



Industrial single- and 3-phase Solid State Relays

PLESR-T

Economy (triac) single phase version



These economical, sleek and robust single phase SSR's are designed to control resistive loads, such as heater bands and cartridge heaters, using the time proportioned DC or AC driver output from a temperature controller.

Using noise-free ON-OFF zero crossing firing, these DIN rail or wall mounted units employ industrially rated reliable solid state power switching devices for optimal and reliable control in demanding industrial heating applications.

Command type:	time proportioning
Rated control voltage:	OFF state = 0 to 2V DC ON state = 4.5 to 35V DC
Input type:	Constant current (15mA)
Switching type:	zero crossing
Load type:	resistive (min cos F =0,9)
Min. holding current:	150mA RMS
Leakage current:	20mA @ 250V AC
Min. latching voltage:	20V
Voltage drop on thyristors:	1,8V
Insulation:	- between power circuit and earth: 2500V RMS for 1 minute - between command and power circuits: 3500V RMS for 1 minute - between command and earth: 1800V RMS for 1 minute
Insulation resistance:	> 100MΩ at 500V DC
Operational temperature:	from 0 to 40 °C. (from 32 to 104 °F)
Humidity:	from 20% to 85% RH non condensing
Storage temperature:	from -20 to +70°C. (-4 to 158°F)
Protection:	IP20
Approvals:	UL and cUL

Amp. - V	12 - 240	18 - 240
Nominal voltage (MAX +10%)	240 V	240 V
Nominal current (@ 40°C)	12 A	18 A
Non-rep. surge current	160 A	208 A
I ² t for fusing (10 ms)	128	259
Non-rep. peak voltage	900 V	900 V
³ V/ ³ T	250 V/μs	250 V/μs
PRV	800 V	800 V
Power dissipation ($I = I_{nom}$)	18 W	27W
Weight	510 g	510 g

PLESR

Single-phase version with DC input



Command type:	time proportioning
Rated control voltage:	OFF state = 0 to 2V DC ON state = 4.5 to 35V DC
Input type:	Constant current (15mA)
Switching type:	zero crossing
Load type:	resistive (min cos F =0,9)
Min. holding current:	150mA RMS
Leakage current:	20mA @ 250V AC
Min. latching voltage:	20V
Voltage drop on thyristors:	1,8V
Insulation:	- between power circuit and earth: 2500V RMS for 1 minute - between command and power circuits: 3500V RMS for 1 minute - between command and earth: 1800V RMS for 1 minute
Insulation resistance:	> 100MΩ at 500V DC
Operational temperature:	from 0 to 40 °C. (from 32 to 104 °F)
Humidity:	from 20% to 85% RH non condensing
Storage temperature:	from -20 to +70°C. (-4 to 158°F)
Protection:	IP20
Approvals:	UL and cUL

Amp. - V	25 - 400	40 - 400	60 - 400	80 - 400	25 - 600	40 - 600	60 - 600	80 - 600
Nominal voltage (MAX +10%)	400 V	400 V	400 V	400 V	600 V	600 V	600 V	600 V
Nominal current (@ 40°C)	25 A	40 A	60 A	80 A	25 A	40 A	60 A	80 A
Non-rep. surge current	380 A	900 A	1350 A	1350 A	380 A	900 A	1350 A	1350 A
I ² t for fusing (10 ms)	720	4000	9100	9100	720	4000	9100	9100
Non-rep. peak voltage	1300 V	1300 V	1300 V	1300 V	1700 V	1700 V	1700 V	1700 V
³ V/ ³ T	1000 V/μs	1000 V/μs	1000 V/μs	1000 V/μs	1000 V/μs	1000 V/μs	1000 V/μs	1000 V/μs
PRV	1200 V	1200 V	1200 V	1200 V	1600 V	1600 V	1600 V	1600 V
Power dissipation (I = I _{nom})	35 W	56 W	84 W	112 W	35 W	56 W	84 W	112 W
Weight	630 g	900 g	1400 g	2000 g	630 g	900 g	1400 g	2000 g

PLESR AC

Single-phase version with AC input



Command type:	time proportioning.
Rated control voltage:	- for 240V AC models: OFF state = 0 to 10V AC ON state = 100 to 240V AC - for 24VAC models: OFF state = 0 to 4V AC ON state = 24V AC ($\pm 15\%$)
Switching type:	zero crossing
Load type:	resistive (min $\cos F = 0,9$)
Min. holding current:	150mA RMS
Leakage current:	max 20mA RMS @ 600V AC
Min. latching voltage:	20V
Voltage drop on thyristors:	1,4V
Insulation:	- between power circuit and earth: 2500V RMS for 1 minute. - between command and power circuits: 3500V RMS for 1 minute. - between command and earth: 1800V RMS for 1 minute
Insulation resistance:	> 100M Ω at 500V DC
Operational temperature:	from 0 to 40°C. (from 32 to 104°F)
Humidity:	from 20% to 85% RH non condensing
Storage temperature:	from -20 to +70°C. (-4 to 158°F)
Protection:	IP20
Approvals:	UL and cUL

Amp. - V	25 - 400	40 - 400	60 - 400	80 - 400	25 - 600	40 - 600	60 - 600	80 - 600
Nominal voltage (MAX +10%)	400 V	400 V	400 V	400 V	600 V	600 V	600 V	600 V
Nominal current (@ 40°C)	25 A	40 A	60 A	80 A	25 A	40 A	60 A	80 A
Non-rep. surge current	380 A	900 A	1350 A	1350 A	380 A	900 A	1350 A	1350 A
I _t for fusing (10 ms)	720	4000	9100	9100	720	4000	9100	9100
Non-rep. peak voltage	1300 V	1300 V	1300 V	1300 V	1700 V	1700 V	1700 V	1700 V
³ V/ ³ T	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s
PRV	1200 V	1200 V	1200 V	1200 V	1600 V	1600 V	1600 V	1600 V
Power dissipation ($I = I_{nom}$)	35 W	56 W	84 W	112 W	35 W	56 W	84 W	112 W
Weight	630 g	900 g	1400 g	2000 g	630 g	900 g	1400 g	2000 g

PLETR

Three-phase version with DC input



These economical DIN rail or wall mount 3 phase SSR units are designed to control resistive 3 phase loads, such as heater bands and cartridge heaters, using the DC or AC SSR driver output from a temperature controller. Using noise-free zero cross firing, the ITR / ETR / (AC) control 2 legs of the resistive 3 phase load. The third, unswitched leg is bussed through the unit for convenient connection.

Command type:	time proportioning.
Rated control voltage:	OFF state = 0 to 4V DC ON state = 9 to 35V DC
Input type:	Constant current (15mA)
Switching type:	zero crossing.
Load type:	resistive (min cos F = 0,9)
Min. holding current:	150mA RMS
Leakage current:	20mA @ 600 V AC
Min. latching voltage:	20V
Voltage drop on thyristors:	1,4V
Insulation:	- between power circuit and earth: 2500V RMS for 1 minute - between command and power circuits: 3500V RMS for 1 minute - between command and earth: 1800V RMS for 1 minute
Insulation resistance:	> 100M Ω at 500 V DC
Operational temperature:	from 0 to 40°C. (from 32 to 104°F)
Humidity:	from 20% to 85% RH non condensing
Storage temperature:	from -20 to +70°C. (-4 to 158°F)
Protection:	IP20
Approvals:	UL and cUL

Amp. - V	25 - 400	40 - 400	60 - 400	25 - 600	40 - 600	60 - 600
Nominal voltage (MAX +10%)	400 V	400 V	400 V	600 V	600 V	600 V
Nominal current (@ 40°C)	25 A	40 A	60 A	25 A	40 A	60 A
Non-rep. surge current	380 A	900 A	1350 A	380 A	900 A	1350 A
I _t for fusing (10 ms)	720	4000	9100	720	4000	9100
Non-rep. peak voltage	1300 V	1300 V	1300 V	1700 V	1700 V	1700 V
³ V/ ³ T	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s
PRV	1200 V	1200 V	1200 V	1600 V	1600 V	1600 V
Power dissipation (I = I _{nom})	70 W	112 W	168 W	70 W	112 W	168 W
Weight	1800 g	1950 g	1950 g	1800 g	1950 g	1950 g

PLETR AC

Three-phase version with AC input



Command type:	time proportioning
Rated control voltage:	- for 240VAC models: OFF state = 0 to 10V AC ON state = 100 to 240V AC - for 24VAC models: OFF state = 0 to 3V AC ON state = 24V AC ($\pm 15\%$)
Switching type:	zero crossing
Load type:	resistive (min $\cos \Phi = 0,9$)
Min. holding current:	150mA RMS
Leakage current:	max 20mA RMS @ 600V AC
Min. latching voltage:	20V
Voltage drop on thyristors:	1,4V
Insulation:	- between power circuit and earth: 2500V RMS for 1 minute - between command and power circuits: 3500V RMS for 1 minute - between command and earth: 1800V RMS for 1 minute
Insulation resistance:	> 100M Ω at 500V DC
Operational temperature:	from 0 to 40°C. (from 32 to 104°F.
Humidity:	from 20% to 85% RH non condensing
Storage temperature:	from -20 to +70°C. (-4 to 158°F)
Protection:	IP20
Approvals:	UL and cUL

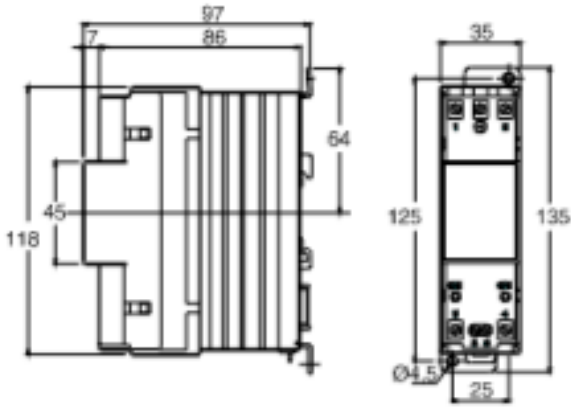
Amp. - V	25 - 400	40 - 400	60 - 400	25 - 600	40 - 600	60 - 600
Nominal voltage (MAX +10%)	400 V	400 V	400 V	600 V	600 V	600 V
Nominal current (@ 40°C)	25 A	40 A	60 A	25 A	40 A	60 A
Non-rep. surge current	380 A	900 A	1350 A	380 A	900 A	1350 A
I _t for fusing (10 ms)	720	4000	9100	720	4000	9100
Non-rep. peak voltage	1300 V	1300 V	1300 V	1700 V	1700 V	1700 V
³ V/ ³ T	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s	1000 V/ μ s
PRV	1200 V	1200 V	1200 V	1600 V	1600 V	1600 V
Power dissipation ($I = I_{nom}$)	70 W	112 W	168 W	70 W	112 W	168 W
Weight	1800 g	1950 g	1950 g	1800 g	1950 g	1950 g

Standard Products

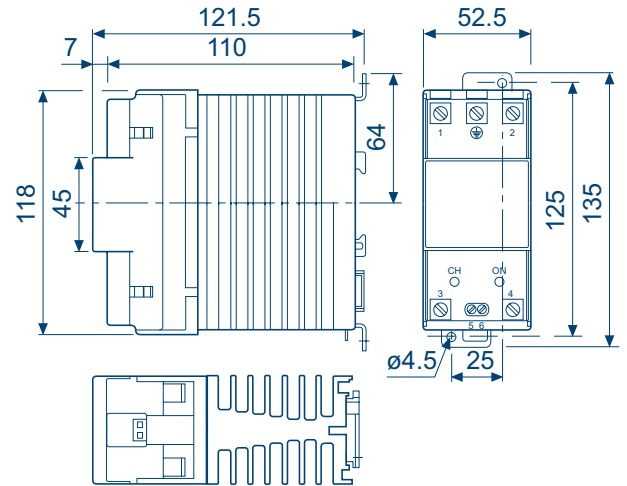
ITEM	TYPE	LOAD CURRENT	LOAD VOLTAGE	CONTROL VOLTAGE
PLESRT122400	1-PHASE SSR'S	12 A	240 V~RMS 50/60 HZ	24 VDC
PLESRT182400	1-PHASE SSR'S	18 A	240 V~RMS 50/60 HZ	24 VDC
PLESRAC25401	1-PHASE SSR'S	25 A	400 V~RMS 50/60 HZ	100-240 VAC
PLESRAC25402	1-PHASE SSR'S	25 A	400 V~RMS 50/60 HZ	24 VAC
PLESRAC25602	1-PHASE SSR'S	25 A	600 V~RMS 50/60 HZ	24 VAC
PLESRAC25601	1-PHASE SSR'S	25 A	600 V~RMS 50/60 HZ	100-240 VAC
PLESR0254000	1-PHASE SSR'S	25 A	400 V~RMS 50/60 HZ	24 VDC
PLESR0254001	1-PHASE SSR'S	25 A	400 V~RMS 50/60 HZ *)	100-240 VAC
PLESR0256000	1-PHASE SSR'S	25 A	600 V~RMS 50/60 HZ	24 VAC
PLESR0256001	1-PHASE SSR'S	25 A	600 V~RMS 50/60 HZ *)	100-240 VAC
PLESR0404000	1-PHASE SSR'S	40 A	400 V~RMS 50/60 HZ	24 VDC
PLESRAC40401	1-PHASE SSR'S	40 A	400 V~RMS 50/60 HZ	100-240 VAC
PLESRAC40402	1-PHASE SSR'S	40 A	400 V~RMS 50/60 HZ	24 VAC
PLESR0404001	1-PHASE SSR'S	40 A	400 V~RMS 50/60 HZ *)	100-240 VAC
PLESRAC40602	1-PHASE SSR'S	40 A	600 V~RMS 50/60 HZ	24 VAC
PLESR0406000	1-PHASE SSR'S	40 A	600 V~RMS 50/60 HZ	24 VDC
PLESRAC40601	1-PHASE SSR'S	40 A	600 V~RMS 50/60 HZ	100-240 VAC
PLESR0406001	1-PHASE SSR'S	40 A	600 V~RMS 50/60 HZ *)	100-240 VAC
PLESRAC60401	1-PHASE SSR'S	60 A	400 V~RMS 50/60 HZ	100-240 VAC
PLESR0604000	1-PHASE SSR'S	60 A	400 V~RMS 50/60 HZ	24 VDC
PLESRAC60402	1-PHASE SSR'S	60 A	400 V~RMS 50/60 HZ	24 VAC
PLESR0604001	1-PHASE SSR'S	60 A	400 V~RMS 50/60 HZ *)	100-240 VAC
PLESRAC60602	1-PHASE SSR'S	60 A	600 V~RMS 50/60 HZ	24 VAC
PLESRAC60601	1-PHASE SSR'S	60 A	600 V~RMS 50/60 HZ	100-240 VAC
PLESR0606000	1-PHASE SSR'S	60 A	600 V~RMS 50/60 HZ	24 VDC
PLESR0606001	1-PHASE SSR'S	60 A	600 V~RMS 50/60 HZ *)	100-240 VAC
PLESRAC80401	1-PHASE SSR'S	80 A	400 V~RMS 50/60 HZ	100-240 VAC
PLESR0804000	1-PHASE SSR'S	80 A	400 V~RMS 50/60 HZ	24 VDC
PLESRAC80402	1-PHASE SSR'S	80 A	400 V~RMS 50/60 HZ	24 VAC
PLESR0804001	1-PHASE SSR'S	80 A	400 V~RMS 50/60 HZ *)	100-240 VAC
PLESR0806000	1-PHASE SSR'S	80 A	600 V~RMS 50/60 HZ	24 VDC
PLESRAC80601	1-PHASE SSR'S	80 A	600 V~RMS 50/60 HZ	100-240 VAC
PLESRAC80602	1-PHASE SSR'S	80 A	600 V~RMS 50/60 HZ	24 VAC
PLESR0806001	1-PHASE SSR'S	80 A	600 V~RMS 50/60 HZ *)	100-240 VAC
PLETR0254000	3-PHASE SSR'S	25 A	400 V~RMS 50/60HZ	24 VDC
PLETR0254001	3-PHASE SSR'S	25 A	400 V~RMS 50/60 HZ *)	100-240 VAC
PLETR0256000	3-PHASE SSR'S	25 A	600 V~RMS 50/60HZ	24 VDC
PLETR0256001	3-PHASE SSR'S	25 A	600 V~RMS 50/60 HZ *)	100-240 VAC
PLETR0404000	3-PHASE SSR'S	40 A	400 V~RMS 50/60HZ	24 VDC
PLETR0404001	3-PHASE SSR'S	40 A	400 V~RMS 50/60 HZ *)	100-240 VAC
PLETR0406000	3-PHASE SSR'S	40 A	600 V~RMS 50/60HZ	24 VDC
PLETR0406001	3-PHASE SSR'S	40 A	600 V~RMS 50/60 HZ *)	100-240 VAC
PLETR0604000	3-PHASE SSR'S	60 A	400 V~RMS 50/60HZ	24 VDC
PLETR0604001	3-PHASE SSR'S	60 A	400 V~RMS 50/60 HZ *)	100-240 VAC
PLETR0606000	3-PHASE SSR'S	60 A	600 V~RMS 50/60HZ	24 VDC
PLETR0606001	3-PHASE SSR'S	60 A	600 V~RMS 50/60 HZ *)	100-240 VAC

Dimensions and panel cut-out

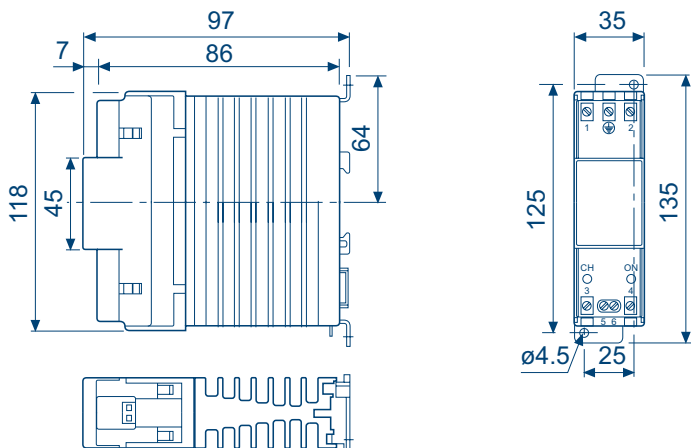
PLESR/ T [12][18]A



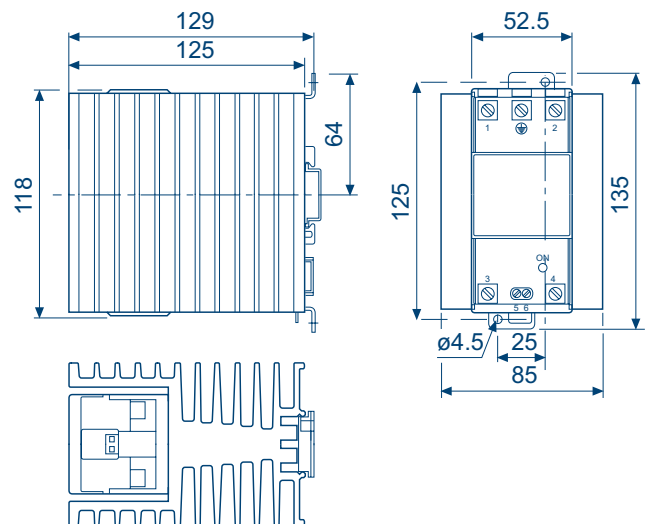
PLESR 40A



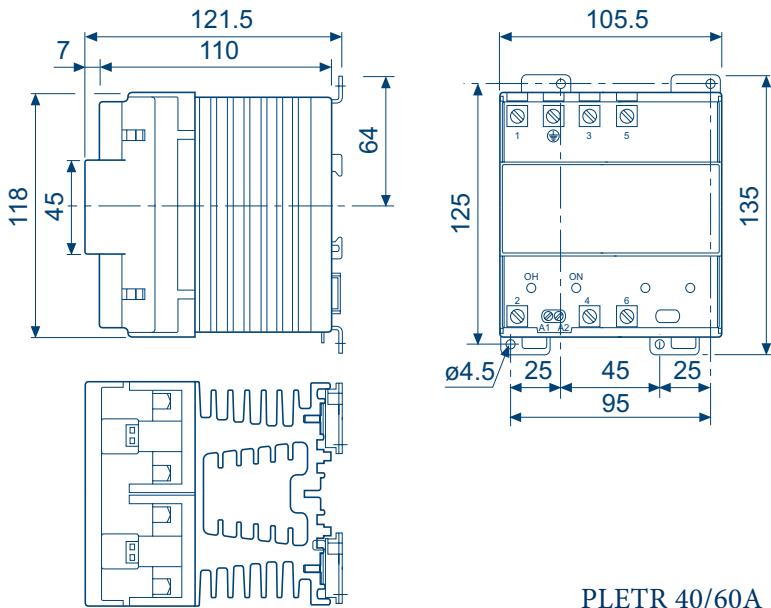
PLESR T 25A



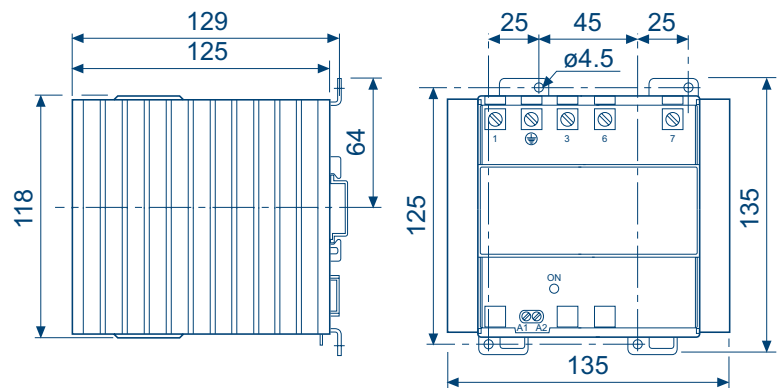
PLESR 60A



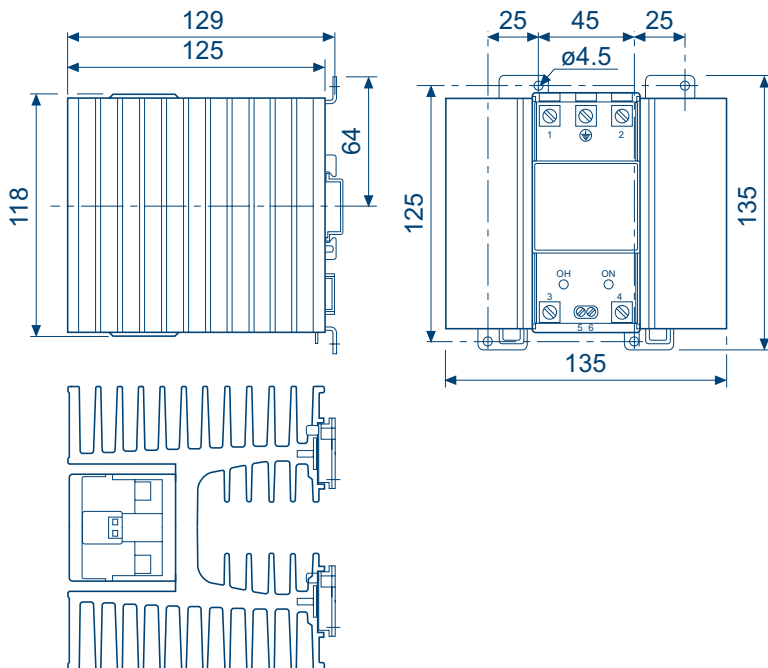
PLETR 25A



PLETR 40/60A



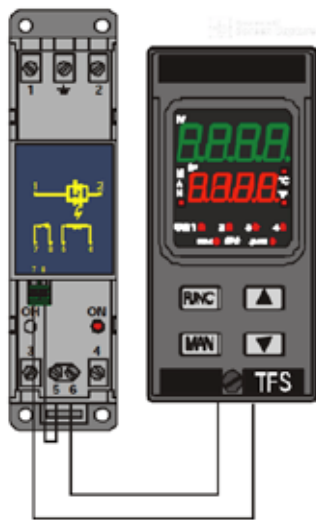
PLESR 80A



Over-heating alarm (optional)

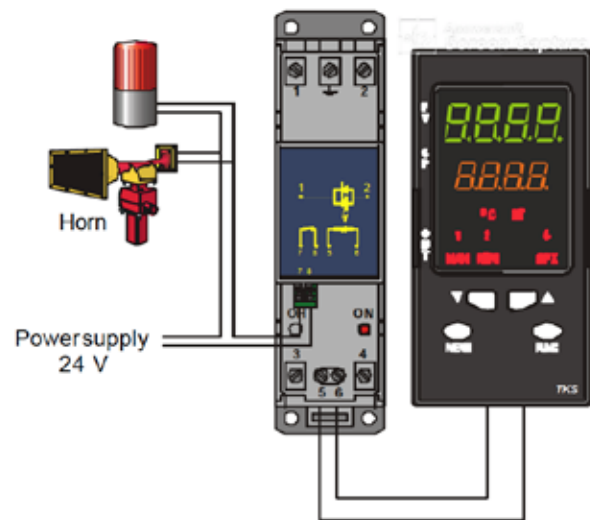
- Contact: gold plated (Maximum resistance = 5 milliOhm)
- Temperature threshold: + 3 °C
- Number of operations: 100000 cycles
- Voltage rating: max. 125 VAC or max. 30 VDC
- Current rating: 1 A
- Approval: CE

EXAMPLE 1



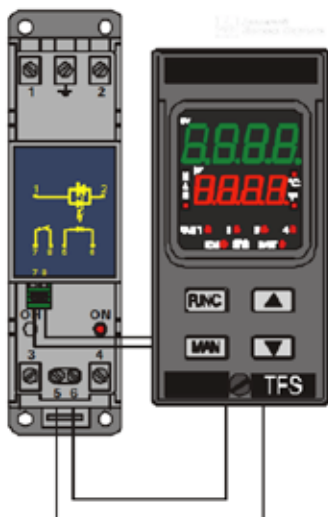
Connecting the alarm contact in series to the command input it is possible to obtain a simple thermal protection.

EXAMPLE 2



With the alarm contact it is possible to drive horns or light indicators.

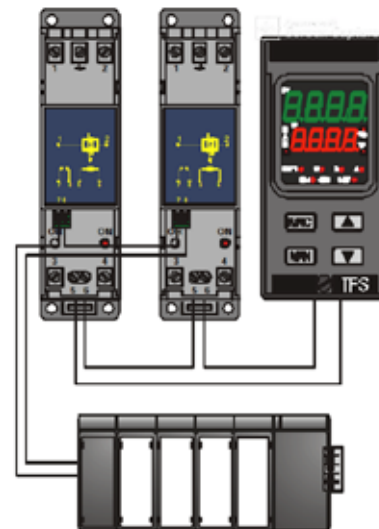
EXAMPLE 3



Connecting the overheating contact to a logic input it is possible to:

1. Select a safety set point
2. Enable the Output power limiting
3. Enable the Output power OFF function

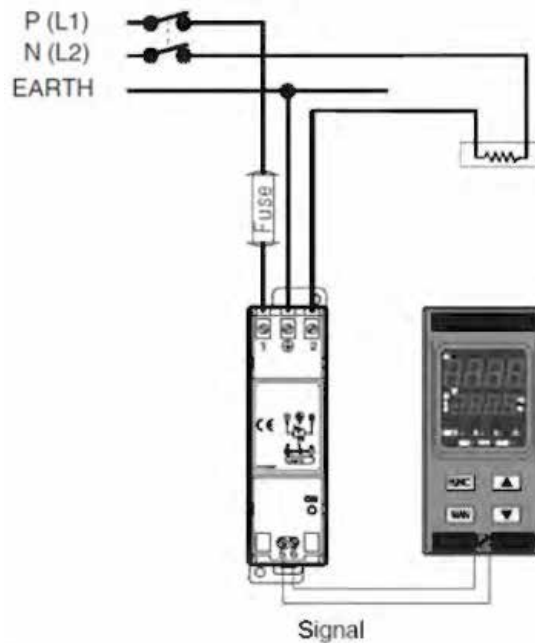
EXAMPLE 4



Connection of the alarms to a PLC for a controlled shutdown.

Connecting two alarm output in series it is possible to obtain an alarm when one or more overheating are detected.

How to connect single phase PLESRT and PLESR



THERMAL PROTECTION

Temperature ratings for Solid State Contractors and SCR Power Controllers are listed in the specifications at continuous operation at 100% output and 100% duty cycle. These conditions assume that all recommended instructions for mounting and cooling airflow access are followed.

Power Controllers are designed to work up to a specific temperature. If that temperature is exceeded, the unit is likely to be damaged. Thermal protection can prevent excessive temperatures from damaging the power unit. When the SSR junction temperature reaches 125°C (275°F), the inhibit and the OH (overheat) LED indicator is illuminated. Once the temperature is within acceptable limits, the command signal is again enabled and the OH LED turns off.

AGENCY APPROVAL

All Delcon SSR models have approval ratings for CE, UL and cUL.

INSTALLATION

These Power Controllers must be installed in accordance with the recommendations expressed in the installation guide supplied with each unit, and also in accordance with local wiring regulations. It is important to note that each controlled phase in an SCR generates a heat loss calculated at approximately 1.2 watts per amp per phase (1.8 for the PLESRT). Adequate ventilation or forced cooling must be provided to maintain ambient conditions inside the control panel enclosures within the operating specification.

FUSE PROTECTION

SCR Power Controllers and Solid State Relays require high speed fuses to protect the power device against short circuit currents resulting from load or wiring faults. High speed fuses must be externally mounted. Consult the catalogue for recommended fusing for our power controllers. The high speed fuse does not provide protection to the load or to the branch of the circuit against sustained medium scale overloads, and it is therefore necessary to fit a standard circuit protection fuse (HCR fuse or circuit breaker) in the supply lines to the Power Controller.

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