

Hot Melt Material Applicators MX 3400 / MX 4400

Manual P/N 290 842 C
– English –



NORDSON ENGINEERING GMBH • LÜNEBURG • GERMANY

Note

This manual applies to the entire series.



Order number

P/N = Order number for Nordson products

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Separate document

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Safety



Observe and follow all safety instructions, the general safety instructions included as a **separate** document, as well as the specific safety instructions in all other related documentation.

Description

Section 2

Description

1. *Intended Use*

Hot melt material applicators of the series *MX 3400* and *MX 4400* – hereafter also referred to as *unit* – may only be used to melt and convey thermoplastic hot melt adhesives.

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

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

Area of Use (EMC)

The unit is designed for use in industrial areas.

Operation Restriction

When operated in residential or commercial areas, the units may cause interference in other electrical units, e.g. radios.

Unintended Use – Examples –

The unit may not be used under the following conditions:

- In defective condition
- Without heat protection and protective panels
- With electrical cabinet door open
- When the electrical cabinet is pulled out
- With tank lid open
- In an explosive atmosphere
- When the values stated under *Specification* are not complied with.

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

- Polyurethane hot melt adhesive (PUR)
- Explosive and inflammable materials
- Erosive und corrosive materials
- Foodstuffs

2. Residual Risks

In the design of the unit, every measure was taken to protect personnel from possible dangers. Nevertheless, some residual risks can not be avoided. Personnel should be aware of the following points:

- Risk of burns from hot adhesive.
- Risk of burns when filling the tank, from the tank lid, and from the tank lid supports.
- Risk of burns when conducting maintenance and repair work for which the unit must be heated up.
- Risk of burns when attaching and removing heated hoses.
- Risk of burns from heated adhesive. It can flow out of the hoses under pressure when the system has not first been relieved of pressure.
- Inhalation of potentially hazardous adhesive fumes.
- Risk of damage to cables/hoses belonging to the customer, if they were installed such that they come into contact with hot or rotating parts.
- The safety valve can malfunction due to hardened or cracked adhesive.

3. Definition of Terms

In Nordson documents, the *safety valve* is also referred to as *bypass* and *bypass valve*.

4. Manual References

- This manual applies to the entire series. A unit with one motor and one gear pump is described here, but the description is valid for all models.
- This instruction manual is valid only in conjunction with all of documents included in the complete set of documentation (blue binder).
- When the unit has special features, customer specifications and/or supplements may be added to this manual.
- The position numbers in the illustrations do not correspond to the position numbers in the technical drawings and spare parts lists.
- The illustrations show only the essential unit components. All other components and details can be found in the included technical drawings (Refer to *Parts List*).

5. Series Overview

The tables show all units in the series *MX 3400* and *MX 4400*. The units differ from one another in the model and size of the tank and in the number of motors, pumps and hose connection fittings (Also refer to the section *Specifications*).

Series MX 3400					
MX 3412-1x1	MX 3412-1x2	MX 3412-2x1	–	–	–
MX 3424-1x1	MX 3424-1x2	MX 3424-2x1	MX 3424-2x2	MX 3424-3x1	MX 3424-4x1
MX 3460-1x1	MX 3460-1x2	MX 3460-2x1	MX 3460-2x2	MX 3460-3x1	MX 3460-4x1

Series MX 4400					
MX 4412-1x1	MX 4412-1x2	MX 4412-2x1	–	–	–
MX 4424-1x1	MX 4424-1x2	MX 4424-2x1	MX 4424-2x2	MX 4424-3x1	MX 4424-4x1
MX 4460-1x1	MX 4460-1x2	MX 4460-2x1	MX 4460-2x2	MX 4460-3x1	MX 4460-4x1
MX 44110-1x1	MX 44110-1x2	MX 44110-2x1	MX 44110-2x2	MX 44110-3x1	MX 44110-4x1
MX 44160-1x1	MX 44160-1x2	MX 44160-2x1	MX 44160-2x2	MX 44160-3x1	MX 44160-4x1

Series Differentiation

The series *MX 3400* and *MX 4400* differ principally from one another in the design of the tank. The series *MX 3400* is equipped with a one piece tank. The tank in the *MX 4400* series is divided into a low melt section and a high melt section (Also refer to *Melting Process*).

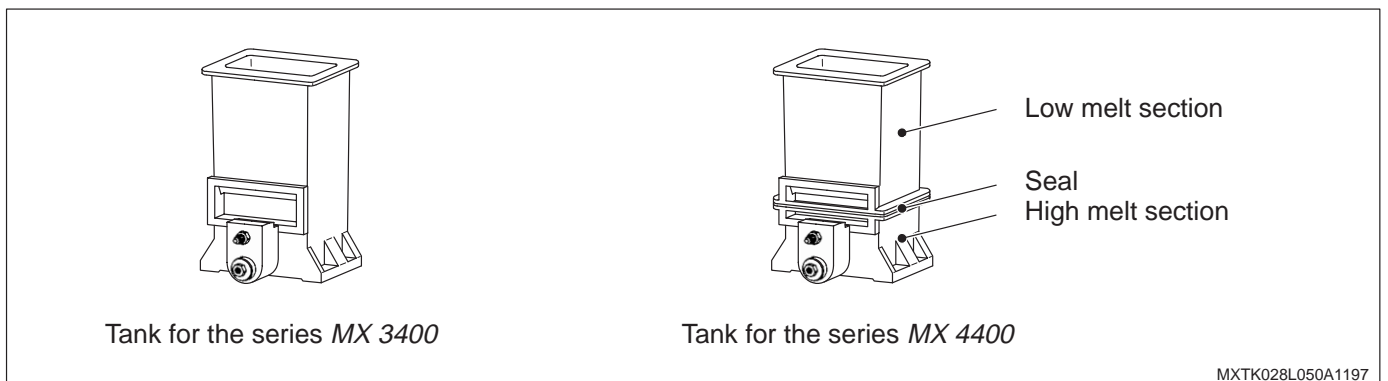
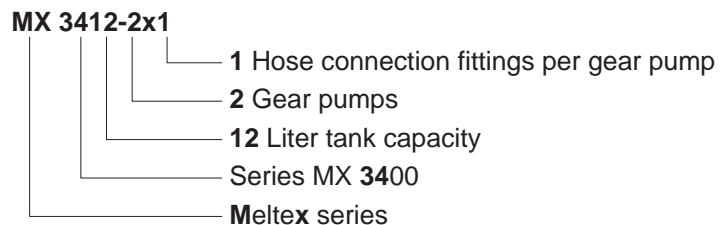


Fig. 2-1

Explanation of Type Designation

The unit MX 3412-2x1 is used as an example.



6. Unit Components

The illustration shows only the unit components that are described in this section, in the following sections of this manual or in separate manuals.

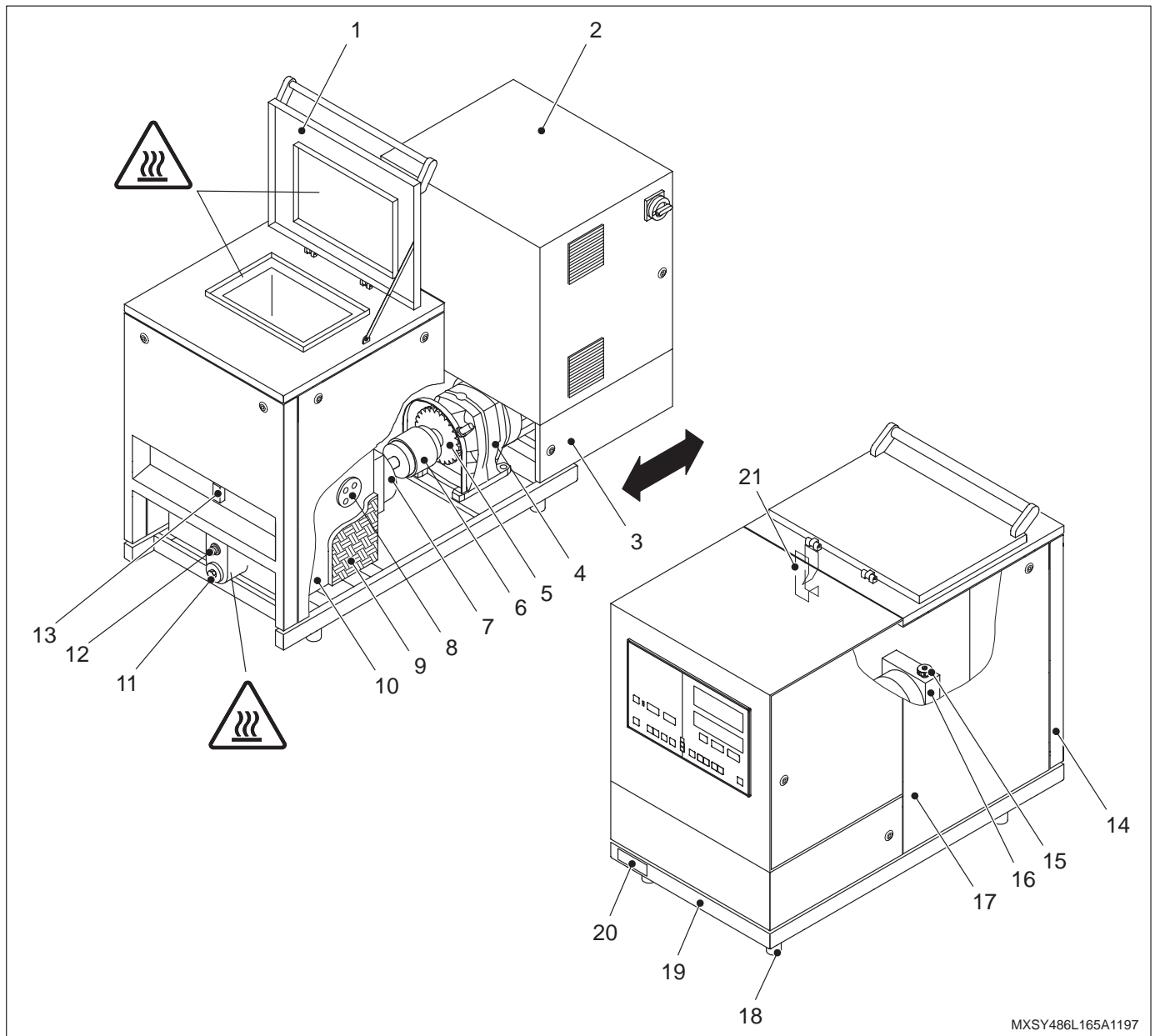


Fig. 2-2

- | | | |
|---------------------------|------------------------------------|---------------------------------------|
| 1. Tank lid | 8. Adhesive drain flange | 15. Safety valve* |
| 2. Electrical cabinet | 9. Heat protection | 16. Bypass plate |
| 3. Motor cover | 10. Tank* | 17. Heat protection panel (removable) |
| 4. Motor* | 11. Filter cartridge* | 18. Unit stand |
| 5. Actual speed compiler* | 12. Hose connection fitting | 19. Unit frame |
| 6. Coupling | 13. Hose connection socket | 20. ID plate |
| 7. Gear pump* | 14. Heat protection panel (hinged) | 21. Cable holder |

Note: There are separate manuals available for all components marked with an asterisk (*).

7. Special Features

The illustration shows commonly used special features. The features are described in separate manuals, customer specifications or supplements when they are part of the unit.

NOTE: There may be a different amount of level limit switches (5) and level sensors with switching amplifiers (6), and they may be located in a different place.

NOTE: When the electrical cabinet for the unit has a base (4), the unit heights stated in the section *Specifications* are increased by approx. 240 mm.

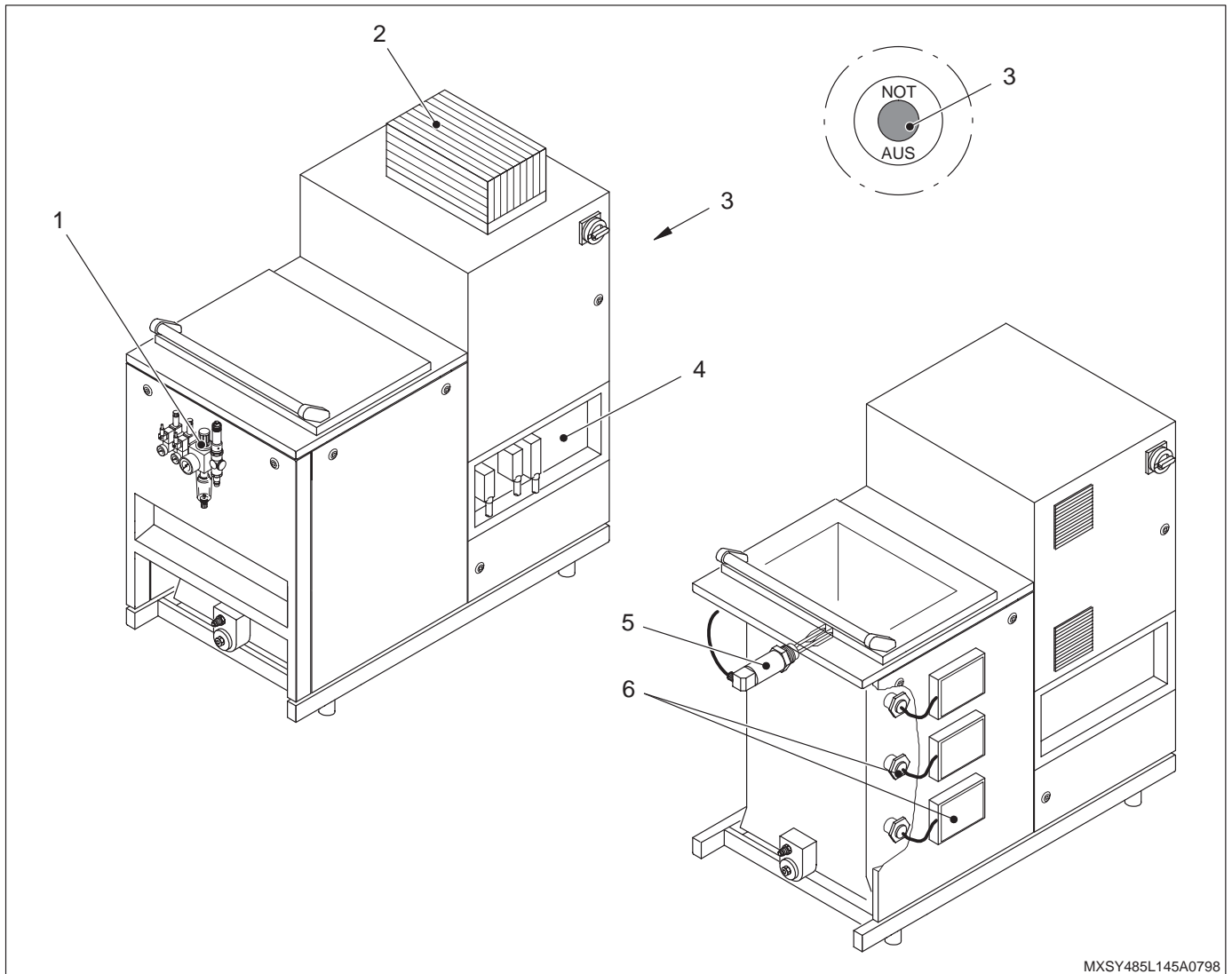


Fig. 2-3

- | | | |
|--|--|---|
| 1. Control unit for pneumatic safety valves* | 3. EMERGENCY OFF button | 5. Level limit switch* |
| 2. Heat exchanger* | 4. Electrical cabinet base with electrical connections | 6. Level sensors with switching amplifiers* |

Note: There are separate manuals available for all components marked with an asterisk (*).

8. Options, Illustration

The illustration shows all options visible on the unit. The options are described in separate manuals. Refer to table for other options.

NOTE: The pressure sensor (2) can also be located in the bypass plate (16, Fig. 2-2). The connectors (9 and 10) can also be located on the other side of the unit. The units MX 3412 and MX 4412 can not be equipped with a weighing cell (1).

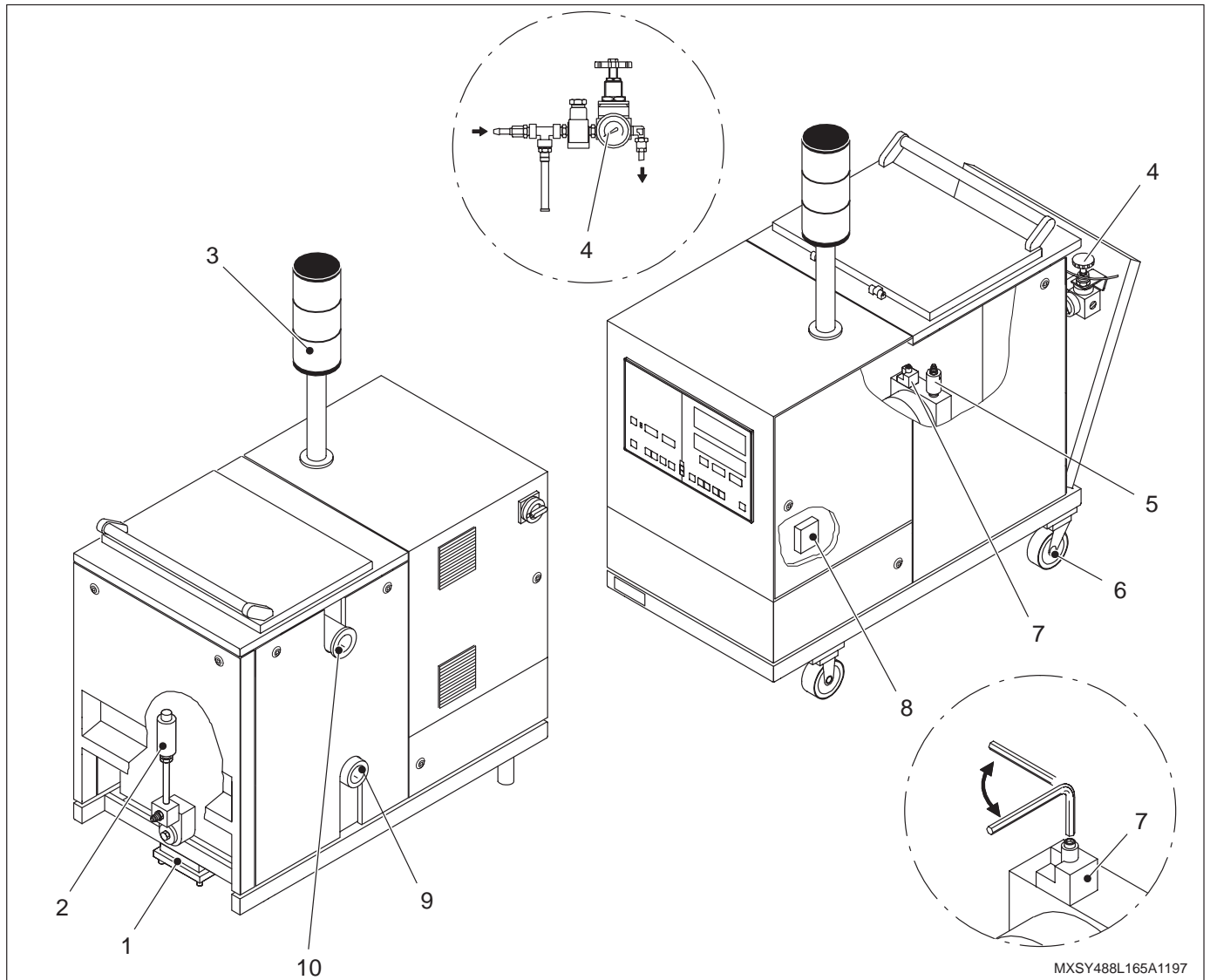


Fig. 2-4

- | | | |
|-------------------------|----------------------------|----------------------------------|
| 1. Weighing cell* | 5. Pneumatic safety valve* | 9. Return hose connection |
| 2. Pressure sensor* | 6. Transport rolls | 10. Tank filling hose connection |
| 3. Indicator light | 7. Shut-off valve | |
| 4. Inert gas equipment* | 8. Week timer* | |

Note: There are separate manuals available for all components marked with an asterisk (*).

9. Options, Brief Description

Option	Brief Description	Refer to
Different operating voltages	230 V _{AC} or 400 V _{AC}	ID plate Wiring diagram
Different temperature sensors	Fe-CuNi (Fe/Ko), Pt 100 or Ni 120	Wiring diagram
Pressure display	Indicates adhesive pressure.	Manuals <i>Pressure Sensor Control System</i>
Indicator light	Indicates operating mode of unit.	Sections <i>Operation Troubleshooting Manual Control System</i>
Bar graph	Shows which range the temperature is in for all temperature channels at the same time.	Manual <i>Control System</i>
Week timer	Used to automatically switch on/off the unit. The week timer is located in the electrical cabinet.	Manual <i>Week Timer</i>
Threshold value switch	Used to start and stop the motor, depending on pilot voltage.	Manual <i>Control System</i>
Shut-off valve	Enables replacement of gear pump without first emptying the tank.	Illustration <i>Options</i>
Pneumatic safety valves	Among other things, the pneumatic safety valves can be used to adapt the adhesive pressure to the production sequence or to automatically relieve adhesive pressure when EMERGENCY OFF occurs.	Manual <i>Safety Valve</i>
Weighing cell	Monitors tank level and can trigger filling system.	Manual <i>Weighing Cell</i>
Inert gas equipment	Used to pressurize tank with inert gas. This may be needed when processing certain materials.	Manual <i>Inert Gas Equipment Control System</i>
High temperature model	The high temperature model is used to process certain materials.	Section <i>Specifications</i>
Extended tank	Increases tank volume.	–
Transport rolls	For moving the unit.	–
Release coated gear pump	The release coating makes it easier to clean the gear pump.	–
Gear pump made of stainless steel	Among other things, it is used when corrosive materials are processed.	–
Tank filling hose connection	Used to automatically fill the tank, e.g. with a drum melter.	Illustration <i>Options</i>
Return hose connection	Used to return adhesive from the application head to the tank. But this is only possible when using application heads with return line control module(s).	Illustration <i>Options</i>

10. Functioning

This section describes the functioning of the unit. The functioning of individual unit components is described in the corresponding manual for the component (Refer to *Index of Documentation*).

Melting Process and Adhesive Flow

The series *MX 3400* and *MX 4400* differ principally from one another in the design of the tank. The series *MX 3400* is equipped with a one piece tank (1). The tank in the *MX 4400* series is divided into a low melt section (2) and a high melt section (4). An insulating seal (3) provides a temperature barrier between the two sections. The temperature barrier allows the adhesive in the low melt section to be gently melted at a low temperature. The adhesive is then melted to processing temperature in the high melt section.

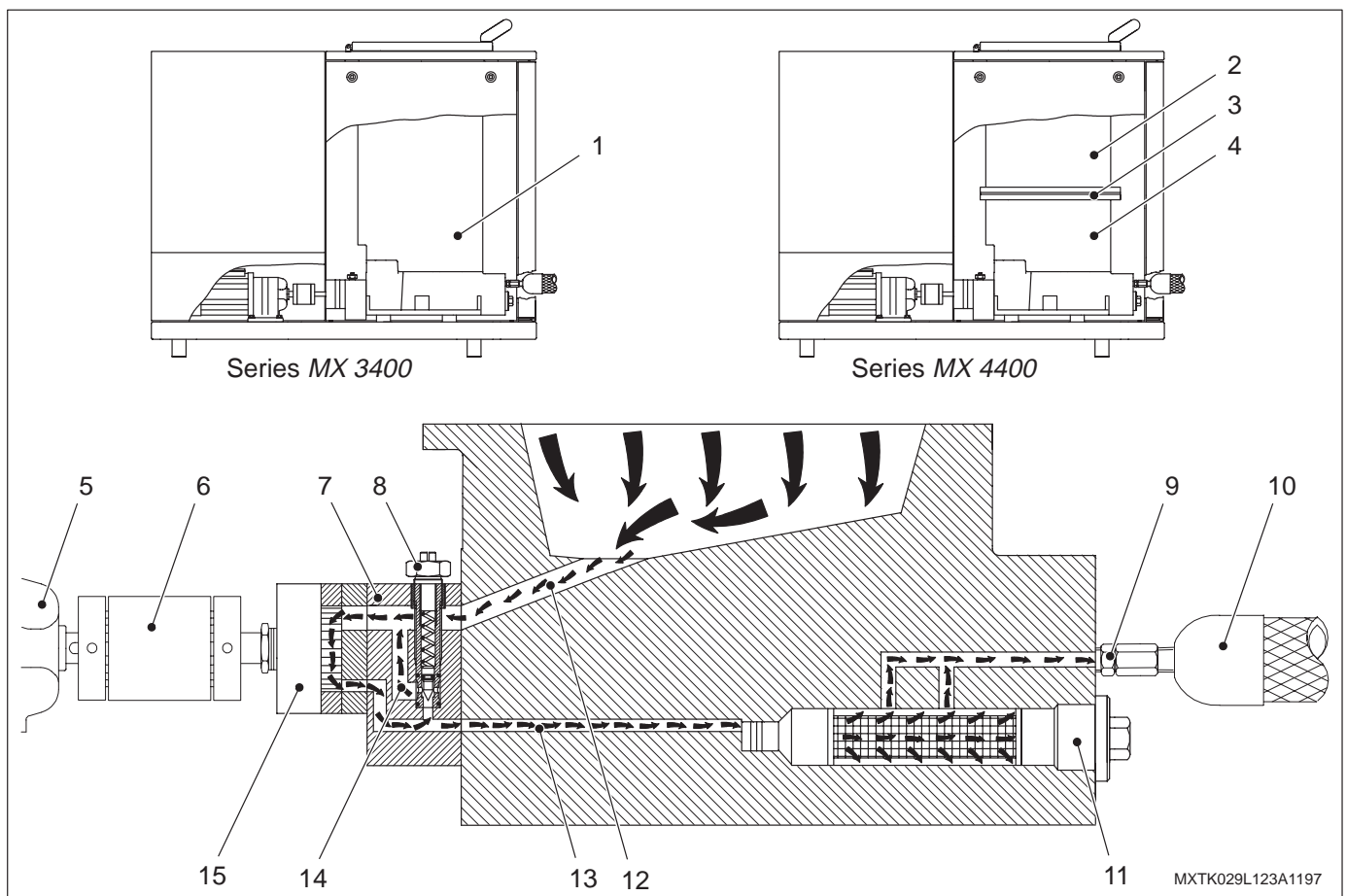


Fig. 2-5

- | | | |
|-----------------------------|-----------------------------|----------------------|
| 1. Tank | 6. Coupling | 11. Filter cartridge |
| 2. Low melt section (tank) | 7. Bypass plate | 12. Suction hole |
| 3. Seal | 8. Safety valve | 13. Pressure hole |
| 4. High melt section (tank) | 9. Hose connection fitting | 14. Bypass hole |
| 5. Motor | 10. Heated hose (accessory) | 15. Gear pump |

Melting Process and Adhesive Flow (contd.)

Description of process shown in fig. 2-5:

The adhesive is melted in the tank (1 or 2 and 4). The processing temperature prescribed by the manufacturer in the safety data sheet is decisive for setting the temperature.

The adhesive flows from the tank through the suction hole (12) into the gear pump (15). The gear pump, driven by an electronically controlled motor (5), conveys the adhesive through the bypass plate (6) and the filter cartridge (11) to the hose connection fitting (9). The adhesive flows through the filter cartridge (11) from the inside to the outside. Thus dirt particles remain in the filter cartridge.

The safety valve (8), located in the bypass plate (7), limits the adhesive pressure generated by the gear pump (15) and keeps it steady. It is factory set and lead sealed. When the set pressure is exceeded – e.g. when the nozzle of an application head is closed – the safety valve opens, and the adhesive circulates within the bypass plate.

Various models of pneumatic safety valves offer options such as adaptation of the adhesive pressure to the production sequence and automatic relief of adhesive pressure when EMERGENCY OFF occurs.

Description of process shown in fig 2-6:

The adhesive is conveyed from the unit (1) through a heated hose (2) to a hot melt application head (3), which then applies the adhesive to the substrate. The heated hose and the application head are accessories.

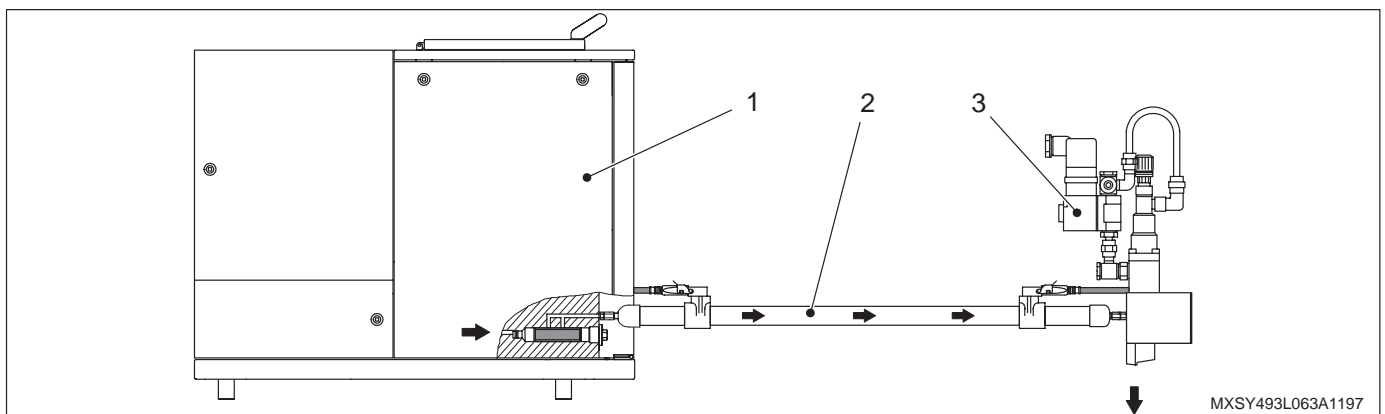


Fig. 2-6 Example of a hot melt material application system

1. Unit

2. Heated hose

3. Application head

Heating and Temperature Control

The melt zone is heated by cast-in heating elements. They guarantee optimum heat transfer and energy efficiency. The temperature is measured by sensors and is electronically controlled by the control system.

Undertemperature Locking Device

The undertemperature locking device prevents the unit or system from starting up when the adhesive is too cold. It is activated until the nominal temperature value minus undertemperature value has been exceeded. On initial heating of the unit, the locking device is first released when the actual temperature is 3 °C below the nominal value temperature.

The undertemperature locking device locks the motors, solenoid valves and, in some cases, other components of the hot melt material application system. Refer to the Wiring Diagram to determine which components are locked.

Overtemperature Indication / Shutdown

The independently operating overtemperature shutdown mechanisms protect the unit and adhesive from overheating. For overtemperature shutdown, the heating and motor are switched off. The red indication lamp *collective fault* lights up.

- Overtemperature indication through temperature controller: Switches relay output *collective fault* when setpoint temperature value plus overtemperature value has been reached and the red indication lamp lights up. The unit remains ready for operation.
- Overtemperature shutdown through temperature controller: The overtemperature shutdown value is set automatically 30 °C above the highest temperature setpoint value.
- Overtemperature shutdown through thermostat(s): Serves as an emergency switch OFF in case the overtemperature shutdown of the temperature controller does not function properly. Refer to section *Specification* for shutdown value.



WARNING: When the overtemperature shutdown is triggered, there is either a fault in settings or unit malfunction. Switch off the unit and have the fault eliminated by qualified personnel.

Temperature Setback (Standby)

Serves to protect the adhesive and save energy during interruptions in production or work stoppages. Setback value and setback period are adjustable.

**Controlling Motor and
Compiling Actual Speed**

The gear pump is driven by a motor that is electronically controlled by the control system. Various parameters and the operating modes *manual mode* and *automatic mode* can be set with the control system.

Manual mode (constant speed)

In manual mode the motor/pump speed is the same as the speed set on the control system. The speed is kept stable at the set value.

Automatic mode (pilot voltage controlled mode)

In automatic mode the motor/pump speed is regulated synchronously to the speed of the parent machine. But automatic mode is possible only when pilot voltage is connected to the control system. Various parameters can be set on the control system.

Compiling actual speed

The actual speed is compiled with a sensor that scans a toothed wheel rim mounted on the gear output shaft without actually touching it. The impulses thus generated are evaluated by the control system and displayed as the actual speed.

Also refer to manual *Actual Speed Compiler*.

Pressure Display (Option)

The electronic pressure display measures and indicates the adhesive pressure generated by the gear pump. The pressure is measured by a pressure sensor located either on the hose connection fitting or in the bypass plate, depending on the model of the unit. The pressure can be displayed in bar or in psi. Various parameters can be set with the control system.

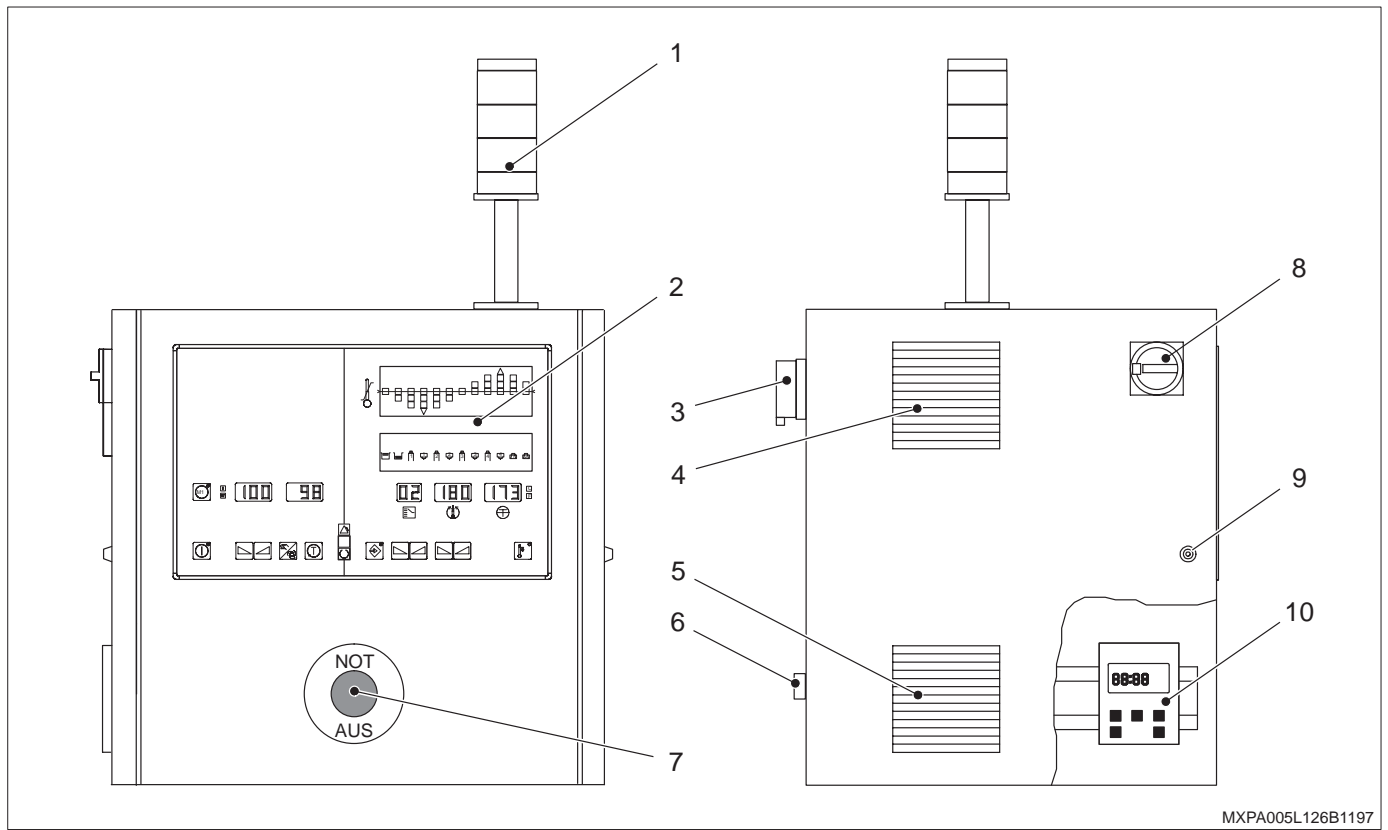
Pressure sensor

The pressure sensor generates output voltage that is evaluated by the control system and shown as actual pressure in the pressure display (option).

Refer to manual *Pressure Sensor*.

11. Electrical Cabinet

The electrical cabinet contains all of the essential operating elements of the unit, described briefly here. Detailed descriptions can be found in the respective sections of this manual or in separate manuals.

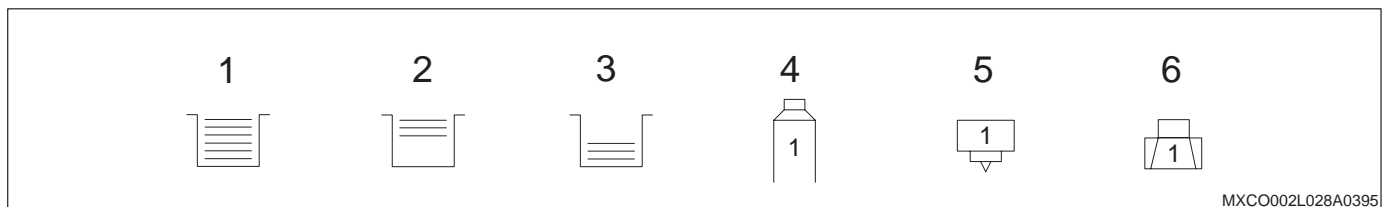


MXPA005L126B1197

Fig. 2-7

- 1. Indicator light (option)
- 2. Control system
- 3. Interface XS 2
- 4. Air filter
- 5. Fan with filter
- 6. Connection socket *tacho generator*
- 7. EMERGENCY OFF button (special feature)
- 8. Main switch
- 9. Door lock
- 10. Week timer (option)

Channel Allocation Symbols



MXCO002L028A0395

Fig. 2-8

- 1. Tank (MX 3400)
- 2. Low melt section / tank (MX 4400)
- 3. High melt section / tank (MX 4400)
- 4. Heated hose (accessory)
- 5. Hot melt material application head (accessory)
- 6. Additional channel

Main Switch**(8, Fig. 2-7)**

The main switch is used to switch the unit on and off.

Position 0/OFF = Unit is switched off.

Position I/ON = Unit is switched on.

The main switch can be secured with padlocks to prevent unauthorized persons from switching on the unit.

**EMERGENCY OFF Button
(Special Feature)****(7, Fig. 2-7)**

The EMERGENCY OFF button is used to switch off the unit in an emergency. The EMERGENCY OFF button must be unlocked before the unit is switched on again.

Control System**(2, Fig. 2-7)**

The unit is operated essentially with the control system. It is used to set various values and parameters and to display operating modes and faults.

Refer to manual *Control System*.

Week Timer (Option)**(10, Fig. 2-7)**

The week timer is used to automatically switch the unit on and off. The main switch must be set to I/ON when using the week timer.

Refer to manual *Week Timer*.

Indicator Light (Option)**(1, Fig. 2-7)**

The indicator light shows the same operating modes as the lamps on the control system.

Refer to section *Troubleshooting* and manual *Control System*.

Red	Collective fault
White	On
Green	Ready for operation

Electrical Cabinet Ventilation**Air filter (4, Fig. 2-7) / fan with filter (5, Fig. 2-7)**

The electrical cabinet ventilation system reduces the temperature inside of the electrical cabinet. The filters must be serviced regularly. Refer to section *Maintenance*. There is no electrical cabinet ventilation on units with heat exchangers (special feature).

**Connection Socket Tacho
Generator****(6, Fig. 2-7)**

This socket is used to connect a tacho generator (accessory) or pilot voltage to regulate the motor of the application unit synchronously to the speed of the parent machine.

Refer to section *Installation* and manual *Tacho Generator*.

Interface XS 2

(3, Fig. 2-7)

Serves as a connection between the unit and external devices. Refer to section *Installation and Wiring Diagram*.

Door Lock

(9, Fig. 2-7)

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 unit may not be operated when the electrical cabinet is open.



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



WARNING: Disconnect equipment from the line voltage.

Pulling Out Electrical Cabinet

The electrical cabinet can be pulled out for installation, maintenance and repair. First unlock with the key.



WARNING: Risk of injury from rotating parts. Do not operate unit when electrical cabinet is pulled out. Ensure that cables do not touch rotating or hot parts after the electrical cabinet is pushed back. Do not pinch cables.

NOTE: Do not operate units with weighing cells when the electrical cabinet is pulled out. This would distort the results.

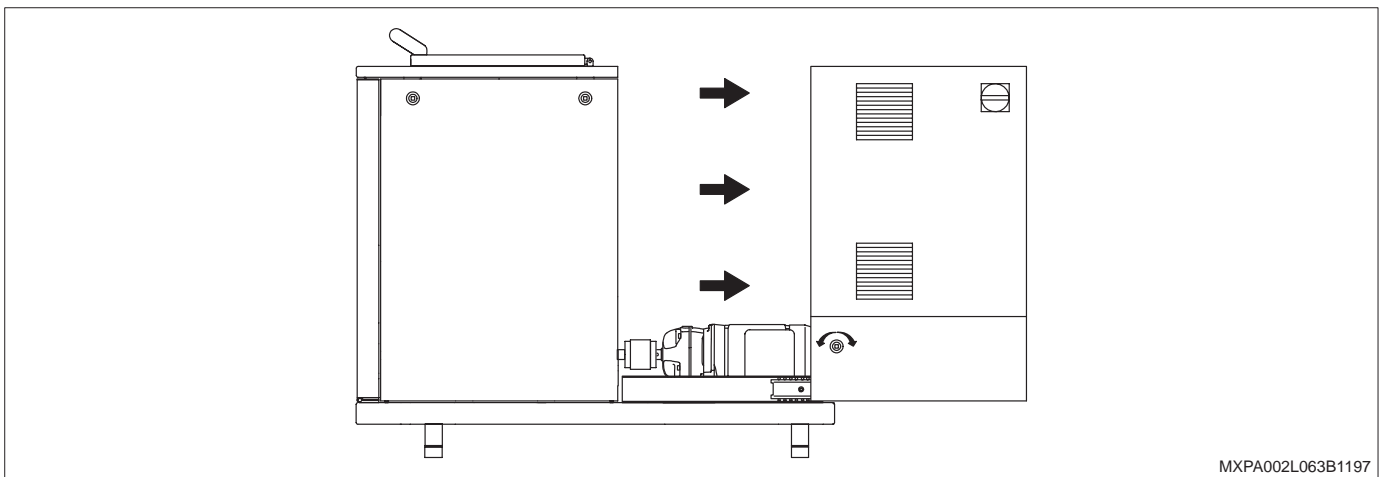


Fig. 2-9

12. Protection Panels



WARNING: Risk of injury from hot or rotating parts. Do not operate without protection panels. Open/remove only for installation, maintenance and repair.

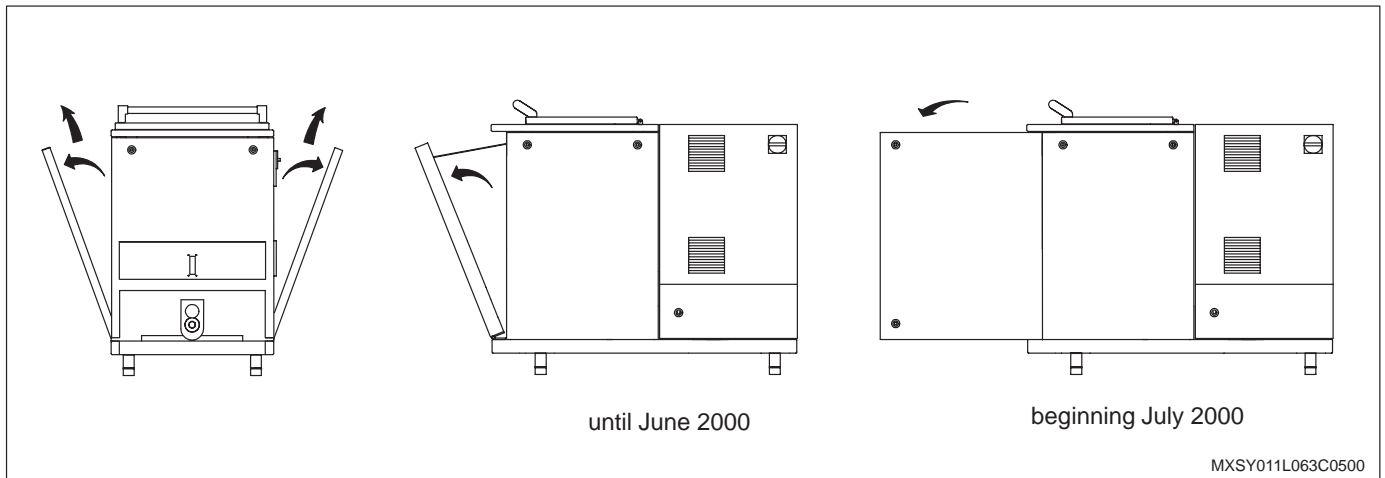


Fig. 2-10

13. ID Plate

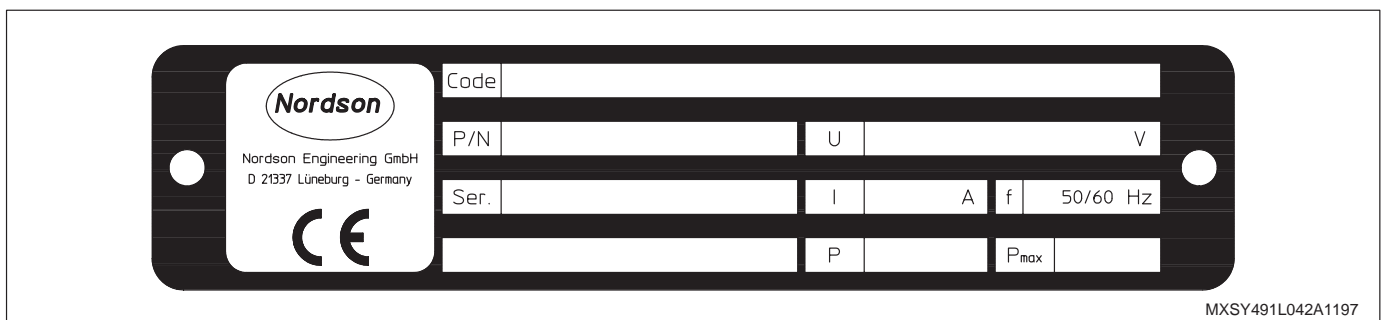


Fig. 2-11

Information	Description	Unit
Code	Unit designation and configuration code	–
P/N	Order number (part number)	–
Ser.	Serial number	–
U	Operating voltage	Volt
I	Fuse rating	Ampère
f	Line voltage frequency	Hertz
P	Power consumption of unit	Watt
P _{max}	Power consumption of unit and connected accessories	Watt

Section 3

Installation

Section 3 Installation



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

1. Unit Components Relevant for Installation

The following illustration shows only components relevant for installation. They may be described in separate manuals. Positions 3 and 7 are special features. Positions 8, 9 and 10 are options. Position 3 may replace positions 1, 2 and 4 when appropriate. When there is a position 7, there is no position 9.

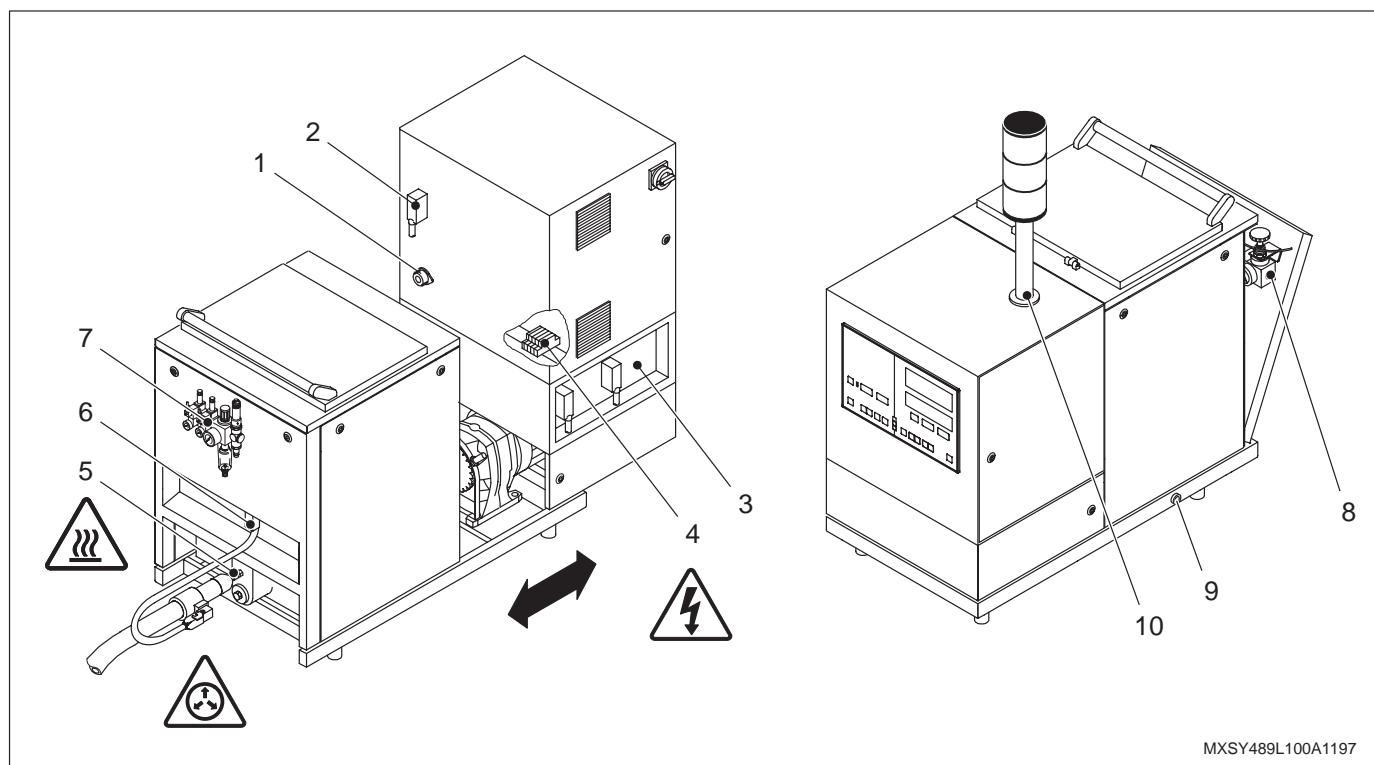


Fig. 3-1

- | | | |
|---|--|---|
| 1. Connection socket <i>tacho generator</i> | 5. Hose connection fitting | 9. Compressed air connection for pneumatic safety valve |
| 2. Interface XS 2 | 6. Hose connection socket | 10. Indicator light |
| 3. Electrical connections | 7. Control unit for pneumatic safety valves* | |
| 4. Mains terminals | 8. Inert gas equipment* | |

Note: There are separate manuals available for all components marked with an asterisk (*).

2. Unpacking

Unpack carefully and check for damage caused during transport. Save pallet (3), angle brackets (2) and box (1) for later use, or dispose of properly according to local regulations (Fig. 3-2).

Lifting (Unpacked Unit)

Refer to section *Specifications* for weight. Lift only at the unit frame using suitable lifting equipment or a forklift.

3. Transport

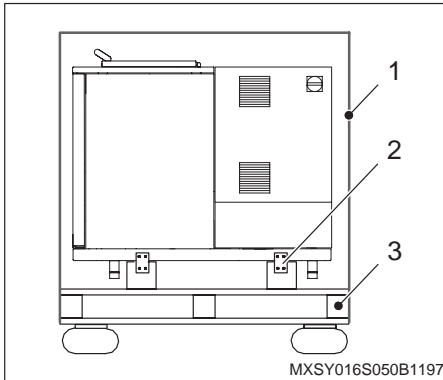


Fig. 3-2

- Refer to section *Specifications* for weight. Use only suitable methods of transport.
- If possible, use the pallet (3) that came with the unit and use angle brackets (2) to fasten the unit.
- Use a sturdy box (1) to protect from damage.
- Protect from humidity and dust.
- Avoid jolts and vibrations.
- Observe additional transport instructions for units with weighing cells (Refer to manual *Weighing Cell*).

4. Removing

Run the unit until empty, separate all connections from the unit, and allow the unit too cool down.

5. Storage

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

6. Disposal

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

7. Setting Up

Set up only in an environment that conforms to the unit's stated Degree of Protection (Refer to section *Specifications*). Do not set up in a potentially explosive environment. Protect from vibration.

Remove transport protection (if present). Leave enough free space around the unit (Fig. 3-3).

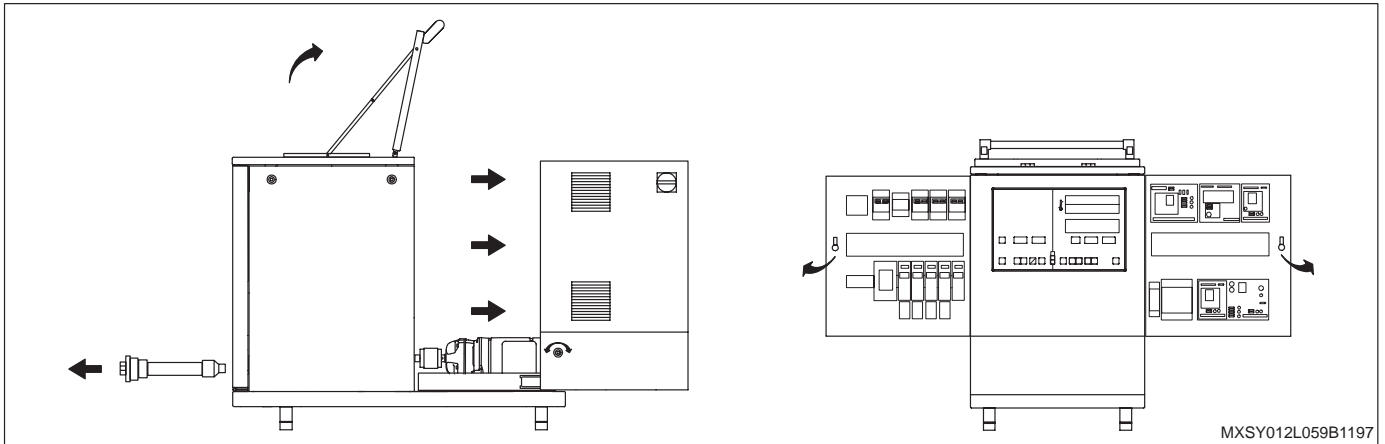


Fig. 3-3 Principle drawing

Exhausting Adhesive Vapors

Ensure that adhesive vapors do not exceed the prescribed limits. Always observe the safety data sheet for the material to be processed. Exhaust adhesive vapors if necessary. Provide sufficient ventilation in the area where the machine is set up.

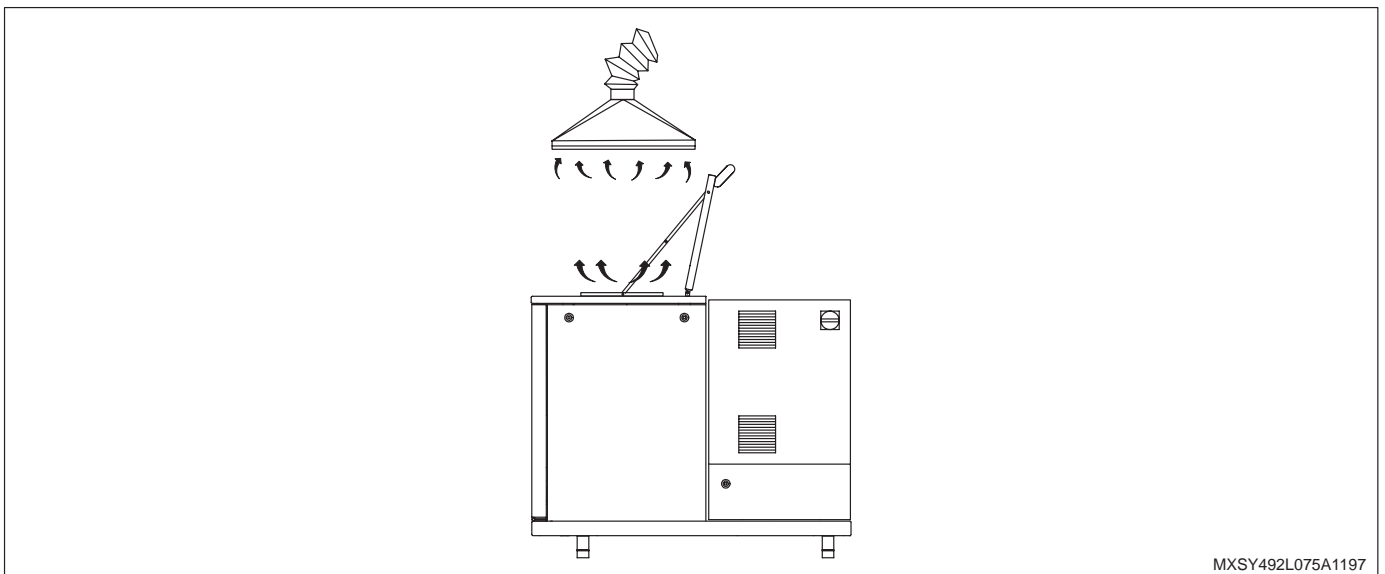


Fig. 3-4 Principle drawing

8. Electrical Connections



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

Laying Cables



WARNING: Use only temperature resistant cable in the heating part of the unit. Ensure that cable does not touch rotating and/or hot parts. Do not pinch cable, and check regularly for damage. Immediately replace damaged cable!

Line Voltage



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

NOTE: Permitted deviation from the rated line voltage is +5% / -10%.

NOTE: The power connection cable must have a cross-section matching the power consumption P_{max} . (Refer to *ID Plate*).

Power Supply

The mains terminals are located in the electrical cabinet. On some special models, the power supply is connected to a plug connection on the base of the electrical cabinet. Refer to *Wiring Diagram* for connecting arrangement.

Tacho Generator (Accessory)

The tacho generator is connected at the connection socket (1, Fig. 3-1). Also refer to *Wiring Diagram* and manual *Tacho Generator*.



CAUTION: The pilot voltage produced by the tacho generator may not exceed 160 V_{DC}. Failure to observe will result in damage to the succeeding components.

NOTE: The pilot voltage produced by the tacho generator must be adjusted (Refer to manual *Control System*).

Interface XS 2

The interface serves as a connection between the unit and external devices. The functions controlled with the digital module are described in detail in the manual *Control System*, section *Digital Module*.

NOTE: On special models the connecting arrangement can deviate from that described here. The connecting arrangement is then as described in the wiring diagram and the supplement.

NOTE: To conform with a European standard regarding electro-magnetic compatibility, only shielded cable may be connected. The cable **must** be connected to ground in compliance with the standard.

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

Interface XS 2 / P/N 403 337 (16 channel)				Digital module	
Pin	Input	Output	Function For a description of the functions, refer to manual <i>Control System</i> , section <i>Digital Module</i> .	Plug connector	Pin
1	–	24 V _{DC}	Internal switching voltage for activating the inputs 2, 5, 8, 9, 10, 11. The switching voltage must be connected to the appropriate input.	X 1	1
2	24 V _{DC}	–	Release <i>Motor 1</i>	X 1	5
3	24 V _{DC}	–	Internal / external switching voltage <i>Solenoid valve 1</i> *		
4	24 V _{DC}	–			
5	24 V _{DC}	–	Release <i>Motor 2</i>	X 1	6
6	24 V _{DC}	–	Internal / external switching voltage <i>Solenoid valve 2</i> *		
7	24 V _{DC}	–			
8	24 V _{DC}	–	Switch on/off <i>Temperature setback</i>	X 1	4
9	24 V _{DC}	–	Mode switch <i>Manual/automatic mode</i> (option) (The dial S1 of the digital module must be set to 7)		
10	24 V _{DC}	–	Release <i>Unit</i>	X 1	2
11	24 V _{DC}	–	Release <i>All motors</i>	X 1	3
12	Maximum 24 V _{DC}	–	External potential for pin 13, 14		
13	–	24 V _{DC} / 2 A	Indication <i>Ready for operation</i>	X 4	1 / 2
14	–	24 V _{DC} / 2 A	Indication <i>Collective fault</i>	X 4	3 / 4
15	24 V _{DC}	–	Release <i>Control unit (ES...)</i>	X 4	7 / 8
16	–	24 V _{DC} / 2 A		X 4	7 / 8

* Remove bridge when triggered externally (Refer to *Wiring Diagram*)

Interface XS 2 (contd.)

It is imperative that the notes on the previous page be observed. Pins 1 to 16 have the same connecting arrangement as the 16 channel interface.

Interface XS 2 / P/N 403 337 (32 channel)				Digital module	
Pin	Input	Output	Function For a description of the functions, refer to manual <i>Control System</i> , section <i>Digital Module</i> .	Plug connector	Pin
1	–	24 V _{DC}	Internal switching voltage for activating the inputs 2, 5, 8, 9, 10, 11, 17, 20. The switching voltage must be connected to the appropriate input.	X 1	1
2	24 V _{DC}	–	Release <i>Motor 1</i>	X 1	5
3	24 V _{DC}	–	Internal / external switching voltage <i>Solenoid valve 1 *</i>		
4	24 V _{DC}	–			
5	24 V _{DC}	–	Release <i>Motor 2</i>	X 1	6
6	24 V _{DC}	–	Internal / external switching voltage <i>Solenoid valve 2 *</i>		
7	24 V _{DC}	–			
8	24 V _{DC}	–	Switch on/off <i>Temperature setback</i>	X 1	4
9	24 V _{DC}	–	Mode switch <i>Manual/automatic mode</i> (option) (The dial S1 of the digital module must be set to 7)		
10	24 V _{DC}	–	Release <i>Unit</i>	X 1	2
11	24 V _{DC}	–	Release <i>All motors</i>	X1	3
12	Maximal 24 V _{DC}	–	External potential for pin 13, 14		
13	–	24 V _{DC} / 2 A	Indication <i>Ready for operation</i>	X 4	1 / 2
14	–	24 V _{DC} / 2 A	Indication <i>Collective fault</i>	X 4	3 / 4
15	24 V _{DC}	–	Release <i>Control unit (ES...)</i>	X 4	7 / 8
16	–	24 V _{DC} / 2 A		X 4	7 / 8
17	24 V _{DC}	–	Release <i>Motor 3</i>	X 1	9
18	24 V _{DC}	–	Internal / external switching voltage <i>Solenoid valve 3 *</i>		
19	24 V _{DC}	–			
20	24 V _{DC}	–	Release <i>Motor 4</i>	X 1	10
21	24 V _{DC}	–	Internal / external switching voltage <i>Solenoid valve 4 *</i>		
22	24 V _{DC}	–			
23	24 V _{DC}	–	Weighing cell <i>Empty indication</i> (option)		
24	–	24 V _{DC} / 2 A			
25	24 V _{DC}	–	Weighing cell <i>Full indication</i> (option)		
26	–	24 V _{DC} / 2 A			
27	24 V _{DC}	–	Weighing cell <i>Fill contact</i> (option)		
28	–	24 V _{DC} / 2 A			
29	24 V _{DC}	–	Weighing cell <i>Operating voltage</i> (option)		
30	0 V _{DC}	–			
31	–	0-10 V _{DC}	Weighing cell <i>Potential</i> (option)		
32	–	–	Weighing cell <i>Analog output</i> (option)		
* Remove bridge when triggered externally (Refer to <i>Wiring Diagram</i>)					

9. Installing Heated Hoses

Connecting

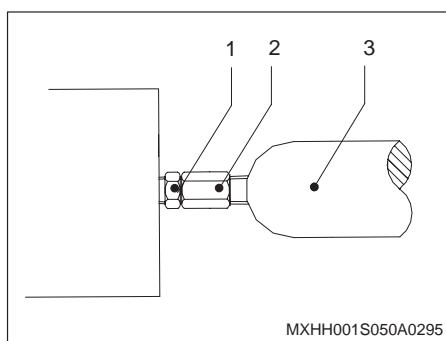


Fig. 3-5 Principle drawing



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

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

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

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

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

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

Disconnecting



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

Relieving Pressure

1. Set motor speed to 0 min⁻¹; switch off motor(s).
2. Place a reservoir under the nozzle(s) of the application head/hot melt handgun.
3. Activate the solenoid valve(s) electrically or manually; or, pull the trigger of the hot melt handgun. Repeat this procedure until no more adhesive flows out.
4. Re-use the adhesive or dispose of properly according to local regulations.

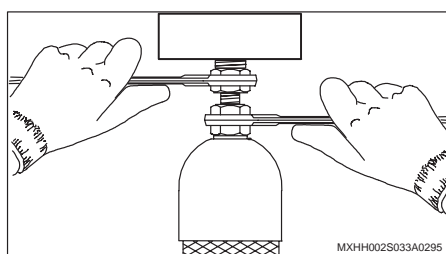


Fig. 3-6 Principle drawing

Second Open-jawed Wrench

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

10. Pneumatic Safety Valve (Option)

The pneumatic safety valve must be supplied with compressed air. Depending on the model of the safety valve, pneumatic connection can occur as follows:

- To a compressed air connection located on the unit frame (9, Fig. 3-1). For additional information, refer to manual *Pneumatic Safety Valve*.
- To a control unit for pneumatic safety valves located on the back protection panel (7, Fig. 3-1). For additional information, refer to manual *Control Unit for Pneumatic Safety Valves*.

Preparing Compressed Air

The safety valve may be pressurized only with filtered, dehydrated and nonlubricated compressed air.

11. Inert Gas Equipment (Option)

The inert gas is connected directly to the pressure controller of the inert gas equipment (8, Fig. 3-1). Refer to manual *Inert Gas Equipment* for additional information.

12. Indicator Light (Option)

The indicator light must be screwed on to the electrical cabinet. It was unscrewed to protect it from damage during transport.

Section 4

Operation

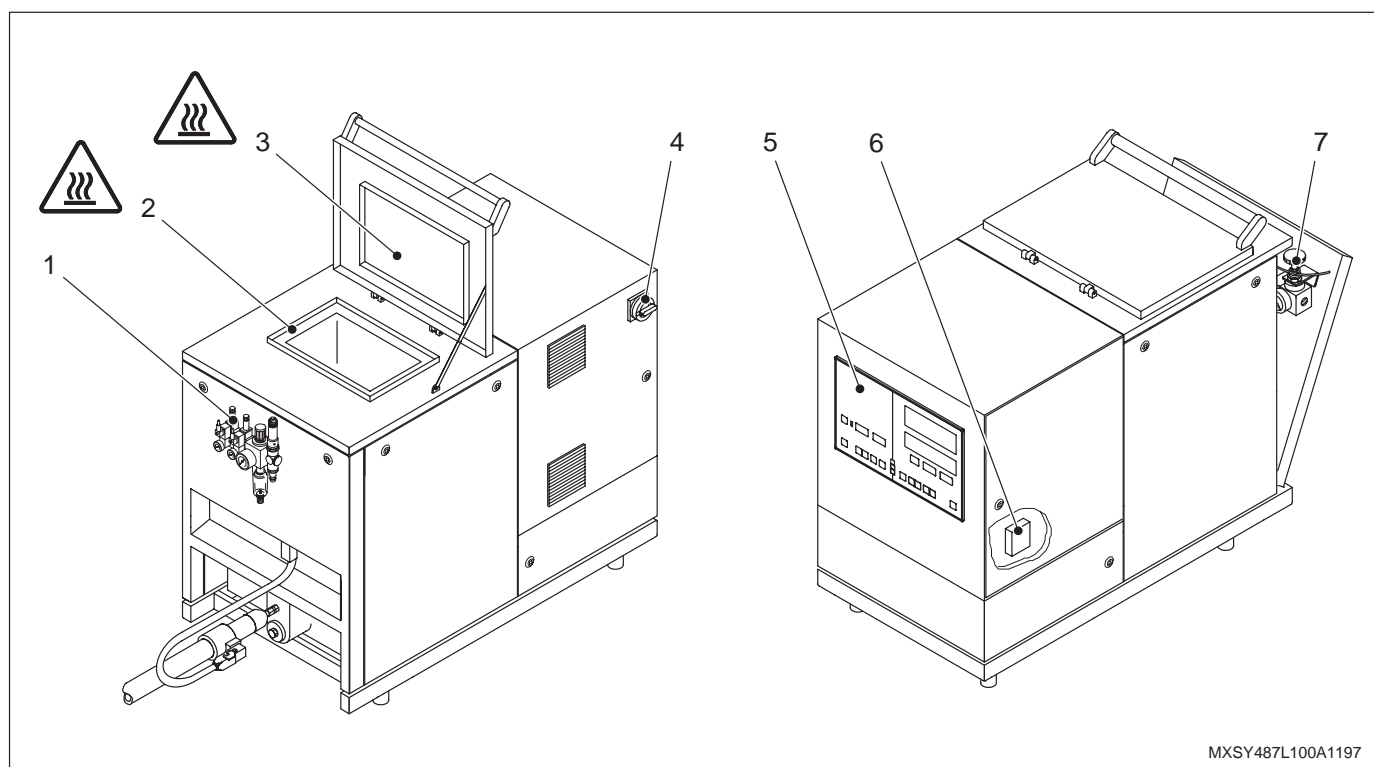
Section 4 Operation



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

1. Unit Components Relevant for Operation

The following illustration shows only the components relevant for operation. They may be described in separate manuals. Position 1 is a special feature. Positions 6 and 7 are options.



MXSY487L100A1197

Fig. 4-1

- | | | |
|--|--------------------|-------------------------|
| 1. Control unit for pneumatic safety valves* | 4. Main switch | 6. Week timer* |
| 2. Tank* | 5. Control system* | 7. Inert gas equipment* |
| 3. Tank lid | | |

Note: There are separate manuals available for all components marked with an asterisk (*).

2. Filling the Tank

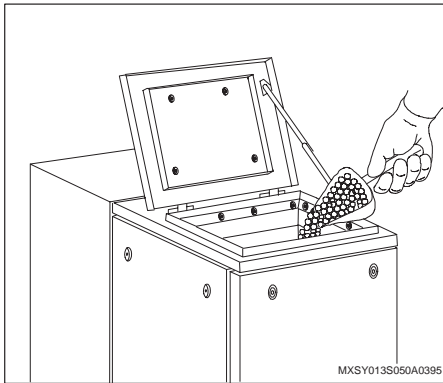


Fig. 4-2



WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment. Tank and tank lid are hot. When filling, hot adhesive may splash out of the tank. Use caution when filling tank with adhesive.



WARNING: Do not operate unit with open tank. When the tank is open, hot adhesive vapors can escape; vapors may contain potentially hazardous substances.

Before filling the tank, ensure that tank and adhesive are clean and free of foreign substances. Foreign substances can result in damage to or malfunctioning of unit or accessories.

NOTE: Cease operation before the tank is completely empty. If there is too little adhesive in the tank, the adhesive can overheat. This can lead to formation of adhesive residue and deposits which can cause the unit to malfunction.

NOTE: For units with inert gas equipment (option): Before filling the tank, ensure that the inert gas inlet hole is not blocked with adhesive.

Maximum Filling Level

The maximum filling level should not exceed 25 mm under the rim of the tank. For units with inert gas equipment (option): 25 mm under the inert gas inlet hole.

3. Setting Values and Parameters – Notes –

All values and parameters are set on the control system (5, Fig. 4–1). All of the functions of the control system are described in detail in the manual *Control System*.

Speeds

NOTE: Avoid a permanent motor/pump speed of less than 5 min⁻¹ and more than 80 min⁻¹ to prevent excessive wear.

Temperatures

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

Nordson will assume no guarantee and/or liability for damage resulting from incorrect temperature settings.

Recommended values

The values stated in the tables are general values determined by experience; deviation may prove necessary.

Series MX 3400	
Heating zone / temperature / time	Setting
Tank	10 °C (18 °F) below prescribed processing temperature
Undertemperature value	10 °C (18 °F) below set processing temperature
Overtemperature value	10 to 30 °C (18 to 54 °F) above set processing temperature
Temperature setback value (Standby)	As needed
Setback time	As needed
Application head (accessory)	Prescribed processing temperature(s)
Heated hose (accessory)	Prescribed processing temperature

Series MX 4400	
Heating zone / temperature / time	Setting
Low melt section (tank)	20 °C (36 °F) below prescribed processing temperature
High melt section (tank)	10 °C (18 °F) below prescribed processing temperature
Undertemperature value	10 °C (18 °F) below set processing temperature
Overtemperature value	10 to 30 °C (18 to 54 °F) above set processing temperature
Temperature setback value (Standby)	As needed
Setback time	As needed
Application head (accessory)	Prescribed processing temperature(s)
Heated hose (accessory)	Prescribed processing temperature

4. Switching Unit ON/OFF

NOTE: Before the unit is switched on for the first time, read and observe *Initial Startup*.

The unit is switched on and off with the main switch (4, Fig. 4-1).

Position 0/OFF = Unit is switched off.

Position I/ON = Unit is switched on.

The main switch can be secured with padlocks to prevent unauthorized persons from switching on the unit.

Unit With Week Timer (Option)

The week timer (6, Fig. 4-1) is used to automatically switch the unit on and off. The main switch must be set to I/ON when using the week timer.

External Unit Release

The external unit release feature is used to externally switch the unit on/off via the interface XS 2. When external unit release is used, the main switch must be set to I/ON (switched on). Also refer to *Installation, Interface XS 2*.

Daily Switch ON

NOTE: Nordson gear pumps may not be operated without hot melt adhesive. Before switching on the motor, make sure the tank is filled.

NOTE: Avoid a permanent motor/pump speed of less than 5 min⁻¹ and more than 80 min⁻¹ to prevent excessive wear.

1. Set main switch to I/ON.
2. Fill tank if necessary.
3. Wait until the unit is ready for operation.
4. Pre-select motor(s).
5. Switch on the motor(s).

Daily Switch OFF

1. Switch off the motor(s).
2. Set main switch to 0/OFF.
3. If necessary, secure main switch with padlock against unauthorized access.

5. Switching Off in an Emergency



WARNING: Immediately switch off the unit in any emergency situation.

1. Set main switch to 0/OFF or – when available – press EMERGENCY OFF button (special feature).
2. After standstill and before switching the unit on again, have the fault remedied by qualified personnel.

6. Initial Startup

After the unit has been properly installed, initial startup can take place.

The unit was subjected to extensive functional tests prior to shipment. In doing so, the tank was filled with a special test material. Residues of this material may still be present in the unit. To remove these residues, melt and feed several kilograms of adhesive before starting production.

NOTE: The temperature setting is determined by the processing temperature prescribed by the adhesive supplier. Do not exceed the maximum operating temperature of the unit or heated system components.

Nordson assumes no guarantee and/or liability for damage caused by incorrect temperature settings.

NOTE: Nordson gear pumps may not be operated without hot melt material. Before switching on the motor, make sure the tank is filled.

NOTE: Avoid a permanent motor/pump speed of less than 5 min⁻¹ and more than 80 min⁻¹ to prevent excessive wear.

The operator must make himself familiar with the *Control System* before carrying out the following steps.

1. Fill the tank.
2. Set main switch to I/ON.
3. On the control system, set:
 - Basic settings
 - Processing temperatur / undertemperature / overtemperature
 - Motor/pump speed(s)
 - Additional parameters, depending on model of unit.
4. When available, set week timer (option).
5. Wait until the unit has heated up and is ready for operation. The heating up phase lasts 30 to 60 minutes, depending on the unit type, the adhesive used and the processing and room temperature.
6. Preselect motor(s).
7. Switch on motor(s).

**7. Setting Record Form,
MX 3400 Series**

Copy before filling out or use a pencil.

Production information:

Hot melt adhesive:	Supplier
	Processing temperature
	Viscosity

Cleaning agent:	Supplier
	Flash point

Leading channel:	Tank (factory-set)
-------------------------	--------------------

Processing temperatures (Nominal value temperatures):							
Tank							
Heated hose (Accessories)	1)	2)	3)	4)	5)	6)	
Application head (Accessories)	1)	2)	3)	4)	5)	6)	
Air heater (Accessories)	1)	2)	3)	4)	5)	6)	

Motor/Pump speeds:							
Motor/Pump	1)	2)	3)	4)	5)	6)	

Air pressures at application head (Accessories):							
Control air	1)	2)	3)	4)	5)	6)	
Spray air	1)	2)	3)	4)	5)	6)	

Notes:

Name	Date
-------------	-------------

**8. Setting Record Form,
MX 4400 Series**

Copy before filling out or use a pencil.

Production information:

Hot melt adhesive:	Supplier
	Processing temperature
	Viscosity

Cleaning agent:	Supplier
	Flash point

Leading channel:	High melt zone (factory-set)
-------------------------	------------------------------

Processing temperatures (Nominal value temperatures):						
Low melt zone (Tank)						
High melt zone (Tank)						
Heated hose (Accessories)	1)	2)	3)	4)	5)	6)
Application head (Accessories)	1)	2)	3)	4)	5)	6)
Air heater (Accessories)	1)	2)	3)	4)	5)	6)

Motor/Pump speeds:						
Motor/Pump	1)	2)	3)	4)	5)	6)

Air pressures at application head (Accessories):						
Control air	1)	2)	3)	4)	5)	6)
Spray air	1)	2)	3)	4)	5)	6)

Notes:

Name	Date
-------------	-------------

Section 5

Maintenance

Section 5 Maintenance



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

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

1. Unit Components Relevant for Maintenance

The following illustration shows only the components relevant for maintenance. They may be described in separate manuals. Positions 1 and 10 are special features. Position 11 is an option.

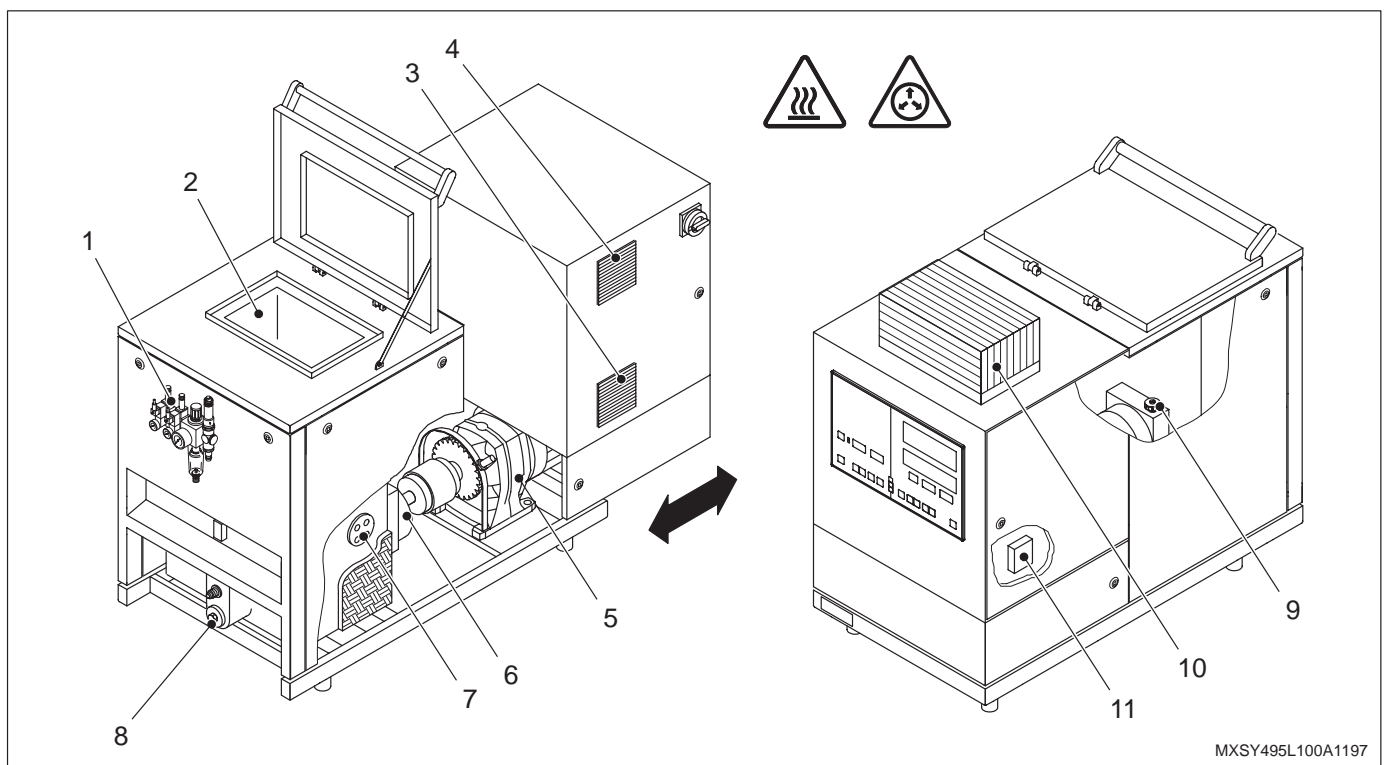


Fig. 5-1

- | | | |
|--|--------------------------|----------------------|
| 1. Control unit for pneumatic safety valves* | 5. Motor* | 9. Safety valve* |
| 2. Tank* | 6. Gear pump* | 10. Heat exchanger * |
| 3. Fan with filter | 7. Adhesive drain flange | 11. Week timer* |
| 4. Air filter | 8. Filter cartridge* | |

Note: There are separate manuals available for all components marked with an asterisk (*).

2. Risk of Burns



WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment. Some maintenance work can only be done when the unit is heated up.

3. Relieving Pressure



WARNING: System and hot melt adhesive under pressure. Before removing heated hoses, application heads or hot melt handguns, relieve system pressure. Failure to observe can result in serious burns.



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

1. Set motor speed to 0 min⁻¹; switch off motor(s).
2. Place a reservoir under the nozzle(s) of the application head/hot melt handgun.
3. Trigger the solenoid valve(s) electrically or manually; or, pull the trigger of the hot melt handgun. Repeat this procedure until no more adhesive flows out.
4. Re-use adhesive or dispose of properly according to local regulations.

4. Daily Maintenance

The stated intervals are general guidelines based on experience. Depending on the location of the unit, production conditions and operating time of the unit, other maintenance intervals may prove necessary.

Unit part	Activity	Interval	Refer to
Complete unit	External cleaning	Daily	Page 5-4
	Inspection for external damage	Daily	Page 5-4
Displays and lamps	Function check (test)	Daily	Manual <i>Control System</i>
Fan with filter Air filter	Clean fan screen	Daily, when dust accumulation is heavy	Page 5-4
Motor	Clean fan cover	Daily, when dust accumulation is heavy	Manual <i>Motor</i>

5. Regular Maintenance

The stated intervals are general guidelines based on experience. Depending on the location of the unit, production conditions and operating time of the unit, other maintenance intervals may prove necessary.

Unit part	Activity	Interval	Refer to
Fan with filter Air filter	Check filter, clean or replace if necessary	Depending on dust accumulation; daily if necessary	Page 5-4
Power cable	Inspection for damage	Every time the unit is serviced	–
Air hoses	Inspection for damage	Every time the unit is serviced	–
Gear pump	Refer to separate manual		
Motor / gear box	Refer to separate manual		
Safety valve	Refer to separate manual		
Filter cartridge	Refer to separate manual		
Tank	Refer to separate manual		
Week timer (option)	Refer to separate manual		
Control unit for pneumatic safety valves (special feature)	Refer to separate manual		
Heat exchanger (special feature)	Refer to separate manual		

6. External Cleaning

External cleaning prevents pollution created by production from causing unit malfunctions.



CAUTION: Observe the unit's Degree of Protection when cleaning (see *Specification*).



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

Only remove hot melt adhesive residues with a cleaning agent recommended by the adhesive supplier. Pre-heat with an air heater if necessary.

Vacuum up dust, fluffs etc. or remove them with a soft cloth.

7. Inspection for External Damage



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

8. Cleaning or Replacing Air Filter

Depending on dust accumulation, the filters (3 and 4, Fig. 5-1) must be cleaned or replaced. A dirty filter can be recognized by its dark color. Clean the filters by tapping out the dirt. Depending on dust accumulation, the filter screens may need to be cleaned daily.

NOTE: Units with heat exchangers (10, Fig. 5-1) have no fan with filter and no air filter (3 and 4, Fig. 5-1).

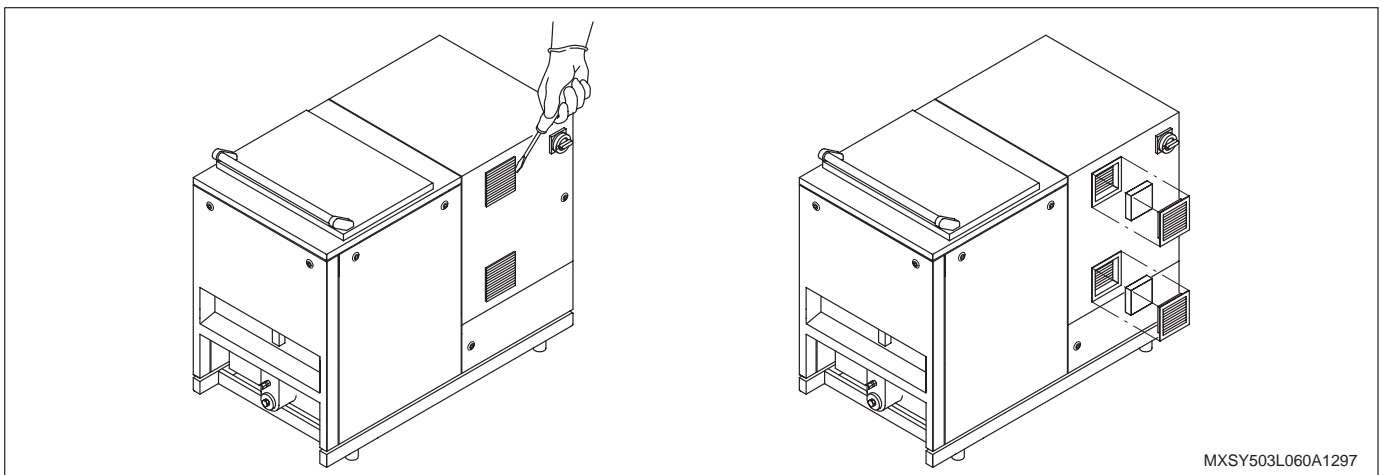


Fig. 5-2

9. Changing of Adhesive Type

Remove the old material from the unit by running until empty or draining from the unit. (Refer to manual *Tank* for information on draining adhesive.)

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

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

NOTE: Ensure proper disposal of the old adhesive according to local regulations.

10. Flushing with a Cleaning Agent



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

Before starting production again, flush out residues of the cleaning agent using the new hot melt adhesive.

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

11. Maintenance Record Form

Copy before filling out or use a pencil.

Unit part	Date / Name	Date / Name	Date / Name
Gear pump			
Motor / gear box			
Fastening screws on pump and tank			
Fan with filter Air filter			
Tank			
Safety valve			
Filter cartridge			
Heat exchanger (special feature)			

Troubleshooting

Section 6

Troubleshooting



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



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

1. Control System

The control system offers the following troubleshooting aids, described in the manual *Control System*:

- Indication lamps and optional indicator light
- Diagnosis program in the temperature section
- Automatic fault display in the temperature section
- Service display *Error* in the motor section
- LEDs on the modules and boards

2. Helpful Tips

Before beginning with systematic troubleshooting activities, check the following points:

- Is the optional week timer programmed correctly?
- Are all parameters correctly set?
- Is the *XS 2* interface connected correctly?
- For automatic operation: is pilot voltage present?
- Do all plug connections have sufficient contact?
- Have fuses been activated?
- Could the fault have been caused by an external SPS?
- 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 sealings.
- Is the optional weighing cell calibrated correctly?

3. Indication Lamps and Indicator Light

The indication lamps and the optional indicator light show the following operating conditions:

- Red = Collective fault indication. The red lamp indicates that the Control System has recognized a fault.
See troubleshooting table *Red indication lamp is lit*.
- White = Switched ON. After switching on and during the heating phase, at first only the white indication lamp is lit (normal condition). A fault has first occurred when the temperature does not increase (observe temperature display) and when the green indication lamp is not lit after the heating phase has ended (1 hour and longer).
See troubleshooting table *Only the white indication lamp is lit*.
- Green = Ready for operation. The green indication lamp lights when all channels have reached their nominal value temperatures.

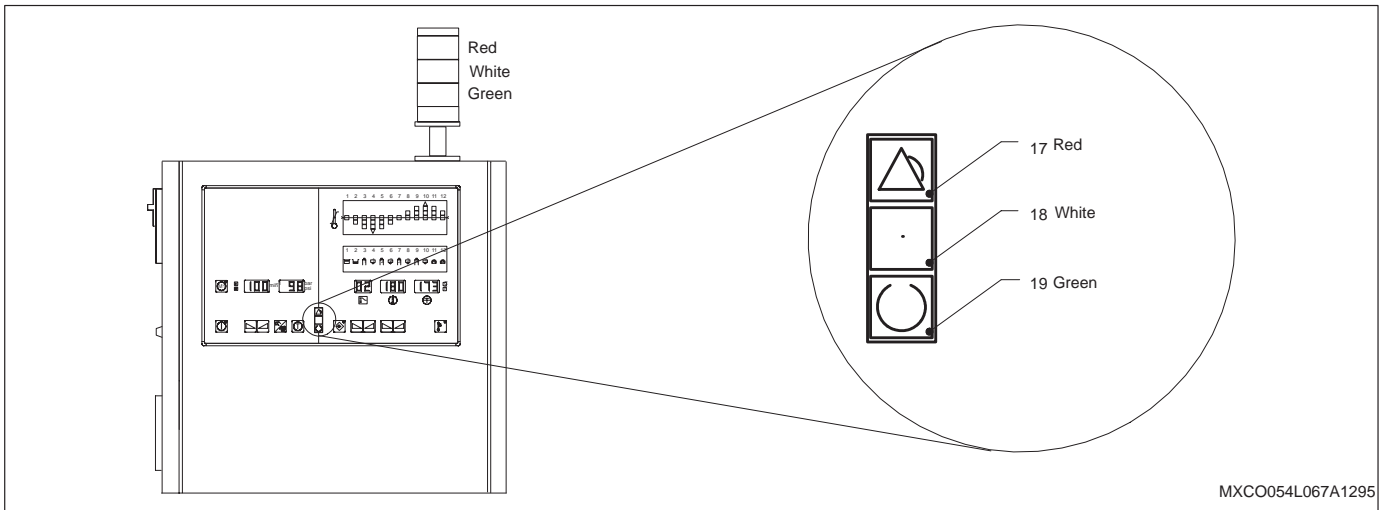


Fig. 6-1 (Refer to manual *Control System* for position numbers)

4. Troubleshooting Tables

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

Only the White Indication Lamp is Lit

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Nominal value temperatures of one or more heating zones are not reached	Release <i>Unit</i> not bridged or not activated	Bridge or activate the corresponding contacts on the XS 2 interface	Section 3 Wiring Diagram
	Programmable week timer (Option) programmed incorrectly	Program correctly	Manual <i>Week Timer</i>
	Programmable week timer (Option) defective	Replace timer	–
	Activate diagnosis program of the temperature section	→	Manual <i>Control System</i>
	Fuse(s) defective (fuses are also located on the modules and boards)	Switch on or replace	Manual <i>Control System</i> Wiring Diagram
	Cable loose or broken	Fix or replace	–
	Overtemperature thermostat (on the tank) defective	Replace	Spare Parts List
	Temperature sensor(s) defective	Replace	Spare Parts List
	Solid-State-Relay defective	Replace	Spare Parts List
	Heater(s) defective	Replace (Heaters in the tank and heated hose cannot be replaced)	–
Temperature setback is switched on	→	Switch off or wait until the setback period has expired	Manual <i>Control System</i>
Automatic temperature setback after motor standstill activated	→	Stop temperature setback	

Red Indication Lamp is Lit

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Overtemperature indication from Control System (Display 5: <i>Hi</i> blinking)	→	→	Manual Control System, Service Display Error
Overtemperature switch-off by Control System (Displays 3, 4 and 5: blinking)	→	→	
Overtemperature switch-off by tank thermostats	→	→	
Motor switched off due to overheating (thermistor located in the motor)	→	→	
Undertemperature during operation (Display 5: <i>Lo</i> blinking)	Adhesive was refilled	Wait until the temperature has been reached	–
	→	→	Manual Control System, Service Display Error
Ambient temperature too high (Displays 3, 4 and 5: <i>AM bIE nT</i> blinking)	Ambient temperature too high	Lower ambient temperature by cooling or airing out	
	Filter of the electrical cabinet fan dirty	Clean or replace	Section 5
	Electrical cabinet fan defective	Replace	–
Temperature sensor short-circuit (Display 5: – <i>S</i> – blinking)	→	Replace	–
Temperature sensor interruption (Display 5: – <i>E</i> – blinking)	→	Replace	–
Main contactor defective or fallen off	→	→	Manual Control System, Service Display Error
Speed alarm Display 30: <i>r_d</i>	→	→	Manual Control System, Service Display Error, Parameter <i>r_d</i> , Display Overview
Coupling fault (only for optional <i>Coupling monitoring</i>) Display 30: <i>CLU</i>	→	→	Manual Control System, Service Display Error, Display Overview, Digital Module
Overpressure (with special function <i>Pressure monitoring</i>) Display 30: <i>Phi</i>	→	→	Manual Control System, Service Display Error, Parameter <i>Phi</i> , Digital Module
Underpressure (with special function <i>Pressure monitoring</i>) Display 30: <i>Plo</i>	→	→	Manual Control System, Service Display Error, Parameter <i>Plo</i> , Digital Module
Safety valve opened Display 30: <i>bPo</i> (special function)	→	→	Manual Control System, Display Overview, Digital Module
Other faults	→	→	Manual Control System, Service Display in Motor Section, Service Display Error

Unit not Functioning

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
No line voltage	→	Connect line voltage	Section 3
Main switch not switched on	→	Switch on main switch	Section 2
Main switch defective	→	Replace main switch	–
Main fuse activated	→	Switch on main fuse	–
Main fuse activated again	Check whether a short-circuit is present in the unit or accessories	→	Wiring Diagram
Fuse <i>Control voltage</i> (UN / UL) activated	Check whether a short-circuit is present in the unit or accessories	→	
24 V _{DC} power supply defective	→	Replace	–

One Channel (Heating Zone) does not Heat

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Channel is switched off	→	Switch on	Manual Control System
Channel is switched to measuring mode	→	Switch to control mode	
Channel/Heating zone defective	→	Activate diagnosis program of the temperature section	

No Pilot Voltage

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Parent machine not operating	→	Start up parent machine	–
Tach generator (Accessories) defective	→	Replace	–
Pilot voltage falsely poled	→	Reverse polarity	–
DIP-Switch of the central module incorrectly set or analog board of the central module not aligned properly	→	Check switch positions and align the board if necessary	Manual Control System, Central Module
Central module defective	→	Replace central module	Manual Control System, Central Module, Service Display Uin

No Adhesive (Motor does not Rotate)

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Unit not yet ready for operation (Undertemperature during the heating phase)	→	Wait until the unit has heated up and the green indication lamp is lit	Troubleshooting table <i>Only the white indication lamp is lit</i>
Unit not ready for operation (Undertemperature during operation)	Adhesive was refilled	Wait until the unit has heated up and the green indication lamp is lit →	
Motor not switched on	→	Switch on (Motor must be preselected)	Manual Control System
Motor not pre-selected	→	Pre-select motor and then switch on	
Motor startup protection activated	Temperature setback switched on	Switch on the motor(s)	
	Undertemperature during operation		
Speed not set	→	Set speed	
Automatic operation selected, however unit should be in manual operation	→	Switch to manual operation	
No external <i>Release Motor</i> via XS 2 interface	→	Bridge or activate the corresponding contacts of the XS 2 interface	Section 3 Wiring Diagram
Automatic operation selected and no pilot voltage present	→	Provide pilot voltage	Manual Control System, Troubleshooting table <i>No pilot voltage</i>
Threshold value switch not properly set	→	Set parameters <i>SLo</i> and <i>Shi</i> accordingly	Manual Control System
Temperature setback switched on	→	Switch off or wait until the setback period has expired	
Automatic temperature setback after motor standstill activated	→	Stop temperature setback →	
Motor overheated	Ambient temperature too high	Decrease ambient temperature by cooling or airing out	–
	Cooling air intake grill dirty	Clean	Section 5
	Pump blocked by foreign particles	Replace pump	Manual Pump
	Pump operates too slowly	Replace pump	
	Adhesive too cold	Set temperature accordingly	Data sheet of the adhesive supplier
Motor defective	→	Replace	–
Motor not supplied with voltage	→	Technical inspection	Wiring Diagram
Fuses defective	→	Replace	–
Frequency inverter defective	→	Replace	–
Digital module defective or incorrectly set	→	Set or replace	Manual Control System
Central module of the motor section defective or incorrectly set	→	Set or replace	
Control panel board of the motor section defective or incorrectly set	→	Set or replace	
Motor module (special equipment) defective or incorrectly set	→	Set or replace	

No Adhesive (Motor Rotating)

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Shutoff valve (Option) closed	→	Open	Section 2
Tank empty	→	Fill tank	Section 3
Filter cartridge clogged	→	Clean or replace filter screen →	Manual <i>Filter Cartridge</i>
Adhesive feed bore to the pump or suction bore of the pump clogged	→	Remove the pump and clean the feed bore or suction bore →	Manual <i>Pump</i>
Pump does not rotate	Screws on the coupling loose →	Tighten	–

Incorrect Motor Rotation in Automatic Operation

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Parameter rLo, rhi and Uhi set incorrectly	→	Set parameters accordingly	Manual <i>Control System</i>
Pilot voltage fluctuation despite constant machine speed	Tach generator defective	Replace	–
	Drive element (e.g. belt) slips	Eliminate slip	–

Not Enough Adhesive

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Adhesive feed bore to the pump or suction bore of the pump partly clogged	→	Remove pump and clean feed bore or suction bore	Manual <i>Pump</i>
Shutoff valve (Option) not completely open	→	Open	Section 2
Filter cartridge partly clogged	→	Clean or replace filter screen	Manual <i>Filter Cartridge</i>
Safety valve defective	→	Clean or replace	Manual <i>Safety Valve</i>
Processing temperature set too low	→	Correct temperature setting	Data sheet of the adhesive supplier
Pump block of the gear pump worn	→	Replace pump	Manual <i>Pump</i>

Adhesive Pressure too High

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Mechanical safety valve dirty (and thereby blocked)	→	Disassemble and clean or replace	Manual <i>Safety Valve</i>
Mechanical safety valve defective	→	Replace	
Mechanical safety valve incorrectly set	→	Set to factory-setting	
Pneumatic safety valve (Option) pressurized with too high pressure	→	Reduce pressure	

Adhesive Pressure too Low

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Mechanical safety valve dirty (and thereby blocked)	→	Disassemble and clean or replace	Manual Safety Valve
Mechanical safety valve defective	→	Replace	
Mechanical safety valve incorrectly set	→	Set to factory setting	
Pneumatic safety valve (Option) pressurized with too low pressure	→	Increase pressure	

Adhesive Residues in Tank

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Tank nominal value temperature set too high	→	Correct temperature setting	Data sheet of the adhesive supplier

Adhesive Hardens in Tank

Possible cause	Possible fault / Troubleshooting	Corrective action	Refer to
Tank nominal value temperature set too high	→	Correct temperature setting	Data sheet of the adhesive supplier
Tank not supplied with inert gas (for optional inert gas equipment)	→	Check whether material supplier has prescribed inert gas	
	Inert gas bottle empty	Replace	–
	Inert gas control not activated	Set DIP-Switch S8 on the control panel board of the temperature section accordingly	Manual Control System
	Inert gas control incorrectly set (interval and duration of injection)	Set parameters <i>Co OFF</i> and <i>Co On</i> accordingly	
	Solenoid valve of inert gas equipment defective	Replace	–
Control panel board defective	Replace	–	

Section 7

Repair

Section 7

Repair



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

1. Risk of Burns



WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment. Some unit components can only be detached when the unit is heated up.

2. Disconnecting Unit from Line Voltage



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



WARNING: Disconnect unit from line voltage before any repairs.

3. Relieving Pressure



WARNING: System and adhesive are pressurized. Relieve system of pressure before disconnecting heated hoses, application heads and hot melt handguns. Failure to observe may result in serious burns.

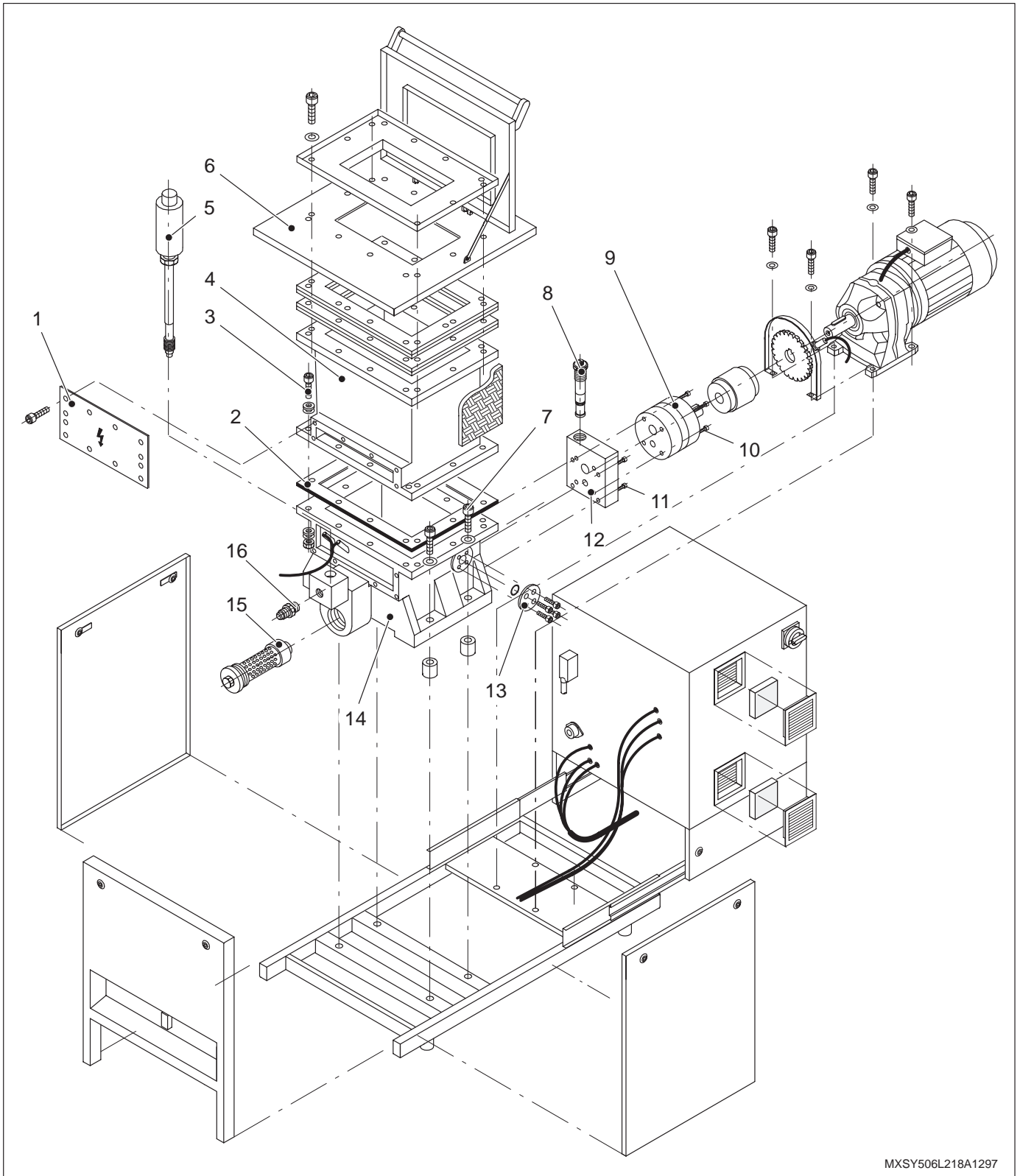


WARNING: Hot! Risk of burns. Wear heat-protective gloves.

1. Set motor speed to 0 min⁻¹; switch off motor(s).
2. Place a reservoir under the nozzle(s) of the application head/hot melt handgun.
3. Activate the solenoid valve(s) electrically or manually; or, pull the trigger of the hot melt handgun. Repeat this procedure until no more adhesive flows out.
4. Re-use the adhesive or dispose of properly according to local regulations.

4. Detailed Illustration of a Unit

The illustration shows the principle design of the unit using the series MX 4400 as an example.



MXSY506L218A1297

Fig. 7-1

5. General Repair Instructions

The following parts may only be detached/extracted when the unit is heated up to a temperature at which the adhesive remaining in the unit is soft.

Position	Designation	Refer to manual
4	Low melt section (tank)	Tank
2	Sealing	Tank
8	Safety valve	Safety valve
9	Gear pump	Gear pump
12	Bypass plate	–
13	Adhesive drain flange	Tank
14	High melt section (tank)	Tank
15	Filter cartridge	Filter cartridge

Before screwing in the following screws and unit components, apply some mounting paste *Never Seez* to the thread.

Order number for mounting paste *Never Seez*: P/N 263 921

The screws and unit components marked with an asterisk (*) may only be tightened with a torque wrench.

Position	Designation	Refer to manual
7	Fastening screws high melt section (tank) *	Tank
3	Fastening screws low melt section (tank) *	Tank
11	Fastening screws bypass plate *	–
10	Fastening screws gear pump *	Gear pump
8	Safety valve *	Safety valve
5	Pressure sensor (option) *	Pressure sensor
15	Filter cartridge	Filter cartridge
6	Tank cover	–
1	Electrical equipment cover	–

Before screwing on the following parts, apply sealing paste *Stucarit 203* to the sealing surfaces.

Order number for sealing paste *Stucarit 203*: P/N 255 369

Position	Designation	Refer to manual
14 and 12	Sealing surface tank / bypass plate	Tank
12 and 9	Sealing surface bypass plate / gear pump	Gear pump

Before screwing in the following part, wrap sealing tape around the thread.

Order number for PTFE sealing tape: P/N 285 127

Position	Designation	Refer to manual
16	Hose connection fitting	–

6. Adhesive Shut-off Valve (Option)

NOTE: Operate the shut-off valve only when the unit is warm.

The shut-off valve (option) is located in the bypass plate. It is used to stop the adhesive flow when the gear pump is to be replaced. It blocks the suction hole. The shut-off valve is operated with a hexagon wrench.

Position 1	Open
Position 2	Closed

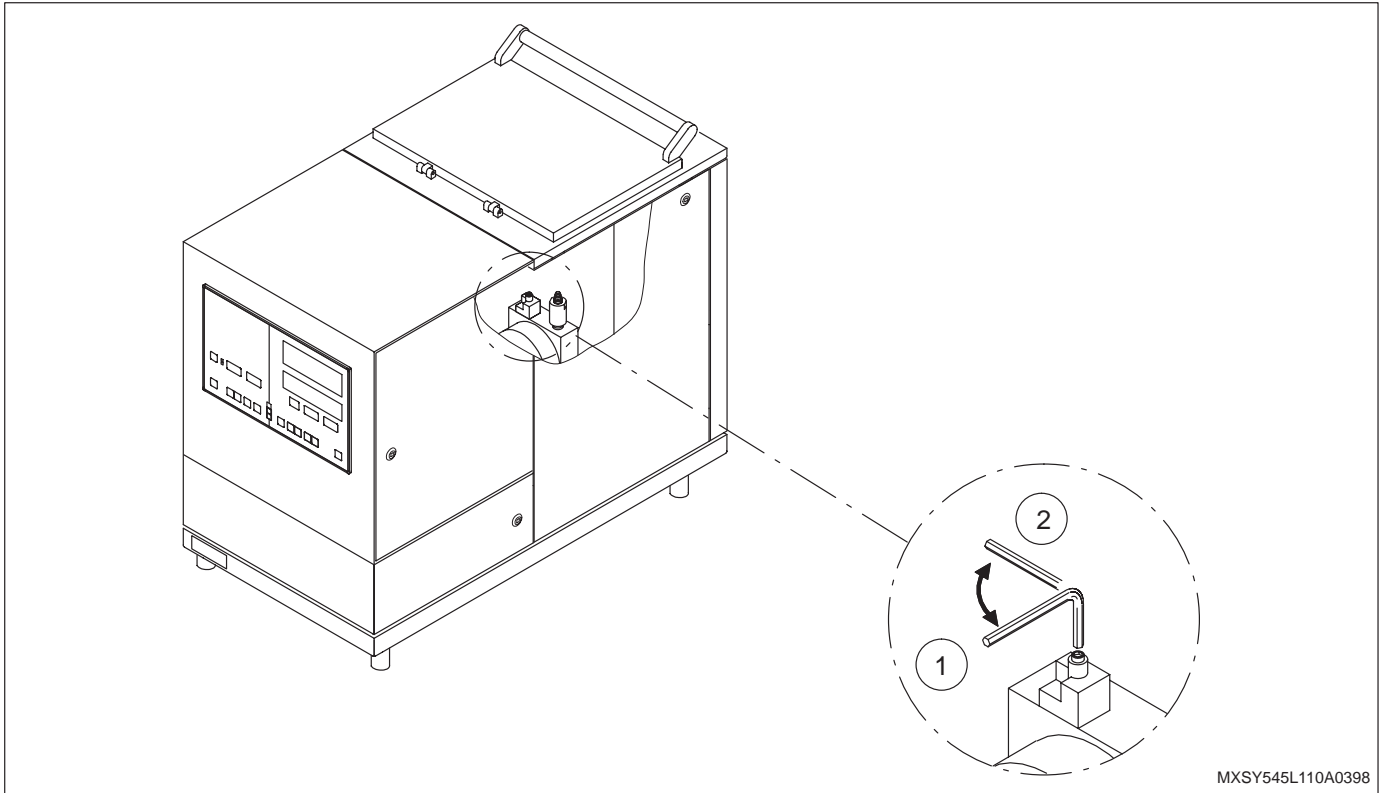


Fig. 7-2

Section 8

Specifications

Section 8

Specifications

1. General Data

Type of heating	Cast-in electrical resistance heating elements
Available temperature sensors	Fe-CuNi (FE/KO) / Pt 100 / Ni 120
Adhesive pressure	5 to 60 bar / 0.5 to 6 MPa / 72.5 to 870 psi On units with a mechanical safety valve, the safety valve is set at the factory and lead sealed. Factory setting: 35 bar / 3.5 MPa / 508 psi
Degree of Protection	IP 54
Noise emission	1 motor: 61.3 dBA 2 motors: 64.3 dBA 3 motors: 66.1 dBA 4 motors: 67.3 dBA
Motor type	3 ph AC motor
Gear box type	Helical gear
Motor/pump speed setting range	1.0 to 100 min ⁻¹ The motor/pump speed should not continuously lie below 5 min ⁻¹ or continuously exceed 80 min ⁻¹ . This would cause excessive wear.
Heating time	30 to 60 minutes, depending on type of unit, adhesive used and ambient temperature

2. Temperatures



WARNING: If no leading channel has been selected, the temperature of the tank can be set to unpermissible 230 °C (446 °F). This may damage O-rings and cause the maximum permitted temperature of the unit's surfaces to be exceeded.

Min. ambient temperature		10 °C / 50 °F
Max. ambient temperature		40 °C / 104 °F
Min. operating temperature		50 °C / 122 °F
Max. operating temperatures (Refer to warning)	Low melt section (tank)	200 °C / 392 °F
	High melt section (tank)	200 °C / 392 °F
	Heated hose	230 °C / 446 °F
	Application head	230 °C / 446 °F
Max. operating temperatures for high temperature units	With Ni 120-temperature sensor	230 °C / 446 °F
	With Pt 100 or Fe-CuNi (FE/KO)	250 °C / 482 °F
Overtemperature switch-off by thermostat		246 °C / 475 °F
	High temperature units	300 °C / 572 °F

3. Electrical Data



WARNING: The unit is designed for only one operating voltage. operate only with the operating voltage stated on the ID plate.

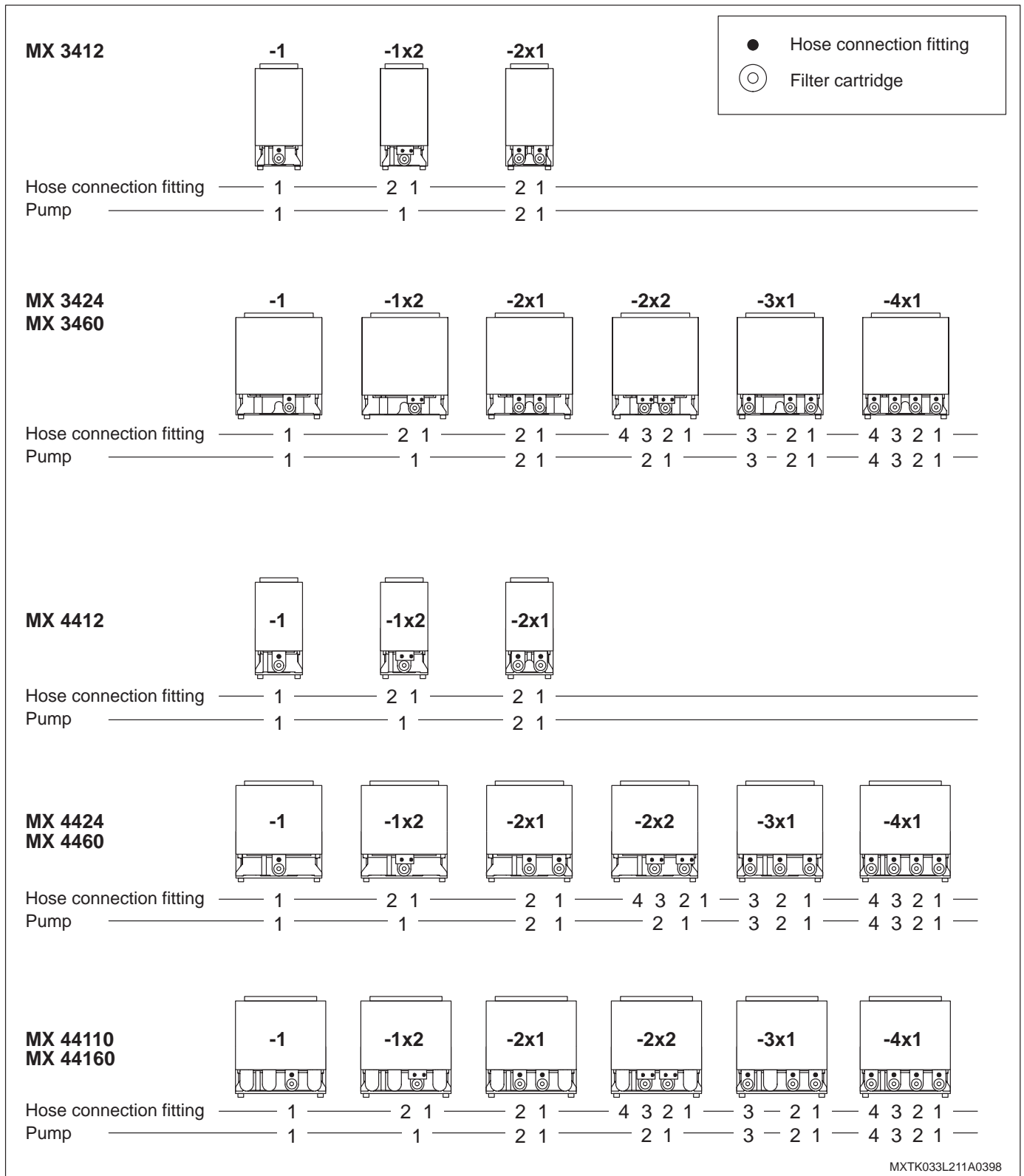


CAUTION: The pilot voltage produced by the tacho generator may not exceed 160 V_{DC}. Failure to observe will result in damage to succeeding components.

Available operating voltages	230 V _{AC} 1 phase with neutral conductor 230 V _{AC} 3 phases without neutral conductor (delta) 400 V _{AC} 3 phases with neutral conductor (star)	
Operating voltage frequency	50/60 Hz	
Fuse rating	Refer to ID plate	
Power consumption P	Refer to ID plate	
Power consumption P_{max}	Refer to ID plate	
Load per hose connection socket	Heated hose	1200 Watt
	Application head	1200 Watt
Tacho generator connection socket, Max. pilot voltage (input voltage)	160 V _{DC} The pilot voltage must be adjusted (Refer to manual <i>Control System</i>).	

4. Assignment of Hose Connection Fittings

The illustration shows which pump the hose connection fittings are assigned to. On model MX ... -2x2, there are two hose connection fittings per pump.



5. Dimensions and Weights for the Series MX 3400

NOTE: Dimensions are valid only for standard units. For special models, the actual dimensions stated in the technical drawing are valid. Refer to consignment note for actual weight.

NOTE: The height of units with an electrical cabinet base is approx. 240 mm higher than stated here (Refer to section *Description*, chapter *Special Features*).

Unit	Unit dimensions (LxWxH)	Tank opening (LxW)	Weight
MX 3412-1x1	950 x 380 x 912 mm	148 x 178 mm	approx. 125 kg
MX 3412-1x2	950 x 380 x 912 mm	148 x 178 mm	approx. 125 kg
MX 3412-2x1	950 x 380 x 912 mm	148 x 178 mm	approx. 150 kg
MX 3424-1x1	950 x 600 x 1047 mm	148 x 345 mm	approx. 175 kg
MX 3424-1x2	950 x 600 x 1047 mm	148 x 345 mm	approx. 175 kg
MX 3424-2x1	950 x 600 x 1047 mm	148 x 345 mm	approx. 200 kg
MX 3424-2x2	950 x 600 x 1047 mm	148 x 345 mm	approx. 200 kg
MX 3424-3x1	950 x 600 x 1047 mm	148 x 345 mm	approx. 225 kg
MX 3424-4x1	950 x 600 x 1047 mm	148 x 345 mm	approx. 250 kg
MX 3460-1x1	1110 x 600 x 1115 mm	286 x 345 mm	approx. 295 kg
MX 3460-1x2	1110 x 600 x 1115 mm	286 x 345 mm	approx. 295 kg
MX 3460-2x1	1110 x 600 x 1115 mm	286 x 345 mm	approx. 320 kg
MX 3460-2x2	1110 x 600 x 1115 mm	286 x 345 mm	approx. 320 kg
MX 3460-3x1	1110 x 600 x 1115 mm	286 x 345 mm	approx. 345 kg
MX 3460-4x1	1110 x 600 x 1115 mm	286 x 345 mm	approx. 370 kg
L = length / W = width / H = height			

6. Dimensions and Weights for the Series MX 4400

NOTE: Dimensions are valid only for standard units. For special models, the actual dimensions stated in the technical drawing are valid. Refer to consignment note for actual weight.

NOTE: The height of units with an electrical cabinet base is approx. 240 mm higher than stated here (Refer to section *Description*, chapter *Special Features*).

Unit	Unit dimensions (LxWxH)	Tank opening (LxW)	Weight
MX 4412-1x1	950 x 380 x 912 mm	148 x 178 mm	approx. 130 kg
MX 4412-1x2	950 x 380 x 912 mm	148 x 178 mm	approx. 130 kg
MX 4412-2x1	950 x 380 x 912 mm	148 x 178 mm	approx. 155 kg
MX 4424-1x1	950 x 600 x 1047 mm	148 x 345 mm	approx. 220 kg
MX 4424-1x2	950 x 600 x 1047 mm	148 x 345 mm	approx. 220 kg
MX 4424-2x1	950 x 600 x 1047 mm	148 x 345 mm	approx. 245 kg
MX 4424-2x2	950 x 600 x 1047 mm	148 x 345 mm	approx. 245 kg
MX 4424-3x1	950 x 600 x 1047 mm	148 x 345 mm	approx. 270 kg
MX 4424-4x1	950 x 600 x 1047 mm	148 x 345 mm	approx. 295 kg
MX 4460-1x1	1110 x 600 x 1115 mm	286 x 345 mm	approx. 240 kg
MX 4460-1x2	1110 x 600 x 1115 mm	286 x 345 mm	approx. 240 kg
MX 4460-2x1	1110 x 600 x 1115 mm	286 x 345 mm	approx. 265 kg
MX 4460-2x2	1110 x 600 x 1115 mm	286 x 345 mm	approx. 265 kg
MX 4460-3x1	1110 x 600 x 1115 mm	286 x 345 mm	approx. 290 kg
MX 4460-4x1	1110 x 600 x 1115 mm	286 x 345 mm	approx. 345 kg
MX 44110-1x1	1110 x 850 x 1115 mm	286 x 633 mm	approx. 365 kg
MX 44110-1x2	1110 x 850 x 1115 mm	286 x 633 mm	approx. 365 kg
MX 44110-2x1	1110 x 850 x 1115 mm	286 x 633 mm	approx. 390 kg
MX 44110-2x2	1110 x 850 x 1115 mm	286 x 633 mm	approx. 390 kg
MX 44110-3x1	1110 x 850 x 1115 mm	286 x 633 mm	approx. 415 kg
MX 44110-4x1	1110 x 850 x 1115 mm	286 x 633 mm	approx. 440 kg
MX 44160-1x1	1110 x 1200 x 1026 mm	286 x 923 mm	approx. 505 kg
MX 44160-1x2	1110 x 1200 x 1026 mm	286 x 923 mm	approx. 505 kg
MX 44160-2x1	1110 x 1200 x 1026 mm	286 x 923 mm	approx. 530 kg
MX 44160-2x2	1110 x 1200 x 1026 mm	286 x 923 mm	approx. 530 kg
MX 44160-3x1	1110 x 1200 x 1026 mm	286 x 923 mm	approx. 555 kg
MX 44160-4x1	1110 x 1200 x 1026 mm	286 x 923 mm	approx. 580 kg

L = length / W = width / H = height

**7. Further Data for the
Series MX 3400**

Unit	Capacity	Number of motors/pumps	Number of hose connections
MX 3412-1x1	12 liter (732 in ³)	1	1
MX 3412-1x2	12 liter (732 in ³)	1	2
MX 3412-2x1	12 liter (732 in ³)	2	2
MX 3424-1x1	24 liter (1464 in ³)	1	1
MX 3424-1x2	24 liter (1464 in ³)	1	2
MX 3424-2x1	24 liter (1464 in ³)	2	2
MX 3424-2x2	24 liter (1464 in ³)	2	4
MX 3424-3x1	24 liter (1464 in ³)	3	3
MX 3424-4x1	24 liter (1464 in ³)	4	4
MX 3460-1x1	60 liter (3661 in ³)	1	1
MX 3460-1x2	60 liter (3661 in ³)	1	2
MX 3460-2x1	60 liter (3661 in ³)	2	2
MX 3460-2x2	60 liter (3661 in ³)	2	4
MX 3460-3x1	60 liter (3661 in ³)	3	3
MX 3460-4x1	60 liter (3661 in ³)	4	4

8. Further Data for the Series MX 4400

Unit	Capacity	Number of motors/pumps	Number of hose connections
MX 4412-1x1	12 liter (732 in ³)	1	1
MX 4412-1x2	12 liter (732 in ³)	1	2
MX 4412-2x1	12 liter (732 in ³)	2	2
MX 4424-1x1	24 liter (1464 in ³)	1	1
MX 4424-1x2	24 liter (1464 in ³)	1	2
MX 4424-2x1	24 liter (1464 in ³)	2	2
MX 4424-2x2	24 liter (1464 in ³)	2	4
MX 4424-3x1	24 liter (1464 in ³)	3	3
MX 4424-4x1	24 liter (1464 in ³)	4	4
MX 4460-1x1	60 liter (3661 in ³)	1	1
MX 4460-1x2	60 liter (3661 in ³)	1	2
MX 4460-2x1	60 liter (3661 in ³)	2	2
MX 4460-2x2	60 liter (3661 in ³)	2	4
MX 4460-3x1	60 liter (3661 in ³)	3	3
MX 4460-4x1	60 liter (3661 in ³)	4	4
MX 44110-1x1	110 liter (6712 in ³)	1	1
MX 44110-1x2	110 liter (6712 in ³)	1	2
MX 44110-2x1	110 liter (6712 in ³)	2	2
MX 44110-2x2	110 liter (6712 in ³)	2	4
MX 44110-3x1	110 liter (6712 in ³)	3	3
MX 44110-4x1	110 liter (6712 in ³)	4	4
MX 44160-1x1	160 liter (9763 in ³)	1	1
MX 44160-1x2	160 liter (9763 in ³)	1	2
MX 44160-2x1	160 liter (9763 in ³)	2	2
MX 44160-2x2	160 liter (9763 in ³)	2	4
MX 44160-3x1	160 liter (9763 in ³)	3	3
MX 44160-4x1	160 liter (9763 in ³)	4	4

Section 9

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Section 9

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