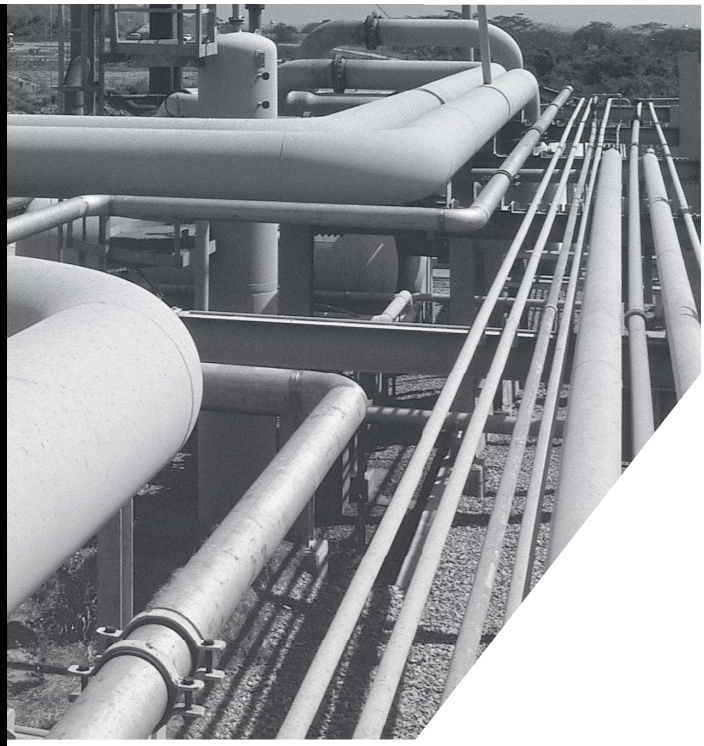
TEMPERATURE CONTROLLER

SELF-ACTING

ENSURES CONTINOUS OPERATION, ALWAYS

Self-acting temperature controller will operate in all conditions - without external controls or energy supply, resulting in continous operation instead of disasterous breakdown.



Clorius CONTROLS

SELF-ACTING TEMPERATURE CONTROLLER

4 REASONS FOR CHOOSING OUR SELF-ACTING CONTROLLER

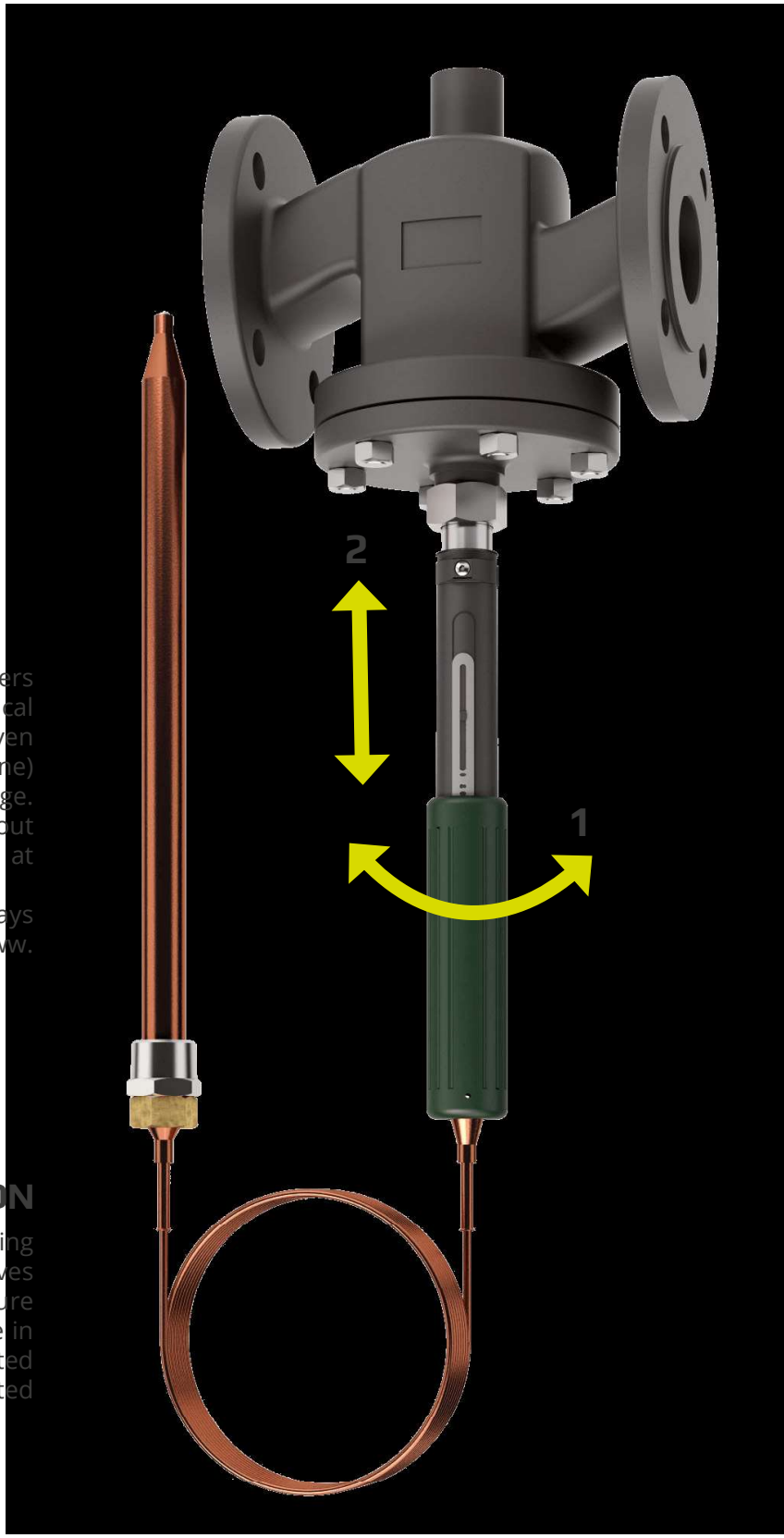
The thermostatic temperature controller, which consists of a thermostat and a valve, is used for controlling heating and cooling systems for central and district heating, industrial plants, marine, offshore, building and utility applications.

RELIABILITY

Self-acting temperature controllers from Clorius Controls will operate in all conditions - without external controls or energy supply. This is why the temperature controllers will continuously adjust temperature even when energy supply has been interrupted and control systems have shut down. The reliability of the temperature controllers ensures continous operation instead of disasterous breakdown.

PRECISE CONTROL

Self-acting temperature controllers from Clorius Controls are available for controlling temperatures between -30°C and 280˚C. The temperature controllers are easy to adjust and their technology makes it possible to maintain the set temperature very precisely, as the neutral zone of the controllers is from 1,5˚C - 2,5˚C. This ensures optimal operating conditions for the system being regulated.



EASY MAINTENANCE

It is easy to service self-acting temperature controllers from Clorius Controls. The simple mechanical construction can be disassembled and serviced even after years of operation by refilling liquid (glycerine) 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.
A service instruction is included, and you will always have access to an online service instruction at www.cloriuscontrols.com

MAINTENANCE DURING OPERATION

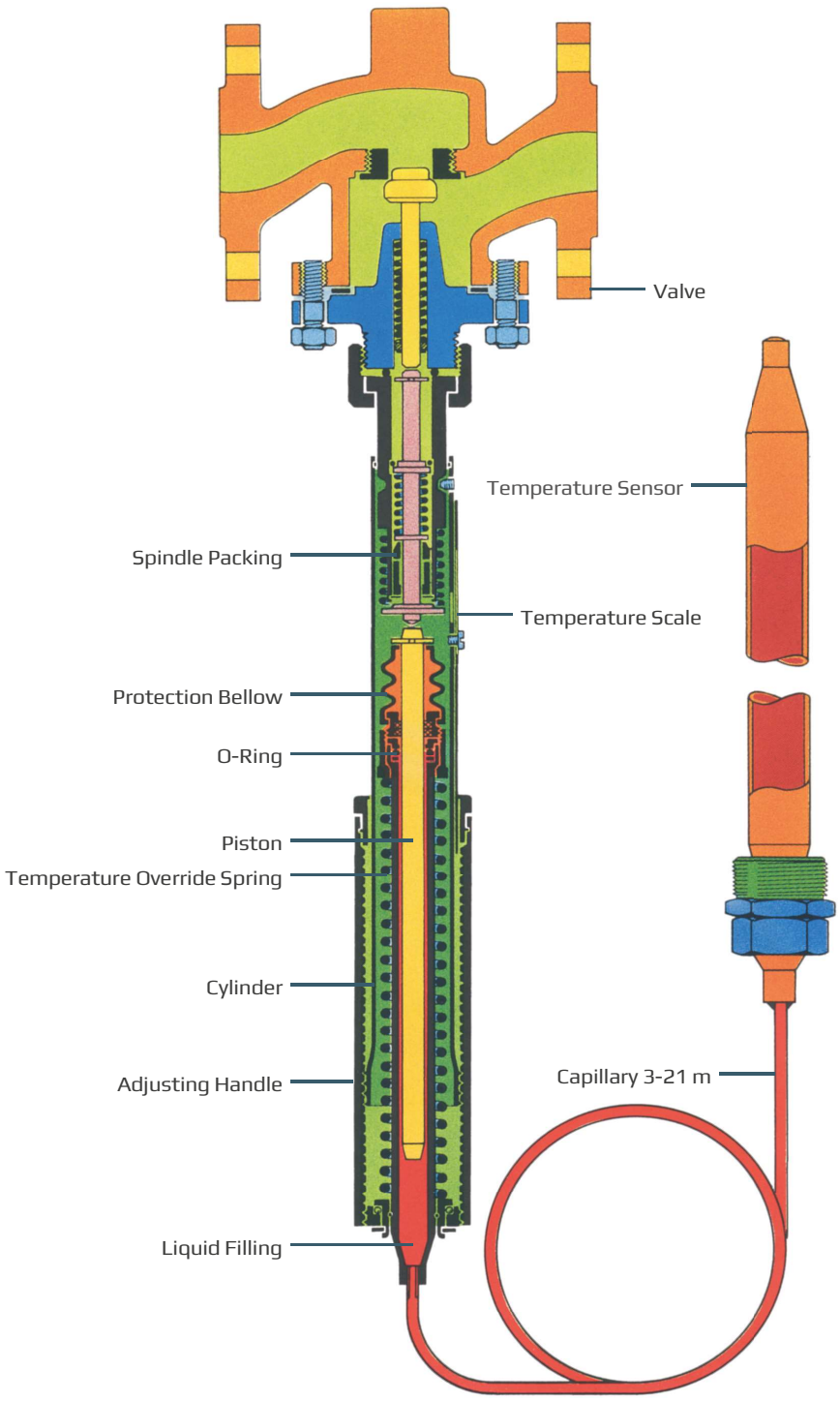
Balanced control valves are designed for regulating hot water, steam and hot oil systems. Balanced valves are used in installations where the system pressure necessitates a closing force greater than available in the actuator programme for a standard single seated valve, and where the leakage rate for a double-seated valve is unacceptable.

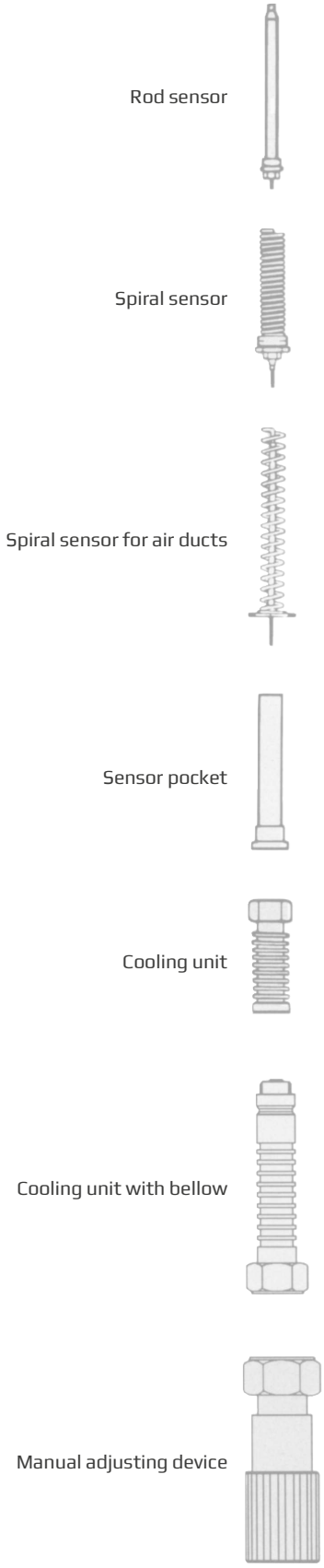
HOW DOES IT WORK?

STURDY DESIGN AND OPERATES WITH A LARGE CLOSING FORCE

A thermostat consists of a sensor and a capillary tube filled with liquid and an adjusting cylinder. The thermostat is self-acting and based on the principle of liquid expansion; it has a sturdy design and operates with a large closing force. The adjusting cylinder of the thermostat is set at the required temperature for the heated or cooled media in °C.

The temperature control is carried out by the thermostatically controlled valve reducing or increasing the flow of the heating (or cooling) media. If the temperature of the media to be heated is above the set point, the sensor liquid expands, causing the piston of the thermostat to act upon the valve, reducing the flow of the heating media.
If the temperature of the media to be heated is below the required level, the temperature of the sensor liquid falls, reducing the volume of the liquid, so that the piston allows the valve to open under its internal spring, thus increasing the temperature of the media.


Valve
Temperature Sensor
Spindle Packing
Temperature Scale
Protection Bellow
O-Ring
Piston
Temperature Override Spring
Cylinder
Adjusting Handle
Capillary 3-21 m
Liquid Filling


Rod sensor
Spiral sensor
Spiral sensor for air ducts
Sensor pocket
Cooling unit
Cooling unit with bellow
Manual adjusting device

SIMPLE DESIGN

NO OPERATING COST FOR CONTROLLING AND ACTIVATING THE VALVE.

Self-acting temperature controllers from Clorius Controls exploit the way in which liquid changes its volume as temperature fluctuates. Activation occures at deviations from the set temperature, where liquid from the sensor part influences the stem of the valve through a capillary tube.
Thus there are no operating costs for controlling and activating the valve.
Self-acting temperature controllers from Clorius Controls are also available with two sensors, which regulate according to the temperature at two measuring points.

INDIVIDUAL ADJUSTMENT

Self-acting temperature controllers from Clorius Controls come as a standard with 3m capillary tube in copper, but are available with up to 21m tube depending on the customer's need. The capillary tubes are available in copper or stainless steel and may also be protected by PVC or spiral reinforcement. Several types of sensors in copper and stainless acid-proof steel are available for different applications and measuring in different media. Threaded joints or flanges are available on request. For high-temperature use, cooling units for protection of the stuffing box are available.

CALIBRATION

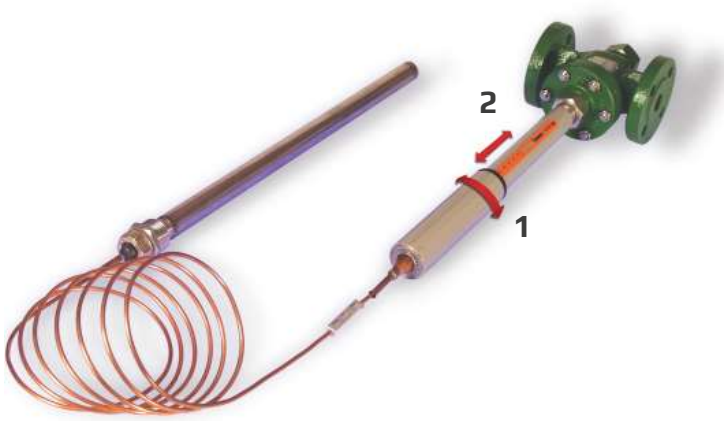
The controller is easy to calibrate in case of deviations between the set temperature and the actual temperature. Move the scale (2) until the set temperature is the same as the actual temperature. The scale will now be accurate.

ADJUSTING THE TEMPERATURE

Turn the handle (1) until the top of the scale bushing points to the wanted temperature on the scale (2).
The temperature seating can be changed at any time, also while the controller is in use.

THERMOSTATS OF STAINLESS STEEL

Clorius Controls additionally offers completely sealed thermostats of stainless steel, which are particularly suitable for installation in demanding environments such as outdoor plants and in non-magnetic areas, e.g. in submarines.



PRODUCT RANGE

When ordering a controller please specify the following:

- Thermostat type
- Temperature range
- Length of capillary tube
- Material of capillary tube
- Type of sensor
- Material of sensor
- Sensor connection

Please refer to our data sheets for our self-acting temperature controllers - in order to find the correct specfications for your needs.

Moreover, we advise you to visit our website and try our updated sizing software, Quick Choice. The software has been developed to quickly and accurately make calculations of a proper valve size, determine the flow cofficient and calculate valve specific data (kvs value, pressure drop).

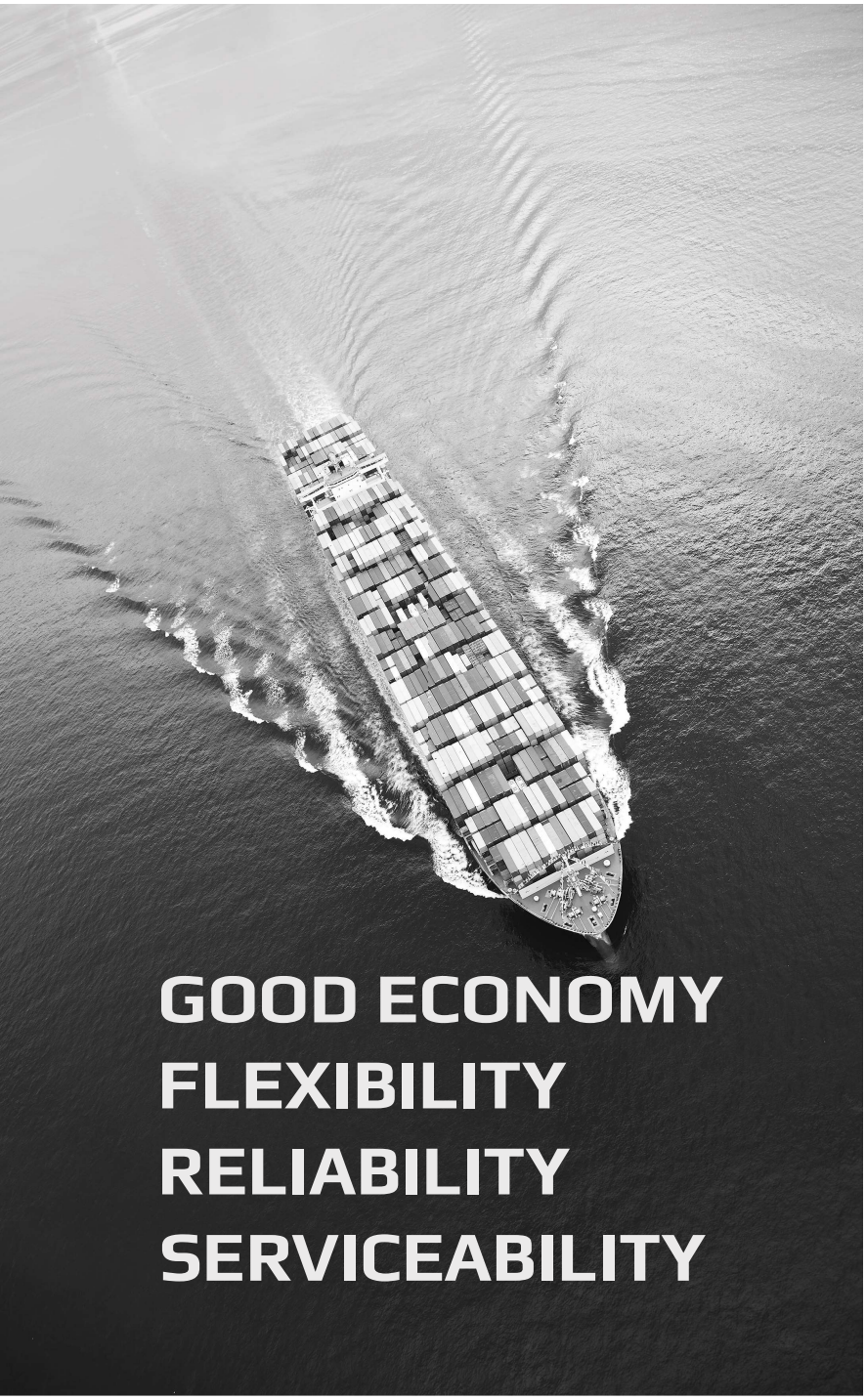
The software provides an easy to used interface, and is meant to help You choose the proper valve and actuator solution for Your application.

Below you will find an overview of the main controller types:

TECHNICAL DATA		CONTROLLER TYPES					
		V2.05	V4.03	V4.05	V4.10	V8.09	V8.18
Max. closing force	N	400	500	500	500	800	800
Setting range for standard thermostats [1]	ºC	0-60	0-160	0-120	0-60	0-120	0-60
		30-90		40-160	30-90	40-160	30-90
		60-120			60-120		60-120
Neutral zone	ºC	2.5	2	2	2	1.5	1.5
For valves with rated travel up to:	mm	10	21	21	21	21	21
Travel (amplification) in range:	-30 to 160ºC [2] mm/ºC	0.5	0.3	0.5	1	0.9	1.8
	140 to 280ºC [3] mm/ºC	0.7	0.33	0.7	1.33	1.2	2.4

[1] Setting ranges from -30 to 280ºC on request. - Excess temp. safety range: 40ºC [2] Glycerine [3] Paraffin

HOW YOU BENEFIT



Good economy

1. Clorius thermostatic temperature controllers are self-acting and require no external power supply. This means no running costs and minimum installation costs.

2. Clorius thermostatic temperature controllers respond accurately and quickly to load changes due to their direct acting liquid system.

Flexibility

3. Clorius thermostatic controllers can be delivered with different proportional bands fitting any control requirement.

4. Clorius thermostatic valves can be supplied from DN 15/4 mm up to DN 150 mm. 2-way and 3-way valves are available in gun metal, cast iron, nodular cast iron or cast steel.

5. The valves can be supplied for working pressures up to PN 40 and maximum operating temperatures of 350°C, making them suitable for water, steam and hot oil systems.

6. The seat and cone design ensures a quadratic characteristic, providing excellent control at all loads.

7. Clorius thermostats can be supplied with three different closing forces:

   Type V2: 400 N
   Type V4: 500 N
   Type V8: 800 N

8. Clorius thermostats can be supplied with rod or spiral sensors with threaded or flanged connections. Sensors are made in copper or stainless steel.

9. Clorius thermostats are available with setting ranges between -30°C and 280°C.

10. Clorius thermostats can be supplied with capillary tubes in lengths up to 21 m in either copper, stainless steel or PVC-covered copper.

Reliability

11. State-of-the-art mechanical technology and sturdy design ensure optimum reliability and accuracy, and give the thermostatic temperature controllers a long life.

12. Clorius direct acting thermostat systems have a very narrow neutral zone (1.5°C - 2.5°C) compared with bellow systems.

13. The use of a solid piston with a single “O” ring instead of bellows secures maximum actuator force and allows for complete on-site maintenance, if required.

14. In case of excessive temperatures a built-in safety spring will compensate for any additional expansion in the thermostat’s liquid system thereby preventing it from failure. One look at the controller will indicate whether the thermostat is exposed to excessive temperatures as the cylinder protrudes from the setting element.

Serviceability

15. No special tools are required for servicing Clorius thermostatic temperature controllers.

16. The stuffing box is an integral part of the thermostatic element for easy and simple maintenance of the valve.

17. Clorius thermostats can be calibrated to ensure that scale values correspond to the value at the sensor.

18. Glycerine is available at local supermarkets etc. for refilling of the Clorius thermostat. In emergencies even water may be used.
We refer to the instruction manual.

19. An optional manual adjusting device is also available for continuous operation of the valve during installation, repair and maintenance of the Clorius thermostat.

20. Our customers can easily change the set point by turning the adjusting handle.

21. Clorius thermostatic temperature controllers can generally be repaired on-site, if required.

Self-acting temperature controllers are easily disassembled for maintenance purposes.

Sensor liquid can be refilled in case of leakage.

DUOSTATS

Duostats are thermostats, type V, which via two sensing elements in a common hydraulic system act on one and the same control valve.

The sensing elements are two spiral sensors for the ventilation duct or two rod sensors (a combination of one spiral sensor and one rod sensor may be supplied in certain combinations). The effect, which the two sensing elements have on the adjustment, is proportional to the liquid volume of the individual sensors.
Duostats are therefore available with varying proportions between the liquid volumes of the two sensors (sensor proportions) and in that way they can meet the requirements made by a number of different adjustment problems. As the adjustment result in a weighted average value of the temperatures of the two sensors, no fixed adjustment value can be indicated. Hence, Duostats are not equipped with a temperature scale, but with a marking for adjustment towards higher or lower temperatures, respectively.

INDIVIDUAL ADJUSTMENT

- Adjustment of discharge air temperatures in hot-air heating plants, dependant on the outdoor temperature.

- Adjustment of two temperatures which are interdependant. E.g. the hot-water tank of a district heating plant with simultaneous control that the return water temperature does not become too high.

GENERAL APPLICATIONS

AIR HEATING PLANTS

For air heating plants Duostats with two spiral sensing elements for air ducts are used. **Fig. 1** shows an example of a plant with Duostat. The primary sensor V_p is the real control sensor which goes into the controlled system.
The secondary sensor V_s which is located outside the controlled system, registers the outdoor temperature and determines the necessary air temperature by V_p. If there is no supply air duct, where the secondary sensor can be built in, it can be placed in free air. For this purpose a wall bracket is available.

FIGURE 1

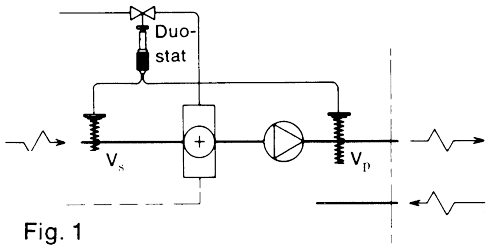


Fig. 1

OTHER APPLICATIONS

Duostats are sometimes used for purposes where both sensing elements go into the same controlled system (see examples 2 and 3). The controlled condition will then be a weighted average of the registrations of the two sensors, as shown in the following examples.
In **fig. 2** a hot-water tank connected to district heating is adjusted by a Duostat whose one sensor - the primary sensor - controls the temperature of the tank which should be constant. The secondary sensor registers the temperature of the water which is led back to the district heating network. It secures that the valve does not open so much that the temperature of the return water rises in an uncontrolled manner, when a large water consumption reduces the temperature in the tank.
Fig. 3 shows a room heated by hot air. The primary sensor is built into the extract air duct in order to serve as a room thermostat from this place. The secondary sensor is built into the discharge air duct where it counteracts that the discharge air temperature becomes too low - which would feel like a draught - when the room temperature rises as a result of the heat development which may come from persons or heating processes in the room.

FIGURE 2

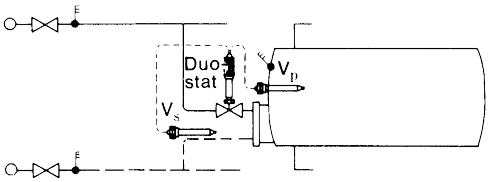
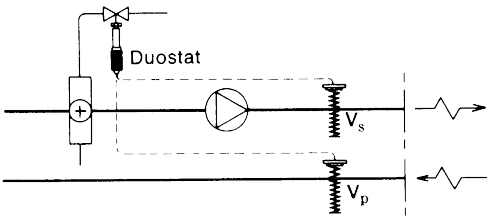


FIGURE 3



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