

CIRCON

Der elektronische Zirkulationscontroller
The electronic circulation controller
Le dispositif de contrôle électronique de circulation
De elektronische circulatiecontroller



Sparprogramm/Economy program/Programme économique/Energiebesparend programma:

Position / Positie	0	1	2	3	4
max. Laufzeit / max. running time / Temps de fonctionnement maximal / Maximale inschakelduur	5 min	10 min	15 min	20 min	30 min

Automatikprogramm/Automatic program/Programme automatique/Automatisch programma:

Position / Positie	5	6	7	8	9
max. Laufzeit / max. running time / Temps de fonctionnement maximal / Maximale inschakelduur	5 min	10 min	15 min	20 min	30 min

Komfortprogramm/Comfort program/Programme de confort/Comfortabel programma:

Position / Positie	A	B	C	D	E	F
Intervall / Interval / Intervalle / Tussentijd	5 min	10 min	15 min	20 min	30 min	40 min
max. Laufzeit / max. running time / Temps de fonctionnement maximal / Maximale inschakelduur	2 min	5 min	8 min	10 min	15 min	20 min

Scope of supply

Basic device with 2 temperature sensors,
Cable fastener, adhesive fabric tape,
Operating Manual

Functional description

The circulation controller **CIRCON** is a modern, microcontroller-controlled device for activating the circulation of hot water in a heating system depending on consumption.

Two temperature sensors monitor the changes in the flow and return temperatures in the circulation circuit. When water is withdrawn from the cooled down circuit, hot water rises from the heat storage tank into the flow pipe so that the pipe heats up rapidly. The temperature rise signals to **CIRCON** that water has been withdrawn, causing it to start the circulation pump. Thus, just briefly opening a hot-water tap at any point in the circuit will suffice for initiating circulation. Circulation stops automatically after a predetermined operating time is reached or after the water in the return pipe has also become sufficiently heated, whatever occurs earlier. If no return-line sensor has been connected, circulation always is switched off after the predetermined operating time.

In case of excess temperature of the water in the flow pipe, starting of the circulation pump is prevented. To avoid the multiplication of Legionella and putrefaction, the circulation pump is automatically activated once after every 48 hours during periods in which no water has been withdrawn.

Controls and indicators

All operating states are signalled via three coloured LEDs:

Flashing light green: Basic device ready for operation, flow and return temperatures are monitored.

Steady light yellow: Circulation pump is on.

Steady light red: Excess temperature in flow pipe.

Flashing light red: Flow-pipe sensor fault (not connected, line interruption or short-circuit)

Operating mode selector switch (works setting = 7, operation with screwdriver) (_ page 2):

Economy program:

- Function: Circulation starts after water has been withdrawn for a short time.
Advantage: Maximum energy saving effect.
Disadvantage: Hot water not *immediately* available at any time.
Important: **Never let the water run until hot water comes out of the tap. Briefly turning on the hot-water tap for one or a few seconds suffices for activating circulation.** After a certain time, which depends on the flow rate of the water (volumetric delivery of pump), hot water can be withdrawn immediately after the tap is turned on.

Automatic program:

- Function: As economy program. In addition, recurrent consumption times are learned and continually updated.
Advantage: No waiting time required for periodically recurring water consumption patterns. Energy saving effect is nevertheless high.
Disadvantage: If hot water is needed outside the regular pattern, hot water is not available *immediately* at any time.

Comfort program:

- Function: As automatic program. Additionally, a cyclic activation function which activates the pump in certain intervals irrespective of consumption .
Advantage: Depending on the length of the interval, hot water is immediately available at any time.
Disadvantage: Only moderate energy saving effect (will be the higher the longer the intervals are)

For an optimum utilisation of the advantage offered by the circulation controller, do not turn on any hot-water tap unless you do not want to wait for the hot water to come (e.g. if you just wish to briefly wash your hands). To remind the users of this, the scope of supply also includes stickers.

Installation



Important ! Read and observe safety hints before starting the installation !

Selecting the temperature measuring positions

The appropriate selection of the installation position and correct attachment of the temperature sensors is of decisive importance for the proper functioning of the device.

Identifying the appropriate pipes on the hot-water storage tank:

- 1) All pipes directly connecting the hot-water storage tank to the heating and hot-water boiler or heating circuit should not come up for closer consideration.
- 2) Characteristic features of the flow pipe (riser):
 - is usually not connected to the top side of the hot-water storage tank
 - is not directly connected to the cold-water pipe
 - is not fitted with a pump
 - in most cases, a three-way mixer valve (thickened T-piece) is installed
- 3) Characteristic features of the return pipe (circulation line):
 - may be connected to the hot-water storage tank from the side or from the top
 - has often a smaller cross-section than the flow pipe
 - is fitted with the circulation pump
- 4) To be on the safe side:
 - feel the temperature on the pipes coming into question with the circulation pump running
 - switch off circulation pump for about 30 min; do not withdraw hot water during this time (the two pipes of the hot-water circuit will now slowly cool down).

- switch on circulation pump again; now, first the flow pipe and then the return pipe will heat up.

Selecting the measuring position in the flow pipe:

If the sensor is fitted closer to the hot-water storage tank, the water quantity required for activating the circulation pump will be smaller. However, the temperature changes in the storage tank itself will also have a greater impact. In particular with continuous copper pipes, it is advisable to position the sensor at a sufficiently large distance from the tank. If there is a mixer valve in the circuit, install the flow sensor between the valve and the storage tank. Practical experience has shown that distances to the storage tank of about 20 to 40 cm are appropriate. With copper pipes, a somewhat greater distance, and with plastic pipes, a somewhat smaller distance should be chosen.

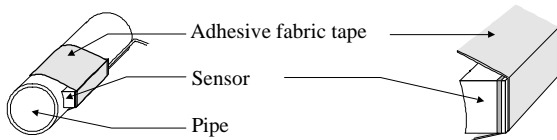
For systems including different materials, the following applies: Prefer metal to plastics and thin-walled to thick-walled parts for fitting the sensors. (Further useful hints can be found at www.dr-clauss.de/circon).

The measuring point in the return pipe is not critical, but it should be located as far away as possible from the hot-water storage tank.

Important: If you have changed the locations at which the sensors have been mounted, you have to newly start CIRCON. (Pull device out of socket outlet for a few seconds.)

Attaching and connecting the temperature sensors

Fasten sensors by means of adhesive fabric tape (included in scope of supply) longitudinally relative to the pipe so that the silicone sheath is uniformly pressed over its entire length with its concave contact surface onto the surface of the pipe. Make sure that no adhesive tape or other foreign matter comes to be placed between the sheath and the pipe and that the ends of the sensors are not bent.



Please mind the following:

- ◆ **Use only the adhesive tape supplied for this purpose for fastening the sensors! Do not use cable fasteners or any other adhesive tapes!**
- ◆ **Do not tear the silicone sheath. Do not expose to tensile forces!**
- ◆ **Exercise greatest care when fastening the sensors. Insufficient heat contact with the pipe may severely affect the proper functioning of the device.**

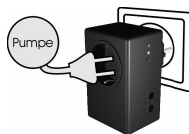
Lay the connecting leads in the direction of the basic device along the pipes or pump connection line so that persons cannot become caught or trip. Tighten the supplied cable fasteners only slightly so as not to constrict the cables.

Plug in the two sensor connectors on the side of the circulation controller in accordance with the colour marking.

- red** = temperature sensor on flow pipe
- blue** = temperature sensor on return pipe

Putting into operation

- Set desired operating mode on selector switch.
- Connect sensors.
- Plug mains plug of circulation pump into socket outlet of basic device.
- Plug basic device into 230V/50Hz wall-mounted socket outlet.



Functional test

- Green LED flashes and signals readiness for operation.
- If the hot-water line has already sufficiently cooled down, the pump must be activated when hot water is withdrawn from the circuit at any point in the house (activation is signalled by the lighting up of the yellow LED). The pump must be deactivated on expiry of the selected running period or prior to this when the temperature of the water in the return pipe has become sufficiently high.

Maintenance

The device is completely maintenance-free. Use exclusively a dry cleaning cloth for cleaning. Solvents or sharp-edged tools must not be used.

Troubleshooting

Fault	Possible cause	Remedy
<ul style="list-style-type: none">• After the pump switches on, the time it takes till hot water is available at the various taps differs, sometimes by many minutes• Controller switches off although hot water has not yet been supplied to all taps	<ul style="list-style-type: none">• Fault in the piping system: No optimum cross-sections in partial circuits or bypasses exist in the system• Pump capacity too low	<ul style="list-style-type: none">• Let controller operate without return sensor: Switch off pump after a fixedly set time• Use pump with a greater capacity
<ul style="list-style-type: none">• Pump switches on during heating up of the water in the hot-water storage tank although no tap has been turned on	<ul style="list-style-type: none">• Flow sensor arranged too close to the hot-water storage tank. Heat contact to storage tank too close• Hot-water storage tank heats up very fast	<ul style="list-style-type: none">• Install flow sensor at a point located farther away from storage tank• Do not make any changes (if no water is withdrawn, the storage tank will also be heated only infrequently; an additional circula-

Fault	Possible cause	Remedy
<ul style="list-style-type: none"> Pump switches on after prolonged standstill without any noticeable cause 	<ul style="list-style-type: none"> Legionella protection feature has become activated, or self-calibration feature has tripped 	<p>tion phase is acceptable)</p> <ul style="list-style-type: none"> System operates properly - no changes required
<ul style="list-style-type: none"> Pump does not start although hot water is withdrawn from system 	<ul style="list-style-type: none"> There is already hot water in the circuit Water in hot-water storage tank is not or only slightly heated 	<ul style="list-style-type: none"> Controller operates properly. In this situation, no cause for starting the pump exists
<ul style="list-style-type: none"> Pump switches on only after greater quantities have been withdrawn or does not switch on at all Pump switches on frequently without any noticeable cause 	<ul style="list-style-type: none"> Flow sensor not properly attached on flow pipe Insufficient heat contact between flow sensor and pipe Draught on sensor Sensor has not been fitted to pipe but to large fittings which heat up only slowly Sensor located too far away from hot-water 	<ul style="list-style-type: none"> Properly and very carefully position and fasten flow sensor (see installation instructions) Provide sensor together with pipe with heat insulation Select small wall diameters for fastening

Fault	Possible cause	Remedy
	storage tank	
<ul style="list-style-type: none"> • No LED display • Pump does not start although yellow LED lights 	<ul style="list-style-type: none"> • Program run has been disturbed by short disturbances in the power supply grid. • Defect, e.g. after overloading 	<ul style="list-style-type: none"> • Disconnect basic device for a few seconds from socket outlet. • Return device to manufacturer for repair
<ul style="list-style-type: none"> • Pump switches on again shortly after deactivation 	<ul style="list-style-type: none"> • Deactivation criteria are already detected in the hot-water circuit while the activation criteria are still active 	<ul style="list-style-type: none"> • No changes required, the controller automatically corrects the erroneous information

Technical data

Mains voltage	230 V AC 50 Hz (own power consumption max. 0.5 W)
Permissible output current	max. 1.6 A
Dimensions (LxWxH)	86 mm x 56 mm x 45 mm
Sensor connection leads	2x2.5 m with one connector each
Protective quality	to DIN VDE 0701





Safety hints

The circulation controller has been shipped from the manufacturer's works in a condition meeting all safety requirements. To ensure a safe operation, observe the following safety hints. We do not accept any liability for damage to property or personal injury caused by inappropriate handling and operation or non-observance of these safety hints.

Purpose, operating conditions

The basic device is exclusively intended, and has been approved only, for use in safety class I (with earthing contact) 230 V / 50 Hz AC grids in connection with the supplied temperature sensors and a circulation pump (230 V / max. 1.6 A). The circulation controller may not be used on human beings or animals.

The device and its accessories must not be opened, modified or reconstructed. Connecting other devices or components to the terminals designed for connection to the temperature sensors and circulation pump may cause personal injury or damage to the basic device or other equipment and is, therefore, not permitted.

The device must not be used in damp locations or outdoors or under severe environmental conditions (moisture or high humidity, dust and flammable gases, vapours or solvents, strong vibrations).



Installation

If the circulation pump is not fitted with a supply lead with fitted mains plug, a qualified electrician will have to fit this plug. Unqualified persons are not allowed to perform such works.

Install the temperature sensors so that existing devices and piping installations will not be damaged.

Special caution will have to be exercised in the proximity of installed gas lines.

The leads for connecting the temperature sensors and the circulation pump shall be laid and fastened so

that they do not cause a tripping hazard or that persons may not get caught.

After a sudden temperature change, e.g. after the device has been transported or stored, allow the device to acclimatise for at least 15 minutes before putting it into operation.

Operation

Make sure that the enclosure and insulation are neither damaged nor destroyed. The circulation controller must not be covered during operation to allow its own heat to dissipate at all times!

Keep children away from electronic devices operated at mains voltage!

In commercial facilities, the accident prevention regulations issued by the association for electrical installations and equipment shall be complied with, and the protective quality shall be tested in regular intervals in accordance with VDE 0701. In schools, training facilities, DIY and self-help workshops, trained personnel shall be assigned to supervise the operation of power supply units.

Important!

Where there are doubts as to the safe operation of the circulation controller, or where safe operation is no longer possible, switch off the device immediately and secure it against unintentional operation, in particular when:

- the circulation controller is visibly damaged,
- the temperature of the basic device rises excessively, or when it gives off a strong smell,
- malfunctioning of the controller occurs or the controller fails completely.

Under no circumstances may the enclosure be opened or enclosure parts removed!

Guarantee

This device is warranted by Dr. Clauß Bild- und Datentechnik GmbH within Germany for a period of 24 months, starting with the date of purchase from a dealer (a note of purchase should be produced as evidence). Dr. Clauß Bild- und Datentechnik GmbH will rectify during the warranty period free of charge any faults caused by defective material or workmanship and will at its own discretion repair or replace the defective part. Replaced parts/devices shall become our property. The original warranty period will not be extended by repairs or replacements. Any work performed by persons not authorised by us will make the guarantee null and void. This guarantee does not cover any damage caused by improper use, non-observance of the operating instructions, tampering by third parties or events of force majeure. We do not accept any liability for consequential damage resulting therefrom. This warranty does also not cover minor defects which have only an insignificant impact on the value or serviceability of the device.

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