



Inspired by **temperature**

Interfaces

Manual

huber



MANUAL

Interfaces

Interfaces

This manual is a translation of the original manual.

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1 Introduction

1.1 Representation of textual emphases

The following emphases are used in the texts and illustrations.

Overview	Emphasis	Description
	■ ➤ Abc	Step-by-step explanation of the procedure.
	→	Reference to information or procedures.
	»Abc«	Reference to a paragraph in the document.
	>Abc< [123]	Reference to the wiring diagram in the annex, specifying the designation and search string (number).
	>Abc< [ABC]	Reference to a drawing in the same paragraph with specification of designation and search string (character).
	▪	List, first level
	–	List, second level

1.2 Symbols used for Safety Instructions

The documentation uses the following combinations of characters and signal word as safety information. The signal word describes the classification of the residual risk when the safety information is disregarded.

 DANGER	Denotes an immediate hazardous situation that will result in death or serious injuries.
 WARNING	Denotes a general hazardous situation that may result in death or serious injuries.
 CAUTION	Denotes a hazardous situation that can result in injury.
NOTE	Denotes a situation that can result in property material damage.
INFORMATION	Denotes important notes and usable hints.
	Notes in conjunction with Ex px cabinets.

Explanation

	Erratic behaviour	Possible hazard source
	EFFECT	Possible effects
	➤ Prevention	Prevention of errors
	➤ Resolve	Resolving problems
	➤ Knowledge	Knowledge transfer
Severity of the residual risk		

The safety information is designed to protect the operating company, the operators and the equipment from damage. Before starting the respective activity, you must inform yourself about the residual risks involved with incorrect handling.

1.3 Representation of symbols on the temperature control unit

The following characters are used.

Overview	Sign	Description
	Mandatory sign	
		- Observe the instructions
	Warning sign	
		- General warning sign - Observe the instructions
		- Warning of electrical voltage
		- Warning of hot surface
		- Warning of flammable substances
	Miscellaneous	
		Follow the national and local instructions for the disposal of electrical appliances.

1.4 Reasonably foreseeable misuse

NOT suitable for safety-related applications.

1.5 Proper disposal

The operating company must check and apply the national and local regulations applicable for it accordingly.

Overview	Material	Description
	Packaging material	Keep the packaging material for future use (e.g. transport).
	Thermal fluid	Disposal see safety data sheet of thermal fluid. Use original containers to dispose of larger amounts.
	Filling accessories	Clean filling accessories (such as beaker) for re-use. Auxiliary material and cleaning agents used must also be properly disposed of.
	Aids	Absorption of thermal fluid: The aids used (such as cloths and cleaning rags) must be disposed of according to the thermal fluid used. Use of cleaning agents: The aids used (such as cloths and cleaning rags) must be disposed of according to the cleaning agent used.
	Cleaning agent	Disposal see safety data sheet of cleaning agent. Use original containers to dispose of larger amounts.
	Consumables	Disposal see data sheet of consumables (such as air filter mats, temperature control hoses).
	Refrigerants	Work on the coolant circuit must be carried out by approved refrigeration/air-conditioning system contractors!

2 General information

NOTE

Connection with the interfaces while the temperature control unit is switched on.

DAMAGE TO THE INTERFACES

- Connecting a component while the temperature control unit is switched on can destroy the interface.
- Switch off the temperature control unit and the component to be connected before connecting them.

NOTE

Failure to observe the specifications of the interface used

MATERIAL DAMAGE

- Only connect components that meet the interface requirements.

NOTE

The "Pilot ONE®" controller is not operated behind a firewall

MATERIAL DAMAGE

- The "Pilot ONE®" controller must be operated behind a firewall if it is connected with a high-risk network.
- The best available technology is to be applied in order to create sufficient security for the LAN!

NOTE

Failure to observe the controller model when using an interface

MATERIAL DAMAGE

- Depending on the controller model used, the interfaces can be specified differently.
- Depending on the installation location, the ECS interface is specified differently. There are differences between the installation location "Unistat® Control ONE" and the installation location "Com.G@te®".
- The specifications in the corresponding sections must be complied with.

INFORMATION

Please note the specifications of the generally applicable standards when using the interfaces. For the exact position of the interfaces, please refer to the respective operation manual.

INFORMATION

Settings of the interfaces: Settings in the "Interfaces" category can be made in the "Pilot ONE®".

INFORMATION

The inputs and outputs of the interfaces must not be used for safety functions for the purpose of functional safety.

To determine the interfaces your temperature control unit is equipped with, please refer to the wiring diagram in the operation manual of the temperature control unit. The respective range of functions of the individual interfaces depends on the temperature control unit used and/or the software of the controller.

3 Controller models

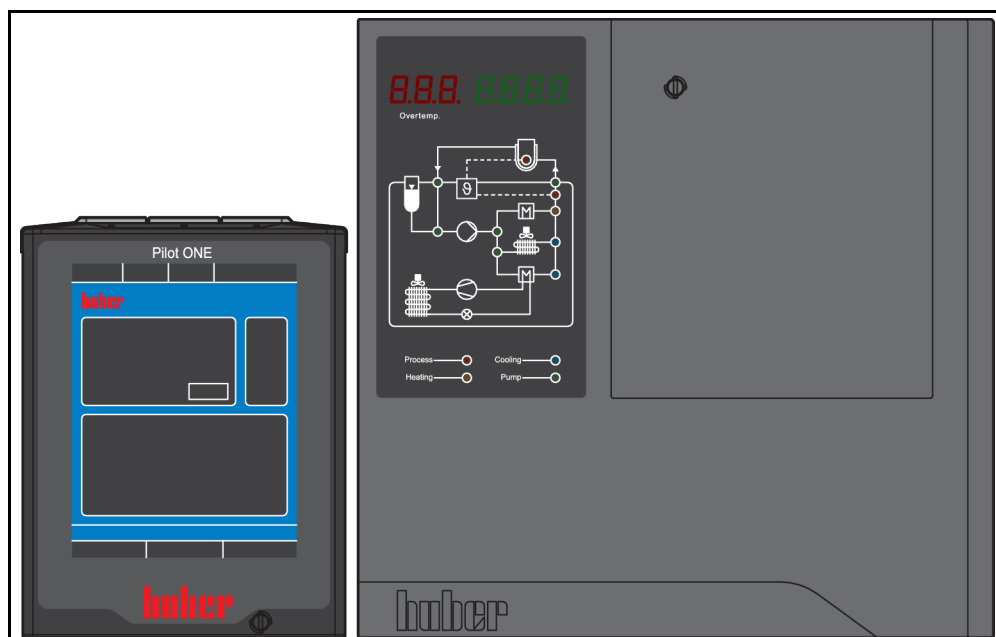
“MPC®”



“OLÉ” and “KISS”



“Pilot ONE®” and, depending on the model, “Unistat® Control ONE”



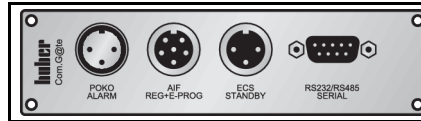
3.1 Controller models - overview

Overview of interfaces

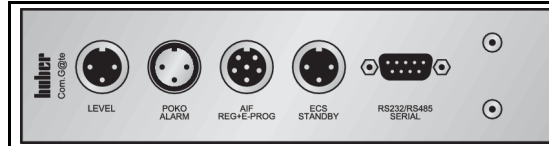
Interface						
	MPC®	OLÉ	KISS®	Pilot ONE®	Unistat® Control ONE	Com.G@te®
AIF	–	–	–	–	–	Com.G@te® Com.G@te® D/A
Control jack cooling bath	–	–	Temp.	–	–	–
ECS	–	Temp.	Temp.	–	Unistat® Control ONE	Com.G@te® Com.G@te® D Com.G@te® D/A
Ethernet	–	–	–	Pilot ONE®	–	–
LEVEL	–	–	–	–	–	Com.G@te®
POKO	–	Temp.	Temp.	–	Unistat® Control ONE	Com.G@te® Com.G@te® D Com.G@te® D/A
Pt100 process	Temp.	–	–	Temp.	–	–
Pt100 process display sensor	–	Temp.	KISS®	–	–	–
RS-232	Temp. ^{a)}	OLÉ	Temp.	Temp.	–	Com.G@te® Com.G@te® D Com.G@te® D/A
RS-232 (option) / control cooling bath	–	–	Temp.	Temp.	–	–
RS-485 Serial	–	–	–	–	–	Com.G@te®
Service interface	–	–	–	Temp.	Unistat® Control ONE	–
USB type A	–	–	–	Pilot ONE®	–	–
USB type Mini-B	–	OLÉ	KISS®	Pilot ONE®	–	–
Temp. = The interface is located on the temperature control unit. ^{a)} Only valid for temperature control units with “plus” in their model designation.						

4 “Com.G@te®” variants

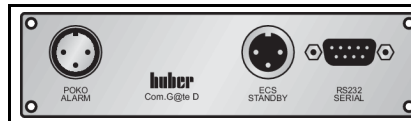
“Com.G@te®” internal



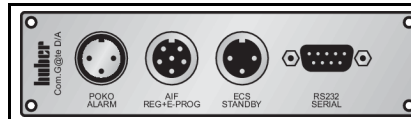
“Com.G@te®” external



„Com.G@te® D“ internal



“Com.G@te® D/A” internal/external



4.1 “Com.G@te®” variants - overview

NOTE

Failure to observe compatibility

MATERIAL DAMAGE

➤ The table “Compatibility” must be observed and implemented.

INFORMATION

The range of functions of the “Com.G@te®” depends on the electronics installed in the temperature control unit. The installed electronics (HE1 or HE2) can be queried in the “Pilot ONE®”. The query is described in the operation manual of the temperature control unit in the section “Display of software version”.

Compatibility - overview

Temperature control unit	HE1	HE2
Com.G@te® internal	Yes	No
Com.G@te® external	Yes	No
Com.G@te® D internal	No	Yes
Com.G@te® D/A internal	No	Yes
Com.G@te® D/A external	Yes, RS-232 without function	Yes

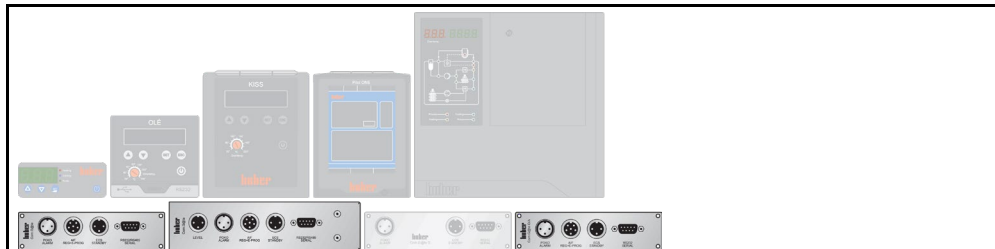
Interfaces of the
“Com.G@te®” variants
- overview

Temperature control unit	HE1				HE2			
Com.G@te variants	Com.G@te®		Com.G@te® D/A (digital/analog)		Com.G@te® D (digital)		Com.G@te® D/A (digital/analog)	
	Internal	External	Internal	External	Internal	External	Internal	External
	X	X	–	X	X	–	X	X
AIF (current / voltage input)	X		X		–		X	
AIF (current outputs)	X		X		–		X	
AIF (switchable: voltage outputs)	X		X		–		X	
ECS (enabling via contact)	X		X		X		X	
ECS (switching to enabling via 24 V)	–		X		X		X	
LEVEL	–	X	–		–		–	
POKO	X		X		X		X	
RS-232	X		without function		X		X	
RS-232 / RS-485 (switching to RS-485)	X		–		–		–	
Series connection (max. number)	1		1		3		3	

5 Interfaces

5.1 AIF [120]

Valid for:



The analog interface is equipped with a programmable input channel and 3 output channels. The interface is programmed via the category "Interfaces".

Only valid for "Com.G@te® D/A": The interface is electrically isolated from the temperature control unit.

Pin assignment
(front view)



Property
(front view)

Description	Figure
3x analog output (4 - 20 mA / 0 - 10 V) Temperature control unit outputs the analog measurement signal. For example proportional to the process temperature.	
1x analog input (4 - 20 mA / 0 - 10 V) The operator applies the analog control signal. For example to control the setpoint temperature.	

Pin assignment -
„Com.G@te®“

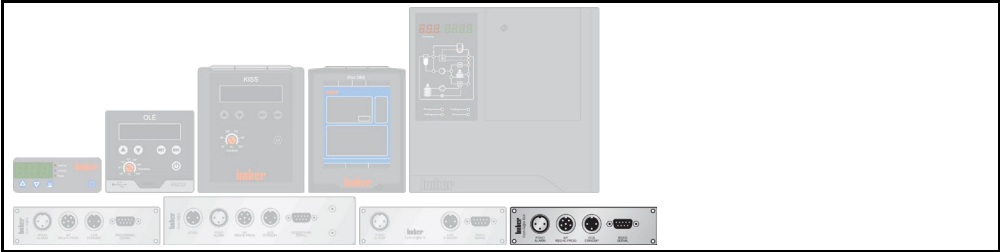
Pin	Description	Signal	
1	Current output, T external	0 ^{a)} /4 - 20 mA or 0 - 10 V	When using 0 - 10 V, an external 500 Ω resistor must be connected. The setting "internal" must be selected in the "Pilot ONE®".
2	Current output, setpoint		
3	GND for analog outputs	GND	
4	Analog input (programmable)	0 ^{a)} /4 - 20 mA or 0 - 10 V	Power input: 200 Ω working resistance Voltage input: 100 kΩ input resistance ^{b)}
5	Current output, freely programmable		When using 0 - 10 V, an external 500 Ω resistor must be connected. The setting "internal" must be selected in the "Pilot ONE®".
6	GND for analog input	GND	

^{a)} a) Consult with our Customer Support. ^{b)} No external resistance is required.

Pin assignment -
"Com.G@te® D/A"

Pin	Description	Signal	
1	Analog output, T external	0 ^{a)} /4 - 20 mA or 0 - 10 V	No external resistance is required. ^{c)}
2	Analog output, setpoint		
3	GND for analog outputs	GND	
4	Analog input (programmable)	0 ^{a)} /4 - 20 mA or 0 - 10 V	No external resistance is required. ^{b)}
5	Analog output, freely programmable		No external resistance is required. ^{c)}
6	GND for analog input	GND	
^{a)} Consult with our Customer Support. ^{b)} Settings in "Pilot ONE®": Voltage input - input resistance (typ.) 100 MΩ; current input - input resistance (typ.) 235 Ω ^{c)} Settings in "Pilot ONE®": Switching current/voltage.			

The following tables
are valid for:



Voltage output -
"Com.G@te® D/A"

Description	min.	typ.	max.	Unit
Load resistance (min.)	500	–	–	Ω
Resolution	–	177	–	μV
Deviation (typ.)	–	10	–	mV

Current output -
"Com.G@te® D/A"

Description	min.	typ.	max.	Unit
Load resistance (max.)	–	–	750	Ω
Resolution	–	354	–	nA
Deviation (typ.)	–	50	–	μA

5.2 Control jack cooling bath

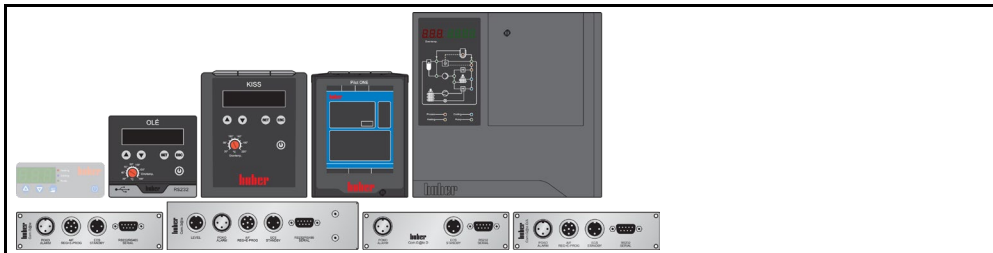
Valid for:



The immersion circulator is connected with a cooling bath via this connection. This enables control of the cooling bath by the immersion circulator.

5.3 ECS (External Control Signal) [48]

Valid for:



INFORMATION

The interface is specified as a digital input. "Unistat® Control ONE" and "Com.G@te®": **Do not apply voltage or current** (Not valid for "Com.G@te® D" and "Com.G@te® D/A").



Control takes place via floating contacts. Pins 1 and 3 are internally bypassed. **ECS** is electronically activated when E1 and E2 are connected by an external floating contact. Specification of contacts: min. 0.1 A/24 V DC.

Only valid for "Com.G@te® D" and "Com.G@te® D/A": The control (floating contact, 24 V) can be set in the "Pilot ONE®".

The functionality of the **ECS** is specified in the "Interfaces" menu item.

INFORMATION

The following distinction is made between the functions: A) The function is triggered at every contact change. B) The function permanently checks the status of the contact.

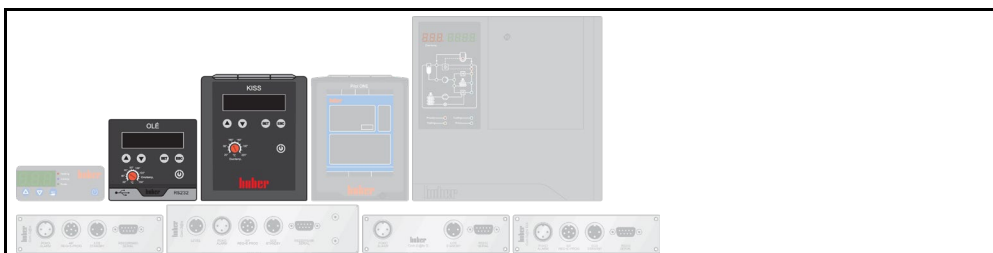
Pin assignment
(front view)



Pin assignment

Pin	Signal
1.3	E2
2	E1

The following table is
valid for:



Function overview -
"OLÉ" and "KISS"

Function	Description
Off	The interface is without function.
Setpoint2	Changes from the set "setpoint1" to the set "setpoint2" and back. Prerequisite: Active temperature control. Contact change to "open": The temperature of "Setpoint1" is maintained. Contact change to "closed": The temperature of "Setpoint2" is maintained.
Standby	Turns the temperature control on or off. Prerequisite: The temperature control unit is turned on. Contact change to "closed": Temperature control is turned on. Contact change to "open": Temperature control is turned off.

The following table is valid for:



Function overview -
"Pilot ONE®"

Function	Description
No action	Contact change to "closed": No action.
Switch to second setpoint	Replaces the set setpoint once with the set second setpoint. Prerequisite: Active temperature control. It is possible to change back at any time directly at the temperature control unit. Contact change to "open": Replaces the setpoint with the second setpoint. Contact "open": The temperature is controlled to the second setpoint. Contact change to "closed": No change is made to the previous setpoint. A new setpoint can be set manually.
Second setpoint selective	Changes from the set setpoint to the set second setpoint and back. Prerequisite: Active temperature control. Contact "open": The temperature of the set second setpoint is maintained. Contact "closed": The temperature of the set setpoint is maintained.
Internal/process	Changes the control from the internal to the external temperature sensor and back. Prerequisite: Active temperature control. Contact change to "open": Change from the external to the internal temperature sensor. Contact change to "closed": Change from the internal to the external temperature sensor.
Temperature control on/off	Turns the temperature control on or off. Prerequisite: The temperature control unit is turned on. Contact change to "closed": Temperature control is turned on. Contact change to "open": Temperature control is turned off.
Enabling	Turns off the active temperature control once. Prerequisite: Active temperature control. Temperature control can only be started if the contact is closed. Contact change to "open": Active temperature control is switched off. Contact "closed": The manual start of a temperature control is enabled.
Resetting messages	Resets messages and faults on the "Pilot ONE®". Messages can be reset as often as required, but faults can be reset a maximum of three times. Resetting is delayed in the event of a fault until the temperature control unit is in standby mode. Contact change to "closed": If possible, all messages are reset.
Program 1 start/stop	Start the preset temperature control program "1". Prerequisite: A temperature control program "1" is stored and no other temperature control program is active. Contact change to "closed": The temperature control program "1" is started. Contact change to "open": The temperature control is stopped.
Fill level alarm	Shows an alarm if the fill level is too low. Prerequisite: A level sensor is installed either in the >Sight glass< [23] or in the external application and connected with the interface. Contact "open": An alarm is output.
Fill level warning	Shows a warning if the fill level is too low. Prerequisite: A level sensor is installed either in the >Sight glass< [23] or in the external application and connected with the interface. Contact "open": A warning is displayed.
Status external pump Only valid for "Multi Flow Control Cube" (M-FCC).	Shows the operation of the external pump. Prerequisite: The "Multi Flow Control Cube" (M-FCC) can only be started when the contact is closed. Contact "closed": The external pump is running.

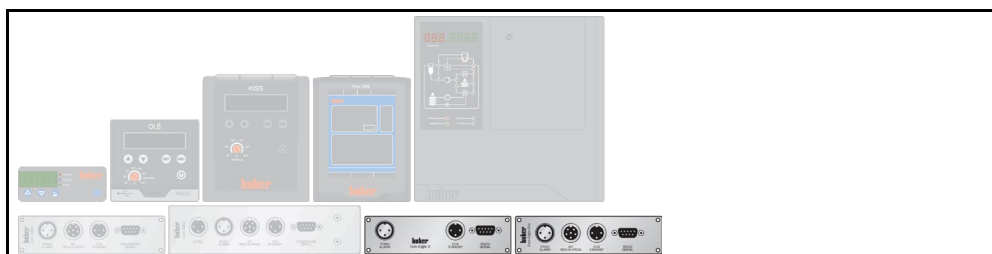
The following table is valid for:



Property
(Front view) -
"Unistat® Control
ONE"

Description	Figure
Internally protected	
Electrical contact Operator places a jumper. For example to start the temperature control.	

The following table is valid for:



Property
(Front view) -
"Com.G@te® D" and
"Com.G@te® D/A"

Description	Figure
Internally protected, switchable, enabling by...	
24 V voltage (default setting) Operator applies voltage. For example to start the temperature control.	
Electrical contact Operator places a jumper. For example to start the temperature control.	

Enabling - voltage -
"Com.G@te® D" and
"Com.G@te® D/A"

Description	min.	typ.	max.	Unit
Voltage at the interface for HIGH	20	24	30	V
Voltage at the interface for LOW	–	0	2.4	V
Current via the interface for HIGH	–	4.6	–	mA

Release - Contact -
"Com.G@te® D" and
"Com.G@te® D/A"

Description	min.	typ.	max.	Unit
Max. contact resistance	–	–	50	kΩ
Current via the interface on contact	–	0.6	–	mA

5.4 Ethernet [86]

Valid for:



INFORMATION

Communication with the “Pilot ONE®” takes place via TCP (Transmission Control Protocol). The specifications of the generally accepted standards must be observed when using the interface.

INFORMATION

The use of PB commands is described in our manual “Data communication”. You can download this manual at www.huber-online.com.



The interface is fast and flexible. The transmission rate is 10/100 Mbps (Fast Ethernet). Can be connected to any existing Ethernet network. Because this interface can also be connected to very large networks, the IT “Best Practices” (firewall) must be observed.

Use:

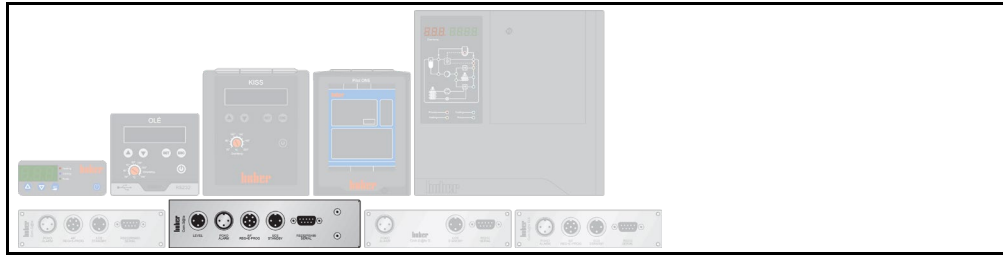
To be able to communicate with the controller “Pilot ONE®”, communication must be enabled. This is an additional safety function. It prevents an accidental connection with the wrong temperature control unit. Thus, the possibility of incorrect temperature control is minimized. The following restrictions are possible:

- Deactivated
- Always on (PLC)
- 12h Inactivity Timer
- 10min Inactivity Timer

Example: Selection of function “Deactivation after 10 min. inactivity”. If the function is confirmed at the controller, the connection must be established within 10 minutes. Otherwise, establishment of the connection is refused.

5.5 LEVEL

Valid for:



INFORMATION

The interface is specified as a digital input. **Do not apply voltage or current.**



This connection is used to monitor the level of an externally closed application. For this purpose, connect a float switch which is positioned in the **>Sight glass< [23]**. The float switch can be obtained from the Huber accessory program. Control takes place via floating contacts.

Pin assignment
(front view)



Pin assignment

Pin	Description
1	Level test (bypass via contact 2 → "absence")
2	Level – (GND)
3	Level + (normally open contact)

5.6 POKO (floating contact) [51]

Valid for:



INFORMATION

Shielded cables are recommended for the floating contact! The interface is specified as a digital output.

INFORMATION

In the function overview, “**active**” means: The “closing contact” is **closed** and the “opening contact” is **open**. “**Inactive**” means: The “closing contact” is **open** and the “opening contact” is **closed**. Temperature control unit is energized (turned off): The switch position is “**inactive**”.

Signal contact for external monitoring.



Depending on the configured response, the state of the temperature control unit is detected by its switch position.

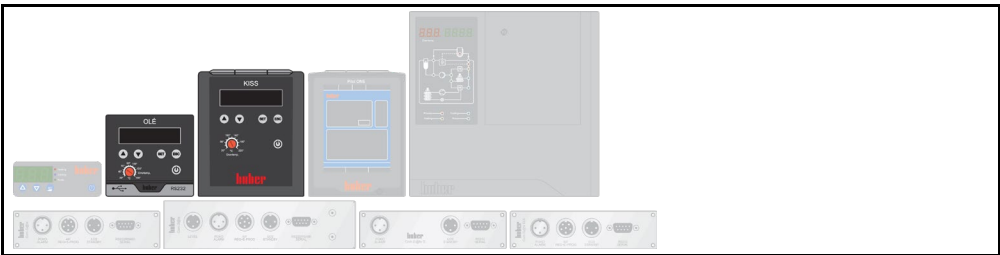
The functionality of the **POKO** is specified in the “Interfaces” menu item.

Pin assignment
(front view)



The connection is designed as a floating changeover contact.
Closing contact between pin 1 and pin 2.
Opening contact between pin 2 and pin 3.
Maximum contact load: 0.3 A at 30 V DC.

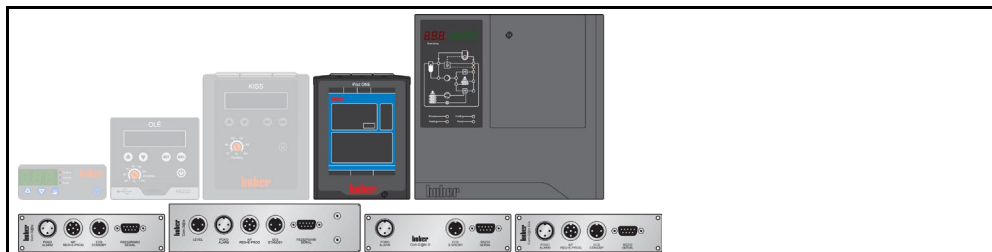
The following table is
valid for:



Function overview -
“OLE” and “KISS”

Function	Description
Off	The interface is without function.
Alarm	Indicates a fault of the temperature control unit. Switching position “ active ”: Fault at the temperature control unit.
Unipump / PCS	Switches an external pressure booster pump (thermal fluid or cooling water circuit) on and off synchronously to the temperature control unit pump. Switching position “ active ”: The internal pump is turned on. Switching position “ inactive ”: The internal pump is turned off. Temperature control unit in standby.

The following table is valid for:



Function overview -
"Pilot ONE", "Unistat®
Control ONE",
"Com.G@te®",
"Com.G@te® D" and
"Com.G@te® D/A"

Function	Description
Off	Shows the readiness for operation of the temperate control unit. Prerequisite: System test (approx. 30 seconds) after turning on was passed. Switching position "active" : Temperature control unit is ready for operation. Switching position "inactive" : Temperature control unit is turned off or a fault is on hand.
Temperature relative	Shows that a defined temperature band is maintained. Prerequisite: Limitation of the difference between setpoint and actual value by entering "min. value" and "max. value". Selection of the control mode internal temperature (internal control) or the process temperature (process control) for the actual value. Switching position "active" : The temperature band is maintained. Switching position "inactive" : The temperature band is overrun or underrun. In addition, a response can be determined: "Ignore standstill/fault" or "Take standstill/fault into account". Switching position "active" during response "Take standstill/fault into account": Temperature control active, the temperature band is maintained.
External alarm	Indicates a fault of the temperature control unit. Advantage: No alarm is triggered when the temperature control unit is turned off. Alarm function together with operating current principle desired: Use function "OFF". Switching position "active" : Fault at the temperature control unit.
Unipump / PCS	Turns an external pressure booster pump on and off synchronous to the temperature control unit pump (thermal fluid or cooling water circuit). Switching position "active" : The internal pump is turned on. Switching position "inactive" : The internal pump is turned off. Temperature control unit in standby.
External control	Switching is done via an external interface. Prerequisite: Use of the PB commands "vPoKoExtMode" and "vPoKoState" . External interfaces: Ethernet, RS-232, RS-485 and USB type mini-B (device). Please also refer to the software offered by us and the Data Communication Manual.
Process temperature relative	Shows that a defined temperature band is maintained. Prerequisite: Limitation of the difference between setpoint and actual value of the process temperature by entering "min. value" and "max. value". Switching position "active" : The temperature band is maintained. Switching position "inactive" : The temperature band is overrun or underrun. In addition, a response can be determined: "Ignore standstill/fault" or "Take standstill/fault into account". Switching position "active" during response "Take standstill/fault into account": Temperature control active, the temperature band is maintained.
Unipump with echo	Turns an external pressure booster pump on and off synchronous to the temperature control unit pump (thermal fluid or cooling water circuit). Difference to "Unipump/PCS" : In addition, the synchronous run is checked. A fault message is displayed in case of asynchronicity. Monitoring can ensure the desired circulation and prevent heating in the thermal fluid circuit. The operating mode of the Unipump is applied to the "LEVEL" interface via a make contact.
Programmer	Activates the associated switching states in the individual segments of a temperature control program.
Internal temperature absolute	Shows that a defined temperature band is maintained. Prerequisite: Definition of a temperature band for the absolute temperature of the internal temperature by entering the "min. value" and "max. value". Switching position "active" : The temperature band is overrun or underrun. Switching position "inactive" : The temperature band is maintained.

Function	Description
Process temperature absolute	Shows that a defined temperature band is maintained. Prerequisite: Definition of a temperature band for the absolute temperature of the process temperature by entering the “min. value” and “max. value”. Switching position “ active ”: The temperature band is overrun or underrun. Switching position “ inactive ”: The temperature band is maintained.
Solenoid valve flow / return flow	Controls a connected solenoid. The switching position is only “ active ” as long as the full pump pressure is applied. Switching position “ active ”: 60 seconds after the start of the pump (full pump pressure). Switching position “ inactive ”: Pump stop (no full pump pressure). The pump may continue to run for a while.
Cooling	Controls the cooling water supply by a solenoid valve. The cooling water supply only begins when the temperature control unit requires cooling water. Switching position “ active ”: Cooling water supply.
Message present	Shows that a message is available on the “Pilot ONE®”. Possible causes: Fault, warning or general message. Switching position “ active ”: A message is available.
Automatic filling	Monitors the fill level. Switching position “ active ”: The fill level is under the minimum value. The system switches to “ inactive ” after 20 seconds. Provided the fill level is above the minimum value. Switching position “ inactive ”: The fill level is above the minimum value or reaches the maximum value.
Setpoint reached	Shows that the setpoint has been reached. Switching position “ active ”: The setpoint (+/- 0.1 K) was reached once. Switching position “ inactive ”: The temperature control was switched off.
M-FCC ready Only valid for “Multi Flow Control Cube” (M-FCC).	Shows the readiness for operation of the “Multi Flow Control Cube” (M-FCC). Prerequisite: The first-time initialization of the VPC was completed. Switching position “ active ”: The “Multi Flow Control Cube” is ready.
Stop flow Only available with bypass valve (VPC or Flow Control Cube).	Displays the flow rate setpoint 0 l/min during flow rate control. Example of use: A solenoid valve is installed downstream of the bypass valve (VPC) to avoid leakages. Flow rate control with or without pressure limitation is active. If the setpoint of the flow is set to 0 l/min, the solenoid valve is closed by the “ active ” switch position. Prerequisite for reopening the solenoid valve: a) The setpoint of the flow rate does not equal 0 l/min. b) The temperature control unit is in standby. c) The control mode is changed. Switching position “ active ”: The flow rate setpoint is 0 l/min.

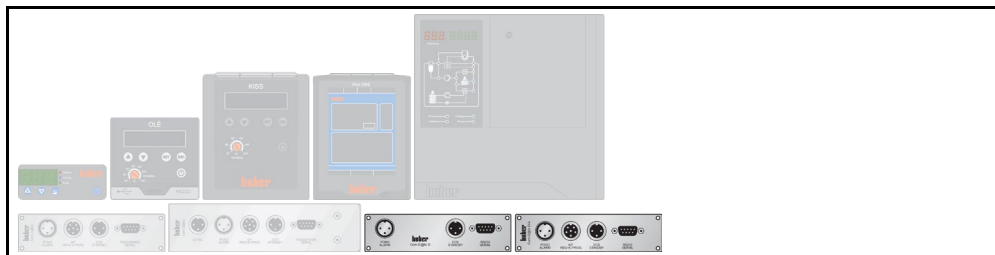
The following table is valid for:



Property (Front view) - “Unistat® Control ONE” and “Com.G@te”

Description	Figure
Temperature control unit opens / closes the contact. For example when the setpoint temperature is reached.	
[A] centre; [B] opening contact; [C] closing contact	

The following table is valid for:



Property
(Front view) -
"Com.G@te® D" and
"Com.G@te® D/A"

Description	Figure
Fused with a self-resetting fuse ($I_{hold} = 500 \text{ mA}$). Temperature control unit opens / closes the contact. For example when the setpoint temperature is reached.	
[A] centre; [B] opening contact; [C] closing contact	

POKO interface -
"Com.G@te® D" and
"Com.G@te® D/A"

Description	min.	typ.	max.	Unit
Voltage at the interface. Observe the minimum load!	0.1	–	30	V
Current at the interface. Observe the minimum load!	1	–	300	mA

5.7 Pt100 [49]

Valid for:



INFORMATION

Depending on operating temperature, insulation losses and exothermic heat: The flow temperature (operation temperature) of the application can be significantly above or below the setpoint of the application. In this context, safety-critical thresholds for the temperature control fluid must be strictly observed.

The control results specified in the data sheet can only be achieved with **shielded** sensor cables. We recommend the external Pt100 process sensors from the Huber accessory program.



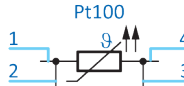
A temperature sensor (Pt100, Lemosa plug) located in the connected application is connected to the Pt100 port.

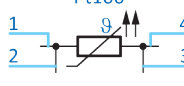
Only valid for “MPC®” and “Pilot ONE®” (Pt100 process): The external actual temperature is recorded and the operating temperature of the temperature control unit is constantly calculated and adjusted.

Only valid for “OLÉ” and “KISS®” (Pt100 process display sensor): It records and displays the external actual temperature.

Pin assignment
(front view)

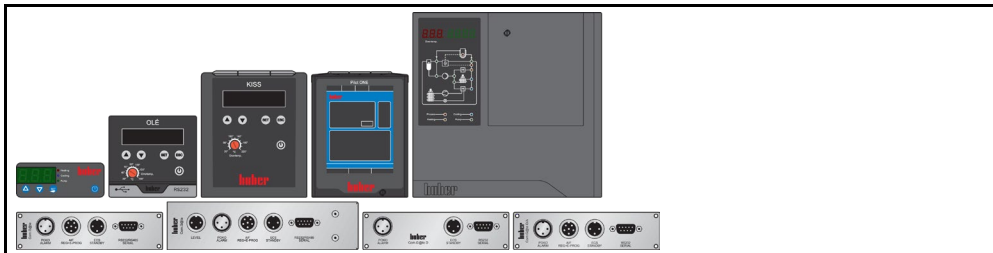


Pin assignment - “MPC®” and “KISS®” (2-conductor technology)	Pin	Signal	Figure	
	1	+ (Plus)		
	2			
	3	- (Minus)		
	4			

Pin assignment - “Pilot ONE®” (4-conductor technology)	Pin	Signal	Figure
	1	I+	
	2	U+	
	3	U-	
	4	I-	

5.8 RS-232 [60]

Valid for:



INFORMATION

The use of PB commands is described in our manual "Data communication". You can download this manual at www.huber-online.com.



A PC, a PLC or a Process Control System (PCS) can be connected to this jack for remote control of the controller electronics.

Only valid for "OLÉ", "KISS", "Pilot ONE" and "Com.G@te D" and "Com.G@te D/A": Please check and where necessary adjust the settings under "Interfaces" before connecting the cable. Temperature control unit without RS-232-jack: Connect an optional adapter cable to the service interface. Please note: Only one RS-232 interface must be used per temperature control unit.

Pin assignment
(front view)



Pin assignment

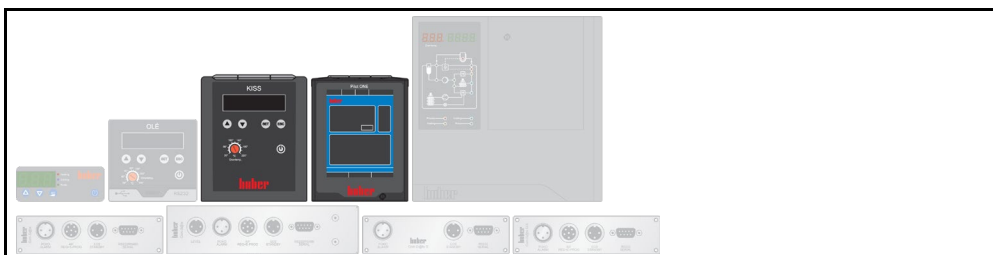
Pin	Signal	Description
2	RxD	Receive Data
3	TxD	Transmit Data
5	GND	Signal GND

RS-232 interface -
"KISS" and "Pilot
ONE"

Description	min.	typ.	max.	Unit
RS-232 baud rate	1.2	9.6	115.2	kBd
Maximum time span between two characters. Incomplete transmissions are discarded. See specifications in the Data Communication Manual.	–	0	< 100	ms
Character format: 8-N-1 (1 start bit, 8 data bits, no parity, 1 stop bit)				

5.9 RS-232 [60] (option)/control cooling bath

Valid for:



The immersion circulator is connected with the cooling bath via this connection. This enables control of the cooling bath via the immersion circulator.

5.10 RS-485 serial [60]

Valid for:



INFORMATION

The use of PB commands is described in our manual “Data communication”. You can download this manual at www.huber-online.com.



A PC, a PLC or a Process Control System (PCS) can be connected to this jack for remote control of the controller electronics. Alternatively, a connection to a RS-485 bus is possible. Please check and where necessary adjust the settings under “Interfaces” before connecting the cable.

Pin assignment
(front view)



Pin assignment -
“Pilot ONE®” and
“Com.G@te®”

Pin	Signal	Description
6	A with 120-Ω terminating resistor	–
7	A	–
8	B	–

RS-232 interface -
“KISS®” and “Pilot
ONE®”

Description	min.	typ.	max.	Unit
RS-232 baud rate	1.2	9.6	115.2	kBd
Maximum time span between two characters. Incomplete transmissions are discarded. See specifications in the Data Communication Manual.	–	0	< 100	ms
Character format: 8-N-1 (1 start bit, 8 data bits, no parity, 1 stop bit)				

5.11 Service interface [50]

Valid for:



This interface is exclusively used by Huber service engineers. An adapter cable makes this interface a RS-232 serial port. Please note: Only one RS-232 interface must be used per temperature control unit.

5.12 USB type A [84] (Host)

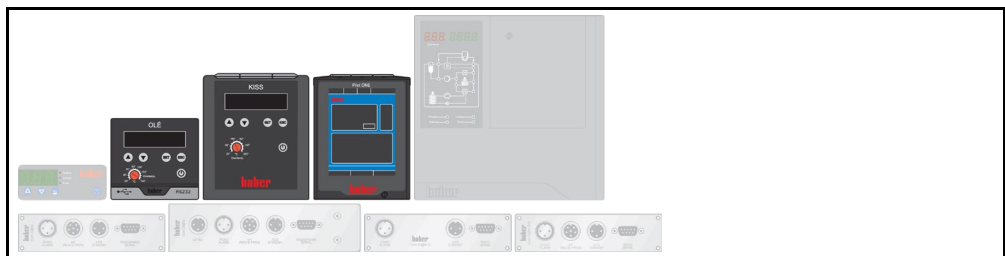
Valid for:



USB-2.0 connection (for connector A), e.g. for data memories. Supported file system: FAT 32.

5.13 USB type mini-B [85] (device)

Valid for:



USB-2.0 connection (for Mini-B connector) for communicating with a computer. For example with our software "SpyControl" or with a Process Control System (PCS).

6 Maintenance

DANGER

Maintenance work on the running temperature control unit

DANGER TO LIFE FROM ELECTRIC SHOCK

- Stop an ongoing temperature control process.
- Switch off the temperature control unit.
- Disconnect the temperature control unit from the power supply.

NOTE

Maintenance work that is not described is carried out

MATERIAL DAMAGE

- For maintenance work that is not described, please contact the Huber company.
- Maintenance work that is not described is reserved for qualified specialists trained by the Huber company.
- Safety-relevant components may only be replaced by equivalent components. The specified safety values for the respective component must be observed.

6.1 Cleaning the surfaces

CAUTION

Extremely hot or cold surfaces, connections and thermal fluids

BURNS OR FREEZING OF LIMBS

- Surfaces, connections and the tempered thermal fluid can be extremely hot or cold depending on the operating mode.
- Avoid direct contact!
- Wear personnel protective equipment. For example heat-resistant protective gloves and safety goggles.

NOTE

Open plug contacts

DAMAGE CAUSED BY FLUID INGRESS

- Protect plug contacts that are not required with the protective caps supplied.
- Clean surfaces only with a damp cloth.

A standard stainless steel cleaning agent is suitable for cleaning the stainless steel surfaces. Carefully clean painted surfaces (damp only) using a solution of sensitive-fabrics detergent. Observe the proper disposal of cleaning agents and aids. → Page 9, section »Proper disposal«.

6.2 Plug contacts

NOTE

Open plug contacts

DAMAGE CAUSED BY FLUID INGRESS

- Protect plug contacts that are not required with the protective caps supplied.
- Clean surfaces only with a damp cloth.

All plug contacts are provided with protective caps. Plug contacts that are not required must be protected with the protective caps.

6.3 Decontamination before shipping

CAUTION

Shipping temperature control units or accessories that are not decontaminated

PERSONAL INJURIES AND DAMAGE DUE TO RESIDUES OF HAZARDOUS SUBSTANCES

- Carry out suitable decontamination.
- The scope of decontamination depends on the type and amount of the substances used.
- The corresponding safety data sheet must be observed.
- You will find a prepared return receipt at www.huber-online.com.

The operating company is responsible for carrying out a decontamination. Decontamination must be carried out **before** the temperature control unit or accessory is shipped. For example for repair or inspection. It must be ensured that third-party personnel do **not** come into contact with a contaminated temperature control unit or accessory. A written note pointing out that decontamination has been carried out must be attached clearly visible on the temperature control unit or accessory.

7 Shutting down

7.1 Disposal

The operating company must observe the national and local regulations for the disposal

NOTE**Improper disposal****ENVIRONMENTAL DAMAGE**

- Environmental damage must be avoided.
- Only commission approved specialized companies to carry out the disposal.

Huber temperature control units and Huber accessories are manufactured from high quality, recyclable materials. For example: Stainless steel 1.4301 / 1.4401 (V2A), copper, nickel, FKM, Perbunan, NBR, ceramic, carbon, Al-Oxid, red brass, brass, nickel-plated brass and silver solder. With proper recycling you actively contribute to the reduction of the CO₂ emissions during the manufacture of these materials.

Inspired by **temperature** designed for you

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