Extruder EX
and
EX .. UFM

Manual P/N 7179048_04
- English -

Edition 12/19

NORDSON ENGINEERING GMBH • LÜNEBURG • GERMANY

Note
This document applies to the entire series.

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

Section 1
Safety

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

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

Safety Alert Symbols

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

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

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

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

Responsibilities of the Equipment Owner

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

Safety Information

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

Instructions, Requirements, and Standards

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

User Qualifications

Equipment owners are responsible for ensuring that users:

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

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

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

Applicable Industry Safety Practices

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

Intended Use of the Equipment

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

Instructions and Safety Messages

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

Installation Practices

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

Operating Practices

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

Maintenance and Repair Practices

- Allow only personnel with appropriate training and experience to operate or service the equipment.
- Perform scheduled maintenance activities at the intervals described in this document.
- Relieve system hydraulic and pneumatic pressure before servicing the equipment.
- De-energize the equipment and all auxiliary devices before servicing the equipment.
- Use only new Nordson-authorized refurbished or replacement parts.
- Read and comply with the manufacturer's instructions and the MSDS supplied with equipment cleaning compounds.

  NOTE: MSDSs for cleaning compounds that are sold by Nordson are available at www.nordson.com or by calling your Nordson representative.
- Confirm the correct operation of all safety devices before placing the equipment back into operation.
- Dispose of waste cleaning compounds and residual process materials according to governing regulations. Refer to the applicable MSDS or contact the authority having jurisdiction for information.
- Keep equipment safety warning labels clean. Replace worn or damaged labels.

Equipment Safety Information

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

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

Equipment Shutdown

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

Relieving System Hydraulic Pressure

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

De-energizing the System

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

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

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

Disabling the Applicators

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

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

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

General Safety Warnings and Cautions

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

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

HM = Hot melt (melters, hoses, applicators, etc.)

PC = Process control

CA = Cold adhesive (dispensing pumps, pressurized container, and applicators)

Table 1-1 General Safety Warnings and Cautions

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

Continued...

General Safety Warnings and Cautions (contd.)

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

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

Continued...

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

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

Other Safety Precautions

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

First Aid

If molten hot melt comes in contact with your skin:

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

Safety Labels and Tags

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

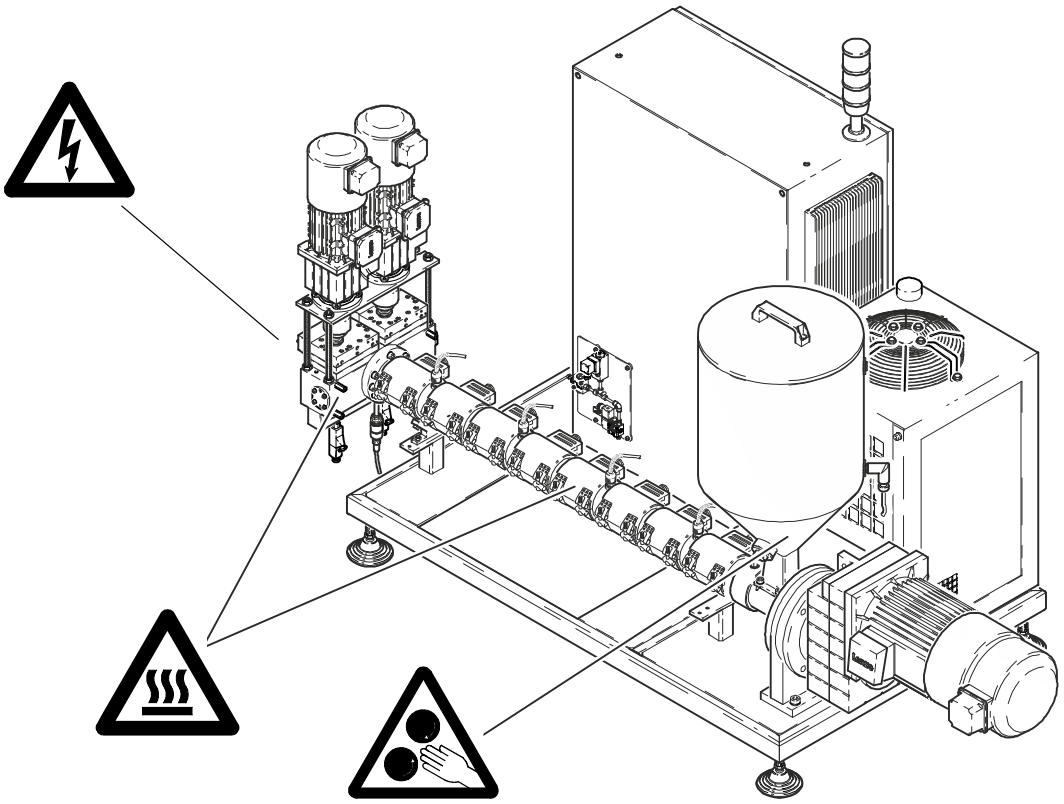


Fig. 1-1 Placement of safety labels and tags

Table 1-2 Safety labels and tags

Position	P/N	Description	
1	290083		**ATTENTION:** Risk of electrical shock. Failure to observe may result in personal injury, death, or equipment damage.
2	290081		**CAUTION:** Hot surface. Failure to observe can cause burns.
3	421461		**ATTENTION:** Risk of being drawn in by screw. Do not operate the extruder without the hopper. Do not operate the hopper without the protective grating when filling manually.

Section 2
Introduction

Intended Use

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

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

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

Area of Use (EMC)

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

Operating Restrictions

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

Unintended Use - Examples -

The extruder may not be used under the following conditions:

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

Continued ...

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

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

Restricted Use

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

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

When in doubt, please contact your Nordson representative.

Residual Risks

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

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

Note on Manual

- The actual extruder model can deviate from the illustrations.
- An application head is referred to as an applicator in newer Nordson literature. Pilot voltage is also referred to as key-to-line, regardless of the type of pilot voltage.
- For extruders with foam station: Mixer
- Depending on the size and type of the extruder, some configurations may not be permitted or they may be mutually exclusive.
- **CAUTION**: The extruder is intended for *Automatic mode*. *Manual mode* is to be equated with service mode (setup/testing) here. Operation in manual mode means lock-free. For this reason, only specially authorized personnel may operate the extruder in manual mode.

EMERGENCY OFF / EMERGENCY STOP

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

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

Both variations will hereafter be referred to as EMERGENCY OFF.

ID Plate

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

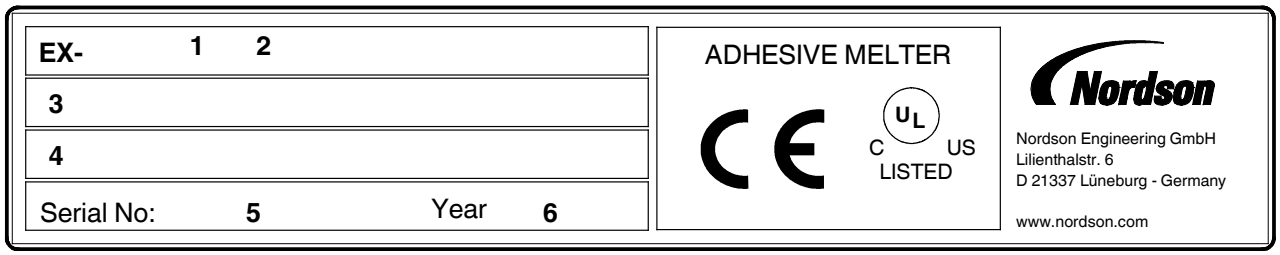
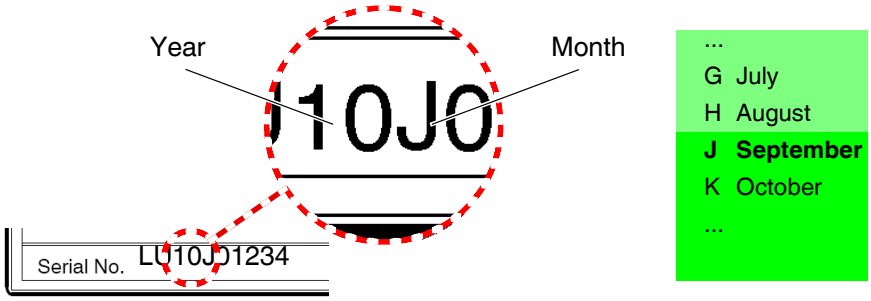


Fig. 2-1 Example

1	Designation for Nordson extruder
2	Order number
3	Configuration code
4	Electrical connection, operating voltage, line voltage frequency, melter fuse protection
5	Serial number  **NOTE:** The year and month of production are indicated within the serial number.
6	Year of construction

Configuration Code

FY2019

Box	Code	Description
1-6	EX-*003*	Extruder - *approximate melting and feeding capacity in l/h (with PA)*
	EX-*007*	
	EX-*100*	
	EX-*020*	Quasi standard P/N 7187567
	EX-*030*	Quasi standard P/N 7187467
	EX-*060*	Quasi standard P/N 7568760
		Other sizes/models are engineered
7	-	Standard
	E	Engineered
8	P	Pt100 temperature sensor
	N	Ni120 temperature sensor (operating temperature: max. 200 °C)
9 in combination with box 10	X	No metering station - flange with one hose connection
	Y	No metering station - flange with two hose connections
	R	One pump 1x1 (with recirculation connection)
	1	One pump 1x1
	2	One pump 1x2 (two outlets)
	3	Two pumps 2x1
	5	Three pumps 3x1
	7	Four pumps 4x1
10 in combination with box 9	X	No pump
	A	Maximum 10 l/h per pump
	B	Maximum 20 l/h per pump
	C	Maximum 40 l/h per pump
	D	Maximum 80 l/h per pump
	E	Maximum 160 l/h per pump
11	1	Hose connection 8 mm
	2	Hose connection 13 mm
	3	Hose connection 16 mm
	4	Hose connection 20 mm

Continued ...

Box	Code	Description
12	X	No water chiller (Customer provides the required cooling water)
	K	Separate water chiller, size S
	M	Separate water chiller, size M
	N	Water chiller, size M on extruder frame (EEX-100)
13	2	2 level sensors *Hopper almost empty / empty*
	3	3 level sensors *Hopper full / almost empty / empty*
14	X	Reserved
15	X	Reserved
16	G	Protective grating in hopper (safety guard) - standard -
	X	No protective grating (only with automatic filling)
17	X	Unit feet
	M	Wheels
18	X	Reserved
19	X	One electrical hose/applicator connection (= two temperature channels)
	1	Two electrical hose/applicator connections
	2	Three electrical hose/applicator connections
	3	Four electrical hose/applicator connections
	4	Five electrical hose/applicator connections
20	S	Control panel with 5.7" screen
	L	Control panel with 10" screen
21	X	I/O interface (no field bus interface)
	D*	Profibus-DP (* was ”P” before SEP 2017)
	N	ControlNet
	E	EtherNet/IP
	P**	Profinet IO (** was ”#” before SEP 2017)

Function

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

If a metering station is connected, extruder operation is pressure-controlled and supplies inlet pressure (preliminary pressure) of max. 25 bar for the metering station / foam station pumps.

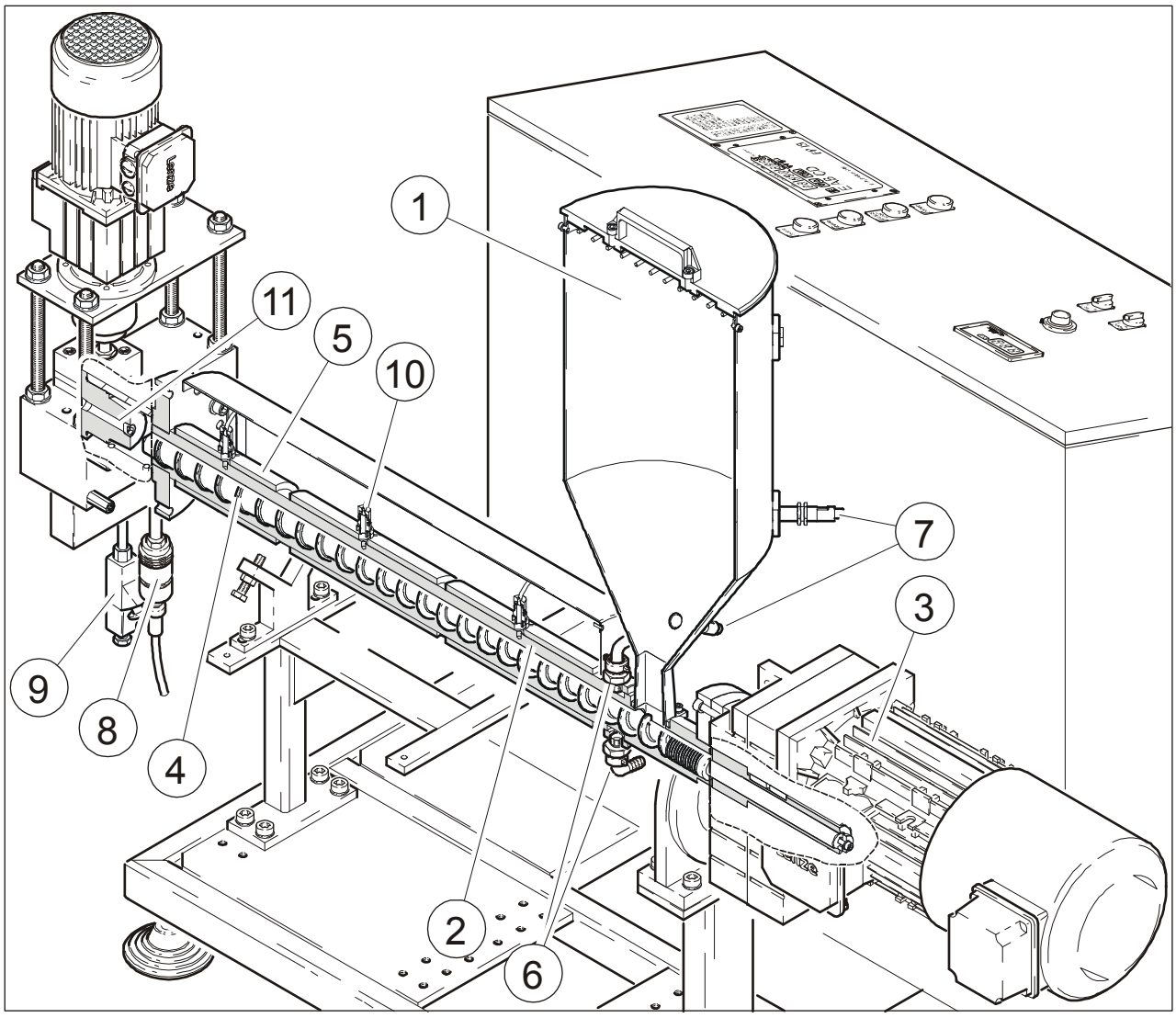


Fig. 2-2 Example with metering station

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

Description of Components

Illustration of EX-007

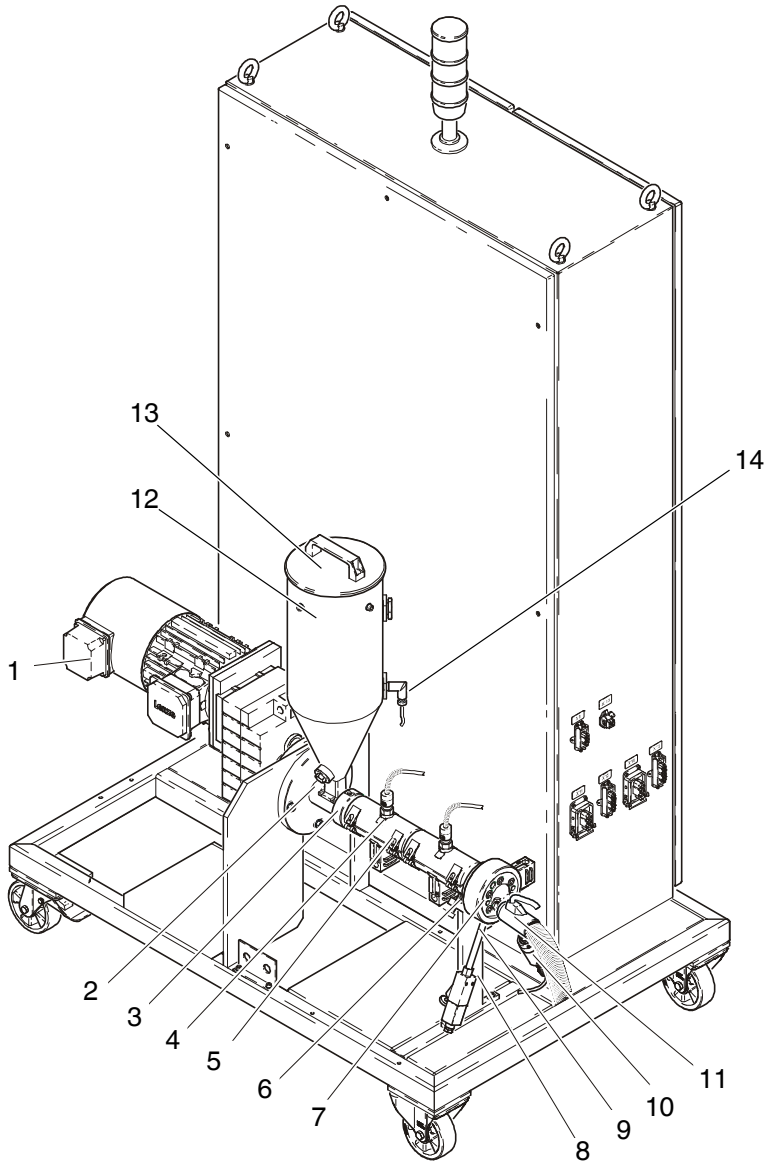


Fig. 2-3 Example without flange-mounted metering or foam station

1 Screw drive motor
2 Drain plug
3 Screw cylinder
4 Temperature sensor
5 Heating cuff
6 Flange heating cuff
7 Flange
8 Support block
9 Piston pressure switch
10 Pressure sensor
11 Hose connection
12 Hopper
13 Hopper lid
14 Level sensor

Illustration of EX-060...UFM

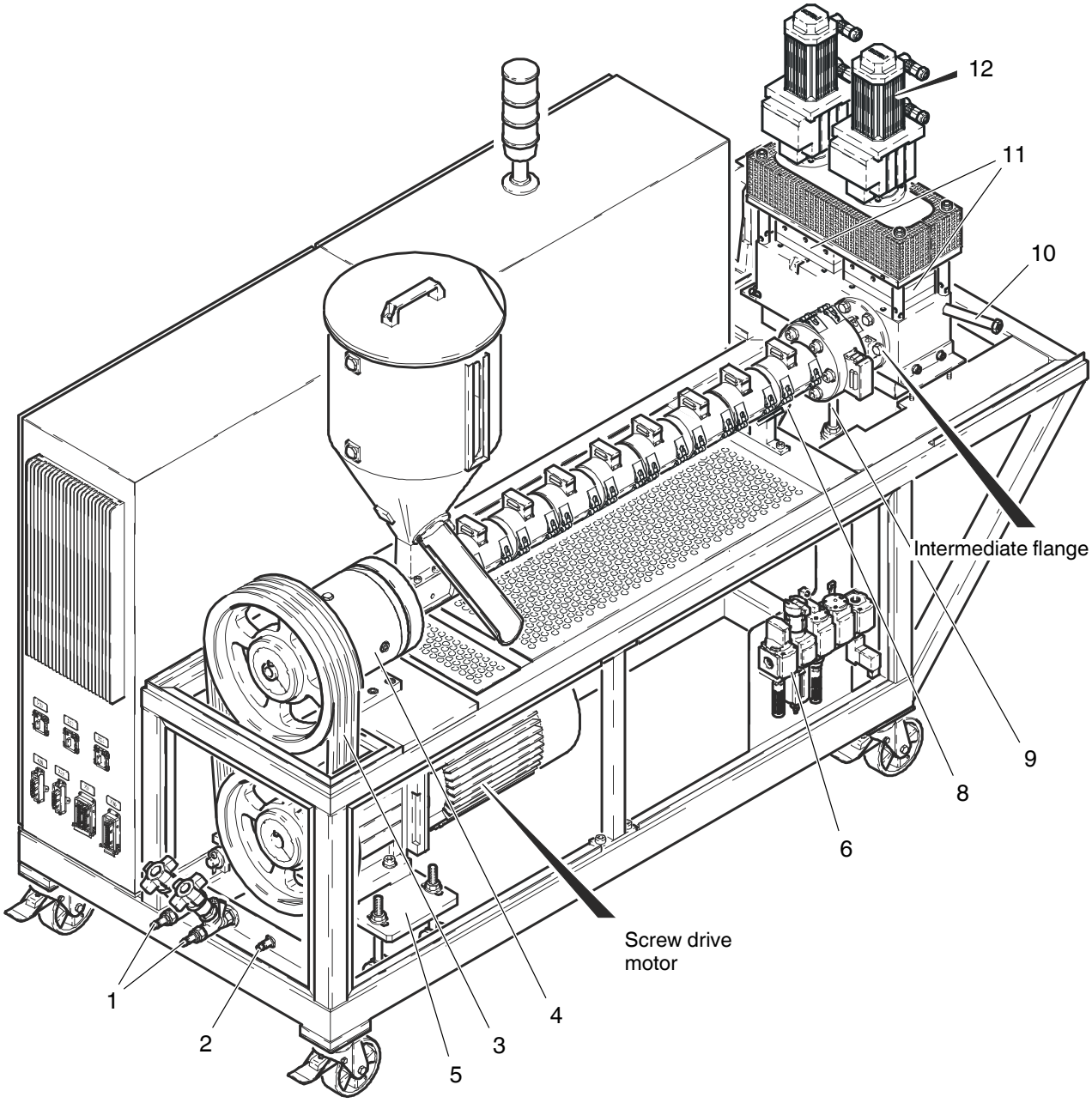


Fig. 2-4 Example with foam station

1 Water supply and recirculation
2 Compressed air connection
3 Belt
4 Thrust bearing
5 Pivoting motor base
6 Air conditioning unit
7 Pressure switch
8 Piston pressure switch
9 Pressure sensor
10 Gas supply unit
11 Loading and foam pump
12 Foam station servomotor

Electrical Cabinet (Operating Side)

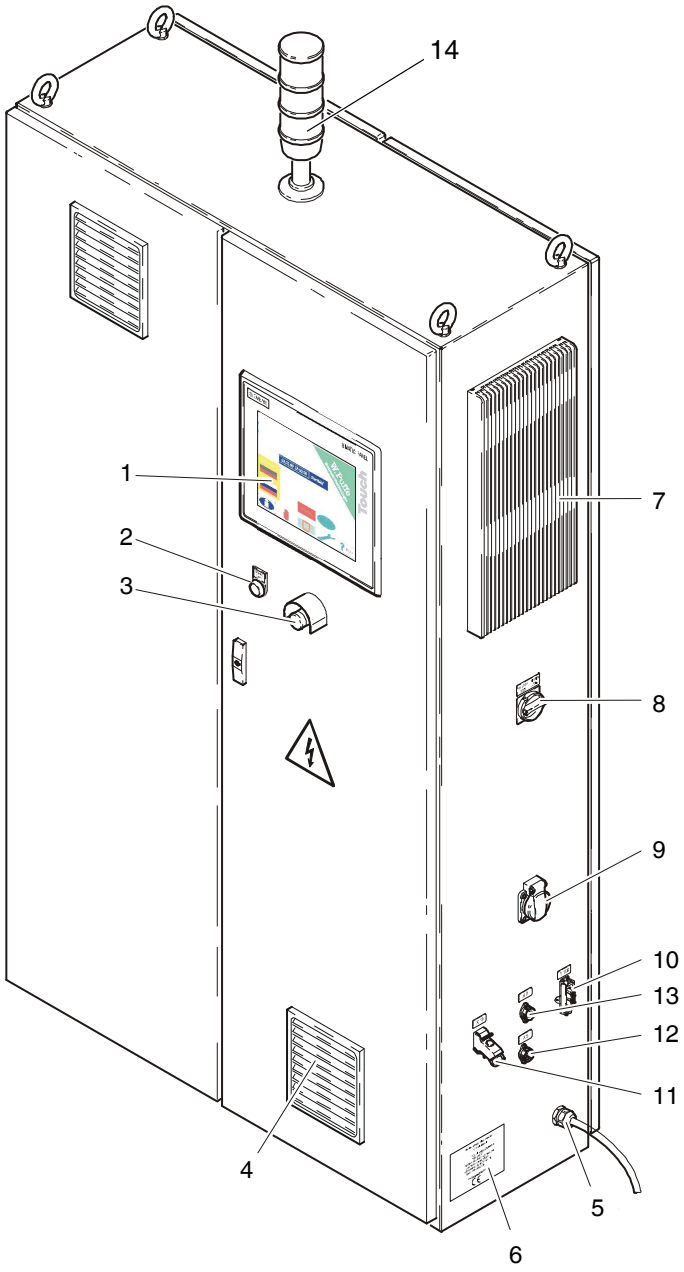


Fig. 2-5 Example

1 Control panel
2 Reset button
3 EMERGENCY OFF button
4 Electrical cabinet ventilation
5 Power cable
6 ID plate
7 Cooling element (not on all units)
8 Main switch
9 Receptacle
10 Customer I/O
11 Standard I/O
12 Enable / fault
13 Key-to-line mode
14 Light tower

Protective Devices

Protective Covers

CAUTION: Hot. Risk of burns. Wear goggles and heat-resistant gloves.

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

Covers

CAUTION: Do not operate the extruder without the covers.

The covers provide protection from the heated screw cylinder.

The covers have to be removed to tighten the heating cuffs or to remove the screw. The covers can be secured with screws, sash locks or quick-release clamps (illustration). The fasteners must be released before the covers can be removed.

Safety Guard

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

Overtemperature Protection

The system is protected by the software and by independent overtemperature fuses such as fuses or thermostats that prevent overtemperature.

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

Pneumatic Assembly and Pneumatic Bypass

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

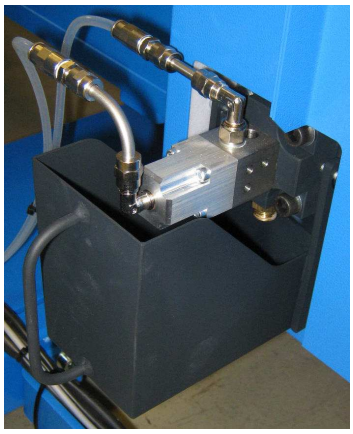
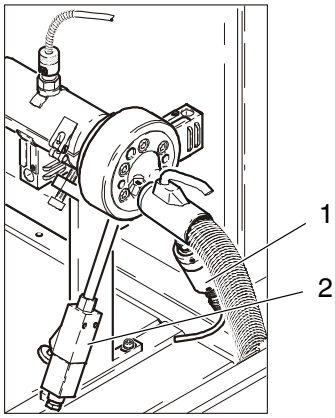


Fig. 2-6 Not on all extruder sizes.

Pressure Control / Pressure Monitoring



Electronic Pressure Control and Switchoff

The pressure sensor (1) continuously compiles the current adhesive pressure. The electronic pressure controller regulates the screw speed according to the set setpoint pressure.

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

NOTE: Refer to separate manual for information on pressure sensor with integrated evaluation electronics.

Piston Pressure Switch

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

Fig. 2-7 Example with metering station

Mechanical Bypass

There is a compression spring (3) in the bypass valve. If the set pressure is exceeded, the adhesive circulates in the bypass plate.

For information on how to set the pressure, refer to the section *Installation*.

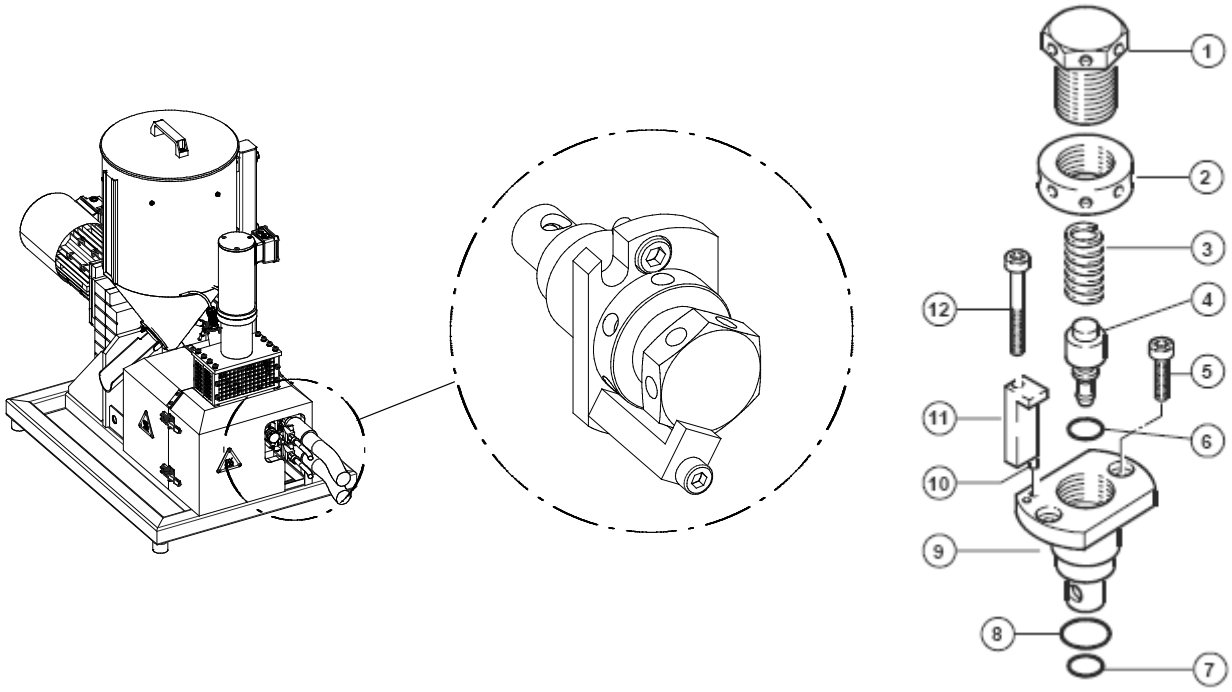


Fig. 2-8

Drive

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

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

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

Hopper

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

Some models have a detection hole through which the operator can check the granulate level.

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

- Hopper empty (1)
- Hopper almost empty
- Hopper full

Filling Area

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

Screw Conveyor

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

The screw conveyor is divided into three different zones:

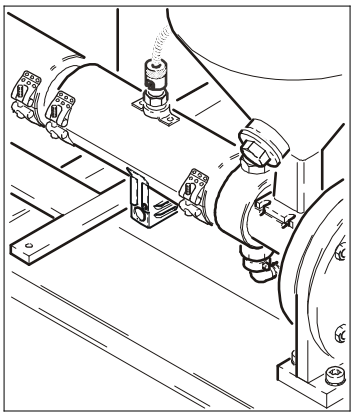
1. Feed zone
2. Compression zone
3. Pumping zone

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

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

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

Screw Cylinder



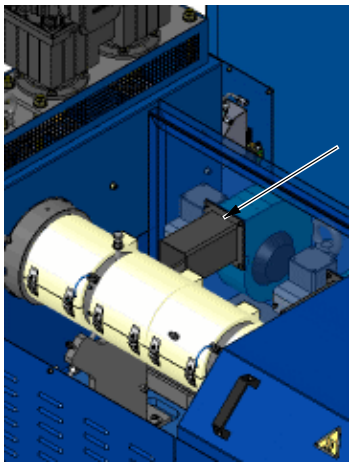
Depending on what is ordered, the inner bore of the screw cylinder is either nitrided, specially nitrided or made of bimetal. It may be equipped with a resin bushing in some places. This is important for processing abrasive adhesives.

Heating Cuff

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

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

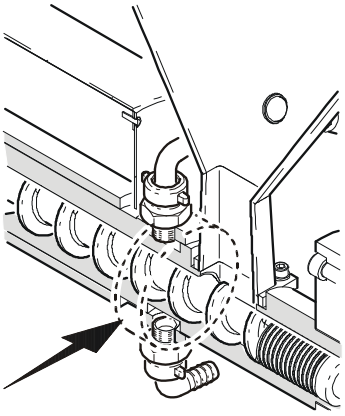
Temperature sensors compile the temperature values.



Air Cooling

Some models require screw cylinder air cooling. The heating cuffs or fan are switched on and off for each heating zone, depending on the temperature.

Cylinder Feed Cooling



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

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

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

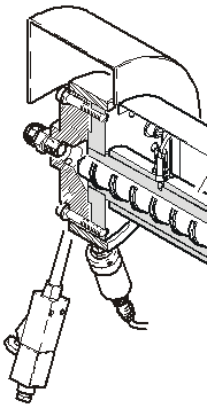
There is one hose connecting piece each for water supply and water draining.

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

Before the extruder is started up, it must be decided whether the feeding section should be operated *Hot* (approx. 40 to 60 ° C) or *Cold*. This depends on the material to be processed.

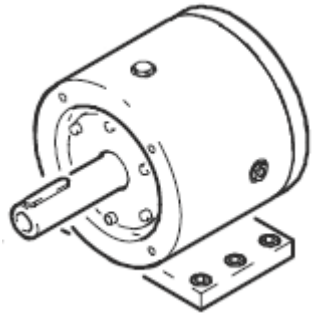
NOTE: *Cold* means approx. 15 to 20 ° C and is standard for the adhesives that are normally processed with Nordson extruders. The water chillers offered by Nordson are designed for this temperature range.

Extruder Flange



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

Compensation Bearings / Thrust Bearings



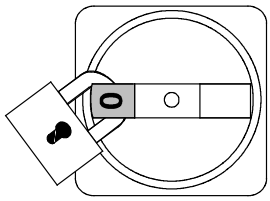
With small extruders, the gear box can absorb back pressure coming from the extruder screw.

But when the extruder exceeds a certain size, the back pressure is too high for the gear box. Then additional compensation bearings or thrust bearings (fan belt drive) absorb the pressure. This prevents the back pressure force from penetrating the gear box.

Refer to Fig. 2-4

Main Switch

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



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

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

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

Padlocks can be used to protect the main switch from unauthorized access.

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

Black Main Switch (Special Model)

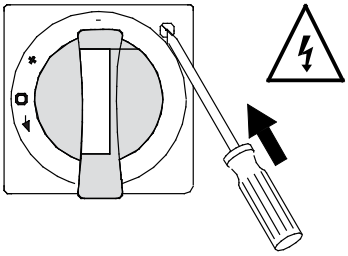
Systems with a black main switch are normally supplied with power by a higher-ranking system; the higher-ranking main switch is on that system. The black main switch does not serve as an EMERGENCY OFF feature. Connected components can still be energized!

Power Switch (With Overcurrent Shutdown)

The power switch replaces the main switch on some extruder models.

Position	State	Notes
0 OFF	Switched off (door locked)	When in this position, the main switch can be secured with up to three padlocks. To open the electrical cabinet door, turn the dial to RESET
+ TRIP	Automatically switched off (door locked)	The switch automatically jumps to **+**TRIP when overcurrent occurs To switch from **+**TRIP to **I** ON, first switch to position RESET
I ON	Switched on (door locked)	
RESET	(door unlocked)	

Only for Qualified Personnel



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

When the electrical cabinet requires work that can be performed only when line voltage is supplied, override the door lock with a screwdriver. Refer to the illustration at left.

Then close the door again. Then the door is locked again.

EMERGENCY OFF Button

The EMERGENCY OFF button is red, on a yellow field.

When the EMERGENCY OFF button has been pressed, it must be pulled out to be unlocked before switching on the system again.

Receptacle

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

Light Tower

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

Door Lock

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

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

Control Panel

On the control panel (touch screen), values and parameters are set, and operating modes and faults are displayed.

Refer to the section Operation and the separate manual for the control panel.

Reducing Temperature Inside Electrical Cabinet

Electrical Cabinet Ventilation and Cooling Element

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

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

Electrical Cabinet Cooling Unit (Depending on Application)

The cooling unit consists of a vaporizer, a compressor, a condenser and an expansion valve; it is operated with a cooling agent. Refer to the manufacturer's manual.

Cold Plate Cooling

Diverts the generated heat directly at the motor controller. Not used with all extruder sizes.

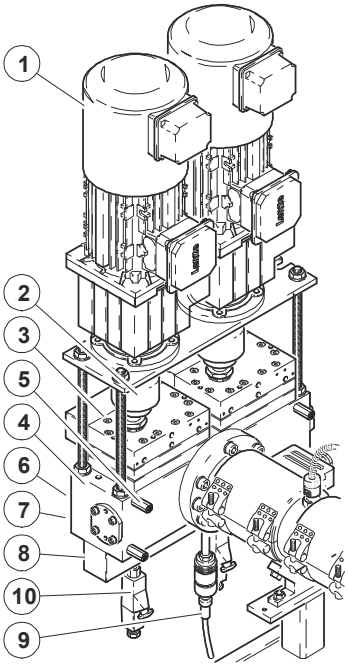
Interfaces

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

Field Bus Interface (Option)

The field bus interface enables remote operation by a higher-ranking control unit (master). Nordson systems on the field bus are always slaves.

Metering Station (Option)



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

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

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

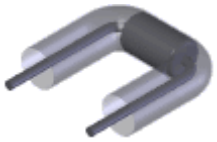
Fig. 2-9

Piston Pressure Switch

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

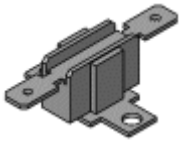
Since 2015, pressure sensors with safety switch contact ”PL c” are also used instead of the piston pressure switches (10, Fig. 2-9).

Overtemperature Fuse (Behind Electrical Cover)



Fuse

Overtemperature shutdown at switchoff values of 180 °C, 240 °C or 280 °C. When they have been triggered, these irreversible overtemperature fuses have to be replaced.



Thermostat

Thermostats are also used in place of fuses. Take into consideration the switchoff temperature when ordering spare parts (Refer to extruder parts list).

Foam Station Ultra FoamMix (Special)

For foaming polyamides, polyolefines and polyesters. Foaming reduces adhesive consumption, and with some adhesives it also reduces energy consumption.

In the foam station, the adhesive is pressurized and mixed with air or inert gas. The gas expands during application and foam forms. Refer to Appendix D, *Determination of Foam Density*.

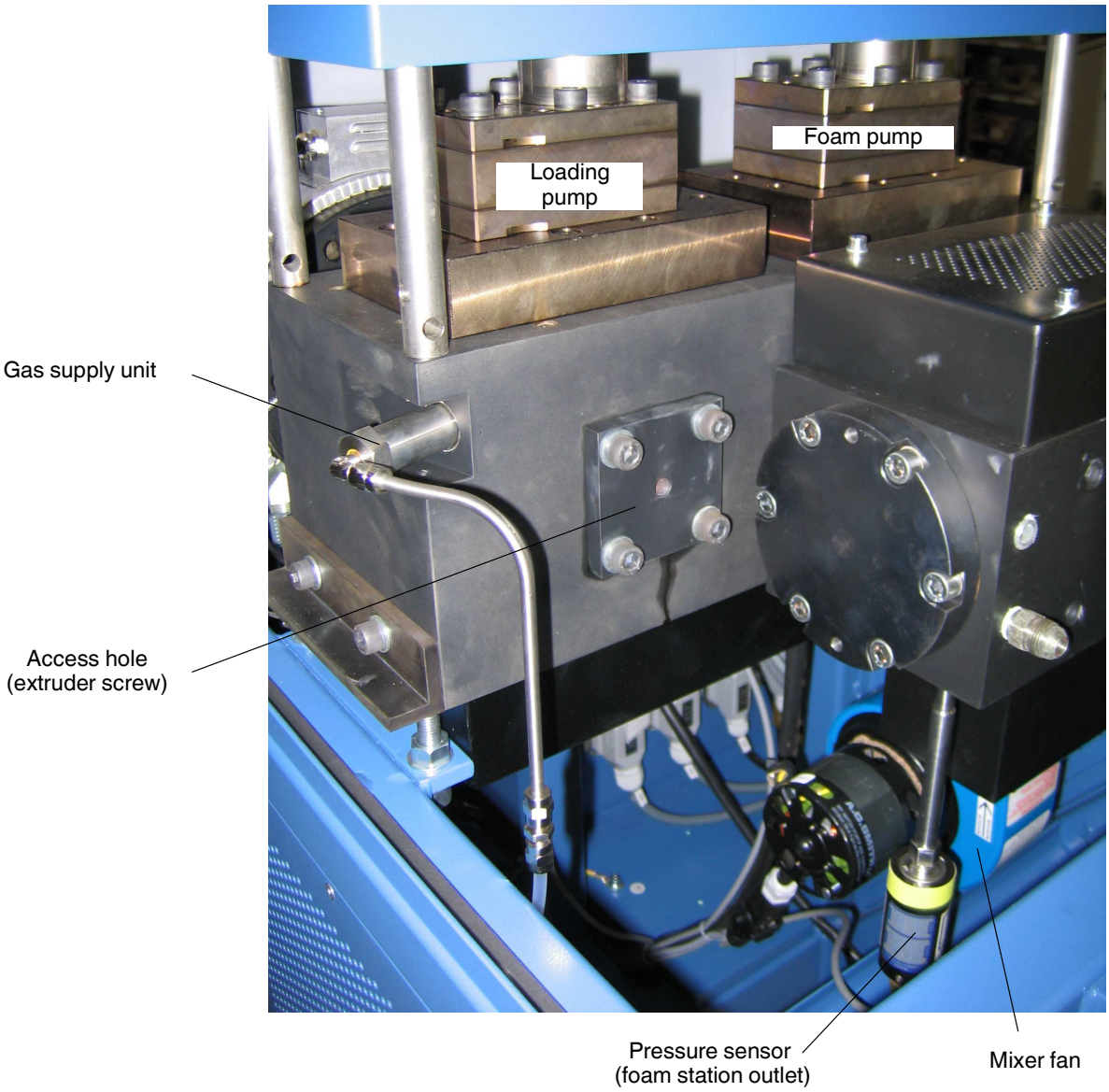


Fig. 2-10

Description of Function

The loading and foam pumps are part of the foam unit. The foam unit, gas supply unit and mixer unit form the foam station.

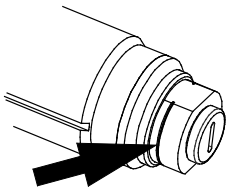
At the foam station outlet there is a pressure sensor (usually 350 bar) that is responsible for pressure-controlled operation of the foam station.

Loading Pump

The extruder is pressure controlled and supplies the foam station with adhesive. The loading pump feeds the metered adhesive to the foam pump. At the same time, gas is provided via the gas supply unit.

Gas Supply Unit

The gas supply unit works like a flap valve to prevent adhesive from penetrating the gas supply.



NOTE: The fine thread on the gas supply valve is a left-hand thread, recognizable by the circumferential groove (arrow). Screw in carefully.

Foam Pump

The foam pump feeds the metered and pressure-controlled gas adhesive mixture to the mixer unit.

Mixer Unit

Gas and adhesive are homogenized in the mixer unit. Mixer unit cooling is regulated by the temperature.

The mixer can be operated either at a fixed speed or as a factor of the foam pump speed. Then the speed is automatically adjusted over the entire speed range.

Operation at a fixed speed is sufficient in most cases. The speed should be as low as possible to not decrease the mixer unit's serviceable life any more than necessary.

Examples of Foamed Adhesive Beads

Since the adhesive either hardens quickly or is viscous, the gas bubbles are trapped in the adhesive instead of escaping.

The foam rate, meaning the proportion of foam, is the amount of gas compared to the amount of adhesive to be applied. It is usually calculated using the adhesive density (900 kg/m^3) and the density of the foamed adhesive (230 ... 270 kg/m^3). (900-270):900 or (900-230):900 means that the proportion of foam is 70 ... 74 %.

The foam rate describes the ratio between the loading pump speed and the foam pump speed.

Continued ...

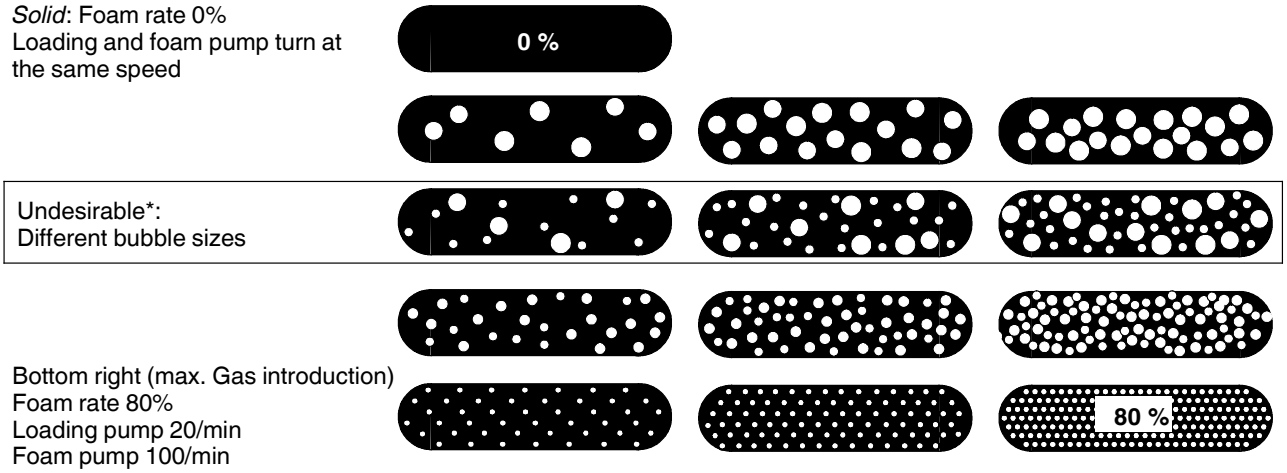


Fig. 2-11 Relationship between foam rate and mixer speed

* Increase mixer speed in small steps

Using a Pressure Relief Valve to Prevent Overpressure Malfunction During Longer Breaks in Production

Pressure relief prevents an overpressure malfunction, which can occur during longer breaks in production (screw not moving). When the set pressure is exceeded, the adhesive is conveyed into the container before it even reaches the foam station.

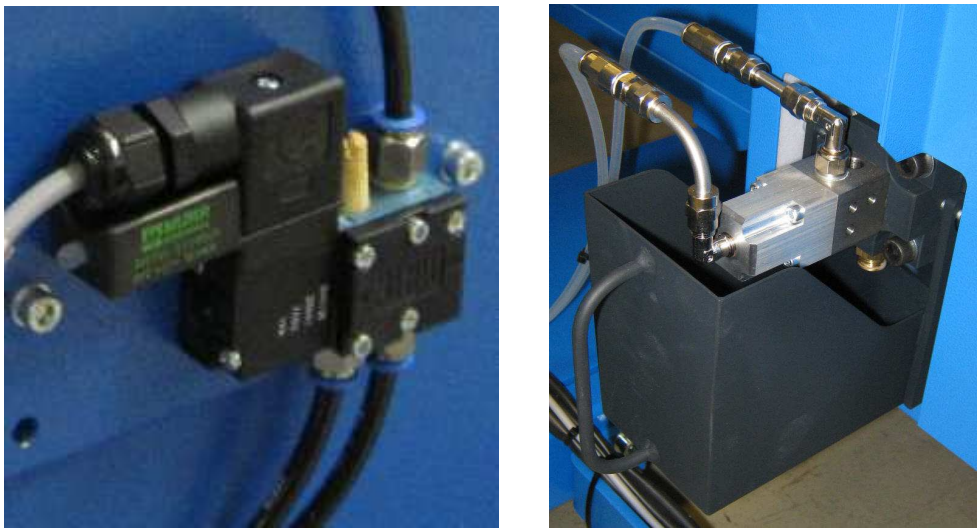


Fig. 2-12 Solenoid valve (left) - pressure relief valve with container

Section 3
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 any damage caused during shipping. Transport damage must be documented by the shipper and immediately reported to Nordson.

Save the pallet and angle brackets for later use. Reuse packaging materials or dispose of properly according to local regulations.

Transport

Refer to page 3-2, *Transport*.

Storage

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

Removal

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

Disposal

Properly dispose of the system according to local regulations.

Transport

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

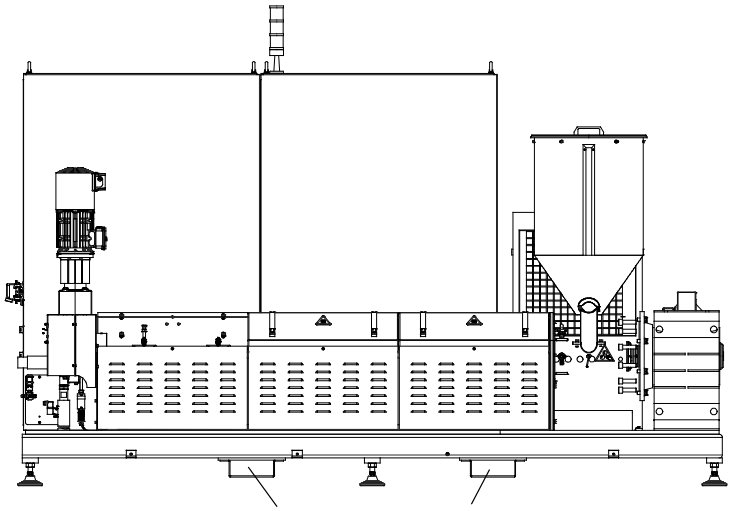
- The system must be transported in a position that is suitable to production. Use transport protection if available.
- Use only suitable transport devices. Also refer to *Lifting (Unpacked Unit).*
- If possible, use the pallet on which the system was delivered, and fasten the system to the pallet
-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

Lifting (Unpacked Unit)

Lift only at the unit frame using suitable lifting equipment or a forklift.

Depending on the size of the extruder, there are eye-bolts and/or other fittings for securing to the forks on the forklift.

CAUTION: Larger extruders can weigh several tons.



Weight approx. 4500 kg

Forklift forks

Fig. 3-1 Example of EX160

Lifting the Metering Station

CAUTION: In there is an eye-bolt in the middle of the metering station, the eye-bolt plate nuts may only be fingertight; otherwise heat expansion will cause the metering station to warp.

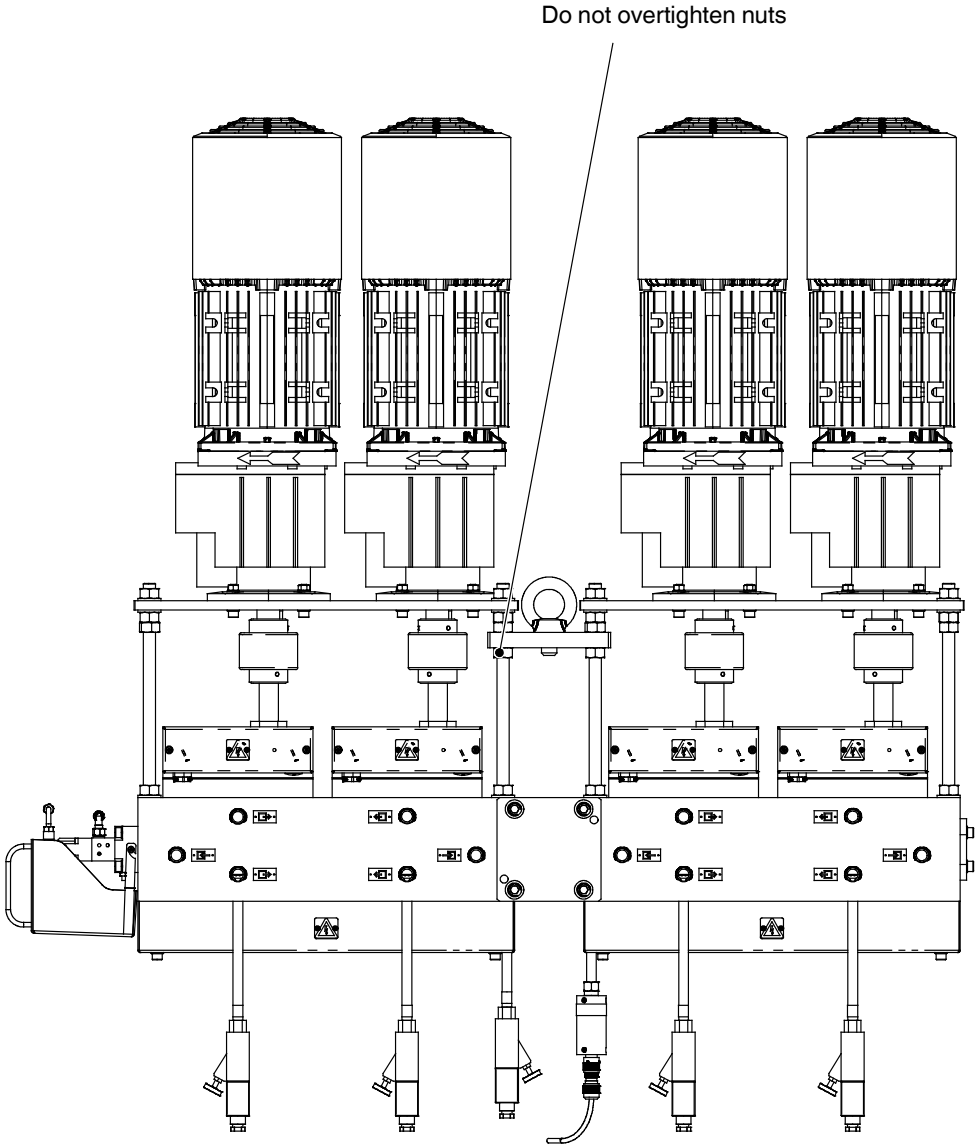


Fig. 3-2 Example P/N 7188094

Installation Requirements

A horizontal surface is required for setting up the equipment.

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

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

Space Requirement

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

Exhausting Adhesive Vapors

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

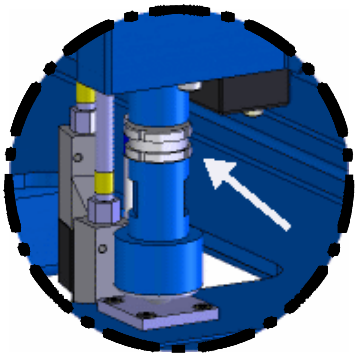
If necessary, exhaust adhesive vapors and/or provide sufficient ventilation of the location of the system.

Installation Personnel's Experience

The instructions contained in this section are intended for personnel with experience/authorization in the following fields:

- Application methods with hot melt adhesive or similar materials
- Industrial electrical wiring of power and control lines
- Industrial mechanical installation
- General knowledge of process control.

Setting Up



- **CAUTION:** After every transport, the motor, coupling and pump should be inspected and, if necessary, adjusted.
- Refer to Appendix C, if the unit has a level compensating element (left illustration).
- The light tower must be screwed onto the electrical cabinet (It was removed before delivery).
- Check if there is (red) transport protection in the unit:

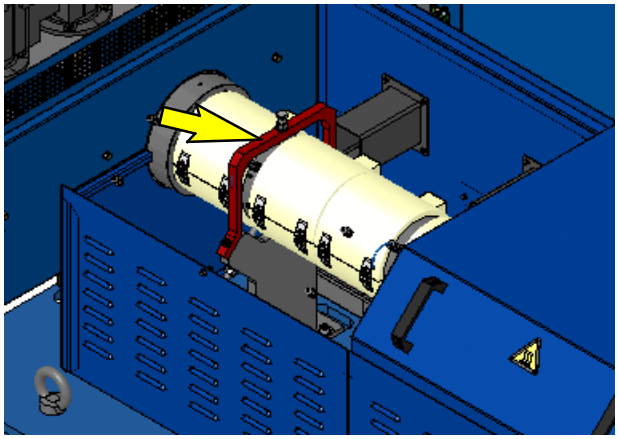
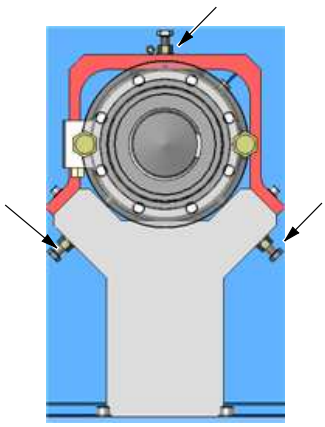


Fig. 3-3 Transport protection

If There is Transport Protection - IMPORTANT -

Do not remove the transport protection until the unit has reached its final destination. Always remove it BEFORE starting up the system.

1. All of the screws are tightened when the unit leaves the factory. Remove the red transport protection and loosen the other two screws (Fig. 3-4).
2. Refer to Appendix C, if the unit has a level compensating element. Align the unit while it is cold.
3. Two hours after the unit is “Ready” and is hot, adjust the screws on each side such that they are 0.3 mm away from the cylinder (heat expansion).



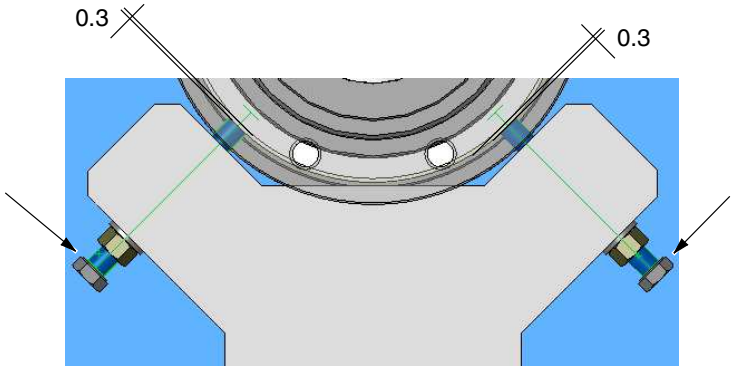


Fig. 3-4

Electrical Connections

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

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

Laying Cable

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

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

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

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

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

Connecting External Transformer

ATTENTION: First connect the transformer, then connect the extruder!

If the transformer cable is already connected to its circuit breaker and threaded to the outside but not yet connected to the transformer, there is dangerous voltage at the end of the cable when the extruder is connected to the power supply.

Line Voltage

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

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

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

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

Protective Ground and Fuse Protection

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

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

External Control/Signal Circuits

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

EMERGENCY OFF Module (Option)

Either plug in the bridge or integrate into the EMERGENCY OFF chain.

If this is not done, the system has the same status as if the module were triggered, meaning that it cannot be started.

Connecting Interfaces

The connecting arrangements are shown in the wiring diagram.

Standard I/O

Serves as a connection between the system and external devices.

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

External EMERGENCY OFF Chain

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

Pilot Voltage Input

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

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

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

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

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

P/N 7588044
(replacement for
7140205)

Coupler
component
P/N 7140205:
0-200/0-10V_{DC}

Fig. 3-5

Field Bus (Option)

Beginning SEP 2017: D = Profibus-DP; P = Profinet IO; N = ControlNet; E = EtherNet/IP

CAUTION: Input via the control panel and access via the field bus or interfaces are not interlocked against each other.

7115660

7188034

The Profibus-DP/DP coupler P/N 7115660 and the Profinet IO PN/PN coupler P/N 7595044 (replacement for P/N 7188034) are offered for Siemens. These couplers are described in the document *Nordson Melters on Field Bus with Siemens (Master) PLC*, available in German (P/N 7580294) and in English (P/N 7580295).

Example of DP/DP Coupler (Siemens)

The two coupled networks - system and customer network - each require an address for communication; each address may be assigned only once in the entire field bus. The master in the system network is the CPU.

The Profibus addresses can either be set with the DIP switches or projected with STEP 7 (observe switch setting ADDR). An address set with a DIP switch is not accepted until the system is restarted.

NOTE: Other functions are also set with the DIP switches. When spare parts are needed, take the settings from the old DP/DP coupler.

To ensure fault-free operation, the field bus must be equipped with a bus terminating resistor at the beginning and the end of a PROFIBUS segment.

Example of DP/DP Coupler ”PAS153” (Helmholz) - Obsolete

The bus subscribers on the field bus each require an address for communication; each address may be assigned only once in the entire field bus. Valid addresses: 1 to 125.

The Profibus address is set with a DIP switch (arrow). The set address is not accepted until the system is restarted.

To ensure fault-free operation, the field bus must be equipped with a bus terminating resistor at the beginning and the end of a PROFIBUS segment.

Analog Modem for PC Connection

Also refer to separate manufacturer's manual *SSW7-TS*.

PC Connection

If the modem is to be used solely as a PC adapter, set the switch on the bottom of the casing to *PC*. The modem is then switched off.

Connect the PC to interface RS232.

Remote Maintenance (Special Feature)

Prerequisite: There must be an analog telephone socket near the electrical cabinet.

1. Set the switch on the bottom of the casing to *TS*.
2. Connect the analog modem (connection *Line*) and the analog telephone socket with a telephone cable.
3. Switch on the extruder.
4. Call Nordson.

   Please have the phone number of the modem connection and the system serial number handy so that a service technician can dial into the system and have the corresponding documentation at hand.

Pneumatic Connection

Pneumatic Bypass (Pressure Relief)

NOTE: Not on all extruder sizes.

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

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

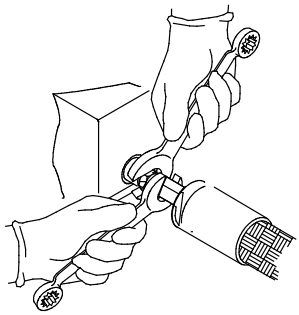
Foam Extruder

With foam extruders that use conditioned air for foaming, the compressed air for the bypass is usually diverted from the air conditioning unit.

Connecting Heated Hose

Also refer to the hose manual.

Using Second Open-end Wrench

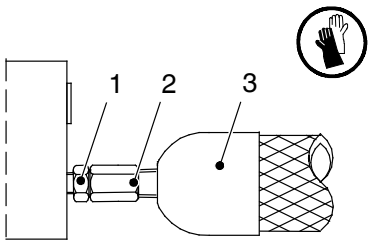


Use a second open-end wrench when connecting and disconnecting the heated hose. This prevents the hose connection on the unit from turning.

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

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

Connecting



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

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

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

Disconnecting

On Extruder or Metering Station

ATTENTION: System and material pressurized. Relieve system pressure before disconnecting heated hoses. Failure to observe can result in serious burns.

On Foam Station

ATTENTION: System and material pressurized. **Escaping compressed foam can be explosive.** Relieve system pressure before disconnecting heated hoses. Failure to observe can result in serious burns.

Relieving Adhesive Pressure (EX)

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

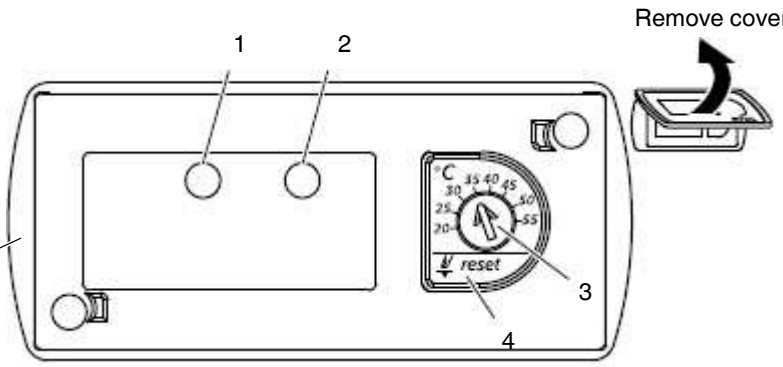
1. Set the motor speed to 0 min-1 (rpm); switch off the motor(s).
2. Place a suitable container under the applicator / assembly handgun.
3. Activate the applicator / assembly handgun electrically or manually. Repeat this procedure until no more adhesive flows out.
4. Properly dispose of adhesive according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

Relieving Adhesive Pressure (EX .. UFM)

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

1. Depending on model: On the control panel, set the foam rate to 0 % (solid) or use the key *Foam* to set to *Solid*.
2. Purge until foam no longer flows out.
3. Switch off the extruder screw motor.
4. Allow the foam station pumps to continue to turn until the adhesive pressure has returned to 0 bar.
5. Properly dispose of adhesive according to local regulations.

Electrical Cabinet Cooling Unit



1: LED ready (green)
2: LED alarm (red)
Behind the cover
3: Adjust temperature setpoint
4: Reset button

For information on installation, operation and maintenance, refer to the separate manufacturer's manual

Connecting Water Chiller (Option)

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

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

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

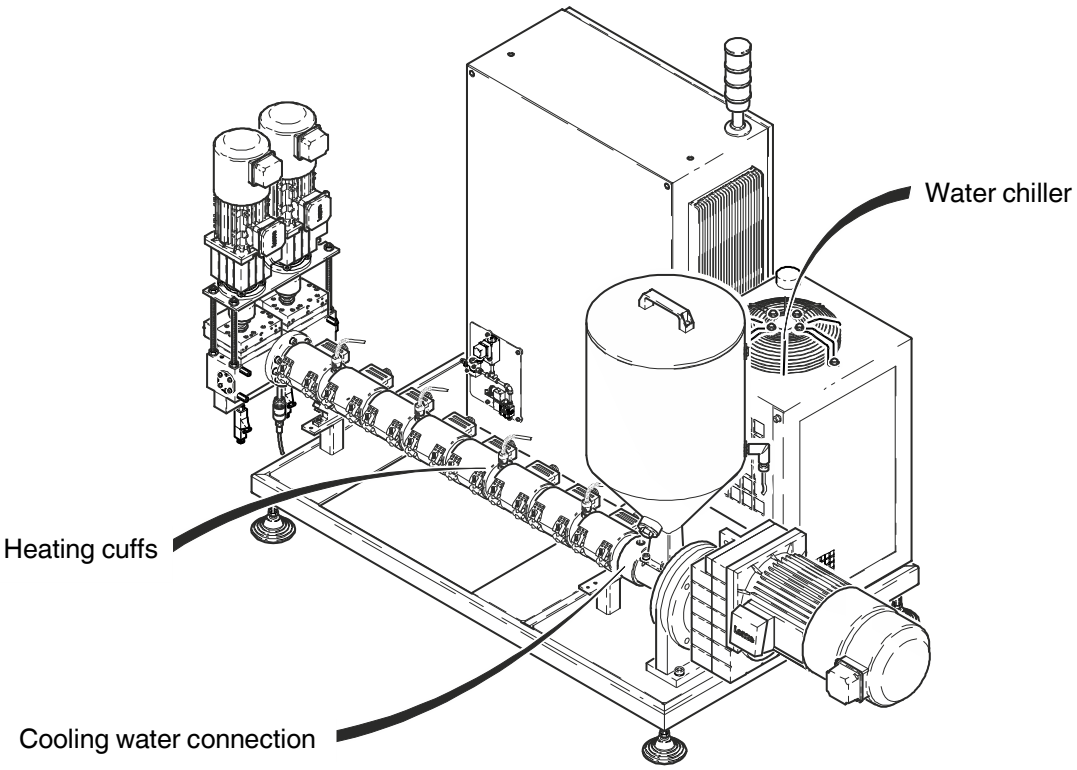
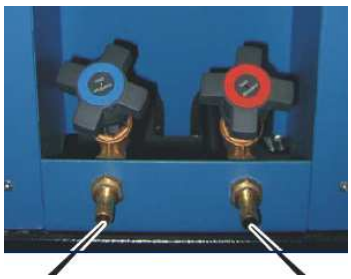


Fig. 3-6 Water chiller connection

Water Installation

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

Observe When Using Own Cooling Water Supply



Supply (blue) Recirculation (red)

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

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

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

Fig. 3-7 Hand valve to regulate flow

Water Specification

Cooling	Treated water	
Feed zone	Total hardness	max. 5° dH
	Noncarbonate hardness	max. 5° dH
	pH value	8 - 9.5
	Fe	max. 0.04 mg/l

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

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

Corrosion Protection

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

The water chiller unit is supplied without cooling water:

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

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

*) Refer to *Tank capacity* in the technical data of the manufacturer's manual for the water chiller.

Motor Controller with Cold Plate Cooling

Motor controllers can also give off substantial heat. To prevent the electrical cabinet from overheating, a water-cooled plate with direct contact to the motor controller is mounted on the electrical cabinet.

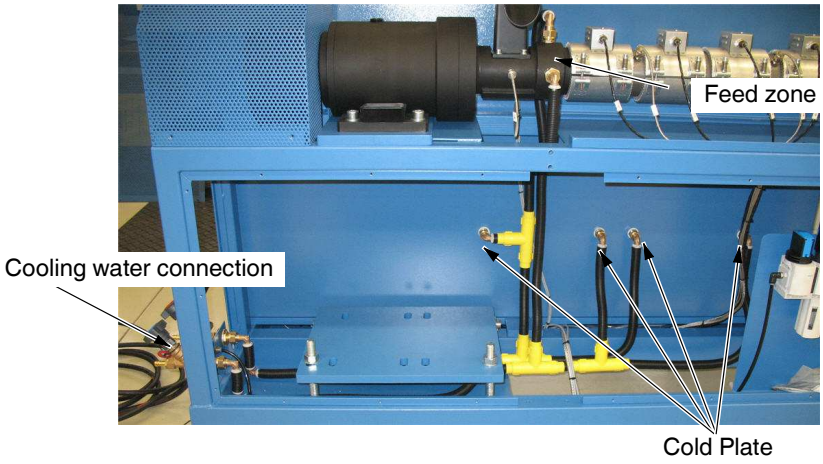


Fig. 3-8 Cooling water supply and recirculation on an EX030..UFM

Cold Plate cooling is used mainly in the extruder sizes EX030 and EX060.

Measurement and Control Diagram

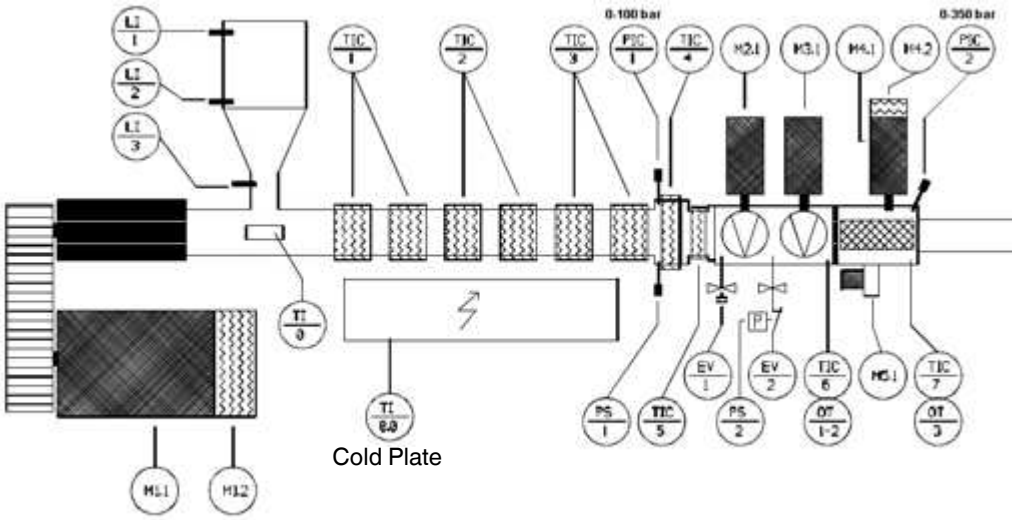
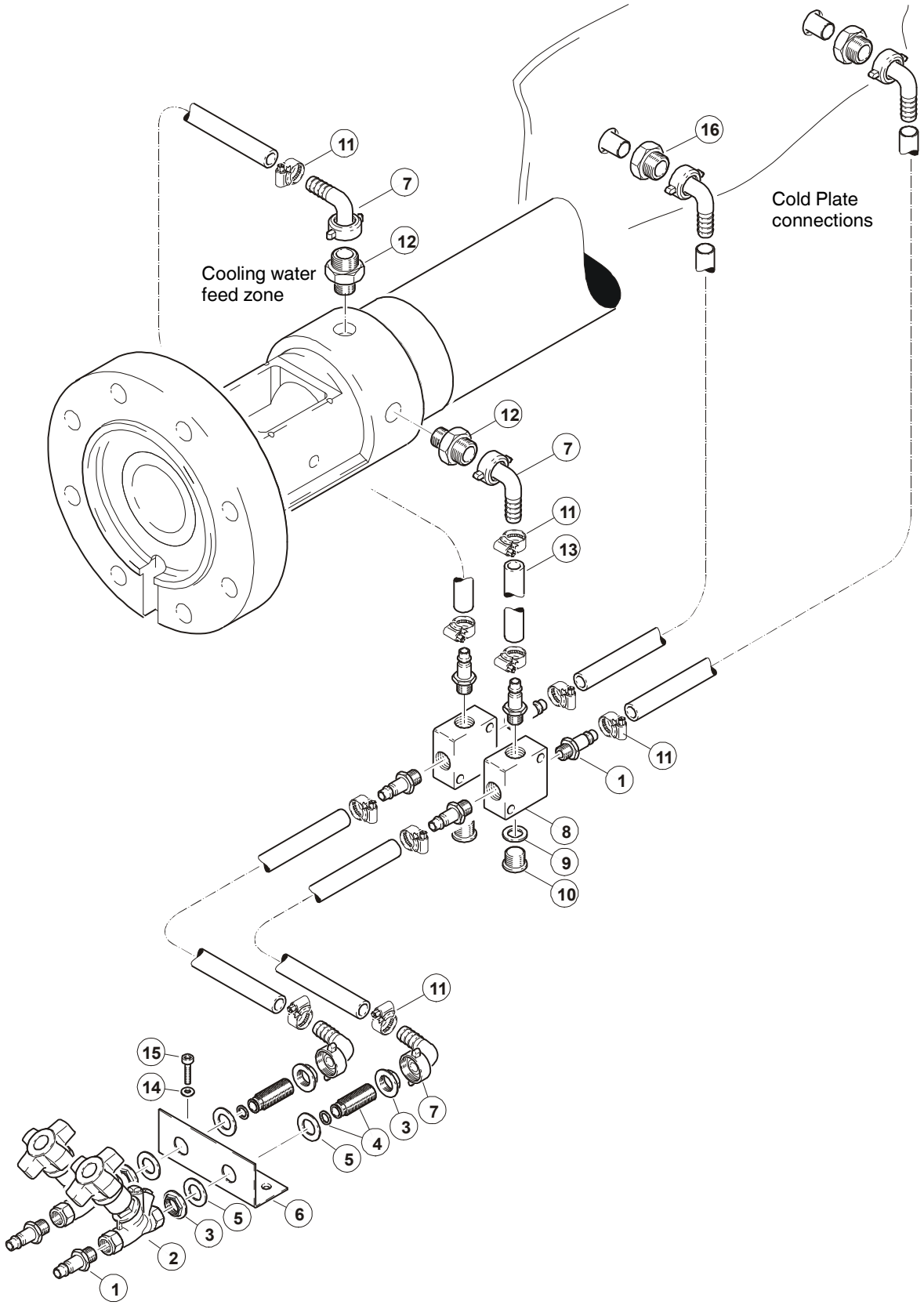


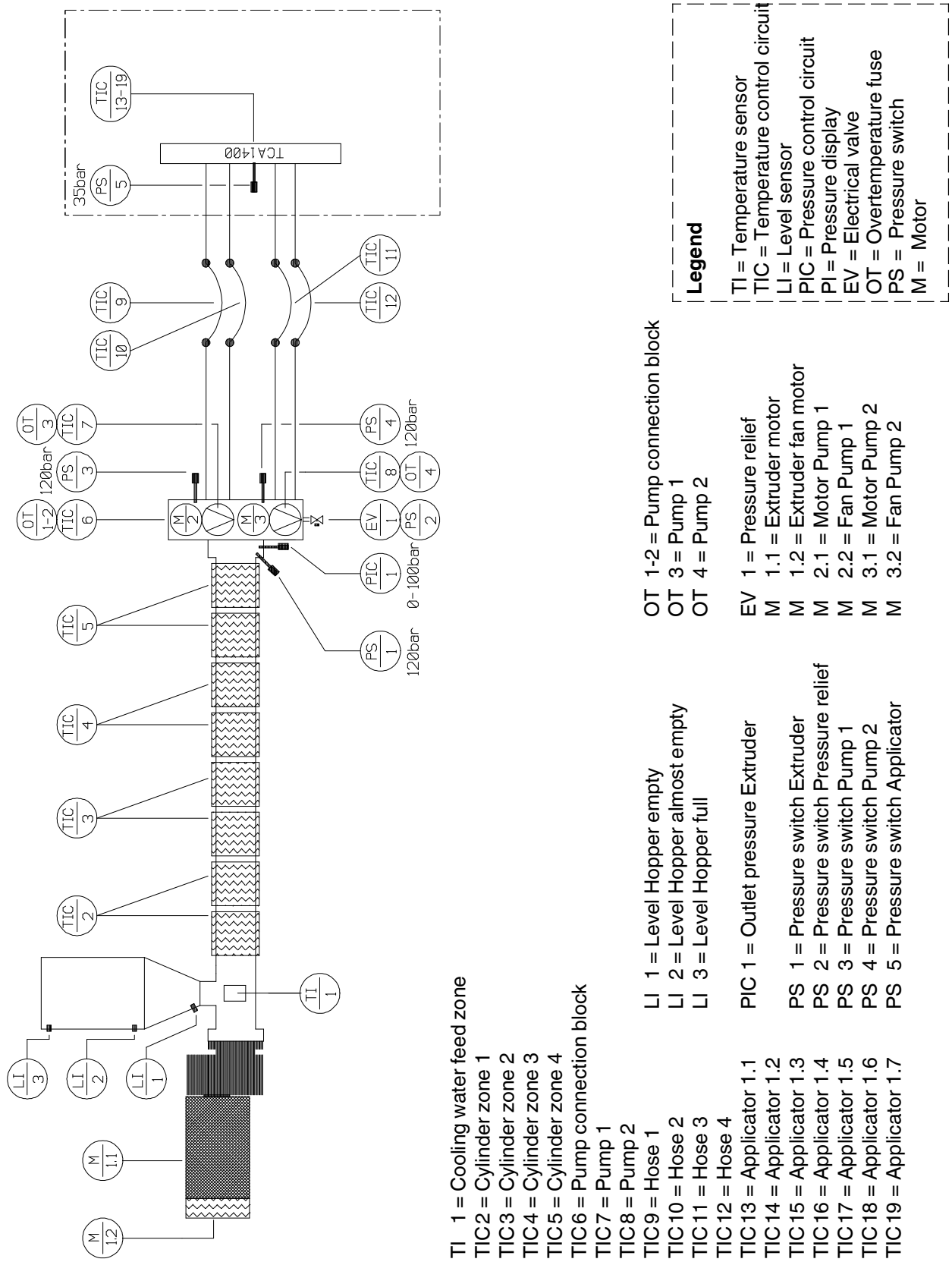
Fig. 3-9 Example of foam extruder with Cold Plate cooling



Cooling water connection

Fig. 3-10

Measurement and Control Diagram (System)



TI 1 = Cooling water feed zone
TIC 2 = Cylinder zone 1
TIC 3 = Cylinder zone 2
TIC 4 = Cylinder zone 3
TIC 5 = Cylinder zone 4
TIC 6 = Pump connection block
TIC 7 = Pump 1
TIC 8 = Pump 2
TIC 9 = Hose 1
TIC 10 = Hose 2
TIC 11 = Hose 3
TIC 12 = Hose 4
TIC 13 = Applicator 1.1
TIC 14 = Applicator 1.2
TIC 15 = Applicator 1.3
TIC 16 = Applicator 1.4
TIC 17 = Applicator 1.5
TIC 18 = Applicator 1.6
TIC 19 = Applicator 1.7

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

PIC 1 = Outlet pressure Extruder

PS 1 = Pressure switch Extruder
PS 2 = Pressure switch Pressure relief
PS 3 = Pressure switch Pump 1
PS 4 = Pressure switch Pump 2
PS 5 = Pressure switch Applicator

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

EV 1 = Pressure relief
M 1.1 = Extruder motor
M 1.2 = Extruder fan motor
M 2.1 = Motor Pump 1
M 2.2 = Fan Pump 1
M 3.1 = Motor Pump 2
M 3.2 = Fan Pump 2

Fig. 3-11 Example of a system

Adjusting Mechanical Bypass Valve

Not on all systems.

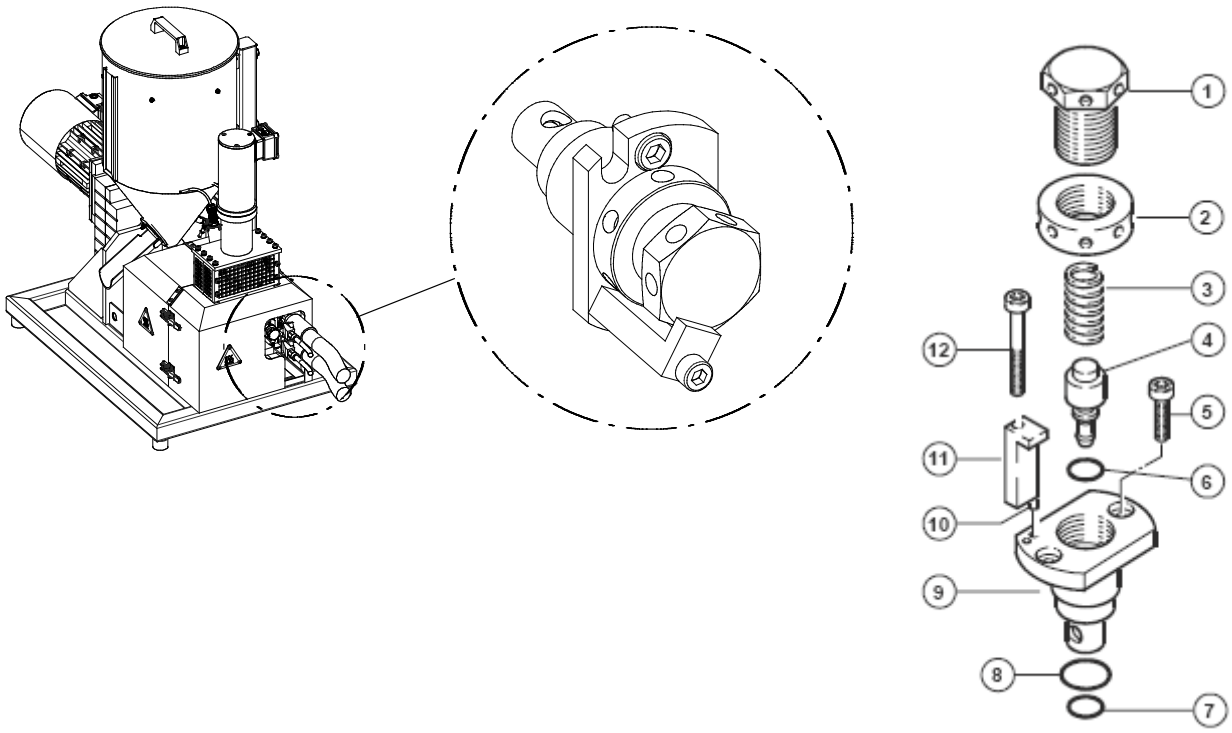
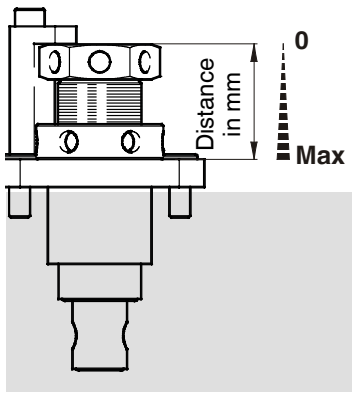


Fig. 3-12



CAUTION: The bypass valve is set at the factory to a fixed value. Do not change! Replace the entire bypass valve when a spare part is needed.

1. Use the parts list to determine which bypass valve is installed:
   e.g. P/N 7058053: Distance 24 mm = 60 bar

   NOTE: This information applies to new compression springs. Wear causes deviations.

Piston Pressure Switch KDS 05/120

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

Factory setting: 120 bar

CAUTION: Do not adjust the setting screw.

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

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

Metering Station (Option) / Foam Station (Special)

When mounting the metering station or foam station to the extruder, ensure that the connecting piece to the screw cylinder is aligned precisely. The sealing surface of the connecting piece must be parallel to the end of the cylinder, and precise centering (height and lateral offset) is important.

Foam Station Ultra FoamMix (Special)

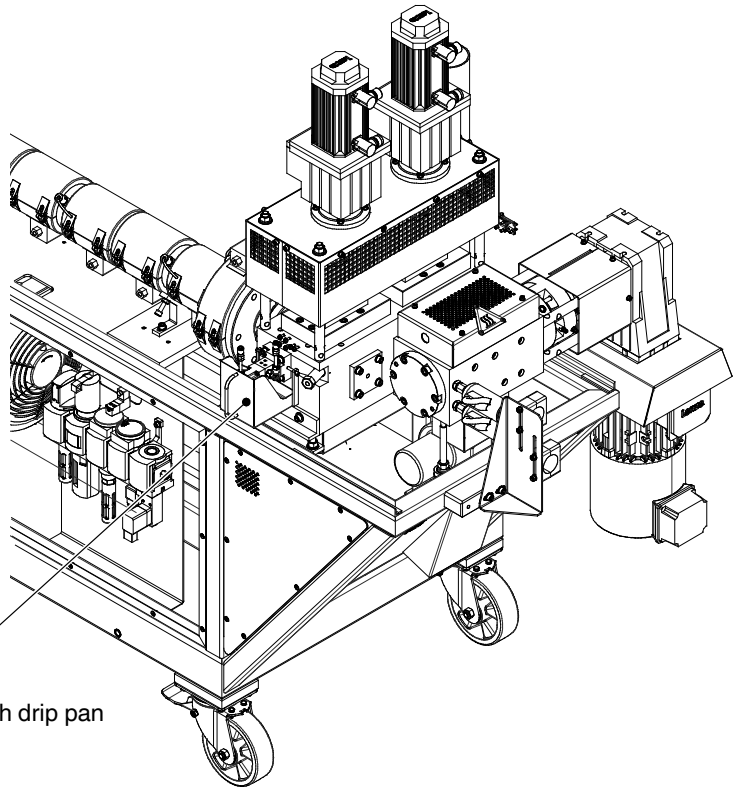


Fig. 3-13

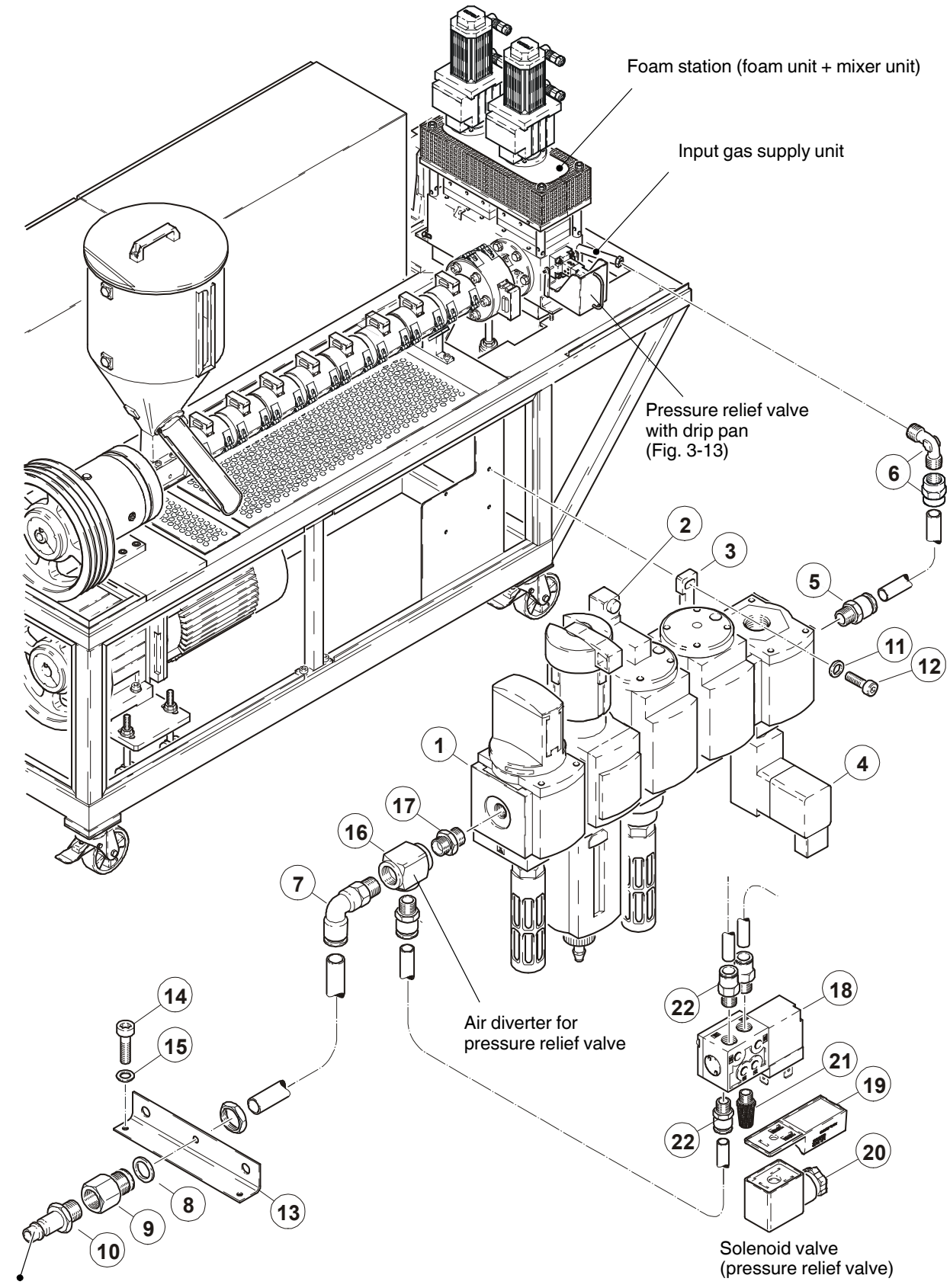
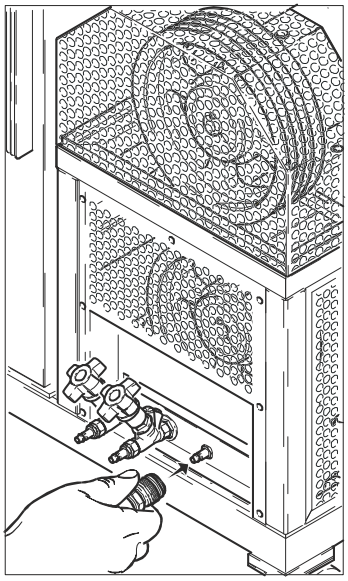


Fig. 3-14 Example

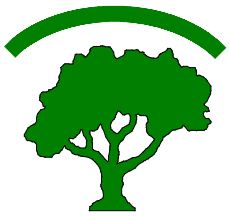
Connecting Compressed Air or Inert Gas



Min. inlet pressure*	Max. inlet pressure	Gas supply pressure
2 bar	6 bar	5 - 6 bar

* Inlet pressure of 0 - 2 bar locks the system.

Condensate Disposal



Condensate consists primarily of precipitation created by compression. However, it is extremely polluted and harmful to the environment, so it must be disposed of properly. Hazardous substances can be, e.g.

- Mineral oil aerosols from the compressor air intake
- Dust and dirt particles from the compressor air intake
- Cooling and lubricating oil from the compressor
- Rust and abraded particles from the supply network.

Pressure Relief Valve with Drip Pan

Pressure relief prevents an overpressure malfunction, which can occur during longer breaks in production (screw not moving). When the set pressure is exceeded, the adhesive is conveyed into the container before it even reaches the foam station.

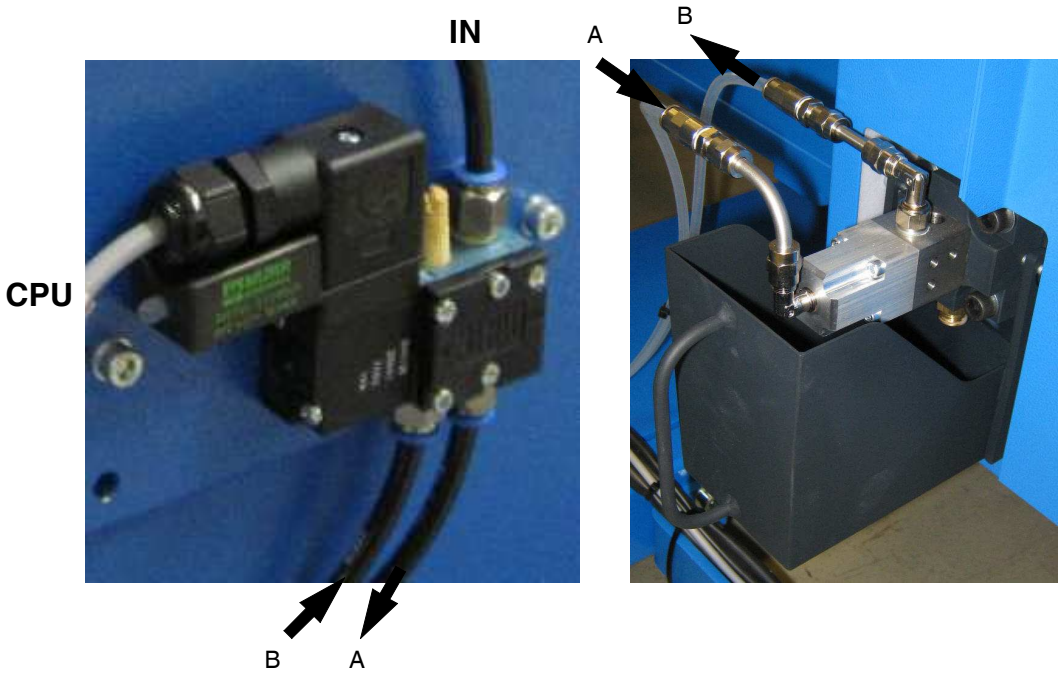
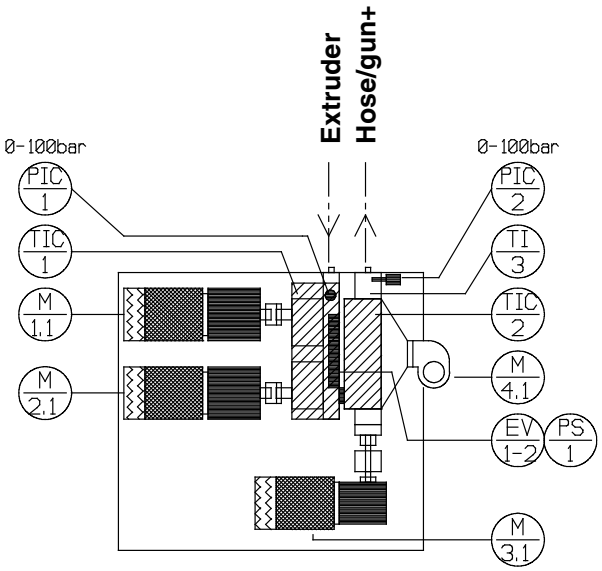


Fig. 3-15 Air and solenoid valve connections

Set the triggering pressure *Pressure relief extruder in automatic mode* for pressure relief such that is it below the switchoff pressure and above the controlled extruder outlet pressure (preliminary pressure of pumps). The control module opens when the screw stops AND the trigger pressure is reached.

NOTE: The container must be checked daily and may need to be emptied several times per day.

Measurement and Control Diagram (Foam Station)



TIC1= Foam unit
TIC2= Mixer unit
TI3= Temperature of gas-adhesive mixture
EV1-2= Gas supply
PS1= Pressure switch gas supply
PIC1= Inlet pressure foam unit
(= outlet pressure extruder)
PIC2= Output pressure mixer unit
M1.1= Loading pump motor
M2.1= Foam pump motor
M3.1= Mixer unit motor
M4.1= Mixer unit fan

Legend

TI=	Temperature sensor
TIC=	Temperature control circuit
LI=	Level sensor
PIC=	Pressure control circuit
PI=	Pressure display
EV=	Electrical valve
OT=	Overtemperature fuse
PS=	Pressure switch
M=	Motor

Fig. 3-16 Example of foam station

Section 4
Operation

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

Remaining Dampness of Granulate

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

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

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

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

Adhesive Expiration Date

Do not use the adhesive when it has passed the expiration date.

Important Upon Initial Startup

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

If the system was run with the customer's original adhesive before delivery, the next step is omitted.

- All heating elements on the extruder should be tightened after initial startup. Use particular caution when tightening ceramic heating cuffs.
- Do not damage the pressure sensor when assembling the screw cylinder.

  If a pressure sensor is defective, it should be replaced with an intact pressure sensor of the same type and pressure measuring range. Never use a plug to replace a defective pressure sensor.
- Compare the customer's connections to the wiring diagram
- Verify that the EMERGENCY OFF and safety switchoff devices, e.g. electrical overpressure fuses, function properly.
- The limits for warning, fault and switchoff should be adjusted according to the procedural conditions.

Initial Startup

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

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

CAUTION: The water chiller used to cool the cylinder feed zone does not begin cooling until after four minutes. Take this time into consideration when switching on the unit.

When Using the Water Chiller

Prepare the water chiller:

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

B. Plug the water chiller into the extruder.

C. Switch the water chiller on with the main switch and leave it on.

   NOTE: The circulation pump for the cooling agent begins to run as soon as the extruder and heaters are switched on using the main switch (step 2.).

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

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

E. Check the water level.

When Using Own Cooling Water Supply

Connect the water supply and recirculation for cylinder feed cooling, and open the water shutoff valve.

Initial Startup *(contd.)*

1. Unlock EMERGENCY OFF if necessary.
2. Switch the extruder on with the main switch.
3. Wait until the starting screen appears on the control panel.
4. Press Reset.
5. Read the current temperature in the feed zone on the control panel.

Temperature Course

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

If the temperature in the cooling zone rises (overtemperature indication), immediately check why the temperature has risen and check the cooling water supply. If the cause cannot be directly remedied or if no water at all is flowing and the temperature continues to rise, the system must be switched off and the fault remedied.

6. Pour granulate into the hopper.

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

ATTENTION: Never use metal devices to attempt to crush granulate clumps in the screw feed zone during operation. Risk of injury and of destroying the extruder!

7. Make settings on the control panel. Also refer to the separate manual for the control panel.

Notes on Temperature Setting

CAUTION: When setting the temperature, the temperature prescribed by the hot melt adhesive manufacturer is decisive. The maximum operating temperature for the product described here and the heated system components may not be exceeded.

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

8. Select automatic mode for production.

   Refer to *Operation in Automatic Mode* and *Operation in Manual Mode (Service).*

   Before switching on the pump, verify that all elements through which adhesive is to be fed are heated (temperature channels switched on).

9. The system can be switched on manually, externally (XS2) or by the seven-day clock. Wait until the system is ready for operation.

   Depending on the adhesive, a follow-up time (0 - 100 min) of at least 10 min should be set. Overtravel time begins after all temperature control circuits have reached their temperatures.

Notes on Operation

To prevent running dry during operation, ensure that the screw feeding section is always covered with granulate.

Ensure that cylinder feed is adequately cooled.

10. Refer to *Selecting Pressure Control or Speed Control.*

After initial startup and after changing filters, deaerate the system, i.e. purge with adhesive until no more bubbles flow out.

Selecting Pressure Control or Speed Control

Select pressure control if

- A metering station or foam station is used

The metering station or foam station pumps do not start until the extruder has reached the set setpoint pressure.

Select speed control if

- No metering station or foam station is used
- The metering station pump block is open
- The screw is to be cleaned
- Tank units are to be filled.

Operation in Manual Mode (Service Mode)

ATTENTION: Special caution is required in manual mode since there are no locks in this mode. For example, the startup speed that slowly brings the extruder to the setpoint pressure is ignored.

For this reason, only specially authorized personnel may operate the system in manual mode.

From the starting screen, the main menu for manual mode can be reached with the  key.

Before Continuing Operation

Wait until the operating temperature has been reached

The system components are triggered on the control panel with the keys *Pump on/off* and the key *Nozzle closed/open*.

Additional Foam Extruder Keys

A foam rate of 0% (compact control) means there is no gas supplied (solenoid valve closes) and the loading and foam pumps turn at the same speed.

The key *Foam pump on/off* switches the loading pump at the same time.

Key *Mixer on/off*

NOTE: Depending on which keys are selected or not, other operating elements will be visible or invisible.

Operation in Automatic Mode

From the starting screen, the main menu for automatic mode can be reached with the  key.

Requirement for Further Operation

- Pressure control parameters (PID) must be entered
- Pressure and speed setpoints must be entered.
- Temperature enable must have occurred. The heatup phase is completed and the overtravel time, if set, has elapsed.

The enabling and control functions occur via the interfaces of the external controller. Refer to wiring diagram for interface assignment.

Extruder Worm / Pump

- Startup speed
- Set the setpoint pressure
- PID parameters, pressure controller (password)

The pump is enabled by the external controller via the interface. Enabling automatically means *Pressure control*.

NOTE: In automatic mode there is no key like the key *Pump on/off* in manual mode.

Applicator

The applicator is triggered via the interface. Enable *Pump* AND enable *Nozzle (Applicator)* means *Speed control*. After the nozzle is closed, the system returns to pressure-controlled mode, if a setpoint > 0 bar was entered.

NOTE: In automatic mode there is no key like the key *Nozzle open/closed* in manual mode.

Foam Station (Special Feature)

Prerequisite for Foam Control

- Set the foam rate on the control panel to > 0 %
- Startup speed for filling mixer unit
- Adjust the setpoint speed of the mixer and the foam pump.
- Set the setpoint pressure
- PID parameters, pressure controller (password)
- The interface signal *Start foam* unit must be present.

During Production

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

Notes on Temperature Setting

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

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

Standby During Breaks

Serves to protect the adhesive and to save energy during breaks in production.

Level Monitoring (Hopper)

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

Dry Run Protection

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

Acknowledging Fault Indications

Faults have to be acknowledged after they are remedied by pressing the reset key.

Also refer to the separate manual for the control panel.

Note on Motor with External Fan

Depending on the type of motor used, the fan may need to run even when the motor is not turning.

Pressure Monitoring

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

Alarm	Alarm value	Effect
Overpressure warning	Any threshold value	Only an indication; the system remains ready for operation
Underpressure fault	Limit (from software) Limit (from piston pressure switch)	Machine stop: Drives are switched off

Temperature Monitoring

Undertemperature Interlock

The undertemperature interlock prevents the system from being started up. It locks the motor(s), when appropriate the solenoid valves and, in some cases, other components of the system for as long as the adhesive is too cold and thus too thick. This prevents damage to the pump or applicator.

Overtemperature Warning

If one of the temperature control circuits reaches the set value, overtemperature is immediately indicated. The system remains ready for operation.

Overtemperature Fault

If one of the temperature control circuits reaches the set value, the motor(s) is/are immediately switched off.

Overtemperature Shutdown

The independently operating overtemperature shutdown mechanisms (via the software or overtemperature fuses) protect the system and the adhesive from overheating (main contactor opens).

Take into consideration the switchoff temperature of the overtemperature fuse (fuse or thermostat) when ordering spare parts. Refer to the extruder parts list.

Switching System ON/OFF

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

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

There are two ways to connect the optional water chiller:

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

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

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

Daily Startup

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

1. Wen using your own cooling water supply: Open the cooling water supply.
2. If there is an air conditioning unit: Switch on with the manual switch on valve.
3. Set the main switch on the extruder and on the optional water chiller to I/ON if necessary.
4. Wait until the system is ready.
5. Switch on the motor(s) via the interface.

Daily Shutdown

1. Switch off the motor(s) via the interface.

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

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

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

3. If there is an air conditioning unit: Switch off with the manual switchon valve. The system is deaerated.

   The manual switchon valve can also be secured with a padlock.

4. Perform daily maintenance.

Emergency Shutdown

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

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

Black Main Switch (Special Model)

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

Section 5
Maintenance

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

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

Hazard areas of the system are generally secured with suitable protective devices.

If a protective device has to be removed for maintenance or repair work, it must be properly attached again upon completion of the work.

Risk of Burns

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

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

Relieving Adhesive Pressure

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

Refer to section *Installation*.

Residual Current Device (RCD) / Earth Leakage Circuit Breaker (ELCB)

Fig. 5-1 Example 2-pin

Test the switch twice a year.* When used in a damp or dusty environment, the manufacturer recommends testing at shorter intervals (e.g. monthly):

1. Open the electrical cabinet when the main switch is off.
2. Press the yellow test button (1, Fig. 5-1) on the switch.

If the ELCB is functioning properly, the water chiller and the lighting inside of the electrical cabinet go off.

If the switch is not functioning properly:

3. Have the ELCB replaced by qualified personnel.
4. Make a note of the test date or the next test date due.

* From the manufacturer's documentation:
Touch the test button "T" to check if the ELCB is functioning properly. This test does not serve as a substitute for measuring ground resistance or inspecting the ground conductor, both of which have to be performed separately.

Shutdown

1. Open the hopper drain plug, collect the granulate and then close the plug again.
2. Start emptying the extruder.

   If the motor power consumption falls, reduce the screw speed to 20 min^{-1} and empty the screw for no longer than 1 minute.
3. If cleaning granulate is not to be used for cleaning: Switch off all of the heating zones with the main switch.

   NOTE: The extruder need be cleaned with cleaning granulate only rarely. Then refer to the section *Repair* for information on how to proceed.
4. Close the cooling unit.

Starting Up System Again

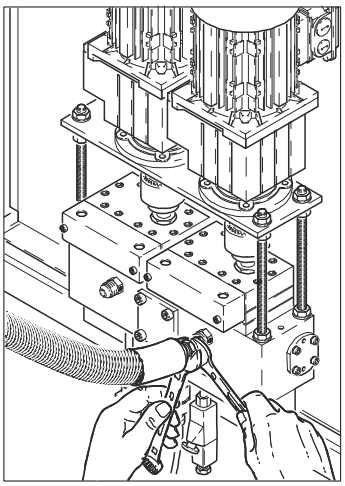


Fig. 5-2 With flange-mounted metering station

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

Then the extruder can return to the normal operating mode.

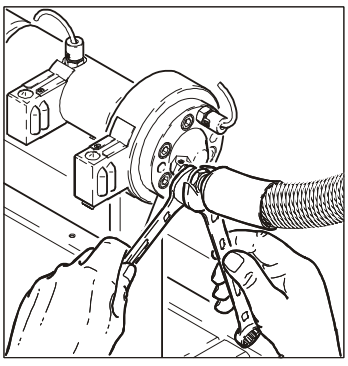


Fig. 5-3 Without flange-mounted metering station

Changing Type of Adhesive

Pump the old adhesive out of the system.

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

- **May be mixed:** Remaining old adhesive can be flushed out using the new adhesive.

  NOTE: Properly dispose of old adhesive according to local regulations.

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

Processing Materials

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

Regular Maintenance

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

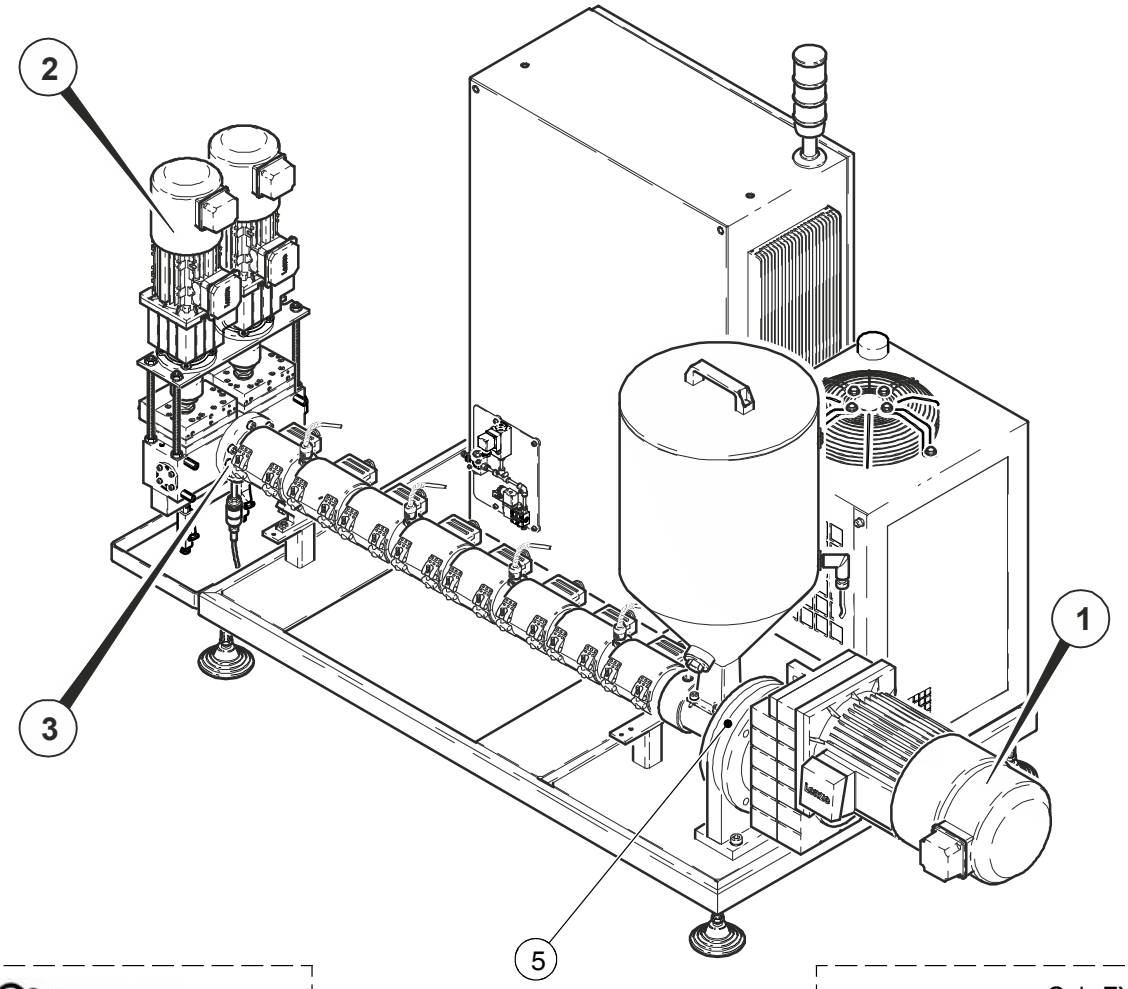
Unit part	Activity	Interval
Entire unit	External cleaning	Daily
	Visual inspection for external damage	Daily
Cordset	Inspect for damage	Daily
Cooling lines	Inspect for damage	Daily

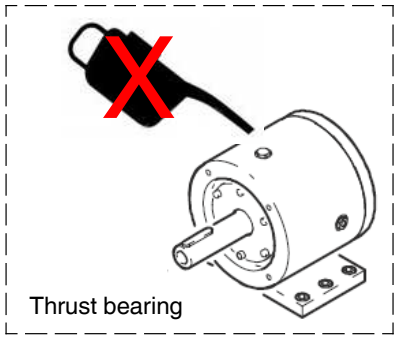
Continued ...

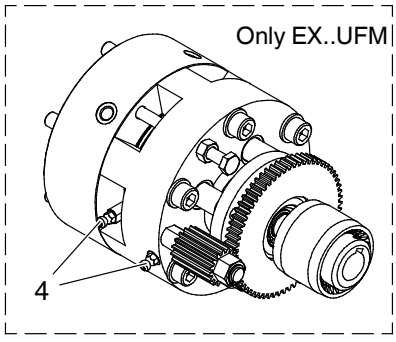
Unit part	Activity	Interval
Hopper	Visual inspection for pollution in hopper; clean if necessary	Before filling every time
Gear pump	Check for leakage Retighten gland Retighten fixing screws	Daily When leaking Every 500 hours of operation
Motor / gear box	Change the oil	Observe manufacturer's instructions
	Clean the fan cover	Depending on dust accumulation, daily if necessary
Compensation bearing	Lubricate (on models with lubricating nipple)	Every 3 months
Thrust bearing	Maintenance-free, lubricated for life	-
Residual current device (RCD) / earth leakage circuit breaker (ELCB)	Press the test button on the ELCB to prevent the contact from sticking over time.	Recommendation: twice a year
Electrical cabinet ventilation	Clean fan screens, clean or replace filter	Daily, if dust accumulation is severe
Pressure sensor	Inspect for leakage (screw insertion area) Check separating membrane for damage and clean	Daily Every time the pressure sensor is removed
Piston pressure switch	Calibrate. Refer to *Calibrating Pressure Sensor* in the section *Repair*.	Every year; more often if conditions of use require
Heater cartridges	Measure; replace if necessary	Refer to *Heater Cartridges*
Heating cuffs	Check that plug connections are uniform and tight Tighten fasteners	
Belt	Check voltage	Weekly
	Check for wear, replace if necessary	Every 3 months
Gas supply valve (UFM)	Clean	When the adhesive does not foam as desired
Mixer unit (UFM)		
Gland	Visual inspection Tighten	Every three months or every 650 hours of operation
Bearings	Lubricate (lubricating nipples)	Every six months
Sealing kit	Replace (gland can no longer be tightened)	When leaking

Lubricating Plan

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







1 Screw drive motor
2 Metering station drive motor
3 Fixing screws
4 Mixer unit lubricating nipple
5 Compensation bearing lubricating nipple

Visual Inspection for External Damage

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

External Cleaning

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

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

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

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

General Electrical Inspection

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

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

Ongoing Checks

- Check that protective devices function properly. The electrical cabinet door must be closed.
- Check the water flow for all water cooling devices. Check connections for leakage.
- Check the oil level in the gear box.
- Check that all cable connections are firmly attached to the terminals and that all fuses are help securely in place by the clips. Heat caused by poor contact damages the fuses as well as the clips.

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

- Check the fit of the thermal elements
- Check all heating zones for electrical flow resistance. Insulation resistance should be above 1000 Ohm/Volt.
- Under load conditions, check the symmetrical power consumption in the three phases of the electrical cabinet with a measuring device.

  The values of the symmetrical power consumption in the three phases should not deviate more than 10 % from one another.
- Inspect the heater contactors and thyristor contacts and check functioning. Worn contacts should be replaced promptly to prevent subsequent damage.
- Check the condition of all connecting cables for the nozzle or tool. Make sure that the ground terminal has a lower resistance than 0.1 Ohm to the steel of the tool.

Heater Cartridges

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

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

Measuring Heater Cartridges

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

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

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

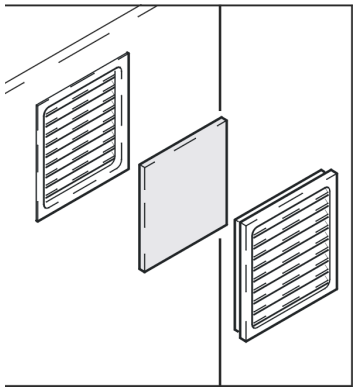
Before beginning inspection, verify that the respective heating zone is triggered and the circuit breaker is switched on.

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

Replacing Heater Cartridges

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

Electrical Cabinet Ventilation



The electrical cabinet fan requires no maintenance.

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

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

  When dust contains grease: Rinse with benzine or warm water with a grease solvent

  - Do not wring out
  - Avoid strong water jets.

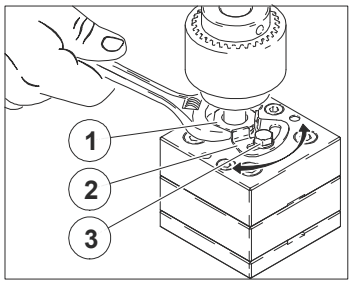
Gear Pump

Retightening Fixing Screws

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

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

Retightening Gland



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

1. Release the hexagon screw (3) from the retaining plate (2).
2. Retighten the gland in the operating direction of the pump. A quarter revolution is usually sufficient.
3. Adjust the retaining plate and tighten it again with the hexagonal screw.

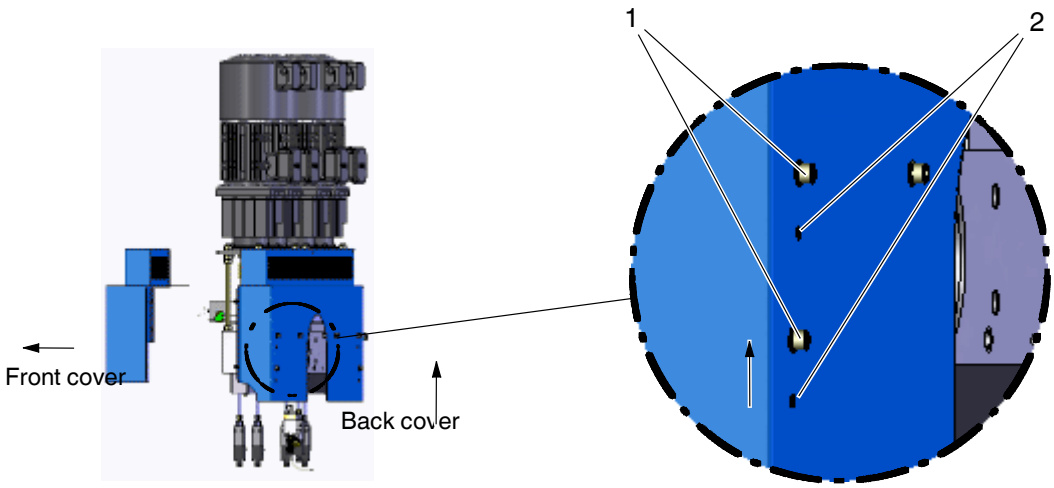
   The retaining plate prevents the gland bolt from coming loose due to vibration or reverse mode.

If tightening is no longer possible, the pump must be replaced.

Metering Station: Maintenance Position of Cover

On some systems the back cover can be moved to a maintenance position e.g. to facilitate replacing the pump.

Release all screws from the back cover and push the cover up far enough that the four screws (1) click into the holes (2). Tighten the screws (1).



Motor / Gear Box

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

Replacing Motor

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

Check before switching on for the first time

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

During operation, be aware of

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

Changing Lubricant

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

- Refer to the manufacturer's information for maintenance intervals

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

- The lubricant type is indicated on the ID plate. Use only the same lubricant. Do not mix.
- Refer to the manufacturer's instructions for the lubricant quantity. Ensure that the upper gears and rolling bearings are properly lubricated.

The manufacturer recommends replacing the bearing grease and the radial shaft seals every time the lubricant is changed.

Gear Boxes with Temperature and Level Sensor

Exceeding the lubricant temperature (overload) or falling below the lubricant level is indicated as a fault. The motors are stopped.

Compression Bearings (On Models with Lubricating Nipple)

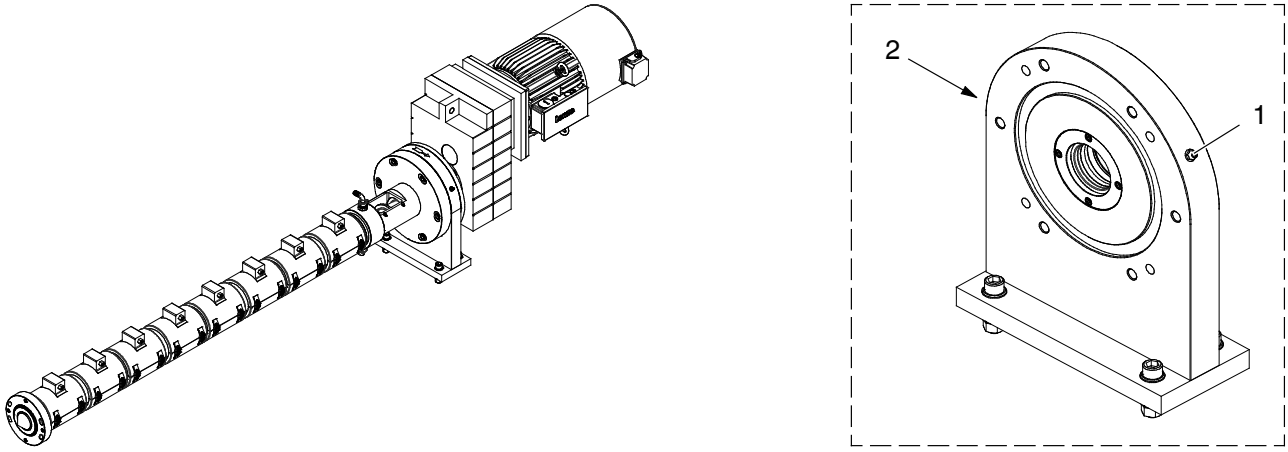


Fig. 5-4

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

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

Recommended every three months

Greasing Compression Bearing

Grease during operation.

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

1. Place a rag underneath to collect the old grease.
2. Place the grease gun on the lubricating nipple (1, Fig. 5-4) and carefully inject grease until the old grease has been completely ejected by the new grease.

   First the old grease then the excess grease is forced out of the bore (2, Fig. 5-4).
3. If necessary, remove grease residue from the extruder and/or floor.

Thrust Bearing (EX030 .. UFM)

The thrust bearing is lubricated for life. DO NOT oil!

Installing and Tightening New Belts

V-belt drives with multiple grooves require the use of a set of belts attuned to one another. When individual belts fail, the belt drive must be equipped with a complete set of new belts; old and new belts cannot be used together because they are not the same length (stretching).

When installing V-belts, ensure that the V-belt pulleys line up and that the grooves are free of rust and dirt before putting the belts in place.

1. Detach the side panel of the belt guard casing.

CAUTION: Risk of being pinched by the V-belt.

The V-belts have to be installed manually, without using a pry bar or other aid, and the axes should be as close together as possible. Then the belts are tensed to preliminary tension.

2. During tensing, turn the belt manually to ensure that the belt fits into the grooves.

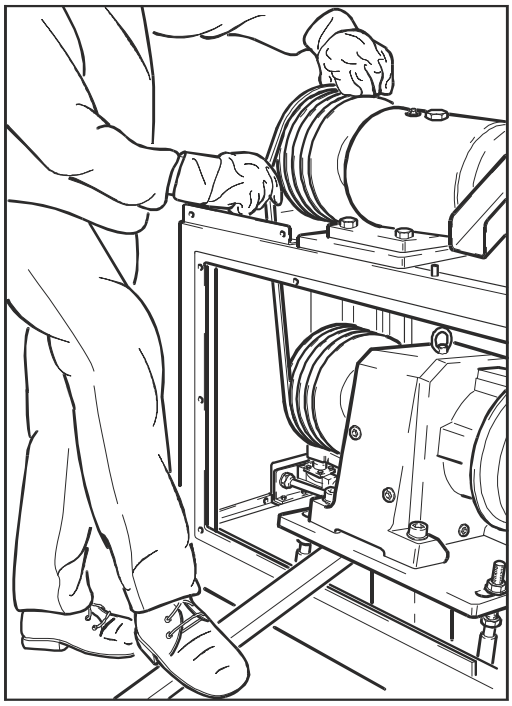


Fig. 5-5

Tightening

After running for about 30 minutes under full load, the belts will have adapted to the pulley grooves and stretched to a certain extent, such that they have to be retensed.

3. Adjust the fixing screws on the pivoting motor base.
    - Turn down: Tighten
    - Turn up: Loosen

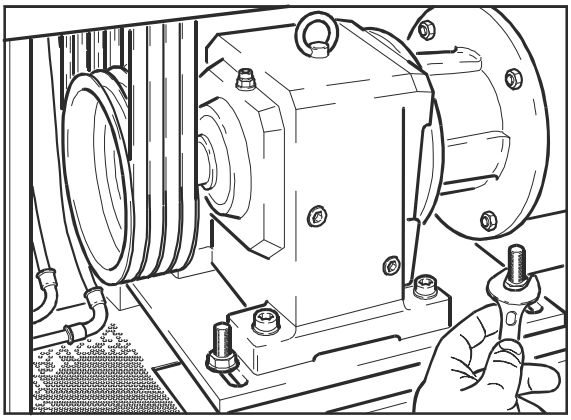


Fig. 5-6 Fixing screws on the pivoting motor base

4. The extruder may not be operated without the belt guard. Re-attach the side panel of the belt guard casing.

After initial tightening of the belt tension, check regularly. If there is is not adequate tension, the belt can fail prematurely due to slippage.

What Happens When Belt Tension is Wrong

Preliminary Tension Too Low

- Belt slippage. Then overheating and excessive wear
- Drive consumes more energy
- Effectiveness of force transmission falls

Preliminary Tension Too High

- Greater strain on belt. This means faster wear.
- Greater strain on bearings.

Heating Cuffs

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

Ceramic Heating Cuffs

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

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

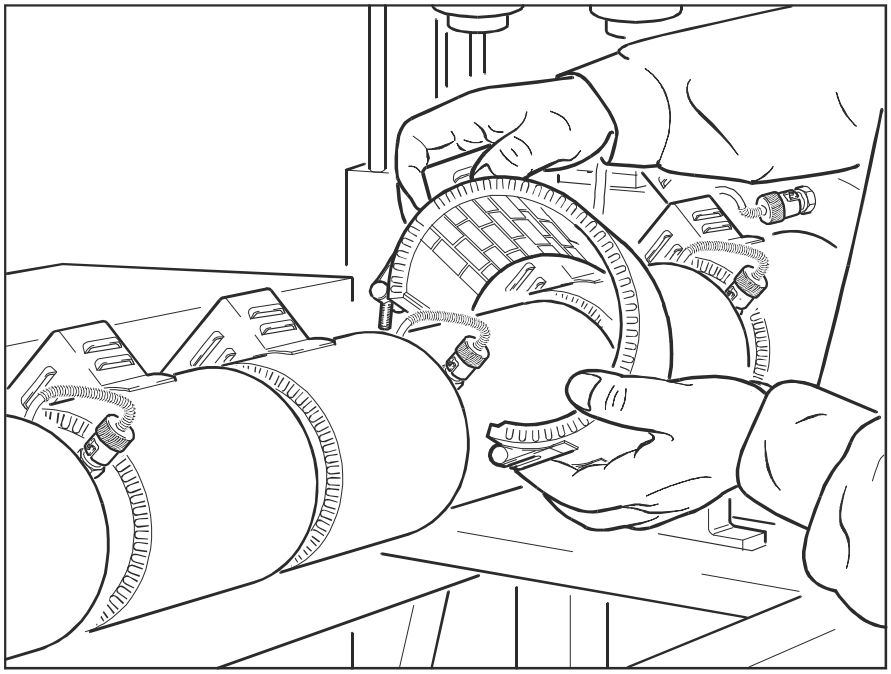


Fig. 5-7 Heating cuff

Micanite Heating Cuffs

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

CAUTION: Micanite heating cuffs need a (metallic) heat dissipater to prevent them from burning out.

During the initial heating phase, check that the tension screws are tight. Tighten if necessary. Check repeatedly for a uniform and tight fit.
The heat conducting plates under the heating cuffs must also fit snugly.

Pressure Sensor

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

Cleaning Adhesive Bore

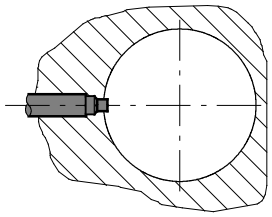


Fig. 5-8 Principle drawing

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

Cleaning Separating Membrane

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

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

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

Screwing In

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

Cleaning Gas Supply Valve (UFM)

NOTE: Nordson recommends keeping a spare gas supply valve (1) on hand to be able to continue production while a polluted valve is being cleaned.

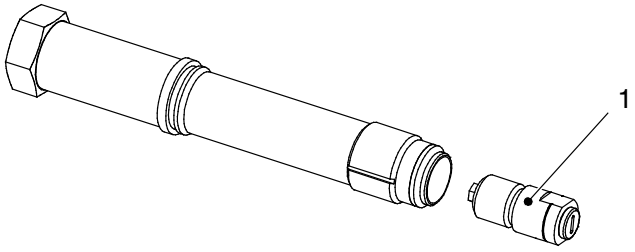
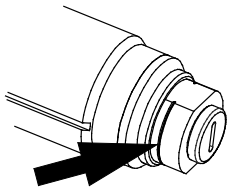


Fig. 5-9 Gas supply unit (casing and gas supply valve)

If the adhesive has not foamed as desired, check whether the gas supply valve is clogged with adhesive:

1. Heat to the processing temperature of the adhesive.
2. Relieve adhesive pressure. Refer to section *Installation*.
3. Stop gas supply.
4. Switch the foam extruder off with the main switch.
5. Extract the gas supply unit.



NOTE: The fine thread on the gas supply valve is a left-hand thread, recognizable by the circumferential groove. Screw in and out carefully.

6. Carefully clean the gas supply valve. The valve seat is very delicate.

Mixer Unit (UFM)

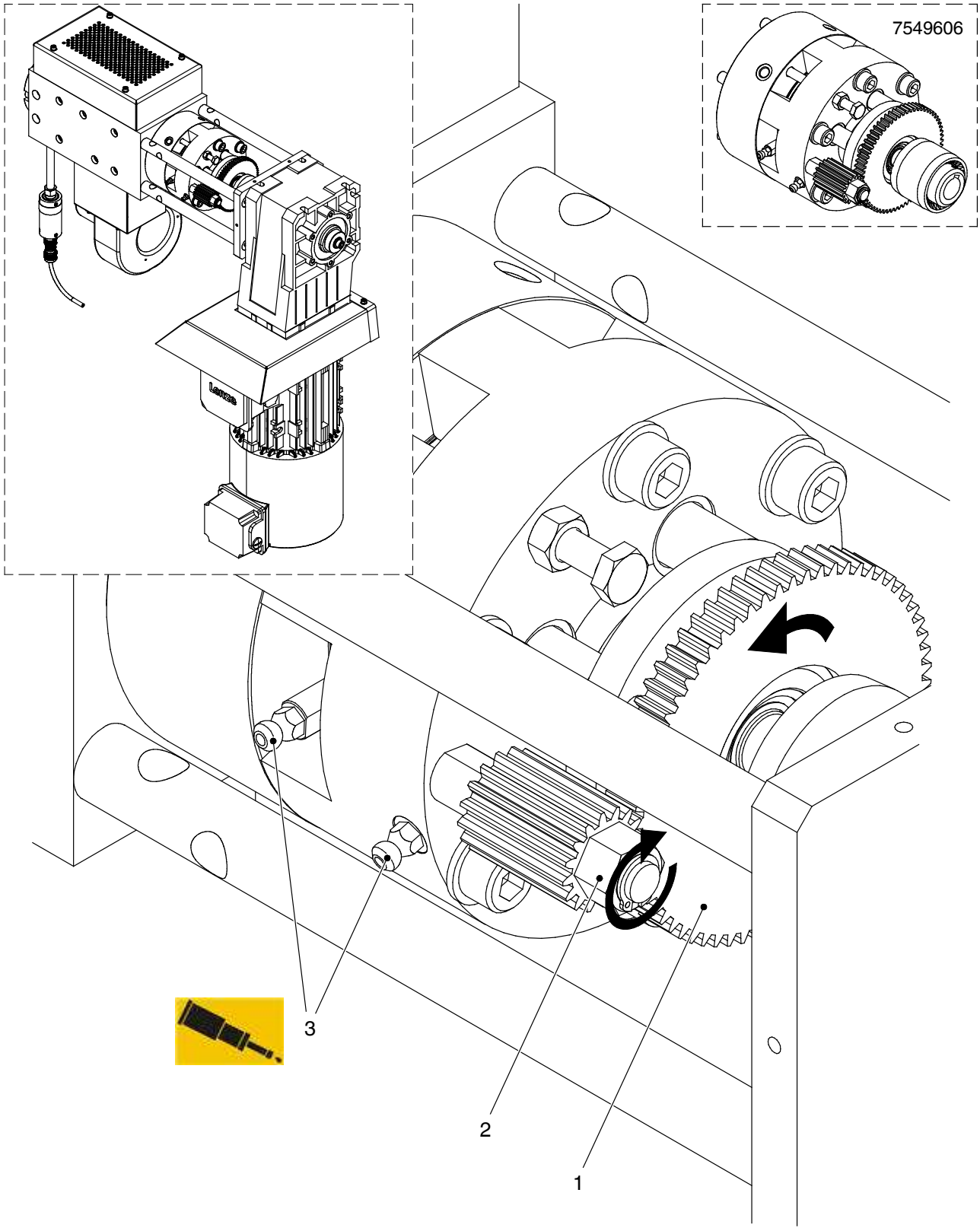


Fig. 5-10 Safety guard not shown

Retightening Gland

Check at lease every three months whether adhesive has escaped at the gland nut (1, Fig. 5-10).

When the mixer motor is switched off: After 650 hours of operation, tighten the adjusting sprocket (2) clockwise with 7 Nm torque.

Lubricating Bearings

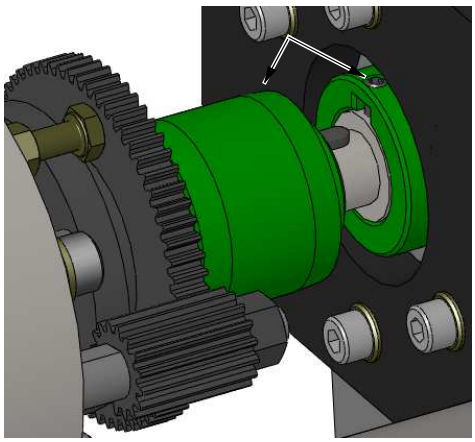
Every six months, force high-temperature grease (P/N 394769) into the lubricating nipples (3, Fig. 5-10).

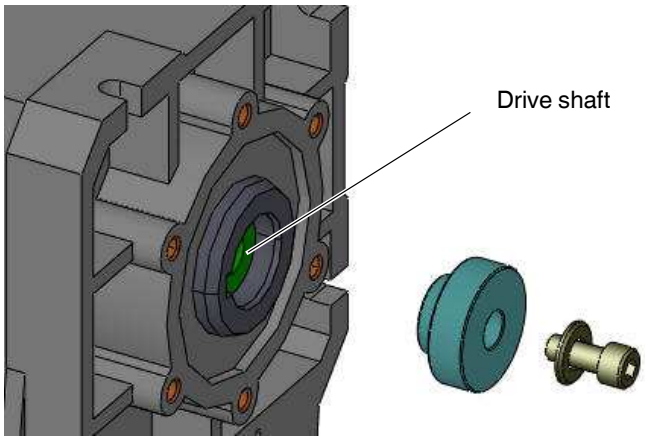
Replacing Sealing Kit P/N 7549606

1. Heat to the processing temperature of the adhesive.
2. Relieve adhesive pressure. Refer to section *Installation*.

CAUTION: Hot. Use personal protective equipment.

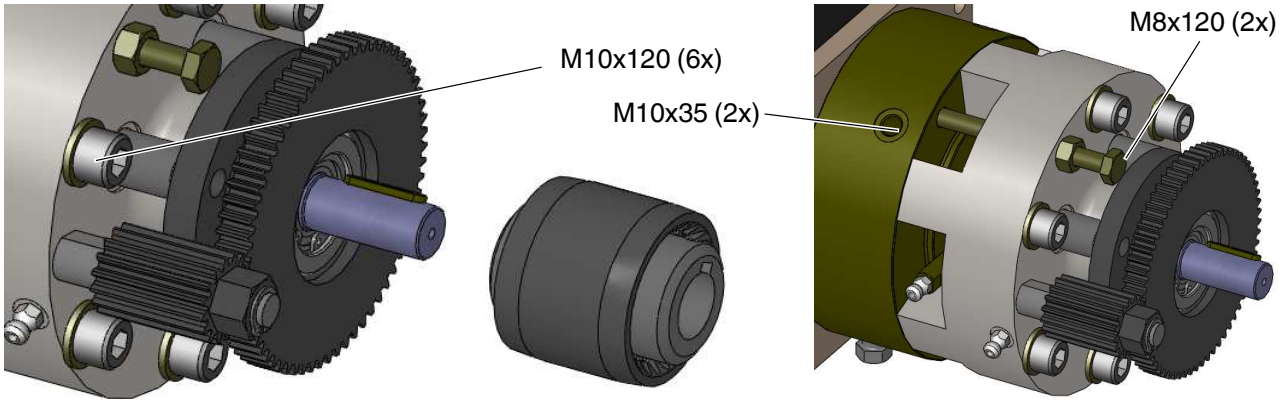
3. Release the clamping screw at the adjusting ring and the motor side of the coupling (arrow).
4. Release the screw from the drive shaft and remove the lock ring.





5. Secure the adjusting ring to prevent it from falling and extract the drive shaft with a prying tool (M10).
6. Release the motor fixing screws and detach the motor.
7. Detach the motor plate and shaft for easier working.

8. Release the second clamping screw from the coupling and detach the coupling.
9. Remove the hex bolts M10x120 and M10x35.



10. Secure the sealing kit to prevent it from falling and release it with the two forcing screws M8x120.
11. Use a soft, lint-free cloth to clean surfaces.
12. Install the new sealing kit. Apply high temperature grease to all fixing screw threads.

Section 6
Troubleshooting

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

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

Troubleshooting / Corrective Action

ATTENTION: Always follow the safety instructions when remedying faults.

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

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

Please keep the following information handy:

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

Acknowledging Fault Indications

Acknowledge fault indications with the Reset key. Acknowledgment is essential for further operation.

Some Tips

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

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

Light Tower

Possible messages (Refer to system wiring diagram for specific information)	
Red	General alarm Refer to *General Alarm: Red Indication Lamp is Lit*
Flashing red	System in standby
Yellow	Automatic mode: System not running Manual mode: At least one pump running
Green	Ready for operation All channels have reached their setpoint temperature AND the follow-up time has elapsed
Green flashing	Hopper almost empty

Troubleshooting Tables

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

General Alarm: Red Indication Lamp is Lit

Problem	Possible cause	Corrective action
Undertemperature	System was just switched on and is not yet ready	Wait until the temperature has been reached
	Temperature sensor short circuit or reversed polarity	
	Damaged temperature sensor cable	Replace
Electrical cabinet interior temperature too high	Ambient temperature too high	Decrease ambient temperature by cooling or airing out
	Filter of the electrical cabinet fan dirty	Clean or replace
	Electrical cabinet fan defective	Replace
	Cold Plate cooling	Check water temperature/quantity
	Electrical cabinet cooling unit	Refer to separate manufacturer manual
Main contactor has dropped	Pressure switch of pneumatic unit *Pneumatic bypass*: Pneumatic inlet pressure falls below 2 bar	Check pneumatic connection (not on all extruder sizes)
	Pressure switch on air conditioning unit: Air pressure below 2 bar	Check pneumatic connection
		Check the position of the manual switchon valve.
Overpressure	Pollution/blockage of: Adhesive channels Hose Applicator / nozzle	Do not feed pollution through the applicator! Disconnect the heated hose / applicator from the system. Purge.
		Follow the cleaning instructions in the separate manuals.

System not Functioning

Possible cause	Corrective action
No power	Connect line voltage
Main switch not switched on	Switch on main switch
Main switch defective	Replace main switch
Main circuit breaker tripped	Check for short circuit in the system or accessories

No Adhesive (Motor does not Rotate)

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

Motor Overheated

Possible cause	Corrective action
Ambient temperature too high	Decrease ambient temperature by cooling or airing out
Cooling air intake grill dirty	Clean
Pump blocked by foreign particles	Replace pump
Pump operates too sluggish	Replace pump
Adhesive too cold	Set temperature accordingly

No Pilot Voltage

Possible cause	Corrective action
Parent machine not operating	Start up parent machine
Tach generator (accessory) defective	Replace
Pilot voltage poled incorrectly	Reverse polarity

Incorrect Motor Rotation with External Line Speed Voltage

Possible cause	Corrective action
Pilot voltage fluctuation despite constant machine speed	Drive element (e.g. belt) slips. Eliminate slip

No Adhesive (Motor Rotating)

Possible cause	Corrective action
Screw is turning in completely melted adhesive: Due to EMERGENCY OFF or extended feeding at maximum output capacity of the extruder, the temperature at the cylinder feed is too high (The first two temperature channels, usually labeled TIC1 and TIC2, are too hot).	If available, open the pneumatic bypass for an extended time so that the granulate can be fed to the middle of the screw and the excess heat transferred to the melting process. Feed sufficient fresh material to reduce the temperature to the normal range.
Hopper empty Dry run protection was not triggered	Fill hopper Check level sensor position and function. It should not be flush with the surface Maintain switching distance. Refer to section *Repair*
Option metering station: Adhesive feed bore to the pump or suction bore of the pump clogged	Remove pump and clean feed bore or suction bore
Option metering station: Pump does not turn, because coupling screws are loose	Tighten

Too Little Adhesive

Possible cause	Corrective action
Adhesive feed bore to the pump or suction bore of the pump partly clogged	Remove pump and clean feed bore or suction bore
Gear pump is worn	Replace pump
Processing temperature set too low	Change temperature setting
Extruder operating pressure (preliminary pressure) too low	- Correct operating pressure - Check extruder temperature - Clean screw

One Channel (Heating Zone) does not Heat

Possible cause	Corrective action
Channel is switched off	Switch on with the on/off button on the control panel
Channel/heating zone defective / broken sensor	Repair defect

Optional Water Chiller Faulty

Problem	Corrective action
Unit does not run	Refer to separate manufacturer manual
Insufficient cooling (check water level first!)	
Compressor or pump switched off	
Shutdown caused by overpressure or underpressure	

Section 7
Repair

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

General Information

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

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

Relieving Adhesive Pressure

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

Refer to section *Installation*.

Replacing Level Sensor

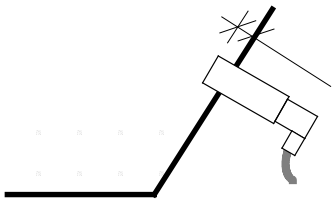


Fig. 7-1 Example

The level sensor is installed such that it is not flush [nf].

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

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

Cleaning Extruder with Cleaning Granulate

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

Risk of burns from hot components and hot adhesive flowing out!

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

Pumping Out Adhesive (Manual Mode)

1. Stop the system by switching off the pumps/motors.
2. Drain remaining material from the hopper or remove it with a vacuum cleaner. Close the drain plug again.
3. Set the temperatures as for the last application and allow the system to heat up.
4. Select manual mode (service mode).
5. Relieve adhesive pressure.
6. **Fig. 7-2 left:**
   a. Detach the hydraulic connection for the hoses from the pump block.
   b. Open the access hole on the pump block.

   Fig. 7-2 right:
   a. Detach the hydraulic connection for the hoses from the extruder flange.
   b. Deactivate the flange heating zone. Do this by switching off its circuit breaker and switching off the heating zone on the control panel, temporarily removing the heating zone from undertemperature interlock.
   c. Quickly unscrew the flange.

Continued ...

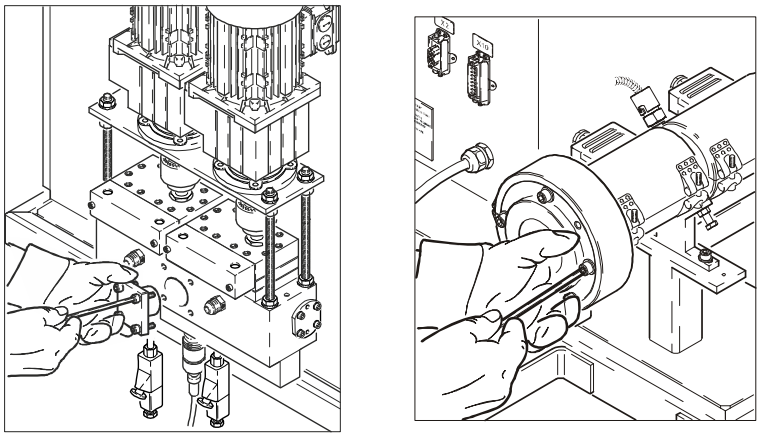


Fig. 7-2 Left illustration with flange-mounted metering station; right without

7. Switch off the heaters of all connected hoses and applicators.
8. In manual mode, select the type of speed control and set the speed to approx. 15 min^{-1} (rpm).
9. Allow the extruder to feed adhesive until the flow ceases.
10. Stop the extruder.

Adding Cleaning Granulate

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

Use only suitable cleaning granulate. Nordson recommends P/N 7050234 (25 kg). Observe the safety data sheet.

11. Switch off feed section cooling. To do this, switch off the cooling unit and stop the water supply. Detach the hoses from the extruder at the same time and quickly hang them up, allowing the cooling water to run out.
12. Set the temperatures for the extruder and, if applicable, the flange-mounted metering station to consistent 200 °C, up to 210 °C, and allow the system to heat up. Wait for the temperature enable.
13. Only the extruder screw should be switched on when the system is in manual mode.

Continued ...

ATTENTION: During filling, sharp, hard chips of the cleaning agent can be flung out of the hopper. Wear face protection!

Fig. 7-3

Feeding of the cleaning granulate must be metered. Slowly pour cleaning granulate into the extruder by hand (Fig. 7-3).

CAUTION: During this process, the extruder screw in the draw-in section may be filled no higher than half the height of the screw; otherwise the extruder will remain jammed.

14. Gradually add cleaning granulate in this state* and convey it through until the granulate flows out completely transparent; it may first come out brown. Watch the end of the screw until cleaning agent feeding ceases.

    *Recommended quantity: min. 250 g (EX003) to 5 kg (EX100)

15. Stop the extruder.

16. **With metering station:**

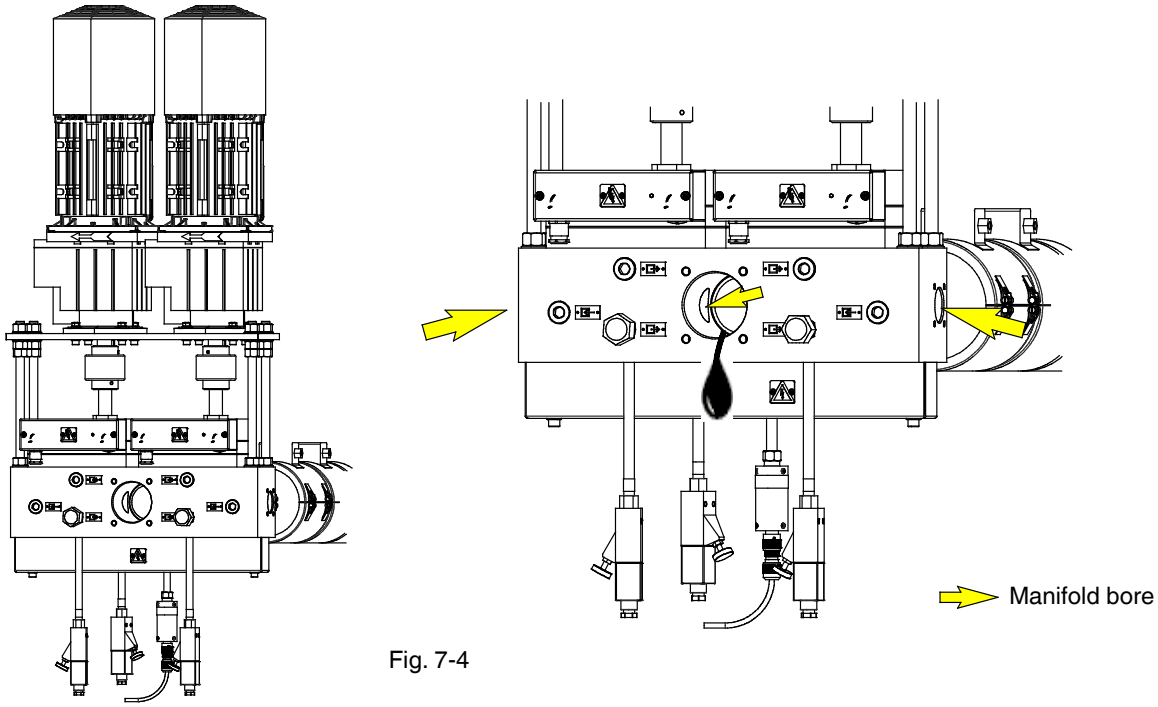


Fig. 7-4

a. Carefully remove any remaining cleaning agent through the access hole. Ensure that no cleaning agent has penetrated the manifold bore. If this has happened, carefully remove it. Then proceed with b.

b. Metering station: Open the blind flanges on the side of the metering station. Remove the pressure relief unit, if there is one, then mechanically* remove residue and charred material from the manifold bore.

   * Manually using cloths and/or soft metal brushes (copper/brass)

c. Set the extruder and flange-mounted metering station to processing temperature again.

d. Switch on the cooling unit or start the water supply again. Wait until feed section cooling has reached its low temperature again.

e. Once the temperatures have reached the setpoint, remove any material dripping out of the manifold bore of the metering station.

f. Reattach the blind flange and, if applicable, the pressure relief unit.

Without metering station:

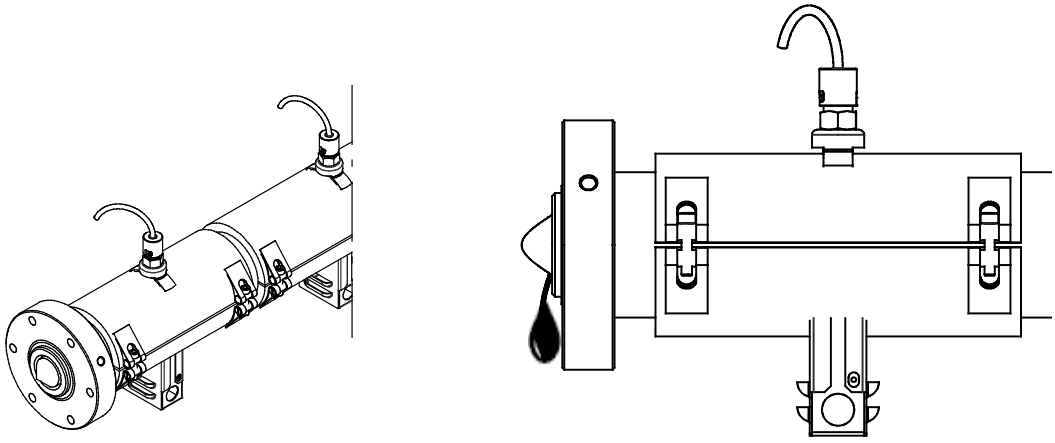


Fig. 7-5

a. Check the flange for residue and clean.

b. Attach the flange.

c. Attach the flange heater.

d. Switch on the circuit breaker for the flange heating zone and then switch on the heating zone on the control panel.

e. Reattach the pressure relief unit, if applicable.

f. Connect the hose.

g. Set the processing temperatures.

h. Switch on the cooling unit or start the water supply again. Wait until feed section cooling has reached its low temperature again.

17. Do not fill the hopper with adhesive granulate until the feed zone has cooled off again.

18. **With metering station. Fig. 7-2 left:**

    a. In manual mode: Select pressure control for the extruder / speed control for the pumps.

    b. Switch on the extruder and wait until the setpoint has been reached.

    c. Start the pumps alternately at 50 min^{-1} (rpm) and feed about 500 g out of each pump individually. Beginning at the outside, work towards the extruder screw.

    d. Connect the hoses.

19. Re-attach all parts that were removed.

20. Switch the system to automatic mode again.

Screw Assembly and Disassembly

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

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

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

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

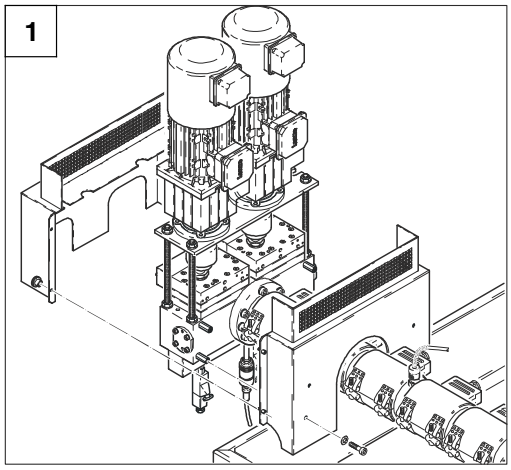
Disassembly (with Flange-mounted Metering Station)

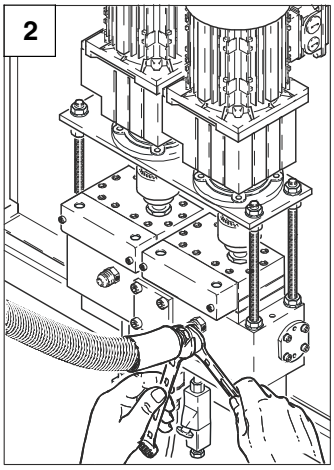
The clean screw is removed without the aid of an ejector (e.g. for alignment).

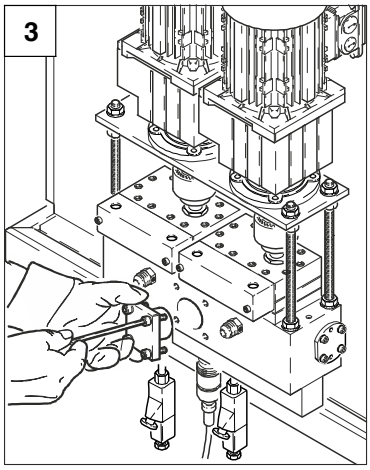
With Ejector

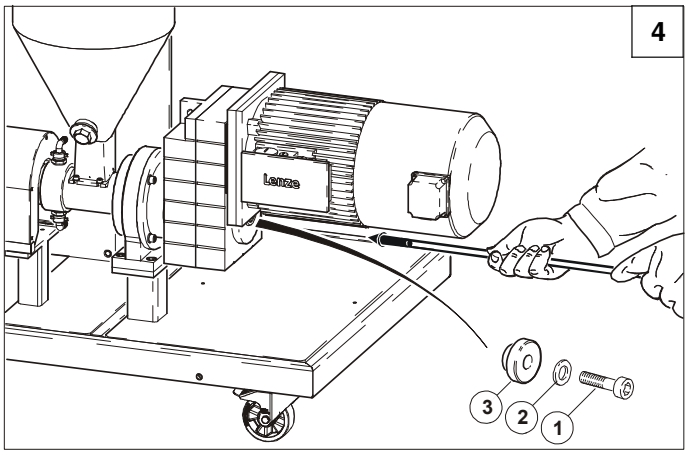
The empty screw is removed with the aid of the ejector (e.g. For *Cleaning Screw*).

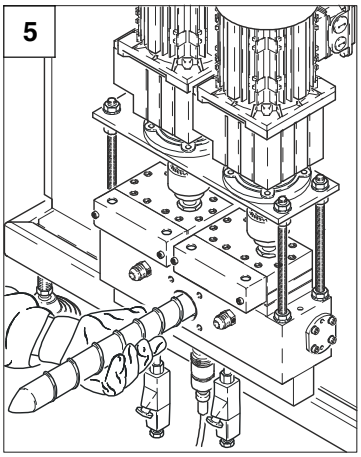
1. Remove the cover.
2. Unscrew heated hoses.
3. Open the access hole on the pump block.











4. Remove the cap (3) and slide the ejector into the motor's hollow shaft.
5. With the ejector, slowly force the screw out the front or pull it out towards the front.

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

6. Continue with *Cleaning screw*.

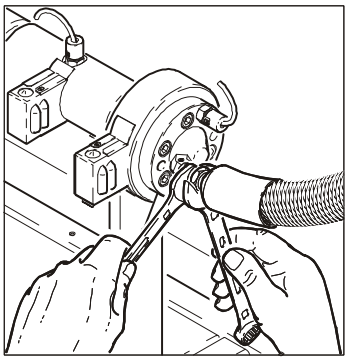
Disassembly (without Flange-mounted Metering Station)

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

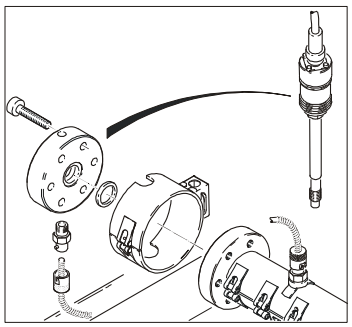
Continued ...

With Ejector

The empty screw is removed with the aid of the ejector (e.g. for *Cleaning Screw*).

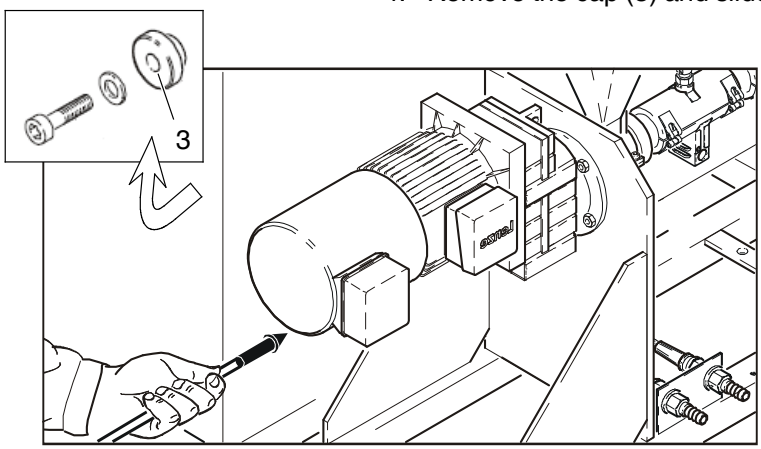


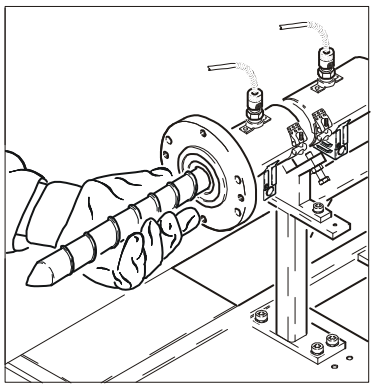
1. Remove the cover.
2. Unscrew heated hoses.



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

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





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

6. Continue with *Cleaning Screw*.

Cleaning Screw

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

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

Assembly

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

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

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

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

2. Guide the screw into the screw cylinder without force and slide it all the way into the screw drive shaft.

   Work very carefully to prevent damage to the screw, the screw drive shaft and the screw cylinder sealing surfaces.

3. Perform disassembly steps 1. to 4. in reverse order.

Checking Assignment of Temperature Channel to Temperature Sensors

1. Deenergize heaters. To do this, switch off the heater circuit breakers.
2. Following the channel numbers (TIC) on the control panel, extract the apparently corresponding temperature sensor from its bore on the screw cylinder.
3. Heat the tip of the sensor with a suitable heat source, e.g. with a cigarette lighter (not with fluid).

   When assignment is correct, a temperature increase will be visible on the display.
4. Switch on the circuit breakers again.

Heating Cuffs

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

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

Replacing Overtemperature Fuse

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

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

Replacing Piston Pressure Switches

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

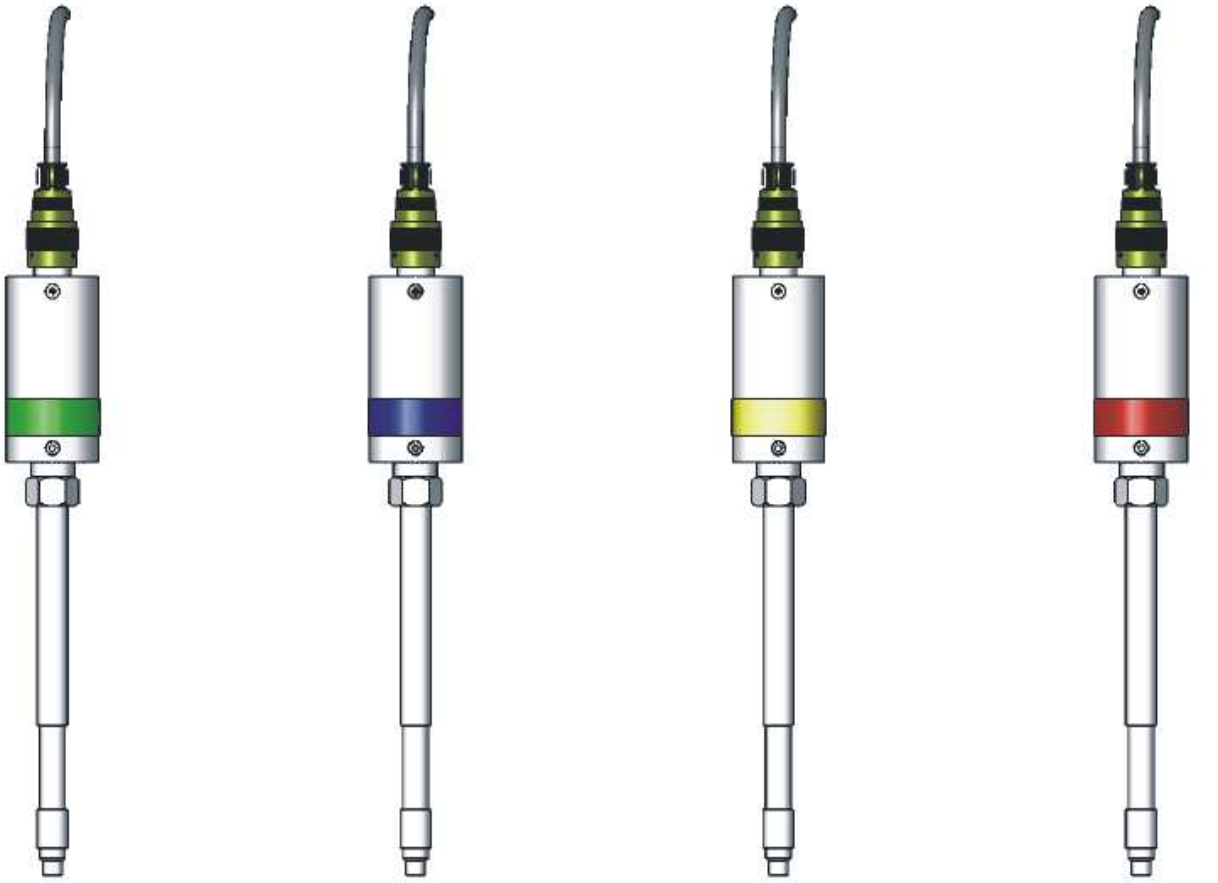
The piston pressure switches are set to a certain limit and marked with colors:

Order number	Limit	Color
7546788	50 bar	green
7546786	80 bar	blue
7056368	120 bar	yellow

Replacing Pressure Sensor

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

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



0-35 bar (green)
P/N 7058726

0-100 bar (blue)
P/N 7050028

0-350 bar (yellow)
P/N 7050076

0-700 bar (red)
P/N 7058727

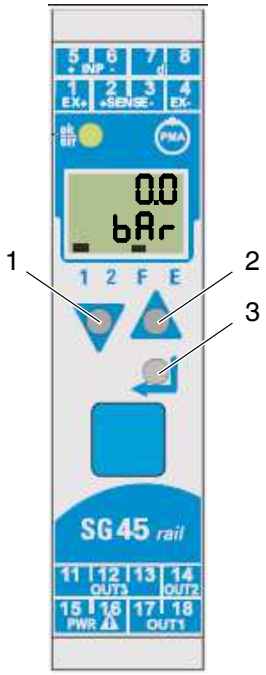
Fig. 7-6 Series overview of pressure sensors (extruder outlet pressure)

Screw-in thread:1/2” 20 UNF
Torque: 12 to 50 Nm

For information on calibration, refer to *Calibrating Pressure Sensor.*

Calibrating Pressure Sensor

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



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

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

Resetting to Zero

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

Optional: Setting Fixed Value to 80% of Measuring Range

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

1. Press arrow-up (2) and the Enter key (3) at the same time.
   Display: 80 bar (with a 100 bar pressure sensor)
   Display: 280 bar (with a 350 bar pressure sensor)
2. After checking performance, reset to zero (see above)

Replacing Pressure Sensor Measuring Transducer

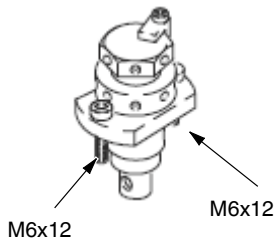
Beginning in 2013, the pressure sensor and transducer are being replaced with a pressure sensor with integrated evaluation electronics. Refer to separate manual.

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

Order number measuring transducer	Pressure measuring range	Color	Pressure sensor used
7052983	0 - 35 bar	green	P/N 7058726
7052984	0 - 100 bar	blue	P/N 7050028
7052985	0 - 350 bar	yellow	P/N 7050076
7052986	0 - 700 bar	red	P/N 7058727

For information on calibration, refer to *Calibrating Pressure Sensor.*

Replacing Mechanical Bypass Valve



1. Heat the system until the adhesive softens.
2. Use a 5 mm Allen key to release the two fixing screws, then extract the bypass valve out the top.
3. Insert the cleaned or new bypass valve and fasten it in place with M6x12 socket head screws.

Replacing Coupler Component

The coupler component P/N 7140205 is no longer available. It can be replaced with P/N 7588044.

ATTENTION: Disconnect equipment from the line voltage.

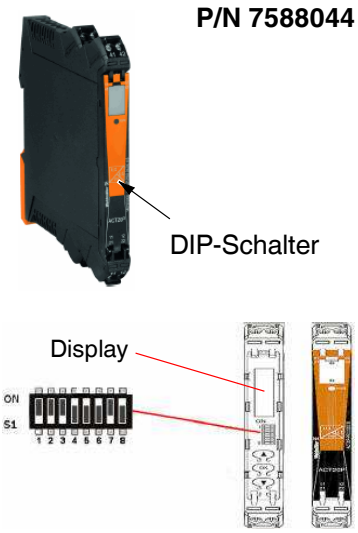
1. Detach the strands, one after the other, and label them anew as indicated in the following table:

Terminal assignment			
P/N 7140205 (old)	P/N 7588044 (new)		
1	22	Input +	> 5 mA
2	21	Input +	≤ 5 mA / 500 mV
3	12	Input +	> 500 mV
4	11	Input -	
5	42	Output +	
6	41	Output -	
7	51	Voltage supply	24-230 VDC ± 20% 24-230 VAC ± 10% at 50/60 Hz
8	52	Voltage supply	24-230 VDC ± 20% 24-230 VAC ± 10% at 50/60 Hz

Continued ...

2. Use the DIP switches to set the proper range on the new coupler component. They are located behind the front cover (arrow).

   NOTE: Configuration via the display is also possible, but only if all of the DIP switches are set to OFF.



Input range	DIP switch				Output range	DIP switch			
	1	2	3	4		5	6	7	8
configuration via display					configuration via display				
-10...+10 V				▯	-10...+10 V				▯
-5...+5V			▯		-5...+5V			▯	
0...300 V			▯	▯	10...0 V *			▯	▯
0...100 V		▯			0...10 V		▯		
0...30 V		▯		▯	2...10 V		▯		▯
0...10 V		▯	▯		5...0 V *		▯	▯	
2...10V		▯	▯	▯	0...5 V		▯	▯	▯
0...5 V	▯				1...5 V	▯			
1...5 V	▯			▯	-20...+20 mA	▯			▯
0...150 mV	▯		▯		-10...+10 mA	▯		▯	
0...60 mV	▯		▯	▯	20...0 mA *	▯		▯	▯
-20...+20 mA	▯	▯			0...20 mA	▯	▯		
0...20 mA	▯	▯		▯	20...4 mA *	▯	▯		▯
4...20 mA	▯	▯	▯		4...20 mA	▯	▯	▯	
reserved	▯	▯	▯	▯	reserved	▯	▯	▯	▯

▯ = ON * Inverted output range: Output polarity must be reversed!

Fig. 7-7 From the Weidemüller (manufacturer) manual

3. Replace the old coupler component with the new one and wire it.

Additional information e.g. on the menu (display) can be found in the manufacturer's manual ACT20P-PRO DCDC II-P.

If a Complete Pump Has Been Replaced

The rotating parts of a new pump are greased to prevent them from running dry before they are lubricated with adhesive during production. For this reason, the grease must be rinsed out with adhesive before beginning production.

Replacing Pump Shaft Seal

NOTE: If the pump shaft seal needs to be replaced, Nordson recommends replacing the pump and sending the old one in to be repaired. Only trained personnel can replace the pump shaft seal.

Motor Controller 8400 (Lenze) Spare Parts

The motor controller has a memory module that, in the event of motor controller failure, just has to be connected to a new, unparameterized motor controller.

CAUTION: Wear a wrist-strap grounding device to protect the electronic components from electrostatic discharges when installing/removing.

1. Order an unprogrammed motor controller. Refer to the parts list for the part number.

ATTENTION: Disconnect equipment from the line voltage.

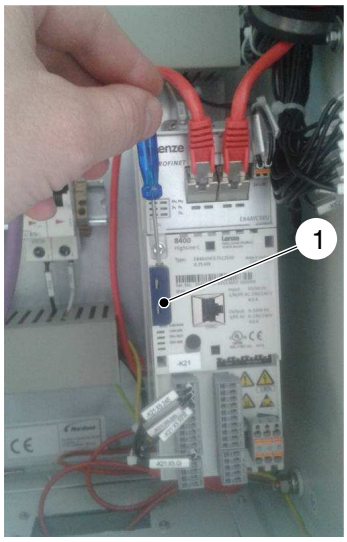


Fig. 7-8

2. Open the electrical cabinet when the main switch is off.
3. Wait at least three minutes. Then first remove the memory module (1, Fig. 7-8) from the defective motor controller.

   NOTE: The memory module will be used again.
4. It may be helpful to take a photo of the defective motor controller and its connections.
5. Release all connections to the defective motor controller.
6. Remove the defective motor controller and dispose of it as electrical scrap.
7. Install the new motor controller and wire it as shown in the current flow diagram and, when applicable, the photo.
8. Plug the memory module into the new motor controller.
9. Close the electrical cabinet.

The memory module contains the motor control parameters and transmits them, along with the IP address, to the motor controller upon restart.

Section 8
Parts

Ordering Spare Parts Using Parts Lists

Information Required

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

Order BOM
* *

Product		**P/N**	**Date:** **Time:** **Page:** **ID no.:** [3]	
[1]		[2]	**Valid:**	
Ref. **P/N**	**Designation** **Description**		**Quantity** **Qty**	**ME** **UM**	**CO** **DE**
[4] [5]	[6]		[7]	[8]	

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

[2] is usually an internal Nordson designation. But if no ID number [3] is stated, [2] becomes the order number for the Nordson product.

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

Section 9
Technical Data

General Data

Design size	EX-003	EX-007	EX-100	
	EX-020	EX-030	EX-060	
Max. melting and feeding capacity	Design size in l/h (depending on adhesive processed)			
Min. ambient temperature	10 °C	50 °F		
Max. ambient temperature	40 °C	104 °F		
Humidity	10 to 95 %, not condensing			
Max. operating height	1000 m	3300 ft		
Setup	Inside, as dust-free and dry as possible			
Possible temperature sensors	Pt100, Ni120			
Adhesive quantity (without metering station)	Dependent on system environment (e.g. hose lengths, connected devices)			
Adhesive pressure (preliminary pressure)	0 to 25 bar	0 to 2.5 MPa	0 to 363 psi	
Adhesive pressure (metering station)	5 to 70 bar	0.5 to 7 MPa	72.5 to 1015 psi	
	Max. 100 bar / 10 MPa / 1450 psi, depending on connected hose and applicator			
Adhesive pressure (shutdown)	Dependent on piston pressure switch used			
	30 to 400 bar	3 to 40 MPa	435 to 5800 psi	
	The piston pressure switch is preset at the factory. Factory setting:			
	120 bar	12 MPa	1740 psi	”yellow
	80 bar	8 MPa	1160 psi	*blue*
	50 bar	5 MPa	725 psi	*green*
Degree of protection	IP 32 There may be no dripping water, spray or water jets near the equipment			
Noise emission at a distance of 1 m	70 dB(A)			
Pump speed setting range	1.0 to 100 min^{-1} To prevent excessive wear, the motor/pump speed should not continuously fall below 5 min^{-1} (rpm) or continuously exceed 80 min^{-1} (rpm).			
Mixer speed (EX_UFM)	Max. 80 to 100 min^{-1}			
Weight	Refer to consignment note			

Electrical Data

CAUTION: The system is designed for only one operating voltage. Operate only at the operating voltage shown on the ID plate.

Operating voltage	Refer to ID plate
Operating voltage frequency	50/60 Hz (+10%)
Total power consumption	Refer to ID plate
Fuse protection [A]	Refer to ID plate
Max. pilot voltage (input voltage)	0 to 10 V Failure to observe will result in damage to succeeding components.

Temperatures

Min. operating temperature	50 ° C
Max. operating temperature	230 ° C / 200 ° C (Ni120)

Water Chiller

Water chiller *BL*	Cooling capacity
Size S (P/N 7056334)	1 kW
Size M (P/N 7052409)	1.5 kW
Size L (P/N 7055306)	3 kW
Degree of protection	IP 54 (P/N 7052409: IP 44)
Cooling agent	Water
Water specification	Refer to section *Installation / Water Specification*
Water temperature in feed section	Water temperature: 15 ° C Δt: 10 ° C

Dimensions / Hopper Volume

Because there are several different models, the dimensions can be found in the technical drawing included with the system.

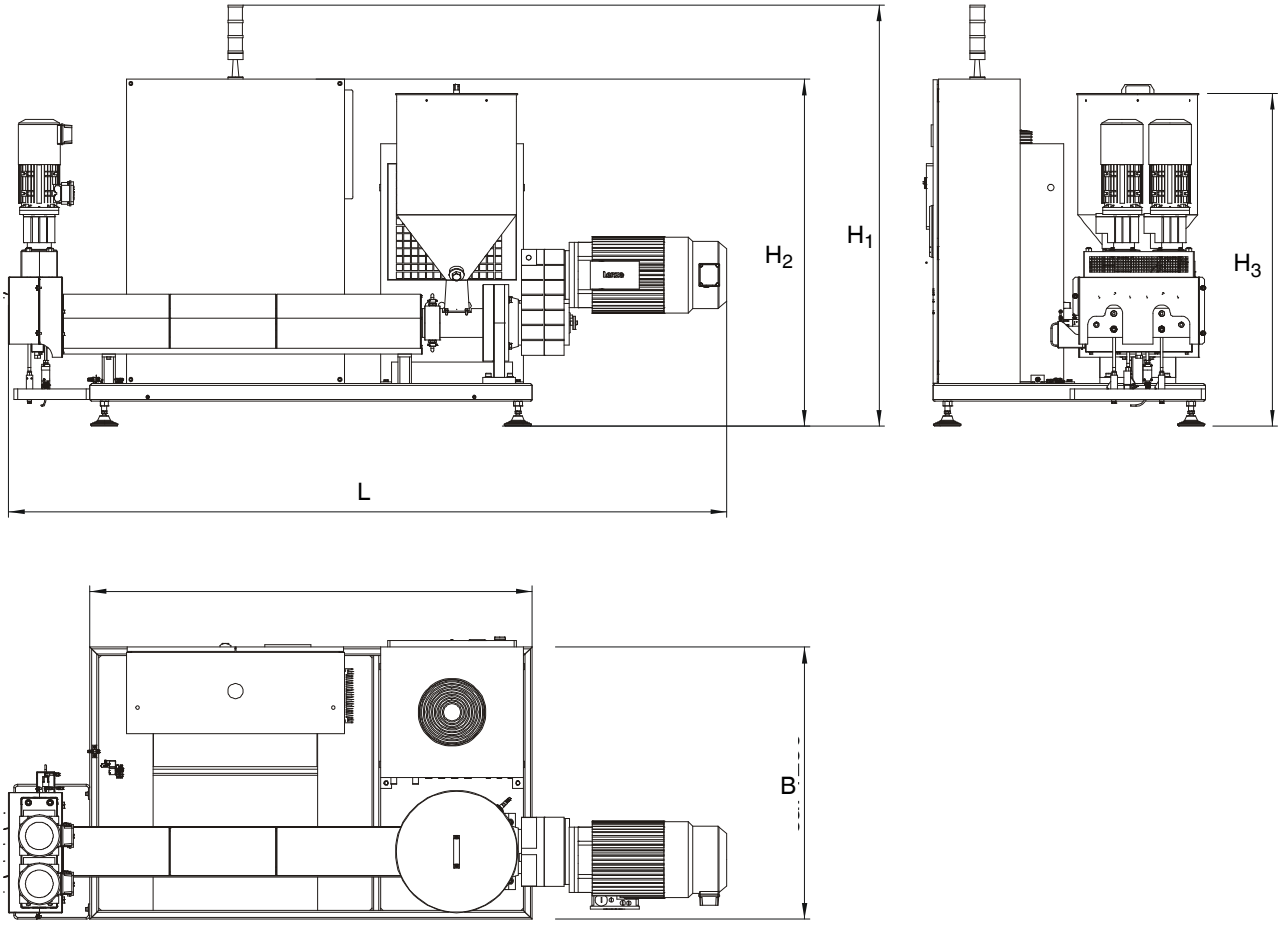


Fig. 9-1

Design size	Standard hopper volume
EX003	
EX007	
EX100	

Appendix A

Tach Generator Adjustment Board - Obsolete

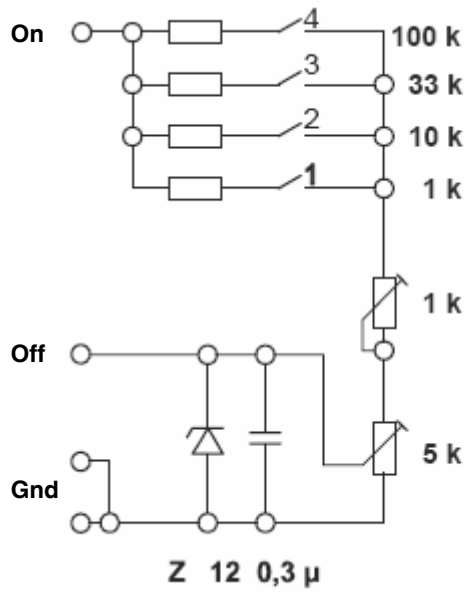
Safety Instructions

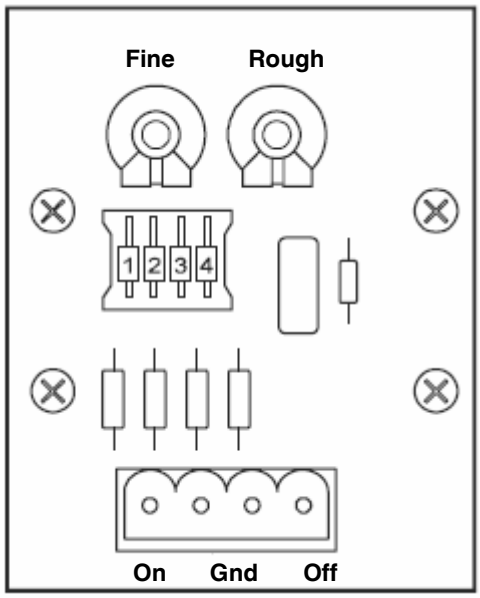
ATTENTION: Allow only qualified personnel to perform the following tasks. Follow the safety instructions here and in the entire documentation.

Description

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

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





Setting Input Voltage

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

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

DIP switch	220 V	80 V	32 V	15 V
1	OFF	OFF	OFF	ON
2	OFF	OFF	ON	OFF
3	OFF	ON	OFF	OFF
4	ON	OFF	OFF	OFF

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

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

Appendix B

Pressure Sensor with Integrated Evaluation Electronics

- Pressure Sensor Series W/K With and Without Safety Switch Contact -

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

It is described in the separate manual

- German: P/N 7119581
- English: P/N 7119609

Appendix C

Instructions on Aligning Level Compensating Element (Special Feature)

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

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

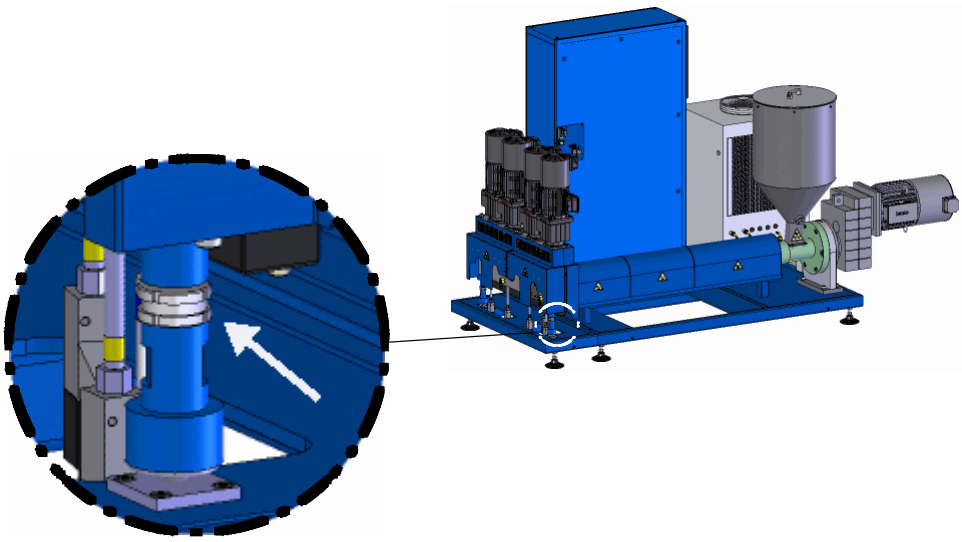


Fig. C-1 Support with level compensating element (arrow) - EEX200 as example

If Adjustment is Required

Adjust only when the system is cold.

Two persons, two sickle wrenches and one open-end wrench size 32 are needed.

Continued ...

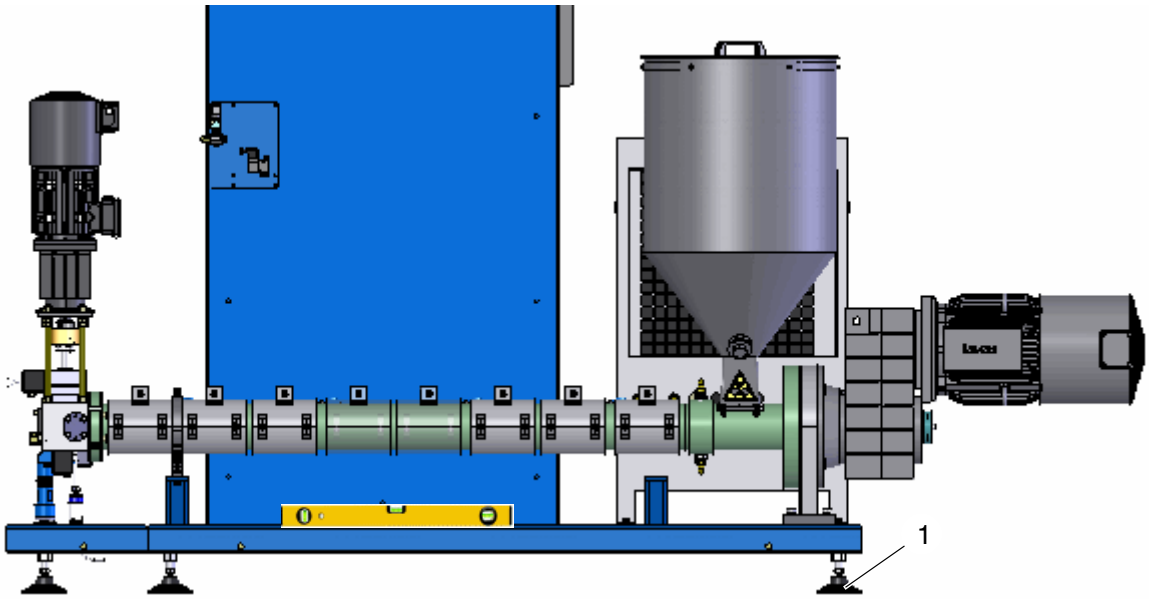


Fig. C-2 Longitudinal

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

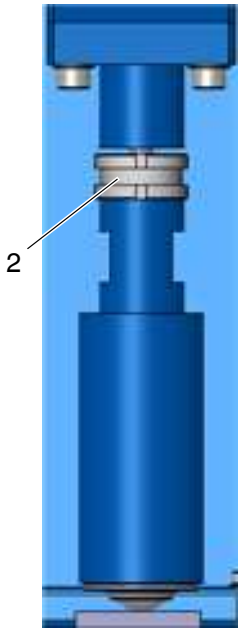
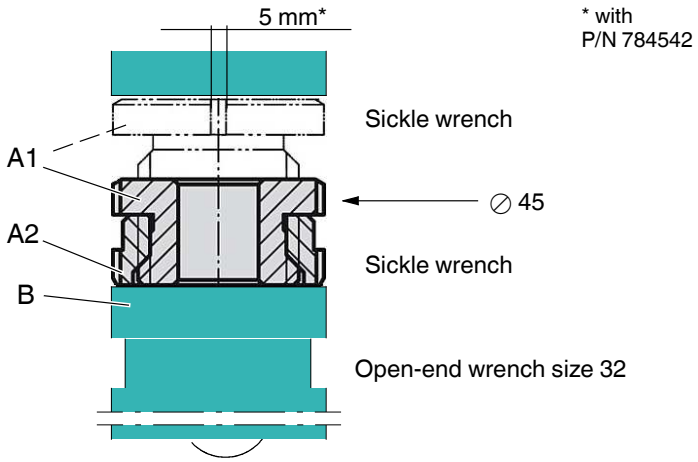


Fig. C-3 Transversely

2. Align *transversely* with the aid of the two level compensating elements (2, Fig. C-3). Do this by pressing part B down until the ball touches the lower plate. Tighten just enough that the support does not wobble.

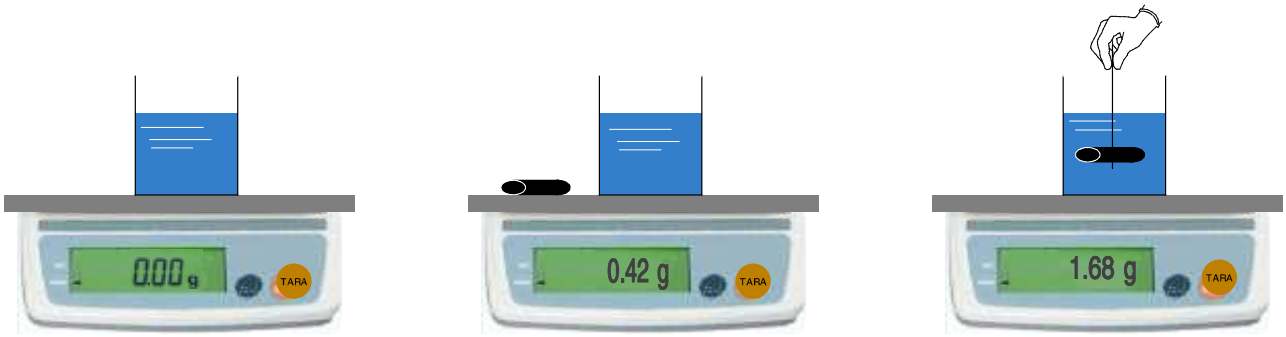


3. Brace with the open-end wrench and hold part A2 (Fig. C-3) with the sickle wrench.
4. Use the second sickle wrench to screw part A1 all the way to the top.

Appendix D

Determination of Foam Density

1. Cut off a 3 cm long foamed bead.
2. Place a container of water on a scale and tare the scale.
   Scale display: 0 g



3. Place the foamed bead next to the container on the scale and make a note of the weight of the bead.
   Example $Mass_{Bead}$ = 0.42 g
4. Spear the bead onto a thin, rigid wire and submerge it complete in the water. Make a note of the weight.
   Example 1.68 g

   This weight is the weight of the displaced water. With a $density_{Water}$ of 1 g/cm^3, the volume is then 1.68 cm^3, which is also the volume of the bead

5. $Density_{Bead} = Mass_{Bead} / Volume$

   $Density_{Bead}$ = 0.42 g / 1.68 cm^3 = 0.25 g/cm^3 x 1000 [kg/m^3] / [g/cm^3]
   $Density_{Bead}$ = **250 kg/m^3**