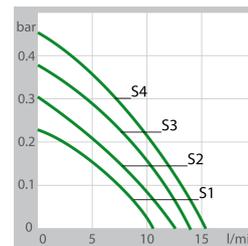


FP89-ME Ultra-Low Refrigerated-Heating Circulator

Upper middle class with ext. Pt100 sensor connection

Ultra-low Refrigerated Circulator with 2-stage cascade-cooling

JULABO Ultra-Low Refrigerated Circulators for heating and cooling are suitable for external temperature tasks. Powerful circulating pump systems and high heating and cooling capacities guarantee short heat-up and cool-down times. ACC 'Active Cooling Control' provides active cooling control across the whole temperature range. An energy saving feature with only minor loss of heat is provided by the proportional cooling capacity control in the 'FP' refrigeration units. The inevitable dust accumulation that occurs in refrigeration systems is solved by means of an easily removed venting grill, which allows for easy cleaning. The units are equipped with handles or castors for an easy transportation. All models have a drain tap on the front allowing the fluid to be drained easily. Additionally the instruments are equipped with an improved insulation to help avoid ice-formation, and have a visual liquid level display.



● Pump capacity (Water)

Your advantages

- VFD COMFORT DISPLAY
- Keypad for setpoints, warning/safety values and menu functions
- PID3 cascade temperature control
- ATC3 3-Point-Calibration
- Pt100 External sensor connection for measurement and control
- SMART PUMP, electronically adjustable pump stages
- Early warning system for low liquid level (DBGM 203 06 059.8)
- Adjustable high temperature cut-out, visible via display
- RS232 interface for online communication
- Integrated programmer for 10 program steps
- Active Cooling Control

Technical Data

Order No.	9162689						
Model series	TopTech						
Category	Ultra-Low Refrigerated-Heating Circulators						
Working temperature range (°C)	-90 ... +100						
Temperature stability (°C)	±0.02						
Setting / display resolution	0.01 °C						
Integrated programmer	1x10 steps						
Temperature Display	VFD						
Heating capacity (kW)	1.3						
Cooling capacity (Medium Ethanol)	°C	20	0	-20	-40	-60	-80
	kW	1	0.92	0.88	0.75	0.58	0.2
Pump capacity flow rate (l/min)	11-16						

Pump capacity flow pressure (bar)	0.23-0.45
Bath opening / bath depth (W x L / D cm)	13 x 15 / 16
Pump connections	M16x1
Barbed fittings diameter (inner dia. / mm)	8 / 10
Filling volume liters	8
Refrigerant stage 1	R404A
Filling volume refrigerant stage 1 (g)	500
Global Warming Potential for R404A	3922
Carbon dioxide equivalent stage 1 (t)	1.961
Refrigerant stage 2	R508B
Filling volume refrigerant stage 2 (g)	270
Global Warming Potential for R508B	13396
Carbon dioxide equivalent stage 2 (t)	3.617
External Pt100 sensor connection	integrated
Digital interface	RS232 Optional: Profibus
Ambient temperature	5...40 °C
Dimensions W x L x H (cm)	55 x 60 x 90
Weight (kg)	133
Classification according to DIN12876-1	Classification III (FL)
Included with each unit	2 barbed fittings suitable for tubing 8 and 10 mm inner dia. (pump connections M10x1 female)
Cooling of compressor	Air
Available voltage versions	230 V / 50 Hz 230 V / 60 Hz

Characteristics

Display



A perfect view

Ample, easy to read VFD Comfort display for simultaneous display of 3 values, warning functions, high temperature cut-off, pump stages (resolution 0.01 °C)



Pump stage and liquid level

Backlit indicator for selected pump stages and filling volume on Presto® PLUS, Magnum 91 & Forte HT

Operation



Comfortable and detailed

Comfortable keypad with additional menu functions for pump stages, calibration, control parameters, programmer, warnings, etc.

Temperature Control



For higher demands

PID Temperature control with drift compensation and adjustable parameters, improved temperature stability for external applications, temperature stability ± 0.01 °C internal, $\leq \pm 0.1$ °C external



Highest measuring accuracy

'Absolute Temperature Calibration' for manual compensation of a temperature difference, 3-point calibration

Refrigeration Technology



Consistent cooling capacity

Easily removable venting grid for quick and easy cleaning



100 % Cooling capacity

'Active Cooling Control' for cooling available throughout the entire working temperature range, fast cool-down even at higher temperatures

Technical Features



Clever pump system

Reliable and consistent pump capacity, electronically adjustable pump stages



Control from the external application

External Pt100 sensor connection for precise measurement and control directly in the external application



Serial connection

RS232 interface for PC connection, e.g. for data communication and recording of measured values



Easy program control

Integrated programmer for the execution of time and temperature dependant profiles, 1 temperature profile with 10 steps max., with real time clock

Warning & Safety Functions



Early warning system for low liquid level

Maximum safety for applications, optical and audible alarm, allows user to refill bath fluid before the unit shuts down



Early warning system for high/low temperature limits

Maximum safety for applications, optical and audible alarm, convertible to automated cut-off function



Enhanced protective functions

Maximum safety, adjustable high temperature cut-off or dry-running protection, additional display of setpoints permits easy and precise adjustments



For flammable bath fluids

Classification III (FL) according to DIN 12876-1