

EC DECLARATION OF CONFORMITY

MANUFACTURER

Business name : Nutek Europe B.V.
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Place: Raamsdonkveer
Country : The Netherlands

DESCRIPTION AND IDENTIFICATION OF THE MACHINERY

Generic name: Destacker
Function: This machine is intended for loading stacked PCBs onto the production line.
Model: NTM220DSL+0.5M CONVEYOR
Type: L-Size
Serial number: 2012-0728 A01
Commercial name: Destacker

COMPLIANCE

The manufacturer declares that the above mentioned installation fulfils all relevant provisions of

Machine Directive (2006/42/EC) Low Voltage Directive (2006/95/EC)
EMC Directive (2004/108/EC) Pressure Equipment Directive (97/23/EG)

In conjunction with the following harmonised standards and where appropriate other technical standards and specifications

for the risk assessment

NEN-EN-ISO 12100:2010

for the design and manufacture

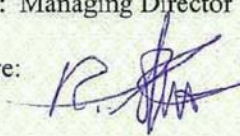
NEN-EN-ISO 12100-1:2010; NEN-EN-ISO 12100-2:2010; NEN-EN-IEC 60204:2006;
NEN-EN 349:1994+A1:2008; NEN-EN-IEC 61310:2008; NEN-EN-IEC 61439-1:2009;
NEN-EN-IEC 61000-1-2:2008; NEN-EN-ISO 3744:2010; NEN-EN 764:2004;

The technical jurists of Certification Experts BV in Weesp, has determined the presumption of conformity of the above mentioned installation with the applicable Directives and standards.

Place: Raamsdonkveer

Identity: Mr. R. Stins
Position: Managing Director

Date: December 5, 2012

Signature: 

In the compilation of this manual, attention has been given to avoid errors and mistakes in an attempt to provide a clear structure to the content.

In spite of this, errors cannot be completely avoided.

If in going through this manual should you:

- discover incorrectness
- encounter unclear statements
- meet with parts that in your opinion needs further explanation, please inform us. We will appreciate any comments which will help us to improve this document.

For corrections or clarification, please contact:

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1.0 INTRODUCTION

1.1 Machine specification

Machine Name :	Destacker, L-size
Job Description :	NTM220DSL+0.5M CONVEYOR
Job No :	2012-0728A01
Voltage :	230 Vac
Phase :	1
Power Consumption :	150 VA Max
Product :	PCB
Product Size :	PCB - 70 ~ 407mm (W) / 80 ~ 457mm (L)
Product Edge Clearance :	3mm
Product Thickness :	0.60 ~ 1.60mm
Fix Rail :	Front
Component Height :	Top : 30mm (Max) Below : 30mm (MAX)
Transfer Height :	950 (+/- 25mm)
Weight :	170 kg (Approx)
Air Pressure :	4-6 bars
Machine Colour :	RAL 9002 (8093A)
Direction :	L to R
Noise Level :	<70 dBA

* Please refer to 3D drawing for physical dimension.

1.2 Terms of Reference

The following list some of the terms that could be used in this Manual.

PCB	-	Printed Circuit Board;
Transfer height / PCB height	-	board flow height from the floor level;
Bareboard	-	PCB without any component mounted onto it;
Stack	-	bareboards placed onto one another without any separator sheet (position flushed against the stopper rod inside the machine);
Upstream Board Available (UBA)	-	a signal sent from the upstream machine to Nutek machine to inform the availability of a PCB at the upstream machine;
Upstream Busy (USB)	-	a signal sent from Nutek machine to the upstream machine to confirm ready to receive a PCB from the upstream machine;
Downstream Board Available (DBA)	-	a signal sent from Nutek machine to the Downstream machine to inform the availability of a PCB at Nutek machine;
Downstream Busy (DSB)	-	a signal sent from the Downstream machine to Nutek machine to confirm ready to receive a PCB from Nutek machine.

1.3 Abbreviation Use in Manual

Abbreviation	Description
BK	Brake
BZ	Buzzer
C	Capacitor
CN	Connector
CYL	Cylinder
D	Diode
DBA	Downstream Board Available
DSB	Downstream Busy
E	Earth
EM	Emergency Switch
F	Fuse
FS	Foot Switch
H	Indicator light
INV	Inverter
K	Relay
L	Live
LS	Limit Switch
M	Motor
MCB	Main Circuit Breaker
N	Neutral
OL	Overload Relay
PB	Push Button
PCB	Printed Circuit Board
PHS	Photo Sensor, Gap Sensor
PS	Power Supply
RS	Reed Switch
SV	Solenoid Valve
SW	Switch
TB	Terminal Block
TP	Terminal Point
UBA	Upstream Board Available
USB	Upstream Busy

1.4 Expected use and limit of use

Important Note: All uses other than the described intended used must be regarded as unintended use and is thus not permitted; the manufacturer cannot be held responsible for any resulting damages!

1. This machine is intended for loading bare PCB onto the production line or another machine.
2. This machine is not intended to be a standalone unit and must always be installed beside machine with integral covers or guards at the vicinity of its opening for PCB exit.
3. During production, this machine operates under the Auto mode with no operator intervention except for loading bare PCB.
4. This machine is intended for use with the PCB size of maximum width of 250mm and length of 330mm for the M size machine and with the maximum PCB width of 407mm and length of 457mm for the L size machine only.
5. This machine is intended for use in an industrial environment that is well ventilated, clean and dry with the maximum humidity at 90% and the temperature range from 15°C to 35°C.
6. This machine is intended for both air and electrical supplies stated on the specification (see section 1.0).
7. This machine is designed for a life of 7 years with adequate maintenance and replacement of worn parts.
8. Before start-up, the operators are expected to have read and understood the Safety section (see Section 2.0) of the instruction manual that accompanies the machine, and to be familiar with the location and operation of each control.

1.5 Operator's Workstation

The Operator's workstation is located in front of the machine where the Membrane Control Panel, E-Stop and other controls are easily accessible. Refer to Figure 1.

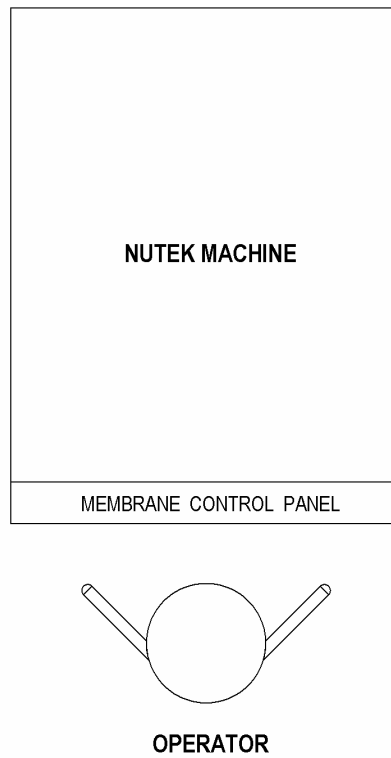


Fig. 1

2.0 Safety

It is essential for person-in-charge, an operator or technician level, to understand how the machine functions and the component hazards before he/she handles the machine. Practice all plant and product safety instructions and precautions. Failure to follow instructions can cause personal injury or property damage. If the equipment is used in a manner not specified in this instruction manual, the protection provided by the equipment may be impaired and the user will take the responsibility of this action.

Production Operator, who operates the machine, requires training and briefing on the following aspect:

- Hazard Warning Definition (Section 2.1)
- Hazard warning labels (Section 2.2)
- Switches Description and Function (Section 6.0)
- Tower Light Indications (Section 7.0)
- Operating Sequence (Section 8.2)

Understanding the machine will help to create an awareness of the machine's capability and limitation which play an important role in safety. All personnel who work with or who are exposed to this equipment must take precautions to protect themselves against serious or possibly fatal bodily injury. Furthermore, a well-ventilated, well-lighted and spacious workstation for the Operator also plays an important role in safety.

Note:




- ***Maintenance and repairs of the machine must be done by experts.***
- ***Correct lighting must be installed in the direct area of the machine by the end user.***
- ***The front door is accessible for the operator and technician. The switch box is accessible for technician only.***
- ***Always switch off the power supply before opening any protective cover over an electrical circuit.***

2.1 Hazard Warning Definitions

Hazard warning labels are an important part of the health and safety controls provided on equipment to warn personnel of potential hazards associated with the equipment. Hazard warning labels should be used when hazards have not been eliminated from equipment through other means (e.g. a complete enclosure of the hazard to exposure) and the potential for exposure to the hazards is still present. This applies both to hazards which can be present at all times during normal operation conditions and hazards which may be present only during specific conditions. Hazard warning labels should be used for the variety of hazards that can be present in equipment.

- **CAUTION:** Indicates a potentially hazardous situation, which, if not avoided, may result in minor or moderate injury.
- **WARNING:** Indicates a potentially hazardous situation, which could result in death or serious injury.
- **DANGER:** Indicates an imminently hazardous situation, which if not avoided, will result in death or serious injury.

2.2 Warning and Hazard Labels

Label	Description
	<p>Danger- High Voltage</p> <p>Danger! High Voltage! Do not detach the protective covers. Operating this equipment without covers may cause electric shock.</p>
	<p>Careful- Moving Parts (General)</p> <p>Do not touch the equipment while it is running. Working near moving machinery may result in getting entrapped in machine.</p>
	<p>Careful- Moving Parts (Hand)</p> <p>Do not touch the equipment while it is running. Working near moving machinery may result in getting the hand entrapped in machine.</p>
	<p>Danger- Injury to the hand</p> <p>Do not touch the equipment while it is running. Working near moving machinery may injury to the hand.</p>

3.0 Machine Functions

This machine mainly operates in 2 different modes:

- i. Non Bypass Mode
- ii. Bypass Mode

3.1 Non Bypass Mode

In Non Bypass Mode, bare PCBs are manually placed inside the Stacker. When the machine is in Auto mode, the Rail Support Board cylinder will extend to its remote position to move the stack of PCBs up. The Bulk clamp will then extend to support the bare PCBs on the Stacker unit. Rail Support Board cylinder will retract to its mid position to wait for the PCB to be released onto it. The separation of board will then be carried out by the activation of the separator cylinder. Thereafter, Release cylinder will extend to release the PCB. The bare PCB will be released onto the Rail Support unit and brought down to the Conveyor. The PCB is transferred to the Conveyor's exit and subsequently to Downstream machine through communication signals.

3.2 Bypass Mode

In Bypass Mode, the machine will transfer a PCB from Upstream machine to Downstream machine through communication signals. Only one PCB is allowed on the Conveyor during each cycle of transfer.

4.0 Width Adjustment

A removable crank is provided for width adjustment. Clockwise rotation reduces the width and vice versa. Remove and keep the crank during operation to avoid accidental width change.

5.0 Operating Conditions

5.1 Start Up Check

- Ensure that air supply is sufficient (4 - 6 Bar).
- Ensure that there is no PCB on the Conveyor.
- Ensure that Emergency switch (EM-1) is not activated. If the Emergency Switch (EM-1) is activated, release it by turning it clockwise. Thereafter, press the **RESET** push button (PB-1) to resume machine operation.
- Ensure that all Safety switches (if any) are closed.
- Turn on the Power Switch (SW-1). Note that POWER indicator turns on.

The machine is now ready for operation.

5.2 Auto Mode

- Press **AUTO** membrane switch to operate the machine in Auto mode.

The machine is now in Auto mode.

5.3 Manual Mode

- Press **STOP** membrane switch if the machine is in Auto mode.
- Press **MANUAL** membrane switch to switch the machine to Manual mode.

The machine is now in Manual mode.

- Press **TRIGGER STEP** membrane switch to perform various task.
 - If the membrane switch is pressed the **first time**, the Rail cylinder will extend.
 - If the membrane switch is pressed the **second time**, the Bulk clamp will activate.
 - If the membrane switch is pressed the **third time**, the Rail cylinder will retract to its mid position.
 - If the membrane switch is pressed the **fourth time**, the Separator cylinder will activate.
 - If the membrane switch is pressed the **fifth time**, the Release cylinder will activate.
 - If the membrane switch is pressed the **sixth time**, the Rail cylinder will retract to its home position.
 - Finally, if the membrane switch is pressed the **seventh time**, the Belt motors will turn on.
- Press **REPEAT STEP** membrane switch to repeat the selected step.

5.4 Bypass Mode

- If the machine is operating in Auto mode, press **STOP** membrane switch to stop the machine operation.
- In Stop Mode, press **MANUAL** membrane switch to operate the machine in Manual Mode.
- Thereafter, press **BYPASS** membrane switch to select Bypass Mode as the machine's operational mode.
- Press **AUTO** membrane switch to start the machine in Bypass Mode.

The machine is now in Bypass mode.

6.0 Switches Description and Function

6.1 Membrane Switches

FUNCTION	DESCRIPTION
AUTO	Press AUTO membrane switch to operate the machine in Auto mode.
STOP	Press STOP membrane switch to stop the machine's operation (Stop Mode).
BYPASS	Press BYPASS membrane switch to select Bypass Mode as the machine's operational mode. Thereafter, start the machine's Bypass Mode operation by pressing the AUTO membrane switch <i>Note: BYPASS membrane switch can only be activated in Manual Mode.</i>
MANUAL	Press MANUAL membrane switch to switch the machine to Manual mode. <i>Note: This membrane switch can only be activated in Stop Mode.</i>
TRIGGER STEP	Press TRIGGER STEP membrane switch to manually trigger the movement of rail cylinder, bulk clamp, separator cylinder, release cylinder and belt motors. <ul style="list-style-type: none"> ▪ Press for the 1st time to extend the Rail Support Board cylinder; ▪ Press for the 2nd time to activate the Bulk clamp; ▪ Press for the 3rd time to retract the Rail cylinder to its mid position; ▪ Press for the 4th time to activate the Separate Board cylinder; ▪ Press for the 5th time to activated the Release Board cylinder; ▪ Press for the 6th time to retract the Rail cylinder to its home position; ▪ Press for the 7th time to turn on the Belt motors. <i>Note: This membrane switch can only be activated in Manual Mode.</i>

REPEAT STEP	Press REPEAT membrane switch to repeat the previous selected step. <i>Note: This membrane switch can only be activated in Manual mode.</i>
ATTACH CONV.	Press ATTACH CONV. membrane switch to manually run the Attached Conveyor's Belt motors. <i>Note: This membrane switch can only be activated in Manual mode.</i>
LOAD	Press LOAD membrane switch to stop the machine's loading sequence in Auto Mode to be able to load in PCBs on the Stacker Unit.

6.2 Push Button

FUNCTION	DESCRIPTION
RESET (PB-1)	When Emergency Switch (EM-1) is pressed, all operations will stop. Release the Emergency Switch (EM-1) by turning it clockwise. Thereafter, press RESET push button to resume machine operation.

7.0 Tower Light Indications

COLOUR	STATUS	DESCRIPTION
Red (T-3)	Flickering	Indicating machine errors. Alarm Buzzer (if installed) will sound intermittently. Press STOP membrane switch to reset the error. Indicating that the Cover Switch is opened if Amber (T-2) light is flickering at the same time.
	Permanent	Machine in Stop mode.
Amber (T-2)	Flickering	No PCBs in the machine during Auto Mode. Indicating that the Cover Switch is opened if Red (T-3) light is flickering at the same time.
	Permanent	Machine in Manual mode.
Green (T-1)	Permanent	Machine in Auto mode.

8.0 Start Up Procedures and Operating Sequence

8.1 Start Up Procedures

1. Ensure that Emergency switch (EM-1) is not activated.
2. Ensure that all Safety switches (if any) are closed.
3. Turn on the Power Switch (SW-1).
4. Turn on the Air Regulator.
5. Load in Bare PCBs onto the Stacker.

*Note: When loading PCBs in Auto Mode, **LOAD** membrane switch must be pressed first to be able to stop the machine's loading sequence to be able to load PCBs safely.*

6. Press **AUTO** membrane switch to start the machine's operation in Non Bypass Mode (Section 8.2.1).
7. To operate the machine in Bypass Mode, press **BYPASS** membrane switch in Manual mode. Thereafter, press **AUTO** membrane switch to start the machine's operation in Bypass Mode (Section 8.2.2).

8.2 Operating Sequence

8.2.1 Non Bypass Mode

1. Upon activation of the **AUTO** membrane switch, Conveyor's Belt motors (M-1 & M-2) will turn on a few seconds for initial run.
2. After initial run and no PCB is detected at Outlet sensor (PHS-3) position, the Rail Cylinder (SV-4 activated) will extend to Remote Position Reed Switch (RS-2) position.
3. When the Remote Position Reed Switch (RS-2) is activated, Bulk Clamp Cylinder (SV-1 activated) will extend to clamp the PCBs on the Stacker Unit.
4. The Rail cylinder (SV-5 activated) will retract to In Position Reed Switch (RS-3) position.
5. Upon the activation of In Position Reed Switch (RS-3), Separator Cylinder (SV-2 activated) will then extend to separate the lowest board in the Stacker Unit.

6. Once the board is separated, the Separator cylinder (SV-2 deactivated) will retract.
7. Thereafter, the Release cylinder (SV-3 activated) will extend to release the PCB.
8. Once the board is released, the Release Cylinder (SV-3 de-activated) will retract.
9. The board will be released onto the Rail Support unit.
10. Once the PCB is released to the Rail Support unit, the Bulk Clamp Cylinder (SV-1) will retract.
11. At the same time, the Rail cylinder (SV-5 activated) will retract to its home position.
12. Upon the activation of Home Position Reed Switch (RS-1), Conveyor's Belt motors (M-1 & M-2) will turn on to transfer the PCB to the Outlet sensor (PHS-3) position.
13. Simultaneously, the PCBs on the Stacker Unit will be stacked down.
14. Upon the activation of Outlet sensor (PHS-3), Conveyor's Belt motors (M-1 & M-2) will stop.
15. If the Attached Conveyor is empty, Conveyor's Belt motors (M-1 & M-2) and Attached Conveyor's Belt motors (M-3 & M-4) will turn on to transfer the PCB to the Attached Conveyor Exit sensor (PHS-4) position.
16. Once the PCB clears Outlet sensor (PHS-3), Conveyor's Belt motors (M-1 & M-2) will stop.
17. When Attached Conveyor Exit sensor (PHS-4) is activated, Attached Conveyor's Belt motors (M-3 & M-4) will stop.
18. The machine will send a Downstream Board Available (DBA) signal to Downstream machine.

19. Upon receiving a returned Downstream Busy (DSB) signal, Attached Conveyor's Belt motors (M-3 & M-4) will turn on again to transfer the PCB to Downstream machine.
20. Once the PCB clears Attached Conveyor Exit sensor (PHS-4), DBA signal will be cut off and Attached Conveyor's Belt motors (M-3 & M-4) will stop.
21. The sequence repeats until **STOP** membrane switch is pressed, the Power supplied to the machine is cut off or the mode of operation is changed.

8.2.2 Bypass Mode

1. Upon the activation of **BYPASS** membrane switch followed by **AUTO** membrane switch, Conveyor's Belt motors (M-1 & M-2) will turn on a few seconds for initial run.
2. Upon receiving an Upstream Board Available (UBA) signal, the machine will return an Upstream Busy (USB) signal to Upstream machine when it is ready to receive a PCB.
3. A PCB will be transferred from Upstream machine onto the Conveyor.
4. When Inlet sensor (PHS-2) is activated, Conveyor's Belt motors (M-1 & M-2) will turn on to transfer the PCB to the Outlet sensor (PHS-3) position.
5. Once the PCB clears Inlet sensor (PHS-2), the USB signal will be cut off.
6. Upon the activation of Outlet sensor (PHS-3), Conveyor's Belt motors (M-1 & M-2) will stop.
7. If the Attached Conveyor is empty, Conveyor's Belt motors (M-1 & M-2) and Attached Conveyor's Belt motors (M-3 & M-4) will turn on to transfer the PCB to the Attached Conveyor Exit sensor (PHS-4) position.
8. Once the PCB clears Outlet sensor (PHS-3), Conveyor's Belt motors (M-1 & M-2) will stop.
9. When Attached Conveyor Exit sensor (PHS-4) is activated, Attached Conveyor's Belt motors (M-3 & M-4) will stop.
10. The machine will send a Downstream Board Available (DBA) signal to Downstream machine.
11. Upon receiving a returned Downstream Busy (DSB) signal, Attached Conveyor's Belt motors (M-3 & M-4) will turn on again to transfer the PCB to Downstream machine.
12. Once the PCB clears Attached Conveyor Exit sensor (PHS-4), DBA signal will be cut off and Attached Conveyor's Belt motors (M-3 & M-4) will stop.

13. The machine is now ready to receive the next PCB from Upstream machine.
14. The sequence repeats until **STOP** membrane switch is pressed, the Power supplied to the machine is cut off or the mode of operation is changed.

- Note:*
- *When Emergency Switch (EM-1) is pressed, all operations will stop. Release the Emergency Switch (EM-1) by turning it clockwise. Thereafter, press **RESET** push button (PB-1) to resume machine operation.*

 - *Short the UBA pins if SMEMA communication is in not use.*