## Contents

Introduction

ETN4-1999 is an all-in-one thermostat for DIN-rail mounting in an approved cabinet. It covers the needs of a variety of applications in which maximum comfort and minimum energy consumption are required, e.g. electric floor heating, frost protection, ice and snow melting, cooling, etc. The thermostat allows a required temperature to be set within the range -19.5 to +70°C. The large backlit display provides a clear view of status, while the three navigation buttons allow easy menu operation.

ETN4-1999 THERMOSTAT

Thermostat operation

The ON/OFF button is used to turn the thermostat off "**0**" or on "**I**". When the ON/OFF switch is in position "**0**", the relay is deactivated. All settings are saved.
The thermostat is easily operated using the navigation buttons. Basic functions like temperature and thermostat settings are simple to perform. Whenever a button is pressed, the backlighting will come on and stay lit for 30 seconds after a button is last pressed.
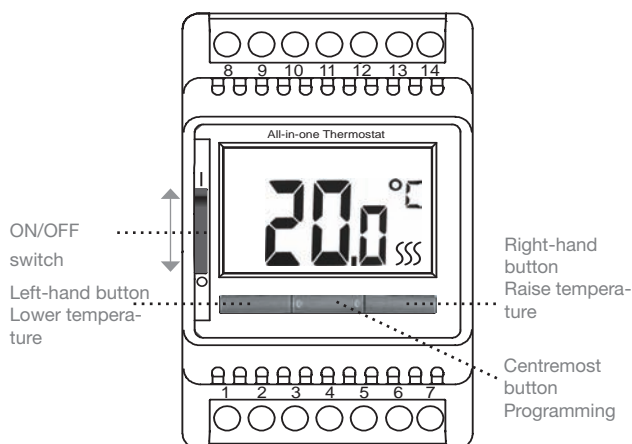
Temperature setting

The thermostat has a temperature setting range of -19.5 to +70°C. The menu allows limits to be defined for the range within temperature may be set (factory setting = 0-40°C). The required temperature is set using the left- or right-hand button. The temperature setting flashes on the display. Five seconds after the setting has been made, the required temperature will be shown on the display continuously.

Settings

To set parameter values, press and hold the centremost button for three seconds. **SCA** ⇨ **Hi** ⇨ **40** will appear on the display. Firstly, **SCA** will be displayed for 1 second, followed by **Hi**, and finally **40**. The required value can now be set using the navigation buttons. To access the next parameter, press the programming button again. If no button is pressed for 30 seconds, the program returns to the initial display.

Parameter	Shown on display	Factory settings
Max. temperature	SCA ⇨ Hi ⇨ 40	40°C (-19.5/+70°C)
Min. temperature	SCA ⇨ Lo ⇨ 0	0°C (-19.5/+70°C)
Max. limit temperature FLOOR *1	Li ⇨ Hi ⇨ 28	28°C (-19.5/+70°C + OFF)
Min. limit temperature FLOOR *1	Li ⇨ Lo ⇨ 15	15°C (-19.5/+70°C + OFF)
Frost protection	dEF ⇨ 8.0	8°C (0/+10°C)
Night setback	nSb ⇨ -5.0	-5°C (-19.5/+30°C)
Measured floor temperature	FLo ⇨ 24.5 (example) *4	
Measured room temperature	ro ⇨ 21.5 (example) *4	
Application	APp ⇨ F (Floor sensor) ⇨ A (Room sensor) ⇨ AF (Room sensor with floor temperature limits) ⇨ C : Regulator	F : Floor
Scale	LCd ⇨ C	C = Celsius (nU = numerical)
Temperature reading in start display	dF ⇨ SP	SP = Setpoint (tP = actual temp.)
Offset	OFF ⇨ 0	0 (+/- 10°C)
Control method	PWM ⇨ On	On (OFF)
PWM cycle time *2	cyc ⇨ 20	20 minutes (10-60 min)
Differential temperature *3	dIF ⇨ 0.3	0.3°C (0.3/10°C)
Relay function	rEL ⇨ no	no = normally open (nc = normally closed)
Software version	SU ⇨ 1.0	

*1 : Only available if APp ⇨ AF is selected under Application.
*2 : Only available if PWM is ON under Control Method.
*3 : Only available if PWM is OFF under Control Method.
*4 : With no or disconnected sensor, - - is shown on the display.

If Regulator (C) is selected under Application, the floor and room sensors are disconnected and heating is controlled on a scale of 0-10, corresponding to 0-100% of full power.

Max. temperature
The highest temperature to which the thermostat can be set.
Min. temperature
The lowest temperature to which the thermostat can be set.
Max. limit temperature
Allows the highest permissible floor temperature to be set for wooden and other floor types when control type has been set to room sensor with floor limit (AF).
Min. limit temperature
Allows the lowest permissible floor temperature to be set for tiled and other floor types when control type has been set to room sensor with floor limit (AF).
Frost protection
The lowest temperature for frost protection when the function is activated via an external signal (fig. 4 in instructions).
Example: The setpoint is 25°C.
Frost protection = 8°C means temp. setting = 8°C.
Night setback / energy-saving function
The number of degrees the temperature setting is to be reduced. The night setback setting must be preceded by a minus sign (-). Is controlled via an external signal (fig. 3 in instructions).
Example: The setpoint is 25°C.
Energy-saving function = -5°C means temp. setting = 20°C.
Energy-saving function = +3°C means temp. setting = 28°C.
Measured floor temperature
Displays actual floor temperature (if a floor sensor is fitted).
Measured room temperature
Displays actual room temperature.
Application
Sets thermostat function. Select the required control type. Four alternatives exist:

Floor (F): The thermostat controls floor temperature alone. A floor sensor must be fitted.

Room (A): The thermostat controls room temperature alone.

Room/limit (AF): The thermostat controls room temperature while respecting min. and max. limits for floor temperature. A floor sensor must be fitted.

Regulator (C): The thermostat functions as a simple regulator and no sensors are used. The setting is in per cent.

Scale
Choose between degrees Celsius and a numerical scale. If the numerical scale is selected, temperature is set on a scale from 0.0 to 10.0 where 0.0 corresponds to min. temperature (SCA ⇨ Lo) and 10.0 corresponds to max. temperature (SCA ⇨ Hi).
Temperature reading
Defines which temperature is to be shown on the start display: the setpoint (SP) or the actual, measured temperature.
Offset
If the actual temperature (measured using a thermometer) differs from that displayed by the thermostat, the thermostat can be adjusted to offset the difference.
Control method
PWM or ON/OFF control can be selected. PWM is an advanced control method which calculates the most effective and economical way to heat homes and other buildings. ON/OFF control is traditional differential control (e.g. 0.3°C) for other tasks.
PWM cycle time
Allows cycle time to be set when using PWM control. At least 20 min is recommended.
Differential temperature
Allows temperature differential to be set when using ON/OFF control. The higher the differential temperature, the lower the number of relay operations.
Relay function
When used for heating purposes, the relay should be in normally open position (NO). If the thermostat is used for cooling purposes, the relay should be turned to normally closed (NC).
Software version
Displays thermostat software version.

Child lock
Allows thermostats in public and other places to be locked, thus preventing unauthorised alteration of the settings. Press and hold the left- and right-hand buttons simultaneously for 10 seconds. A symbol indicates that the thermostat is locked.
The child lock can be released by pressing the left- and right-hand buttons simultaneously for 10 seconds.

Factory settings
Allows factory settings to be restored. Your personal settings will be deleted from the thermostat.

Press and hold the centremost button for 10 seconds. The display is switched off and then on again. Application is shown on the display (APp ⇨F) followed by the temperature setting.

Error messages

If a fault occurs, the master/thermostat will display one of the following error codes:

Error code	Fault	Remedy
E0	Internal fault. Thermostat defective.	Replace thermostat.
E1	External room sensor defective or short-circuited (terminals 10-11).	Replace sensor/sensor cable. To continue to operate the system without sensor, set control type to Regulator under Application (APp ⇨C).
E2	External floor sensor defective or short-circuited (terminals 8-9).	Replace sensor/sensor cable. To continue to operate the system without sensor, set control type to Regulator under Application (APp ⇨C).
E5	Internal overheating. Thermostat shuts off heating.	Check installations. Check that heating cables are not overloaded or that ambient temperature is excessive. When internal temperature drops, the thermostat automatically reactivates.

INSTRUCTIONS

Type ETN4-1999

67096A 10/11 (MBC)

Ⓞ®

- English
- Deutsch
- Русский

English

The ETN4-1999 All-in-one is an electronic on/off thermostat for 1 or 2 NTC sensors located externally.
An All-in-one thermostat for many application types:
- Electrical floor heating
- Frost protection
- Ice and snow melting
- Cooling

The thermostat should be DIN rail mounted.
A floor sensor is supplied.

PRODUCT PROGRAMME

ETN4-1999	Thermostat incl. floor sensor
ETF-944/99-H	Remote room sensor
ETNK	Wall box for ETN4-1999
MM-7595	Electronic day/week timer

WARNING – Important Safety Instructions. Disconnect the power supply before carrying out any installation or maintenance work on this control unit and associated components. This control unit and associated components should only be installed by a competent person (i.e. a qualified electrician). Electrical installation must be in accordance with appropriate statutory regulations.

NOTE: Use philips PH2 or slotted 4x0.8 mm screwdriver. Screws must be tightened with a torque of 1,0 Nm.

MOUNTING OF SENSORS

The 2 sensors contain a safety extra-low voltage (SELV) circuit, allowing the sensors to be placed as close to the floor surface as necessary without the risk of electric shock, should the sensor cable become damaged. The two wires from the sensor to the thermostat must be separated from high voltage wires/cables. The sensor cable may be extended up to 100 m by means of a separate two-core cable. The two-core cable must be placed in a separate pipe or segregated from power cables. Two vacant wires in a multi-core cable used for example to supply current to the floor heating cable must not be used. The switching peaks of such current supply lines may create interference signals that prevent optimum controller function. If a shielded cable is used, the shield must not be connected to earth (PE).

Floor sensor

It is recommended that the cable and sensor be placed in a non-conductive installation pipe embedded in the floor (fig. 2). The end of the pipe must be sealed and the pipe placed as high as possible in the concrete layer. Alternatively, the sensor can be embedded directly in the floor. The sensor cable must be led through a separate pipe or segregated from power cables. The floor sensor must be centred between the heating cable.

Room sensor

The room sensor is used for comfort temperature regulation in rooms. The sensor should be mounted on the wall approx. 1.6 m above the floor in such a way as to allow free air circulation around it. Draughts and direct sunlight or other heat sources must be avoided (fig. 5).

INSTALLATION OF THERMOSTAT

ETN4-1999 should be DIN rail mounted. To cover the terminals, use ETNK wall box. The mains, load and sensor cables should be connected as shown in fig. 1+2.
To prevent loose cables from the fixed installation from coming into contact with the terminal block for the floor sensor, they must be restrained using cable ties.

NIGHT SETBACK / FROST PROTECTION

The ETN4-1999 has 2 inputs for night setback and frost protection. See fig. 3+4. Do not use night setback and frost protection at the same time.

POWER UP

To turn on the ETN4-1999 thermostat, push the power slide button up to On "I". The backlit display will briefly show the application and then the set temperature.

PROGRAMMING

See ETN4-1999 user manual.

FAULT LOCATION

If the sensor is disconnected or short-circuited, the heating system is switched off. The sensor can be checked against the resistance table (fig. 6).

ERROR CODES

E0: Internal error. The thermostat must be replaced.
E1: External room sensor short-circuited or disconnected (terminal 10-11).
E2: External floor sensor short-circuited or disconnected (terminal 8-9).
E5: Overheating. The temperature is too high in the thermostat and the heating is switched off.

CE MARKING

According to the following standard:
LVD/EMC: EN 60730-2-9.

CLASSIFICATION

The product is a Class II device (enhanced insulation) and must be connected in the following way:

Term. 1:	Line (L1) 230 V ±10%, 50/60 Hz
Term. 2:	Neutral (L2/N)
Term. 3:	Output for control, max. 100mA
Term. 4–5:	Load, max. 16 A / 3600 W
Term. 6:	Input, night setback (S)*
Term. 7:	Input, frost protection (❄)*
Term. 8-9:	External floor sensor (SELV)
Term. 10-11:	External room sensor (SELV)
Term. X:	Do not connect

* *Do not use night setback and frost protection at the same time.*

ENVIRONMENT AND RECYCLING

Please help us to protect the environment by disposing of the packaging in accordance with national regulations for waste processing.

RECYCLING OF OBSOLETE APPLIANCES

Appliances with this label must not be disposed of with general household waste. They must be collected separately and disposed of in compliance with local regulations.

TECHNICAL DATA

Voltage	230 VAC ±10% 50/60 Hz
Max. pre-fuse	16 A
Built-in circuit breaker	2-pole, 16 A
Output relay	Make contact - SPST - NO
Output	Max. 16 A / 3600 W
Control principle	ON/OFF or PWM/PI
Sensor type	NTC (12kOhm) 3 m/max. 100 m
Stand-by power	0.5 W
Control temperature range	-19,5/+70°C
Limit sensor	-19,5/+70°C
Ambient operating temperature *	-20/+55°C
Night Setback relative	-19,5/+30°C
Night Setback regulator	0-100%
Frost protection, absolute	0-10°C
Frost protection regulator, relative	0-100%
Control pollution degree	2
Rated impulse voltage	4 kV
Enclosure rating	IP 20
Automatic action	1B
Dimensions	H/86, W/52,5, D/58 mm
DIN module size	3xM36
Display	H/25, W/38 mm. segment backlit

* *At very low ambient temperatues the display may respond slowly.*

The thermostat is maintenance free.

FIGURES

Located on page 2.
Fig. 1: ETN4-1999 terminal overview
Fig. 2: Application with floor and room sensor
Fig. 3: Night setback connection
Fig. 4: Frost protection connection
Fig. 5: Mounting room sensor
Fig: 6: Sensor resistance table

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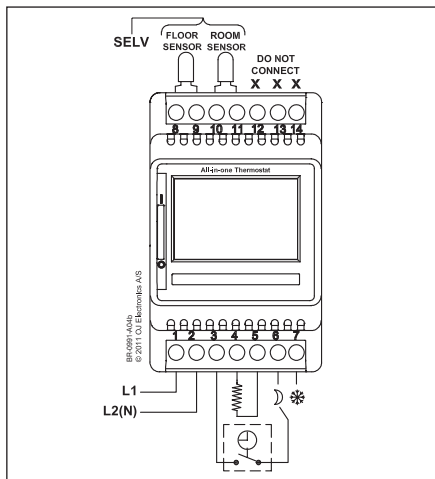oj@ojelectronics.com · www.ojelectronics.com

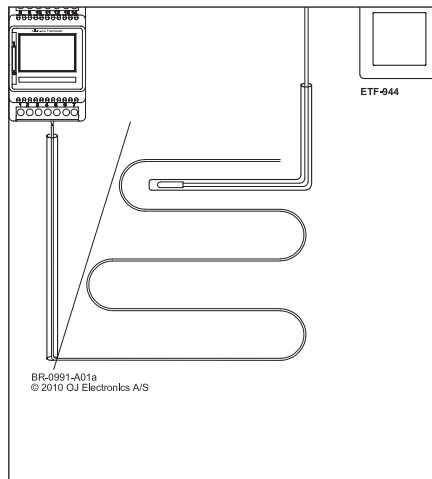© 2011 OJ Electronics A/S
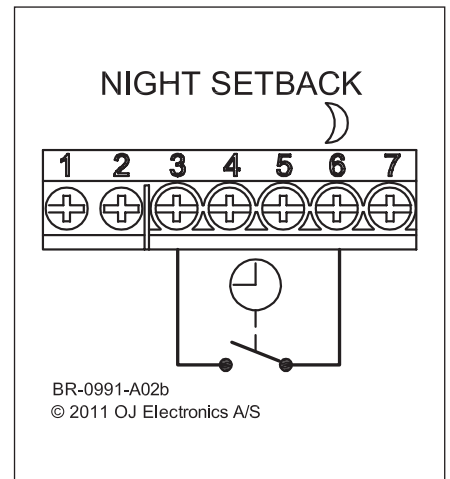
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Fig.1

FLOOR SENSOR ROOM SENSOR

SELV

DO NOT CONNECT X X X

8 9 10 11 12 13 14

All-in-one Thermostat

BR-0991-A04p
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1 2 3 4 5 6 7

L1
L2(N)

Fig.2

ETF-944

BR-0991-A01a
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Fig.3

NIGHT SETBACK

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

BR-0991-A02b
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Fig.4

FROST PROTECTION

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

BR-0991-A03b
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Fig.5

ROOM SENSOR

1.6m
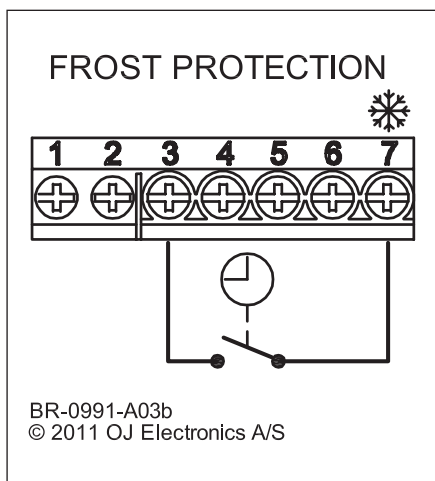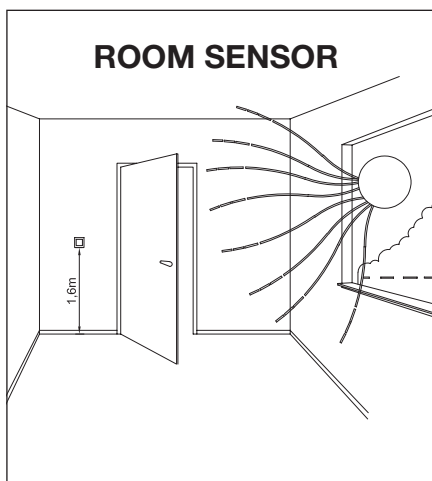
Fig. 6

BR929A08

Sensor	
Temp.(˚C)	Value (ohm)
-10	64000
0	38000
10	23300
20	14800
30	9700

67096A