

## EQJW 125: Heating controller with digital user interface

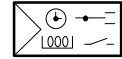
Heating controller with communication capability for weather-compensating supply-temperature control, with digital user interface. Room-temperature connection in conjunction with a room-temperature sensor or remote control unit. Outside temperature transmitted via device bus. Motorised drives connected to valves or control valves (3-pt.) and for a pump (on/off). Suitable for all types of building.

Used in conjunction with Ni1000 temperature sensors. Intuitive user prompting with easy-to-use operating elements (turn and press) and clear LCD. Fixed basic program for use when putting into service for the first time. Max./min. limitation of the supply temperature. Automatic change-over between summer and winter modes (heating-limit function). Frost-protection function. Time-switch with weekly and annual programs. Automatic change-over between summertime and wintertime. Demand-led pump control with anti-jamming function. Floor-drying function. Manual mode for valve and pump. SERVICE level protected by password. Communication with building management system via MOD bus, or amongst several controllers via proprietary device bus. Alarms sent in the form of an SMS via modem.

Housing (144 × 96 mm) of fire-retardant, pure-white (RAL 9010) thermoplastic. Rotary switch for selecting the operating mode (Automatic/Normal/Reduced/Manual) and adjusting the setpoints. For mounting onto walls, into panels or onto top-hat rails as per DIN/EN 50022. Plug-in baseplate of fire-retardant, black thermoplastic with screw terminals for cable of up to 2.5 mm<sup>2</sup>.



T10197



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Type	Features	Power	Weight [kg]
<b>EQJW 125 F001</b>	PI supply-temperature control	230 V~	0.4
Power supply 230 V~	± 15%, 50 Hz	Digital time-switch for weekly/annual program	
Power consumption	approx. 2 VA	Running capacity	min. 24 h; typ. 48 h
Outputs	3 relays	Accuracy	< 1 s/day
Switch rating		Weekly switching program	
Relay: pump <sup>1)</sup>	2 A, 250 V~, cos φ > 0.5	Number of switching commands	48 week
Relay: drive <sup>2)</sup>	0.5 A, 250 V~, cos φ > 0.5	Min. switching period	10 min.
Inputs	3 analogue	Annual switching program	
Analogue inputs	2 Ni1000 1 Ni1000 or remote control	Number of switching commands	20
		Min. switching period	1 day
Control parameters		Ambient temperature	0...+50 °C
Proportional band	2...100 K	Storage temperature	-25...+65 °C
Integral action time	15...1000 s	Ambient humidity	5...95 %rh
Temperature ranges			no-condensating
Normal temperature	0...+40 °C	Degree of protection (when fitted in panels)	IP 40 (EN 60529)
Reduced temperature	0...+40 °C	Protection class	II (IEC 60730 - 1)
Supply temperature	0...+130 °C	Conformity	EN 12098; CE
Outside temperature	-50...+50 °C	EMC immunity	EN 61000-6-1, 2
Valve's running time	30...300 s	EMC irradiation	EN 61000-6-3, 4
Cycle time	running time/15	Safety	EN 60730 - 1
Frost-protection temp.	+3 °C	<b>Documentation</b>	
Communication		Wiring diagram	<a href="#">A10175</a>
Interface	RS485	Dimension drawing	<a href="#">M10176</a>
Protocol	MOD bus, device bus	Fitting instructions	<a href="#">MV 505870</a>
		Abridged operating instructions <sup>3)</sup>	<a href="#">BA 505872</a>
		Operating instructions	7 001029
		Declaration of materials used	MD 44.420

### Accessories

- EGS 52/15 Remote-control unit, see Section 44
- EGT . . . Temperature sensors, see Section 36 in the catalogue
- AVR, AXM Motorised valve drive (3-point), see Section 51, 55 in the catalogue
- Modem Modems tested with EQJW 125 are available on request
- 0220074 001** Adaptor for EQJW; type 41 C
- 0220074 002** Adaptor for EQJW; type 41 D

1) Start-up current max. 7 A, (1 s)  
 2) Low voltage not permissible  
 3) Supplied with every controller, in 5 languages (Ger., Eng., Fre., Ital., Span.)

### Engineering notes

The *equitherm* EQJW 125 controller should be connected to the mains power supply all year round.

### General description of operation

The EQJW 125 heating controller provides weather-compensating supply-temperature control.

The outside temperature, flow temperature and (where applicable) the room temperature are measured by precision sensors.

The microprocessor employed in the controller uses these temperatures to calculate the signals for the outputs. Using the control model stored in the controller, the setpoints, the current control offset and the set control parameters – along with the actual values – are taken into account when the output signals are worked out. These signals are processed further by circuit amplifiers; the on/off commands of the relay outputs for the drive and the pump are derived from here.





The necessary heat is fed into the room and the room temperature is kept constant at the setpoint. If a room sensor is connected to the EQJW 125 and has been parameterised accordingly, the prevailing room temperature is taken into account when calculating the setpoint for the supply temperature.

The switching programme, which can be set up by the user to meet his particular requirements, ensures a minimum of energy consumption while providing optimum room conditions. The setpoint for the room temperature is variable. The operating mode can be chosen easily using the rotary switch provided. For instance, the heating can be switched off for long periods, yet the installation is protected against freezing thanks to the anti-frost function.

The 'Temporary Temperature Change' function acts as an override, enabling the user to change to another operating mode for a certain period of time, thereby saving energy. The prevailing operating condition is indicated to the user by LEDs.

It is possible to communicate with the controller via a Modbus interface. It is also possible to link several controllers with each other and to connect a room remote-control unit with digital user surface. If necessary, alarms can be sent via SMS using a separate modem.

### Abbreviations

TA	= outside temperature	TI	= initial point (foot point)
TF	= flow temperature	TR	= room temperature
Tn	= integral action time	Xp	= proportional band
Ty	= running time of valve	SP	= SERvice parameters
UP	= heating pump	V	= valve
TS/W	= heating limit	S	= slope of heating characteristic
	= factory setting		= normal mode (rating as per EN12098)
	= reduced mode		= Off/stand-by mode (with/without frost protection)
Indizes:		Beispiel:	
Xs	= setpoint	TRs	= room-temperature setpoint
Xi	= actual value	TFi	= actual value of flow temperature
Xged	= attenuated value	TAged	= attenuated outside temperature
max	= maximum	TFsmax	= maximum flow setpoint
min	= minimum	TRsmin	= minimum room setpoint

### Additional technical data

Measuring accuracy	Better than $\pm 0.3 \text{ K}$ @ $25^\circ\text{C}$
Time constant: data processing	Approx. 10 sec for TA, < 5 sec. for TR and TF
Neutral zone	< 1.0 K
Minimum pulse duration	250 msec
Integral action time for pump	$2 \times T_y$
Heating characteristic	Curved, uninfluenced by extraneous heat (see page 4)
Attenuation of outside temperature	Time constant approx. 21 hours
Summer/winter heating limit	ON equals summer → winter OFF equals winter → summer ON when $T_{Aged} < T_{S/W} - 1 \text{ K}$ ; OFF when $T_{Aged} > T_{S/W}$ TS/w can be set via SP 18
Running capacity	Typically 48 (> 24) hours The controller should have been connected to the mains for
at least 4 hours.	
Input for temperature sensor	Ni1000
Zero-point correction for room temp.	up to $\pm 6 \text{ K}$ is possible
Zero-point correction for outside temp.	up to $\pm 9 \text{ K}$ is possible

Outputs for pump, control unit	Relay (with indication of switching status)
Switching frequency, mechanical	> 5 million switching operations
Maximum closed time for control unit	2 times the valve's running time. The control unit is activated again every 15 minutes.
Temporary temperature change	Change in automatic mode. Changes till the next switching command (but at least 2 hours), or from 3 hours to 19 days, are possible. Indication of remaining time in the display. Change can be aborted.
Design temperature	If the EQJW 125 is in automatic mode and $T_A$ is lower than the set design temperature, the heating is controlled in normal mode, regardless of the switching program. The design temperature is parameterised in the SERVICE level.
<b>Special functions</b>	
Connection of room temperature	The room-temperature connection is activated in the SERVICE level, but a room-temperature sensor must be connected. Influence of room-temperature connection can be set in the SERVICE level. Maximum change in $T_F$ due to the room-temperature connection is $\pm 30$ K.
Frost protection	Anti-frost function cuts in if the controller is in OFF mode and the anti-frost function in the SERVICE level has been enabled and the anti-frost limit has been undercut. This limit is $3^\circ\text{C}$ for the outside temperature. The anti-frost function is de-activated when the outside temperature rises above $4^\circ\text{C}$ . When the anti-frost function cuts in, a flow temperature of $+10^\circ\text{C}$ obtains.
Anti-jamming function for pump	This function is enabled in the SERVICE level. The pump is switched on every day at midnight for 60 seconds if it hasn't been in operation at any time in the previous 24 hours. The function is active in all operating modes except manual mode.
Limitation of the flow temperature	The maximum and minimum setpoints for the flow temperature are limited. If the calculation for the setpoint for the flow temperature is outside of the limit, then the limit temperature is in force. The limit value can be set in the SERVICE level. The flow-temperature control is not active in manual mode, so there is no limitation of the flow temperature. If the anti-frost function is active, the limitation of the flow temperature is not in force.
Manual mode	In manual mode, the pump and the valve can be activated separately. The setting for this is menu-led, if manual mode has been enabled, which is done in the SERVICE level. The ex-works setting for manual mode is 'not enabled'.
Automatic cut-off	With the automatic cut-off facility, the heating controller saves energy without any loss of comfort levels, wherever possible. There are the following ways of switching off the heating controller:- a) The EQJW 125 is OFF b) Summer/winter heating limit is OFF c) $T_A \geq TRs$ (when $T_A \leq TRs - 1$ K, controller switches back on)
Floor-drying function	EN 1264, Part 4 describes how anhydrite cement floors should be treated during operational heating before the floor covering is laid. This entails, first of all, maintaining an inlet temperature of $25^\circ\text{C}$ for 3 days. Thereafter, the maximum inlet temperature should be maintained for four days. This function has been included on the EQJW 125; it can be activated via the SERVICE level.
Switching programmes	Weekly switching programme with up to 48 switching commands and calendar switching programme with up to 20 switching commands are available. The minimum switching intervals are 10 minutes and one day respectively. Operating mode with weekly and calendar switching programme with lower energy consumption has priority. An 'empty' switching programme is interpreted as being normal mode. The calendar switching programme is enabled in the SERVICE level. The ex-works setting for the calendar switching programme is 'not enabled'. The commands in the calendar switching programme are not erased after they have been carried out.
Multiplication $T_A$	The outside temperature is registered by an EQJW 125 and made available as a measured value to the other controllers via the device bus. The parameterising for this is done in the communication level.

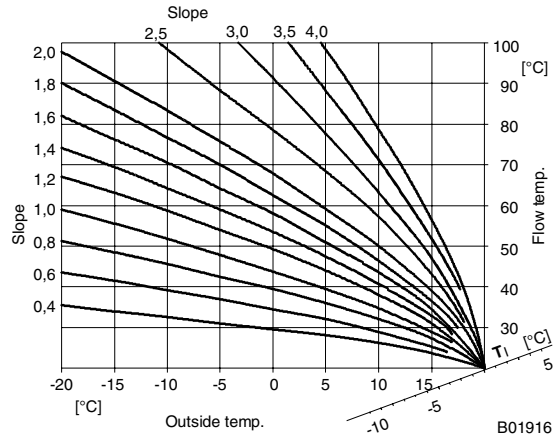
Modbus communication

It is possible to communicate with the EQJW 125 via an RS 485 interface using the Modbus RTU protocol. Data can be exchanged. In so doing, the EQJW 125 is always used as a slave.

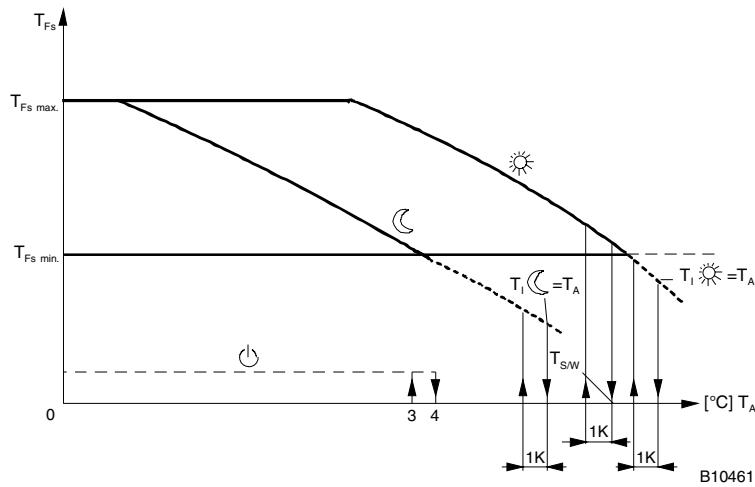
Alerting via SMS

Alarm texts are sent as an SMS (by means of a provider) to a mobile telephone via a modem. An interface that is similar to RS 232, plus the TAP (Telocator Alphanumeric Protocol) protocol are used for this.

**Heating characteristic**



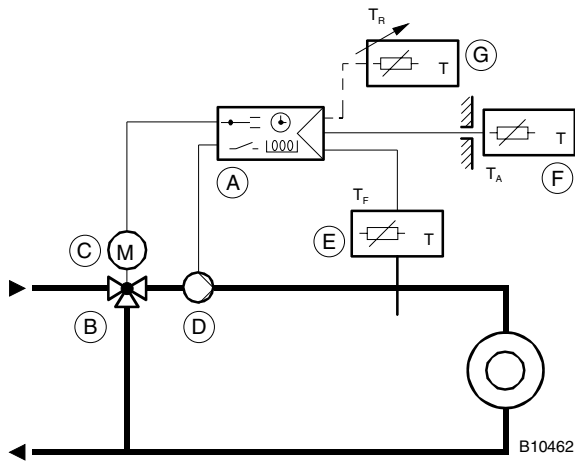
**Heating characteristic diagram with ☀ ☾ mode and heating ⏻ (OFF with frost protection)**



$T_1 \text{ ☀}$  = Foot point of heating characteristic ☀ (= normal mode) or room-temp. setpoint ☀  
 $T_1 \text{ ☾}$  = Foot point of heating characteristic ☾ (= reduced mode) or room-temp. setpoint ☾

The heating is switched off automatically when  $T_A$  exceeds the foot point of the heating characteristic (☀ & ☾ modes), or when the summer/winter heating limit  $T_{SW}$  is exceeded.

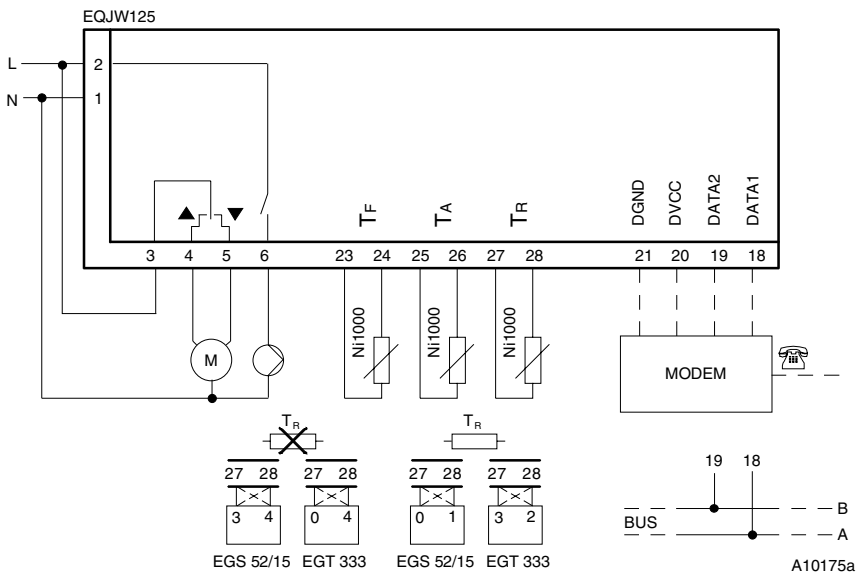
**Example of use**



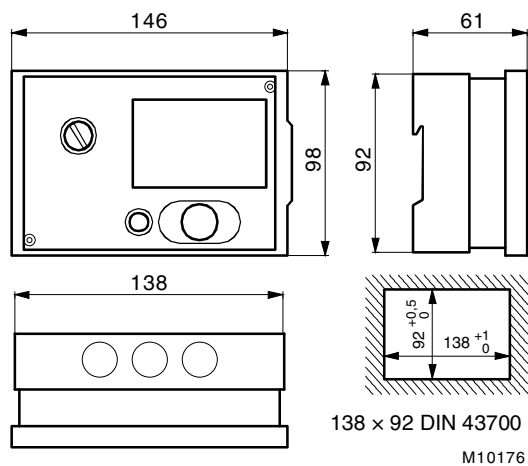
**Weather-compensating flow-temperature control**

- A. EQJW 125 heating controller
- B. Control valve
- C. Control unit with 3-pt. motorised drive
- D. Circulation pump
- E. Flow-temperature sensor
- F. Outside-temperature sensor
- G. Room-temperature sensor and/or remote-control unit (if available)

**Wiring diagram**

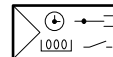


**Dimension drawing**



Elektronischer Heizungsregler  
 Régulateur électronique de chauffage  
 Electronic heating controller  
 Regolatore elettronico per il riscaldamento  
 Regulador de calefacción electrónico  
 Elektronisk värmeregulator  
 Elektronische weersafhankelijke regelaar

Montagevorschrift  
 Instructions de montage  
 Fitting instructions  
 Istruzioni di montaggio  
 Instrucciones de montaje  
 Monteringsanvisning  
 Montagevoorschrift



Y01944

Installationsanweisung für die Elektrofachkraft  
 Notice d'installation pour l'électricien  
 Guidelines for the electrician  
 Informazioni per l'installatore elettrico  
 Instrucciones de instalación para el electricista  
 Installationsinstruktion för behörig elektriker  
 Instalatie aanwijzing voor de elektromonteur

Für den Einsatz in üblicher Umgebung  
 Pour usage dans un environnement normal  
 For use in normal environments  
 Per impiego in ambiente usuale  
 Para el uso en ambiente normal  
 För användning i normal miljö  
 Voor toepassing in normale omgeving

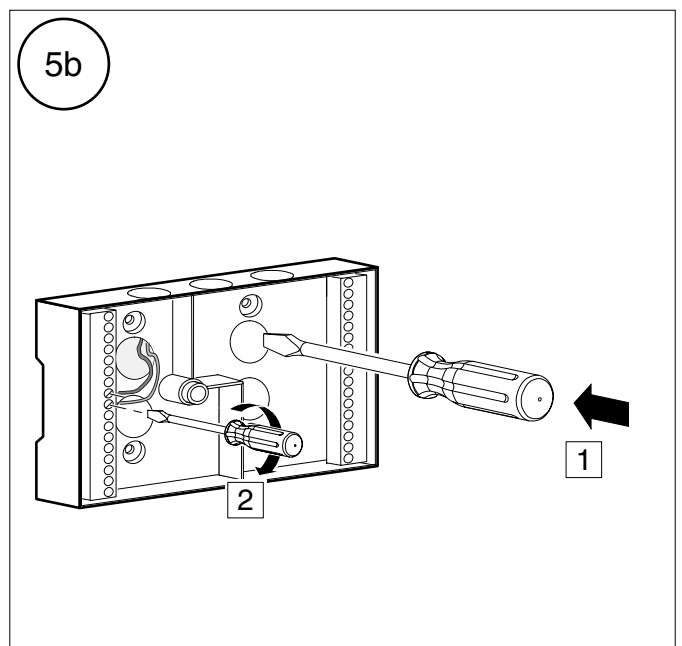
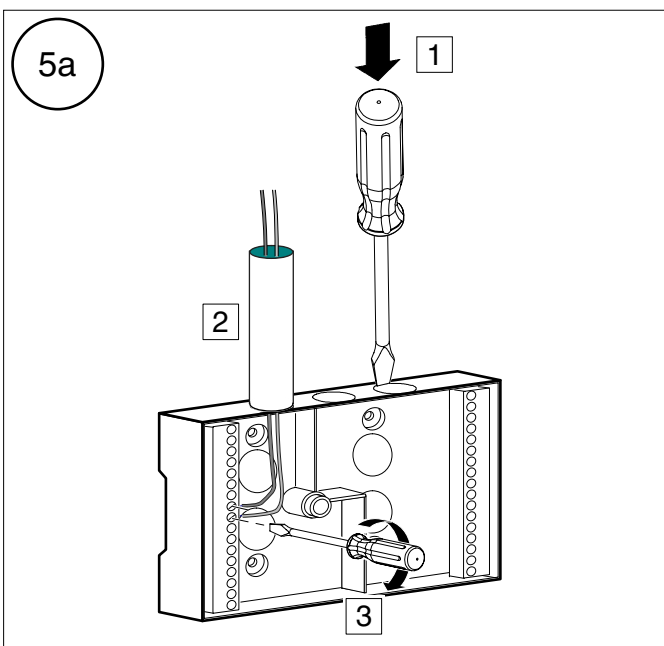
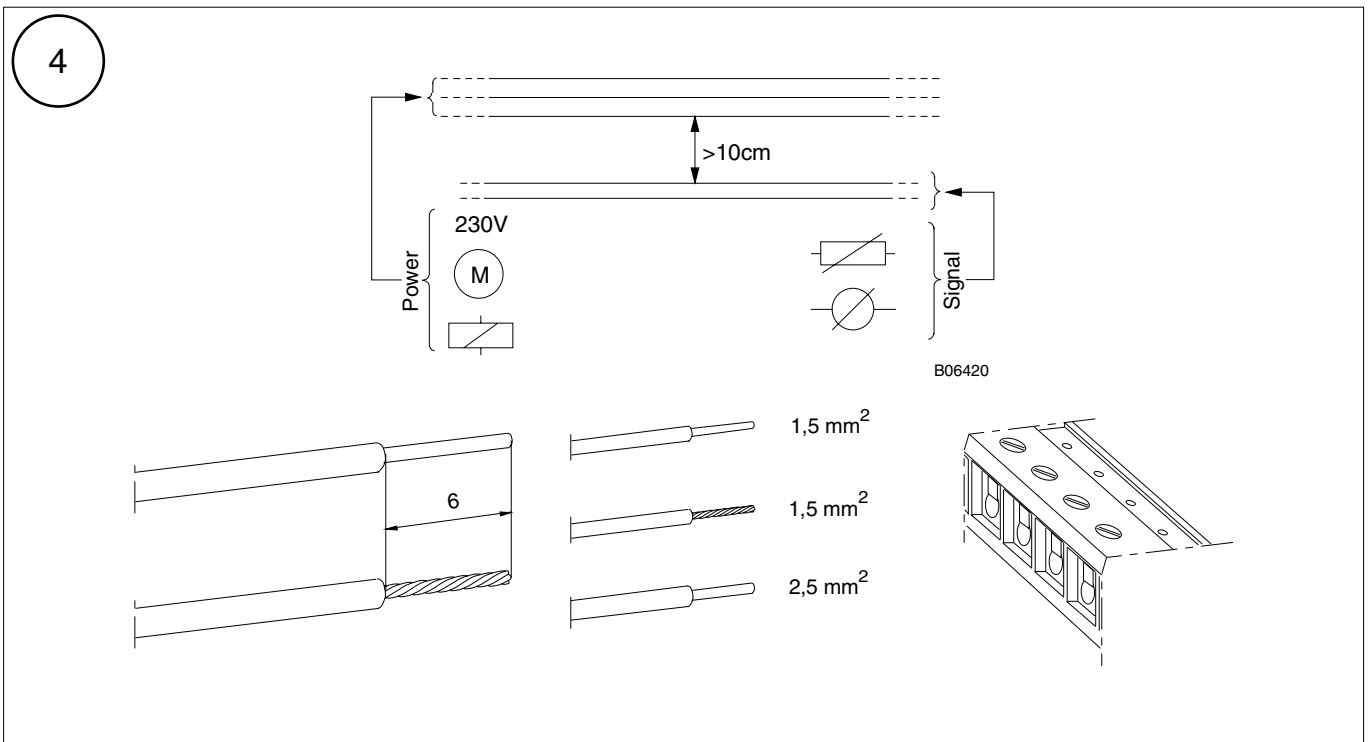
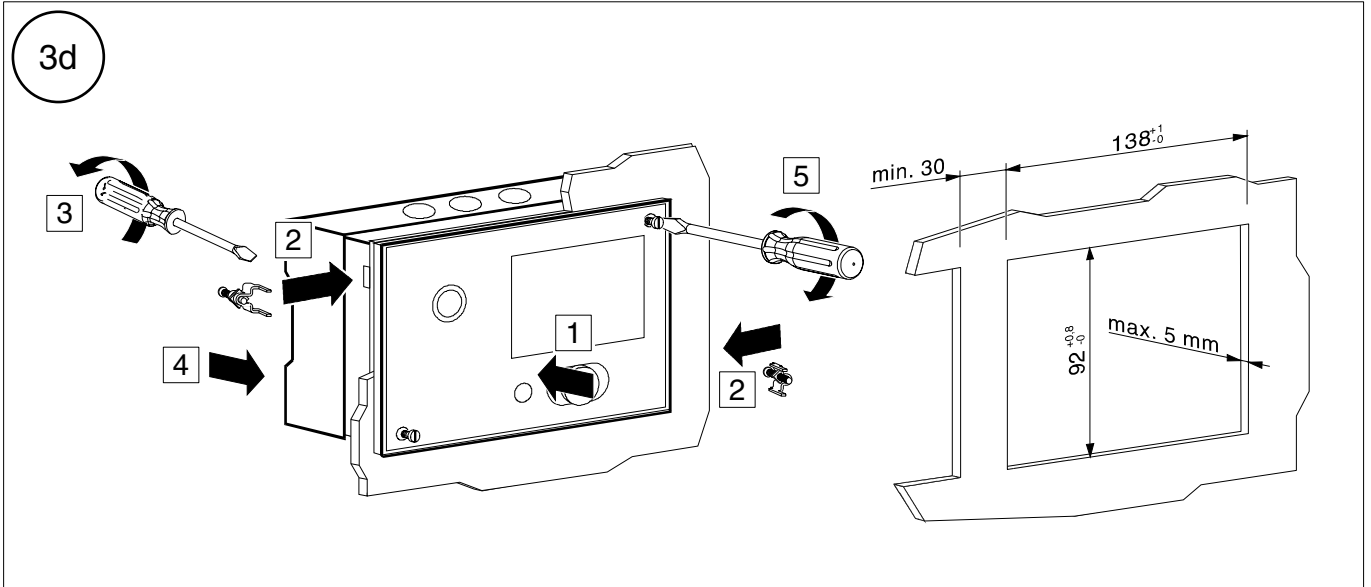
1

2

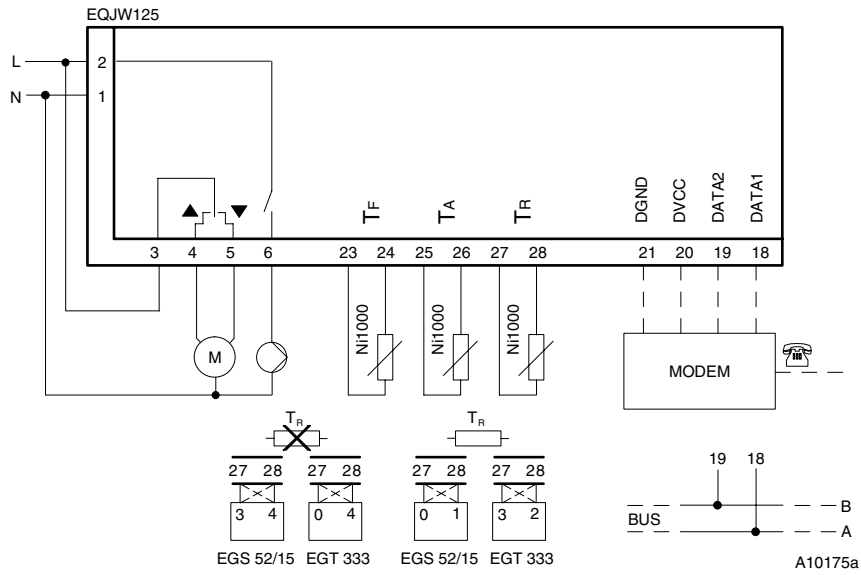
3a

3b

3c



6

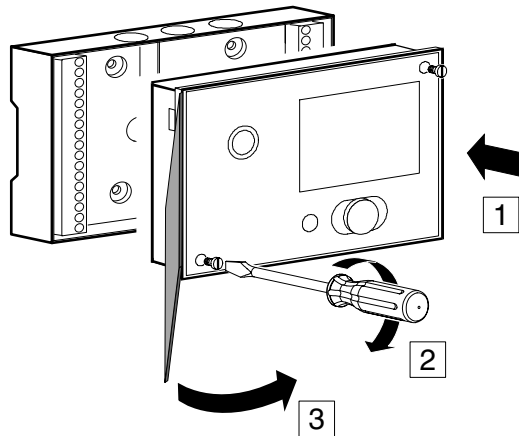


**TA** Aussentemperatur  
 Température extérieur  
 Outdoor temperature  
 Temperatura esterna  
 Temperatura exterior  
 Yttertemperatur  
 Buitentemperatür

**TF** Vorlauftemperatur  
 Température de départ  
 Flow-temperature  
 Temperatura di mandata  
 Temperatura de impulsión  
 Framledningstemperatur  
 Aanvoertemperatür

**TR** Raumtemperatur  
 Température ambiante  
 Indoor temperature  
 Temperatura ambiente  
 Temperatura ambiente  
 Rumtemperatur  
 Ruimtetemperatür

7



8

