

## EQJW 126: 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

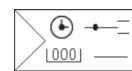
Weather-dependent supply temperature control in buildings of all kinds

### Features

- PI supply temperature control 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 unit and pump
- Manual mode
- Electrical connection in baseplate
- Interface for various accessories such as modem, gateway, data memory module etc.



EQJW126F001



### Technical data

Power supply		
Current draw	Supply voltage	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 the valve	30...300 s
Ambient conditions		
	Admissible ambient temperature	0...40 °C
	Admissible ambient humidity	5...95% rH (non-condensing)
	Storage and transport temperature	-10...60 °C
Inputs/outputs		
	Number of inputs	3 analogue, Ni1000/ Pt1000
	Number of outputs	3 relays
	Pump relay <sup>1)</sup>	1 × 2 A, 250 V~, cos φ > 0.5
	Actuator relay (3-pt or 2-pt) <sup>1)2)</sup>	2 × 2 A, 250 V~, cos φ > 0.5

<sup>1)</sup> Start-up current max. 16 A, (1 s)

<sup>2)</sup> Extra low voltage not admissible

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/W
	Min. switching interval	15 minutes
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	Flame-retardant thermoplastic
	Mounting	Wall, panel, DIN rail
	Screw terminals	For electric cables of up to 2.5 mm <sup>2</sup>

Normen, Richtlinien		
	Ingress protection (panel mounting)	IP40 (EN 60529)
	Protection class	II (IEC 60730-1)
	Software Klasse	EN 60730
CE-Konformität nach	EMC Directive 2014/30/EU	EN 61000-6-1
		EN 61000-6-34
	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***	Temperature sensor Ni1000 (see product data sheet)
0440210001	Kommunikationsmodul zum Anschluss der Regler EQJW126/146 an RS232 (PC)
0440210002	Communication module for connecting EQJW126/146 controllers to a modem (analogue/GSM/ISDN)
0440210003	Communication module for connecting EQJW126/146 controllers to RS-485 bus
0440210004	Communication module for connecting EQJW126/146 controllers to RS-485 bus (master)
0440210005	ModBus-TCP gateway
0440210006	ModBus-MBus gateway
0440210007	Converter/repeater for RS-232 or RS-485 interfaces
0440210008	RS-485 overvoltage protection
0440210010	Parameter storage module for transferring controller parameters
0440210011	ModBus-GPRS gateway
0440210012	Cable converter 2 wires RS-485

### Description of operation

The EQJW126 heating controller performs weather-dependent supply-temperature control. The outside temperature and the supply temperature and, if applicable, the room or return flow 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 EQJW126 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 display, where the user can see it very easily at all times.

Communication with the controller is possible using an interface with various accessories, see the technical manual for EQJW126/146, 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. Modifying or converting the product is not admissible.

### Engineering note

The equitherm EQJW126 controller must be connected to the mains power supply all year round.

### Abbreviations

AF	Outdoor temperature (sensor)	Tn	Integral action time
VF	Supply temperature (sensor)	TY	Running time of the valve
RüF	Return temperature (sensor)	Xp	Proportional band
RF	Room temperature (sensor)	<i>Symbol</i>	Factory setting
TI	Initial point (foot point)	⌚	Reduzierbetrieb
UP	Heating pump	⚙️	Normalbetrieb (Nennbetrieb nach EN12098)
RK	Control unit with 3-point motorised drive	⏻	Off or back-up mode (with/without frost-protection facility)

Indexes		Example	
Xs	Setpoint	VFs	Supply temperature setpoint
Xi	Actual value	VFi	Actual value of the supply temperature
max	Maximum	VFsmax	Maximum supply setpoint
min	Minimum	RFsmin	Minimum room setpoint

**Additional technical data**

Measuring accuracy	Better $\pm 0.3$ K at 25 °C
Time constant for processing of measured values	< 1 sec for all sensors
Neutral zone	$\pm 0.5$ K
Minimum pulse duration	125 ms
Follow-on time for pump	2 × TY
Heating characteristic	Curved or 4-point characteristic
Delayed adjustment for outside temperature	1,0 bis 6,0°C /h
Summertime/wintertime heating limit	Adjustable date and outside temperature limit value 0..30 °C
Back-up power supply	The back-up power supply is typically 48 (min. 24) hours. The EQJW126 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	If the EQJW126 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 (I)**

Room-temperature connection	The room-temperature connection is activated on the configuration level. A room-temperature sensor is a prerequisite.
Frost protection I and II	Frost protection I: limited frost protection when the heating circuit is in OFF mode and frost protection has been activated on the configuration level. Frost protection II: UP always switched on as soon as the temperature falls below the frost limit. The frost limit is adjustable from -15..3 °C.
Anti-jamming function	If the heating circuit pumps have not been activated for 24 hours, forced operation takes place between 12.02 and 12.03 to stop 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, and the other pumps between 12.05 and 12.06. The valves are also actuated with a delay.
Supply temperature limit	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 wherever possible without any loss of comfort. The following options are available for switching off the heating controller: a) EQJW126 in OFF mode b) Summer outside temperature limit value exceeded c) Outdoor temperature above the foot point of heating characteristic TI

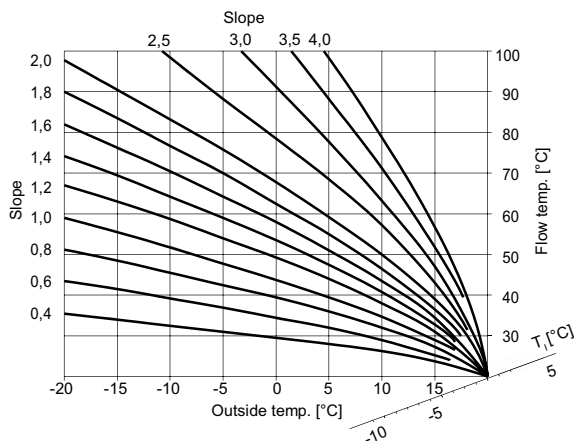
### Special functions (II)

<p>Floor-drying function</p>	<p>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</p>
<p>Switching programmes</p>	<p>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. An operating mode from the weekly and annual switching programme (holidays) with lower energy consumption has priority.</p>

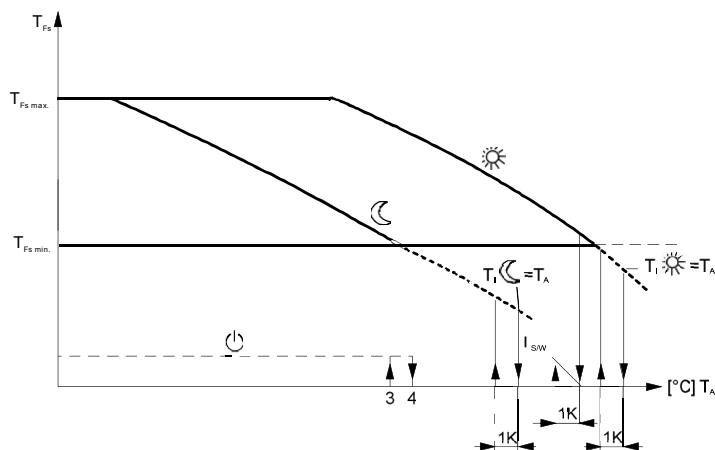
### Disposal

The local, currently valid laws must be observed when disposing of the device. You will find more information on the materials and substances in the Declaration on materials and the environment for this product.

### Heating characteristic



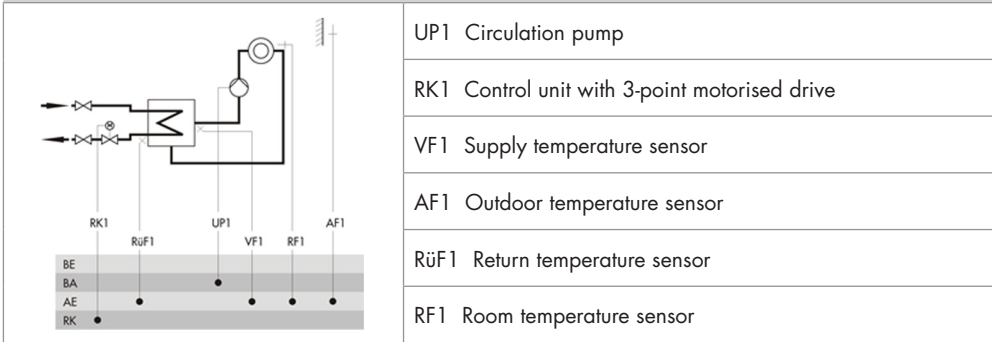
### Heating characteristic diagram with ☀, ☾ - operation and heating ⏻ (OFF with frost protection)



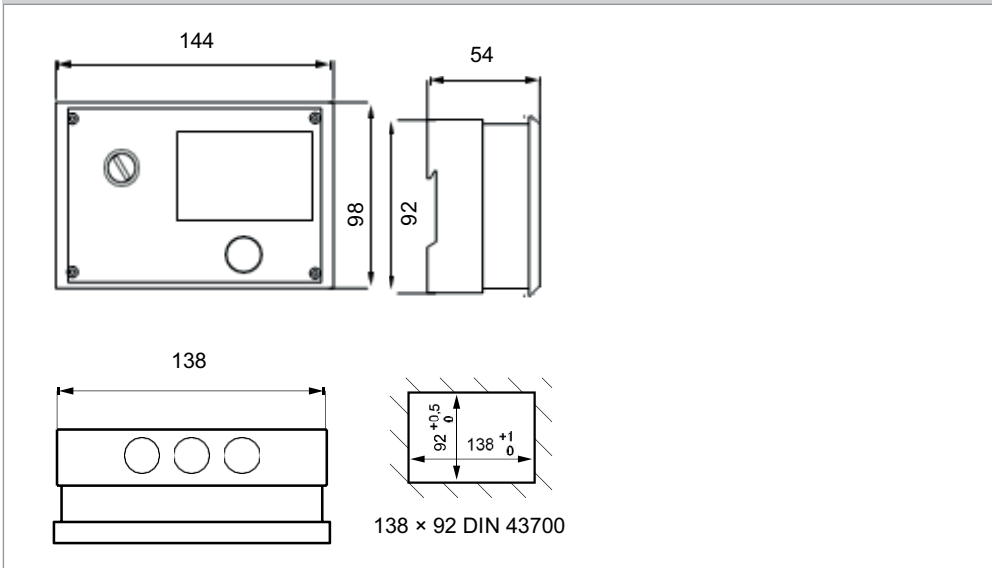
TI☀ = foot point of the heating characteristic ☀ (= normal mode) or room temperature setpoint ☀  
 TI☾ = foot point of the heating characteristic ☾ (= reduced mode) or room temperature setpoint ☾  
 The heating is automatically switched off if the outdoor temperature TA exceeds the foot point of the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

**Application example**

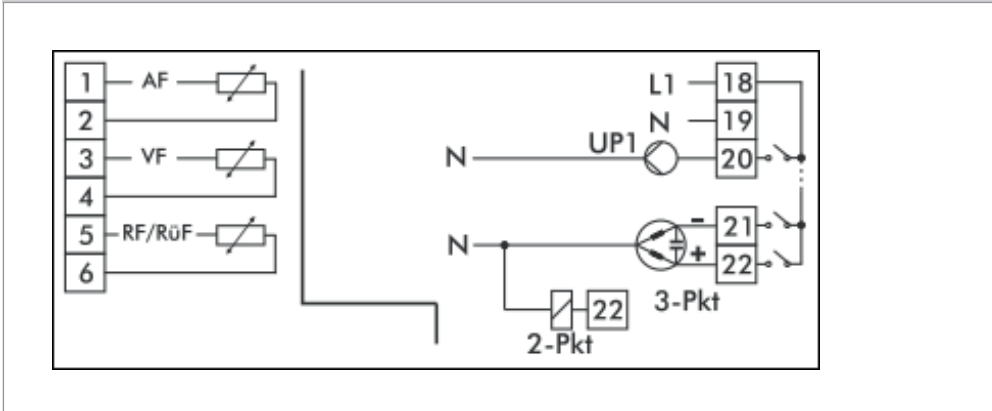
**Weather-dependent supply-temperature control:**



**Connection diagram**



**Dimension drawing**



© Sauter-Cumulus GmbH  
 Hans-Bunte-Str. 15  
 79108 Freiburg  
 Tel. +49 (0)761 5105-0  
 Fax +49 (0)761 5105-234  
 www.sauter-cumulus.de  
 sauter-cumulus@de.sauter-bc.com