WEST Control Solutions

Product Brochure

Relay C

Thyristor Power Controllers for Industrial Applications

Applications & Features

The Relay C thyristor power controllers are designed for many industrial applications using electric heaters in the power range from 30 to 800 A (1-, 2- and 3-phase) and voltages up to 690V.Relay C is the ideal solution for controlling inductive loads (e.g. via transformers) and non-linear loads or heaters that change their resistance with temperature variation and age.
The selectable zero-cross, phase angle, delayed triggering, single cycle, burst fire, and half cycle modes provide control for variety of load types. These include NiChrome, Silicon Carbide, Tungsten and Molybdenum heating elements, mid and long wave infrared lamps, transformers and UV lamps.Relay C can protect and prolong the service life of the connected equipment through optimal control.
Relay C supports the safe and reliable operation of a system by means of a variety of monitoring functions, the signals can be transmitted to the control system via fieldbus.For example, the optional heater current monitoring can detect an individual heater failure or a thyristor short circuit.

The very compact design with integrated high speed fuses saves space in the control cabinet. The unit provides easy and quick access through opening the front cover to change fuses without the need to remove other components.The units include a high-performance heatsink, with fan assisted cooling on some models.This contributes to the very compact overall system design.

Further advantages at a glance:

- 100 kA withstand for a high level short-circuit protection
- Provides quick troubleshooting through system diagnostic features
- Different types of control such as voltage, current, power or external signal
- Bakeout for MgO insulated heating elements to avoid damage
- Current limit with phase control
- Device protection through integral thermal monitoring
- Option data-logger and energy meter

Applications & Features

Application examples Relay C:

- Industrial furnaces for surface processes (Hardening, annealing, tempering)
- Melting furnaces (steel, aluminum, glass, ..)
- Drying plants and ovens
- Paint shops with IR drying
- Hardening systems with UV irradiation
- Chemical systems for temperature control of product
- Wood painting and printing machines

	DESCRIPTION	RELAY C		
	Version:	1-phase	2-phase	3-phase
Load type	Max. voltage 480 V	●	●	●
	Max. voltage 600 V	●	●	●
	Max. voltage 690 V	● from 60A	● from 60A	● from 60A
	Single phase	●		
	3-phase load, star (no neutral) or delta		●	●
	3-phase load, star with neutral			●
	3-phase load, open delta	● (3 x 1PH)		
Input signal	SSR 4 - 30V	●	●	●
	4 - 20 mA	●	●	●
	0 - 10 V	●	●	●
	Potentiometer	●	●	●
operating mode	Zero cross switching / with soft start	● / ●	● / -	● / ●
	Single cycle operation / with soft start	● / ●		
	Burst-fire operation / with soft start	● / ●	● / -	● / ●
	Half-cycle operation / with soft start	● / ●		
	Phase angle operation / with soft start	● / ●		● / ● (≥ 60A)
	Delayed triggering / with soft start	● / ●		● / - (≥ 60A)
Return	Voltage V	●	●	●
	V^2	●	●	●
	Current I	●	●	●
	I^2	●	●	●
	Power (V x I)	●	●	●
Options	Current limit	O		O
	Heater current and short circuit monitoring	O	O	O
	Fuse and fuse holder	● ≤ 40A	● ≤ 40A	● ≤ 40A
	Integrated fuse	● > 40A	● > 40A	● > 40A
	Data-logger function	O	O	O
	Energy meter	O	O	O
Communication	OLED display with plain text and keypad	●	●	●
	Configuration PC software + Micro USB	●	●	●
	Modbus RTU	●	●	●
	Modbus RTU + Profibus DP	O	O	O
	Modbus RTU + Profinet	O	O	O
	Modbus RTU + Modbus TCP	O	O	O

Communications

The Relay C thyristor power controllers offers commonly used field bus communication options:

- Modbus RTU
- Ethernet TCP
- Profibus
- Profinet

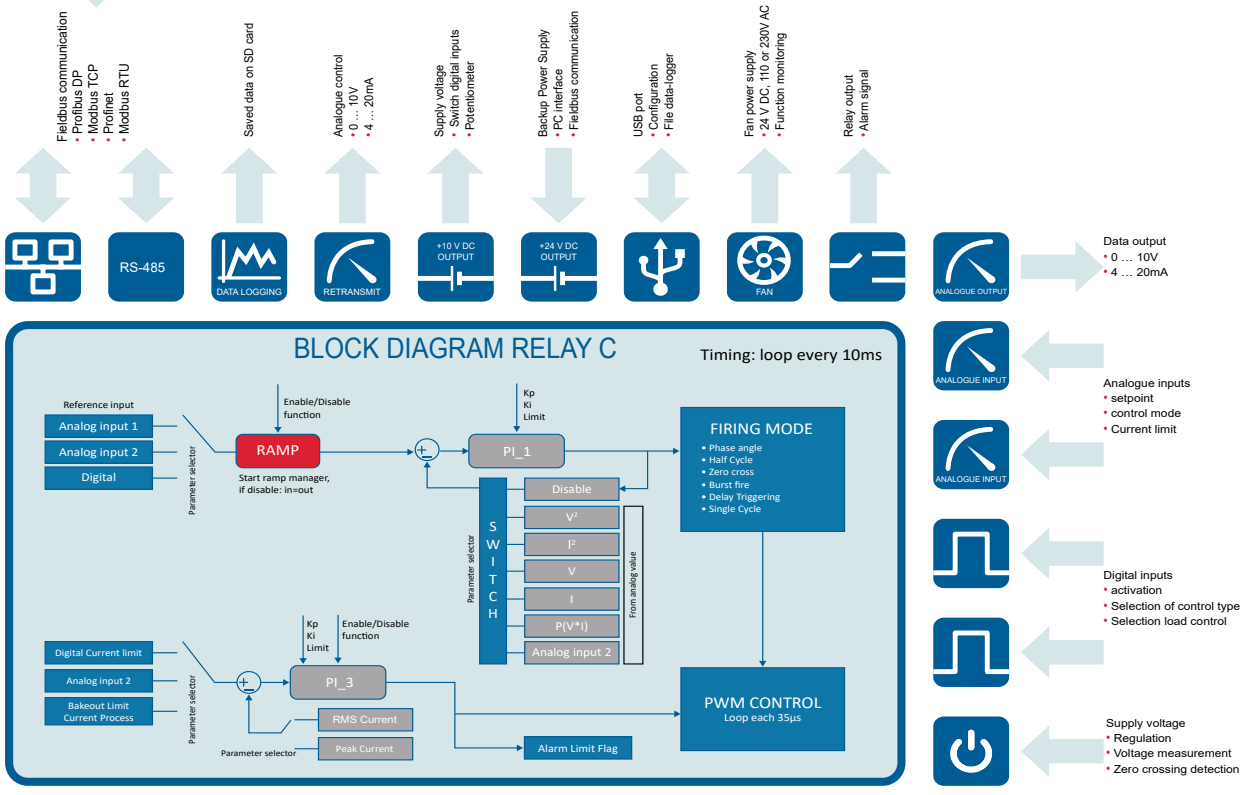
Fieldbus communications for remote connection with the control system or PLC.System data is available online, alarm conditions can be analysed for quick resolution of issues, without the need for a staff member on site.

Readable data:

All settings
Alarms
Voltage
Current
Current
Power
Heater break alarm
Thyristor short circuit alarm

Write function (Write):

Settings and configuration



Operation & configuration

High-contrast OLED display for configuration and read current data, the Relay C is equipped with a .

4 LEDs indicate device status:

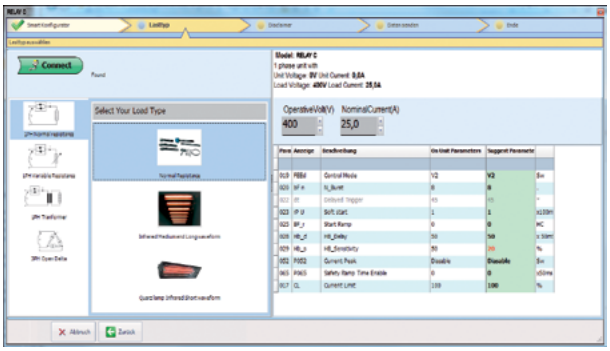
- Heater Controlvia analogue input or communication
- Output
- Communication
- Alarm

Password protection against unauthorised adjustment of parameters - current values can be viewed at all times.

Relay C can be connected to a PC via the micro USB socket on the front panel.The "Thyristor Configurator" software provides very convenient access to the data and set-up parameters.

Configuration Software

The thyristor configurator software can be downloaded for free from our website https://www.west-cs.co.uk

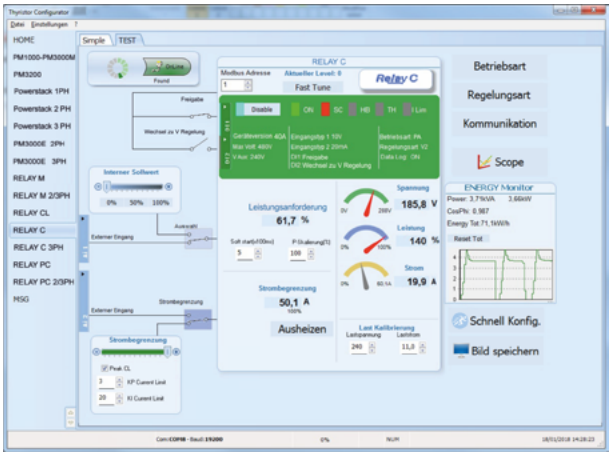


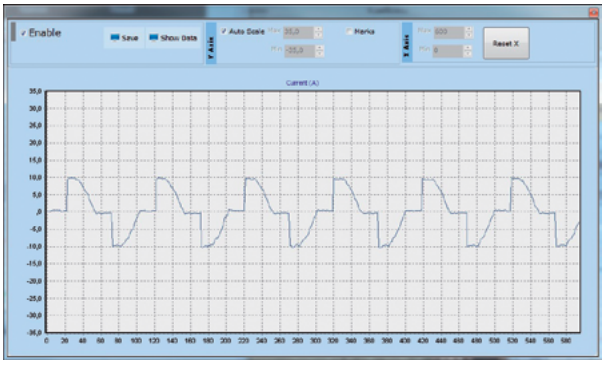
Fast setting

Configuration software allows for very fast and easy adjustment of all parameters using of the 'fast mode'. Select the relevant application to open a window for choosing the options for load type.Either accept the suggested parameter settings or make the necessary adjustments.These configurations can be then transmitted to Relay C at the touch of a button.

Test and commissioning

A page displays all the settings and parameters that are used to fine-tune the process.
It is possible to change these values then then monitor the results.For example, its possible to:See voltage, current and power, current limit va;ues. Select the input signal as V / mA or SSR.Set the different types of control; V, I or V x I, in addition to different operation modes for the load.



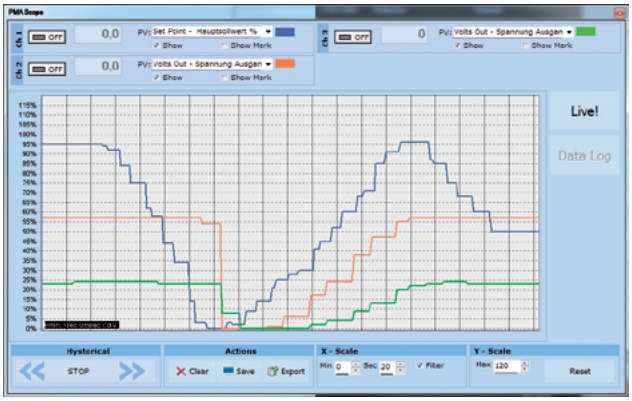


Load Analysis

Load analysis provides real-time information on the output waveform similar to an oscilloscope display.Up to 9 process variables can be selected for display.The waveform shown helps with evaluation and troubleshooting.

Process data

Relay C comes with an optional data logger function stored via an internal SD memory card. The storage intervals are freely selectable.Using the configuration software, the stored data can be read, analysed and stored on the PC.



Order information

Fan
- 0 No fan <90A
- 1 115V AC fan ≥ 90A
- 2 230V AC fan ≥ 90A
- 3 24VDC fan ≥ 90A

Default for load type
- 0 (1PH) Normal resistance
  (2PH) Normal resistance with 3 phase star connection without neutral
  (3PH) Normal resistance with 3 phase star connection with neutral
- 1 (1PH) Infrared - shortwave (6)
  (2PH) Normal resistance with 3 phase delta connection
  (3PH) Normal resistance with 3 phase delta or star connection
- 2 (1PH) MoSi2 heating element (7)
  (2PH) Shortwave infrared with 3 phases star connection
  (3PH) Shortwave infrared with 3 phases star connection with neutral
- 3 (1PH) SiC heating element
  (2PH) Shortwave infrared with 3 phases delta connection
  (3PH) Shortwave infrared with 3 phases star or delta connection
- 4 (1PH) Transformer connected to normal resistance(2)(3)
  (3PH) Three phase transformer with normal resistance
- 5 (1PH) Transformer connected to MoSi2 heating element (2)(3)
  (3PH) Three phase transformer with cold resistance
- 6 Transformer connected to SiC heating element (2)(3)
- 7 Transformer connected to UV lamp (2)(3)

Max. Load current
- 030 30A (1)
- 035 35A (1)
- 040 40A (1)
- 060 60A (1)
- 090 90A
- 120 120A
- 150 150A
- 180 180A
- 210 210A
- 300 300A
- 400 400A
- 450 450A (1)
- 500 500A
- 600 600A
- 700 700A
- 800 800A (1)

Supply voltage for electronics
- 1 90 - 135 VAC (100/120 VAC)
- 2 180 - 265 VAC (200/208/230/240 VAC)
- 3 238 - 330 VAC (277 VAC)
- 5 342 - 528 VAC (380/415/480 VAC)
- 6 540 - 759 VAC (600 VAC)
- 7 540 - 759 VAC (690 VAC)

Control mode
- 0 No regulation
- U Voltage regulation
- Q Voltage control U²
- I Current control
- A Current regulation I²
- W Power control

RC1	090	4	1	V	D	0	0	0	0	2	1

Model
- 1 1 Phase
- 2 2 Phase
- 3 3 Phase

Max. load voltage
- 4 480V
- 6 600V
- 7 690V

Input signal
- S SSR
- B 0..20 mA
- A 4..20mA
- V 0..10V
- K 10kΩ Pot.

operating mode
- C Single-cycle operation without soft start (2)(3)
- S S Single cycle linear soft start (2)(3)
- H Half-cycle operation without soft start (2)(3)
- L Half cycle linear soft start (2)(3)
- I Halfi-cycle Softstart for infrared heaters (2)(3)
- B Burst fire operation without soft start
- J Burst fire mode linear soft start (2)
- P Phase angle without soft start(2)(4)
- E Phase angle linear soft start (2)(4)
- D Delayed triggering without soft start (2)(4)
- T Delayed triggering linear soft start(2)(3)
- Z Zero cross switching without softstart
- R Zero cross switching linear soft start (2)

Options
- 0 No options
- 1 Energy meter
- 2 Datalogger
- 3 Datalogger + energy meter
- 8 Heater current
- 9 Heater current alarm + energy meter
- A Heater current alarm + datalogger
- B Heater current alarm + datalogger + energy meter
- G Current limit (2)
- H Current limit + energy meter (2)
- I current limit + datalogger (2)
- J Current limit + datalogger + energy meter (2)
- O Current limit + heater current alarm(2)
- P Current limit + heater current alarm + energy meter (2)
- Q Current limit + heater current alarm + datalogger (2)
- R Current limit + heater current alarm + datalogger + energy meter (2)

Approvals
- 0 CE
- L cUL + CE

Communication #1+ #2 interface and measured value output
- 0 #1 Modbus RTU - no measured value output
- 1 #1 Modbus RTU - measured value output 4 ... 20 mA
- 2 #1 Modbus RTU - measured value output 0 ... 10 V
- 3 #2 Modbus RTU - no measured value output
- 4 #2 Modbus RTU - Measured value output 4 ... 20 mA
- 5 #2 Modbus RTU - measured value output 0 ... 10 V
- 6 #1 Modbus RTU - #2 Profibus DP - no measured value output
- 7 #1 Modbus RTU - #2 Profibus DP - Measured value output 4 ... 20 mA
- 8 #1 Modbus RTU - #2 Profibus DP - Measured value output 0 ... 10 V
- 9 #1 Modbus RTU - #2 Profinet - no measured value output
- A #1 Modbus RTU - #2 Profinet - Measured value output 4 ... 20 mA
- B #1 Modbus RTU - #2 Profinet - Measured value output 0 ... 10 V
- C #1 Modbus RTU - #2 Modbus TCP - no measured value output
- D #1 Modbus RTU - #2 Modbus TCP - Measured value output 4 ... 20 mA
- E #1 Modbus RTU - #2 Modbus TCP - Measured value output 0 ... 10 V

(1) Not available in all combinations
(2) Not relay-C 2-phase
(3) Not relay-C 3-phase
(4) Not relay-C 3-phase 30 A, 35 A and 40 A
(5) At 2-, 3-phase load in star connection
(6) For 2-, 3-phase load in star or delta connection
(7) At 2-, 3-phase load in delta connection

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BR-RLYC-1-UK-2006