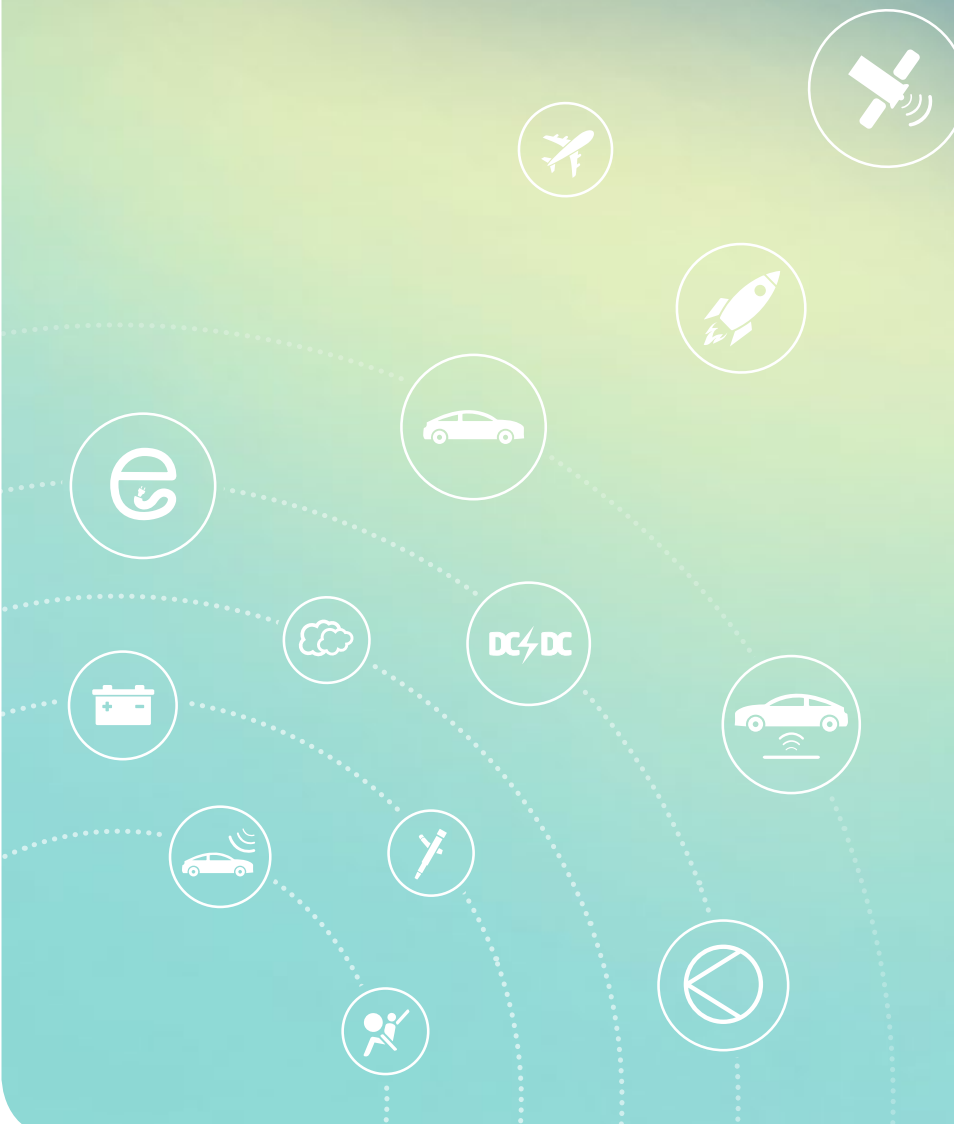


Julabo
THE TEMPERATURE CONTROL COMPANY

TEMPERATURE CONTROL SOLUTIONS

FOR MATERIAL AND COMPONENT TESTS



ENGLISH

TEMPERATURE CONTROL EXPERT IN THE AUTOMOTIVE AND SPACE INDUSTRIES

Fast and accurate temperature control is crucial in the research and development for the automotive industry and aerospace. JULABO offers reliable instruments for the various tests under realistic conditions as well as test simulations. To ensure reproducible temperatures, manufacturers and suppliers require premium instruments supporting more than standard applications.

The high-performance instruments made by JULABO offer the high-precision control and fast temperature changes required today.

JULABO instruments reliably comply with the highest requirements and solve even the most difficult temperature control applications without problems.

CUSTOM SOLUTIONS AND OPTIMUM SUPPORT

With 11 subsidiaries worldwide, customer service and support play a key role at JULABO. In particular, the professional and solution-oriented JULABO Custom Solutions Department focuses on custom applications. The comprehensive accessory program offers suitable complete solutions and supplements for every customer-specific requirement.

COMPLETE SOLUTIONS



AUTOMOTIVE

SPACE



QUALITY

TEMPERATURE CONTROL AT THE HIGHEST LEVEL IN RESEARCH AND DEVELOPMENT

JULABO offers outstanding quality and guarantees the highest customer satisfaction. The Highly Dynamic Temperature Control Systems' performance data speaks for itself: impressively short heat-up and cool-down times, and a very wide working temperature range without changing the bath fluid.

Temperature control of test specimens such as:

- DC/DC converters | inverters
- Electric motors
- Pumps & pump drives
- Electronic components, batteries, charging systems, coupling components, airbags, injection nozzles, and other components

Perfect simulation of environmental conditions

In the meantime, the JULABO PRESTO series instruments are an important, indispensable part of research and development. The instruments reliably control test specimens, optimize heat input and dissipation and simulate environmental conditions during highly sensitive tests. A variety of different interfaces support applications in state-of-the-art sectors and allows for quick digital integration.

Important accessories in the automotive sector

JULABO offers important accessories, such as flowmeters and electronically controlled three-way valves for controlling small flow rates of below 1 l/min. Additional accessories, such as pumps, adapters, hoses, temperature sensors, recording software (EasyTemp) and filters can be found at www.julabo.com.

REPRODUCIBILITY

APPLICATION EXAMPLES



WIRELESS CHARGING SYSTEMS FOR PASSENGER CARS

After the development phase of wireless charging systems for electric cars, extensive validation of such charging equipment is required. The instruments of the JULABO PRESTO series simulate the cooling circuit in the charging equipment and in the vehicle and provide temperature-controlled water-glycol within the shortest amount of time.

EXAMPLE

Test temperature range	-35 °C ... +90 °C
Flow control	2 ... 12 l/min
Flow control with pump	No
Flow control with electr. three-way valve	Yes
Heat transfer device for secondary circuit	No
Temperature control medium	Water-glycol

| PRESTO A45
PRESTO W50



DC/DC CONVERTERS | INVERTERS

DC/DC converters and inverters are becoming increasingly important as components for vehicle construction. During development, these components must be tested under realistic conditions and subjected to a wide temperature spectrum. In this phase, the JULABO PRESTO series instruments deliver quick temperature changes to simulate the cooling circuits of vehicles or environmental influences.

EXAMPLE

Test temperature range	-35 °C ... +95 °C
Flow control	1 ... 30 l/min
Flow control with pump	Yes
Flow control with electr. three-way valve	Yes
Heat transfer device for secondary circuit	No
Temperature control medium	Water-glycol

| PRESTO A45
PRESTO W50



DEVELOPMENT OF NEW ELECTRIC MOTORS

Thanks to a growing interest in electromobility in the aerospace sector, new electric motors are increasingly developed and tested. During the development phase, the optional flow-controlled JULABO PRESTO series instruments are used for precise temperature control of the cooling medium and its flow.

EXAMPLE

Test temperature range	-20 °C ... +90 °C
Flow control	9 ... 26 l/min
Flow control with pump	Yes
Flow control with electr. three-way valve	No
Heat transfer device for secondary circuit	No
Temperature control medium	Water-glycol (W50), Thermal HL60

| PRESTO W50
PRESTO W92





MATERIAL TESTS FOR SATELLITE COMPONENTS

Material tests of satellite components are performed at ambient temperatures occurring in space. In this regard, the JULABO PRESTO series instruments provide extreme temperature differences in vacuum chambers.

EXAMPLE

Test temperature range	-80 °C ... +180 °C
Flow control	No
Flow control with pump	No
Flow control with electr. three-way valve	No
Heat transfer device for secondary circuit	No
Temperature control medium	Thermal HL60, Thermal HL80, inert fluids

| PRESTO A80
PRESTO A85
PRESTO W91



LIFETIME TESTS FOR BATTERIES

To determine the lifetime of batteries, they are subjected to different ambient temperatures in environmental chambers. The instruments of the JULABO PRESTO series simulate the cooling circuit and deliver a wide temperature spectrum.

EXAMPLE

Test temperature range	-35 °C ... +95 °C
Flow control	1 ... 20 l/min
Flow control with pump	Yes
Flow control with electr. three-way valve	Yes
Heat transfer device for secondary circuit	No
Temperature control medium	Water-glycol (A40, W50)

| PRESTO A40
PRESTO W50
PRESTO W91



INJECTOR TEST BENCH

At certain test benches, individual components must be preconditioned (pre-temperature-controlled). To simulate a cold start in different vehicles, fuels such as diesel or gasoline are injected in the engine at a predefined temperature. In this regard, the injector carrier is temperature-controlled by an instrument of the JULABO PRESTO series.

EXAMPLE

Test temperature range	-25 °C ... +110 °C
Flow control	No
Flow control with pump	No
Flow control with electr. three-way valve	No
Heat transfer device for secondary circuit	No
Temperature control medium	Inert fluids

| PRESTO W50



YOU HAVE THE APPLICATION. WE HAVE THE RIGHT SOLUTION FOR YOU.

1 PRESTO

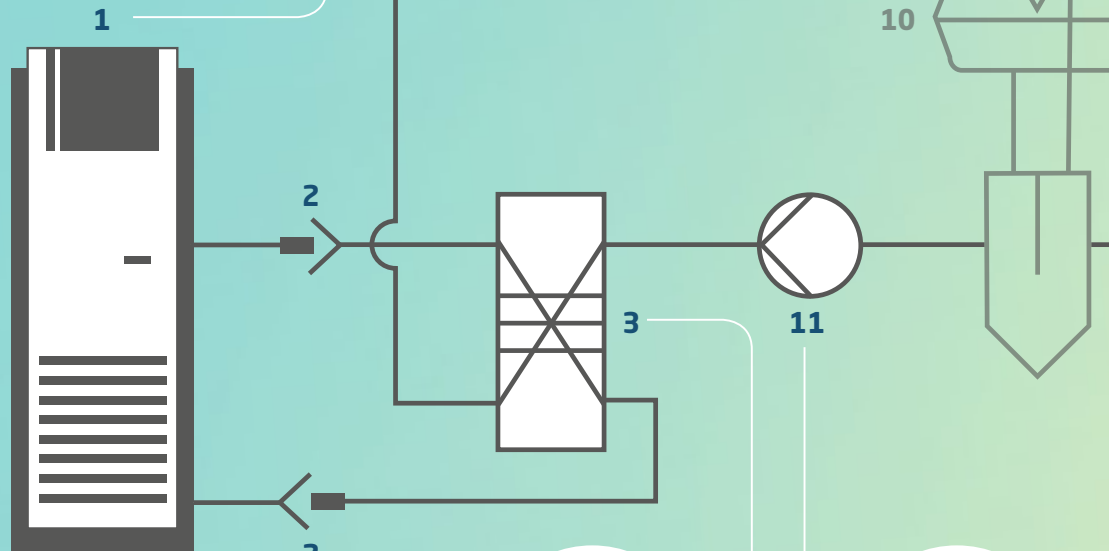
Temperature control through the JULABO PRESTO Highly Dynamic Temperature Control Systems is independent from direct or indirect temperature control. As an option, the JULABO PRESTO can also control the flow.

In the case of direct temperature control applications, the flow is controlled using the integrated, magnetically coupled and speed-controllable pump. In the case of indirect temperature control applications, flow control can be realized by the JULABO PRESTO using an electronically controlled three-way valve from JULABO.

The variety of installed interfaces allows an easy and reliable integration into superordinate test bench or control software.

4 Three-way valve for flow control

This valve is used when the requested flow in the application is smaller than the required flow in the temperature control instrument. Using the three-way valve, flow control is easily realized in a secondary circuit. Here, the Highly Dynamic Temperature Control System is directly used for the control. The flow can be controlled to below 1 l/min in the application.



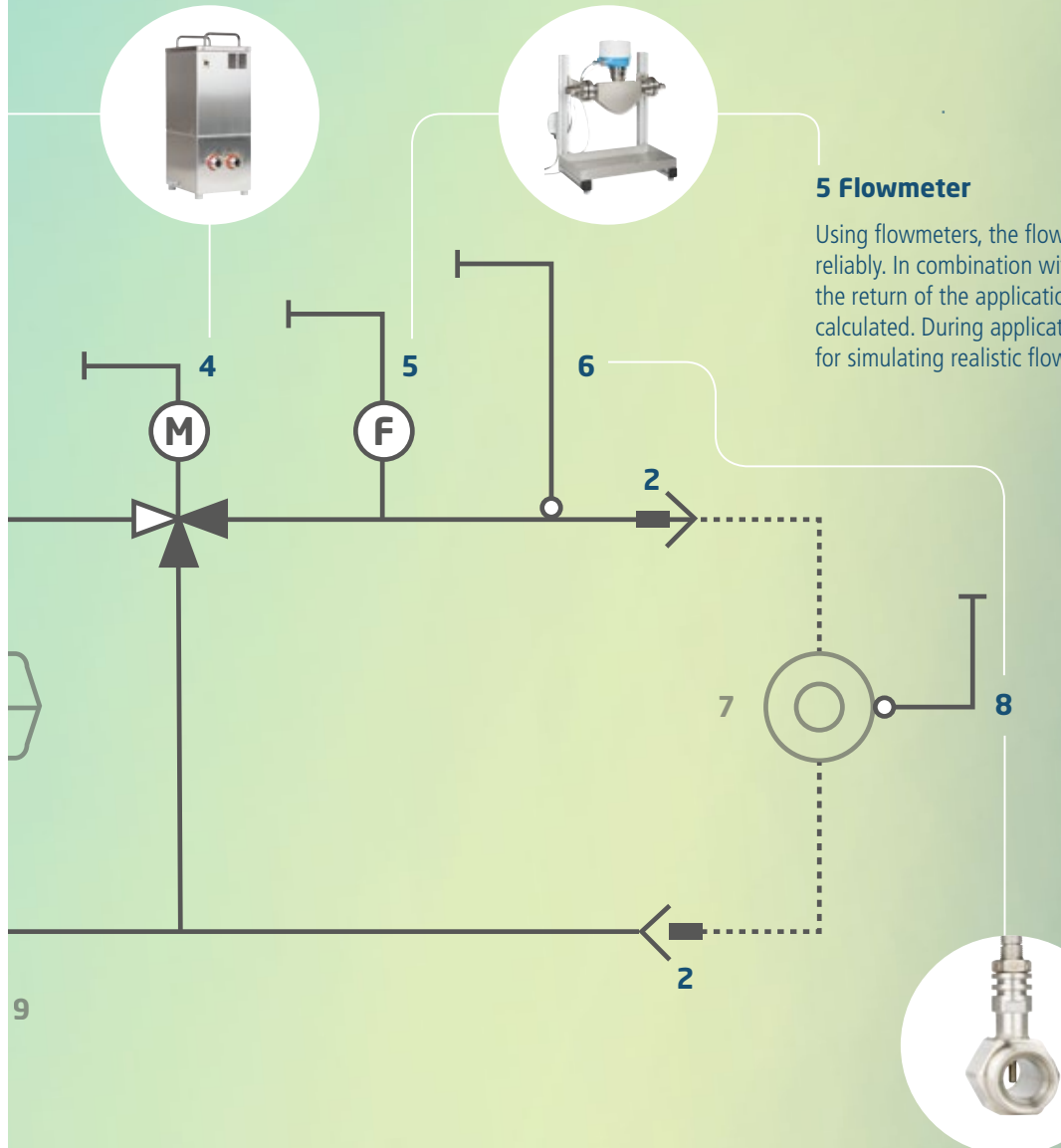
2 Quick couplings

Quick couplings enable clean and safe disconnection of the application from the temperature control circuit (loop circuit). The advantage is that the loop circuit must not be emptied when switching the application.

3 Plate heat exchanger

The plate heat exchanger ensures system separation between the circuit of the temperature control instrument and the application circuit. It is used, when the application's temperature control fluid may not be directly operated in the temperature control instrument due to viscosity, pressure or material compatibility issues.





5 Flowmeter

Using flowmeters, the flow in the application can be measured reliably. In combination with an in-line temperature sensor in the return of the application, the heat capacity can also be calculated. During application validations, flowmeters are used for simulating realistic flow conditions in the application.

11 Circulating pump

7 Application*

9 Air/gas separator*

Ventilation of the application circuit.

10 Expansion reservoir*

Compensates for temperature-related volume changes in the hydraulic circuit.

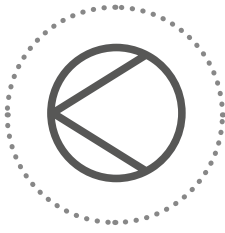


6 + 8 Temperature sensor

According to choice, the temperature can be measured and controlled in the supply or at any point directly in the application using the Highly Dynamic Temperature Control System. The return temperature can also be measured as an option.

*No 7, 9, and 10 are part of your application.

APPLICATION EXAMPLES



PUMP TEST BENCHES

Pumps are main components of vehicle assemblies. The fluids required in development, stress and endurance tests of pumps and their electric motors are temperature-controlled using instruments from the JULABO PRESTO series. The temperature control application can be realized directly in the instrument or indirectly via plate heat exchangers.

EXAMPLE 1 indirect

Test temperature range	-40 °C ... +150 °C
Flow control	No
Flow control with pump	No
Flow control with electr. three-way valve	No
Heat transfer device for secondary circuit	Yes
Temperature control medium	Thermal HL80, hydraulic fluid

EXAMPLE 2 direct

Test temperature range	-30 °C ... +90 °C
Flow control	No
Flow control with pump	No
Flow control with electr. three-way valve	Yes
Heat transfer device for secondary circuit	No
Temperature control medium	Water-glycol

| PRESTO W50
| PRESTO W92



AIR TEMPERATURE CONTROL APPLICATION

The testing for components in power trains must be temperature-controlled; not only fluids, but also air must be tested under different environmental conditions. Here, special solutions are used from the JULABO PRESTO series.

EXAMPLE

Test temperature range	-40 °C ... +160 °C
Flow control	No
Flow control with pump	No
Flow control with electr. three-way valve	No
Heat transfer device for secondary circuit	Yes
Temperature control medium	Thermal HL60, Air

| PRESTO A85
| PRESTO W91





TEST BENCH FOR ELECTRONIC COMPONENTS

Investigation and testing of components for electromobility requires a simulation of the temperature control circuit (loop circuit) of vehicles at different temperatures.

EXAMPLE

Test temperature range	-35 °C ... +90 °C
Flow control	5 ... 40 l/min
Flow control with pump	Yes
Flow control with electr. three-way valve	Yes
Heat transfer device for secondary circuit	No
Temperature control medium	Water-glycol

| PRESTO W50



AIRBAG TESTS

The development of vehicle airbags assumes tests using specific burst samples. JULABO PRESTO series instruments are used for the necessary per-tempering of the explosives.

EXAMPLE

Test temperature range	-70 °C ... +20 °C
Flow control	No
Flow control with pump	No
Flow control with electr. three-way valve	No
Heat transfer device for secondary circuit	Yes
Temperature control medium	Thermal HL80

| PRESTO A85



COMPONENT TESTS FOR POWER MODULES

JULABO PRESTO instruments provide the temperature control circuits (loop circuits) for the characterization and optimization of thermal power modules.

EXAMPLE

Test temperature range	-30 °C ... +150 °C
Flow control	5 ... 12 l/min
Flow control with pump	Yes
Flow control with electr. three-way valve	Yes
Heat transfer device for secondary circuit	No
Temperature control medium	Thermal HL60

| PRESTO A40
PRESTO A85



The **JULABO** advantages at a glance.

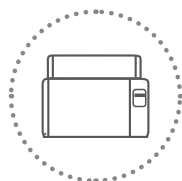
JULABO temperature control solutions – high-precision and speed

JULABO products include high-quality temperature control solutions to cover the temperature range from -95 °C to +400 °C.



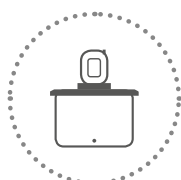
Refrigerated Circulators

The JULABO Refrigerated Circulators are suitable for internal and external applications and can be used within the temperature range from -95 °C to +200 °C.



Water Baths and Shaking Water Baths

Water Baths and Shaking Water Baths from JULABO can be used for a variety of applications within the temperature range from +18 °C to +99.9 °C.



Heating Circulators

Heating Circulators are available in various designs including Heating Immersion Circulators, Open Heating Bath Circulators, or Heating Circulators and cover the temperature range from +20 °C to +300 °C.



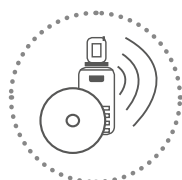
Additional Products

In addition, the JULABO product portfolio offers instruments for special requirements such as Calibration Baths, Visco Baths, Beer Forcing Test Bath, Immersion/Flow-Through Coolers, Temperature Controllers and Refrigerators for Chemicals.



Highly Dynamic Temperature Control Systems

The Highly Dynamic Temperature Control Systems from JULABO can be used for demanding temperature applications ranging from -92 °C to +400 °C. The new PRESTO line offers unique high performance specifications to meet these requirements.



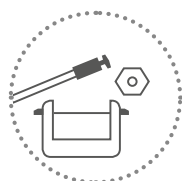
Wireless Communication & Software Solutions

JULABO facilitates the automation of applications. The temperature control instruments can be comfortably controlled and monitored via PC.



Recirculating Coolers

JULABO Recirculating Coolers are highly efficient and therefore offer an environmentally friendly and economic alternative to tap water cooling in the temperature range from -25 °C to +130 °C.



Accessories

The extensive range of accessories for all our instruments allows flexible use of JULABO products in research and industry.

Comprehensive service and on-site support

JULABO takes pride in offering customers expert advice for pairing the proper JULABO temperature control solution to their specific application. JULABO service and support options include installation and calibration, equipment qualification documentation and application training. These invaluable services ensure customer confidence in the operation and maintenance of any JULABO unit.

Individual requirements – individual products

The wide range of JULABO offers a solution for almost any application. However, if a specific application needs more than a standard product can offer, the JULABO specialists will work out an individual solution with you.



JULABO. Quality.

Highest quality standards to ensure a long product life.



Green technology.

Deliberately engineered with environmentally friendly materials and technologies.



Satisfied customers.

11 subsidiaries and more than 100 partners worldwide guarantee fast and qualified JULABO support.



100 % checked.

100 % testing. 100 % quality. Every JULABO product is shipped to customers after a successful final inspection.



Quick start.

Individual JULABO consultation and comprehensive manuals at your disposal.



Services 24/7.

Around the clock availability. You can find suitable accessories, data sheets, manuals, case studies and more at www.julabo.com.



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