

The right temperature worldwide

# LAUDA



- Powerful temperature control on an industrial scale
- Optimized for use in production environments
- Customized connection to process control systems

**LAUDA**  
**Kryoheater Selecta**  
Process thermostats

# LAUDA Kryoheater Selecta

Process thermostat for energy-saving professional temperature control in the working range of -90 up to 200 °C



## Application examples

- Test stands
- Reactors
- Distillation plants
- Freeze-drying
- Temperature stress test for environmental simulation

## High efficiency, compact design, intuitive operation

**LAUDA process thermostats** of the Kryoheater Selecta (KHS) series ensure high-performance temperature control at high energy efficiency and reliability. The compact device construction provides a long service life and maintenance friendliness. Corresponding to the lowest working temperature, two-stage compressors (up to -60 °C) and/or cascade cooling systems (up to

-90 °C) are used. The condenser is cooled by means of cooling water. The cooling capacity is controlled continuously and precisely by injection control. A step switch ensures energy-saving and low-wear partial load operation using an automatic compressor system. By means of the electric heating, Kryoheater Selecta can cover an operating temperature of up to 200 °C.

# Your advantages at a glance



## The advantages

## Your benefits



- Powerful pump (flow rate 85 L/min max. pressure 5.5 bar max.)
- Magnetic coupling
- Integrated frequency conversion
- Pressure limitation

- High volume flow even in case of pressure loss
- No sealing problems at the pump shaft as it is hydraulically sealed
- Highly precise user-specific speed control (40 to 100 percent)
- Protection of the consumer against excess pressure



- Nitrogen overlay of the expansion vessel
- Pressure-resistant expansion vessel made of stainless steel

- No condensation of the air humidity
- No odours
- No evaporation and no oxidation of the heat transfer liquid
- Enables larger operating temperature range of the heat transfer liquids



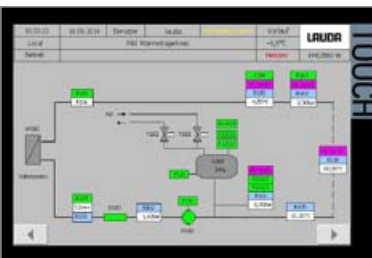
- Automatic on/off of the second refrigeration step for KHS 2190 W (cascade cooling up to -90 °C)

- Up to 50 percent energy conservation in applications over -20 °C



- Protection class IP 54
- Robust construction using steel frames
- Industrial control cabinet

- Safe, reliable and long-term use in production environments
- Protection of the control against all environmental influences, such as dust, dirt, liquids and touch
- Simple maintenance and service by ideal accessibility to all components



- PLC control (programmable logic controller)
- 7" touch panel
- Detailed display of parameters
- Visualisation of alarm and error messages

- Extensive data exchange with process control systems
- Intuitive operation
- Quick analysis of process data
- Identification of disturbance variables



- Use of a refrigerant with low global warming potential (GWP\* < 2,500)
- Low amount of refrigerant

- Fulfills the European F Gas Directive No. 517/2014

\*GWP = Global Warming Potential



# LAUDA Kryoheater Selecta

## Process thermostats for dynamic temperature control from -90 to 200 °C

The Kryoheater Selecta series consists of the two systems KHS 3560 W and KHS 2190 W, which are used in chemical and pharmaceutical production as well as for the simulation of environmental conditions in test stands of the automobile and aerospace industries.

Connections	Nominal size	Nominal pressure	Note
① Heat transfer liquid inlet	DN 25	PN16	DIN 2633
② Heat transfer liquid outlet	DN 25	PN16	DIN 2633
③ Cooling water inlet	G1"; external	PN16	
④ Cooling water outlet	G1"; external	PN16	
⑤ Nitrogen inlet	G1/4"; internal		
⑥ Exhaust pipe	G1/2"; internal		DIN 2633
⑦ Filling and drainage valves	G1/2"; internal		



Technical features		KHS 3560 W	KHS 2190 W
Working temperature range	°C	-60 ... 200	-90 ... 200
Ambient temperature range	°C	5 ... 40	5 ... 40
Temperature stability	±K	0.5	0.5
Heater power	kW	18.0	18.0
Cooling output at 20 °C cooling water temperature		Measured with Kryo 65	Measured with Kryo 90
	200 °C kW	35.0	21.0
	20 °C kW	35.0	21.0
	10 °C kW	32.0	20.0
	0 °C kW	30.0	18.0
	-10 °C kW	29.0	15.0
	-20 °C kW	18.0	11.0
	-30 °C kW	14.0	10.5
	-40 °C kW	10.0	10.0
	-50 °C kW	6.0	9.5
	-60 °C kW	2.5	9.0
	-70 °C kW	–	6.3
	-80 °C kW	–	3.5
	-90 °C kW	–	1.0
Cooling water consumption max. at 20 °C cooling water temperature; 3 bar differential pressure	L/h	3960	2280
Pump pressure max.	bar	5.5	5.5
Pump flow max.	L/min	85	85
Heat transfer liquid connection		DN 25	DN 25
Connection – water cooling		G1". external	G1". external
Filling volume min. (without expansion vessel)	L	15	15
Volume of expansion vessel	L	40	40
Overall dimensions (WxDxH)	mm	920x1200x1700	920x1200x1700
Total power consumption	kW	29.5	32.8
Noise level	dB(A)	68	68
Weight	kg	850	850
Cat. No. 400 V; 3/PE; 50 Hz		LWP 556	LWP 557
Cat. No. 440–480 V; 3/PE; 60 Hz		LWP 656	LWP 657
Cat. No. 400 V; 3/PE; 50 Hz & 440–480 V; 3/PE; 60 Hz		LWP 756	LWP 757

## Advantages ensured by nitrogen overlay

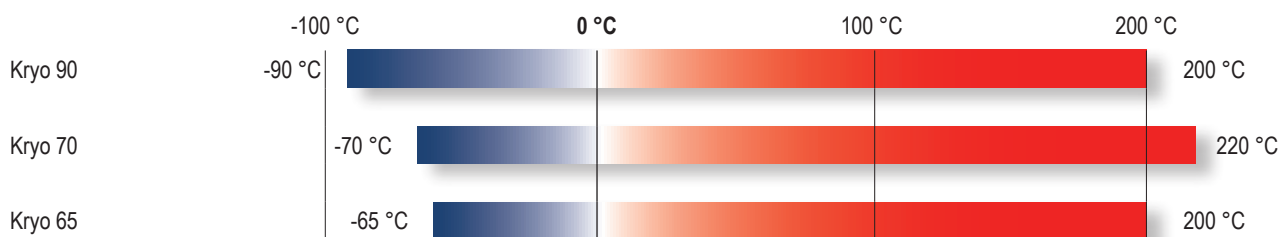
A nitrogen overlay permits the insulation of the heat transfer liquid from atmospheric oxygen in pressureless operation. This prevents an oxidation at high temperatures. Thus the life of the heat transfer liquid is extended drastically on the one hand and in addition the maximum operating temperature permitted is increased. In addition, the overlay prevents the condensation of air humidity at low temperatures. The Kryohheater Selecta process thermostats have been designed for pressurised operation. By a pressurized operation with nitrogen the advantages mentioned above are reached, and in addition the boiling points of the heat transfer liquids and thus the maximum permissible operating temperatures are increased.



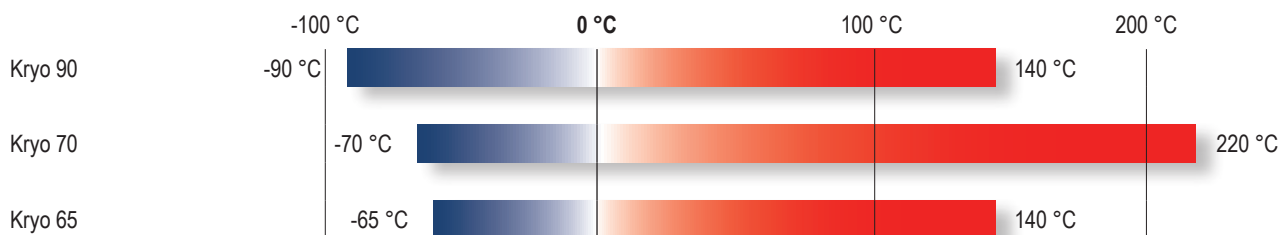
## Heat transfer liquids

For a safe and reliable operation of your thermostats we recommend heat transfer liquids Kryo 65, Kryo 70 and Kryo 90.

### With nitrogen overlay



### Without nitrogen overlay



# LAUDA Kryoheater Selecta

## Interface/data protocol

The standard equipment is

- Lemo sockets for external temperature control
- USB interface to read out data and for information transmission for diagnosis or configuration
- A freely selectable analog or digital interface

If more than one interface is needed, they can be selected as option.  
The following interfaces\* can be used:

Cat. No.	Description
LWZ 937	Analog, 4 x In, 4 x Out, 0...10 V or 4...20 mA
LWZ 938	Profibus, 9-pole Sub-D
LWZ 939	Profinet, RJ 45
LWZ 940	EtherCAT, RJ 45
LWZ 941	RS-232/-485, 9-pole Sub-D

\*A parallel operation of the bus systems (Profibus, Profinet, EtherCAT) is not possible. However, an RS-232/485 interface can be operated parallel with another bus data protocol.



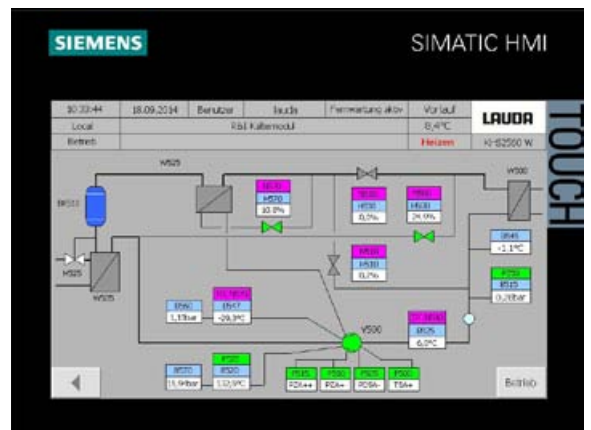
## Operation/control

Simple and intuitively designed user interface

- Visualisation of heating and cooling circle, warning messages and failures
- Clear overview of the parameters - directly recognizable on the piping schematic

PLC (programmable logic controller) fitted in an industrial switch cabinet

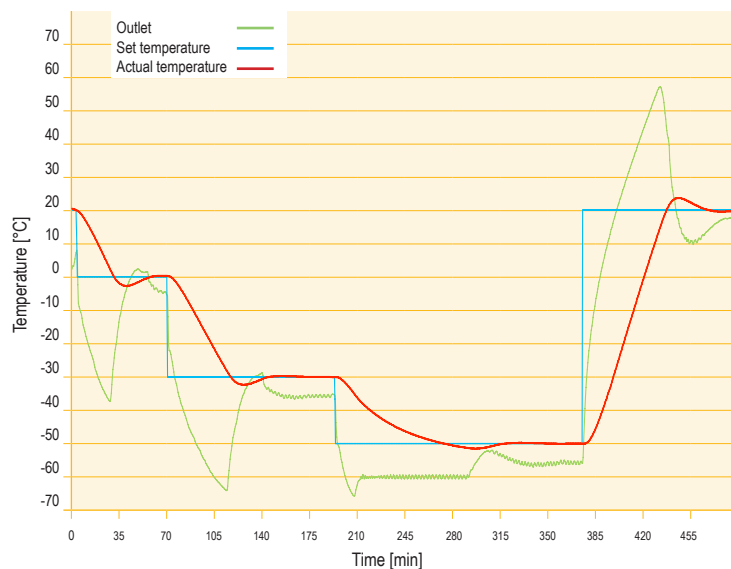
- Comfortable and extensive interlinking with other IT systems
- High process transparency ensured by large information density in the control system
- Long-time compatible, vibration-resistant, maintenance-free and scalable
- Extremely high reliability
- Remote maintenance and remote diagnosis (update of parameter sets or software online possible)



## Application example

### Cooling process of a 250 L reactor between 20 and -50 °C

- High efficiency for every temperature setpoint value by using precisely harmonised refrigerants and frequency-controlled compressors. In case of KHS 2190 W, the two frequency-controlled compressors are automatically run in single or two stage operation depending on load and temperature.
- Transport of the heat transfer liquid with the required pressure by means of the 2.2 kW magnetically coupled and frequency controlled pump in the external consumer, such as a reactor.
- Limitation of the outlet temperature; programmable temperature ramps as well as Delta T limitations to take minimum and maximum temperature loads of reactors into consideration.
- Link to the process control system by various interface options enabled by the standard Siemens PLC control



#### Application information

Temperature range	-90...200 °C
Cooling output	21 kW at 200 °C... 20 °C 11 kW at -20 °C 10 kW at -40 °C 9 kW at -60 °C 3,5 kW at -80 °C
Heating capacity	18 kW
Connections	DN 25/PN 16/DIN 2633
Heat transfer liquid	Kryo 90
Reactor	250 L steel reactor lined with glass (jacket temperature limited to -60 °C)
Reactor liquid	Ethanol

## Our product lines

Thermostats · Circulation chillers · Water baths

Process cooling systems · Heat transfer systems · Secondary circuit systems

## Accessories

### Heat transfer liquids

	Unit	Kryo 65	Kryo 70	Kryo 90
Cat. No.	10 L	LZB 218	LZB 227	LZB 228
Cat. No.	20 L	LZB 318	LZB 327	LZB 328

### Cooling water tube EPDM

Cat. No.	Description	d <sub>i</sub> (mm)	d <sub>a</sub> (mm)	Pressure range	Temp. range (°C)
RKJ 033	Fiber-reinforced	25	34	max. 10 bar	-40...100

### Stainless steel tube clip

EZS 016	External Ø; 1"	25-40
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### Metal hoses with cold insulation

Cat. No.	Description	d <sub>i</sub> (mm)	d <sub>a</sub> (mm)	Length (cm)	Temp. range (°C)
LZM 094	M38X 100S	25	78	100	-100...350
LZM 095	M38X 200S	25	78	200	-100...350
LZM 096	M38X 300S	25	78	300	-100...350

### Quick coupling

Cat. No.	Description	Material
EOF 539	With 1" internal thread	Brass
EOF 540	With hose nozzle 1", attachable with counter nut	Brass

### Adapter

Cat. No.	Description
EDF 222	Flat graphite gasket DN25-PN40 DIN 2690
HKA 198	Flange adapter M38 x 1,5 A to DIN 2633/DN25

### Options

Cat. No.	Description
LWZ 936	Remote maintenance by modem
EZ 214	Machine foot in steel with height adjustment
LWZ 942*	Additional expansion vessel, filling volume 50 L

\*Installation of an optional expansion vessel causes an enlargement of the housing height from 1,650 to 2,350 mm.



RKJ 033



EZS 016



LZM 094/LZM 095/LZM 096



EOF 539



EOF 540



EDF 222



HKA 198



LWZ 936



EZ 214