Thermo-6

The next Generation.
Temperature Control Units

Just
6etter.

Just
6etter.

The next Generation.

The technology of the Thermo-6 temperature control units builds on the extremely successful Thermo-5 series. With over 100 000 units in use, HB-Therm has become the global market leader. The unit technology is persistently focused on quality and durability. HB-Therm backs this with a lifetime warranty on the core components of the heater and now also on the flow meter. "Just better" stands for the consistent advancement of our technology.

Table of Contents

Thermo-6

The next Generation.
Temperature Control Units

Thermo-6

Intelligently networked

Ethernet (OPC UA) is standard for us. The forward-looking hardware and software architecture gives you access to the digital world.

Unrivalled

Lifetime warranty on heating and flow meter.

Control, analyse and manage – all at once

Process data recording, unit history, unit-specific documents such as certificates, calibration data, operating and assembly instructions – everything is displayed quickly and clearly.
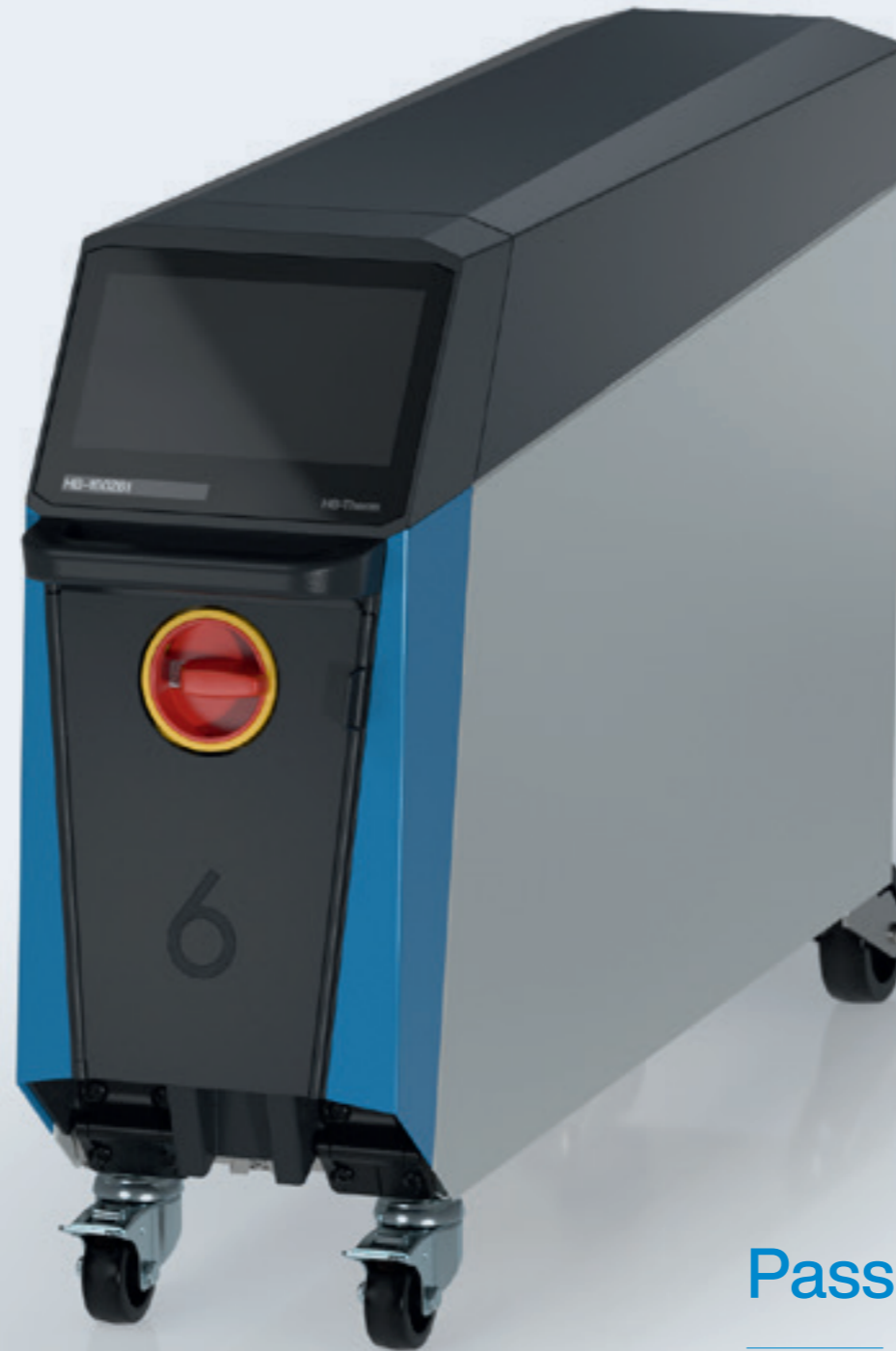
Pure energy efficiency

Speed-controlled pump as standard underlines our commitment to the environment. The Energy-Control wizard guides the user to the optimum operating point. 20 % higher efficiency with new exclusive Direct-Drive pump.

No failures. Ultra-low maintenance

We have consistently developed the unit by building on the proven technology of Thermo-5. The low maintenance requirements also make the Thermo-6 attractive in terms of upkeep.

Brilliant touch screen

You will master the unit in just 10 minutes. The simple control and the clear touch screen come with the expert system that provides assistance, warnings, reports and optimizes unit operation.

Passion

We have put all our expertise, ingenuity and passion into the new Thermo-6. For even better performance.

Just 6etter.

The unit

The proven as base and improvement potentials consistently implemented: The result is a unit technology that is unsurpassed in terms of functionality and serviceability. Lifetime warranty on heater and flow meter does not allow any compromises. Energy efficiency has been redefined with a new pump technology combined with speed control. An Ethernet interface for communication with the injection moulding machine or the HB-Therm interface server Gate-6 is included in the extensive standard equipment.

Precise and powerful	→ High control accuracy ±0,1 °C → Shortest heating and cooling times → Short response times → Calibrated ex works
Safe and comfortable	→ Fully automated process monitoring → Highly accurate flow rate measurement → Unit status monitoring → Elaborate functionality
Energy efficient and sustainable	→ Tankless system → Speed-controlled pump → Energy-efficient heating system / heat management
Reliable and durable	→ Heater and flow meter with a lifetime warranty → Vaporisation-free cooling

" Speed-controlled pumps enable energy savings and can be used universally for large and small moulds "

Kurt Klopfenstein
CSO HB-Therm

Operation

Everything at a glance: The 7 inch IPS touch screen sets new standards in brilliance and speed. The intuitive user interface in the local language provides quick access to the desired functions. Energy-Control, Trend Graph and Dashboard clearly display the important information at a glance. Intelligent assistance systems support the user during commissioning, energy optimisation and process monitoring.

Clear and understandable	→ 7 inch IPS touch screen → Intuitive → Proven logic → Operation in local language
Well-arranged and to the point	→ Everything at a glance → Energy-Control → Dashboard → Trend graph
Smart and convenient	→ Forward-thinking → Self-diagnosis → Comprehensive assistance systems
Independent and flexible	→ Remote control via various input devices (app) → OPC UA is standard → Configurable display

" Simple, intuitive and clear as never before "

Andreas Steiner
Software Engineering HB-Therm

Your possibilities

The temperature control units Thermo-6 are as a standard equipped with an Ethernet interface and communicate via OPC UA with the injection moulding machine or further advanced systems. Combined with an interface server Gate-6 completely new possibilities arise for the user. The Android app "e-cockpit" sends analysis data on the touch of a button or allows the remote access to the unit by a HB-Therm specialist. Additional possibilities are the remote control of a unit and granting access to any external person. Naturally, we adhered to the highest safety standards when developing our digital solutions.

" Series 6 opens the door to the digital world in temperature control technology "

Reto Zürcher
CEO HB-Therm

Safe and modern	→ Our gateway to the digital world of temperature control technology
	→ Android app "e-cockpit" for mobile devices
	→ State of the art data security

| Mobile and independent | → Remote control via various input devices (app) |
| | → Remote Access from any location |

Convenient and well-arranged	→ Overview and information of the connected Gate-6 and Thermo-6
	→ Unit-specific documentation available online
	→ Integrated QR-Code scanner

Supportive and efficient	→ Remote access for support cases (Remote Support)
	→ Direct access to "Knowledge" database
	→ Transmit analysis data at the touch of a button

Gate-6

Data security

Highest security standards vouchsafe data protection and safety. Remote access or upload of analysis data are only initiated after explicit user approval.

Our gateway to the digital world

Products and solutions instead of concepts and theories! Gate-6 and "e-cockpit" are the concrete answer to today's needs and future challenges in the digitalisation of temperature control technology.

Control from any-where via e-cockpit

Work even more efficiently and safely with "e-cockpit" on your mobile device. Call up analysis data, allow remote access or scan the fault QR-Code and quickly order any spare parts. With the "e-cockpit" app from any place and any device.

Control, analyse and support – from anywhere and at the touch of a button

Sending analysis data, remote control of the temperature control units or remote access if required – at any time at the touch of a button.

Everything at a glance

Clear and informative compilation of all important data and documents of the associated Gate-6 and the Thermo-6 temperature control units connected to it.

Securing the future together

We advance the digitalisation of your production. Our new generation of units makes it very easy for you. Open the door to your digital future with us! The digital world of HB-Therm provides you with all the tools you need. Precisely tailored to the needs of your production.

Just 6etter.

Tools

Interface server Gate-6

The Thermo-6 temperature control units communicate with the machine control via Ethernet. This can be done either directly via OPC UA or via the Gate-6 interface server. The interface server Gate-6 is capable of translating Euromap 82.1 into various proprietary machine protocols. These are:

– Interface DIGITAL (**ZD**)
– Interface CAN (**ZC**)
– Interface PROFIBUS-DP (**ZP**)

One Gate-6 is required per injection moulding machine, which ideally remains firmly connected to the machine. Gate-6 allows you to assign a specific name for better identification, such as the internal machine designation. The Gate-6 can communicate with the app "e-cockpit" via Bluetooth or WiFi.

e-cockpit

"e-cockpit" is an app for smartphones and tablets that can access a Gate-6 and the connected Thermo-6 via Bluetooth. "e-cockpit" contains the scanner for the HB-Therm specific QR-Codes on the unit. Currently, analysis data of a Thermo-6 can be sent to the "Ticket" at the push of a button. In addition, "e-cockpit" allows "Remote Support" access. This allows an HB-Therm employee to access the unit directly via a secure connection, if necessary. In addition, unit-specific data such as spare parts lists and test certificates are also available in the "e-cockpit" app. Further "e-cockpit" functions such as "Remote Access", which allows access to a Thermo-6 from another company location, or "Remote Control" of a Thermo-6 via tablet or smartphone are also possible at extra cost. Data transfer is secured by best-of-breed technologies. The "e-cockpit" app is available free of charge in the Google Play Store (as of 2022).

Knowledge

"Knowledge" gives you access to all you need to know for operation and use Series-6 units. QR-Codes * on the unit can be used to call up the latest information. On a PC "Knowledge" is accessed from within the "Ticket" system This gives you access to operating instructions and technical data at any time and from anywhere.

Ticket

"Ticket" is the new service management system that handles all customer requests and events. To ensure global support, every end customer has access to the "Ticket" and a link to the "Knowledge" database. The cutting-edge IT tool is designed for current and future requirements.

Contents:
– Spare parts list
– Test certificates
– Unit configuration

* QR-Codes are HB-Therm specific and can only
  be read via the scanner of the "e-cockpit" app

Thermo-6

Standard equipment

Topic	Feature
Hydraulics	Speed-controlled, sealless pump in stainless steel, IE4
	Heating elements without direct contact to the heat transfer medium
	Continuous, maintenance-free ultrasonic flow meter
	Low-scaling cooling system with plate heat exchanger
	Proportionally controlled cooler bypass (on units above 100 °C)
	Pressure shock-free cooling with proportional valve
	Controlled superimposed system pressure
	Booster pump for system filling (on units above 100 °C)
	Temperature measurement in main line and return line with Pt 1000 sensors
	Hydraulic circuit with low resistance made of non-corroding materials
	Closed circuit with automatic filling and deaeration
	Integrated cooling water and return line filter
	Easy to modify for separate supply of system water
Functions	Mould evacuation by pump reversal
	Pump modes (automatic, temperature difference, flow, speed, boost)
	Energy-Control with optimisation wizard
	3-phase heating control with solid state relay and current measurement
	Changeover to second nominal value
	Nominal value ramp and ramp programme *
	Control on either main line or return line (or external sensor ZE *)
	Cooling with automatic switch-off programme
	Cyclical system water exchange (selectable)
Monitoring / safety	Pump status monitor
	Process monitoring with automatic limit value setting
	Hose rupture and leakage monitor
	Sensor monitoring
	Frequency converter with automatic rotary field adaptation and current measurement
	Triple safety cut-out for heating
	Safety relief valve and pressure gauge on rear of unit
	Dry running protection
	Lockable abrasion-resistant PUR castors with twist lock
	Cleanroom capable
Command / display	7 inch IPS touch screen with interactive user guidance in local language
	Basic display (Process, actual values, trend, energy, maintenance)
	Export of historical data
	Help system with context sensitive information
	Extended help in local language via QR-Code to HB-Therm "Knowledge" platform
	Acoustic alarms
	LED floor lighting for signalling the unit status
	Display of date and time (adjustable time zone)
	Input lock with code
	Logbook
	Selectable units of measurement for temperature, flow rate and pressure *
	Timer *

Interfaces	Ethernet	OPC UA interface (EUROMAP 82.1, OPC 40082-1)
		Switch with 2 RJ-45 sockets
	HB	HB-Therm data interface CAN for connection of flow meters Flow-5
		1 Sub-D 15-pin socket (female)
	USB	Connection for software updates and export of historical data
		USB-A

Additional equipment

Designation	Code	Description
Leak stopper	ZL *	With automatic negative pressure optimisation (up to 70 °C)
Connection for alarm and external control	ZB	Alarm using potential-free contact (rating max. 250 VAC, 4 A)
		3 inputs for selectable functions (e.g. unit ON/OFF, switching nominal value 1 or 2)
		1 socket Harting Han 7D (male), connecting cable 6 m with plug included
Connection for external sensor	ZE	Thermocouple type J, K, T
		Resistance thermometer Pt 100 in 2-, 3- or 4-wire circuit
		Standard signals 0–10 V or 4–20 mA
		1 M12-A 8-pin socket including plug
Mould evacuation with compressed air	ZG *	Replaces mould evacuation by pump reversal

* on request

Temperature control units Thermo-6 communicate with the machine control via the Gate-6 interface server (see page 29).

Special executions

Colour		Code
Front panels	RAL 5015 (glossy sky blue)	Standard
	Custom colour	C006 'colour' *
Side panels	RAL 7035 (glossy light grey)	Standard
	Custom colour	C005 'colour' *
Cover	RAL 9011 (matt graphite black)	Standard
	Custom colour	C004 'colour' *

Cover

Side panels

Main switch

Front panels

Main switch		Code
Colour	red/yellow	Standard
	black	C007

Mains cable		Code
Rubber (H07RN-F)	Length 4 m	Standard
	Length 0,5 to 15 m	C001 'z,z' m
PUR (H07BQ-F)	Length 0,5 to 15 m	C002 'z,z' m
UL	Length 0,5 to 15 m	C003 'z,z' m

* RAL/NCS (matt/glossy)

Accessories

Hydraulic	o/ID
Adapter for central coupling, main line / return line	T25651
Adapter for central coupling, main line / return line including filter in main line	T25651-2
Adapter for central coupling, cooling water	T28810
4-way manifold with shut-off valves	T24963
4-way manifold with shut-off valves and filter in main line	T26368-4

Electrical
Interface cables, mains connectors and other, refer to accessories program D8064-EN

T25651   T25651-2   T28810

T24963   T26368-4
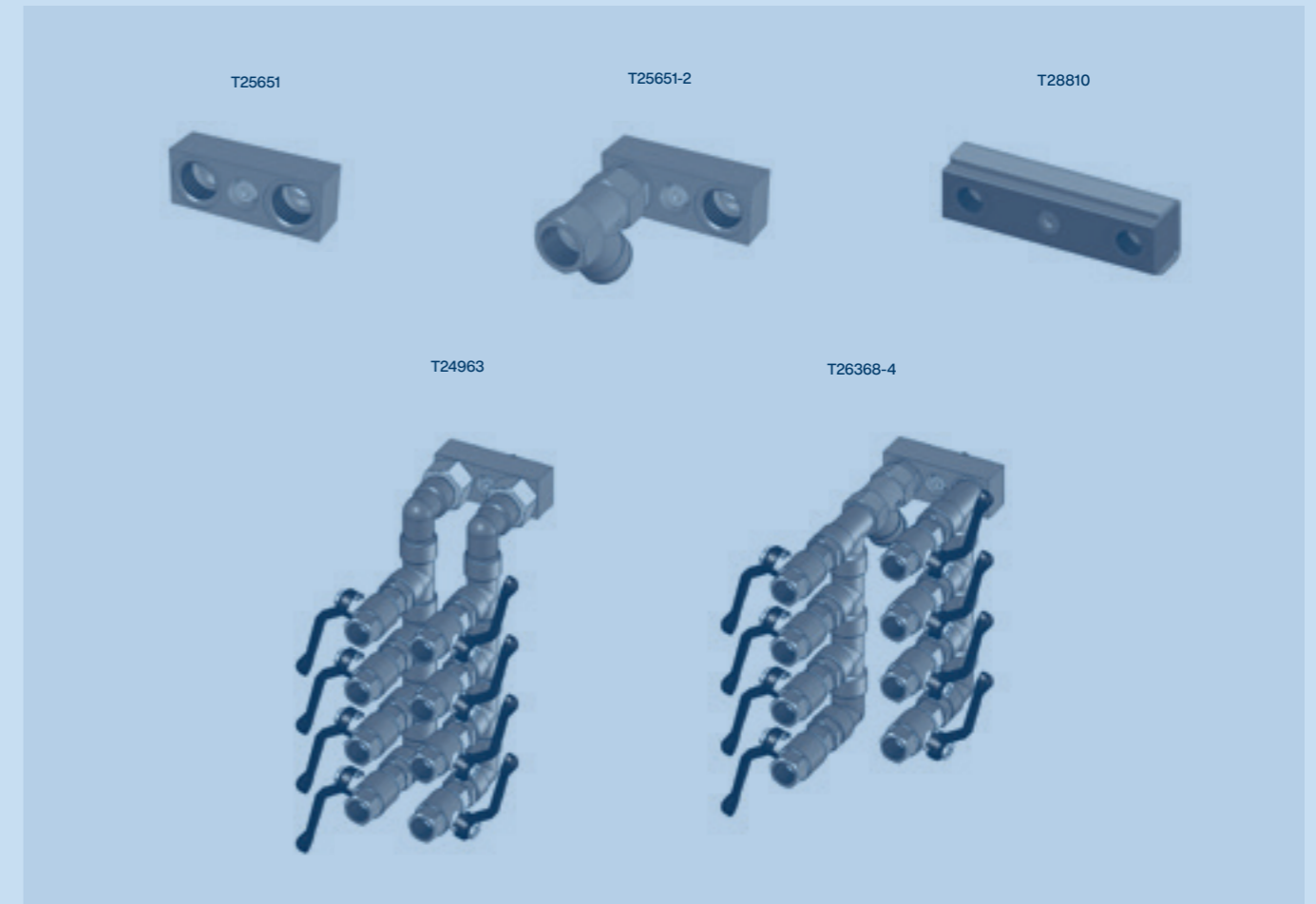
100 °C Water, indirect cooling

Temperature control unit		Type	HB-100Z
Housing size			61
Heating	8 kW	8	●
Pump	1,1 kW; 65 L/min, 85 m	4T	●
Cooling	40 kW @ 60 K	A2	●
Additional equipment			
Leak stopper		ZL *	○
Connection for alarm and external control		ZB	○
Connection for external sensor		ZE	○
Mould evacuation with compressed air		ZG *	○
Mains voltage			
400 V (380–415 V ±5 %), 50/60 Hz; 3LPE		406	●
220 V (200–220 V ±5 %), 50/60 Hz; 3LPE		216	○
460 V (440–480 V ±5 %), 50/60 Hz; 3LPE		466	○

Technical Data		HB-100Z61
Maximum main line temperature		100 °C
Flow rate measurement		0,4–60 L/min
Circulating volume in unit		0,8 L
Dimensions (Height/Width/Depth)		510/190/793 mm
Weight max.		55 kg
Connection, main line and return line	Thread	G¾
	Resistance	20 bar, 120 °C
Connection, cooling water	Pressure	2–5 bar
	Thread	G⅜
	Resistance	10 bar, 100 °C
Connection, separate system water	Pressure	2–5 bar
	Thread	G¼
	Resistance	10 bar, 100 °C
Connection, mould evacuation with compressed air (ZG)	Pressure	2–8 bar
	Thread	G¼
	Resistance	10 bar, 100 °C

Ordering example: HB-100Z61-8-4T-A2-406-English   ● Standard specification   ○ Optional   * on request

140 °C Water, indirect cooling

Temperature control unit		Type	HB-140Z
Housing size			61
Heating	8 kW	8	●
Pump	1,1 kW; 65 L/min, 85 m	4S	●
Cooling	40 kW @ 60 K	A2	●
Additional equipment			
Leak stopper		ZL *	○
Connection for alarm and external control		ZB	○
Connection for external sensor		ZE	○
Mould evacuation with compressed air		ZG *	○
Mains voltage			
400 V (380–415 V ±5 %), 50/60 Hz; 3LPE		406	●
220 V (200–220 V ±5 %), 50/60 Hz; 3LPE		216	○
460 V (440–480 V ±5 %), 50/60 Hz; 3LPE		466	○

Technical Data		HB-140Z61
Maximum main line temperature		140 °C
Flow rate measurement		0,4–60 L/min
Circulating volume in unit		0,8 L
Dimensions (Height/Width/Depth)		510/190/793 mm
Weight max.		59 kg
Connection, main line and return line	Thread	G¾
	Resistance	20 bar, 160 °C
Connection, cooling water	Pressure	2–5 bar
	Thread	G⅜
	Resistance	10 bar, 100 °C
Connection, separate system water	Pressure	2–5 bar
	Thread	G¼
	Resistance	10 bar, 100 °C
Connection, mould evacuation with compressed air (ZG)	Pressure	2–8 bar
	Thread	G¼
	Resistance	10 bar, 100 °C

Ordering example: HB-140Z61-8-4S-A2-406-English   ● Standard specification   ○ Optional   * on request

160 °C Water, indirect cooling

Temperature control unit		Type	HB-160Z
Housing size			61
Heating	8 kW	8	●
Pump	1,1 kW; 65 L/min, 85 m	4S	●
Cooling	40 kW @ 60 K	A2	●
Additional equipment			
Leak stopper		ZL *	○
Connection for alarm and external control		ZB	○
Connection for external sensorr		ZE	○
Mould evacuation with compressed air		ZG *	○
Mains voltage			
400 V (380–415 V ±5 %), 50/60 Hz; 3LPE		406	●
220 V (200–220 V ±5 %), 50/60 Hz; 3LPE		216	○
460 V (440–480 V ±5 %), 50/60 Hz; 3LPE		466	○

Technical Data		HB-160Z61
Maximum main line temperature		160 °C
Flow rate measurement		0,4–60 L/min
Circulating volume in unit		0,8 L
Dimensions (Height/Width/Depth)		510/190/793 mm
Weight max.		59 kg
Connection, main line and return line	Thread	G¾
	Resistance	20 bar, 180 °C
Connection, cooling water	Pressure	2–5 bar
	Thread	G⅜
	Resistance	10 bar, 100 °C
Connection, separate system water	Pressure	2–5 bar
	Thread	G¼
	Resistance	10 bar, 100 °C
Connection, mould evacuation with compressed air (ZG)	Pressure	2–8 bar
	Thread	G¼
	Resistance	10 bar, 100 °C

Ordering example: HB-160Z61-8-4S-A2-ZB-ZE-406-English   ● Standard specification   ○ Optional   * on request
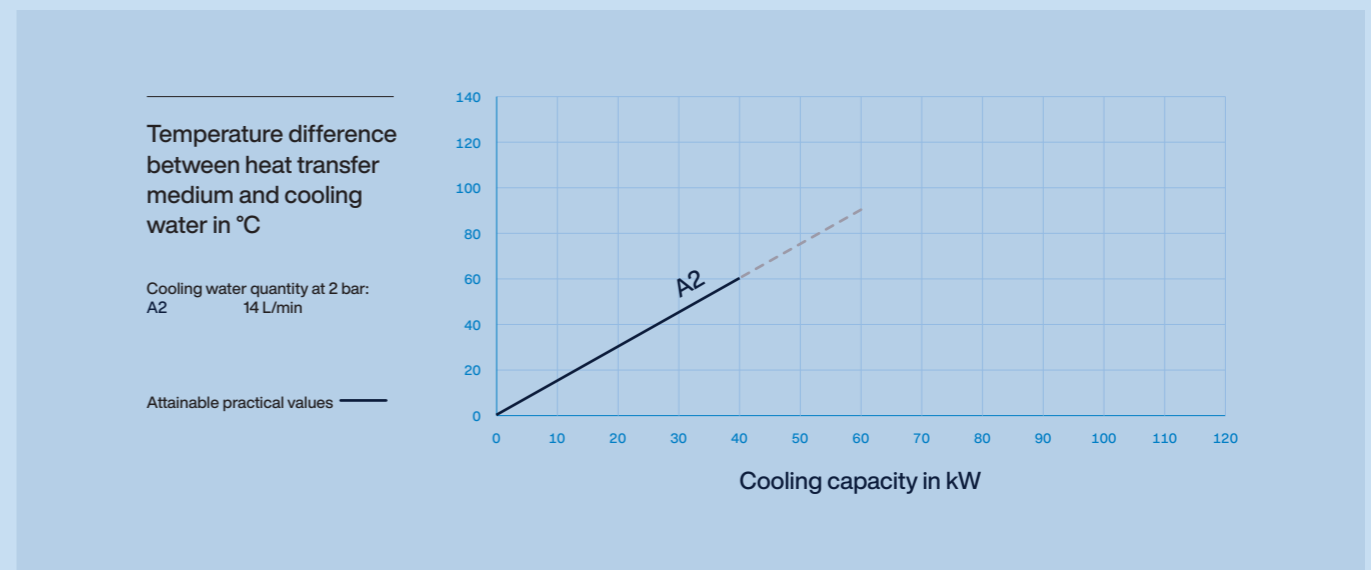
Heating capacity

Electricity supply
The heating capacity applies at rated voltage 3x220/380 V.

Maximum fusing; Cross-section through unit mains cable (with mains voltage)		
Heating	400 V or 460 V	220 V
8 kW	3x20 A; 2,5 mm²	3x32 A; 6 mm²

Cooling capacity

Temperature difference between heat transfer medium and cooling water in °C

Cooling water quantity at 2 bar:
A2   14 L/min
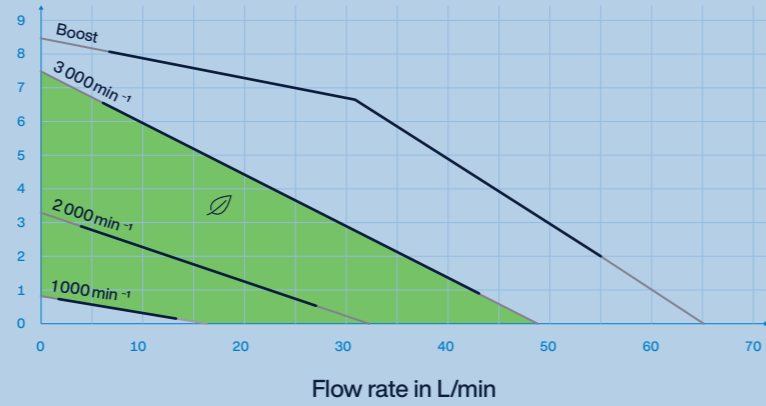
Attainable practical values ——

Cooling capacity in kW

Pump characteristic

Hydraulic

Pressure of pump
4T/4S in bar

Attainable practical values
at water 40 °C and acceleration
due to gravity

Boost
3 000 min⁻¹
2 000 min⁻¹
1 000 min⁻¹

Flow rate in L/min

Electrical

Power of
pump 4T in kW

Boost
3 000 min⁻¹
2 000 min⁻¹
1 000 min⁻¹

Flow rate in L/min

Power of
pump 4S in kW

Boost
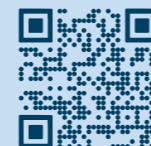3 000 min⁻¹
2 000 min⁻¹
1 000 min⁻¹

Flow rate in L/min
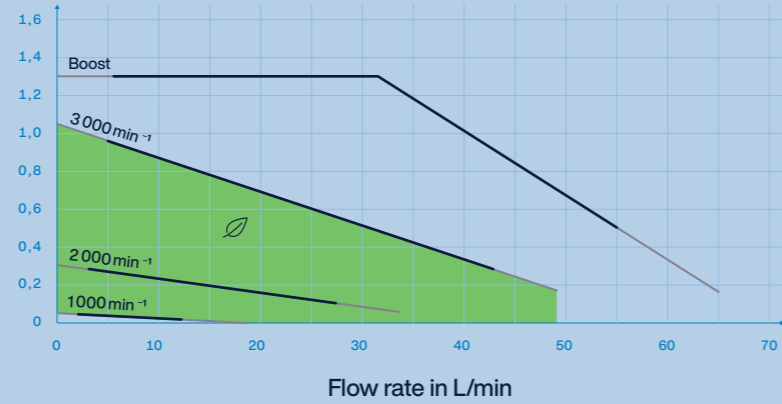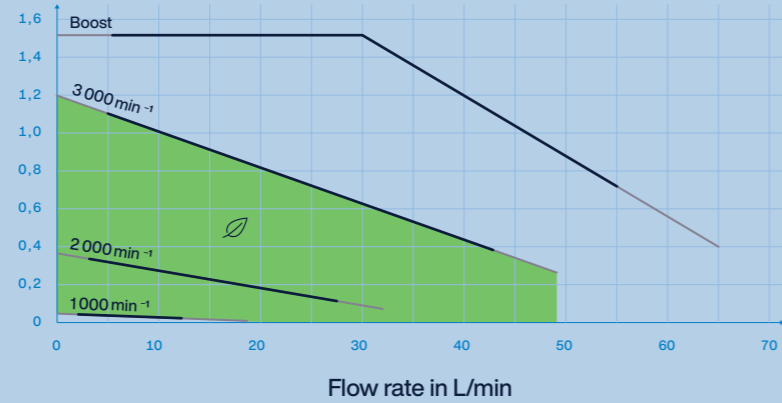
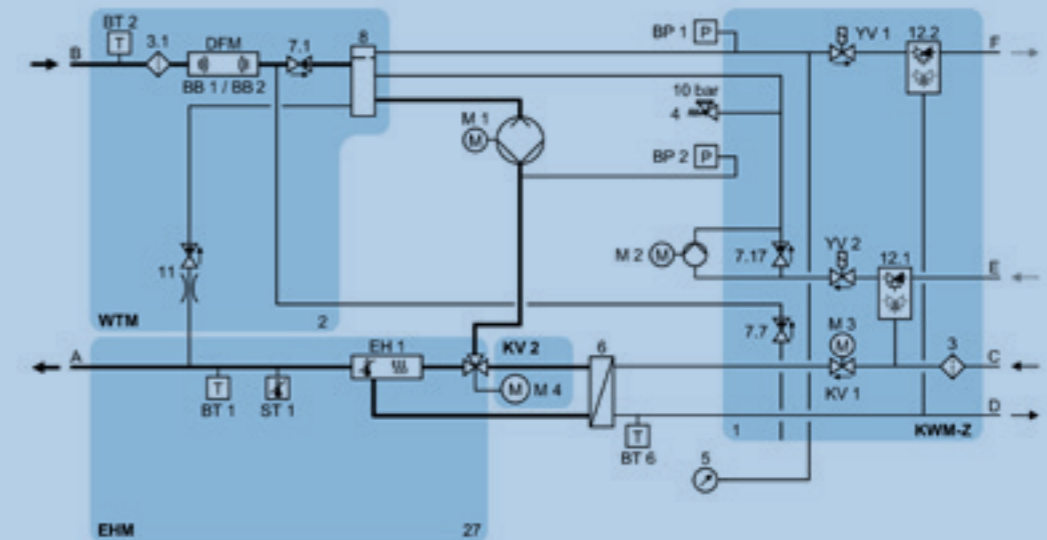# Hydraulics

HB-100Z61
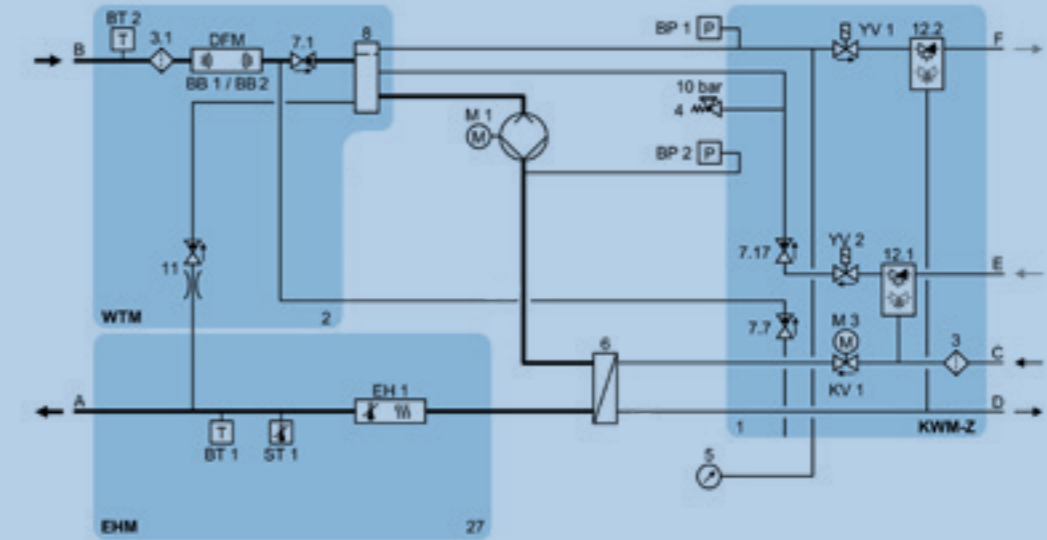
HB-140/160Z61

Legend, further hydraulic diagrams and
animations of the functional sequences.

Dimensions

General technical data

Housing size 61

A	Main line	E	System water inlet	K	Compressed air outlet (ZG)	3	Filter cooling water inlet
B	Return line	F	System water outlet	N	Mains connection cable	3.1	Filter return line
C	Cooling water inlet	J	Compressed air inlet (ZG)				
D	Cooling water outlet						

Feature		Data
Mains cable to unit		3LPE, 4 m (plug on request)
Environment	Temperature	5–40 °C
	Relative humidity	35–85 % RH (non-condensing)
Colour	Front panels	RAL 5015 (glossy sky blue)
	Side panels	RAL 7035 (glossy light grey)
	Cover, Control panel, Door	RAL 9011 (matt graphite black)
Continuous sound pressure level		<70 dB(A)
Protection class		IP 44
Cleanroom capability		Clean room capable version: 'At Rest' < ISO class 6 (class 1 000) 'In Operation' ISO class 7 (class 10 000)
Standards (depending on unit type)		EN 12828, EN 12953-6, EN 61010-1, EN 61010-2-10, EN 60730-2-9, EN IEC 61000-6-2, EN IEC 61000-6-4, EN IEC 63000, EN ISO 12100, EN ISO 13732-1
Certification / Approval		CE (compliance with relevant CE directives)
Temperature measurement	Resolution	0,1 °C
	Control accuracy	±0,1 °C
	Tolerance	±0,8 °C
Flow rate measurement	Resolution	0,1 L/min
	Tolerance	±(5 % of measured value + 0,1 L/min)
Pump pressure indicator		±10 % of rated value

Gate-6

Standard equipment

Topic		Feature
Functions		Communication with e-cockpit via Bluetooth and WiFi
		Converter for optional interfaces to the machine control
Operation / Display		Status LED (green: OK, flashing green: Connecting, red: Error)
Housing		Robust plastic housing
		Fold-out handle (wall mounting or table stand)
		Rubberized magnets (e.g. for mounting on machine base)
		Splash-proof plug-in connections with strain relief
		Cleanroom capable
Interfaces	Ethernet	OPC UA interface (EUROMAP 82.1, OPC 40082-1) for connecting Thermo-6 temperature control units
		Switch with 2 RJ-45 sockets
	Ethernet ext.	Ethernet connection to the company network or cloud
		1 RJ-45 socket
	USB	For service purposes
		USB-A
	Bluetooth ⸙, WiFi 📶	Interface for communication with e-cockpit app (range approx. 10 m)

Additional equipment

Designation	Code	Description
Interface DIGITAL	ZD	Serial data interface 20 mA, RS-232 or RS-422/485
		Various protocols selectable: Arburg, Billion, Bühler, Dr. Boy, Engel, Ferromatik Milacron, Haitian, KraussMaffei, MODBUS * (RTU mode), Negri Bossi, SPI * (Fanuc, etc.), Stork, Sumitomo Demag, Wittmann Battenfeld, Zhafir
		1 Sub-D 25-pin socket (female)
Interface CAN	ZC *	Serial data interface CAN-Bus (Sumitomo Demag) and CANopen (EUROMAP 66; Netstal, etc.)
		1 Sub-D 9-pin socket (female)
Interface PROFIBUS-DP	ZP *	Serial data interface Profibus-DP for max. 4 temperature control units
		1 Sub-D 9-pin socket (female)

Temperature control units Thermo-6 communicate with the machine control via the Gate-6 interface server.

Designation	Code	Type HB-GATE61
Interface DIGITAL	ZD	○
Interface CAN	ZC *	○
Schnittstelle PROFIBUS-DP	ZP *	○

Ordering example: HB-GATE61-ZD   ○ Optional   * on request

Accessories

Topic	Article	Code
Power supply	Power supply 85–265 VAC / 24 VDC, 30 W	T28949
	Mains plug and further accessories see accessories program D8064-EN	

Service package

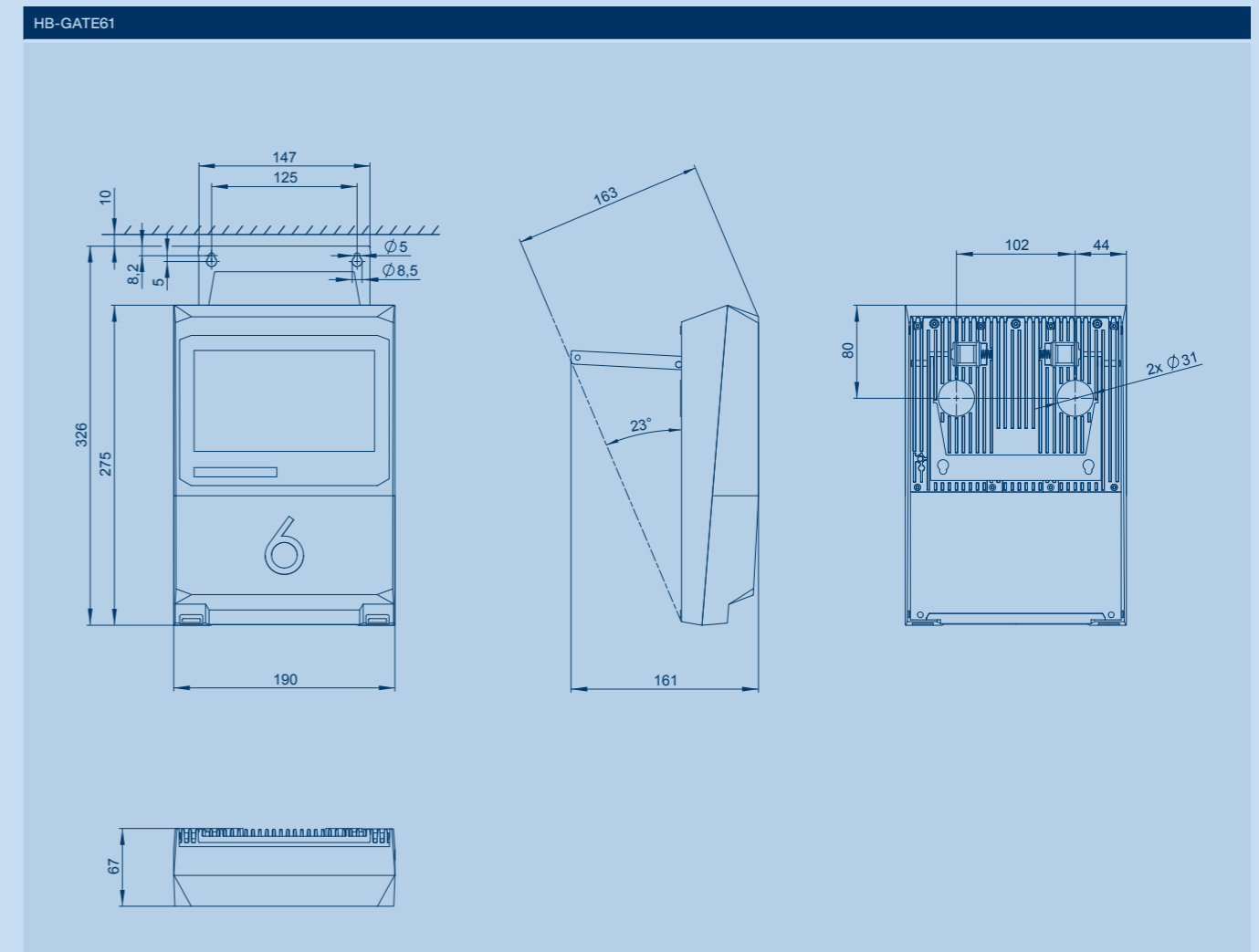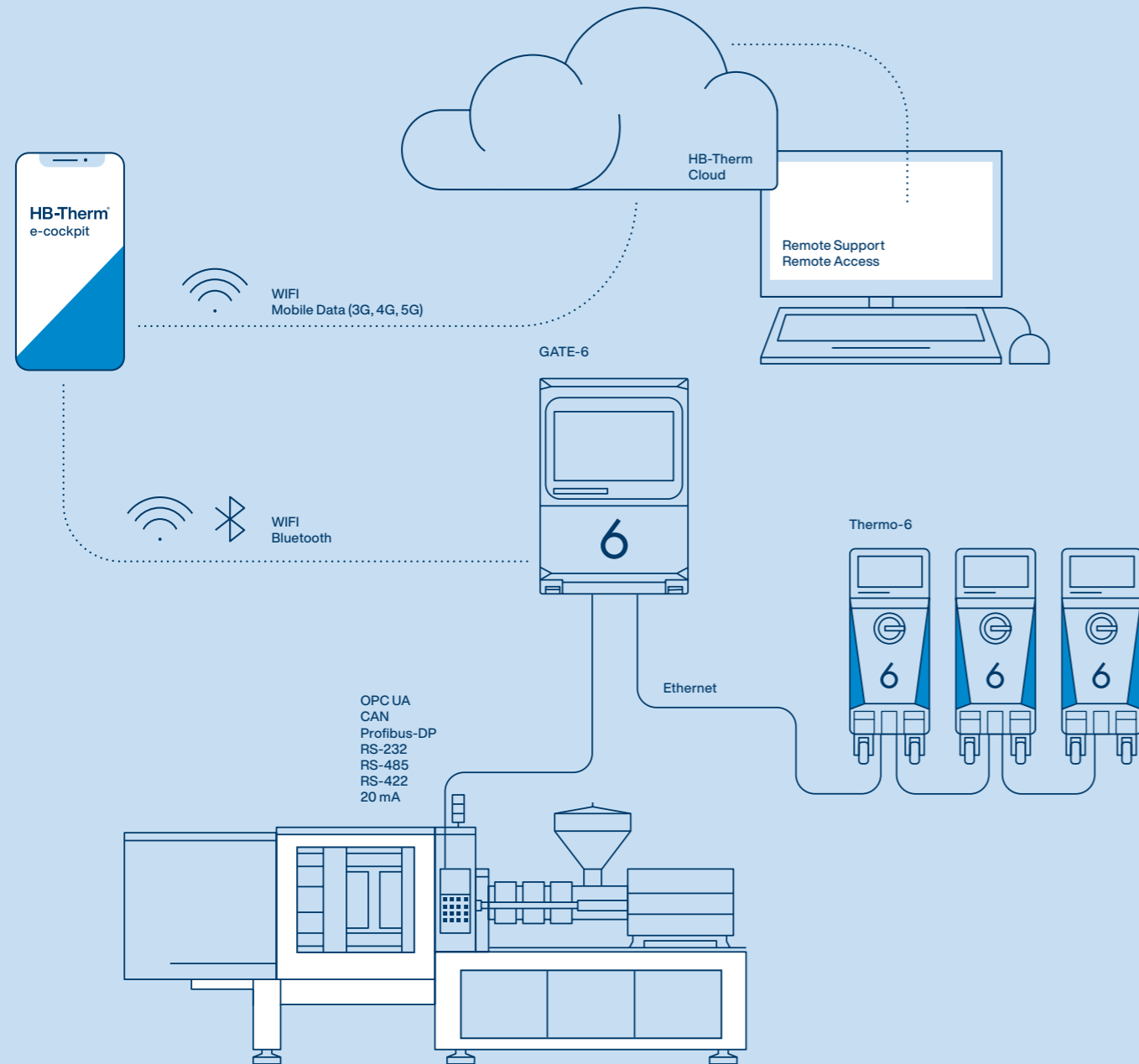| Package	Content
Remote	Remote Control: Remote control via e-cockpit app using a mobile input device (Android) Remote Access: External access to the unit from any e-mail address

General technical data

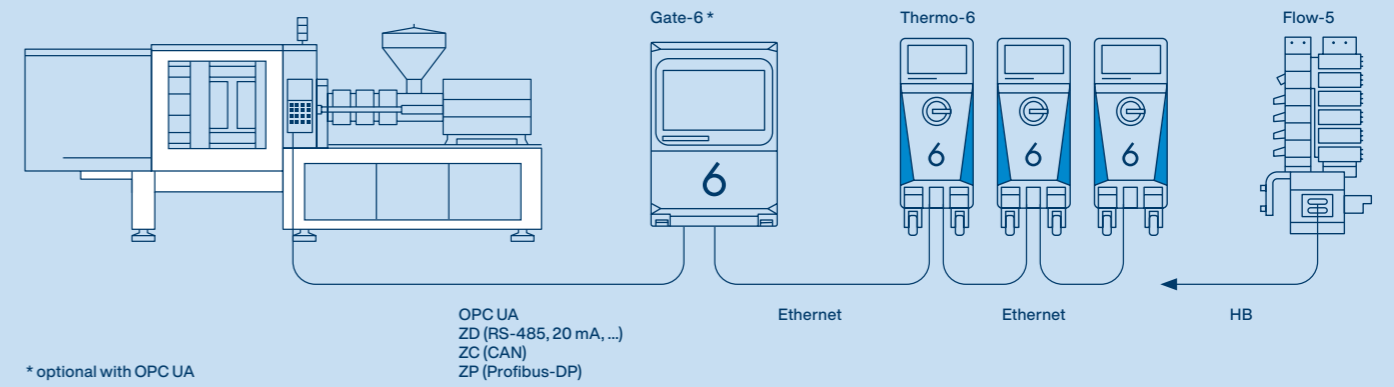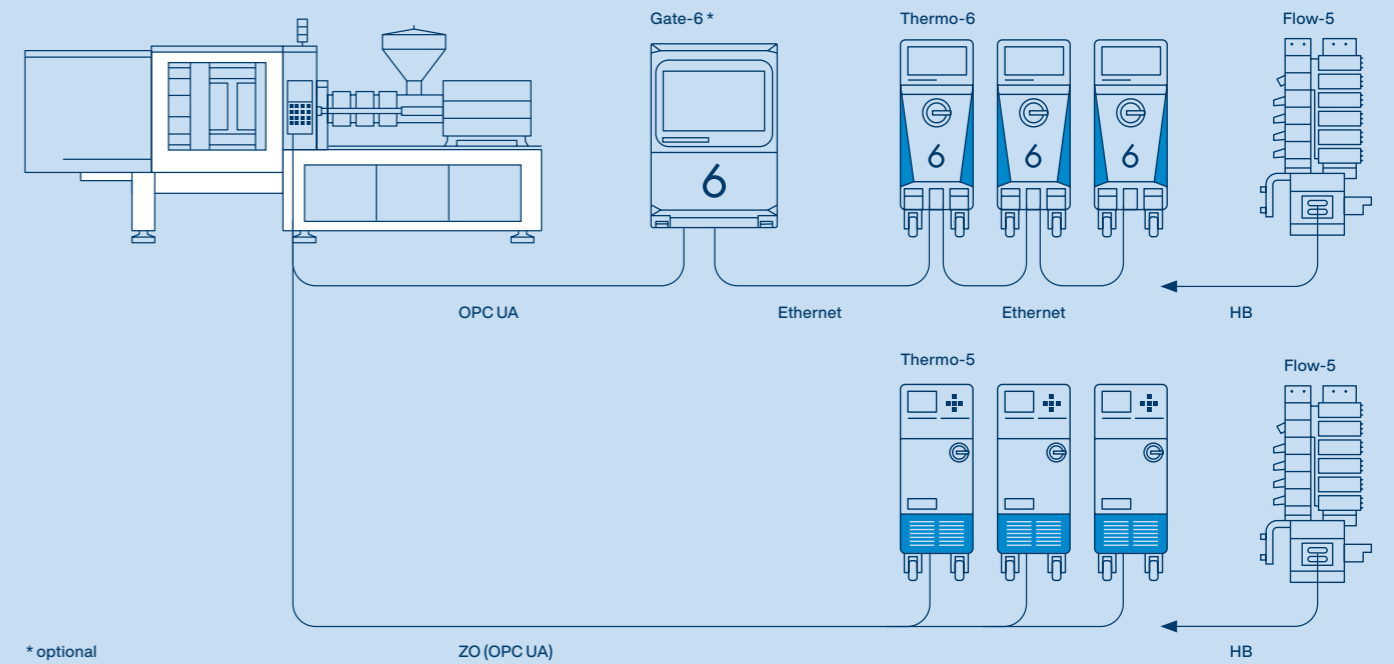| Feature		Data
Power supply		24 VDC, 30 W
Environment	Temperature	5–40 °C
	Relative humidity	35–85 % RH (non-condensing)
Colour	Top covers	RAL 9011 (graphite black matt)
	Cover bottom	RAL 7035 (light grey matt)
Dimensions (Height/Width/Depth)		275/190/67 mm
Weight max.		1,8 kg
Protection class		IP 44
Cleanroom capability		ISO class 6 (class 1 000)
Standards (depending on unit type)		EN 61010-1, EN61010-2-201, UL 61010-1, CSA-C22.2 No. 61010-1-12, EN 61326-1, EN 300328, EN 301893, EN 301489-1, EN 301489-17, EN ISO 12100, EN IEC 63000, EN ISO 13732-1
Certification/Approval		CE (compliance with relevant CE directives)

* on request

Dimensions

The world of Thermo-6 with Gate-6

HB-Therm
e-cockpit

HB-Therm
Cloud

Remote Support
Remote Access

WIFI
Mobile Data (3G, 4G, 5G)

WIFI
Bluetooth

GATE-6

Thermo-6

Ethernet

OPC UA
CAN
Profibus-DP
RS-232
RS-485
RS-422
20 mA

Example 1   Gate-6 and Thermo-6 with any interface

Gate-6 *   Thermo-6   Flow-5

OPC UA
ZD (RS-485, 20 mA, ...)
ZC (CAN)
ZP (Profibus-DP)

Ethernet   Ethernet   HB

* optional with OPC UA

Example 2   Thermo-5 and Thermo-6 with OPC UA

Gate-6 *   Thermo-6   Flow-5

OPC UA   Ethernet   Ethernet   HB

Thermo-5   Flow-5

* optional   ZO (OPC UA)   HB

Example 3   Thermo-5 and Thermo-6 with any interface

Thermo-5   Gate-6   Thermo-6

ZD (RS-485, 20 mA)
ZC (CAN)
ZP (Profibus-DP)   RS-422   Ethernet
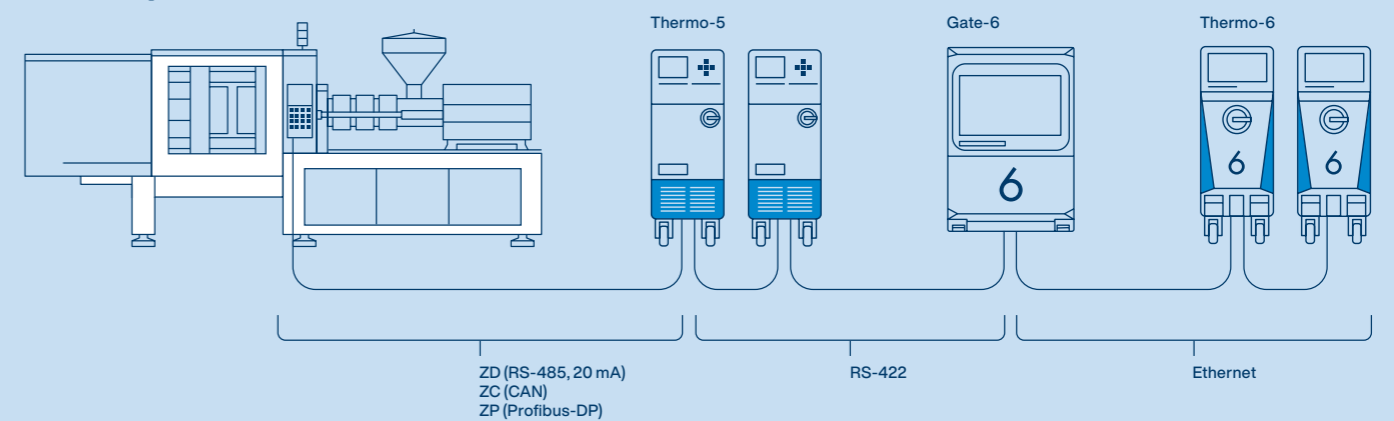
HB-Therm®

HB-Therm AG
St. Gallen, Switzerland

HB-Therm Distributors in over 60 countries.

Algeria	El Salvador	Latvia	Serbia
Argentina	Estonia	Liechtenstein	Singapore
Australia	Finland	Lithuania	Slovakia
Austria	France	Luxembourg	Slovenia
Belgium	Germany	Malaysia	South Africa
Bolivia	Great Britain	Mexico	Spain
Bosnia and Herzegovina	Guatemala	Morocco	Sweden
Brazil	Hong Kong	Netherlands	Switzerland
Chile	Hungary	New Zealand	Taiwan
China	India	North Macedonia	Thailand
Colombia	Indonesia	Norway	Tunisia
Costa Rica	Ireland	Paraguay	Turkey
Croatia	Israel	Peru	Uruguay
Czech Republic	Italy	Poland	USA
Denmark	Japan	Portugal	Venezuela
Ecuador	Korea	Romania	Vietnam

Contact
details