LAVINA® 20 EN Pro User Manual

SUPERABRASIVE

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CONTENT

1. GENERAL INFORMATION

This owner's manual is intended for the operator of the LAVINA® 20 EN Pro machine, the servicing technician as well as for anyone involved with operating or servicing the machine. We recommend that you read the instructions very carefully and follow them strictly. The manual includes information about assembling, using, handling, adjusting and maintaining your LAVINA® 20 EN Pro floor grinding and polishing machine.

MANUFACTURER

Superabrasive was founded 24 years ago, in 1987, as a manufacturer of high quality diamond tools for the stone and concrete industry. Today, Superabrasive is one of the world's leading companies in the production of diamond tools and floor grinding machinery. At Superabrasive, we strive to deliver the very best solutions to our customers, and enable them to work more efficiently.

GENERAL DESCRIPTION

The LAVINA® 20 EN Pro machine is intended for grinding, polishing and buffing concrete, marble, granite, limestone and terrazzo surfaces with diamond tools.
The LAVINA® 20 EN Pro is a three-disc machine, which can be used dry as well as wet.
For best results, use only tools manufactured or recommended by Superabrasive and its distributors. Additionally, the machine could be used for grinding wood floor surfaces.

WARNING!

The LAVINA® 20 EN Pro machine is manufactured and fitted for the above-mentioned applications only! Every other use may possess risks to the persons involved.

MACHINE CHARACTERISTICS

The LAVINA® 20 EN Pro is made of two main component sections:

LAVINA® 20 EN PRO MAIN DESIGN

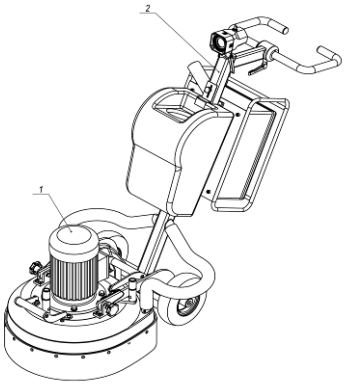


Figure 1.1

- **The two main component sections**, the carriage and main head.

The handle on the frame is adjustable in height and allows the operator to work in a correct and safe posture.

- **The halogen spotlight** (Fig.1.2) enables the operator to work in darker areas.

⚠ WARNING Existing lighting system does not replace adequate overhead lighting.

Figure 1.2

- **The frame**

- **The controls** are positioned on top of the electrical box (fig.1.3)

Figure 1.3

- **The electrical box** (fig.1.3) contains the electric switching devices and the inverter. The motor feeding cable and the main feeding cable are plugged in the socket located on the bottom of the box.

- **The water tank** is on the opposite side of the frame, so that the weight of the water has no influence on the operation of the machine. The frame weight, on the other hand, is fully absorbed by the driving wheels.

- **The motor** is mounted on the base plate and is driving the three heads with a belt system. The planetary motion derives from the friction between the tools and the floor, which is allowing the tools to spin in either clockwise or counterclockwise direction. The design ensures that the tools will not force themselves against the resistance of the floor surface. Instead, the machine will alternate directions to accommodate to a "high spot" or a "low spot" imperfections in the floor without causing damage to the floor or the machine.

ENVIRONMENTAL CONDITIONS

The temperature range for operating the LAVINA® 20 EN Pro outdoors is between 41°F and 86°F or 5°C and 30°C. Never use the LAVINA® 20 EN Pro during rain or snow when working outdoors. When working indoors, always operate the machine in well-ventilated areas.

ELECTRICAL CONNECTION

The voltage (Volt) and power (Ampere) are displayed on a label on the electrical control box to avoid any incorrect connection. Refer to these before connecting the power. To avoid electrical shocks, make sure the ground power supply is functioning properly.

VACUUM CONNECTION

A connection for a vacuum dust extractor is located on the carriage. The LAVINA® 20 EN Pro does not include a vacuum dust extractor. The customer must purchase the vacuum dust extractor separately. The hose of the vacuum extractor must be Ø 50 mm and can be glided over the pipe. The vacuum dust extractor must be adapted for floor grinders and have a minimum air displacement of 320m3/h with a negative vacuum of 21 kPa.

TECHNICAL DATA

	LAVINA® 20 EN Pro	
Voltage/Hz	**3 ph x 380-480 V 50-60Hz**	
Amperage	**Max 14 Amps**	
Power	**5,5 kW**	**7,5 HP**
Tool holder rpm	**300-1100 rpm**	
Working width	**510 mm**	**20"**
Tool holder diameter	**3x 165 mm**	**3x 6.5"**
Tool diameter	**3x 225 mm**	**3x 9"**
Weight	**153 kg**	**337 lbs**
Grinding pressure	**98 kg**	**216 lbs**
Additional weight	**max 2x 22 kg**	**max 96 lbs**
Application	**wet and dry**	
Vacuum hose port	**Yes**	
Water tank capacity	**16 l**	**4.2 gal**
Water feed	**Peripheral**	
Cable length	**17.4 m**	**57 ft**
Machine LxWxH	**1350x540x1100 mm**	**53.1"x21.3"x43.3"**
Packing LxWxH	**1150x730x1155 mm**	**45.2"x28.7"x45.5"**

CE-CERTIFICATION

The LAVINA® 20 EN Pro machine is designed to operate correctly in an electromagnetic atmosphere of industrial type and is equipped with all the mechanical and electrical safety protections in conformity with the following European CEE rules and regulations:
The LAVINA® 20 EN Pro machine complies with the Safety Directive for machines 2006/42/EC, the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC.
Also complies with the norms in use BDS EN ISO 12100-1, BDS EN ISO 12100-2, BDS EN 13862, BDS EN ISO 13857, BDS EN 349, BDS EN ISO 13850, BDS EN 13732-1, BDS EN 953, BDS EN ISO 13849-1, BDS EN 1037, BDS EN ISO 11201, BDS EN ISO 3744, BDS EN 1033:2002, BDS EN ISO 14121-1, BDS EN 60204-1, BDS EN 61000-6-4

Test results are a part of the machine's technical information and can be sent upon a special request. The machine is delivered with the CE mark exposed and provided with a EC declaration of conformity.

VIBRATIONS

The vibrations of the machine are measured in compliance within the standard BDS EN 1033:2002. The vibration on the handles of the LAVINA® 20 EN Pro, working in normal conditions,.is less than 2,5 m/s² with recommended tools.

SONOROUS EMISSIONS

Sonorous emissions are measured in compliance with the standards BDS EN ISO 3744:2010 and BDS EN ISO 11201:2010. The sound pressure level at the workplace is LpA=73 dB(A). The sound power level is Lw(A)=88,5 dB(A). However, as previously stated, the operator must wear ear protectors.

LABEL DATA

The data on the label provides the correct voltage and kW (needed for operational purposes);
Weight (needed for transportation purposes); production year and serial number (needed for maintenance purposes).

CUSTOMER SERVICE

For customer assistance and technical support contact your local distributor or contact the producer Superabrasive Ltd. or visit us at www.superabrasive.com , where you can download a copy of this manual.

2. SAFETY INSTRUCTIONS

RECOMMENDED USE ⚠ WARNING

The LAVINA® 20 EN Pro machine is designed and manufactured to grind and polish concrete, terrazzo and natural stone floors. It can be used for renovations as well as for polishing. The machine is designed for dry or wet use. When using it dry, use a vacuum of appropriate size. For more information, please refer to the chapter on handling the vacuum connection.

PROHIBITED USE ⚠ WARNING

The machine MUST NOT be used:

- For applications different from the ones stated in the General Description chapter.
- For not-suitable materials.
- In environments which:
- Possess risks of explosion
- Possess high concentration of powders or oil substances in the air
- Possess risks of fire
- Feature inclement conditions.
- Possess electromagnetic radiation.

PREPARATION FOR WORK ⚠ WARNING

Make sure that:

- You have closed the work area, so that no person unfamiliar with operating the machine can enter the area
- The tool plate and tools are adjusted to the machine properly
- There are no missing parts of the machine
- The machine is in upright working position
- The protection devices are working properly.
- The electrical cable is free to move and follow the machine easily. In order to keep the electrical cable from being damaged, no vehicle should cross the zone where electrical cables are situated.

PROTECTION DEVICES ⚠ WARNING

- The machine is equipped with several protection devices including the following:
- An emergency stop button
- A protection skirt and a hood for protecting the tool plates.
- These devices protect the operator and/or others persons from potential injuries. Do not remove them. On contrary, before using the machine, please ensure that all protection devices are mounted and function properly.

ARREST FUNCTIONS ⚠ WARNING

Functions of arresting of the machine are following:

- Button to stop the motor (category 1)
- Emergency button (category 1)

SAFE USE ⚠ WARNING

- The LAVINA® 20 EN Pro is designed to eliminate all risks correlated with its use. However, it is not possible to eliminate the risks of an eventual accident with the machine. Unskilled or uninstructed operator may cause correlated residual risks. Such risks are:
    - Position Risks due to operator's incorrect working position
    - Tangling up Risks due to wearing inappropriate working clothes
    - Training Risks due to lack of operational training

NOTE: In order to reduce all consequences of the above-mentioned risks, we advise that machine operators will follow the instructions in the manual at all times.

RESIDUAL RISKS ⚠ WARNING

- During the normal operating and maintenance cycles, the operator is exposed to few residual risks, which cannot be eliminated due to the nature of the operations.

BEFORE YOU BEGIN ⚠ WARNING

- Working area must be clear from any debris or objects.
- A first-time operator must always read the manual and pay attention to all safety instructions.
- All electric connections and cables must be inspected for potential damages.
- Ground wire system of the power supply must be also inspected.
- Perform general daily inspections of the machine and inspect the machine before each use.
- Always inspect the safety devices:
- The emergency break must be clear and working
- The tool protector must be working
- The machine must be clean
- Never operate the machine in the rain!
- Confirm that there are no missing parts especially after transportation, repair or maintenance.
- Before filling the water tank with water make sure the machine is not working and the main switch is turned off.
- Before turning on the machine make sure that the base is placed on the floor, the machine MUST NOT be in an upright position when turned on!

OPERATING MACHINE ⚠ WARNING

- When operating the Lavina 20N Pro/20NHV Pro, make certain that there is no one, but you around the machine.
- Never leave the machine unattended while working.
- The electrical cable must move freely and must be damage-free.
- The water hose must move freely and must be damage-free.
- Check if the floor, you work on, is not too uneven. If this is the case, it may damage the machine.

AFTER WORK IS COMPLETED

⚠ WARNING

- Clean the machine and its surroundings properly
- Empty and clean the water tank
- Unplug the machine and wind up the electrical cable
- Store the machine in a safe place

THE WORK AREA ⚠ WARNING

- Make certain that people or vehicles do not enter the work area.
- Avoid cables and hoses being in the way.
- Always check the floor for debris

PERSONAL PROTECTIVE EQUIPMENT (PPE)

⚠ WARNING

- Always wear safety shoes when working with the machine.
- Always wear ear protectors when working with the machine.
- All personnel in the immediate work area must wear safety glasses with side shields.
- Always wear safety gloves when changing the tools.
- Always wear clothes suitable for the work environment.

⚠ WARNING

OPERATOR

- The Lavina 20N Pro/20NHV Pro machine.
- The operator must know the machine's work environment.
- Only one operator at a time can work with the machine.
- The operator must be properly trained and well instructed prior operating the machine.
- The operator must understand all the instructions in this manual.
- The operator must understand and interpret all the drawings and designs in manual.
- The operator must know all sanitation and safety regulations pertaining to the operation of
- The operator must have floor grinding experience.
- The operator must know what to do in case of emergency.
- The operator must have an adequate technical knowledge and preparation.

3. HANDLING AND TRANSPORTATION

PREPARING THE MACHINE FOR TRANSPORTATION

Figure 3.1

Figure 3.2

Figure 3.3

Unplug the motor cable plug from the control box (Fig. 3.1) and disconnect the water hose from the main head by pulling it out (Fig. 3.2). Wind the electrical cable on the carriage. Release the pin sets (Fig. 3.3) which attach the head to the carriage.

Figure 3.4

Figure 3.5

Figure 3.6

Pull out the vacuum hoses, and dismount the head from the carriage (Fig. 3.4).
The head of the LAVINA® 20 EN Pro has one bar and a support used as handles intended for easy moving and transportation (Fig. 3.5).
The Lavina 20® Pro is engineered with easy transportation in mind. The ability to dismantle the machine in two parts allows convenient transportation and storage (Fig.3.4, Fig.3.6).

STORAGE

Always store and transport the LAVINA® 20 EN Pro in a dry place. Never transport the LAVINA® 20 EN Pro unprotected; it may be damaged if transported unprotected during rain or snow.

4. OPERATION

PRELIMINARY CONTROLS

Inspect the working area as explained in the safety instructions. For wet use, fill in the water tank when the electrical cable is disconnected. Connect the vacuum extractor and ensure that the vacuum hose is clear and it will follow the machine easily. Plug in the machine and make sure that the power cord is free to follow the working direction of the LAVINA® 20 EN Pro.

ADJUSTING AND MOUNTING TOOLS

Figure 4.1

Figure 4.2

Mount the tools only after ensuring that there is enough diamond bond material left. Be sure that the plates are always clean before mounting. Always use the tool holder key (Fig.4.1)
Diamond tools with Velcro are attached on three foam plates of 9 inch. The foam plates (Fig. 4.2) are mounted the same way as the other tools.

THE CONTROL BOARD

Figure 4.3

1. **Digital RPM indicator**
   indicates the revolution per minute of the grinding plates (not the revolution per minute of the entire unit).
2. **Inverter alarm led**
   lights blue when the inverter goes into alarm mode.
3. **Forward/Reverse switch**
   choose forward for clockwise rotation of the grinding plates or reverse for anti-clockwise rotation of the grinding plates
4. **Power led** lights green when the power is on
5. **Emergency button** used in Emergency situations for stopping the motor
6. **ON button** starts the motor
7. **OFF button** stops the motor
8. **Reset button** resets the alarm of the inverter
9. **Potentiometer** changes the RPM of the grinding plates from 300-1100 rpm

STARTING THE MACHINE

First, follow the directions in chapter Safety Devices and Safety Instructions. Next, pull the emergency stop (5) to ensure that the machine is in working condition. Check the potentiometer (9) and ensure that it is set at the working speed. If working wet, add water to the floor surface. If working dry, omit this step, and instead, switch on the vacuum unit. Finally, hold the machine firmly and push the start button (6).

OPERATING THE MACHINE

Guide the machine in straight lines across the floor, and with each new line overlap a little bit of the previously completed surface. Work at a constant speed allowing the tools time to work at a speed appropriate for the tools' grit size. Avoid vibrations. Do not stop the LAVINA® 20 EN Pro machine in one spot while the tools are still working because they will leave marks on the floor surface. When working wet, open the water tank periodically to release water onto the floor surface. When working dry, check the floor surface periodically to ensure that dust is not accumulating on the surface, also check regularly if your vacuum works properly.

STOPPING THE MACHINE

The stopping of the machine must be done gradually until the motor stops. Do not stop moving the machine before arresting the motor as the tools could damage the surface. To stop push the off button (7). Use the Emergency button (5) only in emergency or use it to switch the power totally off.
Remember not to hold the machine in one spot before turning off the motor.

ALARM

The Alarm light (2) will light incase inverter goes in alarm mode. The most common failure is motor in overload. To reset the mode push reset button (8).

5. TOOLS AND ACCESSORIES

WEIGHTS

Superabrasive offers additional weights for increasing the productivity of the machine (Fig.5.1). Each additional weight weighs about 48 lbs or 22 kg. Each individual application, type and condition of surface, power capacity of the outlet, etc. will determine the number of weights you can use without tripping a breaker. The weight stacks on to three posts around the outer bowl (Fig.5.2).

Figure 5.1

Figure 5.2

The additional weights depend on the tools; it is not always possible to add weights. Some tools work too aggressively and the machine can stop. The weight can be ordered with item number A07.00.00.00

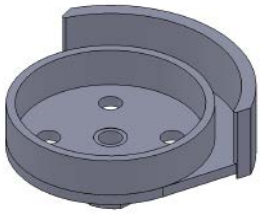


Figure 5.3

BELT REPLACING TOOL

You need the belt replacing (fig.5.3) tool when you want to replace the belt. It is explained below in chapter Troubleshooting.
This tool can be ordered with number L20SPS-00.00.01.00

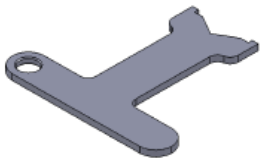


Figure 5.4

TOOL HOLDER KEY

The tool holder key (Fig. 5.4) is used for adjusting, mounting and dismounting of the tools. Always use the key for mounting. Item number is A03.00.00.00

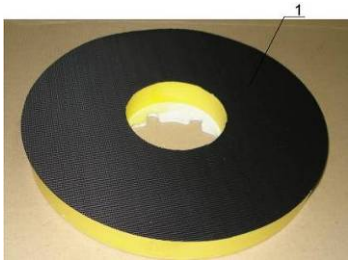


Figure 5.5

FOAM PLATE

Diamond tools with Velcro are mounted on the foam plate 9"(Fig.5.5). The foam plate is mounted on the flexible backer plate. Item number is LV-9-FP

6. POPULAR TOOLS

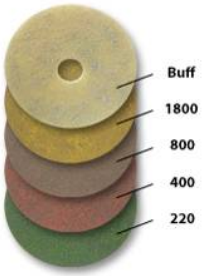
RECOMMENDED TOOLS

QuickChange Plates and Tooling feature extremely fast and convenient tool changes, and a long tool life. The QuickChange plates are produced in several sizes to accommodate any size LAVINA machine, and can be reused many times, providing for great long-term cost savings. The QuickChange trapezoid pads are produced in three different bonds for hard, medium and soft concrete, in a variety of grit sizes, with either 1 or 2 buttons, which allows you to customize the aggressiveness of the cut.

Calibra grinding discs: our popular ceramic bond discs are designed for the removal of difficult scratches and they save you valuable time by eliminating the need for multiple passes with metal tools. They can be used wet or dry, and are best for hard concrete applications.

NATO® polishing discs feature a special resin formula designed for both wet and dry applications and a unique design with wide channels allowing for work on a cleaner surface and ensuring a quality polish. Available in 3 and 4 in sizes.

V-HARR® Premium Polishing Pads are designed for mechanically polishing and restoring concrete; also ideal for terrazzo and hard stone floors. V-HARR® pads are offered in a wide variety of diameters and grit sizes to accommodate many applications. Dry use is strongly recommended.



Diama-Clean pads are high quality diamond-impregnated pads for floor maintenance. Available in a variety of sizes (17, 20, 21, 27 inch and other sizes), they are designed for use under swing machines and burnishers, and are great for daily use – they require only water (no wax or chemicals needed) and are a very environmentally friendly solution for maintaining floors.

Use only Superabrasive's recommended tools see www.superabrasive.com

7. MAINTENANCE AND INSPECTION

CLEANING

Keep your machine clean. Cleaning the machine on a regular basis will help detect and solve potential problems before they cause damage to the machine. Most importantly, check and clean the tool plate connections, power cord and plugs, vacuum hoses and water tank.

CHECK DAILY

After operating the LAVINA® 20 EN Pro, the operator should conduct a visual inspection of the machine. Any defect should be solved immediately. Pay attention to power cords, plugs and vacuum hoses.
Shock absorbers A01/00.00.01 (See page Floating backer plate) are consumables and have to be checked daily and replaced if needed. Buffers and spiders (See page SA tool holder and page SAM tool holder) are consumables and must be visually checked daily and replaced if needed. The key lock holders on the tool holders should be also checked.

CHECK EVERY 200 WORKING HOURS

Every 200 working hours, the operator should inspect all parts of the machine carefully. Most importantly, inspect and clean the tool plate connections, power cord and plugs, vacuum hoses and water tank. Also, check the water flow. Check the guard assembly. Make certain the wheels are clean and rotate properly. Inspect the control buttons. If there are defective control parts, they should be replaced immediately. Replace worn vacuum- and water hoses.
Machines with floating backer plate tool holder (Fig. 12.3.1 and Fig. 12.13.1)
Dismount the seal assemblies (See Troubleshooting) replace all parts (pins, seal assemblies, "O" rings) with the slightest damage or consume. Check the floating backer plates; replace sealer fronts, shock absorbers.
Machines with SA tool holder (Fig. 12.3.2 and Fig. 12.13.2) or with SAM tool holder (Fig. 12.3.3 and Fig. 12.13.3)
Dismount the tool holders (See Troubleshooting) replace all parts (Spider, buffers, sealer caps, "O" rings) with the slightest damage or consume.

CHECK EVERY 400 WORKING HOURS

Besides the checks of 200 working hours, open up the bottom cover like described in chapter "TROUBLE SHOOTING REPLACING BELT AND PULLEY UNITS. Check if sealers, belt and bearings are in good condition, change if needed.

VACUUM

As stated previously, frequently check hoses and other parts for clogging.

WATER LEAKS

Replace any leaking parts immediately as the water could damage your machine

MECHANICAL PARTS

Parts such as the belt, seal rings, cap rings, spiders and buffers and guard assembly are subject to wear and should be replaced as needed.

ELECTRICAL SYSTEM

Dust should not enter the control box, as it will destroy the contacts. Remove (blow out) any dust present.

LAVINA® 20 EN PRO ELECTRICAL SCHEMES WITH YASKAWA INVERTER

380-480 Volt

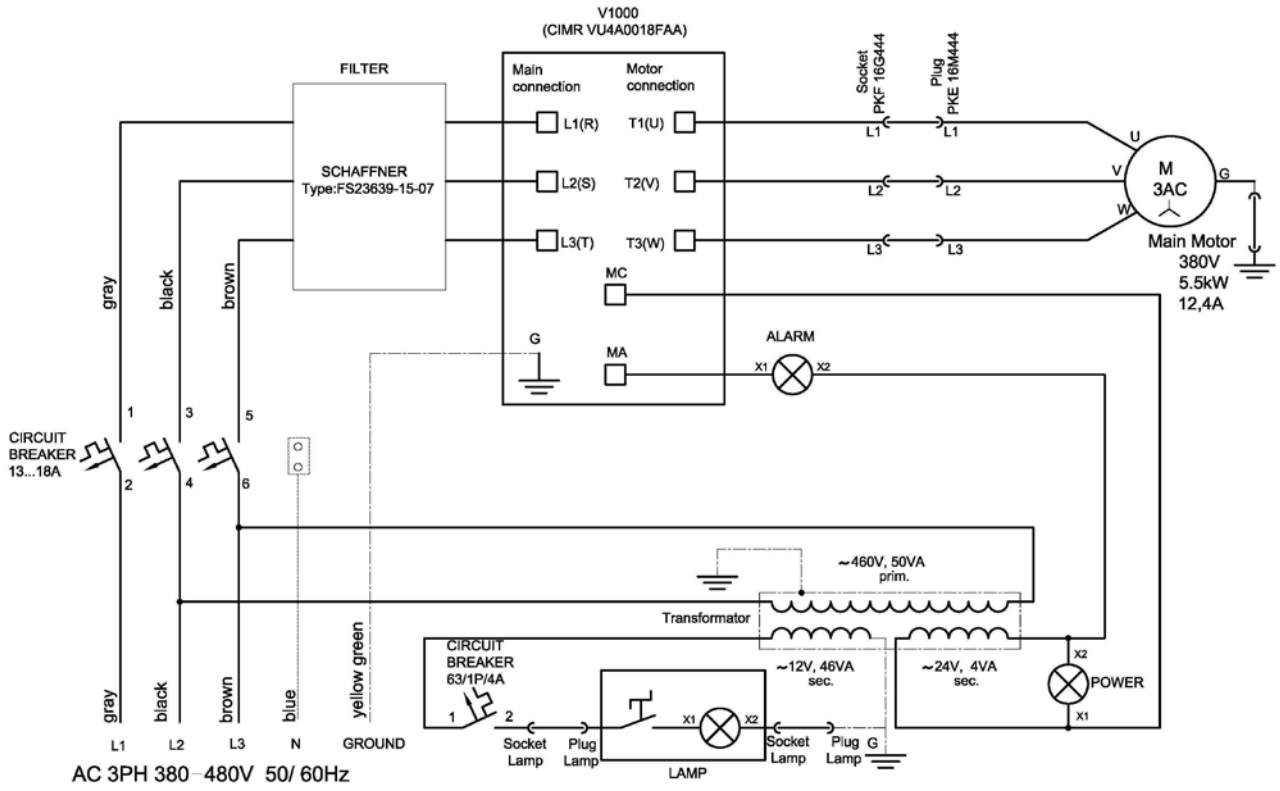


Figure 7.1

The motor is connected in "Star" 380 Volt,
reminder for the wire connection of the motor.

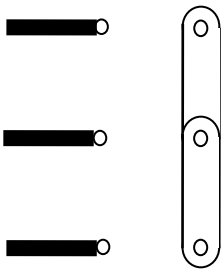


Figure 7.2

LAVINA® 20 EN PRO ELECTRICAL SCHEMES YASKAWA CONNECTION MAIN CIRCUIT TERMINALS

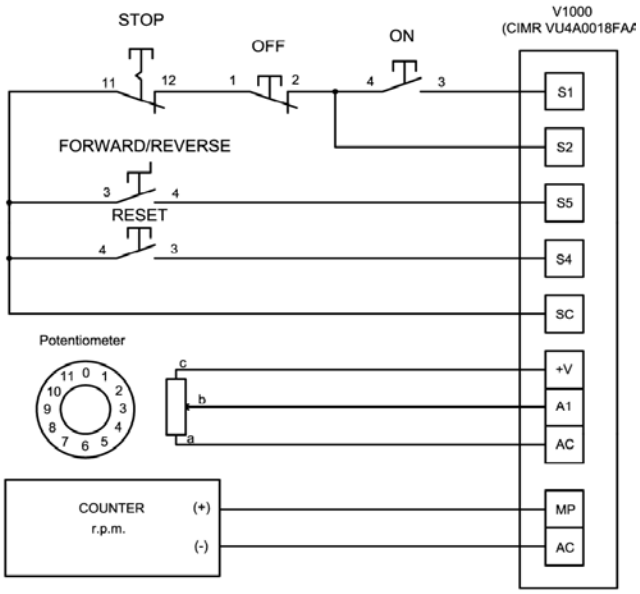


Figure 7.3

8. TROUBLESHOOTING

INDEX OF PROBLEMS AND SOLUTIONS

REPLACING POWER CORD AND PLUGS

When replacing the power cord or plugs always use cords and plugs with specifications as the original ones. Never use lower quality or different type cord and plugs.

DISMOUNTING AND MOUNTING SA TOOL HOLDER

MACHINES WITH NUMBER

L20NP/07.01.11.00.03	L20NP/10.02.11.00.15	L20NP/28.03.11.00.27	L20NP/18.11.11.00.39	L20NP/23.12.11.00.51
L20NP/10.02.11.00.04	L20NP/10.02.11.00.16	L20NP/20.10.11.00.28	L20NP/18.11.11.00.40	L20NP/23.12.11.00.52
L20NP/10.02.11.00.05	L20NP/10.02.11.00.17	L20NP/18.11.11.00.29	L20NP/18.11.11.00.41	L20NP/23.12.11.00.53
L20NP/10.02.11.00.06	L20NP/28.03.11.00.18	L20NP/18.11.11.00.30	L20NP/18.11.11.00.42	L20NP/23.12.11.00.54
L20NP/10.02.11.00.07	L20NP/28.03.11.00.19	L20NP/18.11.11.00.31	L20NP/18.11.11.00.43	L20NP/23.12.11.00.55
L20NP/10.02.11.00.08	L20NP/28.03.11.00.20	L20NP/18.11.11.00.32	L20NP/25.11.11.00.44	L20NP/23.12.11.00.56
L20NP/10.02.11.00.09	L20NP/28.03.11.00.21	L20NP/18.11.11.00.33	L20NP/25.11.11.00.45	L20NP/23.12.11.00.57
L20NP/10.02.11.00.10	L20NP/28.03.11.00.22	L20NP/18.11.11.00.34	L20NP/25.11.11.00.46	L20NP/23.12.11.00.58
L20NP/10.02.11.00.11	L20NP/28.03.11.00.23	L20NP/18.11.11.00.35	L20NP/23.12.11.00.47	
L20NP/10.02.11.00.12	L20NP/28.03.11.00.24	L20NP/18.11.11.00.36	L20NP/23.12.11.00.48	
L20NP/10.02.11.00.13	L20NP/28.03.11.00.25	L20NP/18.11.11.00.37	L20NP/23.12.11.00.49	
L20NP/10.02.11.00.14	L20NP/28.03.11.00.26	L20NP/18.11.11.00.38	L20NP/23.12.11.00.50	

Figure 8.1.1

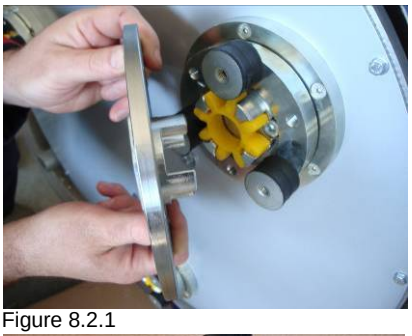


Figure 8.2.1

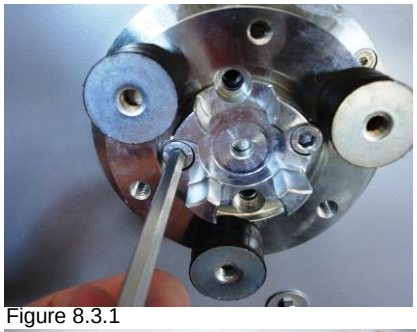


Figure 8.3.1

Figure 8.4.1

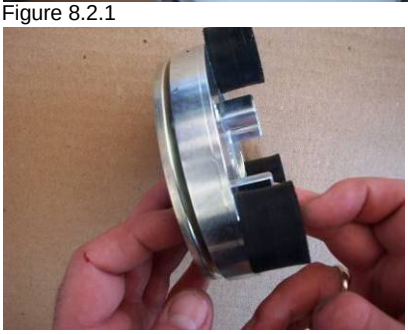


Figure 8.5.1

Figure 8.6.1

To check or replace the buffers, spiders or "O" rings the SA tool holder has to be dismounted. Remove the countersunk screws on top of the buffer (Fig.8.1.1). Take the disc of, the spider can be removed or replaced (Fig.8.2.1). By removing the flange by loosing four Hex cap bolts (Fig.8.3.1), the sealer cap comes loose (Fig.8.4.1) and the "O" ring can be checked or replaced (Fig.8.5.1). Attention, for mounting use always the "blue" thread locking adhesive except of the bolt to lock the buffers, depending on the number of buffers, the holder can be more flexible or rigid (Fig.8.6.1).

DISMOUNTING AND MOUNTING SAM TOOL HOLDER

MACHINES WITH NUMBER

L20NP/27.01.12.00.01	L20NP/27.01.12.00.04	L20NP/27.01.12.00.07	L20NP/27.01.12.00.10	L20NP/27.01.12.00.13
L20NP/27.01.12.00.02	L20NP/27.01.12.00.05	L20NP/27.01.12.00.08	L20NP/27.01.12.00.11	L20NP/27.01.12.00.14
L20NP/27.01.12.00.03	L20NP/27.01.12.00.06	L20NP/27.01.12.00.09	L20NP/27.01.12.00.12	L20NP/27.01.12.00.15

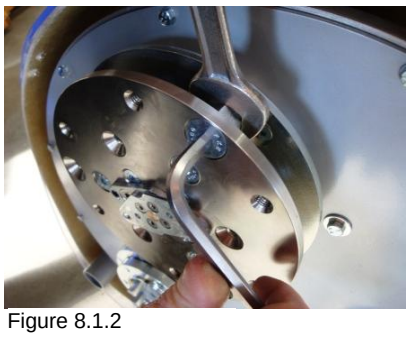


Figure 8.1.2

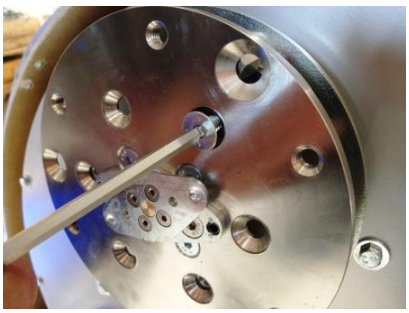


Figure 8.2.2

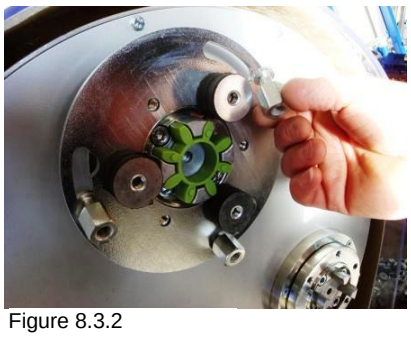


Figure 8.3.2

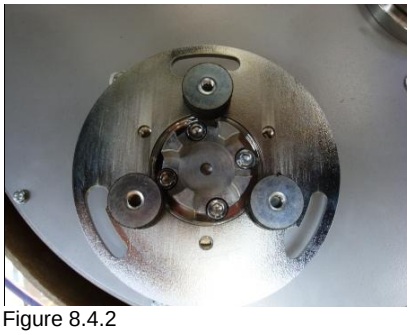


Figure 8.4.2

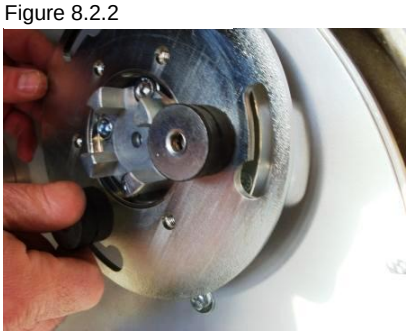


Figure 8.5.2


Figure 8.6.2


Figure 8.7.2


Figure 8.8.2

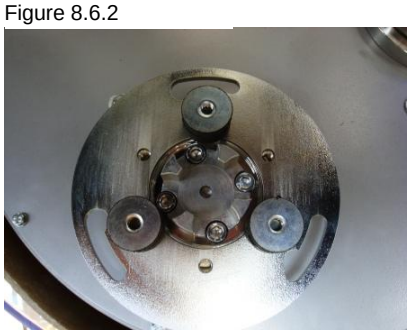


Figure 8.9.2

To check or replace the buffers, spiders or "O" rings the SAM tool holder has to be dismounted.Loose the security bolts in the security disc (Fig.8.1.2) Remove the countersunk screws to take the disc off (Fig.8.2.2). Take out the security bolts (Fig.8.3.2). The spider and buffers can be removed or replaced (Fig.8.4.2). Turn the buffers to take the security disc off (Fig.8.5.2). By removing the flange by loosing four Hex cap bolts (Fig.8.6.2), the sealer cap comes loose (Fig.8.7.2) and the "O" ring can be checked or replaced (Fig.8.8.2). Attention, for mounting use always the "blue" thread locking adhesive except of the bolt to lock the buffers, depending on the number of buffers, the holder can be more flexible or rigid (Fig.8.9.2).

REPLACING BELT AND PULLEY UNITS WITH PINS

In this section, we explain how to replace the belt and the pulley units. In some instances, the belt can be replaced without replacing the pulley units, although it is always necessary to ensure that the pulley units are working properly.

Disconnect the extension cord from the power line and pull out the hoses (Fig. 8.7)


Figure 8.7

Pull the handle out and put the head of the machine in an upright position. Take out the tools (Fig. 8.8).


Figure 8.8

Dismount the tool holders and put the head back on the ground. (Fig. 8.9).

Figure 8.9

Figure 8.10

Remove the two pins from the brackets (Fig.8.10)

Pull the water hose from the tank (Fig. 8.11)

Figure 8.11

Figure 8.12

Separate the carriage from the main head (Fig. 8.12)

Dismount the machine support (Fig. 8.13)
Dismount the guard assembly.
Unscrew the top cover and remove the top cover by pulling it over the motor.
Mount back the machine support as this will make it easier to turn over the main head.
Mount back the carriage. (Fig.14)

Figure 8.13

Figure 8.14

Figure 8.15

Figure 8.16

Figure 8.17

Figure 8.18

Figure 8.19

Figure 8.20

Remove the pins, the Seal Assembly L25P-01.01.00.00 and O-rings D68 under Pulley unit (Fig.8.15, Fig.8.16, and Fig.8.17) Continue see" Paragraph Replacement of the pulley units" Unscrew the bolts holding the cover lower assembly (Fig.8.18; Fig.8.10) and set the bottom cover assembly aside (Fig.8.20).

REPLACING BELT AND PULLEY UNITS WITH SA OR SAM TOOLHOLDER

Do the same as in the paragraph "Replacing Belt and Pulley units with pins" instead to remove the pins, remove the SA tool holder as described in the earlier paragraph "mounting and dismounting "SA tool holder or SAM tool holder"

REPLACEMENT OF THE PULLEY UNITS


Figure 8.21


Figure 8.22


Figure 8.23

Set the bottom cover assembly aside (Fig.8.21).Remove the O-rings to avoid to loose them (Fig.22), remove the belt by turning the pulleys by hand, while pushing the belt off. (Fig.23)

Roll the units to ensure that the bearings are working properly. (Fig. 8.24) Units, whose bearings are worn out or do not turn with ease should be replaced.


Figure 8.24


Figure 8.25


Figure 8.26

First, unscrew the nut, which is holding the pulley unit (Fig.8.25, Fig.8.26) When released, pull out the whole unit. Carefully pull out the unit with crowbars, but do not use excessive force.

MOUNTING THE BELT WITH PINS


Figure 8.27


Figure 8.28


Figure 8.29


Figure 8.30

Bolt on two pins according to the picture (Fig. 8.27). Slide over the belt-replacing tool, in down position (Fig. 8.28). Lay the belt with only ½ of its width showing over the pulleys (Fig. 8.29), and slowly begin to turn the belt replacing tool and the pulleys. Keep turning until the belt is on the pulleys (Fig. 8.30). Only putting ½ of the belt width is very important otherwise if the belt is initially mounted complete over the pulleys, it will be "over" tensioned and destroyed.


Figure 8.31

ATTENTION: NEVER "OVER" TENSION THE BELT, THE BELT WILL BE DAMAGED AND IT WILL NEVER RECOVER ITS ORIGINAL TENSION

Apply the seal ring in the channel of the aluminum cover and close the machine.

Reassemble in the same manner. Do not forget to put back or replace the "O" ring (see Fig. 8.31).
Your Lavina20®N Pro/20®NHV Pro is now ready for use!

MOUNTING THE BELT WITH SA OR SAM HOLDER


Figure 8.32


Figure 8.33


Figure 8.34

Bolt on the belt-replacing tool according the picture (Fig. 8.32). See the belt-replacing tool is in down position (Fig. 8.33). Lay the belt with only ½ of its width showing over the pulleys (Fig. 8.33), and slowly begin to turn the belt replacing tool and the pulleys. Keep turning until the belt is on the pulleys (Fig. 8.34). Only putting ½ of the belt width is very important otherwise if the belt is initially mounted complete over the pulleys, it will be "over" tensioned and destroyed.

ATTENTION: NEVER "OVER" TENSION THE BELT, THE BELT WILL BE DAMAGED AND IT WILL NEVER RECOVER ITS ORIGINAL TENSION


Figure 8.35

Apply the seal ring in the channel of the aluminum cover and close the machine.

Reassemble in the same manner. Do not forget to put back or replace the "O" ring (see Fig. 8.31).
Your LAVINA® 20 EN Pro is now ready for use!

MOTOR CONNECTION
In case of changing the motor, please check the cable connection to your motor.

/
LAVINA® 20 EN Pro
The motor is connected in "Star"
380 Volt, reminder for the
wire connection of the motor.

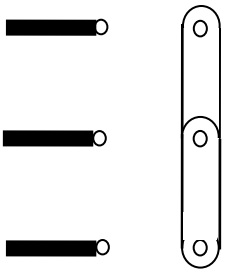


Figure 8.36

FAULT DIAGNOSIS INVERTER YASKAWA V1000
Pages are referring to
Yaskawa Electric SIEP C710606 18A YASKAWA AC Drive – V1000 Technical Manual

◆ Types of Alarms, Faults, and Errors

Check the LED operator for information about possible faults if the drive or motor fails to operate. *Refer to Using the Digital LED Operator on page 70*.

If problems occur that are not covered in this manual, contact the nearest Yaskawa representative with the following information:

- Drive model
- Software version
- Date of purchase
- Description of the problem

Table 6.4 contains descriptions of the various types of alarms, faults, and errors that may occur while operating the drive.

Contact Yaskawa in the event of drive failure.

Table 6.4 Types of Alarms, Faults, and Errors

Type	Drive Responses to Alarms, Faults, and Errors
Faults	When the drive detects a fault: • The digital operator displays text that indicates the specific fault and the ALM indicator LED remains lit until the fault is reset. • The fault interrupts drive output and the motor coasts to a stop. • Depending on the setting, the drive and motor may stop via different methods than listed. • If a digital output is programmed for fault output (H2-☐☐ = E), it will close if a fault occurs. • When the drive detects a fault, it will remain inoperable until that fault has been reset. *Refer to Fault Reset Methods on page 264*.
Minor Faults and Alarms	When the drive detects an alarm or a minor fault: • The digital operator displays text that indicates the specific alarm or minor fault and the ALM indicator LED flashes. • The motor does not stop. • One of the multi-function contact outputs closes if set to be tripped by a minor fault (H2-☐☐ = 10), but not by an alarm. • The digital operator displays text indicating a specific alarm and ALM indicator LED flashes. • Remove the cause of an alarm or minor fault to automatically reset.
Operation Errors	When parameter settings conflict with one another or do not match hardware settings (such as with an option card), it results in an operation error. When the drive detects an operation error: • The digital operator displays text that indicates the specific error. • Multi-function contact outputs do not operate. • When the drive detects an operation error, it will not operate the motor until the error has been reset. Correct the settings that caused the operation error to reset.
Tuning Errors	Tuning errors occur while performing Auto-Tuning. When the drive detects a tuning error: • The digital operator displays text indicating the specific error. • Multi-function contact outputs do not operate. • Motor coasts to stop. • Remove the cause of the error and repeat the Auto-Tuning process.

◆ Alarm and Error Displays

■ Faults

When the drive detects a fault, the ALM indicator LEDs remain lit without flashing. If the LEDs flash, the drive has detected a minor fault or alarm. *Refer to Minor Faults and Alarms on page 240* for more information. An overvoltage situation trips both faults and minor faults, therefore it is important to note whether the LEDs remain lit or if the LEDs flash.

LED Operator Display		Name	Page
bUS	bUS	Option Communication Error	*242*
CE	CE	MEMOBUS/Modbus Communication Error	*242*
CF	CF	Control Fault	*242*
CoF	CoF	Current Offset Fault	*242*
CPF02	CPF02	A/D Conversion Error	*242*
CPF03	CPF03	PWM Data Fault	*243*
CPF06	CPF06	Drive specification mismatch during Terminal Board or Control Board replacement	*243*
CPF07	CPF07	Terminal Board Communication Fault	*243*

LED Operator Display		Name	Page
CPF08	CPF08	EEPROM Serial Communications Fault	*243*
CPF11	CPF11	RAM Fault	*243*
CPF12	CPF12	FLASH Memory Fault	*243*
CPF13	CPF13	Watchdog Circuit Exception	*243*
CPF14	CPF14	Control Circuit Fault	*243*
CPF16	CPF16	Clock Fault	*243*
CPF17	CPF17	Timing Fault	*243*
CPF18	CPF18	Control Circuit Fault	*243*
CPF19	CPF19	Control Circuit Fault	*244*

LED Operator Display		Name	Page
CPF20 or CPF21	CPF20or CPF21	RAM Fault	244
		FLASH Memory Fault	244
		Watchdog Circuit Exception	244
		Clock Fault	244
oH3	oH3	Motor Overheat 1 (PTC input)	247
oH4	oH4	Motor Overheat 2 (PTC input)	248
oL1	oL1	Motor Overload	248
oL2	oL2	Drive Overload	248
oL3	oL3	Overtorque Detection 1	249
oL4	oL4	Overtorque Detection 2	249
oL5	oL5	Mechanical Weakening Detection 1	249
oL7	oL7	High Slip Braking oL	249
oPr	oPr	Operator Connection Fault	249
CPF22	CPF22	A/D Conversion Error	244
CPF23	CPF23	PWM Feedback Data Fault	244
CPF24	CPF24	Drive Capacity Signal Fault	244
dEv	dEv	Excessive Speed Deviation (for Simple V/f with PG)	244
EF0	EF0	Option Card External Fault	244
EF1 to EF7	EF1 to EF7	External Fault (input terminal S1 to S7)	244
FbH	FbH	Excessive PID Feedback	245
FbL	FbL	PID Feedback Loss	245

LED Operator Display		Name	Page
GF	GF	Ground Fault	245
LF	LF	Output Phase Loss	245
LF2	LF2	Output Open Phase	246
oC	oC	Overcurrent	246
oFA00	oFA00	Option Card Fault (port A)	246
oH	oH	Heatsink Overheat	247
oH1	oH1	Heatsink Overheat	247
PGo	PGo	PG Disconnect (for Simple V/f with PG)	250
rH	rH	Dynamic Braking Resistor	251
rr	rr	Dynamic Braking Transistor	251
SEr	SEr	Too Many Speed Search Restarts	251
STO	STO	Pull-Out Detection	251
UL3	UL3	Undertorque Detection 1	251
UL4	UL4	Undertorque Detection 2	251
UL5	UL5	Mechanical Weakening Detection 2	251
Uv1	Uv1	Undervoltage	252
Uv2	Uv2	Control Power Supply Undervoltage	252
Uv3	Uv3	Soft Charge Circuit Fault	252
oS	oS	Overspeed (for Simple V/f with PG)	249
ov	ov	Overvoltage	249
PF	PF	Input Phase Loss	250

Note: If faults CPF11 through CPF19 occur, the LED operator will display CPF00 or CPF11.

■ Minor Faults and Alarms

When a minor fault or alarm occurs, the ALM LED flashes and the text display shows an alarm code. A fault has occurred if the text remains lit and does not flash. *Refer to Alarm Detection on page 253*. An overvoltage situation, for example, can trigger both faults and minor faults. It is therefore important to note whether the LEDs remain lit or if the LEDs flash.

Table 6.5 Minor Fault and Alarm Displays

LED Operator Display		Name	Minor Fault Output (H2-□□ = 10)	Page
bb	bb	Drive Baseblock	No output	253
bUS	bUS	Option Card Communications Error	YES	253
CALL	CALL	Serial Communication Transmission Error	YES	253
CE	CE	MEMOBUS/Modbus Communication Error	YES	253
CrSt	CrSt	Can Not Reset	YES	253
dEv	dEv	Excessive Speed Deviation (for Simple V/f with PG)	YES	254
dnE	dnE	Drive Disabled	YES	254
EF	EF	Run Command Input Error	YES	254
EF0	EF0	Option Card External Fault	YES	254
EF1 to EF7	EF1 to EF7	External Fault (input terminal S1 to S7)	YES	255
FbH	FbH	Excessive PID Feedback	YES	255
FbL	FbL	PID Feedback Loss	YES	255
Hbb	Hbb	Safe Disable Signal Input	YES	255
HbbF	HbbF	Safe Disable Signal Input	YES	255
SE	SE	MEMOBUS/Modbus Test Mode Fault	YES	—
oL5	oL5	Mechanical Weakening Detection 1	YES	249
UL5	UL5	Mechanical Weakening Detection 2	YES	251
dWAL	dWAL	DriveWorksEZ Alarm	YES	244
HCA	HCA	Current Alarm	YES	256
oH	oH	Heatsink Overheat	YES	256
oH2	oH2	Drive Overheat	YES	256
oH3	oH3	Motor Overheat	YES	256
oL3	oL3	Overtorque 1	YES	256
oL4	oL4	Overtorque 2	YES	257
oS	oS	Overspeed (for Simple V/f with PG)	YES	257

LED Operator Display		Name	Minor Fault Output (H2-☐☐ = 10)	Page
ov	ov	Overvoltage	YES	257
PASS	PASS	MEMOBUS/Modbus Test Mode Complete	No output	257
PGo	PGo	PG Disconnect (for Simple V/f with PG)	YES	257
rUn	rUn	During Run 2, Motor Switch Command Input	YES	258
rUnC	rUnC	Run Command Reset	YES	258
UL3	UL3	Undertorque 1	YES	258
UL4	UL4	Undertorque 2	YES	258
Uv	Uv	Undervoltage	YES	258

■ Operation Errors

Table 6.6 Operation Error Displays

LED Operator Display		Name	Page
oPE01	oPE01	Drive Unit Setting Error	259
oPE02	oPE02	Parameter Setting Range Error	259
oPE03	oPE03	Multi-Function Input Setting Error	259
oPE04	oPE04	Terminal Board Mismatch Error	260
oPE05	oPE05	Run Command Selection Error	260
oPE07	oPE07	Multi-Function Analog Input Selection Error	260

LED Operator Display		Name	Page
oPE08	oPE08	Parameter Selection Error	260
oPE09	oPE09	PID Control Selection Error	260
oPE10	oPE10	V/f Data Setting Error	261
oPE11	oPE11	Carrier Frequency Setting Error	261
oPE13	oPE13	Pulse Train Monitor Selection Error	261

9. WARRANTY AND RETURNS

Warranty Policy for LAVINA® 20 EN Pro
Superabrasive Ltd. guarantees that the original purchaser of the LAVINA® 20 EN Pro machine will be covered against defects in material and workmanship for a period of 2 years from the date of delivery or 500 hours of use whichever comes first.
The following conditions pertain to this warranty:

- Applies only to the original owner and it is not transferable.
- Machine must not be dismantled and tampered with in any way.
- Covered components proven defective will be repaired or replaced at no charge. Covered components include motors, bearings and switches.
- This warranty does not apply to any repair arising from misuse, neglect or abuse, or to repair of proprietary parts.
- This warranty does not apply to products with aftermarket alterations, changes, or modifications.
- This warranty is in lieu of and excludes every condition of warranty not herein expressly set out and all liability for any form of consequential loss or damage is hereby expressly excluded.
- This warranty is limited to repair or replacement of covered components and reasonable labor expenses.
- All warranty returns must be shipped freight prepaid.

The above warranty conditions may be changed only by Superabrasive. Superabrasive reserves the right to inspect and make a final decision on any machine returned under this warranty. This warranty applies to new, used and demo machines.

Superabrasive does not authorize any person or representative to make any other warranty or to assume for us any liability in connection with the sale and operation of our products.

RETURN POLICY FOR LAVINA® 20 EN PRO
LAVINA® 20 EN Pro machines may be returned, subject to the following terms:
In no case, a machine is to be returned to Superabrasive Ltd. for credit or repair without prior authorization. Please contact Superabrasive Ltd. or your local distributor for an authorization and issuance of a return authorization number. This number along with the serial number of the machine must be included on all packages and correspondence. Machines returned without prior authorization will remain property of the sender and Superabrasive Ltd. will not be responsible for these.

10. DISPOSAL

If your machine after time is not usable or needs to be replaced, send the machine back to Superabrasive or a local distributor, where a professional disposal complying with the environment laws and directives is guaranteed.

11. MANUFACTURER'S CONTACTS

If you need to contact Superabrasive Ltd. with technical support questions, below is the contact information.

Address; Superabrasive Ltd.
Rabotnicheska 2A
BG-6140 Krun
Bulgaria
Email: info@superabrasive.us
Tel.: +359 431 6 44 77
Fax: +359 431 6 44 66
Website: www.superabrasive.com

12. SPARE PARTS

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS (FIG. 12.1)

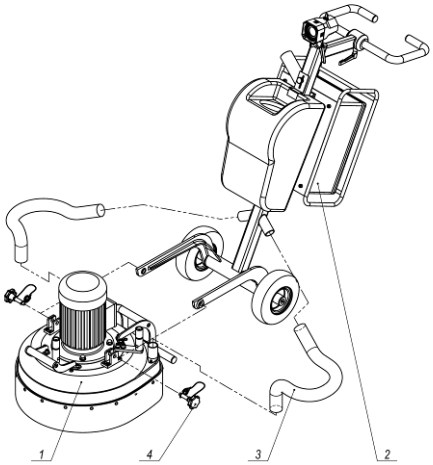


Figure 12.1

№	Item Number	Description	Qty.	Note
1	L20NP-01.00.00.00	Main Head	1	see fig.12.2.1-2
2	L20NP-02.00.00.00	Carriage with Control Box	1	see fig.12.12
3	D40L820	Vacuum Hose	2	
4	L25SPS-07.03.00.00	Pin Assembly	2	

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.2.1) FOR MACHINES WITH SHORT SHAFT MOTOR

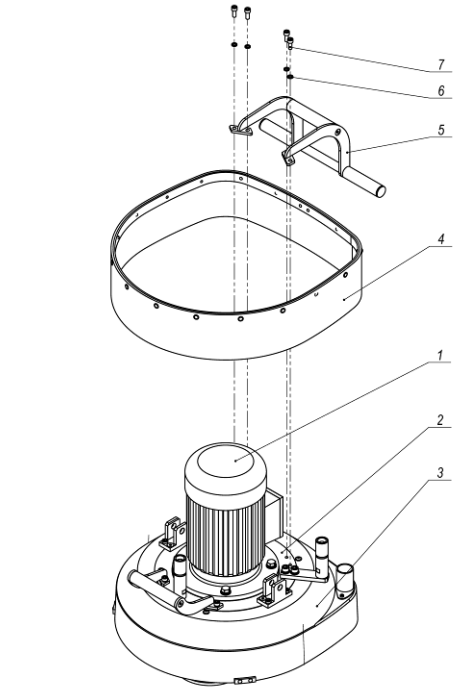


Figure 12.2.1

№	Item Number	Description	Qty.	Note
1	L20NP-01.01.00.10	Electro Motor	1	
2	L20P-01.03.00.00	Base Plate Assembly	1	see fig.12.10
3	L20SPS-04.00.00.00	Top Cover Assembly	1	see fig.12.7
4	L20SPS-05.00.00.00	Guard Assembly	1	see fig.12.11
5	L20SPS-03.00.00.00	Machine Support	1	
6	M8DIN7980	Spring Washer	4	
7	M8x20DIN912	Screw	4	
1a	L20NP-01.01.00.11	Fan Cover	1	see fig.12.1.a
1b	L20NP-01.01.00.12	Fan	1	see fig.12.1.b

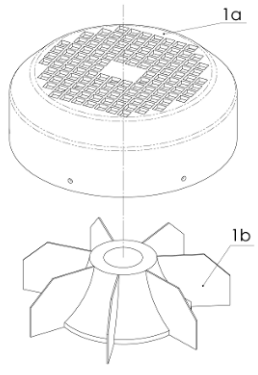


Figure 12.2.1.ab

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.2.2) FOR MACHINES WITH LONG SHAFT MOTOR

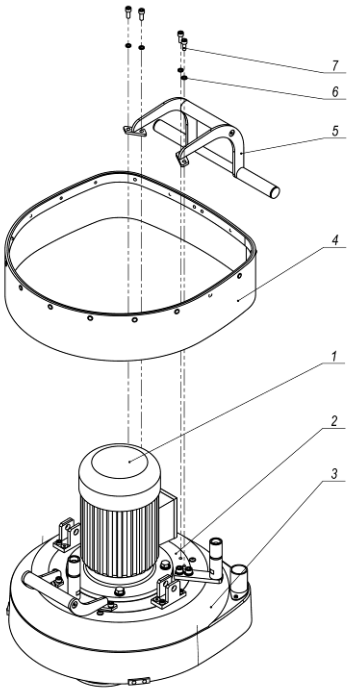


Figure 12.2.2

№	Item Number	Description	Qty.	Note
1	S203	Electro Motor	1	
2	L20P-01.03.00.00	Base Plate Assembly	1	see fig.12.10
3	L20SPS-04.00.00.00	Top Cover Assembly	1	see fig.12.7
4	L20SPS-05.00.00.00	Guard Assembly	1	see fig.12.11
5	L20SPS-03.00.00.00	Machine Support	1	
6	M8DIN7980	Spring Washer	4	
7	M8x20DIN912	Screw	4	
1a	L20NP-01.01.00.11	Fan Cover	1	see fig.12.2.a
1b	L20NP-01.01.00.12	Fan	1	see fig.12.2.b

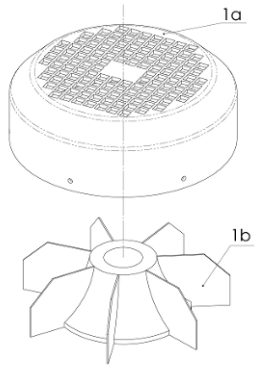


Figure 12.2.2.ab

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.3.1)
SEAL ASSEMBLY WITH PINS FOR MACHINES WITH NUMBERS

L20NP/04.12.09.00.01
L20NP/04.12.09.00.02
L20NP/04.12.09.00.03
L20NPHVP/23.12.10.CJ.70
L20NP/07.23.12.10.CJ.71.RCH
L20NP/07.01.11.00.03

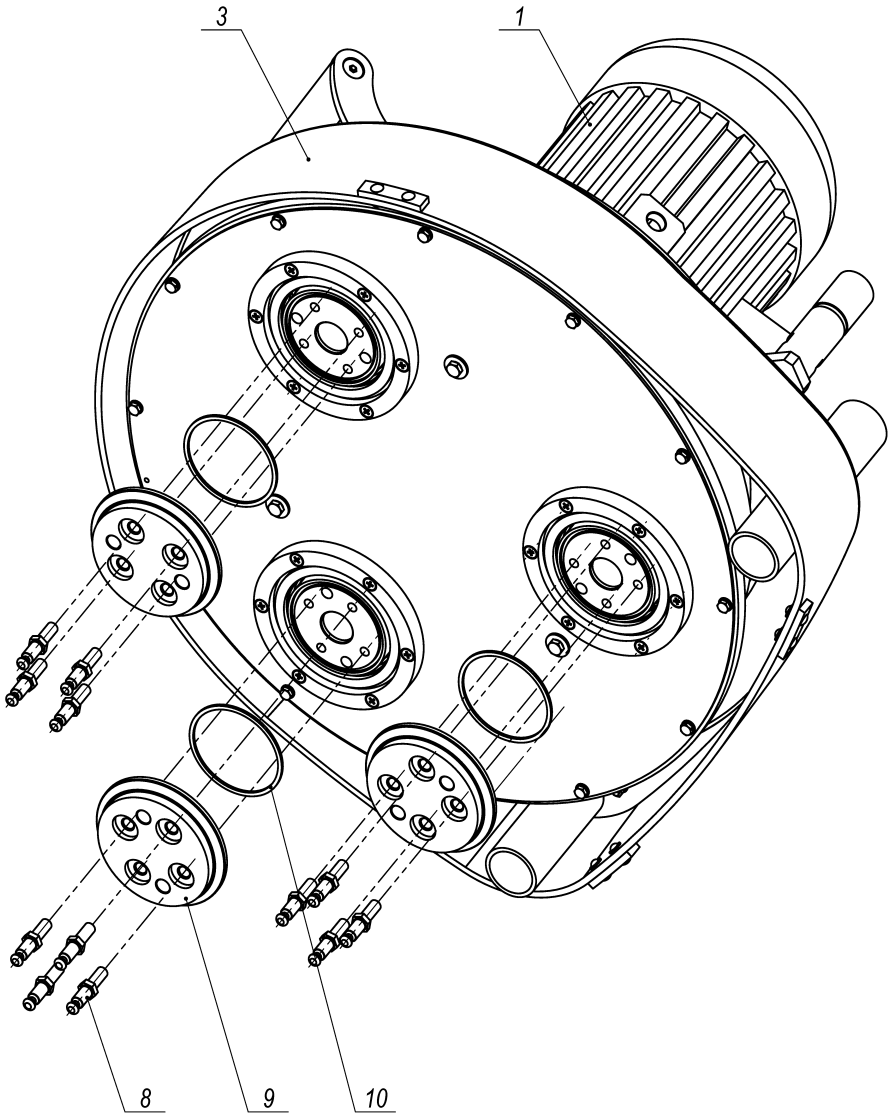


Figure 12.3.1

№	Item Number	Description	Qty.
8	L25P-01.00.00.03	Pin	12
9	L25P-01.01.00.00	Seal Cap	3
10	D68x2.5	O-Ring	3

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.3.2)
SEAL ASSEMBLY WITH SA TOOL HOLDER FOR MACHINES WITH NUMBERS

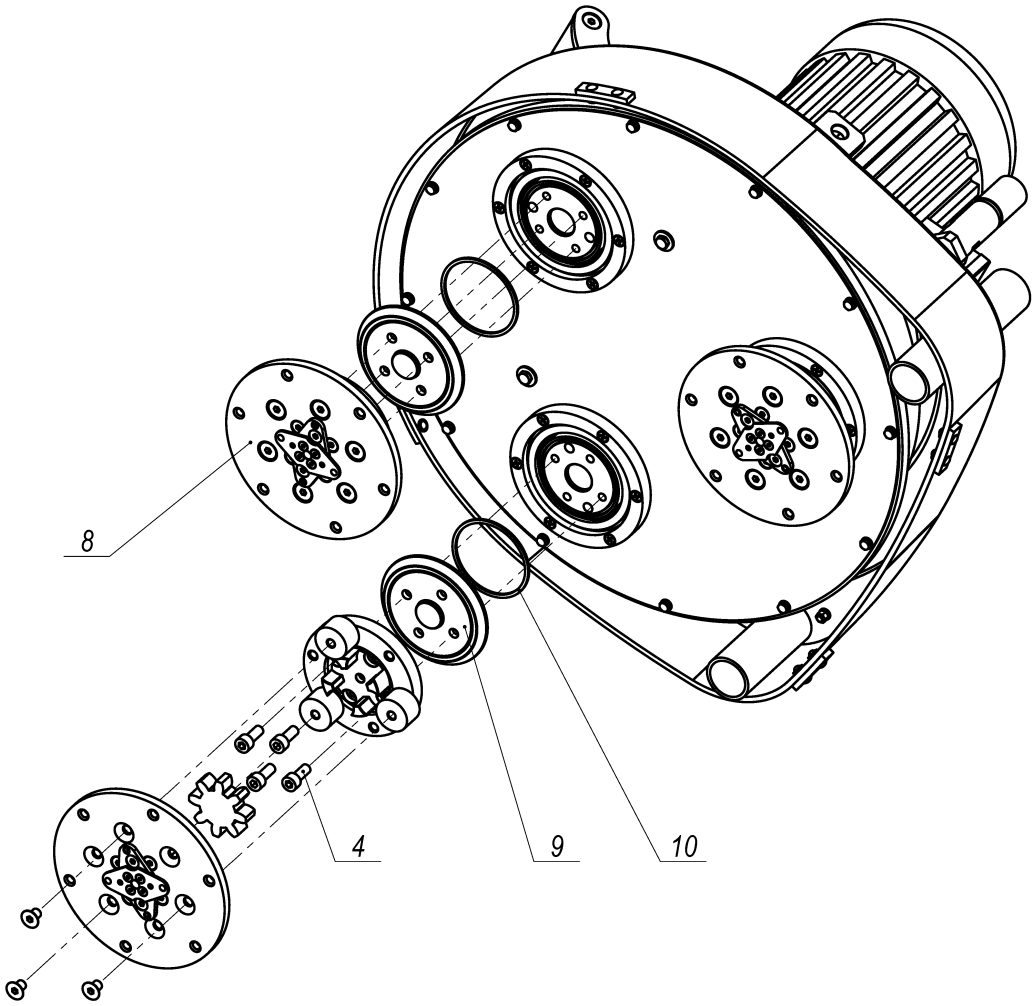


Figure 12.3.2

№	Item Number	Description	Quantity
4	M8x20DIN912	Screw	12
8	A15.00.00	SA Tool Holder	3
9	A16.00.00	Seal Cap	3
10	D68x2.5	O-Ring	3

L20NP/23.07.10.00.40
L20NP/23.07.10.00.41
L20NP/23.07.10.00.42
L20NP/23.07.10.00.43
L20NP/10.02.11.00.04
L20NP/10.02.11.00.05
L20NP/10.02.11.00.06
L20NP/10.02.11.00.07
L20NP/10.02.11.00.08
L20NP/10.02.11.00.09
L20NP/10.02.11.00.10
L20NP/10.02.11.00.11
L20NP/10.02.11.00.12
L20NP/10.02.11.00.13
L20NP/10.02.11.00.14
L20NP/10.02.11.00.15
L20NP/10.02.11.00.16
L20NP/10.02.11.00.17
L20NP/28.03.11.00.18
L20NP/28.03.11.00.19
L20NP/28.03.11.00.20
L20NP/28.03.11.00.21
L20NP/28.03.11.00.22
L20NP/28.03.11.00.23
L20NP/28.03.11.00.24
L20NP/28.03.11.00.25
L20NP/28.03.11.00.26
L20NP/28.03.11.00.27
L20NP/20.10.11.00.28
L20NP/18.11.11.00.29
L20NP/18.11.11.00.30
L20NP/18.11.11.00.31
L20NP/18.11.11.00.32
L20NP/18.11.11.00.33
L20NP/18.11.11.00.34
L20NP/18.11.11.00.35
L20NP/18.11.11.00.36
L20NP/18.11.11.00.37
L20NP/18.11.11.00.38
L20NP/18.11.11.00.39
L20NP/18.11.11.00.40
L20NP/18.11.11.00.41
L20NP/18.11.11.00.42
L20NP/18.11.11.00.43
L20NP/25.11.11.00.44
L20NP/25.11.11.00.45
L20NP/25.11.11.00.46
L20NP/23.12.11.00.47
L20NP/23.12.11.00.48
L20NP/23.12.11.00.49
L20NP/23.12.11.00.50
L20NP/23.12.11.00.51
L20NP/23.12.11.00.52
L20NP/23.12.11.00.53
L20NP/23.12.11.00.54
L20NP/23.12.11.00.55
L20NP/23.12.11.00.56
L20NP/23.12.11.00.57
L20NP/23.12.11.00.58

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

LAVINA 20® PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.3.3)

SEAL ASSEMBLY WITH SAM TOOL HOLDER FOR MACHINES WITH NUMBERS

L20NP/27.01.12.00.01
L20NP/27.01.12.00.02
L20NP/27.01.12.00.03
L20NP/27.01.12.00.04
L20NP/27.01.12.00.05
L20NP/27.01.12.00.06
L20NP/27.01.12.00.07
L20NP/27.01.12.00.08
L20NP/27.01.12.00.09
L20NP/27.01.12.00.10
L20NP/27.01.12.00.11
L20NP/27.01.12.00.12
L20NP/27.01.12.00.13
L20NP/27.01.12.00.14
L20NP/27.01.12.00.15

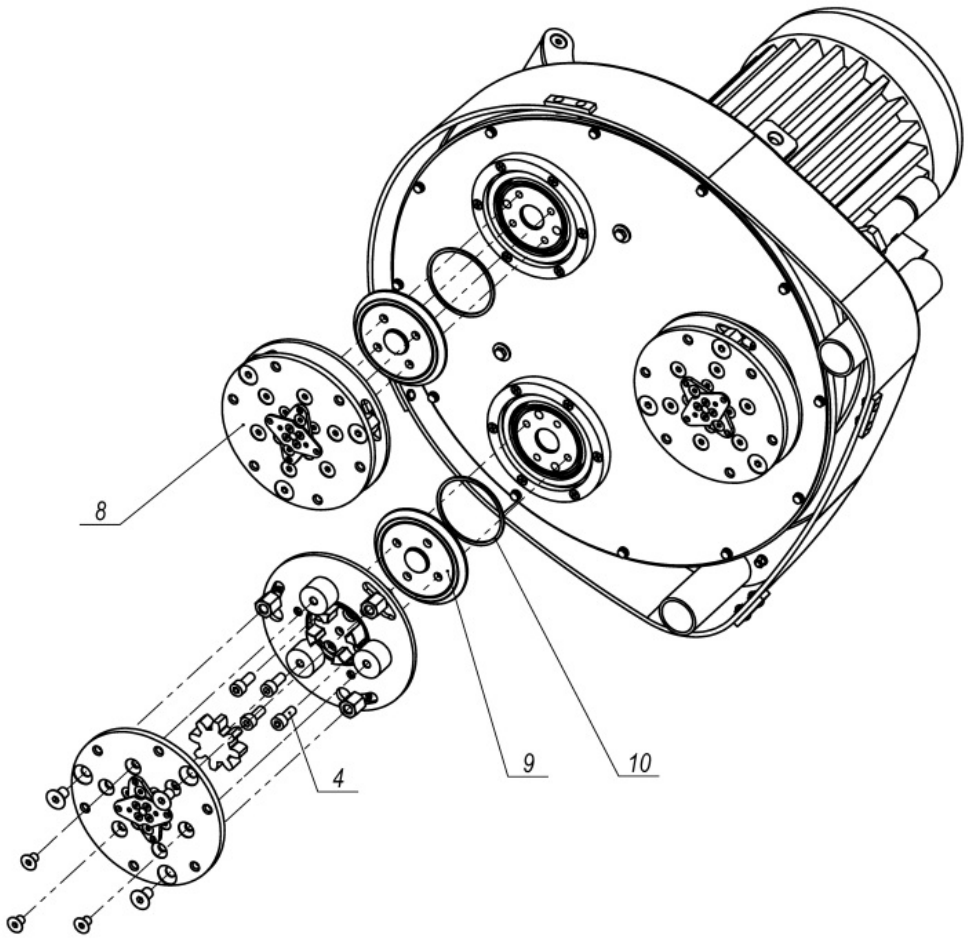


Figure 12.3.3

№	Item Number	Description	Quantity
4	M8x20DIN912	Screw	12
8	A15M.00.00	SAM Tool Holder	3
9	A16.00.00	Seal Cap	3
10	D68x2.5	O-Ring	3

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.4.1)

BOTTOM COVER ASSEMBLY FOR MACHINES WITH SHORT SHAFT MOTOR

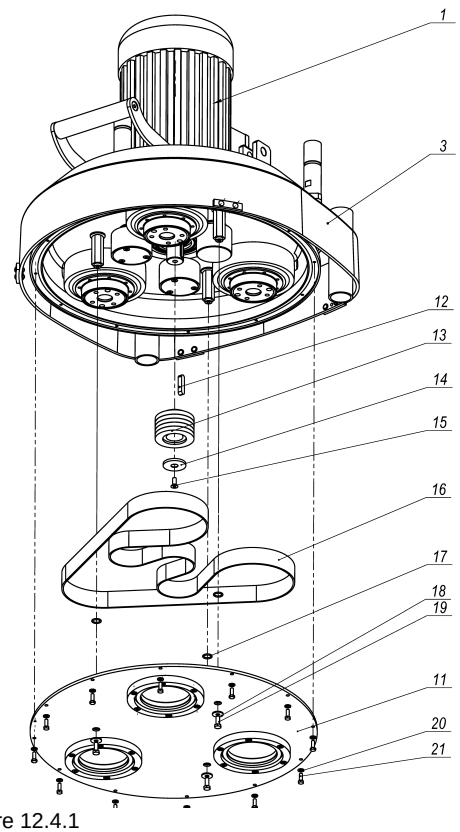


Figure 12.4.1

№	Item Number	Description	Qty.
11	L20P-01.04.00.00	Bottom Cover Assembly	1
12	DIN6885A8x7x36	Key	1
13	L20SPS-00.00.00.08	Central Pulley	1
14	L25SPS-00.00.00.15	Front Washer	1
15	M6x16DIN7991	Screw	1
16	TC-20/25EF1775x30x2.5	Endless Transmission Flat Belt	1
17	D12x2	O-Ring	3
18	M6DIN9021A	Washer	3
19	M6x16DIN933	Bolt	3
20	M5DIN125A	Washer	12
21	M5x10DIN933	Bolt	12

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.4.2)

BOTTOM COVER ASSEMBLY FOR MACHINES WITH SERIAL NUMBERS

L20NPHVP/23.12.10.CJ.70
L20NP/07.23.12.CJ.71.RCH

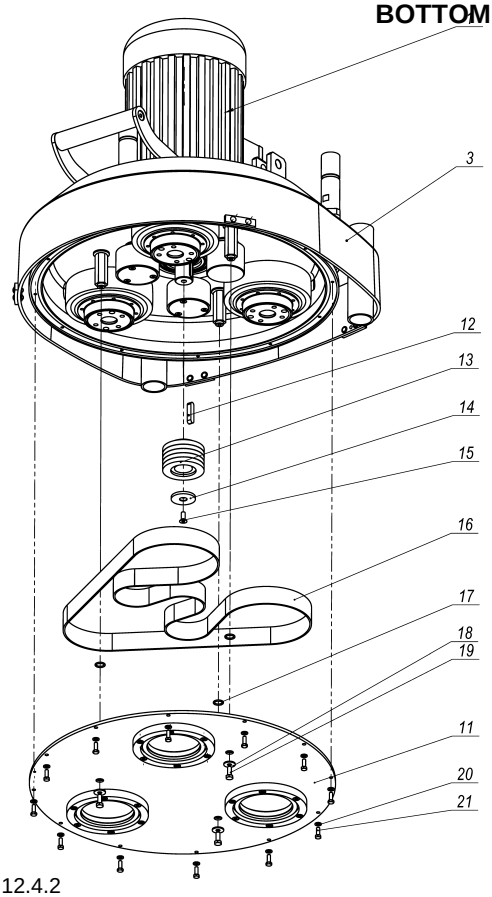


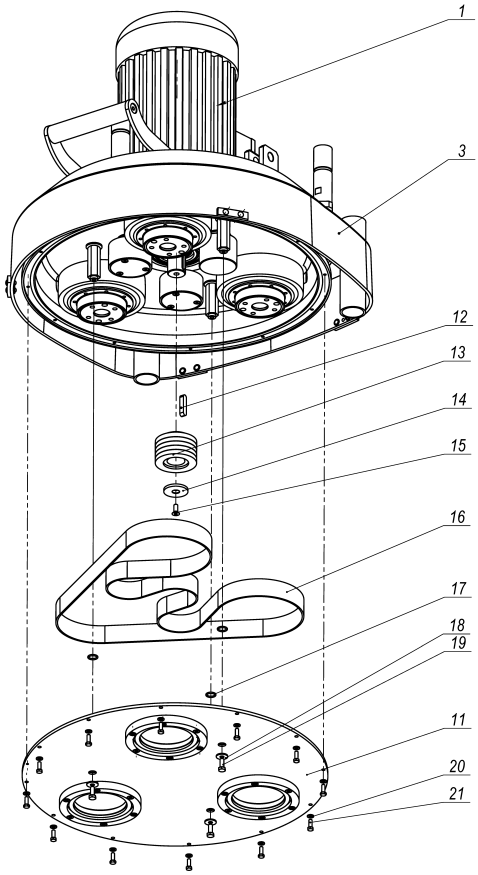
Figure 12.4.2

№	Item Number	Description	Qty.
11	L20P-01.04.00.00	Bottom Cover Assembly	1
12	DIN6885A8x7x36	Key	1
13	L20P-01.00.00.01	Central Pulley	1
14	L25SPS-00.00.00.15	Front Washer	1
15	M6x16DIN7991	Screw	1
16	TC-35/ER1775x35x2.5	Endless Transmission Flat Belt	1
17	D12x2	O-Ring	3
18	M6DIN9021A	Washer	3
19	M6x16DIN933	Bolt	3
20	M5DIN125A	Washer	12
21	M5x10DIN933	Bolt	12

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.4.3)
BOTTOM COVER ASSEMBLY FOR MACHINES WITH SERIAL NUMBERS

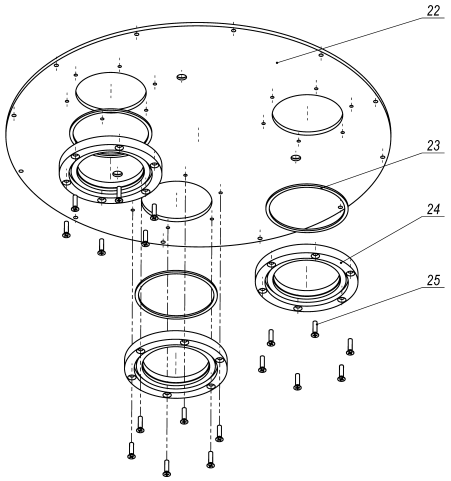
L20NP/23.07.10.00.40	L20NP/10.02.11.00.14	L20NP/18.11.11.00.29	L20NP/25.11.11.00.44	L20NP/27.01.12.00.01
L20NP/23.07.10.00.41	L20NP/10.02.11.00.15	L20NP/18.11.11.00.30	L20NP/25.11.11.00.45	L20NP/27.01.12.00.02
L20NP/23.07.10.00.42	L20NP/10.02.11.00.16	L20NP/18.11.11.00.31	L20NP/25.11.11.00.46	L20NP/27.01.12.00.03
L20NP/23.07.10.00.43	L20NP/10.02.11.00.17	L20NP/18.11.11.00.32	L20NP/23.12.11.00.47	L20NP/27.01.12.00.04
L20NP/07.01.11.00.03	L20NP/28.03.11.00.18	L20NP/18.11.11.00.33	L20NP/23.12.11.00.48	L20NP/27.01.12.00.05
L20NP/10.02.11.00.04	L20NP/28.03.11.00.19	L20NP/18.11.11.00.34	L20NP/23.12.11.00.49	L20NP/27.01.12.00.06
L20NP/10.02.11.00.05	L20NP/28.03.11.00.20	L20NP/18.11.11.00.35	L20NP/23.12.11.00.50	L20NP/27.01.12.00.07
L20NP/10.02.11.00.06	L20NP/28.03.11.00.21	L20NP/18.11.11.00.36	L20NP/23.12.11.00.51	L20NP/27.01.12.00.08
L20NP/10.02.11.00.07	L20NP/28.03.11.00.22	L20NP/18.11.11.00.37	L20NP/23.12.11.00.52	L20NP/27.01.12.00.09
L20NP/10.02.11.00.08	L20NP/28.03.11.00.23	L20NP/18.11.11.00.38	L20NP/23.12.11.00.53	L20NP/27.01.12.00.10
L20NP/10.02.11.00.09	L20NP/28.03.11.00.24	L20NP/18.11.11.00.39	L20NP/23.12.11.00.54	L20NP/27.01.12.00.11
L20NP/10.02.11.00.10	L20NP/28.03.11.00.25	L20NP/18.11.11.00.40	L20NP/23.12.11.00.55	L20NP/27.01.12.00.12
L20NP/10.02.11.00.11	L20NP/28.03.11.00.26	L20NP/18.11.11.00.41	L20NP/23.12.11.00.56	L20NP/27.01.12.00.13
L20NP/10.02.11.00.12	L20NP/28.03.11.00.27	L20NP/18.11.11.00.42	L20NP/23.12.11.00.57	L20NP/27.01.12.00.14
L20NP/10.02.11.00.13	L20NP/20.10.11.00.28	L20NP/18.11.11.00.43	L20NP/23.12.11.00.58	L20NP/27.01.12.00.15



№	Item Number	Description	Qty.	Note
11	L20P-01.04.00.00	Bottom Cover Assembly	1	see fig.12.5
12	DIN6885A8x7x36	Key	1	
13	L20P-01.00.00.01-01	Central Pulley	1	
14	L25SPS-00.00.00.15	Front Washer	1	
15	M6x16DIN7991	Screw	1	
16	TC-35/ER1775x35x2.5	Endless Transmission Flat Belt	1	
17	D12x2	O-Ring	3	
18	M6DIN9021A	Washer	3	
19	M6x16DIN933	Bolt	3	
20	M5DIN125A	Washer	12	
21	M5x10DIN933	Bolt	12	

Figure 12.4.3

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.5)
BOTTOM COVER

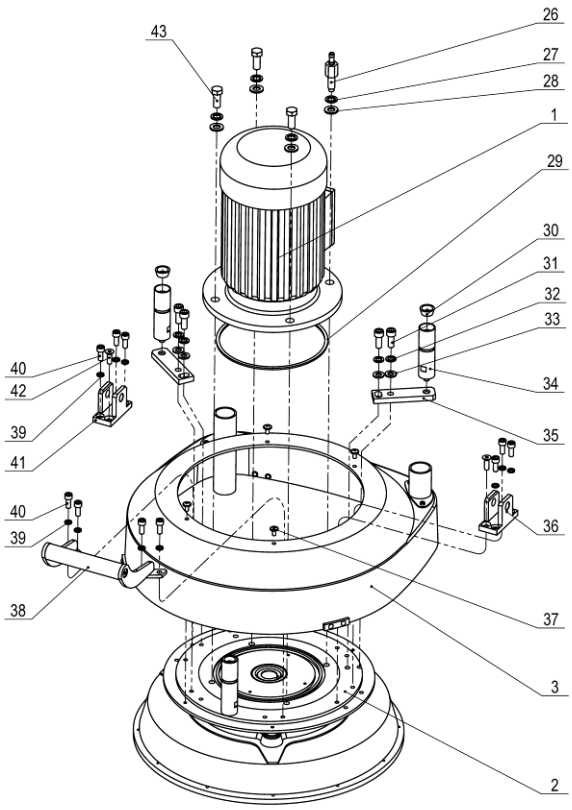


№	Item Number	Description	Qty.
22	L20P-01.04.00.01	Bottom Cover	1
23	D3x2	Seal	3
24	L25P-01.05.00.02	Flange	3
25	M5x20DIN7991	Screw	18

Figure 12.5

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

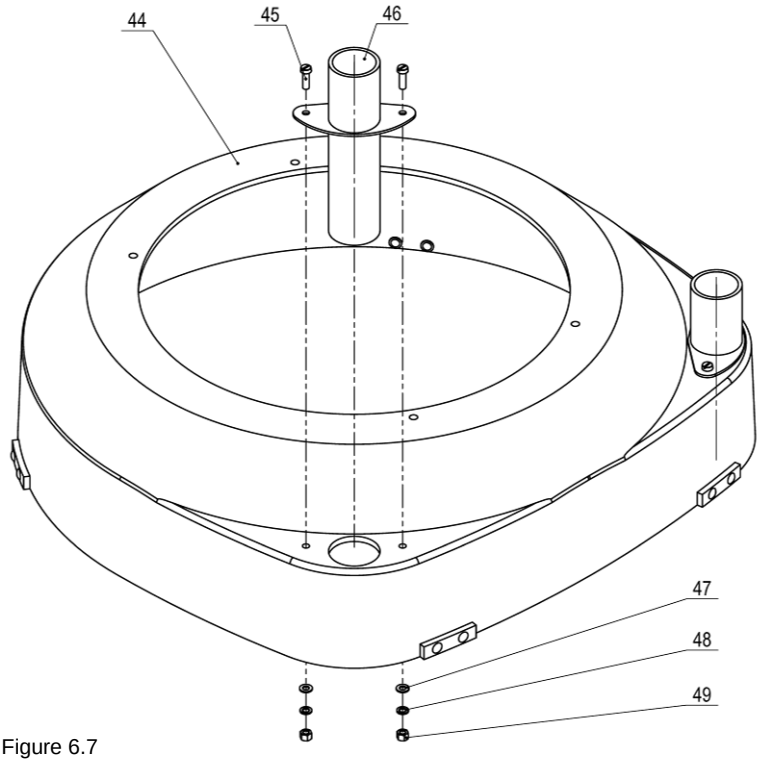
LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.6)
MOTOR AND WEIGHT SUPPORT



№	Item Number	Description	Qty.
26	L25SPS-07.00.00.06	Fitting for Water	1
27	M12DIN127B	Spring Washer	4
28	M12DIN125A	Washer	4
29	D4x2x650	Seal	1
30	L25SPS-07.00.00.29	Rubber Buffer	2
31	M10x25DIN912	Screw	4
32	M10DIN127B	Spring Washer	4
33	M10DIN125A	Washer	4
34	L25SPS-07.00.00.05	Weight Holder	2
35	L20SPS-07.00.00.01	Support	2
36	L25SPS-07.00.00.02-L	Left Fork	1
37	M6x12DIN967	Screw	4
38	L20SPS-08.00.00.00	Handle	2
39	M8DIN127B	Spring Washer	10
40	M8x20DIN912	Screw	10
41	L25SPS-07.00.00.02-R	Right Fork	1
42	M8x25DIN7991	Screw	2
43	M12x30DIN933	Bolt	3

Figure 12.6

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.7)
TOP COVER



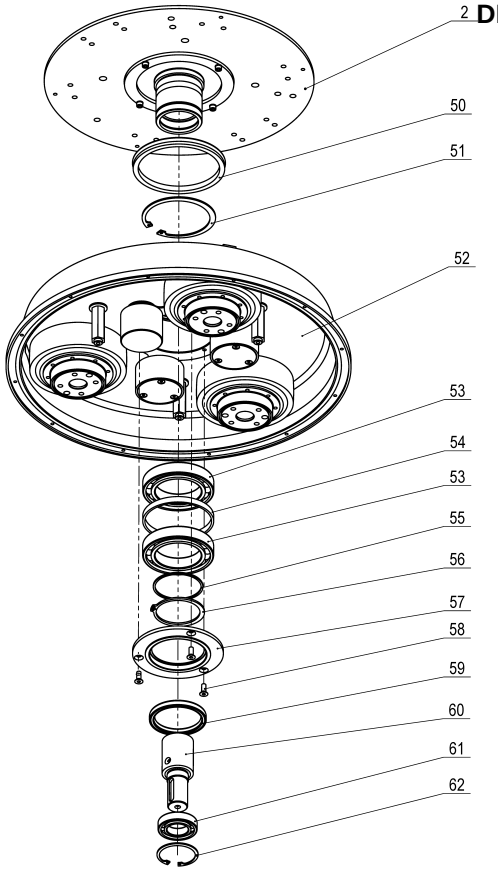
№	Item Number	Description	Qty.
44	L20SPS-04.02.00.00	Top Cover	1
45	M5x16DIN84A	Screw	4
46	L25SPS-04.01.00.00	Vacuum Port	2
47	M5DIN127B	Spring Washer	4
48	M5DIN125A	Washer	4
49	M5DIN934	Nut	4

Figure 6.7

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG.12.8.1)

DISC ASSEMBLY FOR MACHINES WITH SHORT SHAFT MOTOR



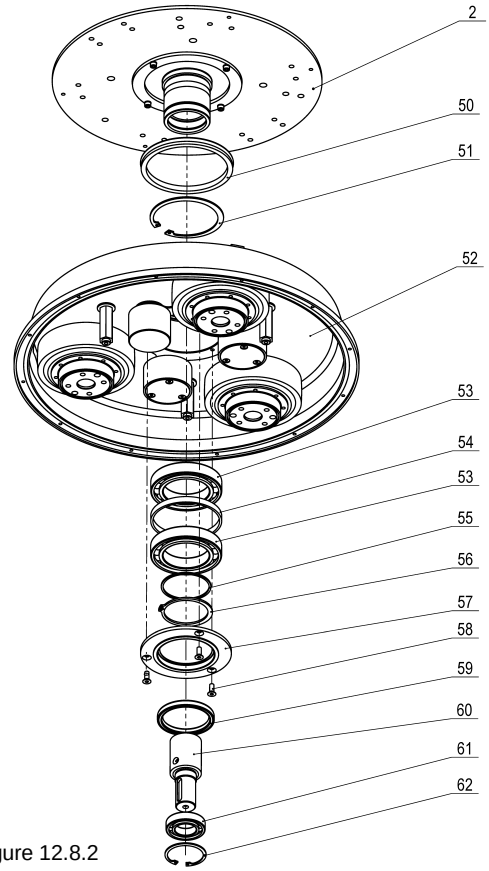
№	Item Number	Description	Qty.
50	TWVA01200	V-Ring Type A	1
51	A100-13943-86	Retaining Ring	1
52	L20P-01.00.00.35	Disc	1
53	6013	Roller Assembly	2
54	L25SPS-00.00.00.34	Distance Ring	1
55	L25SPS-00.00.00.23	Compensating Ring	1
56	B65DIN471	Retaining Ring	1
57	L20P-01.00.00.12	Cap for Rotary Seal	1
58	M6x12DIN7991	Screw	5
59	TRA000650	Rotary Seal	1
60	L25SPS-00.00.00.36	Extension Shaft	1
61	6006	Roller Assembly	1
62	A55-13943-86	Retaining Ring	1

Figure 12.8.1

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG.12.8.2)

DISC ASSEMBLY FOR MACHINES WITH NUMBERS

L20NPHVP/23.12.10.CJ.70
L20NP/07.23.12.10.CJ.71.RCH
L20NP/07.01.11.00.03



№	Item Number	Description	Qty.
50	TWVA01200	V-Ring Type A	1
51	A100-13943-86	Retaining Ring	1
52	L20P-01.00.00.35	Disc	1
53	6013	Roller Assembly	2
54	L25SPS-00.00.00.34	Distance Ring	1
55	L25SPS-00.00.00.23	Compensating Ring	1
56	B65DIN471	Retaining Ring	1
57	L20P-01.00.00.12	Cap for Rotary Seal	1
58	M6x12DIN7991	Screw	5
59	TRA000650	Rotary Seal	1
60	L25P-01.00.00.01	Extension Shaft	1
61	3205	Roller Assembly	1
62	A52DIN472	Retaining Ring	1

Figure 12.8.2

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG.12.8.3)
DISC ASSEMBLY FOR MACHINES WITH NUMBERS

L20NP/23.07.10.00.40	L20NP/10.02.11.00.15	L20NP/18.11.11.00.30	L20NP/25.11.11.00.45	L20NP/27.01.12.00.02
L20NP/23.07.10.00.41	L20NP/10.02.11.00.16	L20NP/18.11.11.00.31	L20NP/25.11.11.00.46	L20NP/27.01.12.00.03
L20NP/23.07.10.00.42	L20NP/10.02.11.00.17	L20NP/18.11.11.00.32	L20NP/23.12.11.00.47	L20NP/27.01.12.00.04
L20NP/23.07.10.00.43	L20NP/28.03.11.00.18	L20NP/18.11.11.00.33	L20NP/23.12.11.00.48	L20NP/27.01.12.00.05
L20NP/10.02.11.00.04	L20NP/28.03.11.00.19	L20NP/18.11.11.00.34	L20NP/23.12.11.00.49	L20NP/27.01.12.00.06
L20NP/10.02.11.00.05	L20NP/28.03.11.00.20	L20NP/18.11.11.00.35	L20NP/23.12.11.00.50	L20NP/27.01.12.00.07
L20NP/10.02.11.00.06	L20NP/28.03.11.00.21	L20NP/18.11.11.00.36	L20NP/23.12.11.00.51	L20NP/27.01.12.00.08
L20NP/10.02.11.00.07	L20NP/28.03.11.00.22	L20NP/18.11.11.00.37	L20NP/23.12.11.00.52	L20NP/27.01.12.00.09
L20NP/10.02.11.00.08	L20NP/28.03.11.00.23	L20NP/18.11.11.00.38	L20NP/23.12.11.00.53	L20NP/27.01.12.00.10
L20NP/10.02.11.00.09	L20NP/28.03.11.00.24	L20NP/18.11.11.00.39	L20NP/23.12.11.00.54	L20NP/27.01.12.00.11
L20NP/10.02.11.00.10	L20NP/28.03.11.00.25	L20NP/18.11.11.00.40	L20NP/23.12.11.00.55	L20NP/27.01.12.00.12
L20NP/10.02.11.00.11	L20NP/28.03.11.00.26	L20NP/18.11.11.00.41	L20NP/23.12.11.00.56	L20NP/27.01.12.00.13
L20NP/10.02.11.00.12	L20NP/28.03.11.00.27	L20NP/18.11.11.00.42	L20NP/23.12.11.00.57	L20NP/27.01.12.00.14
L20NP/10.02.11.00.13	L20NP/20.10.11.00.28	L20NP/18.11.11.00.43	L20NP/23.12.11.00.58	L20NP/27.01.12.00.15
L20NP/10.02.11.00.14	L20NP/18.11.11.00.29	L20NP/25.11.11.00.44	L20NP/27.01.12.00.01	

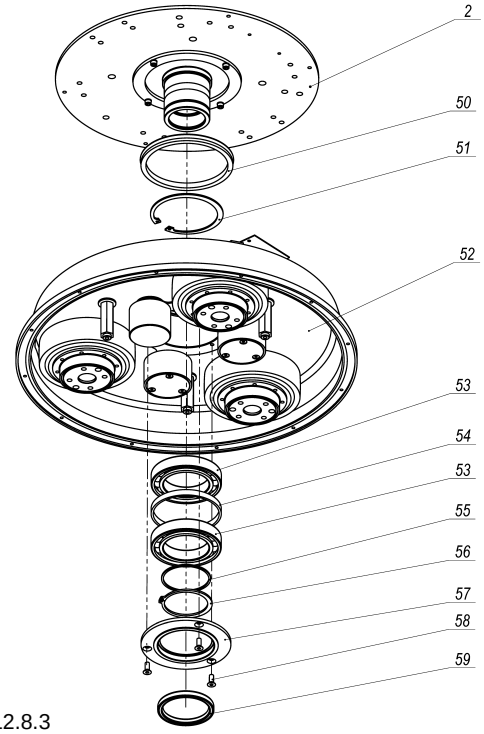


Figure 12.8.3

№	Item Number	Description	Qty.
50	TWVA01200	V-Ring Type A	1
51	A100-13943-86	Retaining Ring	1
52	L20P-01.00.00.35	Disc	1
53	6013	Roller Assembly	2
54	L25SPS-00.00.00.34	Distance Ring	1
55	L25SPS-00.00.00.23	Compensating Ring	1
56	B65DIN471	Retaining Ring	1
57	L20P-01.00.00.12	Cap for Rotary Seal	1
58	M6x12DIN7991	Screw	5
59	TRA000650	Rotary Seal	1

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.9)
PULLEY UNIT

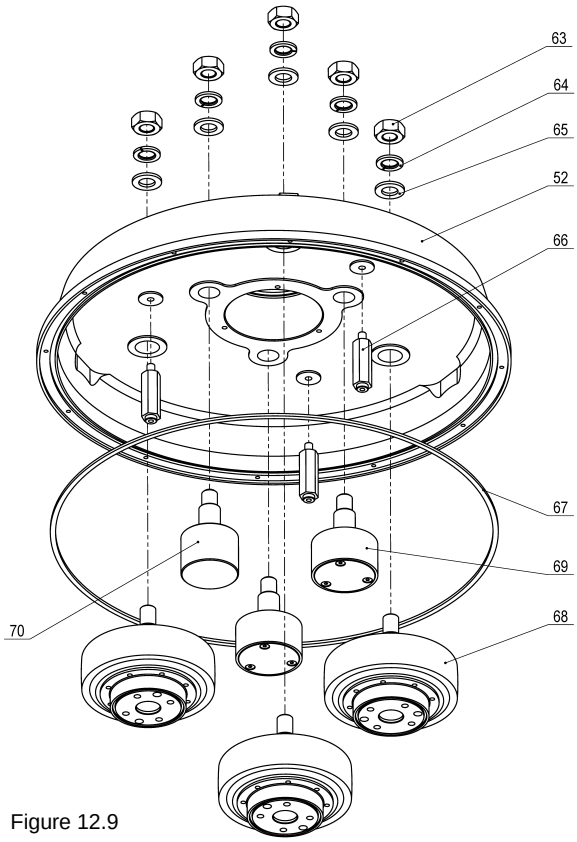
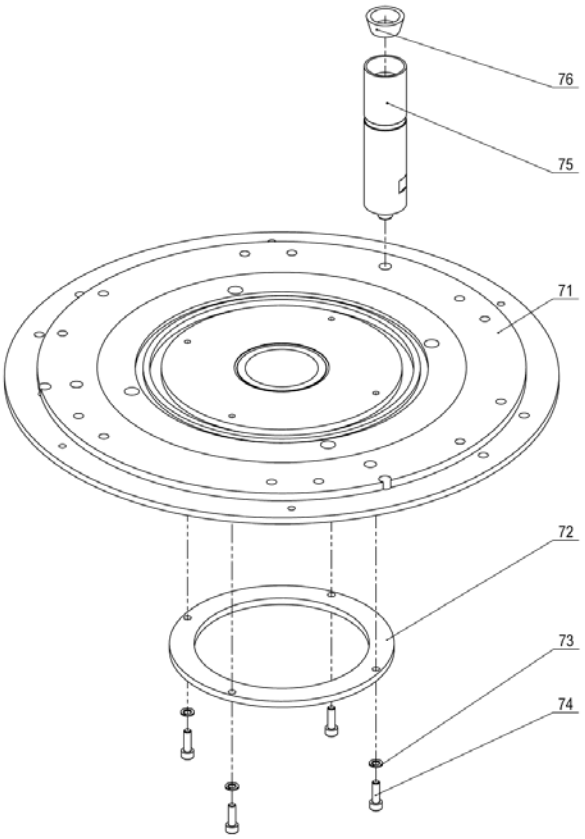


Figure 12.9

№	Item Number	Description	Qty.
63	M16DIN934	Nut	6
64	M16DIN125A	Washer	6
65	M16DIN127B	Spring Washer	6
66	L25P-01.00.00.50	Distance Screw	3
67	D4x2x1450	Seal	1
68	L20P-01.02.00.00-01	Pulley Unit Assembly	3
69	L20P-01.05.00.00	Roller Unit Assembly	2
70	L20SPS-00.00.00.43	Balancing Roller	1

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

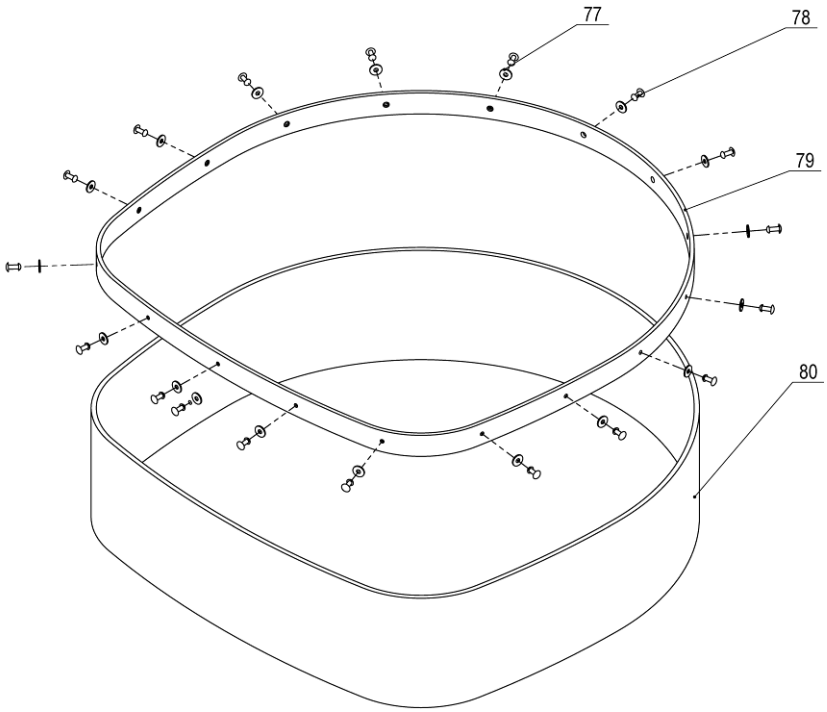
LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD (FIG. 12.10)
BASE PLATE



№	Item Number	Description	Qty.
71	L20P-01.03.01.00-02	Base Plate	1
72	L25P-01.03.00.09	Flange	1
73	M5DIN7980	Spring Washer	4
74	M5x16DIN912	Screw	4
75	L20SPS-07.00.00.02	Front Weight Holder	1
76	L25SPS-07.00.00.29	Rubber Buffer	1

Figure 12.10

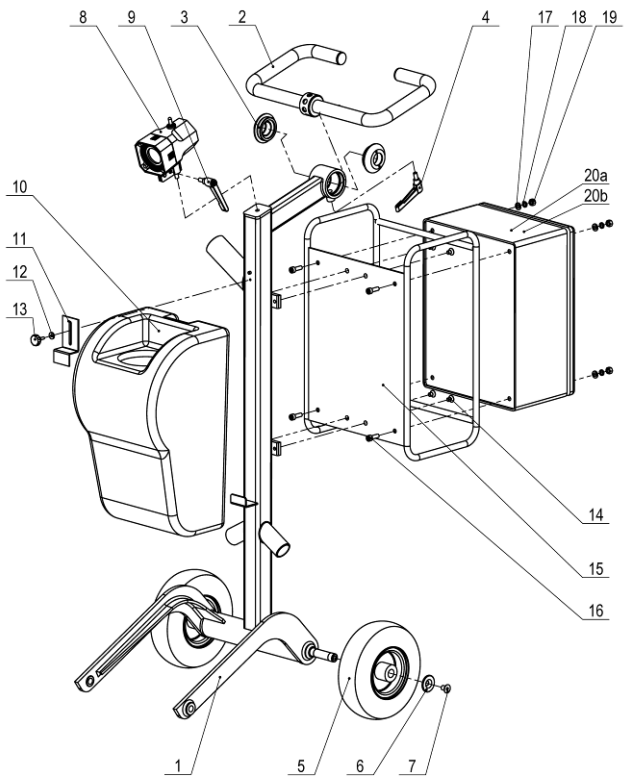
LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE MAIN HEAD FIG. 12.11
GUARD ASSEMBLY



№	Item Number	Description	Qty.
77	D4x10DIN7337	Rivet	18
78	M5DIN9021A	Washer	18
79	L20SPS-05.00.00.01	Ring	1
80	L20SPS-05.00.00.02	Guard	1

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

LAVINA® 20 EN PRO ASSEMBLY AND PARTS SPECIFICATIONS OF THE CARRIAGE (FIG. 12.12)



№	Item Number	Description	Qty.
1	L20P-02.01.00.00	Frame	1
2	L20SPS-02.05.00.00	Handle Assembly	1
3	L25SPS-02.00.00.18	Nut	2
4	A58194	Swivel Bolt	1
5	L20SPS-02.04.00.00	Wheel	2
6	L20SPS-02.00.00.19	Cap	2
7	M10x16DIN7991	Screw	2
8	L25SPS-01.00.00.00	Lamp Unit Incl. Cable and Plug	1
9	A58165	Swivel Bolt	1
10	A26.00.00	Tank	1
11	L12	Top Bracket	1
12	M5UN732	Washer	1
13	T34391	Knob Bolt	1
14	M8x12DIN7991	Screw	4
15	L20SPS-02.00.01.00	Guard	1
16	M8x25DIN912	Screw	4
17	M8DIN127B	Spring Washer	4
18	M8DIN125A	Washer	4
19	M8DIN934	Nut	4
20a	CB-7.5HP-1&3PH-240V-PRO	Control Box L20N Pro	1
20b	CB-7.5HP-3PH-480V-PRO	Control Box L20NHV Pro	1

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

FLOATING BACKER PLATE TOOLHOLDER (FIG. 12.13.1)

A floating backer plate (Fig. 5.6) is mounted on each of the three grinding heads for the machines with pins. Its advantage is that it has elastic shock absorbers, which enable the tool plate to float and follow the surface profile.

A tool can be attached with use of the tool holder key.

	Item Number	Description	Qty.
1	A01/00.00.02	Sealer Front	1
2	M6x20DIN7991	Screw	4
3	A01/00.00.01	Shock Absorber	4

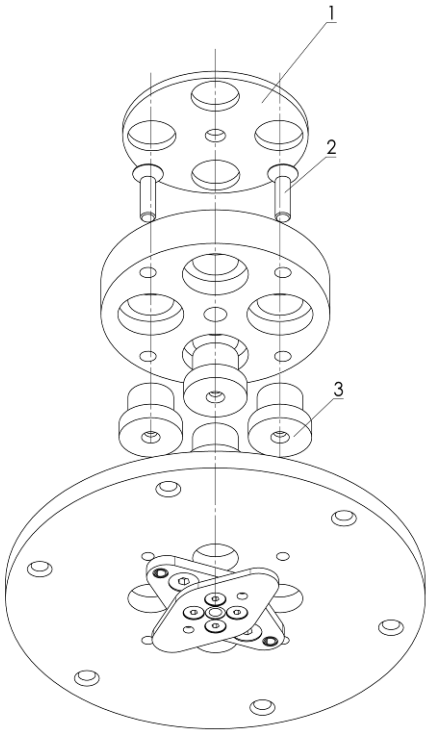


Figure 12.13.1

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

SA TOOL HOLDER (FIG. 12.13.2) FOR MACHINES WITH NUMBERS

The SA tool holder, item number A15.00.00 (Fig. 12.13.2) is mounted on each of the three grinding heads. Its advantage is that it has elastic buffers that enable the tool plate to float and follow the surface profile. It is possible to leave away, three of the six buffers to have more flexibility. The buffers and the spider are consumables, the less buffers mounted the shorter the life of the spider and buffers.
A tool can be attached with use of the tool holder key.

L20NP/07.01.11.00.03	L20NP/10.02.11.00.15	L20NP/28.03.11.00.27	L20NP/18.11.11.00.39	L20NP/23.12.11.00.51
L20NP/10.02.11.00.04	L20NP/10.02.11.00.16	L20NP/20.10.11.00.28	L20NP/18.11.11.00.40	L20NP/23.12.11.00.52
L20NP/10.02.11.00.05	L20NP/10.02.11.00.17	L20NP/18.11.11.00.29	L20NP/18.11.11.00.41	L20NP/23.12.11.00.53
L20NP/10.02.11.00.06	L20NP/28.03.11.00.18	L20NP/18.11.11.00.30	L20NP/18.11.11.00.42	L20NP/23.12.11.00.54
L20NP/10.02.11.00.07	L20NP/28.03.11.00.19	L20NP/18.11.11.00.31	L20NP/18.11.11.00.43	L20NP/23.12.11.00.55
L20NP/10.02.11.00.08	L20NP/28.03.11.00.20	L20NP/18.11.11.00.32	L20NP/25.11.11.00.44	L20NP/23.12.11.00.56
L20NP/10.02.11.00.09	L20NP/28.03.11.00.21	L20NP/18.11.11.00.33	L20NP/25.11.11.00.45	L20NP/23.12.11.00.57
L20NP/10.02.11.00.10	L20NP/28.03.11.00.22	L20NP/18.11.11.00.34	L20NP/25.11.11.00.46	L20NP/23.12.11.00.58
L20NP/10.02.11.00.11	L20NP/28.03.11.00.23	L20NP/18.11.11.00.35	L20NP/23.12.11.00.47	
L20NP/10.02.11.00.12	L20NP/28.03.11.00.24	L20NP/18.11.11.00.36	L20NP/23.12.11.00.48	
L20NP/10.02.11.00.13	L20NP/28.03.11.00.25	L20NP/18.11.11.00.37	L20NP/23.12.11.00.49	
L20NP/10.02.11.00.14	L20NP/28.03.11.00.26	L20NP/18.11.11.00.38	L20NP/23.12.11.00.50	

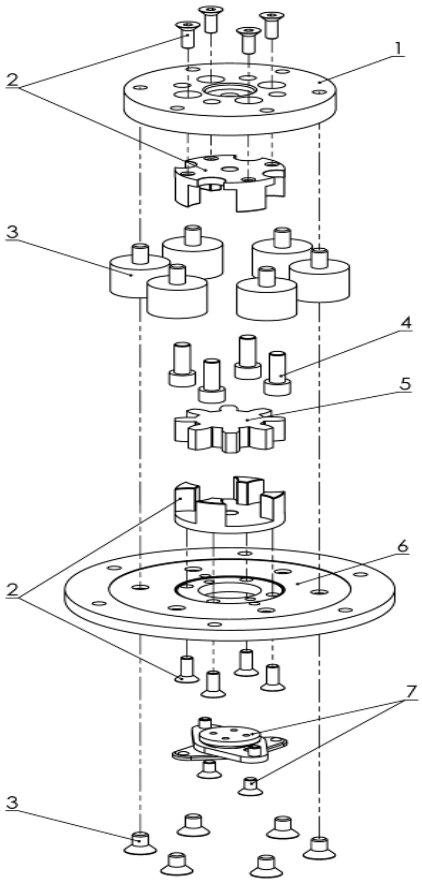


Figure 12.13.2

	Item Number	Description	Qty.
1	A15.00.04	Flange	1
2	A0021	Coupling Assembly	1
3	A0020	Buffer Assembly	3-6
4	M8x20DIN912	Screw	4
5	A15.00.07-01	Spider	1
6	A15.00.01	Disc	1
7	A15.10.00	Key Lock Set	1

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

SAM TOOL HOLDER (FIG. 12.13.3) FOR MACHINES WITH NUMBERS

The SA tool holder, item number A15M.00.00 (Fig. 12.13.3) is mounted on each of the three grinding heads. Its advantage is that it has elastic buffers that enable the tool plate to float and follow the surface profile. It is possible to leave away, three of the six buffers to have more flexibility. The buffers and the spider are consumables, the less buffers mounted the shorter the life of the spider and buffers.
A tool can be attached with use of the tool holder key.

	Item Number	Description	Qty.
1	A15M.00.04	Flange	1
2	A0021	Coupling Assembly	1
3	A0020	Buffer Assembly	3-6
4	M8x20DIN912	Screw	4
5	A15.00.07-01	Spider	1
6	A15M.00.01	Disc	1
7	A15.10.00	Key Lock Set	1
8	A15M.00.12	Security Disc	1
9	A15M.00.11S	Security Bolt	3

L20NP/27.01.12.00.01
L20NP/27.01.12.00.02
L20NP/27.01.12.00.03
L20NP/27.01.12.00.04
L20NP/27.01.12.00.05
L20NP/27.01.12.00.06
L20NP/27.01.12.00.07
L20NP/27.01.12.00.08
L20NP/27.01.12.00.09
L20NP/27.01.12.00.10
L20NP/27.01.12.00.11
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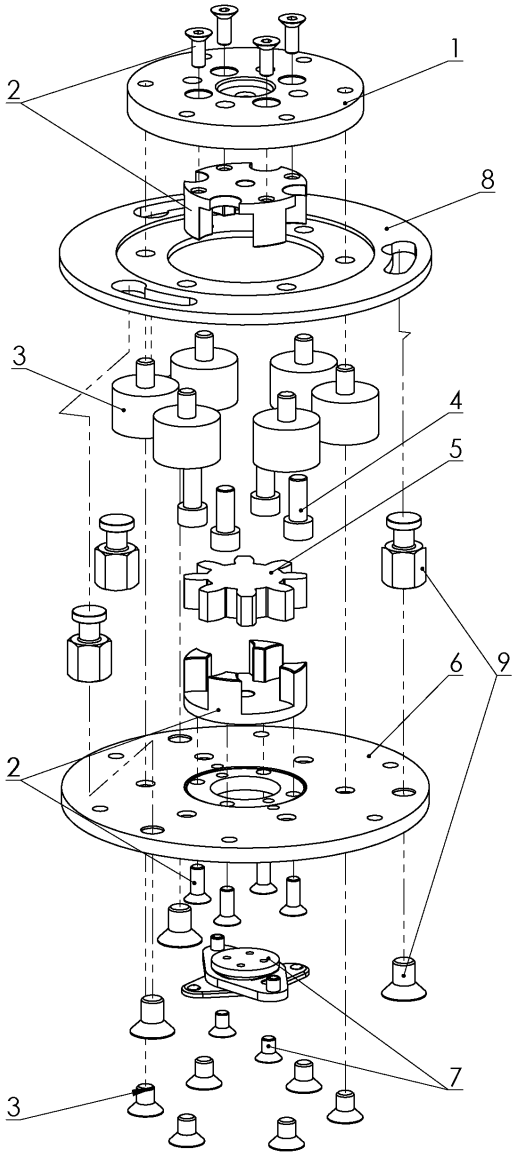
L20NP/27.01.12.00.14
L20NP/27.01.12.00.15



To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.

LAVINA 20®NHV PRO ASSEMBLY AND SPECIFICATIONS OF THE CONTROL BOX (FIG.12.14)

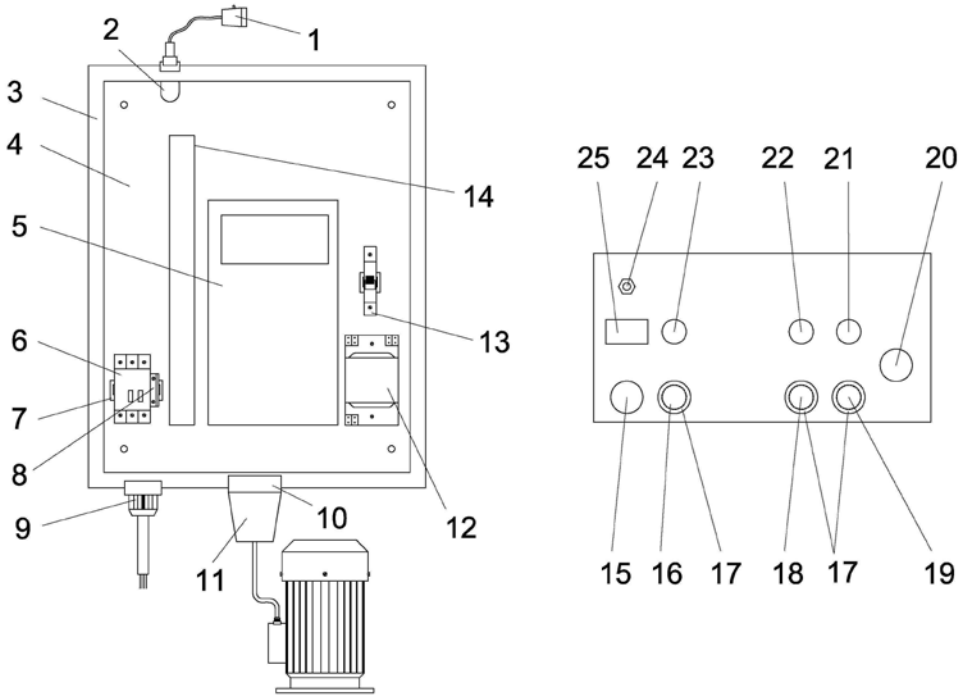


Figure 12.14

380-480 Volt

№		Item Number	Description	Qty.
1	L25SPS-01.00.00.00	L25SPS-01.00.00.00	Lamp Unit Incl. Cable and Plug	1
2	0.625x1/2"	0.625x1/2	Cap	1
3	L25SPS-10.00.00.02	L25SPS-10.00.00.02	Metal Box	1
4	L25SPS-10.00.00.01-01	L25SPS-10.00.00.01-01	Metal Box Plate	1
5	CIMR VU4A0018FAA	CIMRVU4A0018FAA	Inverter Yaskawa (V1000)	1
6	NMMC32 13..18A	NMMC32-13-18	Circuit Breaker	1
7	ER557850	ER557850	Rail	2
8	WK4/U/AP2,5-4	WK4/U/AP2.5-4	Terminal	1
9	M25X1,5/HO7BQ – F5x2,5	M25X1.5/HO7BQ-F5x2.5	Fitting with Cable	1
10	PKF16G444	PKF16G444	Socket	1
11	PKE16M444/HO7BQ-F4x2,5	PKE16M444/HO7BQ-F4x2.5	Plug with Cable	1
12	460/12/24V/50/46/4VA	460/12/24V/50/46/4VA	Transformer	1
13	NB1 - 63/1P/4A	NB1-63/1P/4A	Circuit Breaker	1
14	FS23639-15-07	FS23639-15-07	Filter	1
15	SZ1RV1202	SZ1RV1202	Potentiometer	3
16	NP2 - BA21	NP2-BA21	Button	1
17	ZBPO	ZBPO	Cap	1
18	NP2 - BA42	NP2-BA42	Button	1
19	NP2 - BA31	NP2-BA31	Button	1
20	XB7 - ES542.P	XB7-ES542.P	Emergency Stop	1
21	ND16 - 22CS/2 GREEN	ND16-22CS/2GREEN	Signal Lamp Led Green	1
22	XB4 - BD21.1N.O	XB4-BD21.1N.O	Switch Button Forward/Reverse	1
23	ND16 - 22CS/2 BLUE	ND16-22CS/2BLUE	Signal Lamp Led Blue	1
24	D 6,3	D6.3	Female Jack	
25	H7ER - NV1	H7ER-NV1	Revolution Counter	

To order any parts, customer has to provide the machine model and serial number. Without this information, customer is responsible for ordering the correct part, and no shipping charges will be refunded if the part ordered is wrong.