
Operating and installation instructions
Positive displacement blower unit

DELTA BLOWER

english



**AERZENER MASCHINENFABRIK
GMBH**

G4-004 M EN	
168 393 000	12-2005



Die **INFO-Seite** ist vor der Inbetriebnahme durchzulesen.
Dort evtl. vermerkte Hinweise und Änderungen sind durchzuführen.

Read the **INFORMATION sheet** prior to commissioning.
Possible notes and changes indicated herein are to be effected.

La **page INFO** est à lire avant la mise en route.
Y apporter éventuellement des annotations et modifications.

De **INFO-Bladzijde** moet voor de inbedrijfname worden doorgelezen.
Daar eventueel opgeschreven aanwijzingen en modificaties moeten worden uitgevoerd.

Prima della messa in esercizio leggere la **pagina INFO**, ed eseguire eventuali istruzioni o modifiche indicate.

Antes de proceder a la puesta en marcha, leer detenidamente la **página informativa** y cumplir eventuales indicaciones y modificaciones indicadas en la misma.

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 Manufacturer Declaration
 Certificat du constructeur
 Verklaring van fabrikant
 Declaraci3n de fabricante
 Dichiarazione del produttore

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 EG-Verklaring van overeenstemming voor machines
 Declaraci3n de conformidad
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english

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**Hersteller-Erklärung
Manufacturer Declaration
Certificat du constructeur**

**Verklaring van fabrikant
Declaración de fabricante
Dichiarazione del produttore**

deutsch

Hiermit bestätigen wir, dass diese Maschine den folgenden EG-Richtlinien entspricht:

EG-Maschinen-
Richtlinie 98/37 EG
Anhang II B
für einzubauende Maschinen
EMV-Richtlinie 89/336 EG
Druckgeräte-Richtlinie 97/23 EG
Niederspannungs-
Richtlinie 73/23 EG

Die Maschine wurde konstruiert, gefertigt und dokumentiert, in Übereinstimmung mit den harmonisierten Normen der genannten EG-Richtlinien, von Firma:

**Aerzener Maschinenfabrik GmbH
D-31855 Aerzen**

Eine technische Dokumentation ist vollständig vorhanden.

Die zur Maschine gehörende Betriebsanleitung liegt vor.

Die Inbetriebnahme dieser Maschine ist so lange untersagt, bis festgestellt wurde, dass die Maschine/Anlage, in die sie eingebaut werden soll, den Bestimmungen der EG-Richtlinie entspricht !

english

We herewith confirm that this machine is in accordance with the following EC directive:

EC machine directive 98/37 EG
Appendix II B
for machines to be installed
EMV directive 89/336 EG
pressure device
directive 97/23 EG
low-voltage
directive 73/23 EG

The machine was designed, manufactured and documented in accordance with the harmonized standards of the stated EC-guidelines of:

**Aerzener Maschinenfabrik GmbH
D-31855 Aerzen**

A copy of all relevant technical information is provided and available.

The operating manual pertaining to the machine is provided and available.

Commissioning of this machine must not be carried out until it is determined that the unit/plant in which the machine is to be installed corresponds to the regulations of the EC guideline!

français

Nous déclarons par la présente que cette machine est conforme aux directives CE suivantes :

Directive machine CE 98/37 CE
Annexe II B
pour les éléments destinés à être incorporés
Directive CEM 89/336 CE
Directive équipements sous pression 97/23 CE
Directive basse tension 73/23 CE

La machine a été conçue, fabriquée et documentée en accord avec les normes d'harmonisation des directives CE indiquées, par la société :

Aerzener Maschinenfabrik GmbH D-31855 Aerzen

Une documentation technique complète est disponible.

Le présent document comprend la notice d'instructions de la machine.

Il est interdit de mettre la présente machine en service tant que la machine/installation dans laquelle elle doit être incorporée n'aura pas été déclarée conforme aux dispositions de la directive CE.

nederlands

Hiermee bevestigen we, dat deze machine aan de volgende EG-richtlijnen voldoet:

EG-Machinerichtlijn 98/37 EG
Bijlage II B
voor in te bouwen machines
EMC-Richtlijn 89/336 EG
Drukapparatuurrichtlijn 97/23 EG
Laagspanningsrichtlijn 73/23/EG

De machine werd geconstrueerd, vervaardigd en gedocumenteerd in overeenstemming met de geharmoniseerde normen van de genoemde EG-richtlijnen door de:

**Aerzener Maschinenfabrik GmbH
D-31855 Aerzen**

Een technische documentatie is compleet aanwezig.

De bij de machine behorende bedieningshandleiding ligt ter inzage.

De inbedrijfname van deze machine is zo lang verboden totdat is vastgesteld, dat de machine/installatie waarin ze ingebouwd zal worden aan de voorschriften van de EG-richtlijn voldoet!

español

Nos aseguramos de esta forma, que la máquina cumple con las siguientes Directivas de la CE:

Directiva de máquinas CE 98/37 CE
Anexo II B
para máquinas que serán montadas
Directiva EMV 89/336 CE
Directiva de dispositivos
de impresión 97/23 CE
Directiva de baja
tensión 73/23 CE

La máquina fue construida, concluida y documentada en conformidad con las normativas armonizadas de las Directivas de la CE mencionadas, por la empresa:

**Aerzener Maschinenfabrik GmbH
D-31855 Aerzen**

Se encuentra disponible una documentación técnica completa.

Existe un manual de instrucciones de la máquina.

¡La puesta en marcha de esta máquina se encuentra interdicho, hasta que se haya detectado que la máquina/sistema donde esta será montada, está de acuerdo con las determinaciones de las Directivas de la CE!

italiano

Con la presente si conferma che la presente macchina è conforme alle seguenti direttive CEE:

Direttiva macchine 98/37 CEE
CEE
Appendice II B
per macchine da installare
Direttiva EMV 89/336 CEE
Direttiva per apparecchi
ed impianti a pressione 97/23 CEE
Direttiva bassa
tensione 73/23 CEE

La macchina è stata costruita, prodotta e documentata, in conformità alle norme armonizzate delle succitate direttive CEE dalla ditta:

**Aerzener Maschinenfabrik GmbH
D-31855 Aerzen**

È disponibile la documentazione tecnica completa.

Le istruzioni per l'uso necessarie alla macchina sono allegate.

La messa in servizio di questa macchina è vietata fino a che non viene accertato che, che la macchina/l'impianto in cui deve essere installata sia conforme alle disposizioni della direttiva CEE !

Leiter Techn. Abteilung Unterschrift des Herstellers
Head of the dept. Signature of the manufacturer
Directeur technique Signature du constructeur
Hoofd technische afdeling Handtekening van de fabrikant
Director Dpto. Técnico Firma del fabricante
Responsable reparto tecnico Firma del fornitore

(Herr Seidel)



Konformitäts-Erklärung
Declaration of Conformity
Certificat de conformité

EG-Verklaring van overeenstemming voor machines
Declaración de conformidad
Dichiarazione di conformità



deutsch

Hiermit bestätigen wir, dass diese Maschine den folgenden EG-Richtlinien entspricht:

EG-Maschinen-Richtlinie 98/37 EG
 Anhang II A
 EMV-Richtlinie 89/336 EG
 Druckgeräte-Richtlinie 97/23 EG
 Niederspannungs-Richtlinie 73/23 EG

Die Maschine wurde konstruiert, gefertigt und dokumentiert, in Übereinstimmung mit den harmonisierten Normen der genannten EG-Richtlinien, von Firma:

Aerzener Maschinenfabrik GmbH D-31855 Aerzen

Eine technische Dokumentation ist vollständig vorhanden.

Die zur Maschine gehörende Betriebsanleitung liegt vor.

english

We herewith confirm that this machine is in accordance with the following EC directive:

EC machine directive 98/37 EG
 Appendix II A
 for machines to be installed
 EMV directive 89/336 EG
 pressure device directive 97/23 EG
 low-voltage directive 73/23 EG

The machine was designed, manufactured and documented in accordance with the harmonized standards of the stated EC-guidelines of:

Aerzener Maschinenfabrik GmbH D-31855 Aerzen

A copy of all relevant technical information is provided and available.

The operating manual pertaining to the machine is provided and available.

français

Nous déclarons par la présente que cette machine est conforme aux directives CE suivantes :

Directive machine CE 98/37 CE
 Annexe II A
 Directive CEM 89/336 CE
 Directive équipements sous pression 97/23 CE
 Directive basse tension 73/23 CE

La machine a été conçue, fabriquée et documentée en accord avec les normes d'harmonisation des directives CE indiquées, par la société :

Aerzener Maschinenfabrik GmbH D-31855 Aerzen

Une documentation technique complète est disponible.

Le présent document comprend la notice d'instructions de la machine.

nederlands

Hiermee bevestigen we, dat deze machine aan de volgende EG-richtlijnen voldoet:

EG-Machinerichtlijn 98/37 EG
 Bijlage II A
 EMC-richtlijn 89/336 EG
 Drukapparatuurrichtlijn 97/23 EG
 Laagspanningsrichtlijn 73/23 EG

De machine werd geconstrueerd, vervaardigd en gedocumenteerd in overeenstemming met de geharmoniseerde normen van de genoemde EG-richtlijnen door de:

Aerzener Maschinenfabrik GmbH D-31855 Aerzen

Een technische documentatie is compleet aanwezig.

De bij de machine behorende bedieningshandleiding ligt ter inzage.

español

Nos aseguramos de esta forma, que la máquina cumple con las siguientes Directivas de la CE:

Directiva de máquinas CE 98/37 CE
 Anexo II A
 Directiva EMV 89/336 CE
 Directiva de dispositivos de impresión 97/23 CE
 Directiva de baja tensión 73/23 CE

La máquina fue construida, concluida y documentada en conformidad con las normativas armonizadas de las Directivas de la CE mencionadas, por la empresa:

Aerzener Maschinenfabrik GmbH D-31855 Aerzen

Se encuentra disponible una documentación técnica completa.

Existe un manual de instrucciones de la máquina.

italiano

Con la presente si conferma che la presente macchina è conforme alle seguenti direttive CEE:

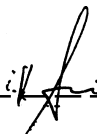
Direttiva macchine CEE 98/37 EG
 Anhang II A
 Direttiva EMV 89/336 EG
 Direttiva per apparecchi ed impianti a pressione 97/23 EG
 Direttiva bassa tensione 73/23 EG

La macchina è stata costruita, prodotta e documentata, in conformità alle norme armonizzate delle succitate direttive CEE dalla ditta:

Aerzener Maschinenfabrik GmbH D-31855 Aerzen

È disponibile la documentazione tecnica completa.

Le istruzioni per l'uso necessarie alla macchina sono allegate.



 (Herr Seidel)

Leiter Techn. Abteilung Unterschrift des Herstellers
 Head of the dept. Signature of the manufacturer
 Directeur technique Signature du constructeur
 Hoofd technische afdeling Handtekening van de fabrikant
 Director Dpto. Técnico Firma del fabricante
 Responsable reparto tecnico Firma del fornitore

Ersatzteile, spare parts, pièces dé tachée, onderdelen, repuestos, pezzi di ricambio

- DELTA BLOWER -

Ersatz- und Zubehörteile

Es wird darauf hingewiesen, daß nicht von uns gelieferte Originalteile und Zubehör auch nicht von uns geprüft und freigegeben sind. Der Einbau oder Anbau sowie die Verwendung solcher Produkte kann daher unter Umständen konstruktive vorgegebene Eigenschaften der Anlagen beeinflussen. Für Schäden, die durch Verwendung von nicht Originalteilen und Zubehör entstehen, ist jede Haftung des Herstellers ausgeschlossen.

Spare parts and accessories

We draw your attention to the fact that original parts and accessories not supplied by us are also not inspected and released by us. Therefore, the installation and application of such products might influence under certain circumstances constructively stipulated properties of the plants. Consequential damages due to application of non-original parts and accessories release the manufacturer from any warranty and liability.

Accessoires et pièces de rechange

Nous attirons votre attention sur le fait que les accessoires et pièces d'origine n'étant pas de notre fourniture ne peuvent être contrôlés et pris en considération lors d'une réclamation. L'intégration ou le montage ainsi que l'utilisation de telles pièces peut influencer sous certaines conditions les caractéristiques et performances de la machine. Pour tout dommage causé du fait de pièces n'étant pas d'origine ou de montage erroné, nous déclinons toute responsabilité.

Reservedelen en toebehoren

Er wordt uitdrukkelijk op gewezen dat niet door ons geleverde originele delen en toebehoren ook niet door ons getest en vrijgegeven zijn. De in of aanbouw alsmede de toepassing van zulke producten kan derhalve onder zekere omstandigheden constructief gegeven eigenschappen van de installatie beïnvloeden. Voor schade, die door gebruik van niet originele delen en accessoires ontstaan, is iedere aansprakelijkheid jegens de fabrikant uitgesloten.

Ricambi e accessori

Facciamo presente che i pezzi e ricambi originali non forniti da noi, non sono da noi controllati e accettati. Il montaggio o l'impiego di questi prodotti può in certe circostanze provocare influenze sul cattivo funzionamento dell'impianto. Danni causati dall'impiego di parti e ricambi non originali esonerano il fornitore da ogni garanzia.

Piezas de repuesto y accesorios

Indicamos expresamente, que aquellos repuestos y/o accesorios no suministrados por nosotros no están comprobados ni homologados por Aerzen. Su montaje, así como su utilización pueden tener incidencia en las características prefijadas de la instalación. Por lo tanto no asumimos garantía ni responsabilidad alguna sobre éstas piezas y de los eventuales daños posteriores y/o alteraciones de las calidades y prestaciones de origen. Para daños originados por la utilización de piezas y accesorios no originales, se excluye cualquier responsabilidad por parte del fabricante.

Leistungsdaten / performance data

- Ersatzteilbestellung / ordering spare parts -

- Bitte richten Sie Ihre Bestellung, an die für Sie zuständige Aerzener Vertretung / -Gesellschaft.
Abruf unter (++49) 0 51 54 81 192
- Please send your order to the Aerzen representative -company responsible for your country.
Fax polling ++49 (0) 515481192



AERZEN

Rechnungsanschrift -----

Invoice address -----

Lieferanschrift -----

Dispatch address -----

Kunden-Bestell-Nr.N° -----

Customer order no. -----

- Ersatzteil-anfrage**
Spare parts inquiry
- Ersatzteil-bestellung**
Spare parts order

Leistungsdaten / performance data

Ersatzteile / spare parts

Gültig für die folgende Verschleißteilzeichnung. *Applicable for the following wear part drawing.*

010	⇒	...	100	⇒	...	190	⇒	...
020	⇒	...	110	⇒	...	200	⇒	...
030	⇒	...	120	⇒	...	210	⇒	...
040	⇒	...	130	⇒	...	220	⇒	...
050	⇒	...	140	⇒	...	230	⇒	...
060	⇒	...	150	⇒	...	240	⇒	...
070	⇒	...	160	⇒	...	250	⇒	...
080	⇒	...	170	⇒	...			
090	⇒	...	180	⇒	...			

Ersatzteile markieren / Stückzahl eintragen. *Mark the spare parts / fill in the quantity.*

Dieses Ersatzteilformular ist ein fester Bestandteil der Betriebsanleitung und darf nicht entfernt werden!
This spare part form is an essential part of the operating manual and must not be removed!
Ce formulaire de pièce détachée est un élément essentiel de l'instruction de service et ne doit pas écarté !

Dit reservedelenformulier is een vast bestanddeel van het bedrijfsvoorschrift en mag niet worden verwijderd!
Este listado de repuestos forma parte integrante de las Instrucciones de Servicio y no puede ser eliminado!
Questo formulario dei ricambi è parte integrante delle istruzioni di esercizio e non deve essere staccato !

Alvorens in te vullen dit formulier s.v.p. kopiëren !
Por favor copiar este listado de cumplimiento !
Si prega di copiare questo formulario prima di compilarlo !

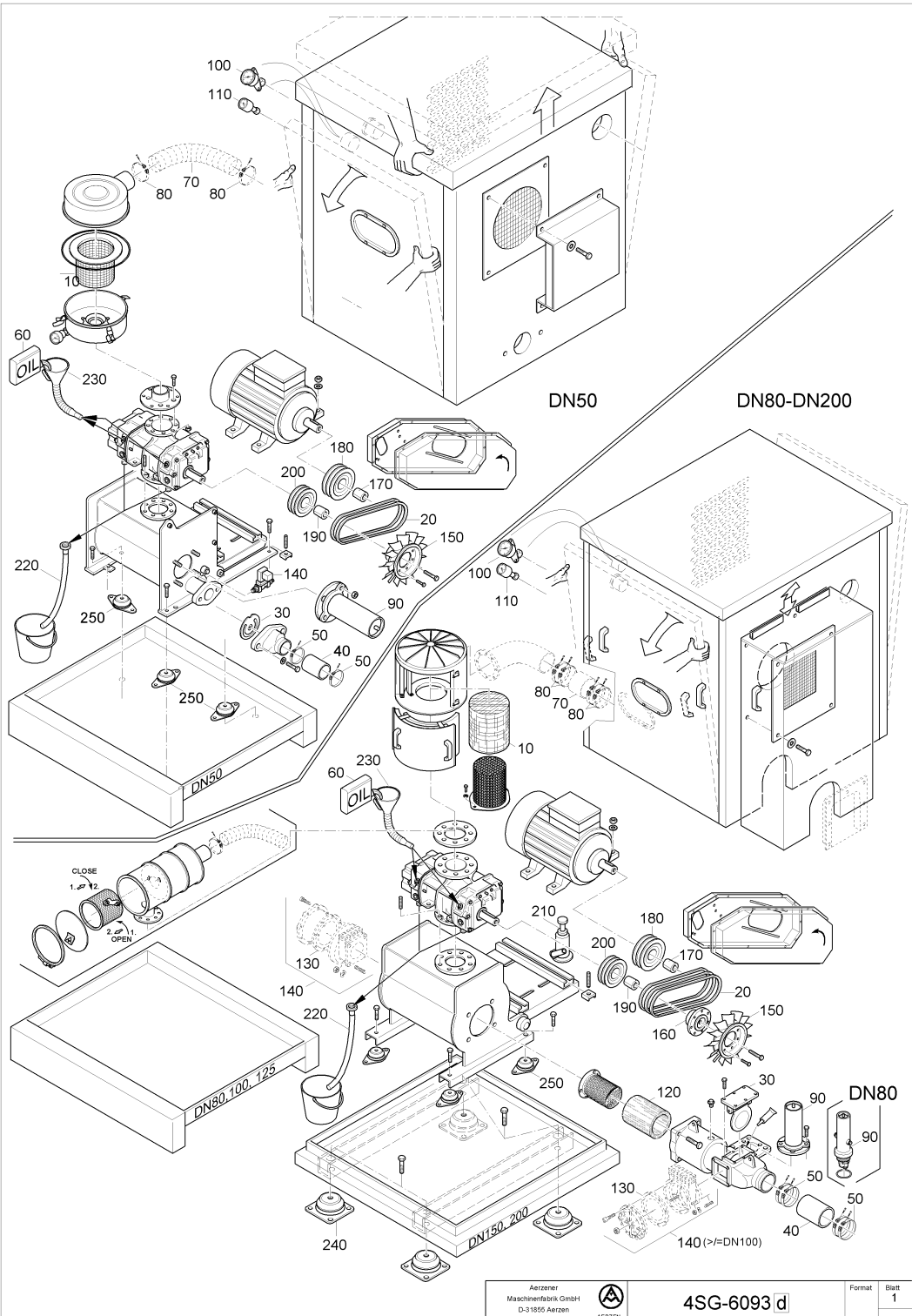


Dieses Formular bitte vor dem Ausfüllen kopieren !
Prior to filling-in this form, please copy !
Avant de remplir ce formulaire, veuillez copier !



DELTA BLOWER

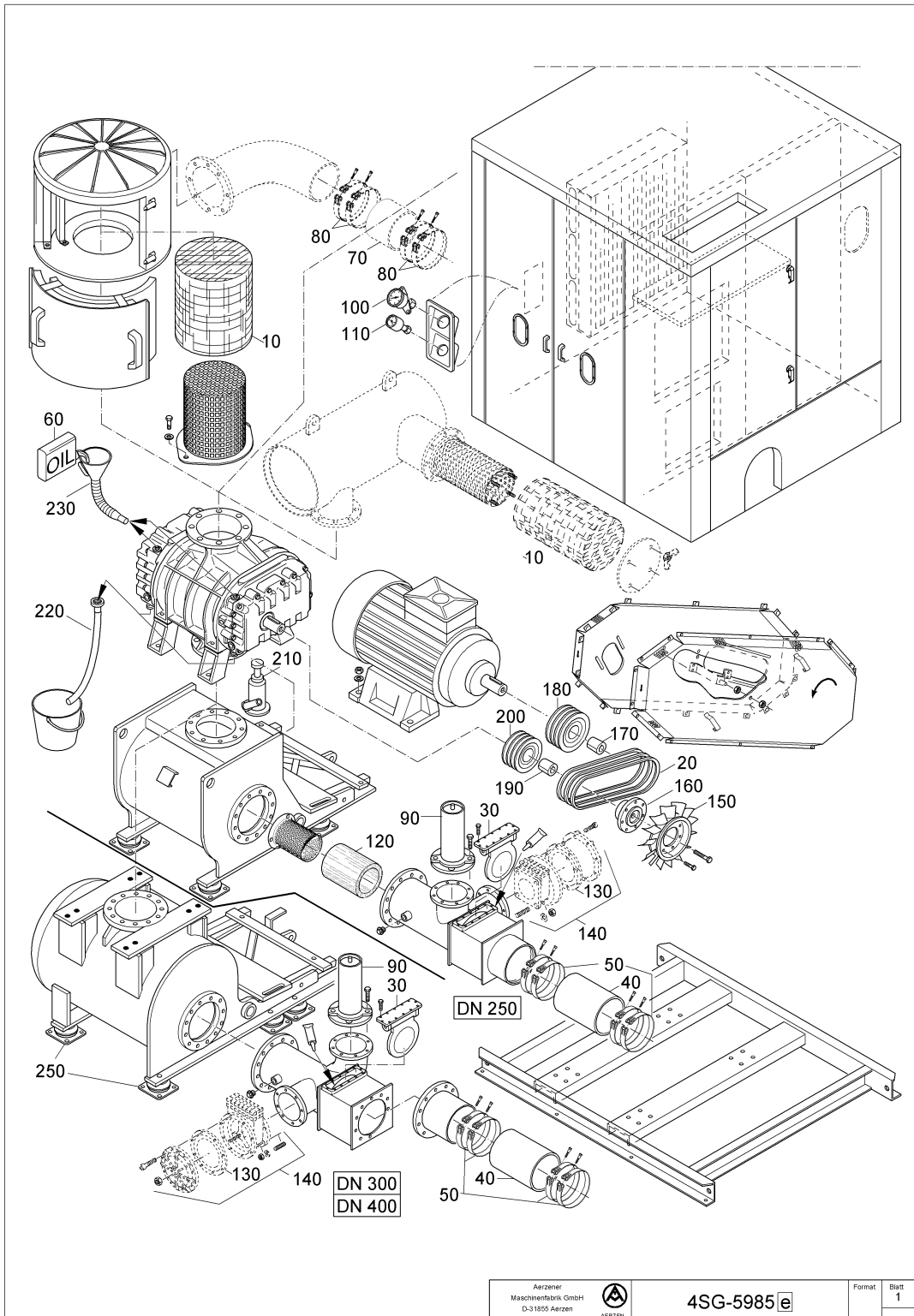
Verschleißteilzeichnung / Wearing parts drawing



**Diese Abbildung ist eine Beispiel-Darstellung und dient der Ersatzteilbestellung.
 Abweichungen zu der ausgelieferten Maschine sind möglich.
 Detaillierte Informationen enthält die, der Auftrags-Nummer entsprechende Zeichnung.
 This figure is an example presentation and serves for spare part ordering.
 Deviations to the machine supplied are possible.
 The drawing gives detail information according to the order number.**

DELTA BLOWER

Verschleißteilzeichnung / Wearing parts drawing



english

**Diese Abbildung ist eine Beispiel-Darstellung und dient der Ersatzteilbestellung.
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1. Suitability, general advice

The useful suitability of Positive Displacement Blower Units made by Aerzener is the oil-free conveying and compressing of air, also of neutral gases in modified design.

In order to ensure an optimum operation, the technical suitability limits have to be observed.

Intake temperature t_1 stated in the order confirmation applies as ambient temperature at place of installation.

Non-observance of the technical application limits and safety regulations releases the Aerzener Maschinenfabrik from warranty and liability regarding replacement for consequential damages. The same applies for defects caused by inspections carried out not in time or not properly.



2. Construction, function

Unit:

The unit is delivered with mounted accessories ready to operate.

The following steps are to be effected in addition:

- Connect the conveying piping.
- Fill up the lube oil.
- Install the electrical connection.
- Mount the special accessories delivered separately - if there are any.

Motor connection:

The electrical installation has to be effected by an authorized electrical fitter.

The terminal diagram for the motor can be found in the cover of the terminal box as well as in the accompanying documentation.

The motor- and control voltage is to be connected to a common network, where the sealing-in of the power contactor is cancelled in case of an interruption of circuit.

Alternative: Parallel to the driving motor an electronic monitoring relay is to be installed which cancels the sealing-in of the power contactor in case of an interruption of circuit.

Base support:

A torsion-stable, cylindrical container serving as absorption-free discharge silencer as well as installation basis for blowers with intake silencer, belt drive, belt guard, hinged motor support and connection casing. The base support rests on flexible machinery mountings and is to be placed on an even, slope-free underground.

Filter silencer:

This silencer is a combination of intake-sided silencer and intake filter. The filter material can be cleaned or replaced.

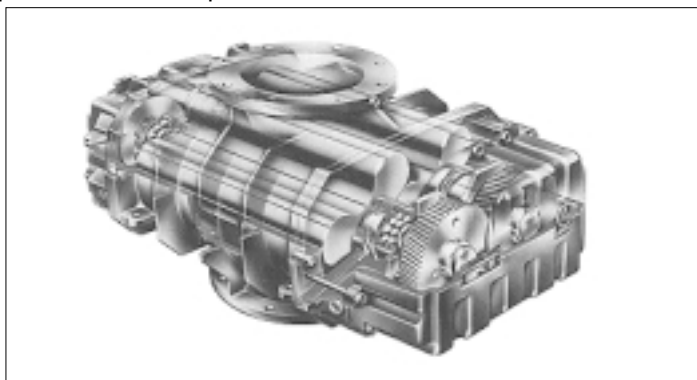
Connection casing:

consisting of:

- A pressure valve is located for the protection of the blower against overload.
- A non-return flap prevents the blower from running in reverse after shut-down.

The discharge-sided piping is connected to the unit via a flexible connection or via a compensator.

Accessories: please refer to chapter 11.



Three-lobe rotary pistons. Pulsation decrease by interference (patented).

The conveying chamber (cylinder) is sealed against the oil chambers (casing cover and gear case) by piston ring labyrinth sealings and the driving shaft is sealed by a radial seal ring.

In case the oil level is too high, oil can penetrate into the conveying chamber in an uncontrolled way.

Compression heat arises upon the compression procedure. The heat is partly released via the outer surfaces of blower and conveying pipings to the ambient air. Outer surfaces and conveying pipings reach temperatures which may burn the unprotected skin.





Read first,
then operate!

english



3. Precautions prior to and during operation

ATTENTION!

Draws the attention to all dangerous situations.

WARNING!



Points to direct risks of persons.

Upon receipt the blower is to be checked for damages during transport and completeness by means of delivery note and order.

Work safety rules, safety regulations as well as the operating instructions, are to be observed.

Read the **INFORMATION sheet** prior to commissioning. Possible notes and changes indicated herein are to be effected.

The following described tasks are only to be carried out by experts who are familiar with the functions of the blower unit and its components as well as with the safety regulations to be kept.

This positive displacement blower meets the European regulations for accident prevention. Nevertheless, a residual technical risk remains, with a possibility of endangering persons and property. To avoid this, operators have to comply with the following **safety regulations**:

- In case of acoustic hood operation the doors are to be locked by means of the provided male triangular wrench and may only be opened when the motor is currentless and the fuses are removed or switched off.
- Do not carry out any improper repair or modification work at the blower. In case of problems contact the Aerzen after-sales service!
- Operators must be skilled, introduced to their job and instructed!
- Prior to commissioning, operators must be familiar with the protection-, operating- and monitoring elements by means of these instructions.
- Use the machine in accordance with its suitability, keep its performance limits.
- Remove solids, liquids and powdery substances from the intake range.
- Safety appliances, such as e.g. belt guard, in case of acoustic hood design hand protection and hood element, motor guard / Emergency-OFF etc. must not be removed while machine is running. **Risk of injury !**
- Ensure that the motor is currentless upon working at the unit.
- Do not operate when electrical connections, belt guard and pressure valve are defective or missing.
- No operation with open intake- or pressure socket / blower stage, as: positive displacement machines are forced conveying machines with risk of injury in the range of conveying chamber.
- **Risk of burns!**
In case of opened or non-existing acoustic hood wear safety gloves when the blower surface is at operation temperature!
- Use **ear protection** in case of blower operation !
Due to the respective operating condition, the sound pressure level can deviate from the mentioned operating data. Therefore a sound pressure level higher than 85 dB(A) can be possible at short notice.
- Upon oil change pay attention to the oil temperature. The oil temperature must not exceed 60 °C. Risk of combustion at oil temperature exceeding 60 °C !
- Only tools that correspond to the standard and design of the bolts, nuts and fittings must be used.

- ⊕ **Danger of poisoning** by inhalation and **risk of causticization** by touching when using cleaning agents and sprays.
- ⊕ Follow manufacturers instructions as well as applicable regulations!



4. **INADMISSIBLE OPERATION METHODS**

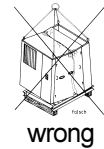
- ⊕ Wrong direction of rotation.
- ⊕ Switching-on - during run-down.
- upon rotating in reverse direction.
- ⊕ Inadmissible pressure increase.
- ⊕ Remaining under or exceeding the limit speed.
- ⊕ Exceeding the limit-discharge temperature / please also refer name plate.
- ⊕ Pole-changing to lower speed prior to standstill of the motor.
- ⊕ Operation without oil filling.



5. **Transport / Assembly**

During transport of the blower unit the following points must be always observed:

- ⊕ The hinged motor support must be always locked by means of the transport locking screw / refer to page 10.7. Remove the V-belts from the pulleys.
- ⊕ Protect the blower unit from impacts.
- ⊕ The unit is to be transported by means of crane, high-lift truck, elevating truck or similar.
- ⊕ Lift the unit only according to sketch.
Concerning units without acoustic hood, transport is effected by application of the transport devices at three resp. four eyelets (hinged motor support / base frame) / or below the transport lugs.

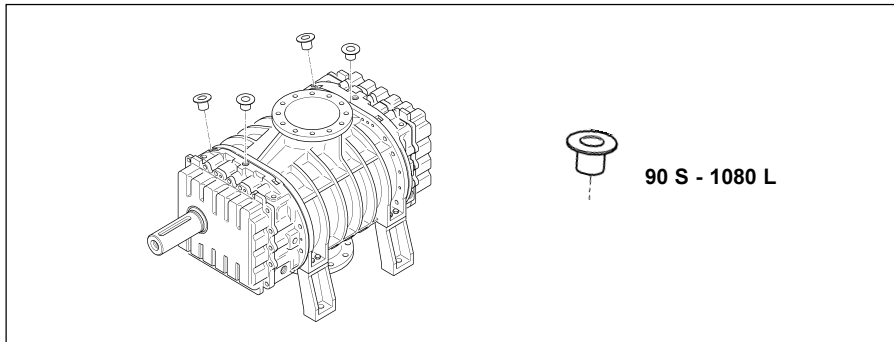


Upon assembly the following points are to be observed:

- ⊕ Upon dispatch Positive Displacement machines are preserved for 12 months and packed accordingly. Upon a storage for more than 12 months, the preservation is to be repeated, observe TN0 1175.
- ⊕ During storage pay attention to proper preservation, packing and if necessary nitrogen filling, according to TN0 1175. Test interval every 6 weeks.
Negative influences are to be removed immediately to guarantee a continuous preservation.
- ⊕ Intermediate storage in dry, clean and vibrationless rooms.
- ⊕ During storage relieve the V-belts.
- ⊕ In case of shutdown for more than 6 weeks, preserve conveying chamber, pistons and polished parts.
- ⊕ Place unit on even, vibrationless and slope-free ground. If necessary - there is the possibility to dowel the units. In this case, only one anchor bolt per machine foot is sufficient.
- ⊕ Remove the packing material completely. In case of acoustic hood design ensure free section of the inlet- and exhaust silencer.
- ⊕ Ensure sufficient aeration and ventilation at place of assembly / inlet- and exhaust air.
The following standard installation conditions have to be adhered to:
Ambient temperature : -10°C to 40°C
Rel. air humidity : 0% to 80%
Chemical-free atmosphere
- ⊕ Check the blower for smooth running / tight running may be the consequence of distortion or foreign particles.



- In case of air conveyance remove the plastic plugs from the condensate drillings. This may lead to a slight air flow to the outside, flushing the condensate drillings.



- In view to conveyance of "Technical Gases" the condensate drillings are closed. If the conveying medium tends to develop condensate built-up, the condensate can be drained depending on the operation case, e.g. by means of storage tanks, residual gas pipings or by short-term opening of the lower drillings.
- In order to avoid electrostatic supercharging of the units, motor, acoustic hood and base frame are to be earthed via the provided connections.
- Fix piping separately, so that stable connection can be established. Connection via flexible connection compensator.
- Connect electric motor. For its technical details, refer to the name plate or the internal side of the terminal box. **Please pay attention to the operating manual for the motor** enclosed separately! The connection shall only be carried out by authorized electricians.
- Install connection cable for electric motor in such a way that no damages may occur by movements of the hinged motor support. Refer instructions G4-031... .

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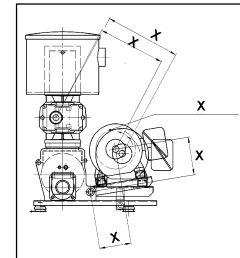
Kabel cable	Kunststoffkabel plastic-insulated cable	
	U ₀ = 0,6 kV	U ₀ > 0,6 kV
r einadrig <i>single-core</i>	15 x d	15 x d
mehradrig <i>multi-core</i>	12 x d	15 x d

Bild 1
picture 1

Chapter from G4-031...

Connection cable transfer

- In case of motor- and belt drive assembly provided by the customer the marked dimensions (X) have to be adhered to according to Aerzen general tables. Only then, an optimum design of the drive unit can be guaranteed.
- Noise prevention is to be taken into consideration! Piping and foundations can be incited to self-vibrations with sound release.
- Ensure that in case of unit planning the safety instructions and the technical documents of the component suppliers are observed.
- Prior to commissioning fill up oil.



6. Commissioning

The blower unit is installed in accordance with chapter 5 of these instructions.



In case of initial commissioning:

Fill up lube oil / refer to chapter 10.3 - 10.5

Check oil filling screw and drain valve for tight fit and impermeability.

Pay close attention to commissioning remarks and lubrication intervals of drive motor manufacturer!

Depending on design, cut off rubber nipple on top of the pressure gauges (if existing) or turn deaeration bracket to OPEN.



Check direction of rotation.

Also refer to red direction of rotation shield on the blower.

No V-belts must be placed on the motor disc.

Remove locking screw between pulley and motor casing.

Start driving motor for a short time (approx. 1 to 2 seconds).

Please also refer to the instructions of the supplier of electric components resp. of the plant manufacturer.

ATTENTION! Incorrect direction of rotation during operation will destroy blower.

Upon looking on the driving shaft the blower rotates anticlockwise.

Direction of rotation of drive motor and blower must be equal.



In case of correct direction of rotation the following tasks are to be effected:

Remove transport locking screw of the hinged motor support / refer to 10.7.

Check alignment of the pulleys.

Lift hinged motor support by means of hydraulic jack.

Put on V-belts (refer to chapter 10.7). The V-belts are tensioned by the motor weight.

Close openings for motor driving shaft in belt guard with pre-mounted, movable protection covers.

Slide protection covers up to max. 2 cm to motor driving shaft and secure.



Connect pipings with unit ready to operate, stickers concerning safety instructions must be legible and safety devices are to be inspected.

Open slide valves available at the unit. Operation can start.



Switch on drive motor!

Switch off after approx. 20 seconds and verify the smooth run-down of the blower.



Should pressure valve blow off, switch off immediately and remove cause of failure.

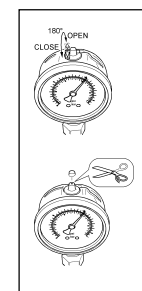


Then, switch on again and **check EMERGENCY-OFF switch!**



Now the unit is ready to operate!

Preparation



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Starting

Operation

Shutdown



7. Admissible connecting frequencies of the drive motors

To 160 kW = 6 starts per hour
 From 200 kW = 3 cold starts or 2 warm starts

- For further indications and advice, please refer to the documentation of the motor manufacturer.
- Please also refer to chapter 2, motor connection.

8. Shutdown

Shutdown:

By means of the power switch of the motor. Following standstill of the blower, withdraw fuses. Ensure that the slide valves in the pipings are closed. Preserve the conveying chamber if standstill lasts longer than 6 weeks. Rotate the blower regularly by hand, in order to prevent damages which may arise from standstill.

In case of danger:

Press **EMERGENCY-OFF** button.

For details please refer to the instructions of the supplier of electric components resp. of the plant manufacturer.

9. Operation of compressor units

9.1 with frequency converter

The following has to be taken into consideration:

- In case the frequency converter is provided by others the electrical and mechanical characteristics of the driving motor are to be taken into account.
- The minimum frequency must always be set in a fixed manner.
Upon operation this frequency must not be remained under.
- The maximum frequency must be set under consideration of the maximum motor speed and the maximum blower- / compressor speed.
- The run-up time of driving motor from standstill up to minimum speed may be 3 to 6 seconds.
- The frequency converter must be designed for operation of a work machine with constant load moment.
Min.- or max. speeds are not to be remained under or exceeded.

- The highest admissible voltage increase speed of the motor converter is 1200 V/ μ s. When exceeding the value, e.g. due to too long cables, frequency converter make etc. a motor throttle / motor filter coil corresponding to the frequency converter is to be applied. A renunciation of these component parts may lead to a damage of the motor isolation and to a motor breakdown.
- The max. speed regulation speed on Positive Displacement blowers /Screw compressors after run-up to min. speed for regulation time upward and downward is 1 Hz per second.
Min.-frequency = 20 Hz // Max.-frequency = 50 Hz results in a regulation time from min. to max. of 30 seconds.
- The max. current limit of the motor must not be exceeded.
Observe the details on the motor name plate.
- In order to avoid operational failures the function "flying restart circuit" must not be parameterized in the control of the frequency converter. Upon shutdown of the frequency converter a re-start is only permitted following complete standstill of blower resp. compressor.

9.2 with pole-changing motor

The following has to be taken into consideration:

- Between a change of motor speed
 - from high to low speed the motor must have reached each time speed zero.
 - from low to high speed switching can be effected directly, undelayed.

10. Attendance / Maintenance

The attendance / maintenance consists of the following points:

Inspection - Pressure valve test - Exchange of lubricants - Lube oil regulations - Exchange of V-belts - Intake filter maintenance - Attendance

In case of questions, please refer to the Aerzen after-sales service.

Please state the following in your queries:

- Order- and serial numbers.
- Describe arisen failures / malfunctions as detailed as possible.
- Steps taken so far to remove the failures.

Is the blower sent back to the supplier, the following measures are to be carried out:

- Drain the oil, otherwise it is a transport of hazardous goods.
- Provide unpolished parts with a preservation oil.
- Close blower flanges by means of blind covers.



10.1 Maintenance schedule

Whenever carrying out work on the blower, it must be switched off, to prevent injury and damage! To guarantee long service life and optimum operating conditions, the maintenance work listed in the following table must be carried out at the specified intervals.

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We recommend carrying out maintenance on the blower at the intervals specified below. The operating hours refer to normal operating conditions. Other intervals could apply depending on environmental conditions. In this case please consult Aerzener Maschinenfabrik.	Maintenance intervals							
	After the first 30h	After the first 250h	Weekly	After the first 500 Oh	After each 1000 Oh -1/2 yearly in clean environment - monthly in dusty environment	After each 4000 Oh or 1/2 yearly	After each 8000 Oh or yearly	After each 20000 Oh or after 3 years
Retaining screws and fittings - re-tighten after machine has cooled	●							
Starting strainer, if installed - check; if no more contaminant it can be removed				●				
Intake filter - check filter contamination, replace if necessary, max. -45 mbar - replace filter insert			●				●	
Air intake openings - check on acoustic hood and clean					●			
V-belt condition - check, replace if necessary		●		●		●	●	
V-belt pulley alignment - check, adjust if required	●	●		●		●	●	
Pressure valve - check for function	●				●			
Oil level - check	●	●	●					
Lubricating oil - exchange *at end temperatures of above 120° C				●		●*	●	
Only for gastight shaft seal, grease - exchange *at end temperatures of above 120° C				●		●*	●	
Non-return valve - check for wear and tightness							●	
Main inspection / maintenance - replacing wearing parts - check complete machine								●
Drive motor - carry out maintenance - observe grease replacement intervals	- observe maintenance intervals and specifications of motor manufacturer! - in cas of Aerzener motors observe additional information 4PG-702!							

Have the blower checked by Aerzener service at the specified intervals or yearly. Or: Take out a maintenance contract with Aerzener Maschinenfabrik. Through regular and proper maintenance Aerzener Maschinenfabrik guarantees maximum safety for your operation.

10.2 Inspection / - dates

After 3 years or 20,000 operating hours we recommend a general inspection at site by an Aerzen technician. On this occasion a preventive overhauling of wearing parts, such as bearings, sealings or similar is effected. We recommend to keep wearing parts on stock, in order to avoid waiting times and non-productive times in case of failures.

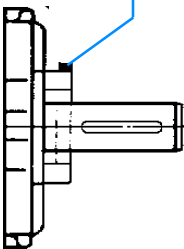
10.3 Exchange of lubricants

In case of gastight design depending on type of sealing

- Weekly - Check oil level in the oiler, if necessary - refill the oiler.
 Yearly - Provide shaft sealing with roller bearing grease / some operating hours before oil change, so that the surplus of grease is flushed.

At gastight design depending on the sealing method

Example	Weekly
<ul style="list-style-type: none"> - oiler - grease lubricating bush - lubricating nipple 	Check level in the oiler refill oil, if necessary



Shaft sealing with roller bearing grease lubricate again / several operating hours prior to oil change so that the excess grease is flushed

Lubricating grease, when using the oil types acc. to oil specification, point 1 and 2, >> except polyglycol oils <<
KHC-2P-30
Filling at works
KLÜBER PETAMO GHY 133 N

Lubricating grease, when using of polyglycol oils, point 3
MPG2K-40
KLÜBER SYNTHESO PROBA 270

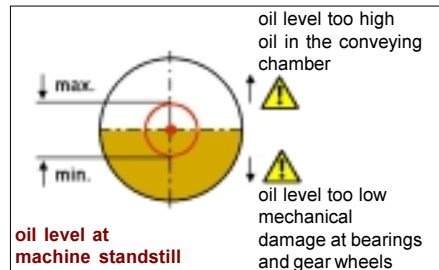
- A mixing of different greases is to be avoided.
- A re-lubrication is admissible only with the same grease.
- If these greases are not available, they are to be removed completely and to be replaced for other greases acc. to KHC-2P-30 resp. MPG2K-40.
- Note sealing consistency with Viton.

Re-lubrication

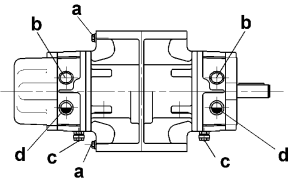
GM 3S - 30L	≈ 5 cm ³
GM 35S - 130L	≈ 10 cm ³
GM 150S - 400L	≈ 20 cm ³

Fill up oil

- ➔ Drain valve (c) must be closed / ensure tight fit.
- ➔ Open oil filling (b).
- ➔ Fill up oil / at first not until center of sight glass / oil can run down the inside walls.
- ➔ Adjust oil level to center of sight glass.
- ⚠ Pay close attention to both oil chambers being filled separately and drained.

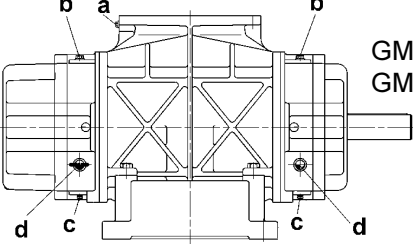


It is also important that the oil levels are checked at both sight glasses.



GM 3S -
GM 80 L

a - measuring device connection
 b - oil filling
 c - oil drain / drain valve
 d - oil level



GM 90S -
GM 400 L



Drain oil

a) b) Screw cap (1), threaded socket (1) off the drain valve.

In case of very tight fit of the cap (1), threaded socket (1), the valve is to be fastened by means of an open-end spanner and item (1) is to be loosened by another spanner.

a) Screw on the delivered hose.

a) Drain valve opens automatically.

a) Lead hose end into a collection reservoir.

b) Open hand valve, lead waste oil into a reservoir

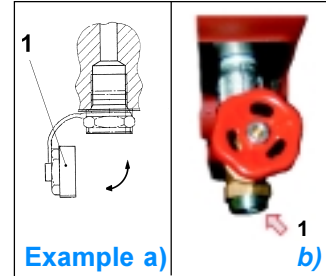
a) b) Effect proper disposal of used oil.

a) Remove hose from drain valve.

b) Close hand valve, screw threaded socket (1) under holding the valve

a) Seal drain valve with the cap (1) by hand.

a) b) As soon as the complete drain valve loosens, it is to be replaced by a new valve with a new sealing.



Example a)

b)

10.4 Lube oil regulations for "Standard" Positive Displacement blowers

Requirements to lube oil characteristics

- Kinematic viscosity at 100°C at least 13 cSt (mm²/s).
- Kinematic viscosity at 100°C at least 28 cSt (mm²/s), only applicable for item 3.
- Kinematic viscosity at -10°C < = 3500 cSt (mm²/s).
- Oil additives, with the following minimum characteristics:
 - EP wearing protection additives for use in anti-friction bearing gearboxes
 - oxidation stability up to 110°C, at item 3 from 110°C up to 220°C oil temperature
 - foam suppression agent
 - Detergents for loosening of deposits
 - Neutrality compared to sealing materials made of Viton (Fluorine-Propylene-Methyl)
 - Neutrality compared to single-package-synthetic resin primer

1. One- or two-shift operation / intermittent service

application conditions - intake temperature up to 60°C
- discharge temperature up to 140°C
- ambient temperatures which may remain under 10°C .

- ☞ **5W-40** / full-synthetic high-performance light motor oil, as per oil specification
- API CF or higher - ACEA B3 / E3 or higher

Example Aerzen Special oil Order No. 160 754 or 160 755

2. Continuous operation 24 hours / day

application conditions - intake temperature up to 60°C
- discharge temperature up to 140°C
- ambient temperatures above 10°C all the year round

- ☞ **5W-40** see also item 1
- ☞ **PAO gearbox oils** / full-synthetic Poly-Alpha-Olefins

Example MOBIL SHC 629 / and as mentioned under item 1

3. Operation at continuous oil temperatures above 120°C

application conditions - continuous oil temperatures above 120°C
- at oil temperatures above 160°C the oil change intervals halve

- ☞ **ISO VG 220** / synthetic lube oil with a basic oil type Polyglycol

Example ESSO Glycolube 220 ARAL Degol GS 220

4. Lube oils in foodstuff and pharmaceutical industry

Lube oils, approved acc. to USDA H1 can be used.

Example Klüberoil 4 UH1-100 application at conveying discharge temperatures up to 100°C
Klüberoil 4 UH1-220 application at conveying discharge temperatures from 100°C up to 140°C

General

- ☞ In case of a change-over from one oil brand to another an oil change has to be carried out after 24 operating hours.
- ☞ For filling or refilling the oil chambers, lube oil of the same brand and same type is to be used only.
- ☞ All the oil brands can be used observing the specification.



10.5 Lube oil quantities

Total oil fillings in approx. litres (until center of sight glass)

GM 3S	0,55l	GM 4S	0,55l	GM 7L	0,55l
GM10S	0,86l	GM 15L	0,86l	GM 25S	1,20l
GM 30L	1,20l	GM 35S	3,00l	GM 50L	3,00l
GM 60S	6,50l	GM 80L	6,50l	GM 90S	11,50l
GM 130L	11,50l	GM 150S	11,00l	GM 220L	11,00l
GM 240S	17,50l	GM 315L	17,50l	GM 400L	22,00l

10.6 Check pressure valve for functioning

⤵ **ATTENTION!**

- ⤵ The valve is no control device and must also not be used as such.
- ⤵ Please pay attention to the operating manual for the pressure valve G4-002...
- ⤵ For a function check of the Aerzen pressure valves in case of a unit with acoustic hood, depending on design, the exhaust air louver is to be disassembled.

Function check R2" // DN 50 // DN 80 // DN 125

- ⤵ The valve is to be lifted during operation by means of two screw drivers.
- *The valve must open properly.*

ATTENTION! Hot gas escapes from the protection cylinder.

Function check DN 150 // DN 200 // DN 300

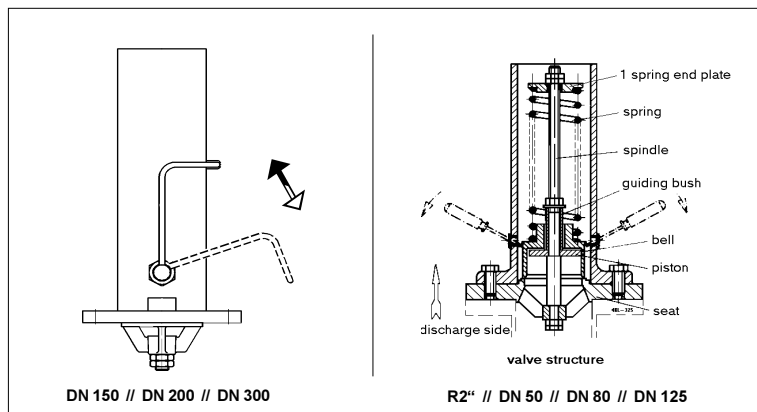
- ⤵ The valve is to be lifted during operation by moving the handle.
- *The valve must open properly.*

ATTENTION! Hot gas escapes from the protection cylinder.

- ⤵ Afterwards the screw drivers are to be removed or the lifting device is to be released.

→ *An intact valve closes properly.*

- ⤵ The valve can be used for temperatures up to 150°C.

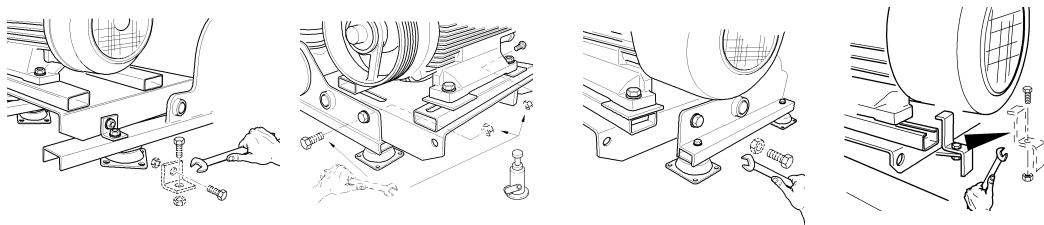




10.7 V-belts - installation / - replacement

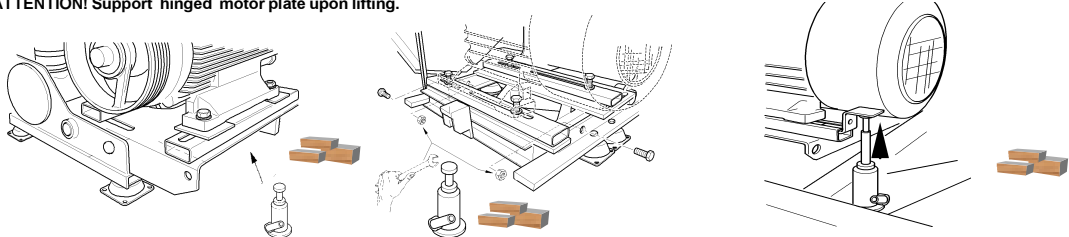
- ⚠ For all work necessary at belt drive, the machine is to be taken out of operation and disconnected properly from the supply.
A starting / operation of the machine must be excluded.
Attention: At belt drive and hinged motor plate risk of shearing and squeezing!
- ➡ Open belt protection housing and / or acoustic hood.
- ➡ Dismount protection cover of compressor- resp. blower belt pulley, only in case of design with acoustic hood.
- ➡ Protection cover / plastic plate of motor belt pulley to be dismantled, only in case of design with acoustic hood.
- ➡ At first placement of belts the transport locking screws resp. the transport locking angle are to be removed.
- ➡ Depending on machine size the hinged motor plate is to be lifted by hand or by means of the supplied hydraulic jack kit until the belts can be placed upon resp. exchanged.
- ➡ During lifting the hinged motor plate is to be supported step-by-step, in order to avoid possible accidents.
- ➡ The V-belts are to be replaced set by set.
- ➡ Regarding the acoustic hood design the V-belts are to be turned via a fan blade omitting the fan channel. Mount V-belts.
- ➡ The hinged motor plate is to be completely lowered.
- ➡ The tension of the belt drive is effected automatically by the motor weight.
- ➡ Belt protection housing and protection covers to be mounted properly and / or acoustic hood to be closed.
- ➡ Upon design with belt protection housing the distance between motor drive shaft and plastic cover is 10 mm maximum.

Disassembly of various transport safety devices



Lifting of various hinged motor plates

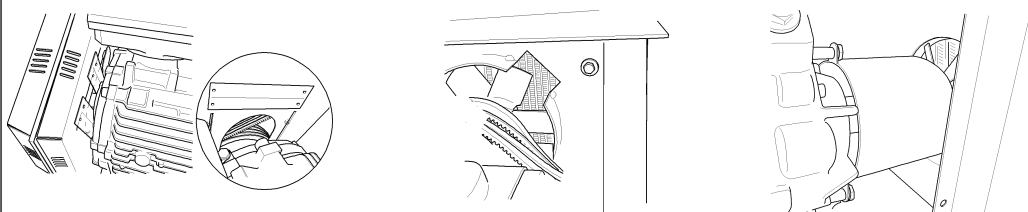
ATTENTION! Support hinged motor plate upon lifting.



Motor shaft cover

Fan cover

Fan cover



10.8 Intake filter / starting strainer / - maintenance

Example

DN 50

- ⇒ Unfasten hexagon nut
- ⇒ Remove housing cover
- ⇒ Replace filter element
- ⇒ Install filter housing properly

DN 400

- ⇒ Open toggle-type fasteners
- ⇒ Remove housing cover
- ⇒ Exchange filter element
- ⇒ Center sealing ring at housing
- ⇒ Install filter housing properly

DN 50

- ⇒ Unscrew nuts
- ⇒ Remove housing cover
- ⇒ Replace filter element
- ⇒ Install filter housing properly

DN 400

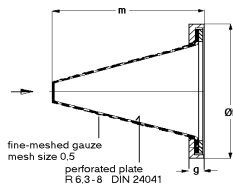
- ⇒ Open clamp
- ⇒ Remove housing cover
- ⇒ Loosen filter element by "counter-clockwise rotation" and exchange
- ⇒ Put new filter element into the guiding bores and fasten by "clockwise rotation"
- ⇒ Install filter housing properly

DN 50

- ⇒ Open hinged breech blocks and pull maintenance flap
- ⇒ Detach fixing screw of the support body ground
- ⇒ Pull filter element with support body off the maintenance opening
- ⇒ Replace filter element
- ⇒ Insert support body with filter element paying close attention to the lead-in groove
- ⇒ Mount fixing screw and secure against loose fit
- ⇒ Install maintenance flap properly

DN 400

- ⇒ Unscrew nuts
- ⇒ Replace filter element
- ⇒ Fasten filter properly



DN	Øf	m	g
125	180	250	15
150	212	265	15
200	268	280	15
250	325	220	15
300	375	200	15
350	435	460	15
400	485	342	15

Starting strainer

- ⇒ Upon intake from a closed piping system a starting strainer resp. a filter housing is to be installed upstream of the compressor intake side. Depending on order it is included in scope of supply. Therefore the machine is protected against contamination and torn foreign particles in intake flow.
- ⇒ The resistance of starting strainer / filter element, max. 45-50 mbar, is to be monitored and not to be exceeded.
- ⇒ If the strainer stays clean after approx. 500 operating hours, it can be dismantled and replaced by the supplied adjusting ring.
- ⇒ The filter element is to be checked resp. replaced according to corresponding indications 'intake filter' of maintenance plan.

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Intake filter

If required open the acoustic hood roof.

For outdoor operation the roof element of acoustic hood sizes DN 50 – 125 is bolted to the side panel. Before opening the roof element the bolts must be removed!

10.9 Overhauling / chart of failures

Malfunction	Possible cause	Remedy
Abnormal running noise	<ul style="list-style-type: none"> -Belt alignment -Bearing damages -Rotary pistons contact each other or in the conveying chamber -Contaminated pistons -Foreign particles in gear wheels -Shaft deflection 	<ul style="list-style-type: none"> -Measure and adjust - if necessary -Exchange -Check clearance adjustment/check for cracks -Clean them -Clean wheels -Measure/exchange
Blower too hot	<ul style="list-style-type: none"> -Intake filter contaminated -Ambient temp. too high -Hood slots clogged, ventilator defective -Oil level or viscosity too high -Rotary piston clearances too large -Overloaded 	<ul style="list-style-type: none"> -Clean/exchange -Ensure sufficient room ventilation inlet-/exhaust air -Clean ventilating slots repair ventilator -Adjust / drain -Adjust / ask after-sales service -Keep operating data
Oil in conveyed air	<ul style="list-style-type: none"> -Oil chambers overfilled with oil 	<ul style="list-style-type: none"> -Drain, clean the conveying chambers
Intake volume flow too low	<ul style="list-style-type: none"> -Starting strainer / intake filter contaminated -Leaky piping -Incorrect dimensioning of blower -Piston wear 	<ul style="list-style-type: none"> -Clean or replace it -Seal it -Compare with performance diagram -If necessary - replace pistons
Excessive power requirement of motor	<ul style="list-style-type: none"> -Operating data differ from order data -Mechanical blower- or motor damage -Motor tensioning dropped 	<ul style="list-style-type: none"> -Compare performance data with measured data -Repair by manufacturer -Adjust power, refer to instructions motor
Side belt vibrations	<ul style="list-style-type: none"> - V-belts worn 	<ul style="list-style-type: none"> -Inspect V-belt condition and renew - if necessary
Blower runs in reverse direction after switching-off	<ul style="list-style-type: none"> - Non-return flap defective resp. leaky 	<ul style="list-style-type: none"> -Replace it
Machine damaged, due to incorrect power supply	<ul style="list-style-type: none"> - Motor and control system are connected to two different networks 	<ul style="list-style-type: none"> - Motor and control voltage are to be connected to one supply network -Alternatively: installation of a power monitoring

After each interference at the blower due to malfunction, the following is to be checked:

- ➡ Smooth running.
- ➡ Contactless rotation.
- ➡ Proper functioning.

In case of resistances, do not start blower !
After starting observe the blower thoroughly !

11. Accessories

1. **Acoustic hood for unit**
2. **Start-up unloading device**
3. **Maintenance indicator for monitoring of the filter contamination**
4. Thermometer for indication of the discharge temperature
5. Pressure gauge for monitoring of the intake- and discharge pressure
6. Accessories for maintenance (V-belts, intake filter, oil etc.)

In addition to the standard delivery scope the a./m. accessories can be inquired of the Aerzen after-sales service where spare parts can also be ordered. The instructions for special accessories in bold face are listed as follows. Pay attention to the notes of possible separately delivered manuals of manufacturers of accessories.

Accessories no. 1: Acoustic hood

- ☞ The acoustic hood is made of galvanized steel plate in segmental construction. It is forced ventilated by a fan mounted at the blower shaft. Acoustic hoods for units up to a nominal width of 250 are always delivered completely assembled. For acoustic hoods in disassembled segmental design installation manual G4-030... is available.
- ☞ Concerning all work at the acoustic hood the unit is set at standstill and the drive is disconnected from the supply.
- ☞ The acoustic hood serves at the same time as belt guard.
- ☞ When the unit is running the breech blocks of the doors are to be locked by the provided male triangular wrench. Then, check the correct locking. The wrench must be kept at a safe place. Only authorized persons may have access.
- ☞ All maintenance work of the unit can only be effected at standstill of the machine after opening of the acoustic hood doors.
- ☞ The hinges are to be re-lubricated periodically acc. to the installation conditions.
- ☞ In order to protect the units from electrostatic supercharging of the units, connect earthing cables at the ground straps of the base frame and the acoustic hood.
- ☞ Ensure that the safety labels are fixed to the acoustic hood in a visible way.

Intake from a piping

- ☞ Regarding the intake from a piping the corresponding perforated sheets are to be "cracked off" the acoustic hood element, the foamed material in the diameter of the intake piping to be cut out and removed. Lead the connection piping through the openings.

Accessories no. 2 : Start-up unloading device / AEROMAT

- ☞ The start-up unloading device is installed in units which are driven by electric motors with star/delta drive. Therefore, blowers resp. compressors can start in an unloaded condition against the consisting supply pressure.
- ☞ Concerning drives with pole-changing motors a start-up unloading device with solenoid valve can be applied, in order to start also in higher speed in unloaded condition.
- ☞ For frequency converter drives a start-up unloading device is not necessary.
- ☞ Following the setting the start-up unloading device works maintenance-free.
- ☞ Should the start-up unloading device not close after correct adjustment, the nozzle (5) is to be cleaned by compressed air, please also refer to sectional drawing, page 17.

Attention!

The start-up unloading device does not serve for regulating the operating data ! If the start-up unloading device is within the acoustic hood, in case of machine standstill an adjustment is to be effected step by step. Furthermore, the drive motor is to be started paying attention to the starting frequency, also control the closing time.

Due to safety reasons all adjusting work within the acoustic hood must only be effected when the motor is switched off!

Acoustic hood

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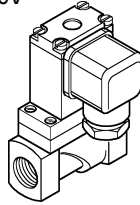
Start-up unloading device / general



Start-up unloading device DN 50

Technical standard data:

open at zero current
 220V - 240V
 50 c/s
 IP 65
 8 W



DN 50

- At DN 50 a solenoid valve offers the possibility to start in unloaded condition .
- The closing time is determined by the voltage application. If voltage is applied to, the valve closes immediately.
- **Star-delta connection:** The valve must close after the change from „star to delta“ only.
- **Pole change:** In case of “Star-double-star start-up” the solenoid valve is to be connected so that it opens prior to switchover to high speed and closes after high speed has been reached.

Start-up unloading device DN 80-400

- The necessary closing time is to be set as follows:
- In view to acoustic hoods the outlet silencer is to be disassembled depending on the unit design.
- Upon delivery the maximum closing time is adjusted.
- The start-up unloading device may only completely close after switchover from star to delta and after nominal speed has been reached.
- The closing process can be noticed by hearing and can also be seen due to the discharge pressure gauge.
- If necessary change adjustment, in order to receive optimum closing time:
 The closing time is to be set by loosening the counter nut (10) and moving the spindle (8):

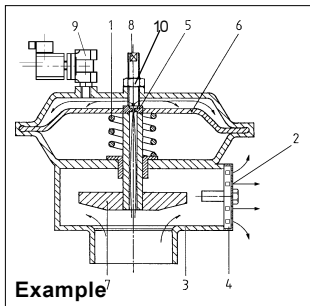
- spindle (8) clockwise closing time is decreased
- spindle (8) anticlockwise closing time is increased

Following the adjustment, tighten counter nut (10).

- Following the adjustment, all loosened and disassembled component parts are to be fastened properly.

Pole-changing

- The start-up unloading device is to be set to operation with „lower speed“ and acc. to steps 1 - 5 in case of star/delta-drive.
- **Closing time:**
 Regarding pole-changing motors the closing time is to be set in the lower speed range as long as possible, so that in case of higher speed an acceptably long closing period can be still obtained.
- If this is not possible due to the high conveying quantity, or is high speed started from the low speed of the “Star-double-star start-up”, an additional solenoid valve is used.
- The solenoid valve (9) keeps the start-up unloading device open at „high speed“ in case of direct run-up.
- In case of „Star-double-star start-up“ the solenoid valve is connected so that it opens prior to switchover to high speed and closes after high speed has been reached.



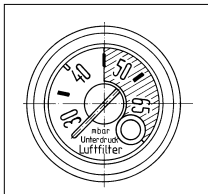
Example

- 1 spring
- 2 blow-off opening
- 3 housing
- 4 protection grid
- 5 hollow spindle with nozzle
- 6 diaphragm
- 7 valve
- 8 spindle
- 9 solenoid valve
- 10 counter nut

Technical standard data

close at zero current
 230 V
 50 Hz
 IP 65
 8 W

Accessories no. 3 : Maintenance indicator



- The maintenance indicator indicates the contamination degree of the intake filter.
- At -45 mbar / red field the intake filter is to be cleaned resp. exchanged.
- After exchange or cleaning of the filter, the indicator is to be reset into normal position by pressing the reset button.

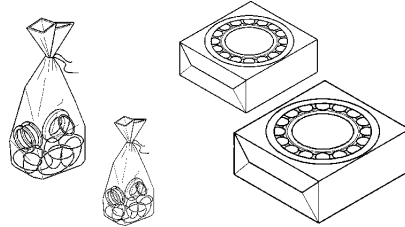
12. Overview of spare parts

Spare parts for blower sizes GM 3S up to GM 400L

First-rated parts

Are to be replaced at each disassembly and therefore these parts must always be available.

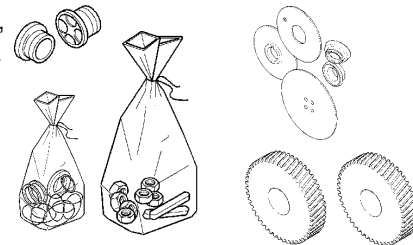
The package includes: bearings, seal rings, bushing sleeves, adjusting elements and repair instruction.



Second-rated parts

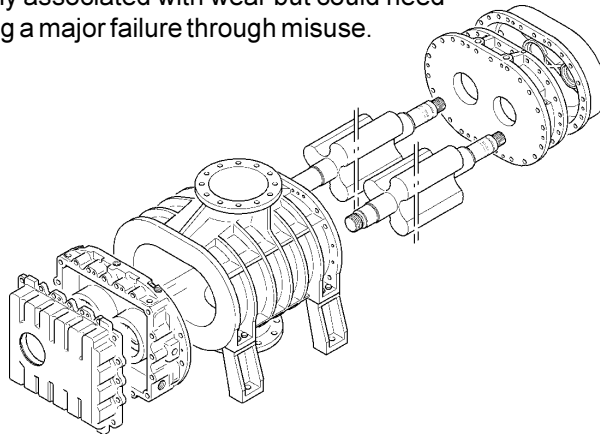
Are replaced at disassemblies depending on their condition.

They should also be available. The package includes: gear wheels, fittingkeys, seal rings, oil level indicators, nuts, bushes, retainers, oil splashers and oil throwers.



Third-rated parts

Are parts not normally associated with wear but could need replacement following a major failure through misuse.



Spare parts and accessories

We expressly draw your attention to the fact that replacement parts and accessories not supplied by us are not tested and approved by us. The integration or installation, as well as the use of such products can, under certain circumstances, alter the original design characteristics of the equipment. We exempt ourselves from any liability for damages resulting from the use of parts and accessories not supplied by us.

13. Recycling / Disposal



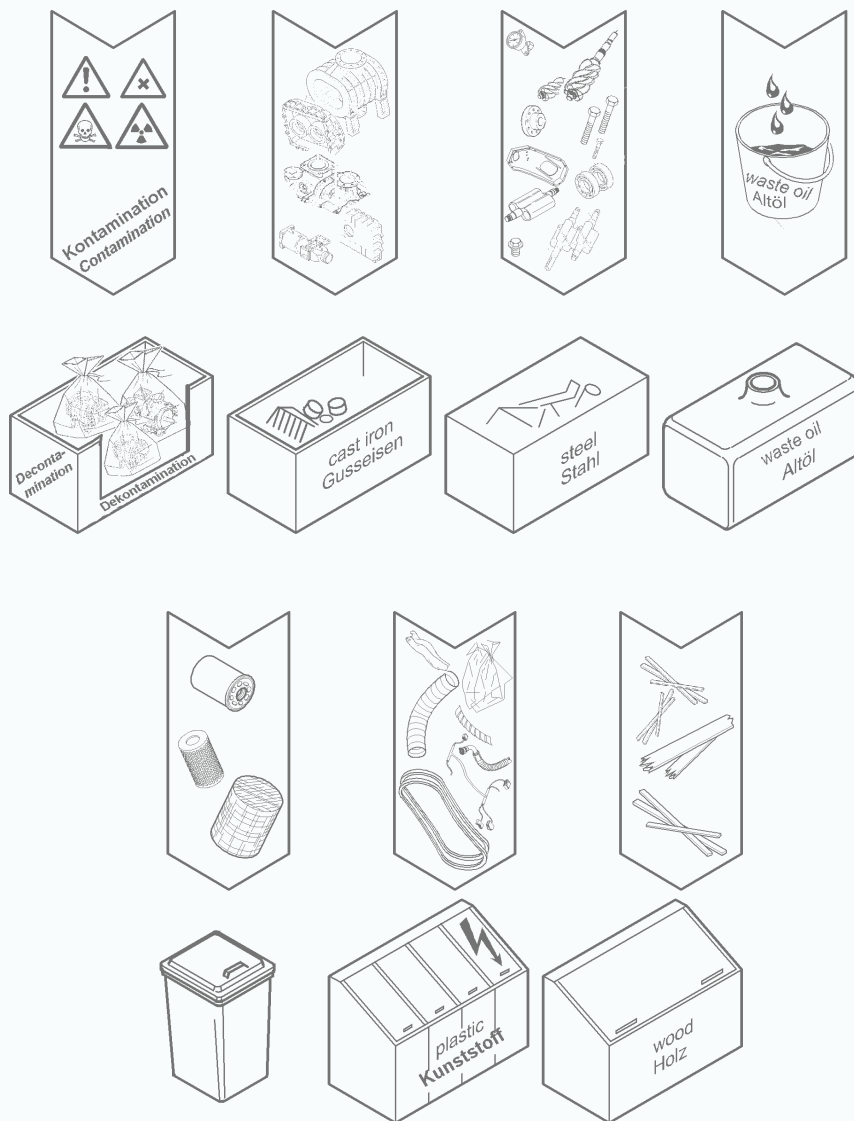
- ⇒ All waste products are to be disposed of or treated not harmful to the environment.
- ⇒ Used lubricants are to be disposed of properly.
- ⇒ Contaminated components and auxiliary material are to be packed and decontaminated.

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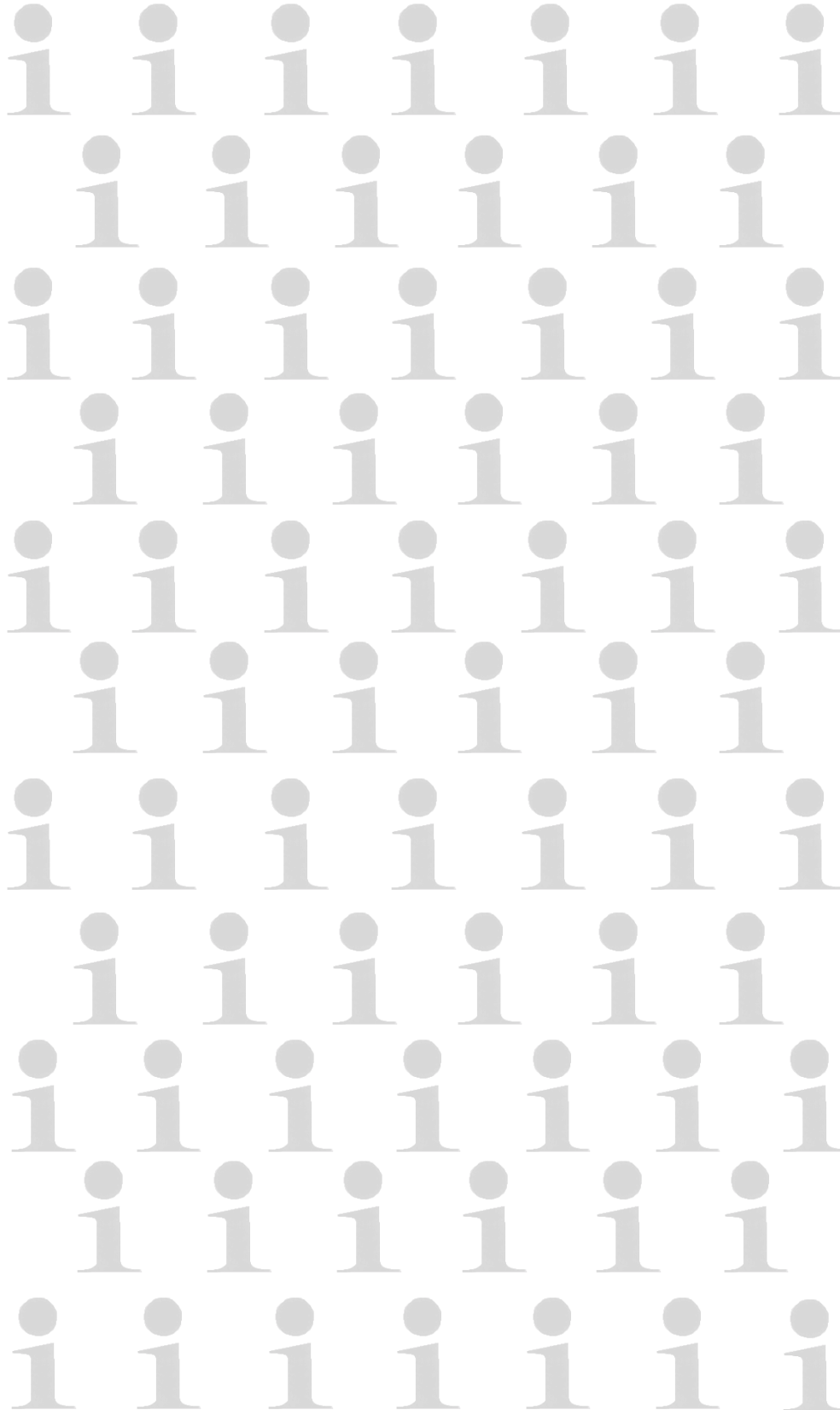


Recycling

Entsorgung




14. Information sheet



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Gegenüber Darstellungen und Angaben dieser Betriebsanleitung sind technische Änderungen,
die zur Verbesserung der Kompressoren notwendig werden, vorbehalten.

This operating- and installation manual is subject to engineering changes necessary for the compressor advancement.

Nous nous réservons le droit dans les instructions de service procéder à toutes modifications techniques utiles visant à améliorer la qualité des compresseurs.
Wat de betreft de tekeningen en gegevens in deze bedienings- en opstellings-handleiding verbetering van de schroefcompressor noodzakelijk worden, voorbehouden.

Nos reservamos el derecho de efectuar, frente a las representaciones e indicaciones de esta
instrucciones de montaje servicio modificaciones técnicas necesarias para perfeccionar.

Rispetto all'illustrazione ed alle indicazioni di questa Istruzioni di Esercizio ci si riserva quelle modifiche tecniche che sono necessarie per migliorare i compressori.