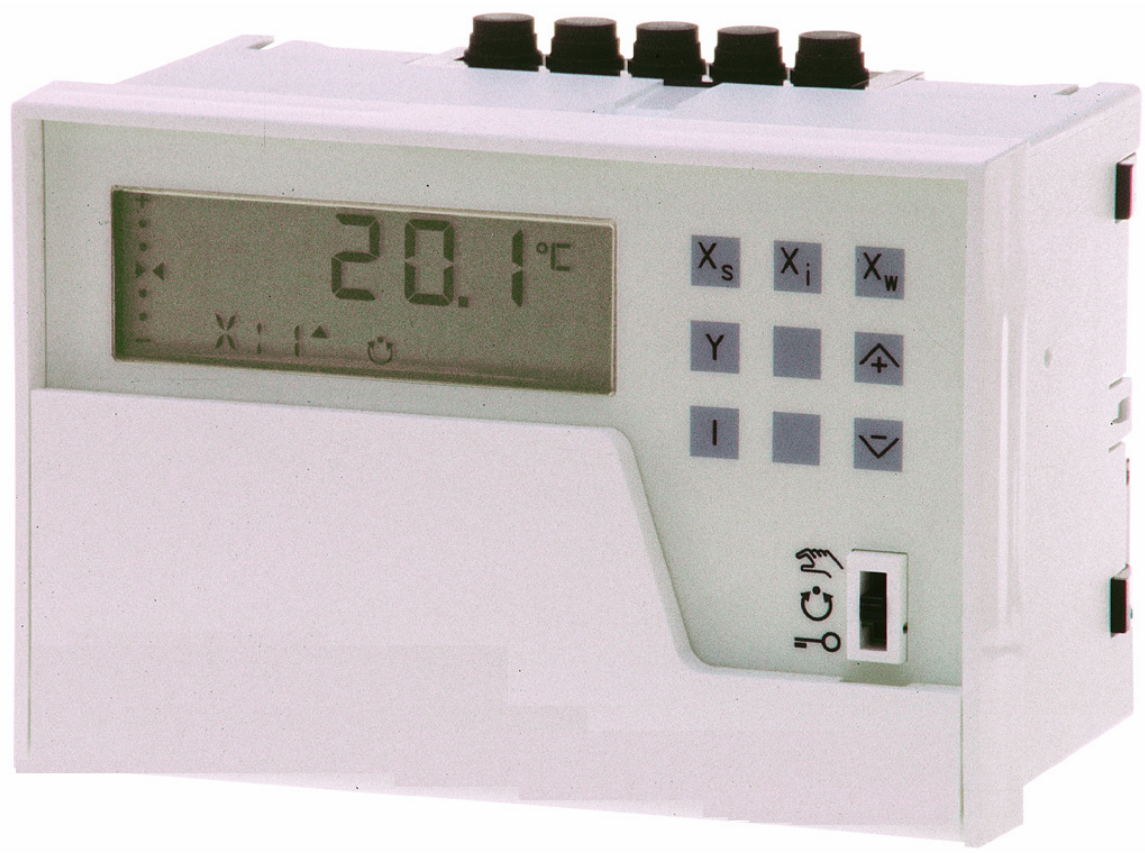
oventrop

Premium Armaturen + Systeme

Instruction for fitter and user



This description corresponds to the current state program. Changes could take place at any time without previous announcement.

Security indications

The following standards and directives must be respected at all works:

- Protection measures after VDE0100 and VDE0105
- Accident prevention rule BGV A2 in full extent
- DIN EN 50110-1 and DIN EN 50110-2 (Company of electrical arrangements)
- DIN EN 50274 (Protection against electrocution)

Regarding the switch authorizations, the industrial safety low and the company authorizations are considered and required.

During works on electric devices, engines etc… the following points must be Respected:

1. Disconect
2. Block in open position
3. Release the tension
4. Cover and protect all close electrical device

The main switch must be used only during the repair works, service or in case of emergency. The main switch must be activated only if necessary. All actuators must be in the position ‘’exit’’ before all switch off.

During the works on devices with switches of revision, all those must be switched off.

Please, read carefully the installation and assembly guide!

Non Respect of this guide can cause invalidity of your guaranty!

Keep safely the guide!

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1 The controller for air-conditioning Heating/cooling

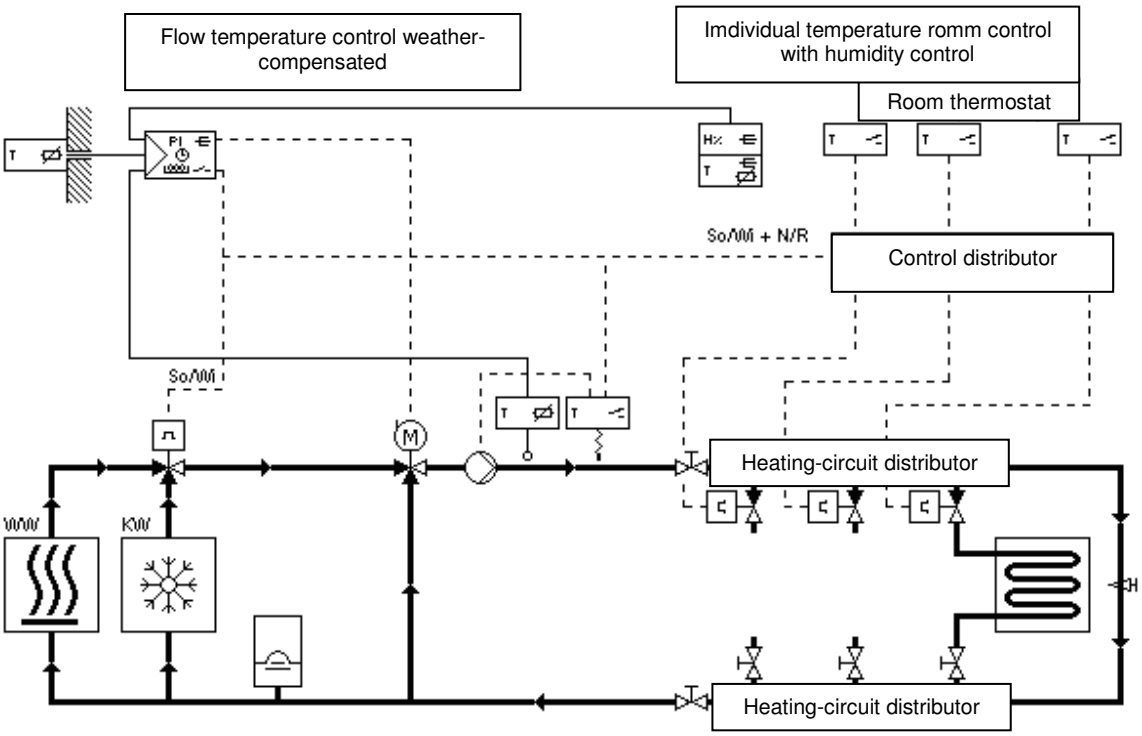
1 The controller for air-conditioning

The heating floor is a technique more and more used in, flats, houses, shops, schools, industrial installations, museums…
This heating system is also more and more use in summer for cooling and giving a comfortable temperature when the sun shines. To conserve an optimal comfort in your life space we know that a cooling floor is about 40 to 60 Watt/m2. But in comparison, with a cooling ceiling, we can work with 150 Watt/m2, tree time more efficient as a cooling floor. As we all know that the heat rise, cooling ceiling is nowadays the best way to keep a fresh head!
The big multifunctional screen of the controller gives us all the informations about the state of the system. The functions buttons place in front are very useful, they allow a direct access to all the important parameters like actual value, set point value, position signal, temporary function… they make life easy to the user. With his integrated manual function and his failure research function all the components link to the controller can be check by the controller.
For using or configuring the air-conditioning controller no tool, neither programming device is required. You also can plug-in the controller a memory sticks to save the controller setting data automatically. That plug-in allows us to save and to copy all the setting data from a controller to another in one second, with no effort, and this as many times as you wish at a low cost.
So now we can create a standard installation, with setting data dedicated to your system and multiply as you mind. All this quality makes complex technology way easier and operable by everybody.

Example

The next diagram shows a system composes of a 2 tubes circuit. We install in addition, in the boiler-room, a cooling pump and a heating pump near the boiler.
In that boiler-room, we manage the temperature of each room of the house individually (room per room) with the help of actuators. In the cooling rooms we must give a particular attention to the dew point. If we are not careful about that and we unfortunately take over this dew point, air will condense into water and cause damage in furniture, wood floor and, in an extreme case cause mould!

Diagram of system compose of 2 circuits



The water transfer to the several distributors is managing by valves in the 2 circuits.

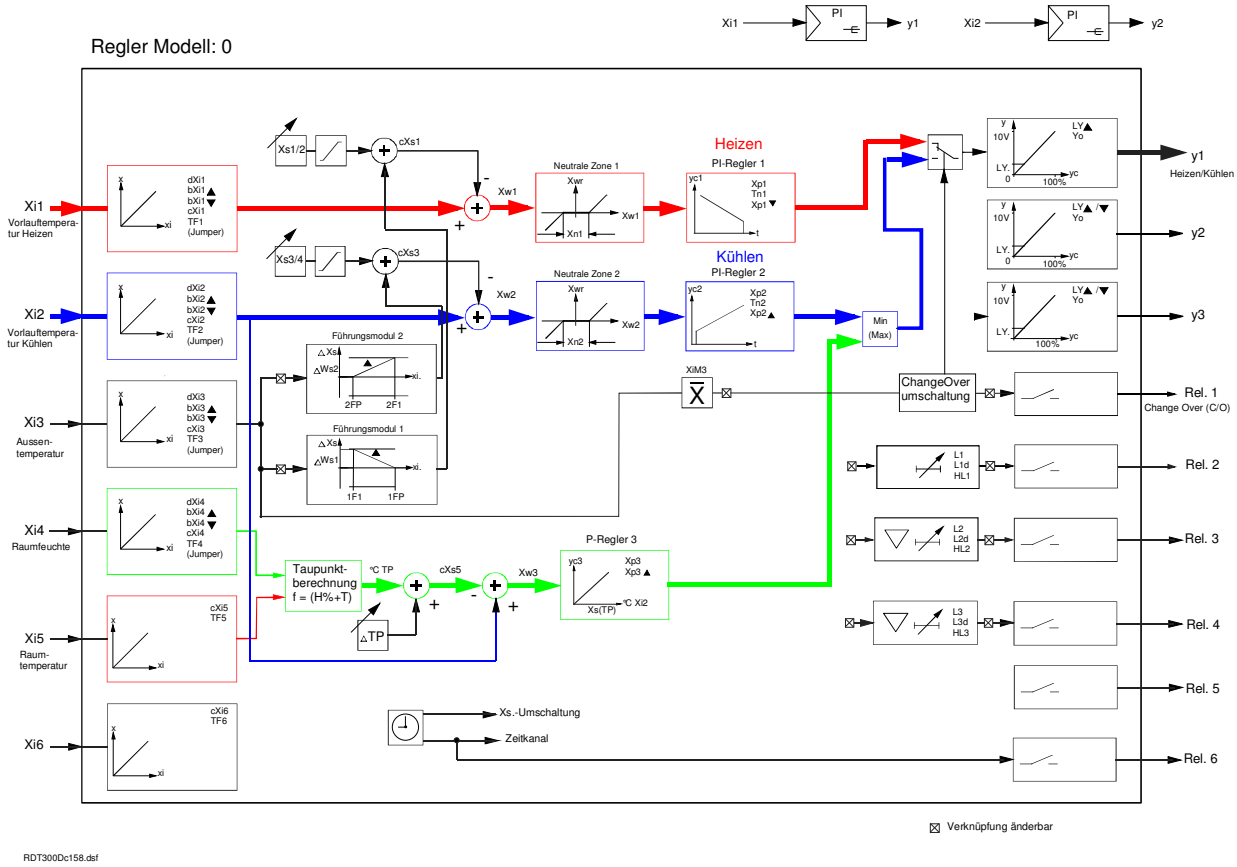
Controller task:

- Change-over between heating and cooling for a 2 tubes circuit
- Release warming or cooling production
- Manage the indoor water temperature with an outdoor temperature detector while respecting the heating curve. When outside temperature rise, inside water temperature goes down.
- Switching signal for the individual room controllers on heating or cooling
- Week program for set point change over
- Circulation pump circuit command with controlled switching cycle
- Active dew point, prevention by additional rule function
- In option: mural remote control with LCD screen allowing switch operating-mode
- Drying control function according to DIN 4725 part 4, this function is used to avoid cracks cause by a drying process to fast.

Explanation: how the active dew point prevention work?

The active dew point prevention has great advantages compared to a simple dew point monitor. When we are to close to the dew point, this protection switches off the cooling circuit. Because of that the temperatures increase in the room. As soon as we are below a predefine point we switch on again the cooling system in using the maximum power, then we stop when we are to close to the dew point etc…
Switching between 2 points the cooling system can give an uncomfortable temperature fluctuation. To avoid this, the controller will reduce the heating/cooling water temperature and so the performance of the system. This water temperature reduction will fully cancel the temperature fluctuation.

How is the heating/cooling working?



The graphic show the several function of a controller. The temperature of the cooling and heating water his managed by two PI controllers, working independently of each other, with the possibility to manage a day and night time program.
Temperature and humidity are calculated and compared all the time with the temperature of the cooling water. We must give a particular attention to the adjustment of the limit cooling point, because we must never meet the dew point to avoid all condensation.
The choice between heating and cooling is made regarding the average outside temperature of a 12 hours time period.

According to the control signal, heating or cooling, the room temperature controller and the direction of control action will be set by two different set of pipes/pipe devices, either intern or extern.

The controllers RDT 300 allows the function of heating and/or cooling. This controller takes in charge application like heating/cooling floor, ceiling cooling, cooling bar and also concrete floor cooling. Thanks to his large memory and his different function we can use all the different part of the building for heating or cooling your life space with a maximum of comfort. Oventrop offers you a complete global solution composed of sensor, temperature controller, individual room controllers and actuators. But Oventrop offers you more that products, we also offer to you, all our technical Know how developed by our engineers.

2 The controller for air-conditioning conects to the control distributor Heating/cooling with a 2 pipes system

2.1 Components connected to the controller

- Outdoor sensor EGT301F101 (Measures the outside temperature/ installed in the North side)

- Clamp-on detector EGT311F101 stem temperature detector with Immersion tube EGT346F101 (Measure the beginning temperature)

or

- Humidity room transmitter EGH130F001
  (Measure the temperature and the humidity of a room and calculates the humidity. This device is commonly use in living rooms and can also be use to estimate the value of the dew point)

- Actuator for 3 way valves AXM117S
  (Temperature regulation for heating/cooling)

- Actuator for 2 way valves (Heating/cooling)

- Circulation Pump (optional)
- Area control device RDB300 (optional)
  (Control the operating mode in distance, presence/absence, and the adjustment of the time. In case of freezing or when we take over the dew point this device shows specific symbols to signal the failure.)

2.2 Devices connected to the distributor

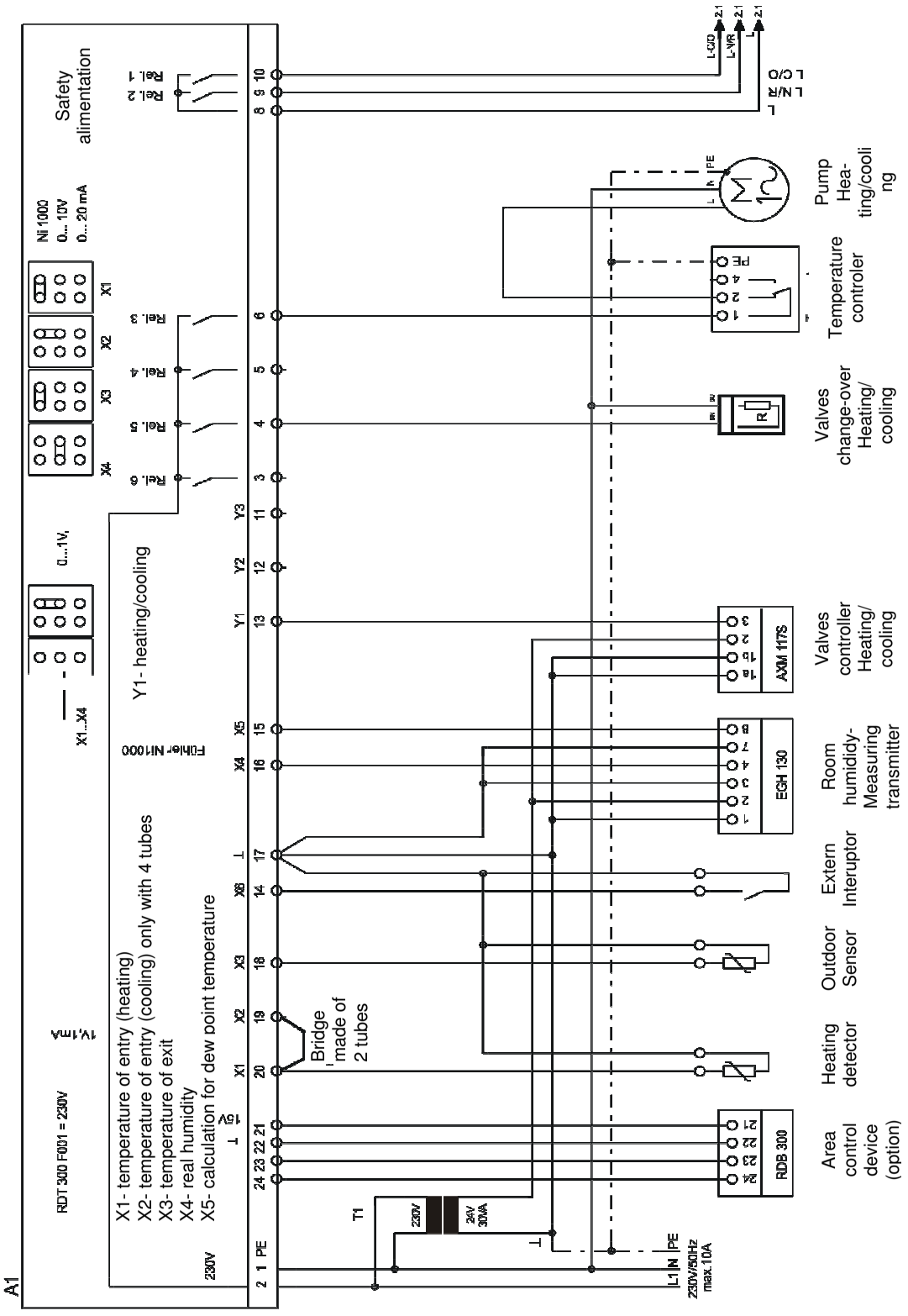
- Room temperature controller NRT210F011(control the temperature of each room individually, temperature sensor in each room)

- Actuator (to control the temperature of each area individually, commonly use for all under floor heating system, control all type of circuit)

- Dew point controller EGH102F001 (can also be used like a humidity controller and will be normally used for the heating floor system. Electric connection must be made to the distributor)

3 Writing diagrams

3.1 Connections of the controller Heating/Cooling



Important informations for the fitter:

- The second part of the transformer 24VAC must be connected to the earth. The point 17 must also be connected to the earth!
- The creation of a bridge between the 19 and 20 is an obligation!

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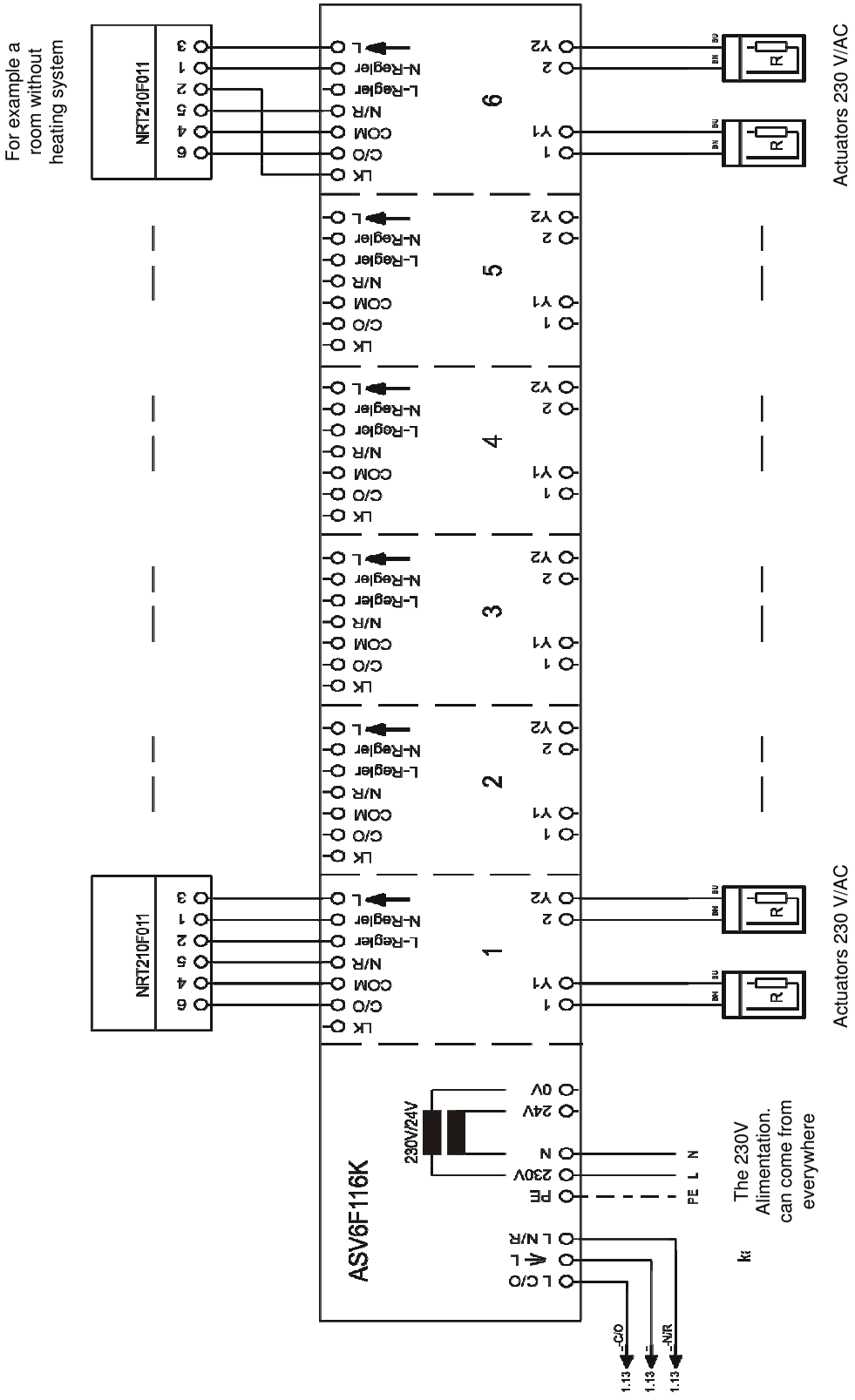
3.2 Connections of the distributor

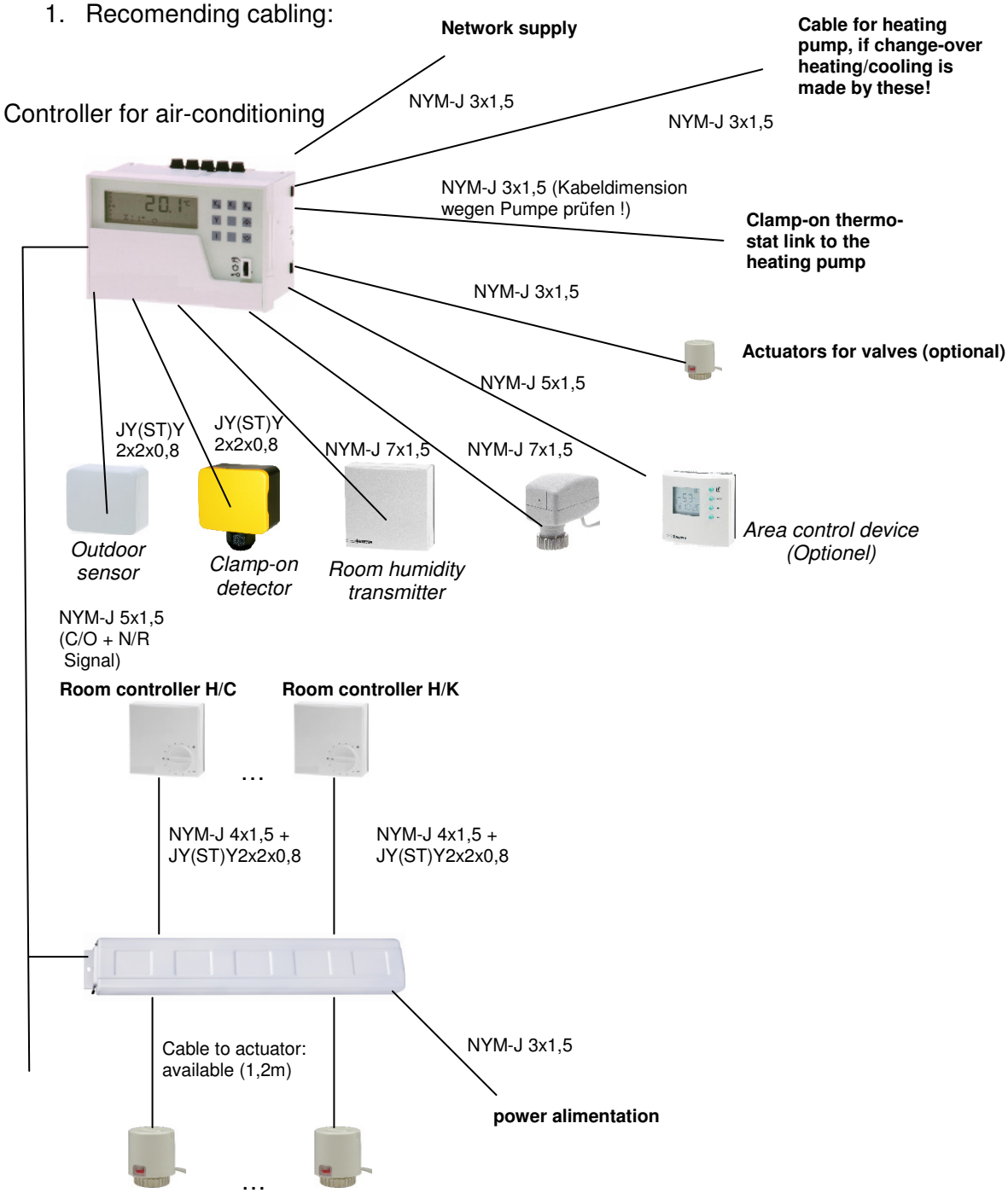


Informations Important for the fitter:

- The 230V alimentation can also be supply in the concern floor E-distributor!
- A distributor can have 5 channels. Every channel can manage 2 actuators. In case of you would like to manage more as 2 actuators, you just need to link the different channels with a bridge from the L point of the first channel to the L point of the second channel of the distributor. The different channel will work in parallels.

3.3 The wiring

1. Recomending cabling:

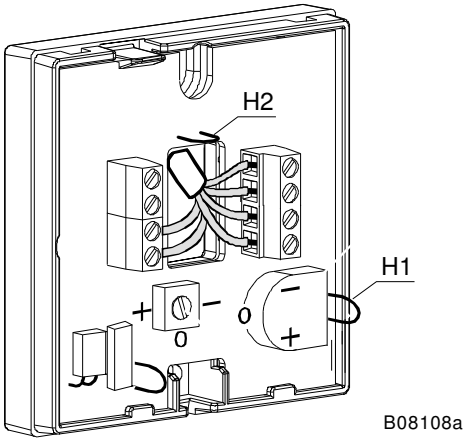


Important information: When using 24V transformer you need to respect the appropriated writing diagrams!

4 Important introduction indications!

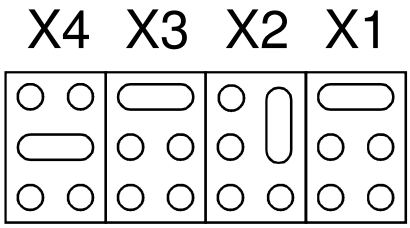
4.1 Room temperature transducer EGH 130

Bridge H1 and H2 must be cut

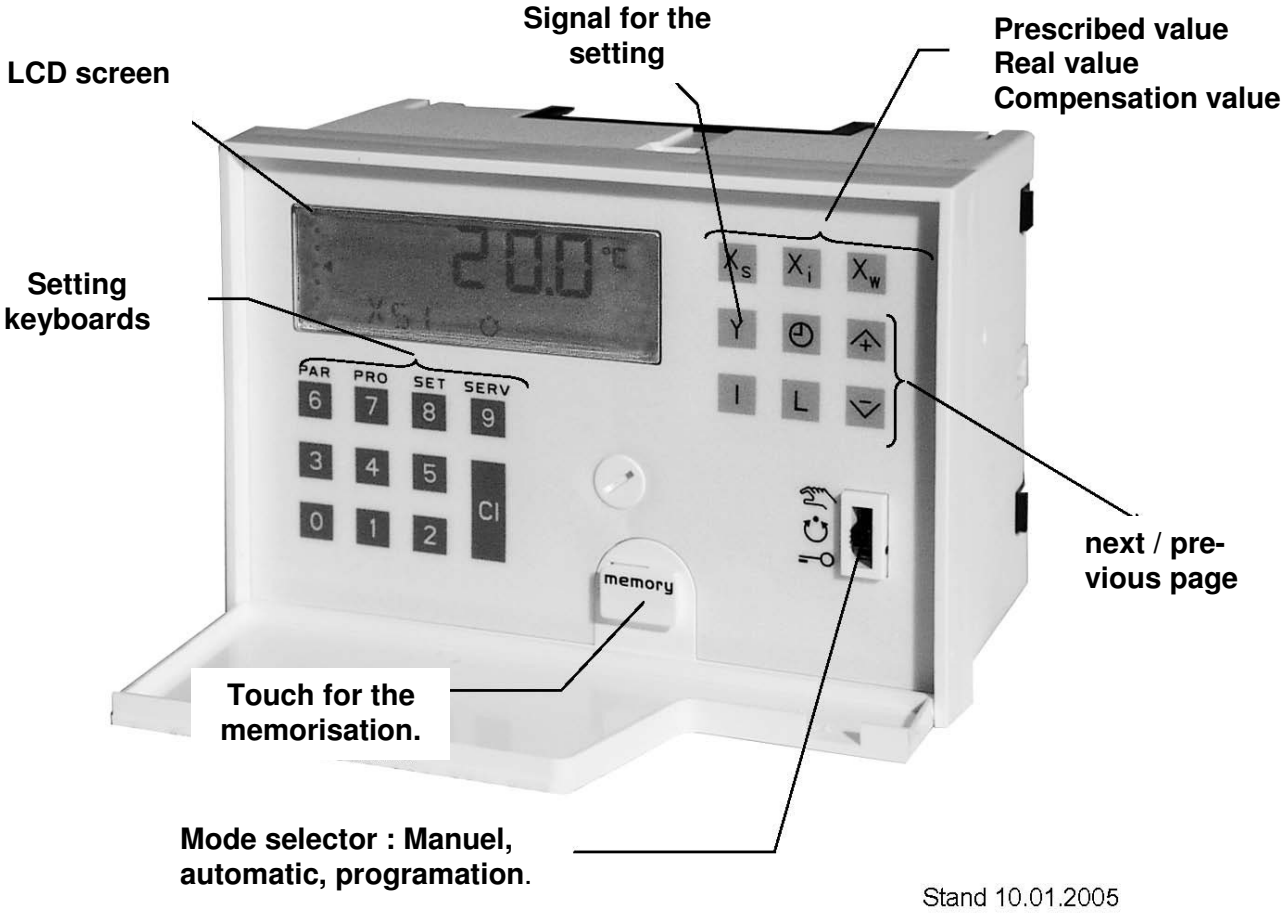


Controller for air-conditioning

You need to check Jumper located at the back of the controller.



Please check if the bridge of the controller between 19 and 20 is correct!



Stand 10.01.2005

Mode selector :.

- **Manuel**
- **Automatic**
- **Programation**

In Automatic mode:

Turn on the alimentation

With the touch +/- we can show prescribed value

1. Indication Xs1 20,0 °C heating

2. Indication Xs2 16,0 °C we slow down the heating

Info :

The setpoint 1 named XS1 (Heating base temperature) is 20°C, that mean that when we have a outside temperature of 20°C a flow-temperature of 20°C is set.

If the outside temperature changes, the setpoint 1 changes accordingly.

The setpoint 2 named XS2 set to 16 °C mean that we lower the heating graphics line of 4 Kelvin, so every working point are lower of 4 Kelvin

3. Indication Xs3 16,0 °C cooling (cooling temperature flow)

4. Indication Xs4 19,0 °C Reduction of the cooling set point

Info :

The setpoint 3 named XS3 is set to 16°C. That means that when we have an outside temperature of 32°C we have a 16°C flow temperature inside. With 22°C we have an inside flow temperature of 19°C (-3°C).

The setpoint 4 named XS4 setting to 19°C means that we lower the heating graphics line of 3 Kelvin : every working points increase of 3 Kelvin.

Setting model number for checking

1. Sliding switch in '**Programation**´ (key symbol)
2. Type **6 7 8 9**
3. Model **0** must be selected!
4. When that is ok, Sliding switch in **"Automatic"**
5. When that not ok:
6. Press **" CI "** and the model will be deleted
7. Then Press **„ 0 „** button
8. Slide switch in **„Automatic"**

Checking the detector function:

1. Sliding switch to **„Automatic"**
2. Press **"Xi"** button
3. Explore the different page with **"+"** and **"-"**

Xi1	Heating flow-temperature
Xi2	Cooling flow-temperature (Important in the 2 tubes installations : link Xi2 and Xi1 with a bridge like Kl.19/20)
Xi3	Outside temperature
Xi4	Real humidity (Room)
Xi5	Temperature in the room
Xi6	Doesn't occupy
nXi3	Average outside temperature (Average value calculate in 12hours)

Checking the output relay:

1. Press **„Y"** button
2. Check the pages with the arrow button **" rel1 "**.
   (▲ Means that the relay is headed, ▼ means that the relay is not headed)

rel1: C/O (this contact do the change over between heating and cooling)

3. Check the different Relay with the **" + "** button

rel2:	Day/Night (contact will be made in the control distributor)
rel3:	Pump
rel4:	Doesn't occupy
rel5:	Valves change-over Heating/Cooling (thermo Actuator)
rel6:	Wird nur bei 3 punkt antrieb verwendet

Change-over-Setpoint (Temperature setpoint for Heating and cooling) Check:

1. Sliding switch in **„Automatic“**(Same approach as point 4.4)

2. Press **„ Xi „** button,

3. Explore the different page with **„ + „** and **„ - „**to nXi3

4. nXi3 -> Read and note outside average temperature!

Now the appropriate setpoint value **„ co „** (AT- Switching value Heating/cooling) change:

5. In addition press **„ L „** button,

6. Explore the different page with **„ + „** to **„ co „**

7. Change the setpoints **„ co „** in order to simulate the change-over on cooling

8. Switch to **„ Manuel„** mode

„ co „ must be displayed in the screen

9. **„ Cl „** Press (Clear the setpoint value)

10. Write a new setpoint (for example: 13° C) -> **0 1 3 0**

The CO setpoint (AT-Switch the value heating/cooling) must be smaller as the averaged outside temperature nXi3, so that the change-over takes place! Please compare with the displayed outside temperature value!

11. Slide switch in **„Automatic“**!

Now we can check the relay:

If the value CO < nXi3 (cooling)

1. Slide the switch to **„Automatic“**
2. Check the output of the relay, follow the point. 4.5

Display: rel 1 ▲ (Correspond to the cooling)
rel 5 ▲ (Transfer valve H/C is headed for, i.e. active)

or

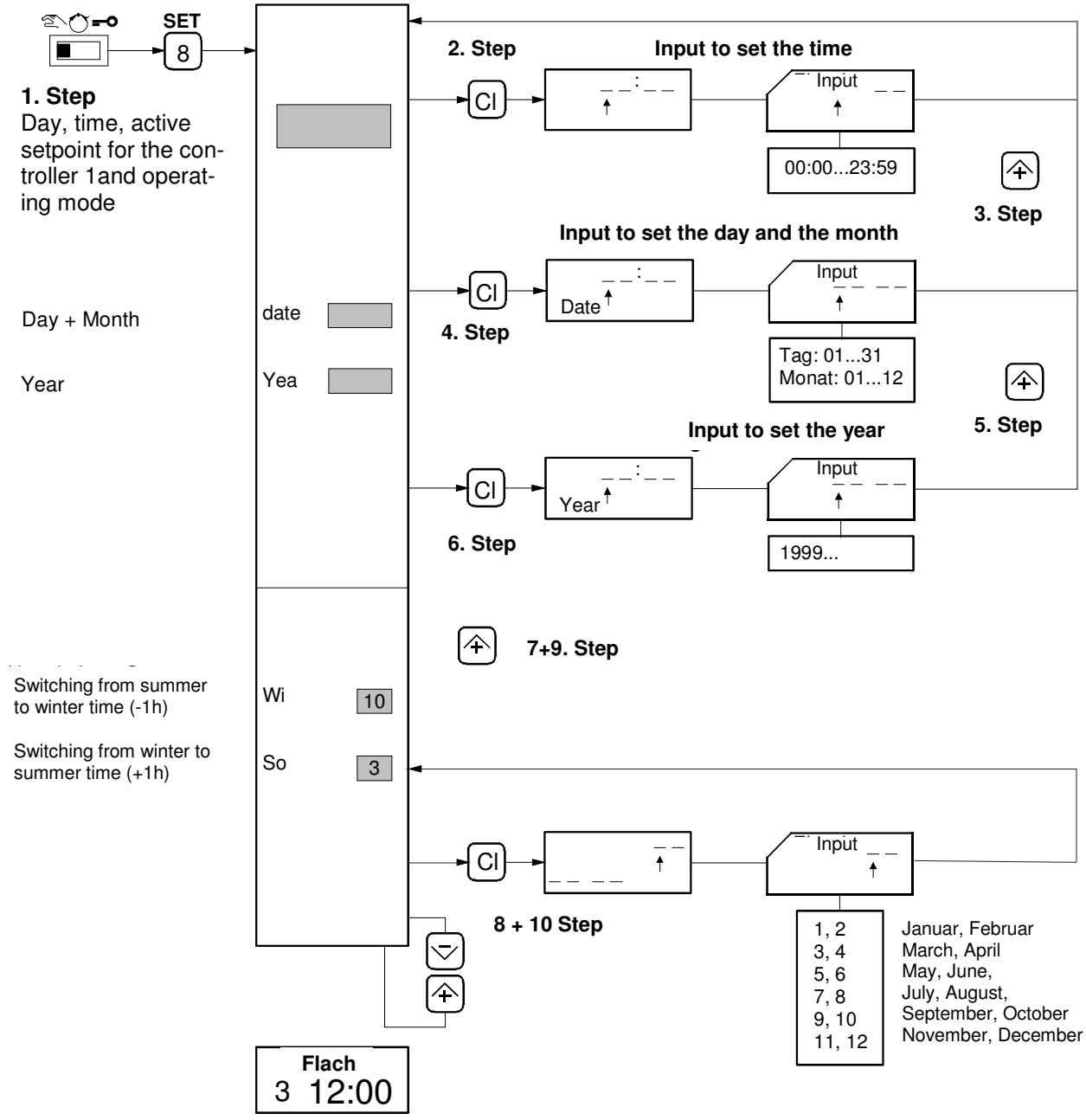
When the value **co > nXi3**, the fallowing announcement take place:

Display: rel 1 ▼ (Correspond to the heating)
rel 5 ▼ (Transfer valve H/C is not headed for, i.e. active)

After checking the c/o –Setpoint will be program to a desired value as above, for example 23°C (Standard value). According to the requirement, this value could be change by the users.

5 FAQ,s

5.1 How can I set the time, the date and So change-over ?



11. Step -> Sliding the switch in automatic!

If the safety battery gets empty, the time will be lost. This status is signal by the inscription "Wednesday 12" flashing on the screen. Time-dependent switching operation will only be executed after the time has been corrected

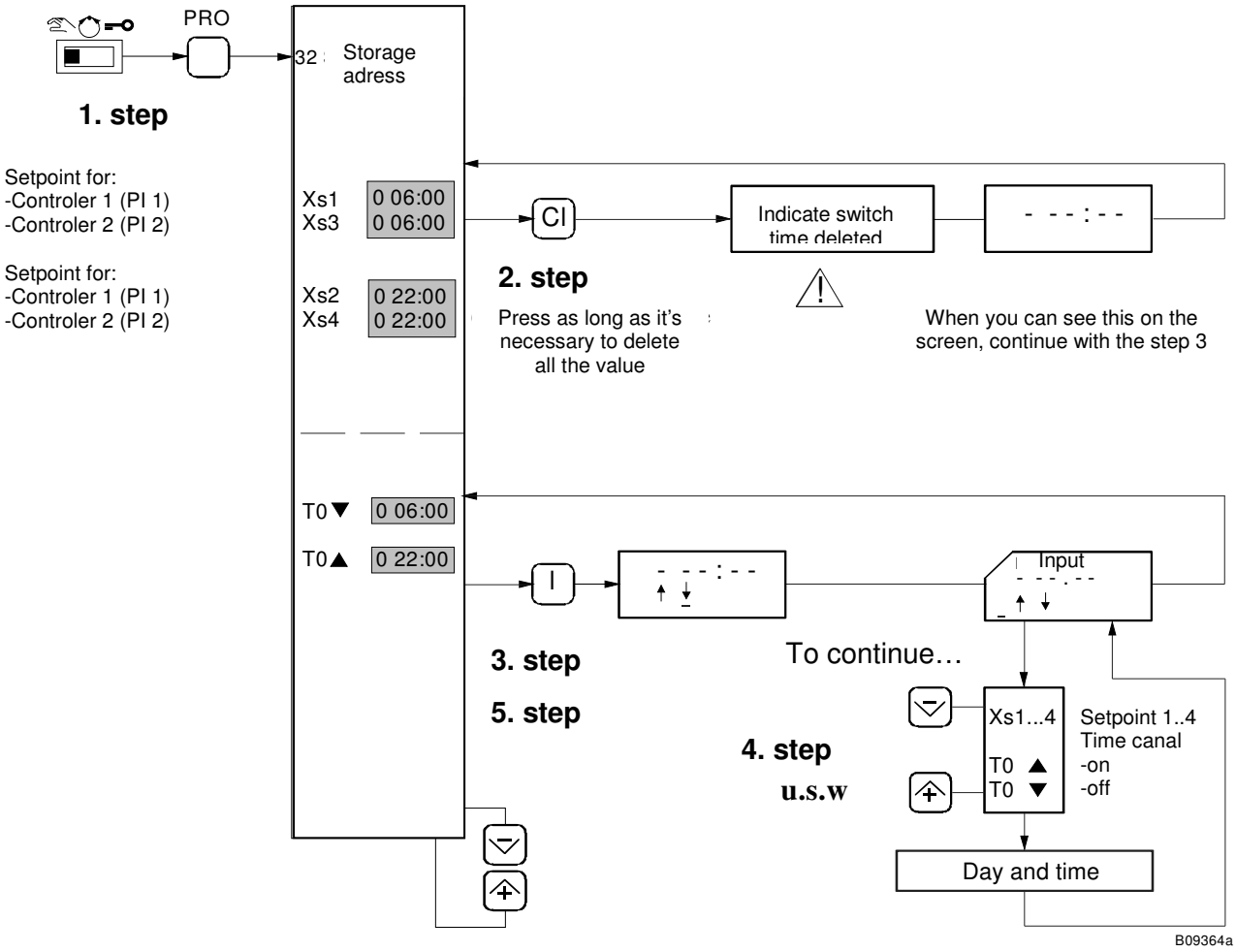
1) The automatic change over between summer and winter time occurs on the last Sunday of the month that is entered, between 02:00 and 03:00

Example: we want to set this hour and this date →

1. Sliding switch in **„ Manual „**
2. Press **„ SET „** button
3. Press **„ Cl „** to clear the actual data
4. Enter a hour for example for 12:33 press **„1 2 3 3 „**
5. With **„ + „** you can change the day and the month
6. With **„ Cl „** delete the actual value
7. Save the day and the month, for example 12 July 2007, input **„1 2 0 6 „**
8. With **„ + „** to change the year
9. Save the year, input **2 0 0 7**

Now switch again in automatic mode (middle position). Time, date and year is save!

5.2 How can I change the time program?



Switch again in automatic mode!

Example: you want to program this hour program →

Program every day (Monday to sunday) from 06:00 to 23:00 hour

(Heating and cooling)

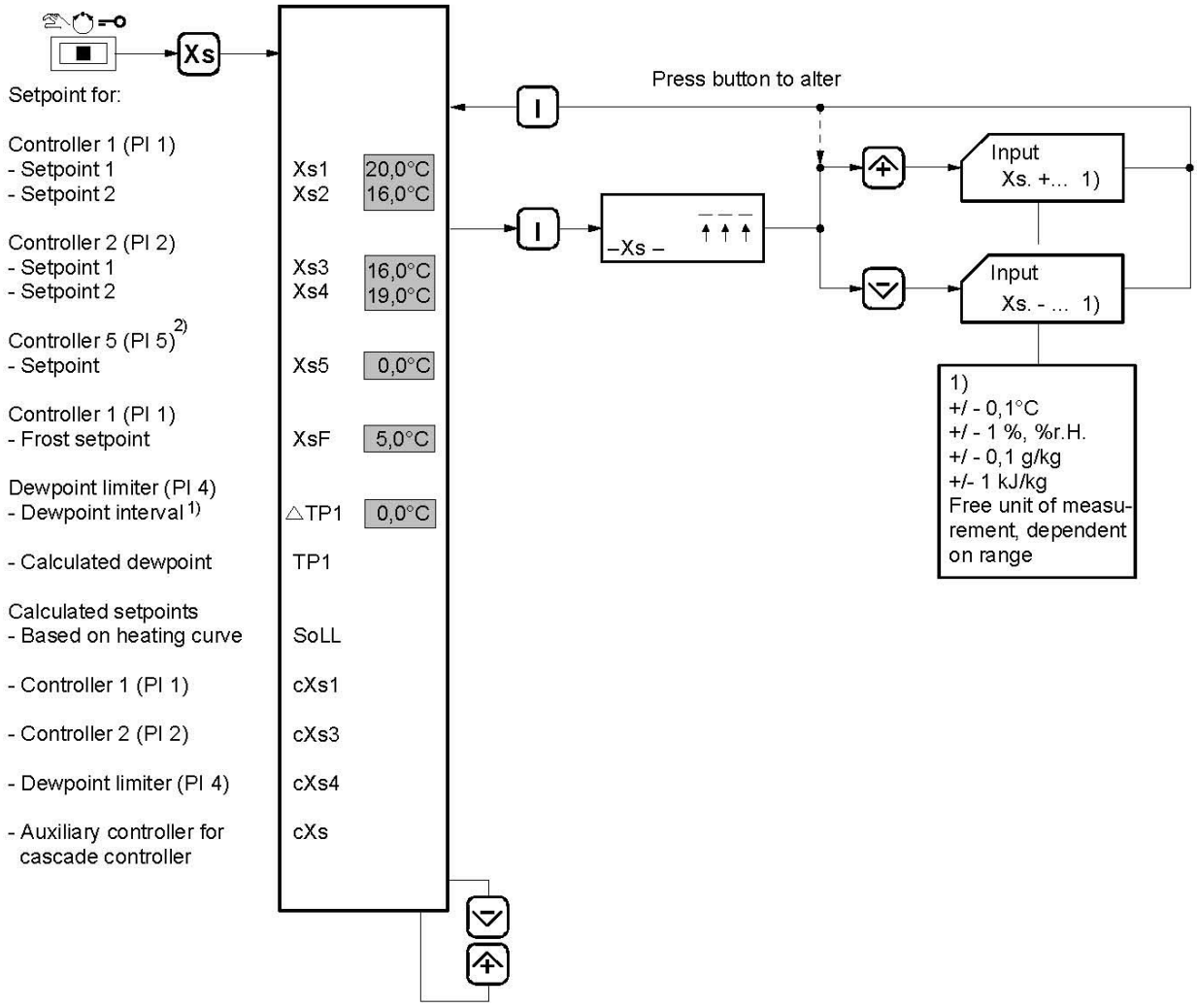
1. Sliding switch in **„ manual „**
2. Press **„ PRO „** button
3. Press **„ CI „** as long as a number display in the screen. When all the number is deleted follow the list:
4. Press **„ I „** button
5. Press „ **0** „ to program the day, now input the departure time Xs1 for daily heating possibility Type → „ **0 6 0 0** „
6. Press **„ I „** button and with **„ + „** go to Xs2
7. Press „ **0** „for dailly programation, now input the end heating time possibility Xs2 Type → „ **2 3 0 0** „
8. Press**„ I „** button and with **„ + „** go to Xs3
9. Press „ **0** „for dailly programation, now input the departure time Xs3 for daily cooling possibility Type → „ **0 6 0 0** „
10. Press**„ I „** button and with **„ + „** go to Xs4
11. Press „ **0** „for dailly programation, now input the end time Xs4 for daily cooling possibility Type → „ **2 3 0 0** „

Switch again in automatic mode! Your weekly program is done and saves!

Day code:	***1 = Monday***	***5 = Friday***
	2 = Tuesday	***6 = Saturday***
	3 = Wednesday	***7 = Sunday***
	4 = Thursday	***0 = Weekly***

If all the switching times are deleted, or if the time is lost (safety battery is empty) control operation will use setpoints Xs1 and Xs3

5.3 How can I change the setpoint Heating or Cooling?



Announcement Xs1 20,0 °C	Day program, Heating (Base temperature)
Announcement Xs2 16,0 °C	Absent program, Heating (Advance base temperature)
Announcement Xs3 16,0 °C	Day program, Cooling (Base temperature)
Announcement Xs4 20,0 °C	Reduction program heating (advance corresponds to a increased temperature)

Heating setpoint

The setpoint 1 named XS1 (Heating base temperature) is 20°C, that mean that when we have a outside temperature of 20°C a flow-temperature of 20°C is set.

If the outside temperature changes, the setpoint 1 changes accordingly.

The setpoint 2 named XS2 set to 16 °C mean that we lower the heating graphics line of 4 Kelvin, so all the operating points are lower of 4 Kelvin

The **slope** of the line for under-floor heating is about **0.6**, most of time it is enough.

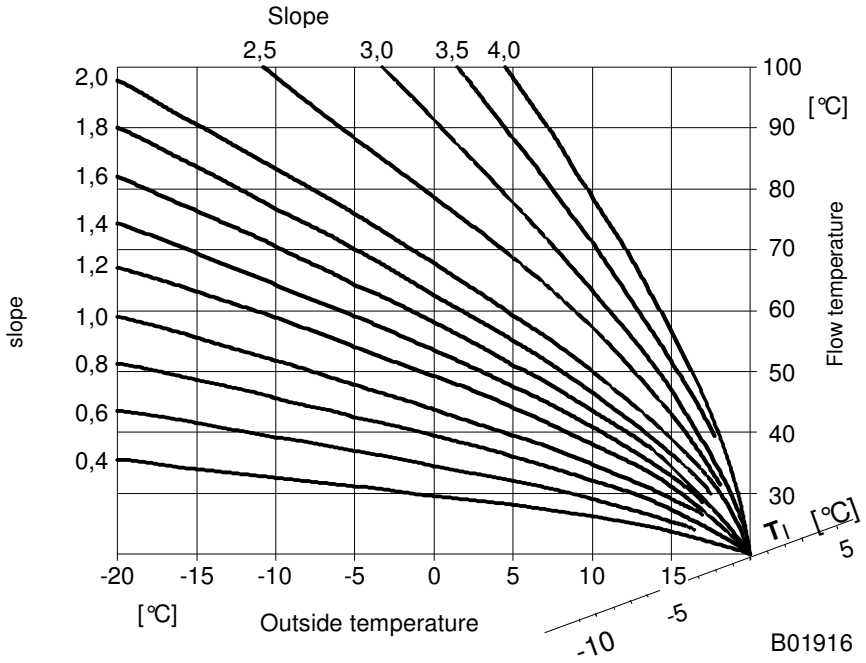
Cooling setpoint

The setpoint 3 named XS3 is set to 16°C. That means that when we have an outside temperature of 32°C we have a 16°C flow temperature inside. With 22°C we have an inside flow temperature of 19°C (-3°C).

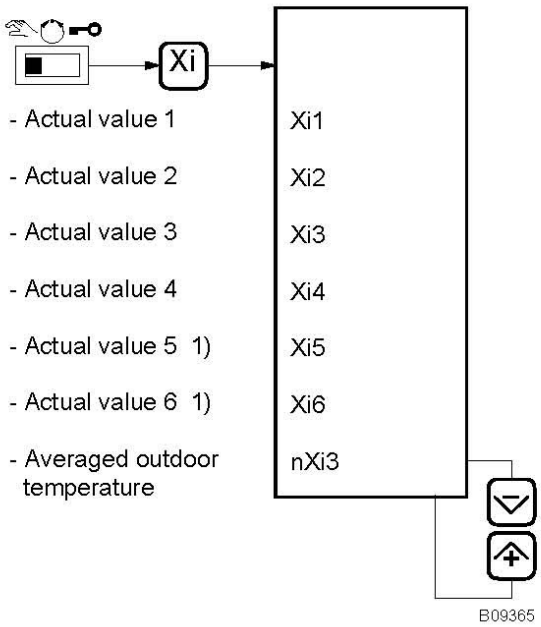
The setpoint 4 named XS4 setting to 19°C means that we lower the heating graphics line of 3 Kelvin : every working points increase of 3 Kelvin.

Heating characteristic

The heating characteristic determines the desired value of the secondary flow temperature in dependence of the outside temperature. The heating characteristic becomes essentially by T_I☼ *(= X_{S1})* and the specified slope.



5.4 How can I now the sensor value?



1. Slide switch to „ **Automatic** „
2. Press„ **Xi“** button
3. With „ **+** „ change the page to read the value

Xi1 = VL-Heating temperature

Xi2= Same with Xi1 (Don’t forget to build a bridge between the point 19 and 20 Of the controller)

Xi3= Outside sensor

Xi4= Relative humidity (Humidity of the room-Measuring transmitter)

Xi5= Temperature of the room (Humidity of the room-Measuring transmitter)

Xi6= Doesn’t occupy

nXi6=Average outside temperature

5.5 Did the external heating / cooling change over is necessary ?

If do you use an external changer over Heating/cooling (terminal 14/17 of the controller) above a free potential contact; you need to turn off the automatic change over.

Execute the following instruction:

1. Sliding switch in **„Programation“**
   Input 6 7 8 9
   Model **0** must be chosen!
2. Press **„ L „** button
3. With **„ + „** navigate until the **C-o** inscription appears. Under this announcement
   C-o stands nXi3 ▲
4. Press **„ I „** button
5. With „ + „Navigate until the **Xi6** ▼ inscription appears.
6. Press **„ I „** button
7. Sliding switch in **„ Automatic“**.

Now the external commutation is activated. That means; when the contact is open the heating program work, and when the contact is close the cooling program work. We need this program if a heating pump gives the change-over by heating to cooling.

5.6 How can I change the slope of the heating caracteristic ?

The heating characteristic is drawn page 27. The standard heating floor slope is located between 0,5 and 0,6

To change the slope of the heating characteristic, follow this instruction:
:

1. Sliding switch on **„manuel“**
2. Press **„PAR“** button
3. With **„ + „** navigate until the **SL** inscription appears.
4. Press **„ CI“** Button
5. Input the new slope, for example. **0,7** (press **0 7)**
6. Sliding switch on **„ Automatic“**

You have program a new slop, now S=0,7 !

5.7 How to activate a room controler unit ?

Follow these instructions:

1. Sliding switch on **„Programation“**
   Input **6 7 8 9**
2. With **„ + „** navigate until the **RC** inscription appears on the screen.
3. Press **„ I“** button
4. Stay press on **„ + „** until **ON** appears
5. Press **„ I“** button
6. Sliding switch on **„ Automatic“**.

The remote control RDB300 is now activated!

5.8 Where can I find more information about controler?

If you need more information, our operating instructions part 1 and 2 are naturally in your disposition.
In this document all parameters about controller is explain.

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