FPW91-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
- 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
- Unique early warning system for low liquid level
- 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
- Active Cooling Control

Performance values

400V/3PNPE/50Hz (Plug 63A CEE)	
Heating capacity kW	3
Viscosity max. cSt	70
Pump capacity flow rate l/min	22 ... 26
Pump capacity flow pressure bar	0.4 ... 0.7
Maximum suction bar	0.2 ... 0.4
Power consumption A	32

Order No.	9352793N.07					
Cooling capacity (Ethanol)						
°C	20	0	-20	-40	-60	-80
kW [1]	4.5	4.1	3.7	3.1	2	0.75

Refrigerant stage 1		Refrigerant stage 2	
Refrigerant	R404A	Refrigerant	R23
Filling weight g	900	Filling weight g	1000
Global Warming Potential for R404A	3922	Global Warming Potential for R23	14800
Carbon dioxide equivalent t	3.5298	Carbon dioxide equivalent t	14.8

[1] Performance specifications measured in accordance with DIN 12876. 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.

Technical data

Available voltage versions	
Order No.	9 352 793N
Available voltage versions:	
9352793N.07	400V/3PNPE/50Hz (Plug 63A CEE) (R404A)
9352793N.16	230V/3PPE/60Hz (Without Plug) (R404A)

Cooling	
Cooling of compressor	2-stage Water
Cooling water pressure max. bar	6

Recommended cooling water properties	
Cooling water temperature range °C	20
Cooling water difference pressure bar	3.5
Cooling water consumption l/min	7.5

Bath	
Bath cover	integrated

Other	
Classification	Classification III (FL)
IP Code	IP 21

Electronics	
Interfaces	Profibus optional
External pt100 sensor connection	integrated
Integrated programmer	6x60 steps
Temperature control	ICC
Absolute temperature calibration	3 Point Calibration
Temperature display	VFD
Temperature setting	Keypad

Dimensions and volumes	
Weight kg	303
Cooling Water Connection in	G¾
Dimensions cm (W × L × H)	85 x 76 x 116
Filling volume l	22
Pump connections	M16x1 male

Temperature values	
Setting the resolution of the temperature display °C	0.01
Working temperature range °C	-91 ... +100
Temperature stability °C	±0.2
Ambient temperature °C	+5 ... +40
Setting the resolution of the temperature display °C	0.01

Included in delivery
2 Barbed fittings for tubing 8 and 12 mm ID. (Pump connections M16x1 male)
2 each barbed fittings for tubing 8 and 12 mm inner dia. (pump connections M16x1 female).

All Benefits

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

Early warning system for high/low temperature limits
Maximum safety for applications, optical and audible alarm, convertible to automated cut-off function

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

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

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

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

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.com.

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