

Operating Instructions

Connection Box



TCS 010

Contents

	Page		Page
1. Safety Precautions	3	4. Maintenance, Service	9
2. Understanding The TCS 010.....	4	5. Technical Data	9
2.1. For Your Orientation.....	4	5.1. Data List TCS 010.....	9
2.2. Product Description.....	4	5.2. Dimensions Diagram TCS 010.....	9
Proper Use TCS 303.....	4	6. Accessories	10
Improper Use	4	Declaration Of Conformity.....Annex 1	
2.3. Description Of The Connections.....	5		
3. Installation TCS 010.....	5		
3.1. Preparations For Installation.....	5		
3.2. Ambient Conditions.....	5		
3.3. Connection Diagram TCS 010/TC 100.....	6		
3.4. Connection To The TC 100	6		
3.5. Voltage Supply.....	6		
3.6. Connecting The Air Cooling	6		
3.7. Connecting The Vent Valve	6		
3.8. Connecting The Heating	6		
3.9. Connecting The Backing Pump	7		
3.10. Connecting The RS485 Serial Interface	7		
3.11. Connecting The Remote Control.....	7		
Pin Arrangement And FunctionOf The Plug X3*	8		

1. Safety Precautions

- ☞ Read and follow all the instructions in this manual.
- ☞ Inform yourself regarding:
 - Hazards which can be caused by the unit,
 - Hazards which can arise in your system,
- ☞ Comply with all safety and accident prevention regulations.
- ☞ Check regularly that all safety requirements are being complied with.
- ☞ Do not carry out any unauthorised conversions or modifications on the unit.
- ☞ Only connect the right plugs.
- ☞ Take account of the ambient conditions when installing the TCS 010. The protection type is IP30.
The unit is protected against the ingress of foreign bodies \varnothing 2,5 mm.
- ☞ When returning the unit to us please note the shipping instructions (please see Section 6).

Pictogram Definitions:



Danger of personal injury.



Danger of damage to the unit or system.



Attention to particularly important information on the product, handling the product, or to a particular part of the documentation.

Please note

Current operating instructions are available via www.pfeiffer-vacuum.net under "Products".

2. Understanding The TCS 010

2.1. For Your Orientation

Operating Instruction In The Text

➔ Here you have to do something.

2.2. Product Description

The TCS 010 is a connection box. It serves, in conjunction with the Electronic Drive Unit TC 100, to control the air cooling system and the venting valve. Alternatively it is also possible to connect a heating unit or a backing pump relay box (please see Section 10, "Accessories"). The Operating And Display Unit DCU or a PC can be connected via Serial Interface RS 485.



Delivery Consignment

The following components are included on delivery:

- TCS 010
- 2 fitting screws M3 x 60 mm

Proper Use

- The TCS 010 may only be used in conjunction with the TC 100 and original accessory parts.

The TCS 010 connection box serves, in conjunction with the Electronic Drive Unit TC 100, to control and monitor Pfeiffer Pumping Stations and Turbopumps.

- The Electronic Drive Unit TC 100 is required for the control of the turbopump, the venting valve, the air cooling unit, the TMP heating unit and the backing pump relay box.
- All installations, commissioning and maintenance instructions must be observed.

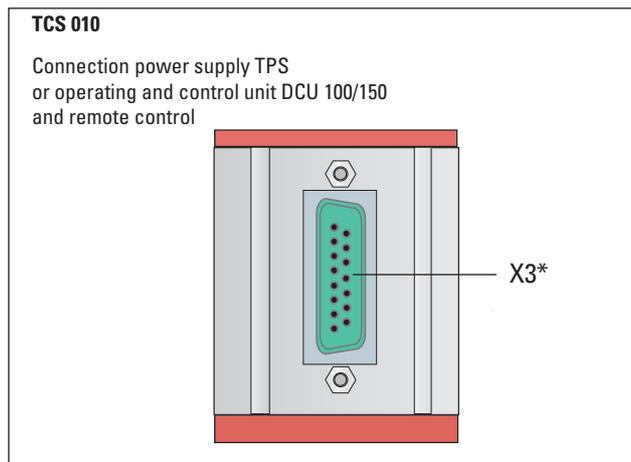
Improper Use

The following is regarded as improper:

- The use for purposes which deviate from the above and, in particular:
 - The connection to pumps and components which is not permitted in the operating instructions for those units;
 - The connection to components which contain touchable, voltage carrying parts.

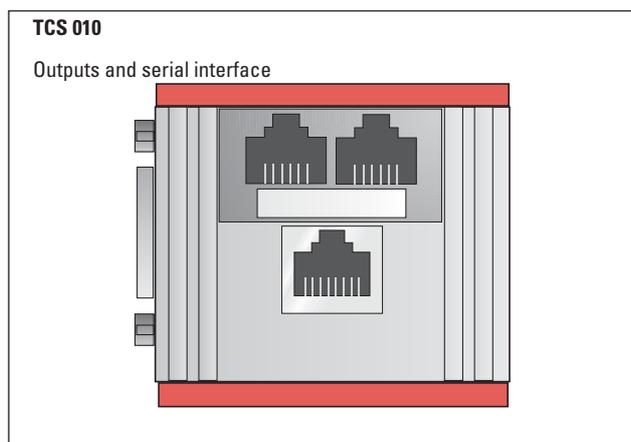
No liability or guarantee claims will be accepted where improper use is involved.

2.3. Definition Of The Connections



Connection to the power supply (via power supply TPS)

X3* input plug, 15 pole



Output 1 / output 2 and serial interface RS 485

Out1 or Out2

- Air cooling
- Vent valve
- Heating
- Backing pump relay box

RS485

- Connection DCU or PC

3. Installation TCS 010

3.1. Preparations For Installation



Do not carry out any unauthorized modifications or conversions to the connection box. Installation work may only be carried out by authorized personnel.

- ➔ All electrical connections must be made in accordance with the connections diagram, section 3.3.
- ➔ When carrying out installation work the mains plug must be disconnected and any local connections must be rendered free of voltage.

The TCS 010 is designed to operate with connection voltage of 24 V DC. The unit protection type is IP 30.

- ➔ The TCS 010 may only be used in conjunction with the TC 100 and original accessory parts.
- ➔ Connect the voltage supply to the 15 pole input plug X3*.

Components required for pumping station installation:

- Turbopump with TC 100
- TCS 010
- Connection Cable TPS - TC 100
- Display and Control Unit DCU

3.2. Ambient Conditions

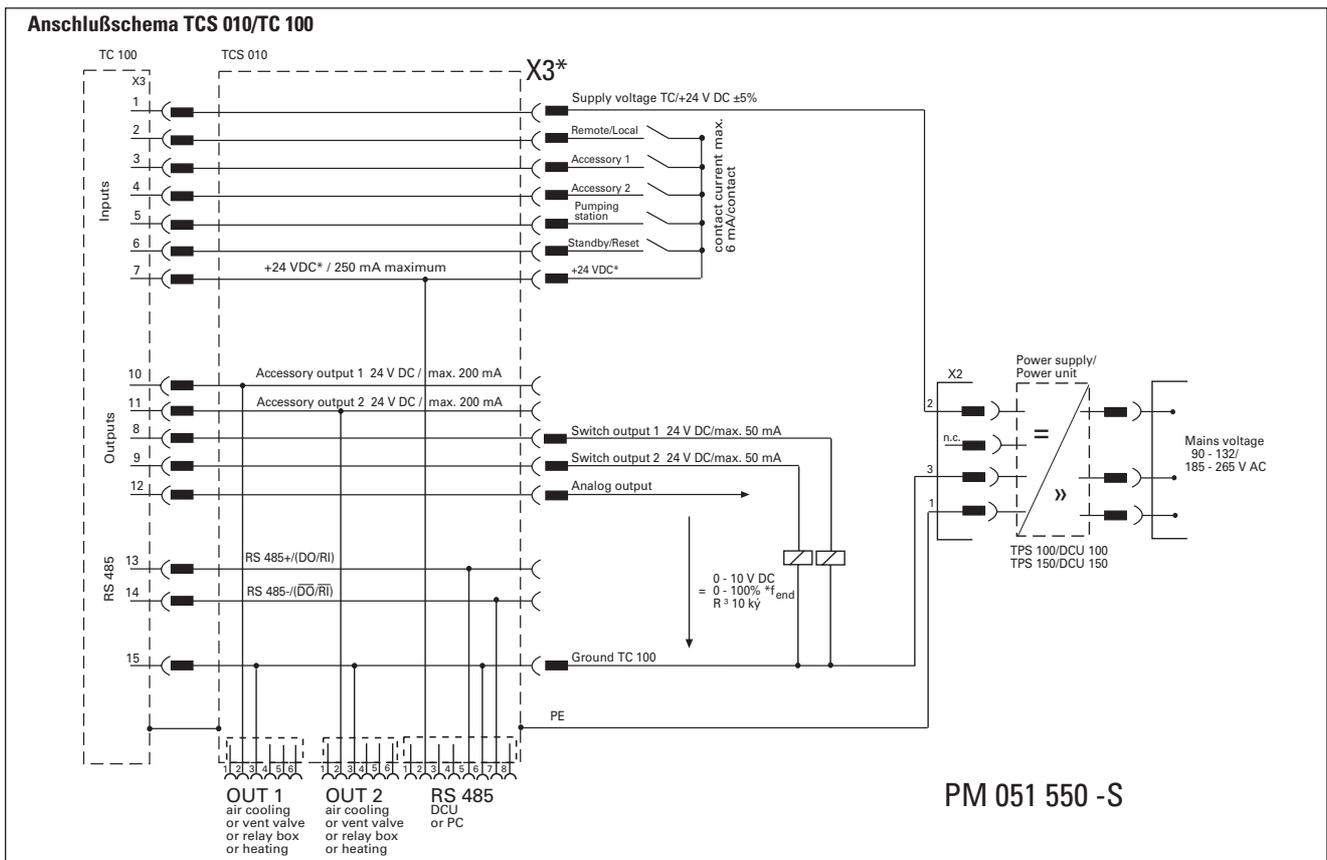
- ➔ Take account of the following ambient conditions when installing the TCS 010.

Installation location: Protected against the weather.

The following is applicable for open buildings and operations rooms which are not fully air conditioned:

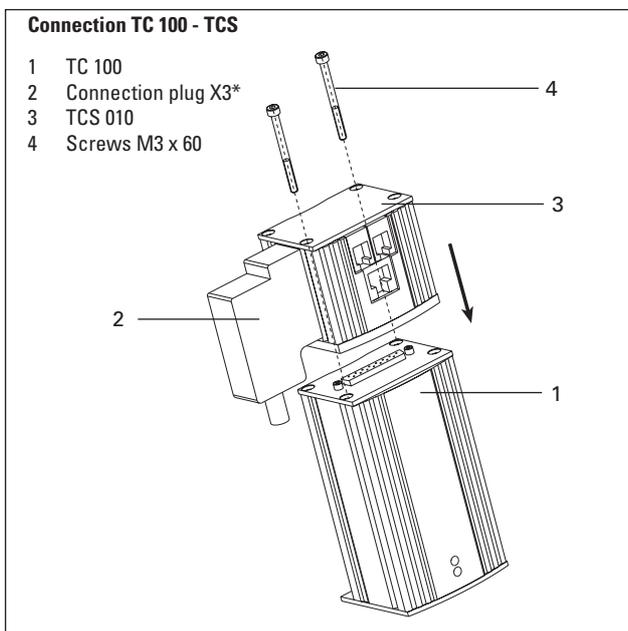
Temperature: +5°C - +40°C.
Relative humidity: 5 - 85%, non-condensing.
Air pressure: 86 kPa - 106 kPa.

3.3. Connection Diagram TCS 010/TC 100



3.4. Connecting To The TC 100

- ➔ Unscrew the 2 opposing screws M3 from the TC 100.
- ➔ Position the TCS 010, as shown in the diagram, onto Electronic Drive Unit TC 100.
- ➔ Secure the TCS 010 with the enclosed screws M3 x 60 onto the TC 100.



3.5. Voltage Supply

Voltage is supplied via Mains Power Unit TPS 100/150 or via the Operating And Display Unit DCU 100/150 on plug X3*.

3.6. Connecting The Air cooling Unit

- ➔ Plug the air cooling unit control lead into the connector "Out1" of the TCS 010.

3.7. Connecting The Venting Valve

- ➔ Plug the venting valve control lead into the connector "Out2" of the TCS 010.

3.8. Connecting The Heating Unit

- ➔ Plug the heating unit control lead into the connector "Out1" or "Out2" of the TCS 010.



The outputs should be configured in accordance with Operating Instructions PM 800 547 BN "Pumping Operations With The DCU", Section 3.19.

3.9. Connecting The Backing Pump

- ➔ Plug the backing pump relay box control lead into the connector "Out1" or "Out2" of the TCS 010.



The outputs should be configured in accordance with Operating Instructions PM 800 547 BN "Pumping Operations With The DCU", Section. 3.19.

3.10. Connecting Serial Interface RS 485

The connection of an external operating unit (DCU 001/DCU 150) is possible via the TCS 010 (Accessory) on the plug "RS485".

Pin	Arrangement
1	not connected
2	+24 V Output (loadable 210 mA)
3	not connected
4	not connected
5	RS 485: D+ (DO / RI)
6	Gnd
7	RS 485: D- (DO / RI)
8	not connected

RS 485



1 ... 8

(view from plug side TC 100)

3.11. Connecting The Remote Control

Remote control options are provided via connector plug X3 (Pin 2 - Pin 7) on the TC 100 for a variety of functions.

- ➔ Only use shielded cable.
- ➔ Connect the shielding on the plug side of the TC 100 with the TC casing.

Activate inputs 2-6

- ➔ Connect inputs with +24 V on Pin 7 (active high) (see Connections Diagram, Section 3.3).

Pin Arrangement And Functions Of The 15 pole plug X3*

(Please see the following table)



With the use of original PFEIFFER connecting cables (PM 051 421 -T) the turbopump is started once voltage has been supplied.

Status On Delivery

Pin 3, Pin 4, Pin 5 and Pin7 are bridged on the mating plug.



The connection of an RS 232 (for example, a PC) is possible via a level converter (please see "Accessories").

A Profibus DP Gateway TIC 250 is available for the connection of a Profibus DP (Accessory). Please consult the Operating Instructions PM 800 599 BN for details concerning the use of the TIC 250.

Description	Value
Serial Interface:	RS 485
Baudrate:	9600 baud
Data word length:	8 bit
Parity:	no (no parity)
Startbits:	1
Stopbits:	1..2

Connection

For detailed information regarding operations via Serial Interface RS 485 and the respective electrical data please refer to the separate Operating Instructions PM 800 488 BN.

Pin arrangement and function of the plug X3*			
Pin No.	Function		
1	Supply voltage	+24 V DC $\pm 5\%$ ($I_{term} = 4,2 \text{ A}$; $I_{max} = 4,6 \text{ A}$)	
	Inputs	Open (low)	Closed (high)
2	Input remote/local	Remote: Priority of the serial interface RS 485	Local: Priority of the inputs (Pin 3-7)
3	Input Accessory 1	Accessory 1 out	Accessory 1 on
4	Input Accessory 2	Accessory 2 out	Accessory 2 on
5	Input pumping station	Pumping station off	Pumping station on: Turbopump is moved, Input accessories 1 and 2 activated
6	Input standby / reset	Standby off	Standby on: Pumpe accelerates to 66% of the nominal rotation speed. Reset: By a pulse feeding ($T < 2 \text{ s}$) with an ampli- tude of 24 V an error acknowledgement can be executed.
7	+24 VDC* / max. 21 mA		
	Outputs	Open (low)	Closed (high)
8	Switching output 1	Rotation switch point not attained	Rotation switch point attained: Output can be loaded with 24 V/50 mA
9	Switching output 2	Collective malfunction message	Malfunction-free operations: Output can be loaded with 24 V/50 mA
10	Accessory output 1	Accessory out	Accessory on Work setting: fan
11	Accessory output 2	Accessory out	Accessory on Work setting: automatical venting
12	Analog output	0 - 10 V DC = 0 - 100% * f_{end}	
13	Serial interface RS 485	D + (DO/RI)	
14	Serial interface RS 485	D - (DO/RI)	
15	Ground		

4. Maintenance, Service

The TCS 010 requires no maintenance. If the unit should be cleaned up ensure that it is first disconnected from the power supply.

Do Make Use Of Our Service Facilities

In the event that repairs are necessary a number of options are available to you to ensure any system down time is kept to a minimum:

- Have the unit repaired on the spot by PFEIFFER Service Engineers;
- Return the unit to the manufacturer for repairs;
- Replace with a new value unit.

Local PFEIFFER representatives can provide full details.

When carrying out their own repairs customers must bear in mind that dangerous voltage levels are present. When carrying out own repairs or maintenance work on the units which are in contact with hazardous substances it is important to comply with all relevant safety regulations.

Please note:

Units returned to us for repair or maintenance are covered by our general conditions of sale and supply.

Contact addresses and telephone hotline:

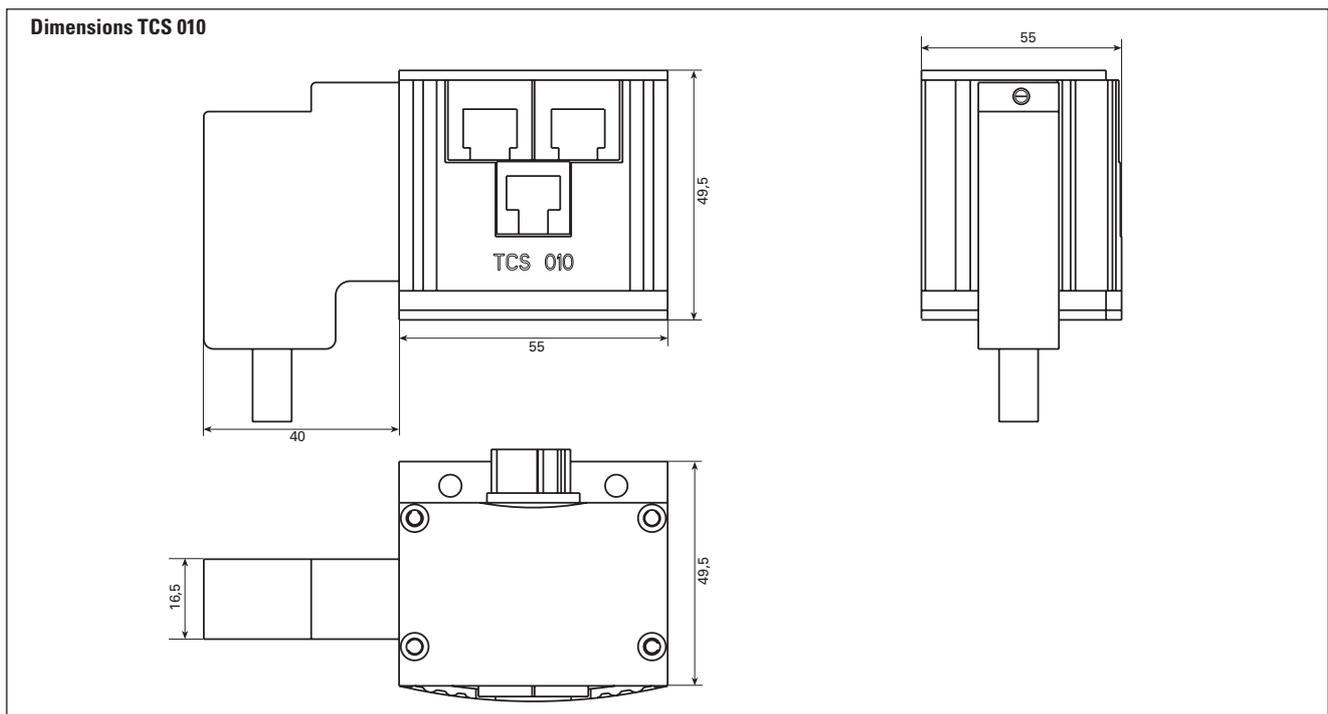
Please refer to the back cover of this manual for contact addresses and telephone hotline numbers.

5. Technical Data

5.1. Data list TCS 010

Pumping station control unit		TCS 010	
Voltage (SELV)	V DC	24 ±5%	
Permissible ambient temperature.	°C	5-40	
Weight	kg	0,11	

5.2. Dimensions diagram TCS 010



6. Accessories

Description	Size	Piece	Number	Comments	Order quantity
Connecting cable TC 100 - TPS	3 m	1	PM 051 421 -T		
Connecting cable TC 100 - DCU	3 m	1	PM 051 431 -T		
Air cooling TMH/U 071		1	PM Z01 253		
Air cooling TMH/U 261		1	PM Z01 252		
Vent valve TVF 005			PM Z01 135		
Fore vacuum relay box			PM 041 937 AT		

Vacuum is nothing, but everything to us!



Turbopumps



Rotary vane pumps



Roots pumps



Dry compressing pumps



Leak detectors



Valves



Components and feedthroughs



Vacuum measurement



Gas analysis



System engineering



Service

PFEIFFER  **VACUUM**

Pfeiffer Vacuum Technology AG · Headquarters/Germany

Tel. +49-(0) 64 41-8 02-0 · Fax +49-(0) 64 41-8 02-2 02 · info@pfeiffer-vacuum.de · www.pfeiffer-vacuum.net