

## 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 psi	5.8 ... 10.2
Maximum suction psi	2.9 ... 5.8
Power consumption A	11

Order No.	9400331.03		
Cooling capacity (Ethanol)			
°C	20	0	-20
kW <sup>1</sup>	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		

<sup>1</sup> 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

<b>Available voltage versions</b>		<b>Cooling</b>	
Order No.	9 400 331	Cooling of compressor	1-stage Air
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)		
<b>Bath</b>		<b>Other</b>	
Bath tank	Stainless steel	Classification	Classification III (FL)
Bath cover	integrated	Pump type	Immersion Pump
Usable bath opening in. (W x L / D)	6.3 x 1.2 / 5.5		
<b>Electronics</b>		<b>Dimensions and volumes</b>	
Interfaces	Alarm output optional, REG/EPROG optional, RS485, Standby-Input optional	Weight lbs	77.2
External pt100 sensor connection	integrated	Barbed fittings inner diameter mm	8/12 mm
Integrated programmer	6x60 steps	Dimensions in. (W x L x H)	9.4 x 18.1 x 15.7
Temperature control	ICC	Filling volume l	2 ... 3.5
Absolute temperature calibration	3 Point Calibration	Pump connections	M16x1 male
Temperature display	LCD		
<b>Temperature values</b>		<b>Included in delivery</b>	
Working temperature range °C	-30 ... +200	2 Barbed fittings for tubing 8 and 12 mm ID. (Pump connections M16x1 male)	
Temperature stability °C	±0.02		
Ambient temperature °C	+5 ... +40		
Setting the resolution of the temperature display °C	0.01		

## All Benefits

	<p><b>For flammable bath fluid</b> Classification III (FL) according to DIN 12876-1</p>		<p><b>ATC3. Calibration.</b> 'Absolute Temperature Calibration' for compensating a physically caused temperature difference, 3-point calibration.</p>
	<p><b>Process. Under control.</b> Full control of the dynamic, access to all important control parameters for individual process optimization.</p>		<p><b>100 % Cooling capacity</b> 'Active Cooling Control' for cooling available throughout the entire working temperature range, fast cool-down even at higher temperatures</p>
	<p><b>Early warning system for high/low temperature limits</b> Maximum safety for applications, optical and audible alarm, convertible to automated cut-off function</p>		<p><b>Energy saving cooling</b> 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</p>
	<p><b>100% Checked.</b> 100% testing. 100% quality. Each JULABO Circulator undergoes thorough quality testing before leaving the factory.</p>		<p><b>Green technology.</b> Development consistently applied environmentally friendly materials and technologies.</p>
	<p><b>JULABO. Quality.</b> Highest standards of quality for a long product life.</p>		<p><b>Quick start.</b> Individual JULABO consultation and comprehensive manuals at your disposal.</p>
	<p><b>Satisfied customers.</b> 11 subsidiaries and more than 100 partners worldwide guarantee fast and qualified JULABO support.</p>		<p><b>Services 24/7.</b> Around the clock availability. You can find suitable accessories, data sheets, manuals, case studies, and more at <a href="http://www.julabo.com">www.julabo.com</a>.</p>
	<p><b>Intelligent temperature control.</b> Intelligent cascade control - automatic and self-optimizing adaptation of the PID control parameters with external stability of +/- 0.05 °C.</p>		