

# FORTE HT

## HIGH TEMPERATURES AND A HIGH

### FORTE HT – for extremely high temperatures

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 especially at high temperatures.

- High heating capacity for short heat-up times
- High pump capacity
- Small filling volume
- Cooling water connection for cold oil overlay
- Wide working temperature range without fluid change
- Extended lifetime of the fluid
- Easy to integrate into installations due to the modular concept (separation of circulator and operating panel)
- External Pt100 sensor connection
- Various interfaces



# SAFETY LEVEL

## FORTE HT with cooling unit

The FORTE HT models with C.U. Cooling units are suitable for temperature control tasks from +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 compensated, especially at high temperatures.

### Additional benefits of models with C.U. cooling unit:

- Controlled cooling water supply for temperature applications from +40 °C
- High cooling capacity up to 15 kW (at +20 °C cooling water and +300 °C oil temperature)
- Rapid cooling
- Rapid temperature control i.e. of exothermic reactions



## FORTE HT

### FORTE HT

For working temperatures from +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 especially at high temperatures.

- High heating capacity for short heat-up times
- High pump capacity
- Small filling volume
- Cooling water connection for cold oil overlay
- Wide working temperature range without fluid change
- Extended lifetime of the fluid
- Easy to integrate into installations due to the modular concept (separation of circulator and operating panel)
- External Pt100 sensor connection
- Various interfaces
- Reduction of pump pressure via bypass (accessory)



#### Connections Control unit

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



### SAFE EVEN AT HIGH TEMPERATURES

FORTE HT high temperature circulators have a closed design that prevents the escape of oil vapors even at high temperatures.



## FORTE HT30-M1

Order No.	9 800 031
Model	HT30-M1
Working temperature range °C	+70 ... +400
Temperature stability °C	±0.01 ... ±0.1
Cooling capacity kW, max. (Water +20 °C)	-
Heating capacity kW	3
Pump capacity	l/min 14 ... 18
Flow Rate/Pressure	bar 0.8 ... 1.2
Filling volume min. liters	2
Power requirement V/Hz	230 / 50 or 230 / 60
Dimensions	W × L × H
Circulator cm	23 x 23 x 58
Dimensions	W × L × H
Control unit cm	25 x 25 x 18

## FORTE HT60-M2

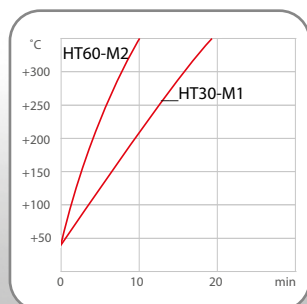
Order No.	9 800 062
Model	HT60-M2
Working temperature range °C	+70 ... +400
Temperature stability °C	±0.01 ... ±0.1
Cooling capacity kW, max. (Water +20 °C)	-
Heating capacity kW	7
Pump capacity	l/min 14 ... 18
Flow Rate/Pressure	bar 0.8 ... 1.2
Filling volume min. liters	2
Power requirement V/Hz	3 x 400 / 50
Dimensions	W × L × H
Circulator cm	23 x 23 x 58
Dimensions	W × L × H
Control unit cm	25 x 25 x 18

## FORTE HT60-M3

Order No.	9 800 063
Model	HT60-M3
Working temperature range °C	+70 ... +400
Temperature stability °C	±0.01 ... ±0.1
Cooling capacity kW, max. (Water +20 °C)	-
Heating capacity kW	6
Pump capacity	l/min 14 ... 18
Flow Rate/Pressure	bar 0.8 ... 1.2
Filling volume min. liters	2
Power requirement V/Hz	3 x 208 / 60
Dimensions	W × L × H
Circulator cm	23 x 23 x 58
Dimensions	W × L × H
Control unit cm	25 x 25 x 18

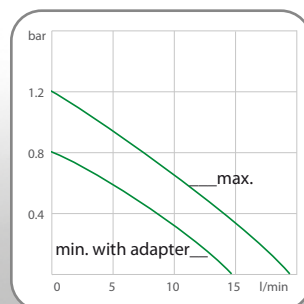
### Heat-up time

Bath fluid: Thermal H



### Pump capacity

Bath fluid: Thermal H



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/dm<sup>3</sup>.

### FORTE HT with cooling unit

For working temperatures from +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 compensated, especially at high temperatures.

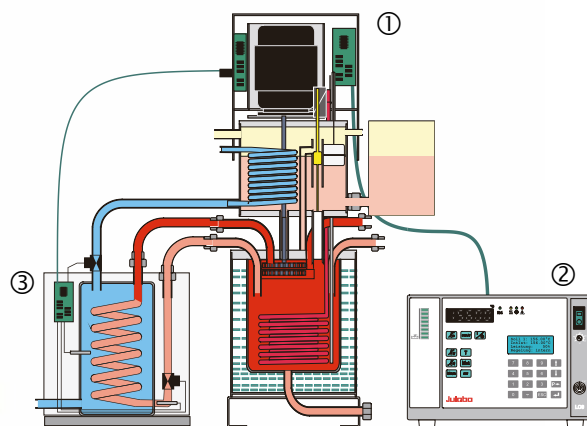
#### Additional benefits of models with C.U. cooling unit:

- Controlled cooling water supply for temperature applications from +40 °C
- High cooling capacity up to 15 kW  
(at +20 °C cooling water and +300 °C oil temperature)
- Rapid cooling
- Rapid temperature control i. e. of exothermic reactions

### FORTE HT with cooling unit

FORTE HT high temperature circulators are designed for applications that require very high temperatures, as high as +400 °C. The closed design of FORTE HT avoids oil vapor contamination even at high temperatures. These units have automated heat-up, filling, and degassing features.

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





## FORTE HT30-M1-C.U.

<b>Order No.</b>	<b>9 800 035</b>
<b>Model</b>	<b>HT30-M1-C.U.</b>
Working temperature range °C	+40 ... +400
Temperature stability °C	±0.01 ... ±0.1
Cooling capacity kW, max. (Water +20 °C)	15
Heating capacity kW	3
Pump capacity	l/min 14 ... 18
Flow Rate/Pressure	bar 0.8 ... 1.2
Filling volume min. liters	2
Power requirement V/Hz	230 / 50 or 230 / 60
Dimensions	W × L × H
Circulator cm	43 x 23 x 58
Dimensions	W × L × H
Control unit cm	25 x 25 x 18

## FORTE HT60-M2-C.U.

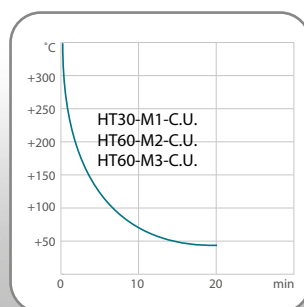
<b>Order No.</b>	<b>9 800 065</b>
<b>Model</b>	<b>HT60-M2-C.U.</b>
Working temperature range °C	+40 ... +400
Temperature stability °C	±0.01 ... ±0.1
Cooling capacity kW, max. (Water +20 °C)	15
Heating capacity kW	7
Pump capacity	l/min 14 ... 18
Flow Rate/Pressure	bar 0.8 ... 1.2
Filling volume min. liters	2
Power requirement V/Hz	3 x 400 / 50
Dimensions	W × L × H
Circulator cm	43 x 23 x 58
Dimensions	W × L × H
Control unit cm	25 x 25 x 18

## FORTE HT60-M3-C.U.

<b>Order No.</b>	<b>9 800 066</b>
<b>Model</b>	<b>HT60-M3-C.U.</b>
Working temperature range °C	+40 ... +400
Temperature stability °C	±0.01 ... ±0.1
Cooling capacity kW, max. (Water +20 °C)	15
Heating capacity kW	6
Pump capacity	l/min 14 ... 18
Flow Rate/Pressure	bar 0.8 ... 1.2
Filling volume min. liters	2
Power requirement V/Hz	3 x 208 / 60
Dimensions	W × L × H
Circulator cm	43 x 23 x 58
Dimensions	W × L × H
Control unit cm	25 x 25 x 18

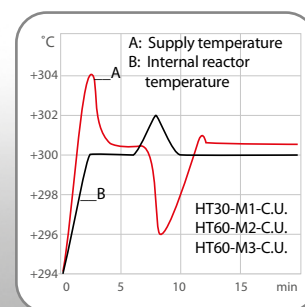
### Cool-down time

Bath fluid: Thermal H



### Reaction compensation

5 liter reactor | Bath fluid: Thermal H



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/dm<sup>3</sup>.

## Accessories

### JULABO Thermal bath fluids

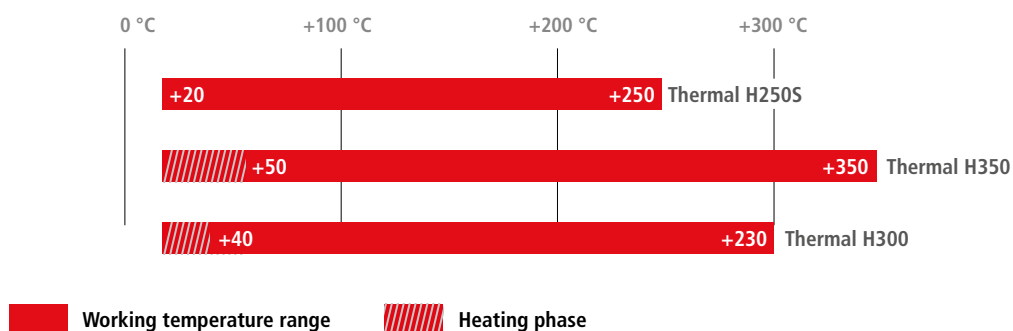
JULABO Thermal bath fluids are carefully selected and longterm tested. They are perfectly suited for temperature control tasks in temperature control systems and guarantee safe and reliable operation. Choosing the right thermal bath fluid is very important for achieving optimal temperature control results. The viscosity and thermal conductivity of our thermal bath fluids are designed especially for use with JULABO temperature control instruments.



#### Advantages

- Broad temperature ranges
- Low viscosity
- High stability
- Good thermal conductivity
- Almost odorless
- Long life

#### Working temperature range





## Thermal H250S

Order No. 5 liters 8 940 133

Order No. 10 liters 8 940 132

Suitable for FORTE HT

Working temperature range °C +20 ... +250

Flash point °C >+200

Fire point °C +264

Viscosity, (kinematic at +20 °C) mm<sup>2</sup>/s 20

Density (at +20 °C) g/cm<sup>3</sup> 0.95

Pour point °C -70

Boiling point °C +424

Ignition temperature °C +385

Color light brown

## Thermal H350

Order No. 5 liters 8 940 111

Order No. 10 liters --

Suitable for FORTE HT

Working temperature range °C +50 ... +350

Flash point °C +200

Fire point °C +235

Viscosity, (kinematic at +20 °C) mm<sup>2</sup>/s 48.3

Density (at +20 °C) g/cm<sup>3</sup> 1.04

Pour point °C -34

Boiling point °C +390

Ignition temperature °C +450

Color clear

## Thermal H300

Order No. 5 liters 8 940 113

Order No. 10 liters -

Suitable for FORTE HT

Working temperature range °C +40 ... +300

Flash point °C +245

Fire point °C +255

Viscosity, (kinematic at +20 °C) mm<sup>2</sup>/s 76.5

Density (at +20 °C) g/cm<sup>3</sup> 0.858

Pour point °C -18

Boiling point °C +380

Ignition temperature °C +330

Color clear

### JULABO Thermal bath fluids based on silicone ...

... are chemically inert substances which do not affect metals like iron, copper, zinc, aluminum, chrome or nickel. Compared to other fluids, JULABO Thermal fluids have an extraordinarily low electrical conductivity. When properly stored, the fluids will last for 12 months and longer as they are not susceptible to climatic influences.

### JULABO Thermal bath fluids based on water-glycol ...

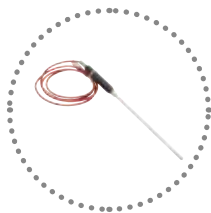
... (monoethyleneglycol with anti-corrosion additives) have excellent thermal characteristics and a low viscosity. In addition, they provide anti-freeze protection, i.e. they can be applied at temperatures below the freezing point of water.

### More information on JULABO Thermal bath fluids ...

... in our brochure 'Thermal Bath Fluids' at [www.julabo.com](http://www.julabo.com).



## Accessories



### External Pt100 sensors/ Extension Cable

Order No.	Description	Suitable for
8 981 003	200 × 6 mm dia., stainless steel, 1.5 m cable	FORTE HT
8 981 006	20 × 2 mm dia., stainless steel, 1.5 m cable	FORTE HT
8 981 010	300 × 6 mm dia., stainless steel, 1.5 m cable	FORTE HT
8 981 017	200 × 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	FORTE HT
8 981 015	300 × 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	FORTE HT
8 981 013	600 × 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	FORTE HT
8 981 016	900 × 6 mm dia., stainless steel/PTFE coated, 3.0 m cable	FORTE HT
8 981 014	1200 × 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

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)



### Metal tubing

Order No.	Description	Suitable for
<b>Metal tubing flexible, triple insulated, -100 °C to +350 °C</b>		
8 930 209	0.5 m Metal tubing, 2 fittings M16 × 1 female	FORTE HT
8 930 210	1.0 m Metal tubing, 2 fittings M16 × 1 female	FORTE HT
8 930 211	1.5 m Metal tubing, 2 fittings M16 × 1 female	FORTE HT
8 930 214	3.0 m Metal tubing, 2 fittings M16 × 1 female	FORTE HT
<b>Metal tubing flexible, insulated, -50 °C to +200 °C</b>		
8 930 220	0.5 m Metal tubing, 2 fittings M16 × 1 female	FORTE HT
8 930 221	1.0 m Metal tubing, 2 fittings M16 × 1 female	FORTE HT
8 930 222	1.5 m Metal tubing, 2 fittings M16 × 1 female	FORTE HT
8 930 223	3.0 m Metal tubing, 2 fittings M16 × 1 female	FORTE HT

### Accessories for connecting metal tubing

8 970 443	Adapter M16 × 1 male to M16 × 1 male	FORTE HT
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## Adapters/Valves/Connectors etc.



Order No.	Description	Suitable for
8 970 457	Shut-off valve for loop circuit (-30 °C ... +200 °C), M16 × 1	FORTE HT
8 970 490	2 Collar nuts M16 × 1 female	FORTE HT
8 970 442	2 Elbow fittings 90°, M16 × 1 female/male, side length 2 × 54 mm	FORTE HT
8 970 448	2 Elbow fittings 90°, M16 × 1 female/male, side length 2 × 54 mm / 2 × 120 mm	FORTE HT
8 890 004	2 Adapters M16 × 1 female to NPT 1/4" male	FORTE HT
8 890 005	2 Adapters M16 × 1 female to NPT 1/4" female	FORTE HT
8 890 006	2 Adapters M16 × 1 female to NPT 3/8" male	FORTE HT
8 890 007	2 Adapters M16 × 1 female to NPT 3/8" female	FORTE HT
8 890 008	2 Adapters M16 × 1 female to NPT 1/2" male	FORTE HT
8 890 009	2 Adapters M16 × 1 female to NPT 1/2" female	FORTE HT
8 890 010	2 Adapters M16 × 1 male to NPT 1/4" female	FORTE HT
8 891 008	1 Adapter M16 × 1 male to BSP 1/2" female	FORTE HT
8 891 009	1 Adapter M16 × 1 male to BSP 3/4" female	FORTE HT
8 890 011	2 Adapters M16 × 1 female to tube 1/4" male	FORTE HT
8 890 012	2 Adapters M16 × 1 female to tube 3/8" male	FORTE HT
8 890 013	2 Adapters M16 × 1 female to tube 1/2" male	FORTE HT
8 890 024	2 Adapters M16 × 1 female to M16 × 1 female	FORTE HT

## Connection plugs



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