PRODUCT-INFO

Measuring - Controlling - Regulating
All from the same source

TEMPERATURE REGULATOR

for milk cooling systems

MRF-M2

www.welba.de

Device description

Welba's milk temperature regulators are used to control stirrer motors and refrigeration compressors in milk cooling systems.

The currently measured milk temperature is permanently displayed of all controller models on the display. If the milk temperature exceeds the selected setpoint temperature by the value of the hysteresis, the compressor contactor and the stirrer are automatically switched on. When the setpoint temperature is reached, the compressor contactor switches off, the stirrer continues to move by the set "additional stirring time". During the cooling pauses, the stirrer switches on again according to the set pause time, in order to ensure an even temperature distribution of the milk.

Adjustable minimum pauses and minimum response times for each switching stage allow an individual adaptation to the various conditions of the systems.

The benefits of our milk temperature regulators include not only the high functionality and the various connection possibilities but also a high degree of reliability, which can be attributed not least to the exclusive use of high-quality components.

Parameterization in general

In order to ensure easy operation (by the user) and clear parameterisation (by the plant engineer), the development of the devices was given the utmost importance to easy-to-understand programming.

Parameter levels

The operation and presetting of the controller are divided into three levels, the access authorization of which is to be assigned by the system manufacturer.

Working level

The working level is used for everyday operation by the user. Unintentional parameter adjustments are not possible here. The set target temperature for relay contact K1 can be read and changed here at any time by pressing a button.

Programming level

This is the level at which the regulatory parameters are set.

Setting is more complex and possible only using specific combinations of buttons so as to prevent accidental changes to settings.

Configuration level

This is the level at which the basic functions of the regulator are set.

As subsequent interventions by the end user (after the parameters have been set) can result in dangerous changes to functions which might not be immediately obvious, access to the configuration level is even more complex.

Operation overview for configuration level

Switching to configuration level: see description

		Display setting: Press button SET	Altering setting: Press button ▽ and △ simultanously	Factory setting
Sensor failure function K1	P5	SET	or	1
Sensor failure function K2	P6	SET	or	1
Hysteresis-mode for T1	P10	SET	or	1
Hysteresis-mode for T2	P11	SET	or	1
Limit for target-temp. T1 downw.	P20	SET	or	0
Limit for target-temp. T1 upw.	P21	SET	or	10
Limit for target-temp. T2 downw.	P22	SET	or	0
Limit for target-temp. T2 upw.	P23	SET	or	20
Limit for Hyst. 1 downwards	P30	SET	or	0,1
Limit for Hyst. 1 upwards	P31	SET	or	2
Limit for Hyst. 2 downwards	P32	SET	or	0,1
Limit for Hyst. 2 upwards	P33	SET	or	2
Min. action time Compr. K1	P70	SET	or	0
Min. pause time Compr. K1	P71	SET	or	0
Switching T1 to T2	P80	SET	or	0
Mode intermitt. stirring	P81	SET	or	1
Temperature scale	P99	SET	or	0

To switch back to the working level:
△+▽ *Press for 5 seconds simultaneously*
(Switches back automatically after 30 seconds.)

Milk temperature regulator MRF-M2

106 x 68 mm

Milk temperature regulator in flat display housing

The microprocessor-controlled milk cooling temperature regulator MRF-M is used to control agitator motors and refrigeration compressors on milk cooling equipment.

- Relay for agitatorand compressor
- integr. automatic post-agitation
- Cooling start delay for the first milking
- Intermediate stirring function

Features

- Easy operation via three work levels
- 2 freely selectable target temperatures
- Various "intermediate agitating" functions
- Option of switching to “Permanent agitating”
- Automatic subsequent agitating
- Various "cooling start delay" variants can be set: Time Lag / clocking / time-delayed and clocked
- Digital input - can be used for various functions:
  - Remote start cooling
  - External temperature changeover
  - External compressor lock
  - Anti-icing protection when there is little filling in the tub (e.g. for calf feeding...)
  - Compressor fault monitoring
- "Milk cooling tub lid" safety switch
- Alarm in the event of sensor short-circuit/sensor fault (adjustable relay switching state in event of fault)
- Emergency cooling function in the event of a sensor fault
- Compressor sway protection
- PC-programmable via RS-485 interface
- Data logger (temperature profile and occurrence can be called up via KONSOFT for up to two days)
- Service function for testing agitator, compressor and digital input
- Automatic parameter storage without data loss when a power-cut occurs

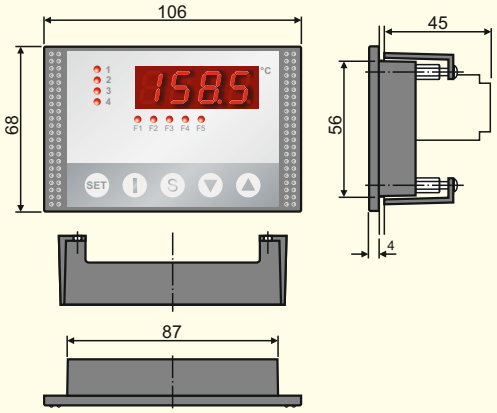
optionally anti-splash cover

Technical Data

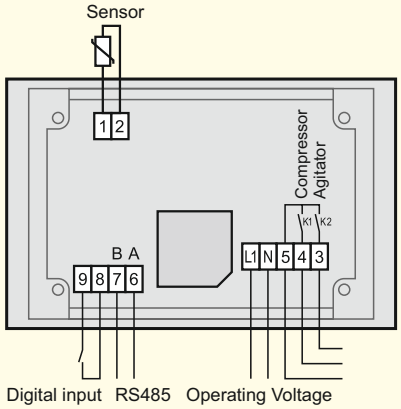
Operating voltage	230V AC +/-10%, 50/60 Hz or
Relay contacts	2 power relays
max. switching current	K1 = 12A AC1 / K2 = 10A AC1
max. switching voltage	250 V ~
Display	13 mm LED - Display, 3 digits
Display range	-99 .. 999
Switching status LED	3 mm LED
Temperaturauflösung	0,1°C
Number of sensors	1
Sensor type	PT-1000
Measurement range	-20° bis +120°C (regulator)
Target temperatur T1*	factory-set to 4 °C
Target temperatur T2*	factory-set to 4 °C
Control type	two-step regulator
Hysteresis*	0,1 K to 10 K (standard adjusting 0,7 K)
Digital Input	1 (via optocoupler)
Interface	RS485
Stirrer	
- resting time (interval) *	factory-set to 20 min.
- stirring time *	factory-set to 2 min.
Housing	
- front dimension	68 x 106 mm
- front panel cut out	56 x 87 mm
- insertion depht	38 mm
Protection (front / rear)	IP 64 / IP 20
Environment specifications:	
- Operation temperature	-10° .. +50°C
- Storage temperature	-20° .. +70°C
- max. humidity	75% (no dew)

* freely adjustable

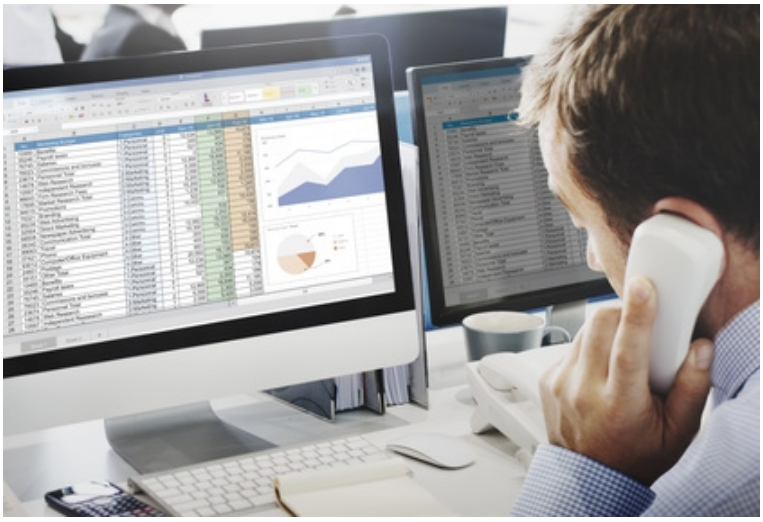
Dimension



Connection



Customized developments



The development of solutions tailored to solve our clients' specific problems is one of Welba's major strengths. Here we can offer extensive experience, as well as excellent references.

On the basis of many previous development projects we are in a position to devise a solution to meet your specific needs. Nor is our know-how not restricted to temperature measurement technology; we can also develop solutions in completely different areas of measurement and regulation technology. We can often achieve the necessary simply by modifying our standard products.

In any event, we will always recommend the best solution for you.

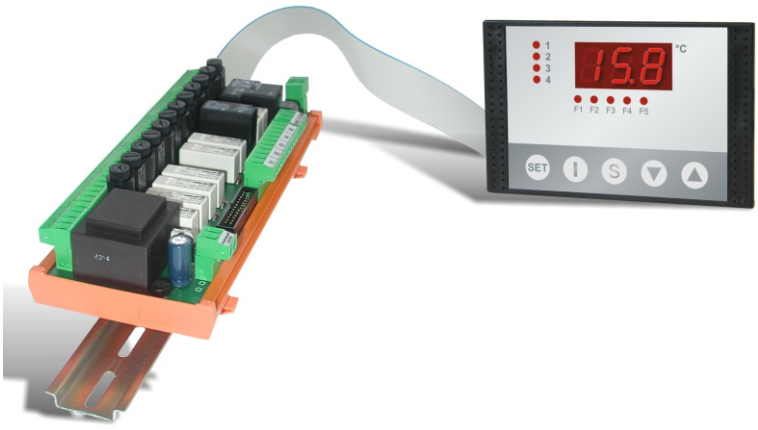
A full service

In many cases we offer more than just development work.

At Welba we also understand service to include the development of concepts for the use of the new product by your own customers, the design and production of frontal foils or even housings, or the provision of operating instructions with your own corporate design.

Not always major developments...

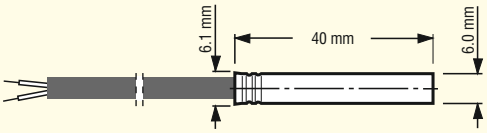
For many of our clients we also develop and manufacture simple electronic systems for straightforward applications.

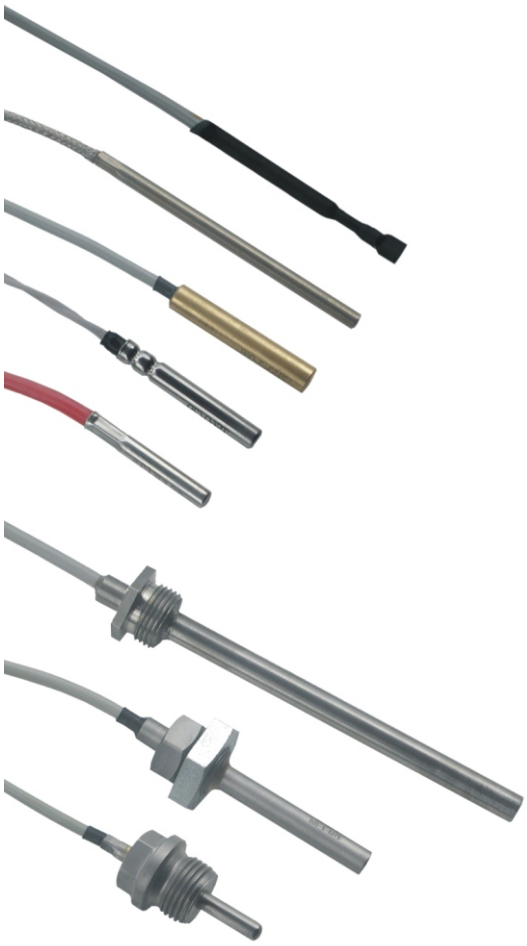


Sensor

Welba's standard temperature sensors are characterized by high measuring accuracy and a long service life.

The case material made of stainless steel (1.4301) is food-safe and allows the use in many aggressive media.





On request, we manufacture sensors in different case shapes and cable materials.

The following figure gives an impression of the possibilities.

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