

LAUDA



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HIGH-TEMPERATURE THERMOSTAT USH 400

TEMPERATURE CONTROL UP TO 400° C

Temperature control to 400° C

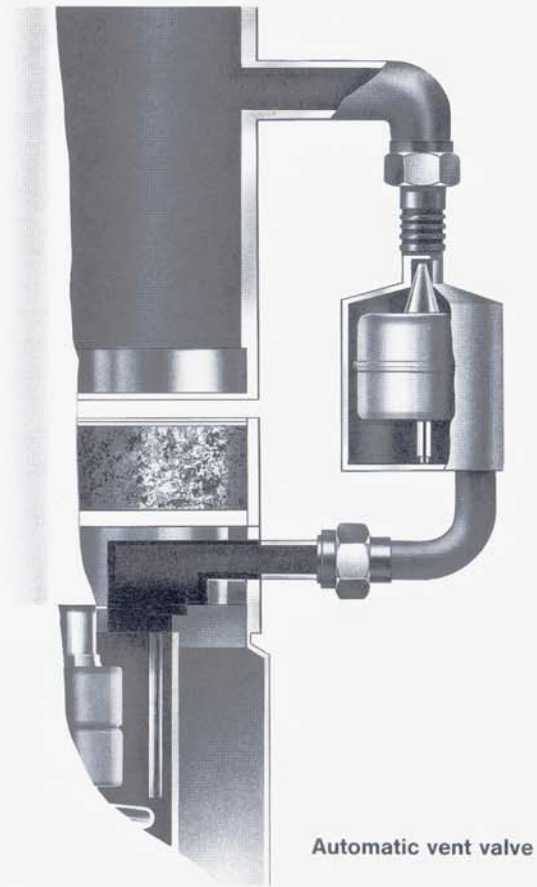
The LAUDA high-temperature thermostat USH 400 is a thermostatic circulator for operation up to 400° C which meets the most advanced technical specification.

The unit is designed for use in the chemical industry for thermostating external circuits in the laboratory or in product development. Special design features prevent all contact of the hot oil with atmospheric oxygen. This ensures complete absence of smell even at high temperatures and extends the life of the heat transfer oil.

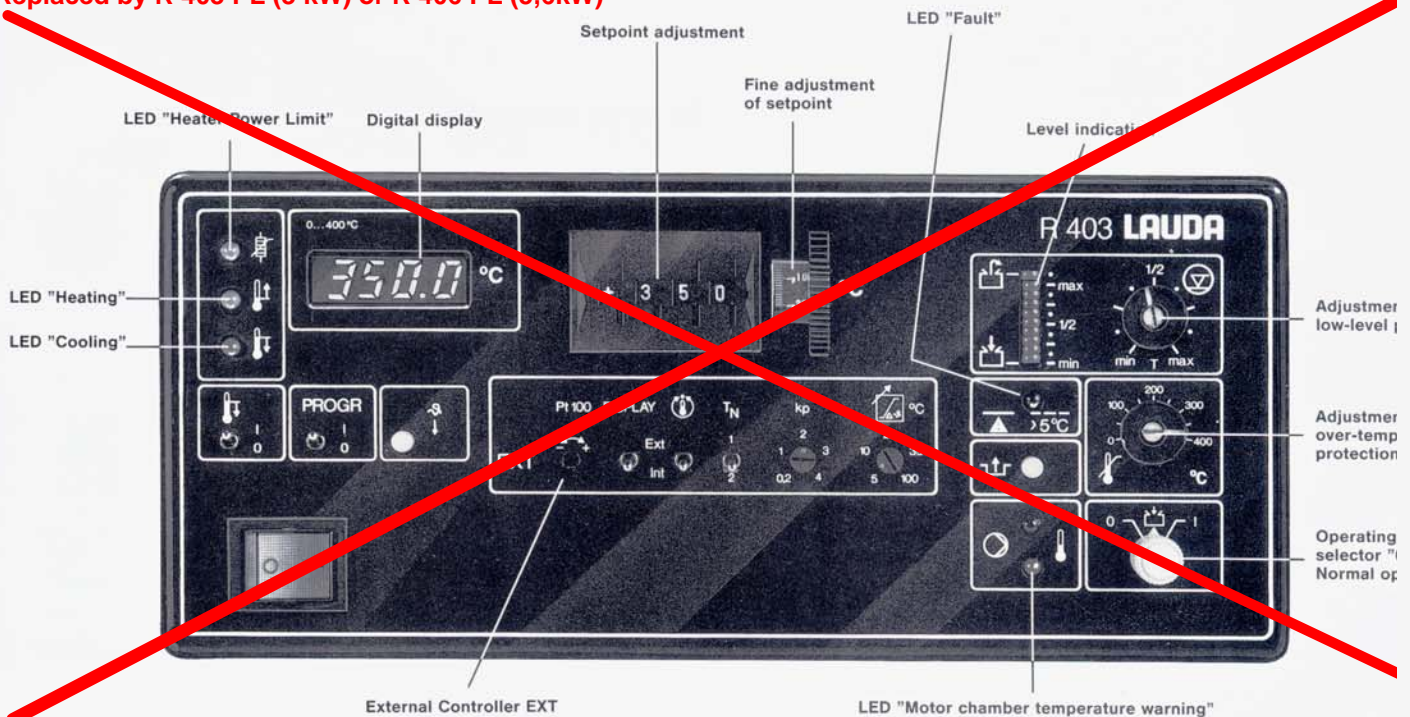
Use of the oils recommended by us allows operation in regular use at extremely high temperatures, at present up to 350° C. Separation between thermostat and control unit (R 403) permits remote operation. In this way the thermostat can for example be integrated into a technical installation and operated remotely.

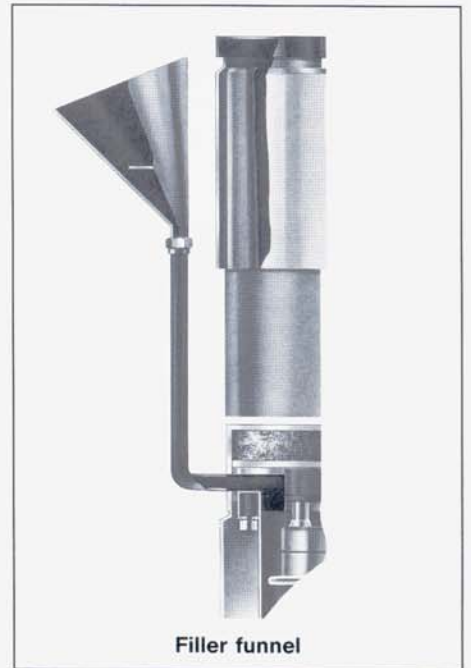
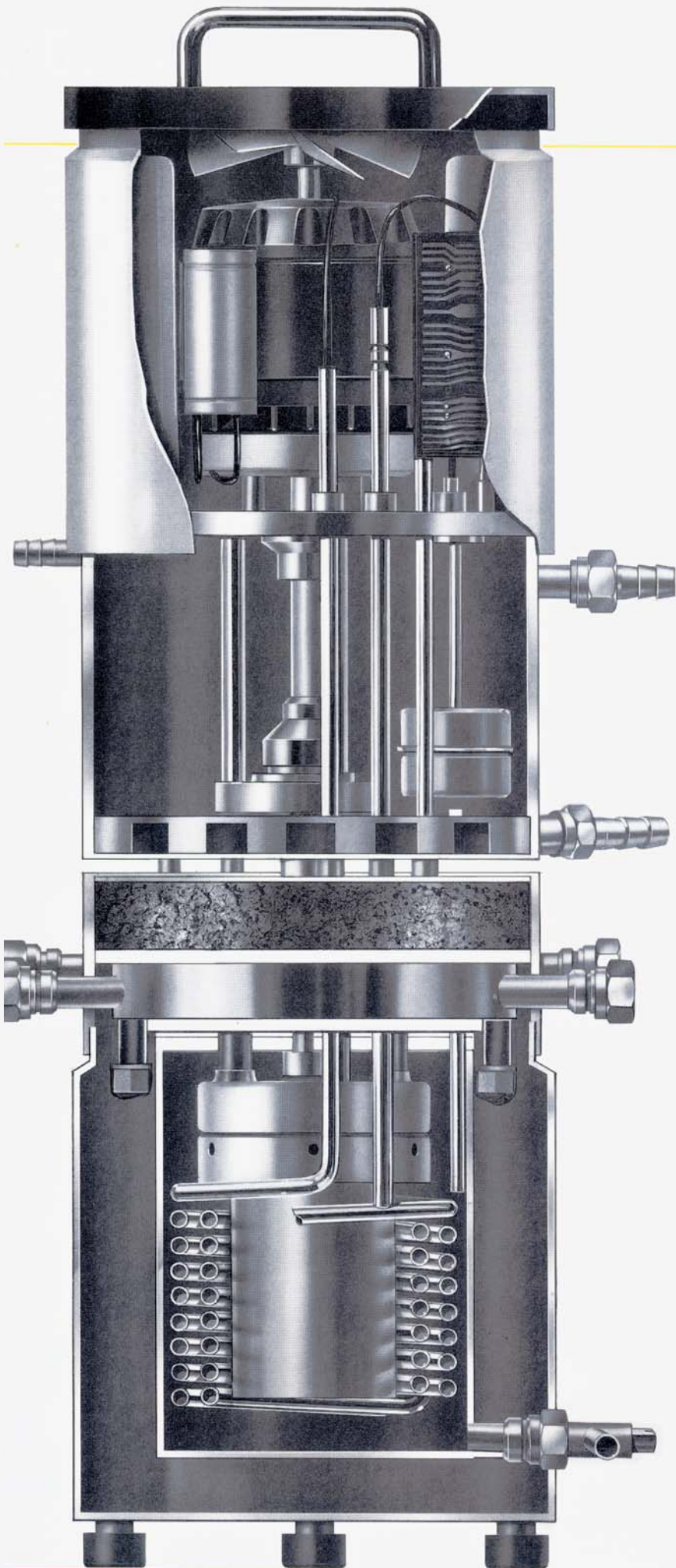
The entire electronics and all appropriate controls, the temperature indication and adjustment as well as the safety functions are arranged in a single unit, the R 403.

The low internal volume (1.9 litre) and the large heater rating (3 kW) ensure rapid heating-up in the external systems.

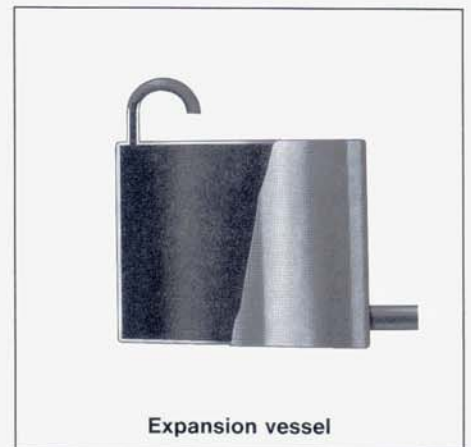


Replaced by R 403 PL (3 kW) or R 406 PL (5,6kW)





Filler funnel



Expansion vessel



External Consumer

OUR KNOW-HOW – YOUR ADVANTAGE

1 Safety Class 3

The high-temperature thermostat USH 400 is protected with safety systems to DIN 12879, Class 3, i. e. against over-temperature and low liquid level, and is suitable for continuous unattended operation.

Temperature limiter as over-temperature protection, disconnects the thermostat from all poles of the mains supply if an adjustable switch off temperature is exceeded.

Level limiter as low-level protection, adjustable between minimum and maximum liquid level, disconnects the thermostat from all poles of the mains supply when the level falls below the switch-off point.

The status of the safety circuit is held in the memory on switch-off or supply failure.

2 Level indication

The liquid level in the expansion vessel is indicated remotely on the control unit R 403 in the form of a LED bargraph.

3 External controller

Standard external controller using cascade control with PID action, PD/PID structure changeover and adjustable correction signal limitation.

The external setpoint is shown on the display. On changing over to external control, cascade control is available which compares the actual temperature at the remote sensing point with the selected setpoint. Result: simplified operation / improved control action.

4 Floating contact

Floating contact in control unit R 403 as standard for general alarm and motor chamber temperature.

5 Controlled cooling

Fitting the option MVH permits operation with controlled water cooling.

Automatic cooling in accordance with energy requirements over the entire working temperature range.

6 Auto-fill function

Auxiliary filling function and venting of the external system, even with high-level containers.

Heating is out of action during filling. The pump runs only with adequate liquid level in the system.

7 Heater power limit

No additional setting of the heater power limit during heating-up since the built-in electronics limits the heater surface temperature to approx. 15^o C above the outflow temperature. Protection of oil during start-up.

8 Motor warning circuit

2-stage warning system to prevent interruption of tests due to excessive ambient temperature.

9 Centrifugal immersion pump

2-stage circulating pump. A part oil flow passes continuously over the heater independently of the external circuit. This ensures internal tank circulation even when the external flow is interrupted. Max. discharge pressure 0.8 bar; 22 l/min at zero head.

10 2 external circuits

Connections for two external circuits.

Either two load circuits or one application circuit and one heat exchanger (when using the MVH cooling option) can be operated to suit requirements.

11 Cooling of expansion vessel

Cooling of the cold oil tank is not normally necessary up to about 250^o C operating temperature. Above this temperature the floor of the expansion vessel can be cooled with air, nitrogen or water through the built-in cooling chamber.

12 Safety drain valve

The drain valve can only be opened with a tool for safety reasons.

Technical data according to DIN 58 966

USH 400 / R 403

Ambient temperature range	(°C)	5...50 (thermostat)	5...40 (R 403)
Operating temperature range			
with external cooling	(°C)	80...400	
with external cooling and extra chiller	(°C)	20...400	
Operating temperature range	(°C)	80...250	
Temperature probe/control action		Pt 500 Class A to DIN IEC 751	
Indication/resolution		green LED, 0,1° C	
Temperature control	(°C)	± 0,02 to ± 0,1	
Temperature setting/resolution	(°C)	digit switch / 1	
Fine temperature adjustment range/resolution	(°C)	- 0,2 to 1,2 / 0,01	
EXT controller			
Temperature probe/control action		Pt 100 DIN IEC 751 / PD/PID	
master controller			
Multifunction output		<ul style="list-style-type: none"> - connection for programmer PM 351 - computer link through A/D converter or R 61 - remote transmission of fault indication 	
Heater rating	(kW)	3.0	
Heater surface loading	(W/cm ²)	approx. 3	
Class to DIN 12879		3, additional level indication	
Simplex pumps			
flow against zero head			
(pump output)	(l/min)	22	
max. discharge head	(bar)	0,8	
Filling volume	(l)	1.9	
Expansion volume	(l)	0.9	
with extra expansion vessel:			
Filling volume	(l)	2.1	
Expansion volume	(l)	2.2	
Bath liquid	20...350° C	Ultra-Therm 330 SCB	
Base area	(mm)	(thermostat \varnothing x H) 180 x 540 (R 403 W x D x H) 300 x 170 x 50	
Weight	(kg)	(thermostat) 17 (R 403) 4.5	
Supply (thermostat)		230 V; 50 Hz / 230 V; 60 Hz / 3.2 kW Protection Class 1 to VDE 0100	
Supply (R 403)		230 V; 50/60 Hz Protection Class 1 to VDE 0100	
Interference suppression		suppressed to VDE 0875	
Cat. No. 230 V; 50 Hz		LTH 109	
230 V; 60 Hz		LRZ 209	

Standard accessories:

	Cat. No.
1 Filler funnel	UD 259
8 Screwed rings M16 x 1	HKM 032
1 Nipple 13 \varnothing (for overflow)	HKO 026
2 Nipples 11 \varnothing (for cooling chamber)	HKO 009
2 Screwed rings M14 x 1.5 (for cooling chamber)	HKM 045
1 Control and operating unit R 403	LRK 009

Options available:

	Cat. No.
Extra expansion vessel 1 l	UD 260
Automatic vent valve	UD 253
MVH (cooling water control)	LTZ 034
19" adapter	LRZ 004



Cooling water control MVH

Option MVH converts the high-temperature thermostat USH 400 into a small-size heating/cooling system. Double cooling control permits automatic operation over the entire working range - with appropriate selection of the heat transfer liquid. A high-temperature valve in the liquid circuit with safety circuit and a solenoid valve in the coolant circuit prevent vapour

formation and optimize the cooling water demand. The cooling option MVH extends the control systems of the USH 400 by a fully automatic cooling control.

The appropriate electronics is incorporated in the R 403 control unit.

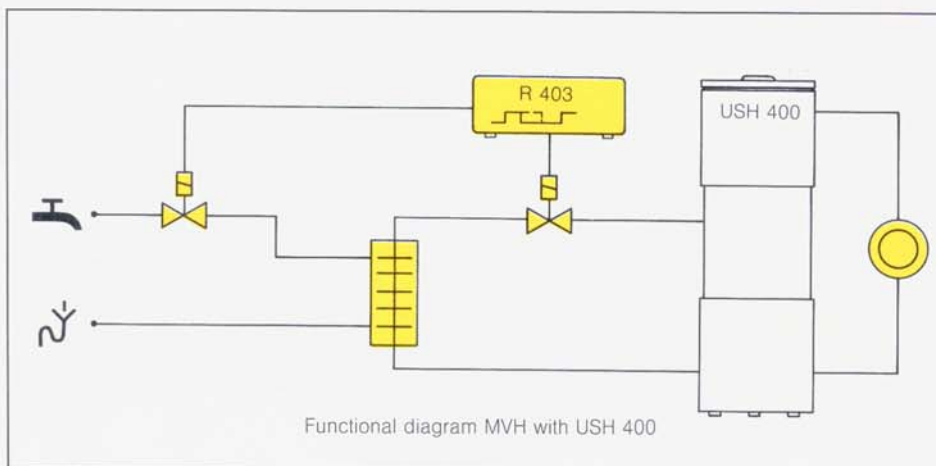
Technical data:

Heat transfer liquid Ultra-Therm 330 SCB, cooling water temperature 10° C, flow with cooling on: approx. 10 l/min.

Cooling capacity (kW) at
 300° C 6
 100° C 2.5
 80° C 1.2

Base area W x D x H (mm)
 165 x 165 x 245
 (without connections, fixings etc.)

Weight (kg) 6



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