

Operating Instructions

TSD 022 E

TSH 064 D E / TSU 064 D E

TSH 065 D E / TSU 065 D E

Turbomolecular Drag Pumping Stations



INDEX

	Page		Page
1. Safety Precautions	12	5. What To Do In Case Of Breakdowns?	17
2. Understanding The Pumping Station	13	6. Maintenance	17
2.1. Main Features.....	13	6.1. Lubricant.....	17
2.2. Pumping Station Control.....	13	7. Service	17
2.3. Pumping Station Components.....	13	8. Technical Data	18
2.4. For Your Orientation.....	13	8.1. Dimensions.....	18
3. Installation	14	9. Accessories	19
3.1. Preparations For Installation.....	14	10. Spare Parts	19
3.2. Laying The Exhaust Line.....	14	Declaration Of Contamination	20
3.3. Venting Connection.....	14	Declaration Of Conformity	(last page)
3.4. Electrical Connections.....	14		
3.5. Connecting The Vacuum Equipment.....	16		
3.6. Cooling.....	16		
4. Operations	16		
4.1. Lubricant Filling.....	16		
4.2. Starting.....	16		
4.3. Switching Off.....	16		

1. Safety Precautions

- ☞ Read and follow all the instructions in this manual.
- ☞ Inform yourself regarding:
 - Hazards which can be caused by the pumping station;
 - Hazards which can arise in your system;
 - Hazards which can be caused by the medium being pumped.
- ☞ Avoid exposing any part of the body to vacuum.
- ☞ Observe 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 pumping station.
- ☞ When returning individual components to us please note the shipping instructions (see the operating instructions for the pumping station components).

Pictogram Definitions:



Danger of personal injury.

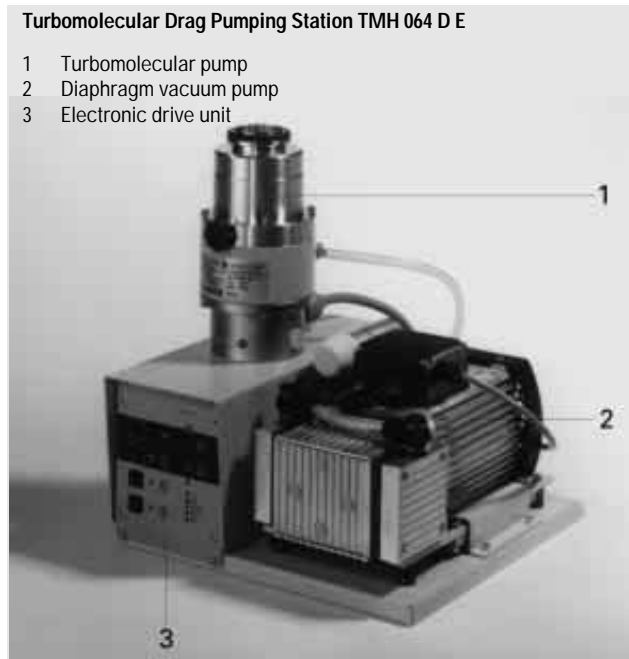


Danger of damage to the pumping station and/or system.

Modifications reserved.

2. Understanding The Pumping Station

2.1. Main Features



Pumping stations are ready for connection and are fully automatic operating pumping units.

Pumping station control and monitoring are carried out via the electronic drive unit.

The backing pump is controlled via a relay.

Cooling

Standard: Convection cooling

Alternative: Air or water cooling where the ambient temperature is more than 30 °C and the system is heated.
Where the ambient temperature is in excess of 35 °C water cooling only.

Proper use

- Turbomolecular pumping stations may only be used for the purpose of generating vacuum.
- Turbomolecular pumping stations may only be operated in the configuration depicted.

Improper use

Certain types of use are regarded as improper, e.g.:

- Pumping corrosive or explosive gases.
- Operating the pumping station in locations where explosive processes are involved.
- Using accessories not named in this manual and/or not authorised by the manufacturer.

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

2.2. Pumping Station Control

Pumping Station	Pumping Station Control
TSD 022 E TSH 064 D E TSU 064 D E TSH 065 D E TSU 065 D E	TCP 015 / relay

Accessory connection to the TCP 015:

- Air cooling
- Turbopump heating

2.3. Pumping Station Components

Pumping Station	TSD 022 E	TSH 064 D E TSU 064 D E	TSH 065 D E TSU 065 D E	Operating Instructions
Pumping Station Components				
Turbomolecular drag pump	TPD 022	TMH 064 TMU 064	TMH 065 TMU 065	PM 800 412 BN PM 800 308 BN with supplementary sheet PM 800 321 BN PM 800 308 BN
Diaphragm vacuum pump	MVP 015	MVP 015	MVP 015	PK 800 181 BN
Electronic drive unit	TCP 015	TCP 015	TCP 015	PM 800 230 BN

2.4. For Your Orientation

Instruction in the text

➔ Operating instruction: Here, you have to do something.

Symbols used

The following symbols are used throughout in the illustrations:

- ⊕ High vacuum flange
- ⊖ Venting connection
- ⚡ Electric connection

Position numbers

Identical pump and accessory parts have the same position numbers in all illustrations.

3. Installation

3.1. Preparations For Installation



Do not carry out any unauthorised conversions or modifications on the pumping station.

- Only remove the blank flanges from the high vacuum and fore-vacuum side immediately before connecting.
- The lubricant reservoir on turbopumps has been fitted and filled on delivery.
- Permissible magnetic field ≤ 7 mT.
- The pumping station should be set up on a horizontal surface.

3.2. Laying The Exhaust Line



When laying the exhaust line the instructions in the operating instructions for the backing pump must be observed.

Exhausted gases and vapors can be a danger to health and the environment.

3.3. Venting Connection

TPD 022

The Turbomolecular Drag Pump TPD 022 must be vented on the HV side because it has no separate venting connection. Where pumps are blank flanged, the venting time must not be less than 30 seconds.

TMH/U 064 and TMH/U 065

The Turbomolecular Drag Pumps TMH/U 064 and TMH/U 065 are vented manually via the standard venting screw in the venting connection. A special manual venting valve is not required.

3.4. Electrical Connections



The electrical connections must be carried out in accordance with local regulations.

The voltage and frequency values on the rating plate must concur with the mains voltage.

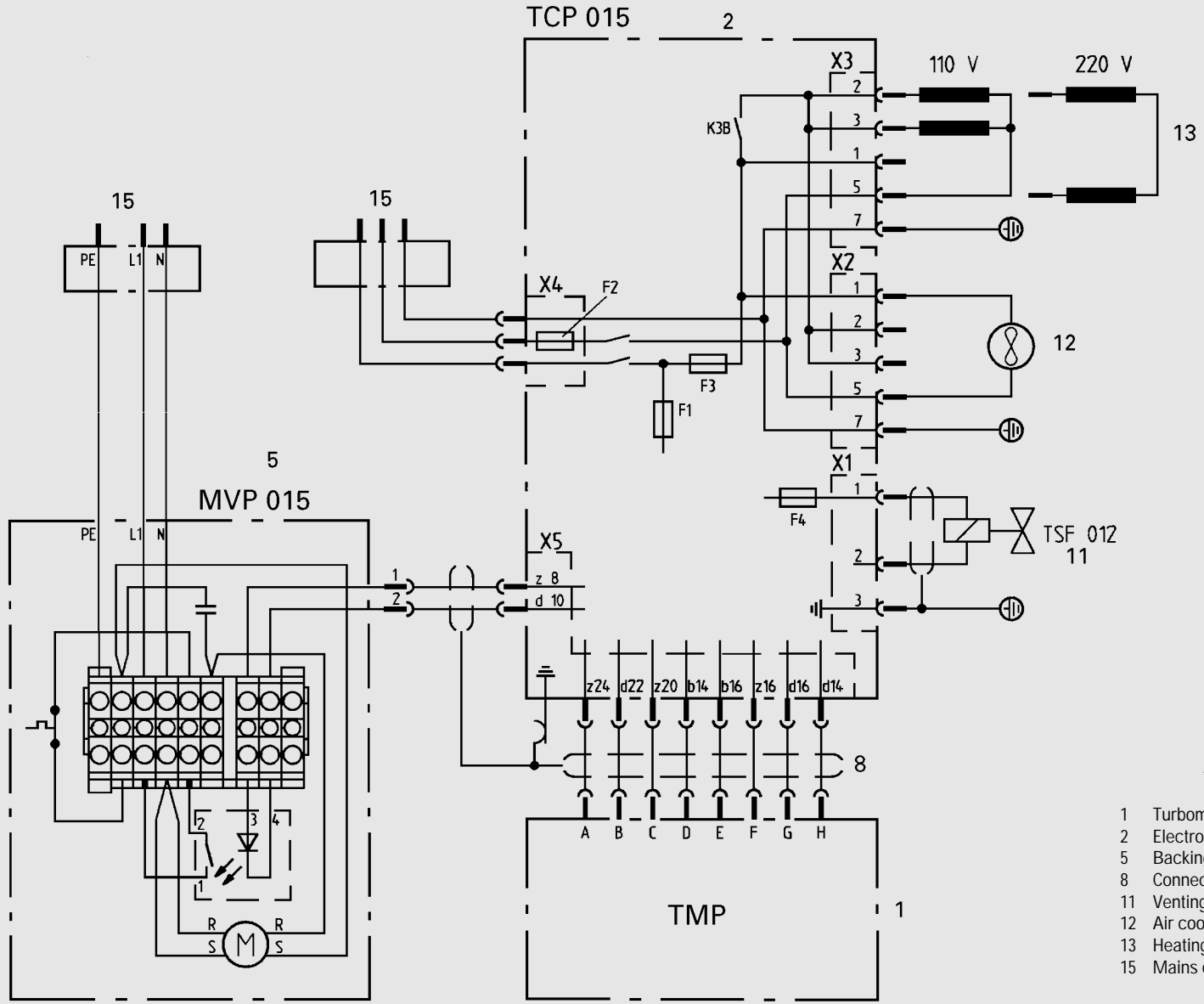
Alternating current is necessary to operate the pumping station. A mains connecting cable (2.5 m) is provided on the pumping station.

- ➔ Connect both mains plugs (electronic drive unit and diaphragm vacuum pump). The pumping station can now be operated.

Accessory connections

The electrical connection of the accessory:

Where a TCP 015 is involved, as per Connection Plan PM 041 650-S.



- 1 Turbomolecular pump
- 2 Electronic Drive Unit TCP
- 5 Backing pump
- 8 Connection, Turbo-TCP
- 11 Venting Valve TSF 012
- 12 Air cooling
- 13 Heating
- 15 Mains connection

3.5. Connecting The Vacuum Equipment



The weight of a freely flanged vacuum chamber on the vacuum flange must not exceed 200 N (equivalent to 20 kg).

Important

The utmost cleanliness must be observed when fitting all high vacuum parts. Unclean components prolong the pumping time.

- ➔ Only remove the blank cover on the high vacuum flange once the apparatus is ready for connection so that no moisture deposits in the pump; this would increase the pumping time required to attain final vacuum.
- ➔ Insert a splinter shield in the high vacuum flange as a protection against foreign particles (see turbopump accessories).

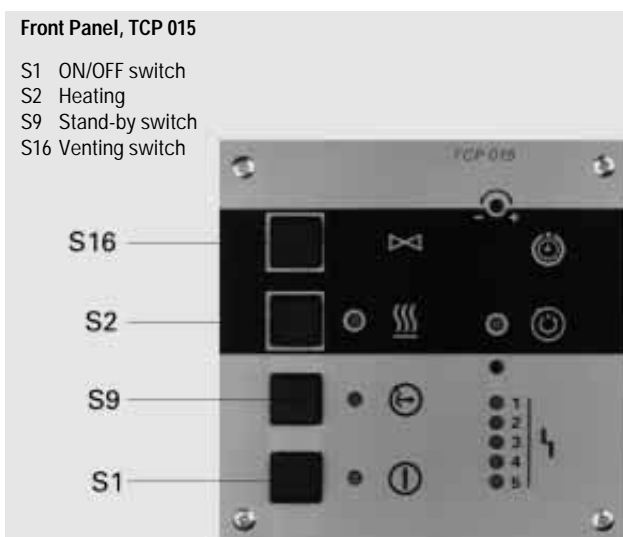
4. Operations

4.1. Lubricant Filling

- The turbomolecular drag pump bearing has been provided with the required amount of lubricant in the works. Changing the lubricant should be carried out in accordance with the respective operating instructions.
- The diaphragm vacuum pump is lubricated for as long as its working life.

4.2. Starting

- ➔ With switch S1 on the front panel of the pumping station.



Pipelines must be connected free of stress. Fit a bellows in the pipeline to compensate for any possible stress.

3.6. Cooling

The pumping stations are convection cooled. They can be converted to water cooling if required (water cooling on request).

The turbopumps can be provided with air cooling (see the operating instructions for the turbopump).

- The turbomolecular drag pump runs up automatically. The running-up phase up to the attainment of the rotation speed switchpoint is dependent on the size of the vacuum chamber. Please refer to "Technical Data" for the running-up times for the pumps in the respective operating instructions.
- If the vacuum pump does not start when switched on, please refer to "What To Do In Case Of Breakdowns?" in the respective operating instructions.



During transport or after the pumping station has been shut down for longer periods it is possible that condensate forms between the first and second stages of the diaphragm pump and the pumping station does not attain the stated final pressure values.

Please produced as follows:

TSH/TSU 064 D E and TSH/TSU 065 D E

Open the venting screw on the turbopump for approximately two minutes after the pumping station has been switched on for about five minutes.

If the stated high vacuum pressure value is still not attained the procedure should be repeated.

TSD 022 E

The Turbomolecular Pump TPD 022 on Pumping Station TSD 022 E has no venting screw and the venting procedure must therefore be carried out via the high vacuum side.

4.3. Switching Off

- ➔ The whole pumping station is switched off via switch S1.
- ➔ Both pump and vacuum chamber can be vented directly after switching off (see Section 3.3.).

5. What To Do In Case Of Breakdowns?

Action which should be taken in the event of breakdowns is described in the respective operating instructions for the individual components.

6. Maintenance

Please Note:

Maintenance should be carried out in accordance with the relevant sections in the respective operating instructions for the individual pumping station components

6.1. Lubricant

The diaphragm vacuum pump is lubricated for as long as its working life.

- ➔ The lubricant reservoir on the turbopump should be changed at least once a year and under extreme operating conditions or where unclean processes are involved, more frequently.

Lubricant Reservoir	Order Nr.
TPD 022	PM 033 759-T
TMH / TMU 064	PM 033 759-T
TMH / TMU 065	PM 033 759-T

7. Service

Do Make Use Of Our Service Facilities

In the event that repairs are necessary to your pumping station or individual components, a number of options are available to you to ensure any system down time is kept to a minimum:

- Have repairs carried out on the spot by PFEIFFER Service Engineers;
- Return the individual components to the manufacturer for repairs;
- Replace individual components with a new value exchange units.

Local PFEIFFER representatives can provide full details.

Before Returning:

- ➔ Attach a clearly visible notice: "Free of harmful substances" (to the unit being returned, the delivery note and accompanying paperwork).

"Harmful substances" are substances and preparations as defined in current legislation and in the U.S.A. as

"materials in accordance with the Code of Federal Regulations (CFR) 49 Part 173.240 Definition and Preparation".

PFEIFFER will carry out the decontamination and invoice this work to you if you have not attached this note. This also applies where the operator does not have the facilities to carry out the decontamination work. Units which are contaminated microbiologically, explosively or radioactively cannot be accepted as a matter of principle.

Fill Out The Declaration of Contamination

- ➔ In every case the "Declaration of Contamination" must be completed diligently and truthfully.
- ➔ A copy of the completed declaration must accompany the unit; any additional copies must be sent to your local PFEIFFER Service Center.

Please get in touch with your local PFEIFFER representatives if there are any questions regarding contamination.



Decontaminate units before returning or possible disposal. Do not return any units which are microbiologically, explosively or radioactively contaminated.

Returning Contaminated Units

If contaminated units have to be returned for maintenance/repair, the following instructions concerning shipping must be followed without fail:

- ➔ Neutralise the pump by flushing with nitrogen or dry air.
- ➔ Seal all openings to the air.
- ➔ Seal pump or unit in suitable protective foil.
- ➔ Ship units only in appropriate transport containers.

Please Note:

Repair orders are carried out according to our general conditions of sale and supply. If repairs are necessary, please send the unit to your nearest PFEIFFER Service Center.

Contact Addresses And Telephone Hotline

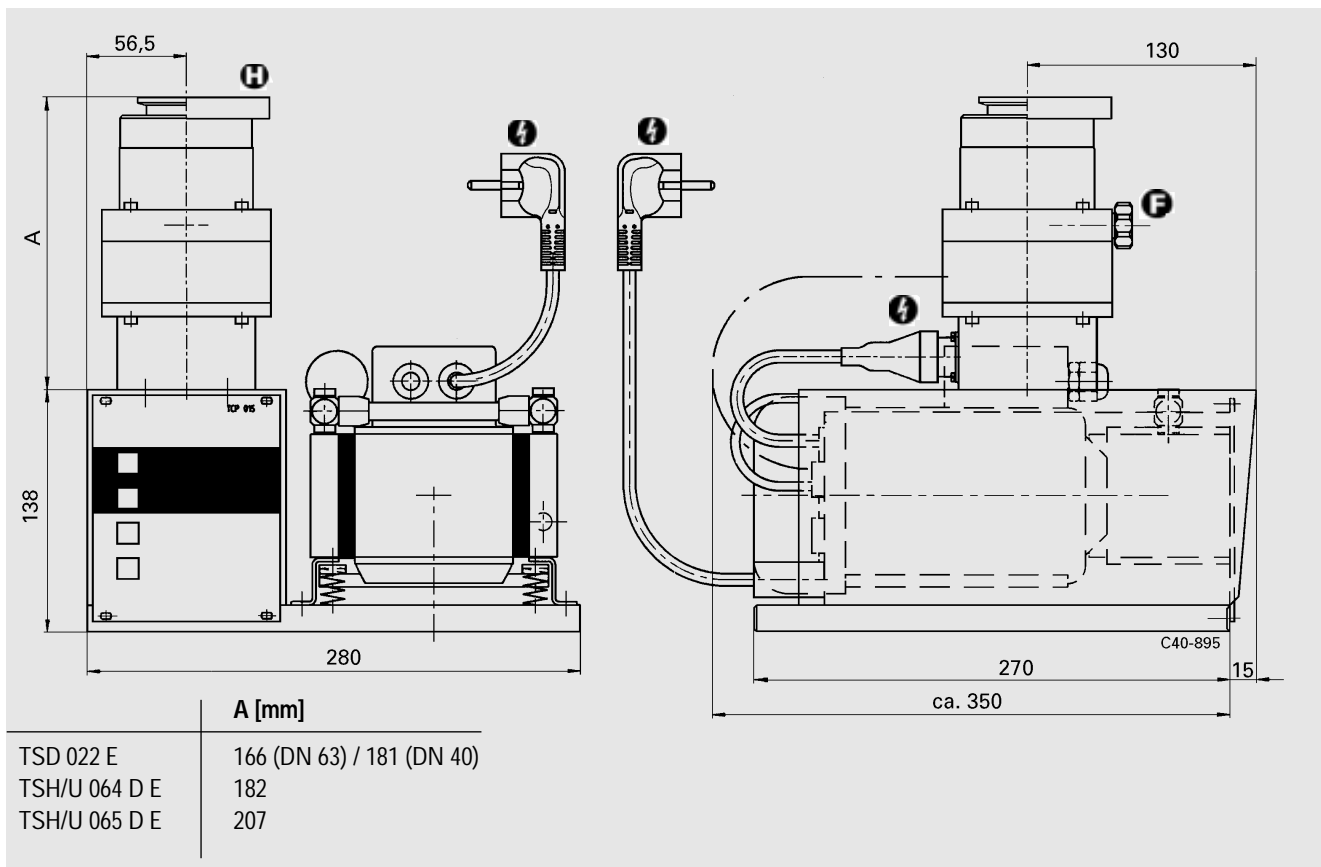
Contact addresses and service hotlines can be found on the back cover of these operating instructions.

8. Technical Data

Pumping Station	Unit	TSD 022 E	TSH 064 D E	TSH 064 D E TSU 064 D E	TSH 065 D E	TSH 065 D E TSU 065 D E
Connection nominal diameter		DN 63 ISO-K ¹⁾	DN 40 ISO-KF	DN 63 ISO-K DN 63 CF-F	DN 40 ISO-KF	DN 63 ISO-K DN 63 CF-F
Pumping speed for						
Nitrogen N ₂	l/s	18 (15) ¹⁾	30	53	30	56
Helium He	l/s	12 (10) ¹⁾	40	42	40	48
Hydrogen H ₂	l/s	9 (7) ¹⁾	20	31	34	36
Working range						
from	mbar	1000	1000	1000	1000	1000
to	mbar	$2 \cdot 10^{-7}$	$< 1 \cdot 10^{-8}$	$< 1 \cdot 10^{-9}$	$< 1 \cdot 10^{-8}$	$< 1 \cdot 10^{-9}$
Weight	kg	12	12,4	12,4/12,6	13,5	13,5/13,9
Pumping Station Components						
Turbomecular Drag Pump		TPD 022	—	—	—	—
			TMH 064	TMH 064	TMH 065	TMH 065
				TMU 064		TMU 065
Diaphragm Vacuum Pump		MVP 015	MVP 015	MVP 015	MVP 015	MVP 015
Electronic Drive Unit		TCP 015	TCP 015	TCP 015	TCP 015	TCP 015

- 1) Adapter set DN 40 ISO-KF optional (see accessories)
Values in brackets for input DN 40 ISO-KF

8.1. Dimensions



9. Accessories

Description	Size	Number	Comments/ relevant operating instructions	Ordering Quantity
Adapter set for TSD 022 E		PM 053 127-T	for reduction to DN 40 ISO-KF	
Heating sleeve, turbopump ¹⁾				
TPD 022	115 V/230 V	PM 043 443-T		
TMH/U 064	115 V/230 V	PM 043 443-T		
TMH/U 065	115 V/230 V	PM 043 443-T		

¹⁾ Only in conjunction with water cooling.

Further accessories for individual components are listed in the respective operating instructions.

10. Spare Parts

Spare parts for individual components are listed in the respective operating instructions.

When ordering accessories and spare parts please be sure to state the full part number. When ordering spare parts please state additionally the unit type and unit number (see rating plate). Please use this list as an order form (by taking a copy).

Declaration of Contamination of Vacuum Equipment and Components

The repair and/or service of vacuum components will only be carried out if a correctly completed declaration has been submitted. Non-completion will result in delay.

The manufacturer could refuse to accept any equipment without a declaration.

This declaration can only be completed and signed by authorised and qualified staff:

1. Description of component:

- Equipment type/model: _____
- Code No.: _____
- Serial No.: _____
- Invoice No.: _____
- Delivery Date: _____

2. Reason for return:

3. Equipment condition

- Has the equipment been used?
yes no
- What type of pump oil was used?

- Is the equipment free from potentially harmful substances?
yes (go to section 5)
no (go to section 4)

4. Process related contamination of equipment

- toxic yes no
- corrosive yes no
- microbiological hazard*) yes no
- explosive*) yes no
- radioactive*) yes no
- other harmful substances yes no

*) We will not accept delivery of any equipment that has been radioactively or microbiologically contaminated without written evidence of decontamination!

Please list all substances, gases and by-products which may have come into contact with the equipment:

Tradename Product name Manufacturer	Chemical name (or Symbol)	Danger class	Precautions associated with substance	Action if spillage or human contact
1.				
2.				
3.				
4.				
5.				

5. Legally Binding Declaration

I hereby declare that the information supplied on this form is complete and accurate. The despatch of equipment will be in accordance with the appropriate regulations covering Packaging, Transportation and Labelling of Dangerous Substances.

Name of Organisation: _____

Address: _____ Post code: _____

Tel.: _____

Fax: _____ Telex: _____

Name: _____

Job title: _____

Date: _____ Company stamp: _____

Legally binding signature: _____

⇒ **DE, AT**

Konformitätserklärung 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 den Bestimmungen der EU-Maschinenrichtlinie 89/392/EWG - Anhang IIA, der EU-Richtlinie über elektromagnetische Verträglichkeit 89/336/EWG und der EU-Niederspannungsrichtlinie 73/23/EWG entspricht.

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

⇒ **GB, IE**

Declaration of conformity 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 in accordance with the provision of EU Machinery Directive 89/392/EEC - Annex II A, EU Electromagnetic Compatibility Directive 89/336/EEC and EU Low Voltage Directive 73/23/EEC.

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

⇒ **BE, FR**

Déclaration de conformité 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 répond bien aux dispositions de la directive machine CE 89/392/CEE - appendice II A, 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 di conformità 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 rispetta le disposizioni della direttiva UE sui macchinari 89/392/CEE - Appendice II A - della direttiva UE sulla compatibilità elettromagnetica 89/336/CEE e della 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 de conformidad 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 concuerda con las disposiciones resultantes de la Directiva 89/392/MCE de la UE sobre Maquinarias - Apéndice IIA, 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 inzake de conformiteit 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 voldoet aan de bepalingen van de EU-machinerichtlijn 89/392/EEG - appendix II A, de EU-richtlijn over elektromagnetische compatibiliteit 89/336/EEG en de EU-richtlijn over laagspanning 73/23/EEG.

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

⇒ **DK**

EF-konformitetserklæring 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 i overensstemmelse med bestemmelserne i EU-maskindirektiv 89/392/EWG - tillæg II A, Eu-direktiv vedrørende elektromagnetisk kompatibilitet 89/336/EWG og EU-lavspændingsdirektiv 73/23/EWG.

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

⇒ **SE**

Konformitetsförklaring 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 stämmer överens med EG's maskindirektiv 89/392/EEC - annex II A, 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.



Vaatumusten mukaisuus vakuutus seuraavien EU-direktiivien mukaisesti:

- konedirektiivi 89/392/ETY
- sähkömagneettinen siedettävyyks 89/336/ETY
- pienjännite 73/23/ETY

Vahvistamme, täten, että allmainittu tuote vastaa EU-konedirektiivin 89/392/ETY - liite IIA, EU-direktiivin sähkömagneettinen siedettävyyks 89/336/ETY ja EU-pienjännitedirektiivin 73/23/ETY vaatimuksia.

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



Declaração de conformidade, 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 está em conformidade com as disposições pertinentes na Directiva CE para máquinas, na redacção 89/392/CEE - Apêndice II A, na Directiva CE sobre compatibilidade electromagnética, na redacção 89/336/CEE, e 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.



Δήλωση συμμόρφωσης κατά το νόμο των ελλήσ οδηγιών της Ε.Ε.:

- 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 ανταποκρίνεται στην οδηγία περί μηχανών της Ε.Ε. 89/392/Ε.Ο.Κ.- παράρτημα Ι Α, στην οδηγία περί ηλεκτρομαγνητικής συμβατότητας της Ε.Ε. 89/336/Ε.Ο.Κ. και στην οδηγία περί χαμηλής τάσης της Ε.Ε. 73/23/Ε.Ο.Κ.

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

Produkt/Product/Produit/Prodotto/Producto/Produkt/Produkt/Produto/ Προϊόν:

TSD 022 E
TSH/U 064 D E
TSH/U 065 D E

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:

Direttive 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 292-1	EN 50 081-1
EN 292-2	EN 50 082-2
EN 294	IEC 801 1-4
EN 61 010	VDE 0843-6
EN 55 011	

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

Geschäftsführer (W. Dondorf)
Managing Director
Gérant d'affaires
Gerente
Directeur
Administrerende Direktor
Verkställande Direktör
Gerente
Διευθύνων Σύμβουλος

Zentrale/Headquarters

Pfeiffer Vacuum GmbH

Emmeliusstrasse 33
D-35614 AsslarTelefon 06441/802-0
Telefax 06441/802-202

Hotline 06441/802-333

Internet:

<http://www.pfeiffer-vacuum.de>**Argentina**ARO S.A., Casilla de Correo 4890,
1000 Buenos Aires, telephone 0054 / 1 331 3918,
telefax 0054 / 1 331 3572**Australia**Balzers Australia Pty. Ltd., Level 1,
3, Northcliff Street, Milsons Point, NSW 2061,
telephone 0061 / 2 9954 1925, telefax 0061 / 2 9954 1939**Austria**Pfeiffer Vacuum Austria GmbH
Diefenbachgasse 35, A-1150 Wien,
telephone 0043 / 1 8941 704, telefax 0043 / 1 8941 707
Service Hotline: 0043 / 1 8941704**Belgium / Luxemburg**Pfeiffer Vacuum Belgium N.V./S.A.
Minervastraat 14, B-1930 Zaventem
telephone 0032 / 2 725 0525, telefax 0032 / 2 725 0873
Service Hotline: 0032 / 2 725 3545**Brazil**Elmi Tec
Assistencia Técnica e Representação S/C Ltda.
Rua Bernadino de Compos, 551
CEP 04620-002 São Paulo, SP - Brasil
telephone 0055 / 11 532 0740
telefax 0055 / 11 535 3598**Chile**BERMAT S.A., Coyuncura 2283, piso 6
Providencia, P.O. Box 9781, Santiago
telephone 0056 / 2 231 8877,
telefax 0056 / 2 231 4294**Colombia**Arotec Colombiana S.A., Carrera 15 No.38-17
P.O. Box 050 862, Santafe de Bogota / D.C.
telephone 0057 / 1 288 7799, telefax 0057 / 1 285 3604**Denmark**Pfeiffer Vacuum Scandinavia AB, Vesterengen 2,
DK-2630 Taastrup, telephone 0045 / 43 52 38 00,
telefax 0045 / 43 52 38 50**France**Pfeiffer Vacuum France SAS
47, rue d'Arthelon, BP 18 F-92190 Meudon Cedex
telephone 0033 / 1 4623 7070, telefax 0033 / 1 4534 4441**Germany**Pfeiffer Vacuum Vertriebs GmbH,
Emmeliusstrasse 33, D-35614 Asslar
telephone 0049 / 6441 802 400
telefax 0049 / 6441 802 399
Service Hotline: 0049 / 6441 802 333**Great Britain**Pfeiffer Vacuum Ltd.
Bradbourne Drive, Tilbrook,
Milton Keynes, MK7 8AZ, United Kingdom
telephone 0044 / 1 908 373 333
telefax 0044 / 1 908 377 776**Greece**Analytical Instruments S.A., 1 Mantzarou St.,
GR-15451 Athens,
telephone 0030 / 1 674 8973, telefax 0030 / 1 674 8978**India**Pfeiffer Vacuum India Ltd.
25-E Nicholson Road, Tarbund
Secunderabad 500 009,
telephone 0091 / 40 775 0014, telefax 0091 / 40 775 7774**Israel**Eastronics Ltd., 11 Rozanis Street, P.O. Box 39 300,
Tel Aviv 61392,
telephone 00972 / 3 6458 777,
telefax 00972 / 3 6458 666**Italy**Pfeiffer Vacuum Italia S.p.a.
Via San Martino, 44 I-20017 RHO (Milano)
telephone 0039 / 2 93 99 051, telefax 0039 / 2 93 99 05 33**Japan**Hakuto Co. Ltd., C.P.O. Box 25,
Vacuum & Scientific Instruments Division
Tokyo Central 100-91,
telephone 0081 / 3 32 258 910,
telefax 0081 / 3 32 259 009**Korea**Pfeiffer Vacuum Korea Ltd., 3F Haein Building 453,
Dokok-Dong, Kang Nam-Ku, Seoul, 135-270
telephone 0082 / 2 3461 0671,
telefax 0082 / 2 3461 0676**Netherlands**Pfeiffer Vacuum Nederland BV
Veldzigt 30a, NL-3454 PW De Meern,
telephone 0031 / 30 6666050, telefax 0031 / 30 6662794**Peru**Ing. E. Brammert S.C.R.L., José Pardo 182,
Apartado 173, PE-18 Miraflores,
telephone 0051 / 1 445 8178
telefax 0051 / 1 445-1931**Poland**Softrade Sp.z.o.o, ul. Malwowa 35,
PL-60-175 Poznan, telephone 0048 / 61 8677 168,
telefax 0048 / 61 8677 111**Portugal**Unilaser Lda, Taguspark
Núcleo Central, sala nº 268, Estrada Cacém-
Porto Salvo, P-2780 Oeiras
telephone 00351 / 1 421 7733,
telefax 00351 / 1 421 7744**Singapore**APP Systems Services Pte. Ltd, 2 Corporation Road
06-14 Corporation Place, Singapore 618494,
telephone 0065 / 268 2024, telefax 0065 / 268 6621**Spain**Tecnovac
Tecnologia de Vacio S.L., Ronda de Poniente, 6 Bajo F
Centro Empresarial Euronova
E-28760 Tres Cantos (Madrid)
telephone 0034 / 91 804 11 34,
telefax 0034 / 91 804 30 91**Sweden**Pfeiffer Vacuum Scandinavia AB
Magasinsgatan 35, Box 10412
S-43424 Kungsbacka
telephone 0046 / 300 710 80
telefax 0046 / 300 172 85
Service Hotline: 0046 / 300 710 85**Switzerland**Pfeiffer Vacuum Schweiz S.A.
Förribuckstraße 30, CH-8005 Zürich
telephone 0041 / 1 444 2255,
telefax 0041 / 1 444 2266
Service Hotline: 0041 / 1 2730119**South Africa**Labotec Pty Ltd., P.O. Box 6553,
Halfway House
1685 Midrand
telephone 0027 / 11 315 5434,
telefax 0027 / 11 315 5882**Taiwan**Heli-Ocean Engineering and Trading Co., Ltd.
6th Floor, No. 67, Shyr Pin Road,
Hsinchu 300, Taiwan R.O.C.,
telephone 00886 / 3 5725 848, telefax 00886 / 3 5725 849**Thailand**Thai Unique Co. Ltd., 80-82 Prachathipathai Road,
Bangkok 10200,
telephone 00662 / 282 97 49, telefax 00662 / 280 1788**U.S.A.**Pfeiffer Vacuum Technology, Inc.
24 Trafalgar Square
Nashua, NH 03063-1988
USA
telephon 001/ 603 578 6500
telefax 001/ 603 578 6550**Venezuela**Secotec S.A., Apartado 3452, Caracas 1010-A,
telephone 0058 / 2 573 8687
telefax 0058 / 2 573 1932**Other countries**AVI - Applied Vacuum Industries GmbH
Leginglenstrasse 17A; CH-7320 Sargans
Switzerland
telephon 0041 / 81 710 03 80
telefax 0041 81 710 03 81**Scope of represented countries**Armenia, Azerbaijan, Bangladesh, Belarus, Bulgaria,
Cambodia, Estonia, Georgia, Hong Kong, Kazakhstan,
Kingdom of Nepal, Kirghizia, Latvia, Lithuania,
Maldavia, Philippines, P.R. China, Rumania, Russia,
Tajikistan, Turkmenistan, Ukraine, Uzbekistan, Vietnam**A.E.M.S.**Advanced Equipment Materials and Systems
P.O. Box 25
Föhrenweg 18
FL-9496 Balzers
telephon 0041 / 75 380 0550
telefax 0041 / 75 380 0551**Scope of represented countries**Bahrain, Egypt, Iraq, Jordan, Kuwait, Lebanon,
Lybia, Oman, Pakistan, Saudi-Arabia, Sudan, Syria,
Turkey, United Arab Emirates, Yemen