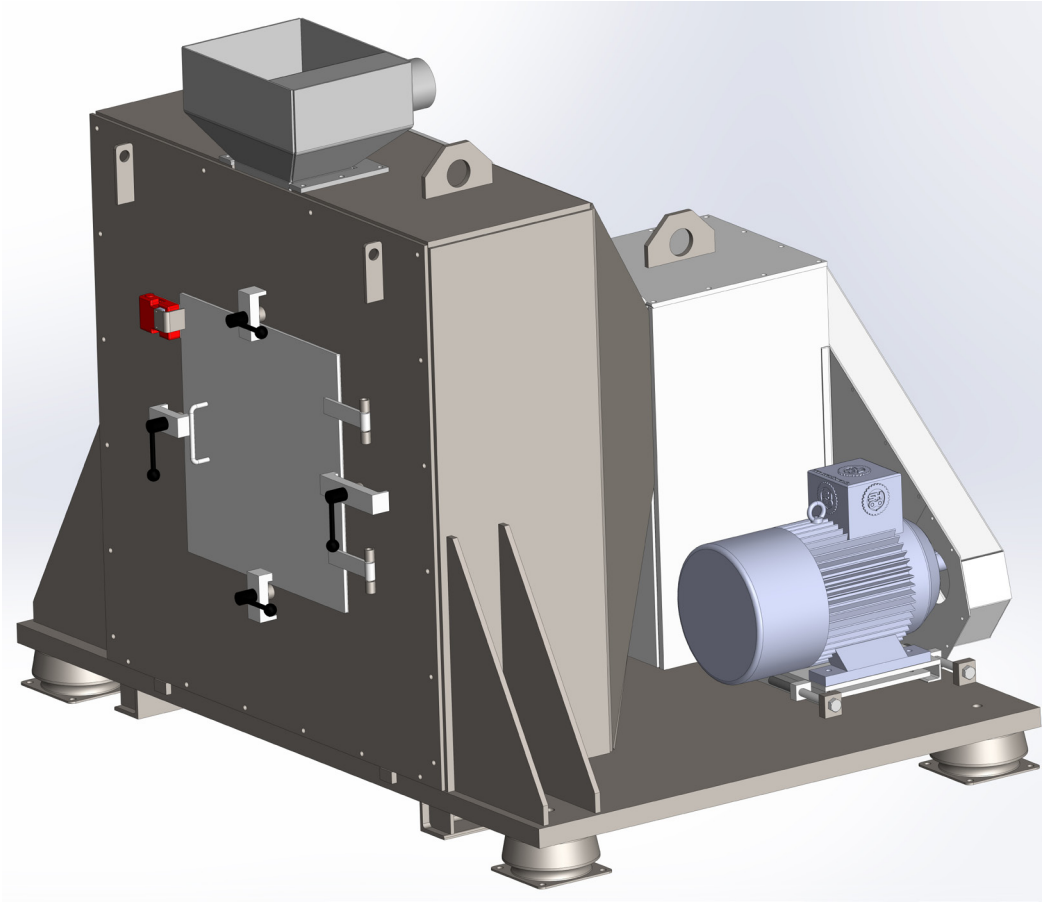
Nederman

# Instruction manual

# Chip & swarf management system

## Swarf centrifuge

HD100



**Original instruction manual**

| | |
|---|---|
| INSTRUCTION MANUAL | EN |

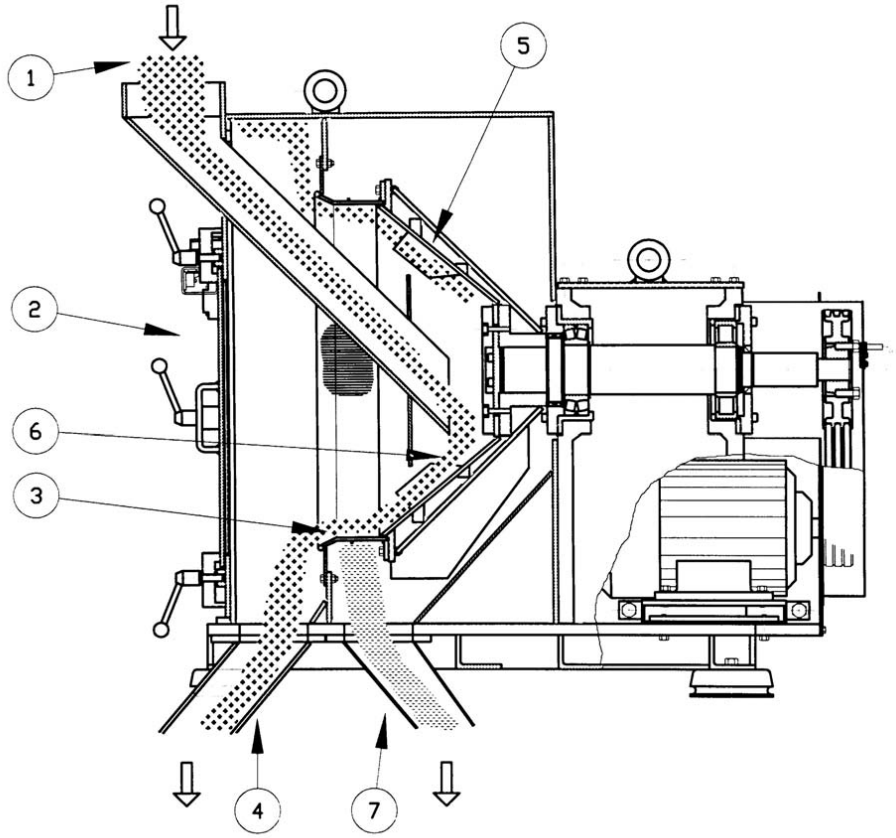
**Translation of original instruction manual**

| | | | |
|---|---|---|---|
| ANVÄNDARMANUAL | SV | MANUAL DE INSTRUÇÕES | PT |
| BEDIENUNGSANLEITUNG | DE | MANUAL DE UTILIZARE | RO |
| BETJENINGSVEJLEDNING | DA | MANUALE D'ISTRUZIONE | IT |
| BRUKSANVISNING | NO | MANUEL D'INSTRUCTION | FR |
| FELHASZNÁLÓI KÉZIKÖNYV | HU | NAUDOJIMO INSTRUKCIJA | LV |
| HANDLEIDING | NL | NAVODILA ZA UPORABO | SL |
| İŞLETME KILAVUZU | TR | NÁVOD K OBSLUZE | CS |
| INSTRUKCJA UŻYTKOWANIA | PL | NÁVOD NA POUŽITIE | SK |
| KASUTUSJUHEND | ET | ΕΓΧΕΙΡΙΔΙΟ ΧΡΗΣΗΣ | EL |
| KÄYTTÖOHJEET | FI | НАРЪЧНИК С ИНСТРУКЦИИ | BG |
| LIETOŠANAS INSTRUKCIJA | LT | РУКОВОДСТВО ПО ЭКСПЛУАТАЦИИ | RU |
| MANUAL DE INSTRUCCIONES | ES | 说明书 | ZH |

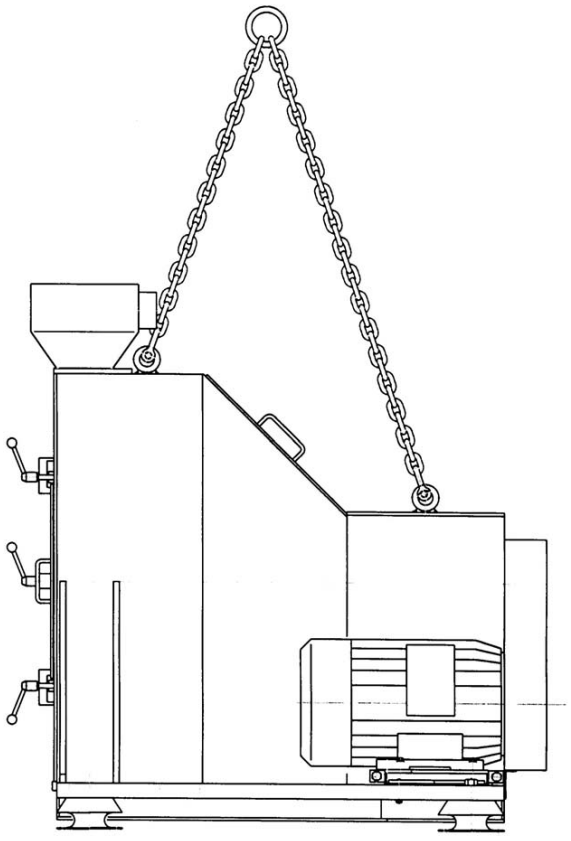
QMM033(02)

# Figures

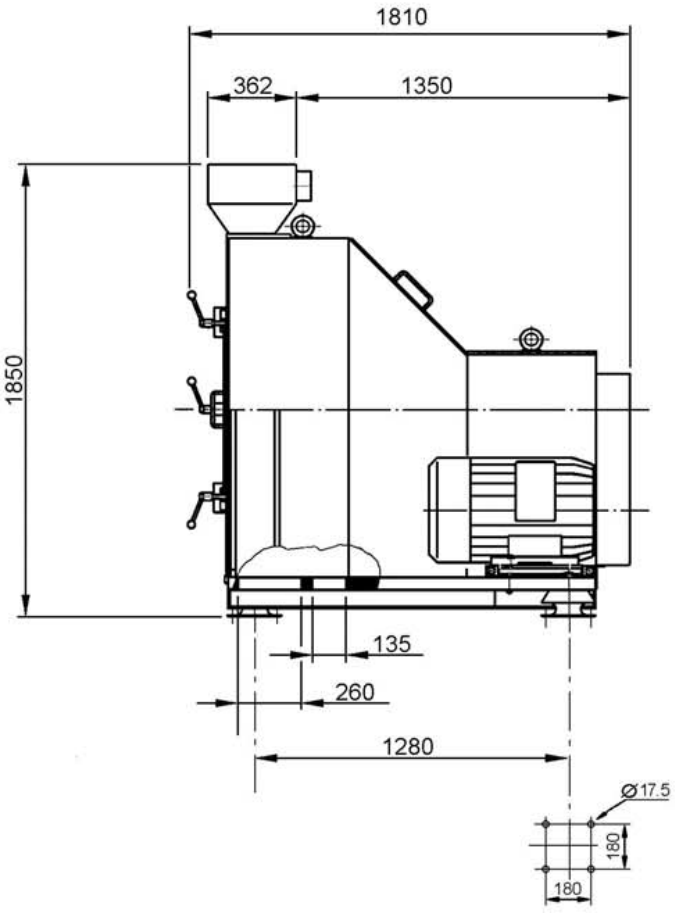
**1**

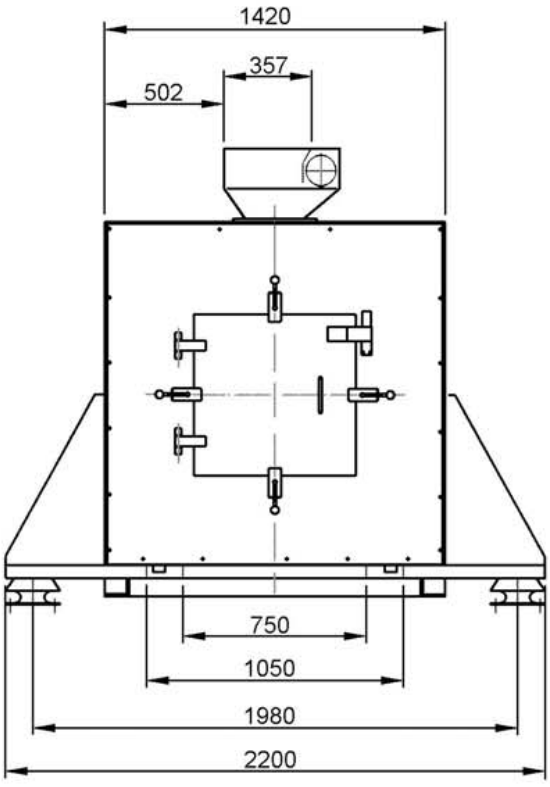



**2**

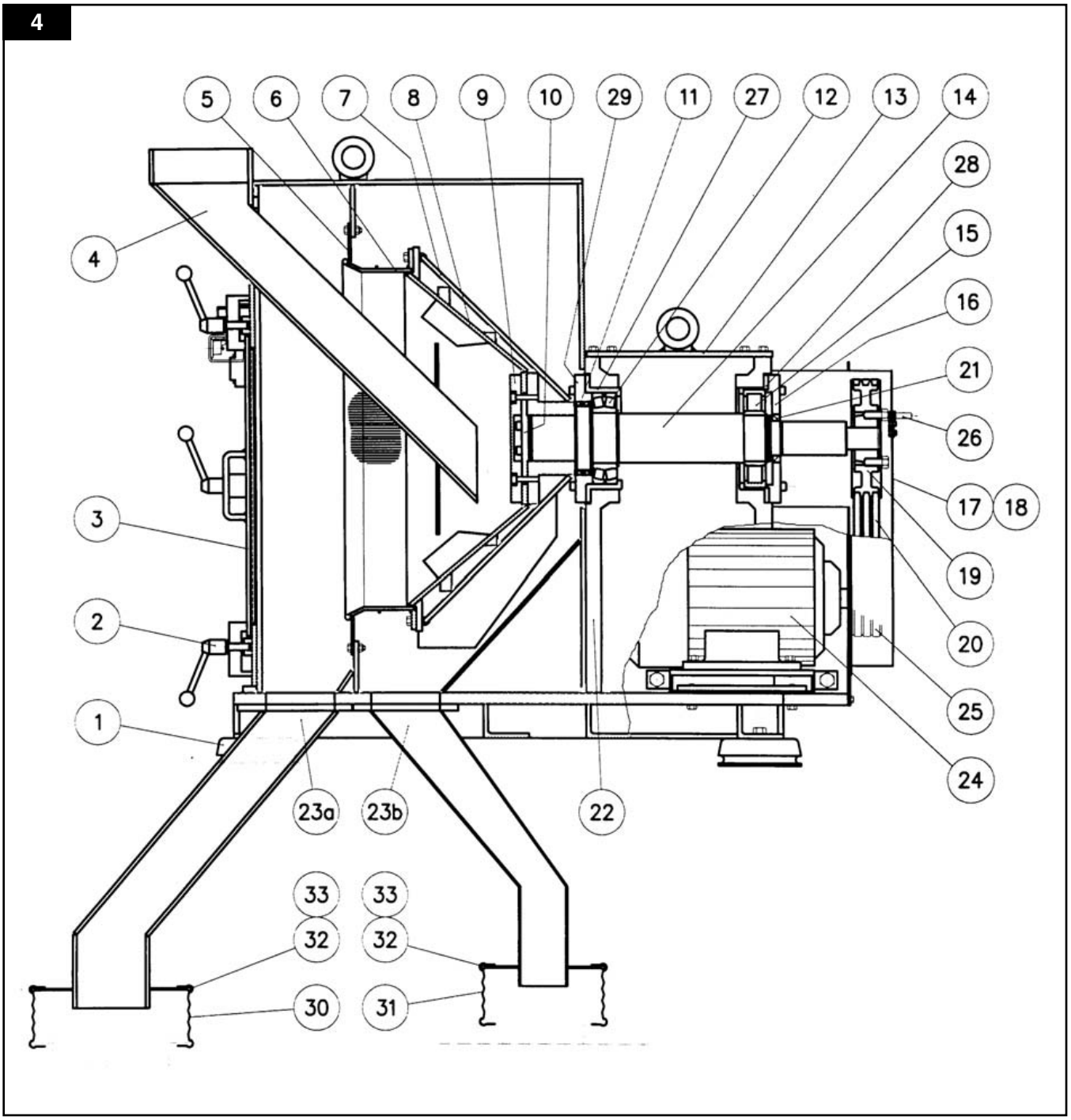


3


1810
362
1350
1850
135
260
1280
Ø17.5
180
180


1420
357
502
750
1050
1980
2200

4


5
6
7
8
9
10
29
11
27
12
13
14
28
15
16
21
26
17
18
19
20
25
24
4
3
2
1
23a
23b
22
33
33
32
32
30
31

# English

Instruction manual

**Chip & swarf management system**

## Swarf Centrifuge

HD100

### Table of contents

# 1 Declaration of conformity

*Below is presented the document setting out the contents of the EC Declaration of Conformity, not including the serial number and the signature of the person empowered. The formal Declaration is attached to your **HD100 Swarf Centrifuge**.*

1. **DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY**

We,

**Nederman Manufacturing Poland Sp. z o. o.**
ul. Okólna 45 A
05-270 Marki, PL

herewith declare that

| | |
|---|---|
| the machine: | **Swarf Centrifuge** |
| type: | **HD100** |
| serial number: | |
| year of manufact.: | |

is in conformity with the provisions of the Directive **2006/42/EC** with exclusion of point **1.3.7 Annex I** until correctly installed according to the manual.

Proper technical documentation for the above mentioned machine has been prepared according to Annex VII part B. Technical Dpt. Manager at Nederman Manufacturing Poland Sp. z o. o. is responsible for this documentation.

The product is also in conformity with other following directives:

Low Voltage Directive **2006/95/EC**,

Electromagnetic Compatibility Directive **2004/108/EC**,

and complies with harmonized standards relating to EC Directives:

**EN ISO 12100-1, EN ISO 12100-2, EN 60204-1**

Nederman Manufacturing Poland Sp. z o. o. furthermore declares that the partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of the Directive 2006/42/EC.

*The identity and signature of the person empowered to draw up the declaration*

Marki, *date*

# 2 Preface

This manual is for the correct installation, use and maintenance of this product. Read it carefully before using this product or carrying out maintenance. Replace the manual immediately if lost.

This product has been designed to meet the requirements of relevant EC directives. To maintain this status, all installation, repair and maintenance work for this product is to be carried out by qualified personnel using only original spare parts. Contact the nearest authorized distributor or Nederman for advice on technical service and obtaining spare parts. Also read Chapter '4 Safety' thoroughly.

Nederman continuously improves its products design and efficiency through modifications, and reserves the right to do so without introducing these improvements to previously supplied products. Nederman also reserve the right to, without previous notice, modify data and equipment as well as operating and maintenance instructions.

## 2.1 Foreword

Your **HD100** Swarf Centrifuge has been manufactured by:

**Nederman Manufacturing Poland Sp. z o. o.**
ul. Okólna 45 A
05-270 Marki, Poland
Tel: +48 22 7616000
Fax: +48 22 7616099
E-mail: info@nederman.pl

**www.nederman.com.pl**
**www.nederman.com**

NEDERMAN Swarf Centrifuges guarantee good design, quality components and skilled labour plus years of experience in swarf handling and swarf crushing. All these abilities have been used to design a product with high reliability and long service life. We are convinced that your experiences will confirm your choice of NEDERMAN Swarf Centrifuge.

Length of life and reliability can, as with any machine tool, be prolonged with correct installation and correct maintenance. It pays off to follow our advice for maintenance.

This maintenance manual consists of instructions and spare parts list for your new NEDERMAN Swarf Centrifuge. It also contains greasing instructions, exploded view and a simple schedule for trouble-shooting.

NEDERMAN Swarf Centrifuges are normally used in swarf handling systems which we design, sell and install.

All Swarf Centrifuges which leave our works are checked and do not need any additional maintenance other than stated in this manual.

For orders of spare parts and if you want to contact our engineers please find our phone number and address at the front page of this instruction.

# 3 Notices on hazards

This document contains important information that is presented either as a warning, caution or note. See the following examples:

**WARNING! Type of injury.**
Warnings indicate a potential hazard to the health and safety of personnel, and how that hazard may be avoided.

**CAUTION! Type of risk.**
Cautions indicate a potential hazard to the product but not to personnel, and how that hazard may be avoided.

**NOTE!** Notes contain other information that is important for personnel.

# 4 Safety

This chapter contains important information that refer to a potential hazard to the health and safety of personnel, and how that hazard may be avoided.

**Safety regulations:**

- Electrical installations have to be done by qualified personnel only.
- At connection of voltage feed as well as at service and maintenance work on the hydrostatic clarifier the circuit breaker must be off.
- Test the emergency stop at installation and always when maintenance and service have been done.
- The centrifuge must not be operated with the covers removed.
- Materials able to centrifuge are different qualities of steel swarf as well as brass and cast iron swarf, if any other material please ask Nederman.
- The data sheet from the coolant supplier must be studied as parts from coolant can cause allergic reactions.

**WARNING!** The floor around the device might get slippery from coolant getting outside the machine.

# 5 Description

## 5.1 Function

The NEDERMAN horizontal Swarf Centrifuge is a drum centrifuge, which via rotation movement exposes the supplied material to high G-forces. The solid particles are separated on the inner periphery of a drum lining, whilst the liquid passes through this.

## 5.2 Technical data

The main technical characteristics of HD100 are presented in Table 5-1

Table 5-1: HD100 Swarf Centrifuge characteristics

| Model | Capacity [kg/h] | Motor | Height [mm] | Weight [kG] | Space requirements [mm] |
|---|---|---|---|---|---|
| HD100 | max. 5000 | 18 kW -3 ph | 3000 | 3600 | 1650 × 2330 |
| | | | | | |

**NOTE:** Flow rate dependent on nature of coolant, contaminate and media grade.

# 6 Main components

We continuously improve our products and their efficiency through the introduction of design modifications. We reserve the right to do this without introducing these improvements on previously supplied products. We also reserve the right, without previous notice, to modify data and equipment, as well as operating and maintenance instructions.

Centrifuge HD100 consists of the following main components (see Fig. 1).

Table 6-1: Main components of Swarf Centrifuge HD100

| Item N° | Component name |
|---|---|
| 1 | Inlet - wet chips |
| 2 | Access door |
| 3 | Self cleaning wedge bar screen |
| 4 | Outlet - dry chips |
| 5 | Separator bowl |
| 6 | Accelerator zone |
| 7 | Outlet - liquid |

## 6.1 Accessories

The screen opening is delivered as a standard 0.7 mm if not otherwise specified in the order. Other screen openings may be fitted.

The centrifuge is equipped with variable speeds, soft start and brake. The rate of rotation is adjusted with a potentiometer in the electrical cabinet.

# 7 Before installation

## 7.1 Delivery checks

Check the unit for any transport damage. In case of damage or parts missing, notify the carrier and your local Nederman representative immediately.

## 7.2 Installation requirements

Consideration must be taken to the positioning of the centrifuge in relation to other equipment. The centrifuge requires very little space. However, space for maintenance must be available and adequate space must be ensured for

access to all the hatches. There must be space in front of the machine for the replacement of screen, drum and the interior components.

Lifting fixtures should be available in view of the fact that several of the parts which need to be replaced weigh over 125 kg.

### Lifting instructions

Lift the centrifuge by crane. Use a two-part chain of approved quality and strength and in adapted lengths. Place the chain in the eye bolts on the upper side of the centrifuge (see Fig. 2).

Weight **3600** kG.

# 8 Installation

## 8.1 Installing the centrifuge

A conveyor should be connected to remove the solid particles. The liquid should be drained to a sedimentation tank, which in turn should be equipped with a drag conveyor.

Your NEDERMAN Swarf Centrifuge is designed to operate at high rpm and is almost completely vibrationless. Each component in the rotating system is individually balanced so that all parts are fully replaceable without disturbing overall balance.

Despite the fact that the parts are individually balanced a certain imbalance may arise when material is fed in. To avoid vibrations being transferred to mountings the centrifuge is installed on vibration absorbers.

NEDERMAN Swarf Centrifuge is delivered fully fitted. Observe care during installation and always use the lifting hooks which it is equipped with. The mountings should be level and sufficiently secure to support a load of about 3000 kg (including frame and outlet chutes) and also be available to sustain dynamic loads via the centrifuge's vibration absorber. The dynamic loading is normally very low.

There should be no rigid connections to the centrifuge. When the centrifuge is correctly installed it should be able to vibrate on the vibration absorbers without striking or causing any abrasion against any connection. Liquid and solid particles should be fed to a tank or conveyor. A fixed pipe connection should be avoided. The liquid outlet, however, must be shielded to prevent splash.

Installation drawing - see Fig. 3.

The motor is dimensioned as 18,5 kW, 400 V AC, 50 Hz and 3-phase.

The electric cables to the motor must accommodate a certain flexibility.

# 9 Using the centrifuge

## 9.1 Before start-up

**WARNING:** Before any kind of activity, the SAFETY REGULATIONS (Chapter 4) must be read carefully, and the safety regulations must be strictly adhered to.

The centrifuge is designed for approximately 1-5 cm long chips. Before feeding the centrifuge solid parts should be separated to reduce wear and sound level.

Study Fig. **1** - *Material flow in centrifuge* - where a general description is provided.

Check the following points prior to putting into operation:

1. Free rotation.
   The drum should be able to be turned round by hand.
2. Motor loading.
   Check zero-load power and compare with power during loading and rating data of motor.
3. Observation of zero-load sound.
   Attention should be paid to the normal sound level of the equipment.
   **NOTE!** A screaming noise may be emitted by the V-belt when the drum is accelerating. This is normal.
4. Always start machine unloaded.
   If the machine is started when loaded then start load will exceed motor capacity. The centrifuge must not be fed until the correct speed of the drum has arised.
5. Feed the centrifuge evenly.
   Since the centrifuge works continuously it is of great importance that it is fed evenly to ensure a level of residual moisture in the centrifuged chips as low as possible. The feeding of the centrifuge should be done in intervals by a conveyor. As default setting on the feeding conveyor 4 s stop time is used followed by 2 s run time. This value can vary depending on the shape of the material.
6. Supplementary adjustment.
   NEDERMAN Swarf Centrifuge is on delivery adjusted to cope with the majority of chip types unless otherwise specified. If a chip type should be run subsequently to installation which was unknown to us on the occasion of installation then a supplementary adjustment may be made.

The operator should always be aware of the normal power consumption of the motor, normal outflow of solid particles, the liquid content of the material and the level of vibration. By considering the above mentioned factors and observing modifications one can be quite sure that the centrifuge will function properly.

## 9.2 Operation

Figure 1 shows the material flow through the centrifuge.

The material fed in through the top inlet hopper (1), glides down and is fed directly to the drum walls (6). On contact with the drum walls the material is accelerated to the speed of the drum at the periphery. During this acceleration

phase the material moves outwards along the drum until it comes into contact with the wedge bar screen (3) or remaining layer of previously accelerated material. By building up an additional layer of material over the previous layer the old material is forced to glide over the screen and out from the centrifuge via the outlet for dry chips (4). During the time the material is exposed to the centrifugal force the liquid is separated from the solid particles. When the material passes over the screen the liquid goes through this and out from the centrifuge via the outlet for liquids (7). This outlet is located immediately behind the outlet for dry chips.

# 10 Maintenance

Read Chapter ‘4 Safety’ before carrying out maintenance.

Installation, repair and maintenance work is to be carried out by qualified personnel using only original Nederman spare parts. Contact your nearest authorized distributor or Nederman for advice on technical service.

**NOTE!** The service intervals in this chapter are based on the unit being professionally maintained.

## 10.1 Maintenance instruction

NEDERMAN Swarf Centrifuge is very robust in design but should like every other production machine be regularly checked and maintained.

Daily checks should be made at the start of operations until a permanent maintenance schedule can be established. When this has been done only routine checks and general observations are necessary.

All parts coming into contact with the material which passes through the centrifuge are subject to wear. Negligent or delayed replacement of worn parts results in high repair costs and unsatisfactory separating of liquid. A maintenance schedule should therefore be established which also indicates when it is time to replace worn parts. This schedule may only be drawn up by you since wear is highly dependent upon the ingoing chip quality. A basic rule, however, is to check the screen, drum and housing once a month in the case of one-shift operations. Inspection takes place via the front door.

## 10.2 Lubrication

The Swarf Centrifuge has an automatic lubricator for the two roll bearings. The lubricator is on delivery filled with oil, Shell OMALA EP150 or equivalent.

Check the oil level in the container regularily (once a month) and fill additionally. Changing of oil must be done every six months during 1-shift operation.

A grease nipple is situated between the packing rings at the housing.

On delivery Castrol N1-ENTGR-18K (NLGI 2) grease or equivalent has been used.

The greasing intervals should be adjusted to the operating intensity, there must always be grease between the packing rings.

## 10.3 Spare parts

Contact your nearest authorized distributor or Nederman for advice on technical service or if you require help with spare parts. See also **www.nederman.com**

### Ordering spare parts

When ordering spare parts always state the following:

- Product serial number and Nederman reference number (see the product identification plate).
- Article number and designation - see Table 10-1.
- Quantity of the parts required.

Table 10-1: Spare parts specification - see Fig. 4

| Pos. | Article No. | Designation | Qty | Unit |
|---|---|---|---|---|
| 1 | 901727 | Basket | - | pce |
| 2 | 901710 | Cover | - | pce |
| 3* | 76374735 | Drum | - | pce |
| 4 | 901703 | Sleave for drum | - | pce |
| 5 | 901702 | Shaft plate | - | pce |
| 6 | 901614 | Bearing cover, front | - | pce |
| 7 | 901612 | Bushing, front bearing | - | pce |
| 8 | 901708 | Bearing house cover | - | pce |
| 9 | 76374736 | Shaft | - | pce |
| 10 | 901613 | Bushing, rear bearing | - | pce |
| 11 | 9702407 | Belt pulley | - | pce |
| - | 9702513 | Bushing | - | pce |
| 12 | 901706 | Bearing cover, rear | - | pce |
| 13 | 971523 | Lubricating pump | - | pce |
| 14* | 76374737 | Vibration absorber | 4 pcs | set |
| 15* | 76374738 | V-belt | 3 pcs | set |
| 16 | 901701 | Housing | - | pce |
| 17 | 76374747 | Packing ring | - | pce |
| 18* | 76374748 | Screen | - | pce |
| 19 | 901603 | Front door plate | - | pce |
| 20 | 971613 | Locking for door | 4 pcs | set |
| 21 | 901705 | Front plate | - | pce |
| 22 | 901709 | Inlet chute | - | pce |
| 23* | 76374739 | Packing ring | 2 pcs | set |
| 24* | 76374740 | Packing ring | - | pce |
| 25* | 76374741 | Bearing | - | pce |
| 26* | 76374742 | Bearing | - | pce |
| 27 | 9702406 | V-belt sheave | - | pce |
| - | 9702512 | Bushing | - | pce |
| 28 | 76374734 | Motor | - | pce |

* Spare parts to keep in stock

| Pos. | Article No. | Designation | Qty | Unit |
|---|---|---|---|---|
| 29 | 95235 | Inductive proximity switch | - | pce |
| 30 | - | Flow check | - | pce |
| 31 | 95254 | Safety switch | - | pce |
| 32 | - | Discharge chute - swarf/ coolant | - | pce |
| 33 | 76374744 | Rubber - swarf | - | pce |
| 34 | 76374745 | Rubber - coolant | - | pce |
| 35 | 970713 | Rubber clamp - straight | - | m |
| 36 | 970714 | Rubber clamp - angle | - | pce |
| -* | 76374746 | Wear lining | - | pce |

* Spare parts to keep in stock

# 11 Recycling

The product has been designed for component materials to be recycled. Its different material types must be handled according to relevant local regulations. Contact the distributor or Nederman if uncertainties arise when scrapping the product at the end of its service life.

# 12 Troubleshooting

This trouble-shooting schedule only serves as a guide to probable reasons for faults. As mentioned earlier correct maintenance is the best insurance against the development of defects.

Table 12-1: Trouble shooting guide

| Problem | Possible cause | Solution |
|---|---|---|
| Motor starts but drum stands still | Belts off | Replace belts |
| Motor protector fuses or motor sluggish (high power consumption) | Blown fuse | Check/replace fuse |
| | Motor fault | Replace motor |
| | Excess feed | Check that feed is not higher than indicated in order document |
| | Solid particles have piled up in centrifuge housing | Clean housing and check that free outlet is available for liquid and chips. |
| Too much chips in liquid outlet | Worn or deformed screen | Replace screen |
| Too high level of residual moisture in centrifuged chips | Screen blocked | Clean screen |
| | Screen damaged | Replace screen |
| | Excess feed | Check that feed is not higher than indicated in order document |
| To high level of vibration | Worn bearings | Replace bearing |
| | Screen damaged by component and swarf has collected at damage location | Replace screen |
| | Worn drum | Replace drum |

# 13 Acronyms and abbreviations

Nederman Manufacturing Poland Sp. z o.o.
ul. Okólna 45A
05-270 Marki, Poland
Tel: +48 22 7616000
Fax: +48 22 7616099
E-mail: info@nederman.pl
**www.nederman.com.pl**