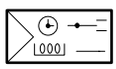
EQJW 126: Heating controller with digital user interface, equitherm

EQJW 126 F001



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 by heating curve or 4-point characteristic
- Convenient to use with modern operating concept (turn and press) and large LCD
- Convenient weekly and annual switching programmes with optimisation of switching times
- Automatic summertime/wintertime changeover
- Min./max. limitation of supply temperature and max. limitation of return temperature
- Frost-protection facility and pump and valve anti-jamming function
- Function heating (floor-drying function)
- Room temperature switching using room temperature sensor
- Ni/Pt1000 inputs for the outside, supply, return flow and room temperature
- Relay outputs with varistor suppression for activating control units and pump
- Manual mode
- Electrical connection in baseplate
- Interface for various accessories such as modem, gateway, data logging module etc.

Technical data

Power supply		
	Power supply	230 V~, ± 15%, 50...60 Hz
	Power consumption	Approx. 1.5 VA
Parameters		
Control parameters	Proportional band	0.1...50 K
	Integral action time	1…999 s
	Frost-protection temperature	3 °C
Temperature ranges	Normal temperature	0...40 °C
	Reduced temperature	0...40 °C
	Supply temperature	-5...150 °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...40 °C
	Admissible ambient humidity	5...95% rh, no condensation
	Storage and transport temperature	-10...60 °C
Inputs/outputs		
	Number of inputs	3 analogue, Ni1000/Pt1000
	Number of outputs	3 relays
	Pump relay[1)]	1 × 2 A, 250 V~, cos φ > 0,5
	Actuator relay (3-point or 2-point)[2)]	2 × 2 A, 250 V~, cos φ > 0,5
Function		
Digital timer for weekly/annual switching programme	Backup power supply	Min. 24 h, typically 48 h
	Accuracy	< 1 s/d
Weekly switching programme	Number of switching commands	42 per week
	Min. switching interval	15 minutes

1) *Start-up current max. 16 A (1 s)*
2) *Extra low voltage not admissible*

Annual switching programme	Number of switching commands	20
	Min. switching interval	1 d
Interfaces and communication		
	Interface	RJ45
	Protocol	Modbus, device bus (TAP)
Construction		
	Weight	0.5 kg
	Dimensions	144 × 98 × 54 mm
	Housing	Light-grey
	Housing material	Fire-retardant thermoplastic
	Fitting	Wall, switch panel, DIN rail
	Screw terminals	For electrical cables of up to 2.5 mm²
Standards and directives		
	Type of protection (when fitted in panels)	IP40 (EN 60529)
	Protection class	II (IEC 60730-1)
	Software class	A (IEC 60730-1, Appendix H)
CE conformity according to	EMC Directive 2014/30/EU	EN 61000-6-1, EN 61000-6-3
	Low-Voltage Directive 2014/35/EU	EN 60730-1

Overview of types

Type	Features
EQJW126F001	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)
EGT***	External temperature sensor Ni1000 (see product data sheet)
0440210001	Communication module for connecting EQJW 126/146 controllers to RS-232 (PC)
0440210002	Communication module for connecting EQJW 126/146 controllers to modem
0440210003	Communication module for connecting EQJW 126/146 controllers to RS-485 bus
0440210004	Communication module for connecting EQJW 126/146 controllers to RS-485 bus (master)
0440210005	ModBus-TCP gateway
0440210011	ModBus-GPRS gateway
0440210006	ModBus-MBus gateway
0440210007	Converter/repeater for RS-232 or RS-485 interfaces
0440210008	RS-485 overvoltage protection
0440210009	Data logging module for recording controller data
0440210010	Parameter storage module for transferring controller parameters

Description of operation

The EQJW 126 heating controller performs weather-dependent supply-temperature control.
The outside temperature and the supply temperature and, if applicable, the room or return temperature are determined by means of precision sensors. The microprocessor in the controller uses the digitalised temperature 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 126 and parameterised, the current room temperature is considered in the calculation of the setpoint for the supply temperature.
The switching programmes, which the user can adapt individually, provide 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 if the room is empty for a lengthy period. The frost-protection facility prevents the system from freez-

ing. 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 display, where the user can see it easily at all times. Communication with the controller is possible using an interface with various accessories, see the technical manual for EQJW 126/146, Communication connection.

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 126 controller must be connected to the mains power supply all year round.

Abbreviations			
AF	Outdoor temperature (sensor)	T_n	Integral action time
VF	Supply temperature (sensor)	T_Y	Running time of valve
RüF	Return temperature (sensor)	T_A	Outside temperature
RF	Room temperature (sensor)	X_p	Proportional band
T_I	Initial point (foot point)		Reduced mode
UP	Heating pump		Normal mode (nominal mode based on EN 12098)
RK	Control unit with 3-point motorised actuator		Off or back-up mode (with/without frost-protection facility)

Indexes		Example	
X_s	Setpoint	VF_s	Supply temperature setpoint
X_i	Actual value	VF_i	Actual value of the supply temperature
max	Maximum	VF_{smax}	Maximum supply setpoint
min	Minimum	RF_{smin}	Minimum room setpoint

Additional technical data

Measuring accuracy	Better ± 0.3 K at 25 °C
Time constant for processing of measured values	< 1 sec for all
sensors in neutral zone	± 0.5 K
Minimum pulse duration	125 milliseconds (ms)
Follow-on time for pump	2 × T_Y
Heating characteristic	Curved or 4-point characteristic
Delayed adjustment for outside temperature	1.0 to 6.0 °C/h
Summertime/wintertime heating limit	Date adjustable and outside temperature limit value 0...30 °C
Backup power supply	Typically 48 h (min. 24 h). The device must have been supplied with mains power for at least 4 hours
Input for temperature sensor	Ni1000/Pt1000
Switching frequency, mechanical	> 5 million switching cycles
Maximum closing time, control unit	Twice the running time of the valve. The control unit is constantly actuated
Temporary temperature change	Temperature change from 15 minutes to 48 hours
Outside temperature switch-on value in normal operation (design temperature)	If the device is in automatic mode and the outside temperature is lower than the set outside temperature switch-on value in normal mode, the heating is controlled in normal mode independently of the switching programme.

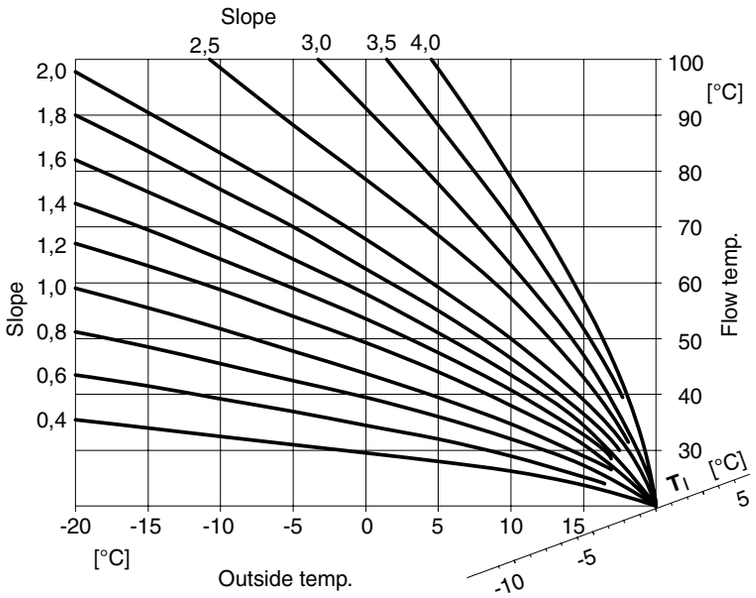
Special functions

Room-temperature connection	The room-temperature connection is activated on the configuration level. A room-temperature sensor is required
Frost protection programmes I and II	Frost protection programme I: Limited frost protection when the heating circuit is in OFF mode and frost protection has been activated on the configuration level. Frost protection programme II: If the temperature falls below the frost limit, the heating pump (UP) is always switched on. The frost limit is adjustable from -15...+3 °C
Anti-jamming function for pump	If the heating circuit pumps have not been activated for 24 hours, forced operation takes place between 12.02 and 12.03 a.m. This stops the pumps from jamming from being stationary too long. In the drinking water circuit, the circulation pump is operated between 12.04 and 12.05 a.m. The other pumps are operated between 12.05 and 12.06 a.m. The valves are also actuated with a delay
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 configuration 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 setting is made using a menu
Automatic cut-off	The heating controller uses its automatic cut-off to save energy without any loss of comfort. Possible conditions for automatically switching off the heating controller: • Device is in OFF mode • Outside temperature limit value for “Summer” is exceeded • Outdoor temperature is above the initial point (TI) of the heating characteristic
Floor-drying function	The following parameters can be set for the automatic floor-drying function: • Start temperature: 20...60 °C • Temperature increase/decrease/day: 0...10 °C • Maximum temperature: 25...60 °C • Holding period Tmax: 0...10 days
Switching programmes	A weekly switching programme with a maximum of 42 switching commands and an annual switching programme with a maximum of 20 switching commands are available. The minimum switching interval is 15 minutes and 1 day respectively. The operating mode from the weekly and annual switching programme (holidays) with lower energy consumption has priority

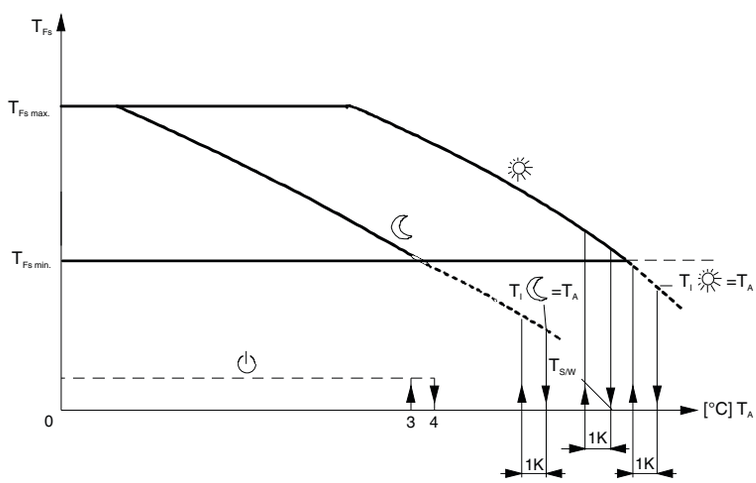
Disposal

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 for foot point T_I = 20 °C



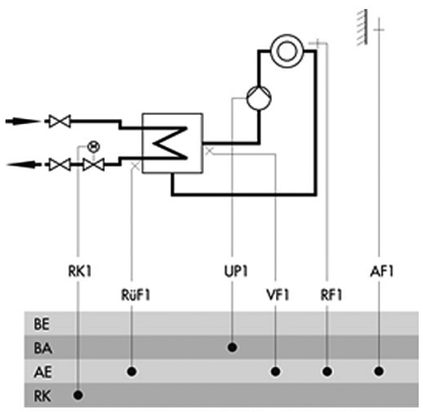
Heating characteristic diagram with ☼, ☾ Mode and heating ⏻ (OFF with frost-protection facility)



TI ☼ = foot point of the heating characteristic ☼ (= normal mode) or room-temperature setpoint ☼
TI ☾ = foot point of the heating characteristic ☾ (= reduced mode) or room-temperature setpoint ☾
The heating is switched off automatically if the outdoor temperature TA exceeds the foot point of the heating characteristic (☼, ☾mode), or if the "Summer" outside temperature limit value is exceeded.

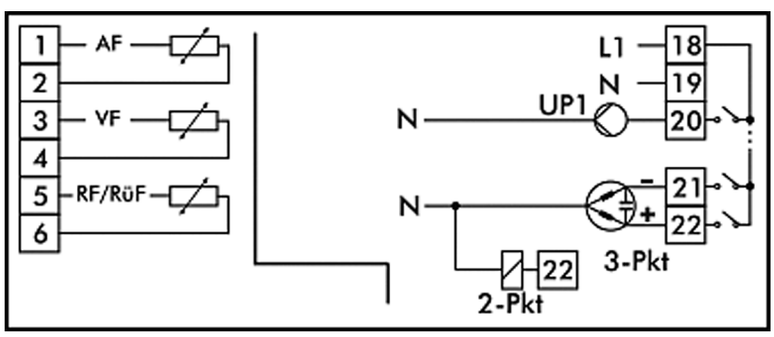
Application example

Weather-dependent supply-temperature control:

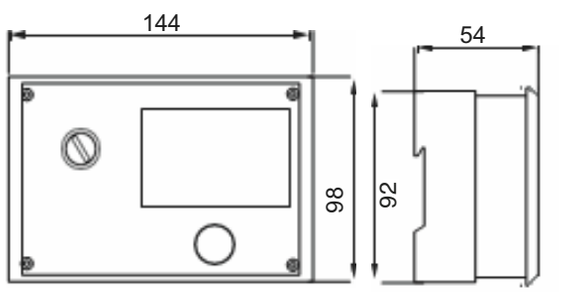


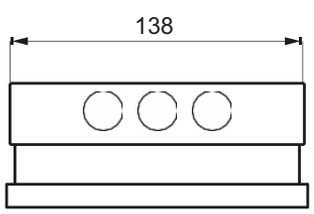
RK1	Control unit with 3-point motorised actuator
RüF1	Return-temperature sensor
UP1	Circulation pump
VF1	Supply-temperature sensor
RF1	Room-temperature sensor
AF1	Outdoor-temperature sensor

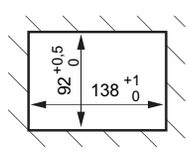
Connection diagram



Dimension drawing







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