Applicators in the Series
TC-FS Generation 2
with Motor-driven Application Width Adjustment
and
Grammage Control (Option)
incl. Control Box and Operating Unit

Manual P/N 7179884_11
- English -

Edition 12/2021

NORDSON ENGINEERING GMBH • LÜNEBURG • GERMANY

Note

This document applies to the entire series.

This equipment is regulated by the European Union under WEEE Directive 2002/96/EC, under WEEE Directive 2012/19/EU-WEEE2.

See www.nordson.com for information about how to properly dispose of this equipment.

Order number

P/N = Order number for Nordson articles

Note

- Translation of original manual -

Trademarks

http://www.nordson.com/en/global-directory

Table of Contents

Safety Instructions

ATTENTION: Please comply with the safety instructions included as a separate document and with the specific safety instructions throughout the documentation.

Safety Labels and Tags

Figure 1 shows the places on the applicator where safety signs and labels are affixed. Table 1 indicates what the labels and symbols mean.

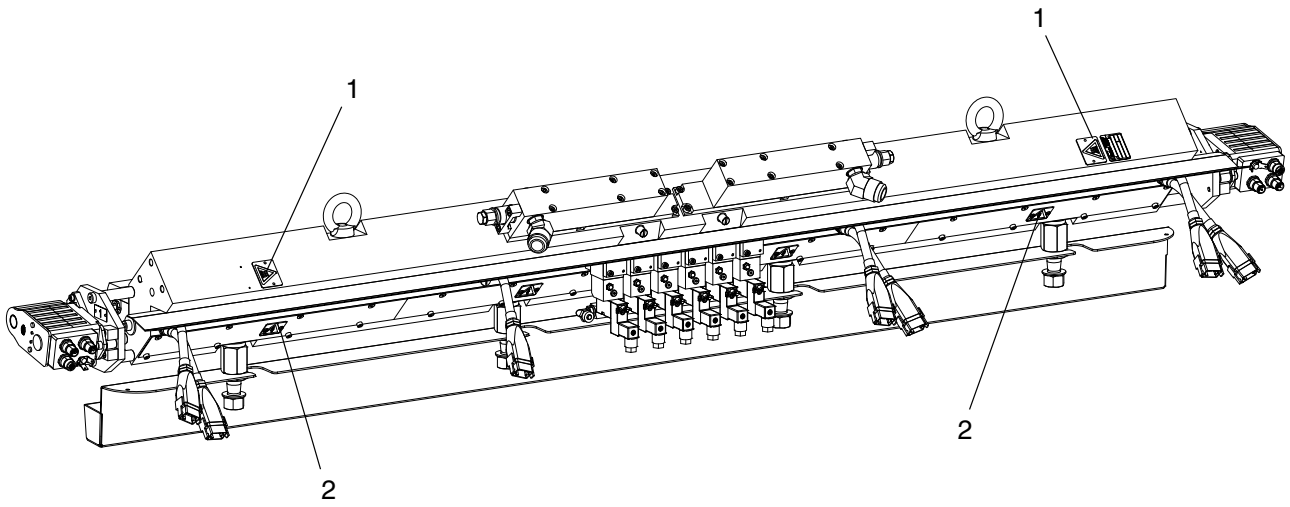


Fig. 1

Tab. 1 Safety labels and tags

Position	P/N	Description	
1	290082		**CAUTION:** Hot surface. Failure to observe can cause burns.
2	290083		**ATTENTION:** Risk of electrical shock. Failure to observe may result in personal injury, death, or equipment damage.
-	455754		**For PFW with web guide** **CAUTION:** Risk of squash. Failure to observe may result in hand injuries.

Introduction

Intended Use

EVA, RET, PUR Applicators in the series *TC-FS* (TrueCoat-FlexSpan) are intended to be used specifically for flat lamination, which is a process that coats paper or plastic foils that are then adhered to plates.

PFW The model PFW is intended to be used to coat paper and plastic foils in a process referred to as *Profile wrapping*. But it can also be used for flat lamination.

Polyolefines and EVA (ethylene vinyl acetate) or PUR (polyurethane) hot melt adhesives can be processed. If PUR is to be processed, this must be properly set up when the system is ordered (PUR model).

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.

Recommended System Environment - Examples -

EVA, RET, PUR The applicator works in an application system, in combination with one of the the following melters:

- System with one or two extruders and one applicator, control box and operating unit each.
- System with a VD200 bulk melter instead of the extruder.

PFW The applicator works in an application system, in combination with one of the the following melters:

- VersaDrum or VersaPail bulk melter
- VersaBlue melter
- VersaPUR melter.

The control box, operating unit and pressure sensor are not included in the scope of delivery of the applicator.

Unintended Use - Examples -

The applicator may not be used under the following conditions:

- When changes or modifications have been made by the customer
- In defective condition
- In a potentially explosive atmosphere
- In the food industry
- In any installation position other than that described in this manual.
- When the values stated under *Technical Data* are not complied with.

The applicator may not be used to apply the following materials:

- PUR, unless it was configured upon ordering the system
- Explosive and flammable materials
- Erosive and corrosive materials
- Food products.

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! The applicator is hot.
- Risk of burns! The material that comes out of the nozzle is hot.
- Risk of burns when connecting and disconnecting heated hoses.
- Risk of burns when conducting maintenance and repair work for which the applicator must be heated up.
- Material fumes can be hazardous. Avoid inhalation.

  When the prescribed limits are exceeded, install an exhaust system. Always comply with the processing instructions in the respective adhesive data sheets.

Note on Manual

In this manual, the nozzle *BtT* for the substrate feeding direction *Bottom to Top* is usually shown in the illustrations.

The user interfaces refer to an applicator with centered zero point and two motors. When an applicator has only one motor, the input fields for the second motor are not visible.

Definition of Terms

BtT: Substrate feeding direction *Bottom to Top*
TtB: Substrate feeding direction *Top to Bottom*

An *Applicator* is also referred to as *Application head* in older Nordson literature.

In some places *Material* is used as a general term to designate adhesives and similar hot melt substances.

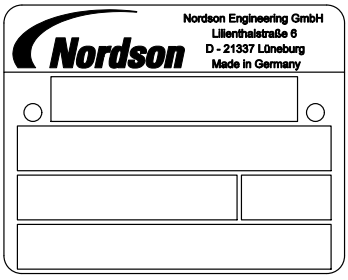
Melter is the general term for all units that supply adhesive to the applicator.

Symbols

Delivery state

Nordson default (original setting of parameters that can be reset to the defaults on the control panel)

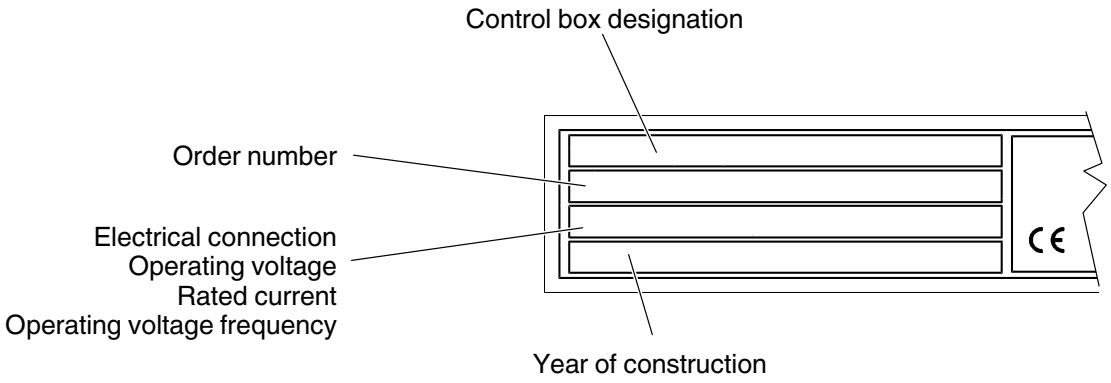
Applicator ID Plate



NOTE: Please always state the serial number AND order number when asking questions.

1st line	Applicator designation
2nd line	Serial number
3rd line	Order number and year of construction
4th line	Operating voltage, applicator power consumption, operating voltage frequency

Control Box ID Plate



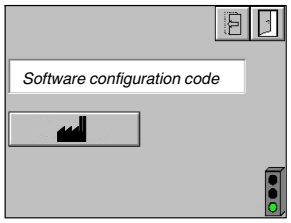
Software Configuration Code (Overview)

Some configurations are mutually exclusive, e.g. web guide and doctor roll. Please contact Nordson with any questions.

Box	Code	Description
1 - 6	**TC-FS-** TC-FSE	Standard configuration Engineered
	0350 0500 0700 1000 1400 *1800*	Maximum application width in [mm] 0350 to 0700: PFW 0700 to 1400: EVA, RET or PUR *Not enabled*
11 - 13	EVA RET PUR **PFW**	EVA (or PO) application reacTec application PUR application Profile Wrapping
14	**S**	Motor-driven width adjustment
	R L	Manual width adjustment, handwheel on the right (viewed in direction in which board runs) Manual width adjustment, handwheel on the left (viewed in direction in which board runs) *Applicators with manual adjustment; refer to separate manual*
15	3 **4**	Nozzle slot size: 0.3 mm - *only for reacTec* - Nozzle slot size: 0.4 mm
16	**1** 2 4	One hose connection Two hose connections Four hose connections - *only for reacTec* -
17	**N** P	Temperature sensor: Ni120 (16 mm hose connection) Temperature sensor: PT100 (13 mm hose connection)

Continued ...

Box	Code	Description
18	B **T**	Substrate feeding direction: Bottom-to-Top Substrate feeding direction: Top-to-Bottom
19	**C** L R	Centered zero point - always two motors Zero point left (viewed in direction in which board runs) Zero point right (viewed in direction in which board runs)
20	X	*Reserved*
21	**/**	**Options begin here**
22	X	Tool steel nozzle, hardened and coated
23	X 1 **2**	No filter Filter mesh size 0.1 mm - *only for reacTec* - Filter mesh size 0.2 mm
24	**X** W	Without web guide With web guide - *only PFW* -
25	**X** C P	No field bus communication CANopen Profinet IO
26	**D** X	Drip tray No drip tray
27	P **X**	Pressure sensor No pressure sensor
28	R **X**	Doctor roll - *Information at the end of this manual* - No doctor roll
29	**X** G	No grammage control Pump speed control as a factor of grammage
30	**X** U I	No line speed signal Line speed voltage 0 - 10 V Line speed current 4 - 20 mA
31	X	*Reserved*



CAUTION: Software supplied at a later date (e.g. an update) is always set to a standard configuration (pre-set data shown bold: **TC-FS-0350PFW** ...) and must be adapted to the existing applicator.

Nordson recommends making a note of the existing settings before the update. Refer to page 39, *Password*.

Description of Components

EVA, RET, PUR

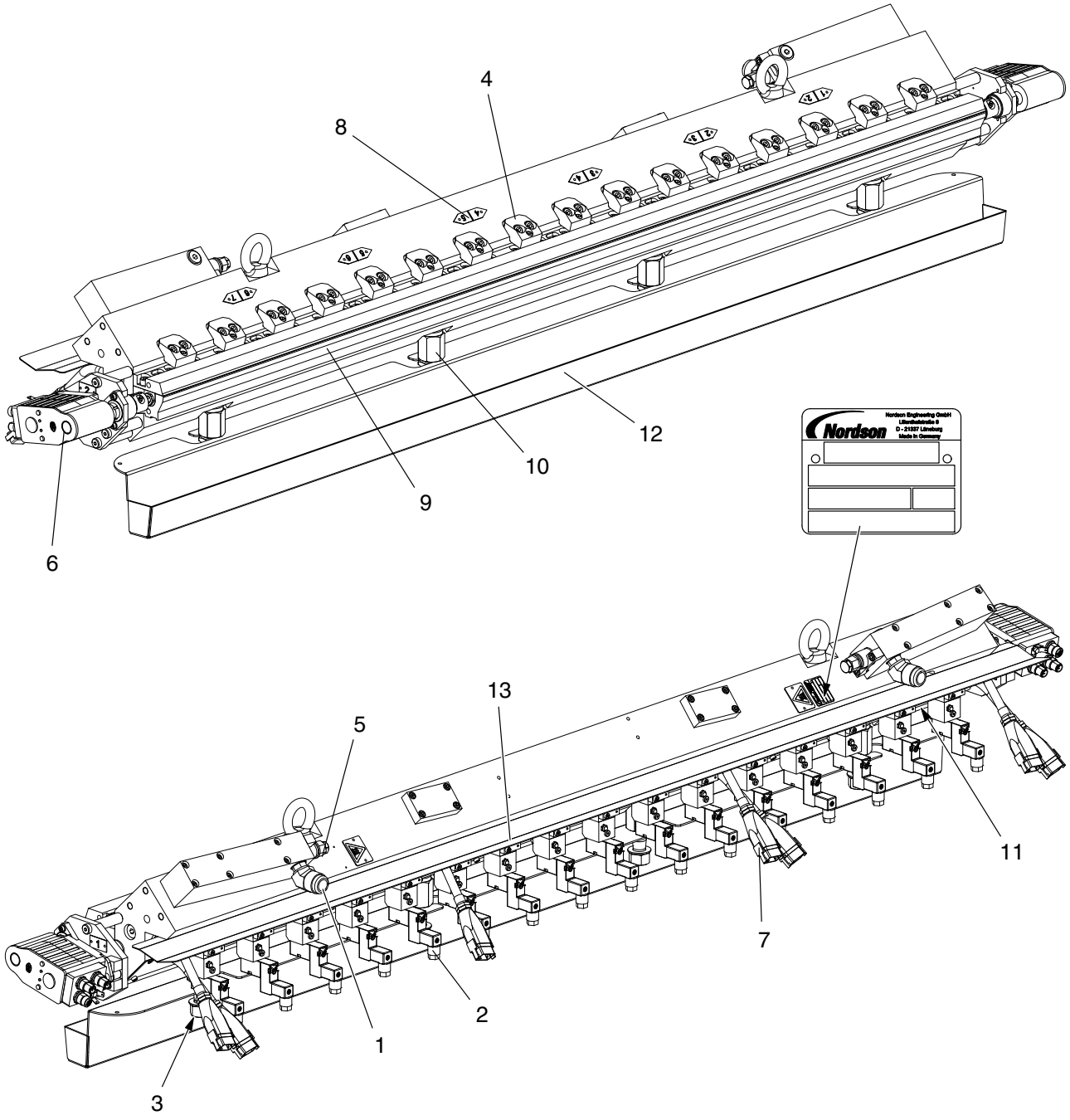


Fig. 2 Example similar to TC-FS 1400 EVA / TC-FS RET

1 Hose connection
2 Control module / solenoid valve
3 Air manifold bar air connection
4 Nozzle clamp
5 Filter cartridge
6 Motor *Application width*
7 Heater power cable
8 Heating zone shield
9 Nozzle
10 Fixing screws
11 Pressure sensor receptacle
12 Drip pan (option)
13 Drip tray

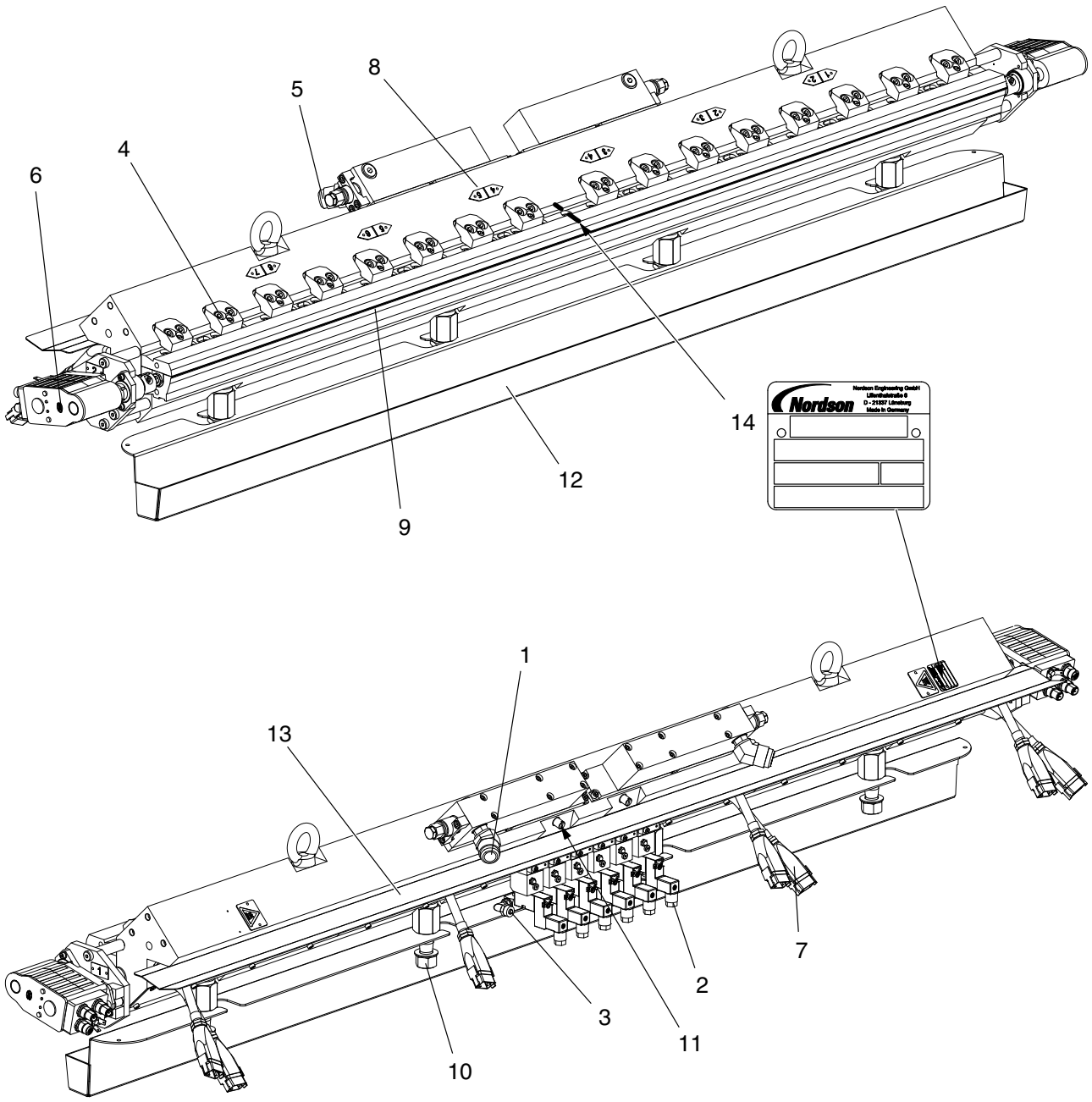


Fig. 3 Example TC-FS 1400 PUR

1 Hose connection (2x)
2 Control module / solenoid valve (6x)
3 Air manifold bar air connection
4 Nozzle clamp
5 Filter cartridge (2x)
6 Motor *Application width* (2x)
7 Heater power cable (7x)
8 Heating zone shield (1 to 6)
9 Nozzle
10 Fixing screws
11 Pressure sensor receptacle
12 Drip pan (option)
13 Drip tray
14 Center mark (box 19:C "Centered zero point")

PFW

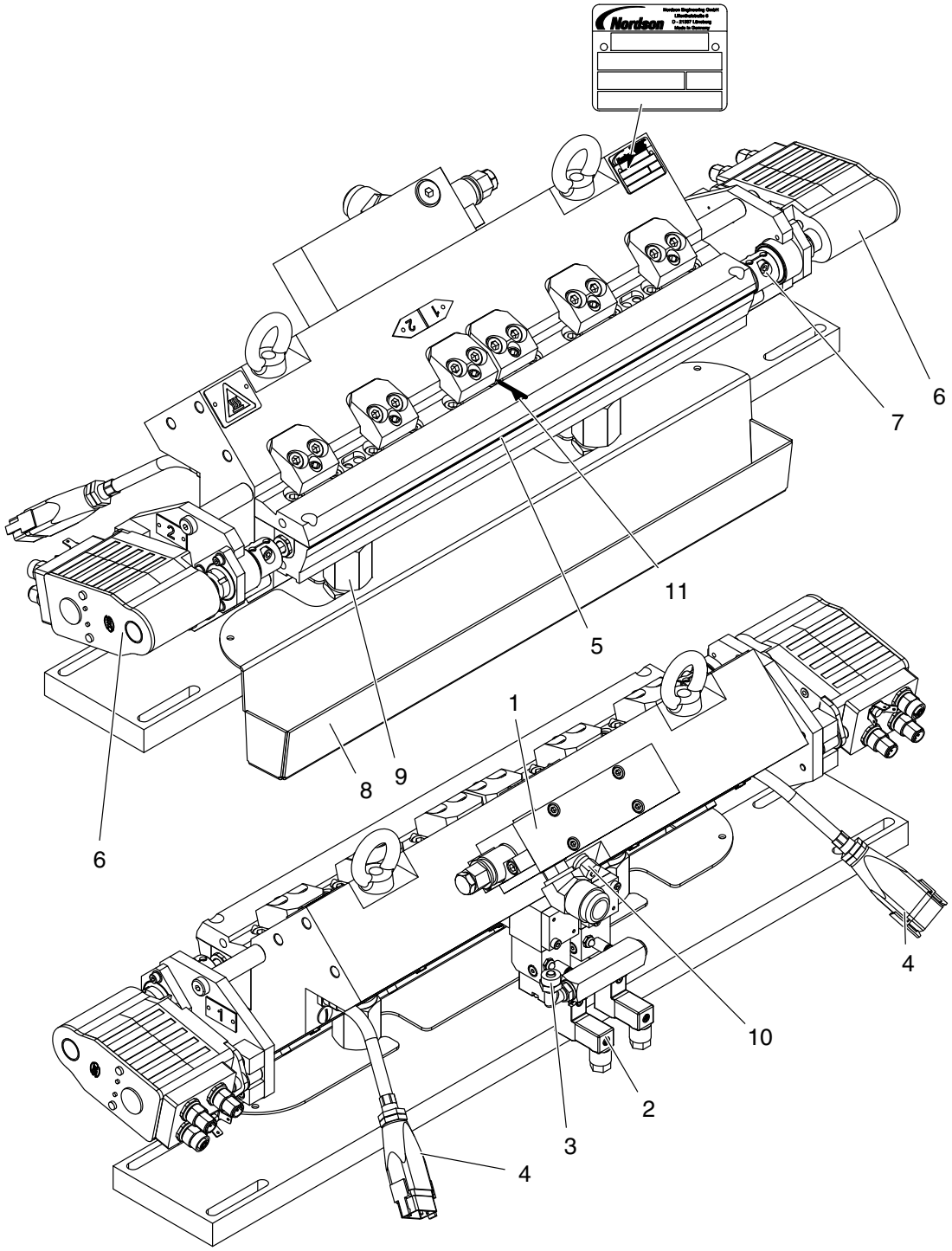


Fig. 4 Example TC-FS PFW, centered zero point

1 Filter block with hose connection
2 Control module
3 Air connection, control air
4 Heater power cable
5 Nozzle
6 Motor *Application width*
7 Coupling
8 Drip tray
9 Fastening bolt
10 Pressure sensor receptacle
11 Center mark
(box 19:C "Centered zero point")

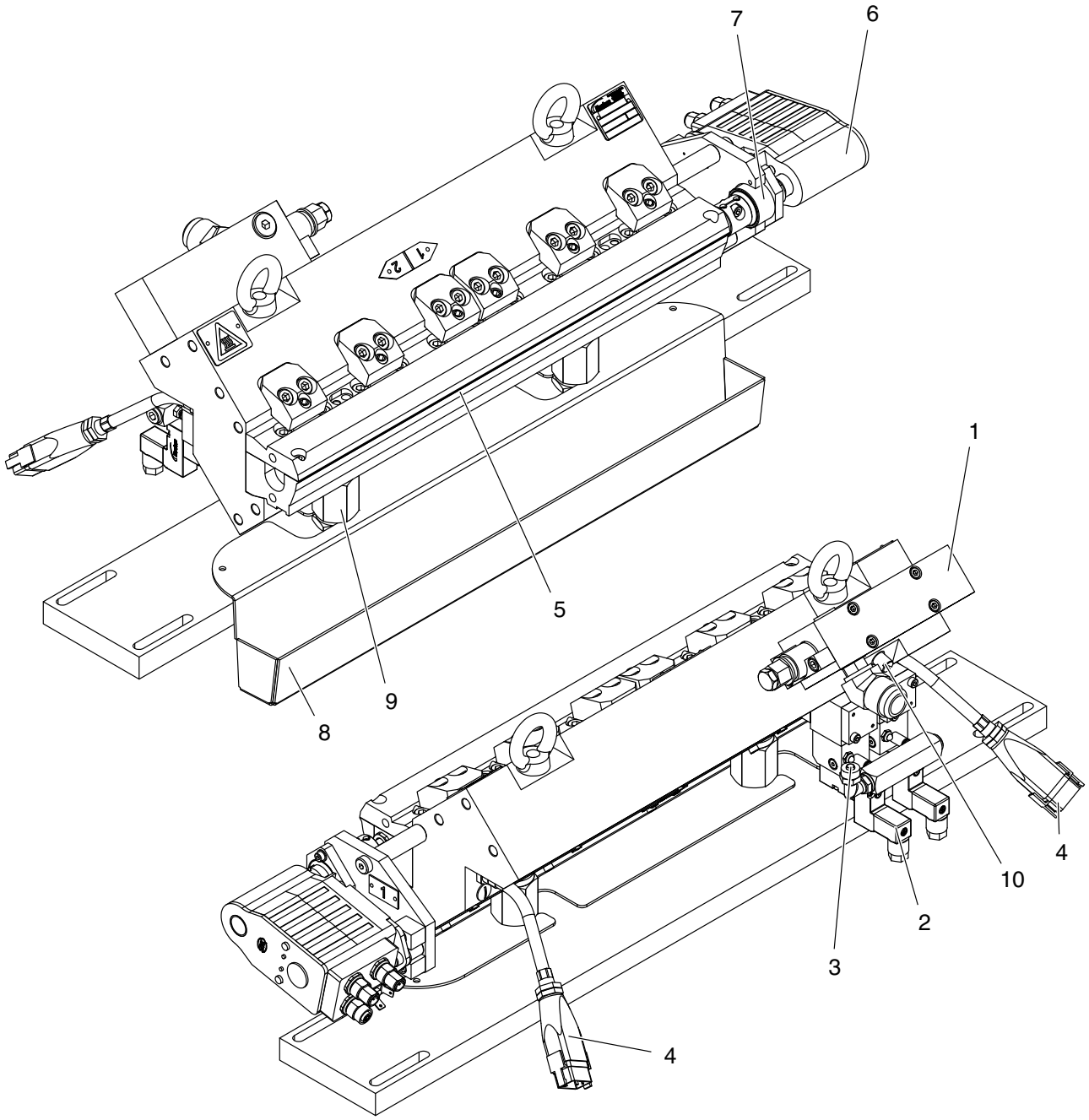


Fig. 5 Example: Zero point right

1 Filter block with hose connection
2 Control module
3 Air connection, control air
4 Heater power cable
5 Nozzle
6 Motor *Application width*
7 Coupling
8 Drip tray
9 Fastening bolt
10 Pressure sensor receptacle

With Web Guide

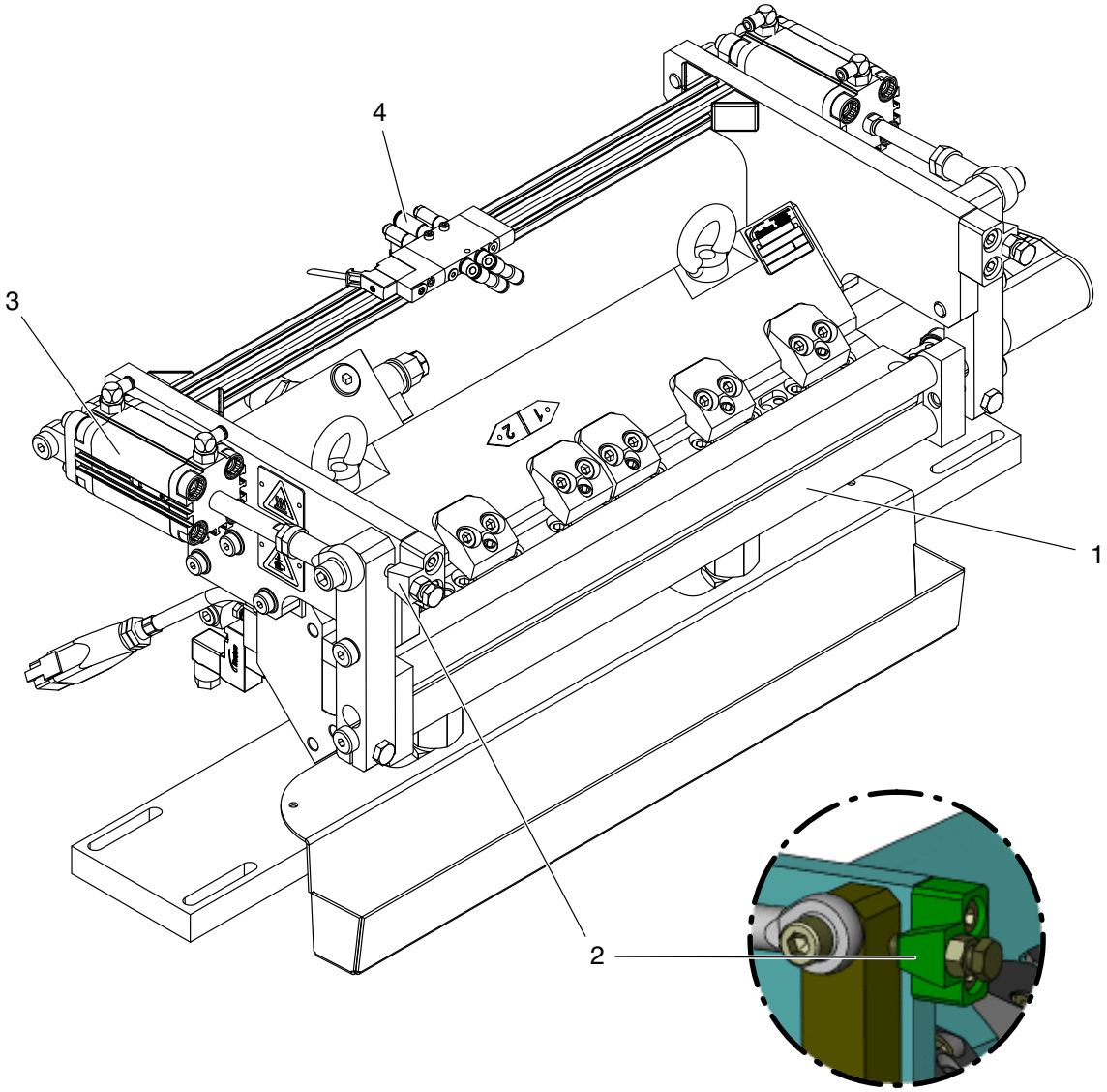
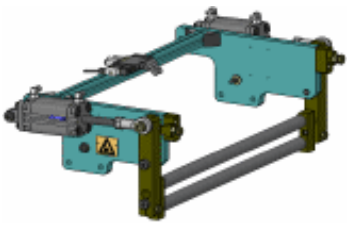


Fig. 6 TC-FS PFW with web guide swiveled in

1 Web guide (option)
2 Motion limiter
3 Swivel cylinder
4 Air connection, solenoid valve swivel cylinder



The web guide that brings in the substrate can be swiveled in and out.

Function

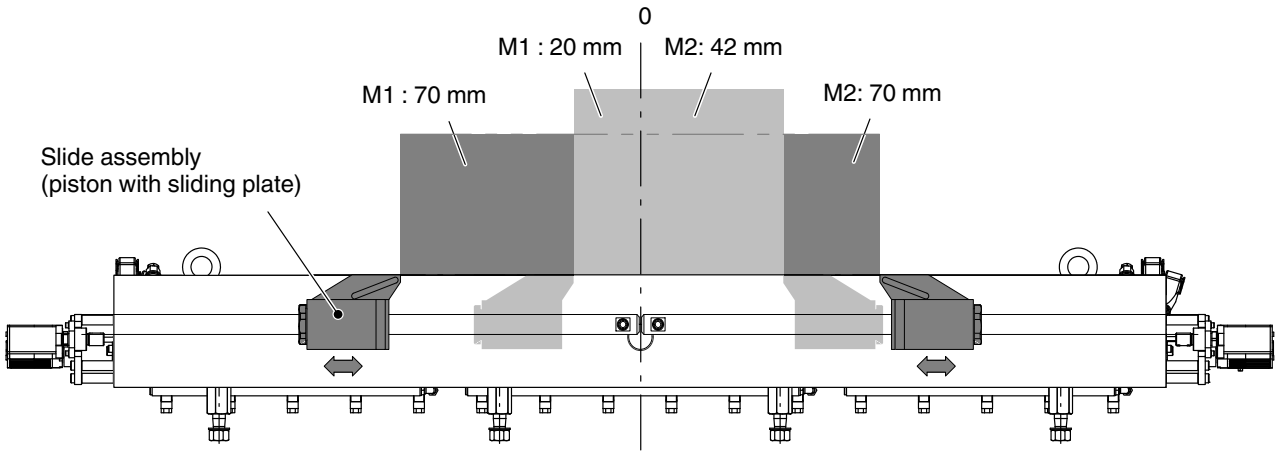
Adhesive Flow

The melter pumps the adhesive through heated hoses to the applicator. In the applicator the material flows through the filter cartridges and the control modules to the surface nozzle. The nozzle applies the adhesive to the substrate. The nozzle has contact to the substrate.

A pressure sensor (accessory) monitors the pressure in the applicator.

Motor-driven Application Width Adjustment (Example with Centered Zero Point)

Motors turn the spindles of the two pistons with the sliding plates. The sliding plates are guided into the nozzle application slot. Material escapes only between the sliding plates.



The application width can also be adjusted during application. The two sides can be set continuously and independently of one another.

The minimum and maximum application width depend on the applicator. The number in the type designation indicates the maximum application width in mm.

NOTE: For longer breaks in production, the slides can be pushed together to the minimum application width.

Filter Cartridge

A filter cartridge prevents any impurities that the adhesive may contain from getting into the applicator. The adhesive flows from the inside of the filter cartridge to the outside. Thus dirt particles remain trapped in the filter cartridge.

PFW The filter block and consequently the adhesive inlet can be located on the right, on the left or in the center of the applicator.

Heating

The applicator is heated with electrical heater cartridges.

The heater cartridges form one or more heating zones, depending on the size of the applicator. The temperature of each heating zone is continuously measured by a temperature sensor and regulated by a temperature controller, usually located in the electrical cabinet of the melter.

Control Module(s)

The electropneumatic control modules open and close the adhesive supply to the nozzle by raising or lowering the nozzle stems. A compression spring ensures that the control module outlet is closed when control air pressure drops, preventing adhesive from being applied.

Control Box

The control box provides the voltage supply to the applicator motors and solenoid valves, and it serves as the connection to the operating unit. Also refer to control box wiring diagram.

Enable Solenoid Valves

The customer's control system must supply the signal *Enable solenoid valves* as soon as production begins.

Interface Motor Enable / Operating Modes (XS2)

The melter supplies the signal *Enable motors* when all of the applicator heating zones have reached their setpoint temperatures.

The piston can be adjusted only when the signal is received by the control box (contact closed). This prevents damage to seals from adhesive that is still too cold.

Optional Field Bus Interface

The field bus interface is used to exchange data between the applicator and the customer's control system. Refer to separate manual *Field Bus on Nordson Applicators*.

Enable solenoid valves: In addition to the signal from the customer's control system, bit 2 of *Control* also has to be set on the field bus.

Enable motors: In addition to the signal from the melter, bit 1 of *Control* also has to be set on the field bus.

Optional Grammage Control

Line Speed Input XS5
Line Speed Output per Motor/Pump XS5.1 + XS5.2

Operating Unit

The operating unit contains an industrial PC (IPC) to control the applicator.

The applicator is essentially operated via the control panel (1) on the operating unit. The control panel is a touch screen.

Installation

ATTENTION: Allow only qualified personnel to perform the following tasks. Follow the safety instructions here and in the entire documentation.

Unpacking

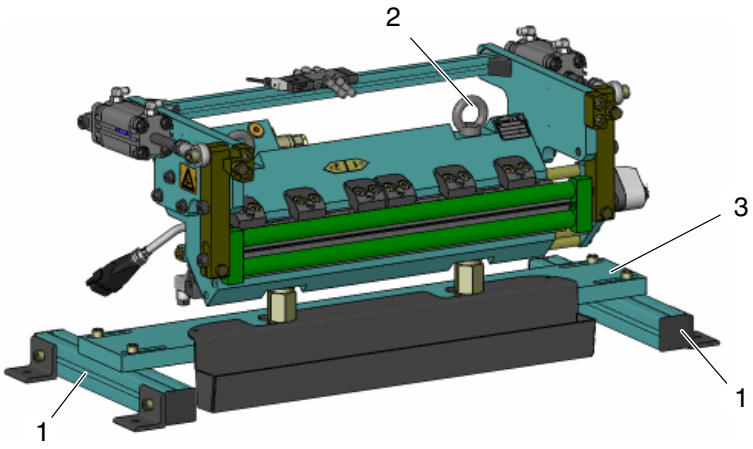
Unpack carefully. Then check for damage caused during transport. Reuse packaging materials or dispose of properly according to local regulations.

A handwheel is included in the delivery. It can be used for manual adjustment in the event of an emergency (e.g. motor defective).

Transport

The applicator is a high precision, valuable part. Handle very carefully! Protect the nozzle from damage.

Insert the eye bolts (2) in the intended places. Use suitable and inspected lifting equipment. Refer to consignment note for weight.



Remove the transport pieces (1). The base plate (3) can be used to install the applicator.

Storage

Do not store outside! Protect from humidity and dust. Do not lay unit on the nozzle. Protect the nozzle from damage, e.g. by placing it in the original packaging.

Disposal

When your Nordson product has exhausted its purpose and/or is no longer needed, dispose of it properly according to local regulations.

ATTENTION: Risk of explosion from incorrect disposal. The operating unit contains a lithium battery that is soldered into place.

Space Requirement

For maintenance work, leave space around the applicator to accommodate

- Electrical connections
- Heated hose
- Removal of drip tray and drip pan
- Changing filter cartridges
- Swiveling out motors
- Extracting the nozzle

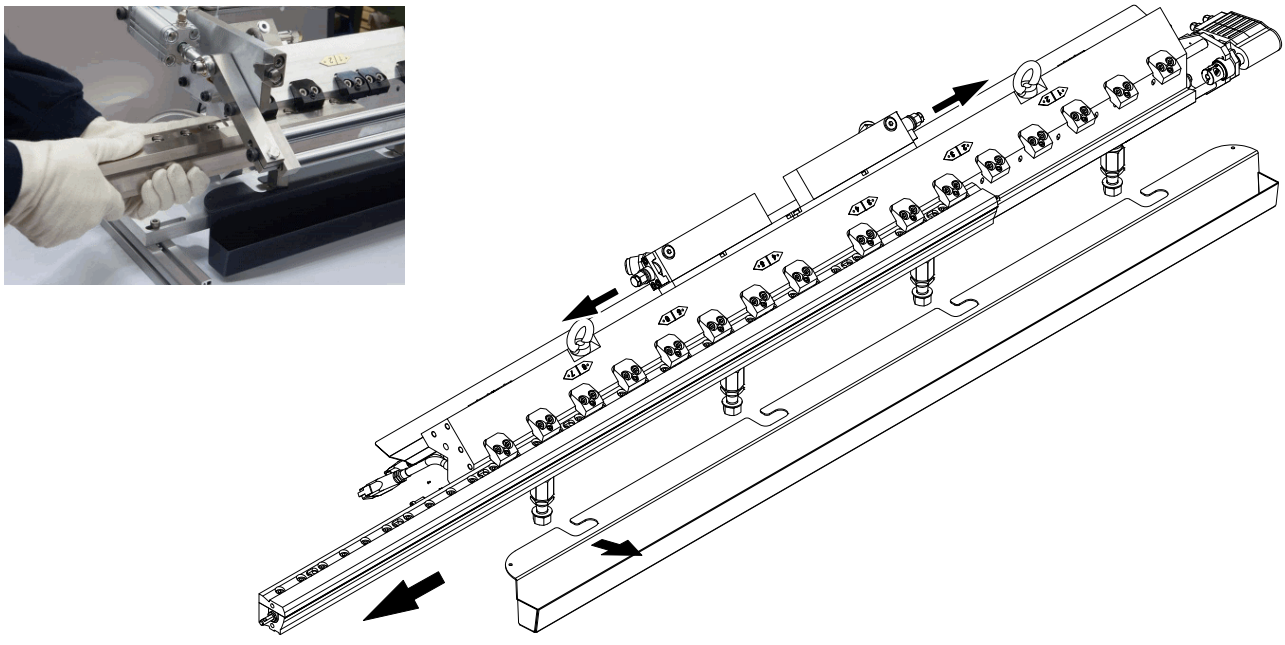


Fig. 7 Extracting nozzle, detaching drip tray and changing filter cartridge

Exhausting Adhesive Vapors

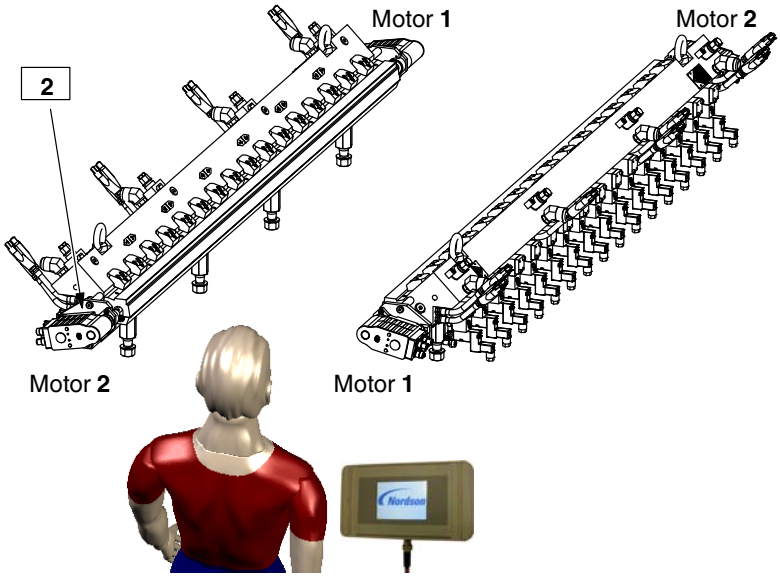
Ensure that adhesive vapors do not exceed the prescribed limits. Exhaust adhesive vapors if necessary. Provide sufficient ventilation in the area where the machine is set up.

BUT: Avoid air conditioning vents and open doors/windows near the application system, especially near the nozzle. Temperature fluctuations have a negative impact on the application pattern.

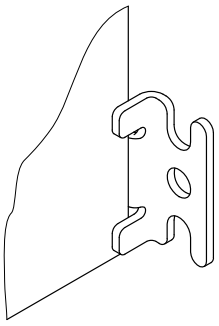
Definition of Operator Side (with Two Motors)

The motors are labeled 1 and 2 on the applicator: Depending on how they are positioned, either motor *1* or motor *2* is in the front from the operator's point of view, meaning from the operator side.

NOTE: The section Operation describes how the control panel is adapted for the mounting position. Refer to page 37, *Adapting Control Panel to Mounting Position.*



Installing



Fastening material for wall-mounting the control box (distance from wall: 10 mm)

- Take into consideration the heat expansion of the applicator bracket
- Protect from humidity, vibrations, dust and drafts
- Ensure access to parts relevant for maintenance and operation
- Applicators without web guide: To achieve optimum adhesive application, install the applicator such that the distance and, when appropriate, the angle between the nozzle and the substrate can be varied.
- When installing ensure that cables, air hoses and heated hoses cannot be bent, pinched, torn off or otherwise damaged.
- Mounting position: Nozzle horizontal.

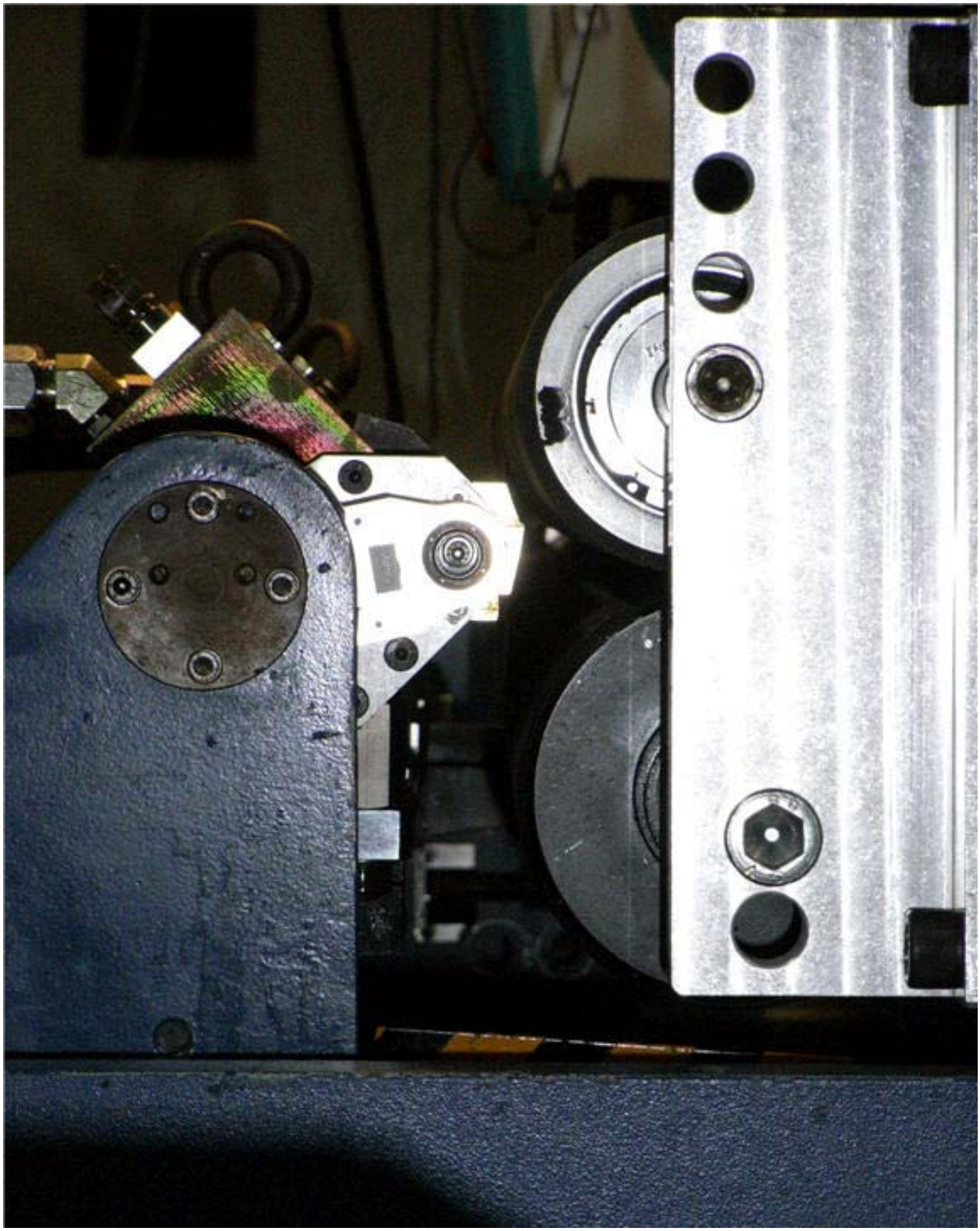


Fig. 8 Applicator in a Nordson CT6000 coater

Heat Transfer and Heat Expansion

The applicator is secured with fastening bolts (1, Fig 9). The spacer bolts ensure less heat transfer between the applicator and the bracket.

If the applicator is secured differently than intended, find a different way to ensure heat insulation between the applicator and the bracket.

At 200 °C, heat expansion of the 1400 applicator is approx. 3.5 mm. So three of the four fastening bolts should be fastened such as to be mobile in the direction of applicator operation.

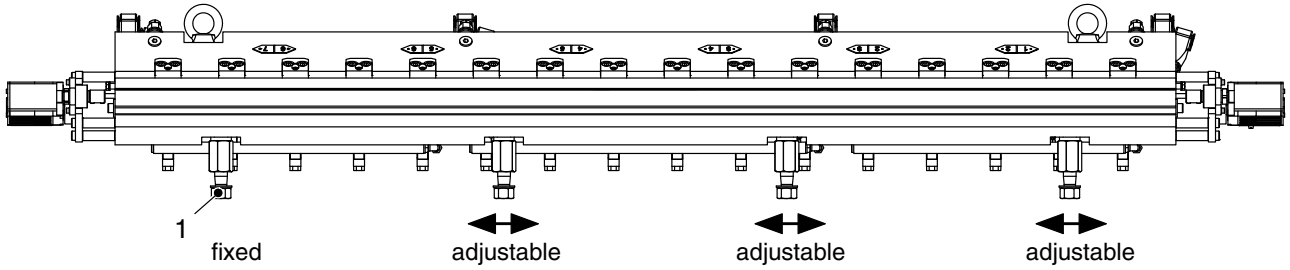


Fig. 9 Example of arrangement fixed/adjustable

Recommended Position when Production Stops

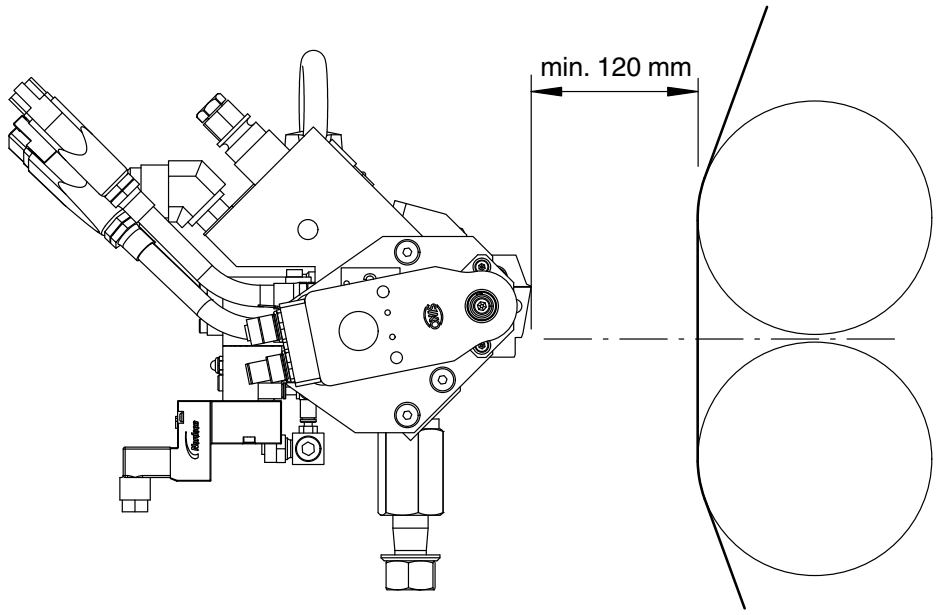


Fig. 10

Positioning Applicator EVA, RET, PUR

Position the applicator bracket such that both sides of the applicator can be set to a 0 to 10 mm submersion independently of one another.

* 5 mm depth of submersion is the recommended guideline. The exact value depends on actual production.

The ideal web tension for reacTec applications is 0.2 to 0.3 N/mm web width; for EVA/PUR it is 0.1 to 0.2 N/mm web width.

Substrate Feeding Direction TtB (Top to Bottom)

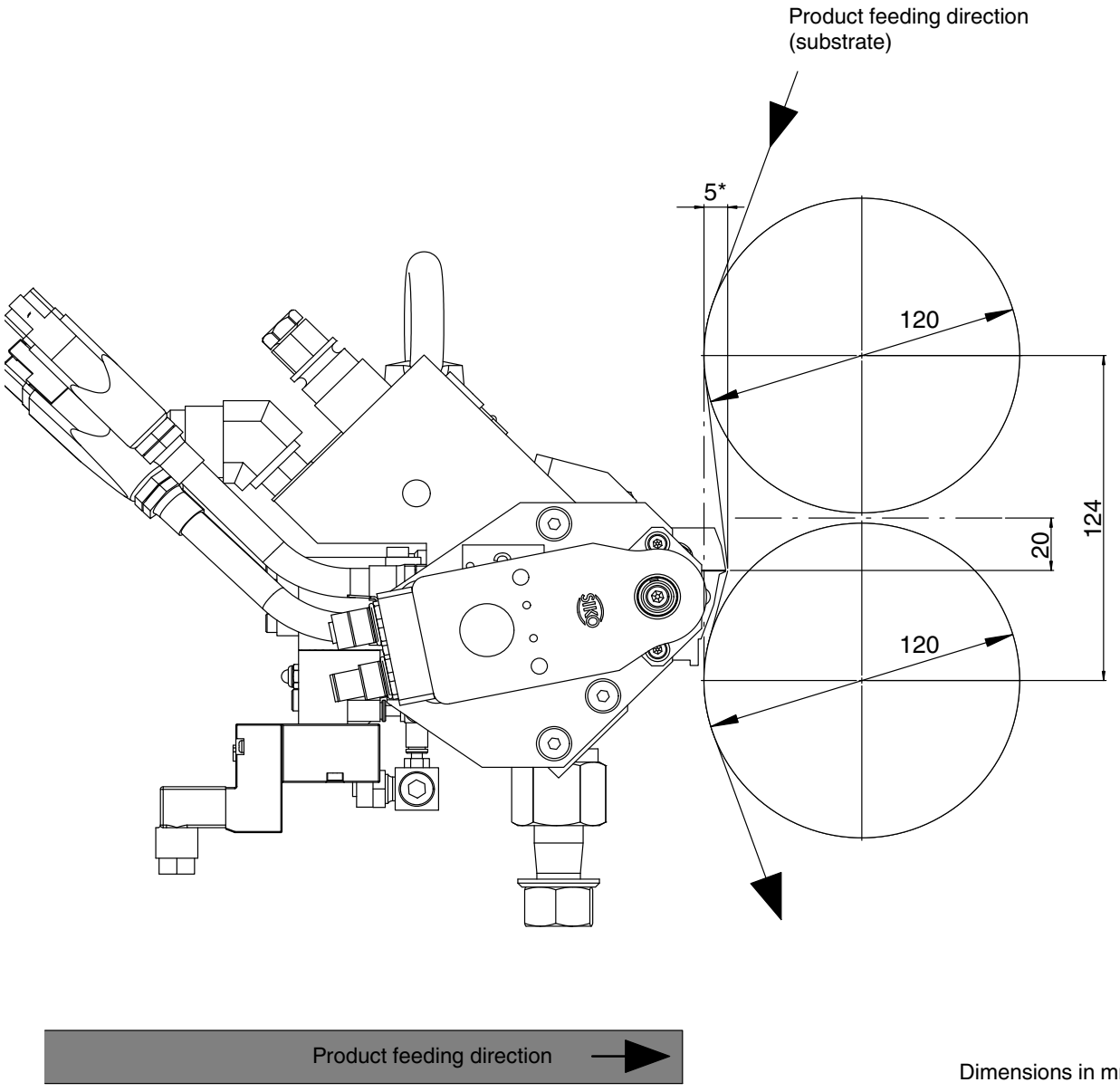
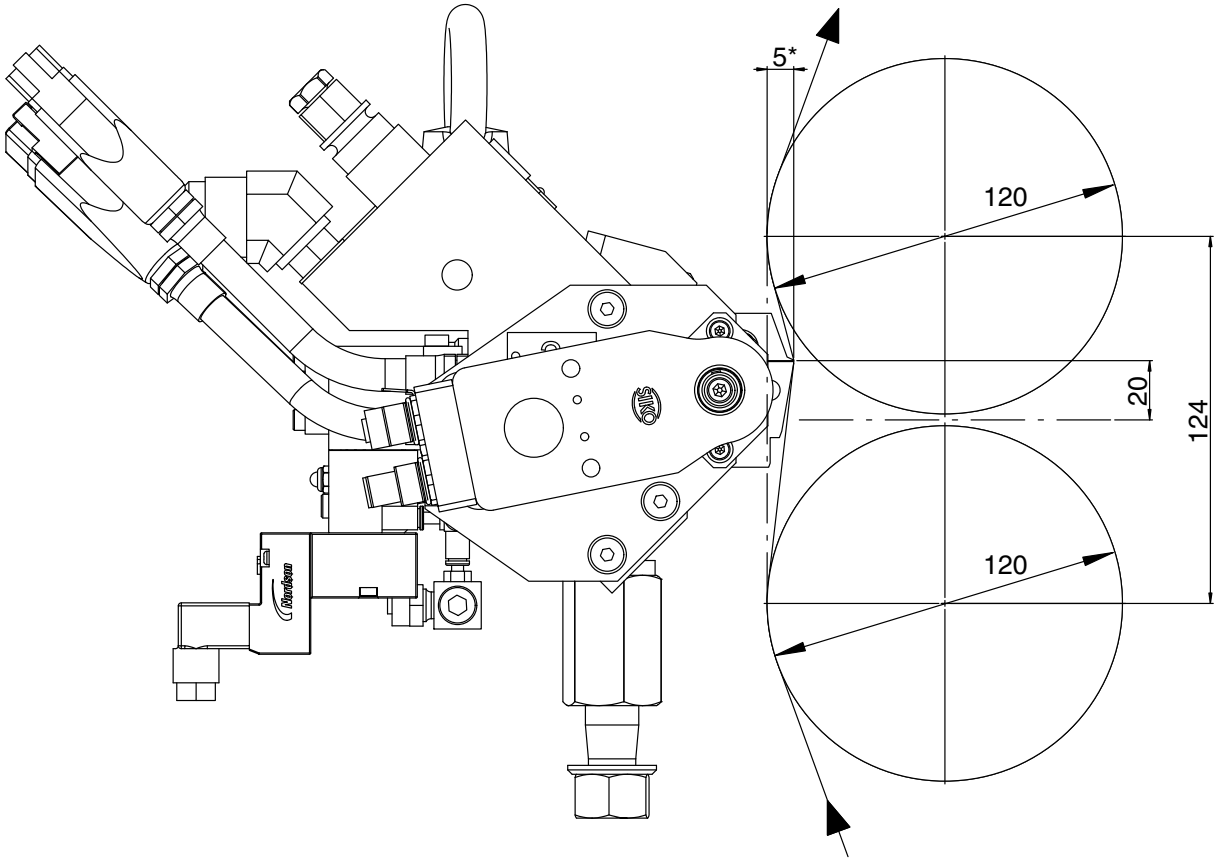


Fig. 11 Applicator's position in relation to rolls and substrate (substrate feeding direction from top to bottom)

Substrate Feeding Direction BtT (Bottom to Top)



Dimensions in mm

Fig. 12 Applicator's position in relation to rolls and substrate (substrate feeding direction from bottom to top)

Positioning Applicator PFW with Web Guide

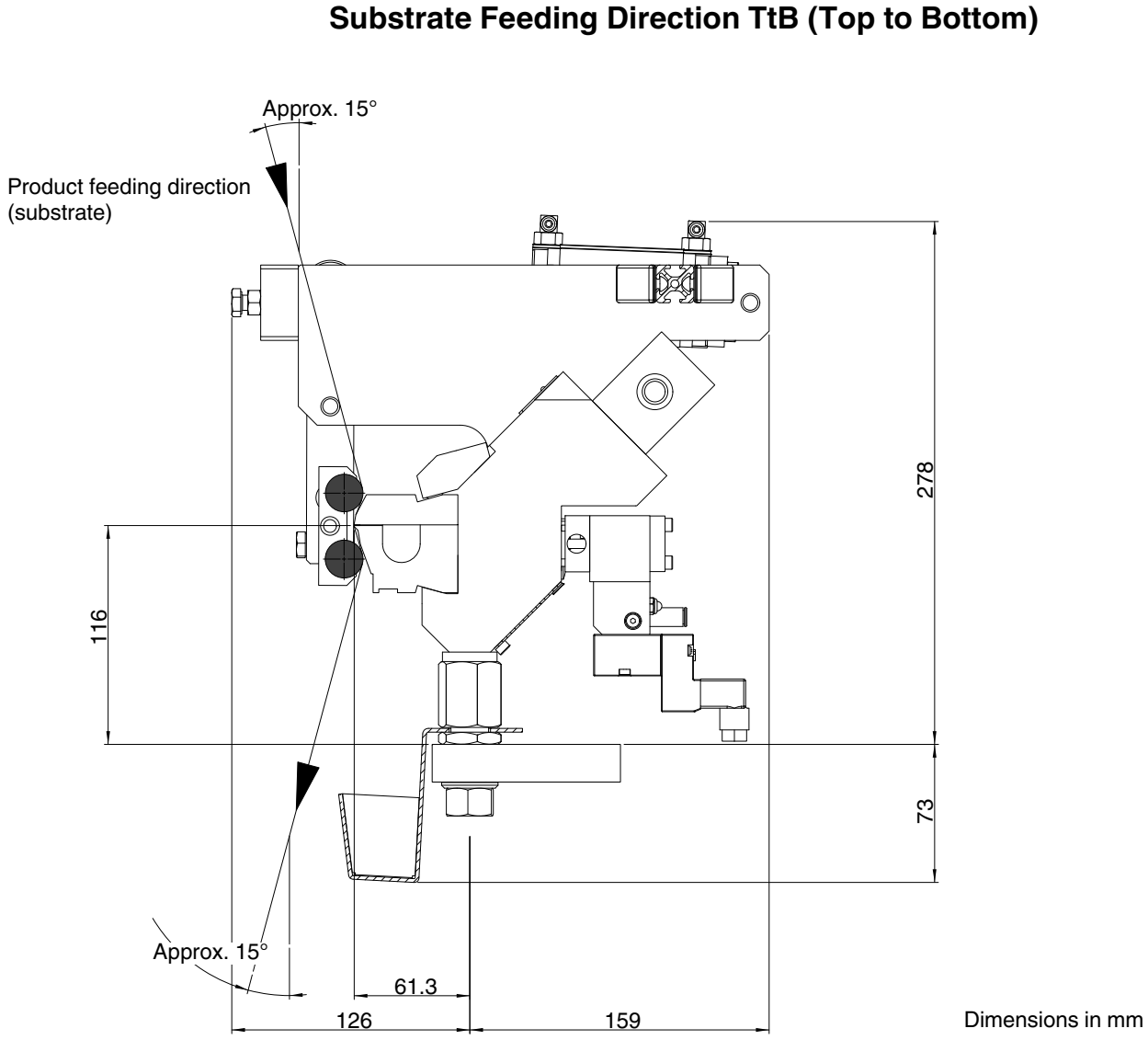


Fig. 13 Example applicator P/N 7183200 - Substrate feeding direction from top to bottom

Changing Substrate Feeding Direction

The applicator can be easily adapted by replacing the nozzle assembly. Please contact your Nordson representative for P/Ns of the nozzle groups *TtB* and *BtT*.

Electrical Connections

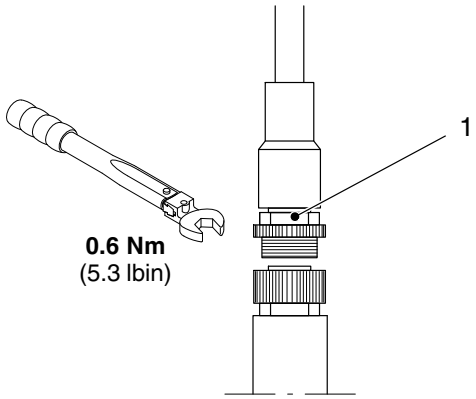
ATTENTION: Risk of electrical shock. Failure to observe may result in personal injury, death, or equipment damage.

Laying Cable

ATTENTION: Do not pinch cables and check regularly for damage. Replace damaged cables immediately!

CAN Bus: Securing Plug Connections

Tighten the hexagonal head (1) with torque of 0.6 Nm. Nordson recommends using a torque wrench made by Murr Elektronik, Murr article number 7000-99102-0000000.



Connecting Solenoid Valves

CAUTION: Operate the solenoid valves only with the voltage shown on the ID plates.

Do not mistakenly exchange solenoid valve cables: Start on the left side (motor M1) with solenoid valve 1.

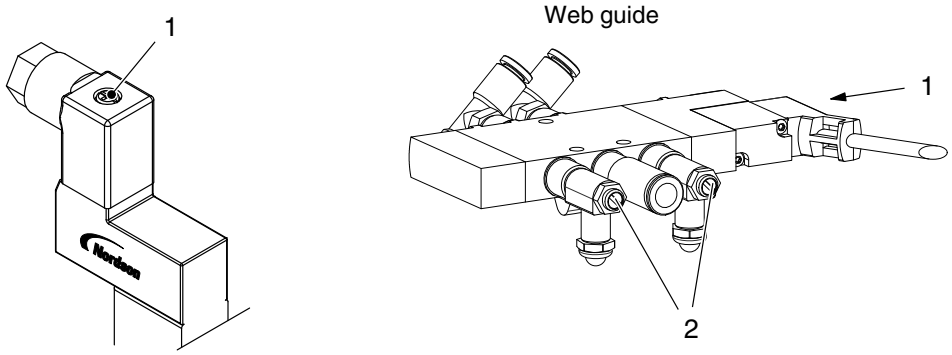


Fig. 14

Secure the plug connection with the screw (1, Fig. 14).

Control Modules

The solenoid valves on the control modules are triggered by a 24 V_{DC} voltage supply from the control box.

Set the signal *Enable solenoid valves* only when the applicator is heated to operating temperature (Signal *Enable motors* received). Seals in the control modules could be damaged if the adhesive were too cold.

For EVA and RET: Only the solenoid valves of the control modules inside of the set application width are triggered.

Web Guide

PFW Triggered by an external 24 V_{DC} voltage supply from the parent machine.

Adjust the swivel speed with the throttles (2, Fig. 14).

Connecting Heater

1. Plug the connecting cables for heating zones 1, 2, 6 and 7 into the corresponding heated hoses. With the aid of the adapter and extension cable, connect the cables for heating zones 4 and 5 to a hose receptacle on the melter. Use an extension cord to connect heating zone 3 to the hose receptacle on the melter (Fig. 15).

2. Use safety clips - when available - to secure the plug connection.

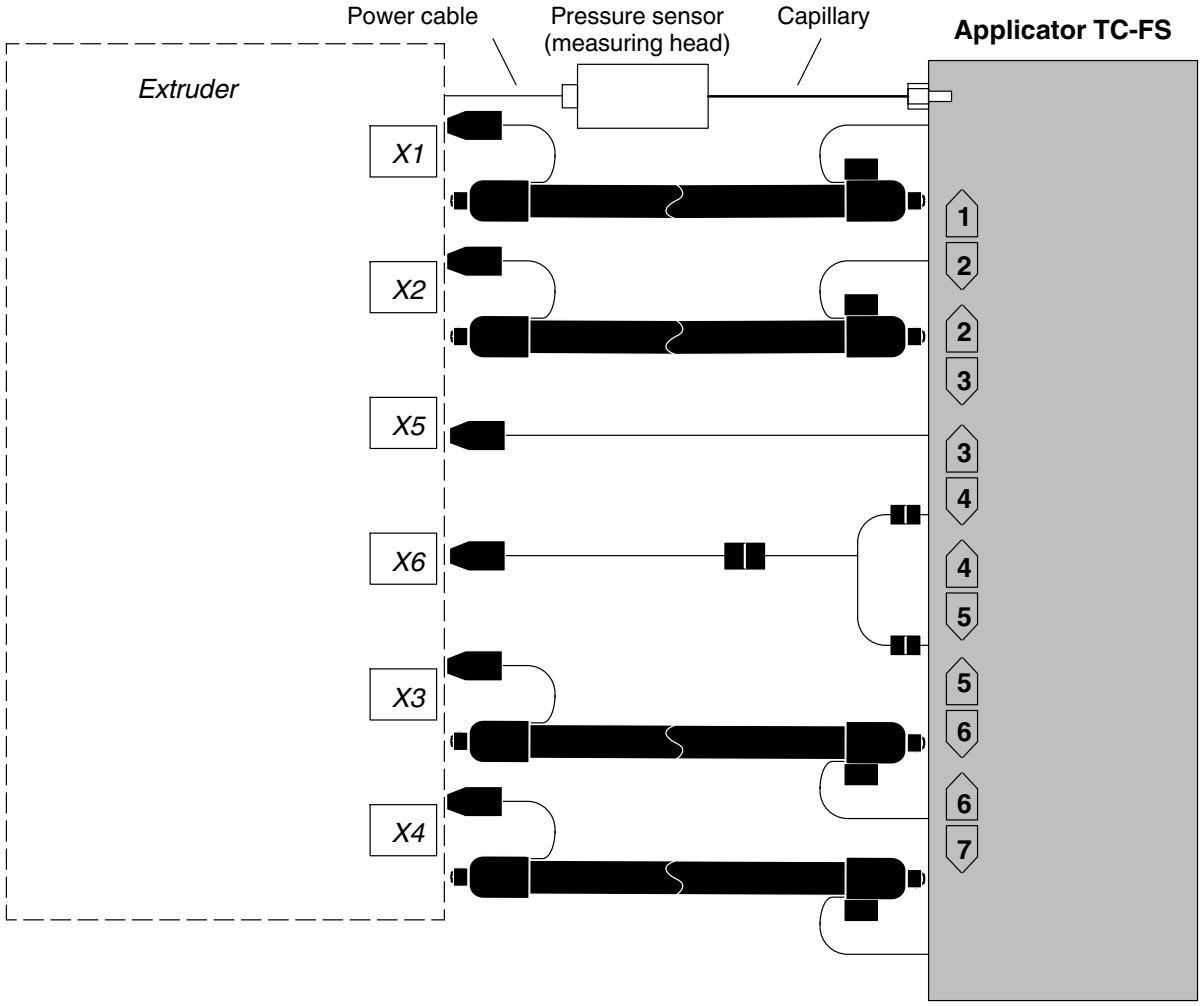


Fig. 15 Example: Application system with one extruder (excerpt)

Connecting Applicator, Control Box and Operating Unit

The motors are labeled 1 and 2 on the applicator:

CAUTION: Do not mix up the CAN bus cable and the voltage supply cable. Plugging the voltage supply into the CAN bus receptacle would destroy the motor.

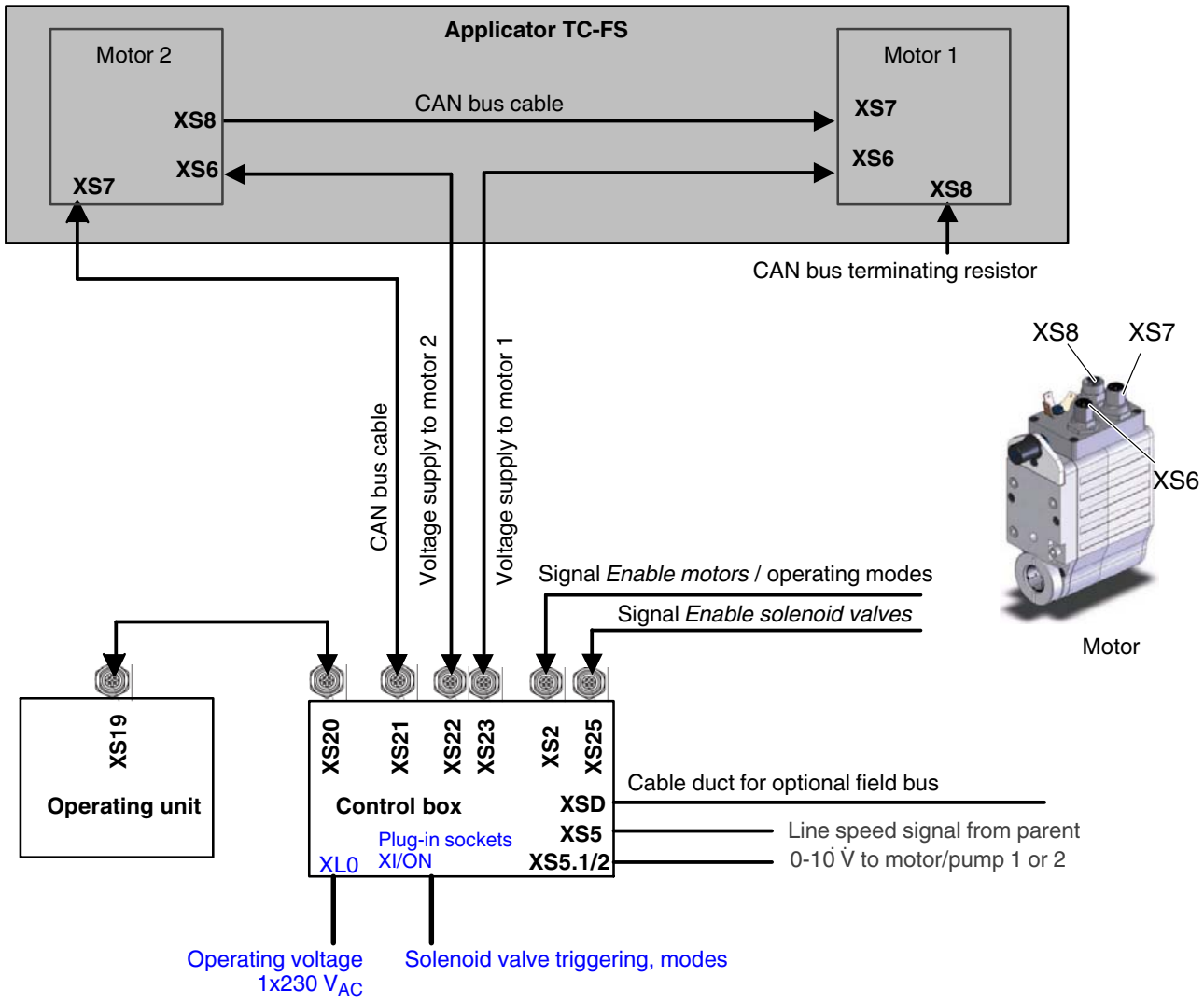


Fig. 16

Adjusting Web Guide - Initial Setting -

CAUTION: Risk of pinching on hot components, if adjustments are made when the web guide is connected.

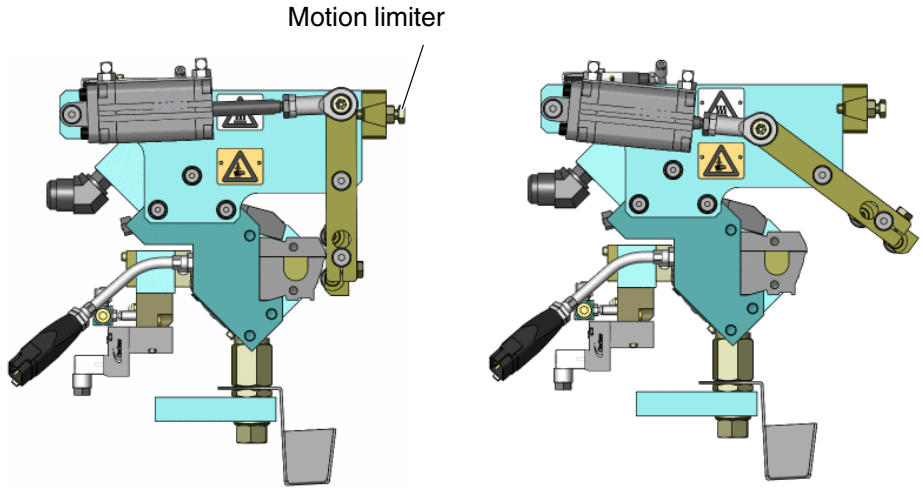
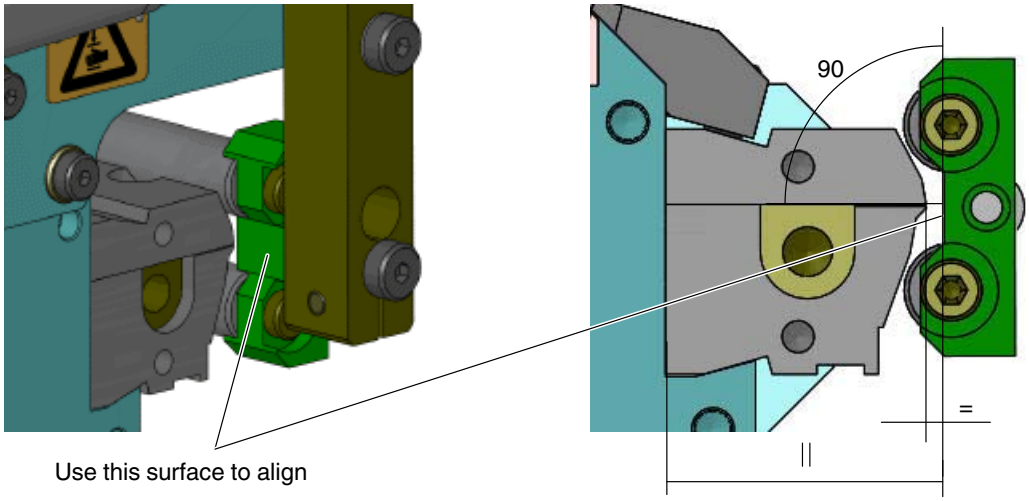
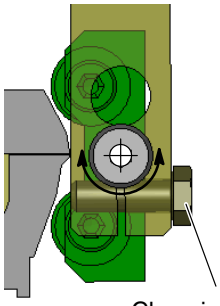


Fig. 17 Left: Web guide swiveled in



Continued ...



Clamping screw

When adjusting with the two motion limiters, ensure that

- The distance to the nozzle is the same in the front and the back.
- The surface of the web guide is parallel to the nozzle and perpendicular* to its slot

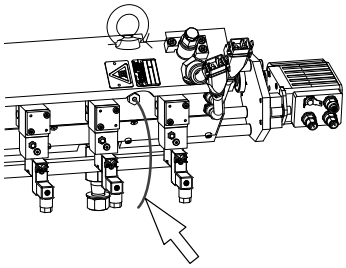
  *Depending on the application pattern, it may be necessary to turn the web guide rolls somewhat. To do this, release the clamping screw on both sides.

- The rolls are parallel and not twisted
- The rolls do not touch the nozzle.

After adjusting, secure the motion limiter with the counternut.

NOTE: If the web tension is not even, re-position the entire applicator.

Connecting Pressure Sensor



Nordson's intention is to integrate the measuring head into the cable harness.

If the measuring head is to be installed somewhere else, always take into consideration the maximum ambient temperature* permitted for the measuring head. Ensure that the capillaries (arrow) are positioned such that they cannot be damaged.

1. Connect the power cable to the melter (Refer to Fig. 15).
2. Calibrate the pressure sensor.

The manual for the Nordson melter contains instructions on how to calibrate the CAN bus pressure sensor. It is done via the melter control panel.

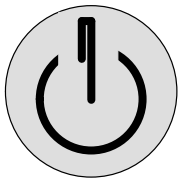
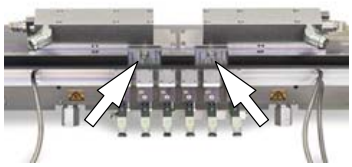


Fig. 18

The 4-20 mA (0-10 V) pressure sensors are calibrated* via the magnetic contact on the measuring head. When the magnetic pin touches the contact (Fig. 18), various functions are activated. The length of time that the pin touches the contact determines which functions are activated.

* Refer to the pressure sensor manual.

Using Pressure Sensor Bore for Pressure Display



P/N 269257 (analog pressure display 0-60 bar) can be screwed in directly, e.g. to show the purging pressure.

Pneumatic Connections

Operation with Non-lubricated Compressed Air

When an applicator is connected to a compressed air system in which the compressed air has previously been lubricated, simply ceasing to lubricate the air is not sufficient. The oil remaining in the compressed air supply will reach the solenoid valves and the control modules and wash out the original lubricant/oil from these parts, substantially decreasing the service life of the units.

To operate with non-lubricated compressed air, ensure that:

- The system has been converted to absolutely non-lubricated operation
- No oil from a possibly defective compressor can penetrate the compressed air supply.

NOTE: Nordson will assume no warranty or liability for damage caused by unpermitted, temporary lubrication.

Conditioning Compressed Air

The quality of the compressed air must be at least class 2 as stipulated by ISO 8573- 1. This means:

- Max. particle size 1 μm
- Max. particle density 1 mg/m^3
- Max. pressure dewpoint -40 ° C
- Max. oil concentration 0.1 mg/m^3.

Connecting Compressed Air

The applicator may only be connected to pressure-controlled and conditioned compressed air.

1. Connect the customer's air supply to the inlet of an air conditioning unit.
2. Connect the control modules and when appropriate the web guide to the air conditioning unit.
3. Set control air pressure:

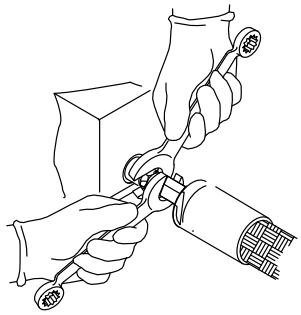
4 to 6 bar	0.4 to 0.6 MPa	58 to 87 psi

For Applicators with Web Guide

ATTENTION: Risk of pinching on web guide! When EMERGENCY OFF occurs, ensure that the air supply is stopped with the customer's EMERGENCY OFF chain.

Connecting Heated Hose

Using Second Open-end Wrench

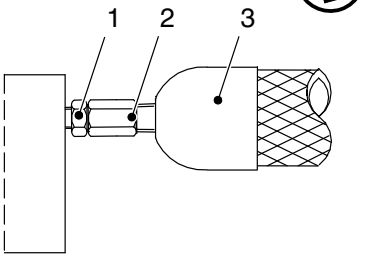


Use a second open-end wrench when connecting and disconnecting the heated hose. This prevents the hose connection on the unit from turning.

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 melters are usually subjected to extensive testing prior to shipment. There may be some of the test material, similar to adhesive, left in the hose connection.

Connecting



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

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

Disconnecting

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

Continued ...

Relieving Adhesive Pressure

ATTENTION: Hot! Risk of burns. Wear safety goggles and heat-protective gloves.

1. Set the motor speed of the melter feeding the adhesive to 0 rpm; switch off the motor(s).
2. Place a suitable container under the filter cartridge(s) of the applicator to collect the adhesive.
3. Stop the compressed air supply and relieve the adhesive pressure in the applicator with the pressure relief screws on the filter cartridges (Fig. 30).
4. Properly dispose of adhesive according to local regulations.

Important Information for Initial Startup and When Replacing Parts

If the applicator is ordered and delivered along with its control boxes, the applicable* software configuration code is already set and the slide position will have been calibrated by Nordson.

*Nordson recommends making a note of the software configuration code. Refer to page 39, *Password*.

CAUTION: When spare parts are ordered - either a motor (for width adjustment) or the entire applicator - calibration must be performed on site, following the instructions in the section *Repair / Calibrating Slide Positions*. This ensures that the control unit and applicator are attuned to one another.

Failure to observe can result in irreversible damage to the applicator.

Observe Before Beginning Production

Unless agreed otherwise, the applicator was tested with a material similar to adhesive before it left the factory. Flush out the test material residue before beginning production.

Important for Interruptions in Production

- Depending on adhesive properties: If the break in production will be longer than 3 to 4 h, set the smallest application width and switch off the system
- Depending on adhesive properties: Purge the system with cleaning agent if the break in production will be longer than 3 days.

Operation

ATTENTION: Allow only qualified personnel to perform the following tasks. Follow the safety instructions here and in the entire documentation.

Polyurethane Application Materials (PUR)

It is imperative that the following guidelines are followed when processing polyurethane application materials (PUR):

- Wear respiratory protection when the maximum permissible concentration of hazardous substances is exceeded.
- Reduce the temperature during production interruptions or breaks throughout the day. Seal the nozzle slot with high temperature grease or with aluminum tape.

  CAUTION: The adhesive tape is not compatible with every PUR adhesive. Test it first.

  If PUR adhesives are used that react quickly, a nozzle slot cover can be ordered to close the nozzle slot for a few hours during brief production standstill. Refer to page 122 *Nozzle Slot Cover (Accessories)*.

- Moving the slides together to reduce the application width is also a form of cleaning.

  CAUTION: The motor has a torque limit. Unintentional stopping during width adjustment may indicate that the slide is blocked (e.g. by charred material). To prevent irreparable damage to the nozzle, do not continue to attempt to adjust the width. Proceed as described under *Disassembling and Cleaning Nozzle* on page 73.

- When PUR adhesive is used, it must be prevented from reacting to the thermal load in the applicator. The applicator has to be purged with adhesive for about one minute every day when work is finished for the day and whenever production is interrupted for >1 h. Set to the maximum width during purging.

  CAUTION: Never exceed the maximum applicator pressure permitted (Refer to *Technical Data*), whether purging with adhesive or with cleaning agent.

  - After purging, set to the minimum application width and cover the application slot.
  - With some very aggressive adhesives, it is better to leave the application width set to the maximum after purging. Cover application slot.

  Rinse out cleaning agent just before beginning production again.

Continued ...

- Before prolonged standstill of the application system for four days or longer, purge with a suitable cleaning agent. Use only a cleaning agent recommended by the adhesive manufacturer.

  CAUTION: Never exceed the maximum applicator pressure permitted (Refer to *Technical Data*), whether purging with adhesive or with cleaning agent.

  Rinse out the cleaning agent just before beginning production again.

- Close open adhesive connections, e.g. hose connections, airtight.

Setting Temperatures

Set all of the applicator heating zones to the same temperature. The procedure for setting the temperatures is described in the temperature controller manual. It differs depending on the melter.

Temperature controllers are not part of the applicator. They are usually located in the electrical cabinet of the melter.

Maximum Operating Temperature

The maximum operating temperature of the applicator is 200 °C (392 °F).

NOTE: The maximum operating temperature may not be exceeded.

The values stipulated by the adhesive manufacturer serve as the basis for temperature selections.

Nordson will assume no warranty or liability for damage resulting from incorrect temperature settings.

PUR Adhesives

CAUTION: Reduce temperature when production is to cease for longer than 30 minutes.

Control Panel Description

NOTE: *Application section* designates the combination of the application width and application position.

Screen saver

The screen saver is activated when the screen has not been touched for ten minutes.

To deactivate the screen saver:

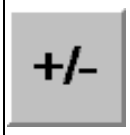
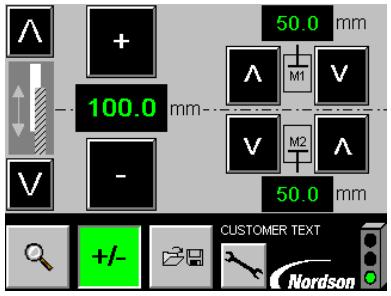
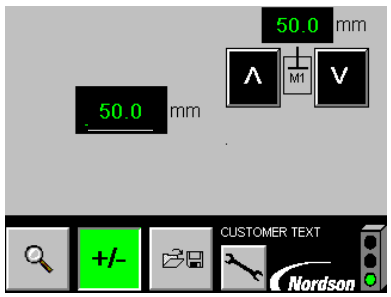
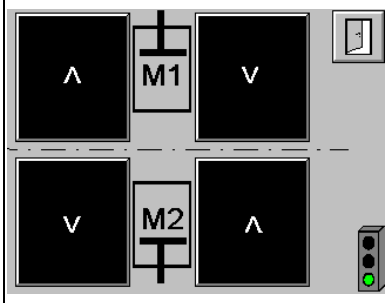
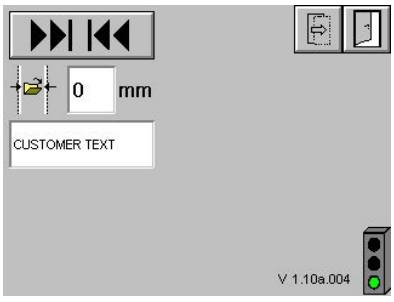
1. Touch the screen and then touch the key that appears.

The starting screen appears.

2. Call up the control panel screens by touching the respective keys.

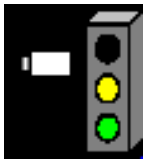
Continued ...

Control Panel Description *(contd.)*

Key	Control panel screen
	  **Starting screen** Set the application section. The display adapts to the respective applicator. The upper illustration shows an applicator with two motors and the lower illustration an applicator with one motor. Refer to page 41, *Setting Application Section*.
	 **Fine adjustment** The keys *Back application width* and *Front application width* are enlarged. This makes fine adjustment during operation easier when the operator is looking at the substrate and not at the control panel. Refer to page 43, *Fine Adjustment*.
	 **Saving / Loading Application Section** There are five memory locations available. Also, the special application areas *Maximum application width* and *Minimum application width* can be loaded/started. Refer to page 44, *Saving/Loading Application Section*. These keys are reversed in older software: 
	 **Setup** Settings that need be made only rarely, e.g. upon initial startup. Refer to page 36, *Initial Startup*. **NOTE:** Some settings are protected with passwords. Refer to page 39, *Password*.

Elements of Control Panel Screens

Signal Beacon and Battery Symbol



The signal beacon indicates the status of the applicator:

- Red = fault or shutdown
- Yellow = warning
- Green = ready for operation

If the battery symbol appears next to the signal beacon, the battery voltage of a motor's absolute encoder is low.

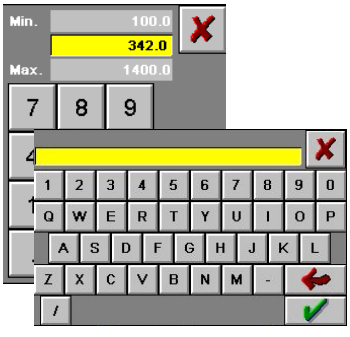
NOTE: The absolute encoder remembers the position even after switching off. The operating unit reads out the position and uses it to display the application width, application section, etc.
In some situations, the position must be calibrated (Refer to section *Repair, Calibrating Slide Positions*).

Touch the signal beacon to display the control panel screen *Alarms*. Refer to section *Troubleshooting, Alarms* (page 85).

Navigation Keys

	Back	To the next-higher control panel screen Cancel and close when in input windows
	To the next subscreen	A control panel screen can have multiple subscreens

Input Window



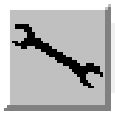
When a field for entering text or a numerical value is touched, an input window appears when the field is touched.

	Cancel	Exit input window without implementing changes
	Backspace, delete	To correct unintended input
	Confirm	Acceptance of a value

Initial Startup

Switch on the control box for startup: **I**. (With the customer's switching device, when the control box has no switch).

Setting Parameters

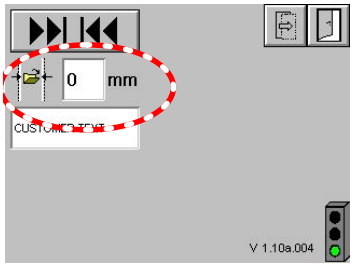


Upon initial startup, set the following parameters in the control panel screen *Setup* as required.

NOTE:

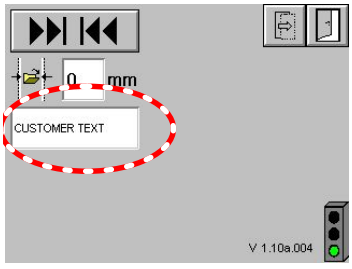
- Some parameters are protected with passwords. Refer to page 39, *Password*.
- Keys and fields in this control panel screen that are not relevant to initial startup are explained in the appropriate part of this manual.

Entering Safety Margin



When an application section is loaded (Refer to page 44, *Saving/Loading Application Section*), an application section reduced on both sides (front and back) by this safety margin is coated. This prevents material from being applied beyond the edge of the substrate. Setting range: 0 - 10 mm.

Information Line: Entering Text



The operator can enter any text that is to appear in the *Information line*. The information line appears in most control panel screens:

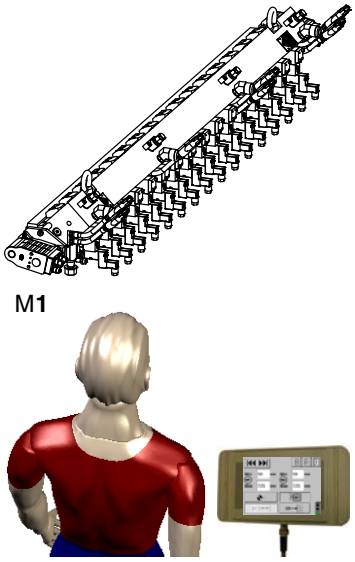
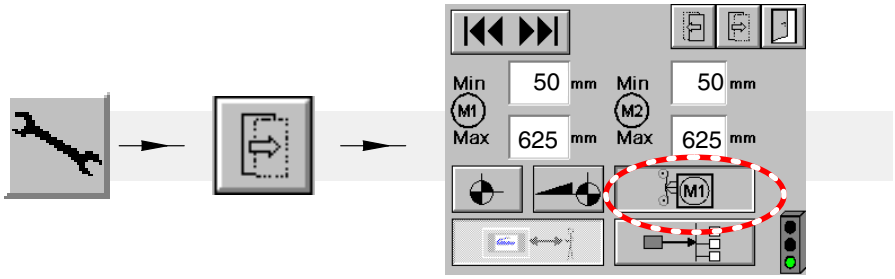


Fig. 19 Example

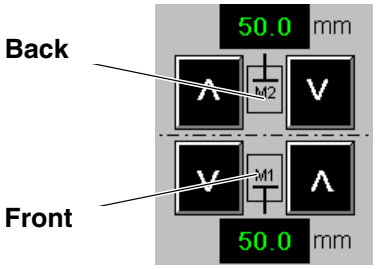
Adapting Control Panel to Mounting Position (with Two Motors)

Depending how they are positioned, either motor *M1* or motor *M2* is in the front from the operator's point of view:

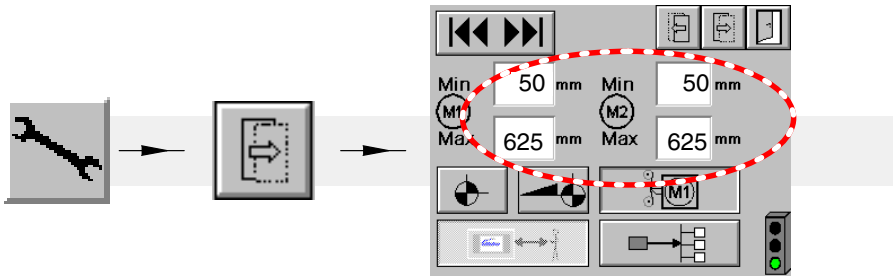
Ensure that the front motor is selected in the control panel screen *Setup* (M1 in this example):



This setting determines how the control panel keys are assigned to the motors:



Limiting Application Section

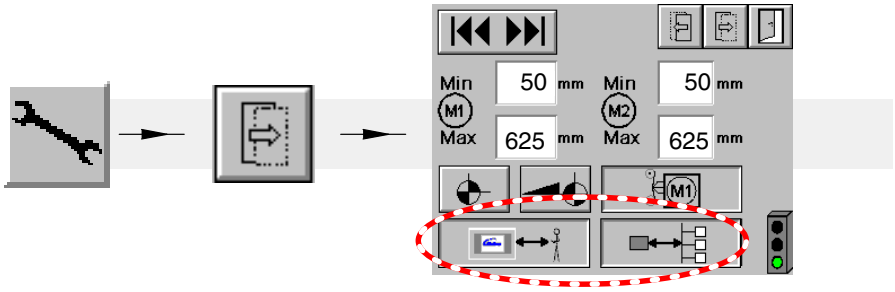


Limits can be set for both motors/slides to prevent an application section from being coated when the production system is not intended for this purpose.

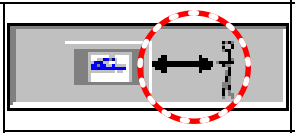
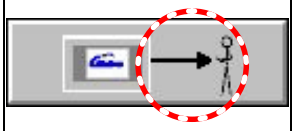
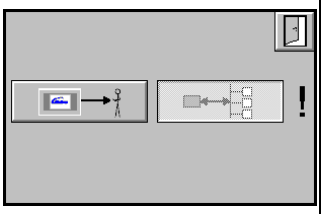
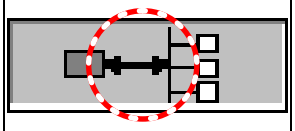
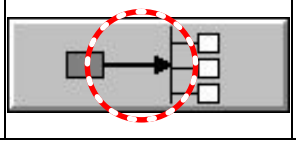
NOTE:

- The values are based on the center of the nozzle
- Values beyond the range cannot be entered.

Selecting Control Options (with Field Bus Option)

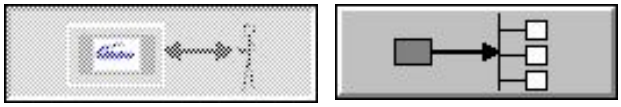


Example: *Control panel* selected, *Field bus* selected

Control option		Function
Control panel		The applicator can be controlled via the control panel
		The applicator can **not** be controlled via the control panel. **Exception:** *Fine adjustment*. Refer to page 43, *Fine Adjustment*. Values can be read. When an attempt is made to control via the control panel, a message appears: 
Field bus		The applicator can be controlled with field bus signals
		The applicator can **not** be controlled with field bus signals. Data from the applicator can be received

NOTE: It is not possible to deactivate both control options. This is why only one of the selected control option keys is faded gray.

Control panel selected, *Field bus* deactivated:

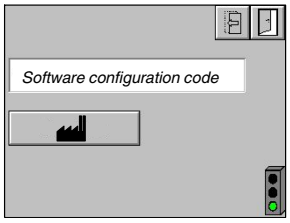


Password

Some settings are protected with passwords. When a field or button is pressed, an input window opens in which to enter the password. If no key is touched for ten minutes after pressing a password-protected feature, password protection is reactivated. Then the password prompt appears again for password-protected features.

Notes Regarding Initial Startup

Print this page, fill it out and store it in a safe place.

<table>
<tr><td colspan="2">Serial number (applicator)
Refer to the applicator ID plate</td></tr>
<tr><td colspan="2">To be entered by customer</td></tr>
<tr><td>Software configuration code
For the above serial number of the applicator controlled with the operating unit.</td><td>Password (operating unit)</td></tr>
<tr><td> 

To be entered by customer</td><td>1234</td></tr>
</table>

Setting Application Section

Precision of Display

A differential, meaning an adjustment of a specific amount, is 1/10 precise.

The absolute value, meaning the actual application width applied, can deviate slightly from the application width indicated on the control panel. Possible causes:

- Slack in the spindle nut.

  Insert additional shim rings to increase the pretension. Refer to page 81 *Increasing Spindle Nut Pretension*.

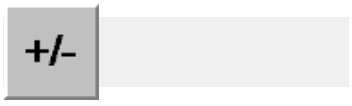
- Manufacturing tolerances in the spindle pitch.

  Then refer to section *Repair, Adjusting Application Width Display.* Page 95 for applicators with two motors or page 100 for applicators with one motor.

- Different heat expansion at different operating temperatures.

  Then repeat calibration at the new operating temperature.

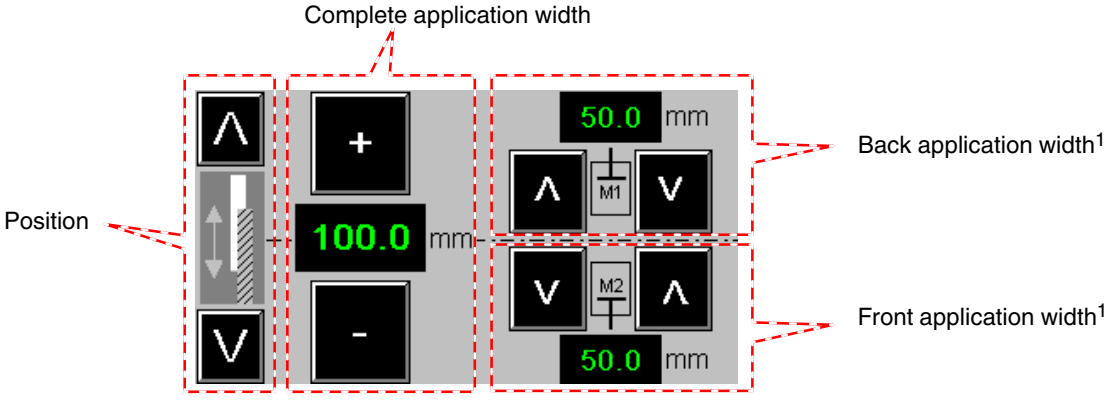
Rough Adjustment



Principle Procedure

Nordson recommends the following procedure:

- For symmetrical application sections:
  Set *Complete application width* and then correct *Position*, if necessary
- For asymmetrical application sections:
  Set the *Back application width* and *Front application width* separately, thus setting the position at the same time.



Note: [1] *Back* and *Front* refer to the positions as viewed by the operator (In this example, motor 2 is in the front). Refer to page 37, *Adapting Control Panel to Mounting Position*.

Adjusting (Increasing and Decreasing Application Width)

Adjustment itself (moving the slides into position) can occur as follows:

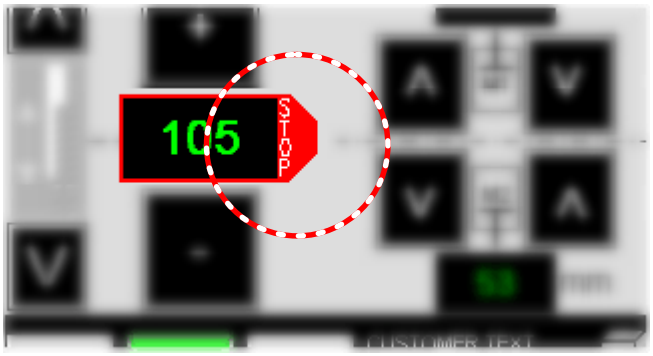
A. Press the keys.

- Adjustment is immediate
- The speed of adjustment increases with the length of time that the key is touched.
- The keys + and − adjust the front and back application width equally.

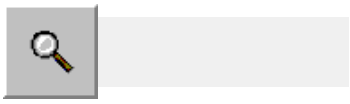
B. Touch the number field.

- An input window opens. Enter a value (in mm, resolution 0.1 mm) and confirm.
- Touch the *Stop* key to stop adjustment prematurely:

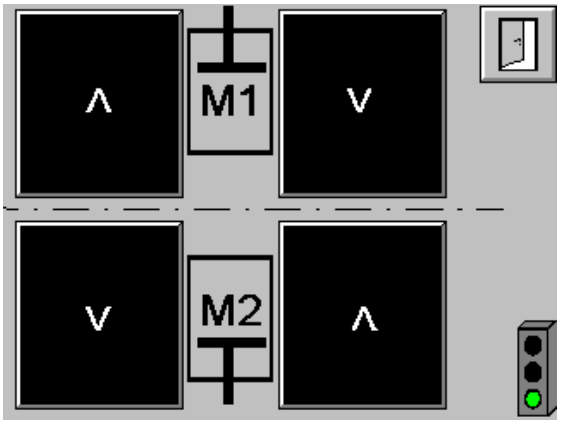
Input Window



Fine Adjustment



The keys *Front/back application width* are enlarged:

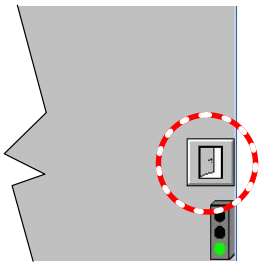


This makes fine adjustment during operation easier, when the operator is looking at the product and not at the control panel.

To return to the normal view:

1. Touch the key 
2. Touch the second key  , which then appears.

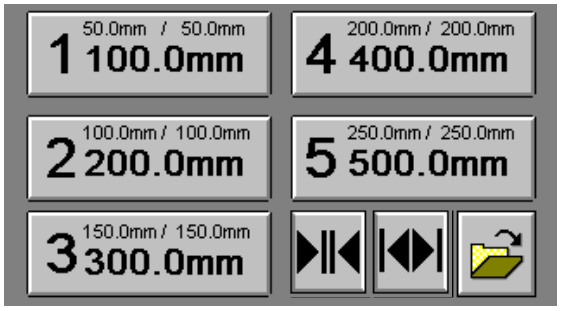
   This prevents incorrect operation when the first key is touched unintentionally.



Second key

Saving/Loading Application Section

There are five memory locations available. The label for each memory location depends on the saved application section and is entered automatically.

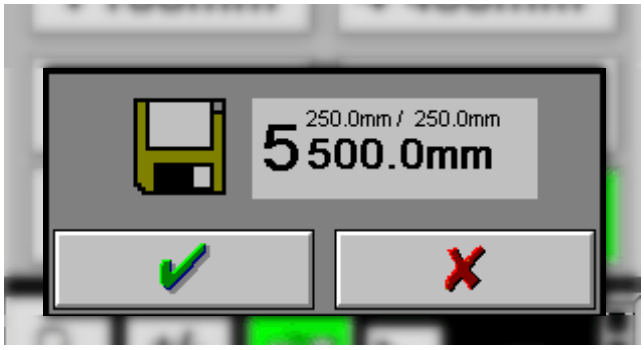


Saving

Save mode

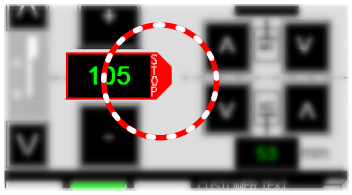
To save the current application section:

1. Touch the key  to go to *Save* mode: 
2. Touch the key for the desired memory location.
   The following confirmation prompt appears:



3. Save the current application section with  , or cancel with  .

Loading



NOTE: After loading an application section, adjustment occurs automatically. Touch the *Stop* key to stop adjustment prematurely.

Loading Saved Application Sections

Load mode

1. Verify that the  key is in *Load* mode, meaning that it is not pressed.
2. Touch the key for the desired memory location.
   The following confirmation prompt appears:

3. Load the current application section with  , or cancel with  .

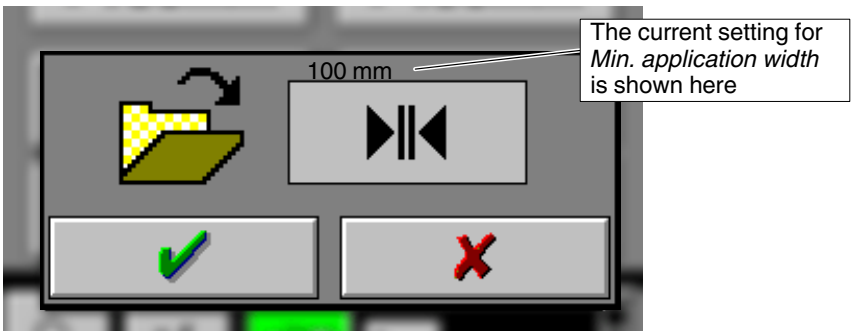
   NOTE: An application section is loaded that is reduced on both sides (front and back) by the safety margin (Refer to page 36, *Entering Safety Margin*). So the application section should then be corrected with the *Fine adjustment*.

Loading Special Application Sections

1. Select the desired application section:

 **Minimum application width**	**NOTE:** The maximum and minimum application widths can be specified. Refer to page 37, *Limiting Application Section*.
 **Maximum application width**	

   The following confirmation prompt appears:



2. Load the current application section with  , or cancel with  .

Enabling Solenoid Valves

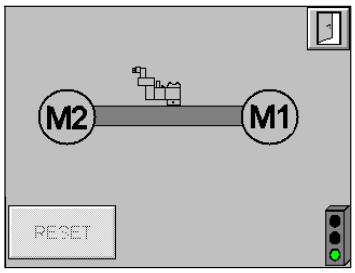
The status is indicated by these symbols:

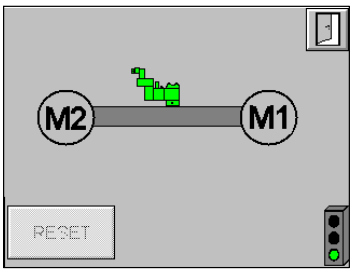
- Gray control module: Solenoid valves not enabled

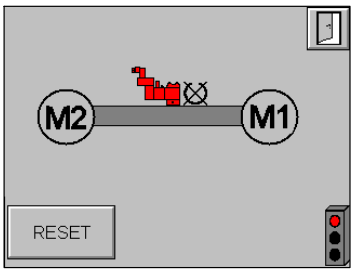
  Wait until the parent machine is ready and the signal *Enable solenoid valves* has been transmitted to the control box.

  NOTE: The message *Solenoid valves not enabled* will also appear if the enable cable is missing.

- Green control module: Solenoid valves enabled
- Red control module: Solenoid valve control failed





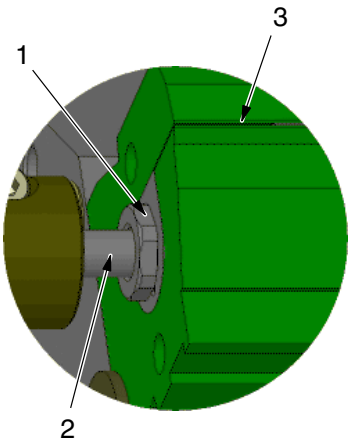


For Grammage (Option)

The control box is wired such that no Nordson photosensor for product detection is connected.

A Nordson photosensor can, however, be added. Then follow the instructions included in the kit.

Recommended Procedure when Application Width is Decreased* upon Changing Product

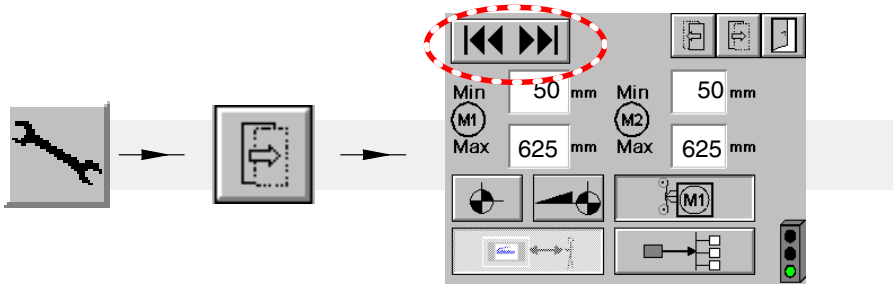


* Adhesive is forced out when the application width is decreased. However, this does not refer to changing/adjusting the width in the course of ongoing production.

1. Pull out trolley/applicator if step 6. is not otherwise possible.
2. With the pump switched off, go to the maximum application width (maintenance position).
3. When applicators have a centered zero point, use a brass brush to clean the screw (1), spindle (2) and nozzle slot (3) on both sides of the surface nozzle; When applicators have the zero point on the left or right, clean the side opposite the zero point.
4. Purge at the maximum application width (with grammage control: set *Purge speed factor*) until the adhesive flows out free of bubbles and clots. Switch the pump off again.

   CAUTION: The maximum adhesive pressure of the applicator also may not be exceeded when purging, whether with adhesive or with a cleaning agent.
5. With the pump off, reduce to the new production application width.
6. Externally clean the nozzle.
7. Push the trolley/applicator back in.

Increasing to Maximum Application Width (Maintenance Position)



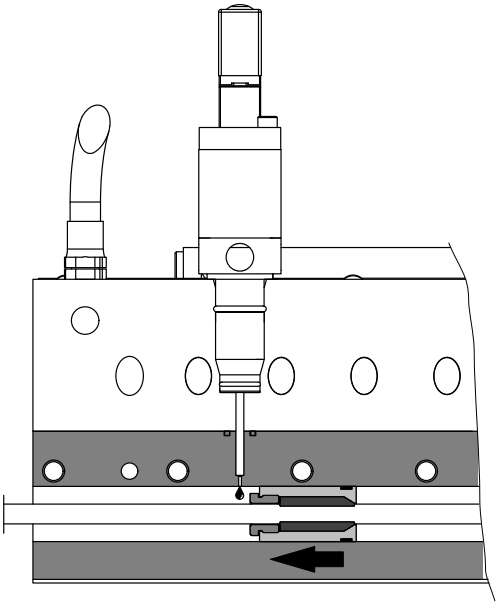
Only with this key can the applicator be opened wider than the maximum application width, e.g. for maintenance and repair purposes. The pistons then reach their outer position.

The stated maximum values for motor 1 and 2 (*625 mm* in the illustration) are ignored.

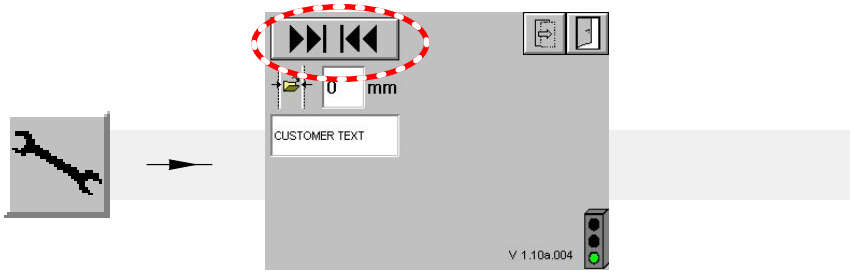
Increasing Application Width

After the applicator has been opened to increase the application width, purge it until the adhesive flows out of the nozzle slot evenly and free of bubbles. The following note applies to all applicators except for TC-FS-PUR.

NOTE: Some adhesive will flow out of the adhesive bores behind the switched off control modules, behind the pistons into the distribution canal. This adhesive is forced out when the applicator is opened to the maximum application width. This is a normal process during widening and is not leakage that has to be remedied.



Decreasing to Minimum Application Width



After confirmation: The motors close the nozzle to the application width value saved and displayed in the software.

Software Configuration Code

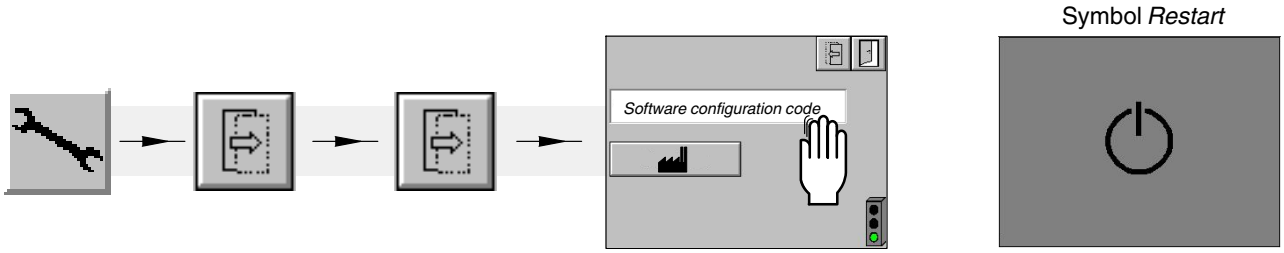
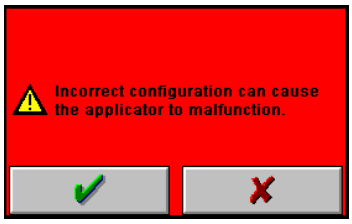


Fig. 20



1. Touch the input field.
2. Confirm the warning.

   CAUTION: Change the software configuration code only when the configuration has actually changed (e.g. due to retrofitting) or has to be changed, e.g. for a software update (Refer to page 102 *Software Update*). Otherwise the applicator may not function properly.

   Nordson will inform of the new, changed software configuration code.
3. Enter the software configuration code. Then the operator will be prompted to restart.
4. Touch the *Restart* symbol to boot the operating unit.

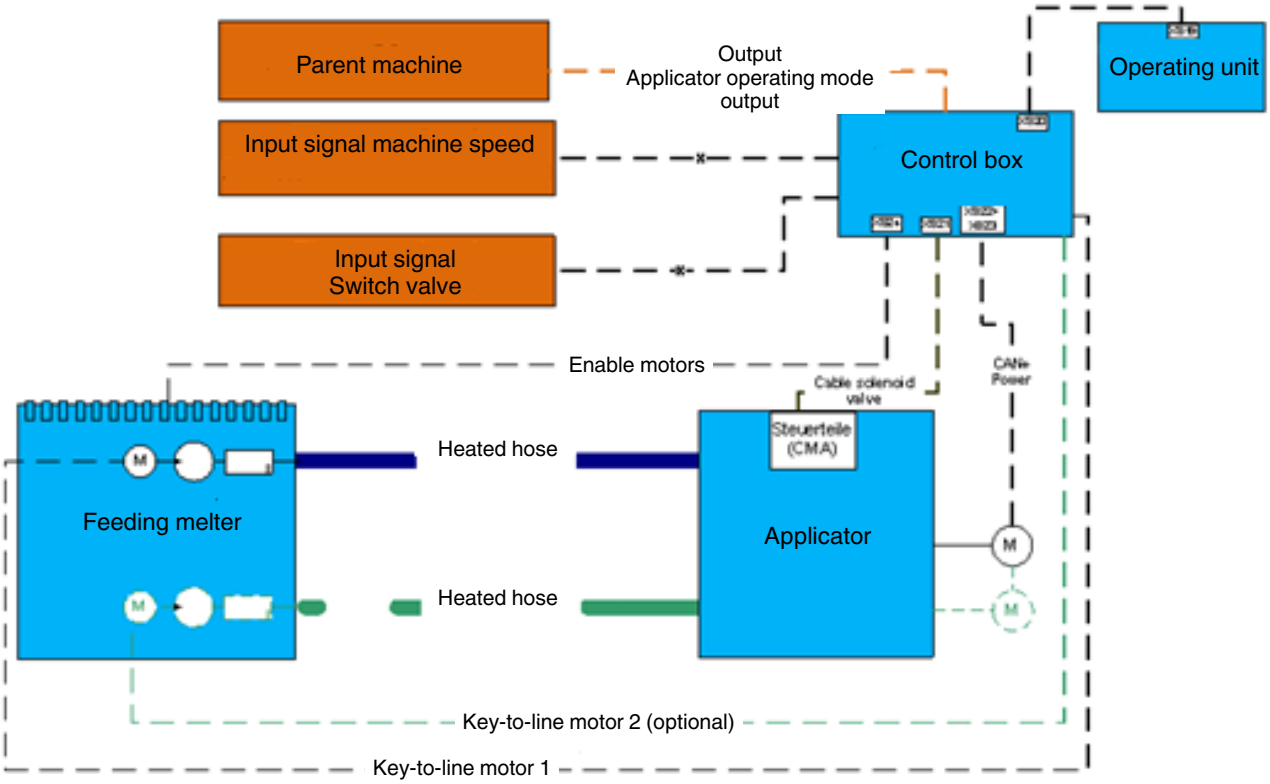
Resetting to Nordson Default

Nordson default

Delivery state of parameters that can be reset to the default with the key (Fig. 20).

Grammage Control (Option)

The weight (grammage) of the application material applied to the substrate per surface unit. The application weight is generally stated in g/m^2.



Flat lamination requires continuous application. One motor is triggered with a single-pump melter or both motors with a 2-pump melter, depending on the line speed, the application width and the grammage required. The interfaces XS5 and XS5.1 (motor 1) and possibly XS5.2 (motor 2) on the control box are used for this purpose. The adhesive is fed through the nozzle during the entire application time.

Connecting Control Box (Additional Interfaces)

Line Speed Input XS5

Line speed value of parent machine: 0-10 V or 4-20 mA.

Pilot Voltage Output per Motor/Pump XS5.1 + XS5.2

Line speed values to motors: 0- 10 V

Setting up Applicator for Grammage Control

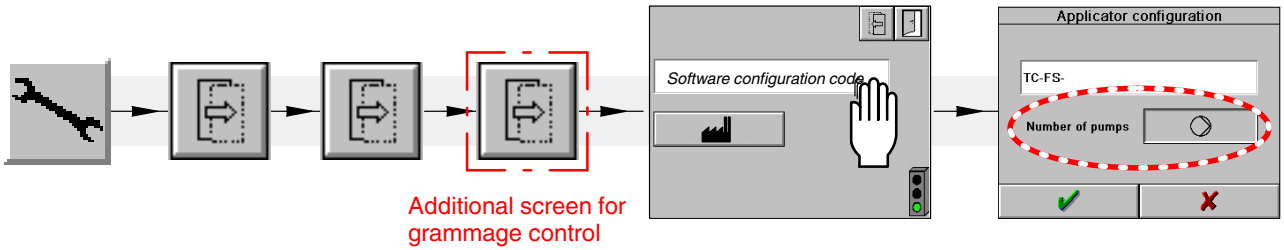


Fig. 21

Selecting Number of Pumps

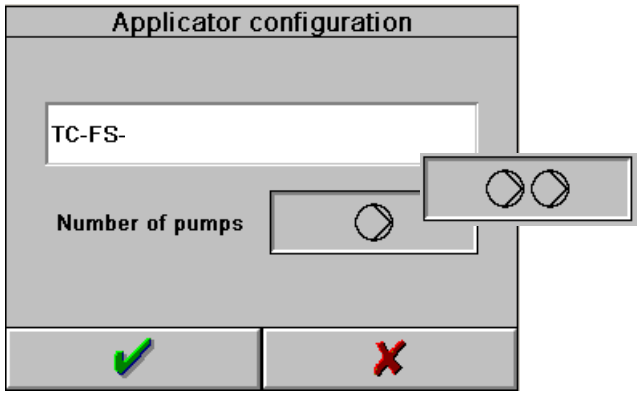


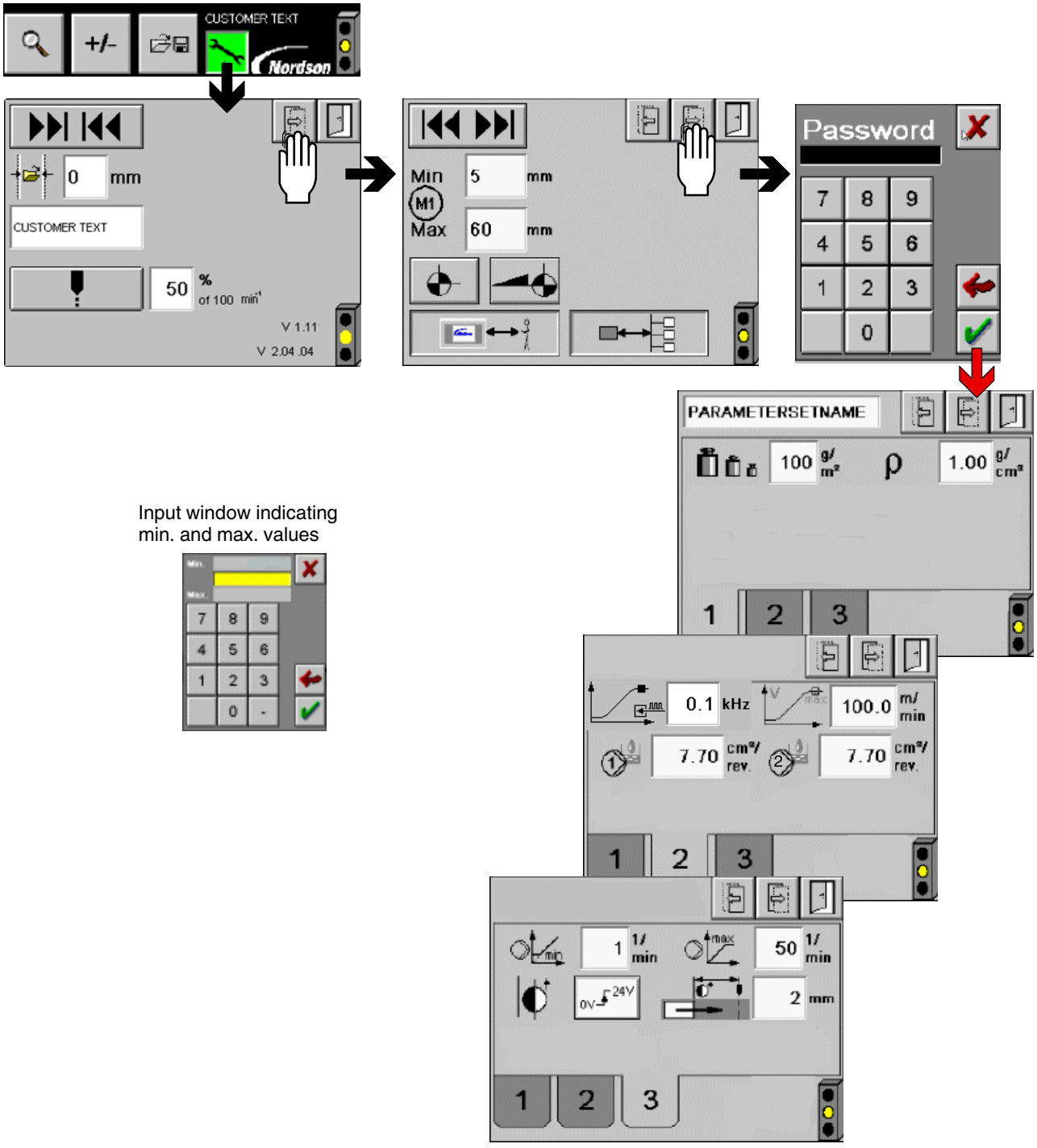
Fig. 22

Number of pumps: Set the number of melter pumps that supply adhesive to the applicator. Touch the key to switch from one pump to two. The key symbol changes accordingly.

Photosensor

Check/adjust photosensor type and GTO (Nozzle-to-sensor offset). Refer to Fig. 26.

Control Panel Overview with Grammage Control



Input window indicating min. and max. values

Purging with Purge Key

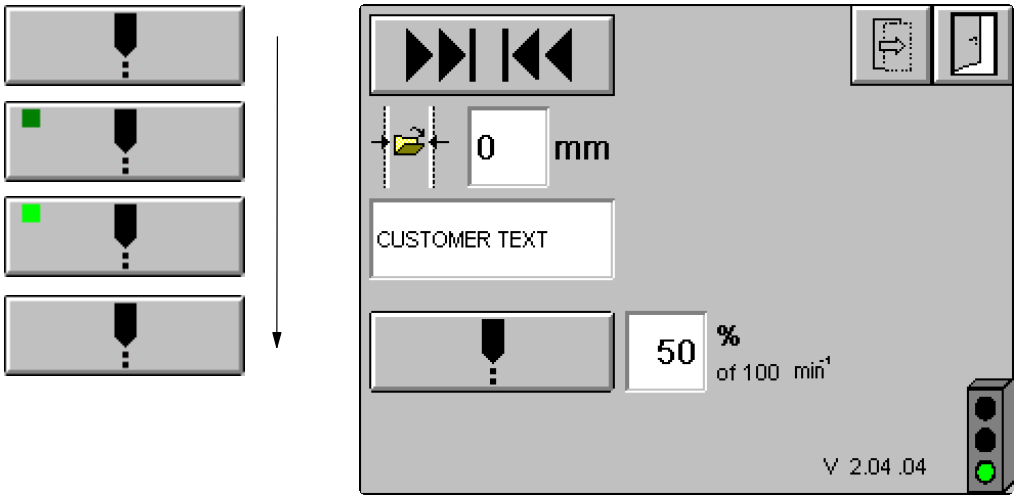
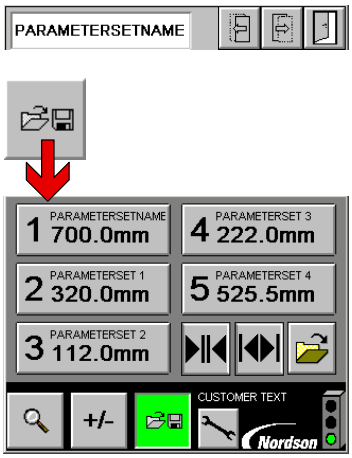


Fig. 23

	Meaning	Range	
min-1	Purge speed factor [%] The purge speed is controlled as a factor of the application width set and the *Purge speed factor*. The speed factor is based on the value shown below the percentage symbol (in this case: 100 min^{-1}) Acts as a key when pressed for shorter than 5 seconds. The LED is dark green during this time. Then the key clicks into place and the LED changes to light green. Touch again to stop purging.	10 - 100	50

PARAMETERSETNAME (Parameter Set Name)



The following parameters are stored under the parameter set name.

- Application weight
- Adhesive density

This information is stored along with the total application width in a recipe and is accessible with the respective key (1 to 5).

Control Panel Screen 1

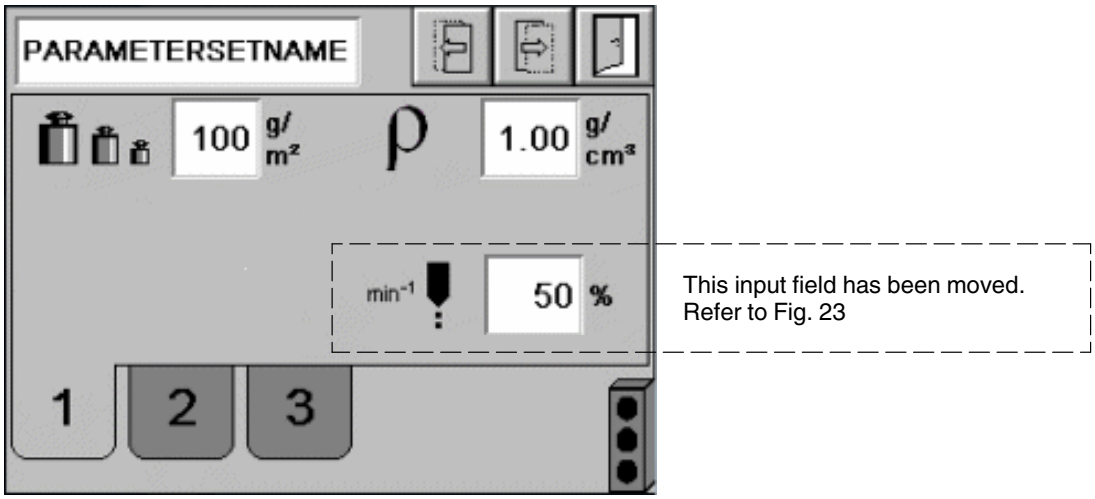


Fig. 24

	Meaning	**Range**	
Parameter set name (assigned by customer)			
	Application weight [g/m^{2}] Volume calibration is a simple way to check the setpoints. This is done by weighing the amount of adhesive that flows out in one minute. At least three samples should be taken to obtain a good average. OR Measuring application weight: Use a circular cutter to cut out several 100 mm^2 circles from the uncoated substrate. The sampling points should be evenly distributed across the substrate width. Measure the weight with a precision of 0.01 g and then calculate the average weight. Do the same with the coated substrate. The number of samples to be taken depends on how much the weights of the samples deviate from one another. The application weight is the difference between the coated and the uncoated substrate. The application weight is generally stated in g/m^2.	5 - 500	100
ρ	Adhesive density [g/cm^3] Refer to the data sheet of the adhesive supplier	0.50 - 5.00	1.00

2 *Control Panel Screen 2*

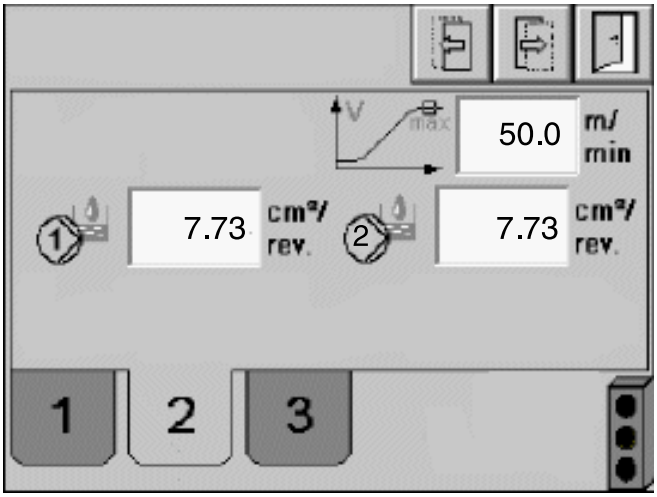
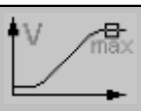


Fig. 25

	Meaning	**Range**	
	Max. machine speed [m/min]	0.1 - 200.0	50.0
	Delivery rate of pump 1 [cm^3/rev] This value can be used to correct deviations, such as those resulting from wear. Enter the actual delivery rate here.	0.10 - 120.00	7.73
	Delivery rate of pump 2 [cm^3/rev] Pump 1 and 2 are always the same type, meaning that they have the same delivery rate. This value can be used to correct deviations, such as those resulting from wear. Enter the actual delivery rate here.	0.10 - 120.00	7.73

3 *Control Panel Screen 3*

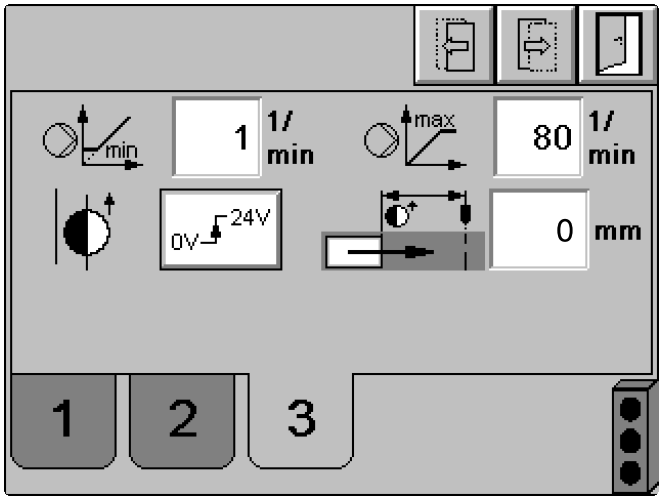
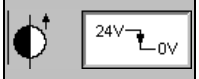


Fig. 26

	Meaning	**Range**	
	Minimum pump speed threshold value [min^{-1}] **With one pump:** If the calculated* required pump speed is below the value entered here, the pump works at the minimum threshold value. **With two pumps:** If the calculated* required speed of one pump is below the value entered here, both pumps work at the minimum threshold value.	1 - 10	1
	Maximum pump speed threshold value [min^{-1}] **With one pump:** If the calculated* required pump speed is above the value entered here, the pump works at the maximum threshold value. **With two pumps:** If the calculated* required speed of one pump is above the value entered here, both pumps work at the maximum threshold value.	50 - 100	80 (old: 50)
	Photosensor type "Light switching": Application when change from 0 V to 24 V (slope)	Light Dark	Light
	Photosensor type "Dark switching": Application when changed from 24 V to 0 V (slope)		
	Nozzle-to-sensor offset (GTO) [mm] If the GTO = 0, some of the parameter values are faded gray, meaning that they cannot be adjusted because they are not useful until the GTO is >0 * Set the GTO = 0 when the sensor signal for the solenoid valves comes directly from the parent machine (sensor provided by customer) or when no Nordson photosensor is used for product detection.	0 - 1000	0* - Do not change -

* The parameters *Max. machine speed*, *Application weight*, *Adhesive density*, application width set and *Pump delivery rate* enter into the calculation.

Daily Shutdown

1. Perform daily maintenance.
2. Turn off the control box with the switch (or with the customer's switching device).

Maintenance

ATTENTION: Allow only qualified personnel to perform the following tasks. Follow the safety instructions here and in the entire documentation.

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

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

CAUTION: Verify that the control option *Field bus* is deactivated. This prevents unintentional adjustment of the piston. Refer to page 38, *Selecting Control Options (with Field Bus Option).*

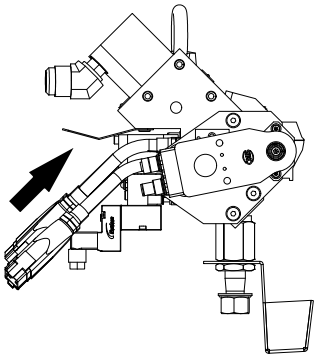
For Applicators with Web Guide

Shutting Down Web Guide

ATTENTION: Risk of squash! Ensure that the web guide cannot be triggered. Stop control air supply to prevent triggering.

Relieving Adhesive Pressure

ATTENTION: Hot! Risk of burns. Wear safety goggles and heat-protective gloves.



1. Set the motor speed of the melter feeding the adhesive to 0 rpm; switch off the motor(s).
2. Applicators without drip tray (arrow): Place a suitable container under the filter cartridges of the applicator to collect the adhesive.
3. Stop the compressed air supply and relieve the adhesive pressure in the applicator with the pressure relief screws on the filter cartridges (Fig. 30).
4. Properly dispose of adhesive according to local regulations.

Processing Materials

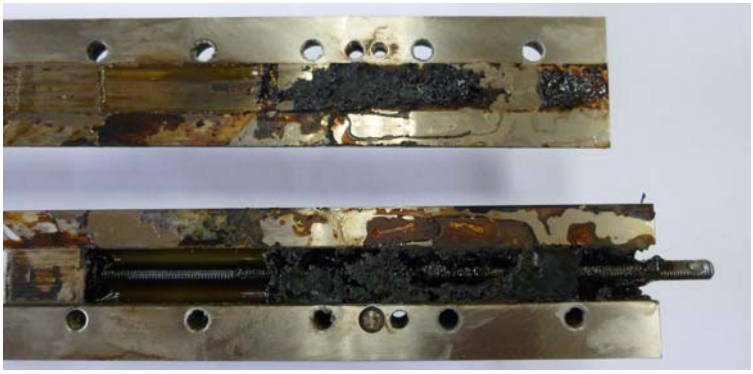
CAUTION: Always consult the material safety data sheet (MSDS) issued by the respective manufacturer. Nordson MSDS can be found at http://emanuals.nordson.com/MSDS/default.htm

Manufacturer / designation		**Use**
Elkalub GLS 595/N2	Please purchase from the processing material manufacturer	High temperature grease to be applied to O-rings and threads and to cover the nozzle slot during breaks in production **NOTE:** The grease should not be mixed with other lubricants. Oily/greasy parts must be cleaned before application.
Henkel Loctite® 620	Please purchase from the processing material manufacturer	Refer to page 81 High-strength retaining compound
Nordson CLEANER C NF 4 spray bottles, 0.5 l each	Order number P/N 7334104	Cleaning agent for external cleaning
Nordson CLEANER C ODORLESS 4 spray bottles, 0.5 l each	Order number P/N 7334088	NEW! Cleaning agent for external cleaning
Aluminum tape (50 m) Aluminum tape (80 m) Length 20 m	P/N 7053121 P/N 7053122	To tape the nozzle closed during production breaks when processing PUR **CAUTION:** The adhesive tape is not compatible with every PUR adhesive. Test it first.

Regular Maintenance

Unit part	Activity	Interval	Refer to
Entire applicator Power cable Air hoses	Visual inspection for external damage	Daily	Page 61
Entire applicator	External cleaning	Daily	Page 61
	Purge with cleaning agent	When adhesive is changed or before extended production standstill (4 days or longer)	Page 63
	Empty drip tray/pan	As needed	-
Control panel	Clean	When dirty	Page 62
Coupling bushing	Check the clamping screw (2, Fig. 33) and the setscrew (1); tighten if necessary	Weekly	-
Control modules	Check detection holes for leakage	Daily	Page 65
	Replace	When leakage or a functional fault occurs	Page 65
Filter cartridge	Clean filter cartridge and replace filter screen	When the adhesive pressure exceeds 50 bar. Depending on the degree of adhesive pollution, the filter cartridges may need to be replaced every 200 hours of operation.	Page 67
Pressure sensor (if present)	Check performance	Dependent on purpose and conditions of use of pressure sensor	Separate manual
	Calibrate Zero point calibration via IPC/PLC, if the software offers this feature; otherwise with the aid of the magnetic pin	Every year; more often if conditions of use require	
	Check separating membrane for damage	Every time the pressure sensor is removed, more often if necessary	
	Check if hardened or charred material is stuck to the membrane; clean if necessary		

Continued ...

Melter part	Activity	Interval	Refer to
Nozzle **CAUTION:** To avoid expensive total failure of the nozzle - refer to illustration - always follow the purging instructions!			
	Disassemble and clean	At the latest when the application pattern deteriorates When the torque limit of the motor stops width adjustment. When width adjustment requires force when using the handwheel.	Page 73
	Purge with adhesive **CAUTION:** Never exceed the maximum applicator pressure permitted (Refer to page 112 *Technical Data*), whether purging with adhesive or with cleaning agent.	Note when using PUR: Once daily for approx. 1 min and when production pauses for >1 h. More often if necessary with small product quantities.	Page 62 Page 63
	Replace	When damaged	Beginning on page 70
Spindle inlet in nozzle/piston	Inspect for leakage* **NOTE:** Some adhesive always escapes due to the design and operation	Monthly	-
Spindle	Increase pretension of spindle nuts with additional shim rings or replace the spindle nuts and adjust the pretension	When leaking* When noticeably slack	Page 81 or Page 80 and Page 81
Piston	Replace the slide assembly seals or install a new slide assembly and adjust the spindle nut pretension	When leaking*	Page 78, 81
* Refer to *Definition of Leakage* in the following text			

Definition of Leakage

If during production one drop forms on the surface nozzle near the spindle/piston and drips off every hour - without the application width having been adjusted - leakage must be remedied. This quantity of adhesive is collected in the drip tray (standard for PFW) and does not impact the application.

The following note applies to all applicators except for TC-FS-PUR.

NOTE: Some adhesive will flow out of the adhesive bores behind the switched off control modules, behind the pistons into the distribution canal. This adhesive is forced out when the applicator is opened to the maximum application width or to the maintenance position. This is a normal process during widening and is not leakage that has to be remedied.

Visual Inspection for External Damage

CAUTION: When damaged parts pose a risk to the operational safety of the applicator and/or safety of personnel, switch off the applicator or application system and have the damaged parts replaced by qualified personnel. Use only original Nordson spare parts.

External Cleaning

External cleaning prevents impurities created during production from causing the unit to malfunction.

CAUTION: Do not use hard tools to clean the hardened nozzle. Do not use steel wire brushes! This could cause scratches that are detrimental to adhesive application. Nordson recommends using wooden spatulas, brass brushes or brass spatulas. Before using near the nozzle slot, try out the tool in a less critical place.

Always follow the manufacturer's instructions when using cleaning agents!

1. Electrically heat the cold applicator until the material is liquid.
2. Thoroughly remove the warm material with a cleaning agent and/or a soft, lint-free cloth.
3. Remove dust, fluffs, etc. with a vacuum cleaner or a soft, lint-free cloth.

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

Cleaning Drip Tray

The drip tray is release-coated. Do not use metallic tools to clean. This could irreparably damage the release coating. Use only wooden or plastic spatulas and brushes (no wire brushes).

Cleaning Control Panel

CAUTION: De-energize the control box. This ensures that no functions are unintentionally triggered.

- Do not use any sharp objects (e.g. knife) to clean
- Do not use aggressive or abrasive cleaning agents or solvents
- Prevent liquids from penetrating the operating unit.
- Clean the control panel regularly with a soft, damp cloth. Use caution to ensure that the surface is not scratched or scoured, particularly when removing hard residue and abrasive dust.

Changing Type of Material

NOTE: Before changing the type of material, determine whether the old and new material may be mixed.

- May be mixed: Remaining old material can be flushed out using the new material.
- May not be mixed: Thoroughly purge the melter with a cleaning agent recommended by the material supplier.

NOTE: Properly dispose of the material and cleaning agent according to local regulations.

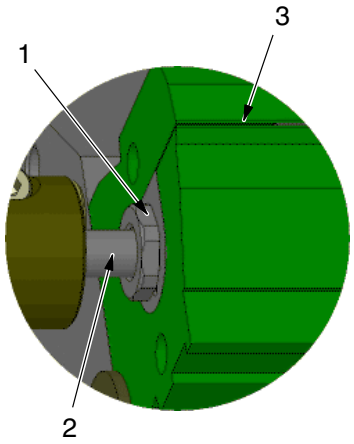
Purging with Adhesive

NOTE: Depending on the adhesive used and specifically for PUR: once per shift for approx. 1 min and when production pauses for >1h. More often if necessary with small product quantities.

CAUTION: When purging, comply with the maximum applicator pressure permitted (Refer to page 112 *Technical Data*).

Continued ...

Purging



As the nozzle opens and closes, adhesive charring is prevented around the surface nozzle, and the nozzle slot and spindle are cleaned.

1. With the pump switched off, go to the minimum application width.
2. With the pump switched off, go to the maximum application width (maintenance position).
3. When applicators have a centered zero point, use a brass brush to clean the screw (1), spindle (2) and nozzle slot (3) on both sides of the surface nozzle; When applicators have the zero point on the left or right, clean the side opposite the zero point.

   As a factor of how frequently the width was adjusted and of the design of the equipment, adhesive may be forced out when moving to the maximum maintenance position; this is not considered leakage. If the escaping adhesive increases over the lifetime of the applicator, adjust the spindle nut pretension and/or replace the slide assembly seals.
4. Purge at the maximum application width (with grammage control: set *Purge speed factor*) until the adhesive flows out free of bubbles and clots. Switch the pump off again.
5. With the pump off, reduce to the production application width.
6. Externally clean the nozzle.

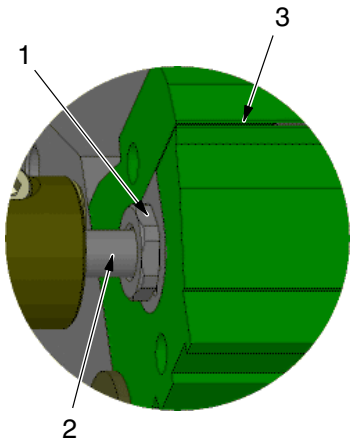
Purging with Cleaning Agent

When the type of adhesive is changed or depending on the adhesive properties and specifically for PUR: purge with cleaning agent before extended breaks in production (four days or longer).

CAUTION: Use only a cleaning agent recommended by the hot melt material manufacturer. Observe the Material Safety Data Sheet for the cleaning agent.

CAUTION: When purging, comply with the maximum applicator pressure permitted (Refer to page 112 *Technical Data*).

1. Maintain operating temperature.
2. *Relieve adhesive pressure*.
3. Detach the heated hose from the applicator to prevent impurities from the melter and hose from being forced into the applicator during purging.



4. Purge melter and heated hose.
5. Screw the heated hose onto the applicator again and purge the applicator:

   As the nozzle opens and closes, adhesive charring is prevented around the surface nozzle, and the nozzle slot and spindle are cleaned.

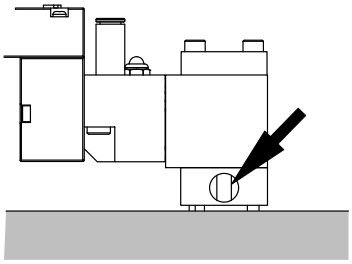
   a. With the pump switched off, go to the minimum application width.
   b. With the pump switched off, go to the maximum application width (maintenance position).
   c. When applicators have a centered zero point, use a brass brush to clean the screw (1), spindle (2) and nozzle slot (3) on both sides of the surface nozzle; When applicators have the zero point on the left or right, clean the side opposite the zero point.
   d. Purge at the maximum application width (with grammage control: set *Purge speed factor*) until the adhesive flows out free of bubbles and clots. Switch the pump off again.

If the adhesive supplier does not recommend otherwise and especially when PUR adhesives are used, do not continue until right before the next production:

6. With the pump off, reduce to the production application width.
7. Purge the system (melter, hose, applicator) with the material currently in use to flush out the cleaning agent; continue until the adhesive flows out free of bubbles and clots.
8. Switch off the pump and clean the outside of the nozzles.
9. Properly dispose of the cleaning agent according to local regulations.

NOTE: Because of the penetration properties of the cleaning agent, leakage can occur during purging. This is not necessarily a sign of insufficient pretension of the spindle nuts.

Inspecting Control Module



If material escapes from the detection hole (arrow), the internal O-rings have worn and the control module must be replaced.

The assembly tool P/N 7103611 is needed to replace the seals.

Replacing Control Module

ATTENTION: Hot! Risk of burns. Wear safety goggles and heat-protective gloves.

CAUTION: The control module is a high precision, valuable part. Handle very carefully!

Removing Control Module

1. *Relieve adhesive pressure*.
2. Stop compressed air supply.
3. Release the air connection and electrical connection.
4. Release screws (M4).
5. Use a suitable tool, e.g. a screwdriver, to detach the control module from the air bar (instant plug connection) (1, Fig. 27).

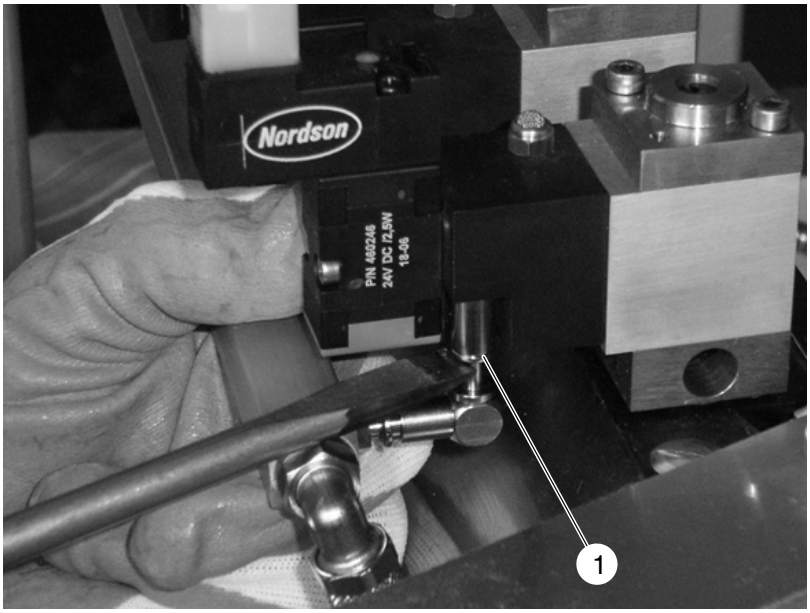


Fig. 27 Example with air manifold bar

6. Extract the control module from the warm applicator.

Installing Control Module

NOTE: Required tool: Torque wrench.

1. Apply high temperature grease (arrow, Figure 28):

- To the O-rings
- To the screw threads
- Under the screw heads.

2. Insert the new control module. Do not tilt! The control module is positioned properly when there is an even gap of approx. 2 mm between the square part of the control module with the detection holes and the applicator body (gray).

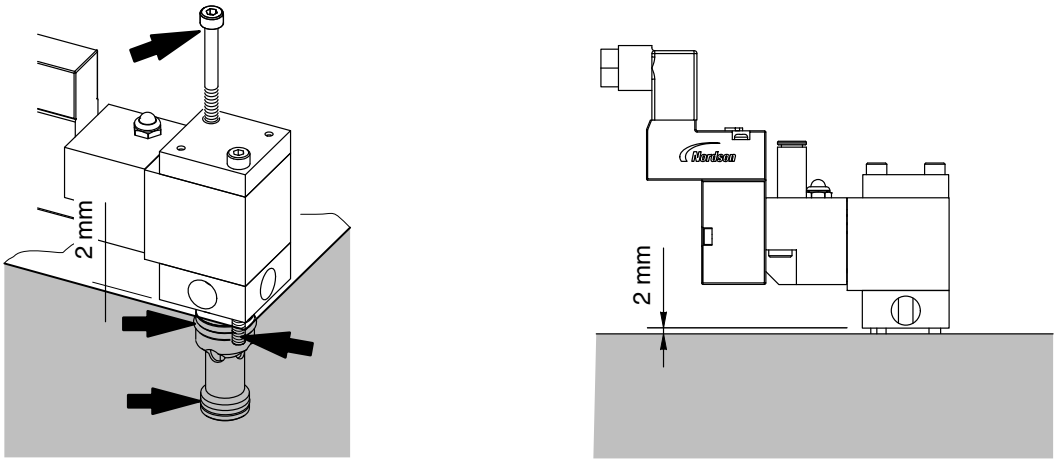


Fig. 28

3. Screw in the screws by hand. Do not tighten yet.
4. Alternately tighten the screws with a torque wrench, in three steps of 0.9 Nm, until the maximum value of 2.7 Nm is reached.
5. Re-connect air and electrical connections.

NOTE: Observe the voltage stated on the ID plate of the solenoid valve.

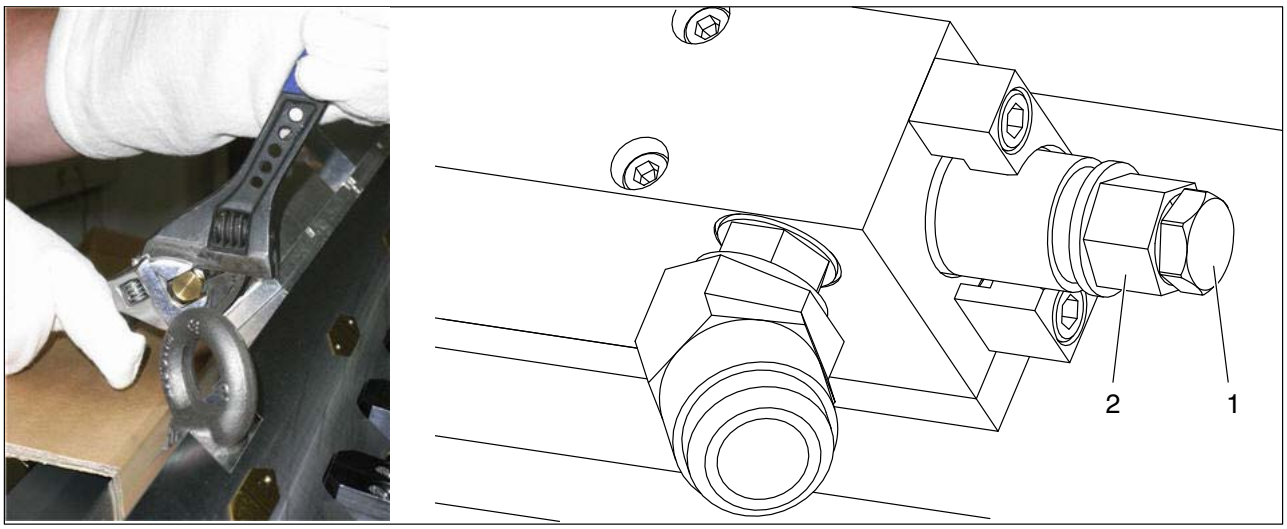
Cleaning Filter Cartridge

NOTE: Remove the filter cartridge only when the applicator is hot and not pressurized. Install only when the applicator is hot.

Removing Filter Cartridge

1. *Relieve adhesive pressure*.

   NOTE: Use a second open-end wrench when screwing in and out the pressure relief screw (1). This prevents the filter cartridge (2) from turning.



2. Screw the pressure relief screw out of the filter cartridge until adhesive flows out (Refer to illustration "closed" / "open").

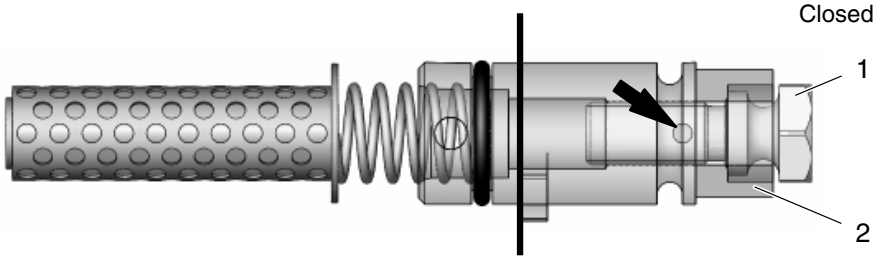


Fig. 29

   Adhesive escapes before the hole (arrow) in the pressure relief screw (1) is visible outside of the filter cartridge (2):

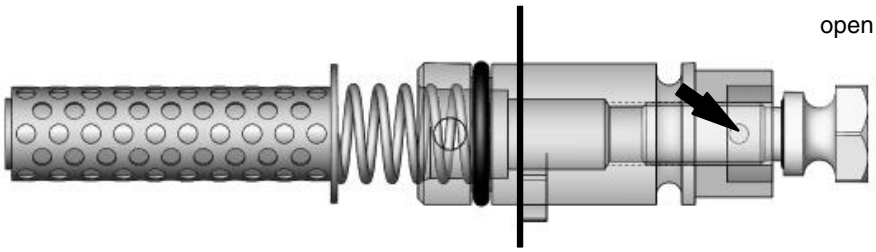


Fig. 30

3. Simultaneously press the filter cartridge in and screw counterclockwise (bayonet fastener); then extract it. Use an open-end or ring wrench (size 17) if needed.

   NOTE: If the filter cartridge is stuck in the filter bore, grasp the filter cartridge with a pliers and extract.

4. Purge the filter bore by allowing the pump to run briefly with adhesive. This rinses out particles of dirt that may still be in the filter bore.

5. Properly dispose of adhesive according to local regulations.

Replacing Filter Screen

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

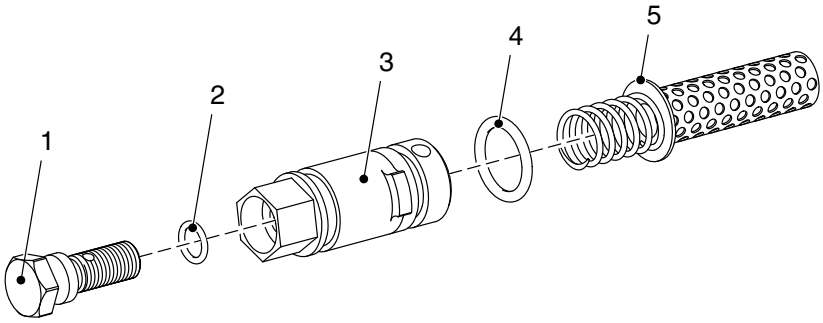


Fig. 31

1 Pressure relief screw
2 O-ring
3 Filter screw
4 O-ring
5 Filter screen with spring

1. Heat the filter cartridge until adhesive is liquid.

2. Turn the unit consisting of pressure relief screw, filter screen and spring counterclockwise out of the filter screw, then replace.

Installing Filter Cartridge

1. Heat the applicator until the adhesive is liquid.
2. Apply high temperature grease to the O-ring (4, Fig. 31).
3. Slide the filter cartridge into the filter bore.

   NOTE: Air penetrates the filter bore when the filter cartridge is replaced. The applicator is deaerated with the aid of the pressure relief screw.
4. Unscrew the pressure relief screw somewhat.
5. Allow the pump to run briefly until adhesive flows out. This forces out air.
6. Screw in the pressure relief screw clockwise all the way when the adhesive flows out free of bubbles (bayonet fastener).

If the filter block (4, Fig. 32) has been removed, the O-ring (5) must always be replaced.

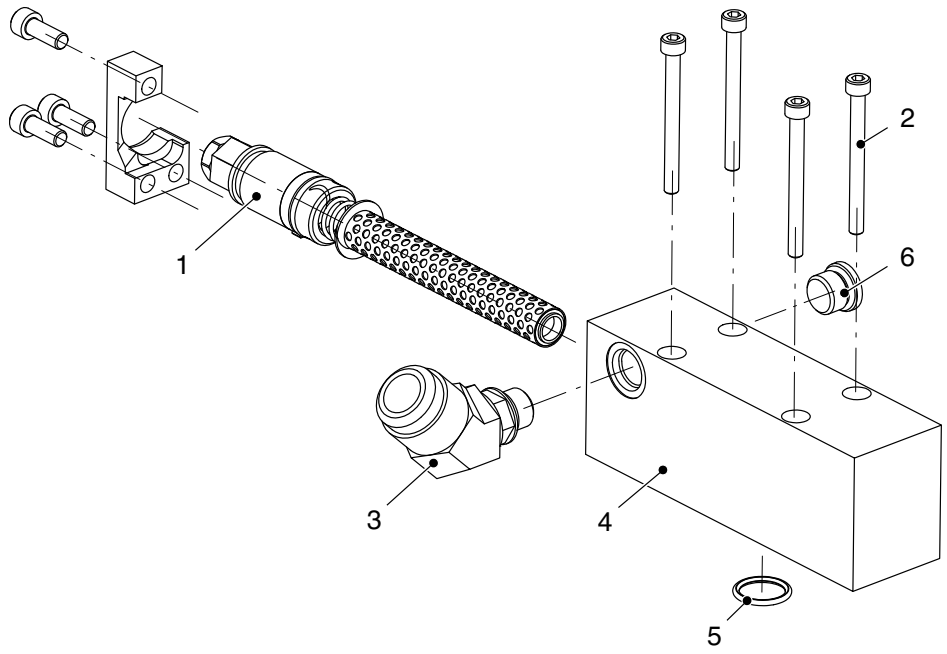
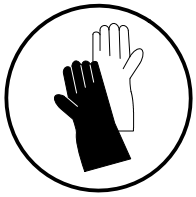


Fig. 32

1 Filter cartridge	3 Hose connection	5 O-ring
2 Cylinder screw	4 Filter block	6 Plug

Removing Nozzle

NOTE: Increase the application width all the way before removing the nozzle.



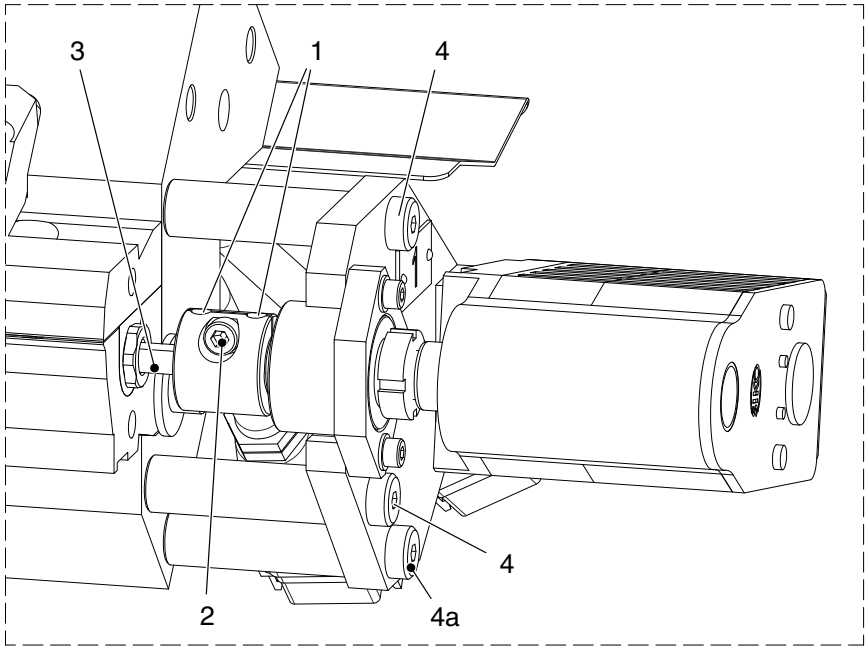
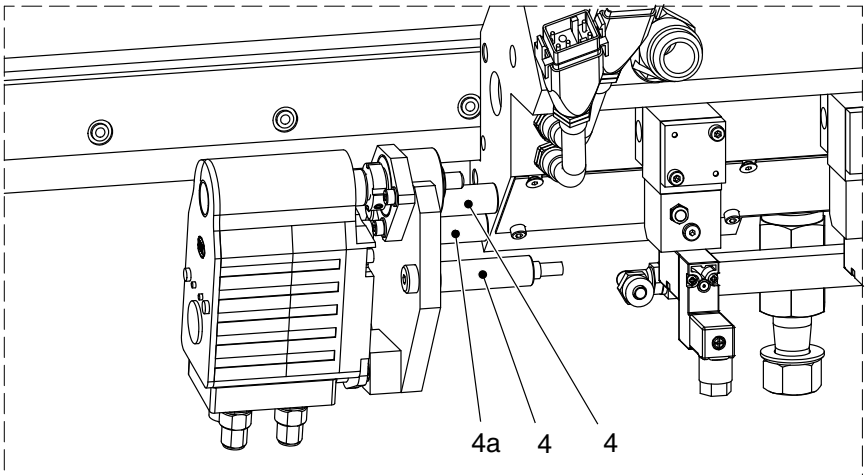


Fig. 33

PFW

1. Swivel out the web guide.
2. *Relieve adhesive pressure*.
3. Release the clamping screw (2, Fig. 33) and the setscrew (1) from the coupling bushing.
4. Slide the coupling bushing towards the nozzle until the end of the spindle is free (3).
5. On models with centered zero point: Repeat the steps on the other side.
6. On the side to which the nozzle is to be extracted, remove the aligning pins (4, Fig. 34) and release the lower aligning pin (4a). Swivel the motor with the side plate around the lower aligning pin (4a).



Motor swiveled out

Fig. 34

EVA, RET, PUR

7. Application width 700 and greater: On the side to which the nozzle is to be extracted, remove the screw (5, Fig. 35). The nozzle is positioned longitudinally using the screw and the washer.

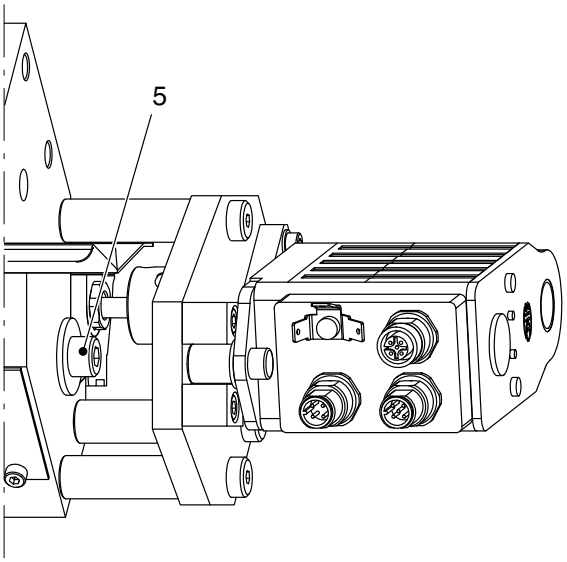
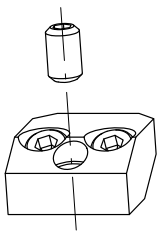


Fig. 35



8. Release the setscrews (4, Fig. 36) from all of the clamps.

Continued ...

PFW Until 700: The screw/washer (5, Fig. 35) used to position a large nozzle longitudinally is omitted. Instead, the nozzle is centered with the aid of a groove in which the tip of a setscrew takes hold (4b).

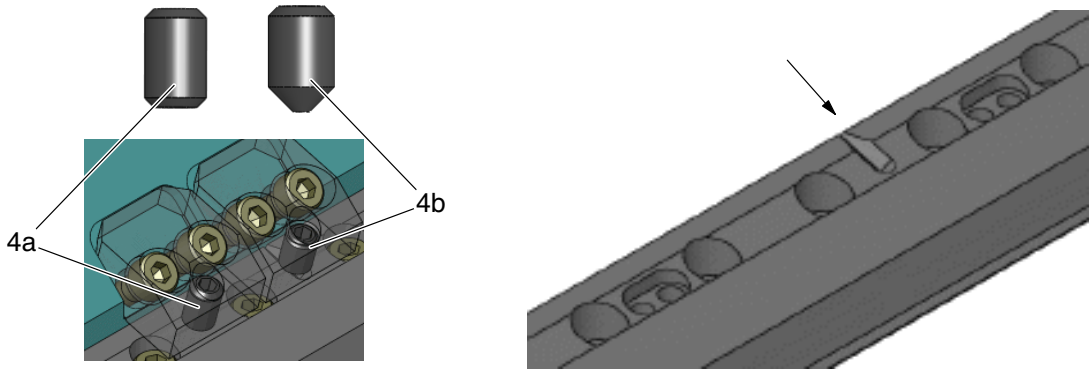


Fig. 36

9. Have a suitable surface ready: The nozzle is hot and adhesive can drip.
10. Pull out the entire nozzle assembly (2, Fig. 37) with two people when the applicators are large. Check that all of the sealing rings* (3) have come out with the nozzle and none are left in the body.

    * Shape and quantity dependent on applicator.

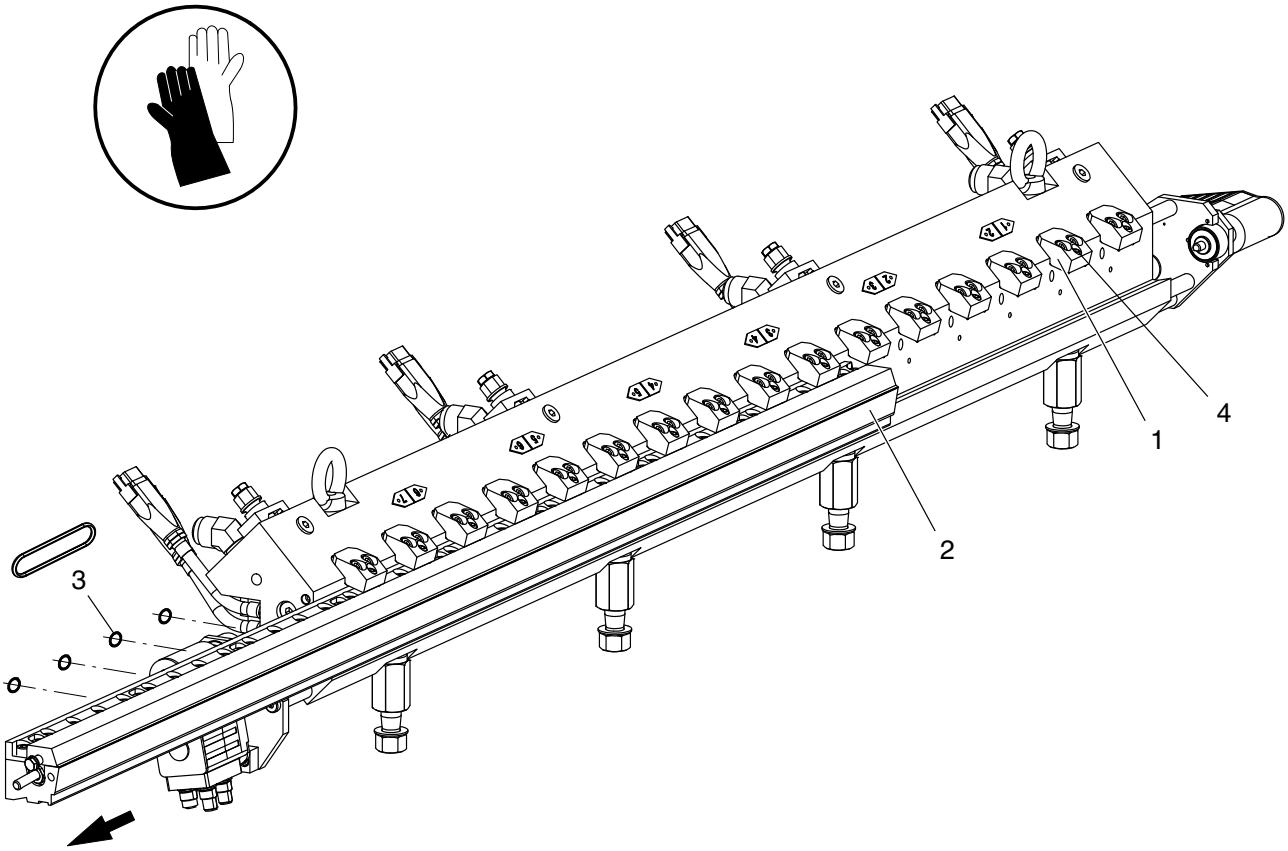


Fig. 37

Disassembling and Cleaning Nozzle

Nordson recommends having the nozzle disassembled and cleaned by Nordson if there are no properly trained persons on site or if pollution is excessive. Otherwise the nozzle could be damaged beyond repair or begin leaking.

In general:

- Wipe off the adhesive with a soft, lint-free cloth
- Heat adhesive residue with a hot air fan
- Clean the spindle thread and the inside edges of the slide assembly piston with a brass brush
- Use wooden or brass spatulas Before using near the nozzle slot, try out the tool in a less critical place.

Wooden spatulas that can be used to clean the nozzle are available in retail outlets; a set of spatulas (6 spatulas) can also be purchased from Nordson, P/N 7162022 (Fig. 38, left).

Wooden tongue depressors can e.g. be cut to the desired width (Fig. 38, right).

Fig. 38

Preparing Work Space

CAUTION: The assembly area has to be clean. Ensure that there are no pollutants such as chips on the worktop near the surface nozzle. Do not store the high temperature grease needed for later assembly in open containers. This could allow pollutants to contaminate the grease.

Then pollutants could get into area around the piston and the sliding plate, which would cause the applicator to leak.

PFW: Centered Zero Point

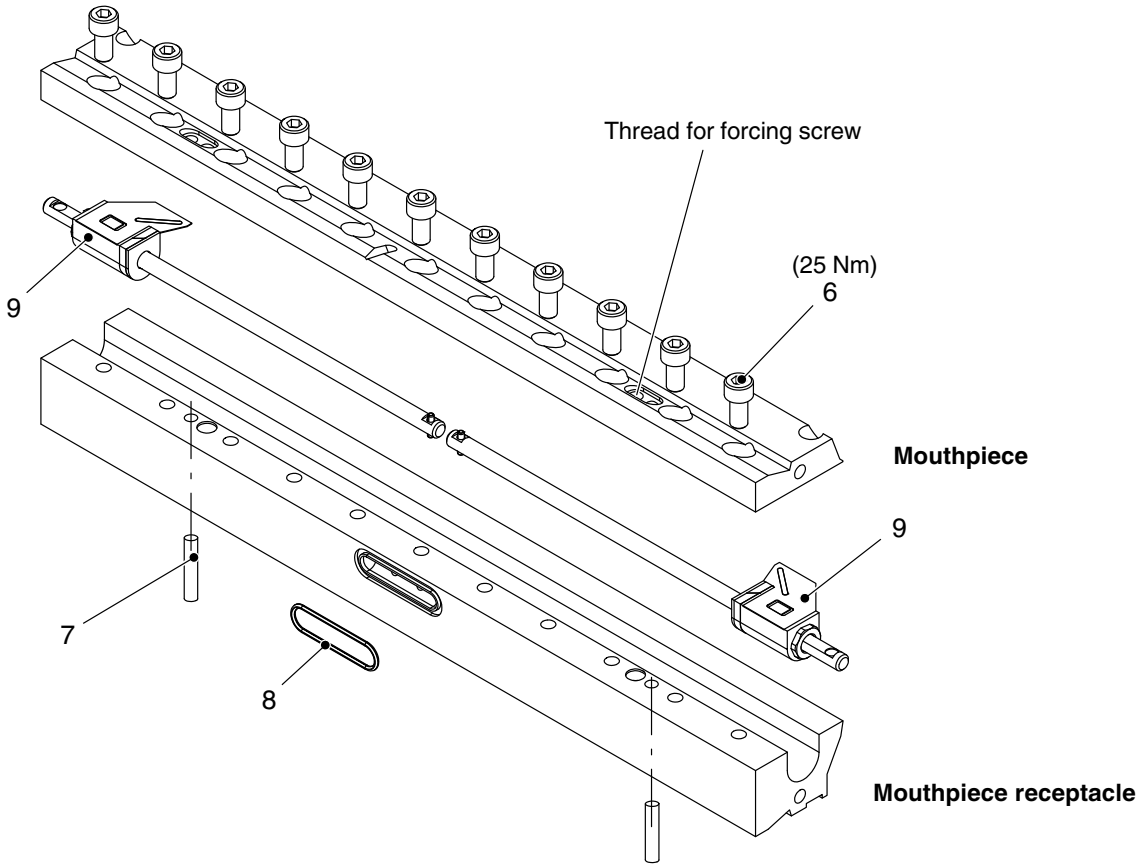


Fig. 39

1. Knock the aligning pins (7) out the bottom.
2. Loosen the screws (6) and remove the mouthpiece.

   If the mouthpiece cannot be detached, insert the screws M8x30 in the thread adjacent to the aligning pins and use them to pry the mouthpiece out of the mouthpiece receptacle. Alternately turn the screws only 1/4 of a revolution so as not to jam them when separating the parts.

3. Clean detached parts.

Observe when assembling:

1. Replace the sealing ring (8, Fig. 39) and the seals on the two slide assemblies (Fig. 43).

   Apply high temperature grease to the threads and seals. This makes disassembly easier.

2. Carefully put the mouthpiece into place. Tighten the screws (6, Fig. 39) near the piston somewhat tighter to prevent the slide from shifting; tighten all other screws only loosely at first.
3. Knock in the alignment pins.
4. Tighten screws (6). Torque: 25 Nm

Zero Point on Left or Right

This side is plugged when the zero point on the applicator is on the left or right. The bore (1) can be used for prying out; the groove (2) is for the anti-twist device.

NOTE: Screw (3) only on the plug side.

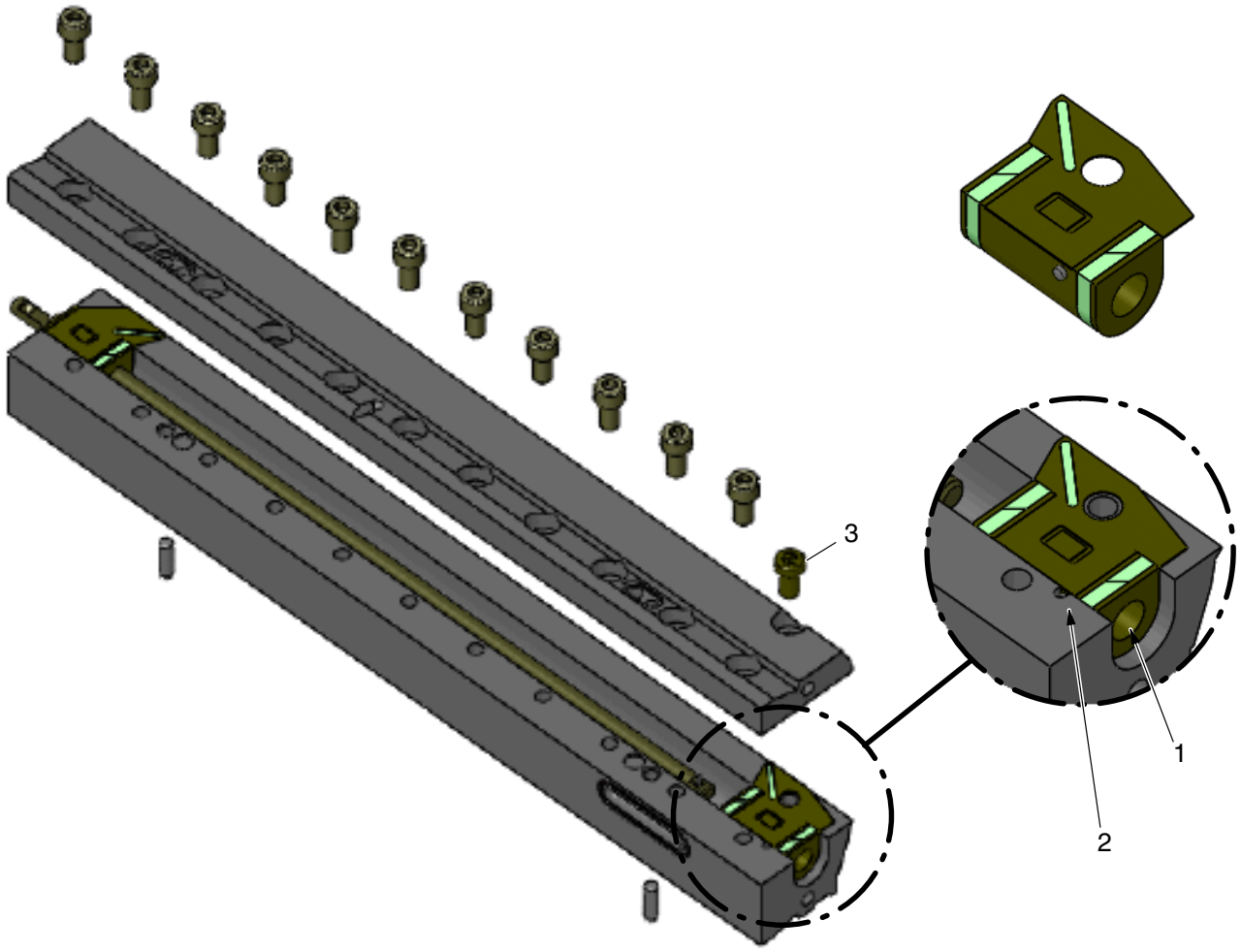


Fig. 40 Example PFW

EVA, RET, PUR: Centered Zero Point

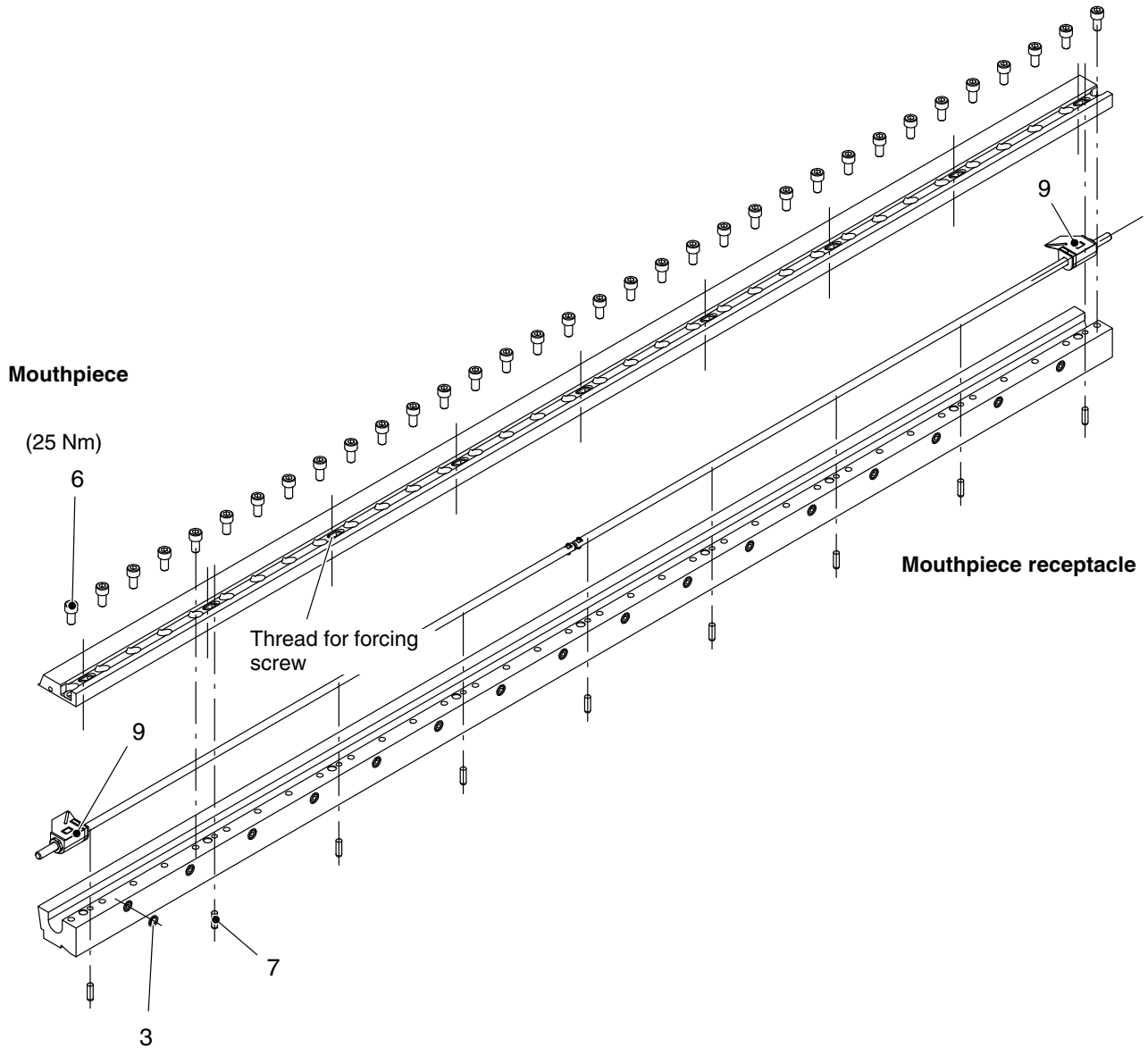


Fig. 41

1. Knock the aligning pins (7) out the bottom.
2. Loosen the screws (6) and remove the mouthpiece.

   If the mouthpiece cannot be detached, insert the screws M8x30 in the thread adjacent to the aligning pins and use them to pry the mouthpiece out of the mouthpiece receptacle. Alternately turn the screws only 1/4 of a revolution so as not to jam them when separating the parts.

3. Clean detached parts.

Observe when assembling:

1. Replace damaged sealing rings (3, Fig. 41) and seals on the two slide assemblies (Fig. 43).

   Apply high temperature grease to the threads and seals. This makes disassembly easier.

2. Carefully put the mouthpiece into place. Tighten the screws (6, Fig. 41) near the piston somewhat tighter to prevent the slide from shifting; tighten all other screws only loosely at first.
3. Knock in the alignment pins.
4. Tighten screws (6). Torque: 25 Nm

Cleaning Mouthpiece and Mouthpiece Receptacle

CAUTION: Do not use hard tools to clean the hardened nozzle. Do not use wire brushes! This could cause scratches that are detrimental to adhesive application. Nordson recommends using a wooden or brass spatula. Before using near the nozzle slot, try out the tool in a less critical place.

Cleaning Spindle and Slide Assembly

1. Wipe off the adhesive with a soft, lint-free cloth.
2. Remove the slide assembly seals for further cleaning to avoid damaging them. Check if they need to be replaced. Refer to page 78, *Replacing Slide Assembly Seals.*
3. Heat adhesive residue with a hot air fan.
4. Clean the spindle thread and the inside edges of the slide assembly piston with a brass brush.

   NOTE: To ensure that the sliding plate lines up properly, the inside edges (arrow, Fig. 42) have to be clean.

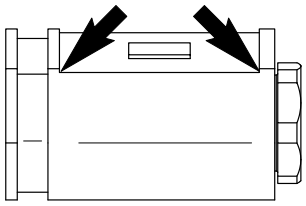


Fig. 42 Piston shown without seal and sliding plate

Replacing Slide Assembly Seals

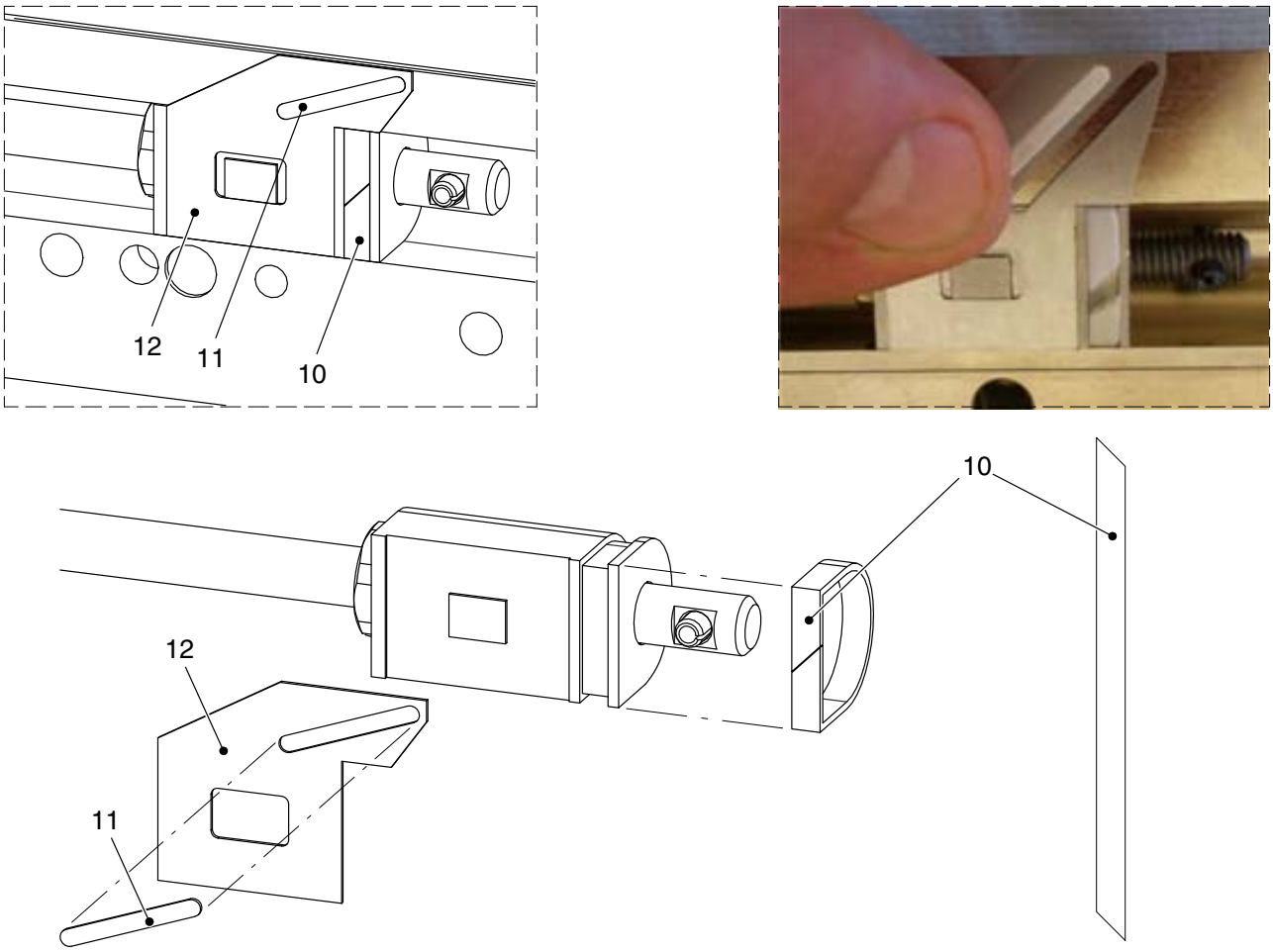
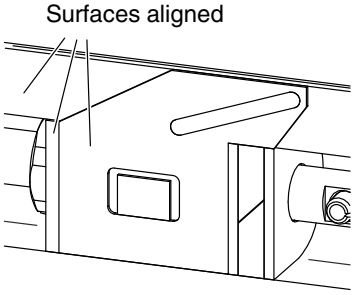
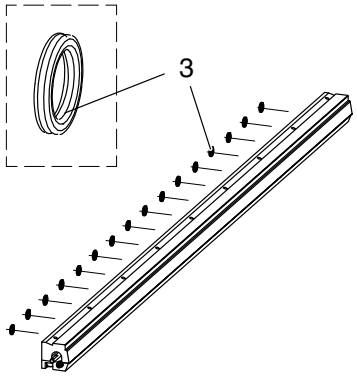


Fig. 43

1. Lift the slide assembly and the spindle out of the mouthpiece. Remove the old seals (10 + 11, Fig. 43).
2. Place the new seal (10) in the groove and wrap it around the piston such that the diagonal ends of the seal meet on the straight side of the piston.
3. Place the assembly in the mouthpiece again. Press the seals tightly into place.
4. Place the sliding plate on the piston.
5. Insert the seal (11) in the sliding plate and press firmly into place.
6. Before continuing assembly, ensure that
   - The seals (10 + 11) are pressed completely into their grooves
   - The sliding plate is aligned properly during assembly; otherwise the nozzle will be damaged.

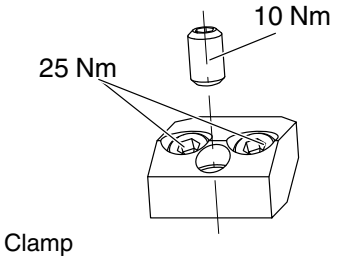


Installing Nozzle



- When re-installing the old nozzle:
  Replace damaged sealing rings (3).
- When installing a new nozzle:
  Before installing, turn both slide assemblies all the way to the edge of the nozzle.
  After assembly; *Aligning Motor Shaft to Spindle*.

Observe when Installing

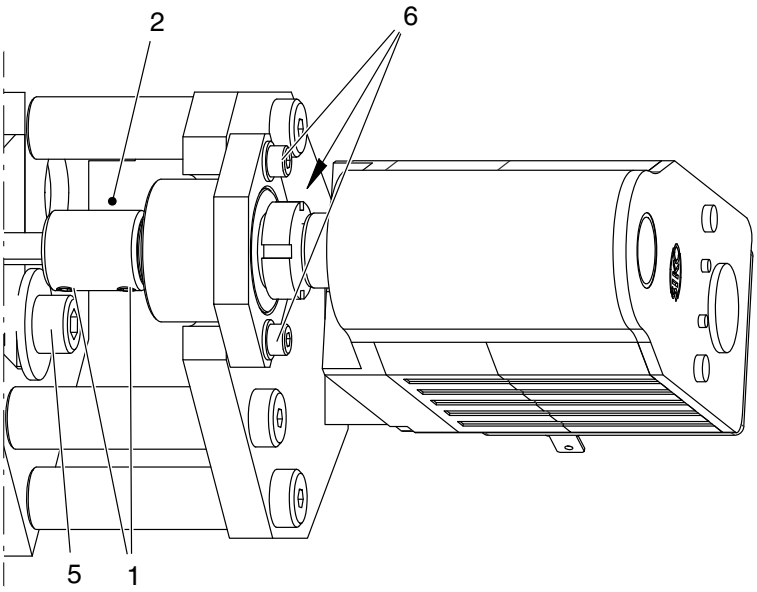


Clamp

- When inserting the nozzle, check that the sealing rings fit properly.
- The nozzle should be flush with the body.
- **PFW:** First tighten the pointed setscrew (centering aid) to align the nozzle, then tighten the other screws.
- Torque for clamp setscrews: 10 Nm
- Also tighten the two clamp fastening screws with 25 Nm.
- **EVA, RET, PUR:** Put the washer/screw (5, Fig. 36) back into place.
- Torque for coupling setscrews: 5 Nm

Aligning Motor Shaft to Spindle

Prerequisite: Both slide assemblies are turned all the way to the edge of the nozzle.



1. Loosen the three bearing screws (6) but do not remove them.
2. Verify that all of the sealing rings (3, Fig. 37) are seated properly and insert the nozzle. Put the washer/screw (5) back into place.
3. Slide the coupling bushing over the shaft and spindle and tighten the setscrews (1) with 5 Nm. The bearing then automatically adjusts itself.
4. Tighten the coupling bushing clamping screw (2) and the three bearing screws (6) again.
5. After assembly, go to *Calibrating Slide Positions* (Refer to section *Repair*). Otherwise the application section will not correspond to the set values.

Replacing Spindle Nut

When the spindle nut is replaced, ensure that the cylinder pin is inserted again to prevent twisting.

After assembly, refer to *Adjusting Spindle Nut Pretension* (page 81).

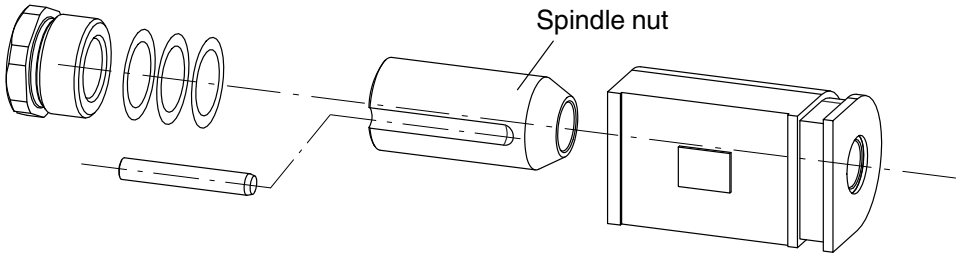


Fig. 44

Adjusting Spindle Nut Pretension

Correct pretension ensures hydraulic sealing on the spindle, similar to a gland. It has to be adjusted when the slide assembly or the spindle nut is replaced.

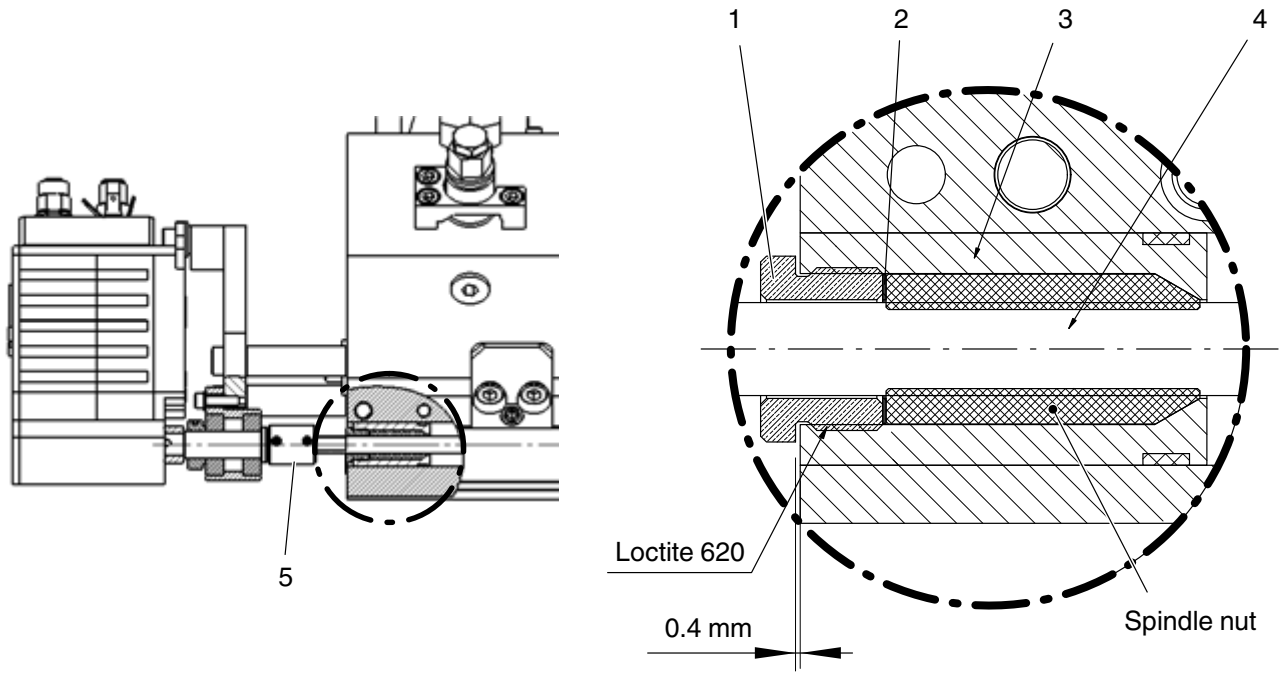
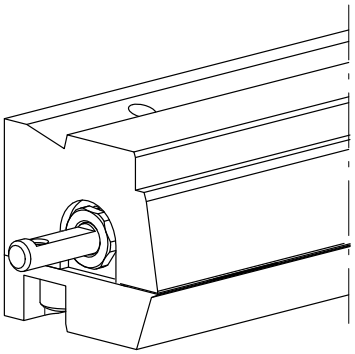


Fig. 45 Initial setting at the plant or after parts are replaced



1. *Remove the nozzle*.

   NOTE: The nozzle does not have to be disassembled.

2. Detach the coupling bushing (5, Fig. 45) from the nozzle assembly and remove the screw (1) with the aid of a long hexagon nut, size 15 (wrench size 15).
3. Set the gap to 0.4 mm by inserting 0.1 mm shim rings (2). Always tighten the screw (1) only hand-tight.
4. When the gap size has been achieved, extract the screw again and apply Loctite 620 to the screw thread.
5. Tighten the screw all the way.

   CAUTION: Tighten the screw (1) all the way only when the piston (3) is on the spindle (4).

Increasing Spindle Nut Pretension

If there is leakage or the spindle is slack, the pretension can be increased with additional shim rings (2, Fig. 45).

Troubleshooting

ATTENTION: Allow only qualified personnel to perform the following tasks. Follow the safety instructions here and in the entire documentation.

Introduction

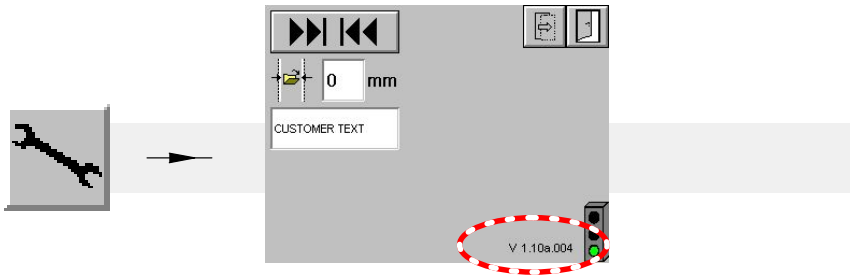
Troubleshooting tables are intended as an orientation for qualified personnel. They cannot, however, replace targeted troubleshooting with the aid of wiring diagrams and measuring instruments. They also do not include all possible problems, only those which most typically occur.

The following problems are not included in the troubleshooting tables:

- Faults in installation
- Faults in operation
- Defective cables
- Loose plug and/or screw connections.

Software Version

The software version may be relevant for troubleshooting or when calling the Nordson hotline. It is displayed on the control panel screen *Setup*.



Overvoltage Protection (Control Box Power Supply)

The power supply's overvoltage protection switches off the output voltage as soon as it reaches approx. 130 % of the nominal voltage. Remedy the cause of overvoltage and reset the power supply.

Reset

Switch off the control box for 3 minutes and then switch it on again.

Troubleshooting Table

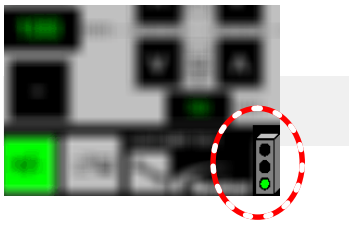
Problem	Possible cause	Corrective action	Refer to
No material	Melter tank is empty	Fill	
	Melter motor is not switched on	Switch on	
	Melter pump is not working	Check	Separate manual *Melter*
	Applicator has not yet reached operating temperature	Wait until temperature has been reached; check temperature setting if necessary	
	Applicator cold or not yet warm enough	Refer to *Applicator does not heat*	- -
	Compressed air not connected	Connect	Page 28
	Nozzle clogged	Disassemble and clean nozzle	Page 73
	Nozzle stem is stuck	Replace control module	Page 65
	Filter cartridge is clogged	Clean or replace filter screen if necessary	Page 67
	Solenoid valves do not switch	Control unit not switched on	- -
		If the plug is not connected or is loose, secure the connection with a screw	Page 23
Applicator does not heat	Temperature is not set	Set on the melter control panel	Separate manual *Melter*
	Plug not connected	Connect	Page 24
	Fuses in melter defective	Disconnect melter from line voltage, check fuses and replace if necessary	- -
	Heater cartridge(s) in applicator defective	Replace	- -
Applicator does not reach the set temperature	Heater cartridge(s) in applicator defective	Replace	- -
	Ambient temperature too low	Increase ambient temperature	- -

Continued ...

Problem	Possible cause	Corrective action	Refer to
Application pattern not exact	Production parameters not attuned to one another	Check/correct system temperatures and adhesive quantity/pressure	- -
	Applicator does not have even contact with the substrate	Check positioning, adjust if necessary	Page 19
	Control unit not programmed correctly	Correct programming	- -
	Nozzle partially blocked or damaged	Disassemble and clean nozzle	Page 73
	Pollution inside of nozzle	Clean	Page 73
	Nozzle damaged	Replace nozzle	- -
	Application quantity and substrate processing speed not attuned to one another	Check settings; change so as to be attuned to one another if necessary	- -
	Adhesive unsuitable	Ask manufacturer	Data sheet of material manufacturer
The *open time is too long**	Application temperature too high	Set temperature lower	Separate manual *Melter*
	Adhesive unsuitable	Ask manufacturer	Data sheet of material manufacturer
The *open time is too short**	Application temperature too low	Set temperature higher	Separate manual *Melter*
	Adhesive unsuitable	Ask manufacturer	Data sheet of material manufacturer
Slack in spindle drive (application width not displayed precisely) or leakage around spindle nut	Wear has caused the spindle nut pretension to decrease	Insert additional shim rings	Page 81
		Replace spindle nuts after two years	Page 80
Grammage option: No analog voltage for melter motor(s)	Product detection was ordered or added, but the Nordson photosensor was not connected	Connect photo sensor	- -
Leakage around pressure sensor	Brass washer missing	A pack of ten can be ordered as P/N 7157515	- -

* The *open time* is the time from when the adhesive leaves the nozzle until it hardens on the substrate.

Alarms



Touch the signal beacon to display the control panel screen *Alarms*.

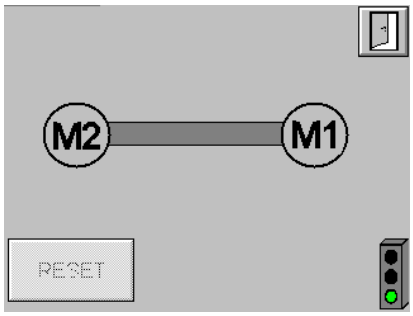


Fig. 46 *Alarms* screen: no warning, no fault

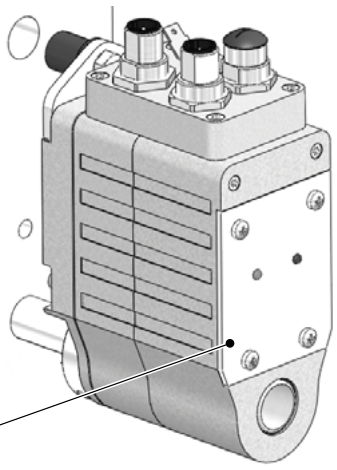
If a motor is affected, it is shown in color: Yellow for *Warning*, red for *Fault / shutdown*. The alarm is explained with a symbol. Example:

Fig. 47 Fault *Motor 1 is blocked*

Servomotor AG03 and Servomotor AG03/1

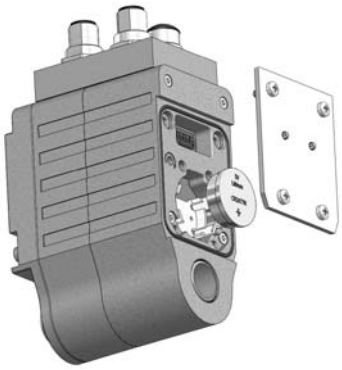
The model AG03 is not longer available. It has been replaced with the AG03/1:

Round cover (DIP switch)



Square cover (DIP switch and battery)

AG03 **AG03/1**



Replacing Battery in AG03/1

1. When the battery is replaced with the voltage supply connected, the position has to be re-calibrated upon completion. But then verify that the control option *Field bus* is deactivated. This prevents unintentional adjustment of the nozzle mouthpiece.
2. Release the screws in the cover but do not remove them.
3. Carefully remove the cover with the four screws such that the optical fibers do not break and the four rings in the body do not fall out.
4. Risk of short-circuit when tools are conducting. For this reason, extract the battery with your fingers.
5. Snap the new battery (CR2477N; 3 V lithium; 950 mAh) into the bracket.
6. Verify that the O-ring is completely submerged in the groove and then put the cover back into place. Tighten the screws uniformly until the lid lies flat.
7. If the voltage supply was not connected when the battery was replaced, proceed as described under *Calibrating Position*.

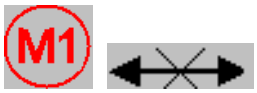
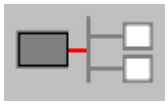
Warning

The ready state yes/no remains the same.

Symbol	Possible cause	Corrective action
	The battery voltage of the motor's absolute encoder is low	**AG03/1:** The battery lasts about five years and can be replaced by the customer. Refer to *Replacing Battery in AG03/1* **AG03:** The customer cannot replace the battery. The battery lasts approx. 10 years. Replace the motor as soon as possible (within six months). Refer to page 91, *Replacing Motor*
	Signal *Enable motors* not received	Wait until the setpoint temperature has been reached (the melter does not transmit the *Enable motors* signal until then). Check wiring
	For a certain task (e.g. *Replacing piston*), the piston was moved to a position that is outside of the limited application section. Refer to page 37, *Limiting Application Section*	Upon completion of the task, return to the application section

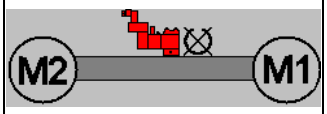
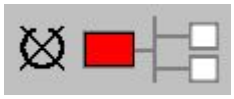
Fault

The applicator is no longer ready for operation. After remedying the cause of the fault, press *RESET*

Symbol	Possible cause	Corrective action
	Motor electronic control component fault	The fault is more clearly indicated by LEDs on the motor. Refer to page 89, *Status LED on Motor*
	Motor is blocked	Find the cause and remedy: • Is the piston blocked by charred material in the nozzle? Clean nozzle
	Field bus communication disrupted: • Transmission data block faulty • Field bus cable defective or not connected to the customer's control system • Field bus terminating resistor missing or defective • Communication disrupted (e.g. customer's control system not switched on) • Network not set up correctly • Sudden resets or crashes, e.g. caused by electromagnetic interference	Find the cause and remedy. Refer to separate manual *Field Bus on Nordson Applicators*. **NOTE:** This fault cannot be reset; it goes away as soon as field bus communication has been restored.

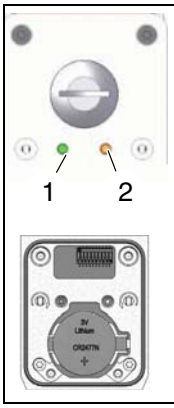
Shutdown

The applicator is no longer ready for operation. After remedying the cause of the fault, touch *RESET* - the operating unit boots.

Symbol	Possible cause	Corrective action
	Motor not connected to CAN bus	Check the CAN bus plug on the affected motor. Refer to page 22, *CAN Bus: Securing Plug Connections* Check CAN bus terminating resistors. Refer to page 103, *CAN Bus Terminating Resistor*
	Motor not connected to voltage supply	Measure to determine cause
	Motor defective	
	Motor CAN address set incorrectly	Refer to page 91, *Observe when Assembling*
	Solenoid valve control failed	XI/ON station failed Failure of CAN bus communication to XI/ON station **NOTE:** Enable cable missing or loose (XS25 on control box or customer's control system), triggers the indication *Solenoid valves not enabled*.
	Field bus gateway: • No power supply • Sudden resets or crashes, e.g. caused by electromagnetic interference • CAN address set incorrectly	Find the cause and remedy. Also refer to the control box wiring diagram and to the separate manual *Field Bus on Nordson Applicators*
	CAN bus terminating resistor missing or defective	Refer to page 103, *CAN Bus Terminating Resistor*
	CAN BUS cable defective or not connected	Refer to page 25, *Connecting Applicator, Control Box and Operating Unit*

Motor

The motors contain the required electronic control components. LEDs indicate various states:



LED	State	Meaning
Status **(1, green)**	flashing	Motor malfunction (Refer to *Status LED on Motor*)
	ON	Signal *Enable motors* received
	OFF	No signal *Enable motors* or voltage supply
Bus **(2, orange)**	ON	Normal state
	flashing	*Boot* process. Of it continues to flash; Refer to page 85, *Alarms*.

Status LED on Motor

The green status LED (1) indicates the fault by the number of times that it flashes:

Flashing	Fault	Corrective action
1 x	Supply voltage too low	Measure to determine cause
2 x	Blocked spindle	Find the cause and remedy: • Is the piston blocked by charred material in the nozzle? Clean nozzle • Is the ambient temperature of the motor elevated, e.g. by hot air flow or heat build-up?
3 x	Motor current too high	
4 x	Output temperature too high	
5 x	Reserved	-
6 x		
7 x		
8 x	CAN bus fault at motor	Refer to page 85, *Alarms*
9 x		

Optional Field Bus Gateway

Gateways installed beginning in November 2014 offer additional troubleshooting help with their LEDs. Refer to separate manual *Field Bus on Nordson Applicators*.

Repair

ATTENTION: Allow only qualified personnel to perform the following tasks. Follow the safety instructions here and in the entire documentation.

CAUTION: Verify that the control option *Field bus* is deactivated. This prevents unintentional adjustment of the piston. Refer to page 38, *Selecting Control Options (with Field Bus Option).*

A handwheel is included in the delivery. It can be used for manual adjustment in the event of an emergency (e.g. motor defective).

Manual Adjustment with Handwheel in Case of Emergency

Removing Motor

When the cables or terminating resistor are detached, the control unit shuts down.

NOTE: The motor does not have to be swiveled out.

1. Detach the cable and terminating resistor (if present) from the connections on the motor.
2. Extract the screw (1).
3. Pull the motor forwards and out (arrow).

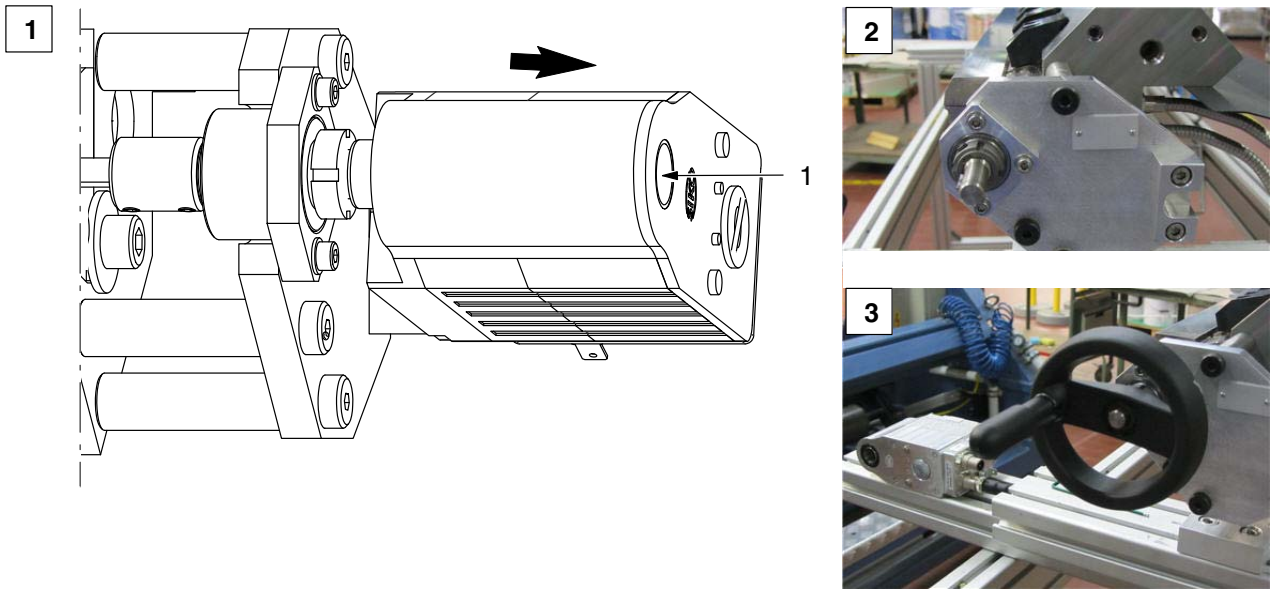


Fig. 48

4. Slide the handwheel onto the shaft.

CAUTION: Adjust the handwheel gently when the applicator is heated.

Replacing Motor

NOTE: The motor does not have to be swiveled out.

1. Detach the cable and terminating resistor (if present) from the connections on the motor.
2. Extract the screw (1).
3. Pull the motor forwards and out (arrow).

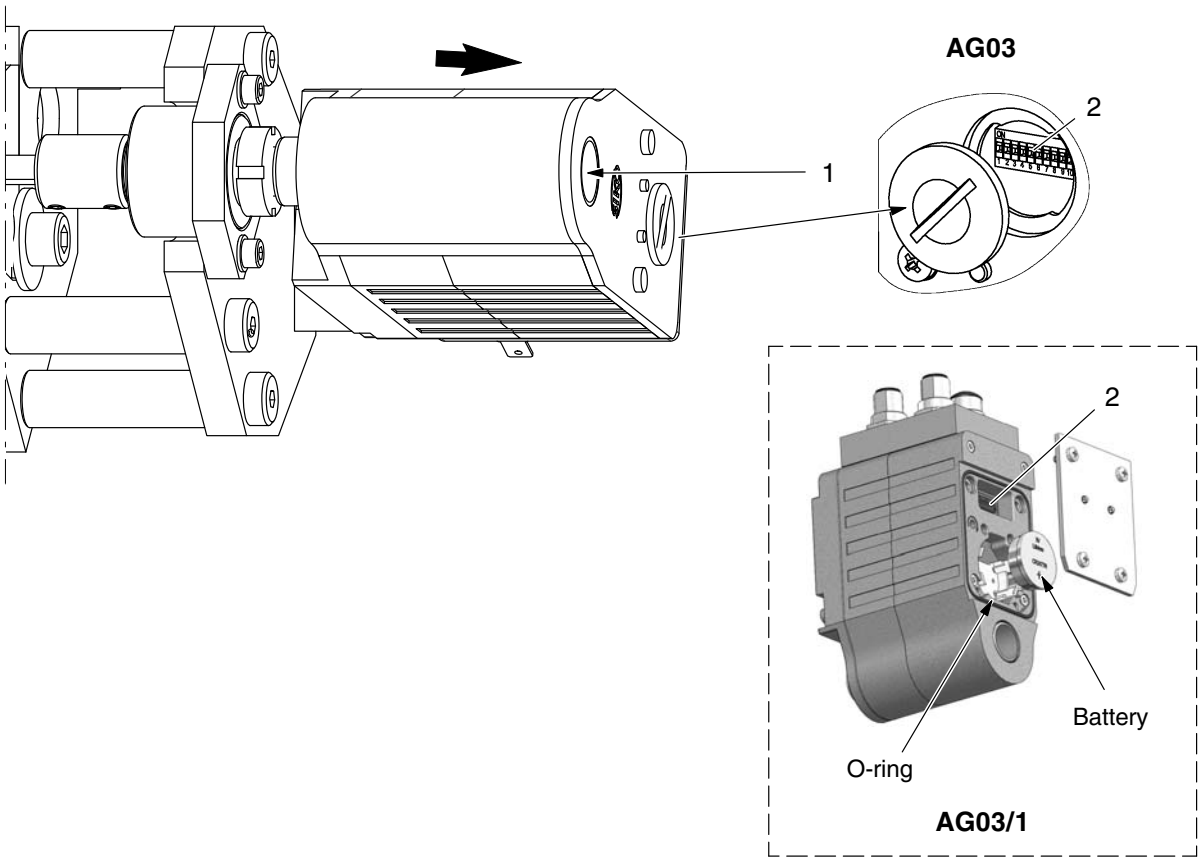
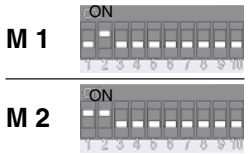


Fig. 49

Observe when Assembling

CAUTION: Do not mix up the CAN bus cable and the voltage supply cable. Plugging the voltage supply into the CAN bus receptacle would destroy the motor.

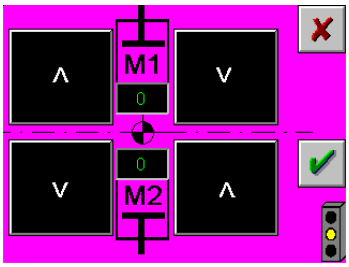


DIP switch

- Set the DIP switch (2)
- Tighten screw (1)

CAUTION: After assembly, proceed with *Calibrating Slide Positions*. Otherwise the application section will not correspond to the set values.

Calibrating Slide Positions (Applicators with Two Motors)



The slide positions must be calibrated anew when one of the following situations occurs:

a. The spindle and the motor shaft have been separated
b. A motor has been replaced
c. After a software update.

In the event that b. or c. applies, the control panel screen for calibration opens automatically.

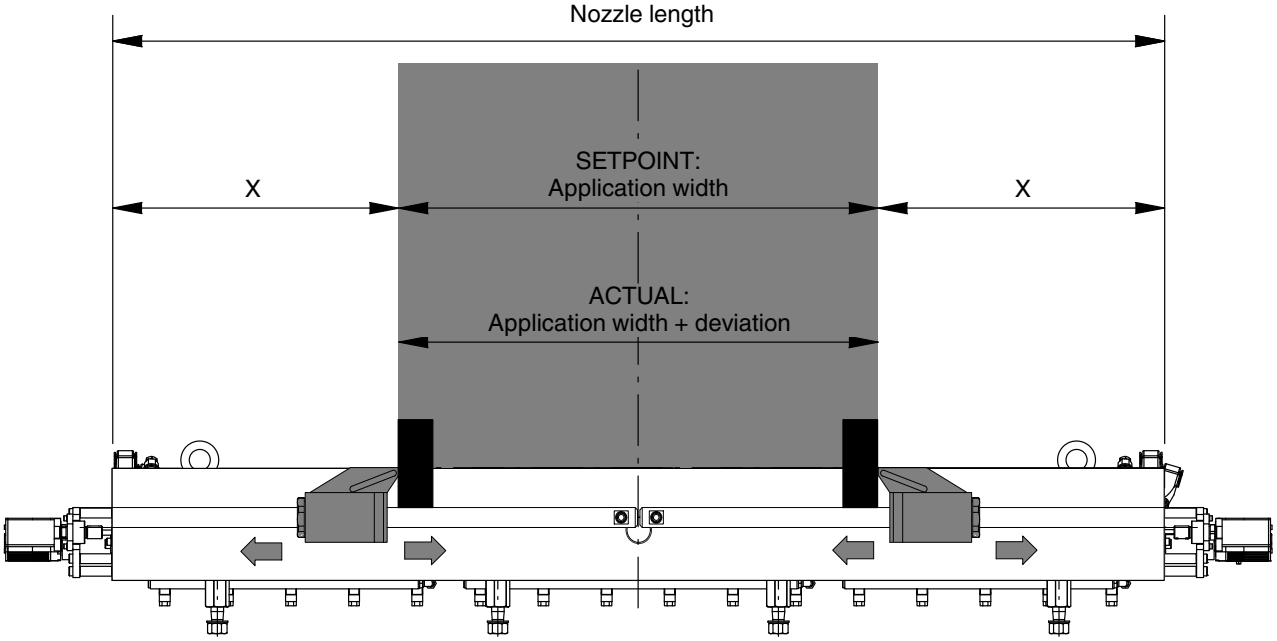
Calibration sets a reference point for each slide that the software uses to calculate the slide positions.

CAUTION: When calibrating, never adjust the application width using setpoint input; use only the arrow keys.

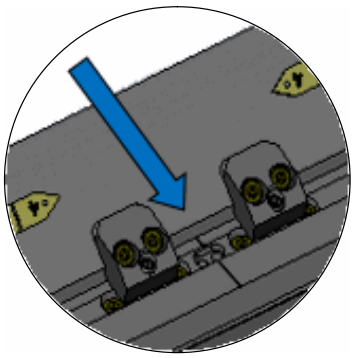
Centering Application Pattern

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

1. Heat the applicator.
2. Have a steel rule on hand that covers dimension X as well as the application width.

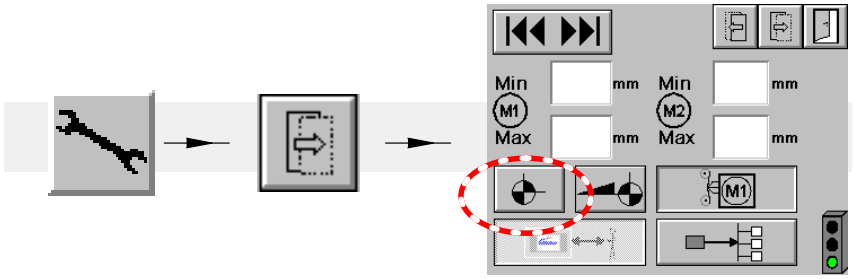


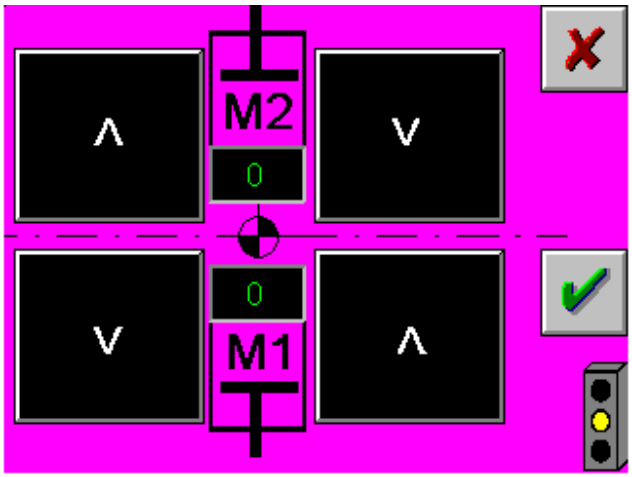
3. Insert two sensor gauges or rectangular plates (slot size or thinner) all the way into the application slot. Ensure that they are at a right angle.



Center mark on newer applicators

4. Open the calibration screen:

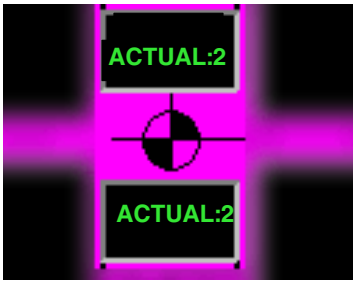




5. Use the ^ and v keys to adjust both slides such that the dimension X, measured from the edge of the nozzle, is the same on both sides.

6. Measure the actual distance (ACTUAL value = application width) between the slides.

   The ACTUAL value will deviate from the desired application width depending on the manufacturing tolerance and heat expansion.



7. Divide the ACTUAL value by 2 and enter the result for each slide in the control panel screen.

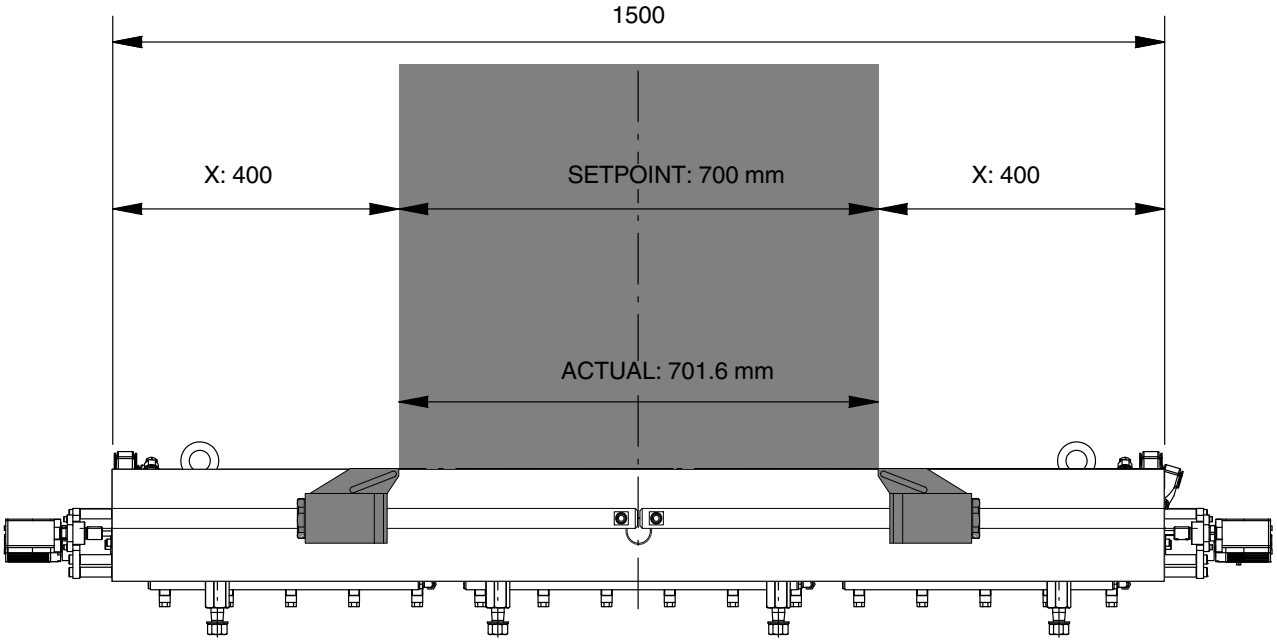
8. Save the input with ✔, or cancel with ✘.

   NOTE: If no values have been saved (e.g. after a motor is replaced), the process cannot be canceled.

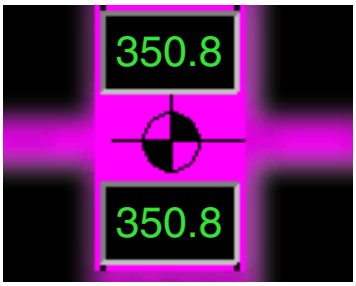
9. If any imprecisions are determined in the application width display, continue with *Adjusting Application Width Display / Second Position Calibration for Each Slide Individually.*

Example: Calibrating Slide Positions on a TC-FS-1400

For nozzle length refer to drawing. Here: 1500 mm.



1. Use the arrow keys to adjust both slides such that on both sides the dimension X, measured from the edge, is 400 mm.
2. Measure the actual distance (application width) between the slides.
   Depending on the manufacturing tolerance and heat expansion, the value will differ from the desired value of 700 mm, e.g. 701.6 mm.



3. Divide 701.6 by 2 and enter this value in the control panel screen. Here: 350.8 mm for each slide.
4. Save input.

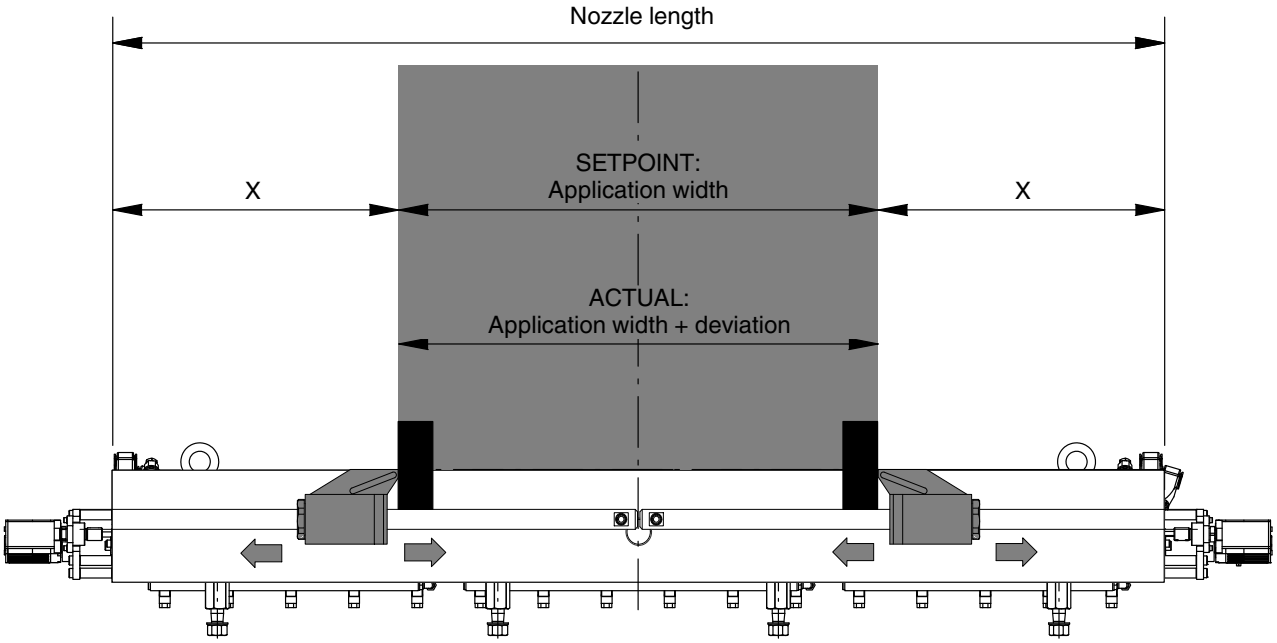
Adjusting Application Width Display (Applicators with Two Motors)

Definition of *Transmission ratio*: Rotation of motor in relation to linear motion of slide. In this case *1:Spindle pitch*.

If the transmission ratio changes greatly, e.g. due to a significantly different operating temperature, the display can become imprecise. Adjustment compensates for the change.

CAUTION: For the first position calibration, never adjust the application width using setpoint input; use only the arrow keys.

1. Verify that the applicator is heated to operating temperature.

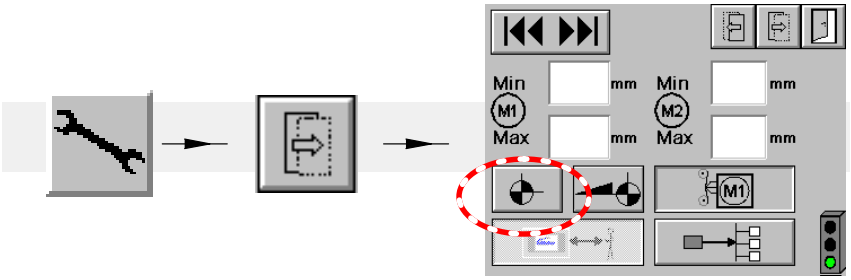


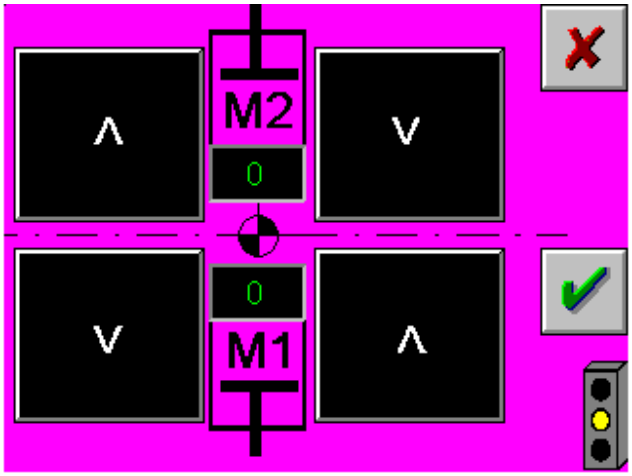
2. Insert two sensor gauges or rectangular plates (slot size or thinner) all the way into the application slot. Ensure that they are at a right angle.

Continued ...

First Position Calibration for Both Slides

3. Open the calibration screen:



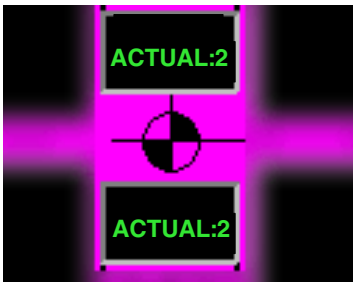


4. Use the arrow keys to adjust both slides such that the dimension X, measured from the edge of the nozzle, is the same on both sides.

   NOTE: Vast differences in the application width between the first and second position calibration increase the precision of adjustment.

5. Measure the actual distance (ACTUAL value = application width) between the slides.

   The ACTUAL value will deviate from the desired application width depending on the manufacturing tolerance and heat expansion.



6. Divide the ACTUAL value by 2 and enter the result for each slide in the control panel screen.

7. Save input with .

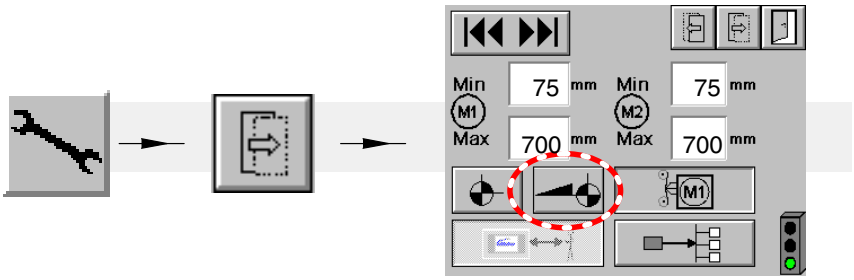
Second Position Calibration for Each Slide Individually

Now the application width can be adjusted using setpoints. Refer to *Setting Application Section, Rough Adjustment*.

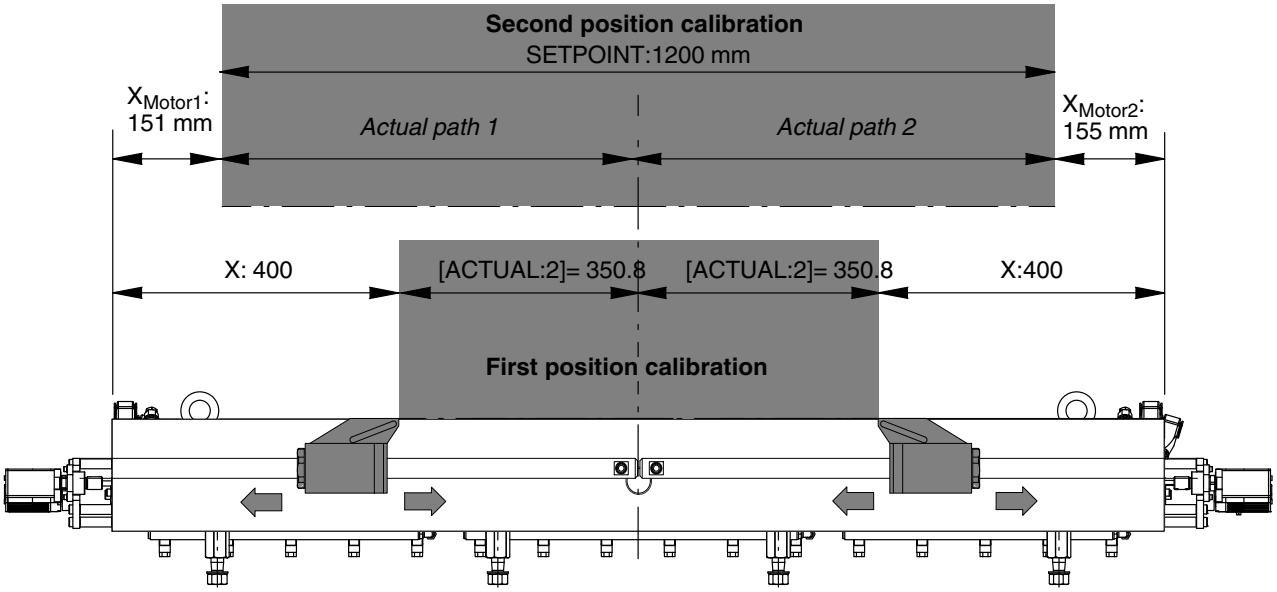
Example	Application width (SETPOINT):	1200 mm (600 per display)
	ACTUAL distance from nozzle edge:	X_{Motor1}: 151 mm
	ACTUAL distance from nozzle edge:	X_{Motor2}: 155 mm

The greater the application width discrepancy to the first position calibration, the more precise is the adjustment.

8. Set the application width.
9. Open the adjustment screen:



10. On each side: Measure distance between nozzle edge and slide.

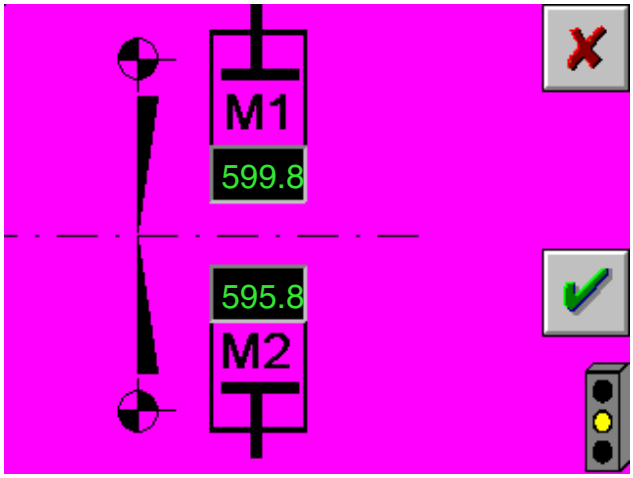


Continued ...

11. Calculate actual path for each slide.

    Slide/motor1: X plus [ACTUAL:2] minus X_{Motor1} = 599.8
    Slide/Motor2: X plus [ACTUAL:2] minus X_{Motor2} = 595.8

12. Enter the calculated values for each slide in the control panel screen:



13. Save input with  .

What Does the Software Do With the Values?

As a result of the first position calibration, the actual value [ACTUAL:2] became the reference point for further internal calculations. The theoretical value is now the actual value.

However, the actual spindle pitch can deviate from the theoretical pitch saved in the software, either because of heat expansion or manufacturing tolerances.

The second position calibration is needed to store the actual pitch in the software. And since there are two spindles, this process must be performed for each spindle.

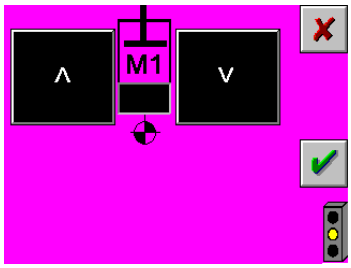
To open from the actual 350.8 mm to the (theoretical) 600 mm, the software calculates 207.67 revolutions with a theoretical pitch of 1.2 mm. However, because of the spindle tolerances, with this number of revolutions there are actually 599.8 for motor 1 and 595.8 for motor 2 instead of the 600 revolutions. These values were calculated in step 11..

For motor 1, the actual spindle pitch is then (599.8-350.8):207.67 revolutions = 1.199 mm

For motor 2, the actual spindle pitch is then (595.8-350.8):207.67 revolutions = 1.179 mm

After step 13., these values are applied for all further internal calculations.

Calibrating Slide Position (Applicator with One Motor)



The position must be calibrated anew when one of the following situations occurs:

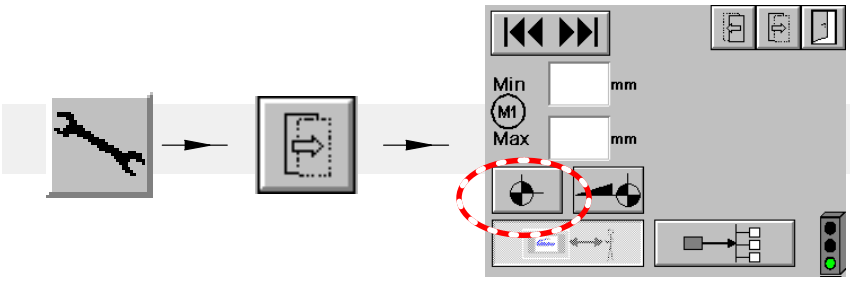
a. The spindle and the motor shaft have been separated
b. The motor has been replaced
c. After a software update.

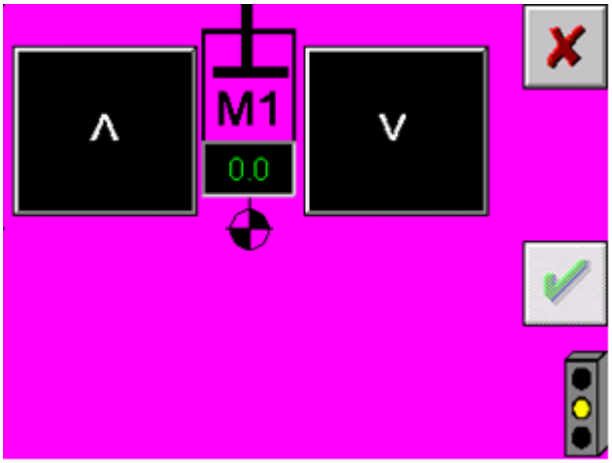
In the event that b. or c. applies, the control panel screen for calibration opens automatically.

Calibration sets a reference point that the software uses to calculate the application width.

CAUTION: When calibrating, never adjust the application width using setpoint input; use only the arrow keys.

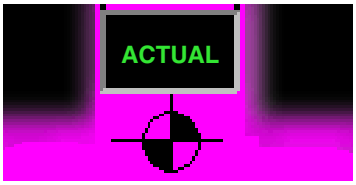
14. Open the calibration screen:





15. Enter any application width using the arrow keys.

NOTE: The value in the number field does not change. The value measured in step 16. is entered here.



16. Measure the actual application width (ACTUAL value).

17. Enter the ACTUAL value in the control panel screen.

18. Save the input with  , or cancel with  .

    NOTE: If no values have been saved (e.g. after a motor is replaced), the process cannot be canceled.

If any imprecisions are determined in the application width display, continue with *Adjusting Application Width Display / Second Position Calibration.*

Adjusting Application Width Display (Applicators with One Motor)

Definition of *Transmission ratio*: Rotation of motor in relation to linear motion of mouthpiece. In this case *1:Spindle pitch*.

If the transmission ratio changes greatly, e.g. due to a significantly different operating temperature, the display can become imprecise. Adjustment compensates for the change.

Verify that the applicator is heated to operating temperature.

 *First Position Calibration*

CAUTION: For the first position calibration, never adjust the application width using setpoint input; use only the arrow keys.

Refer to page 99, *Calibrating Slide Position*.

As a result of the first position calibration, the actual value [ACTUAL] became the reference point for further internal calculations.

However, the actual spindle pitch can deviate from the theoretical pitch saved in the software, either because of heat expansion or manufacturing tolerances.

The second position calibration is needed to store the actual pitch in the software.

Continued ...

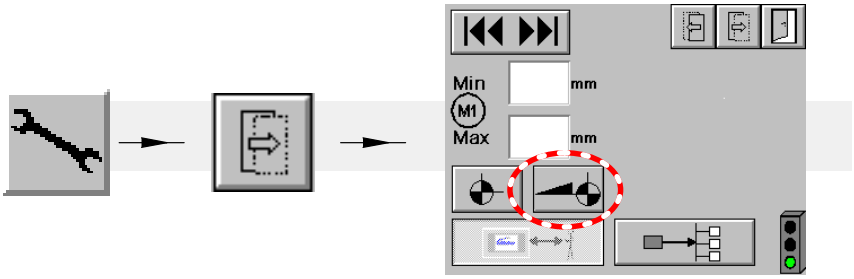
Second Position Calibration

Now the application width can be adjusted using setpoints.

1. Set the application width.

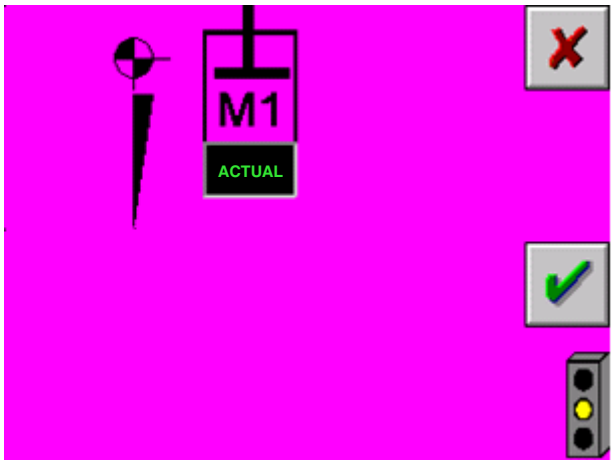
   NOTE: The greater the application width discrepancy to the first position calibration, the more precise is the adjustment.

2. Open the adjustment screen:



3. Measure the actual application width (ACTUAL value).

4. Enter the ACTUAL value in the control panel screen:



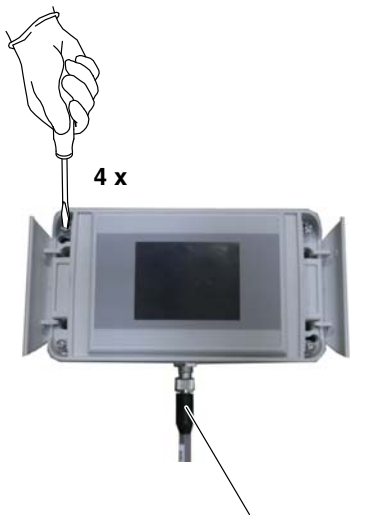
5. Save input with  .

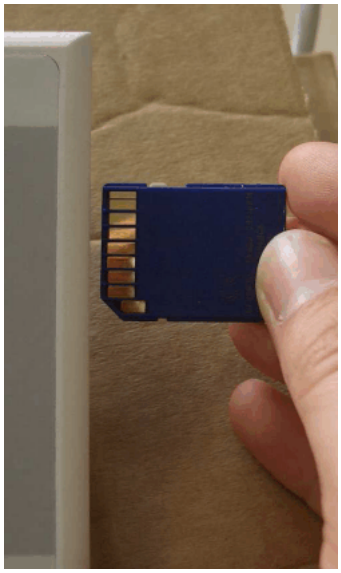
Software Update

The new software version is loaded onto the IPC from an *SD* memory card. All of the previous settings are lost. Nordson recommends making a note of the existing settings (e.g. Fig. 20: Software configuration code) before the update.

CAUTION: The memory card may be inserted and removed only when the IPC is deenergized.

1. Disconnect the operating unit from the voltage supply. To do this, either
   - Disconnect the plug and detach from operating unit
   - Switch off control box.
2. Open the operating unit, release the screws from the IPC and press it out somewhat to be able to insert the memory card:





```
REM ****************************************
REM
REM   Update complete!
REM
REM   Please disconnect the ipc from
REM   power and
REM   remove the SD-Card .
REM.
REM
REM ****************************************
```

Message *Copying completed*

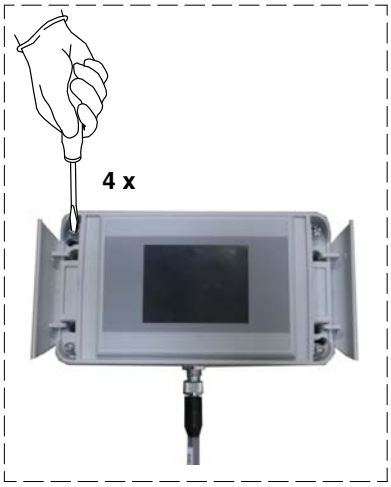
3. Start the voltage supply again. After about one minute, a message on the control panel indicates that copying has been completed.
4. Disconnect the operating unit from the voltage supply again.
5. Remove the memory card.
6. Secure the IPC again and close the operating unit.
7. Start the voltage supply again. If the connector to the operating unit was released, plug it in again and secure with knurled nuts. The screen for calibrating the slide positions opens automatically.
8. *Calibrating Slide Positions*. Refer to section *Repair*.
9. Enter the configuration code.
   Refer to page 49, *Software Configuration Code*.
10. Refer to page 36, *Initial Startup* for instructions on how to proceed.

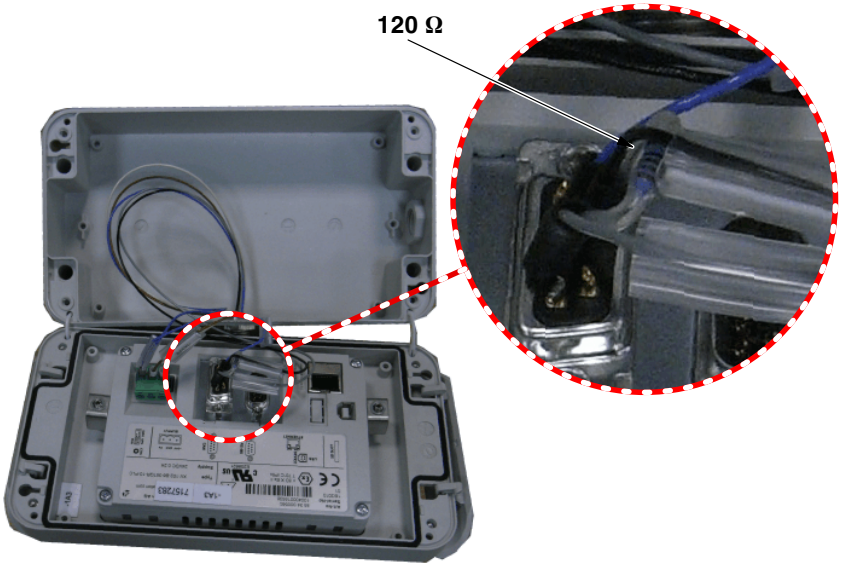
CAN Bus Terminating Resistor

There must be a terminating resistor on each end of the CAN bus.

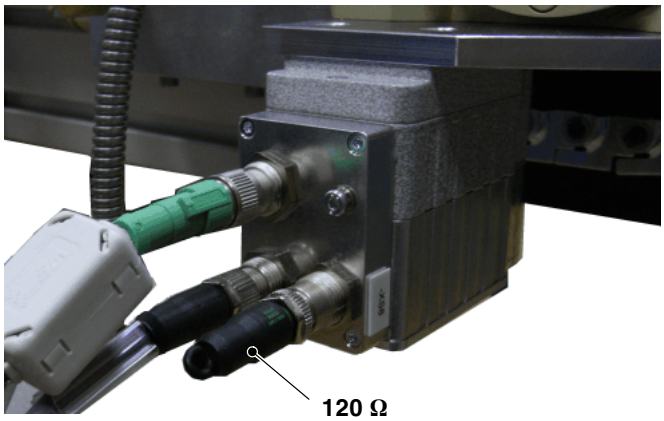
NOTE: The two CAN bus terminating resistors are connected in parallel via the bus. When the resistance is measured in the installed state, the result is 60 Ω.

One terminating resistor is located in the operating unit.





The second terminating resistor must be attached to XS8 of one of the two motors:

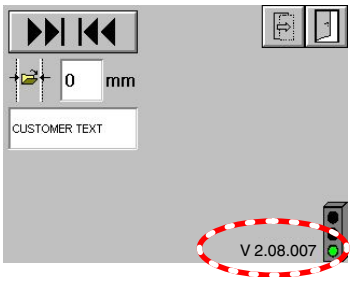


Also refer to page 22, *CAN Bus: Securing Plug Connections*.

There is a third terminating resistor in the CAN plug in the control box on the optional field bus gateway (Fig. 50). It must be switched OFF.

Optional Field Bus Gateway

Also refer to separate manual *Field Bus on Nordson Applicators*. Includes Profinet IO information beginning with Rev. 08.



Box 25 of the configuration code has been expanded in 2018 by the option *Profinet IO*. Profinet IO is available beginning with IPC program version V2.08.007, with the relevant hardware.

Box	Code	Description
25	X	No field bus communication
	C	CANopen P/N 7186458 (Gateway w/CANopen software>=V2.0)
	P	Profinet IO P/N 7588396 (Gateway w/Profinet software)

Control Box, Internal Side - DO NOT CHANGE!

There is a third terminating resistor in the CAN plug in the control box on the field bus gateway. It must be switched OFF.

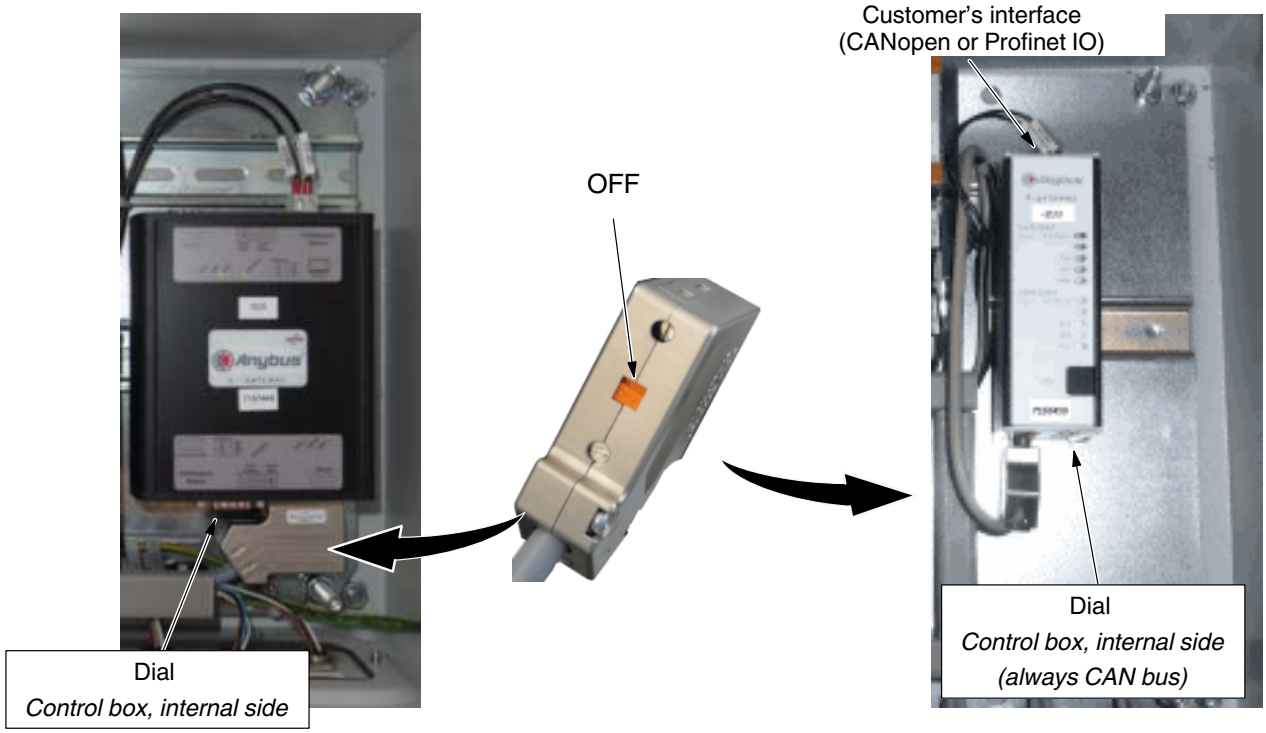
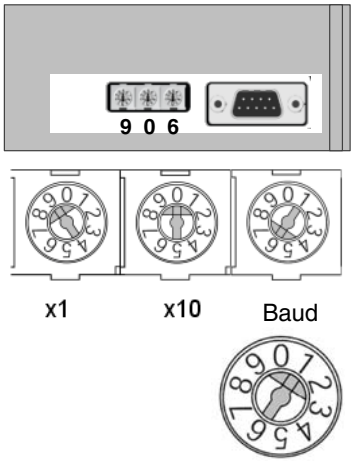


Fig. 50

Control Box, Internal Side - DO NOT CHANGE! *(contd.)*



Delivery State

Baud rate (500 kbit/s): 6

Internal CAN bus address: 9

If the Dial is Unintentionally Adjusted

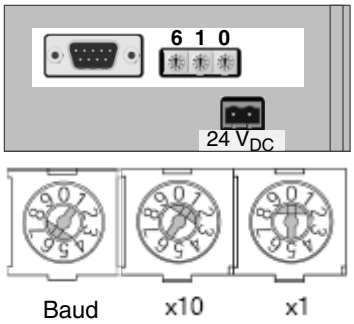
CAUTION: Adjust the dials only when the control box is deenergized.

The dials are very small. The switch setting is indicated by the small groove on the flattened side.

In this example, the dial is set to 1.

Customer's Interface

Each unit on the field bus needs a field bus address for communication purposes. Each address may be assigned only once in the entire network.



Delivery State of CANopen (Box 25:C)

CAUTION: Adjust the dials only when the control box is deenergized.

Baud rate (500 kbit/s): 6

CANopen field bus address: 10

Delivery State of Profinet IO (Box 25:P)

IP address 192.168.0.98

Possible Implementation of Communication Data in a Siemens PLC

UDT1 TC-FS Status Word: Status 1

Address	Name	Type	Initial value	Comment
0.0		STRUCT		
+0.0	System_ready	BOOL	FALSE	
+0.1	Alert	BOOL	FALSE	
+0.2	Fault	BOOL	FALSE	
+0.3	Shutdown	BOOL	FALSE	
+0.4	Pos_adjustm_possib_M1	BOOL	FALSE	
+0.5	Width_changed_int_M1	BOOL	FALSE	
+0.6	Pos_adjustm_possib_M2	BOOL	FALSE	
+0.7	Width_changed_int_M2	BOOL	FALSE	
+1.0	Switch_nozzle_possible	BOOL	FALSE	Nozzle closure - not with TC-FS
+1.1	Control_over_panel_on	BOOL	FALSE	
+1.2	Control_over_bus_on	BOOL	FALSE	
+1.3	Reserved_1	BOOL	FALSE	
+1.4	Reserved_2	BOOL	FALSE	
+1.5	Reserved_3	BOOL	FALSE	
+1.6	Reserved_4	BOOL	FALSE	
+1.7	Reserved_5	BOOL	FALSE	
=2.0		END_STRUCT		

UDT2 TC-FS Data Input (PLC View): TC_IN

Address	Name	Type	Initial val	Comment
0.0		STRUCT		
+0.0	Status	"Status 1"		
+2.0	Width_motor_1	INT	0	
+4.0	Width_motor_2	INT	0	
+6.0	Reserved_1	INT	0	
+8.0	Statusapplicator	BYTE	B#16#0	
+9.0	Setpoint_validity_statu	BYTE	B#16#0	
+10.0	Alarms_applicator	INT	0	
+12.0	Alarms_motor	INT	0	
+14.0	Reserved_2	INT	0	
+16.0	MaxWidth_motor_1	INT	0	
+18.0	Min_Width_motor_1	INT	0	
+20.0	Max_Width_motor_2	INT	0	
+22.0	Min_Width_motor_2	INT	0	
+24.0	Max_pos_max_width_m1	INT	0	
+26.0	Max_pos_min_width_m1	INT	0	
+28.0	Min_pos_max_width_m1	INT	0	
+30.0	Min_pos_min_width_m1	INT	0	
+32.0	Max_pos_max_width_m2	INT	0	
+34.0	Max_pos_min_width_m2	INT	0	
+36.0	Min_pos_max_width_m2	INT	0	
+38.0	Min_pos_min_width_m2	INT	0	
=40.0		END_STRUCT		

UDT3 TC-FS Control Word: Control 1

Address	Name	Type	Initial val	
0.0		STRUCT		
+0.0	Enable_data_exchange	BOOL	FALSE	
+0.1	Enable_width_adjustment	BOOL	FALSE	
+0.2	Enable_module_control	BOOL	FALSE	
+0.3	Open_nozzle	BOOL	FALSE	Nozzle closure - not with TC-FS
+0.4	Minimize_applicat_slot	BOOL	FALSE	
+0.5	Maximize_applicat_slot	BOOL	FALSE	
+0.6	Drive_to_min_width	BOOL	FALSE	
+0.7	Drive_to_max_width	BOOL	FALSE	
+1.0	Drive_to_setp_width_M1	BOOL	FALSE	
+1.1	Stop_width_adjustment_M1	BOOL	FALSE	
+1.2	Value_max_width_M1_to_HM	BOOL	FALSE	
+1.3	Value_min_width_M1_to_HM	BOOL	FALSE	
+1.4	Drive_to_setp_width_M2	BOOL	FALSE	
+1.5	Stop_width_adjustment_M2	BOOL	FALSE	
+1.6	Value_max_width_M2_to_HM	BOOL	FALSE	
+1.7	Value_min_width_M2_to_HM	BOOL	FALSE	
=2.0		END_STRUCT		

UDT4 TC-FS Data Output (PLC View): TC_OUT

Address	Name	Type	Initial val	Comment
0.0		STRUCT		
+0.0	Control	"Control 1"		
+2.0	Width_motor_1	INT	0	
+4.0	Width_motor_2	INT	0	
+6.0	Reserved_1	INT	0	
+8.0	Max_width_motor_1	INT	0	
+10.0	Min_width_motor_1	INT	0	
+12.0	Max_width_motor_2	INT	0	
+14.0	Min_width_motor_2	INT	0	
+16.0	Acknowledgealarms	BYTE	B#16#0	
+17.0	Reserved_2	BYTE	B#16#0	
=18.0		END_STRUCT		

Data Block with Input and Output Data Structure of TC-FS

Declaration View

DB1 -- "TCFS_application1" -- TCFS_Profinet\SIMATIC 300(1)\CPU 315-2 PN/DP\...\DB1

Address	Name	Type	Initial value	Comment
0.0		STRUCT		
+0.0	TC_IN	"TC_IN"		
+40.0	TC_OUT	"TC_OUT"		
=58.0		END_STRUCT		

Data View

@DB1 -- "TCFS_application1" -- TCFS_Profinet\SIMATIC 300(1)\CPU 315-2 PN/DP\...\DB1 ONLINE

Address	Name	Type	Initial value	Actual value
0.0	TC_IN.Status.System_ready	BOOL	FALSE	FALSE
0.1	TC_IN.Status.Alert	BOOL	FALSE	FALSE
0.2	TC_IN.Status.Fault	BOOL	FALSE	FALSE
0.3	TC_IN.Status.Shutdown	BOOL	FALSE	FALSE
0.4	TC_IN.Status.Pos_adjustm_possib_M1	BOOL	FALSE	FALSE
0.5	TC_IN.Status.Width_changed_int_M1	BOOL	FALSE	FALSE
0.6	TC_IN.Status.Pos_adjustm_possib_M2	BOOL	FALSE	FALSE
0.7	TC_IN.Status.Width_changed_int_M2	BOOL	FALSE	FALSE
1.0	TC_IN.Status.Switch_nozzle_possible	BOOL	FALSE	FALSE
1.1	TC_IN.Status.Control_over_panel_on	BOOL	FALSE	FALSE
1.2	TC_IN.Status.Control_over_bus_on	BOOL	FALSE	FALSE
1.3	TC_IN.Status.Reserved_1	BOOL	FALSE	FALSE
1.4	TC_IN.Status.Reserved_2	BOOL	FALSE	FALSE
1.5	TC_IN.Status.Reserved_3	BOOL	FALSE	FALSE
1.6	TC_IN.Status.Reserved_4	BOOL	FALSE	FALSE
1.7	TC_IN.Status.Reserved_5	BOOL	FALSE	FALSE
2.0	TC_IN.Width_motor_1	INT	0	0
4.0	TC_IN.Width_motor_2	INT	0	0
6.0	TC_IN.Reserved_1	INT	0	0
8.0	TC_IN.Statusapplicator	BYTE	B#16#0	B#16#00
9.0	TC_IN.Setpoint_validity_statu	BYTE	B#16#0	B#16#00
10.0	TC_IN.Alarms_applicator	INT	0	0
12.0	TC_IN.Alarms_motor	INT	0	0
14.0	TC_IN.Reserved_2	INT	0	0
16.0	TC_IN.MaxWidth_motor_1	INT	0	0
18.0	TC_IN.Min_Width_motor_1	INT	0	0
20.0	TC_IN.Max_Width_motor_2	INT	0	0
22.0	TC_IN.Min_Width_motor_2	INT	0	0
24.0	TC_IN.Max_pos_max_width_m1	INT	0	0
26.0	TC_IN.Max_pos_min_width_m1	INT	0	0
28.0	TC_IN.Min_pos_max_width_m1	INT	0	0
30.0	TC_IN.Min_pos_min_width_m1	INT	0	0
32.0	TC_IN.Max_pos_max_width_m2	INT	0	0
34.0	TC_IN.Max_pos_min_width_m2	INT	0	0
36.0	TC_IN.Min_pos_max_width_m2	INT	0	0
38.0	TC_IN.Min_pos_min_width_m2	INT	0	0
40.0	TC_OUT.Control.Enable_data_exchange	BOOL	FALSE	TRUE
40.1	TC_OUT.Control.Enable_width_adjustment	BOOL	FALSE	TRUE
40.2	TC_OUT.Control.Enable_module_control	BOOL	FALSE	TRUE
40.3	TC_OUT.Control.Open_nozzle	BOOL	FALSE	FALSE

Reading Data

```
Netzwerk 1: Read data from mTC-FS
Kommentar:

      L     PEW  256
      TAW
      T     DB1.DBW    0
      L     PEW  258
      T     "TCFS_applicationl".TC_IN.Width_motor_1            DB1.DBW2
      L     PEW  260
      T     "TCFS_applicationl".TC_IN.Width_motor_2            DB1.DBW4
      L     PEW  262
      T     "TCFS_applicationl".TC_IN.Reserved_1               DB1.DBW6
      L     PEB  264
      T     "TCFS_applicationl".TC_IN.Statusapplicator         DB1.DBB8
      L     PEB  265
      T     "TCFS_applicationl".TC_IN.Setpoint_validity_statu  DB1.DBB9
      L     PEW  266
      TAW
      T     "TCFS_applicationl".TC_IN.Alarms_applicator        DB1.DBW10
      L     PEW  268
      TAW
      T     "TCFS_applicationl".TC_IN.Alarms_motor             DB1.DBW12
      L     PEW  270
      T     "TCFS_applicationl".TC_IN.Reserved_2               DB1.DBW14
      L     PEW  272
      T     "TCFS_applicationl".TC_IN.MaxWidth_motor_1         DB1.DBW16
      L     PEW  274
      T     "TCFS_applicationl".TC_IN.Min_Width_motor_1        DB1.DBW18
      L     PEW  276
      T     "TCFS_applicationl".TC_IN.Max_Width_motor_2        DB1.DBW20
      L     PEW  278
      T     "TCFS_applicationl".TC_IN.Min_Width_motor_2        DB1.DBW22
      L     PEW  280
      T     "TCFS_applicationl".TC_IN.Max_pos_max_width_ml     DB1.DBW24
      L     PEW  282
      T     "TCFS_applicationl".TC_IN.Max_pos_min_width_ml     DB1.DBW26
      L     PEW  284
      T     "TCFS_applicationl".TC_IN.Min_pos_max_width_ml     DB1.DBW28
      L     PEW  286
      T     "TCFS_applicationl".TC_IN.Min_pos_min_width_ml     DB1.DBW30
      L     PEW  288
      T     "TCFS_applicationl".TC_IN.Max_pos_max_width_m2     DB1.DBW32
      L     PEW  290
      T     "TCFS_applicationl".TC_IN.Max_pos_min_width_m2     DB1.DBW34
      L     PEW  292
      T     "TCFS_applicationl".TC_IN.Min_pos_max_width_m2     DB1.DBW36
      L     PEW  294
      T     "TCFS_applicationl".TC_IN.Min_pos_min_width_m2     DB1.DBW38
```

Writing Data

Network 2 : Write data to TC-FS

Comment:

```
L     DB1.DBW   40
CAW
T     PQW  256
L     "TCFS_applicationl".TC_OUT.Width_motor_1        DB1.DBW42
T     PQW  258
L     "TCFS_applicationl".TC_OUT.Width_motor_2        DB1.DBW44
T     PQW  260
T     "TCFS_applicationl".TC_OUT.Reserved_1           DB1.DBW46
T     PQW  262
L     "TCFS_applicationl".TC_OUT.Max_width_motor_1    DB1.DBW48
T     PQW  264
L     "TCFS_applicationl".TC_OUT.Min_width_motor_1    DB1.DBW50
T     PQW  266
L     "TCFS_applicationl".TC_OUT.Max_width_motor_2    DB1.DBW52
T     PQW  268
L     "TCFS_applicationl".TC_OUT.Min_width_motor_2    DB1.DBW54
T     PQW  270
L     "TCFS_applicationl".TC_OUT.Acknowledgealarms    DB1.DBB56
T     PQB  272
L     "TCFS_applicationl".TC_OUT.Reserved_2           DB1.DBB57
T     PQB  273
```

Parts

How to Use the Illustrated Parts List

The parts lists in the separate document *Parts List* are divided into the following columns:

Item— Identifies the parts shown, available from Nordson.

Part— Nordson spare part number for each available part shown in the illustration. A series of hyphens (- - - - -) in the Parts column means that the part cannot be ordered separately.

Description— This column contains the name of the part and, when appropriate, the dimensions and other properties. The dots in the *Description* column illustrate the relationship between assemblies, subassemblies and individual parts.

Quantity— The quantity required per unit, assembly or subassembly. The abbreviation AR (as required) is used to designate that items are stated in drum sizes or that the quantity required per assembly is a factor of the product version or the model.

NOTE: The texts are available only in English. Refer to separate document Parts List, P/N 7192556.

Recommended Spare Parts

To prevent production stoppage, Nordson recommends keeping a spare

- Complete nozzle assembly, nozzle assembly sealing rings
- Control module, service kit with seals
- Filter cartridge, filter screen and O-rings for the filter cartridge
- Slide assembly (left and right), seals, shim rings, spindle nuts
- Temperature sensor
- Pressure sensor (if present)

Technical Data

General Data

Maximum operating height	3000 m (9840 ft)
Humidity	10 to 95 %, not condensing
Use (inside or outside)	Only inside
Required degree of cleanliness 1 (e.g. metal foundry) ... 6 (e.g. residential area) ... 10 (e.g. operating room)	4
Operating air pressure	4-6 bar (58-87 psi)
Noise emission	< 85 dB(A)
Degree of protection	IP50
Temperature sensors	Ni120 or PT100

Electrical Data

Operating voltage	230 V
Operating voltage frequency	50/60 Hz
IP class (I, II, III, protective insulation pursuant to DIN EN 61140)	I

Data Dependent on Application

PFW

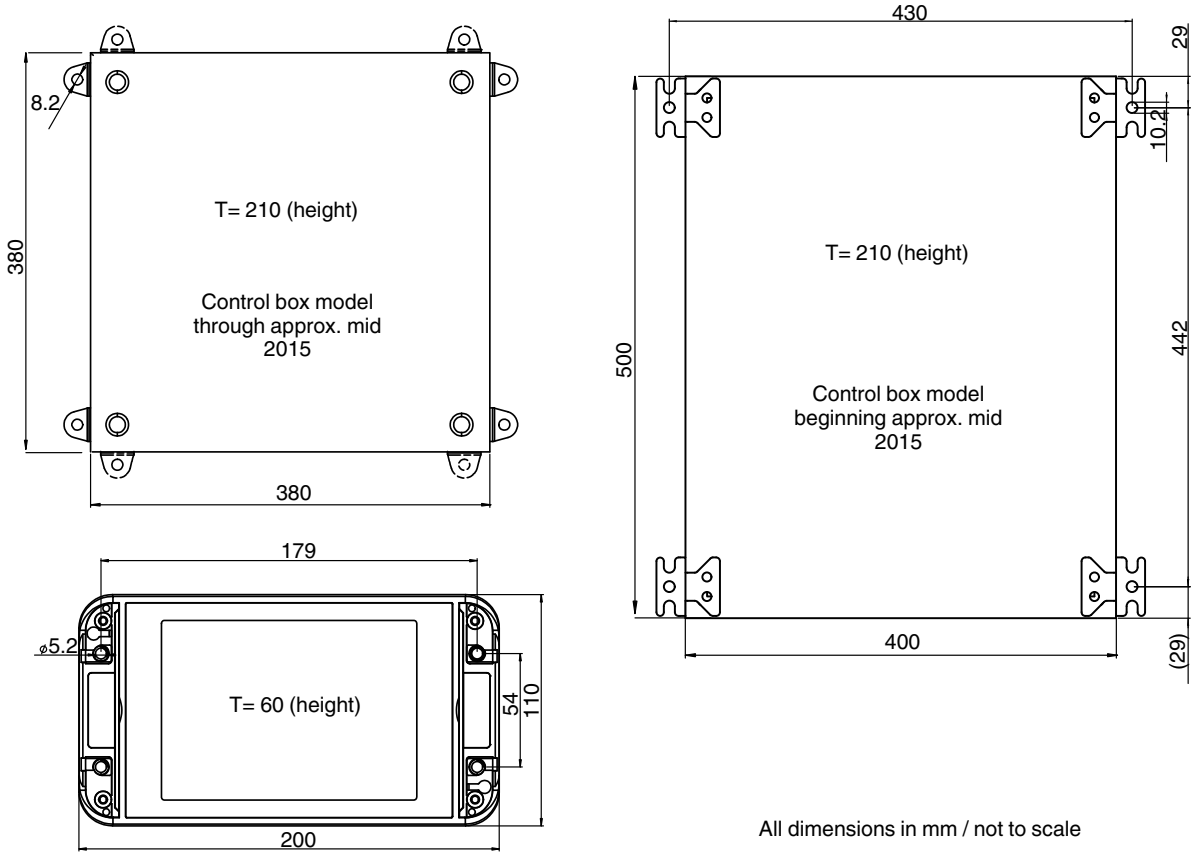
Minimum (= technically possible) application width	The actual minimum application width depends on the system, meaning it is a factor of the minimum possible output quantity of the pump(s) used
Maximum application width	Refer to *Setup (Software)*
Weight	Refer to consignment note
Maximum operating temperature	200 °C (392 °F)
Heatup time	180 °C (356 °F) Approx. 30 min, depending on system environment
Max. adhesive pressure at applicator inlet **With grammage**	Application widths > 100 mm: 30 bar (435 psi) Application widths ≦ 100 mm: 20 bar (290 psi) 20 bar
Dimensions for the respective applicator)	Refer to technical drawing

EVA, RET, PUR

	reacTec	**EVA / PO**	**PUR**
Minimum (= technically possible) application width	The actual minimum application width depends on the system, meaning it is a factor of the minimum possible output quantity of the pump(s) used		
Maximum application width	Refer to *Setup (Software)*		
Weight **(Refer to consignment note for all others)**	**TC-FS1400** approx. 140 kg (approx. 310 lb)		
Maximum operating temperature	200 °C (392 °F)	200 °C (392 °F)	170 °C (338 °F)
Heatup time	180 °C (356 °F) Approx. 45 min, depending on system environment		Approx. 45 min, depending on system environment
Max. adhesive pressure at applicator inlet	Application widths > 100 mm: 30 bar (435 psi) Application widths ≦ 100 mm: 20 bar (290 psi)		
Dimensions for the respective applicator)	Refer to technical drawing		

Control Box and Operating Unit

ATTENTION: The control box is designed for only one operating voltage. Operate only at the operating voltage shown on the ID plate.



All dimensions in mm / not to scale

Degree of protection	IP 54
Control box connection	Customer's connection: 1x230 V_{AC}
Permitted voltage deviation	± 10%
Operating voltage frequency	50/60 Hz
XION gateway board (in the control box)	
Storage temperature	- 20°C to + 85 °C
Ambient temperature	0 to +55 °C
Humidity	15 to 95 %, not condensing
Base module switch settings **(delivery state)**	Baud rate for bus lengths up to 100 m: 500 kbit/s Internal CAN bus address: 8 **NOTE:** Do not change internal addresses. Adjust the switches only when the control box is deenergized.
XI/ON digital output modules	Normal load voltage: 24 V_{DC} Output current at 24 V_{DC} Max. constant current (ohmic): 2 A Minimum load current (recommended): 10 mA

Replacing Electronics Modules

Digital input module

A single electronics module can be replaced with a module with the same function.

CAUTION: Follow the order of the plug-in sockets. Do not change.

gray	Gateway / voltage supply
white	Digital inputs
light blue	Analog inputs
orange	Relay outputs
green	Analog outputs

XI/ON Gateway Module (Base Module)

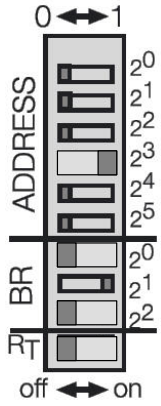
Gateway XNE-GWBR (current)

Gateway XN-GWB (obsolete)

Gateway XN-GW (obsolete)

Fig. 51 Base modules

The kit P/N 7556554 is available for retrofitting an old gateway to the new gateway XNE-GWBR.



Replacing Gateway XNE-GWBR

CAUTION: The terminals may only be connected or disconnected when the control box is deenergized. The frequency converters are still energized after switching off. Wait three minutes before beginning any work!

Whether the upper or lower connections CAN_H, CAN_L and CAN_{GND} are used on the gateway has no impact.

Set the DIP switches (illustration at left):

1. DIP switch ADDRESS (set node address): 8
2. DIP switch BR (set bit rate): 500 kBit/s
3. DIP switch R_T (set terminal resistance): off, because the gateway is not used as the first or last node.
4. Continue with *Gateway XNE-GWBR: Applying XI/ON Configuration*.

Gateway XNE-GWBR: Applying XI/ON Configuration

To see the original text and illustrations, refer to the manufacturer's document *EATON manual (02/2016 MN05002005Z-DE)*

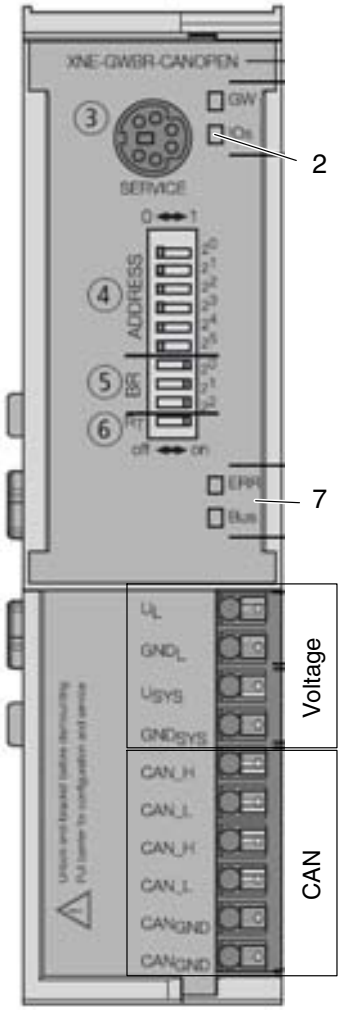


Fig. 52

When the XI/ON station is reconfigured or when the existing station setup (board list) is changed, always apply the current configuration.

This is done with the ADDRESS DIP switch on the gateway. The control box is deenergized.

1. Set a node address (node ID) ≠ 0 on the gateway.
2. Switch on the control box.
3. On the gateway, set the node address = 0, meaning that all ADDRESS DIP switches are set to off.

   The gateway then saves the station configuration. This is indicated by the "IOs" LED (2) flashing yellow.

   When the configuration has been saved, the "IOs" LED briefly flashes orange and then stops flashing.

   NOTE: The LEDs "Err" and "Bus" (7) alternately flash red at a rate of 4 Hz due to the invalid node ID "0" that is still set.

4. Switch off control box.

Continued ...

5. On the gateway, set the node address = 8.
6. Switch on the control box.

   After switching on, the “IOs” LED changes to green after about two seconds.

   NOTE: The green LED ”IOs” indicates that the current XI/ON configuration corresponds to the saved reference board list.

Replacing Gateway XN-GWB

CAUTION: Adjust only when the control box is deenergized. Do not change the dial settings.

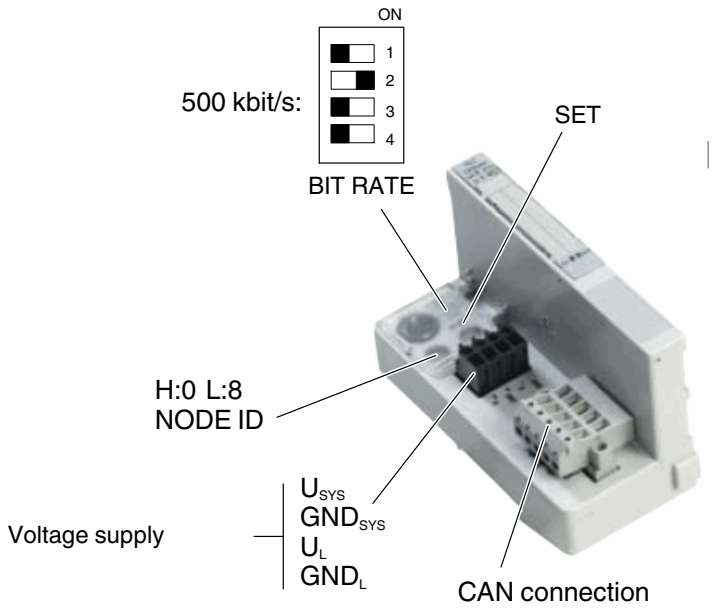


Fig. 53 Base module

Gateway XN-GWB: Applying XI/ON Configuration

After replacing the gateway or replacing (different function) or adding an electronics module, switch the control box on and load the new module configuration by pressing the SET button with a sharp object for several seconds (until all LEDs light up red).

System Plans and Accessories (Examples)

If other hose and cable lengths are needed, please contact your Nordson representative.

NOTE: To convert from EVA to RET, a different nozzle as well as additional filters and hoses are needed.

TC-FS-1400PUR with VD200 System (Fig. 54)		
1	P/N *configurable*	Bulk melter VD200
2	P/N 150155	Hose
3	P/N 115581	CORD,HOSE,30FT,6000,FM,130/170 (extension cord)
4	P/N 116998	CABLE, SPLITTER/COMBINER, LOWPWR (adapter cable)
5	P/N 753462	CBL,ADPTR,6P/12S,30FT, Ni120 (= T-style)
6	P/N 7163497	Kit-SVC cable XS2 (standard I/O)
7	P/N 7163498	Kit-SVC cable XS5 (pilot voltage)
8	P/N 254329	Extension, valve connection L = 10 m (enable motors)
9	-	Pressure sensor cable

TC-FS-1400RET with EEX200 system (Fig. 56)		
1	-	Extruder EEX200
2	P/N 150155	Hose
3	P/N 115581	CORD,HOSE,30FT,6000,FM,130/170 (extension cord)
4	P/N 116998	CABLE, SPLITTER/COMBINER, LOWPWR (adapter cable)
5	P/N 753462	CBL,ADPTR,6P/12S,30FT, Ni120 (= T-style)
6	P/N 7163497	Kit-SVC cable XS2 (standard I/O)
7	P/N 7163498	Kit-SVC cable XS5 (pilot voltage)
8	P/N 254329	Extension, valve connection L = 10 m (enable motors)
9	-	Pressure sensor cable

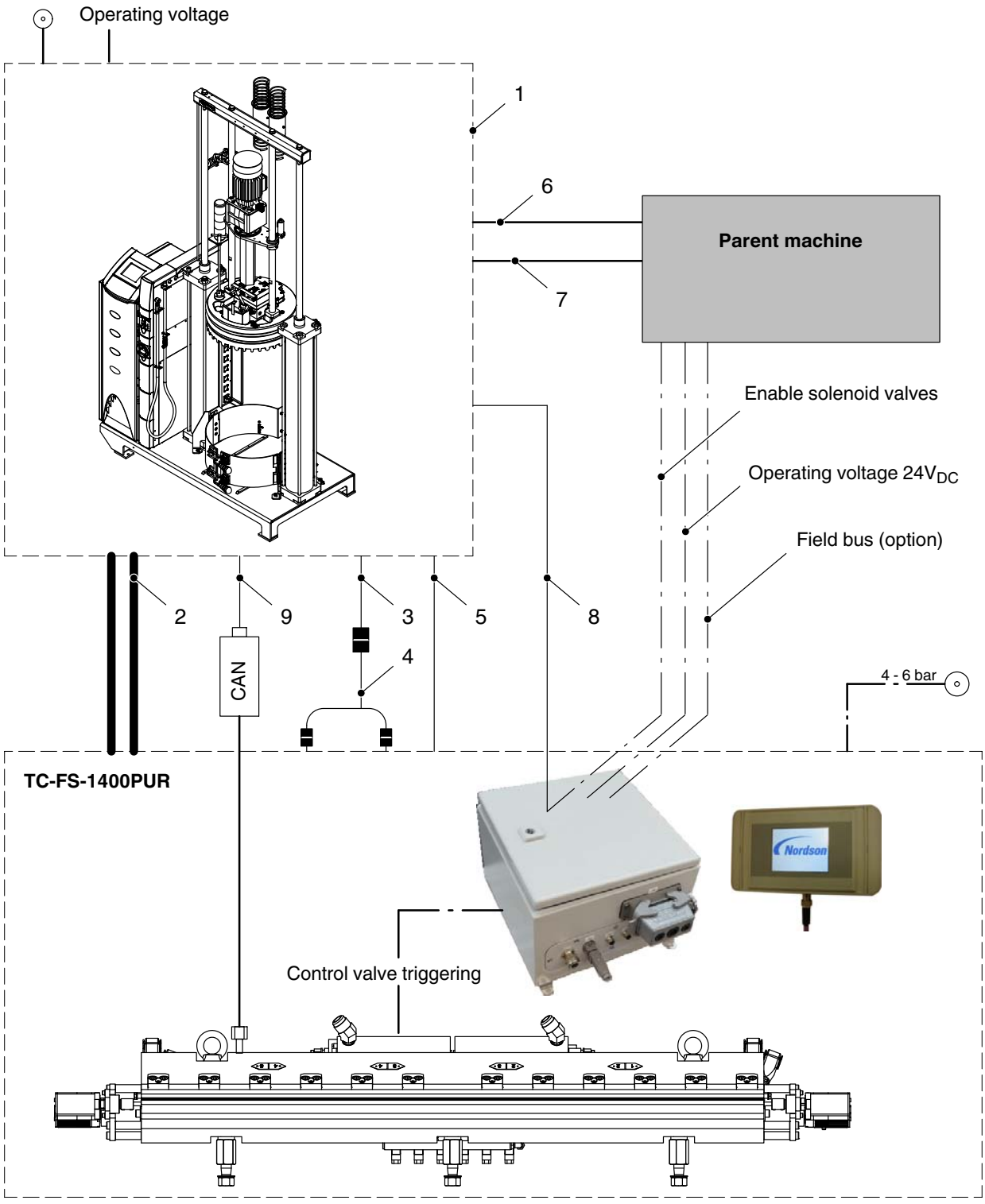


Fig. 54 VD200 system (example)

Interface XSP and Terminating Resistor (CAN Bus Pressure Sensors)

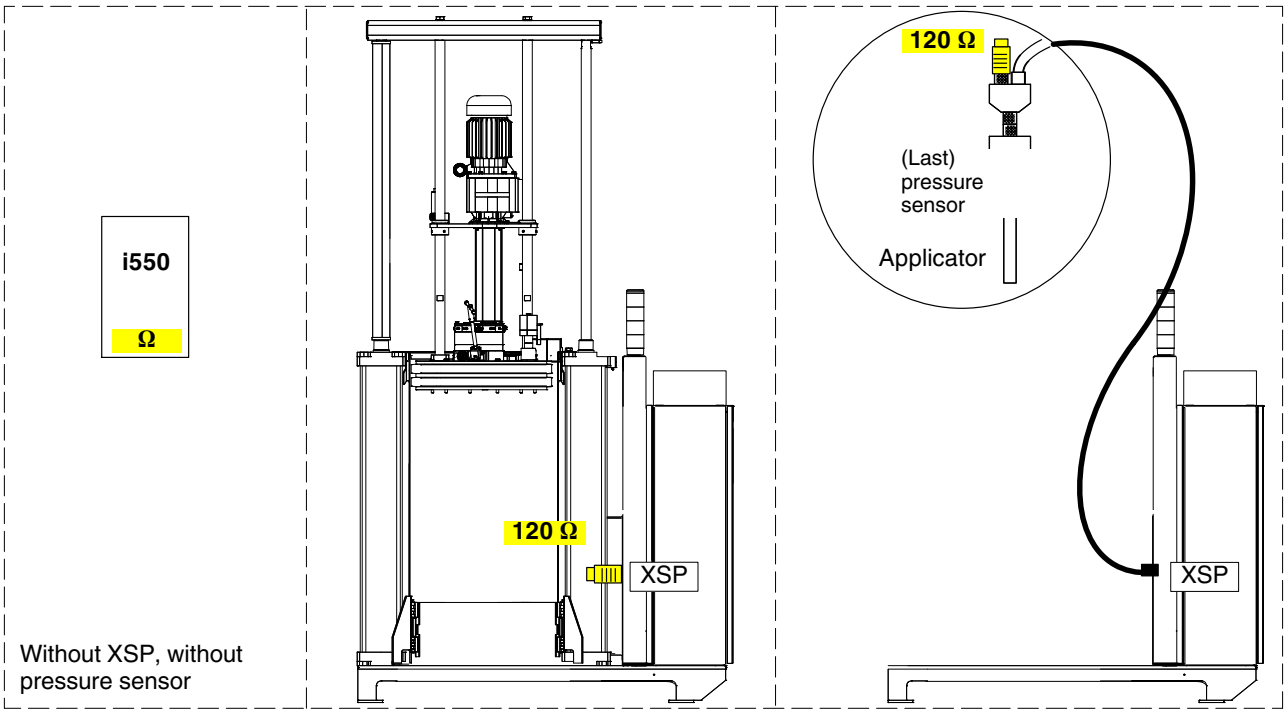


Fig. 55 Principle drawing

Fig. 55, left: If the system does not contain an internal pressure sensor or an interface XSP for external pressure sensors, switch on the terminating resistor on the frequency converter.

Fig. 55, middle: When a bulk melter is equipped to connect external pressure sensors, the terminating resistor (120 Ω) has to attached to the interface XSP; the terminating resistor on the frequency converter is then switched off.

Fig. 55, right: If there are pressure sensors connected to XSP, the terminating resistor is attached to the last pressure sensor on the CAN bus.

Then the configuration box "External pressure sensors" of the bulk melter with IPC may not be set to X. Enter the number of external pressure sensors in the software configuration code on the control panel.

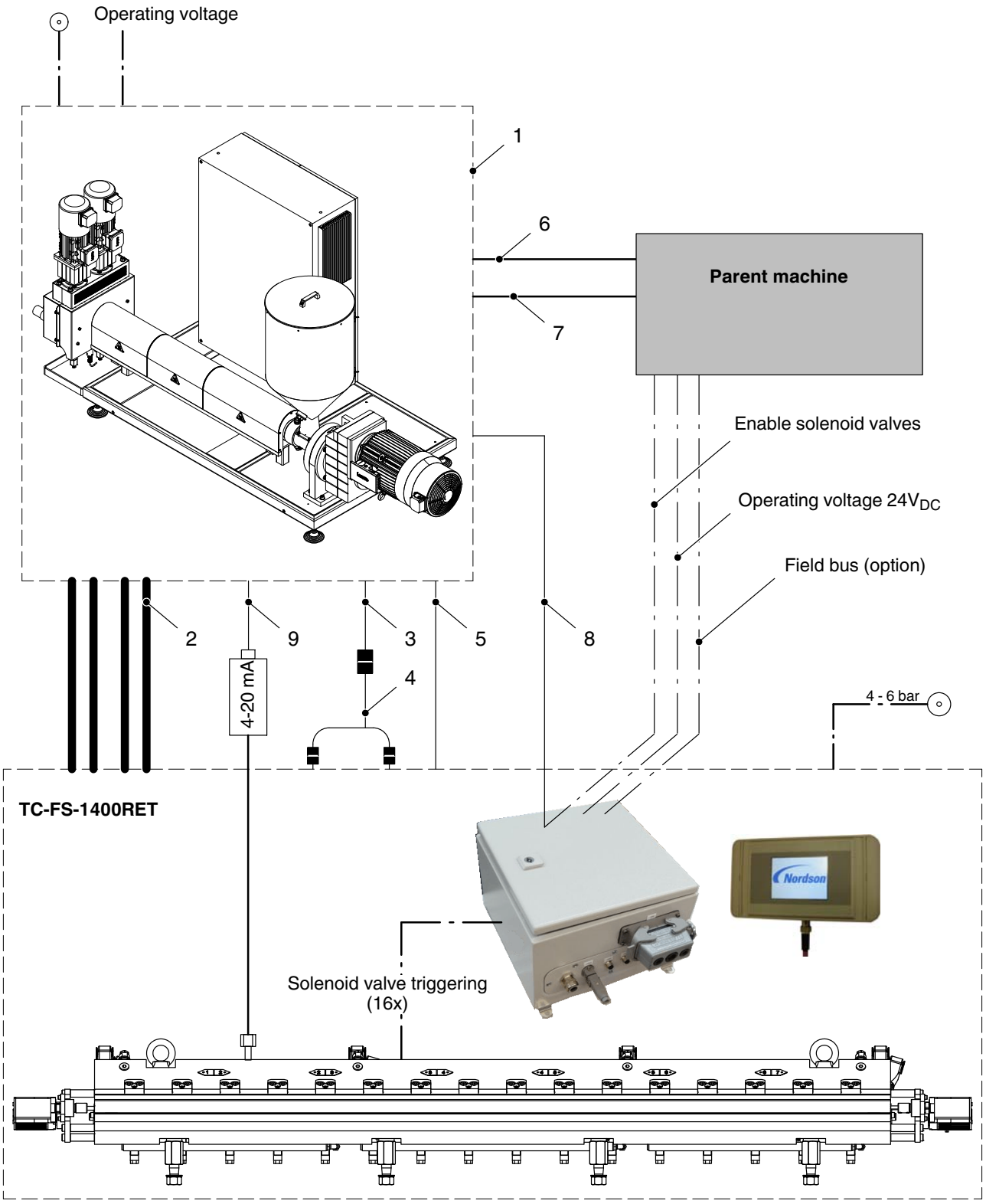


Fig. 56 EEX200 system (example)

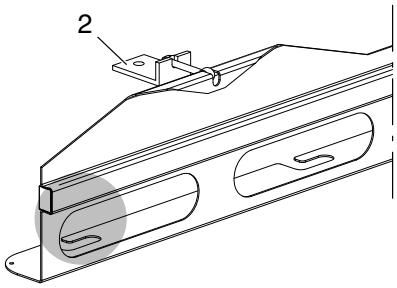
Nozzle Slot Cover (Accessory)

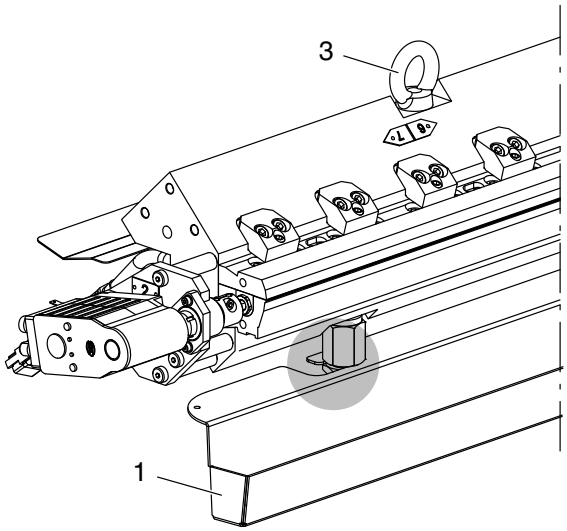
If PUR adhesives are used that react quickly, a nozzle slot cover can be ordered to close the nozzle slot.

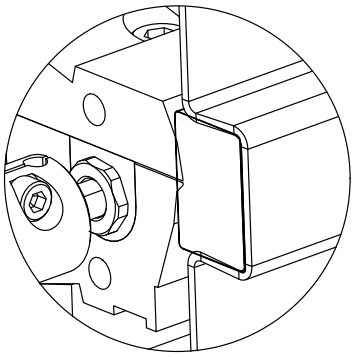
It covers the nozzle slot to protect the adhesive from exposure to air.

Installing Nozzle Slot Cover

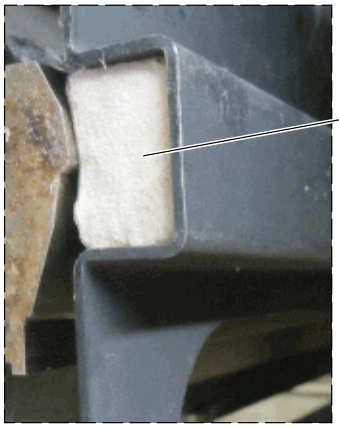
Not for PFW with web guide

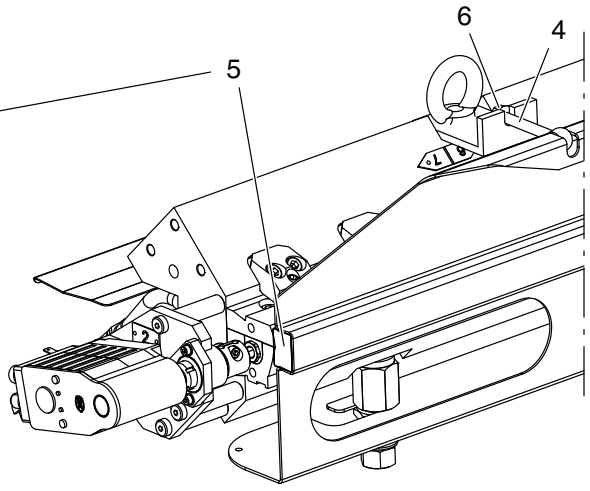






1. Increase to maximum application width.
2. Remove drip tray, if applicable (1).
3. Fasten the two brackets (2) on the nozzle slot cover to the eye bolts (3) on the applicator.
4. Put the nozzle slot cover into place and swivel around the two eye screws (4) such that they can be tightened with the nuts (6) on the bracket.
5. Tighten the nuts such that the nozzle is pressed into the rubber foam (5), effectively sealing the nozzle slot.



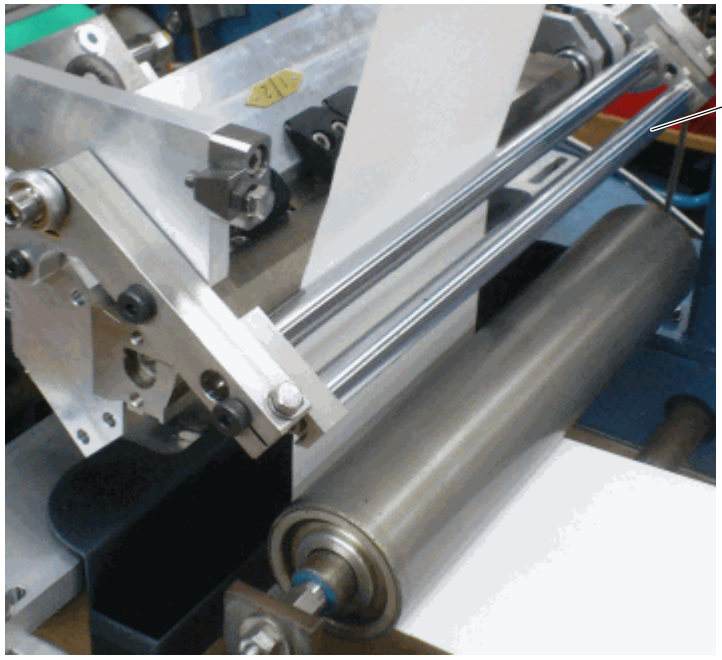


PFW: Web Guide (Option)

Standard delivery of the web guide includes fixed rods (1). They can be replaced with revolving rods.

Swiveled in

Swiveled out



Settings Record

Production information		
Material	Manufacturer	
	Max. processing temperature	
	Viscosity	
Cleaning agent	Manufacturer	
	Flash point	
Basic settings	Application weight (grammage)	
	Application width	
	Substrate speed	
	Material quantity	
	Output capacity	
Air pressure at applicator	Control air	
Basic settings	Applicator	
Temperature (heating zones)	Heated hose	
Pump speeds	Melter	
	Motor controller (setpoint)	
Material pressure	Melter	
	Motor controller (setpoint)	
Notes		
Form filled out by:		
Name	**Date**	

Maintenance Record

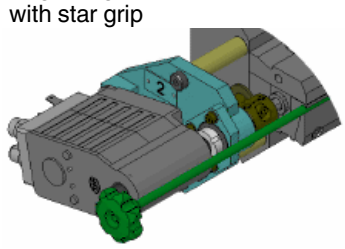
Melter part	Activity	Date	Name	Date	Name
Entire applicator					
Power cable / air hoses					
Pressure sensor					
Control module					
Nozzle					
Filter cartridge / filter screen					
Spindle / spindle nut					
Clean control panel					

Applicators with Doctor Roll

The doctor roll drive cannot be controlled via the control panel. Applicators with a doctor roll also have a separate control box.

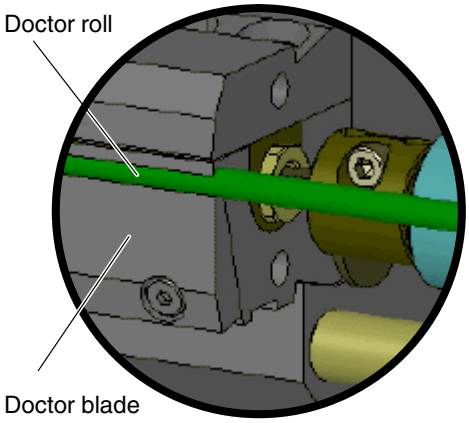
Description of Modification(s)

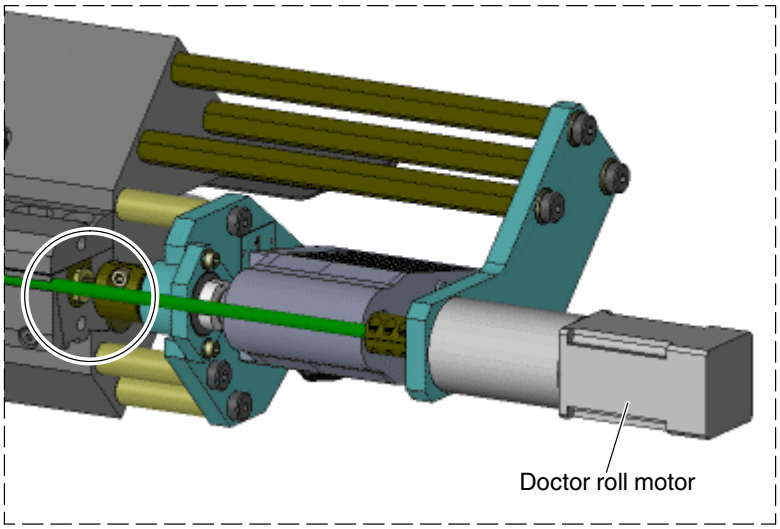
Beginning mid 2018: doctor roll with star grip



The applicator design is based on a TC-FS PUR, one difference being that it has a motor-driven doctor roll - also referred to as rotating bar. Because it has contact to the substrate, the doctor roll wears (Refer to parts list for P/N). The drive of the doctor roll motor is located in a separate control box SC200, which is described in this document.

Delivery of the applicator includes a test pin that can be used to set the proper position of the doctor roll.



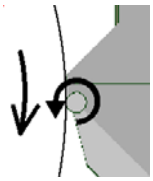


Description of Function

The slowly rotating doctor roll is located near the nozzle slot. It evenly distributes the adhesive that flows out of the nozzle slot on the substrate. It also conveys away particles to prevent stripes in the application by distributing the particles with the applied adhesive film.

When the substrate is very thin and/or only a very fine coating is applied, especially when the substrate width is less than the maximum application width, doctor blades that only have contact to the substrate in the center section should be used to prevent damage to the coating roll.

Observe



- The doctor roll speed should be max. 10 % of the web speed [m/min]. At 25 m/min: 2.5 rpm

  Also refer to *Control Box SC200 "Doctor Roll Motor," Automatic: Correction Potentiometer "Doctor Roll"*

- The doctor roll must turn in the same direction as the substrate (illustration on left).

Control Box SC200 "Doctor Roll Motor"

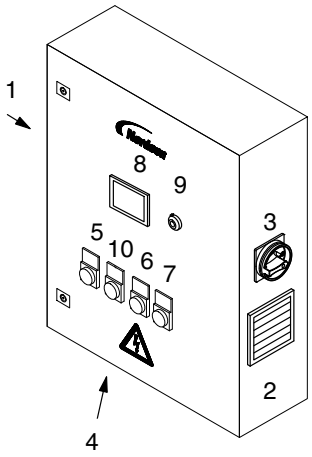


Fig. 57

The control box may not be used under the following conditions:

- In defective condition
- When changes or modifications have been made by the customer
- In a potentially explosive atmosphere
- When the degree of protection IP 40 is not complied with.

1 Fan with filter
2 Air filter
3 Main switch
4 Interfaces
5 Indication lamp *Ready*
6 Mode switch *Manual/auto*
7 Mode switch *Motor ON/OFF* in manual mode
8 Speed display
9 Potentiometer *Doctor roll* in manual mode
10 Indication lamp *Manual mode*

Store the electrical cabinet key such that it is accessible only to qualified and authorized personnel. Observe before opening the control box:

ATTENTION: Observe all safety instructions and regulations concerning energized unit components (active parts). Failure to observe may result in an electric shock.

Fan with Filter / Air Filter

The fan is maintenance-free. The filters must be cleaned or replaced, depending on dust accumulation.

A dirty filter can be recognized by its dark color. Clean by shaking the filter out.

Main Switch

Used to switch on/off the electrical cabinet.

Position 0/OFF = Electrical cabinet is switched off.
Position I/ON = Electrical cabinet is switched on.

Up to three padlocks can be used to protect the main switch from unauthorized access.

"Ready" Indication Lamp

Illuminated: The undertemperature interlock has been released. In manual mode the doctor roll can now be switched on with the mode switch *Motor ON/OFF* on the control box.

Mode Switch "Manual/Auto"

Manual mode: The motor is started and stopped with the *Motor ON/OFF* mode switch.

Automatic mode: The motor is started and stopped by external signals. The undertemperature interlock has to be released to be able to start the motor.

Indication Lamp “Manual Mode” - Beginning in 2020

Jumper inserted (wired in plug): When the operator moves the switch *Manual/auto* to *Manual*,the indication lamp remains illuminated for as long as manual mode is set.

Jumper removed: If a higher-ranking control unit switches to manual mode, the indication lamp is not illuminated.

Mode Switch "Motor ON/OFF"

Used to switch the motor on and off in manual mode.

Manual Mode: Potentiometer "Doctor Roll" (-R82 on Electrical Cabinet Door)

The doctor roll speed can be modified with the potentiometer. The current speed is shown on the speed display.

Continued ...

Automatic: Correction Potentiometer "Doctor Roll" (-R58 in Electrical Cabinet)

The speed of the doctor roll is a factor of the line speed signal from the customer (key-to-line). The speed can be reduced with the correction potentiometer.

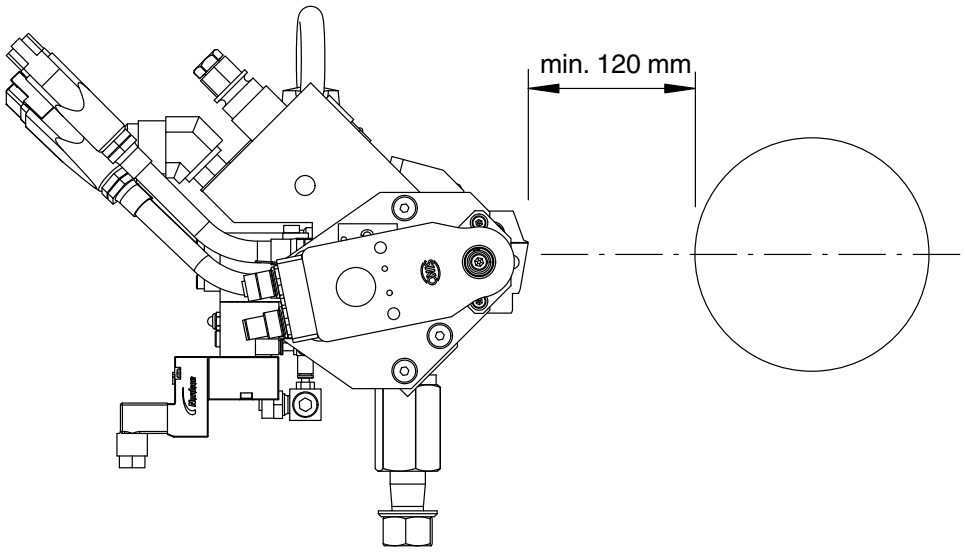
There is a scale from 0 to 10 on the correction potentiometer.
10 corresponds to 100 % of the speed controlled by the line speed.

Example
The line speed signal-controlled speed is 5 min^{-1}. The correction potentiometer is set to 5. The doctor roll then turns at a speed of 5 min^{-1} x 0.5 = 2.5 min^{-1}.

(Additional) Space Required

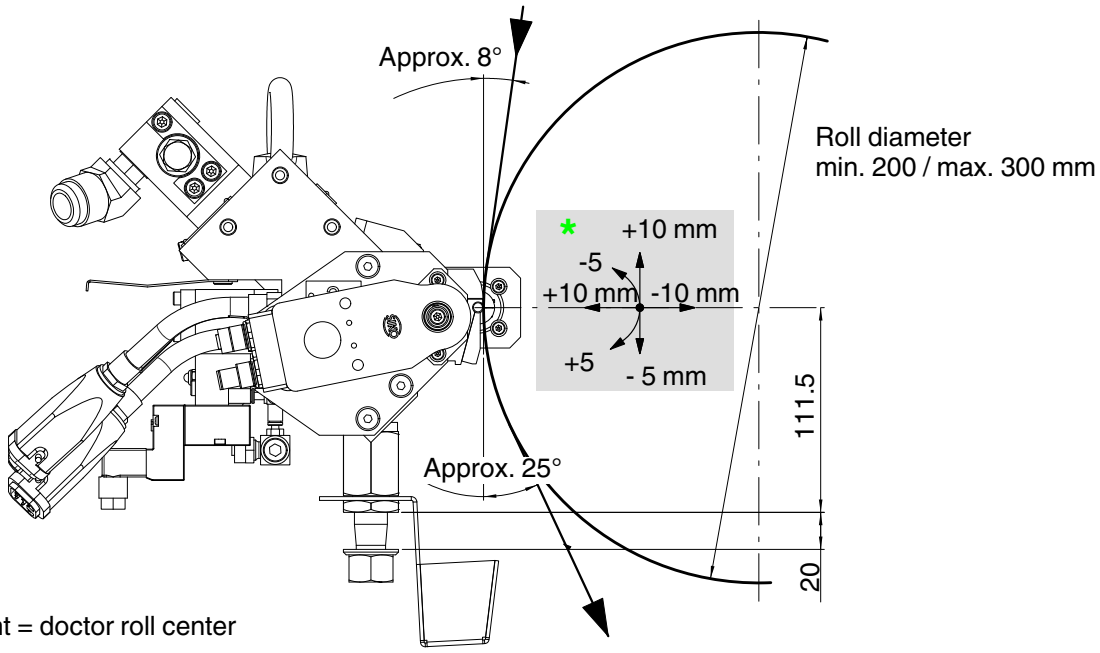
- Extracting doctor roll
- Depending on which side the nozzle is to be extracted from; also to swivel out the doctor roll motor.

Recommended Position when Production Stops



Depending on the roll surface material (e.g. rubber), a greater clearance up to 180 mm may be needed to prevent heat radiating from the hot applicator from damaging the roll surface or deforming it on one side. This would cause roll imbalance, the negative effect of which would be apparent upon beginning production.

Positioning Applicator with Doctor Roll



* Pivot point = doctor roll center

Position the applicator such that the doctor roll (2) touches the substrate (3) and the nozzle lip (1) does not. Depending on the roll diameter, the applicator may need to be tilted slightly to achieve this.

In general: Apply as little pressure as possible but as much as necessary to achieve a uniform application pattern with acceptable tolerances and minimal wear.

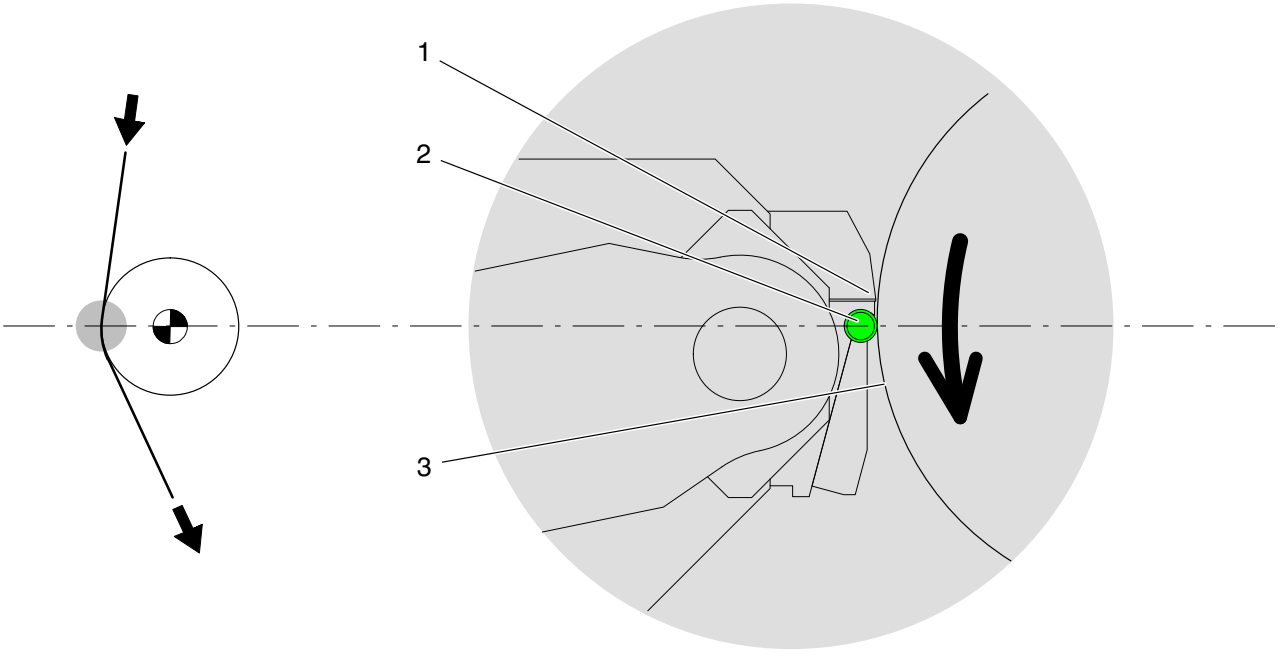


Fig. 58 Coating against a roll

Electrical Connection

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

Laying Cable

Ensure that cables do not touch rotating and/or hot components. Do not pinch cables and check regularly for damage. Replace damaged cables immediately!

NOTE: Use only shielded cables/lines. The shield must be connected to ground in compliance with the standard regarding electromagnetic compatibility.

NOTE: Inductive loads (e.g. solenoid valves) connected to the unit must be equipped with a protective device (e.g. recovery diode) that disables the inductive voltage generated when an inductive load is switched off.

Line Voltage

ATTENTION: The control box may only be operated using the operating voltage stated on the ID plate.

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

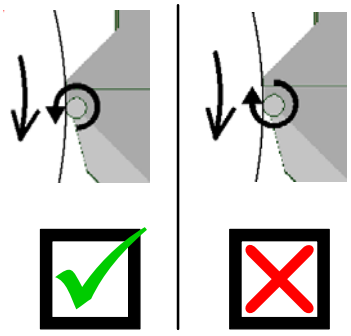
NOTE: The cross-section of the power cable must correspond to the rated current.

The mains terminals are located in the control box. Refer to wiring diagram for connecting arrangement.

Control Box SC200

The interfaces serve as the connection between the control box and other components of the system. Refer to control box wiring diagram for connecting arrangement.

"Doctor Roll" Motor



This motor - meaning the speed and direction of rotation of the doctor roll - is controlled with the control box SC200.

CAUTION: Verify that the doctor roll turns the same way as the web path direction. The wiring diagram indicates whether it turns to the left or the right. If necessary, adapt the direction of rotation to the production conditions.

Optimizing Adhesive Application with Heating Plate

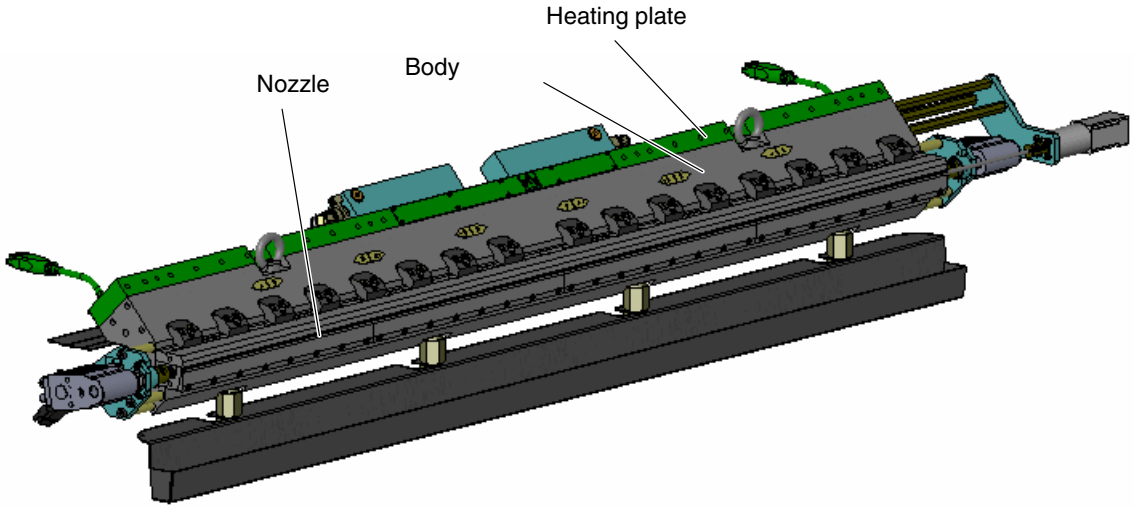


Fig. 59 Example TC-FS1400

Bending Section

The bending section is made up of the heating zones of the heating plates, also referred to as bending plates. The temperature differential to the setpoint of the body heating zones should counteract the bending (concave or convex) of the nozzles on longer applicators.

If adhesive is properly applied to the outer edges of the application pattern but not in the middle, the applicator nozzle is concave (hollow) to the coating roll.

If the adhesive is applied properly in the middle but not near the edges, the nozzle is convex (spherical).

These deviations from the parallel path can be corrected by setting different temperature setpoints for the heating zones on the back of the applicator than for the body.

NOTE: Set a temperature differential between the heating plate and body of up to ±10 °C.

Correcting Nozzle Concavity

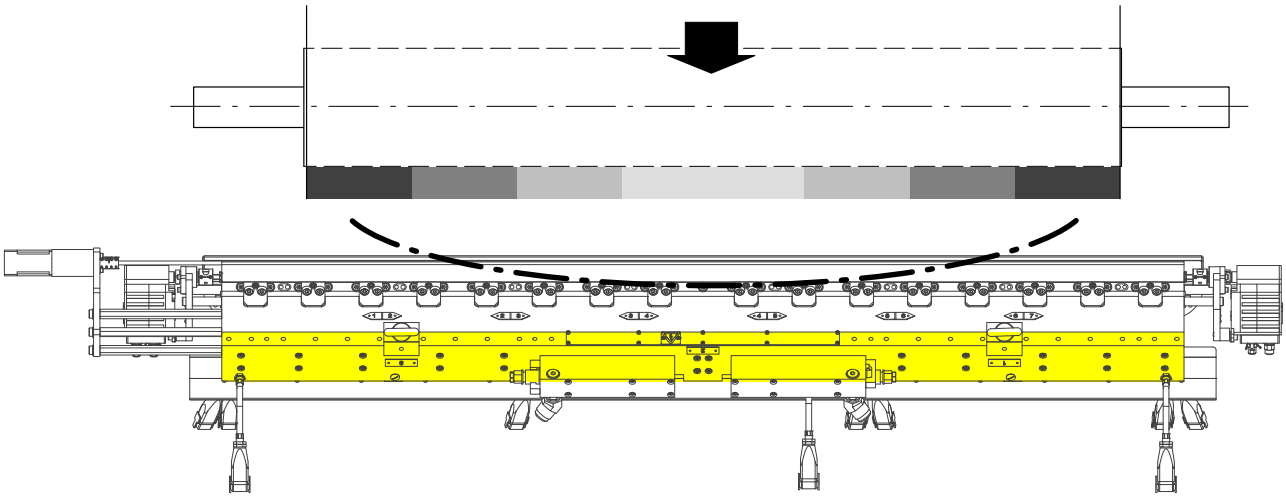


Fig. 60 Nozzle is hollow (concave)

1. Set the temperature setpoints for the heating plates one to two degrees lower than the setpoint for the body. The lesser heat expansion of the heating plate on the back of the applicator compensates for the concavity on the nozzle side.

   NOTE: Wait at least 20 min to see the result of the temperature modification. Cooling off usually takes longer than heating up.

2. As long as adhesive application is not uniform across the application width, continue to adjust the temperature setpoints in steps.

Correcting Nozzle Convexity

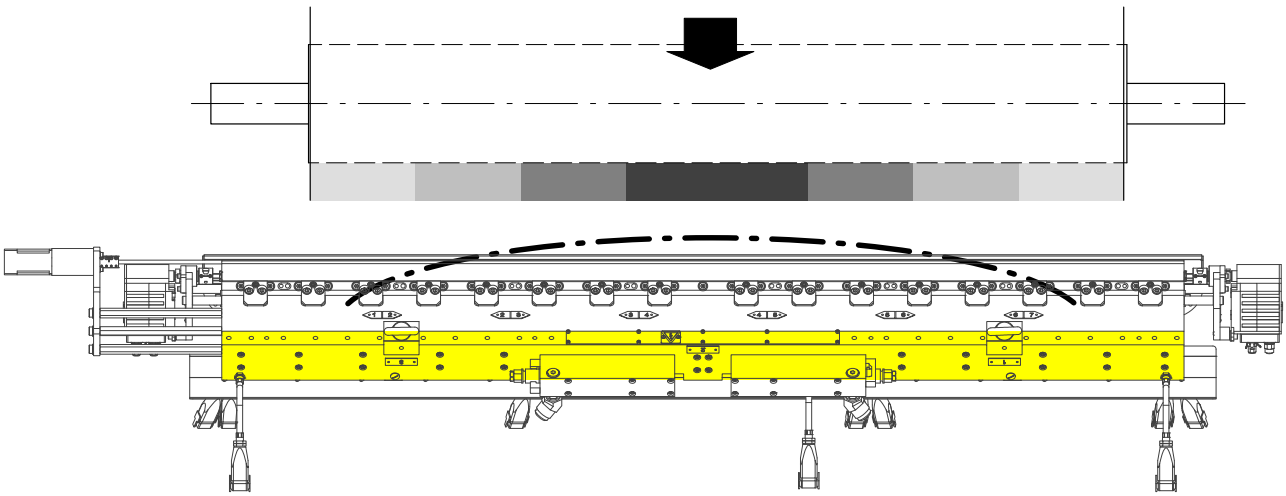


Fig. 61 Nozzle is spherical (convex)

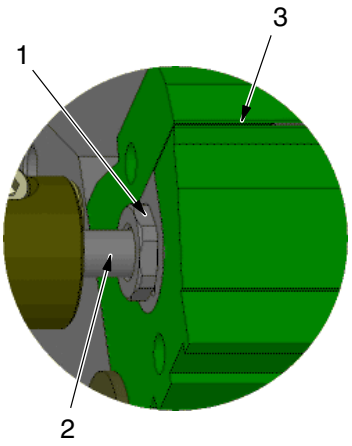
1. Set the temperature setpoints for the heating plates one to two degrees higher than the setpoint for the body. The greater heat expansion of the heating plate on the back of the applicator compensates for the convexity on the nozzle side.

   NOTE: Wait at least 20 min to see the result of the temperature modification. Cooling off usually takes longer than heating up.

2. As long as adhesive application is not uniform across the application width, continue to adjust the temperature setpoints in steps.

Recommended Procedure when Application Width is Decreased* upon Changing Product

* Adhesive is forced out when the application width is decreased. However, this does not refer to changing/adjusting the width in the course of ongoing production.



1. Pull out trolley/applicator if step 6. is not otherwise possible.
2. With the pump switched off, go to the maximum application width (maintenance position).
3. Use a narrow brass brush to clean the screw (1), spindle (2) and nozzle slot (3) on both sides of the surface nozzle.

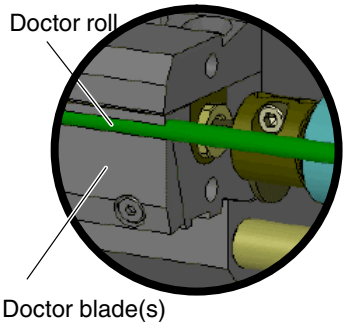
   Additionally for applicators with doctor roll and particularly for PUR: Refer to section *Extracting and Cleaning Doctor Roll (Nozzle when Installed).*

4. Purge at the maximum application width (with grammage control: set *Purge speed factor*) until the adhesive flows out free of bubbles and clots. Switch the pump off again.

   CAUTION: The maximum adhesive pressure of the applicator also may not be exceeded when purging, whether with adhesive or with a cleaning agent.

5. With the pump off, reduce to the new production application width.
6. Externally clean the nozzle.
7. Push the trolley/applicator back in.

Cleaning Doctor Blade (Nozzle Installed)



Use a brass spatula or brass brush to regularly remove adhesive before it drips or hardens.

Extracting and Cleaning Doctor Roll (Nozzle Installed)

Depending on adhesive; recommendation once per shift - takes approx. 10 min

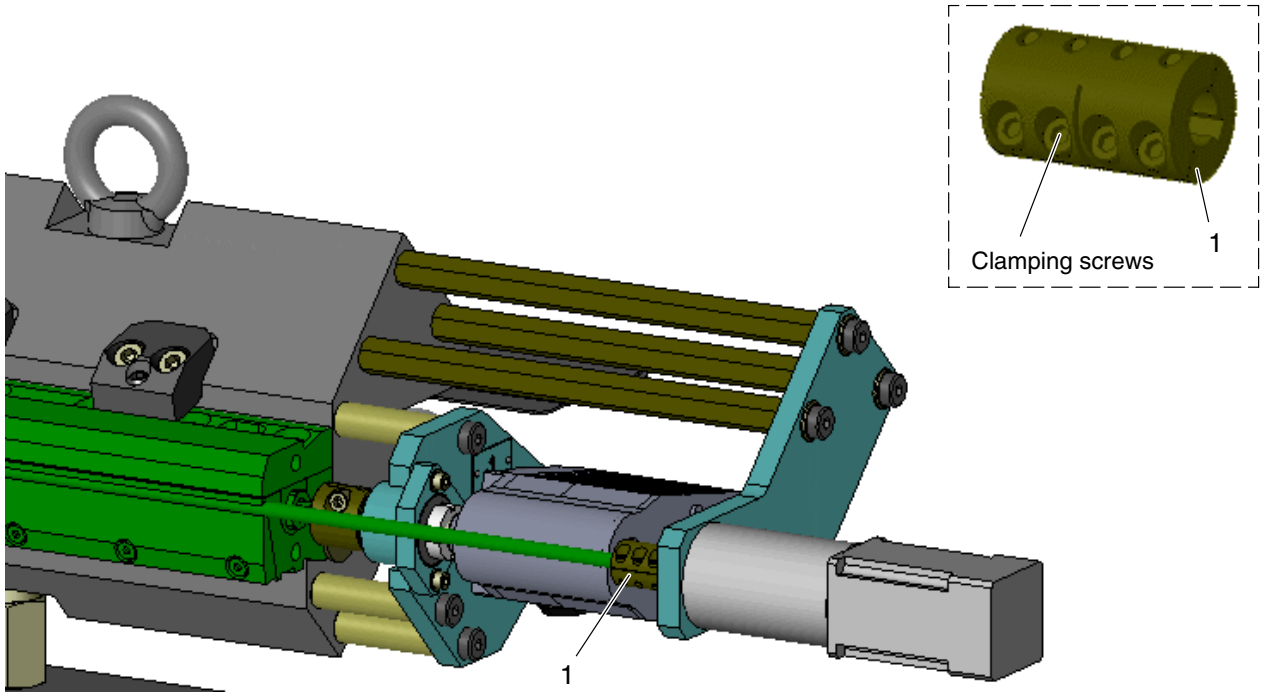


Fig. 62

1. Switch off all motors. Perform the following tasks as long as the adhesive is soft.
2. Release the clamping screws from the doctor roll coupling (1, Fig. 62).
3. Extract and clean the doctor roll.

Do not detach the doctor blades.

4. Clean the doctor roll seat. A pot scrubber works well to remove the material.
5. Slide the doctor roll back under the doctor blade.
6. Connect the doctor roll to its motor again.

Disassembling and Cleaning Nozzle

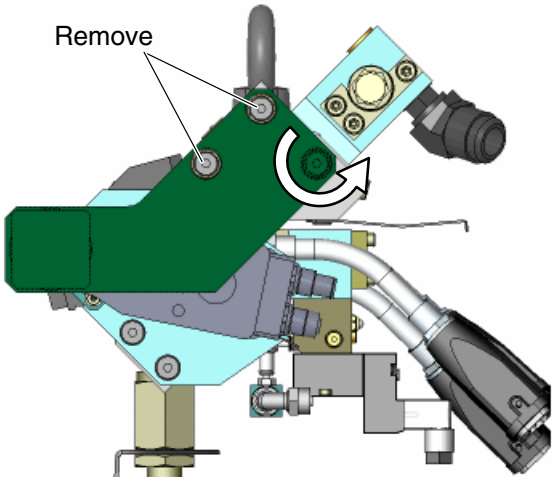
Remove the nozzle as described in the applicator manual under *Removing Nozzle* (page 70).

But before extracting the nozzle assembly, disconnect the doctor roll from its motor. Do this by switching off the motor and releasing the coupling (1, Fig. 62).

If the nozzle is to be pulled out towards the doctor roll motor, it must be swiveled out - like the servomotor.

a. Release the coupling and pull the doctor roll out of the coupling.

b. Remove two screws and washers, and release the third screw such that the doctor roll motor can be swiveled out with its side plate.



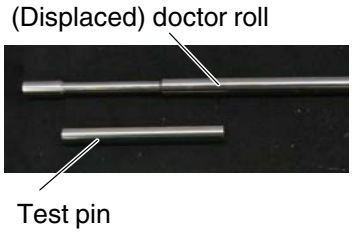
On the removed nozzle

1. Pull the doctor roll laterally out of its track and clean.

ATTENTION: Ensure that the doctor blades are not mixed up when reinstalling at a later time.

2. Then unscrew the doctor blades.

Remove and clean the nozzle as described in the applicator manual under *Removing and Cleaning Nozzle* (page 73).



NOTE: Nordson supplies a test pin with the doctor roll. It helps to optimally adjust the position of the the doctor roll. The diameter of the test pin is 0.02 mm larger than that of the doctor roll.

Continued ...

3. Clean the doctor roll seat. If there are stress marks visible on the doctor roll seat, polish them. Cutting oil on material similar to a pot scrubber polishes well.
4. Re-assemble the mouthpiece receptacle, mouthpiece, spindle and slide assembly. Refer to the instructions on page 73 ff.
5. Put the doctor blades in place and initially tighten the fixing screws only finger-tight. Finger-tight means that the doctor blades can still be repositioned.
6. Slide the test pin into the doctor roll seat, with the side that is not beveled leading. Slide the doctor blade against the test pin (photo) until the test pin just begins to jam, then tighten the screw near the test pin.

   Slide the test pin farther and repeat the procedure until the doctor blade screws are tightened.
7. Extract the test pin and save it for later use.
8. Slide the doctor roll under the doctor blade.
9. Install the nozzle in the applicator.
10. Connect the doctor roll to its motor again.

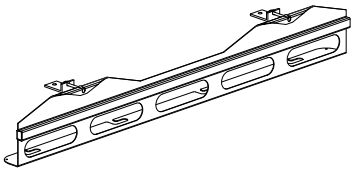
NOTE: The test pin for doctor roll ∅6 mm can be re-ordered as P/N 7183129.

Observe when Shutting Down

When work is to cease for an extended period, purge the applicator, remove the doctor roll, and clean the doctor roll and its seat.

Do not slide the doctor roll back into place until production resumes.

Nozzle Slot Cover (Accessory)



If PUR adhesives are used that react quickly, a nozzle slot cover can be ordered to close the nozzle slot.

It covers the nozzle slot to protect the adhesive from exposure to air.

NOTE: When work ceases for extended periods such as a weekend, purge the applicator, remove the doctor roll, and clean the doctor roll and its seat before putting the nozzle slot cover in place.

Page 122 *Installing Nozzle Slot Cover*.

Regular Maintenance (Additional)

Melter part	Activity	Interval
Doctor roll	Extract and clean the doctor roll Clean the doctor roll seat Inspect the surface Replace	Depends on adhesive: After every shift When worn
Control box	Clean or replace air filter	When darkened

Technical Data

Refer to the wiring diagram for information in the operating voltage, frequency and power consumption.