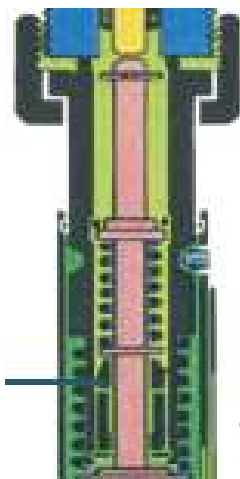




Introduction

It is easy to service self-acting thermostats from Clorius Controls. The simple mechanic construction can be disassembled and serviced even after years of operation by refilling liquid (glycerin) and mounting new seal rings in case of leakage. This means that controlling can continue without problems even when maintenance is required at remote destinations



Stuffing box
(pack box)

It is not necessary to interrupt operations in order to service a self-acting thermostat from Clorius. The stuffing box (also named pack box) is an independent unit, which can remain on the valve while the thermostat is removed. This means that maintenance can be performed during normal operating hours without interrupting operations.

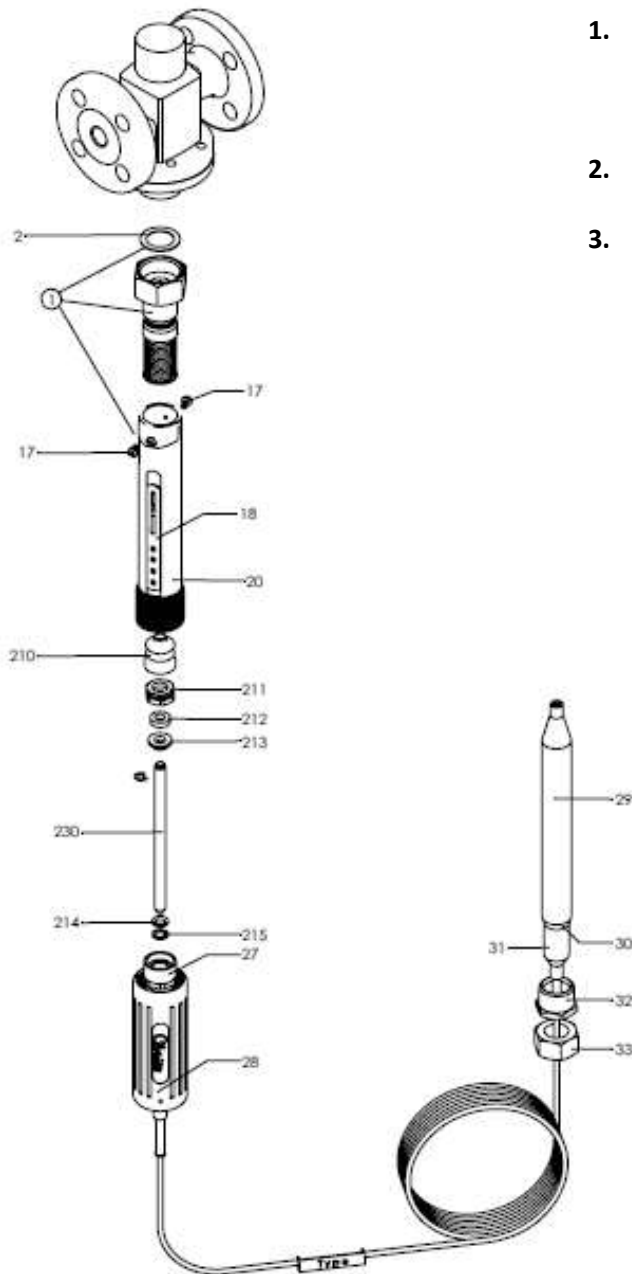
Temperature setting

Turn the handle (28 – see page 2) until the upper edge indicates the desired temperature on the scale (18 – page 2)

Calibration

Imagine that the thermostat controls the temperature in a tank. You observe that the thermometer mounted in the tank shows a temperature of 60°C, but the temperature setting of the thermostat is only 50°C/122°F/122°F. In other words you require 50°C/122°F/122°F in the tank, but the actual tank temperature is 60°C. To solve the problem a simple calibration is needed.





1. Without turning the handle (28), push the scale (18) until it shows the actual tank temperature of 60°C. The scale is now calibrated for all settings.
2. Now, turn the handle to the required setting of 50°C.
3. After some time the temperature in the tank will decrease to 50°C.

Valve leakage

If the medium leaks from the valve, it can be due to two reasons:

1. The packing between the valve and the thermostat (2) must be replaced.
2. The stuffing box (1) is leaking and must be replaced.

How do you know, if the packing (2) or if the stuffing box (1) must be replaced?

1. If the media leaks between the valve and the thermostat, the packing must be replaced.
2. If the media passes through the stuffing box to the scale (18) or the capillary, the stuffing box must be replaced.

Spare parts

Packings fitting all thermostat types can be purchased in bags of 25 pcs. No. **1-3990281**

Stuffing box fitting all thermostat types can be purchased as single units: **No. 1-3990591**

If after a long period of use the thermostat has lost such a large proportion of its fluid (glycerin) that it can no longer close the valve, it must be topped up. This is made as follows:

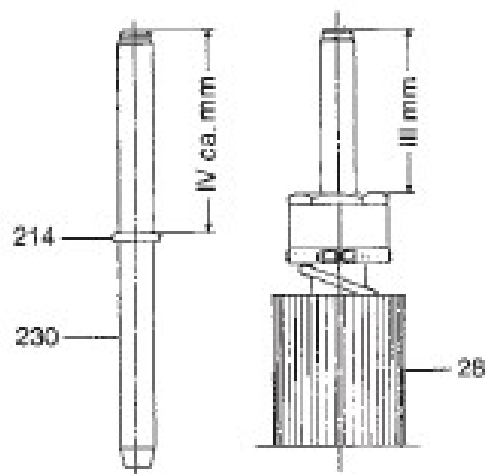
1. Draw off the indicating bushing (19) so that it is free of the handle (28).
2. The handle is then turned towards higher temperatures, until it can be removed from the supporting tube (20).
3. Remove the bellow (210), slacken and remove the threaded bushing (211), remove the two felt rings (212) and the bushing (213).
4. The piston (230), the O-ring (214) and the supporting ring (215) can now be drawn out of the cylinder (27).

NB: Take care not to damage the interior of the cylinder when removing the parts in question. It is recommended to use a wooden stick, never a screwdriver!

The piston should be polished with a soft clothes. If scratched, the piston must be replaced. The fitting of the new packing parts can now begin.

Let's use an example to explain how to assemble a thermostat after topping up with glycerin. We imagine that the thermostat is type V4.10 with a temperature range of 30-90° C.

1. Start mounting the O-ring (214) and the supporting ring (215) on the piston (230). In the below drawing and table 1 you will find a guide showing the approx.. distance IV from the top of the piston to the O-ring. At an approx.. surrounding temperature of 20 degree C, the distance must be approx.. 32 mm (see the table 1 page 3).
2. Pour glycerin into the cylinder (27).
3. Slide the piston into place. **Recommendation:** Hold a cloth around the handle (28) to collect excess glycerin.
4. Screw in the threaded bushing (211). Thereby the piston (230) will be pushed out slightly.
5. Check, if the thermostat has been assembled correctly by measuring the distance from the top of the threaded bushing (211) to the top of the piston (230). As it appears from III in the below table 1, the distance must be approx.. 25 mm. If the actual measurement deviates more than 2-3 mm from the stated measurement – in this example 25 mm – it is necessary to open the thermostat and correct the distance IV from the top of the piston to the O-ring.



			V2.05	V4.03	V4.05	V4.10	V4.09	V8.18
20°C	II	°C	0-60	0-160	0-120	0-60	0-120	0-60
	III	mm	35	40	45	55	70	85
	IV	mm	40	47	52	62	80	95
	II	°C	30-90		40-160	30-90	40-160	30-90
	III	mm	20		25	25	35	55
	IV	mm	25		32	32	45	65
35°C	II	°C	60-120			60-120		60-120
	III	mm	10			10		10
	IV	mm	15			17		20
V mm/°C			0.5	0.25	0.5	1	1.09	1.8

Test for air in the system

1. The fluid system must not contain air. Test it by pressing the piston towards a solid surface – e.g. the floor. If you can move the piston more than 2-3 mm, the system contains air. It must be expelled by heating the sensor. If you can move the piston less than 2-3 mm, you can assemble the thermostat fully.
2. When assembled check if the temperature scale (18) is placed correctly by turning the handle until the stuffing box piston is flush with the packing surface of the stuffing box.
3. The scale (18) must now be pushed to a setting temperature equal to the temperature where the sensor is placed. If the thermostat sensor is placed in a temperature of 20°C, the scale must be pushed until it indicates a setting temperature of 20°C.
4. Turn the handle to the requested setting temperature.
5. You have now finished your work successfully.

Important:

For temperature range 60-120 degree C, it is necessary to top up the cylinder at a temperature higher than 20°C. The details shown in the table 1 for this range apply to a sensor temperature of 35°C.

Suggestion:

You can place the sensor in a bucket of 35°C hot water.

FAQ: What to do if the surrounding temperature differs from 20 degree C when topping up with fluid?

We continue using the example of a thermostat type V4.10 with temperature range 30-90 degree C.

1. If the room temperature in which the thermostat is topped up with glycerin is e.g. 26°C, you need to check the table 1. At the bottom line of the V4.10 thermostat it is informed that mm/degree C = 1. It means that the thermostat spindle moves 1 mm for each degree Celsius the temperature by the sensor changes. In this example the surrounding temperature is 26 degree C. It means that the values III and IV must be increased by $(26-20)*1 = 6$ mm. In other words III must be increased to $25 + 6 = 31$ mm and IV must be increased from $32 + 6 = 38$ mm.
2. If the surrounding temperature is below 20°C, the calculated values must be deducted the values of III and IV.

Spare parts:

Packing set for thermostat type V2: item no: 1-3990346

Packing set for thermostat type V4: item no: 1-3990354

Packing set for thermostat type V8: item no: 1-3990362

Trim set for thermostat type V2: item no: 1-3990303

Trim set for thermostat type V4: item no: 1-3990311

Trim set for thermostat type V8: item no: 1-3990338

For content of the spare part sets we refer to spare part drawing on data sheet S-3.4.01-A