FAQ • October 2015

FAQ Installation of the SIMOTICS L-1FN3
Additional Information to the CM and OI

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Caution

The functions and solutions described in this article are mainly restricted to the implementation of the automation task. Please also note that, if your plant is networked with other plant units, the company network, or the Internet, appropriate protective measures must be taken as part of Industrial Security. For more information, see the article ID 50203404.


Question

What do I need to follow when installing 1FN3 built-in linear motors in addition to the Configuration Manual?

Answer

This manual provides additional information about the installation of SIMOTICS 1FN3 built-in linear motors that has not yet been included in the current SIMOTICS L-1FN3 Configuration Manual (CM) or the current operating instructions (OI) for SIMOTICS-L 1FN3 linear motors, or which complements the information they already contain.

For basic installation information, follow the 1FN3 CM and the 1FN3 operating instructions.

To fully answer this question, follow the handling instructions and notes listed in this document.
# Table of contents

1. Depths of thread and screw-in depths in the primary section ..................... 4  
2. Use of stainless steel screws........................................................................ 6  
   2.1 Advantages of stainless steel screws: ................................................. 6  
   2.2 Disadvantages of stainless steel screws.............................................. 6  
3. Mounting the secondary section cooling.................................................... 7  
4. Mounting the secondary section segments.................................................. 10  
5. Mounting the secondary section cover band.............................................. 15  
6. Mounting the connection cable.................................................................. 22  
7. Angled cable connection............................................................................ 25  
   7.1 Connection with angled screw connectors......................................... 25  
   7.2 Connection via a LIMOTEC 900 angled connector............................. 29  
8. Cooling system connection........................................................................ 30
1 Depths of thread and screw-in depths in the primary section

The following drawings show
- the depth of the start of the threads
- the guaranteed depth of the threaded holes.

As the depth of the thread is guaranteed, no tolerance is stated (the real depth of the hole is actually slightly greater).

The machine manufacturer is responsible for selecting the length of the fixing screws (taking into account all component tolerances) to ensure that:

- The minimum length (1.1 × d) of the load-bearing thread does not fall below the generally valid values in the table (assurance against stripping)
- The maximum screw-in depth of the fixing screws is not exceeded (to prevent them touching the bottom of the threaded holes).

The machine manufacturer states in the drawings a tolerance range for the selection of the length of the screws: green zone).

Table 1-1: Green zones for the screw-in depths for the 1FN3 peak load model

<table>
<thead>
<tr>
<th>Screw-in depths for the 1FN3 peak load model (1FN3xxx-xWxxx)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Without precision cooler</td>
</tr>
<tr>
<td>--------------------------</td>
</tr>
<tr>
<td>1FN3 050 100 150</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M5</th>
<th>M5</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>PLM</td>
</tr>
<tr>
<td>Tolerance range: 6.3 to 9.4 mm</td>
<td></td>
</tr>
<tr>
<td>Tolerance range of screw-in depth: 18.2 to 21.3 mm</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>M8</th>
<th>M8</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLM</td>
<td>PLM</td>
</tr>
<tr>
<td>Tolerance range: 9.6 to 11.6 mm</td>
<td></td>
</tr>
<tr>
<td>Tolerance range of screw-in depth: 21.5 to 23.5 mm</td>
<td></td>
</tr>
</tbody>
</table>
### Table 1-2: Green zone ranges for the screw-in depths for the 1FN3 continuous load model

<table>
<thead>
<tr>
<th>1FN3xxx-xNxxx</th>
<th>Without precision cooler</th>
<th>With precision cooler</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M5</strong></td>
<td>1.3</td>
<td>13.2</td>
</tr>
<tr>
<td><strong>CLM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screw-in depths</td>
<td>6.8 to 9.6 mm</td>
<td>18.7 to 21.0 mm</td>
</tr>
<tr>
<td><strong>M8</strong></td>
<td>1.5</td>
<td>12.9</td>
</tr>
<tr>
<td><strong>CLM</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screw-in depths</td>
<td>10.3 to 12.5 mm</td>
<td>21.7 to 24.4 mm</td>
</tr>
</tbody>
</table>

Tolerance range of screw-in depth: 6.8 to 9.6 mm

Tolerance range of screw-in depth: 18.7 to 21.0 mm

Tolerance range of screw-in depth: 10.3 to 12.5 mm

Tolerance range of screw-in depth: 21.7 to 24.4 mm
2 Use of stainless steel screws

2 Use of stainless steel screws
Standard ferromagnetic steel screws or non-magnetic, corrosion-resistant (stainless) steel screws can be used for mounting the primary and secondary sections of SIMOTICS L-1FN3 linear motors.

Both types of screws have their advantages and disadvantages for use in the 1FN3, which are listed below.

Each of the advantages and disadvantages may be important or unimportant depending on the requirements and operating conditions of the particular application.

Therefore no definitive recommendation can be given for an application. The machine manufacturer is responsible for assessing whether or not corrosion-resistant screws ought to be used in his application.

2.1 Advantages of stainless steel screws:

- Stainless steel screws are not subject to corrosion, even if exposed to corrosive media.
- They are easy to handle during assembly because they are not subject to magnetic forces.
- Their thermal conductance is substantially lower, so less heat is conducted into the body of the machine.

2.2 Disadvantages of stainless steel screws

- Stainless steel screws are considerably more expensive, and forward buying involves additional expense.
- Most users are accustomed to using standard screws, and have little experience of using stainless steel screws.
- Stainless steel screws have considerably lower fracture and yield strength limits.
- The combination of stainless steel and aluminum materials leads to contact corrosion in the threaded hole. Countermeasure: Suitable coating of the threads.
- The friction values of stainless steel scatter much more widely than those of standard screws, and thus make it more difficult to define the tightening torque. The resulting tightening force varies by 50% or more, even if the torque has a high repeat accuracy. Countermeasure: Suitable coating of the threads.
## 3 Mounting the secondary section cooling

Table 3-1: Work steps for assembling the secondary section cooling

<table>
<thead>
<tr>
<th>No.</th>
<th>Work steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Preparation of the heatsink profiles: View of the coupling nipples and coupling sockets. The coupling nipples have a conical nose for entry. The green Viton sealing ring can be seen in the coupling socket lying opposite. Frame sizes 1FN3 050 to 1FN3 450: <strong>One</strong> cooling water duct in each row of profiles Frame sizes 1FN3 600 and 1FN3 900: <strong>Two</strong> cooling water ducts in each row of profiles Note: To make coupling easier, all the coupling nipples should be lubricated with a thin coat of Vaseline.</td>
</tr>
</tbody>
</table>
### 3 Mounting the secondary section cooling

<table>
<thead>
<tr>
<th>No.</th>
<th>Work steps</th>
</tr>
</thead>
</table>
| 2   | Lay out ready heatsink profiles of the required overall length. View of the rows of heatsink profiles. (Red-outlined area: approximate later position of a secondary section segment)  
Frame sizes 1FN3050 to 1FN3450: Lay two rows of profiles alongside the secondary sections  
Frame sizes 1FN3600 and 1FN3900: Place three rows of profiles underneath the secondary sections |
| 3   | Lay out ready the end pieces: Assemble the rows of profiles, and provisionally screw in screws along the whole length. (This is only to ensure that they are correctly positioned; hand-tightening is sufficient.) Lay out the end pieces ready at each end. |
### 3 Mounting the secondary section cooling

<table>
<thead>
<tr>
<th>No.</th>
<th>Work steps</th>
</tr>
</thead>
</table>
| 3   | **Alignment of the end pieces:**  
      Align the end pieces so that all coupling nipples have their conical noses inserted about 2 mm into the associated coupling sockets. |
| 4   | **Coupling the end pieces:**  
      Insert the end pieces by hand into their coupled positions.  
      If necessary, drive them in by tapping **very cautiously** with a hammer at equally spaced intervals across the whole width; place a protective layer, such as a piece of wood, in between hammer and component.  
      The couplings must go in straight **without cantiing**!  
      Otherwise the Viton sealing rings in the coupling sockets will be damaged and leak. |
## 4 Mounting the secondary section segments

Table 4-1: Work steps for assembling the secondary section segments

<table>
<thead>
<tr>
<th>No.</th>
<th>Work steps</th>
</tr>
</thead>
</table>
| 1   | Prepare the work equipment:  
- Wear safety shoes.  
- Cordon off the entire working area with barriers or tapes  
- Keep electronic and magnetic data storage media and devices (credit cards, watches) out of the working area  
- Lay out the following items ready on a non-magnetic working surface:  
- Tool  
- The fixing screws provided  
- Torque wrench  
- Work gloves (cut-resistant)  
- Rescue wedge and hammer (both must be non-magnetic)  
- Secondary section segments (still in their original packaging). |
| 2   | Prepare the mounting surface:  
Clean the mounting surface on the machine, and remove all movable objects.  
The grid of threaded holes must already be present.  
Heatsink profiles of the secondary section cooling (if provided) must be laid out ready in their intended positions, and prevented from slipping by 2 hand-tightened fixing screws. |
| 3   | Prepare the secondary section:  
Unpack the first segment of the secondary section:  
**Leave all the other segments in their packaging!**  
Keep the carton boards from the packaging for a later work step. |
4 Mounting the secondary section segments

4 | Insert the secondary section:
   | Lay the secondary section on the
   | mounting surface, aligned as shown in
   | the installation drawing (see operating
   | instructions).
   | Keep one hand on the top surface at all
   | times to prevent the secondary section
   | from accidentally flipping over.

5 | Position the secondary section:
   | Slide the secondary section into the
   | correct position so that the
   | holes in the secondary section are
   | aligned with the threaded holes.
   | Insert fixing screws into all the holes.

6 | Fixate the secondary section:
   | Screw in all the fixing screws completely
   | until the heads of the screws no longer
   | project. Press the secondary section by
   | hand toward the end of the secondary
   | section track, so that it is positioned by
   | the threaded shafts of the screws.
   | Now tighten all screws hand tight.
4 Mounting the secondary section segments

<table>
<thead>
<tr>
<th>Step</th>
<th>Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>Cover the secondary section: The secondary section, that is held by hand-tightened screws, must be covered by a non-magnetic protective cover at least 2 cm thick. (For example carton boards from the original packaging.)</td>
</tr>
<tr>
<td>8</td>
<td>Next secondary section: Only now unpack the next secondary section! Place each subsequent secondary section on the mounting surface at a distance of one hand width from the already fastened sections. Ensure that all the segments have the same magnetic orientation. (The N symbols on the secondary sections all point in the same direction.)</td>
</tr>
<tr>
<td>9</td>
<td>Next secondary section: <strong>Hold down</strong> the secondary section in a horizontal position, and <strong>slide</strong> it towards the already fastened secondary section.</td>
</tr>
</tbody>
</table>
| 10 | Next secondary section:  
If the magnetic orientation is correct, the secondary section is distinctly attracted toward the stop when it reaches a minimum distance of about 20 mm. Keep hands and fingers out of the intervening gap without fail! |
| 11 | Next secondary section:  
Insert all fixing screws. The slightly increased resistance felt when starting to screw the screws in results from the secondary section being drawn into the correct position. Now tighten all screws hand tight. |
| 12 | Next secondary section:  
Cover each subsequent secondary section with a protective cover as soon as it has been fully screwed into place. Do not unpack the next secondary section until this has been done. |
### 4 Mounting the secondary section segments

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
</table>
| 13 | **Align secondary section:**
Mount all the subsequent secondary sections with the same work steps (8 to 12).
It must be ensured, without fail, that the N symbols on the secondary sections all point in the same direction. |
| 14 | **Fasten as defined:**
Finally tighten all the fixing screws with the specified torque (see the table in the CM) in the specified order (see operating instructions).
The intended gaps between the secondary sections are reached automatically.
**Caution!**
Danger of crushing when using a ferromagnetic tool! |
| 15 | **Secure the working area:**
To avoid dangers, after mounting, keep the secondary section track covered with the protective covers until all the other preparatory work has been completed. |
5 Mounting the secondary section cover band

5 Mounting the secondary section cover band

If necessary, the secondary sections of the SIMOTICS L-1FN3 linear motors can be protected from contamination and damage by a band-shaped cover plate ("cover band") or by segmented cover plates.

All parts that have to be ordered are available:

- Multi-piece cover consisting of preformed cover segments
  (See the operating instructions for SIMOTICS L 1FN3 linear motors)
- One-piece, continuous covering by a cover band of the appropriate length.

If a cover band is used, it is absolutely essential to use an (aluminum) secondary section end piece at each end of the secondary section track to fixate it in position. If combination end pieces are not specified as part of the secondary section cooling system, at least cover end pieces must be provided.

The two end pieces have fixing wedges, which are absolutely essential to hold down the cover band.

The cover band is supplied by the factory rolled up and in the exact length required. It is made of corrosion-resistant, semi-magnetic spring steel. It is therefore subject to substantial magnetic forces, which attract it toward the secondary section of the 1FN3 linear motor. As soon as the cover plate lies directly on the secondary section track, the attractive force creates stiction, which makes subsequent precise alignment of the band much more difficult.

Safety note: The magnetic attractive forces can set the cover band unexpectedly in fast motion, especially while it is being placed on the secondary section segments. There is a danger of the comers and edges of the band causing crushing and cutting injuries. Wear safety gloves without fail!

The material of the cover band has a minimum bending radius of 200 mm. Bending the material to a radius less than this minimum will cause an irreparable kink. The cover band is then unusable. A kink in the cover band projects into the air gap, with the result that it is caught and destroyed by the moving primary section.

The assembly work should be done by at least two people. It is possible for one person to do the assembly work, but this is difficult and requires considerably more effort.

- While one person inserts the cover band into the gap under the machine slide, the second person feeds in the remaining part of the cover band at a suitable angle.
- Especially with axes longer than 4 meters, the band can only be aligned precisely if the central part is also guided by additional persons standing between 1 and 2 meters apart.

Linear axes can be classified by the length of their traversing paths as either a:

- Short-path axis (after installation of the machine slide, at least one secondary section segment is not accessible for assembly purposes).
- Long-path axis (after installation of the machine slide, each secondary section segment can be made accessible for assembly purposes by appropriate positioning of the slide).

As a rule, the cover band has to be mounted on short-path axes before the machine slide is mounted. In this case, the fully mounted secondary section track is easily accessible, and the simplified assembly procedure for the cover band consists of work steps 6, 8, 9, 10 and 14 of the following assembly instructions (applied analogously).

The following block diagrams are not to scale. The main purpose of the gaps between the secondary section segments is to demarcate the boundaries between the segments.
5 Mounting the secondary section cover band

Fig. 5-1: Block diagram of a short-path axis

The terms “left-hand end” and “right-hand end” are used in these installation instructions in relation to the secondary section track. They can be freely selected by the machine.
5 Mounting the secondary section cover band

manufacturer, and must be selected from the viewpoint on the more easily accessible side of
the machine bed.

Table 5-1: Work steps in the installation of the secondary section cover band

<table>
<thead>
<tr>
<th>No.</th>
<th>Work steps for a long-path axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Prepare the end pieces:</td>
</tr>
<tr>
<td></td>
<td>- Remove the fixing wedges from the two end pieces.</td>
</tr>
<tr>
<td></td>
<td>- Place the fixing wedges and their fixing screws to one side.</td>
</tr>
<tr>
<td></td>
<td>- Lay out ready an <strong>insertion guide</strong> made of hard, non-magnetic material (preferably wood).</td>
</tr>
<tr>
<td>2</td>
<td>Prepare the secondary section track:</td>
</tr>
<tr>
<td></td>
<td>Move the machine slide into the right-hand end position. Starting at the left-hand end of the secondary section track, mount as many secondary section segments as are required to underlay the full length of the machine slide plus at least one segment length.</td>
</tr>
<tr>
<td>3</td>
<td>Lay out ready the cover band:</td>
</tr>
<tr>
<td></td>
<td><strong>Safety note</strong>: There is a risk of cutting injuries during all work with the cover band.</td>
</tr>
<tr>
<td></td>
<td><strong>Wear safety gloves!</strong></td>
</tr>
<tr>
<td></td>
<td>Place the <strong>insertion guide</strong> on the last-mounted segment, and secure it against slipping (if necessary, have it held by a second person), so that it forms a ramp to the gap under the machine slide.</td>
</tr>
<tr>
<td></td>
<td>Unroll the cover band, and place one end on the insertion guide.</td>
</tr>
</tbody>
</table>
|   | Insert the cover band:  
|---|---|
| 4 | Slide the cover band down the insertion guide into the gap under the slide, and slide it further until almost its full length has been inserted.  
|   | Position the cover band at the right-hand end:  
|---|---|
| 5 | Guide the cover band onto the right-hand end piece as soon as it has reached the right-hand end of the machine bed.  
|   | Align the band in the traversing direction:  
|   | The threaded holes for the screws that hold the retaining wedge must not be covered.  
|   | At the same time, align the band centrally and transversally to the traversing direction.  
|   | Fixate the right-hand end of the cover band:  
|---|---|
| 6 | Place the retaining wedge on the right-hand end piece, hold it down against the spring force, and screw it on with the appropriate M3, SW2 fixing screws.  
|   | Initially, only tighten the screws by hand.  

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SIMOTICS L-1FN3 Additional information for installation  
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## 5 Mounting the secondary section cover band

<table>
<thead>
<tr>
<th>Step</th>
<th>Instructions</th>
</tr>
</thead>
</table>
| 7    | Remove the insertion guide:  
Lift the left-hand end of the cover band off the insertion guide, and bend it upwards with a rolling movement.  
Remove the insertion guide: |
| 8    | Place the cover plate on the left:  
Lay the cover band on the secondary section segments by unrolling it from its curved state.  
Maintain its central and parallel alignment at all times. |
| 9    | Check the alignment:  
The laid cover band must end directly in front of the threaded holes for the retaining wedge in the left-hand end piece, and it must not be laterally offset. If there is any deviation, the band can be raised again with a rolling movement and realigned. |
5 Mounting the secondary section cover band

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Fixate the left-hand end of the cover band: Place the retaining wedge on the left-hand end piece, hold it down against the spring force, screw it on with the appropriate M3, SW2 fixing screws. Tightening torque: 1.0 Nm</td>
</tr>
</tbody>
</table>
| 11   | Continue the assembly at the right-hand end:  
- Move the machine slide into the left-hand end position.  
- Release the cover band from the right-hand end piece, and bend it upwards with a rolling movement.  
- Fixate the cover band in this position (if necessary insert a wooden wedge to counteract the attractive forces of the secondary section segment). |
| 12   | Mount the remaining segments: Mount the remaining secondary section segments one after the other up to the right-hand end of the machine bed, and screw them in place with the specified tightening torque. |
5 Mounting the secondary section cover band

13 Lay the right-hand end of the cover band:
Lay the cover band on the secondary section segments by unrolling it from its curved state. Maintain the parallel alignment at all times. If there is any deviation, the band can be raised again with a rolling movement and realigned.

14 Fixate the right-hand end of the cover band:
Place the retaining wedge on the right-hand end piece, hold it down against the spring force, fasten with the appropriate M3, SW2 fixing screws. Tightening torque: 1.0 Nm
6 Mounting the connection cable

Almost all versions of the primary section of the SIMOTICS L-1FN3 built-in linear motor have an integrated terminal panel to which the power cable and signal line, or the combined cable, are connected. This connector is generally installed when the customer installs the primary section in the machine.

The mounting procedure is illustrated here mainly with a combined power and signal cable. The work steps also apply appropriately to separately routed power cable and signal line.

Note:
A (resolvable) thread sealant is not absolutely necessary. Nevertheless, it increases the protection against water penetration, and against the threaded joint parting as a result of severe vibration.

Table 6-1: Work steps for mounting the connection cables

<table>
<thead>
<tr>
<th>No.</th>
<th>Work steps</th>
</tr>
</thead>
</table>
| 1   | Prepare the connection cover  
     | Insert a line of silicon foam into the slot in the connection cover.  
     | Note: If the power cable and signal line are routed separately, the sequence of the work steps applies correspondingly. |
| 2   | Prepare the power cable:  
     | Thread the connection cover onto the prefabricated combination cable, or the power cable and sensor line. |
### 6 Mounting the connection cable

<table>
<thead>
<tr>
<th>No.</th>
<th>Work steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td><strong>Prepare the power cable conductors:</strong>&lt;br&gt;Align the ring cable lugs of the power conductors with the terminal panel.&lt;br&gt;Put the ring cable lugs of phases U, V, W, PE onto their respective threaded pins on the terminal panel.</td>
</tr>
<tr>
<td>4</td>
<td><strong>Connect the power cable conductors:</strong>&lt;br&gt;Put the washers, spring-lock washers and nuts on the threaded pins, and tighten the nuts.&lt;br&gt;&lt;strong&gt;Tightening torque: 6 to 7 Nm&lt;/strong&gt;</td>
</tr>
<tr>
<td>5</td>
<td><strong>Prepare the sensor conductors:</strong>&lt;br&gt;Put the spring-lock washers, washers and ring cable lugs of the sensor conductors on the oval head screws.</td>
</tr>
<tr>
<td>6</td>
<td><strong>Connect the sensor conductors:</strong>&lt;br&gt;Mount the sensor conductors on their respective connectors as shown in the drawing, and tighten the screws&lt;br&gt;&lt;strong&gt;Tightening torque: 0.6 to 0.8 Nm&lt;/strong&gt;</td>
</tr>
</tbody>
</table>
### 6 Mounting the connection cable

<table>
<thead>
<tr>
<th>No.</th>
<th>Work steps</th>
</tr>
</thead>
</table>
| 7   | Fasten the connection cover:  
     Screw the connection cover to the front panel with the retaining screws provided.  
**Tightening torques:**  
(According to the table in the CM)  
<table>
<thead>
<tr>
<th>Screw size</th>
<th>Tightening torque [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>M4</td>
<td>2.2</td>
</tr>
<tr>
<td>M5</td>
<td>3.4</td>
</tr>
</tbody>
</table>
| 8   | Mount the screw connector:  
     Screw the screw connector into the threaded hole in the cover, and tighten as shown in the table below.  
**Nominal size**  
<table>
<thead>
<tr>
<th>Width across flats [mm]</th>
<th>Tightening torque [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>M17</td>
<td>19 7.0</td>
</tr>
<tr>
<td>Size 1</td>
<td>25 16.5</td>
</tr>
<tr>
<td>Size 1.5</td>
<td>36 33.0</td>
</tr>
</tbody>
</table>
| NOTICE: If screw connectors **without their own seal** are used, their threads must be wetted with thread sealant to create adequate seals.  
(e.g. **DELO ML 5249**) |
| 9   | Fasten the union nut:  
     Tighten the screw connector until the cable seal becomes visible.  
**Criterion for adequate tightening:**  
The seal must not project above the screw connector.  
**Note:**  
If the power cable and signal line are routed separately, the sequence of the work steps applies correspondingly. |
7 Angled cable connection

7.1 Connection with angled screw connectors

SIMOTICS L-1FN3 built-in linear motors are fitted as standard with a connector cover that has two threaded holes. The power cable and signal line are connected separately to this cover.

The prefabricated connection cables from SIEMENS already have screw connectors of sizes matching the thread sizes.

M20 x 1.5 for the signal line
M20 x 1.5 or M32 x 1.5 for the power cable (depending on the cable diameter).

Because of the design, the screw connectors can only be mounted in a straight line – that is in the traversing direction.

If the installation space is so limited that only a 90° angled cable outlet is possible or desired, this can be achieved by using freely rotatable, angled screw connectors. Versions of angled screw connectors must be selected with a connection thread that matches the size of the female thread.

Source of supply:
PFLITSCH GmbH & Co.KG  [www.pflitsch.de](http://www.pflitsch.de)
Bracket with coupling outside M20 x 1.5 →inside M20 x 1.5  article no. 220 EF
Bracket with coupling outside M32 x 1.5 →inside M32 x 1.5  article no. 232 EF
7 Angled cable connection

Table 7-1: Angled connector for prefabricated connection cables.

As a rule, the screw connectors are screwed directly (that is in the traversing direction) into the connection cover.
To create a 90° angled connection, the angled screw connectors are fitted between the original screw connector and the cover plate.

The following applies to the prefabricated power cable:

Cut back the cable jacket and protective braided shield to expose a length of the cable conductors that is long enough for the size of the screw connector:
- Approx. 80 mm for M32
- Approx. 60 mm for M20
7 Angled cable connection

The same applies to the prefabricated signal line (M20 screw connector):

The cable jacket and protective braided shield must be cut back by 60 mm.

Furthermore, if necessary, the angled screw connectors can be fastened in a rotated position to the extent that the adjacent connection and the cooling system connections permit this arrangement.
7 Angled cable connection

7.2 Connection via a LIMOTEC 900 angled connector

The angled connector contains a screw connector for a single cable. This means that it is suitable only for a combination cable (power conductors and signal conductors are laid together).

Only one connector size is offered, which is suitable for frame sizes 1FN3000 to 900 primary sections (but it is not suitable for frame sizes 1FN3050, 100 and 150 primary sections). A LIMOTEC 900 angled connector cannot be used together with the primary section cooling on frame size 1FN3300 primary sections because of their narrow width.

Table 7-2: LINMOT 900 angled connector

| The LIMOTEC900 angled connector is mounted directly on the front panel of the primary section instead of the connection cover. |
| Manufacturer: INTERCONTEC Produkt GmbH info@intercontec.biz |
| Order number S ST N 001 FC 02 45 0400 002 |
| The complete equipment includes an additional 4 x 2 mm signal plug sockets, which have to be ordered separately. Order number 60.229.11 |
Cooling system connection

Straight and angled hose push-in fittings are available for quickly connecting the cooling system of the SIMOTICS L-1FN3 linear motor.

The cooling system of the primary section, the precision cooler and the secondary section cooling can all be connected by screw-type fittings (thread type G1/8; hose diameter 6, 8 or 10 mm).

Depending on the mounting situation, a hose infeed with angled push-in fittings or straight push-in fittings or a combination of the two may be most advantageous. Only rotatable versions of the push-in fittings should be selected.

To release the push-in fitting, press the release ring when the push-in-fitting is not under tension (see also the product data sheet for the particular push-in fitting). Otherwise the interior ring claw cannot be released.

Table 8-1: Illustrated description of possible types of connection using push-in fittings.

| Cooling system connection with angled screw-type push-in hose fittings |
| Source of supply, e.g. AVS Ing. J.C. Römer GmbH Type 951X4-8F-1/8 (for 8 mm hose) |

| Cooling system connection with straight push-in hose fittings |
| Source of supply, e.g. AVS Ing. J.C. Römer GmbH Type 930X4-8F-1/8 (for 8 mm hose) |