

FP90-SL 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. | 9 352 790N150 | Bath cover | integrated |
| Available voltage versions: | | | |
| 9 352 790N150.07 | 400V/3PNPE/50Hz (Plug 32A CEE) | | |
| 9 352 790N150.16 | 208V/3PPE/60Hz (Without 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 | 201 |
| External pt100 sensor connection | integrated | Dimensions cm (W x L x H) | 59 x 76 x 116 |
| 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 | | | |
| Setting the resolution of the temperature display °C | 0.01 | | |
| Temperature display resolution °C | 0.01 | | |

Performance values

400V/3PNPE/50Hz (Plug 32A CEE)

| 400V/3PNPE/50Hz | | | | | | |
|------------------------------------|-------------|-----|-----|------|------|------|
| Heating capacity kW | 3 | | | | | |
| Cooling capacity (Ethanol) | | | | | | |
| °C | 20 | 0 | -20 | -40 | -60 | -80 |
| kW | 1.8 | 1.7 | 1.6 | 1.35 | 0.75 | 0.15 |
| Viscosity max. cST | 70 | | | | | |
| Refrigerant | R404A | | | | | |
| Filling volume g | 850 | | | | | |
| Global Warming Potential for R404A | 3922 | | | | | |
| Carbon dioxide equivalent t | 3.334 | | | | | |
| Refrigerant | R23 | | | | | |
| Filling volume g | 380 | | | | | |
| Global Warming Potential for R23 | 14800 | | | | | |
| Carbon dioxide equivalent t | 5.624 | | | | | |
| Pump capacity flow rate l/min | 22 ... 26 | | | | | |
| Pump capacity flow pressure bar | 0.4 ... 0.7 | | | | | |
| Maximum suction bar | 0.2 ... 0.4 | | | | | |

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

| 208V/3PPE/60Hz | | | | | | |
|------------------------------------|-------------|-----|-----|------|------|------|
| Heating capacity kW | 3 | | | | | |
| Cooling capacity (Ethanol) | | | | | | |
| °C | 20 | 0 | -20 | -40 | -60 | -80 |
| kW | 1.8 | 1.7 | 1.6 | 1.35 | 0.75 | 0.15 |
| Viscosity max. cST | 70 | | | | | |
| Refrigerant | R404A | | | | | |
| Filling volume g | 850 | | | | | |
| Global Warming Potential for R404A | 3922 | | | | | |
| Carbon dioxide equivalent t | 3.334 | | | | | |
| Refrigerant | R23 | | | | | |
| Filling volume g | 380 | | | | | |
| Global Warming Potential for R23 | 14800 | | | | | |
| Carbon dioxide equivalent t | 5.624 | | | | | |
| 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/3PPE/60Hz | | | | | | |
|------------------------------------|-------------|-----|-----|------|------|------|
| Heating capacity kW | 3 | | | | | |
| Cooling capacity (Ethanol) | | | | | | |
| °C | 20 | 0 | -20 | -40 | -60 | -80 |
| kW | 1.8 | 1.7 | 1.6 | 1.35 | 0.75 | 0.15 |
| Viscosity max. cST | 70 | | | | | |
| Refrigerant | R404A | | | | | |
| Filling volume g | 850 | | | | | |
| Global Warming Potential for R404A | 3922 | | | | | |
| Carbon dioxide equivalent t | 3.334 | | | | | |
| Refrigerant | R23 | | | | | |
| Filling volume g | 380 | | | | | |
| Global Warming Potential for R23 | 14800 | | | | | |
| Carbon dioxide equivalent t | 5.624 | | | | | |
| Pump capacity flow rate l/min | 22 ... 26 | | | | | |
| Pump capacity flow pressure bar | 0.4 ... 0.7 | | | | | |
| Maximum suction bar | 0.2 ... 0.4 | | | | | |

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
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



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