

## MAGIO MS-449F 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.

The MAGIO MS-449F refrigerated circulator has an exceptionally large bath volume. This makes the unit ideal for precisely tempering larger or a variety of different samples in the bath.

### High energy efficiency

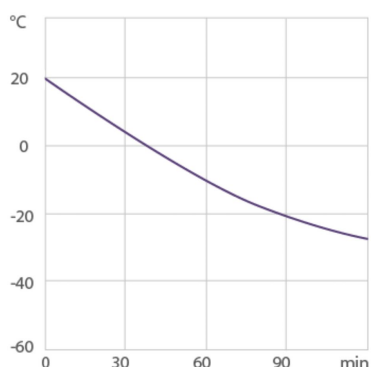
The 449F cooling machine uses natural, environmentally friendly refrigerant and was also developed with a focus on energy efficiency. This leads to significant operating cost savings in many application scenarios and thus to a faster amortization of the investment. At the same time, the lower energy consumption makes a positive contribution to climate protection.



### Product features

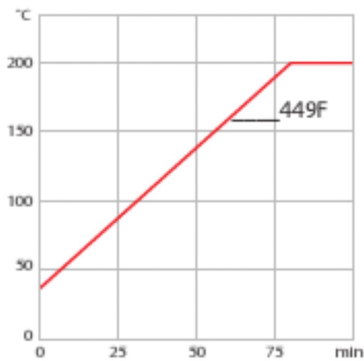
- Ideal for demanding external applications
- Simple control of complex applications
- Continuously adjustable, extremely powerful pressure / suction pump
- Flow rate 16 ... 31 l / min, pressure 0.24 ... 0.92 bar, suction 0.03 ... 0.4 bar
- Large, high-resolution TFT touch display with multilingual user 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
- Connections for solenoid valve
- Integrated pump connection M16×1

### 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 consumption A	13

Order No. 9032716.N1.33

#### Cooling capacity 1 (Ethanol)

°C	20	0	-10	-20	-30
kW	0.46	0.37	0.29	0.22	0.08

\* Performance specifications measured in accordance with DIN 12876. 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 1 = capacity at minimum pump level, cooling capacity 2 = capacity at maximum pump level

#### Cooling capacity 2 (Ethanol)

°C	20	0	-10	-20	-30
kW	0.4	0.31	0.24	0.19	0.05

\* Performance specifications measured in accordance with DIN 12876. 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 1 = capacity at minimum pump level, cooling capacity 2 = capacity at maximum pump level

#### Note about natural refrigerants:

Temperature control units using natural refrigerants are often subject to regulatory requirements regarding the installation site, operation, transport or disposal of the units. If you have any questions, we will be happy to advise you.

#### Refrigerant stage 1

Refrigerant	R290
Filling weight g	41
Global Warming Potential for R290	3
Carbon dioxide equivalent	0.000123 t

## Technical data

Available voltage versions		Bath	
Order No.	9 032 716	Bath tank	Stainless steel
Available voltage versions:		Bath cover	integrated
9032716.N1.01	100V/50-60Hz (Nema N5-15 Plug) (R290)	Usable bath opening cm (W x L / D)	28 x 35 / 20
9032716.N1.02	115V/60Hz (Nema N5-15 Plug) (R290)		
9032716.N1.33	200-230V/50-60Hz (Schuko Plug - CEE 7/4 Plug Type F) (R290)		
9032716.N1.33.chn	200-230V/50-60Hz (CN Plug) (R290)		
9032716.N1.04	200-230V/50-60Hz (UK Plug Type BS1363A) (R290)		
9032716.N1.05	200-230V/50-60Hz (CH Plug Type SEV 1011) (R290)		
Cooling		Other	
Cooling of compressor	1-stage Air	Classification	Classification III (FL)
		IP Code	IP 21
		Pump function	Pressure Suction Pump
		Pump type	Immersion Pump
		User Interface Language	Chinese, Czech, Dutch, English, French, German, Italian, Japanese, Korean, Polish, Portuguese, Russian, Spanish, Turkish
Electronics		Dimensions and volumes	
Interfaces	Ethernet, Modbus, RS232, RS485, Stakei, USB	Weight kg	42
External pt100 sensor connection	integrated	Dimensions cm (W x L x H)	37 x 59 x 69
Integrated programmer	8x60 steps	Filling volume l	21 ... 30
Temperature control	ICC	Pump connections	M16x1 male
Absolute temperature calibration	10 Point Calibration		
Temperature display	7" TFT Touchscreen		
Temperature setting	Touchscreen		
Electronic Timer hr:min	00:00 ... 99:59		
Temperature values		Included in delivery	
Setting the resolution of the temperature display °C	0.01	2 Barbed fittings for tubing 8 and 12 mm ID. (Pump connections M16x1 male)	
Working temperature range °C	-30 ... +200		
Temperature stability °C	±0.01		
Ambient temperature °C	+10 ... +40		
Temperature display resolution °C	0.01		

## All Benefits



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



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



**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.



**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).



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



**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.



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



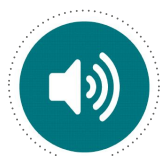
**Programmer. Integrated.**  
The integrated internal programmer makes it possible to automatically run temperature time profiles.



**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.



**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 (M16x1) facilitate the connection of applications. Each unit includes 2 barbed fittings of 8/12 mm diameter each.



**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.



**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.



**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.



**Analog I/O.**  
 Analog interfaces for integration into process control systems (optional).



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



**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.



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