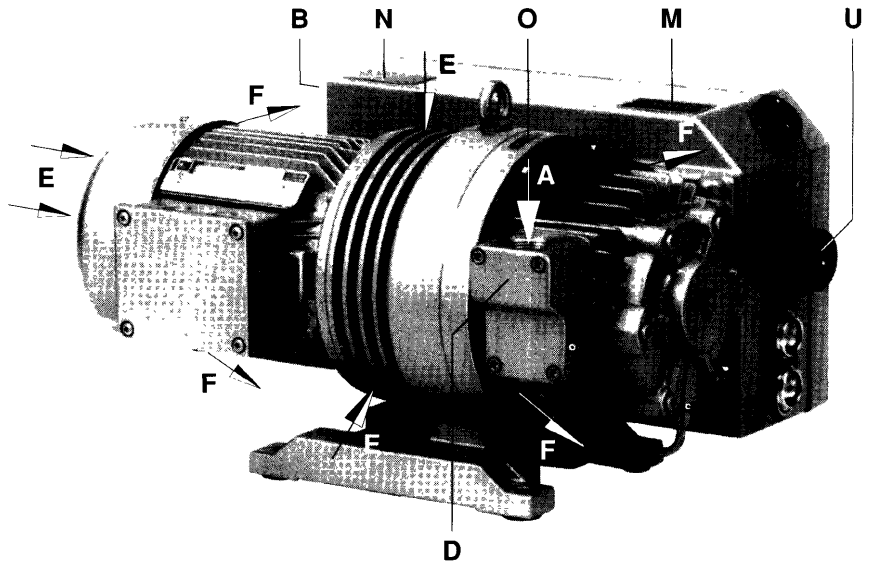
Operating Instructions

Rietschle

Vacuum pumps

VCA
VCE



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VCA 15
VCA 25
VCA 40
VCA 60
VCA 100
VCE 15
VCE 25
VCE 40
VCE 60
VCE 100

Pump ranges

These operating instructions concern the following oil flooded rotary vane vacuum pumps:
VCA 15, VCA 25, VCA 40, VCA 60, VCA 100 (ultimate vacuum 0.5 mbar abs.)
VCE 15, VCE 25, VCE 40, VCE 60, VCE 100 (ultimate vacuum 10 mbar abs.)
The vacuum capacities at atmosphere are 15, 25, 40, 60 and 100 m^3/hr on 50 cycles The pumping curves showing capacity against vacuum can be seen in data sheets D 150 (VCA) and D 154 (VCE).

Description

VCA and VCE vacuum pumps are fitted with a micro fine filter on the pump inlet. On the exhaust side of the pump an oil mist eliminator is fitted which has the function of re-circulating oil back into the circulation system as well as providing high efficiency separation on the pump exhaust. Situated between the pump housing and the motor, a high efficiency cooling fan pulls cooling air in through the fan cover, which also provides protection from accidentally touching the fan when the pump is in operation
A standard built in non return valve on the inlet of the pump seals the pump from the process when the pump is stopped. This prevents oil moving into the pumping cylinder when the pump is stationary. Excessive oil in the cylinder could cause an hydraulic lock when the pump is started and hence undue stress on the rotor blades.
The gas ballast valve (U) which is fitted as standard avoids any condensation of a small amount of water vapour inside the pump and hence emulsification of the oil The gas ballast vapour handling capacity can be increased if required to tolerate higher vapour loads than normal.
All the pumps are driven by a direct flanged three phase, standard TEFV motor via a pin and bush coupling.
Optional extras: The following standard optional extras can be supplied if required. Vacuum regulating valve (ZRV), additional non return valve (ZRK), dust inlet filter (ZFP), high vacuum suction filter (ZVF), direct on line (DOL) motor starter (ZMS) and various vacuum gauges.

Suitability

These models can be used for the evacuation of a closed system or for a permanent vacuum from:
50 Hz → VCA: 0.5 to 130 mbar (abs.) • VCE: 10 to 500 mbar (abs.)
60 Hz → VCA: 0.5 to 100 mbar (abs.) • VCE: 10 to 400 mbar (abs)
Using the pumps on permanent operation outside these ranges there may be oil seepage at the exhaust port. If closed systems are evacuated from atmospheric pressure down to a suction pressure close to the ultimate vacuum there is no problem with the oil system providing the vacuum limit can be achieved within a 10 minute pump down time.

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

These pumps can tolerate small amounts of water vapour, but water, other liquids, aggressive gases, or vapours may not be handled.

For installation in explosion proof or special areas,motors conforming to the relevant standard must be fitted. An automatic temperature cut out can also be fitted if required.
The back pressure on the exhaust port must not exceed + 0 1 bar.

⚠ **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.**

BE 150

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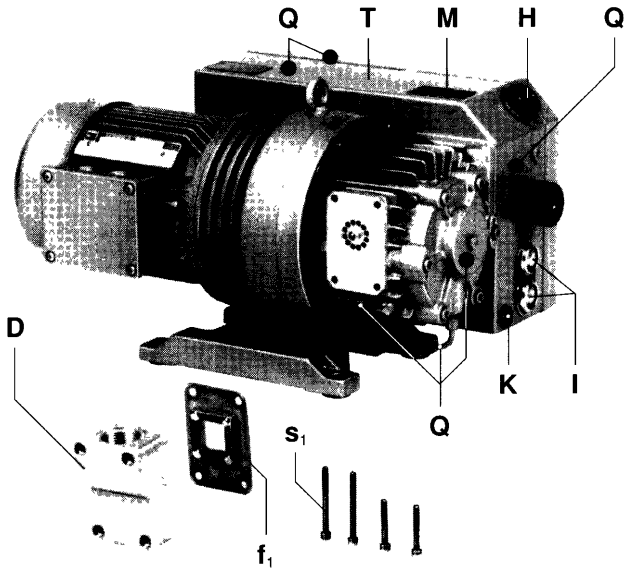

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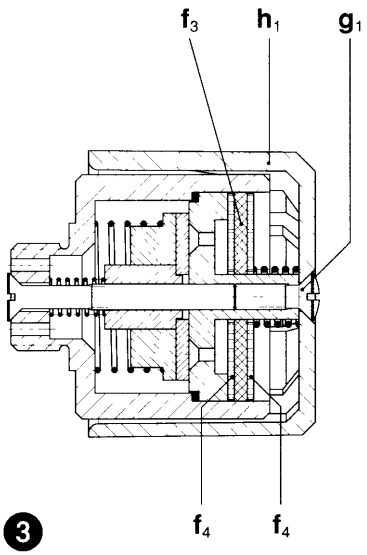

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Handling and Setting up (pictures ❶ and ❷)

⚠ **Pumps that have reached operating temperature may have a surface temperature at position (Q) of more than 70° C. WARNING! Do Not Touch.**

Filter housing (D), oil filler port (H), oil sight glass (I), oil drain plug (K), gas ballast (U) and oil separator housing (T) must all be easily accessible. The cooling air entries (E) and the cooling air exits (F) must have a minimum distance of 20 cm from any obstruction. The discharged cooling air must not be recirculated. For maintenance purposes we recommend a space of 0.4 m in front of the filter housing and oil separator.

⚠ **The VCA and VCE pumps can only be operated reliably if they are installed horizontally. 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 to fit anti vibration mounts. This range of vacuum pumps are almost vibration free in operation.

Installation (pictures ❶ and ❷)

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

1 The vacuum connection (A) is situated on the filter housing (D).
The air handled can be exhausted into the atmosphere through the exhaust port (B) or by utilising an exhaust pipe.

⚠ **Long and/or small bore pipework should be avoided as this tends to reduce the capacity of the pump. The exhaust port (B) must not be obstructed or partly obscured.**

2. The lubricating oil (recommended brands see under servicing) can be put into the pump at the oil filler port (H) of the oil separator housing, until the oil level shows at the upper mark of the oil sight glass (I). After filling make sure oil filler port is closed.
3. The electrical data can be found on the data plate (N) or the motor data plate. The motors correspond to DIN/VDE 0530 and have IP 54 protection and insulation class B or F. 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.).
4. 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.

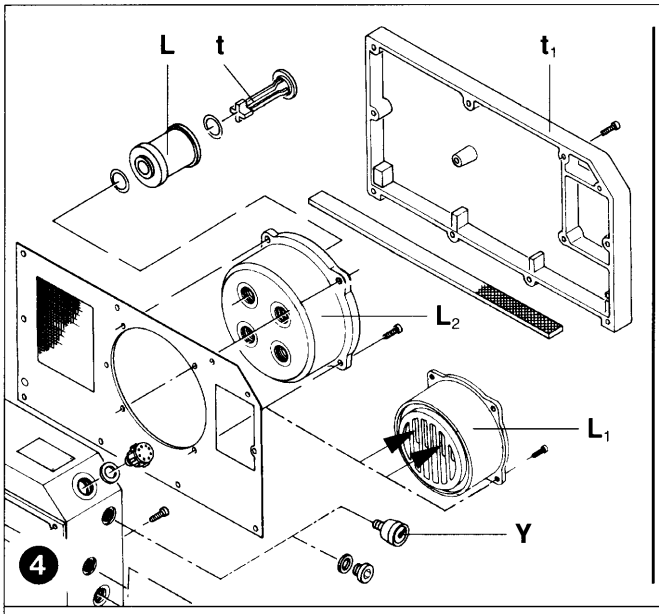
⚠ **Electrical connections should only be made by qualified electricians.**

Initial Operation (pictures ❶ and ❷)

1 Initially switch the pump on and off for a few seconds to check the direction of rotation against the direction arrow (O).
2. Run the pump for two minutes with correct rotation. Stop pump and top up the oil utilising the oil filler port (H) to the correct level (see sight glass (I)).
On no account open the oil filler port when the pump is operating.
3. Connect the suction pipe at (A).
4. Vacuum regulating valve (optional extra):
The vacuum can be adjusted by turning the regulating valve (C) according to the symbols as indicated on the top of the regulating valve.

Potential risks for operating personnel

1. 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.
2. Oil Aerosol in the Exhaust Stream: Even with the high efficiency oil mist eliminator the exhausted air could still contain extremely low amounts of oil aerosol which can occasionally be detected by smell. Permanent breathing of these aerosols may result in health problems, therefore it is extremely important to make sure that the installation area is well ventilated.



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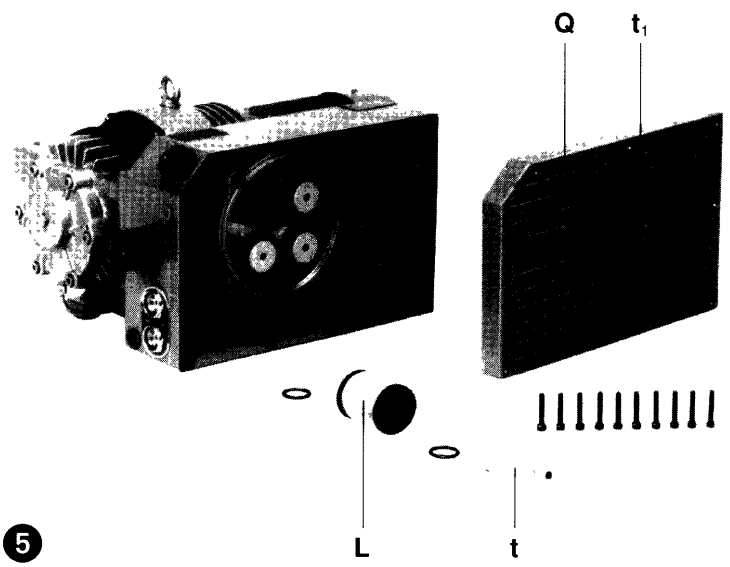

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Maintenance and Servicing

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 or hot lubricant.

1. Air filtration

The capacity of the pump can become reduced if the air inlet filters are not maintained correctly.

Filters on the suction side: Mesh Filter (f_1) must be cleaned regularly depending upon the amount of contamination Cleaning can be carried out by washing out or by blowing out with compressed air. Replace filters if contaminated completely.
The mesh filter (f_1) can be dismantled by removing screws (s_1) on the filter housing (D) (picture ❷).
Filter for Gas ballast. All pumps are equipped with a gas ballast valve (U).
The built in disc (f_3) and mesh discs (f_4) must be cleaned regularly depending upon the amount of contamination by blowing out with compressed air. By removing the screw (g_1) and plastic cap (h_1) the filter elements can be removed for cleaning. Re-assemble in reverse order (picture ❸).
Filter Cartridge (Optional Extras): The filter cartridge of the vacuum tight suction filter (ZVF) or dust separator (ZFP) must be cleaned regularly again depending upon the amount of contamination Cleaning can be achieved by washing or by blowing out with compressed air. Replace the filter cartridge if necessary. The cartridge can be removed completely by undoing the relevant retaining clips

2. Lubrication (picture ❷)

Check the oil level regularly depending upon the operating hours. First oil change after 500 operating hours (see oil drain plug (K)) Further changes every 500 operating hours. The oil change times should be shortened if the application is dusty.
Only oils corresponding to DIN 51506 group VC/VCL or a synthetic oil (obtainable from Rietschle) should be used. The viscosity must correspond to ISO-VG 100 according to DIN 51519.
The recommended Rietschle Oil types are: MULTI-Lube 100 (mineral oil); SUPER-Lube 100 (synthetic oil) (see oil type plate (M)).
When the oil is under a high thermal load, e g. ambient or suction temperatures over 30°C, unfavourable cooling or operating with increased speed etc., the oil change time can be extended by using the recommended synthetic oil.

Old and used oil must be disposed of corresponding with the relevant health, safety and environmental laws.
If the oil brand is changed, the old oil must be drained completely from the oil separator housing.

3. Oil separation (pictures ❹ and ❺)

Extremely blocked filter elements will result in an increased pump temperature and will cause discolouration of the lubricant.

The oil mist separator (VCA/VCE 15/25) or oil separator elements (VCA/VCE 40-100) may become contaminated after a long period of operation which can result in high pump temperature and motor overload. We therefore recommend to change the oil mist separator (L_1) or the oil separator elements (L) every 2000 operating hours or when the filter back pressure is in excess of 0.7 bar (see back pressure gauge (Y) → optional extra). It is not possible to clean these elements.
VCA/VCE 15/25: Remove oil separator covers (t_1) Exchange the oil mist separator (L_1)

When refitting the oil mist separator (L_1) check for correct orientation.
(the air entry opening must be positioned at the top half of the pump → see picture ❹)

VCA/VCE 40-100: Remove oil separator covers (t_1). Remove plastic fixings (t) and exchange the elements (L). If possible re-use the o-ring for reassembly. Re-assemble in reverse order.

4. Coupling (picture ❻)

The coupling rubbers (k) are wearing parts and should be checked regularly. When the coupling rubbers are worn this can be detected by a knocking sound when the vacuum pump is started.

Defective coupling rubbers can cause extensive damage and even in some extreme cases break the rotor shaft.

To check the coupling stop the motor (m) and isolate. Remove the screws (s_5). Pull off the motor together with the motor side coupling half (q). If the coupling rubbers (k) are damaged remove the circlips (l) from the coupling bolt (r) and exchange the coupling rubbers (k). Leave the spacer (p) in place, check the coupling bolts (r) for any wear and replace if necessary. To replace, remove the fan cover (v_1), remove the circlip (l_1), pull off the coupling and fan (v) complete from the pumpshaft, remove the nut (w) with washer (u) and exchange the coupling bolts.
Re-assemble in reverse order.

Trouble Shooting

1. Motor starter cuts out vacuum pump:

1.1 Check that 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 The vacuum pump or the lubricating oil is too cold.
1.6 The viscosity of lubricant is too high
1.7 Oil mist separator or oil mist eliminator elements are blocked or contaminated.
1.8 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.

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 Viscosity of lubricant incorrect.

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 1.6, 1.7 and 1.8.

5. Exhausted air contains visible oil mist:

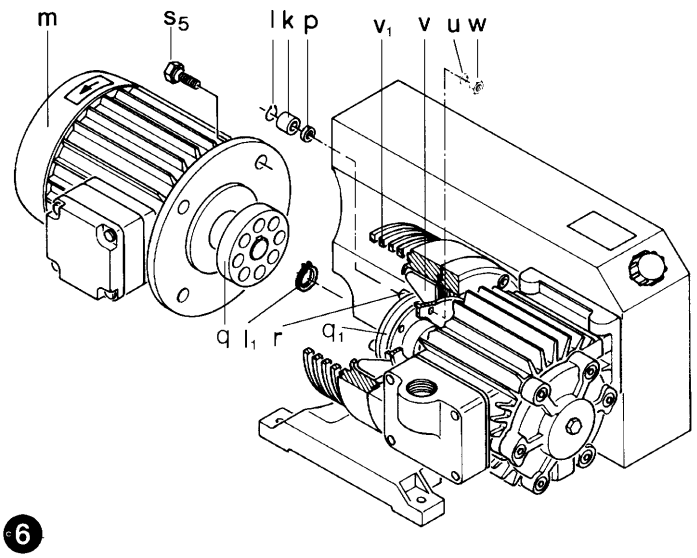
5.1 Oil mist separator or oil mist eliminator elements are fitted incorrectly.
5.2 Incorrect oil brand is used.
5.3 Problem as per 1.7, 1.8, 4.1 and 4.2.

6. Unit emits abnormal noise:

Note: A knocking noise from the rotor blades is normal when starting cold as long as it disappears within two minutes with increasing operating temperature.
6.1 The coupling rubbers are worn (see under "servicing").
6.2 The pump cylinder is worn. Solution: send your complete unit off for repair to the supplier or approved service agent.
6.3 The vacuum regulating valve (if fitted) is noisy. Solution· replace valve.
6.4 Blades are damaged.
6.5 Problem as per 1.5 and 1.6.

7. Water in lubricant i.e. Emulsification:

7 1 Pump pulls in water because of the application.
Solution: Fit water separators on to the vacuum side.
7.2 Unit handles more water vapour than the gas ballast is designed for.
Solution· Consult supplier for the provision of an increased gas ballast capability.
7.3 Pump operates only for a short time and does not reach normal operating temperature.
Solution: Run the pump with closed suction until the oil has been cleaned.



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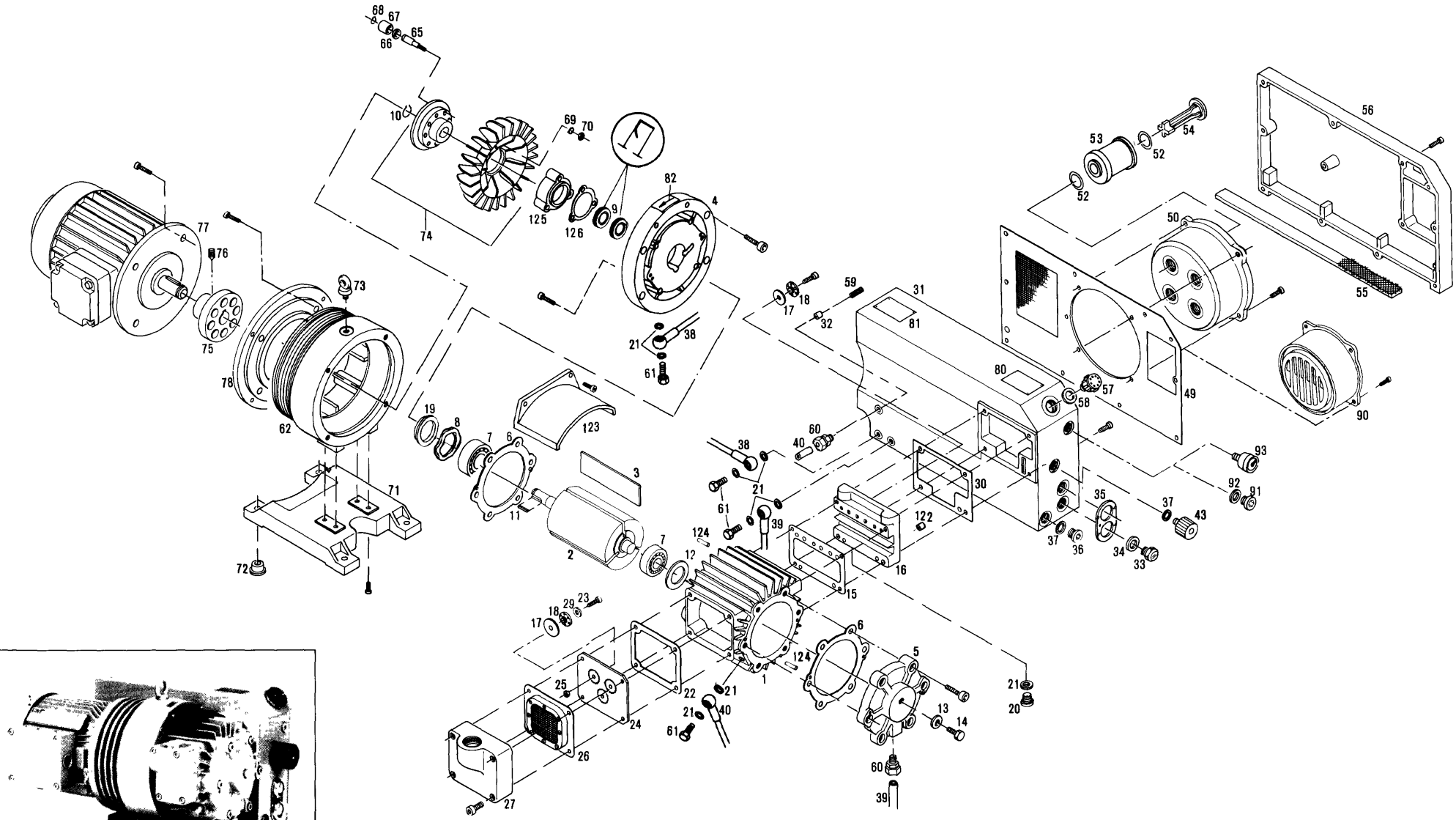
Appendix:

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".
Lifting and Transport: To lift and transport the vacuum pump the eye bolts on the fan cover must be used.
The weight of the pumps is shown in the accompanying table.
Storage: VCA and VCE units must be stored in dry ambient conditions with normal humidity. If a pump needs to be stocked for a period longer than 3 months we would recommend using an anticorrosion oil rather than the normal lubricant.
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 150 → VCA 15 - VCA 100
E 154 → VCE 15 - VCE 100

VCA / VCE			15	25	40	60	100
Noise level (max.)	dB(A)	50 Hz	63	65	67	68	70
		60 Hz	65	67	69	70	72
Weight (max.)	kg	50 Hz	34	37	45	60	85
		60 Hz	36	39	47	64	89

VCA / VCE		15	25	40	60	100
Length	50 Hz	456 mm	456 mm	508 mm	578 mm	672 mm
	60 Hz	456 mm	483 mm	533 mm	622 mm	672 mm
Width		321 mm	329 mm	381 mm	391 mm	443 mm
Height		264 mm	264 mm	264 mm	264 mm	280 mm



VCE 15 – 100

Rietschle

VCE 15 – 100

		Grundteile	**Fundamental unit**	**Elément de base**	**Parti fondamentali**
1		Gehause	Cylinder	Corps	Corpa pompa
2		Rotor	Rotor	Rotor	Rotore
3	V	Lamelle	Blade	Palettes	Paletta
4		Gehausedeckel A	End cover A	Couvercle de corps A	Coperchio corpa pompa A
5		Gehausedeckel B	End cover B	Couvercle de corps B	Coperchio corpa pompa B
6	D	Packung	Gasket	Joint	Guarnizione
7	V	Rillenkugellager	Roller bearing	Rouleau aiguille	Cuscinetto a sfere
8	V	Ausgleichscheibe	Tolerance shim	Rondelle de rappel	Rondella di tolleranza
9	D	Wellendichtring	Shaft seal	Joint d'arbre	Anello di tenuta sull' allbero
10	V	Sicherungsring	Security ring	Circlips	Anello di sicurezza
11		Paßfeder	Key	Clavette	Chiavetta
12		Paß-Scheibe	Spacer	Rondelle	Rondella di rasamento
13	D	Dichtring	Seal ring	Joint	Anello di tenuta
14		6-Kt -Schraube	Screw	Vis 6 pans	Vite esagonale
15	D	Dichtung	Gasket	Joint	Guarnizione
16		Zwischenplatte	Plate	Plaque intermédiaire	Plastra intermedia
17	D	Ventilscheibe	Valve disk	Rondelle de clapet	Rondella valvola
18		Ventilteller	Valve plate	Disque de clapet	Disco valvola
19	D	Nilos-Ring	Nilos-Ring	Rondelle fibre	Anello Nilos
20		Verschl.-Schraube M 10 x 1	Plug	Bouchon obturateur	Tappo
21	D	Dichtring	Sealing ring	Joint	Anello guarnizione
122		Einsatzduse	Nozzle	Douille calibrée	Ugello
123		Abdeckschild	Cover plate	Capot	Piasta di protenzione
124		Zylinderstift	Dowel pin	Goujon cylindrique	Spina cilindrica
125		Lagerdeckel	Bearing cover	Couvercle pallier	Coperchio cuscinetti
126	D	Dichtung	Gasket	Joint	Guarnizione
		Filterseite	**Filter side**	**Côte filtre**	**Lato filtrante**
22	D	Dichtung	Gasket	Joint	Guarnizione
23		Flachkopfschraube	Flat head screw	Vis	Vite
17	D	Ventilscheibe	Valve disk	Rondelle de clapet	Rondella valvola
18		Ventilteller	Valve plate	Disque de clapet	Disco valvola
24		Zwischenblech	Non return valve plate	Plaque intermédiaire	Lamierina intermedia
25		6-Kt -Mutter	Nut	Ecrou 6 pans	Dado esagonale
26	D	Siebfilter	Mesh filter	Crépine filtre	Filtro in reticella
27		Filtergehause	Filter housing	Carter filtre	Coperchio del filtro
29	D	Dichtring	Sealing ring	Anneau d'étanchéité	Anello guarnizione
		Entölerseite	**Oil separator side**	**Côte déshuileur**	**Lato separatore olio**
30	D	Dichtung	Gasket	Joint	Guarnizione
31		Entolergehause	Oil separator housing	Carter déshuileur	Scatola del separatore olio
32		Buchse	Nozzle	Douille	Valvolina
33	V	6-Kt.-Ólauge	Oil sight glass	Voyant d'huile 6 pans	Spia livello olio ad esagona
34	D	Dichtring	Seal ring	Rondelle joint	Rondella di tenuta
35		Olstandsschild	Oil level label	Etiquette niveau d'huile	Targhetta livello olio
36		Verschl -Schraube G 3/8	Plug	Bouchon obturateur	Tappo
37	D	Dichtring	Seal ring	Joint	Anello di tenuta
38		Olleitung A	Oil pipe A	Tubulure d'huile A	Tubo olio A
39		Olleitung B	Oil pipe B	Tubulure d'huile B	Tubo olio B
40		Absaugeleitung	Resuction pipe	Tubulure de réaspiration	Tubo di aspirazione

43		Gasballastventil 3/8 kpl.	Gasballast valve cpl.	Lest d'air cpl	Valvola zavorra gas cpl.
49	D	Dichtung mit Siebfilter	Gasket with mesh filter	Joint avec tamis	Guarnizione con filtro a reticella
55		Trenngitter	Grill	Grille séparatrice	Griglia di separazione
56		Entolerdeckel	Oil separator cover	Couvercle carter déshuileur	Coperchio scatola separatore olio
57		Oleinfullknopf	Oil filter plug	Bouchon remplissage d'huile	Tappo serbatoio olio
58	D	Dichtring	Seal ring	Joint	Anello di tenuta
59		Ansaugsieb	Suction mesh	Crépine d'aspiration	Rete di aspirazione
60		GE 6 M 10 x 1	Fitting	Raccord droit	Attacco diritto per
61		Hohlschraube M 10 x 1	Hollow screw	Vis creuse	Vite cava
91		Verschl -Schraube G 1/4	Plug	Vis obturatrice	Vite di chiusura
92	D	Dichtring	Sealing ring	Anneau d' étanchéité	Anello guarnizione
93		Manometer (USA)	Manometer	Manomètre	Manometro
		Entölereinsätze	**Oil separator elements**	**Déshuileurs**	**Separatori olio**
90	V	Entolereinsatz (VCE 15, 25)	Oil separator	Elément déshuileur	Filtro separatore olio
		VCE 40–100	VCE 40–100	VCE 40–100	VCE 40–100
50		Olnebelfilter komplett	Oil mist filter complete	Filtre de bro d'huile comp	Filtro nebbie olio completo
52	D	O-Ring	O-ring	Joint torique	O-ring
53	V	Luft-Entolelement	Oil separator	Elément déshuileur	Filtro aria-olio
54		Schraubteil	Screw-in part	Vis	Inserto filettato
		Kühlung	**Cooler**	**Refroidissement**	**Raffreddamento**
62		Ventilatorhaube	Fan cover	Capot ventilateur	Calotta del ventilatore
65	V	Kupplungsbolzen	Coupling bolt	Têton d'accouplement	Perno del giunto
66	V	Distanzring	Distanze ring	Rondelle entretoise	Anello distanziatore
67	V	Kupplungsgummi	Coupling rubber	Caoutchouc d'accouplement	Gommino del giunto
68	V	Sicherungsring	Security ring	Circlips	Anello di sicurezza
69	V	Scheibe	Disk	Rondelle	Rondella
70	V	6-Kt -Mutter	Nut	Ecrou 6 pans	Dado esagona
71		Fuß	Foot	Support	Supporto
72		Fußpolster	Rubber foot	Silenbloc	Piedino in gomma
73		Ringschraube	Transport hool	Vis	Golfare
74		Ventilator/Kupplung kpl.	Fan/Coupling cpl	Ventilateur/Accoupl. cpl	Ventilatore/Giunto cpl.
		Antrieb	**Drive**	**Entrainement**	**Parti di collegamento**
75		Kupplung 'treibend	Coupling 'driving	Accouplement entrainement	Giunto azionante
76		Gewindestift	Threaded pin	Vis pointeau	Vite di fissaggio
77		Motor	Motor	Moteur	Motore
78		Motorflansch	Motor flange	Bride moteur	Flangia motore
		Schilder	**Labels**	**Plaque signalétique**	**Targhette**
80		Ölempfehlungsschild	Oil label	Etiquette huile	Targhetta olio consigliati
81		Datenschild	Data plate	Etiquette caractéristique	Targhetta pompa
82		Pfeilschild	Rotation arrow	Flèche sens rotation	Freccia senso di rotazione

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 recambi, il motore (kW, V, Hz)

V = Verschleißteile **D** = Dichtungen
V = Fast-wearing parts **D** = Seals
V = Pièces d'usure **D** = Joints
V = Parti usurabili **D** = Guarnizioni

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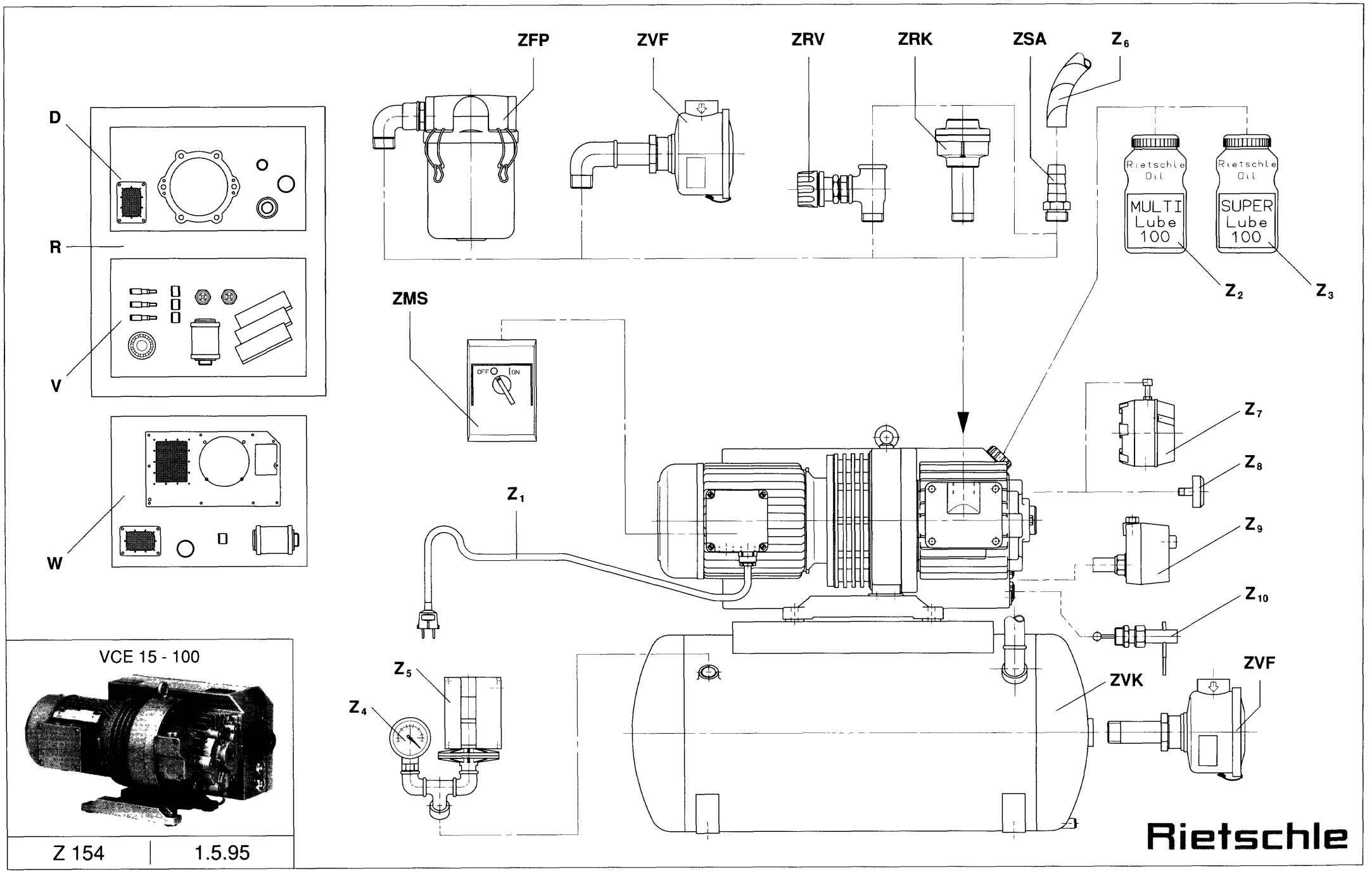
ZFP
ZVF
ZRV
ZRK
ZSA
Z6
D
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V
W
Rietschle Oil
MULTI Lube 100
Rietschle Oil
SUPER Lube 100
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Z3
ZMS
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ON
Z1
Z7
Z8
Z9
Z10
ZVF
ZVK
Z5
Z4
VCE 15 - 100
Z 154
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	Deutsch	English	Francais	Italiano	Hollands
D	Dichtungssatz	Gasket set	Pochette de joints	Serie guarnizioni	Pakkingset
V	Verschleißteilsatz	Wearing parts set	Kit pièces d'usure	Serie parti usurabili	Set slijtdelen
R	Reparatursatz	Repair set	Kit d'entretien	Set revisione	Reparatie set
W	Wartungssätze	Maintenance sets	Kit de première intervention	Set manutenzione	Service set
ZMS	Motorschutzschalter	Motor starter	Disjoncteur moteur	Interruttore magnetotermico	Motor beveiliging schakelaar
ZFP	Vakuumdichter Staubabscheider	Vacuum tight dust separator	Filtre séparateur étanche	Separatore polveri	Vacuümdicht stofafscheider
ZRK	Rückschlagventil	Non return valve	Clapet anti-retour	Valvola di non ritorno	Terugslagklep
ZRV	Vakuum-Regulierventil	Vacuum regulating valve	Valve réglage vide	Valvola regolazione vuoto	Vacuüm regelventiel
ZSA	Schlauchanschluß	Hose connection	Raccord tuyau	Attacco portagomma	Slangpilaar
ZVF	Vakuumdichter Ansaugfilter	Vacuum tight suction filter	Filtre d'aspiration étanche	Filtro aspirazione ermetico	Vacuümdicht voorfilter
ZVK	Vakuumkessel	Vacuum receiver	Réservoir	Serbatoio del vuoto	Vacuümketel
Z_1	Anschlußkabel mit Stecker	Connection cable with plug	Câble raccordement avec fiche	Cavo di collegamento con prese	Aansluitsnoer met stekker
Z_2	MULTI-Lube 100 (Mineralöl)	MULTI-Lube 100 (mineral oil)	MULTI-Lube 100 (huile minérale)	MULTI-Lube 100 (olio minerale)	MULTI-Lube 100 (minerale olie)
Z_3	SUPER-Lube 100 (synthetisches Öl)	SUPER-Lube 100 (synthetic oil)	SUPER-Lube 100 (huile synthétique)	SUPER-Lube 100 (olio sintetico)	SUPER-Lube 100 (synthetische olie)
Z_4	Vakuummeter	Vacuum gauge	Vacuomètre	Vacuometro	Vacuüm meter
Z_5	Vakuum-Schalter	Vacuum switch	Commutateur vide	Vacuostato	Vacuümschakelaar
Z_6	Vakuumschlauch	Flexible pipe	Flexible	Tubo flessibile	Vacuüm slang
Z_7	Differenzdruckschalter	Differential pressure switch	Contacteur de pression différentielle	Pressostato differenziale	Drukverschil schakelaar
Z_8	Manometer	Manometer	Manomètre	Manometro	Manometer
Z_9	Temperaturüberwachung	Temperature control	Thermostat de sécurité	Termostato	Temperatuur bewaking
Z_{10}	Niveauwächter	Level switch	Contacteur de niveau	Interruttore di livello	Niveau bewaking

	Español	Português	Dansk	Svensk	Suomi
D	Kitt de juntas	Jogo de juntas	Pakningssæt	Packningssats	Tiivistesarja
V	Kitt partes desgastables	Jogo de peças de desgaste	Sliddelssæt	Slitdelssats	Kulutusosasarja
R	Kitt de revisión	Jogo de revisão geral	Reparationssæt	Renoveringssats	Korjaussarja
W	Kitt de mantenimiento	Jogo de manutenção	Servicesæt	Servicesats	Huolto-osasarja
ZMS	Interruptor guarda motor	Discontactor para motor	Motorværn	Motorskyddsbrytare	Moottorin suojakytkin
ZFP	Separador polvo estanco	Separador de poeiras para vácuo	Vakuumtæt støvfilter	Vakuumtätt partikelfilter	Pölyn erotin
ZRK	Válvula de retención	Válvula anti-retorno	Tilbageslagsventil	Backventil	Takaiskuventtiili
ZRV	Válvula reguladora de vacio	Válvula de regulação de vácuo	Vakuumreguleringsventil	Vakuumreglerventil	Alipalneen saatöventtiili
ZSA	Racord conexión	Ponteira para tubo flexível	Slangestuds	Slangnippel	Letkuliitin
ZVF	Filtro de aspiración	Filtro de aspiração para vácuo	Vakuumtæt indsugningsfilter	Vakuumtätt insugningsfilter	Imusuodatin
ZVK	Recipiente de vacio	Reservatório de vácuo	Vakuumbeholder	Vakuumtank	Alipainesälliö
Z_1	Cable conector con clavija	Cabo com ficha de ligação	Kabel med stik	Kabel med stickpropp	Liitäntäkaapeli
Z_2	MULTI-Lube 100 (aceite mineral)	MULTI-Lube 100 (óleo mineral)	MULTI-Lube 100 (mineralolie)	MULTI-Lube 100 (mineralolja)	MULTI-Lube 100 (mineraaliolja)
Z_3	SUPER-Lube 100 (aceite sintético)	SUPER-Lube 100 (óleo sintético)	SUPER-Lube 100 (syntetisk olie)	SUPER-Lube 100 (syntetisk olja)	SUPER-Lube 100 (synteettinen öljy)
Z_4	Vacuómetro	Vacuómetro	Vakuumeter	Vakuumeter	Alipainemittari
Z_5	Interruptor vacio	Vacuostato	Vakuumstat	Pressostat	Alipainekytkin
Z_6	Tubo flexible	Tubo flexível para vácuo	Vakuumslange	Vakuumslang	Joustava liitos
Z_7	Interruptor presión diferencial	Pressostato diferencial	Differenstrykpressostat	Differenstryckvakt	Paine-erokytkin
Z_8	Manómetro	Manómetro	Manometer	Manometer	Painemittari
Z_9	Interruptor temperatura	Termóstato	Temperaturføler	Temperaturvakt	Termostaatti
Z_{10}	Interruptor nivel	Interruptor de nível	Niveaukontrol	Nivåvakt	Pinnankorkeuskytkin

Bei Bestellungen folgendes angeben: Typ, Baugroße, Motordaten
To order please indicate: Model, size, motor data
En cas de commande préciser: Type, série, caractéristique moteur
Nell'ordine indicare: Tipo, grandezza construttiva, dati motore
Bij bestelling vermelden: Type, bouwgrotte, motorgegevens

En caso de pedido precisamos: Modelo, serie, caracteristicas del motor
Ao encomendar indique: Modelo, tamanho, características do motor
Ved bestilling opgiv: Type, størrelse og motordata
Vid beställning ange: Typ, storlek, motordata
Tilattaessa mainittava: Tyyppi, koko, moottorin tiedot

Hauptverwaltung • Werner Rietschle
Maschinen- und Apparatebau GmbH
Postfach 1260 • D-79642 Schopfheim
Tel 07622 / 392-0
Fax 07622 / 392300 • Telex 773225

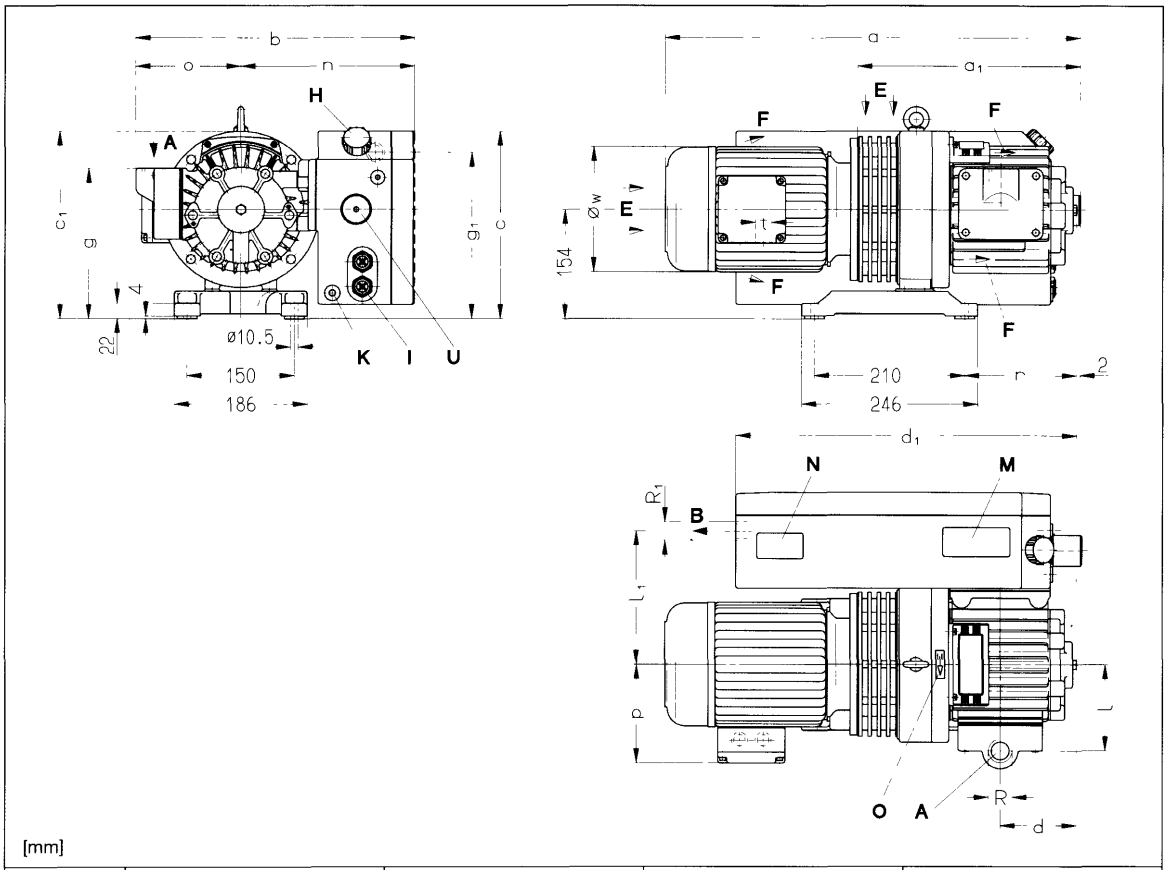
Daten

Rietschle

Vakuum-pumpen | Vacuum Pumps | Pompes à vide | Pompe per vuoto

VCE

- VCE 15
- VCE 25
- VCE 40
- VCE 60
- VCE 100



[mm]

A	Vakuum-Anschluß	Vacuum connection	Raccord du vide	Attacco vuoto
B	Abluft-Austritt	Exhaust	Refoulement	Scario aria
E	Kuhlluft-Eintritt	Cooling air entry	Entrée air refroidissement	Entrata aria di raffredd
F	Kuhlluft-Austritt	Cooling air exit	Sortie air refroidissement	Uscita aria di raffredd.
H	Oleinfullstelle	Oil filling point	Point remplissage d'huile	Punto riempimento olio
I	Ölkontrolle	Oil check	Contrôle d'huile	Controllo olio
K	Ölablaßstelle	Oil drain	Point de vidange d'huile	Punto scarico olio
M	Olempfehlungsschild	Oil type plate	Plaquette recommand d'huile	Targhetta olio consigliati
N	Datenschild	Data plate	Etiquette caractéristique	Targhetta dati
O	Drehrichtungsschild	Direction of rotation	Flèche sens rotation	Targhetta senso rotazione
U	Gasballast	Gasballast	Lest d'air	Valvola zavorra

VCE			15	25	40	60	100
[mm]	a	3 ~ 50 Hz / 60 Hz	456/456	456/483	508/533	578/622	672/672
		1 ~	456	511	571	616	–
	a_1		229	229	264	309	349
	b		321	329	381	391	443
	c		249	249	264	264	310
	c_1		264	264	264	264	280
	d		66	66	84	106	126
	d_1		335	356	406	476	536
	g		212	212	212	212	220
	g_1		213	213	231	234	262
	h		154	154	154	154	154
	l		105	105	110	122	136
	l_1		145	145	188	188	202
	n		193	201	243	243	271
	o		128	128	138	148	172
	p		143	151	151	151	181
	r		76	76	111	156	196
	t		Pg 13,5	Pg 13,5	Pg 16	Pg 16	Pg 21
	Ø w		160	176	176	176	196
	R		G ½	G ¾	G 1	G 1	G 1½
	R_1		Rp ½	Rp ½	Rp ¾	Rp ¾	Rp 1¼

D 154

1.9.94

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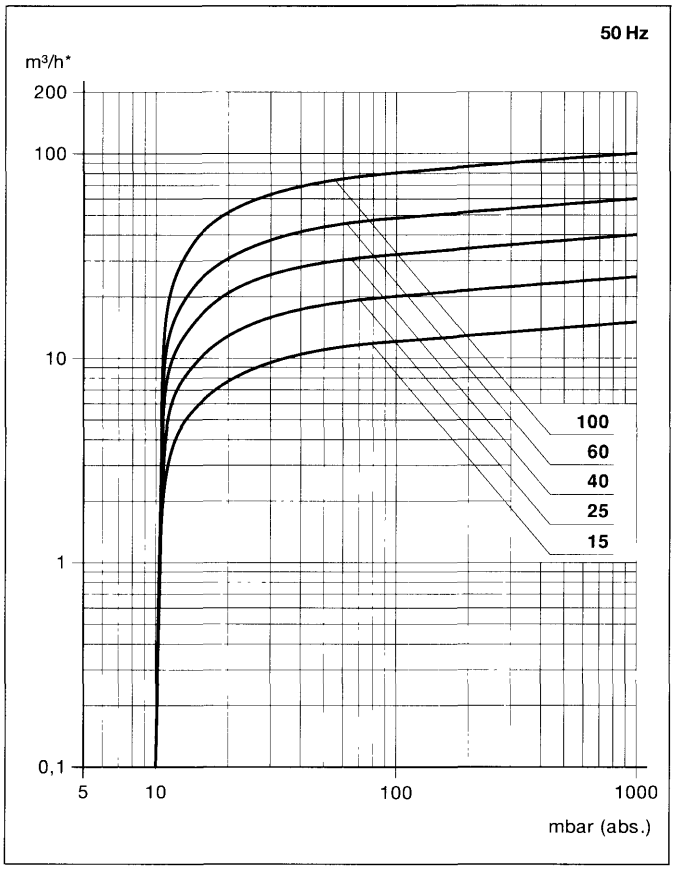
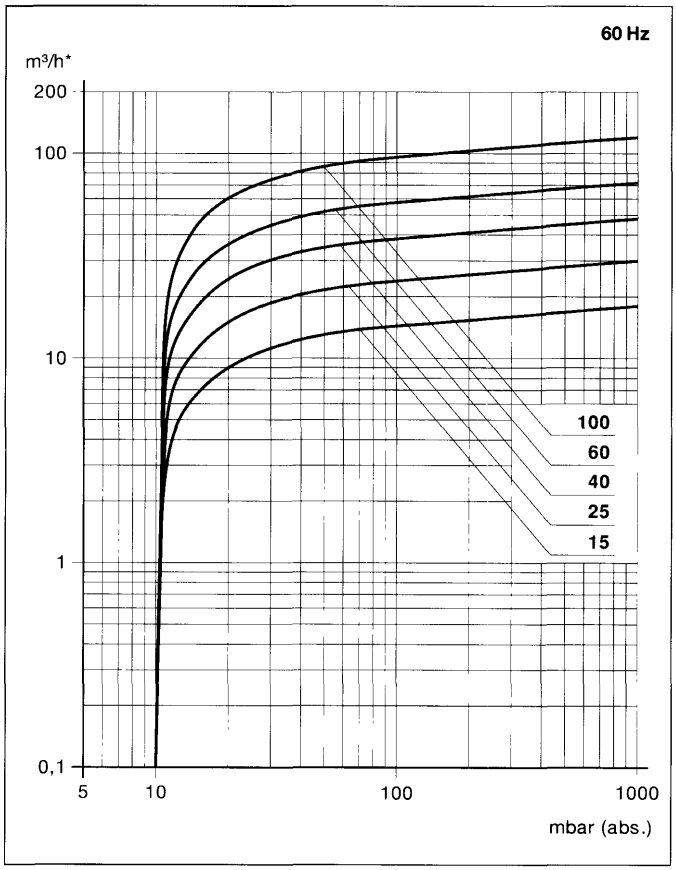
VCE		15	25	40	60	100
m^3/h	50 Hz	15	25	40	60	100
	60 Hz	18	30	48	72	120
mbar (abs)•		10				
3 ~	50 Hz	230/400 V ± 10%				
	60 Hz	220/380 V				
1 ~	50 Hz	230 V ± 10%				–
	60 Hz	220 V				–
kW (50 Hz)	3 ~	0,55	0,75	1,1	1,5	2,2
	1 ~	0,75	1,0	1,25	1,5	–
kW (60 Hz)	3 ~	0,75	1,1	1,5	2,2	3,0
	1 ~	0,9	1,2	1,5	1,8	–
A (50 Hz)	3 ~	2,9/1,7	3,5/2,0	5,19/3,0	6,57/3,8	9,4/5,44
	1 ~	5,6	6,5	8,5	9,5	–
A (60 Hz)	3 ~	#	#	#	#	#
	1 ~	6,5	7,8	10,2	11,8	–
min^{-1}	50 Hz	1450				
	60 Hz	1740				
dB(A)	50 Hz	58	61	62	64	68
	60 Hz	60	63	64	66	70
kg		34	37	45	60	85
l		0,46	1	2	2	3

ZRV	13/1 (05)	13/2 (05)	20/1 (05)	20/1 (05)	25/2 (05)
ZRK	13 (03)	20 (03)	25 (03)	25 (03)	40 (03)
ZFP	145 (11)	145 (11)	145 (06)	145 (06)	216 (06)
ZVF	20 (52)	20 (53)	20 (54)	32 (52)	32 (54)
ZMS (50 Hz) 3 ~	40/24	40/24	60/40	100/40	100/60
ZMS (50 Hz) 1 ~	60	100	100	100	–
ZMS (60 Hz) 3 ~	40/24	40/24	60/40	100/60	160/100
ZMS (60 Hz) 1 ~	100	100	100	160	–

m^3/h	Saugvermogen	Capacity	Débit	Portata
mbar (abs.)•	Enddruck	Ultimate vacuum	Pression absolue	Pressione finale
mbar (abs.)	Ansaugdruck	Suction pressure	Pression d'aspiration	Pressione di aspirazione
3 ~/1 ~	Motorausfuhrung	Motor version	Exécution moteur	Esecuzione motore
kW	Motorleistung	Motor rating	Puissance moteur	Potenza motore
A	Stromaufnahme	Current drawn	Intensité absorbée	Corrente nominale
min^{-1}	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
l	Oleinfullmenge	Oil capacity	Charge d'huile	Quantità olio
	Zubehor	Optional extras	Accessoires	Accessori
ZRV	Vakuum-Regulierventil	Vacuum regulation valve	Valve règlage du vide	Valvola regolazione vuoto
ZRK	Ruckschlagventil	Non return valve	Clapet anti-retour	Valvola di non ritorno
ZFP	Staubabscheider	Dust separator	Filtre séparateur	Separatore polveri
ZVF	Vakuumdichtes Ansaugfilter	Vacuum tight suction filter	Filtre d'aspiration étanche	Filtro ermetico sull'aspirazione
ZMS	Motorschutzschalter	Motor starter	Disjoncteur moteur	Interruttore magnetotermico





*bezogen auf den Zustand im Sauganschluß / related to suction conditions at inlet connection / Relatif à l'état règnant 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!
auf Anfrage / # on request / # sur demande / # a richiesta
Die Abmessungen a und ø w sowie die Stromaufnahme konnen je nach Motorfabrikat von den hier aufgefuhrten Angaben abweichen / The dimensions a and ø w and/or the current drawn can differ when compared with the data list, depending on the motor type / Les dimensions a et ø w ainsi que l'ampérage peuvent différer des données indiquées, ci-dessus, selon le fabricant du moteur / Le dimensioni a e ø w come la corrente nominale possono scostarsi leggermente dai dati qui riportati a seconda del costruttore del motore