

## Vacuum pumps

## VTE

### COOLING

VTE 3

VTE 6

VTE 8

### Pump ranges

These operating instructions concern the following dry running rotary vane vacuum pumps: Models VTE 3, VTE 6 and VTE 8. The vacuum capacities at atmosphere are 3.5, 6 and 8 m<sup>3</sup>/hr operating on 50 cycles. The pumping curves showing capacity against pressure can be found in data sheet D 187.

### Description

All models are complete with a pipe connection on the inlet and an exhaust silencer on the outlet. All the air handled is filtered by a built-in micro-fine filter. The motor fan cools the motor and pump housing. Both the motor and pump have a common shaft.

**Optional extras:** As required, vacuum regulating valve (ZRV), non return valve (ZRK) and motor starter (ZMS).

### Suitability

The VTE can be used for the evacuation of a closed system or for a permanent vacuum from: 150 to 1000 mbar (abs.)

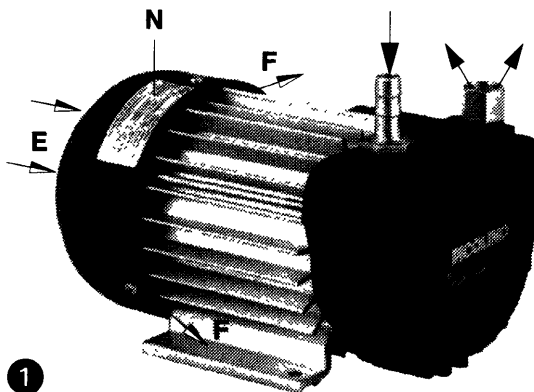
**⚠ The ambient and suction temperatures must be between 5 and 40° C. For temperatures outside this range please contact your supplier.**

These dry running vacuum pumps are suitable for use with air of a relative humidity of 30 to 90%.

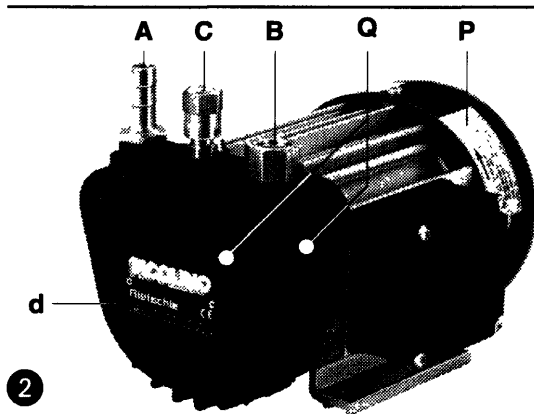
**⚠ No dangerous mixtures (i.e. flammable or explosive gases or vapours) extremely humid air, water vapour, aggressive gases or traces of oil and grease can be handled.**

The standard versions may not be handled in explosion areas.

**⚠ All applications where an unplanned shut down of the vacuum pump could possibly cause harm to persons or installations, then the corresponding safety backup system must be installed.**



1



2

### Handling and Setting up (pictures 1 and 2)

**⚠ Pumps that have reached their operating temperature, may have on the VTE 6 and VTE 8 a surface temperature, at position (Q) of more than 70° C. WARNING! Do Not Touch.**

There must be a minimum space of 20 cm in front of the housing cover (d) for servicing. The cooling air entries (E) and the cooling air exits (F) must have a minimum distance of 8 cm from any obstruction. The discharged cooling air must not be recirculated.

**The VTE pumps can only be operated reliably if they are installed horizontally. Other built-in positions on request.**

**⚠ For installations that are higher than 1000 m above sea level there will be a loss in capacity. For further advice please contact your supplier.**

Installed on a solid base these pumps may be installed without fixing down. If the pumps are installed on a base plate we would recommend fitting anti-vibration mounts. This range of vacuum pumps are almost vibration free in operation.

### Installation (pictures 1 and 2)

**⚠ For operating and installation follow any relevant national standards that are in operation.**

#### 1. Vacuum connection at (A).

The air handled can be exhausted into the atmosphere through the exhaust port (B) or by utilising a pipe connection and pipeline.

**⚠ Long and/or small bore pipework should be avoided as this tends to reduce the capacity of the pump.**

2. The electrical data can be found on the motor data plate (P). The motors correspond to DIN/VDE 0530 and have IP 54 protection and insulation class B. The connection diagram can be found in the terminal box on the motor (unless a special plug connection is fitted). Check the electrical data of the motor for compatibility with your available supply (voltage, frequency, permissible current etc.).

3. Connect the motor via a motor starter. It is advisable to use thermal overload motor starters to protect the motor and wiring. All cabling used on starters should be secured with good quality cable clamps.

We recommend that motor starters should be used that are fitted with a time delayed trip resulting from running beyond the amperage setting. When the unit is started cold overamperage may occur for a short time.

**⚠ The electrical installation may only be made by a qualified electrician under the observance of EN 60204. The main switch must be planned through the operator.**

BE 187

1.10.96

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**Initial Operation (picture 1)**

1. Initially switch the pump on and off for a few seconds to check the direction of rotation against the direction arrow (see motor data plate (P)).

**Note: The suction pipework should not be connected. If the pump runs backwards this could result in damaged rotor blades.**

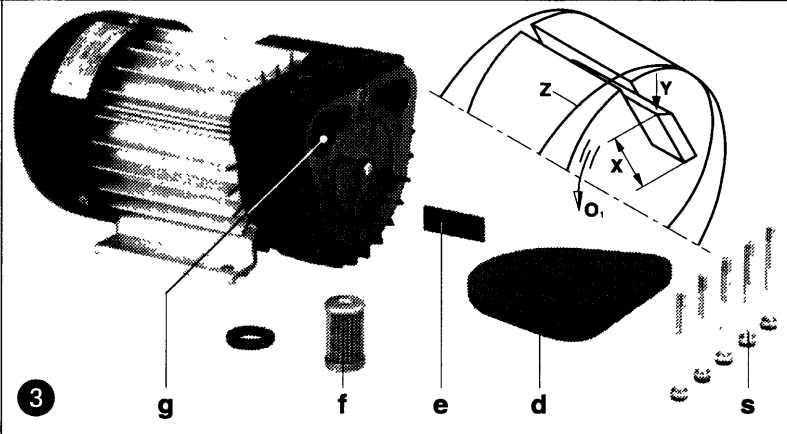
2. Connect the suction pipe at (A).

3. Vacuum regulating valve (optional extra):

The vacuum can be adjusted by turning the regulating valve (C) according to the symbols on the top of the regulating valve.

**Potential risks for operating personnel**

**Noise Emission:** The worst noise levels considering direction and intensity measured according to DIN 45635 part 3 (as per 3. GSGV) are shown in the table at the back. When working permanently in the vicinity of an operating pump we recommend wearing ear protection to avoid any damage to hearing.



**Maintenance and Servicing**

**⚠ When maintaining these units and having such situations where personnel could be hurt by moving parts or by live electrical parts the pump must be isolated by totally disconnecting the electrical supply. It is imperative that the unit cannot be re-started during the maintenance operation. Do not maintain a pump that is at its normal operating temperature as there is a danger from hot parts.**

**1. Lubrication**

The VTE pumps have bearings that are greased for life. They need not be serviced.

**2. Air filtration (picture 3)**

**⚠ The capacity of the pump could be reduced if the air inlet filters are not maintained correctly.**

The filter cartridge (f) has to be cleaned monthly depending on the amount of contamination. This is achieved by blowing compressed air from the inside of the cartridge outwards. Even if the cartridges are cleaned their separating efficiency deteriorates. We would therefore recommend exchanging the cartridges once a year depending on operating conditions.

Changing the filter: Screw off housing cover (d). Remove filter cartridge (f) with gaskets from filter room (g). Clean or exchange filter and check gaskets. Reassemble in reverse order.

**3. Blades (picture 3)**

**Checking blades:** The models VTE have 4 blades which have a low but permanent wear factor.

First check after 6,000 operating hours, thereafter every 3,000 operating hours. Screw off housing cover (d) from housing. Remove blades (e) for inspection. All blades must have a minimum height (X) of larger than 10 mm (VTE 3 and VTE 6) and 12 mm (VTE 8):

**⚠ Blades must be changed completely.**

**Changing blades:** if the minimum height is reached, then the whole set of rotor blades should be changed.

Before fitting new blades clean the housing and rotor slots with compressed air. Place the blades with the radius outwards (Y) such that the bevel is in the direction of rotation (O<sub>1</sub>) and corresponds with the radius of the housing (Z). Replace housing cover (d) and slightly tighten the screws (s). Start pump and check for free and smooth running blades. Then firmly tighten end cover screws (s).

**Trouble Shooting:**

**1. Motor starter cuts out vacuum pump:**

- 1.1 Check that the incoming voltage and frequency corresponds with the motor data plate.
- 1.2 Check the connections on the motor terminal block.
- 1.3 Incorrect setting on the motor starter.
- 1.4 Motor starter trips too fast. Solution: Use a motor starter with a time delay trip (version as per IEC 947-4).
- 1.5 Back pressure on the exhaust pipework is excessive.

**2. Insufficient suction capacity:**

- 2.1 Inlet filters are obscured.
- 2.2 Suction pipe work is too long or too small.
- 2.3 Leak on the pump or on the system.
- 2.4 Blades are damaged.

**3. Vacuum pump does not reach ultimate vacuum:**

- 3.1 Check for leaks on the suction side of the pump or on the system.
- 3.2 Blades are worn or damaged.

**4. Vacuum pump operates at an abnormally high temperature:**

- 4.1 Ambient or suction temperature too high.
- 4.2 Cooling air flow is restricted.
- 4.3 Problem as per 1.5.

**5. Unit emits abnormal noise:**

- 5.1 The pump cylinder is worn. Solution: send your complete unit off for repair to the supplier or approved service agent.
- 5.2 The regulating valve (if fitted) is noisy. Solution: replace valve.
- 5.3 Blades are damaged.

**Appendix:**

**Repair on Site:** For all repairs on site an electrician must disconnect the motor so that an accidental start of the unit cannot happen.

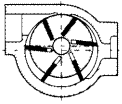
All engineers are recommended to consult the original manufacturer or one of the subsidiaries, agents or service agents. The address of the nearest repair workshop can be obtained from the manufacturer on application. After a repair or before re-installation follow the instructions as shown under the headings "Installation and Initial Operation".

**Storage:** VTE units must be stored in dry ambient conditions with normal humidity. We recommend for a relative humidity of over 80% that the pump should be stored in a closed container with the appropriate "drying" chemicals.

**Disposal:** The fast wearing parts (as listed in the spare parts lists) should be disposed of with due regard to health and safety regulations.

**Spare part lists:** E 187 → VTE 3 - VTE 8

VTE		3	6	8
Noise level (max.)	50 Hz	60	63	65
	60 Hz	61	64	66
Weight	kg	6,5	7,5	8,0
Length	mm	209	224	249
Width	mm	153,5	153,5	153,5
Height	mm	151	157	157



## Compact dry running vacuum pumps

VTE

**PICOLINO**

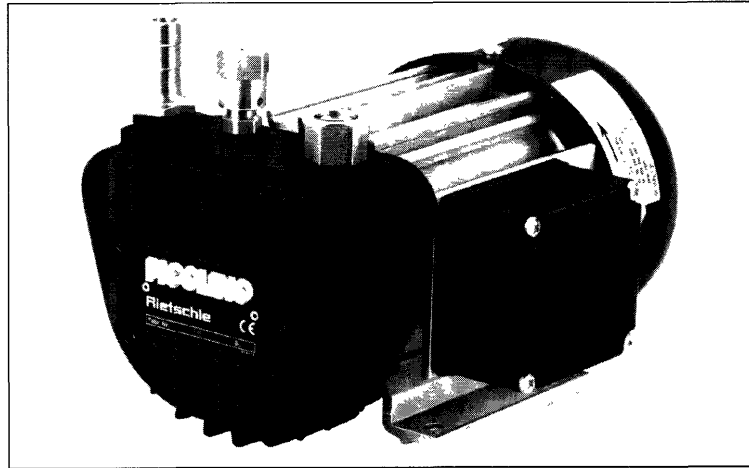
For modern applications which require a capacity of less than 10 m<sup>3</sup>/hr combined with a good vacuum level, dry running vacuum pumps are used almost exclusively due to their compact size, high efficiency and low noise level.

Rietschle has improved their performance through extensive applications experience and has therefore retained leadership in this field.

The pump range VTE includes the sizes 3, 6 and 8 m<sup>3</sup>/hr and achieves an ultimate vacuum of 150 mbar (abs). The VTE is distinctive due to its compact construction, which makes it easy to build into end user equipment.

A paper inlet filter, exhaust silencer and hose connection are fitted as standard, with the option of a vacuum regulating valve if required.

This vacuum pump model is also available in three electrical versions to meet virtually any voltage and frequency requirements:



1. Three phase application  
200-255/346-440 V, 50/60 Hz
2. Single phase operation  
230 V ± 10%, 50/60 Hz
3. Single phase operation  
100 V ± 10%, 50/60 Hz  
115 V ± 10%, 60 Hz

Plug and cable can easily be fitted on request.

The TEFV motor conforms to protection IP 54.

Models with a single phase motor have a thermo bi-metal contact in the winding, which enables the motor to automatically switch off if it becomes too hot due to overload or insufficient

cooling. The motor will automatically re-start when the temperature decreases.

UL approved motors can be obtained

Noise levels from the VTE are minimised by the use of cast iron for the housing and end cover, making it ideal for applications in quiet areas such as offices and laboratories.

The rotor is corrosion resistant so that a long stand still period, even at high humidity, is no problem.

The main dimensions are:

Length:

- VTE 3 → 209 mm
- VTE 6 → 224 mm
- VTE 8 → 249 mm

Width:

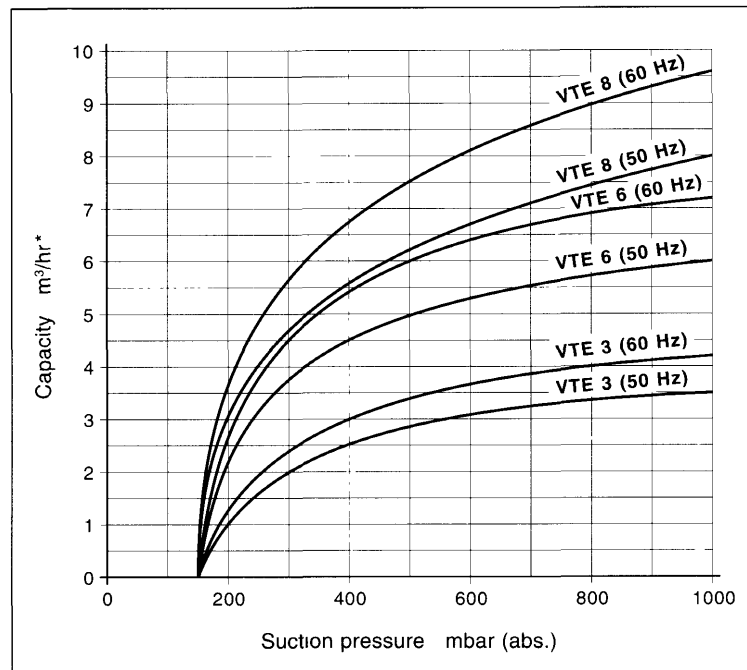
- VTE 3-8 → 154 mm

Height incl. hose connection:

- VTE 3 → 151 mm
- VTE 6 → 157 mm
- VTE 8 → 157 mm

Please do not hesitate to contact us for more detailed information!

\* related to suction conditions at inlet connection. Curves and specifications refer to vacuum pump at normal operating temperature.



VTE 3

VTE 6

VTE 8

**PE 187**

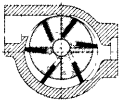
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# Daten

# Rietschle



Vakuum-  
pumpen

Vacuum  
Pumps

Pompes  
à vide

Pompe  
per vuoto

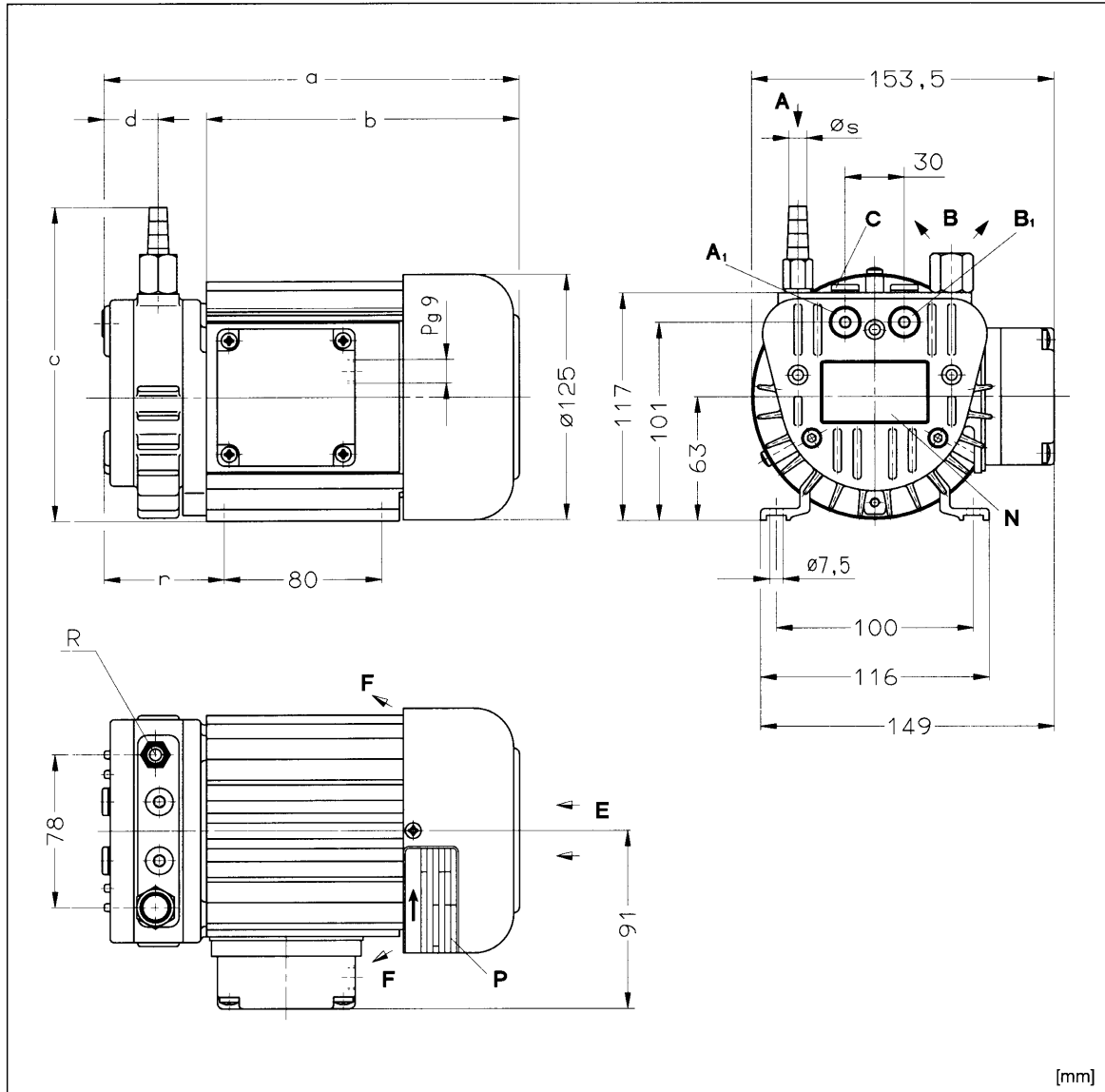
VTE

**RICOLINO**

VTE 3

VTE 6

VTE 8



[mm]

A	Vakuum-Anschluß	Vacuum connection	Raccord du vide	Attacco vuoto
A <sub>1</sub>	Alternativer Vakuum-Anschluß	Vacuum connection alternative	Raccord alternatif du vide	Attacco vuoto alternativo
B	Abluft-Austritt	Exhaust	Refolement	Scarico aria
B <sub>1</sub>	Alternativer Abluft-Austritt	Exhaust alternative	Refolement alternatif	Scarico aria alternativo
C	Anschlußmöglichkeit für Vakuum-Regulierventil	Connection possibility for vacuum regulating valve	Possibilité de raccordement pour valve réglage vide	Possibilità di allacciamento per valvola regolazione vuoto
E	Kühlluft-Eintritt	Cooling air entry	Entrée air refroidissement	Entrata aria di raffreddamento
F	Kühlluft-Austritt	Cooling air exit	Sortie air refroidissement	Uscita aria di raffreddamento
N	Datenschild	Data plate	Etiquette caractéristique	Targhetta dati
P	Motordatenschild	Motor data label	Etiquette caractérist. moteur	Targhetta dati del motore

VTE		3	6	8
[mm]	a	209	224	249
	b	158	158	179
	c	152	158	158
	d	24	38	27
	r	59	74	79
	Øs	9	12	12
	R	G 1/8	G 3/8	G 3/8

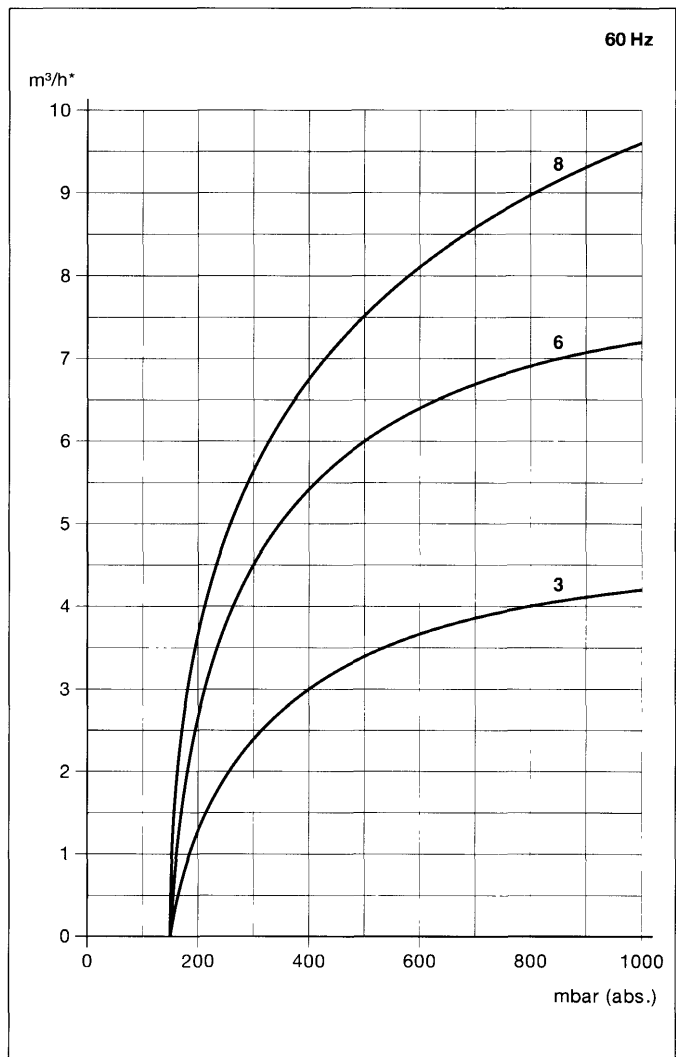
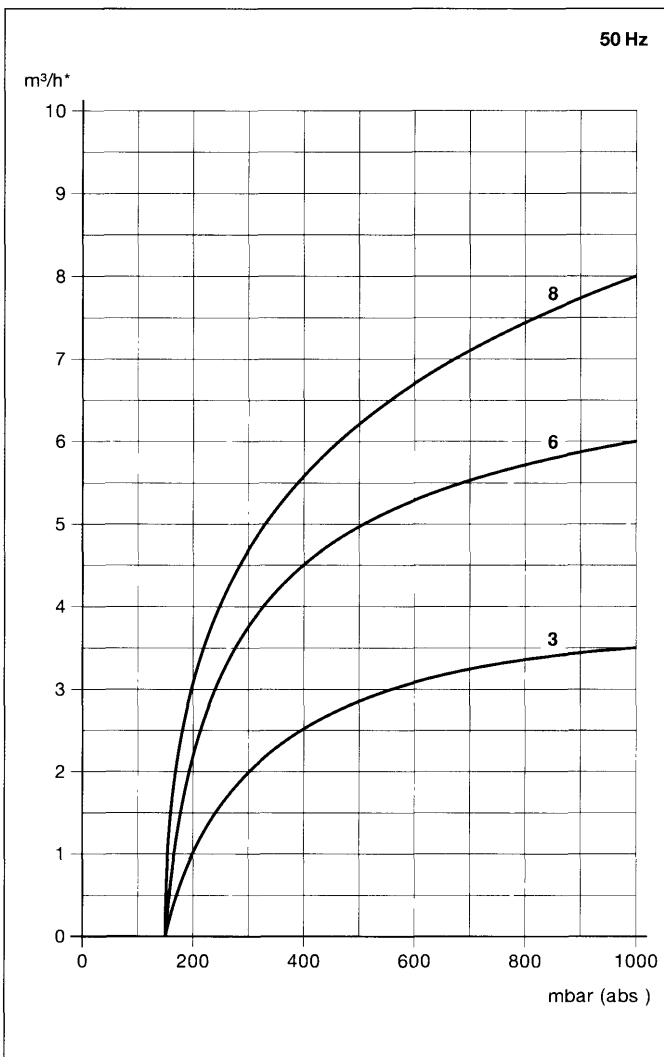
D 187

2.6.94

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VTE		3	6	8
m <sup>3</sup> /h	50 Hz	3,5	6,0	8,0
	60 Hz	4,2	7,2	9,6
mbar (abs.)*		150		
3 ~		200-255/346-440 V (50/60 Hz)		
1 ~		230 V ± 10% (50/60 Hz)		
kW (50 Hz)	3 ~	0,12	0,25	0,37
	1 ~	0,12	0,25	0,35
kW (60 Hz)	3 ~	0,145	0,30	0,44
	1 ~	0,145	0,30	0,42
A (50 Hz)	3 ~	1,1/0,63	1,4/0,81	2,42/1,4
	1 ~	1,3	2,3	3,9
A (60 Hz)	3 ~	0,9/0,52	1,44/0,83	2,25/1,3
	1 ~	1,4	2,5	3,4
min <sup>-1</sup>		2750		
50 Hz		3300		
dB(A)	50 Hz	57	60	63
	60 Hz	58	61	65
kg		6,3	7,9	9,1
ZRV		6/0	6/0	12/0
ZRK		6 (03)	12 (03)	12 (03)
ZMS (50 Hz)	3 ~	16/10	16/10	40/60
	1 ~	16	24	40
ZMS (60 Hz)	3 ~	10/10	16/10	24/16
	1 ~	16	40	40

m <sup>3</sup> /h	Saugvermögen	Capacity	Débit	Portata
mbar (abs.)*	Enddruck	Ultimate vacuum	Pression limite	Pressione finale
mbar (abs.)	Ansaugdruck	Suction pressure	Pression d'aspiration	Pressione di aspirazione
3 ~/1 ~	Motorausführung	Motor version	Exécution moteur	Esecuzione motore
kW	Motorleistung	Motor rating	Puissance moteur	Potenza motore
A	Stromaufnahme	Current drawn	Intensité absorbée	Corrente nominale
min <sup>-1</sup>	Drehzahl	Speed	Vitesse rotation	Numero giri
dB(A)	mittlerer Schallpegel	Average noise level	Niveau sonore moyen	Rumorosità media
kg	max. Gewicht	Weight max.	Poids maxi.	Peso massimo
ZRV	Zubehör	Optional extras	Accessoires	Accessori
ZRK	Vakuu-Reguliventil	Vacuum regulating valve	Valve de réglage vide	Valvola regolazione vuoto
ZMS	Ruckschlagventil	Non return valve	Clapet anti-retour	Valvola di non ritorno
	Motorschutzschalter	Motor starter	Disjoncteur moteur	Interruttore magnetotermico



\*bezogen auf den Zustand im Sauganschluß / Related to suction conditions at inlet connection / Relatif à l'état régnant à l'aspiration / Riferito alle condizioni in aspirazione  
 Kennlinien und Tabellenangaben beziehen sich auf betriebswarme Vakuumpumpen / Curves and tables refer to vacuum pump at normal operating temperature / Les courbes et tableaux  
 sont établis, pompe à température de fonctionnement / Le curve caratteristiche ed i dati riportati nelle tabelle si riferiscono alle pompe per vuoto con funzionamento a regime  
 Technische Änderungen vorbehalten! / We reserve the right to alter technical information! / Sous réserve de modification technique! / Salvo modifiche tecniche!

VTE 3 - VTE 8

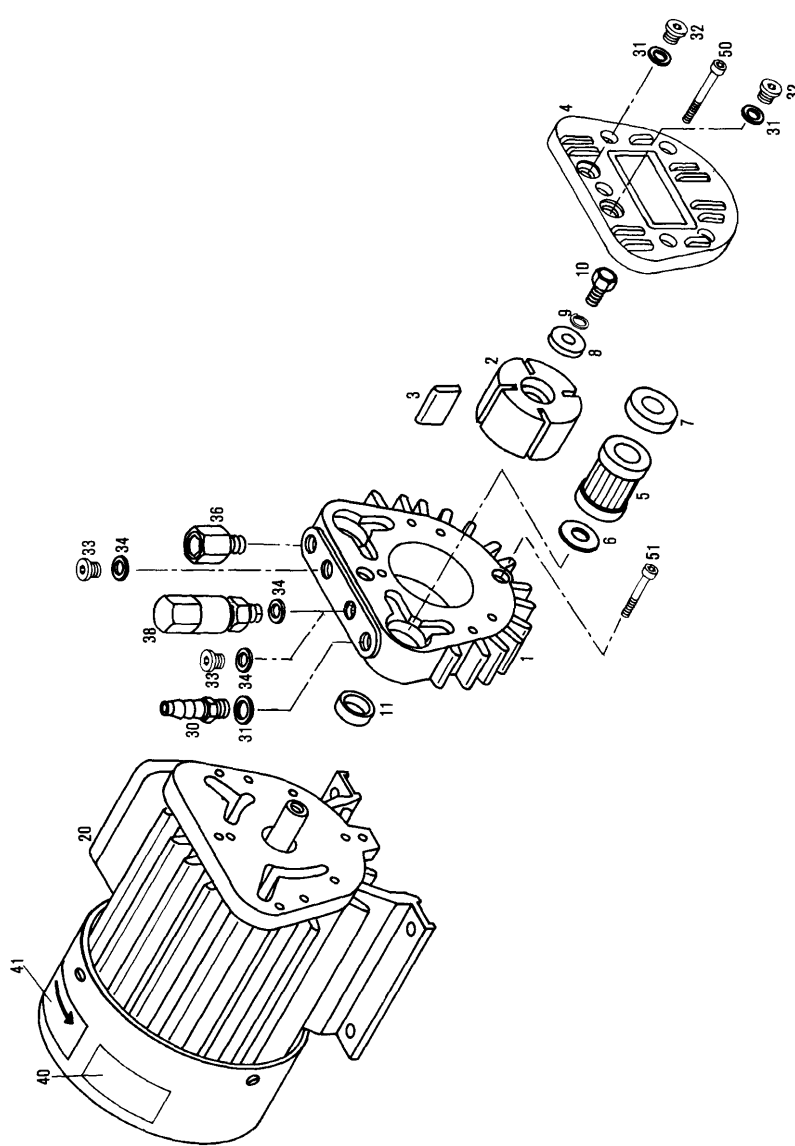
	Grundteile	Parts	Eléments de base	Parti fondamentali		Anbauteile	Assembly parts	Eléments de montage	Elementi di montaggio
1	Gehäuse	Housing	Corps	Corpo pompa	30	Schlauchanschluß	Hose connection	Raccord tuyau	Allacciamento flessibile
2	Rotor	Rotor	Rotor	Rotore	31	Dichtring	Sealing ring	Anneau d'étanchéité	Anello guarnizione
3	Lamelle	Blade	Palette	Paletta	32	Verschlußschraube	Plug	Bouche obturateur	Vite di chiusura
4	Gehäusedeckel	End cover	Couvercle de corps	Coperchio corpo pompa	33	Verschlußschraube	Plug	Bouche obturateur	Vite di chiusura
5	Filterpatrone	Filter cartridge	Cartouche filtre	Cartuccia filtrante	34	G 1/8	G 1/8	G 1/8	G 1/8
6	Dichtring	Sealing ring	micronique	microfine	36	Dichtring	Sealing ring	Anneau d'étanchéité	Anello guarnizione
7	Dichtscheibe	Sealing disc	Anneau d'étanchéité	Anello guarnizione		Auslassschalldämpfer	Exhaust silencer	Silencieux refoulement	Silenziatore allo scarico
8	Scheibe	Disc	Disque	Disco		<b>Zubehör</b>	<b>Optional extra</b>	<b>Accessoires</b>	<b>Accessori</b>
9	Federscheibe	Spring shim	Rondelle ressort	Disco elastico	38	Vakuum-Regulierventil	Vacuum regulating valve ZRV	Valve réglage vide ZRV	Valvola regolazione vuoto ZRV
10	Sechskantschraube	Hexagon head screw	Boulon six pans	Vite con testa esagonale					
11	Distanzscheibe	Spacer shim	Rondelle entre-toise	Disco distanziatore	40	<b>Schilder</b>	<b>Labels</b>	<b>Plaque signalétiques</b>	<b>Targhette</b>
20	Motor mit Anschlußdeckel	Motor with connection cover	Moteur avec couvercle raccordement	Motor con coperchio di collegamento	41	Datenschild	Data plate	Etiquette caractéristique	Targhetta dati
					50	Motor datenschild	Motor data label	Etiquette caractéristique	Targhetta dati del motore
					51	Schraube	Screw	Vis	Vite
						Schraube	Screw	Vis	Vite

Bei Bestellungen folgendes angeben: Typ, Fabrikations-Nr., Positions-Nr., Motor (kW, V, Hz)  
 To order please indicate: model, serial-no., item-no., motor (kW, V, Hz)  
 En cas de commande préciser: type, d'appareil, no. de position des pièces, moteur (kW, V, Hz)  
 Nell'ordine indicare: tipo, il numero di matricola, il numero di posizione dei ricambi, il motore (kW, V, Hz)

V = Verschleißteile  
 V = Fast-wearing parts  
 V = Pièces d'usure  
 V = Parti usurabili

D = Dichtungen  
 D = Seals  
 D = Joints  
 D = Guarnizioni

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