

FP89-HL HighTech SL/HL Ultra-Low Refrigerated-Heating Circulator

The Ultra-Low Refrigerated Circulators of the HighTech Series with HL or SL circulator feature powerful pressure and suction pumps. The instruments provide the entire variety of functions of the professional HighTech Series of circulators.



Your advantages

- VFD COMFORT DISPLAY
- LCD DIALOG DISPLAY backlit for convenient interactive operation
- ICC (Intelligent Cascade Control), self-optimizing temperature control
- TCF Temperature Control Features to optimize the control behavior
- ATC3 3-Point-Calibration
- SMART PUMP, electronically adjustable pump stages
- Adjustable high temperature cut-out, visible via display
- RS232/RS485 interface for online communication
- Integrated programmer for 6 x 60 program steps
- Connections for solenoid valve and HSP booster pump
- Proportional cooling control

Technical data

Available voltage versions		Bath	
Order No.	9 312 689	Bath cover	integrated
Available voltage versions:		Usable bath opening cm (W x L / D)	13 x 15 / 16
9 312 689.03	230V/50Hz (Schuko Plug - CEE 7/4 Plug Type F)		
9 312 689.13	230V/60Hz (Nema N6-20 Plug)		
Cooling		Other	
Cooling of compressor	2-stage Air	Classification	Classification III (FL)
		IP Code	IP 21
Electronics		Dimensions and volumes	
Digital interface	Profibus optional	Weight kg	135
External pt100 sensor connection	integrated	Dimensions cm (W x L x H)	55 x 60 x 92
Integrated programmer	6x60 steps	Filling volume l	5.5 ... 8
Temperature control	ICC	Pump connections	M16x1 male
Absolute temperature calibration	3 Point Calibration		
Temperature display	VFD		
Temperature setting	Keypad		
Temperature values			
Setting the resolution of the temperature display °C	0.01		
Temperature display resolution °C	0.01		

Performance values

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

230V/50Hz

Heating capacity kW							1.3
Cooling capacity (Ethanol)							
°C	20	0	-20	-40	-60	-80	
kW	1	0.92	0.88	0.75	0.58	0.2	
Viscosity max. cST							70
Refrigerant							R404A
Filling volume g							500
Global Warming Potential for R404A							3922
Carbon dioxide equivalent t							1.961
Refrigerant							R508B
Filling volume g							270
Global Warming Potential for R508B							13396
Carbon dioxide equivalent t							3.617
Pump capacity flow rate l/min							22 ... 26
Pump capacity flow pressure bar							0.4 ... 0.7
Maximum suction bar							0.2 ... 0.4

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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.



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



Connection of additional equipment
Stake connections for solenoid valve, HSP booster pump and HST booster heater



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



Condensation and ice protection
A heated cover plate prevents condensation or ice build-up in the bath