

Presto® and Magnum 91

– External temperature applications in wide temperature ranges

JULABO offers a sophisticated range of Highly Dynamic Temperature Control Systems on pages 41 to 46.

The systems provide many unique features compared to conventional heating and cooling circulators.

- ▶ **Presto®** is suitable for extended temperature ranges, for example from -40 to +250 °C or from -85 to +170 °C – without the requirement to changing bath fluids.
- ▶ **Presto®** avoids oxidation and ensures prolonged lifetime of the bath fluid.
- ▶ **Presto®** is time-saving: rapid heat-up and cool-down times throughout the entire temperature range, control for unsupervised continuous operation.
- ▶ **Presto®** compensates exothermic and endothermic reactions quickly and with exceptional temperature accuracy.
- ▶ **Presto®** is hydraulically sealed to prevent unpleasant steam and odors.
- ▶ **Presto®** does not allow absorption of air humidity into the bath fluid. This prevents condensation and ice build-up.

Bright VFD COMFORT-DISPLAY

- For actual value, setpoint Resolution 0.01 °C
- Illuminated displays for
A: selected pump stage
B: filling volume
- Status displays (heating, cooling, etc.)

Remote device 'RD'

- Backlit, 4-line LCD-DISPLAY for user-friendly operation
- Splash-proof keypad for stepoint, actual temperature, pump pressure control
- System status, high/low temperature warning functions with intermittent tone
- Integrated programmer with real time clock for 6 x 60 program steps
- Best reproducibility of all set values



Keypad, splash-proof

- ① Start key for filling process
- ② Key to toggle display from setpoint / actual value
- ③ High temperature cut-off according to DIN 12876-1
- ③a High temperature cut-off for cooled fluid in reservoir

Analog/ digital connections

- External Pt100 sensor
- Serial interface RS232 / RS485
- Analog input for external programming
- Standby input for external emergency cut-off
- Connector for external alarm device
- Control cable for remote device 'RD' or 5 m extension cable (accessory)

Presto® benefits:

- Small space required
 - LH40, LH45, LH46 and LH85 can be placed under lab bench
- LH45, LH46 and LH85: Combination of air and water cooling, i.e. automatic changeover at high ambient temperatures or interruption of cooling water
- Handles and castors allow easy relocation
- Time-saving filling process for the entire system with permanent air purge
- Reservoir with cooling device and integrated high temperature cut-off
- Integrated warning, safety and supervision functions via 9 sensors
- Optional expansion vessels (accessories)
- Automatic de-gas mode
- Small filling volume enhances instrument performance
- IP class according to IEC 529: IP31



• Active Cooling Control: Cooling available throughout the entire temperature range



• Proportional cooling control: energy-saving performance

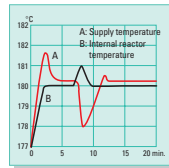


• Removable venting grid: Hassle-free cleaning of the condenser
• Drain port easily accessible on the front

Highly dynamic control

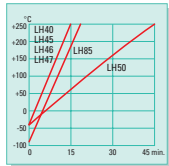
The diagram on the right shows how the LH45 automatically compensates an exothermic reaction in order to keep the setpoint temperature in the connected 2 liter reactor.

Automatic control of an exothermic reaction with a 2 liter reactor



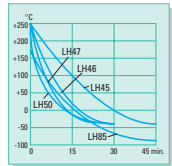
Heat-up times

Bath fluid: Thermal HL

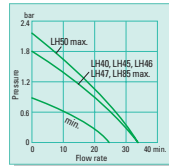


Cool-down times

Bath fluid: Thermal HL



Presto® Pump capacities
Bath fluid: Thermal HL



More space in your lab:



LH40 / LH45

Can be placed under the bench!



LH46 / LH85

Small footprint.
High capacity.



LH47 / LH50

| JULABO Order No. | JULABO Model | Working temp. range °C | Temperature stability in external system °C | Temperature display / Resolution °C | Indication of pump pressure and filling volume | Heating capacity kW |
|------------------|--------------|------------------------|---|-------------------------------------|--|---------------------|
|------------------|--------------|------------------------|---|-------------------------------------|--|---------------------|

Technical features (see fold-out page)



| | | | | | | |
|-----------|------|--------------|-----------------|-------------------|----------------|-----|
| 9 410 140 | LH40 | -40 ... +250 | ±0.01 ... ±0.05 | VFD + LCD / ±0.01 | on VFD display | 1.8 |
| 9 410 145 | LH45 | -40 ... +250 | ±0.01 ... ±0.05 | VFD + LCD / ±0.01 | on VFD display | 1.8 |
| 9 410 146 | LH46 | -45 ... +250 | ±0.01 ... ±0.05 | VFD + LCD / ±0.01 | on VFD display | 1.8 |
| 9 410 147 | LH47 | -45 ... +250 | ±0.01 ... ±0.05 | VFD + LCD / ±0.01 | on VFD display | 1.8 |
| 9 410 150 | LH50 | -50 ... +250 | ±0.01 ... ±0.1 | VFD + LCD / ±0.01 | on VFD display | 6.0 |
| 9 410 185 | LH85 | -85 ... +250 | ±0.01 ... ±0.05 | VFD + LCD / ±0.01 | on VFD display | 1.8 |

Included with each unit: 1.5 m CR® tubing for overflow

Applications

- Jacketed reactors, autoclaves, e.g. for polymerization, polycondensation
- Combinatorial chemistry, reaction blocks, organic synthesis
- Reaction calorimeters
- Distillation, pilot plants
- Calibration
- Semiconductor industry
- External open systems (except LH40)

| Cooling capacity kW ¹⁾ (Bath fluid: JULABO Thermal Ethanol) +200 +20 -20 -40 -60 -80 °C | Cooling of compressor | Pump capacity Flow rate / Pressure l / min. / bar | Filling vol. liters | Dimensions W x L x H cm | Weight kg | Power requirement V / Hz |
|--|-----------------------|---|------------------------|-------------------------------|--------------|-----------------------------|
|--|-----------------------|---|------------------------|-------------------------------|--------------|-----------------------------|

Technical features (see fold-out page)



| | | | | | | | | | | | | |
|-----|-----|-----|------|-----|-----|-----------|-------|-----------|------|---------------|-----|--|
| 1.5 | 1.0 | 0.4 | 0.05 | -- | -- | air | 24-33 | 0.8 - 1.6 | 2.5 | 30 x 49 x 64 | 71 | 230~ / 50 or 230~ / 60 |
| 1.5 | 1.2 | 0.5 | 0.1 | -- | -- | air/water | 24-33 | 0.8 - 1.6 | 2.5 | 30 x 49 x 64 | 77 | 230~ / 50 or 230~ / 60 |
| 2.5 | 2.1 | 0.9 | 0.1 | -- | -- | air/water | 24-33 | 0.8 - 1.6 | 2.5 | 50 x 59 x 64 | 103 | 230~ / 50 or 230~ / 60 |
| 2.5 | 3.0 | 1.3 | 0.3 | -- | -- | air | 24-33 | 0.8 - 1.6 | 2.5 | 40 x 55 x 127 | 150 | 3x400~ / 50 ²⁾ or 3x230~ / 60 |
| 5.5 | 7.0 | 2.8 | 0.9 | -- | -- | water | 24-35 | 0.8 - 2.2 | 10.0 | 40 x 55 x 127 | 182 | 3x400~ / 50 ²⁾ or 3x230~ / 60 |
| 1.5 | 1.0 | 0.9 | 0.7 | 0.5 | 0.1 | air/water | 24-33 | 0.8 - 1.6 | 2.5 | 50 x 59 x 64 | 130 | 230~ / 50 or 230~ / 60 |

¹⁾ Cooling capacity measured at pump stage 1 = 24 l/min. – 0.8 bar (and water-cooling on models LH45, LH85, LH50)

²⁾ 32A CEE power supply line necessary for LH47 and LH50

Magnum 91

- The Powerful Temperature Control System -

Magnum 91 offers the same benefits as the **Presto®** models. This system is particularly suitable for temperature control of external systems because it provides:

- Working temperature range from -91 to +250 °C
- High heating and cooling capacities
- Strong pump performance
- IP class according to IEC 529: IP20

Cooling of the two-stage refrigeration unit can be performed via the built-in cooling water connections G 3/4" using industrial water.

Additional benefits

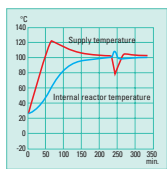
- Convenient arrangement of operating elements
- Keypad control
- Large VFD COMFORT-DISPLAY
- Backlit LCD display for user-friendly operation
- Connections for external Pt100 sensor – as well as other analog and digital connectors

Applications

- Reactor systems up to 50 liters
- Pilot plants, Kilo labs
- Polymerization, polycondensation, etc.

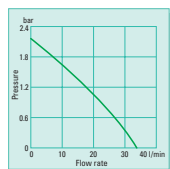
Automatic control

of an exothermic reaction with a 30 liter reactor



Pump capacity

Bath fluid: Thermal HL



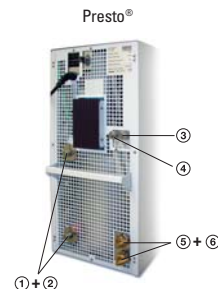
Magnum 91

| JULABO Order No. | JULABO Model | Working temp. range °C | Temp. stability in external system °C | Temperature display / resolution °C | Indication of pump pressure and filling volume | Heating capacity kW |
|------------------|--------------|------------------------|---------------------------------------|-------------------------------------|--|---------------------|
| 9 410 191 | Magnum 91 | -91 ... +250 | ±0.05 ... ±0.2 | VFD + LCD / ±0.01 | on illuminated display | 6.0 |

Technical features (see fold-out page)



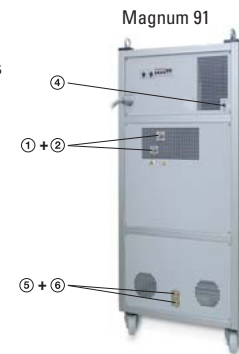
| Cooling capacity kW (Bath fluid: JULABO Thermal Ethanol) | | | | | | Cooling of compressor | Pump capacity Flow rate / l / min. | Press. bar | Filling volume liters | Dimensions W x L x H cm | Weight kg | Power requirement V / Hz | Amp. at 50 / 60 Hz |
|--|-----|-----|-----|-----|-------|-----------------------|------------------------------------|------------|-----------------------|-------------------------|-----------|------------------------------|--------------------|
| +200 | +20 | -20 | -40 | -60 | -80°C | | | | | | | | |
| 3.5 | 5.0 | 4.5 | 4.0 | 2.5 | 0.6 | water | 24-35 | 0.8-2.2 | 21.5 | 71 x 88 x 165 | 420 | 3 x 400-~/50 or 3 x 230-~/60 | 20 / 35 |



Pump and cooling water connections

Rear view:

- ① + ② Pump connections M16x1 male
- ③ Expansion vessel connection M16x1 male
- ④ Overflow connector
- ⑤ + ⑥ Cooling water connections G 3/4" with barbed fittings for tubing 1/2" inner dia.



Bath Fluids

| Order No. | Description | Quantity | Suitable for working temperature ranges | Flash point | Fire point | Color |
|-----------|--------------|----------|---|-------------|------------|-------------|
| 8 940 106 | Thermal H5S | 10 l | -40...+250 °C | >+110 °C | >+130 °C | light brown |
| 8 940 107 | Thermal H5S | 5 l | -40...+250 °C | | | |
| 8 940 122 | Thermal HL45 | 10 l | -45...+250 °C | >+121 °C | >+162 °C | clear |
| 8 940 123 | Thermal HL45 | 5 l | -45...+250 °C | | | |
| 8 940 120 | Thermal HL80 | 10 l | -85...+170 °C | >+63 °C | >+112 °C | clear |
| 8 940 121 | Thermal HL80 | 5 l | -85...+170 °C | | | |

These temperature ranges are only valid for use with Presto® and Magnum 91! Bath fluids for use with circulators, please refer to page 31.



Bath fluid

Accessories

| Order No. | Description | Suitable for |
|-------------------------------|--|---------------------|
| External Pt100 sensors | | |
| 8 981 003 | 200 x 6 mm dia., stainless steel, 1.5 m cable | Presto® + Magnum 91 |
| 8 981 005 | 200 x 6 mm dia., glass, 1.5 m cable | |
| 8 981 006 | 20 x 2 mm dia., stainless steel, 1.5 m cable | |
| 8 981 010 | 300 x 6 mm dia., stainless steel, 1.5 m cable | |
| 8 981 013 | 600 x 6 mm dia., stainless steel/Teflon coated, 3 m cable | |
| 8 981 014 | 1200 x 6 mm dia., stainless steel/Teflon coated, 3 m cable | |
| 8 981 020 | M + R in-line Pt100 sensor (including 2 fittings M16x1 male) | |
| 8 981 103 | 3.5 m Extension cable for Pt100 sensor | |
| 8 981 030 | TCCB Thermo-Couple Converter Box | |



External Pt100 sensor/ M+R in-line Pt100 sensor

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

| Order No. | Description | Suitable for |
|-----------|--------------------|---------------------|
| 8 930 209 | 0.5 m Metal tubing | Presto® + Magnum 91 |
| 8 930 210 | 1 m Metal tubing | |
| 8 930 211 | 1.5 m Metal tubing | |
| 8 930 214 | 3 m Metal tubing | |

Metal tubing, flexible, insulated, -50 ... +200 °C

| Order No. | Description | Suitable for |
|-----------|--------------------|---------------------|
| 8 930 220 | 0.5 m Metal tubing | Presto® + Magnum 91 |
| 8 930 221 | 1 m Metal tubing | |
| 8 930 222 | 1.5 m Metal tubing | |
| 8 930 223 | 3 m Metal tubing | |



Metal tubing, triple insulated

Additional accessories

| Order No. | Description | Suitable for |
|-----------|---|---|
| 8 970 443 | Adapter M16x1 male to M16x1 male | Connecting metal tubing Presto® + Magnum 91 |
| 8 970 750 | Icing protection sleeve for pump connectors | |



Castor platform



Expansion vessel
(rear view)



FREE of charge

Application:
Presto® LH50 with
jacketed 20 liter
glass reactor



| Order No. | Description | Suitable for |
|-----------|-------------|--------------|
|-----------|-------------|--------------|

Additional accessories

| | | |
|-----------|--|--------------------------|
| 8 910 041 | Castor platform | Presto® LH40, 45, 46, 85 |
| 8 970 830 | Expansion vessel 2 liters | Presto® LH40, 45, 46, 85 |
| 8 970 831 | Expansion vessel 5 liters | Presto® LH47, LH50 |
| 8 980 127 | 5 m Extension cable for remote device RD | Presto® |

Connectors / Valves / Adapters, etc.

| | | |
|-----------|---|------------------------|
| 8 970 457 | Shut-off valve for loop circuit (max. +250 °C), M16x1 | Presto® |
| 8 970 490 | 2 Collar nuts M16x1 female | + Magnum 91 |
| 8 890 004 | 2 Adapters M16x1 female to NPT 1/4" male | Presto® + Magnum 91 |
| 8 890 005 | 2 Adapters M16x1 female to NPT 1/4" female | |
| 8 890 006 | 2 Adapters M16x1 female to NPT 3/8" male | |
| 8 890 007 | 2 Adapters M16x1 female to NPT 3/8" female | |
| 8 890 008 | 2 Adapters M16x1 female to NPT 1/2" male | |
| 8 890 009 | 2 Adapters M16x1 female to NPT 1/2" female | |
| 8 890 010 | 2 Adapters M16x1 male to NPT 1/4" female | |
| 8 891 008 | 1 Adapter M16x1 male to BSP 1/2" female | |
| 8 891 009 | 1 Adapter M16x1 male to BSP 3/4" female | |
| 8 890 011 | 2 Adapters M16x1 female to tube 1/4" male | |
| 8 890 012 | 2 Adapters M16x1 female to tube 3/8" male | |
| 8 890 013 | 2 Adapters M16x1 female to tube 1/2" male | |
| 8 890 024 | 2 Adapters M16x1 female to M16x1 female | |

Software / Lab automation

| | | |
|-----------|---|------------------------|
| 8 901 102 | 'EasyTemp' control software (free download www.julabo.de) | Presto® + Magnum 91 |
| 8 901 105 | 'EasyTemp Professional' control software, incl. USB dongle | |
| 8 980 073 | RS232 interface cable, 2.5 m | |
| 8 900 110 | USB Interface adapter cable | |
| 8 900 015 | PBM Profibus DP Master | |
| 8 900 002 | PB-2 Option: integrated Profibus DP | |

Perfect:

Presto® and Magnum 91 are the perfect solution for temperature control of reactors. Please contact JULABO and ask for the most suitable unit for your requirements.

For YOUR convenience!

Get detailed information about functioning, operation and setup from the interactive Presto® CD-ROM, which you can order free of charge at www.julabo.de!