

## MAGIO MS-310F Refrigerated / heating circulator

As with all circulators from the MAGIO range, the refrigerated circulators stand out thanks to their premium quality, high performance and intuitive operation. The devices offer extra strong pressure and suction pumps, thus fulfilling the highest demands for temperature control of external applications. Whether in basic research, material testing or technical systems – the MAGIO refrigerated circulators offer high-tech solutions for high customer requirements.

### Alternatively with natural refrigerant

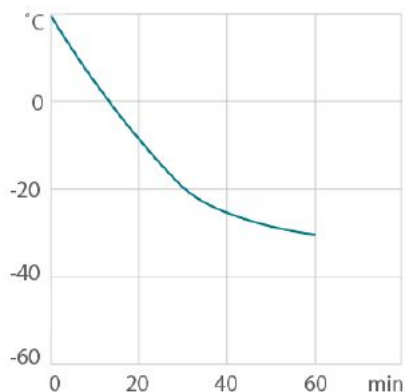
The MAGIO MS-310F is alternatively available with natural refrigerant. Order No.. 9 032 713.N1



### Product features

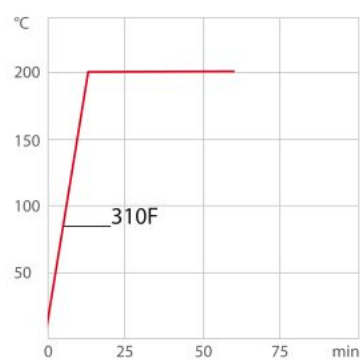
- Ideal for demanding external applications
- Simple control of complex applications
- Continuously adjustable, extremely powerful pressure / suction pump
- Flow rate 16 ... 31 l / min, pressure 0.24 ... 0.92 bar, suction 0.03 ... 0.4 bar
- Large, high-resolution TFT touch display with multilingual user interface
- Parts being in contact with the medium made of stainless steel
- Integrated programmer
- Integrated external Pt100 connection
- USB connection
- RS232 interface for online communication
- Ethernet
- analog interfaces (accessory)
- Class III (FL) according to DIN 12876-1
- Modbus
- Profibus DP (Accessory)
- RS232/RS485 interface for online communication
- Connections for solenoid valve

#### Cool-down time



Medium: Ethanol

#### Heat-up time



Medium: Thermal

## Performance values

230V/50Hz (Schuko Plug - CEE 7/4 Plug Type F)

Heating capacity kW	2
Viscosity max. cST	70
Pump capacity flow rate l/min	16 ... 31
Pump capacity flow pressure bar	0.24 ... 0.92
Maximum suction bar	-0.03 ... -0.4
Power A	16

## Refrigerant variants

Order No. 9032713.N1.33

### Cooling capacity 1 (Ethanol)

°C	20	0	-10	-20	-30
kW	0.33	0.28	0.23	0.13	0.05

\* Performance specifications measured in accordance with DIN12876. Cooling capacities up to 20 °C measured with ethanol; over 20 °C with thermal oil unless otherwise specified. Performance specifications apply at an ambient temperature of 20 °C. Performance values may differ with other bath fluids.

### Cooling capacity 2 (Ethanol)

°C	20	0	-10	-20	-30
kW	0.26	0.21	0.17	0.1	0.01

\* Performance specifications measured in accordance with DIN12876. Cooling capacities up to 20 °C measured with ethanol; over 20 °C with thermal oil unless otherwise specified. Performance specifications apply at an ambient temperature of 20 °C. Performance values may differ with other bath fluids.

### Refrigerant stage 1

Refrigerant	R290
Filling volume g	31
Global Warming Potential for R290	3
Carbon dioxide equivalent t	0

Order No.	9032713.S1.33				
<b>Cooling capacity 1 (Ethanol)</b>					
°C	20	0	-10	-20	-30
kW	0.33	0.28	0.23	0.13	0.05
* Performance specifications measured in accordance with DIN12876. Cooling capacities up to 20 °C measured with ethanol; over 20 °C with thermal oil unless otherwise specified. Performance specifications apply at an ambient temperature of 20 °C. Performance values may differ with other bath fluids.					
<b>Cooling capacity 2 (Ethanol)</b>					
°C	20	0	-10	-20	-30
kW	0.26	0.21	0.17	0.1	0.01
* Performance specifications measured in accordance with DIN12876. Cooling capacities up to 20 °C measured with ethanol; over 20 °C with thermal oil unless otherwise specified. Performance specifications apply at an ambient temperature of 20 °C. Performance values may differ with other bath fluids.					
<b>Refrigerant stage 1</b>					
Refrigerant	R449A				
Filling volume g	60				
Global Warming Potential for R449A	1397				
Carbon dioxide equivalent	0.084				
t					

## Technical data

Available voltage versions		Bath	
Order No.	9 032 713	Bath tank	Stainless steel
Available voltage versions:		Bath cover	integrated
9032713.N1.01	100V/50-60Hz (Nema N5-15 Plug) (R290)	Usable bath opening cm (W x L / D)	13 x 15 / 15
9032713.S1.01	100V/50-60Hz (Nema N5-15 Plug) (R449A)		
9032713.N1.02	115V/60Hz (Nema N5-15 Plug) (R290)		
9032713.S1.02	115V/60Hz (Nema N5-15 Plug) (R449A)		
9032713.N1.33	200-230V/50-60Hz (Schuko Plug - CEE 7/4 Plug Type F) (R290)		
9032713.S1.33	200-230V/50-60Hz (Schuko Plug - CEE 7/4 Plug Type F) (R449A)		
9032713.N1.33.chn	200-230V/50-60Hz (CN Plug) (R290)		
9032713.S1.33.chn	200-230V/50-60Hz (CN Plug) (R449A)		
9032713.N1.04	200-230V/50-60Hz (UK Plug Type BS1363A) (R290)		
9032713.S1.04	200-230V/50-60Hz (UK Plug Type BS1363A) (R449A)		
9032713.N1.05	200-230V/50-60Hz (CH Plug Type SEV 1011) (R290)		
9032713.S1.05	200-230V/50-60Hz (CH Plug Type SEV 1011) (R449A)		
Cooling		Other	
Cooling of compressor	1-stage Air	Classification	Classification III (FL)

IP Code	IP 21
Hint to the technical data table	Cooling capacity 1 = capacity at minimum pump level, cooling capacity 2 = capacity at maximum pump level
Pump function	Pressure Suction Pump
Pump type	Immersion Pump

Electronics	
Digital interface	RS232, RS485, USB, Ethernet, Modbus
External pt100 sensor connection	integrated
Integrated programmer	8x60 steps
Temperature control	ICC
Absolute temperature calibration	10 Point Calibration
Temperature display	7" TFT Touchscreen
Temperature setting	Touchscreen
Electronic Timer hr:min	00:00 ... 99:59

Dimensions and volumes	
Weight kg	29
Dimensions cm (W x L x H)	23 x 40 x 65
Filling volume l	3 ... 4
Pump connections	M16x1 male

Temperature values	
Setting the resolution of the temperature display °C	0.01
Working temperature range °C	-30 ... +200
Temperature stability °C	±0.01
Ambient temperature °C	+10 ... +40
Temperature display resolution °C	0.01

**Included in delivery**  
 2 Barbed fittings for tubing 8 and 12 mm ID. (Pump connections M16x1 male)

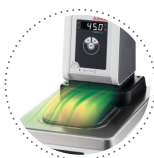
### All Benefits



**100% Checked.**  
 100% testing. 100% quality. Each JULABO Circulator undergoes thorough quality testing before leaving the factory.



**Green technology.**  
 Development consistently applied environmentally friendly materials and technologies.



**Condensation protection.**  
 Superb design solution. Integrated ventilation directs air over the bath lid and minimizes condensation.



**Handle with ease.**  
 Makes day-to-day work easy. Comfortably move your JULABO Circulator around by using the ergonomic handles (front and rear).



**Intelligent temperature control.**  
 Intelligent cascade control - automatic and self-optimizing adaptation of the PID control parameters with external stability of +/- 0.05 °C.



**JULABO. Quality.**  
 Highest standards of quality for a long product life.



**Internal. External.**  
 The pump is controlled via a lever located directly below the display. Easily change between internal and external circulation.



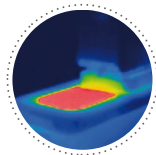
**More bath.**  
 Designed for more comfort. Thanks to the recessed cooling coil, the internal bath provides more space.



**Quick start.**  
Individual JULABO consultation and comprehensive manuals at your disposal.



**Satisfied customers.**  
11 subsidiaries and more than 100 partners worldwide guarantee fast and qualified JULABO support.



**Solid.**  
Minimized energy loss through high-quality insulation.



**Services 24/7.**  
Around the clock availability. You can find suitable accessories, data sheets, manuals, case studies, and more at [www.julabo.com](http://www.julabo.com).



**Space saving. Free up space.**  
Place your JULABO Circulator right next to an application, another unit, or wall. That saves space. This is made possible by eliminating vents and connections on the sides.



**Highest measuring accuracy**  
'Absolute Temperature Calibration' for manual compensation of a temperature difference, 10-point calibration



**Stable.**  
Rubber feet allow for a secured footing of your CORIO to prevent damage to your laboratory equipment.



**Tidy.**  
The special drain tap for easy draining of bath fluids without tools.



**Touching permitted.**  
Optimum safety. The ergonomic plastic handle protects your fingers from hot surfaces.



**Quick support**  
If an error occurs, the integrated Black-Box function permits fast diagnosis by the JULABO service team



**Touch display. Perfect operation.**  
With the touch display, the user always has an overview of all values and functions. The intuitive and multilingual menu structure enables perfect control.



**Many interfaces.**  
Straight-forward remote control, data management, and integration into process structures. USB, Ethernet, RS232, SD card, and alarm off are permanently integrated. Further interfaces available as accessories.



**Maximum safety.**  
Classification III according to DIN12876-1 enables safe operation, even with flammable fluids. Automatic switch-off in the event of high temperature or low liquid level.



**Multi-lingual.**  
Operation in multiple languages.



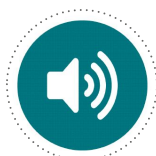
**Programmer. Integrated.**  
The integrated internal programmer makes it possible to automatically run temperature time profiles.



**Temperature. Under control.**  
External Pt100 sensor connection for precise measurement and control directly in the external application.



**Fill level. Monitored.**  
Fill level indicator on the display for heat-transfer liquid.



**Process stability.**  
Early warning - visual and acoustic - of critical states increases process stability.



**Process. Under control.**  
Full regulation of the dynamics control, access to all important control parameters for individual process optimization.



**Stable. Mobile.**  
Rubber feet keep JULABO Circulators standing firm. Larger and more powerful units also have integrated rollers for easy handling.



**Energy-saving.**

The high-quality insulation of all relevant components saves energy.



**Everything made of stainless steel.**

Quality and material compatibility at the highest level. All parts in contact with the medium are entirely made of stainless steel.



**Wide range.**

Refrigerated and heating circulator in various combinations, circulator in various sizes. Maximum flexibility through a large selection of accessories.



**Connection. Easy.**

Inclined pump connections (M16×1) facilitate the connection of applications. Each unit includes 2 barbed fittings of 8/12 mm diameter each.



**Analog I/O.**

Analog interfaces for integration into process control systems (optional).



**Most powerful pump.**

The integrated pressure/suction pump with performance values of 0.9 bar and -0.4 bar is the most powerful in its class and continuously adjustable.



**Condensation protection.**

Superb design solution. Integrated ventilation directs air over the bath lid and minimizes condensation.