

## FPW90-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.

### Your advantages

- VFD COMFORT DISPLAY
- LCD DIALOG DISPLAY backlit for convenient interactive operation
- 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



### Technical data

<b>Available voltage versions</b>		<b>Bath</b>	
Order No.	9 352 791N150	Bath cover	integrated
Available voltage versions:			
9 352 791N150.07	400V/3PNPE/50Hz (Plug 32A CEE)		
9 352 791N150.16	230V/3PPE/60Hz (Without Plug)		
<b>Cooling</b>		<b>Other</b>	
Cooling of compressor	2-stage Water	Classification	Classification III (FL)
Cooling water pressure max. bar	6	IP Code	IP 21
Cooling water difference pressure bar	3.5 ... 6		
Cooling water consumption l/min	4.2		
<b>Electronics</b>		<b>Dimensions and volumes</b>	
Digital interface	Profibus optional	Weight kg	190
External pt100 sensor connection	integrated	Cooling Water Connection in	G $\frac{3}{4}$
Integrated programmer	6x60 steps	Dimensions cm (W x L x H)	59 x 76 x 116
Temperature control	ICC	Filling volume l	22
Absolute temperature calibration	3 Point Calibration	Pump connections	M16x1 male
Temperature display	VFD		
Temperature setting	Keypad		
<b>Temperature values</b>			
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					

### 230V/3PPE/60Hz (Without Plug)

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.



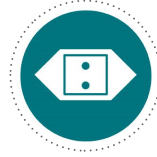
**Quick start.**  
Individual JULABO consultation and comprehensive manuals at your disposal.



**Services 24/7.**  
Around the clock availability. You can find suitable accessories, data sheets, manuals, case studies, and more at [www.julabo.com](http://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