

# HB-THERM®

## THERMO-5

### Temperature Control Units

Product Catalogue 2015-10



# Temperature Control Units Thermo-5

Regulated mould temperatures are essential for plastics injection moulding.

Temperature control units regulate mould temperatures through a liquid heat carrier by controlled inducing or dissipating of heat.

Thermo-5 units provide efficient and reliable operation and are used to control temperatures in injection moulding or similar processes.

*...precise, powerful and efficient*

Highly accurate temperature control

- ± 0,1 kelvin with self-optimizing regulation

Fastest heating and cooling times

- the tankless system tempers only as much heat carrier as necessary

Uses lower heating and cooling energy

- Minimal circulation volume requires less power
- Clever cooling concept reduces loss

Low energy stainless steel pump

- Sealless IE2 pump with improved efficiency

*...easy, intelligent and convenient*

Simple operation

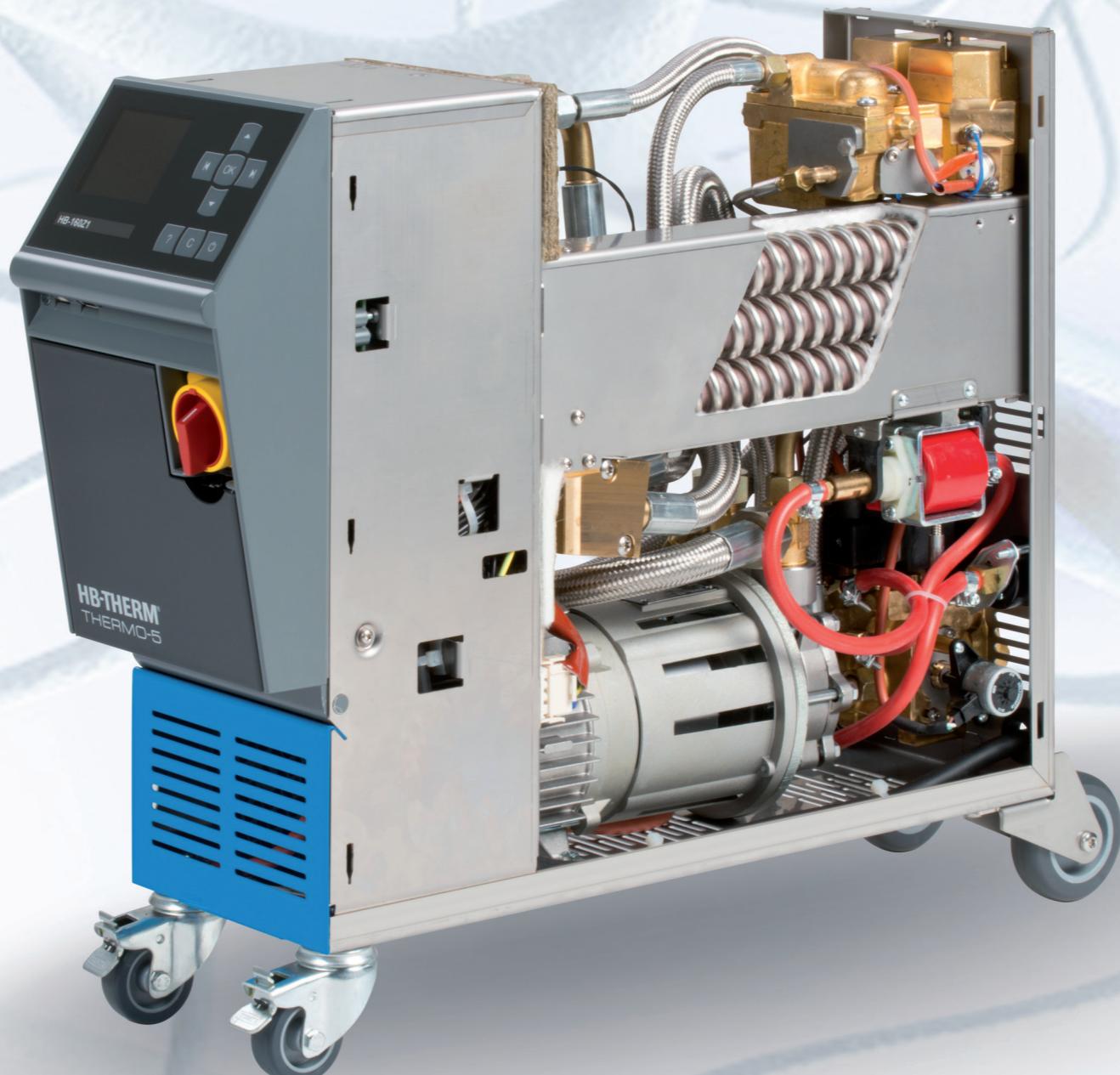
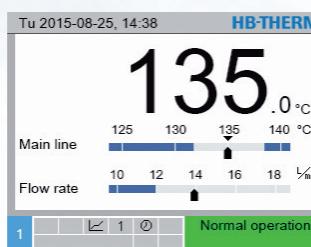
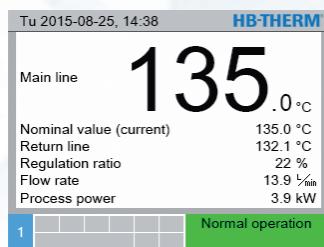
- Well-arranged menus in 18 languages
- Intuitive navigation
- On-the-spot instructions at the push of a button

Bright display

- Easily legible with accentuated contrast
- Free choice of display windows and values

Convenient functions

- Fully automated mould cooling and evacuation
- Recording of data via USB and analysis in Excel
- Store function for mould-specific parameters
- Control also via the machine



*...safe, reliable and low on maintenance*

Fully automated process monitoring

- Continuous monitoring of temperature, flow and pressure
- Highly accurate ultrasonic flow rate measurement
- Detection of hose ruptures and leaks
- Pump status is monitored

Durable construction

- Solely non-corroding materials in the hydraulic circuit
- Heating elements without direct contact to the heat transfer medium
- Bypass and proportional valve result in vaporisation-free cooling without scaling
- Sealless pump in stainless steel

Improved protection for the mould

- Closed system with no oxygen contact
- Completely automatic purging of air
- Active regulation of pressure, only as much as necessary

*...small, clean and quiet*

Squeezes into almost everywhere

- Made possible by ingenious hydraulic modules and a tankless system

Can also be used in a clean room

- Fibre-free insulation, abrasion resistant castors and high-gloss finish

Draws attention only when necessary

- Intelligent monitoring of all processes

# Technical Data

## Standard Equipment

<b>Hydraulics</b>	Closed system without oxygen contact, with efficient automatic deaeration, automatic filling Temperature measurement in main line and return line with sensor Pt 1000 Continuous maintenance-free ultrasonic flow meter Low-scaling and pressure shock-free cooling with cooling water filter and proportional valve Proportionally controlled cooler bypass (on units over 100 °C) Stainless steel pump without mechanical seal; Energy efficiency class IE2 Hydraulic circuit made of non-corroding materials No direct contact between heating elements and heat transfer medium Easy to modify for separate supply of system water Booster pump for system filling (on water units over 100 °C) Controlled superimposed system pressure (on water units) Bypass and return line filter Heat transfer circuit with superimposed cold oil (on oil units) Tank with level measuring for expansion and mould evacuation (on oil units)
<b>Functions</b>	Mould evacuation with pump reverse (on water units in drain) Even load distribution at all heating stages with solid-state relays Auto-tuning cascade control Control on either main line or return line (or external sensor <b>ZE</b> ) Continuous cooling and automatic switch-off programme Change-over to second nominal value Nominal value ramp and ramp programme Cyclical system water exchange selectable
<b>Monitoring / Safety</b>	Automatic limit value setting Monitoring of various process parameters Hose rupture and leakage monitor Sensor failure monitor Pump and heater current monitor Dry-running protection Triple safety cut-out for heating Depressurised at unit OFF Safety relief valve and pressure gauge on rear of unit Automatic phase direction adaptation and phase monitor Lockable and abrasion resistant castors (PUR)
<b>Command / Display</b>	TFT-Colour display 3,5" with interactive user guidance in 18 languages Help button with context sensitive information Display of flow rate, pump pressure and process power Large choice of display windows and values Temperature display in 0,1 °C Units of measurement for temperature, flow rate and pressure can be set Visual and acoustic alarms; volume adjustable Store function for mould specific parameters Display of date and time Timer Hours run counter and service interval display Logbook for alarms Data input password protected
<b>Interface</b>	USB Connection (Host / Device) for software updates, parameter transfer and data recording HB HB-Therm data interface CAN to connect modular units, flow meters Flow-5 and switching units Vario-5 (1 socket Sub-D 15 pin, female)

Note: Modular units do not have a proper command

#### Additional Equipment

<b>ZL</b>	<b>Leak stopper</b>	With automatic depression optimisation (up to 70 °C)
<b>ZB</b>	<b>Connection for alarm and external control</b>	Alarm using potential-free contact (rating max. 250 VAC, 4 A) Unit ON/OFF, ramp programme ON/OFF and switching nominal value 1 or 2 using potential-free contact 1 socket Harting Han 7D (male)
<b>ZE</b>	<b>Connection for external sensor</b>	Thermocouple type J, K, T or Pt 100 in 3-wire system, with selectable production detector 1 socket Audio 5 pin (female)
<b>ZD</b>	<b>Interface DIGITAL</b>	Serial data interface 20 mA, RS-232 or RS-422/485 Various protocols selectable: Arburg, Bühler, Dr. Boy, Engel, Ferromatik Milacron, KraussMaffei, MODBUS (RTU-Mode), Negri Bossi, SPI, Stork, Sumitomo Demag, Wittmann Battenfeld 2 sockets Sub-D 25 pin (female)
<b>ZC</b>	<b>Interface CAN</b>	Serial data interface CAN-bus (Sumitomo Demag) and CANopen (EUROMAP 66) To remotely control singular units 2 sockets Sub-D 9 pin (1 male / 1 female)
<b>ZP</b>	<b>Interface PROFIBUS-DP</b>	Serial data interface PROFIBUS-DP 1 socket Sub-D 9 pin (female); not possible with <b>ZC</b>
<b>ZU</b>	<b>Pump status monitor</b>	Additional pressure sensor in main line
<b>ZK</b>	<b>Keyboard-protection</b>	Transparent flap over display and controls
<b>ZR</b>	<b>Clean room package</b>	Clean room capable version: 'At Rest' < ISO class 6 (class 1000) 'In Operation' ISO class 7 (class 10 000) Fibre-free insulation Quality test with report

Singular unit



Modular unit



Temperature control units Thermo-5 are available as singular or modular units. Contrary to singular units, modular units do not have a proper command and display. They can only be controlled via a singular unit or a control module Panel-5 but thus enable a common changing of parameters as well as a remote control. The units are linked to the master and among each other always via the interface HB.

Further, modular units have a cost advantage over the singular units and are distinguished from the latter by adding the letter **M** to the unit designation (e. g. HB-140ZM1).

Communication (→P. 11, Fig. 1)

100 °C

Single Units  
Water

**Technical Specifications**

Temperature control unit	Heat transfer medium	Water					
		Indirect			Direct		
Type	with maximum main line temperature in °C	HB-100Z			HB-100X		
<b>Heating</b> (→P. 12, Fig. 2)	kW	1	2	3	1	2	3
	8	●			●		
	16		●	●		●	●
	32			○			○
<b>Pump</b> (→P. 12, Fig. 3)	sealless, stainless; 0,5 kW; 30 L/min, 52 m	●	●		●	●	
	sealless, stainless; 1,0 kW; 50 L/min, 70 m	○	○ <sup>1)</sup>	○	○	○ <sup>1)</sup>	○
	stainless; 2,8 kW; 110 L/min, 70 m			●			●
	sealless, stainless; 2,8 kW; 110 L/min, 70 m			○			○
	stainless; 3,5 kW; 160 L/min, 70 m			○			○
	sealless, stainless; 3,5 kW; 160 L/min, 70 m			○			○
<b>Cooling</b> (→P. 12, Fig. 4)	30 kW @ 60 K	A2	●	●			
	38 kW @ 60 K	B1			●	●	
	90 kW @ 60 K	C2		●			
	110 kW @ 60 K	E1					●
<b>Additional equipment</b>	Leak stopper	ZL	○	○			
	Connection for alarm and external control	ZB	○	○	○	○	○
	Connection for external sensor	ZE	○	○	○	○	○
	Interface DIGITAL	ZD	○	○	○	○	○
	Interface CAN	ZC	○	○	○	○	○
	Interface PROFIBUS-DP	ZP	○	○	○	○	○
	Pump status monitor	ZU	○	○	○	○	○
	Keyboard-protection	ZK	○	○	○	○	○
	Clean room package	ZR	○	○	○	○	○
<b>Mains voltage</b>	400 V (380–415 V), 50 Hz; 3LPE	405	●	●	●	●	●
	400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE	406	○	○	○	○	○
	210 V (200–220 V), 50 Hz; 3LPE	215	○	○	○	○	○
	210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE	216	○	○	○	○	○
	460 V (440–480 V), 60 Hz; 3LPE	466	○	○	○	○	○

Ordering example: HB-100Z1-8-2M-A2-ZE-ZD, 405, English

Maximum main line temperature	°C	100	100	100	100	100	100
Dimensions (→P. 13/14, Fig. 5)	Height	mm	510	700	850	510	700
	Width	mm	180	240	300	180	240
	Depth	mm	661	661	982	661	661
Weight max.	kg	54	73	155	47	72	135
Circulating volume in unit	approx.	L	1,2	1,8	6,5	1,0	1,6
Connection, main/return line	Thread	G $\frac{3}{8}$	G $\frac{3}{8}$	G1 $\frac{1}{4}$	G $\frac{3}{8}$	G $\frac{3}{8}$	G1 $\frac{1}{4}$
	Resistance	bar, °C	20, 120	20, 120	20, 120	20, 120	20, 120
Connection, cooling water	Pressure	bar	2–5	2–5	2–5	2–5	2–5
	Thread	G $\frac{3}{8}$	G $\frac{3}{8}$	G $\frac{3}{8}$	G $\frac{3}{8}$	G $\frac{3}{8}$	G $\frac{3}{8}$
	Resistance	bar, °C	10, 100	10, 100	10, 100	10, 100	10, 100
Connection, separate system water	Pressure	bar	2–5	2–5	2–5	-	-
	Thread	G $\frac{1}{4}$	G $\frac{1}{4}$	G $\frac{1}{2}$	-	-	-
	Resistance	bar, °C	10, 100	10, 100	10, 100	-	-
Drain	Thread	G $\frac{3}{8}$	G $\frac{3}{8}$	G $\frac{1}{2}$	G $\frac{3}{8}$	G $\frac{3}{8}$	G $\frac{1}{2}$

● Standard specification    ○ Optional    <sup>1)</sup> Typical specification

140 °C

Single Units  
Water

**Technical Specifications**

<b>Temperature control unit</b>	Heat transfer medium	Water		
	Cooling	Indirect		
<b>Type</b>	with maximum main line temperature in °C	<b>HB-140Z</b>		
<b>Heating</b> (→P. 12, Fig. 2)	Housing size (→P. 13, Fig. 5) kW	<b>1</b>	<b>2</b>	<b>3</b>
	8	●		
	16		●	●
	32			○
	2M	●	●	
	4M	○	○ <sup>1)</sup>	○
	6G			●
	6M			○
	8G			○
	8M			○
<b>Cooling</b> (→P. 12, Fig. 4)	30 kW @ 60 K 50 kW @ 60 K 90 kW @ 60 K	A2	●	●
		B2		○
		C2		○
<b>Additional equipment</b>	Leak stopper	ZL	○	○
	Connection for alarm and external control	ZB	○	○
	Connection for external sensor	ZE	○	○
	Interface DIGITAL	ZD	○	○
	Interface CAN	ZC	○	○
	Interface PROFIBUS-DP	ZP	○	○
	Pump status monitor	ZU	○	○
	Keyboard-protection	ZK	○	○
	Clean room package	ZR	○	○
<b>Mains voltage</b>	400 V (380–415 V), 50 Hz; 3LPE 400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE 210 V (200–220 V), 50 Hz; 3LPE 210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE 460 V (440–480 V), 60 Hz; 3LPE	405	●	●
		406	○	○
		215	○	○
		216	○	○
		466	○	○

Ordering example: HB-140Z1-8-2M-A2-ZE-ZD, 405, English

Maximum main line temperature	°C	140	140	140
Dimensions (→P. 13/14, Fig. 5)	Height	510	700	850
	Width	180	240	300
	Depth	661	661	982
Weight max.	kg	55	74	158
Circulating volume in unit	approx.	L	1,5	2,1
Connection, main/return line	Thread		G $\frac{3}{4}$	G1 $\frac{1}{4}$
	Resistance	bar, °C	20, 160	20, 160
Connection, cooling water	Pressure	bar	2–5	2–5
	Thread		G $\frac{3}{8}$	G $\frac{3}{4}$
	Resistance	bar, °C	10, 100	10, 100
Connection, separate system water	Pressure	bar	2–5	2–5
	Thread		G $\frac{1}{4}$	G $\frac{1}{2}$
	Resistance	bar, °C	10, 100	10, 100
Drain	Thread		G $\frac{3}{8}$	G $\frac{1}{2}$

● Standard specification    ○ Optional    <sup>1)</sup> Typical specification

160 °C

Single Units  
Water

**Technical Specifications**

<b>Temperature control unit</b>	Heat transfer medium		Water
	Cooling		Indirect
<b>Type</b>	with maximum main line temperature in °C		<b>HB-160Z</b>
	Housing size (→P. 13, Fig. 5)		
<b>Heating</b> (→P. 12, Fig. 2)	kW	1	2
	8	●	
	16		●
	32		○
	2M	●	●
	4M	○	○ <sup>1)</sup>
	6M		●
	8M		○ <sup>1)</sup>
			○
<b>Cooling</b> (→P. 12, Fig. 4)	30 kW @ 60 K	A2	●
	50 kW @ 60 K	B2	
	90 kW @ 60 K	C2	
<b>Additional equipment</b>	Leak stopper	ZL	○
	Connection for alarm and external control	ZB	○
	Connection for external sensor	ZE	○
	Interface DIGITAL	ZD	○
	Interface CAN	ZC	○
	Interface PROFIBUS-DP	ZP	○
	Pump status monitor	ZU	○
	Keyboard-protection	ZK	○
	Clean room package	ZR	○
<b>Mains voltage</b>	400 V (380–415 V), 50 Hz; 3LPE	405	●
	400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE	406	○
	210 V (200–220 V), 50 Hz; 3LPE	215	○
	210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE	216	○
	460 V (440–480 V), 60 Hz; 3LPE	466	○

Ordering example: HB-160Z1-8-2M-A2-ZE-ZD, 405, English

Maximum main line temperature	°C	160	160	160
Dimensions (→P. 13/14, Fig. 5)	Height	510	700	850
	Width	180	240	300
	Depth	661	661	982
Weight max.	kg	55	74	158
Circulating volume in unit	approx.	L	1,5	2,1
Connection, main/return line	Thread		G <sup>3</sup> / <sub>4</sub>	G1 ¼
	Resistance	bar, °C	20, 180	20, 180
Connection, cooling water	Pressure	bar	2–5	2–5
	Thread		G <sup>3</sup> / <sub>8</sub>	G <sup>3</sup> / <sub>4</sub>
	Resistance	bar, °C	10, 100	10, 100
Connection, separate system water	Pressure	bar	2–5	2–5
	Thread		G <sup>1</sup> / <sub>4</sub>	G <sup>1</sup> / <sub>2</sub>
	Resistance	bar, °C	10, 100	10, 100
Drain	Thread		G <sup>3</sup> / <sub>8</sub>	G <sup>1</sup> / <sub>2</sub>

● Standard specification    ○ Optional    <sup>1)</sup> Typical specification

# 180 °C

Single Units  
Water

## Technical Specifications

<b>Temperature control unit</b>	Heat transfer medium	Water	
	Cooling	Indirect	
<b>Type</b>	with maximum main line temperature in °C	<b>HB-180Z</b>	
<b>Heating</b> (→P. 12, Fig. 2)	Housing size (→P. 13, Fig. 5)	2	3
		8	●
		16	○ <sup>1)</sup>
		32	○
		2M	●
		4M	○ <sup>1)</sup>
		6M	○ <sup>1)</sup>
		8M	○
<b>Cooling</b> (→P. 12, Fig. 4)	30 kW @ 60 K	A2	●
	50 kW @ 60 K	B2	○
	90 kW @ 60 K	C2	○
<b>Additional equipment</b>	Connection for alarm and external control	ZB	○
	Connection for external sensor	ZE	○
	Interface DIGITAL	ZD	○
	Interface CAN	ZC	○
	Interface PROFIBUS-DP	ZP	○
	Pump status monitor	ZU	○
	Keyboard-protection	ZK	○
	Clean room package	ZR	○
<b>Mains voltage</b>	400 V (380–415 V), 50 Hz; 3LPE	405	●
	400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE	406	○
	210 V (200–220 V), 50 Hz; 3LPE	215	○
	210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE	216	○
	460 V (440–480 V), 60 Hz; 3LPE	466	○

Ordering example: HB-180Z2-16-4M-A2-ZE-ZD, 405, English

Maximum main line temperature	°C	180	180
Dimensions (→P. 13/14, Fig. 5)	Height	700	850
	Width	240	300
	Depth	661	982
<b>Weight max.</b>	kg	74	158
Circulating volume in unit	approx.	L	2,1
Connection, main/return line	Thread		G $\frac{3}{4}$
	Resistance	bar, °C	25, 200
Connection, cooling water	Pressure	bar	2–5
	Thread		G $\frac{3}{8}$
	Resistance	bar, °C	10, 100
Connection, separate system water	Pressure	bar	2–5
	Thread		G $\frac{1}{4}$
	Resistance	bar, °C	10, 100
Drain	Thread		G $\frac{1}{8}$

● Standard specification    ○ Optional    <sup>1)</sup> Typical specification

200/250 °C

Single Units  
Oil

**Technical Specifications**

Temperature control unit	Heat transfer medium	Oil	
		Indirect	
Type	with maximum main line temperature in °C	HB-200T	HB-250T
<b>Heating</b> (→P. 12, Fig. 2)	kW	2	3
8	●	●	
16		○	
2M	●	●	
4M	○	○	
A3	●	●	
C3		○	
<b>Pump</b> (→P. 12, Fig. 3)	sealless, stainless; 0,5 kW; 30 L/min, 52 m sealless, stainless; 1,0 kW; 50 L/min, 70 m	ZB	○
<b>Cooling</b> (→P. 12, Fig. 4)	34 kW @ 120 K 60 kW @ 120 K	ZE	○
<b>Mains voltage</b>	400 V (380–415 V), 50 Hz; 3LPE 400 V (380–415 V), 60 Hz (50/60 Hz); 3LPE 210 V (200–220 V), 50 Hz; 3LPE 210 V (200–220 V), 60 Hz (50/60 Hz); 3LPE 460 V (440–480 V), 60 Hz; 3LPE	ZD	○
		ZC	○
		ZP	○
		ZU	○
		ZK	○
		405	●
		406	○
		215	○
		216	○
		466	○

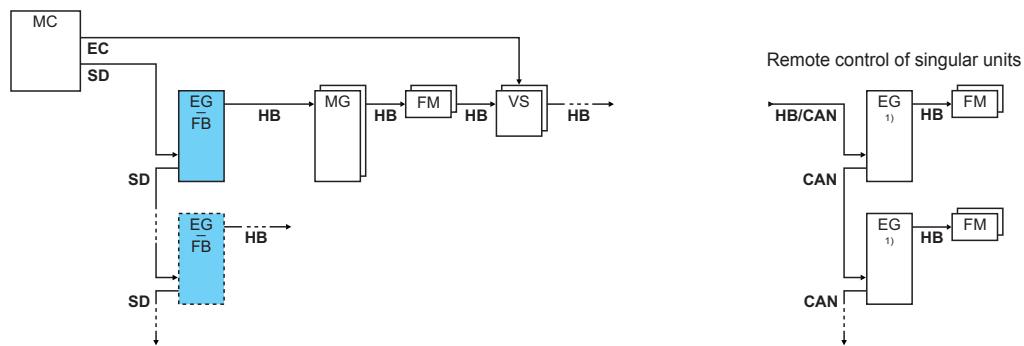
Ordering example: HB-200T2-8-2M-A3-ZE-ZD, 405, English

Maximum main line temperature	°C	200	250
Dimensions (→P. 13/14, Fig. 5)	Height	700	850
	Width	240	300
	Depth	684	945
Weight max.	kg	69	103
Circulating volume in unit	approx.	L	1,6
Connection, main/return line	Thread		3,5
	Resistance	G <sup>3</sup> / <sub>4</sub>	G <sup>3</sup> / <sub>4</sub>
Connection, cooling water	Pressure	bar, °C	10, 220
	Thread		10, 270
	Resistance	bar	2–5
Drain	Thread		2–5
Volume of internal expansion tank	approx.	G <sup>3</sup> / <sub>8</sub>	G <sup>3</sup> / <sub>8</sub>
		L	10, 100
			5,5
			15

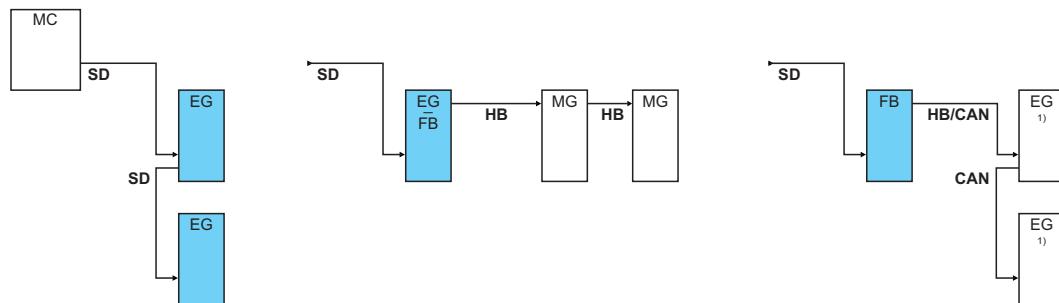
● Standard specification    ○ Optional

### Communication (Fig. 1)

Basic circuit diagram



### Examples



Legend	Description	Note
MC	Machine control	max. 1
FB	Control modul Panel-5	max. 1
EG	Temperature control unit Thermo-5, singular unit	max. 16 (per command)
MG	Temperature control unit Thermo-5, modular unit	
FM	Flow meter Flow-5	max. 32 (at 4 circuits each)
VS	Switching unit Vario-5	max. 8
SD	Communication via serial data interface DIGITAL (ZD), CAN (ZC) or PROFIBUS-DP (ZP)	Maximum number of units, operating range and transfer of flow rate values depend on machine control and protocol
HB	Communication interface HB	Order of connection is not relevant
HB/CAN	Communication interface HB/CAN	To remotely control singular units
CAN	Communication interface CAN (ZC)	
EC	External Control	Assignment dependent on machine control unit

■ Command

<sup>1)</sup> Command deactivated

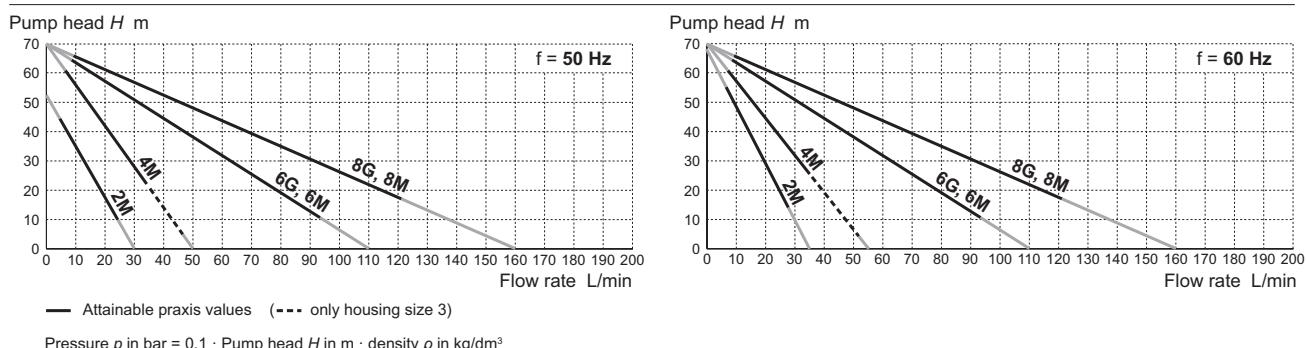
### Heating Capacity, Electricity Supply (Fig. 2)

The heating capacity applies at rated voltage (400 V, 460 V or 210 V) and varies max.  $\pm 10\%$  within the range indicated.

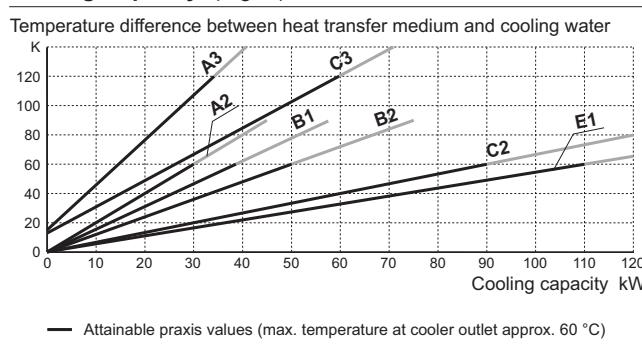
Maximum fusing; Cross-section through unit mains cable (with mains voltage)

Heating	400 V or 460 V	210 V
8 kW	3x20 A; 2,5 mm <sup>2</sup>	3x32 A; 6 mm <sup>2</sup>
16 kW	3x32 A; 6 mm <sup>2</sup>	3x63 A; 16 mm <sup>2</sup>
32 kW	3x63 A; 16 mm <sup>2</sup>	3x125 A; 50 mm <sup>2</sup>

### Pump Capacity (Fig. 3)



### Cooling Capacity (Fig. 4)



Cooling water quantity at 2 bar:

A2	12 L/min
A3	14 L/min
B1	9 L/min
B2	16 L/min
C2	34 L/min
C3	16 L/min
E1	30 L/min

### General Technical Data

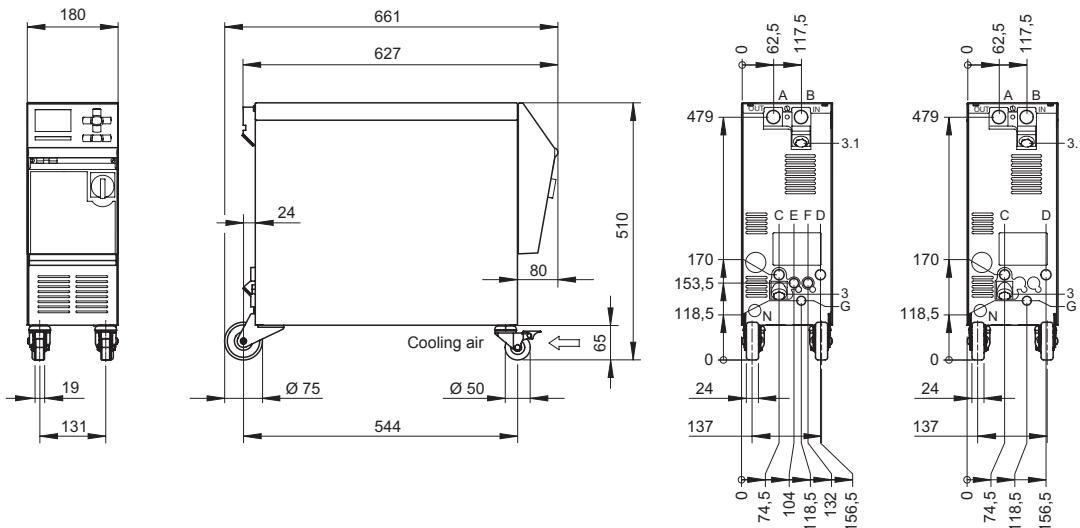
Mains cable to unit	3LPE, 4 m (plug on request)
Environment	Temperature Humidity
Colour	Cover Control panel
Continuous sound pressure level	<67 dB(A)
Protection class	IP 44
Standards (depending on unit type)	EN ISO 12100, EN ISO 13732-1, EN 60335-1, EN 60204-1, EN 60730-2-9, EN 61000-6-2, EN 61000-6-4, EN 12828, EN 12953-6, DIN 4754
Certification / Approval	CE (compliance with relevant CE directives)
Tolerance	$\pm 0,1 \text{ K}$
	$\pm 5\%$ of measured value
	$\pm 10\%$ of rated value
Control accuracy	
Flow indicator	
Pump pressure indicator	

**Dimensions (Fig. 5)**

Housing size 1, scale 1:15

HB-  Z1

HB-100X1

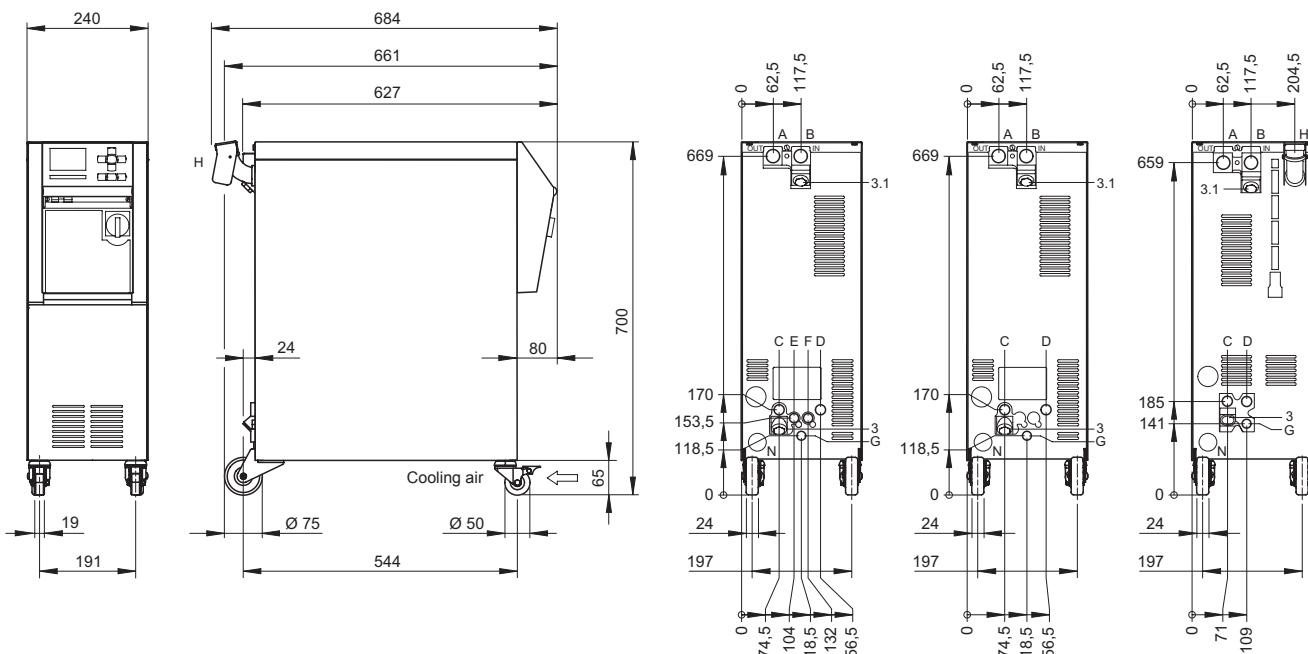


Housing size 2, scale 1:15

HB-  Z2

HB-100X2

HB-200T2



A Main line

B Return line

C Cooling water inlet

D Cooling water outlet

E System water inlet

F System water outlet

G Drain

H Filling (on oil units)

N Mains connection cable

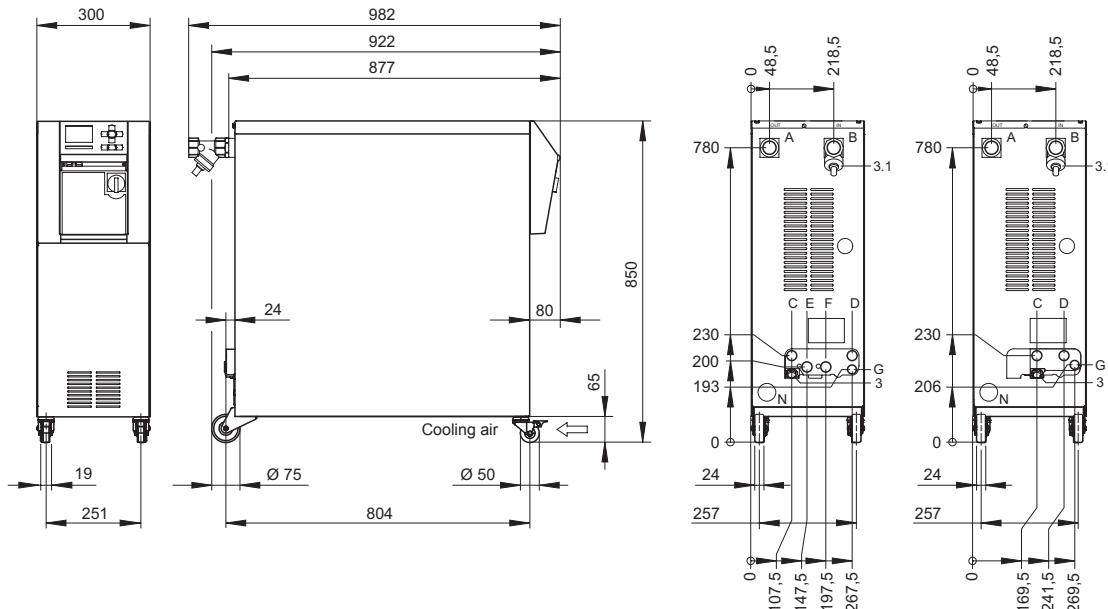
3 Filter cooling water inlet

3.1 Filter return line

Housing size 3, scale 1:20

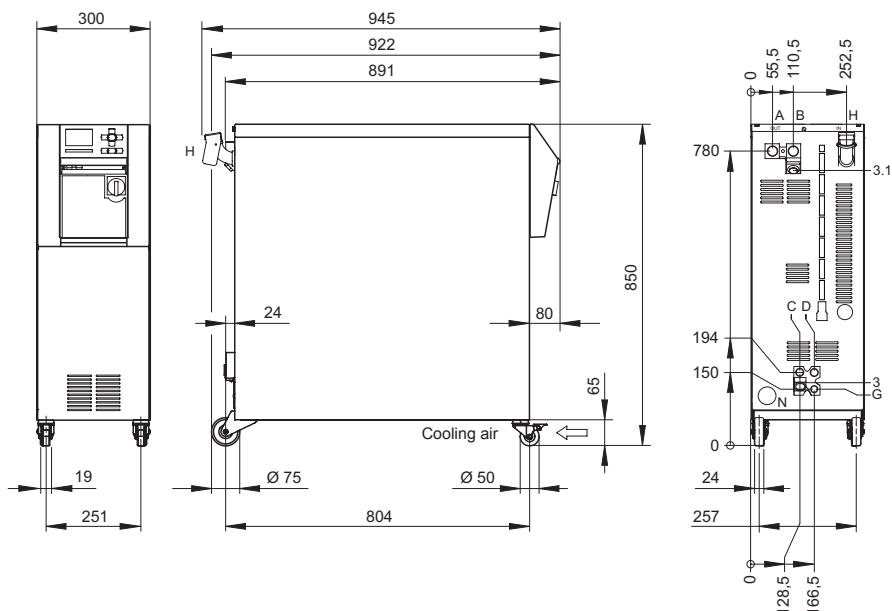
HB-  Z3

HB-100X3



Housing size 3, scale 1:20

HB-250T3



- A Main line
- B Return line
- C Cooling water inlet

- D Cooling water outlet
- E System water inlet
- F System water outlet

- G Drain
- H Filling (on oil units)
- N Mains connection cable

- 3 Filter cooling water inlet
- 3.1 Filter return line

# HB-THERM®

## Temperature Control Technology

### **HB-Therm worldwide.**

Since 1967 HB-Therm AG has been developing and producing innovative „Swiss-made“ temperature control technology to the highest quality standards. With its comprehensive know-how and motivated workforce, the company has succeeded in becoming the technology leader in its sector.

This Swiss family enterprise employs around 110 staff and has established itself as a systems supplier offering seamless customer support from machine design through to a complete after-sales service. Production is exclusively in St. Gallen.

Own subsidiaries (Sales & Service) in Germany and France as well as 40 other national agencies are representing HB-Therm around the globe.

The company's quality and environmental management system is based on the continual improvement of all activities and processes and is certified to ISO 9001/14001. All its products and services are based on a philosophy of offering „Swiss-made“ quality to customers.

### **Customer service. Included.**

With our sales and marketing network service we can offer comprehensive expert advice and assistance in:

- Optimum temperature control process
- Determination of the specification of the product and advice regarding functionality
- Electrical and hydraulic connections
- Data interfaces
- Heat transfer medium
- Servicing of the equipment

Our experts are always available for support when questions of specialist requirements or applications arise or when putting the equipment into operation, or for the operational training of your staff.

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