

## FP50-HE Refrigerated - Heating Circulator

The HighTech Series features refrigerated heating /circulators with innovative technology for sophisticated applications. The instruments provide powerful, electronically adjustable pressure and suction pumps.

The instruments can be used for internal as well as external temperature control applications of closed and open systems.

### 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
- 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



### Technical data

<b>Available voltage versions</b>		<b>Bath</b>	
Order No.	9 212 650	Bath cover	integrated
Available voltage versions:		Usable bath opening cm (W x L / D)	18 x 12 / 15
9 212 650.13	230V/60Hz (Nema N6-20 Plug)		
9 212 650.04	230V/50Hz (UK Plug Type BS1363A)		
9 212 650.05	230V/50Hz (CH Plug Type SEV 1011)		
9 212 650.03	230V/50Hz (Schuko Plug - CEE 7/4 Plug Type F)		
<b>Cooling</b>		<b>Other</b>	
Cooling of compressor	1-stage Air	Sound pressure level dbA	56
		Classification	Classification III (FL)
		IP Code	IP 21
		Pump type	Immersion Pump
<b>Electronics</b>		<b>Dimensions and volumes</b>	
Digital interface	Profibus optional	Weight kg	57
External pt100 sensor connection	integrated	Barbed fittings inner diameter	8/12 mm
Integrated programmer	1x10 steps	Dimensions cm (W x L x H)	42 x 49 x 72
Temperature control	ICC	Filling volume l	5.5 ... 8
Absolute temperature calibration	3 Point Calibration	Pump connections	M16x1 male
Temperature display	VFD		
Temperature setting	Keypad		
<b>Temperature values</b>			
Setting the resolution of the temperature display °C	0.01		
Working temperature range °C	-50 ... +200		

Temperature stability °C	±0.01
Temperature stability external °C	±0.01 ... ±0.2
Ambient temperature °C	+5.0 ... +40.0
Temperature display resolution °C	0.01

## Performance values

### 230V/60Hz (Nema N6-20 Plug)

230V/60Hz					
Heating capacity kW	2				
Cooling capacity (Ethanol)					
°C	20	0	-20	-30	-40
kW	0.9	0.8	0.48	0.3	0.15
Viscosity max. cST	70				
Refrigerant	R449A				
Filling volume g	385				
Global Warming Potential for R449A	1397				
Carbon dioxide equivalent t	0.538				
Pump capacity flow rate l/min	22 ... 26				
Pump capacity flow pressure bar	0.4 ... 0.7				
Maximum suction bar	0.2 ... 0.4				

### 230V/50Hz (UK Plug Type BS1363A)

230V/50Hz					
Heating capacity kW	2				
Cooling capacity (Ethanol)					
°C	20	0	-20	-30	-40
kW	0.9	0.8	0.46	0.3	0.14
Viscosity max. cST	70				
Refrigerant	R452A				
Filling volume g	385				
Global Warming Potential for R452A	2140				
Carbon dioxide equivalent t	0.824				
Pump capacity flow rate l/min	22 ... 26				
Pump capacity flow pressure bar	0.4 ... 0.7				
Maximum suction bar	0.2 ... 0.4				

### 230V/50Hz (CH Plug Type SEV 1011)

230V/50Hz					
Heating capacity kW	2				
Cooling capacity (Ethanol)					
°C	20	0	-20	-30	-40
kW	0.9	0.8	0.46	0.3	0.14
Viscosity max. cST	70				

Refrigerant	R452A
Filling volume g	385
Global Warming Potential for R452A	2140
Carbon dioxide equivalent t	0.824
Pump capacity flow rate l/min	22 ... 26
Pump capacity flow pressure bar	0.4 ... 0.7
Maximum suction bar	0.2 ... 0.4

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

230V/50Hz					
Heating capacity kW	2				
Cooling capacity (Ethanol)					
°C	20	0	-20	-30	-40
kW	0.9	0.8	0.46	0.3	0.14
Viscosity max. cST	70				
Refrigerant	R452A				
Filling volume g	385				
Global Warming Potential for R452A	2140				
Carbon dioxide equivalent t	0.824				
Pump capacity flow rate l/min	22 ... 26				
Pump capacity flow pressure bar	0.4 ... 0.7				
Maximum suction bar	0.2 ... 0.4				

All Benefits



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



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



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



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



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



**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).



**Early warning system for high/low temperature limits**  
Maximum safety for applications, optical and audible alarm, convertible to automated cut-off function



**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



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



**ATC3. Calibration.**  
'Absolute Temperature Calibration' for compensating a physically caused temperature difference, 3-point calibration.



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



**100 % Cooling capacity**  
'Active Cooling Control' for cooling available throughout the entire working temperature range, fast cool-down even at higher temperatures



**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