

PFEIFFER VACUUM

Operating Instructions

DCU 001

NIRC2

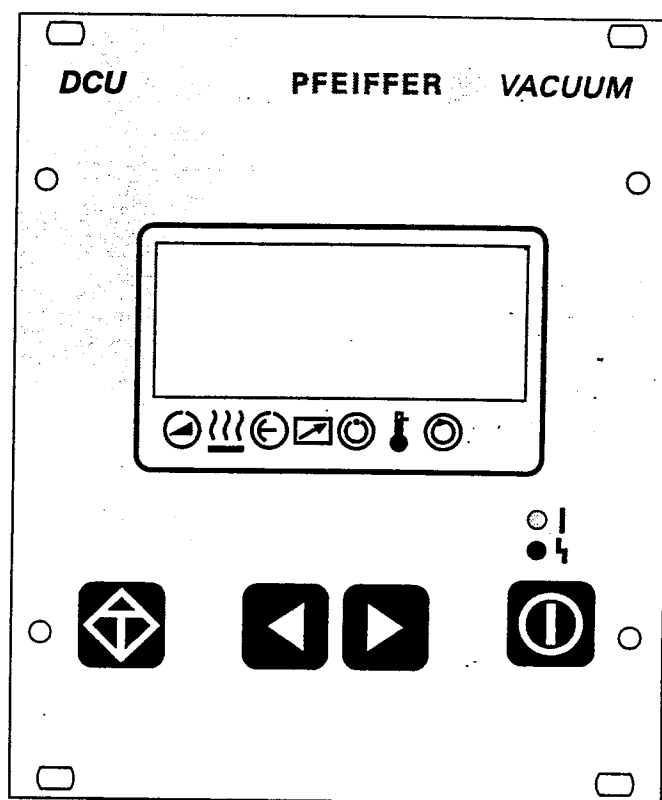
DCU 100

Display Control Unit

DCU 200

DCU 300

DCU 600



Instruments - NIRC 2
Archives
W.M. Keck Observatory

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1. Safety Instructions

- ☛ Read and follow all instructions in this manual.
- ☛ Inform yourself regarding
 - Dangers which can arise from the unit;
 - Dangers which can arise from the system;
- ☛ Follow the safety and accident prevention instructions.
- ☛ Check regularly that all safety and protection requirements are being observed.
- ☛ When installing the DCU, take account of the ambient conditions. The protection type is IP 20. The units DCU 100 to DCU 600 are protected against the ingress of foreign bodies $\geq \varnothing 12$ mm. Since water protection is not provided, the unit should be mounted in a suitable housing (see Section 3. "Installation").
- ☛ Do not carry out any unauthorised modifications or alterations to the Display Control Unit DCU.
- ☛ Do not open the housing cover when the unit is connected to the mains nor during pumping operations.
- ☛ Take account of the prescribed mains voltage values when connecting units DCU 100 to DCU 600.
- ☛ When shipping, please note the instructions in Section 7.

Pictogram definitions:



There is danger of an electric shock if the contacts are touched.



There is danger of personal injury.



There is danger of damage to the unit or to the system.

2. Understanding The Display Control Unit DCU

2.1. For Your Orientation

Symbols used

The following symbols will be used in the illustrations throughout the manual:

- ⚡ Electrical connection

Abbreviations used

TMP = Turbomolecular Pump

DCU = Display Control Unit

TC = Turbo Electronic Unit

TPS = Mains Unit

Position numbers

The same accessory parts have the same position numbers in all illustrations.

In the Text

⇒ Operation instruction: Here, you must do something.

2.2. Product Description

The Display Control Unit DCU is an operating unit for PFEIFFER drive units. It enables control over all the main parameters of the unit. Additionally, the connection of a vacuum gauge is possible.

DCU 001 = Basic unit without mains power unit

DCU 100/200/300/600 = Unit with mains power unit.

Mechanical design

The DCU is fitted in a housing suitable for mounting in a 19"/3HE.

Connection options:

The DCU provides the following connection options:

- TMP Heating (HEAT/TMS).
- TMP Air Cooling (FAN).
- TMP Venting Valve (VENT).
- RS 485 for communicating with the DCU or PC.

The Turbo Electronic TC contains the following function units:

- Power supply for and monitoring of the turbopump.
- Connection options for:
 - TMP Heating (HEAT/TMS).
 - TMP Air Cooling (FAN).
 - TMP Venting Valve (VENT).
 - RS 485 for communicating with the DCU or PC.

The units DCU 001, DCU 100 - DCU 600 have been tested and passed by the authorities in accordance with EN 61010/VDE 0411 "Safety Equipment For Electrical Units".

Proper use:

- The Display Control Unit DCU may only be used to control PFEIFFER Turbo Electronic Units TC and their peripheral units.
- The operations unit TC- turbopump may only be operated together with a backing pump.
- Instructions concerning installation, start-up, operating and maintenance must be observed.

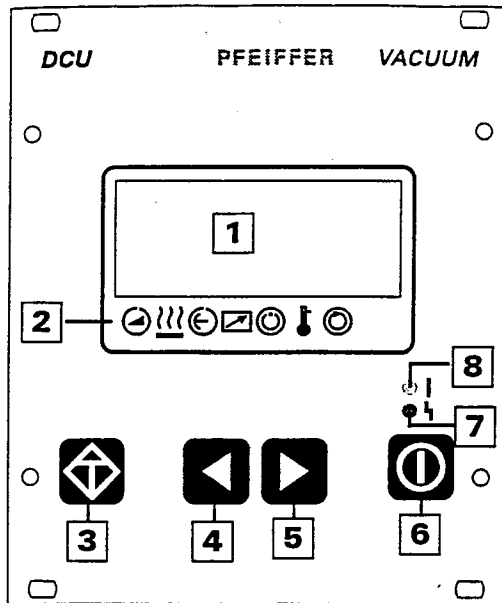
Improper use:

Improper is:

- Uses not covered above, especially:
 - Connection to pumps and units which is not permitted in their operating instructions.
 - Connection to units which contain touchable and voltage carrying parts.

Improper use will cause any rights regarding liability and guarantees to be forfeited.

2.3 Front Panel

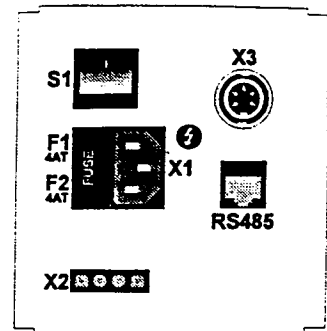


The front panel contains all the operating and display elements.

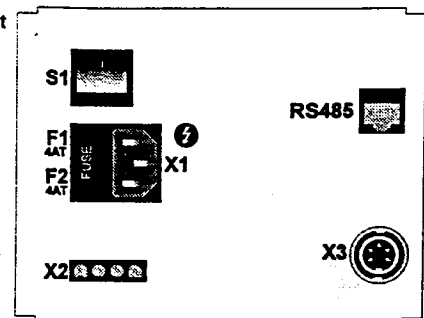
- 1 LCD display
- 2 Status display
- 3 "Error acknowledgement" key
- 4 Key "Left"
- 5 Key "Right"
- 6 "Pumping Station ON/OFF" key
- 7 Red illuminating diode for error status
- 8 Green illuminating diode for operating status

2.4 Rear Panel

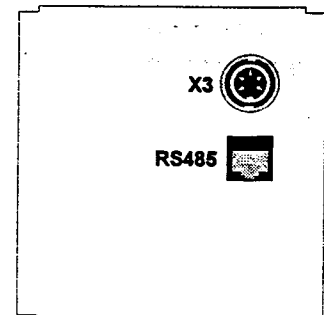
DCU with 100/200/300W-
Mains power unit



DCU with 600W-
Mains power unit



DCU without Mains power
unit



- S1 Mains switch
- F1 Fuse
- F2 Fuse
- X1 Mains connection 90-265 V-
- X2 Output for voltage supply, Turbo Electronic TC
- X3 Vacuum gauge connection
- RS 485 Communication with Turbo Electronic TC

3. Installation

3.1. Preparations For Installation



Unauthorised modifications or alterations to the Display Control Unit are not allowed. The unit must be fitted in a housing taking account of the ambient conditions (see Section 9, "Technical Data").

Refer also to the operating instructions for TMP with TC.

- ➔ Disconnect mains power plug before installation work.

3.2. Rack Fitting

The units DCU 001, DCU 100 - DCU 600 are designed to be fitted into a 19"/3HE rack. For installation the front panel should be secured to the rack using four fixing screws. Space between the DCU and other components is not necessary.

The ambient temperature in the rack housing must not exceed 40°C.

Depending on the version, various connections are provided on the DCU.

3.4. Making The Connections

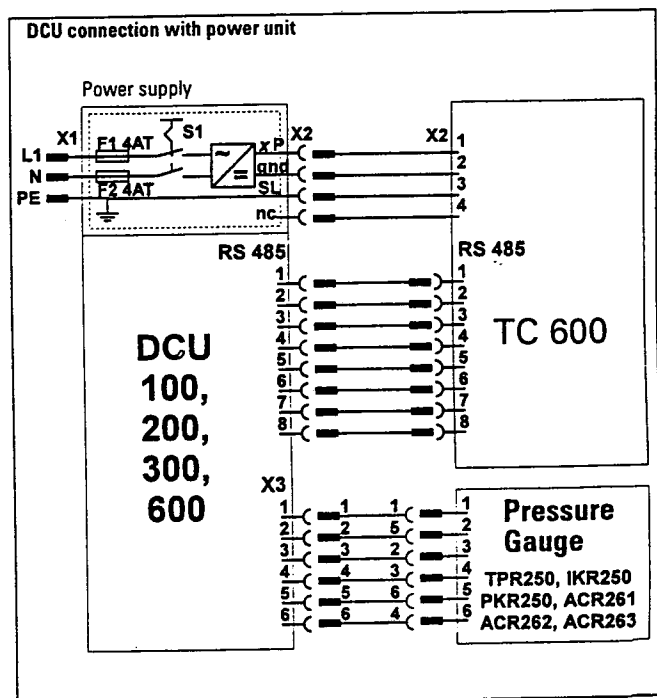
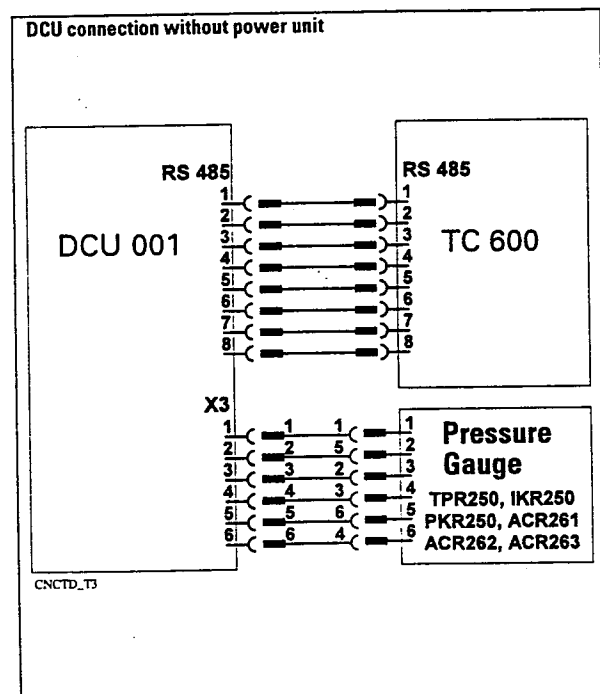
- The units DCU 100 - DCU 600 have been designated protection class 1 and must always be connected with the earthed conductor (PE) via the mains cable.
- ➔ Mains connection must be made in accordance with the local regulations.
- ➔ Make the connection X2 - TC in accordance with Section 3.3. "Wiring Diagram"
- ➔ Make the connection pressure gauge to X3 as required.
- ➔ Make connection RS 485/TC via 8 pole cable.

The DCU 001 is re-supplied with its operating voltage via the Serial Interface RS 485 cable from the TC. As soon as the TC is switched on, the DCU is supplied with voltage.

Mains voltage

DCU 001:	7 - 24V~
DCU 100:	90 - 265V~, 100W
DCU 200:	90 - 265V~, 200W
DCU 300:	90 - 265V~, 300W
DCU 600:	90 - 265V~, 600W

3.3. Connecting Diagram



4. Operations

4.1. General

All function relevant aspects of the turbo electronics are illustrated in the form of parameters. Each parameter has a number and a clear text designation (for example, "720: Vent frequency").

The value of the parameter is always readable, in some cases also modifiable. In the base parameter set (pre-set on delivery) the following parameters can be attained.

Setting Command	Status Request (only readable parameters)	Set Value Standard
Parameter 0xx	Parameter 3xx	Parameter 7xx
001: Heating(ON/OFF) 002: Stand-by (ON/OFF)	308: Set rotation speed TMP (in Hz) 309: Actual rotation speed TMP (in Hz) 310: TMP Motor current (in A) 311: Operating hours TMP (in h)	700: Maximum run-up time (in min) 701: Switchpoint (in %) 794: Parameter set

On delivery parameter set 794 is pre-set to the value "0" (base parameter set). The extended parameter set is attained by setting the value to "1". Please refer to "Parameters In The Base Parameter Set" for an overview of the parameters and

their meaning. Turbo pump heating can be pre-selected. Once the rotation speed switchpoint is attained, the heating is switched on automatically.

4.2. Switching On The Control Unit

➔ Make the connection to the Serial Interface RS 485.

DCU 001:

➔ Switch on the external voltage supply to the TC.
In the event of a error message: depress .

DCU 100/200/300/600:

➔ Switch on the DCU with switch S1 on the rear panel.

Self-Testing

After switching on, the DCU performs a self-test and also a test on the connected turbo electronics. During the test a bar appears in the display in line 4 and this shows the progress of this procedure.

- **Display test:** All signs in the LC display are shown for a short time in black.
- **LED test:** During the whole testing process the red and the green LEDs illuminate.
- **DCU test:** The DCU hardware tests itself.
- **Connection to the turbo electronics test:** The correct connection to the turbo electronics and their identity are examined.
- **Parameter test:** Information regarding the parameters is loaded.
- **Identification of the connected components:** The designation of the drive unit is displayed.

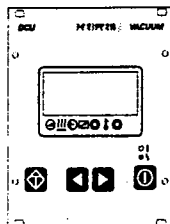
Providing there are no errors the DCU is now ready to operate.

4.3. Pumping Station, Switching ON/OFF

Please take the following action if the pumping station is to be switched ON/OFF via the front panel of the DCU:

- ➔ Remove the bridges 4-9 on the TC.
- ➔ Switch on switch S1 on the mains power unit.
- ➔ Switch the pumping station ON/OFF with the key .

4.4. Short Overview, Operating



Selecting the parameters

- ➔ Select the parameter numbers with the keys  (back) or  (forward) (keeping the key depressed enables rapid scrolling).

Setting parameters

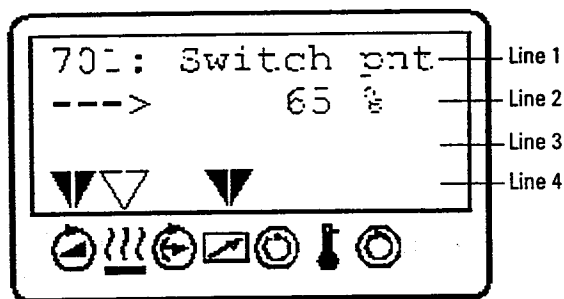
- ➔ Selecting parameters
- ➔ Depress keys  and  simultaneously.
➔ The arrow (---->) appears in the second line from the top.
- ➔ Reduce and increase the values with the keys  and  respectively.
- ➔ Depress keys  and  simultaneously.
➔ The arrow (---->) disappears.

4.5. Functions Of The Keys

The four keys on the front panel have the following functions:

Key	Application/Example		Explanation
			Reset (error acknowledgement) Acknowledges errors (red LED illuminates)
		309: Act rotspd 310: TMP I-Mot	Scroll back parameters Scrolls back the parameters
	→	871 Hz ⇌ 872 Hz	Reduce a value (with arrow "→")
		310: TMP I-Mot 311: TMP Op hrs	Scroll parameters forwards Scrolls forward a parameter
	→	871 Hz ⇌ 872 Hz ⇌ ...	Increases a value (with arrow "→")
		001: Heating off	Alters a value (⇒ data editing mode) Access to a displayed value, if possible (arrow "→" appears)
	→	001: Heating off ✓	Confirm a value (⇒ parameter selection mode) Takes over an altered value (The arrow "→" disappears)
	010: Pump stat. on ⇌ off		Pumping Station ON/OFF Switches the pumping station ON and OFF, equivalent to parameter 010: "pump stat"

4.6. LC-Display



The functions are displayed via a four line LC display. During normal operations a special function is assigned to each line:

- **Line 1:** Number and name of the selected parameter (for example "701: Switch pnt").
- **Line 2:** Relating value. If an arrow ("--->") is displayed, the displayed value is accessed.
- **Line 3:** Two functions
Function 1: Messages relating to operations and operating are displayed.
Function 2: An optional second parameter in the form of

"Parameter number: Value" is displayed. The function of this line enables setting via parameter 795 "Servicelin": The value "795" allows the display of actual messages and every other value stands for the number of the second parameter.

Error messages are displayed independent of the selected function.

- **Line 4:** An arrow which points to the underlying symbol. This restores the unit status.

Please note:

Prolonged depressing of the keys and enables rapid scrolling and/or alterations to the data.

The data mode (arrow "--->" wird angezeigt) is automatically relinquished, without taking over the values to be altered, under the following conditions:

- Do not depress any key for longer than 10 minutes.
- The occurrence of an error.
- The key has been depressed.

Symbol-Definitions

	Symbol	Arrow	Explanation
	Pump	—	No acceleration
	accelerates	▼	yes
	Pre-selection	—	No pre-selection
	Heating	▽	Pre-selection heating, but switchpoint not attained
		▼	Heating ON, switchpoint attained
	Stand-by	—	No stand-by
		▼	yes
	Unit under remote control	—	No remote control
		▼	yes
	Switchpoint	—	Switchpoint not attained
	attained	▼	yes
	Excess temperature	—	No excess temperature
		▽	Excess temperature TMP
		▽	Excess temperature turbo-elektronik
		▼	Excess temperature TMP and Turbo-Electronics
	Final rotation speed	—	Final rotation speed not attained
	attained	▼	Yes

4.7. LED Display

The red LED (error status) and green LED (operations status) on the front panel can take on the following conditions:

Red LED

Illuminates: Collective error message
Flashes: Warning

grüne LED

Illuminates: Mains power unit OK, switchpoint attained
Flashes: Mains power unit OK, switchpoint not attained
Blinks: Mains power failure

4.8. Parameters When Connecting To The TC 600

Dependent on the setting of parameter 794 "Parameter set", various parameters are available for selection:

794 - "0" = base parameter set

794 - "1" = extended parameter set

Parameters denoted with "☞" are saved internally and are available when the unit is switched on again.

Base Parameter Set

Setting commands

Displayed in the display

	Possible value	Commentary	Parameter name
001: 	Heating ON/OFF	ON: Heating EIN OFF: Heating AUS - This command is inoperative when a bridge is plugged into the remote input "Heating" on the TC - The conventional heating is activated only once the rotation speed switchpoint is exceeded. The TMS heating is not affected. - The status of the heating is displayed by an arrow on the symbol  on the front panel.	Heating
002: 	Standby ON/OFF	ON: Stand-by ON OFF: Stand-by OFF - When stand-by mode operations are activated the set rotation speed goes to 66% of the final rotation speed of the TMP. - This command is inoperative when a bridge is plugged into the remote input "Standby" on the TC - The status of the stand-by mode operations is displayed by an arrow on the symbol  on the front panel. - This command is inoperative in rotation speed setting operations.	Stand-by

Status requests

Displayed in the display

	Possible value	Commentary	Parameter name
308:	Set rotspd x Hz	- The set rotation speed is the set rotation speed in rotation speed setting mode, the stand-by rotation speed or the final rotation speed of the TMP, depending on the operations mode of the pump.	Set rotation speed TMP
309:	Act rotspd x Hz		Actual rotation speed TMP
310:	TMP I-Mot x A	- Displayed is the effective value of the motor current.	TMP Motor current
311:	TMP Op hrs x h		Operating hours

Set value standards

Displayed in the display

	Possible value	Commentary	Parameter name
700: 	TMP RUTime 1 ... 120 min	- If after the run-up time has elapsed, the switchpoint is not exceeded or is non-attained during operations, an error message is triggered.	Maximum run-up time
701: 	Switch pnt 50 ... 90 %	- The switchpoint is measured in % of the final rotation speed of the TMP. - This value is only valid in final rotation speed and stand-by operations. - In rotation speed setting mode, the switchpoint is fixed on 20%.	Rotation speed switchpoint
794: 	Param. set 0, 1	0: Base parameter set. 1: Extended parameter set.	Parameter set

Extended Parameter Sets

Setting Commands

Shown in the display

	Possible Values	Comments	Parameter Name
001: Heating			Heating
 on, off		on: heating pre-selected off: heating off - This command is ineffective when there is a bridge on the remote input "heating" of the TC 600. - The housing heating and the TMS heating are only activated once the rotation speed switchpoint has been exceeded. - The status of the heating is shown by an arrow on the symbol  on the front panel.	
002: Standby			Standby
 on, off		on: stand-by operations activated off: no stand-by operations. - If stand-by is activated the set rotation speed goes to 66% of the final rotation speed of the TMP. - this command is ineffective when there is a bridge on the remote input "standby" of the TC 600. - The status of stand-by is shown by an arrow on the symbol  on the front panel. - This command is ineffective in rotation speed setting operations.	
004: RUTime ctr			Start-up time monitoring
 on, off		on: start-up time monitoring activated. off: start-up time monitoring inactive. If, after the pump has started and the start-up time has elapsed the switchpoint has not been exceeded, an error is triggered providing the monitoring is active.	
009			Malfunction acknowledgment
		- This parameter is not visible in the display, it is only operable via the serial interface: "111111" = acknowledge malfunction. - Acknowledging a malfunction is equivalent to activating push-button  on the front panel.	
010: Pump stat.			Pumping Station ON/OFF
on, off		on: Pumping station on off: Pumping station off - This command is ineffective when there is a bridge on the remote input "Pumping Station" of the TC 600. - Activating the push-button  on the front panel is equivalent to altering the parameter.	
023: Motor TMP			Motor TMP
on, off		on: motor Turbopump on. off: motor Turbopump off. - This command is ineffective when there is a bridge on the remote input "Motor TMP" of the TC 600.	
024: Conf. Out1			Configuration potentialfree relay output K1
 0, 1		0: Rotation speed switchpoint attained 1: TMS regulator engaged (actual value = set value)	
025: OpMode BkP			Operating mode backing pump
 0, 1		0: non-stop operations 1: intermittent operations At interval operations the backing pump is switching off, if the motor current underflows I_{min} and switching on, if the motor current overflows I_{max}.	

Shown in the display

	Possible Values	Comments	Parameter Name
026: OpMode TMP			Operations mode TMP
 0, 1		0: final rotation speed operations 1: rotation speed setting operations • If there is a signal on the remote input "PWM-f_{sol}" of the TC 600 this value is set to "1". • Stand-by mode is ineffective in rotation speed setting operations with the rotation speed switch point fixed at 20%. • Rotation speed setting operations are available if 60% of the final rotation speed are attained.	
027: gas mode			Gas mode
 0, 1		0: Characteristics for heavy inert gases. 1: Characteristics for all other gases.	
030: Vent mode			Venting mode
 0, 1, 2		0: automatic venting • If, after attainment of 15% of the rated rotation speed, the pumping station is switched off, venting will take place if the venting frequency (P:720) is non-attained after the expiry of 6 seconds and for the duration of the venting time (P:721). • After mains power has been restored the venting valve is closed. 1: do not vent 2: venting on • If the pumping station is switched off, the venting valve opens after 6 seconds and remains open.	

Status requests

Shown in the display

Possible Values	Comments	Parameter Name
300	(only readable) • This parameter is not visible in the display but is represented by an arrow on the symbol  on the front panel.	Unit is remote controlled via X16
301 Oil defic.	(only readable) yes: Oil deficiency no: no oil deficiency	Oil deficiency
302	(only readable) • This parameter is not visible in the display but is represented by an arrow on the symbol  on the front panel.	Switchpoint attained
303: Error code	(only readable) no Err: no Error Wrnxxx: Warning xxx is present Errxxx: Error xxx is present	Actual error code
304	(only readable) • This parameter is not visible in the display but is represented by an arrow on the symbol  on the front panel.	Excess temperature, electronic drive unit
305	(only readable) • This parameter is not visible in the display but is represented by an arrow on the symbol  on the front panel.	Excess temperature, TMP
306	(only readable) • This parameter is not visible in the display but is represented by an arrow on the symbol  on the front panel.	Set rotation speed attained
307	(only readable) • This parameter is not visible in the display but is represented by an arrow on the symbol  on the front panel.	TMP accelerates
308: Set rotspd x Hz	(only readable) • The set rotation speed is the set rotation speed in rotation speed setting operations, stand-by rotation speed or the final rotation speed of the TMP, dependent of the operating mode of the pump.	Set rotation speed, TMP
309: Act rotspd x Hz	(only readable)	Actual rotation speed, TMP
310: TMP I-Mot x A	(only readable) • The effective value of the motor current is displayed.	TMP motor current
311: TMP Op hrs  x h	(only readable)	Operating hours TMP
312: Drv Softw. Vxxx	(only readable)	Software version, Electronic drive unit
313: TMP Dclink xx V	(only readable)	Intermediate circuit voltage, TMP
314: Drv Op hrs xx V	(only readable)	Operating hours, Electronic drive Unit
315: TMP finspd x Hz	(only readable) • The final rotation speed is dependent on the type of pump in use.	Final rotation speed, TMP
316: TMP power x W	(only readable)	power reduced

Status requests

Shown in the display

	Possible Values	Comments	Parameter Name
317: power red	x W	(only readable) yes: TMP motor power reduced no: TMP motor power not reduced	Motor power reduced
319: Cycl count	x	(only readable) • "Pumping station ON" is counted	Cycle counter
331: TMS ActTmp	x °C	(only readable)	Actual value, TMS heating
333: TMS steady	yes, no	(only readable) yes: regulator engaged no: regulator not engaged • The regulator is engaged when the TMP temperature = set temperature (parameter 704) ±2%.	TMS regulator engaged
334: TMS maxTmp	x °C	(only readable)	Maximum TMS temperature concerning
335: Heat type	0, 1, 2	(only readable) 0: conventional heating 1: TMS heating 2: Cooling	Type of heating
340: Pressure	x mbar	(only readable) <u>Display (Example):</u> ----- mbar < 5E-4 mbar > 1E3 mbar 6-3E-9 mbar id fam mbar Error! mbar	Actual pressure value
		<u>shown at:</u> no pressure gauge connected remaining measuring range (corresponding to the gauge type) exceeding measuring range (corresponding to the gauge type) measured pressure value gauge type not identified (see: P 738) error in the pressure gauge	
349: Drv Name	TC600	(only readable via serial interface)	Unit type, electronic drive unit
360: Past Err1	s. Parameter 303	(only readable) • The last error which occurred	Error history, position 1
361: Past Err2	s. Parameter 303	(only readable)	Error history, position 2
362: Past Err3	s. Parameter 303	(only readable)	Error history, position 3
363: Past Err4	s. Parameter 303	(only readable)	Error history, position 4
364: Past Err5	s. Parameter 303	(only readable)	Error history, position 5
365: Past Err6	s. Parameter 303	(only readable)	Error history, position 6
366: Past Err7	s. Parameter 303	(only readable)	Error history, position 7
367: Past Err8	s. Parameter 303	(only readable)	Error history, position 8
368: Past Err9	s. Parameter 303	(only readable)	Error history, position 9
369: Past Err10	s. Parameter 303	(only readable)	Error history, position 10

Set values

Shown in the display

	Possible Values	Comments	Parameter Name
700: TMP RUTime			Maximum start up time
 1 ... 120 min		If the switchpoint has not been exceeded when the start-up time has elapsed an error is triggered (see Section 7 "Errors And Warnings")	
701: Switch pnt			Rotation speed switchpoint
 50 ... 90 %		- The switchpoint is measured as a % of the final rotation speed of the TMP. - This value is only valid in final rotation speed setting operations and in stand-by operations. - The switchpoint is fixed at 20% in rotation speed setting operations.	
704: TMSheatset			TMS heating temperature set value
 30 ... 100 °C			
707: TMProt set			Rotation speed setting in rotation speed setting operations
 20,0 ... 100,0 %		- Stated as a % of final rotation speed, TMP - This command is ineffective if there is a PWM signal on the remote input "PWM f_{sol}" on the TC 600.	
720: Vent frequ			Venting frequency
 40 ... 80 %		- Only valid in "automatic venting" mode (see parameter 030). - Stated as a % of the final rotation speed, TMP.	
721: Vent time			Venting time
 6 ... 3600 s		- Only valid in "automatic venting" mode (see parameter 030). - Step by step ±1 at <100s, ±10 at ≥100s.	
738: Gaugetype			Type of pressure gauge
794: Param. set			Parameter set
 0, 1		0: Basic parameter set (see Section 3.1. "Parameter in basic parameter set"). 1: Extended parameter set.	
795: Servicelin			Content of the service line
 x		- When containing "795" actual messages which relate to operations are displayed. - Content ≠ "795" allows the parameter with this name to appear in the service line (third line from the top in the LC display).	
797: Address			Unit adress
 x		is equivalent to the logical address under which the TCM 1601 can be accessed via the serial interface.	

4.9. Serial Interface

The serial Interface is only used for connecting the Turbopump Controller TC at the turbomolecular pump.

5. Error Codes

5.1. General

Errors ("Errxxx" oder "Error Exxx") always causes to shut-down of the TMP, the fan, the heating and the backing pump.

⇒ After the error is removed depress key .

→ The unit is again ready to operate.

Warnings ("Wmxxx" oder "Warning Fxxx") are only displayed and do not cause components to be shut down.

5.2. Errors During Self-Testing

The following errors can occur during self-testing performed when the DCU is switched on:

Display	Error	Possible action
** Error E040 **	Hardware error: external RAM defective	
** Error E042 **	Hardware error: EPROM checksum	
** Error E090 **	Insufficient RAM	
	The DCU is connected to the wrong turbo electronics	Connect correct turbo electronics
** Error E698 **	The connected drive unit does not respond	Check communication lead between TC and DCU Switch on TC

5.3. Errors During Operations With The TC 600

During operations, errors and warnings which occur are, independent of the function of the service line, always shown in the display and can be additionally requested in parameter 303 "actual error code". In addition, parameters 360 to 369 retain the last ten errors or warnings which occurred.

Code	Description
E001	TMP excess rotation speed Actual rotation speed of the turbopump > 105% of the pump specific final rotation speed.
E002	Power pack unit error The voltage of the TC power pack unit is outside the valid tolerances.
E006	Run-up time expired The maximum run-up time value set in parameter 700 has been exceeded.
E007	Operating fluid deficiency.
E008	Faulty connection between TC and pump.
E021	Programmer voltage image impedance. Supply voltage defective or undefined image impedance in the TMP.
E032	Electronics supply voltage. Internal voltage supply for the TC electronics defective.
E037	Motor end stage Short circuit in the end stage, motor leads or coils.
E039	Protective earth error, TC
E104	Backing pump Excess temperature in the backing pump or not connected.
E698	TC does not respond Communication between TC and DCU defective.

5.4. Warnings

Code	Description	Explanation
F001	TMS heating start up time elapsed	TMS heating start-up timer elapsed
F002	TMS limit temperature	TMP-temperature > 100°C
F003	TMS heating circuit temperature sensor	TMP temperature not within the range 5°C and 120°C
F007	Mains power failure	Operations voltage has failed
F110	Pressure gauge defective	

When an error has occurred all parameters are still visible but can no longer be altered. Exception: Error 698: "TC does not respond". No actualisation of the parameter is possible here until the communication has been restored.

6. What To Do In Case Of Breakdowns?

Check the fuses

In case of a error:

- ➔ Loosen F1/F2 with a screwdriver and check fuses. Replace if defective. The safety values are stated on the rear panel of the DCU.

7. Maintenance And Service

The unit requires no maintenance. A damp cloth can be used to wipe away any dirt which has collected on the front panel. Ensure that the unit is first disconnected from the mains 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.

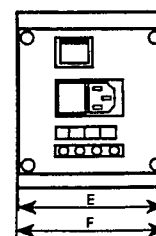
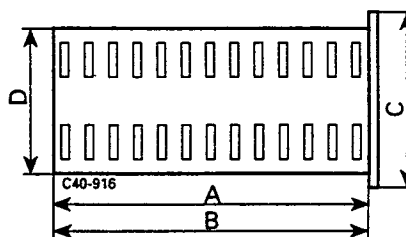
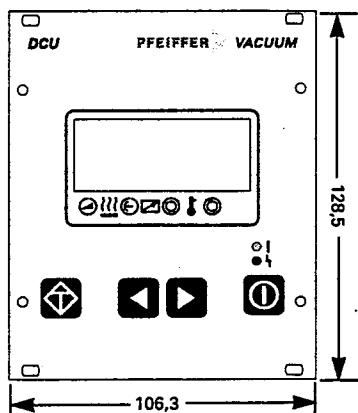
8. Technical Data

8.1. Data List, Display Control Unit DCU

		DCU 001	DCU 100	DCU 200	DCU 300	DCU 600
Connection voltage:	V DC	12-30	–	–	–	–
Connection voltage:	V AC	–	90-264	90-264	90-264	185-264
Frequency	Hz	–	50-60	50-60	50-60	50-60
Power consumption:	VA	≤ 5	≤ 125	≤ 230	≤ 350	≤ 660
Output voltage X2	VDC	–	24	48	72	140
Output current X2, max.	A	–	4,2	4,2	4,2	4,3
Output power X2, max.	W	–	100	200	300	600
Permissible ambient temperature	°C	0 - 40				
Maximum relative humidity:	% (at 35 °C)	80				
Maximum relative humidity	% (at 40 °C)	50				
Protection type:		IP 20				
Weight:	kg	0,4	1,6	1,9	22,	2,6

8.2. Dimensions

DCU 001/100-600



	DCU 100/200/300	DCU 600
A	231,5	229,5
B	234	232
C	128,5	128,5
D	106	111
E	105	140,4
F	106,3	141,9

⇒ **DE, AT**

Herstellererklärung im Sinne folgender EU-Richtlinien:

- Maschinen 89/392/EWG
- Elektromagnetische Verträglichkeit 89/336/EWG
- Niederspannung 73/23/EWG

Hiermit erklären wir, daß das unten aufgeführte Produkt zum Einbau in eine Maschine bestimmt ist und daß deren Inbetriebnahme so lange untersagt ist, bis festgestellt wurde, daß das Endprodukt den Bestimmungen der EU-Richtlinie 89/392/EWG, Anhang II B entspricht.

Wir bestätigen Konformität mit der EU-Richtlinie über elektromagnetische Verträglichkeit 89/336/EWG und der EU-Niederspannungsrichtlinie 73/23/EWG.

Die angewandten Richtlinien, harmonisierten Normen, nationalen Normen und Spezifikationen sind unten aufgeführt.

⇒ **GB, IE**

Manufacturer's declaration pursuant to the following EU directives:

- Machinery Directive 89/392/EEC
- Electromagnetic Compatibility Directive 89/336/EEC
- Low Voltage Directive 73/23/EEC

We hereby certify that the product specified below is intended for installation in a machine which is forbidden to be put into operation until such time as it has been determined that the end product is in accordance with the provision of EU Directive 89/392/EEC, Annex II B.

We certify conformity with EU Electromagnetic Compatibility Directive 89/336/EEC and EU Low Voltage Directive 73/23/EEC.

The guidelines, harmonized standards, national standards and specifications which have been applied are listed below.

⇒ **BE, FR**

Déclaration du constructeur conformément aux directives CE suivantes:

- directive machine CE 89/392/CEE
- directive CE 89/336/CEE concernant la compatibilité électromagnétique
- directive CE 73/23/CEE concernant la basse tension

Nous déclarons par la présente que le produit mentionné ci-dessous est prévu pour le montage sur une machine et que sa mise en service est interdite tant qu'il n'a pas été déterminé que le produit final répond bien aux dispositions de la directive CE 89/392/CEE, appendice II B.

Nous confirmons la conformité du produit avec la directive CE 89/336/CEE concernant la compatibilité électromagnétique et la directive CE 73/23/CEE concernant la basse tension. Les directives appliquées, normes harmonisées et les normes et spécifications nationales appliquées figurent ci-dessous.

⇒ **IT**

Dichiarazione del costruttore ai sensi delle seguenti direttive UE:

- Macchinari 89/392/CEE
- Compatibilità elettromagnetica 89/336/CEE
- Bassa tensione 73/23/CEE

Si dichiara che il prodotto qui menzionato è destinato al montaggio in una macchina e che la sua messa in funzione è vietata sin quando non è stato accertato che il prodotto finale non rispetta le disposizioni della direttiva UE 89/392/CEE, Appendice II B.

Attestiamo la conformità con la direttiva UE sulla compatibilità elettromagnetica 89/336/CEE e la direttiva UE sulla bassa tensione 73/23/CEE.

Sono riportate in basso le direttive applicate, le norme standardizzate nonché le norme e le specifiche nazionali utilizzate.

⇒ **ES**

Declaración del fabricante al tenor de las siguientes Directivas de la UE:

- Maquinarias 89/392/MCE
- Compatibilidad Electromagnética 89/336/MCE
- Baja Tensión 73/23/MCE

Por la presente declaramos que el producto mencionado más abajo está previsto para ser incorporado en una máquina y que la puesta en servicio de la misma queda prohibida en tanto que no se haya verificado que el producto final concuerda con las disposiciones resultantes de la Directiva 89/392/MCE de la UE, Apéndice II B.

De nuestra parte certificamos la conformidad con la Directiva 89/336/MCE de la UE sobre Compatibilidad Electromagnética y la Directiva 73/23/MCE de la UE sobre Baja Tensión.

Las directivas aplicadas, normas armonizadas y las normas y especificaciones nacionales aplicadas se mencionan abajo.

⇒ **NL**

Verklaring van de fabrikant in de zin van de volgende EU-richtlijnen:

- machinerichtlijn 89/392/EEG
- richtlijn over elektromagnetische compatibiliteit 89/336/EEG
- richtlijn over laagspanning 73/23/EEG

Hiermee verklaren wij dat het hieronder genoemde produkt is bedoeld om te worden ingebouwd in een machine en dat de ingebruikneming hiervan zolang verboden is, totdat is vastgesteld dat het eindprodukt voldoet aan de bepalingen van EU-richtlijn 89/392/EEG, appendix II B.

Wij bevestigen de conformiteit met de EU-richtlijn over elektromagnetische compatibiliteit 89/336/EEG en de EEG-richtlijn over laagspanning 73/23/EEG

De toegepaste richtlijnen, geharmoniseerde normen en de toegepaste nationale normen en specificaties zijn hierna aangegeven.

⇒ **DK**

Producenterklæring i henhold til følgende EU-direktiver:

- Maskiner 89/392/EWG
- Elektromagnetisk kompatibilitet 89/336/EWG
- Lavspænding 73/23/EWG

Hermed erklærer vi, at det nedenstående produkt er beregnet til indbygning i en maskine og at dennes idriftsættelse er forbudt, indtil det er fastslået, at slutproduktet er i overensstemmelse med EU-direktiv 89/392/EWG tillæg II B.

Vi attesterer konformitet med EU-direktiv vedrørende elektromagnetisk kompatibilitet 89/336/EWG og med EU-lavspændingsdirektiv 73/23/EWG.

De anvendte direktiver, harmoniserede standarder og de anvendte nationale standarder og specifikationer er angivet nedenfor.

Herst./9604

⇒ SE

Tillverkarens förklaring enligt följande EG-direktiv:

- Maskindirektiv 89/392/EEC

- Elektromagnetisk tolerans 89/336/EEC

- Lågspänning 73/23/EEC

Härmed förklarar vi, att den nedan nämnda produkten är avsedd för inmontering i en maskin och att denna maskin inte får tas i drift förrän det har konstaterats, att slutprodukten stämmer överens med EG's direktiv 89/392/EEC, annex II B.

Vi bekräftar konformitet med EG's-direktiv om elektromagnetisk tolerans 89/336/EEC och EG's lågspänningsdirektiv 73/23/EEC.

De riktlinjer, anpassade standarder, nationella standarder och specifikationer som har blivit accepterade, anges här nedan.

⇒ FI

Valmistajan vakuutus seuraavien EU-direktiivien mukaisesti:

- konedirektiivi 89/392/ETY

- sähkömagneettinen siedettävyyden 89/336/ETY

- pienjännite 73/23/ETY

Vakuutamme täten, että allamainittu tuote on tarkoitettu asennettavaksi koneeseen ja sen käyttöönotto on kielletty kunnes on todettu, että lopullinen tuote vastaa EU-direktiivin 89/392/ETY vaatimuksia.

Vahvistamme vaatimustenmukaisuuden EU-direktiivin sähkömagneettinen siedettävyyden 89/336/ETY ja EU-pienjännitedirektiivin 73/23/ETY kanssa.

Soveltamamme suuntaviivat, harmonisoidut standardit, kansalliset standardit ja rakennemääräykset on lueteltu alempana.

⇒ PT

Declaração do fabricante, de acordo com as seguintes Directivas CE:

- Máquinas, na redacção 89/392/CEE

- Compatibilidade electromagnética, na redacção 89/336/CEE

- Baixa tensão, na redacção 73/23/CEE

Com a presente, declaramos que o produto abaixo indicado se destina à montagem numa máquina e que é proibida a colocação em serviço da mesma antes de se ter declarado, que o produto final está em conformidade com o disposto na Directiva CE, na redacção 89/392/CEE, Apêndice II B.

Certificamos haver conformidade com o disposto na Directiva CE sobre compatibilidade electromagnética, na redacção 89/336/CEE, e o disposto na Directiva CE sobre baixa tensão, na redacção 73/23/CEE.

Abaixo, dá-se indicação das directivas aplicadas, das normas harmonizadas e das normas e especificações aplicadas no respectivo país.

⇒ GR

Δήλωση κατασκευαστή κατά το νόημα των εχής οδηγιών της ΕΕ:

- περί μηχανών 89/392/Ε.Ο.Κ.

- περί ηλεκτρομαγνητικής συμβατότητας 89/336/Ε.Ο.Κ.

- περί χαμηλής τάσης 73/23/Ε.Ο.Κ.

Με την παρούσα δήλωση βεβαιώνουμε ότι το κατωτέρω αναφερόμενο προϊόν προορίζεται για την προσαρμογή σε μία άλλη μηχανή, και ότι η έναρξη λειτουργίας της απαγορεύεται, μέχρις ότου διαπιστωθεί, ότι το συνολικό συγκρότημα ανταποκρίνεται στους ισχύοντες κανονισμούς της οδηγίας της Ε.Ε. 89/392/Ε.Ο.Κ., παράρτημα II Β.

Οι εφαρμοσθέντες κανονισμοί, οι εναρμονισμένες προδιαγραφές και οι εφαρμοσθείσες εθνικές προδιαγραφές και τεχνικές προδιαγραφές αναφέρονται κατωτέρω

Produkt/Product/Produit/Prodotta/Producta/Product/Produkt/Produkto/Προϊόν:

DCU 001, DCU 100, DCU 200, DCU 300, DCU 600

Angewendete Richtlinien, harmonisierte Normen und angewendete, nationale Normen in Sprachen und Spezifikationen:

Guidelines, harmonised standards, national standards in languages and specifications which have been applied:

Les directives appliquées, normes harmonisées et les normes nationales appliquées en langues et spécifications:

Le directives applicate, norme standardizzate e norme nazionali utilizzate in lingue e specifiche:

Directivas aplicadas, normas armonizadas y normas nacionales aplicadas en idiomas y especificaciones:

Toegepaste richtlijnen, geharmoniseerde normen en toegepaste nationale normen met betrekking tot talen en specificaties:

Anvendte direktiver, harmoniserede standarder og de anvendte nationale standarder med sprog og specifikationer:

Directivas aplicadas, normas harmonizadas e normas aplicadas na linguagem e nas especificações do respectivo país:

Εφαρμοσθέντες κανονισμοί, εναρμονισμένες προδιαγραφές και εφαρμοσθείσες εθνικές προδιαγραφές σε γλώσσες και τεχνικές προδιαγραφές:

EN 61010, EN 55011, EN 50081-1, EN 50082-2, IEC 801 1-4, VDE 0843-6

Unterschriften/Signatures/Signature/Firme/Firmas/Handtekening/Underskrifter/Underskrift/ Allekirjoitukset/Assinaturas/ Υπογραφές:



Geschäftsführer (W. Dondorf)
Managing Director

Gérant d'affaires
Gerente

Διευθύνων Σύμβουλος

Administrerende Direktør
Verkställande Direktör
Directeur

DTP
Form.-Nr. 10117 / (9606)

Herst./9606

Zentrale/Headquarters

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Kingdom of Nepal, Kirghizia, Latvia, Lithuania,
Moldavia, Philippines, P.R. China, Rumania, Russia,
Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Vietnam

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Turkey, United Arab Emirates, Yemen

