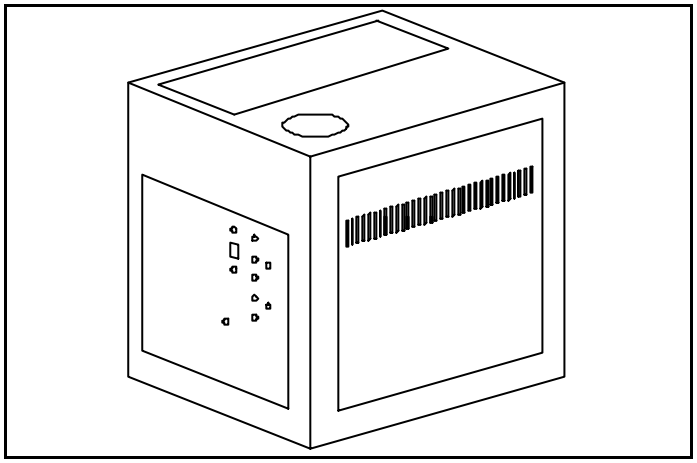
smeva



UTB-COMPACT

SERVICEMANUAL

version 12-1997

TABLE OF CONTENTS

1. WORKING OF THE UTB-COMPACT

1.1 The principle

The Smeva humidifier works according to the ultrasonic principle. With the assistance of electronics, a ceramic vibrating plate (the transducer), which is fixed in a easy detachable screw cap (transducer mounting head), is set into vibration at a certain frequency. By means of these vibrations, the water above the vibrating plate is also set into vibration and microscopically small droplets of water are swung upwards well over the water surface. The form and dimension of reservoir and piping is such that only droplets of usable size are taken along by passing air. Transport air is guided past these droplets by means of a fan. The water level in the reservoir must be kept on a level as constant as possible. This is regulated in 2 ways:

- The maximum water level in the reservoir is regulated by the form of the piping. In case too much water is injected in the reservoir, the surplus of water runs, via the neck, in the het water seal and subsequently via the overflow to the sewage pipe connection.

- The minimum water level in the reservoir is controlled by electronics. The electronics is regulated in such a way that every 45 seconds for 2 seconds a control impulse is sent to the water valve. During this time the water valve is open and water is injected in the reservoir via 2 injection heads. The minimum water level is therefore dependent on impulse time and impulse frequency.

1. Intake of transport air;
2. Overflow rinse water;
3. Water seal;
4. Transducer mounting head;
5. Transducer;
6. Injection head;
7. Cone of droplets;
8. Too big a droplet;
   (Falls back in reservoir)
9. Outlet of humidified air.

drawing of the piping

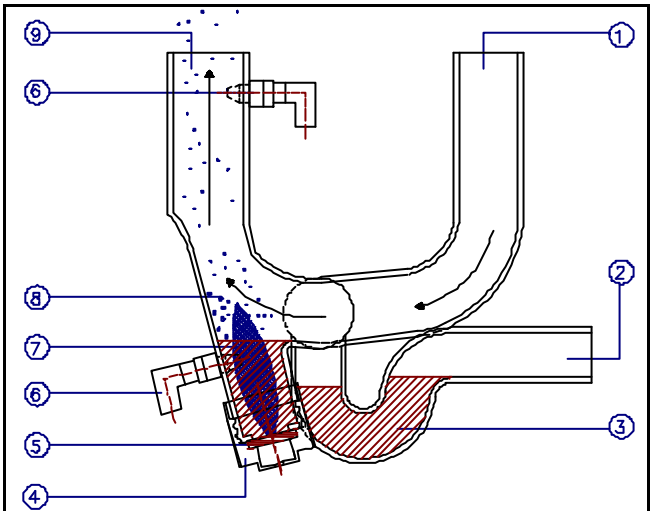


Figure 1: Schematic

Via 2 sensors it is controlled whether the minimal quantity of water required is present in

the piping. When this is not the case, the vibrating plate will not be controlled any longer by the electronics and LED "level" will illuminate. This control will be done for 2 reasons:

- When the humidifier is used for the first time, the reservoir has to be filled first before the transducer is controlled.

- When the water pipe pressure is lost (regardless of the cause), the vibrating plate would become defective if it would be controlled "without water".

This ultrasonic humidifier is suited to be connected to regular water supply systems. In case the water pipe pressure is higher than 8 bar, a reducer must be connected to the water pipe before the humidifier. The reducer must be, preferably, adjusted to ± 4 or 5 bar. In case the hardness of the drinking-water is higher than 8 German degrees, a decalcifier needs to be placed, however do not decalcify further than ± 3 German degrees. More information can be obtained from your local waterworks.

1.2 Cleaning

For reasons of mutual anticipated differences in water quality, with as possible consequence the silting up or the growing of algas in the piping, the humidifier is equipped with a self-cleaning system:

- By means of water movement in the reservoir, created by the vibrating plate, the walls of the reservoir will be cleaned.

- The design of the reservoir is such that there are no acute and blind angles, which strongly decreases the chance of deposit of dirt in the water reservoir.

- The reservoir is frequently filled with clean tap water. Because of this, the water temperature remains low, as a result of what algas don't get the chance to grow in the reservoir.

- The internal reservoir system is constructed in such a way, that every "more heavier particles", sucked in by the air current, are swung from the air. The pipe of the spray outlet is damp. As a result, particles of dirt are deposited against the wall and drained away with the excess rinse water and filling water to the sewage connection.

- The choice of material of the piping is such that a minimum growth of algas and microbes can take place.

1.3 Injection of water

The injection of water happens on 2 places in the system:

- Under water in the reservoir, at which it is used directly on the vibrating plate, so that it is kept as clean as possible.

- At the highest point in the humidifier, well above the water column. This injection takes care of the cleaning of the internal reservoir. The most important task, however, is the aeration of the injection pipe in case of underpressure in the water supply system. Because of this aeration, water from the reservoir can never flow back into the water supply system.

2. ELECTRONIC CONTROL UNIT

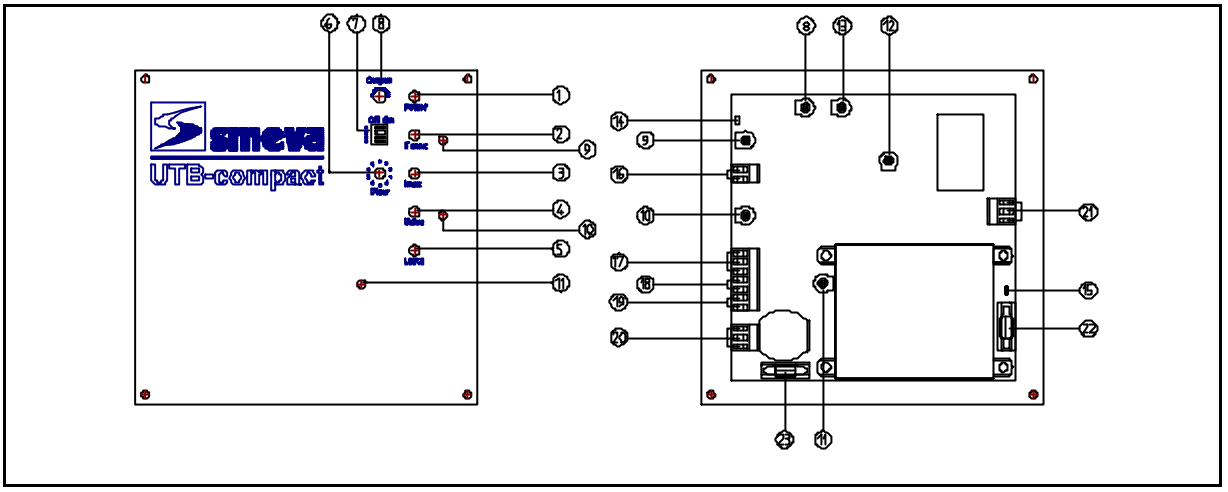


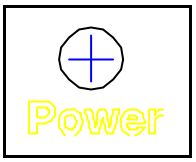
Figure 2: Front side **Figure 3: Print side**

2.1 Explanation of symbols

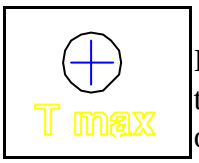
1. Indication mains voltage on;
2. Indication too high a temperature of main transistor;
3. Indication too big a current intensity in oscillator circuit;
4. Indication impulse time;
5. Indication too low a water level;
6. Adjustment number of revolutions fan;
7. Adjustment external/internal regulation output;
8. Adjustment measuring oscillator circuit;
9. Adjustment interval time;
10 Adjustment impulse time;
11. Adjustment water level protection;
12. Adjustment maximum current intensity in oscillator circuit;
13. Adjustment temperature protection of main transistor;
14. Jumper (Adjusting external signal 0-5 V/ 0-10 V DC);
15. Jumper (Measuring maximum current intensity in oscillator circuit);
16. Connection external capacity regulation;
17. Connection magnetic valve;
18. Connection fan;
19. Connection water sensor;
20. Connection feeding 230 VAC/ 50-60 Hz;
21. Connection (orange);
22. Fuse oscillator circuit (1.6 A F, 250 V);

23. Fuse 230 VAC circuit (315 mA T, 250 V).

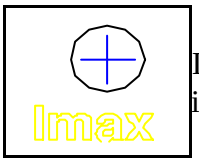
3. INDICATIONS ELECTRONIC CONTROL UNIT



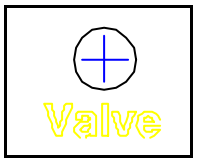
Indication mains voltage on. During normal operation, the green LED (Power) will permanently illuminate.



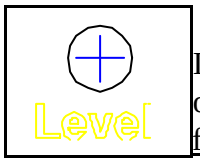
Indication too high a main transistor temperature. When the temperature of the main transistor is becoming too high, the red LED will illuminate and the oscillator circuit will be switched off.



Indication too big a current intensity in oscillator circuit. In case the current intensity in the oscillator circuit is over 1000 mA, the red LED will illuminate.



Indication impulse time. During impulse time (water valve is open), the yellow LED will illuminate.

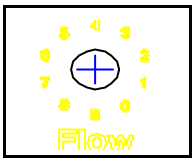


Indication too low a water level in the reservoir. In case there is too little water or even no water at all in the reservoir, the red LED will illuminate from flashingly to vividly.

4. ADJUSTMENTS ELECTRONIC CONTROL UNIT

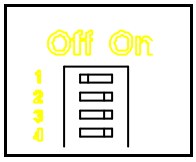
4.1 Adjustments on the front

4.1.1 Number of revolutions fan engine



By means of this potentiometer, the air current through the piping can be controlled, at which "0" is the minimum number of revolutions and "9" the maximum number of revolutions.

4.1.2 Internal/external capacity adjustment



With switch 1 can be chosen between internal and external regulations of the humidifier.

Internal: (By hand)
Switch 1 on "off". Switch 2, 3 and 4 have no meaning.
Now the capacity can be regulated with the potentiometer "output", which is situated above this switch. See paragraph 4.1.3, page 9.

External: (Via SCU 515/535 controlpanel)
Switch 1 on "on".
The capacity of the humidifier will be regulated by the control-panel SCU 515 or SCU 535.

4.1.3 Output capacity regulation internal

With this potentiometer the capacity of the humidifier (dampness profit per hour) can be adjusted. That is only possible if switch 1 is put on "off". See also paragraph 4.1.2, page 9.

4.2 Adjustments on print and front

4.2.1 Water level control

Impulse time:

The impulse time (time in which the water valve is open) is adjustable with the aid of potentiometer 10 (see figure 2/3, page 7) and can take a minimum value of ± 0.8 second and a maximum value of 3.5 seconds. Standard ex-works, the impulse time will be ± 1 second. This position is obtained by, from the front side point of view, turning the potentiometer entirely to the right (clockwise) and subsequently by turning it to the left approximately 45° (anticlockwise), see figure 5. From the print side point of view, potentiometer 9 will have to be turned first entirely to the left (anticlockwise) and then approximately 45 ° to the right (clockwise), see figure 4.

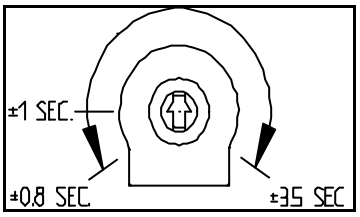


Figure 4: Adjustment impulse time print side

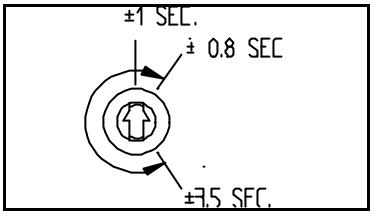


Figure 5: Adjustment impulse time front side

Please note that in general an ideal water level is obtained with the standard impulse time. The impulse time only has to be increased when the water pipe pressure is very low (<1.0 bar). The impulse time can not be less than 1 second, although it is adjustable. The water level in the reservoir will be too low, as a result of what only a small dampness profit is obtained and the level protection will regularly cutt off the power to the transducer.

Interval time:

The interval time (time in which the watervalve is closed) is adjustable with the aid of potentiometer 9 (see figure 2/3, page 7) and can take a minimum value of ± 30 seconds and a maximum value of approximately 3.5 minutes. Standard ex-works, the interval time will be ± 45 seconds. This position is obtained by, from the front side point of view, turning the potentiometer first entirely to the right and subsequently by turning it approximately 45° to the left, see figure 7. From the print side point of view, potentiometer 9 will have to be turned first entirely to the left and then approximately 45° to the right, see figure 6.

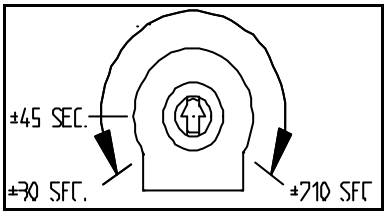


Figure 6: Adjustment interval time print side

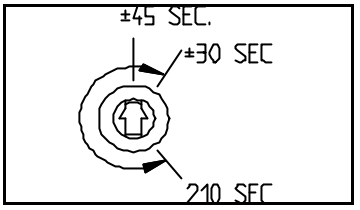


Figure 7: Adjustment interval time front side

In general the standard interval time adjustment will be sufficient for a good water level control.

4.2.2 Water level protection

The water level protection is adjusted ex-works in such a way that the humidifier operates optimally with the average European drinking-water quality. Potentiometer 11, which controls this (figure 2/3, page 7) is in the maximum position, turned to the left (from the front side point of view). The adjustment of potentiometer 11 will only have to be changed in case the water quality is such that too little minerals are in the water, which have to see to the electrical conduction between the 2 sensors in the reservoir. LED 5 (Level) will illuminate, possibly till it is on entirely. In case this situation occurs, proceed as follows:

1. The reservoir must be filled entirely with water. Switch on and switch off the humidifier a number of times. The reservoir is entirely filled now;
2. Turn potentiometer 11 to the right (clockwise), until LED 5 (Level) stops flashing and humidification starts again;
3. Subsequently turn again approximately 5° to the right (safety margin).

4.3 Adjustments on the print

4.3.1 Adjusting maximum current intensity in oscillator circuit

The oscillator circuit is the circuit which provides the frequency of oscillations for the transducer. It is protected by a fuse (1.6 A F - 250 V). The adjustment of the maximum current intensity is as follows:

1. Switch off the humidifier. Subsequently, put the switch 1 on "off" and the capacity regulator on maximum;
2. Detach front plate;
3. Remove jumper 15 (see figure 3, page 7) from the print plate and connect the released print paws to an amperemeter (scale minimal 1000 mA - AC);
4. Turn potentiometer 12 (see figure 3 ,page 7) entirely to the right (clockwise);
5. Switch on the humidifier again;
6. Turn potentiometer 12 to the left now (anticlockwise) until the amperemeter indicates ± 850 mA(AC). In case the current intensity is over 1000 mA, the oscillator circuit will automatically switch off and LED 3 will illuminate vividly. In case this happens, potentiometer 12 will have to be turned back. Subsequently, the plug has to be disconnected from the power socket for just a moment and after that connected again, in order to reset the electronic control unit. Step 6 has to be repeated now. During normal conditions, LED 3 will not illuminate;
7. The jumper can subsequently be put back and the front plate can be fitted.

4.3.2 Temperature protection main transistor

The temperature protection has ex-works been adjusted with the aid of potentiometer 13 (see figure 3, page 7). Never turn this potentiometer. If the transistor temperature has become too high, the power to the transducer will be cut off (LED 2 will illuminate). After cooling off, it will switch on again and LED 2 will go out.

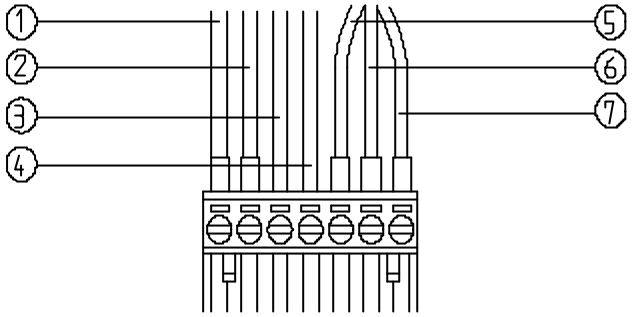
Please note, in case this protection enters regularly, control the working of the fan and the air vent on the side of the housing, which must be dust-free, so that sufficient cooling air can flow past the cooling plate.

4.3.3 Adjusting entry for external control capacity

Jumper 14 is placed when the external control gives a 0-10 V DC. This is the case with the Smeva control panels, the SCU 515 and 535. In case an external control with a 0-5 V DC signal is used, jumper 14 has to be removed.

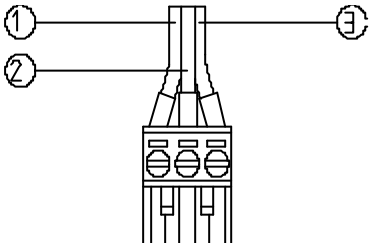
5. CONNECTORS

Water sensor, fan, magnetic valve and earthing print



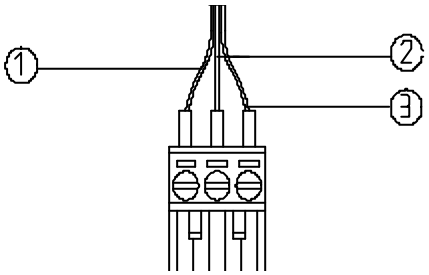
1. water sensor (blue)
2. water sensor (red)
3. fan (black, -)
4. fan (red, +)
5. magnetic valve (blue)
6. magnetic valve (brown)
7. earthing magnetic valve (yellow-green)

Feeding control



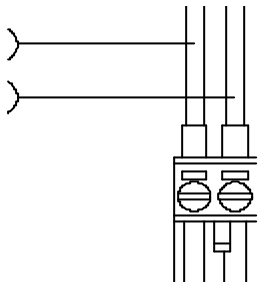
1. blue (zero)
2. yellow-green (earth)
3. brown (phase)

Transducer



1. green
2. white
3. grey (earth)

External capacity control



1. + (brown)
2. - (blue)

6. MAINTENANCE

The UTB-compact does not demand a lot of maintenance. Once a year, a few parts need to be checked or replaced.

Transducer

Smeva recommends to replace the transducer every year, in case it makes 8000 or more operating hours per year. The transducer can turn till approximately 8000 hours at maximum capacity, after that the capacity will gradually decrease. The replacement of the vibrating plate is as follows:

1. Switch off the humidifier via the external control and detach the supply cable and if necessary the cable of the external control;
2. Close off the water supply tap;
3. Take front plate from the housing;
4. Loosen up the connectors from print;
5. Unscrew transducer head from piping;
6. Mount new transducer head with transducer;
7. Put connectors on the print;
8. Connect water supply again;
9. Switch on humidifier and check on leakages (Pay attention! there is tension on the print);
10. Switch off humidifier;
11. Install front plate in housing;
12. Switch on humidifier again.

Water-filter

In case a water-filter is mounted, Smeva recommends to maintain this according to the manufacturer's maintenance plan.

Humidification distribution system in counters

The pipe distribution system can internally be cleaned by means of a nozzle, which is available with Smeva Products, department Service After Sales. This is mounted on a hose which, at it's turn, is connected to the water supply of the counter.

- Detach the flexible hose, which connects the unit to the distribution system;
- Push the nozzle in the humidification pipe and turn on the water supply;
- Collect the polluted waste water!

Internal piping

The internal piping must be cleaned at least once a year. The piping can be detached and can be cleaned over a sink by means of a round brush. Tap water (possibly a decalcifier) is a suitable cleaning product. Do not use any alkaline cleansing agents during cleaning (soap)! They influence the surface tension of the reservoir water, which negatively influences the capacity of the humidifier. In case, by accident, an alkaline cleansing (soap) is used for cleaning, the best thing to do is to clean the piping again with a solvent. Subsequently, it has to be rinsed again thoroughly with water.

Electronic control unit

It has to be blown clean once a year. Pollution of the ventilator can result in the fact that insufficient air is being sucked in, as a result of which the electronics will get insufficient cooling and too little air is passing through the system which will result in a low dampness profit humidity level.

7. INSTALLATION

During the (re)installation of the UTB-compact beware of the following matters:

- The humidifier must be connected to a water supply system with drinking water. Groundwater can not be used for the humidification.

- The humidifier must be put in a good, horizontal place (support). Mounting brackets are fitted in the counters with Smeva assemblage. During separate assembly, it has to be installed on a solid frame.

- The connection hose between the humidifier and the pipe distribution system must be connected fluently. The hose must be free of cracks. Otherwise siphon effects will occur. The maximum length of the distribution system is 5 meters, measured from the outlet of the humidifier.

- The connection to the sewer may not be a fixed connection. The drainage of the excess rinse water and filling water must take place via a so-called "open" sewer connection. There may not be any contact between sewer and humidifier.

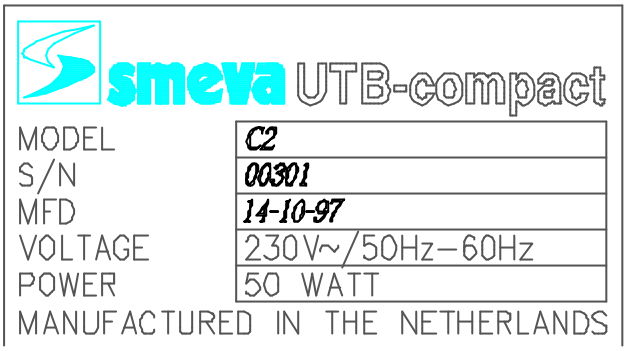
- The connection to the electricity of a counter for example must be in conformity with the instructions of the counter control. The switching on and off must take place via the control panel of the counter.

- - Smeva recommends a plastic tube with a length of 5 meters maximum and with a diameter between 32 and 40 mm for the distribution of humidified air in a counter. Holes are put in with a diameter of 8 mm and a mutual distance (centre to centre) of 200 mm. By means of putting in little plugs in these holes, an optimal distribution of humidified air can be obtained. This distribution is dependent on the goods to be presented in the counter. Depending the type of counter the plugs have to be aligned up or down, see manual for the respective counters.

- Dependent on the position of the humidification pipe (the "warm" or "cold" section of a counter), possibly a heating cable will have to be put in the pipe distribution system in order to prevent freezing. These heating cables are available with Smeva Products,department Service After Sales.

8. ENCLOSURES

Type plate



Example type plate

Model: UTB- Compact
S/N: Serial number
MFD: production date

Conditions

- Maximal hardness of the drinking water : 6-8 German degrees
- Working pressure of the water : 1-10 bar