
SAFETY

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Correct Use

Basic understanding of the INDEX K120i

The *INDEX K120i* has been built in accordance with:

- The latest developments in technology and the established safety regulations.

The machine should not be operated improperly, as danger can occur to the operator's physical well being as well as damage to the machine and other property.

Improper modes of operation

It is improper to operate the machine:

- With unapproved power sources, products and material not recommended by the manufacturer.
- With a machine/plant altered by the operator that creates hazardous conditions for the operator's health.

Allowable modes of operation

It is permissible to operate the machine only:

- If this operating manual has been completely read and understood.
- In the way described in this manual.

The *INDEX K120i* is intended for operation as specified in the contract. Any other or further use of the machine as, for example, the processing of products not listed in the order confirmation as well as operating with dangerous or hazardous substances are contrary to the regulations.

INDEX assumes no liability if the machine is operated contrary to the terms of the contract or safety regulations. The risk is exclusively with the operator.

This manual must be followed for installation, startup and maintenance.

Requirements of Personnel

The owner/employer may assign work which entails potential danger only to such persons who are authorized and who are able to carry out such work independently and with safety or, following prior training, are under the supervision of a person who is familiar with this work.

Operation by unskilled personnel is dangerous.

Employment Restriction

Minimum age

It is recommended that persons must be at least 18 years of age to operate this machine independently, provided they are trained and/or familiar with the operation of this machine.

Qualification

Connections, installation, maintenance and repair work may only be carried out by trained, skilled personnel.

Responsibilities of the Operator

It is the operator's duty to verify correct operation of the machine. Danger points occurring between *INDEX K120i* machines and customer installations must be rendered safe by the employer/operator.

Determine all Safety Devices

Safety devices, interlocks and couplings must be inspected at least once a year by a qualified mechanic for their safe and proper operation.

Mechanical devices venting harmful substances must be determined for their efficiency by a specialist prior to the initial start-up.

All test results should be documented.

Qualified Mechanics and Operators

Only skilled and trained personnel should be assigned responsibility for set-up, operation, maintenance and repair and the responsibility should be clearly defined.

Verify that all safety regulations are followed and that all personnel are made aware of the dangers involved.

Instructional Requirements

Prior to operating the machine, personnel should be instructed on the proper operation of the machine, having read and understood the instruction manual, especially the chapter about “*Safety Precautions*” as well as the valid regulations.

The Instruction Manual must be kept easily accessible for operators and maintenance personnel.

The operator’s duties may involve the handling of dangerous and toxic substances. It is suggested that the operator be furnished with proper protective gear.

Operation

- Do not climb on the machine while it is in operation.
- Do not reach over the guards located at the top of the machine.
- Guards located on all sides and bottom of machine must be closed at all times while operating the machine.
- It is dangerous to wear long, unbound hair, loose clothing or jewelry. There is danger of injury by being drawn in.
- Encapsulation machines must be firmly secured to the floor at all times.
- Immediately notify responsible management of damage to the machine. Do not continue production before all problems are eliminated.
- Obey all safety precautions. Informational signs on possible hazards must be clearly displayed and legible.
- Wear hearing protection, as necessary.
- Installed safety devices must not be removed and safety switches must not be bypassed.

Information to Personnel

The machine operator must inform his fellow workers about any kind of dangers before starting the machine. In addition, he is obliged to determine that nobody is located within the range of the moving parts of the machine, or is reaching into it.

If warning signals light up or are sounded, the personnel working there must leave the danger zone immediately.

Working on the Machine

The supplier should be consulted before altering any parts. This is for the safe operation of the machine, and applies to the installation and adjustment of safety devices, valves and any other parts.

Conditions for Operation

- Ensure that the machine is switched off completely and that it cannot be switched on accidentally.
- All pneumatic and hydraulic devices must be switched off and the stored pressure must be released.
- Lock out the power supply to the machine and attach a warning sign at the main switch.
- All movable parts must be secured.
- Wait until hot parts of the machine cool down.
- Secure the working area with barrier chains and warning signs.
- Assign one person with the responsibility of operation and notify personnel of this assignment.

Spare Parts

- All spare parts must comply with the technical requirements demanded by the manufacturer.
- Install larger parts and subassemblies correctly using lifting devices. Only employ technically perfect lifting devices.
- Use safety steps while working in elevated positions.
- Do not employ machine parts for climbing.
- When working in high positions, secure yourself with restraining safety harnesses.
- All handles, steps, railings, landings, platforms and ladders *should be kept clean*.

Change of Location

- Should the machine be moved even slightly, shut off the electric mains.
- Secure all movable parts that could be of danger.
- Reconnect and start the machine after change of location.

Guarantee and Responsibility

Responsibility and guarantee are as specified in the Terms and Conditions of the Manufacturer's Quotation as made a part of each Purchase Order issued.

Electrical/Electronic Installations

Work on electrical parts/subassemblies must only be carried out by a skilled or licensed electrician.

Do not work on the machine without turning the power off. Determine absence of voltage with a voltmeter.

Electrical problems must be corrected immediately. If imminent danger exists, the installation, subassembly or operating means may not be employed in a defective condition.

Safety Measures for Electrical Solder Work

Only authorized personnel may perform solder, welding or grinding work on the machine. There can be danger of fire and explosion.

Observe the following measures strictly:

- Turn off the main power supply of the machine.
- Clean machine of dust and flammable substances.
- The welding device is not to be connected to the control cabinet of the machine.
- Electronic devices and cards inside the control cabinet must be pulled out, as there is danger of voltage spikes.
- Electronic devices located on the machine must be disconnected.
- The ground connection for the welding device must be made right next to the welding point and have perfect contact. If this is not verified any ground conductors present in the vicinity of the welding point (e.g. motors) have to be released for the duration of the welding work.

If electrical welding is being performed on the machine(s) or unit(s) that are mechanically and hence conductively connected to the *INDEX K120i* machine (e.g. hoppers, feeding conveyors etc.), the same measures have to be taken.

Reasonable Lifting and Carrying Weights

All applicable codes and regulations must be followed on lifting and carrying of weights

Cleaning

Cleaning work may not be performed on moving parts of the machine while it is operation.

After cleaning, perform a leak test and inspect all fuel, motor oil and hydraulic oil connections for looseness, abrasion and damage. Any defects must be eliminated immediately.

First Aid

- If the eyes come into contact with solvents, rinse with water immediately. It is recommended to install an eye shower. Consulting a doctor is absolutely necessary.
- Clean your skin and clothes immediately with water after contact with solvents.
- Change soiled clothes immediately.

Cleaning Agents

- Do not employ a high-pressure water jet to wash the machine.
- In case of normal soiling, use non-flammable commercial cleaning agents
- Heed the instructions and indications on the containers and packaging of the solvents.
- In case of heavy soiling, use non-flammable solvents
- If solvent vapors can get into the surroundings, it is necessary to wear a respirator.
- Verify sufficient ventilation of the workroom during cleaning process.
- Never clean large parts such as cover guards or floors with solvents.
- Protect yourself from health hazards by wearing safety wear and by using protective skin cream.

Wear safety clothes

- Respirators
- Safety gloves
- Safety glasses
- Safety shoes
- Safety coat

General Instructions

- Work on the electrical installation may only be carried out by a qualified electrician.
- Do not re-adjust built-in safety valves arbitrarily or render them ineffective.
- Report leaking pressure lines, pressure hoses, or union joints immediately.
- Do not loosen or tighten any union joints when the machine is switched on.
- When working with oil or grease, employ skin protection and skin care agents.

Hydraulic Systems (for Water Vacuum Pumps - if applicable)

Health Hazards

Avoid skin contact and inhalation of spray when handling pressurized liquids. If this cannot be excluded, employ suitable personal protective equipment.

Penetration of the skin by pressure liquids is particularly dangerous if these squirt out under high pressure due to leakage from hydraulic systems. Immediate medical attention is necessary in the case of such injuries that initially appear to be only slight.

Suitable personal protective equipment includes protective gloves and protective glasses that are resistant to the pressure liquid. Furthermore, skin protection and skin care agents must be made available and be employed if skin contact is involved.

Replacement of Pressure Liquids

If the serviceability of the pressure liquid is no longer sufficient, suitable measures for the purpose of re-establishing the serviceability have to be undertaken or the pressure liquid has to be replaced. In this case the pressure liquid that is no longer serviceable has to be removed as completely as possible from the hydraulic system. The new pressure liquid has to be filled via a suitable filter. Filter inserts in the hydraulic system must be replaced or cleaned.

Storage and Filling

Store and fill pressure liquids in accordance with the manufacturer's specifications and in compliance with the pertinent legal regulations.

Pressure liquids are as a rule substances that present a hazard when in contact with water.

Collection of Leakages

Liquid accumulated during maintenance or due to leakages outside of the system may not be fed back to the tank but must be collected in an easily cleanable container.

Hydraulic Hose Lines

Hose lines have to be tested as to their condition in terms of work safety by a technically competent person prior to initial operation of the technical operating means and afterwards at least once annually.

If defects are detected, they must be eliminated immediately or suitable measures have to be undertaken.

Examples of possible defects with hose lines:

- Damage to the outer layer down to the intermediate layer (e.g. abrasion points, cuts or cracks).
- Embrittlement of the outer layer (crack formation in the hose material).
- Deformation that does not correspond with the natural shape of the hose line in pressureless or pressurized condition or when folded, e.g. layer separation, bubble formation, squashed points, folded points.
- Leaking points.
- The requirements for installation have not been complied with.
- Wandering of the hose out of the fitting.
- Damage or deformation to the fitting that reduces the function and strength of the fitting or connection of the hose.
- Corrosion to the fitting that reduces its function and strength.
- Storage times and usage duration exceeded.

Replacement of hose lines

The employer/owner must make provision that the hose lines are replaced at appropriate time intervals even if no defects in terms of safety regulations are perceivable on the hose line.

GUIDELINE: Usage duration of the hose lines: Four years, including a maximum storage period of two years.

Installation of hose lines

In order to be able to verify the functionality of hose lines and not to shorten the usage duration by way of additional loads, the following has to be complied with:

- Hose lines have to be installed so that their natural position and movement is not hindered.
- Fundamentally, when in operation, hose lines may not be subjected to a tensile, torsional or compressive load brought about by external influence.
- A smaller bending radius of the hose than the smallest quoted by the manufacturer may not be affected.
- Hose lines must be protected as far as possible against damage due to external mechanical, thermal or chemical influences.
- Painting over of hose lines is to be avoided.

Storage of hoses and hose lines

- Store in a cool, dry place with a low dust incidence; avoid solar or ultra-violet radiation; shield in the vicinity of heat sources.
- Storage temperatures of under 14° F are to be avoided for elastomers. Other guide values may be applicable to thermoplastics. Temperatures of between + 59° F and + 77 ° F and a relative air humidity of under 65 % are to be regarded as favorable storage conditions.
- Employ no ozone-forming lighting units or electrical appliances with spark generation in the immediate vicinity.

- Hoses and hose lines may in particular not come into contact with materials that could cause damage. Such substances can be, for example: acids, alkalis and solvents
- Hoses and hose lines have to be stored voltage-free and lying horizontally. If stored in a coil, a bending radius smaller than the smallest quoted by the manufacturer may not be employed.
- The storage period should not exceed 4 years for hoses and 2 years for hose lines.

Handling Acids and Alkalis

Concentration of the Nitric acid HNO_3 - more than 70 %

- Danger of fire in case of contact with inflammable substances!
- Causes severe caustic burns!
- Do not inhale vapors!
- In case of contact with the eyes rinse with a lot of water and consult a doctor.
- When working with these substances wear protective clothing.

Concentration of the soda lye $NaOH$ = 1 - 5 %

- Affects eyes and skin!
- Must not be accessible for children!
- In case of contact with the eyes rinse with a lot of water and consult a doctor.
- When working with this substance wear protective clothing.

Safety Devices

The machine is equipped with the following safety devices in order to protect the operating personnel, environment and line:

- Warning signs at danger zones.
- Optical fault display.
- Acoustic fault display.
- Automatic control of the working process and automatic interruption of operation at faults.
- EMERGENCY STOP impact key.
- Automatic machine stop when opening the safety devices in the working range of the machine.
- Do not wash down with hose or high-pressure cleaning device.
- Metal covering of the drives and the moveable mechanical components.
- Metal covering of electrically loaded parts.
- Exhaust devices and fans. (In case of venting the exhaust air into the workroom a catalyst must be installed additionally)
- Employ protection for safe opening of the safety devices in the sterile area.
- An excess pressure of 50-60 psi in the sterile area prevents the penetration of non-sterile exterior air.

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K120i Capsule Filler
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