

The right temperature worldwide

LAUDA



- High cooling capacities down to $-90\text{ }^{\circ}\text{C}$
- Compact design
- Large baths up to 40 liters

NEW

LAUDA
Proline Kryomats

LAUDA Proline Kryomats

Extra powerful cooling thermostats for bath applications from -90 up to 200 °C
LAUDA Proline Kryomats



Application examples

Constant temperatures

- Notch bending test
- Drop test

Changing temperatures

- Determination of pour point
- Brookfield test of lubricants
- Test of slide bearings

The new **Proline Kryomats** are floor-standing, low temperature thermostats suitable for a wide variety of applications. They never fail to impress through their compact design and high cooling capacities, especially at low temperatures. All Proline Kryomats are fitted with the Command remote control for easy and user-friendly operation. The units are equipped with a pressure pump optimized for internal

circulation adjustable from performance level five to eight. To prevent moisture in the atmosphere from condensing at low temperatures, bath bridge and bath edge heating are integrated into the design. Proline Kryomats stand out for having the latest technologies and an excellent price-performance ratio.

Your advantages at a glance



The Proline Kryomat advantages

Your benefits



- Removable Command remote control with graphic LCD
- Automatic adjustment of the control parameters via integrated software for adaptive control

- Easy and intuitive operation. Quick setting changes
- Saves time-consuming calculation of control parameters



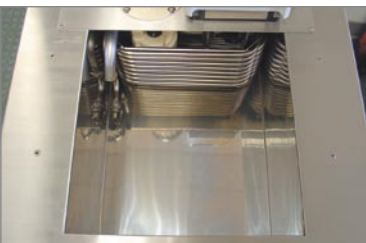
- Offset control head
- Integrated electrically heated cover plate and bath bridge heating
- Use of innovative cooling technology

- Allows installation of optional supplementary pumps
- Avoids condensation and ice build-up
- High cooling capacity and low operating temperatures with very small footprint



- Updated, adjustable pump nozzle

- Optimum circulation and temperature distribution throughout the entire bath



- Spacious baths with large bath openings
- Thread sleeves as standard on the edge of the bath

- Accommodates various sample shapes and sizes with efficient flow
- Allow for the fixing of testing equipment without further conversion measures



- Intelligent cooling fan control
- Optimised cooling airflow
- Internal release valve

- Optimum heat discharge while reducing noise emission
- Bath drain at front of unit
- No protruding release valve

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Detachable Command remote control

All Proline Kryomats are fitted with the Command remote control as standard. The highly-efficient programmer fulfills all the requirements of complex thermostating processes – with real-time function. The simple menu-driven operation and the easy editing of test programs allow for quickly changing thermostating tasks. The Command remote control is removable and can be used easily. An RS-232-/485 interface is integrated as standard.



Energy-saving cooling thermostats in two variants

The air-cooled Proline Kryomats have a working temperature range from -90 up to 200 °C. The models are available with bath volumes of 30 and 40 liters. The Proline SmartCool system, with its energy-saving digital cooling management, ensures that the cooling output is run in accordance with the application needs. That saves up to 75 percent of energy compared to standard cooling methods. Two different booster pumps are available as accessories especially for external applications that require a considerable increase in volume flow/discharge pressure.

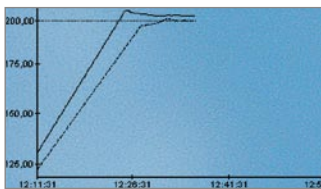
In the case of the water-cooled Proline Kryomats, the process heat is dissipated with the use of facility cooling water. This largely prevents unnecessary heating of the surrounding environment. As a result of this type of cooling, even higher cooling capacities are achieved than with the air-cooled units. The electronic cooling water management minimizes water consumption.

The enhanced booster pumps available as accessories are particularly recommended for external applications where increased volume flow or greater pressures are required.



Versatile configuration

Clearly arranged display of the most important information. Easy configuration by the user.



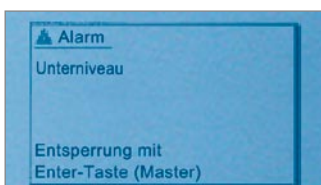
Optimal display

Graphic display of temperature values for control also without computer.

Pump	Level
Settings	Calibration
Graph	Default Settings
Clock	Resolution
Programmer	Device Status
Interfaces	Keyboard
Control	Basic Settings
Limits	

Clear menu navigation

Easy menu navigation in plain text, programmer with 150 temperature/time segments, divided into five programs, menu navigation in German, English, French and Spanish.



Time saving trouble shooting

In case of failure clear indication to the user. Alarms signal critical situations. Thereby downtimes are prevented.

Important applications



Notch Bending Test

The notch bending test is a material testing procedure in which the ductile properties of materials, e.g. steels, are determined. In the trial, a pendulum hammer hits a thermostated sample and thereby penetrates it. From the procedure, it is possible to investigate the material behaviour at various temperatures. The typical temperature range is between -90 and 150 °C.

Drop Test

The Battelle drop-weight tear test (BDWTT) in accordance with DIN EN 10274 serves to assess the breaking behaviour of ferritic steels. A notch is pressed into a metal sample. A drop or pendulum striking machine strikes the opposite side from the notch. The impact must result in a break. The purpose of the test is to determine the impact energy consumed at a specific temperature or, by visual detection, to determine the relative proportion of deformed and brittle fracture area. The typical temperature range is between 0 and -90 °C.

Pour Point Determination

According to ASTM D97 (for petroleum products) or ASTM D5853 (for crude oils) the pour point is to be determined as follows: Heat the substance to be tested until it is clearly fluid, then slowly cool the substance in a test vessel. In stages of 3 K at a time, check whether the flow properties are still displayed. The temperature from which the flow properties are no longer present is the pour point.

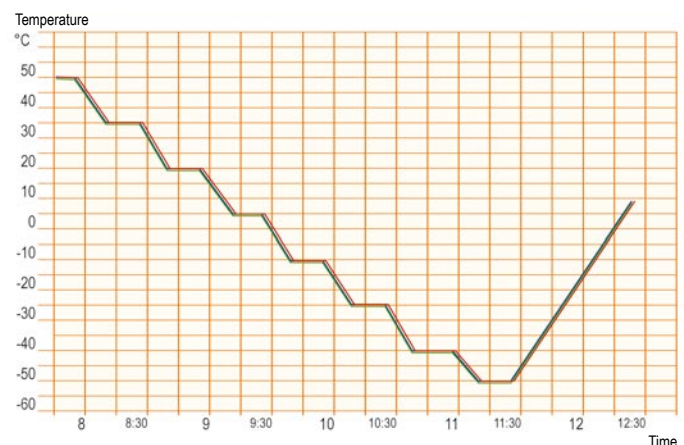
Brookfield Test

The Brookfield test in accordance with DIN 51398 is a test to determine the dynamic viscosity of gear oils. The samples to be tested are cooled down to -40 °C in the thermostating bath at a cooling rate of 1 K/min. After the test temperature at ± 0.3 K, thermostating is carried out for two hours. Following the cooling and thermostating time, the viscosity is determined using a rotary viscometer.

Test of slide bearings

The sliding friction test in accordance with DIN EN 1337-2 tests the material properties of bridge bearings. The plastic bearings are stressed with a load along a temperature profile. A sliding path and sliding speed are set. The temperature range is dependent on the sliding bearing material. Typical temperature trends range for example from 21 down to -35 °C or from 48 down to -50 °C.

Temperature profile for test of slide bearings



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Proline Kryomats Air-cooled cooling thermostats

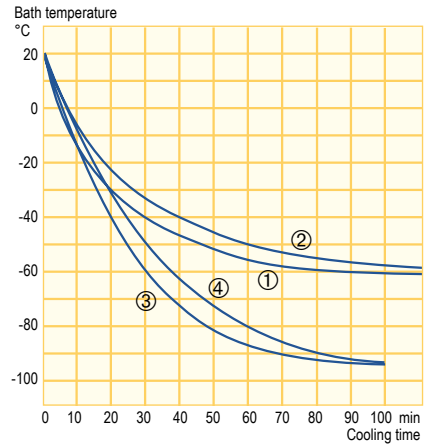


1160 mm

Cooling thermostat RP 4050 C



Cooling curves Heat transfer liquid: Ethanol, bath closed



- ① RP 3050 C
- ② RP 4050 C
- ③ RP 3090 C
- ④ RP 4090 C

Temperature range

-90...200 °C

Standard accessories

Bath cover · 4 closing plugs for pump connections

Recommended accessories

Optional modules: analogue, RS 232/485, contact, Profibus module

Technical features		RP 3050 C	RP 4050 C	RP 3090 C	RP 4090 C
Working temperature range	°C	-50...200	-50...200	-90...200	-90...200
Temperature stability	±K	0.05	0.05	0.05	0.05
Heater power 400V/208V/200V	kW	3.5/3.0/2.8	3.5/3.0/2.8	3.5/3.0/2.8	3.5/3.0/2.8
Cooling output at 20 °C	kW 20 °C	5.0	5.0	3.0	3.0
	0 °C	3.0	3.0	2.9	2.9
	-20 °C	1.6	1.6	2.5	2.5
	-30 °C	1.0	1.0	2.3	2.3
	-40 °C	0.5	0.5	2.0	2.0
	-50 °C	0.25	0.25	1.6	1.6
	-60 °C	–	–	1.3	1.3
	-70 °C	–	–	0.8	0.8
	-80 °C	–	–	0.5	0.5
	-90 °C	–	–	0.15	0.15
Pump pressure max.	bar	0.5	0.5	0.5	0.5
Pump flow max.	L/min	19	19	19	19
Bath volume	L	23...31	32...44	23...31	32...44
Bath opening/depth	mm	350x200/250	350x350/250	350x200/250	350x350/250
Dimensions (WxDxH)	mm	600x700x1160	600x700x1160	600x700x1160	600x700x1160
Weight	kg	130	130	155	155
Cat. No. 400 V; 3/N/PE; 50 Hz		LUK 239	LUK 241	LUK 245	LUK 247
Cat. No. 208 V; 3/PE; 60 Hz		LUK 339	LUK 341	LUK 345	LUK 347
Cat. No. 200 V; 3/PE; 50/60 Hz		LUK 439	LUK 441	LUK 445	LUK 447

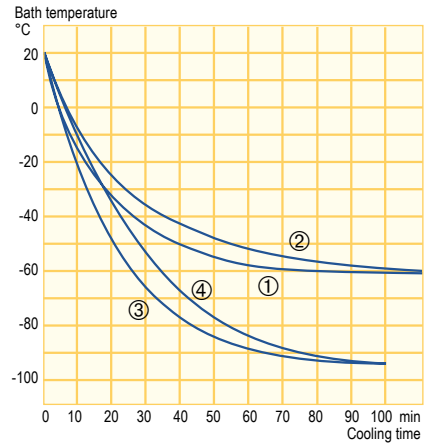
Proline Kryomats Water-cooled cooling thermostats



Cooling thermostat RP 4090 CW



Cooling curves Heat transfer liquid: Ethanol, bath closed



- ① RP 3050 CW
- ② RP 4050 CW
- ③ RP 3090 CW
- ④ RP 4090 CW

Temperature range
-90...200 °C

Standard accessories

Bath cover · 4 closing plugs for pump connections ·
G 3/4" screw cap with 1/2" hose clip · 2 nipples 13 mm

Recommended accessories

Tubing for cooling water · Optional modules: analogue,
RS 232/485, contact, Profibus module

Technical features		RP 3050 CW	RP 4050 CW	RP 3090 CW	RP 4090 CW
Working temperature range	°C	-50...200	-50...200	-90...200	-90...200
Temperature stability	±K	0.05	0.05	0.05	0.05
Heater power 400V/208V/200V	kW	3.5/3.0/2.8	3.5/3.0/2.8	3.5/3.0/2.8	3.5/3.0/2.8
Cooling output at 20 °C	kW 20 °C	6.0	6.0	4.0	4.0
	0 °C	3.5	3.5	3.7	3.7
	-20 °C	1.8	1.8	3.1	3.1
	-30 °C	1.1	1.1	2.7	2.7
	-40 °C	0.6	0.6	2.3	2.3
	-50 °C	0.25	0.25	1.8	1.8
	-60 °C	–	–	1.4	1.4
	-70 °C	–	–	0.9	0.9
	-80 °C	–	–	0.5	0.5
	-90 °C	–	–	0.15	0.15
Pump pressure max.	bar	0.5	0.5	0.5	0.5
Pump flow max.	L/min	19	19	19	19
Bath volume	L	23...31	32...44	23...31	32...44
Bath opening/depth	mm	350x200/250	350x350/250	350x200/250	350x350/250
Dimensions (WxDxH)	mm	600x700x1160	600x700x1160	600x700x1160	600x700x1160
Weight	kg	130	130	155	155
Cat. No. 400 V; 3/N/PE; 50 Hz		LUK 240	LUK 242	LUK 246	LUK 248
Cat. No. 208 V; 3/PE; 60 Hz		LUK 340	LUK 342	LUK 346	LUK 348
Cat. No. 200 V; 3/PE; 50/60 Hz		LUK 440	LUK 442	LUK 446	LUK 448

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Proline Kryomats accessories

Interface modules

An RS 232/485 interface is integrated as a standard feature. The control head is equipped for two interface modules to be plugged into the rear of the unit.

Cat. No.	Description
LRZ 912	Analogue module
LRZ 913	RS-232-/485 interface
LRZ 914	Contact module with 1 x In, 1 x Out (NAMUR)
LRZ 915	Contact module with 3 x In, 3 x Out (SUB-D)
LRZ 917	Profibus module



Suitable tubings for heat transfer liquids and cooling water

Available upon request.



Booster pumps

For higher flow rates and pressure for external systems, connections M 30 x 1.5 O (O = outer thread)

Cat. No.	Description	Temperature range	Pressure max.	Pump flow max.
LWZ 080	EMP 174	-100...150 °C	0,9 bar	90 L/min
LWZ 086	EMP 081	-40...150 °C	3,2 bar	40 L/min



Baskets

For notch bending tests

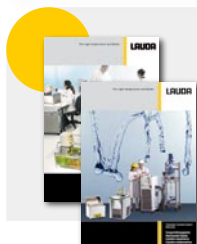
Cat. No.	Suitable for
LUZ 008	RP 3050 C, RP 3050 CW, RP 3090 C, RP 3090 CW
LUZ 009	RP 4050 C, RP 4050 CW, RP 4090 C, RP 4090 CW



Pour point determination

Bath cover accommodates up to 16 metal beakers

Cat. No.	Suitable for
UP 065	RP 4050 C, RP 4050 CW, RP 4090 C, RP 4090 CW



Order the detailed LAUDA accessories brochure and the heat transfer liquids brochure free of charge. This and additional product information can also be found at www.lauda.de

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