Inspired by
temperature

Interfaces

Manual

huber

huber

Interfaces

Interfaces

This manual is a translation of the original manual.

Table of contents

1 Introduction

1.1 Representation of textual emphases

The following emphases are used in the texts and illustrations.

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

Overview appears to the left of the table header row.

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.

⚠ Ex — Notes in conjunction with Ex px cabinets.

Explanation

⚠	**Erratic behaviour** ——— Possible hazard source
	EFFECT ——— Possible effects
	▸ Prevention ——— Prevention of errors
	▸ Resolve ——— Resolving problems
Severity of the residual risk	▸ Knowledge ——— Knowledge transfer

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 signs are used on the temperature control unit.

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 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).

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.

3   Controller models

"MPC®"
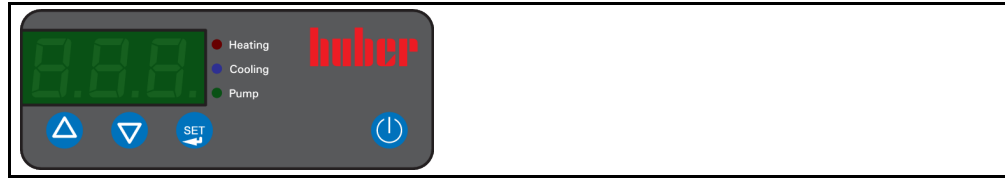
"OLÉ" and **"KISS®"**

"Pilot ONE®" and, depending on the model, **"Unistat® Control ONE"**
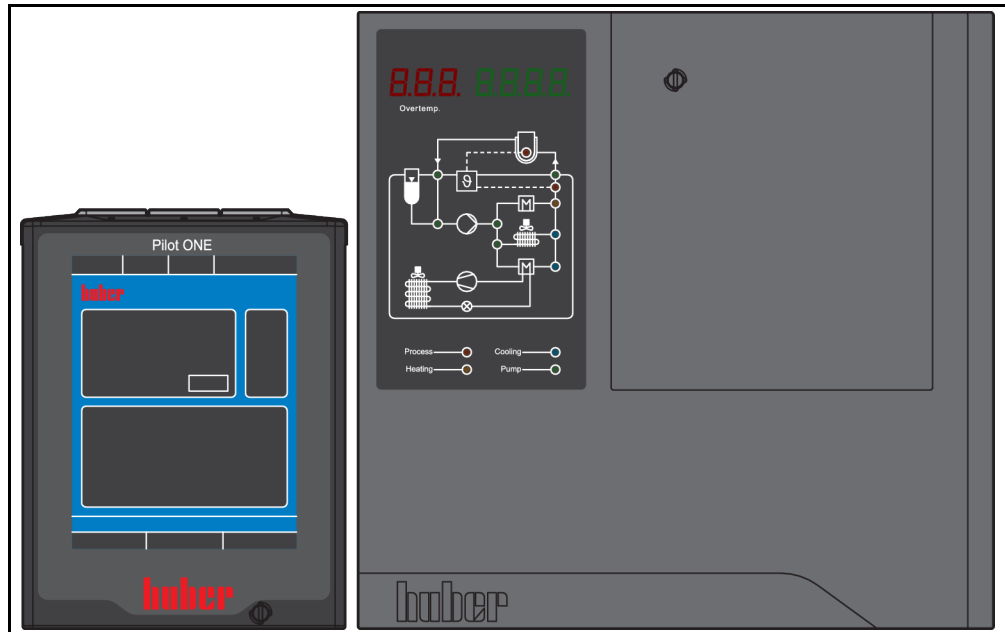
3.1   Controller models - overview

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®" exter-nal
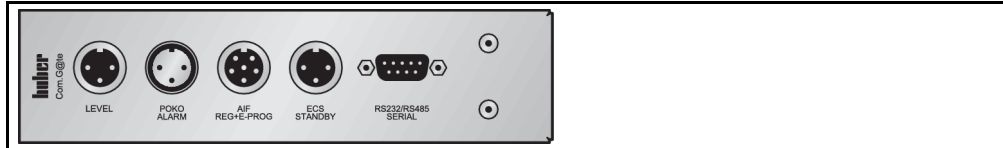
"Com.G@te® D"

"Com.G@te® D/A"

4.1 "Com.G@te®" variants - overview

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".

Overview of "Com.G@te®" variants

Interface	HE1			HE2	
	Com.G@te®	Com.G@te® D[a]	Com.G@te® D/A[b]	Com.G@te® D[a]	Com.G@te® D/A[b]
AIF (current / voltage input)	X	–	X	–	X
AIF (current outputs)	X	–	X	–	X
AIF (switchable: voltage outputs)	–	–	X	–	X
ECS (enabling via contact)	X	X	X	X	X
ECS (switching to enabling via 24 V)	–	X	X	X	X
LEVEL	X [c]	–	–	–	–
POKO	X	X	X	X	X
RS-232	X	– [d]	– [d]	X	X
RS-232 / RS-485 (switching to RS-485)	X	–	–	–	–
„Com.G@te®" (max. number)	1	1	1	3	3
[a] D = digital; [b] D/A = digital/analog; [c] Com.G@te® external only; [d] Interface without function					

5 Interfaces

5.1 AIF [120]

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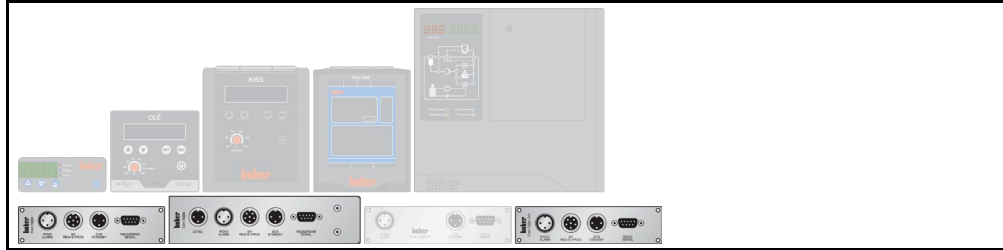
The analog interface is equipped with a programmable input channel and 3 output channels. The interface is programmed via the category "Interfaces".

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)		Power input: 200 Ω working resistance Voltage input: 100 kΩ input resistance [b)]
5	Current output, freely programmable	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®".
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:
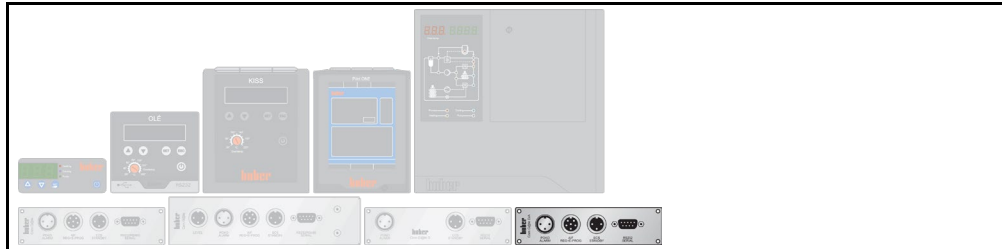
Voltage output - **"Com.G@te® D/A"**

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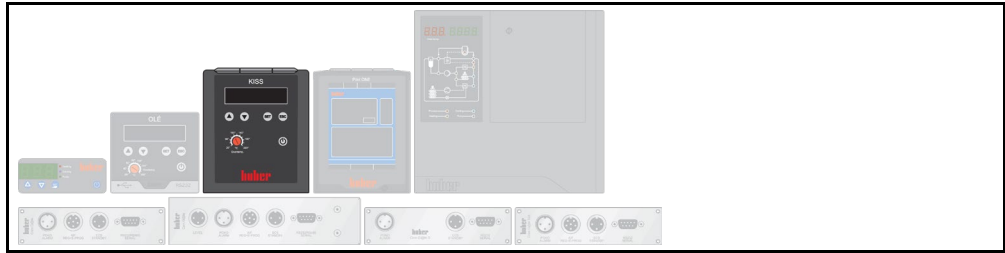
The immersion circulator is connected with a cooling bath via this connection. This enables control of the cooling bath by the immersion circulator.

5.3 ECS (External Control Signal) [48]

Valid for:
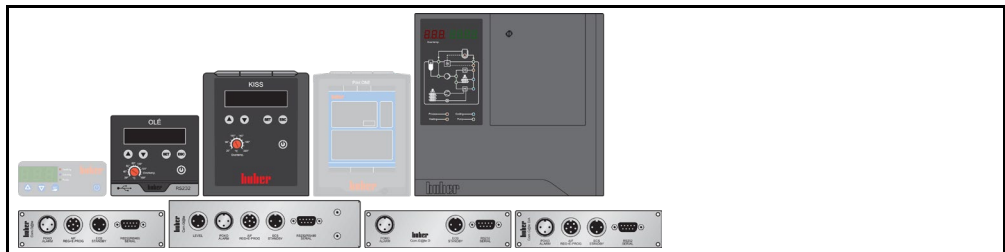
INFORMATION

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.

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	Contact open: Temperature control to "setpoint1". Contact closed: Temperature control to "setpoint2".
Stand-by	Contact change (open -> closed): Temperature control is switched on. Contact change (closed -> open): Temperature control is switched off.

The following table is valid for:

Function overview - **"Pilot ONE®"**

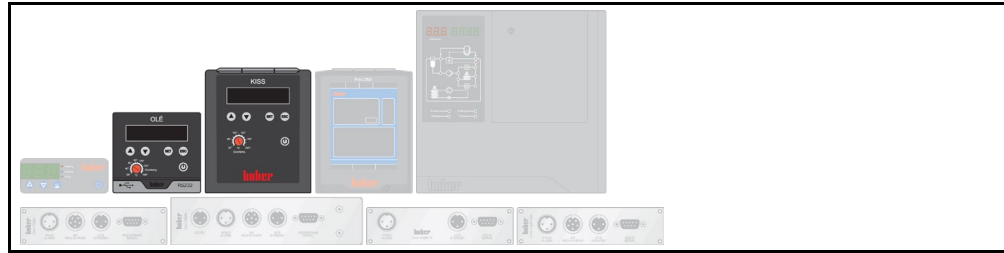| Function	Description
No action	Contact change (open <-> closed) is without function.
Switch to second setpoint	Contact change (closed -> open): The set setpoint is replaced with the value of the preset second setpoint. This change can be made by the operator at the temperature control unit at any time. Contact change (open -> closed): Contact closed: No impact. The temperature control is not reset to the original setpoint.
Second setpoint selective	Contact open: Temperate control to the original setpoint. Contact closed: Temperature control to the second setpoint.
Internal/Process	Contact open: The internal temperature sensor is used for control. Contact closed: The externally connected temperature sensor is used for control. Contact change (open <-> closed): Switching between the two temperature sensors takes place.
Temperature control on/off	Contact change (open -> closed): Temperature control is switched on. Contact change (closed -> open): Temperature control is switched off.
Enabling	Contact change (closed -> open): Active temperature control is switched off. Another contact change (open -> closed): Inactive temperature control is **not switched on**!
Reset Messages	Contact change (open -> closed): All messages in the "Pilot ONE®" are reset (if possible). Resetting is delayed in the event of a fault until the temperature control unit is in stand-by mode. Messages can be reset as often as required, but faults can be reset only 3 times.
Program 1 Start/Stop	Contact change (open -> closed): The preset temperature control program 1 is started. Contact change (closed -> open): The temperature control program is stopped.
Fill level alarm	Contact change (closed -> open): An alarm is triggered if the fill level is too low. Prerequisite: A level sensor is placed in the **>Sight glass<** [23] or in the external application and connected with the interface.
Fill level warning	Contact change (closed -> open): A warning is triggered if the fill level is too low. Prerequisite: A level sensor is placed in the **>Sight glass<** [23] or in the external application and connected with the interface.
Status External Pump	If the external pump is running, the input is closed. The accessory can only be started if the contact is closed. Note: Only valid for "Multi Flow Control Cube" (M-FCC).

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:
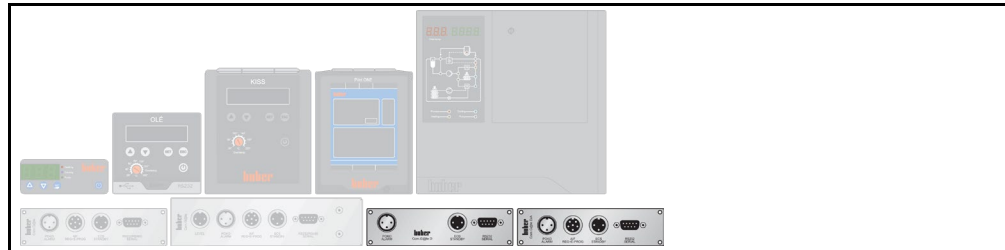
Property (Front view) - **"Com.G@te® D"** and **"Com.G@te® D/A"**	Description	Figure
	Internally protected, switchable, enabling by...	
	24 V voltage (default setting) Operator applies voltage. For example to start the temperature control.	
	Electrical contact Operator places a jumper. For example to 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:
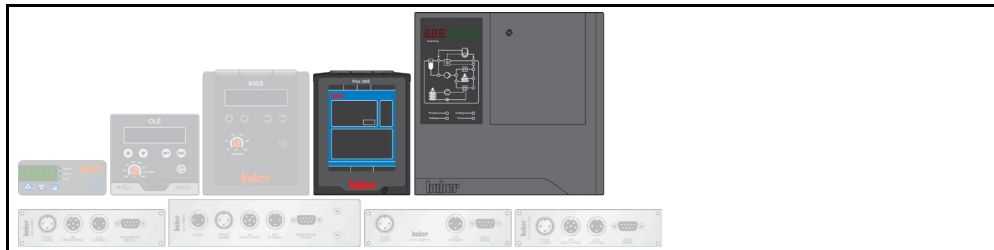
INFORMATION	Communication with the "Pilot ONE®" takes place via TCP (Transmission Control Protocol). The specifications of the generally accepted standards must be observed when using the interface.

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. |

Signal contact for external monitoring.

The floating contact (POKO) signals the state of the temperature control unit via its switch position. Contact closed: Readiness for operation. In case of a fault or failure: Contact is opened (between pin 1 and pin 2).

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	The POKO relay becomes active (OK state) if the temperature control unit is switched on and goes into "Fault" mode.
Unipump/PCS	When an external pump is used to increase the pressure in the thermal fluid or cooling water circuit: The external pump operates synchronously to the pump in the temperature control unit due to the enable contact. If the internal pump is started, the POKO assumes the OK state. **PCS**: The state of the temperature control unit is signaled to the process control system. **POKO ON**: The pump is active. **POKO OFF**: The pump is inactive, the temperature control unit is in standby mode.

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	If the temperature control unit is ready for operation: The OK state is displayed. A system test is carried out (approx. 30 seconds) after the temperature control unit is switched on. If the test is successful, the temperature control unit is ready for operation. The OK state ends: By switch-off or by a fault.
Internal temperature relative	POKO "min. value" and POKO "max. value": Input of upper and lower limit of a temperature range around the setpoint. The set temperature range specifies the smallest difference between setpoint and actual value. The temperature range is exceeded: The POKO switches away from the OK state. There are no other reactions of the temperature control unit. The actual value is once more within the temperature range: The contact returns to the OK state.
External alarm	The POKO relay becomes active (OK state) only if the temperature control unit is switched on and goes into "Fault" mode. The advantage: The alarm will not be triggered if the temperature control unit is switched off. If you desire to use the alarm function together with the operating current principle: Use function **"OFF"**.
Unipump/PCS	When an external pump is used to increase the pressure in the thermal fluid or cooling water circuit: The external pump operates synchronously to the pump in the temperature control unit due to the enable contact. If the internal pump is started, the POKO assumes the OK state. **PCS**: The state of the temperature control unit is signaled to the process control system. **POKO ON**: The pump is active. **POKO OFF**: The pump is inactive, the temperature control unit is in standby mode.
External control	The POKO is switched on and off with the PB commands "vPoKoExtMode" and "vPoKoState" via an external interface. External interfaces: Ethernet, RS-232, TS485 and USB device. Please also refer to the software offered by us and the Data Communication Manual.
Process temperature relative	POKO "min. value" and POKO "max. value": Input of upper and lower limit of a temperature range around the setpoint. The set temperature range specifies the smallest difference between setpoint and actual value. The temperature range is exceeded: The POKO switches away from the OK state. There are no other reactions of the temperature control unit. The actual value is once more within the temperature range: The contact returns to the OK state.
Unipump with echo	Verification that the Unipump controlled by the POKO runs synchronously with the pump of the temperature control unit. For this purpose, the operating mode of the Unipump is applied to the "LEVEL" interface via a make contact. A fault message is output if asynchronous. Purpose of this operating mode: Monitoring a Unipump. Either to guarantee a desired circulation or to avoid heating of the thermal fluid.
Programmer	The allocated POKO switching states are activated in the individual segments of a temperature control program.
Internal temperature absolute	Definition of a temperature range in relation to the internal sensor (absolute temperature). The POCO is active outside of this temperature range; the POCO is inactive inside of this temperature range.
Process temperature absolute	Definition of a temperature range in relation to the external sensor (absolute temperature). The POCO is active outside of this temperature range; the POCO is inactive inside of this temperature range.

Function	Description
Solenoid valve flow / return flow	To control a connected solenoid valve. The switch-on delay of the POKO is 60 seconds after you have started the pump in the temperature control unit. For example, if a temperature control/circulation is stopped: The POKO is switched off before the complete standstill of the pump. Thus, the POKO is switched on only as long as the full pump pressure is applied.
Cooling	To control the cooling water supply by a solenoid valve. The cooling water supply only begins when the temperature control unit requires cooling water. The POKO is switched on when the temperature control unit is cooling.
Message present	The POKO switches on when a message is present at the "Pilot ONE®". This message can be a fault, warning or general message.
Automatic filling	The fill level drops below the minimum value: The POKO switches on. The POKO switches off again after 20 seconds. Provided the fill level has risen above the minimum value. The fill level reaches the maximum value: The POKO switches off immediately.
Setpoint reached	The control temperature has reached the setpoint once (+/- 0.1 K): The POKO switches on. The POKO only switches off again when the temperature control is switched off.
M-FCC ready	If the "Multi Flow Control Cube" (M-FCC) is ready: The POKO switches on. Provided: The first VPC initialization was completed. Note: Only valid for "Multi Flow Control Cube" (M-FCC).
Stop Flow Not available without bypass valve (VPC or Flow Control Cube)	The POKO switches if the flow rate setpoint is 0 l/min during flow rate control. **Example of use:** Leakage is to be avoided. For this purpose, a solenoid valve is installed downstream of the bypass valve. Flow rate control with or without pressure limiter is activated. If the flow rate setpoint is set to 0 l/min, the POKO switches and the solenoid valve is closed. The solenoid valve is reopened, if...: ...the flow rate setpoint does not equal 0 l/min; ...the temperature control unit is in standby; ...the control mode is changed.

The following table is valid for:
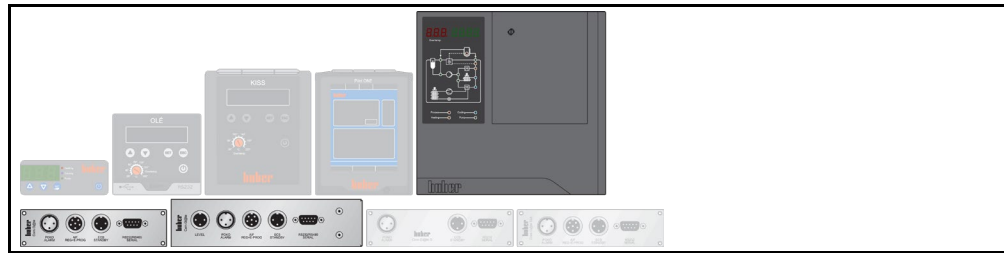
Property (Front view) - **"Unistat® Control ONE"** and **"Com.G@te®"**	Description	Figure
	Temperature control unit opens / closes the contact. For example when the setpoint temperature is reached.	

[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 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 tempera-
ture (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 rec-
orded 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 technol-
ogy)

Pin	Signal	Figure
1	+ (Plus)	
2		
3	– (Minus)	
4		

Pin assignment -
"Pilot ONE®"
(4-conductor technol-
ogy)

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

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 CO_2 emissions during the manufacture of these materials.

Inspired by **temperature**
designed for you

-125 °C ...+425 °C

huber