

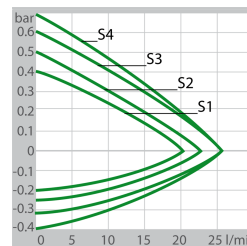
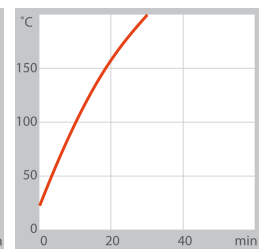
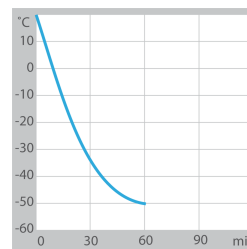
## FP50-HE Refrigerated/Heating Circulator

The powerful upper class unit for demanding applications.

JULABO Refrigerated & Heating Circulators for heating and cooling are suitable for external temperature tasks and for temperature applications directly in the bath. A model from three different series' with different capacities can be selected. Powerful circulating pump systems and high heating and cooling capacities guarantee short heat-up and cool-down times. The inevitable dust accumulation that occurs in refrigeration systems is solved by means of an easily removed venting grid, which allows for easy cleaning. Depending on the model, 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. The compact assembly of each unit enables space to be saved in the laboratory.

### Your advantages

- VFD COMFORT DISPLAY
- Keypad for setpoints, warning/safety values and menu functions
- ICC (Intelligent Cascade Control), self-optimizing temperature control
- ATC3 3-Point-Calibration
- Pt100 External sensor connection for measurement and control
- SMART PUMP, electronically adjustable pump stages
- Adjustable pressure and suction pump
- 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
- Optional: analogue interfaces
- Integrated programmer for 10 program steps
- Active Cooling Control
- Proportional cooling control



- Cool-down time (Ethanol)
- Heat-up time (thermal)
- Pump capacity (Water)

### Technical Data

Order No.	9212650				
Model series	HighTech				
Category	Refrigerated - Heating Circulators				
Working temperature range (°C)	-50 ... +200				
Temperature control	ICC				
Temperature stability (°C)	±0.01				
Setting / display resolution	0.01 °C				
Integrated programmer	1x10 steps				
Temperature Display	VFD				
Heating capacity (kW)	2				
Cooling capacity (Medium Ethanol)	°C	20	0	-20	-40
	kW	0.9	0.8	0.5	0.16

Pump capacity flow rate (l/min)	22-26
Pump capacity flow pressure (bar)	0.4-0.7
Pump capacity flow suction (bar)	0.2-0.4
Bath opening / bath depth (W x L / D cm)	18 x 12 / 15
Pump connections	M16x1
Barbed fittings diameter (inner dia. / mm)	8 / 12
Filling volume liters	8
Refrigerant stage 1	R404A
Filling volume refrigerant stage 1 (g)	385
Global Warming Potential for R404A	3922
Carbon dioxide equivalent stage 1 (t)	1.51
External Pt100 sensor connection	integrated
Digital interface	RS232 Optional: Profibus
Ambient temperature	5...40 °C
Dimensions W x L x H (cm)	42 x 49 x 72
Weight (kg)	57
Classification according to DIN12876-1	Classification III (FL)
Included with each unit	2 each barbed fittings for tubing 8 and 12 mm inner dia. (pump connections M16x1 female).
Cooling of compressor	Air
Power requirement V / Hz / A	230/50/14
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 perfect results

'Intelligent Cascade Control', automatic & self optimizing adjustment of PID control parameters, temperature stability ±0.005 °C internal, <±0.05 °C external



#### Full control

'Temperature Control Features' for individual optimization, access to all important control parameters, additional settings for band limit, limits, Co-Speedfactor etc.



#### Highest measuring accuracy

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

### Refrigeration Technology



#### Energy saving cooling

Proportional cooling control for automatic adjustment of cooling power or temporary switch-off of compressor as needed to save up to 90 % energy in comparison to unregulated cooling machines



**Consistent cooling capacity**  
Easily removable venting grid for quick and easy cleaning



**For flammable bath fluids**  
Classification III (FL) according to DIN 12876-1



**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