Thermostats and Electronic Controller

ETO2

Energy efficient control of ice and snow melting

An intelligent all-in-one solution for ice and snow melting usable for all applications within hydronic as well as electrical heating. Optimal operation is ensured due to output control which makes the system both effective and economical. ETO2 offers you the possibility of snow melting—the green way.

- Electronic on/off control up to 11KW
- 2 zone control, individually controlled at the same time
- Economical control-minimising energy consumption
- Adjustable moisture sensitivity
- Detection of temperature and moisture
- Display and “knob wheel” for easy programming
- Control of electrical or water-based ice and snow melting systems
- Language options

WE CANNOT CHANGE THE WEATHER - BUT WE DO CONTROL THE CONSEQUENCES

We has developed the ETO2 controller for ice and snow melting in gutters and ground areas. Using readings from temperature and moisture sensors, the controller ensures economical control of power consumptions when keeping out door areas and roofs free of ice and snow. The moisture sensor is installed in the surface of the out door area or placed in the gutter. As soon as moisture is detected, the ETO2 controller activates the snow melting system. Once the sensor has driedout, the thermostat immediately goes in after run and the system will continue to provide heat for a chosen time.

THERMOSTAT FUNCTION SENSURING MINIMAL ENERGY COMSUMPTION

The snow melting system will be energized only when the outdoor temperature is below the selected setting and snow or ice occurs on the sensors. This way you only use energy when absolutely needed.

For Gutters-ETO2-4550,ETOR-55 and ETF-744/99:

The sensor type ETOR is designed for mounting in gutters and downpipes etc. ETOR detects moisture, while ETF detects temperature.

For Outdoor areas - ETO2-4550 and ETOG-55 isused:

The sensor type ETOG is designed for embedding into the surface of the outdoor area. ETOG detects ground temperature and moisture. The air sensor type ETF-744/99 can be used for measuring rapidly temperature decreases.

Product Qualification

CE

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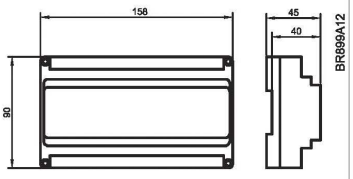
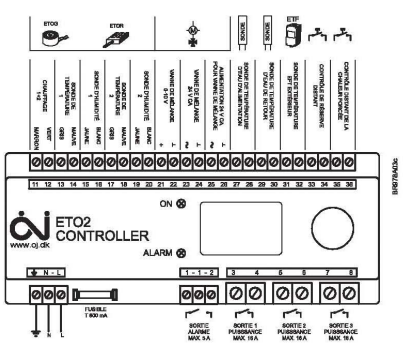
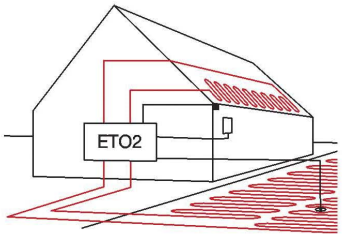
Schémas



Dimensions (mm)



Connexions



Application en toiture et surface au sol

Remote control:
It is possible to control the ETO2 from an external signal (day/week timer, GSM -module or other signal source) The ETO2 can be switched on/off (standby) and the heating system can be forced on, in the after run time that has been set in the menu.

SENSORS

Ground sensor type ETOG:
Designed for embedding into the surface of the outdoor area. Detects temperature and moisture. Up to two sensors type ETOG can be installed.

Gutter sensor type ETOR:
Designed for mounting in gutters and downpipes etc. Detects moisture only. Is mounted in combination with outdoor sensor ETF. Up to two sensors type ETOR can be installed.

Outdoorsensortype ETF:
Detects temperature. Is used in combination with gutter sensor ETOR, but can also be used separately only for temperature detection. The outdoor sensor can also be used together with the ETOG sensor for outdoor areas. The outdoor sensor detects rapidly decrease in air temperatures avoiding icy areas.

MOUNTING

Mounting of thermostat ETO2:
DIN-rail mounting in switch board, mounting box or on wall surface.

Mounting of ground sensor ETOG:
Is mounted where the worst snow and ice problems normally occur. The sensor is mounted on a hard foundation, in a concrete base, with the top of the sensor flush with the surface.
Where an asphalt surface is used, it should be placed in a concrete recess.

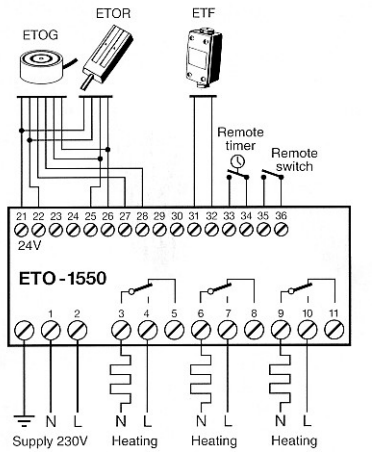
Mounting of gutter sensor ETOR:
Is mounted in the gutter or down pipe on the sunny side of the building. The contact point of the sensor must be placed in the direction of flow of the melting water. Where necessary, it is possible to connect two sensors in parallel.

Mounting of outdoor sensor ETF:
Is mounted under the roof eaves on the north side of the building.

TECHNICAL DATA

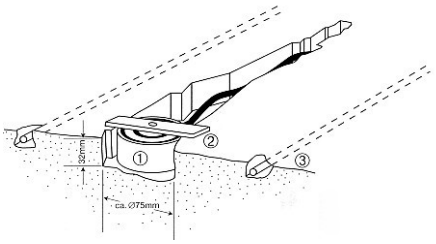
THERMOSTAT ETO2-4550:

Supply voltage	120/230V ±10%, 50-60 Hz
Temperature range	0/+10°C
Built-in timer for manual	
Snow melting/after run	0-18hours
Output relay	3x16A potential free relay
2 zone application	Output is 2x16A potential free relay
Water based system	Controlling a 3 or 4 way valve, primarypump, secondary pump.
Display	Graphic and with back light
Ambient temperature	0/+50°C
Housing/incl.cover	IP20
Weight	495g
Dimensions excl. cover(H/W/D)	90/156/45mm
Dimensions incl. cover(H/W/D)	170/162/45mm
LED's indicate the functions:	
ON/Green	Supply voltage to the thermostat
Error/Red	Fault indication

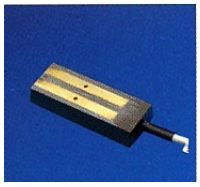


GROUND SENSOR ETOG-55:

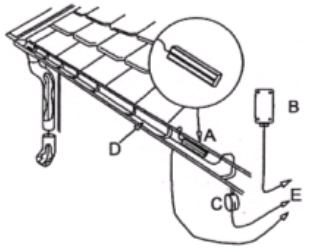
Detecting	Moisture and temperature
Mounting	Outdoor area
Housing	IP68
Ambient temperature	-50/+70°C
Dimensions	H32, Ø60 mm



GUTTER SENSOR ETOR-55

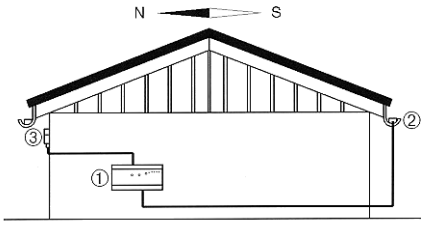


Detecting	Moisture
Mounting	Gutter and down pipe
Housing	IP68
Ambient temperature	-50/+70°C
Dimensions (H/W/D)	105/30/13mm



OUTDOORSENSOR ETF-744/99

Detecting	Temperature
Mounting	Wall surface
Housing	IP54
Ambient temperature	-50/+70°C
Dimensions (H/W/D)	86/45/35mm



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USER MANUAL - ETO2

GLOSSARY

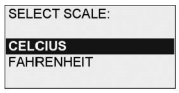
Zone 1, 2: Independent heating zones in which ice and snow can be melted. Encoder button: Button which can be turned or pressed to easily configure the settings. ETOG-55: Ground sensor for detecting moisture and temperature.
ETOR-55: Gutter sensor for detecting moisture.
ETF-744/99: Outdoor sensor for detecting temperature.
Y/Δ: Advanced 2-stage control of electric heating systems.
Afterrun: The heat provided by the system, for a specified length of time, after the moisture/temperature signal has been eliminated by a heating cycle.

INTRODUCTION

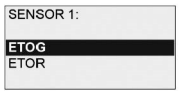
Type ETO2 is an electronic controller for fully automatic, economical ice and snow melting on outdoor areas and in gutters. Ice forms due to a combination of low temperature and moisture. ETO2 detects both temperature and moisture and the heating system will only be activated if a possibility of snow or ice is indicated by both parameters.
An easily operated encoder button and backlit graphic display ensure quick and easy configuration and simple indication of temperature, status, etc.
ETO2 is suitable for controlling electric heating cables in 1 or 2 zones. It also features advanced two-stage output control for economic operation.
In hydronic mode, the supply sensor maintains the required supply water temperature while the system is active. When heat is demanded, the circulation pump is activated and the valve is opened 20% for 1 minute to let the system stabilise. The main pump is then activated.
When there is no need for melting, the system activates the circulation pump for 1 minute every 15 minutes to check whether the return water temperature has dropped below the required “idle temp.” If this is the case, the system fully activates to increase the return water temperature to the required level.

STARTUP

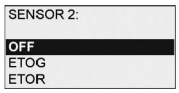
When ETO2 is switched on for the first time, Celsius or Fahrenheit must be selected. Turn the encoder button until the required temperature scale is highlighted. Then OK the selection by pressing the encoder button.



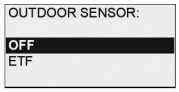
SENSOR 1 is shown on the display, allowing the type of sensor connected for input 1 to be selected:
ETOG : Ground sensor
ETOR : Gutter sensor + outdoor sensor
Then OK the selection by pressing the encoder button.



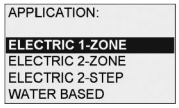
SENSOR 2 is then shown on the display, allowing the type of sensor connected for input 2 to be selected. If none sensor is connected for input 2, OFF must be selected.



Select if outdoor sensor ETF is connected terminals 31-32.
If none sensor ETF is connected, OFF must be selected. Press encoder button for OK.

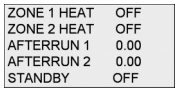


Select the application type by turning the encoder button and pressing OK.
ELECTRIC 1-ZONE : 1 zone electric heating control/simple waterbased.
ELECTRIC 2-ZONE : 2 zones individual electrical heating control/simple waterbased.
ELECTRIC 2-STEP : Advanced 2-stage electric heating control (Y/Δ) for 1 zone.
WATERBASED : 1 zone waterbased heating control with supply water control.



Select the appropriate option and press OK. The system is now set up, and will begin operating fully automatically, in accordance with the pre-configured standard program, see FACTORY SETTINGS. Alternative settings can also be made, see SETTINGS.

Status and afterheat data for zones 1 and 2 are now shown on the display.

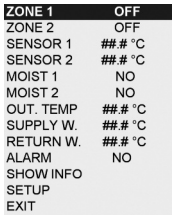


OPERATION

ETO2 is equipped with an easily operated encoder button (turn and press) and a display which describes the current situation. The display is backlit and is illuminated by pressing the encoder button (OK). The illumination is automatically switched off after 30 seconds.

Press the encoder button and the main menu will be shown on the display.
Turn the button to scroll through the options. Not all the options are shown on the display at once, but they can be accessed by turning the encoder button.
Press OK to select a highlighted option.

MAIN MENU



DISPLAY TEXTS

Zone 1	OFF	Heating zone 1 active (ON) or inactive (OFF)
Zone 2	OFF	Heating zone 2 active (ON) or inactive (OFF)
SENSOR 1	##.#°C	Sensor 1 (heated sensor) core temperature. Applies only when ETOG sensor is connected. NOTE: Not ambient temperature!
SENSOR 2	##.#°C	Sensor 2 (heated sensor) core temperature. Applies only when ETOG sensor is connected. NOTE: Not ambient temperature!
MOIST1 NO		Sensor 1 moisture status. YES / NO / Blank. Blank will be shown if temperature is above Set Temp or the system is in Afterrun mode
MOIST 2 NO		Sensor 2 moisture status. YES / NO / Blank. Blank will be shown if temperature is above Set Temp or the system is in Afterrun mode.
OUT TEMP	##.#°C	Ambient outdoor temperature. Applies only when ETF sensor is connected.
SUPPLY W	##.#°C	Supply water temperature, only waterbased application
RETURN W	##.#°C	Return water temperature, only waterbased application
ALARM	NO	Fault message, fault type will be displayed. Red LED on front of unit will flash.

APPLICATION INFORMATION

SHOW INFO

APP. E.1ZONE	Application type: electric or water-based heating
SW VERSION 1.00	Software version
SENSOR 1 ETOG	Sensor type, sensor 1
SENSOR 2 OFF	Sensor type, sensor 2
SENSOR ETF OFF	ETF sensor connected
EXIT	Return to main menu

SETTINGS

Please note that incorrect sensor setup may lead to poor or lacking ice and snow melting.
Press OK and a submenu will be shown on the display.
Select the parameter to be set and press OK.

SETUP

FORCE HEAT OFF Manual start of forced heat. Press OK and select ON to start Forced heat. ETO2 controller will heat in the pre-programmed afterrun time, see AFTERRUN
1 and 2.

SELECT SCALE C Whether temperature is to be displayed in Celsius (C) or Fahrenheit (F) can be selected here. Select the required scale and press OK. Press OK to return to the SETUP menu.

SET TEMP 1 3°C Set temperature for Zone 1: The temperature at which the ice and snow melting system will become active can be set here. The temperature setting can be adjusted from +50 / -20°C (122 / -4°F). Set the required temperature and press OK.

SET TEMP 2 3°C Set temperature for Zone 2: The temperature at which the ice and snow melting system will become active can be set here. The temperature setting can be adjusted from +50 / -20°C (122 / -4°F). Set the required temperature and press OK.

OFF TEMP 1 OFF The lowest operating temperature for Zone 1 can be set here. Below this tempera- ture, the system will enter standby mode. The adjustment range goes down to -20°C/OFF (-3.9°F/OFF). OFF = no limit. To change the minimum cut-off tempera- ture, press OK, turn the encoder button to the desired value and confirm with OK

OFF TEMP 2 OFF The lowest operating temperature for Zone 2 can be set here. The adjustment range goes down to -20°C/OFF (-3.9°F/OFF). OFF = no limit. To change the minimum cut-off temperature, press OK, turn the encoder button to the desired value and confirm with OK.

OFFSET T1 La température de zone 1 peut être calibrée ici. La température enregistrée par la sonde ETOG peut être ajustée pour que la température précise soit affichée sur l'ETO2. Mesurez la température à côté de la sonde en utilisant un thermomètre. Ajustez l'offset nécessaire en utilisant le bouton de l'encodeur Appuyez sur OK.

OFFSET T2 La température de zone 2 peut être calibrée ici de la même façon. Ajustez l'offset nécessaire en utilisant le bouton de l'encodeur puis appuyez sur OK.

OFFSET OUT La température extérieure peut être calibrée ici. La température enregistrée par la sonde d'extérieur ETF peut être ajustée pour que la température précise soit affichée sur l'ETO2. Mesurez la température à côté de la sonde en utilisant un thermomètre. Ajustez l'offset nécessaire en utilisant le bouton de l'encodeur.
Appuyez sur OK.

MIN WATER La température minimum d'eau de retour peut être réglée ici. Réglez la température minimum requise puis appuyez pour confirmer. Cette option du menu n'est disponible que si un chauffage à l'eau est utilisé.
La température maximum d'eau d'alimentation peut être réglée ici. Réglez la température maximum puis appuyez pour confirmer. Cette option du menu n'est disponible que si un chauffage à l'eau est utilisé.

FACTORY RESET
EXIT Tous les réglages d'usine de l'ETO2 peuvent être restaurés ici. En sélectionnant cette option, tous les réglages personnalisés sont supprimés.

REINSTALL Si un paramétrage échoue dans le menu de démarrage ou si un nouvel équipement est raccordé, le réglage initial doit être changé dans le menu de DÉMARRAGE. Sélectionnez PASSWORD et tournez le bouton de l'encodeur au code d'usine (1202). Le contrôleur retournera alors au menu de démarrage, voir DÉMARRAGE. Sélectionnez cette option et appuyez sur OK pour retourner au menu principal.

RÉGLAGES D'USINE

PARAMÈTRE	RÉGLAGES D'USINE	RÉGLAGES PERSONNALISÉS
Application	Électrique	
Zone 1	ETOG	
Zone 2	OFF (arrêt)	
Choix d'échelle	Celsius	
Durée après chauffage zone 1	0,30 heure	
Durée après chauffage zone 2	0,30 heure	
Temp. offset zone 1	0,0 °C	
Temp. offset zone 2	0,0 °C	
Temp. offset ETF	0,0 °C	
Réglage température	3,0 °C	
Température min. de l'eau	5 °C	
Température max. de l'eau	55 °C	

Fig. 1

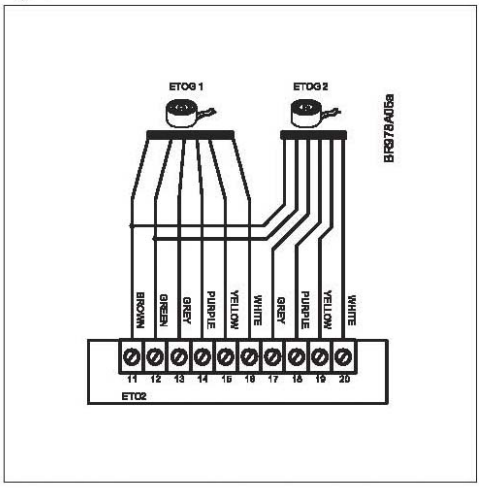


Fig. 2

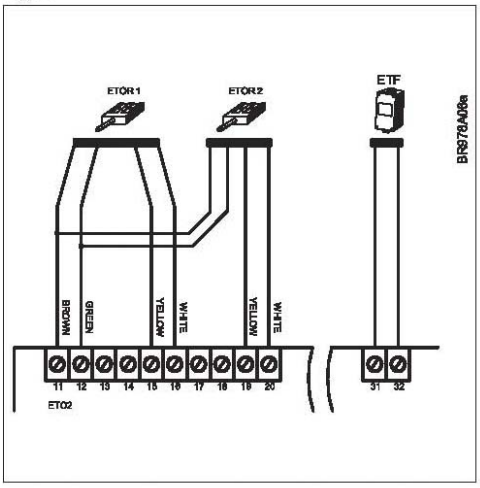


Fig. 3

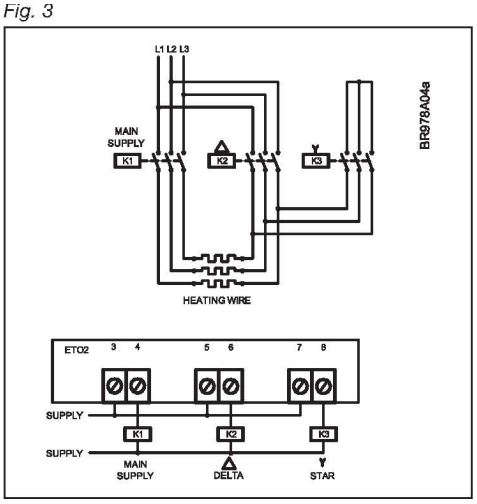


Fig. 4

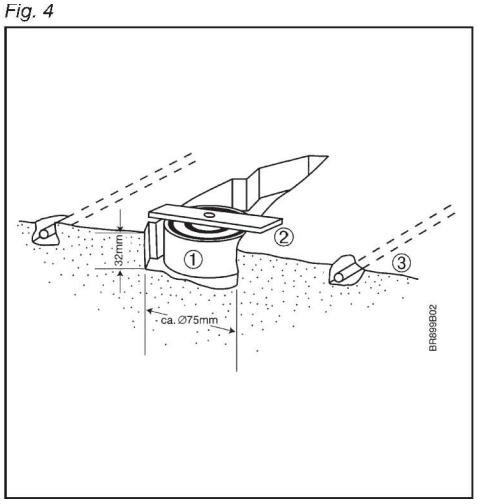


Fig. 5