

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 stage 2 | |
|------------------------------------|-------|----------------------------------|-------|
| Refrigerant | R404A | Refrigerant | R23 |
| Filling volume g | 850 | Filling volume g | 380 |
| Global Warming Potential for R404A | 3922 | Global Warming Potential for R23 | 14800 |
| Carbon dioxide equivalent t | 3.334 | 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 × L × 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.