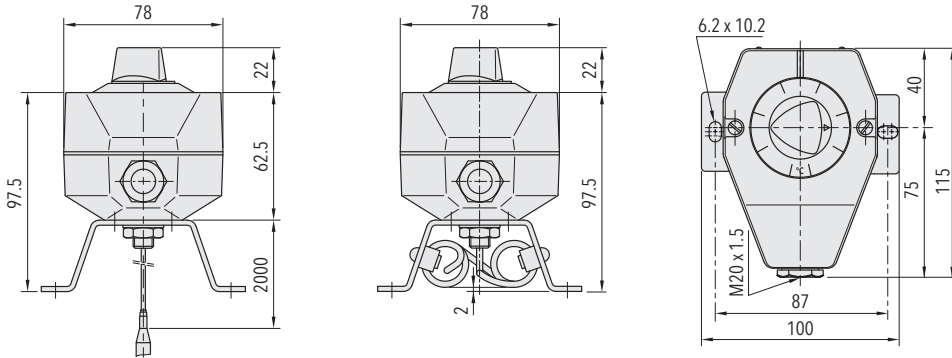


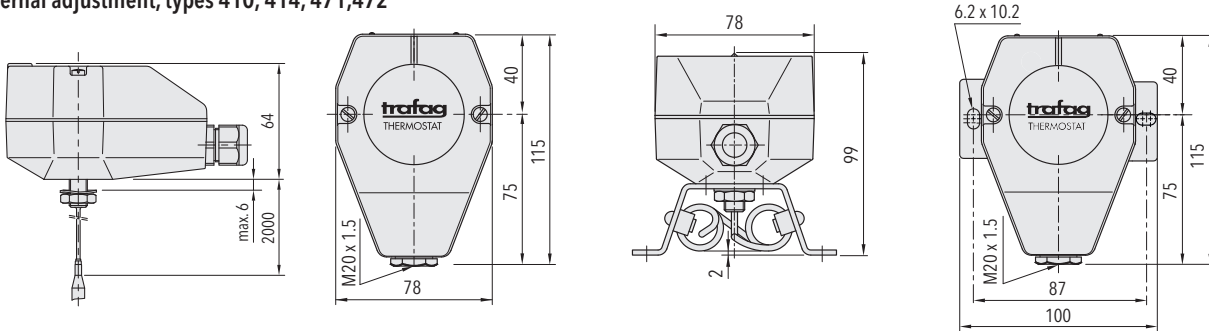
**Typ External adjustment, type 404, 412**



**Related documents**

- 404/414 [www.trafag.com/H72110](http://www.trafag.com/H72110)
- 410/412 [www.trafag.com/H72138](http://www.trafag.com/H72138)
- 409/419 [www.trafag.com/H72116](http://www.trafag.com/H72116)
- 471/472 [www.trafag.com/H72111](http://www.trafag.com/H72111)

**Typ Internal adjustment, types 410, 414, 471, 472**

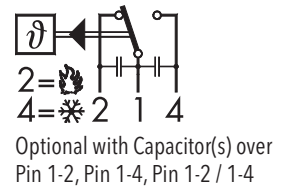
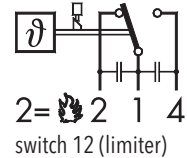
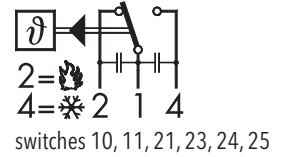


**Electrical data switch**

Type	Features	Rating Resistive Load (Inductive Load)	
		AC	DC
10	Small switching differential, not adjustable	125 V, 10 (1.5) A 250 V, 10 (1.25) A	250 V, 0.2 (0.02) A 125 V, 0.4 (0.03) A 30 V, 2 (1) A 14 V, 15 (2.5) A
11	Average switching differential, not adjustable	125 V, 15 (1.5) A 250 V, 15 (1.25) A 500 V, 10 (0.75) A	250 V, 0.25 (0.03) A 125 V, 0.5 (0.05) A 30 V, 6 (1.5) A 14 V, 15 (1.5) A
12	Average switching differential, high vibration resistance	125 V, 15 (1.5) A 250 V, 15 (1.25) A 500 V, 10 (0.75) A	250 V, 0.3 (0.2) A 125 V, 0.75 (0.4) A 30 V, 15 (1.5) A 14 V, 15 (1.5) A

Type	Features	Rating Resistive Load (Inductive Load)	
		AC	DC
21	Gold plated contacts, not adjustable	24 V, 0.1 (0.1) A 12 V, 1 (1) A 5 V, 2 (2) A	24 V, 0.1 (0.1) A 12 V, 1 (1) A 5 V, 2 (2) A
25	Adjustable standard switching differential	125 V, 15 (1.5) A 250 V, 15 (1.25) A 500 V, 10 (0.75) A	250 V, 0.25 (0.03) A 125 V, 0.5 (0.05) A 30 V, 6 (1.5) A 14 V, 15 (2.5) A
24	Adjustable large switching differential	125 V, 15 (1.5) A 250 V, 15 (1.25) A 500 V, 10 (0.75) A	250 V, 0.3 (0.2) A 125 V, 0.75 (0.4) A 30 V, 15 (1.5) A 14 V, 15 (1.5) A

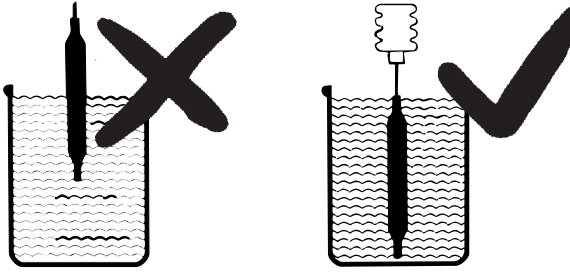
**Electrical connections**



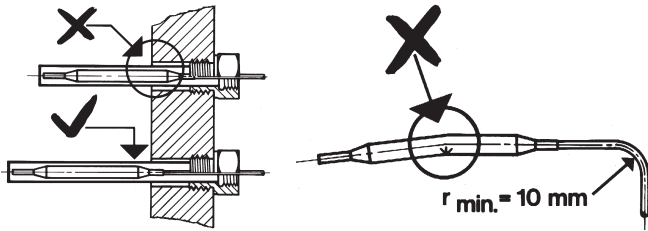
**Switchpoint ranges**

Product	Code	Range [°C]	Sensor max. [°C]	Code	Range [°C]	Sensor max. [°C]	Ambient temperature	Storage temperature
I/IS 404/414	01	-30 ... +40	45	20	+5 ... +95	105	Range: ≤ +45°C: -30°C ... +50°C +45°C ... +250°C: -30°C ... +70°C > +250°C: -10°C ... +70°C (Important: Temperature at sensor may not exceed maximum sensor temperature)	Range: ≤ +40°C: -30 ... +50°C > +40°C: -30 ... +85°C
IS...R 410/412	07	-10 ... +25	60	23	+20 ... +110	115		
ISN/ISNT 471/472	09	0 ... +35	70	31	+20 ... +150	165		
	11	+10 ... +45	85	24	+20 ... +230	250		
	13	+10 ... +80	100	53	+40 ... +300	330		
	94	-10 ... +35	70	54	+70 ... +350	380		
IA/IAS 409/419	02	-30 ... +30					-30 ... +40	Range: ≤ +40°C: -30 ... +50°C > +40°C: -30 ... +85°C
	06	-30 ... +50					-30 ... +50	
	10	-30 ... +70					-30 ... +70	
	12	0 ... +60					-30 ... +70	

## Mounting of sensor



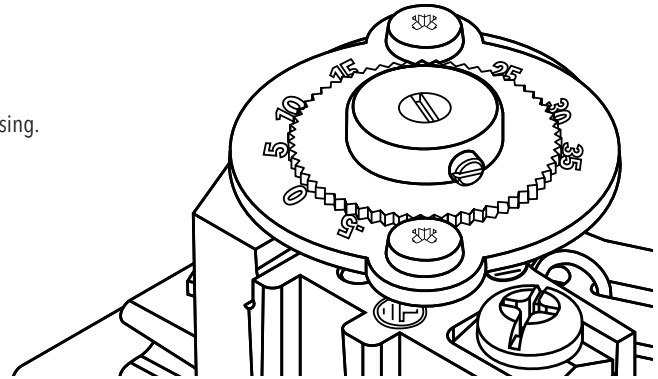
The sensor must be fully immersed in the media to have accurate switching and reproducible response times.  
The capillary tube should not be immersed in media.  
Thermal effects on the capillary tube will affect the switching point.



If the protection tube is filled with heat-conducting oil to improve the heat transfer, the thermal expansion of the oil over the whole temperature range must be considered.

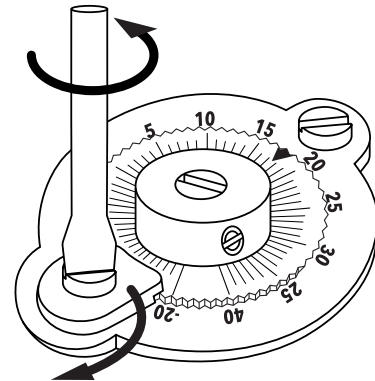
## Adjustment of switch point

1. Immerse sensor in calibrated bath or dry block.  
Set environmental conditions for capillary tube similar to target application.
2. Wait approx. 1 hour to ensure constant condition of sensor, capillary tube and housing.
3. Adjust switchpoint (release switchpoint locking before adjusting).  
Increasing switchpoint: slowly turn set point screw clockwise from lower to higher temperatures until the microswitch clicks.  
Decreasing switchpoint: slowly turn set point screw counter-clockwise from higher to lower temperatures until the microswitch clicks.
4. In case the indicated temperature on the dial differs too much from the set temperature, the dial can be adjusted according page 3 of this instruction. (online version only, [www.trafag.com/H73111](http://www.trafag.com/H73111))



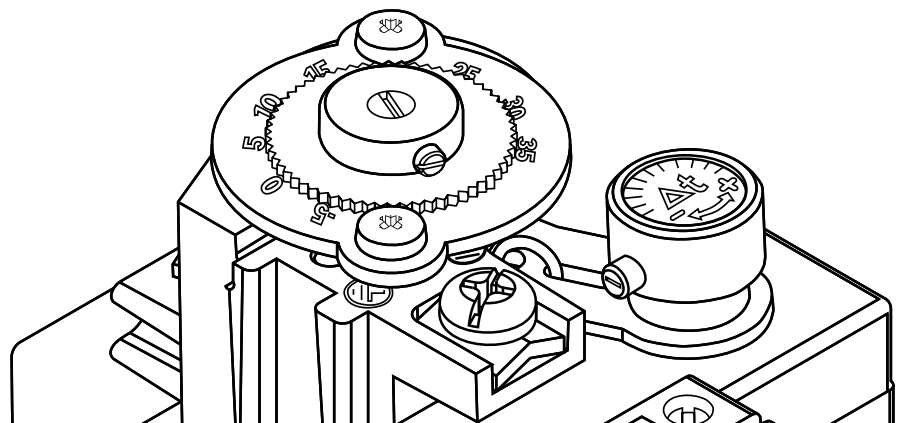
## Release of switchpoint locking

To adjust the switch point, the switchpoint locking must be released before turning the set point screw. After completing the adjustment, the switchpoint must be locked again.



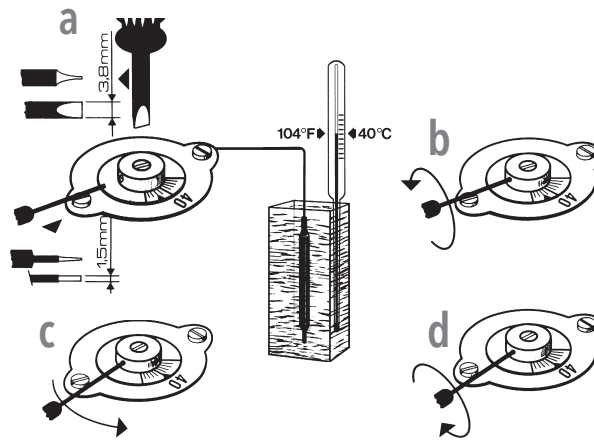
## Adjustable switching differential

The differential can be set by turning the knurled knob on the operating lever. The knurled knob is equipped with a scale. Turning to the left (direction of arrow +) increases the differential. Turning to right (direction of arrow -) decreases the differential. The adjustment of the differential only affects the lower switchpoint, the upper switchpoint remains unchanged.



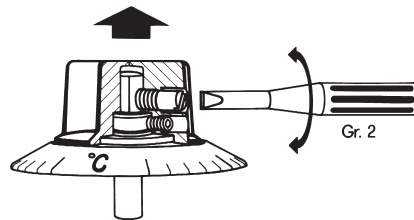
## Adjustment of switchpoint indicator scale

### Instruments with internal setpoint adjustment

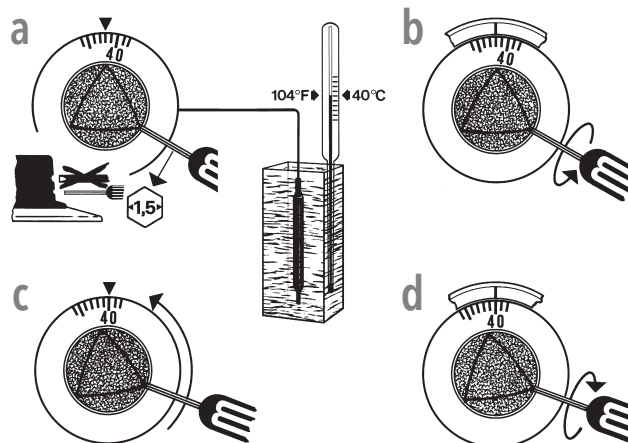


### Instruments with external setpoint adjustment

1. Release the setpoint knob



2. Adjust the scale based on a reference temperature



3. Fix the setpoint knob again

