

high precision
thermoregulation



huber-USA
PAPER-TECH



The Tango Factory is bright and always perfectly thermo-regulated

The Tango Factory – a Masterpiece

In Offenburg stands the modern facility with a genuinely pleasant ambience: The Tango Factory. The architects Antonia and Wilhelm Kasten from Aulendorf have created a building, which offers optimal conditions for both, visitors and the Tango team.

There is always a comfortable temperature in the Tango Factory – irrespective of the season. The secret is thermal transfer and temperature control for minimal energy. The company founder Peter Huber has taken personal responsibility for the thermoregulation of the Tango Factory. His results prove once more the core competency of the company in thermal transfer resulting in temperature control.

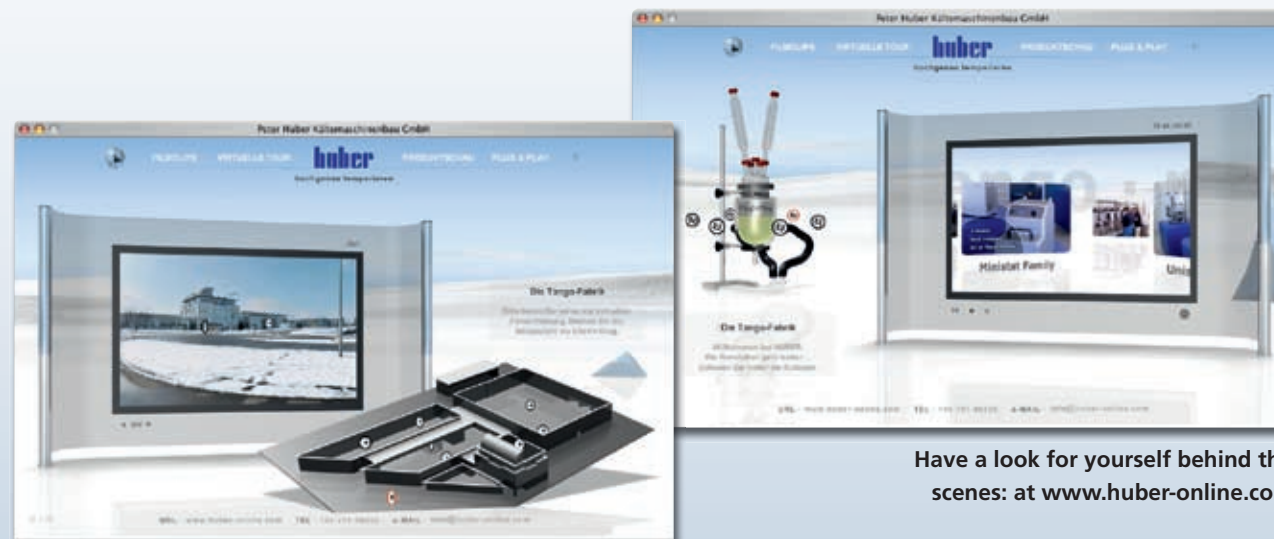
Upon the completion of the third phase the Tango

Factory now has a volume of 60,000 cubic meters and a floor area of 8,500 square meters. The solid concrete walls of the office block are well insulated. The production halls have walls and roofs with PU insulation which would be suitable for an ice rink in the desert. 40 kilometers of pipe have been embedded into the floors and ceilings of the office block and the floors of the production halls. The gigantic heat transfer area requires a maximum flow temperature of 24.5°C. The

heat load of the Tango Factory is 5.5 kilowatts per degree temperature difference from external to internal temperature. The fact is: with an average external temperature of about 0°C in winter and a required internal temperature of 20°C the heating energy requirement is 110 kilowatts. "We are warmed by the orders of our customers", says Peter Huber in his Handbook of Thermoregulation (www.temperierttechnik.de). All units are 'wet' tested. The heat discharged from the aircooled refrigeration machines heat the well insulated production halls. The heat from the test runs of the water cooled refrigeration machines is reclaimed via heat exchangers to heat the building.

Where the action is: our website

We have innovated thermoregulation solutions ranging between -120°C to 400°C. Please visit our website at www.huber-usa.com, where you'll find all the important facts about our product line. An overnight update service ensures that the information on our site is always current. You will be convinced of the superior performance of the Huber thermoregulation technology when you see the wide range of case studies available on our website. Our unique pilot navigation allows you to find quickly what you are looking for on our site. Using the function "MyHuber" you can customize your search to define particular areas of interest. These preferences are stored and are available to you the next time you log on. You will also find an excellent film we have put together showing a view of "behind the scenes" of our production line. Have a look for yourself at life in the Tango Factory.



Have a look for yourself behind the scenes: at www.huber-online.com



The Tango Club ensures innovation

Many of the innovations would not have been possible without the support of the like-minded user community. Ideas and inspirations from the practice are important drivers for modern, future orientated product development. The members of the Tango Club have challenged and driven the power of innovation at Huber. Many of these results can be found in this catalogue.



Dance the tango with me: Join the club

Do you want to join the Tango-club? Learn more at www.tango-club.de or www.art-at-huber.com.

Simple is simply better!

Thanks to self-explanatory, multilingual menus, with graphical displays, we have managed to develop one straight forward interface – from the smallest immersion circulator up to the most powerful Unistat. It is now possible to operate every Huber unit intuitively through the menus. This doesn't mean that you don't need the operation manual, but it makes your daily work simpler.

I want to take this opportunity to thank our users for giving us many suggestions and ideas, which have helped us make improvements on our products. Also I'd like to thank the unique Huber team of highly motivated colleagues and our international partners for their sales and service support. Stick with Huber and you will enjoy better results into the future through more innovations.



Daniel Huber, Managing Director



Hot technology, cold precision



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All stainless steel
Ministats or
powerful Unistats:
Huber is the correct
choice



Innovative temperature
control solutions for
laboratory and industry



Unistats – Highly dynamic thermoregulation

Unistats should not be compared to conventional technology. Thermodynamically there is no alternative.



Tango and the big Unistats for -120 to 400°C for laboratory and production

Our engineers know what is required in research and production: **PROCESS SAFETY!**

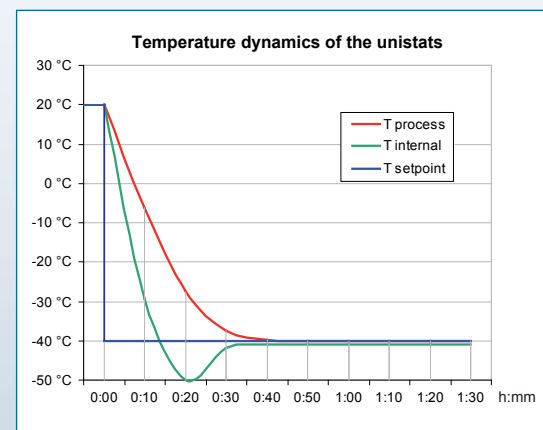
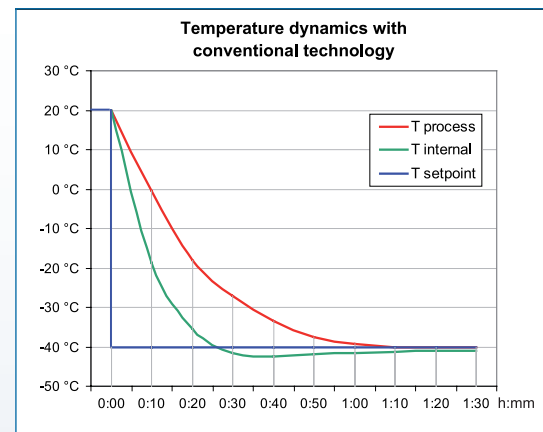
The assurance that the critical process temperatures in your laboratory or production facility run exactly as required – no compromises – every time. Unistats bring this peace of mind, thermodynamically on the safe side.

Precise and reliable control of thermodynamic parameters is required, without compromises, for successful results.

We value the fact that our Unistats deliver what you require: **PROCESS STABILITY in high end quality!**

The temperature control application in the foreground:

The international Tango Club (Unistat users across the whole world) sheds light on the trends of tomorrow. We have added more functions to the menu bar, and easy control has revolutionized operation. The new functions have been tested and proven to work effectively. Every function of the Unistat has been



subjected to many uncompromising tests on applications under industry conditions the quality spotlight of experienced users focused on results.

Our improvements in pump technology that have increased HTF flow rates, has resulted in improved heat transfer to and from the application. Predictable and repeatable results and previously unachieved response times to changing temperature loads, produce a clearly greater Return on Investment (ROI). In addition to the the minimal operating costs of the Unistat Principle. In 1988 the first generation proved the concept of the Unistat Technology. The second generation consolidated and led the growth of Unistat Technology into the industry. In The Third Generation we developed more refined, more efficient and more responsive units, giving birth to machines capable of having tighter control and made easier to manage.

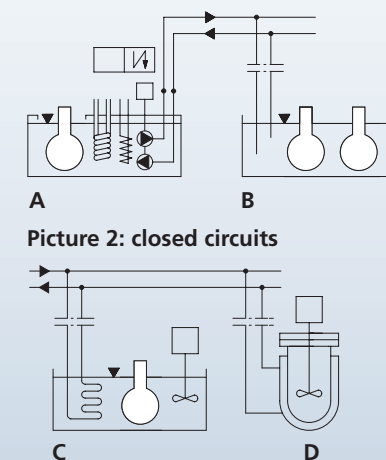
Conventional baths and circulating chillers operate with a hydraulically open bath.

With open bath technology (picture 1) the bath fluid is open to atmosphere and un-pressurized (regardless of whether the temperature control is internal A, or external B). During external temperature control (B) the level must be controlled in two locations. In typical externally closed temperature control (picture 2) where the object is directly (D) or indirectly (C) in contact with the heat transfer medium, the atmospherically open bath is also used to contain the expansion and contraction in HTF volume as the fluid heats and cools.

Unistats embody capacity and dynamics. (Small in size, big in power)

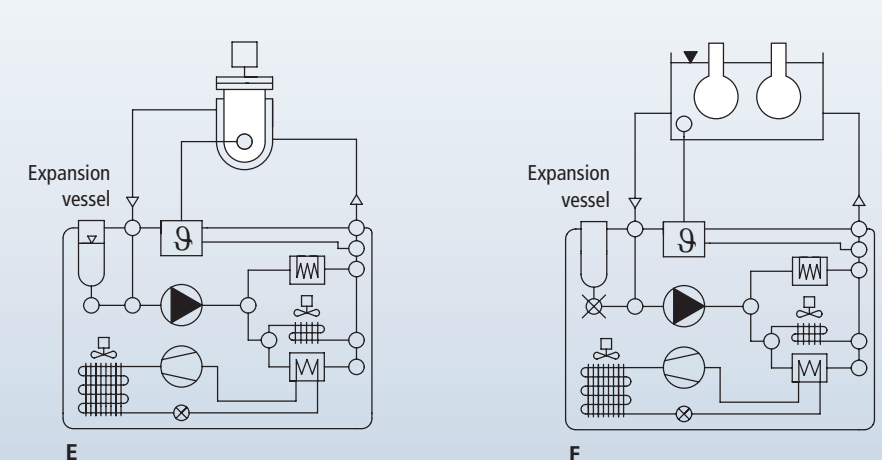
The Unistat System (Picture 3) combines the efficien-

Picture 1: open baths



Picture 2: closed circuits

Picture 3: The Unistat Principle



es of effective thermodynamics and modern microelectronics, making it a highly efficient alternative to open bath temperature control technology. Unistats are circulation thermostats without a bath. An expansion vessel for thermal expansion and contraction replaces the conventional bath. The expansion vessel is isolated for the thermoregulation of open baths (F). Being hydraulically sealed they can be located below or above the application.

The Unistat principle minimal HTF volume and increased thermal transfer abilities through higher HTF flow rates, reduced HTF pressure and highly efficient heat exchange surfaces increases the system's speed of response to changes in demand. Unistats have the most rapid ramping rates capable of cooling rates of more than a hundred Kelvin per hour. For comparisons in cooling power densities (Watt/litre) please refer to DIN 12876.



The cc-410 in conventional format is perfect for direct thermo-regulation of objects in it bath

Unistat Pilot – everything under control



The Unistat Pilot offers continually clear and concise information about process relevant parameters.

A 5'7" TFT color touch screen clearly displays all information. The graphic screen allows the direct display of dynamic information during thermoregulation. Clear and easy to read, information such as the process temperature, internal (jacket) temperature, pump pressure, safety relevant data and much more is displayed.

The unique Easy-Control menu operation: this is supported by the alphabetical arrangement of the menu functions. Language options currently available are: German, English, French, Italian, Spanish and Russian (Cyrillic script). Administrators can limit the available functions into individual user menus. Settings can be entered via the touch screen, the soft keys, the rotary encoder or a combination of them.

One controller for all Unistats. The modular concept convinces in the case of service through the unique Plug and Play technology. The controller can be updated at any time using the most modern Flash technology.

Plug&Play – priceless advantage in the event of service – it's so easy!



Environmental protection

Made from recyclable materials with an option to have 100% environmentally refrigerants, consuming 1/3 the water of conventional systems (water-cooled units) and an energy management system to keep electrical power consumption to a minimum, the Unistats are truly environmentally friendly.

Unistat advantages

- **the fastest heating and cooling rates**
ideal for isothermal chemical processes
- **highly responsive**
the first choice for operational safety with exothermic reactions
- **the highest cooling power density [Watts/l]**
for dynamic and rapid temperature changes
- **incredibly compact**
„volume cooling power“
truly powerful, truly compact
- **large temperature ranges with no oil change**
with the thermofluid DW Therm for the temperature range from -90 to 200°C, for as long as 5 years.
- **large colour TFT touch screen display**
graphics, multilingual, simple communication and easy to use
- **reproducible precision**
for demanding temperature applications



Safety

Unistats have many safety features and handle temperature control applications – remotely, safely, and while operating continuously. Overtemperature setting, setpoint – and alarm limits are can be set according to the conditions of the application to be controlled. The temperature and pressure sensors can be calibrated and the microprocessor controller monitors the operating status. VPC (Variable Pressure Control) monitors the maximum pressure in the fluid loop. Passive components ensure an extraordinarily high order of reliability. In case of emergency, the Unistats can be electrically isolated. For critical processes an optional additional “emergency cooling system” can be activated.

“Process safety over temperature protection”: This unique user-initiated feature disables the heater while initiating 100% cooling should an over-temperature condition be caused by a thermal runaway in the process.



Extremely powerful and space saving: Unistats

Unistats create space

A compact machine is one that is small with no loss of power. This is measured with the ratio watts/liter. At every temperature the Unistat is the most compact.

Professional Scale-Up

To control the smallest processes up to production volumes. Temperatures from -120 up to 400°C. Over 60 models, in sleek tower housings, or flat-build, with cooling capacities from 0.7 to 130 kW for flexible scale-up in Research, Kilo-labs, Mini-plant, Pilot-Plant, and Production. While the Unistats grow with the application, their operation and the Unistat Principle remain the same.

Controller Plug&Play technology		Cat.No.	G	Price
Unistat Controllers are upgradeable through modern Flash Technology (please ask your service partner).	Unistat Control	503.0002	3	
	Unistat Pilot	503.0003	3	



With kind permission of Roche AG (CH)

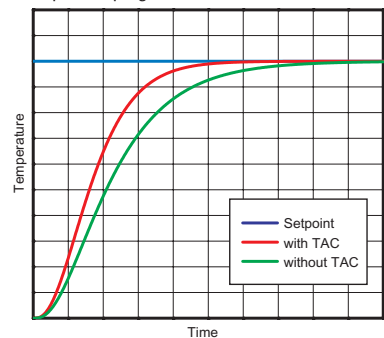


Maximum HTF flow

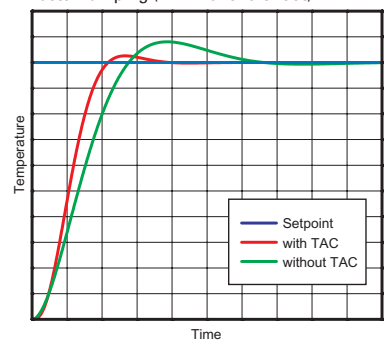
Improved pump design together with reduced internal flow resistance gives higher HTF flows with lower HTF pressures meaning more efficient thermal transfer and faster ramping of the process for the same power.

Bench-top and floor standing Unistats that use the new "M24" pump connections are supplied with "M16" adaptors to allow for convenient fitting to existing systems using "M16" fittings.

Rapid ramping (no overshoot)



Faster ramping (minimal overshoot)



True Adaptive Control

Self-optimizing temperature control

Varying research criteria and process demands change the thermal load on the temperature control system. What does not change is the requirement for good control.

The solution is "TAC" which has the capability to automatically change with those demands. By building a multi-dimensional model of the process, the TAC is able to automatically adjust its PID parameters to cope with and respond rapidly to sudden changes in the process.

Operating in both "Jacket" and "Process" control, TAC provides responsive and close control. Rapid changes with no overshoot, that is what TAC brings to the process...automatically and under all conditions. User defined response rates allows for dampened or rapid response. If TAC is not required, the user can manually adjust the PID parameters.



Variable Pressure Control (VPC)

Pressure control with controllable soft-start

VPC was developed to protect glass reactors from damage caused by high fluid pressure. VPC also compensates for changes in viscosity as heat transfer fluid is heated and cooled. Unistats for typical laboratory applications have a variable speed pump with soft-start, and using a pressure sensor can control their maximum fluid pressure. Unistats with larger capacities (as an option) can control the pressure using a pressure sensor and a stepless bypass.

Minimal pressure, maximum flows, optimal heat transfer. The VPC allows the best operation while remaining inside the defined pressure limits of the application.



Jorge Zaragoza, Ajjitec Mexicana

TAC (true adaptive control) convinces the user

"In research our customers often work with different reactors. The functionality of the Unistats is impressive and allows an individual solution for every temperature control process. The TAC technology is convincing due to the reproducible temperature control results."

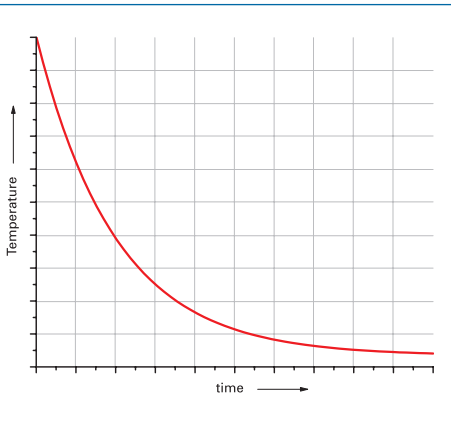
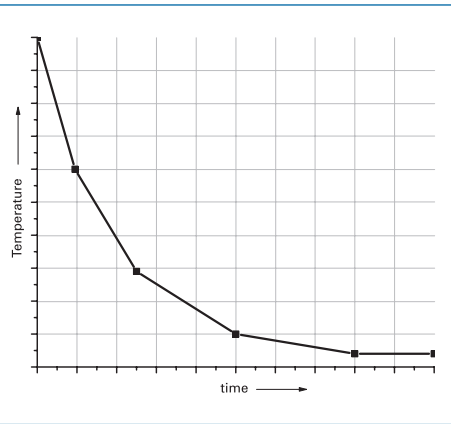
Programmer

Programmer with linear ramp function

Single temperature changes can be achieved using the linear ramp function. The easy to use programmer, with 100 steps, is available for more complex temperature requirements. Individual steps can be pieced together to form a suitable profile. Each step of the program can be selected to be either temperature or time stable. For each step, additional functions (Potential Free contact, Analogue Interface, temperature control mode) can be activated or deactivated.

Non-linear Ramp Function (NLR)

Especially for crystallisation processes, non-linear temperature profiles allow higher purity crystals to be produced. Instead of using the temperature programmer to piece together discrete rectangular or linear ramps, e-functions can be used to define a continuous setpoint form. The diagrams shows the high precision of the e-function (below) in contrast to a linear ramp (above, with 6-steps).



The ComBox

The ComBox – Easy to talk to

The ComBox offers interfaces to the NAMUR Standard. This makes the communication possibilities of the Nuevos even more flexible. The ComBox can be removed and connected via one single data cable. This has the advantage that the ComBox can be integrated in a process control system with the minimum of cabling.

The standard version of the ComBox has the following interfaces:

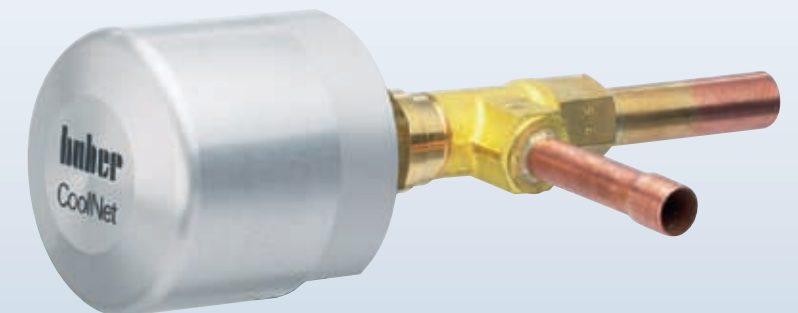
- RS232 (bidirectional)
- RS485 (bidirectional)
- Volt Free Contact
- Analogue Interface
- 4-20 mA (bidirectional)
- External Control Signal

CoolNet®

CoolNet® – unique valve control

In refrigeration equipment, refrigerant is controlled by a metering valve. Unistat refrigeration works with a CoolNet® stepper-motor controlled expansion valve, that has been produced in the Tango Factory since 2002. The valve opening is precisely controlled at between 0 and 600 steps, with a resolution of 0.005 mm/step. This allows the CoolNet to achieve the optimal evaporator flow, and highest possible cooling capacity at each working temperature. Precise and reproducible control for temperatures down to -120°C.

Job done: Unistats guarantee reproducible thermoregulation performance with the fastest possible dynamics





-55 °C
Models
from 0,7 to 6 kW

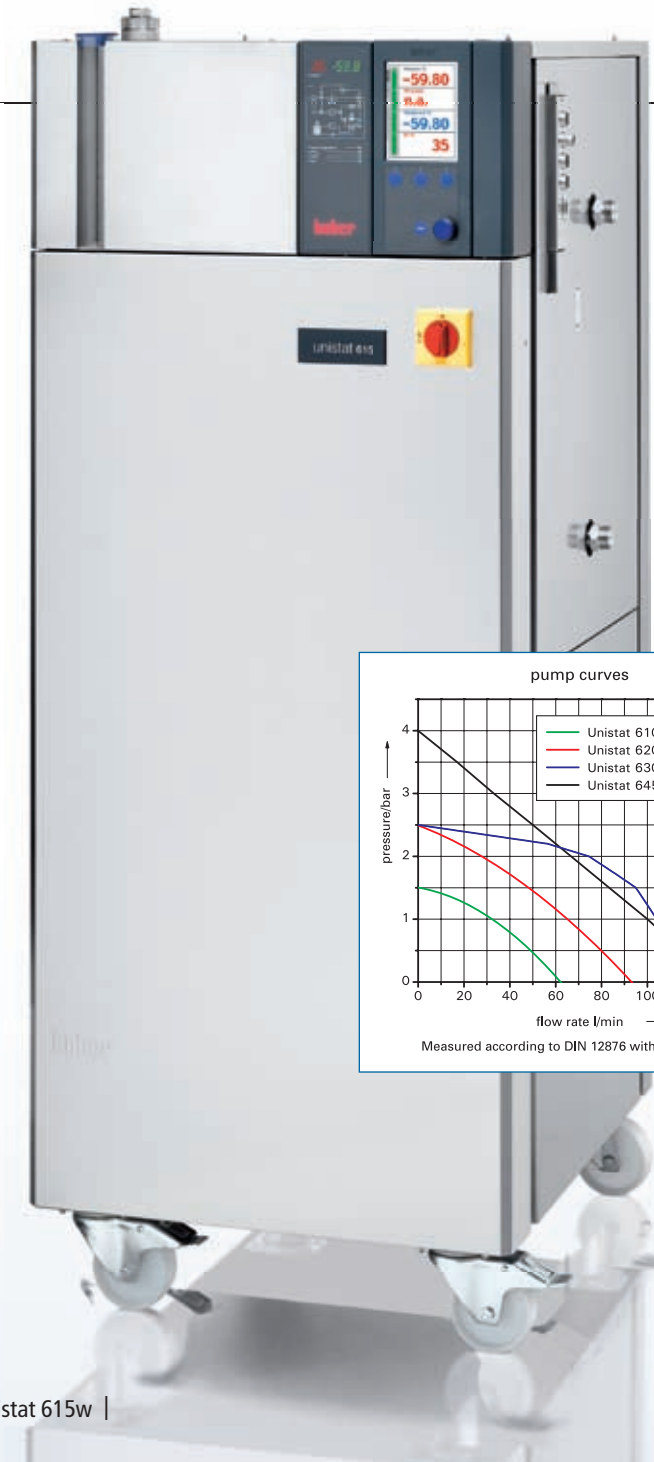


| unistat tango nuevo |

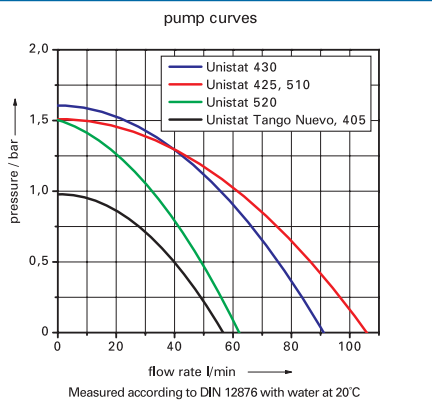


| unistat 650w |

-60 °C
Models
from 7 to 130 kW



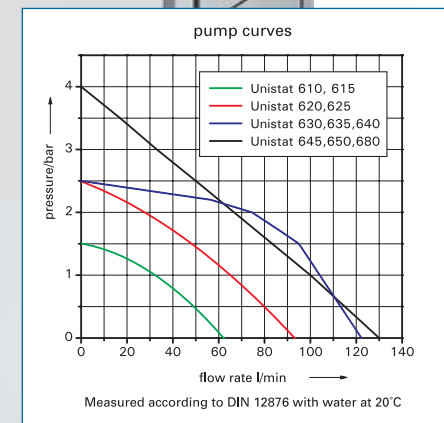
| unistat 615w |



VPC
Variable Pressure Control

ATEX
ATEX Solutions (Option)

Additional heating
(Option)



Model	Working temperature range (°C)	Pump max. VPC		Heating (kW)	Cooling Power (kW) at (°C)						Dimensions WxDxH (inch)	Cat.No.	G	Price
		(gpm)	(bar)		250	200	100	0	-20	-40				
tango nuevo	-45...250	14,5	1,0 ¹	3,0	0,7	0,7	0,7	0,7	0,4	0,06	16,7x10,6x25,0	1000.0003.05	3	
tango nuevo wl	-45...250	14,5	1,0 ¹	3,0	0,7	0,7	0,7	0,7	0,4	0,05	16,7x10,6x25,0	1000.0004.05	3	
unistat 405	-45...250	14,5	1,0 ¹	3,0	1,0	1,0	1,0	1,0	0,6	0,1	16,7x12,1x25,0	1002.0004.05	3	
unistat 405w	-45...250	14,5	1,0 ¹	3,0	1,3	1,3	1,3	1,3	0,7	0,15	16,7x10,6x25,0	1002.0005.05	3	
unistat 425	-40...250	27,6	1,5 ²	2,0	2,0	2,0	2,0	2,5	1,8	0,2	18,1x21,8x52,4	1005.0013.05	3	
unistat 425w	-40...250	27,6	1,5 ²	2,0	2,5	2,5	2,5	2,5	1,9	0,2	18,1x21,8x52,4	1005.0016.05	3	
unistat 430	-40...250	23,7	1,7 ²	4,0	3,5	3,5	3,5	3,5	2,2	0,3	18,1x21,8x52,4	1005.0019.05	3	
unistat 430w	-40...250	23,7	1,7 ²	4,0	3,5	3,5	3,5	3,5	2,2	0,3	18,1x21,8x52,4	1005.0022.05	3	
unistat 510w	-50...250	27,6	1,5 ²	6,0	5,3	5,3	5,3	5,3	2,8	0,9	18,1x21,8x52,4	1005.0025.05	3	
unistat 520w	-55...200	15,8	1,5 ²	6,0	-	6,0	6,0	6,0	4,2	1,5	21,3x23,8x52,4	1006.0004.05	3	

¹Integrated VPC pressure control

²VPC pressure control via bypass

Option: natural refrigerants available on request

Flat built models available on request

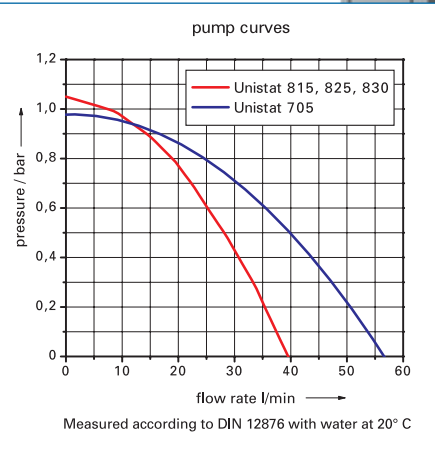
Model	Working temperature range (°C)	Pump max. VPC		Heating (kW)	Cooling Power (kW) at (°C)						Dimensions WxDxH (inch)	Cat.No.	G	Price
		(gpm)	(bar)		200	100	0	-20	-40	-60				
unistat 610w	-60...200	15,8	1,5 ²	6,0	7,0	7,0	7,0	6,4	3,3	0,8	23,6x27,7x59,8	1007.0005.05	4	
unistat 615w	-60...200	15,8	1,5 ²	12,0	9,5	9,5	9,5	8,0	4,8	1,2	23,6x27,7x59,8	1007.0008.05	4	
unistat 620w	-60...200	23,7	2,5 ²	12,0	12,0	12,0	12,0	12,0	6,5	1,8	27,6x31,7x59,8	1008.0006.05	4	
unistat 625w	-60...200	23,7	2,5 ²	12,0	16,0	16,0	16,0	15,0	7,4	2,2	27,6x31,7x59,8	1008.0009.05	4	
unistat 630w	-60...200	28,9	2,5 ²	24,0	22,0	22,0	21,0	20,0	15,0	5,0	36,2x39,5x65,2	1009.0005.05	5	
unistat 635w	-60...200	28,9	2,5 ²	24,0	27,0	27,0	27,0	25,0	18,0	6,0	36,2x39,5x65,2	1009.0008.05	5	
unistat 640w	-60...200	28,9	2,5 ²	30,0	32,0	32,0	32,0	27,0	20,0	6,0	36,2x47,4x65,2	1010.0002.05	5	
unistat 645w	-60...200	34,2	4,0 ²	36,0	45,0	45,0	45,0	42,0	22,0	7,0	72,0x47,2x72,0	1011.0002.05	5	
unistat 650w	-60...200	34,2	4,0 ²	48,0	65,0	65,0	65,0	56,0	30,0	11,0	72,0x47,2x72,0	1012.0003.05	5	
unistat 680w	-60...200	34,2	4,0 ²	96,0	130,0	130,0	130,0	80,0	60,0	20,0	177,2x78,7x78,7	1013.0002.05	5	

Option: natural refrigerants available on request



Unistat models

-85 °C
Air- or water-cooled



VPC
Variable Pressure Control

ATEX
ATEX Solutions (Option)

Additional heating
(Option)

Model	Working temperature range (°C)	Pump max. VPC (gpm) (bar)	Heating (kW)	Cooling Power (kW) at (°C)								Dimensions WxDxH (inch)	Cat.No.	G	Price
				250	200	100	0	-20	-40	-60	-80				
unistat 705	-75...250	14,5 1,0 ¹	3,0	0,6	0,6	0,6	0,65	0,6	0,6	0,3	16,7x15,7x28,3	1001.0004.05	3		
unistat 705w	-75...250	14,5 1,0 ¹	3,0	0,6	0,6	0,6	0,65	0,6	0,6	0,3	16,7x15,7x28,3	1001.0005.05	3		
unistat 815	-85...250	10,5 1,0 ¹	2,0	1,3	1,3	1,3	1,5	1,5	1,4	1,2	0,2	18,1x23,8x52,8	1014.0011.05	3	
unistat 815w	-85...250	10,5 1,0 ¹	2,0	1,5	1,5	1,5	1,5	1,5	1,4	1,2	0,2	18,1x23,8x52,8	1014.0014.05	3	
unistat 825	-85...250	10,5 1,0 ¹	3,0	2,3	2,3	2,3	2,2	2,0	2,0	1,4	0,3	18,1x23,8x52,8	1014.0017.05	4	
unistat 825w	-85...250	10,5 1,0 ¹	3,0	2,3	2,3	2,3	2,4	2,4	2,4	1,5	0,3	18,1x23,8x52,8	1014.0020.05	4	
unistat 830	-85...200	10,5 1,0 ¹	3,0	-	4,0	3,8	3,6	3,5	3,5	2,2	0,7	21,3x25,7x59,1	1015.0005.05	4	
unistat 830w	-85...200	10,5 1,0 ¹	3,0	-	4,0	3,8	3,7	3,6	3,6	2,2	0,7	21,3x25,7x59,1	1015.0008.05	4	

¹Integrated VPC pressure control ²VPC pressure control via bypass Option: natural refrigerants available on request



Scale-up live – more than 30 Unistats in operation

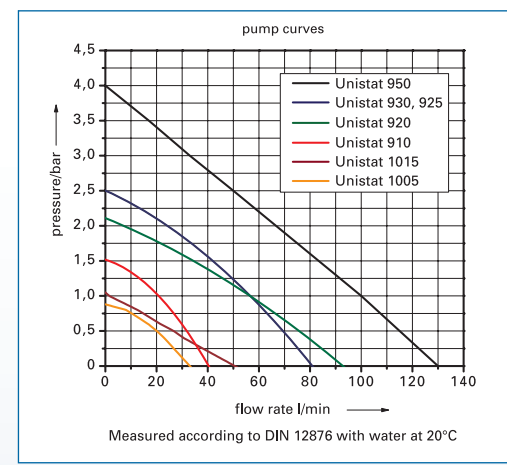
„Here in GSK Chemical Development, at Research Triangle Park, we’ve been using jacketed laboratory reactors of various sizes for over ten years now. From the very beginning, our temperature control requirements demanded the best solution available, and we have relied on Huber Unistats to deliver this capability. The Huber technology has allowed us to significantly improve our process development activities and is a critical tool in collecting data for Quality by Design studies.“



Roy Flanagan,
Team Manager, Process Safety and Design



-90 °C
-120 °C
Models from 5,2 to 36 kW



Model	Working temperature range (°C)	Pump max. VPC (gpm) (bar)	Heating (kW)	Cooling Power (kW) at (°C)								Dimensions WxDxH (inch)	Cat.No.	G	Price
				250	200	100	0	-20	-40	-60	-80				
unistat 910w	-90...250	10,5 1,5 ²	6,0	5,2	5,2	5,2	5,2	5,2	4,7	3,1	0,9	23,6x27,7x61,6	1016.0005.05	4	
unistat 920w	-90...200	29,1 2,5 ²	12,0	-	11,0	11,0	11,0	11,0	10,0	8,0	2,0	36,2x47,4x65,2	1017.0015.05	4	
unistat 925w	-90...200	29,1 2,5 ²	12,0	-	16,0	16,0	16,0	16,0	15,0	13,5	3,5	36,2x47,4x65,2	1017.0005.05	4	
unistat 930w	-90...200	29,1 2,5 ²	24,0	-	19,0	19,0	20,0	20,0	20,0	15,0	5,0	36,2x47,4x65,2	1017.0008.05	5	
unistat 950	-90...200	34,2 4,0 ²	36,0	-	30,0	30,0	30,0	30,0	30,0	24,0	10,0	66,9x137,8x72,8	1018.0006.05	5	
unistat 950w	-90...200	34,2 4,0 ²	36,0	-	36,0	36,0	36,0	36,0	36,0	25,0	10,0	103,5x51,2x76,0	1018.0004.05	5	

Model	Working temperature range (°C)	Pump max. VPC (gpm) (bar)	Heating (kW)	Cooling Power (kW) at (°C)								Dimensions WxDxH (inch)	Cat.No.	G	Price
				200	100	0	-20	-40	-60	-80	-100				
unistat 1005w	-120...100	7,9 0,8 ¹	2,0	-	1,5	1,5	1,5	1,5	1,4	1,4	1,0	27,6x31,7x59,8	1019.0004.05	4	
unistat 1015w	-120...100	11,6 1,5 ¹	4,0	-	2,5	2,5	2,5	2,5	2,5	2,0	2,0	36,2x47,4x65,2	1020.0003.05	5	

Option: natural refrigerants available on request

High Temperature Thermostats

High-precision and space-saving temperature control up to +400°C. The new HT thermostats of the Unistat cc400 range set new standards in safety, easy operation, and rapid, dynamic temperature control. The Unistat cc401w HT model features integral stepper motor to control the HT-Cooling, level protection and configurable overtemperature protection. Its minimal internal volume allows the shortest heat-up times to be achieved, while at the same time the maximum expansion tank temperature is limited to +60°C. The working life and properties of the thermal fluid are also protected, by avoiding direct contact between the hot fluid and atmosphere.

The HT thermostats with controlled HT-Cooling are suitable for temperature control applications up to +400°C, e.g. a double-jacketed reaction vessel (reac-

tor), and pilot plants, as well as the semiconductor industry and high temperature distillation. They are suitable to maintain a high constant temperature, or to contain an exothermic reaction at high temperature.

Advantages:

- Small space required
- Low fill-volume
- High Pump capacity
- Rapid filling of the complete application efficient with venting
- +60°C max. expansion tank temperature
- Plug & Play Technology
- Simple operation
- High level of safety through constant



Some like it hot

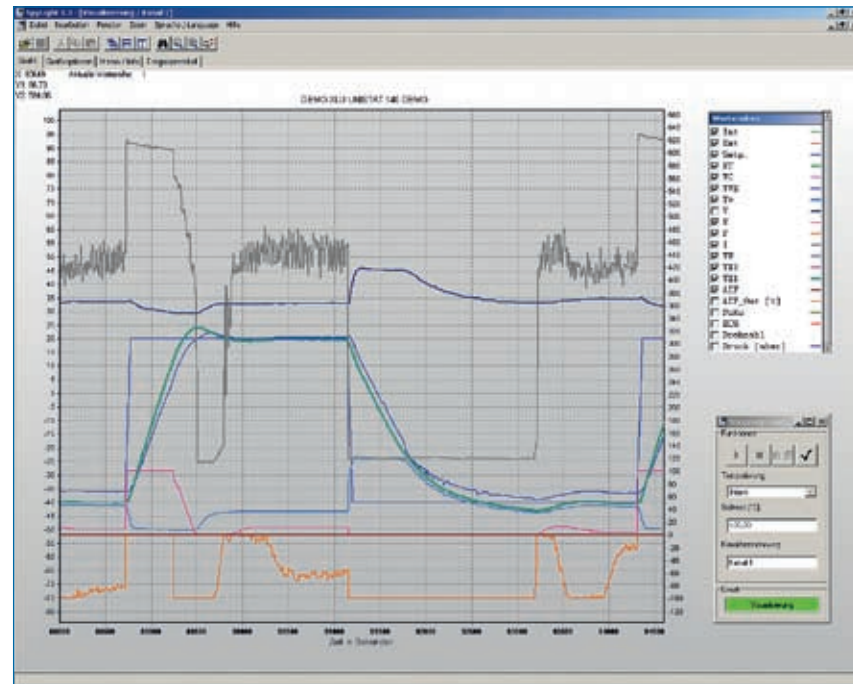
In the DSM Nutritional Products, NRD/CC-Miniplant Process Technology Solutions Centre, Switzerland, Huber HT Thermostats are used extensively where heating power is required in confined spaces. My colleagues are particularly impressed with the technical functionality, which is simple to use with the Huber Software. The optional pressure booster pump is ideal for use with the HT thermostats in both glass and stainless steel apparatus. This equipment is irreplaceable in our daily work.



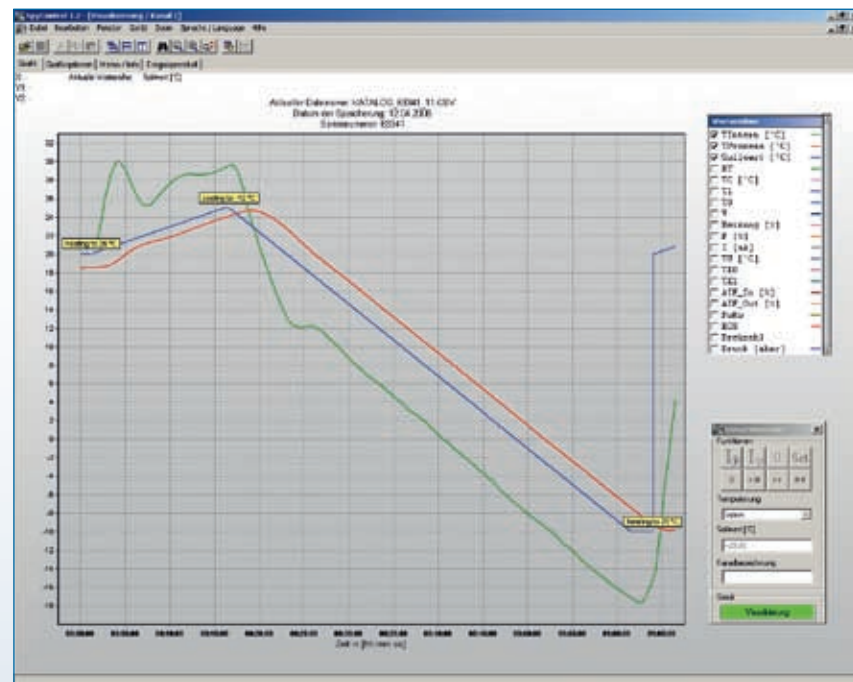
Peter Zimmermann,
Technical Team
Leader Mini-Plant,
DSM Nutritional
Products

Model	Temperature range (°C)	Pump max. (gpm) (bar)	Heating (kW)	Cooling Power (kW) at (°C)	Dimensions WxDxH (inch)	Cat.No.	G	Price
unistat T305	(15) 65..300	11,9 0,9	4,5	– – – –	16,7x9,8x25,0	1003.0004.05	3	
unistat T305 HT	65..300*	11,9 0,9	4,5	– 3,2 2,3 0,6	16,7x9,8x25,0	1003.0006.05	3	
unistat T305w HT	(15) 65..300	11,9 0,9	4,5	– 10,0 10,0 6,0	16,7x9,8x25,0	1003.0007.05	3	
unistat T320	(15) 65..300	18,4 1,5	12,0	– – – –	18,1x21,8x52,4	1004.0005.05	3	
unistat T320w HT	(15) 65..300	15,8 1,5	12,0	– 10,0 10,0 6,0	18,1x21,8x52,4	1004.0010.05	3	
unistat T330	(15) 65..300	18,4 2,5	24,0	– – – –	18,1x21,8x52,4	1004.0011.05	3	
unistat T330w HT	(15) 65..300	15,8 2,5	24,0	– 10,0 10,0 6,0	18,1x21,8x52,4	1004.0012.05	3	
unistat T340	(15) 65..300	19,7 2,5	48,0	– – – –	23,6x27,7x59,7	1024.0003.05	3	
unistat T340w HT	(15) 65..300	15,8 2,5	48,0	– 10,0 10,0 6,0	23,6x27,7x59,7	1024.0004.05	3	

* Lowest working temperature 15 K above ambient temperature



Test with a 20 litre reactor filled with DW Therm



Temperature with ramp function in a 20 litre reactor filled with DW Therm

Huber Software	Cat.No.	G	Price
SpyLight (1 Channel)	6790	1	
SpyWatch (10 Channel)	6791	1	
SpyControl (10 Channel)	6792	1	

SpyLight

The SpyLight software enables process relevant data to be visualised and documented. The communication options are RS232, RS485 or TCP/IP. SpyLight is easy to install, it's economical, with computer resources and child's play to use. The recorded data is displayed to a base of time. The axes are freely scalable and a zoom function helps the evaluation of individual segments.

SpyWatch

SpyWatch is based on the SpyLight software but offers more features. Installation and operation is identical. SpyWatch can operate up to 10 channels simultaneously. Each channel is independently documented and the graphic options can be configured as required. SpyWatch allows the user to use the following instructions to the unit:

- Set point
- Change from jacket to process temperature
- Start/Stop

SpyControl

SpyControl is software which contains the functions of SpyLight and SpyWatch. An additional point is that it offers the possibility to control one or more machines with a programmer. The user can give temperature programs for the machines, which then automatically run. The segments of a temperature control program can be input in a user friendly manner using the so called Temperature control-Xplorer which is a module of SpyControl. The temperature control programs so produced can be modified or changed and archived. The basic course of a temperature control program can also be displayed graphically.

For explosion proof installations

A practical solution for Explosion Proof

A complete solution in a pressure encapsulated cabinet according to NEC requirements for location within the EX Zone.



Description:

Explosion proof cabinet made of stainless steel with nitrogen flush and pressure control.

Type:

NEC Class 1, Div I, group C&D

Features:

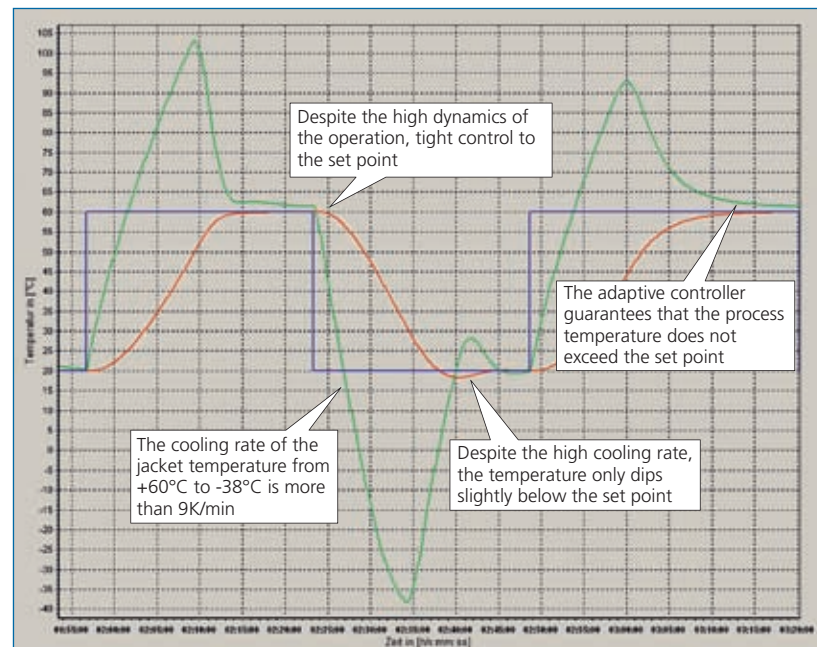
- Stainless steel construction
- 1 Door for access of Unistat Pilot Control Pad for ease of operation. Sensors and controls to maintain and assure explosion proof environment.

Explosion Proof Cabinet	for Unistat model	Cat.No.	G	Price
Explosion Proof Cabinet	425w, 430w, 510w, 520w, 815w, 825w, 830w, 910w, 1005w 610w, 615w, 620w, 625w	US6967	-	
Explosion Proof Cabinet	630w, 635w, 640w, 925w, 930w	US6968	-	
Explosion Proof Cabinet	tango nuevo w/, 405w, 705w	US6970	-	

Case study: Unistat 610w

Unistat 610w connected to a 20-litre glass reactor from Büchi AG Uster. The case study illustrates the different types of results which can be obtained using periodic and aperiodic controller settings.

Dynamic control with minimal over-/undershoot: The graphic shows a rapid heating from 20°C to 60°C within 16 minutes. It can be seen that the jacket temperature reaches 103°C, so the process temperature of 60°C can be reached quickly. The TAC (True Adaptive Control) shows even with dynamic controller settings the process temperature has negligible overshoot. The following cooling process to 20°C also shows only a minimal undershoot. The



Dynamics and Performance, the Unistats convince

Unistat 610w cools the 20-litre reactor within 17 minutes to 20°C, using a temperature difference of 40 K.

The adaptive controller was adjusted to avoid over- and undershoot. Repeating the heating process from 20°C to 60°C with the condition that the process temperature must not overshoot the new setpoint. TAC calls for a jacket temperature of 92°C, a slightly lower heating rate than before. The time to reach temperature takes 24 minutes. The cooling time from 60°C to 20°C is 30 minutes.

Setup details:

Temperature range: -60...200°C
 Cooling power: 7 kW @ 200°C...0°C
 6.4 kW @ -40°C
 Heating power: 12 kW
 Hoses: 2x metal hose 1m connection M38x1.5
 HTF: DW-Therm
 Reactor: Büchi AG Uster
 20-litre glass jacketed
 Reactor content: 15-litre M90.055.03
 Reactor stirrer: 70 rpm
 Control: Process

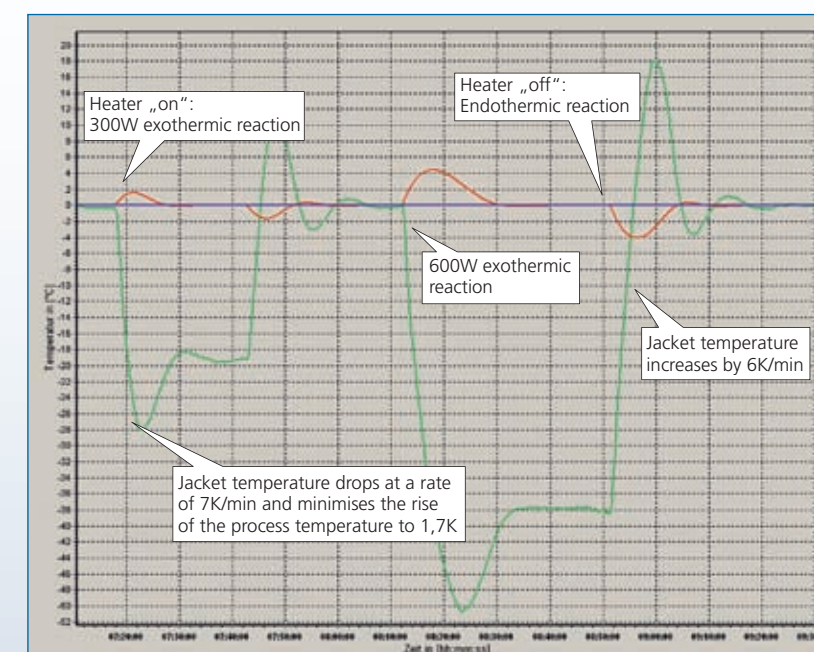
Case Study: Unistat 830

The Unistat 830 simulated and controls 300 watt exothermic and endothermic reactions in a 25-litre reactor from QVF.

Exothermic reactions are simulated using an electric heater. The graphic shows that the Unistat 830 recognizes the exothermic reaction and immediately activates the refrigeration system. The jacket temperature drops rapidly. The first reaction has a power of 300 watts, and the corresponding temperature rise of 1,7 K is removed within 9 minutes. An endothermic reaction is simulated by switching the heater off. The Unistat reacts by delivering heating power immediately. The process temperature is controlled to the set point within 15 minutes. The Unistat behaves similarly with a reaction of 600 watts. The process temperature rises 4,3 K and after 18 minutes the brings the process temperature to the setpoint.



Dynamics and Performance, the Unistats convince



Setup details:

Temperature range: -85...200°C
 Cooling power: 3.6kW @ 0°...0°C
 3.5kW @ -40°C
 Heating power: 3kW
 Hoses: metal hose 2x 1,5m connections M38x1.5
 HTF: DW-Therm
 Reactor: QVF
 25-litre glass jacketed
 Reactor content: 18.75-litre M90.055.03
 Reactor stirrer: 70 rpm
 Control: Process

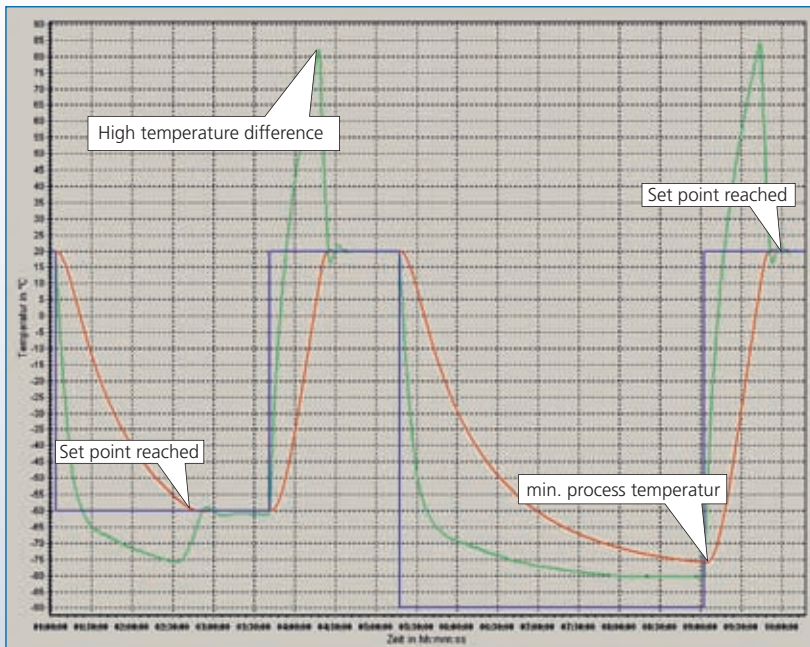
Case Study: Unistat 910w

Unistat 910w connected to a 50-litre glass reactor from Chemglass Inc., Vineland, NJ USA

Cooling from +20°C to -60°C. The Unistat 910w quickly drops the jacket temperature. During the cooling process a maximum temperature difference between reactor contents (process temperature) and the jacket of about 60 K is achieved. The setpoint is reached in about 100 minutes. The heating process begins and a temperature difference of between reactor contents and jacket of 85 K is quickly established. The set point of 20°C is reached within 65 minutes. The second cooling process shows the minimum achievable end temperature lies slightly below -75°C (the jacket temperature is no longer decreasing).

Setup details:

Temperature range: -90...250°C
 Cooling power: 5.2 kW @ 200...-20°C
 4.7 kW @ -40°C
 Heating power: 6 kW
 Hoses: M30x1,5; 2*1,5 m
 HTF: DW-Therm
 Reactor: Chemglass Inc.
 50-litre glass jacketed
 Reactor content: 37-litre M90.055.03
 Reactor stirrer speed: 80 rpm
 Control: Process



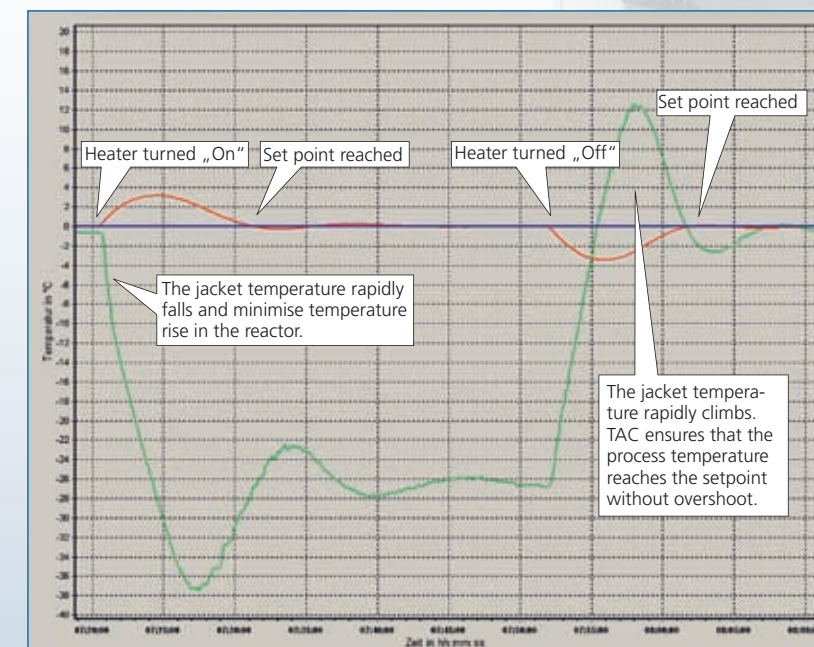
Case Study: Unistat 825w

The Unistat 825w controls simulated 300 watt exothermic and endothermic reactions in a 10-litre reactor from Büchi AG Uster.

How quickly can a sudden 300 watt heat source (exothermic reaction) be brought under control by a Unistat 825w. The Unistat reacts immediately to the temperature increase in the reactor. The reaction is brought under control by rapidly dropping the jacket temperature. The reaction causes a 3,2 K increase in the process temperature. The process temperature is brought back to the 0°C setpoint within 11 minutes. An endothermic reaction is simulated by switching off the heating. The process temperature drops 3,2 K and within 10 minutes the process temperature is back to the setpoint.



Simulation of exothermal and endothermal reactions



Setup details:

Temperature range: -85...250°C
 Cooling power: 2.4kW @ 0°C...-40°C
 1.5kW @ -60°C
 Heating power: 3kW
 Hoses: 2 x metal hose 1m connection M30x1.5
 Pump speed: 3500rpm
 HTF: DW-Therm
 Reactor: Büchi AG Uster;
 10-litre glass jacketed
 Reactor content: 7.5-litre M90.055.03
 Reactor stirrer speed: 400 rpm
 Control: Process

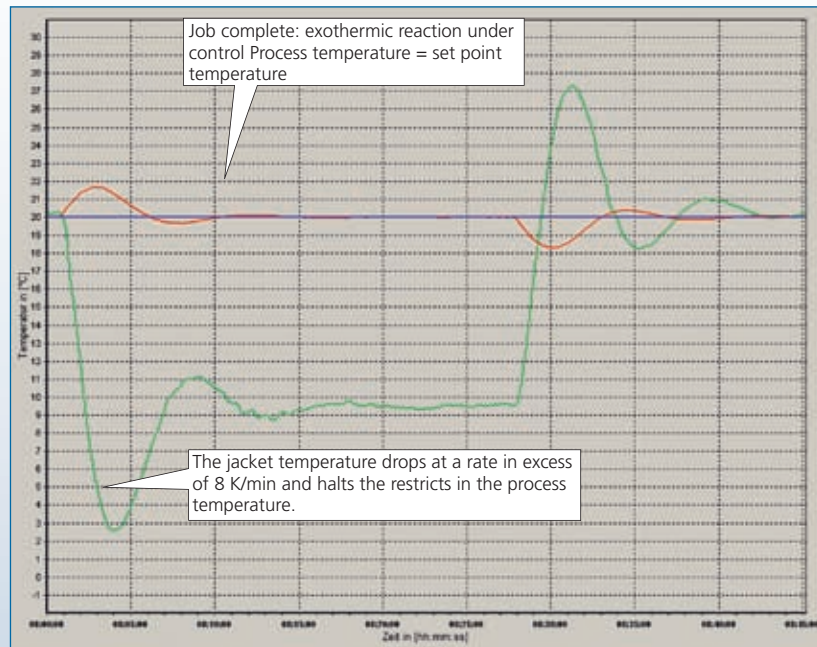


Setup details:
 Temperature range: -50...250°C
 Cooling power: 5.0 kW @ 250°C...100°C
 5.3 kW @ 0°C
 2.8 kW @ -20°C
 Heating power: 6.0 kW
 Hoses: 2 x hose 1m connection M24x1.5
 HTF: DW-Therm
 Reactor: Büchi AG Uster
 15-litre – glass/enamel reactor
 Reactor content: 10-litre M90.235.20
 Reactor stirrer: 80 rpm
 Control: Process

Case Study: Unistat 510w

The Unistat 510w controls 300 watt exothermic and endothermic reactions in a 15-litre reactor from Büchi AG Uster.

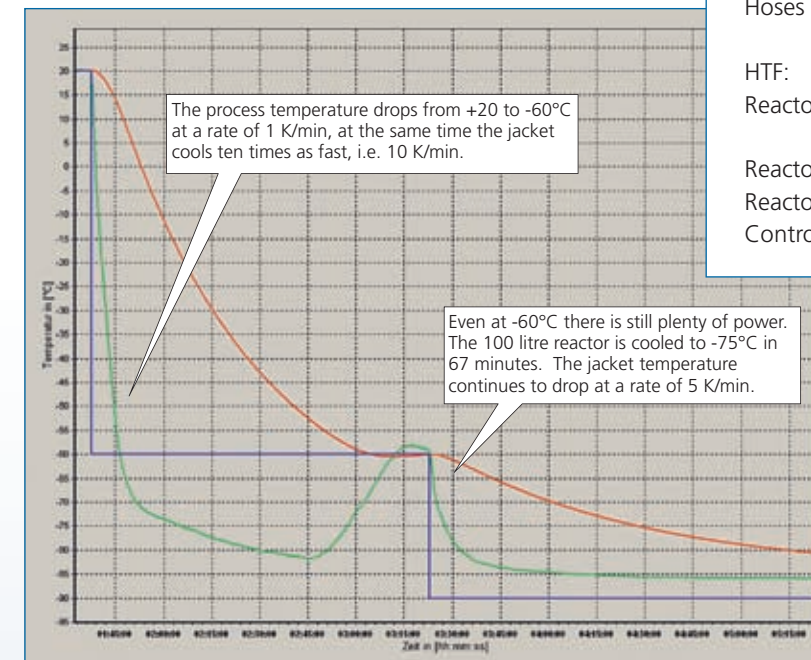
The graphic illustrates the thermoregulation dynamics during a simulated exothermic reaction. Immediately after the heater (simulation of the exothermic reaction) was switched on the Unistat reacts by dropping the jacket temperature by 17 K at a rate of 8 K/min. The sudden temperature drop restricts the rise in the process temperature to 1.7 K. The Unistat 510w removes this temperature rise within 9 minutes. After 25 minutes the heating is switched off (simulating an endothermic reaction) and the process temperature drops to circa 18.3°C. The Unistat brings the process temperature to the setpoint within 12 minutes.



Case Study: Unistat 930w

Unistat 930w connected to a 100-litre glass reactor from Diehm. This case study shows the cooling rates and the minimum achievable end temperature in the reactor.

Cooling from +20°C to -60°C is achieved within 86 minutes. The process temperature drops at a rate of 1 K/min. After the temperature was controlled at -60°C a test was made to establish the minimum achievable end temperature in the reactor. After 120 minutes the 100 litre reactor from Diehm reaches -82°C. The graphic shows that the process and jacket temperatures have a difference of only 5 K.



Impressive Thermoregulation

Unistats convince our customers with the performance. The results are predictable and repeatable. The Unistat Technology guarantees the highest possible process safety and stability.

Dr. Libor Reichstätter, Mercı Ltd

Setup details:
 Temperature range: -90...200°C
 Cooling power: 19 kW @ 200°C
 20 kW @ 0°C to -40°C
 15 kW @ -60°C
 5 kW @ -80°C
 Heating power: 24 kW
 Hoses : 2 x hose 1m connection M38x1.5
 HTF: DW-Therm
 Reactor: Diehm
 100-litre glass jacketed not insulated
 Reactor content: 75-litre M90.055.03
 Reactor stirrer speed: 400 rpm
 Control: Process



Controller in Plug&Play-Technology		Cat.No.	G	Price
Unistat-Controllers are upgradeable with modern Flash technology (please ask your service partner).	Unistat Control	503.0002	3	
	Unistat Pilot	503.0003	3	
	ComBox for Unistats	6915	1	
	Table stand for Unistat Pilot	9237	1	
	Wall mounting bracket for Unistat Pilot	9375	1	
	Side mounting bracket for Unistat Pilot	9408	1	

Control Cables	Control Cables (Standard length 3 m)			Cat.No.	G	Price
	from	to	note			
Control cable for use with RS232, RS485 or analogue interface (AIF). Control cables can be configured to request.	ComBox RS232/CC/UC	PC		6146	1	
	Unistat Control/CC/UC	Unistat Pilot/CC Pilot	Extension cable	16160	1	
	ComBox RS485		Cable end open	6279	1	
	ComBox AIF		Cable end open	9353	1	
			Cable with special length available on request			

External Pt100 sensor	Sensors (standard cable length 1,5 m)	Cat.No.	G	Price
For external thermoregulation applications there are different sensors available. Special versions can be made on request.	closed Ø 0,2 inch 7,1 inch	6138	1	
	closed with handle Ø 0,2 inch 7,9 inch	6105	1	
	closed Ø 0,3 inch 15,7 inch	6064	1	
	mounted in protective pipe Ø 0,3 inch 6,7 inch	6205	1	
	M16x1 sensor for flow or return	6352	1	
	M16x1 sensor for flow or return double	6353	1	
	M30x1,5 sensor for flow or return	6509	1	
	M30x1,5 sensor for flow or return double	6363	1	
	Extension cable Pt100, 3m	6292	1	
		Sensor with special length available on request		

Bypass, (variable pressure control, vpc)			Cat.No.	G	Price
Stepless controlled bypass for Unistats without variable pressure controlled pump. The max. pressure will be adjusted at the Unistat Pilot.	stepless controlled bypass	M30 x 1,5	9334	4	
		M38 x 1,5	9335	4	
	external pressure sensor	M24 x 1,5	9338	4	
		M30 x 1,5	9336	4	
		M38 x 1,5	9337	4	

Manual adjustable bypasses (uncontrolled) page 77

Safety Devices			Cat.No.	G	Price
Float switch in-sight glass, leak monitoring (highest safety class).	Float switch		6152	1	
	Sealing kit		6523	2	
Atmospheric sealing kit for sight glass and expansion vessel, e.g. for inert gas blanketing.					

Trolleys	for	Cat.No.	G	Price
The trolleys make the Unistats mobile.	tango nuevo, unistat 405w	9350	2	
	unistat 705, 705w	6263	2	
	unistat 405	9392	2	

Connections for Mettler Toledo „LabMax“, „RC1“	Adaptor unistat 40x Metal Hose NW20 / M30 x 1,5:	Qty	Cat.No.	G	Price
For use with the LabMax or the RC1 in variations High temp, Mid temp and low temp, use the adapters listed here.	M30 x 1,5 AG - 1/2" BPT female	1x	6394	1	
	M30 x 1,5 AG - 3/4" female	1x	6442	1	
	M30 x 1,5 AG - M16 x 1 BPT female	1x	6431	1	



DW-Therm - 90°C ...+200°C

Specifications

Appearance and odour: transparent, colourless or yellow liquid with characteristic odour

Silane content: 99%

Viscosity: 2,0–2,2 mm² / sec at 20°C

Density: 0,88 g / cm³ at 15°C

Boiling range: 228–235°C

Solidification at: -137 °C

Flash point: 101 °C

Ignition temperature: 265 °C

Usage: closed systems only

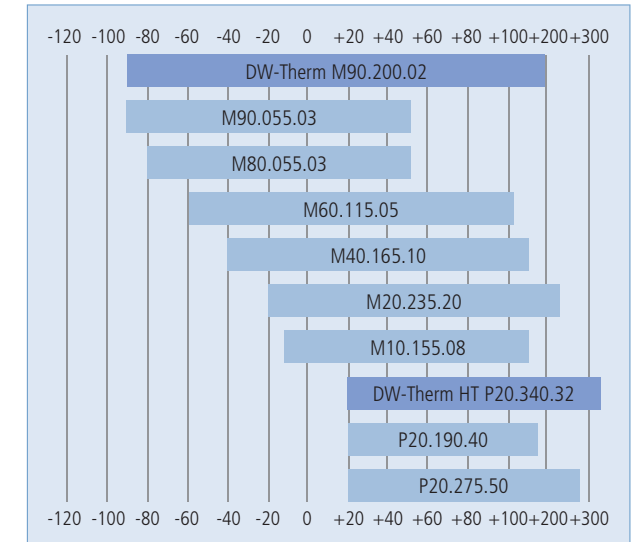
Properties

DW-Therm is a mixture of isometric triethoxysilanes and has been developed for hydraulically sealed systems.

Notes

- broad working range from -90°C to +200°C (hydraulically sealed systems)
- excellent thermooxidative stability at high temperatures
- low viscosity at low temperatures
- low volatility and pleasant odour
- easy handling (no creeping like silicone oils)
- good compatibility with silicone oils
- insoluble in water and environmentally friendly
- not classified as dangerous goods, no known toxicity

Operating range of thermal fluids			
P20.340.32:	plus 20°C	+340°C	32 mm ² /s at 25°C
M40.165.10:	minus 40°C	+165°C	10 mm ² /s at 25°C



DW-Therm HT +20°C ...+340°C

Specifications

Appearance: clear, orange coloured liquid

Content: 99,5% partially hydrogenated terphenyls

kinematic Viscosity: 32 mm² / sec at 20°C

Density: 1,004 g / cm³ at 20°C

Boiling starts at: approx. 350°C

Pour point: -33°C

Flash point: ca. 190°C

Fire point: ca. 218°C

Ignition temperature: ca. 390°C

Usage: closed systems only

Properties

DW-Therm HT is a mixture of partially hydrogenated terphenyls. It is for use exclusively in high temperature unistats.

Notes

- broad working range from +20°C to +340°C (hydraulically sealed system)
- long lifetime at high temperatures under inert atmosphere: 3-4 years
- good thermal properties for heat transfer
- high oxidation stability

Thermal Fluid	Litre	Cat.No. (G1)	Price
DW-Therm* M90.200.02	10	6479	
DW-Therm HT* P20.340.32	5	6672	
MinOil P20.190.40	10	6673	
	5	6155	
	20	6156	
SynOil M10.155.08	5	6159	
	10	6160	
SilOil P20.275.50	5	6157	
	10	6158	
SilOil M20.235.20	5	6161	
	10	6162	
SilOil M40.165.10	5	6163	
	10	6164	
SilOil M60.115.05	5	6165	
	10	6166	
SilOil M80.055.03	5	6167	
	10	6168	
SilOil M80.100.03	5	6275	
	10	6276	
SilOil M90.055.03	5	6258	
	10	6259	
Antifreeze (Ethylenglykol)	10	6170	
	50	6171	
Algae Protection	0,1	6172	

* exclusive for Unistats

More informations und er www.dws-synthese.de

CC-Pilot – Intelligence for the Unichillers

The masterpiece of Plug & Play technology and constructive user involvement has a name: Compatible Control.

The new Compatible Control CC Pilot offer many new functions that are easy to use come with Plug & Play technology. The TFT screen clearly displays all information. The unique menu system Easy-Control is virtually identical with the Unistats. A clear advantage for the users is that all Huber thermoregulation units:

circulators and chillers use a universal operator interface.

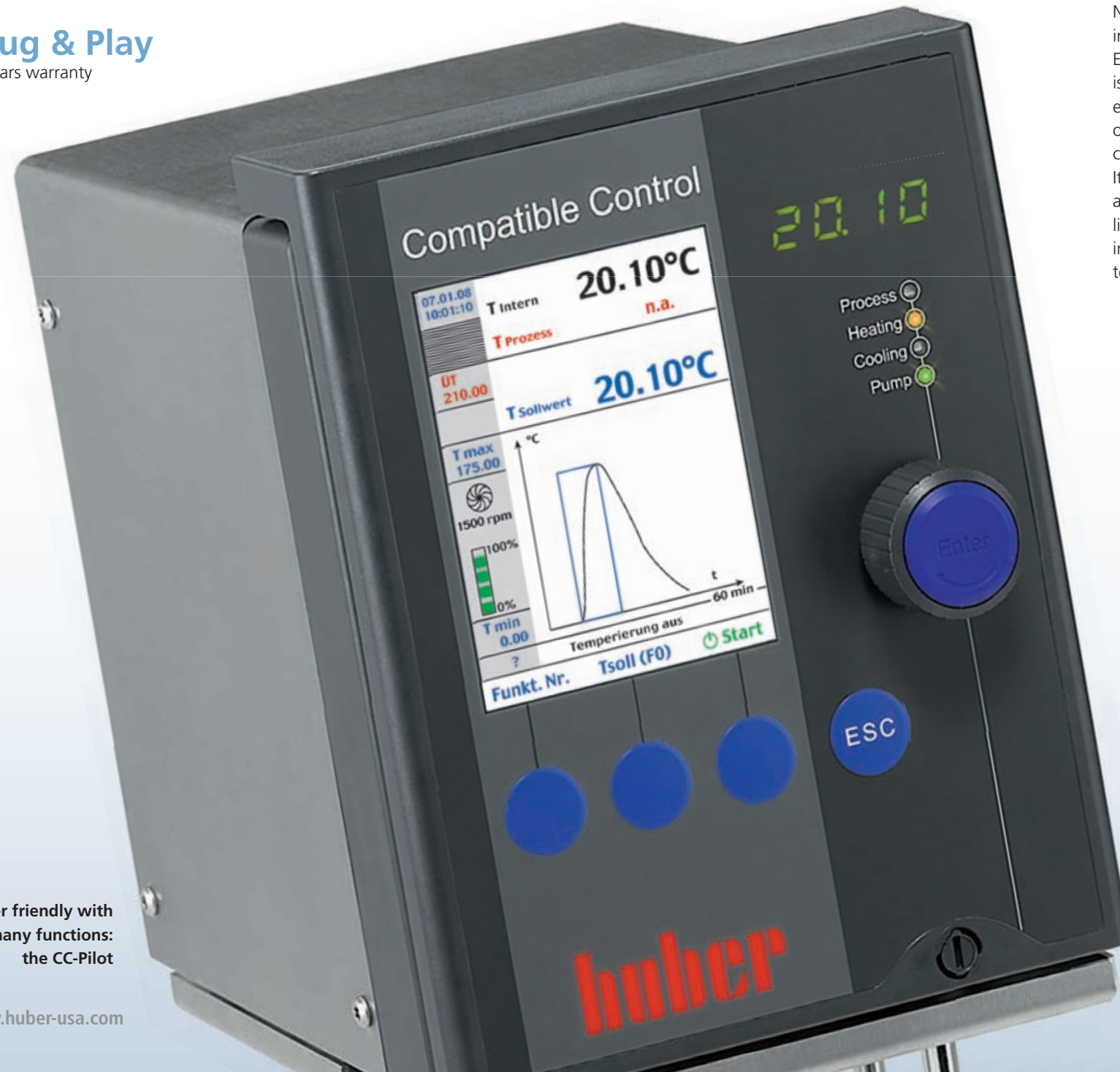
The proven Plug & Play technology (since 1980) which enables a quick response in the event service is required has been retained in the new generation. Also the CC Pilot is exchangeable and (with a data cable) can be used as a remote control.

New means of functionality and flexibility have been introduced. The functionality can be extended by E-grade (page 33). In the basic version the functionality is already comprehensive: The functions are self-explanatory and are listed in alphabetical order in each of the selected languages. The language display is currently available in German, English, Spanish, Italian, French and Russian. The display can be adjusted to the operators preference. A comprehensive list of data can be displayed or the most important information (setpoint, actual internal and process temperatures and overtemperature setpoint) can be

displayed in a larger format. This allows the values to be read from a distance and to keep the important parameters in view. The display resolution in the basic version is 0.1°C. The temperature can be displayed in Celsius or Fahrenheit. Depending on the system the pump speed or maximum pressure can be steplessly controlled. VPC (variable pressure control) also protects against pressure sensitive devices (e.g. reactor).

The working range can be limited using the setpoint limiting function and the alarm response can be adjusted as required. An optical and acoustic alarm can be activated in the event of an alarm. The clock and calendar functions allow auto-start to be programmed. The temperature sensor can be calibrated. An RS232 interface allows data recording, the installation of a ComBox enables connection to a process control system.

Plug & Play
3 years warranty



Economic, cost effective and robust: the controller for low cost unichillers



Simple – cost effective – all you need!

Low-Cost-controller for unichillers

No rule without exception: This modern controller does without the unique plug & play technology. It is a simple and effective solution for minichillers and Unichillers in classic look.

What matters:

You pay only for what you need. When it comes to safety no compromises have been made. The operation is of course simple.

Features:

- Large temperature display
- LED- indicators for pump, cooling and heating
- simple operation using 3 keys

User friendly with many functions: the CC-Pilot

Huber chillers are called Minichiller or Unichiller

Small footprints, robust and service friendly units, modern energy management, simple to use, flexible functionality, modular technology – these are the results of designs without compromise.



Unichillers are intelligent chillers which are used mainly as an environmentally friendly and economic alternative to tap water for process cooling. Low temperatures increase efficiency and recovery rates in gas condensation processes. In contrast to tap water a desired setpoint can be selected between -10/-20°C to 40°C and controlled with a temperature stability of +/- 0.5°C. The product range includes 27 air cooled and 26 water cooled models, with cooling powers from 0.3kW to 50kW. An optional heating system is available on most models. The casings are made of stainless steel to ensure long life and reasons of quality.

Compact, value-for-money units are available in classic look with cooling powers up to 2.5kW for cooling applications in the lab. The models from Minichiller to UC 025w are suitable for on or under the lab bench.

minichiller and unichiller for environmentally friendly refrigeration

The proven Huber tower models offer power with small footprints. These top models have the upgradeable Compatible Control (CC-Pilot). These models are used in both research and production, the range of cooling powers available is from 1.6 to 100 kW.

Features of Unichillers with the CC-Pilot

- Space saving tower design: small dimensions, high powers
- Robust stainless steel construction
- Reliable continuous operation with alarm and early warning functions
- CC-Pilot with Plug & Play Technology
- Splash protection of display and function keys
- Large and bright TFT display
- Digital level indicator
- Simple to fill and drain
- Simple to use EASY Control, with rotary input and function keys
- All functions listed alphabetically
- RS232 interface and connection for optional Combox (NAMUR Standard)

- Strong pumps for systems with large pressure drops
- High flow rates for optimal heat transfer
- External Pt100 sensor via 4-wire Lemosa connector
- 5-Point calibration
- IP-class to IEC EN 60529: 21
- Options (factory fitted)
 - Heater and adjustable over temperature protection
 - VPC (variable pressure control) with steplessly variable Bypass and pressure sensor
 - Winter operation for use in low temperature external environments
 - Weather protection
 - Tropical versions for environmental temperature up to 40°C
 - Stronger pumps

E-grade – it's so easy

Using the E-grade the functionality can be extended to suit particular thermoregulation tasks and the budget. E-grade stands for electronic upgrade and is simple to use: To extend the functionality a unit specific activation code must be entered via the control panel. This unique code is specific to the unit serial number and can be activated during manufacture or ordered later (activation code sent by e-mail).

E-grade Package Exclusive

The E-grade Package Exclusive activates the graphic function and the display resolution of 0.01 K. A simple programmer with three programs (each with five steps), True Adaptive Control (TAC), the intelligent self-optimising cascade control and a ramp function complete the functionality for an extremely low price.

E-grade package Professional

The E-grade Package Professional has the function of the E-grade Package Exclusive and more. The administrator function is activated and allows individual user profiles to be defined. An extremely comprehensive programmer with 100 segments, which can be distributed over ten programs replaces the simpler programmer from the Exclusive package. The Professional package also contains the option for external temperature control via an external Pt100 sensor, NLR (Non-Linear-Ramping) and a 2nd setpoint function which can be activated in the event of an alarm.

Model	Cat.No.	Price (EUR)
E-grade „Standard“>„Exclusive“	9495	
E-grade „Exclusive“>„Professional“	9496	
E-grade „Standard“>„Professional“	9496	

minichiller

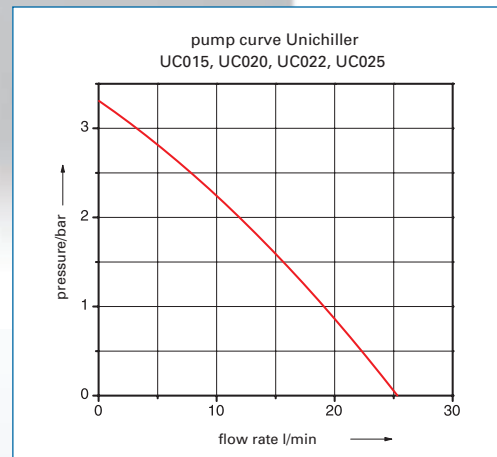
Small, robust and cost effective with its stainless steel casing. The minichiller is the smallest Unichiller in the World. Minichillers are available with air- or water-cooled refrigeration systems, illuminated level indicator, overflow and drain on the front. The filling port is on the top of the unit.



| minichiller |



| UC006 |



| UC007 |



| UC022 |



Model	Working Temp. Range (°C)	Pump max.		Cooling Power (kW) at (°C)			Dimensions WxDxH (inch)	mobile with trolley	Cat.No.	G	Price
		(gpm)	(bar)	15	0	-10					
minichiller	-20...40	3,2	0,2	0,3	0,2	0,14	8,9x14,2x15,0	–	3006.0007.99	2	
minichiller w	-20...40	3,2	0,2	0,3	0,2	0,14	8,9x14,2x15,0	–	3006.0008.99	2	
UC006	-20...40	7,9	0,7	0,6	0,5	0,22	10,9x19,3x16,3	–	3007.0003.99	3	
UC007	-20...40	6,6	3,0	0,7	0,55	0,35	13,7x16,9x24,5	–	3012.0012.99	3	
UC010	-10...40	6,6	3,0	1,0	0,8	0,5	13,7x16,9x24,5	–	3012.0013.99	3	
UC012	-10...40	6,6	3,0	1,2	1,0	0,7	16,5x18,9x22,8	height: 660	3009.0010.99	3	
UC012w	-10...40	6,6	3,0	1,2	1,0	0,7	13,7x16,9x24,5	–	3012.0014.99	3	
UC015	-10...40	6,6	3,0	1,5	1,0	0,4	16,5x18,9x22,8	height: 660	3009.0009.99	3	
UC015w	-10...40	6,6	3,0	1,5	1,0	0,4	13,7x16,9x24,5	–	3012.0015.99	3	
UC022	-10...40	6,6	3,0	2,2	1,6	1,0	18,0x23,1x29,2	incl.	3010.0005.99	3	
UC022w	-10...40	6,6	3,0	2,2	1,6	1,0	16,5x18,9x22,8	height: 660	3009.0011.99	3	
UC023w	-10...40	6,6	3,0	2,0	2,0	1,3	13,7x16,9x24,5	–	3012.0016.99	3	
UC025	-10...40	6,6	3,0	2,5	2,0	1,2	18,0x23,1x29,2	incl.	3010.0006.99	3	
UC025w	-10...40	6,6	3,0	2,5	2,0	1,2	16,5x18,9x22,8	height: 660	3009.0012.99	3	

Option heating for minichiller-x 1 kW, for UC models 2 kW

Option: Natural Refrigerant available on request

Classic Look and Minitower with value for money technology

Minichiller and Unichiller present themselves in classic look with cooling powers from 0.3 to 2.5 kW. Two water-cooled models in tower casings with a minimal footprint. Excellent control performance is achieved using a modern and easy to use microprocessor based controller with a large display. Thanks to high safety standards and a robust construction especially suited to removing process heat with continuous operation. With the exception of the two models in tower casings all units can be factory fitted with optional

heating and independent overtemperature protection. The maximum working temperature increases to 100°C and the temperature stability is +/-0.5 K. The new construction allows constant operation in ambient temperatures up to 40°C. The water-cooled models are especially quiet and require little cooling water even at full cooling power. Due to increasing costs of water the ROI is exceptionally short. All models with maximum pump pressure of 3 bar have an adjustable bypass and a pressure gauge.



Unichiller (bench top) with water cooled refrigeration

Chillers with mini footprints for the lab

The models UC006Tw and UC009Tw have a footprint of only 230 x 280 mm and are therefore suitable for installation in laboratory furniture or in extract hoods.

The water-cooled chillers emit almost no heat and require minimal amounts of cooling water.



[W] 900W

On top: pump and cooling water connections, illuminated sightglass.
Front: drain, overflow and operation panel



| UC009Tw |

Ideal partner for rotary evaporators

The UC009Tw with the 2-way-valve system allows my customers to connect two exhaust vapour condensers from chemistry pumps or two condensate coolers from rotary evaporators in parallel. They appreciate the space saving design.



Judy Iguchi, Chemglass Inc.

Unichiller in Tower Housings with CC-Pilot

Chillers with state-of-the-art technology

All stand models have the exchangeable Compatible Control "CC Pilot". The cooling power is regulated by an automatic stepper motor controlled valve to adapt to the actual requirements. The intelligent and environmentally friendly energy management system minimizes heat emission and reduces the operating costs (cooling water and electricity) of the water cooled models. The sound levels of the air-cooled models have been minimized through the use of speed controlled condenser fans. The refrigeration systems are exceptionally robust and can operate in environmental temperatures up to 40°C. The internal CAN technology allows connection to a range of power and control components and is therefore suitable for this wide ranging product group:

The new Unichillers with air- or water-cooled refrigeration systems are available from cooling powers of 1.7kW for typical laboratory applications. The powerful Unichillers with cooling powers up to 100 kW are also used as a central supply of cooling water for labs or complete buildings.

Process circulators with heating

Unichillers with a optional heating become powerful process circulators for the mid temperature range -10/-20 up to 100°C with a temperature stability of +/-0.1 K.

For the highest quality and flexibility requirements

For reasons of quality and a long operational life the casings are all made of stainless steel. The options weather protected and/or winter operation allow the big Unichillers to be located outdoors and controlled remotely by the CC pilot at the application. Stronger pumps are available for systems with high pressure drops, a maximum delivery pressure of 6 bar and flow rates of over 200 liter per minute are available.



Model	Working Temp. Range (°C)	Pump max.			Cooling Power (kW) at (°C)				Dimensions WxDxH (inch)	(W/dm³) at		Cat.No.	G	Price
		Type	(gpm)	(bar)	15	0	-10	-20		15°C	0°C			
UC006Tw	-20..40	A	7,9	0,7	0,6	0,45	0,4	0,25	9,1x11,0x21,3	16,9	12,7	3022.0003.99	3	
UC009Tw	-25..40	A	7,9	0,7	0,9	0,7	0,4	0,2	9,1x11,0x21,3	25,4	22,6	3022.0004.99	3	

Option: Natural Refrigerant available on request

Unichiller with air cooled refrigeration

[kW]
to 40 kW

air cooled models
from 1.7 to 40 kW



| UC045T |



| UC110T |

Unichiller with water cooled refrigeration



[kW]
to 50 kW

water cooled models
from 1.7 to 50 kW



| UC 025Tw |



| UC 130Tw |

Model	Working Temp. Range (°C)	Pump max.		Cooling Power (kW) at (°C)				Dimensions WxDxH (inch)	(W/dm³) at		Cat.No.	G	Price
		Type	(gpm) (bar)	15	0	-10	-20		15°C	0°C			
UC017T	-10..40	B	7,1 3,0	1,7	0,9	0,4	-	17,7x20,1x45,7	6,4	3,4	3013.0007.04	3	
UC020T	-20..40	B	7,1 3,0	2,0	2,0	1,3	0,5	17,7x20,1x45,7	7,5	7,5	3013.0008.04	3	
UC025T	-10..40	B	7,1 3,0	2,5	1,2	0,6	-	17,7x20,1x45,7	9,4	4,5	3013.0009.04	3	
UC040T	-10..40	B	7,1 3,0	4,0	2,5	1,5	-	19,7x21,7x52,0	11,0	6,9	3014.0005.04	3	
UC045T	-20..40	B	7,1 3,0	4,5	4,5	2,9	1,5	19,7x21,7x52,0	12,4	12,4	3014.0006.04	3	
UC055T	-10..40	C3	17,1 5,5	5,5	3,0	1,3	-	23,6x24,8x63,0	9,1	5,0	3015.0006.04	3	
UC060T	-20..40	C3	17,1 5,5	6,0	6,0	3,9	2,0	23,6x24,8x63,0	9,9	9,9	3015.0007.04	3	
UC080T	-10..40	C3	23,7 5,5	8,0	4,8	2,5	-	23,6x28,7x63,0	11,4	6,5	3016.0003.04	3	
UC100T	-20..40	C3	23,7 5,5	10,0	10,0	6,5	2,5	23,6x31,1x63,4	13,1	13,1	3017.0005.04	4	
UC110T	-10..40	C3	23,7 5,5	11,0	6,0	2,7	-	23,6x31,1x63,4	14,4	7,9	3017.0006.04	4	
UC130T**	-10..40	C3	23,7 5,5	13,0	8,5	4,5	-	34,4x46,7x73,0	6,8	4,4	3018.0005.04	4	
UC150T**	-20..40	D3	47,4 4,5	15,0	15,0	9,7	3,7	34,4x58,5x73,0	6,2	6,2	3019.0005.04	4	
UC160T**	-10..40	D3	47,4 4,5	16,0	8,8	4,0	-	34,4x46,7x73,0	8,3	4,6	3018.0006.04	4	
UC200T**	-10..40	D3	47,4 4,5	20,0	11,0	5,0	-	34,4x58,5x73,0	8,3	4,6	3019.0006.04	4	
UC210T**	-20..40	D3	47,4 4,5	21,0	21,0	13,6	5,2	34,4x78,1x73,0	6,6	6,6	3020.0009.04	4	
UC250T**	-10..40	D3	47,4 4,5	25,0	14,0	6,2	-	34,4x78,1x73,0	7,8	4,4	3020.0010.04	5	
UC260T**	-20..40	D3	57,9 4,5	26,0	26,0	13,6	5,2	34,4x78,1x73,0	8,0	8,0	3020.0011.04	5	
UC300T**	-10..40	D3	57,9 4,5	30,0	16,5	7,5	-	34,4x78,1x73,0	9,3	5,1	3020.0012.04	5	
UC400T**	-10..40	D3	57,9 4,5	40,0	22,0	10,0	-	98,4x66,3x70,3	5,3	2,9	3021.0003.04	5	

** without trolley Option: heating 2 kW to 100°C

Option: Natural Refrigerant available on request

Model	Working Temp. Range (°C)	Pump max.		Cooling Power (kW) at (°C)				Dimensions WxDxH (inch)	(W/dm³) at		Cat.No.	G	Price
		Type	(gpm) (bar)	15	0	-10	-20		15°C	0°C			
UC017Tw	-10..40	B	7,1 3,0	1,7	0,9	0,4	-	15,7x17,3x43,3	8,8	4,6	3024.0008.04	3	
UC020Tw	-20..40	B	7,1 3,0	2,0	2,0	1,5	0,8	15,7x17,3x43,3	10,3	10,3	3024.0010.04	3	
UC025Tw	-10..40	B	7,1 3,0	2,5	1,2	0,6	-	15,7x17,3x43,3	12,9	6,2	3024.0012.04	3	
UC030Tw	-20..40	B	7,1 3,0	3,0	3,0	2,0	1,0	15,7x17,3x43,3	15,5	15,5	3025.0005.04	3	
UC040Tw	-10..40	B	7,1 3,0	4,0	2,5	1,5	-	15,7x17,3x43,3	20,7	12,9	3025.0006.04	3	
UC055Tw	-10..40	C3	17,1 5,5	5,5	4,0	2,0	-	19,7x21,7x49,8	15,8	11,5	3026.0008.04	3	
UC060Tw	-20..40	C3	17,1 5,5	6,0	6,0	3,8	2,1	19,7x21,7x49,8	17,2	17,2	3026.0009.04	3	
UC080Tw	-10..40	C3	23,7 5,5	8,0	4,65	2,35	-	19,7x21,7x49,8	23,0	13,4	3026.0010.04	3	
UC100Tw	-20..40	C3	23,7 5,5	10,0	10,0	6,3	3,0	23,6x23,6x57,1	19,2	19,2	3027.0010.04	4	
UC110Tw	-10..40	C3	23,7 5,5	11,0	5,8	2,55	-	23,6x23,6x57,1	21,1	11,1	3027.0011.04	4	
UC130Tw	-10..40	C3	23,7 5,5	13,0	7,0	3,0	-	23,6x23,6x57,1	24,9	13,4	3027.0012.04	4	
UC150Tw	-20..40	D3	47,4 4,5	15,0	15,0	10,0	5,0	29,9x31,5x61,4	15,8	15,8	3028.0012.04	4	
UC160Tw	-10..40	D3	47,4 4,5	16,0	9,5	5,5	-	23,6x23,6x57,1	30,7	18,2	3027.0013.04	4	
UC200Tw	-10..40	D3	47,4 4,5	20,0	10,7	4,7	-	29,9x31,5x61,4	21,1	11,3	3028.0013.04	4	
UC210Tw	-20..40	D3	47,4 4,5	21,0	21,0	15,5	9,5	29,9x31,5x61,4	22,1	22,1	3028.0014.04	4	
UC250Tw	-10..40	D3	47,4 4,5	25,0	13,6	5,8	-	29,9x31,5x61,4	26,4	14,3	3028.0015.04	5	
UC260Tw	-20..40	D3	57,9 4,5	26,0	26,0	20,0	12,0	29,9x31,5x61,4	27,4	27,4	3028.0016.04	5	
UC300Tw**	-10..40	D3	57,9 4,5	30,0	16,0	7,1	-	29,9x35,4x61,4	28,1	15,0	3029.0005.04	5	
UC400Tw**	-10..40	D3	57,9 4,5	40,0	21,0	10,0	-	29,9x35,4x61,4	37,5	19,7	3029.0006.04	5	
UC500Tw**	-10..40	D3	57,9 4,5	50,0	26,0	-	-	42,1x29,9x64,0	37,8	19,7	3030.0003.04	5	

** without trolley Option: heating 2 kW to 100°C

Option: Natural Refrigerant available on request

ROTACOOOL – a Co-Product

The "Rotacool" is a product co-developed with Heidolph Instruments to provide a dedicated cooling service for small bench top Rotary Evaporators. It works well with all Rotary Evaporators.



Benefits are:

- Independent cooling for individual Rotary Evaporators
- Non-reliance on un-predictable house water supplies
- Consumes no additional bench space, the rotary evaporator sits on top
- Compact and powerful



Also available from:

Heidolph Instruments GmbH & Co. KG
Walpersdorferstrasse 12
D-91126 Schwabach
Tel. 09122-9920-69
E-Mail: Heidolph.Instruments@Heidolph.de
Internet: www.heidolph.com

Model	Working Temp. Range (°C)	Cooling Power (kW) at (°C)			Pump max.		Dimensions W x D x H (inch)	Cat.No.	G	Price
		15	0	-10	(gpm)	(bar)				
RotaCool	-10..40	0,42	0,35	0,22	2,6	0,2	18,5x22,8x16,5	3033.0002.99	3	

Option: Natural Refrigerant available on request

Pumps

We offer alternative pumps for applications with higher pressure drops. Models with Pump (A) are only suitable for externally closed systems. Models with Pumps (B), (C) and (D) can also be configured for operation with external open systems. The quoted technical data is indicative, and will vary slightly depending on the model.

Pump	Pump duty (gpm) at (bar)						
	0,2	0,5	1,0	2,0	2,5	3,0	4,0
A	5,3	2,6	–	–	–	–	–
B*	5,8	5,3	4,5	2,6	–	1,3	–
B1*	–	10,5	9,2	7,4	6,3	5,3	2,6
C3**	–	–	17,1	15,8	11,8	10,5	6,6
C4**	–	–	21,1	19,7	19,7	15,8	7,9
D3**	–	–	36,8	42,1	36,8	34,2	23,7

*Stronger pump options available from UC017T through UC017Tw ** Pump suitable for UC055T and above

Pump	Reduction in cooling power:	Price
B1 for B	150 W	
C4 for C3	400 W	
D3 for C3	750 W	
D3 for C4	350 W	

Occasionally it might be necessary to increase the unit housing.

External Pt100-sensors

For external thermoregulation applications there are different sensors available. Special versions can be made on request.

Sensors (Standard length 1,5 m)	Cat.No.	G	Price
Ø 0,23 inch 7 inch	6138	1	
with handle Ø 0,23 inch 7,87 inch	6105	1	
Ø 0,31 inch 15,75 inch	6064	1	
mounted in protective pipe Ø 0,31 inch 6,7 inch	6205	1	
M16x1 sensor for flow or return	6352	1	
M16x1 sensor for flow or return double	6353	1	
M30x1,5 sensor for flow or return	6509	1	
M30x1,5 sensor for flow or return double	6510	1	
Extension cable Pt100, 3m	6292	1	

sensors with special lengths on request

Extension Cables

For use with the Unistat Pilot and CC-Pilot and also for the external ComBox.

Extension Cables (Standard length 3 m)	Cat.No.	G	Price
Unistat Control / CC / UC Unistat-Pilot / CC-Pilot	16160	1	

cables with special lengths on request

Control Cables

for ComBox

Control cables for operation via the RS232, RS485 or the analogue interface (AIF). A range of control cables and plugs are available for ECS (external control signal), programmable volt-free (POKO) and for an external float switch.

Control Cables (Standard length 3 m)	Cat.No.	G	Price
from	note		
ComBox RS232	e.g. to PC	6146	1
ComBox RS485	Cable end open	6279	1
ComBox AIF	Cable end open	9353	1
ComBox ECS	Cable end open	9491	1
ComBox POKO	Cable end open	9490	1
ComBox LEVEL	Cable end open	9492	1

Cables with special lengths on request

Accessories

	Cat.No.	G	Price
Float switch	6152	1	
Weather resistant option	on request		



CC-Pilot – Navigation for Professionals

The master piece of Plug & Play technology and the constructive user involvement has a name: Compatible Control.

The new Compatible Control CC Pilot offer many new functions and are easy to use come with Plug & Play technology. The TFT screen clearly displays all information. The unique menu system "Easy-Control" is virtually identical to the Unistats. A clear advantage for the users is that all Huber

thermoregulation units: circulators and chillers use a universal operator interface.

The proven Plug & Play technology (since 1980) which enables a quick response in the event of service has been retained in the new generation. Also the CC-Pilot is exchangeable and (with a data cable) can be used as a remote control.

New means of introducing functionality and flexibility have been introduced. The functionality can be extended by E-grade (page 33). In the basic version the functionality is already comprehensive: The functions are self-explanatory and are listed in alphabetical order in each of the selected languages. The language selection is at the moment (only) limited to German, English, Spanish, Italian, French and Russian. The display can be adjusted to the operators preference. A comprehensive list of data can be displayed or the most important information (setpoint, actual internal

and process temperatures and overtemperature set-point) can be displayed in a larger format. This allows the values to be read from a distance and to keep the important parameters in view. The display resolution in the basic version is 0.1 K. The temperature can be displayed in Celsius or Fahrenheit. Depending on the system the pump speed or maximum pressure can be steplessly controlled. VPC (variable pressure control) also protects against glass breakage.

The working range can be limited using the setpoint limiting function and the alarm response can be adjusted as required. An optical and acoustic alarm can be activated in the event of an alarm. The clock and calendar functions allow auto-start to be programmed. The temperature sensor can be calibrated. An RS232 interface allows data recording, the installation of a ComBox enables connection to a process control system.

User friendly despite massive functionality: CC-Pilot



It's so easy

My customers love the self-explanatory menus of the CC-Pilot. The large display shows all the important information in color and clear text.



Cathy Nevins, Chemglass Inc.



It's so easy!

Controller CC1 – Basic and practical

- User and Administrator levels
- Digital encoder "turn to search - push to select"
- 48 character, 4-line LCD display
- Full character user menu
- Visual and audible alarms
- Set-point limits
- Programmable alarm function



Controller CC2 – External process oriented

- All that the CC1 is furnished with plus:
- Process control capability,
- Ramping function, 5-step internal programmer ... and more.



Controller CC3 – Automation capable

- All that the CC2 is furnished with plus
- 10-program, 50 step internal programmer
- RS232, RS485 and analogue interfaces
- ... and more.

Model	Cat.No.	G	Price
CC-1	658.0001	1	
CC-2	658.0002	1	
CC-3	658.0003	1	

The immersion thermostat CC-E is the basis for many baths circulators

Modern Classics: Bath Thermostats

Compatible Control Circulators are modern classics. Their predecessors have spread the still exclusive exchangeable controllers throughout the world since 1980.

CC circulators are classic constructions. Pump, control sensor, heater and evaporator are all located at the back part of the bath. This allows the use of both, optional calibration inserts for high precision calibration and also displacement inserts for increasing system temperature dynamics.

State of the art pump technology: The top range models with the CC pilot have powerful pressure and suction pumps. The pump speed can be controlled steplessly to suit the bath configuration. The maximum permissible pressure for an external application can be controlled via the optional "Combox" (digital interfaces RS232 and RS485, analogue interface 4-20mA, external control signal and programmable alarm) and pressure sensor. The pressure control VPC (variable pressure control) has already proved itself as an additional protection against glass breakage in the Unistats.

Robust construction: The thermoregulation bath is welded to the unit cover plate. This means that no seal is required and offers lifelong protection to the insulation. The cover plate is also thermoregulated to avoid the formation of condensation or ice.

Hot and Cold: Compatible Control heating circulators operate up to 300°C and with heating powers up to 4 kW.

Refrigerated bath circulators are available with working ranges between -90°C and 200°C. Beginning with the Ministat, the smallest refrigerated circulator in the world, the cc range actively cools at 200°C.

Chic: Thermostats with stainless steel casing and large TFT displays with the exchangeable CC-Pilot



E-grade – it's so easy

Using the E-grade the functionality can be extended to suit particular thermoregulation tasks and the budget. E-grade stands for electronic upgrade and is simple to use: To extend the functionality a unit specific activation code must be entered via the control panel. This unique code is specific to the unit serial number and can be activated during manufacture or ordered later (activation code sent by e-mail).

E-grade package Exclusive

The E-grade package Exclusive activates the graphic function and the display resolution of 0.01 K. A simple programmer with three programmes (each with five steps), True Adaptive Control (TAC), the intelligent self-optimizing cascade control and a ramp function complete the functionality for an extremely low price.

E-grade package Professional

The E-grade package Professional has the function of the E-grade package Exclusive and more. The administrator function is activated and allows individual user profiles to be defined. An extremely comprehensive programmer with 100 segments, which can be distributed over ten programmes replaces the simpler programmer from the Exclusive package. The Professional package also contains the option for external temperature control via an external Pt100 sensor, NLR (Non-Linear-Ramping) and a 2nd setpoint function which is activated in the event of an alarm.

Model	Cat.No.	Price (EUR)
E-grade „Standard“>„Exklusiv“	9495	
E-grade „Exklusiv“>„Professional“	9496	
E-grade „Standard“>„Professional“	9496	

▶ Active Cooling Control – this means permanent operation of the refrigeration system at the maximum working temperature is possible, and has been a feature of all Compatible Control refrigerated circulators since 1976.

Environmentally friendly refrigeration: All refrigeration machines have automatic cooling power control and thereby reduce the energy consumption and heat emission to an absolute minimum. Water-cooled models have water saving refrigeration machines and typically use approximately one third of the cooling water required by other circulators. Huber refrigeration machines had stopped using CFCs and HCFCs (R22) years before the prohibition and therefore had a zero ozone depletion potential (ODP). To bring the greenhouse effect also to zero, Compatible Control circulators are also available with natural refrigerants.



Safety first: No compromises with safety: The requirements of the highest safety classification (3) to DIN 12876 are achieved through level protection and an adjustable independent overtemperature protection.

Plug & Play: This proven technology, since 1980, allows rapid response in the event of service. The CC Pilot used in the top range models is also exchangeable and can additionally be used as a remote control in combination with a data cable. The CC Pilot does not just give the Compatible Control circulators a new look, but by E-grade can be used to flexibly establish the functionality allowing a price differential.

Infinitely variable: The simple versions are typical bath circulators, and as the name suggests mostly used for direct thermoregulation in the bath. They comprise of an immersion circulator and a bath. The bath is available in different sizes and materials. The polycarbonate baths (A) are transparent with operating temperatures up to 100°C. The insulated stainless steel baths (B) have a maximum working temperature of 200°C. The simple refrigeration circulators comprise of an immersion circulator (CC-E) and a refrigerated bath (K).



CC-Pilot with TFT-display and Plug&Play-Technology



Robust, versatile and low-cost: immersion thermostats with Plug&Play-Technology

The facts are convincing!

High cooling power density (W/dl³): Many bath circulators are suitable for displacement inserts (accessory). This allows unusually high cooling power density and the corresponding rapid temperature changes even at low temperatures.

Large power to HTF volume ratio (W/L): Unusually large cooling powers, also at low temperatures and compact build form result large power to HTF volume ratios.

Stainless steel casings: Quality and chic – stainless steel and little paint.

Air-cooled or water-cooled: The larger water-cooled units use typically two thirds the amount of cooling water used by conventional units. The CC410wl was the first refrigeration circulator in the world (introduced in 1997) with an automatic change-over air- or water-cooled refrigeration system. In summer economic use of water – in winter air-cooled operation for heating the lab.

Heating Thermostats with Polycarbonate bath

The transparent polycarbonate baths are suitable for use up to 100°C. A CC-E Immersion Thermostat is mounted on the bath bridge for all models. With a pump adaptor, this combination can also be used with external, closed applications. The models with

the CC-Pilot have a variable speed pressure/suction pump and are therefore also suitable for external open applications. The temperature stability, in accordance with DIN 12876, is 0.02 K.



| CC-E |

Immersion Thermostats

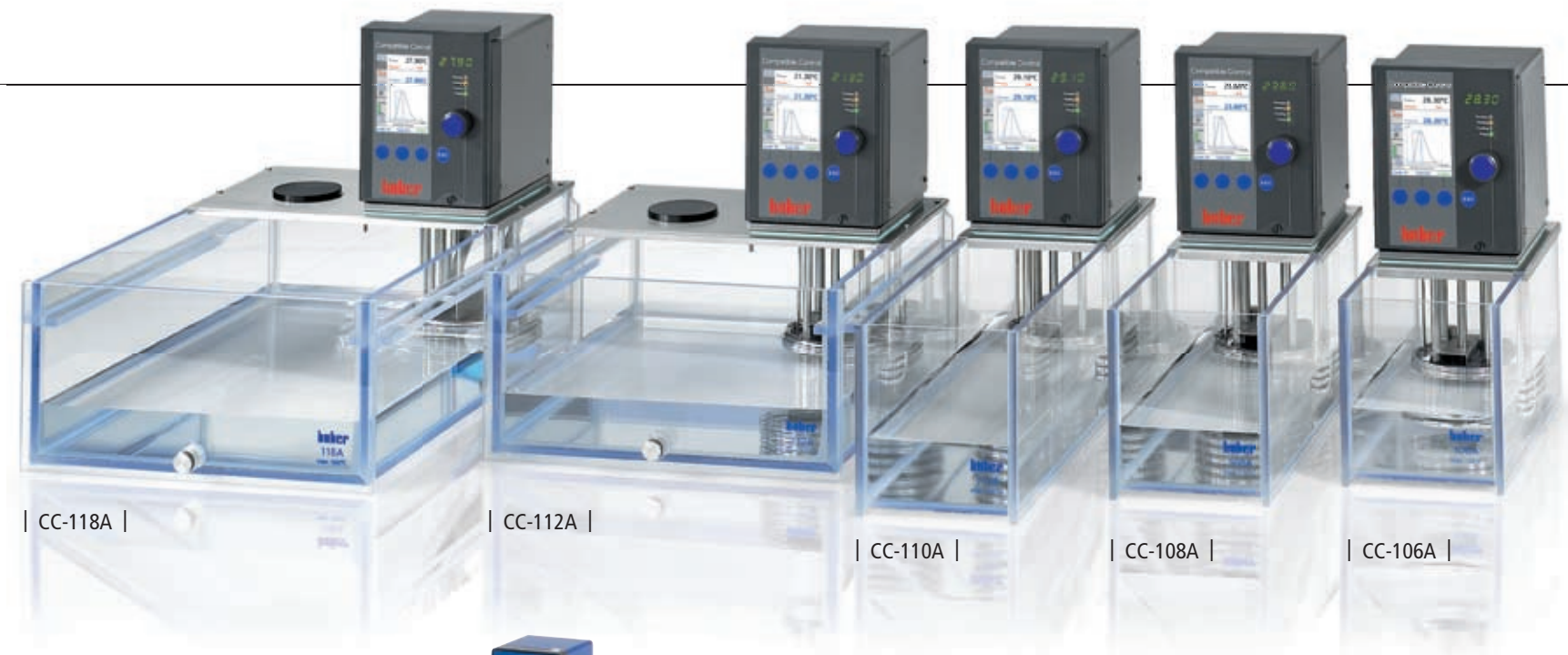
Immersion thermostats are the basis of many combinations of polycarbonate and stainless steel baths. Together with a cooling bath exact and reproducible temperatures down to -30°C are possible.



| CC1-E |
Simple

| CC2-E |
Versatile

| CC3-E |
Interactive



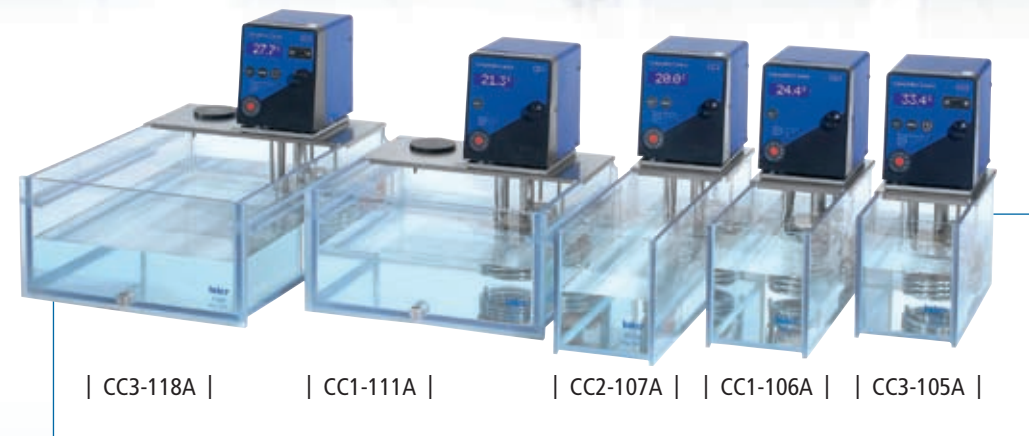
| CC-118A |

| CC-112A |

| CC-110A |

| CC-108A |

| CC-106A |



| CC3-118A |

| CC1-111A |

| CC2-107A |

| CC1-106A |

| CC3-105A |

Model	Temperature Range (°C)	Temperature Stability* (K)	Heating Power (kW)	Pump Data				Safety Class**	Dimensions WxDxH (inch) / ID (inch)	Cat.No.	G	Price
				max. Pressure (gpm)	max. Suction (bar)	max. Pressure (gpm)	max. Suction (bar)					
CC1-E	(-30) 25..200	0,02	1,0	2,6	0,2	-	-	FL, III	4,7x5,3x11,8/5,9	688.0051S43	1	
CC2-E	(-30) 25..200	0,02	1,0	2,6	0,2	-	-	FL, III	4,7x5,3x11,8/5,9	688.0052S43	1	
CC3-E	(-30) 25..200	0,02	1,0	2,6	0,2	-	-	FL, III	4,7x5,3x11,8/5,9	688.0053S43	1	
CC-E	(-30) 25..200	0,01	1,5	8,7	0,7	5,8	0,4	FL, III	5,2x6,3x12,4/5,9	2000.0002.04	1	

* to DIN 12876, measured in al stainless steel tank 12 liters

** FL for flammable liquids, III = adjustable overtemperature protection and addition low-liquid level protection

Model	Temp. max. (°C)	Heating (kW)	Opening (inch)	Bath Depth (inch)	Volume (ltr)	Pump Data				Dimensions WxDxH (inch)	Cat.No.	G	Price
						max. Pressure (gpm)	max. Suction (bar)	max. Pressure (gpm)	max. Suction (bar)				
CC1-105A	100	1	4,7x4,3	5,9	5	2,6	0,2	-	-	5,2x11,0x12,6	405.0001S43	1	
CC2-105A	100	1	4,7x4,3	5,9	5	2,6	0,2	-	-	5,2x11,0x12,6	405.0002S43	1	
CC3-105A	100	1	4,7x4,3	5,9	5	2,6	0,2	-	-	5,2x11,0x12,6	405.0003S43	1	
CC-106A	100	1,5	5,1x4,3	5,9	6	8,7	0,7	5,8	0,4	5,8x12,1x13,0	2001.0008.04	1	
CC1-106A	100	1	4,7x8,3	5,9	6	2,6	0,2	-	-	5,2x15,0x12,6	405.0011S43	1	
CC2-106A	100	1	4,7x8,3	5,9	6	2,6	0,2	-	-	5,2x15,0x12,6	405.0012S43	1	
CC3-106A	100	1	4,7x8,3	5,9	6	2,6	0,2	-	-	132x15,0x12,6	405.0013S43	1	
CC-108A	100	1,5	5,1x8,3	5,9	8	8,7	0,7	5,8	0,4	5,8x16,0x13,0	2001.0009.04	1	
CC1-107A	100	1	4,7x12,2	5,9	7	2,6	0,2	-	-	5,2x18,9x12,6	405.0021S43	1	
CC2-107A	100	1	4,7x12,2	5,9	7	2,6	0,2	-	-	5,2x18,9x12,6	405.0022S43	1	
CC3-107A	100	1	4,7x12,2	5,9	7	2,6	0,2	-	-	5,2x18,9x12,6	405.0023S43	1	
CC-110A	100	1,5	5,1x12,2	5,9	10	8,7	0,7	5,8	0,4	5,8x20,0x13,0	2001.0010.04	1	
CC1-111A	100	1	11,9x6,5	5,9	11	2,6	0,2	-	-	13,1x12,3x12,8	405.0031S43	1	
CC2-111A	100	1	11,9x6,5	5,9	11	2,6	0,2	-	-	13,1x12,3x12,8	405.0032S43	1	
CC3-111A	100	1	11,9x6,5	5,9	11	2,6	0,2	-	-	13,1x12,3x12,8	405.0033S43	1	
CC-112A	100	1,5	11,9x6,3	5,9	12	8,7	0,7	5,8	0,4	13,1x14,2x13,2	2001.0011.04	1	
CC1-118A	100	1	11,9x12,8	5,9	18	2,6	0,2	-	-	13,1x18,6x12,8	405.0041S43	1	
CC2-118A	100	1	11,9x12,8	5,9	18	2,6	0,2	-	-	13,1x18,6x12,8	405.0042S43	1	
CC3-118A	100	1	11,9x12,8	5,9	18	2,6	0,2	-	-	13,1x18,6x12,8	405.0043S43	1	
CC-118A	100	1,5	11,9x12,6	5,9	18	8,7	0,7	5,8	0,4	13,1x20,5x13,2	2001.0012.04	1	

Safety class FL, III



Heating Thermostats with Stainless steel baths

The insulated stainless steel baths are suitable for use up to 200°C. All models have a bridge-mounted CC-E Immersion Thermostat. With a pump adaptor, this combination can also be used with external, closed applications. The temperature stability, is 0,02 K to DIN 12876. The models with the CC-Pilot have a variable speed pressure/suction pump and are therefore also suitable for external open applications.



Model	Temp. max. (°C)	Heating Power (kW)	Bath Opening (inch)	Bath Depth (inch)	Bath Volume (ltr)	Pump Data				Dimensions WxDxH (inch)	Cat.No.	G	Price
						max. Pressure (gpm)	max. Suction (bar)	(gpm)	(bar)				
CC1-208B	200	1	9,1x6,5	5,9	8,5	2,6	0,2	-	-	11,4x13,8x14,4	407.0001S43	1	
CC2-208B	200	1	9,1x6,5	5,9	8,5	2,6	0,2	-	-	11,4x13,8x14,4	407.0002S43	1	
CC3-208B	200	1	9,1x6,5	5,9	8,5	2,6	0,2	-	-	11,4x13,8x14,4	407.0003S43	1	
CC-208B	200	1	9,1x5,0	5,9	8,5	8,7	0,7	5,8	0,4	11,4x13,8x14,8	2002.0006.04	1	
CC1-212B	200	1	11,4x7,6	5,9	12	2,6	0,2	-	-	13,8x14,8x14,4	407.0011S43	1	
CC2-212B	200	1	11,4x7,6	5,9	12	2,6	0,2	-	-	13,8x14,8x14,4	407.0012S43	1	
CC3-212B	200	1	11,4x7,6	5,9	12	2,6	0,2	-	-	13,8x14,8x14,4	407.0013S43	1	
CC-212B	200	1	11,4x6,0	5,9	12	8,7	0,7	5,8	0,4	13,8x14,8x14,8	2002.0007.04	1	
CC1-215B	200	1	11,4x7,6	7,9	15	2,6	0,2	-	-	13,8x14,8x16,3	407.0021S43	1	
CC2-215B	200	1	11,4x7,6	7,9	15	2,6	0,2	-	-	13,8x14,8x16,3	407.0022S43	1	
CC3-215B	200	1	11,4x7,6	7,9	15	2,6	0,2	-	-	13,8x14,8x16,3	407.0023S43	1	
CC-215B	200	1	11,4x6,0	7,9	15	8,7	0,7	5,8	0,4	13,8x14,8x16,7	2002.0008.04	1	
CC1-220B	200	1	11,4x14,6	5,9	20	2,6	0,2	-	-	13,8x21,9x14,4	407.0031S43	1	
CC2-220B	200	1	11,4x14,6	5,9	20	2,6	0,2	-	-	13,8x21,9x14,4	407.0032S43	1	
CC3-220B	200	1	11,4x14,6	5,9	20	2,6	0,2	-	-	13,8x21,9x14,4	407.0033S43	1	
CC-220B	200	1	11,4x13,0	5,9	20	8,7	0,7	5,8	0,4	13,8x21,9x14,8	2002.0009.04	1	
CC1-225B	200	1	11,4x14,6	7,9	25	2,6	0,2	-	-	13,8x21,9x16,3	407.0041S43	1	
CC2-225B	200	1	11,4x14,6	7,9	25	2,6	0,2	-	-	13,8x21,9x16,3	407.0042S43	1	
CC3-225B	200	1	11,4x14,6	7,9	25	2,6	0,2	-	-	13,8x21,9x16,3	407.0043S43	1	
CC-225B	200	1	11,4x13,0	7,9	25	8,7	0,7	5,8	0,4	13,8x21,9x16,7	2002.0010.04	1	



Heating Circulation Thermostats

Good things come in small packages! Thanks to their low bath volumes the CC-202C and CC-205B are especially suitable for controlling the temperature of small external applications. The temperature of small objects can also be controlled by placing them directly in the

bath. Both models have a variable speed pressure/suction pump with variable pressure control (VPC). The maximum working temperature is 200°C. The temperature stability to DIN 12876 is 0.01 K.

Model	Temp. Range (°C)	Bath Opening (inch)	Bath Depth (inch)	Bath Volume (ltr)	Heating Power (kW)	Pump Data				Dimensions WxDxH (inch)	Cat.No.	G	Price
						max. Pressure (gpm)	max. Suction (bar)	(gpm)	(bar)				
CC-202C	(-30)45..200	Ø1,0	5,9	2	1,0	8,7	0,7	5,8	0,4	7,0x10,2x14,0	2003.0002.04	1	
CC-205B	(-30)45..200	4,1x3,5	5,9	5	1,0	8,7	0,7	5,8	0,4	7,0x13,3x14,0	2004.0002.04	1	



| CC-130A Visco 3 |

VPC
Variable Pressure Control



| CC-200BX |



| CC-300BX |

Visco-Thermostats

The "Visco-Thermostats" are designed for capillary viscometry or for density measurements. They are constructed from transparent polycarbonate and are suitable for temperatures from 20°C to 80°C. They have a cooling coil for connection (e.g. for a Minichiller) to provide cooling.

The Visco 3-Model features a steel cover to facilitate three measurement inserts of 3,5 x 3,5 inches.

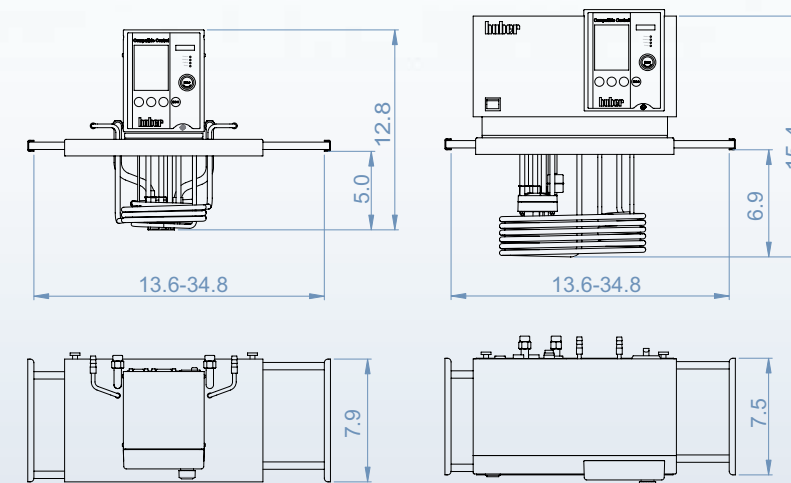
The Visco 5-Model is fitted with a steel cover with five Ø 2,0 inch openings.



Laurie Scioletti,
Chemglass Inc.

This makes working fun:

Great! A viscosity bath with large and legible temperature display. The pump speed can be set to avoid any disturbing turbulence effects. This ensures perfect measurements every time. For certain customers a resolution of 0.01 K is required, therefore the E-grade "Exclusive" is activated.



Bridge Thermostats

The bridge thermostats are suitable for use with a range of baths. The variable speed pressure/suction pump with VPC Technology is ideal for external thermoregulation applications. Models with bigger heating capacities are suitable for larger baths. The telescopic arms can be extended up to 34,8 inches.

Model	Temperature max. (°C)	Heating Power (kW)	Bath Opening WxD(inch)	Bath Depth (inch)	Volume (ltr)	Pressure pump Pressure max. (gpm) (bar)	Dimensions WxDxH (inch)	Cat.No.	G	Price
CC-130A Visco 3	100	2	3,5x3,5	12,2	31	8,7 0,7	19,7x8,1x19,3	2001.0013.04	1	
CC-130A Visco 5	100	2	Ø 2,0	12,2	31	8,7 0,7	19,7x8,1x19,3	2001.0014.04	1	

Model	Temperature Range (°C)	Heating Power (kW)	Temperature Stability* (K)	Pump Data				Cat.No.	G	Price
				max. Pressure (gpm) (bar)	max. Suction (gpm) (bar)					
CC-200BX	(-20)28..200	1,5	0,02	8,7 0,7	5,8 0,4			2000.0004.04	1	
CC-300BX	(-20)28..300	3,2	0,02	8,7 0,7	5,8 0,4			2007.0004.04	1	

* to DIN 12876

Heating bath circulators

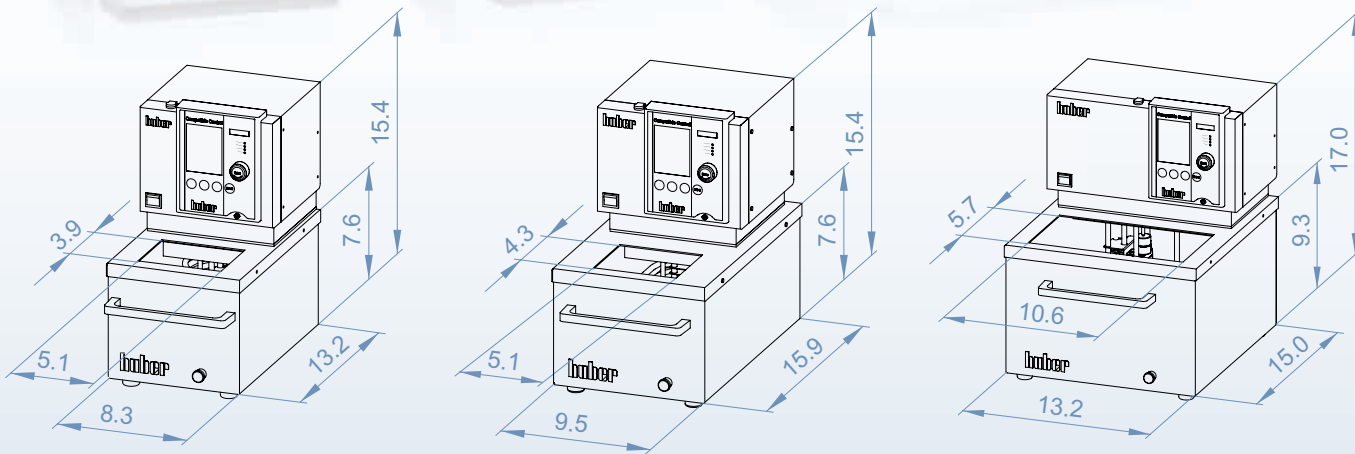
Temperatures up to 300°C the extremely compact models have the smoothly controllable “vpc” pressure suction pump. The pump pressure can be controlled from the user-menu, using an optional pressure sensor, so protecting your glassware or other delicate apparatus from breakage.



| CC-304B |

| CC-308B |

| CC-315B |



Model	Temperature Range (°C)	Bath Volume (ltr)	Bath Depth (inch)	Heating Power (kW)	Temperature Stability* to DIN 12876 (K)	Pump Data				Cat.No.	G	Price
						max. Pressure (gpm)	(bar)	max. Suction (gpm)	(bar)			
CC-304B	(-20)28..300	5,0	6,1	2,0	0,02	8,7	0,7	5,8	0,4	2005.0002.04	1	
CC-308B	(-20)28..300	8,5/5,2*	6,1	3,0	0,02	8,7	0,7	5,8	0,4	2006.0003.04	1	
CC-315B	(-20)28..300	15/8,5*	7,9	3,0/4,0	0,02	8,7	0,7	5,8	0,4	2007.0003.04	1	

* with displacement insert



| K25-cc |

| K20-cc |

| K15-cc |

| K12-cc |

Plug & Play

Cooling Circulators

Combinations of immersion circulators and insulated refrigeration baths are a low-cost solutions for direct thermoregulation for temperature ranging in -20°C/-30°C to 200°C. The CC1-CC3 models can be fitted with a pump adapter (optional) for externally closed thermoregulation applications. The new CC-E immersion circulator has a pressure/suction pump and is therefore suitable for external open thermoregulation applications. The temperature stability is 0.02 K and the safety class is FL, III, both to DIN 12876.



| CC2-K20 |

| CC3-K15 |

| CC1-K12 |

Model	Temp. Range (°C)	Heating Power (kW)	Bath			Pump Data				Cooling Power (kW) at			Dimensions W x D x H (inch)	Cat.No.	G	Price
			Opening (inch)	Depth (inch)	Volume (ltr)	max. Pressure (gpm)	(bar)	max. Suction (gpm)	(bar)	0°C	-10°C	-20°C				
CC1-K12-NR	-20..200	1	11,4x7,6	5,9	12	2,6	0,2	-	-	0,18	0,1	-	13,8x22,0x14,6	653.0031S34	2	
CC2-K12-NR	-20..200	1	11,4x7,6	5,9	12	2,6	0,2	-	-	0,18	0,1	-	13,8x22,0x14,6	653.0032S34	2	
CC3-K12-NR	-20..200	1	11,4x7,6	5,9	12	2,6	0,2	-	-	0,18	0,1	-	13,8x22,0x14,6	653.0033S34	2	
K12-cc-NR	-20..200	1,5	11,4x6,0	5,9	12	8,7	0,7	5,8	0,4	0,2	0,12	0,05	13,8x22,0x16,9	2009.0004.04	2	
CC1-K15-NR	-20..200	1	11,4x7,6	7,9	15	2,6	0,2	-	-	0,2	0,12	-	13,8x22,0x16,5	645.0041S34	2	
CC2-K15-NR	-20..200	1	11,4x7,6	7,9	15	2,6	0,2	-	-	0,2	0,12	-	13,8x22,0x16,5	645.0042S34	2	
CC3-K15-NR	-20..200	1	11,4x7,6	7,9	15	2,6	0,2	-	-	0,2	0,12	-	13,8x22,0x16,5	645.0043S34	2	
K15-cc-NR	-20..200	1,5	11,4x6,0	7,9	15	8,7	0,7	5,8	0,4	0,2	0,12	-	13,8x22,0x16,9	2010.0004.04	2	
CC1-K20-NR	-30..200	1	11,4x14,6	5,9	20	2,6	0,2	-	-	0,35	0,3	0,21	13,8x21,9x21,9	646.0041S34	2	
CC2-K20-NR	-30..200	1	11,4x14,6	5,9	20	2,6	0,2	-	-	0,35	0,3	0,21	13,8x21,9x21,9	646.0042S34	2	
CC3-K20-NR	-30..200	1	11,4x14,6	5,9	20	2,6	0,2	-	-	0,35	0,3	0,21	13,8x21,9x21,9	646.0043S34	2	
K20-cc-NR	-30..200	1,5	11,4x13,0	5,9	20	8,7	0,7	5,8	0,4	0,35	0,3	0,21	13,8x21,9x22,2	2011.0004.04	2	
CC1-K25-NR	-30..200	1	11,4x14,6	7,9	25	2,6	0,2	-	-	0,35	0,3	0,21	13,8x21,9x23,8	647.0045S34	2	
CC2-K25-NR	-30..200	1	11,4x14,6	7,9	25	2,6	0,2	-	-	0,35	0,3	0,21	13,8x21,9x23,8	647.0042S34	2	
CC3-K25-NR	-30..200	1	11,4x14,6	7,9	25	2,6	0,2	-	-	0,35	0,3	0,21	13,8x21,9x23,8	647.0043S34	2	
K25-cc-NR	-30..200	1,5	11,4x13,0	7,9	25	8,7	0,7	5,8	0,4	0,35	0,3	0,21	13,8x21,9x24,2	2012.0004.04	2	

Safety class FL, III



Compatible Control Cooling Baths

The K6 models are compact refrigeration bath circulators for temperatures from -25 to 200°C. These units are a combination of a miniature refrigerated bath and immersion circulator CC1, CC2 or CC3, in combination with a pump adapter they are suitable for external applications. The combination with the immersion circulator CC-E with its suction/pressure pump is suitable for externally open and closed applications. The temperature stability is better than 0.02 K to DIN 12876. The K6 models and the powerful K6s-CC are low cost alternatives to the Ministat 125, the smallest refrigeration circulator in the world and bestseller since 1976.

| K6-cc |
| K6s-cc | NEW



| CC1-K6 | | CC2-K6 | | CC3-K6 |

Model	Working Temperature Range (°C)	Heating Power (kW)	Bath			Pump Data				Cooling Power (kW)			Dimensions WxDxH (inch)	Cat.No.	G	Price
			Opening (inch)	Depth (inch)	Volume (ltr)	max. Pressure (gpm)	max. Suction (bar)	max. Suction (gpm)	max. Suction (bar)	0	-10	-20				
CC1-K6-NR	-25..200	1,5	5,5x5,5	5,9	4,5	2,6	0,2	-	-	0,15	0,1	0,05	8,3x14,6x21,1	666.0031S34	2	
CC2-K6-NR	-25..200	1,5	5,5x5,5	5,9	4,5	2,6	0,2	-	-	0,15	0,1	0,05	8,3x14,6x21,2	666.0032S34	2	
CC3-K6-NR	-25..200	1,5	5,5x5,5	5,9	4,5	2,6	0,2	-	-	0,15	0,1	0,05	8,3x14,6x21,2	666.0033S34	2	
K6-cc-NR	-25..200	1,5	5,5x4,7	5,9	4,5	8,7	0,7	5,8	0,4	0,15	0,1	0,05	8,3x14,6x21,5	2008.0003.04	2	
K6s-cc-NR	-25..200	1,5	5,5x4,7	5,9	4,5	8,7	0,7	5,8	0,4	0,21	0,15	0,05	8,3x15,8x21,5	2008.0004.04	2	

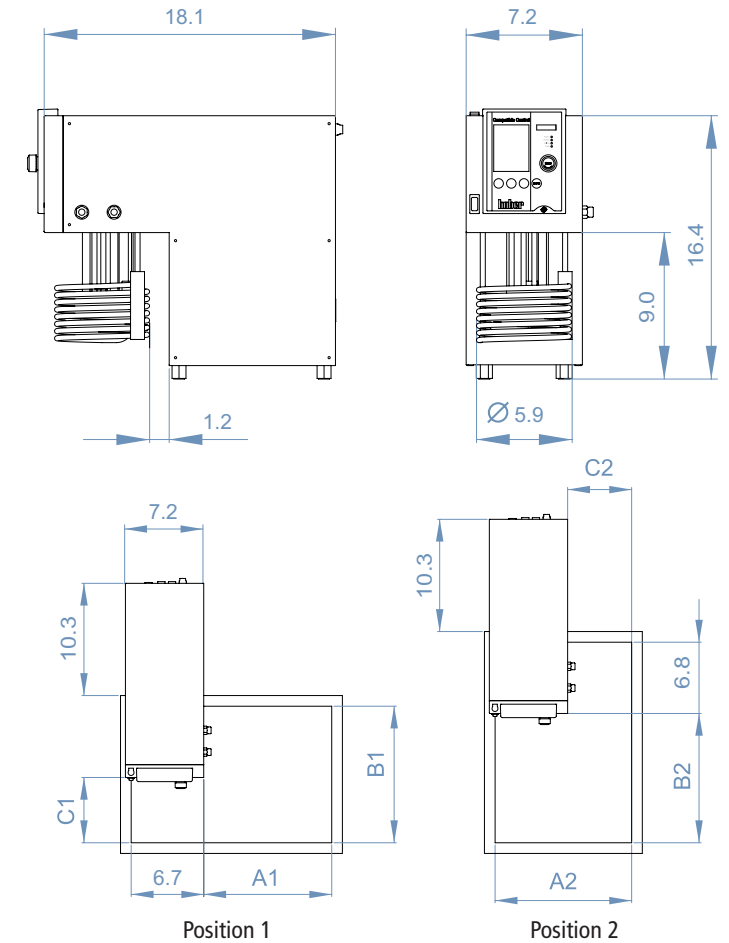
Option: Natural Refrigerant available on request



Variostat cc – the cooling thermostat for a variety of baths

This unique immersion circulator can thermoregulate a wide range of baths between -30°C and 150°C. This innovative construction allows the user ultimate flexibility. The circulation can be adjusted to suit the bath size using the stepless variable speed suction/pressure pump. The pump can also be controlled with an optional pressure sensor for external applications.

Insulated stainless steel baths are available in three standard sizes or made to measure. A drain is fitted as standard on the short side, on request this can be fitted on the long side. The order number has an L added to indicate the drain on the long side (Example 6052-L), see drawing.



Volume (Liter)	End-Temp. (°C)	Cooling Time* (min) with Ethanol to			free Bath Opening (inch)					
		0°C	-10°C	-20°C	Position 1			Position 2		
5,5	-30	15	30	55	3,3	6,3	-	6,3	3,3	-
11,0	-25	30	60	110	7,9	7,9	1,1	7,9	7,8	1,2
22,0	-20	65	130	240	11,8	12,6	5,8	12,6	11,7	5,9

*Cooling time, measured with 2/3 of bath covered

Insulated baths see Page 68

Model	Working Temperature Range (°C)	Bath Volume (ltr)	Heating Power (kW)	Pump Data				Cooling Power (kW) at (°C)					Cat.No.	G	Price
				max. Pressure (gpm)	max. Suction (bar)	max. Suction (gpm)	max. Suction (bar)	100	20	0	-20	-30			
variostat cc	-30..150	variable	1,0	4,7	0,6	3,2	0,3	0,3	0,3	0,2	0,12	0,03	2013.0002.04	2	

3 controller options

Option: Natural Refrigerant available on request

Temperature Stability to DIN 12876: 0,02 K

All stainless steel ministats set the standard in the compact class

Ministats – exceptionally compact and powerful – the smallest cooling thermostat in the world since 1976. Its compact form allows it to be placed in a small space, e.g. in a laboratory extract hood. All three ministats are now available with air- or water-cooling. The maximum ambient temperature is +40°C. A powerful variable speed pressure/suction pump can thermoregulate either objects in the bath and/or external applications. The maximum pressure can be controlled using an optional pressure sensor. VPC (variable pressure control) protects delicate glassware. This small volume and high power means exceptionally rapid heating and cooling rates are achieved. Displacement inserts (optional) reduce the bath volume by approximately 50 % amplifying this effect. All models have Active Cooling Control for cooling power control at the maximum working temperature and an automatic cooling power regulation for energy saving operation and reduced heat dissipation into the lab.

The bath opening is large enough to allow small objects to be thermoregulated in the bath. All parts in contact with the thermofluid are made of stainless steel or high quality plastic. Ministats have the CC-Pilot with Plug&Play-Technology (proven since 1980). In the event of service the controller can be simply swapped. Using a data cable the ministat can be remotely controlled. The CC-Pilot has a state of the art microprocessor controller and a high precision temperature measurement system for exact and reproducible temperature control. The functionality and TFT-display are supported by Easy Control. Ministats can be fitted with a ComBox (NAMUR Standard) and so be integrated in a process control system. Typical applications for the smallest cooling thermostat in the world are external closed systems e.g. photometer, refractometer and viscosimeter.



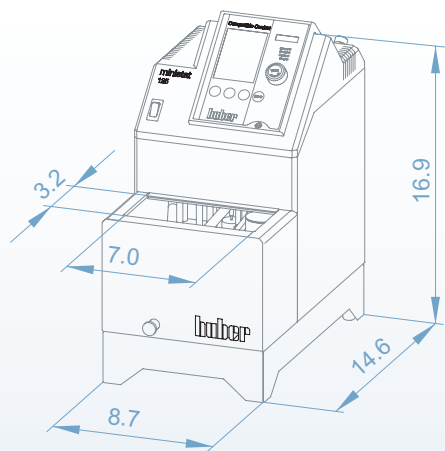
| ministat 240-cc |



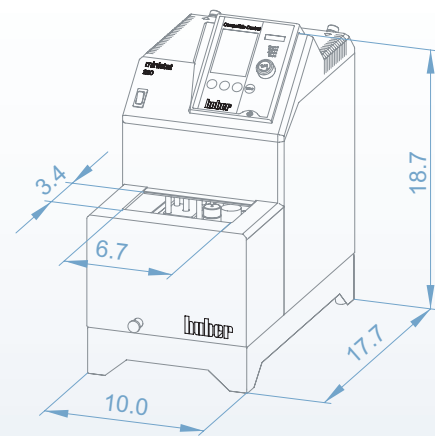
| ministat 230-cc |



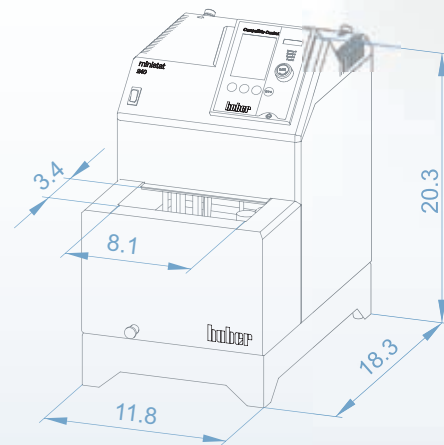
| ministat 125-cc |



| ministat 125-cc |



| ministat 230-cc |



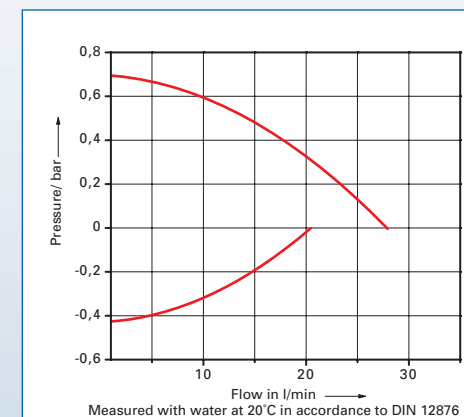
| ministat 240-cc |

Features

- Compact ergonomic design
- CC-Pilot with Plug & Play technology
- Large TFT-display, bright LCD-display with zoom function and display resolution 0.1°C
- EASY Control
- RS232 interface and connection for optional ComBox (NAMUR Standard)
- Steplessly variable pump speed for homogeneous temperature distribution in bath or optimal circulation and heat transfer in external applications
- Active Cooling Control
- Pt100 External-Sensor
- Calibrateable temperature sensor
- Adjustable over temperature and level protection
- Low level early warning system
- Compliant with DIN12876-1 class 3
- Pump connections for external applications
- Bath opening for thermoregulation of objects in bath
- Drain on front
- **Increased functionality with E-grade (Option):** True Adaptive Control – self optimising internal and cascade control
Display resolution 0.01 K
Integrated programmer with 3 programs each with 5 segments or up to 100 segments distributed over 10 programs
Ramp function for quick temperature changes
Multi point calibration of temperature sensor
- **Increased functionality with accessories (Option):** External pressure sensor for VPC pressure control
Combox (NAMUR Standard): (RS232, RS485, programmable volt-free contact, ECS (external control signal), Level monitoring), Calibration and displacement insert.

VPC
Variable Pressure Control

Plug & Play



Model	Working Temperature Range (°C)	Bath		Heating Power (kW)	Pump Data				Cooling Power (kW) at (°C)			Cat.No	G	Price
		Volume (ltr)	Depth (inch)		max. Pressure (gpm)	max. Suction (gpm)	20	0	-20					
ministat 125-cc	-25..150	2,75/1,3*	4,7	1,0	7,1	0,7	5,3	0,4	0,30	0,21	0,05	2014.0003.04	2	
ministat 125w-cc	-25..150	2,75/1,3*	4,7	1,0	7,1	0,7	5,3	0,4	0,30	0,20	0,10	2014.0004.04	2	
ministat 230-cc	-33..200	3,2/1,7*	5,3	1,5	7,1	0,7	5,3	0,4	0,40	0,35	0,25	2015.0003.04	2	
ministat 230w-cc	-33..200	3,2/1,7*	5,3	1,5	7,1	0,7	5,3	0,4	0,40	0,35	0,25	2015.0004.04	2	
ministat 240-cc	-40..200	4,9/2,8*	6,2	2,0	7,1	0,7	5,3	0,4	0,55	0,50	0,35	2016.0003.04	2	
ministat 240w-cc	-40..200	4,9/2,8*	6,2	2,0	7,1	0,7	5,3	0,4	0,55	0,50	0,35	2016.0004.04	2	

* with displacement insert

Option: Natural Refrigerant available on request

Temperature Stability to DIN 12876: 0,02K

Refrigeration Bath Circulators

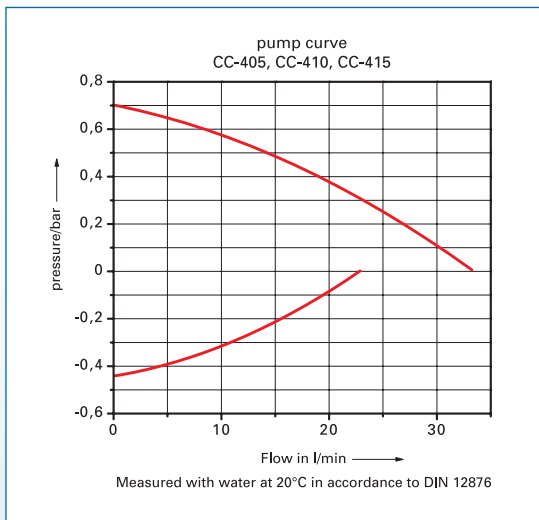
HUBER refrigerated bath circulators in the classic form perform safe and repeatable heating and cooling tasks in the lab. 19 models covering the range -90 to 200°C with a selection of heating and cooling powers are available with air- or water-cooled (w) refrigeration machines. Natural refrigerants for environmentally friendly operation are available on request. A powerful variable speed pressure/suction pump allows the thermoregulation of objects in the bath or external applications. The pump speed is steplessly controlled. In combination with an optional pressure sensor the maximum pressure can be controlled. VPC (variable pressure control) ensures the best circulation and protects delicate glass apparatus from breakage due to overpressure. Small volume and high heating and cooling powers result in the shortest heating and cooling rates. Displacement inserts (optional) reduce the bath volume by half increases this effect. Additionally the bath surface area is reduced and the moisture absorption also. The calibration insert (optional) allows all HUBER refrigeration circulators to be used

as calibration baths. The calibration insert ensures an even temperature distribution with a temperature stability of +/-0.01K. All models have Active Cooling Control for cooling power control at the maximum working temperature and an automatic cooling power regulation for energy saving operation and reduced heat dissipation into the lab. Depending on the model carry handles or rollers are fitted for easy transportation. The drain is located on the front of the unit to enable simple drainage of the bath. The cover

plate is thermoregulated to avoid condensation. All models have the CC Pilot with Plug&Play technology: In the event of service the controller can be simply swapped. The CC Pilot can be used as a remote control (with data cable). The CC Pilot is a high tech microprocessor based controller with a high precision measurement system for exact and reproducible results. The wide ranging functionality is supported by a large TFT display and simple operation. HUBER refrigeration circulators can be equipped with a Combox to the Namur standard to enable integration in a process control system. Depending on the bath dimensions objects can be thermoregulated in a bath. Typical applications for these classics are the thermoregulation of externally closed systems, e.g. photometer, refractometer, viscosimeter, double-jacketed reactors and autoclaves. They are used in miniplants, kilo labs, for stock point measurement, for low temperature calibration, for petroleum tests and many more applications.



| CC-405 |



Model	Working Temperature Range (°C)	Bath		Heating Power (kW)	Pump Data				Cooling Power (kW) at (°C)						Cat.No	G	Price
		Volume (ltr)	Depth (inch)		max. Pressure (gpm) (bar)	max. Suction (gpm) (bar)	100	20	0	-20	-30	-40					
CC-405	-40..200	5	5,9	1,2	8,7	0,7	5,8	0,4	0,7	0,7	0,7	0,45	0,18	0,03	2017.0003.04	2	
CC-405w	-40..200	5	5,9	1,2	8,7	0,7	5,8	0,4	0,7	0,7	0,7	0,45	0,18	0,03	2017.0004.04	2	
CC-415	-40..200	5	5,9	1,2	8,7	0,7	5,8	0,4	1,2	1,2	1,0	0,6	0,2	0,05	2018.0007.04	2	
CC-415wl	-40..200	5	5,9	1,2	8,7	0,7	5,8	0,4	1,2	1,2	1,0	0,6	0,2	0,05	2018.0009.04	3	

* with displacement insert Option: Natural Refrigerant available on request Temperature Stability to DIN 12876: 0,02K

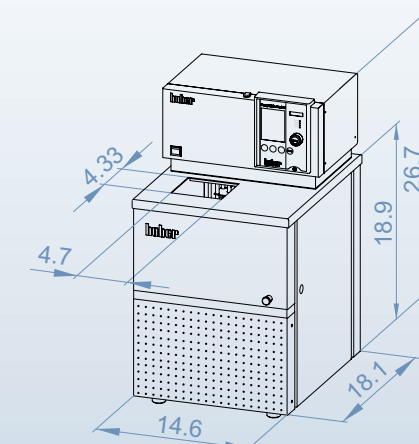


| CC-415wl |

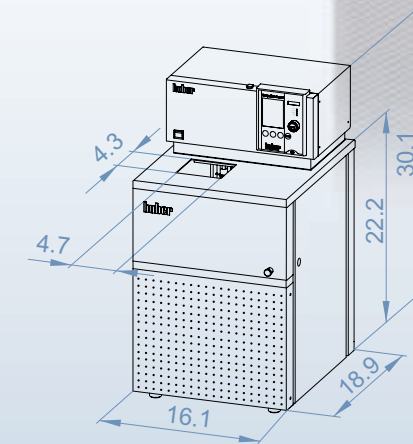
| CC-410wl |

VPC
Variable Pressure Control

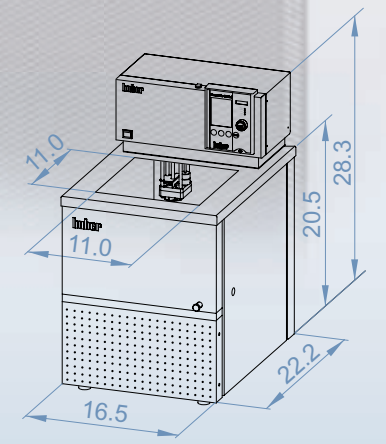
Plug & Play



| CC-405, CC-405w |



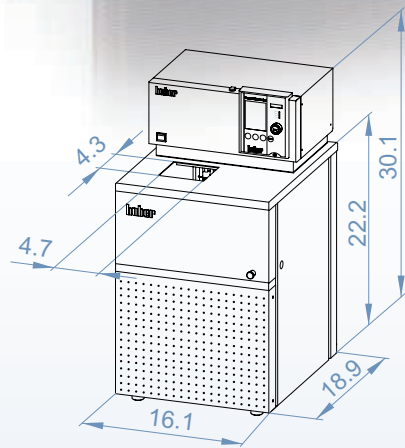
| CC-415, CC-415wl |



| CC-410wl |



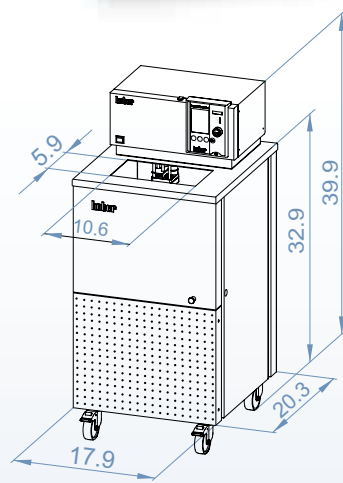
| CC-505 |



| CC-505, CC-505wl |



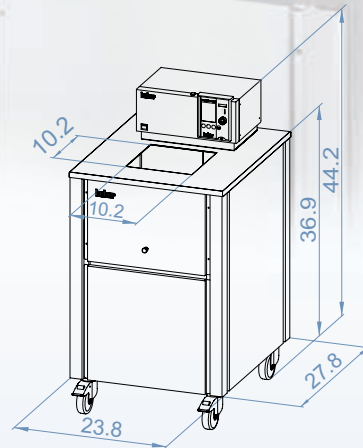
| CC-510 |



| CC-510, CC-510w, CC-515w |



| CC-515 |



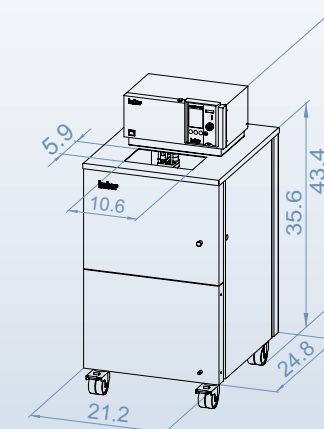
| CC-515 |

Features

- Compact ergonomic design
 - CC-Pilot with Plug & Play technology
 - Display and function keys protected against splashing
 - Large TFT-display, bright LCD-display with zoom function and display resolution 0.1°C
 - EASY Control: simple operation with rotary knob and function keys
 - All menu functions listed alphabetically
 - RS232 interface and connection for optional ComBox (NAMUR Standard)
 - Steplessly variable pump speed for homogeneous temperature distribution in bath or optimal circulation and heat transfer in external applications
 - Active Cooling Control – mechanical cooling up to maximum working temperature
 - Intelligent energy management with cooling power control for energy saving and environment friendly operation and reduced heat emission
 - Pt100 External-Sensor connection via 4-wire Lemos-a-plug
 - Calibrateable temperature sensor
 - Adjustable over temperature and level protection
 - Low level early warning system
 - Compliant with DIN12876-1 class 3
 - Pump connections for external applications
 - Bath opening for thermoregulation of objects in bath
 - Drain on front
- **Increased functionality with E-grade (Option):**
 - True Adaptive Control – self optimising internal and cascade control
 - Display resolution 0.01 K
 - Integrated programmer with 3 programs each with 5 segments or up to 100 segments distributed over 10 programs
 - Ramp function for quick temperature changes
 - Multi point calibration of temperature sensor
 - **Increased functionality with accessories (Option):**
 - External pressure sensor for VPC pressure control
 - Combox (NAMUR Standard): (RS232, RS485, programmable volt-free contact, ECS (external control signal), Level monitoring), Calibration and displacement insert



| CC-520w |



| CC-525w |

Model	Working Temp. Range (°C)	Bath		Heating power (kW)	Pump Data				Cooling Power (kW) at (°C)					Cat.No.	G	Price
		Volume (ltr)	Depth (inch)		max. Pressure (gpm)	max. Suction (bar)	max. Suction (gpm)	max. Suction (bar)	100	20	0	-20	-40			
CC-505	-50..200	5	5,9	1,2	8,7	0,7	5,8	0,4	1,2	1,2	1,0	0,6	0,15	2018.0010.04	2	
CC-505wl	-50..200	5	5,9	1,2	8,7	0,7	5,8	0,4	1,2	1,2	1,0	0,6	0,15	2018.0011.04	3	
CC-510	-50..100	18/11*	7,9	2,4	8,2	0,6	6,3	0,35	2,1	2,1	2,1	1,0	0,4	2020.0004.04	2	
CC-510w	-50..100	18/11*	7,9	2,4	8,2	0,6	6,3	0,35	2,4	2,4	2,4	1,0	0,4	2020.0005.04	2	
CC-515	-55..100	26/15*	7,9	3,0	8,2	0,6	6,3	0,35	3,3	3,3	3,3	1,6	0,6	2021.0002.04	2	
CC-515w	-55..100	18/11*	7,9	3,0	8,2	0,6	6,3	0,35	3,3	3,3	3,3	1,6	0,6	2020.0006.04	2	
CC-520w	-55..100	17/10*	7,9	3,0	8,2	0,6	6,3	0,35	5,0	5,0	5,0	3,0	1,5	2022.0002.04	3	
CC-525w	-55..100	17/10*	7,9	3,0	8,2	0,6	6,3	0,35	7,0	7,0	5,0	3,0	1,5	2023.0002.04	3	

Function version available by E-grade * with displacement insert Option: Natural Refrigerant available on request Temperature Stability to DIN 12876: 0,02 K

The CC-805 is a low cost alternative for low temperature applications when low power is required.



| CC-805 |



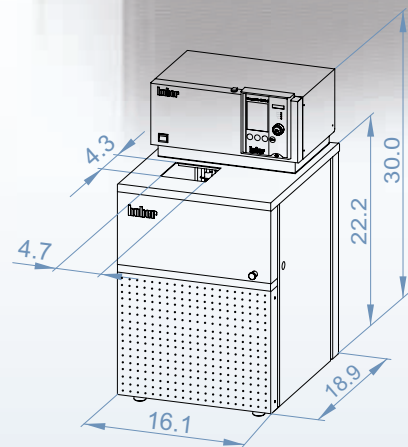
| CC-820 |



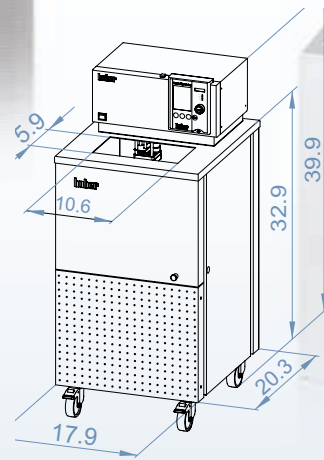
| CC-815 |



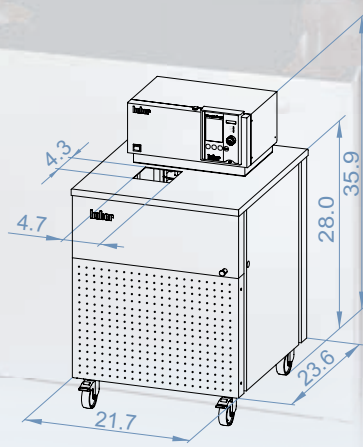
| CC-905 |



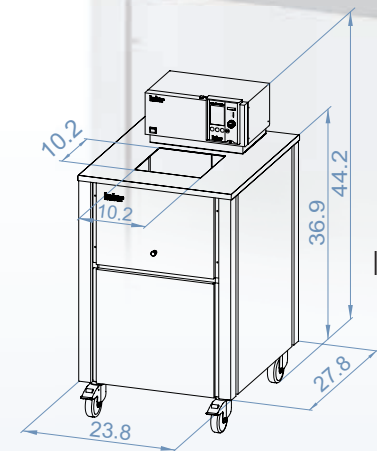
| CC-805 |



| CC-820, CC-820w |

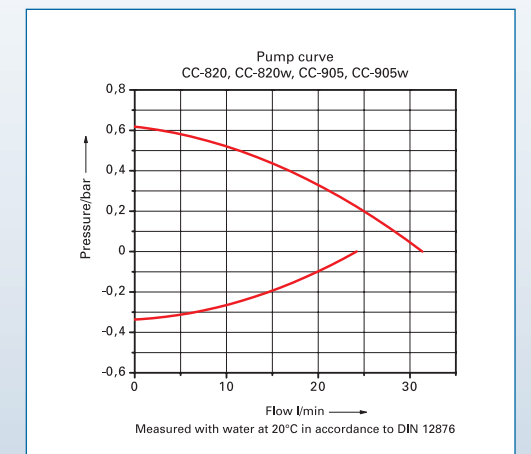
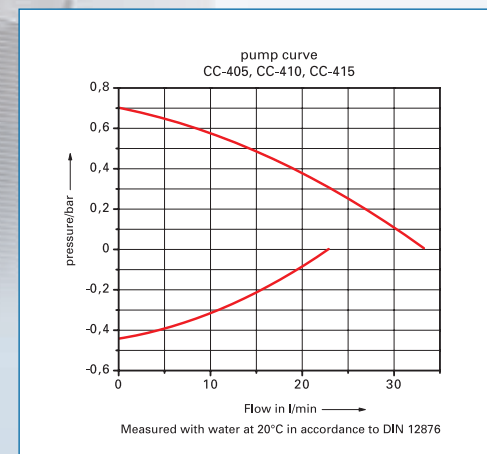


| CC-815 |



| CC-905, CC-905w |

Pump Data



Model	Working Temp. Range (°C)	Bath		Heating Power (kW)	Pump Data				Cooling Power (kW) at (°C)					Cat.No.	G	Price	
		Volume (ltr)	Depth (inch)		max. Pressure (gpm) (bar)	max. Suction (gpm) (bar)	100	20	0	-20	-40	-60					
CC-805	-80..100	5	5,9	1,2	8,7	0,7	5,8	0,4	0,5	0,5	0,5	0,4	0,3	0,3	2024.0002.04	2	
CC-815	-85..100	5	5,9	1,5	8,7	0,7	5,8	0,4	1,0	1,0	1,0	0,8	0,75	0,6	2026.0002.04	3	
CC-820	-80..100	17/10*	7,9	3,0	8,2	0,6	6,3	0,35	1,2	1,2	1,2	1,1	0,9	0,6	2025.0003.04	3	
CC-820w	-80..100	17/10*	7,9	3,0	8,2	0,6	6,3	0,35	1,2	1,2	1,2	1,1	0,9	0,6	2025.0004.04	3	
CC-905	-90..100	26/15*	7,9	3,0	8,2	0,6	6,3	0,35	2,0	2,0	2,0	1,9	1,7	1,0	2027.0003.04	3	
CC-905w	-90..100	26/15*	7,9	3,0	8,2	0,6	6,3	0,35	2,0	2,0	2,0	1,9	1,7	1,0	2027.0004.04	3	

Function version available by E-grade * with displacement insert Option: Natural Refrigerant available on request Temperature Stability to DIN 12876: 0,02 K





Flow-through Chillers

The "Flow-through Chillers" are designed for simple, low demand cooling applications. They are commonly used in combination with the CC202C or CC205B series to remove heat in order to cool a process back to room temperature.

Model	Working Temp. Range (°C)	Cooling Power (kW) at			Dimensions W x D x H (inch)	Cat.No	G	Price
		0°C	-10°C	-20°C				
DC30	-30..50	0,2	0,15	0,07	7,5x9,8x14,2	3000.0002.99	2	
DC31	-30..50	0,4	0,35	0,10	9,8x12,2x15,7	3001.0002.99	2	
DC32	-30..50	0,6	0,47	0,12	11,0x13,4x18,1	3002.0002.99	2	

| DC30 |

Immersion Coolers

"Dip" or "Immersion" coolers are ideal for simple cooling applications when low temperatures are required such as vapour traps or for cooling individual flasks. They are also commonly used to remove heat from the baths in the "A" and "B" series. The units with an "E" have the capability to control the temperature to a stability of +/- 0,5 K to DIN 12876. All models can be delivered with a flexible evaporator coil (no extra cost). The model name and Cat.No. get the addition "F". Flexible probes & custom probes available.



| TC100E |

| TC50 |

| TC45-F |

Model	Working Temp. Range (°C)	Cooling Power (W) at				Dimensions WxDxH (inch)	Cat.No. „Standard“	G	Price	Cat.No. with flexible evaporator	G	Price
		0°C	-20°C	-30°C	-90°C							
TC45	-45..100	240	180	100	-	7,5x11,6x14,6	3003.0005.99	2		3003.0007.99	2	
TC45E	-45..100	240	180	100	-	7,5x11,6x14,6	3003.0006.99	2		3003.0008.99	2	
TC50	-50...50	300	260	200	-	10,2x13,0x16,3	3004.0005.99	2		3004.0007.99	2	
TC50E	-50...50	300	260	200	-	10,2x13,0x16,3	3004.0006.99	2		3004.0008.99	2	
TC100	-100..40	160	150	140	70	11,6x18,5x22,0	3005.0005.99	2		3005.0007.99	2	
TC100E	-100..40	160	150	140	70	11,6x18,5x22,0	3005.0006.99	2		3005.0008.99	2	

Polycarbonate Baths

All models are designed to operate up to a maximum temperature of 100°C.



Model	Dimensions WxDxH (inch)	Opening (inch)	Bath Depth (inch)	Volume (ltr)	Cat.No.	G	Price
106A	5,2x15,0x6,3	4,7x14,3	5,9	6	6006	1	
106A-E	5,6x12,0x6,3	5,1x11,4	5,9	6	30527	1	
107A	5,2x18,9x6,3	4,7x18,3	5,9	7	6007	1	
108A-E	5,6x15,9x6,3	5,1x15,4	5,9	8	30528	1	
110A-E	5,6x19,9x6,3	5,1x19,3	5,9	10	30529	1	
111A	13,1x12,3x6,5	11,9x11,7	5,9	11	6008	1	
112A-E	13,1x14,1x6,5	11,9x13,5	5,9	12	30523	1	
118A	13,1x18,6x6,5	11,9x18,0	5,9	18	6009	1	
118A-E	13,1x20,4x6,5	11,9x19,8	5,9	18	30526	1	

Stainless Steel Baths (Insulated)

All models are designed to operate up to a max temperature of 200°C.



| 225B |

| 215B |

| 208B |

Model	Dimensions BxTxH (inch)	Opening (inch)	Bath Depth (inch)	Volume (ltr)	Cat.No.	G	Price
212B	13,8x14,8x8,1	11,4x12,6	5,9	12	6684	1	
215B	13,8x14,8x10,1	11,4x12,6	7,9	15	6012	1	
220B	13,8x21,9x8,1	11,4x19,7	5,9	20	6685	1	
225B	13,8x21,9x10,1	11,4x19,7	7,9	25	6013	1	



| K25, K25-E |

| K15, K15-E |

| K12, K12-E |

Refrigerated Baths

The refrigerated baths K12 to K25 use natural refrigerants. The immersion circulator does the temperature control. In combination with an immersion circulator these refrigerated baths can cover the complete temperature range. The refrigeration system offers active cooling, in continuous operation over the complete working range.

Model	Temperature Range (°C)	Bath Opening WxD (inch)	Bath Depth (inch)	Volume (ltr)	Cooling Power (kW) at			Dimensions WxDxH (inch)	Cat.No.	G	Price
					0°C	-10°C	-20°C				
K12-NR	-20..200	11,4 x 12,6	5,9	12	0,2	0,12	0,05	13,8x22,0x10,4	2009.0003.99	2	
K15-NR	-20..200	11,4 x 12,6	7,9	15	0,2	0,12	0,05	13,8x22,0x10,4	2010.0003.99	2	
K20-NR	-30..200	11,4 x 19,7	5,9	20	0,35	0,27	0,16	13,8x21,9x17,6	2011.0003.99	2	
K25-NR	-30..200	11,4 x 19,7	7,9	25	0,35	0,27	0,16	13,8x21,9x17,6	2012.0003.99	2	



Insulated Baths "Variostat"

Insulated stainless steel baths are available in 3 standard sizes or in dimensions to suit customer requirements. The drain is on the short side as standard but can be fitted on the long side on request. The order number has additionally -L (e.g. 6052-L).

Variostat Baths	Bath Volume	Bath Depth	Bath Opening WxD	Cat.No.	G	Price
Standard*	5,5 litre	6,5 inch	10,1 x 6,3 inch	6052	2	
	11 litre	6,5 inch	14,5 x 7,9 inch	6053	2	
	22 litre	6,5 inch	18,4 x 12,6 inch	6054	2	
Ball Valve M16x1				6091	1	
insulated Cover for:				Cat.No.	G	Price
Bath	5,5 litre			6176	2	
Bath	11 litre			6178	2	
Bath	22 litre			6180	2	

*Custom sizes on request

Bath Bridges

Model	Cat.No.	G	Price
Polycarbonate bath 105A, 106A, 107A	6309	1	
Polycarbonate bath 111A, 118A	6310	1	
Stainless steel bath 208B with CC1, CC2, CC3	6303	1	
Stainless steel bath 212B, 215B, 220B, 225B with CC1, CC2, CC3	6308	1	
Refrigerated bath K12, K15, K20, K25	6311	1	
Telescopic bridge for CC1 to CC3 extendible up to max. 25,2 inch	6306	1	
Polycarbonate bath 106A-E, 108A-E, 110A-E	19592	1	
Polycarbonate bath 112A-E, 118A-E	19593	1	
Stainless steel bath 208B with CC-E	19594	1	
Stainless steel bath 212B, 215B, 220B, 225B with CC-E	19595	1	
Refrigerated bath K12, K15, K20, K25 with CC-E	19596	1	



Bath Covers

for stainless steel and refrigerated baths

Model	Cat.No.	G	Price
Bath cover 208B with CC1, CC2, CC3	6214	1	
Bath cover front 212B-225B, K12-K25 with CC1, CC2, CC3	6023	1	
Bath cover back 220B-225B, K20-K25 with CC1, CC2, CC3, CC-E	6024	1	
Bath cover one piece 220B-225B, K20-K25 with CC1, CC2, CC3	6025	1	
Bath cover 208B with CC-E	19597	1	
Bath cover front 212B-225B, K12 – K25 with CC-E	19598	1	
Bath cover one piece 220B-225B, K20 – K25 with CC-E	19599	1	

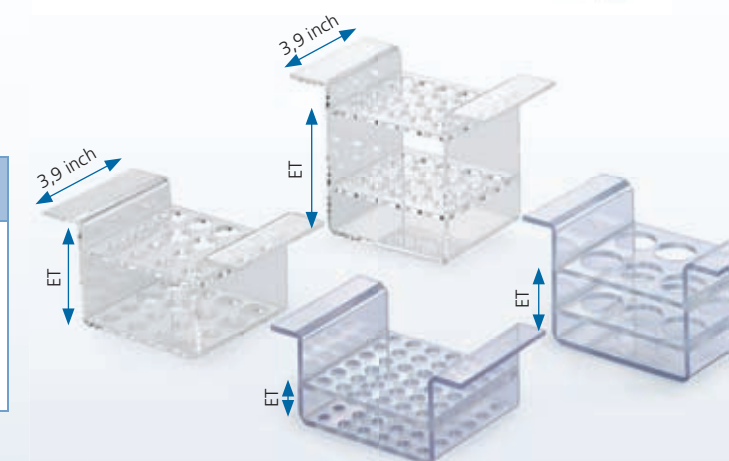


20 litres and larger can be in one or two parts.

Polycarbonate test tube racks

for 105A to 107A, 106A-E to 110A-E

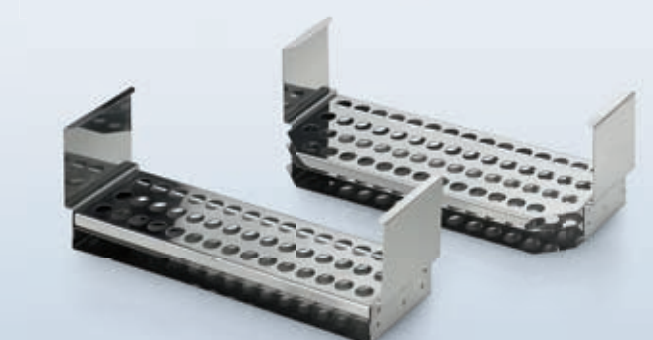
Type	Holes	Immersion Depth (inch)	Cat.No.	G	Price
A	12 x Ø0,9	2,0	6028	1	
B	20 x Ø0,7	2,2	6029	1	
C	20 x Ø0,7	3,7	6030	1	
D	30 x Ø0,5	1,8 (Hemolyse)	6031	1	
E	6 x Ø1,2	2,0	6032	1	
F	36 x Ø0,4	1,0 (Eppendorf)	6033	1	



Stainless steel test tube racks

for 111A, 118A, 112A-E, 118A-E, 212B to 225B and refrigerated baths K12-K25, K12-E to K25-E

Type	Holes	Immersion Depth (inch)	Cat.No.	G	Price
1	36 x Ø0,7	3,9	6037	1	
2	45 x Ø0,5	2,8	6038	1	
3	46 x Ø0,7	3,9	6039	1	
4	58 x Ø0,5	2,8	6040	1	





Adjustable Bases

Available in 3 options

Model	Cat.No.	G	Price
Adjustable base for 118A with CC-1 to CC-3, CC-E	6328	1	
Adjustable base for 111A, 112A with CC-1 to CC-3, CC-E, 212B, 215B, K12, K15 with CC1-CC3	6297	1	
Adjustable base for 220B, 225B, K20, K25 with CC1 to CC3	6298		
Adjustable base 220B, 225B, K20, K25 with CC-E	19655		
Adjustable base 212B, 215B, K12, K15 CC-E	19654		



Trolleys

The stainless steel trolleys make the Compatible Control Thermostate mobile.

Model	Cat.No.	G	Price
K20, K25, K20-E, K25-E	6334	2	
CC805, CC415, CC505	6235	2	
CC410wl	6295	2	
TC100, TC100-F, TC100E, TC100E-F	9442	2	



Unipump Pressure booster

Made of stainless steel for temperatures from -120 to 300°C to compensate for the pressure loss in external systems. The Unipump is connected in series with the pump of compatible control thermostat and can be controlled via the volt-free contact of the ComBox.

Unipump	max. Pressure Increase (bar)	Cat.No.	G	Price
Unipump I M16x1	0,8	527.0001	2	
Unipump I 2 stage M16x1	1,5	527.0002	2	
Unipump I DC M24x1,5	1,0	527.0008	2	
Unipump II M30x1,5	1,5	527.0003	2	
Unipump II 2 stage M30x1,5	2,5	527.0004	2	
Unipump III M38x1,5	1,5	527.0006	2	
Unipump III 2 stage M38x1,5	2,5	527.0007	2	
Control Cable Unipump / unistat (3m)		6221	1	
Control Cable Unipump I / CC (3m)		6222	1	



Controller

Controller	Cat.No.	G	Price
Compatible Control CC1	658.0001	1	
Compatible Control CC2	658.0002	1	
Compatible Control CC3	658.0003	1	
CC-Pilot	658.0020	1	
Wall bracket for CC-Pilot	9493	1	
Table stand for CC-Pilot	9494	1	



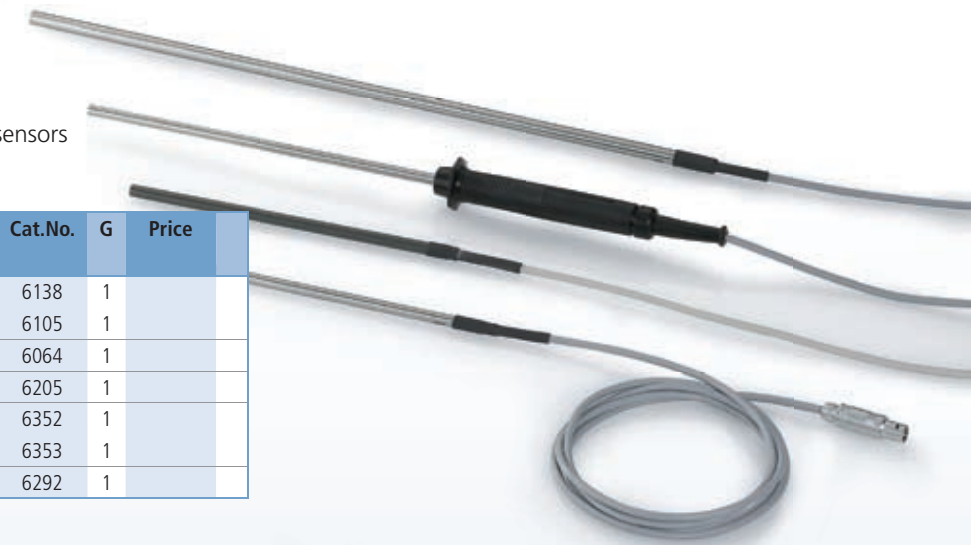
| CC-Pilot |

External Pt100-sensor

For external thermoregulation applications a range of sensors are available. Special versions can be made on request.

Sensors (Standard cable length 1,5 m)	Cat.No.	G	Price
Ø 0,2 inch 7,1 inch	6138	1	
with handle Ø 0,2 inch 7,9 inch	6105	1	
Ø 0,3 inch 15,7 inch	6064	1	
mounted in protective pipe Ø 0,3 inch 6,7 inch	6205	1	
M16x1 sensor for flow or return	6352	1	
M16x1 sensor for flow or return double	6353	1	
Extension cable Pt100, 3m	6292	1	

Sensor with special length available on request



Control cables

for ComBox

Control cables for operation via the RS232, RS485 or the analogue interface (AIF). A range of control cables and plugs are available for ECS (external control signal), programmable volt-free (POKO) and for an external float switch.

Control Cables (Standard length 3 m)	Cat.No.	G	Price
ComBox R232	6146	1	
ComBox RS485	6279	1	
ComBox AIF	9353	1	
ComBox ECS	9491	1	
ComBox POKO	9490	1	
ComBox LEVEL	9492	1	

Cables with special lengths on request



ComBox

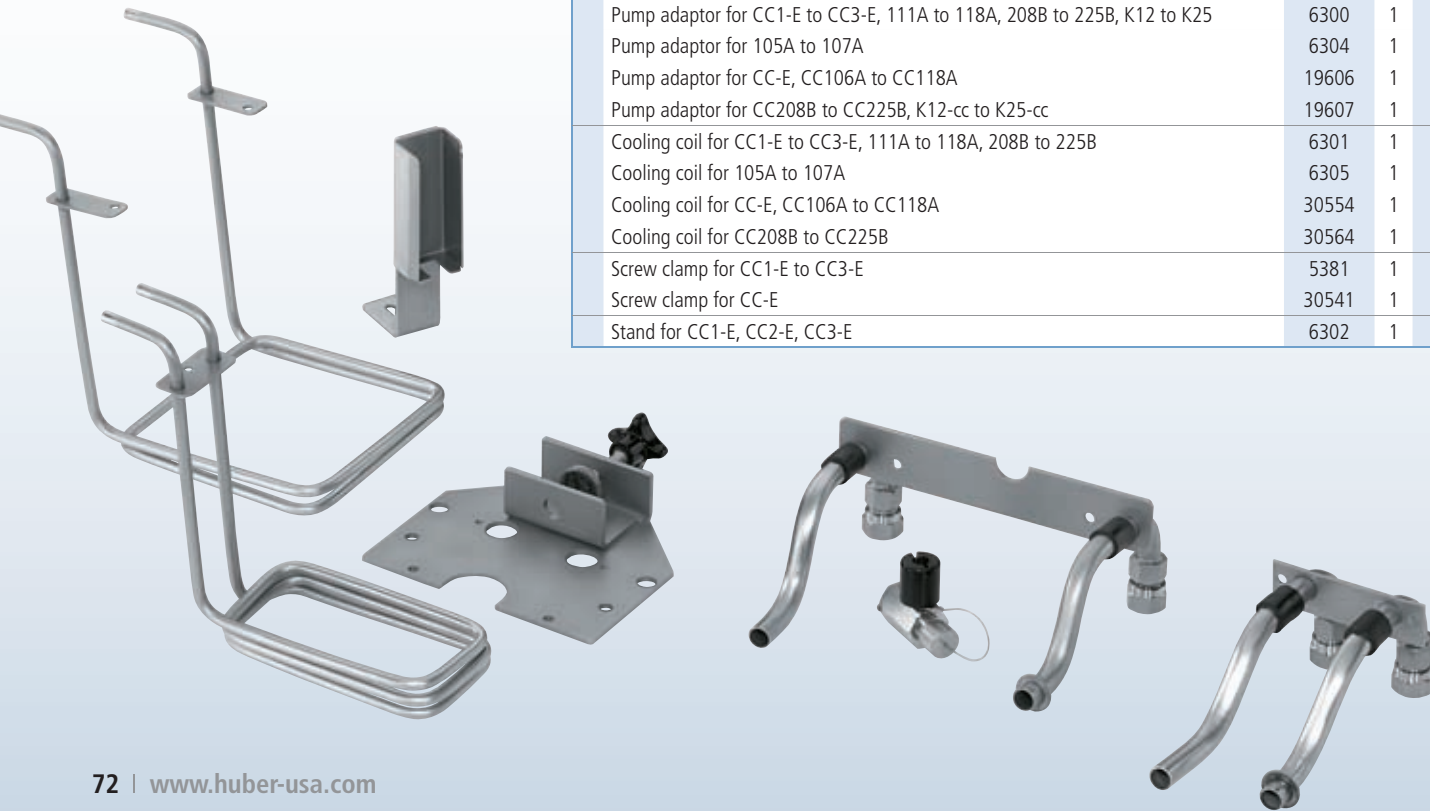
Internal or external ComBox (NAMUR Standard): digital interfaces RS232 and RS485, analog interfaces 4..20mA, programmable volt-free contact (e.g. alarm) and ECS (external control signal). The ComBox can be located externally (e.g. control panel) and communicates with the circulator via one single data cable.



ComBox (NAMUR Standard)	Cat.No.	G	Price
ComBox Ministats, CC internal	31217	1	
ComBox Unistats, CC external	6915	1	

Accessories

	Cat.No.	G	Price
Holder for dip cooler TC45(E)-TC100(E) for mounting on bath	14562	1	
Drain valve with cap	6839	1	
Pump adaptor for CC1-E to CC3-E, 111A to 118A, 208B to 225B, K12 to K25	6300	1	
Pump adaptor for 105A to 107A	6304	1	
Pump adaptor for CC-E, CC106A to CC118A	19606	1	
Pump adaptor for CC208B to CC225B, K12-cc to K25-cc	19607	1	
Cooling coil for CC1-E to CC3-E, 111A to 118A, 208B to 225B	6301	1	
Cooling coil for 105A to 107A	6305	1	
Cooling coil for CC-E, CC106A to CC118A	30554	1	
Cooling coil for CC208B to CC225B	30564	1	
Screw clamp for CC1-E to CC3-E	5381	1	
Screw clamp for CC-E	30541	1	
Stand for CC1-E, CC2-E, CC3-E	6302	1	



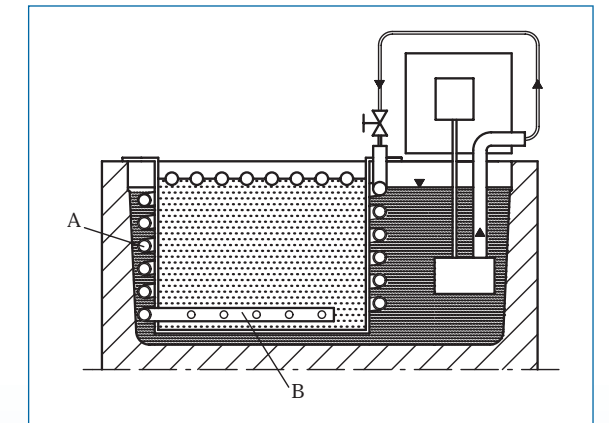
Calibration inserts

Calibration insert	Cat.No.	G	Price
ministat 125	6806	2	
ministat 230	6807	2	
ministat 240	6808	2	
CC410wl	6294	2	
CC505wl – CC520w, CC820	6496	2	
CC515, CC905	6150	2	
CC308B	9355	1	
CC315B	6126	1	



Function principle

The thermofluid at constant temperature flows through the heat exchanger (A) and via the distributor pipe (B) down into the calibrating bath. Temperature fluctuations in the thermostat are evened out in (A). The entire system acts as a calorimeter. There are virtually no gradients and no delay in the case of swift ramps. Temperature stability can be improved by a factor of 5 to 10.



Displacement inserts

Displacement insert	Cat.No.	G	Price
ministat 125	6818	2	
ministat 230	6819	2	
ministat 240	6820	2	
CC410wl	6293	2	
CC505wl – CC520w, CC820	6049	2	
CC515, CC905	6050	2	
CC308B	31973	1	
CC315B	6043	1	
CC205B	6041	1	



Simple options to boost performance

Displacement inserts:

- reduce the liquid volume. Reducing the bath volume reduces the thermal load and leads to faster ramping times.
- reduce the liquid's exposed surface area, which reduces moisture absorption.
- contain the expansion volume HTF and prevent the bath from overflowing.

Beer Force-Ageing-Test Thermostat

We offer a special air or water cooled thermostat unit for the Beer Force-Ageing-Test. Both models are equipped with a comfortable programmer for the usual change between 0°C and 60°C in the usual 24 hour cycle. The BFT 2 is for 20 bottles in the original Eurobox. The CFC free units comply with the safety class FL, III. Ca sings and bath parts are made of Stainless steel.



| BFT2 |



| BFT1 |



Model	Working Temperature Range (°C)	Bath Opening W x D (inch)	Bath Depth (inch)	Heating Power (kW)	Cooling Power at 20°C (kW)	Dimensions WxDxH (inch)	Cat.No.	G	Price
BFT1	0..80	11,0x11,0	5,9	1,5	1,0	16,5x22,2x28,3	2032.0003.04	2	
BFT1w	0..80	11,0x11,0	5,9	1,5	1,0	16,5x22,2x28,3	2032.0004.04	2	
BFT2	0..80	20,9x15,7	14,2	3,0	2,5	26,4x28,1x43,5	2033.0003.04	2	
BFT2w	0..80	20,9x15,7	14,2	3,0	2,5	26,4x28,1x43,5	2033.0004.04	2	

Option: Natural Refrigerant available on request

Flexible solutions for calibration in production



Calibration bath for measurement and control sensors



Calibration baths -110 °C to +300 °C

Calibration baths are used in quality assurance in industry and R&D. This modular concept is based on the combination of a calibration bath and a unistat. The temperature range and rate of change are dependent on the unistat selected. The stainless steel calibration bath is constructed similar to a calorimeter and ensures a good homogeneity. Calibration baths with a diameter of 4,7 inch and a bath depth of 15,7 inch are offered for the calibration of measurement and control sensors. The calibration zone is freely accessible and symmetrical. The top edge of the bath is constructed to allow both accurate reading of glass thermometer and also a well sealed lid if required. A heat exchanger (option) can be fitted to separate the calibration bath fluid from the unistat thermofluid.

Special calibration software can be installed in the unistat and the self-optimising TAC-Technology allows quick changes of calibration temperature. The calibration can be constructed with calibration zones to suit customer requirements.

Advantages

- Highest temperature stability up to ± 0.002 °C
- Temperature homogeneity better than ± 0.01 °C
- external overflow vessel
- special firmware for calibration
- 5-point calibration of the control sensor

Adaptor for M16 x 1	Thread	to	(G1)	Cat.No.	Price
	male	M16 x 1 male		6278	
	female	M16 x 1 female		6359	
	male	1/2" male		6742	
	male	1/2" female		6743	
	female	1/2" male		6744	
	female	1/2" female		6745	
	male	3/4" female		6747	
	female	3/4" female		6749	
	female	M30 x 1,5 male		6431	
	male	M30 x 1,5 male		6449	
	male	M30 x 1,5 female		6454	

Adaptor for M24 x 1,5	Thread	to	(G1)	Cat.No.	Price
	female	M30 x 1,5 male		6723	
	female	M16 x 1 male		6724	
	female	3/4" female		6874	
	male	M16 x 1 female		6945	
	male	1/2" female		9555	
	female	1/2" male		9556	
	male	M24 x 1,5 male		9386	

Adaptor for M30 x 1,5	Thread	to	(G1)	Cat.No.	Price
	male	M30 x 1,5 male		6448	
	female	3/8" male		9552	
	male	1/2" male		9450	
	male	1/2" female		6751	
	female	1/2" male		6752	
	female	1/2" female		6753	
	male	3/4" male		6456	
	male	3/4" female		6755	
	female	3/4" female		6757	
	female	3/4" NPT male		6472	
	male	1" male		13255	
	female	1" female		9454	

Adaptor for 1/2"	Thread	to	(G1)	Cat.No.	Price
	female	1/2" BPT female		6358	
	female	3/4" NPT female		6356	

Adaptor for M38 x 1,5	(G1) Thread	to	Cat.No.	Price
	female	1" NPT male	6600	
	female	M30 x 1,5 male	6612	

M16 x 1		(G1)	Cat.No.	Price
	Hose Connector NW 8		6086	
	Hose Connector NW 12		6087	
	Blank Plug		6088	
	Nut		6089	
	Micro Hose Connector NW 3,2		6090	
	90° Adaptor		6195	
	Ball Valve		6091	
	2-way Header		6194	
	3-way Header		6193	
	4-way Header		6187	
	5-way Header		6815	
	2-way Valve System		6284	
	3-way Valve System		6285	
	4-way Valve System		6286	
	5-way Valve System		6816	

M24 x 1,5		(G1)	Cat.No.	Price
	90° Adaptor		9256	
	Ball Valve		9236	
	2-way Header		9233	
	3-way Header		9234	
	4-way Header		9235	
	2-way Header with Ball Valves		9245	
	4-way Header with Ball Valves		9247	

M30 x 1,5		(G1)	Cat.No.	Price
	90° Adaptor		6461	
	Ball Valve		6451	
	2-way Header		6420	
	3-way Header		6421	
	4-way Header		6422	
	2-way Header with Ball Valves		6423	
	3-way Header with Ball Valves		6463	
	4-way Header with Ball Valves		6464	

M38 x 1,5		(G1)	Cat.No.	Price
	90° Adaptor		6699	
	Ball Valve		6700	
	2-way Header		6706	
	3-way Header		6707	
	4-way Header		6708	
	2-way Header with Ball Valves		6709	
	3-way Header with Ball Valves		6710	
	4-way Header with Ball Valves		6711	

1/2" and 3/4"		(G1)	Cat.No.	Price
	Hose connections 1/2" for 3/8" hose		2294	
	Hose connections 3/4" for 1/2" hose		2295	

Manual bypass		(G1)	Cat.No.	Price
	M24 x 1,5		9339	
	M30 x 1,5		6417	
	M38 x 1,5		9340	

Hoses

Hose*		Temperature Range	Length	Cat.No.	G	Price/m
NW 3,2	PVC	-20...60 °C	variable	6072	1	
NW 8	PVC	-20...60 °C	variable	6071	1	
NW 12	PVC	-20...60 °C	variable	6070	1	
NW 8	Perbunan	-30...80 °C	variable	6075	1	
NW 12	Perbunan	-30...80 °C	variable	6073	1	
NW 8	Silicon	-40...180 °C	variable	6077	1	
NW 12	Silicon	-40...180 °C	variable	6076	1	
NW 8	Viton	-20...180 °C	variable	6079	1	
NW 12	Viton	-20...180 °C	variable	6078	1	
NW 8	Teflon	-60...180 °C	variable	6350	1	
NW 12	Teflon	-60...180 °C	variable	6351	1	

* As protection against condensation or high temperatures, we recommend the insulated hoses listed on page 79.

Hoses, insulated

Plastic hose for optimal thermal performance	Temperature Range	Length	Cat.No.	G	Price
NW 12 OD 1,7 inch M24 x 1,5	-60...260 °C	39.4 inch	9325	1	
NW 12 OD 1,7 inch M24 x 1,5	-60...260 °C	59.1 inch	9326	1	
NW 12 OD 1,7 inch M24 x 1,5	-60...260 °C	78.7 inch	9327	1	
NW 12 OD 1,7 inch M24 x 1,5	-60...260 °C	118.1 inch	9328	1	

Metal hose insulated	Temperature Range	Length	Cat.No.	G	Price
NW 12 OD 1,7 inch M16 x 1	-100...350 °C	39.4 inch	6084	1	
NW 12 OD 1,7 inch M16 x 1	-100...350 °C	59.1 inch	6085	1	
NW 12 OD 1,7 inch M16 x 1	-100...350 °C	78.7 inch	6136	1	
NW 12 OD 1,7 inch M16 x 1	-100...350 °C	118.1 inch	6255	1	
NW 12 OD 1,7 inch M24 x 1,5	-100...350 °C	39.4 inch	9274	1	
NW 12 OD 1,7 inch M24 x 1,5	-100...350 °C	59.1 inch	9275	1	
NW 12 OD 1,7 inch M24 x 1,5	-100...350 °C	78.7 inch	9276	1	
NW 12 OD 1,7 inch M24 x 1,5	-100...350 °C	118.1 inch	9277	1	
NW 12 OD 2,2 inch M24 x 1,5	-120...400 °C	39.4 inch	6784	1	
NW 12 OD 2,2 inch M24 x 1,5	-120...400 °C	59.1 inch	6785	1	
NW 12 OD 2,2 inch M24 x 1,5	-120...400 °C	78.7 inch	6786	1	
NW 12 OD 2,2 inch M24 x 1,5	-120...400 °C	118.1 inch	6787	1	
NW 20 OD 2,2 inch M30 x 1,5	-100...350 °C	39.4 inch	6426	1	
NW 20 OD 2,2 inch M30 x 1,5	-100...350 °C	59.1 inch	6386	1	
NW 20 OD 2,2 inch M30 x 1,5	-100...350 °C	78.7 inch	6427	1	
NW 20 OD 2,2 inch M30 x 1,5	-100...350 °C	118.1 inch	6428	1	
NW 25 OD 2,5 inch M38 x 1,5	-100...350 °C	39.4 inch	6655	1	
NW 25 OD 2,5 inch M38 x 1,5	-100...350 °C	59.1 inch	6656	1	
NW 25 OD 2,5 inch M38 x 1,5	-100...350 °C	78.7 inch	6657	1	
NW 25 OD 2,5 inch M38 x 1,5	-100...350 °C	118.1 inch	6658	1	

NW = Nominal width (mm) OD = outer diameter

Cooling Water Hoses

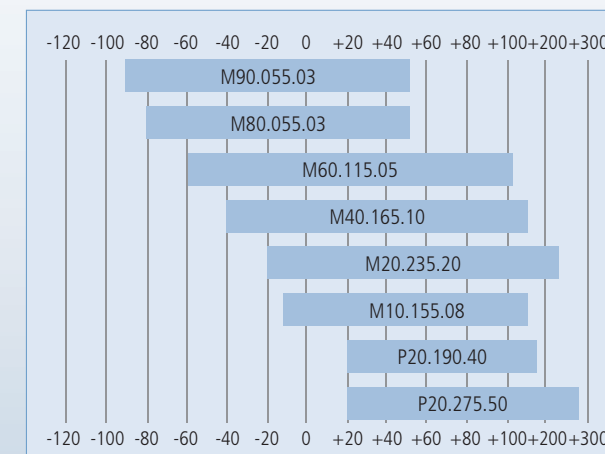
Cooling Water Hose (Flexible braided hose)	Temperature Range	Length	Cat.No.	G	Price
1/2"	-10...100 °C	39.4 inch	16851	1	
1/2"	-10...100 °C	59.1 inch	16852	1	
1/2"	-10...100 °C	78.7 inch	16853	1	
3/4"	-10...100 °C	39.4 inch	16854	1	
3/4"	-10...100 °C	59.1 inch	16855	1	
3/4"	-10...100 °C	78.7 inch	16856	1	
1"	-10...100 °C	39.4 inch	16857	1	
1"	-10...100 °C	59.1 inch	16858	1	
1"	-10...100 °C	78.7 inch	16859	1	

Hose insulation

Hose insulation	Thick-ness	Internal-Ø	Cat.No.	G	Price
Hose: 0,3 inch	0,3 inch	0,5 inch	6083	1	
Hose: 0,5 inch	0,3 inch	0,7 inch	6082	1	
Hose: 0,5 inch	0,5 inch	0,7 inch	3968	1	
metal hose, insulated: M16x1	0,9 inch	1,7 inch	6375	1	
metal hose, insulated: M30x1,5	0,9 inch	2,2 inch	6377	1	
metal hose, insulated: 1/2"	0,9 inch	2,0 inch	6376	1	

Safe thermoregulation: the selection of thermal fluids

Huber thermal fluids have the best possible thermodynamic and environmental characteristics. The correct selection is vitally important and is dependent on the temperature range. Consideration must be given to the safety standards to ensure reliable and safe operation and optimal results. Maximum life of the fluids is also expected. The material safety data sheets are available in the download area of the website. (www.huber-online.com).



Operating range of thermal fluids			
P20.340.32:	plus 20°C	+340°C	32 mm ² /s at 25°C
M40.165.10:	minus 40°C	+165°C	10 mm ² /s at 25°C

Thermal Fluid	Litre	Cat.No. (G1)	Price
MinOil P20.190.40	5	6155	
	20	6156	
SynOil M10.155.08	5	6159	
	10	6160	
SilOil P20.275.50	5	6157	
	10	6158	
SilOil M20.235.20	5	6161	
	10	6162	
SilOil M40.165.10	5	6163	
	10	6164	
SilOil M60.115.05	5	6165	
	10	6166	
SilOil M80.055.03	5	6167	
	10	6168	
SilOil M80.100.03	5	6275	
	10	6276	
SilOil M90.055.03	5	6258	
	10	6259	
Antifreeze (Ethylenglykol)	10	6170	
	50	6171	
Algae Protection	0,1	6172	



A Ambient Temperature Range

Ambient Temperature Range is the permissible temperature range of the environment in which the unit will function. It is 5...32°C for all Huber units in this catalogue. The quoted cooling powers are for an ambient temperature of 20°C.

B Bath Opening

is the usable surface that is available for direct thermoregulation, as a rule over the entire usable depth.

Bath Thermostat

is a thermostat which is equipped with a pump and a bath that contains the object to be thermoregulated. The built-in circulating pump is used to mix the bath liquid, but can also be used if necessary to circulate the thermofluid through an externally connected circuit, e.g. connection of a through-flow cooler to allow the cooling of heating thermostats.

Bath/Circulation Thermostat

is a thermostat with a bath opening which allows objects to be directly thermoregulated in the bath as well as a pump (Compatible Control thermostats have pressure and suction pump) for closed (pressure pump) and open (suction and pressure pumps) external circuits.

Bath Volume (also fill volume)

is the volume of the bath liquid that is required for adequate operation of the thermostat, but without considering the volume of thermofluid in the external circuit. If two values are given, the lower value indicates the minimum required volume with displacement insert, the upper value the permissible maximum amount. The difference is the so-called expansion volume. Especially in the case of external applications, the size of the expansion tank must be considered, since the circulating thermostat must also take up the expansion of the liquid in the external circuit. The smaller the surface area of the expansion tank the lower is the area of thermofluid open to attack from oxidation and air humidity absorption.

C Calibration Thermostat (CAL)

is a bath thermostat with especially high temperature stability and especially consistent temperature distribution through the bath.

Clear-view Thermostat

is a bath thermostat with transparent walls for direct observation of the object being thermoregulated.

D Discharge Pressure

is the positive pressure of the circulating pump of a thermostat directly at the pump discharge. If only one value is given in the tables, then this involves the maximum delivery pressure for flow rate zero. Pump curves illustrate discharge in relation to the flow rate.

E E-grade

stands for electronic upgrade. E-grade can extend the functionality of the CC-Pilot. A unit specific activation code is required. This can be carried out in the factory. If ordered at a later date the activation code can be sent by E-Mail.

Extended Working Temperature Range

Extended Working Temperature Range is the temperature range that can be attained when using a factory-fitted cooling coil when operating with cooling water.

F Flow Rate

is the volume of liquid delivered per time unit by the circulating pump measured with water. If only one value is given in the table, this is the maximum flow rate for a zero discharge pressure. Pump curves illustrate discharge in relation to the flow rate.

H Heat Load

is the maximum capacity of the installed electric heater. The heating is controlled proportionally. The heating is continually controlled, and as the set point temperature is approached the power is reduced automatically.

Heating Thermostat

is a thermostat whose working temperature range is primarily above the ambient temperature adds heat to the thermofluid.

I Immersion Cooler

is an additional chiller with a flexible tube and a cooling coil (evaporator) for immersion cooling of any desired bath.

Immersion Thermostat

is a thermostat that can be combined with a bath and to form a complete unit. Immersion thermostats are equipped with a screw clamp to attach them to any desired bath wall or can be fixed on a stand. Immersion thermostats can also be fitted to a bridge and mounted permanently in a bath.

Industrial Thermostats (UC-Hx)

are refrigerated circulators (Unichiller range) with factory fitted heating. The units have high cooling, heating and pump powers which allow quick cooling and heating rates due to the small internal volumes. They are ideal for temperature control in process technology, within a smaller temperature range (-20..120°C).

Interface, analogue

is used to input the set value or to output the actual value of temperature in analogue form, generally in the form of a current (4...20 mA).

Interface, digital

is used to transfer data between connected units in digital form via data cable. The set and actual temperature values are the main items transferred. The serial RS 232 interface allows a point-to-point connection. This means that at anyone time only two participants such as the thermostat and the PC can communicate with each other via the interface. The RS 485 interface is an addressable interface where up to 32 participants can be connected. Each participant of the bus system has its address.

Intrinsic Temperature

is the operating temperature of a heating thermostat that is reached when the heating is switched off. It depends on the pump power, thermofluid (viscosity and density) used and the insulation of the thermostat, e.g. with or without a cover on the bath.

N Net Cooling Capacity

is the effective capacity available in refrigeration thermostats or circulating chillers. This is the net cooling power of the unit after the frictional heat produced by the circulating pump and the heat entering as a result of non-ideal insulation has been subtracted.

O Operating Temperature Range

Operating Temperature Range is the temperature range that is limited by the permissible lowest and highest operating temperatures.

P Pressure/Suction Pump

This pump has a pressure and a suction stage which are driven by the same motor. The thermofluid is delivered from the pressure stage from the thermostat into the circuit, and the suction stage draws the liquid back into

the thermostat. A pressure/suction pump can be used in just the same way as a pressure pump for a closed circuit. It has the advantage compared to a pressure pump that the pressure in the external circuit falls from positive values (pressure) in the flow line and to negative values (suction) in the return line and is almost zero in the application itself. Thus it is suitable for the thermoregulation of pressure-sensitive glass vessels. Additionally it is possible to thermoregulate an open external circuit (e.g. a bath) with the aid of a pressure/suction pump. This cannot be done with a pure pressure pump, since this delivers thermofluid to the bath. The thermofluid can only be returned to the bath via a suction stage. In any case a so-called constant level device is required to maintain a constant level in the bath and this ensures that the flows of both pump stages are controlled so that they are equal. This is the only way that the level in the external bath can be maintained constant.

Process Control

Often cascade control, is when the temperature control is dictated by the temperature of the connected external application. A temperature sensor (often a Pt100 4 wire configuration with a Lemos plug) is therefore required in the external application, which is connected to the thermostat. The actual value measured at the external application is measured and a set point for the thermostat is continually calculated. Depending on the operating temperature, insulation losses and exothermic reactions, the bath temperature and thus the flow temperature of the thermostat can be considerably above or below the set point. (Always consider the safety limits of the fluid!!)

R Recirculation Thermostat (Unistats)

Is a thermostat in which thermofluid is pumped through an open or closed external circuit. Recirculation thermostats e.g. the Unistats can have a thermally decoupled expansion vessel, whose surface temperature is not the operating temperature. They do not have an accessible bath. Unistats have a thermally developed active surface (expansion vessel), whereby the surface temperature is not necessarily the same as the operating temperature.

Refrigerated Circulator

is a special cooling thermostat which is designed exclusively as a circulation thermostat. Circulation chillers have evolved from thermostats and form a separate range of units in terms of their type of construction (DeskTop, To-

wer), the cooling and pump capacities. Generally they have no accessible bath. They are often used as a substitute for cooling with tap water. (exception: minichiller).

Refrigerated/Heating Thermostat

is a thermostat whose working temperature range is above and below the ambient temperature, and which can either add heat to or extract heat from the bath liquid.

Refrigerant

This is used in the refrigeration unit within the thermostat and extracts the heat from the thermoregulating liquid, when the compressed gas expands in the evaporator. Huber has been completely CFC free since 1992 and HCFC (e.g. R22) free since 1994. Huber uses only refrigerants which do no damage to the ozone layer (ODP Ozone Depletion Potential, ODP=0), and minimal Global warming potential (GWP, i.e. Green house effect).

Refrigerated Thermostat

is a thermostat whose working temperature range is below the ambient temperature and draws heat from the thermofluid. Huber refrigerated thermostats are strictly speaking cooling/heating thermostats, since their working temperature range is above and below the ambient temperature. Heat can be extracted from and added to the thermofluid.

S Safety Classes

It is possible to use non-flammable or flammable bath liquids with thermostats. The relevant safety requirements are given in DIN EN 61010-2-010. There is a distinction made between the NFL classes with built-in over-heating protection that are exclusively for non-flammable liquids and FL (Flammable) with adjustable overtemperature protection and bw level protection for flammable liquids (all Huber thermostats).

Standards

The safety requirements for electrical laboratory equipment, and especially also those for thermostats, have been defined in European standards EN 61010-1 and EN 61010-2-01 0, replacement for DIN 12879, among others. The terms and characteristic of characteristic data is defined in DIN 12876-1 and DIN 12876-2.

Suction Pressure

is the negative pressure of the circulating pump of a thermostat directly at the pump suction. If only one value is given in the tables, then this involves the maximum

suction pressure for zero flow rate. Pump curves illustrate suction pressure in relation to the flow rate.

T Temperature Stability

is half of the temperature difference between the highest and lowest temperatures which are measured for a specific set point after attaining a stable value over a 30 minute period. The details are quoted for 70°C (using water) for a heating thermostat and at -10°C (using ethanol) for a cooling thermostat (see also DIN 12876).

True Adaptive Control

TAC is a Huber designed dynamic adaptive controller that continually updates its PID parameters. The TAC controller constructs a virtual multidimensional model of the application in real time to cope with sudden changes in thermal load such as during an exothermic reaction.

Through-flow Coolers (DC)

are add-on coolers which are connected into an external circuit to upgrade a heating thermostat to a heating/cooling thermostat. They are used to replace water cooling, and also to extend the lower operating temperature.

V Variable Pressure Control VPC

VPC is an active pressure control capability that allows the operator to control to either a maximum set pressure or pump speed. Through this feature it is possible to maintain the highest HTF flow rates within application pressure limitations (e.g. glass reactors).

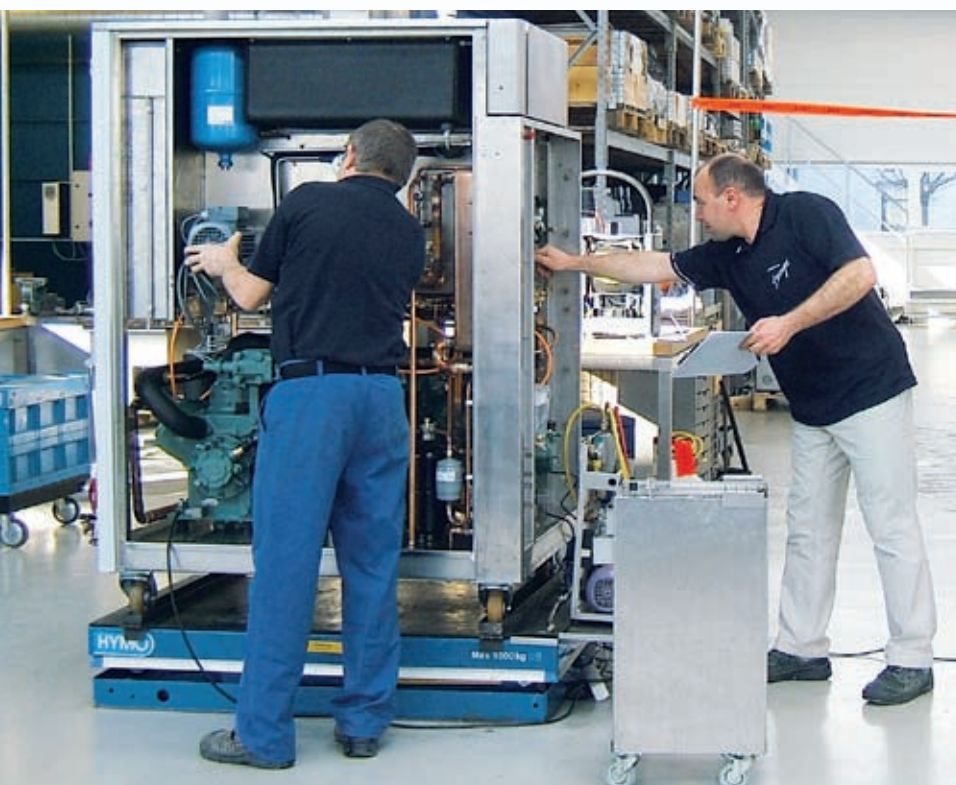
W Working Temperature Range

Working Temperature Range is the temperature range which can be attained at an ambient temperature of 20°C by the thermostat alone and with the exclusive use of electrical energy. In the case of a heating thermostat the working temperature begins above room temperature (as a result of the energy introduced by the pump and the effective insulation) and ends at the upper limit of the operating temperature. The WTR of a refrigeration thermostat begins with the lowest operating temperature of the unit and finishes with the upper temperature at which the refrigeration machine can permanently operate.

Technical details and dimensions are subject to change. No liability is accepted for errors or omissions.



In the Tango-Factory



art@huber

it takes two to tango

art@huber is an art collection created by an artist in the studio of the tango factory. This gallery contains artwork bringing together form and technology to be found no where else in the world. www.art@huber.com



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