

SINGLE-TUBE HEATERS WITH FIRE CONTROL SYSTEM

Straight heaters with ABS (Anti-Burn System) minimize possible thermal damages to the systems and tanks in the event of a partial or complete loss of the liquid to be heated. Although Regulation EN 60519/1-2 specifies that electrically heated systems must be equipped by the user with a technology that allows safe use (protection against overheating and against dry operation), even the best safety technology cannot protect systems from errors made by operators or from incorrect maintenance.

The following "critical" situations in liquid solutions up to 100°C can be avoided by using an immersion safety heater with an anti-burn system:

- operation of the heater even at a low level of liquid (due, for example, to the evaporation of the fluid);
- operation of the heater even in the absence of liquid (due, for example, to a sudden and unexpected loss of fluid);
- operation of the heater when the heat transfer from the tube of the immersion heater to the fluid is reduced (for example, due to high fouling on the immersion tube).

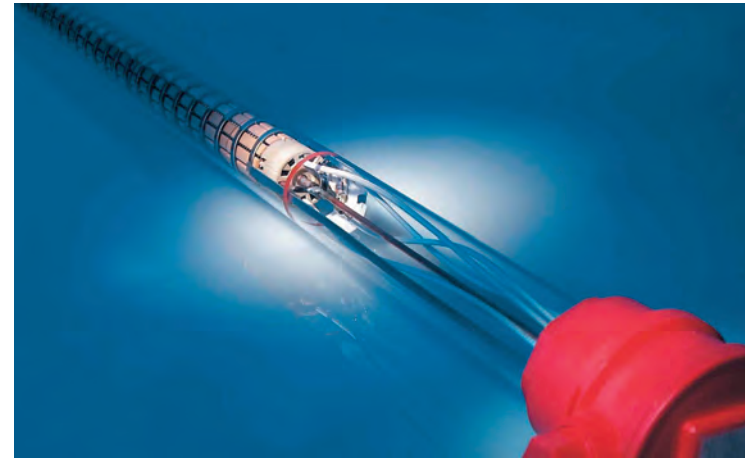
Safety immersion heaters in the straight range with an anti-burn system can take both vertical and horizontal positions in tanks and other systems.

Please note that the normal protection systems against overheating and dry operation must be installed both in the systems and in the tanks, even for the immersion heaters in the straight range with anti-burn systems.

The optimal solution for dealing with this situation is our range of floats, conductive level probes and related control electronics. We will be happy to advise you on the solution that suits your safety needs.

MONO-PHASE OR TWO-PHASE CONNECTION

The integrated anti-burn system blocks too high temperatures and turns off the heater. The heater remains off until the safety circuit is manually reset. This can only be done if the other safety devices are used correctly, and both the tank and the heater are in a good condition. Heater cartridges are available for all stated voltages up to 400 V and with a given power up to 6.0 kW.



THREE-PHASE CONNECTION

When the immersion tube reaches a temperature that is too high, the integrated anti-burn system disables the resistor using an electronic device called DSW 3/2 and a power relay. The heater is then switched off until the safety circuits in the immersion resistor and the electronics are manually restored.

A necessary prerequisite for the proper use of this procedure is that all devices used operate properly and that both the tank and the resistor are in a good condition. The anti-burn system can be installed in all three-phase resistors with rated voltages up to 400V and a current consumption from 1.8 to 16 A.

The DSW 3/2 differential current monitor controls currents in the individual phases (L1, L2, L3) of a three-phase power supply. When the limit value set for power consumption is exceeded, the power contactor switches off via the relay contact and the display shows an error message. The recommended limit value for power consumption imbalance is 5%.

The actual parameters of the process (e.g., phase current) are indicated on the display. If the values exceed or do not reach the set limits, the display shows the corresponding error message.

The DSW 3/2 differential current monitor is activated in the following situations:

- overload protection (for monitoring the current consumption);
- phase current malfunction (if the temperature limiter in the immersion heater is enabled);
- phase current malfunction (if the heating resistor stops working or in case of a cable breakage).

After an "error" phase, the DSW 3/2 differential current monitor can be reset directly from the control keys.

If the error is not solved, the differential current monitor goes in the alarm state again and the corresponding error message is shown on the display. The DSW 3/2 differential current monitor is an IO link device.

Therefore, it can be used as a sensor/actuator for transferring data parameters to the PLC (via the IO link protocol).

With a PLC and an IO link you can also monitor the following parameters:

- monitoring of phase current overload;
- monitoring for an insufficient phase current;
- monitoring of the 2 joint variables;
- monitoring of current imbalances;
- detection of the three-phase powered state;
- phase sequence detection (inductive load).



DSW 3/2 TECHNICAL DATA	
Code	221.x.000200
Dimensions	W = 45 mm, H = 86 mm, D = 80 mm
Mounting	35 mm guides (with DIN EN 60715)
Ambient temperature	-25...60°C
Maximum humidity	10...95 % (no condensation)
Power supply voltage	24 V DC ± 15 %
Power consumption	2,5 W a 24 V DC
Measurement input	3 x I with I _{MAX} = 16 A~
Output	Relay contact 230 V / 3 A~
Terminal section	1,5 mm ² ...4 mm ²

TABLE OF SINGLE TUBES FOR DSW 3/2	
Immersion heaters with detected power [kW] per 400V 3PH	Max. number of heaters for DSW 3/2
1,6 / 2,0	5
2,5	4
3,15 / 3,5	3
4,0 / 5,0	2
6,3 / 7,0 / 8,0 / 10,0	1

TYPE DESIGNATION

... - ... / ... - ...

Immersion tube material
 Nominal length
 Rated power
 Rated voltage
 Current type

T = immersion heater with anti-burn, single-phase
 A = immersion heater with anti-burn, three-phase

Example: T - PS 630 / 1,6 - 230 Ws
 Immersion heater straight series with anti-burn system, porcelain tube, rated tube length of 630 mm;
 Detected power: 1.6 kW;
 Detected voltage: 230V (single phase)

Notes on restrictions
 The DSW 3/2 differential current monitor cannot be used with other control instruments that have phase angular control or for groups of signals that change sine waves.

