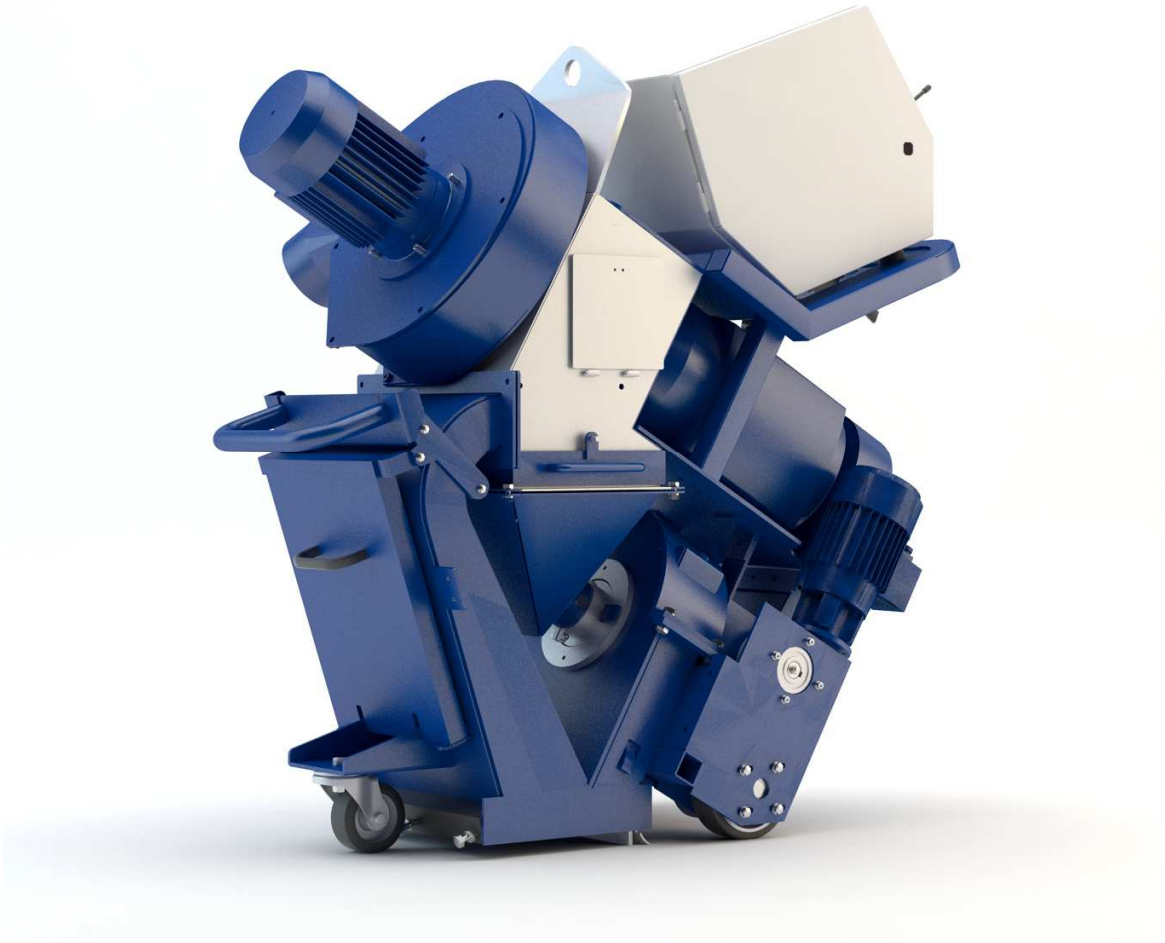
BLASTRAC



Original instructions

OPERATING INSTRUCTIONS 350E Global

VERSION 2.2

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BLASTRAC

EC DECLARATION OF CONFORMITY

in accordance with Appendix II sub A of Directive 2006/42/EC

We,

BLASTRAC B.V.
Utrechthaven 12
NL - 3433 PN NIEUWEGEIN
The Netherlands

Declare under our sole responsibility that the blast cleaning machine as described below,

Model: ***Blastrac 350E Global*** ***Serial number: XXXXXXXX***

satisfies the conditions set out in the:

Machinery Directive	(2006/42/EC);
Low Voltage directive	(2006/95/EC);
EMC directive	(2004/108/EC);

Where appropriate, are in conformity with the following harmonized standards:

NEN-EN-ISO	12100:2010
NEN-EN-IEC	60204-1:2006/C11:2010

In case of changes to the machine without our written authorization this declaration loses its validity.

Nieuwegein 17-11-2015

Michiel Kalisvaart
Operational Manager

CE

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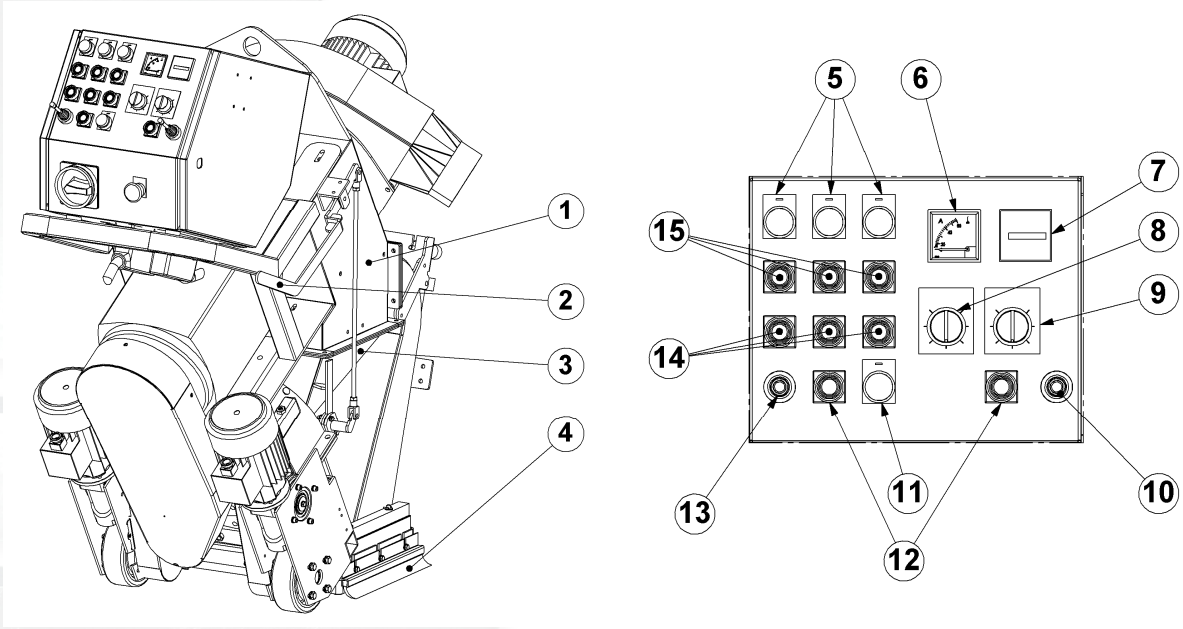
1. Introduction

Before use, operators must be provided with information, instruction and training for the use of the machine and the substances for which it is to be used, including the safe method of removal and disposal of the material collected. All persons who are working with or maintaining this machine must read the manual carefully and understand it fully. In case you sell the unit, hand it on to the next owner.
Keep this manual always with the machine, to enable it to be referred to at any time.
Any other work not covered by this operating manual must not be carried out.

This machine is designed for industrial use by professionals. Only authorized and trained personnel may operate this machine. This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge. **Blastrac BV** offers a course on the use of the machine in order to make the operating and maintenance personnel familiar with all elements of the machine.

2. Machine description

The **Blastrac** blast cleaning machine 350E Global is a downward blasting machine with a closed abrasive circuit exclusively designed for the pre-treatment of dry, frost free horizontal surfaces. The bouncing impact of metallic abrasive onto the surface to be treated thoroughly removes surface contaminants, coats of paint, sealants and thin coatings. The intended use of this machine is blast cleaning of steel surfaces. The machine may not be used for other purposes. The manufacturer will not be liable for damage resulting from incorrect usage, in these cases the user assumes all risks.
A suitable filter unit must be connected to the machine in order to separate the dust from the abrasive. A specially designed dust collection system ensures dust-free operation of the machine and clean air at the workspace.



1	Separator	6	Ammeter	11	Control light Voltage
2	Shot valve handle	7	Hour counter	12	Drive motor L or R Stop
3	Hopper	8	Speed control	13	Joystick drive motor left
4	Brush sealing	9	Tracking	14	Push buttons OFF: Drive/fan motor/blast motor
5	Control lights	10	Joystick drive motor right	15	Push buttons ON: Drive/fan motor/blast motor

3. Safety

Warning!
Read all safety warnings and all instructions. Failure to follow the warnings and instructions may result in electric shock, fire, explosions and / or serious injuries.

Only authorized and trained personnel may operate this machine. This machine is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge.

In case of any inappropriate usage, improper operation or repair, the producer shall be exempt from liability.

3.1 Work area safety

a) Do not use the machine in rain, damp or wet locations.
b) Avoid dangerous environments: do not work in the presence of explosive atmospheres, in the presence of flammable liquids, gases or dust. Remove materials or debris that may be ignited by sparks.
c) In some cases sparks could be created by the blast cleaning process.
d) The surface to be treated must be clean, make sure to remove all stones, screws etc..
Any stones, screws, bolts, pieces of wire etc. could cause serious damage to the machine if it gets inside the machine!
e) Make sure there is enough ambient light on the work area. Cluttered or dark areas invite accidents.
f) Keep children and bystanders away while operating the machine. They are likely not to foresee the potential dangers of the machine. Distractions could cause you to lose control of the machine.
g) Persons who are not operating the machine must not be permitted to stay in the surrounding area of at least 5 meter from the machine.
h) Never use the machine when the surface is not clear and if there is a risk of stumbling or tripping.
i) Remove electrical cables and dust hose(s) from the surface to be treated.
j) Make sure that there are no cables or hoses in the driving direction of the machine.
k) Make sure that there is nothing standing or situated on the surface to be treated.
l) Make sure the machine can travel over all inequalities on the surface, small inequalities like weld seams or (floor) joints are no barriers for the machine.
m) Never operate the machine when workplace is wet. Never stay in the rain with the machine.
n) Check if there are any obstacles that can snag the cables when the machine is moving.
o) Remove all objects from the surface that can damage the machine. Remove reinforcing steel or other objects protruding from the surface in order to prevent damage to the machine.
p) Warning! Make sure that the surface to be treated does not contain dangerous materials such as:
- combustible or explosive dusts or substances.
- carcinogenic or pathogenic substances.
q) It is necessary to provide for an adequate air change rate L in the room if the exhaust air from the dust collector is returned to the room. Comply with the National regulations.
r) Secure the work area around the machine in public areas providing an adequate safety distance from the machine. Use a red and white safety chain and danger sign to enclose the work area.

3.2 Electrical safety

a) Use only extension cables for extending the main cable that are sized and marked in accordance with the overall power consumption of the machine. Do not use damaged extension cables.
b) Electrical cables must be rolled entirely off of the reels.
c) Any damage to the electric cables and/or electrical components is not permitted.
d) If the power supply cable or plug is damaged, it must be replaced immediately.
Only use original Blastrac parts.
e) The voltage on the identification plate must comply with the power supply.
f) Use an electrical power supply connection with earth connection and earth leakage circuit breaker.

g) The circuit breaker of the power supply must have a ‘’D’’ characteristic. Circuit breakers with a “C” or “B” characteristic can give problems when switching the machine on.
h) **Keep the machine original; The machine is always equipped with an earthed connection, do not change this** and always use earthed cables with an earthed plug.
i) Inspect and test the electrical components regularly. The electrical components have to satisfy with the requirements set out in the harmonised norm EN60204-1.
j) Always call a skilled electrician or your distributor when you have questions about the safety of the electrical components.
k) Work on electrical equipment or operating materials may only be undertaken by a skilled electrician or by trained persons under the guidance and supervision of a skilled electrician as well as in accordance with the electrical engineering regulations.
l) Always use tools that are insulated against voltages.
m) Do not abuse the cables. Never use the cables for carrying, pulling or unplugging the machine. Keep cables away from heat, oil, sharp edges or moving parts. Damaged or entangled cables increase the risk of electric shock. Do not fold the cable or clamp it.
n) Don’t pull out the power supply cable out by the wire, but by the connector.
o) Be careful with water on the treated surface. Electrical cables must not come into contact with water.
p) The main power switch on the machine must be in the “Off” position before connecting to the power supply.
q) During a long standstill of the machine, pull out the main plug.
r) If the machine is to be operated using power from a generator, the generator must be operated in accordance with the current legal regulations and directives in force. (this applies to the protective earth conductor in particular) in order to ensure that all safety devices are functioning and to eliminate possible damage to electrical components.

3.3 Personal safety

a) Always wear Personal Protective Equipment while working with the machine.
-Dust mask class FFP2 or higher
-Ear protection
-Safety glasses with lateral protection
-Protecting gloves
-Safety shoes
b) Dress properly. Do not wear loose clothing or jewellery. Keep your hair, clothing and gloves away from moving parts.
c) Personnel must tie back long hair and not wear loose clothing or jewellery including rings.
d) Stay alert, watch what you are doing and use common sense when operating the machine.
e) Always seek professional medical attention immediately in case of injury.
f) All persons surrounding the machine should wear Personal Protective Equipment.

3.4 Machine safety general

a) Safety functions and operating functions must work correct.
b) No loose bolts and nuts permitted.
c) Never operate machine without the guards and/or safety devices in place.
d) Never change anything on the safety devices on the machine!
e) Do not use the machine when it is damaged.
f) Do not **open** or **remove protective guards** while driving gears are running.
g) The temperature of the machine can be above 37° C.
h) The machine, specially the handle grips and control devices must be dry and free of fats/oils.
i) If the length of the brushes is, due to wear, less than 5mm or they are extremely deformed, the brushes have to be replaced. Check the Service Manual for the order numbers.
j) All repair work has to be done by qualified Blastrac personnel, this guarantees a safe and reliable machine.
k) Always use original Blastrac spare parts and abrasives. This will ensure the best performance.
Only original parts meet the factory specifications and quality. Otherwise Blastrac BV cannot guarantee the safety of the machine.
The part numbers can be found in the Service Manual.
l) Check the rotating direction of the motor before operation. The correct direction is given with an arrow on the housing of the motor.

m) If safety-critical changes occur to the machine or its working method, the machine must be shut down immediately! The cause of the fault must be established, and rectified.
n) In the event of operational malfunctions the machine must be shut down immediately and secured!
o) **Never use the machine without a suitable (Blastrac) dust collector!**

3.5 Shot/steelblasting safety

a) Never lift the blast head during blasting! This could cause serious injury to yourself and others around you!
b) Abrasive can escape from the sides of the blast head at high speed. Wear safety glasses with lateral protection and close-fitting protective clothing.
c) Check the following parts daily for damage and wear to avoid unnecessary long and costly standstill on the workplace; blastwheel, feedspout, liners, rubber- and brush sealing;
Replace the parts when you can see obvious signs of wear and tear.
Wear grooves are acceptable until 75% of blade thickness has been worn away.
d) Check the parts of the separator on wear and defects. Remove foreign bodies and dust deposits to prevent clogging of the separator.
e) The door of the separator and separator tray must be closed to keep the vacuum in the machine.
f) The machine will heat up during blasting, don't risk getting burned, always wear gloves and only touch the handle grip(s) and control devices.
g) Check the level of abrasive in the storage hopper before work starts. Refill if necessary.
h) Remove the abrasive from the abrasive storage hopper before storage.
i) **In some cases sparks could be created by shot / steelblasting.**

3.6 Dustcollector safety

a) Always use a Blastrac dust collector to ensure a dust-free operation of the machine and clean air at the workspace. Also the airflow helps to cool the machine and prevents overheating.
b) Read the operating instructions of the dust collector before using it.
c) The dust container/bag of the dust collector must be emptied regularly. Comply with the local waste treatment regulations considering the removed material.
d) The dust hose must be connected properly with a hose clamp and industrial tape.
e) The dust hose must be undamaged and free of obstructions.
f) Always switch on the dust collector first!

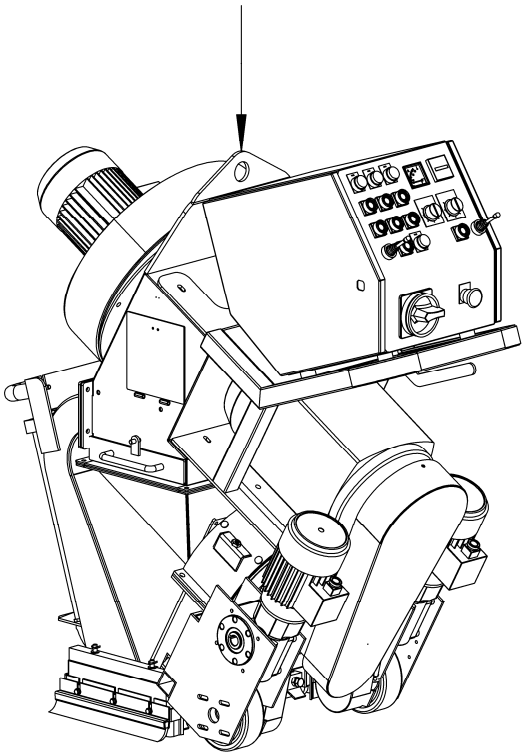
3.7 Maintenance safety

a) Pull out the main plug and place it in sight, before starting inspections and repairing on the machine. The main switch can be locked in the "OFF" position by using a padlock and placing it through the main switch.
b) Wait for standstill of all drives before any inspections, adjustments and/or maintenance work is started.
c) Block machine in stable position before doing any maintenance work.
d) Failures due to inadequate or incorrect maintenance may generate very **high repair costs** and long standstill periods of the machine. **Regular** maintenance therefore is imperative.
e) Operational safety and service life of the machine depends, among other things, on proper maintenance.
f) Prevent premature wear by keeping the machine as dust free as possible. Clean the machine for this reason regularly with a dust collector and non-aggressive materials. Never use a high pressure water cleaner to clean the machine.
g) Do not use any aggressive cleaning materials! Use lint-free cleaning cloths!
h) It is advisable to stock all spare parts or wear parts that cannot be supplied quickly. As a rule, production standstill periods are more expensive than the cost for the corresponding spare part.
i) The suitable precautions include decontamination before disassembling the machine, adequate filtered ventilation of the exhaust air from the room in which it is disassembled, cleaning of the maintenance area and suitable personal protection equipment.

3.8 Transport safety

a) Be aware of your surroundings and machine operating level. Do not side hill, do not run on steep incline, this could cause machine to tip over.

b) The weight of 350E Global is 430 kg. Use a crane or lift when transporting the machine, use the lifting eye of the machine.
c) Before every use check the lifting eyes/lugs and welds for: deformation, damages, cracks, corrosion and wear.
d) When lifting the machine from the ground, always use the lowest lifting speed. The cables must first be tensioned at this speed; they must not be slack when the machine is lifted from the ground.
e) During hoisting make sure to be at a safe distance from the machine with the most optimal view on the machine and working environment.
f) Never stand directly below the machine.
g) When transporting the machine do so in such a manner that damage due to the effects of the use of force or incorrect loading and unloading is avoided.
h) The lifting eye can also be used to fasten the machine on a pallet or during transport.
i) Always drive backwards when driving up to a ramp or grade, and forwards when driving of the ramp.
j) Chock wheels for transport and keep control handle in neutral position.
k) Don't leave the machine unsecured on jobsites.
l) Park the machine always on a flat horizontal and levelled surface.
m) Remove the abrasive from the machine before transport.
n) Make sure the electrical cable and dust hose are disconnected before transport.
o) Store the cleaned and dry machine in a humid free room. Protect the electrical motor from moisture, heat dust and shocks.
p) Never use the machine for lifting persons or items.
q) Only lift the machine as shown in the picture below.

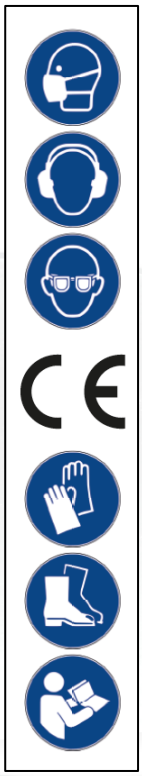


3.9 Signs on the machine

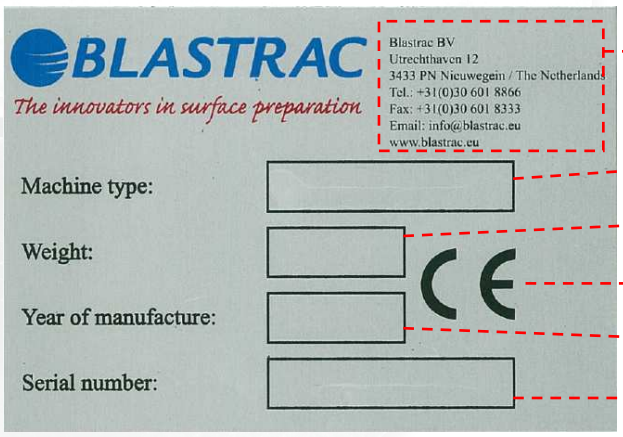
The following stickers are placed on the machine. Meanings of these symbols are:

- ! Danger Hazardous voltage in motor even when solid state controller is OFF. Disconnect main power before servicing motor, controller or associated wiring.

- Warning! Hot surface



- Wear a dust mask class FFP2 or higher
- Ear protection is obliged
- Safety glasses with lateral protection are obliged
- CE-mark on this machine
- Wear protecting gloves
- Safety shoes obliged
- Consult the manual before operating the machine



Name, address, telephone & fax number, Email address and website.

The machine type.

The net weight of the machine in kilogram.

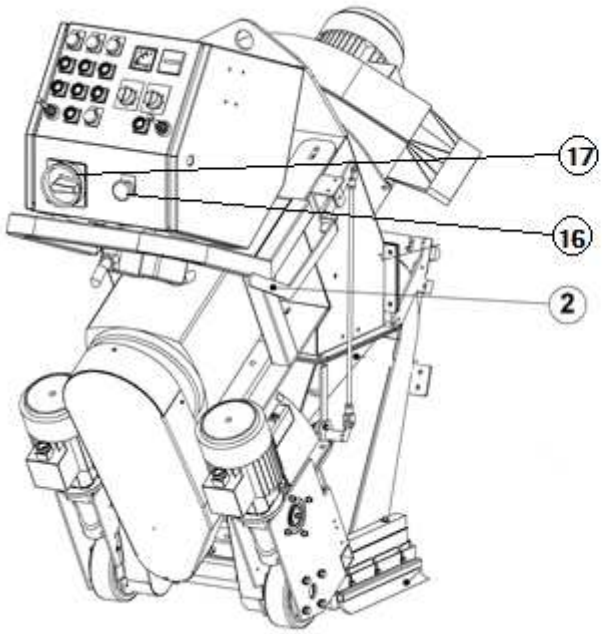
CE mark.

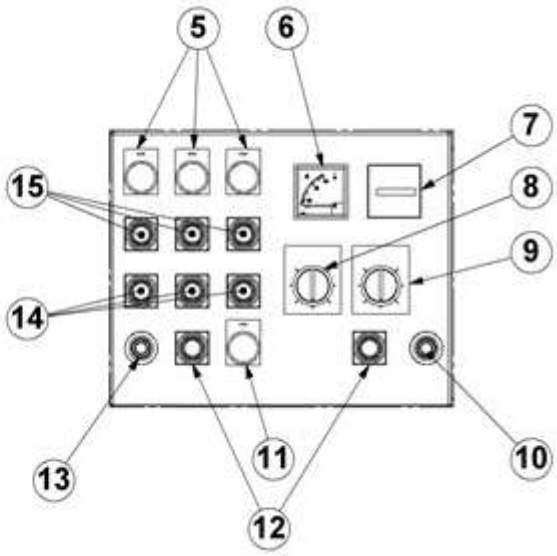
The year of manufacture.

The serial number of the machine.

4. Getting to know the 350E Global

The control box is equipped with all control elements and instruments for monitoring and controlling the machine.





2	Abrasive valve handle	9	Tracking	14	Push buttons OFF: Drive / Fan / Blast motor
5	Control lights	10	Joystick drive motor right	15	Push buttons ON: Drive / Fan / Blast motor
6	Ammeter	11	Control light Voltage	16	Emergency shutdown button
7	Hour counter	12	Drive motor L or R Stop	17	Main power switch
8	Speed control	13	Joystick drive motor left		

4.1 Control box

3. Abrasive valve handle

This lever is located at the right side of the control box and can be adjusted so that any quantity of abrasive can be fed to the blastwheel. Optimum blast cleaning power is reached when the ammeter indicates the operating current. It is not permitted to blast with a higher current value.
Pull the handle upwards to open the shot valve, and push the handle downwards to close the shot valve.

5. Control lights for: Drive / Fan motor / Blast motor.

When lit it indicates that the selected item has been turned on.

6. Ammeter

This meter indicates the power consumption of the blastmotor in ampere. The ammeter shows the blast cleaning load onto the surface.

7. Hour counter

Shows the number of working hours. Useful for maintaining a proper maintenance schedule.

8. Speed control

Dial for setting the drive speed of both drive motors. Rotating the speed control dial in counter-clockwise direction reduces the directional speed of the machine to a full stop.

9. Tracking

This dial can be used to steer the machine slowly by tuning down the left or right drive motor.

10. + 13. Joystick drive motor right & left

Each joysticks has 3 settings to control the corresponding drive motor : Forwards – Neutral – Reverse.
Left and right controls are independent from each other, giving instant forward, reverse and precise steering control as follows:

Both controls in forward position	:	Machine drives forwards
Both controls in reverse position	:	Machine drives backwards
One control forward, one control reverse	:	Machine turns around its center point

11. Control voltage lamp

When lit it indicates that the machine has power supply.

12. Drive motor L or R Stop

These buttons can be used to steer the machine by shortly actuating them. Pressing one of the buttons will make the corresponding drive-motor stop (as long as the button is pressed). Releasing the button will make the corresponding drive-motor drive again.

14. Push buttons OFF: Drive / Fan / Blast motor

Pressing the red STOP-buttons switches the corresponding parts of the machine OFF.

15. Push buttons ON: Drive / Fan / Blast motor

Pressing the green START-buttons turns the corresponding parts of the machine ON.

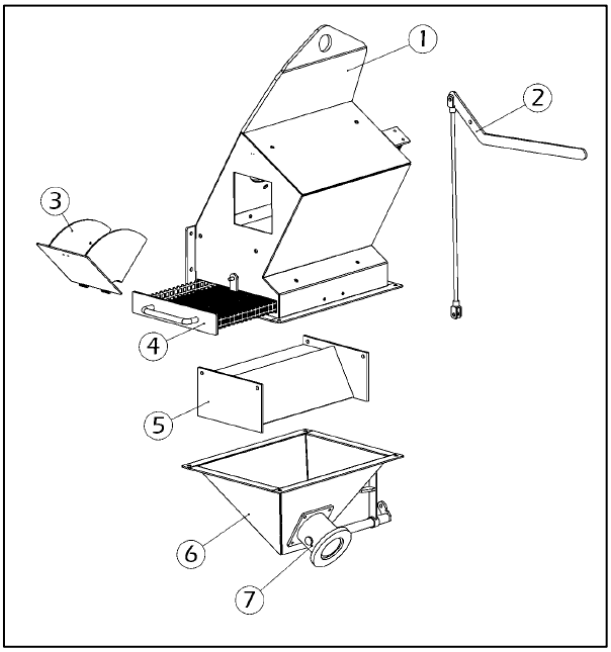
16. Emergency shutdown button

Red mushroom-shaped emergency shutdown push button, this button cuts off all power to the machine. Turn to unlock. After use of the emergency button, all functions have to be re-started manually.

17. Main power switch

The main power switch is located on the control box. It has to be switched OFF when connecting the machine to the power supply. It has to be switched ON before operating the machine. The main power switch can be locked in the "OFF" position by using a padlock and placing it through the main switch.

1	Separator
2	Abrasive valve handle
3	Separator door
4	Separator tray (wire mesh)
5	Baffle plates
6	Hopper
7	Shot valve



4.2 Separator

The abrasive separator is mounted to the end of the rebound plenum. It separates the abrasive from contaminants and feeds the cleaned abrasive back to the abrasive storage hopper. A wire mesh is fitted to prevent any large contaminants from getting into the blast wheel. In order to clean the wire mesh, the drawer can be removed from the side. The separator door can be opened to remove the large contaminants. Check and empty the wire mesh before and after each operation.
During operation U should check the wire mesh every 3 hours for foreign matter and large contaminants.

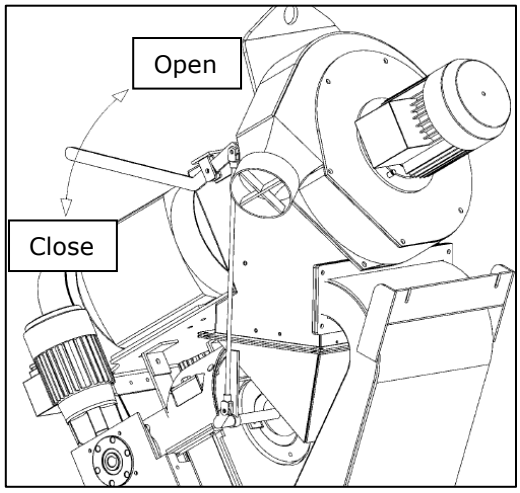
4.3 Hopper

The abrasive storage hopper contains the abrasive before it is led to the feed spout and abrasive valve. Fill the separator equally with the selected abrasive up to the bottom of the separator tray. The abrasive valve must be closed whilst doing this. Check regularly and refill if necessary.

4.4 Control handle of the abrasive valve

Between the abrasive storage hopper and the blast housing there is a valve in order to control the abrasive flow towards the blast wheel. Any change in the opening of the valve causes the amount of abrasive fed to the blast wheel to change. The change in the abrasive fed can be read from the ammeter.
The valve is hand-operated by the **abrasive valve handle**.

This lever is located on the right side of the control box and can be adjusted so that any quantity of abrasive can be fed to the blastwheel. Optimum blast cleaning power is reached when the ammeter indicates the operating current. It is not permitted to blast with a higher current value. Pull the handle upwards to open the shot valve, and push the handle downwards to close the shot valve.

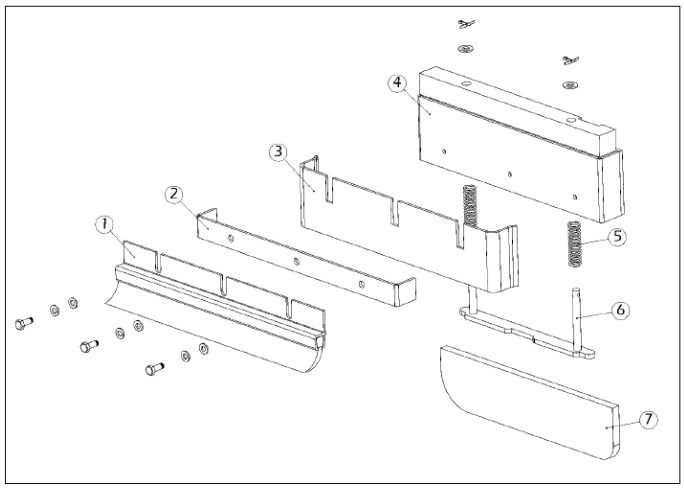


4.5 Abrasive sealing

The front seal system consists of three polyurethane seals to ensure that a good fit is maintained between the side seals and the work surface at the bottom.
The rear seal system comprises of one back brush, which is located inside the rear seal box.

Side seal system:

1	Side brush
2	Side skirt fixing plate
3	Side skirt
4	Seal box
5	Side seal spring
6	Side seal spring plate
7	Side seal



Method of installing side seals (7) :

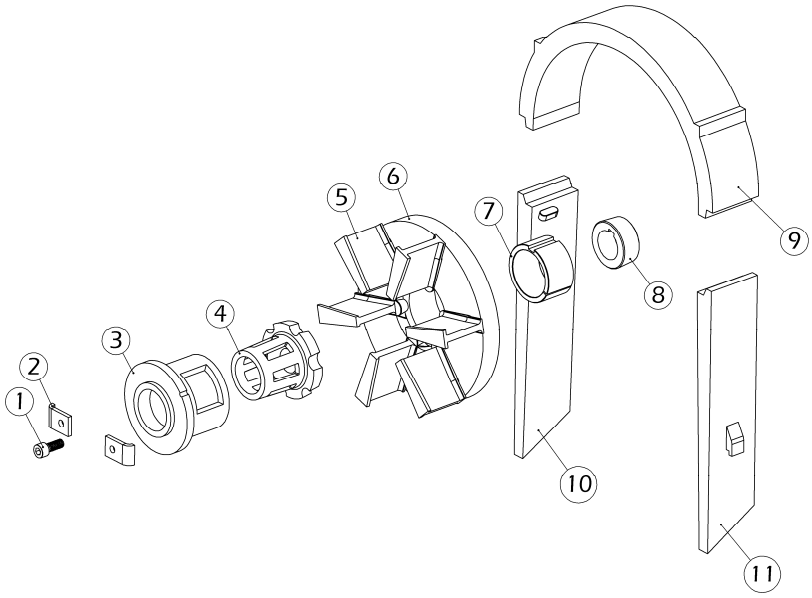
It is necessary to lift one side of the machine at a time to enable the seals to be put in place at the bottom.
This is achieved as follows:

1. Check that power to the machine is on and ask a co-worker for assistance.
2. With the directional controls in central position (neutral) press the drive start button.
3. Place a drive ramp behind one of the drive wheels, position both switches in reverse, slowly turn the speed control clockwise and the machine will drive backwards on the drive ramp. When the side of the machine is approx. 75 mm from ground level, turn the speed switch counter-clockwise to stop.
4. From the rear, slide the side seal into the seal box.
5. Position both switches in forward position, slowly turn the speed control clockwise. The machine will move forward and down the ramp. At the same time the side seal will fully locate into seal box. Check that both axles of the side seal spring plate have come out at the top of the seal box, to be sure that the side seal is positioned correctly.
6. Repeat this sequence of operations to install a new seal at the opposite side.

4.6 Blast wheel

The heart of the blast cleaning machine is the blastwheel, it throws the abrasive onto the surface to be treated using centrifugal force. The blastwheel is placed in a protective housing lined with replaceable wear parts. The blast wheel is driven by an electric motor.

1	Impeller bolt
2	Cage clamps
3	Control cage
4	Impeller
5	Blades (set of 6)
6	Blastwheel
7	Taperlock adapter blastwheel
8	Blastwheel shaft taperlock bush
9	Top liner
10	Liner Right Hand side
11	Liner Left Hand side



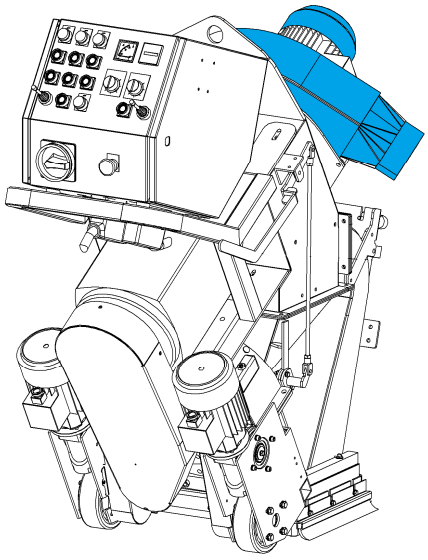
The impeller (4) is placed in the center of the blast wheel (5+6). The impeller feeds dosed quantities of abrasive onto the blades (5) of the turning blast wheel.
The control cage (2) is placed over the impeller. The control cage has a lateral window (indicated with 1 notch) which regulates the throwing angle of the abrasive.

4.7 Air suction system

The air streaming through the complete system created by exhaust fans (1 on the machine and 1 on the dust collector) will separate the dust from the abrasive and transport the dust to the dust collector.
The airflow will also help to cool the abrasive and machine.

Make sure the dust hose is connected properly between the fan and dust collector. Use hose clamps and industrial tape.

Use a dust hose 130 mm in diameter.
The length of the dust hose depends on the power of the dust collector used. Contact our experts at Blastrac for advice and recommendations.



5. Before operation

Before using the machine it is essential to inspect the machine.
It is not permitted to use the machine if the machine safety is not according the checkpoints below.

5.1 Checkpoints power supply

- Use only extension cables for extending the main cable that are sized and marked in accordance with the overall power consumption of the machine.
- Electrical cables must be fully unwind of their reels.
- No damage is permitted for electrical cables.
- Use an electrical power supply connection with earth connecting.
- The main switch of the machine should be put to 'Off' before connecting to the power supply.
- Make sure the power supply is in accordance with the machine specifications.
- The circuit breaker of the power supply must have a ''D'' characteristic. Circuit breakers with a "C" or "B" characteristic can give problems when switching the machine on.
- If the machine is to be operated using power from a generator, the generator must be operated in accordance with the current legal regulations and directives in force. (this applies to the protective earth conductor in particular) in order to ensure that all safety devices are functioning and to eliminate possible damage to electrical components.

5.2 Checkpoints of machine

- Safety functions and operating functions must work correct.
- Check all screws and other fasteners for tightness. No loose bolts and/or nuts are permitted.
- Check the electrical components, cables and connections for wear and/or damages.
- Dust hose connection must be reliable: use hose clamps and industrial tape.
- Dust hoses must be undamaged and free of obstructions
- Make sure that the dust bin / bigbag of the dust collector is empty and connected properly.
- Make sure the machine is parked on a flat and horizontal surface before operation.
- Check the following parts for damage and wear: blastwheel, feedspout, liners, rubber- and brush sealing. Replace the parts when you can see obvious signs of wear and tear.
  Wear grooves are acceptable until 75% of blade thickness has been worn away.
- Check de parts of the separator on wear and defects. Remove foreign bodies and dust deposits.

5.3 Checkpoints surface to be treated

- Make sure that the surface to be treated does not contain dangerous materials.
- Check he surface to be treated for loose parts. The surface must be clean, make sure to remove all stones, screws etc. Remove all fluids from the surface such as water, oil, etc.
  Any stones, screws, bolts, pieces of wire etc. could cause serious damage to the machine if it gets inside the machine!
- Make sure the machine can travel over all inequalities on the surface, small inequalities like weld seams or (floor) joints are no barriers for the machine.

5.4 Before switch on

- Check the distance from brush sealing to the floor. This may be max. 1 mm.
- Fill the separator equally with the selected abrasive up to the bottom of the separator tray. Magnetic valve must be closed whilst doing this.
- Connect the blast machine and filter unit with the dust hose. This connection must be reliable.

- Connect the power supply cable of the filter unit with the generator. Be sure that electrical power supply is correct.
- Turn the main power switch to "ON", the control light voltage lights up.

5.5 Checking the turning direction of the motor(s)

- Start the machine for a few seconds by pressing the green 'Blastmotor ON' button.
- Stop the machine by pressing the red 'Blastmotor OFF' button.
- Check the rotating direction of the Blastmotor (indicated with an arrow).

Correcting the turning direction of the motor(s)

- Switch off all motors and put the main power switch to the OFF-position
- Wait for a complete standstill of all drives.
- Change the phases and check the turning direction of the motor again.

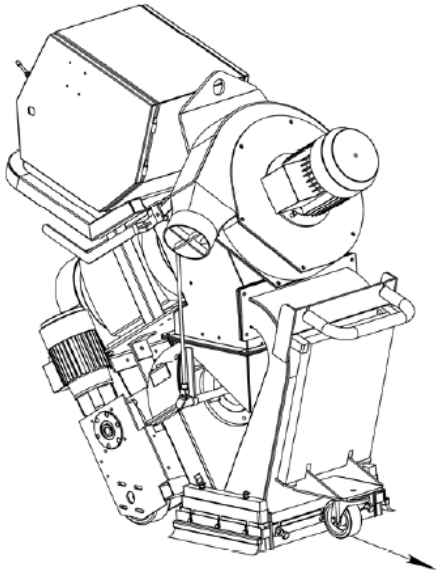
5.6 Switch on the machine

1) Before switching on the blast machine, switch the dust collector on. The dustcollector is needed to vacuum off all the created dust and helps to cool the blast machine.

2) Check that the abrasive valve is closed (abrasive valve handle downwards)

3) Press the green push buttons "FAN ON" and "BLASTMOTOR ON", observe the ammeter to check the power consumption of the blast motor. The motor requires a lot of power (starting current) when it is started until it reaches its maximum speed. Once the blast motor has reached its rated speed the current drops to approximately 8 A (no-load consumption). If the ammeter indicates more than the normal current value after 20 seconds, interrupt the power supply and find the cause.

4) Set the speed control knob to "0". (item 8 of machine description)



Working direction

5) Set the 2 travel control switches (item 10 of machine description) to FORWARD, and turn the speed control knob until the machine starts travelling.

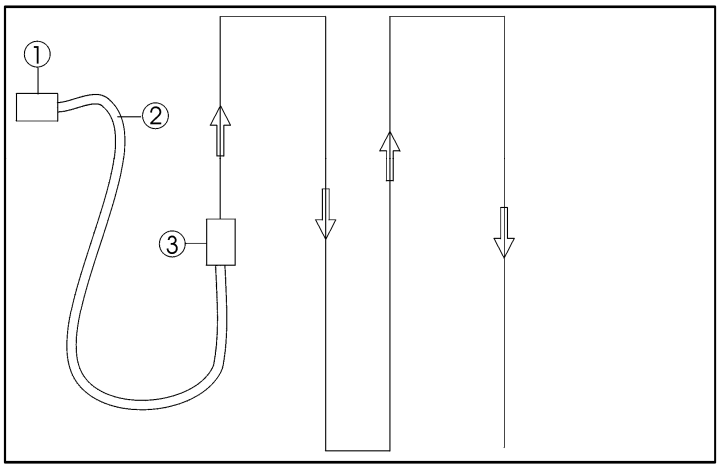
6) When the machine is traveling adjust the abrasive control handle to open the magnetic valve. Observe the ammeter. It may indicate the full load amperage. After having blasted aprox. 2 m, close the abrasive valve, stop the machine and check the blasted surface.

7) If the blast pattern is irregular it may be necessary to re-adjust the blast pattern or select another travelling speed for the machine.
If the 'hotspot' is too much on the right, turn the cage a little bit clockwise.

Never adjust the cage during blasting!

5.7 Operation

Carry out blast cleaning in parallel tracks in such way that the dust hose and electric cable do not become twisted.
The next figure shows the recommended blast paths leading away from the dust collector.



1	Dust collector
2	Dust hose and electric cable
3	Blast cleaning machine

Make sure that no vehicles, such as forklift trucks and other equipment run over the electric cable and the dust hose.

The selection of the correct advancing speed of the blast machine is important for a good blast cleaning result. In the case that the surface has different characteristics (e.g. different hardness or different coating thicknesses), a uniform blast result can be achieved by varying the advancing speed during blast cleaning.

The advancing speed depends on the material of the surface to be treated and the desired profiling.

The correct advancing speed can be found out by observing the blasted surface and varying the speed during the blast cleaning process.

Check the separator tray every 3 hours for foreign matter and large contaminants.

When the blast head is lifted from the floor, abrasive escapes from the sides of the blast head at high speed! If the machine is moved with the blast head raised, the abrasive magnetic valve must be closed!

Alter the direction only after the magnetic valve is closed!

5.8 Switching off the machine

- Close the abrasive valve
- Switch off the drive motors
- Switch off the blast motor
- Switch off the fan motor
- Switch the main power switch to position “OFF”
- Pull out the connector of the main power supply of the machine.
- Switch off the filter unit.
- Wait for standstill of all drives before any inspection or maintenance works are started.

5.9 The blast pattern

Abrasive leaving the blast wheel blades is not thrown in all directions. Scatter is restricted to an angle of about 80°. This is achieved through the use of a control cage which surrounds the impeller. The position of the window in the control cage determines the blast pattern.

Correct adjustment of the control cage and thus of the blast pattern is the most important factor for optimum working with the blast cleaning machine.

Incorrect adjustment of the control cage results in very high wear and premature blasting-through of the liners in the blast wheel housing, as well as reduced blasting performance and a possible loss of the rebounce energy of the abrasive.

The following 5 factors affect the blast pattern:

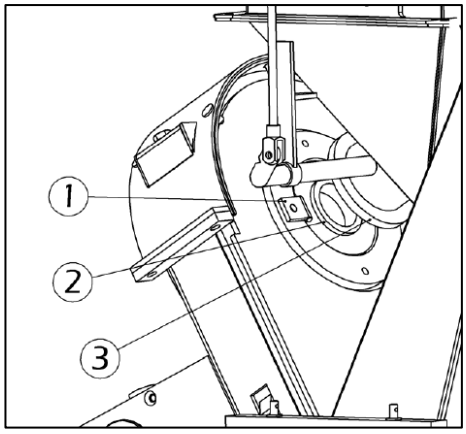
-The turning direction of the blast wheel must correspond to the instructions on the housing (arrow indicating the turning direction).

-With increased wear of the blast wheel, blades, impeller and control cage, the blast pattern will change.

-The size of the abrasive affects the blast pattern. With every exchange of abrasive, the blast pattern must be re-adjusted.

-The correct adjustment of the control cage is the most important factor to obtain an optimum blast pattern. Each control cage has a lateral window. The position of the window determines where the abrasive is fed onto the blast wheel blades and where it hits the surface to be treated.

-Different types and hardness of surfaces.



1	Cage clamp
2	Control cage
3	Shot valve housing And feed spout rubber

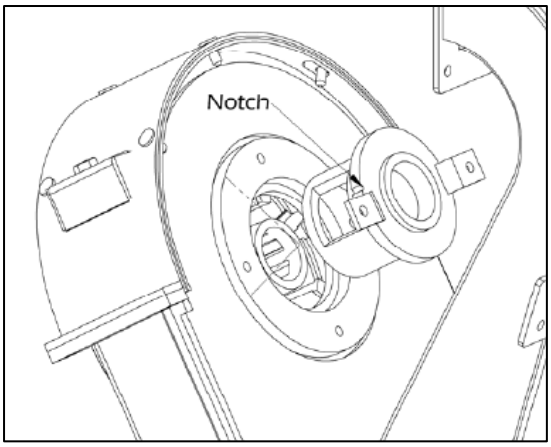
5.10 Adjusting the blast pattern

The adjustment is effected by loosening the cage clamps (1) and turning of the control cage (2).
The cast groove on the control cage(2) shows the position of the control cage opening.

a) Move the blast head of the blast machine onto a 5-8 mm thick steel plate and blast for 15 seconds at full amperage without moving the machine from the spot.

b) Move the machine from the blast zone and carefully inspect the steel plate.

c) You will find the hot spot on the blasted surface where the machine has developed the highest blast cleaning intensity. This spot is normally somewhat lighter than the rest of the blast cleaned area due to the large amount of heat that is generated.



d) If the 'hotspot' is too much on the right, turn the control cage a little bit clockwise: Loosen the cage clamps to adjust the position (3-6mm). Look at the notch which indicates the central position of the control cage window. Tighten the cage clamps after adjusting.
If the 'hotspot' is too much on the left, turn the control cage a little bit counter-clockwise.

e) Repeat the process until an even temperature across the blast pattern is achieved. An even temperature from left to right indicates that the control cage is correctly positioned.

f) Now the blasting procedure can be started. When a concrete surface is to be blasted, check the blast pattern again after some meters and re-adjust slightly if necessary.

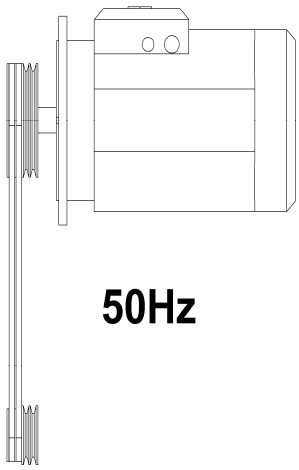
WARNING! Never loosen the cage clamps or try to adjust the control cage when the machine is in operation!!

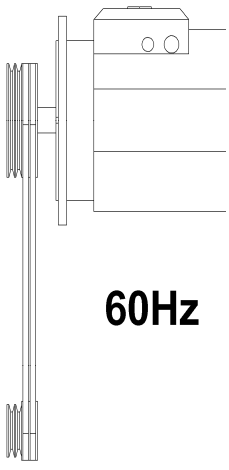
5.11 Changing the transmission ratio (for machines with a adjustable drive option)

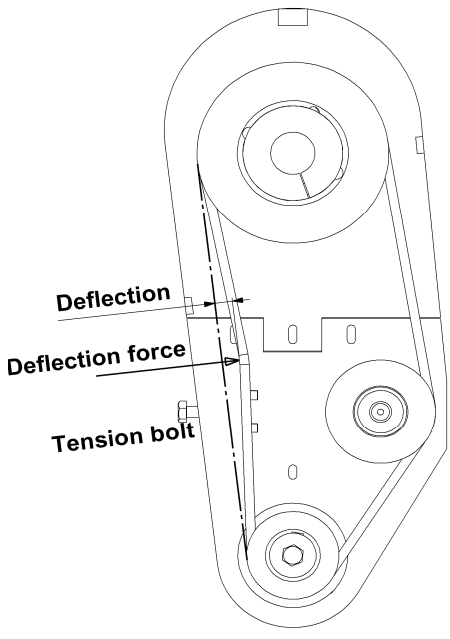
- Remove the pulley guard
- Loose the central bolt of the tension pulley at back side
- Loose the tension bolt located by the left drive motor. The belts will be untensioned now.
- For the 50Hz configuration place the 2 V-belts into the smallest two grooves of the bottom pulley. (see figure below)
- For the 60Hz configuration place the 2 V-belts into the biggest two grooves of the bottom pulley. (see figure below)
- Check the pulley alignment and correct if necessarily.
- Tension the V-belts by tighten the tension bolt and tighten the central bolt of the tension pulley. For a accurate result a tension gauge needed.

2 ways to tension the v-belts:

- *Measuring belt tension by deflection:* Put the tension gauge in the middle of the span length of the V-belt. The deflection must be 3.5mm by a deflection force of 11N for a new belt. For used belts the deflection must be 3.5mm by a deflection force of 9N.
- *Measuring belt tension by frequency:* Turn on the frequency-finding device. The laser light will turn on. Tap or pluck the free belt span to induce vibration in the belt. Hold the laser probe no more than 25mm off the free belt span, with the laser facing the outside of the belt. Check the frequency being displayed on the frequency-finding device. For new belts the frequency must be 103Hz. For used belts it must be 96Hz.







6. Maintenance

Pay attention to Chapter 3 **"Safety"** during maintenance and repair works.

Failures due to inadequate or incorrect maintenance may generate very **high repair costs** and long standstill periods of the machine. **Regular** maintenance therefore is imperative.

Operational safety and service life of the machine depends, among other things, on proper maintenance.

The following table shows recommendations about time, inspection and maintenance for the normal use of the machine.

Operating hours/ time period	Inspection points, maintenance instructions
12 h after repairing	Check all accessible screw connections for tight seat.
Every 3 hour	Check the separator tray, the hopper, the feed spout and blast wheel unit for foreign matter and large contaminants.
Daily and prior to starting work	Check that all safety devices working adequate. Check the feed spout, and abrasive sealing. Check the blastwheel, control cage and liners. Check the electric connections for sediments of dirt or foreign bodies. Check the electric motors for dirt and other contaminants. Check the function of the residual current operated device. Check the hose connections for tightness and fixed seat. Check all hoses on the machine for damages or leakage. Make sure that the dust bin is emptied
Every 3 months	Check the tension of the V-belts
Annually	Full overhaul and cleaning of the complete machine.

The time indications are based on uninterrupted operation. When the indicated number of working hours is not achieved during the corresponding period, the period can be extended. However a full overhaul must be carried out at least once a year.

Due to different working conditions it can't be foreseen how frequently inspections for wear check's, inspection, maintenance and repair works ought to be carried out. Prepare a suitable inspection schedule considering your own working conditions and experience.

Our specialists will be happy to assist you with more advice.

Prior to any repair works on the machine and its drives, secure the machine against unintentional switching on. Put the machine to its safety off position.

The machine is in a safe condition when it cannot generate any hazard.

Follow additional operating and maintenance of OEM if included during your service and maintenance work.

Further is advised:
Store the cleaned and dry machine in a dry and humid free room. Protect the electrical motors from moisture, heat, dust and shocks.

All repair work must to be done by qualified Blastrac personnel, this to guarantee a safe and reliable machine.

Any guarantee on the machine is expired when:

- Non original Blastrac parts have been used
- Repair work is not done by qualified Blastrac personnel
- Changes, add on's or conversions are undertaken without written permission of Blastrac BV

Screws, bolts etc. that have been removed must be replaced with those of the same quality, strength, material and design.

Do not weld, flame cut or perform grinding works on or near the machine. Danger of fire or explosion exists!

Provide adequate ventilation when working in a confided space.
Secure the maintenance area if necessary.

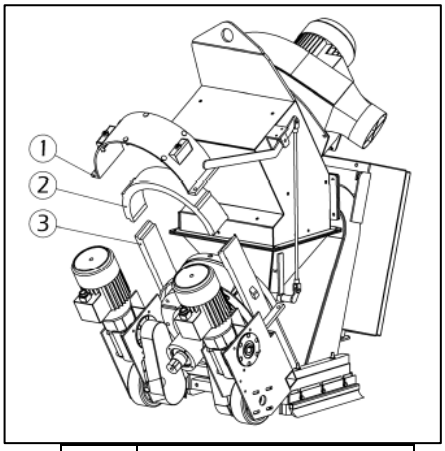
Clean the machine every day with air and non-aggressive materials. Never use a high pressure water cleaner to clean the machine.

6.1 Changing the liners

- Loosen the press bolts of the top liner and remove the cover and top liner.
- Hammer out the side liners from the blast housing. Take them out at the top of the housing.

To mount the liners, keep on the following sequence:

- Replace all worn items.
- Clean the liners and the inside of the blast housing thoroughly.
- Re-assembly the machine in reverse order, using kit between the top liner and the side liners, and between the top liner and the front and rear plates of the blast housing.
- Make sure that the top liner sits close at the edges of the side liners.

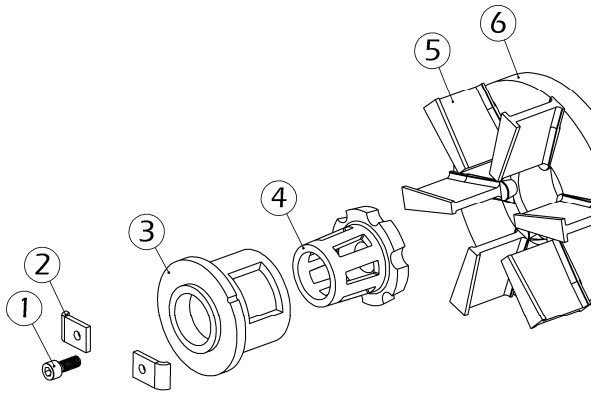


1	Top liner cover
2	Top liner
3	Side liner

6.2 Changing the blast wheel blades and impeller

- Remove the abrasive storage hopper from the separator.
- Remove the cage clamps and control cage.
- Block the blast wheel and remove the central fixing bolt.
- Remove the impeller using a wooden or brass drift.
- Remove the top liner cover and remove the top liner using a screw driver or a crowbar.
- Clean the blast wheel and the blades with air.
- Carefully tip the machine backwards. Through the opening of the blast housing: use a wooden or brass drift to tap out all six blades from the blast wheel towards the center of the blast wheel.
- Clean the blast wheel thoroughly to make sure that the blades and impeller will fit well and to avoid any imbalance of the blast wheel.
- Replace the blades with 6 new ones and re-assemble the machine in reverse order.

1	Impeller bolt
2	Cage clamp
3	Control cage
4	Impeller
5	Blades (set of 6)
6	Blastwheel



IMPORTANT NOTES:

Blast wheel blades must be replaced as a set. Replacing only some of the blades can cause imbalance of the blast wheel.

Use a new central fixing bolt when mounting a new blast wheel.

Every time the control cage is replaced, the thread of the blast wheel fixing bolt should be checked. Make sure that this bolt will be tightened correctly. In addition, absolute care must be taken to clean the thread from dust and abrasive.

After each blast wheel repair work switch on the blast wheel motor for a short period (without feeding abrasive) in order to find out whether the rotating parts turn freely and without vibration. After that, the blast cleaning procedure can be continued.

6.3 The V-belts

The V-belt drives are designed for the installed driving power. To force a higher output through an excessive high tension of the V-belts will result in broken belts, damage to the bearings and causes loss of the total efficiency. Too low belt tension will cause slipping with the result of a very high temperature of the V-belt and a premature destruction of it. Temperatures over 70° for a longer period will decrease the working life and the efficiency of the V-belts. The grooves of the V-belt pulleys must be free of rust, fat and dirt and must not show any damages. The use of belt wax or similar substances in order to increase the friction coefficient is not necessary and it damages the V-belts. Soiling due to oil, grease or chemicals have to be avoided.

In order to get perfect power transmission the V-belt drives have to be checked every 3 months.

V-belt mounting

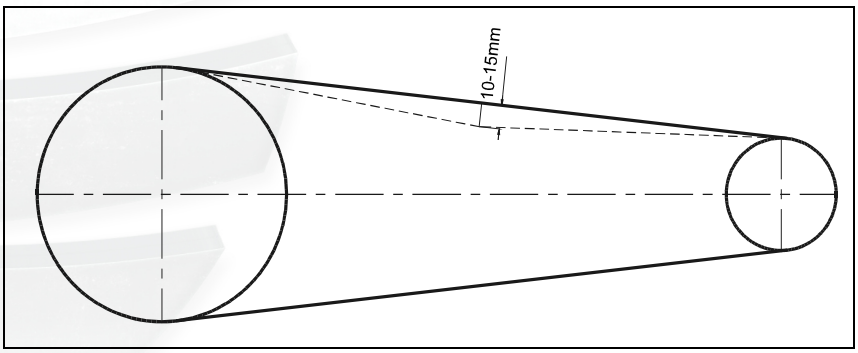
Remove the belt guard only when the driving motor is in standstill and the power supply cable of the machine is disconnected from the power source.

- Reduce the distance between the driving motor and the bearing to release the tension of the V-belt drive.
- Carefully put the V-belt in the grooves of the V-belt pulley by hand and without using the force.
- Increase the distance between the driving motor and the bearing to stretch the V-belt as following described.
- Fix the required driving gear guards.

V-belt tension

The correct V-belt tension is of utmost importance in order to obtain a perfect power transmission and to reach the usual working life of the V-belt. Too low or to high tension causes frequently a premature breakdown of the V-belt. Excessive belt tension results in damaged bearings at drives.

Check the tension of the V-belt by pressing the thumb on the belt. The belt has the correct tension If you can press it in about 10-15 mm at approx. 10 kg. pressure.



7. Troubleshooting

Fault	Possible cause	Remedy
Excessive vibration	Blast wheel is worn irregularly. Imbalance due to worn or broken wheel blades. Machine fan impeller is worn.	Replace the worn blast wheel parts and remove all broken parts from the machine. Replace the worn fan impeller.
Unusual noise	Too little play or poor alignment of the rotating parts. Loose and incorrect set screws. Squeaking wheels. Seizing motor.	Check alignment of the rotating parts (blast wheel and control cage). Check whether all screws and parts are fixed tightly). Replace the wheels. Replace the motor.
Reduced or no blasting performance	Inadequate abrasive supply to the blast wheel. Contaminated abrasive. Feeding of abrasive shot valve and abrasive storage hopper. Blast wheel or control cage. Adjustment of the shot valve. "Shocked blast wheel". At the start of the blast process too much abrasive at once hits the wheel. The travel speed is too high.	Clean wire mesh, top up abrasive if necessary. Abrasive is heavily contaminated, check the ventilation system. Check and clean blocked shot valve housing. Worn blast wheel or control cage, replace worn parts if necessary. Check the adjustment of the valve. Close the shot valve and stop the blast wheel motor. Start the blast process again and slowly open the valve. Reduce the travel speed.
Escaping abrasive	Poor sealing.	Check all seals and replace if necessary.
Abrasive loss on the surface or escaping abrasive at the blast head	Poor abrasive quality. Worn blast wheel parts.	Contact **Blastrac**. Replace worn blast wheel parts.

Fault	Possible cause	Remedy
Contaminated abrasive	The dust collector is not generating enough suction power so that dust remains in the abrasive. Clogged dust hose Ripped or damaged dust hose	Check the dust collector (filter-cartridges, dust hopper and seals). Check and clean the dust hose Replace dust hose
Excessive wear in blast housing and recovery duct	Wrong abrasive. Incorrect setting of the control cage	Contact **Blastrac**. The thrown abrasive blasts the housing and not the surface to be blasted. Adjust the blast pattern.
Machine is not moving	The travel speed is too low.	Increase the travel speed.
Control system does not switch on	Motor protection switch has triggered.	Check and switch on again. Check the mains power supply.
Control system switches off during operation	Connection cable is defective. Cables connecting the units are defective. Motor protection switch has triggered. Main switch of the dust collector switches off due to overload.	Replace the cable. Replace the cable. Have the fault checked by an electrician. Switch the main switch "ON" - with fault, have the unit checked by an electrician.
Machine does not travel	Fuse defective, short circuit in the travel motor lead or tachometer lead, motor defective. Control unit defective. Potentiometer defective.	Have the unit checked by an electrician. Replace the control unit. Replace the potentiometer.

Note: If the motor protection switch of the blast wheel motor has been triggered by overload, it can be switched on again after a short cooling down period.

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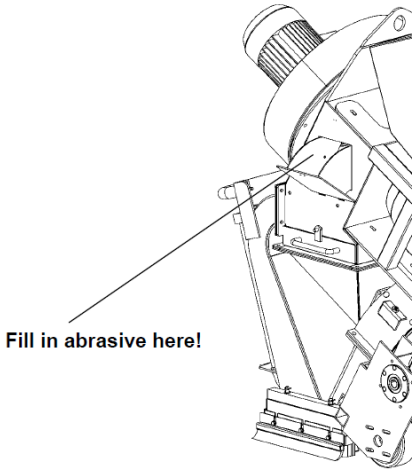
8. Selection of abrasive

The Blastrac blast cleaning machines are designed and built to operate with **Blastrac abrasive**.

Blastrac abrasive has a very high quality and has the rebouncing ability required for the efficient use of the machine. The selection of abrasive is very important since this is the material to carry out the surface treatment.

Media nr. 2
Is often used when the surface is only subsequently sealed.
- creates fine profiles, e.g. on vacuum concrete and non-glazed tiles
- removes thin layers of rust on steel surfaces
- removes thin layers of paint



Media nr. 3
- creates a fine to medium texture on concrete.
- removes glazing from tiles prior to subsequently coating with antiskid floor sealings
- removes old impregnations and coatings about 1 mm thick

Media nr. 4
Standard abrasive, suitable for about 50-60 % of all applications. Creates a medium profile on concrete. Fulfils the same purpose as Media No. 3 when a higher speed of the machine is required, e.g. on asphalt, in order to keep the thermal load low.
- removes laitance from new concrete
- roughening of smooth concrete or natural stone
- removes coatings with a thickness of 1-3 mm
- cleaning of steel surfaces

Media nr. 5
This media is used to create a coarse profile or to increase the work speed in the case of surfaces hard to treat.
- removes sediments on concrete prior to coating
- removes thick paint coatings or rust from steel surfaces, bridges, tanks, etc.
- removes flexible coatings on parking house decks
- removes road markings and retexturing of asphalt and concrete roads

Media nr. 8
Only as an addition to Media No. 3, No. 4 and No. 5 with maximum 30% content.
Media No. 8 should never be used without blending since otherwise the wear in the machine as a whole would increase disproportionately.
- removes polyurethane coatings
- removes adhesive remnants
- removes rubber deposits
- penetrates coatings hard to remove
- also suitable to be used on steel for extraordinary roughness

Please take into account that the use of incorrect abrasive increases wear.

Our service engineers have the experience to select the appropriate abrasive for the individual cases of application.

Please consult your local **Blastrac** customer service department if you have any questions about the selection of the best abrasive for your blast cleaning work.

9. Technical data

	EBE 350E Global
Power consumption blast motor	11KW
Electrical connection (voltage is given on the control box)	400-480V / 50/60Hz, 32A
Blast width	350 mm
Drive speed	0 – 15 m/min
Max. blast cleaning output on steel	50 m²/h
Abrasive consumption	0.1 – 0.5 kg/m²
Length	1350 mm
Width	650 mm
Height	1100 mm
Weight	430 kg
Noise level (under load)	Over 90dB(A)
Vibration level	3.09 m/s² Allows >8 hrs. of working with the mentioned equipment without having to use anti vibration precaution measures.
Operating temperature range	-5°C to +40°C
Dust hose connection	Ø130 mm
Recommended filter unit	Contact Blastrac BV for a suitable filter unit

The electrical diagrams of the electrical system are placed inside of the control panel.
Design and specifications are subject to change without notice by Blastrac BV.

IMPORTANT NOTES:
The indicated values are measured on new machines. Noise and vibration levels will vary in different circumstances. Area influences like open outside or closed inside space, ambient temperature, different surfaces to be treated, daily use, different tools or accessories, poor maintenance, etc. will give different values at all time and could increase the exposure level over the total working period.

The declared vibration and noise emission levels represent the main applications of the machine. The values may be measurements from a representative sample of technically comparable machinery. The values may be used for a preliminary assessment of exposure.

A precise estimation of the level of exposure to vibration and noise should also take in account the times when the machine is switched off or even running, but not actually in use. This may significantly decrease the exposure level over the total working period.

Identify additional safety measures to protect the operator from the effects of vibration and noise such as: proper and regular maintenance of the machine and the accessories, keeping the hands warm, organization of work patterns for example by using rotation schedules. The use of anti-vibration gloves could also decrease the effects of the vibrations transmitted.

Always wear ear protection when working with this machine.

Old equipment contains valuable materials which are valuable for re-processing. **The machine parts must not be thrown away in the normal household waste,** but should be disposed of at a suitable proper collection system, e. g. via your communal disposal location. This way the materials can be re-used in an environmentally responsible manner.

10. Enclosures

Parameters for motor frequency control

Settings left frequency–drive	
C007	14
C010	10,0Hz
C011	85,0Hz
C012	3,0s
C013	3,0s
C014	2
C015	50,0Hz
C016	15,0%
C087	1350
C088	1,1A
C089	50,0Hz
C090	400,0V
C091	0,79
C105	0,5s

Settings right frequency–drive	
C007	14
C010	10,0Hz
C011	65,0Hz
C012	3,0s
C013	3,0s
C014	2
C015	50,0Hz
C016	15,0%
C087	1350
C088	1,1A
C089	50,0Hz
C090	400,0V
C091	0,79
C105	0,5s

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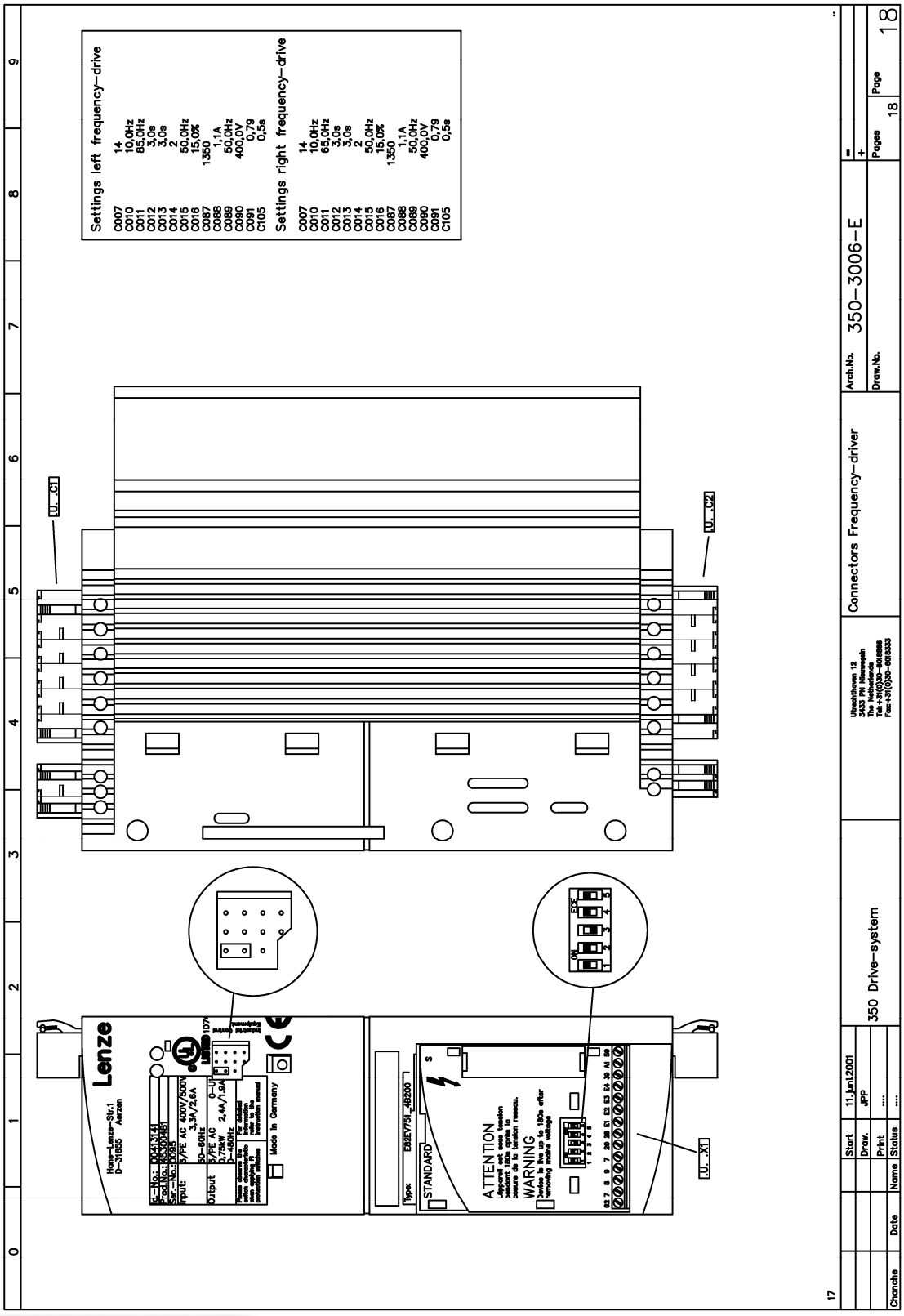
Settings left frequency-drive
C007 14
C010 10,0Hz
C011 85,0Hz
C012 3,0s
C013 3,0s
C014 2
C015 50,0Hz
C016 15,0%
C087 1350
C088 1,1A
C089 50,0Hz
C090 400,0V
C091 0,79
C105 0,5s
Settings right frequency-drive
C007 14
C010 10,0Hz
C011 65,0Hz
C012 3,0s
C013 3,0s
C014 2
C015 50,0Hz
C016 15,0%
C087 1350
C088 1,1A
C089 50,0Hz
C090 400,0V
C091 0,79
C105 0,5s
W..C1
W..C2
W..X1
Lenze
Hans-Lenze-Str.1
D-31855 Aerzen
Made in Germany
STANDARD
ATTENTION
WARNING
Connectors Frequency-driver
350-3006-E
350 Drive-system
Arch.No.
Drow.No.
Pages
Page
18
11.Jun.2001
JPP
Start
Drow.
Print
Status
Name
Date
Change

Adjustments for motor soft-starter controller

DIP switch number	Adjustment
1	OFF
2	ON
3	ON
4	OFF
5	OFF
6	OFF
7	OFF
8	OFF
9	OFF
10	OFF
11	ON
12	OFF
13	OFF
14	ON
15	ON
16	OFF

DIP SWTCHES

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1
L1
3
L2
5
L3
HOLD TO TEST
PUSH TO RESET
A-B
SMC-3
OVLD SETTING
LED ON
STATUS RUN/ON
1 OVLD
2 TEMP
3 PHASE REVERSAL
4 PHASE LOSS/ OPEN LOAD
5 PHASE IMBALANCE
6 SHORTED SCR
7 TEST
RUN/FAULT
22.2
27.1
17.3
32.1
12.3
37.0
A1
A2
IN1
IN2
97
98
13
14
2
T1
4
T2
6
T3

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SMC-3™ SMART MOTOR CONTROLLERS

Description of Features

Electronic Motor Overload Protection

The SMC-3 controller incorporates, as standard, electronic motor overload protection. This motor overload protection is accomplished electronically with the use of current transformers on each of the three phases. The controller's overload protection is programmable, providing the user with flexibility. The overload trip class selection consists of either OFF, 10, 15, or 20. The trip current is easily selected by adjusting the rotary potentiometer to the motor full load current rating. Trip reset is selectable to either automatic or manual mode.

Note: Trip rating is 120% of dial setting.

Over-temperature

The SMC-3 monitors the SCR temperature by means of internal thermistors. When the power poles maximum rated temperature is reached, the microcomputer switches off the SMC, a TEMP fault is indicated via LED, and the 97/98 fault contact closes.

Phase Reversal Protection

When enabled via a DIP switch, 3-phase input power will be verified before starting. If input power phasing is detected to be incorrect, the start will be aborted and a fault indicated.

Phase Loss/Open Load

The unit will not attempt a start if there is a single-phase condition on the line. This protects from motor burnout during single-phase starting.

Phase Imbalance

The unit monitors for imbalance between phase currents. To prevent motor damage, the unit will trip if the phase imbalance exceeds 50% current imbalance for 3 seconds, and a fault will be indicated.

Shorted SCR

Prior to every start and during starting, the unit will check all SCRs for shorts and unit load connections to the motor. If there is a shorted SCR in the SMC-3 and/or open load, the start will be aborted and a shorted SCR or open load fault will be indicated. This prevents damage from phase imbalance.

Push to Test

The unit with control wiring can be tested for fault conditions by using the Push to Test function. Hold down the Reset button for 5 seconds to activate the fault Aux (97, 98) and shut down the SMC-3. To clear, either push the Reset button or cycle control power to the device.

LED Description (Number of Flashes)

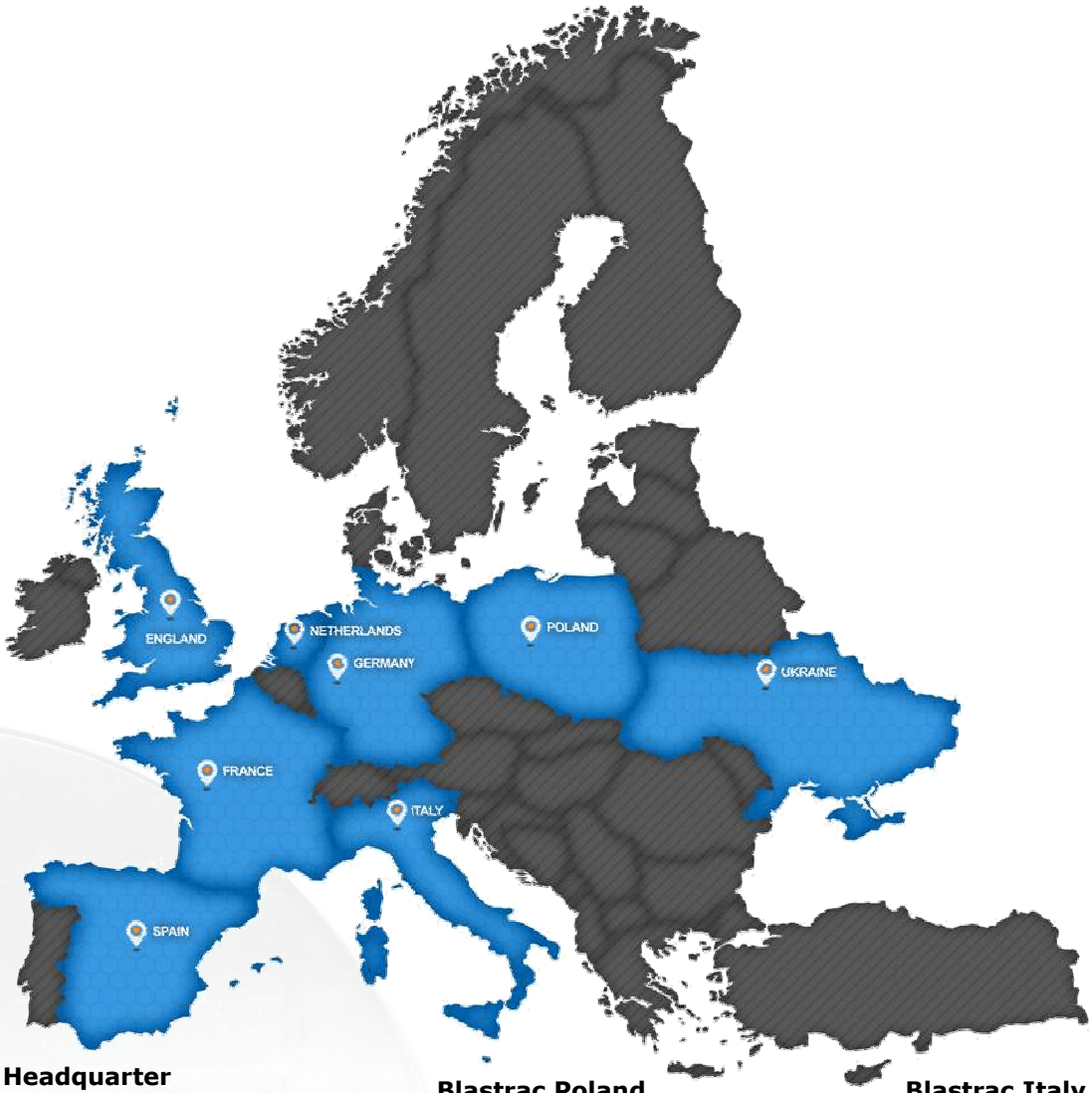
1. Overload
2. Overtemperature
3. Phase Reversal
4. Phase Loss/Open Load
5. Phase Imbalance
6. Shorted SCR
7. Test

Source :

Allen-Bradly (manufacturer)

http://www.ab.com/en/epub/catalogs/12768/229240/229262/3073021/1179231/tab4.html

BLASTRAC



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