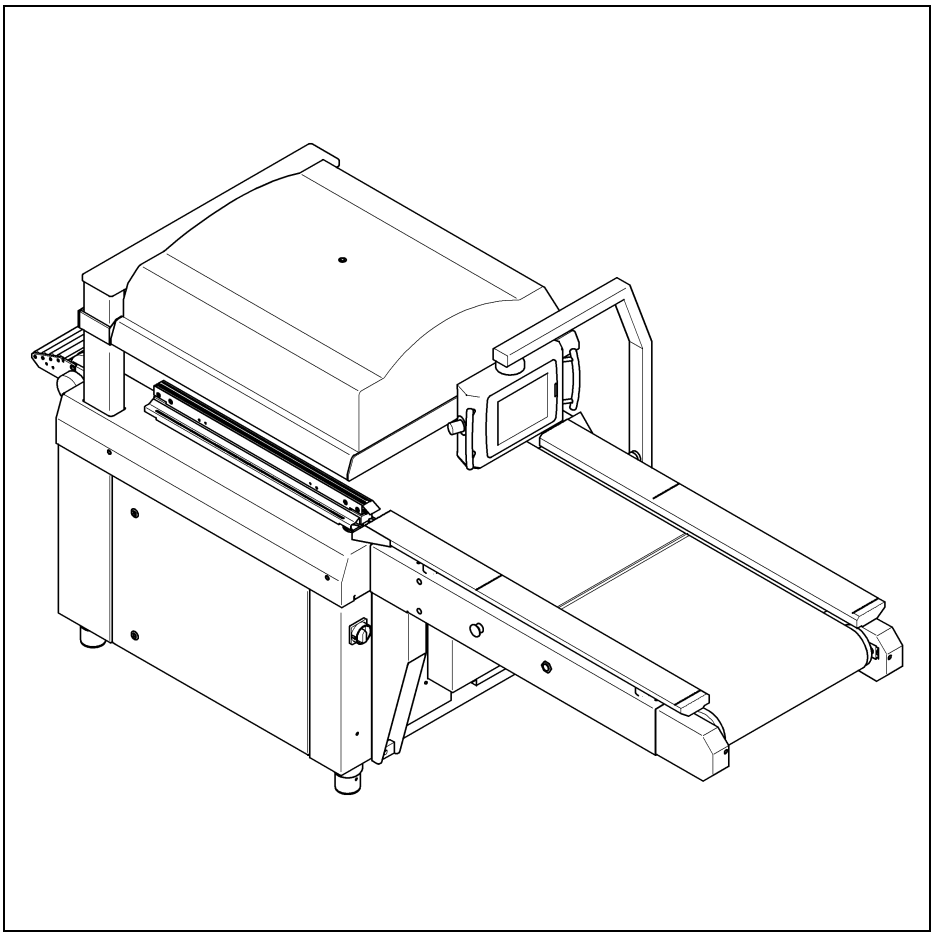
Operating manual

Art. no. 592.016

Vacuum Packaging Machine

K7



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☞ NOTICE

The following handover declaration has to be completed by the owner. The owner is obliged to return the original, completed handover declaration to us. The owner hereby certifies that he/she has understood and taken full note of the operator manual. By signing this document the owner certifies that he/she shall observe the safety instructions contained in the operator manual and shall inform each and every machine user or persons working at the machine of the relevant safety instructions.

The operator shall be liable for any personal injuries or damage to property resulting from non-observance of the safety instructions.

Handover Declaration

(1) Type of Machine ..... Machine No. .....

(2) Owner's Address .....

(3) I/We hereby declare that the machine specified under point 1 has been handed over in perfect external condition. Briefing and training of operating personnel including the creation of an acceptance protocol with documented training will be carried out on ..... . The person responsible for acceptance is:

.....

If necessary, agents of the suppliers of auxiliary materials are consulted for acceptance purposes. These are the suppliers of trays, bags, films, and inert gases which may be used. The owner has the responsibility to consult these agents.

I/We hereby declare that I/we have received the Operating Manual art. no. ..... The contents of this manual shall be read and understood prior to commissioning and made available to the employees authorised to work at or operate the machine. If parts of the operator manual refer to safety at the workplace, the regulations become part of the respective labour and service level agreements.

(4) The machine has been delivered to the owner in accordance with the manufacturer's delivery conditions. If the owner and buyer are not identical, it is expected that the owner acts on behalf and with the authorisation of the buyer.

(5) The completed handover declaration has to be sent to the manufacturer's address via registered mail on the day of or, at the latest, on the day after handover:

Inauen Maschinen AG
Melonenstrasse 2
CH-9100 Herisau / Switzerland

Owner's signature: Supplier's signature:

....

Owner's stamp	Date of handover:	*Supplier's stamp*

Contents

1 Introduction

1.1 General information

- This operator manual is an integral part of your machine. The information and safety instructions contained herein have to be carefully read and adhered to by members of staff authorised to operate the machine. Superiors who are responsible for machine operation shall be liable for damages and their consequences resulting from incorrect handling of the machine. It is therefore in the interest of the operator that this operator manual is strictly adhered to.
- The manufacturer shall not be liable for any damages which occur due to non-observance of this operator manual in its entirety.
- Only the information contained in this operator manual can prevent faults during operation and guarantee trouble-free operation. It is therefore imperative that this operator manual is actually read und understood by members of staff authorised to operate the machine.
- This machine is a state-of-the-art device at the time of delivery. It complies with CE regulations and the latest version of machinery directive 98/37/EC at the time of delivery.
- In the unlikely event that problems should occur, or if questions arise, please do not hesitate to contact our Customer Service.
- Due to technical changes and improvements to the machine some of the diagrams contained in this operator manual may not be exact. However, the diagrams are fully understandable in order to explain processes or a course of action.
- We reserve the right to change dimensions and construction of the machine.

Customer Service Dept. Switzerland

The manufacturer's address is displayed on the name plate. Always state the type of machine and the machine's serial number, which are also displayed on the name plate, when contacting us.

Manufacturer: Inauen Maschinen AG
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Website: www.vc999.biz

Represented by:

1.2 Terms

The following terms are used in this operator manual to describe people who work at or who are in some way involved with the machine:

Buyer

The buyer is the person who purchases the machine from the manufacturer or its representative, even if he/she always allows a third party to use the machine. The buyer is also the manufacturer's customer and is the owner as defined by law.

Owner

The owner is the person who operates or uses the machine, even if he/she is not the actual owner as defined by law. The owner also becomes liable for the legal risk resulting from operation or connected to operation of the machine when operating the machine.

Operator, operating personnel

Operators or operating personnel are the people responsible and authorised to operate the machine. These people should possess sufficient know-how in order to handle and operate the machine correctly. Usually, one or several people are given responsibility for the machine and provided with the operator manual for future reference.

It is expected that these people have been briefed about the machine and the operator manual on-site and are especially aware of the safety regulations for correct handling of the machine and have been expressly informed about compliance with the aforesaid regulations.

Specialist, specialist personnel

Specialists are specially trained people who, due to their vocational training, are qualified to carry out special tasks at the machine.

These people are, e.g., electricians, mechanics, specialist engineers and appropriately qualified cleaning staff. These people also have to be familiar with the contents of the operating manual.

1.3 Copyright protection

2 Safety, warranty

2.1 Explanation of the safety instructions

All the safety instructions in this operating manual provide the operator with early warning of possible dangers, possible damage to the machine and peripheral equipment and of flawed, productive work.

Any sections which are of particular importance to the operator are marked by a warning symbol. The operator must read and comply with this information.

Meanings:

DANGER

indicates a hazardous situation wich, if not avoided, will result in death or serious injury!

WARNING

indicates a hazardous situation wich, if not avoided, could result in death or serious injury!

CAUTION

indicates a hazardous situation wich, if not avoided, may result in minor or moderate injury!

NOTICE

indicates a situation wich, if not avoided, may result in considerable damage to equipment or environmental harm!

2.1.1 Warning safety signs at the machine

All possible areas of danger are described in this operator manual and additionally indicated at the machine via warning safety signs. Please always pay attention to this safety information and act with the respective caution.

WARNING OF A POTENTIAL DANGER ZONE

This warning safety sign displays potential danger zones at the machine. Always observe safety information to prevent injuries. These danger zones are described in detail in the operating manual.

WARNING ELECTRICAL HAZARD

This area contains an electrical appliance; danger of death! Risk of electric shock when coming into direct contact with live parts! Only fully qualified electricians should carry out work on electrical appliances.

2.2 General safety instructions

Pay particular attention to the following instructions:

- Everybody involved with the installation, start-up, operation and servicing (inspection, maintenance, repair work) of the machine at the owner's company has to have carefully read and understood the entire operating manual and especially the chapter entitled "Safety".
- This machine is a state-of-the-art device at the time of delivery. The respective safety regulations for machine operation have been observed.
- All parts, whether self-manufactured or purchased from a component firm, comply with technical standards and EU regulations in accordance with machinery directive 98/37/EC.
- A continuous quality control of our own and third party parts is carried out prior to assembly at our production plant.
- All safety and protective equipment is included in this safety concept which is geared towards protecting all the people who are employed to work on or with this machine against dangers..

☞ NOTICE

Technical intervention in the functioning and effectiveness of the safety devices, safety switches and covers or casing is expressly prohibited.
If any of the safety and protective devices are either entirely or partially put out of service, claims for recourse against the manufacturer shall not be accepted.

The machine is then considered unsafe for operation as defined by law and should neither be operated nor provided to third parties for operation.

☞ NOTICE

Never place objects on the vacuum chamber lid (Fig. 3/1, pos. 15)!

☞ NOTICE

If the operator manual expressly states that the power supply has to be disconnected for certain tasks at the machine, these tasks should only be carried out after it has been ensured that accidental switching on of the power supply cannot occur directly or via a third party. This means:

- **The power supply has to be disconnected either by disconnecting the machine from the mains or by disconnecting the plug,**

or:

- **The main switch has to be secured accordingly, i.e. using a padlock or placing a seal through the provided holes in the switch.**

NOTICE

Before each intervention at pneumatic parts, ensure that the compressed air valves and cylinders are depressurized.

- **Always check all the safety devices prior to each start-up.**
- **Check the earth resistance at the electrical components after carrying out work at the machine**
- **Always observe local and regional safety regulations (e.g. electricity provider). This also applies to the regulations of professional organizations.**

NOTICE

The owner is solely responsible for workplace safety and adherence to statutory regulations regarding machine handling.

This operator manual is part of the machine. If it is lost or damaged, immediately order a replacement copy via our Customer Service. Always state the type of machine and the machine number (according to the data on the name plate).

2.3 Intended Use

The Vacuum Packaging Machine VC999 K7 is a technical appliance which should only be used for its intended task. Use of the Vacuum Packaging Machine in accordance with its intended purpose consists with provisions in vacuuming and sealing suitable products in sealable plastic bags.

Proper use in accordance with the intended purpose also includes compliance with all the instructions and conditions for setting up, connection and the operation of the Vacuum Packaging Machine as specified by the manufacturer.

Suitable products

Suitable products for vacuum wrapping are goods which do not develop any explosive or toxic vapours on introduction of a vacuum and which will not be damaged by the effect of the vacuum. Such products may be from the foodstuffs sector (e.g. meat, sausage, etc.) or the non-food sector (medical equipment, electrical or mechanical components, etc.).

The owner is responsible for the suitability, condition and characteristics of the products being packaged. The machine manufacturer is not responsible for the content of the packages.

If in doubt, check the suitability of products with valueless samples or take advice from the Vacuum Packaging Machine manufacturer.

Any use that deviates from the use in accordance without the written approval of the manufacturer is deemed to be mis-use. The manufacturer cannot be held liable for any damage to the Vacuum Packaging Machine or vacuum-packed products arising from this.

2.4 Safety when vacuuming

DANGER

Vacuums kill living organisms! Do not vacuum-pack any living organisms and also ensure that no living organisms are vacuum-packed by unauthorized persons or children!

Vacuum packaging systems use a vacuum pump to remove air from a hermetically sealed vacuum chamber in which the product and the packaging has been placed. Therefore, access is not possible during the sealing process. External air has to flow into the chamber before the two parts of the sealing tool can be opened.

Never try to open the tool with force!

The vacuum is used to extract the air in the packaging. According to the laws of thermalphysics, moisture in the air starts to evaporate at a relatively low vacuum. This means that products which contain a large amount of uncombined moisture can be affected.

The vacuum pump has the reverse effect, like a compressor. Dust particles, but also moisture, are entrained by the vacuum current and can reach the vacuum pump unhindered. If products for which this process can occur are to be packaged, it is recommended to install a dust or moisture separator in front of the vacuum pump.

This especially applies for products which have a high sugar or starch content (sauces and breadcrumb coating), since entrained particles become incrusted in valves and small bore holes in the tool and on the lamellas of the vacuum pump where they crystallize or agglutinate. And since these locations can hardly be cleaned, functioning of the entire system can be significantly affected if a filter and separator are not installed.

It is also hazardous to package flammable or explosive products (icing sugar or dextrose, but also spray or perfume bottles), since entrained parts or particles can react accordingly.

DANGER

Spray bottles with a specified internal pressure should not be vacuum packed, since a reduction of the external pressure causes the high internal pressure to explode.

The standard version of the Vacuum Packaging Machine VC999 K7 is equipped with a vacuum pump but without a filter or separator, if not ordered with the respective equipment.

2.4.1 Safety precautions and equipment

The following safety precautions and equipment are designed to ensure your safety:

- EMERGENCY STOP button on both sides of the cockpit

  If an emergency or hazardous situation arises, use the EMERGENCY STOP buttons to immediately stop the Vacuum Packaging Machine and to de-energize any hazardous components. Release of the EMERGENCY STOP button does not automatically restart the machine. The machine has to be actively re-started.

- Hand-guard at the vacuum chamber lid

  A hand-guard is fitted around the edge of the vacuum chamber lid. This hand-guard must be completely lowered without hindrance in order to start the packaging cycle.

3 Description of the machine

3.1 Operating principle

This section describes how the Vacuum Packaging Machine is structured. This will assist you in identifying and naming the individual parts and sub-assemblies.

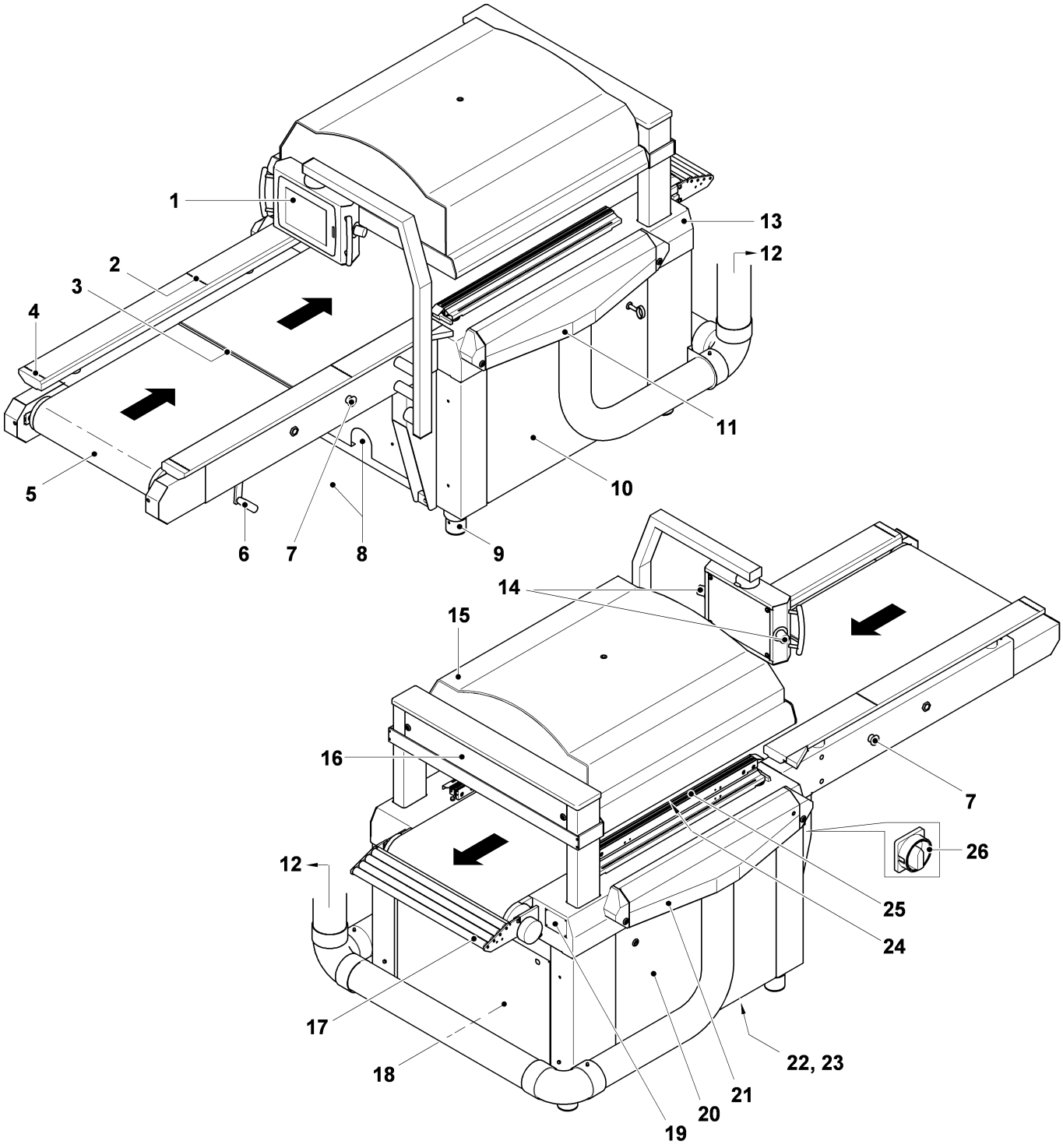


Fig. 3/1

Legend

1	Cockpit with interactive display
2	Loading area limit mark
3	Conveyor belt joint (plastic wire)
4	Loading area limit mark
5	Conveyor belt
6	Tensioning lever for conveyor belt tension
7	Start button for automatic operation
8	Vacuum pump positions (vacuum pumps)
9	Height adjustable foot
10	Electrical cabinet with control unit
11	Right-hand bag waste suction tube (VC999 K7A)
12	To the bag waste suction unit (VC999 K7A)
13	Vacuum chamber bottom
14	Emergency stop buttons
15	Vacuum chamber lid
16	Terminal box with vacuum sensor
17	Outfeed roller conveyor
18	Lifting mechanism
19	Name plate
20	Cabinet for energy supply (electric / pneumatic)
21	Left-hand bag waste suction tube (VC999 K7A)
22	Electrical connection
23	Compressed air connection
24	Upper sealing bars, cutter blade (VC999 K7A), perforation blade (VC999 K7B), pre-perforation
25	Lower sealing bars
26	Main switch

Cockpit (1)

The cockpit is located directly above the conveyor belt and can be operated from either side of the machine. It includes all operating elements for operating the Vacuum Packaging Machine.

Programming of packaging cycles is done on the interactive display.
Here, you can also display the individual parameters and edit their values. A keyboard appears for entering data.

Vacuum generation with vacuum chamber

The vacuum generation unit and vacuum chamber form the central sub-assembly of the Vacuum Packaging Machine. One or more vacuum pumps can be provided for vacuum generation to meet customer requirements.

The vacuum chamber consists of the vacuum chamber lid (15) and the vacuum chamber bottom (13). A lifting mechanism lowers the vacuum chamber lid onto the vacuum chamber bottom and raises it again after vacuuming.

Pre-perforation (24)

The pre-perforation ensures that unusually long bags which protrude from the vacuum chamber lid can be easily processed. Due to the spring-loaded mechanism on both sides of the vacuum chamber lid, the bag is pressed together by hold-down clamps when closing the vacuum chamber. The perforation blade is subsequently released and pressed down onto the bag in the vacuum chamber. This results in small bag perforations via which vacuum can be created in the bag.

Sealing device (24) with cutter blade (VC999 K7A) or perforation blade (VC999 K7B)

The sealing device consists of two sealing bars in the vacuum chamber lid and two sealing bars in the vacuum chamber bottom. When the vacuum chamber closes, the upper and lower sealing bars are positioned opposite each other and pressed together for sealing.

The bag waste is either cut off by a cutter blade (VC999 K7A) or perforated by a perforation blade (VC999 K7B) during the sealing process. The blades are located in the vacuum chamber lid next to the sealing bars.

The bags are perforated (VC999 K7B) to ensure that the bag waste can be removed manually once the bag has left the machine.

Conveyor belt (5)

The conveyor belt runs through the entire Vacuum Packaging Machine. A short run-out roller track (17) at the end of this belt enables optional conveyor devices to be added on as required by the customer.

The integral initiator ensures that within a packaging cycle the conveyor belt moves far enough for the packaging product laid between the markings (2, 4) on the feed belt to come to a stop exactly in the vacuum chamber.

The conveyor belt can be slackened by means of the tension lever (6) for cleaning and opened for dismantling by removing the plastic wire on the cord at the joint.

Power supply (20)

The electrical (22) and compressed air (23) connections are located inside the machine on the rear wall of the power supply cabinet (20). The power cable and the compressed air line are fed into the cabinet from below. The cabinet also contains the compressed air maintenance unit.

Electrical cabinet with control unit (10)

Legend

1 Circuit breaker
2 Power supply unit 24V
3 Temperature control device
4 Contactor
5 Line filter
6 Frequency converter
7 Safety cutout
8 PLC converter
9 PLC control
10 Microfuse FST 6.3 AT
11 2 microsfuses FST 3.15 AT
12 Buffer battery PLC

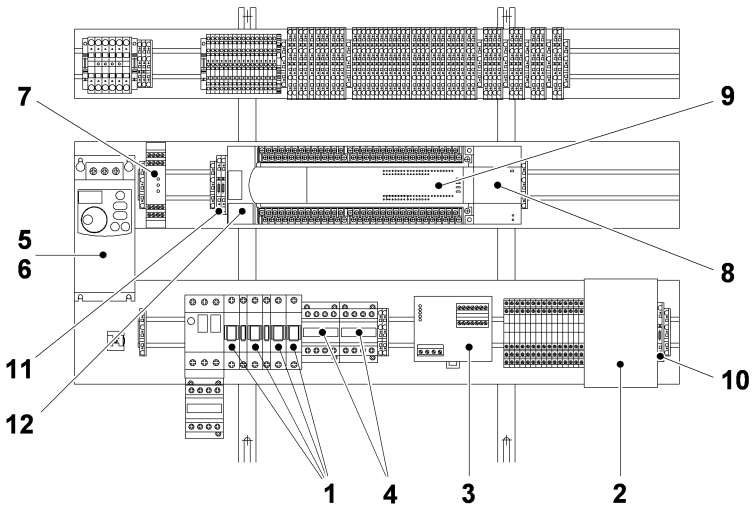


Fig. 3/2

The control unit consists of the operating elements fitted in the cockpit and the electronic power element in the electrical cabinet (Fig. 3/1, Pos. 10). The control unit also receives limit switch and vacuum measurement inputs.

Bag waste suction unit (VC999 K7A)

The bag waste suction unit consists of the bag waste suction tubes at the Vacuum Packaging Machine (Fig. 3/1, Pos. 12, 21) as well as the suction blower (a) and the bag waste separator (b).

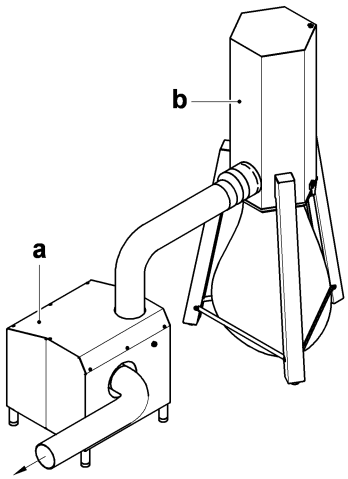


Fig. 3/3

3.2 Principle of operation

The product for packaging is put in a sealable plastic bag and fed in by conveyor belt from the work-surface to the Vacuum Packaging Machine.

In the Vacuum Packaging Machine, the vacuum chamber lid lowers over the bag containing the product for packaging and seals it with an airtight seal.

This produces a vacuum chamber. Unusually long bag parts which protrude from the vacuum chamber are pre-perforated. The air is subsequently removed from the vacuum chamber and thus also from the bag via the perforation. As soon as a preset vacuum has been achieved, the bag is sealed and the bag waste in the vacuum chamber is either cut off by a cutter blade (VC999 K7A) or perforated by a perforation blade (VC999 K7B) outside the sealing zone.

When the vacuum chamber is then vented, the vacuum-pack bag clings closely to the product. The cut off bag waste is automatically removed by the bag waste suction unit (VC999 K7A) when the vacuum chamber is opened. If the Vacuum Packaging Machine is not equipped with a bag waste suction unit (VC999 K7B), the perforated bag waste can be removed manually.

As vacuum generation and sealing of the bags take place, further bags can be placed on the conveyor belt. This means that as the packed bags are ejected, new bags are being introduced into the machine at the same time, so that the next packaging cycle can be started without any delay.

In order to make full use of the machine capabilities, the number of bags placed on the conveyor belt in any one cycle should be the capacity between the markings (Fig. 3/1, pos. 2 and 4) on the work-surface.

3.3 Technical data

3.3.1 Dimensions

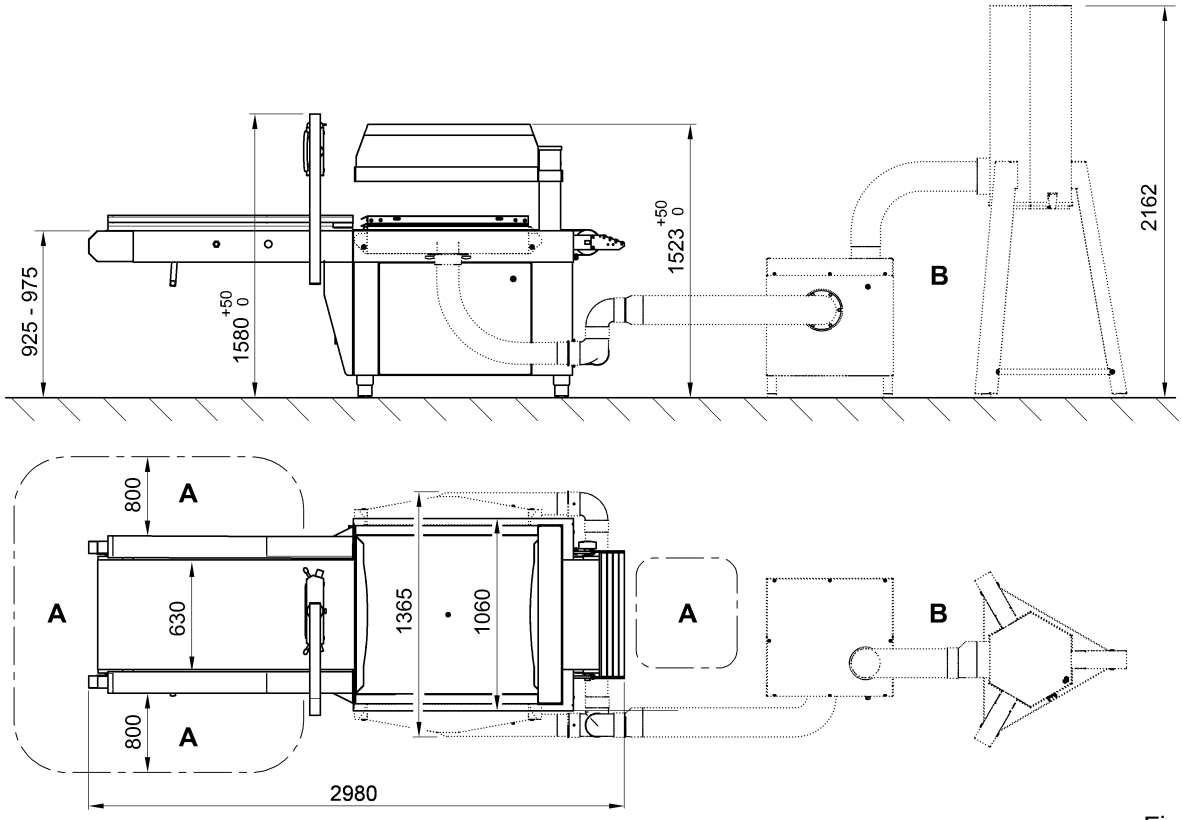


Fig. 3/4

A Operator position B Bag waste suction unit (VC999 K7A)

Vacuum chamber

Max. product height (standard), without filling plate	250 mm
Length	890 mm
Width (sealing bar distance)	630 mm
Sealing bar height (adjustable)	40 or 80 mm
Length	2 x 870 mm

3.3.2 Weight

Machine without pump	approx. 850 kg
Weight of rotary slide vacuum pump (300)	approx. 220 kg
Weight of roots vacuum pump (W500)	approx. 110 kg

3.3.3 Electrical data

Voltage	3 x 400 V / 50 Hz 3 x 440 V / 60 Hz
Other voltages on application	

Performance / Protection (at 400 V / 50 Hz):	**Machine VC999 K7**	**Vacuum pumps** (additional power supply)
Only machine, without pump	4 kW, 20 AT	-
1x Rotary slide vacuum pump (300 m³/h)	4 kW, 20 AT	5.5 kW, 16 AT
2x Rotary slide vacuum pumps (300 m³/h)	4 kW, 20 AT	11 kW, 32 AT
1x Rotary slide vacuum pump (300 m³/h) and 1x Roots vacuum pump (500 m³/h)	4 kW, 20 AT	7 kW, 20 AT

3.3.3.1 Control

Cockpit	High resolution color display Screen diagonal 10.4" Can be operated from both sides of the machine

3.3.4 Pneumatic data

Operating pressure	5 bar
Operating pressure air cushion	0.8 bar

☞ **NOTICE**

The operating pressure required for the air cushion is factory set. It does not normally require adjustment!

Average air requirement	approx. 30 standard liters per packaging cycle approx. 3.6 – 5.4 m^3/h
Connection	Internal diameter of hose 9 mm

3.3.5 Performance data

Rotary slide vacuum pump 300, external	300 m^3/h, per pump
Roots vacuum pump W500, internal	500 m^3/h
without pump	Central vacuum system
Machine cycle times	2 ... 3/min.

3.3.6 Noise emission

The measurement was carried out with the following machine equipment:

- Internal roots vacuum pump W500
- Rotary slide vacuum pump 300, positioned underneath the infeed conveyor
- Accessory: Bag waste suction unit, positioned directly next to the machine

Equivalent continuous noise level 77.9 dB(A).

The measurement was carried according to DIN EN ISO 11204; accuracy class 3, measurement uncertainty +/- 3 dB(A).

The continuous noise level is lower during operation without the bag waste suction unit.

3.4 Accessories

The following accessories are available for the Vacuum Packaging Machine from the manufacturer:

3.4.1 Bag waste suction unit (VC999 K7A)

The extraction fan (a) and the bag waste cutter (b) can be installed near the Vacuum Packaging Machine in a suitable location for operation.

Legend

a Extraction fan
b Bag waste cutter

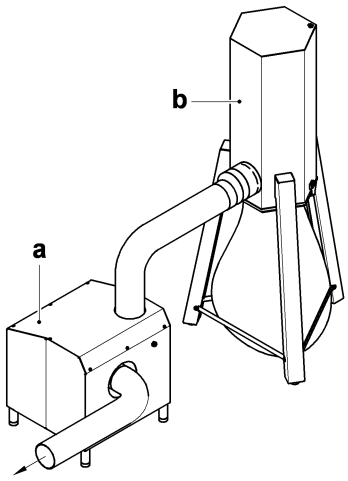


Fig. 3/5

Dimensions and weight

Height	2'162 mm
Suction pipe	ø 160 mm
Bag waste suction unit	approx. 200 kg

Electrical data

Electrical control of VC999 K7 Vacuum Packaging Machine.

Voltage	3 x 400 V / 50 Hz 3 x 440 V / 60 Hz
Capacity at 400 V / 50 Hz	3 kW

Please refer to the separate documents for more information on the bag waste suction unit .

3.4.2 Filling plate

The filling plate can be fitted inside the top of the vacuum chamber lid. This reduces the area of vacuum and also the vacuum generation process.

☞ **NOTICE**

By incorporating the filling plate, the useful chamber height is reduced accordingly from the original 250 mm to 150 mm. Make sure that the remaining chamber height is still greater than the height of the product to be packed.

☞ **NOTICE**

Self-made filling plates of material that is porous or otherwise unsuitable for vacuum generation can result in unacceptable loss of quality in packaging or problems in the packaging cycle. Use original filling plates only.

4 Packaging and transport

For internal transport to the assembly site, it is best to leave the Vacuum Packaging Machine in its packaging as delivered. This is the easiest and safest way to transport it.

NOTICE

Always move the Vacuum Packaging Machine in a vertical position, as tilting it could damage the vacuum pumps.

CAUTION

Risk of damage to the machine and vacuum pumps if the machine is tilted. Do not tilt the machine and inform our customer services department immediately if the machine has been tilted or tipped.

Weight data are given in section 3.3.2 "Weight".

Delivery

The delivery note dictates the scope of supply.

The scope of supply generally includes:

- Vacuum Packaging Machine VC999 K7
- Vacuum pump(s) depending on pump combination
- Accessories as per your order
- Operating manual for Vacuum Packaging Machine VC999 K7

Inspection on receipt

After unpacking, check your delivery to make sure that all components are complete and undamaged.

NOTICE

If the delivery is incomplete or damaged, notify Inauen Maschinen AG or their agents immediately.

5 Setting up the machine

This section is aimed at the "service engineer" responsible for setting up the Vacuum Packaging Machine, connecting it, making it ready for use and commissioning it. It contains all the information needed for this.

5.1 Preparation

Before the Vacuum Packaging Machine can be set up and made ready for use, the site needs to be prepared. The technical documents and diagrams for your VC999 K7 Vacuum Packaging Machine are in the appendix to these operating manual.

5.1.1 Site requirements

The requirements for the site are as follows:

NOTICE

The machine should not be operated in potentially explosive atmospheres!

- The site must be dry and well-ventilated.

CAUTION

If the humidity is too high, problems may arise with the control or vacuum systems due to condensation.

- The ambient temperature should be between 5 °C and 25 °C.

Lower ambient temperatures will result in excessively high pump starting currents, with consequent tripping of fuses. With higher ambient temperatures cooling of the motors and electronics can no longer be guaranteed.

- If water is used in the vicinity of the site, the Vacuum Packaging Machine should be protected against the direct impact spraying and splashing water or water jets.

5.1.2 Space requirement

Space requirements for servicing and maintenance

The machine must be accessible from all sides for servicing and maintenance.

Give due consideration to free space above the machine. It should be possible to open the vacuum chmber lid fully at all times without obstruction for maintenance purposes.

NOTICE

See section 3.3.1 “Dimensions” for machine dimensions.

5.1.3 Base

The Vacuum Packaging Machine does not require any special base for setting up. All that is required is a flat floor that is as level as possible.

The usual uneven floors in the meat industry can also be offset with the adjustable machine feet.

☞ **NOTICE**

The vacuum pumps cause minor vibrations which may spread over the floor in some instances. Contact the manufacturer if such problems arise.

6 Installation of the machine

Once the preparatory work is completed, the Vacuum Packaging Machine can be set up and connected. To set up the Vacuum Packaging Machine proceed as follows:

1. Bring the Vacuum Packaging Machine to the selected site with a lifting truck.

2. Remove the packaging.

3. Use the nuts (2) and washers (3) to install the operating unit at the side of the conveyor support (4). Always remove the nuts and washers from the connecting bolts (5) before fitting the unit from below to the conveyor support (4). Always use the holes (6) on the conveyor support for installation.

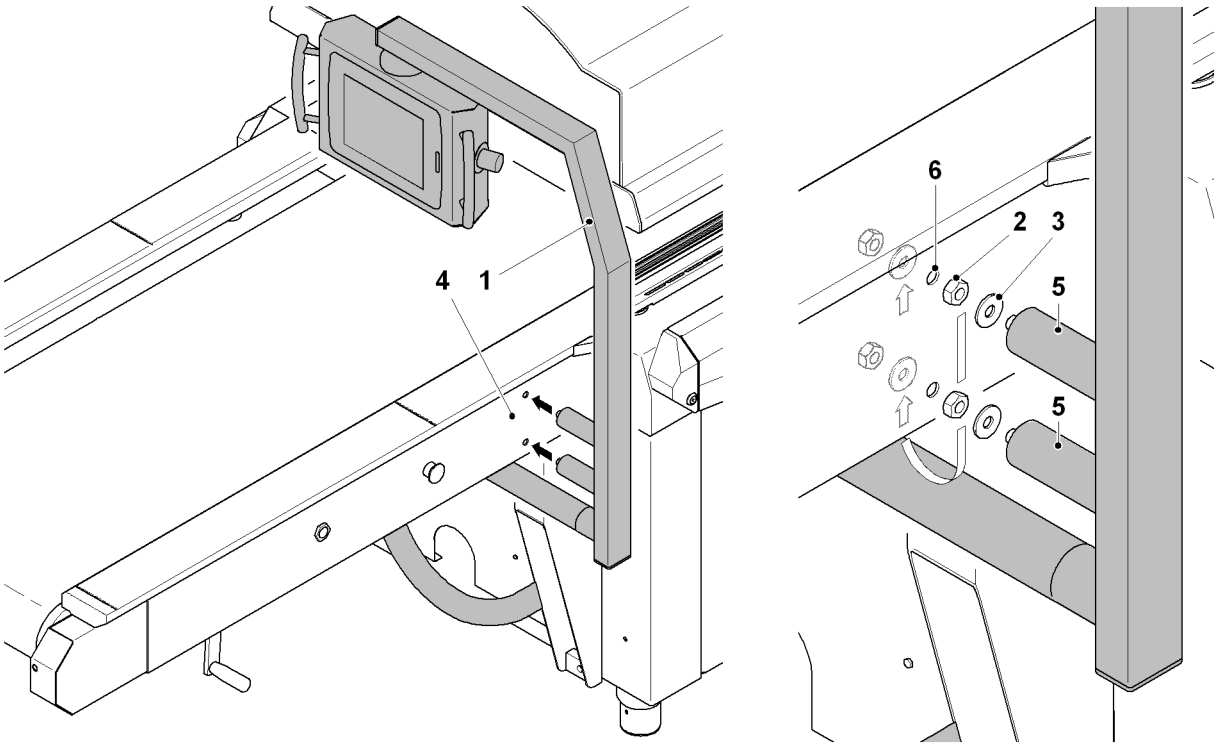


Fig. 6/1

4. VC999 K7A: Position the bag waste suction unit as close as possible to the machine and use as few suction line pipe bends as possible to achieve optimum performance.

5. Connect the machine to the electric power and compressed air supply in accordance with section 6.2 “Connection“.

6.1 Casing plates

Some casing plates must either be removed or opened for installation and maintenance.

Depending on the actual lock, use a hexagon wrench key, a screwdriver or the supplied square wrench key (1) to remove the casing plates.

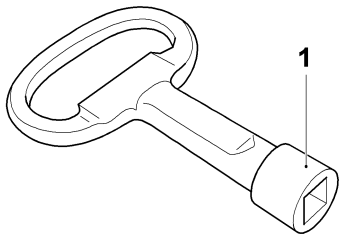


Fig. 6/2

NOTICE

Keep the key in a safe place. The operator must ensure that the machine is completely switched off (main switch OFF (0)) before opening the electrical cabinet and the cockpit.

6.2 Connection

The Vacuum Packaging Machine must be connected to an electrical power and compressed air supply. Vacuum pumps must also be connected to the electrical power supply, separately fused and connected to the vacuum network of the machine.

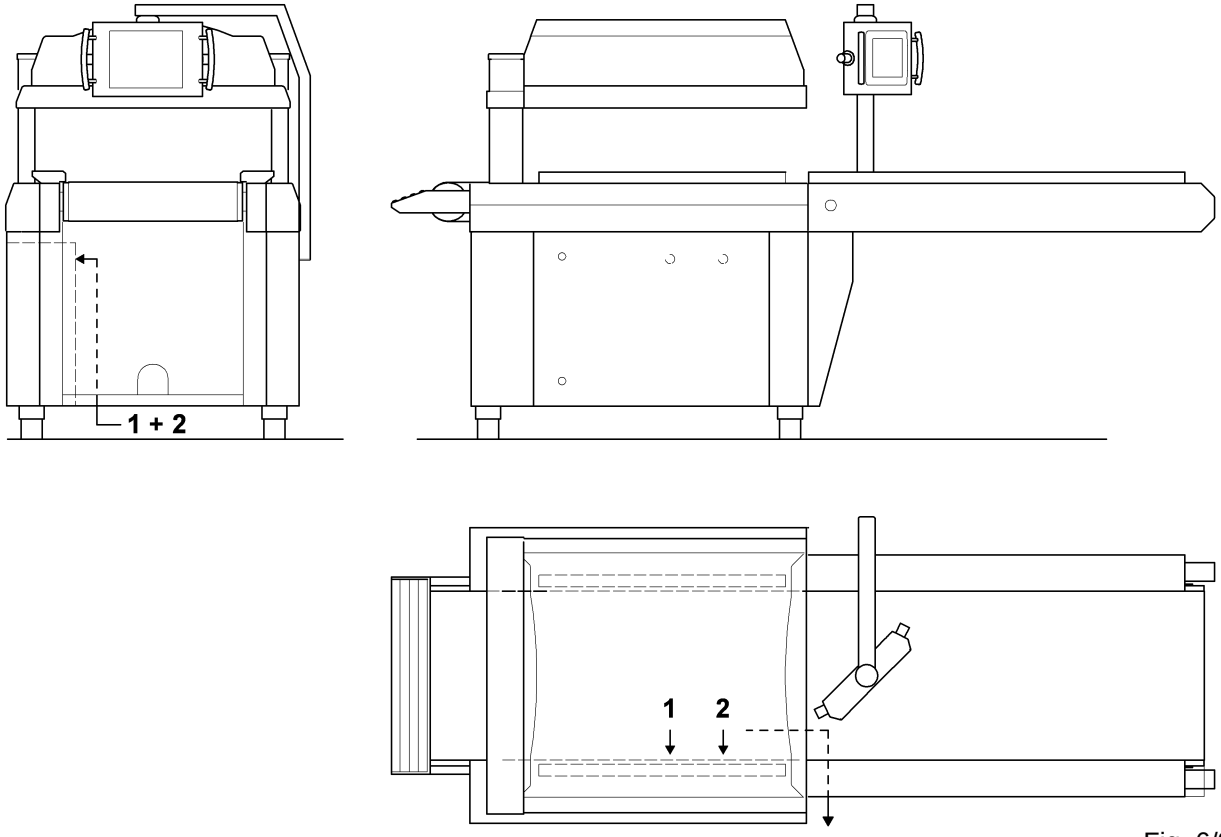


Fig. 6/3

1 Electrical connection 2 Compressed air connection

6.2.1 Connecting the electric power supply

DANGER

Risk of electric shock. The Vacuum Packaging Machine should only be connected by an approved electrician in accordance with local regulations!

Vacuum Packaging Machine VC999 K7

The Vacuum Packaging Machine is already fully wired internally. For the electrical connection, all that is required is to connect it via a 5-wire connector cable (3 phases + E + N) to the incoming terminal block in the power supply cabinet. Make sure that the connecting cable cross-section is compatible with the electrical values stated on the rating plate.

CAUTION

Risk of damage if the operating voltage is incorrect. Before connecting the machine, compare the operating voltage available with the voltage data on the rating plate.

NOTICE

The electrical details are given in the section 3.3.3 "Electrical data" and on the rating plate of the machine. Wiring diagrams can be found in the document folder inside the electrical cabinet (Fig. 3/1, pos. 10) and under section 15.3 "Wiring diagrams" in this operating manual.

The power cable must be inserted into the cabinet below for the power supply (Fig. 3/1, Pos. 20). The electrical connection can be made after opening the cover to the incoming terminal blocks.

Vacuum pumps

One or several vacuum pumps can be connected to the Vacuum Packing Machine. The figure below displays a possible version. The vacuum pumps must be electrically connected according to the wiring diagram.

Legend:

VC300 Rotary slide vacuum pump
W500 Roots vacuum pump

1 Power cable connection from the control box (3) to the internal vacuum pump
2 Power cable connection from the control box (3) to the external vacuum pump
3 Pump control box
4 Control cable connection from the pump control box to the electrical cabinet of the machine (5)
6 Power cable for the vacuum pumps

The wiring diagram can be found inside the electrical cabinet or under section 15.3 "Wiring diagrams" in this operating manual.

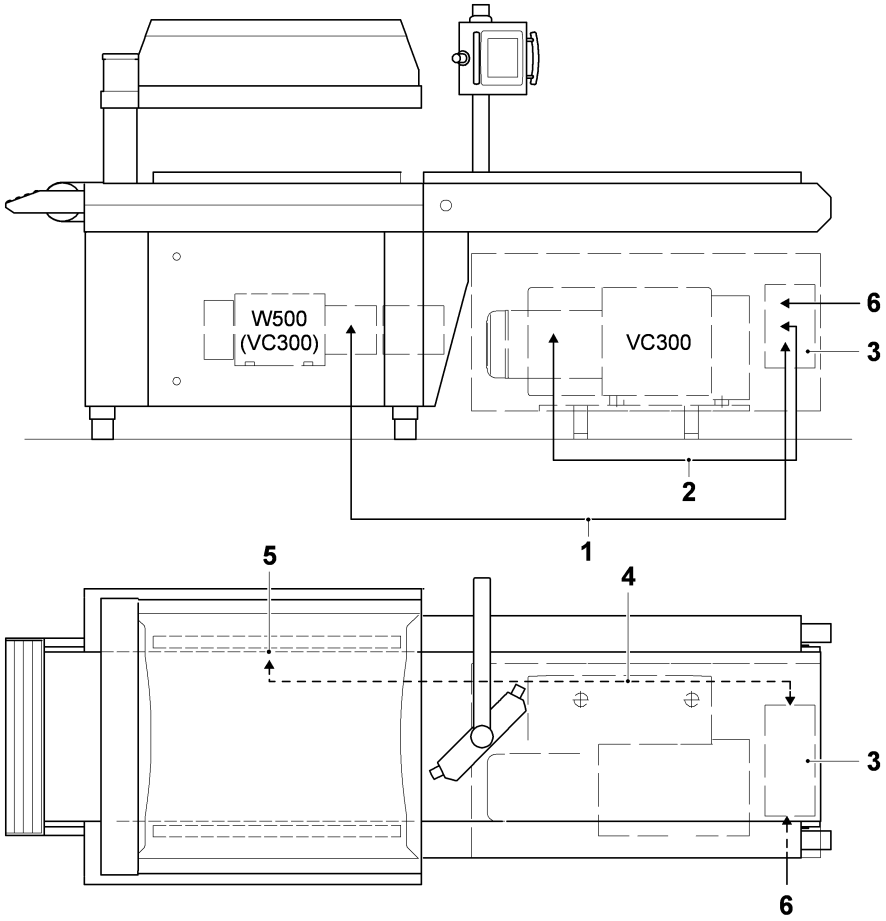


Fig. 6/4

Bag waste suction unit

The unit with the extractor blower and bag waste disposal system is controlled and supplied with electric power by the Vacuum Packaging Machine. The connection cable must therefore be connected in accordance with the Wiring diagrams (section 15.3 „Wiring diagrams“) to the Vacuum Packaging Machine. For this, the electric cable can be run along the extractor pipe to the Vacuum Packaging Machine and from there run through cable screw fixings into the electrical cabinet (Fig. 3/1, Pos. 10).

6.2.2 Connecting the compressed air supply

The Vacuum Packaging Machine needs compressed air to operate the vacuum chamber lid and the air cushion of the upper sealing bars.

The compressed air must be supplied via an air hose with an inside diameter of 9 mm. This hose must be fed from below to the connecting branches (Fig. 6/3, pos. 2) and fixed into position with a suitable hose clip.
The compressed air is fed from this connection in the power supply cabinet to the compressed air maintenance unit.

☞ **NOTICE**

The pneumatic data are contained in section 3.3.4 „Pneumatic data". There is also a pneumatic diagram in the section 15.2 “Pneumatic diagram“.

6.3 Connecting the vacuum pump(s)

Connect the vacuum pump to the vacuum mains by pushing the vacuum hose provided over the end of the corresponding pipe on the pump and the machine and fix using hose flanges.

Please refer to the pneumatic diagram under section 15.2 "Pneumatic diagram" for information on possible combinations when connecting several vacuum pumps.

Connecting to a central vacuum system

The Vacuum Packaging Machine VC999 K7 can be connected to a central vacuum system. Before connecting the machine, please refer to the pneumatic diagram under section 15.2 "Pneumatic diagram" and the wiring diagram inside the electrical cabinet or under section 15.3 "Wiring diagram" in this operating manual.

6.4 Periphery

The following signals are transmitted by the control for the coordination of the VC999 K7 with connected periphery units (conveyor belts, filling systems, etc.):

Sync. output infeed	open = no belt transport	closed = belt transport
Sync. output outfeed	open = no belt transport	closed = belt transport
External error	open = no error	closed = error
Sync. input infeed	depending on logic alarm 39	
Sync. input outfeed	depending on logic alarm 40	
Pump temperature Monitoring input	open = no alarm	closed = alarm after 25s

7 Initial start-up

Initial start-up can take place once installation is completed, and starts with an installation inspection and thorough cleaning of the machine.

7.1 Installation inspection

The installation inspection should include a check on the following points:

- Are all pipes and cables properly wired and connected (no kinks, scuffs or uneven parts)?
- Check the oil level at the level glass of each connected vacuum pump. Make sure there is sufficient oil and that the color of the oil has not altered. If necessary, refill or change oil. The process for refilling or changing oil is described in the separate user manual of the pump manufacturer. This manual can be found under the "Vacuum pump" index tab.
- Is the pressure gauge correct at the compressed air maintenance unit (section 11.2.1 "Compressed air maintenance unit")?
- Are all the panels and covers fitted?
- Clean the Vacuum Packaging Machine thoroughly before starting up.
- Remove all adhesive tapes and remaining packaging.
- Clean the vacuum chamber with particular care and make sure that no foreign matter can enter through the extraction vent.

☞ **NOTICE**

Conventional neutral cleaning agents can be used for cleaning the Vacuum Packaging Machine.

8 Start-up

If the result of the installation inspection is positive, you can proceed as follows for start-up:

1. Make sure that the EMERGENCY STOP buttons (Fig. 3/1, Pos. 14) are released.
2. Switch on the main switch (ON) of the Vacuum Packaging Machine.
3. Press the RESET button on the display.
4. Start the pumps as described under section 9.3 "Switching on the machine".

☞ **NOTICE**

If the conveyor belt is not running in the correct direction: Use an EMERGENCY STOP button to immediately switch off the Vacuum Packaging Machine. Interchange two of the three phases of the mains connection cable at the terminal block provided by the customer.

5. Check the direction of rotation of the connected vacuum pumps after switching on the machine again.

☞ **NOTICE**

If the direction of rotation of a vacuum pump is incorrect: Use an EMERGENCY STOP button to immediately switch off the Vacuum Packaging Machine. There is a risk of damage to the pump! Interchange two of the three phases at the respective pump connection cable.

6. Check the direction of rotation of the fan from the waste bag suction unit (VC999 K7A). arrow on the fan housing indicates the correct direction of rotation.

If the direction of rotation is incorrect, swap two of the three phases on the mains connection cable at the terminal block.

⚠ **CAUTION**

Danger of hand injuries if you reach in to the fan of the suction unit, if the suction pipe is off.

7. Switch the Vacuum Packaging Machine on and check whether it is running smoothly, with no unusual noises and no error messages on the display.
8. Check that the pre-tensioning of the conveyor belt is correct and adjust if necessary.

Details of the procedure for tensioning the conveyor belts will be found in section 11.4 "Tensioning the conveyor belt".

8.1 Functional checks

Before installation can be considered complete, the following checks need to be made with the Vacuum Packaging Machine running:

- Press one of the two emergency stop buttons. The Vacuum Packaging Machine must stop immediately. Release the EMERGENCY STOP button again and the Vacuum Packaging Machine should not start by itself. To restart the machine, press the RESET button on the screen.
- Also carry out this functional check for the second EMERGENCY STOP button.
- Use the test packaging to check that the Vacuum Packaging Machine is operating properly.

If the checks do not go as stated, check installation against the diagram and repeat the checks. Contact the manufacturer if you cannot identify the cause of the fault. Once a positive result is obtained for all the checks, the Vacuum Packaging Machine is ready for operation.

9 Operation

This section is aimed at "users" of the Vacuum Packaging Machine, who use and monitor them in normal operation. It provides all the information required for operation, from start-up through to operation and shutdown of the Vacuum Packaging Machine.

9.1 Requirements for operation

Before the Vacuum Packaging Machine can be started up, the following requirements must be met:

- The Vacuum Packaging Machine must be properly installed and connected by authorized and fully qualified personnel (Service personnel).
- The emergency stop buttons must be released.
- The vacuum chamber must be clean and dry.
- The conveyor belt must be tensioned and centered as far as possible.

9.2 Preparation

Before you can start packaging, you must prepare the product for packaging, prepare the packaging material and adjust the Vacuum Packaging Machine to suit the product to be packed.

9.2.1 Preparing the product

Read the part entitled "Suitable products" in section 2.3 „Use in accordance“ to determine which products are permitted for packaging with the Vacuum Packaging Machine.

The chamber dimensions of the vacuum chamber dictate the maximum product size. Read the section 3.3.1 „Dimensions“. To achieve the optimum packaging result, observe the following points when preparing the product for packaging:

- the product portion size should be selected to avoid soiling the bag opening when the product is inserted.

- cooked products should be left to cool as long as possible.

☞ **NOTICE**

The boiling temperature falls in the vacuum, so that warm products start to evaporate heavily, impairing the vacuum quality and the pump capacity. Choosing a suitable type of vacuum (see description *Mask 101/102: Parameter 1/2 and 2/2*).

☞ **NOTICE**

It is vital to comply with the relevant health and safety regulations when packaging foodstuffs or sterile products, otherwise the products may be inedible or unusable.

9.2.2 Preparing the packaging material

The packaging material must be suitable for vacuum packaging and of a size suited to the product.

Packaging material requirements

The packaging material must be approved for vacuum packaging and for the product to be packaged, and should have the following characteristics:

- sealable
- resistant to low temperatures
- resistant to high temperatures
- sufficiently extensible

Ask the shrink-film manufacturer for a data sheet on material performance.

Bag size

The bag must be large enough for the product not to reach the bag opening even when the bag is laid flat.

A bag overhang of at least 5 cm is required for sealing. The optimum bag position is for the bag opening to align with the outer guide plate edge.

If the bag is too long, it does not affect the packaging cycle, since unusually long bags are pre-perforated (slit) prior to vacuuming. This enables the manual removal of bag waste after vacuuming.

9.2.3 Adjusting the packaging machine to suit the product

To optimize the packaging cycles, the following adjustments can be made to the Vacuum Packaging Machine to suit the product:

- height of sealed seam in relation to conveyor belt
- volume of vacuum chamber (by inserting the filling plate)

9.2.3.1 Adjusting the height of the sealed seam

To achieve the optimum packaging result, the sealed seam should be half-way up the product. The sealing bars can be adjusted in height to achieve this.

On the top sealing bar, this is done by moving the suspension element, and on the lower sealing bars by inserting intermediate rods.

Without intermediate rods, the height of the sealed seam or lower sealing bar is 40 mm. A height of 80 mm above the conveyor belt can be achieved using an intermediate rod.

Recommended settings

for product heights	to approx. 150 mm	no intermediate rods (sealing height = 40 mm)
product heights	from approx. 150 mm to approx. 250 mm	1x intermediate rod (40 mm) (sealing height = 80 mm)

NOTICE

If the height of the sealed seam is moved, both sealing bars, i.e. the lower and upper sealing bars have to be moved. The guide plate on the infeed conveyor then also needs to be adjusted to the new height.

NOTICE

The two sealing sides (left and right) may be at different heights.

Moving the lower sealing bars

Procedure:

1. Switch off the machine.

2. Lift the sealing bar (1) off the bolts (2, 3). Use a screwdriver held at an angle to remove firmly seated sealing bars.

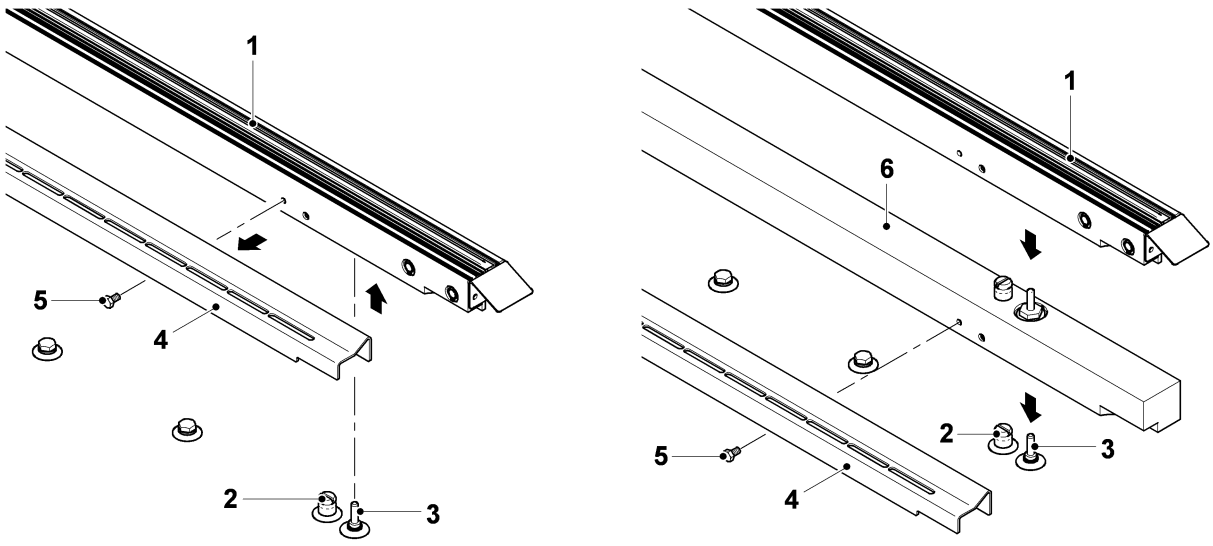


Fig. 9/1

3. Remove the pre-perforation hold-down clamp (4) from the sealing bar (1) by unscrewing the two screws (5).

4. Use the two screws (5) to attach the pre-perforation hold-down clamp (4) to the intermediate rod (6).

5. Place the intermediate rod (6) onto the bolts (2, 3) on the vacuum chamber bottom.

6. Place the sealing bar (1) onto the bolts of the intermediate rod (6).

Carry out the described procedure in reverse order to de-install the intermediate rod.

NOTICE

The pre-perforation hold-down clamp (4) should always be mounted onto the lowest installed element (sealing bar or intermediate rod). It must be moved when adjusting the sealing height.

Moving the upper sealing bars

The upper sealing bar can (including the clamp and blade) be installed at 2 different heights. The following figure displays the sealing bar in the lower position as seen from inside the vacuum chamber lid. The sealing bar must be installed in this position if there is no intermediate rod underneath the lower sealing bar.

If the lower sealing bar has been installed on an intermediate rod, the upper sealing bar must be installed in the upper position.

NOTICE

Correct adjustment on all sides is monitored electronically and a message is displayed in the event of a mistake in setting (Alarm messages 13, 14, 15 and 17).

CAUTION

Danger of injury from the blade. Take care with the blade when adjusting the sealing bars and wear safety gloves to do this.

CAUTION

Please observe the weight!
The sealing bar, incl. the clamp and blade, weighs approx. 11 kg.

Procedure:

1. Always switch off the Vacuum Packaging Machine at the main switch and make sure it cannot be switched on again.

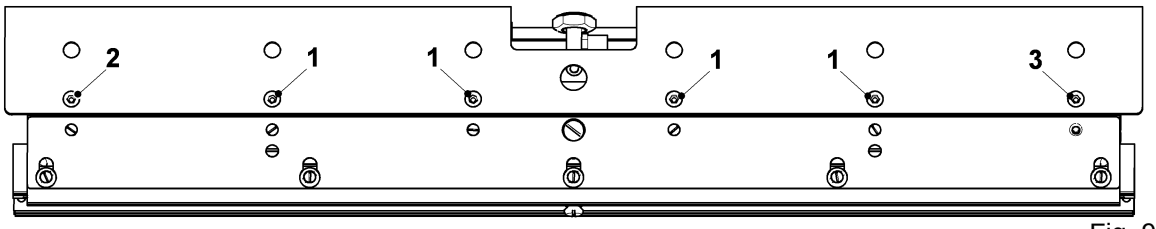


Fig. 9/2

2. Use a size 6 hexagon socket wrench to unscrew the 4 screws (1).

3. Loosen the screw (2) one turn.

4. Unscrew the screw (3). Firmly hold the sealing bar to ensure it cannot fall down.

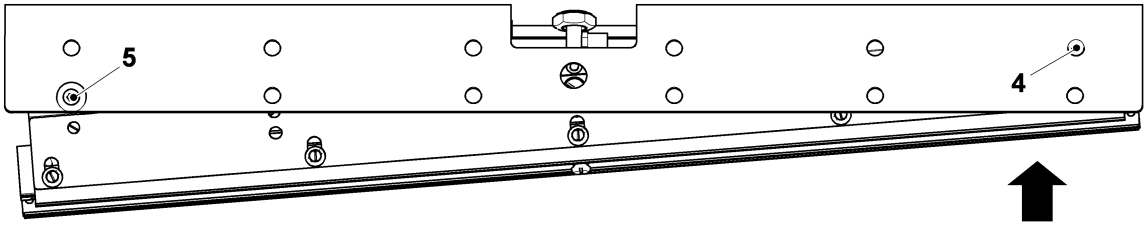


Fig. 9/3

5. Push the sealing bar up until it is possible to insert the removed screw (3) into the thread in the upper hole (4). Do not tighten the screw fully.

6. Unscrew the screw (5). Firmly hold the sealing bar to ensure it cannot fall down.

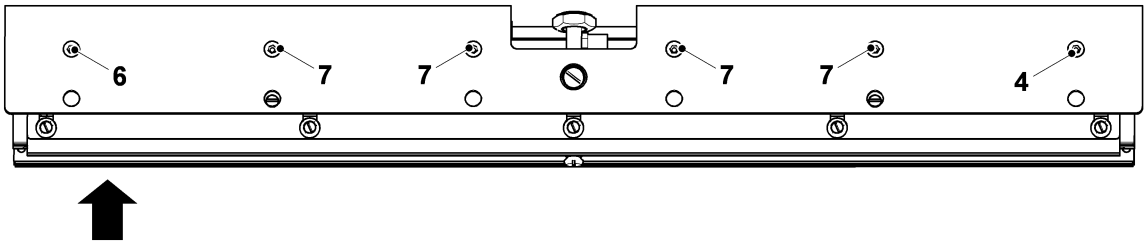


Fig. 9/4

7. Push the sealing bar up until it is possible to insert the removed screw (5) into the thread in the upper hole (6).

8. Screw in the screws (7).

9. Now fully tighten all 6 screws (Fig. 9/4, Pos. 4, 6, 7).

Adjusting the guide plate on the infeed conveyor

The height of both guide plates on the infeed conveyor must likewise be adapted to the height of the sealed seam from the lower sealing bar.

The height of the guide plates above the conveyor belt can be:

without supports (3): 40 mm
with supports: 80 mm

The description below explains how to adjust the height of the guide plates to 80 mm.

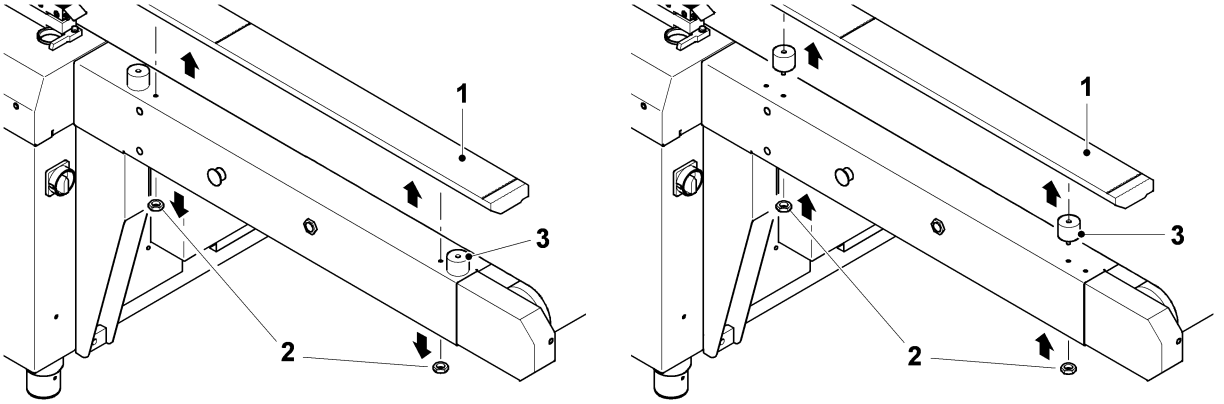


Fig. 9/5

Procedure:

1. To raise the guide plate (1) from the conveyor support, use a socket wrench to unscrew the nuts (2) which hold it in position.

2. Subsequently lift up the guide plate (1).

3. Now remove the supports (3) from the conveyor support and screw them from below onto the set screws on the guide plate (1).

4. Place the guide plate (1) on the conveyor support and fix it into position with the nuts (2).

9.2.3.2 Installing or removing the filling plate

The filler plate is used to compensate the vacuum volume to accelerate the vacuum process. Before installing the filling plate, make sure that you have left enough room for the product to be packed.

☞ **NOTICE**

The filling plate must not be installed when packaging products higher than 150 mm!

To install and remove the filling plate, proceed as follows:

1. To remove the filling plate: loosen the screws accessible underneath on the filling plate and remove the filling plate.

2. To install the filling plate: insert the filling plate in the lid of the vacuum chamber and screw in position.

9.3 Switching on the machine

Before switching on, check that the points in "Requirements for operation", in section 9.1 have been met, then proceed as follows:

1. Switch the Vacuum Packaging Machine on by turning the main switch from OFF (0) to ON (I). The display then shows *Mask 00: Start-up*.

2. Press the RESET button on the screen.

3. Press the **Process monitoring** symbol.

4. Start the vacuum pumps. For this purpose, press the symbol **Vacuum pump** in *Mask 13: Process monitoring*.

The Vacuum Packaging Machine is now ready for use.

☞ **NOTICE**

If the machine was stopped the last time with the belt conveyor running, you will be asked when restarting again to position the belt conveyor. For this purpose, read the description "Start conveyor belt position" in *Mask 52: Test function*.

☞ **NOTICE**

If the switched on Vacuum Packaging Machine is not operated for more than five minutes, the control unit goes into sleep mode. The pumps are switched off in sleep mode.

9.4 Operating display

Operation and programming of the machine are mainly done through the interactive display.

Masks

The individual displays are called masks. Each mask displays a number at the top right-hand corner. This number is part of the mask designation.

Press the cross at the top right-hand corner to return to the start-up mask 00.

The menu for operator guidance is located on the left, right or on both sides of the masks. All the symbols and their functions are explained below.

Function buttons are fields which when pressed either start or stop the function displayed on the button or switch the function on or off. These functions are explained in the individual mask descriptions.

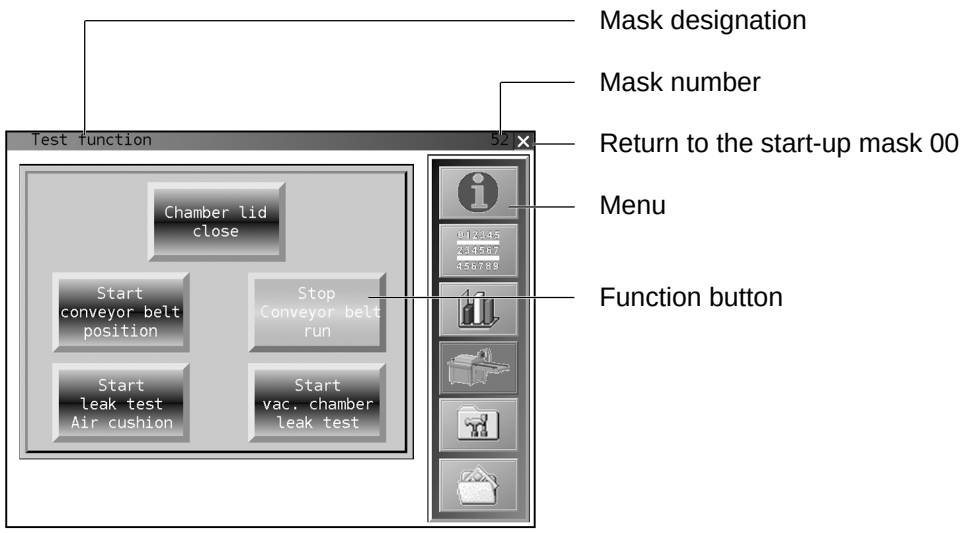


Fig. 9/6

To provide a better overview, the mask designations within a text are in italics: *Mask 10: Information*.

Entry fields

Entry fields demand the entry of data. When an entry field is tipped, a keyboard appears through which you can enter the required data.

Buttons

Buttons are boxes in the display which switch the relevant function on or off when they are activated. Key designations are printed in **bold** in the following description of the masks.

Menu

Operator guidance basically occurs via interactive, language-independent symbols. Press these symbols on the screen to open a certain mask. The following table displays the various symbols and which masks they open. These symbols will not be explicitly explained in the following mask descriptions.

Symbol	Target	Symbol	Target
	Mask 10: Information		Mask 300: Programs
	Mask 11: Counter		Mask 14: Password (Fig. 9/8)
	Mask 12: Graph		Mask 990: Alarm list
	Mask 13: Process monitoring	Test function	Mask 52: Test function
	Return. Opens the last displayed mask.	parameter 1	Mask 101: Parameter 1 Mask 102: Parameter 2
Defect modes	Mask 157: Defect Mode	Service parameter	Mask 156: Service parameters

Steps

Operation on the display is distributed among 5 Steps. Each of these steps is allocated to a certain group of persons, who have the authorization to operate, use, maintain or repair the machine:

Step	Access	Authorized persons	Activity
0	without entry of any password	Operator	Start / Stop packaging cycle Retrieve general information about settings Retrieve information about the loaded program
1	via password 1	Operator	Set the logic of the peripheral devices Switch peripheral devices on and off Load program
2	via password 2	Superior of the operator	Define program Set parameters Save program
3	via password 3	Service personnel VC999 Service engineer	Delete program Set service parameters Calibrate, burn-in Defect Mode
4	via password 4	VC999 Service engineer	Change factory settings Reset counter

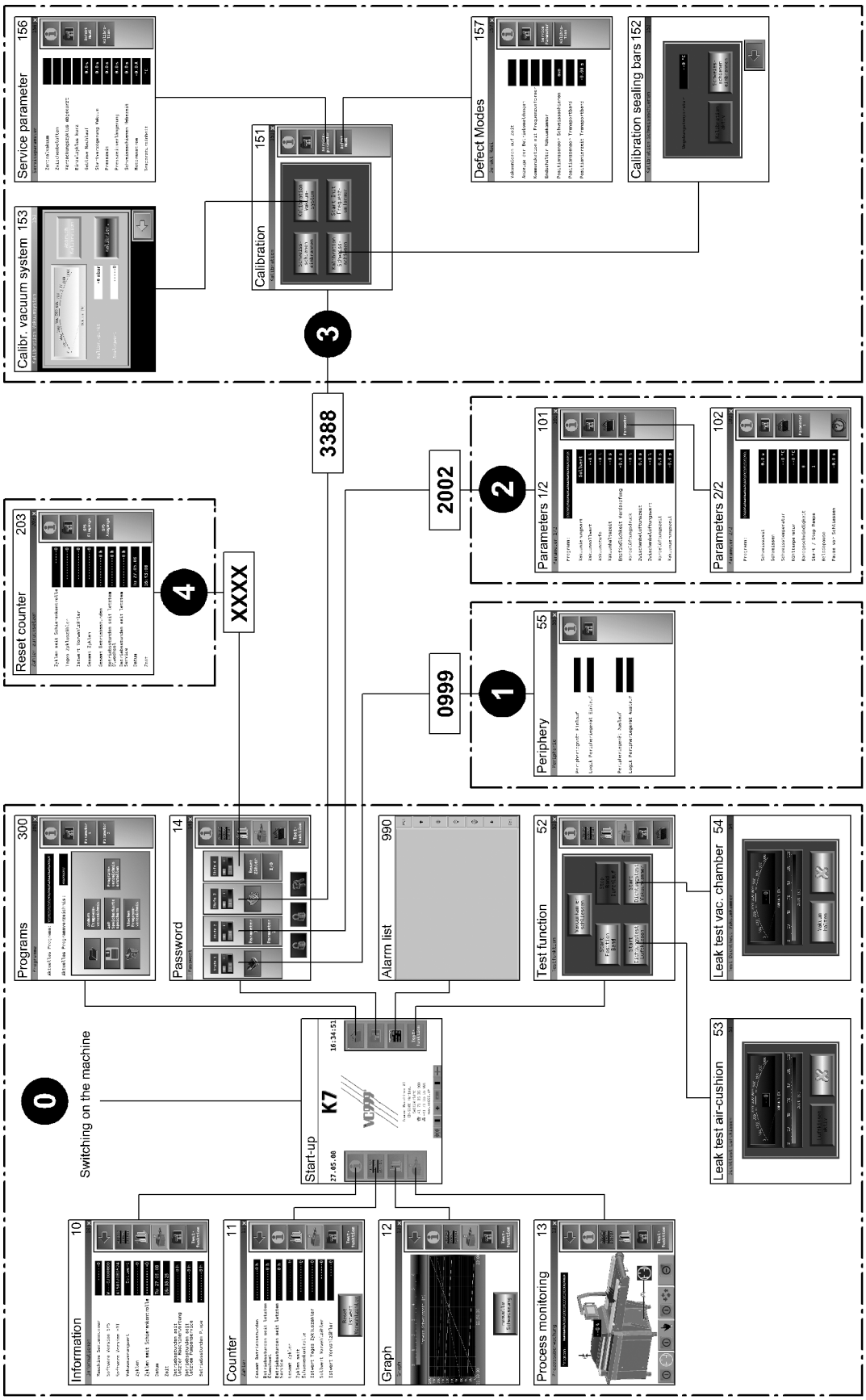

Service parameter 156
Defect Modes 157
Calibration sealing bars 152
Calibr. vacuum system 153
Calibration 151
3
3388
2002
2
Parameters 1/2 101
Parameters 2/2 102
Reset counter 203
4
XXXX
0999
1
Periphery 55
0
Switching on the machine
Programs 300
Password 14
Alarm list 990
Test function 52
Leak test vac. chamber 54
Leak test air-cushion 53
Start-up
K7
Information 10
Counter 11
Graph 12
Process monitoring 13

Fig. 9/7

Password

Steps 1-4 are password protected. The factory-set passwords (4-digit numbers) are shown in this operating manual in the overview of steps (Fig. 9/5) prior to the respective areas.

The 4-digit passwords can be changed any time. Access to passwords is the responsibility of each individual owner, i.e. the owner must decide who has knowledge of which passwords.

☞ NOTICE

An unlocked step also provides access to lower-level steps!
Example: Unlocking step 3 also provides access to steps1 and 2.

☞ NOTICE

Step 4 can only be accessed by VC999 service engineers. It contains factory-set parameters which should not normally be altered.

Unlock step

Lock step

Change password

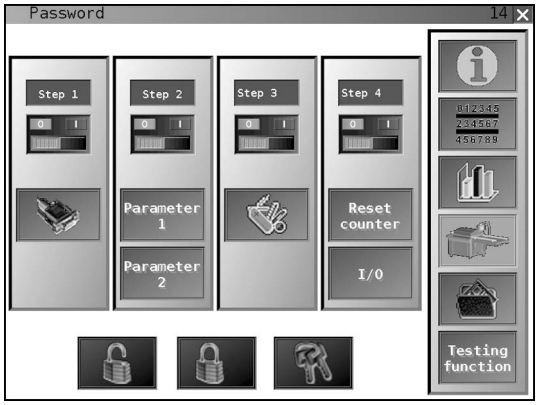


Fig. 9/8

Unlocking steps

Proceed as follows to access steps 1-3:

- Open *Mask 14: Password*.
- Press the function button displaying the unlocked padlock  .
- Enter the password via the displayed numeric keypad and press the ENTER ⏎ button to confirm it.

Unlocked steps appear with switch position I highlighted in green below the step designation. Locked steps appear with switch position 0 highlighted in red.

Access authorization is usually canceled when the function button displaying the locked padlock  is pressed or the machine is switched off.

In steps 1 and 2 it is possible to retain access authorization even after switching off the machine. To achieve this, press the field labeled "Step 1" or "Step 2". The background color of the field changes from red to green or vice versa.

Red = Access authorization is canceled after switching off the machine.
Green = Access authorization is not canceled after switching off the machine.

Locking steps

When exiting an unlocked password-protected step, the access protection must be reactivated. Press the function button displaying the locked padlock  . Access protection is now reactivated.

Changing password

- Open *Mask 14: Password*.
- Press the function button displaying the keys  .
- Press the password you wish to change from the selection which appears.
- Enter a new password via the displayed numeric keypad.
- Confirm the new password with OK. The new password is now valid.

9.5 Step 0

9.5.1 Mask 00: Start-up

This mask appears after switching on the machine if the machine is in the initial position.
If the machine is not in the initial position, an alarm message appears.

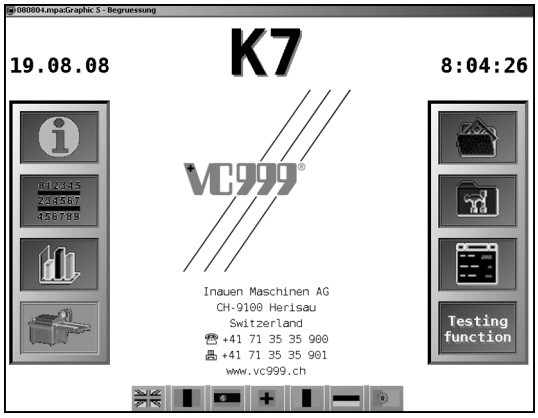


Fig. 9/9

Dialog language

Press the country flag at the bottom of the screen to set the desired dialog language.

9.5.2 Mask 10: Information

This mask contains machine-specific information and the currently set vacuuming mode.

It also displays information which is required when contacting the VC999 Customer Service Department.

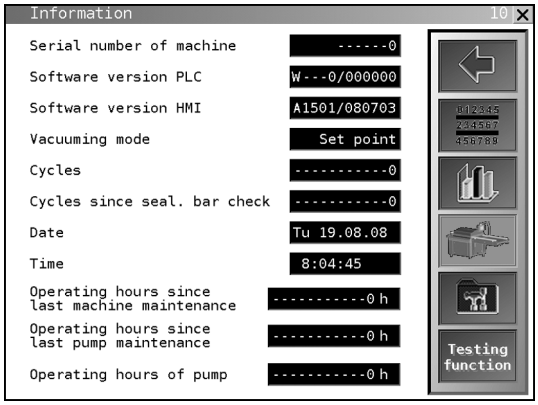


Fig. 9/10

Date / Time

The date and time can be changed in step 2.

Procedure:

- Unlock step 2. The procedure is described in section "Operating display" under "Unlocking steps".
- Press the input field after "Date" or "Time".
- Enter the "Date" or "Time" via the displayed keypad.
- Lock step 2 after changing the time or date. The procedure is described in section 9.4 " Operating display" under "Locking steps".

9.5.3 Mask 11: Counter

This mask contains:

- Operating hours counter
- Cycle counter
- Pre-selection counter

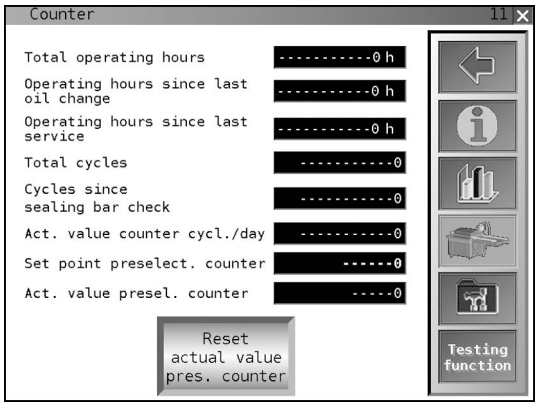


Fig. 9/11

The counters can be reset according to the following table.

Counter	**Resettable in step**
Operating hours since last oil change	4, only by VC999 service engineer
Operating hours since last oil service	4, only by VC999 service engineer
Cycles since sealing bar check	4, only by VC999 service engineer
Actual value counter cycles/day	2
Set point pre-selection counter	2
Actual value pre-selection counter	2

9.5.4 Mask 12: Graph

Press **Manual sealing** to warm up the sealing bars. The temperature profile at the sealing bars is graphically displayed on the screen.

The temperature profile relates to the sealing bars switched on in *Mask 102: Parameter 2/2* under "Sealing".

Function:
The sealing bars are heated up to the set point for 1 second. The heat up and cool down process can be monitored on the displayed graph.

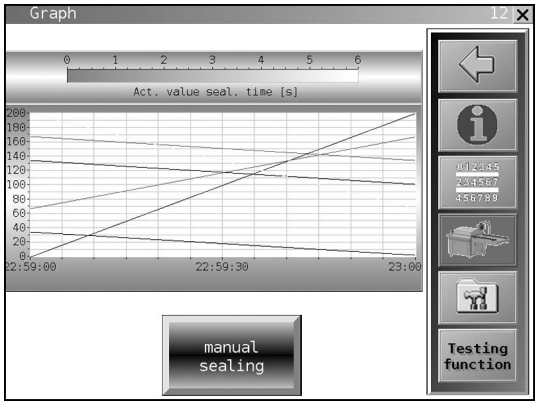


Fig. 9/12

9.5.5 Mask 13: Process monitoring

This mask displays the individual process steps during the packaging cycle.

The name of the currently loaded program is displayed in the corresponding text box.

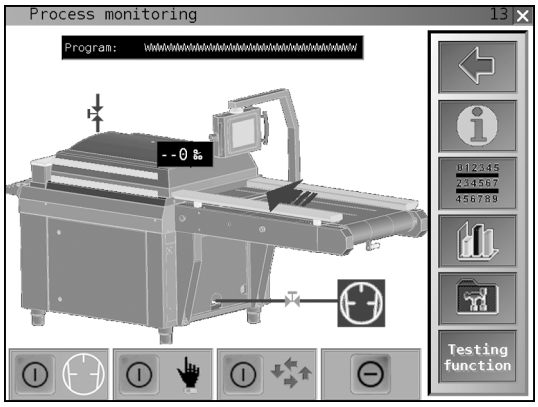


Fig. 9/13

Symbol	Button designation	Function
	**Vacuum pump**	Switching on the vacuum pump: Press the red function button to switch on the vacuum pump, the color of the function button changes to green. Switching off the vacuum pump: Press the green function button to switch off the vacuum pump, the color of the function button changes to red.
	**Single cycle**	Starting single cycle: After the pump has been switched on, press the red function button to start a single packaging cycle. The color of the function button changes to green.
	**Automatic operation**	Starting automatic operation (production): Press the red function button to start automatic operation or production. The color of the function button changes to green. Stopping automatic operation: Press the green function button to stop production. The color of the function button changes to red. The current packaging cycle is completed.
	**Cycle interruption**	Press the function button to immediately stop the current packaging cycle (single cycle or automatic operation). The vacuum pump is switched off and the vacuum chamber is vented and opened!

9.5.6 Mask 300: Programs

Program data can be edited in this mask.

The function buttons and the respective functions are password protected and only displayed in the unlocked steps.

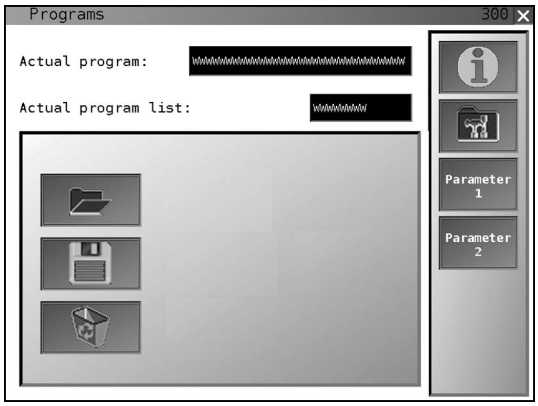


Fig. 9/14

Symbol	Button designation	Step	Function
	**Load program**	1	A list of all available programs is shown.
	**Save program**	2	The program name must be entered via a keypad (max. 32 characters). The first character cannot be _. The displayed program is saved with the values entered in Mask 101/102: Parameter 1/2 and 2/2.
	**Delete program**	3	The program is deleted after confirming a prompt.

9.5.7 Mask 990: Alarm list

This mask lists the last 150 alarm messages in field A.

These messages help to detect and eliminate an error as quickly as possible.

The letters displayed in the alarm messages mean:

S When did the alarm occur?
E When was the alarm message acknowledged?

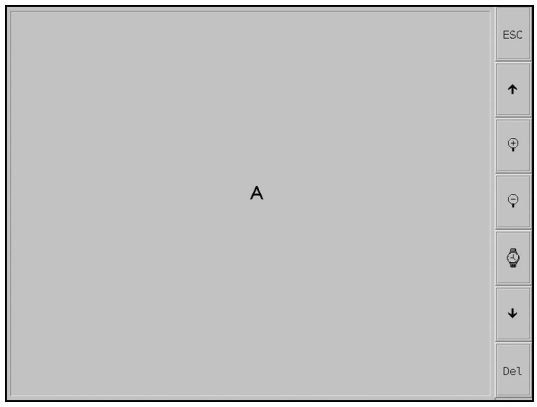


Fig. 9/15

Symbol	Function
ESC	Exit alarm mask, return to start-up mask.
↑ ↓	Go to next or return to previous page in the alarm list.
+ -	Enlarge (+) or reduce (-) the font
	Display further alarm message information.
Del	Delete alarm list (password protected for step 4)

9.5.8 Mask 52: Test function

Various functions can be tested in this mask.

The text changes or another mask opens after pressing a function button.

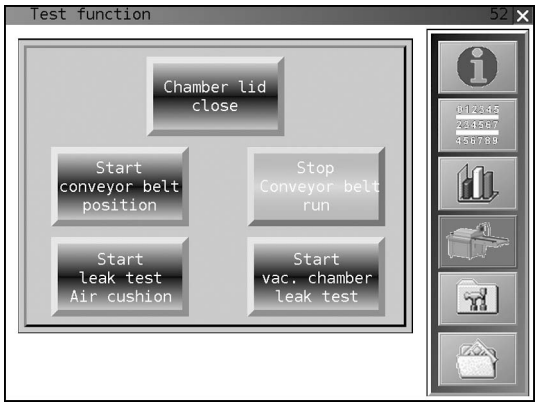


Fig. 9/16

Button designation	Function
Chamber lid close	When you press the key, the lid will descend and the vacuum chamber will be closed. This allows external cleaning and washing down of the machine. When you press the key a second time, the vacuum chamber will be opened again. The machine will move to its home position.
Chamber lid open	The vacuum chamber is opened and the machine moves to the initial position.
Start conveyor belt position	Four positional markings are integrated in the conveyor belt and read by a proximity switch. After pressing the button, the conveyor belt moves to the next positional marking – to the initial position for the next loading. Carry out this belt positioning after releasing the belt tension. "Searching for position" is displayed on the screen until the initial position is reached. If (after initial belt positioning!) the button is pressed four times, the conveyor belt should travel one complete revolution. Please check this action, especially if the error display 12 occurs. If the conveyor belt does not travel one complete revolution, it is most probably due to the fact that one or several of the positional markings have not been recognized. In this case, please read the instructions concerning error display 12 in section 10.2 “Faults and their remedies”.
Start conveyor belt run	The conveyor belt run is started. This enables cleaning of the conveyor belt or adjustment of the running direction.
Stop conveyor belt run	The conveyor belt is stopped.
Start leak test air-cushion	Press the function button to close the vacuum chamber and to switch on the vacuum pump. *Mask 53: Leak test air-cushion* appears on the screen. Please refer to the mask description in the respective section for further details.
Start leak test vacuum chamber	A vacuum is created in the vacuum chamber and *Mask 54: Leak test vacuum chamber* appears on the screen. Please read the mask description in the respective section.

9.5.9 Mask 53: Leak test air-cushion

This mask appears when the function button **Start leak test air-cushion** has been pressed in *Mask 52: Test function*.

The top window displays the current vacuum value in the vacuum chamber.

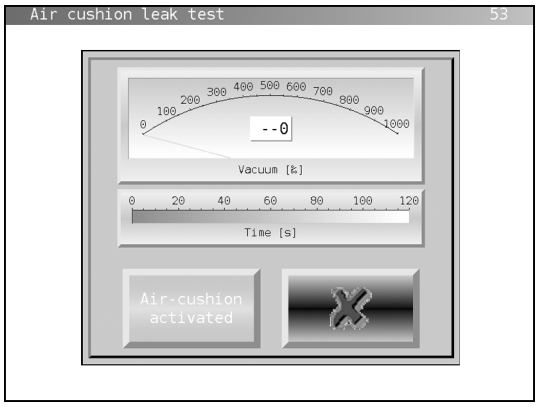


Fig. 9/17

Procedure

- Press **Hold pressure**. The vacuum pump is switched off. Timing starts in the bottom window.
- Monitor the displayed vacuum value. If it remains constant over a longer period of time, the air cushion is air tight.
- Press to cancel the test. The display returns to *Mask 52: Test function*.

☞ **NOTICE**

If the vacuum value decreases during the test phase, the air cushion is defective and must be replaced.

9.5.10 Mask 54: Leak test vacuum chamber

This mask appears when the function button **Start leak test vacuum chamber** has been pressed in *Mask 52: Test function*. The current vacuum value in the vacuum chamber is displayed in the top window during the test. The pump is switched off when the maximum vacuum value of 999 is reached.

The vacuum pump can be switched off via the **Hold vacuum** button even before the maximum vacuum value has been reached.

Timing starts in the bottom window once the vacuum pump has been switched off.

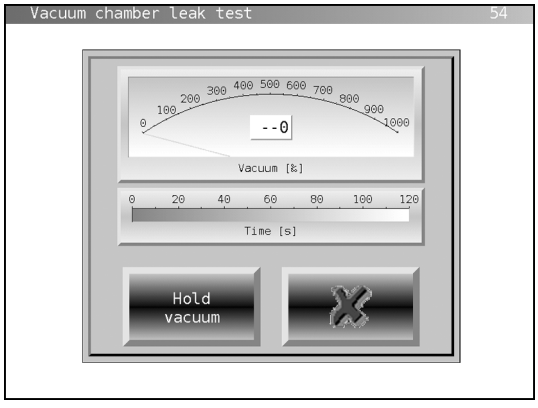


Fig. 9/18

- Monitor the displayed vacuum value. The leak test is positive if the vacuum value has not fallen below 994 after 1 minute.
- Press to cancel the test. The display returns to *Mask 52: Test function*.

☞ **NOTICE**

If the vacuum value decreases rapidly, the seals and the vacuum system must be checked for defects.

9.6 Step 1

9.6.1 Mask 55: Periphery

The connected peripheral devices can be switched on or off in this mask.

= on = off

Furthermore, the logic of the peripheral devices can be defined.
Press the input fields to change the respective display from **+** to **-** or vice versa.

\+ contact closed = alarm peripheral device
\- contact open = alarm peripheral device

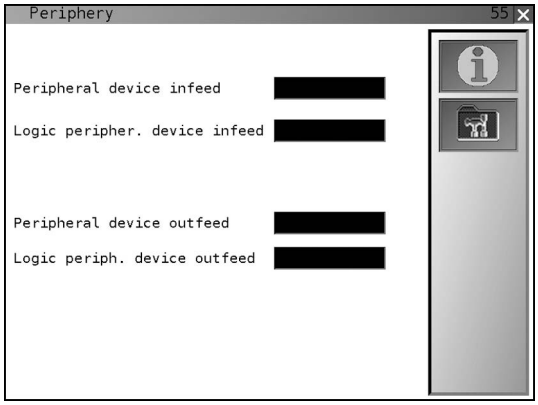


Fig. 9/19

9.7 Step 2

9.7.1 Mask 101/102: Parameters 1/2 and 2/2

The program parameters are displayed in 2 masks. Press the function button **Parameter** (in the right-hand menu bar) to toggle between both masks.

The parameters apply for the displayed program. They are described individually below.

The parameter values can be edited after entering the step 2 password. Press the individual input fields to show a selection menu or a keypad. Select or enter values via the selection menu and keypad respectively.

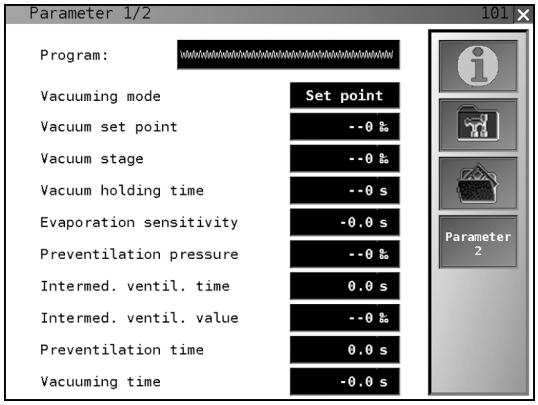


Fig. 9/20

Vacuuming modes

Vacuuming mode	Suitability / Functioning
Set point	Suitable for dry products Vacuuming is carried out until the vacuum set point is reached in the vacuum chamber.
Evaporating	Most frequently used vacuuming mode, suitable for wet, possibly warm products. Vacuuming is carried out until the moisture in the vacuum chamber or the package has evaporated. The evaporation point is temperature dependent. The colder the product, the higher the achievable vacuum is. If evaporation is not possible, vacuuming occurs up to the vacuum set point (select as high as possible). Vacuuming beyond the evaporation point will result in the product drying out. Therefore, the evaporation sensitivity must be between 0.1 s and 10.0 s.
Stage-vacuum	This vacuuming mode is suitable for sensitive and porous products which have a tendency to expand or burst when vacuuming is carried out too quickly, since the products must be degased slowly.
Time-based (emergency operation)	This vacuuming mode is used in certain exceptional cases (e.g. with defective vacuum measurement). Vacuuming occurs instead of the vacuum measurement during the set time period. The "time-based" vacuuming mode is only displayed if the parameter "Time-based vacuuming" is set to "on" in *Mask 157: Defect modes*. This vacuuming mode should only be activated after prior consultation with the VC999 Customer Service Department.

Entering parameter values

- The vacuuming mode must be defined first: Press the input field after **Vacuuming mode** in the mask and select the desired vacuuming mode from the list.

The selected vacuuming mode is now displayed in the input field. All the parameters for this vacuuming mode appear as an input field highlighted in white and can be edited. Parameters highlighted in gray cannot be edited.

- To enter values, press the input field of the parameter. After each entry, press the ENTER ⏎ button. This ensures that the entered value is saved and the keypad is hidden.

If an entered value is outside the setting range, a warning message will appear. Always observe the permissible setting range of the parameter and enter a corresponding value.

All the parameters are described in the following sections "Overview of parameters" and "Explanation of parameters". The table below displays an overview of all the parameters and their allocation to the vacuuming modes.

Overview of parameters

Parameter	Setting range	Factory settings	Vacuuming modes			
			Set point	**Evaporation**	**Satge-vacuum**	**Time** (emrg. operation)
Vacuum set point	500 - 999	996	•	•	•	
Vacuum stage	50 - 499	250			•	
Vacuum holding time	0 - 300 s	20 s			•	
Evaporation sensitivity	0,1 - 10,0 s	1.5 s		•		
Pre-ventilation pressure	500 - 999	999 (no pre-ventilation)	•	•	•	
Intermed.-ventilation time	0,0 – 1.5 s	0.0 s				(•)
Intermed. ventilation value	500 - 999	-	(•)	(•)	(•)	
Pre-ventilation time	0,0 – 9.9 s	0.0 s				•
Vacuuming time	1 - 60 s	10 s				•

(•) Only possible if the function "Intermed. ventilation" is set to "on" in *Mask 156: Service parameter*.

Explanation of parameters

Vacuum set point

The vacuum set point is displayed in ‰. 999‰ is the maximum vacuum. Vacuuming is carried out until the vacuum set point is reached in the vacuum chamber.

Vacuum stage

Step-by-step vacuuming starts at 500‰ and is continued in selectable vacuum stages (with defined vacuum holding time) up to the pre-specified set vacuum value.

Vacuum holding time

During stage vacuuming, the vacuum holding time is the temporary holding of the current vacuum value between the individual vacuum stages.

Evaporation sensitivity

0.1 s — Maximum evaporation sensitivity, i.e. the vacuum process ends when the evaporation point is reached.

10.0 s — Minimum evaporation sensitivity, i.e. the vacuum process is extended by a max. of 10 sec when the evaporation point is reached. This improves the vacuum but extends the packaging cycle.

Pre-ventilation pressure

Pre-ventilation prevents sudden clinging of the bag to the product. This can prevent unwanted creases occurring in the bag.

A residual vacuum limit value can be set for pre-ventilation. A value of 999‰ cuts off pre-ventilation.

Pre-ventilation extends the packaging cycle!

Intermed. ventilation time

This is the same function as "Intermed. ventilation value" except that the time is defined here instead of the vacuum value. This is necessary when production is carried out with the vacuuming mode "Time" (emergency operation).
Please refer to the explanation of the parameter "Intermed. ventilation value".

Intermed. ventilation value

The intermediate ventilation value can only be programmed if the function "Intermed. ventilation" is switched on in *Mask 156: Service parameter*.

Suitable for moist products which tend to foam under vacuum. Intermediate ventilation is a brief blast of air which prevents foaming of wet and moist products.

During the intermediate ventilation process the vacuum chamber is ventilated for a short period after the sealing bar has been lowered. With intermediate ventilation, the bag clings to the product, thus preventing foaming.

Intermediate ventilation only makes sense when working with high vacuum set values or with vacuuming mode "Evaporation"!

Pre-ventilation time

Same function as pre-ventilation pressure, but pre-ventilation only lasts until the set time elapses instead of up to the set value. (Emergency operation in the event of defective vacuum probe)

Vacuuming time

Same function as vacuuming to the set point, but vacuuming continues instead of up to the set value only until the set time elapses. (Emergency operation in the event of defective vacuum probe).

Sealing time

The programmed sealing time starts as soon as the sealing temperature has been reached. The sealing bars are no longer heated once the sealing time has expired. The cool down process subsequently begins.

Setting range: 0,0 – 6,0 s

Sealing

 on – sealing is switched on

 off - sealing is switched off

Sealing temperature

Use test cycles to adjust the sealing temperature to the bag material.

Setting range: 20 °C – 300 °C (68 °F – 572 °F)

Practical value for shrink bags: 90 °C – 130 °C (194 °F – 266 °F)

Cooling temperature

The sealing bars cool down once the sealing period has expired. The upper sealing bars are raised once the defined cooling temperature has been reached.

Setting range: 20 °C – 300 °C (68 °F – 572 °F)

Speed conveyor belt

The conveyor belt can be set to one of six possible speeds or completely switched off (position "0").

Speed stage 0:	Conveyor belt is switched off
Speed stage 1:	Minimum speed (approx. 0.1 m/s)
Speed stage 6:	Maximum speed (approx. 0.5 m/s) (Factory setting)

The speed stages 1 to 6 can be preset in the control box at the frequency converter. See the separate user manual of the frequency converter.

Ramp start / stop

1 steepest ramp, the target speed is achieved quickly
3 slightest ramp, the target speed is achieved slowly

Loading pause

The conveyor belt is stopped for loading.

Loading pause on : The operator determines the cycle start by pressing the green start button in the loading area (Fig. 3/1, pos. 7).

Loading pause off : In automatic operation only: After opening the vacuum chamber the Vacuum Packaging Machine automatically starts the next cycle when the conveyor belt is switched on.

Pause before closing

If after conveying a pause is to be made before the vacuum chamber closes, this pause can be defined by a time value between 0 and 10.0 seconds.

Setting range: 0.0 – 10.0 s
Factory setting: 0.0 s

Select the lowest possible value. A pause before closing extends the packaging cycle!

9.8 Step 3

9.8.1 Mask 151: Calibration

This mask can be accessed after entering the step 3 password.

Temperature and vacuum measuring systems and temperature-conveying components must be adjusted to the circumstances and conditions under which they are used. This is the only way to guarantee reliable values and high packaging quality.

These adjustments include:

- Calibration sealing bars
- Burn-in sealing bars
- Calibration vacuum system

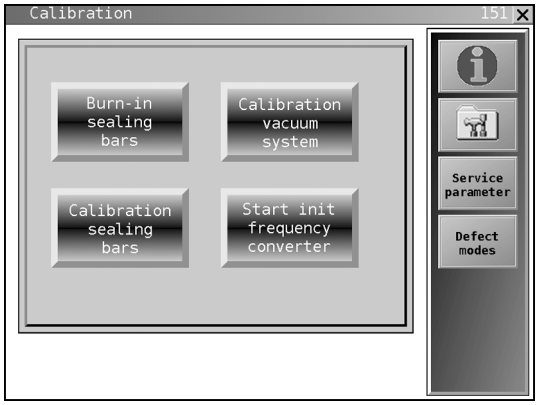


Fig. 9/21

The procedures for the individual processes are described below.

9.8.1.1 Mask 152: Calibration sealing bars

Each newly installed sealing bar must be calibrated prior to use. The temperature control system recognizes the characteristics of the sealing bar during calibration. This ensures constant sealing quality.

Recording of the current ambient temperature is an important prerequisite for calibration.

Procedure

1. *Mask 152: Calibration sealing bars* shown on the right appears if the function button **Calibration sealing bars** is pressed in *Mask 151: Calibration*.
2. Now use a thermometer to measure the ambient temperature.
3. Press the input field after "Ambient temperature" and enter the measured temperature value via the displayed keypad.
4. Press **Start calibration**.

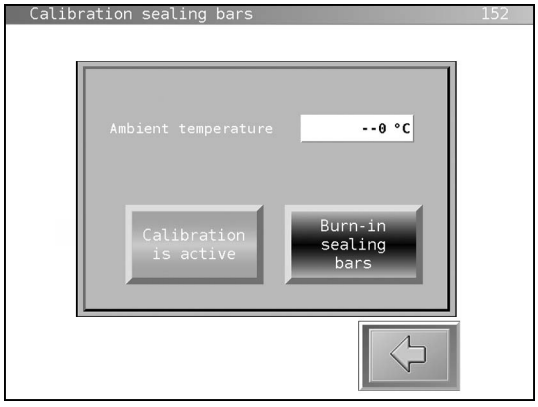


Fig. 9/22

Calibration takes approx. 20 seconds. No other function can be started during this period. The button reads **Calibration is active** during calibration. Calibration has been completed as soon as the button reads **Start calibration** again.

Alarm messages

If calibration cannot be carried out, the temperature control system must be checked for errors, e.g. defective contacts, cable, controller, sealing wires, Teflon coating, etc.. Please contact the VC999 Customer Service Department.

9.8.1.2 Burn-in sealing bars

☞ **NOTICE**

Only use sealing wires and sealing bars specified by the manufacturer and stated in the spare parts list!

☞ **NOTICE**

If sealing bars with new sealing wires have been installed in the machine, the following processes have to be carried out one after the other:

Calibration sealing bars – Burn-in sealing bars – Allow sealing bars to cool down – Calibration sealing bars.

If sealing bars with previously burnt-in sealing wires are installed in the machine, only **Calibration sealing bars** has to be carried out.

Burn-in sealing bar

1. Determine the burn-in sealing bars in *Mask 102: Parameter 2/2* under the parameter "Sealing".

2. Press the function button **Burn-in sealing bars** in *Mask 152: Calibration sealing bars*. The button changes to **Burn-in is active**.

The sealing bars are heated up to 250 °C for 1 second. When a sealing bar is heated up for the first time its material resistance changes; this is also referred to as the burn-in effect.

Burn-in has been completed when the button changes back to **Burn-in sealing bars**.

☞ **NOTICE**

Sealing bars must be calibrated after the burn-in process! This procedure is described in *Mask 152: Calibration sealing bars*.

9.8.1.3 Mask 153: Calibration vacuum system

Calibration of the vacuum sensor can be carried out with a reference measuring device connected to the vacuum system.

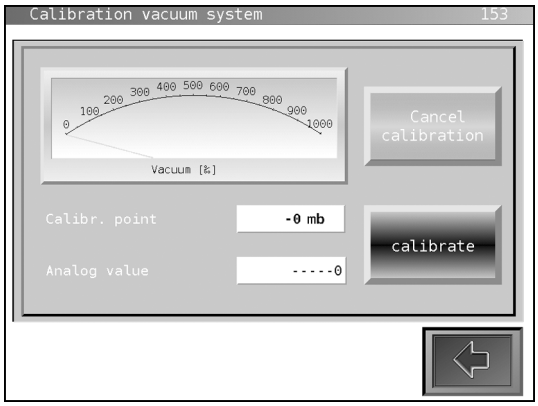


Fig. 9/23

Procedure

1. Connect the reference measuring device to the vacuum system.
2. Define the calibration point. Press the field "Calibration point" and enter "1" (mbar) via the displayed keypad.
3. Press the **Start calibration** button.
4. Press the **Calibrate** button as soon as the calibration point corresponds to the display on the reference measuring device.

During calibration the button changes to **Cancel calibration**. Calibration has been completed once the button changes back to **Start Calibration**.

☞ **NOTICE**

If the defined calibration point is not reached, cancel calibration via the "Cancel calibration" button and enter a higher calibration point. The max. calibration point is 10 mbar, but it should be set as low as possible.

☞ **NOTICE**

If the "Cancel calibration" button is pressed during calibration, the data of the last correct calibration remain active.

Subsequently carry out a leak test to make sure everything is correct. Read the description in *Mask 54: Leak test vacuum chamber*.

Analog value

The analog value is only relevant for VC999 service engineers.

9.8.1.4 Initializing frequency converter

Use this function to reset the frequency converter (FC) to the factory setting. If a new frequency converter is installed, initialization must be carried out prior to initial usage.

9.8.2 Mask 157: Defect Modes

The functions and measuring instruments listed in this mask can be switched on or off.

This can be useful during set-up or test runs and if one of the measuring instruments displayed here becomes defective.

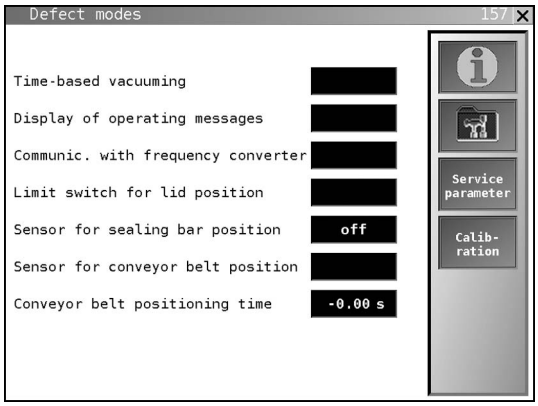


Fig. 9/24

Explanation of the parameters

Parameter	Function	Possible settings	Factory settings
Time-based vacuuming	This vacuuming mode is explained in the description of *Mask 101/102: Parameter 1/2* under "Vacuuming mode". Programs can neither be loaded nor saved when this function is switched on.	on off	off
Display of operating messages	The display of operating messages must only be deactivated if regular maintenance is still ensured. If this function is set to "off", no operating messages will appear anymore on the display.	on off	off
Communic. with frequency converter	There is no communication with the frequency converter. A change of speed or ramp is not written in the frequency converter.	on off	off
Limit switch for lid position	Monitoring the vacuum chamber If a limit switch of the vacuum chamber lid is defective, the defect mode can be activated here. The vacuum chamber lid is then opened and closed in a time-based manner. The limit switches are no longer relevant.	on off	off
Sensor for sealing bar position	If one or both of the position sensors on the sealing bars are defective, you can deactivate the detectors individually. **Deactivate in emergencies only, as otherwise there is danger of damaging the machine!**	on off	off
Sensor for conveyor belt position	Monitoring the conveyor belt position	on off	off

Parameter	Function	Possible settings	Factory settings
Conveyor belt positioning time	If the position sensor of the conveyor belt is defective, the defect mode can be activated here. The conveyor belt is then positioned in a time-based manner. The positioning time appears once the defect mode has been activated.	0,5 - 10,0 s	-

NOTICE

Observe the note on danger for the parameter "Sensor for sealing bar position"!

9.8.3 Mask 156: Service parameter

Access this mask after entering the step 3 password.

The parameters listed here are so-called initial settings. Press an input field to change the corresponding setting.

The individual functions and effects are described below.

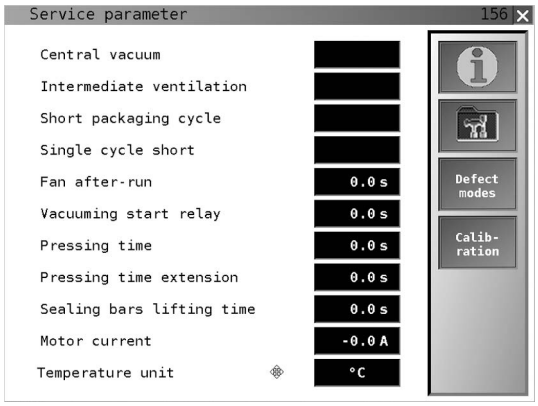


Fig. 9/25

Explanation of the parameters

Parameter	Function	Possible settings	Factory setting
Central vacuum	Switch on this function if the Vacuum Packaging Machine is to be connected to a centrally controlled vacuuming system.	on ☑ off ☒	off ☒
Intermediate ventilation	The function "Intermediate ventilation" is explained in the description of the *Mask 101/102: Parameter 1/2* under "Explanation of the parameters".	on ☑ off ☒	off ☒
Shot packaging cycle	In position "on", the packaging cycle is accelerated by approx. 1 - 2 seconds. As a result, the conveyor belt is, for example, started shortly after opening the vacuum chamber. Please read the NOTICE at the bottom of this table!	on ☑ off ☒	off ☒

Parameter	Function	Possible settings	Factory setting
Single cycle short	Operation of a single cycle in position "on": Packaging cycle – Conveyor belt transport Operation of a single cycle in position "off": Conveyor belt transport – Packaging cycle – Conveyor belt transport	on off	off
Fan after-run	Input 0.0: The fan of the bag waste suction unit switches off as soon as the vacuum chamber lid reaches the target position during opening (at the very top or the intermediate position). Input 0.1 – 5.0 The fan continues to run for the time period programmed here after reaching the target position The fan is switched off at the latest when the lid is lowered.	0.0 – 5.0 s	0.0 s
Vacuuming start delay	Delays the time between closing of the vacuum chamber and vacuum start.	0.0 – 2.0 s	0.8 s
Pressing time	Sealing bar pressing time before sealing is performed.	0.0 - 5,0 s	1.0 s
Pressing time extension	The pressing time of the sealing bars is extended. Switch on the function "Intermed. ventilation" in *Mask 156: Service parameter*. This ensures that no air can flow back into the bag.	0.0 – 5.0 s	2.0 s
Sealing bars lifting time	Time available for the sealing bar to release the bag before ventilation.	0.0 – 5.0 s	1.5 s
Motor current	This ensures that drive motor overload can be recognized by the conveyor belt.	0.5 ... 6.0 A	*
Temperature unit	Temperature unit display	°C / °F	°C

* According to the name plate +10% from the drive motor

☞ **NOTICE**

If the parameter "Short packaging cycle" is switched on, there is a high risk of collisions when sealing high products!

9.9 Step 4

Access to step 4 is password protected and only for VC999 service engineers.

9.10 Programming

We recommend you to first define the programs on paper before entering them. This will give you a clearer overview and ensure that programs will not be lost even in the event of a defect or a manipulating error on the control system. You will find appropriate program tables for copying in the Appendix.

The following descriptions outlines the necessary work steps in a chronological sequence. The detailed work steps as well as the meanings of the parameters are explained in the relevant descriptions of the masks.

☞ NOTICE

If the function "Time-based vacuuming" is switched on in *Mask 157: Defect modes*, programs can neither be loaded nor saved.

9.10.1 Define program

If you want to create a **new** packaging program, proceed as follows:

1. Enter the password to unlock step 2.
2. Ensure that "Time-based vacuuming" is switched off in *Mask 157: Defect Mode*
3. Set the parameters *Parameter 1/2 and 2/2* in *Mask 101/102*.
4. Press **Save program**  and enter the program name via the displayed keypad.
5. Press **Load program**  and then the displayed program name.
6. Answer the subsequent prompt with **YES**. The program is saved in the current program directory, loaded and displayed on the screen.

9.10.2 Load program

The message "Program load" refers to the call-up of a program to the working storage. You can edit a program located in the working storage or start it for the packaging process in the corresponding step.

If you want to load an **existing** packaging program, proceed as follows:

1. Press **Load program**  and then the program name in the list.
2. Ensure that "Time-based vacuuming" is switched off in *Mask 157: Defect Mode*!
3. Answer the subsequent prompt with **YES**. The program is loaded and displayed on the screen.

9.10.3 Edit program

If you want to edit an **existing** packaging program, proceed as follows:

1. Enter the password to unlock step 3.
2. Change the desired parameters in *Masks 101/102: Parameter 1/2 and 2/2*.
3. Press **Save program**  and enter a new or existing program name via the displayed keypad.
4. Press **Load program**  and then the displayed program name.
5. Answer the subsequent prompt with **YES**. The program is saved in the current program directory, loaded and displayed on the screen.

9.10.4 Delete program

If you want to delete a packaging program, proceed as follows:

1. Enter the password to unlock step 3.
2. Press **Delete program**  .
3. Press the program to be deleted in the displayed list.
4. Answer the subsequent prompt with **YES**. The program is deleted from the current program directory.

9.11 Packaging cycle

9.11.1 Conveyor belt positioning

The integral initiator ensures that within a packaging cycle the conveyor belt moves far enough for the packaging product laid between the markings on the feed belt to come to a stop exactly in the vacuum chamber. A prerequisite for this is that the conveyor belt must be in a clearly defined starting position before the packaging cycle.

As the belt position changes when the belt is slackened, it must be reset when the machine is switched on again. This ensures that the product for packaging stops in the correct position right from the first packaging cycle.

Conveyor belt positioning is triggered via the button **Start conveyor belt position** in *Mask 52: Test function*. For this purpose, read the relevant description of the mask functions.

9.11.2 Start / terminate packaging cycle

Make sure that the vacuum chamber is dry before starting the packaging process.

1. Make sure the required program is loaded. If necessary, load the program according to the description in section 9.10.2 "Load program".

2. If new sealing bars have been installed in the machine, they have to be calibrated and, possibly, burnt-in. Please read section 9.8.1.1 *Mask 152: Calibration sealing bars* resp. section 9.8.1.2 "Burn-in sealing bars".

3. Place the bag for packaging on the conveyor belt so that the end of the bag opening lies flat on the guide plate of the conveyor belt.

NOTICE

The bag must be positioned on the guiding plate in the loading area (x) between the two marks (1).

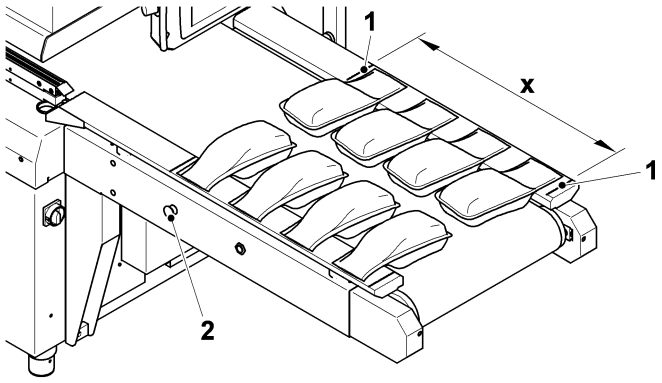


Fig. 9/26

NOTICE

The VC999 K7 Vacuum Packaging Machine can take goods for packaging from both sides of the conveyor belt.

4. To start a single cycle : With the vacuum pump on, press the symbol **Single cycle** in *Mask 13: Process monitoring*.

5. To start automatic consecutive cycles: With the vacuum pump on, press the symbol **Automatic operation** in *Mask 13: Process monitoring* or press one of the green buttons (2) on the side.

6. During processing, each individual processing step is shown simultaneously on the display.

7. If you have selected the automatic consecutive cycles: Place the next bags on the belt.

☞ **NOTICE**

The delay time until the vacuum chamber closes can be specified in the program, but it will extend the cycle time. For this purpose, read the description *Mask 101/102: Parameter 1/2 and 2/2* under "Pause before closing".

8. If you wish to terminate packaging: Press the green button **Automatic operation** in the display. The cycle started will be completed, but no new one will be started.

☞ **NOTICE**

Immediately cycle interruption : To interrupt the packaging cycle immediately, press the red button "Cycle interruption" . The vacuum pump will stop, the vacuum chamber will be ventilated and opened!

9.12 Switch off

Switch off the Vacuum Packaging Machine as follows:

1. If a packaging cycle is running: Press the green button in the display. The cycle started will be completed, but no new one will be started.

2. If no packaging cycle is running anymore stop the vacuum pump: Press the symbol **Vacuum pump** in *Mask 13: Process monitoring*.

3. Switch off the Vacuum Packaging Machine by turning the main switch from ON (I) to OFF (0).

⚠ **CAUTION**

Switch off the machine and allow it to cool down sufficiently before carrying out any repairs or maintenance work: Risk of burns at the vacuum pump and sealing bars!

Emergency stop buttons

The emergency stop buttons enable you to stop the Vacuum Packaging Machine quickly in the event of danger.

☞ **NOTICE**

The emergency stop buttons cut off the power supply to hazardous components. They are only intended for emergency situations, however and should not be used for normal shutdown.

9.13 Operating messages

The Vacuum Packaging Machine monitors the essential servicing intervals. If maintenance or checks become necessary, the control system will report this to the user by operating messages on the display.

The user must acknowledge operating messages by pressing . As a result, these will temporarily disappear from the display. After restarting of the machine, they will reappear.

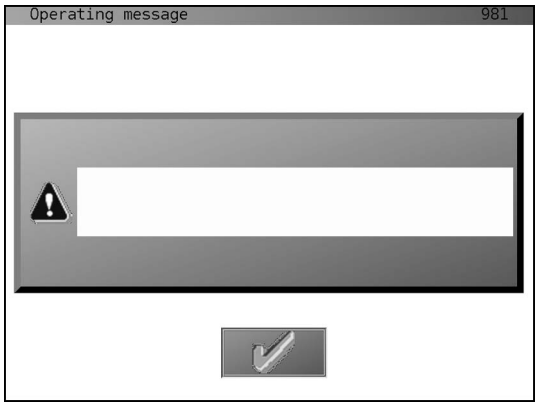


Fig. 9/27

NOTICE

Acknowledge such messages with and inform the shop mechanic or service technician that he must immediately perform the required maintenance and reset the counter. The message will then no longer be displayed.

NOTICE

In *Mask 157: Defect modes* the "Display of operating messages" may also be entirely deactivated. But this is only allowed if routine checks and maintenance are planned and their execution is guaranteed.

If you deactivate this function, this will always be on your own responsibility. The manufacturer recommends you to leave the function activated!

Possible operating messages	**Meaning**
Machine operating for more than 2000 hours. Carry out maintenance!	This message appears after 2,000 operating hours.
Machine operating for more than 100 hours. Check oil level for vacuum pumps!	This message appears after 100 operating hours.
Sealing bars operating for more than 4000 hours. Check sealing bars for correct functioning and damages!	This message appears after 4,000 packaging cycles.

10 Error display and troubleshooting

Operating faults are not defects in the equipment but circumstances resulting in operation being stopped, and the fault must be remedied. You do not need a service engineer for this as you can generally remedy this type of fault yourself.

The information given below on troubleshooting covers the most usual type of malfunction. Consult the manufacturer's customer services at Inauen Maschinen AG, if you come up against a problem for which no troubleshooting instructions are given here.

CAUTION

Risk of crushing. Always switch the Vacuum Packaging Machine off first and make sure that it cannot be switched on again inadvertently before undertaking troubleshooting tasks!

NOTICE

Please note that there are light emitting diodes (LED) for all the electrical control inputs and outputs. This enables fast location of faults and malfunctions (electrical control, wiring, switches, fuses, valves, etc). The wiring diagram can be found in the document folder inside the electrical cabinet (Fig. 3/1, pos. 10) and in section 15.3 "Wiring diagrams" in this operating manual.

10.1 Alarm messages

In the event of a general fault, an alarm mask appears. Under certain circumstances, the packaging cycle will be terminated.

The alarm number is displayed at the top.

The top box displays the cause and the bottom box possible troubleshooting measures.

If an error occurs, it must be eliminated. Subsequently press the function button to confirm error elimination.

The alarm number is entered and saved after acknowledgement in *Mask 990: Alarm list*.

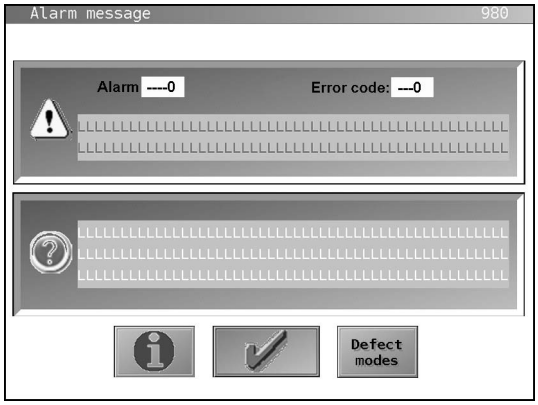


Fig. 10/1

Press the function button **Defect Modes** to open *Mask 985: Defect Modes for alarm* shown on the right.

If an alarm occurs, individual functions or monitoring elements can be switched on or off here, or set values changed to at least ensure continued production.

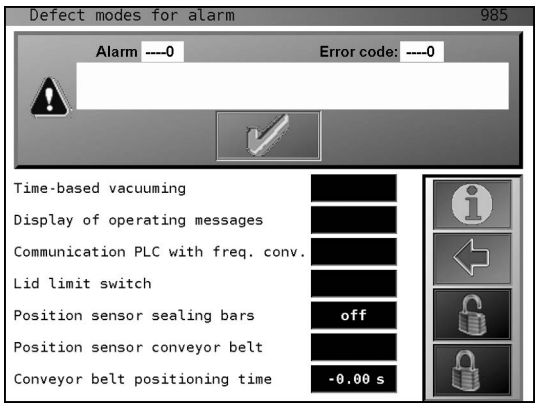


Fig. 10/2

Procedure

1. Press the function button displaying the unlocked padlock  .
2. Enter the step 3 password via the displayed numeric keypad and press the ENTER  button to confirm it.
3. Press the input field whose status is to be changed. The display changes or a numeric keypad is displayed to enter the desired value.
4. Press the function button displaying the locked padlock  . Access is now blocked.
5. Subsequently press  to confirm the alarm message.

10.2 Faults and their remedies

The machine control is able to diagnose certain faults itself and display these accordingly.

General

- When the conveyor belt is off, the loading pause cannot be switched on and no automatic cycle can be started.
- If the pump is running and no cycle is started after 300s or no function is executed, the pump will be switched off. (sleep mode).
- If automatic operation is stopped and restarted, it is assumed that products are already in the chamber area. For this reason, no transport is performed during the subsequent restart. But if the pump was stopped and restarted, the first conveying operation will be performed. (start of production)

The following table describes the possible faults. In the event of one of these alarm messages, the Vacuum Packaging Machine will move to its home position. The message will remain on the display until the fault has been acknowledged.

No	Alarm messages	Cause	Remedy
1	Hand safety-guard monitoring actuated	Resistance of lid on closure	Remove foreign matter from sealing area
2	Compressed air supply is too low	Compressed air not connected	Connect compressed air
		Main valve on mains closed	Open main valve
		Leak in compressed air supply line	Check supply line for leaks, remedy leaks where necessary
		Setting on FRL unit too low	Check: setting at approx. 5 bar
		Pressure switch faulty	Check pressure switch
3	Electric supply roots pump	Thermal relay setting incorrect	Check thermal relay setting
		Fault on vacuum pump(s)	Consult VC999 Customer Service Dep.
		Pump overheats	Leave pump to cool down
4	Electric supply rotary slide pump 1	Thermal relay setting incorrect	Check thermal relay setting
		Fault on vacuum pump(s)	Consult VC999 Customer Service Dep.
		Oil removal filter of pump blocked	Exchange oil separator elements
		Pump overheats	Leave pump to cool down
5	Electric supply rotary slide pump 2	Thermal relay setting incorrect	Check thermal relay setting
		Fault on vacuum pump(s)	Consult VC999 Customer Service Dep.
		Oil removal filter of pump blocked	Exchange oil separator elements
		Pump overheats	Leave pump to cool down
6	Error frequency converter conveyor belt	Current value setting on the frequency converter is too low	Check setting in frequency converter
		Strained running of conveyor belt	Check transport area
		Gearmotor defective	Consult VC999 Customer Service Dep.
7	Electric supply bag waste suction unit is interrupted	Thermal relay setting incorrect F3	Check thermal relay setting
		Fan defect	Consult VC999 Customer Service Dep.
		Fan overheated	Leave fan to cool down
8	Preventilation set point not reached	Air intake filter blocked	Check air intake filter and clean
		Valve faulty	Check preliminary venting valve
		Selected set value too low	Select higher set value
9	Vacuum set point not reached	Vacuum pump(s) not operating at full capacity	Carry out oil change
		Product evaporates under vacuum	Select vacuuming type „Vacuuming to evaporation“
		Vacuum chamber does not close fully	Check sealing area and actuation mechanism
		Vacuum chamber not leak-tight	Check lid seal and hoses
		Vacuum chamber damp	Dry out vacuum chamber and belt
		Incorrect calibration	Carry out sensor calibration

No	Alarm messages	Cause	Remedy
10	Limit switch for top lid position not reached	Limit switch position incorrect	Check limit switch position
		Mechanical obstruction to movement	Check mechanical movement
		Limit switch faulty	Exchange limit switch
		Fault in electrical supply of limit switch or valves	Consult VC999 Customer Service Dep.
11	Limit switch for bottom lid position not reached	Limit switch position incorrect	Check limit switch position
		Mechanical obstruction to movement	Check mechanical movement
		Limit switch faulty	Exchange limit switch
		Fault in electrical supply of limit switch or valves	Consult VC999 Customer Service Dep.
12	Conveyor belt positioning mark not found	Initiator/belt switching distance too large	Check switching distance (set value = 1 - 2 mm)
		Initiator soiled or faulty	Clean initiator and replace if necessary
		Conveyor belt faulty	Please read the description "Start conveyor belt position" in *Mask 52: Test function*. If necessary, replace the belt.
13	Distance of left-hand sealing bars too big	Top and bottom sealing bars not set at the correct	Check height of sealing bars
14	Distance of right-hand sealing bars too big		
15	Distance of right-hand sealing bars too small		
17	Distance of left-hand sealing bars too small		
16	Internal PLC error	Fault in PLC	Read fault code and consult VC999 Customer Service
18	Vacuum chamber could not be closed	Limit switch position incorrect	Check limit switch position
		Mechanical obstruction to movement	Check mechanical movement
		Limit switch faulty	Exchange limit switch
		Fault in electrical supply of limit switch or valves	Consult VC999 Customer Service Department
19	Vacuum chamber could not be opened	Limit switch position incorrect	Check limit switch position
		Mechanical obstruction to movement	Check mechanical movement
		Limit switch faulty	Exchange limit switch
		Fault in electrical supply of limit switch or valves	Consult VC999 Customer Service Department.
20	Alarm temperature controller	Fault in the sealing system	Read error code, discover and eliminate the fault using the table "error codes for alarm 20".
21	Calibration of temp. controller cannot be started	Sealing bars are too hot	Allow sealing bars to cool down
22	Calibration of temp. controller cannot be stopped	Autocalibration fault	Check wiring

No	Alarm messages	Cause	Remedy
23	PLC battery voltage too low	This message appears if the charge state of the PLC buffer battery is too low.	The battery should be replaced as quickly as possible, and be removed and installed within 20 seconds. If necessary, contact the VC999 Customer Service Department!
24	Set temperature sealing bars not reached	Temperature control device may be switched off	Make sure the temperature control device is switched on
		El. supply of the temperature control device may be interrupted	Check el. supply of the temperature control device
			Calibrate sealing bars
25	Temperature monitoring of pumps has triggered	Overheating of the vacuum pump	Allow pump to cool down. Carry out possible pump service
26	Actual temp. sealing bars is higher than set point	Input value of the set temperature is less than the actual temperature	Check the input value of the set temperature
		Error in the temperature control circuit	Carry out calibration
27	El. supply of the rotary blade interrupted	Incorrect thermal relay setting	Check thermal relay setting
		Rotary blade motor overheated	Allow motor to cool down
28	Machine is not in initial position	Mechanical movements hindered	Check mechanical movement
		Limit switch defective	Replace limit switch
		El. supply line to the limit switch or valve defective	Consult VC999 Customer Service Department
29	Cooling temperature not reached	Error in the temperature control circuit	Re-calibrate Burn-in sealing bars
30	Ventilation set point not reached	Check input value	Change input value
		Air flow interrupted	Check for soiling
31	Temp. monitoring motor conveyor belt has triggered	Conveyor belt motor drive overheated	Check thermal relay setting
		Conveyor belt motor drive defective	Consult VC999 Customer Service Department
		Motor drive overheated	Allow motor drive to cool down
		Conveyor belt tension too high	Correct belt tension
32	Communication PLC - frequency converter faulty	El. connection PLC – FC incorrect	Check el. supply of FC Check bus CPU – FC
33	Measuring system: vacuum value faulty	Incorrect calibration	Calibrate vacuum system
		Vacuum sensor defective or soiled	Clean or replace vacuum sesnor
			Check el. supply of vacuum sensor
34	Error reset safety module Emergency Stop	EMERGENCY STOP active At least 1 EMERGENCY STOP circuit interrupted	Release EMERGENCY STOP
35	Emergency Stop circuit is interrupted	EMERGENCY STOP active At least 1 EMERGENCY STOP circuit interrupted	Release EMERGENCY STOP
36	Safety monitoring sealing system is defective	Safety contactor sealing system defective	Consult VC999 Customer Service Department
			Replace contactor
37	Vacuum system cannot be calibrated	Vacuum sensor defective or soiled	Clean or replace vacuum sesnor
38	Intermediate ventilation cannot be carried out	Ventilation valve does not open	Check el. supply
			Check valve for soiling

No	Alarm messages	Cause	Remedy
39	Error infeed	Various causes are possible	Search and eliminate error in the infeed control
40	Error outfeed	Various causes are possible	Search and eliminate error in the outfeed control
41	Hand safety guard safety switch jumper	Hand safety guard safety switch jumper defective OR Hand safety guard safety switch jumper installed incorrectly	Adjust or replace the hand safety guard safety switch jumper
42	Hand safety guard monitoring defective	Hand safety guard safety switch defective OR Hand safety guard safety switch installed incorrectly	Adjust or replace the hand safety guard safety switch

Error codes for alarm-20

No.	Cause	Measure during initial start-up	Measure when the machine is in operation, heating conductor not changed
101	I_R signal missing	Fault range ①	Fault range ①
102	U_R signal missing	Fault range ③	Fault range ③
103	U_R and I_R signal missing	Fault range ②	Fault range ② ⑨
104	Temperature jump	Fault range ④ ⑤ ⑥ (loose contact)	Fault range ④ ⑤ ⑥ (loose contact)
105	Frequency fluctuation, impermissible power frequency	Check mains	Check mains
106	Internal fault	Carry out **RESET**	Carry out **RESET**
107	Internal fault, device defective	Replace device	Replace device
108	U_R and/or I_R signal incorrect	Carry out **AUTOCAL**	Fault range ④ ⑤ ⑥
109	Data error	Carry out **AUTOCAL**	---
110	I_R signal incorrect, calibration not possible	Fault range ⑧ Check configuration	---
111	U_R signal incorrect, calibration not possible	Fault range ⑦ Check configuration	---
112	U_R and I_R signal incorrect, calibration not possible	Fault range ⑦ ⑧ Check configuration	
113	Temperature fluctuates, calibration not possible		

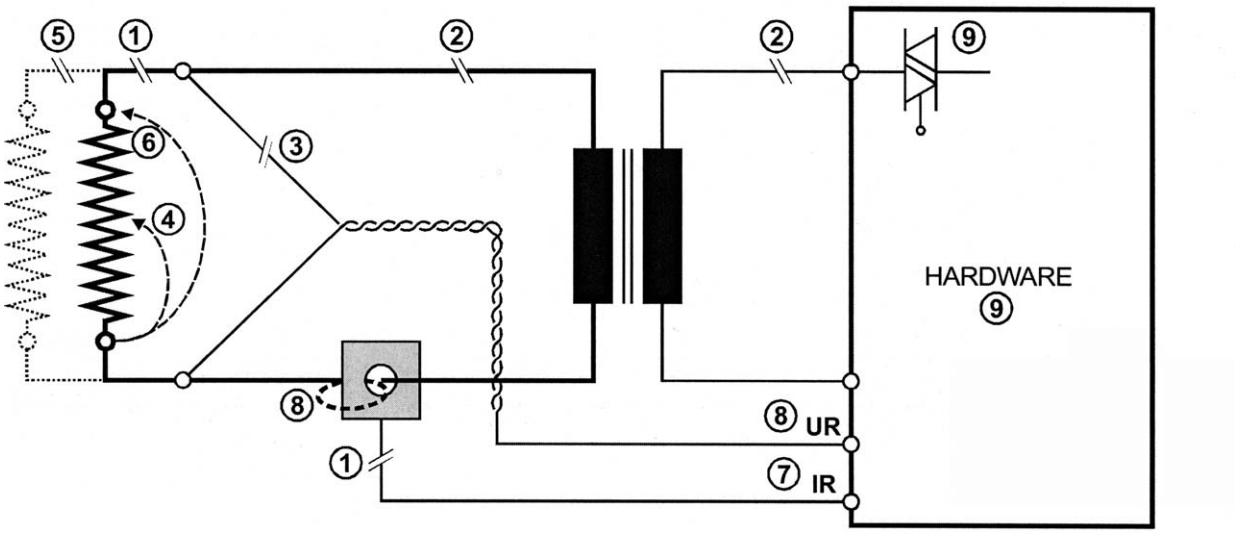


Fig. 10/3

Fault ranges for the temperature controller error codes

Fault ranges	Explanations	Possible causes
①	Interruption of the load circuit after the U_R tap	- Cable break, heating conductor break - Contact to the sealing bar defective
	Interruption of the signal from the current transformer PEX-W2	- I_R measuring line from the current transformer interrupted
②	Interruption of the primary circuit	- Line break, triac defective in the controller - Primary winding of the pulse transformer interrupted
	Interruption of the secondary circuit in front of the U_R tap	- Cable break - Secondary winding of the pulse transformer interrupted
③	U_R signal missing	- Measuring line interrupted
④	Partial short circuit (Delta R)	- The sealing bar is partially bridged by a conducting part (opposite bar, etc.)
⑤	Interruption of the parallel circuit	- Cable break, heating conductor break - Contact to the heating conductor defective
⑥	Total short circuit	- Sealing bars have been assembled incorrectly, insulation missing at the sealing bars or assembled incorrectly - Conducting part totally bridging the sealing bars
⑦	U_R signal incorrect	- U_R outside the permitted range of 0.4..120VAC.
⑧	I_R signal incorrect	- I_R outside the permitted range of 30...500A.
	Windings through the current transformer PEX-W2 incorrect	- Check the number of turns (Two or more turns are required for currents < 30A)
⑨	Internal device fault	- Hardware fault (replace the controller)

10.3 Other faults and their remedies

Not all faults can be identified and displayed by the Vacuum Packaging Machine. The following Table lists possible faults and mentions the causes and the action to take.

Fault	Cause	Remedy
Bag waste suction non-operative, suction effect non-existent or too little	Fan or collector blocked	Check installation
	Fan safety cut-out actuated	Check safety cut-out
	Suction fan direction of rotation incorrect	Check direction of rotation
	Suction system not leak-tight	Check suction system
Bag waste suction operative but bag waste not extracted	Bag waste suction not operating properly	Check edges and points on cutter blade
		Check whether cutter blade inserts in the centre of the 4.5 mm wide groove when cutting
	Bag waste suction and cut-off system contaminated	Clean and dry system so that bag waste does not adhere at any point
Vacuum chamber lid strikes housing when closing	End position dampers on cylinder not set correctly	Set end position dampers correctly
Vacuum chamber lid drops too quickly or too slowly	Air venting attenuation not set correctly	Check air venting attenuation
Vacuum chamber lid drops slowly when machine is switched on	Cylinder not leak-tight	Check cylinder and replace if necessary
	Screw fixing on cylinder not leak-tight	Check screw fixing and seal if necessary
	Screw fixings on valve manifold not leak-tight	
Faults in sealed seams	Sealing time, sealing temperature or cooling temperature not set correctly	Set higher or lower
	Teflon tapes on sealing bars damaged or burned	Check Teflon tapes and replace if necessary
	Sealing wires not taut on sealing bars	Check wire tension, and replace wires if necessary
	Application pressure of sealing bars too high or too low	Check display on pressure regulator, standard value is 4.5 bar, somewhat lower for very thin bags
	Various parameters in the service program affect sealing quality	Check pressing time, bar lifting time in *Mask 156: Serviceparameter*. In case of set values deviating from the standard values, please consult VC999 Customer Service

Fault	Cause	Remedy
Sealed seams damaged or completely separated	Too little bag material between packaging product and sealing bars	Set bulky packaging goods 5 to 10 cm from guide rail to release load on sealed seam in venting.
	Sealed seam adheres to sealing bar after sealing	Check Teflon tapes of the sealing bars for wear, spray Teflon tapes periodically with Teflon spray.
Sealing non-functional	Circuit breaker of the sealing transformer is off or has tripped	Reactivate circuit breakers
	Pressure valve does not open	Check valve and drive
	Sealing type set on OFF	Set to ON
	Compression pressure too low	Compressed air regulator in power supply box must be set at about 4.5 bar
Conveyor belt motor not running	Transport type set on OFF	Select a speed stage in the program
Conveyor belt running but does not position the products exactly in the vacuum chamber (Alarm-12)	Switching sensor for conveyor belt positioning not operating correctly	Check spacing between switching sensor and belt; this should be 1-2 mm
		Clean switching surface on sensor switch
	Conveyor belt slipping on drive cylinder	Check belt tension, and if necessary tighten with tensioning screws on tail pulley
	Products not positioning between markings on belt (Fig. 9/24)	Set products between markings on belt
Program can neither be loaded nor saved	Incorrect step password	Select correct step password
	Function "Time-based vacuuming" is switched on.	Switch off function in *Mask 157: Defect modes*.

Fuses

The fuses are located in the electrical cabinet (Fig. 3/1, pos. 10). Please read section 12.2 "Repairs to electronics or control system" under "Replace fuses".

11 Maintenance

This chapter on maintenance, troubleshooting and repairs to the Vacuum Packaging Machine is aimed at the "operator" and the "service engineer".

Work on electrical installations should only be carried out by specialist personnel who have been properly trained and authorized to do this.

WARNING

Risk of electric shock. Switch the machine off before maintenance work and make sure that the machine cannot be switched on again inadvertently by means of the padlock on the mains switch. Only carry out work on the power mains if you are trained and authorized to do this.

11.1 Servicing plan

Regular servicing in accordance with the servicing plan will ensure problem-free operation of the Vacuum Packaging Machine.

Servicing includes any work designed to maintain the Vacuum Packaging Machine in operation, i.e.

- Cleaning
- Inspection
- Servicing work

For cleaning and servicing work, it may be necessary to set the Vacuum Packaging Machine in a preset status. This is what the service positions are for in *Mask 52: Test function*.

The servicing plans in the sections below describe the tasks and recommended intervals for these. The column "Documentation" gives details of the location of the corresponding work documents.

11.1.1 Cleaning work

The operator cleans the Vacuum Packaging Machine during production as required. In addition, service engineer should also carry out additional cleaning work at periodic intervals.

CAUTION

Risk of cuts or crushing. Wear safety goggles and gloves for cleaning work.

Task	Frequency	Documentation
Clean the outside surfaces of the machine	daily	
Clean conveyor belt		
In vacuum chamber, clean running surface under conveyor belt		
Clean lid seal		
Clean bag waste extractor		
Clean vacuum chamber, remove bag waste		
Clean run-out rollers, remove bag waste		
Remove sealing waste from sealing bars (do not score)		
Remove side panel and clean sub-frame	weekly	
Clean motor housing and motor fan cowl cover grille	monthly	
Clean the running surfaces of the vacuum chamber lid's lifting mechanism		

Cleaning agents

Use the following cleaning agents for cleaning:

Standard trade chrome steel cleaner	for outside surfaces of machine
Standard trade neutral, non-scratch cleaning agent suitable for contact with foodstuffs for:	Vacuum chamber Conveyor belt Sealing bars User console Lid seal

Clean the vacuum chamber

1. Switch off the vacuum pump and turn the main switch to position OFF (0).
2. First clean the inside of the vacuum chamber lid, then the conveyor belt and finally the sealing bars. Also clean the machine under the conveyor belt by slackening and lifting the belt.
3. Rub the machine dry, or leave it to dry thoroughly.

11.1.2 Inspection work

With regular inspection, problems can often be identified before they interrupt production.

WARNING

Risk of injury to persons and damage to property. When routine checks are made with the Vacuum Packaging Machine in operation, the required safety instructions in chapter 2 “Safety, warranty” must be observed!

Task	Frequency	Documentation
General visual inspection	daily	
Check lid seal (this should seal all round and fit closely in the groove)		
Conveyor belt: Check belt run (centering) and belt tension		
Check Teflon tapes on top and bottom sealing bars		
Check movement of vacuum chamber on closing		
Check bolts for vacuum chamber centering		
Check cutter blade (VC999 K7A) / perforation blade (VC999 K7B) and pre-perforation blade		Chapter 11.5 „Maintenance blades“
Bag waste suction: check level in bag waste container		
General acoustic inspection (Noise emission)		
Check oil in vacuum pumps for color change	weekly	According to instructions, see separate user manual of the pump manufacturer under the "Vacuum pump" index tab.
Check oil level in vacuum pump(s)		

11.2 Servicing work

Maintenance on the operational machine is performed to ensure trouble-free operation. Operating messages on the display indicate to the user at an early stage what maintenance must be performed. These messages are described in chapter 9.13 "Operating messages".

We recommend having the Vacuum Packaging Machine fully serviced at least once a year by the manufacturer's customer services. The VC999 Customer Service Dep. is ready and available for any other servicing work at any time.

CAUTION

Risk of crushing. Before undertaking servicing work, always switch the Vacuum Packaging Machine off first, and make sure that the machine cannot be switched on again inadvertently.

Overview of maintenance

Task	**Frequency**	**Documentation**
Carry out general servicing work	every 2,000 operating hours	
Check sealing bars, replace Teflon tape and sealing wire	every 4,000 packaging cycles	Chapter 11.2.2.1 "Replace Teflon tape and sealing wires"
Oil change on vacuum pumps Rotary slide vacuum pump Roots vacuum pump	According to instructions	See separate user manual of the pump manufacturer under the "Vacuum pump" index tab

11.2.1 Compressed air maintenance unit

The compressed air maintenance unit is for cleaning and preparing compressed air. The system includes condensate extraction, pressure regulation and enrichment of compressed air with the requisite oil mist. Die compressed air maintenance unit is located in the power supply cabinet.

Legend

1 Hand stop valve
2 Pressure controller (machine operating pressure)
3 Pressure display (machine operating pressure)
4 Condensate tank with automatic drain function
5 Main valve (6Y6)
6 Compressed air monitoring (9B9)
7 Pressure controller (air cushion)
8 Pressure display (sealing bar)

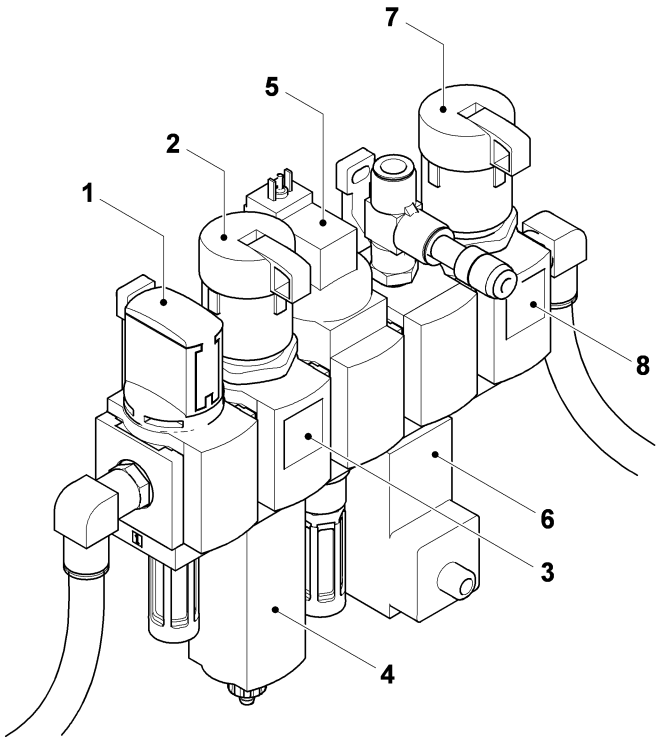


Fig. 11/1

11.2.2 Maintenance sealing bars

Servicing the sealing bars includes replacing the Teflon tape or the sealing wire. The Teflon tape on the sealing bars must be replaced if there are signs of scorching. It may be necessary to replace the sealing wires at the same time. Please read section 11.2.2.1 "Replace Teflon tape and sealing wires".

New sealing bars, or bars with newly installed sealing wires, have to be calibrated and burnt-in after installation and prior to production. Please read section 11.2.2.2 "Calibration and burn-in sealing bars".

☞ **NOTICE**

Keep a spare set of sealing bars so that these can be exchanged when necessary without major interruptions to the production cycle and return to Inauen Maschinen AG for renewal.

11.2.2.1 Replace Teflon tape and sealing wires

The procedure for replacing the Teflon tape or sealing wires is as follows:

Replacing Teflon tape upper sealing bar

1. Disassemble the upper sealing bar (1): Loosen the safety screw (2) and then pull the sealing bar (1) downwards. A firmly seated sealing bar can, depending on its actual position, be released from the sealing bar holder with the aid of a screwdriver via the holes (6 or 7).

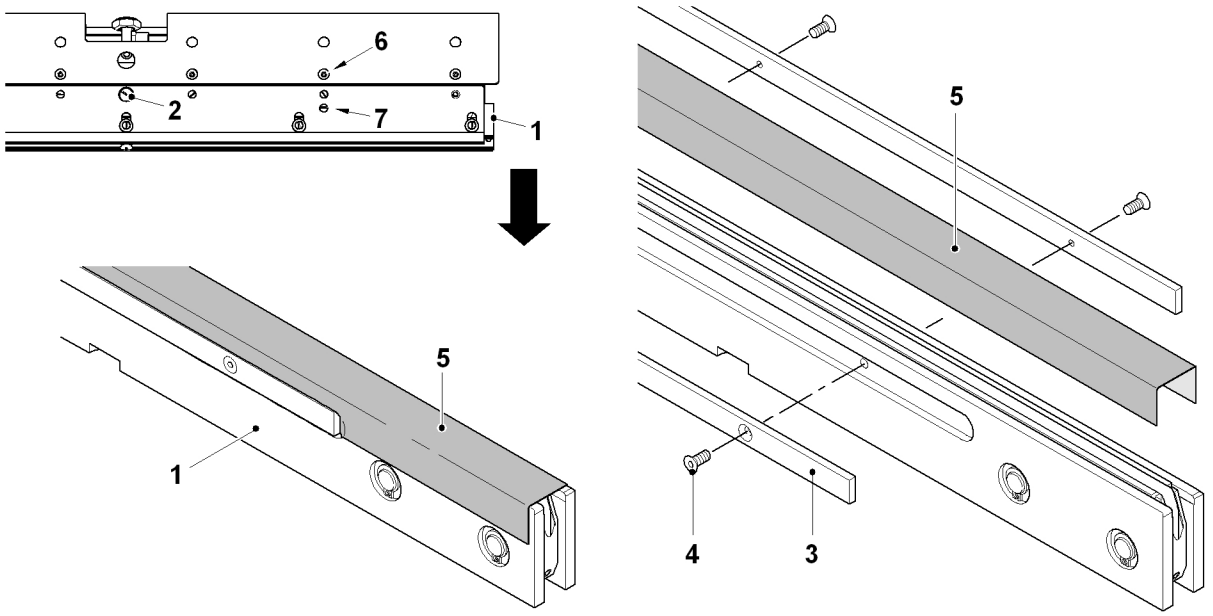


Fig. 11/2

2. Disassemble the clamping bars (3) from both sides of the sealing bar by unscrewing the countersunk screws (4).

3. Remove the Teflon tape (5).

4. Clean the sealing bar with acetone.

CAUTION

Risk of fire when using acetone. Only use acetone in well ventilated space and do not smoke or ignite fires under any circumstances.

NOTICE

When changing the Teflon tape, check the sealing wires for tension; if this is insufficient, they must likewise be replaced.

5. If the sealing wire is not to be replaced, insert a new Teflon tape and re-assemble the sealing bar in reverse order. However, if the sealing wire is to be replaced, proceed as described below "Replacing sealing wire" after point 4.

Replacing Teflon tape lower sealing bar

1. Disassemble the lower sealing bar: Take the sealing bar (1) out of the holder from the top and remove the bracket (2) by unscrewing the two screws (3).

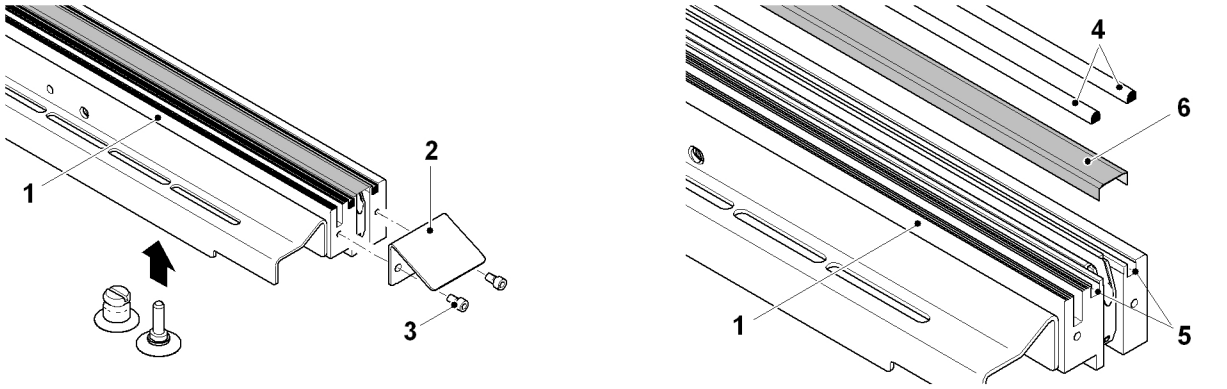


Fig. 11/3

2. Remove the two silicone profiles (4) from the grooves (5).

3. Remove the used Teflon tape (6) from the sealing bar.

4. Clean the sealing bar with acetone.

CAUTION

Risk of fire when using acetone. Only use acetone in well ventilated space and do not smoke or ignite fires under any circumstances.

NOTICE

When changing the Teflon tape, check the sealing wires for tension; if this is insufficient, they must likewise be replaced.

5. If the sealing wire is to be replaced, then proceed from this point as described below "Replacing sealing wire". If the sealing wire is not to be replaced, then proceed according to this description.

6. Stick on a new Teflon tape without creases and use a clean cloth to rub it firmly into position.

7. Press both silicone profiles (4) back into the grooves (5).

8. Assemble the sealing bar and install it in the machine.

Replacing the sealing wire

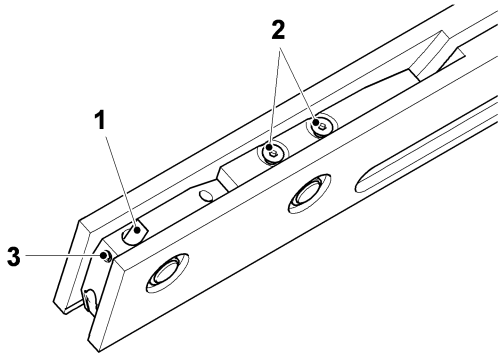
Replace sealing wire as follows:

1. Slacken the sealing wire (1) by releasing the countersunk screws (2), but do not completely unscrew screws.

2. Remove sealing wire by unscrewing the grub screw (3) and withdraw (1).

3. Insert new sealing wire, pull tight and screw in position with grub screw (3).

Upper sealing bar



Lower sealing bar

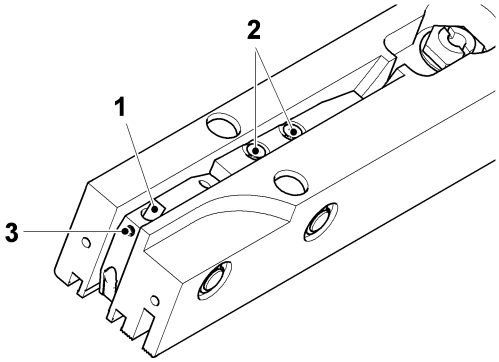


Fig. 11/4

CAUTION

Risk of short-circuit with projecting wire end. Bend the protruding wire end right back into the sealing bar.

4. Tension the sealing wire by tightening the counter-sunk screws (2).

NOTICE

Ensure that the sealing wire does not have electrical contact to the aluminum bar.

5. Insert a new Teflon tape and install the sealing bar in the machine as described above "Replacing Teflon tape lower sealing bar", or "Replacing Teflon tape upper sealing bar".

NOTICE

If sealing bars with new sealing wires have been installed in the machine, the following processes have to be carried out one after the other:

Calibration sealing bars – Burn-in sealing bars – Allow sealing bars to cool down – Calibration sealing bars.

6. Calibrate and burn-in the sealing bars. Please read section 11.2.2.2 "Calibration and burn-in sealing bars".

11.2.2.2 Calibration and burn-in sealing bars

During initial sealing bar heat-up to approx. 200°C – 250°C (392°F – 482°F), the material undergoes a one-off resistance variation, also known as the burn-in effect.

☞ **NOTICE**

If sealing bars with new sealing wires have been installed in the machine, the following processes have to be carried out one after the other:

Calibration sealing bars – Burn-in sealing bars – Allow sealing bars to cool down – Calibration sealing bars.

If sealing bars with previously burnt-in sealing wires are installed in the machine, only **Calibration sealing bars** must be carried out.

These processes are carried out in the step 1. Read section 9.8.1.1 *Mask 152: Calibration sealing bars*.

☞ **NOTICE**

Only use sealing wires and sealing bars specified by the manufacturer and stated in the spare parts list!

11.3 Maintenance vacuum pump(s)

NOTICE

Maintenance work at the pump must be carried out by an authorized and fully qualified technician.

CAUTION

Make sure that the machine is switched off and completely disconnected from the electrical power supply and compressed air supply prior to carrying out maintenance!

Carry out all maintenance work at the vacuum pump according to the instructions in the separate user manual of the pump manufacturer. This user manual can be found under the "Vacuum pump" index tab.

Recommended oil types

Recommended oil products	**Manufacturer**
Indol 100 VC999 spez.	Panolin
Indol ISO 100	Panolin
Teresso 100	ESSO
Corena H 100	Shell
Energol RC 100	BP

NOTICE

Synthetic oils must not be mixed with one another or with mineral oils. Always use the same type of oil when refilling!

NOTICE

Dispose of used oil in accordance with regulations and in an environmentally friendly way.

11.4 Tensioning the conveyor belt

If the tension is correct, the conveyor belt should run centrally. If you find that the belt is running to one side, you will need to adjust the belt tension with the adjusting screws located on the front in the conveyor belt panel.

Let the belt run and move the deflection roller on the side outwards where the belt projects sideways.

11.5 Maintenance blades

The blades for the perforation and for removing bag waste must be checked at least once a month. Always disassemble the blades before carrying out checks. If any of the teeth are damaged, always replace the blade.

11.5.1 Checking cutter blade (VC999 K7A) / perforation blade (VC999 K7B)

CAUTION

Make sure that the machine is switched off and completely disconnected from the electrical power supply and compressed air supply prior to carrying out maintenance!

CAUTION

Wear safety gloves when working on the cutter blade and proceed with requisite care. Serious risk of injuries!

Procedure:

1. Disassemble the blade (1). Loosen the 5 lock nuts (2) for this task.

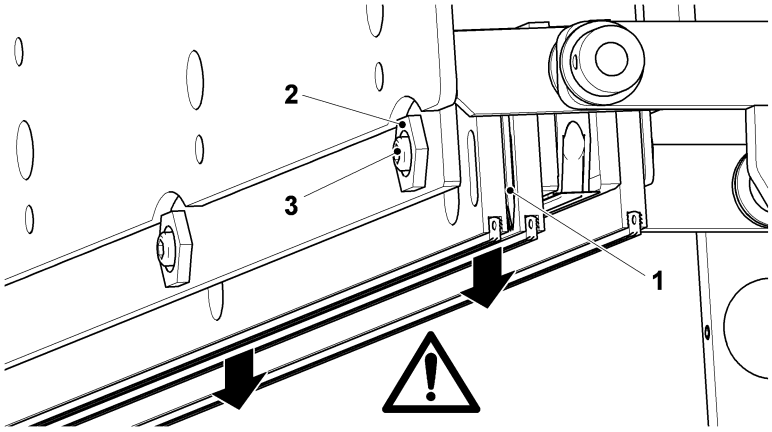


Fig. 11/5

CAUTION

The blade is released when unscrewing the 5 set screws (3) clockwise. Take measures to ensure that the blade cannot fall down!

2. Unscrew the 5 set screws (3) clockwise and remove the blade (1).
3. Check the blade and replace it if any of the teeth are damaged.
4. Re-assemble the blade in reverse order.

11.5.2 Checking pre-perforation blade

CAUTION

Make sure that the machine is switched off and completely disconnected from the electrical power supply and compressed air supply prior to carrying out maintenance!

CAUTION

Wear safety gloves when working on the cutter blade and proceed with requisite care. Serious risk of injuries!

Procedure:

1. Disassemble the blade unit (1). Unscrew and remove the 4 nuts (2).

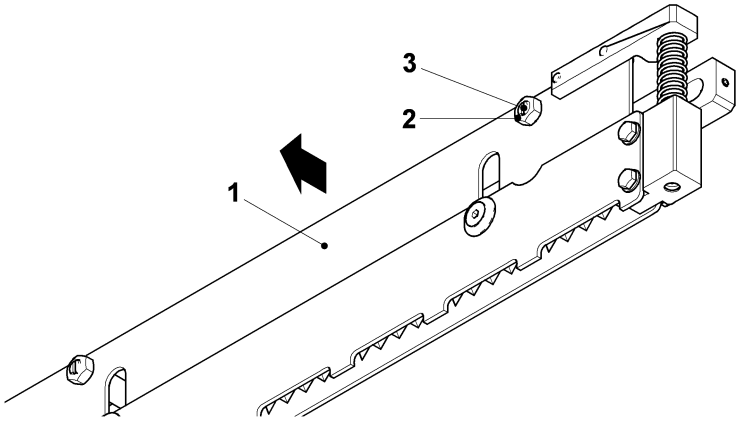


Fig. 11/6

2. Lift the blade unit (1) off the 4 set screws (3) and carefully remove it from the machine.
3. Check the blade and replace it if any of the teeth are damaged.
4. Re-assemble the blade unit in reverse order.

12 Repairs

This section contains information on how to remedy faults. It describes how to dismantle, replace and re-assemble parts.

CAUTION

Risk of acid burns! Wear safety goggles and gloves.

CAUTION

Risk of crushing. Always switch the Vacuum Packaging Machine off first and make sure that it cannot be switched on again inadvertently before starting repair work.

After each repair

Check replaced or repaired parts and perform a test run.

NOTICE

Only use original spare parts. If non-original spare parts are used, Inauen Maschinen AG cannot accept any liability in the event of damage.

12.1 Replacing the conveyor belt

The conveyor belt will have to be replaced in the event of mechanical damage to the belt, or if you wish to continue working with a different type of belt for operational reasons.

NOTICE

Select a conveyor belt with the dimensions given in the technical data in chapter 3.3 „Technical data“.

NOTICE

Tension the conveyor belt after replacement in accordance with section 11.4 „Tensioning the conveyor belt".

12.2 Repairs to electronics or control system

Do not under any circumstances carry out repairs to the electronics yourself. Consult the VC999 Customer Service Dep. for this.

CAUTION

Risk of electric shocks. De-energize the machine before performing any maintenance and lock it against unintentional restarting using a padlock on the main switch. Only perform work on the power network if you are trained and authorized to do so.

12.2.1 Replace buffer battery of PLC control system

The buffer battery of the PLC is located in the electrical cabinet.

1. Open the electrical cabinet.
2. Remove the cover (1) from the PLC housing.
3. Pull out the plug (2).
4. Remove the buffer battery (3) from the housing and replace it **within 20 seconds** with a new one.
5. Reinstall the cover and close the electrical cabinet.

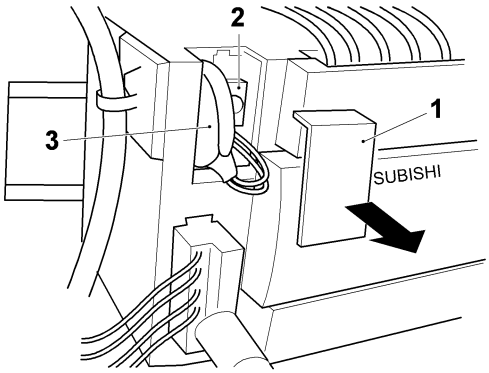


Fig. 12/1

12.2.2 Replacing the buffer battery of the display

1. Use a screwdriver to open the rear of the cockpit.
2. Swing up the lid (1) on the display housing
3. Pull out the plug (2)
4. Remove the buffer battery (3) from the housing and replace it **within 30 seconds** with a new one.
5. Close the lid (1) and the cockpit.

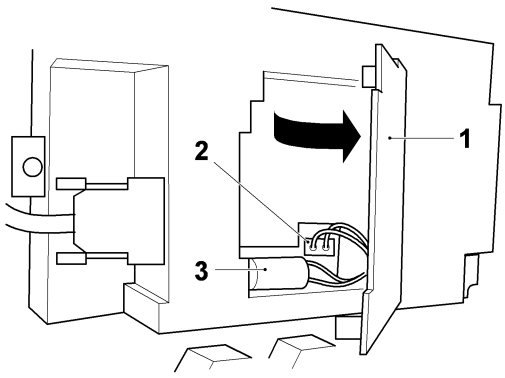


Fig. 12/2

12.2.3 Replace fuses

Change a blown fuse:

Pos. 1
Microfuse FST 6.3 AT

Pos. 2
2 microfuses FST 3.15 AT

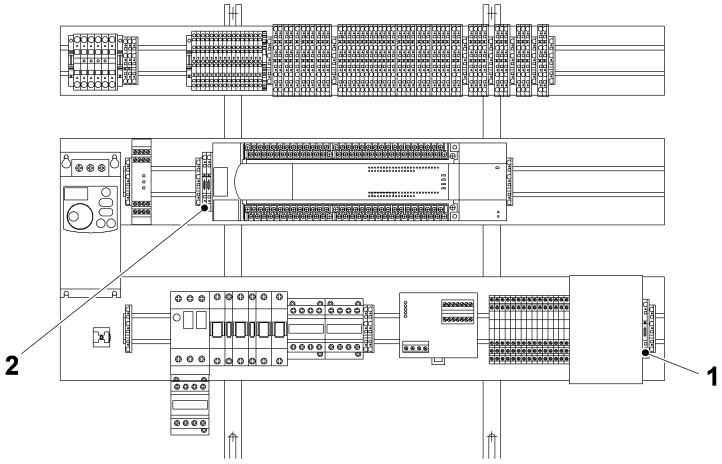


Fig. 12/3

13 Spare parts

13.1 Ordering spare parts

The VC999 Customer Service Department can provide you with a separate list of spare parts, on request. Comply with the following instructions when you order spare parts:

- Check the machine to ascertain which part you need to order.
- Find the relevant part number on the spare parts list and make a note of the name of the part.
- We require the following details for the order:

Characteristic data
Company name, address, address to which to send the spare parts if this is different to the address of the company.

Machine type and serial number
You will find this data on the rating plate on the back of the machine.

Order quantity, description of the spare part and part number
The descriptions of the spare part and part numbers are contained in the separate spare parts list.

- Order the spare parts directly from the machine manufacturer or from an authorized VC999 Customer Service Department. Refer to the section 1 “Introduction” for further details.

14 De-commissioning / Interim storage / Disposal

This section is aimed at the "service engineer" who shuts down, stores or disposes of the Vacuum Packaging Machine at the end of its service life.

14.1 De-commissioning and dismantling

1. Switch the power off and disconnect the power supply line from the terminal block on the control unit of the Vacuum Packaging Machine before starting actual dismantling work.

⚠ WARNING

Risk of electric shocks. Before dismantling the Vacuum Packaging Machine, make sure that the power supply is properly disconnected!

2. Fix the Vacuum Packaging Machine to a crane or lifting truck (see section 4 „Packaging and transport “), and transport to the scheduled site.

14.2 Interim storage

Note the following points if you wish to store the Vacuum Packaging Machine in the interim for later use:

- Clean the machine before interim storage. Take care to remove any food residues in particular.
- Change the oil.
- Store the machine in a dry room with no major temperature variations.

Make sure that the following storage conditions are observed:

- Storage temperature: -10 °C to +70 °C
- Air humidity: 60% max.

☞ IMPORTANT

Servicing is not required during interim storage.

14.3 Disposal

We will take back obsolete machines for proper disposal and offer this service at cost. Please contact our VC999 Customer Service Dep. for details.

Please do not return any obsolete machines to us without agreeing this beforehand with VC999 Customer Service Dep.

Self-disposal

If disposing of the Vacuum Packaging Machine yourself, please note the following points, in addition to local and internal company regulations:

- Drain all oil from the vacuum pumps, and dispose of at a used oil collecting point.
- Separate the operating and control units and dispose of as electronic waste.
- Dismantle non-metallic parts such as the conveyor belt, dispose of these in the appropriate manner and dispose of all other parts as scrap metal.

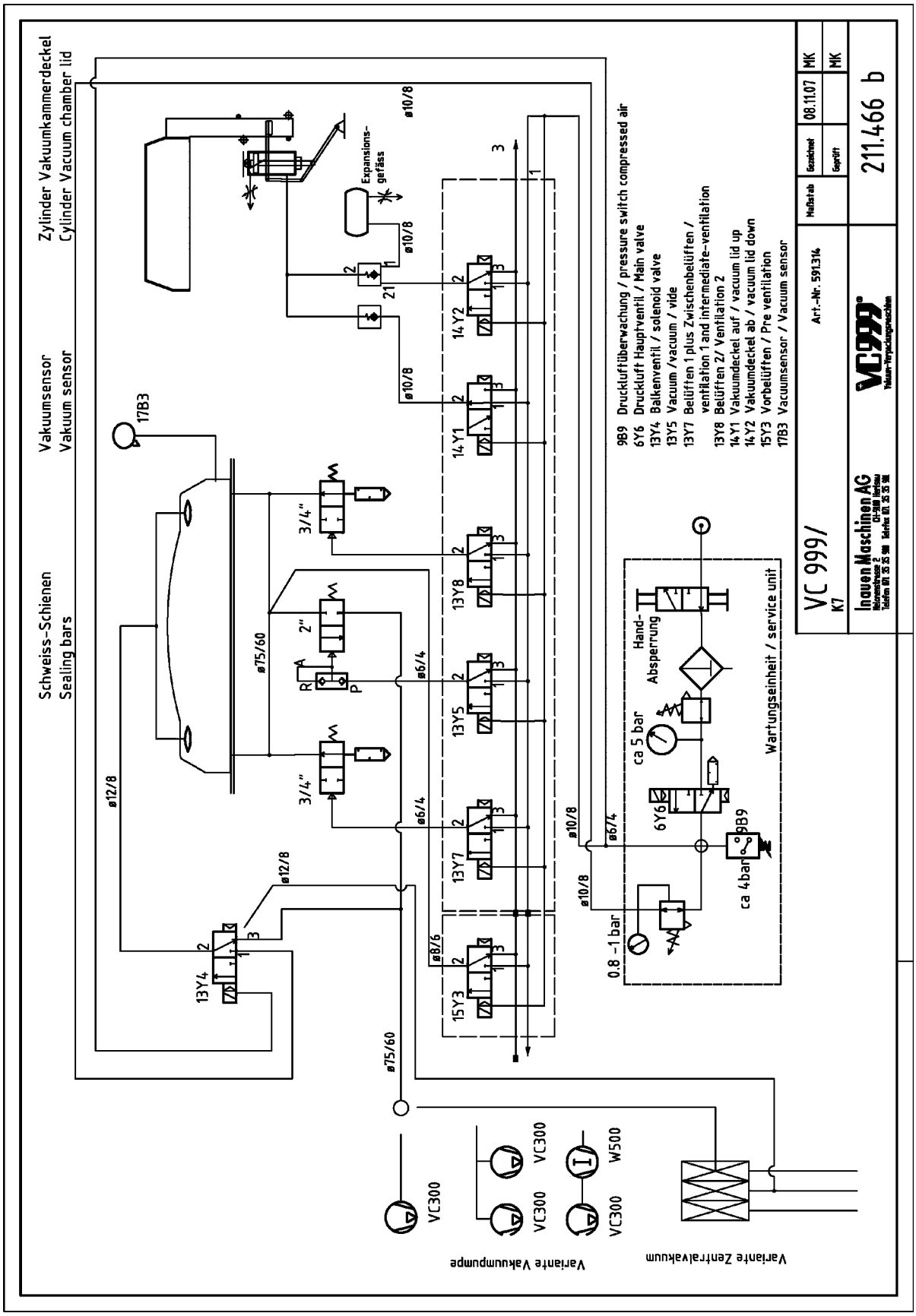
15 Appendix

15.1 Program table

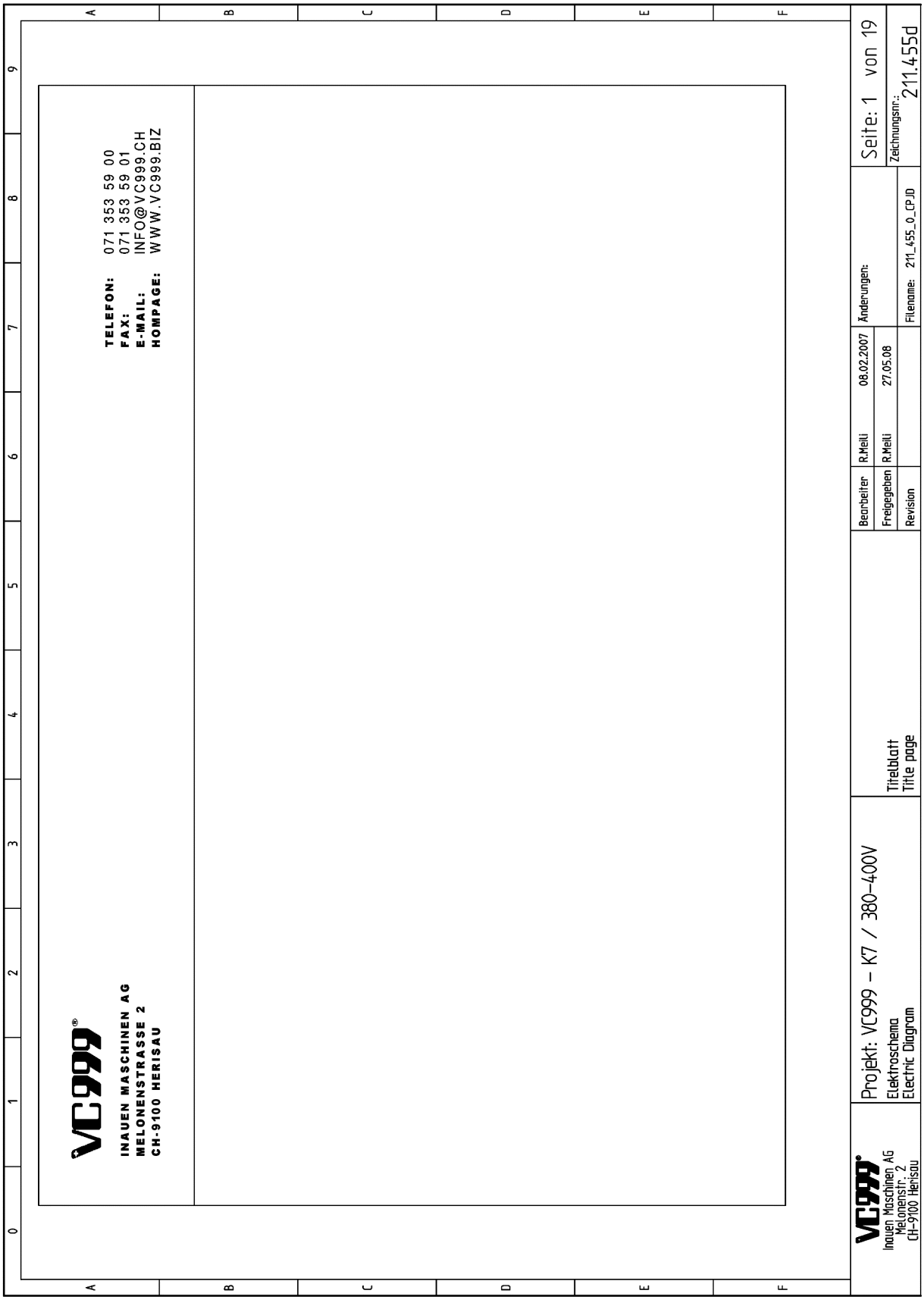
Program name	Product	Type of bag	Vacuuming mode	Vacuum set point o/oo	Evaporation sensitivity s	Vacuum stage o/oo	Vacuum holding time s	Intermed. ventilation value o/oo	Sealing time s	Preventi-lation set point o/oo	Speed conveyor belt 1 - 6	Ramp 1 - 3	Loading pause ON / OFF	Pause before closing s	Sealing temperature °C	Sealing temperature °F	Cooling temperature °C	Cooling temperature °F

Notes

15.2 Pneumatic diagram



15.3 Wiring diagrams



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VC999®
Inauen Maschinen AG
Melonenstr. 2
CH-9100 Herisau

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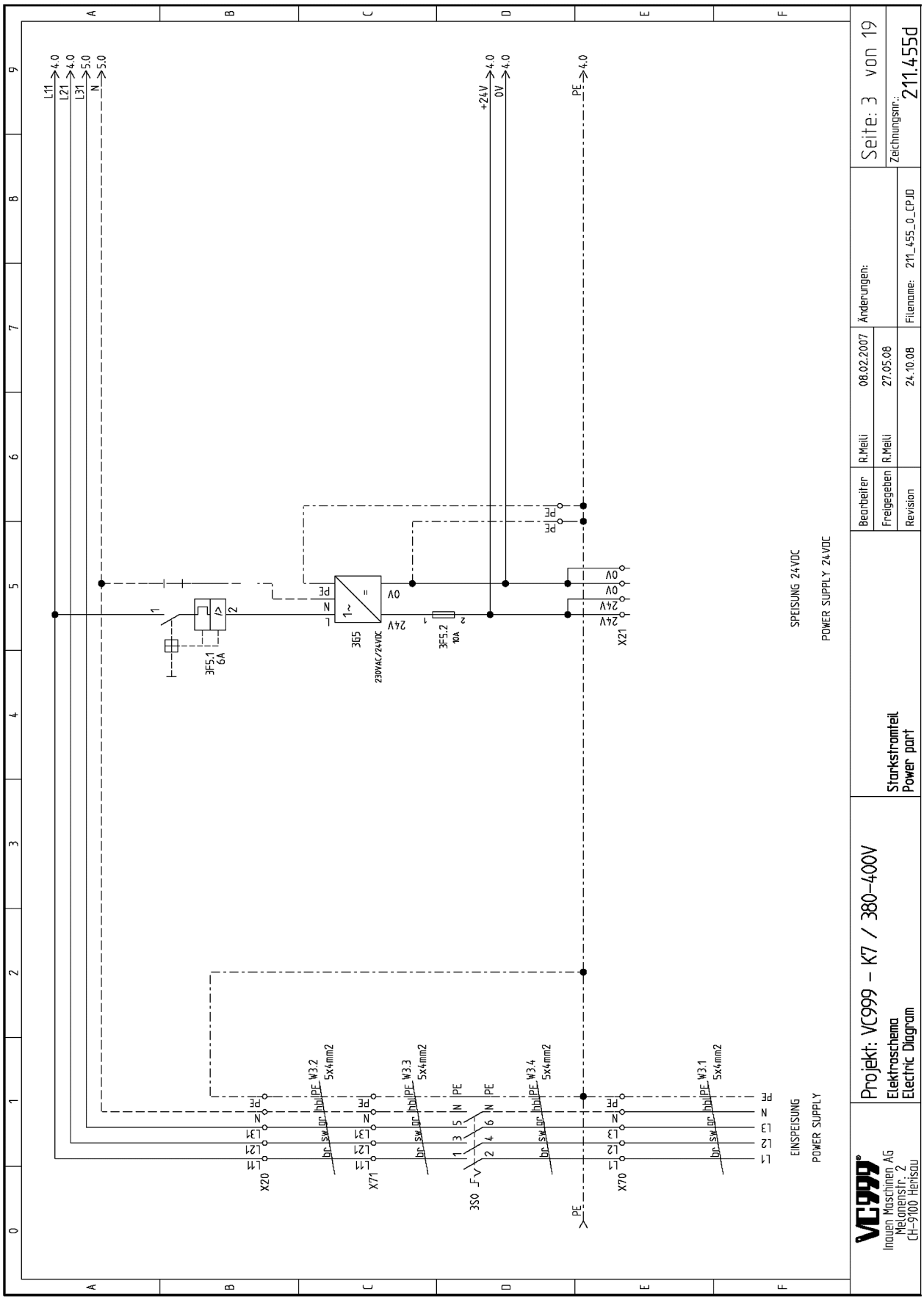
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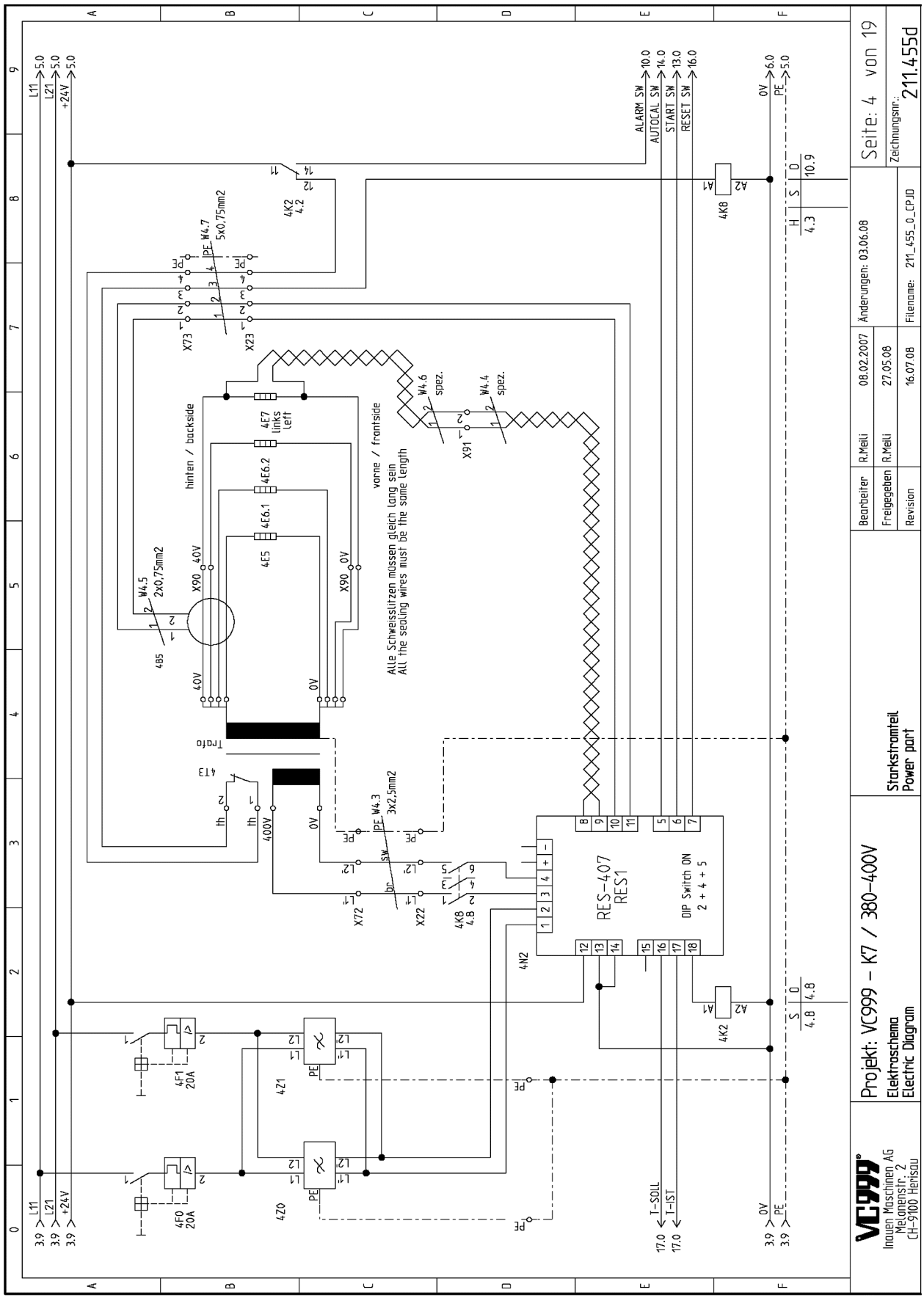
CH-9100 Herisau
EINSPEISUNG
POWER SUPPLY
SPEISUNG 24VDC
POWER SUPPLY 24VDC
3F5.1 6A
3G5 230VAC/24VDC
3F5.2 10A
X20
X71
X70
X21
3S0
W3.1 5x4mm2
W3.2 5x4mm2
W3.3 5x4mm2
W3.4 5x4mm2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Inauen Maschinen AG
Meigenenstr. 2
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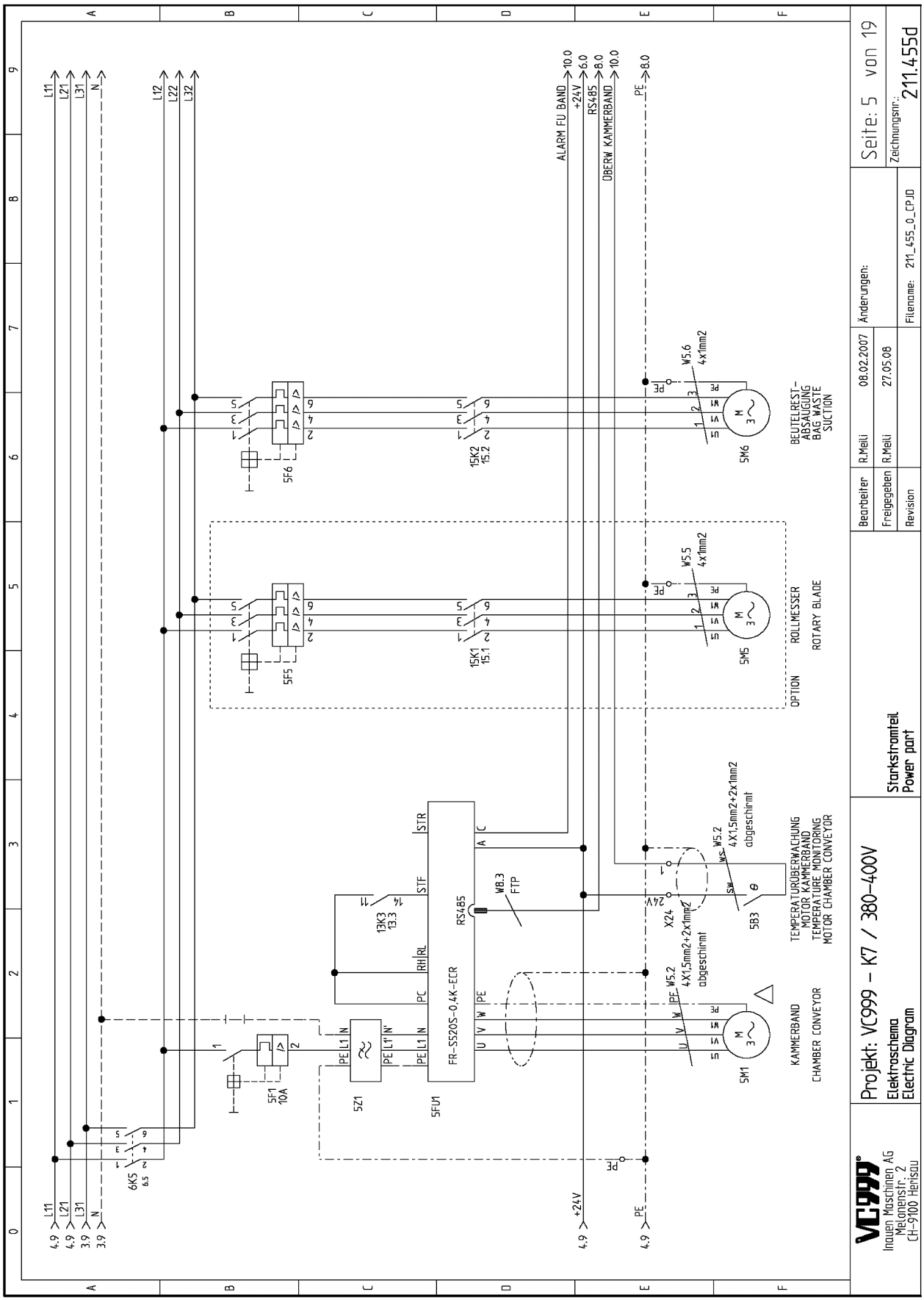
RES-407
RES1
DIP Switch ON
2 + 4 + 5
Trafo
hinten / backside
vorne / frontside
Alle Schweissstützen müssen gleich lang sein
All the sealing wires must be the same length
T-SOLL
T-IST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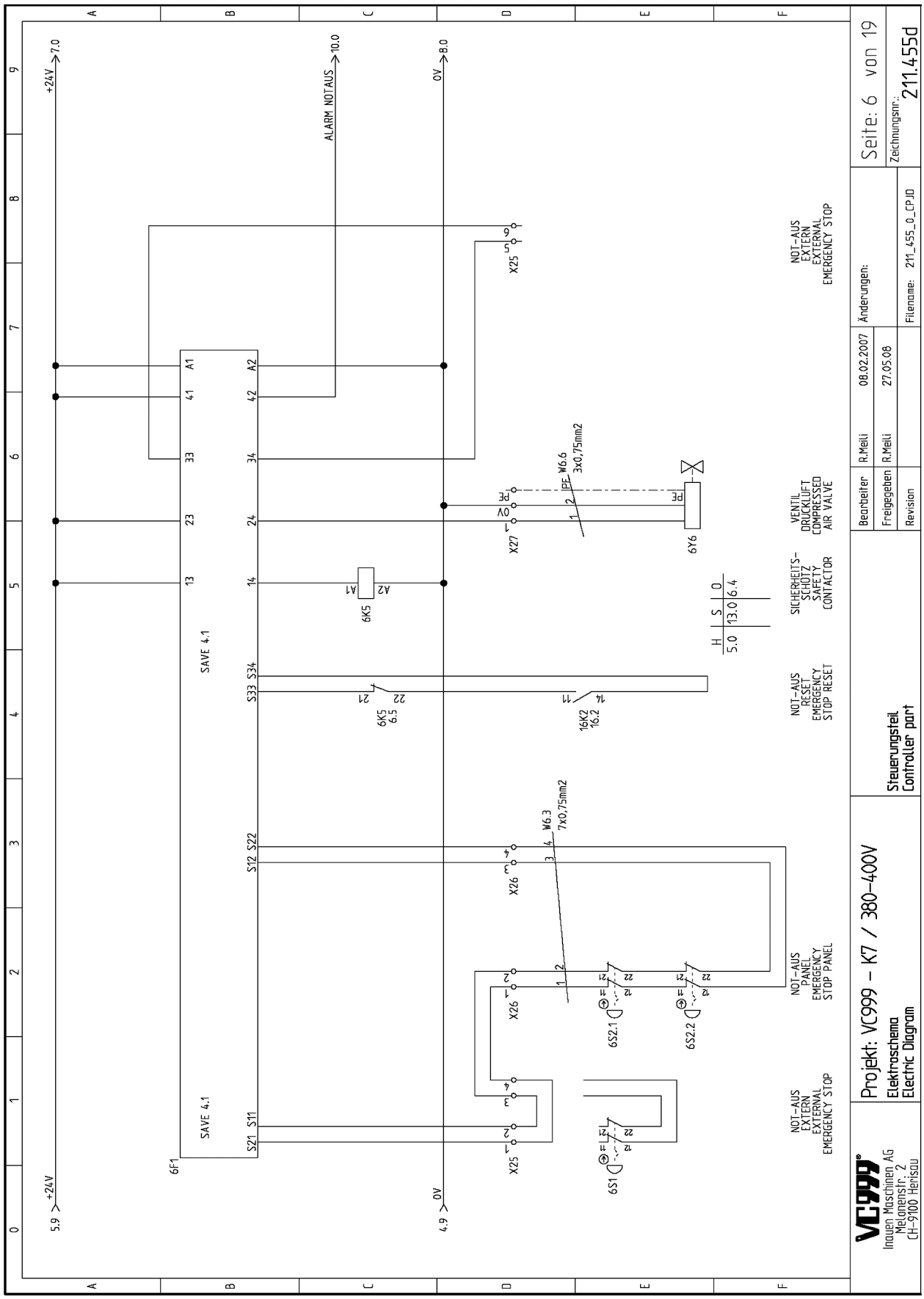
L11
L21
L31
N
L12
L22
L32
PE
+24V
ALARM FU BAND
RS485
ÜBERW KAMMERBAND
5F6
5F5
5F1
10A
6K5
15K2
15.2
15K1
15.1
13K3
13.3
5Z1
5FU1
FR-S520S-0.4K-ECR
5M1
5M5
5M6
5B3
W5.6
4x1mm2
W5.5
4x1mm2
W5.2
4X1,5mm2+2x1mm2
abgeschirmt
W8.3
FTP
X24
BEUTELREST-
ABSAUGUNG
BAG WASTE
SUCTION
ROLLMESSER
ROTARY BLADE
OPTION
KAMMERBAND
CHAMBER CONVEYOR
TEMPERATURÜBERWACHUNG
MOTOR KAMMERBAND
TEMPERATURE MONITORING
MOTOR CHAMBER CONVEYOR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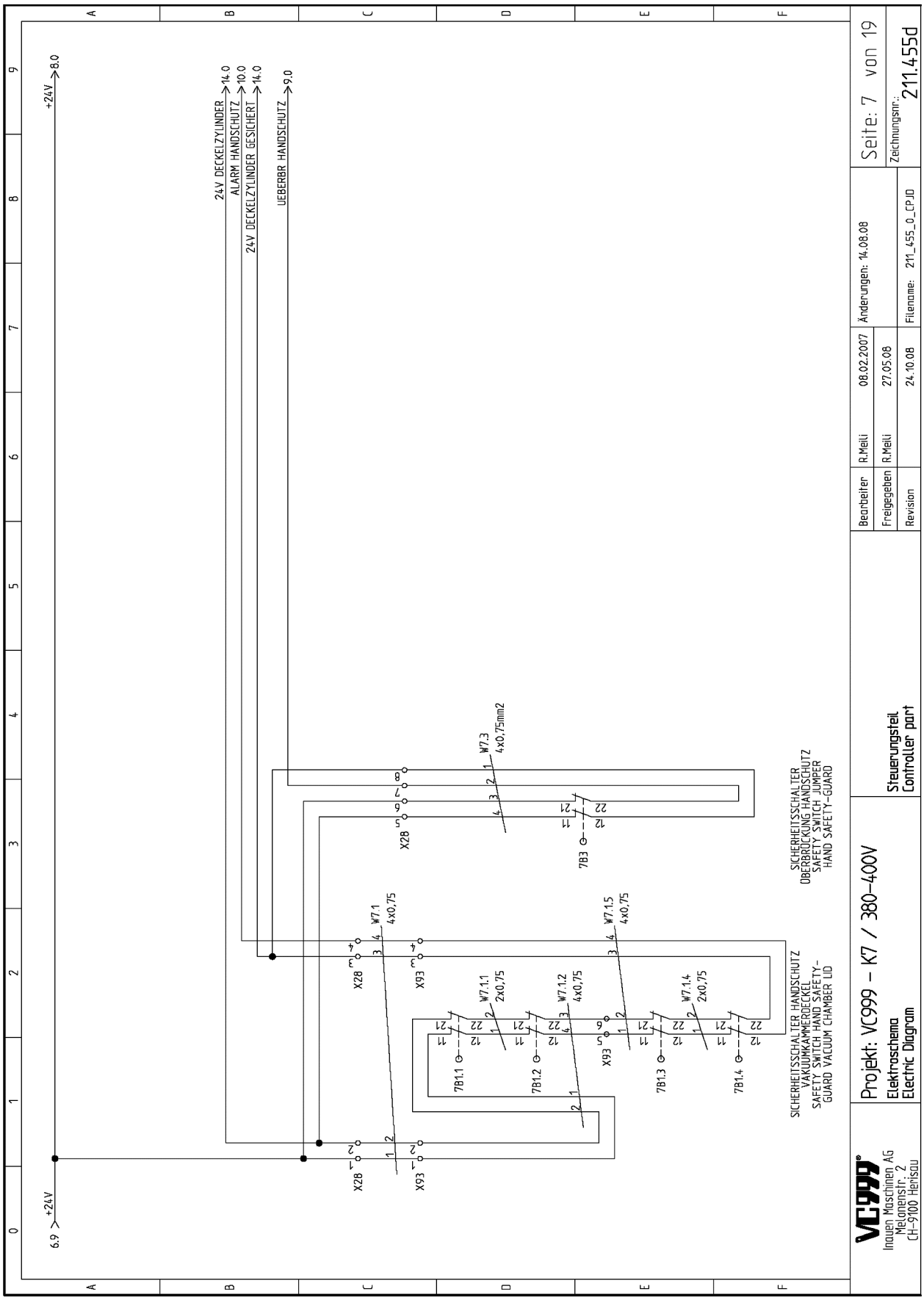
+24V
0V
ALARM NOTAUS
SAVE 4.1
6F1
6K5
6K5 6.5
16K2 16.2
6Y6
6S1
6S2.1
6S2.2
X25
X26
X27
W6.6 3x0,75mm2
W6.3 7x0,75mm2
NOT-AUS EXTERN EXTERNAL EMERGENCY STOP
NOT-AUS RESET EMERGENCY STOP RESET
NOT-AUS PANEL EMERGENCY STOP PANEL
SICHERHEITS-SCHÜTZ SAFETY CONTACTOR
VENTIL DRUCKLUFT COMPRESSED AIR VALVE


24V DECKELZYLINDER >14.0
ALARM HANDSCHUTZ >10.0
24V DECKELZYLINDER GESICHERT >14.0
UEBERBR HANDSCHUTZ >9.0
+24V >8.0
6.9 >+24V
W7.3 4x0,75mm2
W7.1 4x0,75
W7.1.5 4x0,75
W7.1.1 2x0,75
W7.1.2 4x0,75
W7.1.4 2x0,75
X28
X93
7B3
7B1.1
7B1.2
7B1.3
7B1.4
SICHERHEITSSCHALTER ÜBERBRÜCKUNG HANDSCHUTZ
SAFETY SWITCH JUMPER HAND SAFETY-GUARD
SICHERHEITSSCHALTER HANDSCHUTZ VAKUUMKAMMERDECKEL
SAFETY SWITCH HAND SAFETY-GUARD VACUUM CHAMBER LID
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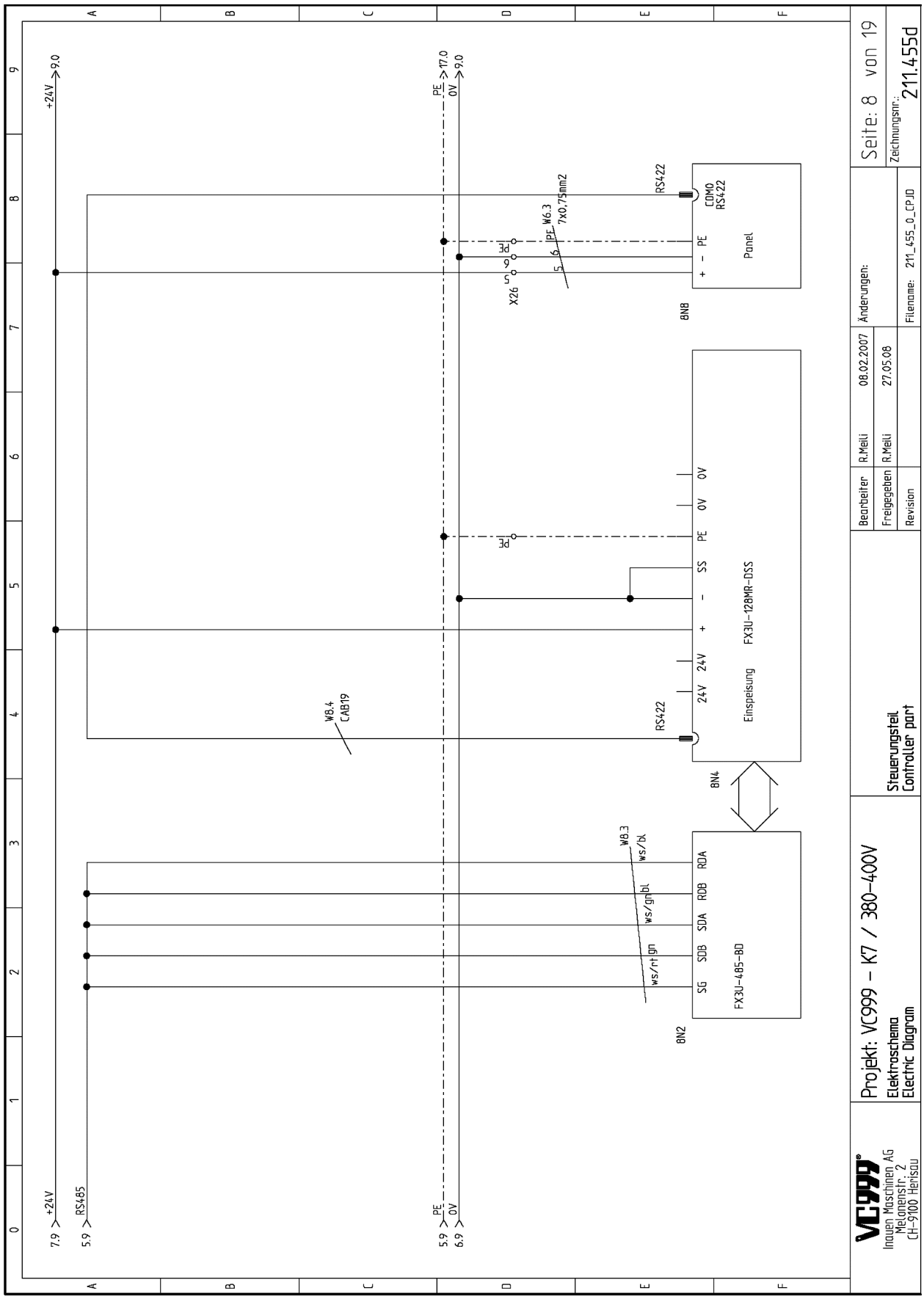
+24V >9.0
PE >17.0
0V >9.0
RS422
CDM0
RS422
PE
+ -
Panel
W6.3
7x0,75mm2
PE
X26
BN8
W8.4
CAB19
RS422
24V
24V
+
-
SS
PE
0V
0V
Einspeisung
FX3U-128MR-DSS
BN4
W8.3
ws/bl
ws/gn bl
ws/rt gn
RDA
RDB
SDA
SDB
SG
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6.9 >0V
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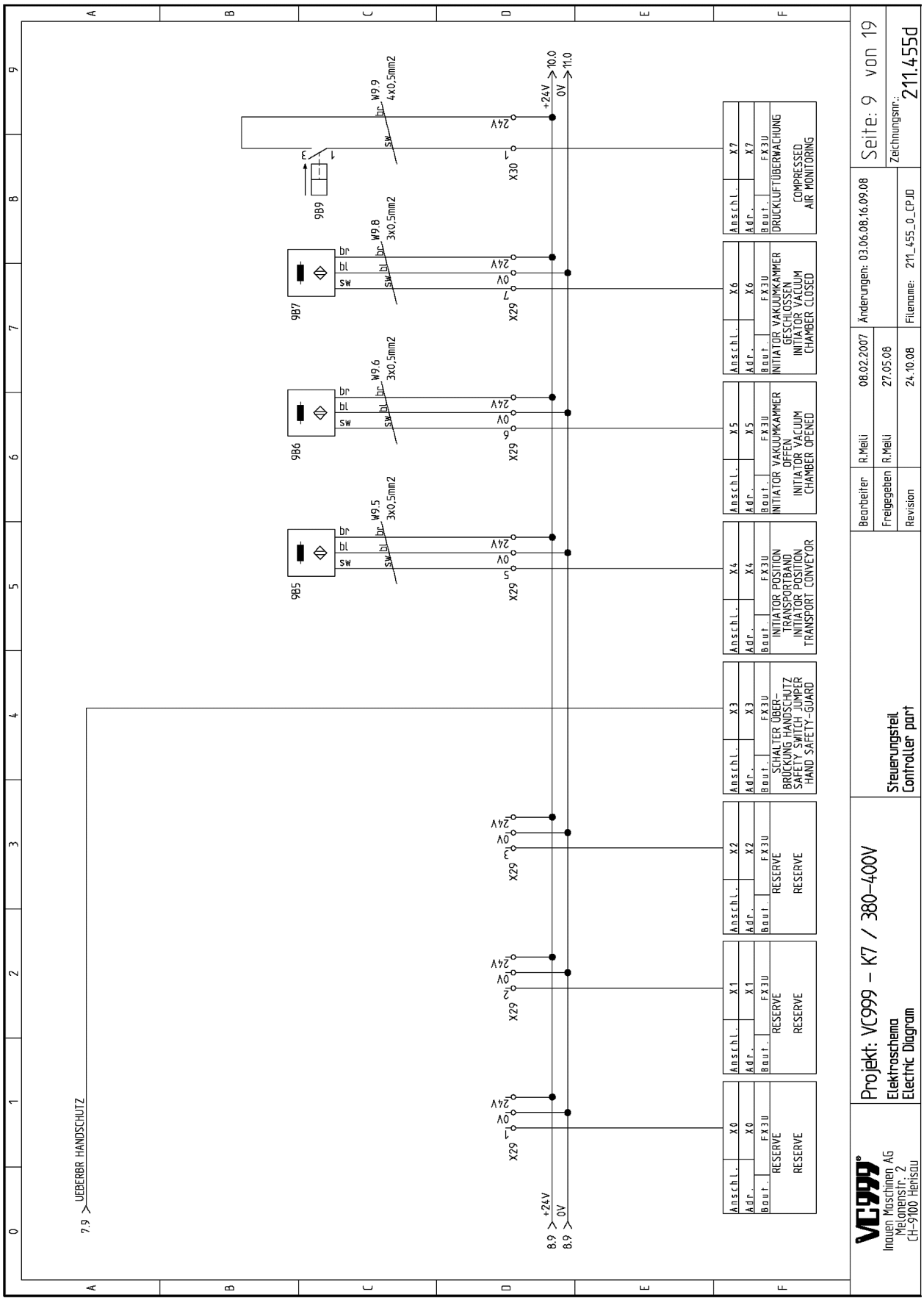
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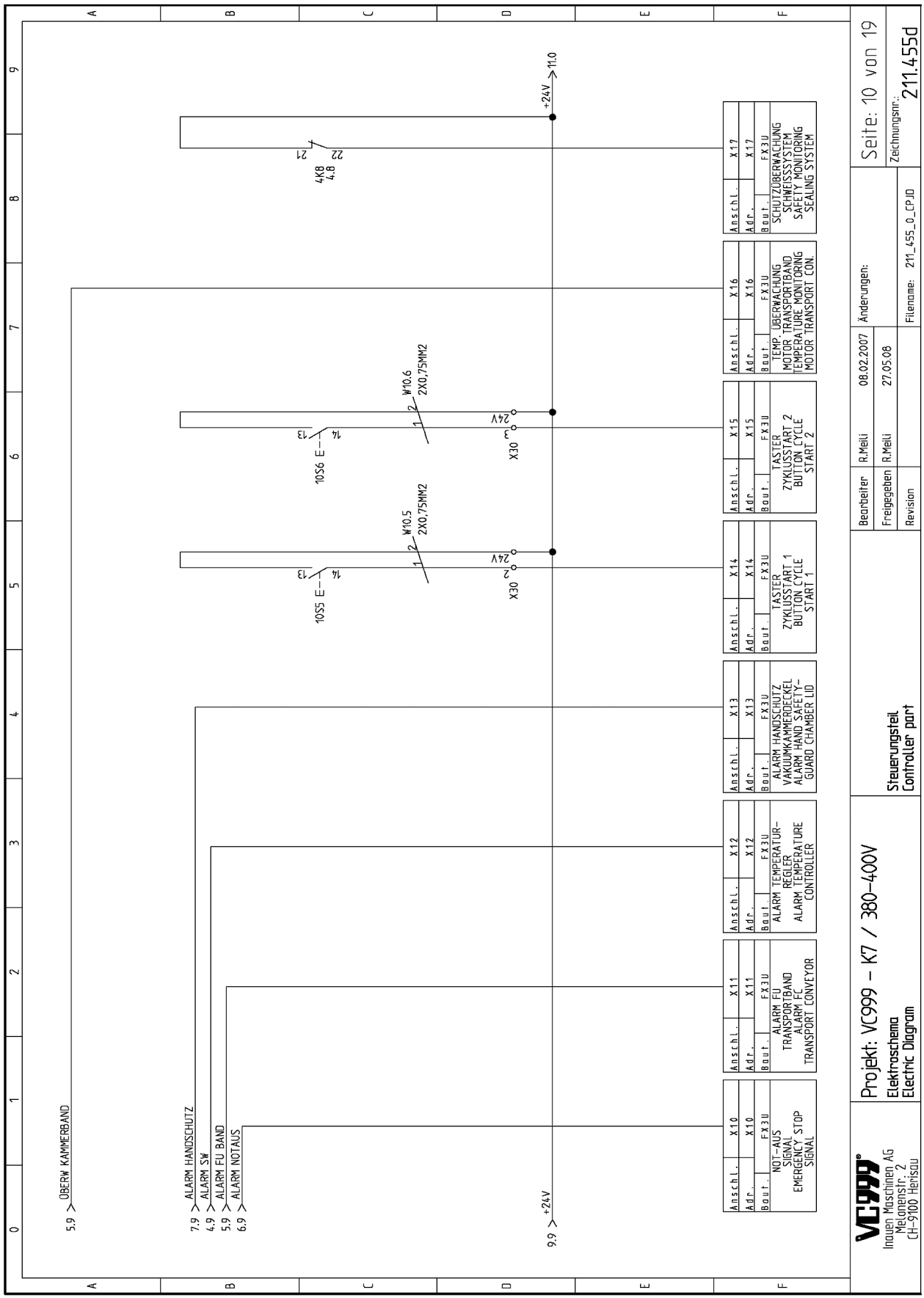
UEBERBR HANDSCHUTZ
SCHALTER ÜBER-
BRÜCKUNG HANDSCHUTZ
SAFETY SWITCH JUMPER
HAND SAFETY-GUARD
INITIATOR POSITION
TRANSPORTBAND
INITIATOR POSITION
TRANSPORT CONVEYOR
INITIATOR VAKUUMKAMMER
OFFEN
INITIATOR VACUUM
CHAMBER OPENED
INITIATOR VAKUUMKAMMER
GESCHLOSSEN
INITIATOR VACUUM
CHAMBER CLOSED
DRUCKLUFTÜBERWACHUNG
COMPRESSED
AIR MONITORING
RESERVE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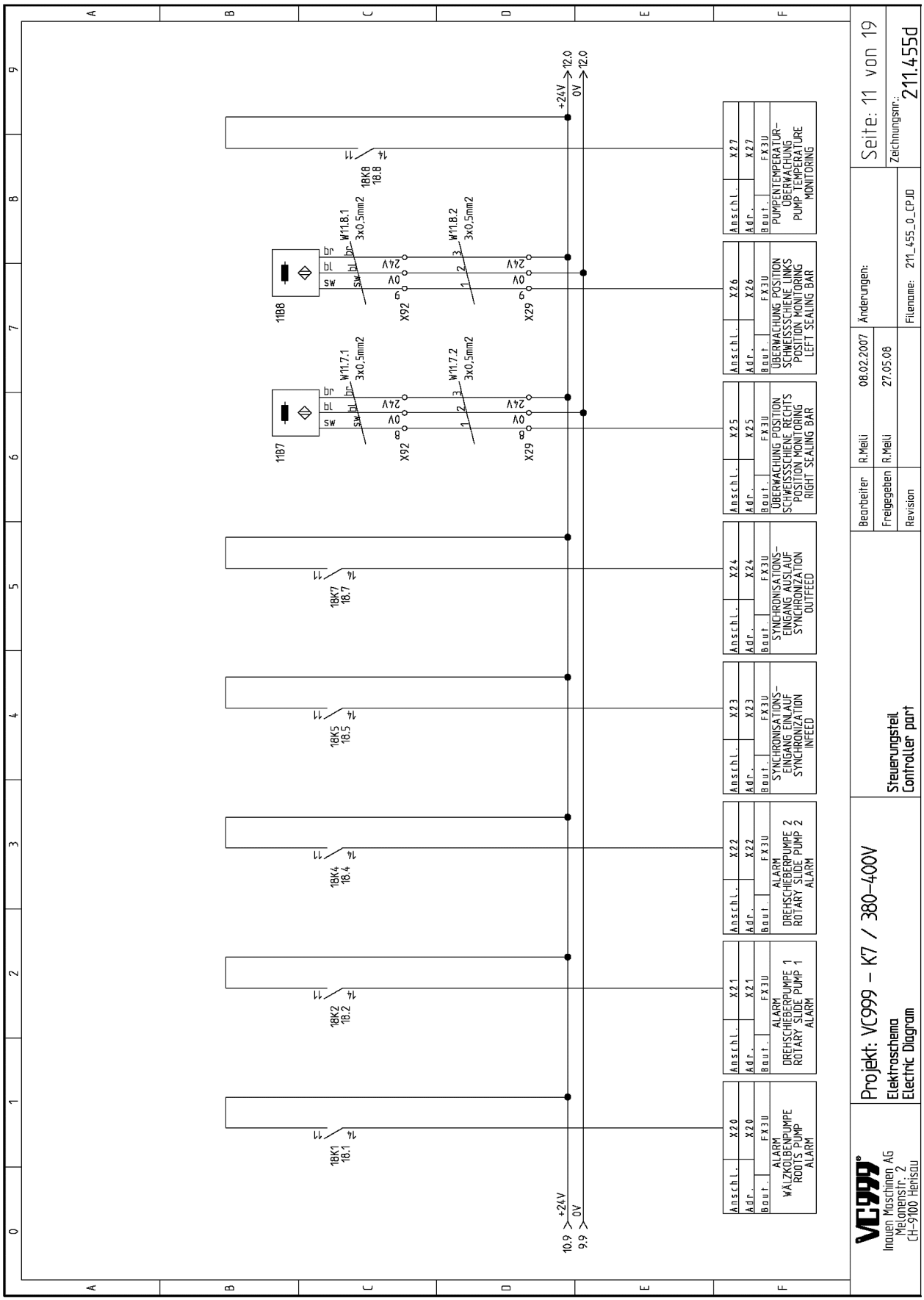
0V
ÜBERW KAMMERBAND
ALARM HANDSCHUTZ
ALARM SW
ALARM FU BAND
ALARM NOTAUS
4KB 4.8
10S6 E
10S5 E
W10.6 2X0,75MM2
W10.5 2X0,75MM2
X30
TASTER ZYKLUSSTART 1 BUTTON CYCLE START 1
TASTER ZYKLUSSTART 2 BUTTON CYCLE START 2
ALARM HANDSCHUTZ VAKUUMKAMMERDECKEL ALARM HAND SAFETY-GUARD CHAMBER LID
ALARM TEMPERATUR-REGLER ALARM TEMPERATURE CONTROLLER
ALARM FU TRANSPORTBAND ALARM FC TRANSPORT CONVEYOR
NOT-AUS SIGNAL EMERGENCY STOP SIGNAL
TEMP ÜBERWACHUNG MOTOR TRANSPORTBAND TEMPERATURE MONITORING MOTOR TRANSPORT CON.
SCHUTZÜBERWACHUNG SCHWEISSSYSTEM SAFETY MONITORING SEALING SYSTEM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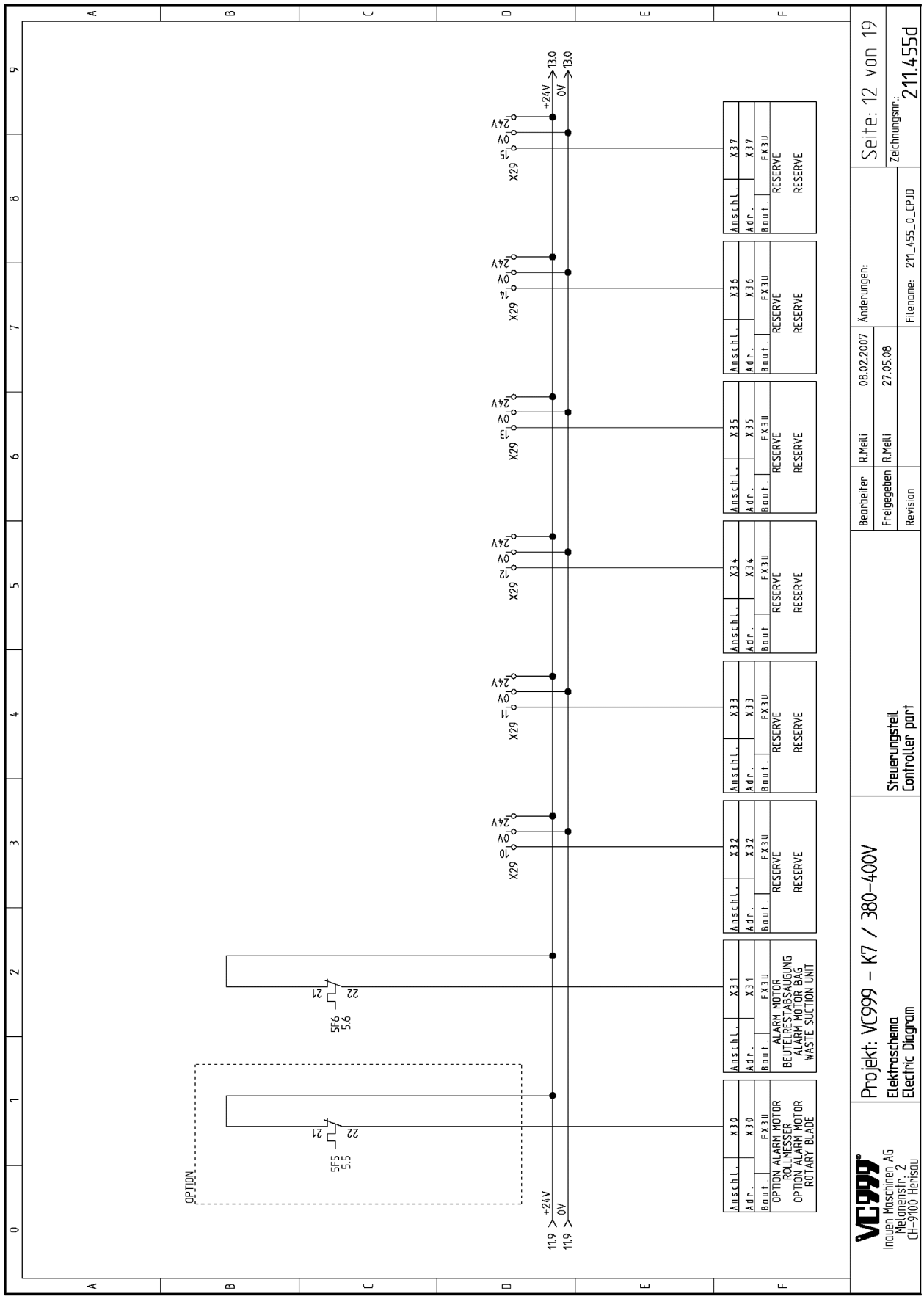
+24V >12.0
0V >12.0
10.9 > +24V
9.9 > 0V
11B8
11B7
W11.8.1 3x0,5mm2
W11.8.2 3x0,5mm2
W11.7.1 3x0,5mm2
W11.7.2 3x0,5mm2
X92
X29
18K1 18.1
18K2 18.2
18K4 18.4
18K5 18.5
18K7 18.7
18K8 18.8
WÄLZKOLBENPUMPE ROOTS PUMP ALARM
DREHSCHIEBERPUMPE 1 ROTARY SLIDE PUMP 1 ALARM
DREHSCHIEBERPUMPE 2 ROTARY SLIDE PUMP 2 ALARM
SYNCHRONISATIONS-EINGANG EINLAUF SYNCHRONIZATION INFEED
SYNCHRONISATIONS-EINGANG AUSLAUF SYNCHRONIZATION OUTFEED
ÜBERWACHUNG POSITION SCHWEISSSCHIENE RECHTS POSITION MONITORING RIGHT SEALING BAR
ÜBERWACHUNG POSITION SCHWEISSSCHIENE LINKS POSITION MONITORING LEFT SEALING BAR
PUMPENTEMPERATUR-ÜBERWACHUNG PUMP TEMPERATURE MONITORING


Projekt: VC999 – K7 / 380–400V
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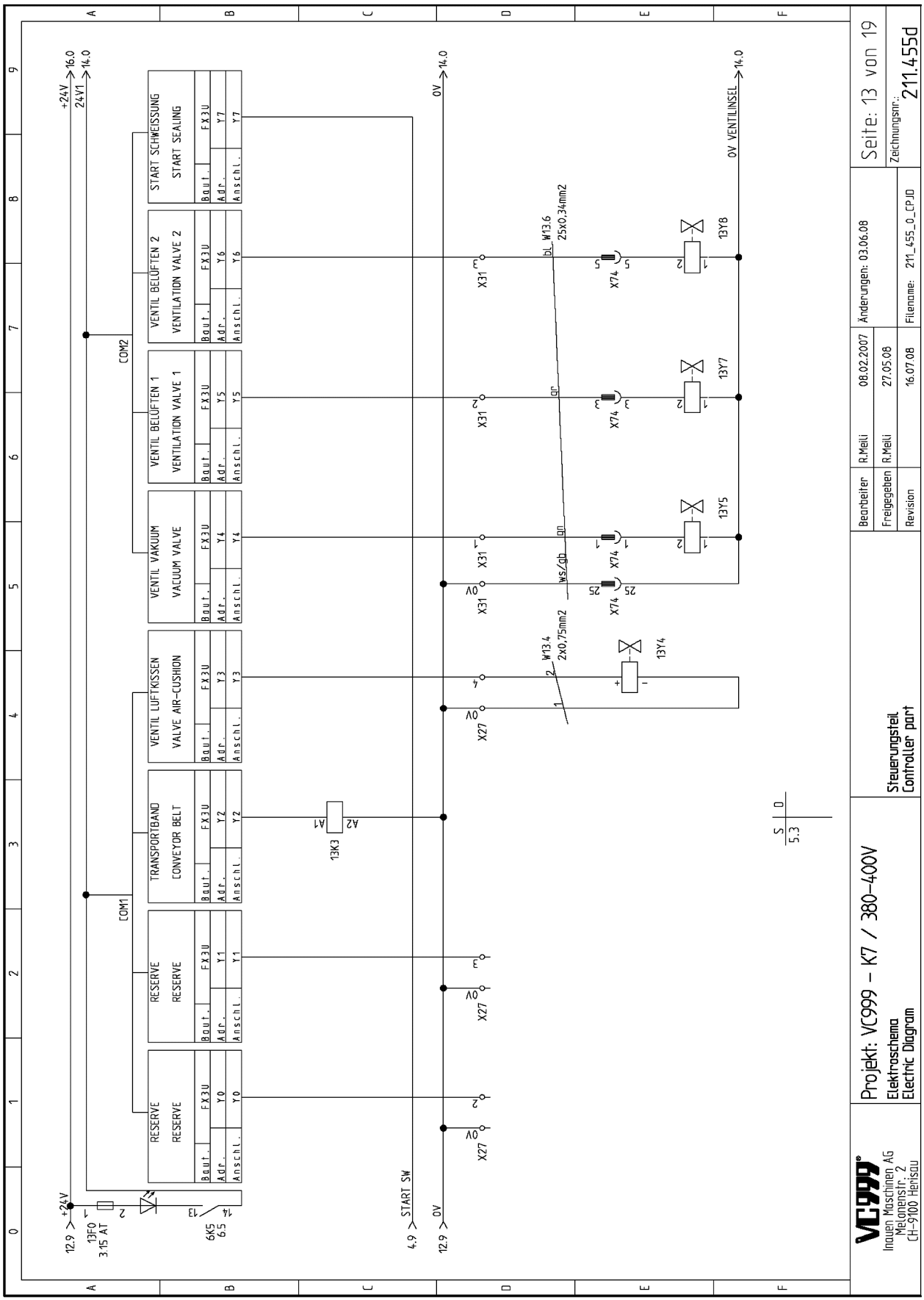
Revision
Inauen Maschinen AG
Meigenenstr. 2
CH-9100 Herisau
OPTION
+24V
0V
X29
X30
X31
X32
X33
X34
X35
X36
X37
FX3U
RESERVE
OPTION ALARM MOTOR ROLLMESSER
OPTION ALARM MOTOR ROTARY BLADE
ALARM MOTOR BEUTELRESTABSAUGUNG
ALARM MOTOR BAG WASTE SUCTION UNIT
5F5 5.5
5F6 5.6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Filename: 211_455_0_CP.JD
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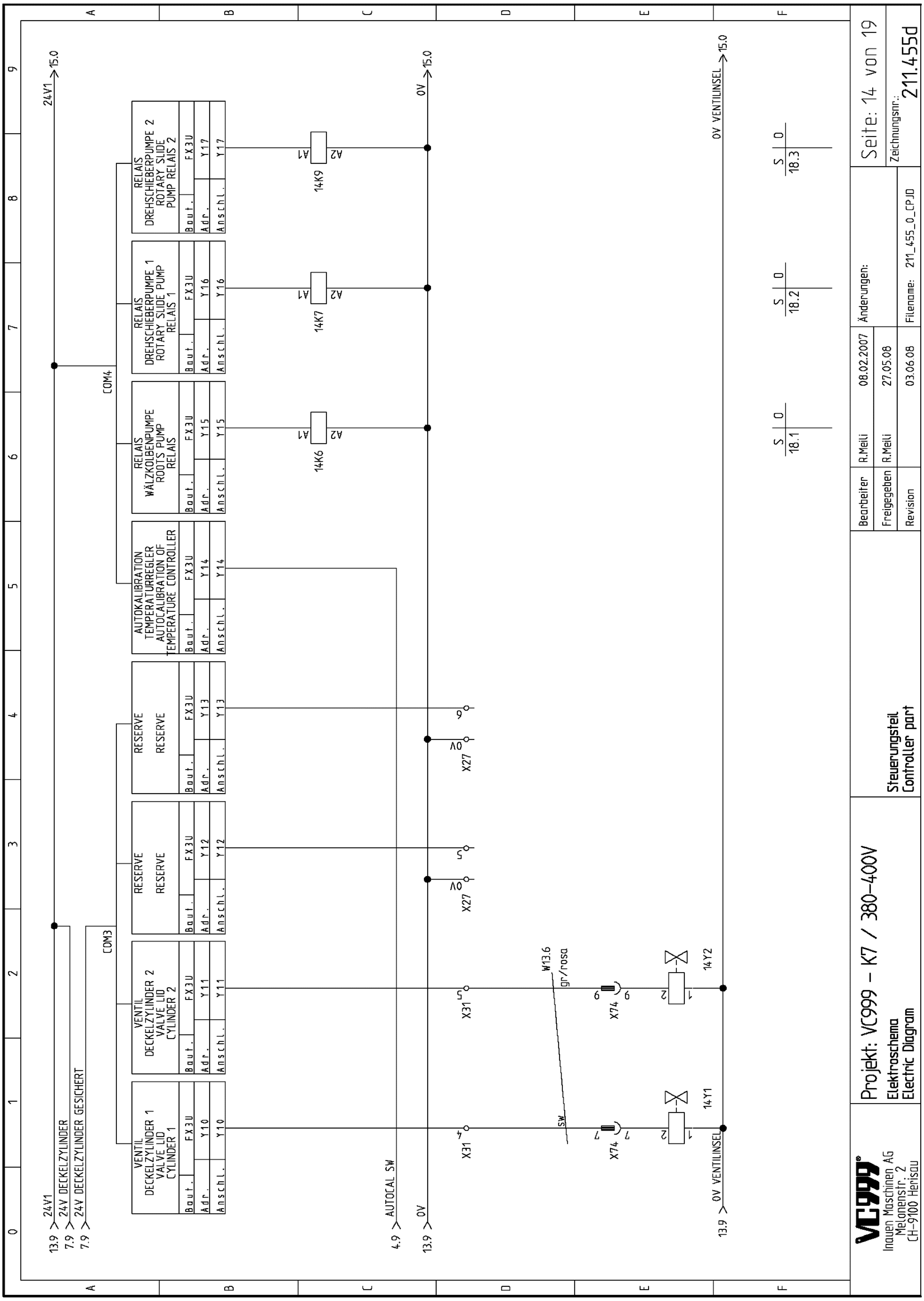
Freigegeben R.Meili 27.05.08
Revision 16.07.08
RESERVE
TRANSPORTBAND
CONVEYOR BELT
VENTIL LUFTKISSEN
VALVE AIR-CUSHION
VENTIL VAKUUM
VACUUM VALVE
VENTIL BELÜFTEN 1
VENTILATION VALVE 1
VENTIL BELÜFTEN 2
VENTILATION VALVE 2
START SCHWEISSUNG
START SEALING
+24V
0V
0V VENTILINSEL
START SW
COM1
COM2
13K3
13Y4
13Y5
13Y7
13Y8


VENTIL DECKELZYLINDER 1 VALVE LID CYLINDER 1
VENTIL DECKELZYLINDER 2 VALVE LID CYLINDER 2
RESERVE RESERVE
RESERVE RESERVE
AUTOKALIBRATION TEMPERATURREGLER AUTOCALIBRATION OF TEMPERATURE CONTROLLER
RELAIS WÄLZKOLBENPUMPE ROOTS PUMP RELAIS
RELAIS DREHSCHIEBERPUMPE 1 ROTARY SLIDE PUMP RELAIS 1
RELAIS DREHSCHIEBERPUMPE 2 ROTARY SLIDE PUMP RELAIS 2
Baut. FX3U Adr. Y10 Anschl. Y10
Baut. FX3U Adr. Y11 Anschl. Y11
Baut. FX3U Adr. Y12 Anschl. Y12
Baut. FX3U Adr. Y13 Anschl. Y13
Baut. FX3U Adr. Y14 Anschl. Y14
Baut. FX3U Adr. Y15 Anschl. Y15
Baut. FX3U Adr. Y16 Anschl. Y16
Baut. FX3U Adr. Y17 Anschl. Y17
COM3
COM4
24V1
24V DECKELZYLINDER
24V DECKELZYLINDER GESICHERT
AUTOCAL SW
0V
0V VENTILINSEL
13.9
7.9
4.9
15.0
14K6
14K7
14K9
A1
A2
X27
X31
X74
W13.6
gr/rosa
sw
14Y1
14Y2
18.1
18.2
18.3
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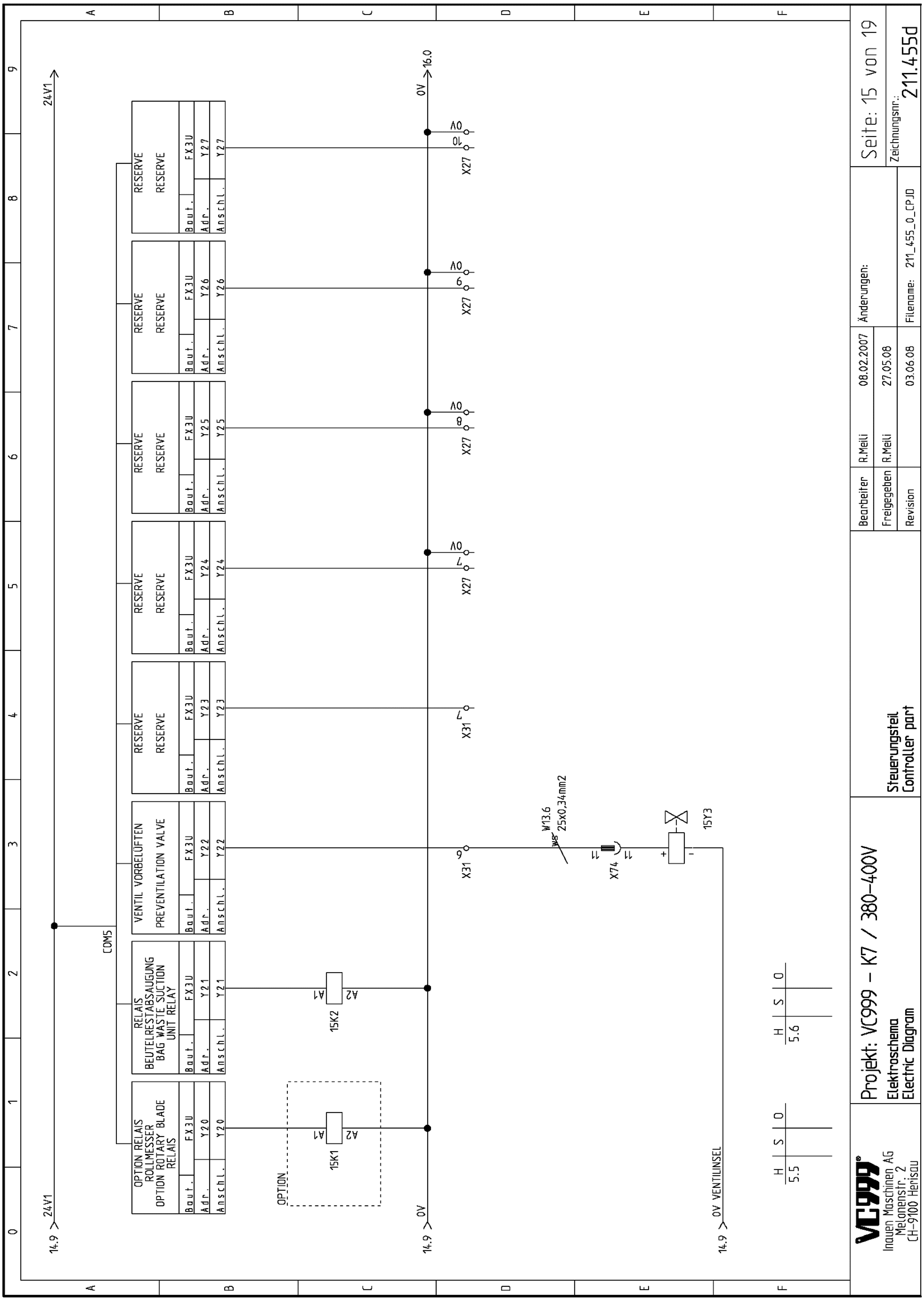
RESERVE
VENTIL VORBELÜFTEN
PREVENTILATION VALVE
RELAIS BEUTELRESTEABSAUGUNG
BAG WASTE SUCTION UNIT RELAY
OPTION RELAIS ROLLMESSER
OPTION ROTARY BLADE RELAIS
COM5
24V1
0V
0V VENTILINSEL
15K1
15K2
15Y3
X27
X31
X74
W13.6
25x0,34mm2
OPTION
Projekt: VC999 – K7 / 380-400V
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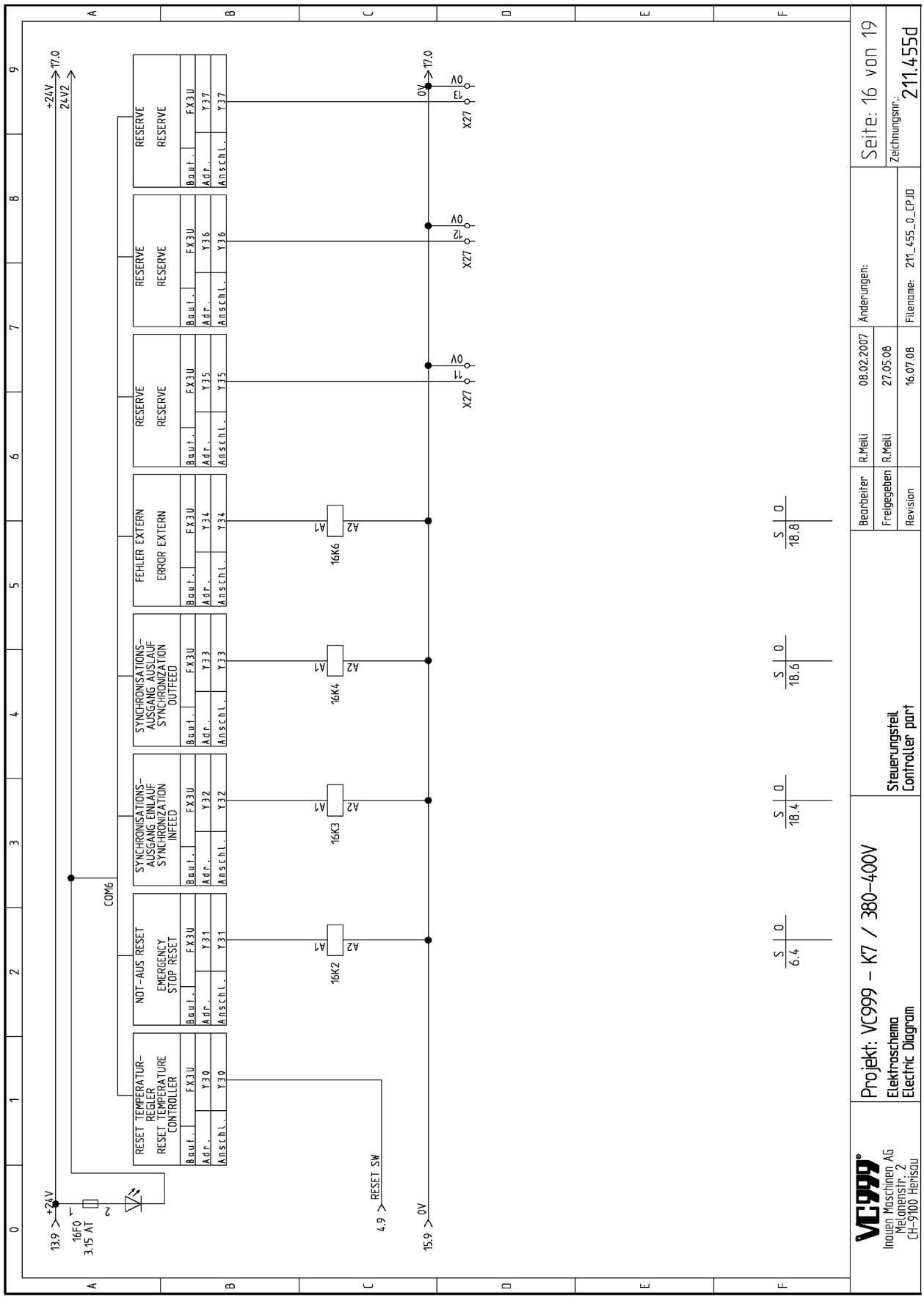
Projekt: VC999 – K7 / 380–400V
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Inauen Maschinen AG
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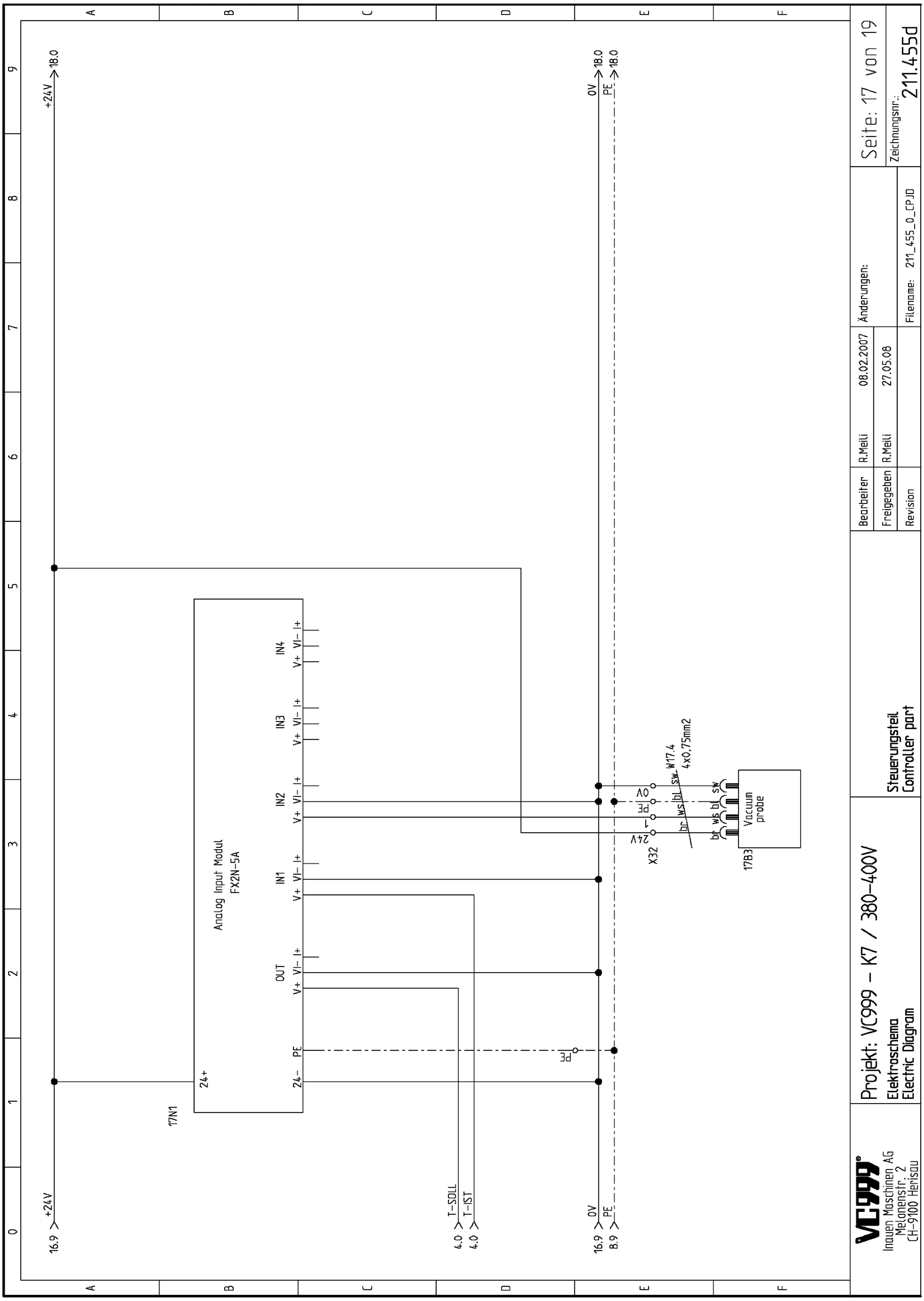
+24V >17.0
24V2 >
0V >17.0
COM6
13.9 > +24V
16F0
3.15 AT
4.9 > RESET SW
15.9 > 0V
RESET TEMPERATUR-REGLER
RESET TEMPERATURE CONTROLLER
NOT-AUS RESET
EMERGENCY STOP RESET
SYNCHRONISATIONS-AUSGANG EINLAUF
SYNCHRONIZATION INFEED
SYNCHRONISATIONS-AUSGANG AUSLAUF
SYNCHRONIZATION OUTFEED
FEHLER EXTERN
ERROR EXTERN
RESERVE
Baut. FX3U
Adr. Y30
Adr. Y31
Adr. Y32
Adr. Y33
Adr. Y34
Adr. Y35
Adr. Y36
Adr. Y37
Anschl. Y30
Anschl. Y31
Anschl. Y32
Anschl. Y33
Anschl. Y34
Anschl. Y35
Anschl. Y36
Anschl. Y37
16K2
16K3
16K4
16K6
A1
A2
X27
13
12
11
0V
S 0
6.4
18.4
18.6
18.8


+24V
18.0
0V
PE
16.9
4.0
8.9
T-SOLL
T-IST
Analog Input Modul
FX2N-5A
17N1
24+
24-
PE
OUT
IN1
IN2
IN3
IN4
V+ VI- I+
X32
24V
0V
W17.4
4x0,75mm2
sw
bl
ws
br
Vacuum probe
17B3
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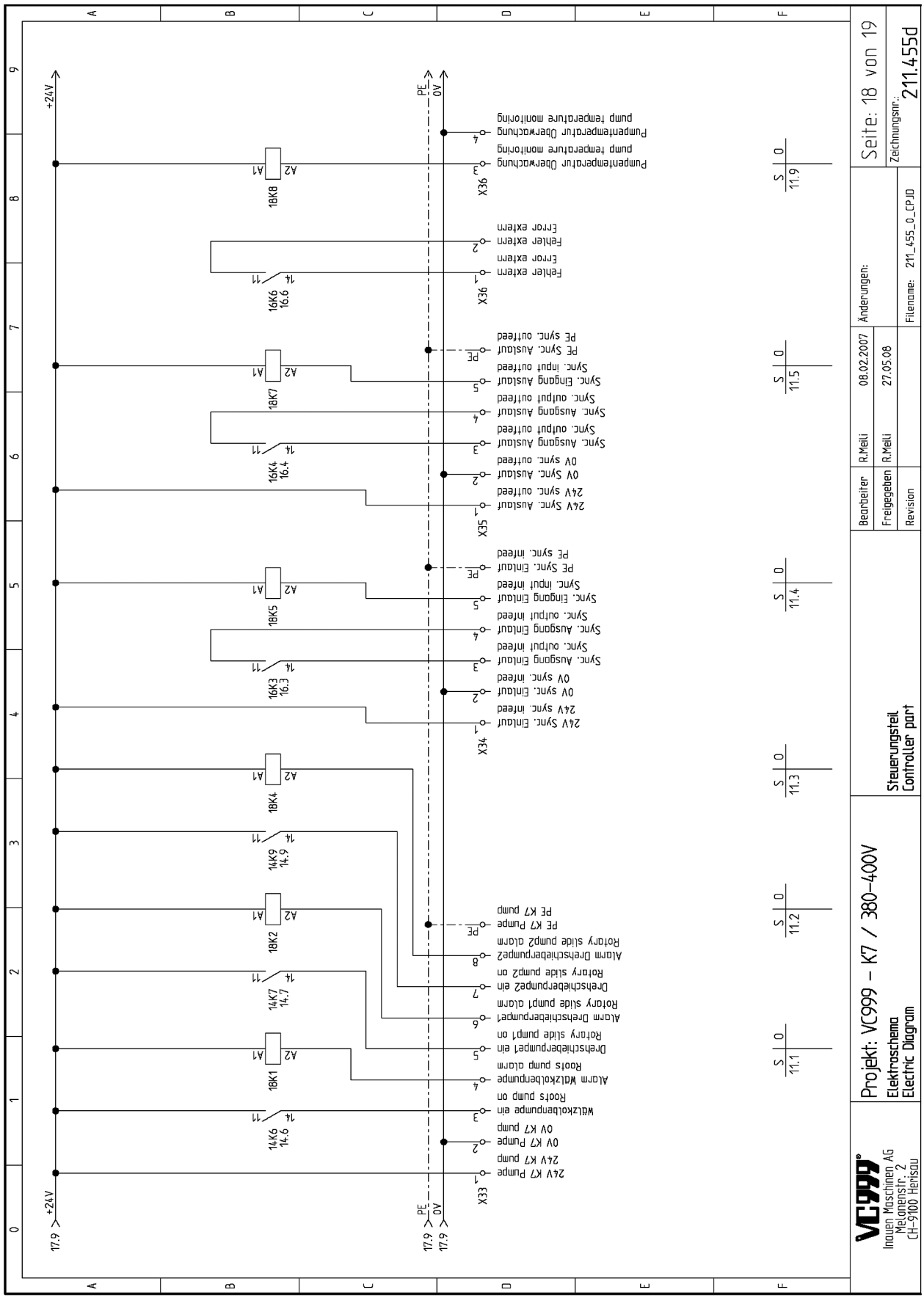
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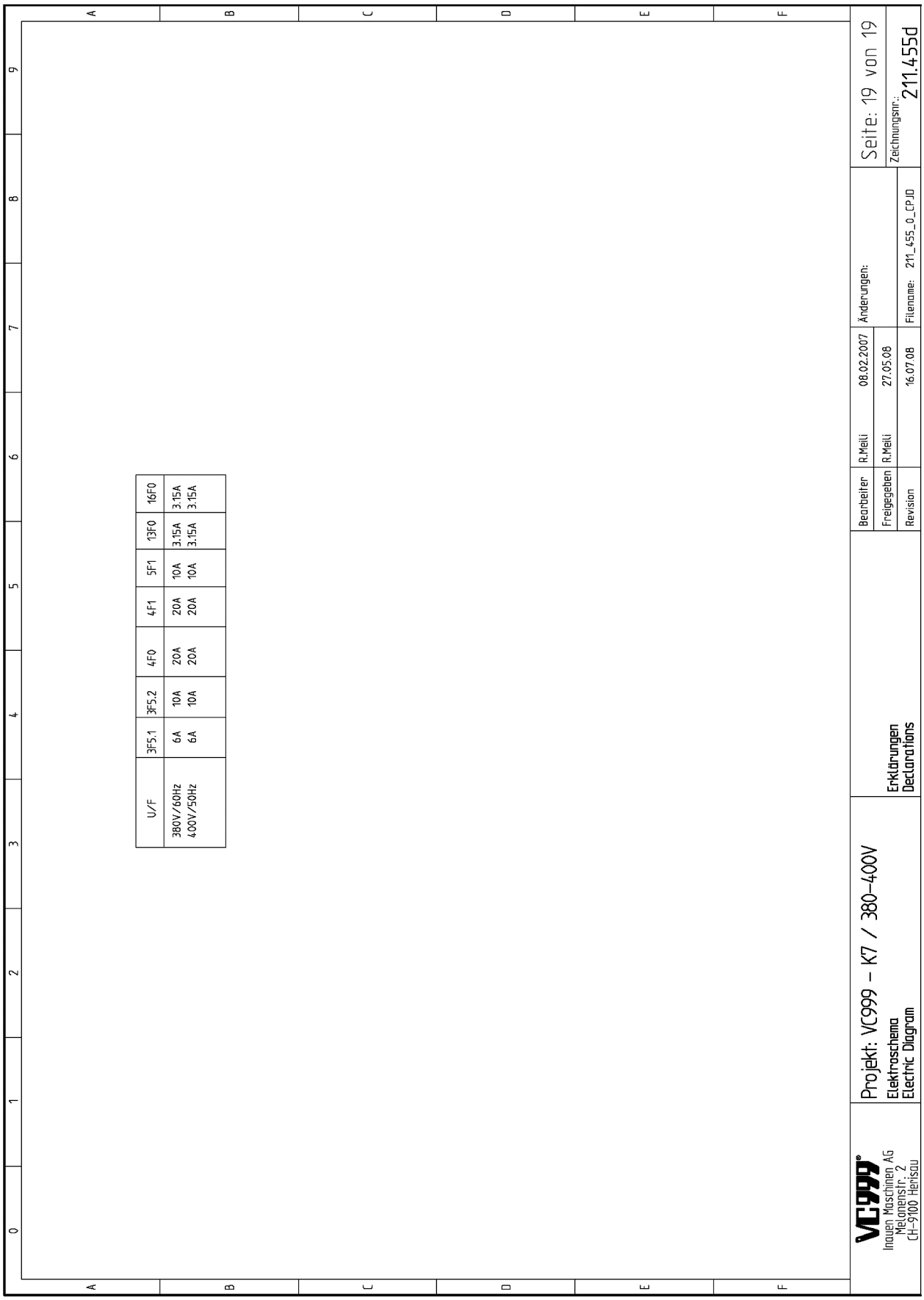
+24V
0V
PE
18K8
18K7
18K5
18K4
18K2
18K1
16K6 16.6
16K4 16.4
16K3 16.3
14K9 14.9
14K7 14.7
14K6 14.6
X33
X34
X35
X36
Pumpentemperatur Überwachung
pump temperature monitoring
Fehler extern
Error extern
PE Sync. Ausgang
PE sync. outfeed
Sync. Eingang Ausgang
Sync. input outfeed
Sync. output outfeed
Sync. Ausgang Ausgang
Sync. output outfeed
0V sync. outfeed
24V Sync. Ausgang
24V sync. outfeed
PE Sync. Eingang
PE sync. infeed
Sync. Eingang Einlauf
Sync. input infeed
Sync. output infeed
Sync. Ausgang Einlauf
Sync. output infeed
0V sync. Einlauf
0V sync. infeed
24V Sync. Einlauf
24V sync. infeed
PE K7 Pumpe
PE K7 Pump
Alarm Drehschieberpumpe2
Rotary slide pump2 alarm
Drehschieberpumpe2 ein
Rotary slide pump2 on
Alarm Drehschieberpumpe1
Rotary slide pump1 alarm
Drehschieberpumpe1 ein
Rotary slide pump1 on
Alarm Wälzkolbenpumpe
Roots pump alarm
Wälzkolbenpumpe ein
Roots pump on
0V K7 Pumpe
0V K7 pump
24V K7 Pumpe
24V K7 pump


U/F
3F5.1
3F5.2
4F0
4F1
5F1
13F0
16F0
380V/60Hz
400V/50Hz
6A
6A
10A
10A
20A
20A
20A
20A
10A
10A
3.15A
3.15A
3.15A
3.15A
Inauen Maschinen AG
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