# User Manual
# ALFA 21 DP and
# ALFANET 21 DP

**Cool/Heat**
**Thermostat**
**-10/+90$^{O}$C per 0,1$^{O}$C**

| VDH doc: 072502 | Versie: v1.1 | Datum: 24-09-2008 |
|---|---|---|
| Software: 072488_ALFA 11/21/31DP | File: Do072502.wpd | Range: -10/+90˚C per 0,1˚C |

## * Function.

The **ALFA(NET) 21 DP** is a digital thermostat for panel mounting. The function from the thermostat can be programmed for cooling or heating.
The **ALFA*NET* 21 DP** has a RS 485 network connection so it can be read out and adjusted on the Alfanet.

## * Installation.

On the topside of the **ALFA(NET) 21 DP** is shown how the sensor, power supply and relay have to be connected.
After connecting the **ALFA(NET) 21 DP** to the power supply, a self-test function is started. As this test is finished, the measured temperature appears in the display.
When the relay is activated, the led 'on' will light-up in the display.

## * Control.

The **ALFA(NET) 21 DP** Thermostat can be controlled by three push buttons on the front. These keys are:

    **SET**    - view / change the set point.
    **UP**    - increase the set point.
    **DOWN** - decrease the set point.

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## * <u>Viewing setpoint.</u>

By pushing the **SET** key the set point appears in the display. The led 'set' starts blinking. A few seconds after releasing the **SET** key the set point disappears and the measured temperature is shown in the display.

## * <u>Changing setpoint.</u>

Push the **SET** key and the set point appears in the display. Release the at **SET** key. Now push the **SET** key again and together with the **UP** or **DOWN** keys the set point can be changed. A few seconds after releasing the keys the measured temperature shows again in the display.

## * <u>Setting internal parameters.</u>

Next to the adjustment of the set point, some internal settings are possible like differential, sensor-offset, set point range and the function cooling or heating.

By pushing the **DOWN** key more than 10 seconds, you enter the 'internal programming menu'. In the left display the upper and lower segment are blinking. Over the **UP** and **DOWN** keys the required parameter can be selected (see table for the parameters).

If the required parameter is selected, the value can be read-out by pushing the **SET** key. Pushing the **UP** or **DOWN** keys together with the **SET** key allows you to change the value of this parameter.

If after 20 seconds no key is pushed, the **ALFA(NET) 21 DP** changes to it's normal operation mode.

## * <u>Parameters ALFA(NET) 21 DP.</u>

| Para-meter | Description Parameter | Range | Standard Value |
|---|---|---|---|
| 01 | Switching differential | 0.1..10.0˚C | 3.0 |
| 02 | Minimum setpoint | -10..+90.0˚C | -10 |
| 03 | Maximum setpoint | -10..+90.0˚C | +90.0 |
| 04 | Offset temperature sensor | -10.0..+10.0˚C | 0.0 |
| 10 | Startup delay after power failure | 0..99 Minutes | 0 |
| 11 | Relays on at sensor failure | 0 = No, 1 = Yes | 0 |
| 15 | Function cooling or heating | 0 = Cool<br>1 = Heat | 0 |
| 16 | Switch on delay relays   1) | 0..99 | 0 |
| 17 | Switch off delay relays  1) | 0..99 | 0 |
| 18 | Parameter 16/17 in sec. or min. | 0 = Seconds<br>1 = Minutes | 0 |
| 19 | Minimum on-time relays | 0..99 Minutes | 0 |
| 20 | Minimum off-time relays | 0..99 Minutes | 0 |
| 90 | Network number | 1..250 | 1 |
| 95 | Software version | 0..255 | - |
| 96 | Production year | 00..99 | - |
| 97 | Production week | 1..52 | - |
| 98 | Serial number (x1000) | 0..255 | - |
| 99 | Serial number (units) | 0..999 | - |

1) During delay time the LED 'on' is flashing.

**\* <u>Adjustment sensor.</u>**

The sensor can be adjusted by using the Sensor Offset (parameter 04).
Indicates the **ALFA(NET) 21 DP** e.g. 2.1˚C too much, the Sensor Offset has to be decreased with 2.1 ˚C.

**\* <u>Error messages.</u>**

In the display of the **ALFA(NET) 21 DP** the following error messages can appear:
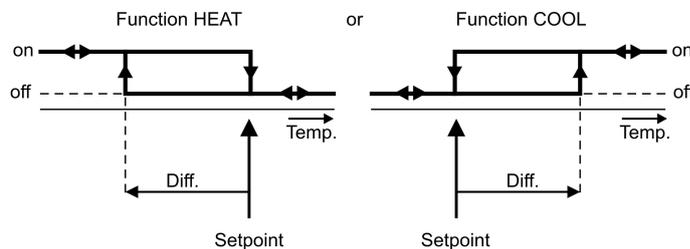
    **Er**   - Sensor broken.  Solution:
          - Check if the sensor is connected correctly.
          - Check the sensor (1000Ω at 25˚C).
          - Replace the sensor.
    **EE**   - Settings are lost.  Solution:
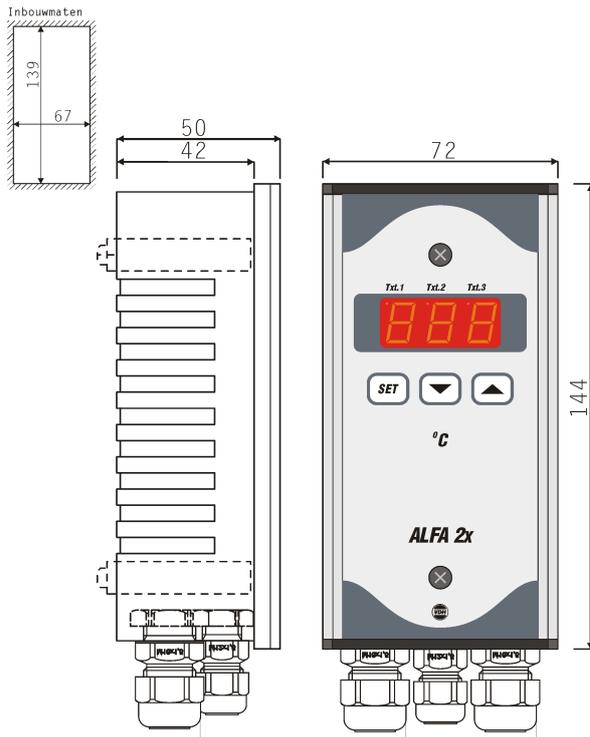          - Reprogram the settings.

**\* <u>Technical details.</u>**

| | |
|---|---|
| Model | : ALFA 21 DP Cool/Heat Thermostat |
| | ALFANET 21 DP Cool/Heat thermostat with Network |
| Range | : -10/+90˚C, readout per 0,1˚C |
| Supply | : 230 Vac 50/60Hz 2,5VA (or else see product sticker) |
| Relay | : SPDT 250V/16A(C-NO), 8A(C-NC) (cos phi=1) |
| Control | : by push buttons on the front. |
| Communication | : RS485-Network (only at ALFANET) |
| | (A, B, (2x)Gnd; 2x twisted pair shielded, min. 0,5mm$^2$) |
| Front | : Polycarbonate |
| Sensor | : T1; SM 811 2-wire temperature sensor (1000Ω at 25˚C) |
| Dimensions | : 144 x 72 x 50mm (hwd) |
| Panel hole | : 139 x 67mm (hw) |

- Provided with memory protection during power failure.
- Connection with screw terminals on the back side.
- Equipped with self test function and sensor failure detection.
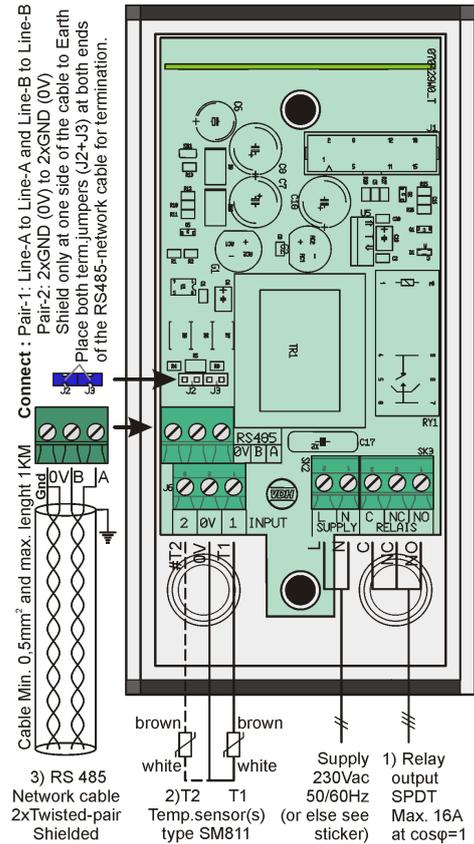- Special version on request available.
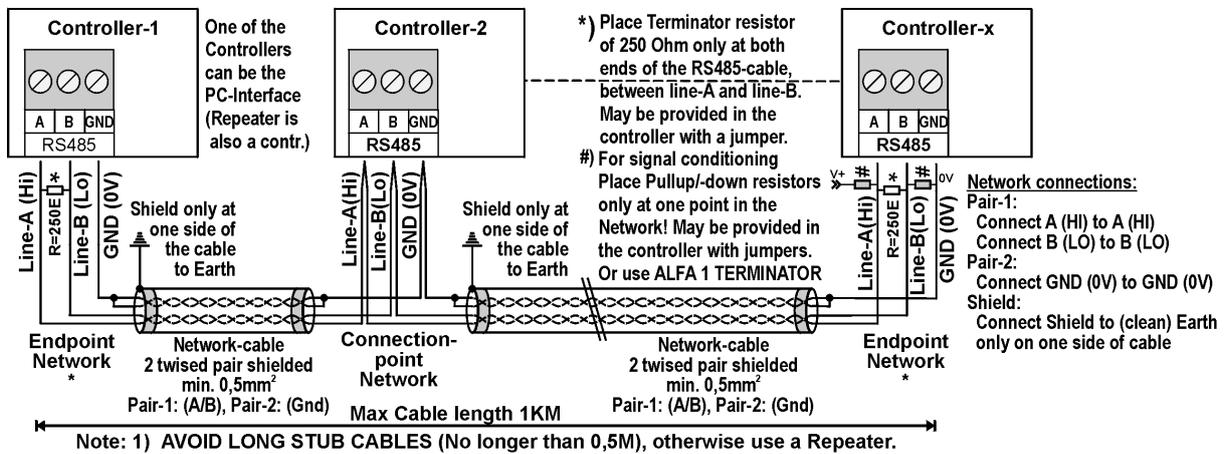
**\* <u>Function Diagram.</u>**

# *  Dimensions.

# *  Connections.

Inbouwmaten

139
67

50
42

72

Txt.1  Txt.2  Txt.3

SET ▼ ▲

°C

144

ALFA 2x

**Connect :** Pair-1: Line-A to Line-A and Line-B to Line-B
Pair-2: 2xGND (0V) to 2xGND (0V)
Shield only at one side of the cable to Earth
Place both term.jumpers (J2+J3) at both ends
of the RS485-network cable for termination.

Cable Min. 0,5mm² and max. lenght 1KM

Gnd 0V B A

RS485
0V B A

2  0V  1
INPUT

L  N
SUPPLY

C  LNC  NO
RELAIS

brown        brown
white         white

3) RS 485
Network cable
2xTwisted-pair
Shielded

2)T2      T1
Temp.sensor(s)
type SM811

Supply
230Vac
50/60Hz
(or else see
sticker)

1) Relay
output
SPDT
Max. 16A
at cosφ=1

Remarks: 1) No relay on ALFA(NET) 20
2) Optional second sensor
3) RS485 only at ALFANET-series

## RS 485  NETWORK CONNECTIONS 2-twisted pair shielded cable:

| Controller-1 | One of the Controllers can be the PC-Interface (Repeater is also a contr.) | Controller-2 | | Controller-x |
|---|---|---|---|---|

A  B  GND
RS485

A  B  GND
RS485

A  B  GND
RS485

Line-A (Hi)
R=250E *
Line-B (Lo)
GND (0V)

Shield only at
one side of
the cable
to Earth

Line-A(Hi)
Line-B(Lo)
GND (0V)

Shield only at
one side of
the cable
to Earth

V+   #
Line-A(Hi)
R=250E *
Line-B(Lo)
#   0V
GND (0V)

**\*)** Place Terminator resistor
of 250 Ohm only at both
ends of the RS485-cable,
between line-A and line-B.
May be provided in the
controller with a jumper.
**#)** For signal conditioning
Place Pullup/-down resistors
only at one point in the
Network! May be provided in
the controller with jumpers.
Or use ALFA 1 TERMINATOR

Network connections:
Pair-1:
Connect A (HI) to A (HI)
Connect B (LO) to B (LO)
Pair-2:
Connect GND (0V) to GND (0V)
Shield:
Connect Shield to (clean) Earth
only on one side of cable

Endpoint
Network
*

Network-cable
2 twised pair shielded
min. 0,5mm²
Pair-1: (A/B), Pair-2: (Gnd)

Connection-
point
Network

Max Cable length 1KM

Network-cable
2 twised pair shielded
min. 0,5mm²
Pair-1: (A/B), Pair-2: (Gnd)

Endpoint
Network
*

Note: 1)  AVOID LONG STUB CABLES (No longer than 0,5M), otherwise use a Repeater.

# *  Adresse.

VDH