

Icon feature description of technical benefits



LED temperature display
for actual value and setpoint.
Resolution 0.1 °C



MULTI-DISPLAY (LED) for actual value, up to 3 setpoints, high/low temperature warning functions, high temperature cut-off, selected pump stage.
Resolution 0.1 °C



VFD¹⁾ COMFORT-DISPLAY features the functions of the MULTI-DISPLAY.
Simultaneous indication of 3 values: actual value, setpoint and external actual value.
Resolution 0.1 °C or 0.01 °C



Illuminated display for selected pump stage and filling volume on 'Presto[®]', 'Magnum91' & 'Forte HT' models



LCD DIALOG-DISPLAY
backlit, offers interactive operation in easy-to-read text with 4 lines x 20 digits



Keypad 1
for setpoint adjustments, automatic toggle to display the actual value



Keypad 2 like keypad 1, with additional warning and safety functions for high and low temperatures



Keypad 3 like keypad 2 with additional menu functions for pump stage, calibration ATC³, band limit TCF, program, etc.

NEW



Keypad 4 like keypad 1 for recirculating coolers of the 'FL' series



PID 1 PID temperature control:
Temperature stability $\pm 0.02 \dots \pm 0.2$ °C



PID 2 PID temperature control with drift compensation:
Temperature stability $\pm 0.01 \dots \pm 0.02$ °C



PID 3 PID cascade temperature control
Temperature stability ± 0.01 °C internally, $< \pm 0.1$ °C externally



Intelligent Cascade Control, self-optimizing, for optimal results.
Temperature stability ± 0.005 °C internally, ± 0.05 °C externally



Temperature Control Features for band limit, limit setting, co-speed factor, control dynamics



Absolute Temperature Calibration
1-point calibration



Absolute Temperature Calibration
3-point calibration



Intelligent pump system
Electronically adjustable pump stages



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



Interface –
Online communication



Interface – Online communication for highest demands, upgradeable with Profibus DP

JULABO early warning systems (patented) with intermittent tone and optical signal



- for low liquid level, ability to refill bath fluid before unit shuts down!



- for high temperature and
- low temperature limits, adjustable to automated cut-off



Integrated programmer with real time clock and keypad operation for 1 x 10 program steps



Integrated programmer with real time clock and convenient keypad operation for 6 x 60 program steps



'Stake' connections for solenoid valve or HSP booster pump/HST booster heater



Maintain cooling performance!

- Removable venting grid: Hassle-free cleaning of the condenser
- Front drain accessibility



Active Cooling Control: Cooling available throughout the entire temperature range



Proportional cooling control for powerful FP models (e.g. FP50-HL)



Heated bath cover plate: prevents condensation or ice build-up



Adjustable high temperature cut-off or dry-running protection



High temperature cut-off adjustable via display

Classification (according to DIN 12876-1) with first failure safe cut-off functions and signal



S1 High temperature cut-off/dry running protection for non-flammable bath fluids (NFL)



S3 High temperature cut-off and low liquid level protection for flammable bath fluids (FL)

¹⁾ VFD: Vacuum Fluorescence Display

Please note the information on pages 4 to 6!

Please keep this page open!

The 'HighTech' Series
for working temperatures from -60 °C to +150 °C

Benefits
of the powerful ultra-low refrigerated circulators on pages 28 to 30:

- Cooling capacities to 5.5 kW, heating capacity 3 kW and the electronically controlled pressure and suction pump with 1.1 bar pressure capacity

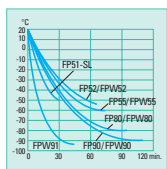
- Energy-saving proportional cooling control
- Active Cooling Control throughout the entire temperature range
- Removable venting grid: Hassle-free cleaning of the condenser
- Drain port easily accessible on the front
- Heated bath cover plate: Prevents ice build-up or condensation (except FP51-SL)

FP models: fan-air-cooling
FPW models: for cooling water connection

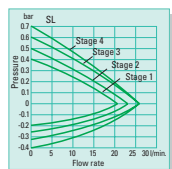
The COMPACT FP51-SL has a bath opening of 18 x 12 cm (depth: 20 cm).

- All other ultra-low models
- have an insulated filling port (70 mm dia.)
 - are upgradable with supplementary heater and pump (page 30)
 - also available with bath opening (page 30)

Cool-down times
Bath fluid: Ethanol



Pump capacities
Bath fluid: Water



- Applications**
for models on pages 28 & 30
- Jacketed reaction vessels
 - Autoclaves, miniplant installations
 - Kilo labs
 - Process development



JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stab. °C	Heat. cap. kW	Pump cap.	Cooling capacity kW (Bath fluid: Ethanol)	Fill. vol. liters	Dimensions W x L x H cm	Weight kg	Power requirement V / Hz
9 350 751	FP51-SL	-51 ... 200	±0.05	3	2.0	1.5 1.0 0.26	--	11 46 x 55 x 89	90	3 x 400~/50 or 3 x 230~/60
9 350 752N	FP52-SL	-60 ... 100	±0.05	3	3.0	2.8 1.6 0.65 0.1	24	59 x 76 x 116	156	3 x 400~/50 or 3 x 230~/60
9 350 753N	FPW52-SL	-60 ... 100	±0.05	3	3.0	2.8 1.6 0.65 0.1	24	59 x 76 x 116	153	3 x 400~/50 or 3 x 230~/60
9 350 755N	FP55-SL	-55 ... 100	±0.05	3	5.2	4.1 2.2 0.7 0.13	27	85 x 76 x 116	182	3 x 400~/50 or 3 x 230~/60
9 350 756N	FPW55-SL	-60 ... 100	±0.05	3	5.5	4.1 2.2 1.0 0.13	27	59 x 76 x 116	163	3 x 400~/50 or 3 x 230~/60

Ultra-Low Refrigerated Circulators

Order No.	Model	Working temp. range °C	Temp. stab. °C	Heat. cap. kW	Pump cap.	Cooling capacity kW (Bath fluid: Ethanol)	Fill. vol. liters	Dimensions W x L x H cm	Weight kg	Power requirement V / Hz
9 350 751	FP51-SL	-51 ... 200	±0.05	3	2.0	1.5 1.0 0.26	--	11 46 x 55 x 89	90	3 x 400~/50 or 3 x 230~/60
9 350 752N	FP52-SL	-60 ... 100	±0.05	3	3.0	2.8 1.6 0.65 0.1	24	59 x 76 x 116	156	3 x 400~/50 or 3 x 230~/60
9 350 753N	FPW52-SL	-60 ... 100	±0.05	3	3.0	2.8 1.6 0.65 0.1	24	59 x 76 x 116	153	3 x 400~/50 or 3 x 230~/60
9 350 755N	FP55-SL	-55 ... 100	±0.05	3	5.2	4.1 2.2 0.7 0.13	27	85 x 76 x 116	182	3 x 400~/50 or 3 x 230~/60
9 350 756N	FPW55-SL	-60 ... 100	±0.05	3	5.5	4.1 2.2 1.0 0.13	27	59 x 76 x 116	163	3 x 400~/50 or 3 x 230~/60

Ultra-Low Refrigerated Circulators, with extended working temperature ranges

Order No.	Model	Working temp. range °C	Temp. stab. °C	Heat. cap. kW	Pump cap.	Cooling capacity kW (Bath fluid: Ethanol)	Fill. vol. liters	Dimensions W x L x H cm	Weight kg	Power requirement V / Hz
9 350 752N150	FP52-SL	-60 ... 150	±0.05	3	3.0	2.8 1.6 0.65 0.1	24	59 x 76 x 116	156	3 x 400~/50 or 3 x 230~/60
9 350 753N150	FPW52-SL	-60 ... 150	±0.05	3	3.0	2.8 1.6 0.65 0.1	24	59 x 76 x 116	153	3 x 400~/50 or 3 x 230~/60
9 350 755N150	FP55-SL	-55 ... 150	±0.05	3	5.2	4.1 2.2 0.7 0.13	27	85 x 76 x 116	182	3 x 400~/50 or 3 x 230~/60
9 350 756N150	FPW55-SL	-60 ... 150	±0.05	3	5.5	4.1 2.2 1.0 0.13	27	59 x 76 x 116	163	3 x 400~/50 or 3 x 230~/60

Included with each unit: 2 each barbed fittings for tubing 8 and 12 mm inner dia. (pump connections M16x1 male)

FPW models: Cooling water connection G3/4" male with barbed fittings for tubing 1/2" inner dia.

**The 'TopTech' Series/
The 'HighTech' Series**
for working temperatures from -88 °C to +100 °C

A real PLUS:
heated bath cover plates

Benefits

- Small dimensions
- Two-stage cascaded technology
- Bath opening: 13 x 15 cm (depth: 16 cm) except F70-ME (12 x 12 cm / depth: 13 cm)

- Active Cooling Control throughout the entire temperature range
- Removable venting grid: Hassle-free cleaning of the condenser
- Drain port easily accessible on the front
- Heated bath cover plate: Prevents ice build-up or condensation

The units are suitable for various internal and external temperature applications:

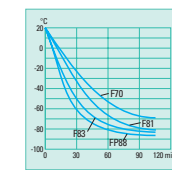
- with pressure pump to 0.45 bar ('TopTech' Series)
 - with pressure and suction pump to 1.1 bar ('HighTech' Series)
- The pump pressure is electronically adjustable in stages.

Applications

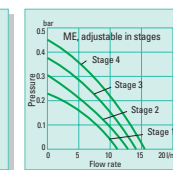
- Freezing point determination
- Calibration at low temperatures
- Petroleum testing
- Cell cultivation at low temperatures



Cool-down times
Bath fluid: Ethanol



Pump capacities
Bath fluid: Water



JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stab. °C	Heat. cap. kW	Pump capacity	Cooling capacity kW (Bath fluid: Ethanol)	Fill. vol. liters	Dimensions W x L x H cm	Weight kg	Power requirement V / Hz
9 160 670	F70-ME	-70 ... 100	±0.02	1.3	see diagram	0.34 0.22 0.17 0.13 0.07	--	4.5 42 x 54 x 71	63	230/50 or 230/60
9 160 681	F81-ME	-81 ... 100	±0.02	1.3	see diagram	0.45 0.38 0.36 0.32 0.27 0.07	6.5	50 x 58 x 88	86	230/50 or 230/60
9 160 683	F83-ME	-83 ... 50	±0.02	1.3	see diagram	0.9 0.78 0.72 0.6 0.38 0.12	8	55 x 61 x 90	116	230/50 or 230/60
9 160 688	FP88-ME	-88 ... 100	±0.02	1.3	see diagram	1.1 0.96 0.92 0.73 0.59 0.15	8	55 x 61 x 90	119	230/50 or 230/60

The 'TopTech' Series

Order No.	Model	Working temp. range °C	Temp. stab. °C	Heat. cap. kW	Pump capacity	Cooling capacity kW (Bath fluid: Ethanol)	Fill. vol. liters	Dimensions W x L x H cm	Weight kg	Power requirement V / Hz
9 160 670	F70-ME	-70 ... 100	±0.02	1.3	see diagram	0.34 0.22 0.17 0.13 0.07	--	4.5 42 x 54 x 71	63	230/50 or 230/60
9 160 681	F81-ME	-81 ... 100	±0.02	1.3	see diagram	0.45 0.38 0.36 0.32 0.27 0.07	6.5	50 x 58 x 88	86	230/50 or 230/60
9 160 683	F83-ME	-83 ... 50	±0.02	1.3	see diagram	0.9 0.78 0.72 0.6 0.38 0.12	8	55 x 61 x 90	116	230/50 or 230/60
9 160 688	FP88-ME	-88 ... 100	±0.02	1.3	see diagram	1.1 0.96 0.92 0.73 0.59 0.15	8	55 x 61 x 90	119	230/50 or 230/60

The 'HighTech' Series

Order No.	Model	Working temp. range °C	Temp. stab. °C	Heat. cap. kW	Pump capacity	Cooling capacity kW (Bath fluid: Ethanol)	Fill. vol. liters	Dimensions W x L x H cm	Weight kg	Power requirement V / Hz
9 310 681	F81-HL	-81 ... 100	±0.02	1.3	see diagram	0.45 0.38 0.36 0.32 0.27 0.07	6.5	50 x 58 x 89	88	230/50 or 230/60
9 310 683	F83-HL	-83 ... 50	±0.02	1.3	see diagram	0.9 0.78 0.72 0.6 0.38 0.12	8	55 x 60 x 92	118	230/50 or 230/60
9 310 688	FP88-HL	-88 ... 100	±0.02	1.3	see diagram	1.1 0.96 0.92 0.73 0.59 0.15	8	55 x 60 x 92	121	230/50 or 230/60

Included with each unit: 2 each barbed fittings for tubing 8 and 12 mm inner dia. (pump connections M16x1 male)

The 'HighTech' Series
for working temperatures from -95 °C to +150 °C

ULTRA-LOW
and powerful!

The powerful two-stage ultra-low refrigerated circulators additionally provide:

- **High cooling capacities at low temperatures**
- **Wide working temperature ranges** (benefits and pump capacities: page 28).

Upgradable:

Ultra-low units on pages 28 and 30 are upgradable (except F95-SL and FW95-SL):



① HST booster heater (6 kW) (order no. 8 810 011 or 8 810 012) = Total: 9 kW
The electronic module (page 32) (order no. 8 900 100) is required for control of the HST booster heater!

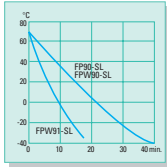
② HSP booster pump max. 3 bar- 30 l/min. (except for FP51-SL) (reduces cooling capacity by 0.4 kW) (order no. 8 810 015)

Option: Bath opening

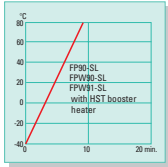


All models to +100 °C on pages 28 and 30 (except FP51-SL/F(W)95-SL) are available with a bath opening of 28 x 23 cm (depth: 22 cm) (order no. without 'N')

Cool-down times
Bath fluid: Thermal H5S



Rapid heating
Bath fluid: Thermal H5S



FPW91-SL

FP90-SL

JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol)					Fill. vol. liters	Dimensions W x L x H cm	Weight kg	Power requirement V / Hz
					20	0	-20	-40	-60	-80°C			

Ultra-Low Refrigerated Circulators

9 350 790 N	FP90-SL	-90 ... 100	±0.05	3	1.8	1.7	1.6	1.35	0.75	0.15	22	59 x 76 x 116	191	3 x 400~/50 or 3 x 230~/60
9 350 791 N	FPW90-SL	-90 ... 100	±0.05	3	1.8	1.7	1.6	1.35	0.75	0.15	22	59 x 76 x 116	188	3 x 400~/50 or 3 x 230~/60
9 350 793 N	FPW91-SL	-91 ... 100	±0.2	3	5.2	4.7	4.0	3.5	2.3	0.8	22	85 x 76 x 116	296	3 x 400~/50 or 3 x 230~/60
9 350 795 N	F95-SL	-95 ... 0	±0.05	3	--	2.0	1.9	1.65	1.2	0.36	22	59 x 76 x 116	201	3 x 400~/50 or 3 x 230~/60
9 350 796 N	FW95-SL	-95 ... 0	±0.05	3	--	2.0	1.9	1.65	1.2	0.36	22	59 x 76 x 116	198	3 x 400~/50 or 3 x 230~/60

Ultra-Low Refrigerated Circulators, with extended working temperature ranges

9 350 790N150	FP90-SL	-90 ... 150	±0.05	3	1.8	1.7	1.6	1.35	0.75	0.15	22	59 x 76 x 116	191	3 x 400~/50 or 3 x 230~/60
9 350 791N150	FPW90-SL	-90 ... 150	±0.05	3	1.8	1.7	1.6	1.35	0.75	0.15	22	59 x 76 x 116	188	3 x 400~/50 or 3 x 230~/60

Included with each unit: 2 each barbed fittings for tubing 8 and 12 mm inner dia. (pump connections M16x1 male)

FPW models: Cooling water connection G^{3/4}" male with barbed fittings for tubing 1/2" inner dia.

Order No.	Description	Qty.	Suitable for working temp. range ¹⁾ for Circulators	Flash point	Fire point	Color
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Bath fluids

8 940 124	Thermal G	10 l	-30 ... + 80°C	--	--	light yellow
8 940 125	Thermal G	5 l	-30 ... + 80°C	--	--	light yellow
8 940 100	Thermal M	10 l	+40 ... +170°C	--	>+280°C	clear
8 940 101	Thermal M	5 l	+40 ... +170°C	--	>+280°C	clear
8 940 102	Thermal H	10 l	+20 ... +250°C	--	>+270°C	light brown
8 940 103	Thermal H	5 l	+20 ... +250°C	--	>+270°C	light brown
8 940 104	Thermal HY	10 l	-80 ... + 55°C	--	> +75°C	clear
8 940 105	Thermal HY	5 l	-80 ... + 55°C	--	> +75°C	clear
8 940 106	Thermal H5S	10 l	-50 ... +105°C	--	>+110°C	light brown
8 940 107	Thermal H5S	5 l	-50 ... +105°C	--	>+110°C	light brown
8 940 110	Thermal H10S	10 l	-20 ... +180°C	--	>+175°C	light brown
8 940 111	Thermal H10S	5 l	-20 ... +180°C	--	>+175°C	light brown
8 940 108	Thermal H20S	10 l	0 ... +220°C	+20 ... +250°C	>+230°C	light brown
8 940 109	Thermal H20S	5 l	0 ... +220°C	+20 ... +250°C	>+230°C	light brown
8 940 116	Thermal H250	10 l	+60 ... +200°C	+80 ... +250°C	>+225°C	clear
8 940 117	Thermal H250	5 l	+60 ... +200°C	+80 ... +250°C	>+225°C	clear
8 940 110	Thermal H350	10 l	--	+50 ... +350°C	>+200°C	light brown
8 940 111	Thermal H350	5 l	--	+50 ... +350°C	>+200°C	light brown

¹⁾ These temperature ranges are only valid for use with circulators and Forte HT! Bath fluids for use with Presto® and Magnum 91, please refer to page 45.

Order No.	Description	Suitable for
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Water bath protective media

To prevent contamination and formation of algae.

8 940 006	6 bottles 'Aqua Stabil', 100 ml each	Open heating bath/heating circulators, water baths, shaking water baths
8 940 012	12 bottles 'Aqua Stabil', 100 ml each	

Heating Immersion Circulators (pages 10 and 11)

for combination with any bath tank. For attachment either use a bath clamp or a stand rod.

8 970 020	Stand rod (for attachment to a laboratory stand)	ED, EH, MB, MC, ME
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External temperature application

8 970 140	Pump set	ED, EH, MB, MC, ME
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Counter-cooling with tap water

8 970 105	Installation cooling coil (for tap water cooling)	ED, EH, MB, MC, ME
	Tubing	see page 32
	External Pt100 sensors	ME

Protection grid

8 970 003	Protection grid for heater/pump/float	ED, EH, MB, MC, ME
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Large selection of bath tanks

Stainless steel bath tanks to +150 °C		Inner / Outer dimensions		
		W x L / D cm	W x L / H cm	
9 902 405	Bath tank 5	33 x 15 / 15	38 x 19 / 18	ED, EH, MB, MC, ME
9 902 413	Bath tank 13	33 x 30 / 15	38 x 33 / 18	
9 902 417	Bath tank 17	33 x 30 / 20	38 x 33 / 23	
9 902 419	Bath tank 19	50 x 30 / 15	56 x 33 / 18	
9 902 427	Bath tank 27	50 x 30 / 20	56 x 33 / 23	
9 902 433	Bath tank 33	83 x 30 / 15	90 x 33 / 20	ED, EH, MC, ME
9 902 439	Bath tank 39	50 x 30 / 30	54 x 33 / 35	ED, EH, MC, ME

Plexiglas® bath tanks to +60 °C		Inner / Outer dimensions		
		W x L / D cm	W x L / H cm	
9 900 305	Bath tank 5A	39 x 12 / 15	41 x 14 / 17	ED, MB
9 900 307	Bath tank 7A	49 x 12 / 15	51 x 14 / 17	ED, MB
9 900 313	Bath tank 13A	32 x 30 / 15	41 x 33 / 17	ED, MB, MC
9 900 319	Bath tank 19A	47 x 30 / 15	55 x 33 / 17	ED, MB, MC

Makrolon® bath tanks to +100 °C		Inner / Outer dimensions		
		W x L / D cm	W x L / H cm	
9 900 505	Bath tank 5M	39 x 12 / 15	41 x 14 / 18	ED, MB
9 900 513	Bath tank 13M	32 x 30 / 15	41 x 33 / 18	ED
9 900 519	Bath tank 19M	47 x 30 / 15	55 x 33 / 18	ED



Bath fluid/
Water bath protective media



Pump set, with the bath attachment clamp removed



Protection grid



Stainless steel bath tanks



Plexiglas®/Makrolon® bath tanks