

EQJW 125: Heating controller with digital user interface, equitherm

How energy efficiency is improved

Integrated automatic cut-off for the heating to save energy and convenient timer for programming the system according to individual requirements

Areas of use

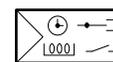
Weather-dependent supply temperature control in buildings of all kinds

Features

- PI supply temperature control
- Convenient to use with modern operating concept (turn and press) and large LCD
- Communication via Modbus/RTU or proprietary device bus
- Convenient weekly and calendar switching programmes with optimisation of switching times
- Automatic summertime/wintertime changeover
- Min./max. limitation of supply temperature
- Frost-protection facility and anti-jamming function for valve
- Function heating (floor-drying function)
- Connection of room temperature via room-temperature sensor or room operating unit
- Ni1000 inputs for outside, supply and room temperatures or for room operating unit
- Multiplication of the outside temperature via device bus
- Relay outputs for activating control units and pumps
- Manual mode
- Notification by text message
- Electrical connection in baseplate



EQJW125F001



Technical data

Power supply

Power supply	230 V~, ±15 %, 50...60 Hz
Power consumption	Approx. 2 VA

Parameters

Control parameters	Proportional band	2...100 K
	Integral action time	15...1000 s
	Frost-protection temperature	3 °C
Temperature ranges	Normal temperature	0...40 °C
	Reduced temperature	0...40 °C
	Supply temperature	0...130 °C
	Outside temperature	-50...50 °C
	Cycle time	Running time of the valve ÷ 15
	Running time of valve	30...300 s

Ambient conditions

Admissible ambient temperature	0...50 °C
Admissible ambient humidity	5...95% rh, no condensation
Storage and transport temperature	-25...65 °C

Inputs/Outputs

Number of inputs	3 analogue
Analogue inputs	2 Ni1000, 1 Ni1000/room operating unit
Number of outputs	3 relays
Pump relay ¹⁾	3 × 2 A, 250 V~, cos φ > 0.5
Actuator relay ²⁾	2 × 0.5 A, 250 V~, cos φ > 0.5

¹⁾ Start-up current max. 7 A (1 s)

²⁾ Low voltage not admissible



Function		
Digital timer for weekly/calendar switching programme	Back-up power supply	min. 24 h, typically 48 h
	Accuracy	< 1 s/d
Weekly switching programme	Number of switching commands	48 per week
	Min. switching interval	10 min
Calendar switching programme	Number of switching commands	20
	Min. switching interval	1 d

Interfaces and communication		
Interface		RS-485, device interface (similar to RS-232)
Protocol		Modbus, device bus (TAP)

Construction		
Weight		0.4 kg
Dimensions		144 × 96 mm
Housing		Pure white (RAL 9010)
Housing material		Fire-retardant thermoplastic
Fitting		Wall, panel, top-hat rail
Screw terminals		For wire of up to 2.5 mm ²

Standards and directives		
	Type of protection (when fitted in panels)	IP 40 (EN 60529)
	Protection class	II (IEC 60730-1)
	Energy class	VII = 3,5 % acc. EU 811/2013, 2010/30/EU, 2009/125/EG
	Software class A	EN 60730
CE conformity according to	EMC directive 2004/108/EC	EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4
	Low-voltage directive 2006/95/EC	EN 60730-1

Overview of types	
Type	Properties
EQJW125F001	Heating controller with digital user interface

Accessories	
Type	Description
AVF***	Motorised valve actuator (see product data sheet)
AVM***	Motorised valve actuator (see product data sheet)
AXM***	Motorised valve actuator (see product data sheet)
EGS 52/15	Room operating unit (see product data sheet)
EGT***	External temperature sensor Ni1000 (see product data sheet)
0220074001	Adaptor for EQJW, type 41 C
0220074002	Adaptor for EQJW, type 41 D
7001029001	Operating manual, German
7001029002	Operating manual, French
7001029003	Operating manual, English

Description of operation

The EQJW 125 heating controller performs weather-dependent supply-temperature control.

The outside temperature and the supply temperature and, if applicable, the room temperature are determined by means of precision sensors. The microprocessor in the controller uses these values to calculate the signals for the outputs. Using the stored control model, the calculation of the output signals is based on the specified setpoints, the current control offset, the set control parameters and the operating mode, along with the current actual values. These signals are processed further via switching amplifiers. The results are the ON/OFF commands of the relay outputs for the control unit and the pump.

The room is supplied with the heat required to keep the room temperature constantly at the current setpoint. If a room-temperature sensor is connected to the EQJW 125 and parameterised, the current room temperature is considered in the calculation of the setpoint for the supply temperature.

The switching programme, which the user can adapt individually, provides an optimal comfort level at the lowest energy consumption. The setpoint for the room temperature can be adjusted. The operating mode can be selected easily using the rotary switch. For example, the heating can be switched off for a longer period, during which the frost-protection facility prevents the system from freezing. The “temporary temperature change” function can be used to activate the party function or switch easily to another operating mode for a specific period, thus saving energy. The current operating status of the system is indicated in the LCD display, where the user can see it very easily at all times.

A Modbus interface is used to communicate with the controller. It is also possible to connect multiple controllers with each other and connect a room remote-control unit with a digital user interface. A separate modem sends alarms via SMS if required.

Intended use

This product is only suitable for the purpose intended by the manufacturer, as described in the “Description of operation” section.

All related product regulations must also be adhered to. Changing or converting the product is not admissible.

Engineering note

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

Abbreviations

T_A	Outside temperature	T_I	Initial point (foot point)
T_F	Supply temperature	T_R	Room temperature
		X_p	Proportional band
T_n	Integral action time	SP	SERVICE parameters
T_y	Running time of valve	V	Valve
UP	Heating pump	S	Slope of heating characteristic
$T_{S/W}$	Heating limit	☼	Normal mode (nominal mode based on EN12098)
<i>Symbol</i>	Factory setting	⏻	Off or back-up mode (with/without frost-protection facility)
☾	Reduced mode		

Indexes		Example	
X_s	Setpoint	T_{Rs}	Room-temperature setpoint
X_i	Actual value	T_{Fi}	Actual value of the supply temperature
X_{ged}	Damped value	T_{Aged}	Damped outside temperature
max	Maximum	T_{Fsmax}	Maximum supply setpoint
min	Minimum	T_{Rsmin}	Minimum room setpoint

Additional technical data

Measuring accuracy	Better ± 0.3 K at 25 °C
Time constant for processing of measured values	Approx. 10 sec for T_A < 5 s for T_R and T_F
Neutral zone	± 0.5 K
Minimum pulse duration	250 ms
Follow-on time for pump	$2 \times T_y$
Heating characteristic	Curved, without influence of extraneous heat
Damping of outside temperature	Time constant approx. 21 hours
Summertime/wintertime heating limit	ON means summer → winter OFF means winter → summer ON for $T_{aged} < T_{S/W} - 1$ K OFF for $T_{aged} > T_{S/W}$ $T_{S/W}$ adjustable via SP 18
Back-up power supply	The back-up power supply is typically 48 (min. 24) hours. The EQJW 125 must be supplied with mains power for at least 4 hours.
Input for temperature sensor	Ni1000
Zero-point correction for room temperature	Up to ± 6 K possible

Zero-point correction for outside temperature	Up to ± 9 K possible
Outputs for pump, control unit	Relay (with indication of switching status)
Switching frequency, mechanical	> 5 million switching cycles
Maximum closing time, control unit	Twice the running time of the valve. The control unit is reactivated every 15 minutes.
Temporary temperature change	Changes in automatic mode. Change until next switching command (however, minimum 2 hours), or from 3 hours to 19 days possible. Indication of the remaining time in the display. Termination of changes possible.
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 independently of the switching programme. The design temperature is parameterised on the SERVICE level.

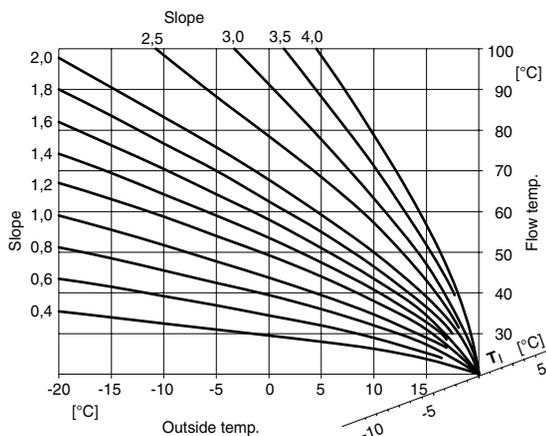
Special functions

Room-temperature connection	The room-temperature connection is activated on the SERVICE level. A room-temperature sensor is a prerequisite. The influence of the room-temperature connection can be adjusted on the SERVICE level. Maximum change in T_F based on room-temperature connection ± 30 K.
Frost-protection facility	The frost-protection facility is activated if the controller is in the OFF mode and the frost-protection facility has been enabled on the SERVICE level. Additionally, the temperature must be below the anti-frost limit. The anti-frost limit is 3 °C for the outside temperature. The frost-protection facility is disabled when the outside temperature is above 4 °C. When the frost-protection facility is activated, a supply temperature of 10 °C is regulated.
Anti-jamming function for pump	The anti-jamming function for the pump is enabled on the SERVICE level. Every day at midnight, the pump is activated for 60 seconds if it has not been operated for the previous 24 hours. This function is active in all operating modes apart from the manual mode.
Limitation of supply temperature	The maximum and minimum setpoints for the supply temperature are limited. If a setpoint is calculated for the supply temperature that is outside these limits, the limit temperature is regulated. The limit value is set on the SERVICE level. In manual mode, the supply-temperature control is not active and therefore the limitation of the supply temperature does not apply. When the frost-protection facility is active, the limitation of the supply temperature is disabled.
Manual mode	In manual mode, the pump and the valve can be activated separately. The settings are performed in a menu if manual mode has been enabled. Manual mode is enabled in the SERVICE mode. In the factory setting, manual mode is "not enabled".
Automatic cut-off	The heating controller uses its automatic cut-off to save energy wherever possible without any loss of comfort. The following options are available for switching off the heating controller: a) EQJW 125 is in the OFF mode b) Summertime/wintertime heating limit OFF c) $T_A \geq T_{RS}$ (when $T_A \leq T_{RS} - 1$ K, the controller switches on again)
Floor-drying function	Section 4 of EN 1264 describes how cement screeds must be treated with operational heating before putting down floor coverings. Initially, a supply temperature of 25 °C must be maintained for 3 days. After this, the maximum supply temperature must be maintained for a further 4 days. This function has been implemented in the EQJW 125. Additionally, a function for screed curing has been implemented. Here the supply temperature, starting at 25 °C, is increased continuously by 5 K/day until the maximum supply temperature is reached. This is then maintained for 7 days. Afterwards, the supply temperature is decreased continuously by 5 K/day until a temperature of 25 °C is reached again. The functions are called up on the SERVICE level.
Switching programmes	A weekly switching programme with a maximum of 48 switching commands and a calendar switching programme with a maximum of 20 switching commands are available. The minimum switching interval is 10 minutes or 1 day. An operating mode from the weekly and calendar switching programmes with lower energy consumption has priority. An "empty" switching programme is interpreted as the normal mode. The calendar switching programme is enabled on the SERVICE level. In the factory setting, the calendar switching programme is not enabled. The commands in the calendar switching programme are not deleted after they have been executed.
Multiplication of T_A	The outside temperature is determined by an EQJW 125 and passed to the other controllers via the device bus as a measured value. The parameterisation for this is performed on the communication level.
Modbus communication	You can communicate with the EQJW 125 via an RS 485 interface using the Modbus/RTU protocol. Data can be exchanged. In the process, the EQJW 125 is always used as a slave.
Notification via SMS	A modem is used to send alarm texts as SMS to a mobile phone via a provider. An interface similar to the RS 232 is used for this. The TAP protocol (Telocator Alphanumeric Protocol) is used here.

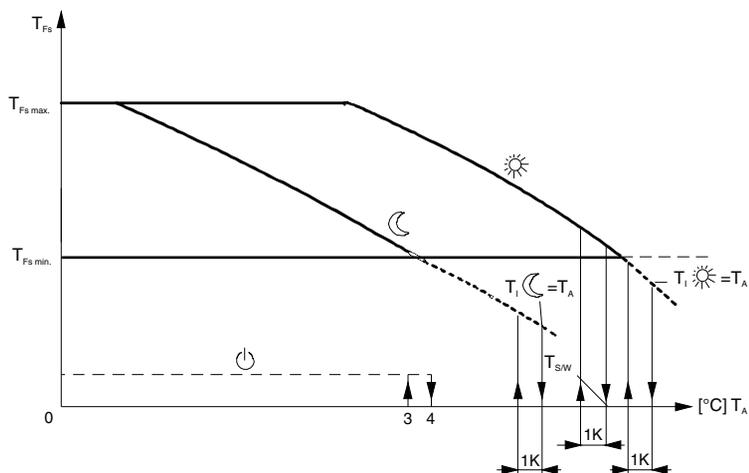
Disposal

When disposing of the product, observe the currently applicable local laws.
 More information on materials can be found in the Declaration on materials and the environment for this product.

Heating characteristic



Heating characteristic diagram with ☀, ☾ mode and heating ⏻ (OFF with frost-protection facility)

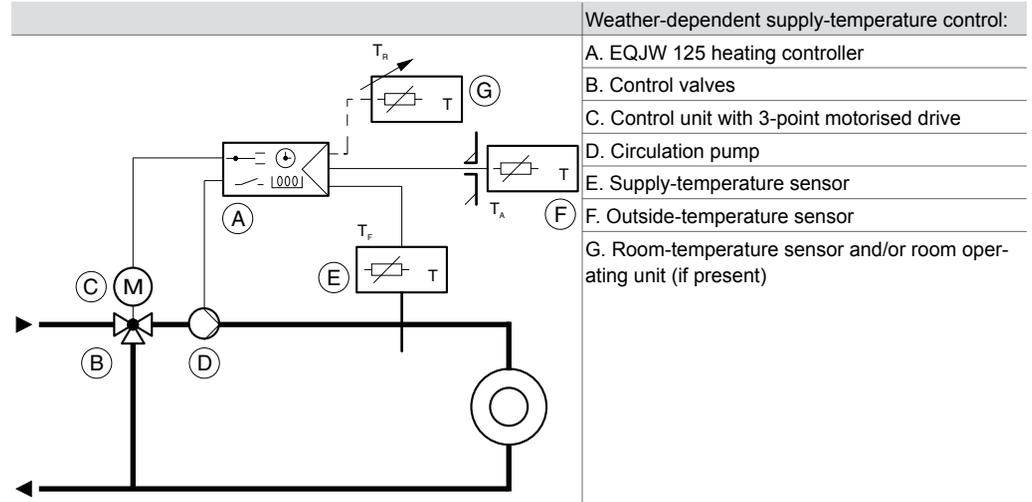


$T_{1☀}$ = foot point of the heating characteristic ☀ (= normal mode) or room-temperature setpoint ☀

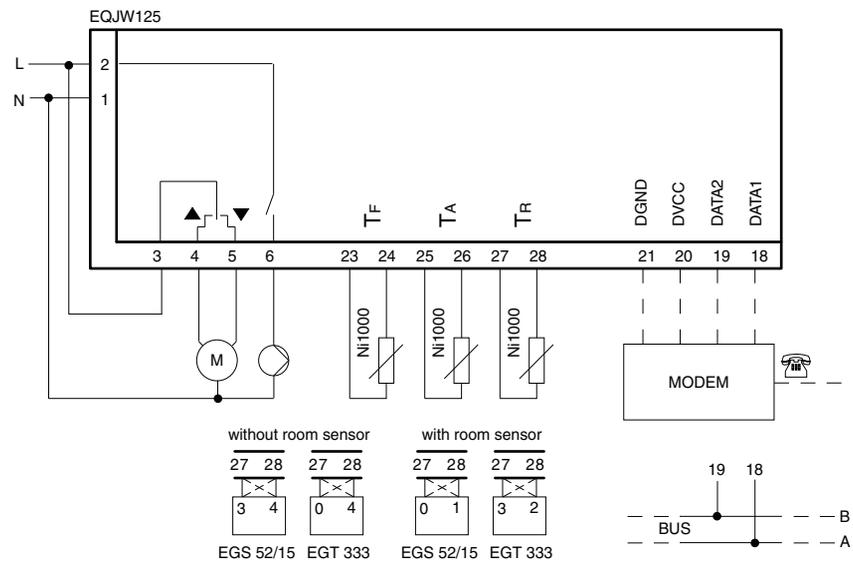
$T_{1☾}$ = foot point of the heating characteristic ☾ (= reduced mode) or room-temperature setpoint ☾

The heating is switched off automatically if T_A exceeds the foot point of the heating characteristic (☾, ☀ mode), or if the summertime/wintertime heating limit T_{SW} is exceeded.

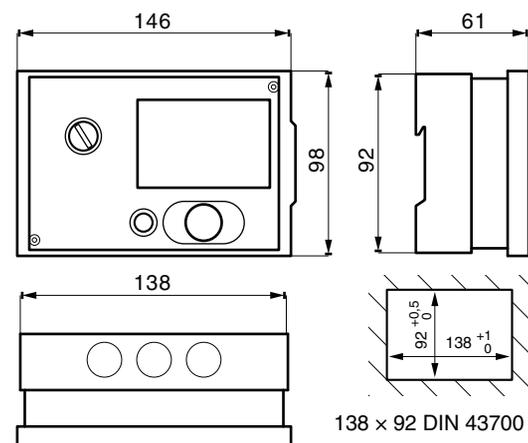
Application example



Connection diagram



Dimension drawing



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