

Operating Instructions

TMS

**Temperature Management System
For Turbomolecular Pumps
-Connection Box-**



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Please note

Current operating instructions are available via www.pfeiffer-vacuum.de under "infoservice".

1. Safety Precautions

- ☞ Read and follow all instructions in this manual.
- ☞ Inform yourself regarding:
 - Hazards which can be caused by the unit;
 - Hazards which can be caused by your system.
- ☞ Observe the safety and accident prevention regulations.
- ☞ Regularly check that all accident prevention measures are being complied with.
- ☞ Take account of the ambient conditions when installing the TMS.
- ☞ If the sensor (plug X3) is not connected when the TMS heating is active, the TMS heating operates in non-stop mode and there is a danger of overheating. The temperature fuse in the pump can blow.
- ☞ Do not disconnect the plug connector on the unit nor on the turbopump during operations and not before the pump is at rest.
- ☞ Do not open the casing cover when the unit is connected to the power mains or during pumping operations.
- ☞ Do not carry out any unauthorised conversions on, or alterations to the TMS.
- ☞ When returning units, take note of our shipping instructions.

Pictogram Definitions:



Danger of personal injury.



Danger of damage to the unit or system.

2. Installation

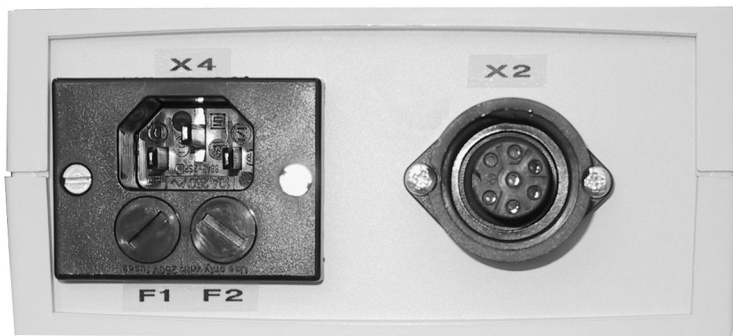
The **Temperature Management System (TMS)** allows controlled heating of the fore-vacuum range of turbomolecular pumps in order to prevent the deposition of condensable gases in the vicinity of the Holweck stage and the fore-vacuum flange.

For TMS operations the heating elements must already be installed in the pump. The temperature control of the heating circuit is constructed as a two point regulator with adjustable set values. The maximum temperature of the TMS system is limited via the respective connected control unit (please refer to the operating instructions for the respective control unit).

In TMS operations the additional heating of the flange on the turbomolecular pump is not possible.

TMS box

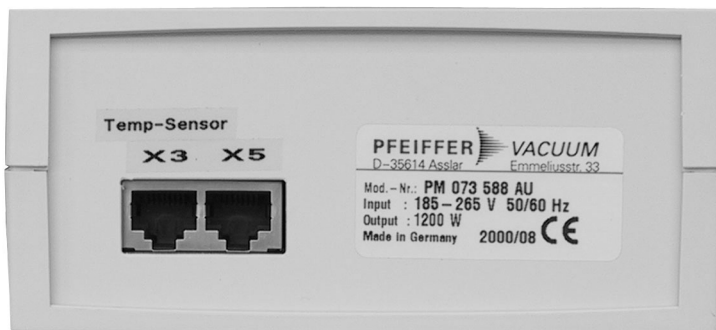
- X4 Mains connection
- F1, F2 Mains fuses
- X2 Connection heating cable



TMS box

X3 Connection sensor cable

X5 Control lead



Proper Use

The temperature management system (TMS) may only be used for the purpose of heating PFEIFFER turbomolecular pumps.

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

2.1. Preparing For Installation

This description is only valid for the supplementary equipment "Temperature Management System" (TMS box). Other installation work is covered in the operating instructions for the DCU, PM 800 477 BE or the operating instructions for the TCM 1601, PM 800 478 BE.



Do not carry out any unauthorised conversions on, or alterations to the TMS.



If the sensor (plug X3) is not connected when the TMS heating is active or sensor 97 is not secured to the pump, the TMS heating operates in non-stop mode and there is a danger of overheating. The temperature fuse in the pump can blow.

Only the temperature sensor supplied may be connected to plug X3.

- ➔ The mains plug must be disconnected when carrying out installation work.
- ➔ The TMS should be installed taking the following ambient conditions into account:

Set-up location: weather protected.

Where halls and operating rooms are not fully air-conditioned please note the following:

Temperature: +5°C - +40°C.

Relative humidity: 5 - 85%, non-dew forming.

Air pressure: 86 kPa - 106 kPa.

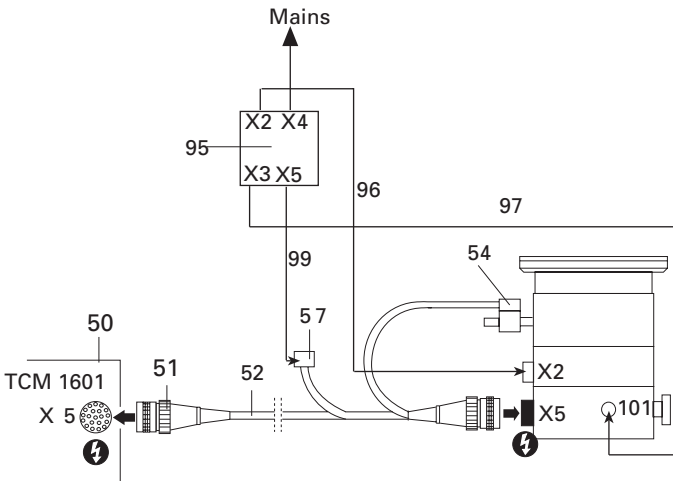
2.2. Connecting The TMS

TCM 1601

- ➔ Screw the temperature sensor with cable (97) onto the pump and connect with X3 of the TMS box (95).
- ➔ Connect the heating cable (96) to X2 of the TMS box and to pump plug X2.
- ➔ Make mains connection on plug X4.
- ➔ Connect control lead (99) to X5 of the TMS box and to the control lead of the TCM 1601 (57).

Connecting the TMS Control Lead

50	Magnetic Bearing Controller TCM 1601	95	TMS box
51	Bayonet plug	96	Heating cable
52	Connecting cable	97	Sensor cable with sensor
54	Venting Valve TVF 005	99	Control lead, TMS
57	Control lead, TCM	101	Connection sensor cable

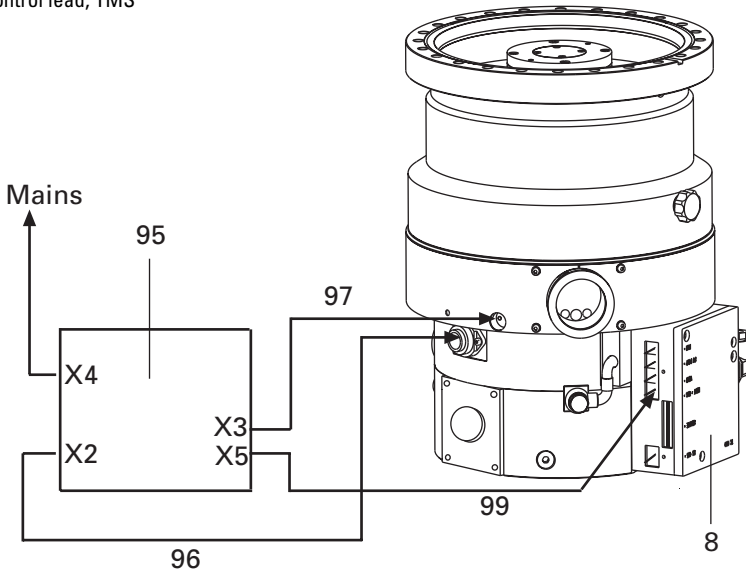


TC 600/750

- ➔ Screw the temperature sensor with cable (97) onto the pump and connect with X3 of the TMS box (95).
- ➔ Connect the heating cable (96) to X2 of the TMS box and to pump plug X2.
- ➔ Make mains connection on plug X4 of the TMS box.
- ➔ Connect the control lead (99) to X5 of the TMS box and to the TC 600/750 (8).

TMS connection with TC 600/750

- 8 TC 600/750
- 95 TMS box
- 96 Heating cable
- 97 Sensor cable
- 99 Control lead, TMS



3. Pump Operations With The TMS

3.1. General Notes On Operations

Pumping operations with the TMS are described in the operating instructions for the DCU, PM 800 547 BE and the operating instructions for the TCM 1601, PM 800 478 BE.


4. What To Do In Case Of Breakdowns?

The heating circuit is monitored by a temperature fuse:

- An irreversible temperature safety fuse interrupts the heating circuit when the temperature in the middle part of the pump is $\geq 128^{\circ}\text{C}$ (Ft 128°).

The melting of this fuse will cause the voltage supply to plug X2 (pins 1 and 2) to be interrupted; the temperature of the pump decreases (please inform PFEIFFER Service).

4.1. Warning Messages

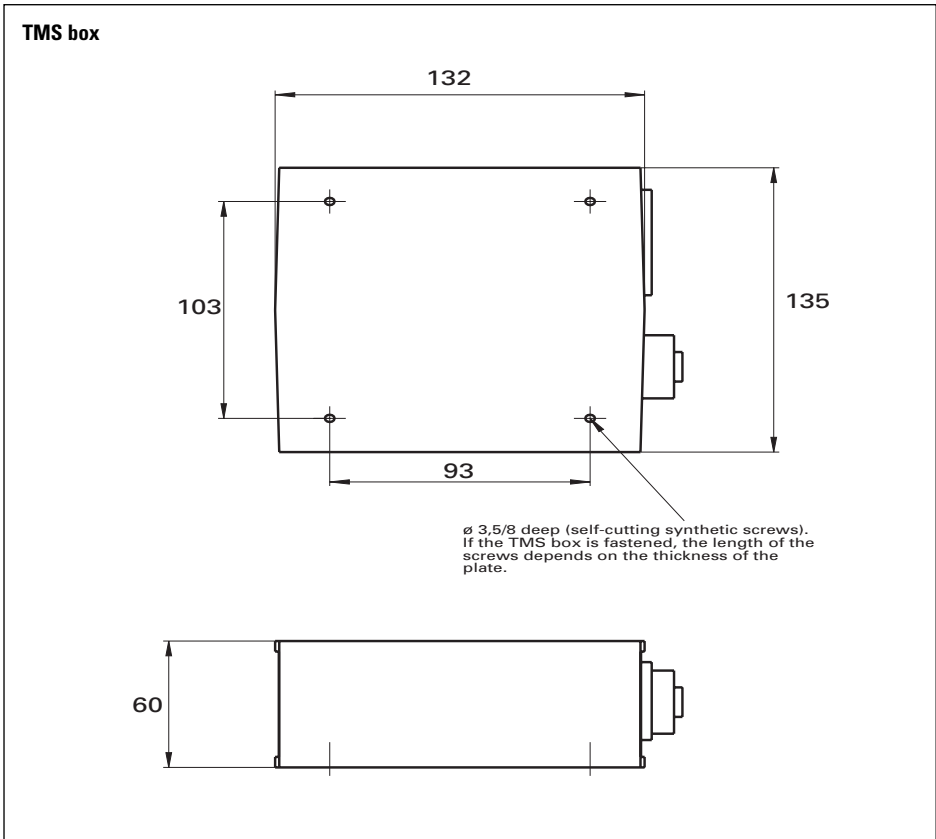
Warning messages on the TCM 1601 or DCU/TC 600/750 do not lead to a shut-down of pump or pumping station operations. The messages on the display can be deleted by activating the reset key , on the TCM 1601 or DCU.

5. Technical Data

5.1. Data List

TMS box		
Description	Unit	Value
Connection voltage	V AC	230 ± 20%
Frequency	Hz	50/60
Fuse (Mains) F1/F2	AT	6.3
Connection power TMS, max.	KVA	1
Permissible ambient temperature	°C	5 -40

5.2. Dimensions



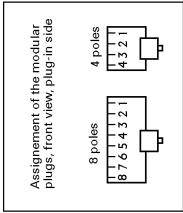
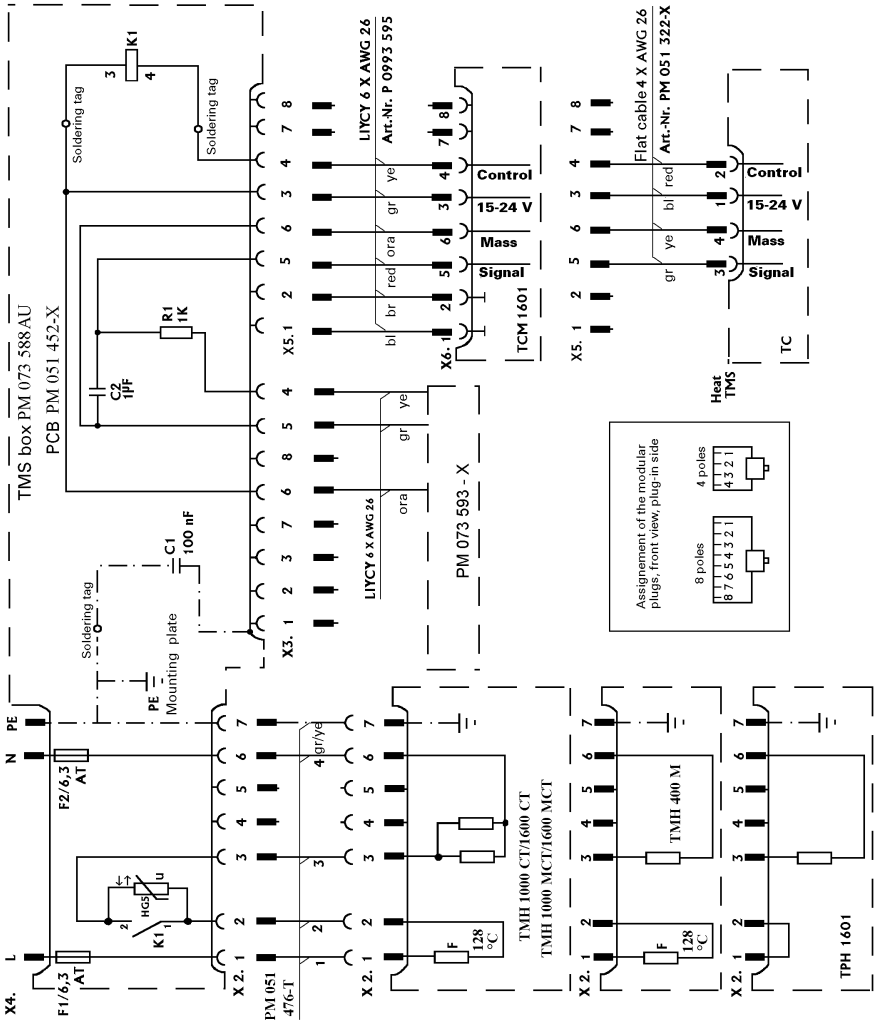
6. Spare Parts

Description	Unit	Order Number
Temperature fuse, pump	Ft 128°	PM 093 191 AX
Mains fuse	6.3 AT	P 4666 452
Temperature sensor		PM 073 593 -X
Control lead TC -TMS box		PM 051 322 -X
Control lead TCM 1601-TMS box		P 0993 595

When ordering accessories and spare parts please state full part numbers required. For spare part orders please state in addition the unit type and unit number (see rating plate).

7. Connection Diagram

Connection Diagram TMS box



PM 073 595 BS



Konformitätserklärung
Declaration of Conformity



im Sinne folgender EU-Richtlinien:
pursuant to the following EU directives:

- **Elektromagnetische Verträglichkeit/ *Electromagnetic Compatibility* 89/336/EWG**
- **Niederspannung/ *Low Voltage* 73/23/EWG**

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

We hereby certify that the product specified below is in accordance with the provision of EU Electromagnetic Compatibility Directive 89/336/EEC and EU Low Voltage Directive 73/23/EEC.

Produkt/Product:

Temperature Management System/ TMS-Box

Angewendete Richtlinien, harmonisierte Normen und angewendete, nationale Normen:

Guidelines, harmonised standards, national standards in which have been applied:

EN 61010, EN 55 011

Unterschrift/Signature:



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