

## T 2043 EN

### Safety Temperature Monitors (STM) with Type 2213 Safety Thermostat Self-operated Temperature Regulators



#### Application

Safety temperature monitoring of the energy supply to heat generators or heat exchangers by closing the valve.

For limit signals from  $-10$  to  $120$  °C · Valves DN 15 to 150 · PN 16 to 40 · Max.  $350$  °C

#### Note

Devices tested according to DIN EN 14597 are available for installations according to DIN 4747-1 or DIN EN 12828.

Further details on the application of safety temperature monitors can be found in Information Sheet ▶ T 2040.

Safety temperature monitors (STM), with a valve and Type 2213 Safety Thermostat, operate without auxiliary energy and are designed for extended safety according to DIN EN 14597. The valve is closed by a spring mechanism when the temperature reaches the adjusted limit, when the capillary tube breaks or when leakage occurs in the sensor system. The safety temperature monitor is automatically reset after the fault has been remedied and the temperature has fallen below the limit.

#### Version

Safety temperature monitors consist of a Type 2111 or Type 2114 Globe Valve or a Type 2119 Three-way Valve and a Type 2213 Safety Thermostat · Type 2213 Safety Thermostat consisting of a temperature sensor (with thermowell, if required) with limit adjustment, capillary tube and connecting element with spring mechanism.

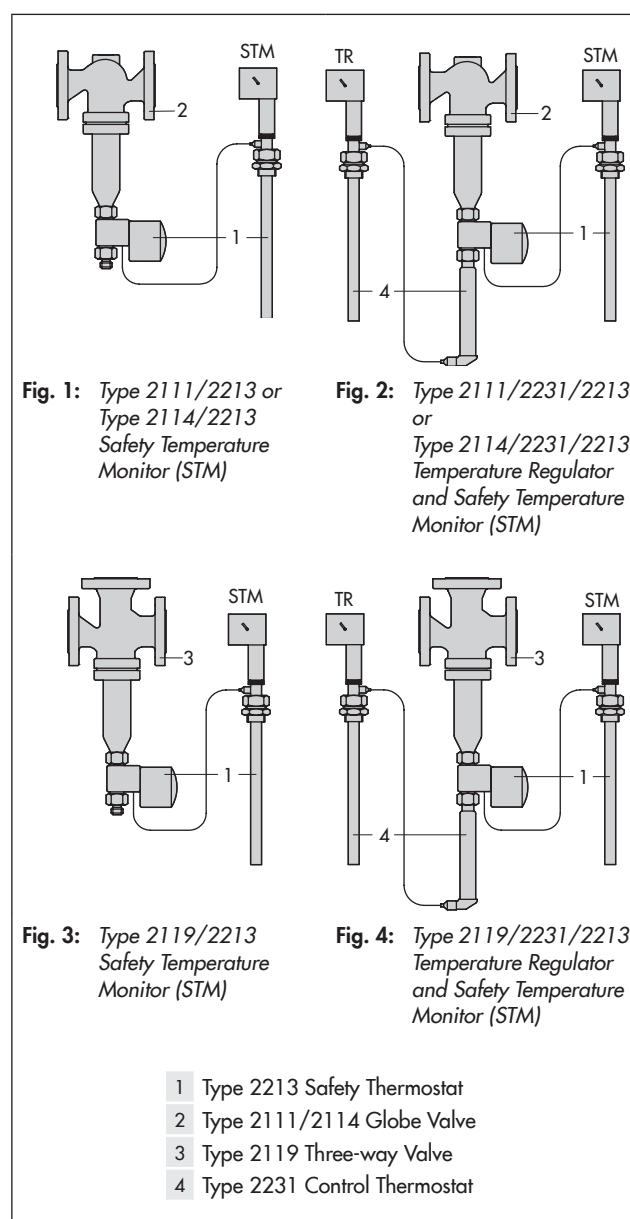
**Safety temperature monitor (STM)** (see Fig. 1 and Fig. 3)

**Type 2111/2213** · With Type 2111 Globe Valve for DN 15 to 50 and Type 2213 Thermostat · Unbalanced · Flanged connection

**Type 2114/2213** · With Type 2114 Globe Valve for DN 15 to 150 and Type 2213 Thermostat · Balanced · Flanged connection

**Type 2119/2213** · With Type 2119 Three-way Valve for DN 15 to 150 and Type 2213 Thermostat · Balanced <sup>1)</sup> · Flanged connection

<sup>1)</sup> DN 15 to 25 unbalanced



Temperature regulators and safety temperature monitors (TR/STM) (Fig. 2 and Fig. 4) consist of one of the above mentioned devices Type ... /2213 and a Type 2231 Control Thermostat tested according to DIN EN 14597, for example:

**Type 2114/2231/2213** · With Type 2114 Valve for DN 15 to 150 · PN 16 to 40 · Type 2231 Control Thermostat and Type 2213 Safety Thermostat

In these device combinations, a Type 2232 or Type 2234 Control Thermostat tested according to DIN EN 14597 can be used instead of a Type 2231 Control Thermostat.

Details on valves and control thermostats can be found in:

Data Sheet ▶ T 2111 with Type 2111 Globe Valve

Data Sheet ▶ T 2121 with Type 2114 Globe Valve

Data Sheet ▶ T 2133 with Type 2119 Three-way Valve

### Principle of operation (see Fig. 5)

The safety temperature monitors (STM) operate according to the liquid expansion principle. The temperature sensor (12), capillary tube (9) and operating element (8) are filled with an expansion liquid.

The temperature-dependent change in volume of the liquid in the bulb sensor (12) causes the piston in the operating element (8) to move. As a result, the pin of the operating element (7) moves the plug stem (5) with the plug (3). The temperature limit can be adjusted by a key (10). This limit value is indicated on the scale (11).

The thermostat closes the valve when the temperature reaches the adjusted temperature limit. The thermostat resets itself automatically when the temperature has fallen to a value of approx. 5 K below the adjusted limit.

The spring mechanism in the operating element is released when the capillary tube breaks or when there is a leak in the sensor. It moves the plug stem (5) with the plug (3) over the pin (7) and closes and locks the valve.

### Special installation regulations according to VdTÜV:

Install the safety temperature monitor only in combination with an upstream strainer (e.g. Type 2 NI in Data Sheet ▶ T 1015).

Only use the thermowells delivered by the manufacturer.

### Register number of devices tested according to DIN EN 14597:

The test marks for the type test of the Type 2111, Type 2114 and Type 2119 Valves with Type 2213 Safety Thermostat (STM), with Type 2231, Type 2232 and Type 2234 Control Thermostats are available on request.

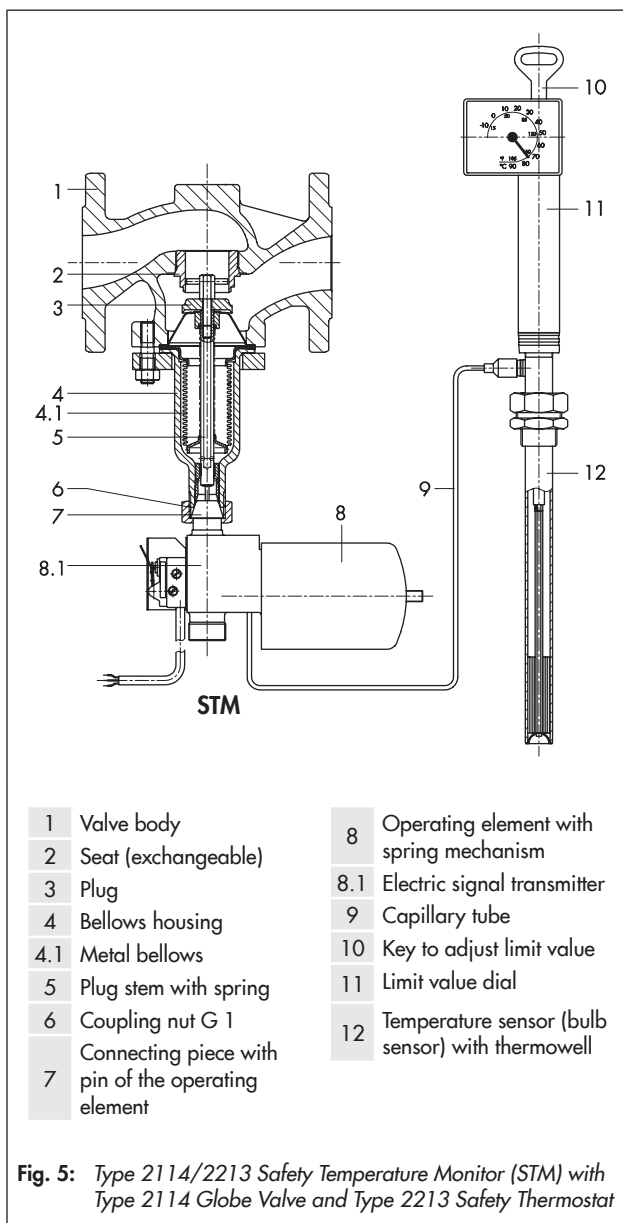


Fig. 5: Type 2114/2213 Safety Temperature Monitor (STM) with Type 2114 Globe Valve and Type 2213 Safety Thermostat

### Installation

#### – Valve

The valves must be installed in horizontal pipelines. The direction of flow must match the arrow on the valve body and the connecting element must be suspended downward.

#### – Capillary tube

The capillary tube must be run in such a way that the ambient temperature range cannot be exceeded, any large deviations in ambient temperature cannot occur and that the tube cannot be damaged. The smallest permissible bending radius is 50 mm.

#### – Temperature sensor

The temperature sensor can be installed in any position as required. Its entire length must be immersed in the medium. Select a place of installation where overheating and noticeable idle times will not occur.

Only the combination of the same kind of materials is permitted, e.g. a stainless steel heat exchanger with thermowells made of stainless steel 1.4571.

**Table 1: Technical data** · All pressure stated as gauge pressure in bar

Valves		Type 2111, Type 2114, Type 2119											
Connection	DN	15	20	25	32	40	50	65	80	100	125	150	
Type 2111	More details on the technical data for valves and control thermostats can be found in the specified data sheets.	Data Sheet ▶ T 2111						-					
Type 2114		Data Sheet ▶ T 2121											
Type 2119		Data Sheet ▶ T 2133											
Pressure rating		PN 16 to 40											
<b>Type 2213 Safety Thermostat for STM</b>													
Adjustable limit range		-10 to 90 °C · 20 to 120 °C											
Permissible ambient temperature range at the limit value adjuster		-40 to +80 °C											
Permissible temperature at sensor		100 K above the adjusted limit											
Permissible pressure at the sensor													
	With G 1 thermowell	PN 40											
	Without thermowell	PN 10											
Capillary tube length		5 m <sup>1)</sup>											
Electric signal transmitter													
	Max. load at 230 V (AC)	10 A with resistive load											
Compliance		<b>CE EAC</b>											

<sup>1)</sup> Special version: 10 or 15 m made of copper and 5, 10 or 15 m made of plastic-coated copper (10 and 15 m not typetested)

**Table 2: Materials** · Material numbers according to DIN EN

Type 2213 Safety Thermostat for STM			
Version		Standard version	Special version
Operating element		Nickel-plated brass	
Sensor		Bronze · Copper <sup>1)</sup>	-
Capillary tube		Copper	Plastic-coated copper
<b>Thermowell</b> (with conductive plate)			
With G 1 threaded connection	Thermowell	Bronze, steel, copper <sup>1)</sup>	
	Threaded nipple	Brass · Steel	
		CrNiMoTi steel	

<sup>1)</sup> Pressure rating PN 16

### Accessories

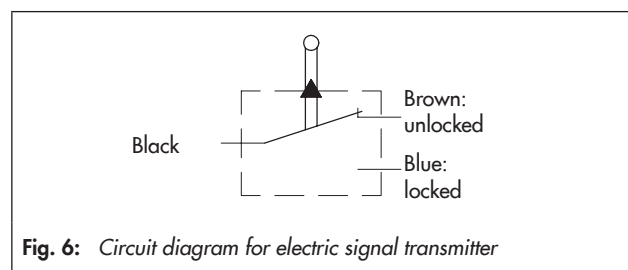
- **Extension piece** made of brass or CrNi steel to protect the connecting element against excessively high temperatures (see details in the associated data sheet).

In combinations of the Type 2111 Valve (body of cast iron, spheroidal graphite iron or red brass) with Type 2213 Safety Temperature Monitor, an extension piece is required for temperatures over 150 °C.

- **Thermowell** with G 1 threaded connection made of bronze (PN 40), copper (PN 16) or CrNiMo steel (PN 40).

### Special version

- **Electric signal transmitter** for remote transmission of the plant state. The signal transmitter contains a microswitch (max. load 230 V, 10 A at ohmic load) which generates a signal if the temperature limit is exceeded or if the sensor fails (capillary tube is broken).

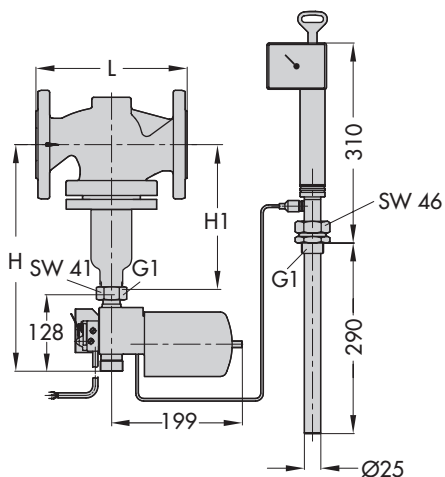


**Fig. 6:** Circuit diagram for electric signal transmitter

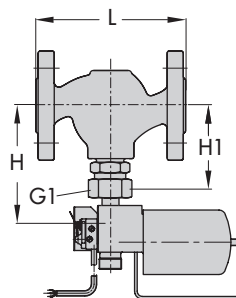
- **Special  $K_{VS}$  coefficient** (reduced) with Type 2111/2213, Type 2114/2213
- **Capillary tube** 10 or 15 m, made of copper and 5, 10 or 15 m made of plastic-coated copper (10 and 15 m not typetested)

Safety temperature monitor with Type 2213 Safety Thermostat

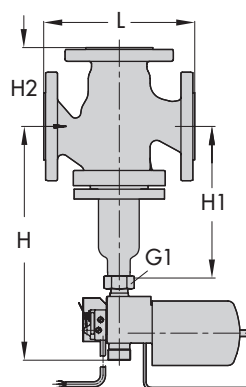
Type 2114 and Type 2111 Valve (1.0619, stainless steel)



Type 2111 Valve (EN-GJS-400-18-LT, EN-GJL-250)



Type 2119 Valve



Extension piece (weight approx. 0.5 kg)  
Add approx. 140 mm to the overall height H or H1 when an extension piece is used.

Thermowell for Type 2213  
With threaded connection G 1 for PN 40

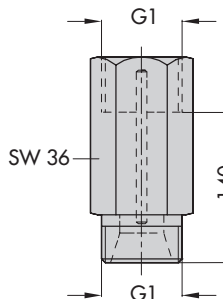
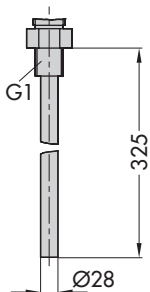


Fig. 7: Dimensional drawings of Type 2111/2213 · Type 2114/2213 · Type 2119/2213 · All dimensions in mm

**Table 3: Dimensions in mm and weights**

Valve	Type 2111										
Valve size DN	15	20	25	32	40	50					
Length L	130	150	160	180	200	230					
H1 <span style="margin-left: 20px;">Without extension <sup>1)</sup></span> <span style="margin-left: 20px;">With</span>	225 <sup>3)</sup> /82 <sup>4)</sup>			225 <sup>3)</sup> /152 <sup>4)</sup>			-				
	365 <sup>3)</sup> /- <sup>4)</sup>			365 <sup>3)</sup> /- <sup>4)</sup>							
Weight (PN 16 body) <sup>2)</sup> , approx.	4 kg	4.5 kg	5.5 kg	13 kg	13.5 kg	16 kg					

Valve	Type 2114										
Valve size DN	15	20	25	32	40	50	65	80	100	125	150
Length L	130	150	160	180	200	230	290	310	350	400	480
H1 <span style="margin-left: 20px;">Without extension</span> <span style="margin-left: 20px;">With</span>	225			225			300	355	460	590	
	365			365			440	495	600	730	
Weight (PN 16 body) <sup>2)</sup> , approx.	5 kg	5.5 kg	6.5 kg	13 kg	13.5 kg	16 kg	27 kg	32 kg	40 kg	70 kg	113 kg

Valve	Type 2119										
Valve size DN	15	20	25	32	40	50	65	80	100	125	150
Length L	130	150	160	180	200	230	290	310	350	400	480
H2	70	80	85	100	105	120	130	140	150	200	210
H1 <span style="margin-left: 20px;">Without extension</span> <span style="margin-left: 20px;">With</span>	235			245			320	355	395	500	
	375			385			460	495	535	640	
Weight (PN 16 body) <sup>2)</sup> , approx.	6 kg	7 kg	8.5 kg	15 kg	17 kg	19 kg	32 kg	50 kg	71 kg	On request	

Type 2213 Safety Thermostat		
Weight	Thermostat	5 kg
	Thermowell	0.5 kg
Overall height H	STM	H = H1 + 125
	TR/STM	H = H1 + 415

<sup>1)</sup> Type 2111: In combinations of valves made of cast iron, spheroidal graphite iron or red brass together with Type 2213 Safety Temperature Monitor, an extension piece is required for temperatures over 150 °C.

<sup>2)</sup> +15 % for PN 25/40

<sup>3)</sup> Type 2111, valve material 1.0619 and stainless steel

<sup>4)</sup> Type 2111, valve material EN-GJS-400-18-LT and EN-GJL-250

### Ordering text

#### Type .../2213 Safety Temperature Monitor (STM)

PN ..., DN ..., K<sub>VS</sub> ..., body material ...

With **Type 2213 Safety Thermostat**, limit range ... °C, limit adjusted to ... °C (standard 90 °C)

Optionally, accessories ...

Optionally, special version

#### Type .../2231/2213 Temperature Regulator with Safety Temperature Monitor (TR/STM)

Type 2111/2231/2213, Type 2114/2231/2213 or

Type 2119/2231/2213

PN ..., DN ..., K<sub>VS</sub> ..., body material ...

With **Type 2231 Thermostat**, capillary tube ... m, set point range ... °C

and

**Type 2213 Safety Thermostat**, capillary tube ... m, limit range ... °C, limit adjusted to ... °C (standard 90 or 110 °C)

Optionally, accessories ...

Optionally, special version

