Caledon Controls

Data Sheet

SRC SERIES THYRISTOR STACKS FOR BURST FIRE CONTROL OF RESISTIVE LOADS

SRC2000 - 125A

NEW EXTENDED RANGES
1, 2 AND 3-PHASE MODELS
RATINGS FROM 63A TO 800A

These thyristor stacks have been developed from our original SR range, first introduced in 1995. The SRs were followed in 1998 by the SRC2000 range, offering neater mechanical design, and more compact dimensions, but limited to 2-phase units with current ratings from 63A to 200A. We have now broadened the range to cover higher currents, and 1, 2 or 3-phase operation. A new analogue driver card is also available, which is powered from the 115 / 230V AC fan supply.

Features

- **Space saving compact, slimline design**
- **Robust conservatively rated construction**
- **Long life ball bearing fans**
- **Built in EMC filters**
- **Built in semiconductor fuses**
- **Logic or analogue control input options**
- **Fuse / Phase failure alarm output**

SRC1000 - 800A

SRC2000 - 300A

GENERAL DESCRIPTION

This is a modern range of thyristor stacks, specifically designed for burst fire control of resistive loads in medium and high current heating applications for furnaces, ovens, dryers etc. These units use a proven MOSFET driver circuit, and feature closely controlled zero-voltage switch on, and low crossover commutation noise.

The standard input is a logic signal, but an optional analogue input driver card is available which accepts 0-5V, 1-5V, 0-10V (and 0-20mA, 4-20mA with 250 ohm burden resistor).

The stacks have generously sized heatsinks and power semiconductors to ensure long term reliability. The power connections are to stud terminals, which are reliable at elevated temperatures, and under conditions of temperature cycling.

The line to line EMC filter capacitors, ensure very low conducted emissions, and together with the MOV and snubber protection, contribute to very high immunity to conducted interference.

The top and bottom removable mounting clips help simplify installation and subsequent removal for maintenance if required. The covers enclose both power and signal connections to protect against accidental contact. The width of the units has been kept small to simplify side by side mounting in multi-zone applications.

SRC 1000 SERIES

Single phase units for higher current applications from 250A to 800A

SRC 2000 SERIES

These units feature two independent controllers, and may be used for two line control of a 3-phase 3-wire load (without neutral connection) either star or delta connected, or alternatively for two independent single phase loads. The slimline design minimises the installed space requirement, particularly useful in multi-zone applications. This range has been extended to include a 100A model, and models from 250A to 800A.

SRC 3000 SERIES

A range of 3-phase units, which may be used to control 3 single phase loads, or a single 3-phase load, either 3-wire star or delta, or 4-wire star, or 6-wire open delta (in delta loop) connected.

CURRENT RATINGS AND APPROXIMATE DIMENSIONS (height x width x depth)

Allow 100mm above and below the stack for ventilation, in addition to the height dimension in the table, and 15mm between units. The fixing clamps at top and bottom of the stack extend 40mm above and below the height dimensions in the table, but within the 100mm ventilation allowance.

Current Rating	SRC 1000 Dimensions and approximate weight	SRC 2000 Dimensions and approximate weight	SRC 3000 Dimensions and approximate weight
63A		350mm x 136mm x 190mm 7kg	
80A		350mm x 136mm x 265mm 7kg	350mm x 262mm x 265mm 11kg
100A		350mm x 136mm x 265mm 7kg	350mm x 262mm x 265mm
125A		350mm x 136mm x 265mm 7kg	350mm x 262mm x 265mm
160A		350mm x 136mm x 265mm 7kg	350mm x 262mm x 265mm
200A		350mm x 136mm x 265mm 7kg	350mm x 262mm x 265mm
250A	350mm x136mm x 265mm 7kg	350mm x 262mm x 265mm 13kg	350mm x 388mm x 265mm 20kg
315A	435mm x 136mm x 265mm 8kg	435mm x 262mm x 265mm 15kg	435mm x 388mm x 265mm 23kg
400A	435mm x 136mm x 265mm	435mm x 262mm x 265mm	435mm x 388mm x 265mm
600A	435mm x 136mm x 265mm 11kg	435mm x 262mm x 265mm 20kg	435mm x 388mm x 265mm 30kg
800A	435mm x 136mm x 265mm 12kg	435mm x 262mm x 265mm 23kg	435mm x 388mm x 265mm 34kg

ORDERING INFORMATION

The stacks may be ordered using the order code shown below, or by description:-

Type	Current Rating	Voltage Rating	Fan Supply Voltage AC 50/60 Hz	Analogue Input Options

SRC1000, SRC2000, SRC3000

From table above

250V, 440V, 480V, 660V*

115V, 230V

See below

The standard stack is supplied with logic inputs. Optionally an analogue input card may be fitted, which converts analogue input signals to logic signals and provides 1 or 2 analogue inputs. On 3-phase models above 200A two cards may be fitted to provide 3 analogue inputs. Specify your requirements and the card(s) will be pre-wired by us to the logic inputs. This card also provides a relay which interfaces to the fuse failure transistor outputs to provide a volt free changeover contact suitable for use with higher voltages.

SPECIFICATIONS

PHYSICAL

Dimensions and approximate weights	See table

ENVIRONMENTAL

Ambient Operating Temperature	0-50^{O}C (800A units 0-45^{O}C) at rated current
Storage Temperature	-25^{O}C to +70^{O}C
Relative Humidity	0-95% non condensing
Pollution (IEC 664)	Degree 2 (Only non conductive pollution is allowed. Temporary condensation may occur, but not normally while equipment is operating).
Elevation	Derate current rating 1% per 100 metres above 200 metres

ELECTRICAL

Rated Supply Voltage (Load)	250V, 440V, 480V, 660V* +10%, -25%
Rated Current	As ordered. Rated current is specified at 50^{O}C ambient temperature except 800A unit (45^{O}C)
Supply Frequency	50Hz or 60Hz +/-8%
Rated Impulse Withstand Voltage (IEC 664)	4KV
Fan supply voltage	115 or 230V AC RMS, +10%, -15%

CONTROL SIGNAL INPUTS AND OUTPUTS

The standard unit accepts logic control inputs for each phase. These may be wired by the user to fire simultaneously, or may be wired independently. Also provided is an isolated transistor output for each phase, indicating phase presence / absence. These also may be wired together or independently. The optional analogue driver card accepts either one or two analogue inputs, and may be used to drive one or two independent single phase loads, or a single 3-phase load. This card also provides a single relay output, which may be driven by the phase detection transistor outputs to interface to higher voltage logic.

Logic input control signal	Max 30V input. Switching threshold >6V on, <2V off. Isolation between inputs on the same stack 1500V
Alarm output	A volt free transistor output is provided on each phase, which is normally on and turns off on loss of phase voltage or semiconductor fuse failure. Rating 24V DC, 250mA

Analogue input card

Supply voltage (match with fans)	115 or 230V AC RMS, +10%, -15%
Input signals	0-5V, 1-5V, 0-10V, 0-20mA, 4-20mA (use 250 burden resistor for mA inputs). Two inputs are available, not isolated from each other.
Output Signal	Volt free relay changeover contact indicates loss of phase voltage / fuse failure. Rated 250V, 0.5A

LED Indicators

Two LEDs are provided on each phase; one which indicates the presence of the line voltage, and thus serves as a fuse status indicator, and one which indicates when load current is being demanded. The analogue input card has an LED to indicate that it is powered.

Notes

The 63A and 80A units are convection cooled. All other units are force cooled, and require an auxiliary power supply of either 115 or 230V +10%, -15%, 50/60 Hz. to power the fans.

All units are fitted with snubber capacitors, MOV transient over voltage protection, and emc filter capacitors.

* 660V units. Note that impulse withstand voltage is restricted to 4kV and emc filter capacitors are omitted. Consult us.

COMPLIANCE WITH STANDARDS

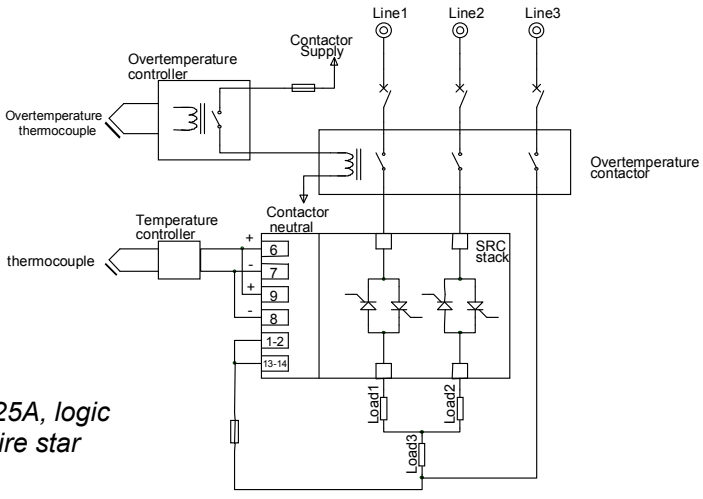
European Low Voltage Directive

The stacks are designed to meet the requirements of international standards and are CE marked in compliance with the European Low Voltage Directive.

The following standards have been applied in whole or in part in the design of these units: EN 60947-1, EN61010-1, EN50178

Electromagnetic Compatibility

The control circuits of the unit meet or exceed the requirements of EN 50 082 part 2 and EN 50 081 part 2 (immunity and emissions for industrial environment). The thyristor drive circuitry is designed to minimise conducted emissions associated with the load current, and additional filtering will not normally be necessary. Application notes provide information on system design
for compatibility.



Typical wiring - SRC2000 125A, logic input, 2-line control of a 3-wire star connected load

Information in this leaflet may be subject to change through product development.

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