Note
This document applies to the entire series.

Order number
P/N = Order number for Nordson articles

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<th>Phone</th>
<th>Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>86-21-3866 9166</td>
<td>86-21-3866 9199</td>
</tr>
</tbody>
</table>

**Japan**

<table>
<thead>
<tr>
<th>Country</th>
<th>Phone</th>
<th>Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>81-3-5762 2700</td>
<td>81-3-5762 2701</td>
</tr>
</tbody>
</table>

**North America**

<table>
<thead>
<tr>
<th>Country</th>
<th>Phone</th>
<th>Fax</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>1-905-475 6730</td>
<td>1-905-475 8821</td>
</tr>
<tr>
<td>USA</td>
<td>1-770-497 3400</td>
<td>1-770-497 3500</td>
</tr>
<tr>
<td></td>
<td>Hot Melt 1-880-433 9319</td>
<td>1-888-229 4580</td>
</tr>
<tr>
<td></td>
<td>Finishing 1-440-985 4592</td>
<td>1-440-985 4593</td>
</tr>
<tr>
<td></td>
<td>Nordson UV 1-440-985 4592</td>
<td>1-440-985 4593</td>
</tr>
</tbody>
</table>
Section 1
Safety

Read this section before using the equipment. This section contains recommendations and practices applicable to the safe installation, operation, and maintenance (hereafter referred to as “use”) of the product described in this document (hereafter referred to as “equipment”). Additional safety information, in the form of task-specific safety alert messages, appears as appropriate throughout this document.

WARNING! Failure to follow the safety messages, recommendations, and hazard avoidance procedures provided in this document can result in personal injury, including death, or damage to equipment or property.

Safety Alert Symbols

The following safety alert symbol and signal words are used throughout this document to alert the reader to personal safety hazards or to identify conditions that may result in damage to equipment or property. Comply with all safety information that follows the signal word.

WARNING! Indicates a potentially hazardous situation that, if not avoided, can result in serious personal injury, including death.

CAUTION! Indicates a potentially hazardous situation that, if not avoided, can result in minor or moderate personal injury.

CAUTION! (Used without the safety alert symbol) Indicates a potentially hazardous situation that, if not avoided, can result in damage to equipment or property.
Responsibilities of the Equipment Owner

Equipment owners are responsible for managing safety information, ensuring that all instructions and regulatory requirements for use of the equipment are met, and for qualifying all potential users.

Safety Information

- Research and evaluate safety information from all applicable sources, including the owner-specific safety policy, best industry practices, governing regulations, material manufacturer's product information, and this document.
- Make safety information available to equipment users in accordance with governing regulations. Contact the authority having jurisdiction for information.
- Maintain safety information, including the safety labels affixed to the equipment, in readable condition.

Instructions, Requirements, and Standards

- Ensure that the equipment is used in accordance with the information provided in this document, governing codes and regulations, and best industry practices.
- If applicable, receive approval from your facility's engineering or safety department, or other similar function within your organization, before installing or operating the equipment for the first time.
- Provide appropriate emergency and first aid equipment.
- Conduct safety inspections to ensure required practices are being followed.
- Re-evaluate safety practices and procedures whenever changes are made to the process or equipment.
User Qualifications

Equipment owners are responsible for ensuring that users:

- receive safety training appropriate to their job function as directed by governing regulations and best industry practices
- are familiar with the equipment owner’s safety and accident prevention policies and procedures
- receive equipment- and task-specific training from another qualified individual

**NOTE:** Nordson can provide equipment-specific installation, operation, and maintenance training. Contact your Nordson representative for information

- possess industry- and trade-specific skills and a level of experience appropriate to their job function
- are physically capable of performing their job function and are not under the influence of any substance that degrades their mental capacity or physical capabilities

Applicable Industry Safety Practices

The following safety practices apply to the use of the equipment in the manner described in this document. The information provided here is not meant to include all possible safety practices, but represents the best safety practices for equipment of similar hazard potential used in similar industries.

Intended Use of the Equipment

- Use the equipment only for the purposes described and within the limits specified in this document.
- Do not modify the equipment.
- Do not use incompatible materials or unapproved auxiliary devices. Contact your Nordson representative if you have any questions on material compatibility or the use of non-standard auxiliary devices.
Instructions and Safety Messages

- Read and follow the instructions provided in this document and other referenced documents.
- Familiarize yourself with the location and meaning of the safety warning labels and tags affixed to the equipment. Refer to Safety Labels and Tags at the end of this section.
- If you are unsure of how to use the equipment, contact your Nordson representative for assistance.

Installation Practices

- Install the equipment in accordance with the instructions provided in this document and in the documentation provided with auxiliary devices.
- Ensure that the equipment is rated for the environment in which it will be used. This equipment has not been certified for compliance with the ATEX directive nor as nonincendive and should not be installed in potentially explosive environments.
- Ensure that the processing characteristics of the material will not create a hazardous environment. Refer to the Material Safety Data Sheet (MSDS) for the material.
- If the required installation configuration does not match the installation instructions, contact your Nordson representative for assistance.
- Position the equipment for safe operation. Observe the requirements for clearance between the equipment and other objects.
- Install lockable power disconnects to isolate the equipment and all independently powered auxiliary devices from their power sources.
- Properly ground all equipment. Contact your local building code enforcement agency for specific requirements.
- Ensure that fuses of the correct type and rating are installed in fused equipment.
- Contact the authority having jurisdiction to determine the requirement for installation permits or inspections.

Operating Practices

- Familiarize yourself with the location and operation of all safety devices and indicators.
- Confirm that the equipment, including all safety devices (guards, interlocks, etc.), is in good working order and that the required environmental conditions exist.
- Use the personal protective equipment (PPE) specified for each task. Refer to Equipment Safety Information or the material manufacturer’s instructions and MSDS for PPE requirements.
- Do not use equipment that is malfunctioning or shows signs of a potential malfunction.


**Maintenance and Repair Practices**

- Allow only personnel with appropriate training and experience to operate or service the equipment.
- Perform scheduled maintenance activities at the intervals described in this document.
- Relieve system hydraulic and pneumatic pressure before servicing the equipment.
- De-energize the equipment and all auxiliary devices before servicing the equipment.
- Use only new Nordson-authorized refurbished or replacement parts.
- Read and comply with the manufacturer’s instructions and the MSDS supplied with equipment cleaning compounds.
  
  **NOTE:** MSDSs for cleaning compounds that are sold by Nordson are available at www.nordson.com or by calling your Nordson representative.
- Confirm the correct operation of all safety devices before placing the equipment back into operation.
- Dispose of waste cleaning compounds and residual process materials according to governing regulations. Refer to the applicable MSDS or contact the authority having jurisdiction for information.
- Keep equipment safety warning labels clean. Replace worn or damaged labels.

**Equipment Safety Information**

This equipment safety information is applicable to the following types of Nordson equipment:

- hot melt and cold adhesive application equipment and all related accessories
- pattern controllers, timers, detection and verification systems, and all other optional process control devices
Equipment Shutdown

To safely complete many of the procedures described in this document, the equipment must first be shut down. The level of shut down required varies by the type of equipment in use and the procedure being completed. If required, shut down instructions are specified at the start of the procedure. The levels of shut down are:

Relieving System Hydraulic Pressure

Completely relieve system hydraulic pressure before breaking any hydraulic connection or seal. Refer to the melter-specific product manual for instructions on relieving system hydraulic pressure.

De-energizing the System

Isolate the system (melter, hoses, applicators, and optional devices) from all power sources before accessing any unprotected high-voltage wiring or connection point.

1. Turn off the equipment and all auxiliary devices connected to the equipment (system).
2. To prevent the equipment from being accidentally energized, lock and tag the disconnect switch(es) or circuit breaker(s) that provide input electrical power to the equipment and optional devices.

   NOTE: Government regulations and industry standards dictate specific requirements for the isolation of hazardous energy sources. Refer to the appropriate regulation or standard.

Disabling the Applicators

NOTE: Adhesive dispensing applicators are referred to as “guns” in some previous publications.

All electrical or mechanical devices that provide an activation signal to the applicators, applicator solenoid valve(s), or the melter pump must be disabled before work can be performed on or around an applicator that is connected to a pressurized system.

1. Turn off or disconnect the applicator triggering device (pattern controller, timer, PLC, etc.).
2. Disconnect the input signal wiring to the applicator solenoid valve(s).
3. Reduce the air pressure to the applicator solenoid valve(s) to zero; then relieve the residual air pressure between the regulator and the applicator.
General Safety Warnings and Cautions

Table 1-1 contains the general safety warnings and cautions that apply to Nordson hot melt and cold adhesive equipment. Review the table and carefully read all of the warnings or cautions that apply to the type of equipment described in this manual.

Equipment types are designated in Table 1-1 as follows:

- **HM** = Hot melt (melters, hoses, applicators, etc.)
- **PC** = Process control
- **CA** = Cold adhesive (dispensing pumps, pressurized container, and applicators)

Table 1-1 General Safety Warnings and Cautions

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Warning or Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HM</strong></td>
<td>![WARNING] Hazardous vapors! Before processing any polyurethane reactive (PUR) hot melt or solvent-based material through a compatible Nordson melter, read and comply with the material's MSDS. Ensure that the material's processing temperature and flashpoints will not be exceeded and that all requirements for safe handling, ventilation, first aid, and personal protective equipment are met. Failure to comply with MSDS requirements can cause personal injury, including death.</td>
</tr>
<tr>
<td><strong>HM</strong></td>
<td>![WARNING] Reactive material! Never clean any aluminum component or flush Nordson equipment with halogenated hydrocarbon fluids. Nordson melters and applicators contain aluminum components that may react violently with halogenated hydrocarbons. The use of halogenated hydrocarbon compounds in Nordson equipment can cause personal injury, including death.</td>
</tr>
<tr>
<td><strong>HM, CA</strong></td>
<td>![WARNING] System pressurized! Relieve system hydraulic pressure before breaking any hydraulic connection or seal. Failure to relieve the system hydraulic pressure can result in the uncontrolled release of hot melt or cold adhesive, causing personal injury.</td>
</tr>
</tbody>
</table>

Continued...
## General Safety Warnings and Cautions (contd.)

### Table 1-1 General Safety Warnings and Cautions (contd)

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Warning or Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM</td>
<td><strong>WARNING!</strong> Molten material! Wear eye or face protection, clothing that protects exposed skin, and heat-protective gloves when servicing equipment that contains molten hot melt. Even when solidified, hot melt can still cause burns. Failure to wear appropriate personal protective equipment can result in personal injury.</td>
</tr>
<tr>
<td>HM, PC</td>
<td><strong>WARNING!</strong> Equipment starts automatically! Remote triggering devices are used to control automatic hot melt applicators. Before working on or near an operating applicator, disable the applicator's triggering device and remove the air supply to the applicator's solenoid valve(s). Failure to disable the applicator's triggering device and remove the supply of air to the solenoid valve(s) can result in personal injury.</td>
</tr>
<tr>
<td>HM, CA, PC</td>
<td><strong>WARNING!</strong> Risk of electrocution! Even when switched off and electrically isolated at the disconnect switch or circuit breaker, the equipment may still be connected to energized auxiliary devices. De-energize and electrically isolate all auxiliary devices before servicing the equipment. Failure to properly isolate electrical power to auxiliary equipment before servicing the equipment can result in personal injury, including death.</td>
</tr>
<tr>
<td>HM, CA, PC</td>
<td><strong>WARNING!</strong> Risk of fire or explosion! Nordson adhesive equipment is not rated for use in explosive environments and has not been certified for the ATEX directive or as nonincendive. In addition, this equipment should not be used with solvent-based adhesives that can create an explosive atmosphere when processed. Refer to the MSDS for the adhesive to determine its processing characteristics and limitations. The use of incompatible solvent-based adhesives or the improper processing of solvent-based adhesives can result in personal injury, including death.</td>
</tr>
</tbody>
</table>

Continued...
### Table 1-1 General Safety Warnings and Cautions (contd)

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Warning or Caution</th>
</tr>
</thead>
<tbody>
<tr>
<td>HM, CA, PC</td>
<td><strong>WARNING!</strong> Allow only personnel with appropriate training and experience to operate or service the equipment. The use of untrained or inexperienced personnel to operate or service the equipment can result in injury, including death, to themselves and others and can damage to the equipment.</td>
</tr>
<tr>
<td>HM</td>
<td><strong>CAUTION!</strong> Hot surfaces! Avoid contact with the hot metal surfaces of applicators, hoses, and certain components of the melter. If contact can not be avoided, wear heat-protective gloves and clothing when working around heated equipment. Failure to avoid contact with hot metal surfaces can result in personal injury.</td>
</tr>
<tr>
<td>HM</td>
<td><strong>CAUTION!</strong> Some Nordson melters are specifically designed to process polyurethane reactive (PUR) hot melt. Attempting to process PUR in equipment not specifically designed for this purpose can damage the equipment and cause premature reaction of the hot melt. If you are unsure of the equipment’s ability to process PUR, contact your Nordson representative for assistance.</td>
</tr>
<tr>
<td>HM, CA</td>
<td><strong>CAUTION!</strong> Before using any cleaning or flushing compound on or in the equipment, read and comply with the manufacturer’s instructions and the MSDS supplied with the compound. Some cleaning compounds can react unpredictably with hot melt or cold adhesive, resulting in damage to the equipment.</td>
</tr>
<tr>
<td>HM</td>
<td><strong>CAUTION!</strong> Nordson hot melt equipment is factory tested with Nordson Type R fluid that contains polyester adipate plasticizer. Certain hot melt materials can react with Type R fluid and form a solid gum that can clog the equipment. Before using the equipment, confirm that the hot melt is compatible with Type R fluid.</td>
</tr>
</tbody>
</table>
Other Safety Precautions

- Do not use an open flame to heat hot melt system components.
- Check high pressure hoses daily for signs of excessive wear, damage, or leaks.
- Never point a dispensing handgun at yourself or others.
- Suspend dispensing handguns by their proper suspension point.

First Aid

If molten hot melt comes in contact with your skin:

1. Do NOT attempt to remove the molten hot melt from your skin.
2. Immediately soak the affected area in clean, cold water until the hot melt has cooled.
3. Do NOT attempt to remove the solidified hot melt from your skin.
4. In case of severe burns, treat for shock.
5. Seek expert medical attention immediately. Give the MSDS for the hot melt to the medical personnel providing treatment.
Safety Labels and Tags

Figure 1-1 shows the location of the safety labels and tags that are affixed to the system. Table 1-2 provides the text of any safety instruction that appears on the labels as well as the meaning of the symbols that appear without any safety message.

Fig. 1-1 Placement of safety signs and labels

<table>
<thead>
<tr>
<th>Position</th>
<th>P/N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>290083</td>
<td><strong>ATTENTION</strong>: Risk of electrical shock. Failure to observe may result in personal injury, death, or equipment damage.</td>
</tr>
<tr>
<td>2</td>
<td>290081</td>
<td><strong>CAUTION</strong>: Hot surface. Failure to observe may result in burns.</td>
</tr>
<tr>
<td>3</td>
<td>421461</td>
<td><strong>ATTENTION</strong>: Risk of being drawn in by the worm. Do not operate the extruder without the hopper. Do not operate the hopper without the protective grating when filling manually.</td>
</tr>
</tbody>
</table>
Section 2
Introduction

Intended Use

Extruders in the series EEX, hereafter also referred to as System, may be used only to melt and feed thermoplastic hot melt adhesives or thermoplastic raw material used to produce adhesives.

Any other use is considered to be unintended. Nordson will not be liable for personal injury and/or property damage resulting from unintended use.

Intended use includes the observance of Nordson safety instructions. Nordson recommends obtaining detailed information on the materials to be used.

Area of Use (EMC)

The electromagnetic compatibility of the system is such that it is intended to be used in industrial areas.

Operating Restrictions

When using in residential, business or industrial areas, the system may cause interference with other units, e.g. radios.

Unintended Use - Examples -

The extruder may not be used under the following conditions:

- In defective condition
- When changes or modifications have been made by the customer
- Without safety guard, hoods and protective covers
- With electrical cabinet door open
- When the hopper lid is open
- In a potentially explosive atmosphere
- When the values stated under Technical Data are not complied with.

The extruder may not be used to process the following materials:

- Explosive and flammable materials
- Erosive and corrosive materials
- Food products.
Restricted Use

When abrasive or chemically aggressive materials are used, the serviceable life of wearing parts, particularly pumps, is greatly reduced.

When hot melt adhesives are used that are highly viscous and/or that contain additives, the built-in standard pumps are subjected to greater wear. As an alternative, specially hardened pumps with relatively longer serviceable lives can be supplied.

When in doubt, please contact your Nordson representative.

Residual Risks

In the design of the unit, every measure was taken to protect personnel from potential danger. However, some residual risks cannot be avoided:

• Risk of burns from hot adhesive
• Risk of burns from hot system components
• Risk of burns when filling the hopper
• Risk of burns when conducting maintenance and repair work for which the system must be heated up
• Risk of burns from heated accessories such as heated hoses and applicators
• Risk of being drawn in by the worm! The extruder may not be operated without the hopper.
• Material fumes can be hazardous. Avoid inhalation.

Note on Manual

• The actual extruder model can deviate from the illustrations.
• An application head is referred to as an applicator in newer Nordson literature. Pilot voltage is also referred to as key-to-line.
• Depending on the size and type of the extruder, some configurations may not be permitted or they may be mutually exclusive.

• CAUTION: The extruder is intended for Automatic mode. Manual mode is to be equated with service mode (setup/testing) here. Operation in manual mode means lock-free. For this reason, only specially authorized personnel may operate the extruder in manual mode.
EMERGENCY OFF / EMERGENCY STOP

EMERGENCY STOP is generally implemented. Refer to the system wiring diagram.

EMERGENCY STOP, category 0: All drives are immediately shut down when the button is pressed.
EMERGENCY OFF: When the button is pressed, all drives are immediately switched off and the power supply to the system's heating circuits is stopped.

Both variations will hereafter be referred to as EMERGENCY OFF.

ID Plate

There are two ID plates. One is on the outside of the system, the other in the electrical cabinet.

<table>
<thead>
<tr>
<th>EEX200</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serial No:</td>
<td>5</td>
<td>Year</td>
</tr>
</tbody>
</table>

Fig. 2-1 Example

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Designation for Nordson extruder</td>
<td>Order number</td>
<td>Configuration code</td>
<td>Electrical connection, operating voltage, line voltage frequency, melter fuse protection</td>
<td>Serial number</td>
</tr>
</tbody>
</table>

Year Month

NOTE: The year and month of production are indicated within the serial number.

6 Year of construction
### Configuration Code

<table>
<thead>
<tr>
<th>Box</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EEX200-</td>
<td>Nordson extruder approximate melting and feeding capacity in l/h (with EVA)</td>
</tr>
<tr>
<td>2</td>
<td>F</td>
<td>FeKo (FeCuNi) temperature sensor</td>
</tr>
<tr>
<td></td>
<td>P</td>
<td>Pt100 temperature sensor</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>Ni120 temperature sensor</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
<td>No metering station</td>
</tr>
<tr>
<td></td>
<td>1</td>
<td>Single metering station (1 pump)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Single metering station with recirculation connection (1 outlet / 1 inlet)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Double metering station (2 pumps)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Double metering station with recirculation connections (2 outlets / 2 inlets)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>4-fold metering station</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>No pump</td>
</tr>
<tr>
<td></td>
<td>A</td>
<td>maximum 10 l/h per pump</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>maximum 20 l/h per pump</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>maximum 40 l/h per pump</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>maximum 80 l/h per pump</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td>maximum 160 l/h per pump</td>
</tr>
<tr>
<td></td>
<td>H</td>
<td>maximum 220 l/h per pump</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>Hose connection 8 mm</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Hose connection 13 mm</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>Hose connection 16 mm</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Hose connection 20 mm</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Hose connection 32 mm</td>
</tr>
<tr>
<td>6</td>
<td>R</td>
<td>Water chiller on extruder frame</td>
</tr>
<tr>
<td></td>
<td>K</td>
<td>Separate water chiller</td>
</tr>
<tr>
<td></td>
<td>X</td>
<td>No water chiller (The customer supplies the required cooling water)</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>1 level sensor Hopper empty</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2 level sensors Hopper almost empty / empty</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>3 level sensors Hopper full / almost empty / empty</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>NOTE:</strong> &quot;3&quot; is required for automatic filling</td>
</tr>
<tr>
<td>8</td>
<td>T</td>
<td>Standby</td>
</tr>
<tr>
<td>9</td>
<td>W</td>
<td>Seven-day clock</td>
</tr>
<tr>
<td>10</td>
<td>G</td>
<td>Safety guard (protective grating in hopper)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>NOTE:</strong> &quot;G&quot; is required for manual filling</td>
</tr>
<tr>
<td>11</td>
<td>X</td>
<td>Unit feet</td>
</tr>
<tr>
<td></td>
<td>M</td>
<td>Wheels</td>
</tr>
<tr>
<td>12</td>
<td>Q</td>
<td>Hoop guard for pressure sensor</td>
</tr>
<tr>
<td>13</td>
<td>1</td>
<td>Number of additional electrical hose/applicator connections</td>
</tr>
<tr>
<td>14</td>
<td>X</td>
<td>Standard configuration</td>
</tr>
<tr>
<td></td>
<td>S</td>
<td>Special feature (described in a separate document when applicable)</td>
</tr>
</tbody>
</table>
Function

The filling hopper is filled with dry, pourable adhesive granulate that reaches the screw conveyor inlet through the force of gravity. Cylinder feed cooling prevents the granulate from melting in the hopper. The worm conveyor moves the granulate to the heated worm cylinder, where it is melted.

If a metering station is connected, extruder driving is pressure-controlled. The extruder supplies admission pressure of max. 25 bar for the metering station pumps.

Fig. 2-1 Example of an EEX10

1 Hopper above the worm conveyor inlet
2 Feed cylinder with end flange
3 Electrical gear motor to drive the worm conveyor
4 Worm conveyor
5 Heating cuffs
6 Cylinder feed cooling
7 Level detection
8 Pressure sensor
9 Piston pressure switch
10 Temperature sensors
11 Access hole
Description of Components

Illustration of EEX200

Fig. 2-2 Example: EEX200 with electrical cabinet, double metering station and water chiller

1 Unit foot
2 Worm drive motor
3 Bearing shield
4 Drain plug
5 Worm cylinder
6 Temperature sensor
7 Heating cuff
8 Support block
9 Pressure sensor
10 Piston pressure switch
11 Electrical equipment cover
12 Pump connection block
13 Gear pump
14 Coupling
15 Gear pump drive motor
16 Hopper
17 Hopper lid
18 Cooling element
19 Extruder frame
20 Water chiller
21 Hoop guard for sensor
22 Level sensor
23 Pneumatic unit
Fig. 2-3  Example

24  Indication lamp *Ready*
25  Control panel
26  Indication lamp *Overtemperature*
27  Reset button
28  Operating switch *Extruder*
29  Speed display *Pump 1*
30  Motor potentiometer *Pump 1*
31  Operating switch *Pump 2*
32  Speed display *Pump 2*
33  Motor potentiometer *Pump 2*
34  Operating switch *Pump 1*
35  Interface *Heaters + sensors*
36  Interface *Heaters + sensors*
37  Interface *Heaters + sensors*
38  Interface *Heaters + sensors*
39  Interface *Heaters + sensors*
40  Power supply
41  ID plate
42  Electrical cabinet ventilation
43  Main switch
44  Indication lamp *Undertemperature*
45  Interface *Heaters + sensors*
46  Interface *Pilot voltage-controlled mode*
47  Interface *Standard I/O*
48  Interface *Ready for production*
49  Interface *Applicator*

Note: The control panel is described in a separate manual.
Illustration of EEX10

Fig. 2-4 Example: EEX10 with control panel and single metering station

1 Unit foot
2 Worm drive motor
3 Bearing shield
4 Drain plug
5 Worm cylinder
6 Temperature sensor*
7 Heating cuff*
8 Support block
9 Pressure sensor
10 Piston pressure switch
11 Electrical equipment cover
12 Pump connection block*
13 Gear pump*
14 Coupling*
15 Gear pump drive motor
16 Hopper
17 Hopper lid
18 Cooling element
19 Extruder frame
20 -
21 -
22 Level sensor
23 Cover

* Under the hood / protective cover
Fig. 2-5 Example

24 Electrical cabinet ventilation  
25 Control panel  
26 Indication lamp Undertemperature  
27 Indication lamp Ready  
28 Indication lamp Overtemperature  
29 Reset button  
30 Speed display  
31 Motor potentiometer  
32 Operating switch Pump  
33 Operating switch Extruder  
34 Operating switch Applicator  
35 ID plate  
36 Main switch  
37 Interface plug X8  
38 Interface plug X9  
39 Interface plug X1.1  
40 Interface Standard I/O  
41 Interface plug X1  
42 Interface plug X2  
43 Power supply

Note: The control panel is described in a separate manual
Protective Devices

Protective Covers


The protective covers can be removed for repair and maintenance purposes.

Covers

CAUTION: Do not operate the extruder without the covers.

The covers protect from the heated worm cylinder.
The covers have to be removed to tighten the heating cuffs or to remove the worm. On some models the covers are secured with a screw (arrow), which must be released before the cover can be removed.

Safety Guard

There is a protective grating in the hopper for manual filling. It prevents reaching into the hopper during filling.

Overtemperature Protection

The system is protected from overheating.

When the trigger temperature is exceeded, the heating circuit is interrupted.
The fuses are mounted on each controlled heating circuit, with the exception of the worm.

Pneumatic Assembly and Pneumatic Bypass

The pressure relief valve opens e.g. when EMERGENCY OFF occurs to quickly relieve the worm of pressure.

Not on all extruder sizes.
Pressure Control / Pressure Monitoring

**Electronic Pressure Control and Switchoff**

The pressure sensor (1) continuously compiles the current adhesive pressure. The electronic pressure control regulates the worm speed according to the digitally set setpoint pressure.

If the actual pressure exceeds the setpoint pressure by an adjustable value, the software switches all drives off.

**NOTE:** Information on the pressure sensor with integrated evaluation electronics can be found in Appendix B.

**Piston Pressure Switch**

The piston pressure switch (2) constantly monitors the current adhesive pressure and switches off the drive at the preset limit.

Fig. 2-6  Example without metering station

**Drive**

The system is driven electromechanically by a pressure or speed controlled three-phase current drive consisting of a three-phase gear motor with motor controller.

The motor causes the worm conveyor to turn. The channels along the worm conveyor feed the granulate.

With its high heating capacity, the motor contributes significantly to heat generation.

**Hopper**

**ATTENTION:** Risk of being drawn in by worm. The extruder may not be filled manually unless the protective grating is in the hopper.

Depending on the number of level sensors (can be set), these levels can be indicated:

- Hopper empty (1)
- Hopper almost empty
- Hopper full
**Filling Area**

The filling area consists of a water-cooled filling piece and a filling hopper. The granulate is supplied through the hopper. The hopper is release coated.

**Worm Conveyor**

The geometry of the worm conveyor generates a defined compression. Heat energy and frictional heat work together to melt the granulate.

The worm conveyor is divided into three different zones:

1. Feed zone
2. Compression zone
3. Pumping zone

Proper, homogenous melting is achieved with a good balance of heat energy and frictional heat.

Since the frictional heat is also a factor of the worm conveyor speed, an optimal speed can often be found for a parameter set. The optimal speed is determined upon initial startup using the adhesive granulate supplied.

Because there are so many different adhesives available for extruders, a temperature profile for the material is created based on the specific granulate.

**Worm Cylinder**

Depending on what is ordered, the inner bore of the worm cylinder is either nitrided, specially nitrided or made of bimetal. It may be equipped with a resin bushing in some places. This is important for processing abrasive adhesives.

**Heating Cuff**

The worm conveyor is equipped with adjustable heating zones. Electrical resistance heating cuffs are used for heating.

They encircle the cylinder along the entire length. The current temperatures of the individual heating zones can be set and viewed on the control panel of the FP13.

Temperature sensors compile the temperature values.
**Cylinder Feed Cooling**

The temperature in the feeding section depends on the heat spreading from cylinder zone 1 and on the frictional heat generated by the worm.

The cylinder is cooled below the hopper in the draw-in area to ensure that the material remains pourable and to prevent an undesired reaction of the adhesive before processing.

Cooling can occur with a water chiller, or the customer can connect the extruder to his own cooling water circuit.

There is hose connecting piece for each water supply and water draining.

Cylinder feed cooling affects the output, which can differ by product and adhesive. Cooling intensity is controlled electronically by the water chiller.

Before the extruder is started up, it must be decided whether the feeding section should be operated *Hot* or *Cold*. This depends on the material to be processed.

*Hot* means approx. 40 to 60 °C.

*Cold* means approx. 15 to 20 °C.

---

**Extruder Flange**

If there is no metering station connected, the hose connection is located on the extruder flange. The pressure sensor and piston pressure switch are responsible for pressure display and/or pressure control as well as for overpressure shutdown.
Main Switch

NOTE: The optional water chiller has its own main switch, electrically located before the system's main switch. Refer to the wiring diagram.

There is a lockable main switch on the system's electrical cabinet. The switch is yellow, with a red knob. This switch acts as an EMERGENCY OFF device.

NOTE: The main switch must always be set to I/ON when using a seven-day clock.

- Used to switch the system on and off.
- Position 0/OFF = System is switched off
  Position I/ON = System is switched on

Padlocks can be used to protect the main switch from unauthorized access.
If multiple persons with different tasks (e.g. fitters, electricians) work on the extruder at the same time, each must place his own lock. Up to three locks can be attached.

Black Main Switch (Special Model)
Systems with a black main switch are normally supplied with power by a higher-ranking system; the higher-ranking main switch is on that system. The black main switch does not serve as an EMERGENCY OFF feature.
Connected components can still be energized!

EMERGENCY OFF Button (Special Model)

The EMERGENCY OFF button is yellow, with a red knob.
When the EMERGENCY OFF button has been pressed, it must be pulled out to be unlocked before switching on the system again.

Receptacle

The receptacle is located on the electrical cabinet / control panel. The separate water chiller is attached there.

Light Tower (Option)

The light tower indicates operating states. Refer to the section Troubleshooting for collective faults (Red indication lamp is lit).
Door Lock

**ATTENTION:** Risk of electrical shock. Failure to observe may result in personal injury, death, or equipment damage.

The electrical cabinet can be opened for installation, maintenance and repair. Store the included key such that it is accessible only to qualified and authorized personnel. The system may not be operated when the electrical cabinet is open.

Control Panel for Temperature Controller FP 13 (Standard Model)

On the control panel FP 13, values and parameters are set, and operating modes and faults are displayed. Refer to the section Operation and the separate manual FP 13.

Up to 15 temperature channels, also called zones, can be controlled. If necessary, a second control panel can control channels 16 to 30, etc.

Reducing Temperature Inside Electrical Cabinet

Electrical cabinet ventilation
A fan blows the warm air out of the electrical cabinet. The inlet and outlet filters must be serviced regularly.

Cooling element
The cooling element is made up of heat sink fins that convey the heat to the outside air.

Interfaces

Serve as a connection between the system and external devices. Refer to the system's wiring diagram for the specific interface designation and function.
Metering Station (Option)

When operated with a metering station, extruder driving is pressure-controlled and the extruder maintains a steady pressure for the metering station. Via the metering station, gear pump(s) supply the applicators with precisely metered adhesive quantities.

Variable output quantities from the applicator are thus possible in automatic mode.

1. Motor 1
2. Coupling
3. Gear pump 1
4. Pump connection block
5. Spacer
6. Access hole
7. Hose connection
8. Electrical equipment cover
9. Pressure sensor (output pressure extruder = preliminary pressure pumps)
10. Piston pressure switch

Piston Pressure Switch

One piston pressure switch per pump constantly monitors the current adhesive pressure and switches all motors (extruder and metering station) off at the set limit.

Overtemperature Fuse (Behind the Electrical Cabinet Cover)

Overtemperature shutdown by thermal fuse element (switchoff value 180 °C, 240 °C or 280 °C).

When they have been triggered, these irreversible thermal fuse elements have to be replaced.
Section 3
Installation

ATTENTION: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Before it leaves the factory, every extruder is set up, aligned and adjusted as it will be for production.
The extruder is normally delivered with the worm inside of the cylinder.
The base frame is sufficiently resistant to warping. Damage within the system is virtually impossible.

Unpacking

Unpack carefully. Then check for any damage caused during shipping. Transport damage must be documented by the shipper and immediately reported to Nordson.
Save the pallet and angle brackets for later use. Reuse packaging materials or dispose of properly according to local regulations.

Storage

Do not store system outside! Protect from humidity, dust and extreme temperature fluctuations (formation of condensation).

Removal

1. Empty the system.
2. If the extruder is to be out or service for an extended period, clean it with cleaning granulate (Refer to section Maintenance).
3. Disconnect all lines to the system, and allow the system to cool.

Disposal

Properly dispose of the system according to local regulations.
Transport

CAUTION: Observe with the option Casters: The base frame must be supported during transport. To prevent uncontrolled motion, the extruder may not rest on the casters.

- The system must be transported in a position that is suitable to production. Use transport protection if available.
- Use only suitable transport devices. Also refer to Lifting (Unpacked Unit).
- If possible, use the pallet on which the system was delivered, and fasten the system to the pallet
- Protect from damage, moisture and dust with suitable packing material
- Avoid jolts and vibrations.

Lifting (Unpacked Unit)

Lift only at the melter frame using suitable lifting equipment or a forklift. Refer to delivery note for weight.
Mounting

- Refer to Appendix C of the unit has a level compensating element.

  ![Image](image1.png)

- The light tower (option) must be screwed onto the electrical cabinet (It was removed before delivery).

- Check if there is a (red) transport protector in the unit. It should be removed before the equipment is started up.

  ![Image](image2.png)

Fig. 3-1 Example of transport protection

- **CAUTION:** After every transport, the motor, coupling and pump should be inspected and, if necessary, adjusted.
Installation Requirements

A horizontal surface is required for setting up the equipment.
- Set up only in an environment that corresponds to the stated Degree of Protection (Refer to section Technical Data).
- Do not set up in a potentially explosive atmosphere.
- Protect from vibration
- Remove transport protection (if present)
- Check that plug and screw connections are secure
- Provide sufficient clearance around the melter.

**NOTE:** Customers' accessories (e.g. tools) attached to the extruder should be supported or braced with appropriate devices. The supporting force of the support or brace should only act vertically. No shear forces that could cause the worm conveyor to warp should occur.

Space Requirement

Refer to the section Technical Data for the dimensions of standard systems.

Exhausting Adhesive Vapors

Ensure that adhesive vapors do not exceed the prescribed limits. Always observe the safety data sheet (MSDS) for the material to be processed.

If necessary, exhaust adhesive vapors and/or provide sufficient ventilation of the location of the system.

Installation Personnel's Experience

The instructions contained in this section are intended for personnel with experience/authorization in the following fields:
- Application methods with hot melt adhesive or similar materials
- Industrial electrical wiring of power and control lines
- Industrial mechanical installation
- General knowledge of process control.
Electrical Connections

**ATTENTION:** Risk of electrical shock. Failure to observe may result in personal injury, death, or equipment damage.

Before beginning installation work, the trained personnel should be made familiar with the circuit diagrams. The customer is responsible for correct dimensioning and design of the power cables.

Use of Residual Current Circuit Breakers

**NOTE:** There are local regulations applying to the use of a residual current circuit breaker in some countries and for some applications.

Then observe the following:

- It is imperative to install the residual current circuit breaker between the mains power supply and the system.
- Only residual current circuit breakers that react to pulsed currents or to all currents (> 30 mA) may be used.

Laying Cable

**ATTENTION:** Use only temperature resistant cable in the heating part of the system. Ensure that cables do not touch rotating and/or hot parts. Do not pinch cables and check regularly for damage. Replace damaged cables immediately!

**CAUTION:** Risk of stumbling. Place the cable that is outside of the system in channels.

All energy cables should be laid separately from the signal lines around the cable channels and cable ways. Energy cables and signal lines are identified accordingly. In the electrical cabinets, the cables should be properly fastened to the connection terminals on the intended cable catch rails and protected from tensile load.

The included connecting cables are used for electrical connection to the electrical cabinet.

The individual leads should be connected as indicated by the labels. A tight and secure clamp connection is essential.
**Line Voltage**

**ATTENTION:** Operate only with the line voltage stated on the ID plate.

**NOTE:** Permitted deviation from the rated line voltage is ±10%.

**NOTE:** The cross-section of the power cable must correspond to the rated current. Refer to ID plate for rated current.

The mains terminals are located in the electrical cabinet. Refer to wiring diagram for connecting arrangement.

**Protective Ground and Fuse Protection**

Ground the system and protect from short-circuiting according to the total power consumption (Refer to the ID plate). Voltage deviations within a range of +5% -5% can be tolerated.

The cables and plugs are connected at the customer’s facility according to plant regulations.

**External Control/Signal Circuits**

**ATTENTION:** Connect external control and signal circuits with suitable cable in accordance with the NEC, class 1. To avoid short-circuiting, lay and connect the cables according to the electronic specifications.

**Pneumatic Connection**

**Pneumatic Bypass (Pressure Relief)**

**NOTE:** Not on all extruder sizes.

- Compressed air connection: 6 bar (max. 8 bar)
- Air quality: oil-free
- Filter size: 40 µm

When the inlet pressure is too low (<2 bar), the system is switched off.
Connecting Interfaces

The connecting arrangements are shown in the wiring diagram.

**Standard I/O**

Serves as a connection between the system and external devices.

- Use only shielded cables/lines. The shield must be connected to ground in compliance with the standard regarding electromagnetic compatibility.
- Inductive loads (e.g. solenoid valves) connected to the system may be equipped with a protective device (e.g. recovery diode) that disables the inductive voltage generated when an inductive load is switched off.

**External EMERGENCY OFF Chain**

The signal triggered by the safety relay (EMERGENCY OFF module) is supplied at the interface.

**Pilot Voltage Input**

In key-to-line the motor/pump speed is regulated proportionately to the line speed.

Pilot voltage must be connected for key-to-line. The pilot voltage can be supplied e.g. by a tach generator (accessory) driven by the parent machine.

Some models with multiple pump drives have separate pilot voltage inputs for the two pump drives.

**CAUTION:** Pilot voltages of 0 - 10 V\text{DC} are standard. Pilot voltages >12 V\text{DC} can destroy the input assemblies.

Higher signal voltages are possible only with a coupler component. The tach generator adjustment board (Refer to Appendix A) used previously is no longer supplied.

![Coupler Component Example](Fig. 3-2 Example of coupler component P/N 7140205: 0 - 200 / 0 - 10 V\text{DC})
Connecting Heated Hose

Also refer to the hose manual.

Using Second Open-end Wrench

Use a second open-end wrench when connecting and disconnecting the heated hose. This prevents the hose connection on the unit from turning.

If cold adhesive can be found in the hose connection, these components (1, 2) must be heated until the adhesive softens (approx. 70 °C/158 °F, depending on the adhesive).

CAUTION: Nordson systems are usually subjected to extensive testing prior to shipment. There may be some of the test material left in the hose connection.

Connecting


1. First connect the hose (3) electrically.
2. Heat the system and hose until the adhesive softens.
3. Screw on heated hose.

CAUTION: If only one heated hose is attached per pump on a metering station, connect it to the lower receptacle. This prevents dead space that could cause the piston pressure switch to fail.

Disconnecting

ATTENTION: System and material pressurized. Before detaching, refer to Relieving Adhesive Pressure. Failure to observe can result in serious burns.

Relieving Adhesive Pressure


1. Set motor speed to 0 min-1 (rpm); switch off motor(s).
2. Place a suitable container under the applicator / assembly handgun.
3. Activate the applicator / assembly handgun electrically or manually. Repeat this procedure until no more adhesive flows out.
4. Properly dispose of adhesive according to local regulations.
Connecting Water Chiller (Option)

When a separate water chiller is used, its plug must also be inserted in the receptacle on the electrical cabinet / control panel.

**CAUTION:** The receptacle remains energized through the extruder's main switch even after the extruder is switched off.

Use treated water to cool the cylinder feed with a water chiller. Refer to *Water Specification*.
Water Installation

**ATTENTION:** No water may come into contact with the heating cuffs (heating element, plugs and cable connection). This is especially important for the water supply and recirculation of cylinder feed cooling!

**Observe When Using Own Cooling Water Supply**

The water in the cooling system must be within the operating pressure range of 2 to 4 bar and have an inlet temperature no higher than 18 °C. The maximum permitted deviation for cylinder feed cooling is +/- 0.2 bar.

**CAUTION:** All of the water recirculation lines must have a depressurized outlet. Do not close the valves during operation.

**CAUTION:** Risk of stumbling. Lay the water lines in channels.

**Water specification**

<table>
<thead>
<tr>
<th>Cooling</th>
<th>Treated water</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed zone</td>
<td>Total hardness max. 5° dH</td>
</tr>
<tr>
<td></td>
<td>Noncarbonate hardness max. 5° dH</td>
</tr>
<tr>
<td></td>
<td>pH value 8 - 9,5</td>
</tr>
<tr>
<td></td>
<td>Fe max. 0.04 mg/l</td>
</tr>
</tbody>
</table>

The water must be free of algae and suspended particles, and it may not contain any gaseous components such as chlorine, ozone, etc. or any turbid materials.

If the water contains suspended particles, we recommend installing a filter in the water intake.

**Corrosion Protection**

**CAUTION:** A corrosion protection agent must be added to the cooling water.

The water chiller unit is supplied without cooling water:

Nordson recommends the anti-corrosion agent *BCG K*, made by the company BaCoGa Technik GmbH. Observe the safety data sheet.

Mixing ratio 1:100 [BCG K:cooling water*)]

*) Refer to *Tank capacity* in the technical data of the manufacturer's manual for the water chiller.
Piston Pressure Switch KDS 05/120

With the pressure switch P/N 7056368 (yellow), absolute pressure values between 30 and 400 bar can be compiled, at temperatures up to 250 °C.

**Factory setting:** 120 bar

**CAUTION:** Do not adjust the setting screw.

Handle the shock-sensitive flange on the sensor membrane with care when installing/removing. Extract only by grasping the intended hexagonal head (size 19).

To insert it, lubricate the thread with high temperature grease and first screw it in by hand. Tighten in steps of a quarter of a revolution: Torque: 12-15 Nm.

Metering Station (Option)

When attaching the metering station to the extruder, it is essential to properly align the connecting piece to the screw cylinder. The sealing surface of the connecting piece must be parallel to the end of the cylinder, and precise centering (height and lateral offset) is important.
Fig. 3-5 Functional Diagram (system example)

TI 1 = Cooling water feed zone
TIC2 = Cylinder zone 1
TIC3 = Cylinder zone 2
TIC4 = Cylinder zone 3
TIC5 = Cylinder zone 4
TIC6 = Pump connection block
TIC7 = Pump 1
TIC8 = Pump 2
TIC9 = Hose 1
TIC10 = Hose 2
TIC11 = Hose 3
TIC12 = Hose 4
TIC13 = Applicator 1.1
TIC14 = Applicator 1.2
TIC15 = Applicator 1.3
TIC16 = Applicator 1.4
TIC17 = Applicator 1.5
TIC18 = Applicator 1.6
TIC19 = Applicator 1.7

LI 1 = Level hopper empty
LI 2 = Level hopper almost empty
LI 3 = Level hopper full

OT 1-2 = Pump connection block
OT 3 = Pump 1
OT 4 = Pump 2

PS 1 = Pressure switch extruder
PS 2 = Pressure switch pressure relief
PS 3 = Pressure switch pump 1
PS 4 = Pressure switch pump 2
PS 5 = Pressure switch applicator

PIC 1 = Outlet pressure extruder
PIC 2 = Pressure control circuit
PIC 3 = Pressure switch extruder
PIC 4 = Pressure switch pressure relief
PIC 5 = Pressure switch pump 1
PIC 6 = Pressure switch pump 2
PIC 7 = Pressure switch applicator

EV 1 = Pressure relief
EV 2 = Fan relief

M 1.1 = Motor extruder
M 1.2 = Air motor extruder
M 2.1 = Motor pump 1
M 2.2 = Fan pump 1
M 3.1 = Motor pump 2
M 3.2 = Fan pump 2

Legend:
TI = Temperature sensor
TIC = Temperature control circuit
LI = Level sensor
PIC = Pressure control circuit
PI = Pressure display
EV = Electrovalve
OT = Overtemperature fuse
PS = Pressure switch
M = Motor
Section 4
Operation

ATTENTION: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Remaining Dampness of Granulate

To prevent undesired adhesive foaming, the remaining dampness of the granulate should be \( \leq 0.05\% \) for extruders without a foam station.

Special PA (polyamides) quickly extract moisture from the ambient air. For this reason, do not open the bag of granulate until it is needed. Immediately seal damaged bags with aluminum tape.

Smaller quantities of granulate can be dried in an oven at 60 - 70 °C for 3 h if necessary.

Always close the hopper lid immediately after filling, and store granulate not yet in the tank in a cool, dry place.

Important Upon Initial Startup

- All drives are designed for clockwise rotary field.
- Check direction of worm conveyor rotation. The worm conveyor must turn to the left when viewed in operating direction. The wrong direction of rotation will destroy the equipment.

If the system was run with the customer’s original adhesive before delivery, the next two steps are omitted.
- All heating elements on the extruder should be tightened after initial startup. Use particular caution when tightening ceramic heating cuffs.

Continued...
• Electrical overpressure fuses should be adjusted according to procedural specifications before initial startup (For the maximum adhesive pressure permitted, refer to the section *Technical Data*).

• Do not damage the pressure sensor when assembling the worm cylinder. If a pressure sensor is defective, it should be replaced with an intact pressure sensor of the same type and pressure measuring range. Never use a plug to replace a defective pressure sensor.

• Compare the customer's connections to the wiring diagram

• Verify that the EMERGENCY OFF and safety switchoff devices, e.g. electrical overpressure fuses, function properly.

• Adjust the warning and shutdown limits according to the process-related circumstances.
### Description of Symbols

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Thermometer" /></td>
<td>Overtemperature</td>
<td><img src="image2" alt="Thermometer" /></td>
<td>Undertemperature</td>
</tr>
<tr>
<td><img src="image3" alt="Thermometer" /></td>
<td>Temperatures at setpoint</td>
<td><img src="image4" alt="Wrenches" /></td>
<td>Service</td>
</tr>
<tr>
<td><img src="image5" alt="Thermometer" /></td>
<td>Enable</td>
<td><img src="image6" alt="Wrenches" /></td>
<td>Ready for operation</td>
</tr>
<tr>
<td><img src="image7" alt="Thermometer" /></td>
<td>Ready for operation</td>
<td><img src="image8" alt="Circle" /></td>
<td>Manual mode</td>
</tr>
<tr>
<td><img src="image9" alt="Extruder" /></td>
<td>Automatic mode</td>
<td><img src="image10" alt="Hand" /></td>
<td>Manual mode</td>
</tr>
<tr>
<td><img src="image11" alt="Extruder" /></td>
<td>Extruder</td>
<td><img src="image12" alt="Power Symbol" /></td>
<td>Reset</td>
</tr>
<tr>
<td><img src="image13" alt="Extruder" /></td>
<td>Speed Control</td>
<td><img src="image14" alt="Pressure Control" /></td>
<td>Pressure control</td>
</tr>
<tr>
<td><img src="image15" alt="Pump" /></td>
<td>Pump (1)</td>
<td><img src="image16" alt="Applicator" /></td>
<td>Applicator (1)</td>
</tr>
</tbody>
</table>

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EEX

P/N 7169667_03
Initial Startup

The filling area consists of a water-cooled filling piece and a filling hopper. The adhesive granulate is fed through the filling hopper. The granulate must be pourable.

**CAUTION:** Cylinder feed cooling must always be switched on before cylinder heating is activated. The temperature in the feed zone may not exceed 40 °C at this time.

When Using the Water Chiller

A. Fill the water chiller with water until the water level reaches the mark. Refer to the manual, section *Installation*, for the water specification.

B. Switch the water chiller off/on with main switch.

**NOTE:** The circulation pump for the cooling agent begins to run as soon as the extruder and heaters are switched on.

C. Press the keys *Arrow up* and *Arrow down* simultaneously until C1 (temperature setpoint) appears. Setting range 15 °C to 25 °C. Recommended: max. 18 °C.

Press the keys *Arrow up* and *Arrow down* simultaneously to leave the parameter level.

D. Check the water level.

When Using Own Cooling Water Supply

A. Open the inlet for cylinder feed cooling: Open the water shutoff valve and set the required flow with the hand valve.

The flow rate can be seen on the meter.

1. Read the current temperature in the inlet zone on control panel FP13:

**Temperature Course**

The temperature in the feed zone will increase slightly during heatup. Once production has begun, increase the temperature again depending on the product and the frictional heat of the worm. During production the temperature stabilizes and remains relatively steady, as do speed, water quantity and water temperature.

If the temperature in the cooling zone rises (overtemperature indication), immediately check why the temperature has risen. If the increase is due to a lack of water, apparent on the water meter, adjust immediately. If the cause cannot be directly remedied or if no water at all is flowing and the temperature has risen another 20 °C, the system must be switched off and the fault remedied.

2. Pour granulate into the hopper.

**CAUTION:** Keep all metal pieces away from the filling area. Risk of destroying the worm conveyor. Put the lid back into place after filling.

*Continued ...*
3. Verify that all operating switches are set to zero.
4. Set the speed potentiometer to zero.
5. Switch on the main switch.
6. Press Reset.
7. Set the temperatures on the FP13:

**Set temperatures**

![FP13 temperature control panel](image)

**Fig. 4-1**

A. Use the keys [A] and [B] to select channel 2 (ZONE 02 = cylinder zone 1).
   **NOTE:** Channel 1 indicates the temperature in the feeding section.
B. Set the desired setpoint temperature with the keys [C] and [D] (The setpoint temperature flashes in the display).
C. Save the setpoint with the key [E] (The setpoint remains in the display).
D. Select channel 3 (ZONE 03) with the key [B] and select the setpoint for this channel. Save the setpoint with the input key [E].
E. Make the setting for all of the other active channels and switch off unused channels.

**NOTE:** The setpoint for free channels without a temperature sensor connected should be set below 20 °C (display: ---) and saved with the key [E]. This deactivates the undertemperature interlock.
Initial Startup  *(contd.)*

**Creating Setpoint Program (e.g. for Standby)**

A. Press [A] until a “P” appears in the channel display.

The setpoint program that is currently active appears in the setpoint display. Here: Setpoint program 1.

![Fig. 4-2](image)

B. Select one of the four setpoint programs with key [C] or [D]. Here: Setpoint program 4.

![Fig. 4-3](image)

C. Activate the selected setpoint program with [E].

D. Scroll to the channels with [B].

Now the valid temperature parameters for a different adhesive or for standby can be entered in the newly activated setpoint program. Proceed as described under Setting Temperatures.

*Continued ...*
8. Wait until the set temperature setpoint have been reached.
   This is the case when the green indication lamp Ready is illuminated and the red indication lamp Undertemperature goes off.

9. Depending on the adhesive, allow the system to heat for at least 10 minutes after Ready.

The extruder is ready for operation.

- To prevent running dry during operation, ensure that the worm feeding section is always covered with granulate.
- To prevent frictional heat, the maximum worm speed is 160/min ± 10%.
- Supply an adequate amount of cooling water (temperature approx. 15 °C) with a cooling unit, such as the optional water chiller.

10. Refer to Calibrating Pressure Sensor.

11. Refer to Selecting Pressure Control or Speed Control.

12. Refer to Selecting Continuous or Intermittent Application.

13. Refer to Operation in Automatic Mode / Setting Automatic Mode.
Calibrating Pressure Sensor (Output Pressure Extruder)

Beginning in 2013, the pressure sensor and transducer are being replaced with a pressure sensor with integrated evaluation electronics. Refer to Appendix B.

CAUTION: The pressure sensor must be calibrated (reset) and set to 80% of the pressure measuring range (e.g. for a performance check) when the system is heated up but depressurized.

Set with the keys 1 to 3 of the measuring transducer.

Resetting to Zero

Press arrow-down (1) and Enter key (3) at the same time.
Display: 0 bar

Optional: Setting Fixed Value to 80% of Measuring Range

CAUTION: Make the 80% setting only after calibration and when depressurized.

1. Press arrow-up (2) and Enter key (3) at the same time.
   Display: 80 bar (with a 100 bar pressure sensor)
   Display: 280 bar (with a 350 bar pressure sensor)

2. After checking performance, Resetting to Zero (see above)
Selecting Pressure Control or Speed Control

**CAUTION:** To switch from speed control to pressure control, set code C0037 (JOG1) to 10% of the maximum output frequency (C0011).

Depending on the gear motor installed, C0011 is either 87 Hz or 50 Hz (can be different for special gear boxes). Set C0037 to 10% -- either 8.7 Hz or 5 Hz. JOG = fixed setpoint.

Refer to Setting Code C0037 with Lenze Keypad.

For pressure-controlled operation: Pull out the bridge XD (2) (Open the terminal).
For speed-controlled operation: Push in the bridge XD (2) (Terminal is bridged).

**Pressure Control**
Select if
- A metering station is being used

**Speed Control**
Select if
- No metering station is being used
- The metering station pump block is open
- The worm is to be cleaned
- Tank units are to be filled.

Depending on the gear motor installed, C0011 is either 87 Hz or 50 Hz (can be different for special gear boxes).

**NOTE:** Set code C0037 (JOG1) to the desired speed. But do not set it higher than the value of C0011, meaning maximum 87 Hz (max. 50 Hz).
Refer to Setting Code C0037 with Lenze Keypad.
Setting Code C0037 with Lenze Keypad

*Note on C0003*

Depending on the setting, the changes are stored in the EEPROM (value: 1) or they are not stored (value: 0).

Nordson parameter set: 1. The changes are not lost when the power is switched off.

**C0037**

This description begins with the screen Disp.

**NOTE:** C0037 cannot be selected in the menu uSEr.

1. Move to the menu ALL to be able to select the code:

   A. Press the key 1 2 to move to line 2.

   B. Select Menu with the key .

   C. Press until ALL appears. Confirm with key . *

2. Press the key 1 2 to move to line 1.

3. Select Code with the key .

   The codes appear in numerical order, from lowest to highest.

4. Use the key to select 0011 and then remember the parameter value that appears.

5. Select 0037 with the key .

6. Use key to jump to Para.

7. Use the keys to change the speed to the desired value and then confirm twice.

Disp appears again. If desired, return to the menu uSEr, following steps 1A to C.

* If the drive controller is blocked.

The ENTER key is deactivated when the drive controller is blocked. Press to confirm.
Operation in Automatic Mode

As an Independent Unit

The pump and applicator can each be switched separately. The solenoid valves are triggered via the heated hose.

Depending on the Parent Machine (External Triggering)

System Starts Automatically When the Parent Machine Starts

The start/stop signals for the extruder, pumps and applicators are activated by the parent machine. Refer to the wiring diagram for interface assignment. Observe the switching sequence.

Triggering Applicator Solenoid Valves

On the interface there are contacts for triggering the solenoid valves. Observe the voltage for the magnetic coils. Triggering is standardly via the heated hose.

Key-to-line Mode

When the substrate speed of the parent machine varies, the gear pump speed can be adapted to the production speed with a tach generator. For this, the tach control voltage and the motor controller must be attuned to one another.

Setting Automatic Mode

1. Set the operating switch for the extruder, pump and applicator to the position Auto.
2. Set the speed potentiometer on the electrical cabinet / control panel to the maximum speed (all the way to the right).
3. Set the pressure potentiometer in the electrical cabinet / control panel (3, Fig. 4-5) such that the desired adhesive quantity is fed.
4. Feed the desired adhesive quantity via external pilot voltage (0 to 10 V). The quantity must be adjusted when the parent machine is running constantly. As the production speed falls, the application quantity decreases, to pump standstill when the machine stops.
Upon Initial Startup: Setting Extruder Setpoint Pressure (Preliminary Pressure Pumps)

The extruder operates pressure-controlled. The metering station pumps do not start up until the extruder has reached the set setpoint pressure.

Fig. 4-5

The preliminary pressure (usually between 5 and 15 bar) for the pumps is set on the potentiometer in the electrical cabinet.

Example, potentiometer 0 to 25 bar
The factory setting is 5 bar, which corresponds to a potentiometer setting of -2-
The maximum pressure is 25 bar, which corresponds to a potentiometer setting of -10-

The actual pressure can be seen on the pressure transducer (4).

Operation in Manual Mode (Service Mode)

ATTENTION: Special caution is required in manual mode since there are no locks in this mode.
For this reason, only specially authorized personnel may operate the system in manual mode.

1. Set the speed potentiometer to zero.
2. Set the operating switch for the extruder, pump and applicator to the position Manual.
3. Set the speed potentiometer such that the desired speed is achieved or the desired adhesive quantity is fed.
Selecting Continuous or Intermittent Application

For continuous application: Pull out bridge XS (1).
For intermittent application: Push in bridge XS (1).

Intermittent application requires the use of a programming unit. The control commands from the controller to open and close the applicators are provided via the extruder electrical cabinet and hose to the solenoid valves on the applicators.

Signal receivers can be detectors, such as photocells, inductive proximity switches, etc., attached to an appropriate place on the production machine. When the machine speed varies, a so-called displacement transducer is also needed.
During Production

CAUTION: Keep the area surrounding the equipment clean. There is a risk of accidents - slipping, stumbling or falling - from adhesive granulate on the floor as well as from hoses and cables for electrical and water installations.

Notes on Temperature Setting

Do not allow temperature ranges to be exceeded or fallen below; regular temperature checks are essential. If the temperature is too high, the adhesive will give off an odor and the quality will decrease.

Temperatures that are too low are also detrimental to quality. If satisfactory results are achieved only by deviating from the stated processing temperature, please promptly contact a Nordson representative.

Standby During Breaks

Serves to protect the adhesive and to save energy during breaks in production. The standby temperatures can be compiled in one of the four setpoint programs.

CAUTION: After extended standstill and depending on how low the standby temperature is, allow the system to heat for at least 10 minutes after Ready.

Level Monitoring (Hopper)

1. Hopper empty – triggers Protection from dry running
2. Hopper almost empty – warning
3. Hopper full – warning (e.g. during automatic filling)

Indication Lamp "Hopper Almost Empty"

The indication lamp is illuminated when the granulate level in the hopper is below the level sensor. The indication lamp goes off as soon as the hopper is filled again.

Dry Run Protection

If the adhesive flow is interrupted during operation and the pressure is not reached during the set time, the extruder switches off (all drives).
Acknowledging Fault Indications

General faults of the drive controllers, pressure sensors, overtemperature fuses and dry run protection are shown over the reset key and have to be acknowledged by pressing the key after the faults have been remedied.

Pressure Monitoring

ATTENTION: Risk of bursting. The extruder may not be operated without the overpressure valve.

<table>
<thead>
<tr>
<th>Alarm</th>
<th>Alarm value</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underpressure warning</td>
<td>Any threshold value</td>
<td>Only indication; The system remains ready for operation.</td>
</tr>
<tr>
<td>Underpressure fault</td>
<td>Limit determined by the system</td>
<td>Machine stops; Drives are switched off</td>
</tr>
</tbody>
</table>

Temperature Monitoring

Refer to the separate manual Temperature Controller FP13.

Undertemperature Interlock

CAUTION: To prevent damage to the system by starting it when it is too cold, the temperatures in the heating zones have to be checked and compared to the setpoint temperatures. After extended standstill the system has to heat for at least 10 minutes (depending on the adhesive) even after the setpoint temperatures are reached.

The undertemperature alarm threshold (parameter 2 on the FP13) is intended to set a range below the setpoint at which, when the value falls below it, an alarm is triggered.

The drives are switched off when an alarm occurs. Indications occur via the indication lamp, the FP13 display and to the interface for evaluation by the customer.

To ensure that the corresponding FP13 relay contact can still be used when the machine is enabled, undertemperature is indicated automatically when

- The unit is switched on
- Sensor short-circuit (Pt 100)
- Broken sensor

The undertemperature interlock prevents the system from being started up. It locks the motor, when appropriate the solenoid valves and, in some cases, other components of the system. Which components are locked can be determined individually.
**Overtemperature Indication**

The overtemperature alarm threshold (parameter 1 on the FP13) is intended to set a range above the setpoint at which, when the value exceeds it, an alarm is triggered. It is triggered in the display as well as by the potential-free relay contact on the FP13.

If one of the connected control circuits (also applies to channels that are deactivated) reaches the HI value (set on the FP13), overtemperature is indicated immediately.

The system remains ready for operation.

**Overtemperature Shutdown**

Independently operating overtemperature shutdown (by the software or thermal fuse elements) protects the system and adhesive from overheating.

If one of the connected control circuits rises to the HI value plus 10 °K, the watchdog alarm is immediately triggered. It is triggered in the display as well as by the potential-free relay contact on the FP13, which switches off the main contactor.

**Overtemperature Shutdown by Thermal Fuse Elements**

Overtemperature shutdown by thermal fuse element (switchoff value 180 °C, 240 °C or 280 °C).

When they have been triggered, these irreversible fuse elements have to be replaced.
Switching System ON/OFF

CAUTION: To prevent the adhesive from clumping in the feeding section, the cooling water must continue to run for about an hour after the extruder is switched off.

With an optional water chiller, this is ensured with the timer relay ETR4. Refer to the extruder wiring diagram for the set time.

There are two ways to connect the optional water chiller:

A. Switching off the extruder with the main switch does not turn off the timer relay.

B. Switching off the extruder with the main switch would also turn off the timer relay. So with this version, program the switchon and switchoff times with the optional seven-day clock.

NOTE: The main switch must be set to I/ON (switched on) when using the week timer.

Daily Startup

NOTE: Gear pumps may not be operated without adhesive. Before switching on the motor, ensure that there is granulate in the hopper.

1. When using your own cooling water supply: Open the cooling water supply.

2. Set the main switch on the extruder and on the optional water chiller to I/ON if necessary.

3. Wait until the system is ready.

4. Switch on the motor(s).
**Daily Shutdown (Model A)**

1. Switch off the motor(s).
2. Set the main switch on the extruder to 0/OFF.

**CAUTION:** The cooling water has to continue to run for about one hour after the extruder is switched off.

3. Set the main switch of the water chiller to 0/OFF or stop the cooling water supply.
4. If necessary, secure the main switch with padlocks against unauthorized access.
5. Perform daily maintenance.

**Daily Shutdown (Model B)**

1. Switch off the motor(s).

**CAUTION:** The cooling water has to continue to run for about one hour after the extruder is switched off.

2. When the time has elapsed and when the customer uses his own cooling water supply: Stop the cooling water supply.

   When the timer relay has elapsed the main switch can be turned off and protected with padlocks from unauthorized access, if maintenance and repair work so require.

3. Perform daily maintenance.

**Emergency Shutdown**

**ATTENTION:** Switch off the unit immediately in any emergency situation.

1. Set the main switch to 0/OFF.
2. After standstill and before switching the unit on again, have the malfunction remedied by qualified personnel.

**Black Main Switch (Special Model)**

The black main switch does not serve as an EMERGENCY OFF feature. Connected components can still be switched on!
Section 5
Maintenance

ATTENTION: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Maintenance is an important preventive measure for maintaining operating safety and extending the service life of the unit. It should never be neglected.

Hazard areas of the system are generally secured with suitable protective devices.
If a protective device has to be removed, e.g. for maintenance or cleaning, it should be properly put into place again upon completion of the work.

Risk of burns

Some maintenance work can only be done when the system is heated up.

ATTENTION: Hot! Risk of burns. Wear appropriate protective clothing/equipment.

Relieving Adhesive Pressure

ATTENTION: System and adhesive pressurized. Relieve the system of adhesive pressure before disconnecting pressurized components (e.g. hoses, pressure sensors). Failure to observe can result in serious burns.

1. Set motor speed to 0 min-1 (rpm); switch off motor(s).
2. Place a suitable container under the applicator / assembly handgun.
3. Activate the applicator / assembly handgun electrically or manually. Repeat this procedure until no more adhesive flows out.
4. Properly dispose of adhesive according to local regulations.
Shutdown

1. Open the hopper drain plug, collect the granulate and then close the plug again.
2. Start emptying the extruder.
   If the motor power consumption falls, reduce the worm speed to 20 min\(^{-1}\) and empty the worm for no longer than 1 minute.
3. If cleaning granulate is not to be used for cleaning: Switch off all of the heating zones with the main switch.
   **NOTE:** The extruder need be cleaned with cleaning granulate only rarely. Then refer to the section *Repair* for information on how to proceed.
4. Close the cooling unit.

Starting Up System Again

1. Fill the hopper with new, dry granulate.
2. Detach the hoses and operate the extruder slowly (<5 min\(^{-1}\)) and speed-controlled until the setpoint pressure is reached.
3. Stop the extruder drive and return to pressure-controlled operation.
4. Start the extruder again pressure-controlled and allow the pumps to feed adhesive at a rate of 5 min\(^{-1}\) until clean adhesive, free of bubbles, flows out of the hose connections.
5. Stop the extruder again and attach the hoses.
   Then the extruder can return to the normal operating mode.
Changing Type of Adhesive

Pump the old adhesive out of the system.

**NOTE:** Before changing the type of adhesive, determine whether the new adhesive may be mixed with the old adhesive.

- **May be mixed:** Remaining old adhesive can be flushed out using the new adhesive.
  
  **NOTE:** Properly dispose of old adhesive according to local regulations.

- **May not be mixed:** Refer to the section *Repair / Cleaning Extruder with Cleaning Granulate*. Clean the optional metering station separately and purge with cleaning agent.

Processing Materials

<table>
<thead>
<tr>
<th>Designation</th>
<th>Order number</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>High temperature grease</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Can</td>
<td>10 g P/N 394769</td>
<td>Apply to O-rings, threads and sealing surfaces. Squeeze into the lubricating nipples of the mixer (UFM). <strong>NOTE:</strong> The grease should not be mixed with other lubricants. Oily/greasy parts must be cleaned before application.</td>
</tr>
<tr>
<td>• Tube</td>
<td>250 g P/N 783959</td>
<td></td>
</tr>
<tr>
<td>• Cartridge</td>
<td>400 g P/N 402238</td>
<td></td>
</tr>
<tr>
<td>Temperature-resistant adhesive <em>Loctite 640</em></td>
<td></td>
<td>Secures screw connections</td>
</tr>
<tr>
<td>• 50 ml</td>
<td>P/N 230359</td>
<td></td>
</tr>
<tr>
<td>Heat transfer compound <em>NTE303</em></td>
<td></td>
<td>For better heat transfer of temperature sensors</td>
</tr>
<tr>
<td>• 1 g</td>
<td>P/N 1023441</td>
<td></td>
</tr>
</tbody>
</table>
## Regular Maintenance

The maintenance intervals are general guidelines based on experience. Depending on operating environment, production conditions and hours of operation, other scheduled maintenance tasks may prove necessary.

<table>
<thead>
<tr>
<th>Unit part</th>
<th>Activity</th>
<th>Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entire unit</td>
<td>External cleaning</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>Visual inspection for external damage</td>
<td>Daily</td>
</tr>
<tr>
<td>Cordset</td>
<td>Inspect for damage</td>
<td>Daily</td>
</tr>
<tr>
<td>Cooling lines</td>
<td>Inspect for damage</td>
<td>Daily</td>
</tr>
<tr>
<td>Hopper</td>
<td>Visual inspection for pollution in hopper; clean if necessary</td>
<td>Before filling every time</td>
</tr>
<tr>
<td>Gear pump</td>
<td>Check for leakage</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>Retighten gland</td>
<td>When leaking</td>
</tr>
<tr>
<td></td>
<td>Retighten fixing screws</td>
<td>Every 500 hours of operation</td>
</tr>
<tr>
<td>Motor / gear box</td>
<td>Change the oil</td>
<td>Observe manufacturer's instructions</td>
</tr>
<tr>
<td></td>
<td>Clean the fan cover</td>
<td>Depending on dust accumulation, daily if necessary</td>
</tr>
<tr>
<td>Electrical cabinet ventilation</td>
<td>Clean fan screens, clean or replace filter</td>
<td>Daily, if dust accumulation is severe</td>
</tr>
<tr>
<td>Pressure sensor</td>
<td>Inspect for leakage (screw insertion area)</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>Check separating membrane for damage and clean</td>
<td>Every time the pressure sensor is removed</td>
</tr>
<tr>
<td>Piston pressure switch</td>
<td>Calibrate. Depending on the model, refer to Calibrating Pressure Sensor (Outlet Pressure Extruder) in the section Operation.</td>
<td>Every year; more often if conditions of use require</td>
</tr>
<tr>
<td>Heater cartridges</td>
<td>Measure; replace if necessary</td>
<td>Refer to Heater cartridges</td>
</tr>
<tr>
<td>Heating cuffs</td>
<td>Check that plug connections are uniform and tight</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tighten fasteners</td>
<td></td>
</tr>
</tbody>
</table>
Lubricating Plan

ATTENTION: All maintenance work may be performed only when the system is deenergized.

1  Worm drive motor  2  Metering station drive motor  3  Fixing screws
Visual Inspection for External Damage

ATTENTION: When damaged parts endanger the operating safety and/or the safety of personnel, switch off the system and have the damaged parts replaced by qualified personnel. Use only original Nordson spare parts.

External Cleaning

External cleaning prevents pollution created by production from causing the system to malfunction.

ATTENTION: Observe the system's Degree of Protection when cleaning (Refer to section Technical Data).

CAUTION: Do not damage or remove warning labels. Damaged or removed warning labels must be replaced by new ones.

1. Only remove hot melt adhesive residue with a cleaning agent recommended by the adhesive supplier.
2. Heat with an air heater if necessary.
3. Remove dust, flakes etc. with a vacuum cleaner or a soft cloth.

General Electrical Inspection

- Check all connections and tighten terminals when needed
- The power supply must have a clockwise rotary field; check with a phase sequence indicator.
- Permitted line voltage deviation at 400 V +6% / 10%
- Check the switch state of all circuit breakers
- Check the state of the controller and the fault indication
- Check all fuses for continuity.

ATTENTION: Do not replace special fuses for semiconductors with normal fuses. Check the motor connections in the terminal box.
Ongoing Checks

- Check that protective devices function properly. The electrical cabinet door must be closed.

- Check the water flow for all water cooling devices. Check connections for leakage.

- Check the oil level in the gear box.

- Check that all cable connections are firmly attached to the terminals and that all fuses are held securely in place by the clips. Heat caused by poor contact damages the fuses as well as the clips.

  **CAUTION:** Loose clamping leads to overheating and may cause a cable fire.

- Check the fit of the thermal elements

- Check all heating zones for electrical flow resistance. Insulation resistance should be above 1000 Ohm/Volt.

- Under load conditions, check the symmetrical power consumption in the three phases of the electrical cabinet with a measuring device.

  The values of the symmetrical power consumption in the three phases should not deviate more than 10 % from one another.

- Inspect the heater contactors and thyristor contacts and check functioning. Worn contacts should be replaced promptly to prevent subsequent damage.

- Check the condition of all connecting cables for the nozzle or tool. Make sure that the ground terminal has a lower resistance than 0.1 Ohm to the steel of the tool.
**Heater Cartridges**

To maintain heatup and temperature stability in the system, the heater cartridges should be inspected regularly and replaced as needed.

The maintenance intervals are determined by the application and by other factors. The system operator must define them himself.

**Measuring Heater Cartridges**

To be able to check the heating capacity of the zone, the current must be measured for each individual heater cartridge.

The current differs according to the heating capacity of the cartridge and must be calculated individually. (formula: \( P = U \times I \))

Information on the heating capacity of the individual zones can be found in the wiring diagrams.

Before beginning inspection, verify that the respective heating zone is triggered and the circuit breaker is switched on.

If there is no or too little current drain, replace the defective heater cartridge; a defective cartridge can cause e.g. temperature fluctuations in the system and longer heatup.

**Replacing Heater Cartridges**

Before replacing, the system must be deenergized and the respective circuit breakers must be switched off.

**Electrical Cabinet Ventilation**

The electrical cabinet fan is maintenance-free.

The filter must be cleaned or replaced, depending on dust accumulation. A dirty filter can be recognized by its dark color.

- Shake out or vacuum the filter, or used compressed air to clean it
- Rinse in water up to 40 °C, using a mild commercial detergent if necessary.

  **When the dust contains grease:** Rinse with benzine or warm water with a grease solvent
  - Do not wring out
  - Avoid strong water jets.
Gear Pump

Retightening Fixing Screws

Thermodynamic tension (heating and cooling) can cause the fixing screws to loosen.

**NOTE:** Tighten the fixing screws only when the system is cold and only with a torque wrench (35 Nm).

Retightening Gland

As soon as adhesive seeps out between the shaft and the seal, tighten the gland (1).

1. Release the hexagon screw (3) from the retaining plate (2).
2. Retighten the gland in the operating direction of the pump. A quarter revolution is usually sufficient.
3. Adjust the retaining plate and tighten it again with the hexagonal screw. The retaining plate prevents the gland bolt from coming loose due to vibration or reverse mode.

If tightening is no longer possible, the pump must be replaced.
Motor / Gear Box

The extruder drive motor is equipped with bearings - some of which require re-lubrication, some of which do not - that have to be replaced when there is a defect or when the motor is extensively overhauled (Refer to manufacturer's documentation).

Replacing Motor

**NOTE:** The drive may only be started up by trained personnel!

Check before switching on for the first time

- Is mechanical fastening correct?
- Are the electrical connections all right?
- Are rotating parts and surfaces that can get very hot protected from contact?

During operation, be aware of

- Unusual noises or temperatures
- Leakage
- Loose fastening elements
- The condition of electrical lines.

Changing Lubricant

The installed gear box and gear motor are delivered ready for operation; they are filled with a lubricant suited to the drive and design. This initial lubricant is one stated in the column for the manufacturer's respective type of gear box.

- Refer to the manufacturer's information for maintenance intervals

  **NOTE:** The lubricant should be changed regularly with gear boxes of design size 05 and larger.

- The lubricant type is indicated on the ID plate. Use only the same lubricant. Do not mix.

- Refer to the manufacturer's instructions for the lubricant quantity. Ensure that the upper gears and rolling bearings are properly lubricated.

The manufacturer recommends replacing the bearing grease and the radial shaft seals every time the lubricant is changed.
Compression Bearings (On Models with Lubricating Nipple)

The compression bearing has to be greased. The grease used to lubricate the bearing at the factory is that indicated above.

Interval: Every 3 months

**Greasing Compression Bearing**

Grease during operation.

**CAUTION:** Slowly and carefully force in the grease. Pressing in too much grease too quickly bridges the gap to the worm and is transported by the worm forward and into the adhesive feeding section.

1. Place a rag underneath to collect the old grease.
2. Place the grease gun on the lubricating nipple (1, Fig. 5-3) and carefully inject grease until the old grease has been completely ejected by the new grease.
   First the old grease then the excess grease is forced out of the bore (2, Fig. 5-3).
3. If necessary, remove grease residue from the extruder and/or floor.

---

**Order number** | **Designation**
--- | ---
P/N 7107443 | Rolling bearing grease SKF LGHB2 (-20 °C to +150 °C bearing temperature)
| • 5 kg

Fig. 5-3
Heating Cuffs

CAUTION: Risk of burn on the heated worm cylinder. Wear heat-resistant gloves!

Ceramic Heating Cuffs

The heating cuffs should fit well. During the initial heating phase, check the clamping screws at regular intervals until the operating temperature is reached. Tighten them if necessary. Tighten with particular care. Excessive preliminary pressure may damage the ceramic.

NOTE: When mounting heating cuffs, fasten them with torque of 1.5 Nm.

Micanite Heating Cuffs

NOTE: These heating cuffs can be used only if no metering station is configured.

During the initial heating phase, check that the tension screws are tight. Tighten if necessary. Check repeatedly for a uniform and tight fit.

The heat conducting plates under the micanite heating cuffs must also fit snugly.
Pressure Sensor

Beginning in 2013, the pressure sensor and transducer are being replaced with a pressure sensor with integrated evaluation electronics. Refer to Appendix B.

Cleaning Adhesive Bore

CAUTION: If the adhesive bore is to be cleaned with a sharp object, first remove the pressure sensor to prevent damage to the separating membrane.

Cleaning Separating Membrane

ATTENTION: Hot! Risk of burns. Wear appropriate protective clothing/equipment.

CAUTION: Clean the separating membrane carefully. Never use hard tools.

Remove material residue only with a cleaning agent recommended by the material supplier. Thermoplastic media such as hot melt adhesives may need to be heated with an air heater and then carefully wiped off with a soft cloth.

Screwing In

- Apply high temperature grease (P/N 394769, 10 g can) to the thread.
- The sensor should only be screwed into an absolutely clean hole.
- The counterpart and the pressure sensor should be at room temperature or at close to the same temperature before the pressure sensor is screwed into place.
- Do not jam when screwing in (Strong resistance should not be felt).
- Torque: 12 to 50 Nm
Section 6
Troubleshooting

ATTENTION: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

ATTENTION: Troubleshooting activities may sometimes have to be carried out when the system is energized. Observe all safety instructions and regulations concerning energized unit components (active parts). Failure to observe may result in an electric shock.

Troubleshooting / Corrective Action

ATTENTION: Always follow the safety instructions when remedying faults.

When a fault has occurred, the system may not be started up again until the cause has been determined and the fault remedied.

This section contains instructions on troubleshooting. The procedures described here cover only the most commonly occurring problems. If the problem can not be solved with the information stated here, contact Nordson’s representative.

Please keep the following information handy:
- Complete type designation and serial number. Refer to the system’s ID plate.
- Precise information on the effect of faults, e.g. the switching states of indication lamps and measured values.

Acknowledging Fault Indications

Acknowledge fault indications with the Reset key. Acknowledgement is essential for further operation.
Some Tips

Before systematic troubleshooting is begun, the following should be checked:

- Are all parameters set correctly?
- Are the interfaces wired correctly?
- During key-to-line: Is pilot voltage present?
- Do all plug connections have sufficient contact?
- Have circuit breakers tripped?
- Could the fault have been caused by an external PLC?
- Are external, inductive loads (e.g. solenoid valves) equipped with recovery diodes? The recovery diodes must be directly allocated to the inductive load, e.g. through luminous seals.

Troubleshooting with the Help of the FP13

The FP13 offers the following troubleshooting aids, described in the separate manual:

- Display of the individual temperature channels and parameters/values
- Scan mode
- LEDs
- Diagnosis program

Light Tower (Option)

<table>
<thead>
<tr>
<th>Possible message</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Refer to system wiring diagram for specific information)</td>
</tr>
<tr>
<td><strong>Red</strong></td>
</tr>
<tr>
<td>Red flashing</td>
</tr>
<tr>
<td><strong>Yellow</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Green</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Green flashing</strong></td>
</tr>
</tbody>
</table>
Troubleshooting Tables

The troubleshooting tables serve as an orientation for qualified personnel. They cannot, however, replace targeted fault location with the help of wiring diagrams and measuring instruments. They also do not include all possible problems, only those that may occur.

General Alarm: Red Indication Lamp is Lit

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undertemperature</td>
<td>System was just switched on and is not yet ready</td>
<td>Wait until the temperature has been reached</td>
</tr>
<tr>
<td></td>
<td>Temperature sensor short circuit or reversed polarity</td>
<td>Replace</td>
</tr>
<tr>
<td></td>
<td>Damaged temperature sensor cable</td>
<td></td>
</tr>
<tr>
<td>Electrical cabinet interior</td>
<td>Ambient temperature too high</td>
<td>Decrease ambient temperature by cooling or airing out</td>
</tr>
<tr>
<td>temperature too high</td>
<td>Filter of the electrical cabinet fan dirty</td>
<td>Clean or replace</td>
</tr>
<tr>
<td></td>
<td>Electrical cabinet fan defective</td>
<td>Replace</td>
</tr>
<tr>
<td>Main contactor has dropped</td>
<td>Pneumatic inlet pressure falls below 2 bar</td>
<td>Check pneumatic connection (not on all extruder sizes)</td>
</tr>
<tr>
<td>Overpressure</td>
<td>Pollution/blockage of: Adhesive channels Hose</td>
<td>Do not feed pollution through the applicator! Disconnect the heated hose / applicator from the system. Purge. Follow the cleaning instructions in the separate manuals.</td>
</tr>
<tr>
<td></td>
<td>Applicator / nozzle</td>
<td></td>
</tr>
</tbody>
</table>

System not Functioning

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>No line voltage</td>
<td>Connect line voltage</td>
</tr>
<tr>
<td>Main switch not switched on</td>
<td>Switch on main switch</td>
</tr>
<tr>
<td>Main switch defective</td>
<td>Replace main switch</td>
</tr>
<tr>
<td>Main circuit breaker tripped</td>
<td>Check for short circuit in the system or accessories</td>
</tr>
</tbody>
</table>
No Adhesive (Motor does not Rotate)

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor overheated</td>
<td>Refer to Motor overheated</td>
</tr>
<tr>
<td>System not yet ready for operation (undertemperature during the heatup phase)</td>
<td>Wait until the system has heated up and the green indication lamp is lit</td>
</tr>
<tr>
<td>Motor was stopped by a fault</td>
<td>Press Reset. If the fault is still present, check the system for the following:</td>
</tr>
<tr>
<td></td>
<td>- Overpressure</td>
</tr>
<tr>
<td></td>
<td>- Undertemperature</td>
</tr>
<tr>
<td></td>
<td>- Sensor fault</td>
</tr>
<tr>
<td>Speed (rpm) not set</td>
<td>Set the speed</td>
</tr>
<tr>
<td>Manual mode selected, however extruder should be in automatic mode</td>
<td>Switch to automatic mode</td>
</tr>
<tr>
<td>Automatic mode selected and no pilot voltage present</td>
<td>Provide pilot voltage</td>
</tr>
<tr>
<td>No external motor enable</td>
<td>Bridge or activate the corresponding contacts of the interface</td>
</tr>
<tr>
<td>Motor defective</td>
<td>Replace</td>
</tr>
<tr>
<td>Motor not supplied with voltage</td>
<td>Technical inspection</td>
</tr>
</tbody>
</table>

Motor overheated

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient temperature too high</td>
<td>Decrease ambient temperature by cooling or airing out</td>
</tr>
<tr>
<td>Cooling air intake grill dirty</td>
<td>Clean</td>
</tr>
<tr>
<td>Pump blocked by foreign particles</td>
<td>Replace pump</td>
</tr>
<tr>
<td>Pump operates too sluggish</td>
<td>Replace pump</td>
</tr>
<tr>
<td>Adhesive too cold</td>
<td>Set temperature accordingly</td>
</tr>
</tbody>
</table>

No Pilot Voltage

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent machine not operating</td>
<td>Start up parent machine</td>
</tr>
<tr>
<td>Tach generator (accessory) defective</td>
<td>Replace</td>
</tr>
<tr>
<td>Pilot voltage poled incorrectly</td>
<td>Reverse polarity</td>
</tr>
</tbody>
</table>
Incorrect Motor Rotation in Automatic Mode

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pilot voltage fluctuation despite constant machine speed</td>
<td>Drive element (e.g. belt) slips. Eliminate slip</td>
</tr>
</tbody>
</table>

No Adhesive (Motor Rotating)

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Worm is turning in completely melted adhesive:</td>
<td>If available, open the pneumatic bypass for an extended time so that the granulate can be fed to the middle of the worm and the excess heat transferred to the melting process. Feed sufficient fresh material to reduce the temperature to the normal range.</td>
</tr>
<tr>
<td>The temperature in the cylinder feed zone is too high (overtemperature in zones 1 and 2) due to EMERGENCY OFF or feeding too long at the extruder's maximum capacity.</td>
<td></td>
</tr>
<tr>
<td>Hopper empty</td>
<td>Fill hopper</td>
</tr>
<tr>
<td>Dry run protection was not triggered</td>
<td>Check level sensor position and function. It should not be flush with the surface Maintain switching distance. Refer to section Repair</td>
</tr>
<tr>
<td>Option metering station: Adhesive feed bore to the pump or suction bore of the pump clogged</td>
<td>Remove pump and clean feed bore or suction bore</td>
</tr>
<tr>
<td>Option metering station: Pump does not turn, because coupling screws are loose</td>
<td>Tighten</td>
</tr>
</tbody>
</table>

Too Little Adhesive

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adhesive feed bore to the pump or suction bore of the pump partly clogged</td>
<td>Remove pump and clean feed bore or suction bore</td>
</tr>
<tr>
<td>Gear pump is worn</td>
<td>Replace pump</td>
</tr>
<tr>
<td>Processing temperature set too low</td>
<td>Change temperature setting</td>
</tr>
<tr>
<td>Extruder operating pressure (preliminary pressure) too low</td>
<td>- Correct operating pressure with potentiometer</td>
</tr>
<tr>
<td></td>
<td>- Check extruder temperature</td>
</tr>
<tr>
<td></td>
<td>- Clean worm</td>
</tr>
</tbody>
</table>
**One Channel (Heating Zone) does not Heat**

<table>
<thead>
<tr>
<th>Possible cause</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel is switched off</td>
<td>Switch on by setting the setpoint temperature of the channel above 20 °C.</td>
</tr>
<tr>
<td>Channel/heating zone defective / broken sensor</td>
<td>Repair defect</td>
</tr>
</tbody>
</table>

**Optional water chiller faulty**

<table>
<thead>
<tr>
<th>Problem</th>
<th>Corrective action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit does not run</td>
<td>Refer to separate manufacturer manual</td>
</tr>
<tr>
<td>Insufficient cooling</td>
<td></td>
</tr>
<tr>
<td>(check water level first!)</td>
<td></td>
</tr>
<tr>
<td>Compressor or pump switched off</td>
<td></td>
</tr>
<tr>
<td>Shutdown caused by overpressure or underpressure</td>
<td></td>
</tr>
</tbody>
</table>
Section 7
Repair

ATTENTION: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

General Information

Use only original spare parts (Refer to parts list / spare parts list).

Some work can only be done when the system is heated up; a hot air gun can be used when appropriate.

Relieving Adhesive Pressure

ATTENTION: System and adhesive pressurized. Relieve the system of adhesive pressure before disconnecting pressurized components (e.g. hoses, pressure sensors). Failure to observe can result in serious burns.

Refer to section Maintenance / Relieving Adhesive Pressure.

Replacing Level Sensor

The level sensor is not flush [nf].

- Switching distance 12 mm [nf]
- The switching distance is adjustable from 4 to 24 mm with the programming keys
- The switching state is indicated by a yellow LED

Adjust and calibrate the new sensor as described in the separate manual.

Fig. 7-1 Example
Cleaning Extruder with Cleaning Granulate

1. Set speed control.
2. Open the hopper drain plug, collect the granulate and then close the plug again.
3. Start emptying the extruder.
   - If the motor power consumption falls, reduce the worm speed to 20 min$^{-1}$ and empty the worm for no longer than 1 minute.

**CAUTION:** The cleaning granulate may not under any circumstances be allowed to penetrate pumps and/or hoses. The cleaning granulate is very hard and does not melt under normal use; thus it could e.g. damage the pumps.

Use only a suitable cleaning agent recommended by the adhesive manufacturer. Observe the safety data sheet.

4. Reduce the worm cylinder temperature to the processing temperature of the cleaning granulate.
5. Slow down the extruder drive so that the worm continues to turn slowly.
   - The worm should operate at a low speed (<5 min$^{-1}$). The current consumption of the worm drive motor should not exceed the maximum value.

**ATTENTION:** Risk of burns from hot components and escaping adhesive! Wear protective gloves, clothing and shoes!

When performing maintenance work or cleaning near the end of the worm cylinder, there is a risk that hazardous fumes can escape from the worm cylinder. Risk of inhalation of hazardous substances!

6. Depending on the configuration: Open the access hole on the pump block or detach the extruder flange.
7. Feeding of the granulate must be metered. Slowly pour cleaning granulate into the extruder, ideally by hand.

**CAUTION:** The worm has to remain visible. If it is completely covered with granulate, the extruder will remain jammed.

So take short breaks during filling. Free spaces between the filling cycles should always be visible, e.g. 30 cm.

8. When cleaning is completed, feed the cleaning granulate completely out of the extruder.

9. Stop the extruder drive and clean the access hole by hand with a cloth and/or soft metal brushes (copper/brass).

The worm normally does not need to be extracted. If it does need to be extracted, proceed as described under *Worm Assembly and Disassembly*. 
Worm Assembly and Disassembly

The worm and worm cylinder are treated with a corrosion protection agent before shipping; they have to be cleaned with petroleum before they are started up (does not apply to systems with adhesive test).

**ATTENTION:** The worm may be assembled and disassembled only when the system is heated and switched off!

**CAUTION:** When it is inserted or extracted, the worm shaft may not be allowed to jam and damage the worm cylinder sealing surface.

**CAUTION:** Risk of burns from hot worm and escaping adhesive! Wear heat-resistant gloves, protective clothing and shoes, and goggles!

Disassembly (with Flange-mounted Metering Station)

The clean worm is removed without the aid of an ejector (e.g. for alignment).

**With Ejector**

An ejector is used to remove the worm (e.g. for Cleaning Worm).

1. Remove the cover.
2. Unscrew heated hoses.
3. Open the access hole on the pump block.
4. Remove the cap (3) and slide the ejector into the motor's hollow shaft.

5. With the ejector, slowly force the worm out the front or pull it out towards the front.

Thoroughly clean the cylinder bore with a round wire brush. Then clean the bore with a cloth soaked in petroleum.

6. Continue with Cleaning Worm.

Disassembly (without Flange-mounted Metering Station)

The clean worm is removed without the aid of an ejector (e.g. for alignment).
With Ejector

An ejector is used to remove the worm (e.g. for Cleaning Worm).

1. Remove the cover.
2. Unscrew heated hoses.

3. Detach the piston pressure switch, pressure sensor, flange heating cuff and flange.

4. Remove the cap (3) and slide the ejector into the motor's hollow shaft.

5. With the ejector, slowly force the worm out the front or pull it out towards the front.

6. Continue with Cleaning Worm.
Cleaning Worm

Use a brass scraper and brush to remove adhesive residue from the worm. Never use hard or sharp-edged tools.

Finally, polish the worm with a soft cloth and fine-grained polishing paste. If the worm is stored for an extended period of time, it should be coated with Vaseline or sprayed with a protective varnish.

Assembly

CAUTION: Ensure that there are no impurities or residue of the cleaning material in the cylinder when putting the worm back into place. The cleaning granulate is very hard and does not melt under normal use; thus it could e.g. damage the pumps.

The worm and worm cylinder have to be at room temperature for assembly. They may not be heated up together until then.

1. Clean the worm shaft and lubricate it with rolling bearing grease.

ATTENTION: Risk of injury from shearing when inserting the worm in the cylinder. Fingers and hands can be injured due to carelessness. Wear protective gloves!

2. Guide the worm into the worm cylinder without force and slide it all the way into the worm drive shaft.
   Work very carefully to prevent damage to the worm, the worm drive shaft and the worm cylinder sealing surfaces.

3. Perform disassembly steps 1. to 4. in reverse order.
Checking Assignment of Temperature Channel to Temperature Sensors

1. Deenergize heaters. To do this, switch off the heater circuit breakers.
2. Set the temperature channel of the temperature sensor to be checked to 60 °C.
3. As indicated by the channel number (ZONE) on the FP13, extract from its bore on the worm cylinder the temperature sensor assumed to correspond.
4. Heat the tip of the sensor with a suitable heat source, e.g. with a cigarette lighter (not with fluid).
   When assignment is correct, a temperature increase will be visible on the display.
5. Switch on the circuit breakers again.

Heating Cuffs

The heating cuff terminals and the corresponding temperature sensors are numbered.

When connecting spare parts, ensure that the heating cuff connections are properly allocated to the temperature controllers. Do this by attaching the lines one after the other to the terminals and then checking the current increase with a measuring caliper amperemeter.

Replacing Overtemperature Protection

When the trigger temperature is exceeded, the heating circuit is interrupted. The fuses are mounted on each controlled heating circuit, with the exception of the worm. They should be checked when the circuit does not heat and replaced if necessary.

NOTE: Fasten the ceramic wire connectors of the thermal fuse element with torque of 1 Nm.

Replacing Piston Pressure Switches

ATTENTION: System and adhesive pressurized. Relieve system of pressure before extracting. Failure to observe can result in serious burns.

The piston pressure switches are set to a certain limit and marked with colors:

<table>
<thead>
<tr>
<th>Order number piston pressure switch</th>
<th>Limit</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>7546788</td>
<td>50 bar</td>
<td>green</td>
</tr>
<tr>
<td>7546786</td>
<td>80 bar</td>
<td>blue</td>
</tr>
<tr>
<td>7056368</td>
<td>120 bar</td>
<td>yellow</td>
</tr>
</tbody>
</table>
Replacing Pressure Sensor

Beginning in 2013, the pressure sensor and transducer are being replaced with a pressure sensor with integrated evaluation electronics. Refer to Appendix B.

ATTENTION: System and adhesive pressurized. Relieve system of pressure before extracting. Failure to observe can result in serious burns.

0-35 bar (green)  
P/N 7058726  

0-100 bar (blue)  
P/N 7050028  

0-350 bar (yellow)  
P/N 7050076  

0-700 bar (red)  
P/N 7058727  

Fig. 7-2  Series overview of pressure sensors (extruder outlet pressure)

Screw-in thread: 1/2” 20 UNF  
Torque: 12 to 50 Nm  
Calibrate; refer to Calibrating Pressure Sensor (Outlet Pressure Extruder) in the section Operation.
Replacing Pressure Sensor Measuring Transducer

Beginning in 2013, the pressure sensor and transducer are being replaced with a pressure sensor with integrated evaluation electronics. Refer to Appendix B.

The measuring transducers are parameterized. Observe the pressure measuring range (nominal pressure range) of the pressure sensor used when ordering spare parts:

<table>
<thead>
<tr>
<th>Order number measuring</th>
<th>Pressure measuring range</th>
<th>Color</th>
<th>Pressure sensor used</th>
</tr>
</thead>
<tbody>
<tr>
<td>7052983</td>
<td>0 - 35 bar</td>
<td>green</td>
<td>P/N 7058726:</td>
</tr>
<tr>
<td>7052984</td>
<td>0 - 100 bar</td>
<td>blue</td>
<td>P/N 7050028:</td>
</tr>
<tr>
<td>7052985</td>
<td>0 - 350 bar</td>
<td>yellow</td>
<td>P/N 7050076:</td>
</tr>
<tr>
<td>7052986</td>
<td>0 - 700 bar</td>
<td>red</td>
<td>P/N 7058727:</td>
</tr>
</tbody>
</table>

Calibrate; refer to *Calibrating Pressure Sensor (Outlet Pressure Extruder)* in the section *Operation*.
### Ordering Spare Parts Using Parts Lists

#### Information Required
- Order number [5] of part
- Desired quantity [7], quantity unit [8]

<table>
<thead>
<tr>
<th>Ref.</th>
<th>Designation</th>
<th>Quantity</th>
<th>ME</th>
<th>CO</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>Description</td>
<td>Qty</td>
<td>UM</td>
<td>DE</td>
</tr>
</tbody>
</table>

#### Order BOM

<table>
<thead>
<tr>
<th>Product</th>
<th>P/N</th>
<th>Date:</th>
<th>Time:</th>
<th>Page:</th>
<th>Id-Nr.:</th>
<th>Valid:</th>
</tr>
</thead>
</table>

1. Designation **Product**
2. Nordson internal designation
3. Order number for the Nordson product
4. Ref.: Position number Assembly, single part in the drawing
5. P/N: Order number for Nordson Assembly, single part
6. Designation Assembly, single part
7. Quantity per Product, assembly
8. Unit quantity
9. CODE: Spare part identification


[7] is the quantity installed per product or assembly, not the quantity that is recommended for storage.
Section 9  
Technical Data

General Data

<table>
<thead>
<tr>
<th>Design size</th>
<th>EEX10</th>
<th>EEX40</th>
<th>EEX100</th>
<th>EEX200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. ambient temperature</td>
<td>10 °C</td>
<td>50 °F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. ambient temperature</td>
<td>40 °C</td>
<td>104 °F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>10 to 95 %, not condensing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. operating height</td>
<td>1,000 m</td>
<td>3280 ft</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Setup</td>
<td>Inside, as dust-free and dry as possible</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Possible temperature sensors</td>
<td>Pt100, Ni120</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adhesive quantity (without metering station)</td>
<td>Dependent on system environment (e.g. hose lengths, connected units)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adhesive pressure (preliminary pressure)</td>
<td>0 to 25 bar</td>
<td>0 to 2.5 MPa</td>
<td>0 to 363 psi</td>
<td></td>
</tr>
<tr>
<td>Adhesive pressure (metering station)</td>
<td>5 to 70 bar</td>
<td>0.5 to 7 MPa</td>
<td>72.5 to 1015 psi</td>
<td></td>
</tr>
<tr>
<td>Max. 100 bar / 10 MPa / 1450 psi, depending on connected hose and applicator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adhesive pressure (shutdown)</td>
<td>Dependent on piston pressure switch used</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 to 400 bar</td>
<td>3 to 40 MPa</td>
<td>435 to 5800 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The piston pressure switch is preset at the factory. Factory setting:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120 bar</td>
<td>12 MPa</td>
<td>1740 psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP 32</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Noise emission at a distance of 1 m</td>
<td>70 dB(A)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor type</td>
<td>3 ph AC motor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gear box type</td>
<td>Helical gear</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Motor/pump speed setting range</td>
<td>1.0 to 100 min⁻¹</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To prevent excessive wear, the motor/pump speed should not continuously fall below 5 min⁻¹ (rpm) or continuously exceed 80 min⁻¹ (rpm).</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. melting and feeding capacity</td>
<td>10/40/100/200 l/h (depending on adhesive processed)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight</td>
<td>Refer to consignment note</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Electrical Data**

CAUTION: Operate only at the operating voltage shown on the ID plate.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating voltage</td>
<td>Refer to ID plate</td>
</tr>
<tr>
<td>Operating voltage frequency</td>
<td>50/60 Hz (+10%)</td>
</tr>
<tr>
<td>Total power consumption</td>
<td>Refer to ID plate</td>
</tr>
<tr>
<td>Fuse protection [A]</td>
<td>Refer to ID plate</td>
</tr>
<tr>
<td>Max. pilot voltage (input voltage)</td>
<td>0 to 10 V (without tach generator adjustment board / without coupler component) Failure to observe will result in damage to succeeding components.</td>
</tr>
</tbody>
</table>

**Cooling Agent Data**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooling agent</td>
<td>Water</td>
</tr>
<tr>
<td>Water specification</td>
<td>Refer to the section <em>Installation/ Water Specification</em></td>
</tr>
<tr>
<td>Water temperature in feed section</td>
<td>15 °C, Δt: 10 °C</td>
</tr>
</tbody>
</table>

**Temperatures**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. operating temperature</td>
<td>50 °C</td>
</tr>
<tr>
<td>Max. operating temperature</td>
<td>230 °C / 200 °C (Ni120)</td>
</tr>
<tr>
<td>Max. temperature that can be set on extruder</td>
<td>250 °C (higher values according to application specifications)</td>
</tr>
</tbody>
</table>
Dimensions

Fig. 9-1

<table>
<thead>
<tr>
<th>Design size</th>
<th>Length x width x height [mm]</th>
<th>Length x width x height [in.]</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEX10</td>
<td>1570 x 1100 x 1250</td>
<td>61.8 x 73.3 x 49.2</td>
</tr>
<tr>
<td>EEX40</td>
<td>1850 x 1100 x 1400</td>
<td>72.8 x 73.3 x 55.1</td>
</tr>
<tr>
<td>EEX100</td>
<td>2500 x 1100 x 1450</td>
<td>98.4 x 73.3 x 57.1</td>
</tr>
<tr>
<td>EEX200</td>
<td>3300 x 1400 x 1600</td>
<td>130 x 55.1 x 63</td>
</tr>
</tbody>
</table>

Hopper volume

<table>
<thead>
<tr>
<th>Design size</th>
<th>Hopper volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEX10</td>
<td>15 liters</td>
</tr>
<tr>
<td>EEX40</td>
<td>30 liters</td>
</tr>
<tr>
<td>EEX100</td>
<td>75 liters</td>
</tr>
<tr>
<td>EEX200</td>
<td>150 liters</td>
</tr>
</tbody>
</table>
Appendix A
Tach Generator Adjustment Board

Safety Instructions

ATTENTION: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Description

With the tach generator adjustment board, any input voltage up to 250 V can be reduced to the lower output voltage needed in multiple steps.

NOTE: The circuit prevents the maximum output voltage of 10 Volt from being substantially exceeded.
Setting Input Voltage

The four DIP switches serve to roughly set the voltage, while the potentiometers are used for precise adjustment.

Setting the potentiometer *Fine* to the middle position and turning the potentiometer *Rough* all the way to the right results in the following maximum input voltages:

<table>
<thead>
<tr>
<th>DIP switch</th>
<th>220 V</th>
<th>80 V</th>
<th>32 V</th>
<th>15 V</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
</tr>
<tr>
<td>2</td>
<td>OFF</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
</tr>
<tr>
<td>3</td>
<td>OFF</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
</tr>
<tr>
<td>4</td>
<td>ON</td>
<td>OFF</td>
<td>OFF</td>
<td>OFF</td>
</tr>
</tbody>
</table>

Setting the potentiometer *Rough* to the center position results in double the input voltage. All voltage values are based on output voltage of 10 Volt.

Turning the potentiometers to the right causes the voltage at the output to rise.
Appendix B

Pressure Sensor with Integrated Evaluation Electronics

Beginning in 2013, the pressure sensor with transducer described in the manual is being replaced with a pressure sensor with integrated evaluation electronics.

Replacing Pressure Sensor

The pressure sensor supplies an analog output signal of 0 to 10 Volt.

Transport and Storage Instructions

- Avoid jolts and vibrations. Transport and store only in sturdy, suitable packaging.
- Always close with the protective cap when transporting or storing to protect the sensitive separating membrane from damage. Before screwing on the protective cap, ensure that the separating membrane and the cap are clean.
- Avoid extreme temperature fluctuations to prevent condensation from forming.

Screwing Out

**ATTENTION:** Hot! Risk of burns. Wear heat-protective gloves.

**ATTENTION:** System and adhesive pressurized. Relieve system of pressure before unscrewing the pressure sensor. Failure to observe can result in serious burns.

**CAUTION:** If the material bore is to be cleaned with a sharp object, first remove the pressure sensor to prevent damage to the separating membrane.

**CAUTION:** The melter part and the pressure sensor must be at operating temperature when the pressure sensor is removed. Otherwise the separating membrane could tear.

Fig. B-1  Principle drawing
**Screwing In**

- Apply high temperature grease to the thread
- If a brass washer has been or will be inserted, refer to Fig. B-3
- The sensor should only be screwed into an absolutely clean hole.
- The counterpart and the pressure sensor should be at room temperature or at close to the same temperature before the pressure sensor is screwed into place.
- Do not jam when screwing in (Strong resistance should not be felt).
- Recommended installation torque: 13.6 Nm / 120 lbin
  Max. installation torque permitted: 56 Nm / 500 lbin.

**Important for Pressure Sensors with Capillary**

- Refer to Fig. B-2: top wrong, bottom correct, because the screw plug (2) is used as a guide for the separating membrane (1).

**When a Brass Washer Has Been or Will Be Used**

In addition to the instructions under *Screwing in*, observe the following:

- The brass washer seals by deforming. When removing the pressure sensor, ensure that the old brass washer is extracted from the bore.
- Use a new brass washer when inserting the pressure sensor. Insert the brass washer as shown in the illustration. A pack of ten can be ordered as P/N 7157515.
Calibration

Calibration Using Magnetic Pin

**CAUTION:** Calibrate the pressure sensor only when it is heated to operating temperature.

The pressure sensor has a magnetic contact in the measuring head. When the magnetic pin touches the contact (see label, Fig. B-4), various functions are activated. The length of time that the pin touches the contact determines which functions are activated.

Calibrating the Zero Point

Zero point calibration works only when the equipment is depressurized (0 to 10% of the pressure sensor measuring range end value).

**Calibration to 0 V**

Hold the magnetic pin to the label for 1 to 10 seconds.

The pressure sensor zero point is calibrated to 0 V.

**Fine Calibration**

1. Hold the magnetic pin to the label for 10 to 30 seconds.
2. Remove the magnetic pin.
   - The offset can be set between ± 100 mV. The signal changes 6 mV per second.
3. To stop, touch the label briefly with the magnetic pin.

**NOTE:** If the temperature deviates more than 10 °C from the temperature at which calibration was performed, Nordson recommends calibrating anew.

Resetting Zero Point

Hold the magnetic pin to the label for 30 to 60 seconds.

This resets the zero point to the factory-set default; the end value remains unchanged.

The default value can be found on the pressure sensor ID plate.

Resetting Zero Point and End Value to Default

Hold the magnetic pin to the label for longer than 60 seconds.

The default value can be found on the pressure sensor ID plate.
Maintenance

1. *Relieve adhesive pressure.*

2. Refer to *Replacing Pressure Sensor* for information on removal and installation.

**Cleaning Separating Membrane**

*NOTE:* Clean the separating membrane carefully. Never use hard tools.

**ATTENTION:** Hot! Risk of burns. Wear heat-protective gloves.

Remove material residue only with a cleaning agent recommended by the material supplier. Thermoplastic materials such as hot melt adhesives may need to be heated with an air heater and then carefully wiped off with a soft cloth.

**Performance Check**

Connect pressure sensor electrically for performance check; do not screw in.

**CAUTION:** Never check performance with objects that could damage the separating membrane. The separating membrane must be absolutely clean. Apply pressure to the separating membrane. If possible, use a suitable pressure instrument; otherwise use a finger or a flexible object.

**Checking Measuring Performance**

<table>
<thead>
<tr>
<th>Pin</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Signal output 0 to 10 V&lt;sub&gt;DC&lt;/sub&gt;</td>
</tr>
<tr>
<td>B</td>
<td>Signal output 0 V&lt;sub&gt;DC&lt;/sub&gt;</td>
</tr>
<tr>
<td>C</td>
<td>Operating voltage 15 to 30 V&lt;sub&gt;DC&lt;/sub&gt;</td>
</tr>
<tr>
<td>D</td>
<td>Operating voltage 0 V&lt;sub&gt;DC&lt;/sub&gt;</td>
</tr>
<tr>
<td>E</td>
<td>Calibration function (bridge E and F)</td>
</tr>
<tr>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

1. Connect a suitable display unit, e.g. DC-Voltmeter. Supply the pressure sensor with operating voltage (15 to 30 V<sub>DC</sub>).

2. When pressure is applied to the separating membrane, there should be an output signal, proportional to the pressure, at the signal output.
<table>
<thead>
<tr>
<th>Unit part</th>
<th>Activity</th>
<th>Interval</th>
<th>Refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure sensor</td>
<td>Check performance</td>
<td>Dependent on purpose and conditions of use of pressure sensor</td>
<td>Page B-4</td>
</tr>
<tr>
<td></td>
<td>Calibrate</td>
<td>Every year; more often if conditions of use require</td>
<td>Page B-3</td>
</tr>
<tr>
<td></td>
<td>Zero point calibration via PLC, if the software offers this feature; otherwise with the aid of the magnetic pin</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check separating membrane for damage</td>
<td>Every time the pressure sensor is removed, more often if necessary</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Check if hardened or charred material is stuck to the membrane; clean if necessary</td>
<td></td>
<td>Page B-4</td>
</tr>
</tbody>
</table>
Appendix C

Instructions on Aligning Level Compensating Element (Special Feature)

The extruder has already been aligned before delivery. However, the alignment should be checked and possibly adjusted at the customer's facility.

Fig. C-1 Support with level compensating element (arrow) - EEX200 as example
ATTENTION: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

Set up at the final location and start up as described in the manual. Do not align until the extruder is ready for operation (at processing temperature).

3. Use a level to check the frame and, if necessary, adjust the feet (1, Fig. C-2) to best suit the floor.

4. Align transversely with the aid of the two supports with level compensating element (2, Fig. C-3). Do this by turning the two support pieces (B) the required distance (X) apart. Secure the setting with the upper element (A). Two sickle wrenches will be needed to do this.