

Smart-PRO

Datasheet



SOLCO.
Advanced Trace Heating Solutions

Product Category

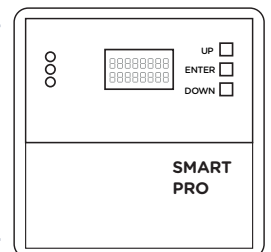
This air/surface sensing programmable temperature control device features innovative Soft-Start functionality, fault monitoring via TTL-RS232 communication, a BMS fault alarm relay, and Auto Switchover capabilities. It is designed for precise electronic temperature control of trace heating systems in commercial, residential, and non-residential applications.

Features

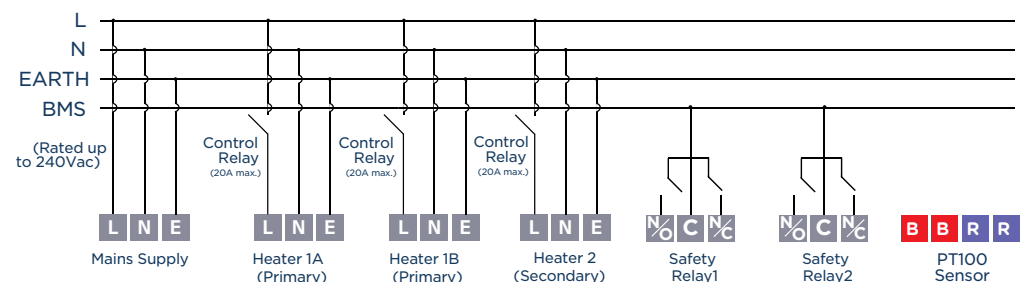
- **Monitoring:** Provides 24/7, year-round active monitoring of 2 independent heating circuits (duty/standby)
- **Soft-Start:** Built-in feature eliminates inrush currents on Solco self-regulating heating cables, allowing substantially longer circuit lengths than standard controllers
- **Security:** Front panel UP, DOWN, and ENTER buttons are locked during normal use to prevent inadvertent or unauthorized changes to programmed settings
- **User Interface:**
 - 3 LED indicators for POWER, FAULT, and LOAD
 - Main 8x2 digit LCD screen alternating between live and set temperature readings every minute
- **Entries:** Guide markings for cable gland entry holes: 3xM20 for power and communications cables, 2xM20/M25 for heating cables
- **Plug & Play:** Pre-set to maintain 5°C for freeze protection; configurable for AIR (ambient) or LINE (pipe) sensing
- **Mounting:** Can be installed using a Solco stainless steel pipe mount bracket

Part List

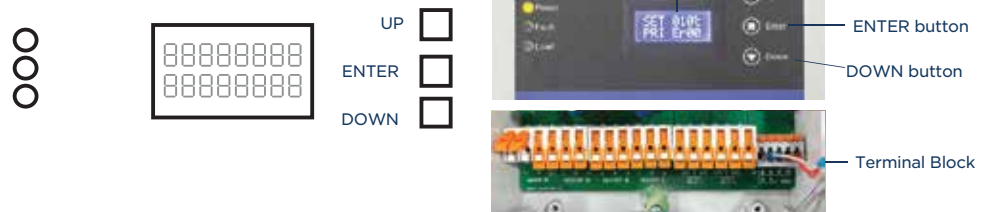
No.	Part Name	Designation	Quantity
1	Smart-PRO V.02	Electronic PCB Assembly	1
2	SABP181808G	Enclosure, IP66, 175mm x 175mm x 75mm	1
3	50.612 PA7035	M12 cable gland	1
4	LN12LG	M12 locknut	1



Wiring diagram



Connection and controls



Specifications:

General

Model	Smart-PRO v.02
Application	Air/surface sensing, -50°C to +450°C
Area of use	Non-hazardous
Ambient operating temperature range	-20°C to +60°C
Temperature measurement range	-50°C to +450°C
Temperature setting range	-45°C to +495°C
Supply voltage	100Vac (min) – 270Vac (max), 50/60 Hz
Load current (max.)	32A (Max. Power 6600 W)
Terminals (WAGO lever type)	9 x 4.0mm ² max. conductor size (24 – 12 AWG) 6 x 2.5mm ² max. conductor size (24 – 14 AWG)

Enclosure

Enclosure dimensions	175mm x 175mm x 75mm
Environmental ingress protection	IP66/67
Base and lid	Grey ABS base and lid
Lid fixing	4 x captive screws
Entries	2 x M20/M25 guide points to drill out for heating cable entry 2 x M20 max. guide points to drill out for mains supply and safety

Temperature sensor

Maximum exposure temperature	450°C (sensor head)
Area of use	Non-hazardous, ordinary area
Length of sensor wire	1 metre – extendable using similar 3 or 4 core braided wire
Temperature sensor type	PT100 type, diameter 5mm (sensor head)
Material	Stainless steel

The sensor cable can also be extended to 100m max. using a 3 or 4 core conductor wire of similar size.

Output relays

Control relay	2 x single pole single throw relay, rating 20A at 240Vac
Alarm relay	2 x single pole single throw relay, volt-free, rating 3A at 240Vac

Settings & programmable parameters

Mode of operation	DUAL or SINGLE
Temperature setting	-45°C to +495°C
High temperature limit	-40°C to +500°C
Low temperature limit	-50°C to +490°C
Buzzer operation	Selectable ON or OFF
Relay setting	Nc or No
Heater operation if any fault	Selectable ON or OFF (single mode only)
Softstart operation	Startup/Disable/Enable
Hysteresis (fixed)	2K approx.

Diagnosed alarm

Error code = XY	PRI = Primary heating cable/load No. 1 SEC = Secondary heating cable/load No. 2
X = 0 X = 8 X = 4 X = C Y = 0 Y = 1 Y = 2 Y = 4 Y = 5 Y = 6 Y = 8 Y = 9 Y = A	No sensor faults Temperature sensor not detected/open circuit Temperature sensor short circuit Read temperature beyond absolute high and low limits set No PRI or SEC heating cable fault SEC Heating cable over current or short circuit detected SEC Heating cable not connected or detected PRI Heating cable over current or short circuit detected PRI & SEC Heating cables short circuit detected PRI Heating cable short circuit detected, SEC not connected PRI Heating cable not connected SEC Heating cable short circuit detected, PRI not connected PRI & SEC Heating cables not connected/open circuit detected
XY = 00	Normally no fault - however if relay state changes then possible BMS comms. cable wire break
Blank display	Loss of power supply

Approvals



Made in United Kingdom, RoHS compliant



www.solcopyroelec.co.uk

TTL-RS232 (RS232-C/UART) Comms. Port

- The comms terminal works on a TTL-RS232 full duplex serial communication protocol.
- The device communicates at 9600 baud rate. Connect the device Rx to your Tx and the device Tx to your Rx wire and ground to ground.
- All commands are ASCII based.
- A typical range for communication is 10 – 15 meters (to reduce noise in the wires, please use shielded cable).
- User can attach a converter board which has Rx/Tx TTL-RS232 port and relay the data in the desired protocol. Please note the convertor board needs to have its own device ID when connected in a network.

There are 2 ASCII commands that can be used to interrogate the electronic controller unit, one is a passive request for status information, the other is an active command to set a value for the set temperature.

1. PASSIVE - Receiving status information from the unit:

By sending 'G' the unit can be asked to send its status info as follows:

Item	Code	Description	Example:
a)	M0 or M1	Device mode	M0 or M1 where 0 = single, 1 = dual
b)	Cxxx	Live/Current temperature	C012 = live reading temperature of 12°C
c)	Sxxx	Set temperature	S005 = set temperature of 5°C
d)	Hxxx	Absolute high temperature set	H045 = High temp. limit of 45°C
e)	Lxxx	Absolute low temperature set	L-20 = Low temp. limit of -20°C
f)	FC or FO	Safety relay setting	FC = NC, normally closed, FO = NO, normally open
g)	XY	Error code	Default = 00 - please see error code table
h)	OFF or ON	Load 1/Primary heater status	ON = Heater on, OFF = Heater OFF
i)	OFF or ON	Load 2/Secondary heater status	ON = Heater on, OFF = Heater OFF

Example of received line of information:

Sending G = Receiving <M1,C125,S250,H400,L-25,FC,00,ON,OFF>

2. ACTIVE - Set Temperature:

- By sending 't' followed by 3 digits the set temperature can be altered e.g. t-30 for a set temperature of -30°C, or t045 for a set temperature of 45°C, or t125 for a set temperature of 125°C etc.
- If the sent parameter is within the controller settable range the response will be 'OK'.
- If the sent parameter is outside the controller settable range the response will be 'Value Out Of Range'.

Other communication protocols:

The TTL-RS232 (RS232-C/UART) protocol that is default with this unit can be converted to other common protocols such as RS-485, MODBUS, RJ45 Ethernet, USB etc.

An example of a suitable converter is the Waveshare Industrial Multi-Bus Converter, SKU 21411 (www.waveshare.com). Other converters are available also.

Notes

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