Julabo

Professional Temperature Control for Science, Research and Industry

THE CATALOG 2015/2016

Julabo

THE TEMPERATURE CONTROL COMPANY

THE CATALOG

for Professional Temperature Control

-95 °C ... +400 °C

JULABO sets the benchmark

Ever since JULABO was founded in 1967 we develop and produce innovative temperature control instruments with highly precise control technology „Made in Germany". JULABO instruments are used anywhere where highly precise temperatures or rapid temperature changes are required. More than 450,000 units installed around the world demonstrate the trust JULABO enjoys with users in science, research and industry. We have earned our place as one of the world's leading firms in the field of temperature control solutions through dedication to quality, German engineering, and rapid, competent support provided by local contacts.

Gerhard Juchheim, Company founder and Managing Director (in the middle) with Markus Juchheim, Managing Director (on the right) and Ralph Juchheim, Managing Director JULABO USA (on the left)

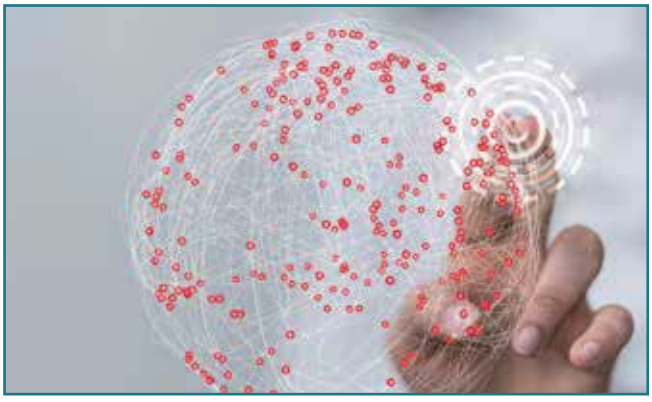
JULABO acts responsible

We strive relentlessly to reconcile technical innovation and environmental protection. For JULABO the use of environmentally friendly materials and the compliance with international standards are obligatory and implicit at the same time. Our customers profit from our environmental commitment. Under the label Cool Green we offer special refrigerated cooling instruments with natural refrigerants.

JULABO operates worldwide

From the German headquarter all the JULABO products are shipped to nearly every corner of the world. JULABO subsidiaries are located on every continent and together with more than 100 sales partners, distributors, and specialty dealers they provide a solid foundation for comprehensive support and valuable services.

Investing in modern and innovative technologies makes sure that this international network will stay reliable to provide as much support as possible.



JULABO worldwide

Julabo The Temperature Control Company

Professional Temperature Control

Product Characteristics & Functions

Display

Easy to read
Large LED temperature display for actual value and setpoint (resolution 0.1 °C)

Several values at a glance
Large Multi-Display (LED), easy to read across the room, for actual value and up to 3 setpoints, warning functions, high temperature cut-off, selected pump stages (resolution 0.01/0.1 °C)

A perfect view
Ample, easy to read VFD Comfort display for simultaneous display of 3 values, warning functions, high temperature cut-off, pump stages (resolution 0.01 °C)

Additional plain text information
Comfortable LCD dialog display for interactive operation with plain text display

Pump stage and liquid level
Backlit indicator for selected pump stages and filling volume on Forte HT

Operation

Clear and simple
3-key operation for easy setpoint adjustment

Comfortable and detailed
Comfortable keypad with additional menu functions for pump stages, calibration, control parameters, programmer, warnings, etc.

Simple and fast
Convenient 3-key setpoint adjustment (F models)

Simple and fast
Convenient 3-key setpoint adjustment (FL models)

Time saving
Comfortable and simple operation for setpoint adjustment

Clearly structured
Comfortable, splash-proof keypad for setpoint adjustment, high/low temperatures, timer and shaking frequeny (SW models)

Temperature control

Precise
PID Temperature control with set con trol parameters, temperature stability ±0.02...±0.2 °C

Highly precise
PID Temperature control with drift compensation and adjustable control parameters, temperature stability ±0.01...±0.02 °C

For higher demands
PID Temperature control with drift compensation and adjustable parameters, improved temperature stability for external applications, temperature stability ±0.01 °C internal, <±0.1 °C external

For perfect results
'**I**ntelligent **C**ascade **C**ontrol', automatic & self optimizing adjustment of PID control parameters, temperature stability ±0.005 °C internal, <±0.05 °C external

Full control
'**T**emperature **C**ontrol **F**eatures' for individual optimization, access to all important control parameters, additional settings for band limit, limits, co-speed-factor etc.

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

High measuring accuracy
'**A**bsolute **T**emperature **C**alibration' for manual compensation of a temperature difference, 1-point calibration

Highest measuring accuracy
'**A**bsolute **T**emperature **C**alibration' for manual compensation of a temperature difference, 3-point calibration

PRESTO®

Display

State-of-the-art display technology
TFT Display for comfortable user guidance, colored display of measurement values, graphs and control options, user-defined views

Operation

Optimal ease of use
Touch screen for direct operation via display

Instructions inside
Help menus and explanations in plain text for all control options, help messages and warning messages

Multilingual user guidance
Language selection for display of control options, notifications and warning messages via touchscreen

Convenience for several users
Administrator level for customizing instrument settings, user levels with limited permissions for fast and safe defined access, password protection, all levels adjustable

Temperature Control

For perfect results
'**I**ntelligent **C**ascade **C**ontrol', automatic & self optimizing adjustment of PID control parameters, temperature stability ±0.01 °C ... <±0.2 °C

Full control
'**T**emperature **C**ontrol **F**eatures', for individual optimization, access to all important control parameters, additional settings for band limit, limits, co-speed-factor etc.

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

Highest measuring accuracy
'**A**bsolute **T**emperature **C**alibration' for manual compensation of a temperature difference, 3-point calibration

Refrigeration Technology

Consistent cooling capacity
Easily removable venting grid for quick and easy cleaning

100 % Cooling capacity
'**A**ctive **C**ooling **C**ontrol' 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

The icons can be found on the intro pages of each product group

Refrigeration Technology

Consistent cooling capacity
Easily removable venting grid for quick and easy cleaning

100 % Cooling capacity
'**A**ctive **C**ooling **C**ontrol' 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

Technical Features

Clever pump system
Reliable and consistent pump capacity, electronically adjustable pump stages

Serial connection
RS232 interface for PC connection, e.g. for data communication and recording of measured values

Connection compliant to standard
RS232/RS485 dual-interface for serial data transmission according to EIA-485 industry standard (2-wire bus technology), upgradable with Profibus DP

Easy program control
Integrated programmer for the execution of time and temperature dependent profiles, 1 temperature profile with 10 steps max., with real time clock

Optimal program control
For the execution of time and temperature dependent profiles, 6 temperature profiles with 60 steps max., with real time clock

Automatic control of operating time
Electronic countdown-timer function for timer-programmed unit shut-down, stand-by mode after programmed time expires

Connection of additional equipment
Stakei connections for solenoid valve, HSP booster pump and HST booster heater

Warning & Safety Functions

Early warning system for low liquid level
Maximum safety for applications, optical and audible alarm, allows user to refill bath fluid before the unit shuts down

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

Protective functions
Adjustable high temperature cut-off or dry-running protection

Enhanced protective functions
Maximum safety, adjustable high temperature cut-off or dry-running protection, additional display of setpoints permits easy and precise adjustments

Only for non-flammable bath fluids
Classification I (NFL) according to DIN 12876-1

For flammable bath fluids
Classification III (FL) according to DIN 12876-1

Technical Features

Intelligent pump system
Reliable and consistent pump capacity, electronically adjustable pump stages or pressure value, automatic adjustment of pump capacity to viscosity

Communication via networks
For the remote control of instruments via Ethernet networks, full access to all functions of the unit via a network-capable PC

Intelligent communication
USB connection for data exchange (e.g. service data) or for wireless remote control via *WirelessTEMP®*

Data exchange via SD-Card
For data exchange (e.g. service data) via SD memory card

Connections according to standard
RS232/RS485 dual-interface for serial data transmission according to EIA-485 industry standard (2-wire bus technology), upgradable with Profibus DP

Comfortable program control
Integrated programmer for the execution of time and temperature dependent profiles, 8 temperature profiles with 60 steps max., with real time clock

Quiet as a whisper
Efficient components produce only a minimal sound decibel level

Space-saving footprint
All connections as well supply and exhaust air are located at the front or rear, no venting grids on the sides, units can be placed close to each other or the application

Continuous operation up to +40 °C
Robust temperature control instrument, continuous operation even at ambient temperatures of up to +40 °C

Easy transport by one person
Ergonomic design facilitates moving and positioning by one person

Filling level at a glance
Backlit indicator for selected pump stages and filling volume

Warning & Safety Functions

Early warning system for high/low temperature limits
Maximum safety for applications, optical and audible signal when limits are exceeded

Duplicate safety
Adjustable high temperature cut-off for internal tank and for integrated expansion vessel

For flammable bath fluid
Classification III (FL) according to DIN 12876-1

Quick support
If an error occurs, the integrated Black-Box function permits fast diagnosis by the JULABO service team

Contents

Cool **Refrigeration Technology** from **-95 °C** to **+200 °C**

Refrigerated Circulators

JULABO circulators and their well proven and reliable technology are valued by users around the world and in all industries.
They are designed for daily applications in research, material testing or in production. The JULABO circulator program features functional solutions and has set the benchmark for temperature control technology for decades.

The JULABO circulator program has the matching equipment for working temperatures to -50 °C. Choose your temperature control solution from three model series:

- Economy Series
- TopTech Series
- HighTech Series

JULABO ultra-low circulators of the TopTech- and HighTech series are available for working temperatures to -95 °C.

- Circulators for working temperatures from -95 °C to +200 °C
- All products feature user-friendly, intuitive operation
- Extra bright, easy to read displays
- Quick and highly precise results thanks to state-of-the-art control technology
- Many professional functions for adjusting control parameters, temperature calibration, temperature profiles, etc.
- High heating and cooling capacities for demanding applications
- Powerful circulating pumps, electronically adjustable
- Intelligent warning and safety functions
- Unique early warning system for low liquid level
- Digital and analog interface for flexible communication
- Wireless monitoring and operation with *WirelessTEMP*® (accessory)
- Maximum cooling capacity at all temperatures (Active Cooling Control)
- Removable venting grids for quick and easy cleaning
- Energy saving proportional cooling control (FP models)
- Heated bath cover plates to prevent condensation or ice build-up
- All wetted parts are made of stainless steel or high grade plastic

Economy

CORIO™ NEW

TopTech

ED/EH Models
-35 °C ... +150 °C

CORIO™ Models
-30 °C ... +150 °C

MA Models
-50 °C ... +200 °C

Basic models for routine and standard applications

PID 1 · S1 · ACC

EH Models (in addition)

S3 · ATC · h

Connection for
③ Refrigeration unit (EH model)
④ Pump connections

Basic models for routine and standard applications

CORIO™ the new entry level into the world of temperature control

Professional temperature control in the lab does not have to be expensive: the new entry-level line JULABO CORIO™ demonstrates this. Whether as Heating Immersion Circulator, Heating Bath Circulator or Refrigerated Circulator – CORIO™ stands for quality and reliability.

Convince yourself of the new, better entry level into the world of temperature control and ask us about CORIO™.

Information on all CORIO™ models in the specific catalog or:
www. julabo.com

Middle class for a broad range of applications

PID 2 · ATC³ · SMART PUMP · RS232 · S3 · ACC

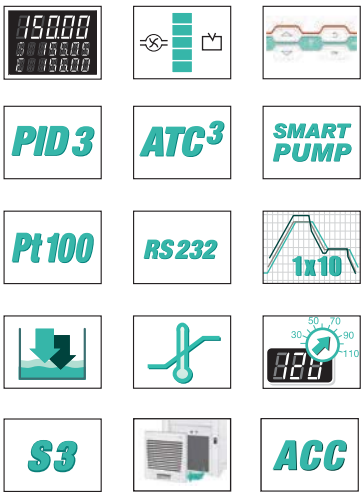
FP Models (in addition)

Connections for
② RS232
③ Refrigeration unit
④ Pump connections

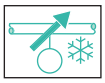
HighTech

ME Models
-90 °C ... +200 °C

Upper middle class with external Pt100 sensor connection



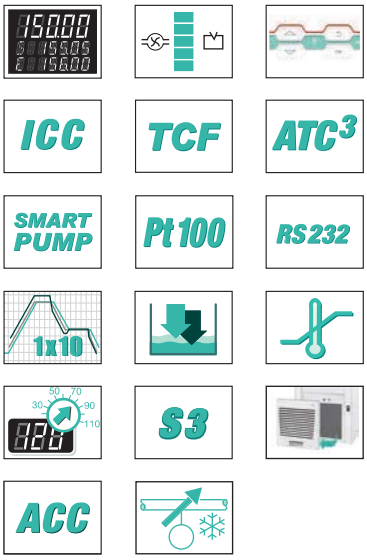
FP Models (in addition)



Connections for
① Ext. Pt100 sensor
② RS232
③ Refrigeration unit
④ Pump connections

HE/SE Models
-50 °C ... +200 °C

Sophisticated models for demanding applications

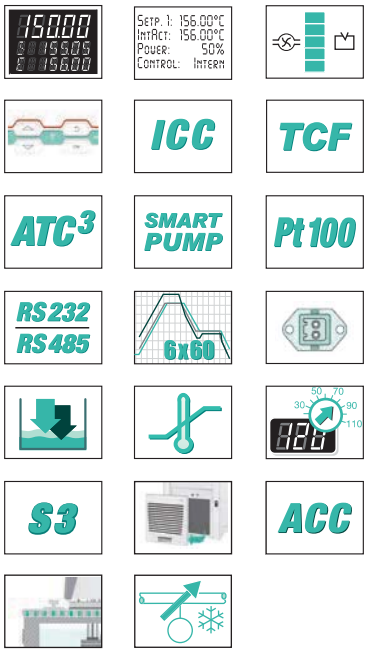


FP Models (in addtion)

Connections for
① External Pt100 sensor
② RS232 / RS485
③ Refrigeration unit
④ Electronic module (option)
⑤ Stakei connections (HL/SL)
⑥ Pump connections M16x1male

HL/SL Models
-95 °C ... +200 °C

Superior models for most demanding applications

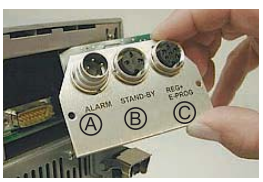


FP Models (in addition)

Electronic module with analog connections Order No. 8 900 100

Optional for HighTech series

Ⓐ Alarm output
Ⓑ Standby input
Ⓒ Analog interface with one input and two outputs for programming, flow sensor, pressure sensor or temperature recorder, scalable (current / voltage)



Please refer to the fold-out page for the description of icons above.


F12-ED


F25-ED


F34-ED

Economy Series

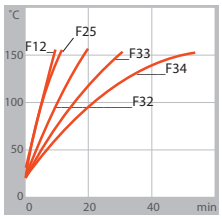
for working temperatures from -30 °C to +100 °C

Our high-quality refrigerated/heating circulators are designed for the use of non-flammable bath fluids and are economically priced.

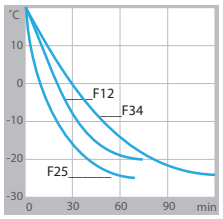
Models with ED circulators

- PID1 temperature control, stability ±0.03 °C
- Adjustable high temperature cut-off, low liquid level protection
- Temperature control of external systems
- Bath opening for internal applications
- Low noise level
- No side vents, units can be placed side by side
- Compact design

Heat-up time
Bath fluid: Thermal



Cool-down time
Bath fluid: Ethanol

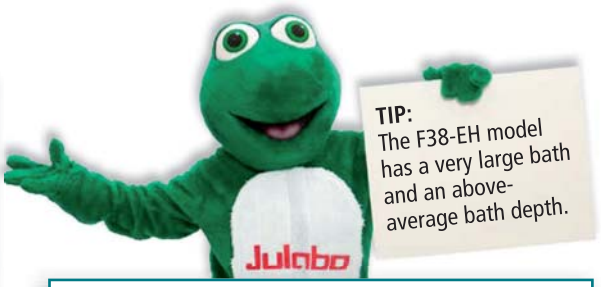


JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20 °C	Pump capacity Flow rate/Pressure l/min.	bar	Bath opening/ Bath depth W x L/D cm	Filling volume liters	Dimensions W x L x H cm
9 116 612	**F12-ED**	-20 ... +100	±0.03	2	0.16	0.1	0.02	15	0.35	13 x 15 / 13	4.5	20 x 36 x 56
9 116 625	**F25-ED**	-28 ... +100	±0.03	2	0.26	0.2	0.06	15	0.35	12 x 14 / 14	4.5	23 x 42 x 61
9 116 634	**F34-ED**	-30 ... +100	±0.03	2	0.45	0.32	0.14	15	0.35	24 x 30 / 15	20	38 x 58 x 62

Included with each unit: 2 barbed fittings for tubing 8 and 10 mm inner dia. (pump connections M10x1 female)

| FN32-EH

| F38-EH



Applications

Routine laboratory applications such as immersing samples for temperature studies in the circulator baths as well as external temperature control applications like measuring cells, refractometers, polarimeters, photometers, viscometers, fermenters, electrophoresis chambers, chromatography columns, rotary evaporators, rheometers

Economy Series

for working temperatures from -35 °C to +150 °C

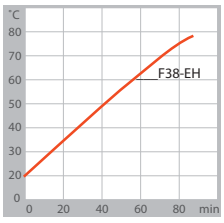
Refrigerated/heating circulator EH combinations are based on the technology of the ED series. However, they feature an extended working temperature range and allow the use of flammable bath fluids.

Models with EH circulators, additional advantages

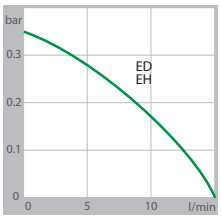
- Extended working temperature range to +150 °C
- Applications with flammable bath fluids
- Protection class III according to DIN 12876-1
- Refrigeration cut-off safety (except F12-EH)
- ATC 1-point calibration
- Electronic countdown timer

More information on circulators with natural refrigerants on page 22

Heat-up time
Bath fluid: Thermal



Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20 °C	Pump capacity Flow rate/Pressure l/min.	bar	Bath opening/ Bath depth W x L/D cm	Filling volume liters	Dimensions W x L x H cm
9 118 612	**F12-EH**	-20 ... +150	±0.03	2	0.16	0.1	0.02	15	0.35	13 x 15 / 13	4.5	20 x 36 x 56
9 118 625	**F25-EH**	-28 ... +150	±0.03	2	0.26	0.2	0.06	15	0.35	12 x 14 / 14	4.5	23 x 42 x 61
9 118 625N	**FN25-EH**	-28 ... +150	±0.03	2	0.26	0.2	0.06	15	0.35	12 x 14 / 14	4.5	23 x 50 x 61
9 118 632	**F32-EH**	-35 ... +150	±0.03	2	0.45	0.39	0.15	15	0.35	18 x 12 / 15	8	31 x 42 x 64
9 118 632N	**FN32-EH**	-35 ... +150	±0.03	2	0.45	0.39	0.15	15	0.35	18 x 12 / 15	8	31 x 50 x 64
9 118 633	**F33-EH**	-30 ... +150	±0.03	2	0.5	0.32	0.12	15	0.35	23 x 14 / 20	16	36 x 46 x 69
9 118 634	**F34-EH**	-30 ... +150	±0.03	2	0.45	0.32	0.14	15	0.35	24 x 30 / 15	20	38 x 58 x 62
9 118 638	**F38-EH**	-35 ... +80	±0.05	2	0.92	0.66	0.32	15	0.35	35 x 41 / 27	45	46 x 70 x 89

Included with each unit: 2 barbed fittings for tubing 8 and 10 mm inner dia. (pump connections M10x1 female)


| F12-MA


| F25-MA


| FP35-MA

FP35-MA for external applications with rapid temperature changes

TopTech Series

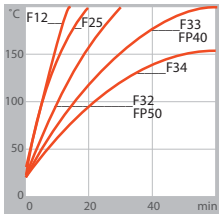
for working temperatures from -50 °C to +200 °C

Refrigerated/heating circulators of the TopTech series are designed for more demanding applications. They feature increased functionality and additional warning and safety functions.

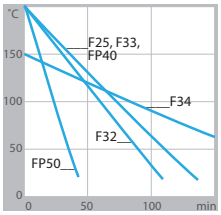
Models with MA circulators

- PID2 temperature control, stability ±0.02 °C
- ATC 3-point calibration
- RS232 interface
- Early warning system for low liquid level and high/low temperature
- Pump capacity electronically adjustable
- Protection class III according to DIN 12876-1

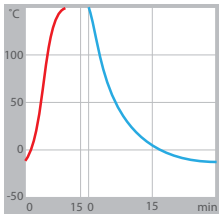
Heat-up time
Bath fluid: Thermal



Cool-down time
Bath fluid: Thermal



Heat-up/cool-down time
Bath fluid: Thermal



JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20	-30	-40 °C	Pump capacity Flow rate/Pressure l/min.	bar	Bath opening/ Bath depth W x L/D cm	Fill. vol. liters	Dimensions W x L x H cm
9 153 612	**F12-MA**	-20 ... +200	±0.02	2	0.16	0.1	0.02	--	--	11-16	0.23-0.45	13 x 15 / 13	4.5	20 x 36 x 56
9 153 625	**F25-MA**	-28 ... +200	±0.02	2	0.26	0.2	0.06	--	--	11-16	0.23-0.45	12 x 14 / 14	4.5	23 x 42 x 61
9 153 625N	**FN25-MA**	-28 ... +200	±0.02	2	0.26	0.2	0.06	--	--	11-16	0.23-0.45	12 x 14 / 14	4.5	23 x 50 x 61
9 153 632	**F32-MA**	-35 ... +200	±0.02	2	0.45	0.39	0.15	0.06	--	11-16	0.23-0.45	18 x 12 / 15	8	31 x 42 x 64
9 153 632N	**FN32-MA**	-35 ... +200	±0.02	2	0.45	0.39	0.15	0.06	--	11-16	0.23-0.45	18 x 12 / 15	8	31 x 50 x 64
9 153 633	**F33-MA**	-30 ... +200	±0.02	2	0.5	0.32	0.12	0.03	--	11-16	0.23-0.45	23 x 14 / 20	16	36 x 46 x 69
9 153 634	**F34-MA**	-30 ... +150	±0.02	2	0.45	0.32	0.14	0.03	--	11-16	0.23-0.45	24 x 30 / 15	20	38 x 58 x 62
9 153 618	**FP35-MA**	-35 ... +150	±0.02	2	0.45	0.39	0.15	0.05	--	11-16	0.23-0.45	18 x 12 / --	2.5	31 x 42 x 64
9 153 640	**FP40-MA**	-40 ... +200	±0.02	2	0.68	0.5	0.32	0.17	0.04	11-16	0.23-0.45	23 x 14 / 20	16	37 x 46 x 69
9 153 650	**FP50-MA**	-50 ... +200	±0.02	2	0.9	0.8	0.5	0.32	0.16	11-16	0.23-0.45	18 x 12 / 15	8	42 x 49 x 70
water-cooled model														
9 153 651	**FPW50-MA**	-50 ... +200	±0.02	2	0.9	0.8	0.5	0.32	0.16	11-16	0.23-0.45	18 x 12 / 15	8	42 x 49 x 70

Included with each unit: 2 barbed fittings for tubing 8 and 10 mm inner dia. (pump connections M10x1 female)

| F26-ME

| FN32-ME

| FP50-ME

TopTech Series

for working temperatures from -50 °C to +200 °C

Models with ME circulators allow for a wide range of applications. The units have a connection for an external Pt100 sensor for direct measuring and control in an external application. The VFD Comfort display features easy operation and shows all temperature values on one display.

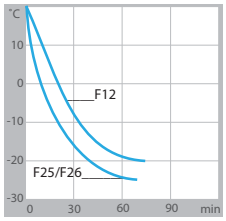
Additional advantages of models with ME circulators

- PID3 temperature control, stability ±0.01 °C
- VFD Comfort Display with simultaneous indication of setpoint and internal and external actual value (resolution 0.01 °C)
- Integrated programmer (1 x 10 steps) with real-time clock
- Illuminated display for adjustable pump capacity

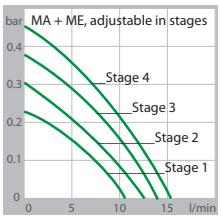
Note: FP models feature an energy-saving proportional cooling control.

More information on circulators with natural refrigerants on page 22

Cool-down time
Bath fluid: Ethanol



Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20	-30	-40 °C	Pump capacity Flow rate/Pressure l/min.	bar	Bath opening/ Bath depth W x L/D cm	Fill. vol. liters	Dimensions W x L x H cm
9 162 625	**F25-ME**	-28 ... +200	±0.01	2	0.26	0.2	0.06	--	--	11-16	0.23-0.45	12 x 14 / 14	4.5	23 x 42 x 61
9 162 625N	**FN25-ME**	-28 ... +200	±0.01	2	0.26	0.2	0.06	--	--	11-16	0.23-0.45	12 x 14 / 14	4.5	23 x 50 x 61
9 162 626	**F26-ME**	-28 ... +200	±0.01	2	0.26	0.2	0.06	--	--	11-16	0.23-0.45	12 x 14 / 14	4.5	42 x 42 x 42
9 162 632	**F32-ME**	-35 ... +200	±0.01	2	0.45	0.39	0.15	0.06	--	11-16	0.23-0.45	18 x 12 / 15	8	31 x 42 x 64
9 162 632N	**FN32-ME**	-35 ... +200	±0.01	2	0.45	0.39	0.15	0.06	--	11-16	0.23-0.45	18 x 12 / 15	8	31 x 50 x 64
9 162 633	**F33-ME**	-30 ... +200	±0.01	2	0.5	0.32	0.12	0.03	--	11-16	0.23-0.45	23 x 14 / 20	16	36 x 46 x 69
9 162 634	**F34-ME**	-30 ... +150	±0.01	2	0.45	0.32	0.14	0.03	--	11-16	0.23-0.45	24 x 30 / 15	20	38 x 58 x 62
9 162 640	**FP40-ME**	-40 ... +200	±0.01	2	0.68	0.5	0.32	0.17	0.04	11-16	0.23-0.45	23 x 14 / 20	16	37 x 46 x 69
9 162 650	**FP50-ME**	-50 ... +200	±0.01	2	0.9	0.8	0.5	0.32	0.16	11-16	0.23-0.45	18 x 12 / 15	8	42 x 49 x 70
water-cooled model														
9 162 651	**FPW50-ME**	-50 ... +200	±0.01	2	0.9	0.8	0.5	0.32	0.16	11-16	0.23-0.45	18 x 12 / 15	8	42 x 49 x 70

Included with each unit: 2 barbed fittings for tubing 8 and 10 mm inner dia. (pump connections M10x1 female)

| F25-HE

| FN32-HE

| FP50-HE

HighTech Series

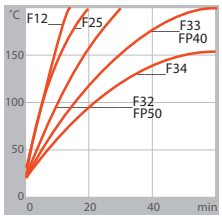
for working temperatures from -50 °C to +200 °C

The HighTech series features refrigerated/heating circulators with innovative technology for sophisticated applications. The instruments provide a powerful, electronically adjustable pressure and suction pump. The instruments can be used for internal as well as external (closed/open) temperature control applications.

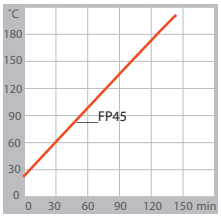
Models with HE circulators

- The ICC Cascade control guarantees highest precision, stability ±0.01 °C
- The VFD Comfort Display shows internal and external temperatures (resolution 0.01 °C)
- Integrated programmer (1 x 10 steps), real-time clock, RS232
- Powerful pressure and suction pump, electronically adjustable, automatic adjustment of pump capacity to viscosity characteristics

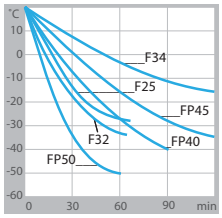
Heat-up time
Bath fluid: Thermal



Heat-up time
Bath fluid: Thermal



Cool-down time
Bath fluid: Ethanol



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20	-30	-40 °C	Pump cap./Flow rate l/min.	Pressure bar	Suction bar	Bath open./ Bath depth W x L/D cm	Fill. vol. liters	Dimensions W x L x H cm
9 212 625	**F25-HE**	-28 ... +200	±0.01	2	0.26	0.2	0.06	--	--	22-26	0.4-0.7	0.2-0.4	12 x 14 / 14	4.5	23 x 42 x 64
9 212 625N	**FN25-HE**	-28 ... +200	±0.01	2	0.26	0.2	0.06	--	--	22-26	0.4-0.7	0.2-0.4	12 x 14 / 14	4.5	23 x 50 x 64
9 212 632	**F32-HE**	-35 ... +200	±0.01	2	0.45	0.39	0.15	0.06	--	22-26	0.4-0.7	0.2-0.4	18 x 12 / 15	8	31 x 42 x 66
9 212 632N	**FN32-HE**	-35 ... +200	±0.01	2	0.45	0.39	0.15	0.06	--	22-26	0.4-0.7	0.2-0.4	18 x 12 / 15	8	31 x 50 x 66
9 212 634	**F34-HE**	-30 ... +150	±0.01	2	0.45	0.32	0.14	0.03	--	22-26	0.4-0.7	0.2-0.4	24 x 30 / 15	20	38 x 58 x 64
9 212 640	**FP40-HE**	-40 ... +200	±0.01	2	0.68	0.5	0.32	0.17	0.04	22-26	0.4-0.7	0.2-0.4	23 x 14 / 20	16	37 x 46 x 71
9 212 645	**FP45-HE**	-42 ... +200	±0.01	2	0.85	0.7	0.42	0.28	0.08	22-26	0.4-0.7	0.2-0.4	23 x 26 / 20	26	38 x 58 x 69
9 212 650	**FP50-HE**	-50 ... +200	±0.01	2	0.9	0.8	0.5	0.32	0.16	22-26	0.4-0.7	0.2-0.4	18 x 12 / 15	8	42 x 49 x 72
water-cooled model															
9 212 651	**FPW50-HE**	-50 ... +200	±0.01	2	0.9	0.8	0.5	0.32	0.16	22-26	0.4-0.7	0.2-0.4	18 x 12 / 15	8	42 x 49 x 72

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

| F25-HL

| FP50-HL

FP35-HL for external applications with rapid temperature changes

Applications

External temperature control applications, particularly for distillation apparatus and mini-plant installations, jacketed reactors, auto-claves, Kilo labs, pilot plants, etc.

HighTech Series

for working temperatures from -50 °C to +200 °C

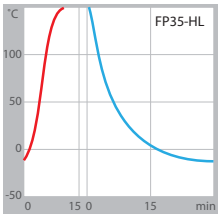
The top-of-the-line HL circulators provide sophisticated technology and maximum functionality for the most demanding applications.

Additional advantages of models with HL circulators

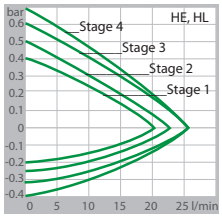
- VFD Comfort Display and additional LCD Display
- Integrated programmer (6 x 60 steps) with real-time clock
- Combined RS232 / RS485 interface
- Temperature display in °C and °F
- Stakei connection for solenoid valve

Note: FP models feature an energy-saving proportional cooling control.

Heat-up/Cool-down time
Bath fluid: Thermal



Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20	-30	-40 °C	Pump cap./Flow rate l/min.	Pressure bar	Suction bar	Bath open./ Bath depth W x L/D cm	Fill. vol. liters	Dimensions W x L x H cm
9 312 625	**F25-HL**	-28 ... +200	±0.01	2	0.26	0.2	0.06	--	--	22-26	0.4-0.7	0.2-0.4	12 x 14 / 14	4.5	23 x 42 x 64
9 312 625N	**FN25-HL**	-28 ... +200	±0.01	2	0.26	0.2	0.06	--	--	22-26	0.4-0.7	0.2-0.4	12 x 14 / 14	4.5	23 x 50 x 64
9 312 632	**F32-HL**	-35 ... +200	±0.01	2	0.45	0.39	0.15	0.06	--	22-26	0.4-0.7	0.2-0.4	18 x 12 / 15	8	31 x 42 x 66
9 312 632N	**FN32-HL**	-35 ... +200	±0.01	2	0.45	0.39	0.15	0.06	--	22-26	0.4-0.7	0.2-0.4	18 x 12 / 15	8	31 x 50 x 66
9 312 633	**F33-HL**	-30 ... +200	±0.01	2	0.5	0.32	0.12	0.03	--	22-26	0.4-0.7	0.2-0.4	23 x 14 / 20	16	36 x 46 x 71
9 312 618	**FP35-HL**	-35 ... +150	±0.01	2	0.45	0.39	0.15	0.05	--	22-26	0.4-0.7	0.2-0.4	18 x 12 / --	2.5	31 x 42 x 66
9 312 640	**FP40-HL**	-40 ... +200	±0.01	2	0.68	0.5	0.32	0.17	0.04	22-26	0.4-0.7	0.2-0.4	23 x 14 / 20	16	37 x 46 x 71
9 312 645	**FP45-HL**	-42 ... +200	±0.01	2	0.85	0.7	0.42	0.28	0.08	22-26	0.4-0.7	0.2-0.4	23 x 26 / 20	26	38 x 58 x 69
9 312 650	**FP50-HL**	-50 ... +200	±0.01	2	0.9	0.8	0.5	0.32	0.16	22-26	0.4-0.7	0.2-0.4	18 x 12 / 15	8	42 x 49 x 72
water-cooled model															
9 312 651	**FPW50-HL**	-50 ... +200	±0.01	2	0.9	0.8	0.5	0.32	0.16	22-26	0.4-0.7	0.2-0.4	18 x 12 / 15	8	42 x 49 x 72

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

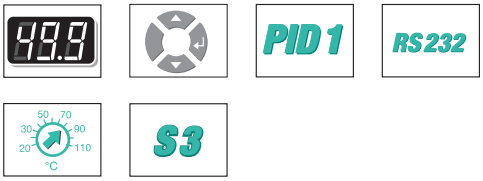
Cryo-Compact Circulators

Economy

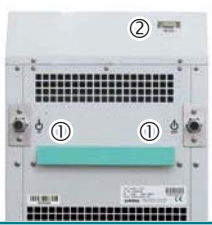
CF30 / CF40

-40 °C ... +150 °C

Basic models for routine and standard applications



- Working temperatures to +150 °C
- Pressure pump
- LED Display for actual value/setpoint (resolution 0.1 °C)
- RS232 interface
- Intuitive operation



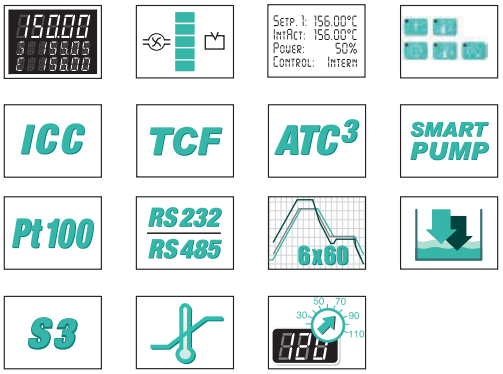
Rear view
① Pump connections
② RS232 Interface

HighTech

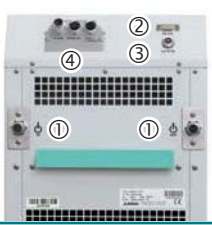
CF31 / CF41

-40 °C ... +200 °C

Superior models for most demanding applications



- Working temperatures to +200 °C
- Pressure and suction pump, electronically adjustable
- VFD Comfort Display (resolution 0.01 °C)
- Additional LCD Display for interactive operation
- ICC Cascade Temperature Control
- RS232 / RS485 interface
- Connection for external Pt100 sensor
- Integrated programmer (6 x 60 steps)



Rear view
① Pump connections
② RS232/RS485 Interface
③ Connection for external Pt100 sensor
④ Electronic module (optional)

Please refer to the fold-out page for description of icons above.

| CF30

| CF41

Extra Compact!

Applications

External temperature control applications, distillation apparatus and miniplant installations, especially installations with limited space, e.g. in fume hoods

Cryo-Compact Circulators

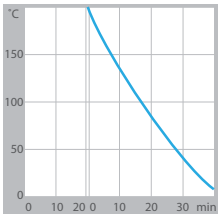
for working temperatures from -40 °C to +200 °C

The CF circulator series provides powerful cooling and heating capabilities in a space-saving, compact design. The instruments feature 2 kW heating capacity with classification III according to DIN 12876-1. The Cryo-Compacts have pump connections for external temperature control applications and a small bath tank for temperature control of small objects.

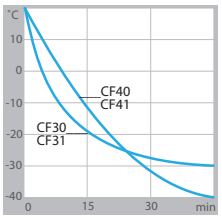
Cryo-compact circulators, CF series

- Extra compact dimensions for easy installation
- Cooling capacities up to 470 Watt
- Permissible ambient temperature up to +40 °C
- Splash-proof keypad
- Pump connections for external temperature control
- Internal bath to immerse small objects, e.g. temperature sensors

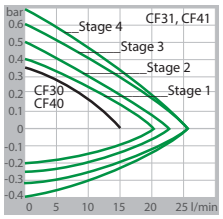
Heat-up/Cool-down time
Bath fluid: Thermal



Cool-down time
Bath fluid: Ethanol



Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20	-30°C	Pump cap./Flow rate l/min.	Pressure bar	Suction bar	Bath open./ Bath depth W x L/D cm	Fill. vol. liters	Dimensions W x L x H cm
9 400 330	**CF30**	-30 ... +150	±0.03	2	0.32	0.25	0.15	--	15	0.35	--	16 x 3 / 14	3.5	24 x 46 x 40
9 400 340	**CF40**	-40 ... +150	±0.03	2	0.47	0.4	0.28	0.12	15	0.35	--	19 x 3 / 19	5.5	28 x 46 x 46
9 400 331	**CF31**	-30 ... +200	±0.02	2	0.32	0.25	0.15	--	22-26	0.4-0.7	0.2-0.4	16 x 3 / 14	3.5	24 x 46 x 40
9 400 341	**CF41**	-40 ... +200	±0.02	2	0.47	0.4	0.28	0.12	22-26	0.4-0.7	0.2-0.4	19 x 3 / 19	5.5	28 x 46 x 46

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

| F70-ME

| F81-ME

TopTech Series

for working temperatures from -90 °C to +100 °C
with bath openings for internal/external applications

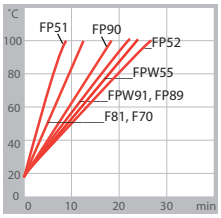
The TopTech Ultra-Low circulators are equipped with a dual-stage compressor refrigeration system for continuous operation of internal and external applications.

Models with ME circulators

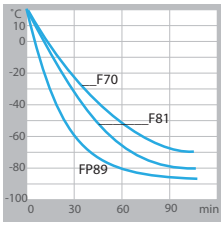
- Heated bath cover plate to prevent condensation and ice build-up
- Pressure pump up to 0.45 bar, electronically adjustable
- ACC Active Cooling Control across the entire temperature range
- Compact design

Note: FP models feature an energy-saving proportional cooling control

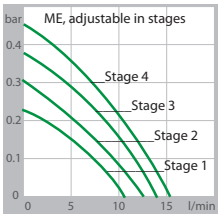
Heat-up time
Bath fluid: Thermal



Cool-down time
Bath fluid: Ethanol



Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20	-40	-60	-80 °C	Pump cap./Flow rate l/min.	Pressure bar	Fill. vol. liters	Dimensions W x L x H cm
9 162 670	**F70-ME**	-70 ... +100	±0.02	1.3	0.34	0.22	0.17	0.13	0.07	--	11-16	0.23-0.45	4.5	42 x 54 x 71
9 162 681	**F81-ME**	-81 ... +100	±0.02	1.3	0.45	0.38	0.36	0.32	0.27	0.07	11-16	0.23-0.45	6.5	50 x 58 x 88
9 162 689	**FP89-ME**	-90 ... +100	±0.02	1.3	1.0	0.92	0.88	0.75	0.58	0.20	11-16	0.23-0.45	8	55 x 60 x 90

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

| FP51-SL

| FP89-HL

Applications

Freezing point determination, calibration at low temperatures, petroleum testing, ultra-low temperature cell culture storage

HighTech Series

for working temperatures from -91 °C to +200 °C
with large bath openings for internal/external applications

The top-of-the-line HighTech ultra-low refrigerated circulators HL, SL feature a powerful pressure and suction pump. The instruments provide sophisticated technology and maximum functionality for the most demanding applications.

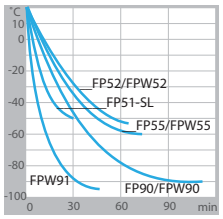
Models with HL, SL circulators

- Energy saving proportional cooling control
- ACC Active Cooling Control for the entire temperature range
- Heated bath cover to prevent condensation and ice build-up
- Pressure and suction pump up to 1.1 bar, electronically adjustable
- SL models with a heating capacity of 3 kW for rapid heat-up

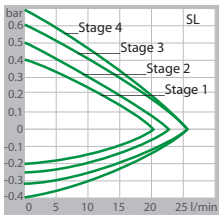
Bath opening

JULABO Model	Dimensions bath opening W x L / Bath depth
F70	12 x 12 / 13 cm
FP51	18 x 12 / 20 cm
F81, FP89	13 x 15 / 16 cm
FP(W)52/55/90/91	28 x 23 / 22 cm

Cool-down time
Bath fluid: Ethanol



Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20	-40	-60	-80 °C	Pump cap./Flow rate l/min.	Pressure bar	Suction bar	Fill. vol. liters	Dimensions W x L x H cm
9 352 751	**FP51-SL**	-51 ... +200	±0.05	3	2.0	1.5	1.0	0.26	--		22-26	0.4-0.7	0.2-0.4	11	46 x 55 x 89
9 352 752	**FP52-SL**	-60 ... +100	±0.05	3	3.0	2.8	1.6	0.65	0.1		22-26	0.4-0.7	0.2-0.4	24	59 x 76 x 116
9 352 755	**FP55-SL**	-60 ... +100	±0.05	3	5.2	4.1	2.2	0.70	0.13		22-26	0.4-0.7	0.2-0.4	27	85 x 76 x 116
9 312 681	**F81-HL**	-81 ... +100	±0.02	1.3	0.45	0.38	0.36	0.32	0.27	0.07	22-26	0.4-0.7	0.2-0.4	6.5	50 x 58 x 89
9 312 689	**FP89-HL**	-90 ... +100	±0.02	1.3	1.0	0.92	0.88	0.75	0.58	0.20	22-26	0.4-0.7	0.2-0.4	8	55 x 60 x 92
9 352 790	**FP90-SL**	-90 ... +100	±0.05	3	1.8	1.7	1.6	1.35	0.75	0.15	22-26	0.4-0.7	0.2-0.4	22	59 x 76 x 116
water-cooled models															
9 352 753	**FPW52-SL**	-60 ... +100	±0.05	3	3.0	2.8	1.6	0.65	0.1		22-26	0.4-0.7	0.2-0.4	24	59 x 76 x 116
9 352 756	**FPW55-SL**	-60 ... +100	±0.05	3	5.5	4.1	2.2	1.0	0.13		22-26	0.4-0.7	0.2-0.4	27	59 x 76 x 116
9 352 791	**FPW90-SL**	-90 ... +100	±0.05	3	1.8	1.7	1.6	1.35	0.75	0.15	22-26	0.4-0.7	0.2-0.4	22	59 x 76 x 116
9 352 793	**FPW91-SL**	-91 ... +100	±0.2	3	4.5	4.1	3.7	3.1	2.0	0.75	22-26	0.4-0.7	0.2-0.4	22	85 x 76 x 116

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

| FP55-SL

| FP90-SL

HighTech Series

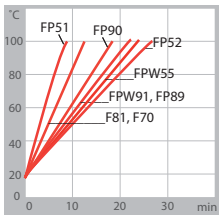
for working temperatures from -95 °C to +150 °C
upgradable with additional heating and pump capacity
for external applications

Ultra-low refrigerated circulators with SL impress with their high heating, cooling and pump capacities for external temperature control applications.

- Cooling capacities up to 5.5 kW, heating capacities up to 3 kW
- Insulated filling port (70 mm dia.)
- Heated bath cover plate to prevent condensation/ice build-up
- Upgradable with booster heater and Booster Pump
- Energy saving proportional cooling control
- Pressure and suction pump up to 1.1 bar, electronically adjustable

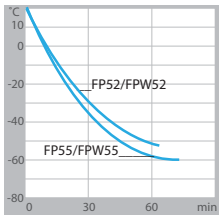
Note: FP models feature an energy-saving proportional cooling control. FPW models for cooling water connection.

Heat-up time
Bath fluid: Thermal



Filling port with insulated cover

Cool-down time
Bath fluid: Ethanol



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20	-40	-60 °C	Pump cap./Flow rate l/min.	Pressure bar	Suction bar	Fill. vol. liters	Dimensions W x L x H cm
9 352 752N	**FP52-SL**	-60 ... +100	±0.05	3	3.0	2.8	1.6	0.65	0.1	22-26	0.4-0.7	0.2-0.4	24	59 x 76 x 116
9 352 755N	**FP55-SL**	-60 ... +100	±0.05	3	5.2	4.1	2.2	0.7	0.13	22-26	0.4-0.7	0.2-0.4	27	85 x 76 x 116
9 352 752N150	**FP52-SL**	-60 ... +150	±0.05	3	3.0	2.8	1.6	0.65	0.1	22-26	0.4-0.7	0.2-0.4	24	59 x 76 x 116
9 352 755N150	**FP55-SL**	-60 ... +150	±0.05	3	5.2	4.1	2.2	0.7	0.13	22-26	0.4-0.7	0.2-0.4	27	85 x 76 x 116
water-cooled models														
9 352 753N	**FPW52-SL**	-60 ... +100	±0.05	3	3.0	2.8	1.6	0.65	0.1	22-26	0.4-0.7	0.2-0.4	24	59 x 76 x 116
9 352 756N	**FPW55-SL**	-60 ... +100	±0.05	3	5.5	4.1	2.2	1.0	0.13	22-26	0.4-0.7	0.2-0.4	27	59 x 76 x 116
9 352 753N150	**FPW52-SL**	-60 ... +150	±0.05	3	3.0	2.8	1.6	0.65	0.1	22-26	0.4-0.7	0.2-0.4	24	59 x 76 x 116
9 352 756N150	**FPW55-SL**	-60 ... +150	±0.05	3	5.5	4.1	2.2	1.0	0.13	22-26	0.4-0.7	0.2-0.4	27	59 x 76 x 116

Included with each unit: 2 each barbed fitting for tubing 8 and 12 mm inner dia. (pump connections M16x1 male)
FPW Models: Cooling water connections G ¾" male with barbed fittings for tubing ½" inner dia.

| FPW91-SL

Applications

Jacketed reactors, miniplant installations, Kilo labs, process development

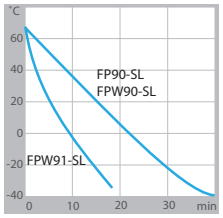
Increase heating and/or pump capacities with booster modules
All models on this double-page are upgradable
(except for F95-SL and FW95-SL).

HST booster heater ①
adds 6 kW of heating capacity
for a total of 9 kW

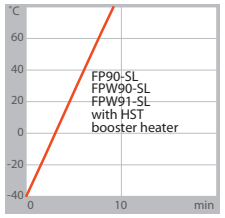
HSP Booster Pump ②
increases pumping capacity to 30 l/min - 3 bar max.
(reduces cooling capacity by 0.4 kW)

Upgradable
with booster heater and pump

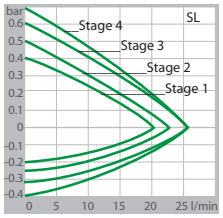
Cool-down time
Bath fluid: Thermal



Heat-up time
Bath fluid: Thermal



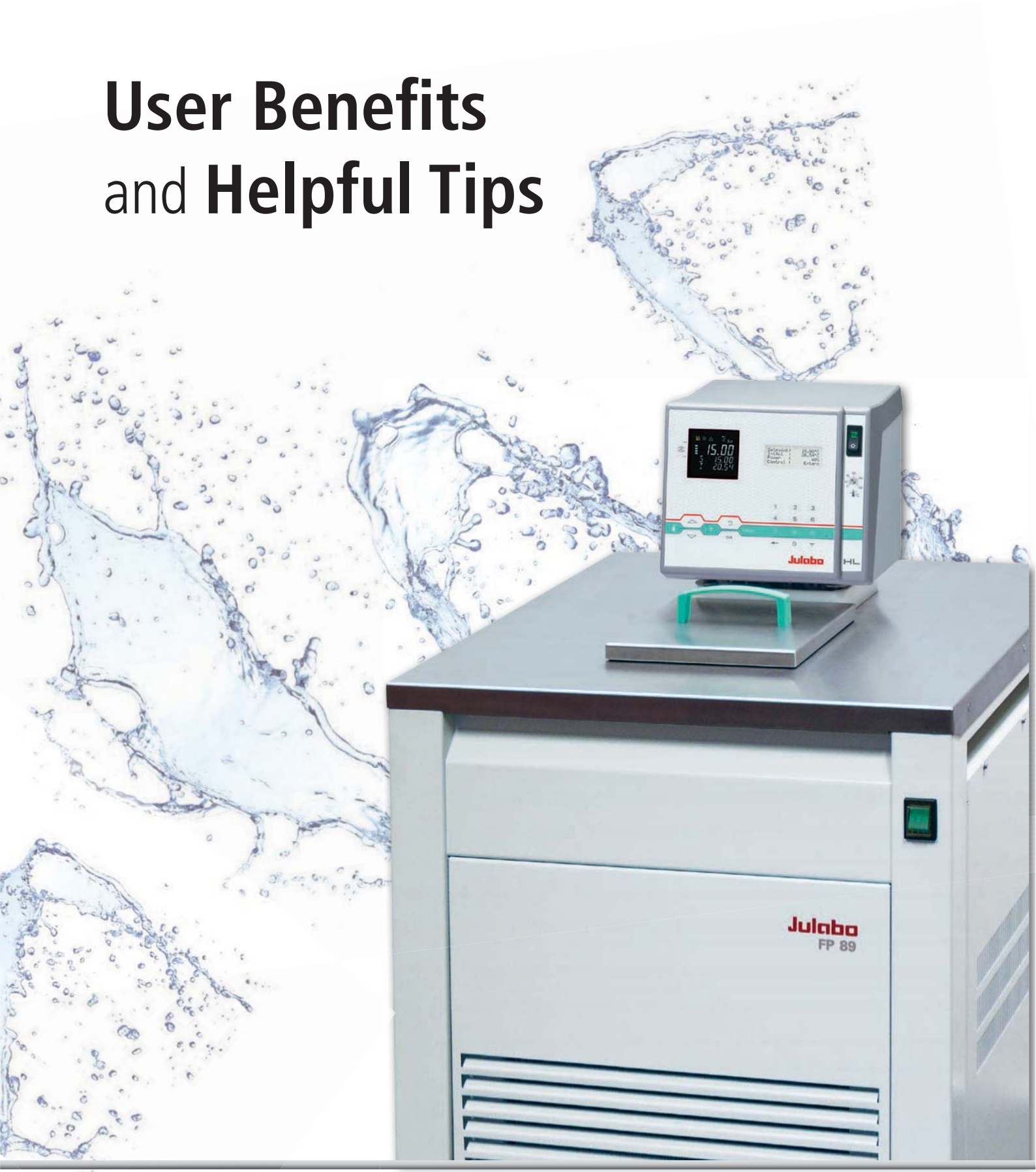
Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stab. °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20	-40	-60	-80 °C	Pump cap./Flow rate l/min.	Press. bar	Suction bar	Fill. vol. liters	Dimensions W x L x H cm
9 352 790N	**FP90-SL**	-90 ... +100	±0.05	3	1.8	1.7	1.6	1.35	0.75	0.15	22-26	0.4-0.7	0.2-0.4	22	59 x 76 x 116
9 352 795N	**F95-SL**	-95 ... 0	±0.05	3	--	1.7	1.5	1.3	1.1	0.36	22-26	0.4-0.7	0.2-0.4	22	59 x 76 x 116
9 352 790N150	**FP90-SL**	-90 ... +150	±0.05	3	1.8	1.7	1.6	1.35	0.75	0.15	22-26	0.4-0.7	0.2-0.4	22	59 x 76 x 116
water-cooled models															
9 352 791N	**FPW90-SL**	-90 ... +100	±0.05	3	1.8	1.7	1.6	1.35	0.75	0.15	22-26	0.4-0.7	0.2-0.4	22	59 x 76 x 116
9 352 793N	**FPW91-SL**	-91 ... +100	±0.2	3	4.5	4.1	3.7	3.1	2.0	0.75	22-26	0.4-0.7	0.2-0.4	22	85 x 76 x 116
9 352 796N	**FW95-SL**	-95 ... 0	±0.05	3	--	1.7	1.5	1.3	1.1	0.36	22-26	0.4-0.7	0.2-0.4	22	59 x 76 x 116
9 352 791N150	**FPW90-SL**	-90 ... +150	±0.05	3	1.8	1.7	1.6	1.35	0.75	0.15	22-26	0.4-0.7	0.2-0.4	22	59 x 76 x 116

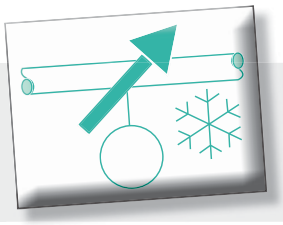
Included with each unit: 2 each barbed fittings for tubing 8 and 12 mm inner dia. (Pump connections M16x1 male)
FPW Models: Cooling water connection G ¾" male with barbed fitting for tubing ½" inner dia.

User Benefits and Helpful Tips



Advantages of JULABO Cooling Systems

- No side vents for ventilation-air cooling: air intake from the front, air discharge to the rear. Therefore the instruments can be placed right next to other equipment without affecting performance.
- All refrigerated circulators have an ambient operating limit up to +40 °C!
- Automatic shut-down of the refrigeration unit when no cooling is required (exception: F12 refrigeration unit and cooling systems with ED circulators).
- Overload protection for refrigeration unit



Full Cooling Capacity, while Saving Energy

JULABO refrigerated circulators feature Active Cooling Control technology which provides full cooling capacity at all times and across the entire working temperature range.

All FP models feature proportional cooling control which automatically adjusts the cooling capacity. Compared to refrigeration instruments without proportional control this results in up to 90 % energy savings.

Detailed Model Designations

The model designations of refrigerated circulators are composed as follows:

F = **F**rigus, Latin for cooling

F**P** = **P**roportional cooling control, energy saving

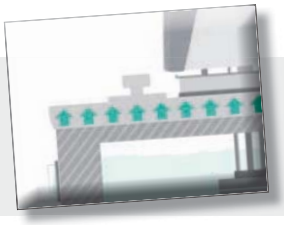
FP**W** = **W**ater-cooled, alternative for powerful models
Advantage: Minimal heat discharge into ambient air, reduced HVAC costs, low noise level

FP**50** = The **Number** following the model designation relates to the appoximately lowest achievable temperature, (e.g. -**50** °C).

FP50-HL = The **complete model designation** is formed in combination with the circulator (e.g. **HL**)

Heated Bath Cover Plate

Ultra-low refrigerated circulators feature a heated bath cover plate to prevent condensation and ice build-up in the circulator bath. Depending on the model, ultra-low refrigerated circulators are equipped either with an insulated bath cover or an insulated filling port.



Responsibility for the Environment

The refrigerated circulators with natural refrigerants (FN models) contribute to the reduction of the greenhouse effect. The use of non-halogenated refrigerants conserves the ozone layer and makes a significant contribution to the protection of the atmosphere.
In addition the new FN models have a reduced current consumption resulting in lower CO_2 emissions from the power grid. This protects the environment and saves the user's money.

Advantages

- High cooling capacities up to 450 W
- Suitable for ambient temperatures up to +40 °C
- ACC Active Cooling Control for maximum cooling capacity
- Powerful recirculating pumps, electronically adjustable
- Innovative

Maximum Safety

JULABO circulators with natural refrigerant have state-of-the-art technology. When developing the products safety aspects received the utmost attention.

The refrigerant cycle is hermetically sealed and permanently leak-proof. Furthermore, all electrical components are segregated. Even in the case of a highly improbable leakage there is no danger of burning refrigerant. JULABO guarantees maximum safety for units with natural refrigerants - with no practical disadvantages for any application.

- Maximum operational safety
- Refrigeration cycle and electronics are spaced apart
- Virtually no application limitations
- Minimum room size for operation of theses units is 5 m³ (according to DIN EN 378-1:2008)

FN Models in our Catalog
In the catalog the refrigerated circulators with natural refrigerants are marked with the Cool Green Logo.

Note: FN models available in selected countries only

Refrigerant R290
FN models use the natural refrigerant R290. This refrigerant is a type of hydrocarbon with a very low GW value (Global Warming Potential) of 3. For comparison the popular refrigerant R134a has a value of 1300.

Only at JULABO!
The electronics of the unit are outside of the refrigeration area

Always visible and easy to read: Brightest Temperature Displays

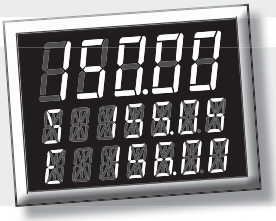
JULABO circulators offer large, easy-to-read temperature displays. The displayed values can be viewed easily from a long distance, at an angle and in very bright surroundings. This makes it easy to monitor the display during your daily tasks.

LED Display
for 1 actual value and up to 3 setpoints, warning functions, high temperature cut-off, pump stages (resolution 0.01/0.1 °C)

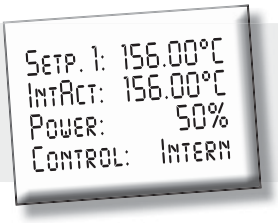
VFD Comfort Display
simultaneous display of 3 values, warning functions, high temperature cut-off, pump stages (resolution 0.01 °C)

LCD Dialog Display
allows for interactive operation with easy-to-read text

LED



VFD



LCD

Highly precise Temperature Control Technology – professional and simple operation

PID1, PID2 and PID3 temperature controls offer fixed control parameters (Xp, Tn, Tv). For the advanced user the PID2 and PID3 settings can be manually changed to reach an improved temperature stability, especially for external temperature control.
ICC temperature control (Intelligent Cascade Control) provides highly precise temperature control results even for the most demanding applications. With ICC the PID control parameters are self-optimizing and automatically adjust to the respective application.
The TCF function permits full control of the control dynamics. In addition to accessing control parameters, this function also allows for setting band limit, limit setting, co-speed factor, etc.

Intuitive and Integrated Operation

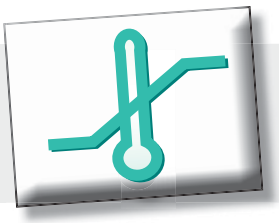
All JULABO products feature a consistent user interface design affording easy operation via the splash-proof and easy-to-clean keypads. Menus allow users to set additional parameters for process optimization such as control parameters, autostart mode, interface configuration, etc.

Early Warning System for Low Liquid Level

The JULABO early warning system for low liquid level recognizes fluid losses in the circulator bath and gives an optical and audible signal. Users have the opportunity to refill the bath tank before the built-in low liquid level protection triggers the undesired automatic safety cut-off.

Early Warning System for High/Low Temperature Limits

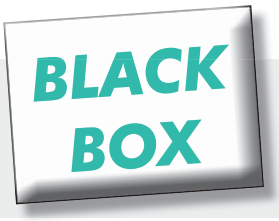
If the operator-defined temperature limits are exceeded - e.g. caused by an exothermic reaction - the early warning system will trigger audible and optical warnings.
Low temperature protection with cut-off function: If required, the warning function can be switched to a cut-off function (e.g. as low temperature protection).



Integrated Additional Protection Functions

JULABO circulators and temperature control systems also feature:

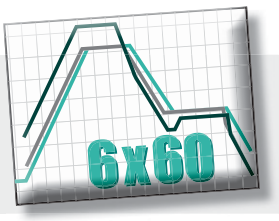
- Standby display and automatic self-test
- Monitoring of sensors and sensor temperature differentials
- *BlackBox* Function with error memory for remote diagnosis
- Overload protection for pump motor and refrigeration unit



Integrated Programmer

Many applications are time and temperature dependent processes. The ME circulators and all HighTech circulators feature an integrated programmer. Temperature profiles can be easily programmed, executed, and saved. Programming functions include a continuous loop setting and adjustable incremental gradients. The real-time clock allows application start-up at a specified time, e.g. heat-up of application prior to the start of the work day.

ME, HE, SE Models: 1 Temperature profile with up to 10 steps
HL, SL Models: 6 Temperature profiles with up to 60 steps

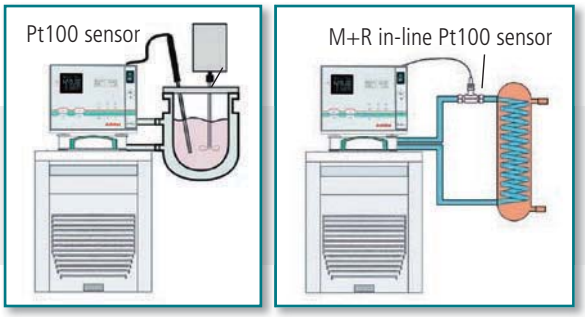


External Temperature Control and Measurement

The ME circulators and all HighTech circulators include a connection for an external Pt100 temperature sensor. Various external sensors made of stainless steel or PTFE coated stainless steel are available in lengths between 20 and 1200 mm. For highly precise temperature control a M+R in-line Pt100 sensor can be installed directly into the cooling circuit. The externally measured actual value is shown on the circulator's display.

8 981 003 to 017 External Pt100 sensors

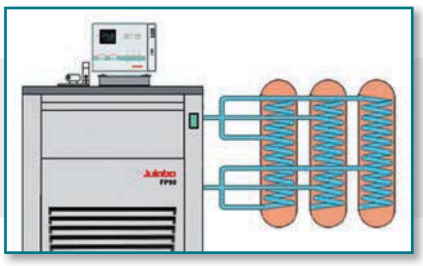
8 981 020 M+R in-line Pt100 sensor



External Temperature Control of large or several Applications

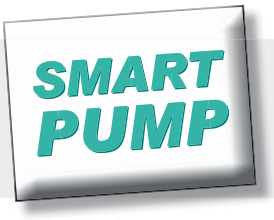
The powerful ultra-low refrigerated circulators of the HighTech series with a heating capacity of 3 kW and a maximum pump pressure of 1.1 bar can have capacities increased with:

8 810 012 HST Booster heater 6 kW
8 810 015 HSP Booster Pump 30 l/min. - 3 bar max.



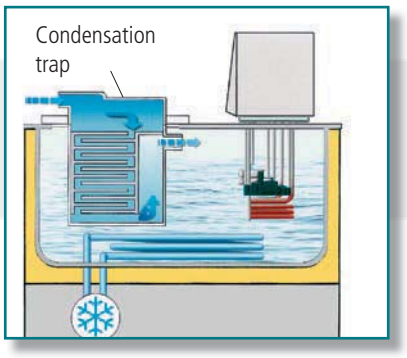
Intelligent Pump Systems

The highly efficient circulating pumps provide high pressures and flow rates. The *SmartPump* electronics have many benefits: The electronically adjustable pump capacity (4 stages) via keypad on one hand. On the other hand an automatic, electronic adjustment of the pump capacity in response to changes in bath fluid viscosity values for reliable and safe operation even when using high viscosity bath fluids.



Condensation Traps

Ice crystals can form when bath fluids are exposed to humidity at ultra-low temperatures reducing the lowest achievable temperature. To avoid negative impact on the efficiency of the refrigerated unit, condensation traps are the ideal solution. They were designed to integrate exactly into the filling port or bath opening of the respective model. The humidity condenses in the trap and remains separate from the bath fluid. Simply remove the trapped ice from time to time in order to maintain full performance.



Julabo
THE TEMPERATURE CONTROL COMPANY

CORIO™ the new entry level into the world of temperature control

Professional temperature control in the lab does not have to be expensive: the new entry-level line JULABO CORIO™ demonstrates this. Whether as Heating Immersion Circulator, Heating Bath Circulator or Refrigerated Circulator – CORIO™ stands for quality and reliability.

Convince yourself of the new, better entry level into the world of temperature control and ask us about CORIO™.

CORIO™

NEW

Information on all CORIO™ models in the specific catalog or:
www. julabo.com

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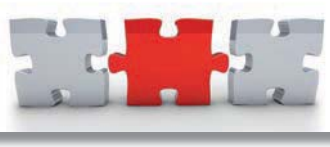
77960 Seelbach/Germany
Tel. (+49) 07823 / 51 - 0

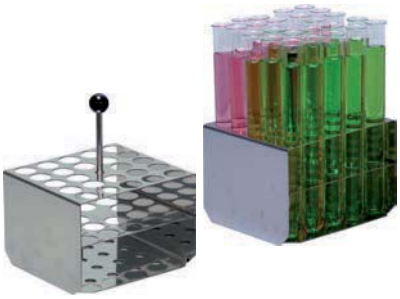
Individual Solutions for Your Application



JULABO provides solutions for any customer's individual requirements. JULABO customers have the following options for refrigerated circulators:

Special inserts

We design and manufacture inserts and racks for sample incubations in the bath. Please contact us for a consultation regarding the insert design and material of construction.



Special bath covers

We design and manufacture bath covers according to your specific information on the geometry of the samples and baths. We will gladly advise you on the design of the bath covers.

Special bath covers

Special temperature sensors

We supply external Pt100 sensors according to your specifications. Customer specified sensor length, sensor diameter and connection cable length solutions are available. Ask us about the accuracy class.

More power

Are the pump and heating capacities of our standard products insufficient? Specify the bath fluid flow requirements of your application and we supply the matching Booster Pump.
Specifying the heating rate needed for your application will allow us to calculate the required heating capacity to manufacture an appropriate booster heater.

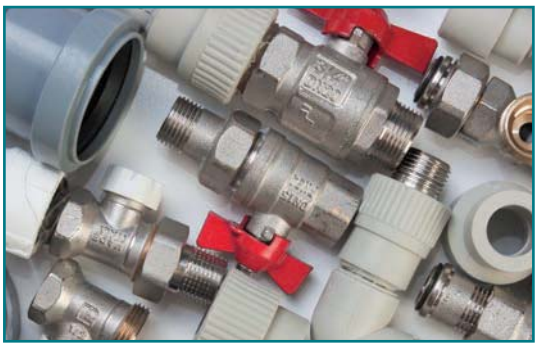
Individual Solutions for Your Application

Special heat exchangers

We design the liquid heat exchanger according to your performance requirements. Simply specify the transmission capacity, the temperature range of the application and the mechanical interfaces to your application. We calculate the required heat exchanger surface and supply your custom-made heat exchanger.

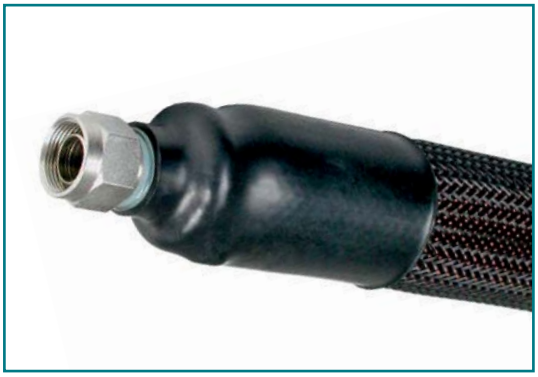
Individual connections and adapters

If you need a special adapter to connect our instrument to your application, specify the mechanical interface and we will manufacture the matching adapter.



Special tubing

Do you have special tubing requirements? Specify your bath fluid, the length, inside diameter and the mechanical interfaces of the tubing. We will choose the compatible material and insulation and supply the required tubing.



Practical Accessories

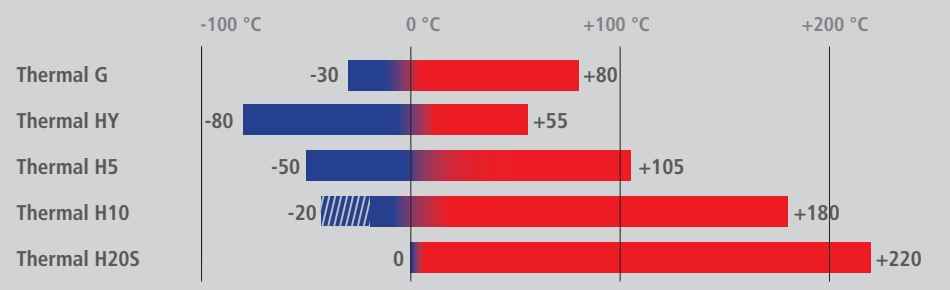
JULABO *Thermal* Bath Fluids

JULABO *Thermal* bath fluids are ideally suited for all of your temperature control applications guaranteeing safe and reliable operation. Choosing the proper bath fluid is critical for the results in temperature control. The viscosity, oxidation and heat transfer characteristics of *Thermal* fluids are specifically matched with each JULABO temperature control instrument.

Advantages

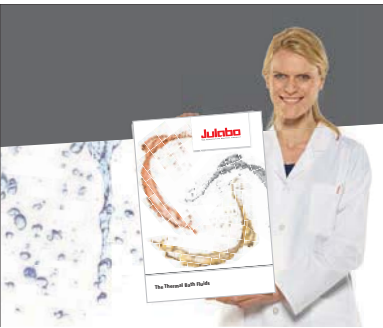
- Wide temperature ranges
- Low viscosity
- High stability
- Good heat conductivity
- Minimum odor
- Low corrosion tendency
- Low toxicity
- Long shelf life

Working temperature ranges



JULABO Description		Thermal G	Thermal HY	Thermal H5	Thermal H10[1)]	Thermal H20S
JULABO Order No.	**10 liters** **5 liters**	**8 940 124** **8 940 125**	**8 940 104** **8 940 105**	**8 940 106** **8 940 107**	**8 940 114** **8 940 115**	**8 940 108** **8 940 109**
Working temperature ranges and specifications						
For refrigerated circulators	°C	-30 ... +80	-80 ... +55	-50 ... +105	(-40) -20 ... +180	0 ... +220
Flash point	°C	--	+62	+124	>+170	+230
Fire point	°C	--	+80	+142	+220	+264
Viscosity, kinetic at +20 °C	mm²/s	4.07	<4	5.66	10.8	22.3
Density at +20 °C	g/cm³	1.08	0.9	0.92	0.94	0.95
Pour point	°C	-70	-100	-100	<-60	-70
Boiling point	°C	+108	+228.5	+288	+288	+424
Ignition temperature	°C	+430	+335	+350	+370	+385
Color		light yellow	clear	clear	clear	light brown

[1)] Extended temperature range: Thermal H10 can be used within the temperature range from -40°C to +180°C with circulators of the TopTech and HighTech series as well as CF31 and CF41.

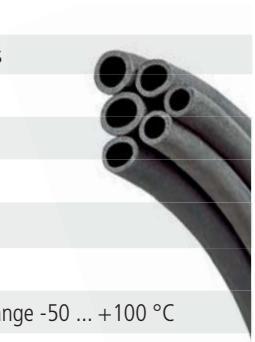


Download our new brochure at
www.julabo.com

Julabo
THE TEMPERATURE CONTROL COMPANY

Tubing / Tubing insulation / Tubing accessories

JULABO Order No.	Description	Suitable for
CR® and Viton® Tubing / Tubing insulation / Tube clamps		
8 930 008	1 m CR® Tubing, 8 mm inner dia. (-30 ... +120 °C)	ED, EH, MA, ME, HE, HL, SL, CF models
8 930 010	1 m CR® Tubing, 10 mm inner dia. (-30 ... +120 °C)	ED, EH, MA, ME
8 930 012	1 m CR® Tubing, 12 mm inner dia. (-30 ... +120 °C)	HE, HL, SL, CF models
8 930 108	1 m Viton® Tubing, 8 mm inner dia. (-35 ... +200 °C)	EH, MA, ME, HE, HL, SL, CF models
8 930 110	1 m Viton® Tubing, 10 mm inner dia. (-35 ... +200 °C)	EH, MA, ME
8 930 112	1 m Viton® Tubing, 12 mm inner dia. (-35 ... +200 °C)	HE, HL, SL, CF models
8 930 410	1 m Insulation for tubing 8 mm or 10 mm inner dia.	CR® and Viton® Tubing, temperature range -50 ... +100 °C
8 930 412	1 m Insulation for tubing 12 mm inner dia.	CR® and Viton® Tubing, temperature range -50 ... +100 °C
8 970 480	2 Tube clamps, size 1	Tubing 8 mm inner dia.
8 970 481	2 Tube clamps, size 2	Tubing 10 or 12 mm inner dia.
Silicone, PTFE and Flexible braided tubing		
8 930 120	1 m Silicone Tubing, 8 mm inner dia. (-50...+180 °C) Not to be used with silicone bath fluid	ED, EH, MA, ME, HE, HL, SL, CF models
8 930 122	1 m Silicone Tubing, 12 mm inner dia. (-50...+180 °C) Not to be used with silicone bath fluid	ED, EH, MA, ME, HE, HL, SL, CF models
8 930 140	1 m PTFE Tubing, 8 mm inner dia. (-60...+180 °C)	ED, EH, MA, ME, HE, HL, SL, CF models
8 930 142	1 m PTFE Tubing, 12 mm inner dia. (-60...+180 °C)	ED, EH, MA, ME, HE, HL, SL, CF models
8 930 331	1.5 m Flexible braided tubing G 3/4" (-30...+100 °C) with 2 straight fittings with cap nut for cooling water connection	Water-cooled units
8 930 332	2 m Flexible braided tubing G 3/4" (-30...+100 °C) with 2 straight fittings with cap nut for cooling water connection	Water-cooled units
8 930 341	1.5 m Flexible braided tubing G 3/4" (-30...+100 °C) 1 straight fitting / 1 elbow fitting 90°, both with cap nut for cooling water connection	Water-cooled units
8 930 342	1.5 m Flexible braided tubing G 3/4" (-30...+100 °C) 1 straight fitting / 1 elbow fitting 90°, both with cap nut for cooling water connection	Water-cooled units
Metal tubing, flexible, triple insulated -100 ... +350 °C		
8 930 209	0.5 m Metal tubing, 2 fittings M16x1 female	HE, HL, SL, CF31, CF41
8 930 210	1.0 m Metal tubing, 2 fittings M16x1 female	HE, HL, SL, CF31, CF41
8 930 211	1.5 m Metal tubing, 2 fittings M16x1 female	HE, HL, SL, CF31, CF41
8 930 214	3.0 m Metal tubing, 2 fittings M16x1 female	HE, HL, SL, CF31, CF41
Metal tubing, flexible, insulated -50 ... +200 °C		
8 930 220	0.5 m Metal tubing, 2 fittings M16x1 female	HE, HL, SL, CF31, CF41
8 930 221	1.0 m Metal tubing, 2 fittings M16x1 female	HE, HL, SL, CF31, CF41
8 930 222	1.5 m Metal tubing, 2 fittings M16x1 female	HE, HL, SL, CF31, CF41
8 930 223	3.0 m Metal tubing, 2 fittings M16x1 female	HE, HL, SL, CF31, CF41
Accessories for metal tubing connections		
8 970 443	Adapter M16x1 male to M16x1 male	Metal tubing connection
8 970 444	Adapter for metal tubing M10x1 male to M16x1 male	EH, MA, ME
8 970 750	Icing protection sleeve for pump connections	SL, ultra-low circulators
8 970 751	Pump nozzle insulating set	ME, HL, SL, ultra-low circulators



Prevention of ice build-up at low temperatures

JULABO Order No.	Description	Suitable for
8 970 700	Condensation trap with bath cover	FP50, FPW50, FP51
8 970 702	Condensation trap with bath cover	F81, FP89
8 970 705	Filling port, insulated with humidity absorber	FP(W)52/55/90/91/95

External Pt100 sensors

JULABO Order No.	Description	Suitable for
8 981 003	200 x 6 mm dia., stainless steel, 1.5 m cable	ME, HE, HL, SL, CF31, CF41
8 981 006	20 x 2 mm dia., stainless steel, 1.5 m cable	ME, HE, HL, SL, CF31, CF41
8 981 010	300 x 6 mm dia., stainless steel, 1.5 m cable	ME, HE, HL, SL, CF31, CF41
8 981 017	200 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	ME, HE, HL, SL, CF31, CF41
8 981 015	300 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	ME, HE, HL, SL, CF31, CF41
8 981 013	600 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	ME, HE, HL, SL, CF31, CF41
8 981 016	900 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	ME, HE, HL, SL, CF31, CF41
8 981 014	1200 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	ME, HE, HL, SL, CF31, CF41
8 981 020	M+R in-line Pt100 sensor, 2 fittings M16x1 male	ME, HE, HL, SL, CF31, CF41
8 981 103	Extension cable 3.5 m for Pt100 sensor	ME, HE, HL, SL, CF31, CF41

Cooling installations / Booster heaters / Booster Pump / Particle filter

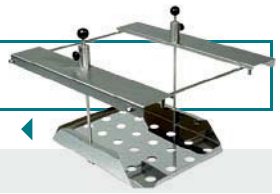
JULABO Order No.	Description	Suitable for
8 970 240	Bath lid with special cooling coil	F12, F25
8 970 243	Bath lid with special cooling coil	F32, FP50, FPW50, FP51
8 810 008	HST booster heater 6 kW	FP40-HL
8 810 009	HST booster heater 6 kW	FP45-HL
8 810 011	HST booster heater 6 kW	FP51-SL
8 810 012	HST booster heater 6 kW	FP(W)52, FP(W)55, FP(W)90, FPW91
8 810 015	HSP Booster Pump 30 l/min. - 3 bar max.	FP(W)52, FP(W)55, FP(W)90, FPW91
8 920 000	Particle filter for cooling water circuit (for water cooled models)	FW, FPW

Test tube racks

JULABO Order No.	Description	Immers. depth mm	Suitable for	Maximum insert capacity for test tube racks
Test tube racks made of stainless steel, to +150 °C				
8 970 320	for 28 tubes, 16/17 mm dia.	80	F12, F25, F26	1
8 970 321	for 38 tubes, 12/13 mm dia.	65	F12, F25, F26	1
8 970 307	for 50 tubes, 16/17 mm dia.	80	FP45	3
8 970 308	for 90 tubes, 12/13 mm dia.	65	FP45	3
8 970 309	for 90 microliter tubes, 11/12 mm dia.	30	FP45	3
8 970 310	for 21 tubes, 30 mm dia.	90	FP45	3

Immersion height adjustable platform / Castor platform

JULABO Order No.	Description	Suitable for
8 970 502	Immersion-height adjustable platform	F34, FP45
8 910 040	Castor platform	FP40, FP50, FPW50



Adapters / Valves / Connectors, etc.

JULABO Order No.	Description	Suitable for
8 970 456	Shut-off valve for loop circuit (-10 °C ... +100 °C), M16x1	HE, HL, SL
8 970 457	Shut-off valve for loop circuit (-30 °C ... +200 °C), M16x1	HE, HL, SL, CF31, CF41
8 980 701	Solenoid valve for loop circuit (-10 °C ... +130 °C), M16x1	HL, SL
8 970 452	Drain tap (-20 °C ... +150 °C)	CF
8 970 450	Drain tap (-30 °C ... +200 °C)	CF
8 970 470	Twin distributing adapter with barbed fitting	Tubing 8 mm inner dia.
8 970 472	Twin distributing adapter with barbed fitting	Tubing 10 mm inner dia.
8 970 471	Twin distributing adapter with barbed fitting	Tubing 12 mm inner dia.
8 970 473	Twin distributing adapter M16x1 female to 2 x M16x1 male	HE, HL, SL
8 970 445	2 Barbed fittings for tubing 12 mm inner dia.	HE, HL, SL, CF
8 970 447	2 Barbed fittings for tubing 10 mm inner dia.	HE, HL, SL
8 970 446	2 Barbed fittings for tubing 8 mm inner dia.	HE, HL, SL, CF
8 970 460	2 Barbed fittings for tubing 8 mm inner dia., M10x1	ED, EH, MA, ME
8 970 468	2 Barbed fittings for tubing 12 mm inner dia., M10x1	ED, EH, MA, ME
8 970 490	2 Collar nuts M16x1 male	HE, HL, SL, CF
8 970 492	1 Collar nut M10x1 male	ED, EH, MA, ME
8 970 442	2 Elbow fittings 90°, M16x1 female/male, side lenght 2x54 mm	HE, HL, SL, CF
8 970 448	2 Elbow fittings 90°, M16x1 female/male, side lenght 2x54 mm / 2x120 mm	HE, HL, SL, CF
8 890 004	2 Adapters M16x1 female to NPT ¼" male	HE, HL, SL, CF
8 890 005	2 Adapters M16x1 female to NPT ¼" female	HE, HL, SL, CF
8 890 006	2 Adapters M16x1 female to NPT ⅜" male	HE, HL, SL, CF
8 890 007	2 Adapters M16x1 female to NPT ⅜" female	HE, HL, SL, CF
8 890 008	2 Adapters M16x1 female to NPT ½" male	HE, HL, SL, CF
8 890 009	2 Adapters M16x1 female to NPT ½" female	HE, HL, SL, CF
8 890 010	2 Adapters M16x1 male to NPT ¼" female	HE, HL, SL, CF
8 891 008	1 Adapter M16x1 male to BSP ½" female	HE, HL, SL, CF
8 891 009	1 Adapter M16x1 male to BSP ¾" female	HE, HL, SL, CF
8 890 011	2 Adapters M16x1 female to tube ¼" male	HE, HL, SL, CF
8 890 012	2 Adapters M16x1 female to tube ⅜" male	HE, HL, SL, CF
8 890 013	2 Adapters M16x1 female to tube ½" male	HE, HL, SL, CF
8 890 024	2 Adapters M16x1 female to M16x1 female	HE, HL, SL, CF
8 890 034	2 Adapters M30x1.5 female to M16x1 male, stainless steel	HE, HL, SL
8 890 035	2 Adapters M30x1.5 male to M16x1 male, stainless steel	HE, HL, SL

Connection plugs

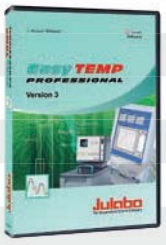
JULABO Order No.	Description	Suitable for
8 980 131	External Pt100 connector	ME, HE, SE, HL, SL, CF31, CF41
8 980 133	Connector 3 pin	HE/SE/HL/SL/CF31/CF41 in combination with electronic module
8 980 135	Alarm connector 5 pin	HE/SE/HL/SL/CF31/CF41 in combination with electronic module
8 980 136	REG+EPROG connector 6 pin	HE/SE/HL/SL/CF31/CF41 in combination with electronic module
8 980 137	Stakei connector	HL, SL

Booster Pump & SCB Converter box

JULABO Order No.	Description	Suitable for
8 810 020	Booster Pump (magnetically coupled), 2.1 bar	HL, SL
8 980 024	SCB Converter box	HL, SL

Software & Hardware for instrument control / Interfaces

JULABO Order No.	Description	Suitable for
	Electronic module with analog connectors provides one input and two outputs for external data transfer, temperature recorder (freely scalable, current/voltage) as well as standby input and alarm output.	
8 900 100	Electronic module with analog connectors	HE, HL, SL, CF31, CF41
	Automatic Refill Device when connected (Stakei) to the circulator - at low level - liquid is automatically pumped from the reservoir (5 liters) into the circulator bath	
8 980 750	ARD Automatic refill device with 5 liter reservoir	HL, SL
	***EasyTEMP* Software for instrument control, data recording and visualization**	
8 901 102	*EasyTEMP* Software (free of charge at www.julabo.com)	Units with RS232
8 901 105	*EasyTEMP* Professional Software, incl. USB-Dongle	Units with RS232
8 980 073	RS232 interface cable, 2.5 m	Units with RS232
8 980 074	RS232 interface cable, 5 m	Units with RS232
8 900 110	USB interface adapter + RS232 interface cable, 2.5 m	Units with RS232
8 980 031	Ethernet / RS232 interface converter	Units with RS232
8 900 005	PB-5 Option: Integrated Profibus DP	*HighTech* circulator models HL, SL
8 900 020	Profibus DP Interface	Units with RS232



Manufacturer's calibration and testing certificates

JULABO Order No.	Description	Suitable for
8 902 901	1-Point Manufacturer's calibration certificate	All circulators
8 902 903	3-Point Manufacturer's calibration certificate	All circulators
8 902 905	5-Point Manufacturer's calibration certificate	All circulators
8 903 025	Manufacturer's testing certificate for JULABO cooling units <1 kW cooling power (at +20 °C)	All circulators
8 903 035	Manufacturer's testing certificate for JULABO cooling units >1 kW cooling power (at +20 °C)	All circulators

Hot **Heating Technology** to **+300 °C**

Heating Circulators

Innovation is our tradition:
The JULABO circulator program features functional solutions for daily applications. Whether in research, material testing or in production – the well proven and reliable technology is valued by users in all industries. With JULABO circulators, rely on innovative temperature control technology that sets standards.

The JULABO circulator program offers the perfect equipment for every application. Choose your temperature control solution from three series:

- Economy series
- TopTech series
- HighTech series

- Complete selection of models for internal and external applications
- Working temperatures from +20 °C to +300 °C
- Bath tanks made of stainless steel
- All products feature user friendly, intuitive operation
- Extra bright displays, easy to read from a distance
- Quick results and high precision thanks to state-of-the-art control technology
- Many professional functions for adjusting control parameters, temperature calibration, temperature profiles, etc. (depending on model)
- Powerful circulating pumps, electronically adjustable
- High heating capacities
- Intelligent warning and safety functions
- Unique early warning system for low liquid level
- Digital and analog interfaces for flexible communication
- Wireless monitoring and operation (*WirelessTEMP®*)
- Complete selection of useful and practical accessories

Economy

CORIO™ NEW

TopTech

ED/EH Models
+20 °C ... +150 °C

CORIO™ Models
+20 °C ... +150 °C

MA Models
+20 °C ... +200 °C

Basic models for routine and standard applications

PID 1 | S1

EH Models (in addition)

S3 | ATC | h

Connection for
③ Solenoid valve (EH Model)
④ Connections for pump and cooling coil

Basic models for routine and standard applications

CORIO™ the new entry level into the world of temperature control

Professional temperature control in the lab does not have to be expensive: the new entry-level line JULABO CORIO™ demonstrates this. Whether as Heating Immersion Circulator, Heating Bath Circulator or Refrigerated Circulator – CORIO™ stands for quality and reliability.

Convince yourself of the new, better entry level into the world of temperature control and ask us about CORIO™.

Information on all CORIO™ models in the specific catalog or:
www. julabo.com

Middle class for a broad range of applications

PID 2 | ATC³ | RS232 | h | S

MA Models (in additon)

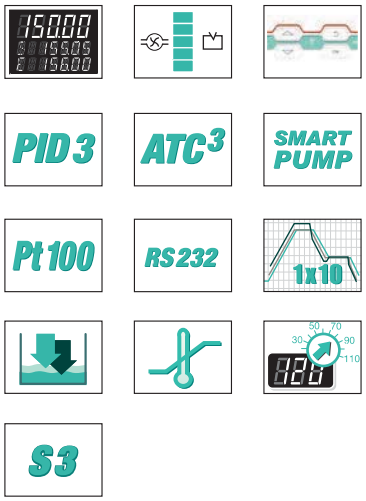
S3 | SMART PUMP

Connections for
② RS232
③ Solenoid valve
④ Connections for pump and cooling coil

HighTech

ME Models
+20 °C ... +200 °C

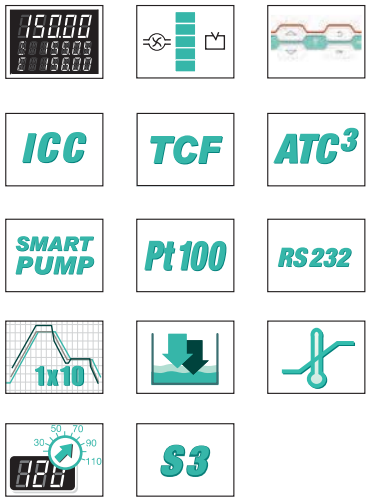
Upper middle class with ext. Pt100 sensor connection



Connections for
① Ext. Pt100 sensor
② RS232
③ Solenoid valve
④ Connections for pump and cooling coil

HE/SE Models
+20 °C ... +300 °C

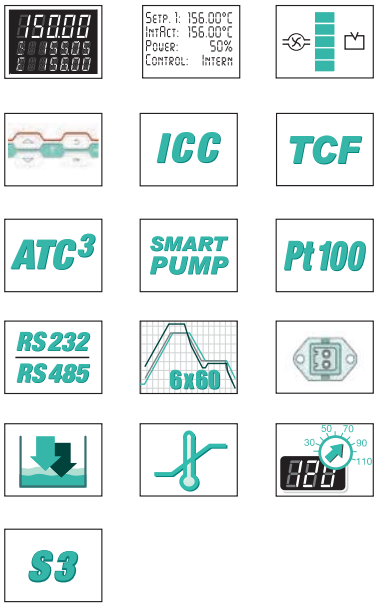
Sophisticated models for demanding applications



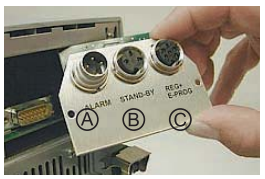
Connections for
① External Pt100 sensor
② RS232 / RS485
③ Solenoid valve
④ Electronic module (optional)
⑤ Stakei connections (HL/SL)
⑥ Connections for pump and cooling coil

HL/SL Models
+20 °C ... +300 °C

Superior models for most demanding applications



Electronic module with analog connections
Order No. 8 900 100
Optional for the HighTech series
Ⓐ Alarm output
Ⓑ Standby input
Ⓒ Analog interface with input and two outputs for programming, flow sensor, pressure sensor or temperature recorder scalable (current/voltage)



Please refer to the fold-out page for the description of icons above.

| ED / EH

| MA

| ME

| External Pt100 Sensor (Accessory)

Heating Immersion Circulators

with attachment clamp for any bath tank up to 50 liters filling volume

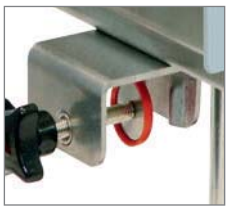
Heating immersion circulators have always been a staple at JULABO. All circulators include a bath attachment clamp allowing for quick and easy mounting to a bath tank up to 50 liters.

Immersion circulators

- Working temperature range up to +200 °C
- Bath attachment clamp for a wall thickness up to 26 mm
- Immersion depth 16.5 cm, reducible to 14.5 cm
- All wetted parts made of stainless steel or high grade plastic
- Pump set for external control application and cooling coil for applications below ambient temperature available as accessories

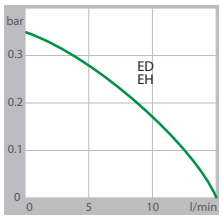
Note: Model ME with connection for external Pt100 sensor and integrated programmer

Bath attachment clamp for any bath tank (included)

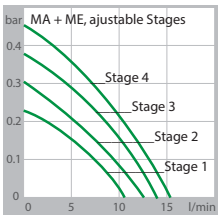


Pump set for external applications (accessory)

Pump capacity
Bath fluid: water



Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C[1]	Temp. stability °C	Heating capacity kW	Pump capacity Flow rate l/min	Pressure bar	Cooling coil	Usable immersion depth cm	Dimensions W x L x H cm
9 116 000	**ED**	+20 ... +100	±0.03	2	15	0.35	Option	8-14.5	13 x 15 x 33
9 118 000	**EH**	+20 ... +150	±0.03	2	15	0.35	Option	8-14.5	13 x 15 x 33
9 153 000	**MA**	+20 ... +200	±0.01	2	11-16	0.23-0.45	Option	8-14.5	13 x 15 x 33
9 162 000	**ME**	+20 ... +200	±0.01	2	11-16	0.23-0.45	Option	8-14.5	13 x 15 x 33

[1] For applications near or below ambient temperature: use a cooling coil or JULABO immersion cooler.

| SE-Z

Applications

Very flexible (with bath attachment clamp or telescopic bridge), for a variety of bath tanks, suitable for a wide range of applications, e.g. temperature applications for samples, analytics, material testing, etc.

Bridge Mounted Circulator

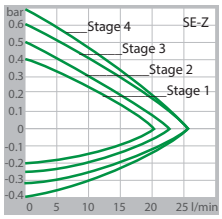
with extendable bridge for bath tanks up to 100 liters filling volume

The bridge mounted circulator features an adjustable stainless steel bridge for any bath tank up to 100 liters. The instrument can be used for internal and external temperature control applications and has a connection for an external Pt100 temperature sensor as well as a cooling coil for applications below or near ambient temperature.

Bridge mounted circulator

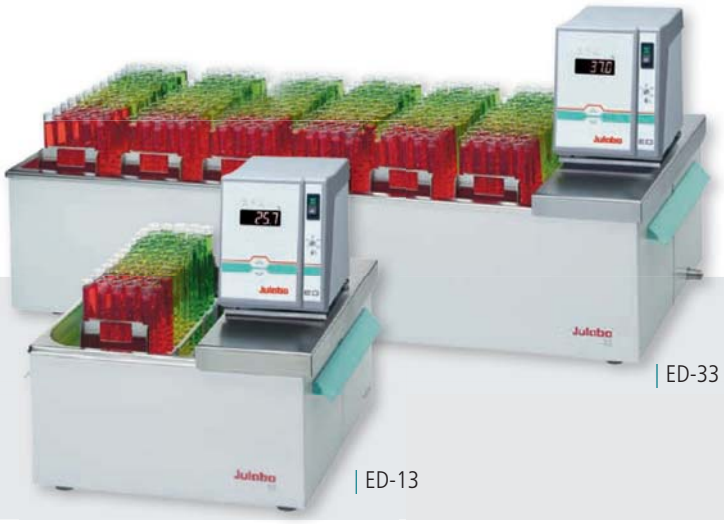
- Working temperature range up to +300 °C
- Expandable stainless steel bridge for bath tanks from 31 to 66 cm wide
- Immersion depth 12 to 19 cm
- Up to 3 kW of heating capacity for applications with large bath tanks
- Powerful pressure/suction pump for turbulant circulation and for the connection of external temperature applications
- Connection for external Pt100 sensor
- Integrated cooling coil

Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C[1)]	Temp. stability °C	Heating capacity kW	Pump capacity Flow rate l/min	Pump capacity Pressure bar	Pump capacity Suction bar	Cooling coil	Usable immersion depth cm	Dimensions W x L x H cm
9 252 218	**SE-Z**	+20 ... +300	±0.01	3	22-26	0.4-0.7	0.2-0.4	Integrated	12-19	32 x 17 x 40

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



ED-33

ED-13

Test tube racks not included in delivery (accessory).

Applications

Temperature applications for samples, preparation of samples for serology and clinical chemistry, analytics, material testing, external temperature control in combination with measuring instruments, measuring cells, photometers, refractometers, polarimeters, etc.

Open Heating Bath Circulators – internal

for internal temperature applications with stainless steel bath tanks

The models on this page are equipped with bath tanks made of high quality stainless steel. Various accessories are available including test tube racks, immersion-height adjustable platforms, cooling coils, lift-up bath covers and flat stainless steel covers.

Open heating bath circulators

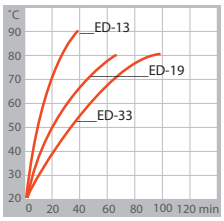
- Bath tanks made of high quality stainless steel
- Models with filling volumes from 13 to 33 liters
- Large bath openings
- All models have handles and are designed for use with test tube racks

Test tube insert capacity

Model	No. of test tubes with 13 mm Ø	17 mm Ø
ED-13	90	60
ED-19, ED-27	270	180
ED-33	540	360

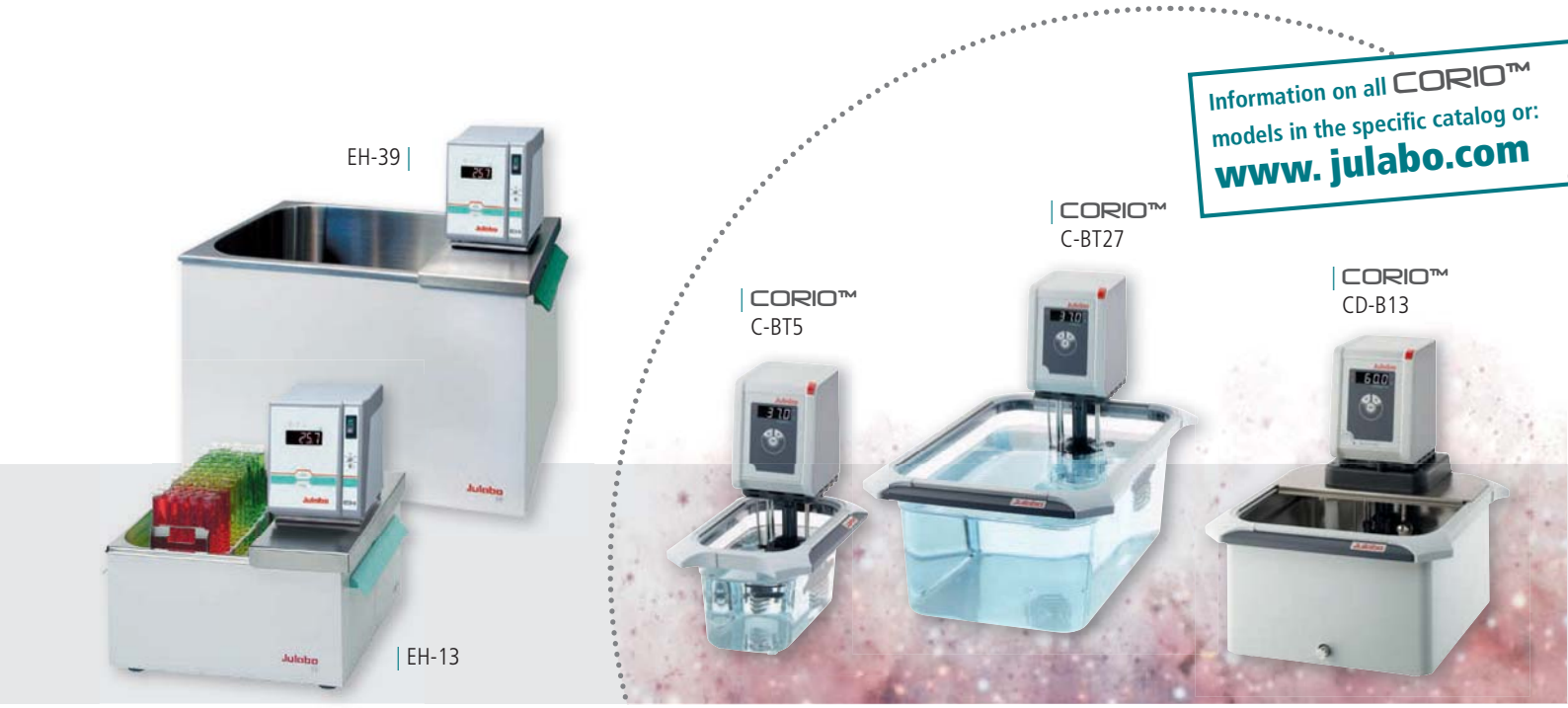
Bath covers
available accessory

Heat-up time
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C[1]	Temp. stab. °C	Heat. cap. kW	Pump capacity Flow rate l/min	Pump capacity Pressure bar	Cooling coil	Bath opening/ Bath depth W x L / D cm	Bath tanks	Filling vol. liters	Dimensions W x L x H cm
9 116 413	**ED-13**	+20 ... +100	±0.03	2	15	0.35	Option	18 x 30 / 15	Option	13	39 x 33 x 37
9 116 419	**ED-19**	+20 ... +100	±0.03	2	15	0.35	Option	36 x 30 / 15	Option	19	57 x 33 x 37
9 116 427	**ED-27**	+20 ... +100	±0.03	2	15	0.35	Option	36 x 30 / 20	Option	27	57 x 37 x 42
9 116 433	**ED-33**	+20 ... +100	±0.03	2	15	0.35	Option	67 x 30 / 15	Option	33	91 x 33 x 38

[1] For applications near or below ambient temperature: use a cooling coil or JULABO immersion cooler.



Heating Circulators with Open Bath internal and external

for internal and external temperature applications up to +150 °C
with stainless steel bath tanks and pump connections

The models on this page are equipped with bath tanks made of high quality stainless steel. Various accessories are available including test tube racks, immersion-height adjustable platforms, cooling coils, lift-up bath covers and flat stainless steel covers.

Heating circulators with open bath

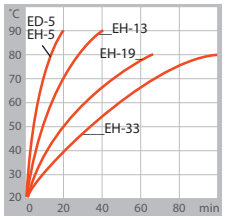
- Bath tanks made of high quality stainless steel
- Models with a filling volume of 5 to 39 liters
- Large bath openings

Note:

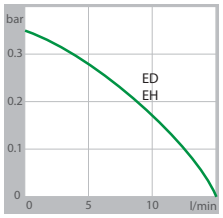
Models EH-27, EH-33 and EH-39 with integrated easy-access drain.
Models ED-5 and EH-5 include bath cover and cooling coil.
EH Models with countdown timer.

Lift-up and flat
bath covers
available as accessory

Heat-up time
Bath fluid: water



Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C[1]	Temp. stab. °C	Heat. cap. kW	Pump capacity Flow rate l/min	Pump capacity Pressure bar	Cooling coil	Bath opening/ Bath depth W x L / D cm	Bath cover	Filling vol. liters	Dimensions W x L x H cm
9 116 405	**ED-5**	+20 ... +100	±0.03	2	15	0.35	Integrated	15 x 15 / 15	Integrated	4.5	17 x 33 x 36
9 118 405	**EH-5**	+20 ... +150	±0.03	2	15	0.35	Integrated	15 x 15 / 15	Integrated	4.5	17 x 33 x 36
9 118 413	**EH-13**	+20 ... +150	±0.03	2	15	0.35	Option	18 x 30 / 15	Option	13	39 x 33 x 37
9 118 419	**EH-19**	+20 ... +150	±0.03	2	15	0.35	Option	36 x 30 / 15	Option	19	57 x 33 x 37
9 118 427	**EH-27**	+20 ... +150	±0.03	2	15	0.35	Option	36 x 30 / 20	Option	27	57 x 37 x 42
9 118 433	**EH-33**	+20 ... +150	±0.03	2	15	0.35	Option	67 x 30 / 15	Option	33	91 x 33 x 38
9 118 439	**EH-39**	+20 ... +150	±0.03	2	15	0.35	Option	36 x 30 / 30	Option	39	54 x 34 x 52

[1] For applications near or below ambient temperature: use a cooling coil or JULABO immersion cooler
Included with each unit: 2 barbed fittings for tubing 8 and 10 mm inner dia. (pump connections M10x1 female)

| MA-4

| ME-26
with integrated immersion-height adjustable platform

Heating Circulators – external and internal

for external and internal temperature applications up to +200 °C
with stainless steel bath tanks and pump connections

Heating circulators are used primarily for the external temperature control of externally closed systems. Temperature control applications in the internal circulator bath are also possible.

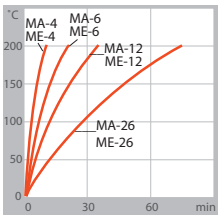
TopTech heating circulators

- For external temperature applications
- Simultaneously, internal temperature applications
- Electronically adjustable pressure pump
- Early warning system for low liquid level and high/low temperature
- RS232 interface
- Integrated cooling coil

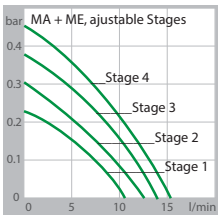
Models with ME circulator also feature

- Connection for external Pt100 sensor
- Integrated programmer (1 x 10 steps) with real time clock

Heat-up time
Bath fluid: Thermal



Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C[1]	Temp. stability °C	Heat. cap. kW	Pump capacity Flow rate l/min	Pump capacity Pressure bar	Cooling coil	Bath opening/ Bath depth W x L / D cm	Filling volume liters	Dimensions W x L x H cm
9 153 504	**MA-4**	+20 ... +200	±0.01	2	11-16	0.23-0.45	Integrated	13 x 15 / 15	4.5	21 x 42 x 38
9 153 506	**MA-6**	+20 ... +200	±0.01	2	11-16	0.23-0.45	Integrated	13 x 15 / 20	6	21 x 43 x 42
9 153 512	**MA-12**	+20 ... +200	±0.01	2	11-16	0.23-0.45	Integrated	22 x 15 / 20	12	30 x 43 x 45
9 153 526	**MA-26**	+20 ... +200	±0.01	2	11-16	0.23-0.45	Integrated	22 x 30 / 20	26	36 x 61 x 45
9 162 504	**ME-4**	+20 ... +200	±0.01	2	11-16	0.23-0.45	Integrated	13 x 15 / 15	4.5	21 x 42 x 38
9 162 506	**ME-6**	+20 ... +200	±0.01	2	11-16	0.23-0.45	Integrated	13 x 15 / 20	6	21 x 43 x 42
9 162 512	**ME-12**	+20 ... +200	±0.01	2	11-16	0.23-0.45	Integrated	22 x 15 / 20	12	30 x 43 x 45
9 162 526	**ME-26**	+20 ... +200	±0.01	2	11-16	0.23-0.45	Integrated	22 x 30 / 20	26	36 x 61 x 45

[1] For applications near or below ambient temperature: use a cooling coil or JULABO immersion cooler
Included with each unit: 2 barbed fittings for tubing 8 and 10 mm inner dia. (pump connections M10x1 female)

| SL-6

| HE-4

Applications

External temperature application in combination with jacketed reactors, distillation apparatus, mini plant applications, photometers, refractometers and temperature applications to small objects

Heating Circulators – external and internal

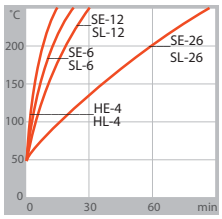
for external and internal temperature applications up to +300 °C
with stainless steel bath tanks and pump connections

HighTech circulators provide superior technology for the most demanding applications. The instruments feature a powerful, electronically adjustable pressure and suction pump.

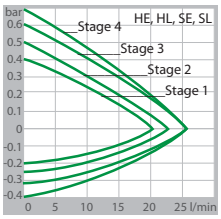
HighTech heating circulators

- External temperature control in closed and open systems
- ICC temperature control for high precision
- VFD Comfort Display with simultaneous display of 3 temperature values
- Integrated programmer with real time clock
- Powerful pressure and suction pump, electronically adjustable
- Automatic adjustment of pump capacity to fluid viscosity
- Integrated cooling coil

Heat-up time
Bath fluid: Thermal



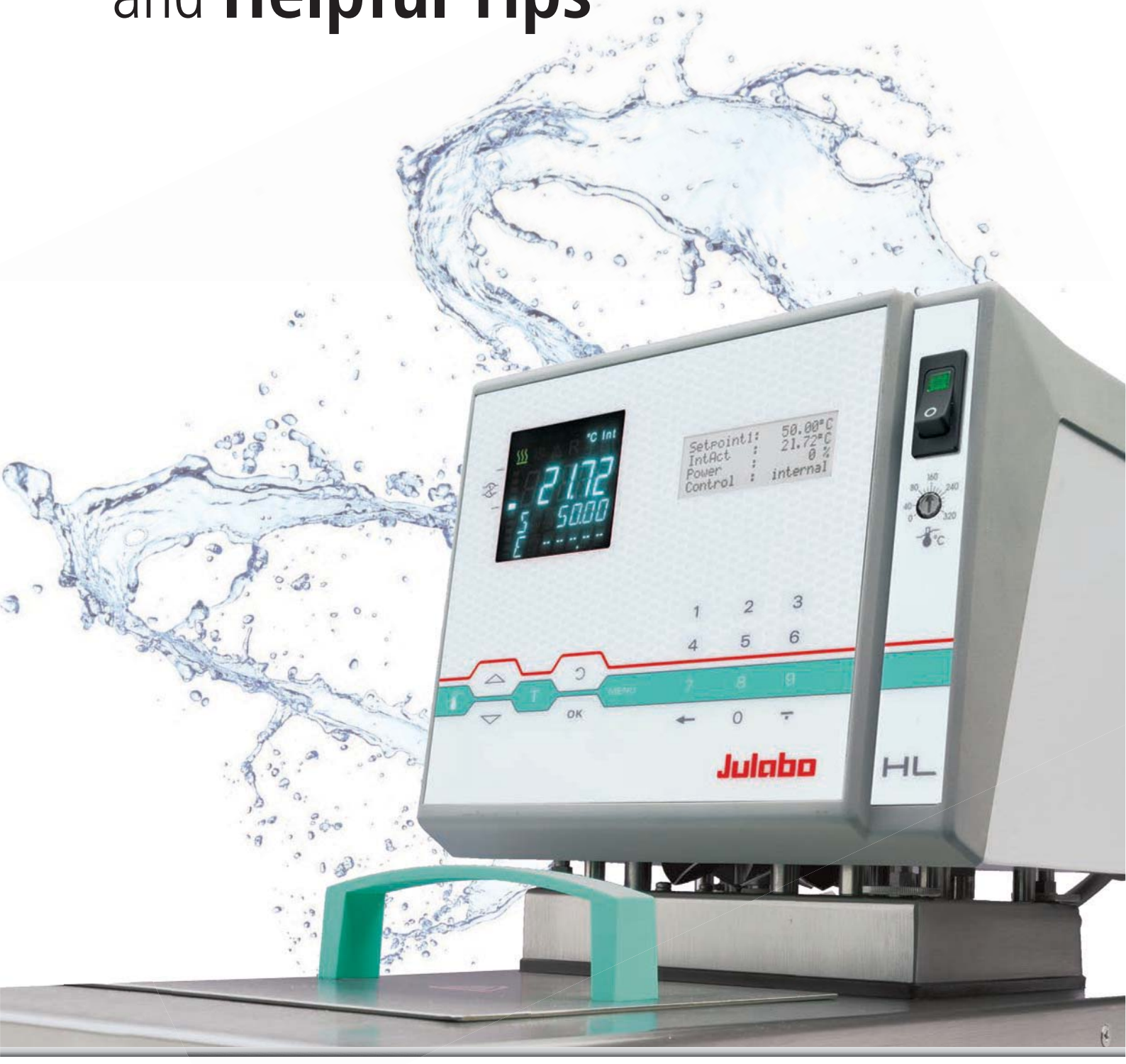
Pump capacity
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C[1)]	Temp. stability °C	Heat. cap. kW	Pump capacity / Flow rate l/min	Pressure bar	Suction bar	Bath opening/ bath depth W x L / D cm	Filling volume liters	Dimensions W x L x H cm
9 212 504	**HE-4**	+20 ... +250	±0.01	2	22-26	0.4-0.7	0.2-0.4	13 x 15 / 15	4.5	21 x 42 x 40
9 252 506	**SE-6**	+20 ... +300	±0.01	3	22-26	0.4-0.7	0.2-0.4	13 x 15 / 20	6	21 x 43 x 44
9 252 512	**SE-12**	+20 ... +300	±0.01	3	22-26	0.4-0.7	0.2-0.4	22 x 15 / 20	12	30 x 43 x 47
9 252 526	**SE-26**	+20 ... +300	±0.01	3	22-26	0.4-0.7	0.2-0.4	22 x 30 / 20	26	36 x 61 x 47
9 312 504	**HL-4**	+20 ... +250	±0.01	2	22-26	0.4-0.7	0.2-0.4	13 x 15 / 15	4.5	21 x 42 x 40
9 352 506	**SL-6**	+20 ... +300	±0.01	3	22-26	0.4-0.7	0.2-0.4	13 x 15 / 20	6	21 x 43 x 44
9 352 512	**SL-12**	+20 ... +300	±0.01	3	22-26	0.4-0.7	0.2-0.4	22 x 15 / 20	12	30 x 43 x 47
9 352 526	**SL-26**	+20 ... +300	±0.01	3	22-26	0.4-0.7	0.2-0.4	22 x 30 / 20	26	36 x 61 x 47

[1)] For applications near or below ambient temperature: use a cooling coil or JULABO immersion cooler
Included with each unit: 2 each barbed fittings for tubing 8 and 12 mm inner dia. (pump connections M16x1 male)

User Benefits and Helpful Tips



Always visible and easy to read: Brightest Temperature Displays

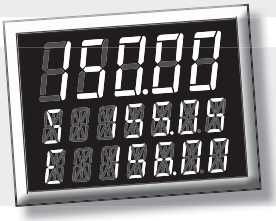
JULABO circulators offer large, easy-to-read temperatures displays. The values can be viewed easily from a long distance, at an angle and in very bright surroundings. This makes it easy to monitor the display during your daily tasks.

LED Display
for 1 actual value and up to 3 setpoints, warning functions, high temperature cut-off, pump stages (resolution 0.01/0.1 °C)

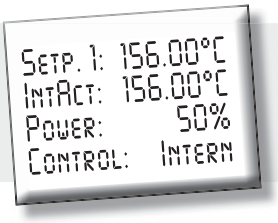
VFD Comfort Display
simultaneous display of 3 values, warning functions, high temperature cut-off, pump stages (resolution 0.01 °C)

LCD Dialog Display
allows for interactive operation with easy-to-read text

LED



VFD



LCD

Highly precise Temperature Control Technology – professional and simple operation

PID1, PID2 and PID3 temperature controls offer fixed control parameters (Xp, Tn, Tv). For the advanced user the PID2 and PID3 settings can be manually changed to reach an improved temperature stability, especially for external temperature control.
ICC temperature control (Intelligent Cascade Control) provides highly precise temperature control results even for the most demanding applications. With ICC the PID control parameters are self-optimizing and automatically adjust to the respective application.
The TCF function permits full control of the control dynamics. In addition to accessing control parameters, this function also allows for setting band limit, limit setting, co-speed factor, etc.

Intuitive and Integrated Operation

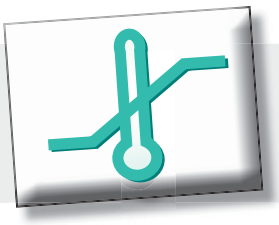
All JULABO products feature a consistent user interface design allowing for easy operation via the splash-proof and easy-to-clean keypads. Menus enable users to set additional parameters for process optimization such as control parameters, autostart mode, interface configuration, etc.

Early Warning System for Low Liquid Level

The JULABO early warning system for low liquid level recognizes fluid losses in the circulator bath and gives an optical and audible signal. Users have the opportunity to refill the bath tank before the built-in low liquid level protection triggers the undesired automatic safety cut-off.

Early warning system for High/Low Temperature Limits

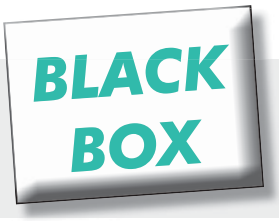
If the operator-defined temperature limits are exceeded - e.g. caused by an exothermic reaction - the early warning system will trigger audible and optical warnings.
Low temperature protection with cut-off function: If required, the warning function can be switched to a cut-off function (e.g. as low temperature protection).



Integrated Additional Protection Functions

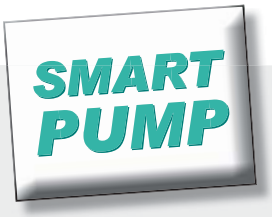
JULABO circulators and temperature control systems also feature:

- Standby display and automatic self-test
- Monitoring of sensors and sensor temperature differentials
- *BlackBox* Function with error memory for remote diagnosis
- Overload protection for pump motor and refrigeration unit



Intelligent Pump Systems

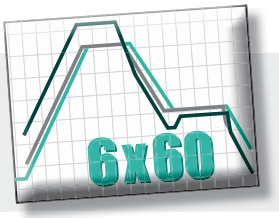
The highly efficient circulating pumps provide high pressures and flow rates. The *SmartPump* electronics has many benefits: The electronically adjustable pump capacity (4 stages) via keypad on one hand. On the other hand an automatic, electronic adjustment of the pump capacity in response to changes in bath fluid viscosity values for reliable and safe operation even when using high viscosity bath fluids.



Integrated Programmer

Many applications are time and temperature dependent processes. The ME circulators and all HighTech circulators feature an integrated programmer. Temperature profiles can be easily programmed, executed, and saved. Programming functions include a continuous loop setting and adjustable incremental gradients. The real-time clock allows application start-up at a specified time, e.g. heat-up of application prior to the start of the work.

ME, HE, SE Models: 1 Temperature profile with up to 10 steps
HL, SL Models: 6 Temperature profiles with up to 60 steps



ATC - Temperature Calibration

The ATC function is designed to compensate for temperature differences, due to physics, which may occur between the circulator and a defined measuring point. When using a reference thermometer the actual temperature can be determined at any measuring point (circulator bath or external application). The ATC function calibrates the circulator control to the reference value. The internal temperature sensor as well as the external sensor (if an external sensor connection exists) can be calibrated.

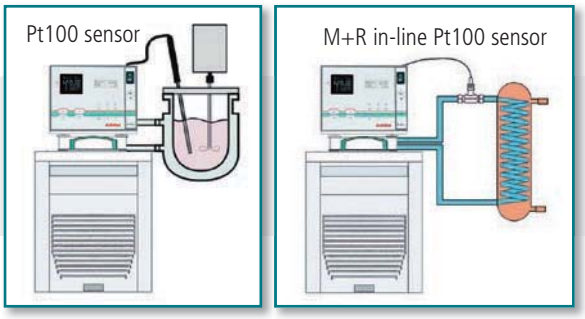
EH Models: 1-Point calibration
TopTech, HighTech Models: 3-Point calibration

External Temperature Control and Measurement

The ME circulators and all HighTech circulators include a connection for an external Pt100 temperature sensor. Various external sensors made of stainless steel or PTFE coated stainless steel are available in lengths between 20 and 1200 mm. For highly precise temperature control a M+R in-line Pt100 sensor can be installed directly into the cooling circuit. The externally measured actual value is shown on the circulator's display.

8 981 003 to 017 **External Pt100 sensors**

8 981 020 **M+R in-line Pt100 sensor**

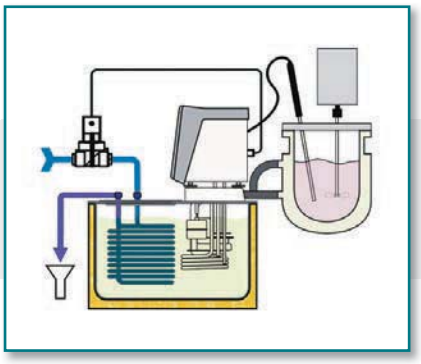


Exothermic Reactions under Control

A bath lid with special cooling coil is available in order to compensate for exothermic reactions. In case of a sudden peak in temperature, cooling water is automatically fed into the cooling coil via a solenoid valve. This instantly compensates for exothermic reactions.

HL and SL feature an integrated automatic solenoid valve controller and require the following accessories:

8 981 003 to 017 **External Pt100 sensors**
8 970 240 to 242 **Bath lids with special cooling coil**
8 980 703 **Solenoid valve for cooling water**

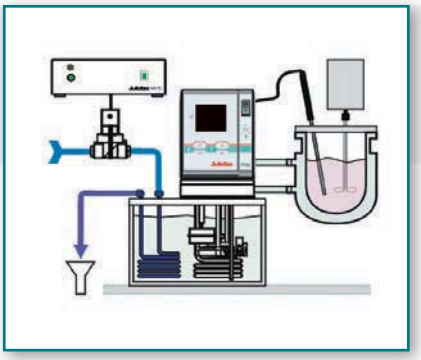


ME, HE and SE circulators can also be equipped with an automatic cooling water supply. As these instruments do not have an integrated solenoid valve controller, they require:

9 790 000 **MVS Solenoid valve controller**
8 981 003 to 017 **External Pt100 sensors**
8 970 240 to 242 **Bath lids with special cooling coil**
8 980 700 **Solenoid valve for cooling water**

Economic Cooling Water Consumption

Heating circulators provide a built-in cooling coil to perform counter-cooling with tap water facilitating applications near ambient temperature. We recommend using a solenoid valve controller to reduce cooling water consumption.



HL and SL circulators have an integrated automatic solenoid valve controller and only require the following accessory:

8 980 703 **Solenoid valve for cooling water**

MA, ME, HE and SE circulators can also be equipped with an automatic cooling water supply. However, these instruments require an additional external controller:

9 790 000 **MVS Solenoid valve controller**

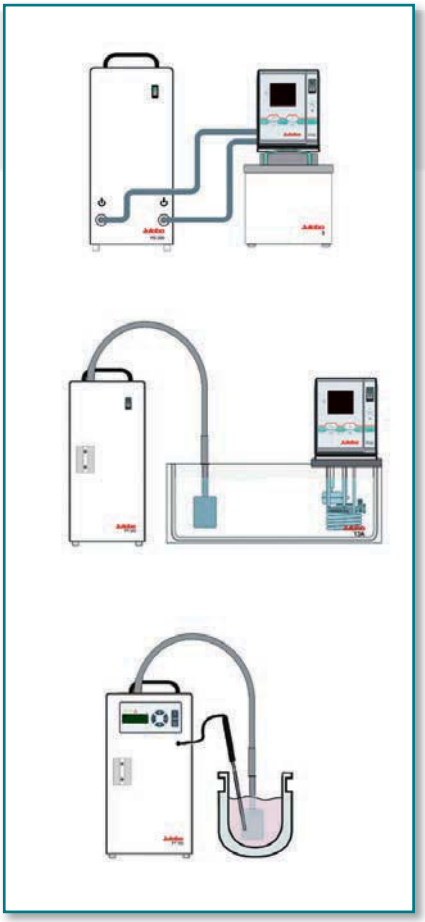
8 980 700 **Solenoid valve for cooling water**

Flow-through and Immersion Coolers

For applications below ambient temperatures JULABO flow-through and immersion coolers can be used for counter-cooling of heating circulators.

Advantages:

- Environmentally friendly
- Reduced tap water consumption
- Reduced energy consumption



Immersion coolers are also recommended for rapidly cooling fluids to low temperature e.g. in a Dewar vessel or as a dry ice substitute.

Immersion coolers can be used apart from circulators for controlled cooling of liquid in any vessel.
This requires immersion coolers with a temperature sensor and permits the setting of a setpoint via keypad: FT402, FT902 and FT903.
For more information see the chapter „Additional Products".

THE SMART CONTROLLERS

JULABO heating circulators are available in three performance categories for a variety of laboratory applications.

The Economy Series

Basic models for routine and standard applications.

Heating circulators of the Economy Series are particularly cost effective. Even the smallest circulators provide temperature control with a stability of ±0.03 °C. Operation could not be easier and the bright display permits reading a setpoint or actual value from a distance. All models with an EH circulator comply with protection class III (FL) according to DIN 12876-1 and feature a countdown timer.

Economy

ED/EH

The TopTech Series

Middle class for a broad range of applications.

Heating circulators of the TopTech Series are designed for more demanding applications. They feature increased functionality and additional warning and safety functions. Models with ME circulators provide maximum flexibility. They feature a connection for an external Pt100 sensor e.g. for direct measurement and control within an external application. The VFD Comfort Display is easy to use and shows all temperature values at once.

TopTech

MA

ME

The HighTech Series

Sophisticated models for demanding applications.

The HighTech Series offers heating circulators which feature a powerful, electronically adjustable pressure and suction pump. Only the HighTech series features an electronic module (accessory) to add further interfaces. The top-of-the-line HL and SL circulators provide maximum functionality. They are equipped with an integrated programmer to monitor up to 6 programs with 60 working steps each. Unique to the SL and SE models is the increased heating capacity with 3 kW for rapid heat-up. The top-of-the range in temperature control impresses with smart functional diversity which leaves nothing to be desired.

HighTech

HE/SE

HL/SL

Individual Solutions for Your Application

JULABO provides solutions for any customer's individual requirements. JULABO customers have the following options for heating circulators:

Special baths made of stainless steel or Makrolon®

JULABO designs and manufactures baths exactly to your specification. You define the geometry and required fittings for the integration into your application. We would be glad to advise you.

Special inserts

We design and manufacture inserts and racks for sample incubations in the bath. Please contact us for a consultation regarding the insert design and material of construction.

Special bath covers

Special bath covers

We design and manufacture bath covers according to your specific information on the geometry of the samples and baths. We will gladly advise you on the design of the bath covers.

Special temperature sensors

We supply external Pt100 sensors according to your specifications. Customer specified sensor length, sensor diameter and connection cable length solutions are available. Ask us about the accuracy class.

Individual Solutions for Your Application

More power

Are the pump and heating capacities of our standard products insufficient? Specify the bath fluid flow requirements of your application and we supply the matching Booster Pump. Specifying the heating rate needed for your application will allow us to calculate the required heating capacity to manufacture an appropriate booster heater.

Special heat exchangers

We design the liquid heat exchanger according to your performance requirements. Simply specify the transmission capacity, the temperature range of the application and the mechanical interfaces to your application. We calculate the required heat exchanger surface and supply your custom-made heat exchanger.

Special tubing

Do you have special tubing requirements? Specify your bath fluid, the length, inside diameter and the mechanical interfaces of the tubing. We will choose the compatible material and insulation and supply the required tubing.

Individual connections and adapters

If you need a special adapter to connect our instrument to your application, specify the mechanical interface and we will manufacture the matching adapter.

Special bridges

You have a special bath and need the matching bridge to position your JULABO circulator. We will advise you on the material and will manufacture a precisely dimensioned bridge.

Practical Accessories

JULABO *Thermal* Bath Fluids

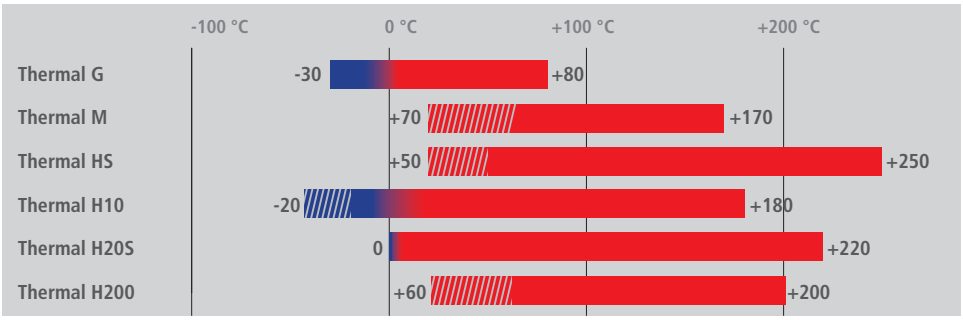
JULABO *Thermal* bath fluids are ideally suited for all of your temperature control applications guaranteeing safe and reliable operation. Choosing the proper bath fluid is critical for high performance temperature control. The viscosity, oxidation and heat transfer characteristics of *Thermal* fluids are specifically matched with each JULABO temperature control instrument.

Advantages

- Wide temperature ranges
- Low viscosity
- High stability
- Good heat conductivity
- Minimum odor
- Low corrosion properties
- Low toxicity
- Long shelf life

Included in delivery:
drain tap

Working temperature ranges



JULABO Description		Thermal G	Thermal M	Thermal HS	Thermal H10[1)]	Thermal H20S	Thermal H200
JULABO Order No.	**10 liters** **5 liters**	**8 940 124** **8 940 125**	**8 940 100** **8 940 101**	**8 940 102** **8 940 103**	**8 940 114** **8 940 115**	**8 940 108** **8 940 109**	**8 940 135**
Working temperature ranges and specifications							
For heating circulators	°C	-30 ... +80	+70 ... +170	+50 ... +250	(-40) -20 ... +180	0 ... +220	+60 ... +200
Flash point	°C	--	+284	+270	>+170	+230	+292
Fire point	°C	--	+306	+360	+220	+264	+334
Viscosity, kinetic at +20 °C	mm²/s	4.07	293	55	10.8	22.3	115
Density at +20 °C	g/cm³	1.08	1.15	0.96	0.94	0.95	1.06
Pour point	°C	-70	-39	<-60	<-60	-70	-50
Boiling point	°C	+108	>+170	+246	+288	+424	+315
Ignition temperature	°C	+430	>+255	>+400	+370	+385	>+400
Color		light yellow	clear	light brown	clear	light brown	clear

[1)] Extended temperature range: Thermal H10 can be used within the temperature range from -40 °C to +180°C with circulators of the TopTech and HighTech series.

Water protective media to prevent formation of algae

JULABO Order No.	Description	Suitable for
8 940 006	6 bottles *Aqua Stabil* 100 ml each	All immersion, bath and
8 940 012	12 bottles *Aqua Stabil* 100 ml each	heating circulators

Accessories for heating immersion circulators

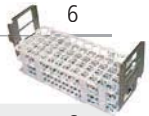
JULABO Order No.	Description	Suitable for	
8 970 022	Stand attachment with rod 200 x 12 mm for laboratory stands	ED, EH, MA, ME	◀
8 970 421	Bath attachment clamp for wall thickness up to 60 mm	ED, EH, MA, ME	
8 970 140	Pump set for external temperature applications	ED, EH, MA, ME	◀
8 970 105	Installation cooling coil for counter-cooling with tap water	ED, EH, MA, ME	

Bath tanks for heating immersion circulators

JULABO Order No.	Description	Fill.vol. liters	Dimensions cm inner (W x L / D)	outer (W x L / H)	Suitable for
Stainless steel bath tanks to +150 °C, insulated					
9 902 405	Bath tank 5	5	33 x 15 / 15	38 x 19 / 18	ED, EH, MA, ME
9 902 413	Bath tank 13	13	33 x 30 / 15	38 x 33 / 18	ED, EH, MA, ME
9 902 419	Bath tank 19	19	50 x 30 / 15	56 x 33 / 18	ED, EH, MA, ME
9 902 427	Bath tank 27 with drain	27	50 x 30 / 20	56 x 33 / 23	ED, EH, MA, ME
9 902 433	Bath tank 33 with drain	33	83 x 30 / 15	90 x 33 / 20	ED, EH, MA, ME
9 902 439	Bath tank 39 with drain	39	50 x 30 / 30	54 x 33 / 35	ED, EH, MA, ME

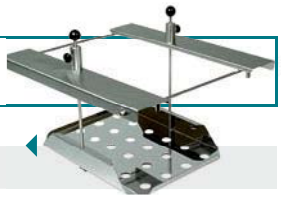
Test tube racks

JULABO Order No.	Description	Immersion depth mm	Suitable for following bath tanks and maximum insert capacity for test tube racks per bath tank				
			5	13	19	27	33
Test tube racks made of Polypropylene®, to +80 °C							
8 970 304	for 60 tubes, 16/17 mm dia.	80	--	1	3	3	6
8 970 306	for 90 tubes, 12/13 mm dia.	65	--	1	3	3	6
Test tube racks made of stainless steel, to +150 °C							
8 970 307	for 50 tubes, 16/17 mm dia.	80	--	1	3	3	6
8 970 308	for 90 tubes, 12/13 mm dia.	65	--	1	3	3	6
8 970 309	for 90 Microliter tubes, 11/12 mm dia.	30	--	1	3	3	6
8 970 310	for 21 tubes, 30 mm dia.	90	--	1	3	3	6
8 970 320	for 28 tubes, 16/17 mm dia.	80	1	--	--	--	--
8 970 321	for 38 tubes, 12/13 mm dia.	65	1	--	--	--	--



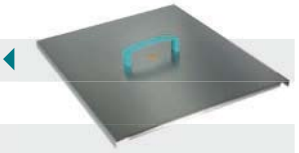
Immersion-height adjustable platforms

JULABO Order No.	Description	Suitable for
8 970 502	Immersion-height adjustable platform	Bath tank 19, 27
8 970 503	Immersion-height adjustable platform	Bath tank 13



Bath covers / Hollow balls

JULABO Order No.	Description	Suitable for
8 970 253	Lift-up gable bath cover made of stainless steel	Bath tanks 13
8 970 254	Lift-up gable bath cover made of stainless steel	Bath tanks 19, 27
8 970 257	Lift-up bath cover made of stainless steel	Bath tank 33
8 970 263	Flat stainless steel bath cover	Bath tank 39
8 970 290	Flat stainless steel bath cover	Bath tanks 13
8 970 291	Flat stainless steel bath cover	Bath tanks 19, 27
8 970 292	Flat stainless steel bath cover	Bath tank 33
8 970 010	Hollow balls, Polypropylene®, 20 mm dia. (1000 pcs.)	All bath tanks



Tubing / Tubing insulation / Tubing accessories

JULABO Order No.	Description	Suitable for
CR® and Viton® Tubing / Tubing insulation / Tube clamps		
8 930 008	1 m CR® Tubing, 8 mm inner dia. (-30 ... +120 °C)	ED, EH, MA, ME, HE, HL, SE, SL
8 930 010	1 m CR® Tubing, 10 mm inner dia. (-30 ... +120 °C)	ED, EH, MA, ME
8 930 012	1 m CR® Tubing, 12 mm inner dia. (-30 ... +120 °C)	HE, HL, SE, SL
8 930 108	1 m Viton® Tubing, 8 mm inner dia. (-35 ... +200 °C)	EH, MA, ME, HE, HL, SE, SL
8 930 110	1 m Viton® Tubing, 10 mm inner dia. (-35 ... +200 °C)	EH, MA, ME
8 930 112	1 m Viton® Tubing, 12 mm inner dia. (-35 ... +200 °C)	HE, HL, SE, SL
8 930 410	1 m Insulation for tubing 8 mm or 10 mm inner dia.	CR® and Viton® Tubing, temperature range -50 ... +100 °C
8 930 412	1 m Insulation for tubing 12 mm inner dia.	CR® and Viton® Tubing, temperature range -50 ... +100 °C
8 970 480	2 Tube clamps, size 1	Tubing 8 mm inner dia.
8 970 481	2 Tube clamps, size 2	Tubing 10 or 12 mm inner dia.
Silicone, PTFE and Flexible braided Tubing		
8 930 120	1 m Silicone Tubing, 8 mm inner dia. (-50...+180 °C) Not to be used with silicone bath fluid	ED, EH, MA, ME, HE, HL, SE, SL
8 930 122	1 m Silicone Tubing, 12 mm inner dia. (-50...+180 °C) Not to be used with silicone bath fluid	ED, EH, MA, ME, HE, HL, SE, SL
8 930 140	1 m PTFE Tubing, 8 mm inner dia. (-60...+180 °C)	ED, EH, MA, ME, HE, HL, SE, SL
8 930 142	1 m PTFE Tubing, 12 mm inner dia. (-60...+180 °C)	ED, EH, MA, ME, HE, HL, SE, SL
Metal tubing, flexible, triple insulated -100 ... +350 °C		
8 930 209	0.5 m Metal tubing, 2 fittings M16x1 female	HE, HL, SE, SL
8 930 210	1.0 m Metal tubing, 2 fittings M16x1 female	HE, HL, SE, SL
8 930 211	1.5 m Metal tubing, 2 fittings M16x1 female	HE, HL, SE, SL
8 930 214	3.0 m Metal tubing, 2 fittings M16x1 female	HE, HL, SE, SL

JULABO Order No.	Description	Suitable for
Metal tubing, flexible, insulated -50 ... +200 °C		
8 930 220	0.5 m Metal tubing, 2 fittings M16x1 female	HE, HL, SE, SL
8 930 221	1.0 m Metal tubing, 2 fittings M16x1 female	HE, HL, SE, SL
8 930 222	1.5 m Metal tubing, 2 fittings M16x1 female	HE, HL, SE, SL
8 930 223	3.0 m Metal tubing, 2 fittings M16x1 female	HE, HL, SE, SL

Accessories for metal tubing connections		
8 970 443	Adapter M16x1 male to M16x1 male	Metal tubing connection
8 970 444	Adapter for metal tubing M10x1 male to M16x1 male	MA, ME

Cooling accessories / Booster heater

JULABO Order No.	Description	Suitable for
9 790 000	MVS Solenoid valve controller for cooling water	MA, ME, HE, SE
8 980 700	Solenoid valve for cooling water, for tubing 8 mm inner dia.	MA, ME, HE, SE
8 980 703	Solenoid valve for cooling water, for tubing 8 mm innner dia.	HL, SL
8 970 180	Installation cooling coil	ED, EH
8 970 240	Bath lid with special cooling coil	MA-4, MA-6, ME-4, ME-6, HE-4, HL-4, SE-6, SL-6
8 970 242	Bath lid with special cooling coil	ME-12, SE-12, SL-12
8 810 007	HST Booster heater 6 kW	SL-12

Adapters / Valves / Connectors, etc.

8 970 410	D + S level-adapter to maintain constant level (in external bath)	HE, HL, SE, SL
8 970 456	Shut-off valve for loop circuit (-10 °C ... +100 °C), M16x1	HE, HL, SE, SL
8 970 457	Shut-off valve for loop circuit (-30 °C ... +200 °C), M16x1	HE, HL, SE, SL
8 980 701	Solenoid valve for loop circuit (-10 °C ... +130 °C), M16x1	HL, SL
8 970 452	Drain tap (-20 °C ... +150 °C)	Bath tanks 4, 6, 12, 26, 39
8 970 450	Drain tap (-30 °C ... +200 °C)	Bath tanks 4, 6, 12, 26, 39
8 970 470	Twin distributing adapter with barbed fitting	Tubing 8 mm inner dia.
8 970 472	Twin distributing adapter with barbed fitting	Tubing 10 mm inner dia.
8 970 471	Twin distributing adapter with barbed fitting	Tubing 12 mm inner dia.
8 970 473	Twin distributing adapter M16x1 female to 2 x M16x1 male	HE, HL, SE, SL
8 970 445	2 Barbed fittings for tubing 12 mm inner dia.	HE, HL, SE, SL
8 970 447	2 Barbed fittings for tubing 10 mm inner dia.	HE, HL, SE, SL
8 970 446	2 Barbed fittings for tubing 8 mm inner dia.	HE, HL, SE, SL
8 970 460	2 Barbed fittings for tubing 8 mm inner dia., M10x1	ED, EH, MA, ME
8 970 468	2 Barbed fittings for tubing 12 mm inner dia., M10x1	ED, EH, MA, ME
8 970 490	2 Collar nuts M16x1 male	HE, HL, SE, SL
8 970 492	1 Collar nut M10x1 male	ED, EH, MA, ME
8 970 442	2 Elbow fittings 90°, M16x1 female/male, side lenght 2x54 mm	HE, HL, SE, SL
8 970 448	2 Elbow fittings 90°, M16x1 female/male, side lenght 2x54 mm / 2x120 mm	HE, HL, SL, CF
8 890 004	2 Adapters M16x1 female to NPT ¼" male	HE, HL, SE, SL
8 890 005	2 Adapters M16x1 female to NPT ¼" female	HE, HL, SE, SL

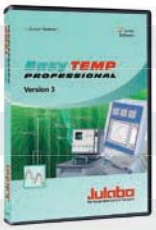
8 890 006	2 Adapters M16x1 female to NPT 3/8" male	HE, HL, SE, SL
8 890 007	2 Adapters M16x1 female to NPT 3/8" female	HE, HL, SE, SL
8 890 008	2 Adapters M16x1 female to NPT ½" male	HE, HL, SE, SL
8 890 009	2 Adapters M16x1 female to NPT ½" female	HE, HL, SE, SL
8 890 010	2 Adapters M16x1 male to NPT ¼" female	HE, HL, SE, SL
8 891 008	1 Adapter M16x1 male to BSP ½" female	HE, HL, SE, SL
8 891 009	1 Adapter M16x1 male to BSP 3/4" female	HE, HL, SE, SL
8 890 011	2 Adapters M16x1 female to tube ¼" male	HE, HL, SE, SL
8 890 012	2 Adapters M16x1 female to tube 3/8" male	HE, HL, SE, SL
8 890 013	2 Adapters M16x1 female to tube ½" male	HE, HL, SE, SL
8 890 024	2 Adapters M16x1 female to M16x1 female	HE, HL, SE, SL
8 890 034	2 Adapters M30x1.5 female to M16x1 male, stainless steel	HE, HL, SE, SL
8 890 035	2 Adapters M30x1.5 male to M16x1 male, stainless steel	HE, HL, SE, SL

Manufacturer's calibration and testing certificates

JULABO Order No.	Description	Suitable for
8 902 901	1-Point Manufacturer's calibration certificate	All circulators
8 902 903	3-Point Manufacturer's calibration certificate	All circulators
8 902 905	5-Point Manufacturer's calibration certificate	All circulators
8 903 015	Manufacturer's testing certificate for units w/o built-in cooling	Heating circulators

Software & Hardware for instrument control / Interfaces

JULABO Order No.	Description	Suitable for
	Electronic module with analog connectors provides one input and two outputs for external data transfer, temperature recorder (freely scalable, current/voltage) as well as standby input and alarm output	
8 900 100	Electronic module with analog connectors	HE, HL, SE, SL
	Automatic Refill Device when connected (Stakei) to the circulator - at low level - liquid is automatically pumped from the reservoir (5 liters) into the circulator bath.	
8 980 750	ARD Automatic refill device with 5 liter reservoir	HL, SL
	***EasyTEMP* Software for instrument control, data recording and visualization**	
8 901 102	*EasyTEMP* Software (free of charge at www.julabo.com)	Units with RS232
8 901 105	*EasyTEMP* Professional Software, incl. USB-Dongle	Units with RS232
8 980 073	RS232 interface cable, 2.5 m	Units with RS232
8 980 074	RS232 interface cable, 5 m	Units with RS232
8 900 110	USB interface adapter + RS232 interface cable, 2.5 m	Units with RS232
8 980 031	Ethernet / RS232 interface converter	Units with RS232
8 900 005	PB-5 Option: Integrated Profibus DP	*HighTech* circulators HL, SL
8 900 020	Profibus DP Interface	Unit with RS232



External Pt100 sensors

JULABO Order No.	Description	Suitable for
8 981 003	200 x 6 mm dia., stainless steel, 1.5 m cable	ME, HE, HL, SE, SL
8 981 006	20 x 2 mm dia., stainless steel, 1.5 m cable	ME, HE, HL, SE, SL
8 981 010	300 x 6 mm dia., stainless steel, 1.5 m cable	ME, HE, HL, SE, SL
8 981 017	200 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	ME, HE, HL, SE, SL
8 981 015	300 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	ME, HE, HL, SE, SL
8 981 013	600 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	ME, HE, HL, SE, SL
8 981 016	900 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	ME, HE, HL, SE, SL
8 981 014	1200 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	ME, HE, HL, SE, SL
8 981 020	M+R in-line Pt100 sensor, 2 fittings M16x1 male	ME, HE, HL, SE, SL
8 981 103	Extension cable 3.5 m for Pt100 sensor	ME, HE, HL, SE, SL

Connection plugs

JULABO Order No.	Description	Suitable for
8 980 131	External Pt100 connector	ME, HE, SE, HL, SL, CF31, CF41
8 980 133	Standby connector 3 pin	HE/SE/HL/SL/CF31/CF41 in combination with electronic module
8 980 135	Alarm connector 5 pin	HE/SE/HL/SL/CF31/CF41 in combination with electronic module
8 980 136	REG+EPROG connector 6 pin	HE/SE/HL/SL/CF31/CF41 in combination with electronic module
8 980 137	Stakei connector	HL, SL

Booster Pump & SCB Converter box

JULABO Order No.	Description	Suitable for
8 810 020	Booster Pump (magnetically coupled), 2.1 bar	HL, SL
8 980 024	SCB Converter box	HL, SL

Julabo
THE TEMPERATURE CONTROL COMPANY

CORIO™ the new entry level into the world of temperature control

Professional temperature control in the lab does not have to be expensive: the new entry-level line JULABO CORIO™ demonstrates this. Whether as Heating Immersion Circulator, Heating Bath Circulator or Refrigerated Circulator – CORIO™ stands for quality and reliability.

Convince yourself of the new, better entry level into the world of temperature control and ask us about CORIO™.

CORIO™

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Information on all CORIO™ models in the specific catalog or:
www. julabo.com

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The **Power** of **Thermodynamics**

NEW

PRESTO®

Highly Dynamic Temperature Control Systems

JULABO Highly Dynamic Temperature Control Systems are designed specifically for extremely fast heat-up and cool-down times in external applications. These units deliver extraordinary power and cover wide temperature ranges without the need to change the bath fluid. These characteristics make Highly Dynamic Temperature Control Systems ideal for controlling the temperature of jacketed reaction vessels.

The pinnacle of temperature technology: Advanced control technology and a small bath fluid reservoir enable highly dynamic temperature control systems to achieve rapid heat-up and cool-down. This gives you the ability to handle difficult temperature challenges quickly.

- Ideal for precise control of external temperature applications
- Wide working temperature ranges using one bath fluid
- Designed for temperature control of jacketed reaction vessels or other demanding applications
- Rapid cool-down and heat-up
- Designed to quickly compensate exothermic and endothermic reactions
- Highly dynamic ICC temperature control, stability to ±0.01 °C
- Powerful circulating pumps, select a stage or a specific pressure
- Extended shelf life of the bath fluid
- Hydraulically sealed to prevent unpleasant vapors and odors
- No condensation or ice build-up

PRESTO®

NEW

PRESTO® Models

-92 °C ... +250 °C

Cutting-edge temperature control
technology for demanding applications

TFT DISPLAY · TOUCH · MULTI LINGUAL · ICC · TCF
INTELLI PUMP · Pt100 · RS 232 RS 485 · 40° · ETHERNET · USB
8x60 · ACC · EASY Transport · S3

PRESTO® takes convenience to a new level
The new generation of highly dynamic temperature units are the first instruments of their kind to revolutionize operation and monitoring with an intuitive industrial-grade color touchscreen.

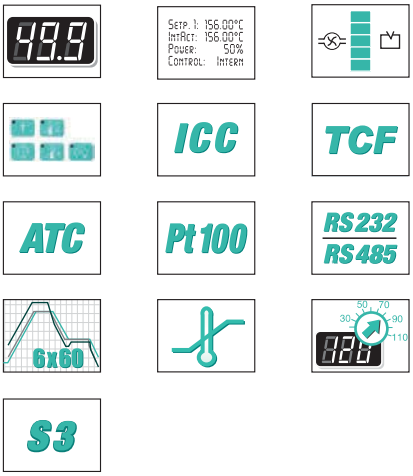
PRESTO® simplifies laboratory routines
The filling funnel is easily accessible on the top of the unit. Maintenance-free pumps and motors are always ready for action and even elevated ambient temperatures are not enough to make the unit sweat.

Forte HT

Forte HT Models

+40 °C ... +400 °C

Dual-zone technology for extremely high working temperatures



PRESTO® has new interfaces
JULABO is first to introduce highly dynamic temperature control systems equipped with Ethernet and USB interfaces.

A brand new generation of highly dynamic temperature control systems by JULABO

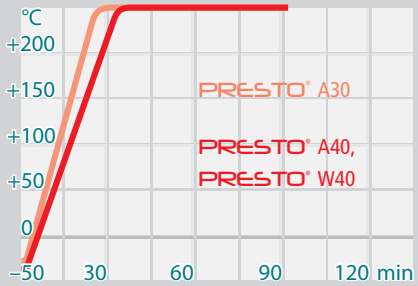
PRESTO® Technology

The new PRESTO® systems are designed for precise temperature control as well as rapid temperature changes, making them ideal for reactor vessels, material stress tests, or temperature simulations.

With high cooling and heating capacities, they cover a working temperature range from -92 °C to +250 °C. Highly efficient components enable these instruments to counteract exothermic and endothermic reactions with extraordinary speed.

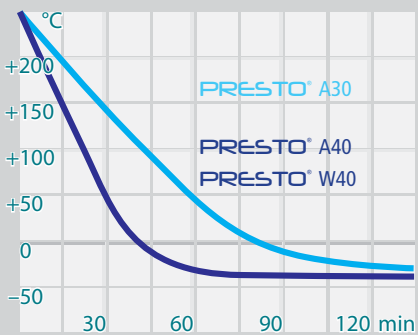
PRESTO® units are hydraulically sealed. A cooled expansion vessel compensates for temperature-induced volume changes in the heat exchanger.

Heat-up time

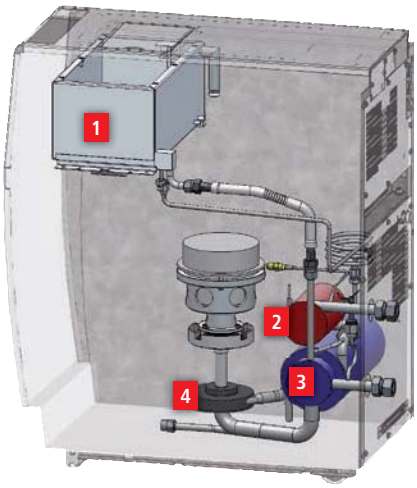


Maximum pump capacity (voltage 230 V)
Bath fluid: JULABO Thermal HL45

Cool-down time



Maximum pump capacity (voltage 230 V)
Bath fluid: JULABO Thermal HL45



The PRESTO® Principle

Expansion vessel (1)

Heat exchanger
Heating section (2)
Refrigeration section (3)

Circulating pump (4)

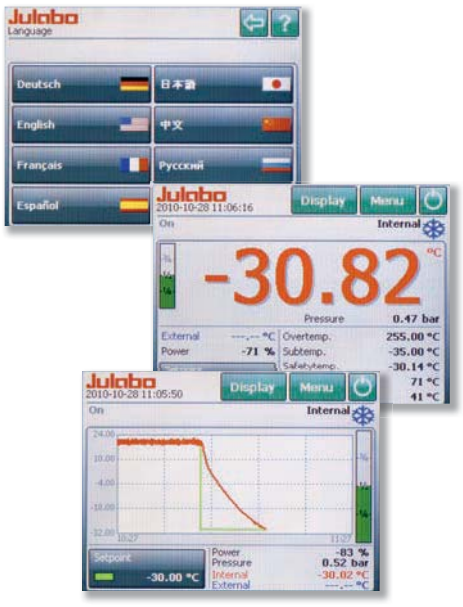
JULABO sets new standards
for intuitive operation

PRESTO® User Convenience

The state-of-the-art 5.7-inch industrial-grade color touchscreen is one of the identifying characteristics of the new PRESTO®. It gives the user a clear and well-organized view of important information with unmatched, intuitive user-friendliness. You can control the new PRESTO® with a simple tap of your finger.

There are three preset screen layouts displaying temperature reading, temperature graph, and other critical information. Users may also customize screen info to their specific needs.
PRESTO® can be operated in eight different languages.

Password management enables administrators to configure a total of three user levels. Managers can set the desired parameters for recurring day-to-day tasks. Employees can then operate the PRESTO® with their limited access rights.



Clear and straightforward operation!

The PRESTO® Operation

- 5.7" industrial color touchscreen
- User defined views
- 3 user levels with password protection
- Clearly structured display
- Intuitive menu navigation (multi-lingual)

Powerful pumps provide high flow rates at constant pressure

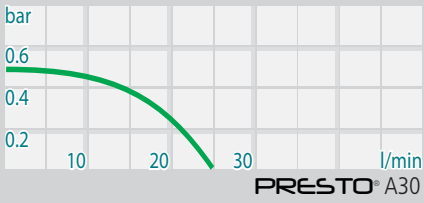
PRESTO® Pump Power

The new PRESTO® units generate the desired pressure at any time – to protect your applications and investments. The pumps even dynamically compensate for viscosity changes in the heat transfer fluid (except A30). Permanent internal monitoring and self-lubricating pumps extend the shelf life of the new PRESTO®.

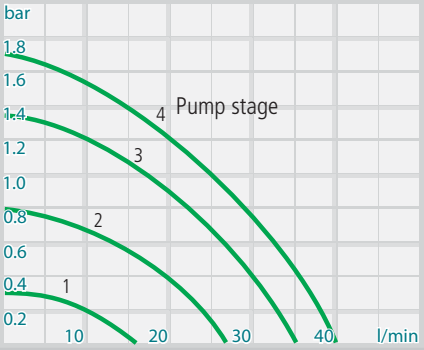
The new PRESTO® units utilize a closed temperature-control loop. This prevents the heat transfer fluid from coming in contact with the ambient air.
Moisture cannot penetrate the system and oxidation is eliminated.
The result: shelf life of the heat transfer fluid is extended significantly.

Here's another major benefit: The closed-loop design of the new PRESTO® eliminates oil vapors in your laboratory.

Pump Characteristics



PRESTO® A30



PRESTO® A40/W40 A80/W80

The PRESTO® Pump

PRESTO® (except A30): The pump capacity can be adjusted in four stages or via a specified pressure value.

- Permanently monitored pressure build-up
- Dynamic compensation of viscosity changes

Many useful features
simplify your
laboratory routine

PRESTO® Features

The new PRESTO® uses a single bath fluid across a wide range of working temperatures. This saves you the trouble of frequently changing the bath fluid and makes stock keeping much easier.

The filling funnel of the new PRESTO® is easily accessible on the top of the unit.

The new PRESTO® is whisper-quiet. You'll hardly know it's running.

Even elevated ambient temperatures (up to +40 °C) are not enough to make the new PRESTO® sweat.

Maintenance-free pumps and motors are always ready for action. So you can be sure that the new PRESTO® will be available when you need it. JULABO is known for rapid reaction times and global support.

Air or Water Cooling

The new PRESTO® units are available with air or water cooling.

Air-cooled units do not require water and can be installed anywhere. If you expect to move the unit frequently, an air-cooled unit will be the best choice. However, it is important to remember that these units draw in air and will slightly elevate the ambient temperature during operation.

Water-cooled units must be connected to an existing cooling water line. These units are even quieter and can be completely enclosed during operation. The new PRESTO® uses robust, maintenance-free heat exchangers for water cooling. Clogging of the heat exchanger by particles or impure water is virtually eliminated.

Extensive interfaces,
remote control via network and
integration in master control systems

PRESTO® Interfaces

The new PRESTO® temperature control systems are designed for connectivity. The Ethernet interface gives you complete access to operating functions.

The PRESTO® Interfaces

- USB (host and device)
- Ethernet interface
- Slot for SD cards
- Modbus
- RS232

Connections for

- Alarm output
- External Pt100 sensor
- Standby input (accessory)
- Analog inputs and outputs (accessory)
- Flow and pressure sensors (except A30)
- Second external Pt100 sensor (accessory, except A30)

Optional Interfaces

- Profibus DP
- RS485

State-of-the-art technology
designed for
state-of-the-art requirements

PRESTO® Other exciting Features

The new PRESTO® units are the only highly dynamic temperature systems that eliminate ventilation slits on the side walls. JULABO units are designed specifically for front-to-rear air flow.
This is a major advantage because it enables several PRESTO® units to operate directly next to each other without any loss of performance.
A retractable handle is integrated into the front of the unit, making it easy for one person to move the new PRESTO® from one place to another.

Space saving design
JULABO units can line-up close to each other.

The PRESTO® Benefits

- Sides without venting slots
- Space saving design
- Quiet as a whisper
- Easy to transport

| A30

| A40

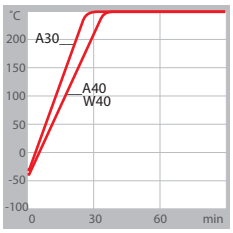
PRESTO® Models

for working temperature range -40 to +250 °C

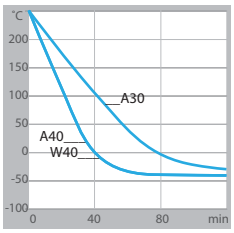
Highly dynamic systems of the PRESTO® series employ cutting-edge temperature control technology. Numerous new functions make day-to-day tasks easier and deliver the thermodynamic power needed to handle even the most demanding external applications. See for yourself what makes these dynamic temperature control systems so unique and take advantage of their special features.

- Extremely fast cool-down and heat-up times
- Wide working temperature ranges without changing the bath fluid
- Ultra-fast compensation of exothermic and endothermic reactions

Heat-up time
Bath fluid: Thermal HL



Cool-down time
Bath fluid: Thermal HL



JULABO Order No.	JULABO Model	Working temp. range °C	Temperature stability °C	Temp. display/ Resolution °C	Cooling capacity kW Bath fluid: JULABO Thermal HL | Ethanol +200	+20	0	-10	-20	-30	-40 °C	Heating capacity kW
9 420 300	**A30**	-30 ... +250	±0.01...±0.05	5.7" TFT / ±0.01	0.5 | 0.5	0.4	0.3	0.2	0.05	--	2.7
9 420 401	**A40**	-40 ... +250	±0.01...±0.05	5.7" TFT / ±0.01	1.2 | 1.2	0.9	0.8	0.6	0.3	0.1	2.7
water-cooled model											
9 421 401	**W40**	-40 ... +250	±0.01...±0.05	5.7" TFT / ±0.01	1.2 | 1.2	1.0	0.8	0.55	0.3	0.06	2.7

All data refers to the nominal voltage of 230 V, nominal frequency of 50 Hz and ambient temperature of +20 °C. Cooling capacity measured at max. pump stage. All pump data refers to a bath fluid with a specific density of 1 kg/dm³.

Useful features make your day-to-day routine easier!

| W40

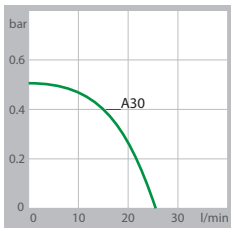
Applications

Jacketed reactors, reactor systems and autoclaves for polymerization, polycondensation, etc., combinatorial chemistry, reaction blocks, organic synthesis, reaction calorimeters, distillation, pilot plants, semiconductor industry

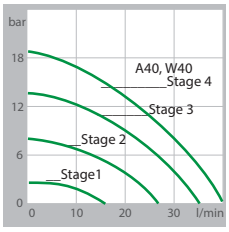
Additional benefits and features:

- Heating capacity of 2.7 kW
- Ambient temperature range +5 °C to +40 °C
- Space optimized design creates more room directly next to the units
- Integrated 5.7" industrial color touchscreen displays the most critical information and enables simple fingertip control
- Extensive warning, protective, and monitoring functions with detailed plain-language displays
- ICC cascade control for extraordinary precision, temperature stability of ±0.01 °C
- Integrated programmer with real-time clock
- Filling level indicator and pump capacity displayed electronically
- Powerful circulating pumps, electronically adjustable in stages or by setting the pressure value (except A30)
- Interface for SD memory card
- Connections for USB, Ethernet, RS232, alarm output, Modbus
- Optional analog connections, RS485, Profibus DP

Pump capacity



Pump capacity



Pump capacity Flow rate l/min	Pump capacity Pressure bar	Cooling of compressor	Noise level (distance 1 m) dbA, max.	Process volume min. (active heat exchanger volume) liters	Internal usable expansion vol. liters	Weight kg	Dimensions W x L x H cm
25	0.5	single stage, air-cooled	54	2.4 (1.4)	1.5	62	25 x 59 x 62
16 ... 40	0.3 ... 1.7	single stage, air-cooled	55	3.5 (1.7)	2.7	79	33 x 59 x 67
16 ... 40	0.3 ... 1.7	single stage, water-cooled	53	3.5 (1.7)	2.7	78	33 x 59 x 67

| A45

PRESTO® Models

for working temperature range -45 °C to +250 °C

Highly dynamic systems of the PRESTO® series employ cutting-edge temperature control technology. Numerous new functions make day-to-day tasks easier and deliver the thermodynamic power needed to handle even the most demanding external applications. See for yourself what makes these dynamic temperature control systems so unique and take advantage of their special features.

- Extremely fast cool-down and heat-up times
- Wide working temperature ranges without changing the bath fluid
- Ultra-fast compensation of exothermic and endothermic reactions

JULABO Order No.	JULABO Model	Working temp. range °C	Temperature stability °C	Temp. display/ Resolution °C	Cooling capacity kW Bath fluid: JULABO Thermal HL | Ethanol +200 | +20	0	-10	-20	-30	-40 °C	Heating capacity kW
9 420 452	**A45**	-45 ... +250	±0.05...±0.1	5.7" TFT / ±0.01	3.4 | 3.5	3.3	2.6	1.8	1.0	0.3	6
9 420 452.T	**A45t**	-45 ... +250	±0.05...±0.1	5.7" TFT / ±0.01	3.4 | 3.5	3.3	2.6	1.8	1.0	0.3	12

All data refers to the nominal voltage of 400 V, nominal frequency of 50 Hz and ambient temperature of +20 °C. Cooling capacity measured at max. pump stage. All pump data refers to a bath fluid with a specific density of 1 kg/dm³.

| A45t

Applications

Jacketed reactors, reactor systems and autoclaves for polymerization, polycondensation, etc., combinatorial chemistry, reaction blocks, organic synthesis, reaction calorimeters, distillation, pilot plants, semiconductor industry, material and stress tests

Additional benefits and features:

- Heating capacity up to12 kW
- Ambient temperature range +5 °C to +40 °C
- Space optimized design
- Integrated 5.7" industrial color touchscreen displays the most critical information and enables simple fingertip control
- Extensive warning, protective, and monitoring functions with detailed plain-language displays
- ICC cascade control for extraordinary precision, temperature stability of ±0.05 ... 0.1 °C
- Integrated programmer with real-time clock
- Filling level indicator and pump capacity displayed electronically
- Powerful circulating pumps, electronically adjustable in stages or by setting the pressure value
- Interface for SD memory card
- Connections for USB, Ethernet, RS232, alarm output, Modbus
- Optional analog connections, RS485, Profibus DP

Pump capacity Flow rate l/min	Pump capacity Pressure bar	Cooling of compressor	Noise level (distance 1 m) dbA, max.	Process volume min. (active heat exchanger volume) liters	Internal usable expansion vol. liters	Weight kg	Dimensions W x L x H cm
35 ... 76	0.48 ... 3.2	single stage, air-cooled	69	7.5 (3.5)	7.5	210	53 x 66.5 x 126
35 ... 76	0.48 ... 3.2	single stage, air-cooled	69	7.5 (3.5)	7.5	210	53 x 66.5 x 126

| A80 / A80t

| W80 / W80t

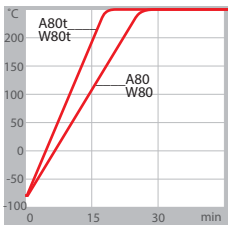
PRESTO® Models

for working temperature range -80 °C to +250 °C

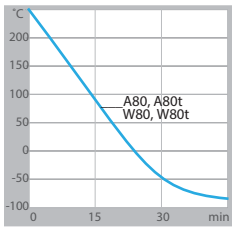
Highly dynamic temperature systems of the PRESTO® series deliver cutting-edge temperature control technology. Numerous new functions make day-to-day tasks easier and deliver the thermodynamic power needed to handle even the most demanding external applications. See for yourself what makes these dynamic temperature control systems so unique and take advantage of their special features.

- Extremely fast cool-down and heat-up times
- Wide working temperature range without changing the bath fluid
- Very fast compensation of exothermic and endothermic reactions

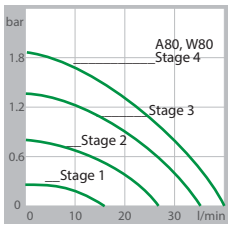
Heat-up time
Bath fluid: Thermal HL



Cool-down time
Bath fluid: Thermal HL

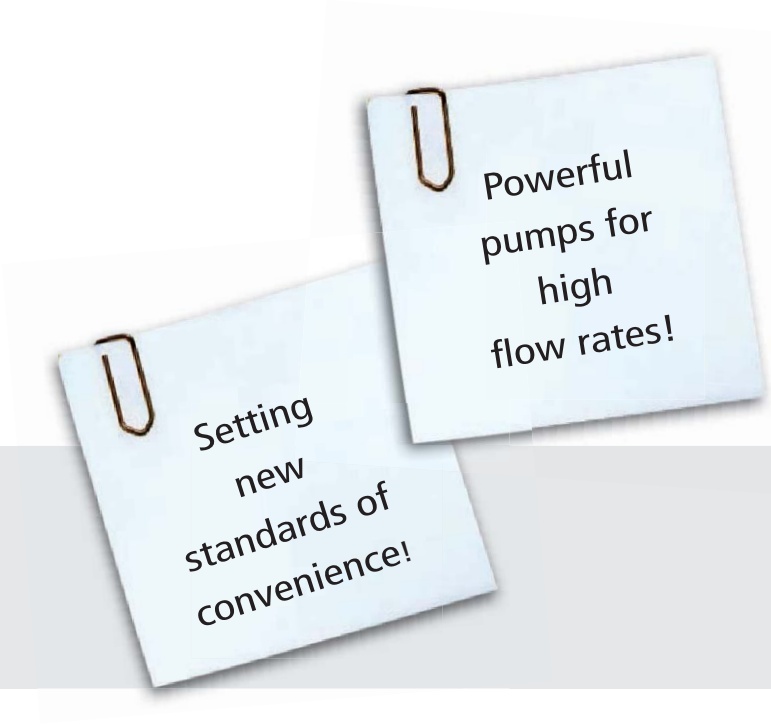


Pump capacity



JULABO Order No.	JULABO Model	Working temp. range °C	Temperature stability °C	Temp. display/ Resolution °C	Cooling capacity kW Bath fluid: JULABO Thermal HL | Ethanol +200	+20	0	-20	-40	-60	-80 °C	Heating capacity kW
9 420 801	**A80**	-80 ... +250	±0.01...±0.05	5.7" TFT / ±0.01	1.2 | 1.2	1.2	1.1	1.1	0.65	0.1	1.8
9 420 801.T	**A80t**	-80 ... +250	±0.01...±0.05	5.7" TFT / ±0.01	1.2 | 1.2	1.2	1.1	1.1	0.65	0.1	3.4
water-cooled models												
9 421 801	**W80**	-80 ... +250	±0.01...±0.05	5.7" TFT / ±0.01	1.2 | 1.2	1.2	1.1	1.1	0.65	0.1	1.8
9 421 801.T	**W80t**	-80 ... +250	±0.01...±0.05	5.7" TFT / ±0.01	1.2 | 1.2	1.2	1.1	1.1	0.65	0.1	3.4

All data refers to the nominal voltage of 230 V, nominal frequency of 50 Hz (respectively 400 V, 3Ph., 50 Hz) and ambient temperature of +20 °C. Cooling capacity measured at max. pump stage. All pump data refers to a bath fluid with a specific density of 1 kg/dm³.



Applications

Jacketed reactors, reactor systems and autoclaves for polymerization, polycondensation, etc., combinatorial chemistry, reaction blocks, organic synthesis, reaction calorimeters, distillation, pilot plants, semiconductor industry, material and stress tests

Additional benefits and features:

- Heating capacity up to 3.4 kW
- Ambient temperature range +5 °C to +40 °C
- Space optimized design creates more room directly next to the units
- Integrated 5.7" industrial color touchscreen displays the most critical information and enables simple fingertip control
- Extensive warning, protective, and monitoring functions with detailed plain-language displays
- ICC cascade control for extraordinary precision, temperature stability of ±0.01 °C
- Integrated programmer with real-time clock
- Filling level indicator and pump capacity displayed electronically
- Powerful circulating pumps, electronically adjustable in stages or by setting the pressure value
- Interface for SD memory card
- Connections for USB, Ethernet, RS232, alarm output, Modbus
- Optional analog connections, RS485, Profibus DP

Pump capacity Flow rate l/min	Pressure bar	Cooling of compressor	Noise level (distance 1 m) dbA, max.	Process volume min. (active heat exchanger volume) liters	Internal usable expansion vol. liters	Weight kg	Dimensions W x L x H cm
16 ... 40	0.3 ... 1.7	2-stage, air-cooled	68	3.9 (1.7)	5.6	164	43 x 65 x 126
16 ... 40	0.3 ... 1.7	2-stage, air-cooled	68	3.9 (1.7)	5.6	167	43 x 65 x 126
16 ... 40	0.3 ... 1.7	2-stage, water-cooled	64	3.9 (1.7)	5.6	159	43 x 65 x 126
16 ... 40	0.3 ... 1.7	2-stage, water-cooled	64	3.9 (1.7)	5.6	162	43 x 65 x 126

| A85 / A85t

PRESTO® Models

for working temperature range -85 °C to +250 °C

Highly dynamic temperature systems of the PRESTO® series deliver cutting-edge temperature control technology. Numerous new functions make day-to-day tasks easier and deliver the thermodynamic power needed to handle even the most demanding external applications. See for yourself what makes these dynamic temperature control systems so unique and take advantage of their special features.

- Extremely fast cool-down and heat-up times
- Wide working temperature range without changing the bath fluid
- Very fast compensation of exothermic and endothermic reactions

JULABO Order No.	JULABO Model	Working temp. range °C	Temperature stability °C	Temp. display/ Resolution °C	Cooling capacity kW Bath fluid: JULABO Thermal HL | Ethanol +200	+20	0	-20	-40	-60	-80 °C	Heating capacity kW
9 420 852	**A85**	-85 … +250	±0.05 … ±0.1	5.7" TFT / ±0.01	2.8 | 2.5	2.4	2.4	2.4	2.2	0.4	6
9 420 852.T	**A85t**	-85 … +250	±0.05 … ±0.1	5.7" TFT / ±0.01	2.8 | 2.5	2.4	2.4	2.4	2.2	0.4	15
water-cooled models											
9 421 852	**W85**	-85 … +250	±0.05 … ±0.1	5.7" TFT / ±0.01	2.8 | 2.5	2.4	2.4	2.4	2.2	0.4	6
9 421 852.T	**W85t**	-85 … +250	±0.05 … ±0.1	5.7" TFT / ±0.01	2.8 | 2.5	2.4	2.4	2.4	2.2	0.4	15

All data refers to the nominal voltage of 400 V, nominal frequency of 50 Hz (respectively 400 V, 3Ph., 50 Hz) and ambient temperature of +20 °C. Cooling capacity measured at max. pump stage. All pump data refers to a bath fluid with a specific density of 1 kg/dm³.

| W85 / W85t

Applications

Jacketed reactors, reactor systems and autoclaves for polymerization, polycondensation, etc., combinatorial chemistry, reaction blocks, organic synthesis, reaction calorimeters, distillation, pilot plants, semiconductor industry, material and stress tests

Additional benefits and features:

- Heating capacity up to 15 kW
- Ambient temperature range +5 °C to +40 °C
- Space optimized design
- Integrated 5.7" industrial color touchscreen displays the most critical information and enables simple fingertip control
- Extensive warning, protective, and monitoring functions with detailed plain-language displays
- ICC cascade control for extraordinary precision, temperature stability of ±0.05 ... ±0.1 °C
- Integrated programmer with real-time clock
- Filling level indicator and pump capacity displayed electronically
- Powerful circulating pumps, electronically adjustable in stages or by setting the pressure value
- Interface for SD memory card
- Connections for USB, Ethernet, RS232, alarm output, Modbus
- Optional analog connections, RS485, Profibus DP

Pump capacity Flow rate l/min	Pump capacity Pressure bar	Cooling of compressor	Process volume min. (active heat exchanger volume) liters	Internal usable expansion vol. liters	Weight kg	Dimensions W x L x H cm
35 … 80	0.48 … 3.2	2-stage, air-cooled	9.5 (5)	7	365	61 x 108 x 125
35 … 80	0.48 … 3.2	2-stage, air-cooled	9.5 (5)	7	365	61 x 108 x 125
35 … 80	0.48 … 3.2	2-stage, water-cooled	9.5 (5)	7	335	61 x 84.5 x 125
35 … 80	0.48 … 3.2	2-stage, water-cooled	9.5 (5)	7	335	61 x 84.5 x 125

| W91 models

PRESTO® Models

Power packages for demanding temperature tasks
for working temperature range -91 °C to +250 °C

Power packages

The PRESTO® W91 Highly Dynamic Temperature Control Systems are among the most powerful units available. Their impressive power is harnessed by cutting-edge control technology. The W91 delivers extraordinary heating, cooling, and pumping performance. But it also comes with the functions and features that make the generation of PRESTO® so unique.

- Extremely fast cool-down and heat-up times
- Wide working temperature range without changing the bath fluid
- Very fast compensation of exothermic and endothermic reactions
- Unsurpassed power and efficiency

JULABO Order No.	JULABO Model	Working temp. range °C	Temperature stability °C	Cooling capacity kW Bath fluid: JULABO Thermal HL | Ethanol +200	+100	+20	0	-20	-40	-60	-80 °C	Heating capacity kW
9 421 912	**W91**	-91 ... +250	±0.05 ... ±0.2	11.0	11.0 |	11.0	10.0	9.5	9.0	6.5	1.5	12
9 421 912.T	**W91t**	-91 ... +250	±0.05 ... ±0.2	11.0	11.0 |	11.0	10.0	9.5	9.0	6.5	1.5	24
9 421 912.TT	**W91tt**	-91 ... +250	±0.05 ... ±0.2	11.0	11.0 |	11.0	10.0	9.5	9.0	6.5	1.5	36
9 421 913	**W91x**	-91 ... +250	±0.05 ... ±0.2	11.0	11.0 |	11.0	10.0	9.5	9.0	6.5	1.5	12
9 421 913.T	**W91tx**	-91 ... +250	±0.05 ... ±0.2	11.0	11.0 |	11.0	10.0	9.5	9.0	6.5	1.5	24
9 421 913.TT	**W91ttx**	-91 ... +250	±0.05 ... ±0.2	11.0	11.0 |	11.0	10.0	9.5	9.0	6.5	1.5	36

All data refers to the nominal voltage of 400 V, nominal frequency of 50 Hz and ambient temperature of +20 °C. Cooling capacity measured at max. pump stage. All pump data refers to a bath fluid with a specific density of 1 kg/dm³.

Applications

Reactor systems, mini plants, pilot plants, Kilo labs, process technology, vacuum chambers, material and stress tests, component testing, simulation of environmental conditions and much more

Additional benefits and features:

- Powerful circulating pumps, electronically adjustable in stages or by setting the pressure value. Choose between a magnetically coupled centrifugal pump or a magnetically coupled gear pump for pressures up to 5.5 bar and virtually constant flow rate at any pressure
- Integrated 5.7" industrial color touchscreen displays all essential information and enables simple fingertip control
- Extensive warning, protection, and monitoring functions with detailed self-explanatory messages
- ICC cascade control for extraordinary precision, temperature stability ±0.05 °C … ±0.2 °C
- Ambient temperature range +5 °C to +40 °C
- Integrated programmer with real-time clock
- Filling level indicator and pump capacity displayed electronically
- Interface for SD memory card
- Connections for USB, Ethernet, RS232, alarm output, Modbus
- Optional analog connections, RS485, Profibus DP

Pump capacity Flow rate l/min	Pressure bar	Viscosity max. cSt.	Cooling of compressor	Process volume min. (active heat exchanger volume) liters	Internal usable expansion vol. liters	Weight kg	Dimensions W x L x H cm
26 ... 80	0.5 ... 3.0	50	2-stage, water-cooled	28 (16)	40	770	95 x 127 x 190
26 ... 80	0.5 ... 3.0	50	2-stage, water-cooled	28 (16)	40	780	95 x 127 x 190
26 ... 80	0.5 ... 3.0	50	2-stage, water-cooled	28 (16)	40	790	95 x 127 x 190
18 ... 70	0.8 ... 5.5	70	2-stage, water-cooled	28 (16)	40	785	95 x 127 x 190
18 ... 70	0.8 ... 5.5	70	2-stage, water-cooled	28 (16)	40	795	95 x 127 x 190
18 ... 70	0.8 ... 5.5	70	2-stage, water-cooled	28 (16)	40	805	95 x 127 x 190

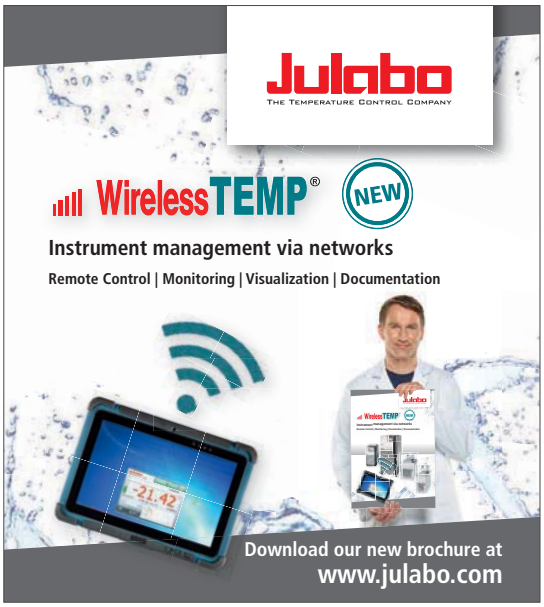
| W92 models

PRESTO® Models

Power packages for demanding temperature tasks
for working temperature range -92 °C to +250 °C

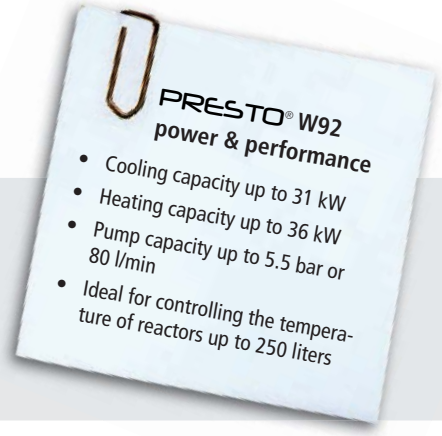
The PRESTO® W92 Highly Dynamic Temperature Control Systems are among the most powerful units available. Their impressive power is harnessed by cutting-edge control technology. The W92 delivers extraordinary heating, cooling, and pumping performance. But it also comes with the functions and features that make the new generation of PRESTO® so unique.

- Extremely fast cool-down and heat-up times
- Wide working temperature range without changing the bath fluid
- Very fast compensation of exothermic and endothermic reactions
- Unsurpassed power and efficiency



JULABO Order No.	JULABO Model	Working temp. range °C	Temperature stability °C	Cooling capacity kW Bath fluid: JULABO Thermal HL | Ethanol +200	+100	+20	0	-20	-40	-60	-80 °C	Heating capacity kW
9 421 922	**W92**	-92 ... +250	±0.05 ... ±0.2	31.0	29.0	19.0	15.5	9.5	9.0	6.5	1.5	12
9 421 922.T	**W92t**	-92 ... +250	±0.05 ... ±0.2	31.0	29.0	19.0	15.5	9.5	9.0	6.5	1.5	24
9 421 922.TT	**W92tt**	-92 ... +250	±0.05 ... ±0.2	31.0	29.0	19.0	15.5	9.5	9.0	6.5	1.5	36
9 421 923	**W92x**	-92 ... +250	±0.05 ... ±0.2	31.0	29.0	19.0	15.5	9.5	9.0	6.5	1.5	12
9 421 923.T	**W92tx**	-92 ... +250	±0.05 ... ±0.2	31.0	29.0	19.0	15.5	9.5	9.0	6.5	1.5	24
9 421 923.TT	**W92ttx**	-92 ... +250	±0.05 ... ±0.2	31.0	29.0	19.0	15.5	9.5	9.0	6.5	1.5	36

All data refers to the nominal voltage of 400 V, nominal frequency of 50 Hz and ambient temperature of +20 °C. Cooling capacity measured at max. pump stage. All pump data refers to a bath fluid with a specific density of 1 kg/dm³.



Applications

Reactor systems, mini plants, pilot plants, Kilo labs, process technology, vacuum chambers, material and stress tests, component testing, simulation of environmental conditions and much more

Additional benefits and features:

- Powerful circulating pumps, electronically adjustable in stages or by setting the pressure value
  Choose between a magnetically coupled centrifugal pump or a magnetically coupled gear pump for pressures up to 5.5 bar and virtually constant flow rate at any pressure
- Integrated 5.7" industrial color touchscreen displays all essential information and enables simple fingertip control
- Extensive warning, protection, and monitoring functions with detailed self-explanatory messages
- ICC cascade control for extraordinary precision, temperature stability ±0.05 °C … ±0.2 °C
- Ambient temperature range +5 °C to +40 °C
- Integrated programmer with real-time clock
- Filling level indicator and pump capacity displayed electronically
- Interface for SD memory card
- Connections for USB, Ethernet, RS232, alarm output, Modbus
- Optional analog connections, RS485, Profibus DP

Pump capacity Flow rate l/min	Pressure bar	Viscosity max. cSt.	Cooling of compressor	Process volume min. (active heat exchanger volume) liters	Internal usable expansion vol. liters	Weight kg	Dimensions W x L x H cm
26 ... 80	0.5 ... 3.0	50	2-stage, water-cooled	28 (16)	40	785	95 x 127 x 190
26 ... 80	0.5 ... 3.0	50	2-stage, water-cooled	28 (16)	40	795	95 x 127 x 190
26 ... 80	0.5 ... 3.0	50	2-stage, water-cooled	28 (16)	40	805	95 x 127 x 190
18 ... 70	0.8 ... 5.5	70	2-stage, water-cooled	28 (16)	40	800	95 x 127 x 190
18 ... 70	0.8 ... 5.5	70	2-stage, water-cooled	28 (16)	40	810	95 x 127 x 190
18 ... 70	0.8 ... 5.5	70	2-stage, water-cooled	28 (16)	40	820	95 x 127 x 190

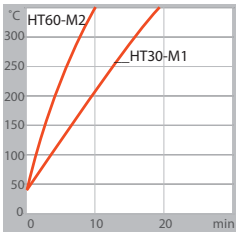
Forte HT

for working temperature range +70 °C to +400 °C

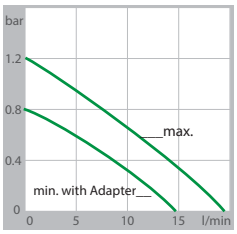
High temperature circulators of the Forte HT series are designed for temperature control in closed external systems. These compact units have a closed design that prevents the escape of oil vapors even at high temperatures.

- High heating capacity up to 7 kW of power for fast heat-up times
- Strong pump capacity, adjustable (with optional adapter)
- Small filling volume
- Cooling water connection when working at high temperatures
- Wide working temperature range without changing of bath fluids
- Prolonged lifetime of bath fluid
- Integrates easily into mini plant installations

Heat-up time
Bath fluid: Thermal H350



Pump capacity
Bath fluid: Thermal H350



JULABO Order No.	JULABO Model	Working temp. range °C	Temperature stability °C	Temp. display/ Resolution °C	Display filling volume	Heating capacity kW
9 800 031	**HT30-M1**	+70 ... +400	±0.01 ... ±0.1	LED LCD / ±0.1	VFD Display	3
9 800 062	**HT60-M2**	+70 ... +400	±0.01 ... ±0.1	LED LCD / ±0.1	VFD Display	7
9 800 063	**HT60-M3**	+70 ... +400	±0.01 ... ±0.1	LED LCD / ±0.1	VFD Display	6
9 800 035	**HT30-M1-C.U.**	+40 ... +400	±0.01 ... ±0.1	LED LCD / ±0.1	VFD Display	3
9 800 065	**HT60-M2-C.U.**	+40 ... +400	±0.01 ... ±0.1	LED LCD / ±0.1	VFD Display	7
9 800 066	**HT60-M3-C.U.**	+40 ... +400	±0.01 ... ±0.1	LED LCD / ±0.1	VFD Display	6

Control unit M2 |

| HT60 Circulator with C.U. cooling unit

Forte HT with cooling unit

for working temperature range +40 °C to +400 °C

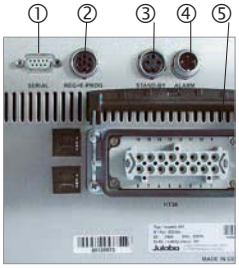
The Forte HT models with C.U. cooling unit are suitable for temperature control tasks at +40 °C and above. Running tap water through the cooling unit permits rapid cool-down across the entire temperature range. As a result, exothermic reactions can be immediately counteracted, even at high temperatures.

Additional benefit of models with C.U. cooling unit:

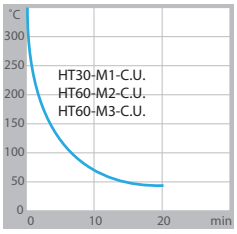
- Controlled cooling water supply for temperature applications from +40 °C
- High cooling capacities up to 15 kW (at +20 °C cooling water)
- Rapid cooling
- Rapid temperature control of exothermic and endothermic reactions

Connections Control unit

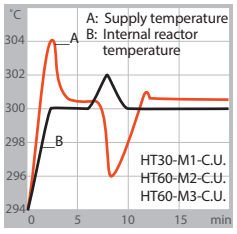
① RS232 / RS485
② Analog input
③ Standby input
④ Alarm output
⑤ Connector for control cable to HT Circulator



Cool-down time
Bath fluid: Thermal H350

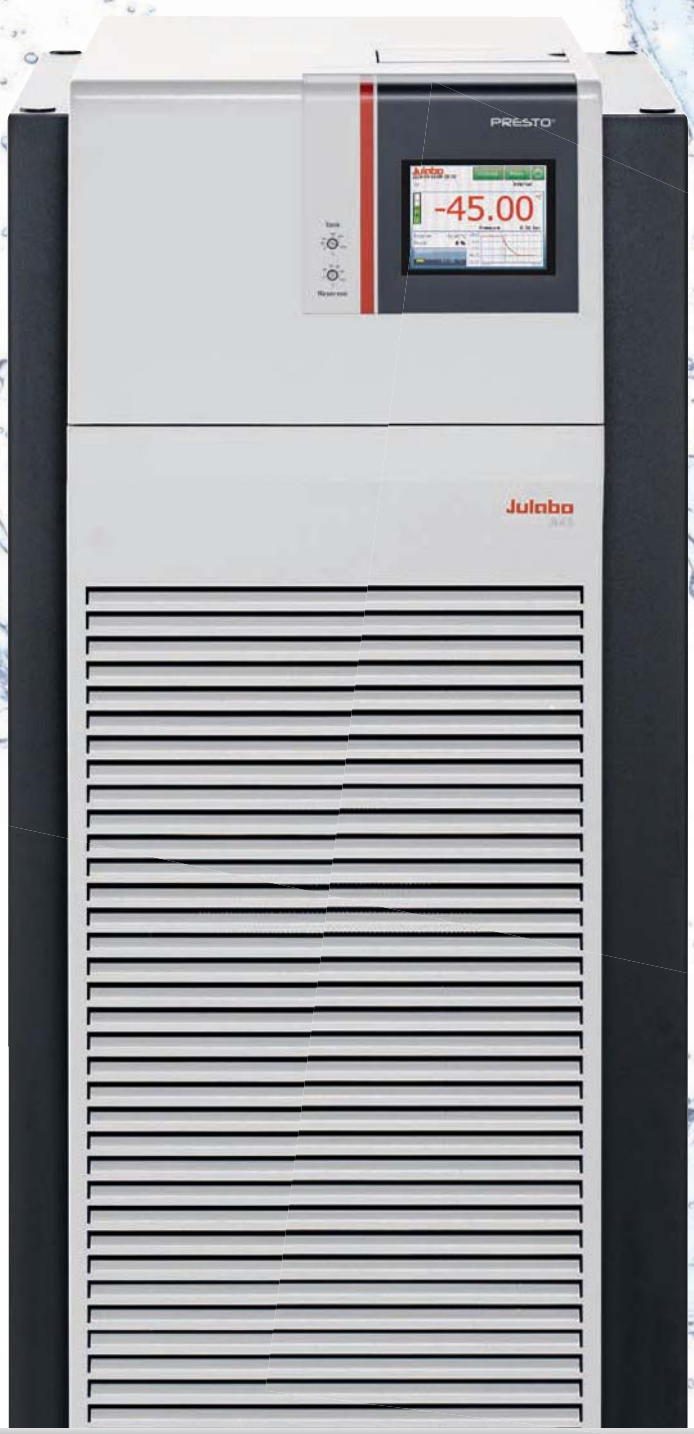


Reaction compensation
5 liter reactor
Bath fluid: Thermal H350



Cooling capacity (Water +20 °C) kW, max.	Pump capacity Flow rate l/min.	Pressure bar	Filling volume liters	Power requirement V / Hz	Dimensions Circulator (W x L x H) cm	Dimensions Control unit (W x L x H) cm
--	14 ... 18	0.8 - 1.2	2	230 / 50 or 230 / 60	23 x 23 x 58	25 x 25 x 18
--	14 ... 18	0.8 - 1.2	2	3 x 400 / 50	23 x 23 x 58	25 x 25 x 18
--	14 ... 18	0.8 - 1.2	2	3 x 208 / 60	23 x 23 x 58	25 x 25 x 18
15	14 ... 18	0.8 - 1.2	2	230 / 50 or 230 / 60	43 x 23 x 58	25 x 25 x 18
15	14 ... 18	0.8 - 1.2	2	3 x 400 / 50	43 x 23 x 58	25 x 25 x 18
15	14 ... 18	0.8 - 1.2	2	3 x 208 / 60	43 x 23 x 58	25 x 25 x 18

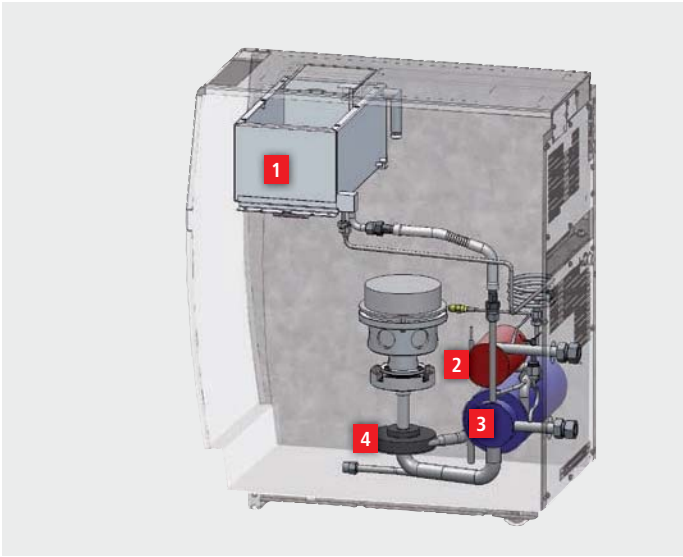
User Benefits and **Helpful Tips**



The Power of Thermodynamics

Each JULABO Temperature Control System is a unified package of intelligent control electronics, adaptive heating output, refined refrigeration engineering, and optimized fluid dynamics. The end result is maximum efficiency and high temperature stability. Cooling power adjusts to the actual requirements of the application. Stepper-motor expansion valves with cutting-edge control technologies achieve high power density and efficiency. Highly Dynamic Temperature Control Systems are additionally characterized by a closed-loop design.

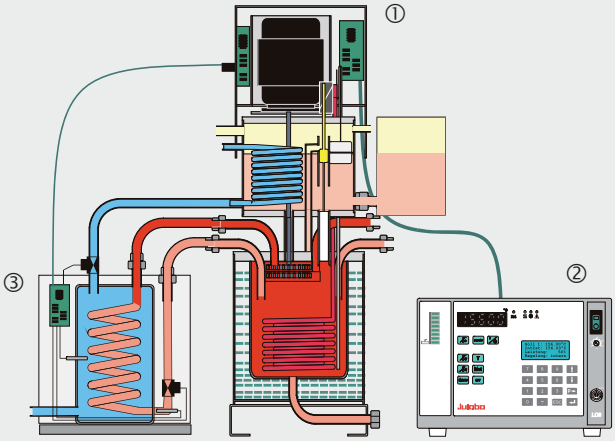
The PRESTO® Principle: Expansion vessel ①, Heat exchanger Heating section ②, Heat exchanger Refrigeration section ③, Circulating pump ④



Forte HT with cooling unit

Forte HT high temperature circulators are designed for applications that require very high temperatures, as high as +400 °C. Thanks to their closed-loop design, they emit no oil odor, even at high temperatures. These units have automated heat-up, filling, and degassing features.

The figure at right shows the major components of high-temperature circulators, with complete separation of circulator ①, control electronics ②, and C.U. cooling unit ③.



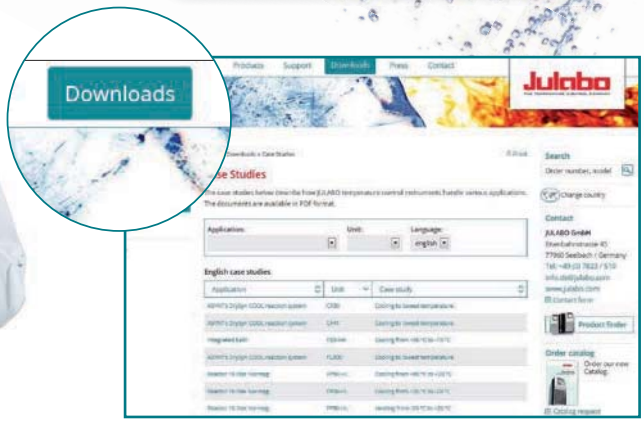
NEW

Julabo
THE TEMPERATURE CONTROL COMPANY

Case Studies

JULABO equipment has to run through a unique quality process. To proof this outstanding performance our products are being tested in real-life environment within everyday test scenarios.

Within our case studies you can find a lot of information about test setups and visualized results. Take our exerience to optimize your setups and learn how to achieve the best test results with your JULABO equipment.



New Casestudies at http://case-studies.julabo.com

For the PRESTO® series

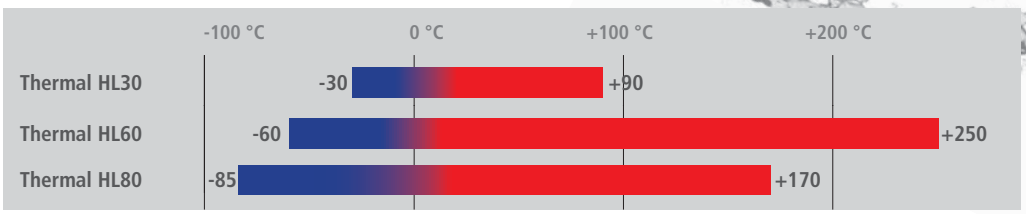
Accessories

JULABO *Thermal* Bath fluids for the new PRESTO®

Benefits

- Wide temperature ranges
- Low viscosity
- High stability
- Good heat conductivity
- Minimum odor
- Low corrosion tendency
- Low toxicity
- Long shelf life

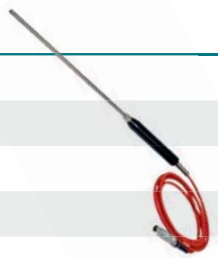
Working temperature ranges



JULABO Description		Thermal HL30	Thermal HL60	Thermal HL80
JULABO Order No.	**10 liters**	**8 940 138**	**8 940 140**	**8 940 120**
	5 liters	**8 940 139**	**8 940 141**	**8 940 121**
Suitable for		A30, A40, W40, A45, A45t	all PRESTO® Models	all PRESTO® Models
Working temperature range	°C	-30 ... +90	-60 ... +250	-85 ... +170
Flash point	°C	--	+124	>+63
Fire point	°C	--	+142	+112
Viscosity, kinetic at +20 °C	mm²/s	4.07	5.66	3.21
Density at +20 °C	g/cm³	1.08	0.92	0.89
Pour point	°C	-70	-100	<-108
Boiling point	°C	+108	+288	+230
Ignition temperature	°C	+430	+350	+335
Color		light yellow	clear	clear

External Pt100 sensors

JULABO Order No.	Description	Suitable for
8 981 003	200 x 6 mm dia., stainless steel, 1.5 m cable	PRESTO®
8 981 006	20 x 2 mm dia., stainless steel, 1.5 m cable	PRESTO®
8 981 010	300 x 6 mm dia., stainless steel, 1.5 m cable	PRESTO®
8 981 017	200 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	PRESTO®
8 981 015	300 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	PRESTO®
8 981 013	600 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	PRESTO®
8 981 016	900 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	PRESTO®
8 981 014	1200 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	PRESTO®
8 981 021	M+R in-line Pt100 sensor, 2 fittings M24x1.5 male, 1.5 m cable	PRESTO®
8 981 022	M+R in-line Pt100 sensor, 2 fittings M30x1.5 male, 1.5 m cable	PRESTO®
8 981 023	M+R in-line Pt100 sensor, 2 fittings M38x1.5 male, 1.5 m cable	PRESTO®
8 981 103	Extension cable 3.5 m for Pt100 sensor	PRESTO®
8 900 106	Module with Pt100 connection socket for second external Pt100 sensor	PRESTO® (except A30)



Metal tubing flexible, triple insulated, -100 to +350 °C

JULABO Order No.	Description	Suitable for
8 930 261	1.0 m Metal tubing, 2 fittings M24x1.5 female	PRESTO®
8 930 262	1.5 m Metal tubing, 2 fittings M24x1.5 female	PRESTO®
8 930 263	2.0 m Metal tubing, 2 fittings M24x1.5 female	PRESTO®
8 930 264	3.0 m Metal tubing, 2 fittings M24x1.5 female	PRESTO®
8 930 271	1.0 m Metal tubing, 2 fittings M30x1.5 female	PRESTO®
8 930 272	1.5 m Metal tubing, 2 fittings M30x1.5 female	PRESTO®
8 930 273	2.0 m Metal tubing, 2 fittings M30x1.5 female	PRESTO®
8 930 274	3.0 m Metal tubing, 2 fittings M30x1.5 female	PRESTO®
8 930 275	5.0 m Metal tubing, 2 fittings M30x1.5 female	PRESTO®
8 930 282	1.5 m Metal tubing, 2 fittings M38x1.5 female	PRESTO®
8 930 283	2.0 m Metal tubing, 2 fittings M38x1.5 female	PRESTO®
8 930 284	3.0 m Metal tubing, 2 fittings M38x1.5 female	PRESTO®
8 930 285	5.0 m Metal tubing, 2 fittings M38x1.5 female	PRESTO®

Silicone, PTFE and Flexible braided tubing

8 930 331	1.5 m Flexible braided tubing G 3/4" (-30...+100 °C) with 2 straight fittings with cap nut for cooling water connection	Water-cooled units
8 930 332	2 m Flexible braided tubing G 3/4" (-30...+100 °C) with 2 straight fittings with cap nut for cooling water connection	Water-cooled units
8 930 341	1.5 m Flexible braided tubing G 3/4" (-30...+100 °C) 1 straight fitting / 1 elbow fitting 90°, both with cap nut for cooling water connection	Water-cooled units
8 930 342	1.5 m Flexible braided tubing G 3/4" (-30...+100 °C) 1 straight fitting / 1 elbow fitting 90°, both with cap nut for cooling water connection	Water-cooled units

Interfaces / Software & Hardware

JULABO Order No.	Description	Suitable for
8 900 105	Electronic module with analog connectors (Input, Output, Standby-In)	PRESTO®
8 900 020	Profibus DP Interface	PRESTO®
8 900 024	RS485 Interface	PRESTO®
8 980 771	Pressure sensor, 2 fittings M24x1.5 male (-95 ... +250 °C)	PRESTO®
8 980 772	Pressure sensor, 2 fittings M30x1.5 male (-95 ... +250 °C)	PRESTO®
8 980 773	Pressure sensor, 2 fittings M38x1.5 male (-95 ... +250 °C)	PRESTO®
8 970 815	Sight glass, -100…+280 °C, PN16/Class 230, 2 fittings M30x1.5 male	PRESTO®
8 901 102	*EasyTEMP* Software (free of charge at www.julabo.com)	PRESTO®
8 901 105	*EasyTEMP* Professional Software, incl. USB-Dongle	PRESTO®

Booster Pump

8 810 020	Booster Pump (magnetically coupled), 2.1 bar	PRESTO®

Adapters / Valves / Connectors, etc.

JULABO Order No.	Description	Suitable for
8 890 110	Adapter M24x1.5 male to M24x1.5 male	PRESTO®
8 890 111	Adapter M30x1.5 male to M30x1.5 male	PRESTO®
8 890 112	Adapter M38x1.5 male to M38x1.5 male	PRESTO®
8 890 120	2 Elbow fittings 90°, M24x1.5 female/male	PRESTO®
8 890 121	2 Elbow fittings 90°, M30x1.5 female/male	PRESTO®
8 890 122	2 Elbow fittings 90°, M38x1.5 female/male	PRESTO®
8 890 034	2 Adapters M30x1.5 female to M16x1 male, stainless steel	PRESTO®
8 890 035	2 Adapters M30x1.5 male to M16x1 male, stainless steel	PRESTO®
8 890 052	2 Adapters M24x1.5 female to M16x1 male	PRESTO®
8 890 053	2 Adapters M24x1.5 female to NPT 1/4" female	PRESTO®
8 890 054	2 Adapters M24x1.5 female to NPT 3/8" female	PRESTO®
8 890 055	2 Adapters M24x1.5 female to NPT 1/2" female	PRESTO®
8 890 056	2 Adapters M24x1.5 female to NPT 3/4" female	PRESTO®
8 890 057	2 Adapters M24x1.5 female to NPT 1" female	PRESTO®
8 890 058	2 Adapters M24x1.5 female to NPT 1/4" male	PRESTO®
8 890 059	2 Adapters M24x1.5 female to NPT 3/8" male	PRESTO®
8 890 060	2 Adapters M24x1.5 female to NPT 1/2" male	PRESTO®
8 890 061	2 Adapters M24x1.5 female to NPT 3/4" male	PRESTO®
8 890 062	2 Adapters M24x1.5 female to NPT 1" male	PRESTO®
8 890 063	2 Adapters M24x1.5 female to tube 1/4"	PRESTO®
8 890 064	2 Adapters M24x1.5 female to tube 3/8"	PRESTO®
8 890 065	2 Adapters M24x1.5 female to tube 1/2"	PRESTO®
8 890 066	2 Adapters M24x1.5 female to tube 1"	PRESTO®
8 890 067	2 Adapters M24x1.5 female/M24x1.5 female	PRESTO®
8 890 068	2 Adapters M24x1.5 female/M30x1.5 male	PRESTO®
8 890 069	2 Adapters M24x1.5 male/M30x1.5 female	PRESTO®
8 890 070	2 Adapters M24x1.5 female/M30x1.5 female	PRESTO®
8 890 071	2 Adapters M24x1.5 male/M16x1 female	PRESTO®
8 890 072	2 Adapters M24x1.5 male to barbed fitting 12 mm	PRESTO®
8 890 080	2 Adapters M30x1.5 female/M38x1.5 male	PRESTO®
8 890 081	2 Adapters M30x1.5 male/M38x1.5 female	PRESTO®
8 890 082	2 Adapters M30x1.5 female/M38x1.5 female	PRESTO®
8 890 083	2 Adapters M30x1.5 female to NPT 3/4" male	PRESTO®
8 890 084	2 Adapters M30x1.5 female to NPT 3/4" female	PRESTO®
8 890 085	2 Adapters M30x1.5 female to NPT 1" male	PRESTO®
8 890 086	2 Adapters M30x1.5 female to NPT 1" female	PRESTO®
8 890 087	2 Adapters M30x1.5 female to tube 1"	PRESTO®
8 890 088	2 Adapters M30x1.5 female/M30x1.5 female	PRESTO®
8 890 089	2 Adapters M38x1.5 female/M38x1.5 female	PRESTO®
8 890 100	2 Adapters M38x1.5 female to NPT 1" male	PRESTO®
8 890 101	2 Adapters M38x1.5 female to NPT 1" female	PRESTO®
8 890 102	2 Adapters M38x1.5 female to NPT 1 1/4" male	PRESTO®
8 890 103	2 Adapters M38x1.5 female to NPT 1 1/4" female	PRESTO®
8 890 104	2 Adapters M38x1.5 female to tube 1"	PRESTO®

Adapters / Valves / Connectors, etc.

JULABO Order No.	Description	Suitable for
8 890 130	Twin distributing adapter M24x1.5, isolated, 1x M24x1.5 female to 2x M24x1.5 male	PRESTO®
8 890 131	Quad distributing adapter M24x1.5, isolated, 1x M24x1.5 female to 4x M24x1.5 male	PRESTO®
8 890 132	Twin distributing adapter M30x1.5, isolated, 1x M30x1.5 female to 2x M30x1.5 male	PRESTO®
8 890 133	Quad distributing adapter M30x1.5, isolated, 1x M30x1.5 female to 4x M30x1.5 male	PRESTO®
8 890 134	Twin distributing adapter M38x1.5, isolated, 1x M38x1.5 female to 2x M38x1.5 male	PRESTO®
8 890 135	Quad distributing adapter M38x1.5, isolated, 1x M38x1.5 female to 4x M38x1.5 male	PRESTO®
8 890 140	Twin distributing adapter M24x1.5, 1x M24x1.5 female to 2x M24x1.5 male	PRESTO®
8 890 141	Quad distributing adapter M24x1.5, 1x M24x1.5 female to 4x M24x1.5 male	PRESTO®
8 890 142	Twin distributing adapter M30x1.5, 1x M30x1.5 female to 2x M30x1.5 male	PRESTO®
8 890 143	Quad distributing adapter M30x1.5, 1x M30x1.5 female to 4x M30x1.5 male	PRESTO®
8 890 144	Twin distributing adapter M38x1.5, 1x M38x1.5 female to 2x M38x1.5 male	PRESTO®
8 890 145	Quad distributing adapter M38x1.5, 1x M38x1.5 female to 4x M38x1.5 male	PRESTO®
8 970 495	2 Collar nuts M24x1.5	PRESTO®
8 970 496	2 Collar nuts M30x1.5	PRESTO®
8 970 497	2 Collar nuts M38x1.5	PRESTO®
8 970 851	Shut-off valve M24x1.5 female/male, -40 °C ... +200 °C	PRESTO®
8 970 852	Shut-off valve M30x1.5 female/male, -40 °C ... +200 °C	PRESTO®
8 970 853	Shut-off valve M38x1.5 female/male, -30 °C ... +200 °C	PRESTO®

External expansion vessels

8 970 832	External expansion vessel, 3 liters	A30, A40, W40
8 970 833	External expansion vessel, 3 liters	A80, W80

Filter mats

8 970 920	Filter mat	A30
8 970 921	Filter mat	A40
8 970 922	Filter mat	A80
8 970 923	Filter mat	A45

Cooling water connection

8 930 312	1 m Reinforced tubing (pressure proof) ½" inner dia.	W40, W80
8 970 482	2 Tube clamps	W40, W80
8 920 000	Particle filter for cooling water circuit	W40, W80, W85, W91, W92

Connection plugs

JULABO Order No.	Description	Suitable for
8 980 131	External Pt100 connector	PRESTO®
8 980 133	Standby connector 3 pin	PRESTO® with electronic module 8 900 105
8 980 135	Alarm connector 5 pin	PRESTO®
8 980 136	REG+EPROG connector 6 pin	PRESTO® with electronic module 8 900 105

Forte HT

Accessories

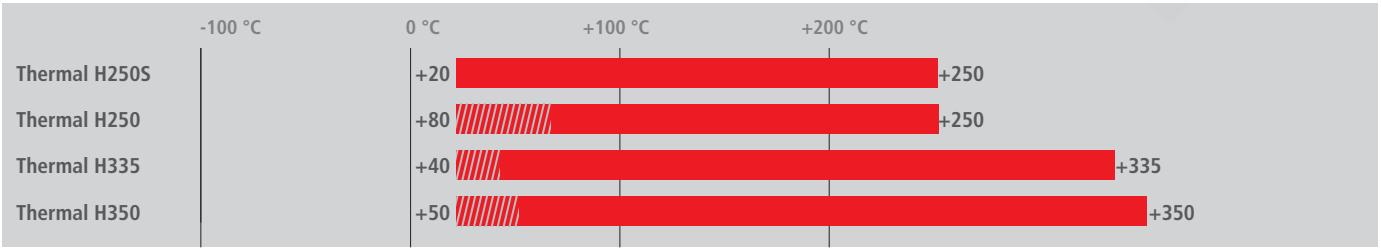
JULABO *Thermal* Bath fluids

JULABO *Thermal* bath fluids are carefully selected and subjected to long-term testing. They are ideally suited to temperature control tasks in specialized systems and help ensure safe and reliable operation. Selection of a suitable bath fluid is of critical importance for achieving the best possible results. Viscosity, oxidation properties, and heat conductivity of Thermal bath fluids are specially adapted for use with JULABO temperature control units.

Benefits

- Wide temperature ranges
- Low viscosity
- High stability
- Good heat conductivity
- Minimum odor
- Low corrosion tendency
- Low toxicity
- Long shelf life

Working temperature ranges



JULABO Description		Thermal H250S	Thermal H250	Thermal H335 [1]	Thermal H350
JULABO Order No.	**10 liters** **5 liters**	**8 940 132** **8 940 133**	**--** **8 940 117**	**8 940 130** **8 940 131**	**--** **8 940 111**
Models/Working temperature ranges and specifications					
Forte HT		**+20 ... +250**	**+80 ... +250**	**+40 ... +335**	**+50 ... +350**
Flash point	°C	+230	+292	+184	+200
Fire point	°C	+264	+334	+190	+235
Viscosity, kinetic at 20 °C	mm²/s	22.3	115	131	48.3
Density at +20 °C	g/cm³	0.95	1.06	1.01	1.04
Pour point	°C	-70	-50	-32	-34
Boiling point	°C	+424	+315	+340	+371
Ignition temperature	°C	+385	+400	+373	+450
Color		light brown	clear	light yellow	clear

[1] Therminol® 66, trademark of Solutia, Inc.

External Pt100 sensors

JULABO Order No.	Description	Suitable for
8 981 003	200 x 6 mm dia., stainless steel, 1.5 m cable	Forte HT
8 981 006	20 x 2 mm dia., stainless steel, 1.5 m cable	Forte HT
8 981 010	300 x 6 mm dia., stainless steel, 1.5 m cable	Forte HT
8 981 017	200 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	Forte HT
8 981 015	300 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	Forte HT
8 981 013	600 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	Forte HT
8 981 016	900 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	Forte HT
8 981 014	1200 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	Forte HT
8 981 020	M+R in-line Pt100 sensor, 2 fittings M16x1 male	Forte HT
8 981 103	Extension cable 3.5 m for Pt100 sensor	Forte HT

Accessories for Forte HT

JULABO Order No.	Description	Suitable for
9 790 100	C.U. cooling unit	Forte HT
8 970 802	Adapter for pump pressure reduction (0.8 bar)	Forte HT
8 970 811	Level indicator (with sight glass)	Forte HT
8 970 435	Handle for stand rod attachment	Forte HT
8 970 801	Expansion vessel (1 liter)	Forte HT
8 980 125	Extension cable 5 m (control electronics for HT circulator)	Forte HT
8 980 704	Solenoid valve for cooling water with 2 m tubing 8 mm inner dia.	Forte HT (without C.U. cooling unit)

NEW

Julabo
THE TEMPERATURE CONTROL COMPANY

Download our new brochure at
www.julabo.com

Metal tubing

JULABO Order No.	Description	Suitable for
Metal tubing flexible, triple insulated, -100 to +350 °C		
8 930 209	0.5 m Metal tubing, 2 fittings M16x1 female	Forte HT
8 930 210	1.0 m Metal tubing, 2 fittings M16x1 female	Forte HT
8 930 211	1.5 m Metal tubing, 2 fittings M16x1 female	Forte HT
8 930 214	3.0 m Metal tubing, 2 fittings M16x1 female	Forte HT
Metal tubing flexible, insulated, -50 to +200 °C		
8 930 220	0.5 m Metal tubing, 2 fittings M16x1 female	Forte HT
8 930 221	1.0 m Metal tubing, 2 fittings M16x1 female	Forte HT
8 930 222	1.5 m Metal tubing, 2 fittings M16x1 female	Forte HT
8 930 223	3.0 m Metal tubing, 2 fittings M16x1 female	Forte HT
Accessories for connecting metal tubing		
8 970 443	Adapter M16x1 male to M16x1 male	Forte HT

Adapters / Valves / Connectors, etc.

JULABO Order No.	Description	Suitable for
8 970 457	Shut-off valve for loop circuit (-30 °C... +200 °C), M16x1	Forte HT
8 970 490	2 Collar nuts M16x1 female	Forte HT
8 970 442	2 Elbow fittings 90°, M16x1 female/male, side length 2x54 mm	Forte HT
8 970 448	2 Elbow fittings 90°, M16x1 female/male, side length 2 x 54 mm / 2 x 120 mm	Forte HT
8 890 004	2 Adapters M16x1 female to NPT 1/4" male	Forte HT
8 890 005	2 Adapters M16x1 female to NPT 1/4" female	Forte HT
8 890 006	2 Adapters M16x1 female to NPT 3/8" male	Forte HT
8 890 007	2 Adapters M16x1 female to NPT 3/8" female	Forte HT
8 890 008	2 Adapters M16x1 female to NPT 1/2" male	Forte HT
8 890 009	2 Adapters M16x1 female to NPT 1/2" female	Forte HT
8 890 010	2 Adapters M16x1 male to NPT 1/4" female	Forte HT
8 891 008	1 Adapter M16x1 male to BSP 1/2" female	Forte HT
8 891 009	1 Adapter M16x1 male to BSP 3/4" female	Forte HT
8 890 011	2 Adapters M16x1 female to tube 1/4" male	Forte HT
8 890 012	2 Adapters M16x1 female to tube 3/8" male	Forte HT
8 890 013	2 Adapters M16x1 female to tube 1/2" male	Forte HT
8 890 024	2 Adapters M16x1 female to M16x1 female	Forte HT

Connection plugs

JULABO Order No.	Description	Suitable for
8 980 131	External Pt100 connector	Forte HT
8 980 133	Standby connector 3 pin	Forte HT
8 980 135	Alarm connector 5 pin	Forte HT
8 980 136	REG+EPROG connector 6 pin	Forte HT

SUPERIOR TEMPERATURE TECHNOLOGY FOR A BETTER LIFE

The Power of Thermodynamics™

PRESTO®

Highly Dynamic Temperature Control Systems. Powerful pumps. Working temperature range of -92 °C to +250 °C. Robust and reliable in ambient temperatures up to +40 °C. Straightforward operation and monitoring with a color industrial grade touch screen.

Julabo

THE TEMPERATURE CONTROL COMPANY

WWW.JULABO.COM

Chill
Environmentally Friendly
and **Economical**

Recirculating Coolers

JULABO recirculating coolers can handle virtually any cooling requirements in laboratories or industrial environments. Their efficiency makes them an environmentally-friendly and economical alternative to cooling with tap water. Compact models from JULABO are ideal for placement on or underneath a laboratory bench. JULABO offers several powerful models with up to 20 kW of cooling capacity for applications in industrial environments.

Exclusive to JULABO instruments
JULABO recirculating coolers have no ventilation slits on the side panels. This means that you can save space by placing several units directly next to each other.

- Environmentally-friendly operation with low energy consumption
- Ergonomic design and easy operation
- Working temperature range from -25 °C to +130 °C
- Cooling capacity of up to 20 kW
- Splash-proof keypad
- Large and bright LED display
- Alarm output (potential free contact) and RS232 interface on virtually all models
- Filling level indicator
- Higher-powered models equipped with a pressure gauge
- Circulating pumps with flow rates up to 80 l/min and pressure up to 6 bar
- Easy filling
- Drain tap easily accessible
- No side vents, instruments can be placed right next to each other
- Air- and water-cooled models available
- All wetted parts made of stainless steel or high grade plastic (except FC-T models)

F / AWC models

F Models

-10 °C ... +40 °C

3 models with 250, 500, and 1000 W of cooling capacity

Recirculating coolers of the F series are low-cost units designed especially for simple cooling tasks where reliability in continuous operation is a high priority.

AWC100

+20 °C ... +40 °C

Air/water recirculating cooler

Ideal for simple cooling tasks: Model AWC100 will save you money and space.

FL models

FL Models

-20 °C ... +40 °C

22 models with up to 20 kW of cooling capacity for laboratory and industrial applications

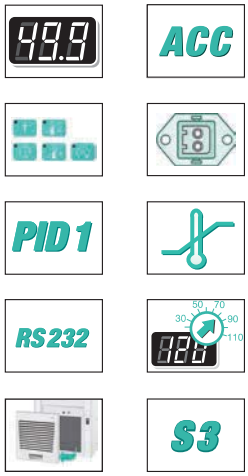
The removable venting grid makes it easy to clean the condenser. As a result, the unit always delivers its full cooling capacity.

FC models

FC Models

-25 °C ... +80 °C

11 models for heating and cooling tasks
Cooling capacity of up to 2.5 kW



on models FC1200T,
FC1600T, FCW2500T

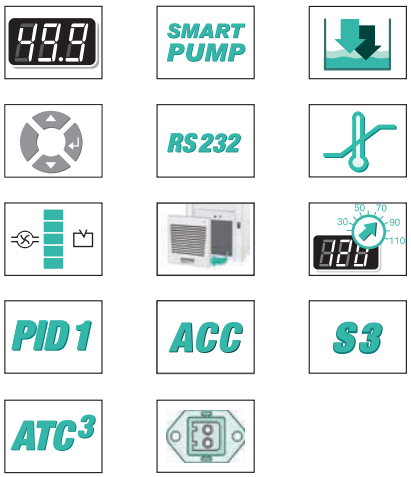
Sophisticated electronics with digital and analog connections for RS232, standby, alarm, external Pt100 sensor, temperature recorder, programming.

SemiChill models

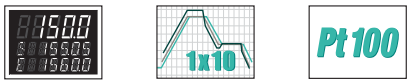
SC Models

-20 °C ... +130 °C

5 basic models for industrial applications
up to 10 kW of cooling capacity, customizable



on models with Professional electronics



Available with optional DI-filter or micro-filter housing.

Please refer to the fold-out page for the description of icons above.

F250

F500

F1000

Compact Recirculating Coolers

for simple cooling tasks

JULABO F models require very little space and have very low procurement costs.

Recirculating coolers of the F Series are a great way to replace costly tap water and are ideal for basic cooling tasks.

- Environmentally-friendly operation with low energy consumption
- Compact design
- Splash-proof membrane keypad with LED temperature display
- Straightforward filling and draining
- Filling level indicator
- May be used with water, water/glycol, JULABO Thermal G

Ideal for cooling:

- Rotary evaporators
- Kjeldahl instruments
- Measurement cells
- Automated analysis systems
- CCD cameras
- Polarimeters, refractometers
- Condensers for glass apparatus
- Calorimeters
- Soxhlet apparatus

JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stability °C	Cooling capacity kW +20	+10	+5	0	-5 °C	Pump capacity Flow rate/pressure l/min	bar	Filling volume liters	Dimensions W x L x H cm
9 620 025	**F250**	-10 ... +40	±0.5	0.25	0.22	0.21	0.18	0.09	15	0.35	1.7 ... 2.6	24 x 40 x 52
9 620 050	**F500**	0 ... +40	±0.5	0.50	0.40	0.30	0.25	--	24	0.5	5 ... 7.5	37.5 x 44 x 59
9 620 100	**F1000**	0 ... +40	±0.5	1.00	0.70	0.55	0.35	--	23	1.0	7 ... 9.5	37.5 x 49 x 64

Included with F250: 2 barbed fittings for tubing 8 and 10 mm inner dia. (pump connections M10x1 female)
Included with F500, F1000: 2 each barbed fittings for tubing 8 and 12 mm inner dia. (pump connections M16x1 male)

| AWC100

Applications

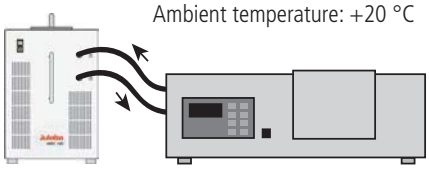
Cooling of Peltier elements, particularly for automated analysis units and CCD cameras, polarimeters, refractometers, electrophoresis chambers, condensers for glass apparatus.

Air-to-Water Recirculating Cooler AWC100

for working near ambient temperature

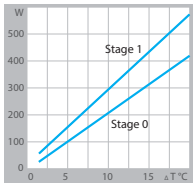
The JULABO AWC100 requires very little space and has a very low procurement cost.

- Plug it in, switch it on, and you're ready to go
- Whisper quiet
- Saves energy (compressor-free design)
- Water loop cooled by fan air
- Uniform pump capacity
- Cooling performance adjustable in two stages
- Filling level indicator



AWC100 is designed to cool water in closed loops. The unit permanently removes heat from water as it flows through the machine.

Example for determining cooling capacity
Ambient temperature: +20 °C
Return temperature: +30 °C
ΔT: +10 °C
Cooling capacity (Stage 1): 300 W



JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stability °C	Cooling capacity[1] W +20	+10	+5 °C		Pump capacity Flow rate/pressure l/min	bar	Filling volume liters	Dimensions W x L x H cm
9 630 100	**AWC100**	+20 ... +40	--	400 550	220 300	120 180	(stage 0) (stage 1)	2.9	0.2	0.9	20 x 34 x 30

[1] Cooling capacity depends on the temperature differential between the return flow and the ambient environment.
Included: 2 barbed fittings for tubing 8 and 10 mm inner dia. (pump connections M10x1 female)


| FL300


| FL601


| FL1201
FL1703

FL Recirculating Coolers

compact models with up to 1.7 kW cooling capacity
for installation below a lab bench

The compact FL models are suited for a wide variety of cooling tasks. Installation under a lab bench saves valuable space.

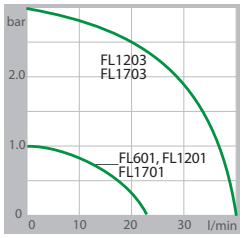
- Easy filling from above
- Feed pressure indicator (FL1201 and above) and filling level indicator (all models)
- Large compensation volume
- Circulating pumps designed for continuous operation
- Permissible return temperature up to +80 °C
- Low liquid level protection with visual and acoustic signals
- May be used with water, water/glycol, and JULABO *Thermal* bath fluids
- Overload protection for pump motor and cooling machine

Practical recessed grip

Rollers add flexibility

Drain tap located behind removable venting grid.

Pump capacity
Bath fluid: Water



JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stability °C	Cooling capacity kW +20	+10	0	-10	-20 °C	Pump capacity Flow rate/pressure l/min	bar	Filling volume liters	Dimensions W x L x H cm
9 660 003	**FL300**	-20 ... +40	±0.5	0.3	0.25	0.2	0.15	0.1	15	0.35	3 ... 4.5	25 x 50 x 60
9 661 006	**FL601**	-20 ... +40	±0.5	0.6	0.5	0.4	0.33	0.2	23	1.0	5.5 ... 8	32 x 50 x 60
9 661 012	**FL1201**	-20 ... +40	±0.5	1.2	1.0	0.9	0.6	0.3	23	1.0	12 ... 17	50 x 76 x 64
9 663 012	**FL1203**	-20 ... +40	±0.5	1.2	0.9	0.8	0.5	0.2	40	0.5 - 3.0	12 ... 17	50 x 76 x 64
9 661 017	**FL1701**	-20 ... +40	±0.5	1.7	1.5	1.1	0.85	0.4	23	1.0	12 ... 17	50 x 76 x 64
9 663 017	**FL1703**	-20 ... +40	±0.5	1.7	1.4	1.0	0.75	0.3	40	0.5 - 3.0	12 ... 17	50 x 76 x 64
water-cooled models												
9 671 017	**FLW1701**	-20 ... +40	±0.5	1.7	1.5	1.1	0.85	0.4	23	1.0	12 ... 17	50 x 76 x 64
9 673 017	**FLW1703**	-20 ... +40	±0.5	1.7	1.4	1.0	0.75	0.3	40	0.5 - 3.0	12 ... 17	50 x 76 x 64

Included: 2 each barbed fittings for tubing 8 and 12 mm inner dia. (pump connections M16x1 male)
2 barbed fittings for tubing 3/4" inner dia. with models FL1203 and FL(W)1703 (pump connections G 3/4" male)

| FL4006

Applications

Rotary evaporators, bio-reactors/fermenters, Soxhlet apparatus, distillation systems, vacuum systems, gas chromatographs, spectrometers, semiconductor applications, metering and adhesive technology, diffusion pumps, mass spectrometers, electron microscopes

FL Recirculating Coolers

powerful models with up to 4.3 kW cooling capacity, tower version

The FL models shown here have higher cooling capacity, powerful circulating pumps, and internal bath volumes of up to 30 liters.

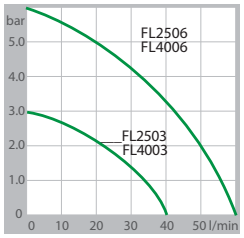
- Powerful circulating pumps up to 60 l/min; 6 bar
- By-pass valve to adjust pump pressure
- Rollers make it easy to move the units
- Early warning function when condenser is dirty
- Overload protection for pump motor and cooling machine
- Stainless steel bath tank
- *BlackBox* function with error memory for remote diagnosis

Filling level indicator
all models

Pump pressure adjustment
models from 3 bar pressure

Pump pressure indicator
on FL1201 and above

Pump capacity
Bath fluid: Water



JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stability °C	Cooling capacity kW +20	+10	0	-10	-20 °C	Pump capacity Flow rate/pressure l/min	bar	Filling volume liters	Dimensions W x L x H cm
9 663 025	**FL2503**	-20 ... +40	±0.5	2.5	2.2	1.5	1.2	0.55	40	0.5 - 3.0	24 ... 30	60 x 76 x 115
9 666 025	**FL2506**	-15 ... +40	±0.5	2.5	1.9	1.0	0.3	--	60	0.5 - 6.0	24 ... 30	60 x 76 x 115
9 663 040	**FL4003**	-20 ... +40	±0.5	4.0	3.4	2.4	1.5	0.65	40	0.5 - 3.0	24 ... 30	60 x 76 x 115
9 666 040	**FL4006**	-20 ... +40	±0.5	4.0	2.9	1.9	0.9	0.05	60	0.5 - 6.0	24 ... 30	60 x 76 x 115
water-cooled models												
9 673 025	**FLW2503**	-20 ... +40	±0.5	2.7	2.5	1.7	1.0	0.4	40	0.5 - 3.0	24 ... 30	60 x 76 x 115
9 676 025	**FLW2506**	-15 ... +40	±0.5	2.5	1.9	1.0	0.3	--	60	0.5 - 6.0	24 ... 30	60 x 76 x 115
9 673 040	**FLW4003**	-20 ... +40	±0.5	4.3	3.0	2.2	1.3	0.45	40	0.5 - 3.0	24 ... 30	60 x 76 x 115
9 676 040	**FLW4006**	-15 ... +40	±0.5	4.0	3.0	1.7	0.7	--	60	0.5 - 6.0	24 ... 30	60 x 76 x 115

Included: 2 barbed fittings for tubing 3/4" inner dia. with models FL/FLW2503 and FL/FLW4003 (pump connections G 3/4" male)
2 barbed fittings for tubing 1" inner dia. with models FL/FLW2506 and FL/FLW4006 (pump connections G 1 1/4" male)

FL7006 to FLW11006

Applications

Electron microscopes, lasers, mills, and kneaders, pilot plants, plastics industry, drying of gases, general industrial applications

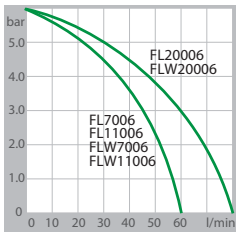
FL Recirculating Coolers

very powerful units, up to 20 kW cooling capacity

The powerful FL models are suitable for a wide range of cooling tasks in industrial environments, such as removal of large process heat.

- High cooling capacity of up to 20 kW
- Powerful circulating pumps
- Large power reserves with all applications
- Low water consumption on FLW models
- Overload protection for pump motor and cooling machine
- *BlackBox* function with error memory for remote diagnosis

Pump capacity
Bath fluid: Water



JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stability °C	Cooling capacity kW +20	+10	0	-10	-20 °C	Pump capacity Flow rate/pressure l/min	bar	Filling volume liters	Dimensions W x L x H cm
9 666 070	**FL7006**	-20 ... +40	±0.5	7.0	6.4	5.1	3.0	1.55	60	0.5 - 6.0	39... 47	78 x 85 x 148
9 666 110	**FL11006**	-20 ... +40	±0.5	11.0	9.0	7.5	5.0	3.0	60	0.5 - 6.0	39... 47	78 x 85 x 148
9 666 200	**FL20006**	-25 ... +40	±0.5	20.0	15.0	10.0	6.0	2.5	80	0.8 - 6.0	15... 37	95 x 115 x 161
water-cooled models												
9 676 070	**FLW7006**	-20 ... +40	±0.5	7.4	7.0	5.5	3.1	1.3	60	0.5 - 6.0	39... 47	78 x 85 x 148
9 676 110	**FLW11006**	-20 ... +40	±0.5	11.5	9.0	7.3	4.8	2.7	60	0.5 - 6.0	39... 47	78 x 85 x 148
9 676 200	**FLW20006**	-25 ... +40	±0.5	20.0	15.0	12.0	7.0	3.0	80	0.8 - 6.0	15... 37	95 x 115 x 161

Included: 2 barbed fittings for tubing 1" inner dia. (pump connections G 1 1/4" male)

| FC600S

| FC1600T

FC Recirculating Coolers

for heating and cooling tasks

The FC models have high temperature stability and are also equipped with integrated heating.

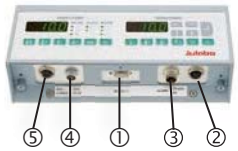
- Expanded working temperatures up to +80 °C
- Two LED displays
- Adjustable feed/return temperature ratio
- Filling level indicator

Models FC1200T, FC1600T, FCW2500T

- Connection for external Pt100 sensor
- Analog connections for external setpoint device and temperature recorder

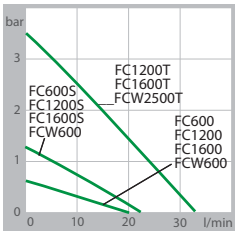
Digital/analog connections

① RS232 interface
② Standby input
③ Alarm output



Pump capacity

Bath fluid: Water



FC1200T, FC1600T, FCW2500T also include:

④ External Pt100 sensor connection
⑤ Connections for external setpoint device, temperature recorder

JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stability °C	Heat cap. kW	Cooling capacity kW +20	+10	+5	- 10	-20 °C	Pump capacity Flow rate/pressure l/min	bar	Pressure display bar	Filling volume liters	Dimensions W x L x H cm
9 600 060	**FC600**	-20 ... +80	±0.2	1.2	0.6	0.47	0.4	0.21	--	20	0.5	--	6 ... 8	35 x 54 x 49
9 600 063	**FC600S**	-10 ... +80	±0.2	1.2	0.5	0.37	0.3	0.1	--	22	1.2	--	6 ... 8	35 x 54 x 49
9 600 120	**FC1200**	-20 ... +80	±0.2	1.2	1.3	0.95	0.75	0.37	--	20	0.5	0 ... 2.5	8 ... 11	46 x 61 x 49
9 600 123	**FC1200S**	-15 ... +80	±0.2	1.2	1.2	0.85	0.65	0.26	--	22	1.2	0 ... 2.5	8 ... 11	46 x 61 x 49
9 600 160	**FC1600**	-20 ... +80	±0.2	1.2	1.65	1.25	1.0	0.47	--	20	0.5	0 ... 2.5	8 ... 11	46 x 61 x 49
9 600 163	**FC1600S**	-15 ... +80	±0.2	1.2	1.55	1.15	0.9	0.36	--	22	1.2	0 ... 2.5	8 ... 11	46 x 61 x 49
9 600 126	**FC1200T**	-10 ... +80	±0.2	1.2	1.1	0.75	0.55	0.15	--	28	3.5	0 ... 4.0	8 ... 11	46 x 61 x 49
9 600 166	**FC1600T**	-15 ... +80	±0.2	1.2	1.45	1.05	0.8	0.25	--	28	3.5	0 ... 4.0	8 ... 11	46 x 61 x 49
water-cooled models														
9 601 060	**FCW600**	-20 ... +80	±0.2	1.2	0.6	0.47	0.4	0.21	--	20	0.5	--	6 ... 8	35 x 54 x 49
9 601 063	**FCW600S**	-10 ... +80	±0.2	1.2	0.5	0.37	0.3	0.1	--	22	1.2	--	6 ... 8	35 x 54 x 49
9 601 256	**FCW2500T**	-25 ... +80	±0.2	1.2	2.5	2.0	1.8	0.8	0.25	28	3.5	0 ... 4.0	8 ... 11	46 x 61 x 49

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

SC2500a
SC2500w

Applications

Semiconductor industry (etching process, stainless steel chucks, PVD, sputtering, wet benches), packaging industry, plastics industry, metering and adhesive technology, jacketed reaction vessels, Kilo labs, pilot plants

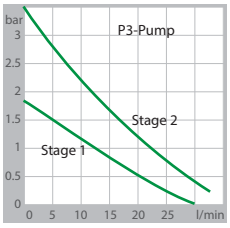
SemiChill Recirculating Coolers

for extreme requirements in industrial environments

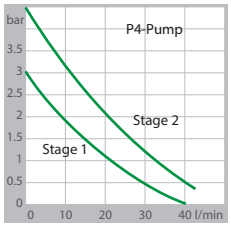
JULABO's SemiChill models are characterized by maximum reliability in continuous operation and under harsh environmental conditions. All parts that contact the bath fluid are made of stainless steel or high-quality plastic. The modular concept permits custom configurations according to your requirements.

- Five basic models, individually configurable
- High cooling capacities and strong pumps
- Optional integrated heater with up to 12 kW of power
- Seal-free immersion pumps, maintenance-free and electronically adjustable
- Pressure and filling level indicator
- Sealed filling port (70 mm dia.)
- Overload protection for pump motor and cooling machine

Pump capacity P3
Bath fluid: Water



Pump capacity P4
Bath fluid: Water



JULABO Order No.	JULABO Model	Working [1] temp. range °C	Temp. stability °C	Cooling capacity kW +20	0	-10 °C	Pump type/ pump capacity	Filling volume liters	Dimensions W x L x H cm
	SC2500a	-20 ... +80	±0.1	2.5	1.5	0.9		21 ... 33	49 x 62 x 105
see	**SC2500w**	-20 ... +80	±0.1	2.5	1.5	0.9	see	21 ... 33	49 x 62 x 105
order index	**SC5000a**	-20 ... +130	±0.1	5.0	2.5	1.2	order index	43 ... 60	59 x 67 x 112
on following	**SC5000w**	-20 ... +130	±0.1	5.0	2.5	1.2	on following	43 ... 60	59 x 67 x 112
pages	**SC10000w**	-20 ... +130	±0.1	10.0	5.0	2.5	pages	43 ... 60	59 x 67 x 112

Models with designation "a" = air-cooled; "w" = water-cooled

Pump connections: NPT ¾" male

[1] Maximum working temperature range (standard working temperature range +5... +35 °C)

Operating and control electronics

Optional features

	Eco	Professional
		
Multi-Display (LED) temperature display	•	
VFD Comfort Display with simultaneous display of 3 values		•
Keypad, splash-proof	•	•
PID temperature control	•	•
3-point calibration	•	•
Pump capacity adjustable in stages	•	•
RS232 interface	•	•
`Stakei´ connection for power supply (e. g. for shut-off valve)	•	•
Early warning system for low level, high and low temperature limits	•	•
High-temperature cut-off adjustable via display	•	•
Low liquid level protection with cut-off function	•	•
Classification III (DIN 12876-1)	•	•
Remote diagnosis function via integrated *BlackBox*	•	•
Connector for external Pt100 sensor for measuring and controlling the external system		•
Integrated programmer with real-time clock for 1x10 program steps		•
Quantitative resistivity measurement and display, range 0.5...5 Ω/cm		•
Flow measurement and status display (factory pre-set limit value)*		•
Options for ***Professional*** electronics		
Scalable analog interfaces (E-PROG input, standby input, alarm output)	--	Optional
RS485 Interface	--	Optional

Professional* electronics with analog interface module requiered. Flow sensor not included.

Additional options for working temperature, pump capacity, and heater

Model	Working temperature ranges				Circulating pumps		Heaters			
	Standard +5...+35 °C	Low temp. -20...+35 °C	Low/high temp I -20...+80 °C	Low/high temp II -20...130 °C	P3 33 l/min 3.5 bar	P4 43 l/min 4.3 bar	H0 no Heater	H1 1 kW	H5 5 kW	H12 12 kW
SC2500a SC2500w	✓	Optional	Optional	--	✓	--	✓	Optional	--	--
SC5000a, SC5000w SC10000w	✓	Optional	Optional	Optional	✓	Optional[1)]	✓	--	Optional	Optional

✓ This feature is already included with the basic model

[1)] Cooling capacity reduced by 0.2 kW

Filter housings

Please specify the desired filter option when ordering. Retrofitting is not possible. Housing is mounted on the right side of the unit.

D1	DI-filter housing, plastic (up to +35 °C), incl. cartridge
D2	DI-filter housing, stainless steel (up to +90 °C), incl. cartridge
M1	Micro-filter housing, plastic (up to +35 °C), w/o cartridge
M2	Micro-filter housing, stainless steel (up to +130 °C), w/o cartridge

Filter housings for DI-filter and micro-filter (optional)

Order index

for custom configuration

Select one of five basic models and then the options of your choice. Please use the order index shown below to create the order number for your instrument.

The following example is for model SC5000a:

9 5	2	1	050	07	P3	H0	D0	M1
9 5	x	x	xxx .	xx .	xx	xx	. xx	xx
	a	b	c	d	e	f	g	h

Custom configuration

- > Electronics
- > Pumps
- > Temperature range
- > Interfaces
- > Heating power
- > Filters

a

9 5 **x** x xxx . xx . xx xx . xx xx

Keypad and control electronics

0 Eco
2 Professional
3 Professional with analog interface module
7 Professional with RS485 interface

b

9 5 x **x** xxx . xx . xx xx . xx xx

Working temperature range

0 Standard (+5 ... +35 °C)
1 LowTemp (-20 ... +35 °C)
2 Low/HighTemp I (-20 ... +80 °C)
3 Low/HighTemp II (-20 ... +130 °C)

c

9 5 x x **xxx** . xx . xx xx . xx xx

Basic model

025 SC2500a
026 SC2500w
050 SC5000a
051 SC5000w
101 SC10000w

d

9 5 x x xxx . **xx** . xx xx . xx xx

Voltage version[1)]

03 230 V / 50 Hz
07 400 V (3 Ph.) / 50 Hz
13 208-230 V / 60 Hz
16 208-230 V (3 Ph.) / 60 Hz

e

9 5 x x xxx . xx . **xx** xx . xx xx

Circulating pump (pump type, pump capacity)

P3 33 l/min. - 3.5 bar max.
P4 43 l/min. - 4.3 bar max.

f

9 5 x x xxx . xx . xx **xx** . xx xx

Integrated Heater

H0 Without heater
H1 Heating capacity 1 kW
H5 Heating capacity 5 kW
H12 Heating capacity 12 kW

g

9 5 x x xxx . xx . xx xx . **xx** xx

DI-filter housing

D0 Without DI-filter housing
D1 DI-filter housing, plastic (to +35 °C max.)
D2 DI-filter housing, stainless steel (to +90 °C max.)

h

9 5 x x xxx . xx . xx xx . xx **xx**

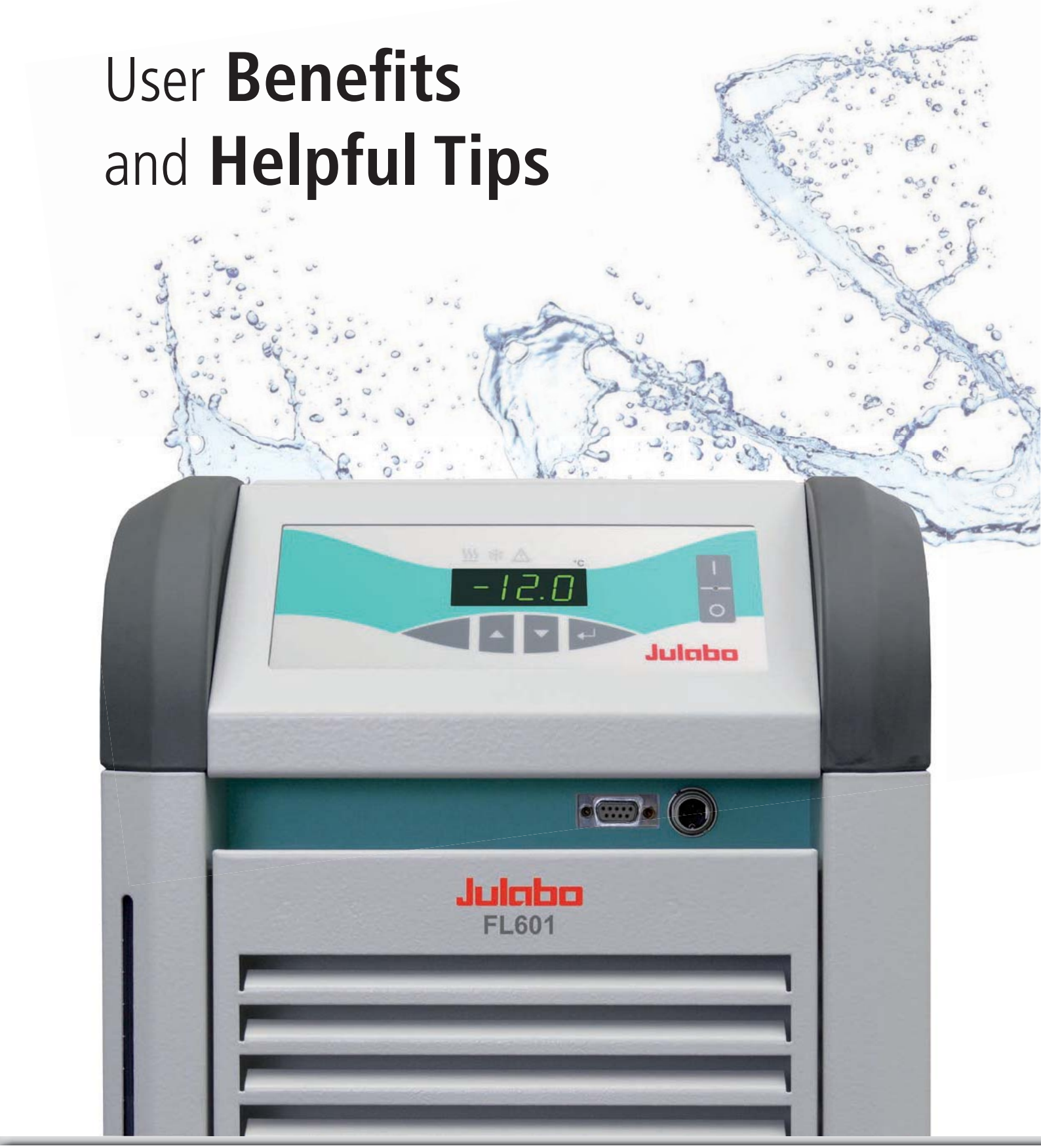
Micro-filter housing

M0 Without micro-filter housing
M1 Micro-filter housing, plastic (to +35 °C max.)
M2 Micro-filter housing, stainless steel (to +130 °C max.)

[1)] **Voltage version**

SC2500a, SC2500w	**SC5000a, SC5000w, SC10000w**
230 V / 50 Hz or	400 V (3 Ph.) / 50 Hz or
208-230 V / 60 Hz	208-230 V (3 Ph.) / 60 Hz

User **Benefits** and **Helpful Tips**



Cost savings (example calculation)

Cooling rotary evaporators is a common way to use recirculating coolers. For example, an average size 3-liter rotary evaporator requires approximately 230,000 liters of cooling water per year. This is almost as much as the yearly consumption of a four-person household! The calculation below is for cooling of two rotary evaporators:

Application parameters

Cooling water inlet:	+15 °C
Cooling water outlet:	+17 °C
Water flow rate:	4 liters per minute

Calculation of cooling capacity

P	=	ΔT * c * m/t
ΔT	=	2 °C (temperature difference)
c	=	4.18 kJ/kg*K (specific heat capacity of water)
m/t	=	0.066 l/sec (water flow rate)

The required cooling capacity is 560 W.

Cooling water costs

4 liters per minute	= 240 liters per hour
Operating time/year	= 240 days x 8 hours
Consumption/year	= 461 m³
Cost per m³	= 4.49 € *
Cost per year	**= 2069.89 € ***

*Average prices in Germany in March 2013

Costs for operating a recirculating cooler (FL601)

Power consumption	= 1.05 kW
Operating time/year	= 240 days x 8 hours
Consumption/year	= 2016 kW
Cost per kWh	= 0.25 € *
Cost per year	**= 504.00 € ***

Water is valuable and costly

The example calculation above indicates **savings of more than €1500 per year!** Therefore, a JULABO recirculating cooler will pay for itself after two years and make a contribution to environmental protection.

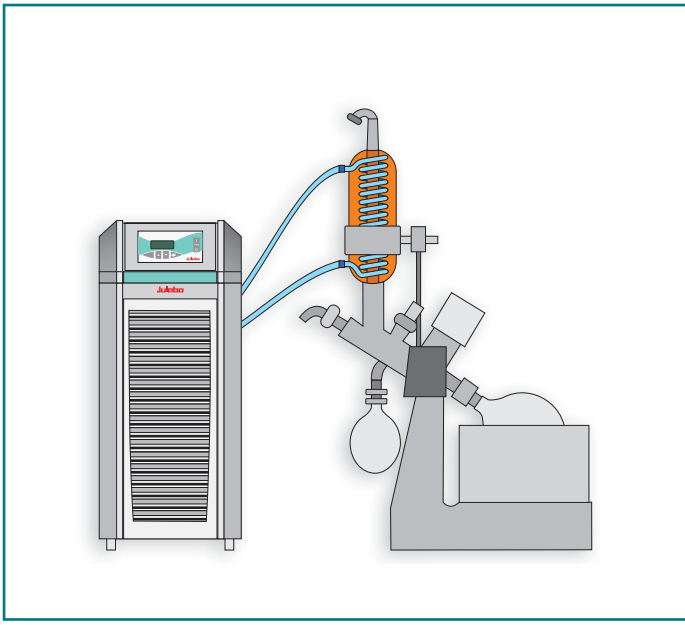
Evaporation and condensation

Commonly used in laboratories for synthetic chemistry, organic chemistry, scale-ups, or in R&D labs for pharmaceuticals, chemicals, cosmetics, and nutritional chemistry.

Evaporation and concentration without consumption of water, elevated efficiency even at cooling temperatures as low as -10 °C. Independent of external conditions.

Cooling and temperature control of 1 to 4 rotary evaporators

JULABO Model	FL300 F250	FL601 F500	FL1201 FL1203 F1000	FL1201 FL1203 F1000	FL1701 FL1703	FL2503 FL4003
Flask size	0.5 - 1 liters	up to 2 liters		up to 4 liters		up to 20 liters
Number of rotary evaporators	1	2	3-4	1	2	1-2

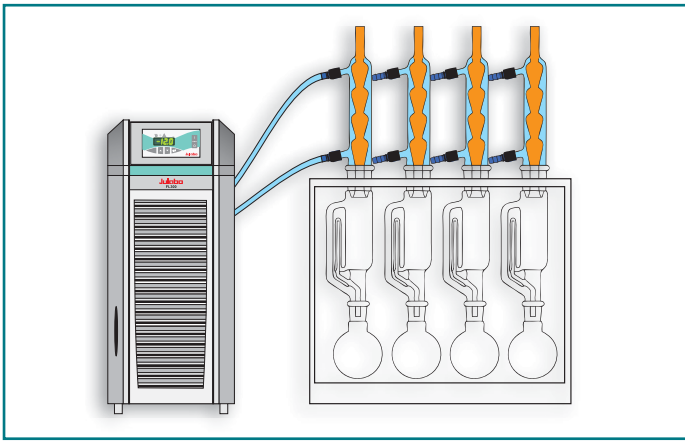


Extraction

Quality control applications in laboratories for determination of fat content and extractable substances in food, animal feed, etc. used in the feed, animal nutrition, and dairy industries.

Extraction without consumption of cooling water, consistently reproducible condensation temperatures, without influence of ambient or seasonal temperature fluctuations.

JULABO Model	FL300 F250	FL601 F500	FL601 F500	FL1201 F1000	FL1701 FL1201	FL1701	FL2503
Number of condensers	2	4	6	8	12	18	24

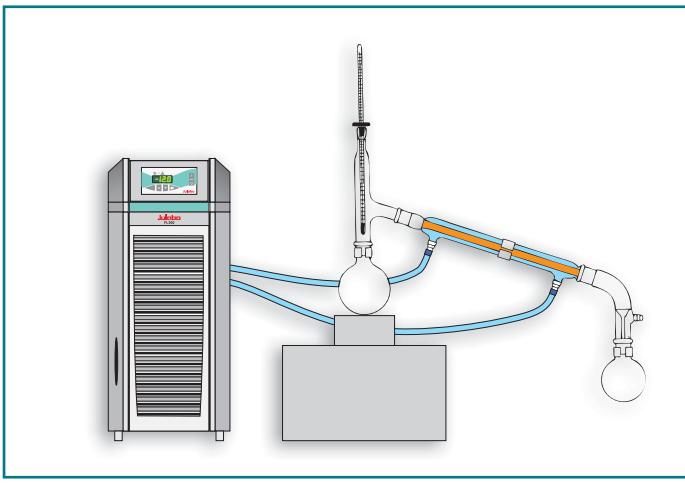


Distillation

Common applications in QA laboratories for determination of alcohol, ethanol, or carbolic levels. Primarily used in the food, beverage, animal feed, cosmetics, and detergent industries as well as in clarification plants.

Distillation without use of tap water, with more effective and reproducible cooling and consistent analysis conditions.

JULABO Model	FL1201 F1000	FL2503	FL2503	FL4003
Number of distillation units	1	2	3	4



Adjustable pump capacity!

JULABO customers have several different options for controlling the pressure and flow rate in our recirculating coolers:

| 1
The simplest option is a manually controlled, steplessly adjustable valve (e.g. accessory 8 970 454).

| 2
Models FL1203 and above have an adjustment wheel on the rear of the unit. The wheel provides for stepless pressure and flow control and diversion through the internal bypass.

| 3
SemiChill models include adjustable pumps.

Order at the same time!
Shut-off valve for recirculating coolers

Adjustment wheel at rear

Electronically controllable pumps

Pump protection

Other units on the market contain pumps (e.g. PD pumps) that may not run up against a closed pump connection without causing damage to the pump. But pumps used in JULABO units are equipped with technology to ensure that they will not be damaged even if the external liquid loop is interrupted by a kink in the tube, for example.

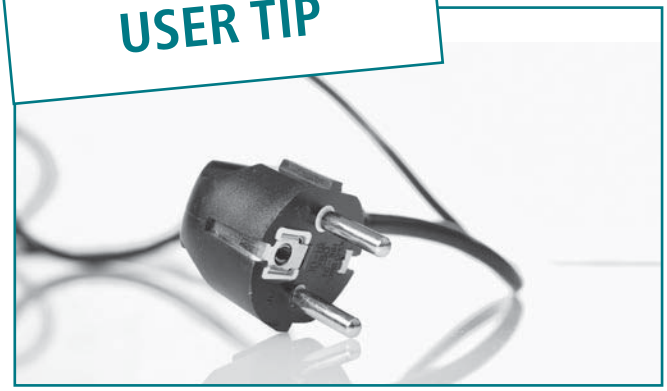
JULABO pumps work reliably even with back pressure

Autostart function after power failure!

All JULABO recirculating coolers have an autostart function. In order to comply with industrial standards, the factory setting is "Off".

A simple key combination makes it easy for a JULABO user to activate the autostart function. Then the recirculating cooler will restart automatically after a power interruption.

USER TIP



What cooling capacity does your application need?

JULABO's temperature control specialists can calculate the ideal cooling capacity with just a few pieces of information.
They will need only **three values**, which are easy to determine in most cases:

| 1
Temperature of the cooling water before it flows into the application.

| 2
Temperature of the cooling water after exiting the application.

| 3
Flow rate of the cooling water in liters per minute.

Send these three values to info.de@julabo.com and you will receive a recommendation for the most suitable JULABO recirculating cooler.

Individual Solutions for Your Application

JULABO is ready to help its customers by providing custom solutions for special requirements. JULABO recirculating coolers can be customized in the following ways:

Electric switch output

Some applications require an additional switch output in order to connect a solenoid valve or enable evaluation of a status signal, for example. In situations like these, JULABO can integrate the connection of your choice into the recirculating cooler. All we need to know is the signal level and the desired connector type.

Higher cooling capacity

Does your application require greater cooling capacity at a specific operating point? If so, please speak with a JULABO technician. Simply define the cooling capacity and the operating point and you will receive exactly the unit that you need.

Useful Accessories

JULABO Thermal bath fluids

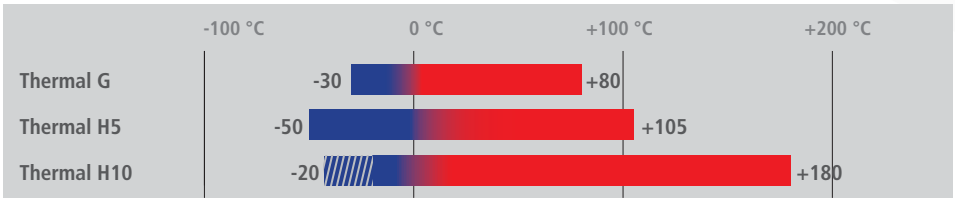
JULABO *Thermal* bath fluids are carefully selected and subjected to long-term testing. They are ideally suited to temperature-control tasks in specialized systems and help ensure safe and reliable operation. Selection of a suitable bath fluid is of critical importance for achieving the best possible results. Viscosity, oxidation properties, and heat conductivity of Thermal fluids are specially adapted for use with JULABO instruments.

Included in delivery:
drain tap

Benefits

- Wide temperature ranges
- Low viscosity
- High stability
- Good heat conductivity
- Minimum odor
- Low corrosion tendency
- Low toxicity
- Long shelf life

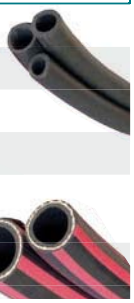
Working temperature ranges



JULABO Description		Thermal G	Thermal H5	Thermal H10
JULABO	**10 liters**	**8 940 124**	**8 940 106**	**8 940 114**
Order No.	**5 liters**	**8 940 125**	**8 940 107**	**8 940 115**
Working temperature ranges and specifications				
For recirculating coolers	°C	-30 ... +80	-50 ... +105	(-40) -20 ... +180
Flash point	°C	--	+124	>+170
Fire point	°C	--	+142	+220
Viscosity, kinetic at +20 °C	mm²/s	4.07	5.66	10.8
Density at +20 °C	g/cm³	1.08	0.92	0.94
Pour point	°C	-70	-100	<-60
Boiling point	°C	+108	+288	+288
Ignition temperature	°C	+430	+350	+370
Color		light yellow	clear	clear

Tubing

JULABO Order No.	Description	Suitable for
8 930 008	1 m CR® Tubing, 8 mm inner dia. (-30 ... +120 °C)	AWC100, F250, FL300
8 930 010	1 m CR® Tubing, 10 mm inner dia. (-30 ... +120 °C)	AWC100, F250
8 930 012	1 m CR® Tubing, 12 mm inner dia. (-30 ... +120 °C)	FL300
8 930 308	1 m Reinforced tubing, 8 mm inner dia., pressure resistant (-40 ... +120 °C)	F500, F1000, FL601/1201/1701, FC models
8 930 312	1 m Reinforced tubing, 12 mm / 1/2" inner dia., pressure resistant (-40 ... +120 °C)	F500, F1000, FL601/1201/1701, FC models
8 930 319	1 m Reinforced tubing, 3/4" inner dia., pressure resistant (-40 ... +120 °C)	FL(W)1203/1703/2503/4003
8 930 325	1 m Reinforced tubing, 1" inner dia., pressure resistant (-40 ... +120 °C)	FL(W)2506/4006/7006/11006/20006



Tubing insulation

JULABO Order No.	Description	Suitable for
8 930 410	1 m Insulation, 14 mm inner dia.	CR® tubing 8 to 10 mm ID
8 930 412	1 m Insulation, 18 mm inner dia.	CR® tubing 12 mm ID, Reinforced tubing 8 mm ID
8 930 413	1 m Insulation, 23 mm inner dia.	Reinforced tubing 12 mm / 1/2" ID
8 930 419	1 m Insulation, 29 mm inner dia.	Reinforced tubing 3/4" ID
8 930 425	1 m Insulation, 35 mm inner dia.	Reinforced tubing 1" ID

Tube clamps

JULABO Order No.	Description	Suitable for
8 970 480	2 Tube clamps, size 1	CR® tubing 8 mm ID
8 970 481	2 Tube clamps, size 2	CR® tubing 10/12 mm ID, Reinforced tubing 8 mm ID
8 970 482	2 Tube clamps, size 3	Reinforced tubing 12 mm / 1/2" ID
8 970 483	2 Tube clamps, size 4	Reinforced tubing 3/4" ID
8 970 484	2 Tube clamps, size 5	Reinforced tubing 1" ID

Twin distributing adapters / Quad distributing adapters

JULABO Order No.	Description	Suitable for
8 970 470	Twin distributing adapters with barbed fittings for tubing 8 mm ID	F, FL, FC
8 970 472	Twin distributing adapters with barbed fittings for tubing 10 mm ID	F, FL, FC
8 970 471	Twin distributing adapters with barbed fittings for tubing 12 mm ID	F, FL, FC
8 970 476	Twin distributing adapters G 3/4" with barbed fittings for tubing 3/4" ID	FL(W)1203/1703/2503/4003
8 970 477	Twin distributing adapters G 1 1/4" with barbed fittings for tubing 1" ID	FL(W)2506/4006/7006/11006/20006
8 970 474	2 Quad distributing adapters, M16x1, with barbed fittings for tubing 8 mm or 12 mm / 1/2" ID	FC
8 970 520	2 Quad distributing adapters, M16x1, with barbed fittings for tubing 8 mm or 12 mm / 1/2" ID	F500, F1000, FL(W)601/1201/1701
8 970 522	2 Quad distributing adapters, G 3/4" female, with barbed fittings for tubing 3/4" ID	FL(W)1203/1703/2503/4003
8 970 524	2 Quad distributing adapters, G 1 1/4" female, with barbed fittings for tubing 1" ID	FL(W)2506/4006/7006/11006/20006

Adapters

JULABO Order No.	Description	Suitable for
8 890 040	2 Adapters G ¾" female to M16x1 male	FL(W)1203/1703/2503/4003
8 890 041	2 Adapters G 1 1/4" female to M16x1 male	FL(W)2506/4006/7006/11006/20006
8 890 042	2 Adapters G 3/4" female to barbed fitting for tubing 1/2" inner dia.	FL(W)1203/1703/2503/4003
8 890 043	2 Adapters G 3/4" female to barbed fitting for tubing 3/4" inner dia.	FL(W)1203/1703/2503/4003
8 890 044	2 Adapters G 1 1/4" female to barbed fitting for tubing 1/2" inner dia.	FL(W)2506/4006/7006/11006/20006
8 890 045	2 Adapters G 1 1/4" female to barbed fitting for tubing 3/4" inner dia.	FL(W)2506/4006/7006/11006/20006
8 890 046	2 Adapters G 1 1/4" female to barbed fitting for tubing 1" inner dia.	FL(W)2506/4006/7006/11006/20006
8 890 047	2 Adapters G ¾" female to NPT 1/2" male	FL(W)1203/1703/2503/4003
8 890 048	2 Adapters G ¾" female to NPT 3/4" male	FL(W)1203/1703/2503/4003
8 890 049	2 Adapters G 1 1/4" female to NPT 1/2" male	FL(W)2506/4006/7006/11006/20006
8 890 050	2 Adapters G 1 1/4" female to NPT 3/4" male	FL(W)2506/4006/7006/11006/20006
8 890 051	2 Adapters G 1 1/4" female to NPT 1" male	FL(W)2506/4006/7006/11006/20006




Particle filter / Shut-off valves / Solenoid valve / Earthquake anchors / Castor

JULABO Order No.	Description	Suitable for
8 970 905	Air filter	AWC100
8 970 906	Filter insert	AWC100
8 920 000	Particle filter for cooling water loop (for water-cooled models)	FLW, FCW, SC5000w, SC10000w
8 970 456	Shut-off valve for temperature control loop M16x1	F500, F1000, FL300/601/1201/1701, FC, FCW
8 970 454	Shut-off valve G 3/4"	FL(W)1203/1703/2503/4003
8 970 458	Shut-off valve G 1 1/4"	FL(W)2506/4006/7006/11006/20006
8 980 701	Solenoid valve set for loop circuit (-10 °C ... +130 °C), M16x1	FC, FCW
8 910 045	Castor	F250




External Pt100 sensors

JULABO Order No.	Description	Suitable for
8 981 003	200 x 6 mm dia., stainless steel, 1.5 m cable	FC1200T, FC1600T, FCW2500T
8 981 006	20 x 2 mm dia., stainless steel, 1.5 m cable	FC1200T, FC1600T, FCW2500T
8 981 010	300 x 6 mm dia., stainless steel, 1.5 m cable	FC1200T, FC1600T, FCW2500T
8 981 017	200 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	FC1200T, FC1600T, FCW2500T
8 981 015	300 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	FC1200T, FC1600T, FCW2500T
8 981 013	600 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	FC1200T, FC1600T, FCW2500T
8 981 016	900 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	FC1200T, FC1600T, FCW2500T
8 981 014	1200 x 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	FC1200T, FC1600T, FCW2500T
8 981 020	M+R in-line Pt100 sensor, 2 fittings M16x1 male	FC1200T, FC1600T, FCW2500T
8 981 103	Extension cable 3.5 m for Pt100 sensor	FC1200T, FC1600T, FCW2500T


Connection plugs

JULABO Order No.	Description	Suitable for
8 980 131	External Pt100 connector	FC-T models
8 980 133	Standby connector 3 pin	FC
8 980 135	Alarm connector 5 pin	FL, FC
8 980 136	REG+EPROG connector 6 pin	FC-T models
8 980 137	Stakei connector	FC

Booster Pump & SCB Converter box

JULABO Order No.	Description	Suitable for
8 810 020	Booster Pump (magnetically coupled), 2.1 bar	FC, SemiChill
8 980 024	SCB Converter box	FC, SemiChill

Accessories for SemiChill recirculating coolers

JULABO Order No.	Description	Suitable for
8 920 016	Micro-filter cartridge 10 micron	Micro-filter housing plastic
8 920 017	Micro-filter cartridge 25 micron	Micro-filter housing plastic
8 920 018	Micro-filter cartridge 40 micron	Micro-filter housing plastic
8 920 019	Micro-filter cartridge 100 micron	Micro-filter housing plastic
8 920 020	Micro-filter cartridge 250 micron	Micro-filter housing plastic
8 920 036	Micro-filter cartridge 10 micron	Micro-filter housing stainless steel
8 920 038	Micro-filter cartridge 40 micron	Micro-filter housing stainless steel
8 920 039	Micro-filter cartridge 100 micron	Micro-filter housing stainless steel
8 920 040	Micro-filter cartridge 250 micron	Micro-filter housing stainless steel
8 920 005	DI-filter cartridge	DI-filter housing, plastic/stainless steel
8 920 100	Drain port, stainless steel, to empty the unit	SemiChill
8 980 705	Solenoid valve set, 230V/50-60Hz, -10 ... +130 °C (Including: 1 solenoid valve and 1 back pressure valve)	SemiChill
8 890 036	2 Barbed fittings for tubing 1/2 " inner dia. to NPT 3/4" female	SemiChill
8 890 037	2 Barbed fittings for tubing 5/8 " inner dia. to NPT 3/4" female	SemiChill
8 890 038	2 Adapters NPT ¾" female to M16x1 male	SemiChill
8 980 073	RS232 Interface cable, 2.5 m	SemiChill
8 980 074	RS232 Interface cable, 5 m	SemiChill
8 900 110	USB Interface adapter cable, 2.5 m	SemiChill
8 980 031	Ethernet / RS232 Interface converter	SemiChill
8 980 131	External Pt100 connector	SemiChill with Professional electronics
8 980 133	Standby connector 3 pin	SemiChill with Professional electronics with analog connections
8 980 135	Alarm connector 5 pin	SemiChill with Professional electronics with analog connections
8 980 136	REG+EPROG connector 6 pin	SemiChill with Professional electronics with analog connections
8 980 137	Stakei connector	SemiChill

Julabo
THE TEMPERATURE CONTROL COMPANY

Original **Accessories**

Enhance the range of application of your equipment with JULABO Original Accessories.

I.e. to achieve higher pump pressure you can use the new JULABO Booster Pump.

Checkout the JULABO Original Accessories within this catalog or on www.julabo.com and you will find the right solution for your specific application.

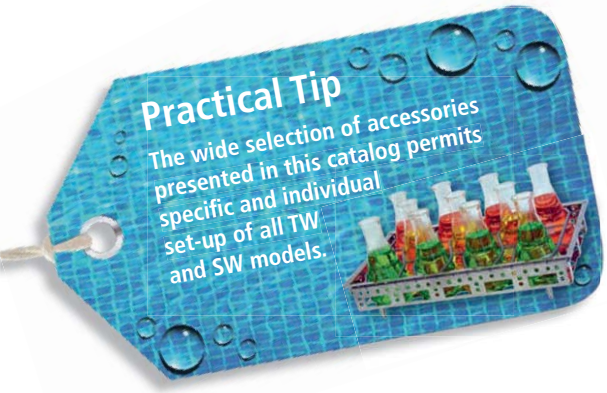
Information on all Accessories www. julabo.com

www.julabo.com

High Quality and **Durable**

Water Baths and Shaking Water Baths

The Water Baths of the TW series or Shaking Water Baths of the SW series are ideal for routine applications.
Examples are temperature control of samples, incubations, material testing, corrosion tests, cell cultivation, food and beverage testing. All TW and SW Baths are robust instruments of high quality. Their working temperature ranges from +20 to +99.9 °C qualifying them for a wide variety of applications.



- User-friendly operation
- Splash-proof design
- Integrated power switch
- Bright LED display
- Bath volumes from 2 to 26 liters
- Lift-up bath cover (accessory)
- High temperature stability of up to ±0.02 °C
- Acoustic and optical low water level alarm
- Convenient bath drain
- Removable bottom plate and shaking insert
- Wide selection of accessories for temperature control of samples
- Highest quality (all wetted parts are made of stainless steel or high grade plastics)

SW models also offer

- Warning and cut-off protection for high/low temperature
- Adjustable shaking frequencies from 20 to 200 rpm
- Integrated timer
- RS232 interface

TW Models

TW keypad

Water Baths

+20 °C ... +99.9 °C

4 different models with bath volumes from 2 to 26 liters

Advantages and functions at a glance

User-friendly keypad with LED display

Wide selection of test tube racks

Lift-up bath covers available in Makrolon® or stainless steel

Small footprint
Large bath volume

Durable handles for easy positioning

Integrated power switch with Auto-Start function

Easy-access drain

Integrated high performance heater

High quality stainless steel bath tank design for minimum fluid loss

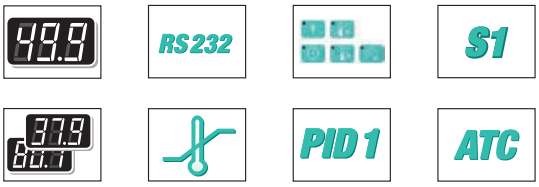
SW Models

SW keypad

Shaking Water Baths

+20 °C ... +99.9 °C

2 different models with 20 liters filling volume



Advantages and functions at a glance

Removable shaking insert

Adjustable shaking frequency (20 ... 200 rpm)

High temperature stability (±0.2 °C or ±0.02 °C)

Countdown timer (0...10 operating hours)

RS232 Interface

User-friendly keypad with LED display

Wide selection of test tube racks

Lift-up bath covers available in Makrolon® or stainless steel

Small footprint Large bath volume

Durable handles for easy positioning

Integrated power switch with auto-start function

Easy-access drain

Integrated high performance heater

High quality stainless steel bath tank design for minimum fluid loss

Please refer to the fold-out page for the description of icons above

Test tube racks and cover not included (optional).

Water Baths TW Series

for working temperatures from +20 °C to +99.9 °C

JULABO water baths facilitate day-to-day laboratory work with their user-friendly operation. Splash water protection and optimized bath tank design are special advantages.

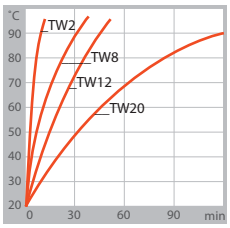
Model TW2

- Space-saving design,
  suitable for samples and for up to 24 test tubes.

Models TW8, TW12, TW20

- Convenient bath drain
- Durable handles for easy positioning
- Removable bottom plate for easy cleaning

Heat-up time
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stability °C	Heating capacity kW	Bath opening / bath depth W x L / D cm	Insert capacity test tube racks 13 mm dia.	17 mm dia.	Filling volume liters	Dimensions W x L x H cm w/o / with cover
9 550 102	**TW2**	+20 ... +99.9	±0.2	1	15 x 13 / 11	--	24	1 ... 2	17 x 16 x 26 / 37
9 550 108	**TW8**	+20 ... +99.9	±0.2	2	23 x 27 / 14	180	120	3 ... 8	29 x 32 x 28 / 44
9 550 112	**TW12**	+20 ... +99.9	±0.2	2	35 x 27 / 14	270	180	5 ... 14	40 x 32 x 28 / 44
9 550 120	**TW20**	+20 ... +99.9	±0.2	2	50 x 30 / 18	360	240	8 ... 26	56 x 35 x 32 / 49

Applications

Routine laboratory applications, e.g. cell cultivation, temperature control of samples, incubation, material / corrosion tests, temperature test of food and beverages

Accessories for TW Models

JULABO Order No.	Description / Dimensions		Suitable for
Lift-up Makrolon® covers (to +80 °C), transparent			
8 970 289	Lift-up Makrolon® cover, 17 x 16 x 16 cm		TW2
8 970 286	Lift-up Makrolon® cover, 29 x 32 x 16 cm		TW8
8 970 287	Lift-up Makrolon® cover, 40 x 32 x 16 cm		TW12
8 970 288	Lift-up Makrolon® cover, 56 x 35 x 17 cm		TW20
Lift-up stainless steel bath covers (to +100 °C)			
8 970 259	Lift-up stainless steel cover		TW2
8 970 266	Lift-up stainless steel cover		TW8
8 970 267	Lift-up stainless steel cover		TW12
8 970 268	Lift-up stainless steel cover		TW20
Flat stainless steel bath covers with sets of rings			
8 970 270	with 1 opening	190 mm dia.	TW8
8 970 271	with 4 openings	92 mm dia.	TW8
8 970 278	with 6 openings	92 mm dia.	TW12
8 970 272	with 2 openings	190 mm dia.	TW20
8 970 273	with 6 openings	115 mm dia.	TW20
8 970 277	with 8 openings	92 mm dia.	TW20
Cooling installation / Continuous water supply			
8 970 415	Liquid level / cooling set		TW8, TW12,TW20
Test tube racks to +80 °C, Polypropylene®			
8 970 380	for 60 test tubes	16/17 mm dia.	TW8, TW12,TW20
8 970 381	for 90 test tubes	12/13 mm dia.	TW8, TW12,TW20
8 970 382	for 90 microliter tubes	11/12 mm dia.	TW8, TW12,TW20
8 970 383	for 21 test tubes	30 mm dia.	TW8, TW12,TW20
Test tube racks to +100 °C, stainless steel			
8 970 330	for 24 test tubes	16/17 mm dia.	TW2
8 970 344	for 50 test tubes	16/17 mm dia.	TW8, TW12,TW20
8 970 345	for 90 test tube	12/13 mm dia.	TW8, TW12,TW20
8 970 346	for 90 microliter tubes	11/12 mm dia.	TW8, TW12,TW20
8 970 347	for 21 test tubes	30 mm dia.	TW8, TW12,TW20
Additional accessories			
8 970 331	Stents lifter		TW2
8 970 339	Hygiene insert, stainless steel		TW2
8 970 453	Drain tap with tube 8 mm inner dia.		TW8, TW12,TW20
8 970 010	Hollow balls, Polypropylene®, 20 mm dia. (1000 pcs.)		TW2, TW8, TW12,TW20
Water bath protective media *Aqua Stabil*			
8 940 006	6 bottles, 100 ml each, to prevent formation of algae		
8 940 012	12 bottles, 100 ml each, to prevent formation of algae		

Lift-up covers

Prevent liquid losses due to evaporation. Protect samples from contamination. Cover made of either Makrolon® or stainless steel.

Flat bath covers

Place beakers or Erlenmeyer flasks directly onto the perforated stainless steel bottom plate.

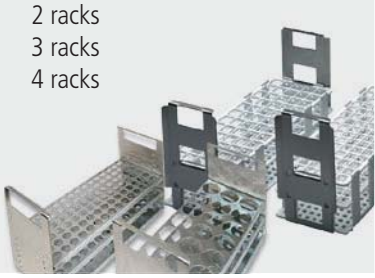
Liquid level/Cooling set

To maintain constant liquid level at high temperatures (with continuous water supply) or for counter-cooling of applications at or near ambient temperature.

Application Tip

Insert capacity of test tube racks for each water bath:

TW2	1 rack
TW8	2 racks
TW12	3 racks
TW20	4 racks



SW23

SW22

The removable shaking insert prevents direct contact with the bath fluid. Carrier trays can be assembled comfortably outside the bath.

Test tube racks and cover not included (optional).

Shaking Water Baths SW Series

for working temperatures from +20 °C to +99.9 °C

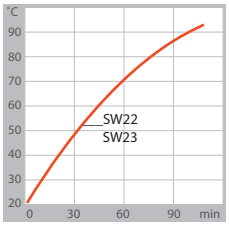
JULABO Shaking Water Baths provide many state-of-the-art features for common day-to-day laboratory tasks. For example: sloped edges keep the water in the stainless steel bath tank even when the lid is open.

- Overall splash water protection
- Low water-level warning and cut-off functions
- Countdown timer (0 ... 10 operating hours)
- User-friendly operation and consistent reproducibility
- 1-point calibration

Model SW22: Temperature stability ±0.2 °C, for general applications

Model SW23: Temperature stability ±0.02 °C, with integrated circulating pump for best temperature stability and homogeneity

Heat-up time
Bath fluid: water



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stability °C	Heating capacity kW	Bath opening / bath depth W x L / D cm	Filling volume liters	Shaking frequency rpm	Shaking stroke mm	Dimensions W x L x H cm w/o / with cover
9 550 322	**SW22**	+20 ... +99.9	±0.2	2	50 x 30 / 18	8 ... 20	20 ... 200	15	70 x 35 x 26 / 43
9 550 323	**SW23**	+20 ... +99.9	±0.02	2	50 x 30 / 18	8 ... 20	20 ... 200	15	70 x 35 x 26 / 43

Applications

Biochemical research, material testing, enzyme and tissue studies, homogenization, routine laboratory tasks, corrosion tests, fermentation, incubation, blood plasma thawing, temperature tests of food and beverages

Accessories for SW Models

Lift-up bath covers / hollow balls

JULABO Order No.	Description
8 970 288	Lift-up Makrolon® cover (to +80 °C), transparent
8 970 268	Lift-up stainless steel cover (to +100 °C)
8 970 010	Hollow balls, Polypropylene® 20 mm dia., (1000 pcs.)

Cooling installation / continuous water supply

8 970 415	Liquid level / cooling set
8 970 416	Cooling coil

All-purpose spring tray

8 970 630	All-purpose spring tray Pre-assembled for 11 Erlenmeyer flasks 250 ml, incl. set of springs for Erlenmeyer flasks 25 ... 1000 ml
8 970 631	Set of springs consisting of 5 springs 190 mm and 12 springs 135 mm (for tray 8 970 630)

Standard carrier tray for Erlenmeyer flasks

8 970 360	for 45 flasks	25 ml	8 970 364	for 11 flasks	250-300 ml
8 970 361	for 32 flasks	50 ml	8 970 365	for 8 flasks	500 ml
8 970 362	for 18 flasks	100 ml	8 970 366	for 5 flasks	1000 ml
8 970 363	for 15 flasks	200 ml			

Base tray and spring clamps for Erlenmeyer flasks

8 970 620	Base tray for assembling spring clamps on a mix and match basis				
8 970 601	Spring clamp for	10 ml flasks	8 970 606	for	200-250 ml flasks
8 970 602	Spring clamp for	25 ml flasks	8 970 607	for	300 ml flasks
8 970 603	Spring clamp for	50 ml flasks	8 970 608	for	500 ml flasks
8 970 604	Spring clamp for	100 ml flasks	8 970 609	for	1000 ml flasks

Carrier tray for test tube racks

8 970 369	Base tray for assembling a maximum of 4 test tube racks

Test tube racks made of Polypropylene® (to +80 °C)		Test tube racks made of stainless steel (to +100 °C)	
8 970 380	for 60 test tubes, 16/17 mm dia.	8 970 344	for 50 test tubes, 16/17 mm dia.
8 970 381	for 90 test tubes, 12/13 mm dia.	8 970 345	for 90 test tubes, 12/13 mm dia.
8 970 382	for 90 Microliter tubes, 11/12 mm dia.	8 970 346	for 90 microliter tubes, 11/12 mm dia.
8 970 383	for 21 test tubes, 30 mm dia.	8 970 347	for 21 test tubes, 30 mm dia.

Complete carrier trays with test tube racks (to +80 °C)

8 960 440	for 240 test tubes, 16/17 mm dia.	8 960 442	for 360 microliter tubes, 30 x 11/12 mm dia.
8 960 441	for 360 test tubes, 12/13 mm dia.	8 960 443	for 84 test tubes, 30 mm dia.

Software

8 901 102	*EasyTemp* software free of charge at www.julabo.com	8 980 075	RS232 interface cable, 3 m, for direct PC connection
8 900 110	USB Interface adapter cable, 2.5 m		

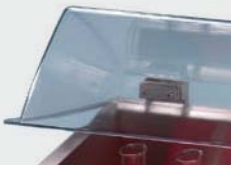
Water bath protective media *Aqua Stabil*

8 940 006	6 bottles, 100 ml each, to prevent formation of algae
8 940 012	12 bottles, 100 ml each, to prevent formation of algae

Lift-up covers

Prevent liquid losses due to evaporation. Protect samples from contamination. Cover made of either Makrolon® or stainless steel.

Makrolon®-cover ▸



For applications near ambient temperature use the cooling coil.

All-purpose spring tray

Standard carrier tray

Base tray with spring clamps

Tray with test tube racks

Additional Products for the right **Temperature**

Additional Products

This section features additional products for various temperature control applications typical for laboratories. Whether you need to calibrate temperature sensors, cool chemicals or determine the ‚best before' date of beer - the comprehensive JULABO program provides the specific solution when it comes to temperature control.

Calibration Baths

- Calibration of sensors, measuring devices, thermometers, etc.
- Highest temperature stability to ±0.005 °C, ISO and DKD certificates

Visco Baths

- For highly precise measuring applications with viscometers and densimeters
- Transparent bath tanks
  (Plexiglas® or stainless steel version with insulated windows)

Beer Forcing Test Refrigerated/Heating Circulating Bath

- Determination of ‚best before' date of beer
- Pre-programmed temperature profiles for forcing tests

Immersion Coolers and Flow-Through Cooler

- Rapid cooling, a perfect complement to heating circulators
- Environmentally friendly alternative to tap water cooling and dry ice

Temperature Controllers

- Measurement, control and monitoring of any electrically heated equipment in laboratories and pilot plants

Refrigerators for Chemicals

- Storing and cooling of hazardous substances
- Spark free interior

Booster Pump

Fluid - Gas Heat Exchanger

| SL-8K

| SL-14K

Calibration Baths

for working temperatures from +50 °C to +300 °C

JULABO calibration baths are ideal for high precision calibration of sensors, measuring devices, thermometers, etc.
These instruments are ideal for applications in calibration laboratories and conform to the requirements specified by DIN EN ISO 9001:2000.

Advantages

- Highest available temperature stability; ±0.005 °C
- Precision Pt100 sensor for reference temperature measurements (optional)
- Display resolution 0.01 °C across the entire temperature range
- Homogeneous temperature chamber with constant level
- ISO and DKD calibration certificates are available

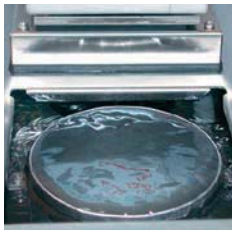
VFD Comfort Display

All temperatures on one screen: The large display shows up to three temperature values simultaneously:

① Reference temperature
② Setpoint temperature
③ Actual temperature

Removable circulator

Temperature chamber with uniform overflow



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stability °C	Heating capacity kW	Pump capacity Flow rate l/min	Pump capacity Pressure bar	Bath opening/ Usable bath depth cm	Filling volume liters	Dimensions W x L x H cm
9 352 508	**SL-8K**	+50 ... +300	±0.005	3	22-26	0.4-0.7	dia. 12 / 17	8	22 x 46 x 47
9 352 514	**SL-14K**	+50 ... +300	±0.005	3	22-26	0.4-0.7	dia. 12 / 31	14	22 x 46 x 61

| FK30-SL

| FK31-SL

Applications

Calibration for the determination of conformity to national and international standards such as temperature sensors, measuring devices or thermometers.

Calibration Baths

for working temperatures from -30 °C to +200 °C
with integrated refrigeration unit

The calibration baths on this page feature an integrated refrigeration unit and are suitable for calibration applications to -30 °C.

Advantages

- Integrated refrigeration unit
- Compact design
- Low noise level
- ACC Active Cooling Control across the entire working temperature range
- Removable venting grid
- ISO and DKD calibration certificates are available

Included with each unit

8 970 246	Bath cover with openings and Viton® sleeves: 2 x 3 mm, 2 x 4 mm, 2 x 6 mm inner dia.

Accessories

8 981 002	Precision Pt100 reference sensor 180 x 4 mm dia.
9 660 003	FL300 recirculating cooler for SL-8K & SL-14K

Viton® sleeves (2 pcs.)

8 930 602	for sensor 2 mm dia.
8 930 603	for sensor 3 mm dia.
8 930 604	for sensor 4 mm dia.
8 930 605	for sensor 5 mm dia.
8 930 606	for sensor 6 mm dia.
8 930 608	for sensor 8 mm dia.

JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stability °C	Heat. cap. kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20 °C	Pump capacity Flow rate / Pressure l/min	bar	Bath opening/ Usable bath depth cm	Filling vol. liters	Dimensions W x L x H cm
9 352 627	**FK30-SL**	-30 ... +200	up to ±0.005	2	0.46	0.34	0.15	22-26	0.4-0.7	dia. 12 / 17	14	32 x 45 x 79
9 352 628	**FK31-SL**	-30 ... +200	up to ±0.005	2	0.46	0.34	0.15	22-26	0.4-0.7	dia. 12 / 31	24	32 x 45 x 91

Calibration Certificates

Calibration at 3 or 5 selectable measuring points depending on certificate

For calibration baths	
8 902 113	ISO-3-Point Calibration certificate
8 902 115	ISO-5-Point Calibration certificate
8 902 123	DKD-3-Point Calibration certificate
8 902 125	DKD-5-Point Calibration certificate

For precision reference sensor	
8 902 213	ISO-3-Point Calibration certificate
8 902 215	ISO-5-Point Calibration certificate
8 902 223	DKD-3-Point Calibration certificate
8 902 225	DKD-5-Point Calibration certificate

Custom design ME-18V-TT with special cooling coil for applications to -40 °C available! Just ask!

Applications

For measurements with capillary viscometers or use of densimeters and other related products. The model ME-18V enables operation conforming to ASTM D445.

Visco Baths

for highly precise temperature applications in the bath tank

JULABO visco baths for highly precise temperature control of viscometers, densimeters and other related products.

Advantages

- Temperature setting and display resolution 0.01 °C
- Temperature stability ±0.01 °C
- Programmer with real time clock
- Cooling coil for applications below ambient temperature

Bath tanks

ME-31A: Plexiglas® bath tank

ME-16G: Glass bath tank

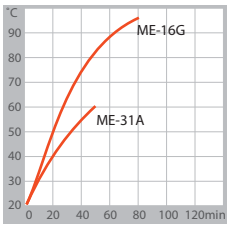
ME-18V: Stainless steel bath tank with insulated bath mantle and two windows of 185 x 245 mm made of high quality multiple-layer insulated glass

Accessories

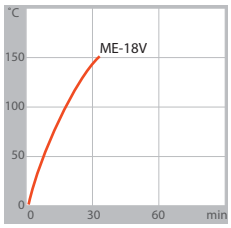
8 970 294 Cover for ME-18V
4 round openings,
51 mm dia.

8 970 295 Cover for ME-31A
5 round openings,
51 mm dia

Heat-up time
Bath fluid: water



Heat-up time
Bath fluid: Thermal H



JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stability °C	Heating cap. kW	Pump capacity Flow rate/ l/min	Pump capacity Pressure bar	Cooling coil	Bath opening/ Number/ Bath depth cm	Number of viscometers	Fill. vol. liters	Dimensions W x L x H cm
9 162 331	**ME-31A**	+20 ... +60	±0.01	2	11-16	0.23-0.45	Integrated	9 x 9 / 3 x / 37	3	31	50 x 20 x 56
9 162 616	**ME-16G**	+20 ... +100	±0.01	2	11-16	0.23-0.45	Integrated	7.6 x 7.6 / 2 x / 31	2	16	dia. 29 x 48
9 162 518	**ME-18V**	+20 ... +150	±0.01	2	11-16	0.23-0.45	Integrated	9 x 9 / 2 x / 37	2	18	36 x 24 x 54

[1] For temperature applications below ambient temperature: counter-cooling with tap water or recirculating cooler via built-in cooling coil.

| F38-ME

Applications

Forcing tests, determination of ‚best before' date by simulating the beer aging process

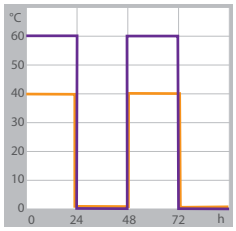
Beer Forcing Test
Refrigerated/Heating Circulating Bath

to determine the ‚best before' date of beer

The JULABO forcing test refrigerated/heating circulator in conjunction with a photometer determines the product life of beer before clouding. The simulated aging process is achieved through a programmable temperature profile which is repeated until the first clouding develops.

- Automatic cycles of temperature ramps simulate aging
- Pre-programmed temperature profiles for forcing test
- Program modification possible at any time
- Built-in meter for counting temperature cycles
- Large bath opening with insert for 20 bottles, 0.5 liters each (Racks for other bottle sizes on request)
- Removable Plexiglas® cover

Convenient!
Pre-programmed temperature cycles!



Forcing test
All program steps for the forcing test are pre-programmed

JULABO Order No.	JULABO Model	Working temp. range °C	Temp. stability °C	Heating capacity kW	Cooling capacity kW (Bath fluid: Ethanol) +20	0	-20 °C	Pump capacity Flow rate / Pressure l/min	bar	Bath opening/ Bath depth W x L / D cm	Filll. vol. liters	Dimensions W x L x H cm
9 162 638	**F38-ME**	-38 ... +80	±0.05	2	0.92	0.66	0.32	11-16	0.23-0.45	35 x 41 / 27	45	46 x 70 x 89

Immersion Coolers

with immersion probe for rapid cooling of liquids

JULABO immersion coolers are ideal for counter-cooling in combination with heating circulators and for rapid cooling of liquids down to low temperatures. These units represent a budget-priced alternative to customary cooling with tap water and as a substitute for dry ice.

- User-friendly operation and handling
- Compact design, small footprint
- FT402, FT902 and FT903 with integrated temperature control and display as well as external Pt100 sensor (200 x 6 mm dia., stainless steel)
- Environmentally friendly by conserving precious tap water
- Dry ice substitution

Applications

Cooling of liquids, dry-ice substitute, counter-cooling for heating circulators, saving of tap water

Accessories

8 970 400	Clamp for cooler probe for open baths (FT200, FT400, FT402)
8 981 017	Pt100 sensor, 200 x 6 mm dia., stainless steel/PTFE coated, 3 m cable (FT402, FT902, FT903)
8 981 010	Pt100 sensor, 300 x 6 mm dia., stainless steel, 1.5 m cable (FT402, FT902, FT903)

JULABO Order No.	JULABO Model	Working temperature range °C	Temp. stab. °C	Display resolution °C	Cooling capacity kW +20	+10	-20	-40	-80 °C	Immersion probe / flexible probe (L x dia. cm)	Connection tube (L) cm	Dimensions W x L x H cm
9 650 820	**FT200**	-20 ... +30	--	--	0.25	0.2	0.04	--	--	9 x 4	120	18 x 27 x 39
9 650 840	**FT400**	-40 ... +30	--	--	0.45	0.36	0.14	0.03	--	12 x 5	120	20 x 30 x 43
9 650 890	**FT900**	-90 ... +30	--	--	0.3	0.27	0.24	0.2	0.07	65 x 1.5 flexible	160	38 x 55 x 60
with temperature control, LED display and keypad												
9 650 842	**FT402**	-40 ... +30	±0.5	0.1	0.45	0.36	0.14	0.03	--	12 x 5	120	20 x 30 x 43
9 650 892	**FT902**	-90 ... +30	±1	0.1	0.3	0.27	0.24	0.2	0.07	65 x 1.5 flexible	160	38 x 55 x 60
9 650 893	**FT903**	-90 ... +30	±1	0.1	0.3	0.29	0.25	0.23	0.05	5.6 x 14.0	160	38 x 55 x 60

| FD200

Applications

For applications with heating circulators for sub-ambient temperatures, integration into loop circuits

Flow-through Cooler

for cooling of loop circuits

The JULABO flow-through cooler is designed for applications below ambient temperature. The cooler is connected with tubing into the loop circuit, e.g. in the return line of a circulator. In combination with a heating circulator almost every application can be equipped with cooling capability.

- Allows applications below ambient temperature with heating circulators and circulating pumps
- Liquids flow through tubing into the cooler
- Environmentally friendly by saving precious tap water

Accessories

- Tubing for liquids
- Tubing insulation

JULABO Order No.	JULABO Model	Working temperature range °C	Cooling capacity kW +20	Cooling capacity kW +10 °C	Dimensions W x L x H cm
9 655 825	**FD200**	+10 ... +30	0.22	0.18	18 x 27 x 39

Included with each unit: 2 each barbed fittings for tubing 8 and 12 mm inner dia.

A large selection of accessories at www.julabo.com

| LC4-F

| LC4

| LC6

Applications

For precise and reliable temperature control for heating mantles and heating collars, oil baths in combination with distillation/pilot plants, indirect tap water cooling with solenoid valve

Temperature Controllers

for measuring, control and monitoring

JULABO temperature controllers measure, control and monitor applications in laboratories and pilot plants.

LC4, LC4-F, LC6

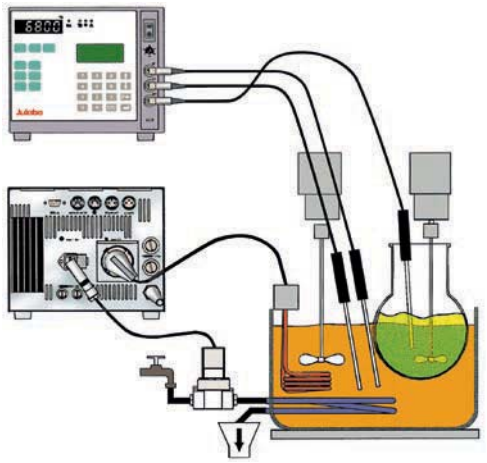
- Multi-Display (LED) with splash-proof keypad
- High/low temperature warning and cut-off
- RS232 Interface

LC4-F additional features

- Separate operating elements for working and safety circuits
- 4 LED displays for actual values and setpoints (working & safety circuits)
- Analog inputs and outputs

LC6 additional features

- 2 working sensors for different measurement locations (cascade-controller)
- Stakei connection for tap water cooling via solenoid valve
- Integrated programmer for 6 x 60 program steps



Practical tip

The external system (e.g. heater) is connected via power socket (Schuko) at the back. Different sensors for working and safety temperatures control the application. Analog and digital interfaces are available for other applications.

JULABO Order No.	JULABO Model	Working temperature range °C	Temperature stability in ext. system °C	LED display/ resolution °C	LCD display/ resolution °C	Working sensor	Safety sensor	Max. connection wattage kW	Dimensions W x L x H cm
9 700 140	**LC4**	-50 ... +350	< ±0.05	2 / 0.1	--	1 x Pt100	1 x Pt100	2	17 x 17 x 16
9 700 142	**LC4-F**	-50 ... +350	< ±0.03	4 / 0.1	--	1 x Pt100	1 x Pt100	2	25 x 20 x 10
9 700 160	**LC6**	-100 ... +400	< ±0.03	1 / 0.01	1 / 0.01	2 x Pt100	1 x Pt100	3	21 x 18 x 18

| KRC50

| KRC180

Refrigerators for Chemicals

for storing and cooling of chemicals and hazardous substances

JULABO refrigerators for chemicals are designed for storing and cooling hazardous substances. The spark free interior prevents damage caused by spilled or evaporating chemicals.

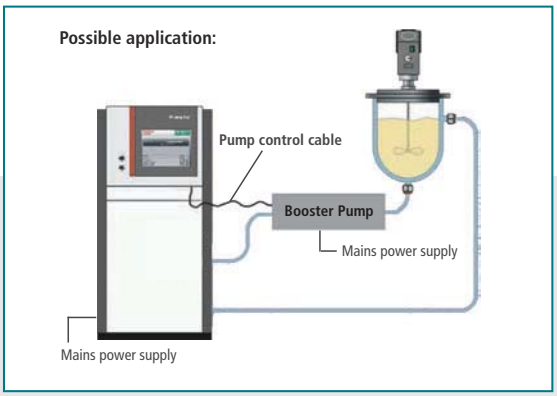
- With spark free interior
- Storing and cooling of hazardous substances
- Self-protecting control circuit
- Digital temperature display (LED)
- Overload protection for cooling compressor with test button
- Cut-off in case of disturbance with optical alarm signal
- Working and safety sensors are protected against short circuits and disconnection

JULABO Order No.	JULABO Model	Working temperature range °C	Temperature selection / display	Temperature stability °C	Volumetric capacity liters	Inner dimensions W x L x H cm	Outer dimensions W x L x H cm
8 800 705	**KRC50**	-2 ... +12	Analog / LED	±1	50	42 x 31 x 39	53 x 63 x 54
8 800 718	**KRC180**	-2 ... +12	Analog / LED	±1	180	52 x 40 x 70	60 x 64 x 86

Booster Pump

The NEW JULABO magnetically coupled Booster Pump is the ideal solution to increase the pressure or flow rate in your application. The Booster Pump is specifically designed to be easily connected between various JULABO units and your application.

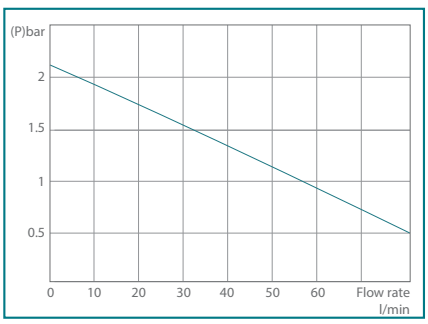
The Mag Drive Booster Pump can increase your fluid pressure up to 2.1 bar. The stainless steel design of the pump provides excellent resistivity against chemical effects. The magnetically driven design guarantees 100 % leakage free operation over an extraordinary temperature range of -90 °C … +250 °C.



NEW

JULABO Model	Booster Pump (magnetically coupled), 2.1 bar
JULABO order number	**8 810 020**
Working temperature range	-90 °C … 250 °C
Pump type	Magnetically coupled centrifugal pump
Pump material	Stainless steel
Suitable fluids	Water-Glycol, Silicon oil, Fluorinert®
Maximum viscosity	50 cSt
Maximum flow rate	80 lpm
Maximum pressure	2.1 bar*1)
Fluid connectors	M30x1.5 male*2)
Mains power supply	208 – 230V ±10% / 50-60 Hz 1~
Current consumption	1.85 A (208V) / 2A (230V)
Heat input	230 W at full motor speed
Control input	3 pin connector to connect to PRESTO® (alarm out) or SCB Converter Box. Pump control cable included (5 m)
Pump pressure adjustment	Manually
Pump pressure indication	2 pressure gauges, for input pressure and ouput pressure
Overall dimensions (W x L x H)	28 x 42.5 x 24 cm
Housing material	Stainless steel
Weight	13.2 kg
Suitable for	PRESTO® A40, W40, A45, A80, W80, A85, W85,W91, W92 HL and SL Refrigerated/Heating Circulators, FC and SemiChill Recirculating Coolers*3)

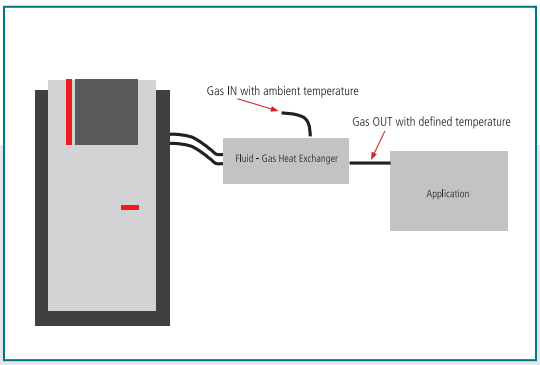
*1) In addition to the pump pressure of the suitable JULABO unit. *2) Adapters may be required. *3) The JULABO SCB Converter Box (order no. **8 980 024**) is required.



(measured with fluid with density of 1kg / dm³)

Fluid – Gas Heat Exchanger Specifications

The stainless steel design of the Fluid – Gas Heat Exchanger provides excellent resistivity against chemical impacts. The extraordinary design of the heat exchanger and the specially composed insulation provide high efficiency at extremely small overall dimensions.



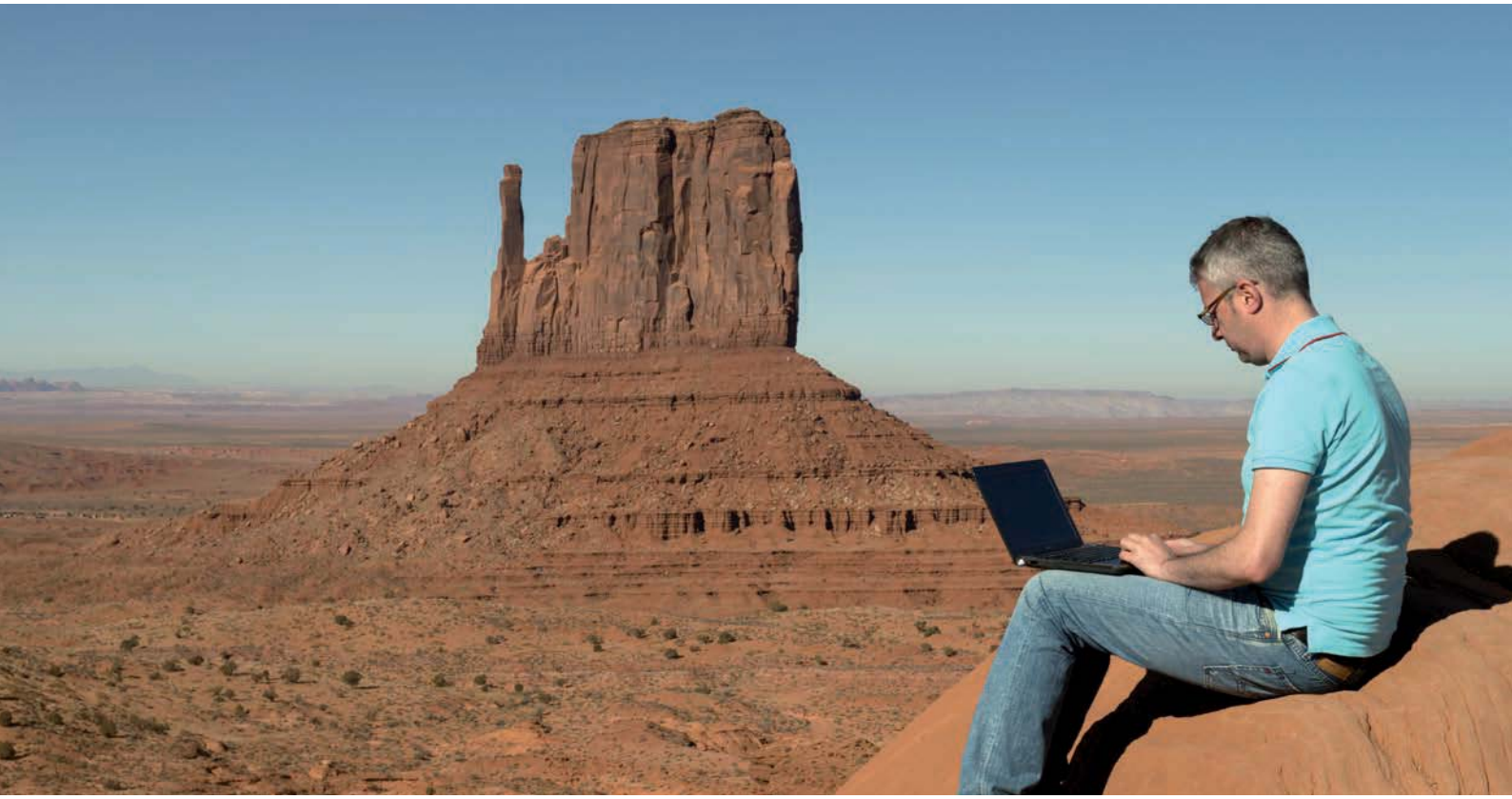
Application	Fluid-based gas temperature control
JULABO order number	**8 810 100**
Working temperature range gas OUT:	- 90 … +200 °C
Working temperature range gas IN:	- 40 … +60 °C
Working temperature range fluid:	- 95 … +210 °C
Suitable fluids:	JULABO Thermal, Water, Ethanol, Water-Glycol, Silicon oil
Maximum viscosity:	30 cSt
Gas properties:	Inflammable, non corrosive, non condensing (dry gas)
Gas flow rate:	0 … 100 Norm liter per minute
Pressure stability:	6 bar
Gas connectors:	IN: 1/4" NPT quick connector OUT: 1/4" NPT female
Fluid connectors:	M16 x 1 male
Overall dimensions (W x L x H) cm:	25.5 x 7 x 7.2
Assembly:	Flange with holes dia. = 6mm
Housing material:	Stainless steel (1.4404 / AISI 316L)
Suitable for:	HE, HL, SL, CF31/41, PRESTO®, FL, FC, SemiChill

The solution:

The NEW JULABO Fluid – Gas Heat Exchanger merges the advantages of fluid based temperature control and your gas process requirements. Wide temperature range, high temperature stability, high stability versus environmental effects.

Easy Control and Wireless Communication

NEW



Instrument Management via PC or Remote Control

JULABO facilitates the automation of applications. With *EasyTEMP Professional* temperature control units are comfortably controlled and monitored via PC. Laboratory instruments are easily connected via RS232, RS485 or Profibus. *WirelessTEMP*® permits wireless control and monitoring. Measurement values are easily recorded, documented and visualized on any PC or notebook.

- Increase efficiency by automating applications
- Convenient instrument control and operation directly from your workstation
- Instrument control via PC or easy remote control
- Numerous possibilities to visualize and record measuring values
- Monitoring of instruments without time-consuming inspection rounds
- Economic solutions for small and medium laboratories
- Easy to start and operate
- For virtually all JULABO units with an RS232 interface
- Download JULABO *EasyTEMP* software free of charge

EasyTEMP PROFESSIONAL

WirelessTEMP®

Networking and Remote Control with *WirelessTEMP* by JULABO

Remote control, monitoring, visualization and documentation: JULABO networking solutions and *EasyTEMP* simplify and automate your workflow. JULABO temperature control instruments are comfortably controlled and monitored via PC or Tablet PC. Measurement values are easily recorded, documented and visualized on any PC or Notebook. Laboratory instruments are easily connected via RS232, RS485, Ethernet, or wirelessly.

Strong benefits for more organization

- Increased efficiency by automated workflow
- Comfortable instrument control directly from your workstation
- Instrument control via PC or Tablet PC (Windows® based)
- Numerous possibilities to visualize and record operational data
- Monitoring of instruments without time-consuming inspection rounds
- Economic solution for small and medium laboratories
- Easy to start and operate
- For virtually all JULABO units with RS232 interface
- Compliant with industrial standards like RS485 and Ethernet

Windows is a registered trademark of Microsoft Corporation.

WirelessTEMP product overview

8 980 036

8 980 031

8 980 034

8 980 035

8 980 032

8 980 033

JULABO offers a variety of accessories for the connection and remote control of temperature control instruments.

8 980 031	Ethernet / RS232 converter
8 980 032	4-Ethernet / RS232 converter
8 980 033	8-Ethernet / RS232 converter
8 980 034	WLAN / RS232 converter
8 980 035	2 Channel WLAN / RS232 converter
8 980 036	ATEX Tablet Agile X

Cable options for hard-wired communication.

8 980 071	RJ45 cable, 5 m
8 980 074	RS232 interface cable, 5 m

WirelessTEMP accessories can be used for various configurations depending on your requirements.

WirelessTEMP application solutions

To find the right *WirelessTEMP* application solution for your requirements, answer the following questions while planning your application.

Question 1 How many JULABO instruments will be networked?
(max. 1 / max. 2 / max. 4 / max. 8)

Question 2 Which type of interface do my JULABO instruments feature?
(RS232 / Ethernet)

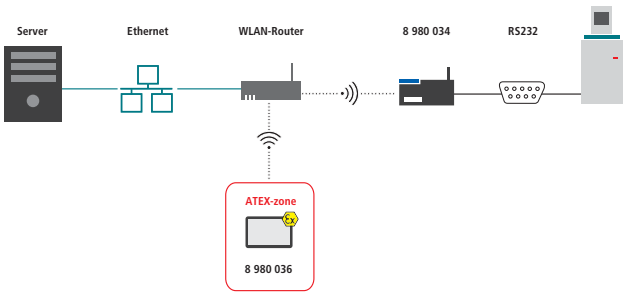
Question 3 How is the connection set-up?
(via WLAN / partially via WLAN / via LAN)

Question 4 Do I require an ATEX solution?
(Yes / No)

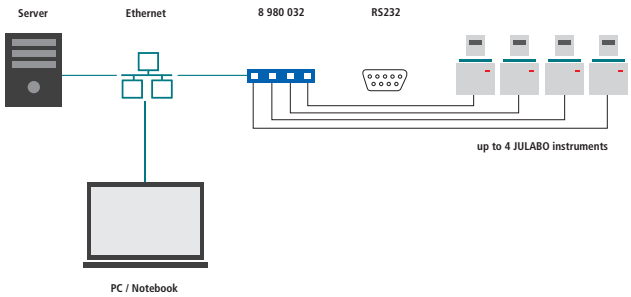
WirelessTEMP®

All *WirelessTEMP* application solutions can be found at **www.julabo.com.**
We gladly support you in the planning of the connection of your JULABO instruments. Call **+49 (0) 7823 51-190**

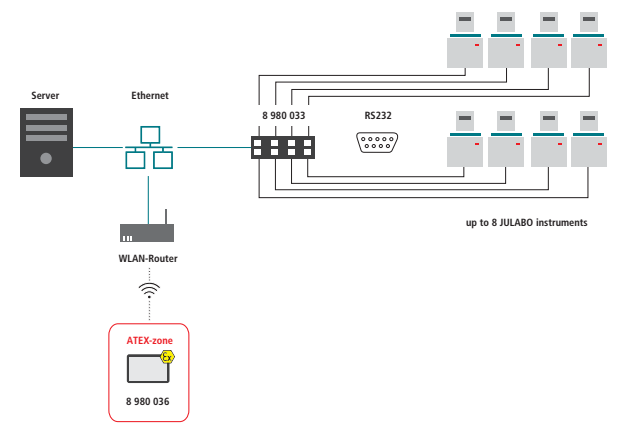
WirelessTEMP application solutions (exemplary)



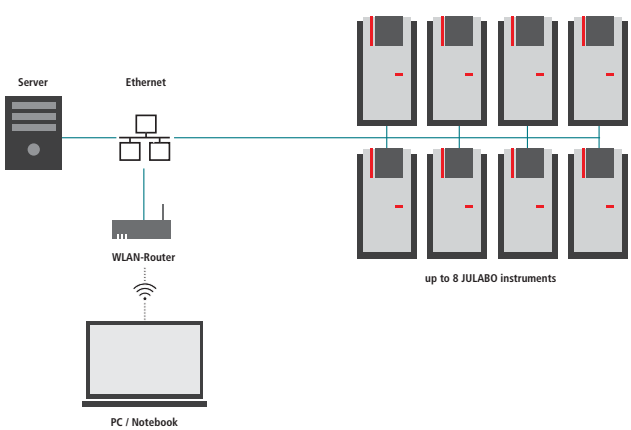
max. 1 instrument / RS232 / WLAN / ATEX



max. 4 instruments / RS232 / LAN / without ATEX

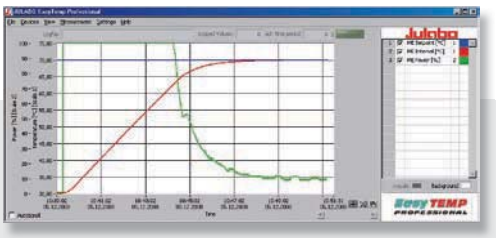


max. 8 instruments / RS232 / partially WLAN / ATEX



max. 8 instruments / Ethernet / partially WLAN / without ATEX

EasyTEMP



Graphic display of temperatures in main window

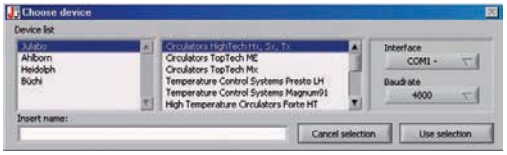
EasyTEMP Professional Software

PC-Software to control, visualize and record

EasyTEMP Software allows control and monitoring of JULABO temperature control instruments using any Windows® based PC. *EasyTEMP* features a variety of functions to visualize and document temperature and time-dependent processes.

- Connect *WirelessTEMP*® via RS232, USB or wirelessly
- Diagram function for graphic display of measurement values
- Storage of measurement values for processing e.g. in Microsoft® Excel®
- Temperature profile programming with one second accuracy
- Display in degrees Celsius (°C) or Fahrenheit (°F)
- *EasyTemp* basic version: free of charge download
- *EasyTemp Professional* version with advanced functions

Easy set-up of laboratory instruments



Each laboratory instrument has its own control window

JULABO Order No.	JULABO Description	Suitable for
8 901 102	EasyTEMP Software (free of charge at www.julabo.com)	Instruments with RS232
8 901 105	EasyTEMP Professional Software, incl. USB-Dongle	Instruments with RS232
8 980 073	RS232 interface cable, 2.5 m	Instruments with RS232
8 980 074	RS232 interface cable, 5 m	Instruments with RS232
8 980 075	RS232 interface cable, 3.0 m	Shaking water baths SW22 and SW23
8 900 110	USB interface adapter cable, 2.5 m	Instruments with RS232
8 980 031	Ethernet / RS232 interface converter	Instruments with RS232
8 900 002	PB-2 Option: Integrated Profibus DP	Presto® PLUS, Forte HT
8 900 005	PB-5 Option: Integrated Profibus DP	HighTech circulators HL, SL
8 900 020	Profibus DP Interface	Instruments with RS232
8 900 024	RS485 Interface	Instruments with RS232

EasyTEMP Version Comparison

Control, visualize and document temperature and time-dependent processes using JULABO software. The free of charge *EasyTEMP* is perfect for simple control applications with one JULABO instrument (download at www.julabo.com). *EasyTEMP Professional* is available for more complex applications with up to 24 instruments. The software installs easily and offers instrument control via RS232 interface, USB converter or *WirelessTEMP*® accessories.

Download the basic software **EasyTEMP** free of charge at **www.julabo.com**

Comparison of the JULABO *EasyTEMP* software versions	EasyTEMP	EasyTEMP PROFESSIONAL
Control of one JULABO unit with integrated interface	•	•
Control of up to 24 JULABO units with integrated interface		•
Support of industrial standards like RS485 and Profibus		•
Instrument:		
Recording and display of currently measured values on PC	•	•
Setpoint programming via PC	•	•
Status indication	•	•
Individual control window for each unit		•
Simultaneous start of units with just one button		•
Recording of measured values:		
Graphic zoom data function	•	•
Displays up to 4 curves in one diagram	•	
Displays unlimited curves in one diagram		•
Curves can be assigned to individual scales		•
Insert formulas such as averaging, differences between measured values, etc.		•
Insert text comments with display in the diagram		•
Ramp programming:		
Ramp function up to 100 steps	•	
Ramp function up to 1000 steps (individually for each instrument)		•
Cyclic repetition of stored profiles	•	•
Modify running profiles	•	•
Graphic display of total profiles		•
Data recording:		
Records measured values in ASCII format	•	•
Records measured values in Microsoft® Excel®		•
Saves additional, relevant measuring data		•
Scalable recording pattern		•
Export function of graphs into JPG format		•
Uploads previously created recordings with print function		•
Control and integration of laboratory instruments of different makes e.g. stirrers, balances, dosing pumps, pH meters, etc.		on request

Chill out at work thanks to our **Services**

Services

Competent advice and good service are JULABO customer support principles. We want you to operate your JULABO unit with success and satisfaction for a long time. Therefore we ensure the best support with our worldwide distribution network.
Divisions and service partners in many countries throughout the world inform and advise our customers in all topics of precise liquid temperature control.

Our Services

- Technical consultation
- Preventive maintenance contracts
- Equipment qualification
- On-site service
- Installation
- Calibration
- User training

Your advantages

- Increased product life
- Prevention of down time
- Optimized equipment performance
- Predictable maintenance costs
- Cost reduction due to fewer repairs
- Conservation of investment value

Certificates

Quality and precision is paramount for the production of JULABO units. Calibrations increase measuring accuracy and ensure that your equipment meets all specifications. JULABO provides manufacturer's calibration certificates for virtually all instruments. In addition JULABO offers on-site calibration for a large variety of our instruments and applications.

JULABO Order No.	Description
8 902 901	1-Point-Manufacturer's Calibration Certificate for JULABO circulators
8 902 903	3-Point-Manufacturer's Calibration Certificate for JULABO circulators
8 902 905	5-Point-Manufacturer's Calibration Certificate for JULABO circulators
8 903 015	Manufacturer's Testing Certificate for JULABO unit without built-in cooling
8 903 025	Manufacturer's Testing Certificate for JULABO cooling units <1 kW cooling power (at +20 °C)
8 903 035	Manufacturer's Testing Certificate for JULABO cooling units >1 kW cooling power (at +20 °C)

IQ/OQ Documentation for Equipment Qualification

JULABO provides Installation and Operational Qualifications (IQ/OQ) for our product lines. Our IQ/OQ documentation includes the mandatory test protocols and standard operating procedures. At JULABO we offer a turn-key solution to assist with the qualification tasks associated with operating in a regulated facility.

Documentation is available for IQ (Installation Qualification) and OQ (Operational Qualification). The documents offered below are for new instruments. Documents for used instruments upon request.
All documentation is available in German, English and French.

Documentation for
IQ & OQ

JULABO Order No.	Description	Valid for the following products
2 310 110	**IQ/OQ Documentation, Category 1**	- Heating & refrigerated circulators Economy series - Heating circulators TopTech series - Water baths TW series - Shaking water baths SW series
2 310 120	**IQ/OQ Documentation, Category 2**	- Refrigerated circulators TopTech series (except F70, F81, FP89) - Heating and refrigerated circulators HighTech series (except ultra-low circulators) - Cryo-compact circulators CF series - Recirculating coolers F & FL series
2 310 130	**IQ/OQ Documentation, Category 3**	- Ultra-low refrigerated circulators TopTech & HighTech series - High temperature circulators Forte HT series - Highly dynamic temperature control systems PRESTO® - Recirculating coolers SemiChill series

Preventive Maintenance Contract

Scheduled maintenance increases your equipment's life time and ensures reliability, always optimizing the performance of your instrument. JULABO offers Preventive Maintenance and Service Contracts to meet your individual requirements.

Your advantages

- Increased product life and optimized equipment performance
- Reduced down time
- Conservation of investment value
- Predictable maintenance costs

JULABO Order No.	Description	Available for the following products
2 350 100	**Preventive Maintenance Contract Standard** include the following services: Visual inspection, technical diagnostics, read-out of BlackBox, testing of tube connections and bath fluid, thorough cleaning of condenser and other components, testing of temperature stability and sensor calibration, testing/measuring of pump and cooling capacity (depending on model) and firmware update (if no hardware adjustment is required)	JULABO Program
2 350 110	**Preventive Maintenance Contract Premium** include all services listed above as well as spare parts and labor required for installation or replacement	JULABO Program

JULABO service contracts include the maintenance of the units as stated in the contract once per year. Availability is subject to model and country.

Rental Equipment

If you have a sudden need for additonal units or a replacement unit to avoid down time, you can now rent JULABO equipment. Equipment in various performance categories is available. Rental period and product availability is subject to model and country. Contact us for more information or quotations.

On-Site Service

JULABO offers on-site service by qualified experts. Many problems can be solved directly on-site, avoiding time-consuming and expensive return shipments. Availability of service is subject to country. For further information call our **service hotline +49 (0) 7823 51-66.**

JULABO Services

- Installation
- Repair & maintenance
- Calibration
- User training

On our way to you!

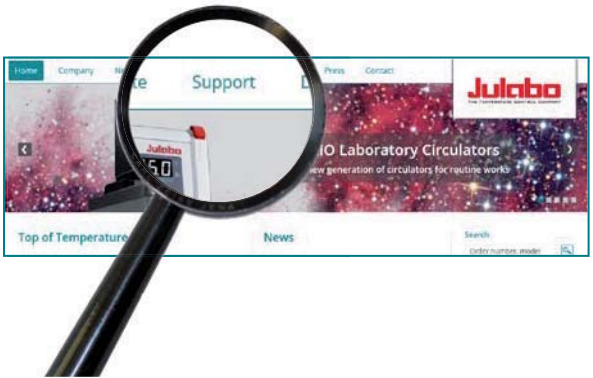
Training

Extensive training programs are available at the JULABO training center or directly at your location. As training schedules are designed individually to your requirements, beginners as well as 'JULABO experts' will benefit. Make use of our know-how and get further information on our training programs by calling +49 (0) 7823 51-190.

Telephone
+49 (0) 7823 51-190

Online Services

JULABO offers comprehensive services online. Choose the categories 'Support' or 'Downloads' and access catalogs, data sheets, operating manuals, case studies and much more. JULABO online service is available 24 hours a day and 7 days per week at **www.julabo.com.**



Glossary

| A

ACC, Active Cooling Control
ACC is the working temperature range in which the refrigeration system remains active as long as refrigeration is desired or required. For all JULABO units the working temperature ranges are equivalent to the ACC range. Thus the refrigeration system can also be used at high temperatures (e.g. +200 °C) for a fast cool-down.

Access Rights
are the regulations deciding user access rights to functions and features of a JULABO temperature control unit. The new PRESTO® series is the line with the most extensive access possibilities: they feature three user levels with password protection.

Air Cooling
If temperature control systems have a refrigeration unit, the heat created by refrigeration must be dissipated. In the case of air-cooled units the heat is dissipated via the condenser of the cooling machine into the ambient air. The air inlet of JULABO units is always at the front. Heated air is dissipated at the back. Other equipment placed on the sides of JULABO units will not be affected.

Ambient Conditions
All JULABO units can be operated at ambient temperatures between +5 °C and +40 °C. The performance data as stated by JULABO is based on ideal ambient conditions of +20 °C and approximately 50 % relative humidity.

| B

Bath Fluids
are mainly selected for their temperature range. The limiting factors of the temperature range are viscosity, fire point, and flash point.
Water: JULABO recommends the use of soft and decalcified water for working temperature ranges from +5 °C to +90 °C.
Distilled and deionized water tends to absorb composites from components, thus causing corrosion.
Alcohols (e.g. Ethanol): Due to their very low fire point these are only partly suitable. For working temperature ranges to -25 °C a water-glycol-mixture (1:1) can be used.
JULABO Thermal bath fluids: are ideal for extended working temperature ranges and have the advantage of much lower specific heat capacities than water and alcohols.

Bath Opening/Bath Depth
is the size of opening which is available for immersing objects or samples into the bath. Usually bath depth is mentioned along with the bath opening.

BlackBox Function, Remote Diagnosis
JULABO circulators with RS232 interface feature a black box which is integrated in the unit and is activated unnoticed in the background recording all relevant data during operation. In the event of a problem the data can be downloaded and sent to JULABO by e-mail. This allows for fast and efficient support. The software Easy BlackBox is available as a free download from www.julabo.com.

| C

Calibration Bath
is a bath circulator with extremely high temperature stability and uniformity (homogeneity). Typical applications are calibration tasks, gauging, and testing of temperature sensors, thermometers, etc.

Capacity Calculation, cooling/heating
The following formula can be used for a time-dependent calculation of the cooling/heating capacity:

Q	= (m * c* dT) / t
Q	= required cooling/heating capacity in kW
m	= mass of material in kg
c	= specific heat capacity (water = 4.2 / Ethanol = 2.5 / silicone oil = 1.8)
dT	= required temperature difference in °C
t	= desired cool-down/heat-up times in seconds

One has to take into consideration that the total mass (m) is the sum of volumes of different sources: e.g. the mass of the circulator, the volume of the tubing, the volume of the reactor's jacket, and the volume of the reactor.
The simple calculation of required cooling/heating capacity as seen above does not take into account differences in weight of the bath fluid or other factors reducing performance. Loss of performance is caused e.g. by: tubing (length, insulation), jacketed reactors (material, thickness, surface), high ambient temperatures, open applications (surface). To supply sufficient cooling/heating capacity a safety factor of 20-30 % should be added.

Classification according to DIN 12876-1
In temperature control instruments, flammable or non-flammable bath fluids may be used. Terms and classifications are specified in DIN 12876-1. JULABO units are part of the following classification:
S1: class I: NFL, for non-flammable bath fluids. Units of this class feature a temperature limiting function called ‚overheating' protection.
S3: class III: FL, for flammable bath fluids. Units of this class feature an adjustable high temperature cut-off and an additional low liquid level protection.
For many models JULABO offers additional protection which clearly exceeds standard requirements.

Circulator
is a laboratory circulator. Its bath fluid is circulated through a closed- or an open-loop.

Cool-down/heat-up times
are the times to reach a defined setpoint. When using JULABO Thermal bath fluids these times are shorter than when using water or alcohol. The reason is their significantly lower and better specific heat capacities.

Cooling Control, proportional
Refrigerated units without proportional cooling have refrigeration systems which are either switched on or off. Systems with proportional cooling have a special electronic valve which automatically controls the cooling capacity. This allows for accurate control of the required cooling power and at the same time saves energy (up to 90 %) and waste heat.

| D

Data Recording, Data logging
JULABO circulators with the appropriate interface can be connected to a PC or a PLC. The JULABO software EasyTemp or a software programmed by the user permits data logging.

DIN 12876
is the German Industry Standard for laboratory circulators and baths. It defines product categories and technical specifications.

Display
Depending on the model JULABO units are equipped with different displays:
- LED display to indicate actual and setpoint value.
- Multi-Display (LED) to indicate actual and setpoint value as well as values high/low temperature warnings and high temperature cut-off. Depending on the model it is possible to display additional values (e.g. pump capacity stages, shaking frequency, etc.)
- LCD display for easy, interactive user guidance with continuous text display
- VFD Comfort Display for permanent, simultaneous indication of three temperature values (internal actual temperature, setpoint temperature and external actual value) and the pump stage.
- TFT Touchscreen: The new PRESTO® series is equipped with 5.7" color industry touchscreens. The intuitive operation provides a fast learning curve.

| E

Early Warning Systems
1. The early warning system for low liquid level: the lack of bath fluid is often the reason for a premature, undesired cut-off caused by the low liquid level protection. Depending on the application, such a cut-off might lead to damage to the objects or samples. The JULABO Early Warning System was designed to avoid this situation by indicating to the user that bath fluid needs to be refilled.
2. The early warning system for high/low temperature detects and signals undesired temperature deviations (e.g. due to exothermic reactions in time).

EasyTEMP => see Software, control

Ethernet => see Interfaces

External Sensor
is a Pt100 sensor which can be applied inside or outside the object being controlled. The sensor is connected to the temperature control unit via a cable. This permits direct measurement and control of an external system.

| F

Fluid => see Bath Fluids

Feed Pressure
is the pressure applied to the pump connection of the circulating pump. If there is only one value indicated in the technical specifications, it is the maximum feed pressure at flow rate zero. The diagrams show the suction in relation to the flow rate.

Feed Suction
is the suction applied to the intake of the circulating pump (pressure/suction pump). If there is only one value indicated in the technical specifications it is the maximum suction at feed pressure zero. The diagrams show the suction in relation to the flow rate.

Filling Volume
is the amount of bath fluid needed for proper operation. The value does not include the amount of fluid which is possibly needed in an external loop. If there are two values stated for the bath volume the smaller value stands for the required minimum amount and the higher value stands for the maximum amount.

Flow Rate
is the volume of liquid per time unit which is moved by the circulating pump. If there is only one value indicated in the technical specifications, it is the maximum flow rate at counter pressure zero. The diagrams show the flow rate in relation to the pressure.

Flow-Through Cooler
is often used as a substitute for cooling with tap water. A flow-through cooler is an uncontrolled cooling unit without a circulating pump. The unit is installed into the external temperature loop in order to cool down the bath fluid. For applications using heating circulators, lower temperatures and/or faster cool-down times can be achieved.

| H

Heating Capacity
is the maximum electrical capacity of the heater which is installed in the unit. The heating capacity is controlled continuously and reduced when getting closer to the pre-set setpoint.

Heating Circulator
is a circulator with a working temperature range that is mainly above ambient temperature and provides heat for the bath fluid.

Heating Immersion Circulator
is fixed with a bath attachment clamp to any bath tank. The bath tank is not included in delivery.

Highly Dynamic Temperature Control Systems
This product group contains model series which have been designed for external temperature control application only (PRESTO®, Magnum91 and Forte HT). Unique features are the extremely rapid heat-up and cool-down times and the unusually wide temperature ranges while using only one type of bath fluid, e.g. Thermal HL40 from -40 °C to +250 °C.

| I

ICC, Intelligent Cascade Control
This is a highly precise PID Cascade Control which was designed for perfect results. The ICC Temperature Control is self-optimizing, i.e. the control parameters automatically adjust to the application.

Immersion Coolers
Immersion coolers are cooling devices with an immersion probe. This is fixed to a flexible tubing and can be used to cool down fluids in any bath tank.
JULABO immersion coolers are optionally available with temperature control and display.

Interfaces, analog, digital
Analog interfaces allow input of the temperature setpoint and output of the actual temperature value analogous as a power or voltage signal. In addition, analog interfaces serve as potential-free alarm output.
Digital interfaces allow a serial data communication between two or more connected units and PCs in digital form. Temperature values, status messages, and application data can be transmitted and recorded. Depending on the model the interfaces RS232, RS485, USB, Ethernet, Profibus, and Modbus are available.

| L

LCD Display => see Display

LED Display => see Display

| M

Main Fuse Protection
The required fuse protection depends on the respective unit. In general the fuse protection has to be higher than the current consumption of the unit which is stated on the type label.
When using a cooling machine, one must keep in mind that upon compressor start up the current draw might be three to five times the nominal current draw.

Mains Voltage
Information on mains voltages and net frequencies required for safe operation can be found on the type label of each unit.

Metal Tubing => see Tubing

Modbus => see Interface

Multi-Display => see Display

| N

Noise Level, Sound Pressure Level
is the acoustic emission of a unit. Sources of noise within the unit are, e.g. the type of counter cooling as well as the ventilation of electronic components. The sound pressure level of JULABO units is determined according to standards, i.e. measurements are made with highly sensitive measuring sensors in the distance prescribed by the standards. The measured values are listed in the chapter 'Technical Specifications' or you can contact JULABO directly.

| O

Open Bath Circulator
are circulators with a bath opening for the insertion of objects for direct temperature control in the bath. A circulating pump with pump connection for an external loop is included.

Open Heating Bath Circulators
are circulators with a circulating pump and an open bath tank. The objects or samples are placed directly into the bath. The circulating pump is used to circulate the bath fluid. Pump connections for an external loop are typically not included.

Operating Temperature Range
is the temperature range limited by the permitted minimum and maximum operating temperature. The adjustable operating temperature range corresponds to the temperature range determined by the control electronics.

| P

Password Management => see Access Rights

PID Temperature Control
JULABO PID1, PID2, and PID3 controls offer fixed control parameters (Xp, Tn, Tv). These can be changed manually with PID2 and

PID3 controls to reach an improved temperature stability especially for external temperature control.

Pressure Pump
is used for the internal circulation of the bath fluid in the bath tank and may additionally be used for fluid circulation in an external temperature loop. Pressure pumps are most frequently used in JULABO units.

Pressure/Suction Pump
Units equipped with a pressure/suction pump (e.g. circulators of the HighTech series) are equipped with two pumps that complement one another. While the pressure pump pumps the fluid from the internal bath tank into the external system, the second pump sucks the fluid through a return line into the bath. Each pump has its own capacity. Therefore, there are two separate values for the pressure and suction capacities stated in the technical specifications. Advantage: an especially high flow rate.

PRESTO® => see Highly Dynamic Temperature Control Systems

Profibus => see Interfaces

Pump Systems
JULABO uses immersion pumps which are designed to work virtually free from mechanical and thermal wear over extended time periods. The main task, beside the internal circulation of the bath fluid, is to constantly supply objects or systems with bath fluid in a loop. The units of the Economy and TopTech series as well as JULABO recirculating coolers, feature pressure pumps of different capacities for closed, external systems.
MA and ME feature electronically adjustable pump capacities in stages. All HighTech circulators feature pressure and suction pumps which can also be adjusted electronically in stages. These pump systems can achieve remarkable pressure, suction and flow rate capacities in closed or open external systems. When working with a connected external glass apparatus the advantage is that by adjusting maximum pressure, damage to the glass vessel can be avoided.
The new PRESTO® (except A30) feature pumps which can be adjusted in four stages via a pressure setpoint.

| R

Recirculating Coolers
are cooling units which are often used as substitutes to cooling solutions with tap water. They usually do not have an accessible bath. The units are equipped with a strong circulating pump with connections for an external application.

Refrigerant
The refrigerant is pumped through a hermetically closed cooling cycle of a cooling machine and withdraws the heat from the bath fluid. For years JULABO has been using environmentallly-friendly refrigerants which are CFC-free. Alternatively, JULABO offers units with natural refrigerants.

Refrigerated and Heating Circulator
is a circulator with a working temperature range above and below ambient temperature. The circulator can either heat up the bath fluid or cool it down.

RS232/RS485 => see Interfaces

Remote Diagnosis => see BlackBox Function

| S

Software, Control
The JULABO software solutions offer the possibility to easily control, display, and record temperature and time related processes. *EasyTEMP,* which is available free of charge, is ideal for simple control tasks of just one JULABO unit. For complex tasks JULABO offers the *EasyTEMP Professional* software.

Systems, external
When connecting an external system, the following points have to be considered for optimal temperature control:
1. Tubing between the circulator and the external system has to be kept as short as possible and has to be secured.
2. Tubing, connections, and the external system have to be well insulated.
3. Use suitable JULABO bath fluid.
4. The exchange of energy between the circulator and the external system has to be optimized (e.g. by avoiding constrictions in the tubing).
5. When using an external temperature sensor, it has to be integrated into the system.
6. The viscosity of the heat transfer liquid has to be kept to a minimum.

| T

TCF (Temperature Control Features)
The TCF Temperature Control Features allow access to all important control parameters. Thus, the user has full control over the control dynamics and can execute manual optimization.
The following functions are available:
1. Band limit: When working in external control mode, this function allows the user to limit the difference between internal and external temperature to freely selectable values. Advantages: Protection of the objects or samples through careful temperature application, e.g. protection of glass reactors from thermal shock.
2. Control dynamics: Option to choose between aperiodic and normal PID behavior when using internal control mode. Aperiodic (factor setting): Perfect, but takes slightly longer to reach the setpoint without overshooting. Normal: reaches the setpoint fast but with minimal overshooting.
3. Limit settings. The limits „IntMax" and „IntMin" are applicable only when operating in external control mode. Fixed temperature limits (maximum and minimum values) can be set for the internal bath temperature. These limits cannot be exceeded by the controller.
   Advantages: Protection against overheating; Freezing pro-

tection when water is used in refrigerated circulators;
Protection against unintended high temperature cut-off
4. Co-speed factor: This parameter influences the time for reaching the setpoint temperature when working in external control mode. Increasing the co-speed factor reduces the time to reach the setpoint but the possibility of overshooting increases.

Temperature control tubing => see Tubing

Temperature Uniformity
is the maximum difference in temperature at different measuring points in the circulator bath. This is especially important for calibration tasks. In JULABO circulators the temperature uniformity differs only slightly from temperature stability. Calibration baths offer the best temperature unifomity.

Temperature Stability
is the maximum difference in temperature at one specific measuring point in the circulator bath. The temperature stability is the maximum deviation of a temperature nominal value measured during a certain period of time and is listed in the catalog for every JULABO unit.

Temperature Control => see PID, ICC, TCF

TFT Touchscreen => see Display

Transparant Bath Circulator
is a circulator with transparent walls which allows direct monitoring of the objects and samples placed into the bath.

Tubing
When used in the proper temperature range JULABO tubing is dependable, extensively chemically resistant and long lasting when used with the recommended JULABO bath fluids. Available tubing:
1. CR Tubing: for working temperatures from -30 °C to +120 °C
2. Viton tubing: for working temperatures from -35 °C to +200 °C
3. Metal tubing, flexible, single insulated:
for working temperatures from -50 °C to +200 °C
4. Metal tubing, flexible, triple insulated:
for working temperatures from -100 °C to +350 °C

Metal tubing is tightly screwed onto the circulator or external system to avoid displacement.

| U

Usable Bath Depth
is the depth which is available in the bath circulator for temperature control applications.

User Guidance, interactive
JULABO Circulators of the HighTech series (except for HE, SE) as well as the highly dynamic temperature control system Forte HT feature an additional 4-line LCD Display in addition to the standard temperature display. All displays, messages and menus are shown as an easy-to-read text. The highly dynamic temperature control systems PRESTO® guides the user via a comfortable TFT Touchscreen.

USB => see Interfaces

| V

VFD Comfort Display => see Display

Viscosity
describes the fluid thickness. High viscosity means low flowability and low viscosity means high flowability.

| W

Warranty, Warranty Period
Standard warranty for all JULABO units is 12 months. The 1PLUS-Warranty gives users the opportunity to extend the warranty up to 24 months, limited to a maximum of 10,000 operating hours. Registration for 1PLUS-Warranty is available at: www.julabo.com.

Water Cooling
When temperature control systems have a cooling machine the heat created by refrigeration must be dissipated. In case of water-cooled units the heat is dissipated to the cooling water (tap water or industrial cooling water) via the condenser of the refrigeration unit. The advantages of water cooling are low noise level and almost zero emission of heat.

WirelessTEMP®
The *WirelessTEMP®* product range allows wireless monitoring and control of JULABO temperature control instruments from a large distance, thus allowing a great variety of operation possibilities. Typical scenarios are e.g. operation of a temperature control unit underneath a fume hood, in a shielded hazard zone, or at locations that are hard to access.

Working Temperature Range
is the temperature range within the operating temperature range which can be reached by the circulator without external cooling at an ambient temperature of +20 °C. The working temperature range for heating circulators starts between +5 °C to +25 °C above ambient temperature. By using a cooling coil (cooling water) or a cooling device the temperature range can be extended towards ambient temperature.

Technical Specifications

Refrigerated/Heating Circulators | Cryo-Compact Circulators

JULABO Model	JULABO Order No.	Working temperature range	Setting/ display resolution	Temperature control	Temp. stability	Heat. cap.	Cooling of refrigeration unit	Cooling capacity (Bath fluid: Ethanol) +20 °C	0 °C	-20 °C	-40 °C
		°C	°C		°C	kW		kW	kW	kW	kW
F12-ED	9 116 612	-20 ... +100	0.1	PID1	±0.03	2	Air	0.16	0.1	0.02	-
F25-ED	9 116 625	-28 ... +100	0.1	PID1	±0.03	2	Air	0.26	0.2	0.06	-
F34-ED	9 116 634	-30 ... +100	0.1	PID1	±0.03	2	Air	0.45	0.32	0.14	-
F12-EH	9 118 612	-20 ... +150	0.1	PID1	±0.03	2	Air	0.16	0.1	0.02	-
F25-EH	9 118 625	-28 ... +150	0.1	PID1	±0.03	2	Air	0.26	0.2	0.06	-
FN25-EH	9 118 625N	-28 ... +150	0.1	PID1	±0.03	2	Air	0.26	0.2	0.06	-
F32-EH	9 118 632	-35 ... +150	0.1	PID1	±0.03	2	Air	0.45	0.39	0.15	-
FN32-EH	9 118 632N	-35 ... +150	0.1	PID1	±0.03	2	Air	0.45	0.39	0.15	-
F33-EH	9 118 633	-30 ... +150	0.1	PID1	±0.03	2	Air	0.5	0.32	0.12	-
F34-EH	9 118 634	-30 ... +150	0.1	PID1	±0.03	2	Air	0.45	0.32	0.14	-
F38-EH	9 118 638	-35 ... +80	0.1	PID1	±0.05	2	Air	0.92	0.66	0.32	-
F12-MA	9 153 612	-20 ... +200	0.01/0.1	PID2	±0.02	2	Air	0.16	0.1	0.02	-
F25-MA	9 153 625	-28 ... +200	0.01/0.1	PID2	±0.02	2	Air	0.26	0.2	0.06	-
FN25-MA	9 153 625N	-28 ... +200	0.01/0.1	PID2	±0.02	2	Air	0.26	0.2	0.06	-
F32-MA	9 153 632	-35 ... +200	0.01/0.1	PID2	±0.02	2	Air	0.45	0.39	0.15	-
FN32-MA	9 153 632N	-35 ... +200	0.01/0.1	PID2	±0.02	2	Air	0.45	0.39	0.15	-
F33-MA	9 153 633	-30 ... +200	0.01/0.1	PID2	±0.02	2	Air	0.5	0.32	0.12	-
F34-MA	9 153 634	-30 ... +150	0.01/0.1	PID2	±0.02	2	Air	0.45	0.32	0.14	-
FP35-MA	9 153 618	-35 ... +150	0.01/0.1	PID2	±0.02	2	Air	0.45	0.39	0.15	-
FP40-MA	9 153 640	-40 ... +200	0.01/0.1	PID2	±0.02	2	Air	0.68	0.5	0.32	0.04
FP50-MA	9 153 650	-50 ... +200	0.01/0.1	PID2	±0.02	2	Air	0.9	0.8	0.5	0.16
FPW50-MA	9 153 651	-50 ... +200	0.01/0.1	PID2	±0.02	2	Water	0.9	0.8	0.5	0.16
F25-ME	9 162 625	-28 ... +200	0.01	PID3	±0.01	2	Air	0.26	0.2	0.06	-
FN25-ME	9 162 625N	-28 ... +200	0.01	PID2	±0.01	2	Air	0.26	0.2	0.06	-
F26-ME	9 162 626	-28 ... +200	0.01	PID3	±0.01	2	Air	0.26	0.2	0.06	-
F32-ME	9 162 632	-35 ... +200	0.01	PID3	±0.01	2	Air	0.45	0.39	0.15	-
FN32-ME	9 162 632N	-35 ... +200	0.01	PID2	±0.01	2	Air	0.45	0.39	0.15	-
F33-ME	9 162 633	-30 ... +200	0.01	PID3	±0.01	2	Air	0.5	0.32	0.12	-
F34-ME	9 162 634	-30 ... +150	0.01	PID3	±0.01	2	Air	0.45	0.32	0.14	-
FP40-ME	9 162 640	-40 ... +200	0.01	PID3	±0.01	2	Air	0.68	0.5	0.32	0.04
FP50-ME	9 162 650	-50 ... +200	0.01	PID3	±0.01	2	Air	0.9	0.8	0.5	0.16
FPW50-ME	9 162 651	-50 ... +200	0.01	PID3	±0.01	2	Water	0.9	0.8	0.5	0.16
F25-HE	9 212 625	-28 ... +200	0.01	ICC	±0.01	2	Air	0.26	0.2	0.06	-
FN25-HE	9 212 625N	-28 ... +200	0.01	ICC	±0.01	2	Air	0.26	0.2	0.06	-
F32-HE	9 212 632	-35 ... +200	0.01	ICC	±0.01	2	Air	0.45	0.39	0.15	-
FN32-HE	9 212 632N	-35 ... +200	0.01	ICC	±0.01	2	Air	0.45	0.39	0.15	-
F34-HE	9 212 634	-30 ... +150	0.01	ICC	±0.01	2	Air	0.45	0.32	0.14	-
FP40-HE	9 212 640	-40 ... +200	0.01	ICC	±0.01	2	Air	0.68	0.5	0.32	0.04
FP45-HE	9 212 645	-42 ... +200	0.01	ICC	±0.01	2	Air	0.85	0.7	0.42	0.08
FP50-HE	9 212 650	-50 ... +200	0.01	ICC	±0.01	2	Air	0.9	0.8	0.5	0.16
FPW50-HE	9 212 651	-50 ... +200	0.01	ICC	±0.01	2	Water	0.9	0.8	0.5	0.16
F25-HL	9 312 625	-28 ... +200	0.01	ICC	±0.01	2	Air	0.26	0.2	0.06	-
FN25-HL	9 312 625N	-28 ... +200	0.01	ICC	±0.01	2	Air	0.26	0.2	0.06	-

Pump capacity Pressure	Suction	Flow rate	Pump connect-ions	Barbed fitting diameter	Bath open-ing/depth W x L / D	Filling volume	Classifica-tion acc. to DIN 12876-1	Power require-ment	Dimensions W x L x H	Weight net	JULABO Model
bar	bar	l/min		inner dia.	cm	liters		V / Hz / A	cm	kg	
0.35	-	15	M10x1	8 / 10 mm	13 x 15 / 13	4.5	I (NFL)	230/50/11	20 x 36 x 56	22	**F12-ED**
0.35	-	15	M10x1	8 / 10 mm	12 x 14 / 14	4.5	I (NFL)	230/50/12	23 x 42 x 61	30	**F25-ED**
0.35	-	15	M10x1	8 / 10 mm	24 x 30 / 15	20	I (NFL)	230/50/12	38 x 58 x 62	41	**F34-ED**
0.35	-	15	M10x1	8 / 10 mm	13 x 15 / 13	4.5	III (FL)	230/50/11	20 x 36 x 56	22	**F12-EH**
0.35	-	15	M10x1	8 / 10 mm	12 x 14 / 14	4.5	III (FL)	230/50/12	23 x 42 x 61	30	**F25-EH**
0.35	-	15	M10x1	8 / 10 mm	12 x 14 / 14	4.5	III (FL)	230/50/12	23 x 50 x 61	31	**FN25-EH**
0.35	-	15	M10x1	8 / 10 mm	18 x 12 / 15	8	III (FL)	230/50/12	31 x 42 x 64	36	**F32-EH**
0.35	-	15	M10x1	8 / 10 mm	18 x 12 / 15	8	III (FL)	230/50/12	31 x 50 x 64	37	**FN32-EH**
0.35	-	15	M10x1	8 / 10 mm	23 x 14 / 20	16	III (FL)	230/50/12	36 x 46 x 69	43	**F33-EH**
0.35	-	15	M10x1	8 / 10 mm	24 x 30 / 15	20	III (FL)	230/50/12	38 x 58 x 62	41	**F34-EH**
0.35	-	15	M10x1	8 / 10 mm	35 x 41 / 27	45	III (FL)	230/50/13	46 x 70 x 89	67	**F38-EH**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	13 x 15 / 13	4.5	III (FL)	230/50/11	20 x 36 x 56	23	**F12-MA**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	12 x 14 / 14	4.5	III (FL)	230/50/12	23 x 42 x 61	31	**F25-MA**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	12 x 14 / 14	4.5	III (FL)	230/50/12	23 x 50 x 61	32	**FN25-MA**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	18 x 12 / 15	8	III (FL)	230/50-60/13	31 x 42 x 64	37	**F32-MA**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	18 x 12 / 15	8	III (FL)	230/50/12	31 x 50 x 64	38	**FN32-MA**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	23 x 14 / 20	16	III (FL)	230/50/12	36 x 46 x 69	44	**F33-MA**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	24 x 30 / 15	20	III (FL)	230/50/12	38 x 58 x 62	42	**F34-MA**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	18 x 12 / -	2.5	III (FL)	230/50/12	31 x 42 x 64	37	**FP35-MA**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	23 x 14 / 20	16	III (FL)	230/50/13	37 x 46 x 69	48	**FP40-MA**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	18 X 12 /15	8	III (FL)	230/50/14	42 x 49 x 70	55	**FP50-MA**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	18 X 12 /15	8	III (FL)	230/50/14	42 x 49 x 70	55	**FPW50-MA**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	12 x 14 / 14	4.5	III (FL)	230/50/12	23 x 42 x 61	31	**F25-ME**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	12 x 14 / 14	4.5	III (FL)	230/50/12	23 x 50 x 61	32	**FN25-ME**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	12 x 14 / 14	4.5	III (FL)	230/50/12	42 x 42 x 42	31	**F26-ME**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	18 x 12 / 15	8	III (FL)	230/50-60/13	31 x 42 x 64	37	**F32-ME**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	18 x 12 / 15	8	III (FL)	230/50/12	31 x 50 x 64	38	**FN32-ME**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	23 x 14 / 20	16	III (FL)	230/50/12	36 x 46 x 69	44	**F33-ME**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	24 x 30 / 15	20	III (FL)	230/50/12	38 x 58 x 62	42	**F34-ME**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	23 x 14 / 20	16	III (FL)	230/50/13	37 x 46 x 69	48	**FP40-ME**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	18 x 12 / 15	8	III (FL)	230/50/14	42 x 49 x 70	55	**FP50-ME**
0.23-0.45	-	11-16	M10x1	8 / 10 mm	18 x 12 / 15	8	III (FL)	230/50/14	42 x 49 x 70	55	**FPW50-ME**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	12 x 14 / 14	4.5	III (FL)	230/50/12	23 x 42 x 64	32	**F25-HE**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	12 x 14 / 14	4.5	III (FL)	230/50/12	23 x 50 x 64	33	**FN25-HE**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	18 x 12 / 15	8	III (FL)	230/50-60/12	31 x 42 x 66	38	**F32-HE**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	18 x 12 / 15	8	III (FL)	230/50/12	31 x 50 x 66	39	**FN32-HE**
0.4 -0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	24 x 30 / 15	20	III (FL)	230/50/12	38 x 58 x 64	44	**F34-HE**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	23 x14 / 20	16	III (FL)	230/50/13	37 x 46 x 71	49	**FP40-HE**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	23 x 26 / 20	26	III (FL)	230/50-60/13	38 x 58 x 69	53	**FP45-HE**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	18 x 12 / 15	8	III (FL)	230/50/14	42 x 49 x 72	57	**FP50-HE**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	18 x 12 / 15	8	III (FL)	230/50/14	42 x 49 x 72	57	**FPW50-HE**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	12 x 14 / 14	4.5	III (FL)	230/50/12	23 x 42 x 64	32	**F25-HL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	12 x 14 / 14	4.5	III (FL)	230/50/12	23 x 50 x 64	33	**FN25-HL**

JULABO Model	JULABO Order No.	Working temperature range	Setting/ display resolution	Temperature control	Temp. stability	Heat. cap.	Cooling of refrigeration unit	Cooling capacity (Bath fluid: Ethanol) +20 °C	0 °C	-20 °C	-40 °C
		°C	°C		°C	kW		kW	kW	kW	kW
F32-HL	9 312 632	-35 ... +200	0.01	ICC	±0.01	2	Air	0.45	0.39	0.15	-
FN32-HL	9 312 632N	-35 ... +200	0.01	ICC	±0.01	2	Air	0.45	0.39	0.15	-
F33-HL	9 312 633	-30 ... +200	0.01	ICC	±0.01	2	Air	0.5	0.32	0.12	-
FP35-HL	9 312 618	-35 ... +150	0.01	ICC	±0.01	2	Air	0.45	0.39	0.15	-
FP40-HL	9 312 640	-40 ... +200	0.01	ICC	±0.01	2	Air	0.68	0.5	0.32	0.04
FP45-HL	9 312 645	-42 ... +200	0.01	ICC	±0.01	2	Air	0.85	0.7	0.42	0.08
FP50-HL	9 312 650	-50 ... +200	0.01	ICC	±0.01	2	Air	0.9	0.8	0.5	0.16
FPW50-HL	9 312 651	-50 ... +200	0.01	ICC	±0.01	2	Water	0.9	0.8	0.5	0.16
CF30	9 400 330	-30 ... +150	0.1	PID1	±0.03	2	Air	0.32	0.25	0.15	-
CF40	9 400 340	-40 ... +150	0.1	PID1	±0.03	2	Air	0.47	0.4	0.28	-
CF31	9 400 331	-30 ... +200	0.01	ICC	±0.02	2	Air	0.32	0.25	0.15	-
CF41	9 400 341	-40 ... +200	0.01	ICC	±0.02	2	Air	0.47	0.4	0.28	-

Ultra-low Refrigerated Circulators

JULABO Model	JULABO Order No.	Working temperature range	Setting/ display resolution	Temp. control	Temp. stability	Heat. cap.	Cooling of refrigeration unit	Cooling capacity (Bath fluid: Ethanol) +20 °C	0 °C	-20 °C	-40 °C	-60° C	-80°C
		°C	°C		°C	kW		kW	kW	kW	kW	kW	kW
F70-ME	9 162 670	-70 ... +100	0.01	PID3	±0.02	1.3	Air	0.34	0.22	0.17	0.13	0.07	-
F81-ME	9 162 681	-81 ... +100	0.01	PID3	±0.02	1.3	Air	0.45	0.38	0.36	0.32	0.27	0.07
FP89-ME	9 162 689	-90 ... +100	0.01	PID3	±0.02	1.3	Air	1.0	0.92	0.88	0.75	0.58	0.2
FP51-SL	9 352 751	-51 ... +200	0.01	ICC	±0.05	3	Air	2.0	1.5	1.0	0.26	-	-
FP52-SL	9 352 752	-60 ... +100	0.01	ICC	±0.05	3	Air	3.0	2.8	1.6	0.65	0.1	-
FP55-SL	9 352 755	-60 ... +100	0.01	ICC	±0.05	3	Air	5.2	4.1	2.2	0.70	0.13	-
F81-HL	9 312 681	-81 ... +100	0.01	ICC	±0.02	1.3	Air	0.45	0.38	0.36	0.32	0.27	0.07
FP89-HL	9 312 689	-90 ... +100	0.01	ICC	±0.02	1.3	Air	1.0	0.92	0.88	0.75	0.58	0.20
FP90-SL	9 352 790	-90 ... +100	0.01	ICC	±0.05	3	Air	1.8	1.7	1.6	1.35	0.75	0.15
FPW52-SL	9 352 753	-60 ... +100	0.01	ICC	±0.05	3	Water	3.0	2.8	1.6	0.65	0.1	-
FPW55-SL	9 352 756	-60 ... +100	0.01	ICC	±0.05	3	Water	5.5	4.1	2.2	1.0	0.13	-
FPW90-SL	9 352 791	-90 ... +100	0.01	ICC	±0.05	3	Water	1.8	1.7	1.6	1.35	0.75	0.15
FPW91-SL	9 352 793	-91 ... +100	0.01	ICC	±0.2	3	Water	4.5	4.1	3.7	3.1	2.0	0.75
FP52-SL	9 352 752N	-60 ... +100	0.01	ICC	±0.05	3	Air	3.0	2.8	1.6	0.65	0.1	-
FP55-SL	9 352 755N	-60 ... +100	0.01	ICC	±0.05	3	Air	5.2	4.1	2.2	0.7	0.13	-
FP52-SL	9 352 752N150	-60 ... +150	0.01	ICC	±0.05	3	Air	3.0	2.8	1.6	0.65	0.1	-
FP55-SL	9 352 755N150	-60 ... +150	0.01	ICC	±0.05	3	Air	5.2	4.1	2.2	0.7	0.13	-
FPW52-SL	9 352 753N	-60 ... +100	0.01	ICC	±0.05	3	Water	3.0	2.8	1.6	0.65	0.1	-
FPW55-SL	9 352 756N	-60 ... +100	0.01	ICC	±0.05	3	Water	5.5	4.1	2.2	1.0	0.13	-
FPW52-SL	9 352 753N150	-60 ... +150	0.01	ICC	±0.05	3	Water	3.0	2.8	1.6	0.65	0.1	-
FPW55-SL	9 352 756N150	-60 ... +150	0.01	ICC	±0.05	3	Water	5.5	4.1	2.2	1.0	0.13	-
FP90-SL	9 352 790N	-90 ... +100	0.01	ICC	±0.05	3	Air	1.8	1.7	1.6	1.35	0.75	0.15
F95-SL	9 352 795N	-95 ... 0	0.01	ICC	±0.05	3	Air	-	1.7	1.5	1.3	1.1	0.36
FP90-SL	9 352 790N150	-90 ... +150	0.01	ICC	±0.05	3	Air	1.8	1.7	1.6	1.35	0.75	0.15
FPW90-SL	9 352 791N	-90 ... +100	0.01	ICC	±0.05	3	Water	1.8	1.7	1.6	1.35	0.75	0.15
FPW91-SL	9 352 793N	-91 ... +100	0.01	ICC	±0.2	3	Water	4.5	4.1	3.7	3.1	2.0	0.75
FW95-SL	9 352 796N	-95 ... 0	0.01	ICC	±0.05	3	Water	-	1.7	1.5	1.3	1.1	0.36
FPW90-SL	9 352 791N150	-90 ... +150	0.01	ICC	±0.05	3	Water	1.8	1.7	1.6	1.35	0.75	0.15

Pump capacity Pressure	Suction	Flow rate	Pump connect-ions	Barbed fitting diameter	Bath open-ing/depth W x L / D	Filling volume	Classifica-tion acc. to DIN 12876-1	Power require-ment	Dimensions W x L x H	Weight net	JULABO Model
bar	bar	l/min		inner dia.	cm	liters		V / Hz / A	cm	kg	
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	18 x 12 / 15	8	III (FL)	230/50-60/12	31 x 42 x 66	38	**F32-HL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	18 x 12 / 15	8	III (FL)	230/50/12	31 x 50 x 66	39	**FN32-HL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	23 x 14 / 20	16	III (FL)	230/50/12	36 x 46 x 71	45	**F33-HL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	18 x 12 / -	2.5	III (FL)	230/50/12	31 x 42 x 66	38	**FP35-HL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	23 x 14 / 20	16	III (FL)	230/50/13	37 x 46 x 71	49	**FP40-HL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	23 x 26 / 20	26	III (FL)	230/50-60/13	38 x 58 x 59	53	**FP45-HL**
0.4 -0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	18 x 12 / 15	8	III (FL)	230/50/14	42 x 49 x 72	57	**FP50-HL**
0.4 -0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	18 x 12 / 15	8	III (FL)	230/50/14	42 x 49 x 72	57	**FPW50-HL**
0.35	-	15	M16x1	8 / 12 mm	16 x 3 / 14	3.5	III (FL)	230/50/10	24 x 46 x 40	35	**CF30**
0.35	-	15	M16x1	8 / 12 mm	19 x 3 / 19	5.5	III (FL)	230/50/12	28 x 46 x 46	41	**CF40**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	16 x 3 / 14	3.5	III (FL)	230/50/11	24 x 46 x 40	36	**CF31**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	19 x 3 / 19	5.5	III (FL)	230/50/13	28 x 46 x 46	42	**CF41**

Pump capacity Pressure	Suction	Flow rate	Pump connect-ions	Barbed fitting diameter	Bath open-ing/depth W x L / D	Filling volume	Classifica-tion acc. to DIN 12876-1	Power require-ment	Dimensions W x L x H	Weight net	JULABO Model
bar	bar	l/min		inner dia.	cm	liters		V / Hz / A	cm	kg	
0.23-0.45	-	11-16	M16x1	8 / 12 mm	12 x 12 / 13	4.5	III (FL)	230/50/14	42 x 54 x 71	63	**F70-ME**
0.23-0.45	-	11-16	M16x1	8 / 12 mm	13 x 15 / 16	6.5	III (FL)	230/50-60/16	50 x 58 x 88	86	**F81-ME**
0.23-0.45	-	11-16	M16x1	8 / 12 mm	13 x 15 / 16	8	III (FL)	230/50/14	55 x 60 x 90	133	**FP89-ME**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	18 x 12 / 20	11	III (FL)	3x400/50/14	46 x 55 x 89	90	**FP51-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	28 x 23 / 22	24	III (FL)	3x400/50/19	59 x 76 x 116	156	**FP52-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	28 x 23 / 22	27	III (FL)	3x400/50/20	85 x 76 x 116	182	**FP55-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	13 x 15 / 16	6.5	III (FL)	230/50-60/16	50 x 58 x 89	88	**F81-HL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	13 x 15 / 16	8	III (FL)	230/50/14	55 x 60 x 92	135	**FP89-HL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	28 x 23 / 22	22	III (FL)	3x400/50/22	59 x 76 x 116	195	**FP90-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	28 x 23 / 22	24	III (FL)	3x400/50/21	59 x 76 x 116	153	**FPW52-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	28 x 23 / 22	27	III (FL)	3x400/50/20	59 x 76 x 116	163	**FPW55-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	28 x 23 / 22	22	III (FL)	3x400/50/22	59 x 76 x 116	188	**FPW90-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	28 x 23 / 22	22	III (FL)	3x400/50/32	85 x 76 x 116	296	**FPW91-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	24	III (FL)	3x400/50/19	59 x 76 x 116	156	**FP52-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	27	III (FL)	3x400/50/20	85 x 76 x 116	182	**FP55-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	24	III (FL)	3x400/50/19	59 x 76 x 116	156	**FP52-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	27	III (FL)	3x400/50/20	85 x 76 x 116	182	**FP55-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	24	III (FL)	3x400/50/21	59 x 76 x 116	153	**FPW52-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	27	III (FL)	3x400/50/20	59 x 76 x 116	163	**FPW55-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	24	III (FL)	3x400/50/21	59 x 76 x 116	153	**FPW52-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	27	III (FL)	3x400/50/20	59 x 76 x 116	163	**FPW55-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	22	III (FL)	3x400/50/22	59 x 76 x 116	195	**FP90-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	22	III (FL)	3x400/50/24	59 x 76 x 116	201	**F95-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	22	III (FL)	3x400/50/22	59 x 76 x 116	195	**FP90-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	22	III (FL)	3x400/50/22	59 x 76 x 116	188	**FPW90-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	22	III (FL)	3x400/50/32	85 x 76 x 116	296	**FPW91-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	22	III (FL)	3x400/50/24	59 x 76 x 116	198	**FW95-SL**
0.4-0.7	0.2-0.4	22-26	M16x1	8 / 12 mm	filling port	22	III (FL)	3x400/50/22	59 x 76 x 116	188	**FPW90-SL**

Heating Immersion Circulators | Bridge Mounted Circulators

JULABO Model	JULABO Order No.	Working temperature range	Setting / display resolution	Temperature control	Temp. stability	Heating capacity	Pump capacity		
							Pressure	Suction	Flow rate
		°C	°C		°C	kW	bar	bar	l/min.
ED	9 116 000	+20 ... +100	0.1	PID1	±0.03	2	0.35	-	15
EH	9 118 000	+20 ... +150	0.1	PID1	±0.03	2	0.35	-	15
MA	9 153 000	+20 ... +200	0.01/0.1	PID2	±0.01	2	0.23 - 0.45	-	11 - 16
ME	9 162 000	+20 ... +200	0.01	PID3	±0.01	2	0.23 - 0.45	-	11 - 16
SE-Z	9 252 218	+20 ... +300	0.01	ICC	±0.01	3	0.4 - 0.7	0.2 - 0.4	22 - 26

Open Heating Bath Circulators | Heating Circulators with Open Bath

JULABO Model	JULABO Order No.	Working temperature range	Setting / display resolution	Temperature control	Temp. stability	Heating capacity	Pump capacity		
							Pressure	Suction	Flow rate
		°C	°C		°C	kW	bar	bar	l/min.
ED-13	9 116 413	+20 ... +100	0.1	PID1	±0.03	2	0.35	-	15
ED-19	9 116 419	+20 ... +100	0.1	PID1	±0.03	2	0.35	-	15
ED-27	9 116 427	+20 ... +100	0.1	PID1	±0.03	2	0.35	-	15
ED-33	9 116 433	+20 ... +100	0.1	PID1	±0.03	2	0.35	-	15
ED-5	9 116 405	+20 ... +100	0.1	PID1	±0.03	2	0.35	-	15
EH-5	9 118 405	+20 ... +150	0.1	PID1	±0.03	2	0.35	-	15
EH-13	9 118 413	+20 ... +150	0.1	PID1	±0.03	2	0.35	-	15
EH-19	9 118 419	+20 ... +150	0.1	PID1	±0.03	2	0.35	-	15
EH-27	9 118 427	+20 ... +150	0.1	PID1	±0.03	2	0.35	-	15
EH-33	9 118 433	+20 ... +150	0.1	PID1	±0.03	2	0.35	-	15
EH-39	9 118 439	+20 ... +150	0.1	PID1	±0.03	2	0.35	-	15

Pump connections	Barbed fitting diameter	Usable immersion depth	Classification according to DIN 12876-1	Power requirement	Dimensions W x L x H	Weight net	JULABO Model
	inner dia.	cm		V / Hz / A	cm	kg	
-	-	8 - 14.5	I (NFL)	230/50/9	13 x 15 x 33	3.3	**ED**
-	-	8 - 14.5	III (FL)	230/50/9	13 x 15 x 33	3.3	**EH**
-	-	8 - 14.5	III (FL)	230/50-60/9	13 x 15 x 33	4	**MA**
-	-	8 - 14.5	III (FL)	230/50-60/9	13 x 15 x 33	4	**ME**
M16x1	8 / 12 mm	12 - 19	III (FL)	230/50-60/13	32 x 17 x 40	8	**SE-Z**

Pump connect-ions	Barbed fitting diameter	Bath opening/ Bath depth W x L / D	Fill. vol.	Cooling coil	Bath cover	Classification according to DIN 12876-1	Power requirement	Dimensions W x L x H	Weight net	JULABO Model
	inner dia.	cm	liters				V / Hz / A	cm	kg	
-	-	18 x 30 / 15	13	Option	Option	I (NFL)	230/50/9	39 x 33 x 37	8	**ED-13**
-	-	36 x 30 / 15	19	Option	Option	I (NFL)	230/50/9	57 x 33 x 37	11	**ED-19**
-	-	36 x 30 / 20	27	Option	Option	I (NFL)	230/50/9	57 x 37 x 42	13	**ED-27**
-	-	67 x 30 / 15	33	Option	Option	I (NFL)	230/50/9	91 x 33 x 38	20	**ED-33**
M10x1	8 / 10 mm	15 x 15 / 15	4.5	Integrated	Integrated	I (NFL)	230/50/9	17 x 33 x 36	7	**ED-5**
M10x1	8 / 10 mm	15 x 15 / 15	4.5	Integrated	Integrated	III (FL)	230/50/9	17 x 33 x 36	7	**EH-5**
M10x1	8 / 10 mm	18 x 30 / 15	13	Option	Option	III (FL)	230/50/9	39 x 33 x 37	8	**EH-13**
M10x1	8 / 10 mm	36 x 30 / 15	19	Option	Option	III (FL)	230/50/9	57 x 33 x 37	11	**EH-19**
M10x1	8 / 10 mm	36 x 30 / 20	27	Option	Option	III (FL)	230/50/9	57 x 37 x 42	13	**EH-27**
M10x1	8 / 10 mm	67 x 30 / 15	33	Option	Option	III (FL)	230/50/9	91 x 33 x 38	20	**EH-33**
M10x1	8 / 10 mm	36 x 30 / 30	39	Option	Option	III (FL)	230/50/9	54 x 34 x 52	19	**EH-39**

Pump connections	Barbed fitting diameter	Bath opening/ Bath depth W x L / D	Fill. vol.	Cooling coil	Bath cover	Classification according to DIN 12876-1	Power require-ment	Dimensions W x L x H	Weight net	JULABO Model
	inner dia.	cm	liters				V / Hz / A	cm	kg	
M10x1	8 / 10 mm	13 x 15 / 15	4.5	Integrated	Integrated	III (FL)	230/50-60/9	21 x 42 x 38	9.6	**MA-4**
M10x1	8 / 10 mm	13 x 15 / 20	6	Integrated	Integrated	III (FL)	230/50-60/9	21 x 43 x 42	12.5	**MA-6**
M10x1	8 / 10 mm	22 x 15 / 20	12	Integrated	Integrated	III (FL)	230/50-60/9	30 x 43 x 45	13	**MA-12**
M10x1	8 / 10 mm	22 x 30 / 20	26	Integrated	Integrated	III (FL)	230/50-60/9	36 x 61 x 45	26	**MA-26**
M10x1	8 / 10 mm	13 x 15 / 15	4.5	Integrated	Integrated	III (FL)	230/50-60/9	21 x 42 x 38	9.6	**ME-4**
M10x1	8 / 10 mm	13 x 15 / 20	6	Integrated	Integrated	III (FL)	230/50-60/9	21 x 43 x 42	12.5	**ME-6**
M10x1	8 / 10 mm	22 x 15 / 20	12	Integrated	Integrated	III (FL)	230/50-60/9	30 x 43 x 45	13	**ME-12**
M10x1	8 / 10 mm	22 x 30 / 20	26	Integrated	Integrated	III (FL)	230/50-60/9	36 x 61 x 45	26	**ME-26**
M16x1	8 / 12 mm	13 x 15 / 15	4.5	Integrated	Integrated	III (FL)	230/50-60/9	21 x 42 x 40	11	**HE-4**
M16x1	8 / 12 mm	13 x 15 / 20	6	Integrated	Integrated	III (FL)	230/50-60/13	21 x 43 x 44	13.5	**SE-6**
M16x1	8 / 12 mm	22 x 15 / 20	12	Integrated	Integrated	III (FL)	230/50-60/13	30 x 43 x 47	14	**SE-12**
M16x1	8 / 12 mm	22 x 30 / 20	26	Integrated	Integrated	III (FL)	230/50-60/13	36 x 61 x 47	27	**SE-26**
M16x1	8 / 12 mm	13 x 15 / 15	4.5	Integrated	Integrated	III (FL)	230/50-60/9	21 x 42 x 40	11	**HL-4**
M16x1	8 / 12 mm	13 x 15 / 20	6	Integrated	Integrated	III (FL)	230/50-60/13	21 x 43 x 44	13.5	**SL-6**
M16x1	8 / 12 mm	22 x 15 / 20	12	Integrated	Integrated	III (FL)	230/50-60/13	30 x 43 x 47	14	**SL-12**
M16x1	8 / 12 mm	22 x 30 / 20	26	Integrated	Integrated	III (FL)	230/50-60/13	36 x 61 x 47	27	**SL-26**

PRESTO® Highly Dynamic Temperature Control Systems | Process Circulators

JULABO Model	JULABO Order No.	Working temp. range	User interface / resolution	Temp. contr.	Temperature stability	Heat cap.	Cooling of refrigeration unit	Cooling capacity (Bath fluid: JULABO Thermal | Ethanol)							
								+200 | +20		0	-20	-30	-40	-60	-80 °C
		°C	°C		°C	kW		kW	kW	kW	kW	kW	kW	kW	kW
A30	9 420 300	-30 ... +250	5.7" TFT /±0.01°C	ICC	±0.01 ... ±0.05	2.7	1-st. Air	0.5	0.5	0.4	0.2	0.05	-	-	-
A40	9 420 401	-40 ... +250	5.7" TFT /±0.01°C	ICC	±0.01 ... ±0.05	2.7	1-st. Air	1.2	1.2	0.9	0.6	0.3	0.1	-	-
W40	9 421 401	-40 ... +250	5.7" TFT /±0.01°C	ICC	±0.01 ... ±0.05	2.7	1-st. Water	1.2	1.2	1.0	0.55	0.3	0.06	-	-
A45	9 420 452	-45 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.1	6	1-st. Air	3.4	3.5	3.3	1.8	1.0	0.3	-	-
A45t	9 420 452.T	-45 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.1	12	1-st. Air	3.4	3.5	3.3	1.8	1.0	0.3	-	-
A80	9 420 801	-80 ... +250	5.7" TFT /±0.01°C	ICC	±0.01 ... ±0.05	1.8	2-st. Air	1.2	1.2	1.2	1.1	1.1	1.1	0.65	0.1
A80t	9 420 801.T	-80 ... +250	5.7" TFT /±0.01°C	ICC	±0.01 ... ±0.05	3.4	2-st. Air	1.2	1.2	1.2	1.1	1.1	1.1	0.65	0.1
W80	9 421 801	-80 ... +250	5.7" TFT /±0.01°C	ICC	±0.01 ... ±0.05	1.8	2-st. Water	1.2	1.2	1.2	1.1	1.1	1.1	0.65	0.1
W80t	9 421 801.T	-80 ... +250	5.7" TFT /±0.01°C	ICC	±0.01 ... ±0.05	3.4	2-st. Water	1.2	1.2	1.2	1.1	1.1	1.1	0.65	0.1
A85	9 420 852	-85 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.1	6	2-st. Air	2.8	2.5	2.4	2.4	2.4	2.4	2.2	0.4
A85t	9 420 852.T	-85 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.1	15	2-st. Air	2.8	2.5	2.4	2.4	2.4	2.4	2.2	0.4
W85	9 421 852	-85 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.1	6	2-st. Water	2.8	2.5	2.4	2.4	2.4	2.4	2.2	0.4
W85t	9 421 852.T	-85 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.1	15	2-st. Water	2.8	2.5	2.4	2.4	2.4	2.4	2.2	0.4
W91	9 421 912	-91 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	12	2-st. Water	11.0	11.0	10.0	9.5		9.0	6.5	1.5
W91t	9 421 912.T	-91 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	24	2-st. Water	11.0	11.0	10.0	9.5		9.0	6.5	1.5
W91tt	9 421 912.TT	-91 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	36	2-st. Water	11.0	11.0	10.0	9.5		9.0	6.5	1.5
W91x	9 421 913	-91 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	12	2-st. Water	11.0	11.0	10.0	9.5		9.0	6.5	1.5
W91tx	9 421 913.T	-91 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	24	2-st. Water	11.0	11.0	10.0	9.5		9.0	6.5	1.5
W91ttx	9 421 913.TT	-91 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	36	2-st. Water	11.0	11.0	10.0	9.5		9.0	6.5	1.5
W92	9 421 922	-92 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	12	2-st. Water	31.0	19.0	15.5	9.5		9.0	6.5	1.5
W92t	9 421 922.T	-92 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	24	2-st. Water	31.0	19.0	15.5	9.5		9.0	6.5	1.5
W92tt	9 421 922.TT	-92 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	36	2-st. Water	31.0	19.0	15.5	9.5		9.0	6.5	1.5
W92x	9 421 923	-92 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	12	2-st. Water	31.0	19.0	15.5	9.5		9.0	6.5	1.5
W92tx	9 421 923.T	-92 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	24	2-st. Water	31.0	19.0	15.5	9.5		9.0	6.5	1.5
W92ttx	9 421 923.TT	-92 ... +250	5.7" TFT /±0.01°C	ICC	±0.05 ... ±0.2	36	2-st. Water	31.0	19.0	15.5	9.5		9.0	6.5	1.5

Pump capacity		Viscosity max.	Pump connections	Process volume min. (active heat exchange volume)	Internal usable expansion volume	Classification acc. to DIN 12876-1	Power requirement	Dimensions W x L x H	Weight net	JULABO Model
Pressure	Flow rate									
bar	l/min.	cSt.		liters	liters		V / Hz / A	cm	kg	
0.5	25	50	M24x1.5	2.4 (1.4)	1.5	III (FL)	230/50/15	25 x 59 x 62	62	**A30**
0.3 ... 1.7	16 ... 40	50	M24x1.5	3.5 (1.7)	2.7	III (FL)	230/50-60/16	33 x 59 x 67	79	**A40**
0.3 ... 1.7	16 ... 40	50	M24x1.5	3.5 (1.7)	2.7	III (FL)	230/50-60/16	33 x 59 x 67	78	**W40**
0.48 ... 3.2	35 ... 76	50	M30x1.5	7.5 (3.5)	7.5	III (FL)	3 x 400/50/13	53 x 66.5 x 126	210	**A45**
0.48 ... 3.2	35 ... 76	50	M30x1.5	7.5 (3.5)	7.5	III (FL)	3 x 400/50/22	53 x 66.5 x 126	210	**A45t**
0.3 ... 1.7	16 ... 40	50	M24x1.5	3.9 (1.7)	5.6	III (FL)	230/50/16	43 x 65 x 126	164	**A80**
0.3 ... 1.7	16 ... 40	50	M24x1.5	3.9 (1.7)	5.6	III (FL)	3 x 400/50/16	43 x 65 x 126	167	**A80t**
0.3 ... 1.7	16 ... 40	50	M24x1.5	3.9 (1.7)	5.6	III (FL)	230/50/16	43 x 65 x 126	159	**W80**
0.3 ... 1.7	16 ... 40	50	M24x1.5	3.9 (1.7)	5.6	III (FL)	3 x 400/50/16	43 x 65 x 126	162	**W80t**
0.48 ... 3.2	35 ... 80	50	M30x1.5	9.5 (5)	7	III (FL)	3 x 400/50/18	61 x 108 x 125	365	**A85**
0.48 ... 3.2	35 ... 80	50	M30x1.5	9.5 (5)	7	III (FL)	3 x 400/50/31	61 x 108 x 125	365	**A85t**
0.48 ... 3.2	35 ... 80	50	M30x1.5	9.5 (5)	7	III (FL)	3 x 400/50/18	61 x 84.5 x 125	335	**W85**
0.48 ... 3.2	35 ... 80	50	M30x1.5	9.5 (5)	7	III (FL)	3 x 400/50/31	61 x 84.5 x 125	335	**W85t**
0.5 ... 3.0	26 ... 80	50	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/31	95 x 127 x 190	770	**W91**
0.5 ... 3.0	26 ... 80	50	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/43	95 x 127 x 190	780	**W91t**
0.5 ... 3.0	26 ... 80	50	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/55	95 x 127 x 190	790	**W91tt**
0.8 ... 5.5	18 ... 70	70	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/31	95 x 127 x 190	785	**W91x**
0.8 ... 5.5	18 ... 70	70	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/43	95 x 127 x 190	795	**W91tx**
0.8 ... 5.5	18 ... 70	70	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/55	95 x 127 x 190	805	**W91ttx**
0.5 ... 3.0	26 ... 80	50	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/31	95 x 127 x 190	785	**W92**
0.5 ... 3.0	26 ... 80	50	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/43	95 x 127 x 190	795	**W92t**
0.5 ... 3.0	26 ... 80	50	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/55	95 x 127 x 190	805	**W92tt**
0.8 ... 5.5	18 ... 70	70	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/31	95 x 127 x 190	800	**W92x**
0.8 ... 5.5	18 ... 70	70	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/43	95 x 127 x 190	810	**W92tx**
0.8 ... 5.5	18 ... 70	70	M38x1.5	28 (16)	40	III (FL)	3 x 400/50/55	95 x 127 x 190	820	**W92ttx**

Forte HT Highly Dynamic Temperature Control Systems / Process Circulators

JULABO Model	JULABO Order No.	Working temperature range	Setting/ display resolution	Temperature control	Temperature stability external	Heating capacity	Integrated Cooling unit C.U.	Pump capacity	
								Pressure	Flow rate
		°C	°C		°C	kW	kW	bar	l/min.
HT30-M1	9 800 031	+70 ... +400	0.01	ICC	±0.01 ... ±0.1	3	-	0.8 - 1.2	14 - 18
HT60-M2	9 800 062	+70 ... +400	0.01	ICC	±0.01 ... ±0.1	7	-	0.8 - 1.2	14 - 18
HT60-M3	9 800 063	+70 ... +400	0.01	ICC	±0.01 ... ±0.1	6	-	0.8 - 1.2	14 - 18
HT30-M1-C.U.	9 800 035	+40 ... +400	0.01	ICC	±0.01 ... ±0.1	3	Ja	0.8 - 1.2	14 - 18
HT60-M2-C.U.	9 800 065	+40 ... +400	0.01	ICC	±0.01 ... ±0.1	7	Ja	0.8 - 1.2	14 - 18
HT60-M3-C.U.	9 800 066	+40 ... +400	0.01	ICC	±0.01 ... ±0.1	6	Ja	0.8 - 1.2	14 - 18

Recirculating Coolers (F/AWC100)

JULABO Model	JULABO Order No.	Working temperature range	Setting/ display resolution	Temperature control	Temp. stability	Cooling of the refrigeration unit	Cooling capacity				
							+20	+10	+5	0	-5 °C
		°C	°C		°C		kW	kW	kW	kW	kW
F250	9 620 025	-10 ... +40	0.1	PID	±0.5	Air	0.25	0.22	0.21	0.18	0.09
F500	9 620 050	0 ... +40	0.1	PID	±0.5	Air	0.5	0.4	0.3	0.25	-
F1000	9 620 100	0 ... +40	0.1	PID	±0.5	Air	1.0	0.7	0.55	0.35	-
AWC100	9 630 100	+20 ... +40	-	-	-	Air	0.55	0.3	0.18	-	-

Recirculating Coolers (FL)

JULABO Model	JULABO Order No.	Working temp. range	Setting/ display resolution	Temp. control	Temp. stability	Heating capacity	Cooling of refrigera-tion unit	Cooling capacity			
								+20	0	-10	-20 °C
		°C	°C		°C	kW		kW	kW	kW	kW
FL300	9 660 003	-20 ... +40	0.1	PID1	±0.5	-	Air	0.3	0.2	0.15	0.1
FL601	9 661 006	-20 ... +40	0.1	PID1	±0.5	-	Air	0.6	0.4	0.33	0.2
FL1201	9 661 012	-20 ... +40	0.1	PID1	±0.5	-	Air	1.2	0.9	0.6	0.3
FL1203	9 663 012	-20 ... +40	0.1	PID1	±0.5	-	Air	1.2	0.8	0.5	0.2
FL1701	9 661 017	-20 ... +40	0.1	PID1	±0.5	-	Air	1.7	1.1	0.85	0.4
FL1703	9 663 017	-20 ... +40	0.1	PID1	±0.5	-	Air	1.7	1.0	0.75	0.3
FLW1701	9 671 017	-20 ... +40	0.1	PID1	±0.5	-	Water	1.7	1.1	0.85	0.4
FLW1703	9 673 017	-20 ... +40	0.1	PID1	±0.5	-	Water	1.7	1.0	0.75	0.3
FL2503	9 663 025	-20 ... +40	0.1	PID1	±0.5	-	Air	2.5	1.5	1.2	0.55
FL2506	9 666 025	-15 ... +40	0.1	PID1	±0.5	-	Air	2.5	1.0	0.3	-

Pump connections	Filling volume	Fill. volume expansion vessel	Classification acc. to DIN 12876-1	IP Class acc. to IEC 60529	Power requirement	Dimensions W x L x H	Control unit dimensions W x L x H	Weight net	JULABO Model
	liters	liters			V / Hz / A	cm	cm	kg	
M16x1	2	1.6+0.9	III (FL)	IP31	230/50/15	23 x 23 x 58	25 x 25 x 18	27	**HT30-M1**
M16x1	2	1.6+0.9	III (FL)	IP31	3 x 400/50/11	23 x 23 x 58	25 x 25 x 18	29	**HT60-M2**
M16x1	2	1.6+0.9	III (FL)	IP31	3 x 208/60/18	23 x 23 x 58	25 x 25 x 18	29	**HT60-M3**
M16x1	2	1.6+0.9	III (FL)	IP31	230/50/15	43 x 23 x 58	25 x 25 x 18	35	**HT30-M1-C.U.**
M16x1	2	1.6+0.9	III (FL)	IP31	3 x 400/50/11	43 x 23 x 58	25 x 25 x 18	37	**HT60-M2-C.U.**
M16x1	2	1.6+0.9	III (FL)	IP31	3 x 208/60/18	43 x 23 x 58	25 x 25 x 18	37	**HT60-M3-C.U.**

Pump capacity		Pump connections	Barbed fitting diameter	Filling volume	Power requirement	Noise level	Dimensions W x L x H	Weight net	JULABO Model
Pressure	Flow rate								
bar	l/min		inner dia.	liters	V / Hz / A	dBA	cm	kg	
0.35	15	M10x1	8 / 10 mm	1.7...2.6	230/50/2	59	24 x 40 x 52	27	**F250**
0.5	24	M16x1	8 / 12 mm	5 ... 7.5	230/50/3	62	37.5 x 44 x 59	34	**F500**
1.0	23	M16x1	8 / 12 mm	7 ... 9.5	230/50/3	62	37.5 x 49 x 64	45	**F1000**
0.2	2.9	M10x1	8 / 10 mm	0.9	230/50-60/1	55	20 x 34 x 30	11	**AWC100**

Pump capacity		Pump connections	Barbed fitting diameter	Filling volume	IP Class acc. to IEC 60529	Power requirement	Noise level	Dimensions W x L x H	Weight net	JULABO Model
Pressure	Flow rate									
bar	l/min.		inner dia.	liters		V / Hz / A	dBA	cm	kg	
0.35	15	M16x1	8 / 12 mm	3...4.5	IP21	230/50/3	55	25 x 50 x 60	39	**FL300**
1.0	23	M16x1	8 / 12 mm	5.5...8	IP21	230/50/5	55	32 x 50 x 60	48	**FL601**
1.0	23	M16x1	8 / 12 mm	12...17	IP21	230/50/7	61	50 x 76 x 64	76	**FL1201**
0.5 - 3.0	40	G ¾"	¾"	12...17	IP21	230/50/12	61	50 x 76 x 64	91	**FL1203**
1.0	23	M16x1	8 / 12 mm	12...17	IP21	230/50/10	62	50 x 76 x 64	85	**FL1701**
0.5 - 3.0	40	G ¾"	¾"	12...17	IP21	230/50/12	63	50 x 76 x 64	91	**FL1703**
1.0	23	M16x1	8 / 12 mm	12...17	IP21	230/50/10	59	50 x 76 x 64	82	**FLW1701**
0.5 - 3.0	40	G ¾"	¾"	12...17	IP21	230/50/12	60	50 x 76 x 64	88	**FLW1703**
0.5 - 3.0	40	G ¾"	¾"	24...30	IP21	230/50/11	64	60 x 76 x 115	146	**FL2503**
0.5 - 6.0	60	G1 ¼"	1"	24...30	IP21	230/50/14	64	60 x 76 x 115	158	**FL2506**

Recirculating Coolers (FL/FC/SemiChill)

JULABO Model	JULABO Order No.	Working temp. range	Setting/ display resolution	Temp. control	Temp. stability	Heating capacity	Cooling of refrigera-tion unit	Cooling capacity +20	0	-10	-20 °C
		°C	°C		°C	kW		kW	kW	kW	kW
FL4003	9 663 040	-20 ... +40	0.1	PID1	±0.5	-	Air	4.0	2.4	1.5	0.65
FL4006	9 666 040	-20 ... +40	0.1	PID1	±0.5	-	Air	4.0	1.9	0.9	0.05
FLW2503	9 673 025	-20 ... +40	0.1	PID1	±0.5	-	Water	2.7	1.7	1.0	0.4
FLW2506	9 676 025	-15 ... +40	0.1	PID1	±0.5	-	Water	2.5	1.0	0.3	-
FLW4003	9 673 040	-20 ... +40	0.1	PID1	±0.5	-	Water	4.3	2.2	1.3	0.45
FLW4006	9 676 040	-20 ... +40	0.1	PID1	±0.5	-	Water	4.0	1.7	0.7	-
FL7006	9 666 070	-20 ... +40	0.1	PID1	±0.5	-	Air	7.0	5.1	3.0	1.55
FL11006	9 666 110	-20 ... +40	0.1	PID1	±0.5	-	Air	11.0	7.5	5.0	3.0
FL20006	9 666 200	-25 ... +40	0.1	PID1	±0.5	-	Air	20.0	10	6.0	2.5
FLW7006	9 676 070	-20 ... +40	0.1	PID1	±0.5	-	Water	7.4	7.0	3.1	1.3
FLW11006	9 676 110	-20 ... +40	0.1	PID1	±0.5	-	Water	11.5	7.3	4.8	2.7
FLW20006	9 676 200	-25 ... +40	0.1	PID1	±0.5	-	Water	20.0	12.0	7.0	3.0
FC600	9 600 060	-20 ... +80	0.1	PID1	±0.2	1.2	Air	0.6	0.33	0.21	-
FC600S	9 600 063	-10 ... +80	0.1	PID1	±0.2	1.2	Air	0.5	0.22	0.1	-
FC1200	9 600 120	-20 ... +80	0.1	PID1	±0.2	1.2	Air	1.3	0.6	0.37	-
FC1200S	9 600 123	-15 ... +80	0.1	PID1	±0.2	1.2	Air	1.2	0.5	0.26	-
FC1600	9 600 160	-20 ... +80	0.1	PID1	±0.2	1.2	Air	1.65	0.8	0.47	-
FC1600S	9 600 163	-15 ... +80	0.1	PID1	±0.2	1.2	Air	1.55	0.65	0.36	-
FC1200T	9 600 126	-10 ... +80	0.1	PID1	±0.2	1.2	Air	1.1	0.4	0.15	-
FC1600T	9 600 166	-15 ... +80	0.1	PID1	±0.2	1.2	Air	1.45	0.5	0.25	-
FCW600	9 601 060	-20 ... +80	0.1	PID1	±0.2	1.2	Water	0.6	0.33	0.21	-
FCW600S	9 601 063	-10 ... +80	0.1	PID1	±0.2	1.2	Water	0.5	0.22	0.1	-
FCW2500T	9 601 256	-25 ... +80	0.1	PID1	±0.2	1.2	Water	2.5	2.0	0.8	0.25
SC2500a *1	9500025XXP3H0D0M0	+5 ... +35	0.1	PID1	±0.1	-	Air	2.5	1.5	0.9	-
SC2500w *1	9500026XXP3H0D0M0	+5 ... +35	0.1	PID1	±0.1	-	Water	2.5	1.5	0.9	-
SC5000a *2,3	9500050XXP3H0D0M0	+5 ... +35	0.1	PID1	±0.1	-	Air	5.0	2.5	1.2	-
SC5000w *2,3	9500051XXP3H0D0M0	+5 ... +35	0.1	PID1	±0.1	-	Water	5.0	2.5	1.2	-
SC10000w *2,3	9500101XXP3H0D0M0	+5 ... +35	0.1	PID1	±0.1	-	Water	10.0	5.0	2.5	-

*1) with Option H1: Current consumption = plus 5A *2) with Option H5: Current consumption = plus 7A *3) with Option H12: current consumption = plus 11A

Water Baths | Shaking Water Baths

JULABO Model	JULABO Order No.	Working temperature range	Setting/ display resolution	Temperature control	Temperature stability	Heating capacity	Bath opening/ Bath depth W x L / D
		°C	°C		°C	kW	cm
TW2	9 550 102	+20 ... +99.9	0.1	PID1	±0.2	1	15 x 13 / 11
TW8	9 550 108	+20 ... +99.9	0.1	PID1	±0.2	2	23 x 27 / 14
TW12	9 550 112	+20 ... +99.9	0.1	PID1	±0.2	2	35 x 27 / 14
TW20	9 550 120	+20 ... +99.9	0.1	PID1	±0.2	2	50 x 30 / 18
SW22	9 550 322	+20 ... +99.9	0.1	PID1	±0.2	2	50 x 30 / 18
SW23	9 550 323	+20 ... +99.9	0.1	PID1	±0.02	2	50 x 30 / 18

Pump capacity Pressure	Pump capacity Flow rate	Pump connections	Barbed fitting diameter	Filling volume	IP Class acc. to IEC 60529	Power requirement	Noise level	Dimensions W x L x H	Weight net	JULABO Model
bar	l/min.		inner dia.	liters		V / Hz / A	dBA	cm	kg	
0.5 - 3.0	40	G ¾"	¾"	24...30	IP21	3 x 400/50/8	67	60 x 76 x 115	148	**FL4003**
0.5 - 6.0	60	G1 ¼"	1"	24...30	IP21	3 x 400/50/12	67	60 x 76 x 115	157	**FL4006**
0.5 - 3.0	40	G ¾"	¾"	24...30	IP21	230/50/11	61	60 x 76 x 115	143	**FLW2503**
0.5 - 6.0	60	G1 ¼"	1"	24...30	IP21	230/50/14	61	60 x 76 x 115	160	**FLW2506**
0.5 - 3.0	40	G ¾"	¾"	24...30	IP21	3 x 400/50/8	65	60 x 76 x 115	143	**FLW4003**
0.5 - 6.0	60	G1 ¼"	1"	24...30	IP21	3 x 400/50/13	65	60 x 76 x 115	160	**FLW4006**
0.5 - 6.0	60	G1 ¼"	1"	39...47	IP21	3 x 400/50/14	74	78 x 85 x 148	252	**FL7006**
0.5 - 6.0	60	G1 ¼"	1"	39...47	IP21	3 x 400/50/17	74	78 x 85 x 148	248	**FL11006**
0.8 - 6.0	80	G1 ¼"	1"	15...37	IP21	3 x 400/50/18	73	95 x 115 x 161	360	**FL20006**
0.5 - 6.0	60	G1 ¼"	1"	39...47	IP21	3 x 400/50/14	74	78 x 85 x 148	220	**FLW7006**
0.5 - 6.0	60	G1 ¼"	1"	39...47	IP21	3 x 400/50/17	74	78 x 85 x 148	250	**FLW11006**
0.8 - 6.0	80	G1 ¼"	1"	15...37	IP21	3 x 400/50	69	95 x 115 x 161	360	**FLW20006**
0.5	20	M16x1	8 / 12 mm	6 ... 8	IP21	230/50/8	51	35 x 54 x 49	48	**FC600**
1.2	22	M16x1	8 / 12 mm	6 ... 8	IP21	230/50/10	54	35 x 54 x 49	52	**FC600S**
0.5	20	M16x1	8 / 12 mm	8 ... 11	IP21	230/50/10	53	46 x 61 x 49	60	**FC1200**
1.2	22	M16x1	8 / 12 mm	8 ... 11	IP21	230/50/12	57	46 x 61 x 49	66	**FC1200S**
0.5	20	M16x1	8 / 12 mm	8 ... 11	IP21	230/50/11	53	46 x 61 x 49	65	**FC1600**
1.2	22	M16x1	8 / 12 mm	8 ... 11	IP21	230/50/13	57	46 x 61 x 49	66	**FC1600S**
3.5	28	M16x1	8 / 12 mm	8 ... 11	IP21	230/50/12	58	46 x 61 x 49	67	**FC1200T**
3.5	28	M16x1	8 / 12 mm	8 ... 11	IP21	230/50/13	58	46 x 61 x 49	67	**FC1600T**
0.5	20	M16x1	8 / 12 mm	6 ... 8	IP21	230/50/8	51	35 x 54 x 49	48	**FCW600**
1.2	22	M16x1	8 / 12 mm	6 ... 8	IP21	230/50/10	54	35 x 54 x 49	52	**FCW600S**
3.5	28	M16x1	8 / 12 mm	8 ... 11	IP21	230/50/12	53	46 x 61 x 49	74	**FCW2500T**
3.5	33	NPT ¾"	¾"	21...33	IP21	230/50/10	65	49 x 62 x 105	123	**SC2500a** *1
3.5	33	NPT ¾"	¾"	21...33	IP21	230/50/10	63	49 x 62 x 105	123	**SC2500w** *1
3.5	33	NPT ¾"	¾"	43...60	IP21	3 x 400/50/11	71	59 x 67 x 112	153	**SC5000a** *2,3
3.5	33	NPT ¾"	¾"	43...60	IP21	3 x 400/50/11	69	59 x 67 x 112	153	**SC5000w** *2,3
3.5	33	NPT ¾"	¾"	43...60	IP21	3 x 400/50/18	69	59 x 67 x 112	159	**SC10000w** *2,3

Filling volume from ... to	Shaking frequency	Shaking stroke	Classification acc. to DIN 12876-1	IP Class acc. to IEC 60529	Power requirement	Dimensions W x L x H without cover	Dimensions W x L x H with cover	Weight net	JULABO Model
liters	rpm	mm			V / Hz / A	cm	cm	kg	
1 ... 2	-	-	I (NFL)	IP43	230/50-60/5	17 x 16 x 26	17 x 16 x 37	3.5	**TW2**
3 ... 8	-	-	I (NFL)	IP43	230/50-60/9	29 x 32 x 28	29 x 32 x 44	8.5	**TW8**
5 ... 14	-	-	I (NFL)	IP43	230/50-60/9	40 x 32 x 28	40 x 32 x 44	9.8	**TW12**
8 ... 26	-	-	I (NFL)	IP43	230/50-60/9	56 x 35 x 32	56 x 35 x 49	14.2	**TW20**
8 ... 20	20 ... 200	15	I (NFL)	IP21	230/50-60/10	70 x 35 x 26	70 x 35 x 43	19.4	**SW22**
8 ... 20	20 ... 200	15	I (NFL)	IP21	230/50-60/10	70 x 35 x 26	70 x 35 x 43	21.4	**SW23**

Calibration Baths | Visco Baths | Beer Forcing Test Refrigerated/Heating Circulating Bath

JULABO Model	JULABO Order No.	Working temperature range	Setting/ display resolution	Temperature control	Temperature stability	Heating capacity	Cooling capacity		
							+20	0	-20°C
		°C	°C		°C	kW	kW	kW	kW
SL-8K	9 352 508	+50 ... +300	0.01	ICC	±0.005	3	-	-	-
SL-14K	9 352 514	+50 ... +300	0.01	ICC	±0.005	3	-	-	-
FK30-SL	9 352 627	-30 ... +200	0.01	ICC	±0.005	2	0.46	0.34	0.15
FK31-SL	9 352 628	-30 ... +200	0.01	ICC	±0.005	2	0.46	0.34	0.15
ME-31A	9 162 331	+20 ... +60	0.01	PID3	±0.01	2	-	-	-
ME-16G	9 162 616	+20 ... +100	0.01	PID3	±0.01	2	-	-	-
ME-18V	9 162 518	+20 ... +150	0.01	PID3	±0.01	2	-	-	-
F38-ME	9 162 638	-38 ... +80	0.01	PID3	±0.05	2	0.92	0.66	0.32

Immersion Coolers | Flow-Through Cooler

JULABO Model	JULABO Order No.	Working temperature range	Setting/ display resolution	Temperature control	Temperature stability	Cooling capacity				
						+20	+10	-20	-40	-80 °C
		°C	°C		°C	kW	kW	kW	kW	kW
FT200	9 650 820	-20 ... +30	-	-	-	0.25	0.2	0.04	-	-
FT400	9 650 840	-40 ... +30	-	-	-	0.45	0.36	0.14	0.03	-
FT900	9 650 890	-90 ... +30	-	-	-	0.3	0.27	0.24	0.2	0.07
FT402	9 650 842	-40 ... +30	0.1	2-point	±0.5	0.45	0.36	0.14	0.03	-
FT902	9 650 892	-90 ... +30	0.1	2-point	±1	0.3	0.27	0.24	0.2	0.07
FT903	9 650 893	-90 ... +30	0.1	2-point	±1	0.3	0.29	0.25	0.23	0.05
FD200	9 655 825	+10 ... +30	-	-	-	0.22	0.18	-	-	-

Temperature Controllers

JULABO Model	JULABO Order No.	Adjustable Temperature range	LED Temperature display / resolution	LCD display / resolution	Temperature control	Temperature stability
		°C	°C	°C		°C
LC4	9 700 140	-50 ... +350	2 / 0.1 °C	-	PID2	< ±0.05
LC4-F	9 700 142	-50 ... +350	4 / 0.1 °C	-	PID3	< ±0.03
LC6	9 700 160	-100 ... +400	1 / 0.01 °C	1 / 0.01 °C	ICC	< ±0.03

Refrigerators for Chemicals

JULABO Model	JULABO Order No.	Working temperature range	Temperature selection	Temperature display	Alarm signal	Temperature stability	Compressor overheating protection
		°C				°C	°C
KRC50	8 800 705	-2 ... +12	Analog	LED	optical	±1	105
KRC180	8 800 718	-2 ... +12	Analog	LED	optical	±1	105

Pump capacity		Bath opening/ Usable bath depth	Fill. vol.	Bath cover	Classification according to DIN 12876-1	Power requirement	Dimensions W x L x H	Weight net	JULABO Model
Pressure	Flow rate								
bar	l/min.	cm	liters			V / Hz / A	cm	kg	
0.4 - 0.7	22 - 26	dia. 12 / 17	8	Integrated	III (FL)	230/50-60/13	22 x 46 x 47	16	**SL-8K**
0.4 - 0.7	22 - 26	dia. 12 / 31	14	Integrated	III (FL)	230/50-60/13	22 x 46 x 61	20	**SL-14K**
0.4 - 0.7	22 - 26	dia. 12 / 17	14	Integrated	III (FL)	230/50/16	32 x 45 x 79	48	**FK30-SL**
0.4 - 0.7	22 - 26	dia. 12 / 31	24	Integrated	III (FL)	230/50/16	32 x 45 x 91	51	**FK31-SL**
0.23 - 0.45	11 - 16	9 x 9 / 3x / 37	31	Integrated	III (FL)	230/50-60/9	50 x 20 x 56	11	**ME-31A**
0.23 - 0.45	11 - 16	7.6 x 7.6 / 2x / 31	16	Integrated	III (FL)	230/50-60/9	Ø 29 x 48	9	**ME-16G**
0.23 - 0.45	11 - 16	9 x 9 / 2x / 37	18	Integrated	III (FL)	230/50-60/9	36 x 24 x 54	17	**ME-18V**
0.23 - 0.45	11 - 16	35 x 41 / 27	45	Integrated	III (FL)	230/50/13	46 x 70 x 89	72	**F38-ME**

Barbed fittings diameter	Immersion probe/ flexible probe (L x dia.)	Connection tube (L)	IP Class acc. to IEC 60529	Power requirement	Dimensions W x L x H	Weight net	JULABO Model
inner dia.	cm	cm		V / Hz / A	cm	kg	
-	9 x 4	120	IP21	230/50/2	18 x 27 x 39	18	**FT200**
-	12 x 5	120	IP21	230/50/4	20 x 30 x 43	24	**FT400**
-	65 x 1.5 flexible	160	IP21	230/50-60/5	38 x 55 x 60	50	**FT900**
-	12 x 5	120	IP21	230/50/4	20 x 30 x 43	24	**FT402**
-	65 x 1.5 flexible	160	IP21	230/50-60/5	38 x 55 x 60	50	**FT902**
-	5.6 x 14.0	160	IP21	230/50-60	38 x 55 x 60	50	**FT903**
8 / 12 mm	-	-	IP21	230/50/2	18 x 27 x 39	16	**FD200**

Working sensor	Safety sensor	Maximum connection wattage	IP Classe acc. to IEC 60529	Power requirement	Dimensions W x L x H	Weight net	JULABO Model
		kW		V / Hz / A	cm	kg	
1 Pt100	1 Pt100	2	IP31	230/50-60/10	17 x 17 x 16	3	**LC4**
1 Pt100	1 Pt100	2	IP31	230/50-60/10	25 x 20 x 10	3	**LC4-F**
2 Pt100	1 Pt100	3	IP31	230/50-60/14	21 x 18 x 18	4	**LC6**

Working sensor	Safety sensor	Volumetric capacity	Power requirement	Inner dimensions W x L x H	Outer dimensions W x L x H	Weight net	JULABO Model
		liters	V / Hz / A	cm	cm	kg	
PTC	PTC	50	230/50/0.5	42 x 31 x 39	53 x 63 x 54	23	**KRC50**
PTC	PTC	180	230/50/0.5	52 x 40 x 70	60 x 64 x 86	35	**KRC180**

Voltage Options / Heating Capacity

Refrigerated/Heating Circulators

JULABO Model	JULABO Order No.	Available voltage option / Heating capacity kW				
		230 V 50 Hz	230 V 60 Hz	230 V 50-60 Hz	115 V 60 Hz	100 V 50-60 Hz
F12-ED	9 116 612	2.0	2.0		1.0	0.8
F25-ED	9 116 625	2.0	2.0		1.0	0.8
F34-ED	9 116 634	2.0	2.0		1.0	
F12-EH	9 118 612	2.0	2.0		1.0	0.8
F25-EH	9 118 625	2.0	2.0		1.0	0.8
FN25-EH	9 118 625N	2.0				
F32-EH	9 118 632	2.0	2.0		1.0	0.8
FN32-EH	9 118 632N	2.0				
F33-EH	9 118 633	2.0	2.0		1.0	0.8
F34-EH	9 118 634	2.0	2.0		1.0	
F38-EH	9 118 638	2.0	2.0			
F12-MA	9 153 612	2.0	2.0		1.0	0.8
F25-MA	9 153 625	2.0		2.0	1.0	0.8
FN25-MA	9 153 625N	2.0				
F32-MA	9 153 632			2.0	1.0	0.8
FN32-MA	9 153 632N	2.0				
F33-MA	9 153 633	2.0	2.0		1.0	0.8
F34-MA	9 153 634	2.0	2.0		1.0	
FP35-MA	9 153 618	2.0			1.0	0.8
FP40-MA	9 153 640	2.0	2.0			
FP50-MA	9 153 650	2.0	2.0			
FPW50-MA	9 153 651	2.0	2.0			
F25-ME	9 162 625	2.0		2.0	1.0	0.8
FN25-ME	9 162 625N	2.0				
F26-ME	9 162 626	2.0			1.0	0.8
F32-ME	9 162 632			2.0	1.0	0.8
FN32-ME	9 162 632N	2.0				
F33-ME	9 162 633	2.0	2.0		1.0	0.8
F34-ME	9 162 634	2.0	2.0		1.0	
F38-ME	9 162 638	2.0	2.0			
FP40-ME	9 162 640	2.0	2.0			
FP50-ME	9 162 650	2.0	2.0			
FPW50-ME	9 162 651	2.0	2.0			
F25-HE	9 212 625	2.0		2.0	1.0	0.8
FN25-HE	9 212 625N	2.0				
F32-HE	9 212 632			2.0	1.0	0.8
FN32-HE	9 212 632N	2.0				
F34-HE	9 212 634	2.0	2.0		1.0	
FP40-HE	9 212 640	2.0	2.0			
FP45-HE	9 212 645			2.0		
FP50-HE	9 212 650	2.0	2.0			
FPW50-HE	9 212 651	2.0	2.0			
F25-HL	9 312 625	2.0		2.0	1.0	0.8
FN25-HL	9 312 625N	2.0				
F32-HL	9 312 632			2.0	1.0	0.8
FN32-HL	9 312 625N	2.0				
F33-HL	9 312 633	2.0	2.0		1.0	0.8
FP35-HL	9 312 618	2.0			1.0	0.8
FP40-HL	9 312 640	2.0	2.0			
FP45-HL	9 312 645			2.0		
FP50-HL	9 312 650	2.0	2.0			
FPW50-HL	9 312 651	2.0	2.0			

Cryo-Compact Circulators

JULABO Model	JULABO Order No.	Available voltage option / Heating capacity kW		
		230 V 50 Hz	230 V 60 Hz	115 V 60 Hz
CF30	9 400 330	2.0	2.0	1.0
CF31	9 400 331	2.0	2.0	1.0
CF40	9 400 340	2.0	2.0	1.0
CF41	9 400 341	2.0	2.0	1.0

Ultra-low Refrigerated Circulators

JULABO Model	JULABO Order No.	Available voltage option / Heating capacity kW					
		230 V 50 Hz	230 V 60 Hz	230 V 50-60 Hz	3 x 230 V 50 Hz	3 x 400 V 50 Hz	3 x 230 V 60 Hz
F70-ME	9 162 670	1.3					
F81-ME	9 162 681			1.3			
FP89-ME	9 162 689	1.3	1.3				
FP51-SL	9 352 751				3.0	3.0	3.0
FP52-SL	9 352 752					3.0	3.0
FP55-SL	9 352 755					3.0	3.0
F81-HL	9 312 681			1.3			
FP89-HL	9 312 689	1.3	1.3				
FP90-SL	9 352 790					3.0	3.0
FPW52-SL	9 352 753					3.0	3.0
FPW55-SL	9 352 756					3.0	3.0
FPW90-SL	9 352 791					3.0	3.0
FPW91-SL	9 352 793					3.0	3.0
FP52-SL	9 352 752N					3.0	3.0
FP55-SL	9 352 755N					3.0	3.0
FP52-SL	9 352 752N150					3.0	3.0
FP55-SL	9 352 755N150					3.0	3.0
FPW52-SL	9 352 753N					3.0	3.0
FPW55-SL	9 352 756N					3.0	3.0
FPW52-SL	9 352 753N150					3.0	3.0
FPW55-SL	9 352 756N150					3.0	3.0
FP90-SL	9 352 790N					3.0	3.0
F95-SL	9 352 795N					3.0	3.0
FP90-SL	9 352 790N150					3.0	3.0
FPW90-SL	9 352 791N					3.0	3.0
FPW91-SL	9 352 793N					3.0	3.0
FW95-SL	9 352 796N					3.0	3.0
FPW90-SL	9 352 791N150					3.0	3.0

Heating Immersion Circulators | Bridge Mounted Circulators

JULABO Model	JULABO Order No.	Available voltage option / Heating capacity kW					
		230 V 50 Hz	230 V 60 Hz	230 V 50-60 Hz	115 V 60 Hz	100-115 V 50-60 Hz	100 V 50-60 Hz
ED	9 116 000	2.0	2.0		1.0		0.8
EH	9 118 000	2.0	2.0		1.0		0.8
MA	9 153 000			2.0		0.8 - 1.0	
ME	9 162 000			2.0		0.8 - 1.0	
SE-Z	9 252 218			3.0			

Open Heating Bath Circulators | Heating Circulators with Open Baths | Heating Circulators

JULABO Model	JULABO Order No.	Available voltage option / Heating capacity kW					
		230 V 50 Hz	230 V 60 Hz	230 V 50-60 Hz	115 V 60 Hz	100-115 V 50-60 Hz	100 V 50-60 Hz
ED-13	9 116 413	2.0	2.0		1.0		0.8
ED-19	9 116 419	2.0	2.0		1.0		0.8
ED-27	9 116 427	2.0	2.0		1.0		0.8
ED-33	9 116 433	2.0	2.0		1.0		0.8
ED-5	9 116 405	2.0	2.0		1.0		0.8
EH-5	9 118 405	2.0	2.0		1.0		0.8
EH-13	9 118 413	2.0	2.0		1.0		0.8
EH-19	9 118 419	2.0	2.0		1.0		0.8
EH-27	9 118 427	2.0	2.0		1.0		0.8
EH-33	9 118 433	2.0	2.0		1.0		0.8
EH-39	9 118 439	2.0	2.0		1.0		0.8
MA-4	9 153 504			2.0		0.8 - 1.0	
MA-6	9 153 506			2.0		0.8 - 1.0	
MA-12	9 153 512			2.0		0.8 - 1.0	
MA-26	9 153 526			2.0		0.8 - 1.0	
ME-4	9 162 504			2.0		0.8 - 1.0	
ME-6	9 162 506			2.0		0.8 - 1.0	
ME-12	9 162 512			2.0		0.8 - 1.0	
ME-26	9 162 526			2.0		0.8 - 1.0	
HE-4	9 212 504			2.0		0.8 - 1.0	
SE-6	9 252 506			3.0			
SE-12	9 252 512			3.0			
SE-26	9 252 526			3.0			
HL-4	9 312 504			2.0		0.8 - 1.0	
SL-6	9 352 506			3.0			
SL-12	9 352 512			3.0			
SL-26	9 352 526			3.0			

Highly Dynamic Temperature Control Systems | Process Circulators

JULABO Model	JULABO Order No.	Available voltage option / Heating capacity kW							
		230 V 50 Hz	230 V 60 Hz	230 V 50-60 Hz	208 V 60 Hz	3 x 400 V 50 Hz	3 x 230 V 50 Hz	3 x 230 V 60 Hz	3 x 480V 60 Hz
A30	9 420 300	2.7 @ 230 V 2.1 @ 200 V	2.7 @ 230 V 2.1 @ 200 V		2.3				
A40	9 420 401			2.7 @ 230 V 2.1 @ 200 V	2.3				
W40	9 421 401			2.7 @ 230 V 2.1 @ 200 V	2.3				
A45	9 420 452					6.0	6.0	6.0 @ 230V 5.5 @ 208V	
A45t	9 420 452.T					12.0	12.0	12.0 @ 230V 10.0 @ 208V	
A80	9 420 801	1.8 @ 230 V 1.3 @ 200 V	1.8 @ 230 V 1.3 @ 200 V		1.5				
A80t	9 420 801.T					3.4	3.4	3.4	
W80	9 421 801	1.8 @ 230 V 1.3 @ 200 V	1.8 @ 230 V 1.3 @ 200 V		1.5				
W80t	9 421 801.T					3.4	3.4	3.4	
A85	9 420 852					6.0	6.0	6.0 @ 230 V 5.5 @ 208 V	
A85t	9 420 852.T					15	15	15 @ 230 V 12.5 @ 208 V	
W85	9 421 852					6.0	6.0	6.0 @ 230 V 5.5 @ 208 V	
W85t	9 421 852.T					15	15	15 @ 230 V 12.5 @ 208 V	
W91	9 421 912					12			12
W91t	9 421 912.T					24			24
W91tt	9 421 912.TT					36			36
W91x	9 421 913					12			12
W91tx	9 421 913.T					24			24
W91ttx	9 421 913.TT					36			36
W92	9 421 922					12			12
W92t	9 421 922.T					24			24
W92tt	9 421 922.TT					36			36
W92x	9 421 923					12			12
W92tx	9 421 923.T					24			24
W92ttx	9 421 923. TT					36			36
HT30-M1	9 800 031	3.0	3.0						
HT30-M1-C.U.	9 800 035	3.0	3.0						
HT60-M2	9 800 062					7.0			
HT60-M2-C.U.	9 800 065					7.0			
HT60-M3	9 800 063							6.0	
HT60-M3-C.U.	9 800 066							6.0	

Recirculating Coolers (F/AWC100)

JULABO Model	JULABO Order No.	Available voltage option					
		230 V 50 Hz	230 V 60 Hz	230 V 50-60 Hz	115 V 60 Hz	100 V 50-60 Hz	200 V 50-60 Hz
F250	9 620 025	•	•		•	•	•
F500	9 620 050	•	•		•	•	
F1000	9 620 100	•	•		•		
AWC100	9 630 100			•	•		

Recirculating Coolers (FL)

JULABO Model	JULABO Order No.	Available voltage option							
		230 V 50 Hz	230 V 60 Hz	115 V 60 Hz	100 V 50-60 Hz	200 V 50-60 Hz	3 x 400 V 50 Hz	3 x 230 V 50 Hz	3 x 230 V 60 Hz
FL300	9 660 003	•	•	•	•				
FL601	9 661 006	•	•	•					
FL1201	9 661 012	•	•	•					
FL1203	9 663 012	•	•						
FL1701	9 661 017	•	•	•					
FL1703	9 663 017	•	•						
FL2503	9 663 025	•	•						
FL2506	9 666 025	•	•						
FL4003	9 663 040						•		•
FL4006	9 666 040						•		•
FLW1701	9 671 017	•	•	•					
FLW1703	9 673 017	•	•						
FLW2503	9 673 025	•	•						
FLW2506	9 676 025	•	•						
FLW4003	9 673 040						•		•
FLW4006	9 676 040						•		•
FL7006	9 666 070						•		•
FL11006	9 666 110						•		•
FL20006	9 666 200						•		•
FLW7006	9 676 070						•		•
FLW11006	9 676 110						•		•
FLW20006	9 676 200						•		•

Recirculating Coolers (FC)

JULABO Model	JULABO Order No.	Available voltage option / Heating capacity kW	
		230 V 50 Hz	230 V 60 Hz
FC600	9 600 060	1.2	1.2
FCW600	9 601 060	1.2	1.2
FC600S	9 600 063	1.2	1.2
FCW600S	9 601 063	1.2	1.2
FC1200	9 600 120	1.2	
FC1200S	9 600 123	1.2	
FC1600	9 600 160	1.2	1.2
FC1600S	9 600 163	1.2	1.2
FC1200T	9 600 126	1.2	
FC1600T	9 600 166	1.2	1.2
FCW2500T	9 601 256	1.2	1.2

Recirculating Coolers (SemiChill)

JULABO Model	Available voltage option / Heating capacity kW			
	230 V 50 Hz	230 V 60 Hz	3 x 400 V 50 Hz	3 x 230 V 60 Hz
SC2500a	• / 1.0	• / 1.0		
SC2500w	• / 1.0	• / 1.0		
SC5000a			• / 5.0 / 12.0	• / 5.0 / 12.0
SC5000w			• / 5.0 / 12.0	• / 5.0 / 12.0
SC10000w			• / 5.0 / 12.0	• / 5.0 / 12.0

Water Baths | Shaking Water Baths

JULABO Model	JULABO Order No.	Available voltage option / Heating capacity kW 230 V 50-60 Hz	115 V 60 Hz	115 V 50-60 Hz
TW2	9 550 102	1.0		1.0
TW8	9 550 108	2.0		1.0
TW12	9 550 112	2.0		1.0
TW20	9 550 120	2.0		1.0
SW22	9 550 322	2.0	1.0	
SW23	9 550 323	2.0	1.0	

Calibration Baths | Visco Baths

JULABO Model	JULABO Order No.	Available voltage option / Heating capacity kW 230 V 50 Hz	230 V 50-60 Hz	115 V 60 Hz	100-115 V 50-60 Hz
SL-8K	9 352 508		3.0		
SL-14K	9 352 514		3.0		
FK30-SL	9 352 627	2.0		1.0	
FK31-SL	9 352 628	2.0		1.0	
ME-31A	9 162 331		2.0		0.8 - 1.0
ME-16G	9 162 616		2.0		0.8 - 1.0
ME-18V	9 162 518		2.0		0.8 - 1.0

Immersion Coolers | Flow-Through Cooler | Beer Forcing Test Refrigerated/Heating Circulating Bath

JULABO Model	JULABO Order No.	Available voltage option / Heating capacity kW 230 V 50 Hz	230 V 60 Hz	230 V 50-60 Hz	115 V 60 Hz
FT200	9 650 820	•			•
FT400	9 650 840	•			•
FT900	9 650 890			•	•
FT402	9 650 842	•			•
FT902	9 650 892			•	•
FT903	9 650 893			•	
FD200	9 655 825	•			•
F38-EH	9 118 638	2.0	2.0		

Temperature Controllers

JULABO Model	JULABO Order No.	Available voltage option / max. connection wattage kW 230 V 50-60 Hz	115 V 60 Hz
LC4	9 700 140	2.0	1.0
LC4-F	9 700 142	2.0	1.0
LC6	9 700 160	3.0	1.0

Refrigerators for Chemicals

JULABO Model	JULABO Order No.	Available voltage option 230 V 50 Hz
KRC50	8 800 705	•
KRC180	8 800 718	•

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