

FP90-SL Ultra-Low Refrigerated / Heating Circulator

Ultra-Low Refrigerated Circulators with SL circulator impress with their high heating, cooling and pump capacities for external temperature control applications.

Product features

- VFD COMFORT DISPLAY
- Keypad for setpoints, warning/safety values and menu functions
- ICC (Intelligent Cascade Control), self-optimizing temperature control
- TCF Temperature Control Features to optimize the control behavior
- ATC3 3-Point-Calibration
- Pt100 External sensor connection for measurement and control
- 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



Performance values

208-230V/3PPE/60Hz (Without Plug)

Heating capacity kW	3
Viscosity max. cST	70
Pump capacity flow rate l/min	22 ... 26
Pump capacity flow pressure psi	5.8 ... 10.2
Maximum suction psi	2.9 ... 5.8
Current Draw A	29

Order No. 9352790.16.N

Cooling capacity (Ethanol)

°C	20	0	-20	-40	-60	-80
kW	1.8	1.7	1.6	1.35	0.75	0.15

* Performance specifications measured in accordance with DIN12876. Cooling capacities up to 20 °C measured with ethanol; over 20 °C with thermal oil unless otherwise specified. Performance specifications apply at an ambient temperature of 20 °C. Performance values may differ with other bath fluids.

Refrigerant stage 1

Refrigerant	R404A
Filling volume g	850
Global Warming Potential for R404A	3922
Carbon dioxide equivalent t	3.334

Refrigerant stage 2

Refrigerant	R23
Filling volume g	380
Global Warming Potential for R23	14800
Carbon dioxide equivalent t	5.624

Technical data

Available voltage versions		Bath	
Order No.	9 352 790N	Bath cover	integrated
Available voltage versions:			
9352790.06.N	230V/3PPE/50Hz (Without Plug) (R404A)		
9352790.07.N	400V/3PNPE/50Hz (Plug 32A CEE) (R404A)		
9352790.16.N	208V/3PPE/60Hz (Without Plug) (R404A)		
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 lbs	443.1
External pt100 sensor connection	integrated	Dimensions in. (W x L x H)	23.2 x 29.9 x 45.7
Integrated programmer	6x60 steps	Filling volume l	22
Temperature control	ICC	Pump connections	M16x1 male
Absolute temperature calibration	3 Point Calibration		
Temperature display	VFD		
Temperature setting	Keypad		
Temperature values		Included in delivery	
Setting the resolution of the temperature display °C	0.01	2 each Barbed fittings for tubing 8 and 12 mm ID. (Pump connections M16x1 male)	
Working temperature range °C	-90 ... +100		
Temperature stability °C	±0.05		
Ambient temperature °C	+5 ... +40		
Temperature display resolution °C	0.01		

All Benefits



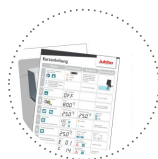
100% Checked.
100% testing. 100% quality. Each JULABO Circulator undergoes thorough quality testing before leaving the factory.



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



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



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



Satisfied customers.

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



Services 24/7.

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



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

Stakei 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



For flammable bath fluid

Classification III (FL) according to DIN 12876-1



Process. Under control.

Full control of the dynamic, 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



Control of the external application

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



ATC3. Calibration.

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