CF31 Cryo-compact circulator

The cryo-compact circulators of the CF Series provide powerful cooling and heating capabilities in a space-saving, compact design. The instruments feature 2 kW heating capacity and classification III according to DIN 12876-1. The cryo-compact circulators have pump connections for external temperature control applications and a bath opening for temperature control of small objects.

Product features

- Ergonomic design and easy operation
- Small overall dimensions for lowest space requirement
- Splash-proof keypad
- Bright VFD display and interactive LCD dialog display
- Highly precise ICC cascade temperature control
- RS232/RS485 interface for PC connection
- SMART PUMP, electronically adjustable pump stages
- Pt100 External sensor connection for measurement and control
- Integrated programmer for 6 x 60 program steps
- Unique early warning system for low liquid level
- ATC3 3-Point-Calibration
- TCF Temperature Control Features
- Adjustable high temperature cut-out, visible via display
- Pump connections for external temperature applications
- Bath opening for temperature control of small objects in the bath
- Front drain
- Extra bright displays, easy to read from a distance
- Precise temperature control
- Class III (FL) according to DIN 12876-1

Performance values

230V/50Hz (Schuko Plug - CEE 7/4 Plug Type F)	
Heating capacity kW	2
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	11

Order No.	9400331.03		
Cooling capacity (Ethanol)			
°C	20	0	-20
kW [1]	0.32	0.25	0.15

Refrigerant stage 1	
Refrigerant	R134a
Filling weight g	150
Global Warming Potential for R134a	1430
Carbon dioxide equivalent t	0.2145

[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.	9 400 331
Available voltage versions:	
9400331.13	230V/60Hz (Nema N6-20 Plug) (R134a)
9400331.02	115V/60Hz (Nema N5-20 Plug) (R134a)
9400331.03	230V/50Hz (Schuko Plug - CEE 7/4 Plug Type F) (R134a)
9400331.04	230V/50Hz (UK Plug Type BS1363A) (R134a)

Cooling

Cooling of compressor	1-stage Air

Bath

Bath tank	Stainless steel
Bath cover	integrated
Usable bath opening cm (W x L / D)	16 x 3 / 14

Other

Classification	Classification III (FL)
Pump type	Immersion Pump

Electronics

Interfaces	Alarm output optional, REG/EPROG optional, RS485, Standby-Input optional
External pt100 sensor connection	integrated
Integrated programmer	6x60 steps
Temperature control	ICC
Absolute temperature calibration	3 Point Calibration
Temperature display	LCD

Dimensions and volumes

Weight kg	35
Barbed fittings inner diameter mm	8/12 mm
Dimensions cm (W × L × H)	24 x 46 x 40
Filling volume l	2 ... 3.5
Pump connections	M16x1 male

Temperature values

Working temperature range °C	-30 ... +200
Temperature stability °C	±0.02
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)

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

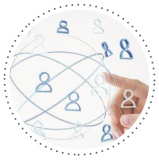
Energy saving cooling
Proportional cooling control for automatic adjustment of cooling power or temporary switch-off of compressor as needed to save up to 90 % energy in comparison to unregulated cooling machines

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.