

F81-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 in-struments 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 voltag	ge versions		Bath	
Order No.	9 312 681		Bath cover	integrated
Available voltage versions:			Usable bath opening cm (W x L / D)	13 x 15 / 16
9 312 681.33	230V/50-60Hz (Schuko Plug - CEE 7/4 Plug Type F)			
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	88
External pt100 sensor connection		integrated	Dimensions cm ($W \times L \times H$)	50 x 58 x 89
Integrated programmer		6x60 steps	Filling volume l	5 6.5
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/50-60Hz (Schuko Plug - CEE 7/4 Plug Type F)

230V/50Hz		230V/60Hz		
Heating capacity kW	1.3	Heating capacity kW 1.3		
Cooling capacity (Ethanol)		Cooling capacity (Ethanol)		
°C 20 0 -20 -40 -60 -8	0	°C 20 0 -20 -40 -60 -80		
kW 0.45 0.38 0.36 0.32 0.27 0.0	7	kW 0.45 0.38 0.36 0.32 0.27 0.07		
Viscosity max. cST	70	Viscosity max. cST 70		
Refrigerant	R404A	Refrigerant R404A		
Filling volume g	500	Filling volume g 500		
Global Warming Potential for R404A	3922	Global Warming Potential for R404A 3922		
Carbon dioxide equivalent t	1.961	Carbon dioxide equivalent t 1.961		
Refrigerant	R23	Refrigerant R23		
Filling volume g	120	Filling volume g 120		
Global Warming Potential for R23	14800	Global Warming Potential for R23 14800		
Carbon dioxide equivalent t	1.776	Carbon dioxide equivalent t 1.776		
Pump capacity flow rate l/min	22 26	Pump capacity flow rate I/min 22 26		
Pump capacity flow pressure bar	0.4 0.7	Pump capacity flow pressure bar 0.4 0.7		
Maximum suction bar	0.2 0.4	Maximum suction bar 0.2 0.4		

Benefits



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



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



Quick start.

Individual JULABO consultation and comprehensive manuals at your disposal.



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



Early warning system for high/low temperature limits

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



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



100% Checked.

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



Services 24/7.

Around the clock availability. You can find suitable accessories, data sheets, manuals, case studies, and more at www.julabo.com.



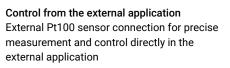
Connection of additional equipment Stakei connections for solenoid valve, HSP booster pump and HST booster heater



Clever pump system Reliable and consistent pump capacity, electronically adjustable pump stages

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ATC3. Calibration. 'Absolute Temperature Calibration' for

compensating a physically caused temperature difference, 3-point calibration.



100 % Cooling capacity

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



Condensation and ice protection

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



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



CF

Process. Under control.

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



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