

**PREVIERO**

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V1060 / 2010**CARBONLITE****37**

**MANUALE USO E MANUTENZIONE
USE AND MAINTENANCE MANUAL
MANUEL USAGE ET ENTRETIEN
VERWENDUNGS UND INSTANDHALTUNGSHANBUCH
MANUAL PARA EL USO Y MANUTENCION**

ITEM	Matricola - Serial - Serie Kennummer - Matricula	Macchina - Machine Maschine - Maquina	Tipo - Type Typ - Tipo
lc0510.00	DCE10/20-132	Centrifuga	DCE 10/20

- Per ogni riferimento ai particolari o ai pezzi di ricambio, citare il numero di matricola sopra riportato
- For any request of items or spare parts mention above machine number.
- Pour chaque repère ou pièces de rechange mentionner le numéro de matricule précité.
- Für jede Ersatz teilanfrage ist es netwendig die entsprechende Matrikel N.ansugben
- En caso de pedido de piezas de repuesto indicar siempre el numero de la maquina y el numero del pedido del trabajo antes expuestos.



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0.1 - Introduzione

0.1 - Introduction



Questo manuale é stato redatto affinché le informazioni in esso contenute vengano utilizzate dal personale predisposto al funzionamento della macchina ed alla sua manutenzione nell'intento principale di prevenzione da uso improprio, sicurezza del personale addetto e sicurezza di persone operanti nella sua area di influenza.

E' fatto obbligo a tutto il personale dell'azienda, che opera nell'impianto dove la macchina é installata, di prendere visione di questo manuale:

- Capi responsabili di impianto (capi area, periti o ingegneri)
- Conduttori di impianto o macchine (capi turno responsabili produzione)
- Manutentori di impianto o macchine (meccanici specializzati, elettricisti)
- Addetti alla lubrificazione (operai qualificati)

ATTENZIONE !!

Il costruttore declina ogni responsabilità su incidenti provocati da improprio uso dell'impianto o della macchina da parte di persone che non abbiano seguito le istruzioni inserite in questo manuale.

This manual has been conceived so that the information given in it are used by the staff operating the machine, with the aim to prevent an improper use and to guarantee the security of the staff itself and of the people operating in its influence area.

All the staff of a firm, operating in the plant where the machine is installed, is compulesed to look over this manual

- Plant directors (section foremen, engineers)
- Machines or plant operators (shift foreman for production)
- Machines or plant maintenance workers (skilled mechanics, electricians)
- Lubrication workers (semiskilled)

WARNING !!

PREVIERO decline all responsibility for accidents caused by and improper use of the plant or of the machine from people not following instructions given by this manual.

«Istruzioni originali»

‘Original instructions’

«Noticeoriginale»

„Originalbetriebsanleitung“

«Manual original»

«Manual original»

«Traduzione delle istruzioni originali»

‘Translation of the original instructions’

«Traduction de la notice originale»

„Übersetzung der

Originalbetriebsanleitung“

«Traducción del manual original».

«Tradução do manual original»

0.2 - Servizi al Cliente

0.2 - Services to the Customer



La ditta PREVIERO é disponibile a fornire su richiesta dell'acquirente i seguenti servizi:

- Assistenza in fase di montaggio
- Assistenza in fase di avviamento
- Istruzione del personale
- Assistenza per la manutenzione
- Assistenza per le riparazioni
- Consulenza per modifiche
- Fornitura di parti di ricambio

Per la richiesta di tali servizi contattare:

PREVIERO N. Srl

Via per Cavolto, 17 - 22040 Anzano del Parco
Como (ITALY)
Tel. 39.31.63491
e-mail sales@previero.it

PREVIERO is available to give, on customer request, the following services:

- Assistance during assembly
- Assistance during start up
- Staff teaching
- Assistance for maintenance
- Assistance for repairs
- Advice for modifications and or revisions
- Supply of spare parts

For the request please call:

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1.1 - Dati tecnici e componenti principali

1.1 - Technical datas and main parts

DATI TECNICI

Potenza (kW) : 132 (150kW 60Hz 480V)

Velocità rotore (R.p.m.) : 1.485

Diametro rotore (Ø mm) : 920

Fori griglia (Ø mm) : 2,5

Superficie griglia (m²) : 4,8

TECHNICAL DATAS

Power (kW) : 132 (150kW 60Hz 480V)

Rotor speed (R.p.m.) : 1.485

Rotor diameter (Ø mm) : 920

Grate holes (Ø mm) : 2,5

Grate surface (m²) : 4,8

COMPONENTI

A - Motore elettrico

B - Trasmissione a cinghie

C - Rotore

D - Palette

E - Griglia

F - Tramoggia scarico acqua

G - Telaio di sostegno

H - Entrata materiale

L - Uscita materiale

M - Uscita acqua

N - Uscita aria

MACHINE PARTS

A - Electric motor

B - Belts transmission

C - Rotor

D - Blades

E - Grate

F - Water discharging hopper

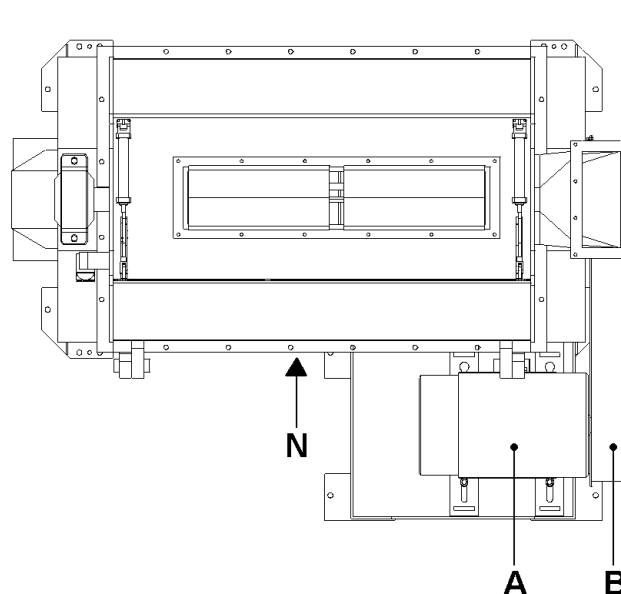
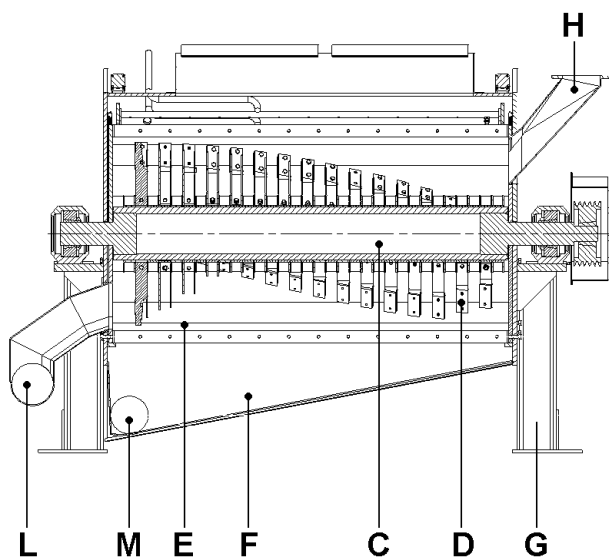
G - Main frame

H - Material inlet

L - Material outlet

M - Water outlet

N - Air outlet



2.1 - Avvertenze generali per la sicurezza

2.1 - General informations for the safety



Le centrifughe accoppiate a motori elettrici sono macchine che presentano parti pericolose in quanto durante il funzionamento esiste il pericolo di contatti con parti in movimento che risultino non protette, pertanto:

- un uso improprio
- la rimozione delle protezioni
- la carenza di ispezioni e manutenzioni

possono causare gravi danni a persone e cose.

Il responsabile della sicurezza deve perciò assicurarsi e garantire che:

- la macchina sia movimentata, installata, messa in servizio, gestita, ispezionata, mantenuta e riparata, esclusivamente da personale qualificato, che quindi dovrà possedere:
- specifica formazione tecnica ed esperienza
- conoscenza delle Norme tecniche e delle leggi applicabili
- conoscenza delle prescrizioni generali di sicurezza nazionali; locali e dell'impianto
- capacità di riconoscere ed evitare ogni possibile pericolo.

Le centrifughe a cui si riferiscono le istruzioni, sono componenti destinati ad operare in aree industriali (macchine/impianti) e quindi non possono essere trattati come prodotti per vendita al minuto. La presente documentazione riporta pertanto le informazioni atte ad essere utilizzate solo da personale qualificato.

Esse devono essere integrate dalle disposizioni legislative e dalle norme Tecniche vigenti e non sostituiscono alcuna norma di impianto ed eventuali prescrizioni aggiuntive, anche non legislative, emanate comunque ai fini della sicurezza.

Centrifuges have dangerous parts: when operating they have live and rotating components. Therefore:

- improper use
- disconnection of protection devices
- inadequate inspection and maintenance can result in severe personal injury or property damage

The person responsible for safety must therefore ensure that:

- the machine is transported, installed, operated, maintained and repaired by qualified personnel only, that must have:
- specific training and experience
- knowledge of applicable standards and laws
- knowledge of the general safety regulations, national and local codes and plants requirements
- the skill to recognise and avoid possible danger.

Centrifuges which are the subject of these instructions are components designed for use in industrial areas (machines / plants) and therefore cannot be treated as retail goods. This documentation consequently contains information that is only suitable for use by qualified personnel.

It must be used in compliance with the regulations, laws and technical Standards in force and cannot under any circumstances take the place of plant stand or additional prescriptions, including any which are not legally enforceable, which have been issued for with the scope of ensuring safety.

2.2 - Funzione della macchina

2.2 - Function of the machine



La macchina é stata costruita per centrifugare il materiale avente le seguenti caratteristiche:

Prodotto : PE - PET - HDPE - LDPE - LLDPE
(depolverato)

Forma : SCAGLIE

Dimensioni : Ø25 mm MAX

Machine has been built to centrifuge materials having the following specifications :

Product : PE - PET - HDPE - LDPE - LLDPE
(without dust)

Shape : FLAKES

Dimensions : Ø25 mm MAX

ATTENZIONE

Evitare il funzionamento con altro tipo di materiale senza avvisare prima la ditta PREVIERO per evitare danneggiamenti alle apparecchiature.

Avvisare il personale addetto sulle operazioni di manutenzione da eseguire per un corretto funzionamento della macchina.

ATTENTION !!

Do not attempt to process material having different characteristics without first consulting PREVIERO to prevent damaging the equipment.

Inform all the persons about maintenance operations to be done for a correct operation of the machine.

2.3 - Utilizzi della macchina in atmosfera esplosiva

2.3 - Use of machine in explosive atmosphere



- La macchina non è stata progettata in conformità ai requisiti minimi previsti dalle direttive 94/9/CE (ATEX), DPR n. 26 del 23 marzo 1998.

- Di conseguenza, tale macchina non è utilizzabile in un ambiente lavorativo in cui sia possibile la formazione di atmosfera esplosiva.

La macchina non deve essere utilizzata per la lavorazione di materiali che possono produrre atmosfere potenzialmente esplosive .

- The machine has not been designed in compliance with the minimum requirements foreseen from the directives 94/9/CE (ATEX), DPR n. 26 dated 23 march 1998.

- Therefore such machine cannot be used in a working environment where there could be the possibility of the formation of explosive atmosphere.

The machine must not be used for the working of materials that can produce potentially explosive atmosphere.

3.1 - Note generali di trasporto

3.1 - General notes for the transport



IMBALLO

La scelta delle soluzioni dei tipi di imballaggi dipende dalla distanza del trasporto, dalle prescrizioni del cliente e dai tempi di giacenza della macchina dentro l'imballo.

La macchina può essere trasportata:

- Sfusa, fissata al pianale dell'autocarro con cunei e cavi
- Disassemblata in container
- Imballata in cassa di legno + imballo barriera (se via mare o stoccaggio prolungato in climi particolarmente umidi o freddi).

ATTENZIONE !!

Le operazioni di scarico, trasporto nell'area di lavoro della macchina e disimballaggio devono essere fatte da personale qualificato abilitato per tali lavori:

- Carrellisti
- Gruisti
- Imbragatori

- Compensare lo sbilanciamento geometrico della macchina facendo variare la lunghezza delle cinghie di sollevamento.
- Accertarsi che la portata del pavimento sia idonea al peso della macchina.
- E' assolutamente vietato passare sotto il carico o in prossimità di esso durante le operazioni di sollevamento.
- Allontanare corpo e mani quando la macchina viene abbassata.

PACKING

The choice of the specific packing depends on the transportation distance, on customers provisions and on the machine lay over within the packing itself.

Machine can be transported:

- In bulk, simply fixed to the flatcar through wedges and wires.
- In containers
- packing (if shipped on sea or for a prolonged lay over under cold or wet conditions).

WARNING !!

Unloading, transportation to the machine operating area and unpacking operations should be carried out by qualified trained personnel only:

- Truck operators
- Crane operators
- Slingers

- Compensate the machine geometric unbalance adjusting the lifting belts length.
- Check that the floor capacity load complies with the machine weight.
- It is absolutely forbidden to walk under the lifted load or nearby during the lifting operations.
- Keep hands and body away when the machine is lowered.

3.2 - Inattività prolungata

3.2 - Prolonged down time

Se la macchina dovrà rimanere per lungo tempo inattiva dal momento della consegna a quello della messa in marcia compreso il trasporto e lo stoccaggio, dovrà essere protetta con speciali liquidi protettivi, (solo sulle superfici non verniciate o trattate), che dovranno essere rimossi prima dell'avviamento.

If the case of a long machine down time from the delivery to the real start-up, including transportation and storage time periods, the machine should be protected with special protection liquids (on unpainted or previously treated surfaces only) which should be removed before start-up.



3.2 - Inattività prolungata e Sistema di sollevamento

3.2 - Prolonged down time and Machine lifting system

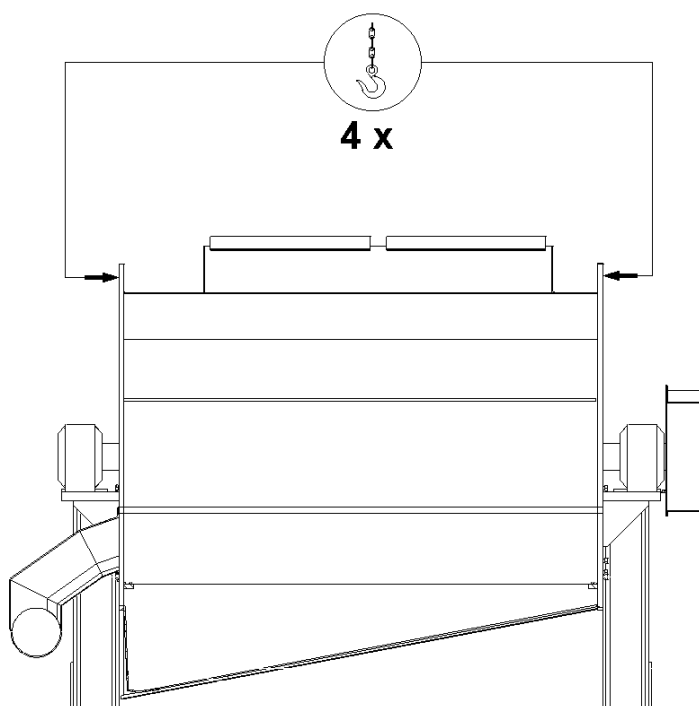


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Sistema di sollevamento

Lifting system



peso con motore 7500 kg
peso senza motore 6000 kg

weight with motor 7500 kg
weight without motor 6000 kg

3.4 - Demolizione e smaltimento

3.4 - Disposal and recycling

ATTENZIONE: La demolizione della macchina deve essere effettuata da un Tecnico Qualificato.

NOTA: Essendo in vigore una differente modalità di demolizione nei vari Stati, si devono osservare le prescrizioni imposte dalle leggi e regolamenti dagli Enti preposti dai paesi stessi.

La macchina va trasportata in luogo idoneo ad effettuare lo smontaggio delle sue parti. Prima dell'intervento svuotare le parti contenenti fluidi (riduttori, centraline idrauliche, silos, ecc..). Stocarli in recipienti idonei e suddivisi per tipo.

Eseguire lo smontaggio del gruppo in tutte le sue parti, facendo molta attenzione ad eseguire le operazioni su componenti pesanti.

Dividere e stoccare le differenti tipologie di materiali per avviarli alla raccolta differenziata per lo smaltimento dei rifiuti.

Non tentare di riutilizzare parti o componenti che apparentemente possono sembrare ancora integri una volta che essi, a seguito di controlli e verifiche e/o sostituzioni condotte da personale specializzato, sono stati dichiarati non più idonei.

WARNING: Disposal must be carried out by a Qualified Technician.

NOTE: As different methods of disposal are required in different countries, you must comply with the requirements provided for by the laws and regulations provided for by the Institutions in charge in each country.

The machine must be transported to a suitable place for the dismantling of its various parts. Before starting work, make sure the parts with liquids have been emptied (gearbox, hydraulic power pack, silos, etc..). Store these in suitable containers separated by type.

Dismantle all the various parts of the unit, taking extreme care with the heavy parts.

Separate and store the different types of materials so they can be sent for waste recycling or disposal.

Do not attempt to re-use parts or components which appear to be in good condition after they have been checked and/or replaced by qualified personnel and declared unsuitable for use.

4.1 - Fissaggio della macchina con tiranti di fondazione

4.1 - Machine clamping with expansion bolts

- Segnare a terra la posizione degli assi della macchina
- Piazzare la macchina sul punto prefissato
- Ricavare nel pavimento i fori di inserimento dei tasselli ad espansione.
- Dopo il piazzamento verificare, con una bolla il livellamento della macchina e correggere eventuali differenze inserendo spessori tra i piatti di appoggio della macchina e il pavimento.
- Inserire i tasselli ad espansione e serrare completamente i dadi di bloccaggio fino al completo fissaggio della macchina.
- Dopo il serraggio verificare ancora una volta il livellamento della macchina ed eventualmente ripetere lo spessoramento delle piastre di appoggio.

Effettuare l'installazione seguendo le indicazioni del costruttore e nel rispetto delle norme di sicurezza.

Una errata installazione può causare danni alle persone o a cose per le quali la ditta costruttrice non può essere considerata responsabile.

- Mark on the ground the position of the machine axis.
- Place the machine on the final point.
- Make, with a drilling machine, the expansion bolts holes.
- After the placement check the machine leveling and rectify the differences with thickness between machine and ground.
- Insert the expansion bolts and tighten nuts until the complete coupling of machine.
- After the coupling recheck the machine leveling and if necessary insert a new thickness.

Carry out installation according to the manufacturer's indications, respecting all safety precautions and regulations.

Incorrect installation may result in damage to persons or goods, for which the Manufacturer will accept no responsibility.

4.3 - Installazione centralina (Prima messa in servizio)

4.3 - Hydraulic unit installation (First installation)

OLIO IDRAULICO

- Nei circuiti oleodinamici l'olio è il mezzo che trasmette la potenza e nello stesso tempo lubrifica gli apparecchi.
- Per una buona conservazione dell'impianto è importante che sia di qualità, con elevato indice di viscosità e con additivi antischiuma e antiossidanti.

PRIMA MESSA IN SERVIZIO

- Controllare che tutte le apparecchiature siano correttamente installate e che le tubazioni siano adeguatamente staffate per evitare vibrazioni e che il relativo montaggio non sia di ostacolo all'accessibilità alle apparecchiature.
- Accertarsi presso il personale che ha eseguito il montaggio dell'impianto che siano state eseguite tutte le operazioni di pulizia previste (es. decapaggi e/o lavaggio).
- Accertarsi che tutti i collegamenti elettrici delle apparecchiature di controllo, comando e potenza siano stati cablati correttamente secondo le normative vigenti.

RIEMPIMENTO SERBATOIO

- E' consigliato eseguire il riempimento del serbatoio utilizzando gruppi di travaso muniti di filtro idoneo.
- Rispettare il livello massimo verificando con l'indicatore di livello visivo.

HYDRAULIC OIL

- In hydraulic circuits the oil is the means that transmits power and simultaneously lubricates machine parts.
- For proper maintenance of the system, it is important to use good quality oil at high viscosity index containing antifoaming and antioxidant additives.

STARTING SEQUENCE

- Make sure that all machine parts have been properly installed and that the pipes are adequately secured to prevent vibrations. Ensure that the assembly does not block access to machine parts.
- Check with the employees who assembled the system to make sure that all required cleaning operations such as pickling and/or cleaning have been done
- Ensure that all electrical connections of control and power equipment have been properly wired according to current regulations.

TANK FILLING

- We recommend that the tank is filled by using transfer units furnished with a suitable filter.
- Keep an eye on the level gauge to not fill pass the maximum level.

4.3 - Installazione centralina (Avviamento pompa)

4.3 - Hydraulic unit installation (Pump priming)

AVVIAMENTO DELLA POMPA

- Controllare che il senso di rotazione del motore coincida con quello della targhetta
- Invasare il corpo della pompa con il fluido impiegato nel circuito, eventualmente attraverso il condotto di mandata o di drenaggio (solo in caso di esterne a pistoni o palette a portata variabile).
- Tarare l'eventuale valvola di massima pressione, posta sul condotto mandata al valore minimo; infatti le pompe devono essere avviate, se possibile, a vuoto;
- Avviare il motore elettrico ad impulsi per favorire l'adescamento della pompa che viene evidenziato dal cambiamento di rumore della stessa che, adescata, diventa più silenziosa;
- Se dopo alcuni tentativi la pompa non eroga ancora è bene fermarla per non danneggiarla e verificare le caratteristiche, il livello dell'olio ed eventuali ostruzioni in aspirazione ed il senso di rotazione.

PUMP PRIMING

- Make sure that the motor rotates in the direction shown on the plate
- Fill pump casing with the fluid used in the circuit, possibly through the delivery pipe or drain pipe (only in case of external piston pumps or vane pumps with variable displacement);
- It may be necessary to set the maximum pressure valve located on the delivery pipe to minimum. If possible, pumps should always be started vacuum.
- Start the electric pulse motor to start priming of the pump which is signalled by a different noise. When the pump is primed it makes less noise.
- If the pump does not deliver after a few attempts, it is better to stop it to avoid causing any damage. Check the characteristics and oil level, make sure there is nothing blocking the suction and check the rotation direction.



4.3 - Installazione centralina (Verifiche generali)

4.3 - Hydraulic unit installation (General inspections)

RIEMPIMENTO DELL'IMPIANTO

- Durante il riempimento dell'impianto spurgare tutta l'aria presente in circuito. La sua presenza è infatti causa di malfunzionamento ed usura accelerata. Generalmente l'aria viene espulsa automaticamente dopo un certo numero di azionamenti a vuoto.
- In casi particolari, bisogna aprire tutti i rubinetti previsti per lo spurgo o allentare i raccordi nelle parti più alte dell'impianto.
- Spurgare i cilindri attraverso l'apposita valvola se prevista sulla testata, oppure allentando il raccordo d'attacco.

VERIFICHE GENERALI

- Nelle prime ore di funzionamento è opportuno verificare con attenzione il livello del fluido e determinare eventuali punti di fuga (controllare in particolare i tubi flessibili) e cambiare le cartucce dei filtri.
- E' pure opportuno rieffettuare la regolazione delle valvole in funzione delle condizioni reali d'esercizio in modo da ottimizzarle.

ISTRUZIONI PER LA SICUREZZA

- Se per ragioni di verifica o di manutenzione bisogna smontare delle apparecchiature, è necessario togliere pressione all'impianto, scaricare eventuali accumulatori e verificare la temperatura dell'olio: ciò evita di avere getti d'olio in pressione ed in temperatura.
- Non operare sulle parti sotto tensione.

FILLING OF THE PLANT

- Eliminate all the air from inside the circuit while filling the system. Any air contained can cause malfunction and accelerated wear. The air is generally bled automatically after a certain number of vacuum operations.
- In special cases, it will be necessary to open all taps provided for bleeding and loosen the unions in the upper part of the system.
- Bleed the cylinders through the special valve if provided on the head, or by loosening the connecting union.

GENERAL INSPECTIONS

- During the first hours of operation, it is recommended to carefully inspect the fluid level, locate any leaks (check all flexible pipes), and replace filter cartridges.
- We also recommend that valves are optimized by regulating them according to real operative conditions.

SAFETY INSTRUCTIONS

- If the system has to be dismantled for inspection or maintenance, it is necessary to cut off the pressure, discharge any accumulators and check the oil temperature. This is to prevent pressurized, hot oil sprays.
- Do no work on live parts.



4.3 - Componenti centralina 1,5 kW 1L

4.3 - 1,5 kW 1L Hydraulic unit parts

A - Posizione leva per apertura

B - Posizione leva per chiusura

C - Manometro

D - Vite di taratura

E - Dado di bloccaggio

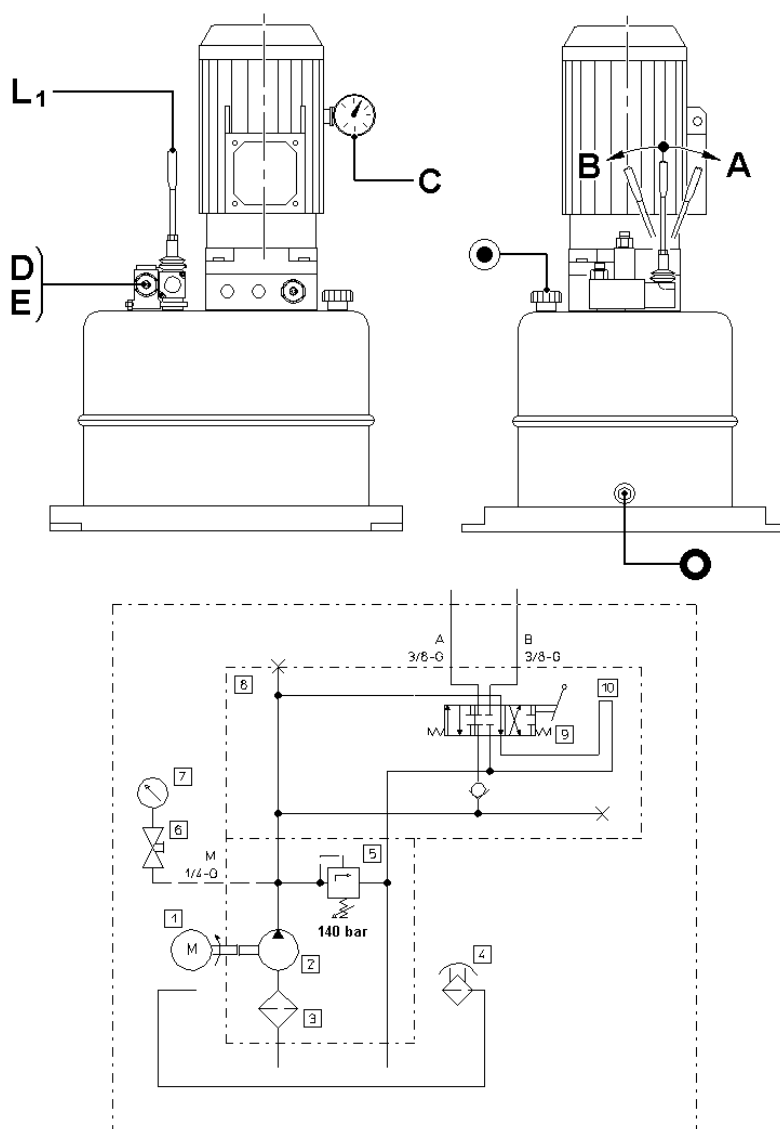
A - Lever position for opening

B - Lever position for closing

C - Manometer

D - Adjusting screw

E - Blocking nut



5.1 - Controlli primo avviamento

5.1 - First start-up controls



COMPONENTI ELETTRICHE

- Verificare la compatibilità della rete elettrica di alimentazione.
- Verificare la taratura delle protezioni termiche dei motori.
- Verificare il serraggio delle coperture di sicurezza.
- Verificare il corretto collegamento dei motori elettrici.
- Verificare il senso della rotazione dei motori elettrici.
- Test unità di emergenza.

COMPONENTI MECCANICHE

- Verificare il livellamento della macchina.
- Verificare il bloccaggio della macchina.
- Verificare la lubrificazione dei cuscinetti.
- Verificare l'assenza di corpi estranei all'interno della carcassa.
- Ruotare a mano la girante della centrifuga per verificare che la rotazione avvenga senza impedimenti.
- Controllare che il punto di arrivo della tubazione di mandata sia libero da ostruzioni che potrebbero impedire il flusso del fluido.
- Controllare il serraggio delle flange di collegamento alle tubazioni e la presenza delle guarnizioni tra flangia e controflangia.
- Controllare l'allineamento e la tensione delle cinghie di trasmissione come indicato nel capitolo manutenzione.

ELECTRIC PARTS

- Check the electric network compatibility .
- Check the right setting of the thermal protection of motors
- Check of safety protection connexion
- Electric motor connection control.
- Verification of the rotation direction of electric motors .
- Emergency unit test.

MECHANICAL PARTS

- Check the machine leveling.
- Foundation tie rods blocking control.
- Control of bearing lubrication.
- Check the absence of foreign bodies in the wheel box.
- Manually swing the centrifuge impeller, inspecting the inner casing.
- Make sure the impeller rotates without hindrance.
- Make sure that the end of the delivery pipe is free from obstructions, which could prevent the fluid flow from circulating freely.
- Make sure connection flanges are well clamped to pipes and check the presence of gaskets between flange and counterflange.
- Check alignment and tension of drive belts, as indicated in the maintenance program.

6.1 - Avviamento a vuoto

6.1 - Idle start

PREMESSA

Prima di avviare la macchina senza materiale assicurarsi di:

- Avere effettuato tutti i controlli previsti per il primo avviamento.
- Avere controllato il collegamento a quadro dei dispositivi di sicurezza elettrici.

La messa in marcia, l'arresto e la gestione della macchina, sono gestiti dal quadro elettrico principale.

AVVIAMENTO

- Dare tensione al quadro elettrico principale e verificare la presenza di tensione.
- Inserire i circuiti ausiliari e verificare la presenza di tensione.
- Bloccare con il corrispondente selettore sul quadro elettrico i finecorsa della macchina.
- Per la messa in marcia premere il corrispondente pulsante di marcia sul quadro elettrico di comando.

DURANTE LA MARCIA

- Controllare che non avvenga un surriscaldamento del motore indicato dall'allarme a quadro elettrico.
- Verificare che la macchina non produca rumori anomali durante il funzionamento.

PREMISE

Before proceeding to the starting without material make sure:

- You have made all the controls foreseen for the first starting
- You have checked the connection to the panel of the electric safety devices.

The starting, the stop and the running of the machine are carried out by the main control panel.

START

- Give tension to the main control panel and check the presence of tension.
- Insert the auxiliary circuits and check the presence of tension.
- Select on control panel the blocking of safety electromagnetical interlocking device.
- To start the machine push the corresponding push-button on the control panel.

DURING RUNNING

- Check that an overheating of the motors is not in relief by the alarm on control panel.
- Check the absence of unusual or loud noise during running.

6.1 - Avviamento a vuoto (Istruzioni per l'arresto)

6.1 - Idle start (Instructions for the stop)



ARRESTO DELLA MACCHINA

Per l'arresto in emergenza premere sul pulsante a fungo installato sul quadro di comando.

Per il riavvio della macchina dopo un arresto di emergenza disimpegnare il fungo di emergenza con la rispettiva chiave, inserire i circuiti ausiliari e controllare la presenza di tensione nei circuiti ausiliari.

Per l'arresto della macchina in condizioni normali premere il corrispondente pulsante di arresto installato sul quadro elettrico.

Togliere la tensione al quadro elettrico di comando con l'interruttore generale e verificare che la luce di tensione linea sia spenta.

DOPO L'ARRESTO

- Controllare che non si siano verificati surriscaldamenti dei cuscinetti.
- Controllare eventuali perdite di grasso.

STOP OF THE MACHINE

For the emergency stop of the machine, push on mush-room button placed on the electric panel

For the restarting of machine after an emergency stop, release the mush-room button using the relevant key, insert auxiliaries circuits and check the presence of tension.

For the stop of machine, in normal conditions, push the relevant push button on the electric panel.

Take off the electrical feeding using the main switch and check the absence of tension inside the electric panel.

AFTER THE STOP

- Verify the absence of overheating of the bearings.
- Check that a grease leakage from rotor supports are not verified.

7.1 - Avviamento con materiale

7.1 - Starting with material



AVVIAMENTO

- Ripetere le operazioni elencate nel capitolo sull'avviamento a vuoto della macchina.
- Dopo qualche minuto di attesa per permettere alla macchina di raggiungere il regime operativo, operare sulle macchine a monte nell'impianto per garantire durante il primo avviamento che l'introduzione del materiale sia graduale fino al raggiungimento della quantità contrattuale.

DOPO LA MARCIA CON MATERIALE

- Controllare che non si siano verificati intasamenti.
- Controllare che non si siano verificati surriscaldamenti dei cuscinetti.
- Dopo un certo periodo di lavoro prima di riavviare la macchina controllare che la rotazione della girante non sia ostacolata.

START

- Repeat the operations given for the idle start.
- Wait some minutes in order to reach the operating speed and operate on the machine upstream in order to guarantee the gradual inlet of material until the reachment of the maximum quantity permissible.

AFTER THE TEST WITH MATERIAL

- Check that no clogging are verified.
- Check that a grease leakage from rotor supports are not verified.
- After a certain period of operation and before restarting the machine, make sure the rotation of the impeller is not hindered.

**8.1 - Programma di manutenzione****8.1 - Maintenance program**

Operazione Operation	(ore) (hours) (°)	Codice lubrificante Lubricant code	Note Notes
Lubrificazione supporti rotore Rotor supports greasing	--	(8H)	Vedi istruzioni allegate See annex instructions
Manutenzione motore Motor maintenance	--		Vedi istruzioni allegate See annex instructions
Controllo dispositivi di sicurezza Check of safeties systems	24		
Tensione cinghie (Primo controllo) Belt tension control (Firs control)	48		
Controllo usura griglia Grate wear control	160		
Controllo usura palette Blades wear control	160		
Pulizia griglia Grate cleaning	160		
Tensione cinghie di trasmissione Belt tension control	670		
Sostituzione olio centralina Hydraulic unit oil replacement	4000	(6)	Solo se necessario Only if necessary

(8) SKF - LGHP2	(6) AGIP - OSO 46 BP - ENERGOL HLP46 ESSO - NUTO H46 MOBIL - DTE 25 SHELL - TELLUS OIL 46 TOTAL - AZOLLA ZS 46	(6) AGIP - OSO 68 BP - ENERGOL HLP68 ESSO - NUTO H68 MOBIL - DTE EXCEL 68 SHELL - TELLUS OIL 68 TOTAL - AZOLLA ZS 68
---------------------------	---	---

(8) Sistema di ingrassaggio automatico (8) Automatic lubrication with SKF LGHP2
con SKF LGHP2

8.2 - Controllo usura griglia e palette

8.2 - Blades and grate wear control

- Dare tensione al quadro con l'interruttore principale
- Inserire i circuiti ausiliari
- Inserire le sicurezze (Interblocchi)
- Avviare la centralina oleodinamica.
- Rimuovere i particolari di fissaggio delle parti da ribaltare con la centralina.
- Agire sulla leva corrispondente della centralina oleodinamica per aprire la parte

Per accedere al rotore rimuovere le viti di fissaggio di uno dei quattro settori della griglia e rimuovere la griglia.

- A controlli ultimati, rimontare il settore della griglia, agire sulla leva corrispondente della centralina oleodinamica per chiudere completamente le parti aperte per l'ispezione.
- Bloccare i finecorsa con il selettore a quadro.
- Procedere all'avviamento della macchina.

- Give tension to the control panel by the main switch.
- Insert auxiliary circuits.
- Insert interblocks
- Start hydraulic unit motor.
- Remove screws which fix parts to be turned
- Open parts with the relevant lever on hydraulic unit.

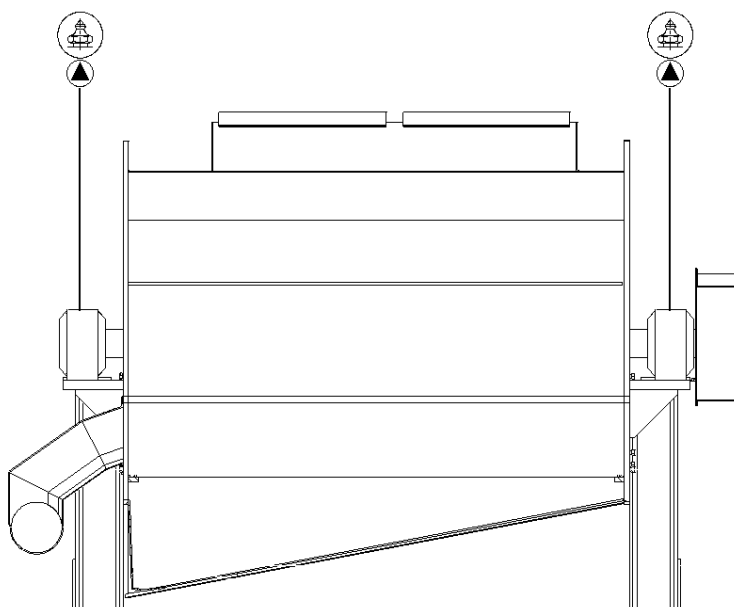
For the access to the rotor, remove screws which fix one of the four sectors of the grate and remove the grate.

- When controls are over, close parts with the relevant lever on hydraulic unit.
- Select on control panel the blocking of Safety electromagnetical interlocking device.
- Start the machine.

8.3 - Lubrificazione

8.3 - Greasing

- La macchina è dotata di un sistema automatico di lubrificazione dei cuscinetti del rotore;
 - Il sistema fornisce automaticamente il grasso necessario immettendolo nei cuscinetti a intervalli programmabili a quadro elettrico;
 - Per maggiori dettagli sulle componenti del sistema, la quantità di lubrificante e la programmazione, vedere le pagine di catalogo al termine di questo manuale.
- Machine is provided with an automatic system of lubrication for rotor bearings;
 - The system automatically give the necessary lubricant introducing him in the bearing supports with main panel programmables intervals;
 - For further details on the components of the system, the quantity of lubricant and the planning of cycle lubrication, see the pages of catalog at the end of this manual.



8.4 - Tensione cinghie di trasmissione

8.4 - Belts tension

- Prima di montare le cinghie di trasmissione sulle pulegge tracciare sul dorso di una di esse due segni di riferimento su un tratto rettilineo che ne renda possibile il controllo dopo il montaggio.
- Tendere in più riprese le cinghie alternando con una rotazione manuale della trasmissione per consentire l'assestamento.
- Ad ogni tensione controllare la distanza fra i due segni, fino a raggiungere un valore di allungamento pari allo 0.8%.
- Dopo le prime 48 ore di funzionamento, controllare la trasmissione ed eventualmente correggerla se le cinghie si sono allungate.
- Before fitting V-belts on the pulleys mark on the back of one of them two reference signs on a straight stretch, so that is possible the control even after assembling.
- Stretch the V-belts many times, alternating with a manual rotation of the transmission to help their settlement.
- At any stretching, check the distance between the two signs till you reach a value of elongation equal to 0.8%.
- After the first 48 Hours of running, check the transmission and eventually correct it if the V-belts have been lengthened.

**9.1 - Inconvenienti e rimedi****9.1 - Trouble shooting****Dalla macchina esce materiale troppo umido.**

Griglia ostruita che non scarica sufficientemente l'acqua.

→ Arrestare la macchina e lavare bene la griglia eventualmente con vapore.

Wet material on outlet.

Clogging of the grate

→ Stop the machine and wash the grate using steam if necessary.

La macchina produce rumori e vibrazioni anormali durante la marcia

Corpi estranei presenti all'interno

→ Ispezione e pulizia interna

Machine makes unusual or loud noise

Foreign objects inside the machine

→ Inspection of the interior and removing of foreign objects

Allentamento dei particolari di fissaggio della macchina

→ Verifica bloccaggio dei tiranti.

Loosening of machine fixing components

→ Check the machine blocking

La macchina gira lentamente e non scarica il materiale

Slittamento delle cinghie di trasmissione

→ Tendere le cinghie

Low speed of the machine.

Sleeding of transmission belts on the pulley.

→ Make the tension of belts.

Macchina ferma

Manca alimentazione elettrica

→ Controllare il circuito di comando

Machine stopped

No electrical feeding

→ Check the position of commands on comand circuit

Premendo il pulsante di marcia la macchina non parte

Intervento degli interruttori di sicurezza posti sulla macchina

→ Verificare la posizione e lo stato degli interruttori di sicurezza e delle parti da essi controllate

After pressing the start push-button the machine does not start.

Operating of safety devices on parts opening.

→ Check the position of safety devices and the opening of parts.

Intervento delle protezioni termiche dei motori

→ Verificare all'interno del quadro elettrico la posizione dei relay termici del motore.

Operation of all the thermic relays of motor protections.

→ Check all the thermic relays of motor protections.

Surriscaldamento dei cuscinetti

Lubrificazione insufficiente

→ Operare la lubrificazione secondo i parametri di quantità e frequenza indicati nella tabella delle operazioni di manutenzioni

Overheating of the bearings

Insufficient greasing

→ Grease the bearings

Surriscaldamento del motore elettrico

Ventilazione del motore ostacolata

→ Pulizia della griglia posteriore del motore elettrico

Overheating of electric motor

Obstruction on motor ventilation

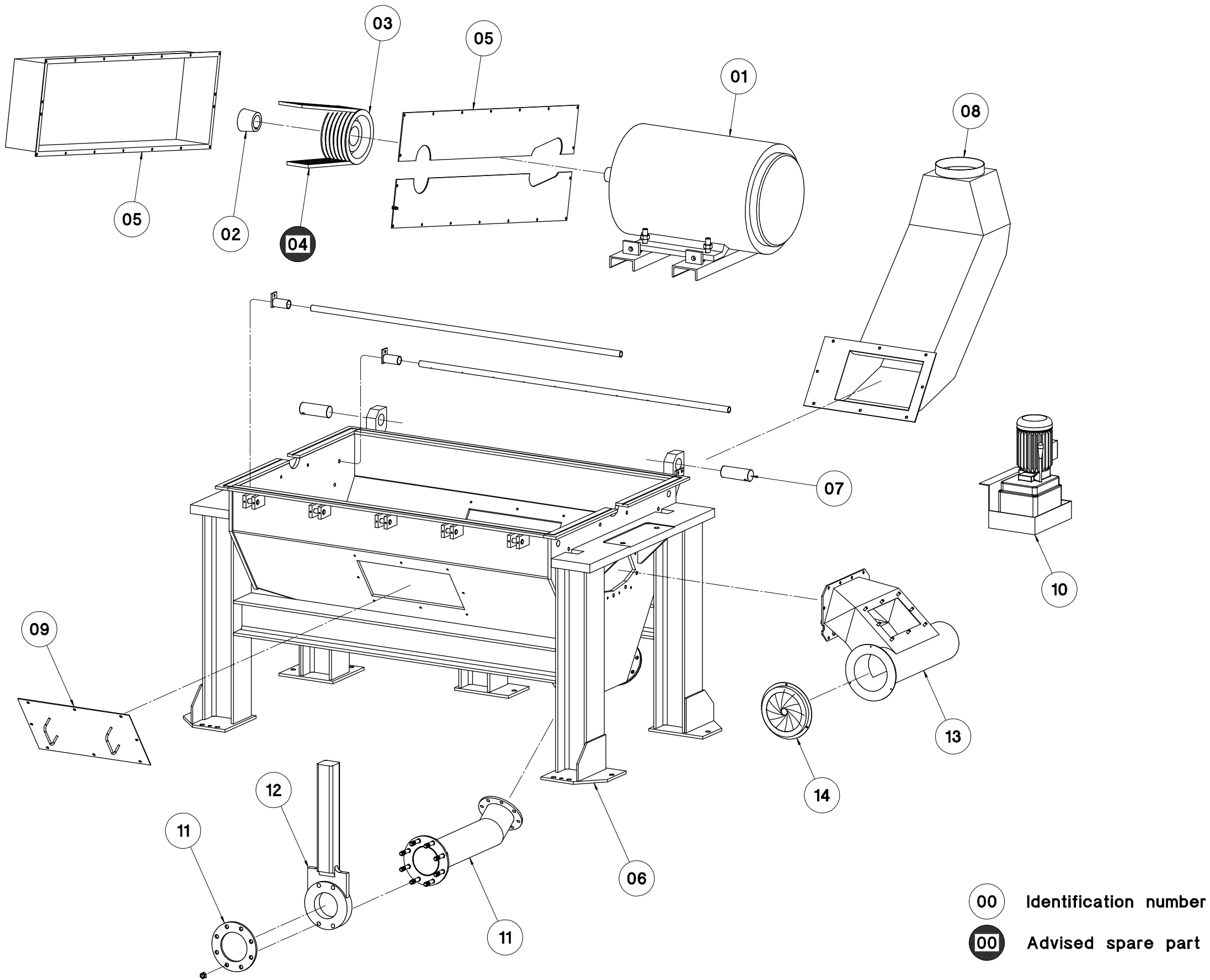
→ Electric motor grate cleaning

10.0 - Disegni e ricambi10.0 - Drawings and spare parts

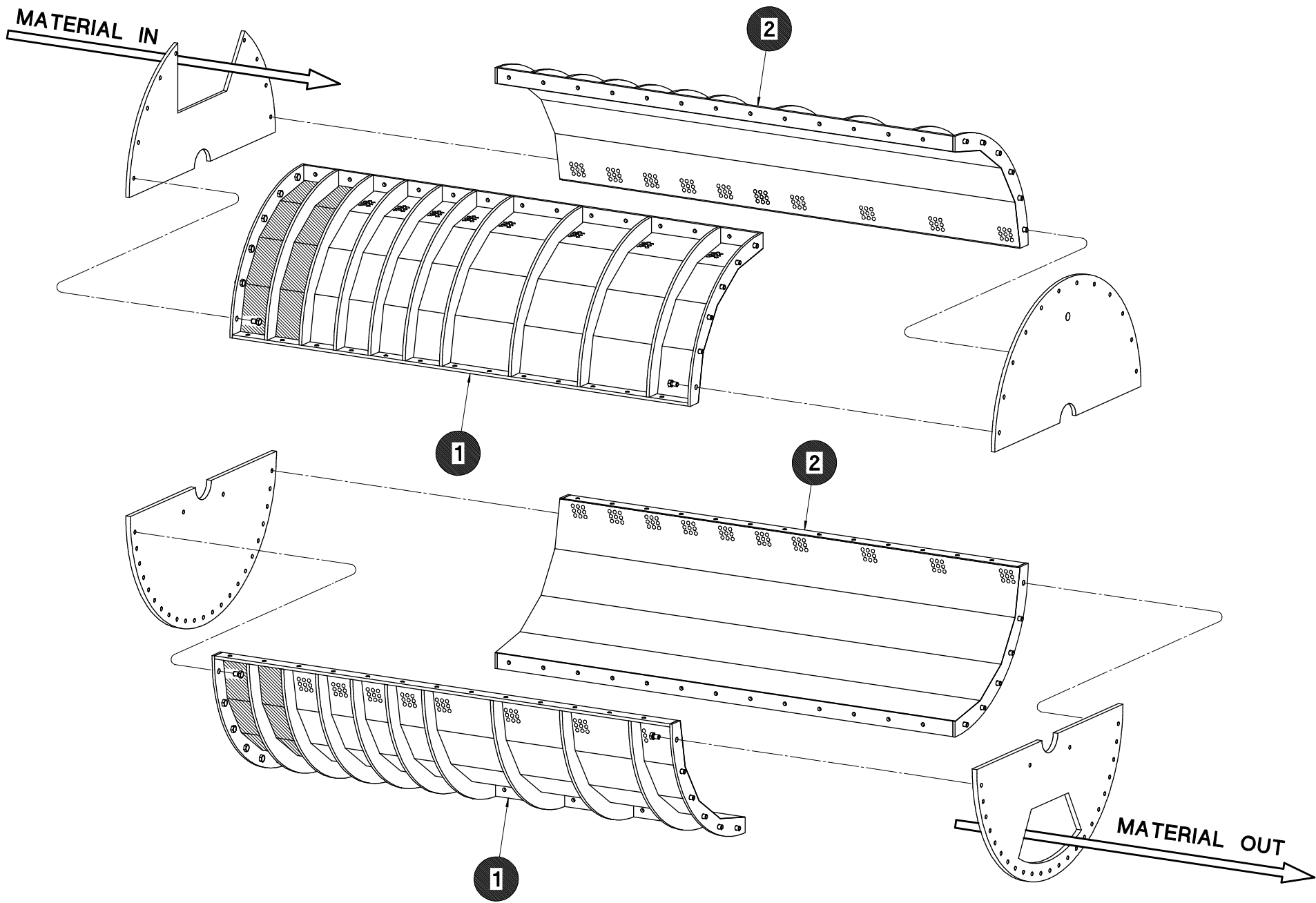
Disegni e ricambi

Drawings and spare parts

Machine	Description	Dwg nr.
DCE 10/20	LOWER PART – DRIVING	030343-07-10-A



Machine	Description	Dwg n°.
DCE 10/20	GRATES	030344-07-10-A



- 00 Identification number
- 00 Advised spare part



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Description

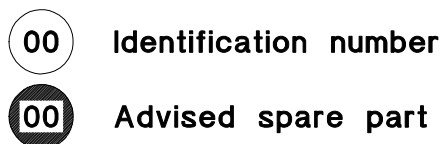
Dwg nr.

Grates

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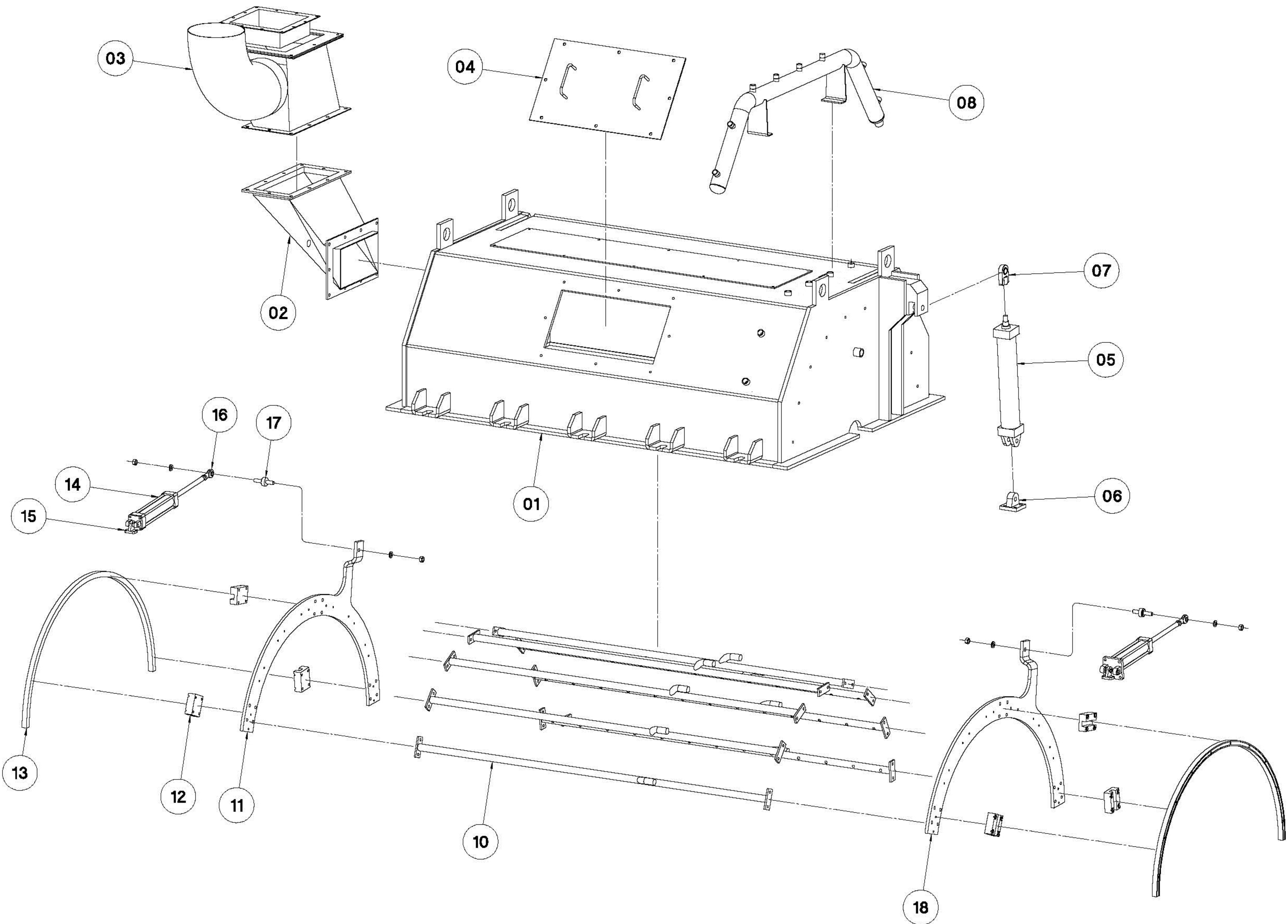
Machine	Description	Dwg nr.
OCE 10/20	Rotor Group	030345-07-10-A

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PREVIERO

Machine	Description	Dwg nr.
DCE 10/20	UPPER PART - CLEANING	030342-07-10-B





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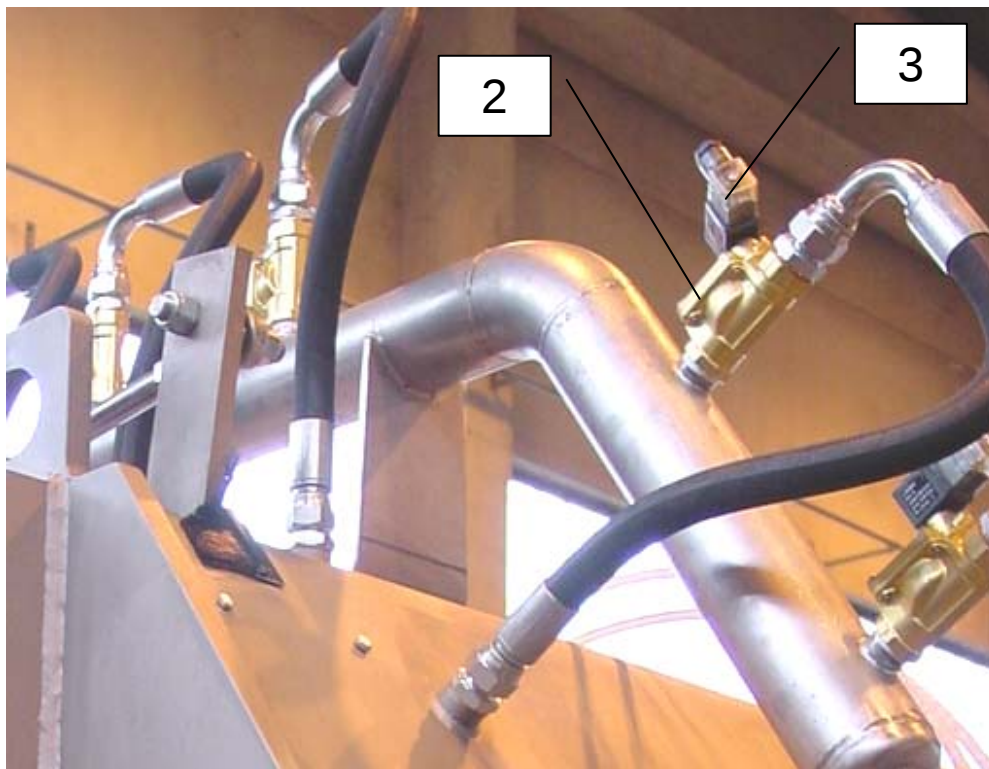


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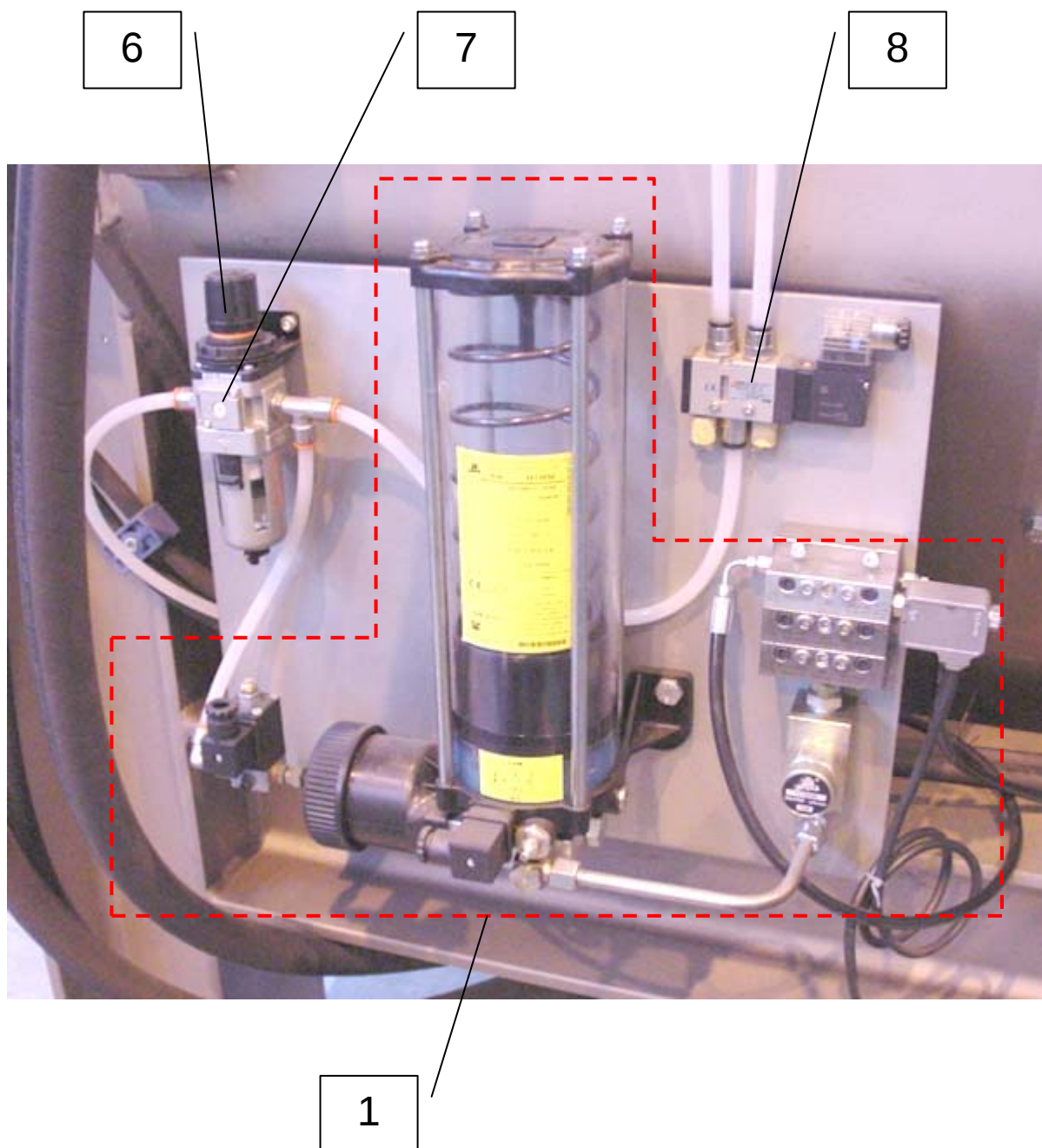


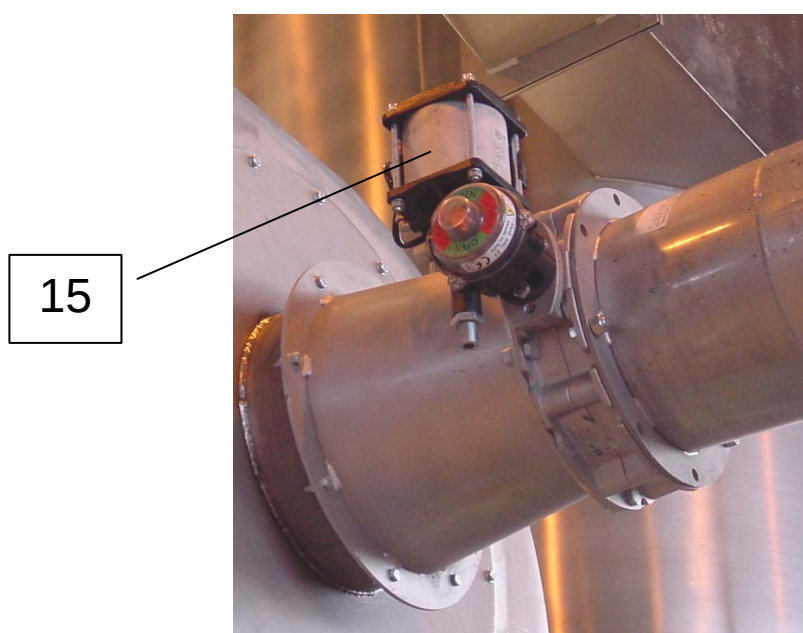
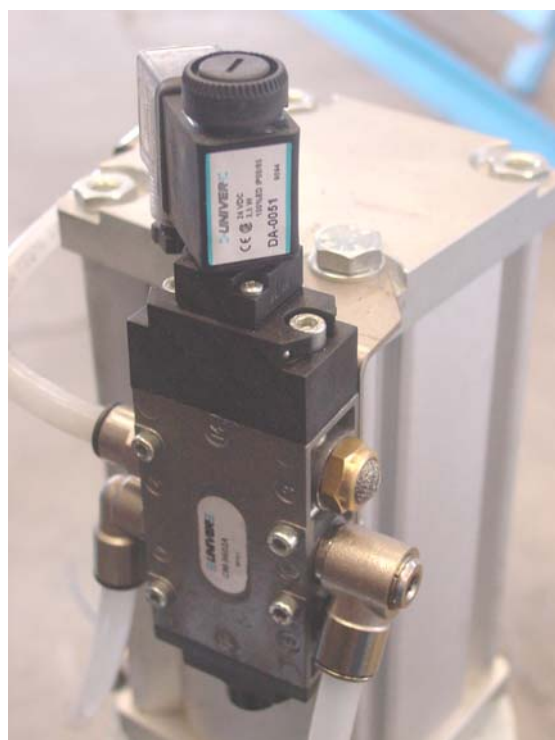
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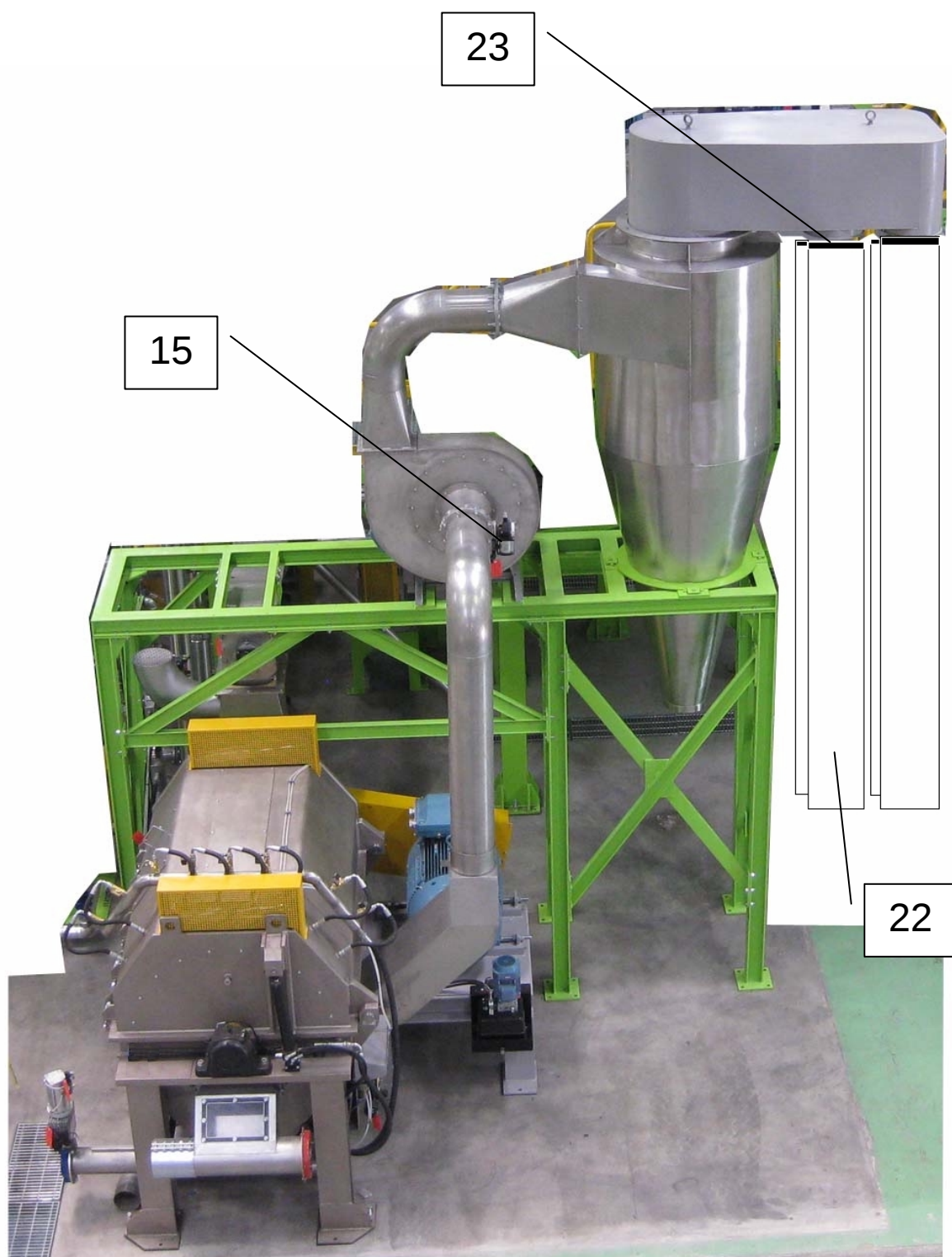


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Machine	Description	Dwg nr.
DCE 10/20	Accessories / Instruments	INS-DCE10-20T

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10.0 - Motore elettrico10.0 - Electric motor

Motore elettrico

Electric motor

Low Voltage Motors

Manual for Low Voltage Motors



- Installation, operation, maintenance and safety manual EN 3
- Montage-, Betriebs-, Wartungs- und Sicherheitsanleitung DE 21
- Manuel d'installation, d'exploitation, de maintenance et de sécurité FR 39
- Manual de instalación, funcionamiento, mantenimiento y seguridad ES 57
- Manuale d'installazione, funzionamento e manutenzione..... IT 75
- Installations-, driftts-, underhålls- och säkerhetsmanual SV 93
- Asennus-, käyttö-, kunnossapito- ja turvallisuusohje FI 111

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www.abb.com/motors&generators >
Motors > Document library

ABB



EC Declaration of Conformity

The Manufacturer: *(Name and address of the manufacturer)*

hereby declares that

The Products: *(Product identification)*

are in conformity with the corresponding essential requirements of following EC directive:

Directive 2006/95/EC (of 12 December 2006).

The motors are in compliance with the following harmonized standard:

EN 60 034-1(2004)

which thus comply with Principal Elements of the Safety Objectives for Electrical Equipement stated in Annex I of said directive.

Note: When installing motors for converter supply applications, additional requirements must be respected regarding the motor as well as the installation, as described in installation manual delivered with converters.

Year of CE marking :

Signed by

Title

Date

Low Voltage Motors

Installation, operation, maintenance and safety manual

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1. Introduction

NOTE!

These instructions must be followed to ensure safe and proper installation, operation and maintenance of the machine. They should be brought to the attention of anyone who installs, operates or maintains the machine or associated equipment. The machine is intended for installation and use by qualified personnel, familiar with health and safety requirements and national legislation. Ignoring these instructions may invalidate all applicable warranties.

1.1 Declaration of Conformity

Declarations of Conformity with respect to the Low voltage Directive 73/23/EEC amended by Directive 93/68 EEC are issued separately with individual machines.

The Declaration of Conformity also satisfies the requirements of a Declaration of Incorporation with respect to the Machinery Directive 98/37/EEC, Art 4.2 Annex II, sub B

1.2 Validity

The instructions are valid for the following ABB electrical machine types, in both motor and generator operation.

series MT*, MXMA,
series M2A*/M3A*, M2B*/M3B*, M4B*, M2C*/M3C*,
M2F*/M3F*, M2L*/M3L*, M2M*/M3M*, M2Q*,
M2R*/M3R*, M2V*/M3V*
in frame sizes 56 - 450.

There is a separate manual for e.g. Ex motors 'Low voltage motors for hazardous areas: Installation, operation and maintenance Manual' (Low Voltage Motors/ Manual for Ex-motors).

Additional information is required for some machine types due to special application and/or design considerations.

Additional information is available for the following motors:

- roller table motors
- water cooled motors
- open drip proof motors
- smoke venting motors
- brake motors
- motors for high ambient temperatures

2. Handling

2.1 Reception check

Immediately upon receipt check the motor for external damage (e.g. shaft-ends and flanges and painted surfaces) and if found, inform the forwarding agent without delay.

Check all rating plate data, especially voltage and winding connection (star or delta). The type of bearing is specified on the rating plate of all motors except the smallest frame sizes.

2.2 Transportation and storage

The motor should always be stored indoors (above -20°C), in dry, vibration free and dust free conditions. During transportation, shocks, falls and humidity should be avoided. In other conditions, please contact ABB.

Unprotected machined surfaces (shaft-ends and flanges) should be treated against corrosion.

It is recommended that shafts are rotated periodically by hand to prevent grease migration.

Anti-condensation heaters, if fitted, are recommended to be used to avoid water condensing in the motor.

The motor must not be subject to any external vibrations at standstill so as to avoid causing damage to the bearings.

Motors fitted with cylindrical-roller and/or angular contact bearings must be fitted with locking devices during transport.

2.3 Lifting

All ABB motors above 25 kg are equipped with lifting lugs or eyebolts.

Only the main lifting lugs or eyebolts of the motor should be used for lifting the motor. They must not be used to lift the motor when it is attached to other equipment.

Lifting lugs for auxiliaries (e.g. brakes, separate cooling fans) or terminal boxes must not be used for lifting the motor.

Motors with the same frame may have a different

center of gravity because of different output, mounting arrangements and auxiliary equipment.

Damaged lifting lugs must not be used. Check that eyebolts or integrated lifting lugs are undamaged before lifting.

Lifting eyebolts must be tightened before lifting. If needed, the position of the eyebolt can be adjusted using suitable washers as spacers.

Ensure that proper lifting equipment is used and that the sizes of the hooks are suitable for the lifting lugs.

Care must be taken not to damage auxiliary equipment and cables connected to the motor.

2.4 Machine weight

The total machine weight can vary within the same frame size (center height) depending on different output, mounting arrangement and auxiliaries.

The following table shows estimated maximum weights for machines in their basic versions as a function of frame material.

The actual weight of all ABB's motors, except the smallest frame sizes (56 and 63) is shown on the rating plate.

Frame size	Aluminum Weight kg	Cast iron Weight kg	Steel Weight kg	Add. for brake
56	4.5	-		-
63	6	-		-
71	8	13		5
80	12	20		8
90	17	30		10
100	25	40		16
112	36	50		20
132	63	90		30
160	95	130		30
180	135	190		45
200	200	275		55
225	265	360		75
250	305	405		75
280	390	800	600	-
315	-	1700	1000	-
355	-	2700	2200	-
400	-	3500	3000	-
450	-	4500	-	-

3. Installation and commissioning

WARNING

Disconnect and lock out before working on the motor or the driven equipment.

Insulation resistance, corrected to 25°C, must exceed the reference value, i.e. 100 MΩ (measured with 500 or 1000 V DC). The insulation resistance value is halved for each 20°C rise in ambient temperature.

3.1 General

All rating plate values must be carefully checked to ensure that the motor protection and connection will be properly done.

WARNING

In case of motors mounted with the shaft upwards and water or liquids are expected to go down along the shaft, the user must take in account to mount some means capable of preventing it.

Remove transport locking if employed. Turn shaft by hand to check free rotation if possible.

Motors equipped with roller bearings:

Running the motor with no radial force applied to the shaft may damage the roller bearing.

Motors equipped with angular contact bearing:

Running the motor with no axial force applied in the right direction in relation to the shaft may damage the angular contact bearing.

WARNING

For machines with angular contact bearings the axial force must not by any means change direction.

The type of bearing is specified on the rating plate.

Motors equipped with regreasing nipples:

When starting the motor for the first time, or after long storage, apply the specified quantity of grease.

For details, see section "6.2.2 Motors with regreasable bearings".

3.2 Insulation resistance check

Measure insulation resistance before commissioning and when winding dampness is suspected.

WARNING

Disconnect and lock out before working on the motor or the driven equipment.

WARNING

The motor frame must be grounded and the windings should be discharged against the frame immediately after each measurement to avoid risk of electrical shock.

If the reference resistance value is not attained, the winding is too damp and must be oven dried. The oven temperature should be 90°C for 12-16 hours followed by 105°C for 6-8 hours.

Drain hole plugs, if fitted, must be removed and closing valves, if fitted, must be opened during heating. After heating, make sure the plugs are refitted. Even if the drain plugs are fitted, it is recommended to disassemble the end shields and terminal box covers for the drying process.

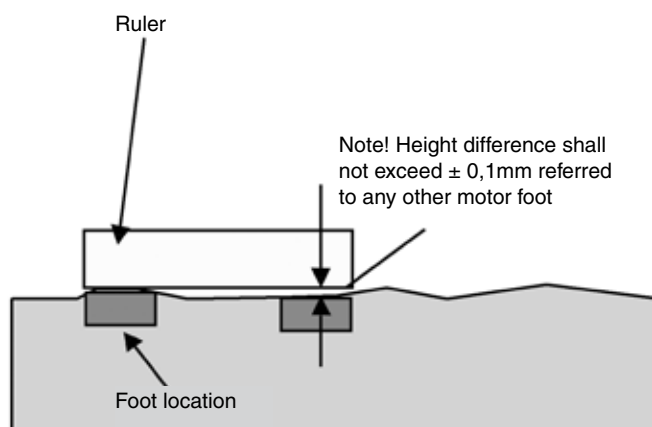
Windings drenched in seawater normally need to be rewound.

3.3 Foundation

The end user has full responsibility for preparation of the foundation.

Metal foundations should be painted to avoid corrosion.

Foundations must be even, see figure below, and sufficiently rigid to withstand possible short circuit forces. They must be designed and dimensioned to avoid the transfer of vibration to the motor and vibration caused by resonance.



3.4 Balancing and fitting coupling halves and pulleys

As standard, balancing of the motor has been carried out using half key

When balancing with full key, the shaft is marked with YELLOW tape, with the text "Balanced with full key".

In case of balancing without key, the shaft is marked with BLUE tape, with the text "Balanced without key".

Coupling halves or pulleys must be balanced after machining the keyways. Balancing must be done in accordance with the balancing method specified for the motor.

Coupling halves and pulleys must be fitted on the shaft by using suitable equipment and tools which do not damage the bearings and seals.

Never fit a coupling half or pulley by hammering or by removing it using a lever pressed against the body of the motor.

3.5 Mounting and alignment of the motor

Ensure that there is enough space for free airflow around the motor. Minimum requirements for free space behind the motor fan cover can be found from the product catalog or from the dimension drawings available from the web: see www.abb.com/motors&generators.

Correct alignment is essential to avoid bearing, vibration and possible shaft failures.

Mount the motor on the foundation using the appropriate bolts or studs and place shim plates between the foundation and the feet.

Align the motor using appropriate methods.

If applicable, drill locating holes and fix the locating pins into position.

Mounting accuracy of coupling half: check that clearance b is less than 0.05 mm and that the difference a_1 to a_2 is also less than 0.05 mm. See Figure 3.

Re-check the alignment after final tightening of the bolts or studs.

Do not exceed permissible loading values for bearings as stated in the product catalogues.

3.6 Slide rails and belt drives

Fasten the motor to the slide rails as shown in Figure 2.

Place the slide rails horizontally on the same level.

Check that the motor shaft is parallel with the drive shaft.

Belts must be tensioned according to the instructions of the supplier of the driven equipment. However, do not exceed the maximum belt forces (i.e. radial bearing loading) stated in the relevant product catalogues.

WARNING

Excessive belt tension will damage bearings and can cause shaft damage.

3.7 Machines with drain plugs for condensation

Check that drain holes and plugs face downwards.

Machines with sealable plastic drain plugs are delivered in open position. In very dusty environments, all drain holes should be closed.

3.8 Cabling and electrical connections

The terminal box on standard single speed motors normally contains six winding terminals and at least one earth terminal.

In addition to the main winding and earthing terminals, the terminal box can also contain connections for thermistors, heating elements or other auxiliary devices.

Suitable cable lugs must be used for the connection of all main cables. Cables for auxiliaries can be connected into their terminal blocks as such.

Machines are intended for fixed installation only. If not otherwise specified, cable entry threads are metric. The IP-class of the cable gland must be at least the same as those of the terminal boxes.

Unused cable entries must be closed with blanking elements according to the IP class of the terminal box.

The degree of protection and diameter are specified in the documents relating to the cable gland.

WARNING

Use appropriate cable glands and seals in the cable entries according to the type and diameter of the cable.

Additional information on cables and glands suitable for variable speed applications can be found from chapter 5.5.

Earthing must be carried out according to local regulations before the machine is connected to the supply voltage.

Ensure that the motor protection corresponds to the environment and weather conditions; for example, make sure that water cannot enter the motor or the terminal boxes.

The seals of terminal boxes must be placed correctly in the slots provided, to ensure the correct IP class.

3.8.1 Connections for different starting methods

The terminal box on standard single speed motors normally contains six winding terminals and at least one earth terminal. This enables the use of DOL- or Y/D-starting. See Figure 1.

For two-speed and special motors, the supply connection must follow the instructions inside the terminal box or in the motor manual.

The voltage and connection are stamped on the rating plate.

Direct-on-line starting (DOL):

Y or D winding connections may be used.

For example, 690 VY, 400 VD indicates Y-connection for 690 V and D-connection for 400 V.

Star/Delta starting (Y/D):

The supply voltage must be equal to the rated voltage of the motor when using a D-connection.

Remove all connection links from the terminal block.

Other starting methods and severe starting conditions:

In case other starting methods are used, such as a soft starter, or if starting conditions are particularly difficult, please consult ABB first.

3.8.2 Connections of auxiliaries

If a motor is equipped with thermistors or other RTDs (Pt100, thermal relays, etc.) and auxiliary devices, it is recommended they be used and connected by appropriate means. Connection diagrams for auxiliary elements and connection parts can be found inside the terminal box.

Maximum measuring voltage for the thermistors is 2.5 V. Maximum measuring current for Pt100 is 5 mA. Using a higher measuring voltage or current may cause errors in readings or damage the system.

The insulations of the winding thermal sensors is of basic type. While connecting the sensors to control systems etc, ensure adequate insulation or isolation, see IEC 60664.

NOTE!

Ensure the insulation level or isolation of thermistor circuit, see IEC 60664.

3.9 Terminals and direction of rotation

The shaft rotates clockwise when viewing the shaft face at the motor drive end, and the line phase sequence - L1, L2, L3 - is connected to the terminals as shown in Figure 1.

To alter the direction of rotation, interchange any two connections on the supply cables.

If the motor has a unidirectional fan, ensure that it rotates in the same direction as the arrow marked on the motor.

4. Operation



4.1 Use

The motors are designed for the following conditions unless otherwise stated on the rating plate.

- Normal ambient temperature limits are -20°C to +40°C.
- Maximum altitude 1000 m above sea level.
- Tolerance for supply voltage is $\pm 5\%$ and for frequency $\pm 2\%$ according to EN / IEC 60034-1 (2004).

The motor can only be used in applications it is intended for. The rated nominal values and operational conditions are shown on the motor rating plates. In addition, all requirements of this manual and other related instructions and standards must be followed.

If these limits are exceeded, motor data and construction data must be checked. Please contact ABB for further information.

WARNING

Ignoring any of given instructions or maintenance of the apparatus may jeopardize the safety and thus prevents the use of the machine.

4.2. Cooling

Check that the motor has sufficient airflow. Ensure that no nearby objects or direct sunshine radiate additional heat to the motor.

For flange mounted motors (e.g. B5, B35, V1), make sure that the construction allows sufficient air flow on the outer surface of the flange.

4.3. Safety considerations

The machine is intended for installation and use by qualified personnel, familiar with health and safety requirements and national legislation.

Safety equipment necessary for the prevention of accidents at the installation and operating site must be provided in accordance with local regulations.

WARNING

Do not carry out work on motor, connection cables or accessories such as frequency converters, starters, brakes, thermistor cables or heating elements when voltage is applied.

Points to observe

1. Do not step on the motor.
2. The temperature of the outer casing of the motor may be too hot to touch during normal operation and especially after shut-down.
3. Some special motor applications require special instructions (e.g. using frequency converter supplies).
4. Be aware of rotating parts of the motor.
5. Do not open terminal boxes while energized.

5. Low voltage motors in variable speed operation

5.1 Introduction

This part of the manual provides additional instructions for motors used in frequency converter supply. Instructions provided in this and respective manuals of selected frequency converter must be followed to ensure safety and availability of the motor.

Additional information may be required by ABB to decide on the suitability for some machine types used in special applications or with special design modifications.

5.2 Winding insulation

Variable speed drives cause higher voltage stresses than the sinusoidal supply on the winding of the motor and therefore the winding insulation of the motor as well as the filter at the converter output must be dimensioned according following instructions.

5.2.1 Phase to phase voltages

The maximum allowed phase to phase voltage peaks at the motor terminal as a function of the rise time of the pulse can be seen in Figure 1.

The highest curve “ABB Special Insulation” applies to motors with a special winding insulation for frequency converter supply, variant code 405.

The “ABB Standard Insulation” applies to all other motors covered by this manual.

5.2.2 Phase to ground voltages

The allowed phase to ground voltage peaks at motor terminals are:

Standard Insulation 1300 V peak

Special Insulation 1800 V peak

5.2.3 Selection of winding insulation for ACS800- and ACS550-converters

In the case of ABB ACS800-series and ACS550-series single drives with a diode supply unit (uncontrolled DC voltage), the selection of winding insulation and filters can be made according to table below:

Nominal supply voltage U_N of the converter	Winding insulation and filters required
$U_N \leq 500$ V	ABB Standard insulation
$U_N \leq 600$ V	ABB Standard insulation + dU/dt filters OR ABB Special insulation (variant code 405)
$U_N \leq 690$ V	ABB Special insulation (variant code 405) AND dU/dt-filters at converter output
$U_N \leq 690$ V AND cable length > 150 m	ABB Special insulation (variant code 405)

For more information on resistor braking and converters with controlled supply units, please contact ABB.

5.2.4 Selection of winding insulation with all other converters

The voltage stresses must be limited below accepted limits. Please contact the system supplier to ensure the safety of the application. The influence of possible filters must be taken into account while dimensioning the motor.

5.3 Thermal protection

Most of the motors covered by this manual are equipped with PTC thermistors in the stator windings. It is recommended to connect those to the frequency converter by appropriate means. See also chapter 3.8.2.

5.4 Bearing currents

Insulated bearings or bearing constructions, common mode filters and suitable cabling and grounding methods must be used according to the following instructions:

5.4.1 Elimination of bearing currents with ABB ACS800 and ACS550 converters

In the case of the ABB ACS800 and ACS550-series frequency converter with a diode supply unit, the following methods must be used to avoid harmful bearing currents in the motors:

Nominal Power (Pn) and / or Frame size (IEC)	Preventive measures
Pn < 100 kW	No actions needed
Pn ≥ 100 kW OR IEC 315 ≤ Frame size ≤ IEC 355	Insulated non-drive end bearing
Pn ≥ 350 kW OR IEC 400 ≤ Frame size ≤ IEC 450	Insulated non-drive end bearing AND Common mode filter at the converter

Insulated bearings which have aluminum oxide coated inner and/or outer bores or ceramic rolling elements, are recommended. Aluminum oxide coatings shall also be treated with a sealant to prevent dirt and humidity penetrating into the porous coating. For the exact type of bearing insulation, see the motor's rating plate. Changing the bearing type or insulation method without ABB's permission is prohibited.

5.4.2 Elimination of bearing currents with all other converters

The user is responsible for protecting the motor and driven equipment from harmful bearing currents. Instructions described in Chapter 5.4.1 can be used as guideline, but their effectiveness cannot be guaranteed in all cases.

5.5 Cabling, grounding and EMC

To provide proper grounding and to ensure compliance with any applicable EMC requirements, motors above 30 kW shall be cabled by shielded symmetrical cables and EMC glands, i.e. cable glands providing 360° bonding. Also for smaller motors symmetrical and shielded cables are highly recommended. Make the 360° grounding arrangement at all the cable entries as described in the instructions for the glands. Twist the cable shields into bundles and connect to the nearest ground terminal/bus bar inside the terminal box, converter cabinet, etc.

NOTE!

Proper cable glands providing 360° bonding must be used at all termination points, e.g. at motor, converter, possible safety switch, etc.

For motors of frame size IEC 280 and upward, additional potential equalization between the motor frame and the driven equipment is needed, unless both are mounted on a common steel base. In this case, the high frequency conductivity of the connection provided by the steel base should be checked by, for example, measuring the potential difference between the components.

More information about grounding and cabling of variable speed drives can be found in the manual "Grounding and cabling of the drive system" (Code: 3AFY 61201998).

5.6 Operating speed

For speeds higher than the nominal speed stated on the motor's rating plate or in the respective product catalogue, ensure that either the highest permissible rotational speed of the motor or the critical speed of the whole application is not exceeded.

5.7 Dimensioning the motor for variable speed application

5.7.1 General

In case of ABB's frequency converters, the motors can be dimensioned by using ABB's DriveSize dimensioning program. The tool is downloadable from the ABB website (www.abb.com/motors&generators).

For application supplied by other converters, the motors must be dimensioned manually. For more information, please contact ABB.

The loadability curves (or load capacity curves) are based on nominal supply voltage. Operation in under or over voltage conditions may influence on the performance of the application.

5.7.2 Dimensioning with ABB ACS800 converters with DTC control

The loadability curves presented in Figures 4a - 4d are valid for ABB ACS800 converters with uncontrolled DC-voltage and DTC-control. The figures show the approximate maximum continuous output torque of the motors as a function of supply frequency. The output torque is given as a percentage of the nominal torque of the motor. The values are indicative and exact values are available on request.

NOTE!

The maximum speed of the motor must not be exceeded!

5.7.3 Dimensioning with ABB ACS550 converters

The loadability curves presented in Figures 5a - 5d are valid for ABB ACS550 series converters. The figures show the approximate maximum continuous output torque of the motors as a function of supply frequency. The output torque is given as a percentage of the nominal torque of the motor. The values are indicative and exact values are available on request.

NOTE!

The maximum speed of the motor must not be exceeded!

5.7.4 Dimensioning with other voltage source PWM-type converters

For other converters, which have uncontrolled DC voltage and minimum switching frequency of 3 kHz, the dimensioning instructions of ACS550 can be used as guidelines, but it shall be noted, that the actual thermal loadability can also be lower. Please contact the manufacturer of the converter or the system supplier.

NOTE!

The actual thermal loadability of a motor may be lower than shown by guideline curves.

5.7.5 Short time overloads

ABB motors can usually be temporarily overloaded as well as used in intermittent duties. The most convenient method to dimension such applications is to use the DriveSize tool.

5.8 Rating plates

The usage of ABB's motors in variable speed applications do not usually require additional rating plates and the parameters required for commissioning the converter can be found from the main rating plate. However, in some

special applications the motors can be equipped with additional rating plates for variable speed applications and those include following information:

- speed range
- power range
- voltage and current range
- type of torque (constant or quadratic)
- converter type and required minimum switching frequency

5.9 Commissioning the variable speed application

The commissioning of the variable speed application must be done according to the instructions of the frequency converter and local laws and regulations. The requirements and limitations set by the application must also be taken into account.

All parameters needed for setting the converter must be taken from the motor rating plates. The most often needed parameters are:

- Motor nominal voltage
- Motor nominal current
- Motor nominal frequency
- Motor nominal speed
- Motor nominal power

Note: In case of missing or inaccurate information, do not operate the motor before ensuring correct settings!

ABB recommends using all the suitable protective features provided by the converter to improve the safety of the application. Converters usually provide features such as (names and availability of features depend on manufacturer and model of the converter):

- Minimum speed
- Maximum speed
- Acceleration and deceleration times
- Maximum current
- Maximum Torque
- Stall protection

6. Maintenance

WARNING

Voltage may be connected at standstill inside the terminal box for heating elements or direct winding heating.

WARNING

The capacitor in single-phase motors can retain a charge that appears across the motor terminals, even when the motor has reached standstill.

WARNING

A motor with frequency converter supply may energize even if the motor is at standstill.

6.1. General inspection

1. Inspect the motor at regular intervals, at least once a year. The frequency of checks depends on, for example, the humidity level of the ambient air and on the local weather conditions. This can initially be determined experimentally and must then be strictly adhered to.
2. Keep the motor clean and ensure free ventilation airflow. If the motor is used in a dusty environment, the ventilation system must be regularly checked and cleaned.
3. Check the condition of shaft seals (e.g. V-ring or radial seal) and replace if necessary.
4. Check the condition of connections and mounting and assembly bolts.
5. Check the bearing condition by listening for any unusual noise, vibration measurement, bearing temperature, inspection of spent grease or SPM bearing monitoring. Pay special attention to bearings when their calculated rated life time is coming to an end.

When signs of wear are noticed, dismantle the motor, check the parts and replace if necessary. When bearings are changed, replacement bearings must be of the same type as those originally fitted. The shaft seals have to be replaced with seals of the same quality and characteristics as the originals when changing bearings.

In the case of the IP 55 motor and when the motor has been delivered with a plug closed, it is advisable to periodically open the drain plugs in order to ensure that the way out for condensation is not blocked and allows condensation to escape from the motor. This operation must be done when the motor is at a standstill and has been made safe to work on.

6.2 Lubrication

WARNING

Beware of all rotating parts!

WARNING

Grease can cause skin irritation and eye inflammation. Follow all safety precautions specified by the manufacturer.

Bearing types are specified in the respective product catalogs and on the rating plate of all motors except smaller frame sizes.

Reliability is a vital issue for bearing lubrication intervals. ABB uses mainly the L_{10} -principle (i.e. that 99% of the motors are certain to make the life time) for lubrication.

6.2.1 Machines with permanently greased bearings

Bearings are usually permanently greased bearings of 1Z, 2Z, 2RS or equivalent types.

As a guide, adequate lubrication for sizes up to 250 can be achieved for the following duration, according to L_{10} .

Duty hours for permanently greased bearings at ambient temperatures of 25 and 40° C are:

Lubrication intervals according to L_{10} principle

Frame size	Poles	Duty hours at 25° C	Duty hours at 40° C
56-63	2-8	40 000	40 000
71	2	40 000	40 000
71	4-8	40 000	40 000
80-90	2	40 000	40 000
80-90	4-8	40 000	40 000
100-112	2	40 000	32 000
100-112	4-8	40 000	40 000
132	2	40 000	27 000
132	4-8	40 000	40 000
160	2	40 000	36 000
160	4-8	40 000	40 000
180	2	38 000	38 000
180	4-8	40 000	40 000
200	2	27 000	27 000
200	4-8	40 000	40 000
225	2	23 000	18 000
225	4-8	40 000	40 000
250	2	16 000	13 000
250	4-8	40 000	39 000

Data valid at 50 Hz, for 60 Hz reduce values for 20 %.

These values are valid for permitted load values given in the product catalog. Depending on application and load conditions, see the applicable product catalog or contact ABB.

Operation hours for vertical motors are half of the above values.

6.2.2 Motors with regreasable bearings

Lubrication information plate and general lubrication advice

If the machine is equipped with a lubrication information plate, follow the given values.

On the lubrication information plate, greasing intervals regarding mounting, ambient temperature and rotational speed are defined.

During the first start or after a bearing lubrication a temporary temperature rise may appear, approximately 10 to 20 hours.

Some motors may be equipped with a collector for old grease. Follow the special instructions given for the equipment.

A. Manual lubrication

Regreasing while the motor is running

- Remove grease outlet plug or open closing valve if fitted.
- Be sure that the lubrication channel is open
- Inject the specified amount of grease into the bearing.
- Let the motor run for 1-2 hours to ensure that all excess grease is forced out of the bearing. Close the grease outlet plug or closing valve if fitted.

Regreasing while the motor is at a standstill

If it is not possible to regrease the bearings while the motors are running, lubrication can be carried out while the machine is at a standstill.

- In this case use only half the quantity of grease and then run the motor for a few minutes at full speed.
- When the motor has stopped, apply the rest of the specified amount of grease to the bearing.
- After 1-2 running hours close the grease outlet plug or closing valve if fitted.

B. Automatic lubrication

The grease outlet plug must be removed permanently with automatic lubrication or open closing valve if fitted.

ABB recommends only the use of electromechanical systems.

The amount of grease per lubrication interval stated in the table should be multiplied by four if an automatic regreasing system is used.

When 2-pole motors are automatically regreased, the note concerning lubricant recommendations for 2-pole motors in the Lubricants chapter should be followed.

6.2.3 Lubrication intervals and amounts

As a guide, adequate lubrication for motors with regreasable bearings can be achieved for the following duration, according to L_1 . For duties with higher ambient temperatures please contact ABB. The formula to change the L_1 values roughly to L_{10} values: $L_{10} = 2.7 \times L_1$.

Lubrication intervals for vertical machines are half of the values shown in the table below.

The lubrication intervals are based on an ambient temperature +25°C. An increase in the ambient temperature raises the temperature of the bearings correspondingly. The values should be halved for a 15°C increase and may be doubled for a 15°C decrease.

In variable speed operation (i.e. frequency converter supply) it is necessary to measure the bearing temperature for the whole duty range and if exceeds 80°C, the lubrication intervals should be halved for a 15°C increase in bearing temperature. If the motor is operated at high speeds, it is also possible to utilize so called high speed greases, see chapter 6.2.4.

WARNING

The maximum operating temperature of the grease and bearings, +110°C, must not be exceeded.
The designed maximum speed of the motor must not be exceeded.

Lubrication intervals according to L₁ principle

Frame size	Amount of grease g/bearing	kW	3600 r/min	3000 r/min	kW	1800 r/min	1500 r/min	kW	1000 r/min	kW	500-900 r/min
Ball bearings											
Lubrication intervals in duty hours											
112	10	all	10000	13000	all	18000	21000	all	25000	all	28000
132	15	all	9000	11000	all	17000	19000	all	23000	all	26500
160	25	≤ 18,5	9000	12000	≤ 15	18000	21500	≤ 11	24000	all	24000
160	25	> 18,5	7500	10000	> 15	15000	18000	> 11	22500	all	24000
180	30	≤ 22	7000	9000	≤ 22	15500	18500	≤ 15	24000	all	24000
180	30	> 22	6000	8500	> 22	14000	17000	> 15	21000	all	24000
200	40	≤ 37	5500	8000	≤ 30	14500	17500	≤ 22	23000	all	24000
200	40	> 37	3000	5500	> 30	10000	12000	> 22	16000	all	20000
225	50	≤ 45	4000	6500	≤ 45	13000	16500	≤ 30	22000	all	24000
225	50	> 45	1500	2500	> 45	5000	6000	> 30	8000	all	10000
250	60	≤ 55	2500	4000	≤ 55	9000	11500	≤ 37	15000	all	18000
250	60	> 55	1000	1500	> 55	3500	4500	> 37	6000	all	7000
280 ¹⁾	60	all	2000	3500	-	-	-	-	-	-	-
280 ¹⁾	60	-	-	-	all	8000	10500	all	14000	all	17000
280	35	all	1900	3200	-	-	-	-	-	-	-
280	40	-	-	-	all	7800	9600	all	13900	all	15000
315	35	all	1900	3200	-	-	-	-	-	-	-
315	55	-	-	-	all	5900	7600	all	11800	all	12900
355	35	all	1900	3200	-	-	-	-	-	-	-
355	70	-	-	-	all	4000	5600	all	9600	all	10700
400	40	all	1500	2700	-	-	-	-	-	-	-
400	85	-	-	-	all	3200	4700	all	8600	all	9700
450	40	all	1500	2700	-	-	-	-	-	-	-
450	95	-	-	-	all	2500	3900	all	7700	all	8700

Roller bearings											
Lubrication intervals in duty hours											
160	25	≤ 18,5	4500	6000	≤ 15	9000	10500	≤ 11	12000	all	12000
160	25	> 18,5	3500	5000	> 15	7500	9000	> 11	11000	all	12000
180	30	≤ 22	3500	4500	≤ 22	7500	9000	≤ 15	12000	all	12000
180	30	> 22	3000	4000	> 22	7000	8500	> 15	10500	all	12000
200	40	≤ 37	2750	4000	≤ 30	7000	8500	≤ 22	11500	all	12000
200	40	> 37	1500	2500	> 30	5000	6000	> 22	8000	all	10000
225	50	≤ 45	2000	3000	≤ 45	6500	8000	≤ 30	11000	all	12000
225	50	> 45	750	1250	> 45	2500	3000	> 30	4000	all	5000
250	60	≤ 55	1000	2000	≤ 55	4500	5500	≤ 37	7500	all	9000
250	60	> 55	500	750	> 55	1500	2000	> 37	3000	all	3500
280 ¹⁾	60	all	1000	1750	-	-	-	-	-	-	-
280 ¹⁾	70	-	-	-	all	4000	5250	all	7000	all	8500
280	35	all	900	1600	-	-	-	-	-	-	-
280	40	-	-	-	all	4000	5300	all	7000	all	8500
315	35	all	900	1600	-	-	-	-	-	-	-
315	55	-	-	-	all	2900	3800	all	5900	all	6500
355	35	all	900	1600	-	-	-	-	-	-	-
355	70	-	-	-	all	2000	2800	all	4800	all	5400
400	40	all	-	1300	-	-	-	-	-	-	-
400	85	-	-	-	all	1600	2400	all	4300	all	4800
450	40	all	-	1300	-	-	-	-	-	-	-
450	95	-	-	-	all	1300	2000	all	3800	all	4400

1) M3AA

For motors M4BP 160 to 250 the interval may be increased by 30 %, up to a maximum of three calendar years. The values in table above are valid also for sizes M4BP 280 to 355.

6.2.4 Lubricants

WARNING

Do not mix different types of grease.

Incompatible lubricants may cause bearing damage.

When regreasing, use only special ball bearing grease with the following properties:

- good quality grease with lithium complex soap and with mineral- or PAO-oil
- base oil viscosity 100-160 cST at 40°C
- consistency NLGI grade 1.5 - 3 *)
- temperature range -30°C - +120°C, continuously.

*) For vertical mounted motors or in hot conditions a stiffer end of scale is recommended.

The above mentioned grease specification is valid if the ambient temperature is above -30°C or below +55°C, and the bearing temperature is below 110°C; otherwise consult ABB regarding suitable grease.

Grease with the correct properties is available from all the major lubricant manufacturers.

Admixtures are recommended, but a written guarantee must be obtained from the lubricant manufacturer, especially concerning EP admixtures, that admixtures do not damage bearings or the properties of lubricants at the operating temperature range.

WARNING

Lubricants containing EP admixtures are not recommended in high bearing temperatures in frame sizes 280 to 450.

The following high performance greases can be used:

- Esso Unirex N2 or N3 (lithium complex base)
- Mobil Mobilith SHC 100 (lithium complex base)
- Shell Albida EMS 2 (lithium complex base)
- Klüber Klüberplex BEM 41-132 (special lithium base)
- FAG Arcanol TEMP110 (lithium complex base)
- Lubcon Turmogrease L 802 EP PLUS (special lithium base)
- Total Multiplex S 2 A (lithium complex base)

NOTE!

Always use high speed grease for high speed 2-pole machines where the speed factor is higher than 480,000 (calculated as $D_m \times n$ where D_m = average bearing diameter, mm; n = rotational speed, r/min). The high speed grease is also used in motor types M2CA, M2FA, M2CG and M2FG, frame sizes 355 to 400 2-pole machines.

The following greases can be used for high speed cast iron motors but not mixed with lithium complex greases:

- Klüber Klüber Quiet BQH 72-102 (polyurea base)
- Lubcon Turmogrease PU703 (polyurea base)

If other lubricants are used;

Check with the manufacturer that the qualities correspond to those of the above mentioned lubricants. The lubrication interval are based on the listed high performance greases above. Using other greases can reduce the interval.

If the compatibility of the lubricant is uncertain, contact ABB.

7. After Sales Support

7.1. Spare parts

When ordering spare parts, the motor serial number, full type designation and product code, as stated on the rating plate, must be specified.

For more information, please visit our web site www.abb.com/partsonline.

7.2 Rewinding

Rewinding should always be carried out by qualified repair shops.

Smoke venting and other special motors should not be rewound without first contacting ABB.

7.3 Bearings

Special care should be taken with the bearings. These must be removed using pullers and fitted by heating or using special tools for the purpose.

Bearing replacement is described in detail in a separate instruction leaflet available from the ABB Sales Office.

8. Environmental requirements

8.1 Noise levels

Most of ABB's motors have a sound pressure level not exceeding 82 dB(A) at 50 Hz .

Values for specific machines can be found in the relevant product catalogues. At 60 Hz sinusoidal supply the values are approximately 4 dB(A) higher compared to 50 Hz values in product catalogues.

For sound pressure levels at frequency converter supply, please contact ABB.

Sound pressure levels for all machines having separate cooling systems and for series M2F*/M3F*, M2L*/M3L*, M2R*/M3R*, M2BJ/M3BJ and M2LJ/M3LJ are indicated in separate additional manuals.

9. Troubleshooting

These instructions do not cover all details or variations in equipment nor provide for every possible condition to be met in connection with installation, operation or maintenance. Should additional information required, please contact the nearest ABB Sales Office.

Motor troubleshooting chart

Your motor service and any troubleshooting must be handled by qualified persons who have proper tools and equipment.

TROUBLE	CAUSE	WHAT TO DO
Motor fails to start	Blown fuses	Replace fuses with proper type and rating.
	Overload trips	Check and reset overload in starter.
	Improper power supply	Check to see that power supplied agrees with motor rating plate and load factor.
	Improper line connections	Check connections against diagram supplied with motor.
	Open circuit in winding or control switch	Indicated by humming sound when switch is closed. Check for loose wiring connections. Also ensure that all control contacts are closing.
	Mechanical failure	Check to see if motor and drive turn freely. Check bearings and lubrication.
	Short circuited stator Poor stator coil connection	Indicated by blown fuses. Motor must be rewound. Remove end shields, locate fault.
	Rotor defective	Look for broken bars or end rings.
	Motor may be overloaded	Reduce load.
Motor stalls	One phase may be open	Check lines for open phase.
	Wrong application	Change type or size. Consult equipment supplier.
	Overload	Reduce load.
	Low voltage	Ensure the rating plate voltage is maintained. Check connection.
	Open circuit	Fuses blown, check overload relay, stator and push buttons.
Motor runs and then dies down	Power failure	Check for loose connections to line, to fuses and to control.
Motor does not come up to nominal speed	Not applied properly	Consult equipment supplier for proper type.
	Voltage too low at motor terminals because of line drop	Use higher voltage or transformer terminals or reduce load. Check connections. Check conductors for proper size.
	Starting load too high	Check the start load of the motor.
	Broken rotor bars or loose rotor	Look for cracks near the rings. A new rotor may be required, as repairs are usually temporary.
	Open primary circuit	Locate fault with testing device and repair.

TROUBLE	CAUSE	WHAT TO DO
Motor takes too long to accelerate and/or draws high current	Excessive load	Reduce load.
	Low voltage during start	Check for high resistance. Make sure that adequate cable size is used.
	Defective squirrel cage rotor	Replace with new rotor.
	Applied voltage too low	Correct power supply.
Wrong rotation direction	Wrong sequence of phases	Reverse connections at motor or at switchboard.
Motor overheats while running	Overload	Reduce load.
	Frame or ventilation openings may be full of dirt and prevent proper ventilation of motor	Open vent holes and check for a continuous stream of air from the motor.
	Motor may have one phase open	Check to make sure that all leads are well connected.
	Grounded coil	Motor must be rewound
	Unbalanced terminal voltage	Check for faulty leads, connections and transformers.
Motor vibrates	Motor misaligned	Realign.
	Weak support	Strengthen base.
	Coupling out of balance	Balance coupling.
	Driven equipment unbalanced	Rebalance driven equipment.
	Defective bearings	Replace bearings.
	Bearings not in line	Repair motor.
	Balancing weights shifted	Rebalance motor.
	Contradiction between balancing of rotor and coupling (half key - full key)	Rebalance coupling or motor.
	Polyphase motor running single phase	Check for open circuit.
	Excessive end play	Adjust bearing or add shim.
Scraping noise	Fan rubbing end shield or fan cover	Correct fan mounting.
	Loose on bedplate	Tighten holding bolts.
Noisy operation	Air gap not uniform	Check and correct end shield fits or bearing fits.
	Rotor unbalance	Rebalance rotor.
Hot bearings	Bent or sprung shaft	Straighten or replace shaft.
	Excessive belt pull	Decrease belt tension.
	Pulleys too far away from shaft shoulder	Move pulley closer to motor bearing.
	Pulley diameter too small	Use larger pulleys.
	Misalignment	Correct by realignment of the drive.
	Insufficient grease	Maintain proper quality and amount of grease in bearing.
	Deterioration of grease or lubricant contaminated	Remove old grease, wash bearings thoroughly in kerosene and replace with new grease.
	Excess lubricant	Reduce quantity of grease, bearing should not be more than half full.
	Overloaded bearing	Check alignment, side and end thrust.
	Broken ball or rough races	Replace bearing, clean housing thoroughly first.

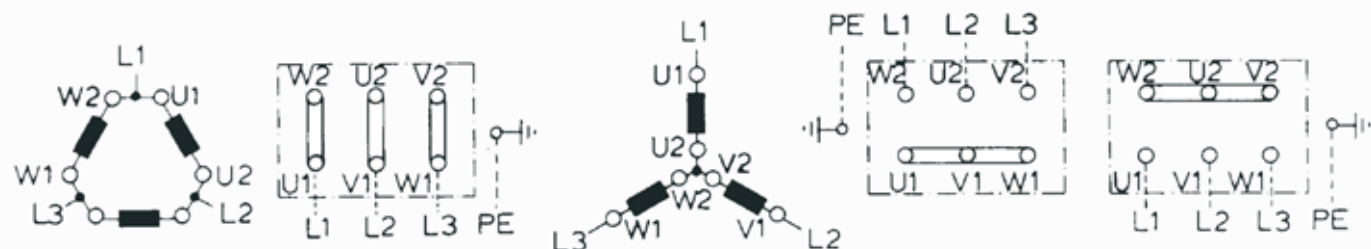


Figure 1. Connection diagram

Bild 1. Anschlußdiagram

Figure 1. Connection

Figura 1. Conexión

Figura 1. Collegamento

Figur 1. Anslutningdiagramm

Kuva 1. Kytentäkaavio

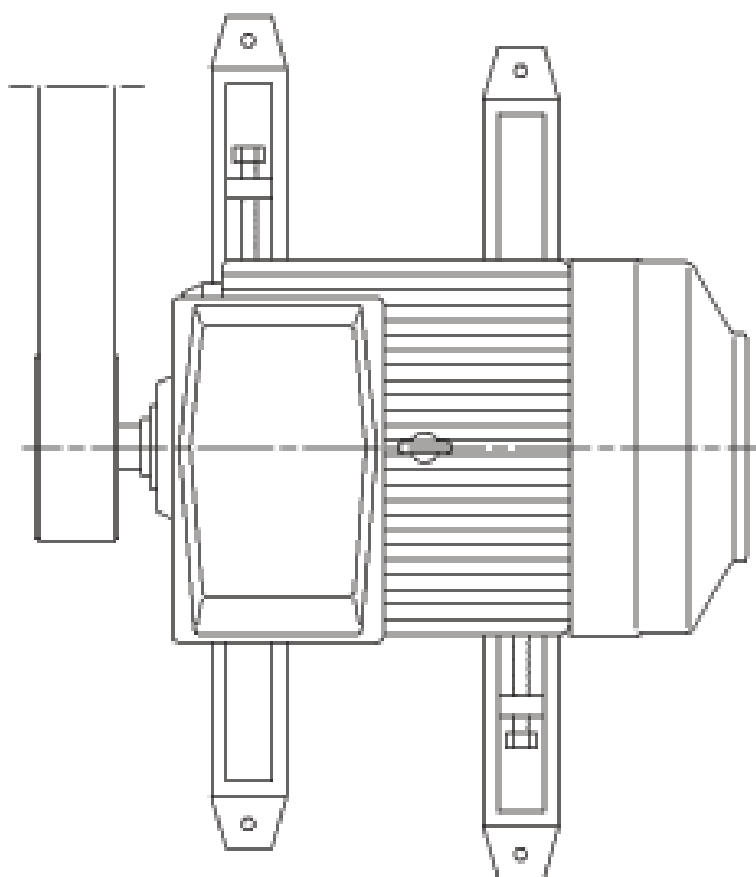


Figure 2. Belt drive

Bild 2. Riementrieb

Figure 2. Glissières et entraînements à courroie

Figure 2. Carriles tensores y correas

Figura 2. Slitte tendicinghia e pulegge

Figur 2. Remdrift

Kuva 2. Hihnakäyttö

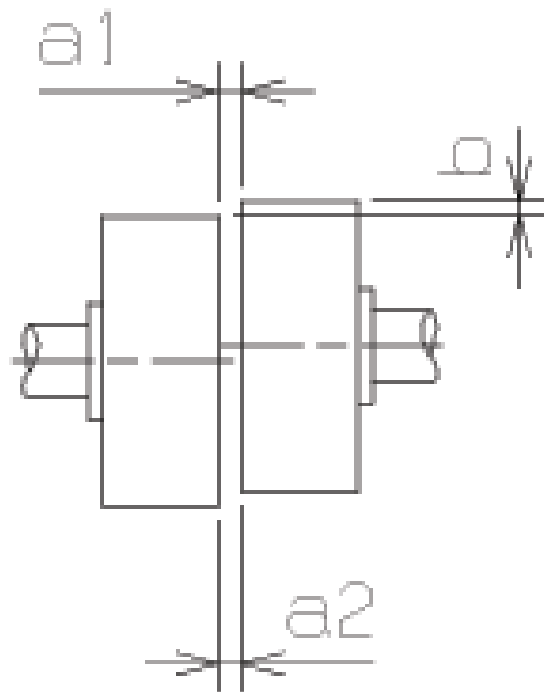


Figure 3. Mounting of half-coupling or pulley

Bild 3. Anbau von Kupplungshälften und Riemenscheiben

Figure 3. Montage des demi-accouplements et des poulies

Figura 3. Montaje de mitades de acoplamiento y poleas

Figura 3. Montaggio di semigiunti e pulegge

Figur 3. Montering av kopplinshalvor och drivskivor

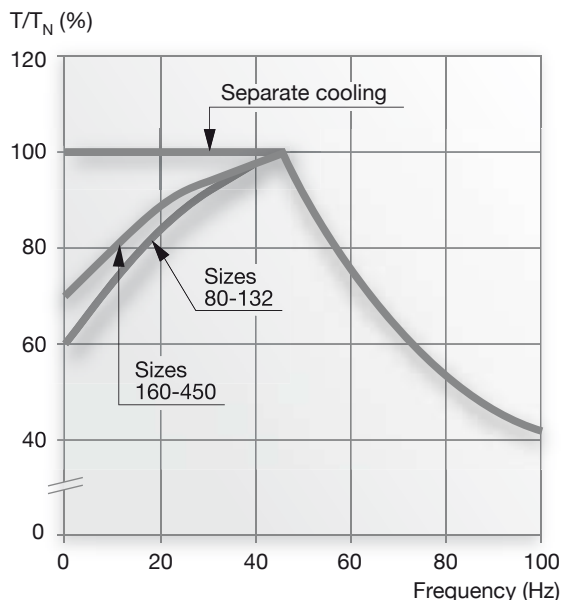
Kuva 3. Kytकिनpuolikkaan ja hihnapyörän asennus

Loadability curves with ACS800 converters with DTC control
Belastbarkeitskurven für ACS800-Frequenzumrichter mit DTC-Steuerung
Courbes de capacité de charge avec convertisseurs ACS800 et commande DTC
Curvas de capacidad de carga con convertidores ACS800 dotados de control DTC
Curve di caricabilità con convertitori ACS800 e controllo DTC
Lastbarhetskurvor för ACS800-omriktare med DTC-styrning
Kuormitettavuuskäyrät DTC-säädöllä varustetuille ACS800-taajuusmuuttajille

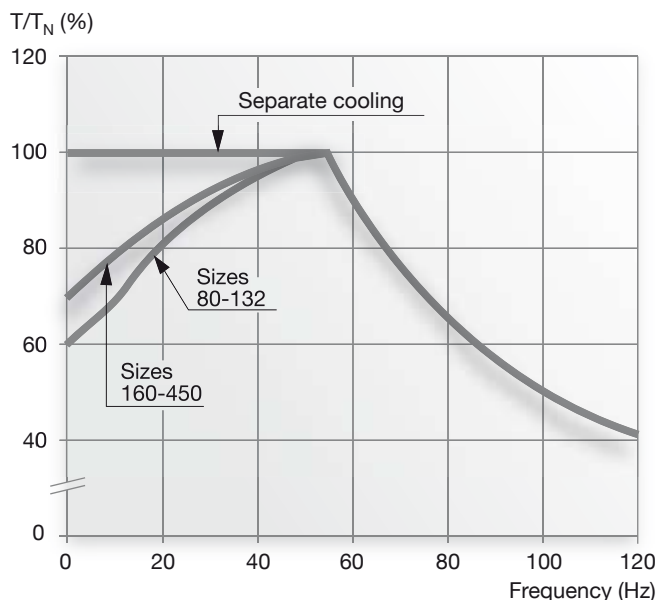
Figures/Abbildungen/Figures/Figure/Figure/Figur/Kuvat 4a, 4b, 4c, 4d

Low voltage motors, nominal frequency of the motors 50/60 Hz, temperature rise B/F
 Niederspannungsmotoren, Nennfrequenz der Motoren 50/60 Hz, Temperaturanstieg B/F
 Moteurs à basse tension, fréquence nominale des moteurs de 50/60 Hz, augmentation de température B/F
 Motores de baja tensión, frecuencia nominal de los motores 50/60 Hz, aumento de temperatura B/F
 Motori a bassa tensione, frequenza nominale dei motori 50/60 Hz, incremento di temperatura B/F
 Lågspänningsmotorer, märkfrekvens för motorerna 50/60 Hz, temperaturstegring B/F
 Pienjännitemoottorit, moottorin nimellistaajuus 50/60 Hz, lämpötilan nousu B/F

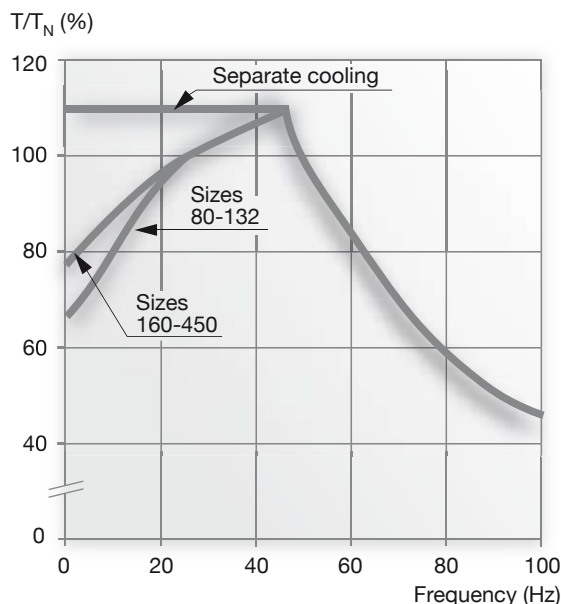
4a ACS800/50 Hz, Temperature rise B



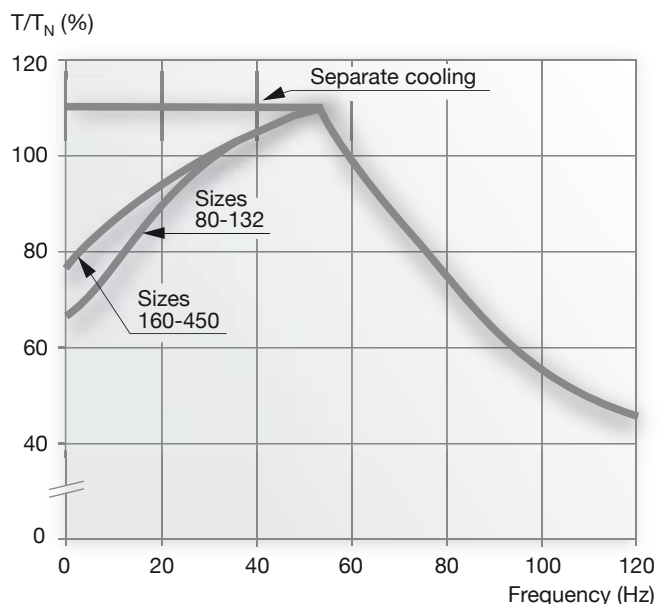
4b ACS800/60 Hz, Temperature rise B



4c ACS800/50 Hz, Temperature rise F



4d ACS800/60 Hz, Temperature rise F

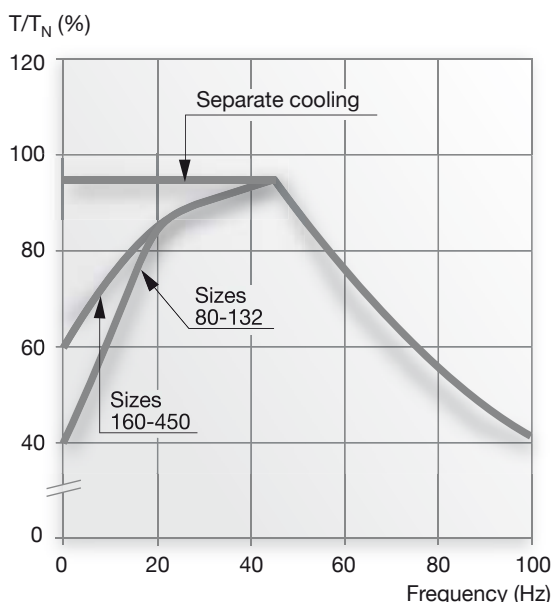


Loadability curves with ACS550 converters
Belastbarkeitskurven für ACS550-Frequenzumrichter
Courbes de capacité de charge avec convertisseurs ACS550
Curvas de capacidad de carga con convertidores ACS550
Curve di caricabilità con convertitori ACS550
Lastbarhetskurvor för ACS550-omriktare
Kuormitettavuuskäyrät ACS550-taajuusmuuttajille

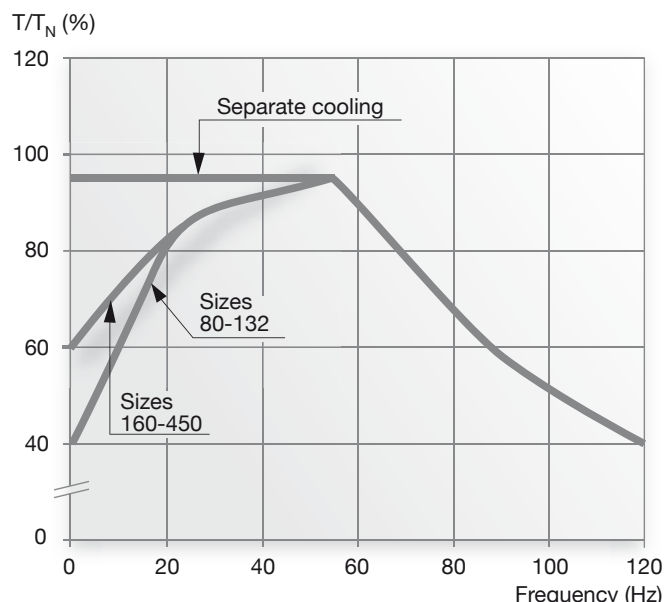
Figures/Abbildungen/Figures/Figure/Figure/Figur/Kuvat 5a, 5b, 5c, 5d

Low voltage motors, nominal frequency of the motors 50/60 Hz, temperature rise B/F
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 Motores de baja tensión, frecuencia nominal de los motores 50/60 Hz, aumento de temperatura B/F
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 Pienjännitemoottorit, moottorin nimellistaajuus 50/60 Hz, lämpötilan nousu B/F

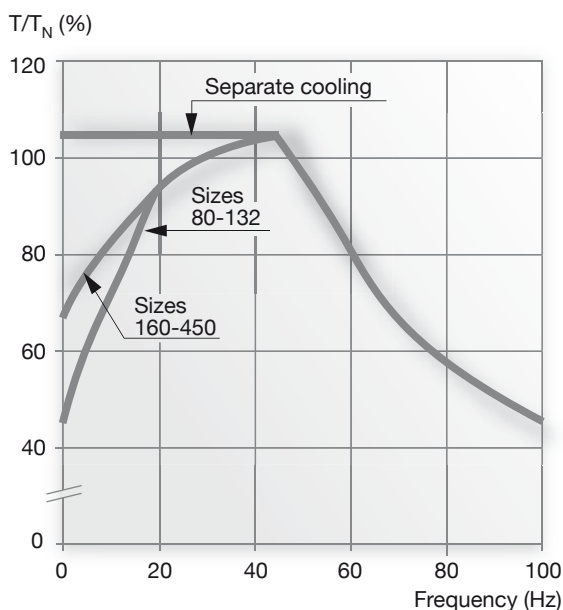
5a ACS550/50 Hz, Temperature rise B



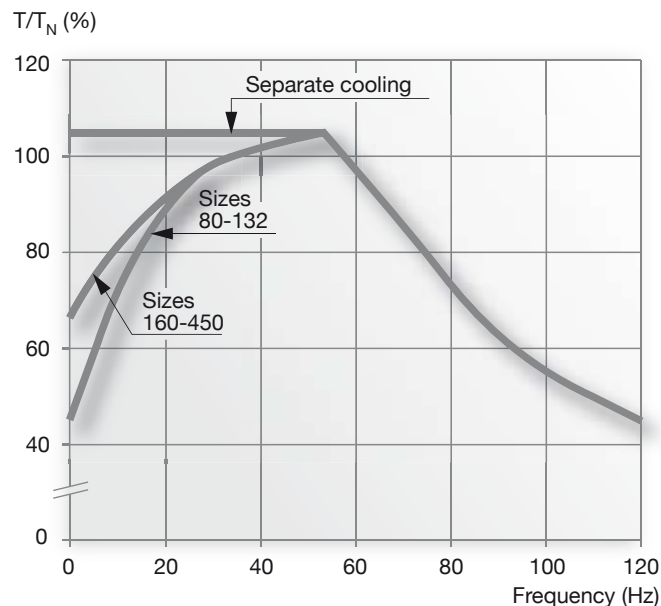
5b ACS550/60 Hz, Temperature rise B



5c ACS550/50 Hz, Temperature rise F



5d ACS550/60 Hz, Temperature rise F



11.1 - Supporti serie SNL11.1 - Supports SNL

Supporto serie **"SNL"**Support **"SNL"** series

Lubrication - Grease lubrication

Grease lubrication is preferred for bearings in SNL plummer block housings. To enable efficient lubrication of the housings they have, as standard, a drilled and tapped hole and a grease nipple AH 1/8-27 PTF in the housing cap (**fig 1**).

An adapter can also be supplied which makes it possible to use other grease nipples without having to rework the standard threaded hole.

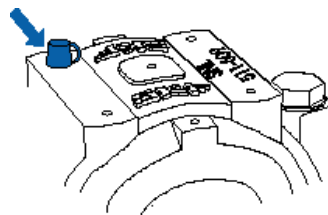


Fig.1

Cast indications on the housing cap (**fig 2**) show where additional holes can be drilled for the supply of grease to bearings via the outer ring or to special seals. SNL housings with a drilled and tapped hole in the middle of the housing cap can be supplied to order. These carry the designation suffix NM, e.g. SNL 511-609 NM.

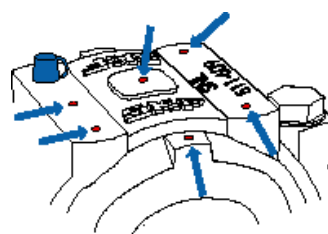


Fig.2

Grease quantities for initial lubrication and relubrication

In the majority of applications, the amount of grease applied to the SNL housings when mounting (first fill) or after an inspection is adequate until the next routine inspection. Certain operating conditions may mean that more frequent relubrication is necessary.

Table 1 gives guideline values for the grease quantities to be applied for the first fill as well as for relubrication. The quantities for the first fill will take up 40 % of the free space in the housing.

HOUSING	Grease quantities	
	First fill ¹⁾	Relubrication
	(gr)	(gr)
SNL 205	25	5
SNL 206-305	40	5
SNL 207	50	10
SNL 208-307	60	10
SNL 209	65	10
SNL 210	75	10
SNL 211	100	15
SNL 212	150	15
SNL 213	180	20
SNL 215	230	20
SNL 216	280	25
SNL 217	330	25
SNL 218	430	40
SNL 505	25	5
SNL 506-605	40	5
SNL 507-606	50	10
SNL 508-607	60	10

HOUSING	Grease quantities	
	First fill ¹⁾	Relubrication
	(gr)	(gr)
SNL 509	65	10
SNL 510-608	75	10
SNL 511-609	100	15
SNL 512-610	150	15
SNL 513-611	180	20
SNL 515-612	230	20
SNL 516-613	280	25
SNL 517	330	25
SNL 518-615	430	40
SNL 519-616	480	50
SNL 520-617	630	55
SNL 522-619	850	70
SNL 524-620	1 000	80
SNL 526	1 100	95
SNL 528	1 400	110
SNL 530	1 700	130
SNL 532	2 000	150

Table 1: Grease quantities

1) Fills approximately 40 % of the free space in the housing

Points to remember

- For arrangements where the bearing is mounted on an adapter sleeve, grease should be supplied at the side opposite to the sleeve nut.
- For bearing arrangements at shaft ends, grease should always be supplied at the end cover side.
- Housings fitted with double-lip seals should be provided with a grease escape hole (**fig 3**) if they are to be relubricated frequently. SNL housings with a grease escape hole in the housing base can be supplied and are identified by the suffix V, e.g. SNL 511-609 V. If they are to be relubricated frequently.

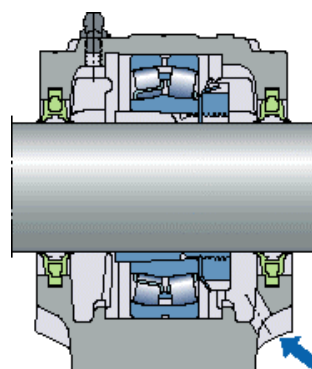
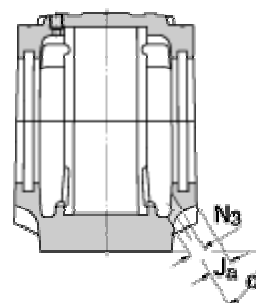


Fig.3

SNL housings with a grease escape hole in the housing base can be supplied and are identified by the suffix V, e.g. SNL 511-609 V. If a grease escape hole has to be drilled, the recommended dimensions will be found in **table 2**. When relubricating periodically, the peripheral speed of the seal lips should be limited to 4 m/s

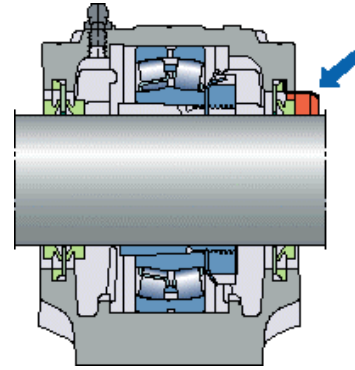


HOUSING	Dimensions		
Size	J_a	N_3	α
	mm		degrees
SNL 205	8,5	10	45
SNL 206-305	10	10	45
SNL 207	10	10	45
SNL 208-307	9	10	45
SNL 209	10	10	45
SNL 210	11	10	45
SNL 211	10	12	45
SNL 212	9	12	45
SNL 213	13	12	45
SNL 215	12,5	12	45
SNL 216	14	16	45
SNL 217	17	16	45
SNL 218	20	16	40
SNL 505	8,5	10	45
SNL 506-605	10	10	45
SNL 507-606	10	10	45
SNL 508-607	9	10	45

HOUSING	Dimensions		
Size	J_a	N_3	α
	mm		degrees
SNL 509	10	10	45
SNL 510-608	11	10	45
SNL 511-609	10	12	45
SNL 512-610	9	12	45
SNL 513-611	13	12	45
SNL 515-612	12,5	12	45
SNL 516-613	14	16	45
SNL 517	17	16	45
SNL 518-615	20	16	40
SNL 519-616	20	16	50
SNL 520-617	21	16	50
SNL 522-619	21	20	50
SNL 524-620	24	20	55
SNL 526	22	20	55
SNL 528	23	20	50
SNL 530	25	20	55
SNL 532	25	20	60

Table 2: Recommended dimensions for grease escape hole

– For housings with V-ring seals the efficiency of relubrication can be appreciably improved if an additional V-ring is arranged inside the housing at the same side as the grease is supplied. This forces grease to leave the arrangement at the side opposite to the supply side. For this purpose a set comprising a V-ring and a splash plate, which covers a sector of more than 180° can be supplied (**fig 4**). The set is designated by the prefix ASN followed by the housing size identification and the suffix V, e.g. ASN 511 V.

**Fig.4**

– Housings fitted with felt seals should be provided with a grease escape hole (**fig 3**) (see over). if they are to be relubricated frequently

SNL housings with a grease escape hole in the housing base can be supplied and are identified by the suffix V, e.g. SNL 511-609 V. If a grease escape hole has to be drilled, the recommended dimensions will be found in **table 7** (see over).

11.2 - Sistema di lubrificazione automatico11.2 - Automatic lubrication system

Sistema di lubrificazione
automatico

Automatic lubrication
system

REPORT ON THE LUBRICATION OF THE CENTRIFUGE DCE 10/20 BEARINGS

The centrifuge fits 2 bearings 22226 CKJ/W33 with dimensions 230x130x64 mm;

The SKF catalogue fixes a formula to calculate the grease quantity (SKF LGHP2) to be given continuously in function of the geometrics parameters of the bearing:

$$G_k = (0,3 \dots 0,5) * D * B * 10^{-4}$$

where:

G_k = quantity of the grease necessary in gr/h;

D = External diameter of the bearing in mm;

B = width of the bearing;

Applying the formula to the centrifuge bearing data, the grease quantity to be continuously given is **0,74 gram per hour (18 gram per day)**;

The centralized lubrication system DROPSA has two outlets, that are deliver **0,41 + 0,41 cm³ of grease for each cycle** sensed by a sensor fitted on the distributor (pos.7); assuming a specific weight of the grease of **0,85 gr/cm³**, for each cycle, each bearing receives approx. **0,35 gram of grease**.

The number of cycles per day for each bearing is given by:

$$N = G_d / G_c$$

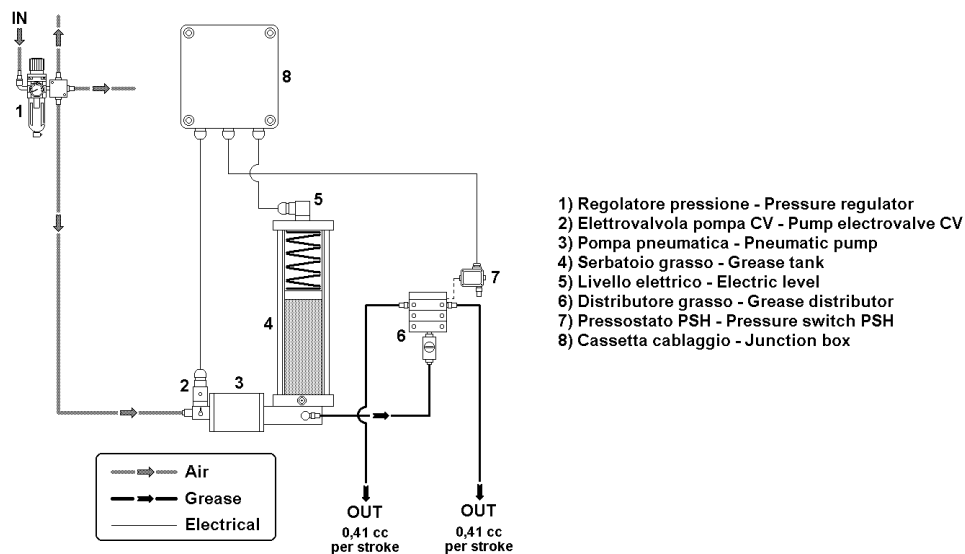
where:

G_d = quantity of the grease necessary for each day;

G_c = quantity of the grease for each cycle.

Applying the formula of the previous data, the number of cycles necessary to grease the bearings of the centrifuge is approx. **50 cycles per day**.

The cycles can be distributed in sub-cycles scheduled as per the electrical panel logistic .



LOCOPUMP S2

Pneumatic Pump

User and Maintenance Manual

Original text translation

Warranty

CONTENTS

1. INTRODUCTION
2. GENERAL DESCRIPTION
3. IDENTIFICATION OF THE MACHINE
4. TECHNICAL CHARACTERISTICS
5. MACHINE COMPONENTS
6. UNPACKING AND INSTALLATION
7. INSTRUCTIONS FOR USE
8. PROBLEMS AND SOLUTIONS
9. MAINTENANCE PROCEDURES
10. DISPOSAL
11. INFORMATION ABOUT ORDERING
12. DIMENSIONS
13. HANDLING AND TRANSPORT
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15. OPERATIONAL HAZARDS
16. GUARANTEE
17. DECLARATION OF CONFORMITY
18. DISTRIBUTORS

Manufacturer	DropsA SpA
Product	LOCOPUMP S2
Year	2009
Certification	CE

1. INTRODUCTION

This user and maintenance manual relates to the "LOCOPUMPS2".

The latest version may be obtained from the Technical-Commercial Office, or by consulting our web site <http://www.dropsa.com>.

This user and maintenance manual contains important information about protecting the health and safety of the personnel who intend to use this apparatus. You must read and look after it carefully, making sure that it is available at all times for the operators who intend to consult it.

2. GENERAL DESCRIPTION

The pneumatic pump "LOCOPUMP S2" uses compressed air to control the grease quantity which is delivered from the pump. Hence, it should be used on machines where compressed air is readily available.

It's a grease single effect pneumatic pump generally used in systems with single-line progressive dividers as SMX, SMO, SMP or SMPM.

In the standard version the pump is fitted of a 2kg reservoir spring loaded, whereby the pump can easily provide grease NLGI 2. The transparent reservoir allows to see clearly the amount of remaining grease moreover there is a minimum level sensor. This pump is designed to mount a maximum level sensor and an adjustable delivery kit.

Loading connection is completed of a filter guaranteeing the input of clean lubricant into the reservoir.

It's possible to use a filtered clean grease return in the reservoir.

3. IDENTIFICATION OF THE MACHINE

On the front part of the pump tank there is a plate which indicates the product code, the supply voltage and the basic characteristics.

4. TECHNICAL CHARACTERISTICS

TECHNICAL CHARACTERISTICS	
Pumping system	Single acting pneumatic piston
Air pressure	3÷6 bar
Compressed air inlet	G 1/8 UNI - ISO 228/1 with cone seating for 6mm tube
Reservoir refilling	grease nipple with check valve type UNI 7663 – "A" – 1/8" NPT
Lubricant outlet	G 1/4 UNI – ISO 228/1
Reservoir return	G 1/4 UNI – ISO 228/1
Compression ratio	50:1
Fixed delivery	2 cm ³ /stroke
Adjustment delivery (kit 3133390)	0.5 ÷ 2 cm ³ /stroke
Max. grease consistence	NGLI 2
Piston total stroke	36.5 mm
Piston working stroke	29.2 mm
Minimum level contact	V max.= 100 Vac I max.= 0.25° @ 30Vac P max.= 7.5 W (NO) – 3 W (NC)
Operating temperature	+5 ÷ +50°C
Storage temperature	+5 ÷ +50°C
Relative humidity max. noncondensing operating damp	90%
Sound pressure level	< 70 db (A)
Weight	4.5 Kg

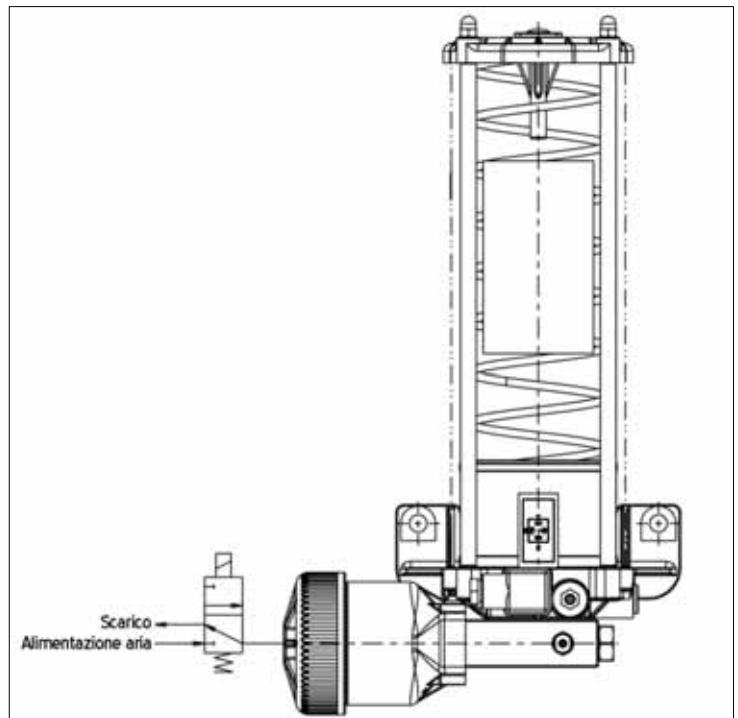
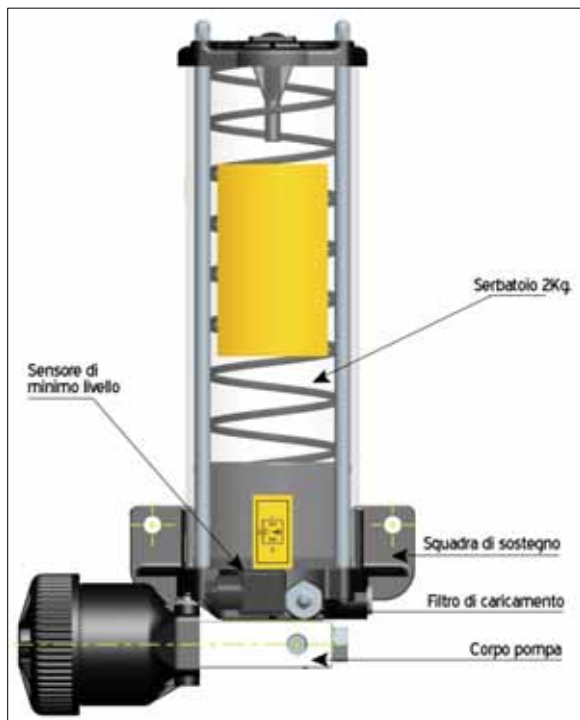
5. MACHINE COMPONENTS

The main part of the pump are:

The reservoir, constructed of transparent type plastic, compatible with commercially available greases.

The pump body , constructed of steel with capability of delivery upto 2 cm³ (0,12 cu.in) per stroke at a maximum pressure of 300 bar (4351 psi). There is an internal check valve mechanism for the grease output.

The level sensor, is an electric contact that indicates that the pump has reached its low level of grease. Its possible to set it to either "Normally Closed" or "Normally Open" (see drawing for further instruction). As standard is set to "Normally Closed".



PART NUMBER	DESCRIPTION
3044260	Reservoir 2 Kg. (4,4 lb)
3045202	Support Bracket
3413502	Body pump
1655183	Minimum level sensor
712100	Refilling Filter

5.1 PNEUMATIC GREASE PUMP WITH STANDARDIZED 400CC LUBRICANT CARTRIDGE LOADING SYSTEM

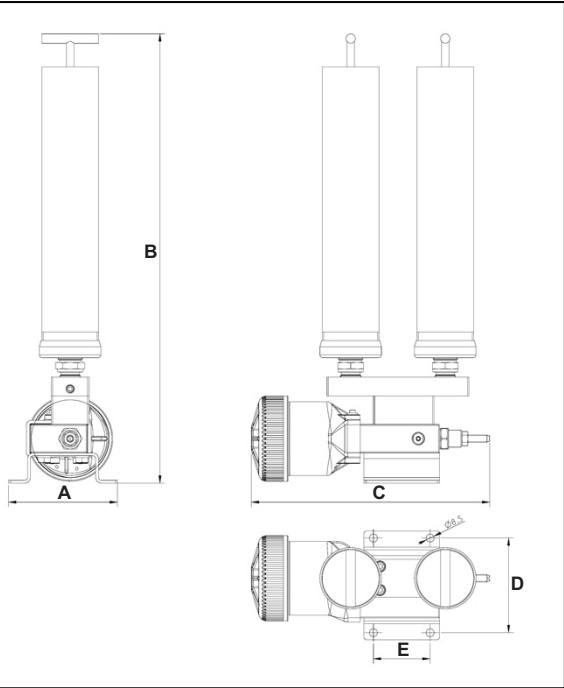
The Pneumatic Pump with cartridge grease loading is a pump for general use in single line progressive divider lubrication systems such as SMX, SMO, SMP or SMPM.

The pump is designed for all those applications where it is ideal to have grease supplied in readily available cartridges.
The pump is equipped with a steel plate with a M57x1.5 mm thread that allows interfacing with up to two 400cc lubricant cartridges.

High Reliability is guaranteed by the use of hardened steel in the construction in all the pumping element components and the pump piston is manufactured in ground hardened steel.

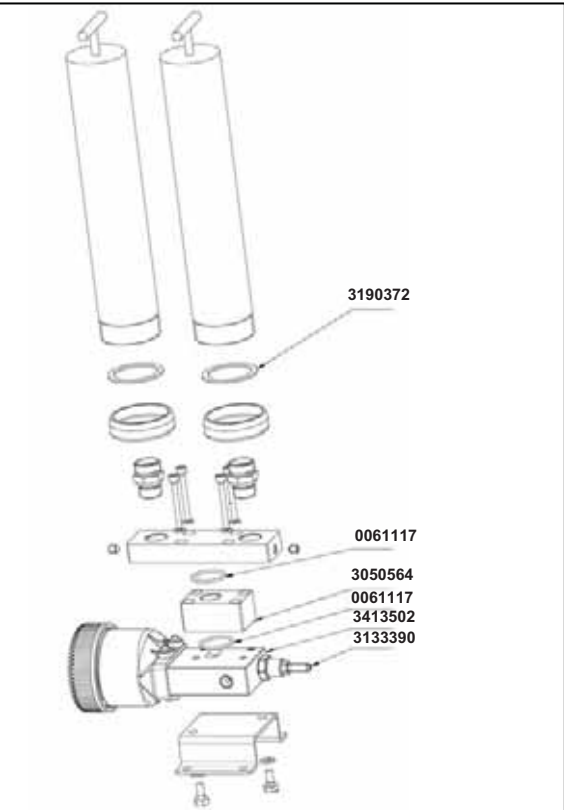


5.1.1 DIMENSIONS



OVERALL DIMENSIONS			QUOTE OF FASTENING	
A	B	C	D	E
115	~480	252	100	60

5.1.2 ORDER INFORMATION



PART NUMBER	DESCRIPTION
3414064	Pneumatic pump with cartridge loading
SPARES	
3190372	Seal gasket
0061117	Gasket
3050564	Flange connection
3413500	Pneumatic pump grease R= 50:1
3133390	Pump delivery adjustment kit

6. UNPACKING AND INSTALLATION



WARNING: The unit is only to be opened and repaired by specialist personnel.

6.1 UNPACKING

Once a suitable installation position has been identified, unpack the pump and prepare for installation. It is important to inspect the pump to ensure that there has been no damage during transportation. The packaging material used does not require any special disposal procedures. You should refer to your regional requirements.

6.2 PUMP INSTALLATION

Allow sufficient space for install with 150mm clear space around the perimeter of the pump.

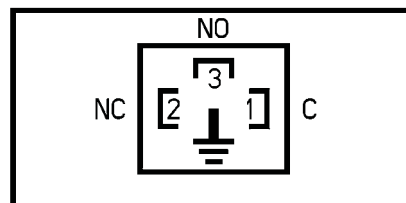
Mount the pump LocopumpSerie2 at "eye level" to avoid any risk of postural problems.

Do not install the pump in dangerous environments such as explosive/flammable areas or in areas subject to high vibration.

Only use the fixing holes on the support bracket which are intended for n°2 holes for screws Ø10 mm (0,4 in.)(use a flat washer with the screw). For more details of the fixing holes please verify the dimensions shown on the drawing in chapter 12.

6.3 ELECTRICAL CONNECTIONS

Ensure the electrical connection of the low level is connected before using the pump. See below drawing for connection details. A label of this drawing is also on the pump's reservoir.



Supply voltage 24 V max.

6.4 PUMP OUTLET CONNECTION

The hydraulic connection of the pump is on the front face of the pump. It is a standard 1/4" BSP (see drawing in chapter 12).

6.5 AIR CONNECTION ON PUMP

Use an 1/8" BSP connection fitting. It is also possible to use DropsA's nut and cone fittings as the seating is already available.

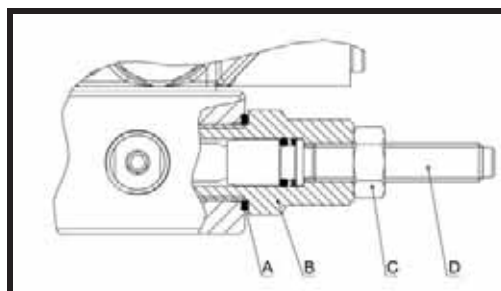
Remember to use a 3/2 valve that allows the air to vent to atmosphere and the internal spring within the pump to reset.

6.6 HOW TO ADJUST THE PUMP OUTPUT OR PRESSURE

This can be done by :Regulating pressure: the output pressure has a 50:1 ratio with the inlet pressure. Therefore this can be regulated depending on the requirements of the system. (see chapter 4 for min and max pressures).

Regulating pump: as standard the pump has a fixed output. For special requirements you can convert the pump by installing the kit 3133390 – *ordered separately to the pump* – the kit is shown below.

To use this kit , mount the o-ring (A) then tighten the fitting (B) with a 27mm spanner. Loosen the counternut (C) with a 13 mm spanner to unblock the screw (D), use the appropriate screw driver to screw IN for less output or screw OUT for more output. After adjustments have been made you must tighten the counternut (C) to block any further movements.



N.B.: After all connections have been made please ensure that they are safe and properly secured down.

7. INSTRUCTIONS FOR USE

7.1 Start Up

- The unit should only be used, opened and repaired by specialized personnel only.
- It is prohibited to use the pump if it is submersed in fluid, in dangerous environments or explosive/flammable areas unless pre-agreed with supplier and appropriate safety/protection measures have been put in place.
- Use gloves and safety glasses as advised in the grease lubricant safety data sheet.
- DO NOT use aggressive lubricants on the NBR seals, if in doubt consult DropsA Spa technical office who can offer advice on lubricants and provide a pre-approved list of greases.
- Ensure proper precaution to keep the pump clean and avoid and potential health hazards.
- Always use suitably pressure rated tubing for the lubrication system.

7.2 Action to be taken before start-up.

- Check the integrity of the pump.
- Refill the tank with suitable lubricant.
- Check that the pump is at working temperature and that there are no air bubbles in the pipes.
- Check that the electric connection has been carried out correctly (CEI 64/8, IEC 364).
- Ensure that the pump is properly connected to the control panel.

7.3 Use

- Check the data sets imposed.
- Press the start button on the machine to which the Sumo pump is connected.
- Check pump start-up.
- Check that the machine is adequately lubricated (if there are still some doubts about its correct functioning you can contact the Dropsa S.p.A Technical Office and request a test procedure).

8. PROBLEMS AND SOLUTIONS

Below is a diagnostic table showing the main faults, the probable causes and the possible solutions.

In the event of doubts and/or problems which cannot be solved, do not proceed to look for the fault by dismantling parts of the machine, but contact the Dropsa Technical Office.

DIAGNOSTIC TABLE		
FAULT	CAUSE	SOLUTION
The pump does not deliver grease or does not deliver the correct amount of grease	The grease level is below minimum.	Add more grease into the reservoir without surpassing the MAX level.
	The solenoid valve on the inlet of the pump does not vent.	Verify if the solenoid vents. Vent the solenoid manually and monitor if the grease flows out.
The pump does achieve required pressure or does not maintain its operating pressure.	The fittings are leaving/loose.	Tighten the fittings and check for leaks on all fittings.
	Regulation of air inlet pressure..	Adjust the air pressure on the inlet of the pump taking into account the pressure ratio.
	Internal Check valve is damaged or contaminated.	Clean or change the valve shown in kit 3133391.

9. MAINTENANCE PROCEDURES

Ensure the pump is positing so that it can be verified easily.

Ensure you have necessary personal protective equipment to avoid any contact with the grease.

The pump undergoes severe factory testing therefore no maintenance is forecasted with the pump.

DropsA recommends the use of lubricants that are free of any impurities as well as a regular cleaning of the pump's components.

The pump is dismantled as follows :

1. **Before removing the reservoir is must be completely emptied of lubricant.**
2. Disconnect the air inlet connection.
3. Disconnect all tubing on the pump.
4. Loosen the screws on the lid, remove the reservoir **taking ABSOLUTE care of the spring inside the reservoir (it may still be under tension – if so remove more lubricant.)**
5. Remove the pump and any filters if fitted.
6. Unscrew the plug on the pneumatic pump body , **be careful** of the load on the internal spring. At this point you can remove the internal components of the pump body.

At this point all components are loose and allows the cleaning and verifying of each component possible.

All components must be clean with cleaning fluid and lubricated before re-assembly.

Periodically it is necessary to check:

CHECK	TOTAL NUMBER OF PUMP CYCLES
The lubrication status	100
Lubricant level	200
Clean refilling filter	400
Clean bottom of reservoir if deposits have formed.	600

The machine does not require any special equipment for any checking and/or maintenance activity, however the recommendation is to use suitable equipment which is in a good condition (according to current regulation) in order to avoid causing damage to persons or machine parts.

Make sure that the electric and hydraulic supply has been disconnected before carrying out any maintenance intervention.

10. DISPOSAL

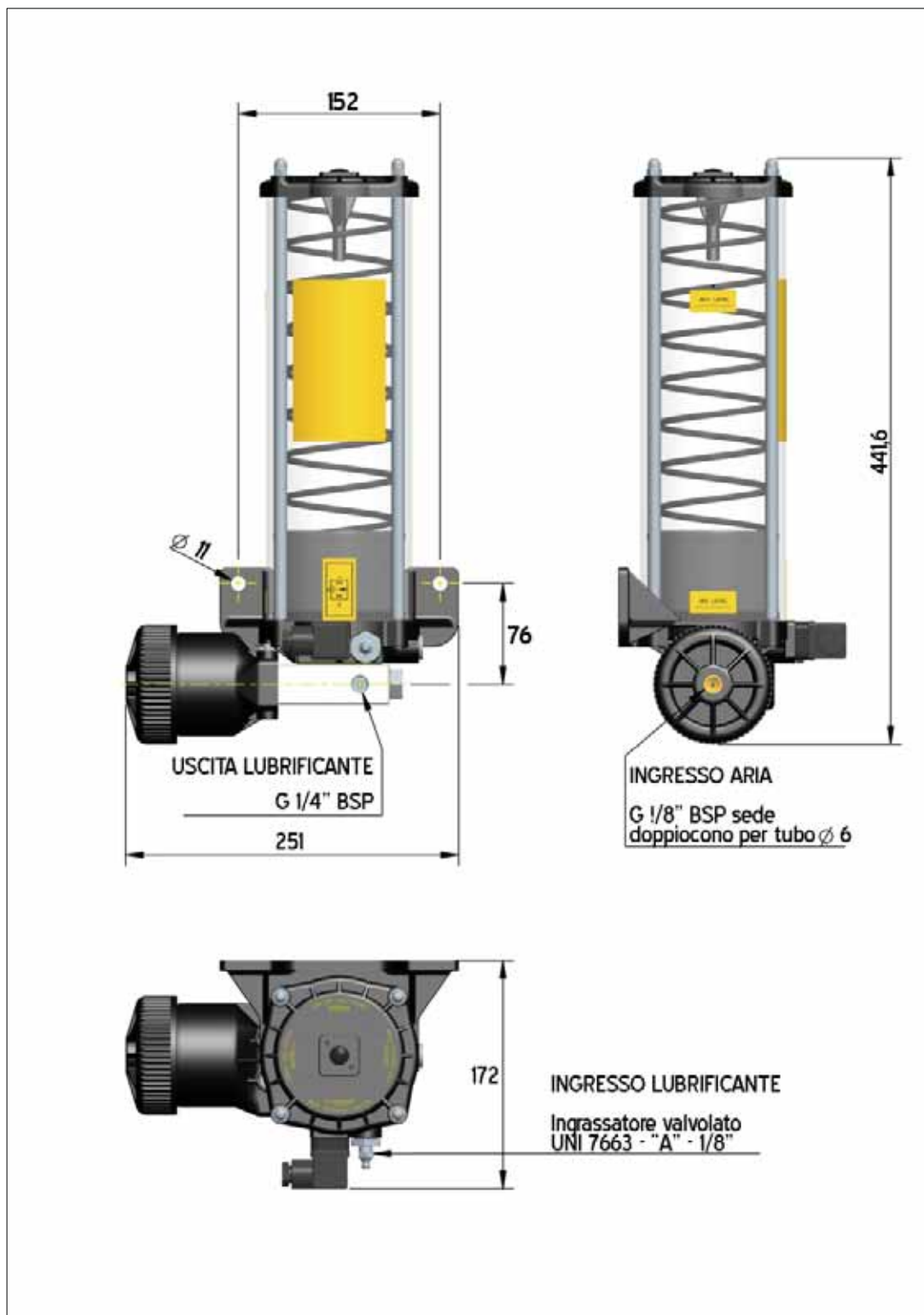
In the course of machine maintenance, or if the machine is scrapped, do not dispose of polluting parts into the environment. Refer to local regulations with regard to their correct disposal. When scrapping the machine the identification plate and any other documents must be destroyed.

11. INFORMATION ABOUT ORDERING

PART NUMBER	FEATURES
3413050	Pneumatic pump R=50:1 Reservoir 2 Kg (4,4 lb)
3133391	Seal kit spares
3133390	Adjustable pump output kit
3133392	Kit max level
3413050 C	Preloaded pneumatic pump R=50:1 Reservoir 2 Kg (4,4 lb)

12. DIMENSIONS

To facilitate future maintenance, increase the spaces indicated by at least 100 mm.



13. HANDLING AND TRANSPORT

Prior to shipping, the equipment is carefully packed in cardboard package. During transportation and storage, always maintain the pump the right way up as indicated on the box. On receipt check that package has not been damaged. Then, store the machine in a dry location.

14. PRECAUTIONS FOR USE

It is necessary to carefully read the warnings and risks associated with using a lubricant pump. The operator must understand how it works and must clearly understand the dangers by studying the user manual.

Power supply

Any type of intervention must not be carried out before unplugging the machine from power supply. Make sure that no one can start it up again during the intervention.

All the installed electric and electronic equipment, reservoirs and basic components must be grounded.

Flammability

The lubricant generally used in lubrication systems is not flammable. However, it is advised to avoid contact with extremely hot substances or naked flames.

Pressure

Prior to any intervention, check the absence of residual pressure in any branch of the lubricant circuit as it may cause oil sprays when disassembling components or fittings.

Noise

Pump produces noise, not more than 70 dB(A).

15. OPERATIONAL HAZARDS

The check on compliance with the essential safety requirements and with the stipulations indicated in the machine directives are to be carried out by means of compiling the checklists already made available and contained in the *technical file*.

Two types of lists were used:

- List of dangers (section from UNI EN ISO 14121-1 relating to UNI EN ISO 12100)
- Application of the essential safety requirements Machine Dir. - app. 1, part 1)

See below a list of dangers which have not been completely eliminated, but are considered acceptable:

- During assembly/maintenance it is possible that there may be an oil splash (consequently this operation must be carried out using appropriate individual protective devices);
- contact with oil -> see instructions for using appropriate individual protective devices DPI;
- **Loaded springs**, in the pump cylinder and in the reservoir.
- Use of an inappropriate lubricant -> fluid characteristics indicated both on the pump and in the manual (**if in doubt consult our Technical Office**);
- protection against direct and indirect contact must be provided by the user;
- The pump's working logic requires it to operate at all times, so it is necessary to pay attention to the electric connection. If there is no current the customer's machine can only be restarted following a reset while the lubrication pump can restart automatically.
- Do not use alcohol or spirits to clean any components.

UNACCEPTABLE FLUIDS	
Fluids	Dangers
Lubricant with abrasive additives	High consumption of contaminated parts
Lubricant with silicon additives	Jamming of the pump
Benzine – solvents – inflammable liquids	Fire – explosion – damage to gaskets
Corrosive products	Corrosion of the pump – injuries to persons
Water	Pump oxidation
Food substances	Contamination of these substances

16. WARRANTY

All Dropsa products are guaranteed for a maximum of 12 months from the delivery date, for constructional and material faults.

The guarantee is extended as indicated below:

Complete installation of the system by Dropsa: 24 months.

Other components: 12 months from the date of installation; if installation takes place 6 months or more following the delivery date, the guarantee will cover a maximum of 18 months from the delivery date.

In the event of equipment malfunction we must be notified of precise details of the fault encountered, supplying the Dropsa code, the test number if present (expressed as: xxxxxx-xxxxxx), delivery and installation date and, finally, conditions of using the product/s in question.

Once this information has been received we will decide at our own discretion whether to provide technical assistance or to provide a return authorisation number (RAN) with precise instructions about returning the equipment.

After receiving the equipment and on the basis of careful analysis Dropsa reserves the right to decide whether to repair or replace the product. If the guarantee is still valid we will proceed to repair or replace the part at our own expense.

If the returned product is not faulty, Dropsa will decide at its own discretion whether or not to charge the customer for the costs incurred (logistics etc.).

This guarantee must be understood to be cancelled if the product shows signs of damage and resulting from incorrect use, negligence, normal wear and tear, chemical corrosion, installation not in compliance with the instructions expressly indicated and use contrary to the manufacturer's recommendations. Any changes, tampering or alterations to the equipment or its parts made without written authorisation from Dropsa S.p.A., relieves the latter from all liability and releases it from the obligations of the guarantee.

Parts subject to normal wear and tear and perishable parts are not covered by the guarantee.

Anything not expressly indicated must be considered to be excluded from the guarantee as well as damages or costs resulting from faults in the actual product.

The conditions of validity of the Dropsa guarantee are understood to be implicitly accepted as soon as the equipment is purchased. Any changes to or departures from this guarantee must only be considered valid after prior authorisation from Dropsa S.p.A.

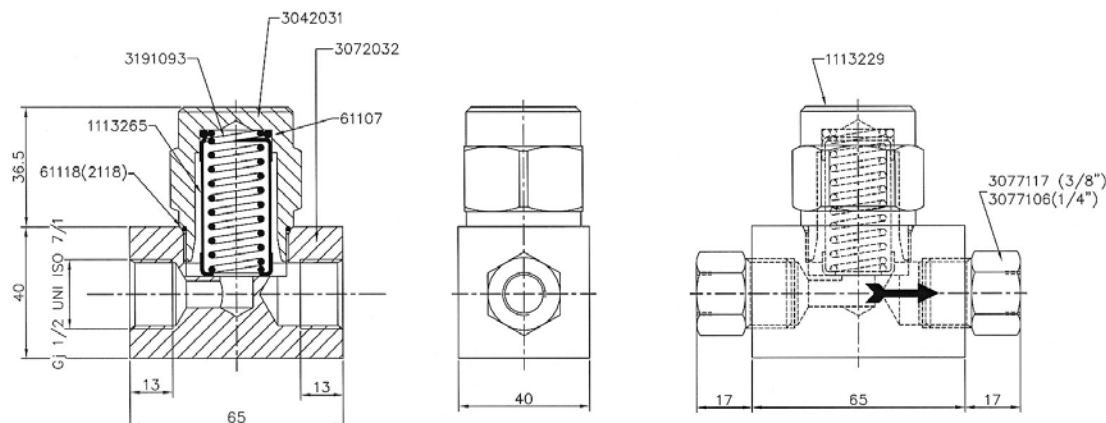
DROPSA S.p.A. declines any liability for personal injuries or damages to property in the event of failure to comply with the instructions provided in this manual.

Any changes to the component parts of the system or a change in the intended use of the latter or its parts without written authorisation from DROPSA S.p.A. relieve the latter from any liability for personal injuries and/or damage to property and relieve it of any guarantee obligation.



FILTER WITH STEEL BODY FOR HIGHT PRESSURE (MAXIMUM 500 BAR – 7200 PSI)

**1113200
÷
1113259**



Filtering degree (micron)	Thread BSP*	Filter Part N.	Cartridge Part N.
25	1/4	1113235	1113265
25	3/8	1113245	
25	1/2	1113255	
40	1/4	1113236	1113266
40	3/8	1113246	
40	1/2	1113256	
40*	1/4	1113259	1113219
60	1/4	1113237	1113267
60	3/8	1113247	
60	1/2	1113257	
125	1/4	1113238	1113268
125	3/8	1113248	
125	1/2	1113258	
150	1/4	1113230	1113231
150	3/8	1113240	
150	1/2	1113250	
300	1/4	1113200	1113205
300	3/8	1113210	
300	1/2	1113220	

The maximum operating pressure indicated refers to the sealing of the system.

If the difference of pressure between inlet and outlet port is greater than 20 bar (290 psi) the filter breaks, for this reason it is advisable to check periodically the filter to avoid clogging.

During the installation of the lubrication system, it is possible than foreign materials remain into the tube.

The use of the filter is recommended to avoid this contamination to enter the lubrication system damaging the machine and the lubrication plant.

• Note: Standard thread of inlet and outlet port is 1/2"BSP.

For the other type of threads, the following reducers are fitted on filter body:

Part N. 3077106 reducer from 1/2"BSP to 1/4"BSP

Part N. 3077117 reducer from 1/2"BSP to 3/8"BSP.

* Filter with holes for wall mounting

717 – 24/02 – 7176903

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11.1 - Valvola a sfera11.1 - Ball valves

Valvola a sfera

Ball valves



ART. 400-401

Valvola a sfera in acciaio inox microfusa 2 vie filettata passaggio integrale

2-way full-bore threaded-ends stainless steel ball valve

Esecuzioni standard:

Costruita per l'utilizzo a medie pressioni.
Temperatura di utilizzo: da -20°C a +150°C
Pressione di utilizzo: vedi diagramma.
Fluido intercettato: aria, acqua, gas, prodotti petroliferi e petrolchimici, fluidi aggressivi.
Trattamento esterno: articolo 400 sabbiata; articolo 401 lucidata.
Estremità filettate femmina a norma UNI/ISO 7/1 Rp.
Testa della valvola a norma ISO 5211

Standard executions:

*Suitable for middle pressure applications.
Working temperature: from -20°C to +150°C
Working pressure: see diagram.
Fluid range: air, water, gas, petroleum and petrochemical products, aggressive media.
Surface treatment: article 400 sandblasted; article 401 polished.
Female threaded ends as per UNI/ISO 7/1 Rp specifications.
Head of the valve as per ISO 5211 specifications.*

Esecuzioni speciali a richiesta:

Attacchi femmina NPT ANSI B1.20.1
Guarnizioni di tenuta in:
PTFE caricato vetro;
PTFE caricato carbogرافite.

Per altre applicazioni contattare il nostro ufficio tecnico.

On request:

*Female threaded ends as per NPT B1.20.1 specifications
Seals made of:
PTFE with glass;
PTFE with carbon graphite.*

For other applications, please contact our technical department.

Certificazioni:

Conforme alla direttiva Europea 97/23 EC "PED"

Approvals:

According to 97/23 EC "PED"

CODICI VALVOLA IN ESECUZIONE STANDARD VALVE CODES IN STANDARD EXECUTION

misura size	DN 10	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100
Asse libero sabbiata <i>Free shaft sand blasted</i>	V400H203	V400H204	V400H205	V400H206	V400H207	V400H208	V400H209	---	---	---
Asse libero lucidata <i>Free shaft polished</i>	V401H203	V401H204	V401H205	V401H206	V401H207	V401H208	V401H209	V419H410	V419H411	V419H412
peso weight Kg.	0,24	0,32	0,51	0,77	1,27	1,81	3,2	5,47	8,92	15,9
Con leva sabbiata <i>With lever sand blasted</i>	L400H203	L400H204	L400H205	L400H206	L400H207	L400H208	L400H209	---	---	---
Con leva lucidata <i>With lever polished</i>	L401H203	L401H204	L401H205	L401H206	L401H207	L401H208	L401H209	L419H410	L419H411	L419H412
peso weight Kg.	0,31	0,39	0,58	0,87	1,37	2,01	3,4	5,67	9,22	16,4

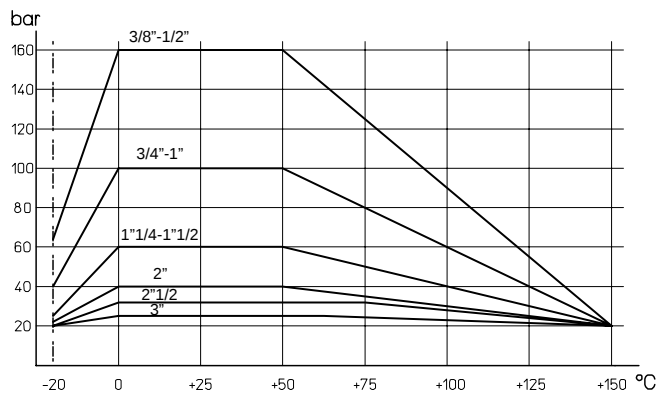
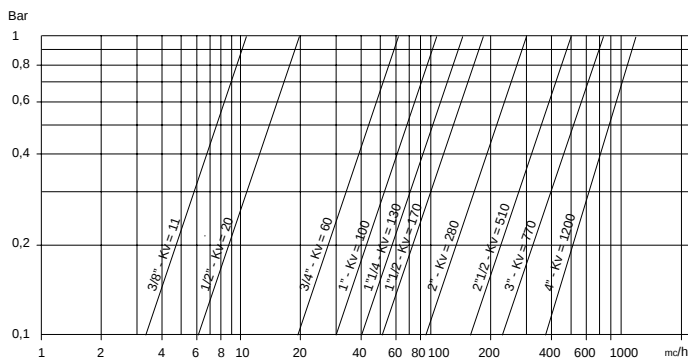


diagramma pressione/temperatura

pressure/temperature diagram



portata/perdita di carico e coefficiente nominale Kv
Il valore Kv è il valore indice in m³/h (con acqua a 15°C) che provoca la caduta di pressione di 1 bar

flow-pressure loss diagram and Kv nominal coefficient.

Kv is the coefficient, expressed in m³/h (with water at 15°C) causing a pressure loss of 1 bar.

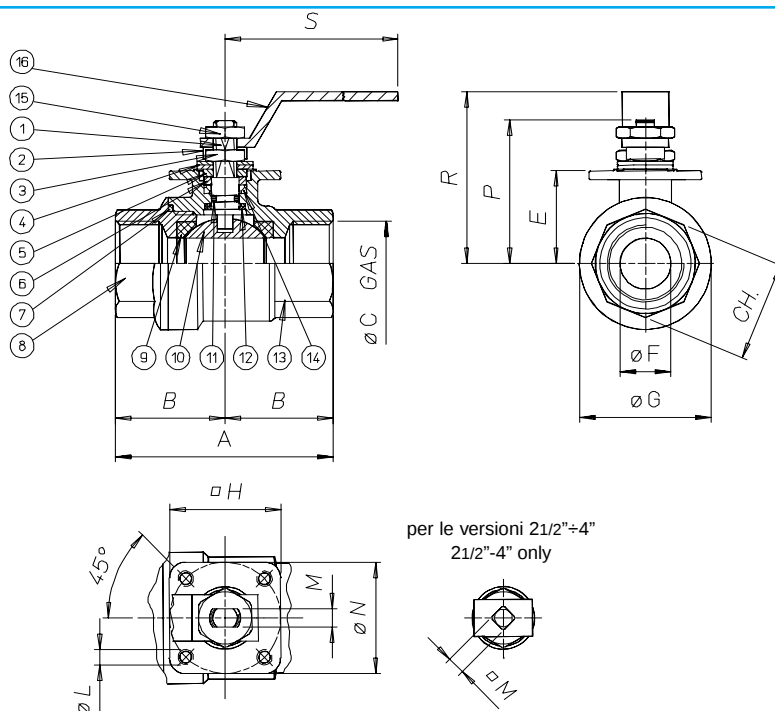
COPPIE DI SPUNTO in Nm *BREAK AWAY TORQUES in Nm*

misura size	DN 10	DN 15	DN 20	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100
PN 25 bar									99	131
PN 32 bar								68		
PN 40 bar							48			
PN 60 bar					23	35				
PN 100 bar			12	15						
PN 160 bar	6	7								

I valori della coppia in Nm possono variare in funzione della temperatura e del tipo di fluido. Considerare un fattore di sicurezza pari a 1,4.
Con frequenti cicli di apertura e chiusura la coppia di manovra può diminuire sensibilmente rispetto a quella iniziale.
Torque can vary depending on temperature and type of fluid; a safety factor of 1.4 must be applied. Torque can drop on high frequency of operations.



VALVOLA MODELLO 400-401 VALVE TYPE 400-401



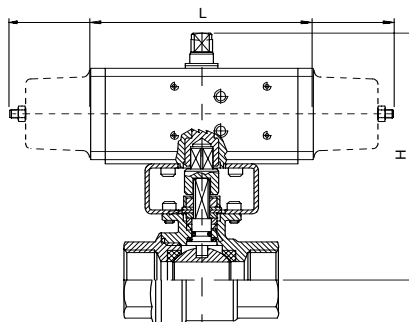
MATERIALI MATERIALS

1) Stelo Shaft	AISI 316	1.4401	UNI X5CrNiMo 17 12
2) Piastra bloccaggio Nut holder	AISI 304	1.4301	UNI X5CrNi 18 10
3) Dado di bloccaggio Lock nut	AISI 304	1.4301	UNI X5CrNi 18 10
4) Molla a tazze Spring	AISI 301	1.4310	UNI X12CrNi 17 07
5) Distanziale Washer	AISI 304	1.4301	UNI X5CrNi 18 10
6) Anello premiguarnizione Gland nut ring	AISI 304	1.4301	UNI X5CrNi 18 10
7) Guarnizione statica Static ring	P.T.F.E.		
8) Manicotto femmina End	AISI 316	1.4408	
9) Guarnizioni di tenuta laterale Seals	P.T.F.E.		
10) Sfera Ball	AISI 316	1.4401	UNI X5CrNiMo 17 12
11) O-Ring di tenuta intermedia O-ring	FKM		
12) Anello di tenuta inferiore Bottom tight ring	P.T.F.E.		
13) Corpo con manicotto femmina Body with female end	AISI 316	1.4408	
14) Coppia di tenuta superiore Top sealing	P.T.F.E.		
15) Dado blocca leva Lever nut	ANSI 304	1.4301	UNI X5CrNi 18 10
16) Leva di manovra Lever	ANSI 304	1.4301	UNI X5CrNi 18 10

DIMENSIONI DIMENSIONS

Size	A	B	øC	D	E	øF	øG	□H	øL	□M	øN	CH	P	R	S			
3/8"	55	25	3/8"	37	19,5	10	29	36	M5	4	36	21,5	37	52	110			
1/2"	65	30	1/2"	42	24,5	15	34	36	M5	4	36	26,5	42	55	110			
3/4"	70	35	3/4"	52	30,5	20	42,5	36	M5	6	36	31,5	52	66	140			
1"	85	42,5	1"	56	34,5	25	50,5	36	M5	6	36	40,5	56	70	140			
1 1/4"	95	47,5	1 1/4"	68	42	32	63	42	M5	8	42	49,5	68	85	180			
1 1/2"	105	52,5	1 1/2"	74	48	40	75,5	42	M5	8	42	54,5	74	91	180			
2"	125	62,5	2"	87	55	50	91	50	M6	10	50	69,5	87	105	230			
2 1/2"	128	64	2 1/2"	109,5	94,5	65	110	90	9	9	70	-	92	110	235			
3"	150	75	3"	121	106	80	141	90	9	9	70	-	110	130	285			
4"	178	89	4"	135	120	100	160	90	9	9	70	-	120	150	310			

VALVOLA 400-401 ATTUATA AUTOMATED VALVE TYPE 400-401



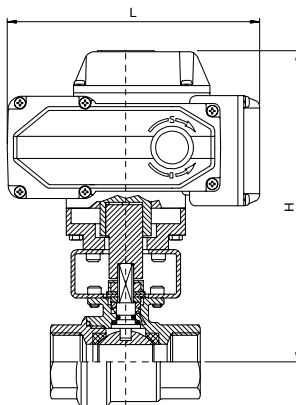
ATTUATORE PNEUMATICO DOPPIO EFFETTO DOUBLE ACTING PNEUMATIC ACTUATOR

Articolo Model	Attuatore Actuator	Kit di montaggio Mounting kit	DN mm	L mm	H mm	Peso Kg Weight Kg
D40 * H003	DA015401S	KCF032562	10	114	133,5	1,1
D40 * H004	DA015401S	KCF032562	15	114	138,5	1,2
D40 * H005	DA030401S	KCF031315	20	130	152,5	1,6
D40 * H006	DA030401S	KCF031315	25	130	156,5	1,9
D40 * A007	DA045402S	KCF042354	32	144	171	2,5
D40 * H008	DA060402S	KCF042354	40	152	181	3,4
D40 * A009	DA090401S	KCF051322	50	169	196	4,8
D419H010	DA120401S	KCF052622	65	184	250,5	5,6
D419A011	DA180401S	-----	80	212	232	14,9
D419H012	DA240401S	-----	100	242	256	23,4

ATTUATORE PNEUMATICO SEMPLICE EFFETTO SPRING RETURN PNEUMATIC ACTUATOR

Articolo Model	Attuatore Actuator	Kit di montaggio Mounting kit	DN mm	L mm	H mm	Peso Kg Weight Kg
S40 * H003	SR015401S	KCF032562	10	221	141,5	1,7
S40 * H004	SR015401S	KCF032562	15	221	146,5	1,8
S40 * H005	SR030402S	KCF042353	20	240	162,5	2,6
S40 * H006	SR030402S	KCF042353	25	240	166,5	2,9
S40 * A007	SR045401S	KCF051909	32	294	183	3,7
S40 * H008	SR060401S	KCF051909	40	320	207	5,4
S40 * A009	SR090401S	KCF071323	50	357	234	7,7
S419H010	SR120401S	-----	65	372	230,5	12,6
S419A011	SR180401S	-----	80	436	254	21,3
S419H012	SR240401S	-----	100	460	280	29,6

* = 0 valvola esterno sabbato (articolo 400); sand blasted valve (model 400) * = 1 valvola esterno lucidato (articolo 401); polished valve (model 401)



ATTUATORE ELETTRICO ON-OFF ON-OFF ELECTRICAL ACTUATOR

Articolo Model	Attuatore Actuator	Kit di montaggio Mounting kit	DN mm	L mm	H mm	Peso Kg Weight Kg
E40 * 16B03	AE160001	KCF051988	10	158,5	181	3,2
E40 * 16B04	AE160001	KCF051988	15	158,5	186	3,3
E40 * 16D05	AE160004	KCF051907	20	158,5	192	3,4
E40 * 16D06	AE160004	KCF051907	25	158,5	196	3,7
E40 * 16D07	AE160004	KCF051909	32	158,5	204,5	4
E40 * 16H08	AE160010	KCE282075	40	207,5	254,5	6,4
E40 * 16H09	AE160010	KCE281912	50	207,5	261,5	7,3
E41916H10	AE160010	KCE281855	65	207,5	264	10
E41916L11	AE160020	-----	80	256,5	291	17,5
E41916L12	AE160020	-----	100	256,5	305	24,5

ATTUATORE ELETTRICO MODULANTE ROTARY MODULAR TYPE ELECTRICAL ACTUATOR

Articolo Model	Attuatore Actuator	Kit di montaggio Mounting kit	DN mm	L mm	H mm	Peso Kg Weight Kg
M40 * 16C03	AM160002	KCF051988	10	158,5	181	3,2
M40 * 16C04	AM160002	KCF051988	15	158,5	186	3,3
M40 * 16F05	AM160005	KCE282077	20	207,5	192	5,9
M40 * 16F06	AM160005	KCE282077	25	207,5	196	6,2
M40 * 16F07	AM160005	KCE282075	32	207,5	204,5	6,3
M40 * 16L08	AM160020	KCE362025	40	256,5	254,5	11,7
M40 * 16L09	AM160020	KCE362022	50	256,5	261,5	12,7
M41916L10	AM160020	-----	65	256,5	279,5	15,6
M41916L11	AM160020	-----	80	256,5	291	19
M41916L12	AM160020	-----	100	256,5	305	26

* = 0 valvola esterno sabbato (articolo 400); sand blasted valve (model 400) * = 1 valvola esterno lucidato (articolo 401); polished valve (model 401)

11.1 - Valvola a ghigliottina

11.1 - Guillotine valves

Valvola a ghigliottina

E' VIETATA la messa in marcia della macchina prima dell'installazione di un sistema di protezione della zona scarico degli scarti. Tale sistema deve impedire l'accesso alle valvole a ghigliottina. L'accesso alle valvole a ghigliottina deve essere possibile esclusivamente con la macchina spenta e in condizioni di sicurezza.

Guillotine valves

It is FORBIDDEN to put in operation the machine before the installation of a protection, correctly connected to the waste outlet flange, in order to prevent the access to the moving blades of the valve.

The access to the blade valve must be done only with motor off and in safe condition.

UNIDIRECTIONAL MONOBLOCK VALVE WITH PNEUMATIC CONTROL (art. 29)

MATERIALS/CHARACTERISTICS

Body:	<i>GG25 or AISI 316</i>	Max. operating pressure:
Sluice gate:	<i>AISI 304 or AISI 316</i>	DN 50 → Max P. < 10 Bar
Packing gland:	<i>GG25, Aluminium or Stainless Steel</i>	DN 65 → Max P. < 10 Bar
Rod cilinder:	<i>C.40 chromium-plated steel</i>	DN 80 → Max P. < 10 Bar
Bolts and screws:	<i>Iron, galvanized or Stainless Steel</i>	DN 100 → Max P. < 10 Bar
Blade protection:	<i>Galvanized or painted Iron</i>	DN 125 → Max P. < 10 Bar
Packings:	<i>Teflon or graphited braid</i>	DN 150 → Max P. < 10 Bar
OR:	<i>NBR, Viton or other on demand</i>	DN 200 → Max P. < 8 Bar
Columns:	<i>Iron, galvanized or Stainless Steel</i>	DN 250 → Max P. < 6 Bar
Support plate:	<i>Iron, painted or Stainless Steel</i>	DN 300 → Max P. < 5 Bar
Flange drilling:	<i>UNI2277-PN10</i>	DN 350 → Max P. < 4 Bar
Passage:	<i>Total</i>	DN 400 → Max P. < 3 Bar
Seal towards the outside:	<i>100%</i>	DN 450 → Max P. < 2,5 Bar
Upstream/Downstream seal:	<i>100%</i>	DN 500 → Max P. < 2 Bar
Control:	<i>Pneumatic</i>	DN 600 → Max P. < 1,5 Bar
Max. operating temp.:	<i><100°C</i>	DN 700 → Max P. < 1 Bar
		DN 800 → Max P. < 1 Bar

USES

Water, drainage waters, mud even with coarse solid bodies, pulp for paper with short fibres, tannery waste.

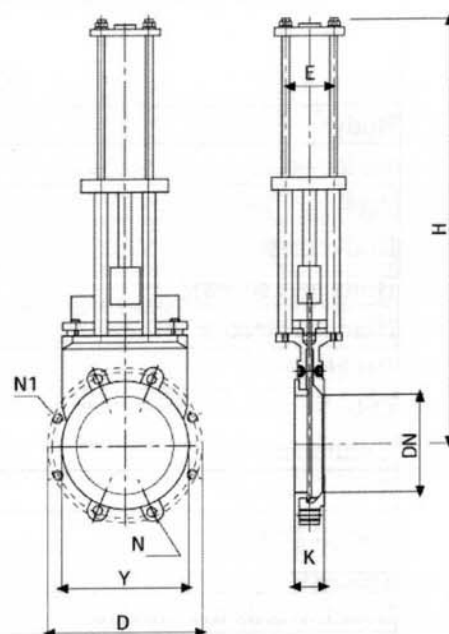
N.B. For all other fluids, use must correspond to **P<0,5 bar**

ACCESSORIES

Solenoid valve 5 output	Oil –hydraulic and magnetic cylinder
Pneumatic 3-15 Psi (Positioner),	Mechanicals, magnetics or inductives limit
Electropneumatic 4-20 mA (Positioner)	switches
Other materials and/or versions upon request	

Monoblock valve maintenance handbook

MONOBLOCK VALVE WITH OR, PNEUMATIC D.E. CONTROL							
DN	Y	N	N1	K	D	H	E
50	125	4xM16	-	45	155	605	80
65	145	4xM16	-	45	180	630	80
80	160	4xM16	-	45	195	640	80
100	180	4xM16	4xM16	50	215	665	80
125	210	4xM16	4xM16	50	250	740	100
150	240	4xM20	4xM20	55	275	820	100
200	295	4xM20	4xM20	60	335	1045	125
250	350	6xM20	6xM20	60	390	1240	160
300	400	6xM20	6xM20	60	445	1410	160
350	460	10xM20	6xM20	70	505	1555	200
400	515	10xM24	6xM24	90	560	1710	200
450	565	14xM24	6xM24	110	610	1855	200
500	620	14xM24	6xM24	110	670	-	250
600	725	14xM27	6xM27	110	780	-	320
700	840	16xM27	8xM27	110	895	-	400
800	950	16xM30	8xM30	110	1010	-	400



MAINTENANCE

ROUTINE AND PREVENTIVE MAINTENANCE

An adequate maintenance is a decisive factor to assure a longer life to the valve under optimal functioning and efficiency conditions, besides ensuring a long lasting safety of functioning.

It is recommended that maintenance operations are carried out by trained personnel.



Personnel must be equipped with the individual protection means that are normally used for similar operations, and respect the safety procedures prescribed in the following chapter.

SAFETY NORMS DURING MAINTENANCE

The main precautions to be adopted in case of maintenance interventions on the valves are:

- Disconnect the electric power and intercept compressed air before removing any part or effecting any replacement of electric or pneumatic components.
- Do not introduce parts of the body, objects or other inside the valve when it is functioning.
- Do not wear rings, watches, chains, bracelets etc. during maintenance operations.
- Use an insulating rubber mat (if possible) under your feet when carrying out maintenance operations.
Do not work on wet floors or in very damp rooms.
- Always use protective gloves, accident prevention shoes and any other individual protection device that is necessary, as well as clothes that cover the body parts as much as possible.
- Do not use open flames, points or pins for cleaning.
- Do not smoke !
- The valve can treat products with high temperatures, up to $T_{max} < 100^{\circ}\text{C}$.



In this case, maintenance must be carried out only after temperature has fallen below 40°C, with stopped installation, electric and pneumatic power disconnected and under conditions of maximum safety.

ATTENTION:



Don't lean on solenoid valve tools, clothes or other things.

ATTENTION:



Pressure of work (recommended) to pneumatic cylinder is 5÷7 bar, cylinder functions rightly until 10 bar.

PERIODICAL CHECKS (EVERY TWO MONTHS):

- Check the seal capacity of the packing gland and eventually adjust it or, if necessary, replace the packing (the blade must always move in a linear way, without skipping).
- Lubricate the control screw of the manual valves with adequate grease.
For standard operating conditions use grease for bearings type ALVANIA 3 by SHELL or an equivalent one.
- Oil and grease the bearings placed under the handwheel.
- Check the efficiency of solenoid valve of the limit switches and of pneumatic cylinder.
- Check command pressure of pneumatic cylinder.

ATTENTION:



Carry out frequent manoeuvres, though not required by standard functioning, above all in presence of very thin and/or solidifying and/or encrusting dusts, in order to avoid the building of deposits or encrustations on the blade and/or the body that can hamper manoeuvring.

MONOBLOCK OR REPLACEMENT

1. Raise the sluice gate in the position of Max opening.

2. Disassemble the valve upper part (cylinder + plate or handwheel + plate) completely.
3. Unloose and remove the packing gland screws.
4. Remove the packing gland and the braid which is present.
5. Raise the sluice gate by 15/20 mm over the normal work limit.
6. Replace OR.
7. Bring the sluice gate again to the Max opening position.
8. Insert braid all around in the seat (braid removed at point 4).
9. Compact with the packing gland.
10. Insert braid all around a second time.

ATTENTION:



The junction of the second turn of the braid must be on the opposite side than the junction of the first turn.

11. Compact evenly with the packing gland and screw the screws (removed at point 3.)
12. Assemble the upper part (cylinder + plate or handwheel + plate).

ATTENTION:



The clamp that connects the rod with the sluice gate must never rest on the packing gland in the completely closed position of the valve.

MONOBLOCK BRAID REPLACEMENT

1. Raise the sluice gate by 20/30%.
2. Disassemble the valve upper part (cylinder + plate or handwheel + plate) completely.
3. Unloose and remove the packing gland screws.
4. Remove the packing gland and the braid which is present.
5. Insert braid all around in the seat.
6. Compact with the packing gland.
7. Insert braid all around a second time.

ATTENTION:



The junction of the second turn of the braid must be on the opposite side than the junction of the first turn.

8. Compact evenly with the packing gland and screw the screws.
9. Assemble the upper part (cylinder + plate or handwheel + plate).

ATTENTION:



After the installation has started to work, check the seal of the valve packing gland periodically and, if necessary, tighten further to eliminate eventual leakage, but not too much in order to avoid an excessive friction on the blade and therefore possible manoeuvring difficulties.

ATTENTION:



It is very important to reassemble all the individual parts in their original position, otherwise a not perfect seal or an anomalous gasket wear could be determined.

When the assembling has been completed, carry out the operating inspections:

Before commissioning, it is recommended to carry out the following inspections:

- Effect some opening and closing manoeuvres.
- Check the correct positioning of the ends of stroke and eventually adjust them.
- Check the correct tightening of the packing gland (the blade must move in a linear way, without skipping).
- Check that all the accessories are correctly assembled.
- Pay attention to the passage direction of liquids.
- Check the lubrication of the external moving parts.