VersaBlue®
Adhesive Melters
Serie N
Model VB, VC, VD, VE, VW, VX, VY, VZ

Manual P/N 7105144G
– English –

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Order number
P/N = Order number for Nordson products

Notice

Trademarks

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Nordson International

http://www.nordson.com/Directory

Europe

Country		Phone	Fax
Austria		43-1-707 5521	43-1-707 5517
Belgium		31-13-511 8700	31-13-511 3995
Czech Republic		4205-4159 2411	4205-4124 4971
Denmark	*Hot Melt*	45-43-66 0123	45-43-64 1101
	Finishing	45-43-200 300	45-43-430 359
Finland		358-9-530 8080	358-9-530 80850
France		33-1-6412 1400	33-1-6412 1401
Germany	*Erkrath*	49-211-92050	49-211-254 658
	Lüneburg	49-4131-8940	49-4131-894 149
	Nordson UV	49-211-9205528	49-211-9252148
	EFD	49-6238 920972	49-6238 920973
Italy		39-02-904 691	39-02-9078 2485
Netherlands		31-13-511 8700	31-13-511 3995
Norway	*Hot Melt*	47-23 03 6160	47-23 68 3636
Poland		48-22-836 4495	48-22-836 7042
Portugal		351-22-961 9400	351-22-961 9409
Russia		7-812-718 62 63	7-812-718 62 63
Slovak Republic		4205-4159 2411	4205-4124 4971
Spain		34-96-313 2090	34-96-313 2244
Sweden		46-40–680 1700	46-40-932 882
Switzerland		41-61-411 3838	41-61-411 3818
United Kingdom	*Hot Melt*	44-1844-26 4500	44-1844-21 5358
	Finishing	44-161-495 4200	44-161-428 6716
	Nordson UV	44-1753-558 000	44-1753-558 100

Distributors in Eastern & Southern Europe

DED, Germany	49-211-92050	49-211-254 658

Outside Europe / Hors d'Europe / Fuera de Europa

- For your nearest Nordson office outside Europe, contact the Nordson offices below for detailed information.
- Pour toutes informations sur représentations de Nordson dans votre pays, veuillez contacter l'un de bureaux ci-dessous.
- Para obtener la dirección de la oficina correspondiente, por favor diríjase a unas de las oficinas principales que siguen abajo.

Contact Nordson		Phone	Fax
Africa / Middle East			
DED, Germany		49-211-92050	49-211-254 658
Asia / Australia / Latin America			
Pacific South Division, USA		1-440-685-4797	–
Japan			
Japan		81-3-5762 2700	81-3-5762 2701
North America			
Canada		1-905-475 6730	1-905-475 8821
USA	*Hot Melt*	1-770-497 3400	1-770-497 3500
	Finishing	1-880-433 9319	1-888-229 4580
	Nordson UV	1-440-985 4592	1-440-985 4593

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* (if available) 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 and 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

- 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 or factory-authorized refurbished 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, guns, 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 Guns

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

1. Turn off or disconnect the gun triggering device (pattern controller, timer, PLC, etc.).

2. Disconnect the input signal wiring to the gun solenoid valve(s).

3. Reduce the air pressure to the gun solenoid valve(s) to zero; then relieve the residual air pressure between the regulator and the gun.

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, guns, etc.)

PC = Process control

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

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 guns 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.
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.

Continued...

General Safety Warnings and Cautions *(contd)*

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

Equipment Type	Warning or Caution
HM, PC	**WARNING:** Equipment starts automatically! Remote triggering devices are used to control automatic hot melt guns. Before working on or near an operating gun, disable the gun's triggering device and remove the air supply to the gun's solenoid valve(s). Failure to disable the gun'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 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.
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 the equipment.

Continued...

Equipment Type	Warning or Caution
HM	 **CAUTION:** Hot surfaces! Avoid contact with the hot metal surfaces of guns, 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.

Section 2
Introduction

Intended Use

Adhesive melters of the series *VersaBlue*® may be used only to melt and convey suitable materials, e.g. thermoplastic hot melt adhesives.

Any other use is considered to be unintended. Nordson will not be liable for personal injury 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)

In regard to electromagnetic compatibility (EMC), the melter is intended for use in industrial applications.

Operating Restrictions

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

Unintended Use – Examples –

The melter may not be used under the following conditions:

- In defective condition
- Without insulation blanket and protective panels
- With electrical cabinet door open
- With tank lid open
- In a potentially explosive atmosphere
- When the values stated under *Technical Data* are not complied with.

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

- Polyurethane hot melt adhesive (PUR)
- Explosive and flammable materials
- Erosive and corrosive materials
- Food products.

Residual Risks

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

- Risk of burns from hot material.
- 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 melter must be heated up.
- Risk of burns when attaching and removing heated hoses.
- Material fumes can be hazardous. Avoid inhalation.
- Risk of damage to cables/lines belonging to the customer, if they were installed such that they come into contact with hot or rotating parts.
- The safety valve may malfunction due to hardened or charred material.
- If the melters are equipped with a coupling broken monitoring feature, keep in mind that the magnets in this feature can
  - Pose a risk to persons with pacemakers
  - Erase magnetic data storage media
  - Interfere with electrical and electronic equipment
  - Cause injury due to excessive attraction
  - Break when handled incorrectly.

Series Overview

This manual describes the following melters:

Type	Tank size (liters)	Temperature sensor	Max. no. of single stream pumps	Max. no. of double stream pumps	Hose/gun connections
VB012	12	Ni 120	2	0	6
VB025	25		4		
VB050	50		4		
VC012	12	Ni 120	2	2	6
VC025	25				
VC050	50				
VD025	25	Ni 120	4	0	8
VD050	50				
VD100	100				
VE025	25	Ni 120	3	3	8
VE050	50		3	3	
VE100	100		4	4	
VW012	12	Pt 100	2	0	6
VW025	25		4		
VW050	50		4		
VX012	12	Pt 100	2	2	6
VX025	25				
VX050	50				
VY025	25	Pt 100	4	0	8
VY050	50				
VY100	100				
VZ025	25	Pt 100	3	3	8
VZ050	50		3	3	
VZ100	100		4	4	

NOTE: Units with a hopper (also referred to as tank extension) are designated with an **H** in the configuration code.

Examples:

- VB25**H**... is a VB025 with hopper, volume approx. 39 liters
- VE50**H**... is a VE050 with hopper, volume approx. 75 liters
- VZ10**H**... is a VZ100 with hopper, volume approx. 148 liters

Note on Manual

- The first generation IPC has been replaced by the new model IPC (generation 2). The instructions in the manual all refer to the new model, with the exception of Appendix B. When ordering spare parts, state the P/N on the control panel ID plate.
- Features that the customer may not have purchased – depending on the configuration of the melter – are also described in the section *Operation*. In this case they are not visible on the control panel.

Definition of Terms

Interface Standard I/O

Component designation: XS 2

Transmits the digital input and output signals between the parent machine and the Nordson melter.

Interface Key-to-line Mode

Component designation: XS 5 (one line speed signal input for all motors) or XS 5.1, XS 5.2, XS 5.3 and XS 5.4 (option: *separate line speed signal inputs).*

NOTE: *Key-to-line* is also referred to as *Automatic mode* in Nordson literature.

In key-to-line the motor/pump speed is regulated synchronously to the speed of the parent machine.

Encoder

The encoder compiles the line speed of the parent machine. It supplies a certain number of electrical pulses per revolution. The frequency is a measure of line speed.

CAUTION: The cable length may not be modified; this could cause incorrect evaluation of the line speed, resulting in incorrect material applications.

Symbols

Original state

Nordson default

Original setting of parameters that can be reset to the defaults by touching  .

Reset

Other Sources of Information

Product Resource Disc

On the CD there is an electronic version of the manual, the catalog of spare parts and other information on using and servicing the melter.

Melter Description

Illustration

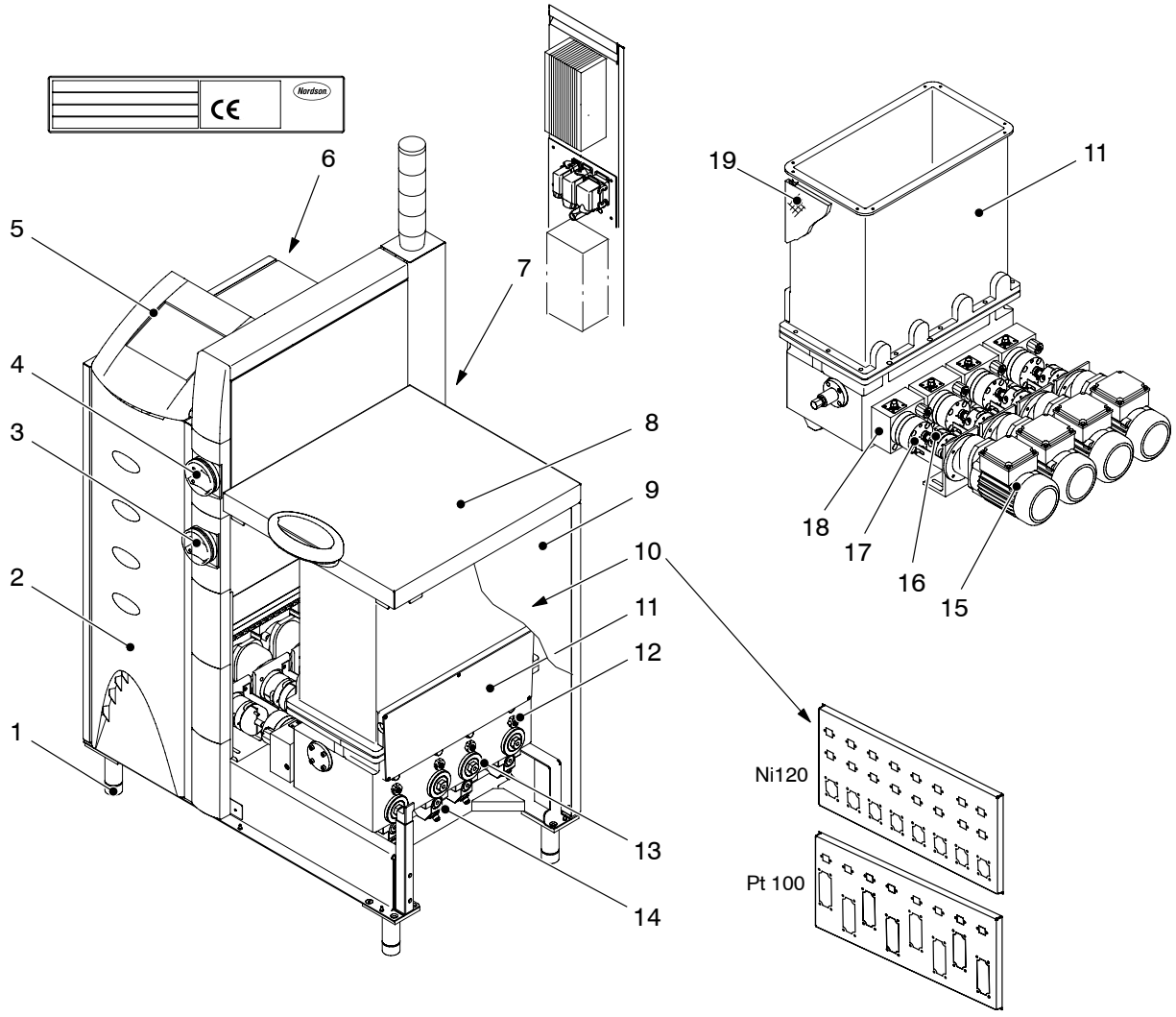


Fig. 2-1

1 Machine foot (option: casters)
2 Electrical cabinet
3 Motor circuit switch (option)
4 Main switch
5 Control panel
6 ID plate
7 Receptacles (XS2, XS3, XS5, XSD, XSP, ...)
8 Tank lid
9 Protective panel
10 Receptacles for guns, hoses and valve control
11 Tank
12 Pressure control valve
13 Filter cartridge
14 Hose connection
15 Motor
16 Coupling
17 Gear pump
18 Safety valve plate
19 Insulation blanket

Tank

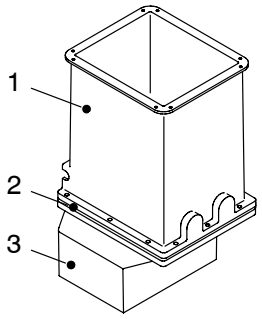


Fig. 2-2

The tank is divided into grid (low melt) and reservoir (high melt) sections. An insulating seal (2) provides a temperature barrier between the two sections. The temperature barrier allows the material in the grid section (1) to be gently melted at a low temperature. The material is then melted to processing temperature in the reservoir (3).

Safety Valve Plate

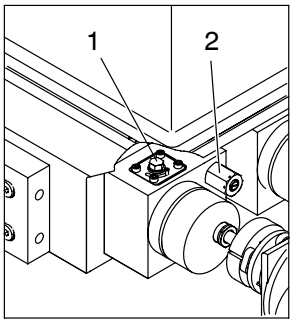


Fig. 2-3

Tank Isolation Valve

The tank isolation valve (1) enables replacement of the gear pump without first emptying the tank.

Safety Valve

The standard safety valve (2) is fixed at

8500 kPa	85 bar	1235 psi

When the pressure is exceeded, the safety valve opens, allowing the material to circulate within the safety valve plate.

Mechanical Pressure Control Valve

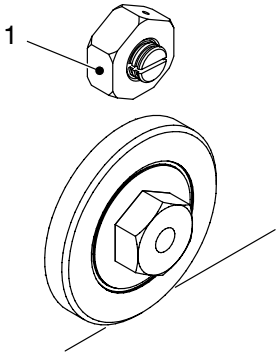


Fig. 2-4

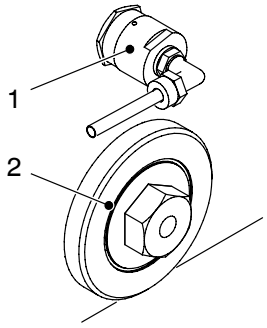
The mechanical pressure control valves (1) are built into the manifold above the filter cartridge. They can be adjusted manually within the range of

500 to 9000 kPa	5 to 90 bar	72.5 to 1305 psi

One pressure control valve per pump is standardly installed after the filter cartridge.

Melter Description *(contd.)*

Pneumatic Pressure Control Valve

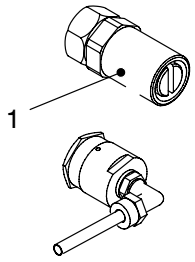


The pneumatic pressure control valves (1) can be installed instead of the mechanical pressure control valves. They are also located in the manifold.

They are connected to the pneumatic control unit in the melter with one pneumatic hose each.

Fig. 2-5
1 Pressure control valve
2 Filter cartridge

Air Relief Valve



There are air relief valves (1) in the manifold. Their purpose is to allow the air entering the manifold when the filter cartridge is replaced to escape.

Fig. 2-6

Material Flow

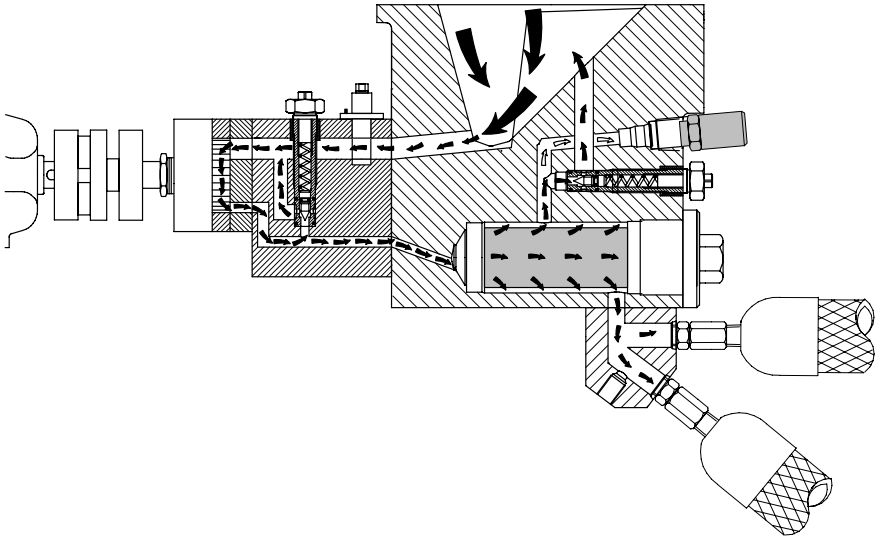


Fig. 2-7 Cross-sectional view of the reservoir – principle drawing

Identification of Hose Connections

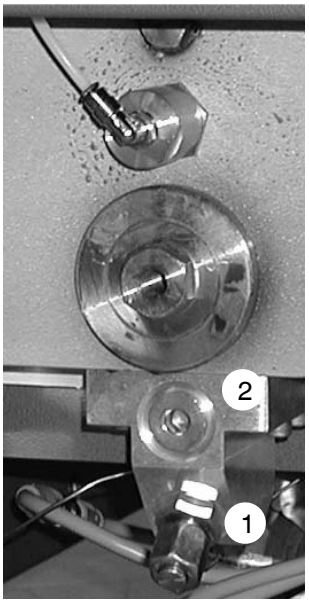


Fig. 2-8

The melter supplies various adhesive streams (pump streams) that are guided through the hoses to the different gear metering pump stations or guns. Engraved numbers identify the hose connections so that the pump streams can be correctly paired with the hoses.

The hose connection that leads down is number 1, the one above it number 2. The hose connections are numbered from right to left beginning with 1.

NOTE: Two hose connections per single-stream pump are possible. Four hose connections per double-stream pump are possible.

Example 1: Hose connection numbering for single-stream pumps

Pump number	**4**	**3**	**2**	**1**
Numbers	Top: 2	Top: 2	Top: 2	Top: 2
	Bottom: 1	Bottom: 1	Bottom: 1	Bottom: 1
Possible hose connections	4.1 4.2	3.1 3.2	2.1 2.2	1.1 1.2

Example 2: Hose connection numbering for double-stream pumps

Pump number	**4**	**3**	**2**	**1**
Pump stream (filter cartridge)	Right: 4.1 Left: 4.2	Right: 3.1 Left: 3.2	Right: 2.1 Left: 2.2	Right: 1.1 Left: 1.2
Numbers	Top: 2	Top: 2	Top: 2	Top: 2
	Bottom: 1	Bottom: 1	Bottom: 1	Bottom: 1
Possible hose connections	4.1.1 4.1.2 4.2.1 4.2.2	3.1.1 3.1.2 3.2.1 3.2.2	2.1.1 2.1.2 2.2.1 2.2.2	1.1.1 1.1.2 1.2.1 1.2.2

Electrical Cabinet

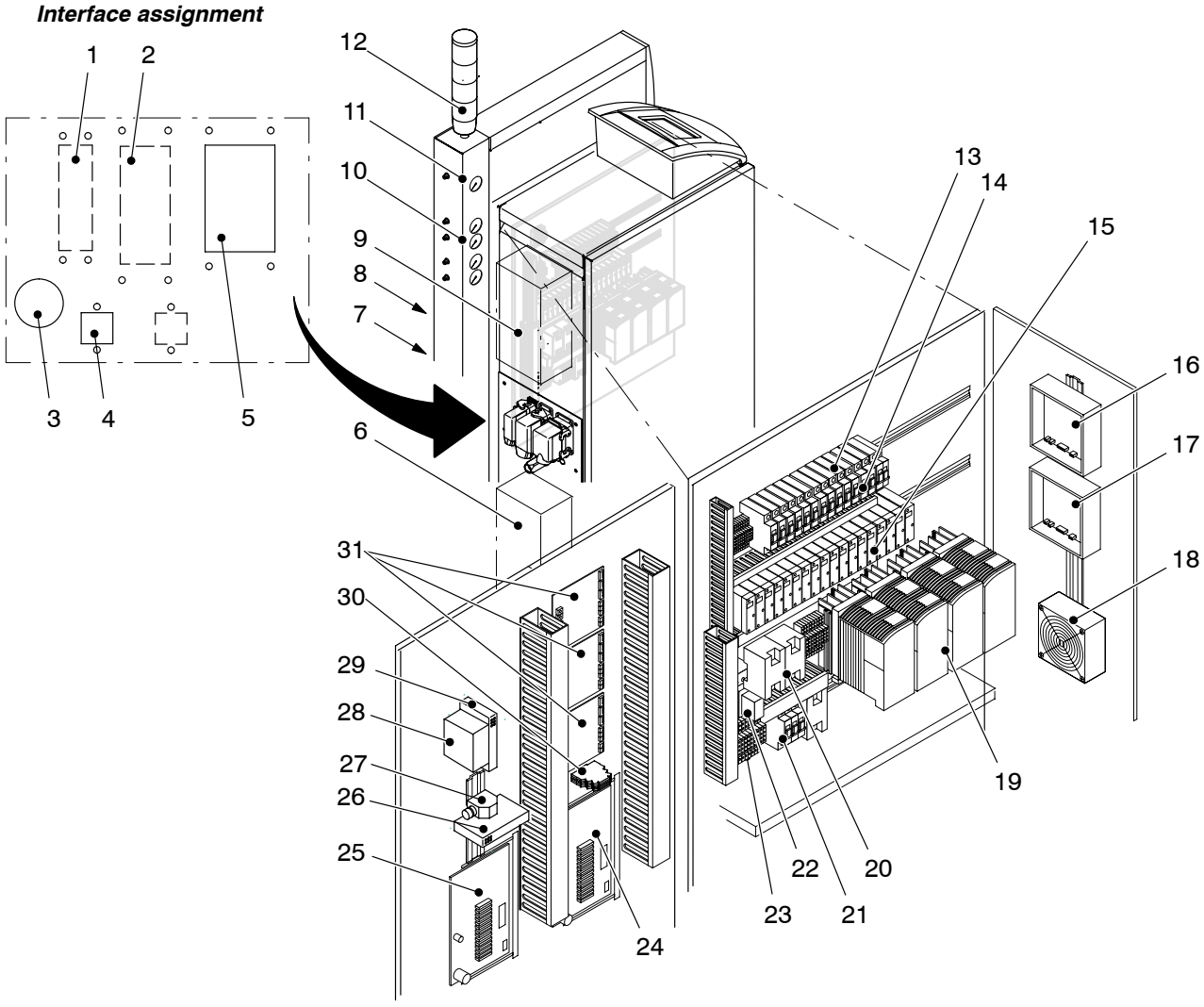


Fig. 2-9

1 Interface *Level control* (option), XS 3
2 Cable duct *PROFIBUS* (option), XS D
3 Cable gland *Power supply*
4 Interface *Key-to-line, XS 5*
5 Interface *Standard I/O*, XS 2
6 Mains filter (accessory)
7 Interfaces *Line speed signal inputs (XS 5.1 to XS 5.4)*
8 Interface *Pneumatic pressure control / bypass control* (option), XS 4
9 Heat exchanger, (option)
10 Pressure displays *Pneumatic bypass* (option)
11 Pressure display *Inert gas* (option)
12 Light tower (accessory/option)
13 Circuit breakers (for 3 x 200 V_{DC} and 3 x 230 V_{DC})
14 Circuit breakers (for 3 x 400 V_{DC}, 3 x 400 V_{DC} + N and 3 x 480 V_{DC})
15 Solid state relay
16 Evaluator *Level control* (option)
17 Evaluator *Separate overflow protection* (option)
18 Fan (not present with heat exchanger)
19 Motor controller
20 Power supply 24 V_{DC}
21 Circuit breaker *Main fuse*
22 Main contactor
23 Mains terminals
24 I/O board 1
25 I/O board 2
26 Gateway (option)
27 ControlNet tap (option)
28 Coprocessor (option)
29 Ethernet switch (option)
30 Transformer module
31 Temperature control board

Options

Level Display, Level Control / Overflow Protection

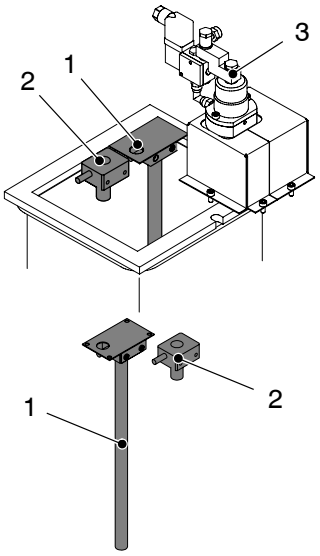


Fig. 2-10

With the option *Level display (variable measuring points)* an analog level sensor is built in. A contact *Fill tank* is made available at the Standard I/O (XS2) interface.

With the options *Level control* the analog level sensor (1) transmits filling signals for a filling valve.

With the option *Level control (fixed measuring points)*, a 5-point sensor is built in. A contact *Fill tank* is made available at the Standard I/O (XS2) interface.

The short level sensor (2) serves as separate overflow protection. The signal is made available to the customer for further evaluation at the interface *Level control*. It is not evaluated by the industrial PC.

The filling valve (3) for automatic tank filling is located on the tank.

The filling valve control module opens when the solenoid valve is triggered. The material is conveyed into the melter tank, e.g. by a bulk melter.

Motor Circuit Switch

All motor controllers and motors are deenergized with the motor circuit switch (motor maintenance or repair switch).

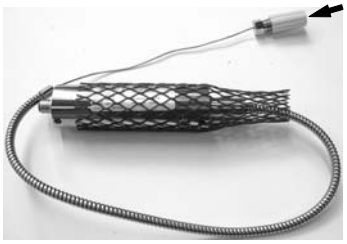
Position 0/OFF = Motor(s) switched off.
Position 1/ON = Motor(s) switched on.

This is important when, in the event of maintenance or repair, the melter and heaters must remain switched on but the motors absolutely may not turn.

Padlocks can be used to protect the motor circuit switch from being turned on by unauthorized personnel.

Options *(contd.)*

Pressure Display



The pressure sensors (Fig. 2-11 and 1, Fig. 2-12) for material outlet pressure are located in the hose connections. The corresponding measuring transducers (2) are located below the manifold. The last pressure sensor along the bus must be equipped with a terminating resistor (3).

Fig. 2-11

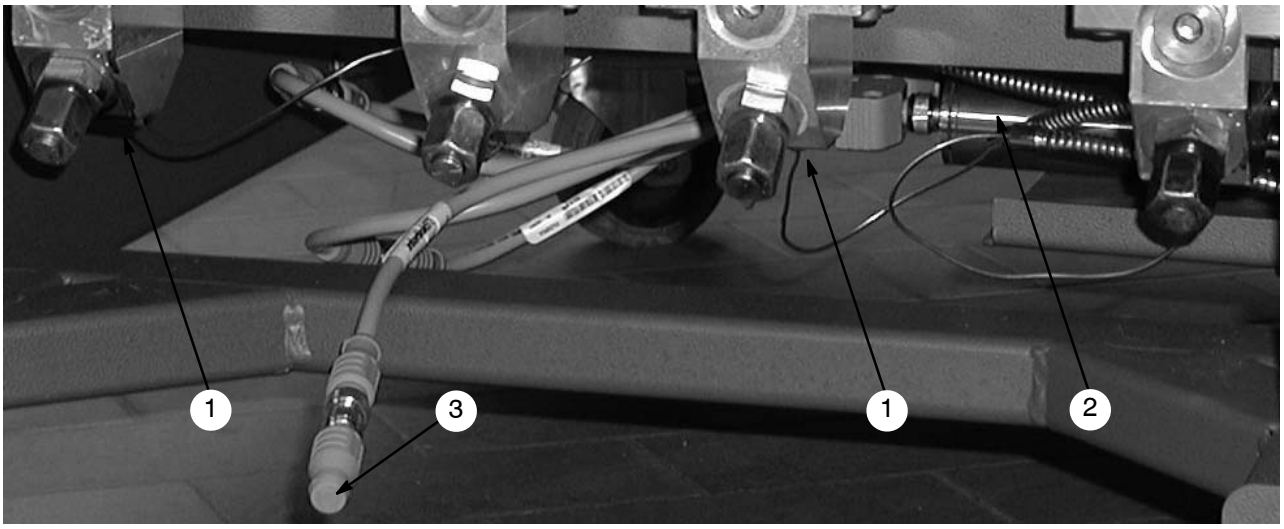


Fig. 2-12 Pressure sensors in the hose connections (right side of melter, refer to Fig. 2-1)

Pressure Display, Box 15, Code A

Each pump stream is equipped with a pressure sensor for the pressure display in systems with only double-stream pumps and in systems with both single-stream and double-stream pumps.

Pressure Display and Pressure Control, Box 14, Code C Pressure Build-up, Box 14, Code N

The single-stream pump is equipped with a pressure sensor for the pressure display and control in systems with both single-stream and double-stream pumps. In the double-stream pump each pump stream is equipped with a pressure sensor for the pressure display. However, only one each is used for pressure control.

In systems consisting only of double-stream pumps, each pump is equipped with two pressure sensors for the pressure display. However, only one each is used for pressure control.

ID Plate

The system has two ID plates. One is located on the outside of the melter (Refer to Fig. 2-1), and the other is in the electrical cabinet.

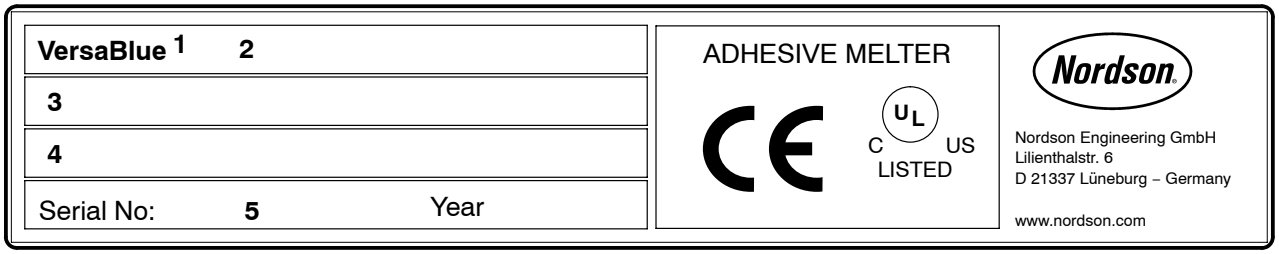


Fig. 2-13

1	Melter designation
2	Order number
3	Configuration code
4	Electrical connection, operating voltage, line voltage frequency, melter fuse protection
5	Serial number

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.

Transport

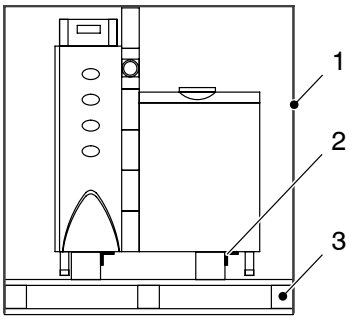


Fig. 3-1

- Refer to section *Technical Data* for weight. Use only suitable transport devices.
- If possible, use the pallet (3) that came with the melter and use angle brackets (2) to fasten the melter.
- Use a sturdy box (1) or the folding box (4) to protect from damage.
- Protect from humidity and dust.
- Avoid jolts and vibrations.

Storage

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

Unpacking

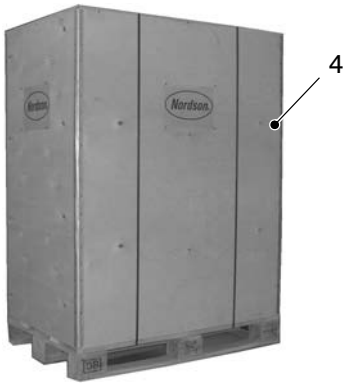


Fig. 3-2

Unpack carefully and check for damage caused during transport. Save pallet, angle brackets and box for later use, or dispose of it properly according to local regulations.

Lifting (Unpacked Melter)

Refer to the section *Technical Data* for weight. Lift melter only at the chassis using suitable lifting equipment or a forklift.

Installation Requirements

Set up only in an environment that corresponds to the stated Degree of Protection (Refer to section *Technical Data*). Do not mount in a potentially explosive atmosphere! Protect from vibration.

CAUTION: Protect the control panel from direct sunlight. The UV rays reduce the lifetime of the liquid crystals.

Melters with Transformer

The transformer is located under the melter.

- Keep cables and hoses out of the space under the melter.
- Position the unit such that air can circulate sufficiently under the melter.

Exhausting Material Vapors

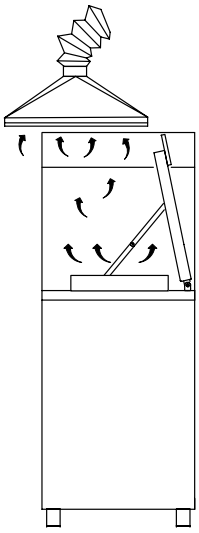


Fig. 3-3

Ensure that material vapors do not exceed the prescribed limits. Always observe the safety data sheet (MSDS) for the material to be processed. If necessary, exhaust material vapors and provide sufficient ventilation of the location of the system.

Required Space

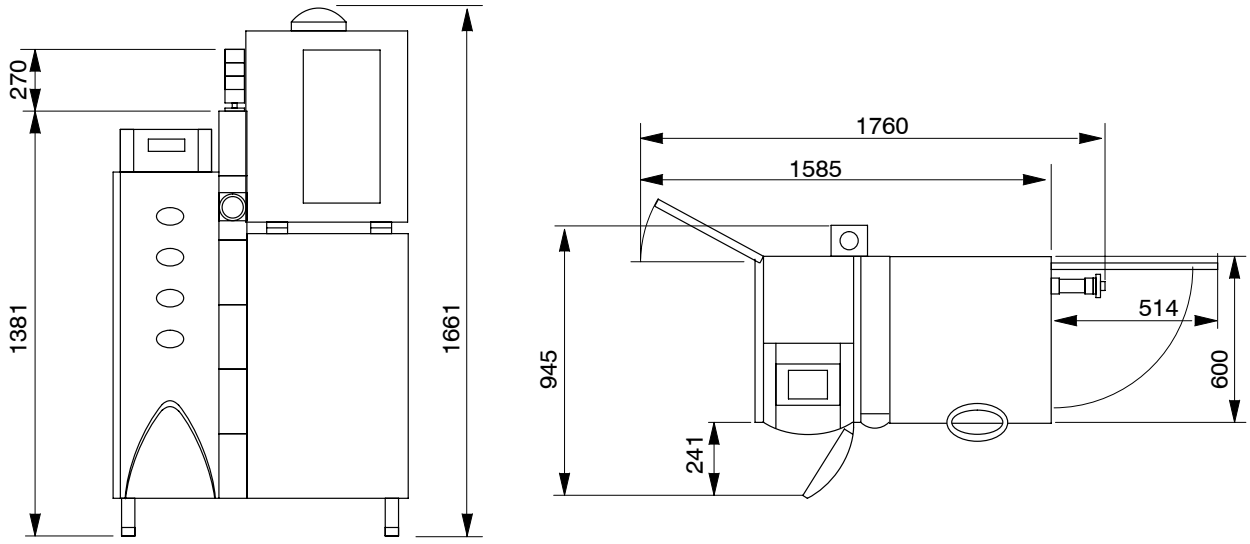


Fig. 3-4 Types VB, VC, VW, VX

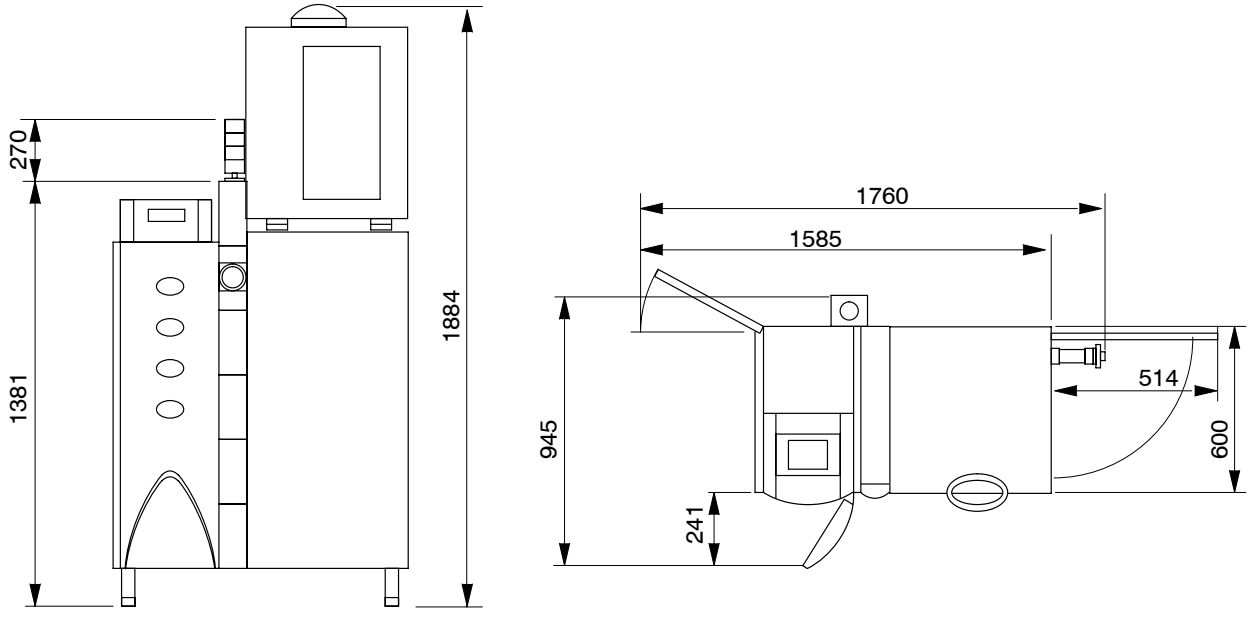


Fig. 3-5 Types VB, VC, VW, VX with tank extension (hopper)

Installation Requirements *(contd.)*

Required Space *(contd.)*

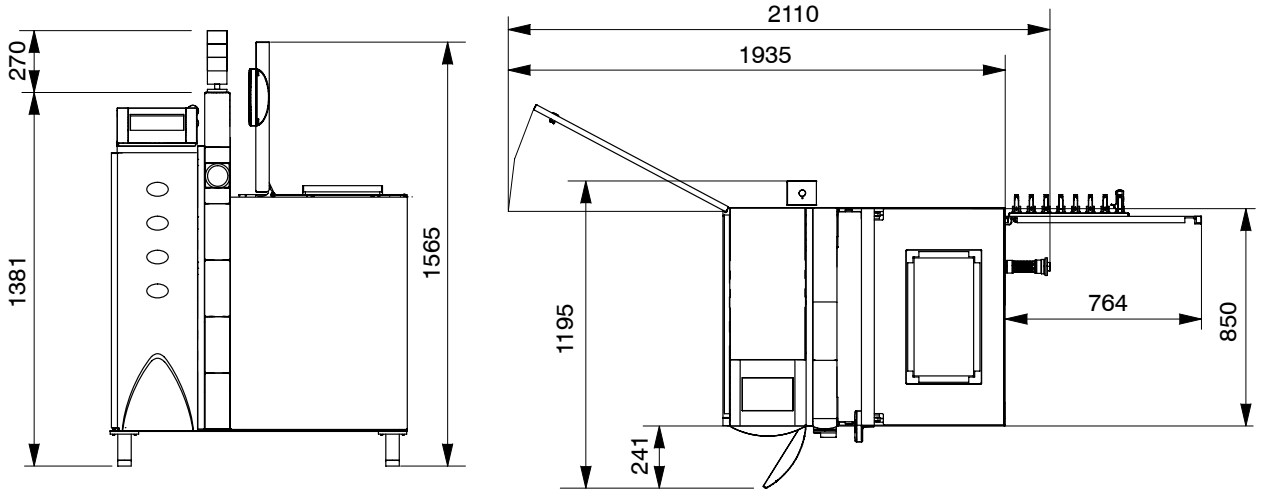


Fig. 3-6 Types VD, VE, VY, VZ

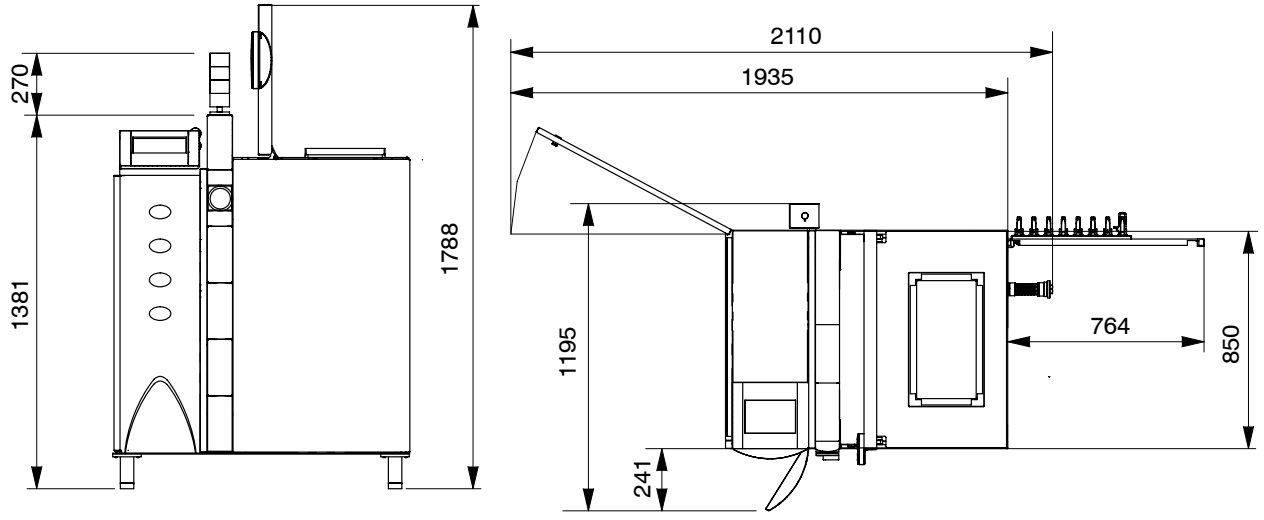


Fig. 3-7 Types VD, VE, VY, VZ with tank extension (hopper)

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.

CAUTION: Illuminated seals may not be installed in the application system.

Screwing on Light Tower (Option)

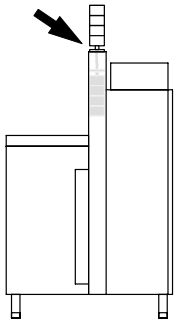


Fig. 3-8

The light tower is not attached upon delivery of the melter. Use the two screws M5 to fasten the light tower to the top of the melter tower.

Electrical Connections

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

Important Note When Using Residual Current Circuit Breakers

Local regulations in some geographic areas or industrial branches may require residual current circuit breakers.

Then observe the following points:

- Residual current circuit breakers are to be installed only between the power supply and the melter.
- Only residual current circuit breakers sensitive to pulsating current or universal current (> 30 mA) may be used.

Laying Cable

WARNING: Use only temperature resistant cable in warm areas of the equipment. Ensure that cables do not touch rotating and/or hot melter components. Do not pinch cables and check regularly for damage. Replace damaged cables immediately!

CAUTION: Lay CAN bus cable with a bending radius > 60 mm (2.4 in).

Operating Voltage

WARNING: Operate only at the operating voltage shown on the ID plate.

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

NOTE: The power connection cable must have a cross-section appropriate for the maximum power consumption (refer to section *Technical Data).*

External Control/Signal Circuits

WARNING: Connect external control and signal circuits with suitable cable in accordance with the NEC, class 1. To prevent short-circuiting, lay the cables such that they do not touch printed circuits on PCBs.

Power Supply

NOTE: The melter must be installed securely (permanent power supply connection).

NOTE: On melters with mains filter, the mains terminals for the customer's power supply are located in the mains filter casing.

Operating voltage	Terminals					Mains terminals in electrical cabinet
	L1	L2	L3	N	PE	
200 V_{AC} 3-phase without neutral (*Delta*)	●	●	●		●	
230 V_{AC} 3-phase without neutral (*Delta*)	●	●	●		●	
400 V_{AC} 3-phase with neutral (star – *WYE*)	●	●	●	●	●	
400 V_{AC} 3-phase without neutral (*Delta*)	●	●	●		●	
480 V_{AC} 3-phase without neutral (*Delta*)	●	●	●		●	
Refer to wiring diagram for connecting arrangement.						

Mains Filter

Installing Kit (Accessory)

WARNING: Disconnect the unit from the line voltage.

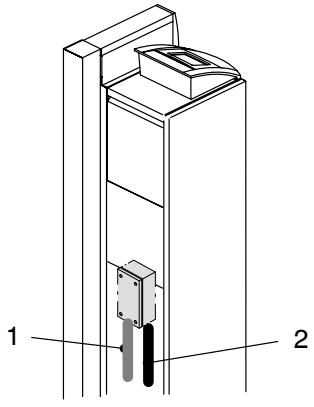


Fig. 3-9

1. Disconnect the customer's power supply from the mains terminals in the electrical cabinet. Extract power cable.
2. Replace the cable gland on the electrical cabinet with the EMC cable gland on the shielded cable (1).
3. Screw on mains filter on electrical cabinet.
4. Connect shielded cable (1) to mains terminals in electrical cabinet.
5. Connect customer's power cable (2) to the terminals in the mains filter casing.
6. Fasten casing cover again.

Connecting Hose

Also refer to the hose manual.

Connecting Electrically

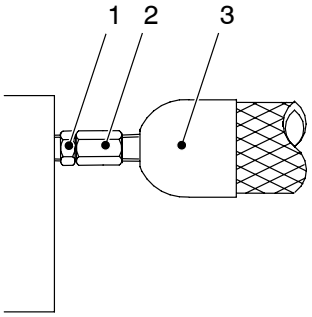


Fig. 3-10

1. First connect the hose (3) electrically to the unit.

Use hose receptacles XS10 to XS17 (Fig. 3-11, bottom row) for the plugs of the hoses.

NOTE: For more than one hose: Every hose connection is allocated to a corresponding receptacle. Do not mistakenly exchange!

Refer to wiring diagram for connecting arrangement.

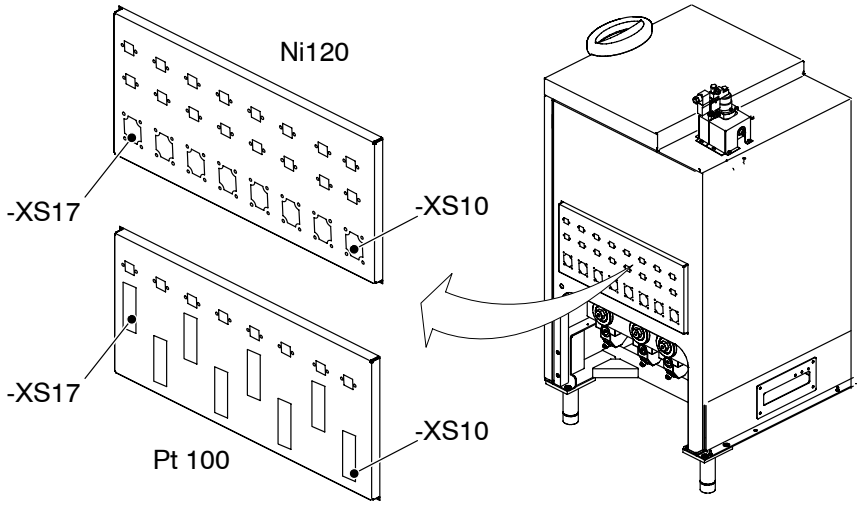


Fig. 3-11 Hose receptacles

Connecting

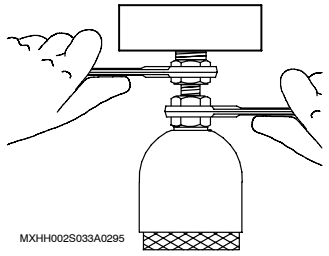


Fig. 3-12

Second Open-jawed Wrench

Use a second open-jawed wrench when connecting and disconnecting the hose. This prevents the unit's hose connection from turning.

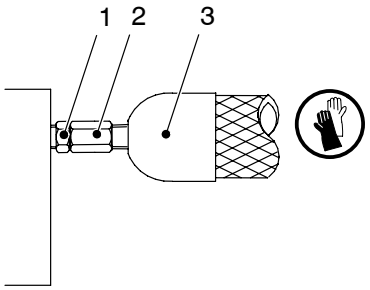


Fig. 3-13

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

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

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

2. Heat the melter and the hose to approx. 70 ˚C (158 ˚F).

CAUTION: Close unused hose connections with Nordson port plugs.

Disconnecting

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

Relieving Pressure

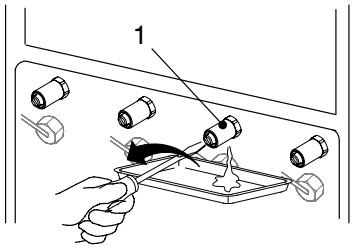


Fig. 3-14

1. Set motor speed to 0 min^{-1} (rpm). Switch off the motor(s) (Refer to section *Operation*).
2. Place a container under the air relief valves (1, Fig. 3-14) to be opened.
3. Use a screwdriver to turn the air relief valve screws counterclockwise and open the valves.
4. Material flows out of the air relief holes, and the melter is relieved of pressure.
5. Use a screwdriver to turn the air relief valve screws clockwise and close the valves.
6. Place a container under the nozzle(s) of the gun / assembly handgun.
7. Activate the solenoid valve(s) electrically or manually, or pull the trigger of the assembly handgun. Repeat this procedure until no more material flows out.
8. Properly dispose of material according to local regulations.

Installing Gun

Refer to the gun manual.

CAUTION: The maximum operating temperature of the installed gun and the other heated system components should be considered when setting temperatures on the melter control panel.

Filling Valve (Option)

Conditioning Compressed Air

The quality of the compressed air must be at least class 2 in compliance with ISO 8573−1. This means:

- Max. particle size 30 μm
- Max. particle density 1 mg/m^3
- Max. pressure dew point − 40 ˚C
- Max. oil concentration 0.1 mg/m^3.

Connecting Filling Valve

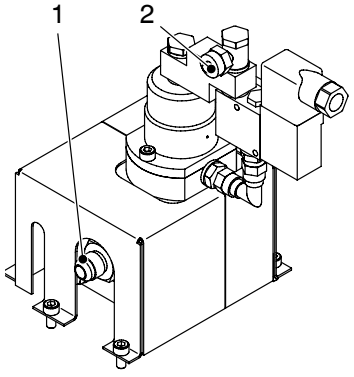


Fig. 3-15

1. Connect customer's compressed air supply to the control air connection (2).

4 to 6 bar	400 to 600 kPa	58 to 87 psi

2. Electrically/mechanically connect hose to the filling unit.
3. Connect hose to filling valve connection (1) (Also refer to 3-15).

The filling valve is heated either via the VersaBlue melter or via the filling unit (e.g. bulk melter).

4. If heating does not occur via the VersaBlue melter, insert the electrical plug (cordset) into the hose receptacle.

Key-to-line Mode: Selecting Line Speed Voltage or Line Speed Current on the I/O Boards

WARNING: The melter must be switched off.

CAUTION: Electrostatic charges can destroy electronic components. Wear grounding strap!

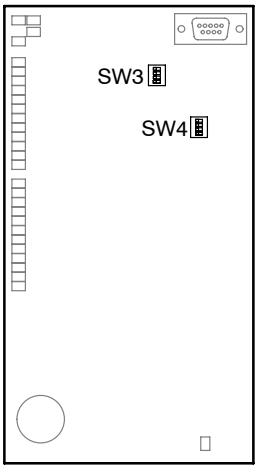


Fig. 3-16 DIP switch

The DIP switch SW 3 on the two I/O boards can be used to choose between two current ranges (0 to 20 mA and 4 to 20 mA).

NOTE: If the line speed signal is a frequency, these DIP switch settings have no relevance.

The following tables indicate the original state when delivered by Nordson (***** =). The entry ”–” in in the table means that this setting is not permitted.

I/O Boards 1 and 2			Current range
SW3	1	**ON**	4 – 20 mA (*****)
		OFF	0 – 20 mA
	2-4	**ON**	4 – 20 mA (*****)
		OFF	–

The DIP switches SW 4 on the two I/O boards are used to switch between voltage and current.

I/O board no. 1			One line speed signal input for all motors	Separate line speed signal inputs (option)
SW4	1	**ON**	Current	–
		OFF	Voltage (0–10 V) (*****)	Voltage (0–10 V) (*****)
	2 to 4	**ON**	–	–
		OFF	Voltage (0–10 V) (*****)	Voltage (0–10 V) (*****)

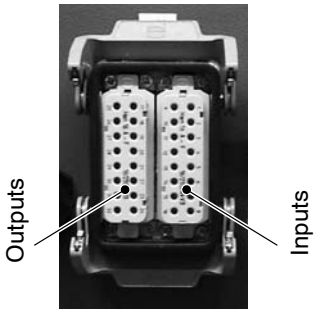
I/O board no. 2			One line speed signal input for all motors	Separate line speed signal inputs (option)
SW4	1 to 4	**ON**	–	–
		OFF	Voltage (0–10 V) (*****)	Voltage (0–10 V) (*****)

NOTE: *Voltage* or *current* must also be set on the melter control panel.

Also refer to section *Operation*, step *M2.1*: *Motor enable, Line Speed Signal*.

Interface Assignment

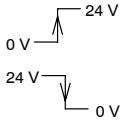
Interface Standard I/O – Standard Assignment –



General Notes

- To conform with a European standard regarding electro-magnetic compatibility (EMC), only shielded cable may be connected. The cable must be connected to ground in compliance with the standard regarding electromagnetic compatibility.
- Inductive loads (e.g. solenoid valves) connected to the melter must be equipped with a protective device (e.g. recovery diode) that disables the inductive voltage generated when an inductive load is switched off.
- The permitted voltage deviation is ±10%.
- In *Field bus* mode (option *Fieldbus communication*) the unit can not be controlled via the interface.

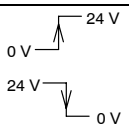
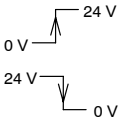
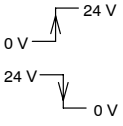
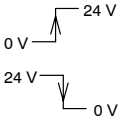
Digital inputs		
Pin	**Input**	**Function**
1*****	24 V_{DC}	Internal (melter)
2*****	0 V_{DC}	External (customer's) **NOTE:** Customer connects his reference potential here, if 24 V_{DC} is provided by customer.
3	24 V / 0 V 24 V / 0 V	Rising edge: Heaters ON (main contactor closes) Falling edge: Heaters OFF (main contactor opens)
4		24 V: All motors ON (collective enable) 0 V: All motors OFF
5		24 V: Enable *Motor 1* 0 V: No *Motor 1* enable
6		24 V: Enable *Motor 2* 0 V: No *Motor 2* enable
7		24 V: Enable *Motor 3* 0 V: No *Motor 3* enable
8		24 V: Enable *Motor 4* 0 V: No *Motor 4* enable
9	24 V / 0 V 24 V / 0 V	Rising edge: Switch on *Standby* Falling edge: Switch off *Standby*
10	24 V / 0 V 24 V / 0 V	Rising edge: Key-to-line mode (for all motors) Falling edge: Manual mode (for all motors)
***** selectable		

Digital inputs		
Pin	**Input**	**Function**
11		Rising edge: Switch application group to control mode (input 1) Falling edge: Switch application group to standby **or** Falling edge: Deactivate application group (*Standby* or *Deactivate* is dependent on the function selected on the control panel, refer to section *Operation, Working with Application Groups, Setup, Selecting Feature*
12		Like pin 11 (input 2)
13		Like pin 11 (input 3)
14		Like pin 11 (input 4)
15		Line started / stopped
Pin 16 not assigned		

NOTE: Contact rating max. 24 V_{DC}/2 A

Digital outputs		
Pin	**Contact**	**Function**
17 18	Make contact	Contact closed: Motor 1 running Contact open: Motor 1 not running
19 20	Make contact	Contact closed: Motor 2 running Contact open: Motor 2 not running
21 22	Make contact	Contact closed: Motor 3 running Contact open: Motor 3 not running
23 24	Make contact	Contact closed: Motor 4 running Contact open: Motor 4 not running
25	24 V_{DC}	External (customer's; to be connected by customer)
26	Make contact	24 V: System ready 0 V: System not ready
27	Break contact	24 V: No general alarm –warning– 0 V: General alarm –warning–
28	Break contact	24 V: No general alarm –fault– 0 V: General alarm –fault–
Pin 29 not assigned		
30	Make contact	Contact closed: Pressure build-up completed Contact open: Pressure build-up not completed
31 32	Make contact	With option *Level display* Contact closed: Fill tank Contact open: Do not fill tank **NOTE:** Pins 31 and 32 are not assigned with the options *Level control* and *Level control with overflow protection*. Instead, there is the interface *Level control* that triggers the filling valve.

Interface Standard I/O – Assignment with Option Solenoid Valve Control

Digital inputs		
Pin	**Input**	**Function**
1*****	24 V_{DC}	Internal (melter)
2*****	0 V_{DC}	External (customer's) **NOTE:** Customer connects his reference potential here, if 24 V_{DC} is provided by customer.
3		Rising edge: Heaters ON (main contactor closes) Falling edge: Heaters OFF (main contactor opens)
4		24 V: All motors ON (collective enable) 0 V: All motors OFF
5		24 V: Enable *Motor 1* 0 V: No *Motor 1* enable
6		24 V: Enable *Motor 2* 0 V: No *Motor 2* enable
7		24 V: Enable *Motor 3* 0 V: No *Motor 3* enable
8		24 V: Enable *Motor 4* 0 V: No *Motor 4* enable
9		Rising edge: Switch on *Standby* Falling edge: Switch off *Standby*
10		Rising edge: Key-to-line mode (for all motors) Falling edge: Manual mode (for all motors)
11		Rising edge: Switch application group to control mode (input 1) Falling edge: Switch application group to standby **or** Falling edge: Deactivate application group (*Standby* or *Deactivate* is dependent on the function selected on the control panel, refer to section *Operation, Working with Application Groups, Setup, Selecting Feature*)
12		Like pin 11 (input 2)
13		Like pin 11 (input 3)
14		Like pin 11 (input 4)
15		Line started / stopped
Pin 16 not assigned		
***** selectable		

NOTE: Contact rating max. 24 V_{DC}/2 A

Digital outputs		
Pin	**Contact**	**Function**
17 18	Make contact	24 V: External solenoid valve 1 is triggered 0 V: External solenoid valve 1 is not triggered
19 20	Make contact	24 V: External solenoid valve 2 is triggered 0 V: External solenoid valve 2 is not triggered
21 22	Make contact	24 V: External solenoid valve 3 is triggered 0 V: External solenoid valve 3 is not triggered
23 24	Make contact	24 V: External solenoid valve 4 is triggered 0 V: External solenoid valve 4 is not triggered
25	24 V_{DC}	External (customer's; to be connected by customer)
26	Make contact	24 V: System ready 0 V: System not ready
27	Break contact	24 V: No general alarm –warning– 0 V: General alarm –warning–
28	Break contact	24 V: No general alarm –fault– 0 V: General alarm –fault–
Pin 29 not assigned		
30	Make contact	Contact closed: Pressure build-up completed Contact open: Pressure build-up not completed
31 32	Make contact	With option *Level display* Contact closed: Fill tank Contact open: Do not fill tank **NOTE:** Pins 31 and 32 are not assigned with the options *Level control* and *Level control with overflow protection*. Instead, there is the interface *Level control* that triggers the filling valve.

Interface Gun Solenoid Valve Control

Fig. 3-17

XS1.1 to XS8.1 (3-pin)		
Pin	**Output**	**Function**
1	– (Ground)	Digital output
2	24 V_{DC}	
Pin 3 not assigned		

XS1.2 to XS8.2 (3-pin)		
Pin	**Output**	**Function**
1	– (Ground)	Digital output via XS 2
2	24 V_{DC}	
Pin 3 not assigned		

Interface Key-to-line Mode

In *Field bus* mode (option *Fieldbus communication*) the line speed signals are deactivated.

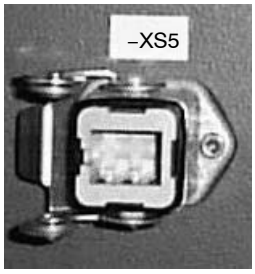


Fig. 3-18

One Line Speed Signal Input for all Motors

P/N	Description
772050	Encoder 500 pulses/revolution, ∅ 10 mm
772051	Encoder 500 pulses/revolution, ∅ 3/8 in
772052	Cable, 9 m (30 ft)
772054	Cable, 18 m (60 ft)

XS5					
			Connection example		
			Cable P/N 772 052	**Encoder** P/N 772 050 P/N 772 051	
Pin	**Input**	**Function**	**Pin**	**Pin**	**Function**
1	– (Ground)	Analog input			
2	0 to 10 V or 4 to 20 mA				
3	+24 V_{DC}	Frequency input	POWER+V	D	POWER+V
4	– (Ground)		COM, SHIELD	F, G	COM, CASE
5	0 to 100 kHz		SIGNAL A	A	SIG. A
Pin 6 not assigned					

Fig. 3-19

Separate Line Speed Signal Inputs

XS5.1 (3-pin)		
Pin	**Input**	**Function**
1	– (Ground)	Analog input
2	0 to 10 V_{DC}	
Pin 3 not assigned		

XS5.2 (3-pin)		
Pin	**Input**	**Function**
1	– (Ground)	Analog input
2	0 to 10 V_{DC}	
Pin 3 not assigned		

XS5.3 (3-pin)		
Pin	**Input**	**Function**
1	– (Ground)	Analog input
2	0 to 10 V_{DC}	
Pin 3 not assigned		

XS5.4 (3-pin)		
Pin	**Input**	**Function**
1	– (Ground)	Analog input
2	0 to 10 V_{DC}	
Pin 3 not assigned		

Interface Level Control

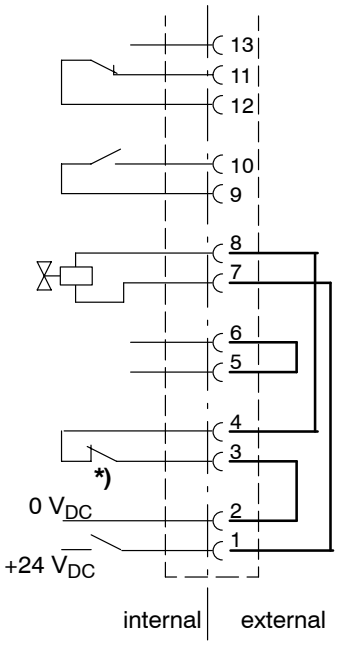


Fig. 3-20 Default bridges

NOTE: Available only with the options with filling valve.

Component designation: XS3

Digital inputs/outputs			
Pin	**Input**	**Output**	**Function**
1	–	24 V_{DC}	Internal voltage supply of separate overflow protection
2	–	0 V_{DC}	
3	–	24 V_{DC}/2 A	*Fill tank* signal to filling valve ***– Additionally with level control with overflow protection –*** ***)** Tank overfilled (contact open when level is exceeded)
4	–		
5	–	–	***– Only with level control with overflow protection –*** Reset (resets signal *Tank is overfilled*)
6	–	–	
7	+24 V_{DC}	–	Voltage supply to filling valve
8	0 V_{DC}	–	
9	–	24 V_{DC} / 2 A	Fill tank
10	–		
11	–	24 V_{DC} / 2 A	***– Only with level control with overflow protection –*** Tank overfilled **NOTE:** Potential-free changeover contact for evaluation by customer
12	–		
13	–		
Pin 14 to 16 not assigned			

Pneumatic Connections

Pneumatic Pressure Control / Bypass Control

Required Air Quality

The compressed air must be dry and non-lubricated. Dirt particles in the air may not exceed 30 µm in size.

Setting Pressures

The safety valve for pneumatics limits the inlet pressure to 600 kPa (6 bar / 87 psi).

The pneumatic pressure control valve has a transmission ratio operating air pressure / material pressure of 1:15.

1: Pressure display *Pneumatic bypass pump 1 *)*
2: Pressure display *Pneumatic bypass pump 2 *)*
3: Pressure display *Pneumatic bypass pump 3 *)*
4: Pressure display *Pneumatic bypass pump 4 *)*
5: Safety valve for pneumatics
6: Interface *Pneumatic pressure control / bypass control* (XS4)
7: Connection *Compressed air*

*) With options *Manual pneumatic pressure control* and *Bypass control*

The arrows point to the handwheels of the individual pressure controllers. They are available only with options *Manual pneumatic pressure control* and *Bypass control*.

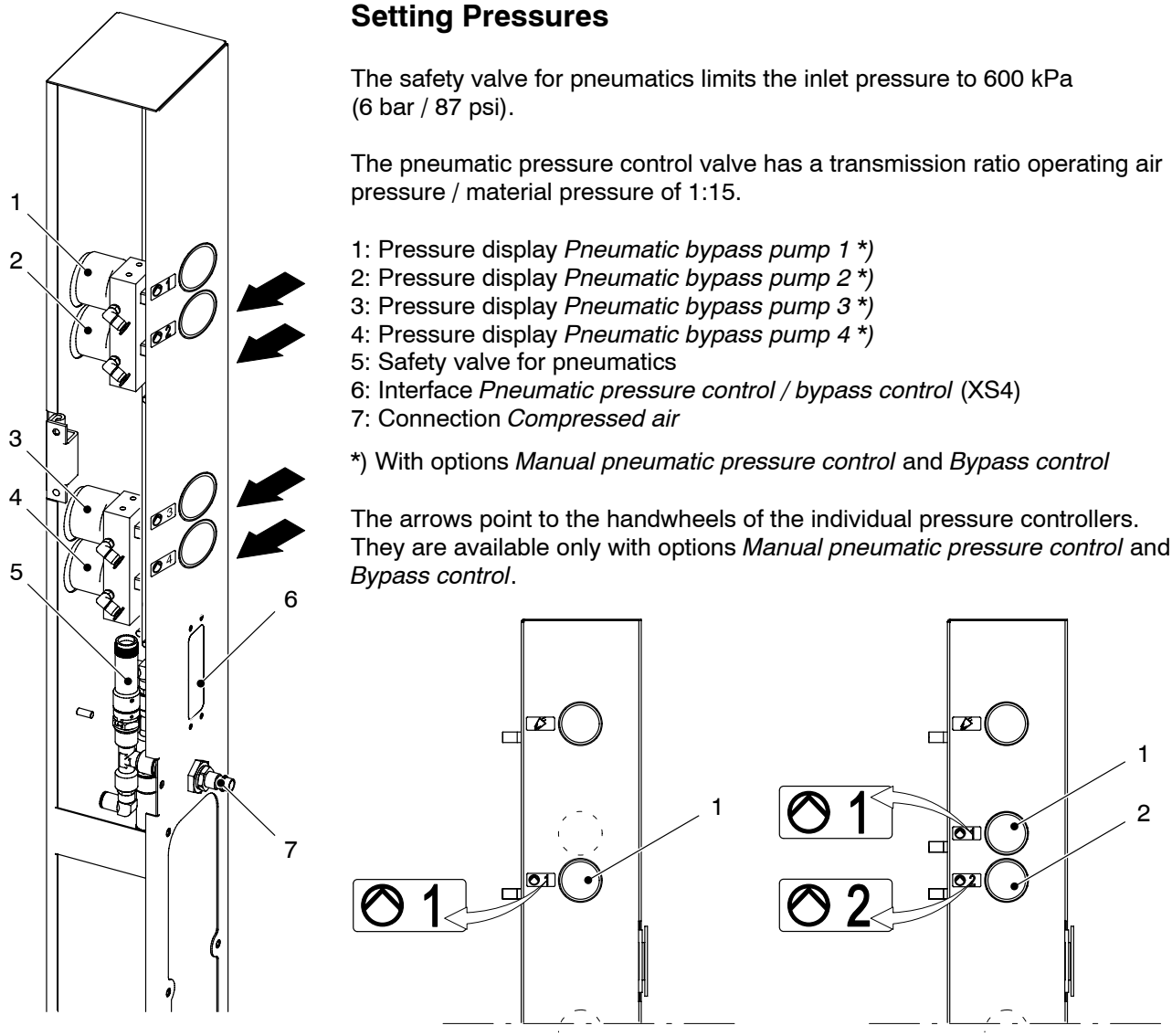


Fig. 3-21 Tower and labels with one pump and with two pumps

Pneumatic Connections *(contd.)*

Pneumatic Pressure Control / Bypass Control (contd.)

Interface Assignment Pneumatic Pressure Control

PIN	Input	Function
1 –	4 – 20 mA	Proportional valve pump 1
2 +	0 – 10 V	
3 –	4 – 20 mA	Proportional valve pump 2
4 +	0 – 10 V	
5 –	4 – 20 mA	Proportional valve pump 3
6 +	0 – 10 V	
7 –	4 – 20 mA	Proportional valve pump 4
8 +	0 – 10 V	

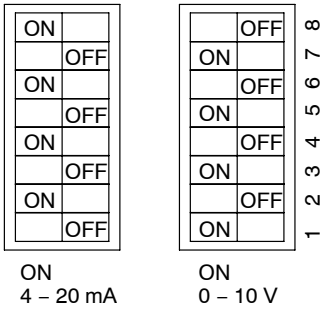


Fig. 3-22 SW1

The proportional valves for pneumatic pressure control are located in the melter tower. The DIP switch *SW 1* is on the back of the printed circuit board.

DIP switch *SW1* to switch between 0 – 10 V and 4 – 20 mA.

0 – 10 V

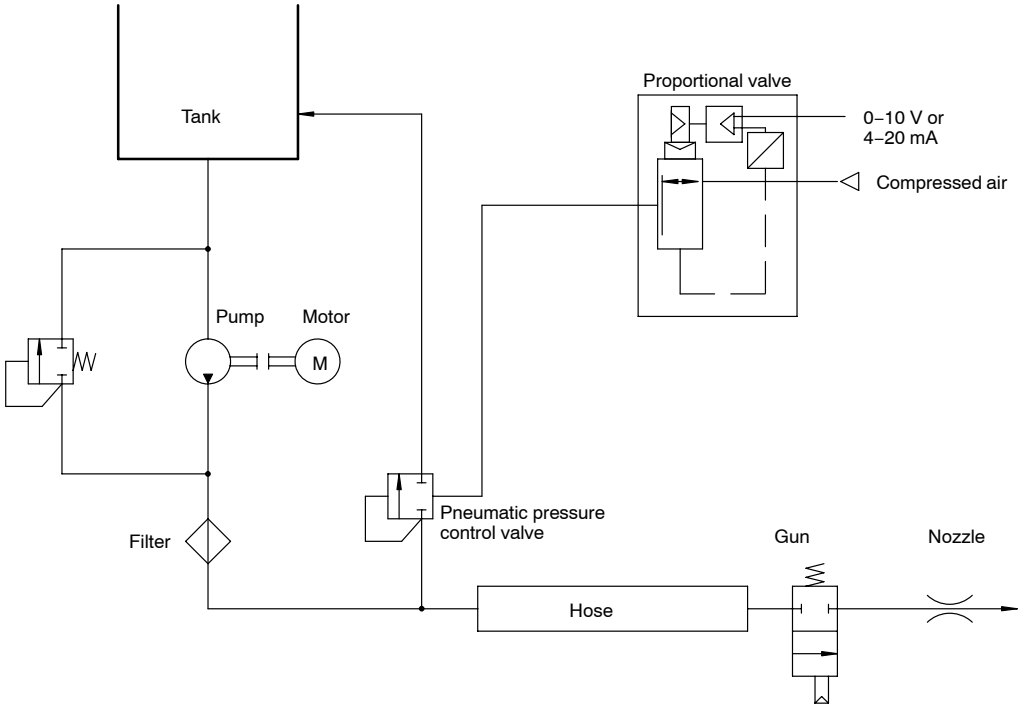


Fig. 3-23 Option *Pneumatic pressure control* (1 pump)

Interface Assignment Bypass Control

PIN	Input	Function
1	24 V_{DC}/ 4 W	Pneumatic pressure control valve 1
2		
3	24 V_{DC}/ 4 W	Pneumatic pressure control valve 2
4		
5	24 V_{DC}/ 4 W	Pneumatic pressure control valve 3
6		
7	24 V_{DC}/ 4 W	Pneumatic pressure control valve 4
8		

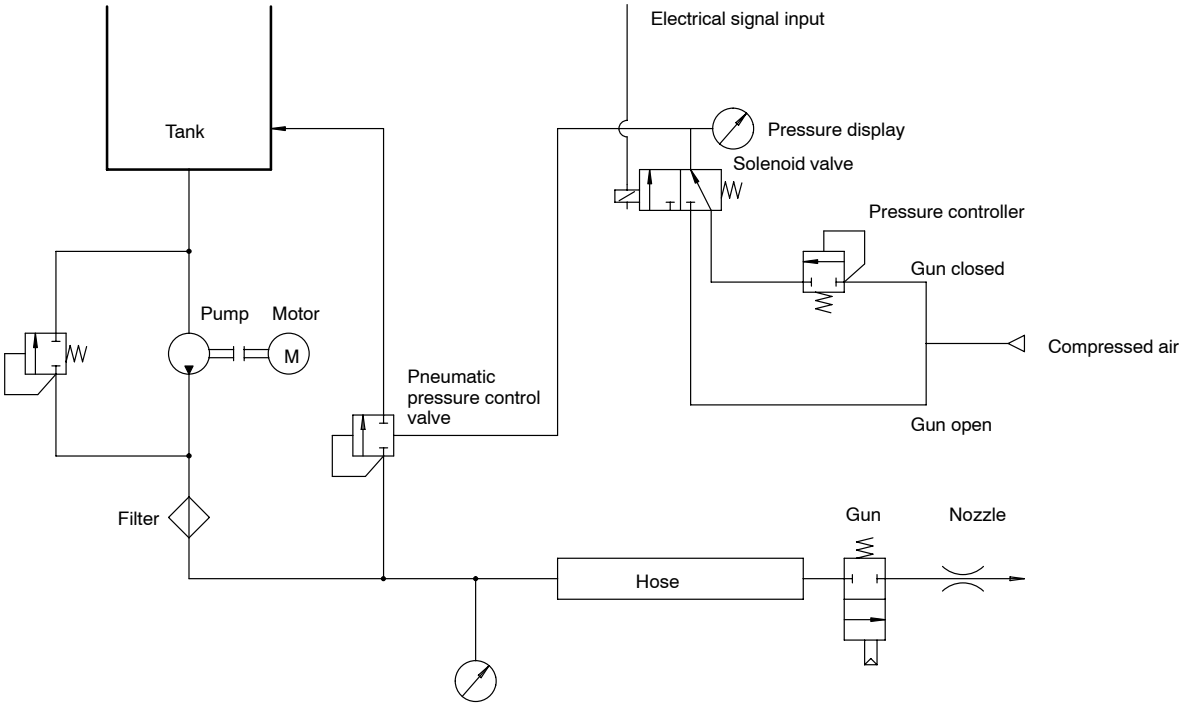


Fig. 3-24 Option *Bypass control* (1 pump)

Inert Gas

WARNING: Observe safety instruction regarding handling technical gas in cylinders. The inert gas inlet pressure may not exceed 5.5 bar (550 kPa / 79.75 psi).

CAUTION: Use only suitable inert gas. Information can be obtained from the Material Safety Data Sheet or the manufacturer of the material in the tank.

The arrow points to the handwheel of the pressure controller.

Recommended setting: 0.3 bar / 30 kPa / 4.35 psi

1: Pressure display *Inert gas*
2: Safety valve for pneumatics
3: Connection *Inert gas*

The safety valve for pneumatics limits the inert gas inlet pressure to 2 bar (200 kPa / 29 psi).

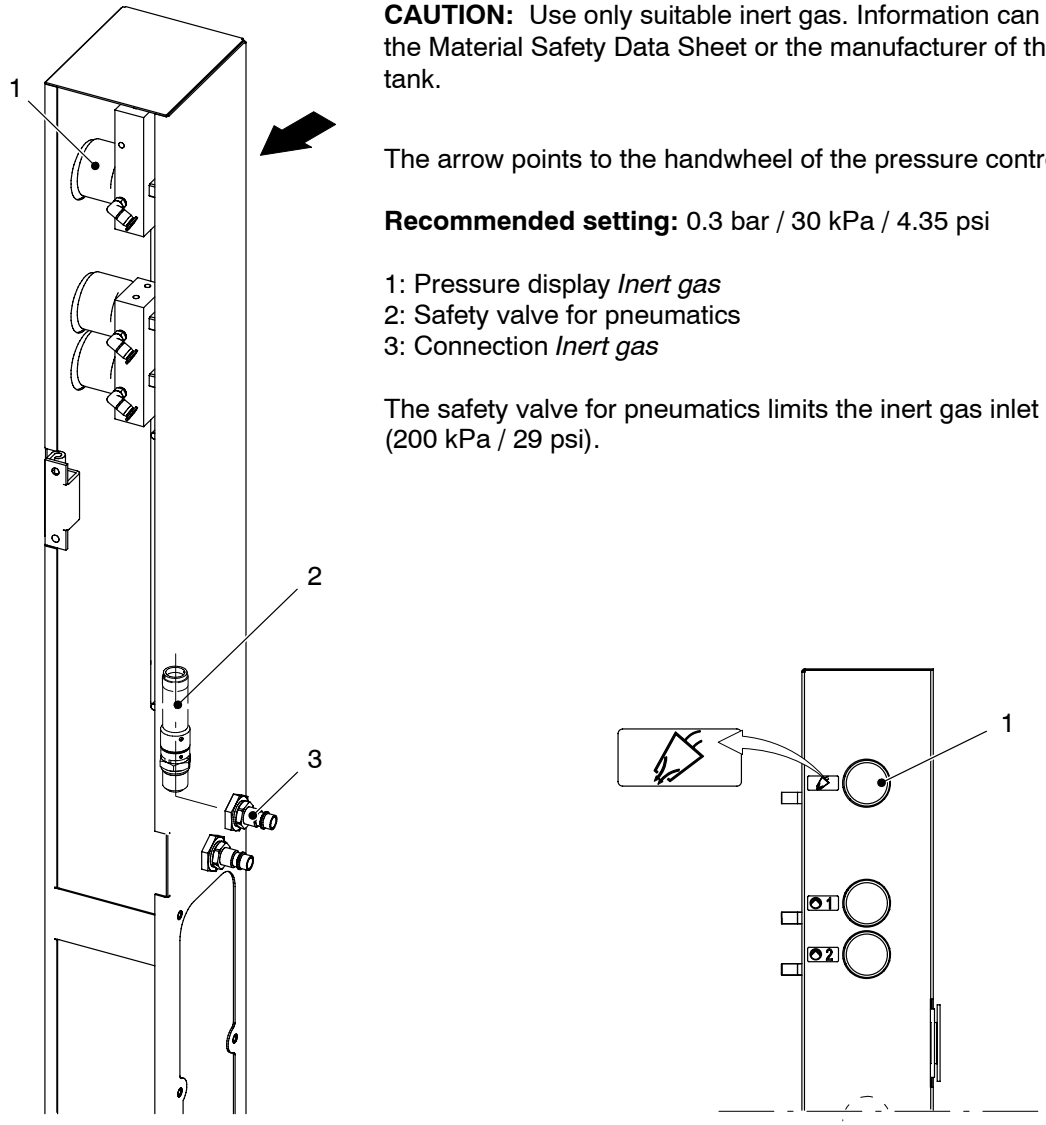


Fig. 3-25 Tower and inert gas labels

Light Tower

Installing Kit (Accessory)

WARNING: Disconnect the unit from the line voltage.

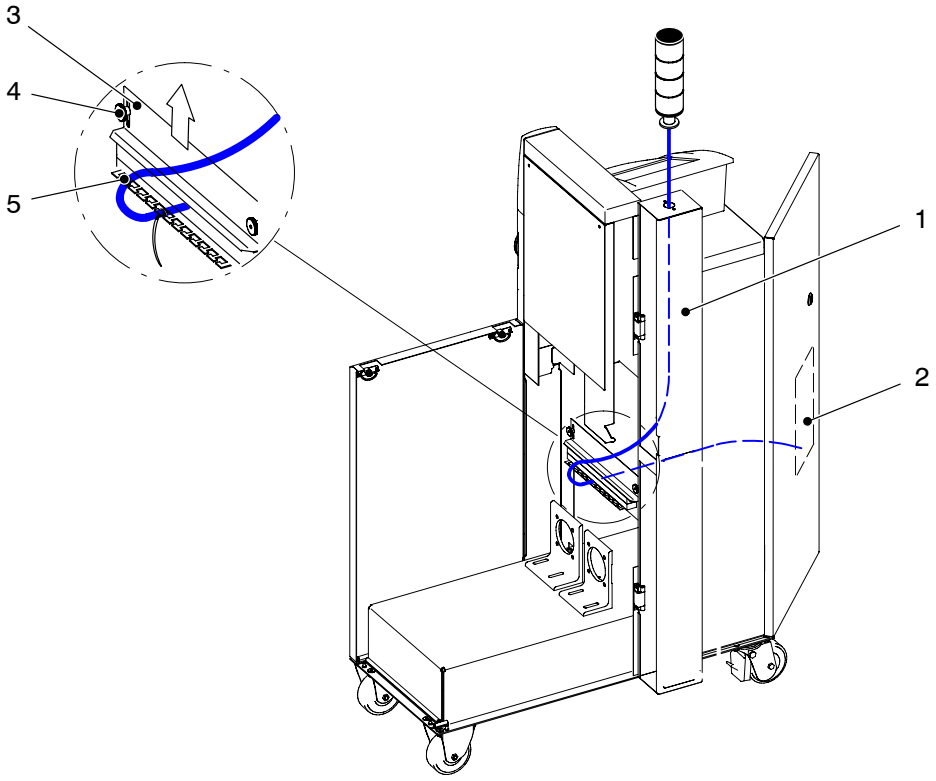


Fig. 3-26

1. Break out the plate from the top of the melter tower (1) along the punched lines and remove.
2. Swivel melter tower open.
3. Guide cable through the resulting hole.
4. Use the two screws M5 to fasten the light tower.
5. Guide the cable through the top opening of the melter tower and to the inside wall (tank side) of the electrical cabinet.
6. Release knurled nut (4) from the bracket *Cable duct* (3). Slide bracket up in the slot.
7. Guide the cable through the resulting hole and then through the cable ducts to the I/O board (2) in the electrical cabinet door.

Light Tower *(contd.)*

Installing Kit (Accessory) (contd.)

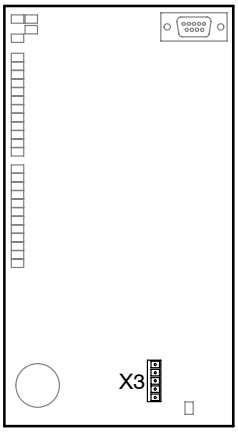


Fig. 3-27

8. Insert the light tower plug into X3 of the I/O board #1 (Refer to Fig. 3-27).
9. Use a cable tie to fasten the cable to one of the metal teeth (5) below the bracket *Cable duct*.
10. Slide the bracket down and tighten knurled nut.
11. To activate the light tower, the new software configuration code must be entered. Box 17 code: W.

    Refer to section *Operation*, Key *Melter configuration* (V26 in the *Control Panel Overview*).

Casters

Installing Kit (Accessory)

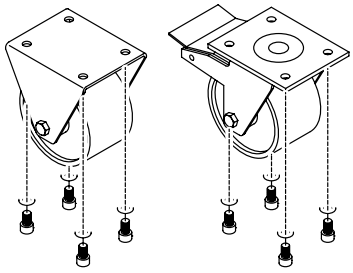


Fig. 3-28

The kit consists of a pair of casters with brakes and a pair without brakes.

NOTE: Attach the casters with brakes (Fig. 3-28, right) to the side of the electrical cabinet.

1. Lift the melter with a suitable floor conveyor (lift truck or fork lift).
2. Detach machine feet.

NOTE: The back plug plate must be removed before the back left machine foot can be detached.

3. Attach casters. Use the fastening holes for the machine feet to attach the wheels.

Retrofitting a Temperature Control Board

For information on the switch settings required on the temperature control board, refer to section *Repair, Replacing Boards.*

IPC Webserver

Refer to the section *Operation, Operation via the IPC Webserver* for information on the connecting cable to be used.

Removing Melter

Run the melter until empty, separate all connections from the melter, and allow the melter to cool down.

Disposing of Melter

When your Nordson product has exhausted its purpose, dispose of it properly according to local regulations.

CAUTION: The fluorescent light for the control panel background lighting contains mercury.

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.

General Information

The control panel is a touch screen.

The melter can also be operated via the Webserver. The user interface is the same as the control panel. Refer to *Operation via the IPC Webserver* at the end of this section.

Transparent Keys

If a feature – e.g. pressure control – is available according to the melter configuration but contradicts the feature currently selected on the control panel (e.g. speed control), all of the keys relevant for pressure control will appear transparent.

Keys with and without Indication Lamp

Control mode

The indication lamp indicates the status (lit = switched on). In this case: Heaters are switched on.

The label indicates the status. In this case: The temperature channel is in control mode.

Meaning of Colors

Red:	Fault
Yellow:	Display of e.g. status, actual values. Also a warning in status line
Green:	Adjustable values: Input of e.g. setpoints/text or switched on
Gray:	Selection (with keys) is possible

Description of Symbols

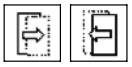
The following symbols appear on several screens and indicate

 Call up a help text

 General information

 Detailed information

 Return to previous level. Cancel and close when in input windows

 To next/previous screen

 Confirmation, acceptance of a value

 Backspace, delete

 Page up/down

 Increase/decrease value

 Setup

Standard Symbols of Temperature Channels

 Grid (low melt)

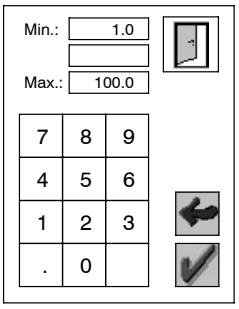
 Reservoir (high melt)

 Hose

 Gun

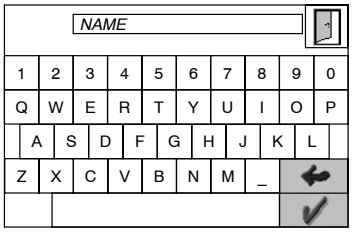
 Air heater

Input Window



When a field for entering a numerical value is touched, this input window with the limits *Min.* and *Max.* appears.

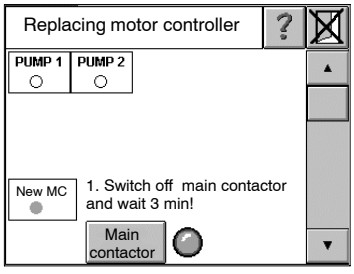
Fig. 4-1



When a field for entering a name is touched, this input window appears.

Fig. 4-2

Screen Motor Controller Replacement

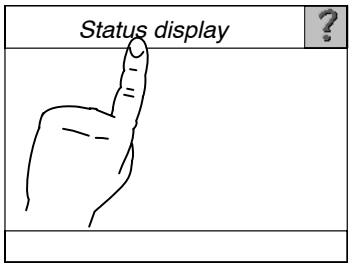


This screen appears automatically when more than one motor controller has been replaced. It is not protected by password.

For information on how to proceed, refer to the section *Repair, On the Control Panel: Allocating Replaced Motor Controllers (MC) to their Motors*.

Fig. 4-3

Status Display



Another screen is called up by touching the line *Status display*. The contents of the screen is a factor of the displayed status:

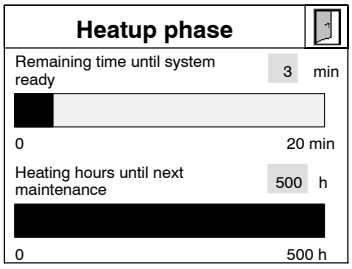
- Heatup phase
- System ready
- Startup protection
- Standby
- Heaters off, motor running or pressure build-up completed.

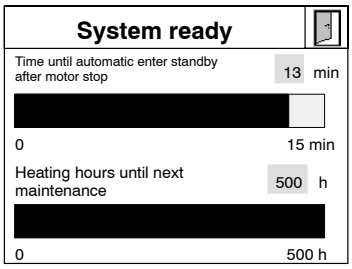
By status

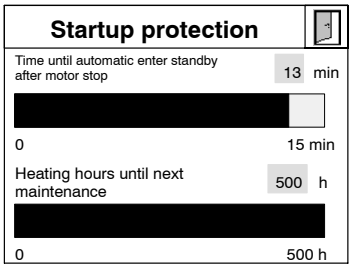
- Warning
- Fault
- Shutdown

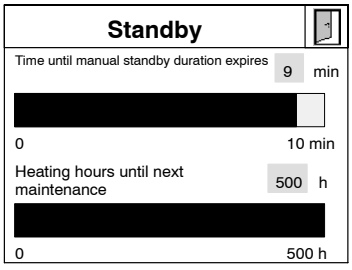
the system moves directly to the screen *Alarm log* (Refer to Fig. 4-29).

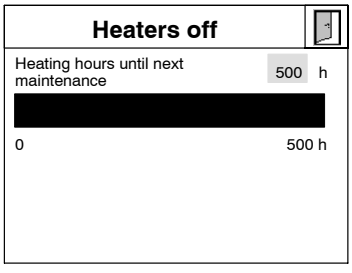
NOTE: This will not work if the screen saver is active (Refer to Fig. 4-15).











Initial Startup

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

Purging Melter

The melter was subjected to extensive testing prior to shipment. In doing so, the tank was filled with a special test material. Material residue may still be present in the melter. To remove the residue, melt and feed several kilograms of material before starting production.

CAUTION: Do not operate Nordson gear pumps without material. Before switching on the motor, ensure that the tank is filled.

1. Fill the tank (Refer to *Filling Tank*).
2. Set the main switch to I/ON. The melter begins to heat up.


Position I/ON = Melter switched on.


Position 0/OFF = Melter switched off.

Padlocks can be used to protect the main switch from being turned on by unauthorized personnel.

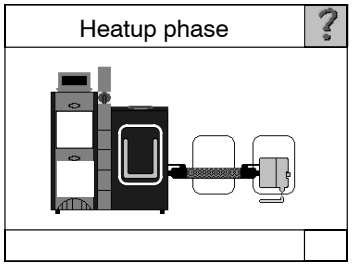


Fig. 4-4 Starting screen

3. Wait until the starting screen appears on the control panel.

NOTE: When the very first startup occurs, password protection is not active (default).

Initial Startup *(contd.)*

Set on Control Panel

- Basic settings

  Change language, if necessary (English is the default)

 Tap repeatedly until the starting screen reappears.

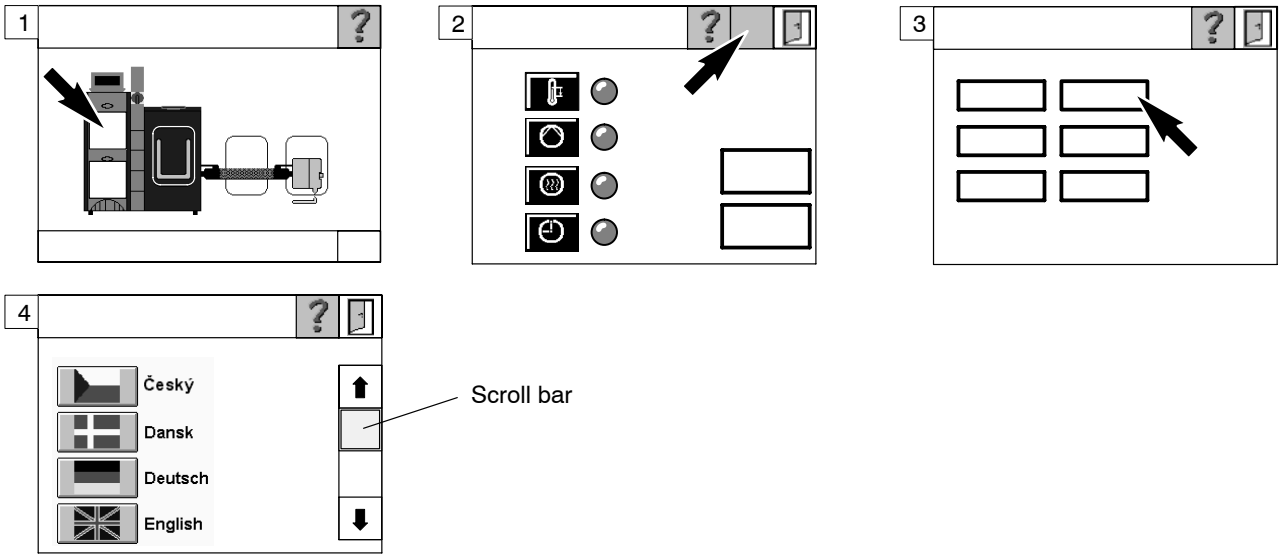


Fig. 4-5 Selecting language

- Temperature setpoints (= processing temperatures)

  Refer to *Control Panel – Overview – / T1*

- Undertemperatures / overtemperatures

  Refer to *Control Panel – Overview – / T2*

- Activate/deactivate channels
- Re-name temperature channels if necessary.

  Refer to *Control Panel – Overview – / T3*

NOTE: Texts that the customer can change are not translated into the selected local language.

- Pump speed(s) in manual mode

NOTE: To prevent excessive wear, the motor/pump speed should not continuously fall below 5 min^{-1} (rpm) or continuously exceed 80 min^{-1} (rpm).

Refer to *Control Panel – Overview – / M1*

- If the melter is to be operated via the interface *Standard I/O*, change the motor enable from *Control panel* to *Control panel AND standard I/O*.

  Refer to *Control Panel – Overview – / M2.1*

Standard I/O: Observe for edge-controlled signals (example)

If standby is switched on via the interface (rising edge), it can be switched off with the seven-day clock or by the operator on the control panel (*Who-touched-me-last*).

If standby is then to be switched on again via the interface, it must first be switched off (falling edge) then on again via the interface.

- Key-to-line – settings

  Refer to *Control Panel – Overview – / M1* to *M3*

- Select temperature unit, ˚C (default) or ˚F

  Select pressure unit: bar (default), psi or kPa

  Refer to *Control Panel – Overview – / V15*

- Set service interval.

  The service tasks that are to be indicated as well as the intervals must be stipulated. For recommended intervals refer to section *Maintenance*. The intervals may need to be adapted to the operating conditions.

  Refer to *Control Panel – Overview – / V16*

- Additional parameters, depending on model of melter.

  For example: Optimize level evaluation (Refer to *Filling the Tank / Level)*

Initial Startup *(contd.)*

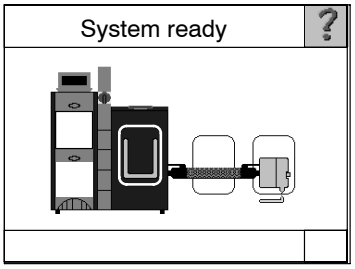


Fig. 4-6

4. Set seven-day clock.

   Refer to *Control Panel – Overview – / V8*

5. Assign passwords and select security level, if desired.

   Refer to Appendix A, *Password* and *Control Panel – Overview – / V18, V19*.

6. Wait until the system is ready for operation (Fig. 4-6).
7. Tighten the gland on pump(s) (Refer to section *Maintenance*).

8. Enable the motor(s) (Fig. 4-7).
9. Switch on the motor(s) (Fig. 4-7).

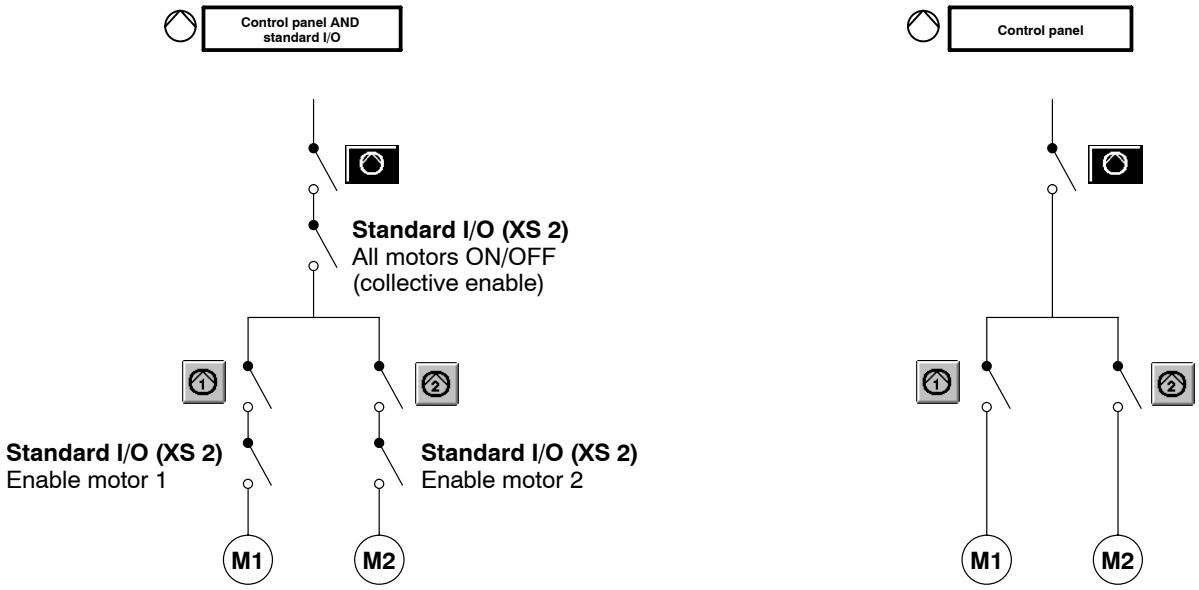


Fig. 4-7 Conditions for *Motor running* with and without interface *Standard I/O*

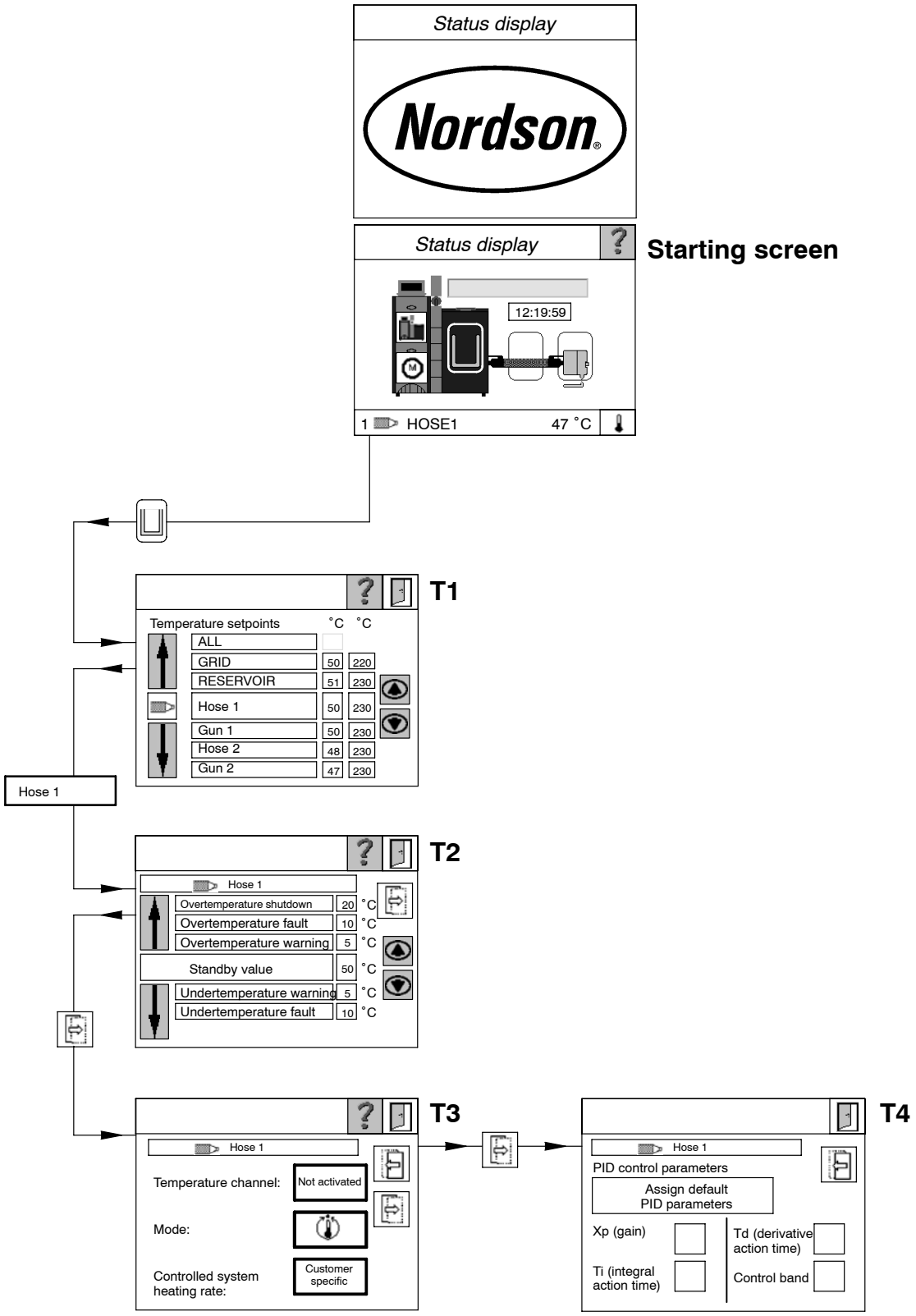
CAUTION: Heating and cooling that occurs during daily operation can cause screwed parts to loosen, resulting in leakage.

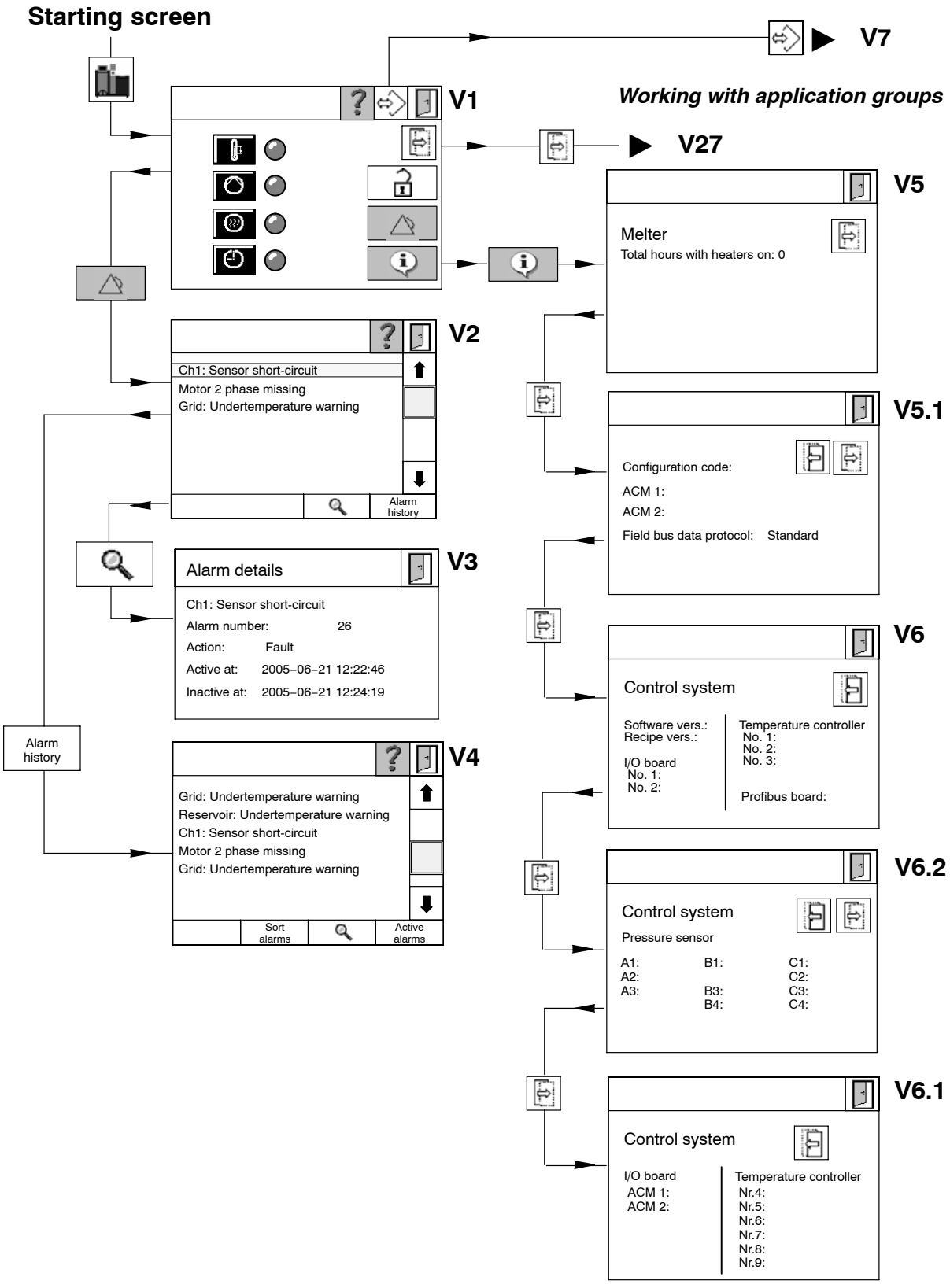
10. On the first day, while the material is still soft (approx. 70 °C/158 °F, depending on the material), tighten the following:

- Safety valve
- Pressure sensors (when applicable)
- Plugs
- Hose connections

Then check at regular intervals and repeat as required. Refer to section *Maintenance*.

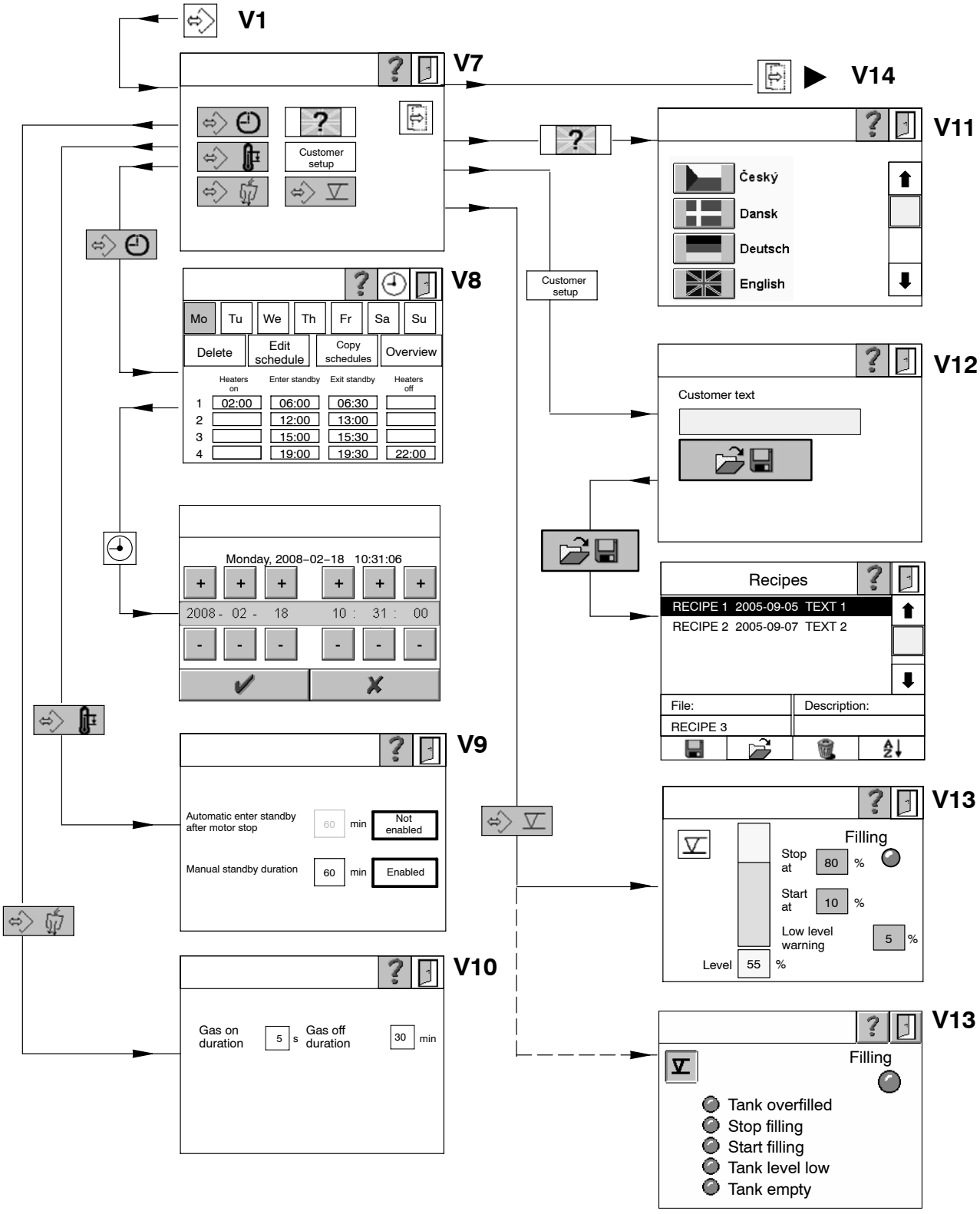
Control Panel – Overview –



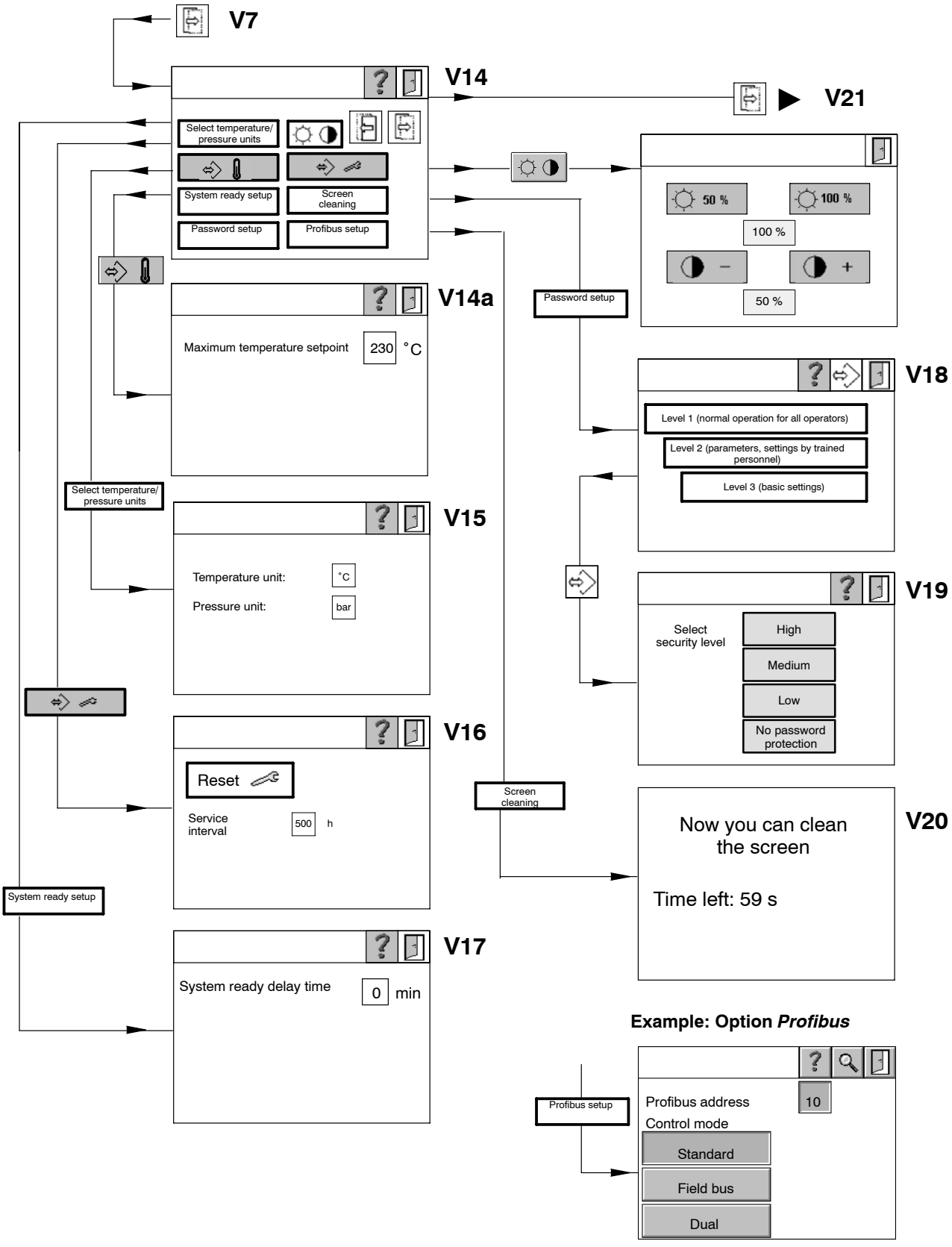

Starting screen
V7
V1
Working with application groups
V27
V5
Melter
Total hours with heaters on: 0
V2
Ch1: Sensor short-circuit
Motor 2 phase missing
Grid: Undertemperature warning
Alarm history
V5.1
Configuration code:
ACM 1:
ACM 2:
Field bus data protocol: Standard
V3
Alarm details
Ch1: Sensor short-circuit
Alarm number: 26
Action: Fault
Active at: 2005–06–21 12:22:46
Inactive at: 2005–06–21 12:24:19
V6
Control system
Software vers.:
Recipe vers.:
I/O board
No. 1:
No. 2:
Temperature controller
No. 1:
No. 2:
No. 3:
Profibus board:
Alarm history
V4
Grid: Undertemperature warning
Reservoir: Undertemperature warning
Ch1: Sensor short-circuit
Motor 2 phase missing
Grid: Undertemperature warning
Sort alarms
Active alarms
V6.2
Control system
Pressure sensor
A1: B1: C1:
A2: C2:
A3: B3: C3:
B4: C4:
V6.1
Control system
I/O board
ACM 1:
ACM 2:
Temperature controller
Nr.4:
Nr.5:
Nr.6:
Nr.7:
Nr.8:
Nr.9:

Control Panel – Overview – *(contd.)*

Melter – Configuration – Screen 1

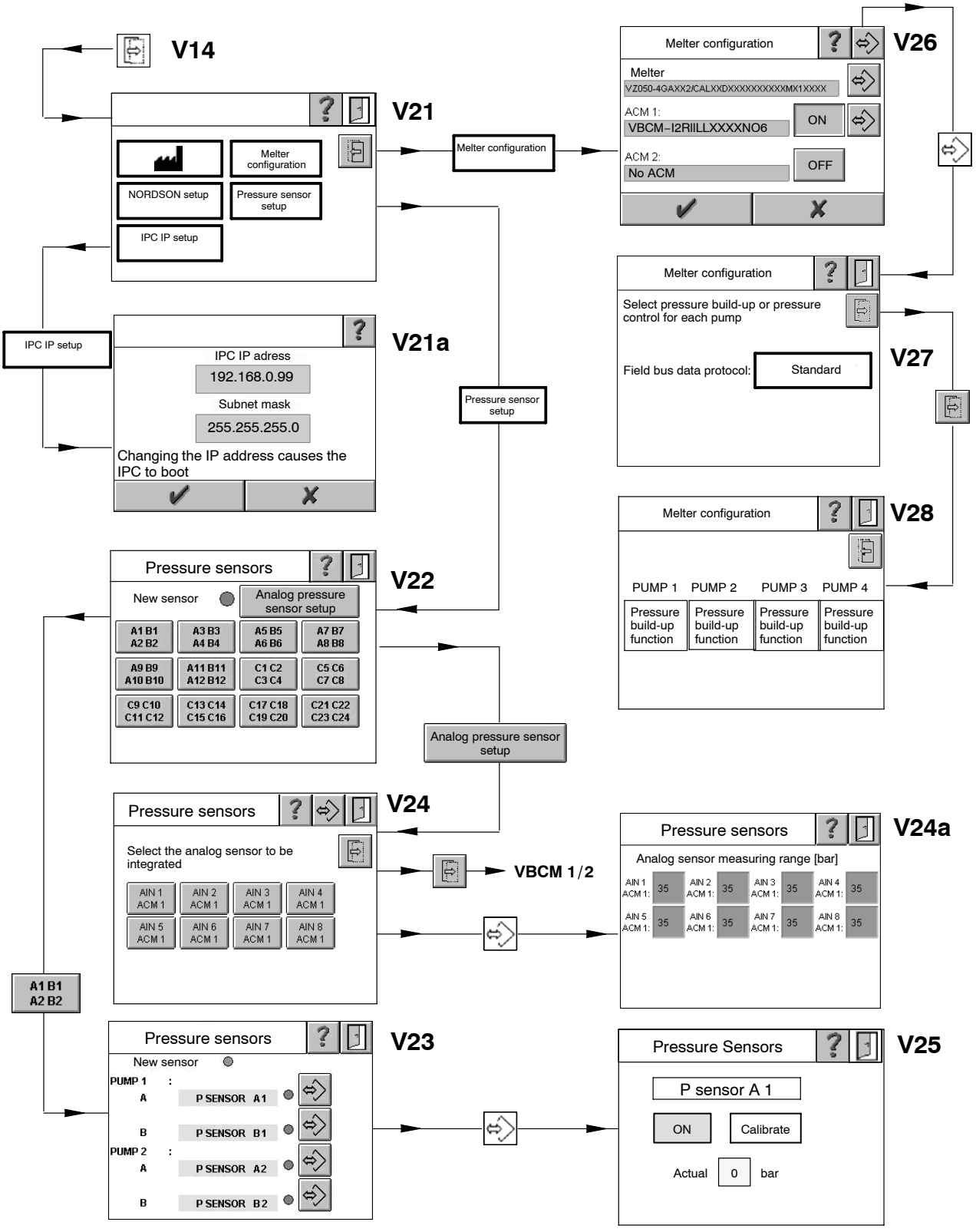


Melter – Configuration – Screen 2

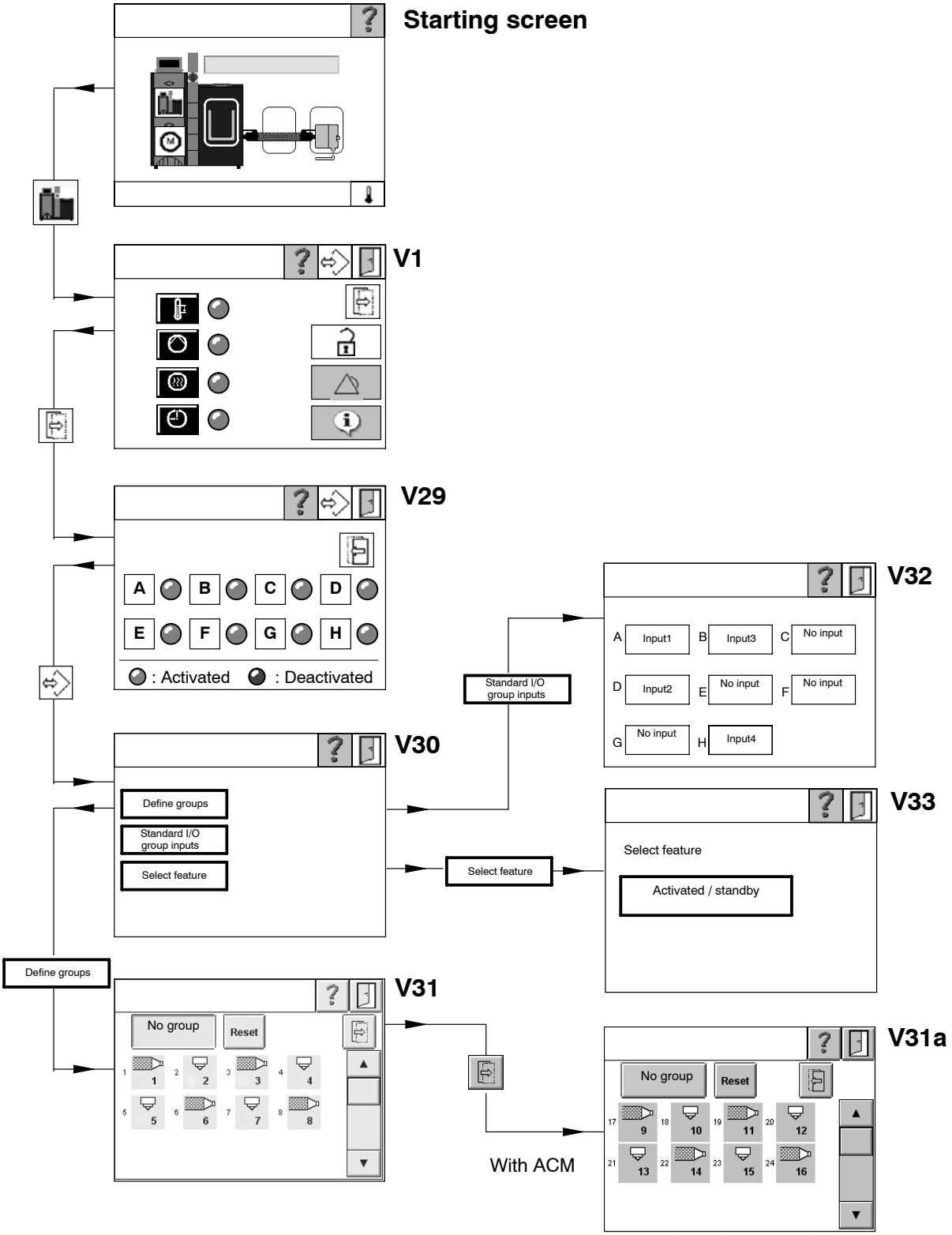


Control Panel – Overview – *(contd.)*

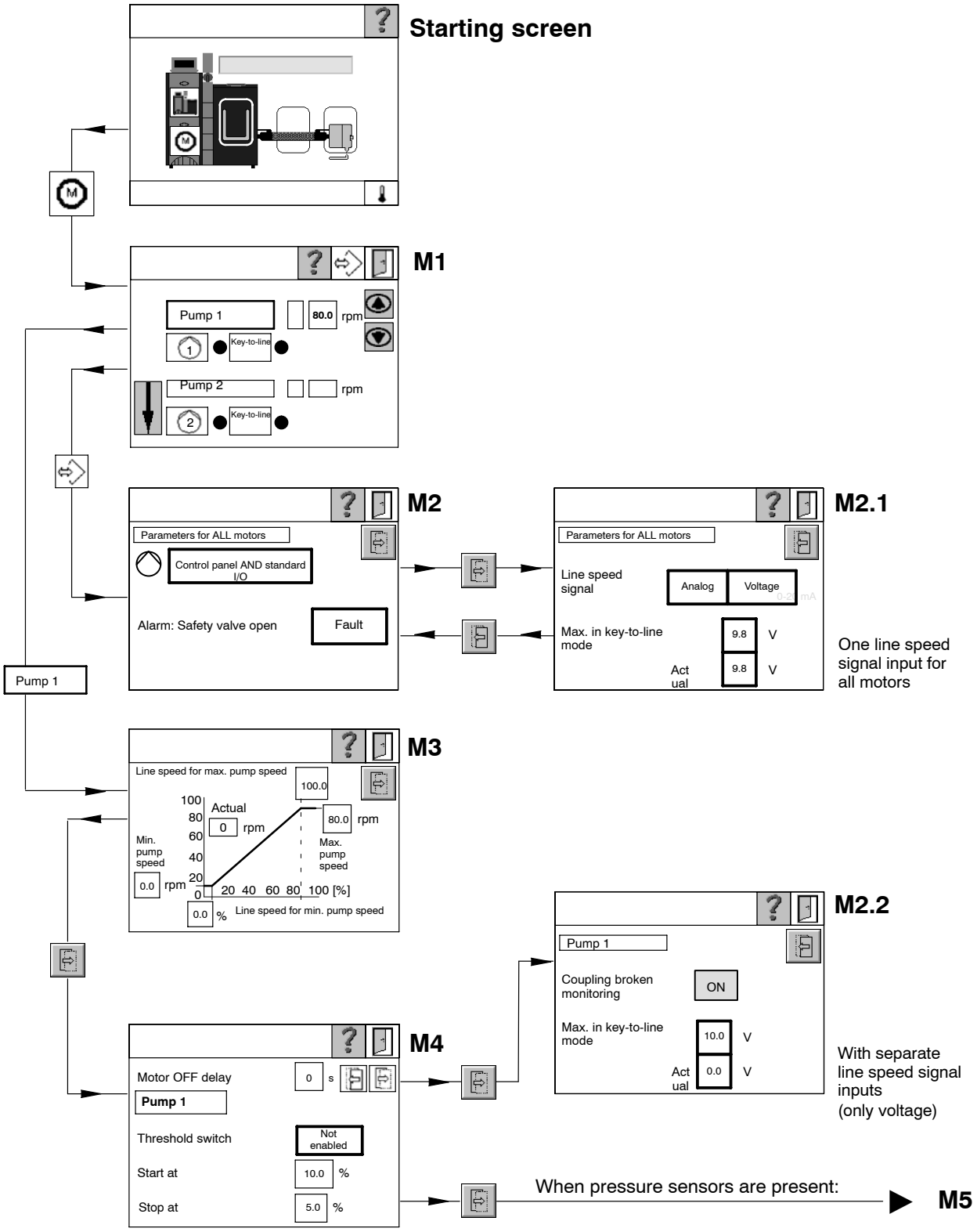
Melter – Configuration – Screen 3

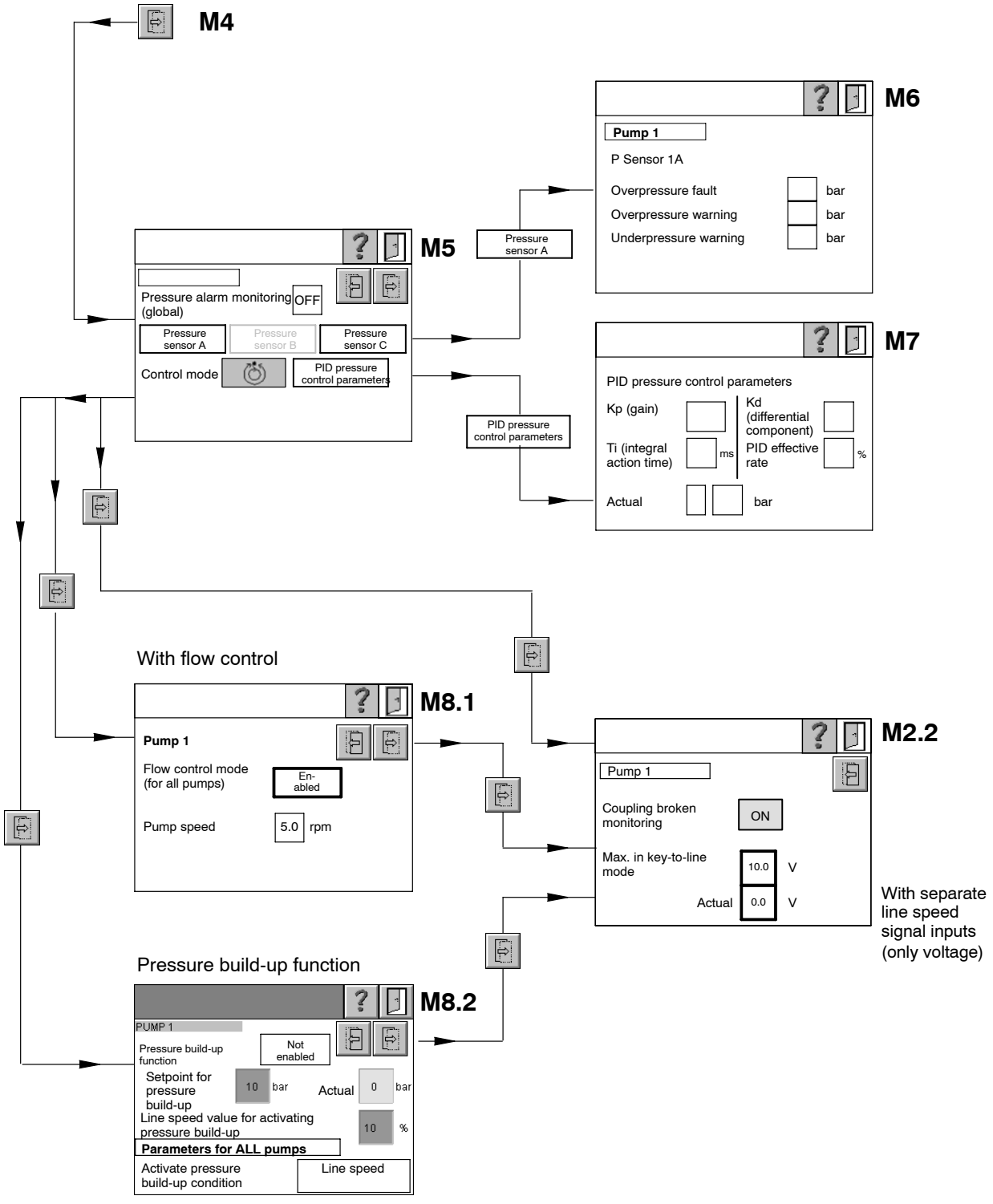


Working with Application Groups



Control Panel – Overview – (contd.)




M4
M6
Pump 1
P Sensor 1A
Overpressure fault
bar
Overpressure warning
bar
Underpressure warning
bar
M5
Pressure sensor A
Pressure alarm monitoring (global)
OFF
Pressure sensor A
Pressure sensor B
Pressure sensor C
Control mode
PID pressure control parameters
PID pressure control parameters
M7
PID pressure control parameters
Kp (gain)
Kd (differential component)
Ti (integral action time)
ms
PID effective rate
%
Actual
bar
With flow control
M8.1
Pump 1
Flow control mode (for all pumps)
En-abled
Pump speed
5.0
rpm
M2.2
Pump 1
Coupling broken monitoring
ON
Max. in key-to-line mode
10.0
V
Actual
0.0
V
With separate line speed signal inputs (only voltage)
Pressure build-up function
M8.2
PUMP 1
Pressure build-up function
Not enabled
Setpoint for pressure build-up
10
bar
Actual
0
bar
Line speed value for activating pressure build-up
10
%
Parameters for ALL pumps
Activate pressure build-up condition
Line speed

Filling the Tank

CAUTION: Cease operation before the tank is completely empty. If there is too little material in the tank, the material can overheat. Overheated material can char, collect on surfaces and cause malfunctioning.

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

Manually

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

CAUTION: Do not operate melter with open tank. When the tank is open, hot material vapors can escape; vapors may contain potentially hazardous substances.

CAUTION: Before filling the tank, ensure that the tank and material are clean and free of foreign substances. Foreign substances can hinder functioning or even cause damage to the melter or accessories.

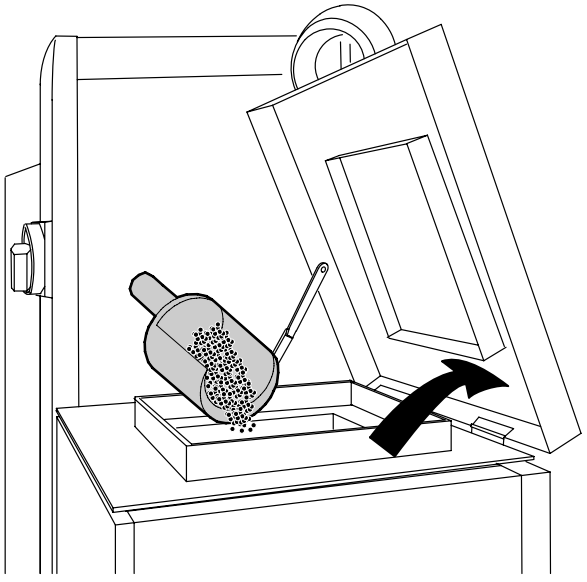


Fig. 4-8

Level Display and Control (Options)

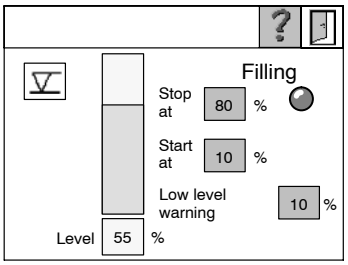


Fig. 4-9 V13

Perform calibration. Refer to section *Repair, Replacing Level Evaluator (Option), Calibration*.

As soon as the material is changed, the level parameters on the control panel must be adapted to the new material.

Automatic Tank Filling

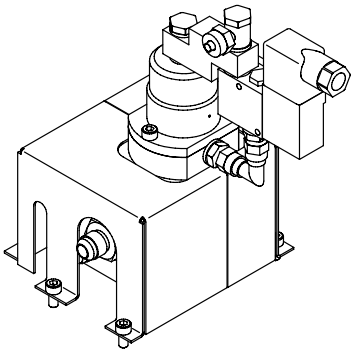


Fig. 4-10 Filling valve

Automatic tank filling is performed e.g. by a bulk melter connected to the optional filling valve with a hose. Level sensors in the tank start and stop the filling process.

Maximum Level

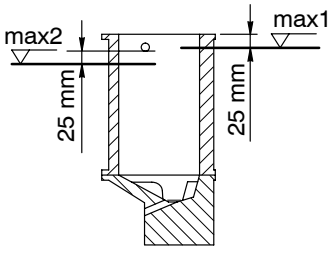


Fig. 4-11 Cross-section of tank

The level should not exceed 25 mm (1 in) under the rim of the tank (max1); for melters with inert gas equipment: 25 mm (1 in) under the inert gas inlet hole (max2).

Adapt the maximum level to the adhesive dispensing speed. Feed adhesives sensitive to temperature quickly to prevent loss of quality.

Recommended Temperature Setpoints

The temperature setting is determined, among other things, by the processing temperature prescribed by the material supplier.

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

Grid (low melt)	Up to 20 °C (36 °F) below prescribed processing temperature
Reservoir (high melt)	Prescribed processing temperature (Material quantity used <50 g/min: 0 to 10 °C (18 °F) below prescribed processing temperature
Undertemperature value (warning)	10 °C (18 °F) below set processing temperature Air heater: approx. 10 °C (18 °F) below set processing temperature
Undertemperature value (fault)	15 °C (27 °F) below set processing temperature Air heater: approx. 20 °C (36 °F) below set processing temperature
Overtemperature value (warning)	10 °C (18 °F) above set processing temperature Air heater: approx. 10 °C (18 °F) above set processing temperature
Overtemperature value (fault)	15 °C (27 °F) above set processing temperature Air heater: approx. 20 °C (36 °F) above set processing temperature
Filling valve (option)	Prescribed processing temperature*****
Gun (accessory)	Prescribed processing temperature(s)*****
Hose (accessory)	Prescribed processing temperature*****

*** CAUTION:** The maximum operating temperature of the installed gun and the other heated components should be considered when setting temperatures on the melter control panel.

Refer to *Control Panel – Overview – / T1* for information on input.

Heatup Guided by Reference Channel

NOTE: All activated channels in control mode are included in the heatup guided by reference channel, including those assigned to an activated application group.

After every switchon and after standby is exited, the melter returns to *Heatup phase* (status display).

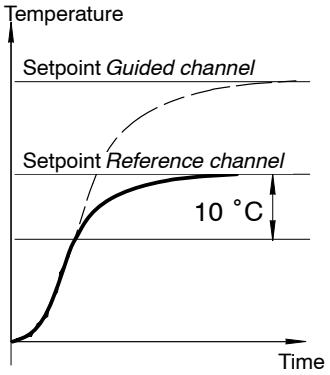


Fig. 4-12

Heatup guided by reference channel prevents individual temperature channels from reaching their setpoint temperature long before the slowest temperature channel (reservoir/high melt = reference channel). It prevents hot melt material from charring in hoses / guns and the build-up of material expansion pressure during heatup. It also helps to save energy.

The actual reservoir temperature serves as the current temperature setpoint for the guided channels until the reservoir has reached a temperature of 10 ˚C (18 ˚F) below its setpoint temperature. Then heatup guided by reference channel ends automatically. This way all channels reach their setpoint temperatures more or less at the same time.

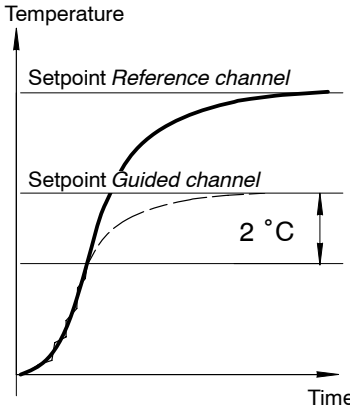


Fig. 4-13

When the current temperature setpoint of a guided channel (= current value of reservoir/high melt) reaches the guided channel's own setpoint minus 2 ˚C (3.6 ˚F), it is excluded from heatup guided by reference channel and then heats to its own setpoint independently (Refer to Fig. 4-13).

Undertemperature Interlock

The undertemperature interlock prevents the melter motors from being switched on as long as the material is too cold and thus too thick. This could damage the pumps.

The undertemperature interlock is active during every *Heatup phase* (status display) and after every standby. Also refer to section *Troubleshooting, Undertemperature Fault Triggered.* If the system ready delay time is activated, this time must also have expired before the interlock is disabled.

Motor Startup Protection

The motor startup protection prevents the motors from starting up on their own after heatup or after a fault. The melter goes to startup protection if the condition for *Motor running*: *All motors ON* **AND** *Enable motor* is fulfilled.

When the system is ready again (status display), the motors can be switched on again via the control panel or the interface *Standard I/O*.

Acknowledge Startup Protection

On the Control Panel

Press the key *Switch on/off all motors (collective enable)*; startup protection is acknowledged and all enabled motors run again.

Via Interface Standard I/O

Switch *All motors ON/OFF* from OFF to ON. All enabled motors run again.

Via Field Bus

Set *Switch ON/OFF All Motors (Collective Enable)* (Rising edge; refer to *Melter control*: If bit 1 = 0, then set to 1. If bit 1 = 1, set to 0 then back to 1). All enabled motors are running again.

or

Switch off all motors with the keys *Switch motor on/off (individual enable)* on the control panel; the startup protection is acknowledged. If the key(s) is/are touched again: The respective motor starts up again:

The same applies to acknowledgement via standard I/O or field bus with the signal *Enable motor* for the individual motor.

Daily Startup

NOTE: The following steps can be performed completely only with a level 1 password.

Entering Password

The key that triggered the password input prompt must be touched again after the correct password has been entered. The level that corresponds to the password entered is enabled for 10 minutes.

1. Set the main switch to I/ON. The melter begins to heat up.

   EXCEPTION: If the seven-day clock is enabled and the melter is switched on, heatup does not begin automatically.

CAUTION: Do not operate Nordson gear pumps without material. Before switching on the motor, ensure that the tank is filled.

2. Fill the tank if necessary.
3. Wait until the system is ready for operation (green status display *System ready*.
4. Enable the motor(s) (password level 1). Refer to Fig. 4-28.
5. If desired, switch immediately to password-protected mode. Press  *Activate password protection*.

   (Refer to *Control Panel – Overview – / V1*)

NOTE: To prevent excessive wear, the motor/pump speed should not continuously fall below 5 min^{-1} (rpm) or continuously exceed 80 min^{-1} (rpm).

6. Switch on the motor(s). Refer to Fig. 4-28.

Daily Switchoff

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

Switching Off in an Emergency

WARNING: Switch off the melter immediately in any emergency situation.

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

Control Panel of the Industrial PC (IPC)

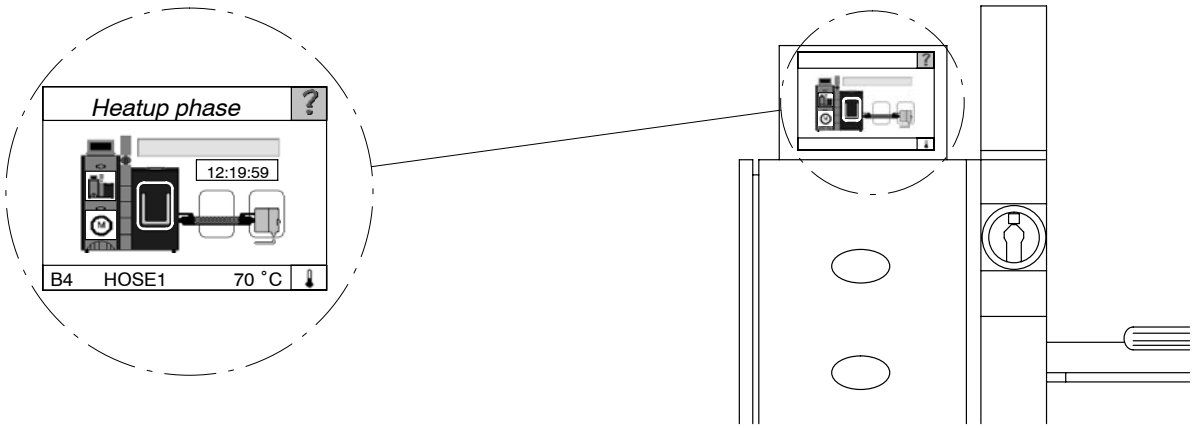


Fig. 4-14

Melter Modes - Overview -

⇒ Control mode *Standard* or *Field bus* or *Dual*

- ⇒ Speed control
  - Manual mode
  - Key-to-line
- ⇒ Pressure control
  - Manual mode
  - Key-to-line

Screen Saver

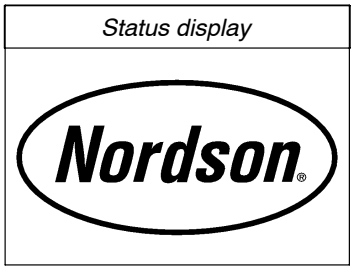


Fig. 4-15

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

To deactivate the screen saver, touch the screen and exit with the door symbol.

Starting Screen

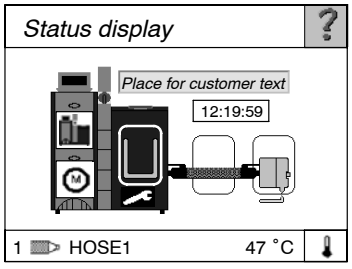


Fig. 4-16

Place for customer text: Can be determined by the customer, e.g. adhesive type used in the production line. Refer to *Control Panel – Overview – / V12* for information on entering text.

Service symbol: A wrench lights up. Refer to *Control Panel – Overview – / V16*.

The scan line can show:

- The actual values of the activated temperature channels
- The motor speeds and the pressures of sensors assigned to a motor
- The pressures of sensors C.

Additional screens are called up by pressing these symbols:

- Move to the screen in which the setpoints can be entered for all temperature channels.
- Hoses, the group ALL HOSES and the group ALL, which contains hoses, are displayed.
- Guns, the group ALL GUNS and the group ALL, which contains guns, are displayed.
- Move to melter screens
- Move to motor screens

Temperature Parameters

VORSICHT: Consider the maximum operating temperature of the installed gun and the other heated system components when setting temperatures.

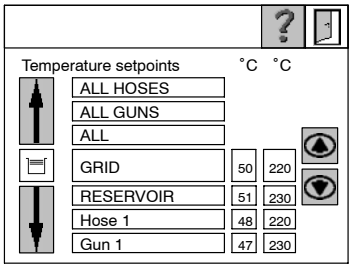


Fig. 4-17 T1

Left temperature column (yellow): Actual values

Right temperature column (green): Setpoints

Display	Meaning
Only setpoints	Channel is deactivated
Only actual values	Channel is activated and in display mode
Setpoints and actual values	Channel is activated and in control mode

ALL: All temperature channels receive the same setpoint.

ALL HOSES / **ALL GUNS:** All temperature channels in the respective group receive the same setpoint.

Fig. 4-18 Keyboard symbol

NOTE: If all of the temperature channels or all temperature channels of a group do not have the same setpoint, a keyboard symbol is visible instead of a setpoint. Touch symbol and set temperature with the input window.

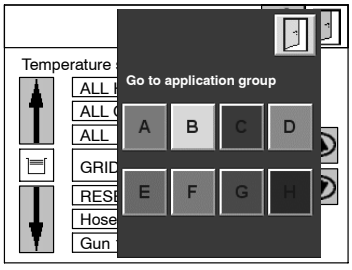


Fig. 4-19

Touch the *Channel symbol/number key.* A window opens; from here the first temperature channel of the selected application group can be accessed.

Grid and reservoir: 175 ˚C (347 ˚F)

Hose 1 / Gun 1: **Deactivated**
or 175 ˚C (347 ˚F) when activated

All other channels: **Deactivated**
or 40 ˚C (104 ˚F) when activated

Temperature Parameters *(contd.)*

Changing Temperature

Example: Increase the temperature of a hose from 220 ˚C to 230 ˚C.

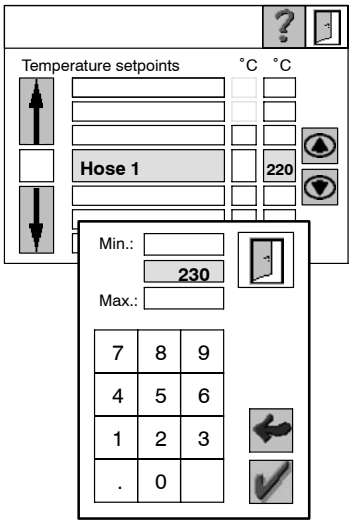


Fig. 4-20

1. Touch to select *Hose 1*.
2. Touch ten times / hold down

OR

3. Touch the green field *220 ˚C* in the right temperature column.
4. Enter 230 in the input window and confirm with .

Hose 1

To set the parameters, select the temperature channel (in this case: Hose 1) and touch the green field *Hose 1*. Refer to *Control Panel – Overview – / T2* to proceed.

For information on changing a name to your local language (e.g. Hose 1 to XYZ 1), refer to *Control Panel – Overview – / T3*.

Screen 1: Alarm Values

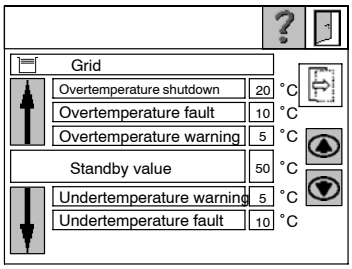


Fig. 4-21 T2

NOTE: The temperatures in this screen are differential values.

Standby temperature =	Setpoint temperature – **Standby value**

NOTE: The minimum standby temperature is 40 °C (100 °F), even if the selected settings would (mathematically) permit the standby temperature to be lower.

Standby value: **50 °C** (90 °F)

NOTE: The values***** are not a factor of the setpoint during the heatup and cooling phases (refer to *Monitoring of Heatup and Cooling*).

When the ALL, ALL HOSES and ALL GUNS groups are used, the values for warning and fault are always assumed together, even if only one of the values has been changed. This ensures that the fault value is always larger than or equal to the value for the respective warning.

Warning *Overtemperature* =	Setpoint temperature + **Overtemperature warning delta***
Warning *Undertemperature* =	Setpoint temperature – **Undertemperature warning delta***

NOTE: The warning value is a factor of the fault value in that the values for the warning may not be larger than the corresponding values for the faults. When appropriate, first increase the fault value.

Overtemperature/undertemperature warning: **5 °C** (10 °F)

NOTE: The values for **Overtemperature/undertemperature warning** are differential values, not absolute temperatures.

Temperature Parameters *(contd.)*

Fault *Overtemperature* =	Setpoint temperature + **Overtemperature fault delta***
Fault *Undertemperature* =	Setpoint temperature – **Undertemperature fault delta***

Overtemperature/undertemperature fault: **10 ˚C** (18 ˚F)

NOTE: The values for **Overtemperature**/**undertemperature fault** are differential values, not absolute temperatures.

Overtemperature shutdown =	Setpoint temperature + **(Overtemperature fault delta + 10 ˚C)*** Setpoint temperature + **(Overtemperature fault delta + 20 ˚F)***

NOTE: The overtemperature shutdown is calculated and therefore can not be changed.

Example

Setpoint temperature = 170 ˚C (338 ˚F),
Overtemperature fault = 60 ˚C (108 ˚F)

This results in

Fault *Overtemperature* at 230 ˚C (446 ˚F)
Overtemperature shutdown at 240 ˚C (466 ˚F).

During operation the operator increases the setpoint to 190 ˚C (374 ˚F); the value *Overtemperature fault delta* is left unchanged. Mathematically, an overtemperature fault indication would then occur at 250 ˚C (482 ˚F). However, shutdown occurs at a fixed value of 245 ˚C (475 ˚F).

Graphic Presentation of Temperature Parameters

*****Refer to *Monitoring of Heatup and Cooling*

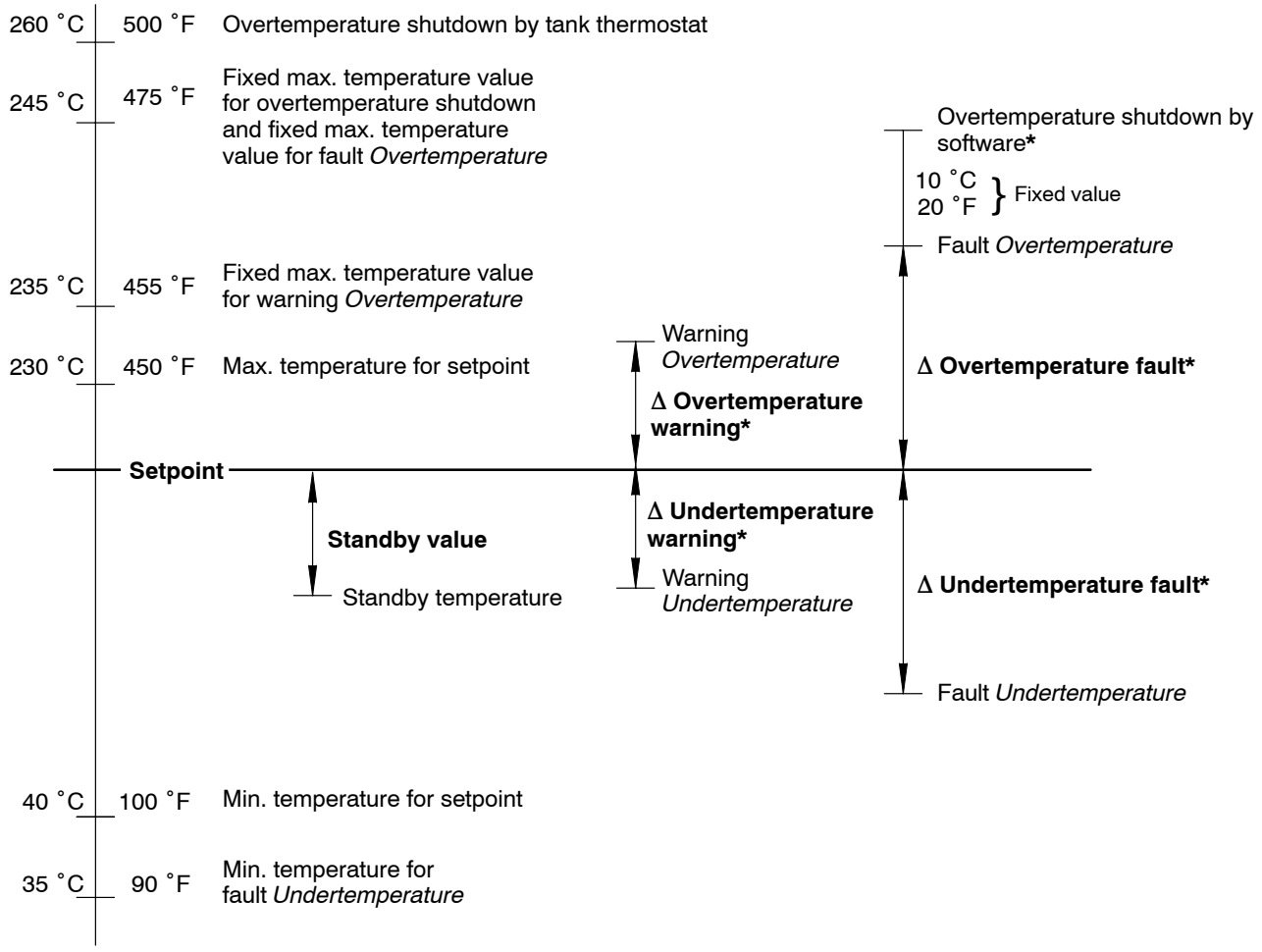


Fig. 4-22

Temperature Parameters *(contd.)*

Monitoring of Heatup and Cooling

The temperature alarm values are not a factor of the setpoint during the heatup and cooling phases of the individual temperature channels. They are based on a theoretical actual value.

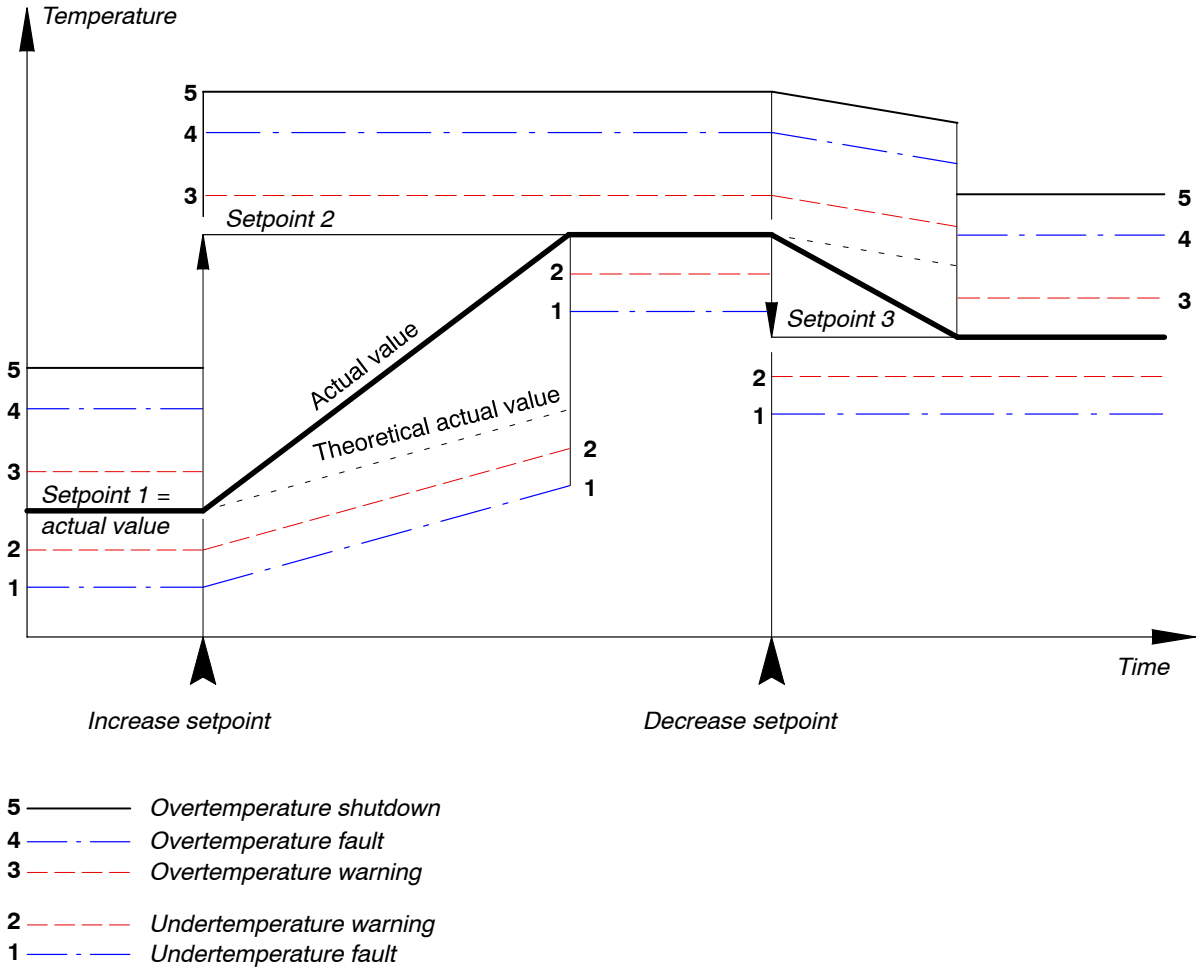


Fig. 4-23

Fig. 4-24 Alarm: If the actual value of a temperature is less by the undertemperature *Warning* ● than the theoretical value ○ that it should have at least reached after time X, an undertemperature warning is issued.

If the actual value of a temperature is less by the undertemperature *Fault* ● than the theoretical value ○ that it should have at least reached after time Y, an undertemperature fault is issued.

The same applies accordingly to the cooling phase.

This has the advantage that

- Changing setpoint
- Switching on cold application groups
- Connecting cold or heated temperature channels to hose receptacles

can occur during operation without triggering undertemperature or overtemperature shutdown, which would cause interruptions in production.

NOTE: This feature requires the temperature controller P/N 729450, which is included in all IPC software versions higher than 1.00.000.

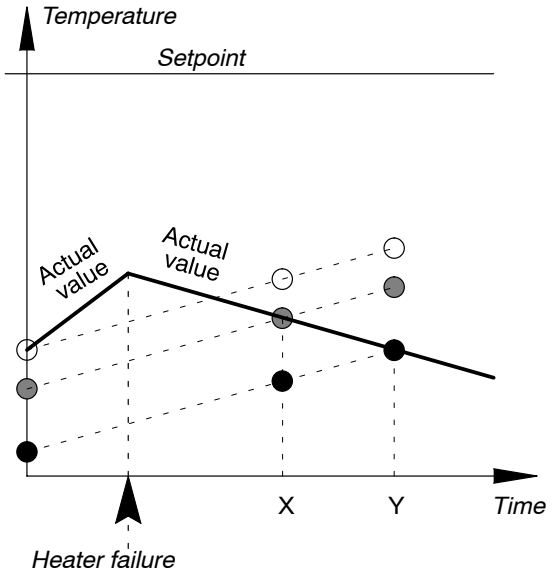


Fig. 4-24 Example of alarm during heatup phase

Temperature Parameters *(contd.)*

Screen 2: Activate Channel, Mode, Controlled System Heating Rate

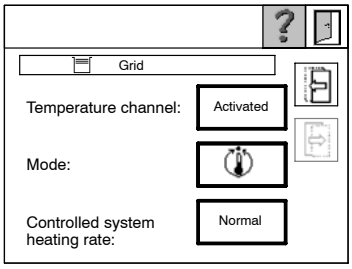


Fig. 4-25 T3

Temperature Channel: Select Deactivated / Activated

Deactivated

A deactivated channel is not heated. Temperature control and monitoring for faults do not take place. Exception: Overtemperature shutdown at fixed temperature of 245 ˚C (475 ˚F).

Activated

Normal state of a channel during operation. Activated channels can be switched to display or control mode.

NOTE: Temperature channels for reservoir and grid can not be deactivated.

Deactivated

Mode: Select Display mode or Control mode

Display Mode

In *Display mode* only the measured temperature is displayed. Temperature control and monitoring for faults do not take place. Exception: Overtemperature shutdown at fixed temperature of 245 ˚C (475 ˚F).

NOTE: Temperature channels for reservoir and grid as well as grouped channels can not be switched to display mode.

Control mode

The PID control algorithm is used for the selected controlled system heating rate, e.g. *Normal*, in control mode.

Control mode

Controlled System Heating Rate

NOTE: The setting *Normal* generally does not need to be changed. It can not be changed for grid and reservoir.

There are fixed parameter sets for the first four types.

Type	Suitable for
Slow*	Temperature channels that heat slowly
Normal	Grid, reservoir, hose, gun
Fast **	Temperature channels that heat quickly
Very fast	Air heater
Customer specific	Refer to *Screen 3: PID control parameters*.

***** To be set if heating the last 5 ˚C up to the setpoint takes too long (possible with a very high temperature setpoint)

****** To be set if the temperature swings above the setpoint during heatup (possible with a very low temperature setpoint)

Normal

Screen 3: PID Control Parameters

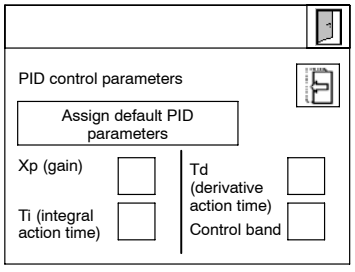


Fig. 4-26 T4

Prerequisite: Controlled System Heating Rate – Customer-specific

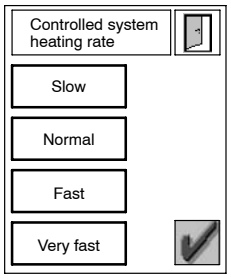
The PID control parameters can be selected as desired in this screen.

NOTE: Should be adjusted only by personnel with experience in metrology and control technology.

NOTE: The I-component can be deactivated with the value *0*.

The control band is the +/– range around the temperature setpoint. Above the band the heater is always off, and below the band the heater is always on.

Recommended control band: 5 ˚C (9˚F)



Assign default PID parameters For orientation purposes, the parameter set of one of the four controlled system heating rates can be loaded. Then individual values can be adjusted.

Melter

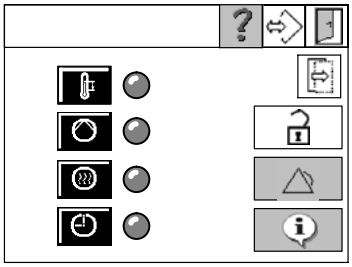


Fig. 4-27 V1

Entering/Exiting Standby

Refer to *Control Panel – Overview – / V9* for information on standby setup.

Switching On/Off All Motors (Collective Enable)

Also refer to *Initial Startup* and *Motor Startup Protection.*

Only enabled motors can be switched on. Prerequisite: The system is ready for operation.

Enabling

If there is no individual enable, the motors are enabled with the key *Switch all motors on/off (collective enable)* **AND** via the interface *Standard I/O* with the signal *All motors ON (collective enable)*.

Switching on

If there are individual enables, the motors are switched on with the key *Switch all motors on/off (collective enable)* **AND** via the interface *Standard I/O* with the signal *All motors ON (collective enable)*.

The indication lamp in the key can be different colors:

Gray (off):	No collective enable on control panel
Yellow:	Collective enable on control panel, but no motor running
Green:	Motor running.

Fig. 4-28 Motor(s): Enable on the motor screen – switch on on the melter screen

NOTE: The *Standard I/O* interface signals *All motors ON/OFF (collective enable)* and *Enable motor* can be disabled with a key. The motors can then only be enabled and switched on via the control panel (Refer to Fig. 4-87 *Motor enable*).

Switching On/Off Heaters

The heaters can be switched on via the control panel, the *Standard I/O* interface, the seven-day-clock or the field bus. The main switch must be set to I/ON.

The main contactor closes. The power supply to heaters and motors is switched on. The heatup phase begins.

NOTE: When the heaters have been switched off, the control unit continues to be supplied with voltage, so the heaters can be switched on at any time via the seven-day clock.

Switching On/Off Seven-day Clock

Refer to *Control Panel – Overview – / V8*

Activate Password Protection

The password protection (selected security level) is active immediately; if this key is not touched, it is activated after 10 minutes.

Refer to *Control Panel – Overview – / V19*.

NOTE: This key is visible only when a password has been entered.

Melter *(contd.)*

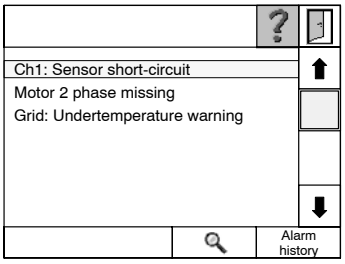


Fig. 4-29 V2

Alarm Log

Mark an alarm via the scroll bar or touch it to see the details of the alarm (using magnifying glass symbol).

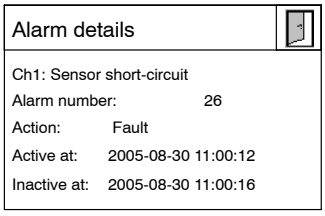


Fig. 4-30 V3

Alarm details

Active at and *Inactive at:* Date and time of alarm.

The date is shown in the following format: YYYY–MM–DD.
(Y: year; M: month; D: day)

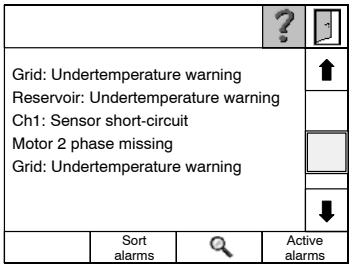


Fig. 4-31 V4

Alarm history

Alarm history

Up to 512 alarms are displayed.

Active alarms: Return to *Alarm log*.

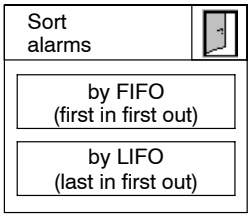


Fig. 4-32

Sort alarms

Sorting alarms

The alarms can be sorted first to last (FIFO) or last to first (LIFO).

The date is shown in the following format: YYYY–MM–DD.
(Y: year; M: month; D: day)

Information (Melter and Control System)

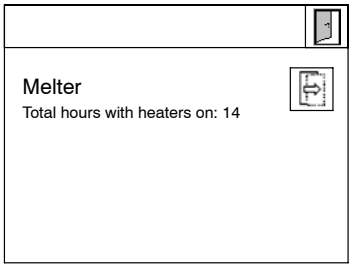


Fig. 4-33 V5

Total hours with heaters on: This value indicates the hours that the heaters were switched on.

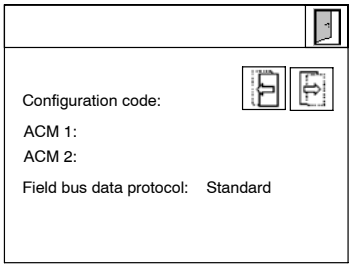


Fig. 4-34 V5.1

The software configuration code, the type of field bus data protocol, the firmware and software versions as well as the pressure sensor used are shown in the subsequent screens.

NOTE: The displayed code and the code on the ID plate should be the same. If the configuration code changes, e.g. after retrofitting, both of the old ID plates should be replaced to avoid any misunderstandings.

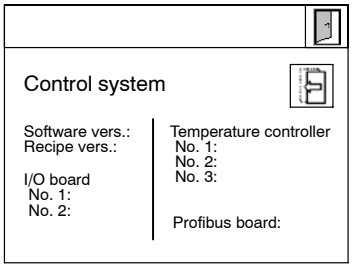


Fig. 4-35 V6

Software vers. Version of control panel software
X.YY.ZZZ (example: 1.00.000)

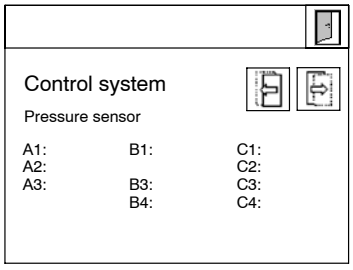


Fig. 4-36 V6.2

Pressure Sensors Used

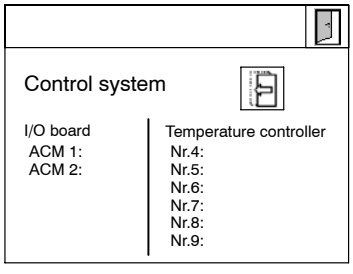


Fig. 4-37 V6.1

ACM Information

Melter *(contd.)*

Working with Application Groups

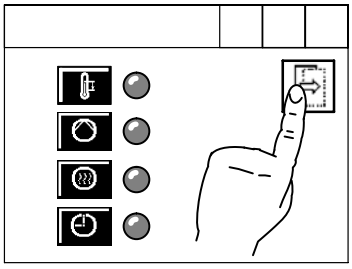


Fig. 4-38 V 1

If no application groups have been established yet, proceed in this order:

1. Define groups
2. Select standard I/O group inputs if groups are to be switched via the interface.
3. Select feature (*Deactivated* or *Standby*)
4. Switch application group(s).

Switch Application Group(s)

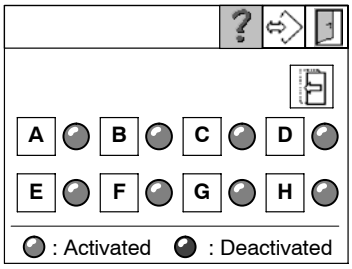


Fig. 4-39 V29

Temperature channels (except for grid and reservoir) can be combined to application groups A to H (Refer to *Defining Groups*).

The indication lamp shows whether the application group is activated (green) or whether the application group is deactivated or in standby (gray). Touch key to switch between *Activated* and *Deactivated* (or *Standby*).

The feature *Deactivated* or *Standby* can be selected in the setup screen. The selection is valid for all application groups.

Application Groups Setup

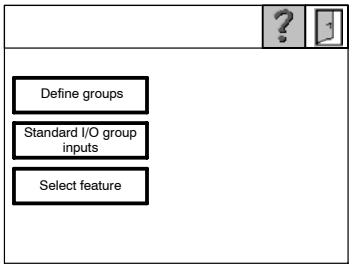


Fig. 4-40 V30

Defining Groups (with ACM)

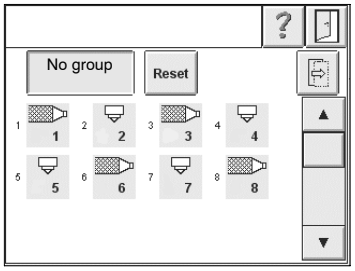


Fig. 4-41 V31

The first screen always indicates all of the temperature channels allocated to the melter. There are no more than 16 channels (hose/gun number 1 to 8); scroll if necessary.

The key *To next screen* appears if at least one of the two ACMs is available. Touch the key to move to the next screen. All of the temperature channels in the ACMs are shown here.

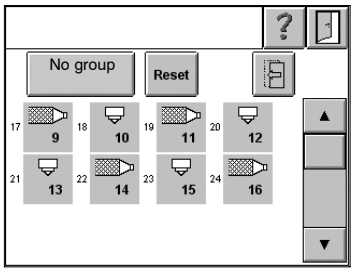


Fig. 4-42 V31a

There are max. 36 channels, beginning with hose/gun number 9 to 26.

NOTE: Because there are several ways to set up an ACM, there is no fixed assignment of channel to ACM. This information can be found in the wiring diagram delivered with the respective ACM. If necessary, compare the P/N on the ACM ID plate to the wiring diagram number.

All temperature channels (except for grid and reservoir) can be combined to application groups *Group A* to *Group H*. Channels not assigned to any group belong to *No group*.

The channels of *Group A*, then *Group B*, etc. up to the channels without group *(No group)* are displayed in the scan line of the starting screen.

Of the eight possible application groups, four can be switched via the control panel as well as via the interface *Standard I/O*; the others can be switched only via the control panel.

Refer to *Standard I/O Group Inputs*.

Melter *(contd.)*

Working with Application Groups *(contd.)*

Displaying Channel Numbers on Control Panel

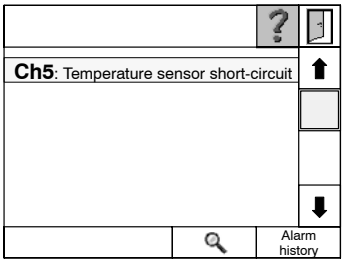
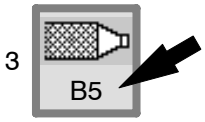


Fig. 4-43 Alarm log

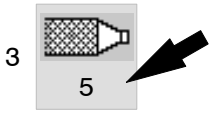
The numbers of the temperature channels shown on the control panel (alarm lists and setpoints) are a factor of the settings made by the operator.

Ch5 (**Ch**annel **5**): If a group contains at least one channel, the channel number refers to the number below the channel symbol (arrow). To determine the current channel numbers, refer to the screen *Define Groups* on the control panel of the relevant melter.

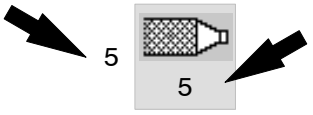
Channel *Ch5* (when part of a group)



Channel *Ch5* (when not part of a group), if at least one other channel belongs to a group



Channel *Ch5* (when not part of a group), if no other channel belongs to a group



Transmitting Channel Groups via Field Bus

When the *Channel number* is transmitted via the field bus, the melter-internal channels grid (low melt) and reservoir (high melt) occupy numbers 1 and 2. This means that the external channels (guns, hoses, ...) begin with number 3. The numbering of the wiring is the same as shown in the wiring diagram and, unlike on the control panel, can not be changed.

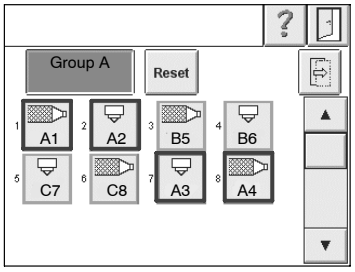


Fig. 4-44 V31

Example

1. Select group letter, e.g. *Group A*.

   A different group letter can be selected by repeatedly pressing the group key.

2. Mark channels that are to be included in the group by touching the respective channel key. In Fig. 4-44 : Channel 1, 2, 7 and 8. The frame around the key is shown in the color of the group key. The channels are counted within the group, and the consecutive number (in this case A1 to A4) appears below the channel symbol.

   If necessary, the channel symbol (hose, gun, air heater) can be changed by pressing the channel symbol repeatedly.

3. Repeat steps 1 and 2 for every group.

   NOTE: Each channel can be assigned only once. It appears transparent for all other groups and can not be assigned to another group until it has been removed from the old group.

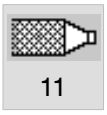


Fig. 4-45 *No group*

Removing a Channel from a Group

1. Select the group from which the channel is to be removed by repeatedly pressing the group key.
2. Touch the channel key repeatedly until the colored frame around the key and the group letter under the channel symbol disappear. Refer to Fig. 4-45.

   The channel can now be assigned to another group. Refer to *Defining Groups, Example*.

Dissolving Group with Reset Key

When this key is touched, all groups are dissolved and the channel symbols are reset. However, the PID parameters remain unchanged.

Melter *(contd.)*

Working with Application Groups *(contd.)*

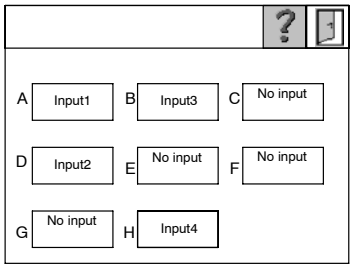


Fig. 4-46 V32

Standard I/O Group Inputs

Input: No more than four of the eight possible application groups A to H can be assigned to the four corresponding inputs of the interface *Standard I/O* (Also refer to section *Installation*).

The desired input for the application group is selected by pressing the key repeatedly. The inputs 1 to 4 are permanently assigned to the pins 11 to 14 of the interface.

No input: These application groups can not be switched via the interface *Standard I/O*. These groups must be switched by the operator via the control panel or via the field bus.

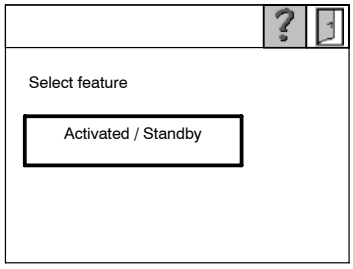


Fig. 4-47 V33

Selecting Feature

Deactivated: The temperature channels assigned to a deactivated application group are not heated.

Temperature control and monitoring for faults do not take place. Exception: Overtemperature shutdown at fixed temperature of 245 ˚C (475 ˚F).

Standby: The temperature channels in this application group are lowered by the standby values set in the temperature parameter screen (Refer to Fig. 4-21).

Melter Setup

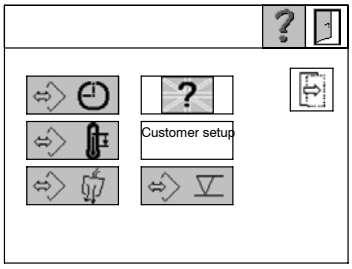


Fig. 4-48 V7

Touch the key to move to the first setup screen. The seven-day clock, standby, inert gas control, language change, recipes and level monitoring can be set up here.

Screen 1: Seven-day Clock, Standby, Inert Gas, Changing Language, Recipes, Level

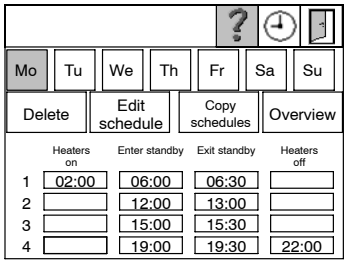
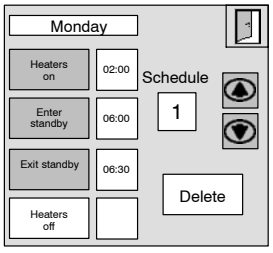


Fig. 4-49 V8: Main screen

Seven-day Clock

Heaters and standby can be controlled via the seven-day clock. Up to four schedules that run at the same time can be stored for each day of the week.

Delete: All of the schedules for the marked day (in this case: Monday) will be deleted.



Editing Schedule

The times are entered by row. The corresponding key must be activated to be able to enter a time.

NOTE: 00:00 is a valid time; it does not mean that the unit is switched off.

Delete (individual schedules): The displayed schedule is deleted.

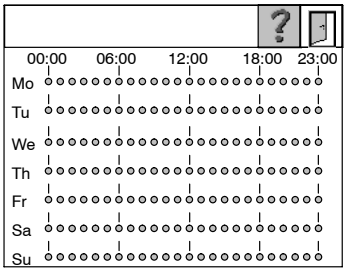
Copying Schedules (Example: Copy schedules for Monday to Tuesday and Friday)

1. Select Mo in the main screen.
2. Copy schedule : A window opens in which the days Tuesday and Friday have to be marked.
3. Confirm selection with .

The schedules have been copied.

Melter *(contd.)*

Screen 1: Seven-day Clock, Standby, Inert Gas, Changing Language, Recipes, Level *(contd.)*



Overview

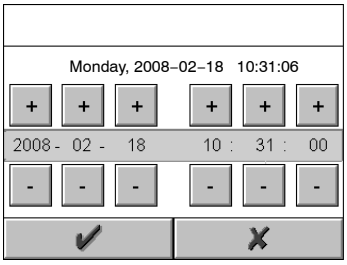
Gray: Heaters off / standby off

Yellow: Enter standby

Green: Heaters on

NOTE: The programmed times are shown, not the melter mode.

Setting Date and Time



The current date and time are set with the +/– keys.

The date is shown in the following format: YYYY–MM–DD.
(Y: year; M: month; D: day)

NOTE: The time is not automatically changed to and from daylight savings time.

Important when Using the Seven-day Clock (Example of a Schedule)

Heater on	08:00
Enter standby	12:00
Exit standby	13:00
Heater off	17:00

If the seven-day clock is not switched on until after 08:00 (key), the switching time 08:00 has already passed; the heater is not switched on by the seven-day clock. The schedule is ineffective.

The operator must then either switch the heater on manually or reprogram the time for *Heaters on*.

Standby

Standby serves to protect the hot melt material and to save energy during breaks in production.

For information on setting the temperature standby value (value by which the setpoint temperature is reduced), refer to *Control Panel – Overview – / T2.*

Automatic Entry

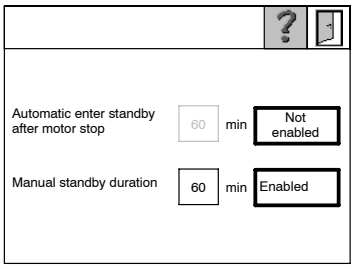


Fig. 4-50 V9

Standby is entered as soon as all of the motors have been stopped for a certain time. Enable *Automatic enter standby* for this purpose.

Manual Exit

Automatic standby is exited by the operator on the control panel .
Manual standby duration is ineffective here.

Automatic enter standby after motor stop: **Not enabled**
(or 60 min if enabled)

Manual Entry/Exit (Control Panel)
External Entry/Exit (Interface)

Either the operator enters and exits standby on the control panel key or this occurs via the interface *Standard I/O*.

Automatic Exit

Exit standby can also occur automatically. Enable *Manual standby* duration for this purpose. After the set time has expired, the melter automatically returns to heatup guided by reference channel.

Manual standby duration: **Not enabled**
(or 60 min if enabled)

Entering/Exiting via the Seven-day Clock

Refer to *Control Panel – Overview – / V7* and *V8*.

Melter *(contd.)*

Screen 1: Seven-day Clock, Standby, Inert Gas, Changing Language, Recipes, Level *(contd.)*

Inert Gas (Option)

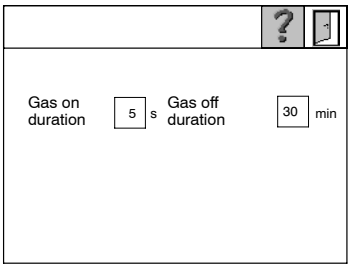


Fig. 4-51 V10

The inert gas control is used to turn on/off the solenoid valve of the inert gas equipment.

Gas on duration: **5 s**

Gas off duration: **30 min**

Change Language

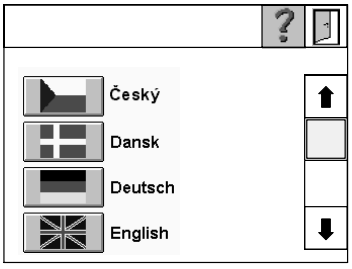


Fig. 4-52 V11

Customer Setup

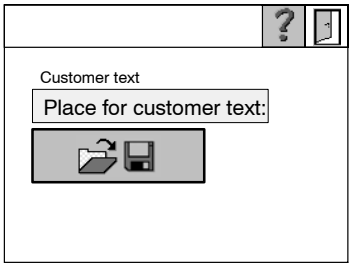


Fig. 4-53 V12

Text can be entered that will appear on the starting screen, e.g. adhesive type used in the production line.

Move to recipes screens

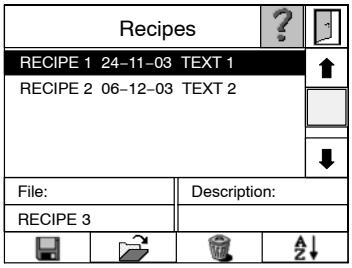


Fig. 4-54

Recipes

A recipe is a file in which the customer saves his production-specific parameters.

Save recipe

The operator must enter a name (max. 8 characters) under *File*. To better identify the individual recipes, information such as the name of the application can be entered under *Description*. All current, adjustable parameters are saved, except for the following.

Exceptions:

- Brightness and contrast
- Date / time
- Local language
- IPC IP address and subnet mask
- PROFIBUS address
- Passwords
- Selected line speed signal and all values based on the line speed signal

NOTE: Up to 500 recipes can be saved.

Load recipe

The current parameters are overwritten with the values from the selected recipe.

NOTE: If during loading of the recipe (approx. 4 s) the melter is switched off (e.g. power failure), the control unit will no longer function properly. The desired recipe must then be loaded again.

Recipe is irrevocably deleted.

Sort recipes by name, description or date.

Melter *(contd.)*

Screen 1: Seven-day Clock, Standby, Inert Gas, Changing Language, Recipes, Level *(contd.)*

Level (Option)

With the option *Level display*, a contact *Fill tank* is made available at the interface *Standard I/O*. With the options *Level control*, the contact is replaced with the interface *Level control* for triggering the filling valve.

Level Display and Control (Variable Measuring Points)

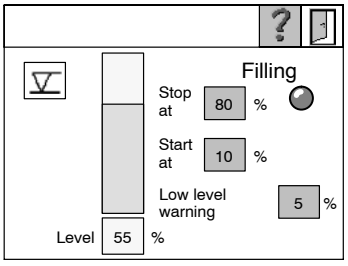


Fig. 4-55 V13

If the melter is heated up and there are no undertemperature faults or sensor alarms (short-circuit / sensor break), the command to fill is given as soon as the level reaches or falls below the value *Start at*.

Filling continues until the level has reached or exceeded *Stop at*. All values are shown as a percentage of the tank volume.

The status diode *Filling* is illuminated during filling.

Filling, the warning *Tank level low* and the fault *Tank empty* can only be triggered when the heaters are switched on. Filling stops when sensor alarms occur or the main contactor or level control is switched off.

Level control is activated

Level control is deactivated.

Level display and monitoring no longer occur. Filling, the warning *Tank level low* and the fault *Tank empty* are no longer triggered.

Now the tank can be emptied for maintenance or repair work without the fault *Tank empty* occurring.

Start at: **10 %**

Stop at: **80 %**

Low level warning: **10 %**

Level Control (Fixed Measuring Points)

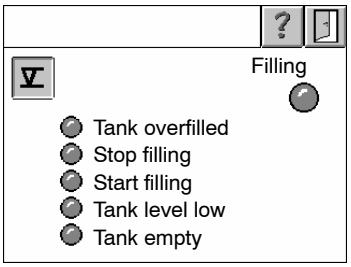


Fig. 4-56 V13

The level sensor measures the presence of material at five different points.

If the melter is heated up and there are no undertemperature faults or sensor alarms (short-circuit / sensor break), the command to fill is given as soon as the level falls below the measuring point *Start filling*.

Filling continues until the measuring point *Stop filling* is reached.

The status diode *Filling* is illuminated during filling.

Filling, the warning *Tank level low* and the fault *Tank empty* can only be triggered when the heaters are switched on. Filling stops when sensor alarms occur or the main contactor or level control is switched off.

Level control is activated

Level control is deactivated.

Level display and monitoring no longer occur. Filling, the warning *Tank level low* and the fault *Tank empty* are no longer triggered.

Now the tank can be emptied for maintenance or repair work without the fault *Tank empty* occurring.

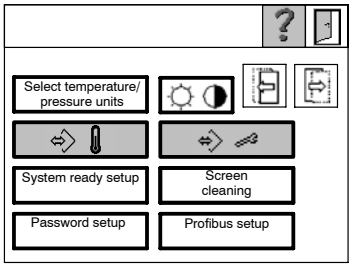


Fig. 4-57 V14

Screen 2: Units, Ready Delay Time, Password, Service Interval, Field Bus

Touch the key to move to the second setup screen. In this screen the units can be changed, the maximum temperature setpoint, ready delay time, password and service interval can be entered, and the type of field bus can be selected.

Additional features: Change screen contrast and clean screen.

Select Temperature/Pressure Units

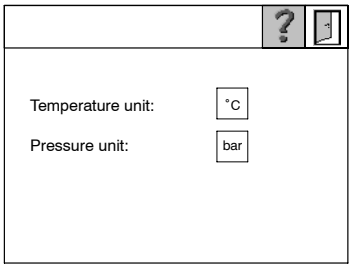


Fig. 4-58 V15

Either ˚C or ˚F can be selected as the temperature unit.

˚C

Either bar, psi or kPa can be selected as the pressure unit.

bar

Melter *(contd.)*

Screen 2: Units, Ready Delay Time, Password, Service Interval, Field Bus *(contd.)*

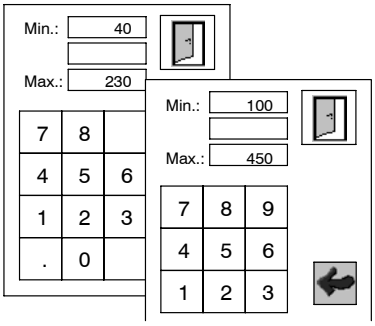


Fig. 4-59 Example ˚C and ˚F

Note on Switching

The limits *Min* and *Max* are not converted exactly; they are rounded to a whole value.

If a setpoint is near a limit, switching back and forth repeatedly between the units can result in slight deviations from the initial input.

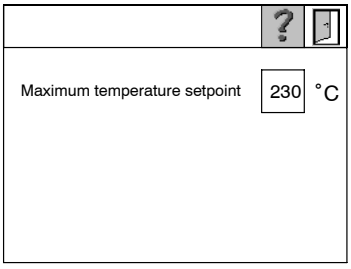


Fig. 4-60 V14a

Maximum Temperature Setpoint

This parameter is used to adapt the melter to the maximum material processing temperature permitted.

	Setting range	
Standard melter	40 to 230 ˚C	100 to 450 ˚F

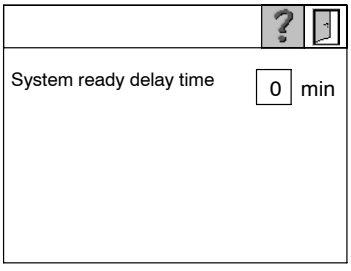
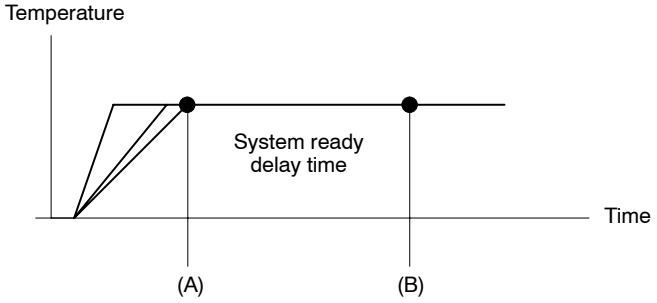


Fig. 4-61 V17

System Ready Setup

The system ready delay time is the time after which all components have reached their setpoint temperatures (A) and before the system indicates readiness (B). This additional time allows the material to reach a thermally homogenous state.



The system ready delay time, if activated, runs after every *heatup phase* (status display).

0 min

Password Setup (Also Refer to Appendix A)

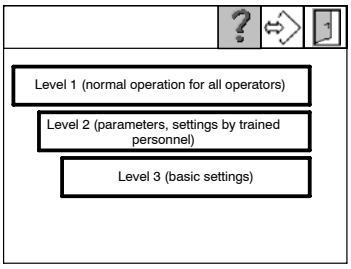


Fig. 4-62 V18

Assigning New Password, e.g. for Level 1

Level 1 (normal operation for all operators) Touch key. An input window appears in which the new password must be entered and confirmed (repeated).

When the passwords have been assigned, a security level must be selected. Refer to *Select Security Level.*

NOTE: The passwords must be different for each level and must be at least one character long and no longer than 16 characters.

NOTE: Every password level also applies to the lower ones. Example: The password for level 2 also grants access to the features of level 1.

Select security level

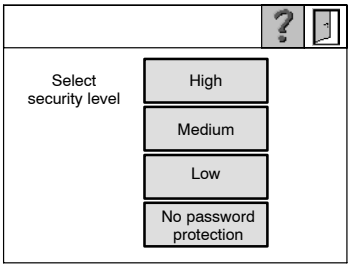


Fig. 4-63 V19

High: Password protection is switched on for all three levels.
Medium: Password protection is switched on for level 2 and 3.
Low: Password protection is switched on only for level 3.
No password protection: Password protection is switched off for all three levels.

No password protection

NOTE: If no keys are touched for 10 minutes, the selected password protection becomes active again. Then the password prompt appears again for password-protected features.

Melter *(contd.)*

Screen 2: Units, Ready Delay Time, Password, Service Interval, Field Bus *(contd.)*

Backlight / Contrast

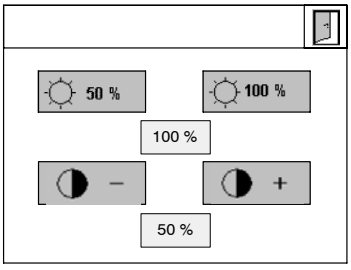


Fig. 4-64

Backlight: 50 % or 100 % selectable
Contrast: adjustable in increments of 2 %

Service Interval Setup

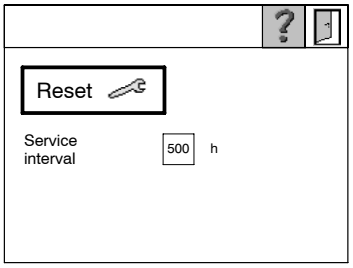


Fig. 4-65 V16

When the *Service interval* time defined by the customer has expired, the service symbol (open-jawed wrench) lights up on the starting screen. The symbol can be used e.g. to signal that the filter needs to be changed.

Reset The time for the service interval is reset, and the service symbol is switched off.

500 h (total hours with heaters on)

Screen cleaning

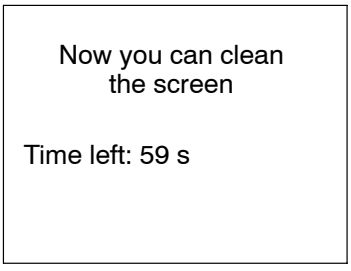


Fig. 4-66 V20

The screen can be cleaned until the time shown has expired, without accidentally triggering any features. An indication is issued when the time has expired, and 10 s later the previous screen appears again.

Profibus Setup (or One of the Other Field Buses)

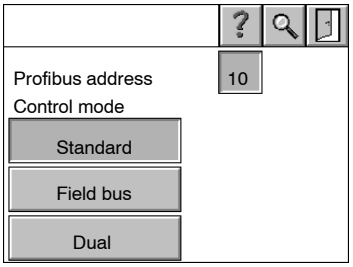


Fig. 4-67 Profibus

The melters on the field bus each require an address for communication; each address may be assigned only once in the entire field bus.

Profibus: The address is set on the IPC (Refer to Fig. 4-67).

10

ControlNet: The address is set with two decimal dials on the gateway located in the electrical cabinet.

EtherNet/IP: The IP address is set with a PC or with the DIP switches on the gateway located in the electrical cabinet.

Refer to separate document *Field Bus in Nordson Melters with IPC*.

Touch to access information on the field bus data protocol. Refer to section *Troubleshooting, Checking Transmitted Field Bus Data*.

Selecting the Control Mode

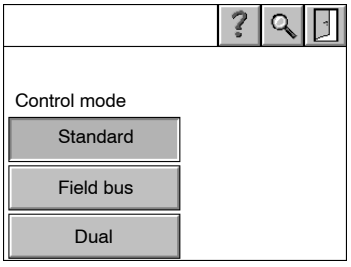


Fig. 4-68

Standard: The melter is operated via the control panel.

Field bus: All screens can still be viewed, but the melter can no longer be operated via the control panel. If this is attempted, *The melter is in field bus mode* appears.

Dual: The melter can be operated via the control panel as well as by the master.

Standard

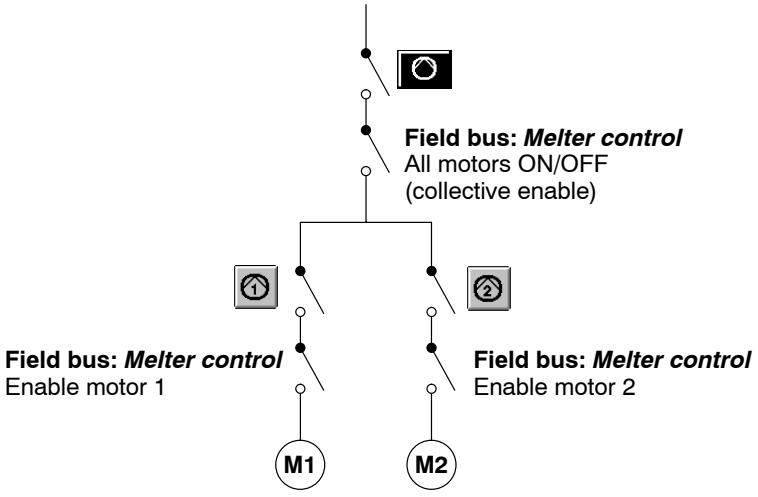


Fig. 4-69 **AND** link in *Dual* mode

Melter *(contd.)*

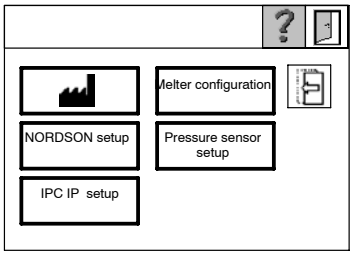


Fig. 4-70 V21

Screen 3: Defaults, IP Address, Pressure Sensor

Touch the key to move to the third setup screen.

All parameters are returned to the Nordson default settings. Exceptions:

- Brightness and contrast
- Date and time
- Local language
- IPC IP address and subnet mask
- PROFIBUS address
- Passwords
- Selected line speed signal and all values based on the line speed signal
- Customer text and other free texts, such as names of temperature channels, etc.
- Alarm history
- Counter (total hours with heaters on)
- Application groups
- Assignment of standard I/O group inputs
- Feature for switching application groups
- Measuring range of the analog pressure sensors (VBCM)
- Settings in the screen *Melter configuration*.

NORDSON Setup

Only for Nordson employees with the Nordson password.

IP Address Setup

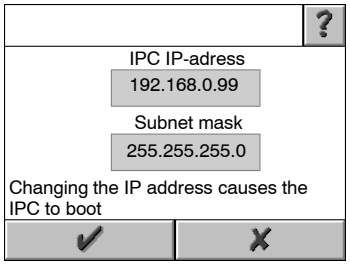


Fig. 4-71 V21a

These settings are needed to communicate with the IPC when using the Webserver. They must be clearly defined in an EtherNet network.

- IPC IP-address: 192.168.0.99
- Subnet mask: 255.255.255.0

Example: Setting IP Addresses in a Network

All Nordson melters are delivered with the same IPC IP address. To be able to work together in a network, every device, including a PC, must be assigned its own IP address (Fig. 4-72).

The subnet mask mentioned above allows changes to be made to the last part (host of melter part) of the IP address.

NOTE: All IP addresses ending with 1 to 254 are possible. IP addresses ending with 0 or 255 are not permitted.

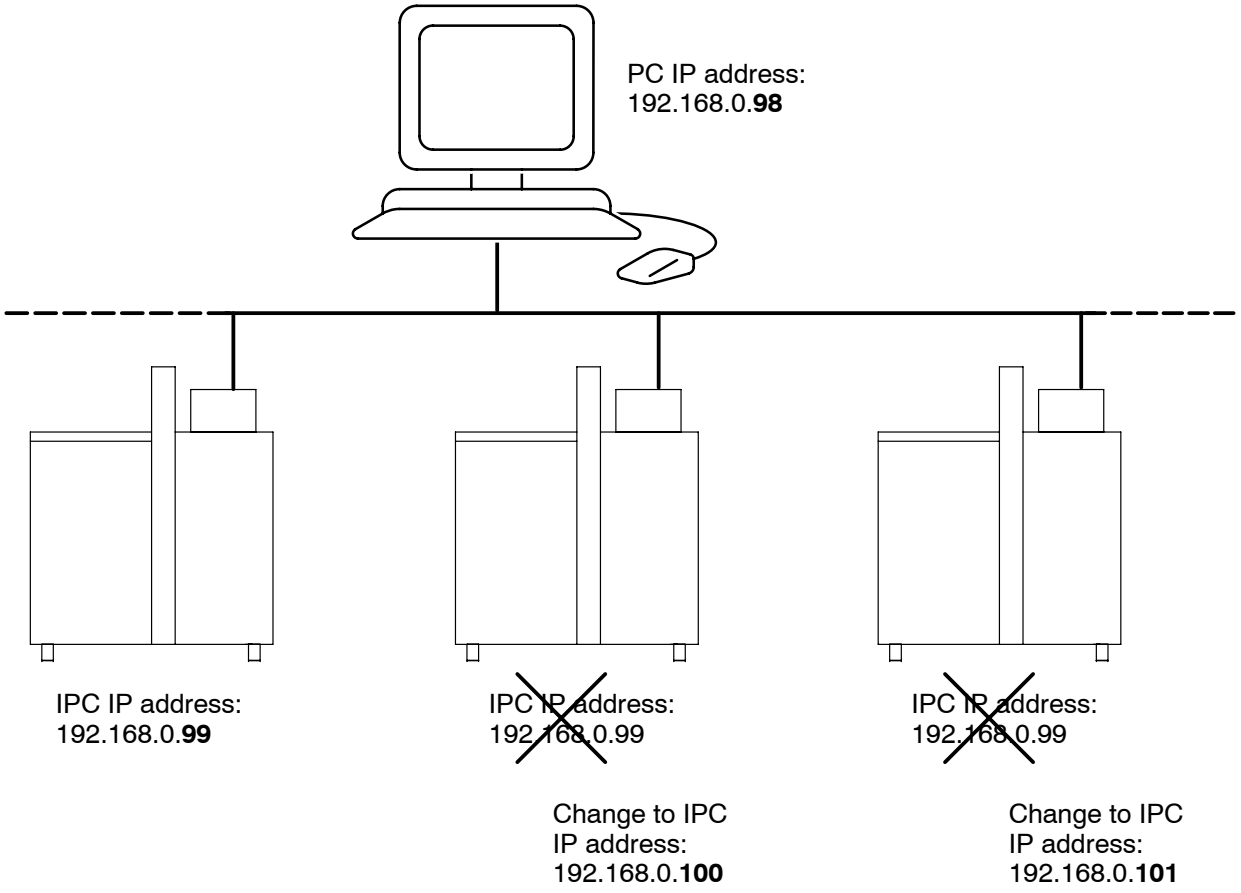


Fig. 9-72 IP addresses in a network –Example–

Melter *(contd.)*

Screen 3: Defaults, IP Address, Pressure Sensor *(contd.)*

Melter Configuration

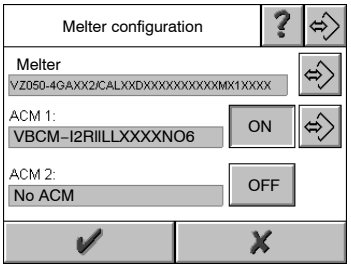


Fig. 4-73 V26

If the memory board is replaced or parts relevant to the configuration are retrofitted, the melter configuration code must be entered twice.

Touch ⇔ next to the configuration code.

NOTE: The options are shown in the configuration code following the slash. If no options or no additional options are entered, the software automatically places an X in the remaining positions.

If the two codes entered are the same, the key to confirm is enabled. After confirmation, the system returns to the overview screen.

NOTE: All of the configurations are saved on the memory board only when the key *Confirm* is touched in the overview screen.

Only in Conjunction with ACM

The configuration key ⇔ is located behind every ACM that is switched on.

The configuration code must be entered twice in the setup screen.

NOTE: If an ACM is switched off, *No ACM* replaces the previously displayed configuration code, even if the ACM is still physically connected to the melter.

Selecting the Type of Field Bus Data Protocol

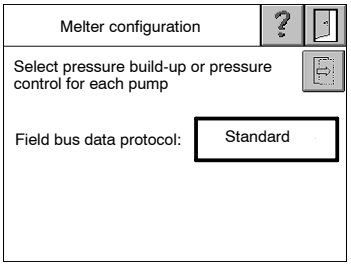


Fig. 4-74 V27

Refer to *Standard Index Protocol* or *Extended Index Protocol* in the separate document *Field Bus in Nordson Melters with IPC*.

CAUTION: The type of protocol selected on the control panel must correspond to the implementation on the master; the type may not be changed during field bus operation.

Select Pressure Build-up or Pressure Control

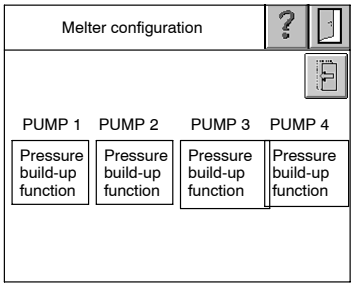


Fig. 4-75 V28

The mode in which it should operate can be selected for each pump here. The parameters are set in in the motor screens.

Depending on what is selected in this screen, speed control / pressure control or speed control / pressure build-up feature can be selected in the motor screen M5.

Pressure Sensor Setup

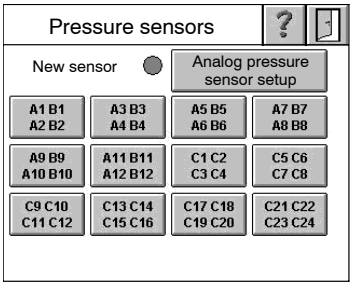


Fig. 4-76 V22

A CAN bus sensor is found automatically and indicated by the lamp.

Continue with A1 B1 / A2 B2 to assign the pressure sensor to a pump (example).

NOTE: Only <u>one</u> pressure sensor can be assigned at a time.

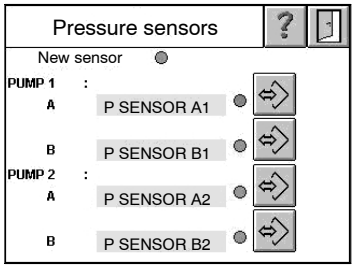


Fig. 4-77 V23

The first two lines are intended for two pressure sensors of pump 1, lines 3 and 4 for two pressure sensors of pump 2.

Indication lamp lit: The pressure sensor is assigned.

NOTE: Pressure sensor A is usually located at the melter outlet, behind the filter cartridge (default). With the option *Pressure display and pressure control*, it transmits the values to the motor controller.

Melter *(contd.)*

Screen 3: Defaults, IP Address, Pressure Sensor *(contd.)*

Assigning New CAN Bus Sensor

1. Connect CAN bus cable to new pressure sensor.
2. The indication lamp *New sensor* lights up after a short time. The new, not yet assigned pressure sensor has been detected.

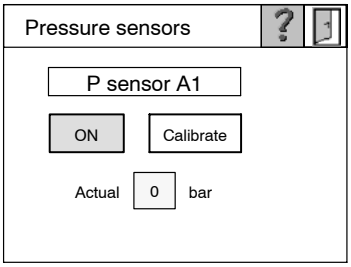
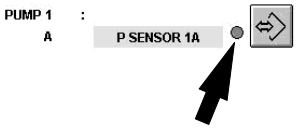


Fig. 4-78 V25

3. Select ⇔ of the desired line, then switch pressure sensor ON.

   The pressure sensor can be switched on and off. If a pressure sensor is switched off, it is removed from the assigned location and is available as a *New sensor* after a short time.

   CAUTION: Do not switch off the melter as long as the ON/OFF key appears transparent.



4. Wait until the keys are no longer transparent.
5. Check the color of the indication lamp:

Color of the indication lamp	Meaning
Green	Pressure sensor is assigned
Red	Pressure sensor is defective CAN bus to sensor is interrupted CAN bus is faulty

6. Repeat steps for every new pressure sensor until all have been assigned.

Calibrating Pressure Sensor

NOTE: To calibrate the sensor, the melter must be heated to processing temperature and may not be pressurized (relieve pressure if necessary; refer to section *Installation*).

Calibrate Perform nullification. Nullification should be performed even if 0 bar is displayed as the actual value; internal calibration is more precise.

Pressure Sensor Setup (Only in Conjunction with ACM)

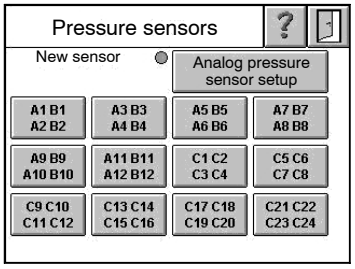


Fig. 4-79 V22

NOTE: In conjunction with ACM, the overview screen appears first.

A CAN bus sensor is found automatically and indicated by the lamp.

Continue with [A1 B1 A2 B2] (example).

An analog pressure sensor must be introduced to the control unit manually as *New sensor*. Continue with [Analog pressure sensor setup].

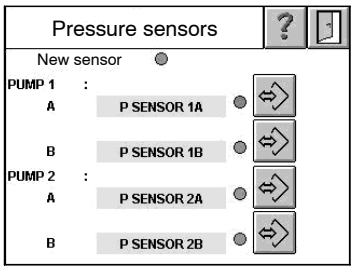


Fig. 4-80 V23

[A1 B1 A2 B2]

Assign, set up, calibrate and switch on and off as described in the section *Operation* of the melter.

NOTE: If an analog pressure sensor is switched off and is not to be assigned again, its key (Fig.4-81) must be touched. The key then appears to not be pressed.

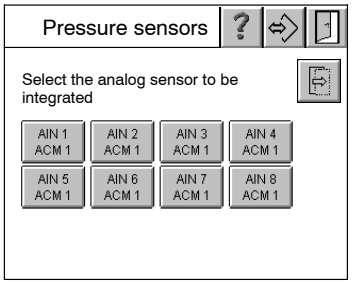


Fig. 4-81 V24

[Analog pressure sensor setup]

Move to the screen for the pressure sensors AIN 1 to AIN 16 for ACM 2.

NOTE: The keys for analog pressure sensors that have already been assigned appear to be pressed down.

1. Touch desired key to assign. All other keys appear subdued.

   Assignment is not possible if the control unit has already found a CAN bus sensor. Then this must be assigned first.

2. Touch the door symbol to exit the screen.
3. The indication lamp *New sensor* is lit in the overview screen.
4. Continue as with CAN bus sensors with the key [A1 B1 A2 B2] (example).

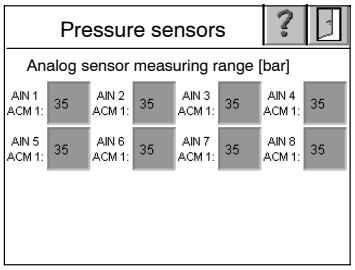


Fig. 4-82 V24a

To pressure sensor measuring ranges screen. The measuring ranges can be entered for each analog pressure sensor.

Motor

Switching On/Off Motor (Individual Enable)

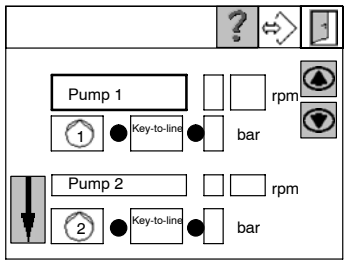


Fig. 4-83 M1: Mode *Speed control* with pressure display

Only enabled motors can be switched on. Prerequisite: The system is ready for operation (green status display *System ready* and green indication lamp on optional light tower lit).

rpm: revolutions per minute

Key-to-line Selecting Key-to-line or Manual Mode

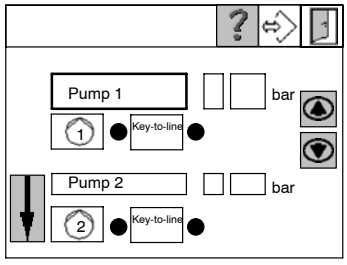


Fig. 4-84 M1: Mode *Pressure control*

In manual mode the motor runs at the set speed; in key-to-line it runs at the speed determined by the line speed signal value.

Key-to-line mode: Indication lamp lit.

Manual mode: Indication lamp not lit.

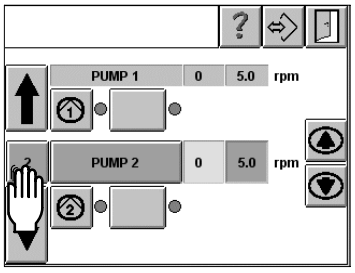


Fig. 4-85

If there are more than three motors, the function *Go to pump* can be used. Touch the key next to a pump field to use the function. A window showing all of the pumps opens.

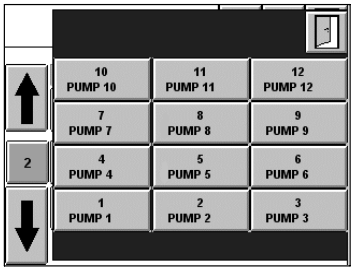


Fig. 4-86

This prevents having to scroll up/down with the arrow keys when there is a large number of pumps.

Also refer to *Initial Startup* (Fig. 4-7) and *Motor Startup Protection.*

Enabling

If there is no collective enable, the individual motors are enabled with the key *Switch on/off motor (individual enable)* **AND** via the interface *Standard I/O* with the signal *Enable motor*.

Switching on

If there is a collective enable, the individual motors are switched on with the key *Switch on/off motor (individual enable)* **AND** via the interface *Standard I/O* with the signal *Enable motor*.

The indication lamp in the key can be different colors:

Gray (off):	No motor enable on the control panel
Yellow:	The motor is enabled on the control panel but at least one of the other enables is not set (motor not running)
Green:	Motor running.

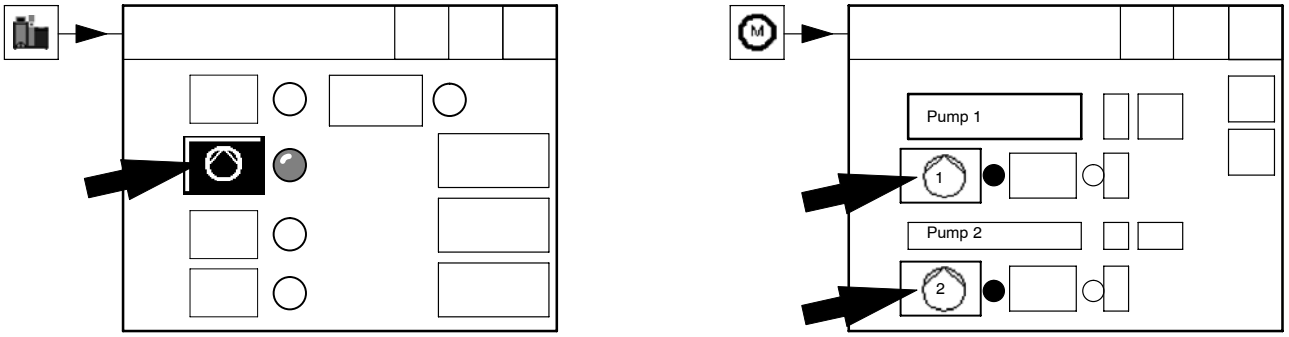


Fig. 4-87 Motors: Enable on the melter screen – switch on on the motor screen

NOTE: The *Standard I/O* interface signals *All motors ON/OFF (collective enable)* and *Enable motor* can be deactivated with a key. The motors can then only be enabled and switched on via the control panel (Refer to Fig. 4-88 *Motor enable*).

Motor *(contd.)*

Motor Parameters

Touch the ⇔ key to move to the setup screens.

Screen 1: Type of Motor Enable, Adaptation to Parent Machine

Motor Enable Via Control Panel / Control Panel AND Standard I/O

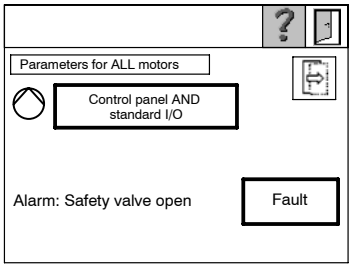


Fig. 4-88 M2

Control panel: The *Standard I/O* interface signals *All motors ON/OFF (collective enable)* and *Enable motor* are deactivated. The motors can then only be enabled and switched on via the control panel.

In this case the melter can function even without a standard I/O connection to the parent machine, e.g. if it is to be purged for maintenance purposes.

The operator can choose whether an open safety valve generates a fault (motors are stopped) or a warning.

Enable motor via **Control Panel**

Line Speed Signal

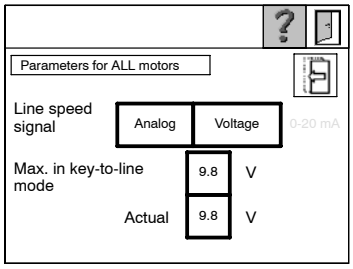


Fig. 4-89 M2.1

Either *Analog* or *Frequency* can be selected, and either *Voltage* or *Current* can be selected. Depending on what is selected, the keys not used will be transparent and the units will change. *0–20 mA* or *4–20 mA* is retrieved from the I/O board.

NOTE: Voltage or current and 0 – 20 mA or 4 – 20 mA must have been set on the I/O board with the DIP switches (Refer to section *Installation*). The switch setting is read once every time the melter starts up, and it is displayed on the control panel.

Max. in key-to-line mode

For calibration with the signal (voltage, current or frequency) received from the parent machine.

Example of operation with pilot voltage: The parent machine runs at maximum speed. An input signal of 9.8 V (*actual* value) is displayed. Then set *Max. in key-to-line mode* to 9.8.

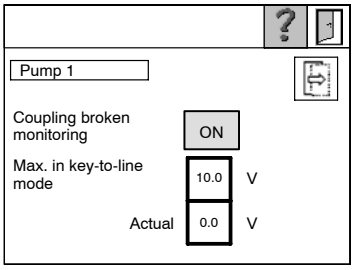


Fig. 4-90 M2.2

This screen can also be called up with ⇔ of *Parameters (Screen 2)* when every motor receives its own line speed signal.

The coupling monitoring function can be switched on and off. It allows faults in the motor–coupling–pump system to be detected.

Screen 2: Key-to-line

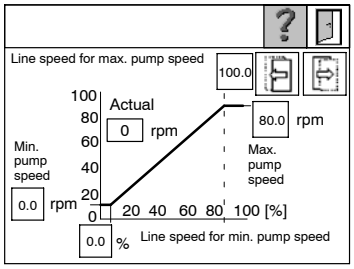


Fig. 4-91 M3

Touch the key to move to the second setup screen.

NOTE: The graph does not change to adapt to the entered values.

Min. pump speed: Pump speed setpoint when the external line speed signal lies below the entered value Line speed for min. pump speed.

0.0 min^{-1}

Max. pump speed: Pump speed setpoint when the external line speed signal exceeds the entered value Line speed for max. pump speed.

80.0 min^{-1}

Line speed for min./max. pump speed: Line speed signal value in %, below or above which the pumps begin to rotate at the set min./max. speed.

Max: 100.0 %

Min: 0.0 %

To M2.2. This key is available only with separate line speed signal inputs (option).

Motor *(contd.)*

Screen 3: Motor OFF Delay, Threshold Switch

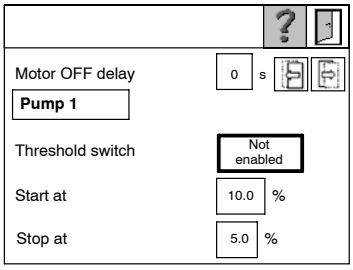


Fig. 4-92 M4

Touch the key to move to the third setup screen.

Motor OFF Delay

The motor OFF delay supports overtravel when identifying the product, if the sensor distance to the gun needs to be considered.

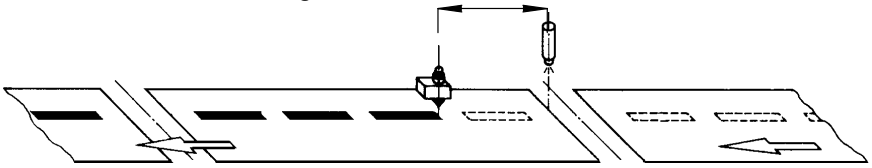


Fig. 4-93 Product identification

If this feature is not activated (delay = 0 s), the motor stops as soon as it is switched off.

If the feature is activated, the motor continues to run for the set time after it has been turned off via the interface *Standard I/O*.

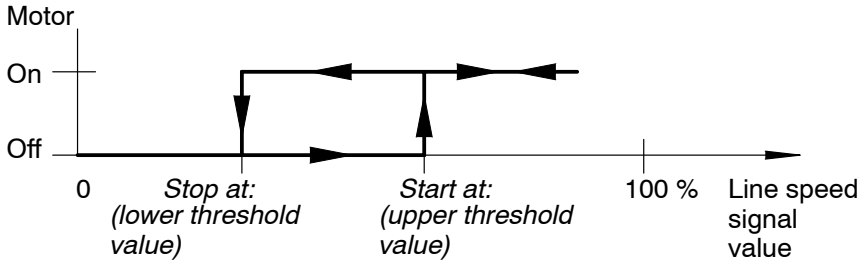
NOTE: If the motor is switched on again via the interface *Standard I/O* before the motor OFF delay has expired, the feature *Motor OFF delay* ends immediately.

0 s

Threshold Switch

NOTE: The threshold switch is automatically deactivated as long as pressure build-up is enabled.

In threshold switch mode the motors are started and stopped by the line speed signal.



When the upper threshold value is exceeded, the motor starts; when the value falls below the lower value, the motor stops.

Start at: **10.0 %**

Stop at: **5.0 %**

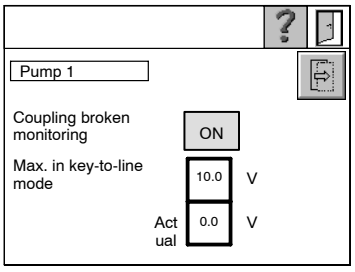


Fig. 4-94 M2.2

If there are **no** sensors present, touching the key leads to a screen in which the coupling broken monitor can be switched on or off.

Screen 4: Pressure Alarms, Speed / Pressure Control

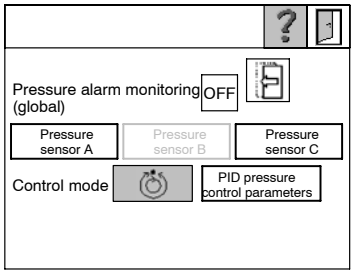


Fig. 4-95 M5

If pressure sensors are present, touching the key leads to the fourth parameter screen.

Pressure alarm monitoring (global)

Global = for all motors

Pressure alarm monitoring is available only with options *Pressure display* and *Pressure control.*

If pressure alarm monitoring is switched on, underpressure and overpressure are monitored. Alarms are triggered depending on the set warning and fault values (Refer to *Pressure Sensor A*).

NOTE: When the speed is regulated in key-to-line mode, an underpressure warning can be displayed during parent machine startup until the melter speed setpoint is reached.

Motor *(contd.)*

Screen 4: Pressure Alarms, Speed / Pressure Control *(contd.)*

Pressure Sensor A / Pressure Sensor B

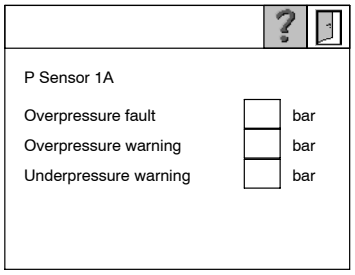


Fig. 4-96 M6

Two pressure sensors (A and B) can be assigned per pump (Refer to *Pressure Sensor Setup* Fig. 4-77). The measured pressures are displayed in the scan line of the starting screen and in the motor screen (Fig. *M1)*.

NOTE: The values for warnings and faults are absolute values in *Speed control* mode with the option *Pressure display* (Fig. 4-96). With the option *Pressure control*, the values are differential values for sensors A and B (Fig. 4-97)and absolute values for the sensors C (Fig. 4-96).

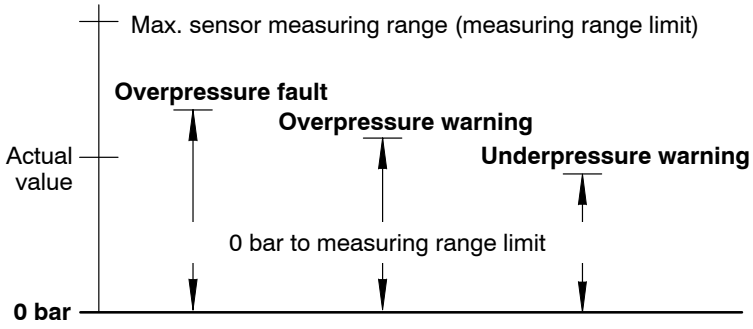


Fig. 4-97 Absolute values

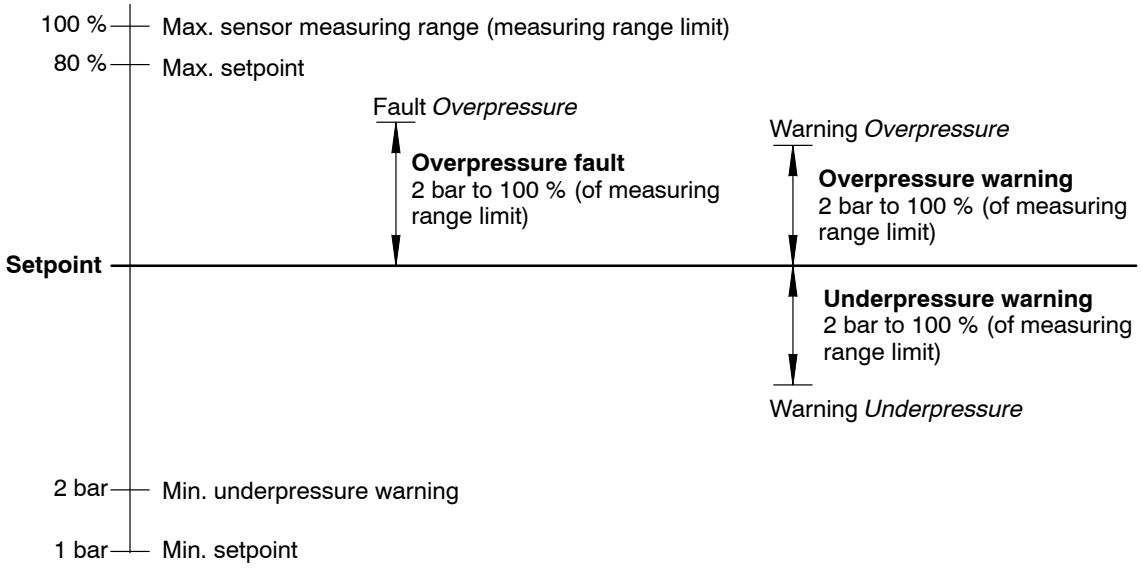


Fig. 4-98 Differential values

NOTE: The value for the overpressure warning can not be greater than the value for the overpressure fault.

NOTE: Only with *Speed control (pressure display):* The value for the overpressure warning/fault can not be less than the value for the underpressure warning.

Overpressure fault: **15 bar** (1500 kPa / 218 psi)

Overpressure warning: **10 bar** (1000 kPa / 145 psi)

Underpressure warning: **0 bar** (0 kPa / 0 psi)

Pressure Sensor C

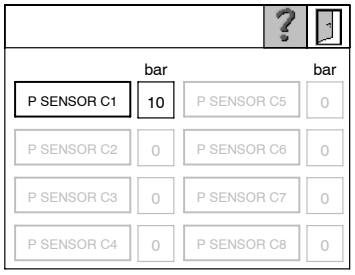


Fig. 4-99

Unlike pressure sensors A and B, the pressure sensors C are not assigned to a motor. For this reason, the operator is shown a screen with an overview of all sensors and their actual pressure values.

Example Fig. 4-99: There is only one pressure sensor C1.

Only in Conjunction with ACM

The key *To next screen* appears if at least one of the two ACMs is available. Touch the key to move to two more screens. All of the other 24 temperature channels are shown there.

NOTE: CAN bus sensors can only be assigned up to sensor C8.

CAUTION: Analog and CAN bus pressure sensors have a different pressure range end value. When in doubt, refer to the ID plate of the respective sensor.

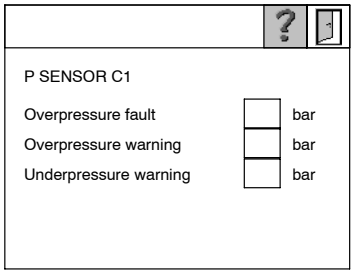


Fig. 4-100

P SENSOR C1 To the pressure alarm parameters

NOTE: The values for warnings and faults are absolute values in *Speed control* mode with the option *Pressure display* (Fig. 4-96). With the option *Pressure control*, the values are differential values for sensors A and B (Fig. 4-97)and absolute values for the sensors C (Fig. 4-96).

Motor *(contd.)*

Screen 4: Pressure Alarms, Speed / Pressure Control *(contd.)*

Switching Between Speed Control  ***– Pressure Control*** 

The motor must be off to be able to switch.

Speed Control - Manual Mode

In manual mode the operator has control over the motors. The pump speed is equal to the setpoint and does not change.

 Speed setpoint: **5 min^{-1}**

Example: Increase Pump Speed

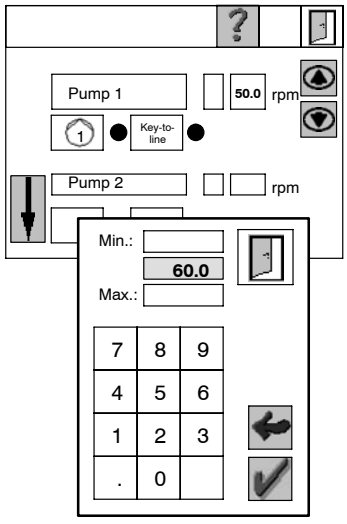


Fig. 4-101

Prerequisite: *Speed control* mode selected, and indication lamp next to key *Key-to-line* is off.

1. Touch  to select the desired pump.
2. Touch the green field *50.0 min^{-1}* (rpm) (setpoint).
3. Enter 60.0 in the input window and confirm with  .
4. If necessary, enable pump (indication lamp next to key  lit).

Speed Control - Key-to-line

Control can occur via various signals:

a. **Frequency**: 0 to 100 kHz

NOTE: Not available with the option *Separate line speed signal inputs*.

Settings on the control panel:

Line speed signal: Frequency

Max. in key-to-line mode: The frequency at maximum line speed is then 100 %.

b. **Voltage**: 0 to 10 V_{DC}

Setting on the I/O board: Voltage

Settings on the control panel:

Line speed signal: Analog, voltage

Max. in key-to-line mode: The voltage at maximum line speed is then 100 %.

c. **Current**: 0 to 20 mA or 4 to 20 mA

NOTE: Not available with the option *Separate line speed signal inputs*.

Settings on the I/O board: Current and 0 – 20 mA or 4 – 20 mA

Settings on the control panel:

Line speed signal: Analog, current

Max. in key-to-line mode: The current at maximum line speed is then 100 %.

Motor *(contd.)*

Screen 4: Pressure Alarms, Speed / Pressure Control *(contd.)*

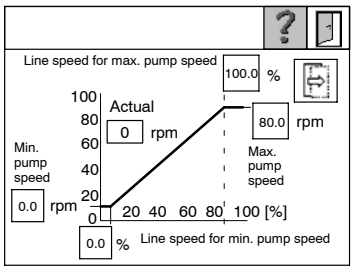


Fig. 4-102

Other Settings

- Speeds (Refer to illustration)
- Touch key *Key-to-line* so that the LED lights up (Refer to Fig. 4-83)

Pressure control

Pressure Control - Manual Mode

In manual mode the operator has control over the motors. The pressure is equal to the setpoint and does not change.

Only pressure sensor A: **5 bar** (500 kPa / 73 psi)

Pressure Control - Key-to-line

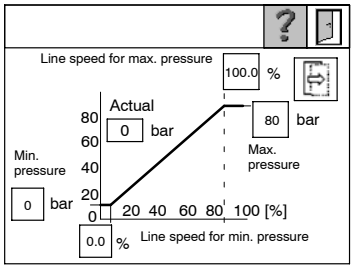


Fig. 4-103

NOTE: The graph does not change to adapt to the entered values.

Min. pressure: Pressure setpoint when the external line speed signal lies below the entered value *Line speed for min. pressure.*

0 bar (0 kPa / 0 psi)

Max. pressure: Pressure setpoint when the external line speed signal exceeds the entered value *Line speed for max. pressure.*

80 bar (8000 kPa / 1160 psi)

Line speed for min./max. pressure: Line speed signal value in %, below or above which the pumps begin to generate the set min./max. pressure.

Max: **100 %**

Min: **0 %**

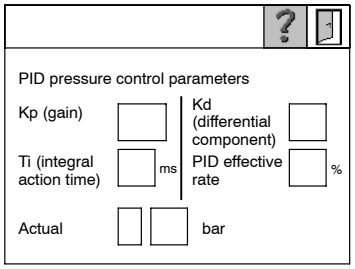


Fig. 4-104 M7

PID pressure control parameters

PID Pressure Control Parameters

NOTE: Should be adjusted only by personnel with experience in metrology and control technology.

The regulation ratio is multiplied by the *Effective rate*.

Kp: **0.80**

Tn: **600 ms**

Kd: **0.0**

Effective rate: **100.0 %**

Motor *(contd.)*

Screen 5: Pressure Build-up, Flow Control

Touch the key to move to the fifth setup screen. The appearance of the screen depends on the melter configuration. Refer to *Control Panel – Overview – M2.2, M8.1 and M8.2.*

Pressure Build-up

This feature allows the material pressure to be regulated to an adjustable value as soon as the parent machine stops (condition for variation 1) or when the line speed signal falls below an adjustable value (condition for variation 2). This allows the melter to maintain a certain pressure even when there is a break in production.

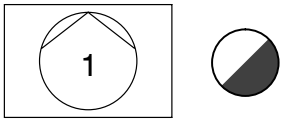


Fig. 4-105 Motor LED

The appearance of the motor LED changes from a single color to two colors as long as the condition for pressure build-up is fulfilled (Refer to illustration).

The pressure sensors A are always responsible for pressure control during pressure build-up.

NOTE: When pumps are in the process of building up pressure, there is no pressure alarm monitoring (sensors A and B).

There is no pressure alarm monitoring for pressure sensors C as soon as at least one pump is building up pressure.

NOTE: The output *Motor running* on the interface *Standard I/O* is switched off as long as the corresponding pump is in the process of building up pressure.

When pressure build-up has been completed for all pumps for which this feature has been selected, meaning that the pressure setpoint has been reached, an indication appears in the status line on the control panel and a signal is switched via the interface *Standard I/O* or the field bus.

NOTE: The threshold switch is automatically deactivated as long as pressure build-up is enabled.

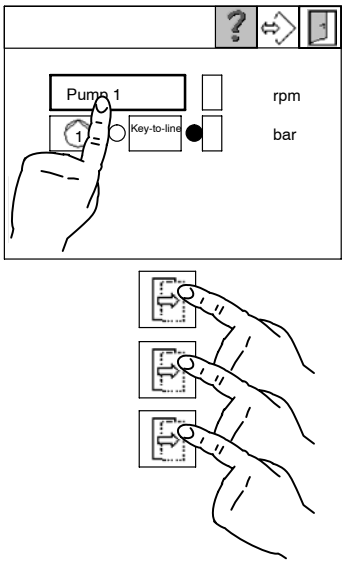


Fig. 4-106

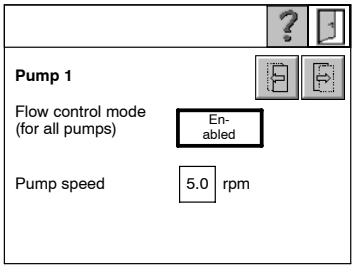


Fig. 4-107

Variation 1: Line stop signal

Enable pressure build-up feature and select condition for which the pressure build-up is to be started (here: *Line stop signal*).

The motors are speed-controlled during production. If the signal *Line stop* is switched via the interface *Standard I/O* or the field bus, the motors are pressure-controlled to the value *Setpoint for pressure build-up*.

As soon as the signal *Line started* is switched, the melter returns to speed-controlled mode.

Motor *(contd.)*

Screen 5: Pressure Build-up, Flow Control *(contd.)*

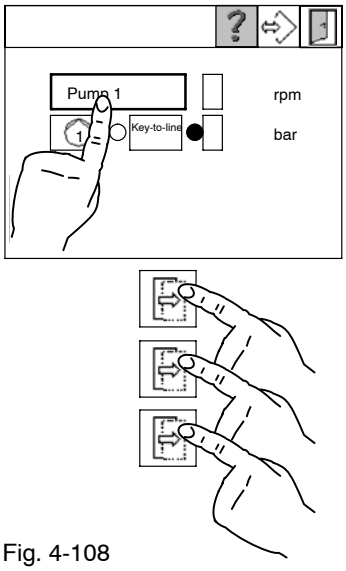


Fig. 4-108

Variation 2: Line speed

Enable pressure build-up feature and select condition for which the pressure build-up is to be started (here: *Line speed*).

The motors are speed-controlled during production. If the line speed signal falls below the value *Line speed value for activating pressure build-up*, the motors are pressure-controlled to the value *Setpoint for pressure build-up*.

As soon as the line speed signal exceeds the value plus 5% (15% in the example), the melter returns to speed-controlled mode.

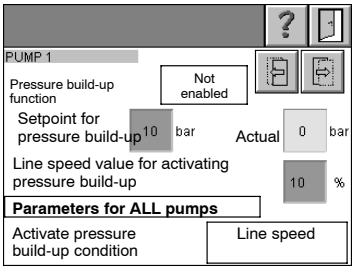


Fig. 4-109

Flow Control Mode

Variation 1: Line start/stop signal

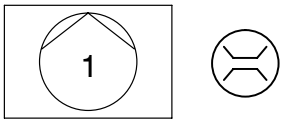
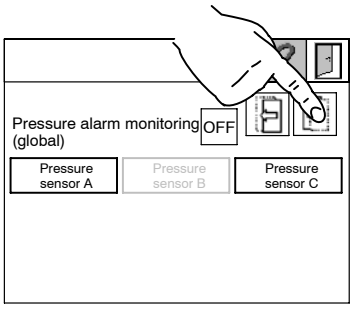


Fig. 4-110

The appearance of the motor LED changes from a single color to a symbol as long as the line stop signal is active (Refer to illustration).



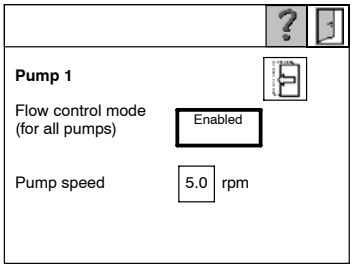


Fig. 4-111

This function allows the speed to be regulated to an adjustable value as soon as the parent machine stops. The signal at the interface *Standard I/O* or from the field bus is used.

The production line is running: The solenoid valve of the pneumatic pressure control valve is activated, and the pressure control valve is closed. The material quantity is determined by the speed set for key-to-line mode.

The production line is not running: The solenoid valve of the pneumatic pressure control valve is deactivated. The compressed air is reduced and the pressure control valve opens according to the reduced air pressure. The material flows through the pressure control valve and back into the tank. The motor turns at the preset value *Pump speed*, maintaining a minimum material pressure, since the gun is closed.

Variation 2: Motor not running signal

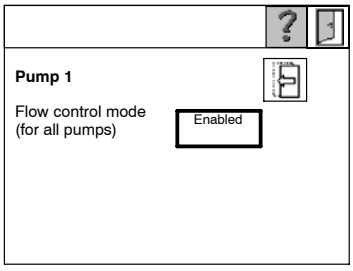


Fig. 4-112

This function allows the material pressure to be reduced through the pneumatic pressure control valve when the motor stops.

Motor running: The solenoid valve of the pneumatic pressure control valve is activated, and the pressure control valve is closed. The material quantity is determined by the speed set for key-to-line mode or manual mode.

Motor not running: The solenoid valve of the pneumatic pressure control valve is deactivated. The compressed air is reduced and the pressure control valve opens according to the reduced air pressure. The material flows through the pressure control valve and back into the tank. Since the motor is not running, the material pressure continues to decrease.

Motor Circuit Switch (Motor Maintenance Switch)

All motor controllers and motors are deenergized with the motor circuit switch.

This is important when, in the event of maintenance or repair, the melter and heaters must remain switched on but the motors absolutely may not turn.

Padlocks can be used to protect the motor circuit switch from being turned on by unauthorized personnel.

WARNING: It takes about three minutes for all of the motor controllers to be deenergized and actually be free of voltage. The LEDs on the motor controller are then off.

When the motor circuit switch has been turned off, the following text appears in the status line on the control panel: *Motor circuit switch open*.

NOTE: When maintenance or repair work has been completed, the motor circuit switch must be turned on again. It can then take up to 10 seconds before the motor controllers have initiated and indicated so to the control unit. The display in the status line does not change until this time has elapsed.

Operation via the IPC Webserver

- PC system requirements: Java Runtime Environment (Sun), version 1.1 or higher
- The server (IPC) and the client (HTML browser) are linked with a Ethernet cable (Cat5).

  NOTE: Use a cross-over cable for a direct connection between the PC and the IPC.

- Use a cable duct (P/N 7104405).
- Set up IP address. Refer to *Control Panel Overview – V21a.*

Setting up Connection Between the Server and the Client

WARNING: Switch off the melter with the main switch and disconnect from the line voltage.

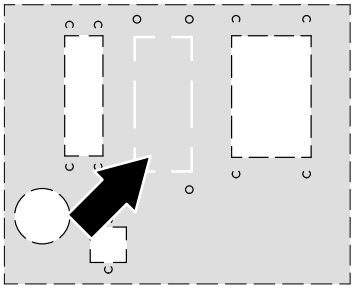


Fig. 4-113

Fig. 4-113 shows the area on the back of the melter intended to accommodate the cable.

1. Punch out perforated plate and remove.
2. Connect Ethernet cable.

NOTE: This EtherNet cable is not used to transfer data on the field bus, described in the separate document *Field Bus in Nordson Melters with IPC*.

Operation via the IPC Webserver *(contd.)*

Setting up Connection Between the Server and the Client (contd.)

Connecting Ethernet Cable

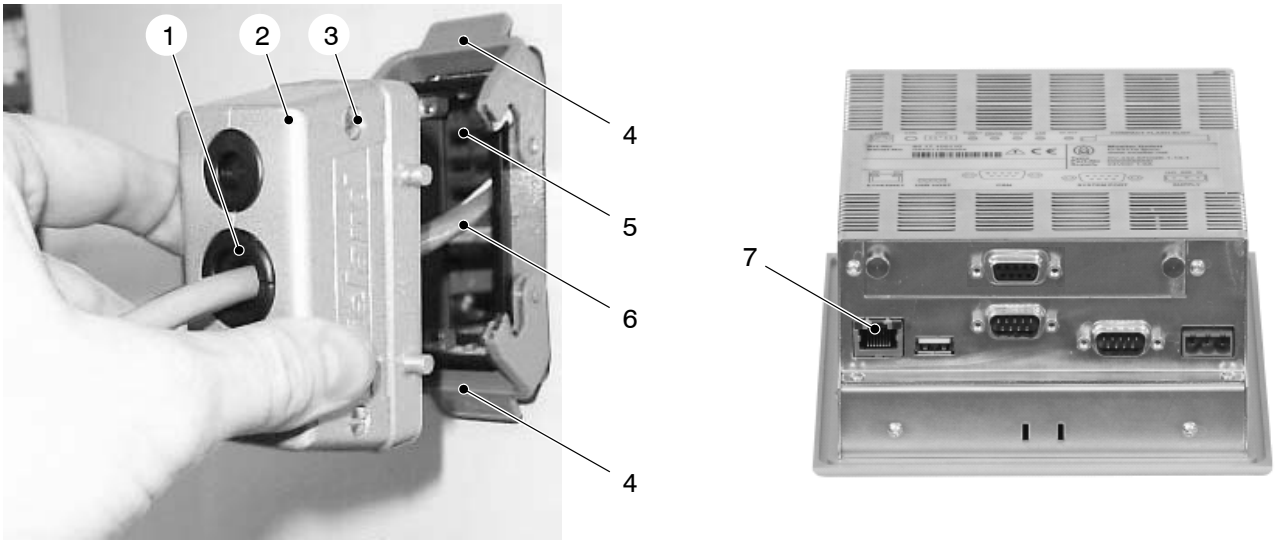


Fig. 4-114

1. Release clamps (4) and pull the socket casing (2) off of the casing plate (5) if necessary.
2. Screw the casing plate (5) onto the back of the melter.
3. Release screws (3) and open socket casing.
4. Slide one of the sealing rings (1) onto the EtherNet cable (6).
5. Guide the cable through the socket casing, then insert the cable and sealing ring in the socket casing and secure with a cable clamp.
6. Guide free end of EtherNet cable (6) through the casing plate.

   Connect the EtherNet cable (6) to the control panel (7). If necessary, refer to section *Repair, Detaching Control Panel*.
7. Screw the two halves of the socket casing together again, put into place on the casing plate and secure with clamps.
8. Close the electrical cabinet.
9. Connect the other end of the EtherNet cable to the PC.

CAUTION: Lay the cable outside of the melter such that there is no risk of stumbling over it.

10. Switch melter back on.
11. Call up melter.

Calling up Melter (VersaWeb)

1. Call up the melter in the browser with the configured address, for example http://192.168.0.99/.
   Refer toe *IP Address Setup* in this section.
2. The web server is protected. Refer to Appendix A of this manual for the user name and keyword to log on.
3. *Password* input in the next window can be skipped by pressing OK. Then the current control panel screen is displayed.

WARNING: Operation via the webserver and operation via the control panel are not mutually exclusive.

Download

Process parameters can be saved in recipes on the memory board (Refer to Fig. 4-54).

When the memory board has to be replaced, the recipe data can be transferred to the new memory board, if the recipe versions of the old and new software are compatible.

Please consult Nordson Engineering GmbH in Lüneburg to find out whether the versions are compatible.

NOTE: If incompatible recipes are uploaded to the control system (*Upload customer recipe*), they are not displayed on the control panel and can not be loaded.

Downloading recipes from the control system to the PC:

1. Click *Up-/Download* on the IPC Webserver.
2. All of the recipes are shown under *Download customer recipe*. Click on the desired recipe name and download the recipe (Fig. 4-115).
3. Repeat the process for additional recipes.

Operation via the IPC Webserver *(contd.)*

Setting up Connection Between the Server and the Client (contd.)

Upload

Upload transfers the recipe files from the PC to the new memory board.

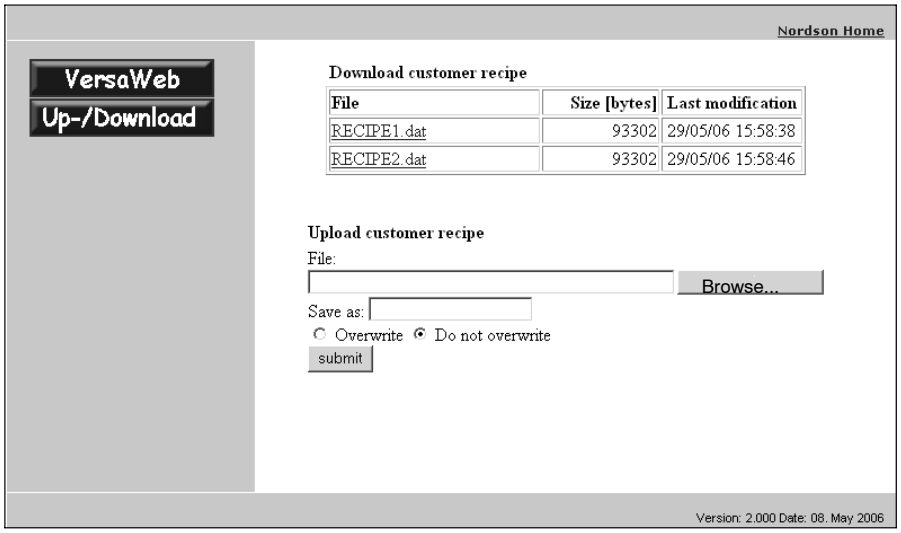


Fig. 4-115

Uploading recipe from the PC to the control system:

1. Click *Up-/Download* on the IPC Webserver.
2. Under *Upload customer recipe*, click on *Browse* and select the desired recipe (Fig. 4-115).
3. Enter a file name by *Save as* (max. 8 characters).
4. The file extension should be **.DAT**.
5. Then click on *submit*.
6. For more than one recipe, repeat steps 2. to 5..
7. Load the desired recipe on the control panel (Refer to section *Operation, Customer Setup, Recipes*)

Settings Record

Production information:

Material:	Manufacturer
	Processing temperature
	Viscosity

Cleaning agent:	Manufacturer
	Flash point

Processing temperatures (Setpoints):					
Grid (low melt)					
Reservoir (high melt)					
Filling valve	(Option)				
Hose	(accessory)	1)	2)	3)	4)
Gun	(accessory)	1)	2)	3)	4)
Air heater	(accessory)	1)	2)	3)	4)

Speeds / pressures (Setpoints):					
Pump	[min^{-1}]	1)	2)	3)	4)
Sensor A	[bar]	1)	2)	3)	4)
Sensor B	[bar]	1)	2)	3)	4)
Sensor	[bar]	1)	2)	3)	4)
Sensor	[bar]	1)	2)	3)	4)

Air pressures at gun (accessories):				
Control air	1)	2)	3)	4)
Spray air	1)	2)	3)	4)

Notes:

Name	**Date**

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 lifetime of the unit. It should not be neglected under any circumstances.

Risk of Burns

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

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

Relieving Pressure

WARNING: System and material pressurized. Relieve system of pressure before disconnecting hoses, guns and hot melt handguns. Failure to observe can result in serious burns.

Relieve pressure as described in section *Installation, Connecting Hose, Disconnecting*.

Important when Using Cleaning Agents

- Use only a cleaning agent recommended by the hot melt material manufacturer. Observe the Material Safety Data Sheet for the cleaning agent.
- Properly dispose of cleaning agent according to local regulations.

Processing Materials

Designation	Order number	Use
High temperature grease • Can 10 g • Tube 250 g • Cartridge 400 g	 P/N 394 769 P/N 783 959 P/N 402 238	To be applied to O-rings and threads **NOTE:** The grease may not be mixed with other lubricants. Oily/greasy parts must be cleaned before application.
Temperature-resistant adhesive *Loctite 640* • 50 ml	 P/N 290 359	Secures screw connections
Heat transfer compound *NTE303* • 1 g	 P/N 1023441	To improve heat conducting of temperature sensors

Preventive Maintenance

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

NOTE: Coupling and motor controller are maintenance-free.

Melter part	Activity	Interval	Refer to
Complete melter	External cleaning	Daily	5-4
	Inspect for external damage	Daily	5-5
	Purge melter with cleaning agent	When material is changed	5-6
Displays and lamps	Safety and function tests	Daily	5-5
Tank	Clean tank by hand	When there is material residue in tank	5-6
	Tighten fixing screws	Every 500 hours of operation	5-6
Safety valve	Activate piston	Monthly	5-6
Fan and Air filter	Check filter, clean or replace if necessary Clean fan screen	Depending on dust accumulation; daily if necessary	5-8

Melter part	Activity	Interval	Refer to
Heat exchanger, (option)	Clean Performance check Replace fan	Depending on dust accumulation; daily if necessary Daily Every 40000 hours	5-9
Power cable	Inspect for damage	Every time the melter is serviced	–
Air hoses	Inspect for damage	Every time the melter is serviced	–
Gear pump	Tighten the gland	After initial startup	5-10
	Check for leakage, tighten gland if necessary	Dependent on hours of operation, pump speed and pump temperature Recommendation: Monthly	5-10
	Tighten fixing screws	Every 500 hours of operation	5-10
Motor / gear box	Change lubricant	Every 15000 hours of operation or every 2 to 3 years	5-11
	Clean fan cover	Depending on dust accumulation; daily if necessary	–
Pressure control valve	Replace outer O-rings (service kit)	At the latest when leakage occurs	5-12
	Disassemble and clean	Every six months	Separate *Parts List*
Filter cartridge	Replace filter cartridge Disassemble and clean filter cartridge	Depending on degree of material pollution Recommendation: Every 1000 hours of operation	5-14
Safety valve plate	Replace O-rings (service kit)	When the safety valve plate is detached, at the latest when leakage occurs	5-16
Tank isolation valve	Replace O-ring (service kit)	When the tank isolation valve is detached, at the latest when leakage occurs	5-17
Safety valve for pneumatics	Performance check; clean or replace if necessary	Every six months	5-18
Pressure sensor	Calibrate	Once/year, more often when conditions dictate	Section *Operation*
	Check separating membrane for damage	Every time pressure sensor is removed, more frequently if necessary	–
	Check whether hardened or charred material is stuck to the membrane; clean separating membrane if necessary	Every time pressure sensor is removed, more frequently if necessary	5-19

Preventive Maintenance *(contd.)*

Melter part	Activity	Interval	Refer to
Filling valve (option)	Check control module detection hole; replace complete control module if necessary	When excess material seeps out of detection hole (seals in inside worn)	5-20
Level and overflow protection evaluators	Calibrate	Only when evaluator or level sensor is replaced	Section *Repair*

External Cleaning

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

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

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

Remove material residue only with a cleaning agent recommended by the material supplier. Heat with an air heater if necessary.

Remove dust, flakes etc. with a vacuum cleaner or a soft cloth.

Nordson recommends the orange cleaning agent P/N 771 192 (12 spray bottles, 0.5 liter each).

Control Panel

CAUTION: Set *Screen cleaning* (V20 in section *Operation*). This ensures that no functions are unintentionally triggered by touching the screen.

Clean the insides of the plastic frame on the control panel front regularly with a damp, soft cloth. Use caution to ensure that the surface is not scratched or scoured, particularly when removing hard residue and abrasive dust. Do not allow solvents to come into contact with the panel front; solvents could corrode the plastic frame.

Visual Inspection for External Damage

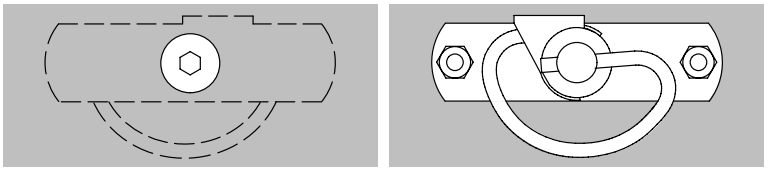
WARNING: When damaged parts pose a risk to the operational safety of the melter and/or safety of personnel, switch off the melter and have the damaged parts replaced by qualified personnel. Use only original Nordson spare parts.

Safety and Function Tests

During power up of the melter, the lights in the light tower are all switched on briefly as a test. The operator should check whether all lights function properly. Replace defective lamps.

Detaching Protective Panels

Open the protective panels with a 4 mm Allan key.



On the inside

Fig. 5-1

Detaching Insulation Blanket

1. Release Velcro and clamps.
2. Take insulation blanket out of hooks.

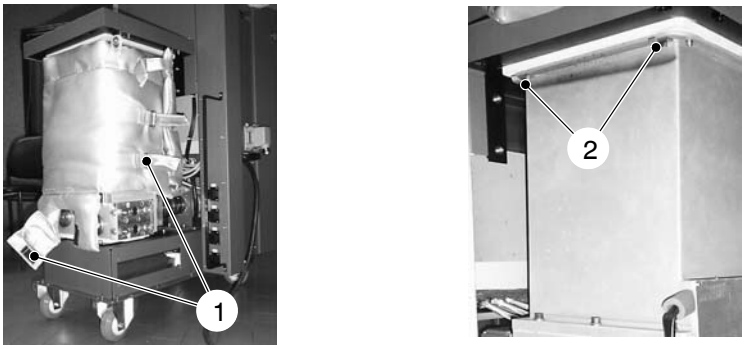


Fig. 5-2

Changing Type of Material

Remove old material from the melter (Refer to *Tank*, *Draining Material*).

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

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

NOTE: Properly dispose of the old material according to local regulations.

Purging with Cleaning Agent

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

Cleaning agent residue can be flushed out of the unit with new material before production begins again.

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

Safety Valve

Activate the safety valve piston once a month. This prevents the material from blocking the safety valve.

Procedure

1. Relieve melter of pressure as described in section *Installation*.
2. Disconnect all hoses.
3. Close hose connections with Nordson port plugs.
4. **Mechanical pressure control valves:** Measure insertion depth (Fig. 5-3) of setting screw (dimension X) and make a note. This ensures that insertion depth can be reproduced. Then close pressure control valve.
5. **Pneumatic pressure control valves:** Shut off compressed air. Operate the melter at full motor speed and with hose connections closed. Switch the motor on and off several times.

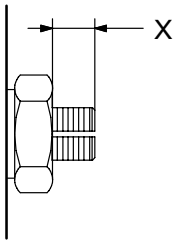


Fig. 5-3

Tank

Draining Material

Allow the melter pump(s) to run until the material has drained from the melter.

CAUTION: Do not feed charred material through the gun. Particles can block the gun. Instead unscrew the hose and feed the material out through the hose connection (Refer to section *Installation*).

If the Unit is Equipped with a Drain Valve (Option)

1. Place a container under the drain valve and open the ball valve.
2. Feed the material out of the drain valve and collect it.
3. Close the ball valve and dispose of the material properly according to local regulations.

Cleaning Tank by Hand

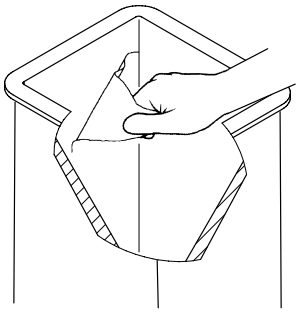


Fig. 5-4

Cold material can usually be peeled off of the sides of the tank (Refer to Fig. 5-4). If necessary, first heat tank to material softening temperature, approx. 70 °C / 158 °F.

NOTE: The inside of the tank is release coated. Do not use metallic tools to clean. Do not use wire brushes! This could damage the release coating.

Tightening Fixing Screws

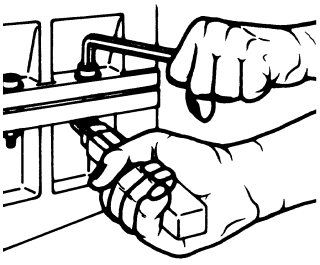


Fig. 5-5

Heating and cooling that occurs during daily operation can cause the fixing screws to loosen. Tighten screw as indicated in the table.

NOTE: Tighten fixing screws only using a torque wrench and when the melter is cold.

Connection	Thread	Torque
Tank / melter chassis	M 8	25 Nm / 220 lbin
Grid (low melt) / reservoir (high melt)	M 8	20 Nm / 177 lbin

Fan and Air Filter

Depending on dust accumulation, the filters (1 and 3) for the air inlet and outlet (4) must be cleaned (knocked out) or replaced.

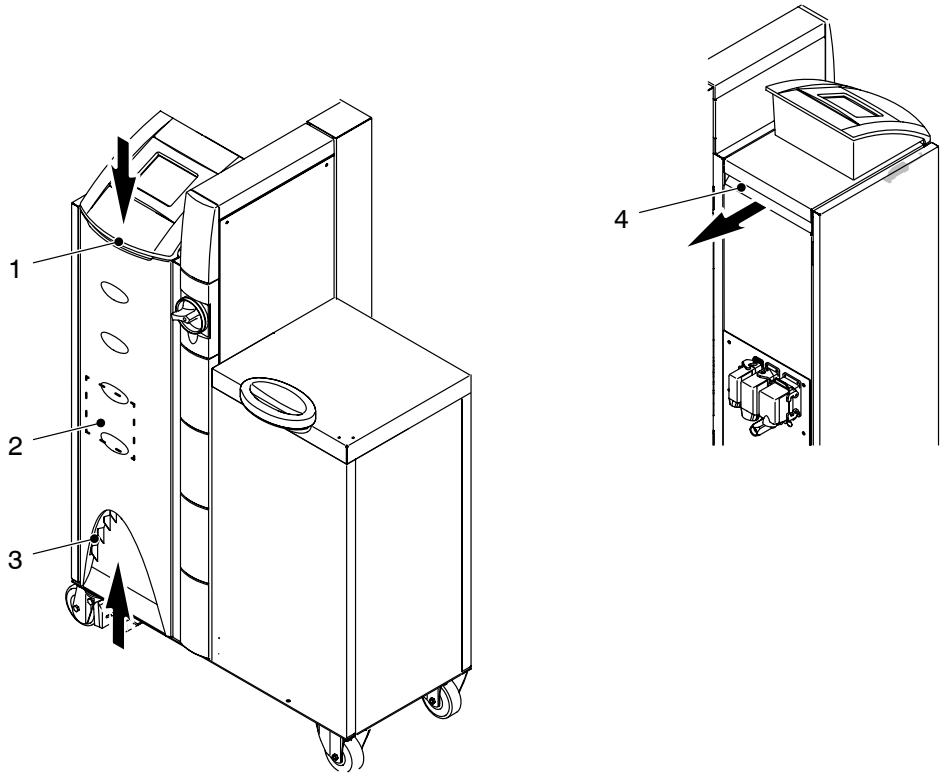


Fig. 5-6

1 Air filter, top air inlet
2 Fan
3 Air filter, bottom air inlet
4 Air filter, air outlet

Heat Exchanger

The melter can also be equipped with a heat exchanger. The frequency of cleaning is a factor of the actual situation (dust and dirt accumulation).

WARNING: Disconnect equipment from the line voltage.

Cleaning

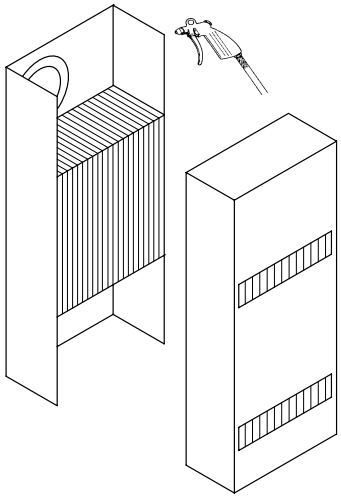


Fig. 5-7

1. Loosen the cover screws.
2. Remove the cover.
3. Clean the heat exchanger blades:
   a. Blow out the dry dust in the opposite direction of air flow during operation.
   b. Rinse out grease and oil residue with soapy water (max. 75 ˚C / 167 ˚F).

CAUTION: The detergent must be suitable for cleaning PVC, PE and silicone. Do not use acids! Ensure that the electrical connections are not exposed to the soapy water.

NOTE: Dry well.

4. Put cover back into place and screw on.

Performance Check

NOTE: The heat exchanger can cool the electrical cabinet properly only when the fans work. Two simple ways to check the performance of the fans are:

- Listen to whether the fans are operating.
- Feel whether air is flowing out of the electrical cabinet.

Defective heat exchangers must be replaced.

Replacing Fan

Nordson recommends replacing the fans in the heat exchanger after every 40000 hours of operation.

Gear Pump

Checking for Leakage

The gear pump is equipped with a self-sealing pump shaft seal. Material may seep out of the seal at irregular intervals. The gland must then be tightened.

NOTE: When 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.

Tightening Gland

NOTE: Tighten only when the melter and the pump are warm.

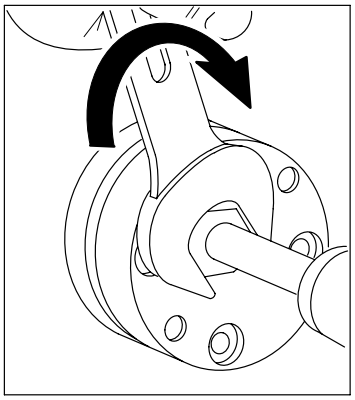


Fig. 5-8

Tighten the gland approx. ¼ of a revolution in the operating direction of the pump. If tightening is no longer possible, the gear pump must be replaced.

Pumps with Variseal™

NOTE: Pumps with Variseal™ differ from the pumps normally used in Nordson melters (with gland) in that the shaft sealing bush is longer. If the pump leaks, it must be replaced completely.

Tightening Fixing Screws

Normal heat cycling (heating and cooling) can cause the fixing screws to become loose.

NOTE: Tighten the fixing screws only when the melter and the pump are cold. Tighten only with a torque wrench (25 Nm / 220 Ibin).

Motor / Gear Box

WARNING: Before beginning work near the motor, switch off the melter or, when present, switch off the motor circuit switch (motor maintenance switch, option).

The only motor maintenance required is cleaning the fan cap.

Changing Lubricant

NOTE: Use only the stated lubricant or one that has proven to be equivalent (Refer to *Lubricant Selection*). Using any other lubricant can result in premature wear and/or damage to the gear box.

NOTE: Drain lubricant only when the melter is warm and the lubricant fluid.

Remove gear box from the motor to change lubricant. Wash out casing with suitable cleaning agent and remove lubricant residue.

NOTE: Properly dispose of the old lubricant according to local regulations.

Lubricant Changing Interval

Lubricant temperature is below 100˚C / 212˚F:
Every 15000 hours of operation or at least every 2 to 3 years.

Capacity

The lubricant quantity is indicated on the ID plate. Ensure that the upper gears and rolling bearings are properly lubricated.

NOTE: Different types of lubricant may not be mixed.

Motor / Gear Box *(contd.)*

Lubricant Selection

Lubricant manufacturer	Lubricant (Mineral oil CLP 220)
AGIP	Blasia 220
ARAL	Degol BMB 220 or Degol BG 220
BP	Energol GR-XP 220
DEA	Falcon CLP 220
ESSO	Spartan EP 220 or GP 220
KLÜBER	Klüberoil GEM 1-220
OPTIMOL	Optigear 220
SHELL	Omala Oil 220
TEXACO	Geartex EP-A SAE 85 W-90

Pressure Control Valve

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

WARNING: System and material pressurized. Relieve system pressure. Failure to observe can result in serious burns. Refer to section *Installation, Relieving Pressure*.

Important for Mechanical Pressure Control Valve

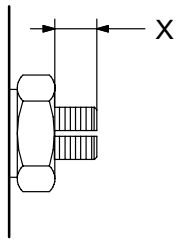


Fig. 5-9

NOTE: Screw in/out only when valve is warm and material is soft (approx. 70 °C / 158 °F, depending on material).

Measuring Insertion Depth

Measure and make a note of the insertion depth of the setting screw (dimension X). This way the insertion depth can be replicated after reassembly.

Adjusting Setting Screw

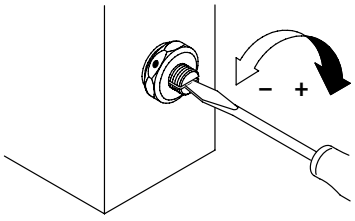


Fig. 5-10

Adjust the setting screw to the recorded dimension X.

- Turning clockwise increases material pressure.
- Turning counterclockwise decreases material pressure.

Installing Service Kit

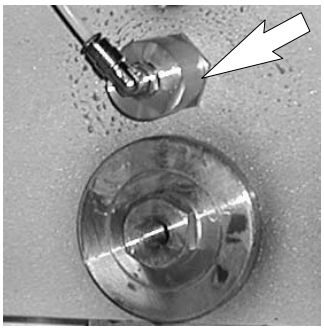
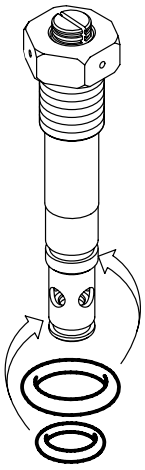


Fig. 5-11

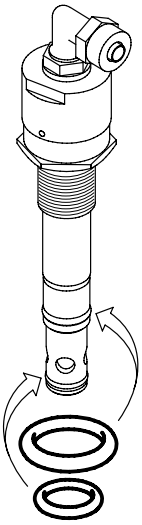
Each kit contains two O-rings and high-temperature grease.

Nordson recommends keeping a supply of pressure control valves on hand to prevent disruptions in production.

Mechanical pressure control valve	**Pneumatic pressure control valve (option)**
Service kit P/Ns: 394600	Service kit P/Ns: 394600
Required tools: Open-jawed wrench, size 24 Pliers Torque wrench	**Required tools:** Open-jawed wrench, size 27 Pliers Torque wrench



1. Heat melter to operating temperature. **WARNING:** Hot! Risk of burns. Wear appropriate protective clothing/equipment.	
2. Relieve melter pressure.	
–	3. Close compressed air supply.
4. Refer to *Measuring Insertion Depth*	4. Unscrew air hose.
5. Use an open-jawed wrench to screw out the pressure control valve, then extract with a pliers. ***If the tank is not empty:*** Collect any adhesive that may escape (bowl). Quickly screw in a replacement pressure control valve or a plug, then perform maintenance work.	
6. Remove old O-rings and disassemble and clean pressure control valve. Refer to separate *Parts List* for detailed drawing of the valve. **NOTE:** Disassemble valve only when warm.	
7. Install new O-rings. Apply grease to all threads and O-rings.	
8. Guide pressure control valve into the hole when the melter is warm and tighten with torque wrench. Torque: 15 Nm (133 lbin)	
9. Refer to *Adjusting Setting Screw*	9. Attach air hose.
–	10. Open compressed air supply again.



Filter Cartridge

Replacing Filter Cartridge

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

WARNING: System and material pressurized. Relieve system pressure. Failure to observe can result in serious burns.

Removing Filter Cartridge

Nordson recommends keeping a supply of filter cartridges on hand to prevent disruptions in production.

NOTE: Remove the filter cartridge when the melter is hot and not under pressure.

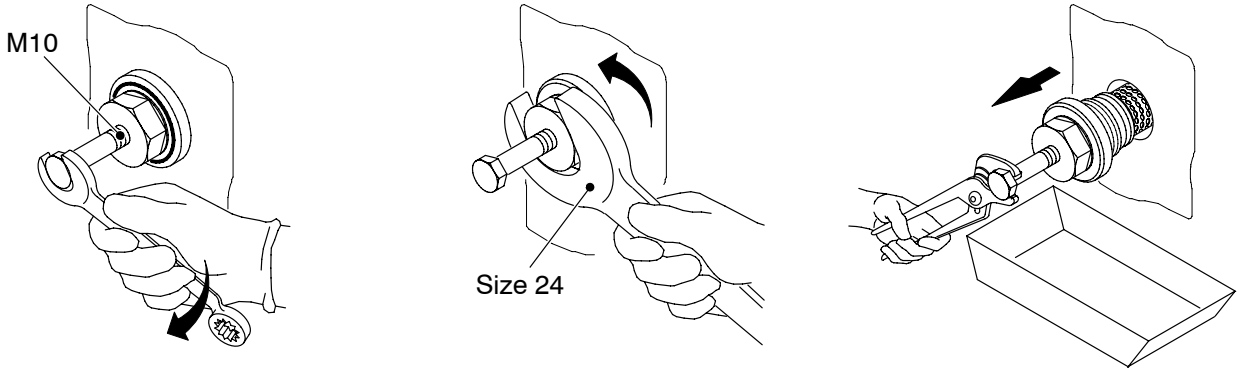


Fig. 5-12

CAUTION: Stop turning as soon as the thread is free; otherwise part of the filter cartridge could remain in the bore.

Use e.g. a pliers to extract the filter cartridge.

If the Tank is not Empty

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

1. Allow the unit to cool until the adhesive is somewhat viscous.
2. Use e.g. a pliers to extract the filter cartridge.
3. Collect any adhesive that may escape (bowl).
4. Quickly screw in a replacement filter cartridge or a plug, then clean the filter cartridge.

Cleaning Filter Cartridge

1. Disassemble the filter cartridge.
2. Use a cleaning agent to remove any adhesive residue that can not be removed mechanically.
3. Always follow the manufacturer's instructions when using cleaning agents!

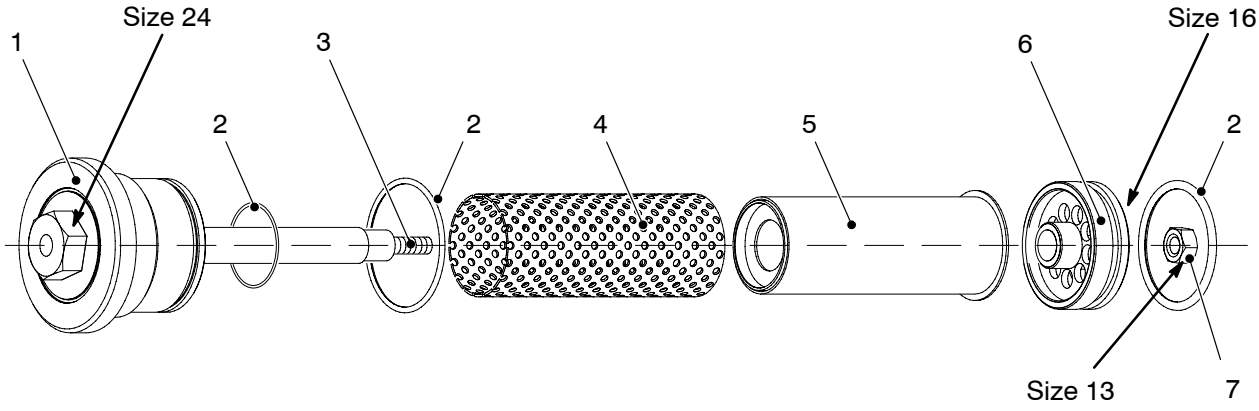


Fig. 5-13

1 Filter screw
2 O-ring
3 Thread
4 Filter sheath
5 Filter screen
6 Nut
7 Hexagon nut (locknut)

Assembling Filter Cartridge

1. Clamp the filter screw vertically in a vice.
2. Carefully inspect O-rings; replace if necessary.
3. Assemble the individual parts (Refer to illustration above).
4. Screw the nut (6, Fig. 5-13) onto the thread (3, Fig. 5-13) by hand. Use caution to prevent the filter screen from jamming.
5. Tighten with a torque wrench (size 16).
   Torque 14 Nm / 124 lbin.
6. Secure with a locknut; use a torque wrench (size 13).
   Torque 24 Nm / 212 lbin.

NOTE: Nordson recommends using a second wrench to brace the nut and prevent it from turning.

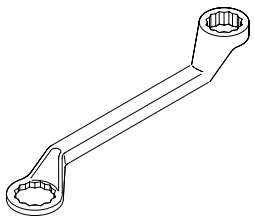


Fig. 5-14

Filter Cartridge *(contd.)*

Replacing Filter Cartridge (contd.)

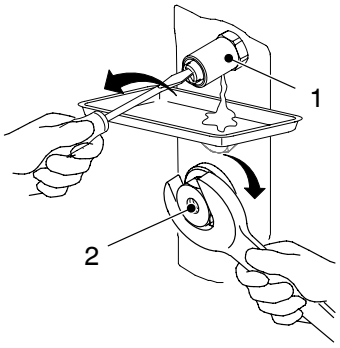


Fig. 5-15

Installing Filter Cartridge

NOTE: Install the filter cartridge only when the melter is hot.

1. Apply high temperature grease to all threads and O-rings (Refer to *Processing Materials* in this section).
2. Insert the filter cartridge (2, Fig. 5-15) in the filter bore and tighten somewhat.
   Torque 1 Nm / 8.85 lbin).

NOTE: The dragged in air must now be removed:

3. Place a container under the respective air relief valve (1, Fig. 5-15).
4. Use a screwdriver to turn the air relief valve screw counterclockwise and open the valve.
5. Allow the pump to run and feed material until it comes out free of bubbles.
6. Use a screwdriver to turn the air relief valve screw clockwise and close the valve.
7. Properly dispose of material according to local regulations.

Installing Service Kit

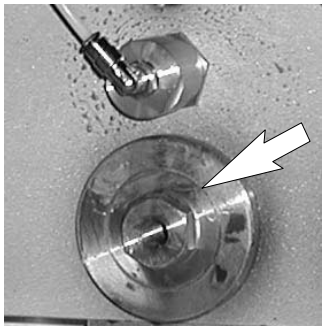


Fig. 5-16

Each kit contains three O-rings, filter sheath, filter screen and high-temperature grease.

Required tools:

Open-jawed wrench size 24 and torque wrench size 13 and size 16

Refer to *Replacing Filter Cartridge.*

Safety Valve Plate

Installing Service Kit

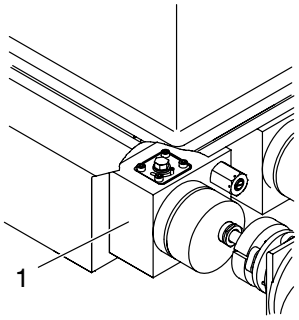
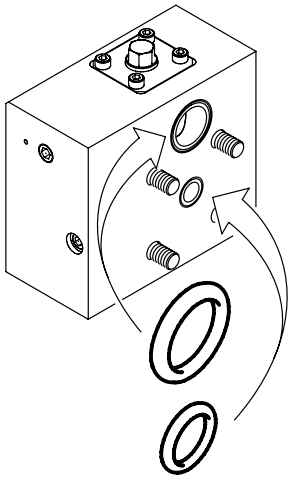


Fig. 5-17

Each kit contains two O-rings and high-temperature grease.

Service Kit, for P/N refer to separate *Parts List*.	
Required tools: Allan key, size 6 (torque wrench)	
	1. Heat melter to operating temperature. **WARNING:** Hot! Risk of burns. Wear appropriate protective clothing/equipment.
	2. Empty tank.
	3. Detach pump (Refer to section *Repair*).
	4. Release the four fixing screws M8 from the safety valve plate and remove plate.
	5. Remove old O-rings and when present, the filter screen in the suction hole.
	6. Clean sealing surfaces on tank, safety valve plate and pump.
	7. If there is one, clean filter screen and place in the groove again, or replace with a new filter screen (P/N 394072).
	8. Apply high temperature grease to O-rings and sealing surfaces. Attach O-rings.
	9. Screw on safety valve plate. Tighten the fixing screws crosswise using a torque wrench. Torque: 25 Nm / 220 lbin
	10. Attach pump (Refer to section *Repair*).
	11. Fill the tank.

Tank Isolation Valve

Installing Service Kit

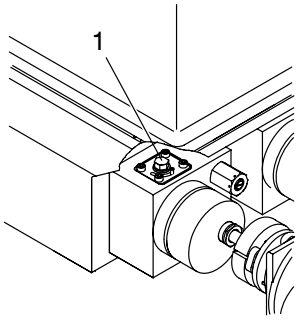


Fig. 5-18

Each kit contains one O-ring and high-temperature grease.

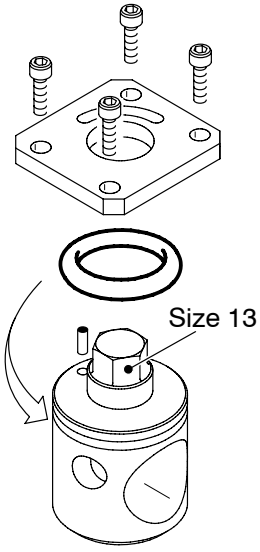
Service Kit, for P/N refer to separate *Parts List*.

Required tools:

Allan key, size 4

Pliers

Open-jawed wrench, size 13, to operate the tank isolation valve



1. Heat melter to operating temperature.

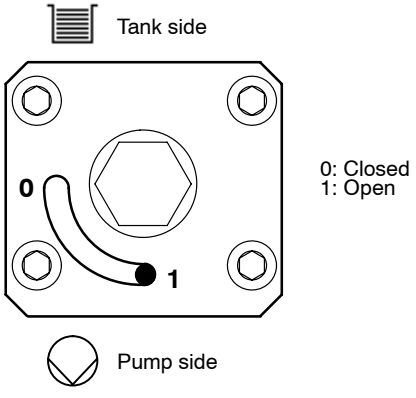
WARNING: Hot! Risk of burns. Wear appropriate protective clothing/equipment.

2. Empty tank.

3. Release four Allan screws M5 and lift off plate. Use a pliers to extract the tank isolation valve from the safety valve plate.

4. Remove old O-ring and clean tank isolation valve.

5. Apply high temperature grease to O-ring, then install again with tank isolation valve.



NOTE: Operate the tank isolation valve only when the melter has reached operating temperature.

Safety Valve for Pneumatics

The safety valves, preset at the factory and lead sealed, prevent higher pressurization than permitted of the subsequent pneumatic components. When the factory settings are exceeded, compressed air audibly escapes.

NOTE: The safety valves for the pneumatic options are located in the melter tower.

Performance Check

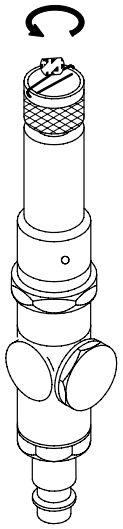


Fig. 5-19

The performance of the safety valve should be checked approx. every six months. Turn the knurled screw until compressed air audibly escapes. If the safety valve does not function properly, it should be cleaned. If it still does not function, it must be replaced.

NOTE: A defective safety valve may be replaced only with an original spare part. Only the manufacturer may perform repairs to the safety valve!

Cleaning

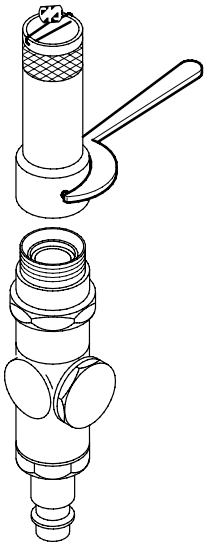


Fig. 5-20

Pollution that has penetrated fitting surfaces and conical nipples can be removed by unscrewing the entire top piece – without changing the minimum operating pressure. Use a sickle wrench to unscrew.

Pressure Sensor

Available only with options *Pressure display* and *Pressure control.*

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

Cleaning Separating Membrane

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

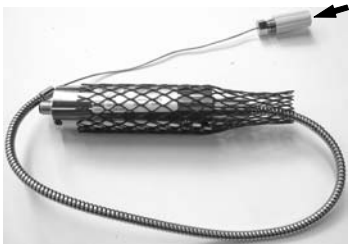
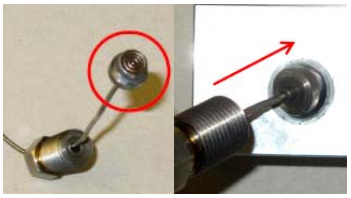


Fig. 5-21

CAUTION: Clean the separating membrane (arrow, Fig. 5-21) with particular care. Never use hard tools.

Whenever possible, remove material residue only with a cleaning agent recommended by the material supplier. Thermoplastic substances such as hot melt adhesive may need to be heated with a hot air fan and then carefully wiped off with a soft cloth.

Screwing in Pressure Sensor



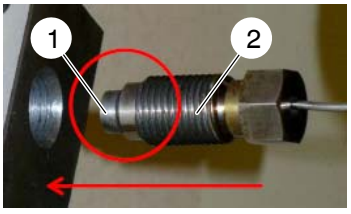


Fig. 5-22 Top wrong – bottom right

NOTE: The unit part and the pressure sensor should be at or near room temperature before the pressure sensor is screwed in firmly.

1. Apply high temperature grease to the thread (Refer to *Processing Materials*).
2. Only screw pressure sensor into a very clean hole.

NOTE: Do not tilt or jam when screwing into place.

Refer to Fig. 5-22: Top illustration wrong; bottom correct: The screw plug (2) is used as a guide for the separating membrane (1).

Recommended installation torque: 13.6 Nm / 120 lbin
Max. installation torque permitted: 56 Nm / 500 lbin

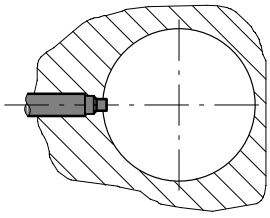


Fig. 5-23 Principle drawing

CAUTION: If the material hole is to be cleaned with a hard object, the pressure sensor must first be removed; otherwise the separating membrane would be damaged.

Filling Valve

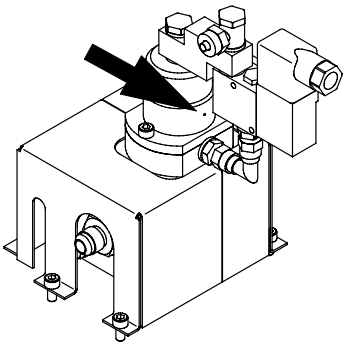


Fig. 5-24 Air relief hole

Available only with option *Level control with filling connection* (box 16, code B and P).

If material seeps out of the air relief hole, the control module must be replaced.

Replacing Control Module

Nordson recommends keeping a supply of control modules on hand to prevent disruptions in production.

NOTE: Replace only when control module is warm and material is soft (approx. 70 °C / 158 °F, depending on material).

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

1. Disconnect air supply and electrical connection.
2. Release screws M5 and extract control module from the warm filling valve.
3. Put new control module in place and tighten screws crosswise.
4. Re-connect air supply and electrical connection.

NOTE: Observe voltage shown on solenoid valve ID plate.

Control air pressure:

4 to 6 bar	400 to 600 kPa	58 to 87 psi

The quality of the compressed air must be at least class 2 in compliance with ISO 8573−1. This means:

- Max. particle size 30 μm
- Max. particle density 1 mg/m^3
- Max. pressure dew point − 40 ˚C
- Max. oil concentration 0.1 mg/m^3.

Maintenance Record Form

Unit part	Activity	Date	Name	Date	Name
Visual inspection of melter					
External cleaning of melter					
Tank					
Safety valve					
Fan and air filter					
Heat exchanger					
Gear pump					
Motor / gear box					

Unit part	Activity	Date	Name	Date	Name
Pressure control valve					
Filter cartridge					
Safety valve plate					
Tank isolation valve					
Pneumatic safety valve					
Pressure sensor					
Filling valve (option)					
Level and overflow protection evaluators					

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.

This section contains instructions on troubleshooting. The procedures described here cover only the most commonly occurring problems. If the information supplied here is not sufficient for solving the problem, please consult the Nordson representative.

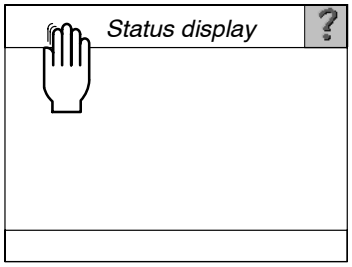
WARNING: Troubleshooting activities may sometimes have to be carried out when the unit is energized. Observe all safety instructions and regulations concerning energized unit components (active parts). Failure to observe may result in an electric shock.

Helpful Tips

Before starting systematic troubleshooting, check the following:

- Is the seven-day clock set correctly?
- Are all parameters set correctly?
- Is the interface wired correctly?
- In key-to-line mode: Is there a line speed signal provided?
- Do all plug connections have sufficient contact?
- Have circuit breakers been activated?
- Could the fault have been caused by an external PLC?
- Are external, inductive loads (e.g. solenoid valves) equipped with recovery diodes?

Alarm Number, Alarm Text and Optional Light Tower



The status display of the control panel indicates only *Warning*, *Fault* or *Shutdown*.

The special alarm text can be found under  (V2, Alarm log) or is shown directly when the line *Status display* is touched.

	Status	Light tower colors		
		Green	Yellow	Red
Status display	**Heatup phase**		●	
	(Motor) **startup protection** active	●	●	
	System ready	●		
	Standby active		●	
	Heaters off			
	Motor running	●		
	Pressure build-up completed	●		

Alarm no.	Status	Green	Yellow	Red
Status display	**Warning** The operator must decide whether the situation is critical for the application and action is required. The system remains ready for operation.			
4	IPC battery voltage low Coprocessor battery voltage low ○ Replace battery	●	●	
6	Service interval is expired	●	●	
11	Tank level is low	●	●	
12	Tank overfilled	●	●	
14	I/O board: incorrect software version ○ The firmware version of the I/O board installed is not compatible with the IPC program version		●	
22	*Channel:* Overtemperature warning ○ Refer to alarm no. 21 *Channel:* Overtemperature fault	●	●	
24	*Channel:* Undertemperature warning ○ Refer to alarm no. 23 *Channel:* Undertemperature fault	●	●	
41	Overpressure warning: Motor #, sensor # ○ Refer to *Troubleshooting Tables* in this section.	●	●	
42	Underpressure: Motor #, sensor # ○ Refer to *Troubleshooting Tables* in this section.	●	●	

Alarm no.	Status	Light tower colors		
		Green	Yellow	Red
Status display	**Fault** A fault switches off the motors. As soon as the fault is corrected, the motor startup protection is automatically activated.			
3	Command from field bus master missing in control mode *Field bus* or *Dual* ○ The transmission data block contains the illegal command = 0 ○ Field bus cable broken, defective or not connected ○ Interruptions in communication, e.g. if the master is not switched on ○ Defective or missing bus terminating resistor ○ The network was not set up properly ○ Sudden resets or crashes, e.g. due to electro-magnetic interference **NOTE:** Field bus data transmitted from the field bus master to the melter can be checked. Refer to *Checking Transmitted Field Bus Data*.			●
5	Temperature controller output short-circuit			●
10	Tank empty			●
16	Level sensor defective ○ 5-point sensor transmits a faulty signal			●
17	Level sensor failure ○ Broken wire at 5-point sensor			●
21	*Channel:* Overtemperature fault ○ Check wiring of temperature channels ○ Check wiring of temperature sensors (Sensor connected to correct channel?) ○ Correct temperature sensor type? (Also for external components?) ○ Temperature controlled system OK?			●
23	*Channel:* Undertemperature fault ○ Is temperature controller working/regulating? ○ Are the solid state relays being triggered? ○ Are the solid state relays switching through the line voltage? ○ Is the line voltage too low? ○ Heater defective? ○ Check wiring of temperature channels ○ Check wiring of temperature sensors (Sensor connected to correct channel?) ○ Correct temperature sensor type? (Also for external components?) ○ Temperature controlled system OK?			●

Continued...

Alarm Number, Alarm Text and Optional Light Tower

(contd.)

Alarm no.	Status	Light tower colors		
		Green	Yellow	Red
25	*Channel:* Sensor input open or sensor broken (Sensor = temperature sensor) ○ Hose/gun connected?			●
26	*Channel:* Sensor short-circuit (Sensor = temperature sensor)			●
31	Motor or controller overtemperature ○ Ambient temperature too high ○ Fan cap / cooling section dirty ○ Pump blocked by foreign matter ○ Pump operates too sluggish ○ Material too cold ○ Check motor controller wiring and output voltage			●
40	Overpressure fault: Motor#, sensor# ○ Refer to *Troubleshooting Tables* in this section.			●

Alarm no.	Status	Light tower colors		
		Green	Yellow	Red
Status display	**Warning or fault (operator can choose)**			
	When a **Warning** is issued, the operator must decide whether the situation is critical for the application and action is required.			
43	Safety valve open: Motor#	●	●	
	A **Fault** switches off the motors. As soon as the fault is corrected, the motor startup protection is automatically activated.			
43	Safety valve open: Motor#			●

Alarm no.	Status	Light tower colors		
		Green	Yellow	Red
Status display	**Shutdown** Shutdown turns the melter off (main contactor opens).			
1	Main contactor / thermostat fault ○ Main contactor defective or open Check wiring of main contactor and checkback contact ○ Transformer temperature exceeded ○ Temperature exceeded			●

Continued...

Alarm no.	Status	Light tower colors		
		Green	Yellow	Red
Status display	**Shutdown** Shutdown turns the melter off (main contactor opens).			
2	CAN bus not started ○ CAN bus cable defective (particularly at the motor controllers) ○ Check CAN bus plugs on all components ○ Check CAN terminating resistors Measure bus resistor when switched off (CAN-H, CAN-L): 60 Ω I/O board failure ○ Contact fault in voltage supply ○ Fuse(s) on board have activated ○ Incorrect or fluctuating operating voltage ○ The CAN bus address of the board was changed (dial) while the melter was operating. ○ Short-circuiting or potential faults at the plug connections X5, X10, X14, X15 of the I/O board. Temperature controller failure ○ Refer to *I/O board failure* Pressure sensor failure Controller fault: ○ Controller or controller CAN module defective ○ Controller not connected to CAN bus ○ Overload ○ Motor short-circuit Gateway failure ○ Contact fault in voltage supply or fuses have activated ○ Gateway defective or not connected to the serial subnet ○ Serial cable IPC to gateway *Subnet* defective ○ Bus terminating resistor missing or defective			●
13	Temperature controller: incorrect software version ○ The firmware version of the controller installed is not compatible with the IPC program version			●
20	*Channel:* Overtemperature shutdown			●
30	Motor: Phase missing			●
32	Motor: Coupling blocked or phase missing (motor current exceeds limit)			●
33	Controller: Faulty parameter file			●
34	Controller: No parameter file			●
35	Motor: Coupling broken			●
36	Controller: Wrong type ○ Hardware does not correspond to software configuration			●

Triggering and Resetting Alarms

Faults can trigger different alarms with various consequences. If several alarms are triggered at once, the most severe takes priority: *Shutdown* before *Fault* before *Warning*.

Graphic Presentation of Temperature Parameters

*****Refer to *Monitoring of Heatup and Cooling*

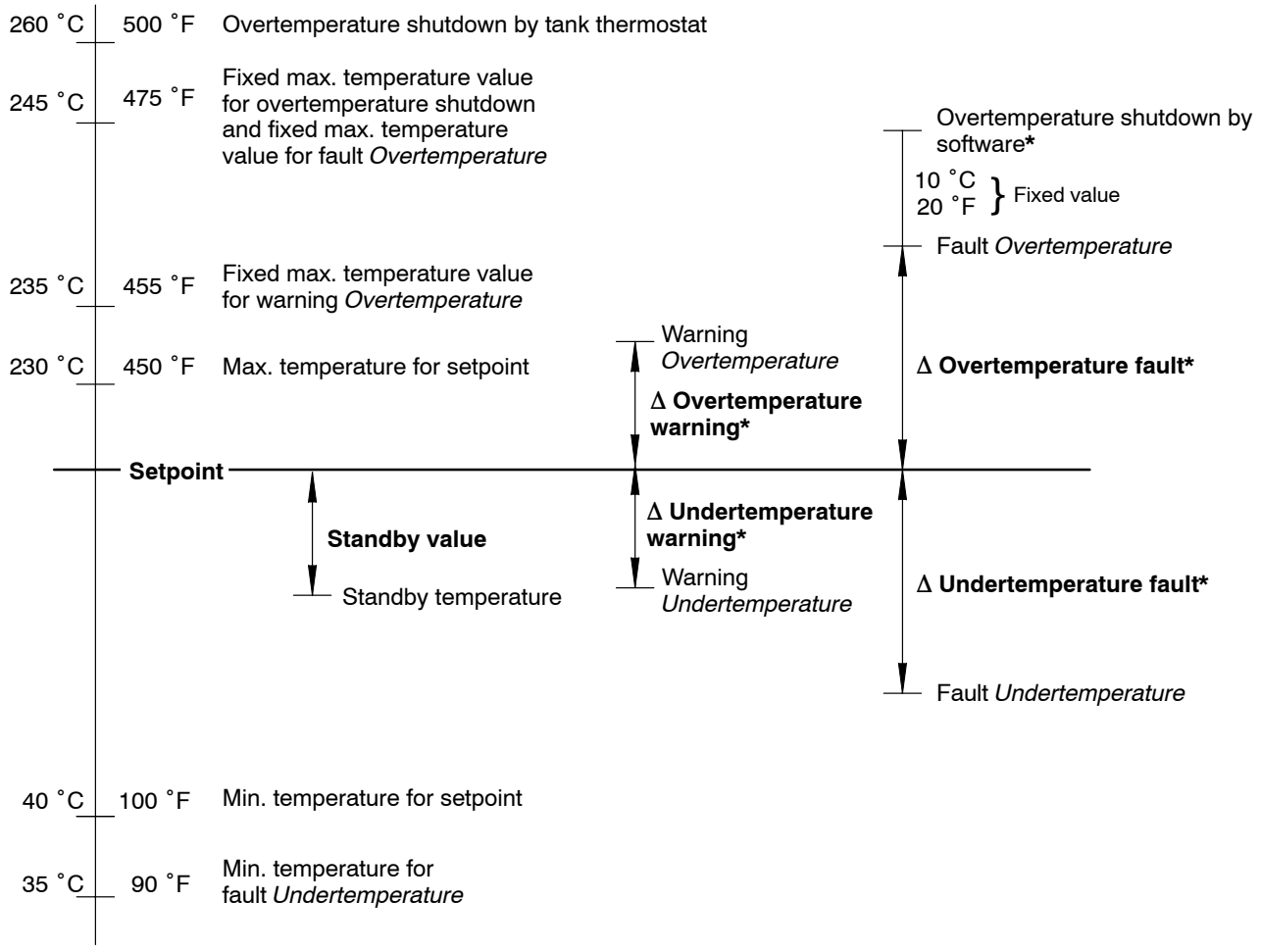
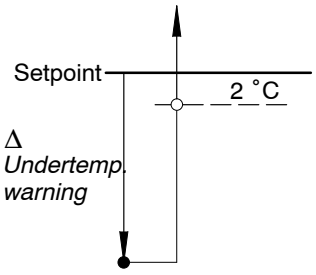


Fig. 6-1

Undertemperature and Overtemperature – Warning –

- ● Alarm Triggered
- ○ Alarm Reset



Undertemperature warning

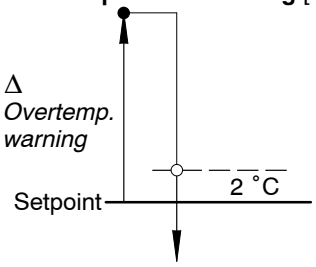
Undertemperature Warning Triggered

The temperature has fallen below the setpoint by more than the differential value (Δ) *Undertemperature warning delta* for longer than 5 seconds.

Automatic Reset

The temperature has increased to 2 °C (3.6 °F) below the setpoint.

Overtemperature warning [1]



Overtemperature Warning Triggered

[1] The temperature has exceeded the setpoint by more than the differential value (Δ) *Overtemperature warning delta* for longer than 5 seconds.

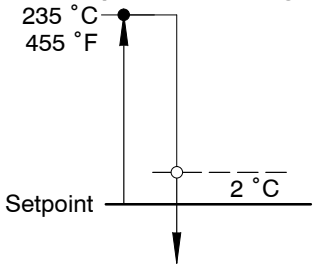
or

[2] 235 °C (455 °F) was exceeded for longer than 5 seconds.

Automatic Reset

The temperature has fallen to 2 °C (3.6 °F) above the setpoint.

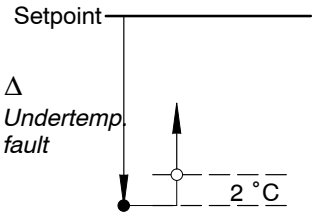
Overtemperature warning [2]



Triggering and Resetting Alarms *(contd.)*

Undertemperature and Overtemperature – Fault –

- ● Alarm Triggered
- ○ Alarm Reset



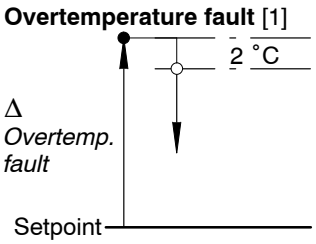
Undertemperature fault

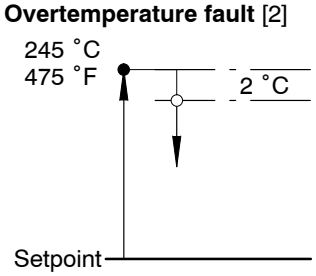
Undertemperature Fault Triggered

The temperature has fallen below the setpoint by more than the differential value (Δ) *Undertemperature fault delta* for longer than 5 seconds.

Automatic Reset

The temperature has exceeded the setpoint minus the differential value (Δ) *Undertemperature fault delta* by 2 °C (3.6 °F).





Overtemperature Fault Triggered

[1] The temperature has exceeded the setpoint by more than the differential value (Δ) *Overtemperature fault delta* for longer than 5 seconds.

or

[2] 245 °C (475 °F) was exceeded for longer than 5 seconds.

Automatic Reset

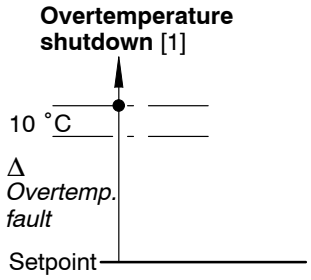
[1] The temperature has fallen below the setpoint plus differential value (Δ) *Overtemperature fault delta* by 2 °C (3.6 °F).

or

[2] The temperature has fallen below 243 °C (471 °F).

Overtemperature – Shutdown –

- Alarm Triggered



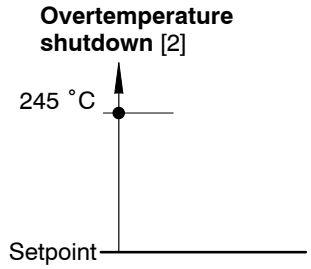
Software-triggered

[1] The temperature has exceeded the setpoint by more than the differential value (Δ) *Overtemperature fault delta* plus 10 ˚C (20 ˚F) for longer than 5 seconds.

or

[2] 245 ˚C (475 ˚F) was exceeded for longer than 5 seconds.

NOTE: Channels in display mode trigger shutdown only when they have reached the maximum temperature of 245 ˚C (475 ˚F).



Reset

Switch melter off/on with main switch.

Shutdown by Thermostats

Tank Thermostat

The thermostats are located behind the electrical equipment cover of the tank.

The shutdown value depends on the installed thermostat (Also refer to *Technical Data* for possible thermostats).

Transformer Thermostat

The shutdown temperature for all melters with transformer is 155 ± 5 ˚C / 311 ± 9 ˚F.

Reset

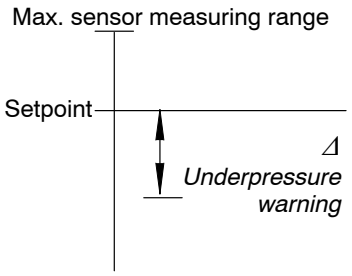
Switch melter off/on with main switch.

Triggering and Resetting Alarms *(contd.)*

Underpressure – Warning –

NOTE: The values for warnings and faults are absolute values in *Speed control* mode with the option *Pressure display*. With the option *Pressure control*, the values are differential values for sensors A and B and absolute values for the sensors C.

Underpressure Warning Triggered

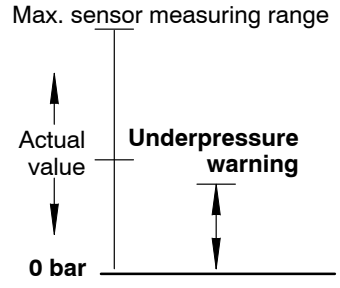


Pressure Control: Pressure Sensors A and B

The pressure has fallen below the setpoint by more than the differential value (Δ) *Underpressure warning* for longer than 20 seconds. The motor assigned to the pressure sensor has received all of the releases needed to run. However, the system must be ready for operation.

Automatic Reset

The pressure has exceeded the setpoint minus differential value (Δ) *Underpressure warning*.



Pressure Control: Pressure Sensors C
Speed control (pressure display): Pressure sensors A, B, and C

The pressure has fallen below the absolute value *Underpressure warning* for more than 20 seconds. The warning is indicated even if the system is not yet ready.

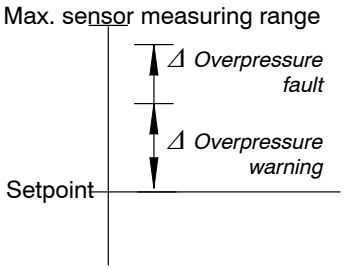
Automatic Reset

The pressure has exceeded the absolute value *Underpressure warning*.

Overpressure – Warning – / Overpressure – Fault –

NOTE: The values for warnings and faults are absolute values in *Speed control* mode with the option *Pressure display*. With the option *Pressure control*, the values are differential values for sensors A and B and absolute values for the sensors C.

Overpressure Warning Triggered

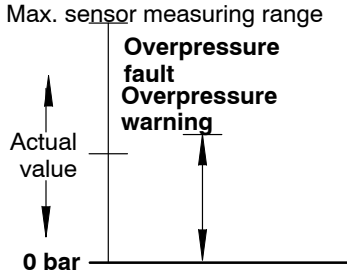


Pressure control: Pressure Sensors A and B

The pressure has exceeded the setpoint by more than the differential value (Δ) *Overpressure warning* for longer than 20 seconds. This warning is indicated even if the system is not yet ready.

Automatic Reset

The pressure has fallen below the setpoint plus differential value (Δ) *Overpressure warning*.



Pressure control: Pressure Sensors C
Speed Control (Pressure Display): Pressure Sensors A, B, and C

The pressure has exceeded the absolute value *Overpressure warning* for more than 20 seconds. This warning is indicated even if the system is not yet ready.

Automatic Reset

The pressure has fallen below the absolute value *Overpressure warning*.

Overpressure Fault Triggered

Pressure Control: Pressure Sensors A and B

The pressure has exceeded the setpoint by more than the differential value (Δ) *Overpressure fault* for longer than 60 seconds. This fault is indicated even if the system is not yet ready.

Automatic Reset

The pressure has fallen below the setpoint plus differential value (Δ) *Overpressure fault*.

Pressure Control: Pressure Sensors C
Speed Control (Pressure Display): Pressure Sensors A, B, and C

The pressure has exceeded the absolute value *Overpressure fault* for more than 60 seconds. This fault is indicated even if the system is not yet ready.

Automatic Reset

The pressure has fallen below the absolute value *Overpressure fault*.

Temperature Sensor – Fault –

Every temperature sensor is monitored.

Short-circuit-triggered

The temperature is lower than – 10 ˚C (14 ˚F) for more than 5 seconds.

Triggered by Broken Sensor or Open Sensor Input

The temperature is higher than 305 ˚C (581 ˚F) for more than 5 seconds.

Automatic Reset

When the temperature remains above – 10 ˚C (14 ˚F) or below 305 ˚C (581 ˚F) for longer than 5 seconds, or when the defective sensor has been replaced.

Level (Variable Measuring Points)

Warning Tank Overfilled

The warning is triggered as soon as the level has reached or exceeded 98% for longer than 5 seconds. This is a fixed internal value.

Automatic Reset

When the level falls below 90 %.

Warning Tank Level Low

NOTE: This warning can only be triggered when the melter heater is on.

As soon as the level has fallen below the set value for longer than 5 seconds, a warning is triggered. The value for this warning is set in the screen *Level* (Refer to *Operation / Control Panel – Overview – / V13*).

Automatic Reset

When the set value is exceeded.

Fault *Tank Empty*

The fault is triggered as soon as the level reaches or falls below 2 % for longer than 5 seconds. This is a fixed internal value.

Automatic Reset

When the level exceeds 5 %.

Level (Fixed Measuring Points – 5-point Sensor)

Warning Tank Overfilled

If the measuring point *Tank overfilled* is reached or exceeded for longer than 5 seconds, a warning is triggered.

Automatic Reset

When the level falls below the measuring point.

Warning Tank Level Low

When the level falls below the measuring point *Tank level low* for longer than 5 seconds, a warning is triggered.

Automatic Reset

When the measuring point is reached.

Fault Tank Empty

When the level falls below the measuring point *Tank empty* for longer than 5 seconds, a fault is triggered.

Automatic Reset

When the measuring point is reached.

Fault Level Sensor Defective

The level sensor transmits a faulty signal for longer than 5 seconds.

Fault Level Sensor Failure

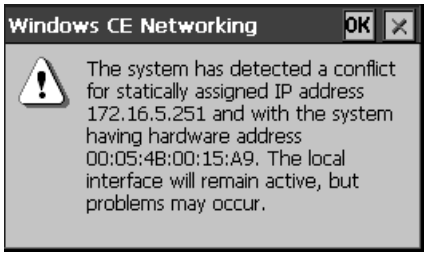
Triggered when a wire breaks.

Automatic Reset

After replacement of the defective sensor.

Troubleshooting Tables

Melter not Functioning

Problem	Possible Cause	Corrective Action
No line voltage	–	Connect line voltage
Main switch not switched on	–	Switch on main switch
Main switch defective	–	Replace main switch
Main circuit breaker activated	–	Switch on main circuit breaker
Main circuit breaker activated again	Check for short circuit in melter or accessories	–
24 V_{DC} power supply defective	–	Replace
IP address was assigned twice in the network		Check the IP addresses and set a unique IP address for each node

One Channel does not Heat

Problem	Possible Cause	Corrective Action
Channel is deactived	–	Activate the temperature channel on the control panel (or via the optional field bus)
The channel is assigned to a group, and the group is deactived or in standby	Check the state of the group in the screen *Switch application group(s)* (Refer to section *Operation*)	Activate the group via the control panel, or if set up so, via the Standard I/O interface.
Channel is in display mode	–	Switch to control mode

Control panel does not function

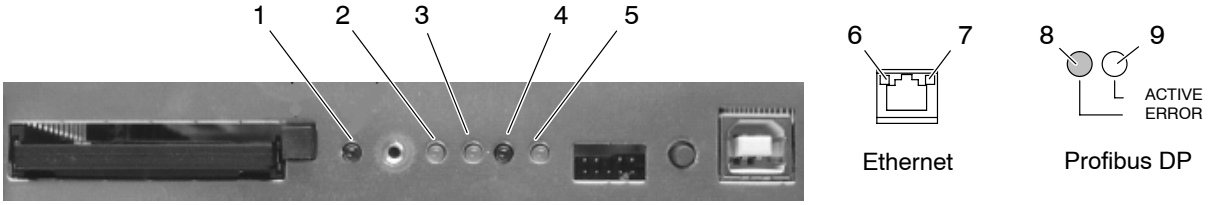


Fig. 6-2

1. CF ACT
2. CAN ACT
3. TOUCH ACT
4. TOUCH ERROR
5. SUPPLY OK
6. LINK (Ethernet)
7. ACT (Ethernet)
8. ERROR (Profibus DP)
9. ACTIVE (Profibus DP)

Problem	Possible Cause	Corrective Action
Does not start. Control panel dark or fault indications upon startup	No voltage: LED SUPPLY OK (5, Fig. 6-2) not illuminated.	Check voltage supply
	Memory board (CompactFlash) not in place	Insert as described in section *Repair, Replacing Memory Board*
Control panel dark or bright	Background lighting / contrast misadjusted	Set with ☼◑ (Refer to section *Operation*)
Control panel does not function/react	Hardware defective	Replace control panel For spare parts numbers, refer to the separate *Parts List* or to Appendix B (depending on the melter)
	Control panel dirty	Clean as described in section *Maintenance / External Cleaning / Control Panel*
No Ethernet connection Refer to the section *Operation, Operation via the IPC Webserver*	Wrong/invalid IPC IP address set	Correct the IP address on the control panel (Refer to section *Operation / Control Panel – Overview – / V21a*)
	Incorrect EtherNet cable plugged in	The LINK LED (6, Fig. 6-2) is illuminated when connected properly The ACT LED (7, Fig. 6-2) flashes when data is transferred properly Also refer to LEDs of the IPC in this section
	Missing/defective cables or components	Check connecting cable between IPC, EtherNet switch and coprocessor. Connect as shown in the system plan, if necessary.

No Material (Motor does not Rotate)

Problem	Possible Cause	Corrective Action
System not yet ready for operation	Undertemperature during heating phase	Wait until the melter has heated up and when appropriate until *System ready delay time* has expired (*System ready* appears in the status line).
Melter has lost system ready status	Undertemperature during operation Material was refilled	Wait until the melter is heated.
Motor not switched on	–	Switch on motor **NOTE: AND** link. Refer to *Initial Startup*, illustration ”Conditions for *Motor running* with and without interface *Standard I/O*”
Motor startup protection actived	Standby entered Undertemperature during operation	Switch on the motor(s) again
Speed (rpm) not set	The parameter *Max. pump speed* in key-to-line is on 1 min^{-1}	Set speed (rpm) (Refer to section *Operation / Control Panel – Overview – / M3*)
***Key-to-line* mode selected, however melter should be in manual mode**	–	Switch to manual mode
No external motor enabling via interface *Standard I/O*	–	Activate the corresponding contacts of the interface. To do this, the motor enable key must be set to *Control panel AND standard I/O*.
***Key-to-line* selected but no line speed signal present**	–	Provide line speed signal Check whether the type of input signal is the same as that selected on the control panel (analog/frequency)
Threshold switch not properly set	–	Check and set values on control panel
Standby entered	–	Exit or wait until standby period has expired

Continued...

Problem	Possible Cause	Corrective Action
Motor overheated	Ambient temperature too high	Decrease ambient temperature by cooling or airing out
	Fan cap dirty	Clean
	Pump blocked by foreign matter	Replace pump
	Pump operates too sluggish	Replace pump
	Material too cold	Set temperature accordingly
Motor defective	–	Replace
Motor not supplied with voltage	–	Technical inspection
Motor controller fault	⇒	Switch melter off and on again with main switch
	Motor overheated	Refer to *Motor overheated*
	Motor controller overheated	Decrease ambient temperature by cooling or airing out
		Clean cooling section of motor controller
	Short circuit	Check motor power
	Overload (pump blocked by foreign matter, pump too sluggish, material too cold)	Refer to *Motor overheated*
Motor controller defective	–	Replace **NOTE:** If more than one motor controller has been replaced, the screen *Motor controller replacement* appears. Refer to section *Repair, Replacing Motor Controller*.

No Line Speed Signal (Voltage / Current / Frequency)

Problem	Possible Cause	Corrective Action
Parent machine not operating	–	Start up parent machine
Polarity of line speed voltage input is reversed	–	Reverse polarity
Encoder defective	–	Replace

No Material (Motor Rotating)

Problem	Possible Cause	Corrective Action
Tank isolation valve closed	–	Open
Tank empty	–	Fill tank
Filter cartridge clogged	–	Clean or replace filter screen
Material supply hole to pump or pump suction hole clogged	Blocked by foreign objects/particles	Detach pump and clean supply hole or suction hole
	Blocked by unmelted material	Refer to table *Too Little Material (Large tank and large quantity of material)*
Heated hose or gun is cold	Hose/gun not connected electrically	Insert plug into the corresponding receptacle (Refer to wiring diagram for assignment)
	Hose/gun temperature channel not activated	Activate on control panel
	Hose/gun heater defective	Replace hose
		Replace heater cartridge(s) in gun

Too Little Material or Irregular Feeding

Problem	Possible Cause	Corrective Action
Material supply hole to pump or pump suction hole partially clogged	–	Detach pump and clean supply hole or suction hole
Tank isolation valve not completely open	–	Open
Filter cartridge partly clogged	–	Clean or replace filter screen
Pressure control valve defective	–	Clean or replace
Processing temperature set too low	–	Correct temperature setting
Pump block of the gear pump worn	–	Replace pump
Large tank and large quantity of material	Material is not completely melted	Set or increase the *System ready delay time* on the control panel

Material Pressure too High

Problem	Possible Cause	Corrective Action
Safety valve or pressure control valve dirty and thus blocked	–	Disassemble and clean or replace
Safety valve or pressure control valve defective	–	Replace
Pressure control valve set incorrectly	–	Set to default
Pneumatic safety valve (option) pressurized with too high pressure	–	Reduce pressure

Material Pressure too Low

Problem	Possible Cause	Corrective Action
Gear pump is worn	–	Replace pump
Safety valve does not close any more	–	Replace
Pressure control valve dirty and thus clogged	–	Disassemble and clean or replace
Pressure control valve defective	–	Replace
Pressure control valve set incorrectly	–	Set to default
Pneumatic safety valve (option) pressurized with too low pressure	–	Increase pressure

Incorrect Motor Rotation in Key-to-line Mode

Problem	Possible Cause	Corrective Action
Line speed signal fluctuates during constant machine speed	Encoder defective or loose contact	Replace
	Drive element (e.g. belt) slips	Eliminate slip

Material Residue in Tank

Problem	Possible Cause	Corrective Action
Tank setpoint temperature set too high	–	Correct temperature setting
	Material of low quality or not appropriate for application (temperature resistance poor)	Consult material supplier

Material Hardens in Tank

Problem	Possible Cause	Corrective Action
Tank setpoint temperature set too high	–	Correct temperature setting
Tank was not supplied with inert gas	–	Check whether material supplier has prescribed inert gas
	With the option *Inert gas equipment*	
	Inert gas bottle empty	Replace
	Inert gas control not activated	Check software configuration code: In box 22 there should be a G instead of an X.
		Check times for *Gas on duration* and *Gas off duration*
	Solenoid valve of inert gas equipment defective	Replace
		(The solenoid valve is in the melter tower on the pressure display)
	I/O board 1: Plug X7.1, X7.2	Check plug connection
	I/O board 1 defective	Replace

Filling Valve (Option)

Problem	Possible Cause	Corrective Action
No material	No compressed air to control module or compressed air set too low	Connect compressed air and set to correct value
	Control module defective	Replace control module
Filling valve does not heat	Temperature not set	Set on control panel of VersaBlue melter or on filling unit
	Plug not connected	**Regulating via VersaBlue** Connect to corresponding hose receptacle **Regulating via filling unit** Connect to hose receptacle
	Temperature sensor(s) defective	Replace
Filling valve does not reach set temperature	Heater cartridge(s) defective	Replace
Solenoid valve does not switch	Solenoid valve is not triggered or is defective	Trigger via customer's PLC or replace solenoid valve

Others

Problem	Possible Cause	Corrective Action
Leakage at pump shaft seal	Pump shaft seal is worn	Tighten the gland bolt
	–	Replace pump
Material pressure too low, output quantity too low	Gear pump is worn	Replace pump
Gear pump blocked	Processed material too cold	Correct temperature setting (observe data sheet of material manufacturer)
	Foreign material in gear pump	Replace pump
Leakage at gun during heatup phase	Safety valve does not open (expansion pressure)	Replace safety valve

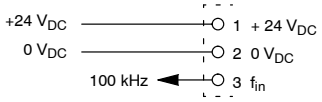
Continued...

Others *(contd.)*

Problem	Possible Cause	Corrective Action
Overflow protection (option) is activated, although level has fallen below sensor	Material residue stuck to sensor causes the alarm	If overflow protection is triggered, the fault must be acknowledged. As soon as the level has fallen below the sensor, it must be cleaned to prevent material residue from immediately triggering another alarm.
The 5-point level sensor transmits a faulty signal, causing the fault *Level sensor defective*	The sensor can not determine a constant level at the measuring points	Material residue is stuck to the upper measuring point. Remove residue.
	A block of material is added that is too far from the sensor.	Increase sensitivity if needed (Refer to *Replacing 5-point Sensor Evaluator (Option) / Calibrating* in the section *Repair*)
	Granulate was poured into the tank but not distributed evenly	Distribute such that the granulate is spread evenly around the sensor
Fault *Level sensor failure* at 5-point level sensor	Wire broken or not plugged in	Refer to *5-point Sensor Evaluator LEDs* to determine which cable is faulty
Melter always switches to the state *Shutdown*	One or more control components on the CAN bus have failed	Check, replace if necessary
	CAN bus terminating resistors not connected properly	Terminate CAN bus on both ends (*Temperature control board – motor controller* or *Temperature control board – pressure sensor*) with resistance as shown in the wiring diagram.
IPC does not find CAN bus pressure sensor	The pressure sensor in question was already used in a different place and was not removed properly from the CAN bus.	Switch off the sensor on the control panel as described in *Assigning New CAN Bus / Analog Sensor* (section *Operation*) so that the IPC can assign the new, correct CAN address.
Control panel always shows 0 (analog pressure sensor)	No sensor is connected, and 0 volt means ”no pressure.”	Connect sensor and assign on control panel (Refer to section *Operation*)

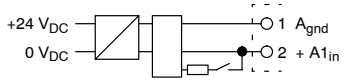
I/O Board

Frequency Input

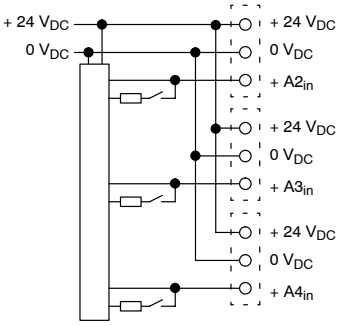


X14.3	One line speed signal for all motors (I/O board #1)

Analog Inputs



X4.2	One line speed signal for all motors (I/O board #1)

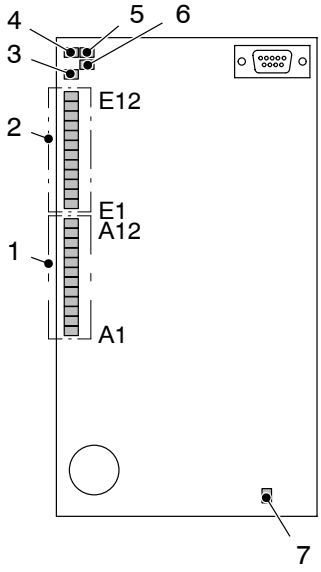


X5.3	Level sensor (I/O board #1)

X10	Line speed signal for motor 1 (I/O board #1)
X10	Line speed signal for motor 3 (I/O board #2)

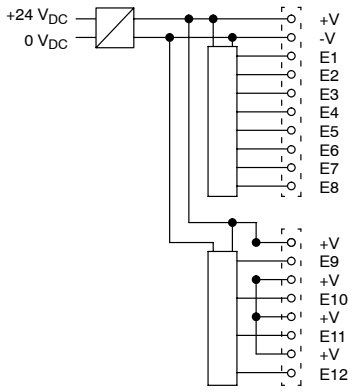
X15	Line speed signal for motor 2 (I/O board #1)
X15	Line speed signal for motor 4 (I/O board #2)

Digital Inputs/Outputs (LEDs)

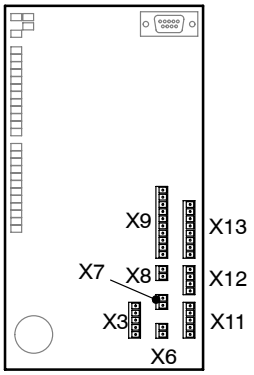


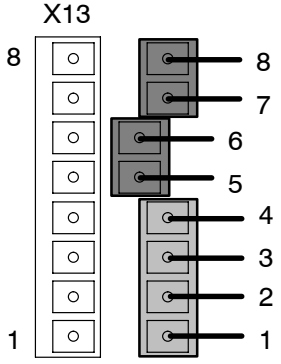
Digital outputs LEDs (1)	Lit for active output
Digital inputs LEDs (2)	Lit for active input
FIN LED (3)	Lights as soon as pulses > 1 Hz at frequency input
RUN LED (4)	Lit when power is ON (melter switched on) Flashing during operation
CAN communication (5)	Lights up as soon as communication occurs at CAN bus
CAN error (6)	Lit with communication fault
Fuse (7)	Lit when 24 V_{DC} supply to internal outlets OK

I/O Board #1: Digital Inputs (24 V_{DC})



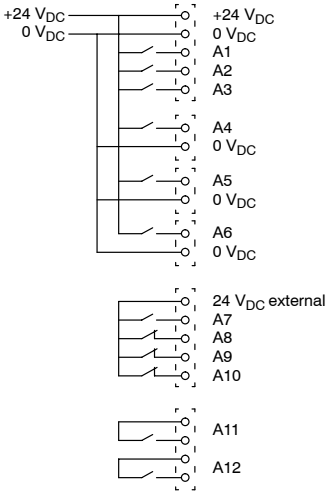
Plug	LED	Meaning
X9.3	E1	Heaters on/off
X9.4	E2	All motors on/off (collective enable)
X9.5	E3	Enable *Motor 1*
X9.6	E4	Enable *Motor 2*
X9.7	E5	Enter/exit *Standby*
X9.8	E6	Switch between *manual mode / key-to-line*
X9.9	E7	Application group 1
X9.10	E8	Application group 2
X13.2	E9	Application group 3
X13.4	E10	Application group 4
X13.6	E11	Main switch (main contactor)
X13.8	E12	Motor circuit switch





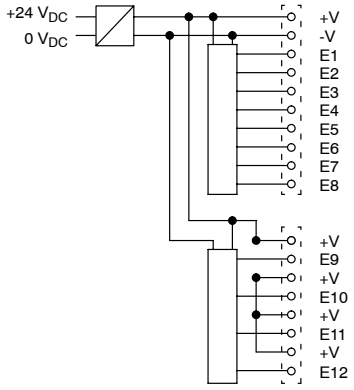
Split Plug Model

I/O Board #1: Digital Outputs (30 V, 2 A)



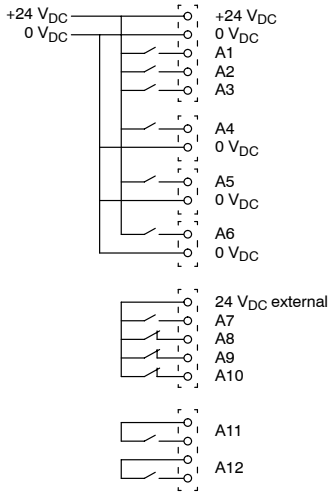
Plug	LED	Meaning
X3.3	A1	Light tower: Green lamp *System ready*
X3.4	A2	Light tower: Yellow lamp *Warning*
X3.5	A3	Light tower: Red lamp *Fault*
X6.1	A4	Main contactor
X7.1	A5	Inert gas control (solenoid valve)
X7.2		
X8.1	A6	Pressure build-up completed
X11.2	A7	System ready
X11.3	A8	General alarm –warning–
X11.4	A9	General alarm –fault–
X11.5	A10	*Reserved*
X12.1	A11	Fill tank
X12.2		(signal at interface XS2)
X12.3	A12	Fill tank
X12.4		(signal at interface XS3)

I/O Board #2: Digital Inputs (24 V_{DC})



Plug	LED	Meaning
X9.3	E1	Enable *Motor 3*
X9.4	E2	Enable *Motor 4*
X9.5	E3	Line started / stopped
X9.6	E4	Reserved
X9.7	E5	Safety valve 1
X9.8	E6	Safety valve 2
X9.9	E7	Safety valve 3
X9.10	E8	Safety valve 4
X13.2	E9	Coupling monitoring *Motor 1*
X13.4	E10	Coupling monitoring *Motor 2*
X13.6	E11	Coupling monitoring *Motor 3*
X13.8	E12	Coupling monitoring *Motor 4*

I/O Board #2: Digital Outputs (30 V, 2 A)



Plug	LED	Meaning
X3.3	A1	*Reserved*
X3.4	A2	*Reserved*
X3.5	A3	Pneumatic pressure control valve 1 or 1 and 2 with double-stream pumps
X6.1	A4	Pneumatic pressure control valve 2 or 3 and 4 with double-stream pumps
X7.1	A5	Pneumatic pressure control valve 3 or 5 and 6 with double-stream pumps
X8.1	A6	Pneumatic pressure control valve 4 or 7 and 8 with double-stream pumps
X11.2	A7	*Reserved*
X11.3	A8	*Reserved*
X11.4	A9	*Reserved*
X11.5	A10	*Reserved*
X12.1	A11	Pressure buildup completed
X12.2		
X12.3	A12	*Reserved*

LEDs of Temperature Control Board

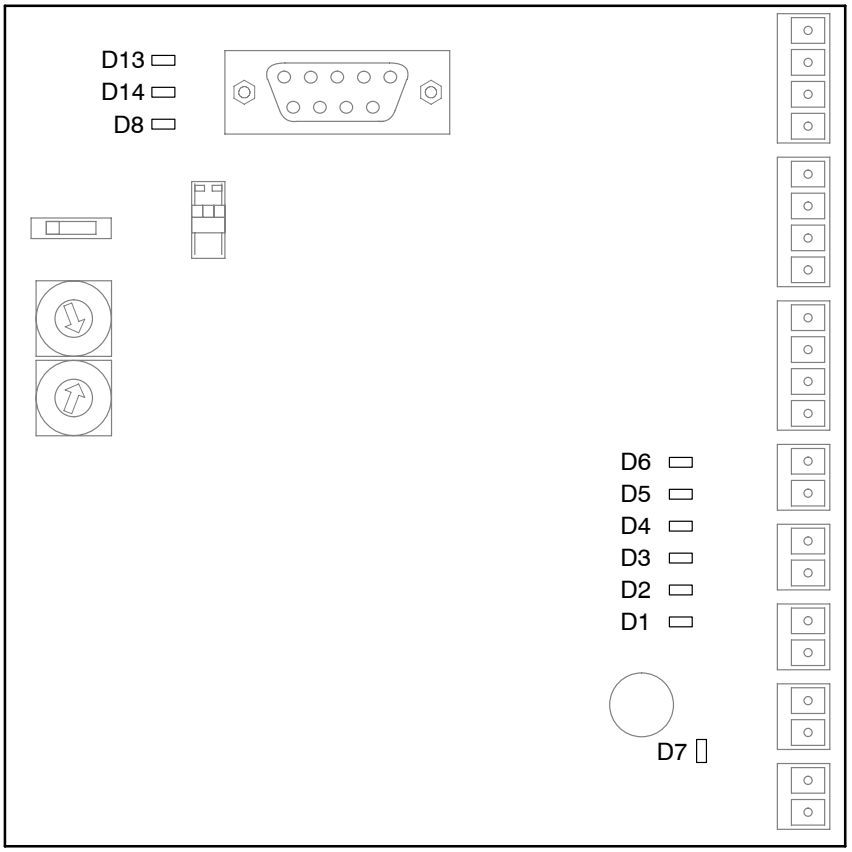


Fig. 6-3

LED	Meaning
D7	Operating voltage present
D8	CAN data received or transmitted
D14	No connection to control unit (IPC)
D13	Lit: Controller software reset Flashing: CAN fault counter overflow, stack error, power down not finished properly
D1	Heater output of the first channel is switched on.
D2 (... D6)	Heater output of the second (... sixth) channel is switched on.

LEDs of Motor Controller

LED		Operating mode
Green	**Red**	
On	Off	Motor controller enabled
On	On	Mains switching and automatic start blocked
Flashing	Off	Motor controller blocked
Off	Flashing (every 1 s)	Fault message Motor controller is being parameterized
Off	Flashing (every 0.4 s)	Overvoltage or undervoltage shutdown
Off	Off	Missing voltage supply

LED of Overflow Protection Evaluator

LED		Fault
Red (LED *Full*)	Flashing	Sensor break Sensor plug disconnected Operational ground not connected (Refer to section *Repair* for correct connection).
Refer to section Repair for additional LEDs and LEDs for level evaluator.		

LED of Proportional Valve

LED	Operating mode
Red	Operating voltage present
Green	Pressure achieved

LED's of 5-point Sensor Evaluator

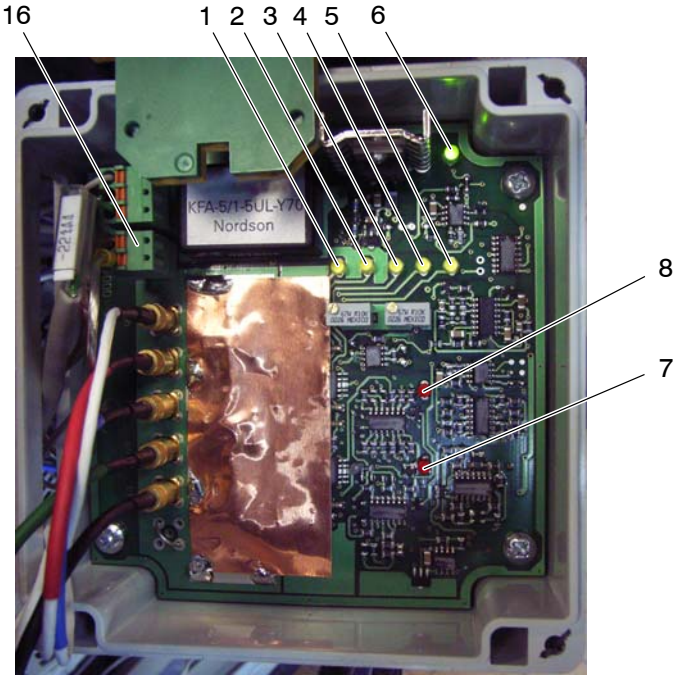


Fig. 6-4

LED			Fault or mode	Sensor cable color
1	Yellow	On	Material covering 1st measuring point *Tank empty*	White (wh)
2	Yellow	On	Material covering 2nd measuring point *Tank level low*	Red (rd)
3	Yellow	On	Material covering 3rd measuring point *Start filling*	Blue (bl)
4	Yellow	On	Material covering 4th measuring point *Stop filling*	Green (gn)
5	Yellow	On	Material covering 5th measuring point *Tank overfilled*	Black: (bk)
6	Green	*Power* On	Supply voltage present	–
7	Red	*Fault LED 2* On	Same as the fault indication *Level sensor defective* Switching sequence mixed up. Sensor cables exchanged. Observe colors!	–
8	Red	*Fault LED 1*	Same as the fault indication *Level sensor failure*	–
		On	Broken wire at highest or lowest measuring point	–
		Flashing	Broken wire at highest and lowest measuring point or Operating ground *BE* (16, Fig. 6-4) connection interrupted	–

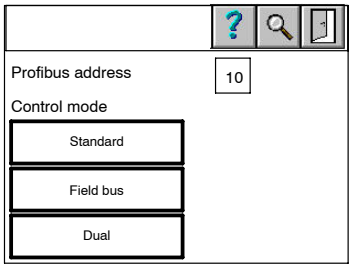
LEDs of IPC

Fig. 6-5

1. CF ACT
2. CAN ACT
3. TOUCH ACT
4. TOUCH ERROR
5. SUPPLY OK
6. LINK (Ethernet)
7. ACT (Ethernet)
8. ERROR (Profibus DP)
9. ACTIVE (Profibus DP)

Pos.	LED		Meaning
1	CF ACT (red)	Flashes briefly	(Internal) access to memory board
2	CAN ACT (green)	Flashes briefly	CAN active (data traffic)
3	TOUCH ACT (green)	Lit	Control panel (touch panel) ready
		Flashing	When control panel is touched
		off	During booting
4	TOUCH ERROR (red)	Lit	During booting, otherwise fault
		Flashing	Control panel dirty
		off	Control panel (touch panel) ready
5	SUPPLY OK (green)	Lit	Energized
6	LINK (green)	Lit	EtherNet connected and detected
7	ACT (yellow)	Flashing	EtherNet active (data traffic)
8	ERROR	Lit	Command from field bus master missing: Field bus cable broken, defective or not connected Interruptions in communication, e.g. if the master is not switched on Defective or missing bus terminating resistor The network was not set up properly Sudden resets or crashes, e.g. due to electro-magnetic interference
9	ACTIVE	Flashing	Profibus active (data traffic)

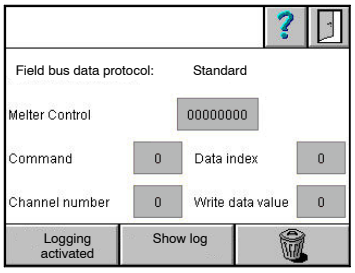
Checking Transmitted Field Bus Data



Introductory screen (example) *Profibus setup*

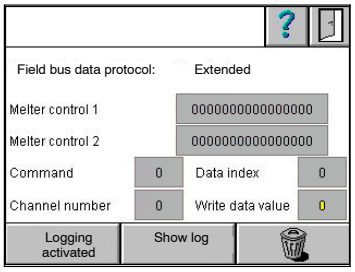
Touch  to access the information on the field bus data protocol.

The field bus data shown is a factor of the field bus data protocol used, which was selected under *Melter configuration*.



When *Standard* is used:

- *Melter control*, binary value
- *Command*, decimal value
- *Data index*, decimal value
- *Channel number*, decimal value
- *Write data value*, decimal value.

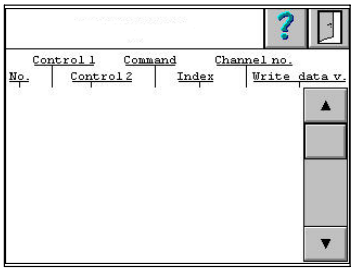


When *Extended* is used:

- *Melter control 1*, binary value
- *Melter control 2*, binary value
- *Command*, decimal value
- *Data index*, decimal value
- *Channel number*, decimal value
- *Write data value*, decimal value.

This data forms a data set. Every change in the data set is recorded when logging is activated (key *Logging activated*).

NOTE: In exceptional cases, logging may not be able to keep up with the speed of the data changes. Logging ends automatically as soon as there would be a gap in the log.



The most recently recorded changes in the data set can be displayed (key *Show log*).

NOTE: Melter control, hexadecimal display in this case

- *No.* = Data set counter, decimal value from 1 to 99

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.

Risk of Burns

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

Some melter components can only be detached when the melter is heated up.

Observe Before Performing Repairs

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

WARNING: Disconnect equipment from line voltage before any repairs.

Relieving Pressure

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

Relieve pressure as described in section *Installation, Connecting Hose, Disconnecting*.

Control Panel

CAUTION: When a melter has no communication assembly, operate only with the cover to protect the slot.

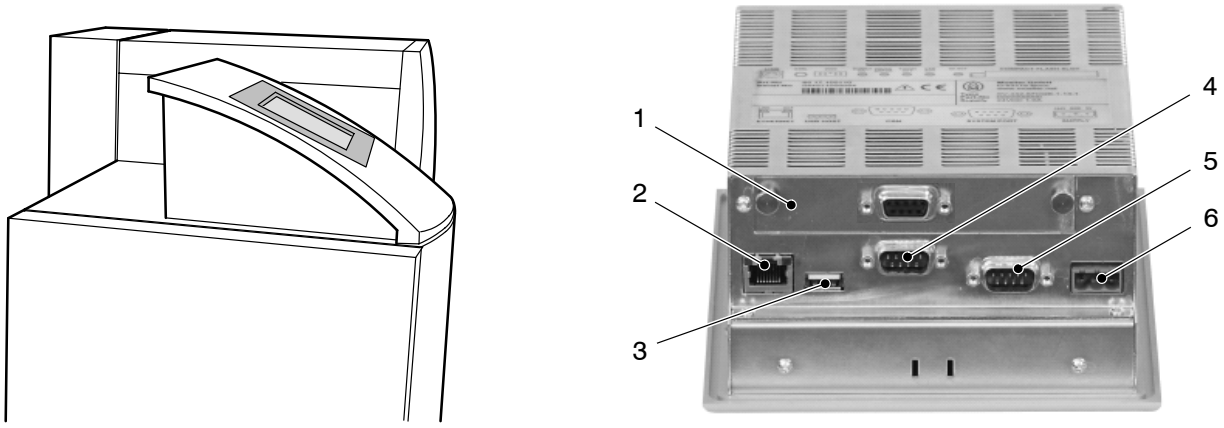
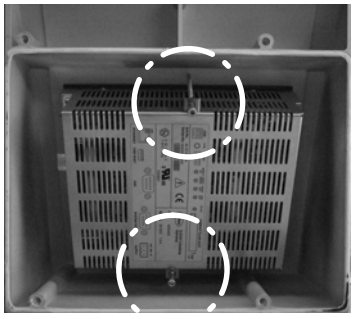


Fig. 7-1

1 Communication assembly PROFIBUS-DP (option)*
2 RJ45 EtherNet
3 *Not in use*
4 CAN plug 9 pol. DSub male
5 RS232 plug 9-pin DSub male *System port*
6 24 V_{DC} power supply

Note: * If the system does not include the option PROFIBUS DP, there is a cover on this port.

Detaching Control Panel



1. Open electrical cabinet.
2. The control panel is fastened to the console with two clamping screws. The two angled brackets slide into the IPC cooling slots.
3. Release the clamps, then remove the clamping screws and brackets.
4. Detach the connections, if necessary. The control panel can now be removed.

CAUTION: When the control panel is put into place, tighten the clamping screws only by hand.

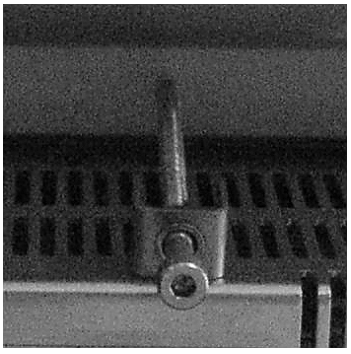


Fig. 7-2

Replacing Memory Board

WARNING: The memory board may be replaced only when the melter is switched off.

NOTE: All of the set parameters are lost when the memory board is replaced. The melter is returned to the original state.

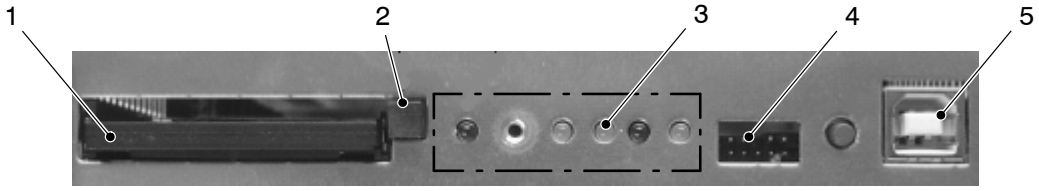


Fig. 7-3

1 Memory board *CompactFlash*
2 Eject button for memory board
3 Indication lamps (LEDs)
4 *Not in use*
5 *Not in use*

1. Switch melter off with main switch.
2. Refer to *Detaching Control Panel*.
3. Press the eject button and remove the old memory board.
4. Carefully slide in the new memory board until the eject button pops out again.
5. Reconnect any cables that may have come loose.
6. Attach control panel.
7. Switch on the melter again.
8. Enter configuration code.

   Refer to section *Operation, Melter Configuration*.

Installing/Replacing the Communication Assembly

CAUTION: When a melter has no communication assembly, operate only with the cover to protect the slot.

Please Observe!

- A grounding wrist-strap should be worn to protect electronic parts from electrostatic discharges when installing/removing the communication assembly.
- Install the communication assembly only when the IPC is deenergized.

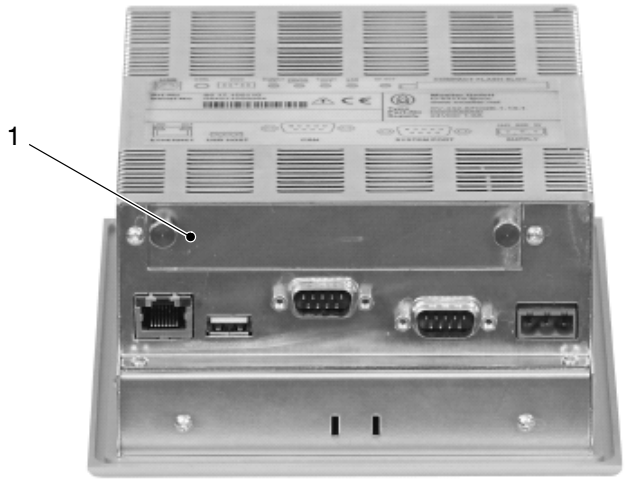


Fig. 7-4

1. Unscrew the cover (1, Fig. 7-4) and place aside for later use, or unscrew and extract the old communication assembly.
2. Carefully slide in the new communication assembly until it clicks into place.

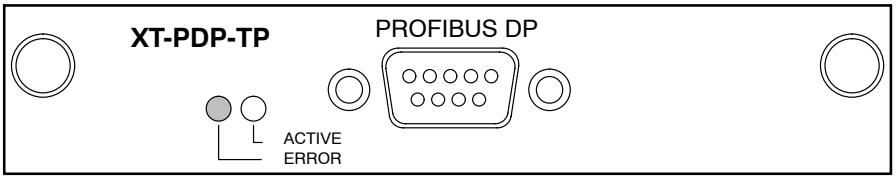


Fig. 7-5 Communication assembly PROFIBUS DP

3. Secure the communication assembly with the two knurled screws.

Replacing Motor Controller

CAUTION: Connect or disconnect lines only when the melter is deenergized. The motor controller is still energized after switching off. Wait at least 3 minutes before beginning any work!

NOTE: If more than one motor controller has been replaced, the screen *Replacing motor controller* appears. Proceed with *On the Control Panel: Allocating Replaced Motor Controllers (MC) to their Motors*.

Replacing CAN Module of Motor Controller

1. Disconnect motor controller from power supply and wait at least 3 minutes.
2. Release CAN module connections.
3. Use a screwdriver to pry away the male connector (1) first and then the CAN module (2).
4. Remove protective cap (3) of the new CAN module.
5. Insert CAN module into the serial port of the motor controller.
6. Insert male connector (1) into female connector of the CAN module.
7. Connect according to the labels on the lines.

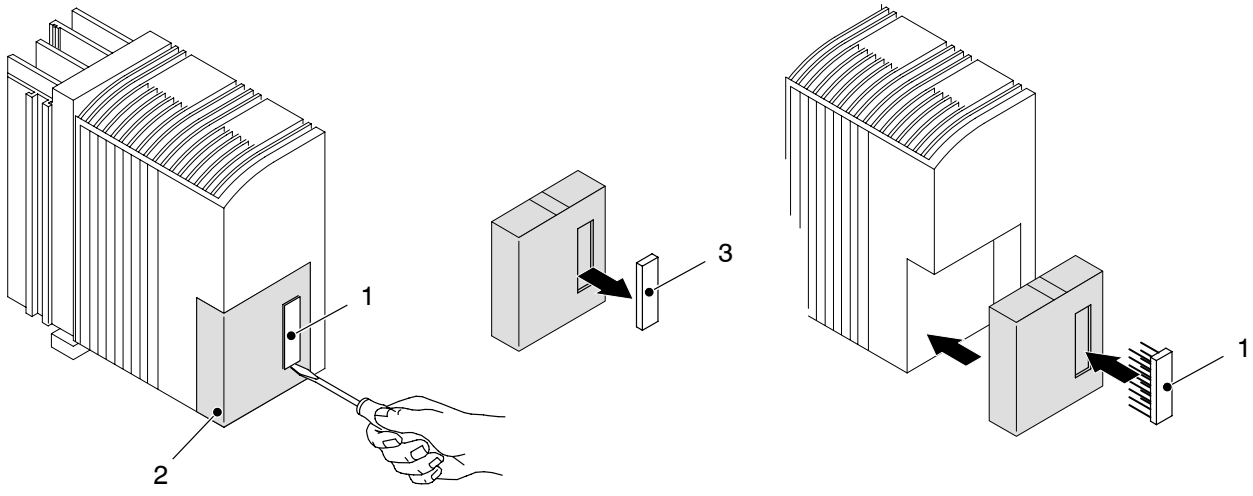


Fig. 7-6

Replace CAN Module of Motor Controller *(contd.)*

CAN Bus Terminating Resistor

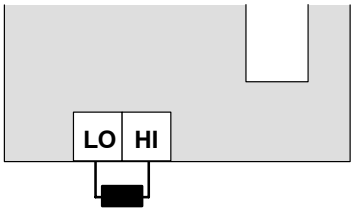


Fig. 7-7 CAN module

The last motor controller along the bus must be equipped with a terminating resistor (120 Ω).

CAUTION: If there are pressure sensors built into the system, the last pressure sensor receives a terminating resistor instead. Refer to Fig. 7-7.

On the Control Panel: Allocating Replaced Motor Controllers (MC) to their Motors

Example: On a melter with four configured motors/pumps, the motor controller for motors 2 and 4 were replaced because they were defective. When the melter is switched on again, Fig. 7-8 appears.

NOTE: If only one MC is defective and thus replaced, the IPC automatically assigns it to the correct motor. The operator need not assign manually.

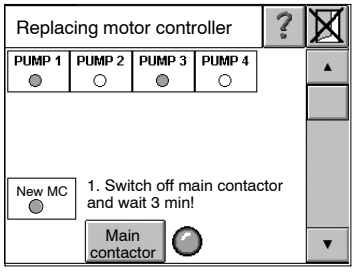


Fig. 7-8

Indications lamps show the configured motors/pumps for which motor controllers are found. In this case: Pumps 1 and 3.

Allocation is possible only when the system has found only <u>one</u> motor controller (indication lamp *New MC* lit). This is why the replaced motor controllers must be integrated into the CAN bus individually.

There is a switch for the main contactor in this screen to allow work to be done when the melter is deenergized.

1. Switch off the main contactor and wait 3 min.

   NOTE: The screen can be scrolled up and down.

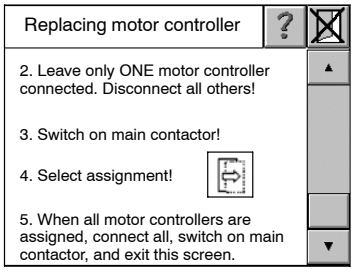


Fig. 7-9

2. Leave only ONE controller connected. Disconnect all of the others from the power supply. In this case: Disconnect the operating voltage from MC 1, 3 and 4.
3. Switch on main contactor.
4. Select assignment. Touch  to go to Fig. 7-10.

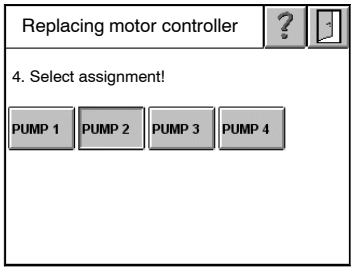


Fig. 7-10

5. In this case: Touch key PUMP 2.

   Exit the screen again by touching the door symbol.
6. Switch off the main contactor and wait 3 min.
7. Disconnect the operating voltage from MC 1, 2 and 3. Connect MC 4.
8. Switch on main contactor.
9. Select assignment. Touch key PUMP 4.
10. Switch off the main contactor and wait 3 min.
11. Reattach all motor controller connections. In this case: MC 1, 2 and 3.
12. Switch on main contactor.

All motor controllers are now assigned.

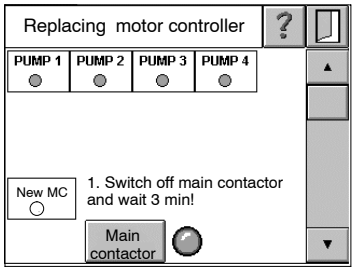


Fig. 7-11

13. Exit the screen again by touching the door symbol.

    NOTE: The screen can not be exited until all of the motor controllers have been assigned.
14. Switch melter off and on again with main switch.

Replacing Pressure Sensor

CAN Bus Terminating Resistor

The last node on the CAN bus (e.g. a pressure sensor or electrical cabinet *VBCM*) must be equipped with a terminating resistor (120 Ω).

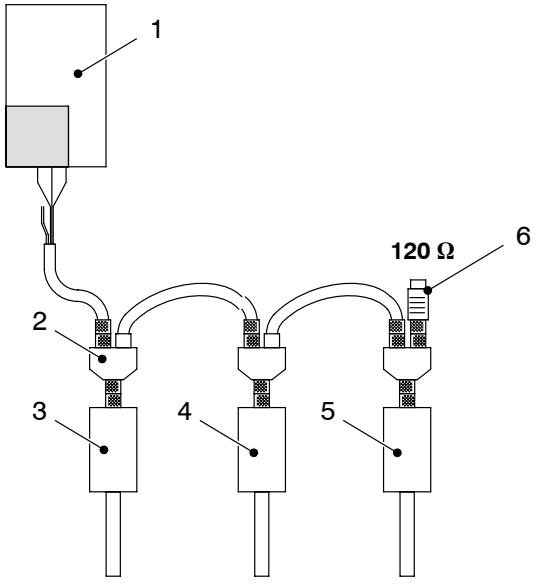


Fig. 7-12 Example with three pressure sensors

1 Motor controller
2 Connector
3 First pressure sensor
4 Second pressure sensor
5 Third pressure sensor
6 Terminating resistor

Procedure

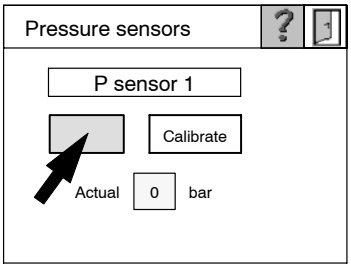


Fig. 7-13 Example

1. Switch off the pressure sensor to be replaced (*P sensor 1* in the example). Also refer to section *Operation*.
2. Wait until the ON/OFF key is no longer transparent.
3. Disconnect the pressure sensor from the CAN bus.
4. Connect CAN bus cable to new pressure sensor.
5. Refer to *Pressure Sensor Setup* in the section *Operation* for information on how to proceed.

NOTE: If during work on the CAN bus errors occur that have no readily apparent cause (red indication lamps) or the unit shuts down, switch the melter off then on again with the main switch.

Replacing Gear Pump

Nordson recommends replacing the pump and sending the old one in to be repaired.

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

Tank Isolation Valve

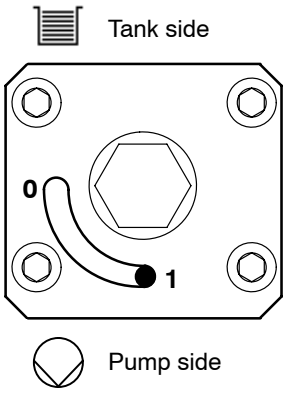


Fig. 7-14

NOTE: Operate the tank isolation valve only when the melter is heated to operating temperature.

Pin in position ***0***: Closed

Pin in position ***1***: Open

Detaching Gear Pump

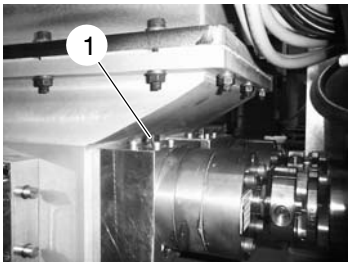


Fig. 7-15

1. Close tank isolation valve (1).

NOTE: Detach the gear pump only when the material is soft (70 ˚C/158 ˚F, depending on material).

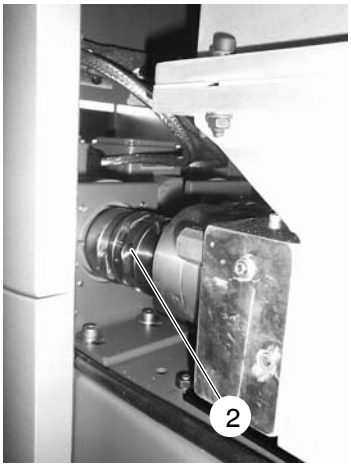


Fig. 7-16

CAUTION: The motor is precisely aligned and may not be be slid back with the bracket in the slot.

2. Turn the coupling until the screws of the coupling half shells are more easily accessible.
3. Release the screws (2) of the coupling half shells on the pump side.
4. The released coupling halves can fall apart. Remove carefully to prevent separation. Store the coupling halves and protect them from dust. They will be needed again.

Replacing Gear Pump *(contd.)*

Detaching Gear Pump (contd.)

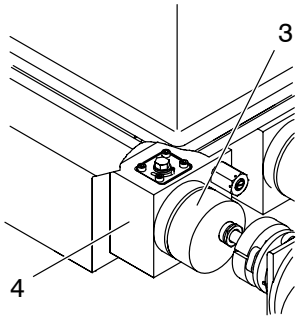


Fig. 7-17

5. Place a container under the pump (3) to collect any material left.
6. Detach pump.
7. Clean sealing surface on the plate (4). If necessary, heat material residue with a hot air fan, then remove.
8. Allow melter to cool to room temperature.

Attaching Gear Pump

NOTE: The gear pump may only be screwed on when the melter is cold.

NOTE: The sealing surfaces on the plate and the pump must be clean. Always replace any O-rings.

Required tool: Torque wrench

1. Apply high-temperature grease (Refer to section *Maintenance, Processing Materials*) to the new pump and to any O-rings.

CAUTION: Pump types SF and DF seal metallically. Do not apply high-temperature grease.

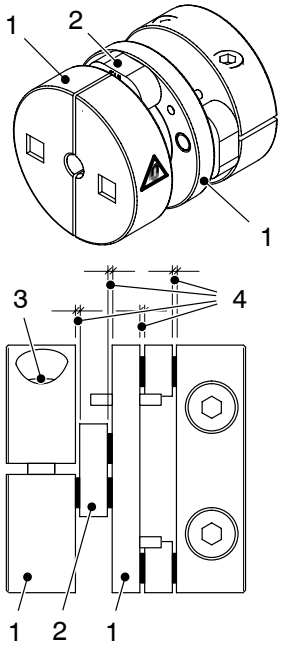


Fig. 7-18

2. Apply high-temperature grease to the pump fixing screws (Refer to *Maintenance, Processing Materials)*. Tighten screws crosswise using a torque wrench. Torque: 25 Nm / 220 lbin.
3. Refer to *Important Regarding Coupling*

   The axial offset, meaning the sum of the four gaps (4, Fig. 7-18), must result in at least 2 mm (0.08 in) of air to accommodate the heat expansion during operation.

   Permitted radial offset: 1 mm (0.04 in)
   Permitted angle offset: 1 °

NOTE: New magnets for the coupling monitoring should be installed now, while the coupling is easily accessible. Refer to *Replacing Coupling Magnets.*

4. Slide coupling half onto the shaft of the new pump.
5. Center the coupling disks (1) to one another and allow the coupling links (2) to hang vertically (Refer to Fig. 7-18). Turn the coupling half on the motor shaft to its position by hand.
6. Tighten coupling screws (3). Torque: 36 Nm / 320 lbin.
7. Heat melter to operating temperature and open tank isolation valve again.

Important Regarding Coupling

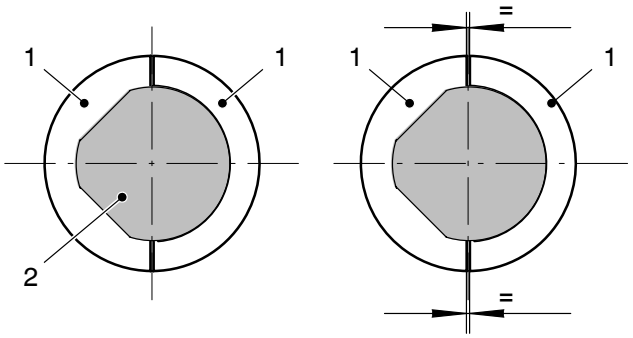


Fig. 7-19

- Turn the coupling half shells (1) such that the diagonal surfaces of the pump shaft (2) rest on those of the coupling half shells (Refer to Fig. 7-19).
- The coupling half shells must be tightened such that the gaps are the same size (Refer to Fig. 7-19).

Extract from manufacturer's installation and operating instructions:

- The drive shaft and output shaft should be parallel* to one another. If the axes lean towards one another, excess load is applied to the edges of the bearings, causing premature wear.
- The coupling may not be twisted axially. Intermediate disk should move freely.
- The coupling should not be disassembled. Interchanging of coupling links and disks, damaged sealing rings, polluted bearings, etc. can cause premature malfunctioning.
- All three coupling disks must be aligned to the dimension** of the shaft offset. If the intermediate disk is extremely off-center – meaning that the coupling links are no longer parallel – the coupling may be destroyed upon startup.

  * = *axially aligned*

  ** = *within the permitted shaft offset*

Replacing Motor

NOTE: Perform work only when the material is soft (approx. 70 °C/158 °F, depending on material); otherwise the coupling can not be turned.

1. Disconnect motor power cable in the electrical cabinet.
2. Detach plug connector from motor controller.
3. Turn the coupling until the screws of the coupling half shells are more easily accessible.
4. Release the screws of the coupling half shells on the motor side.
5. The released coupling halves can fall apart. Remove carefully to prevent separation. Store the coupling halves and protect them from dust. They will be needed again.

CAUTION: The bracket may not be slid back in the slot or unscrewed.

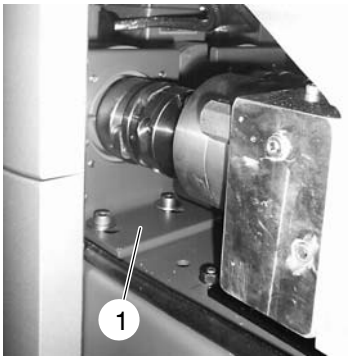


Fig. 7-20

6. Unscrew motor from bracket (1).
7. If there is protective varnish on the shaft of the new motor, remove it.
8. Attach the coupling to the shaft without using force (no jolts or pounding). If this is difficult or impossible, sand the pulley keys and shaft with emery paper. Lubricate pulley keys and shaft if needed.
9. Install new motor in the bracket. Tighten the fixing screws crosswise using a torque wrench. Torque: 20 Nm / 177 lbin.
10. Attach coupling (Refer to *Important Regarding Coupling*). Torque (coupling screws): 36 Nm / 320 lbin.
11. Reconnect motor electrically.
12. Secure power cable with strain relief. Ensure that cable shield and clamp have contact.
13. Verify that the motor is connected properly. The pump should turn clockwise (See arrow).

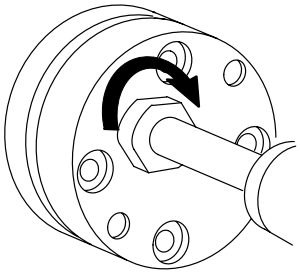


Fig. 7-21 Direction of pump rotation

Attaching Bracket for Coupling Monitoring

The bracket for the coupling monitoring sensor must be attached above the coupling (Refer to Fig. 7-22).

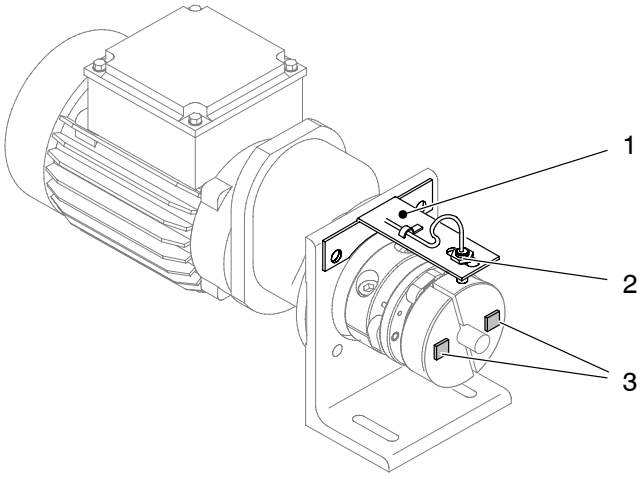


Fig. 7-22

1 Bracket
2 Sensor
3 Magnet

Replacing Coupling

NOTE: All new couplings have square indentations (pockets) for the coupling broken monitoring magnets.

WARNING: Strong magnetic field. Risk of injury. Maintain 0.3 m / 12 inches clearance between magnets and magnetic data storage devices, sensitive electrical or electronic equipment, and persons with pacemakers.

Risk of injury due to strong magnetic attraction.

The magnets can break when handled incorrectly.

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

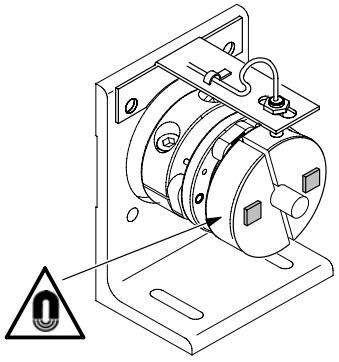


Fig. 7-23

1. Disconnect the melter from the line voltage.
2. Detach protective panels and insulation blanket.
3. Turn the coupling far enough that assembly work can be performed easily.
4. Allow the coupling to cool; the following tasks can be performed best without gloves.
5. Release the coupling on the motor side.
6. Mark the position of the motor, then slide back the motor bracket (with the motor and coupling broken-sensor) in the slot.
7. Release and detach the coupling from the pump side, then dispose of it properly.
8. Unscrew the sensor from the sensor bracket (The sensor will be used again) and replace the old sensor bracket with the new one from the spare parts kit *Coupling*.
9. Slide the magnets into the square indentations on the surface of the coupling.
10. Degrease the edge of the coupling (e.g. with spirit) so that the adhesive labels remain affixed.
11. Stick the two warning labels from the parts kit to the edge of the coupling, next to the indentations.
12. Slide the motor in the slot until the motor shaft touches the pump shaft. The two shafts must be aligned vertically and horizontally. Then slide the motor back again.
13. Attach the new coupling to the pump shaft without using force (no jolts or pounding).

For more information on the coupling, refer to the manual *VersaBlue*, section *Repair*, chapter *Attaching Gear Pump*, beginning with point 5.

14. Slide the motor with the motor bracket in the slot until it lines up with the first coupling element or protrudes no more than 1 to 2 mm (0.04 to 0.08 inch).
15. Align the motor bracket with the aid of an angle on the melter chassis; refer to Figure 7-24.

For more information on the coupling, refer to the manual *VersaBlue*, section *Repair*, chapter *Replacing Motor*.

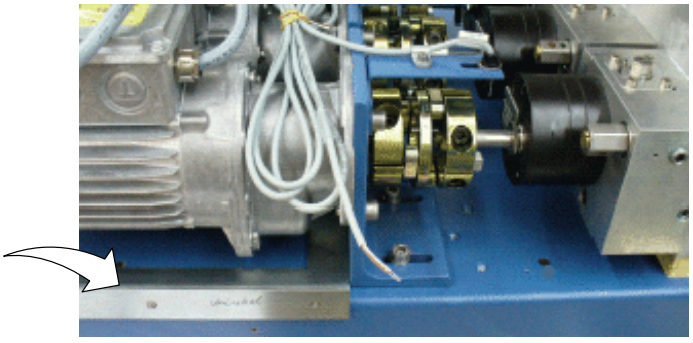


Fig. 7-24

16. Tighten the motor bracket screws.
    Torque (screws): 20 Nm / 177 lbin
17. Tighten coupling screws.
    Torque (screws): 36 Nm / 320 lbin
18. Align sensor. Refer to Fig. 7-25.

NOTE: The dimensions indicated in the drawing (5 mm / 0.2 inch) must be complied with.

19. Check if the drive and output shafts are aligned at low speed (5 min^{-1}). If not, align the motor anew.
20. Put the insulation blanket and protective panels back into place.

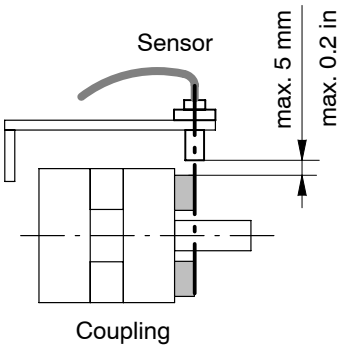


Fig. 7-25

Replacing Coupling Magnets

WARNING: Strong magnetic field. Risk of injury. Maintain 0.3 m / 12 inches clearance between magnets and magnetic data storage devices, sensitive electrical or electronic equipment, and persons with pacemakers.

Risk of injury due to strong magnetic attraction.

The magnets can break when handled incorrectly.

NOTE: The indentations (pockets) in the coupling prevent the coupling magnets from getting lost. However, if the magnets are lost despite this feature, they can be ordered from Nordson. Refer to *Parts List*. The new magnets must then be inserted in the indentations (pockets) as described under *Replacing Coupling*.

CAUTION: The galvanic coating that protects from corrosion may not be damaged.

Replacing Hopper Band Heater

WARNING: Disconnect equipment from the line voltage.

CAUTION: Hot surface. Allow the tank to cool off before beginning retrofitting. Failure to observe can cause burns.

Removing Old Band Heater

1. Detach protective panels and insulation blanket.
2. Open the electrical cabinet.
3. Disconnect the electrical connections to the band heater (Refer to original wiring diagram).
4. Thread the electrical line through the wall of and out of the electrical cabinet.
5. Remove the band heater from the hopper.
6. Properly dispose of the band heater; it is no longer needed.

Fig. 7-26

Installing New Band Heater

NOTE: Two people should work together for the next two steps.

1. Center the two pieces of the band heater on the hopper and hold them in place.
2. Join the two pieces of the band heater using the screws, washers and nuts (Refer to Fig. 7-27).

Fig. 7-27

3. Thread the electrical lines from the two pieces of the band heater through the wall of and into the electrical cabinet.
4. Cut the electrical lines to the proper length, squeeze on wire end ferrules and label the incoming cables.
5. Electrically connect the two pieces of the band heater.

   Refer to the wiring diagram that goes with the retrofitting kit.
6. Close the electrical cabinet.
7. Put the insulation blanket and protective panels back into place.
8. Start up system again.

Replacing Safety Valve

WARNING: For safety reasons, the safety valve may not be disassembled. The complete valve must be replaced every time.

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

Safety Valve

Refer to *Installing Service Kit* for procedure. However, points 3 and 4 are omitted.

Safety Valve with Reed Switch

1. Before the safety valve with Reed switch (1) can be detached, the connecting cable (2) must be unscrewed.
2. Refer to *Installing Service Kit* for other tasks. However, points 3 and 4 are omitted.
3. Screw the cable onto the new safety valve with Reed switch.

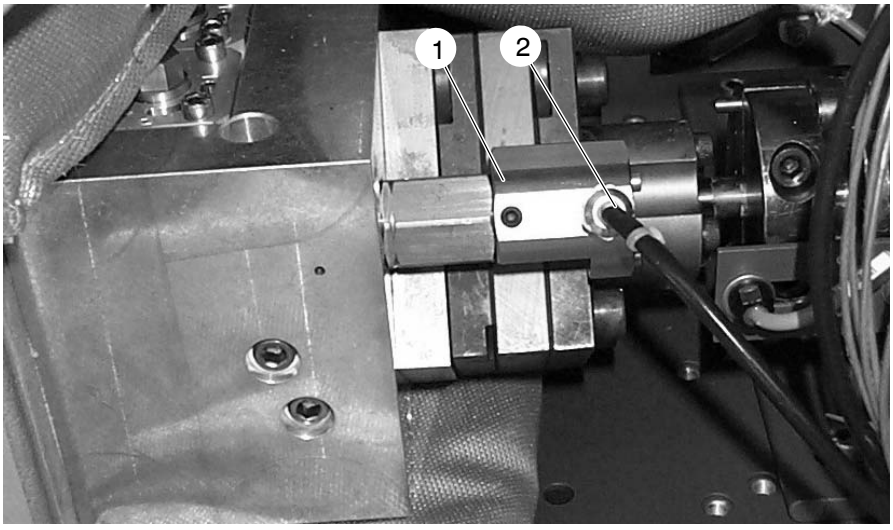


Fig. 7-28

1 Safety valve with Reed switch
2 Connecting cable

Installing Service Kit

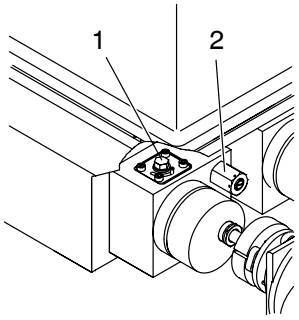
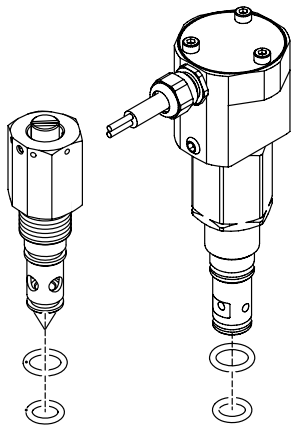


Fig. 7-29

Each kit contains two O-rings and high-temperature grease.

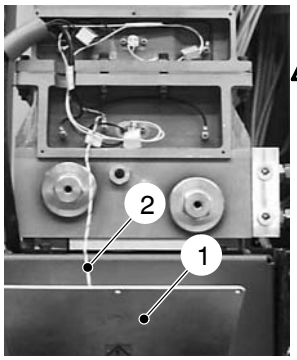
NOTE: Screw in/out only when the safety valve (2, Fig. 7-29) and pump are warm and the material is soft (approx. 70 ˚C / 158 ˚F, depending on material).

Service kit P/N: 394592 (for safety valve and safety valve with Reed switch)	
Required tools: Open-jawed wrench: size 19 for standard safety valve; size 24 safety valve with Reed switch Pliers Torque wrench	
	1. Close the tank isolation valve (1, Fig. 7-29).
	2. When present: Unscrew the connecting cable from the Reed switch.
	3. Use an open-jawed wrench to screw out the safety valve, then extract with a pliers.
	4. Remove outer O-rings and clean outside of safety valve.
	5. Install new O-rings.
	6. Apply grease to all threads and O-rings.
	7. To prevent damage to the O-rings, carefully guide the valve into the hole when the melter is warm.
	8. Tighten valve with a torque wrench. Torque: 15 Nm (133 lbin)
	9. When present: Screw the connecting cable back onto the Reed switch.
	10. Open tank isolation valve.

Replacing Filter Cartridge

Proceed as described in section *Maintenance* to replace filter cartridge.

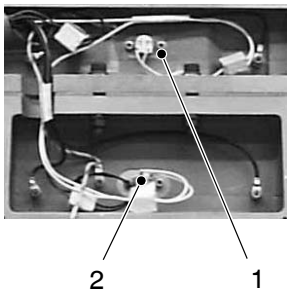
Observe when Performing Work behind Electrical Equipment Cover



WARNING: The electrical cover (1) is linked to ground conductors. The ground conductor (2) must be reconnected after every repair.

Fig. 7-30

Replacing Thermostat



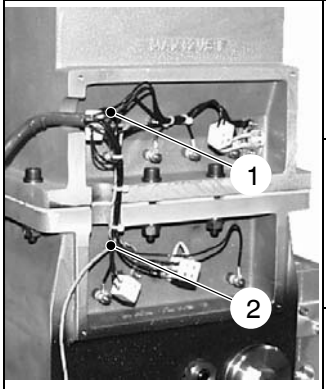
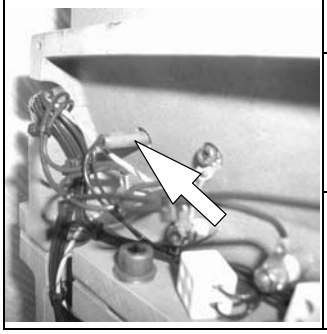
1. Remove electrical equipment cover.
2. Release the fixing screws and remove the defective thermostat (1: in grid or 2: in reservoir).
3. If necessary, clean the fastening point with a lint-free cloth.
4. Attach connecting wires to the new thermostat.
5. Apply heat transfer compound to the bottom of the thermostat (Refer to *Processing Materials* in section *Maintenance*), then fasten it to the tank again.
6. Attach electrical equipment cover again.

Fig. 7-31

Replacing Temperature Sensor

Installing Service Kit

The kit contains a temperature sensor and heat transfer compound.

Service Kit, for P/N refer to separate *Parts List*.	
Required tools: Pliers Side cutting pliers	
	1. Remove electrical equipment cover.
	2. Disconnect connecting wires and extract defective temperature sensor (1: in grid or 2: in reservoir) by the connecting wires or with the aid of a pliers.
	3. Apply heat transfer compound to new sensor.
	4. Insert sensor and reconnect electrically.
	5. Attach electrical equipment cover again.

Replacing I/O Board, Temperature Control Board

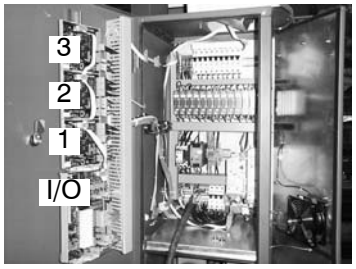


Fig. 7-32

NOTE: Switch / DIP switch settings, bus terminating resistors yes/no and jumper settings are to be assumed from the replaced board.

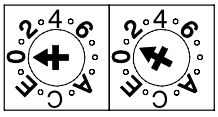


Fig. 7-33

The CAN address is set on the dials using a screwdriver.

I/O Board

Setting CAN Address

Dial (default)		Board no.
SW1	**SW2**	
0	5	1
0	6	2
NOTE: Dial setting SW1 may not be changed.		

Temperature Control Board

Setting CAN Address

Dial (default)		Board no.	Temperature channel
S1	**S2**		
7	1	1	1 to 6
7	2	2	7 to 12
7	3	3	13 to 18
NOTE: The switch setting S1 may not be changed.			

Setting Ni 120 or Pt 100

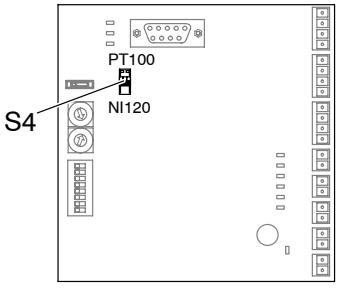


Fig. 7-34

The temperature sensor type (Ni 120 or Pt 100) is set with the switch S4.

Switching Bus Terminating Resistor On and Off

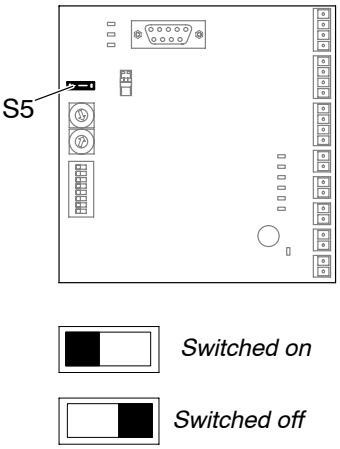


Fig. 7-35

The terminating resistor is switched on and off with switch S5. The terminating resistor on the last temperature control board must always be switched on; on the others it must always be switched off.

If e.g. a third board is added:

1. Switch the resistor on board 2 from *on* to *off*
2. Switch the resistor on the added board 3 to *on*.

Setting DIP Switch S3

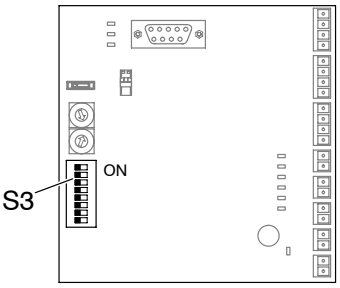


Fig. 7-36

All switches to OFF.

Replacing Level Evaluator with Analog Sensor (Option)

Important Notes

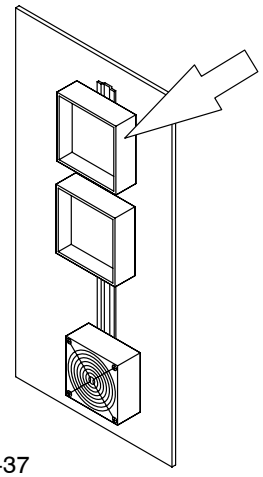


Fig. 7-37

The evaluator is located in the electrical cabinet door. The active measuring range is indicated by two lines on the level sensor.

- The length of the sensor cable may not be changed.
- Adjustment by electrostatically charged persons can cause the amplifier to malfunction.
- All adjustments should be made with operating ground (no ground conductor function) connected. The operating ground must be linked to the metal casing of the melter along the shortest path. Do not connect via ground conductor!
- All potentiometers have 20 revolutions and no mechanical limit stop, meaning no fixed end position. They can not be damaged by turning too far.

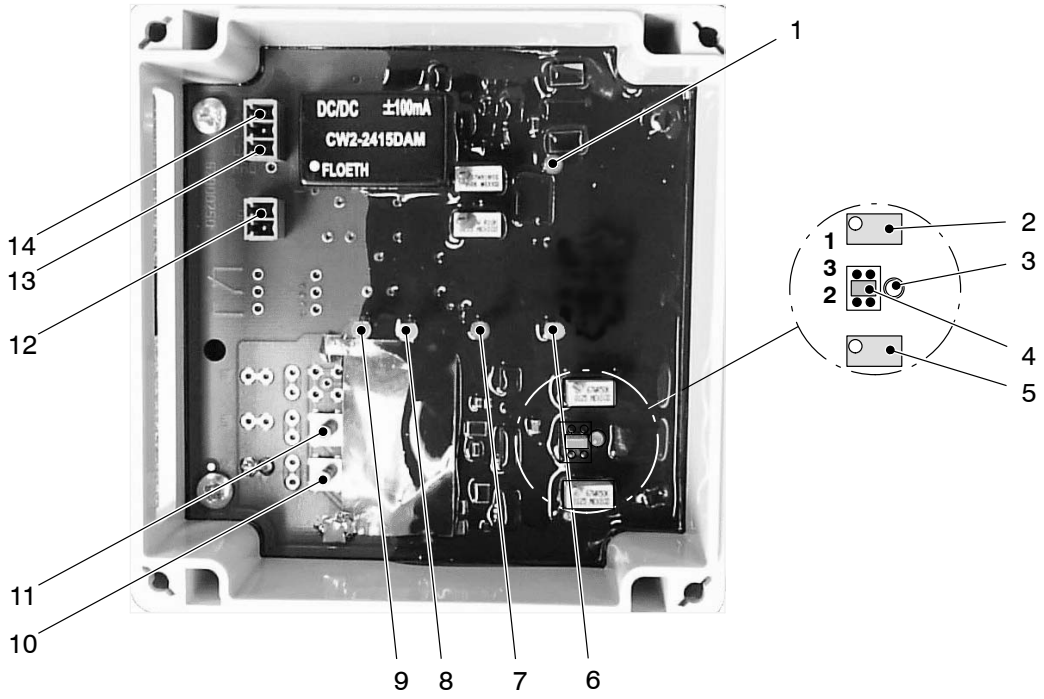


Fig. 7-38

1 LED *Operating voltage* (green)
2 Potentiometer *1*
3 LED *Calibration*
4 Jumper *Calibration*
5 Potentiometer *2*
6 LED *Tank overfilled* (red)
7 LED *Level* (green)
8 LED *Tank empty* (yellow)
9 LED *Reference section* (green)
10 Coaxial connection *Sensor* (black)
11 Coaxial connection *Sensor* (white)
12 Connection *Operating ground*
13 Signal output
14 Voltage supply (24V)

Calibrating

CAUTION: When calibrating, keep hands or conducting tools away from coaxial connections (10, 11, Fig. 7-38) to prevent distortion of the signal.

Prerequisites

- Level sensor is installed, fastened mechanically and connected electrically (observe color of sensor cable)
- Tank is empty
- Level sensor is clean
- Operating voltage applied (LED *Operating voltage* (1, Fig. 7-38) lit).

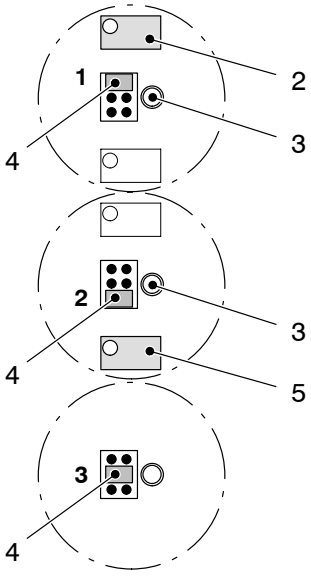


Fig. 7-39

1. Plug jumper *Calibration* (4) into position **1**.
2. With potentiometer *1* (2), find the switching point of the LED *Calibration* (3) (LED just lights up).

   Turn clockwise: LED on

   Turn counterclockwise: LED off
3. Plug jumper *Calibration* (4) into position **2**.
4. With potentiometer *2* (5), find the switching point of the LED *Calibration* (3) (LED just lights up).

   Turn clockwise: LED on

   Turn counterclockwise: LED off
5. Plug jumper *Calibration* (4) into position **3** (center) to switch off the LED *Calibration*.

The evaluator is now ready for operation.

NOTE: The LED *Reference section* (9, Fig. 7-38) lights up as soon as the reference section (area between the lower inactive section and the sensor measuring range) is covered with material.

Replacing Level Evaluator with 5-point Sensor (Option)

Important Notes

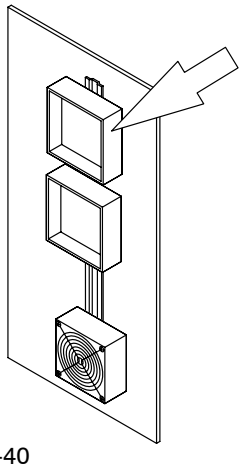


Fig. 7-40

The evaluator is located in the electrical cabinet door.

- The length of the sensor cable may not be changed.
- Adjustment by electrostatically charged persons can cause the amplifier to malfunction.
- All adjustments should be made with operating ground (no ground conductor function) connected. The operating ground must be linked to the metal casing of the melter along the shortest path. Do not connect via ground conductor!
- All potentiometers have 20 revolutions and no mechanical limit stop, meaning no fixed end position. They can not be damaged by turning too far.

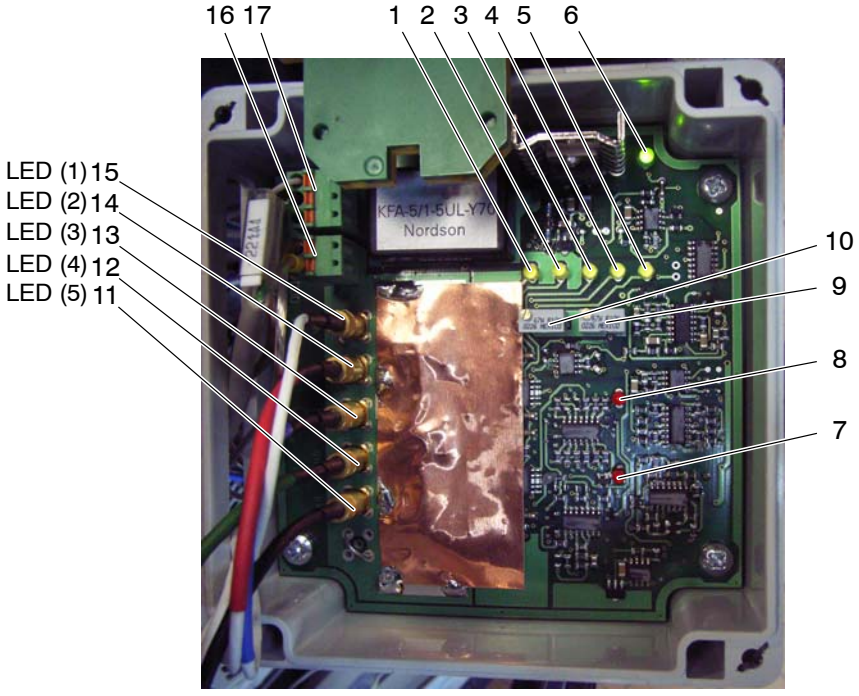


Fig. 7-41 Sensor cable colors black (bk) – green (gn) – blue (bl) – red (rd) – white (wh)

1 LED *Tank empty* (yellow)
2 LED *Tank level low* (yellow)
3 LED *Start filling* (yellow)
4 LED *Stop filling* (yellow)
5 LED *Tank overfilled* (yellow)
6 LED *Operating voltage* (green)
7 LED *Fault* (red)
8 LED *Sensor break* (red)
9 Potentiometer *P4*
10 Potentiometer *P3*
11 Power cable (bk)
12 Power cable (gn)
13 Power cable (bl)
14 Power cable (rd)
15 Power cable (wh)
16 Connection *Operating ground*
17 Voltage supply (24V)

Calibrating

CAUTION: When calibrating, keep hands or conducting tools away from coaxial connections (11 to 15) to prevent distortion of the signal.

Prerequisites

- Level sensor is installed, fastened mechanically and connected electrically.

  Observe the sensor cable color. The English abbreviation of the color is engraved on the board.
- Tank empty
- Level sensor is clean
- Operating voltage is applied (LED *Operating voltage* (6) lit).

Fig. 7-42 Direction

1. Turn potentiometer *P3* (10, Fig. 7-41) until the LED *Tank empty* (1, Fig. 7-41) just begins to light up.
2. Turn back to the switching point when the LED *Tank empty* just goes off.
3. From the switching point, turn half of a revolution more to the left.

NOTE: The closer the setting is to the switching point, the higher the sensitivity.

4. Turn potentiometer *P4* (9, Fig. 7-41) until all of the LEDs (2 to 5, Fig. 7-41) just begin to light up. Manufacturing tolerances may cause the LEDs to light up at different times.
5. Turn back to the switching point when LEDs 2 to 5 just go off.
6. From the switching point, turn half of a revolution more to the left.

Replacing Overflow Protection Evaluator (Option)

Important Notes

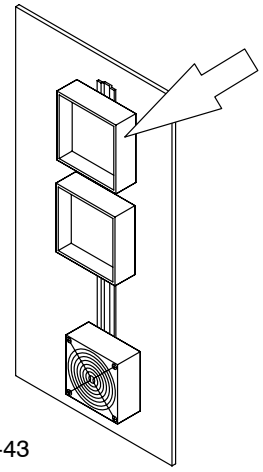


Fig. 7-43

The evaluator is located in the electrical cabinet door.

- The length of the sensor cable may not be changed.
- Adjustment by electrostatically charged persons can cause the amplifier to malfunction.
- All adjustments should be made with operating ground (no ground conductor function) connected. The operating ground must be linked to the metal casing of the melter along the shortest path. Do not connect via ground conductor!
- All potentiometers have 20 revolutions and no mechanical limit stop, meaning no fixed end position. They can not be damaged by turning too far.

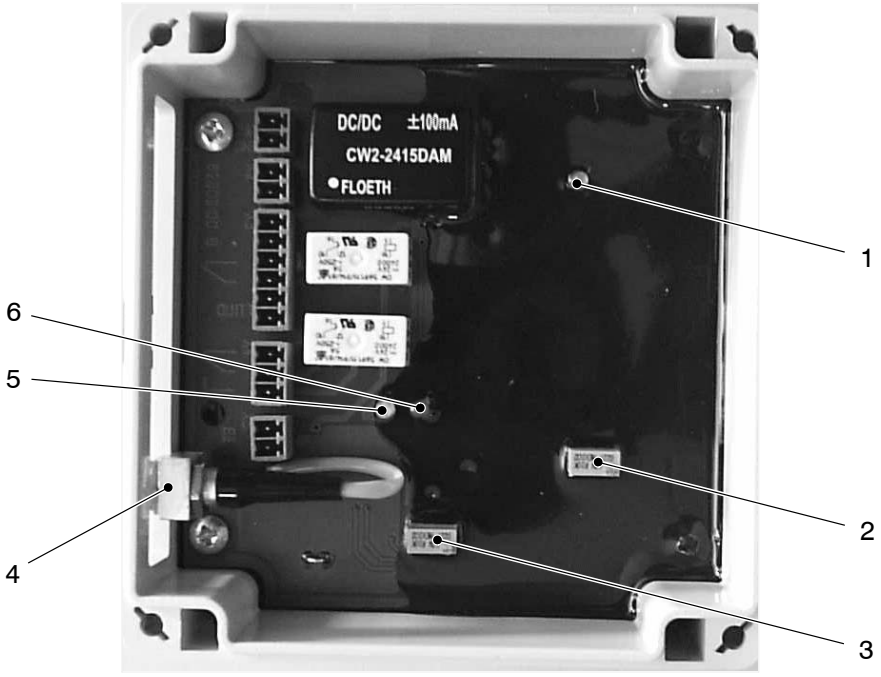


Fig. 7-44

1 LED *Operating voltage* (green)
2 Potentiometer *3*
3 Potentiometer *A*
4 Triaxial socket for sensor cable
5 LED *empty* (green)
6 LED *full* (red)

Calibrating

Prerequisites

- Level sensor is installed, fastened mechanically and connected electrically (observe color coding of sensor cable)
- Tank is empty (empty calibration: most sensitive setting, material irrelevant)
- Operating voltage applied (LED *Operating voltage* (1) lit).

Sensor Break

Fig. 7-45 Direction

1. Turn potentiometer *A* (3, Fig. 7-44) 20 revolutions counterclockwise.
2. Turn potentiometer *P3* (2) counterclockwise until the green LED *empty* (5) is off and the red LED *full* (6) begins to flash.
3. Turn potentiometer *P3* counterclockwise to the switching point (green LED *empty* on, red LED *full* off).
4. Then turn counterclockwise one or two more revolutions past the switching point.

NOTE: The closer the setting is to the switching point, the more precise is the measurement. When the potentiometer *P3* is turned all the way counterclockwise, sensor break monitoring is deactivated.

5. Perform function test: Disconnect sensor cable; sensor break monitoring is triggered (red LED *full* flashes).

Limit Switching Points

1. Turn potentiometer *A* clockwise to the switching point (green LED *empty* off, red LED *full* on).
2. Turn back from switching point until the green LED *empty* is on.

Replacing Coupler Component (Option: Separate Line Speed Signal Inputs)

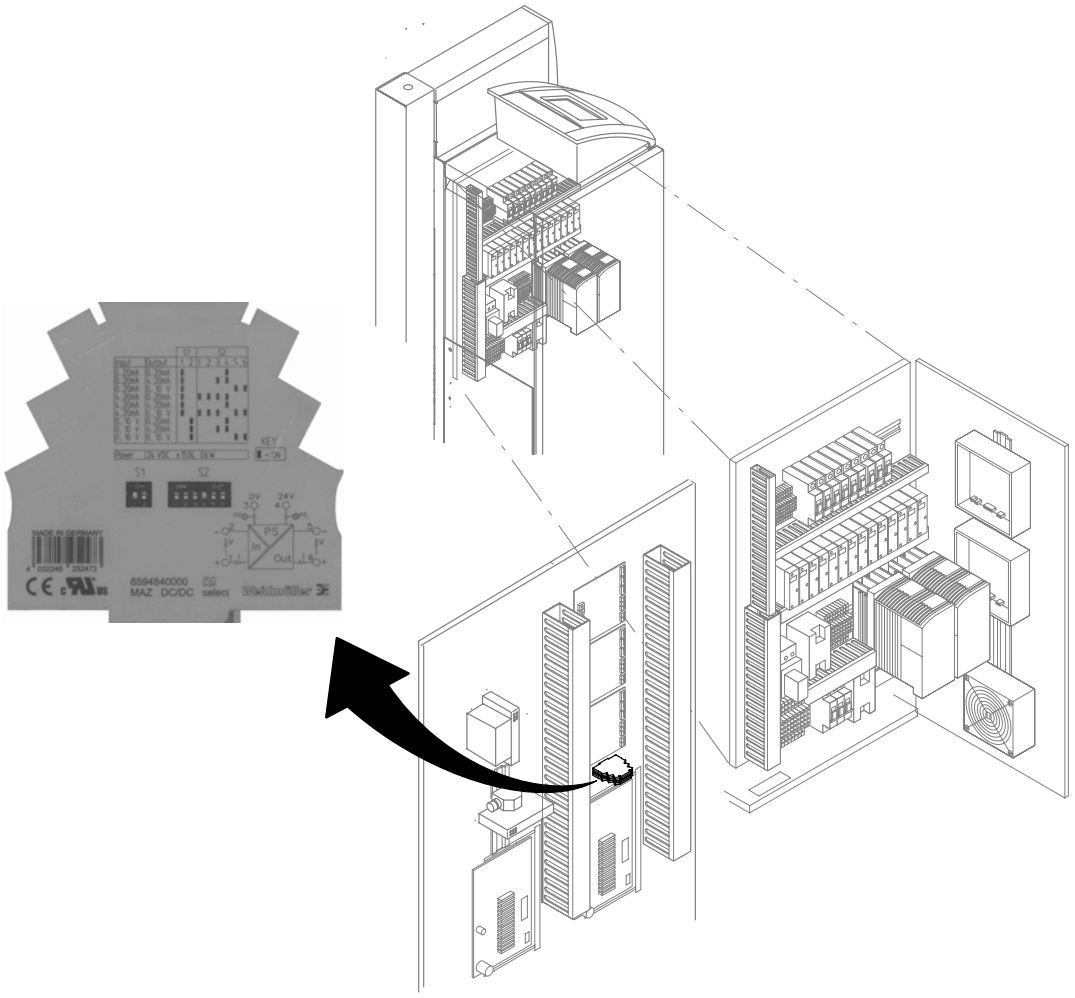
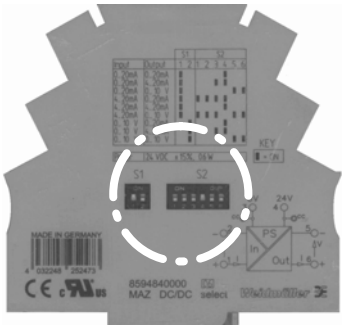


Fig. 7-46



Set the DIP switches on the coupler components always on *Input /Output*: 0–10 VDC / 0–10 VDC (Refer to Fig. 7-47).

Fig. 7-47 Coupler component

Section 8
Parts

How to Use Illustrated Parts List

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

Item— Identifies parts that can be obtained from Nordson.

Part— Nordson part number for each spare part shown in the illustration. A row of hyphens in the column Part (- - - - -) indicates that this part can not be ordered separately.

Description— This column contains the name of the part and, when appropriate, its dimensions and other properties. The points in the column *Description* show the relationship between assemblies, subassemblies and single parts.

Quantity— The quantity needed per unit, assembly or subassembly. The abbreviation AR (as required) is used when this item is a bulk item or when the quantity per assembly depends on the product version or model.

HINWEIS: Refer to separate document *Parts List*, P/N 7119994.

Fasteners

Fasteners are shown as *Fx* in every illustration, whereby ”x” indicates the number of the fastener in the list *Schedule of Fasteners* at the end of the separate document *Parts List*.

Component Designation

The electrical components are labeled in accordance with DIN 40719, part 2.

Section 9
Technical Data

General Data

Storage temperature	–45 ˚C to +75 ˚C	– 49 ˚F to + 167 ˚F	
Min. ambient temperature	– 5 ˚C	+ 23 ˚F	
Max. ambient temperature	+ 50 ˚C	+120 ˚F	
Humidity	10 to 95 %, not condensing		
Max. operating height	3000 m	9840 ft	
Type of heating	Cast-in electrical resistance heating elements		
Possible temperature sensors	Ni 120 (standard unit) Pt 100 (optional)		
– Measuring precision	± 1 ˚C	± 1 ˚F	(1 digit)
Material pressure (standard)	5 to 85 bar	500 to 8500 kPa	72.5 to 1233 psi
	The pressure control valve is preset at the factory. Default:		
	35 bar	3500 kPa	508 psi
Degree of protection	IP 54		
Noise emission (at a distance of 1 m)	1 motor: 62 dB(A) 2 motors: 65 dB(A) 3 motors: 66 dB(A) 4 motors: 68 dB(A)		
Motor type	3 ph AC motor		
Gear box type	Helical gear		
Motor/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).		
Heatup time	< 45 minutes		
Melting capacity	1 tankfull per hour		

Temperatures

CAUTION: The maximum operating temperature of the installed gun and the other heated system components should be considered when setting temperatures on the melter control panel.

Min. operating temperature	+ 40 ˚C	+100 ˚F	
Max. operating temperature	+ 230 ˚C	+450 ˚F	
Overtemperature shutdown by thermostat	+ 260 ˚C	+480 ˚F	
Shutdown by transformer thermostat	+ 155 ˚C (± 5 ˚C)	+311 ˚F (± 9 ˚F)	
Max. operating temperature of filling valve (option)	+ 230 ˚C	+450 ˚F	

Ni120 **Pt100**

Fig. 9-1 Hose receptacles

Electrical Data

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

Available operating voltages	200 V_{AC} 3-phase without neutral (*Delta*) 230 V_{AC} 3-phase without neutral (*Delta*) 400 V_{AC} 3-phase with neutral (star – *WYE*) 400 V_{AC} 3-phase without neutral (*Delta*) 480 V_{AC} 3-phase without neutral (*Delta*)
Permissible voltage deviations	Power supply: ± 10% I/O: ± 10%
Operating voltage frequency	50/60 Hz
Melter fuse protection	Refer to ID plate
Max. melter load	Refer to ID plate
Key-to-line **Max. input**	0 to 10 V_{DC} 0 to 20 mA 4 to 20 mA 0 to 100 kHz

Electrical Data *(contd.)*

Max. Melter Load (Without Accessories)

All data at 230 V_{AC}	**V12**	**V25, V25H**	**V50, V50H**	**V100, V10H**
• With 1 motor	6850 W	7480 W	12805 W	21540 W
• With 2 motors	7650 W	8280 W	13605 W	22340 W
• With 3 motors	8450 W	9080 W	14405 W	23140 W
• With 4 motors	9250 W	9880 W	15205 W	23940 W

Max. Load (Accessories)

Melter Types VB, VC, VW and VX

All data at 230 V_{AC}	**V12**	**V25, V25H**	**V50, V50H**
	*Max. 6 pairs		
• Total	10800 W		
• Per hose/gun pair*	1800 W		
• Per channel	1800 W		

Melter Types VD, VE, VY and VZ

All data at 230 V_{AC}	**V25, V25H**	**V50, V50H**	**V100, V10H**
	*Max. 8 pairs		
• Total	14400 W		
• Per hose/gun pair*	4000 W		
• Per channel	2000 W		

Melter Fuse Protection

Melter Types VB, VC, VW and VX

	V12			V25, V25H			V50, V50H		
	Hose/gun			Hose/gun			Hose/gun		
	2	4	6	2	4	6	2	4	6
200 V 3 Ph Δ	46 A	62 A	62 A	57 A	72 A	72 A	61 A	76 A	78 A
230 V 3 Ph Δ	40 A	54 A	54 A	49 A	62 A	62 A	53 A	66 A	66 A
400 V 3 Ph Y	21 A	29 A	31 A	26 A	33 A	34 A	30 A	38 A	46 A
400 V 3 Ph Δ	21 A	29 A	31 A	26 A	33 A	34 A	30 A	38 A	46 A
480 V 3 Ph Δ	17 A	24 A	26 A	22 A	28 A	28 A	25 A	32 A	38 A

Melter Types VD, VE, VY and VZ

	V25, V25H				V50, V50H				V100, V10H			
	Hose/gun				Hose/gun				Hose/gun			
	2	4	6	8	2	4	6	8	2	4	6	8
200 V 3 Ph Δ	56 A	72 A	72 A	86 A	61 A	76 A	79 A	90 A	90 A	90 A	90 A	90 A
230 V 3 Ph Δ	49 A	62 A	62 A	75 A	53 A	66 A	68 A	83 A	78 A	90 A	90 A	90 A
400 V 3 Ph Y	27 A	35 A	35 A	43 A	32 A	34 A	41 A	49 A	43 A	49 A	51 A	64 A
400 V 3 Ph Δ	27 A	35 A	35 A	43 A	32 A	34 A	41 A	49 A	43 A	49 A	51 A	64 A
480 V 3 Ph Δ	23 A	29 A	29 A	36 A	26 A	28 A	34 A	41 A	36 A	41 A	43 A	53 A

Mechanical Data

Type designation	**V12**	**V25, V25H**	**V50, V50H**	**V100, V10H**
Tank volume [liters]	15	29	50	97
Tank extension [liters]	– –	14	25	50
Tank opening [mm] ● With filling valve (option)	165 x 191 165 x 62	160 x 359 160 x 205	230 x 460 230 x 308	306 x 685 306 x 419
Weight [kg]	**Melter Types VB, VC, VW, VX**			
Melter with two pumps, without transformer, without packaging	Approx. 225	Approx. 250	Approx. 275	– –
... plus tank extension	– –	Approx. 255	Approx. 285	– –
Weight [kg]	**Melter Types VD, VE, VY, VZ**			
Melter with two pumps, without transformer, without packaging	– –	Approx. 265	Approx. 290	Approx. 360
... plus tank extension	– –	Approx. 270	Approx. 300	Approx. 375
	Refer to consignment note for exact weight			
Max. no. of single stream pumps	Depending on melter model. Refer to Series overview in section *Introduction*			
Max. no. of double stream pumps	Depending on melter model. Refer to Series overview in section *Introduction*			
Number of hose connections	2 per pump stream			

Dimensions

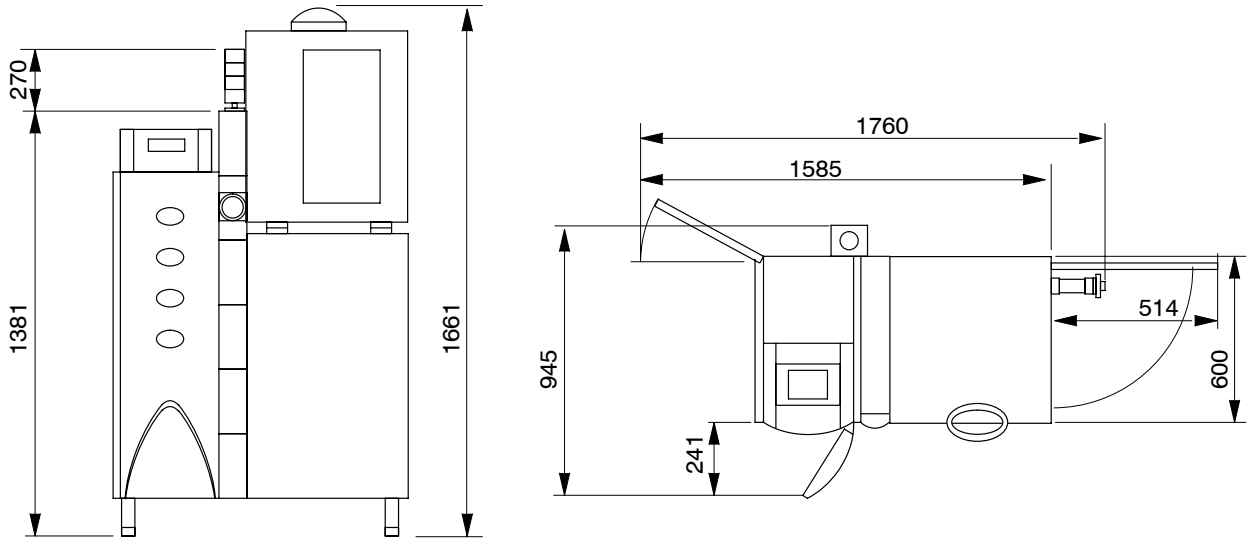


Fig. 9-2 Types VB, VC, VW, VX

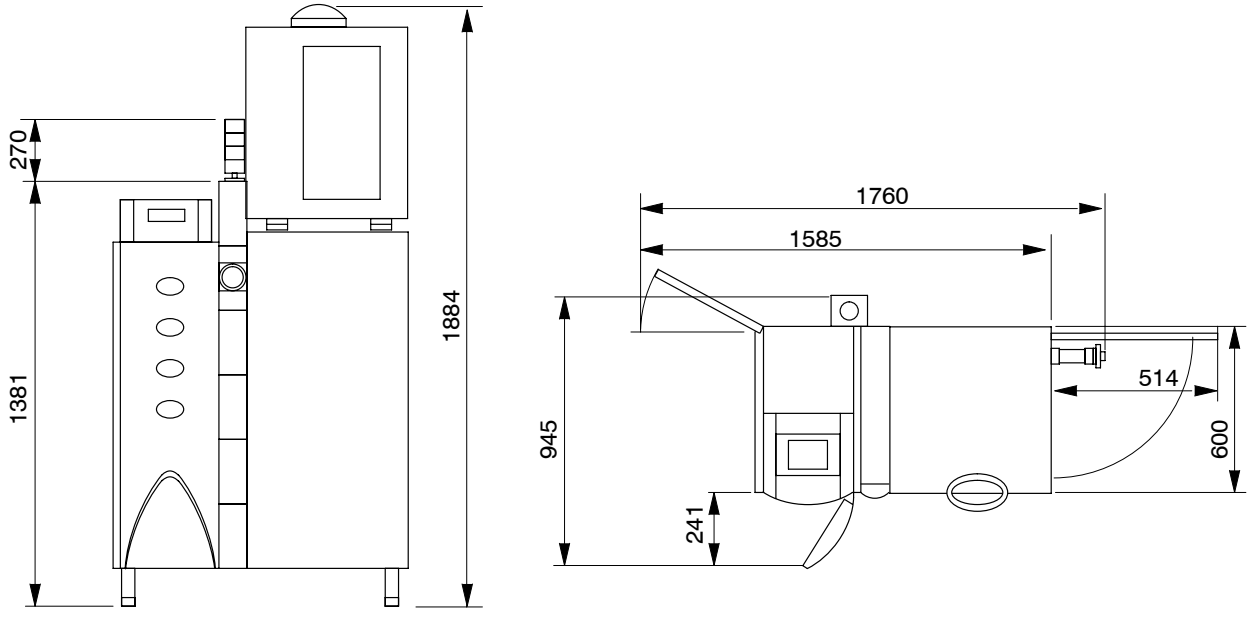


Fig. 9-3 Types VB, VC, VW, VX with tank extension (hopper)

Mechanical Data *(contd.)*

Dimensions *(contd.)*

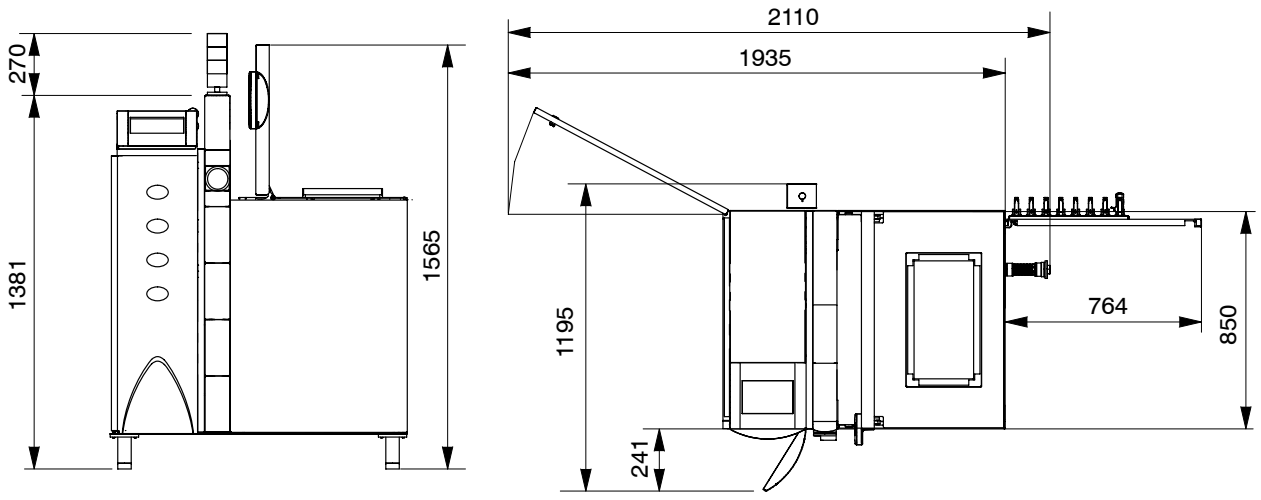


Fig. 9-4 Types VD, VE, VY, VZ

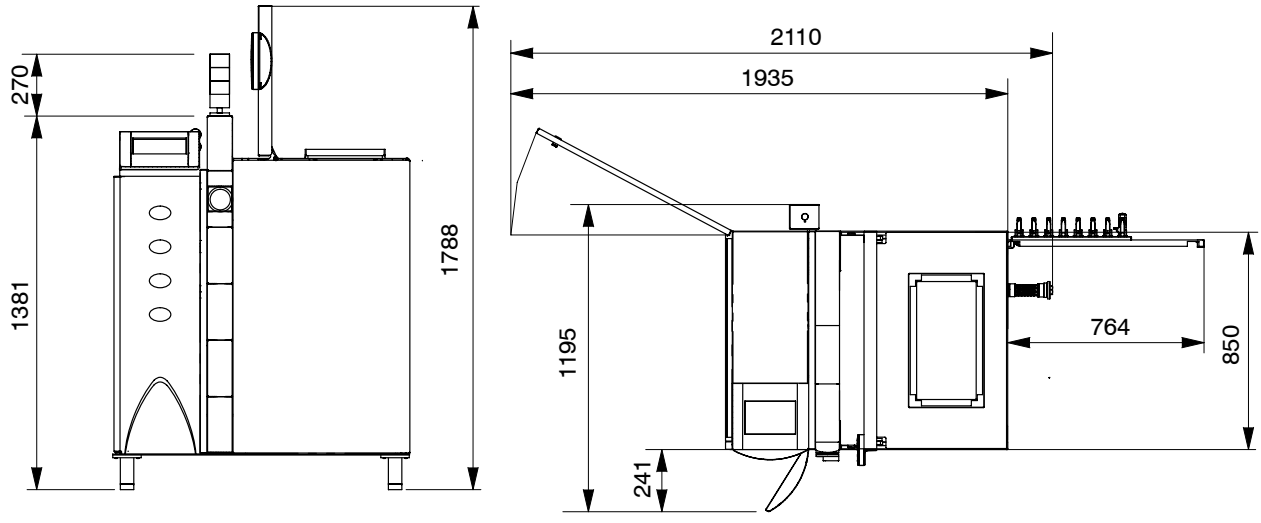
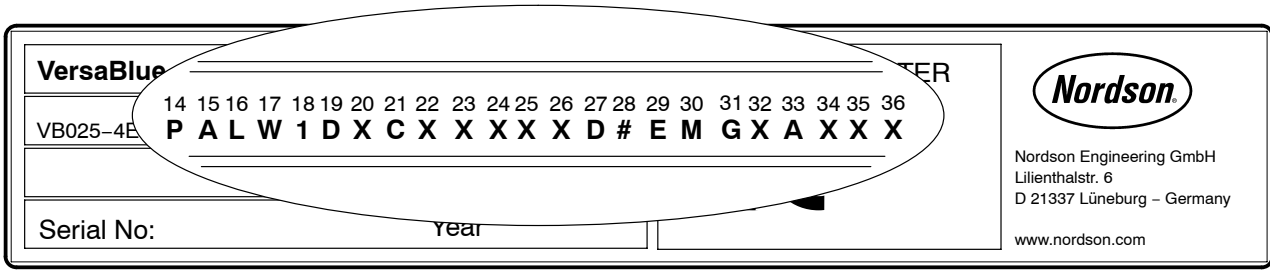


Fig. 9-5 Types VD, VE, VY, VZ with tank extension (hopper)

Section 10
Options

Option: Parts or features that must be known when melter assembly is begun.

Accessories: Parts that can be added at anytime without modifying the melter.



Configuration code box	14	15	16	17	18	19	20	21
Options	P	A	L	W	1	D	K	C
	M		B		2	N		
	F		P		3	E		
	C		C					
	T		D					
	B		F					
	N							
	O							

Configuration code box	22	23	24	25	26	27	28	29
Options	G	C	Reserved			D	#	E
	X	D						
		G						
		X						

Configuration code box	30	31	32	33	34	35	36	–
Options	M	G	1	B	Reserved			
				C				
				D				

Option in configuration code	Box	Also available as accessory	Description
Pneumatic pressure control	14	–	The pneumatic pressure control valve replaces the installed mechanical pressure control valve. **P**: Automatic A proportional valve supplies regulated compressed air to the pneumatic pressure control valve. It receives the line speed signal from the parent machine needed for regulation. **M**: Manual The operator sets the required compressed air with the pressure controller handwheel.
Bypass control	14	–	**F**: The pneumatic pressure control valve replaces the installed mechanical pressure control valve. In normal production mode, the pressure control valve is supplied with maximum air pressure (approx. 6 bar) and is closed. The material is conveyed to the melter outlet. When the gun closes, the solenoid valve receives an electrical signal. The pressure control valve is supplied with regulated compressed air and begins to open. The material is returned to the tank (bypass).
Pressure display and pressure control	14	–	**C**: One pressure sensor per pump stream. Double-stream pumps are equipped with two pressure sensors: one for display and one for control. There is no pressure control valve. The desired pressure is set on the control panel. The pressure sensor converts the pressure to an electrical signal, which is used for control via the CAN bus.
Flow control	14	–	**T**: This function allows the speed to be regulated to an adjustable value as soon as the parent machine stops. **B**: This function allows the material pressure to be reduced through the pneumatic pressure control valve when the motor stops.
Pressure build-up	14	–	**N**: The mechanical safety valve with Reed switch replaces the installed mechanical safety valve. One pressure sensor per pump stream. Double-stream pumps are equipped with two pressure sensors: one for display and one for control. There is no pressure control valve. This feature allows the material pressure to be regulated to an adjustable value as soon as the parent machine stops or when the line speed signal falls below an adjustable value.

continued

Option in configuration code	Box	Also available as accessory	Description
Safety valve with display	14	–	**O**: The mechanical safety valve with Reed switch replaces the installed mechanical safety valve. There is no pressure control valve. If filters or application nozzles are blocked, the material pressure increases. The safety valve opens at 85 bar, and the material flows back into the tank. The Reed switch on the safety valve generates an electrical signal that can be emitted as a fault or a warning.
Pressure display	15	–	**A**: One pressure sensor per pump stream (double-stream pumps are equipped with two pressure sensors). The melter outlet pressure is displayed and monitored. Alarms for underpressure and overpressure are displayed.
Level display	16	–	**L**: Level sensor in tank for analog level display
Level display and filling valve	16	–	**B**: Level control (Ni120) **C**: Level control (Pt100) Level sensor in tank for the analog level display and the filling signals for a filling valve. Automatic tank filling is performed e.g. by a bulk melter connected to the filling valve with a hose.
Level display and filling valve and overflow protection	16	–	**P**: Level control (Ni120) with overflow protection **D**: Level control (Pt100) with overflow protection Level sensor in tank for the analog level display and the filling signals for a filling valve. Automatic tank filling is performed e.g. by a bulk melter connected to the filling valve with a hose. Additional level sensor in tank for separate overflow protection
Level display (fixed measuring points)	16	–	**F**: The level sensor measures the presence of material at five different fixed measuring points.
Light tower	17	●	**W**: Four colors. Indicates operating mode of melter.
Main switch	18	–	**1**: red-yellow, 4-pin **2**: black, 3-pin **3**: black, 4-pin

continued

Option in configuration code	Box	Also available as accessory	Description
Host communication	19	–	**D**: PROFIBUS DP **N**: ControlNet **E**: EtherNet/IP **X**: Standard IPC
Separate line speed signal inputs	20	–	**K**: Every motor receives its own line speed signal.
Casters	21	●	**C**: To move melter; two can be locked
Inert gas equipment	22	–	**G**: Used to blanket tank contents with inert gas. This is needed when processing certain materials.
Filter cartridge / safety valve	23	●	**C**: 0.8 mm filter with 85 bar safety valve **D**: 0.2 mm filter with 100 bar safety valve **G**: 0.8 mm filter with 100 bar safety valve **X**: 0.2 mm filter with 85 bar safety valve
Spare	24 – 26	–	–
Drain valve	27	●	**D**: The drain valve is used to quickly remove the material from the tank.
Inputs for external pressure display	28	●	**#**: The unit can receive and process signals from external pressure sensors.
Heat exchanger	29	–	**E**: The heat exchanger serves to maintain a constant temperature in the electrical cabinet.
Motor circuit switch (Service or repair switch)	30	–	**M**: Lockable motor circuit switch. Motors can be deenergized. Additional contact for triggering by control system.
Gun solenoid valve	31	–	**G**: 24 V_{DC} is supplied for the gun solenoid valves. The voltage is controlled via standard I/O.
ACM Connectivity (ACM = Auxiliary Control Module = additional electrical cabinet)	32	–	**1**: One or two separate electrical cabinet(s) (with additional motor and temperature channels) can be connected and controlled.
Programmable controller (PLC)	33	–	**B**: A-B ControlLogix with ControlNet and PanelView **C**: A-B ControlLogix with EtherNet/IP and PanelView **D**: A-B ControlLogix with DataHighway$^+$ and PanelView
Spare	34 – 36	–	–

Accessories

Flap Valve	For 8 mm and 16 mm hose connections
Adapter cable	For connection to the interface *Standard I/O*
Mains filter	Filters electromagnetic interference
Safety valve (100 bar)	Replaces standard safety valve (85 bar)

Appendix A
Password

NOTE: The customer's master password is valid for levels 1 to 3.

Level	Functions enabled
No password protection	Switch on/off heaters Switch on/off collective motor enable Switch on/off seven-day clock Enter/exit standby Backlight / contrast Change language Change date / time
Level 1 Operation Normal operation for all operators	Temperature setpoints Switch application groups on/off Individual motor enable Pressure setpoint Speed setpoint Max. pump speed/pressure (in key-to-line mode)
Level 2 Parameters Settings for trained personnel	Undertemperature/overtemperature *warning/fault* Standby values Automatic enter standby Manual standby duration Temperature channel activated/deactivated Switch between manual mode / key-to-line
Level 3 Basic settings	Application names (temperature channels, pumps, pressure sensors) Controlled system heating rate temperature Switch between ˚C,˚F Temperature channel: Display mode, control mode Maximum temperature setpoint Define application group Select function for switching application groups Assign standard I/O inputs for application groups Seven-day clock: Delete, edit schedule, copy schedule

Continued...

Level	Applies to
Level 3 *(contd.)*	Switch between bar, psi, kPa Pressure alarm monitoring on/off Overpressure and underpressure alarms Pressure PID parameters Motor enables from control panel / control panel AND standard I/O Key-to-line signal: Analog/frequency, voltage/current Speed control / pressure control Pressure build-up function Flow control Line speed for min./max. pump speed/pressure Min. pump speed/pressure (in key-to-line mode) Threshold switch Restore default settings Melter configuration Control modes (standard, field bus, dual) Level parameters Inert gas parameters Customer setup (recipes / application names) Service interval *System ready* setup Password setup Recipes IPC IP address and subnet mask Pressure sensors setup Profibus setup ControlNet setup EtherNet/IP setup Coupling monitoring
Level *Nordson* Only for Nordson personnel	NORDSON setup

If appropriate, remove this page and store in a safe location.

Customer Master Password

For Nordson *VersaBlue* adhesive melters

X5SW3HH

User Name and Keyword

For Nordson *VersaBlue* adhesive melters for operation via the IPC webserver

NOTE: Observe capitalization.

User name

VBweb

Keyword

manager

Appendix B

Control Panel P/N 207023 and P/N 207850 (First Generation)

Validity

- This appendix applies to melters with the above, first generation control panels. The P/N of the control panel can be found on the ID plate.
- The appendix describes the differences between the old model and the new model.

Visible Distinguishing Features

The connections are arranged differently.

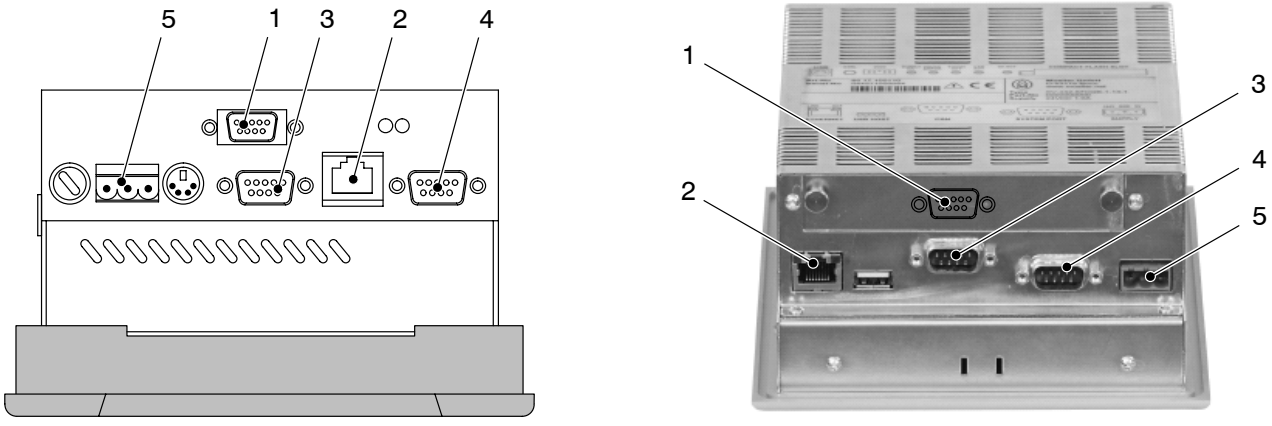


Fig. B-1 First generation control panel (left) – new model (right)

Save Recipe


Up to 20 recipes can be saved.

Troubleshooting

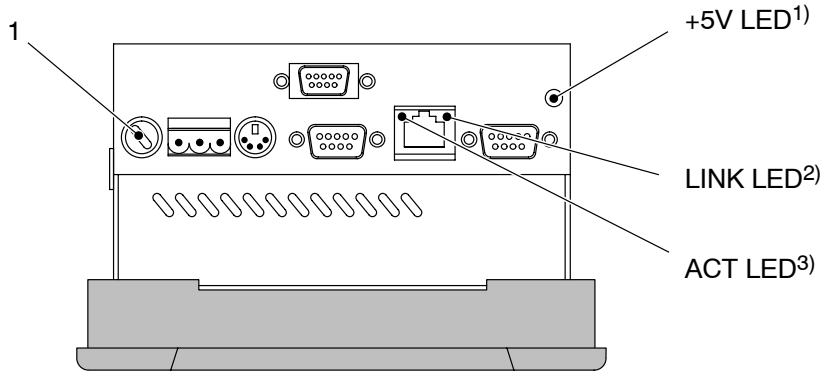
Alarm no.	Status	Light tower colors		
		Green	Yellow	Red
Status display	**Warning** The operator must decide whether the situation is critical for the application and action is required. The system remains ready for operation.	●	●	
4	IPC battery voltage low Coprocessor battery voltage low ○ Replace battery	●	●	

From the Communication Data List

Data index	Data designation	Channel number	Setting range, resolution	
	Melter			
15 [R]	**Melter status and alarms** Bit 2 Value: 1 Alarm: IPC or coprocessor battery voltage low (warning) 0 No alarm	0	Bit field	–

Alarm no.	Status	Light tower colors		
		Green	Yellow	Red
Status display	**Fault**			●
3	**OLD:** Field bus communication failure **NEW:** Command from field bus master missing in control mode *Field bus* or *Dual* ○ Programming error. The master was programmed incorrectly with Command=0. ○ Field bus cable broken, defective or not connected ○ Interruptions in communication, e.g. if the master is not switched on ○ Defective or missing bus terminating resistor ○ The network was not set up properly ○ Sudden resets or crashes, e.g. due to electro-magnetic interference			●

Control Panel does not Function



Problem	Possible Cause	Corrective Action
1. Does not start. Control panel dark or fault indications upon startup	Fuse (1) defective (+5V LED[1)] not lit)	Check voltage supply
	Memory board (CompactFlash) not in place	Insert as described in section *Replacing Memory Board*
2. Date/time incorrect		Insert or replace battery and set date and time
3. Control panel dark or bright	Background lighting / contrast misadjusted	Set with 
4. Control panel does not function	Hardware defective	
	Control panel dirty *)	Clean as described in section *Maintenance / External Cleaning / Control Panel*
5. No EtherNet connection Refer to the section *Operation, Operation via the IPC Webserver*	Wrong/invalid IPC IP address set	Correct the IP address on the control panel.
	Incorrect EtherNet cable plugged in	The LINK LED[2)] is lit when connected properly The ACT LED[3)] is lit when data is transferred properly (flashes during transmission)
	Missing/defective cables or components	Check connecting cable between IPC, EtherNet switch and coprocessor. Connect as shown in the system plan, if necessary.

*) The software checks the surface of the control panel during startup and indicates dirt or defects with an X. Fingers or notepaper would also be recognized as a ”fault,” stopping initialization until the fault is remedied.

Repair

Control Panel

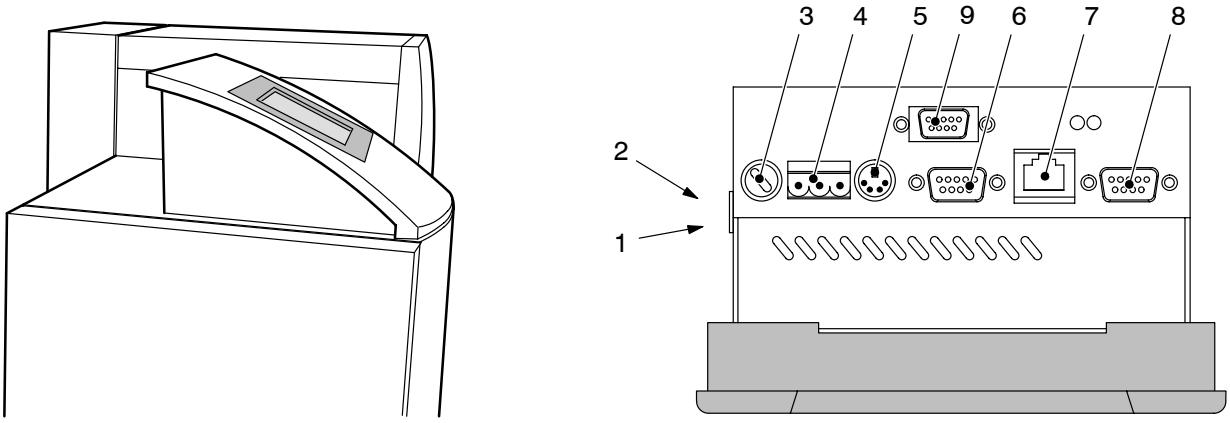


Fig. B-2

1 Battery
2 Memory board
3 Fuse
4 24 V_{DC} power supply
5 *Not in use*
6 CAN plug, 9-pin, sub-D, male
7 RJ45 EtherNet
8 RS232 COM1 (for options ControlNet and EtherNet/IP)
9 PROFIBUS-DP (option)

Detaching Control Panel

1. Lift one side of the control panel and press in a spring clip (arrows) on the other side. Then the control panel can be lifted high enough that the connections are exposed.

2. Press control panel back into place.

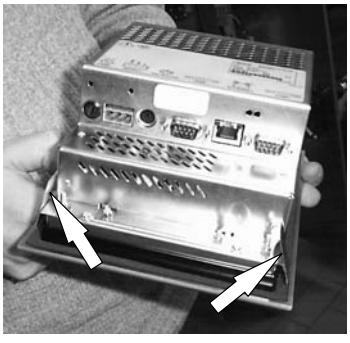


Fig. B-3

Replacing Battery

The battery serves as a backup for the realtime clock and to prevent data loss in the event of power outage. The battery should be replaced every three years to prevent loss of data. At the latest when the alarm *IPC battery voltage low* appears.

NOTE: The realtime clock must be reset after the battery has been replaced. Refer to section *Operation, Seven-day Clock, Set Date/Time.*

Procedure for Replacing Battery

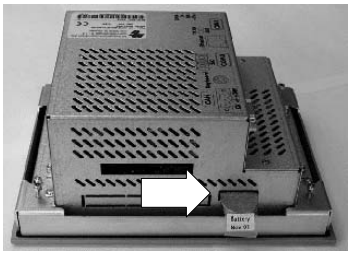


Fig. B-4

1. Switch on the melter for at least 10 minutes.
2. Then switch off the melter and replace battery quickly (data in battery backed memory is saved for at least 2 minutes).
3. Switch on the melter. The alarm *IPC battery voltage low* remains after the control panel is started up.
4. Switch melter off and then on again. The alarm *IPC battery voltage low* no longer appears.

Replacing Memory Board

WARNING: The memory board may be replaced only when the melter is switched off.

NOTE: All of the set parameters are lost when the memory board is replaced. The melter is returned to the original state.

However, the recipe data can be transferred to the new memory board, if the recipe versions of the old and new software are compatible. Refer to section *Operation, Download*.

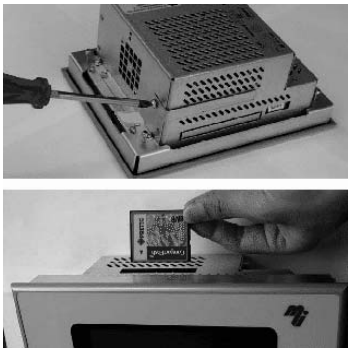


Fig. B-5

1. Switch melter off with main switch.
2. Refer to *Detaching Control Panel*.
3. Unscrew the cover (Fig. B-5)
4. Press the black pin near the board slot to be able to remove the old memory board.
5. Carefully slide in the new memory board.
6. Screw the cover back into place.
7. Reconnect any cables that may have come loose.
8. Attach the control panel.
9. Switch on the melter.
10. Enter the configuration code.
    Refer to section *Operation, Melter Configuration*.

Parts

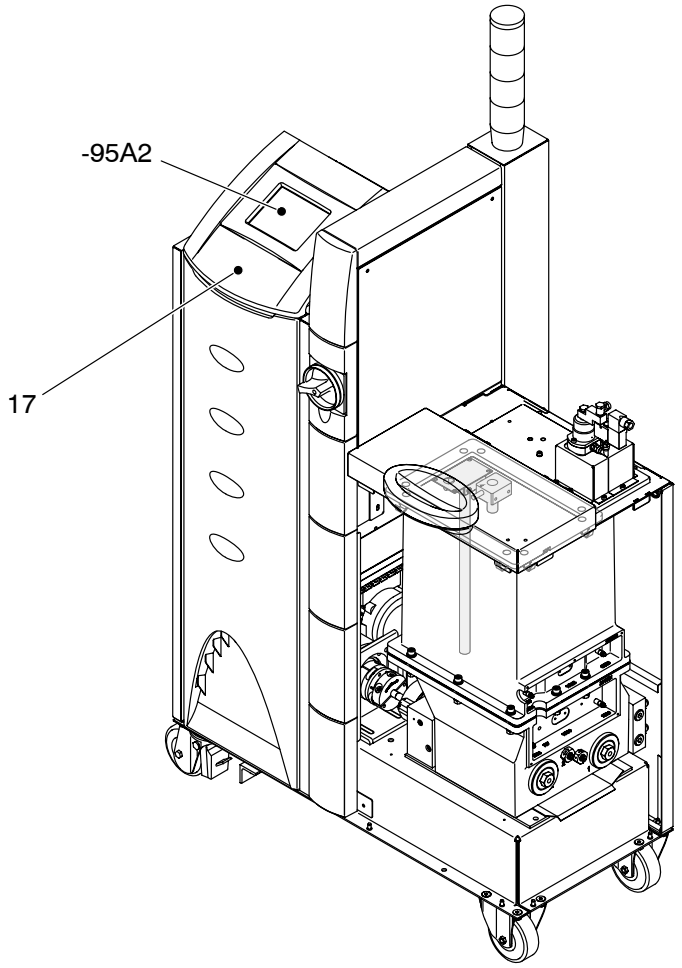


Fig. B-6

Item	Part	Description	Quantity	Note	Box	Code
17	207086	Console IPC	1			
	394829	Sealing cord D2,5	910 mm			
-95A2	207023	Central unit, IPC	1	A	19	≠D
	207850	Central unit, IPC, w/ PROFIBUS-DP-Slave	1	A	19	D
	394201	• Battery 3V / 950mAh Lithium, RENATA CR2477N	1			
	–	Memory Card (IPC Software Version ≤ 1.00.000)	1	B		
	729736	Memory Card (1.00.000< IPC Software Version <3.30.020)	1			
	7116383	Memory Card (IPC Software Version ≥3.30.020)	1			
–	207876	Plug, PROFIBUS, EasyConn, PB	1		19	D

NOTE A: The *Central unit* does not contain the Nordson software. Use either the existing memory card, or order memory card P/N 729736 or P/N 7116383.

B: **Contact Nordson Engineering.** The melter serial number (ID plate) should always be stated when ordering the memory card.

Spare Parts for Unit Types VB, VC, VD, VE, VW, VX, VY, VZ

Item	Part	Description	Quantity	Note	Box	Code
-96A1	7109062	Ethernet Switch 8 ports	1		32	1
-95A2	207023	Central unit, IPC	1	A	19	≠ D
	207850	Central unit, IPC, w/ PROFIBUS-DP-Slave	1	A	19	D
	394201	• Battery 3 V / 950 mAh, Lithium, RENATA CR2477N	1			
	- - - -	• Memory Card (IPC-Software Version ≤ 1.00.000)	1	B		
	729736	• Memory Card (1.00.000 < IPC-Software Version < 3.30.020)	1		32	X
	7116383	• Memory Card (IPC-Software Version ≥ V3.30.020)	1		32	1
-96A5	7116242	IPC coprocessor with software package and ControlNet gateway 1.00.000 < IPC-Software Version < 3.30.020	1		19 32	N 1
	7116385	IPC coprocessor with software package 1.00.000 < IPC-Software Version < 3.30.020	1		19 32	≠ N 1
	7116385	IPC coprocessor with software package IPC-Software Version ≥ V3.30.020	1		19 32	N 1
	7116385	IPC coprocessor with software package IPC-Software Version ≥ V3.30.020	1		19 32	≠ N 1
-96A5	7104901	• Battery for IPC coprocessor (XT-CPU-BAT1)	1			
	7109494	• Software package for VersaBlue w/ ACM (IPC-Software Version ≥ V3.30.020)	1		32	1
–	207876	Plug, PROFIBUS, EasyConn, PB	1		19	D

NOTE A: The memory card of the *Central unit* does not contain the Nordson software. Either the existing memory card can be used, or memory card P/N 729736 can be ordered.

B: **Contact Nordson Engineering.** The melter serial number (ID plate) should always be stated when ordering the memory card.

Repair (Melter Types VB, VC, VD, VE, VW, VX, VY, VZ)

Replacing Coprocessor Battery

The battery in the coprocessor ensures that all saved data is not lost, even when the melter is switched off.

The battery charge level is monitored. If the voltage is too low, an error is generated (Also refer to Troubleshooting, Alarm no. 4: *Coprocessor battery voltage low*).

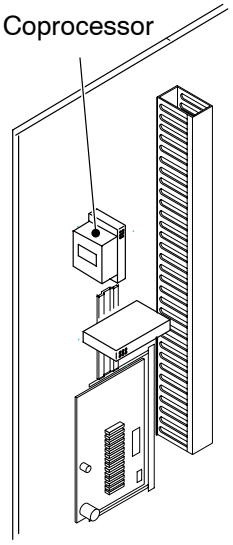


Fig. B-7 Location

Battery Back-up Times

- At least three years
- Five years is typical.

WARNING: To retain the data in the coprocessor, the melter **must** remain **ON** when the battery is replaced.

This is the only way to prevent complete failure of the melter!

The tasks described below should be performed on an energized electrical cabinet. Any work near energized electrical components should be performed with utmost care!

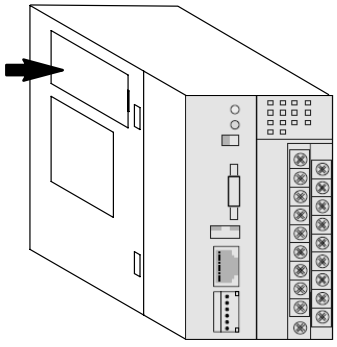


Fig. B-8 Coprocessor

1. Have the new battery readily available so that battery replacement can be performed quickly.

   Type: XT-CPU-BAT1, P/N 7104901.

2. Switch on the melter (Set the main switch to **I**/**ON**).

   The coprocessor is located inside of the VersaBlue melter electrical cabinet, on the left door (Fig. B-7).

   The battery compartment is on the left side of the coprocessor (Fig. B-8).

3. Open the battery compartment of the coprocessor.

4. Remove the old battery and place it aside.

CAUTION: Ensure that the polarity is correct. The plus terminal on the new battery must point towards the front of the coprocessor.

5. Insert the new battery in the coprocessor.
6. Close the battery compartment.
7. Properly dispose of the old battery.

Appendix C

General Instructions Regarding Working with Application Materials

Definition of Terms

Application materials can be e.g. thermoplastic hot melt materials, adhesives, sealants, liquid adhesives and similar application materials. They are referred to as materials.

NOTE: The materials that may be processed with your Nordson product are described in the manual under *Intended Use* and *Unintended Use*. When in doubt, please contact your Nordson representative.

Manufacturer Information

Materials may be processed only when the manufacturer's product descriptions and Safety Data Sheets (MSDS) are observed.

They provide information, amongst other things, on correct processing of the product, transport, storage and disposal. Information regarding reactivity and potentially hazardous decomposition products, toxic properties, flash points, etc. can also be found there.

Liability

Nordson is not be liable for danger or damage resulting from the materials.

Risk of Burns

There is a risk of burns when handling heated materials. Work carefully and wear appropriate protective clothing/equipment.

Vapors and Gases

Ensure that vapors and gases do not exceed the prescribed limits. If necessary, exhaust vapors and gases and/or provide sufficient ventilation of the work space.

Substrate

The substrate should be free of dust, grease and moisture. The suitable material, optimum working conditions, and possible pre-treatment of the substrate must be determined by testing.

Processing Temperature

When materials require heating, adherence to the prescribed processing temperature is imperative to ensure the quality of the application. It may not be exceeded! Overheating can cause material coking or cracking, resulting in malfunctioning or unit failure.

Material should always be melted gently. Extended, unnecessary temperature load should be avoided. The temperature should be reduced during breaks in work. The temperature in the tank should be attuned to the material consumption. Thus it is close to the prescribed processing temperature for high material consumption and lower for lower consumption.

When materials are processed cold, take into consideration the shear heat and the ambient temperature; cool if necessary.

Appendix D
Glossary

Advance Distance

Distance between initiator and gun/application head.

Angel Hair

Fine threads of adhesive that are created when adhesive is incorrectly transferred from the nozzle to the substrate. This could be caused e.g. by poor shaving of high viscosity material at the nozzle.

Application Head

Refer to *Gun*.

Application System, Hot Melt

An arrangement of units and components that melt, feed, meter and apply hot melt adhesive, e.g. bulk melter, melter, gear metering pump station, gun, coating stand and heated hoses.

Application Weight

The weight (grammage) of the application material applied to a surface unit of the substrate.

Determining the application weight: A circle cutter is used to cut several 100 mm^2 sized circles from the uncoated substrate. The cut out sections should be evenly distributed on the substrate. The samples are each weighed to exactly 0.01 g, and the average weight is calculated. The same is done with the coated substrate. The number of samples taken depends on how much the weights of the samples differ. The application weight is the difference between the coated and uncoated substrate. The application weight is usually stated in g/m^2.

Assembly Handgun

Manually operated system component used to apply material as a bead, dot, surface or spray application.

bar

Legal unit for pressure. The SI unit is Pascal (Pa). The unit commonly used in the USA is psi. Refer to *Conversions.*

Bd (Baud)

Rate of data transfer: Bit/s.

Bead Size

The width of a bead of material applied to a substrate. The size refers to the bead before it is compressed by the two parts.

CAN Bus

The **C**ontroller **A**rea **N**etwork is an internationally standardized serial bus system. With Nordson melters, control components such as temperature controllers, motor controllers (frequency converters) and pressure sensors exchange data with the industrial PC via the CAN bus. The CAN bus is used as an internal network for Nordson unit control and is not intended to be an interface for the customer's control units.

Cast-in Heater

A resistance heating element that is cast into a tank or melting plate. This fixed connection provides optimal heat conducting.

Charring

Decomposition of a synthetic material, particularly through heat influence. Can occur when processing temperature is too high.

Class of protection

Protective measures are required to ensure electrical safety of the units. The measures prevent accessible metal parts from conducting voltage when a fault occurs. Assignment of classes of protection indicates the protective measures.

Class of protection	Symbol	Precaution
1		All accessible metal parts are conductively connected to one another and are linked to the mains ground conductor.
2		The unit is insulated such that there are no accessible metal parts that could conduct voltage in the event of a fault. There is no ground conductor.
3		The unit is operated with extra-low voltage up to 42 V from a safety isolating transformer or a battery.

Component

1. System component:
   This term designates a single unit (e.g. melter) that is part of an application system.
2. Unit component:
   This term designates a single part (e.g. coupling, *EMERGENCY OFF* button) or a group of parts that forms a functional unit (e.g. inert gas equipment).

Controller

Used to control proportional valves (pressure control unit) or solenoid valves and guns/application heads (pattern controller) dependent on the speed of the parent machine.

ControlNet

Internationally standardized serial field bus with scanner and adapter subscribers. Nordson melters (adapter) with a ControlNet interface can be controlled remotely by the customer's control unit (scanner).

Control Voltage

Electrical cabinet internal voltage for electrical components such as temperature controllers, PLC, etc. The control voltage in Nordson electrical cabinets is usually 230 V_{AC} or 24 V_{DC}.

Conversions

In mesh	In mm	In mesh	In mm
2,5	8.0	50	0.30
3	6.73	60	0.25
5	4.0	80	0.18
8	2.38	100	0.149
10	2.0	140	0.105
14	1.41	170	0.088
18	1.0	200	0.074
20	0.84	270	0.053
30	0.59	325	0.044
40	0.42	400	0.037
Table: U.S. Bureau of Standards			

Conversions *(contd.)*

Unit		Multiplied by	Result	
Density		SI unit: [kg/m^3]		
Kilograms per cubic meter	kg/m^3	1.0 x 10^{-3}	Kilograms per liter	kg/l
Kilograms per cubic meter	kg/m^3	8.35 x 10^{-3}	Pounds per gallon (US)	lb/gal
Kilograms per liter	kg/l	8.35	Pounds per gallon (US)	lb/gal
Pounds per gallon (US)	lb/gal	0.12	Kilograms per liter	kg/l
Starting torque		SI unit: [Nm]		
Newtonmeter	Nm	8.85	Pound inch (US)	lbin
Newtonmeter	Nm	0.74	Pound foot (US)	lbft
Pound inch (US)	lbin	0.113	Newtonmeter	Nm
Pound foot (US)	lbft	1.36	Newtonmeter	Nm
Pressure		SI unit: Pascal [Pa = N/m^2]		
Pascal	Pa	1.0 x 10^{-5}	Bar	bar
Pascal	Pa	0.69 x 10^{-6}	Pounds per square inch (US)	psi
Bar	bar	14.5	Pounds per square inch (US)	psi
Pounds per square inch (US)	psi	0.069	Bar	bar
Speed		SI unit: [m/s]		
Meters per second	m/s	196.89	Feet per minute	ft/min
Feet per minute	ft/min	5.1 x 10^{-3}	Meters per second	m/s
Length		SI basic unit: Meter [m]		
Meter	m	3.2808	Foot	ft
Foot	ft	0.3048	Meter	m
Centimeter	cm	0.3937	Inch	in
Inch	in	2.54	Centimeter	cm

Conversions *(contd.)*

Unit		Multiplied by	Result	
Mass		SI basic unit: Kilogram [kg]		
Kilogram	kg	2.2046	Pound (US)	lb
Pound (US)	lb	0.4536	Kilogram	kg
Gram	g	0.0353	Ounce	oz
Ounce	oz	28.35	Gram	g
Temperature		SI basic unit: Kelvin [K]		
Degrees Celsius	˚C	(˚C x 1.8) + 32	Degrees Fahrenheit	˚F
Degrees Fahrenheit	˚F	(˚F – 32) ÷ 1.8	Degrees Celsius	˚C
Viscosity, dynamic		SI unit: Pascal second [Pas]		
Pascal second	Pas	1.0×10^{3}	Centipiose[A]	cP
Centipiose[A]	cP	1.0×10^{-3}	Pascal second	Pas
Viscosity, kinematic		SI unit: [m^2/s]		
Square meters per second	m^2/s	1.0×10^{-6}	Centistoke[A]	cSt
Centistoke[A]	cSt	1.0×10^{6}	Square meters per second	m^2/s
Volume		SI unit: [m^3]		
Cubic meter	m^3	$1. 0 \times 10^{3}$	Liter	l
Cubic meter	m^3	264.2	Gallon (US)	gal
Liter	l	0.2642	Gallon (US)	gal
Gallon (US)	gal	3.7853	Liter	l
NOTE: A: Has not been a legal unit since 1986.				

dB (A)

Unit for the sound intensity level, measured according to the internationally standardized evaluation curve A, which measures sound in a way similar to how it is perceived by the human ear.

Degree of Protection

According to IEC 529/DIN 40 050.

The degrees of protection of electrical components through metal protection are stated as an abbreviation such as IP 54. The first numeral stands for the contact and impurity protection, and the second numeral indicates water protection. The third numeral, which indicates impact protection, is usually not stated.

	1. numeral	2. numeral	3. numeral
IP	**Contact and impurity protection**	**Water protection**	**Impact protection**
	Protection from...	**Protection from...**	**Protection from impact strength up to...**
0	–	–	–
1	Foreign object > 50 mm	Water dripping vertically	0,225 J = Impact of 150 g from a height of 15 cm
2	Foreign object > 12 mm	Water dripping diagonally	0,375 J = Impact of 250 g from a height of 15 cm
3	Foreign object > 2.5 mm	Spray water	0,5 J = Impact of 250 g from a height of 20 cm
4	Foreign object > 1 mm	Splash water	–
5	Dust accumulation	Water stream	2,0 J = Impact of 500 g from a height of 40 cm
6	Dust penetration	Upon flooding	–
7	–	When dipped	6,0 J = Impact of 1.5 kg from a height of 40 cm
8	–	When submerged	–
9	–	–	20 J = Impact of 5 kg from a height of 40 cm

Drop-off Delay

1. The time between the signal to switch off the gun/application head and the end of material application.
2. The time that a delay relay remains engaged after it has been switched off.

Encoder

The encoder compiles the line speed of the parent machine. It supplies a certain number of electrical pulses per revolution. The frequency is a measure of line speed. Refer to *Line Speed Signal*.

Firmware

Internal software that cannot be changed by and that is not accessible to the customer.

Flap Valve

A valve through which material can only flow in one direction. The valve closes automatically when the flow direction changes.

Free-wheeling Diode

Electronic component that protects electronic assemblies from power surges that occur when relays or solenoid valves are switched off.

Grammage

Refer to *Application Weight.*

Gun, Hot Melt

System component used to apply material as a bead, dot, surface or spray application.

Heater Cartridge

A replaceable, cylindrical resistance heating element. It is inserted into a hole in the component to be heated.

Hopper

Unheated tank extension, used to increase tank volume.

Host

Higher-order control unit.

Hot Melt

Synonym for *hot melt adhesive*.

Hot Melt Adhesive

Hot melt adhesives are thermoplastic synthetic materials. They are processed in a liquid state. They bond by solidifying.

Inert gas

Gas (e.g. nitrogen) used to protect the adhesive from contact with humidity and therefore from undesired reactions. Inert gas is also referred to as protective gas.

Initiator

Component that generates a signal when an object is in a certain area of its surroundings. Possible models are e.g. proximity initiators and light beam photo cells.

Intermittent Mode

Mode of operation for guns/application heads. Instead of material application being continuous, it occurs with pauses to create the desired application pattern.

LED

Light Emitting Diode.

Line Speed Signal

A signal generated by the parent machine (voltage, current or frequency) to control the melter.

Line Voltage

Voltage in the customer's network. It may need to be converted to operating voltage by a transformer.

Machine Enable

A control unit is enabled by a signal from the parent machine. In Nordson literature the enable feature is also referred to as *Parent Machine Interlock* or *Security*.

Master-Slave

The setup of two or more units in which one assumes control of one or more slaves.

Example: Nordson melters on the PROFIBUS are slaves that are controlled by the customer's master.

Material

General Nordson term for application materials such as thermoplastic hot melt adhesives, adhesives, sealants, cold glue, etc.

Melter

Melts and feeds hot melt adhesives or similar materials.

Menu

Branched program structure from which the operator selects the desired functions/features.

min^{-1}

min^{-1} = 1/min. Revolutions per minute (rpm).

MSDS

Material Safety Data Sheet.

Ni 120

Abbreviation for a nickle based resistance temperature sensor. At a temperature of 0˚ C (32˚ F), it has an electrical resistance of 120 Ω.

Nm

Newtonmeter, SI unit for energy and starting torque. Refer to *Conversions.*

Noise Emission

Noise level that a unit produces in the immediate vicinity. The noise emission is stated in dB (A).

Nominal Air Quantity

States suction volume of exhaust hoods. The pressure drop from the exhaust hood to the customer's fan must also be taken into consideration.

Nozzle

The component through which the material leaves the gun/application head. The nozzle determines the volume, shape and direction of the material outlet.

Open Time

The maximum time in which bonding can occur between application of the material to the substrate and pressing on the second part. Factors such as application temperature, substrate, adhesive properties and amount of adhesive are relevant to *open time*.

Operating Air Pressure

The customer's compressed air supply is usually reduced by pressure controllers in the units. The operating air pressure is the reduced pressure at which pneumatic components are operated.

Operating Voltage

The voltage used to operate the unit. The operating voltage is stated on the ID plate. A transformer may be necessary to adapt the melter to the customer's line voltage.

Output Quantity

The material volume fed by the pump. Stated e.g. in cm^3/min.

Pa

Pascal, SI unit for pressure. Refer to *Conversions.*

Parameters

Variably adjusted values that must be entered into a control unit, a PLC control or the control system.

Parent Machine

The user's machine that generates the line speed signal for key-to-line mode. Refer to *Line Speed Signal*.

Pas

Pascal second, SI unit for dynamic viscosity.

PID Controller

A type of controller that combines different control characteristics of proportional, integral and differential aspects.

The controller should be calibrated such that the controlled variable (output variable) and the manipulating variable (input variable) fluctuate as little as possible and the time needed for the manipulating variable to stabilize is as short as possible.

PLC

Programmable Logic Controller.

Polyamide

A term used by Nordson to describe polyamide-based hot melt adhesives. Other common designations are polyamide resin and polyamide hot melt adhesive.

Polyurethane Hot Melt Adhesive

Moisture interlaced hot melt adhesive. Common abbreviations are PU and PUR. When processing polyurethane adhesives, additional safety instructions must be observed.

Power Consumption P

The electrical power consumption (wattage) of the unit (motor, heater and the electrical components in the electrical cabinet).

Power Consumption P_{max}

The maximum electrical power consumption (wattage) of the unit and the connected accessories. It is calculated as the product of the connected voltage and the maximum current protected by fuse.

Processing Temperature

The processing temperature is prescribed or recommended by the material manufacturer. It can be found in the product information and/or in the Material Safety Data Sheet (*MSDS*)

PROFIBUS

Internationally standardized serial field bus with master-slave subscribers. Nordson melters (slave) with a PROFIBUS DP interface can be controlled remotely by one of the customer's control units (master).

Proper Disposal

Disposal of all types of waste in compliance with all local regulations.

Proportional Pressure Control Valve

Electropneumatic component that enables control of pneumatic pressure with an electrical variable (usually control voltage).

Protective Gas

Refer to *Inert Gas*.

Pt 100

Abbreviation for a platinum based resistance temperature sensor. At a temperature of 0˚ C (32˚ F), it has an electrical resistance of 100 Ω.

Pull-in Delay

1. The time between the signal to switch on the gun/application head and the beginning of material application.
2. The time between when the voltage is turned on and when the delay relay is actually engaged.

PUR

Refer to *Polyurethane Hot Melt Adhesive*.

Rated Current

The setpoint for current to a unit, determined by standards or as agreed upon by the manufacturer and the customer.

Release Coating

Largely prevents hot melt adhesive from burning onto the surface and makes it easier to clean the application system parts coming into contact with the adhesive.

Residual Risks

Hazards that can pose a danger to the user, even when all safety regulations for manufacturing a product are followed and when the unit is used only as intended. Residual risks are noted - as extensively as the manufacturer is aware of them - in the manual and/or with waning signs on the unit.

Resistance Temperature Sensor

Component with an electrical resistance, the value of which changes as a factor of the temperature. Nordson units use the models *Pt 100* and *Ni 120*.

Reverse Mode

A pump motor operates counter to the direction of material feeding. Prevents material from dripping.

RPM

Revolutions per minute, same as min^{-1} = 1/min.

Safety Valve

A valve that prevents the material pressure from exceeding a preset value.

Safety Valve Plate

A component in which material circulates when the installed safety valve is open.

Set Time

The amount of time that the adhesive needs from application to complete hardening.

SI

Système International d' Unités (international standardization system).

Solenoid Valve

Usually part of the gun/application head. A control valve that is activated by an electromagnetic coil.

Solid State Relay

Electronic assembly without mechanical parts but with the function of an electromechanical relay.

Solvent

Solvents are liquid, organic materials and their compounds, used to clean adhesive off of surfaces. Solvents are slightly volatile. Special regulations must be followed when using solvents.

In Nordson literature, the solvent is always the substance prescribed by the hot melt manufacturer.

Substrate

The product – fabric, foil, etc. – to which a material is applied.

Tach Generator

A component that generates electrical voltage (pilot voltage). The voltage is proportional to the speed at which the tach generator is driven.

Temperature Sensor

A part of a temperature control system that compiles the temperature and transmits it to the control system. *Resistance temperature sensor* are used in Nordson units.

Thermostat

Component that regulates temperature. It is usually an electrical switch that switches at a certain or set temperature. The difference between the temperatures at which the unit switches on and off is called hysteresis.

Transformer

Voltage converter.
Used in Nordson units to convert the customer's line voltage to the operating voltage.

V_{AC}

Abbreviation for *Alternating Current*. AC voltage.

V_{DC}

Abbreviation for *Direct Current*. DC voltage.

Viscosity

Strength; an indication of the force that must be generated to move a liquid:

1. Viscosity (also called dynamic viscosity).
   Unit: Pas (Refer to *Conversions*).
2. Kinematic viscosity (dynamic viscosity divided by material density).
   Unit: m^2/s (Refer to *Conversions*).