1-2-3
Current 150/0,05	0	0	2	1-2-3
Current 200/0,05	0	0	3	1-2-3
Current 250/0,05	0	0	4	1-2-3
Current 400/0,05	0	0	5	1-2-3
Current 800/0,05	0	0	6	1-2-3
Current 1000/0,05	0	0	7	1-2-3
Current 1500/0,05	0	0	8	1-2-3
Current 2000/0,05	0	0	9	1-2-3

Note (1) Use 1 Off Current Sensor for each 8 Channels on Revo PC Example: System with 24 zone 1 phase.
To be able to equilibrate the current on phase L1, L2 and L3 it's necessary to connect 8 zone on each phase coupled with one Revo PC synchronized on same voltage supply. In total we need: 3 Off Revo PC 08 + 3 Off Current sensor + 24 Off Revo S 1PH with Random Firing.

Note (2) Example System with 6 three phase loads controlled on 2 Phase.1 Off Revo PC 28 + 3 Off Current sensor + 12 Off Revo S 1PH with Zero Crossing Firing. With Revo PC the Revo S 2PH has to be formed by 2 Off Revo S 1PH

Note (3) Example System with 6 three phase loads controlled on 3 Phase.1 Off Revo PC 38 + 3 Off Current sensor + 18 Off Revo S 1PH with Zero Crossing Firing. With Revo PC architecture the Revo S 3PH has to be formed by 3 Off Revo S 1PH
For more details see ask for Application Note on Revo PC

REVO is a system not just a product

The innovative designe of REVO Family has been done to satisfy system solutions and to do it has been considered following auxiliary units:

Copper bar

This picture show how it is possible to mount REVO on copper bars
with Length 12:30 mm and thickness 5:10 mm
Lateral Support for 3 copper bars **Code:** SC3-30
Lateral Support for 4 copper bars **Code:** SC4-30
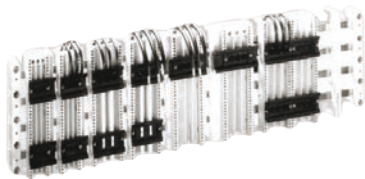
Base plate

Different type of base plate are available
The Base Plate have 3 Off Screw terminals 16 mm2
W 54 x L 200 **Code:** BP-54-200
W 72 x L 200 **Code:** BP-72-200
W 54 x L 260 **Code:** BP-54-260
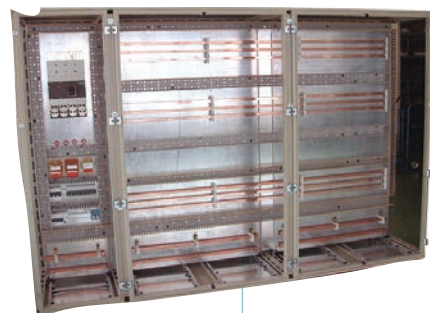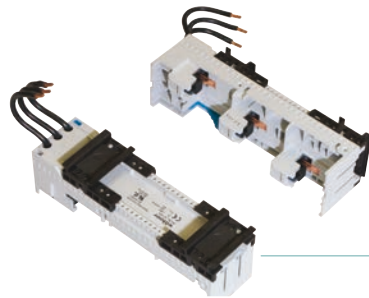
Cabinet

This is a cabinet under construction where is possible to see copper bars on all cabinet back panel.
The structure rapresented is the best possible solution to have system coordination for hight short circuit current.
In addition is not necessary to wire power cables from Automatic circuit breaker to each thyristor units.
The base plate are plug- in thus in case of fault it's possible to substitute a complete zone.

Cabinet

This is the cabinet at the end of the mounting and wiring of 60 off temperature controll zones.
The cabinet is very clean from mounting point of view.

Base plate + Adaptator

How it's possible to see on original base plate can be mounted an adaptor.
CD Automation has many of this adaptor for its product.
This is an adaptor for REVO 3PH Thyristor unit
Code: AD-Insert code REVO unit

Adaptator

This is an adaptor for REVO up to 210 A in different configuration like 1, 2 or 3 Phase Controll.
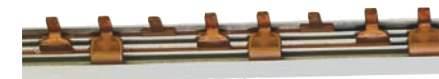
Copper comb 3PH

This is a copper comb for three phase connections.
This product is sold in pices of one meter.
To have IP20 is available a plastic protection that is supplied as standard with comb copper.
Pitch:36 Central connection:130A Side connection:80A
Code: Comb-3PH-36

Copper comb 1PH

This is a comb done with copper to make a multiple connection of REVO 1PH or REVO SSR
This product is sold in pices of one meter.
To have IP20 is available a plastic protection that is supplied as standard with comb copper.
Pitch:36 Central connection:130A Side connection:80A
Code: Comb 1PH-36

Screw terminal

This is a screw terminal that can be mounted in each position of the copper comb above.
Code: ST16

Package

This is an example of package where there are 9 Unit.
One or more screw terminal can be allocated where we want.
From this terminal a traditional cable will be connected to circuit breaker directly.

3 phase diode bridge
Horizon for diode high current bridge

S36 H 640 x W 717 x D 320 - 86/110 kg.
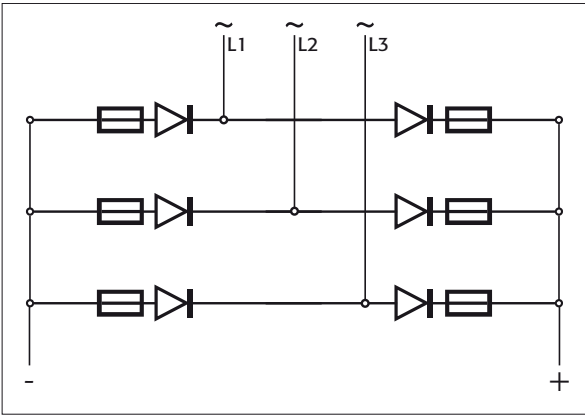
General description

- All circuit board, fuses and thyristor can be inspected on opening front door
- Internal fixed fuses are standard with relay contact output for fuse failure
- Current transformer integrated (option)
- Special design for heat sink with very high dissipation value and cooling tunnel
- Easy for use with diagnostic and wiring diagram on front unit
- Aluminium modulare structure and copper treated against oxidation
- Comply with EMC
- Panel mounting

Maintainability in function

These are our targets:
- Each phase can be substituded by front unit by technician just removing 4 screw without the help of forklift.
  The avarage weight of phase is 16kg
  Time required to substitute one phase not more than 10 minuts
- Plant downtime not more than 10 minuts, vital for important process
- When the operator substitute one phase all the auxiliary connection are plug in
- This allow to be fast and to don't do mistakes in wiring

OUTPUT FEATURES							
Current Idc	Voltage Range up to	Ripetitive peak reverse voltage (600V)	(690V)	Max peak one cycle (10 msec)	Diode	Frequency range (Hz)	Power Loss I=Inom (W)
2000A	330÷690V	2900	2900	17900	1602000	47÷70	1827
2300A	330÷690V	2900	2900	17900	1602000	47÷70	2220
3000A	330÷600V	3000	3000	30200	3920000	47÷70	2590
3500A	330÷690V	2600	2600	35300	6230000	47÷70	2765
4000A	330÷600V	2500	2500	45000	10125000	47÷70	2933

3 PHASE DIODE BRIDGE

ORDERING CODE	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16
	B	D	_	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT	3	4	5	6	
description		code			note
2000A	2	0	0	0	
2300A	2	3	0	0	
3000A	3	0	0	0	
3500A	3	5	0	0	
4000A	4	0	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	

VOLTAGE SUPPLY AUX.	8	
description	code	note
110V	1	
220V	2	

INPUT	9	
description	code	note
No Input	0	

FIRING	10	
description	code	note
None	0	

CONTROL MODE	11	
description	code	Note
None	0	

OPTION & FUSE	12	
description	code	Note
Fix Fuses Standard	F	
Fix Fuses + CT	Y	

FAN VOLTAGE	13	
description	code	Note
Fan 110V	1	
Fan 220V Standard	2	

APPROVALS	14	
description	code	Note
CE EMC	0	

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

LOAD TYPE	16	
description	code	Note
Resistive Load	1	
Inductive Load	2	

SIZE 32

DIMENSION	
Current	2000A / 2300A / 3000A / 3500A
Wide	635 mm
Deep	320 mm
Height	550 mm

SIZE 35

DIMENSION	
Current	4000A
Wide	635 mm
Deep	320 mm
Height	640 mm

3 phase SCR bridge
Horizon for SCR high power bridge

S36 H 640 x W 717 x D 320 - 86/110 kg.
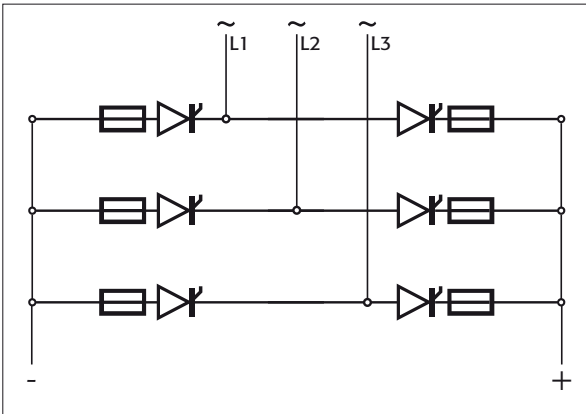
General description

- All circuit board, fuses and thyristor can be inspected on opening front door
- Electronic circuit fully isolated from power
- Internal fixed fuses are standard with relay contact output for fuse failure
- Current transformer integrated (option)
- Special design for heat sink with very high dissipation value and cooling tunnel
- Easy for use with diagnostic and wiring diagram on front unit
- Aluminium modulare structure and copper treated against oxidation
- Comply with EMC
- Panel mounting

Maintainability in function

These are our targets:
- Each phase can be substituded by front unit by technician just removing 4 screw without the help of forklift
  The avarage weight of phase is 16 kg
  Time required to substitute one phase not more than 10 minuts
- Plant downtime not more than 10 minuts, vital for important process
- When the operator substitute one phase all the auxiliary connection are plug in
- This allow to be fast and to don't do mistakes in wiring
- Control board plug in for the connection
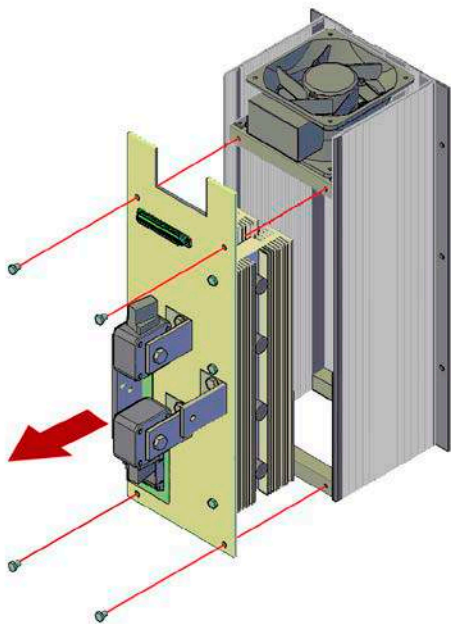
OUTPUT FEATURES

Current	Voltage Range	Ripetitive peak reverse voltage (600V)	(690V)	Latching current (mAeff)	Max peak one cycle (10 msec)	Leakage current (mAeff)	I2T value for fusing tp=10msec	Frequency range (Hz)	Power Loss I=Inom (W)
1000A	330÷690V	1600	2400	700	12500	300	78100	47÷70	2442
1300A	330÷690V	1800	1800	700	22400	300	2509000	47÷70	2594
1600A	330÷600V	1600	N.A.	700	24600	300	3026000	47÷70	2972
1800A	330÷690V	1600	N.A.	700	26900	300	3618000	47÷70	2876
2000A	330÷600V	1800	1800	700	36000	300	6480000	47÷70	3032
2200A	330÷690V	1800	1800	700	36000	300	6480000	47÷70	3896
2400A	330÷600V	N.A.	2200	700	60000	300	18000000	47÷70	4496

ORDERING CODE	1	2	3	4	5	6	-	7	8	9	10	11	12	13	14	15	16
	B	T	_	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT		3	4	5	6
description		code			note
1000A		1	0	0	0
1300A		1	3	0	0
1600A		1	6	0	0
1800A		1	8	0	0
2000A		2	0	0	0
2200A		2	2	0	0
2400A		2	4	0	0

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	

VOLTAGE SUPPLY AUX.	8	
description	code	note
110V	1	
220V	2	

INPUT	9	
description	code	note
0:10V	V	
4:20 mA	A	

FIRING	10	
description	code	note
Phase Angle	P	

CONTROL MODE	11	
description	code	Note
Voltage	U	

OPTION & FUSE	12	
description	code	Note
Fix Fuses Standard	F	
Fix Fuses + CT	Y	

FAN VOLTAGE	13	
description	code	Note
Fan 110V	1	
Fan 220V Standard	2	

APPROVALS	14	
description	code	Note
CE EMC	0	

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

LOAD TYPE	16	
description	code	Note
Resistive Load	1	
Inductive Load	2	

SIZE 32

DIMENSION	
Current	1000A / 1300A
Wide	717 mm
Deep	320 mm
Height	550 mm

SIZE 35

DIMENSION	
Current	1600A / 1800A / 2000A / 2200A / 2400A
Wide	717 mm
Deep	320 mm
Height	640 mm

Custom Family

This products range has been designed with these targets:

• Basic product able to satisfy OEM needs

• Basic Options like Analogue input and Heather Break Alarm

• Easy to be used rugged and very reliable

• Possibility to be customized with OEM logo

• Manuals available in neutral version whithout CD Brand

• Plastic parts in light and dark grey for covers

• Competive pricing where quantity are available

CD3000/Custom feature comparison

Feature comparison

		CD3000S 1PH	CD3000S 2PH	CD3000S 3PH	CD3000M 1PH	CD3000M 2PH	CD3000M 3PH	CD3200	Custom 1PH	Custom 2PH	Custom 3PH
	Unit type	CD3000S 1PH	CD3000S 2PH	CD3000S 3PH	CD3000M 1PH	CD3000M 2PH	CD3000M 3PH	CD3200	Custom 1PH	Custom 2PH	Custom 3PH
	CODE	CD3000S 1PH	CD3000S 2PH	CD3000S 3PH	CD3000M 1PH	CD3000M 2PH	CD3000M 3PH	CD3200	C1	C2	C3
LOAD TYPE	Nominal max voltage power supply	240*-480-600V	480-600V	480-600V	240*-480-600V	480-600V	480-600V	480-600V	480-600-690V	480-600-690V	480-600-690V
	Current range	15:700A	10:700A	15:700A	15:700A	15:700A	15:700A	15:700A	300:2400A	150:2400A	150:2400A
	Single phase	●			●		●	●			
	3 phase load delta or star no neutral		●			●				●	●
	3 phase load star with neutral			●			●				●
	3 phase load open delta			●			●				●
INPUT TYPE	SSR 0-30VDC	●	●	●	●	●	●	●		●	●
	Ac input 110 or 230V	up to 110A ○	up to 110A ○	up to 90A ○							
	4-20mA loop powered	up to 110A ○									
	4-20mA				●	●	●	●	○	○	○
	0-10VDC				●	●	●	●	○	○	○
	Potentiometer (10k)				●	●	●	●			
	Communication command				●	●	●	●			
FIRING	Zero crossing	●	●	●	●	●	●			●	●
	Single cycle				●						
	Burst firing				●	●	●	●		●	●
	Soft start + burst				●						
	Phase angle				●			●			
	Delayed triggering				●						
	Universal firing				●	●	●	●			
FEED BACK	Voltage drop compensation				●	●	●	●			
	Voltage or current feedback (V or I)							●			
	Power feed back (V x I)							●			
OPTION	Internal current limit							●			
	External current limit profiling							●			
	Heater break + short circuit on SCR	up to 110A ○*	up to 100A ○*	up to 90A ○*	○	○	○	○	○	○	○
	External fuse & fuse holder	≤110A	≤100A	≤90A	≤110A	≤100A	≤90A	≤110A			
	Internal fuse	>110A	>100A	>90A	>110A	>110A	>90A	>110A			
COMM	RS485 with modbus protocol				●	●	●	●	●	●	●
	Profibus + Devicenet + Canbus				TU-PB; TU-DN	TU-PB; TU-DN	TU-PB; TU-DN	TU-PB; TU-DN			
CONFIG.	Cd keypad connectivity				●	●	●	●			
	Frontal keypad										
	Personal computer programmable				●	●	●	●			

NOTE

The products CD3000E 1PH_2PH_3PH and Multidrive 1PH_2PH_3PH are units CE/cUL approved.

These units are in the family REVO with name:
RE 1PH_2PH_3PH and M1_M2_M3

CURRENT / SIZE / MARK

CURRENT	S1PH SIZE	MARK	S2PH SIZE	MARK	S3PH SIZE	MARK	M1PH SIZE	MARK	M2PH SIZE	MARK	M3PH SIZE	MARK	CD3200 SIZE	MARK	C1 SIZE	MARK	C2 SIZE	MARK	C3 SIZE	MARK
2x10			S0	CE																
15	S0	cUL/CE	S1	cUL/CE	S2	cUL/CE	S0C	cUL/CE	S1C	cUL/CE	S2C	cUL/CE	S0C	cUL/CE						
25	S0	cUL/CE	S1	cUL/CE			S0C	cUL/CE	S1C	cUL/CE			S0C	cUL/CE						
30					S4	cUL/CE					S4C	cUL/CE								
35	S3	cUL/CE	S4	cUL/CE			S3C	cUL/CE	S4C	cUL/CE			S3C	cUL/CE						
45	S3	cUL/CE	S7	cUL/CE	S6	cUL/CE	S3C	cUL/CE	S7C	cUL/CE	S6C	cUL/CE	S3C	cUL/CE						
60	S7	cUL/CE			S8	cUL/CE	S7C	cUL/CE			S8C	cUL/CE	S7C	cUL/CE						
75			S8	cUL/CE	S8	cUL/CE			S8C	cUL/CE	S8C	cUL/CE								
90	S7	cUL/CE			S8	cUL/CE	S7C	cUL/CE			S8C	cUL/CE	S7C	cUL/CE						
100			S8	cUL/CE					S8C	cUL/CE										
110	S8	cUL/CE					S8C	cUL/CE					S8C	cUL/CE						
125	S9	cUL/CE	S9	cUL/CE	S11	cUL/CE	S9	cUL/CE	S9	cUL/CE	S11	cUL/CE	S9	cUL/CE						
150	S9	cUL/CE	S9	cUL/CE	S11	cUL/CE	S9	cUL/CE	S9	cUL/CE	S11	cUL/CE	S9	cUL/CE			S28	CE	S28	CE
200	S9	cUL/CE	S10	cUL/CE			S9	cUL/CE	S10	cUL/CE			S9	cUL/CE						
210																	S28	CE		
225					S13	cUL/CE					S13	cUL/CE								
275			S14	UL/CE					S14	cUL/CE										
300	S12	cUL/CE (1)			S14	cUL/CE	S12	cUL/CE (1)			S14	cUL/CE	S12	cUL/CE (1)	S28	CE	S28	CE	S30	CE
350					S14	cUL/CE (1)					S14	cUL/CE (1)								
400	S12	cUL/CE (1)	S14	cUL/CE (1)	S14	cUL/CE	S12	cUL/CE (1)	S14	cUL/CE (1)	S14	cUL/CE	S12	cUL/CE (1)						
450			S14	UL/CE	S14	cUL/CE (1)			S14	cUL/CE	S14	cUL/CE (1)					S29	CE		
500	S12	cUL/CE (1)	S14	cUL/CE (1)	S14	cUL/CE	S12	cUL/CE (1)	S14	cUL/CE (1)	S14	cUL/CE	S12	cUL/CE (1)						
550															S28	CE	S29	CE	S30	CE
600	S12	cUL/CE (1)	S14	cUL/CE (1)			S12	cUL/CE (1)	S14	cUL/CE (1)			S12	cUL/CE (1)			S29	CE		
700	S12	UL/CE	S14	UL/CE			S12	cUL/CE (1)	S14	cUL/CE			S12	cUL/CE						
800															S28	CE	S29	CE	S30	CE
1100															S31	CE	S32	CE	S33	CE
1400															S31	CE	S32	CE	S33	CE
1700															S34	CE	S35	CE	S36	CE
1900															S34	CE	S35	CE	S36	CE
2100															S34	CE	S35	CE	S36	CE
2700															S34	CE	S35	CE	S36	CE

● Standard   ○ Option   Note (*) no cUL MARK   Note (1) Strengthened ventilation system in cUL version

CD3000 size and dimensions CE-EMC & cUL Approval
See full specification on web

S0 H 120 x W 30 x D 120
S0C H 120 x W 63 x D 120

S1 H 120 x W 60 x D 120
S1C H 120 x W 95 x D 120

S2 H 120 x W 92 x D 120
S2C H 120 x W 123 x D 120

S3 H 120 x W 52 x D 120
S3C H 120 x W 85 x D 120
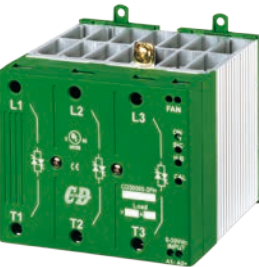
S4 H 120 x W 117 x D 123
S4C H 120 x W 148 x D 123

S6 H 138 x W 117 x D 123
S6C H 138 x W 148 x D 123
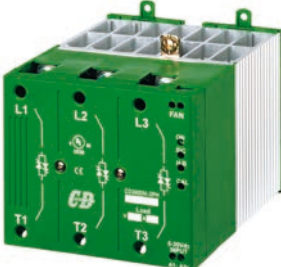
S7 H 120 x W 117 x D 159
S7C H 120 x W 148 x D 159

S8 H 138 x W 117 x D 159
S8C H 138 x W 148 x D 159

S9 H 316 x W 116 x D 187

S10 H 350 x W 116 x D 220

S11 H 440 x W 137 x D 270

S12 H 520 x W 137 x D 270

S13 H 440 x W 262 x D 270

S14 H 520 x W 262 x D 270

Custom size and dimensions CE-EMC Approval
See full specification on web

S28 H 478 x W 130 x D 274 - 14kg.

S29 H 478 x W 260 x D 274 - 27kg.

S30 H 478 x W 390 x D 274 - 42kg.

S31 H 550 x W 329 x D 320 - 27kg.

S32 H 550 x W 523 x D 320 - 49kg.

S33 H 550 x W 717 x D 320 - 72kg.

S34 H 640 x W 329 x D 320 - 32/40kg.

S35 H 640 x W 523 x D 320 - 59/75kg.

S36 H 640 x W 717 x D 320 - 86/110kg.

CD 3200

SIZE S0C   SIZE S11

INPUT
RS485
POT 10K
0-10V
4-20mA
SSR

FIRING
Delay Trig.
Phase Angle
Soft Start +
Phase Angle

OPTIONS
HB
SCR cc
HB+SCR cc

CONTROL MODE
V
I
VxI
I²

Std Config
Digital Input

Current Limit

Alarm
Relay Output

MODBUS
Std RS485

CD 3200
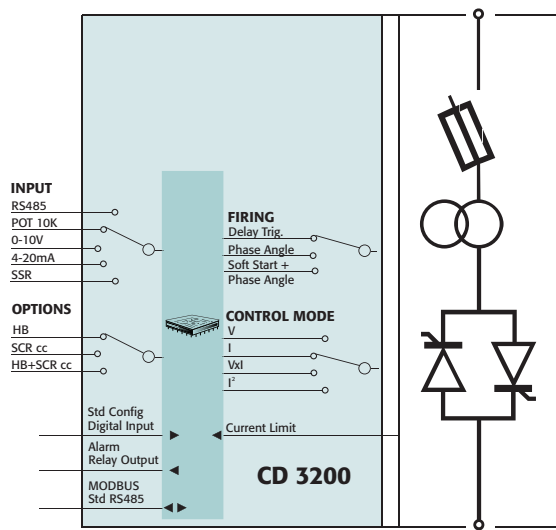
Technical Specification

- **Voltage power supply:** 24V minimum, 480V or 600V max
- **Current limit:** Adjustable by pot or by serial comm
- **Dimensions:** See size and dimensions from page 56 to 59
- **Load type:** Normal resistance, infrared long, short and medium waveform, silicon carbide, cold resistance coupled with transformer
- **Inputs:** 0-10V dc, 4-20mA, 10kpot, SSR, RS485
- **Firing mode:** Soft Start + Phase Angle, Delayed Triggering
- **Operating temperature:** 0 to 40°C without derating
- **Control mode:** Voltage, VxI power, current I and I²
- **RS485 port. RTU Modbus Protocol**
- **Comply with EMC - cUL**
- **Mounting:** DIN rail up to 110A, bulk head over 110A
- **IP20 protection**
- **Data sheet:** More details on "CD3200" bulletin

Tool

- Configuration software to configure thyristor units Free of charge on www.cdautomation.com
- Set of cables and connectors plus converter for the connection between thyristors unit port and computer with installed above configuration software

ORDERING CODE

Model	Current (A)	Oper. Voltage (V)	Max Voltage (V)	Aux Voltage (V)	Input	Firing mode	Feed back	Options	Manual
	15A							NCL (No current limit)	
	25A								
	35A							COMM (RS485 Modbus)	
	45A							CD-KP (Eternal Key Pad)	None
	60A			90:130V	0÷10V		V	EF (External Fuse + fuse holder)	Italian
	90A			170:265V	4÷20mA	S+PA (Soft start + Phase Angle)	I	NF (No Fuse)	English
CD 3200	110A	24V min	480	230:345V	10K Pot.	PA (Phase Angle)	V x I	IF (Internal Fuses are St. over 110A)	German
	125A		600	300:530V	SSR		I²	HB (Heater Break alarm)	French
	150A			510:690V				110V Fan (Fan at 110V)	
	200A							UL (cUL us listed)	
	300A								
	400A								
	500A								
	600A								
	700A								

Example code compilation

CD 3200	125A	440V	480V	300:530V	0÷10V	PA	I	HB + UL	English

CD 3000S 1PH

SIZE S0   SIZE S11
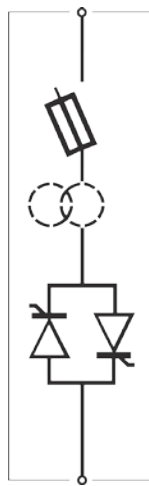
Technical Specification

- **Single phase thyristor:** Unit up to 700A
- **Dimensions:** See size and dimensions from page 56 to 59
- **Load type:** Normal resistance, infrared long and medium waveform
- **Inputs:** SSR Standard, 0:10V, 4:20mA and Heather Break alarm are options
- **Firing mode:** Zero Crossing, Burst Firing available with analogue input only
- **Operating temperature:** 0 to 40°C without derating
- **Comply with EMC**
- **Heater break alarm:** diagnostic partial or total load failure up to 110A
- **IP20 Protection**
- **Data sheet:** More details on "CD 3000S 1PH" bulletin

Option

- Analog input: 4/20 mA or 0/10V
- Heather Break Alarm + Current Transformer

ORDERING CODE

Model	Current (A)	Oper. Voltage (V)	Max Voltage (V)	Aux Voltage (V)	Input	Firing mode	Options	Manual
	2x10							
	15A							
	25A							EF (External Fuse + fuse holder)	
	35A							
	45A				No	SSR	ZC (Zero Crossing)	NF (No Fuse)	None
	60A			90:130V	14:24V	0÷10V	BF (Burst Firing) with analog	IF (Internal Fuses are St. over 110V)	Italian
	90A			170:265V	4÷20mA	BF04 (4 cycles on + 4 off)		English
CD 3000S 1PH	110A	24V min	480	230:345V	10K Pot.	BF08 (8 cycles on + 8 off)	HB (Heater Break alarm)	German
	125A		600	300:530V	110V ac (1)	BF016 (16 cycles on + 16 off)	110V Fan (Fan at 110V)	French
	150A			510:690V	230V ac (1)		UL (cUL us listed)	
	200A				4:20 Loop powered	Note: For Bust Firing specify the desired n° of cycles ON at 50% of power demand		
	300A							
	400A							
	500A							
	600A							
	700A							

Example code compilation

CD 3000S 1PH	150A	440V	480V	300:530V	4:20 mA	BF08	HB	English

Note (1) This feature is available up to 110A included

CD 3000S 2PH

SIZE S0   SIZE S14

Technical Specification

- **Dimensions:** See size and dimensions from page 56 to 59
- **Load type:** Normal resistance, infrared long and medium waveform
- **Inputs:** SSR Standard, 0:10V, 4:20mA and Heather Break alarm are options
- **Firing mode:** Zero Crossing, Burst Firing available with analogue input only
- **Operating temperature:** 0 to 40°C without derating
- **Comply with EMC and cUL**
- **CD 3000S 2PH:** Two legs switcing 3 wire load star or delta connected
- **Thyristor unit up to 700A**
- **HB alarm** to diagnostic partial or total load failure from 40 to 100A
- **IP20 protection**
- **Data sheet:** More details on "CD3000S 2PH" bulletin

Option

- Current transformers
- HB alarm to diagnostic partial or total load failure

ORDERING CODE

Model	Current (A)	Oper. Voltage (V)	Max Voltage (V)	Aux Voltage (V)	Input	Firing mode	Options	Manual
CD 3000S 2PH	10	24V min	480 600	No (1) 14:24V (3) 90:130V (2) 170:265V (2) 230:345V (2) 300:530V (2)	SSR 0÷10V 4÷20mA 10K Pot.	ZC (Zero Crossing) BF (Burst Firing) with analog BF04 (4 cycles on + 4 off) BF08 (8 cycles on + 8 off) BF016 (16 cycles on + 16 off) Note: For Bust Firing specify the desired n° of cycles ON at 50% of power demand	EF (External Fuse + fuse holder up to 100A) NF (No Fuse up to 100A) IF (Internal Fuses are St. over 100A) HB (Heater Break alarm) 110V Fan (Fan at 110V) UL (cUL us listed)	None Italian English German French
	15A							
	25A							
	35A							
	45A							
	75A							
	100A							
	125A							
	150A							
	200A							
	275A							
	400A							
	450A							
	500A							
	600A							
	700A							

Example code compilation

CD 3000S 2PH	150A	440V	480V	300:530V	4:20 mA	BF08	HB	English

Note (1) No auxiliary voltage supply from 10 to 100A included
Note (2) This is the auxiliary voltage supply over 100A
Note (3) Necessary with 0:10V - 4:20 mA and HB Alarm

CD 3000S 3PH

SIZE S2   SIZE S14

Technical Specification

- **Dimensions:** See size and dimensions from page 56 to 59
- **Load type:** Normal resistance, infrared long and medium waveform
- **Inputs:** SSR Standard, Heather Break alarm are options
- **Firing mode:** Zero Crossing, Burst Firing available with analogue input only
- **Operating temperature:** 0 to 40°C without derating
- **Comply with EMC**
- **Data sheet:** More details on "CD3000S 3PH" bulletin

Option

- Analog input: 4/20 mA or 0/10V
- Heather Break Alarm + Current Transformer
- Current Transformer + HB Alarm
- Input: 110V ac

ORDERING CODE

Model	Current (A)	Oper. Voltage (V)	Max Voltage (V)	Aux Voltage (V)	Input	Firing mode	Options	Manual
CD 3000S 3PH	15A	24V min	480 600	No (1) 90:130V (2) 230:345V (2) 300:530V (2) 510:690V (2)	SSR 110 Vac	ZC (Zero crossing)	EF (External Fuse + fuse holder up to 90A) NF (No Fuse up to 90A) HB (Heater Break alarm) 110V Fan (Fan at 110V) UL (cUL us listed)	None Italian German French
	30A							
	45A							
	60A							
	75A							
	90A							
	125A							
	150A							
	225A							
	300A							
	350A							
	400A							
	450A							
	500A							

Example code compilation

CD 3000S 3PH	150A	440V	480V	300:530V	SSR	ZC	UL + EF	English

Note (1) No auxiliary voltage supply from 15 to 90A included
Note (2) This is the auxiliary voltage supply over 90A

CD 3000M 1PH

SIZE SOC   SIZE S12
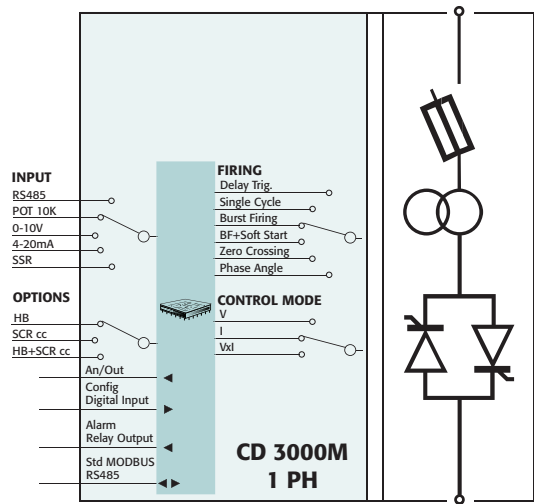
INPUT
RS485
POT 10K
0-10V
4-20mA
SSR

OPTIONS
HB
SCR cc
HB+SCR cc
An/Out
Config Digital Input
Alarm Relay Output
Std MODBUS RS485

FIRING
Delay Trig.
Single Cycle
Burst Firing
BF+Soft Start
Zero Crossing
Phase Angle

CONTROL MODE
V
I
VxI

CD 3000M 1 PH

Technical Specification

- **Dimensions:** See size and dimensions from page 56 to 59
- **CD3000M:** Is a digital and universal thyristor unit configurable via serial communication port
- **RS485 comm. ModBus Protocol:** Included as standard
- **Single phase thyristor:** Unit up to 700A
- **Universal input**
- **Load type:** Normal resistance, infrared short long and medium waveform, Silicon Carbide
- **Inputs:** 0:10V dc, 4:20mA, 10kpot, SSR, RS485
- **Firing mode:** Zero Crossing, Burst Firing, Single Cicle, Soft Start + Phase Angle, Delayed Triggering
- **Operating temperature:** 0 to 40°C without derating
- **Control mode:** Voltage, VxI Power, I and I^2
- **RS485 port. RTU Modbus Protocol**
- **Comply with EMC and cUL**
- **IP20 protection**
- **Data sheet:** More details on "CD 3000M 1PH" bulletin

Option

- HB + CT : Current transformer plus HB Alarm
- Configuration software + CCA (cable + converter)

ORDERING CODE

Model	Current (A)	Oper. Voltage (V)	Max Voltage (V)	Aux Voltage (V)	Input	Firing mode	Control mode	Options	Manual
CD 3000M 1PH	15A 25A 35A 45A 60A 90A 110A 125A 150A 200A 300A 400A 500A 600A 700A	24V min	480 600	90:130V (1) 170:265V (1) 230:345V (1) 300:530V (1) 510:690V (1)	SSR 0÷10V 4÷20mA 10K Pot.	ZC (Zero Crossing) SC (Single Cycle) BF (Burst Firing) DT (Delayed trigg. + Burst Firing) S+BF (Soft start + Burst Firing) PA (Phase Angle) Note: For Bust Firing specify the desired n° of cycles ON at 50% of power demand	V I V x I	COMM (RS485 ModBus) CD-KP (Eternal Key Pad) EF (External Fuse + fuse holder) NF (No Fuse) IF (Internal Fuses are St. over 110V) HB (Heater Break alarm) 110V Fan (Fan at 110V) UL (cUL us listed)	None Italian English German French

Example code compilation

| CD 3000M 1PH | 150A | 440V | 480V | 300:530V | 4÷20mA | PA | I | HB | English |

Note (1) Auxiliary voltage supply must be synchronized with load voltage.
Load voltage must be inside the aux voltage range

CD 3000M 2PH

SIZE S14
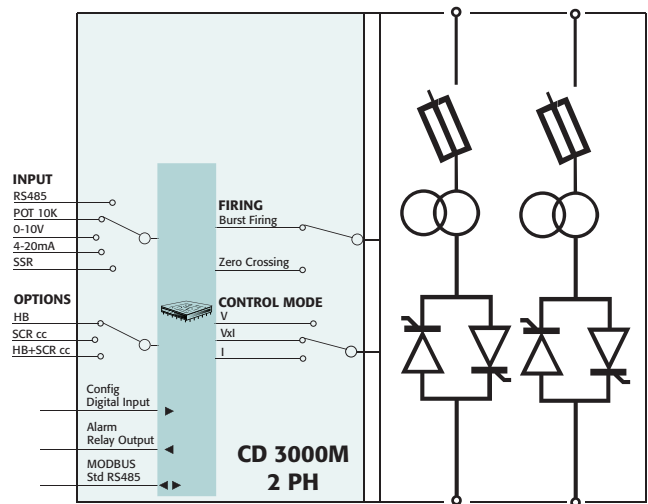
INPUT
RS485
POT 10K
0-10V
4-20mA
SSR

OPTIONS
HB
SCR cc
HB+SCR cc
Config Digital Input
Alarm Relay Output
MODBUS Std RS485

FIRING
Burst Firing

Zero Crossing

CONTROL MODE
V
VxI
I

CD 3000M 2 PH

Technical Specification

- **Dimensions:** See size and dimensions from page 56 to 59
- **CD3000M:** Is a digital and universal thyristor unit configurable via serial communication port
- **RS485 comm. ModBus Protocol:** Included as standard
- **Two phase thyristor:** Unit up to 700A
- **Universal input**
- **Load type:** Normal resistance, infrared long and medium waveform
- **Inputs:** 0-10V dc, 4-20mA, 10kpot, SSR, RS485
- **Firing mode:** Zero Crossing, Burst Firing
- **Operating temperature:** 0 to 40°C without derating
- **Control mode:** V Voltage, VxI Power
- **RS485 port. RTU Modbus Protocol Std.**
- **Comply with EMC and cUL**
- **IP20 protection**
- **Data sheet:** More details on "CD 3000M 2PH" bulletin

Option

- HB + CT : Current transformer plus HB Alarm
- Configuration software + CCA (cable + converter)

ORDERING CODE

Model	Current (A)	Oper. Voltage (V)	Max Voltage (V)	Aux Voltage (V)	Input	Firing mode	Control mode	Options	Manual
CD 3000M 2PH	15A 25A 35A 45A 75A 90A 125A 150A 200A 300A 400A 500A 600A 700A	24V min	480 600	90:130V (1) 170:265V (1) 230:345V (1) 300:530V (1) 510:690V (1)	SSR 0÷10V 4÷20mA 10K Pot.	ZC (zero crossing) SC (Single cycle) BF (Burst firing) Note: For Burst Firing specify the desired n° of cycles ON at 50% of power demand	V I V x I	EF (External Fuse + fuse holder) NF (No Fuse) IF (Internal Fuses are St. over 110V) HB (Heater Break alarm) 110V Fan (Fan at 110V) UL (cUL us listed)	None Italian English German French

Example code compilation

| CD 3000M 2PH | 150A | 440V | 480V | 300:530V | 4÷20mA | PA | I | HB | English |

Note (1) Auxiliary voltage supply must be synchronized with load voltage.
Load voltage must be inside the aux voltage range

CD 3000M 3PH
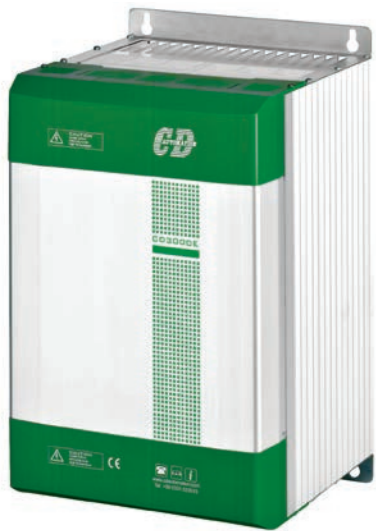
SIZE S13
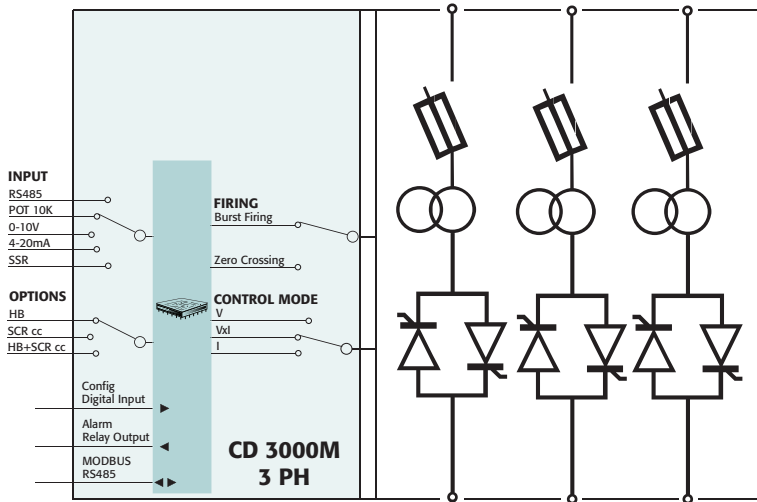
Technical Specification

- **Dimensions:** See size and dimensions from page 56 to 59
- **CD3000M:** Is a digital and universal thyristor unit configurable via serial communication port
- **RS485 comm. ModBus Protocol:** Included as standard
- **Three phase thyristor:** Unit up to 500A
- **Load type:** Normal resistive, infrared long and medium waveform
- **Inputs:** 0-10V dc, 4-20mA, 10kpot, SSR, RS485
- **Firing mode:** Zero Crossing, Burst Firing
- **Operating temperature:** 0 to 40°C without derating
- **Control mode:** Voltage, VxI Power I and I2
- **RS485 port. RTU Modbus Protocol Std.**
- **Comply with EMC and cUL**
- **IP20 protection**
- **Data sheet:** More details on "CD 3000M 3PH" bulletin

Option

- **HB + CT :** Current transformer plus HB configuration software + CCA (cable + converter)

ORDERING CODE

Model	Current (A)	Oper. Voltage (V)	Max Voltage (V)	Aux Voltage (V)	Input	Firing mode	Control mode	Options	Manual
CD 3000M 3PH	15A	24V min	480	90:130V (1)	SSR	ZC (zero crossing)	V	COMM (RS485 ModBus)	None
	25A			170:265V (1)		SC (Single cycle)		CD-KP (Eternal Key Pad)	
	30A			230:345V (1)	0÷10V	BF (Burst firing)		EF (External Fuse + fuse holder)	Italian
	45A			300:530V (1)	4÷20mA	DT (Delayed Trigg. + Burst Firing)	I	NF (No Fuse)	English
	60A			510:690V (1)	10K Pot.	S+BF (Soft start + Burst Firing)		IF (Internal Fuses are St. over 110V)	German
	75A		600			PA (Phase angle)	V x I	HB (Heater Break alarm)	French
	90A							UL (cUL us listed)	
	125A					Note:			
	150A					For Bust Firing specify the			
	225A					desired n° of cycles ON at 50%			
	300A					of power demand			
	350A								
	400A								
	500A								

Example code compilation

CD 3000M 3PH	150A	440V	480V	300:530V	4÷20mA	PA	I	HB	English

Note (1) Auxiliary voltage supply must be synchronized with load voltage. Load voltage must be inside the aux voltage range

DON'T GO CRAZY!
If you want an easy life select our Custom Unit

Rugged and very reliable

Each phase can be substitute by front

Diagnostic and readout V-I-P

Easy to be used

Competitive pricing

Input and output copper bar from up-down side or front unit
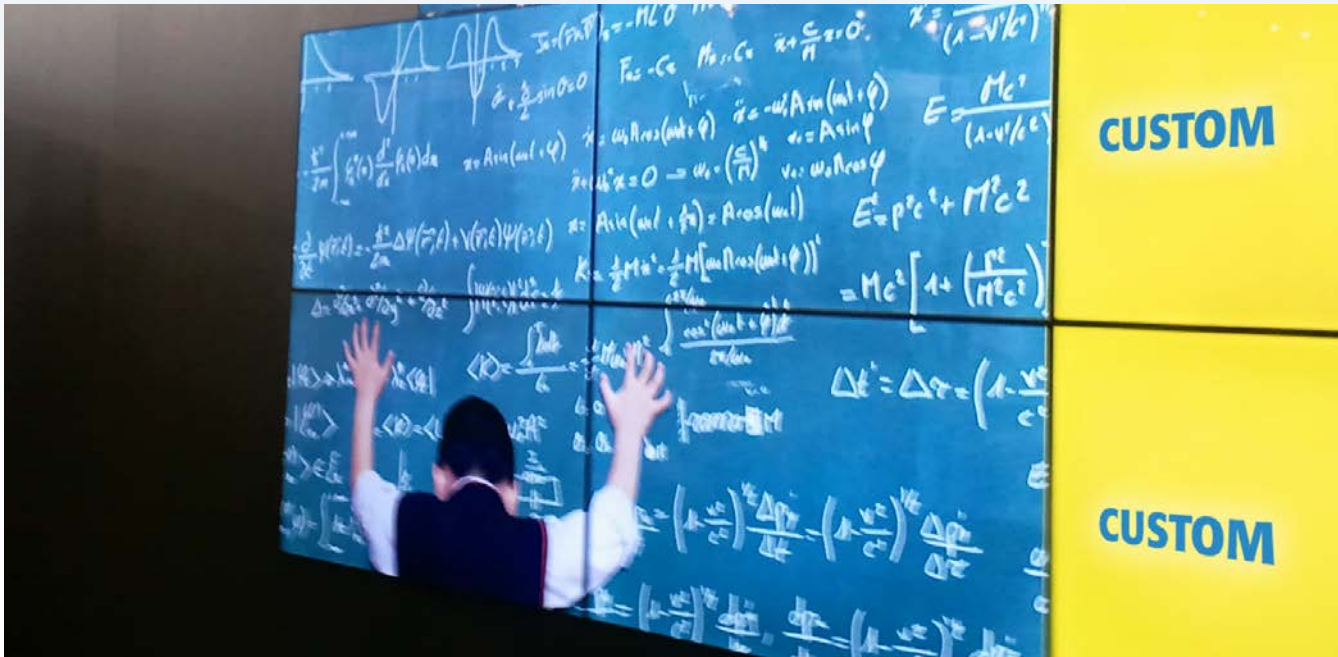
Custom 1PH from 300A to 800A

SIZE S28 - from 300A to 800A
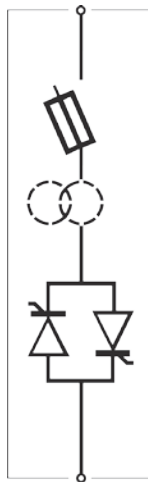
Technical Specification

- **One phase thyristor:** Unit from 300 to 800A
- **Suitable to drive:** 1 phase loads at 480-600-690V
- **Dimensions:** See size and dimensions from page 56 to 59
- **Load type:** Normal resistance, infrared long and medium
- **Frontal key pad:** Alarm indication and setting
- **Protection:** Inside semiconductor fuses
- **Inputs:** SSR Standard, 0:10V, 4:20mA as option
- **Firing mode:** Zero Crossing and Burst Firing available with analog input
- **Operating temperature:** 0° to 40°C without derating
- **IP20 protection:** Standard
- **Comply with CE-EMC**
- **Data sheet:** More details on "Custom 1PH from 300 to 800A" bulletin

Option

Measurement package including:
- **Heather break alarm:** Diagnostic partial or total load failure
- **Digital read out:** Current, voltage and power
- **Second thermal switch:** For high heat sink temperature with free voltage contact output
- **Fuse failure:** Microswitch with free voltage contact output

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

CURRENT		3	4	5	6	
description			code			note
300A		0	3	0	0	
550A		0	5	5	0	
800A		0	8	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	

AUX. VOLTAGE SUPPLY	8	
description	code	note
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	
0:10V dc	V	
4:20 mA	A	

FIRING	10	
description	code	note
Zero Crossing with SSR input	Z	
Burst Firing 4 Cycles ON at 50% Power Demand	4	2
Burst Firing 8 Cycles ON at 50% Power Demand	8	2
Burst Firing 16 Cycles ON at 50% Power Demand	6	2

CONTROL MODE	11	
description	code	Note
Open Loop	0	

OPTION	12	
description	code	Note
Measurement package including heater break alarm and current, voltage and power read out	H	
None	O	

FAN VOLTAGE	13	
description	code	Note
110V	1	
220V Standard	2	

APPROVALS	14	
description	code	Note
CE-EMC	0	

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

VERSION	16	
description	code	Note
Standard in line with above code	1	
Standard + 2nd thermal switch	2	
Standard + fuse micro switch	3	
Standard + 2nd thermal switch + fuse micro	4	

Note (1) Load voltage supply as value must be included in auxiliary voltage supply range.
**Note (2)** Burst firing is a zero crossing firing

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Custom 1PH from 1100A to 2700A

SIZE S31 - from 1100A to 1400A

SIZE S34 - from 1700A to 2700A

Technical Specification

- **One phase thyristor:** Unit from 1100 to 2700A
- **Suitable to drive:** 1 phase loads at 480-600-690V
- **Dimensions:** See size and dimensions from page 56 to 59
- **Load type:** Normal resistance, infrared long and medium
- **Frontal key pad setting:** Alarm indication and configuration
- **Protection:** Inside semiconductor fuses
- **Inputs:** SSR Standard, 0:10V, 4:20mA selectable
- **Firing mode:** Zero Crossing and Burst Firing available with analog input and configurable from 1 to 255 cycles ON at 50% power demand
- **Removible phase:** By front unit without fork lift help
- **Stall protection alarm:** For faulty fan
- **Second thermal switch:** For high heat sink temperature with free voltage contact output standard
- **Fuse failure microswitch:** Free voltage contact output standard
- **Structure:** Alluminium and copper structure treated against oxidation
- **Diagnostic and wiring diagram:** Easy to use on front unit
- **Operating temperature:** 0° to 40°C without derating
- **IP0 protection:** Standard
- **IP20 protection:** Option
- **Comply with CE-EMC**
- **Data sheet:** More details on "Custom 1PH from 1100 to 2700A" bulletin

Option

Measurement package including:
- **Heather break alarm:** Diagnostic partial or total load failure
- **Digital read out:** Current, voltage and power

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

CURRENT		3	4	5	6	
description			code			note
1100A		1	1	0	0	
1400A		1	4	0	0	
1700A		1	7	0	0	
1900A		1	9	0	0	
2100A		2	1	0	0	
2700A		2	7	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	

VOLTAGE AUX. SUPPLY	8	
description	code	note
110V	0	
230V	2	

INPUT	9	
description	code	note
SSR	S	
0:10V dc	V	
4:20 mA	A	
Potentiometer	K	

FIRING	10	
description	code	note
Zero Crossing with SSR input	Z	
Burst Firing configurable from 1 to 255 at 50% power demand	B	1

CONTROL MODE	11	
description	code	Note
Open Loop	O	
Voltage feed back	U	
Power feed back	W	
Current feed back	I	

OPTION	12	
description	code	Note
None	O	
Measurement package including heater break alarm and current, voltage and power read out	H	

FAN VOLTAGE	13	
description	code	Note
110V	1	
220V	2	

APPROVALS	14	
description	code	Note
CE-EMC + IP0 protection standard	0	
CE-EMC + IP20 protection standard	1	
CE-EMC + protection with flat plexiglass mounted on pillars (on VERSION 1,2)	2	

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

VERSION	16	
description	code	Note
Version with Multidrive board. Production just as spare part	1	2
Version with Custom board and frontal support of heat sink white	2	2
New version in production from January 2015	3	

Note (1) Burst firing is a zero crossing firing
Note (2) Available just as spare unit giving serial number
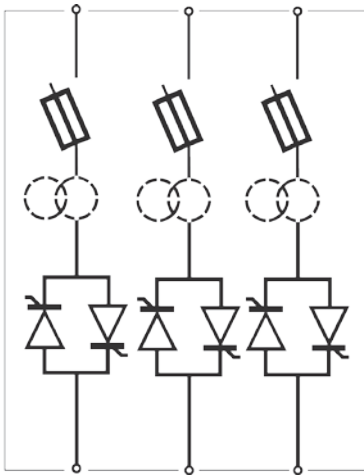
Custom 2PH from 150A to 800A

SIZE S28 - 150A - 210A - 300A

SIZE S29 - 450A - 550A - 800A
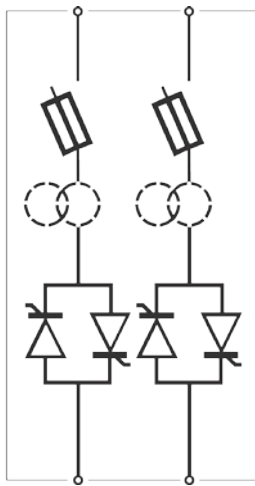
Technical Specification

- **Two phase thyristor:** Unit from 150 to 800A
- **Suitable to drive:** 3 phase loads at 480-600-690V on three phases
- **Dimensions:** See size and dimensions from page 56 to 59
- **Load type:** Normal resistance, infrared long and medium
- **Frontal key pad:** Alarm indication and setting
- **Protection:** Inside semiconductor fuses
- **Inputs:** SSR Standard, 0:10V, 4:20mA as option
- **Firing mode:** Zero Crossing and Burst Firing available with analog input
- **Operating temperature:** 0° to 40°C without derating
- **IP20 protection:** Standard
- **Comply with CE-EMC**
- **Data sheet:** More details on "Custom 3PH from 150 to 800A" bulletin

Option

Measurement package including:
- **Heather break alarm:** Diagnostic partial or total load failure
- **Digital read out:** Current, voltage and power
- **Second thermal switch:** For high heat sink temperature with free voltage contact output
- **Fuse failure:** Microswitch with free voltage contact output

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

CURRENT		3	4	5	6	
description		code				note
150A		0	1	5	0	
210A		0	2	1	0	
300A		0	3	0	0	
450A		0	4	5	0	
550A		0	5	5	0	
800A		0	8	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	

AUX. VOLTAGE SUPPLY	8	
description	code	note
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	
0:10V dc	V	
4:20 mA	A	

FIRING	10	
description	code	note
Zero Crossing with SSR input	Z	
Burst Firing 4 Cycles on at 50% Power	4	2
Burst Firing 8 Cycles on at 50% Power	8	2
Burst Firing 16 Cycles on at 50% Power	6	2

CONTROL MODE	11	
description	code	Note
Open Loop	0	

OPTION	12	
description	code	Note
Measurement package including heater break alarm and current, voltage and power read out	H	
None	O	

FAN VOLTAGE	13	
description	code	Note
Fan 110V	1	
Fan 220V Standard	2	

APPROVALS	14	
description	code	Note
CE-ECM	0	

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

VERSION	16	
description	code	Note
Standard in line with above code	1	
Standard + second thermal switch	2	
Standard + fuse micro switch	3	
Standard + fuse micro switch + fuse micro	4	

Note (1) Load voltage supply as value must be included in auxiliary voltage supply range.
**Note (2)** Burst firing is a zero crossing firing

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Custom 2PH from 1100A to 2700A

SIZE S32 - from 1100A to 1400A

SIZE S35 - from 1700A to 2700A
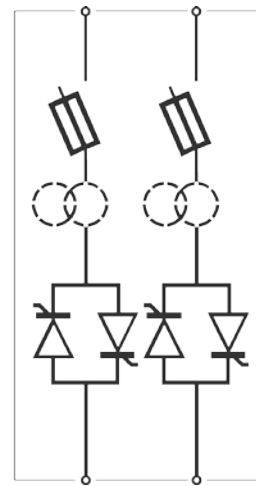
Technical Specification

- **Two phase thyristor:** Unit from 1100 to 2700A
- **Suitable to drive:** 3 phase loads at 480-600-690V with 2 phase controlled
- **Dimensions:** See size and dimensions from page 56 to 59
- **Load type:** Normal resistance, infrared long and medium
- **Frontal key pad setting:** Alarm indication and configuration
- **Protection:** Inside semiconductor fuses
- **Inputs:** SSR Standard, 0:10V, 4:20mA selectable
- **Firing mode:** Zero Crossing and Burst Firing available with analog input and configurable from 1 to 255 cycles ON at 50% power demand
- **Removible phase:** By front unit without fork lift help
- **Stall protection alarm:** For faulty fan
- **Second thermal switch:** For high heat sink temperature with free voltage contact output standard

- **Fuse failure microswitch:** Free voltage contact output standard
- **Structure:** Alluminium and copper structure treated against oxidation
- **Diagnostic and wiring diagram:** Easy to use on front unit
- **Operating temperature:** 0° to 40°C without derating
- **IP0 protection:** Standard
- **IP20 protection:** Option
- **Comply with CE-EMC**
- **Data sheet:** More details on "Custom 2PH from 1100 to 2700A" bulletin

Option

Measurement package including:
- **Heather break alarm:** Diagnostic partial or total load failure
- **Digital read out:** Current, voltage and power

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

CURRENT		3	4	5	6	
description		code				note
1100A		1	1	0	0	
1400A		1	4	0	0	
1700A		1	7	0	0	
1900A		1	9	0	0	
2100A		2	1	0	0	
2700A		2	7	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	

VOLTAGE AUX. SUPPLY	8	
description	code	note
110V	0	
230V	2	

INPUT	9	
description	code	note
SSR	S	
0:10V dc	V	
4:20 mA	A	
Potentiometer	K	

FIRING	10	
description	code	note
Zero Crossing with SSR input	Z	
Burst firing configurable from 1 to 255 at 50% power demand	B	1

Note (1) Burst firing is a zero crossing firing
Note (2) Available just as spare unit giving serial number

CONTROL MODE	11	
description	code	Note
Open Loop	O	
Voltage feed back	U	
Power feed back	W	
Current feed back	I	

OPTION	12	
description	code	Note
None	O	
Measurement package including heater break alarm and current, voltage and power read out	H	

FAN VOLTAGE	13	
description	code	Note
110V	1	
220V	2	

APPROVALS	14	
description	code	Note
CE-EMC + IP0 protection standard	0	
CE-EMC + IP20 one protection for each phase	1	
CE-EMC + protection with flat plexiglass mounted on pillars (on VERSION 1,2)	2	

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

VERSION	16	
description	code	Note
Version with Multidrive board. Production just as spare part	1	2
Version with Custom board and frontal support of heat sink white	2	2
New version in production from January 2015	3	

Custom 3PH from 150A to 800A

SIZE S28 - 150A   SIZE S29 - 300A   SIZE S30 - 550A - 800A

Technical Specification

- **Three phase thyristor:** Unit from 150 to 800A
- **Suitable to drive:** 3 phase loads at 480-600-690V on three phases
- **Dimensions:** See size and dimensions from page 56 to 59
- **Load type:** Normal resistance, infrared long and medium
- **Frontal key pad:** Alarm indication and setting
- **Protection:** Inside semiconductor fuses
- **Inputs:** SSR Standard, 0:10V, 4:20mA as option
- **Firing mode:** Zero Crossing and Burst Firing available with analog input
- **Operating temperature:** 0° to 40°C without derating
- **IP20 protection:** Standard
- **Comply with CE-EMC**
- **Data sheet:** More details on "Custom 2PH from 150 to 800A" bulletin

Option

Measurement package including:
- **Heather break alarm:** Diagnostic partial or total load failure
- **Digital read out:** Current, voltage and power
- **Second thermal switch:** For high heat sink temperature with free voltage contact output
- **Fuse failure:** Microswitch with free voltage contact output

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

CURRENT				3	4	5	6	
description				code				note
150A				0	1	5	0	
300A				0	3	0	0	
550A				0	5	5	0	
800A				0	8	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	

AUX. VOLTAGE SUPPLY	8	
description	code	note
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	
0:10V dc	V	
4:20 mA	A	

FIRING	10	
description	code	note
Zero Crossing with SSR input	Z	
Burst Firing 4 Cycles on at 50% Power	4	2
Burst Firing 8 Cycles on at 50% Power	8	2
Burst Firing 16 Cycles on at 50% Power	6	2

CONTROL MODE	11	
description	code	Note
Open Loop	0	

OPTION	12	
description	code	Note
Measurement package including heater break alarm and current, voltage and power read out	H	
None	O	

FAN VOLTAGE	13	
description	code	Note
Fan 110V	1	
Fan 220V Standard	2	

APPROVALS	14	
description	code	Note
CE-ECM	0	

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

VERSION	16	
description	code	Note
Standard in line with above code	1	
Standard + second thermal switch	2	
Standard + fuse micro switch	3	
Standard + fuse micro switch + micro	4	

Note (1) Load voltage supply as value must be included in auxiliary voltage supply range.
Note (2) Burst firing is a zero crossing firing

Custom 3PH from 1100A to 2700A

SIZE S33 - from 1100A to 1400A   SIZE S36 - from 1700A to 2700A
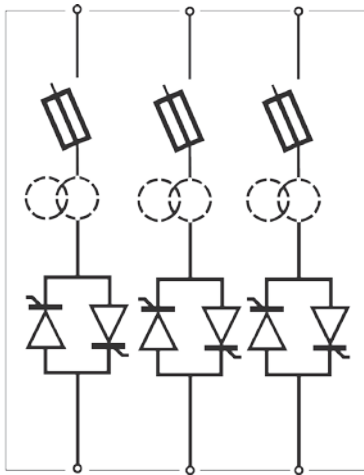
Technical Specification

- **Three phase thyristor:** Unit from 1100 to 2700A
- **Suitable to drive:** 3 phase loads at 480-600-690V with 3 phase controlled
- **Dimensions:** See size and dimensions from page 56 to 59
- **Load type:** Normal resistance, infrared long and medium
- **Frontal key pad setting:** Alarm indication and configuration
- **Protection:** Inside semiconductor fuses
- **Inputs:** SSR Standard, 0:10V, 4:20mA selectable
- **Firing mode:** Zero Crossing and Burst Firing available with analog input and configurable from 1 to 255 cycles ON at 50% power demand
- **Removible phase:** By front unit without fork lift help
- **Stall protection alarm:** For faulty fan
- **Second thermal switch:** For high heat sink temperature with free voltage contact output standard
- **Fuse failure microswitch:** Free voltage contact output standard
- **Structure:** Alluminium and copper structure treated against oxidation
- **Diagnostic and wiring diagram:** Easy to use on front unit
- **Operating temperature:** 0° to 40°C without derating
- **IP0 protection:** Standard
- **IP20 protection:** Option
- **Comply with CE-EMC**
- **Data sheet:** More details on "Custom 3PH from 1100 to 2700A" bulletin

Option

Measurement package including:
- **Heather break alarm:** Diagnostic partial or total load failure
- **Digital read out:** Current, voltage and power

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

CURRENT				3	4	5	6	
description				code				note
1100A				1	1	0	0	
1400A				1	4	0	0	
1700A				1	7	0	0	
1900A				1	9	0	0	
2100A				2	1	0	0	
2700A				2	7	0	0	

MAX VOLTAGE	7	
description	code	note
480V	4	
600V	6	
690V	7	

VOLTAGE AUX. SUPPLY	8	
description	code	note
110V	0	
230V	2	

INPUT	9	
description	code	note
SSR	S	
0:10V dc	V	
4:20 mA	A	
Potentiometer	K	

FIRING	10	
description	code	note
Zero Crossing with SSR input	Z	
Burst firing configurable from 1 to 255 at 50% power demand	B	1

Note (1) Burst firing is a zero crossing firing
Note (2) Available just as spare unit giving serial number

CONTROL MODE	11	
description	code	Note
Open Loop	O	
Voltage feed back	U	
Power feed back	W	
Current feed back	I	

OPTION	12	
description	code	Note
None	O	
Measurement package including heater break alarm and current, voltage and power read out	H	

FAN VOLTAGE	13	
description	code	Note
110V	1	
220V	2	

APPROVALS	14	
description	code	Note
CE-EMC + IP0 protection standard	0	
CE-EMC + IP20 one protection for each phase	1	
CE-EMC + protection with flat plexiglass mounted on pillars (on VERSION 1,2)	2	

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

VERSION	16	
description	code	note
Version with Multidrive board. Production just as spare part	1	2
Version with Custom board and frontal support of heat sink white	2	2
New version in production from January 2015	3	

Auxiliary Units

CD-RS
Compact and smart communication converter
Input RS232 Output RS485 or 422
RS232 connection via a 9 pin connector on front of unit
RS485 or 422 via screw terminals
This converter can be used to interface a computer with CD Automation communicating Thyristor Units.
Code: CD-RS | For more informations see "CD-RS" bulletin

Field Bus Modules
Code: TU-RS485-PDP-BASIC used to convert RS485 Modbus to Profibus DP
For more informations see "TU-RS485-PDP-BASIC" bulletin
Code: TU-RS485-ETH used to convert RS485 Modbus to Ethernet Modbus TCP
For more informations see "TU-RS485-ETH" bulletin
Code: TU-RS485-PNT used to convert RS485 Modbus to ProfiNet
For more informations see "TU-RS485-PNT" bulletin

CD KP-Operator Interface
The CD-KP is designed to be connected with CD 3000E and Multidrive via RS485 communications.
The LED display will show Power, Voltage or Current values, all in engineering units.
Any one of these variables can be selected and retransmitted via an isolated output (4-20mA or 0-10V).
No need to open the cubicle door and stop the process, an RS485 connector on the front of the unit
allows direct connection to a portable PC for easy configuration.
In addition the display unit allows simple diagnostics of fault conditions.
For more informations see "CD-KP" bulletin

Revo-KP2 Graphic Operator Terminals for Thyristor Units
This unit is based on a colour touch panel and can be used to be interfaced up to 6 Thyristor units.
On front unit is possible to set or to read:
• Load Current in RMS value and Load Voltage
• Power delivered to the load and Power demand
• Digital input Status
• SC = Short circuit on Thyristor
• HB = Partial or total load failure
• Local/Remot, Up/Down
• Trend of the selected variable Ex.Current Voltage for Revo M, Revo CL, CD 3000E, Multidrive
• Language selection
More details on manual

Configuration Software
CD Automation Configurator Software is free of charge.
The thyristor unit leave the factory alredy configured but if is necessary to verify the configuration or to
modify it is necessary to have the configurator plus the Cable Kit.
Code: CCA cable + converter.
There is one page very friendly named „Test Unit" from where without instruction is possible to
communicate in intuitive mode. Just clicking on what you need.
With CD-RS converter (see above) it's possible to communicate with the Thyristor unit without cable kit.
Code: CD-CONFIGURATOR
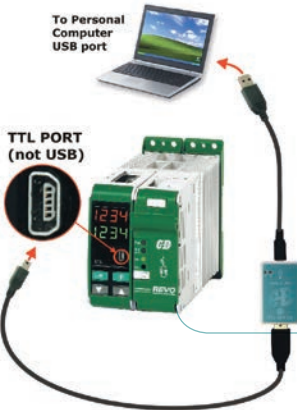
Cable Kit
The cable kit on left side is for universal use on CD Automation Thyristor unit including Revo and
CD 3000 Familys Type of connector and USB cable as described on the Manual.
The components of the Kit are:
• 2 USB cable
• 1 USB/TTL converter
• 1 adapter with 4 poles
• 1 adapter with 9 pin connector
Code: CCA

DIN-RAIL mount semiconductor fusing
Protection for your CD 1-2-3 PH Solid state power controllers

For efficient protection of your CD 1-2-3 PH
solid state power controller, use semiconductor fuses to
ensure a long life.

To safeguard your Power Controllers CD Automation
offers Fuse and Fuse Holder correctly sized to protect the
Thyristors.

All Fuses should be rated at 25% more than Power
Controller rating.
The semiconductor I^2t should be 30% less than Power
Controller I^2t.

Semiconductor Fuses are classified for UL as
additional protection for semiconductor.
They are not approved for branch circuit protection.
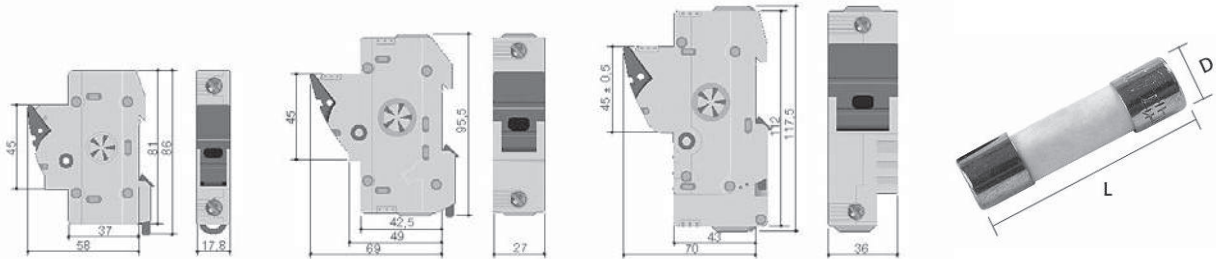
CE VERSION

	FUSE				FUSE HOLDER			
Amp Reating	I^2t (A^2 Sec)	Code	Diameter	Length	Code	CD1	CD2	CD3
32	600	FU1038/32A	10,3	38	FFH1038/32A	CD1025	CD2025	CD3025
50	2000	FU1451/50A	14	51	FFH1451/50A	CD1045	CD2045	CD3045
80	6550	FU2258/80A	22	58	FFH2258/80A	CD1060		CD3060
100	13500	FU2258/100A	22	58	FFH2258/100A		CD2075	
125	14000	FU2258/125A	22	58	FFH2258/125A	CD10090	CD2090	CD3090

cUL VERSION

	FUSE				FUSE HOLDER	THYRISTOR UNIT TYPE		
Amp Reating	I^2t (A^2 Sec)	Code	Diameter	Length	Code	CD1	CD2	CD3
32	600	FWC32A10F	10,3	38	FFH1038/32A	CD1025	CD2025	CD3025
50	1800	FWP50A14F	14	51	FFH1451/50A	CD1045	CD2045	CD3045
80	6600	FWP80A22F	22	58	FFH2258/100A	CD1060		CD3060
100	6970	CPURQ27x60/125	22	58	FFH2258/1250A	CD10090	CD2075-CD90	CD3090

Fuse table

FUSE FOR REVO FAMILY

Model fuse & Thyristors	RS 1PH	RM 1PH RCL	RS 2PH	RM 2PH	RS 3PH	RM 3PH	RE 2PH	RE 3PH	M 1PH	M 2PH	M 3PH
Current											
30A	FU1451/40A	FU1451/40A	FU1451/40A	FU1451/40A	FU1451/40A	FU1451/40A					
35A	FU1451/50A	FU1451/50A	FU1451/50A	FU1451/50A	FU1451/50A	FU1451/50A	20 559 20.160	2x 50 073 06. 100		20 559 20.160	20 559 20.160
40A	FU1451/50A	FU1451/50A	FU1451/50A	FU1451/50A	FU1451/50A	FU1451/40A					
45A							20 559 20.160	2x 50 073 06. 100		20 559 20.160	20 559 20.160
60A	20 559 20.160	20 559 20.160	20 559 20.160	20 559 20.160	2x 50 073 06. 100	2x 50 073 06. 100					
75A							20 559 20.160	2x 50 073 06. 100		20 559 20.160	20 559 20.160
90A	20 559 20.160	20 559 20.160	2x 50 073 06. 100	20 559 20.160	2x 50 073 06. 100	2x 50 073 06. 100					
100A							20 559 20.160	20 559 20.160		20 559 20.160	20 559 20.160
120A	20 559 20.180	20 559 20.180	20 559 20.180	20 559 20.180	20 559 20.180	20 559 20.180					
125A							20 559 20.180	20 559 20.180		20 559 20.180	20 559 20.180
150A	20 559 20.200	20 559 20.200	20 559 20.200	20 559 20.200	20 559 20.200	20 559 20.200	20 559 20.250	20 559 20.250		20 559 20.250	20 559 20.250
180A	20 559 20.250	20 559 20.250	20 559 20.250	20 559 20.250	20 559 20.250	20 559 20.250					
200A							20 559 20.315				
210A	20 559 20.315	20 559 20.315	20 559 20.315	20 559 20.315	20 559 20.315	20 559 20.315					
225A					20 559 20.315	20 559 20.315		20 559 20.315		20 559 20.315	20 559 20.315
280A	2x 20 559 20.200	2x 20 559 20.200	2x 20 559 20.200	2x 20 559 20.200			2x 20 559 20.200			2x 20 559 20.200	
300A					FU450FMM	FU450FMM		FU450FMM			FU450FMM
350A					FU550FMM	FU550FMM		FU550FMM			FU550FMM
400A	FU550FMM	FU550FMM	FU550FMM	FU550FMM	FU550FMM	FU550FMM	FU550FMM	FU550FMM		FU550FMM	FU550FMM
450A			2x FU315FM	2x FU315FM	FU700FMM	FU700FMM	2x FU315FM	FU700FMM		2x FU315FM	FU700FMM
500A	FU700FMM	FU700FMM	2x FU315FM	2x FU315FM	FU700FMM	FU700FMM	2x FU315FM	FU700FMM		2x FU315FM	FU700FMM
600A	2x FU450FMM	2x FU450FMM	2x FU450FMM	2x FU450FMM			2x 450FMM			2x 450FMM	2x 450FMM
700A	2x FU450FMM	2x FU450FMM	2x FU450FMM	2x FU450FMM			2x FU450FMM				
850A									2x FU550FMM	2x FU550FMM	2x FU550FMM
1100A									2x SQB3.800	2x SQB3.800	2x SQB3.800
1400A									2x SQB3.1250	2x SQB3.1250	2x SQB3.1250
1700A									2x SQB3.1250	2x SQB3.1250	2x SQB3.1250
1900A									2x SQB3.1400	2x SQB3.1400	2x SQB3.1400
2100A									2x SQB3.1600	2x SQB3.1600	2x SQB3.1600
2700A									4X SQB3.1100	4X SQB3.1100	4X SQB3.1100

FUSE FOR CD 3000 & CUSTOM

Model fuse & Thyristors	CD 3200 CD 3000S 1PH	CD 3000S 2PH	CD 3000S 3PH	CD 3000M 1PH	CD 3000M 2PH	CD 3000M 3PH	CUSTOM 1PH	CUSTOM 2PH	CUSTOM 3PH
Current									
120A							FU250URB	FU250URB	FU250URB
125A	FEE200	FEE200	2x 100FE	FEE200	FEE200	2x 100FE			
150A	FEE200	URB250	2x100FE	FEE200	URB250	2x 100FE	FU250URB	FU250URB	FU250URB
200A - 210A	URB315	URB315		URB315	URB315		FU315URE	FU315URE	FU315URE
225A			URB315			URB315			
275A		URB315				URB315			
300A	FM350		450FMM	FM350	450FMM	2x 250 URE	2x 250 URE	2x 250 URE	2x 250 URE
350A			550FMM		550FMM				
400A	FMM550	FMM550	FMM550	FMM550	FMM550	FMM550			
450A		2x 315FM	700FMM		2x 315FM	700FMM	FU630 FMM	FU630 FMM	FU630 FMM
500A	700FMM	2x 315FM	700FMM	700FMM	2x 315FM	700FMM			
550A							2x 450 FMM	2x 450 FMM	2x 450 FMM
600A	2x 450 FMM	2x 450 FMM			2x 450 FMM	2x 450 FMM			
650A							2x 550 FMM	2x 550 FMM	2x 550 FMM
700A	2x 550 FMM			2x 550 FMM					
800A							2x 550 FMM	2x 550 FMM	2x 550 FMM
850A									
1100A							2x SQB3.800	2x SQB3.800	2x SQB3.800
1400A							2x SQB3.1250	2x SQB3.1250	2x SQB3.1250
1700A							2x SQB3.1250	2x SQB3.1250	2x SQB3.1250
1900A							2x SQB3.1400	2x SQB3.1400	2x SQB3.1400
2100A							2x SQB3.1600	2x SQB3.1600	2x SQB3.1600
2700A							4x SQB3.1100	4x SQB3.1100	4x SQB3.1100

Note: The internal fuses for CD3000E 2 - 3PH are listed as RE 2PH - 3PH at page 74
The internal fuses for Multidrive 1 - 2 - 3PH are listed as M1PH - M2PH - M3PH at page 74

Amplivect IGBT

Stop to chop voltage with phase angle generating harmonics.
Control the voltage adjusting its amplitude with IGBT technology.

Amplivect feature

- Three phase IGBT unit with balanced current input
- One phase output with square waveform
- One phase output with sinussoidale waveform with internal choke
- Amplitude control of output vector
- Short circuit prevention
- Control mode in voltage, current and power
- Semiconductor internal fuses not necessary
- No downstream transformer to reduce load voltage
- Automatic calculation of load resistance
- Power load management for multiple units with power limit
- Automatic compensation temperature and aging for SIC elements
- Heather break alarm to diagnostic partial or total failure
- Alarm indication
- External key pad

Technical Specification

- **Voltage supply:** 3 phase 400V ± 10% 50/60Hz
- **Auxiliary voltage:** 220V ac
- **Output:** 3/9/10/21 KW
- **EMC filter on input**
- **Fan cooling**
- **Communication Std:** RS232/RS485 other field bus available
- **USBport**
- **Ethernet**

- **Read out:**
  - Load current
  - Input line current on the three fases
  - Load voltage
  - Load power consumption

- **Analog output:**
  - Four analog configurable output as 4-20 or 0:10V

- **Analog input:**
  - Three analog input

- **Digital input/output:**
  - Four input Std 24V dc

EMI FILTER   RECTIFIER   IGBT INVERTER

L1
L2
L3

Ac Out 1
Ac Out2

LOAD

Control Input

Σ

CURRENT SENSOR

Menu Visual

ORDERING CODE	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16
	A	M	V	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT			
description		code	note
	4	**5**	**6**
15A	0	1	5
40A	0	4	0
55A	0	5	5
100A	1	0	0

MAX VOLTAGE	**7**	
description	code	note
220V	2	
400V	4	

VOLTAGE SUPPLY AUX.	**8**	
description	code	note
230V ac	2	

INPUT	**9**	
description	code	note
0-10V	V	
4:20mA	A	

CONTROL	**9**	
description	code	note
Amplitude control	T	

CONTROL MODE	**11**	
description	code	Note
Voltage V	V	
Current I	I	
Power Vxl	W	

FUSES & OPTION	**12**	
description	code	Note
No internal fuse	0	

FAN VOLTAGE	**13**	
description	code	Note
Fan 220V	2	

APPROVALS	**14**	
description	code	Note
CE EMC	0	

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

VERSION	**16**	
description	code	Note
Standard	1	

UVC the IGBT lamp UV control

The UVC unit has been designed to control UV lamp using IGBT technology with continuos voltage to the lamp.
In this period the people is very sensitive to reduce power consumption to be able to minimize energy cost and respect the environment reducing CO_2.

THE ADVANTAGES ARE:

Lower operation costs
With standby output power at 10% of nominal and with UVC ready to reach in second the 100% power when the product is ready to be dried.

UVC is compact and modular
Unit with possibility to mount side by side or one unit over the other one to save space and money in the construction.

UVC available
At low voltage up to 9 KW and 2000V up to 22 KW with integrated high frequency transformer

Lamp output control
In continuos mode with power regulation from 10 to 100%

UVC feature
- Three phase IGBT unit with balanced current input on the three phase
- One phase output with square waveform or 1 EMC input filter integrated
- One phase output with sinussoidal waveform with internal transformer sized to supply UV lamps up to 2700V
- Amplitude control of output vector
- Short circuit prevention
- Control mode in voltage, current and power
- Semiconductor internal fuses not necessary
- Power load management for multiple units with power limit
- Alarm indication
- External key pad for alarm and read-write parameters
- Multi language instruction and alarm read out

Technical Specification
- **Voltage supply:** 3 phase 400V ± 10% 50-60Hz
- **Auxiliary voltage:** 220V ac
- **Output:** 3/9/10/21 KW
- **EMC filter on input**
- **Fan cooling**
- **Communication Std:** RS232/RS485 other field bus available
- **USBport**
- **Ethernet**
- **Read out:**
  - Load current
  - Input line current on the three fases
  - Load voltage
  - Load power consumption
- **Analog output:**
  - Four analog configurable output as 4-20mA or 0:10V
- **Analog input:**
  - Three analog input
- **Digital input/output:**
  - Four input Std 24V dc
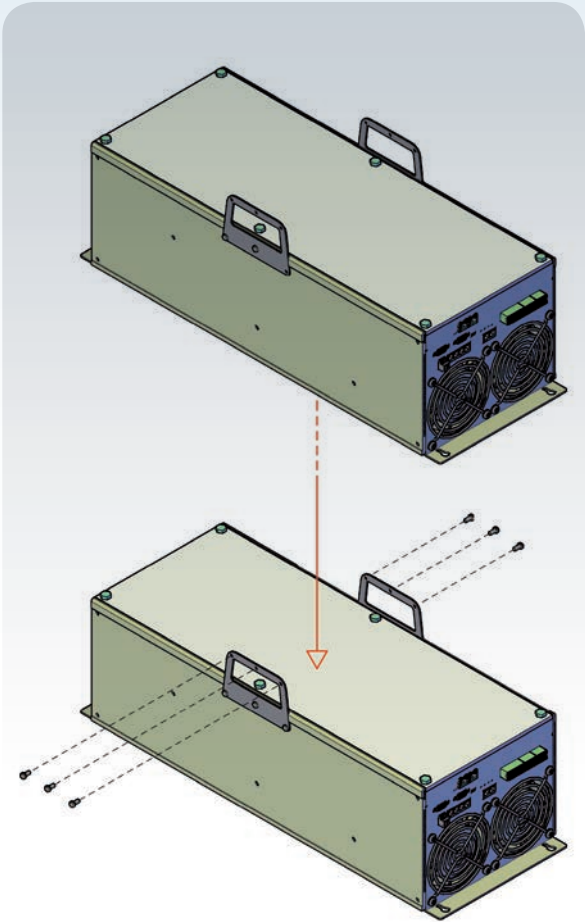
Units mounting side by side or one over the other

Circuit diagram

L1 L2 L3

EMI FILTER

RECTIFIER

Control Input

M

CURRENT SENSOR

IGBT INVERTER

TRANSF.

UV LAMP
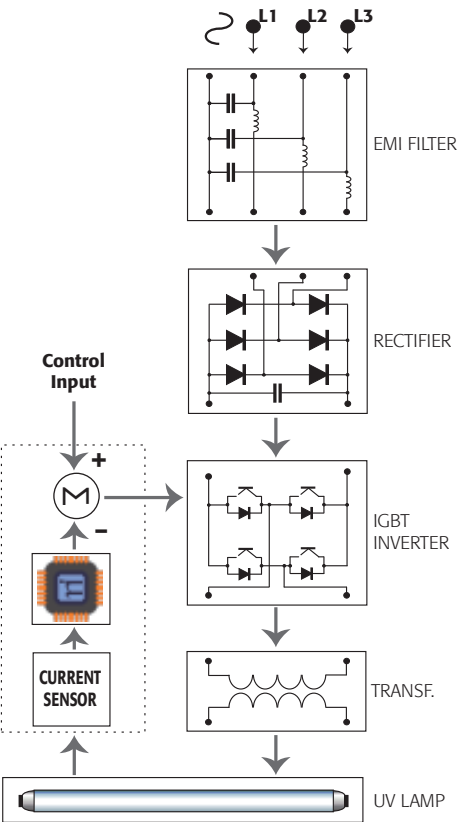
Ordering Code

ORDERING CODE	1	2	3	4	5	6	-	7	8	9	10	11	12	13	14	15	16
	U	V	C	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT				4	5	6		
description				code			note	
15A				0	1	5		
40A				0	4	0		
55A				0	5	5		
100A				1	0	0		

MAX VOLTAGE	7	
description	code	note
220V	2	
400V	4	

VOLTAGE SUPPLY AUX.	8	
description	code	note
230V ac	2	

INPUT	9	
description	code	note
0-10V	V	
4:20mA	A	

CONTROL	9	
description	code	note
Amplitude control	T	

CONTROL MODE	11	
description	code	Note
Voltage V	V	
Current I	I	
Power VxI	W	

FUSES & OPTION	12	
description	code	Note
No internal fuse	0	

FAN VOLTAGE	13	
description	code	Note
Fan 220V	2	

APPROVALS	14	
description	code	Note
CE EMC	0	

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

VERSION	16	
description	code	Note
Standard	1	

Buy our application software

You get CD Automation Know How

SOFTWARE

APPLICATION

KNOW HOW

Application with infrared lamps

CD Automation Thyristor Units are suitable to drive simple and complex Heating Elements. The wide Product Range in terms of performance (5 product families) and Current Range (from 3,5:2700A) offers a product solution for all application requirements.

NORMAL RESISTANCE

In this application, REVO S family up to 700A is normally used.
Over this current we recommend the Multidrive or Custom family up to 2700A.

INFRARED LAMPS MEDIUM AND LONG WAVEFORM

This type of heating elements are controlled as a normal resistance load, providing that the nominal supply voltage is used.
If using medium waveform at a lower voltage than nominal, then this should be treated as short waveform load.
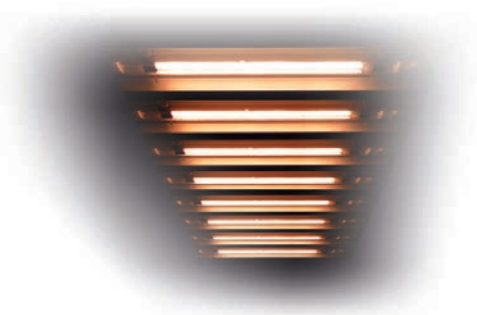
INFRARED LAMPS SHORT WAVEFORM
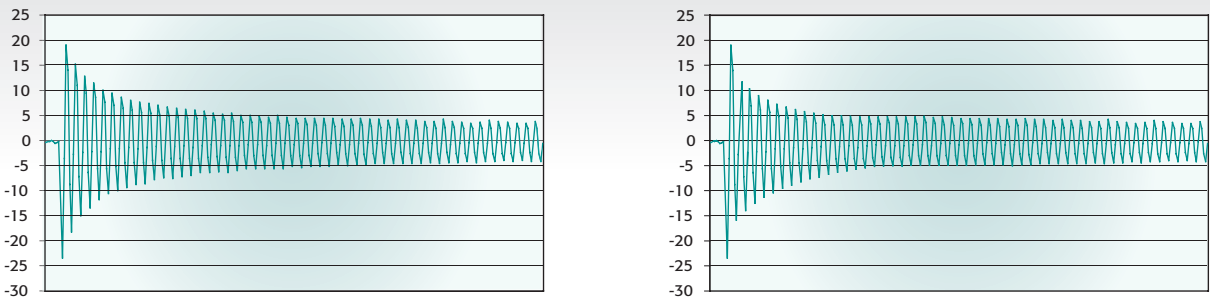
Infrared Short Wave loads can be driven with different types of Firing: Single Cycle, Burst Firing and Phase Angle with Current Limit.
The above graph demonstrates how the inrush current remains high for a longer period if we use phase angle plus current limit, than with single cycle. Single cycle technique is the most used to drive infrared short waveform. During the off time the IRSW elements become cold (due to their low inertia) and when switched ON again there is a peak of current.
This peak of current is a function of the number of burst firing cycles, for this reason the off time must be as short as possible to reduce this current peak. Phase angle firing is not used because the supply voltage is normally less than nominal and therefore the elements never reach the working temperature.

Infrared lamps system architecture

ETHERNET MODBUS/TCP

REVO PC   REVO S 1PH   REVO S 1PH   REVO S1PH (MAX 24)

BLOK 1 CONNECTED BETWEEN PHASE L1 - L2

GTWA

REVO TCM (1)

INFRARED SENSOR

ETHERNET MODBUS/TCP

REVO PC   REVO S 1PH   REVO S 1PH   REVO S1PH (MAX 24)

BLOK 1 CONNECTED BETWEEN PHASE L2 - L3

REVO PC   REVO S 1PH   REVO S 1PH   REVO S1PH (MAX 24)

BLOK 1 CONNECTED BETWEEN PHASE L1 - L3
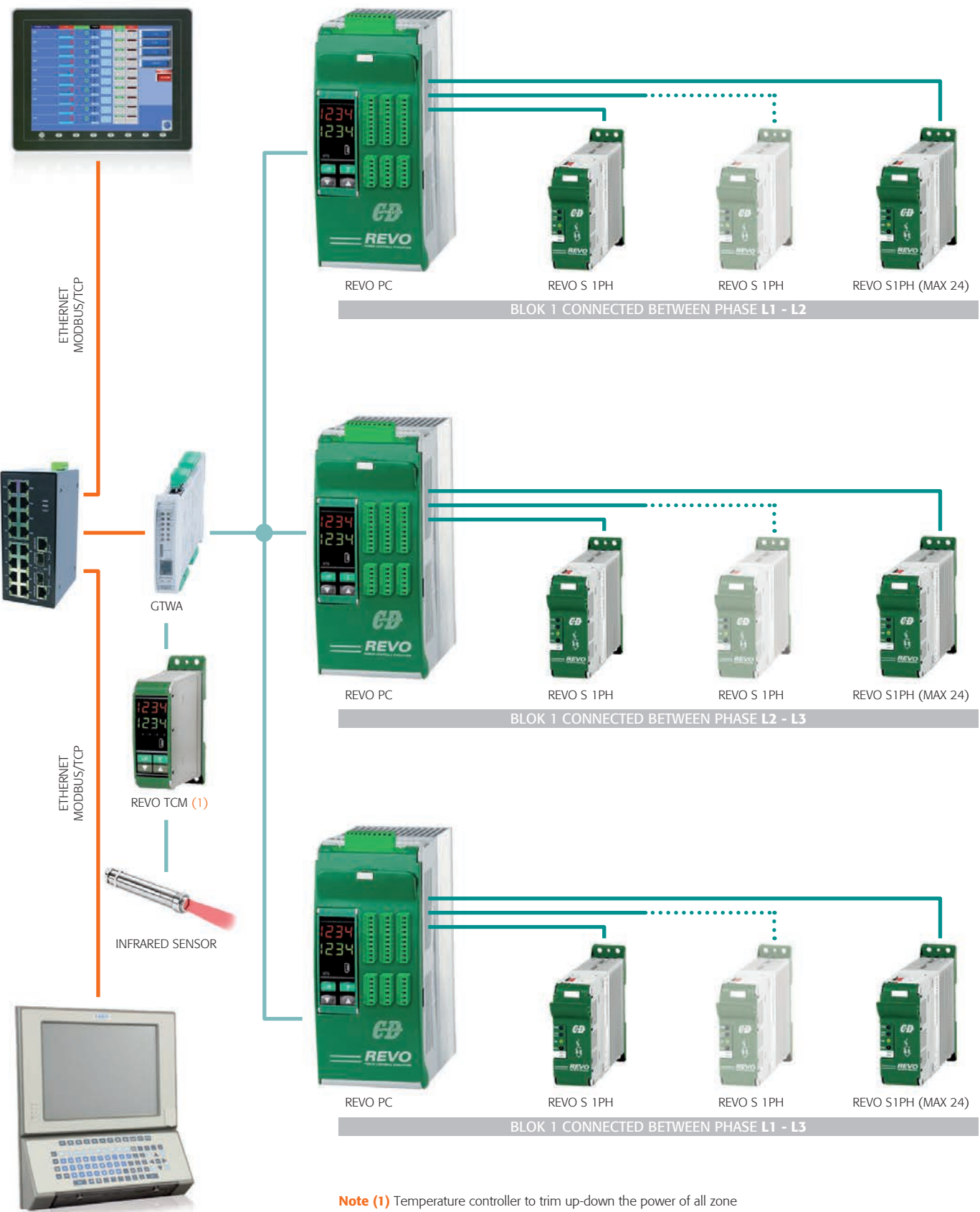
Note (1) Temperature controller to trim up-down the power of all zone

Si-C touch panel

CD Automation has developed many applications dedicated to drive particular loads and one of these application is for Silicon Carbide.
The Philosopy is to use standard thyristor units with serial communication and to implement the control strategy inside the intelligent panel.
This Touch Panel in addition to a CD Automation universal unit able to work with all firing and control mode removing all application risks due to the control type selection.

THIS SOLUTION GIVES MANY ADVANTAGES
• The thyristor units are standard and easy to be found every where
• An external port is available to connect your normally used PLC
• One ethernet port is available on 8 " touch panels
• The human interface is friendly and just feeling few data of thermic
  project is possible to achive the final configuration

Two different modes to drive SI-C:
  - Burst firing with automatic adjustment of power limit
  - Phase angle with transfer from voltage to Power control mode
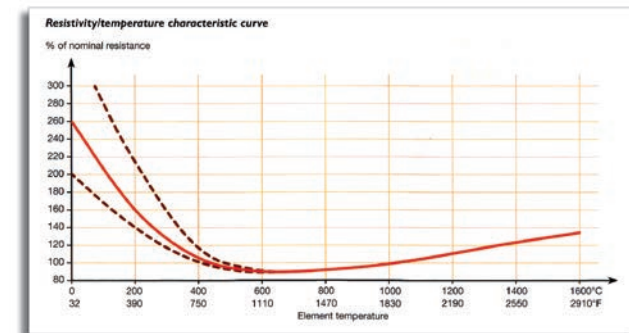
FEATURES
• Automatic configuration and tuning of the thyristor unit
• Automatic tuning of power control mode VxI
• Message on when to change the elements because are at the end of their life
• Automatic switch from voltage to VxI control mode when the element temperature
  is the correct one
• Automatic tuning procedure of heather break alarm to diagnostic partial or total load failure
• Diagnostic of fuse failure and thyristor in short circuit
• Recent and historical curve of following process variable
  - Power density W/Cm2
  - Load voltage
  - Load current
  - Power to the load
  - Resistance value curve with element new
  - Time elapsed from start to actual resistance value

All in line with SANDVIK specifications for a long element life.

These touch panel is available with different features:
• Model 5" in black and white
• Model 5",8",10" and 12" in colour
Below Thyristor units can be connected:
  - REVO CL to drive 1 phase unit SI-C elements or 3 Phase open delta or star with neutral
  - MULTIDRIVE or 3000E 3PH to drive 3 phase loads in delta or star connection.

Kanthal super touch panel

Kanthal Super increase resistivity sharply with temperature.
The graph on below show that at ambient temperature the resistance value is very low and increase its value up to 10 times.
To don't oversize in current the Thyristor unit it's necessary to limit the current to the load reducing the voltage with phase angle firing and current limit.
When the resistance value reach a setted value are possible two types of working method that can be selected from HMI:
  - Phase angle plus current limit all the time long
  - Phase angle plus current limit when the resistance is cold and transfering to delayed
    Triggering if load is coupled with transformer

If the Kanthal super are coupled directly to the main voltage supply the unit start in phase angle plus current limit when the resistance is hot transfer automatically to burst firing.
This application is typical for cold resistances and CD Automation has developed its own software to drive these types of loads. The size of the HMI available are 5", 8", 10" and 12".

FEATURES
• Automatic configuration and tuning of the thyristor unit
• Automatic tuning of current control mode I or I² selectable
• Automatic tuning of current limit
• Automatic transfer from phase angle to delay triggering
  if the load is coupled with a transformer
• Automatic transfer from phase angle to burst firing with
  element coupled directly to line supply voltage
• Automatic tuning procedure of heather break alarm
  to diagnostic partial or total load failure
• Diagnostic of fuse failure and thyristor in short circuit
• Recent and historical curve of following process variable
  - Power density W/Cm2
  - Load voltage
  - Load current
  - Power to the load
  - Resistance value curve

**All in line with SANDVIK specifications
for a long element life.**
Real time clock for furnace maintenance.

BENEFITS
• Phase Angle used just to reach the working temperature of elements with reduction of harmonics
• High power factor with furnace working in Burst Firing or delayed triggering
• The thyristor units are standard and easy to be found every where
• An external port on HMI is available to connect your normally used PLC
• One ethernet port is also available on touch panel => 8"
• The human interface is friendly and just inserting few data of thermic project is possible to achive the features listed above.

The Thyristor Unit suitable to drive these type of load are:
• REVO CL to drive 1 phase unit or 3 phase open delta or star with neutral
• MULTIDRIVE CD3000E 3PH to drive 3 phase loads in delta or star connection

Complex heating elements

TRANSFORMER
REVO CL has been designed to drive single phase Transformers.
CD3000E 3PH or MULTIDRIVE 3PH are suitable to drive
3 Phase transformers.

All above Thyristor units work in Phase Angle, or in Delayed Triggering
if transformer is coupled with normal resistance.

No need to worry which firing type to order, you can select phase angle or delayed triggering directly from the front keypad removing
any application risks and giving you piece of mind.
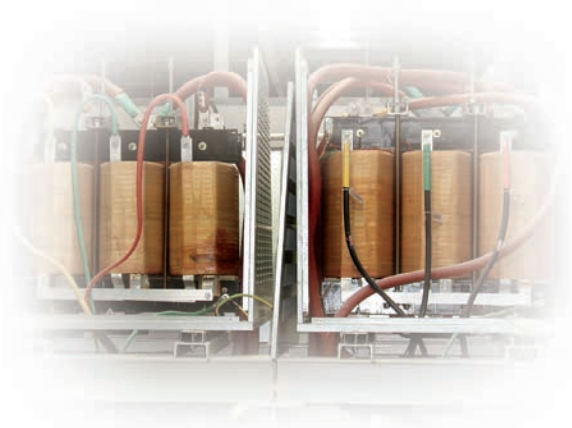
REVO PC & MULTIDRIVE

MULTIDRIVE 2PH SYNCHRONIZATION THROUG SYNC INPUT

REVO PC
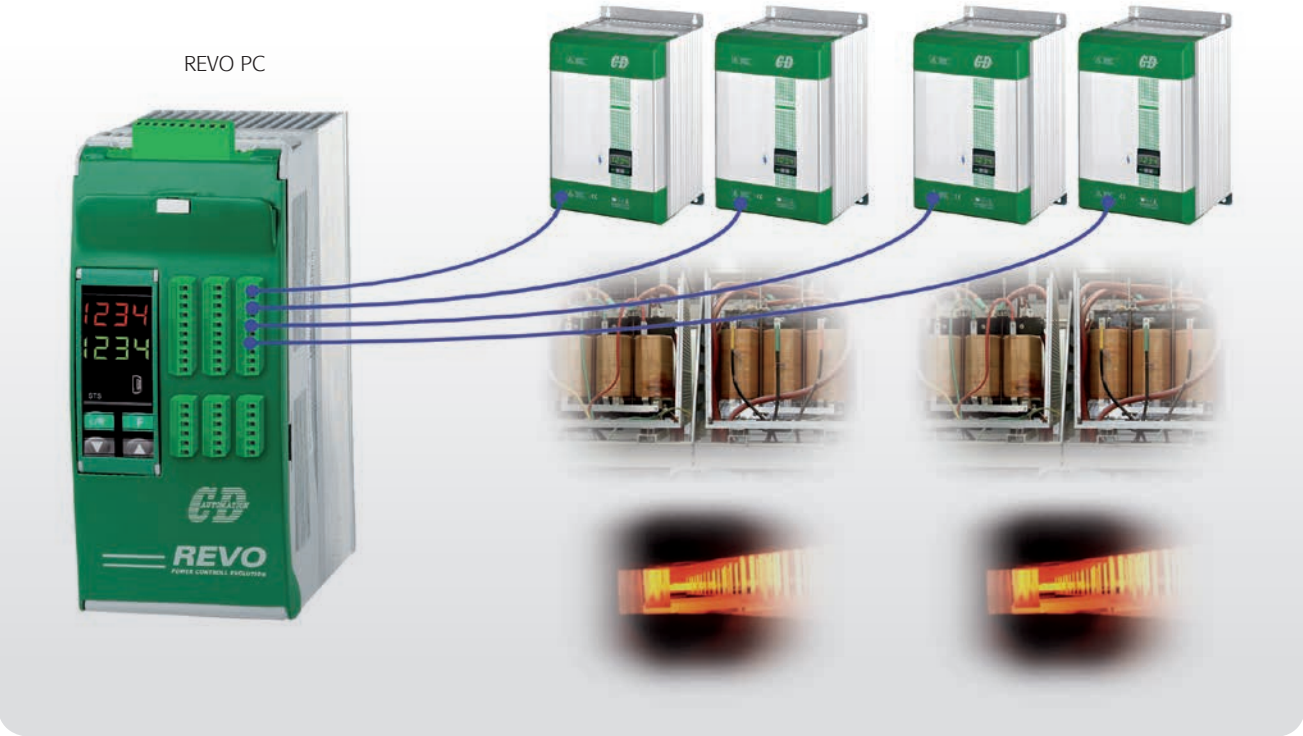
Glass industry

This is a cabinet to control the Bath Furnace in a Float glass Plant.
CD Automation specialises in this type of application, supplying the
complete cabinet package including the Thyristor units.
With its own technical department, CD Automation can study the
process & system, produce the hardware & software, fully
commission the start up process and provide a first class service
during the Float Life.
Typical systems can have between 30 and 35 zones, each one
having a power range from 100 to 150 KW.

CD Automation product normally used is MULTIDRIVE 3PH.

An example of a control Zone is shown below.
In addition CD Automation can offer REVO PC.
This powerful unit with its unique algorithm will minimize energy cost
by controlling synchronisation and power limit of each zone.

CD Automation can also supply product and specialist know how for
the following applications in the Glass Industry.
• Boosting power control
• Tin furnace power control
• Power control of continuous annealing furnace

TIPICAL LOOP FOR GLASS INDUSTRY WITH ETHERNET MODBUS/TCP

• Power set point
• Power feed-back
• On/Off
• Local/Remote
• General alarm
• Current 1-2-3
• Power (Kw)

DCS/PLC

ETHERNET MODBUS/TCP

Reading parameters + Diagnostics
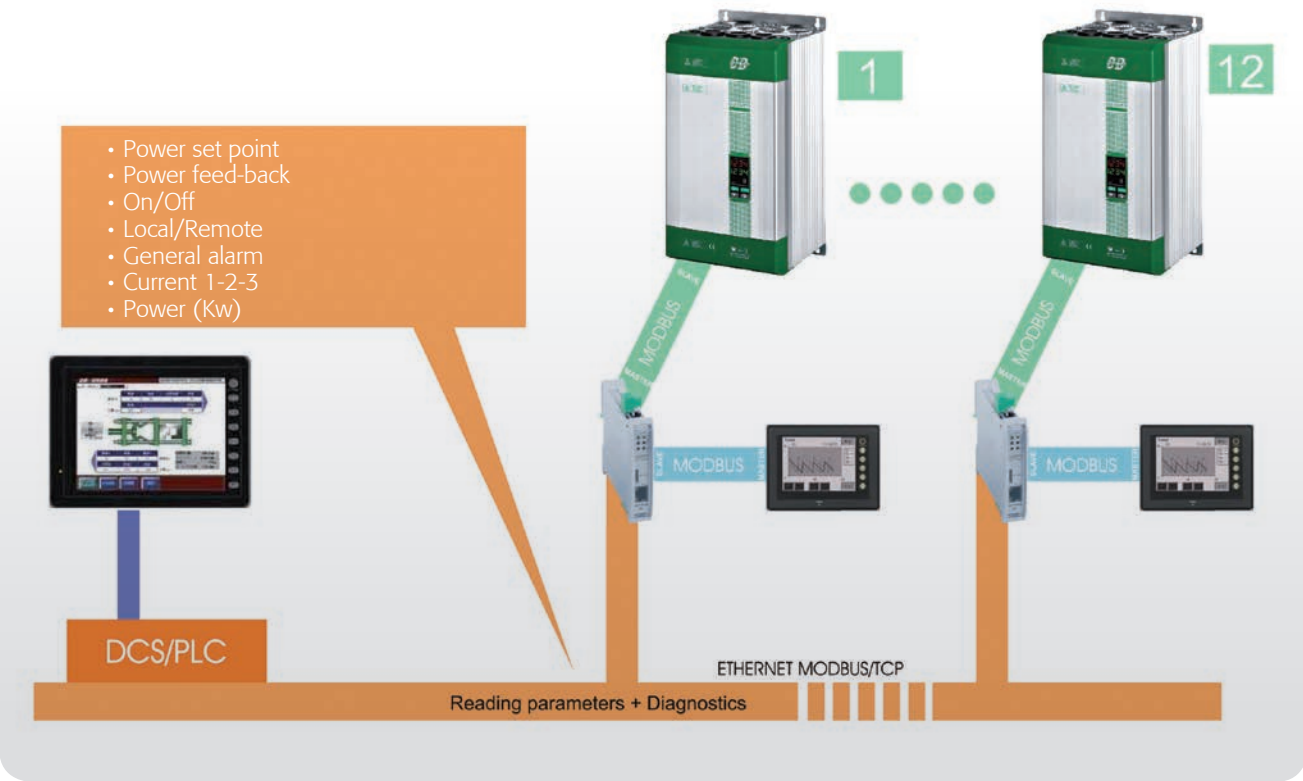
Glass tempering furnaces

CD Automation has acquired experience in this type of application where there are up to 60 zones and where a sophisticate control of the power is necessary to don't create glass molecolar tensions.

Following feature are normally used:

• Power set point via communication
• Power feed back to compensate voltage fluctuation
• Very fast Burst Firing to increase the thyristor and resistance life

In applications like oscillating and continuous furnaces the power involved it's a lot and is necessary to use the power load management using REVO PC that gives following advantages:

• Power picks elemination with istantaneous values close to average value
• Power factor close to one due to zero crossing firing
• REVO PC keeps your istantaneous power within the limit of your electricity supply contract
• Calculation of instant current and RMS voltage current and power
• Calculation of resistance with heather break alarm for partial or total load failure and thyristor in short circuit
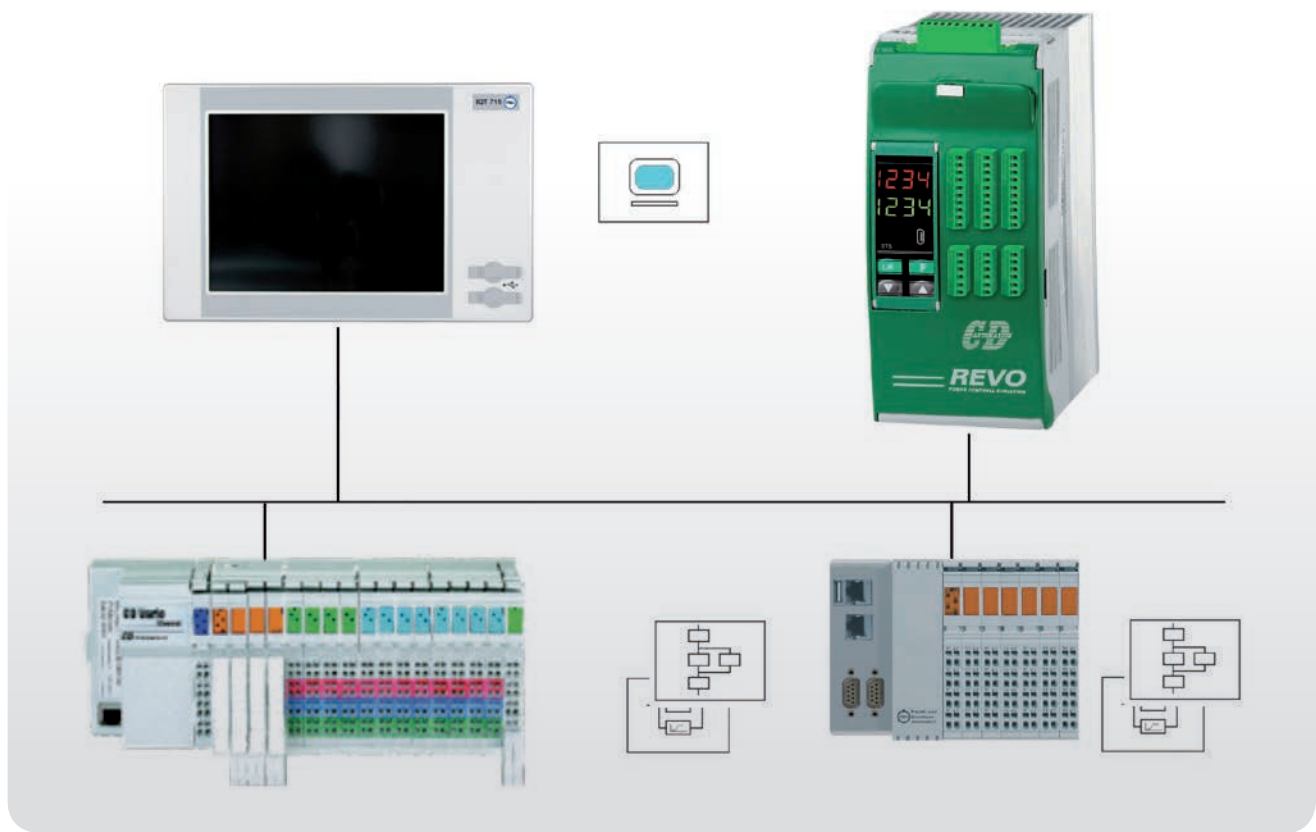
UV lamps
With REVO CL the power is under control

ELECTRONIC CONTROL

CD Automation has developed its own system based on HMI. Where inside there is a standard software to drive UV lamps. REVO CL thyristor unit is in communication with the touch panel.

The electronic controll for UV Lamps is becoming every day more and more used for application in printing machines and dry painting on wood.
The feature Voltage/Current is a function depending on type of gas and on the working temperature.
The right power management of the lamp gives the advantages of lower power consumption and thus a lower CO2 emmission.

REVO CL is able to reduce the power at stand by value when the material is not there and to increase it when the production start again.
This unit have a very sophisticate alghoritm able to switch on the lamp at constant current and to avoid the switch off while it is working.
When a transformer is provided to switch on the lamp the REVO CL is designed to drive it at constant current.
These transformers are special designed and with a secondary voltage of KV.
After the starting procedure that can take many seconds an input signal set the lamp emission.
Via communication or via an analog input is possible to adjust it from 30% to 100%.
These percentage depends on lamp type.
REVO CL is a digital thyristor unit thus the customer avoid wire many cables.
If customer want to implement its own software in the Panel CD Automation can do it.
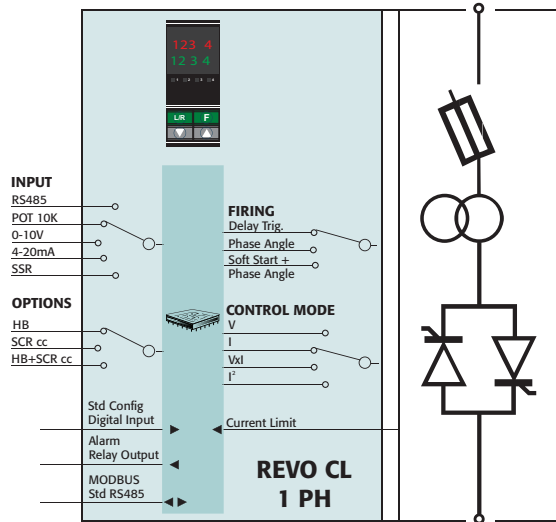
Plastic machinary application

CD Automation is the market leader for this type of application and has thyristor product specifically designed for this market.
CD Automation has extensive knowledge and experience in plastic machinery systems. CD REVO up to 40A has been designed for this application.

What REVO offers?

- Modularity of its components
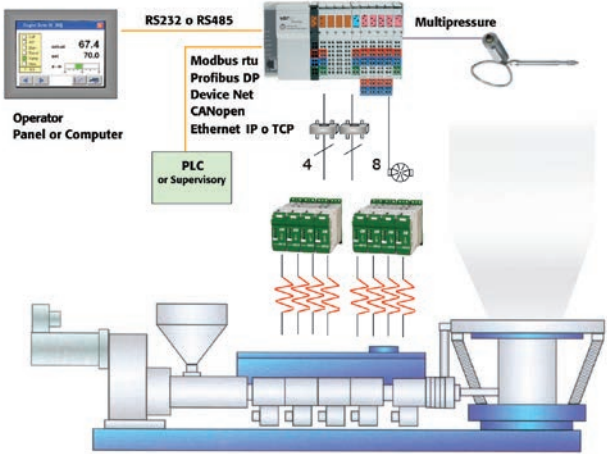- Configurability that allows increased product performances

REVO's "value add" capable of saving 50% of labour and space.
Innovation based on knowledge of process.
International assistance from around the world via trained distributors and joint venture multi-national companies.
REVO is a system not a simple product.
Includes all key components of a typical control zone.
REVO TC is an integrated product including, fuse & fuse holder, solid state relay, current transformer and temperature control, all in one.
REVO in SSR version can be mounted side by side on large heat sinks giving high density solutions.

HOT RUNNER APPLICATION

Max 64 zones with option to set temperature controllers locally, or via remote set point.
Includes a boost function to give a programmed max set point to all zones to clean the mould.
Heater Break alarm on each zone available as an option.
Option of standard controllers as shown in photo or a multiloop system with an operator interface on front cabinet door with 5,25" or 12" TFT colour touch screen.
For further information ask for our brochure and application notes.

OTHER APPLICATION IN PLASTIC MACHINARY THERMOFORMING

- Thermoforming
- Power control on blow moulding
- Power control on injection moulding machinery

Tipical plastic machinary architecture

ETHERNET MODBUS/TCP

RS485-MODBUS

GTW1

TU MODULE   REVO TCM   REVO TCM   REVO TCM (MAX 24)

BLOK 1 CONNECTED BETWEEN PHASE L1 - L2

REVO S 1PH   REVO S 1PH   REVO S 1PH (MAX 24)

RS485-MODBUS

GTW2

TU MODULE   REVO TCM   REVO TCM   REVO TCM (MAX 24)

BLOK 1 CONNECTED BETWEEN PHASE L2 - L3

REVO S 1PH   REVO S 1PH   REVO S 1PH (MAX 24)

ETHERNET MODBUS/TCP

RS485-MODBUS

GTW3

TU MODULE   REVO TCM   REVO TCM   REVO TCM (MAX 24)

BLOK 1 CONNECTED BETWEEN PHASE L1 - L3

REVO S 1PH   REVO S 1PH   REVO S 1PH (MAX 24)

Soft Starter family STB - STO - STE

Control types available

VOLTAGE RAMP (torque ramp)
Soft Starter start from a setted initial voltage, and ramp up to the nominal one in a setted time.
In addiction on all family products is possible to start high friction load with kickstart that gives to the motor for 100÷300 msec 80% of full voltage, without current limit.
When is started, the motor reach the full speed and remain there, up to when stopped and it can reach zero speed by inerthia or via setted ramp down.

As an option is also available the dynamic braking

RAMP PLUS CURRENT LIMIT

CURRENT RAMP
Soft starter start from a setted initial current and ramp up to the nominal value in a setted time. This type of control is available on STO+STE family

CURRENT LIMIT
This parameter sets the current at which to start.
This value depend on the application and must not exceed the soft starter sizing (see on next two pages).

INITIAL CURRENT LIMIT
This parameter sets the initial start current for the current ramp mode.

KICKSTART (BOOSTER)

MOTOR PROTECTION
Inside STO and STE soft starter families, has been implemented electronic motor thermal protection.
The curves are rapresented on right side, and basically one is for normal sevice, and the other one for severe service.
This is an overload relay.

MOTOR THERMAL PROTECTION
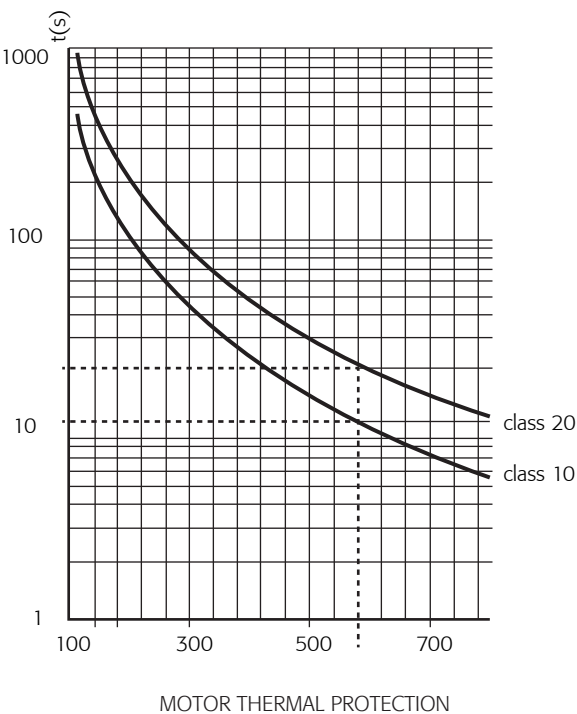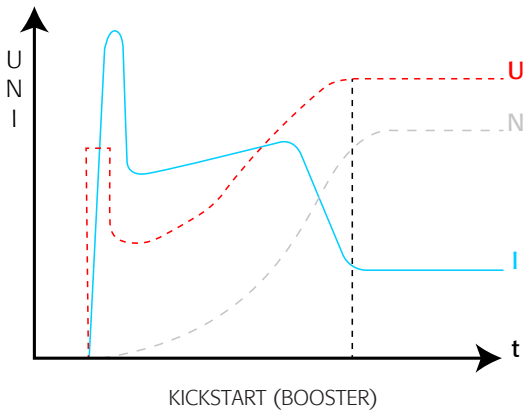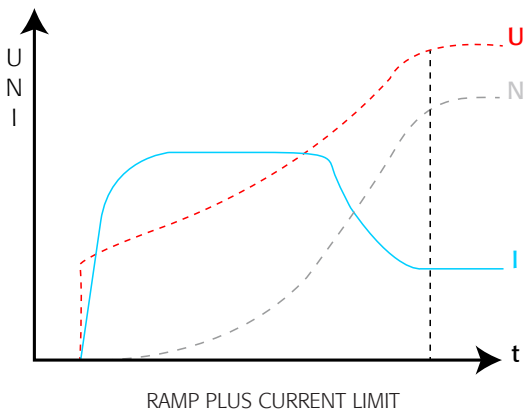
Soft Starter Model

FUNCTIONALITY		STB (Basic)	STO (Overload Relay)	STE (Enanched)
START / STOP	Ramp up voltage	●	●	●
	Ramp up current		●	●
	Ramp down	●	●	●
	Stop by coasting	●	●	●
CONTOL MODE	Internal bypass relay up to 200A	●	●	●
	Current limit facility		●	●
	Torque control		●	●
	Constant current control		●	●
	kick start 80% 100 msec	●	●	
	kick start 80% 200 msec	●	●	
	kick start 80% 300 msec	●	●	
	kick start 80% adjustable msec			●
PROTECTION	Start time out of limit	●	●	●
	Phase loss	● (1)	●	●
	Motor overload		●	●
	Phase sequence		●	●
	Unbalanced current		●	●
	Power circuit failure	●	●	●
	Thyristor in short circuit	●	●	●
	Supply frequency out of limits	●	●	●
	Istantaneous peak current		●	●
	Bypass overload		●	●
	Overvoltage	●	●	●
	Overcurrent		●	●
	Undercurrent protection (pump)		●	●
	Overtemperature on heatsink		●	●
	Overload relay and curve selection		●	●
	PTC motor termistor		●	●
	Communication failure		●	●
COMMUNICATION	Modbus RTU Std		●	●
	Modbus TCP (option)		●	●
	Profibus DP (option)		●	●
	Profinet (option)		●	●
	USB device Std		●	●
	Devicenet (option)			
SOFTWARE APPLICATIONS	Pump application	●	●	●

(1) Protection attive during ramp up

Main features

	SOFT STARTERS MAIN FEATURES	STB	STO	STE
GENERAL	Current range	6:200A	>32:200A	>32:200A
	3 wire motor connection	●	●	●
	Internal bypass St. from 6 to 200A	●	●	●
MAIN SUPPLY VOLTAGE	Supply voltage 3x200V; 3x440V Max (+10 : -15%) ac	●	●	●
	Supply voltage 3x200V; 3x575V Max (+10 : -15%) (just for >32A)	●	●	●
	Auxiliary voltage 110-240V (+10 : -15%) ac (just for >32A)	●	●	●
	Auxiliary voltage 380-440V (+10 : -15%) ac (just for >32A)	●	●	●
	Auxiliary voltage 24V ac/dc (+20 : -20%) ac (just for >32A)	●	●	●
	Voltage frequency 45 to 66 Hz	●	●	●
DIGITAL INPUTS	Start/stop optoisolated input + 24V dc start with Dip 4 off (≤32A)	●		
	Start with power up with Dip 4 on (≤32A)	●		
	Start optoisolated input + 24V dc	●		
	Stop optoisolated input + 24V dc	●		
	Configurable digital input 1		●	●
	Configurable digital input 2		●	●
CONTROL	Ramp up 0 to 15 sec adjustable	●	●	●
	Ramp down 0 to 15 sec adjustable	●	●	●
	Initial torque 0 to 80%	●	●	●
	Current limit >32A		●	●
	Motor full load current >32A		●	●
	Overload relay >32A		●	●
	Digital in/out >32A		●	●
	Phase sequence enable >32A		●	●
	Exceded max start time >32A		●	●
LED STATUS ALARM INDICATION	Run green led slow blinking ready to start	●	●	
	Run green led fast blinking ramp active	●	●	
	Run green led on end of ramp	●	●	
	Alarm red led off no alarm	●	●	
	PW green on power supply available	●	●	
	PW green on power supply not available	●	●	
KEYPAD	Rotary switch	●	●	
	Colour touch panel with alarm message in different language			●
	Read out of voltage, current, power etc			●
	Logging and trend			●
COMMUNICATION	Modbus RTU Std		●	●
	USB device Std		●	●
	Modbus TCP (option)		●	●
	Profibus DP (option)		●	●
	Profinet (option)		●	●
	Devicenet (option)		●	●
ENVIRONMENTAL	Protection IP20	●	●	●
	Current sizing as in TAB for 40°C for temperature over see derating	●	●	●
	Operating temperature -10 to 60°C max	●	●	●
	Humidity 5% to 95% relative humidity	●	●	●
	Conformal coating (option)	●	●	●
RELAY OUTPUT	2 Relay output free voltage contact (500mA, 125 Vac)	● (1)	●	●

(1) 1 Relay ≤32A

Soft Starter Selection

- Start from application table on the right
  Example: Agitator 50A the suggested start current is 4 times FLC (full load current 50A)

- **Select model from table at the bottom page**

- Go on column HEAVY (4) and nominal current of your motor must be equal or less than the value (In our example is 55A)

- If selected model is STB your soft starter is STB075

- If you want to receive Soft Starter already configured follow the code below:

$$55A: \; AC53b \; 4.0\text{-}20: \; 580 < 1000m$$

- Altitude
- Off time sec
- Start time sec
- Start current (multiple FLC)
- Reference rule
- FLC full load current
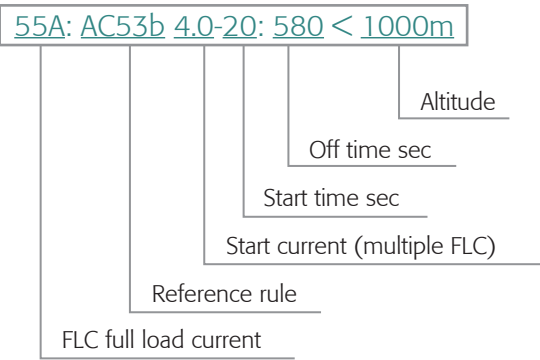
APPLICATION	3 In	3,5 In	4 In	4,5 In
AGITATOR			●	
ATOMIZER			●	
BANDSAW				●
BOTTLE WASHER	●			
CENTRIFUGAL PUMP		●		
CENTRIFUGE				●
CHIPPER				●
CIRCULAR SAW		●		
CONVEYOR BELT				●
CONVEYOR SCREW			●	
CRANE TRANSLATOR			●	
CRUSHER CONE			●	
CRUSHER JAW				●
CRUSHER ROTARY			●	
CRUSHER VERTICAL IMPACT			●	
DEBARKER			●	
DRYER				●
DUST COLLECTOR			●	
EDGER			●	
ELEVATOR		●		
FAN AXIAL CLAMPED			●	
FAN AXIAL UNCLAMPED				●
FAN CENTRIFUGAL CLAMPED			●	
FAN CENTRIFUGAL UNDAMPED				●
FAN HIGH PRESSURE				●
GRINDER			●	
HYDRAULIC POWER PACK			●	
LOADED PISTON COMPRESSOR				●
MILL				●
MILL BALL				●
MILL HAMMER				●
MIL ROLLER				●
MIXER				●
MONORAILS			●	
PALLETISER				●
PLANER			●	
POSITIVE DISPLACEMENT PUMP				●
PRESS			●	
PUMPS BORE		●		
REPULPER				●
ROLLER CONVERYOR			●	
ROTARY TABLE				●
SANDER				●
SCREW COMPRESSOR				●
SCREW CONVEYOR				●
SEPARATOR				
SHREDDER				●
SLICER		●		
SLURRY PUMP				●
TUMBLER			●	
UNLOADED PISTON COMPRESSOR				●
HYDRAULIC PUMP		●		

SERVICE		LIGHT	MEDIUM	HEAVY	SEVERE
Start Current (Multiple of **FLC***)		3	3,5	4	4,5
		AC53b 3,0 -10:350<1000m	AC53b 3,5 -15:345<1000m	AC53b 4,0 -20:340<1000m	AC53b 4,5 -30:340<1000m
MODEL		Rating at 40° C for 3xFLC	Rating at 40° C Amps	Rating at 40° C Amps	Rating at 40° C Amps
STB	006	6A	5A	4A	3A
STB	012	12A	11A	9A	7A
STB	022	22A	20A	17A	13A
STB	032	32A	29A	25A	19A
STB - STO - STE	043	43A	40A	35A	29A
STB - STO - STE	050	50A	44A	38A	30A
STB - STO - STE	060	60A	55A	48A	37A
		AC53b 3,0 -6:590<1000m	AC53b 3,5 -15:585<1000m	AC53b 4,0 -20:580<1000m	AC53b 4,5 -30:570<1000m
STB - STO - STE	075	75A	65A	55A	47A
STB - STO - STE	100	100A	88A	75A	61A
STB - STO - STE	140	140A	123A	107A	90A
STB - STO - STE	170	170A	145A	122A	97A
STB - STO - STE	200	200A	190A	160A	135A

***FLC** Full load current
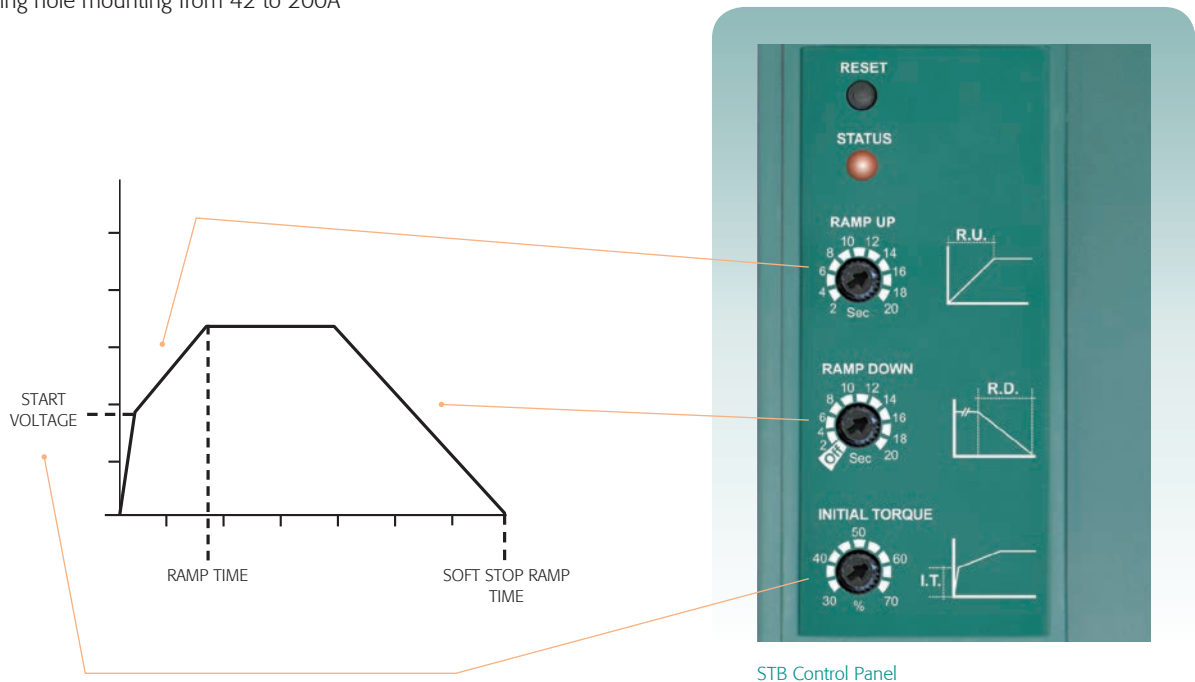
STB Soft Starter

SIZE SS1   SIZE SS2   SIZE SS3   SIZE SS4
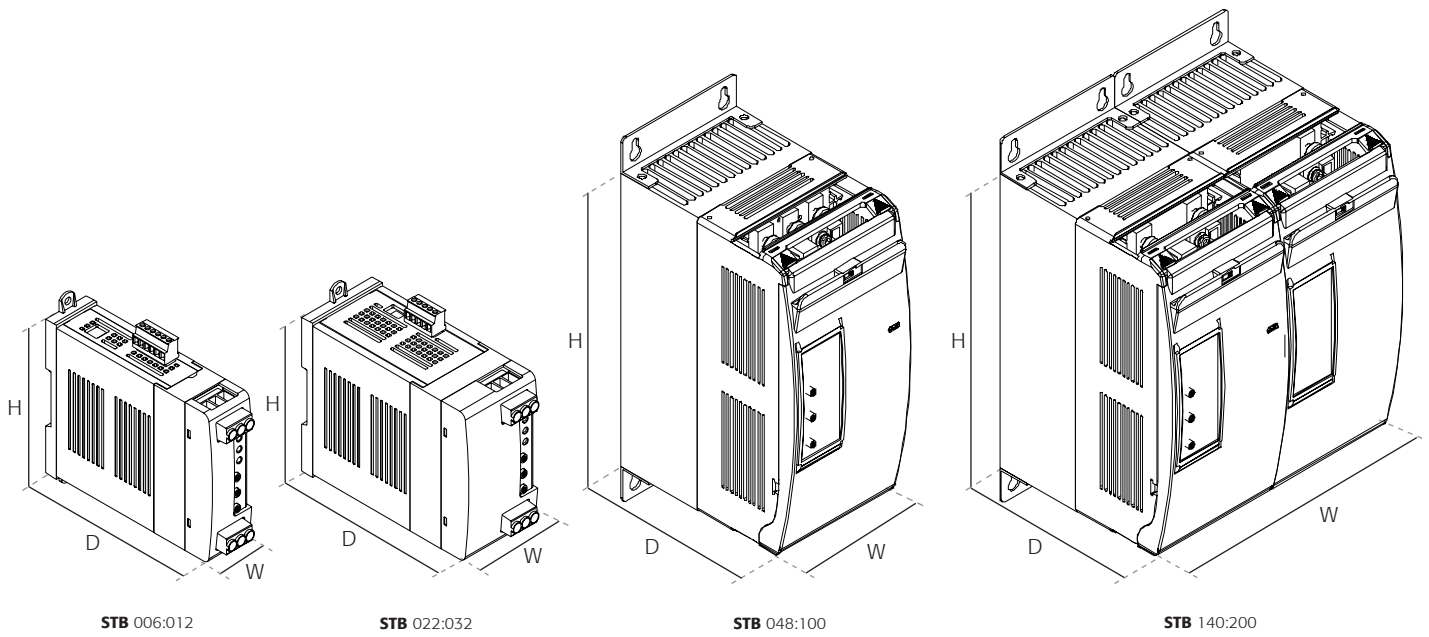
SOFT STARTER OF THIS FAMILY ARE DESIGNED TO CONTROL THREE PHASE AC MOTOR FROM 6A TO 200A NOMINAL WITH INTERNAL BYPASS CONTACTOR.

Technical Specification

- STB family has 3 adjustaments:
  - Initial start voltage
  - Start ramp time
  - Soft stop ramp time
- Kickstart 100 to 300 msec can be configured by DIP switch
- DIN rail or fixing hole mounting: from 6 to 32A
- Fixing hole mounting from 42 to 200A

RAMP TIME   SOFT STOP RAMP TIME
START VOLTAGE

RESET
STATUS
RAMP UP
10 12 14
8 16
6 18
4
2 Sec 20
R.U.
RAMP DOWN
10 12 14
8 16
6 18
4
Sec 20
R.D.
INITIAL TORQUE
50
40 60
30 % 70
I.T.

STB Control Panel

STB 006:012   **STB** 022:032   **STB** 048:100   **STB** 140:200

DIMENSIONS	
Wide	30 mm
Deep	130 mm
Height	122 mm

DIMENSIONS	
Wide	52 mm
Deep	130 mm
Height	122 mm

DIMENSIONS	
Wide	93 mm
Deep	144 mm
Height	253 mm

DIMENSIONS	
Wide	186 mm
Deep	144 mm
Height	253 mm

|	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16
ORDERING CODE	S	T	B	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT	4	5	6	
description		code		note
6 Amp full load current (FLC)	0	0	6	
12 Amp FLC	0	1	2	
22 Amp FLC	0	2	2	
32 Amp FLC	0	3	2	
48 Amp FLC	0	4	8	
60 Amp FLC	0	6	0	
75 Amp FLC	0	7	5	
85 Amp FLC	0	8	5	
100 Amp FLC	1	0	0	
140 Amp FLC	1	4	0	
170 Amp FLC	1	7	0	
200 Amp FLC	2	0	0	

MAIN SUPPLY VOLTAGE	7	
description	code	note
3x200V +10:-15%	2	
3x400V +10:-15%	4	
3X575V +10:-15%	6	

VOLTAGE SUPPLY AUX.	8	
description	code	note
No auxiliary voltage supply unit ≤32A	0	
Auxiliary voltage 110-240V (+10 : -15%) ac (just for >32A)	1	
Auxiliary voltage 380-440V (+10 : -15%) ac (just for >32A)	2	
Auxiliary voltage 24V ac/dc (+20 : -20%) ac (just for >32A)	3	

INPUT	9	
description	code	note
Start with power up	1	
Start/stop optoisolated + 24V	2	

OVERLOAD RELAY	10	
description	code	note
No overload relay	0	

CONTROL MODE	11	
description	code	Note
Voltage control mode	V	

OPTION & FUSE	12	
description	code	Note
No Fuses	O	
External fuse & fuse holder	F	

FAN VOLTAGE	13	
description	code	Note
No fan up to 32A	0	

APPROVALS	14	
description	code	Note
CE EMC	0	

MANUAL	15	
description	code	Note
None	0	
Italian	1	
English	2	
German	3	
French	4	
Spanish	5	

| VERSION	16	
description	code	Note
Standard version	1	

STO Soft Starter

SIZE SS3

SIZE SS4

SOFT STARTERS OF THIS FAMILY ARE DESIGNED TO CONTROL THREE PHASE AC MOTOR FROM 48A TO 200A NOMINAL WITH INTERNAL BYPASS CONTACTOR.

Technical Specification

- STO family rotary adjustaments on front unit:
  - Initial start voltage
  - Start ramp time
  - Stop ramp time
- Kickstart 100, 200 or 300 msec can be configured by DIP switch
- Internal electronic overload relay
- Hole mounting from 42 to 200A fixing
- Modbus RTU standard
- USB device standard
- Modbus TCP option
- Profibus DP option
- Profinet option
- Devicenet option

max t3

t1

Motor FLC
STO FLC

t2

Ue

 Is

Cold star curves

Class 20
Class 10
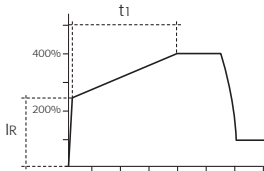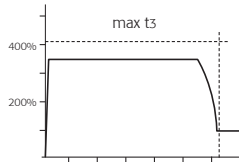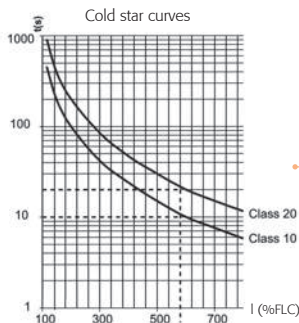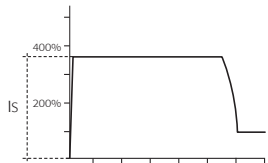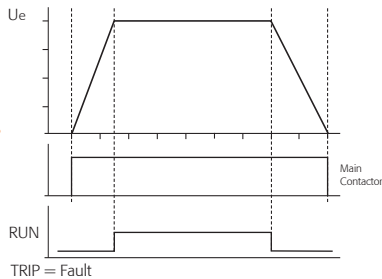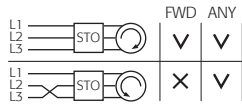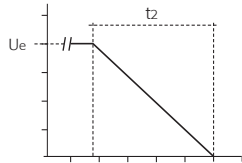
OFF= No overload protection
NOTE: Trip class must be set to match installation limitations

STO Control Panel

FWD ANY

Ue

RUN

TRIP = Fault

Main Contactor
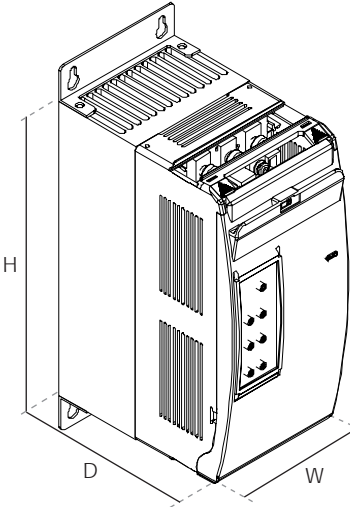
STO 048 : STO100

DIMENSIONS	
Wide	93 mm
Deep	144 mm
Height	253 mm
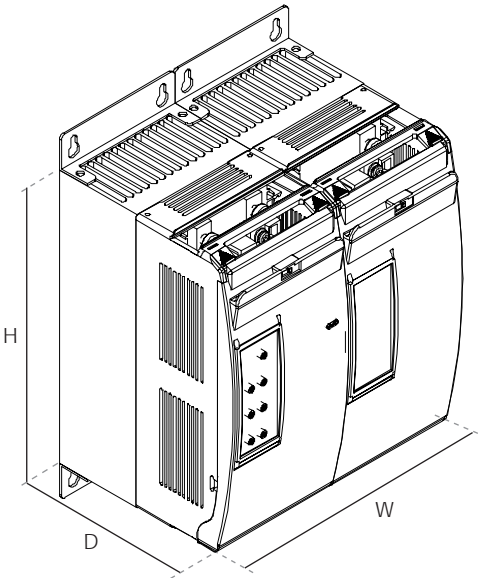
STO 140 : STO200

DIMENSIONS	
Wide	186 mm
Deep	144 mm
Height	253 mm

	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16
ORDERING CODE	S	T	O	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT	4	5	6	
description		code		note
48 Amp FLC	0	4	8	
60 Amp FLC	0	6	0	
75 Amp FLC	0	7	5	
85 Amp FLC	0	8	5	
100 Amp FLC	1	0	0	
140 Amp FLC	1	4	0	
170 Amp FLC	1	7	0	
200 Amp FLC	2	0	0	

MAIN SUPPLY VOLTAGE	7	
description	code	note
3x200V +10:-15%	2	
3x400V +10:-15%	4	
3x575V +10:-15%	6	

VOLTAGE SUPPLY AUX.	8	
description	code	note
No auxiliary voltage	0	
Auxiliary voltage 110-240V (+10 : -15%) ac (just for >32A)	1	
Auxiliary voltage 380-440V (+10 : -15%) ac (just for >32A)	2	
Auxiliary voltage 24V ac/dc (+20 : -20%) ac (just for >32A)	3	

INPUT	9	
description	code	note
Start with power up	1	
Start/stop optoisolated + 24V	2	

OVERLOAD RELAY	10	
description	code	note
Overload relay	1	

CONTROL MODE	11	
description	code	Note
Automatic control mode	0	

OPTION & FUSE	12	
description	code	Note
No Fuses	O	
External fuse & fuse holder	F	

COMMUNICATION	13	
description	code	Note
Modbus TCP	T	1
Profibus DP	R	
Profinet	P	
Devicenet	D	

APPROVALS	14	
description	code	Note
CE EMC	0	

MANUAL	15	
description	code	Note
None	0	
Italian	1	
English	2	
German	3	
French	4	
Spanish	5	

VERSION	16	
description	code	Note
Standard version	1	

Note (1) Modbus RTU and USB port standard

STE Soft Starter

SIZE SS3

SIZE SS4

SOFT STARTERS OF THIS FAMILY ARE DESIGNED TO CONTROL THREE PHASE MOTOR FROM 48A TO 200A

Technical Specification

- Color touch panel for an easy human interface
- Special vector control
- Message and information, front display panel in different languages
- Voltage Current and Power available
- Trend of electrical variable
- Two configurable digital input
- Two configurable digital Output
- Most popular FieldBus*:

ModBus RTU standard

USB port standard

ModBus TCP available as option

Profibus DP available as option

Profinet available as option

Devicenet available as option

Ethercat available as option

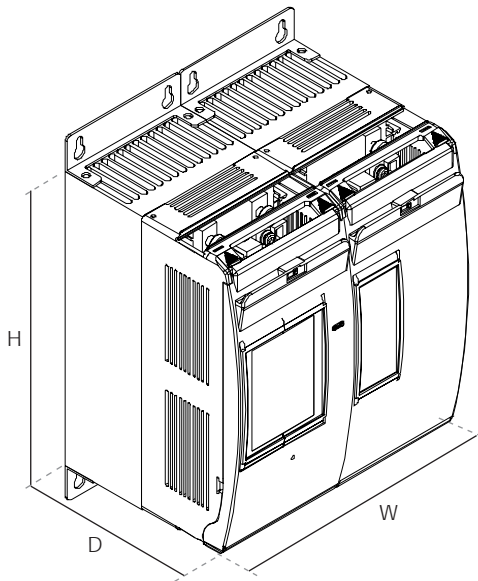Ethernet IP available as option

Powerlink available as option

FULL-COLOR MONITOR

EASY TO USE TOUCHSCREEN

ON OFF

STE Control Panel
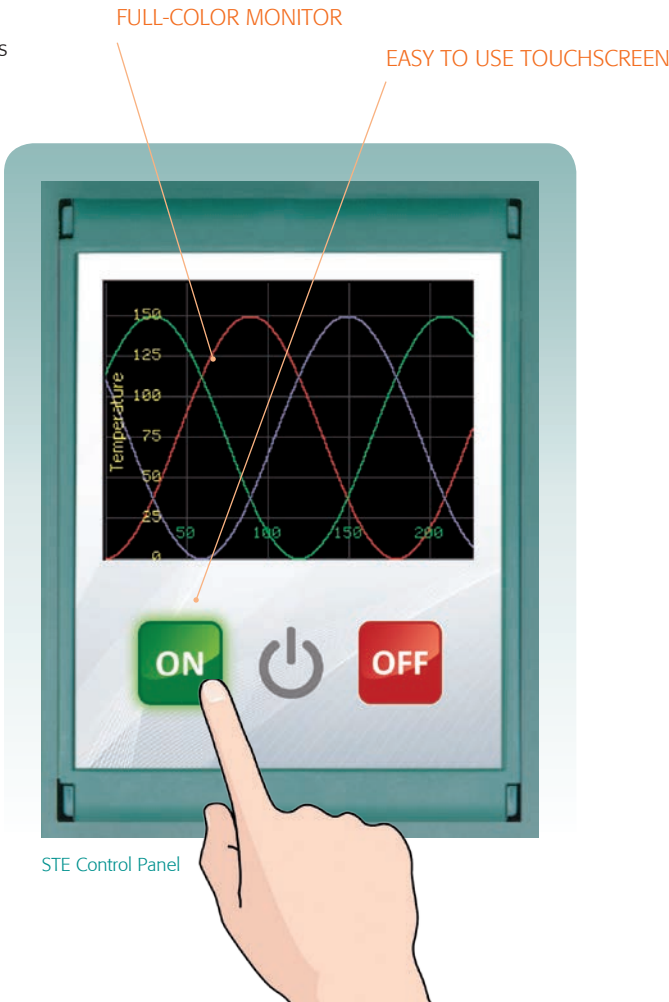
*Logos and trademarks shown above are of their respective owners

H

D W
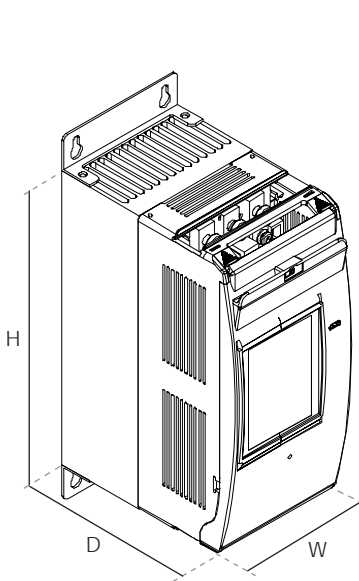
STE 048 : STE100

DIMENSIONS	
Wide	93 mm
Deep	144 mm
Height	253 mm

H

D W

STE 140 : STE200

DIMENSIONS	
Wide	186 mm
Deep	144 mm
Height	253 mm

	1	2	3	4	5	6		7	8	9	10	11	12	13	14	15	16
ORDERING CODE	S	T	E	_	_	_	-	_	_	_	_	_	_	_	_	_	_

CURRENT		4	5	6	
description			code		note
48 Amp FLC		0	4	8	
60 Amp FLC		0	6	0	
75 Amp FLC		0	7	5	
85 Amp FLC		0	8	5	
100 Amp FLC		1	0	0	
140 Amp FLC		1	4	0	
170 Amp FLC		1	7	0	
200 Amp FLC		2	0	0	

MAIN SUPPLY VOLTAGE	7	
description	code	note
3x200V +10:-15%	2	
3x400V +10:-15%	4	
3x575V +10:-15%	6	

VOLTAGE SUPPLY AUX.	8	
description	code	note
No auxiliary voltage	0	
Auxiliary voltage 110-240V (+10 : -15%) ac (just for >32A)	1	
Auxiliary voltage 380-440V (+10 : -15%) ac (just for >32A)	2	
Auxiliary voltage 24V ac/dc (+20 : -20%) ac (just for >32A)	3	

INPUT	9	
description	code	note
Start with power up	1	
Start/stop optoisolated + 24V	2	

OVERLOAD RELAY	10	
description	code	note
No overload relay	1	

CONTROL MODE	11	
description	code	Note
Automatic control mode	0	

OPTION & FUSE	12	
description	code	Note
No Fuses	O	
External fuse & fuse holder	F	

FAN VOLTAGE	13	
description	code	Note
No fan	0	

APPROVALS	14	
description	code	Note
CE EMC	0	

MANUAL	15	
description	code	Note
None	0	
Italian	1	
English	2	
German	3	
French	4	
Spanish	5	

VERSION	16	
description	code	Note
Standard version	1	