

Self-operated Temperature Regulators

Typetested Safety Devices Series 43



Application

Control, limitation, safety monitoring and safety limitation of the energy supply to heat generators and heat exchangers which must be equipped with typetested devices.

Note

Typetested devices for installations according to DIN 4747, DIN EN 12828, DIN EN 12953-6, and DIN 4753 are available.



The safety devices are used to control and protect indirectly heated heat generators in heating and hot water heating installations. The temperature regulators, temperature limiters, safety temperature monitors and safety temperature limiters are compulsory according to the relevant regulations (e.g. DIN 4747, DIN EN 12828, DIN EN 12953-6, and DIN 4753) for installations with heat generators or heat exchangers which are heated by steam, hot liquids or by district heating systems. These devices must be tested for reliability and certified accordingly. Therefore the devices listed in this information sheet have been tested by TÜV (German Technical Inspectorate) and licensed with a register number.

Device designation

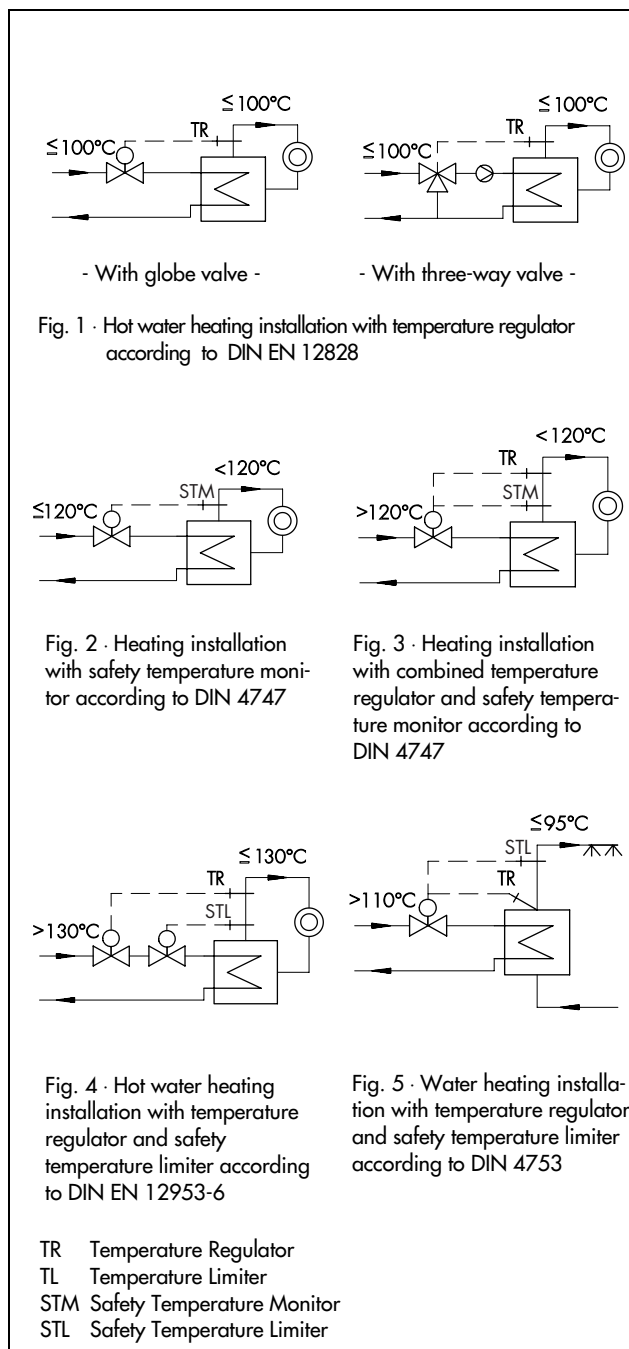
The designation of the safety devices is laid down in DIN 3440 (temperature control and limiting devices for heat generators). The temperatures quoted in Figs. 1 to 5 are meant only as a guide to the typical application ranges of the devices shown. The device needed in each case must meet the requirements of the installation and comply with the relevant safety regulations.

Temperature Regulators (TR), which have been typetested, are necessary in many installations. They constantly measure the temperature as a controlled variable, compare it with a given set point, adjust the actual temperature to the set point and interrupt the energy supply when the temperature exceeds the set point.

Safety Temperature Monitors (STM) interrupt the energy supply when the temperature reaches the adjusted limit value, when the capillary tube ruptures or when there is a leak in the sensor (Fig. 3). They reset themselves automatically when the temperature has fallen below the limit value and the fault has been removed.

Safety Temperature Limiters (STL) interrupt and block the energy supply when the temperature reaches the adjusted limit value, when the capillary tube ruptures or when there is a leak in the sensor (Figs. 4 and 5). They can only be reset and put back into operation with a tool when the temperature has fallen below the limit value and the fault has been removed.

Safety temperature monitors and safety temperature limiters are designed for "Extended Safety" according to DIN 3440, since they are also effective even when a defect occurs. The safety temperature limiters are available optionally with a signal transmitter which produces a signal for fault indication.



Associated Data Sheets

T 2171 EN, T 2172 EN, T 2173 EN, T 2178 EN
T 2183 EN and T 2185 EN

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Typetested Safety Devices

Versions for G 1/2 to G 1 · DN 15 to DN 50 · PN 16 or PN 25 · Limit values to 120 °C

The regulators and limiters function according to the adsorption principle or the vapor pressure principle.

The temperature-dependent pressure change in the sensor causes the valve plug position to change, thus changing the flow rate of the heating medium.

Table 1 gives an overview of the Series 43 Temperature Regulators.

Time behavior of thermostats

The regulator's dynamics is largely determined by the sensor's response behavior and its typical time constant.

Table 2 shows the time constants of SAMSON thermostats for Series 43 Regulators with varying functioning principles on measuring water.

Table 2 · Time behavior of thermostats

Principle	Type	Without thermowell			
		Without		With	
Adsorption	2430 K	15 s ¹⁾	30 s ²⁾	40 s ¹⁾	80 s ²⁾
	2439 K	- ³⁾		40 s	
Vapor pressure	2403 K	3 s	- ³⁾		

¹⁾ DN 15 to 25 ²⁾ DN 32 to 50 ³⁾ Not permissible

Temperature Regulators TR (Fig. 6) consist of a Type 2430 K Control Thermostat (3) and a valve (1).

They control the temperature and adjust the energy supply when the temperature exceeds the adjusted set point.

Safety Temperature Monitors STM

Safety Temperature Monitors (STM) (Fig. 7) consist of a Type 2403 K Safety Thermostat (4) and a valve (1).

The safety thermostat not only closes the valve when the temperature reaches its limit value adjustable between 60 to 75 °C, 75 to 100 °C or 100 to 120 °C, but also when the capillary tube ruptures or when there is a leak in the sensor. It resets itself automatically when the fault has been removed and the temperature has fallen below the limit value.

Legend for Figs. 6 to 11

- 1 Type 2431 K, Type 2432 K, Type 2435 K, Type 2436 K, Type 2437 K Globe Valves
- 2 Type 2433 K Three-way Valve
- 3 Type 2430 K Control Thermostat
- 4 Type 2403 K Safety Thermostat
- 5 Type 2439 K Safety Thermostat
- 6 Electric signal transmitter (optional)

Table 1 · Overview of temperature regulators

Regl. Type	With valve			Details see Data Sheet
	Type	Nominal size	PN	
43-1	2431 K	G 1/2 to G 1	25	T 2171 EN
43-2	2432 K	DN 15 to DN 50 ²⁾	25	
43-3	2433 K	G 1/2 to G 1	25	T 2173 EN
		DN 15 to DN 50 ²⁾		
43-5	2435 K	G 1/2 to G 1	25	T 2172 EN
43-6 ¹⁾	2436 K	G 1/2 to G 1	16	
		DN 32 to DN 50 ²⁾	25	
43-7	2437 K	DN 15 to DN 50	25	T 2178 EN
43-8	2432 K	DN 15	25	
Double adapter/manual adjuster				T 2176 EN

¹⁾ Reverse function: "valve opens" instead of "valve closes"

²⁾ Also available with flanged body made of EN-JS1049 for DN 32 to 50

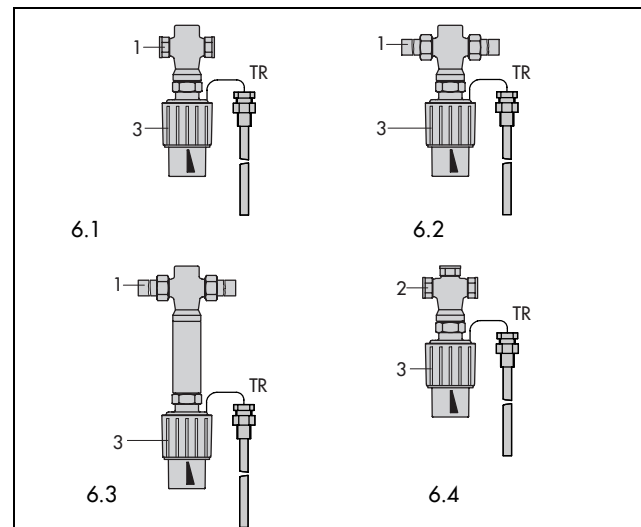


Fig. 6 · Temperature Regulators (TR)

6.1 · Type 43-1 or 43-5

6.2 · Type 43-2 or 43-6

6.3 · Type 43-7

6.4 · Type 43-3

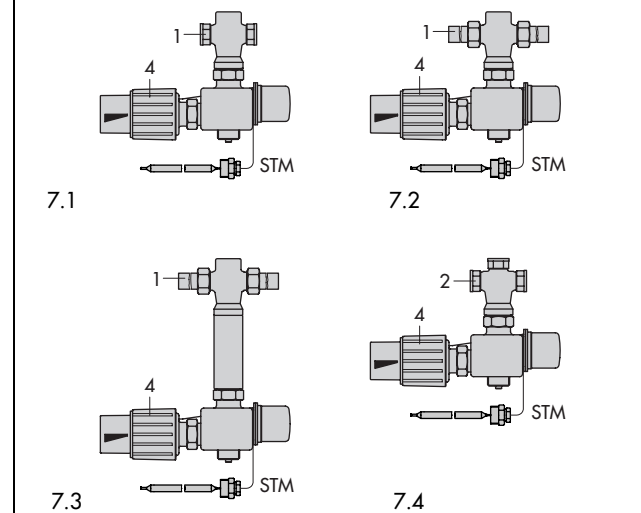


Fig. 7 · Safety Temperature Monitors (STM) with Type 2403 K Safety Thermostat

7.1 · Type 2431 K/2403 K or 2435 K/2403 K

7.2 · Type 2432 K/2403 K

7.3 · Type 2437 K/2403 K or 2436 K/2403 K

7.4 · Type 2433 K/2403 K

Temperature Regulators (TR) and Safety Temperature Monitors (STM)

The combination TR/STM (Fig. 8) consists of a Type 2403 K Safety Thermostat (4), a Type 2430 K Control Thermostat (3) and a valve (1).

The Type 2430 K Control Thermostat (3), additionally attached to the spring mechanism, functions in this combination as a temperature regulator.

Safety Temperature Limiters (STL)

The Safety Temperature Limiters STL (Fig. 9) consist of a Type 2439 K Safety Thermostat (5) and a valve (1).

The spring mechanism in the safety thermostat closes and locks the valve when the temperature reaches the limit value adjustable between 40 to 95 °C or 70 and 120 °C as well as when the capillary tube ruptures or when there is a leak in the sensor. It can only be reset and put back into operation with a screwdriver when the temperature has fallen below the limit value and the fault has been removed.

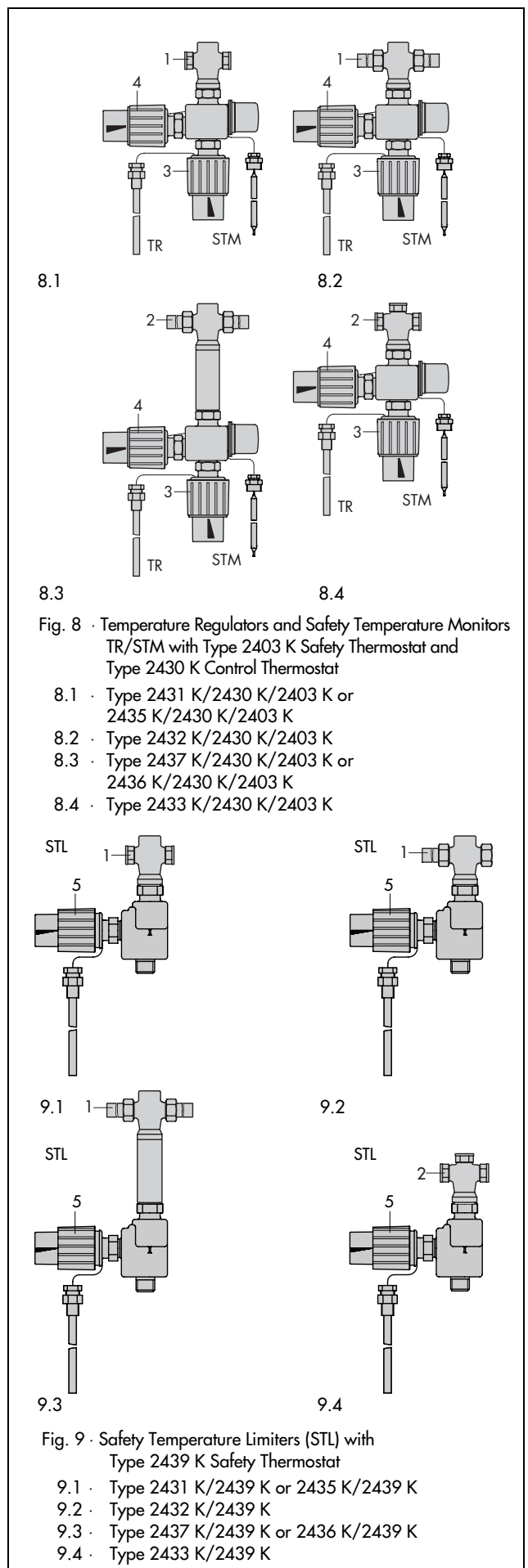
Typetested regulators conforming to DIN 3440

The following typetested regulators are available:

- Temperature regulators (TR) with Type 2430 K Control Thermostat.
- Safety temperature monitors (STM) with Type 2403 K Control Thermostat.
- Safety temperature limiters (STL) with Type 2439 K Safety Thermostat.

The register numbers are available on request.

Further details can be found in the Data Sheet T 2185 EN.



Temperature Regulators (TR) and Safety Temperature Limiters (STL)

The combination TR/STL (Fig. 10) consists of a Type 2439 K Safety Thermostat (5), a Type 2430 K Control Thermostat (3) and a valve (1).

The Type 2430 K Control Thermostat, attached to the Type 2439 K Safety Thermostat, functions in this combination as a temperature regulator (TR).

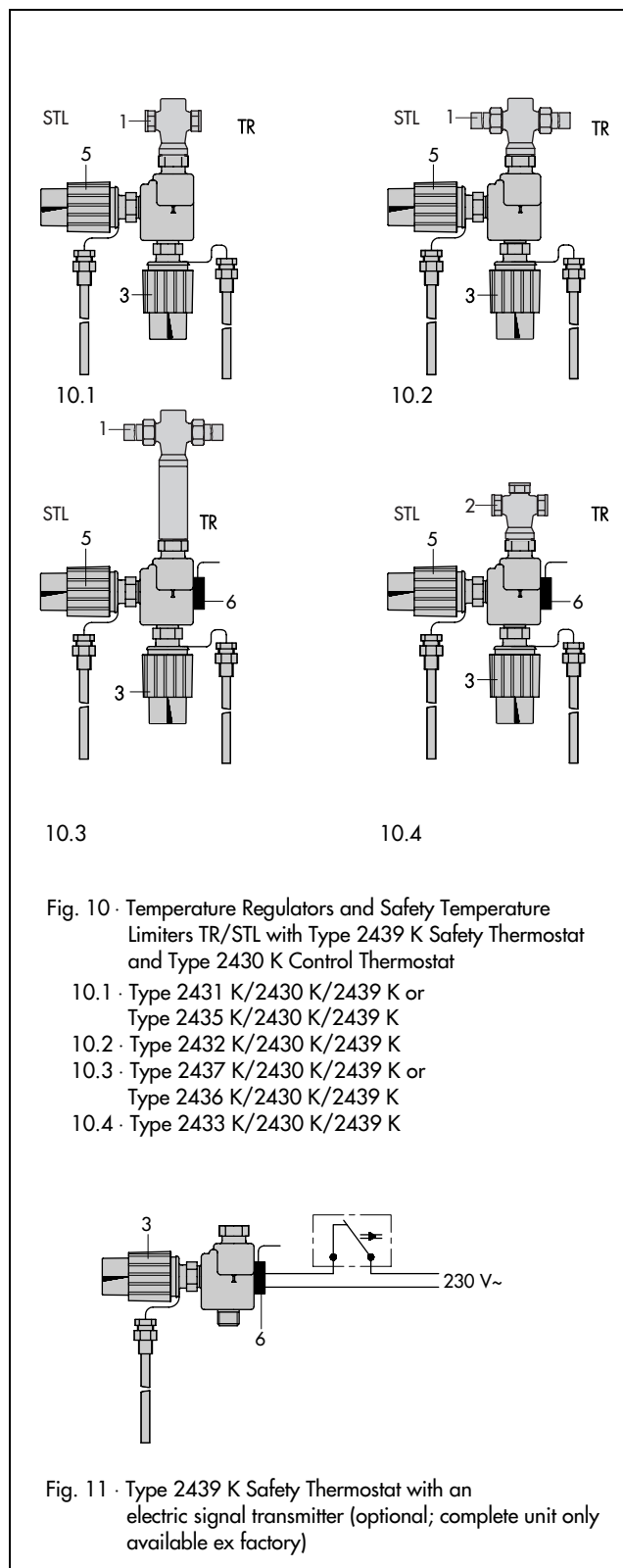
Pressure Limiters (PL)

In combination with a Type 2400 K Pressure Element, Temperature Regulators (TR), Safety Temperature Monitors (STM) and Safety Temperature Limiters (STL) can be used as typetested Pressure Limiters (PL): TR/PL · STM/PL · STL/PL. These devices have been typetested by TÜV (German Technical Inspectorate). Test marks are available on request.

Further details can be found in the Data Sheet T 2625 EN.

Electric signal transmitter

Type 2439 K Safety Thermostat is available ex factory with an electric signal transmitter which produces a signal for fault indication (Fig. 11).



Specifications subject to change without notice.



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T 2181 EN