SMART BLOCKTHERM System

1 Application

SMART BLOCKTHERM is a heating system, which consists of an explosion proof electrical heater, and a microprocessor, which manages both the set point while making sure that the BLOCKTHERM heater doesn't over heat.

The SMART BLOCKTHERM System is especially suited for demanding heating applications in areas with explosive atmospheres. For example: to keep analyzers at high temperatures.

The BLOCKTHERM heater heats through conduction and must be in firm contact with the valve block, measure instruments, controlling valve etc. The conduction heating principle is simple, reliable and economical. A conduction heater needs less energy then a finned convection heater.

Conduction of heat through metal is more efficient than heating by means of air. As the air inside the enclosure surrounds the application, it works as an additional insulation.

2 Particular advantages

- Energy saving
- Space saving
- Hole pattern according to the ISA / ANSI SP76.00.02 "open architecture" analyser standard.
- The maximum temperature of the heater is managed electronically and a built in temperature sensitive fuse ensures that the maximum allowed temperature never is exceeded. This principle protected by Intertec patent is very reliable and ensures a high safety in terms of explosive protection.
- Very precise temperature set point accuracy through a digital PID controller
- A RS 485 interface enables networking and setting parameters from a PC.
- extensive error monitoring
- Long service life of the controller, as no mechanical switching elements are used (solid state). The calculated failure probability with uninterrupted operation of 10 years is less than 5 %.
- Negligible network regeneration through phase group control with no voltage triac switching
- The set point temperature can be adjusted continuously.
- Industrial design inside an aluminium box.

3 System description

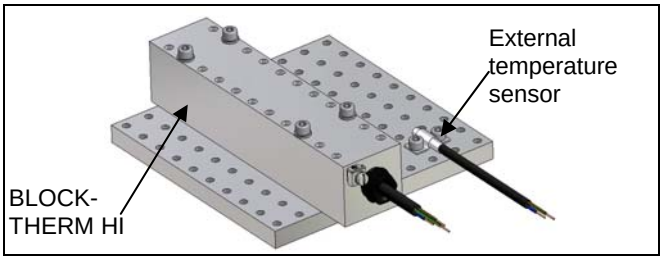
A SMART BLOCKTHERM heating system consists of an electrical heater (BLOCKTHERM HI) and one digital controller (SMART).

The BLOCKTHERM is a block of aluminium. An electrical cartridge heats the block and the heat is conducted to the item, which needs to be heated. Inside the BLOCKTHERM there is a temperature sensor, which reports the heaters inside temperature to the SMART controller.

The controller consists of an electronic section which is completely sealed with silicon and is accessed through a connecting terminal. The SMART controller has 3 analogue inputs:

- One temperature sensor on the chip inside the box.
- One temperature sensor inside the BLOCKTHERM heater
- Option: an intrinsically safe external temperature sensor.

4 Installation and temperature management



The BLOCKTHERM heater transmits its' heat through conduction. Therefore when installed, it shall be firmly attached to an even surface which conducts heat well (metal). The heater should be fastened with 4 screws.

The SMART controller has two different controlling loops. One supervises the temperature of the heater and the second the temperature set point. For the set point two different temperature sensors can be used. Either the internal sensor, which is positioned inside the SMART controller or the optional external sensor. If the internal sensor is used, the SMART controller has to be placed where the set point needs be controlled and the maximum temperature set point is then +80°C. The external sensor is recommended.

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5 Type and Technical dat

5.1 SMART Controller

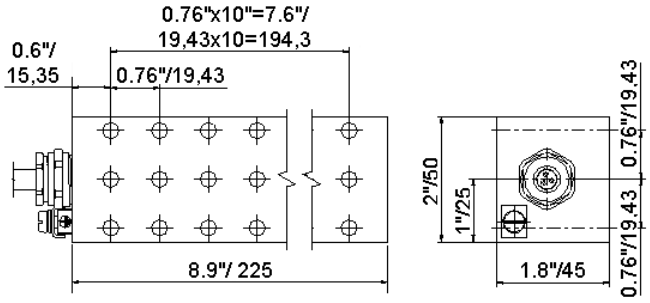
CSA Certificate	1655545 (LR43674)
CSA Type of Protection	Cl. 1, Div. 1, Grp ABCD T4
Ingress Protection	IP65
Nominal voltage	120 V AC
Minimum power	30 W
Maximum power	1200 W
Maximum Temperature	max. 80°C (box) -58°F to + 176°F/ -50°C to +80°C *
Conduit connection	½" NPT
Height x width x depth	4.3"x5.1"x5.1"/ 110x130x130 mm
Material	sea water proof aluminium; coated

** see data sheet HD253*

5.2 CP BLOCKTHERM…

Type	CPA 200 T4 HI	CPA 500 T3 HI	CLA 100 T3 HI
CSA Certificate	1655545 (LR43674)		
CSA Type of Protection	Cl. 1, Div. 1, Grp ABCD T3/T4		
Ingress Protection	IP 68		
Operating temp. range	-58°F to + 356°F/ -50°C to 180°C		
Nominal voltage	120 V AC		
Length of connection cable	39"/ 1 m		
Length x Width x Height	8.9"x1.8"x2"/ 225x45x50 mm		
Material	seawater-proof aluminium, black anodized		

6 Dimensions CP BLOCKTHERM …



Ordering example:
SMART controller with CP BLOCKTHERM CPA 500 T3 HI

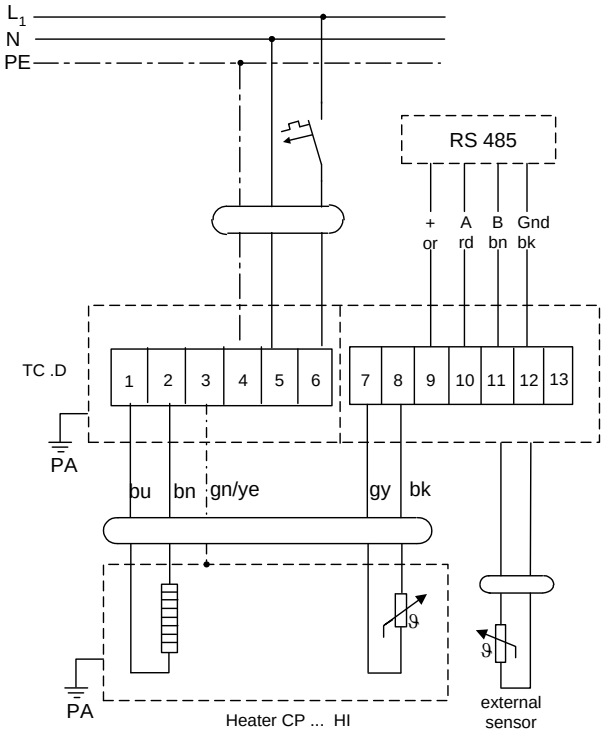
7 The SMART controllers' functionality

- PID-Controller
- Temperature management

The controller consists of an integrated triac which, when switching, is making use of phase group control with no voltage triac switching. A thermistor (NTC) is used as a temperature sensor. The electronics are completely sealed.

8 Mounting example

9 Electric wiring



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