Heated Hoses
TC ...

Manual P/N 317044H
– English –

Issued 06/11
**Note**  
This document is valid for the entire series.

**Order number**  
P/N = Order number for Nordson products

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Safety

Safety symbols

The following symbols are used to warn against dangers or possible sources of danger. Become familiar with them! Failure to heed a warning could lead to personal injury and/or damage to the unit or other equipment.

WARNING: Failure to observe may result in personal injury, death, or equipment damage.

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


WARNING: System or material pressurized. Relieve pressure. Failure to observe may result in serious burns.

CAUTION: Failure to observe may result in equipment damage.

Qualified Personnel

Qualified personnel is defined here as individuals who thoroughly understand the equipment and its safe operation, maintenance, and repair. Qualified personnel are physically capable of performing the required tasks, familiar with all relevant safety rules and regulations, and have been trained to safely install, operate, maintain, and/or repair the equipment. It is the responsibility of the company operating the equipment to see that its personnel meet these requirements.
Installation and electrical Connections

**WARNING:** Failure to follow the safety procedures can result in injury or death.

- Cables must never be squeezed or pinched. Do not locate cables or hoses in high traffic areas.

**Residual Risks**

**WARNING:** An operator or service technician working with the unit should be aware of less-obvious dangers that often cannot be completely minimized at production sites:

- Exposed surfaces of the unit which cannot be practically safeguarded. They may be hot and take time to cool after the unit has been operating.
- Hot melt material and vapors.

**Risk of Burns**

Contact with hot melt materials or hot areas of the unit may produce a severe skin burn.

**WARNING:** Hot! Risk of burns. Wear heat-protective clothing, safety goggles, and/or heat-protective gloves depending on the symbols shown.

- Be extremely careful when using hot melt material. Even solidified material may still be very hot.
- Always wear protective clothing which safely covers all exposed parts of the body.

**In case of burns**

- Immediately cool affected skin areas using cold, clean water.
- Do not forcefully remove hot melt material from the skin.
- Immediately seek medical attention.
Introduction

Intended Use

Heated hoses of the Series TC... may only be used for the feeding of hot melt materials and similar thermoplastic materials between the components of material application systems.

Any other use is considered as not intended and is carried out at the operator’s own risk. Nordson will not be responsible for personal or equipment damage resulting from unintended use.

Intended use also includes the observance of Nordson safety instructions. Nordson recommends collecting detailed information about the materials to be used.

Unintended Use

Heated hoses may not be used under the following conditions:

- In defective condition
- In an explosive atmosphere
- To feed substances which are not compatible with the hose core material (see: Chemical Compatibility).

Residual Risks

The unit is designed to protect operating personnel from possible risks. However, some residual risks cannot be avoided. Personnel must consider the following:

- Inhalation of potentially hazardous hot melt material vapors
- Risk of injury from automatically–positioned system components (e.g. robots)
- Risk of burns from heated components, e.g. hose fittings or hot melt material application heads.
Series Overview

The following hose types are available for different applications:

<table>
<thead>
<tr>
<th>Hose Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC ...</td>
<td>Standard hose</td>
</tr>
<tr>
<td>TC ...-H</td>
<td>For higher operating temperatures</td>
</tr>
<tr>
<td>TC ...-Y</td>
<td>For higher operating pressures</td>
</tr>
<tr>
<td>TC ...-X</td>
<td>For higher pressures at higher temperatures</td>
</tr>
</tbody>
</table>

**NOTE:** For more information on pressure and temperature capacity of individual hose types see Section Overview.

Ausstattungsvarianten

<table>
<thead>
<tr>
<th>Variant</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-K</td>
<td>Without control line for solenoid valves</td>
</tr>
<tr>
<td>-L</td>
<td>With air hose for spray air supply</td>
</tr>
<tr>
<td>-LB</td>
<td>With air hose and additional connection socket, e.g. for air heater</td>
</tr>
<tr>
<td>-Pt 100</td>
<td>Temperature sensor <em>Pt 100</em> instead of thermoelement Fe-CuNi (FeKo)</td>
</tr>
<tr>
<td>-S</td>
<td>Steel-reinforced jacket instead of polyamide netting</td>
</tr>
<tr>
<td>-So</td>
<td>Special version according to customer specification</td>
</tr>
</tbody>
</table>

**NOTE:** Since 9/98 versions with temperature sensor *PT 100* have been marked with a white tracer in the polyamide netting.
Chemical Compatibility

The cores of TC... hoses are made of various materials and are compatible with most other materials.

<table>
<thead>
<tr>
<th>Hose type</th>
<th>Core material</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC... and TC...-H</td>
<td>PTFE</td>
<td>Swells on contact with fluorcarbohydrates and oils.</td>
</tr>
<tr>
<td>TC...-Y</td>
<td>FEP</td>
<td>Small amounts of water diffuse through the material.</td>
</tr>
<tr>
<td>TC...-X</td>
<td>Stainless steel</td>
<td>Completely diffusion-resistant. Not suitable for chlorides, bromides and other halogens.</td>
</tr>
</tbody>
</table>

NOTE: Bei allen Anwendungen das DIN-Sicherheitsdatenblatt (Material Safety Data Sheet) des Materials beachten, das gefördert werden soll.
ID plate

The following ID plate can be found on the heated hoses:

![ID Plate Image]

Fig. 2

The information is as follows:

<table>
<thead>
<tr>
<th>Information</th>
<th>Meaning</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typ</td>
<td>Type description</td>
<td>–</td>
</tr>
<tr>
<td>P/N</td>
<td>Article number</td>
<td>–</td>
</tr>
<tr>
<td>Ser.</td>
<td>Serial number</td>
<td>–</td>
</tr>
<tr>
<td>U</td>
<td>Operating voltage</td>
<td>Volt</td>
</tr>
<tr>
<td>P</td>
<td>Power consumption</td>
<td>Watt</td>
</tr>
<tr>
<td>T</td>
<td>Maximum operating temperature</td>
<td>°C</td>
</tr>
</tbody>
</table>

Explanation of Type Description

Example TC-15-8-L-6-Pt 100:
Installation

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

Unpacking

CAUTION: Unroll the hose when unpacking to avoid bending or pinching.

Installing

In order to guarantee long operating life and safe operation, observe the installation instructions when laying heated hoses (see Fig. 4). Ensure proper ventilation of covered hoses to avoid overheating.

Minimum bending radius

Observe minimum bending radius (see Overview).

Electrical Connection

WARNING: Disconnect equipment from the line voltage before plugging or unplugging electrical hose connections. Observe national installation practice and corresponding safety regulations.

Units with Plugs

1. Switch off the unit’s main switch.
2. Disconnect power cable and secure against re-connection.

Units with Fixed Connection

1. Disconnect and lock out power to the main circuit breaker for the applicator input power line.
2. Move the applicator circuit breaker to the OFF position.

NOTE: Disconnect and lock out main power!
**Installation Instructions**

![Diagram of installation instructions]

- P/N 111 940 (only for TC−xx−8...)
- X=13 mm (0.50 in.)
- siehe Minimum bending radius
- P/N 271 486 – TC−8
  P/N 274 174 – TC−13
  P/N 253 570 – Universal

Fig. 4
Installing Heated Hoses

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

**Connecting**

If cold hot melt material can be found in the hose connection fitting (1) and/or hose connection (2), these components must be heated until the material softens (approx. 80 °C, 176 °F).

1. First connect the hose (3) electrically to the unit. For more than one hose: every hose connection is allocated to a corresponding connection socket. Do not mistakenly exchange!

**NOTE:** For units with recirculation hoses: do not mistake recirculation hoses for feed hoses.

2. Heat the unit and hose to approx. 80 °C (176 °F).

3. Screw the hose onto the unit.

**NOTE:** Close unused hose connection with Nordson screw caps.

**Disconnecting**

**WARNING:** System and hot melt material pressurized. Relieve pressure before disconnecting heated hoses. Failure to observe can result in serious burns.

**Relieving Pressure**

See operating manual of the material pressure-producing system components.

**Use second Open-jawed Wrench**

Using a second open-jawed wrench prevents the hose connection fitting on the unit from turning.

---

*Fig. 5*  
*Fig. 6*
Maintenance

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

**NOTE:** Maintenance is an important preventative measure for maintaining operational safety and extending the lifetime of the unit. It should not be neglected under any circumstances.

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

External Cleaning

**WARNING:** Risk of fire! Deposits of hot melt or other materials can cause overheating.

1. Remove all dust and dirt deposits from the hose.
2. Remove all hot melt material residues from the hose and fittings. If necessary, heat with an air heater until soft.

Check Condition

1. Check all hoses and fittings for leakiness. Replace leaking hoses. Tighten screw connections if necessary. Use a second open-jawed wrench.
2. Check electrical plug connections for tightness.
Changing Hot Melt Material Type

Remove the old material from the unit by running until empty or draining from the unit.

NOTE: Before changing the material type, determine whether the old and new hot melt materials can be mixed.

- If mixing is possible: Residues of the old material can be flushed out using the new material.
- If mixing is not possible: Thoroughly flush the unit with a cleaning agent recommended by the hot melt material supplier.

NOTE: Ensure proper disposal of the old hot melt material according to local regulations.

Flush with a Cleaning Agent

CAUTION: Only use a cleaning agent recommended by the hot melt material supplier. Observe the Material Safety Data Sheet of the cleaning agent.

Residues of the cleaning agent can be flushed out of the unit by the new hot melt material before production begins.

NOTE: Ensure proper disposal of the cleaning agent according to local regulations.
Troubleshooting

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

Introduction

The troubleshooting table serves as an orientation for qualified personnel, however it cannot replace targetted troubleshooting using e.g. wiring diagrams and measuring instruments. The table does not contain all possible faults, only those which typically occur.

Troubleshooting Table

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible Cause</th>
<th>Corrective Action</th>
<th>Refer to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hose does not heat at all or not enough</td>
<td>Application system is switched off</td>
<td>Switch on application system</td>
<td>Operating manual of the application system</td>
</tr>
<tr>
<td></td>
<td>Temperature controller malfunction</td>
<td>Check temperature controller, replace if necessary</td>
<td>Operating manual of the application system</td>
</tr>
<tr>
<td></td>
<td>Loose electrical connections</td>
<td>Check and tighten electrical connections</td>
<td>–</td>
</tr>
<tr>
<td></td>
<td>Damaged or broken plug connection</td>
<td>Replace</td>
<td>–</td>
</tr>
</tbody>
</table>
Overview

Pressure and Temperature

**NOTE:** The maximum operating temperature of the hose can be found on the ID plate. Observe max. pressure!

**Hose Type TC ...**

<table>
<thead>
<tr>
<th>NW</th>
<th>Dynamic operating pressure at 24 °C / 75,2°F</th>
<th>100 °C / 212°F</th>
<th>200 °C / 392°F</th>
<th>230 °C / 446°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 mm</td>
<td>200 bar 2900 psi</td>
<td>180 bar 2610 psi</td>
<td>160 bar 2320 psi</td>
<td>103 bar 1493,5 psi</td>
</tr>
<tr>
<td>13 mm</td>
<td>125 bar 1812,5 psi</td>
<td>112 bar 1624 psi</td>
<td>103 bar 1493,5 psi</td>
<td>103 bar 1493,5 psi</td>
</tr>
<tr>
<td>20 mm</td>
<td>70 bar 1015 psi</td>
<td>63 bar 913,5 psi</td>
<td>58 bar 841 psi</td>
<td>58 bar 841 psi</td>
</tr>
<tr>
<td>32 mm</td>
<td>70 bar 1015 psi</td>
<td>63 bar 913,5 psi</td>
<td>58 bar 841 psi</td>
<td>58 bar 841 psi</td>
</tr>
<tr>
<td>40 mm</td>
<td>50 bar 725 psi</td>
<td>45 bar 652,5 psi</td>
<td>40 bar 580 psi</td>
<td>40 bar 580 psi</td>
</tr>
</tbody>
</table>

**NOTE:** 10\(^5\) Pa = 1 bar = 14,5 psi

**Hose Type TC ...-H**

<table>
<thead>
<tr>
<th>NW</th>
<th>Dynamic operating pressure at 24 °C / 75,2°F</th>
<th>100 °C / 212°F</th>
<th>200 °C / 392°F</th>
<th>250 °C / 572°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 mm</td>
<td>250 bar 3625 psi</td>
<td>225 bar 3262,5 psi</td>
<td>200 bar 2900 psi</td>
<td>140 bar 2030 psi</td>
</tr>
<tr>
<td>13 mm</td>
<td>156 bar 2262 psi</td>
<td>140 bar 2030 psi</td>
<td>125 bar 1812,5 psi</td>
<td>88 bar 1276 psi</td>
</tr>
<tr>
<td>20 mm</td>
<td>87 bar 1261,5 psi</td>
<td>79 bar 1145,5 psi</td>
<td>70 bar 1015 psi</td>
<td>49 bar 710,5 psi</td>
</tr>
<tr>
<td>32 mm</td>
<td>87 bar 1261,5 psi</td>
<td>79 bar 1145,5 psi</td>
<td>70 bar 1015 psi</td>
<td>49 bar 710,5 psi</td>
</tr>
<tr>
<td>40 mm</td>
<td>62 bar 899 psi</td>
<td>56 bar 812 psi</td>
<td>50 bar 725 psi</td>
<td>35 bar 507,5 psi</td>
</tr>
</tbody>
</table>

**NOTE:** 10\(^5\) Pa = 1 bar = 14,5 psi

**Hose Type TC ...-Y**

<table>
<thead>
<tr>
<th>NW</th>
<th>Dynamic operating pressure at 24 °C / 75,2°F</th>
<th>100 °C / 212°F</th>
<th>200 °C / 392°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 mm</td>
<td>300 bar 4350 psi</td>
<td>270 bar 3915 psi</td>
<td>125 bar 3480 psi</td>
</tr>
<tr>
<td>20 mm</td>
<td>265 bar 3842,5 psi</td>
<td>238 bar 3451 psi</td>
<td>70 bar 3074 psi</td>
</tr>
</tbody>
</table>

**NOTE:** 10\(^5\) Pa = 1 bar = 14,5 psi
Hose Type TC ...-X

<table>
<thead>
<tr>
<th>NW</th>
<th>24 °C / 75,2°F</th>
<th>100 °C / 212°F</th>
<th>150 °C / 302°F</th>
<th>200 °C / 392°F</th>
<th>250 °C / 572°F</th>
<th>300 °C / 572°F</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 mm</td>
<td>350 bar 5075 psi</td>
<td>309 bar 4480,5 psi</td>
<td>291 bar 4219,5 psi</td>
<td>273 bar 3958,5 psi</td>
<td>255 bar 3697,5 psi</td>
<td>230 bar 3335 psi</td>
</tr>
<tr>
<td>16 mm</td>
<td>280 bar 4060 psi</td>
<td>240 bar 3480 psi</td>
<td>226 bar 3277 psi</td>
<td>212 bar 3074 psi</td>
<td>198 bar 2871 psi</td>
<td>179 bar 2595,5 psi</td>
</tr>
</tbody>
</table>

NOTE: 10^5 Pa = 1 bar = 14,5 psi

Fittings

NOTE: Auch andere als in der Tabelle angegebenen Gewinde können vorkommen.

<table>
<thead>
<tr>
<th>NW</th>
<th>Gewinde</th>
<th>SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>9/16-18 UNF</td>
<td>17</td>
</tr>
<tr>
<td>10</td>
<td>3/4-16 UNF</td>
<td>19</td>
</tr>
<tr>
<td>13</td>
<td>3/4-16 UNF</td>
<td>22 / 24</td>
</tr>
<tr>
<td>16</td>
<td>M 30 x 1,5</td>
<td>36</td>
</tr>
<tr>
<td>20</td>
<td>M 30 x 1,5</td>
<td>36</td>
</tr>
<tr>
<td>32</td>
<td>M 45 x 1,5</td>
<td>50</td>
</tr>
<tr>
<td>40</td>
<td>M 52 x 1,5</td>
<td>60</td>
</tr>
</tbody>
</table>

¹ NW = Inner diameter of hose core in mm
² SW = Wrench size in mm

Minimum Bending Radius

CAUTION: For hoses with air lines, the minimum bending radius must be increased by a factor of 1.5!

<table>
<thead>
<tr>
<th>NW</th>
<th>Polyamid jacketing</th>
<th>Metal jacketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>100 mm</td>
<td>130 mm</td>
</tr>
<tr>
<td>10</td>
<td>150 mm</td>
<td>180 mm</td>
</tr>
<tr>
<td>13</td>
<td>180 mm</td>
<td>220 mm</td>
</tr>
<tr>
<td>16</td>
<td>190 mm</td>
<td>230 mm</td>
</tr>
<tr>
<td>20</td>
<td>220 mm</td>
<td>280 mm</td>
</tr>
<tr>
<td>32</td>
<td>500 mm</td>
<td>600 mm</td>
</tr>
<tr>
<td>40</td>
<td>850 mm</td>
<td>1000 mm</td>
</tr>
</tbody>
</table>

¹ NW = Inner diameter of hose core in mm
Electrical Data

See ID plate.

Electrical Connections

**NOTE:** Figure 7 shows equipment variant *TC...-LB-* with additional connection socket and air hose.

---

Fig. 7  TC ...-LB

Note: For connection allocation refer to Wiring Diagram
Wiring Diagram

Fig. 8

Note: The shaded, additional connection socket is only available for equipment variant TC...-LB- hoses.