INSTRUCTIONS

WARMZONE
PREMIER RADIANT HEATING

Controller for ice and snow melting



57651 06/08 (BJ)

Type ETO2 is an electronic controller for fully automatic, economical ice and snow melting on outdoor areas and in gutters. Ice forms due to a combination of low temperature and moisture. ETO2 detects both temperature and moisture and the snow melting system will usually only be activated if snow or ice is present. ETO2 is suitable for controlling electric heating cables or water-based heating pipes.

Product programme

ETO2-xxxx	Thermostat.
ETOG-55	Embedded sensor for detecting temperature and moisture.
ETOR-55	Gutter sensor for detecting moisture.
ETF-744/99	Outdoor sensor for detecting temperature

CE MARKING, FOR EU
OJ Electronics A/S hereby declares that the product is manufactured in accordance with Council Directive 2004/108/EC on electromagnetic compatibility (and subsequent amendments) and Council Directive 2006/95/EEC on electrical equipment designed for use within certain voltage limits.

Applied standards
CAN/CSA E 60730-2-9:01, UL 60730-2-9.

The product may only be used if the complete installation complies with current directives.

The product carries a manufacturer's warranty if installed in accordance with these instructions and current regulations.

If the product has been damaged in any way, e.g. during transport, it must be inspected and checked by authorised personnel before being connected to the power supply.

WARNING – Important safety instructions.
Always disconnect the power supply before performing installation or maintenance work on this control unit or any of the components connected to it. This control unit and the components connected to it should only be installed by qualified electricians. Electrical installation must be performed in accordance with applicable local regulations.

Technical data
Thermostat ETO2-4550:
Supply voltage . . . . .120/240V AC ±10%, 50-60 Hz
Built-in electronic
power supply (SMPS) . . . . . .24 V DC, 8 VA
3 output relays (potential-free contact, NO) .3 X 16 A
Alarm relay (potential-free contact, NO) . . .max. 5 A
Control signal to actuator (mixing valve) . .0-10 V DC
Supply voltage to actuator
(mixing valve) . . . . . .24 V AC / 100 mA
On/off differential . . . . . .0.3°C
Temperature range . . . . . .0/+5°C
Ambient temperature . . . . . .0/+50°C
Ambient air humidity 10-95%
Enclosure rating . . . . . .IP 20 / Nema 1
Weight . . . . . .600 g
Dimensions H/W/D . . . . . .90/156/45 mm

Type 1B
Control pollution degree 2
Rated impulse voltage . . . . . .4 kV

Embedded sensor type ETOG-55:
Designed to be embedded in outdoor areas.
Detection . . . . . .Moisture and temperature
Mounting . . . . . .Outdoor area
Enclosure rating . . . . . .IP 68

Ambient temperature . . . . . .-20/+70°C
Dimensions . . . . . .H32, Ø60 mm
Temperature for the ball pressure test . . . . . .100°C

Gutter sensor type ETOR-55:
Designed to be mounted in gutter or downpipe. Is used together with outdoor sensor type ETF.
Detection . . . . . .Moisture
Mounting . . . . . .Gutter or downpipe
Enclosure rating . . . . . .IP 68
Ambient temperature . . . . . .-20/+70°C
Dimensions H/W/D . . . . . .105/30/13 mm
Temperature for the ball pressure test . . . . . .100°C

Outdoor sensor type ETF-744/99:
Detection . . . . . .Temperature
Mounting . . . . . .Wall
Ambient temperature . . . . . .-20/+70°C
Dimensions H/W/D . . . . . .86/45/35 mm
Temperature for the ball pressure test . . . . . .100°C

The snow and ice melting system is deactivated in the event of sensor failure.

SENSOR INSTALLATION
Embedded sensor ETOG, fig. 1:
For installation on outdoor areas where snow and ice is a regular problem. The sensor must be embedded with its top flush with the surroundings with the help of the accompanying installation plate. The sensor cable must be installed in accordance with current regulations. We recommend that cable pipes be laid to protect the sensor cable. Detailed installation instructions are supplied with the sensor.

Gutter sensor ETOR, fig. 2:
For installation in a gutter or downpipe on the sunny side of the building. It is important to ensure that the sensor contact elements face against the flow of melt water. If necessary, two sensors can be installed in parallel. Detailed installation instructions are supplied with the sensor.

Outdoor sensor ETF, fig. 2:
For use in conjunction with gutter sensor ETOR. Can also be used separately for the detection of temperature alone. The sensor should be mounted on the wall under the eaves on the north side of the building.

Sensor cables:
ETOG and ETOR are supplied with 10 m cable, which can be extended up to approx. 200 m using standard installation cable: 6x1.5 mm² for ETOG and 4x1.5 mm² for ETOR (total resistance must not exceed 10 ohm). The ETF cable can be up to approx. 50 m in length. Sensor cables must be installed in accordance with current regulations. They must never be installed parallel to power cables as electrical interference may distort the sensor signal.

Thermostat installation, fig. 6
The unit should be DIN-rail mounted in an approved panel or wall-mounted in a specially designed and approved metal box (accessory). Connect supply voltage to terminals PE, N and L. All electrical and mechanical installation must be performed in accordance with applicable local regulations.

Setup:
Two sensors can be connected to the thermostat, e.g. two ETOG in the same zone, one ETOG in each of two zones (2-zone control), or two ETOR/ETF in gutter or downpipe.

- **1-zone electric heating control with ETOG, output relays 1, 2 and 3 (fig. 3):**
  Connect 2 (1) ETOG sensors to terminals 11-20. Connect heating cable to output relays 1, 2 and 3 using terminals 3-8.

- **1-zone electric heating control with ETOR + ETF, output relays 1, 2 and 3 (fig. 4):**
  Connect 2 (1) ETOR sensors to terminals 11-20.
  Connect 1 ETF sensor to terminals 21-32.
  Connect heating cable to output relays 1, 2 and 3 using terminals 3-8.

- **1-zone electric heating control and output control (Y/Δ) (fig. 5):**
  Connect 2 (1) ETOG sensors to terminals 11-20.
  Connect external contactor/relays to output relays 1, 2 and 3 using terminals 3-8 (see wiring diagram, fig. 3).

- **2-zone electric heating control with ETOG, output relays 1 and 2 respectively (fig. 3):**
  Connect 2 ETOG sensors to terminals 11-20.
  Connect heating cable for zone 1 to output relay 1 using terminals 3-4.
  Connect heating cable for zone 2 to output relay 2 using terminals 5-6.

- **2-zone electric heating control with ETOR, output relays 1 and 2 respectively (fig. 4):**
  Connect 2 ETOR sensors to terminals 11-20.
  Connect heating cable for zone 1 to output relay 1 using terminals 3-4.
  Connect heating cable for zone 2 to output relay 2 using terminals 5-6.

- **1-zone water-based heating control:**
  Connect 1 ETOG sensor to terminals 11-16.
  Connect 1 ETF sensor to terminals 21-32.
  Connect 3/4-way mixing valve to terminals 21-24.
  Connect external supply voltage (24 V AC) for mixing valve to terminals 25-26.
  Connect primary pump to output relay 1 using terminals 3-4.
  Connect secondary pump to output relay 2 using terminals 5-6.

WIRING

Terminal	Colour code	Wiring
PE, N, L		Supply voltage, 120-240 V AC 50/60 Hz
1, 2		Alarm relay (potential free) max. 5 A
3, 4		Output relay 1, 16 A (potential free), Heating cable 1 (zone 1) / Primary pump
5, 6		Output relay 2, 16 A (potential free), Heating cable 2 (zone 2) / Secondary pump
7, 8		Output relay 3, 16 A (potential free), Heating cable 3
11, 12	brown/green	Heating element 1+2, ETOG and ETOR
13, 14	grey/purple	Temperature sensor 1, ETOG
15, 16	yellow/white	Moisture sensor 1, ETOG / ETOR
17, 18	grey/purple	Temperature sensor 2, ETOG
19, 20	yellow/white	Moisture sensor 2, ETOG / ETOR
21, 22		3/4-way mixing valve, 0-10 V
23, 24		3/4-way mixing valve, 24 V AC
25, 26		Supply voltage 24 V AC for 3/4-way mixing valve

Terminal	Colour code	Wiring
27, 28		Supply water temperature sensor
29, 30		Return water temperature sensor
31, 32		Outdoor temperature sensor, ETF
33, 34		External standby input
35, 36		External override of heating input

Environment protection and recycling
Help protect the environment by disposing of the packaging and redundant products in a responsible manner.

Product disposal



Products marked with this symbol must not be disposed of along with household refuse but must be delivered to a waste collection centre in accordance with current local regulations.

Figures

Fig. 1 Installation of embedded sensor
1 Sensor
2 Installation plate
3 Heating element

Fig. 2 Installation of ETOR gutter sensor and ETF outdoor sensor
1 Thermostat ETO2
2 Gutter sensor
3 Outdoor sensor

Fig. 1

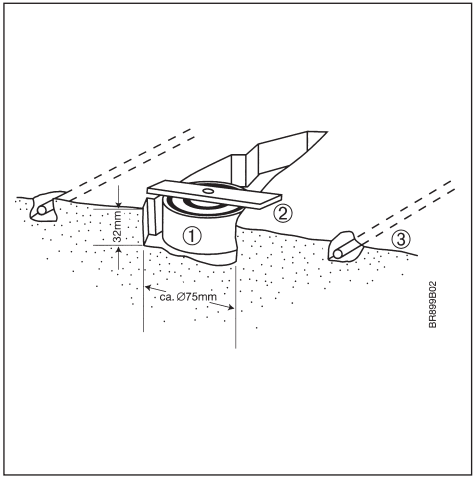


Fig. 2

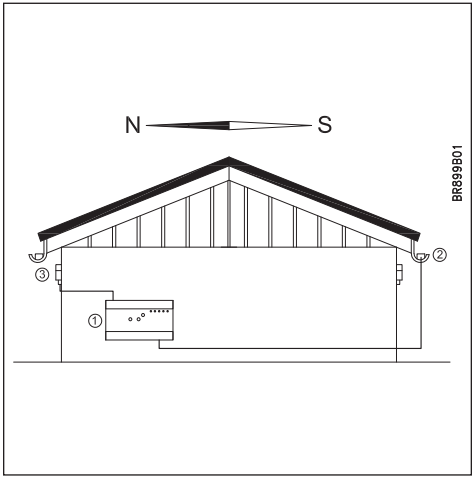


Fig. 3

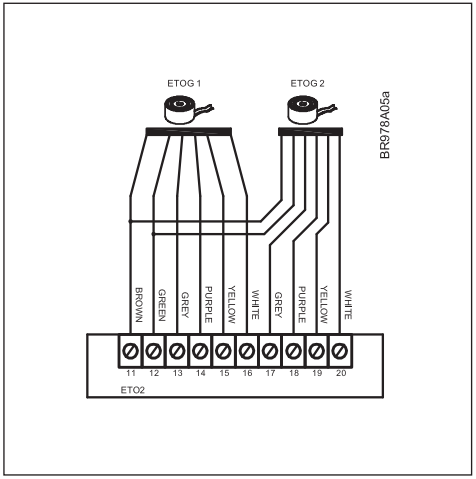

ETOG 1
ETOG 2
BR978A05a
BROWN
GREEN
GREY
PURPLE
YELLOW
WHITE
GREY
PURPLE
YELLOW
WHITE
11 12 13 14 15 16 17 18 19 20
ETO2

Fig. 4

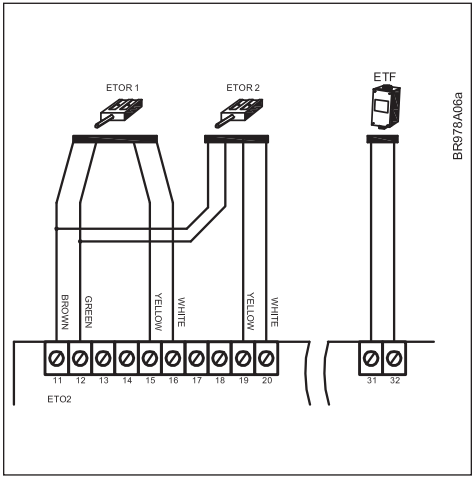

ETOR 1
ETOR 2
ETF
BR978A06a
BROWN
GREEN
YELLOW
WHITE
YELLOW
WHITE
11 12 13 14 15 16 17 18 19 20
31 32
ETO2

Fig. 5

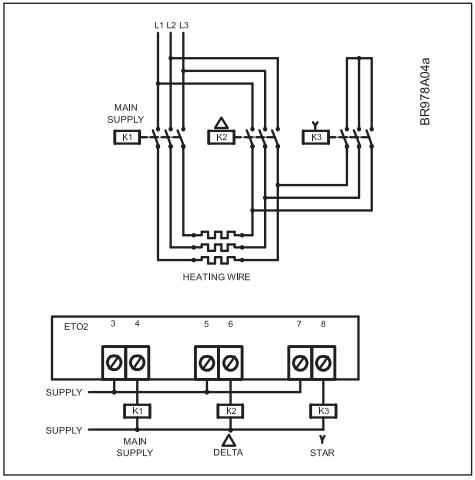
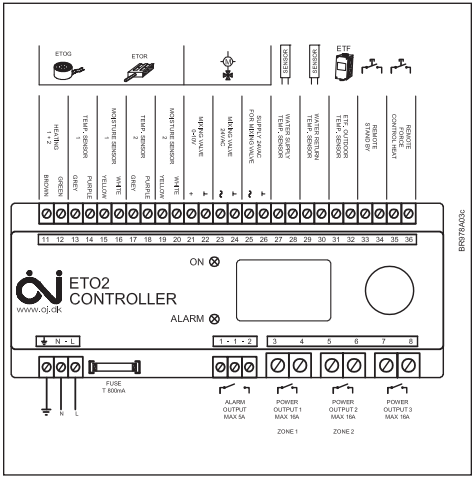

L1 L2 L3
MAIN SUPPLY
K1
K2
K3
BR978A04a
HEATING WIRE
ETO2
3 4
5 6
7 8
SUPPLY
SUPPLY
K1
K2
K3
MAIN SUPPLY
DELTA
STAR

Fig. 6


ETOG
ETOR
ETF
SENSE1
SENSE2
BROWN
GREEN
GREY
PURPLE
WHITE
YELLOW
GREY
PURPLE
WHITE
YELLOW
BLUE
BLUE
BLUE
BLUE
BLUE
BLUE
BLUE
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BLUE
BLUE
11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
ON
ETO2
CONTROLLER
www.oj.dk
ALARM
N - L
1 - 1 - 2
3 4 5 6 7 8
FUSE
T 800mA
N
L
ALARM OUTPUT MAX 5A
POWER OUTPUT 1 MAX 16A
ZONE1
POWER OUTPUT 2 MAX 16A
ZONE2
POWER OUTPUT 3 MAX 16A
BR978A03c

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