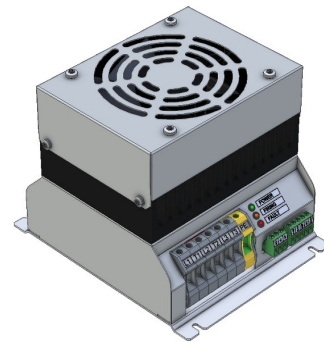


### PRELIMINARY TECHNICAL INFORMATION

#### HIGHLIGHTS

- Main power 230/400/440 V<sub>AC</sub> / 50-60 Hz
- 24 V<sub>DC</sub> powered
- Proportional/Burst mode operation
- Multiple input levels (0-10 V / 4-20 mA)
- Thermal protection with thermal switch
- LED indications of status
- Fault contact NC



non-contractual image

SC-ACP series is a range of AC power regulators (SCR) which can adjust output power provided to a resistive load as heating loads. The adjustment of output power can be made through a controller (PLC) or analog external signal with a range of 0-10 V or 4-20 mA but also with direct connection of a potentiometer. This series adjust output power with zero-cross switching of SCR avoiding RFI in burst mode operation (switched wave packets). Activation of forced-air cooling fan (when apply) or automatic shutdown when an overtemp fault condition is present is automatically done by the unit itself.

#### RANGE AND CHARACTERISTICS

Reference	Cooling	I <sub>OUT</sub> Nom [A <sub>AC</sub> ]	230 V <sub>AC</sub> 50/60 Hz	400 V <sub>AC</sub> 50/60 Hz	440 V <sub>AC</sub> 50/60 Hz
SC-ACP440/025kW	Natural	33	13	22	25
SC-ACP440/050kW	Forced	67	26	44	50

Characteristics at T<sub>A</sub> = 40°C, 1000 m.a.s.l., working factor 100%

#### ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Notes / test conditions	Min	Typ	Max	Units
V <sub>AC</sub>	Mains rated operating line voltage	±10%, 50/60 Hz	125	400	440	V <sub>AC</sub>
I <sub>OUT</sub>	Rated load	depending on model, see: RANGE AND CHARACTERISTICS				
V <sub>SUPP</sub>	Supply voltage for control and fan	±10%	21.6	24	26,4	V
I <sub>SUPP</sub>	Supply current	Full conduction, natural convection	-	90	-	mA
		Full conduction, forced cooled version	-	280	-	V
V <sub>CTL0-10V</sub>	Voltage setpoint (0-10V)	R <sub>N(0-10)</sub> ≈ 100 kΩ	-0.5	-	11	V
V <sub>CTL0-10V</sub>	Current setpoint (4-20mA)	R <sub>N(4-20)</sub> ≈ 250 Ω	-1	-	22	mA
T <sub>op</sub>	Operating temperature		-	40	55	°C

#### FAN MODULE CHARACTERISTICS (FORCED-AIR VERSIONS ONLY)

Symbol	Parameter	Notes / test conditions	Min	Typ	Max	Units
Q <sub>max</sub>	Air flow	Free air	-	-	190	m <sup>3</sup> /h
n	Speed		-	2700	-	min <sup>-1</sup>
L <sub>p</sub>	Sound pressure level		-	43	-	dB(A)
L10	Service life	T <sub>A</sub> = 40°C	-	72500	-	h

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## CONNECTIONS

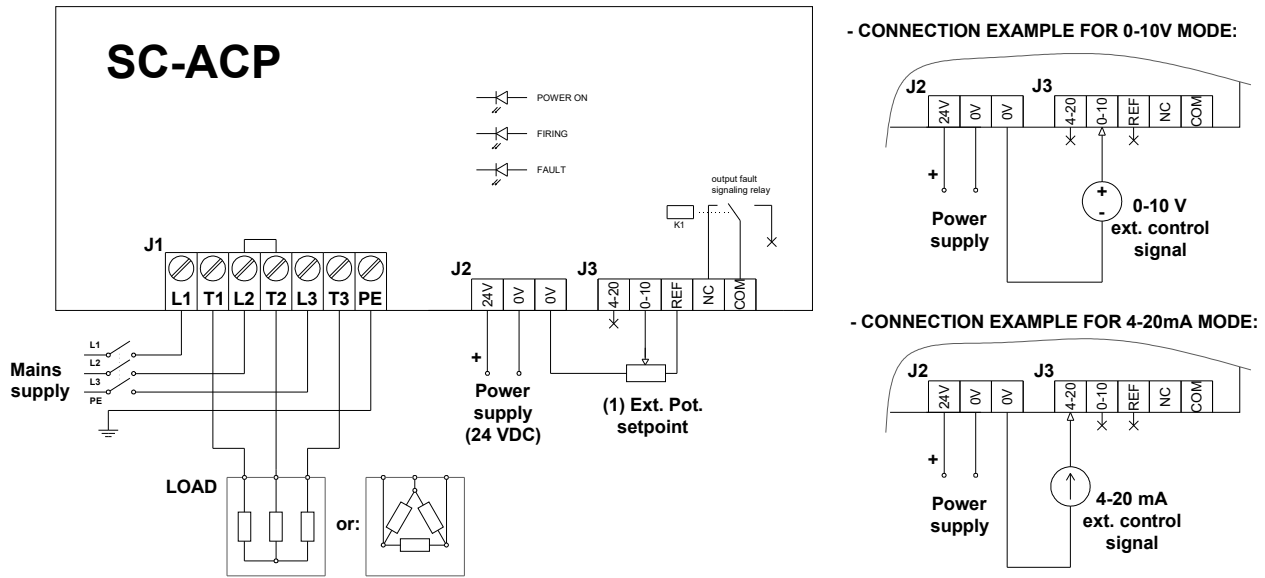


figure 1: Connection example diagram.  
(1) Regulation with potentiometer: Any type of 4k7 linear potentiometer can be used.

## MAIN POWER SUPPLY AND SIGNAL INTERFACE CONNECTIONS

### J2 PINOUT (SUPPLY CONNECTOR)

Pin	Function
1 24V	Fan power supply +24 V <sub>DC</sub>
2 0V	GND signal and supply
3 0V	GND signal and supply

### J3 PINOUT (SUPPLY CONNECTOR)

Pin	Function
1 4-20	4-20 mA input setpoint
2 0-10	0-10 V input setpoint
3 REF	Internal 10 V <sub>DC</sub> reference for potentiometer
4 NC	NC terminal from K1 relay (Fault)
5 COM	COM terminal from K1 relay (Fault)

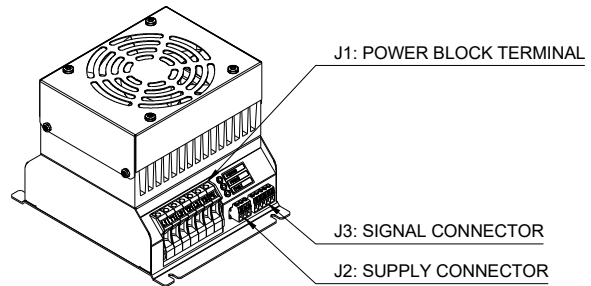


figure 2: Disposition of connectors and terminals.

### Connectors and terminal types:

J1 (POWER CONNECTIONS): UT 10 series terminal block (Phoenix Contact) or equivalent alternative.

Cable wire (flexible) cross section: 20...6 AWG (0.5...16 mm<sup>2</sup>). Screw connection M4, tightening torque 1.5...1.8 Nm.

J2 & J3 (SUPPLY & SIGNALING CONNECTIONS): COM series pluggable connectors (SAURO) or equivalent alternative, 5.08 mm pitch. With plugs.

Cable wire cross section: 30...12 AWG (0.05...2.5 mm<sup>2</sup>).

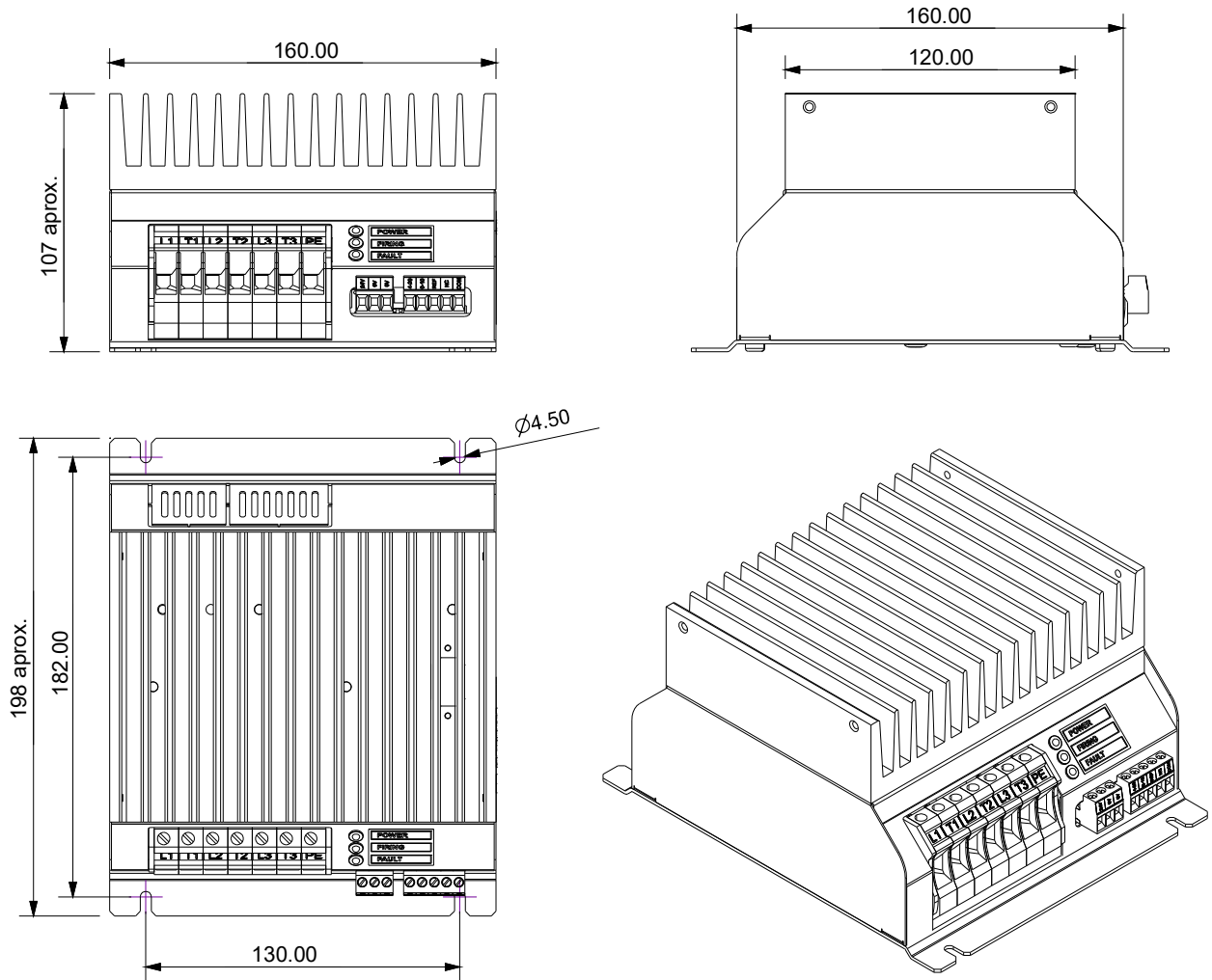
## MOUNTING CONSIDERATIONS

All models are based on a W3.2C topology, connections on L2 and T2 are therefore internally connected. When using a 3-phase load on star-connection central point must not be connected to neutral so that would let on phase always fully connected.

Units with natural convection air cooling must be mounted in upright position allowing vertical air flowing through the heatsink fins.

**MECHANICAL DIMENSIONS**

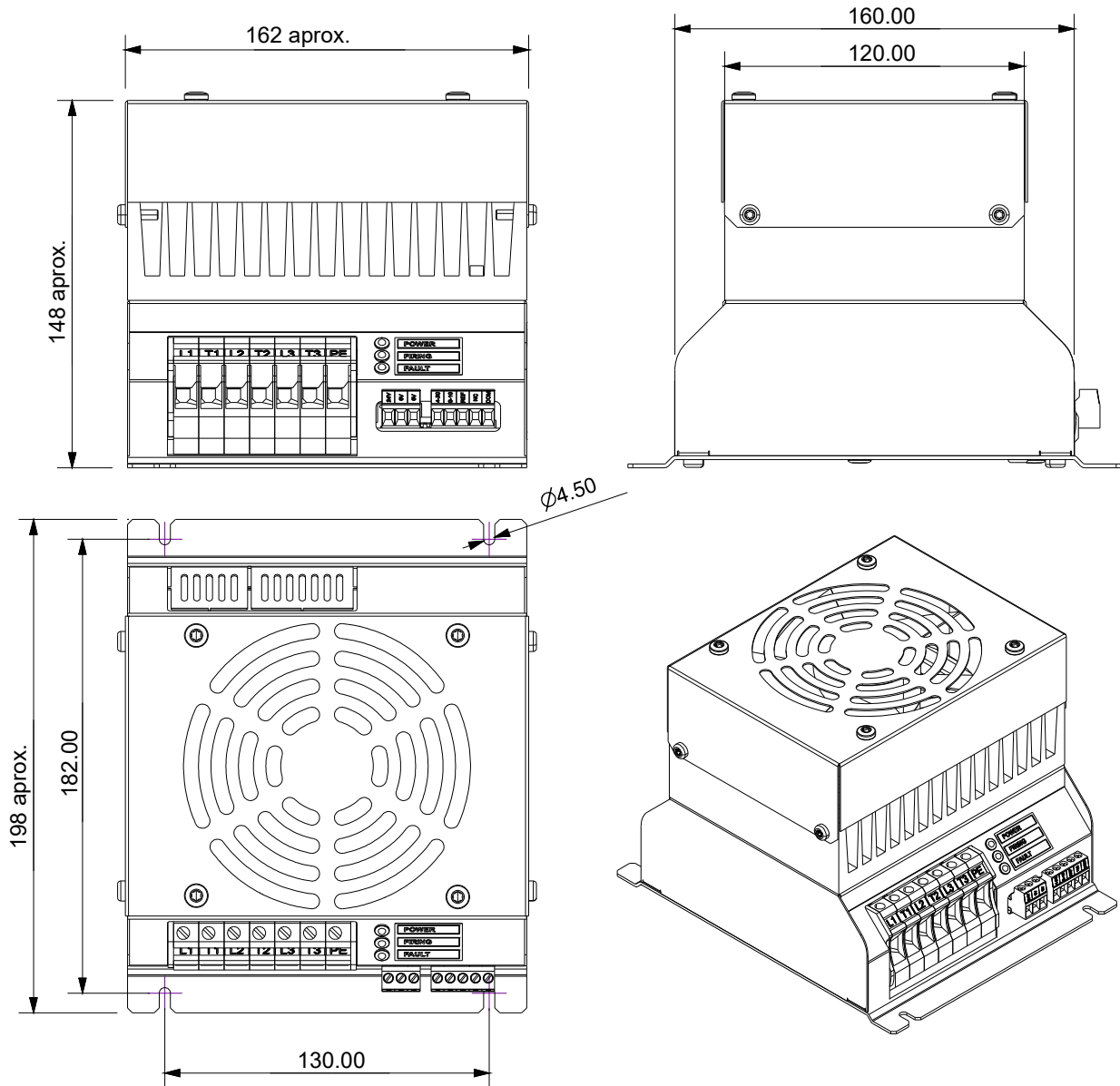
- Natural convection cooling versions:  
**SC-ACP480/025kW**



(All dimensions in mm)

Dimension	Typ	Units
Length	160	mm
Height	198	mm
Prof.	107	mm
Weight	3.2	kg

**- Forced-air cooling versions:  
SC-ACP480/050kW**



(All dimensions in mm)

Dimension	Typ	Units
Width	168	mm
Height	198	mm
Prof.	150	mm
Weight	3.6	kg

- **Overtemperature fault condition. K1 internal relay.**

The AC power regulator SC-ACP automatically stops firing and sets the alarm condition when heatsink exceeds 90°C.

By default, when not powered up or when a fault condition is present (overtemp) K1 (internall fault relay) will be not set and providing open contact between J3:4(COM) and J3:5(NC). When an overtemp fault is active red LED (FLT) will be ON.

When the equipment is powered up and with no fault condition active (normal operation) K1 fault relay is set and J2:4(COM) and J2:5(NC) will be an shortcircuited.

**K1 fault relay characteristics:**

$V_{max} := 125 V_{AC} / 125 V_{DC}$ ,  $I_{max} := 2 A @ 30 V_{DC} / 0,5 A @ 125 V_{AC}$

- **Forced-air cooling activation**

On models where fan module is included the fan activation is automatically set by the unit itself when required according the temperature reached on heatsink. In forced-air models please allow a sufficient distance on inlet/outlet air premises.

- **Proportional/Burst operation mode (full wave switch)**

SC-ACP switches the mains voltage periodically firing in burst packets of AC waves relative to the defined setpoint. This operating mode, full wave switch principle is particularly suited for loads with a high thermal inertia (resistive heaters e.g.). As unit switches on zero-cross avoids harmonics and RFI. By default SC-ACP switches packets of 200 periods (4 s) in the zero-cross of the mains proportionally to the value of setpoint giving a good adjustment resolution.

In next figure is shown a FWS waveform example according the alpha setpoint. In this image and for sake of simplicity the wave packets are 5 periods long.

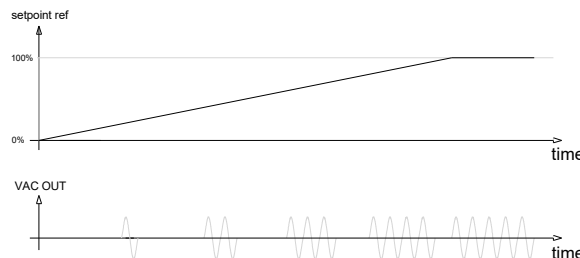


figure 3: Burst operation example diagram.

- **0-10 V or 4-20 mA mode selection**

On power up the unit awaits for a initial setpoint signal from 4-20 or 0-10 inputs to decide and set the signal mode of operation in use. When set, the mode of operation is used until the unit is reset by deactivating its supply ignoring the other input signal.

**MOUNTING CONSIDERATIONS**

It's necessary a minimum lateral distance of 100 mm with regard to the envelope. The free air circulation should be guaranteed at the inlet/outlet. Avoid heat sources nearby the assembly.

In final application it is important to consider a safety margin with regards the working current, a safety margin of 20% is recommended.

For critical cases (24 hours work, repetitive overloads...), safety margins from 30% to 50% are used.

**MAINTENANCE**

An annual inspection of the following aspects is recommended:

- Check that there is no accumulation of dirt that prevents free cooling, if necessary clean the fins of the heatsink.
- Check correct tightening of the input / output terminals and the PE connection.

# Cost Effective Products

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