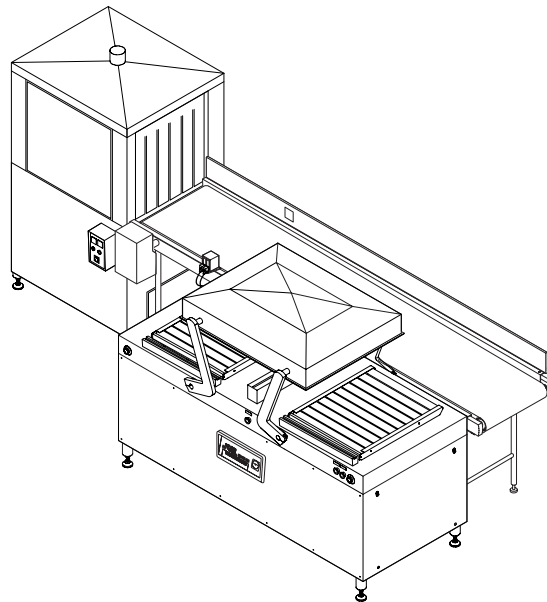


TURBOVAC

<http://www.turbovac.nl>, e-mail: info@turbovac.nl.

User manual



Vacuum packaging machine	APM-1000
Dip tank	ADT-TV 60/80
Conveyor	CS-TV 285/50

Manufactured by:

HFE vacuum systems 

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2002 HFE vacuum systems b.v.

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The information in this document is based on the general data associated with the construction, material qualities and working methods, known at the moment of publication, so that we reserve the right to make changes without giving prior notice.

This document is applicable to the Turbovac packing line in the version supplied. The manufacturer therefore does accept any liability for any from of damage or injury resulting from deviating from the specifications of these machines as supplied to you.

All possible care was taken when creating this document, but the manufacturer accepts no liability for mistakes or any consequences thereof.

TAKE THE TIME TO READ THIS DOCUMENT THOROUGHLY TO ACQUAINT YOURSELF WITH THE CORRECT AND APPROPRIATE USE OF THE TURBOVAC PACKING LINE.

PREFACE

USE OF THE MANUAL

This manual is mentioned as a reference for users who can install, use and maintain the machine(s) stated on the front cover of this document in a safe way.

PICTOGRAMS AND SYMBOLS

The following pictograms and symbols are used in this manual:



Suggestions and advice to make carrying out the particular tasks or actions easier.



ATTENTION!

Procedures that can result in damage to the machine, the surroundings or the environment – when not carried out carefully.



WARNING

Procedures that can result in serious damage to the machine or physical injury - when not carried out carefully.



DANGER

Danger of electrical shock!



JAMMING DANGER

Danger for getting jammed between parts of the machine!

ILLUSTRATIONS

Because of the number of types and models it is impossible for practical reasons to illustrate every variation. Nevertheless, the used illustrations show the operation principles of the machine identified on the front cover of this document.

SERVICE AND TECHNICAL SUPPORT

For information concerning specific settings, maintenance or repair work that is outside the scope of this manual, please contact the supplier of the machine. He is always ready to help you. Make sure that you have the following data available:

- machine type
- serial number

This data can be found on the identification plate.

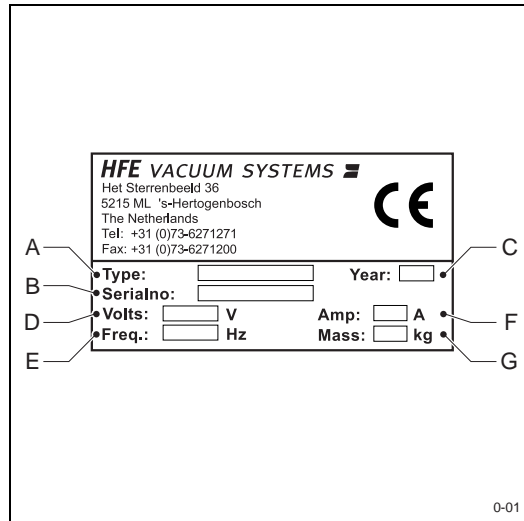
IDENTIFICATION PLATE

All the machine information can be found on this identification plate.

IDENTIFICATION OF THE MACHINE

The identification plate contains the following information data:

- A Type
- B Serial number
- C Year of manufacture
- D Number of phases – volt V
power
- E Frequency Hertz Hz
- F Power ampere A
- G Weight kilogram kg



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SAFETY INSTRUCTIONS AND DANGER WARNINGS

GENERAL

The manufacturer accepts no liability whatsoever for damage or injury caused by not (strictly) following the safety directions and instructions in this manual, or carelessness during the installation, use, maintenance and repair of the machines identified on the front cover of this document and any accompanying options.

The user of the machine is responsible at all times for observing the local applicable safety regulations and guidelines. Follow all safety instructions and guidelines as stated in this manual.

USERS MANUAL

- Every user should be informed of the contents of this manual and follow the instructions carefully. Management must train employees on the basis of this manual and obey all directions and indications.
- Never change the follow up of the actions to be taken.
- Always keep the manual in the proximity of the machine.

PICTOGRAMS AND INSTRUCTIONS ON THE MACHINE

The pictograms, warnings and instructions that have been attached to the machine are part of the safety measures taken.

They should not be covered or removed and they should remain present and readable during the entire life span of the machine.

Replace or repair unreadable or damaged pictograms, warnings and instructions immediately.

PICTOGRAMS AND INSTRUCTIONS ON THE VACUUM PACKAGING MACHINE

On the backside of the machine the following pictograms can be found.



Danger!

First consult the documentation with regard to the connection of the extra seal pressure.

Following pictogram is situated on the switch box of the machine:



Danger of electrical shock

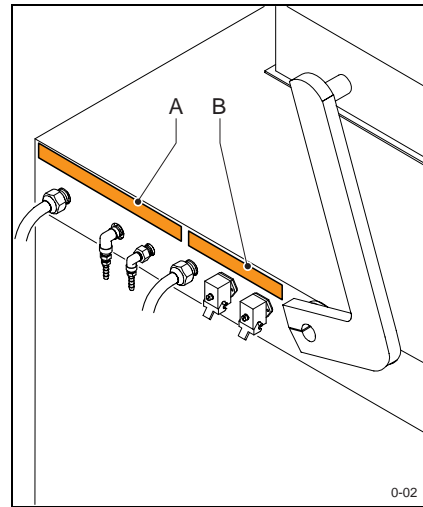
Before opening: first remove the plug from the wall socket!

Only qualified personnel are allowed to open the unit.

CONNECTIONS ON THE VACUUM PACKAGING MACHINE

The following instruction plates are placed on the vacuum packaging machine, which should be used for several connections:

No	Text	Connection for:
A	Power	Power supply
	Seal press	Extra seal pressure (optional)
	Compressed air	Compressed air
	Vacuum pump	Control from vacuum packing machine
B	Photo cell	Photo cell (sensor 1): conveyor belt
	Conv. Motor	Motor of the conveyor belt



PICTOGRAMS ON THE DIPTANK

In de machine the following pictograms are placed on the switch box of the machine.



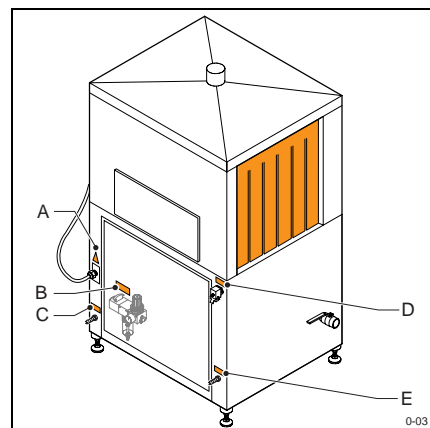
Danger for electrical shock

Before opening: first remove the plug from the wall socket! Only qualified personnel are allowed to open the unit.

CONNECTIONS ON THE DIPTANK

On the dip tank the following instruction labels are placed, which should be used for several connections:

No	Text	Connection for
A	Power	Power supply
B	Compressed air	Compressed air
	Photo cell	Sensor 2: conveyor belt



INTENDED USE OF THE MACHINE ^{*1}

The machine has been designed for vacuum packing of food products. Any other or extended use is not according to the purpose. The manufacturer accepts no liability for damage or injury resulting from this. Use the machine only in a technically perfect condition, in accordance with the purpose described above.

Technical specifications

The in this manual described specifications are not allowed to be changed.

MODIFICATIONS

Modification of (spares of) the machine(s) are not permitted.

In cases of modifications, executed by others than HFE vacuum systems b.v.

- Claims for guarantee will not be granted
- The manufacturer accepts no liability

^{*1} The "Use in accordance with purpose" as established in EN 292-1 is the use for which the technical product is suitable according to the statement by the manufacturer – including his directions in the sales brochure -. When in doubt it is the use that appears to be the most usual from the construction, model and function of the product. Use in accordance with the purpose means observing the instructions in the user manual.

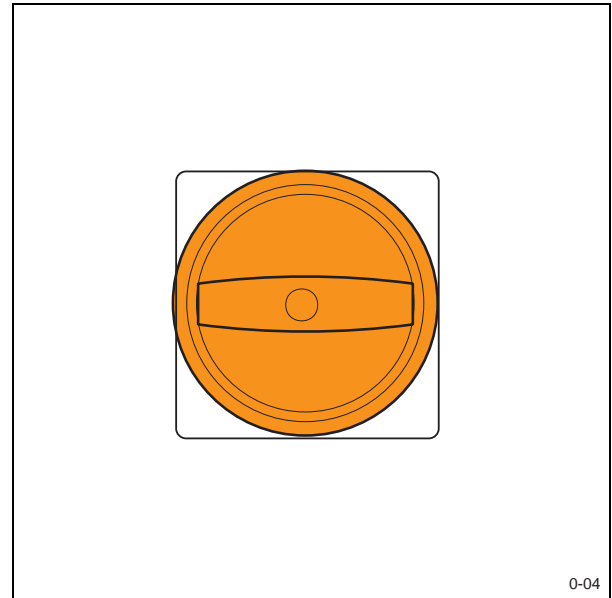
SAFETY PRECAUTIONS ON MACHINES

VACUUM PACKAGING MACHINE

The machine is standard equipped with the following safety precautions:

- **Main switch**

With the main switch the machine can be made voltage free. The main switch can also be used as an emergency stop.

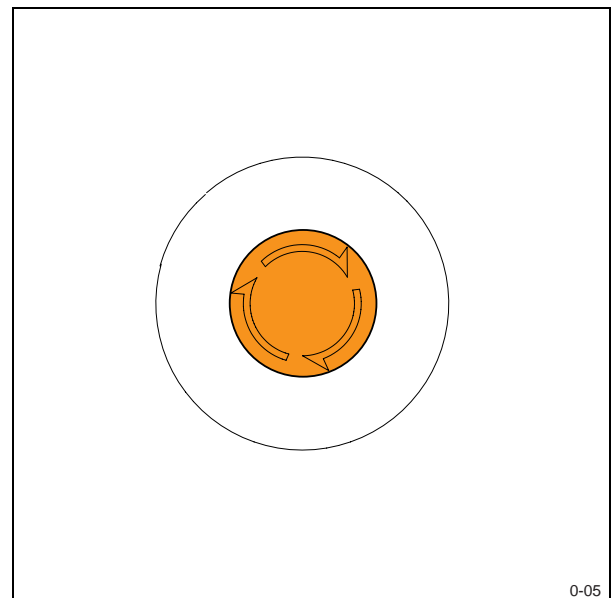


- **Emergency switches**

On both sides of the front side of the machine an emergency switch is placed: in case of emergency one of these emergency switches should be pressed in. In this case:

- the air pressure will be interrupted
- the vacuum chamber decompresses and the cover will come in a free position
- the power will be switched of
- the pump will be switched of

For switching the machine on again the emergency switch should be turned to the right and the switch will be automatically be released. After this the machine can be started again.



- **Start switch**

The start switch is situated in the machine and cannot be adjusted.



WARNING

- The safety works correctly when the machine starts vacuuming, when the lid is almost closed. This safety must regularly be checked for correct operation and, if necessary, repaired immediately.

- **Short circuit and overload safety**

The machine is equipped with safety measures that prevent components becoming overheated by overloading or short-circuiting.



ATTENTION!

- The overload safety circuits on the seal transformers are self-resetting, which means that the safety resets itself when the transformer has cooled down sufficiently. Operate the machine at a slower speed or decrease the sealing time if the overload safety is trips regularly. Obviously, tripping the overload safety shortens the life of the transformer.
- On some machines extra sealing power (see chapter vacuum packaging machines) can be installed. Consult your dealer.
- The short-circuit safety on the seal transformer is not self-resetting, which means that the transformer must be replaced when this safety is tripped. Consult your dealer for this.

- **Pump guards**

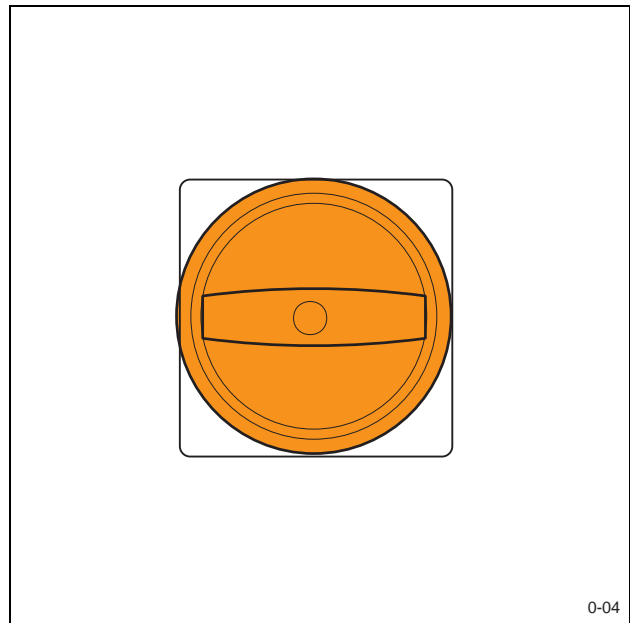
The vacuum pump is fitted with guards that prevent you touching the fan while it is running.

DIPTANK

The machine is standard equipped with the following safety precautions:

- **Main switch**

With the main switch the machine can be made voltage free. The main switch can also be used as an emergency stop.



0-04

- **Boiling-dry-protection**

The machine is executed with a boiling-dry protection. As hot water evaporates and some water is transported out with the packed products, the water level in the dip tank will decrease. As the machine is equipped with an automatic refill system the level will automatically be adjusted to the required level. As a special precaution a special safety is built in. When the water level becomes too low, the heating elements will automatically be switched off.

SAFETY MEASURES

- All safe guards may only be removed for maintenance and repair by well-trained and authorised service technicians.
- The machines may never be used if the safe guards are not complete or not present, or when they are or have been disabled.
- Safe guards may never be bridged.

USE

- Inspect the machine before use and check it for possible damage.
- Switch the machine off at the main switch if it is not being used for a long period of time.
- Never use sharp objects to operate the keys.
- Do not allow unauthorised persons into the working environment.
- Always ensure there is adequate ventilation, especially in confined places.
- Wear clothing that is suitable for the work. Loose clothing or jewellery can come in between the moving parts of the machine.
- Never use the machine in an explosion risk environment.
- Replace all damaged wires and avoid wires to be damaged by being wedged.

Hygiene

- Cleaning the machine is of the utmost importance when food products are wrapped. Clean the machine regularly and thoroughly, preferably every day (see chapter 8).
- Work hygienically and prevent direct contact between the product and the machine as much as possible.
- Keep the operating controls free of dirt and grease.
- Tie-up long hair.

Service, maintenance and repairs

A clear distinction is made in this manual between the service, maintenance and repair work that can be carried out by the user, and that is reserved for only trained and qualified service technicians.

- Make sure there is sufficient lighting.
- Always switch off the machine at the main switch during maintenance and or repairs and/or remove the plug from the socket.
- Observe the specified maintenance schedule. Overdue maintenance can lead to high costs for repair and servicing and the right to guarantee can be suspended.
- Always use parts, materials, lubricants and service techniques approved by the manufacturer. Never use worn out tools and do not leave any tools inside the machine.
- Do not carry out service, maintenance or repair work to the machine, when it is indicated that the dealer should carry it out.
- Always have a recognised Turbovac dealer carry out repair and maintenance work.
- Safety measures that have been removed in order to carry out service, maintenance or repairs must be replaced immediately after this work and they must be checked for correct operation.

MACHINES AND THE ENVIRONMENT



Packaging

The packaging that is for the transportation and protection of the machine is mainly made of cardboard and/or wood, which are suitable for recycling. Do not dispose of the packaging as industrial waste but ask the sanitation department of your local government authority where you can hand in the material.



Machine

When you dispose of your machine, it can still contain valuable substances and materials. Do not dispose of the machine as industrial waste, but enquire at your local government authority about the possibilities for recycling or environmentally-friendly disposal of the material.

- Most parts of the machine have been manufactured from stainless steel and can be disposed of as scrap metal in the normal way. From health and environmental considerations, no asbestos has been used.
- The printed circuit boards and the components mounted on the boards are electronic waste. Deliver old printed circuit boards to specialised companies for environmentally friendly processing.



Oil

Ask the sanitation department of your local government where you should take the used oil for an environmentally friendly processing.

1 PRODUCTION LINE

The production line A-5000 contains:

- vacuum packaging machine
- conveyor
- dip tank

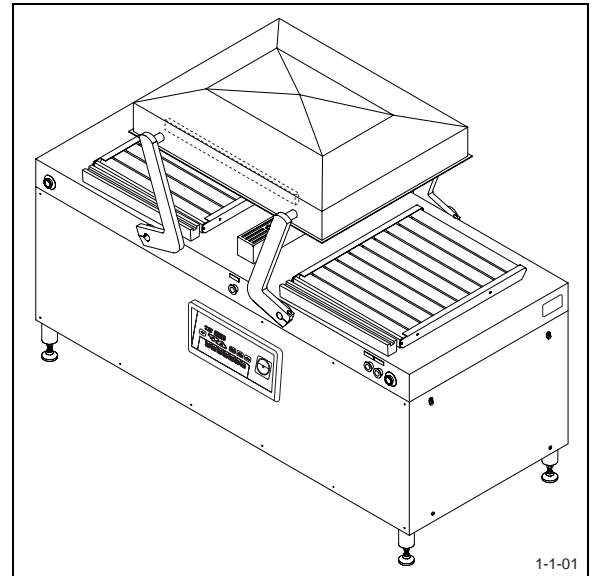
1.1 Execution of the vacuum packing machine

With the Turbovac vacuum packaging machine products can be vacuum packed. The food and products to be packed vacuum, are placed in a vacuum bag. This will be placed in the vacuum chamber of the machine.

The machine can be work manually as well as automatically.

Automatic control

If the machine works on automatic control, the cover will close and the vacuum pump starts sucking the air out of the chamber. When the required vacuum level has been reached, the opening of the bag between the seal beam and the counter beam is pushed together, after which the bag is sealed. When the vacuum chamber is aerated the cover is being released and swings to the other vacuum chamber. As soon as the other vacuum chamber starts to vacuum, the discharge system will go up and the packed product rolls down on the conveyer. The discharge system will automatically go back to its original horizontal position and ready to be loaded with new products.



Manual control

If the machine works in manually control, the operator takes care of the several steps in the process. The operator closes the vacuum chamber and the vacuum pump starts sucking the air out of the chamber. When the required vacuum has been reached, the bag between the seal beam and the counter beam is pushed together, after which the bag is sealed. After that the vacuum chamber is aerated and the lid comes up. The operator swings the cover to the other vacuum chamber and pushes the button for vacuuming the vacuum chamber. As soon as the other vacuum chamber starts to vacuum the discharge system will go up and the products packed will roll on the conveyer. A new package can be placed on the discharge system.

1.1.1 Control system

The machine is equipped with a control system where the software prevents illogical settings. The control has 9 programs that can be adjusted to the requested levels. Therefore it is very easy to pack various kinds of products perfectly.



- The factory settings can always be recalled, which erases the adjusted levels in the various programs. (See chapter factory settings).

1.1.1.1 Sensor control

The machine is equipped with an accurate sensor control. With this sensor the pressure in the vacuum chamber is measured during vacuuming and, when appropriate, during the gasflushing and controlled aeration (soft-air option). The machine carries out the particular function automatically until the pressure set has been reached. Because of this the result of that particular function is independent of the air volume in the chamber or of the surrounding pressure, which guarantees a constant packing quality.



- The vacuum pressure is indicated in mbar. The range is from 0 mbar (absolute vacuum) to 999 mbar.
- A changeable surrounding pressure has no effect on the measurement (for example when working at a high altitude).

1.1.1.2 Time control

The sensor control can be switched off. The machine now operates time controlled. This means that the vacuum, gas and soft air functions operate until the set time has elapsed.



- To change from sensor control to time control, see under “special functions program vacuum packaging machine”.
- The vac+, seal1 and seal2 functions are always time controlled.

1.1.2 Options

The Turbovac machines can be equipped with the following options:

1.1.2.1 Less vacuum

With this option the vacuum level can be set higher than 200 mbar. The vacuum level for a machine without the less-vacuum option is limited to 200 mbar.

1.1.2.2 Vacuum plus (vac+)

This option allows extra vacuuming, to give the air that is trapped inside the product time to escape from the product. When the vac+ function is activated, the machine continues to vacuum for the set vac+ time after reaching the set vacuum level.

This option can only be activated with a sensor control.

1.1.2.3 Sealing: seams, pressure and power

With the help of the following options optimal sealing of the vacuum bag can be achieved for every situation.

- **Different sealing seams**

- **Double seal**

For extra seal security, two equal width sealing wires are mounted on the sealing beam. The sealing method is the standard model.

- **Cut off seal**

For simple removal of the bag surplus, a thin cutting wire is mounted next to the sealing wire. The thin cutting wire melts through the bag.

- **Seal 1/2**

The sealing beam is equipped with a sealing and a cutting wire, just like the trenn beam. In this model the time for sealing (the seal1 time) can be set independently of the cutting time (the seal2 time). This option is used when the sealing and cutting times cannot be the same, such as with shrinking bags.

- **Extra seal pressure:**

With this option the seal pressure can be increased with compressed air (maximum 1 bar). The extra pressure makes sure that the seal beam is pushed harder against the counter beam during sealing. This option should especially be fitted when the sealing seam is melting badly and a longer sealing time gives insufficient improvement. This situation can occur especially when using the gassing option. The higher the gas pressure set, the more useful the extra seal pressure is.

- **Extra seal power:**

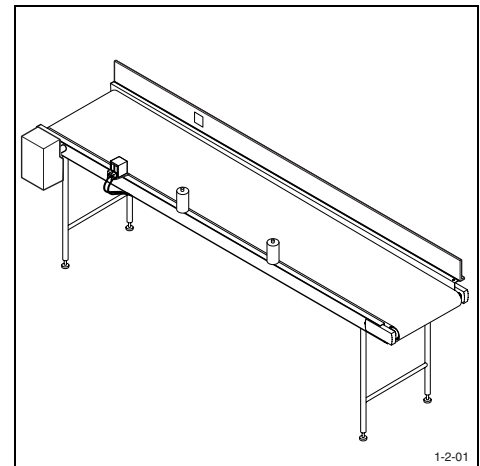
With this option the sealing capacity of the machine can be increased so that the machine can seal more often and/or longer. The option cannot be fitted to all machines. Consult your dealer for this.

1.1.2.4 Soft air

This option can be used when delicate products, or products with hard protrusions must be packed. The vacuum chamber is then vented slowly so that the bag has the time to shape itself around the product. A machine with the soft-air option is also fitted with the less-vacuum option.

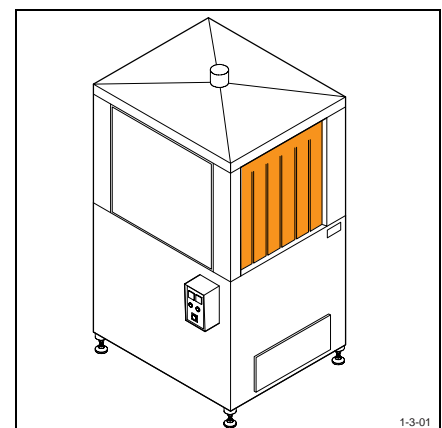
1.2 Execution conveyor

The conveyor that is placed against the vacuum packaging machine will take care of the transport of the packed product to the dip tank. Guide rollers on the conveyor takes care of the turning of the packed product, so that it will lay in the correct direction for the transport. The conveyor has an own drive that is controlled by the vacuum packaging machine. Sensors control the on and off switching of the transport to obtain the correct doses for the dip tank. This prevents that packed products will be supplied while there is already process going on in the dip tank of processing packed products.



1.3 Execution dip tank

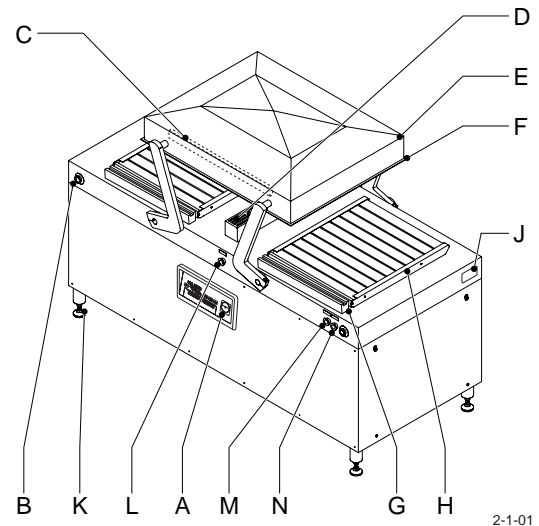
In the dip tank products, which are packed under vacuum, in shrink bags. Shrink bags are vacuum bags, which will shrink under the influence of warmth. A dip tank is a machine with a water reservoir. The water will be heated till the programmed temperature. After vacuum packing the products the package shows lids and wrinkles. If the packed product will be dipped in warm water, the package including the wrinkles and lids will shrink in such a way that the bag is tightly shaped around the product. The grade in the diptank is in such a position that it can receive the products to be shrunk. Once the batch of products are on the grade, the grade will enter the heated water for the time set and automatically come up and discharge the finished products will be discharged.



2 MAIN COMPONENTS

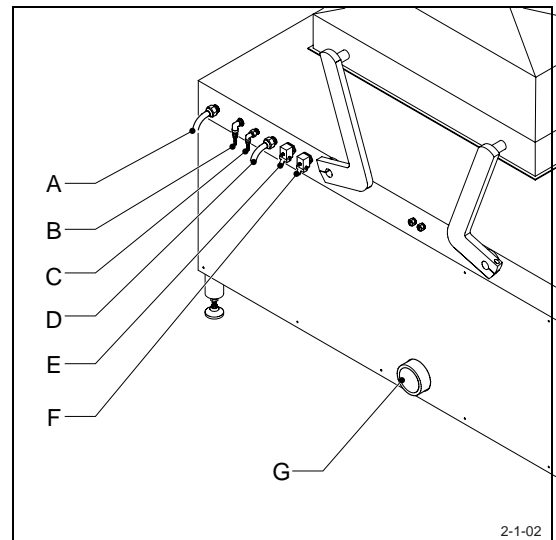
2.1 Main components vacuum packaging machine

No.	Description
A	Control panel
B	Emergency stop
C	Seal beam
D	Suction and flush opening
E	Cover
F	Silicon sealing
G	Silicon holder
H	Discharge system
J	Identification plate
K	Adjustable feet
L	"Start" bottom
M	"Enable" bottom
N	"Out/Man" bottom



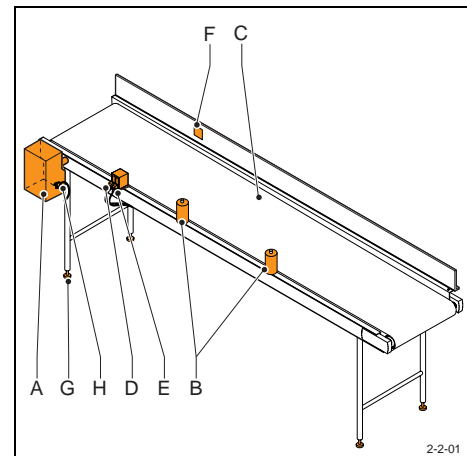
2.1.1 Connections vacuum packaging machine

No.	Description
A	Air pressure connection
B	Seal connection (option)
C	Connection cable
D	Control vacuum pump
E	Control photo cell
F	Control conveyor
G	Vacuum connection



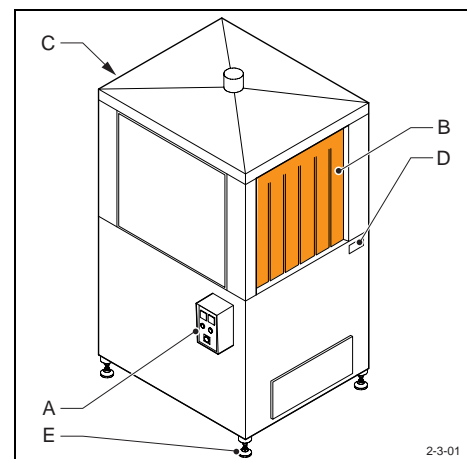
2.2 Main components conveyor

No.	Description
A	Drive motor
B	Guide roll
C	Belt
D	Sensor 2: controls the dip tank
E	Sensor 1: control of the motor by the vacuum packaging machine
F	Reflector for the sensors
G	Adjustable feet
H	Connection cable motor



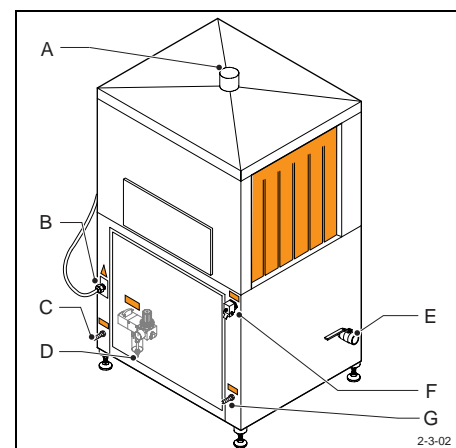
2.3 Main components dip tank

No.	Description
A	Control panel
B	Input packed product
C	Output shrink packed product
D	Identification plate
E	Adjustable feet



2.3.1 Connections dip tank

No.	Description
A	Vapour outlet
B	Power supply Connection cable
C	Air pressure connection
D	Draw-Off tap reservoir
E	Outlet tank
F	Control cable sensor 2
G	Connection water fill



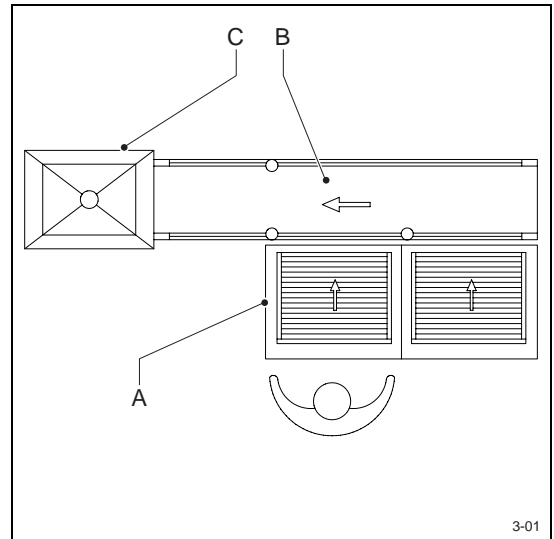
3 MACHINES INSTALLATION

The installations of the machines can be executed according to the following situations:

- **Left**

The to be packed product will be transported to the dip tank on the left side.

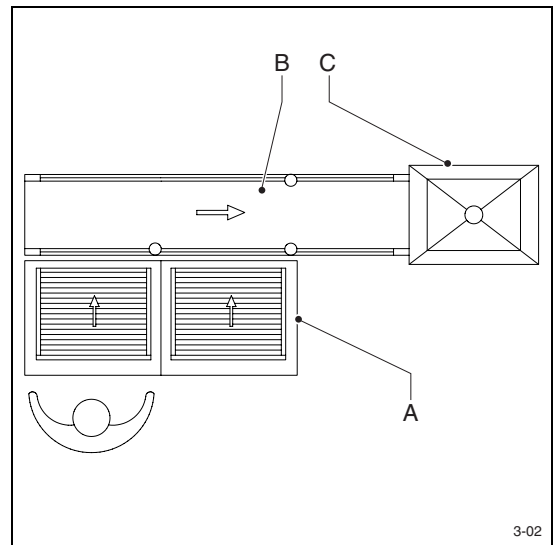
- A. Vacuum packaging machine
- B. Conveyor
- C. Dip tank



- **Right**

The to be packed product will be transported to the dip tank on the right side.

- A. Vacuum packaging machine
- B. Conveyor
- C. Dip tank



3.1 Placing vacuum packaging machine

1. Unpack the vacuum packaging machine.



WARNING

Keep the machine horizontal during transport. Move the machine only by a fork truck or a pallet wagon. Be careful that no one is trapped, or that the machine tilts.

2. Position the machine so that it is levelled on a firm, flat surface. For this the adjustable feet can be adjusted to the required level.

**WARNING**

Never install the machine in front of entrances, exits or passages that are intended for emergency services. Make sure that the machine is free on all sides for placing the conveyor, for operation and maintenance.

3.2 Placing of the vacuum pump

1. Unpack the vacuum pump.
2. For this the adjustable feet can be adjusted to the required level.

**WARNING**

Never install the machine in front of entrances, exits or passages that are intended for emergency services. Make sure that the machine is free on all sides so that proper ventilation is ensured and make sure that the ventilation openings are free so that the pump cannot become overheated.

3. Connect the vacuum connection of the pump to the vacuum connection of the vacuum packaging machine by using the enclosed vacuum hose.



The vacuum pump should be filled with oil:

- Check the oil level

**WARNING**

- Never start the machine without oil inside the pump.

4. Connect the vacuum pump, with the delivered vacuum hose, to the vacuum packaging machine.

3.3 Placing the conveyor

1. Unpack the conveyor.
2. Position the conveyor so that it is levelled on a firm, flat surface. For this the adjustable feet can be adjusted to the required level.
3. Make sure that the conveyor is correctly connected to the vacuum packaging machine.
4. Adjust the tension of the conveyor belt (see tension conveyor belt).

3.4 Placing dip tank

1. Unpack the dip tank.
2. Position the dip tank so that it is levelled on a firm, flat surface. For this the adjustable feet can be adjusted to the required level. Make sure that the dip tank is correctly connected to the conveyor.

4 CONNECTIONS

4.1 Vacuum packaging machine

For the connection of the vacuum packaging machine, see “connections vacuum packaging machine”.

4.1.1 Compressed air vacuum packaging machine

1. Connect the compressed air to the compressed air connection of the vacuum packaging machine (see installation).



WARNING

- Use a suitable hose that fits well on the hose pillar of the reducing valve on the machine and secure the hose with a hose clamp.
- The pressure of the supply may not be higher than 6 bar.
- Use only dry air.

2. Turn the reducing valve open, till the working pressure on the manometer is 2 bar.

4.1.2 Vacuum connections vacuum packaging machine

1. Connect the vacuum connection of the vacuum packaging machine to the vacuum connection of the vacuum pump with the supplied vacuum hose.

4.1.3 Electrical connections vacuum packaging machine

The following electrical connections must be made:

1. Connection to the electricity supply
2. Control of the vacuum pump
3. Control of sensor 1 to the conveyor
4. Control of the conveyor

The machine should be connected according to the electrical diagram (see electrical connections installation).



WARNING

- Check that the power and the frequency of the machine stated on the identification plate of the machine agree with the power and the frequency of the electricity supply.
- Check that the power supply can supply the power that is necessary for the installation.



DANGER

- Check that the electrical connection has a properly earth connection.
- Check that the connection cable or the control cable is not trapped or damaged. Have the dealer replace a damaged connection cable immediately.

4.2 Optional connections vacuum packaging machine

4.2.1 Extra seal pressure vacuum packaging machine

1. Connect the compressed air to the seal connection of the machine (see connections vacuum packaging machine).



DANGER

- Use a suitable hose that fits the connection and secure the hose with a hose clamp.
- Use only clean, dry compressed air.
- The pressure at the seal connection may not be greater than 1 bar.

4.3 Vacuum pump

4.3.1 Vacuum connection vacuum pump

1. Connect the vacuum connection of the pump, together with the supplied vacuum hose, to the vacuum connection of the vacuum packaging machine.

4.3.2 Electrical connections vacuum pump

The following electrical connections should be made:

1. Connection to the electricity supply
2. Control from the vacuum packaging machine (see connections vacuum packaging machine)

The machine should be connected according to the electrical diagram (see electrical connections installation).



DANGER

- Check that the power and the frequency stated on the identification plate of the machine agree with the power and the frequency of the electricity supply.
- Check that the power supply can supply the power that is necessary for the installation.



DANGER

- Check that the electrical connection is properly earthed.
- Check that the connection cable or the control cable is not trapped or damaged. Have the dealer replace a damaged connection cable immediately.

4.4 Conveyor

For connecting the conveyor, see “connections conveyor”

4.4.1 Electric connections conveyor

The following electric connections should be made:

1. Connection of the motor to the vacuum packaging machine.
2. Connection of the control of the photo cell (sensor 1) as from the vacuum packaging machine.
3. Connection of the control of the photocell (sensor 2) to the dip tank.

For the different connections, see “connections vacuum packaging machine” and “connections dip tank”. The machine should be connected according to the electrical diagram (see electrical connections installation).



WARNING

- Check that the power and the frequency of the machine stated on the identification plate agree with the power and the frequency of the electricity supply.
- Check that the power supply can supply the power that is necessary for the installation.

**DANGER**

- Check that the electrical connection has a properly earth connection.
- Check that the connection cable or the control cable is not trapped or damaged. Have the dealer replace a damaged connection cable immediately.

4.5 Dip tank

For the connection of the dip tank, see “connections dip tank”.

4.5.1 Compressed air connection dip tank

1. Connect the compressed air to the compressed air connection of the reducing valve on the machine, see “connections dip tank”.

**WARNING**

- Use a suitable hose that fits the hose pillar of the reducing valve on the machine well and secure it with a hose clamp.
- The pressure of the supply may not be higher than 6 bar.
- Use dry air only.

2. Turn the reducing valve open, till the working pressure on the manometer is 6 bar.

4.5.2 Electrical connections dip tank

The following electrical connections must be made:

1. Connection to the electricity supply
2. Connection of the control via sensor 2 as from the conveyor

The machine should be connected according to the electrical diagram (see electrical connections installations).

**WARNING**

- Check that the power and the frequency of the machine stated on the identification plate agree with the power and the frequency of the electricity supply.
- Check that the power supply can supply the power that is necessary for the installation.

**DANGER**

- Check that the electrical connection is properly earthed.
- Check that the connection cable or the control cable is not trapped or damaged. Have the dealer replace a damaged connection cable immediately.

4.5.3 Moisture dip tank

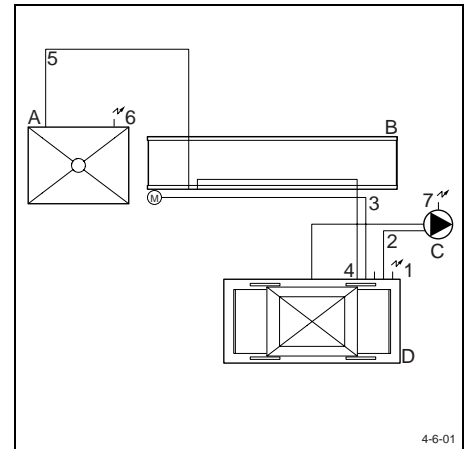
The vapour that will be formed in the dip tank due to hot water should evaporate through the vapour outlet:

1. Connect the vapour outlet in such a way that the vapour will not flow in the working area but will flow outside.

4.6 Electric connection diagram

The installation should be connected according to the electric connection diagram :

No.	Machine
A	Dip tank
B	Conveyor
C	Vacuum pump
D	Vacuum packaging machine



No.	Electrical connection	Function
1	Vacuum packaging machine	Supply for: <ul style="list-style-type: none"> • Vacuum packaging machine and the control of it • Drive of the conveyor
2	Vacuum pump	Connection of the vacuum pump as from the vacuum packaging machine
3	Motor of the conveyor	Supply for the motor of the conveyor as from the vacuum packaging machine
4	Photo cell (sensor 1)	Control of the motor of the conveyor as from the vacuum packaging machine
5	Photo cell (sensor 2)	Control of the dip tank as from the conveyor
6	Dip tank	Supply for the dip tank
7	Vacuum pump	Supply for the vacuum pump

With this the complete installation is electric connected.



WARNING

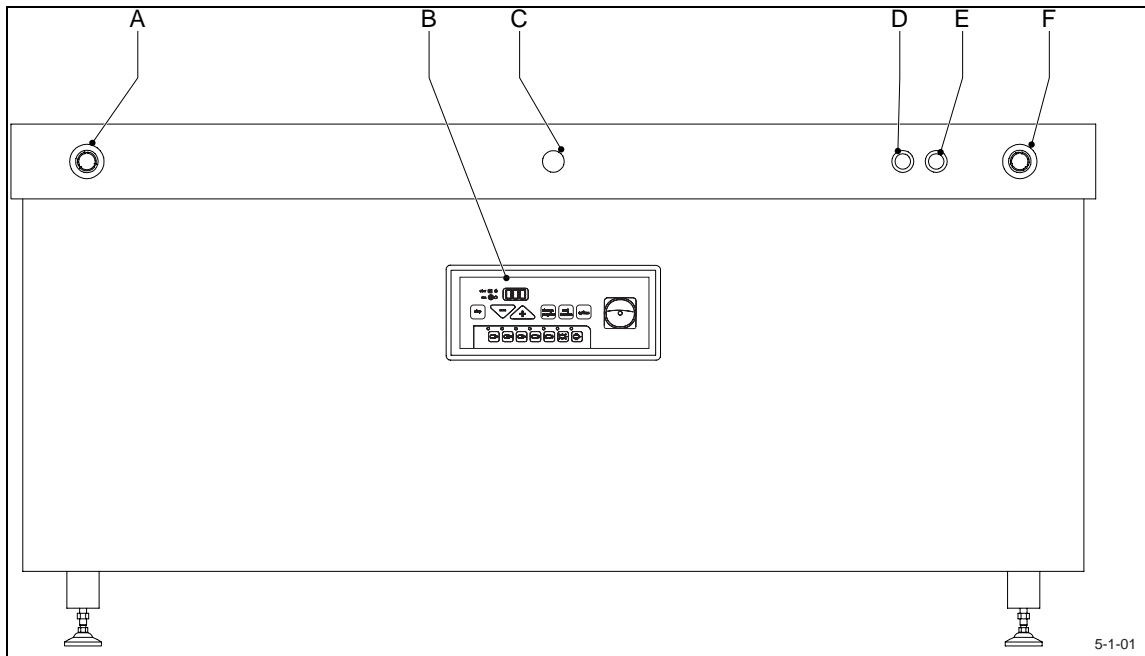
Check the rotation direction of the vacuum pump on a 3-phase machine as follows: Switch on the machine. The pump starts. Switch the machine off immediately afterwards at the main switch. Check the rotation direction of the pump while it is runs down. An arrow on the motor indicates the correct direction of rotation. Switch over the phase 2 wires in the plug if the rotation direction is not correct. When in doubt, contact your dealer.

5 CONTROL

The control of the installation is as follows:

Machine	Control
Conveyor	Has no own control
Vacuum pump	Has no own control
Vacuum packaging machine	<ul style="list-style-type: none"> • Has an own main switch • Control panel and control buttons for the vacuum program • Control of the conveyor • Control of the vacuum pump
Dip tank	<ul style="list-style-type: none"> • Has a own main switch • Control of the dip tank • Control via conveyor

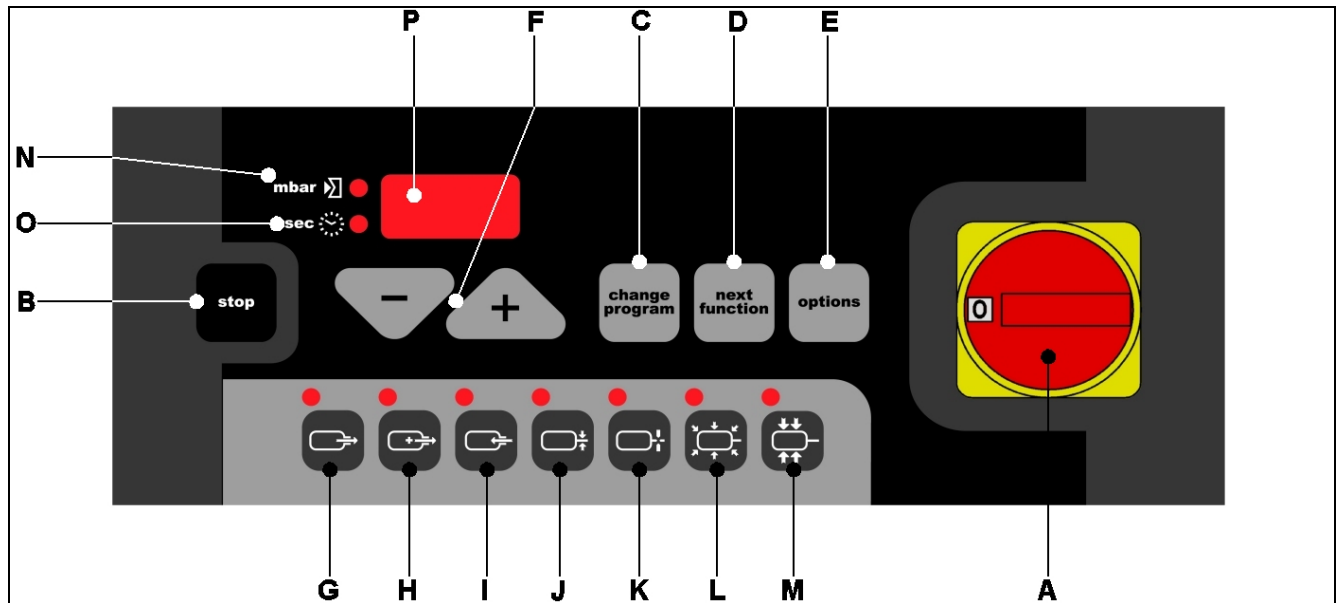
5.1 Control vacuum packaging machine



On the vacuum packaging machine you will find the following control buttons.

No.	Organ	Kind	Function
A	Emergency button	Pressure button	Switching of the machine in case of emergency by means of pressure.
B	Control panel		Switching the machine on and off. Programming
C	Start	Pressure button	Manual starting the vacuum
D	Enable	Pressure button	Starting the required program: <ul style="list-style-type: none"> • At the beginning of a working day • After the emergency stop is ended
E	Aut / Man	Choice button	<ul style="list-style-type: none"> • AUT: automatic control • MAN: Manual control
F	Emergency button	Pressure button	Switching of the machine in case of emergency by means of pressure.

5.2 Control panel vacuum packaging machine










The control panel contains the following control organs:

No.	Organ	Function
A	Main switch	<ul style="list-style-type: none"> Switching the machine on and off. Emergency stop.
B	Stop-key	<ul style="list-style-type: none"> “Resetting” the oil counters by pressing the key for 5 seconds. Stopping the packing. The control supplies the vacuum chamber with air. Stopping the programming (of a program or a special function). The changed values are not stored.
C	Progr. save-key	<ul style="list-style-type: none"> Programming the chosen program. Recall the factory setting by pushing in the key for 5 seconds. Storing the changed program values or special functions.
D	Next-key	<ul style="list-style-type: none"> Showing the values of the selected program step-by-step. Continuing to the next step in the packing cycle. Recalling the next program value or special function.
E	Options on/off-key	<ul style="list-style-type: none"> Shortcut key to switch the most important option of the selected program on or off. Programming the special functions by pressing the key for 5 seconds. Switching the selected option on or off during programming.
F	Up- en down key	<ul style="list-style-type: none"> To choose another program number or the warm-up mode. The corresponding symbols will automatically light up. To increase or decrease the program value or a special function.
G-M	Hidden symbols	<ul style="list-style-type: none"> The symbols that the chosen program is going to carry out are illuminating. The symbol of the operating function is illuminated during packing. The symbol of the value that is programmed is illuminating.
N-O	LED's	<ul style="list-style-type: none"> The mbar LED lights-up when there is sensor-controlled operation. The sec. LED lights when there is a time-controlled operation. The LEDs indicates the unit of the function that is carried out or programmed.
P	Display	<ul style="list-style-type: none"> The display shows the chosen program number. During packing, the display shows the current value of the function that is being carried out. The display shows the program value or special function that is programmed. The display shows “off” when the particular option is switched off.

5.2.1 Hidden symbols

Each hidden symbol (see G till M) on the control panel represents a function or option. The meaning of each symbol is as follows.

						
Vacuuming (Vac)	Vacuum plus (Vac+)	Gassing (n/a)	Seal1	Seal2	Soft-air	Airing
G	H	I	J	K	L	M

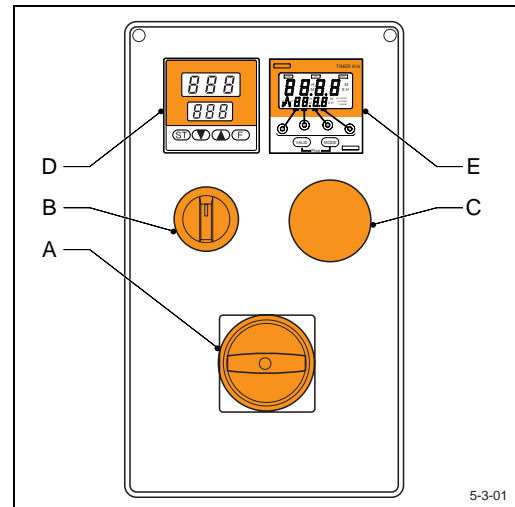
5.2.2 Factory settings

The factory operating settings are shown in the table below. By programming the operation these values can be changed. The factory settings can always be recalled. The programmed values are then erased.

Progr. No.	Sensor controlled						Time controlled				
	Vac	Vac+	Gas	Seal1	Seal2	Soft-air	Vac	Gas	Seal1	Seal2	Soft-air
	Mbar	Sec	Mbar	sec	sec	Sec	sec	sec	sec	sec	sec
1	10	5	n/a	2,0	"off"	"off"	30	n/a	2,0	"off"	"off"
2	10	"off"	n/a	2,0	"off"	"off"	30	n/a	2,0	"off"	"off"
3	10	"off"	n/a	2,0	"off"	"off"	30	n/a	2,0	"off"	"off"
4	10	"off"	n/a	2,0	2,5	"off"	30	n/a	2,0	2,5	"off"
5	10	"off"	n/a	2,0	"off"	400	30	n/a	2,0	"off"	5
6	10	"off"	n/a	2,0	2,5	"off"	30	n/a	2,0	2,5	"off"
7	10	"off"	n/a	2,0	"off"	400	30	n/a	2,0	"off"	5
8	10	"off"	n/a	2,0	2,5	400	30	n/a	2,0	2,5	5
9	10	"off"	n/a	2,0	2,5	400	30	n/a	2,0	2,5	5

5.3 Control dip tank

On the control panel of the dip tank the following control buttons and components are mentioned:



No.	Organ	Kind	Function
A	Main switch	Rotation key	Switching on and of the machine
B	Aut / Man	Choice switch	<ul style="list-style-type: none"> AUT: automatic control MAN: manual control
C	Start	Press button	Starting of the requested program: <ul style="list-style-type: none"> During the warming up For the execution of a manual cycle
D	Temperature regulator		Adjust water temperature
E	Time regulator		Adjust cycle time

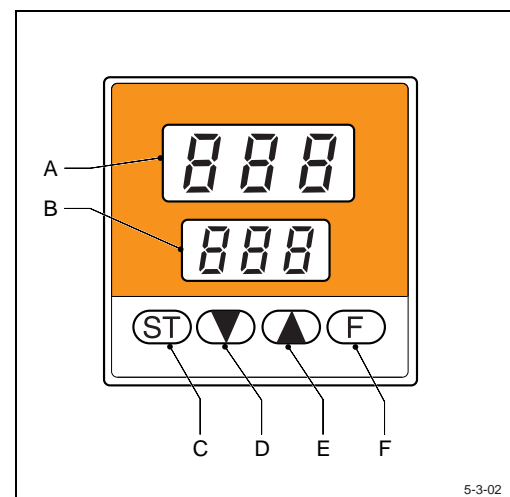
5.3.1 Adjust water regulator

The temperature regulator has the following organs:

No.	Description	Function
A	Display 1	Actual temperature
B	Display 2	Adjusted temperature
C	Key "ST"	No function
D	Key "down"	Temperature down
E	Key "up"	Temperature up
F	Key "F"	No function

The temperature of the water can be adjusted as follows.

1. Press the key "down" or "up" in order to adjust the requested water temperature.
2. Press the key for at least 5 seconds to change the adjustment. The temperature has been set on 90° C. in the factory.

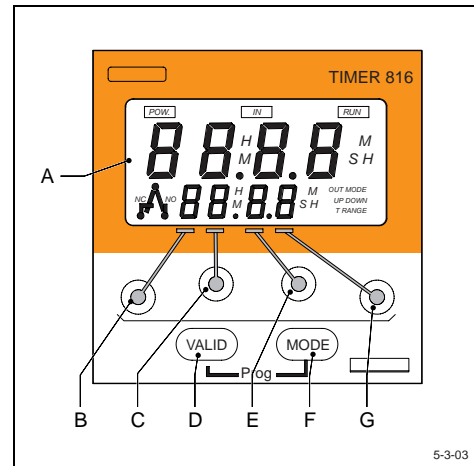


5.3.2 Adjust cycles

The time regulator has the following organs:

No.	Description	Function
A	Display	Shows the adjustments and actual situation during the cycle
B	Key	Adjustment hours
C	Key	Adjustment minutes
D	Key "valid"	No function
E	Key	Adjustment seconds
F	Key "mode"	No function
G	Key	Adjustment of tens of seconds

The time regulator can be adjusted by pushing the key concerned. The time regulator has been set on 0,5 sec. in the factory.



6 PROGRAMMING VACUUM PACKAGING MACHINE

6.1 Programming vacuum packaging machine

The factory operating settings can be adapted to your own requirements very simply by programming the operation.

The factory settings can always be recalled.



When different products are packed regularly, it is useful to program a program for each product. For example program 1 can be used for packing meat, program 2 for packing sauce, program 3 for packing vegetables, and so on. In order to pack a product one only needs to select the correct program.

Programming can be done as follows:

1. Switch the machine on at the main switch and the main switch of the control panel.
2. Press the key: 'ENABLE': The control starts up.



After the operation has started up the last used program is loaded. When the lid is closed during the start-up, the vacuum chamber will be decompressed vented first, so that the lid opens.

3. Choose by using the "up" and "down" keys the program number, which should be programmed.
4. Press the progr-save-key



- The vac-symbol lights on.
- The vacuum level flashes on the display.

By pressing the key for 5 seconds, the factory settings are recalled, and the settings that were programmed are erased. The operation then starts up again.

5. Change the value with the "up" and "down" key.
6. Press the "step key" to set the next value. All functions can be set step-by-step, during which the appropriate symbol lights and the value is indicated in the display.
7. Press the "options on/off key" to switch an install option on or off. When the option is turned off, the display shows "off". When the option is switched on, the value can be changed with the +/- knob.
8. Press the "progr-save-key" to save the changes. The control returns to stand-by.



- By pressing the stop key the control returns to the stand-by position without the changes are being saved.
- The vacuum value cannot be set to less than 200 mbar on a machine without the less-vacuum option.
- The vacuum and gas value cannot be set to more than 800 mbar on any machine.
- The gas value cannot be set below the vacuum level.
- The soft-air value cannot be set to more than 999 mbar.

6.2 Special functions program vacuum packaging machine

The control has a number of special functions. In addition, information can be read out so that the dealer can support you better with possible problems.

1. Switch the machine on with both main switches and press the ENABLE key (see control panel vacuum packaging machine" and " control vacuum packaging machine). The program starts.
2. Press the options on/off-key for 5 seconds. The first function with the settings (see table "special functions") appears on the display.
3. Change the setting with the "up- en down-key".

4. Press the step-key to adjust the following special functions. All the special functions can be set one-by-one and then the information can be read out. All the steps are as follows:



- The settings are valid for all programs.
- In step 6 the up- and down-keys do not have a function (see table “special functions”).

5. Press the progr-save-key to save the changes.



By pressing the stop key you quit the programming of special functions, without saving the changes

Table: special functions:

Step	Adjustment	Display	Meaning of the hashes	Factory settings
1	Starting position oil-cycle-counter	C##	The starting position in hundreds of cycles	9000 cycles
2	Starting position oil-hour-counter	h##	The starting position in tens of operating hours	900 hours
3	Sensor- or time controlled	SF#	0: operation is time-controlled 1: operation is sensor controlled	1
4	Multi-cycle actions	rC#	The number of multi-cycle actions.	0 (off)

Step	Information	Display	Meaning of the hashes
5	Software version	U##	The version number. (After pressing '+' or '-' key, the release number is indicated)
6	Dip switch setting	d##	A code that represents the dip-switch settings (the electronic settings of the machine)
7	Serial number of the operation	n #	The hash indicates the first digit of the control system. The complete number is readable step-by-step by pushing the up-key. Alternatively a point is switched on and off alternately.

7 USE OF THE INSTALLATION

In order to start the installation, you first have to start the machine, which needs most time to get operational. The starting-up of the installation should be done in the undermentioned order:

- | | | |
|----|---------------------------------------|---|
| 1. | Starting up dip tank: | The water must be warmed up. |
| 2. | Starting up vacuum pump: | This must heat up for 5 minutes, so that the vacuum packaging machine can be operational. |
| 3. | Starting up vacuum packaging machine: | The production can be started. |

7.1 Starting up dip tank

1. Switch on the dip tank with the main switch on the control panel (see “control dip tank”).
2. Adjust the required water temperature (see “adjust temperature”).
3. Adjust the required cycle time (see “adjust cycle time”).
4. Push the button 'START' to start the program:
The grid will move up and down and will position itself in the users position.
The machine is ready for use, but can only be operational if the required water temperature has been reached.



If the water has the correct temperature, the vacuum packaging machine can start up.

7.2 Starting up vacuum packaging machine

1. Switch the vacuum packaging machine on with the main switch on the control panel.
2. Press the button 'START': The control starts up.
In one view you can see how the product is packed:
The display shows the program number:
 - The symbols of the functions, which will be proceed during the packing, are lightning up.
 - The “mbar”-LED is lightning up by a sensor controlled controller and the “sec”-LED lights up by a time controlled controller.



- During starting up 3 points in the display will light up.
- After the control is started up, the last used program will be loaded.
- If the cover is closed, the vacuum chamber will be decompressed till the cover opens.
During the decompress the air symbol lights up and blinking.

3. Choose with the help of the up- and down keys the requested program number.



- With the up- and down keys the warming up option can be selected. The symbols will lightning up one at the time, see also under 'warming up'.

7.3 Packing of products

With the installation, several kind of products can be packed and the package can be final processed. Generally there is a difference in:

- Dry products
- Moist and liquid products.

7.3.1 Automatic packing of dry products

1. Place the selector switch to 'AUT' (automatic control).
2. Place the product in a vacuum bag.

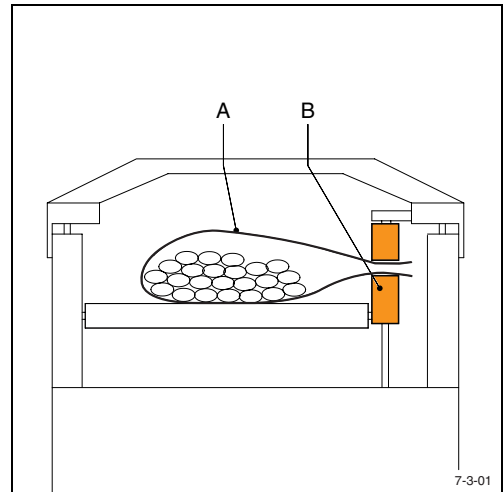


- The bag may not be filled for more than three-quarters.
- Keep the seal border of the bag clean.

3. Place the vacuum bag (A) with the product in it into the vacuum chamber.



- Place the opening of the bag without wrinkles on the contra bar (B). Make sure that the opening of the bag does not put out of the vacuum chamber.
- Work hygienically: prevent direct contact between the machine and the product as much as possible.



4. Push the 'START' button: The installation begins with the cycle:
 - The cover closes.
 - The vac-symbol is lightning. The pump starts to vacuum the chamber.



DANGER OF JAMMED

- NEVER touch the moving parts of the machine with your hands. Prevent that you will get jammed.
- Dangerous places are:
 - Between the cover and vacuum chamber during closing the cover.
 - Between the moving arms of the cover and the machine by automatically turning over the cover.
 - Between the conveyor belt and the vacuum chamber, if the conveyor belt are moving downwards.



The vacuum pump starts automatically by every cycle, therefore it can take a while before the chamber gets vacuumed.

- The machine finishes the set program. During this program the concerned symbol lights-up step by step and the actual value is shown in the display.
- While the machine is running, a next product can be prepared for packing on the other side of the machine.
- The last step is decompressing the chamber: the cover will go open and will turn to the other chamber.
- As soon as the vacuuming of the other chamber begins, the conveyor belt, on which the packed product is lying, will come up to have the product glided to the conveyor. After this the conveyor belt turns back to its start position, so that a new product can be prepared for packing.
- Because of the guide the product will be turned, so that it will lay correctly on the conveyor.
- The conveyor transports the packed product to the dip tank. As soon as the dip tank is filled, the conveyor will stop.
- As soon as the dip tank can do the next movement, the conveyor will move again and the product will glide on the grate.
- The grate will go down and the packed product will come in the warm water, so that the package will shrink.
- After this process the grate will go up and will be tilted in such way that the product will roll on the other side out of the machine.
- Meanwhile the vacuum packaging machine has started a new cycle.



- By pressing the step-key the next step in the vacuum cycle will be executed.
- By pressing the stop-key the vacuum cycle will stop and the chamber will be decompressed. The decompressing is finished as soon as the cover opens.

- The pump will not be switched off. The pump automatically stops if you do not work with the machine for 5 minutes.



ATTENTION

Are not scared of a warm sealing bar. Especially when you use the machine intensive the seal bar can become warm. If necessary use gloves. Shorten the seal time if possible.

7.3.2 Manual packing of dry products

1. Place the selector switch to 'MAN' (manual control).
2. Place the product in a vacuum bag.



- The bag may not be filled for more than three-quarters.
- Keep the seal border of the bag clean.

3. Place the vacuum bag with the product in the vacuum chamber.



- Place the opening of the bag without wrinkles on the contra bar. Make sure that the opening of the bag does not put out of the vacuum chamber.
- Work hygienically: prevent direct contact between the machine and the product as much as possible.

4. Push the 'START' button. The installation begins with the cycle.
 - The cover closes.
 - The vac-symbol lights up. The pump starts to vacuum the chamber.



The vacuum pump starts automatically by every cycle. That is why it can take some time before the chamber will be vacuumed.

- The machine finishes the adjusted program. During this program the concerned symbol lights up step by step and the actual value will be shown in the display.
- While the machine is running, a next product can be prepared for packing on the other side of the machine.
- Finally the chamber will be decompressed and the cover will come loose, but will not start a new cycle. The operator should start a new cycle by pressing the button 'START'.
For the continuation of the finishing process, see 'automatic packing of dry products'.

7.3.3 Packing of moistened and liquid products

The packing of moistened and liquid products like sauces is done in the same way as packing of dry products. However the vacuum should be limited, so that the water in the product will not boil. The boiling point of water will be reached earlier in case of low pressure (see table "boiling point of water by several pressures").

The boiling of the product should be limited, because:

- The product will become dry if the machine does not stop vacuuming.
- The storage life of the product will not improve: the oxygen in the chamber has been driven away by the moisture.
- The inside of the pump can become rusty: the pump pumps moistened air.
- The chamber will become dirty: the water in the product can splash.
 - If you pack moistened and liquid products, the oil of the pump should be replaced more often, see "maintenance". Also the pump should be warmed up more often, see "warming up".
 - If the note "toU" shows up during the packing of the products, the pressure has not been changed during 3 seconds. Usually this indicates that a lot of moisture will evaporate from the product. By increasing the vacuum value this note will not show up again.
 - By switching on the vac-plus function you can vacuum longer if required.

Moistened and liquid products can, like dry products, be packed and progressed automatically as well as manually.

Table: Boiling point water by several pressures:

Vacuum pressure (mbar]	1000	800	600	400	200	100	50	20	10	5	2
Vacuum-percentage [%]	0	20	40	60	80	90	95	98	99	-	-
Temperature [°C]	100	94	86	76	60	45	33	18	7	-2	-13

7.4 Stopping vacuum packaging machine

If vacuuming should be stopped, handle as follows:

1. Switch off the main switch on the control panel, so that the program will be stopped and as a result of this the vacuuming will stop.
2. Switch off the main switch on the machine, as the whole process has finished, so that also the vacuum pump and the conveyor will stop.
3. Disconnect the air pressure supply.
4. Disconnect the extra seal pressure.

7.5 Stopping conveyor

The conveyor does not have an own control, but will be controlled by the vacuum packaging machine. If you switch off the vacuum packaging machine, the drive of the conveyor will stop automatically.

7.6 Stopping dip tank

The dip tank can be switched off, if there is none supply of packed products anymore. This should be done as follows:

1. Switch off the main switch.

7.7 Emergency stop

In case of emergency the emergency stop button of the vacuum packaging machine should be pressed.

Because of this:

- the air pressure supply in the machine will be interrupted, see ' air pressure connection vacuum packaging machine'
- the vacuum chamber will be decompressed and the cover will come loose
- the power will be switched off
- the vacuum pump will be switched off

For switching on the machine again:

- all emergency stop buttons should be checked and turned to the right.
- the machine should be released by pressing the button 'ENABLE'.

After this the machine is ready for production.

8 MAINTENANCE

Regular maintenance prevents malfunctions and extend the life of the machine. This can also achieve an optimal level of hygiene.



ATTENTION

- Observe the given maintenance intervals. Overdue maintenance can lead to high costs for repair and servicing and it can invalidate the guarantee.
- Observe the rules for hygiene (mentioned under hygiene).



WARNING

- Ensure that there is adequate illumination.
- Do not carry out service, maintenance or repair work to the machine when it states that the dealer should carry this out.
- Always have a recognised Turbovac dealer carry out repair and maintenance work.



DANGER

Always switch the machine off with the main switch, and/or remove the plug from the socket during maintenance work. Lock the main switch with a padlock.

8.1 Maintenance table

8.1.1 Maintenance table vacuum packaging machines

Description	1 x a year				To be carried out by:	Referring to
	Day	Month	Year	5 Years		
Cleaning vacuum chamber	X				Yourselves	Cleaning in general
Cleaning conveyor belt	X				Yourselves	
Cleaning seal bar	X				Yourselves	Seal bar and contra bar
Cleaning contra bar	X				Yourselves	
Checking teflon tape	X				Yourselves	
Checking rubber contra bar	X				Yourselves	
Checking work pressure	X				Yourselves	Compressed air connection vacuum packaging machine
Draw off water of condensation from air pressure system		X			Yourselves	Water separator
Checking cover rubber		X			Yourselves	Cover rubber
Checking cables		X			Yourselves	Checking cables
Checking vacuum hose			X		Yourselves	Checking vacuum hose and tubes
Pneumatic cylinders				X	Dealer	Pneumatic cylinders and springs
Springs				X	Dealer	

8.1.2 Maintenance table vacuum pump

Description	Once a			To be carried out by:	Referring to
	Month	6 months	year		
Checking oil level	X			Yourselves	Filling oil
Checking cables	X			Yourselves	Checking cables
Changing oil		X		Yourselves	Changing oil
Changing oil exhaust filter			X	Dealer	Maintenance vacuum pump
Checking vacuum hose			X	Yourselves	Checking vacuum hose and tubes.

NOTE: in case of “oil” showing on the display the oil should always be changed.

8.1.3 Maintenance table conveyor

Description	Once a		To be carried out by:	Referring to
	Day	Month		
Cleaning conveyor belt	X		Yourselves	Cleaning in general Maintenance conveyor
Cleaning sensors	X		Yourselves	Maintenance conveyor
Cleaning mirrors	X		Yourselves	
Checking cables		X	Yourselves	Checking cables

8.1.4 Maintenance table dip tank

Description	Once a:				To be carried out by:	Referring to
	Day	Week	Month	5 years		
Cleaning grate	X				Yourselves	Cleaning in general Maintenance dip tank
Water temperature	X				Yourselves	Maintenance dip tank
Checking working pressure	X				Yourselves	Compressed air connection dip tank
Checking water level	X				Yourselves	Maintenance dip tank
Changing water		X			Yourselves	
Changing flashing			X		Yourselves	Flashing
Checking cables			X		Yourselves	Checking cables
Vapour exhaust			X		Yourselves	Maintenance dip tank
Cleaning heating elements				X	Dealer	Heating elements
Checking pneumatic cylinder				X	Dealer	Pneumatic cylinder
Draw off water of condensation from air pressure system			X		Yourselves	Water separator

8.2 Cleaning general

1. Clean the machines of the installation regularly and thoroughly, preferable every day.



ATTENTION

- Do not clean the machine with a high-pressure cleaner. Water jets may penetrate and damage the electronics. Use a moistened cloth to clean the machine from the installation.
- Use small amounts of water.

8.3 Maintenance vacuum packaging machine



ATTENTIE

- Treat the lid rubber with talcum powder if it sticks to the vacuum chamber. Make sure that the vacuum chamber is decompressed: the cover is opened.
- Do not spill any water in the vacuum chamber suction opening and the air control opening of the vacuum chamber (see main components vacuum packaging machine).

8.3.1 Lid rubber

The lid rubber must not show any signs of damage because then the vacuum chamber will not close properly and it will leak, having an adverse effect on the quality of the packing.

1. Check the lid rubber monthly for damage, and replace it if necessary.

Replacement is as follows:

1. Pull the old rubber off the lid lip.
2. Clean the lip to which the rubber was attached.
3. Press the new rubber evenly over the lid lip.

8.3.2 Pneumatic cylinders and springs

The machines are executed with pneumatic cylinders and springs for automatically opening of the cover after the vacuum chamber has been decompressed.

- Let the dealer check and, if necessary replace the pneumatic cylinders and springs every 5 years.
- Adjust the tension of the springs or replaced and / or have the pneumatic cylinders been replaced if the cover does not open properly.

8.3.3 Seal beams and counter beams

The seal beams and counter beams must be in good condition for a sealed package.

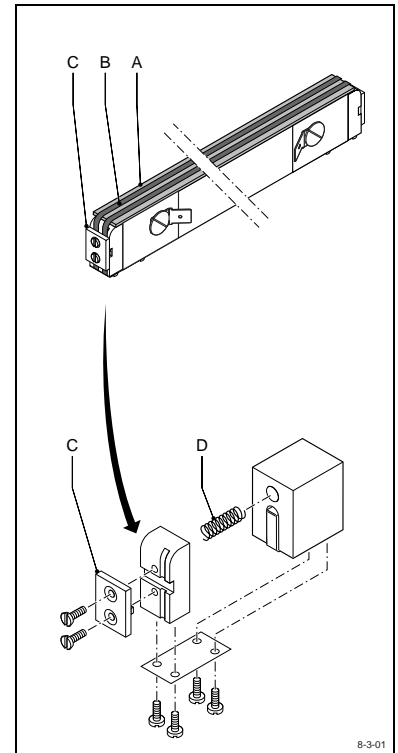
- Clean the seal and counter beams every day with a dry cloth.
- Check the condition of the teflon tape and the sealing wires every day. Replace the tape if it is damaged and replace the sealing wire if there are any kinks in it.
See under sealing and cutting wire and the teflon tape".
 - 'removing old wires'
 - 'placing wires on the seal bar'
 - 'placing teflon tape on the seal bar'
- Check the condition of the silicon rubber in the counter beam every day. Replace the rubber if it is burnt in.
See under "Replacing the counter beam silicon rubber".

8.3.4 Removing old wires

1. Disconnect the connecting wires free from the sealing beam contacts.
2. Loosen the clamp screws and remove the sealing beam from the mounting.
3. Remove the teflon tape that is stuck to the beam.
4. Remove the mounting plates (C) at both ends of the sealing beam by loosen the screws. This loosens the sealing wires (B) or the sealing and the cutting wire
5. Clean the sealing beam thoroughly.

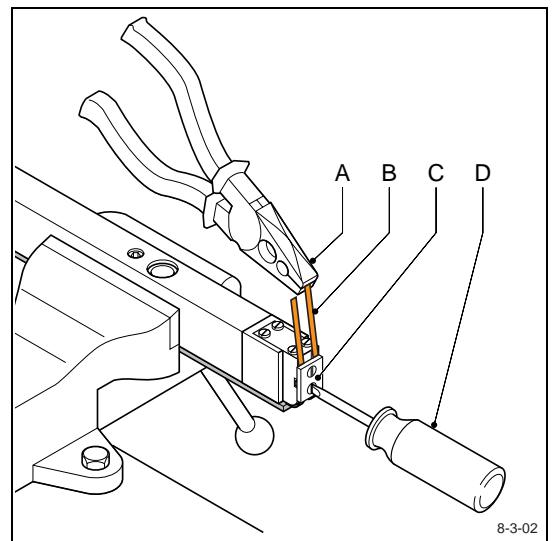


- Check the strips of hard glass fibre (A) for damage after removing the wires. Replace them if they are damaged.
- Check the condition of the tightening springs (D) at the ends of the sealing beam. Replace if necessary.



8.3.5 Fitting new wires on the sealing beam:

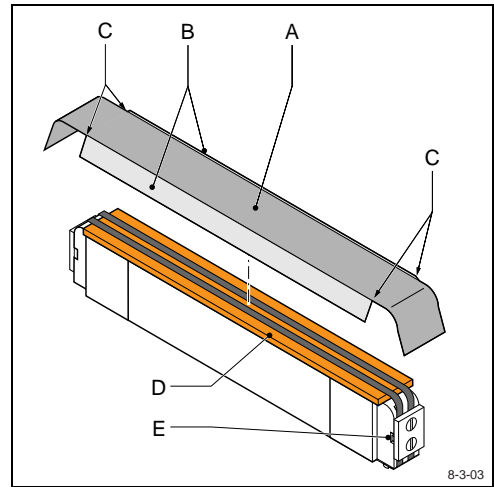
- 1 Fit any new hard glass fibre strips to the sealing beam
- 2 Position the new wires (B) behind one of the mounting plates (C) and ensure that the ends of the wires are level with the bottom side of the mounting plate. Now tighten the screws (D)
- 3 Position the wires over the sealing beam at the other side and loosely mount the second mounting plate.
- 4 Now carefully clamp the sealing beam upside down in a bench vice.
- 5 Tighten the wires as tightly as possible with a pair of pliers (A) and secure the mounting plate by tightening the screws (D)



- Loosening the screws a little can tighten each of the wires so that the wires stay tight around the sealing beam.
- Now the wires can be pulled tighter, one-by-one, with the pliers.
- Cut the end of the wires level with the bottom side of the mounting plate.

8.3.6 Fitting a new teflon lining to the sealing beam

1. Replace the hard glass fibre strip, if necessary. (D)
2. Put new teflon lining (A) on the sealing beam.
3. Cut the corners (C) off the teflon lining.
4. Remove the protective layer from the teflon lining.
5. Stick the new lining onto the sealing beam (B). The teflon lining has an adhesive strip on either side for this purpose. The teflon lining should not stick to the tightening blocks (E)
6. Slide the sealing beam into the lid holder and securely tighten the clamp screws.
7. Connect the wiring to the sealing beam.



8.3.7 Replacing the counter beam silicon rubber

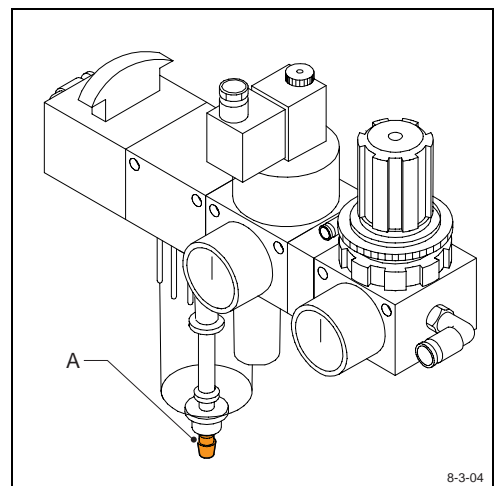
The counter beam is securely mounted on the work surface. The rubber is clamped in the counter beam. Replacement of the rubber is done as follows:

1. Pull the rubber out of the counter beam.
2. Clean the groove.
3. Push a new rubber evenly into the groove and make sure that it does not stick out at the ends of the counter beam.

8.3.8 Water separator vacuum packaging machine

Compressed air can contain moisture. This can harm the pneumatic cylinders. Because of this, it is necessary to dry the compressed air system. The procedure is as follows:

1. Remove the side plates from the machine, now you can reach the reduction valve.
2. Open the valve (A) from the water separator, remove all the water.
3. Close the valve.
4. Replace the side plates.



8.4 Maintenance vacuum pump

To protect the vacuum pump, good maintenance is important. Carry out the following work carefully:

1. Check, and clean if necessary, the ventilation openings in the machine before you start working with the machine, so that proper cooling of the pump is ensured.
2. Have the dealer replace the oil filter one time each 1,5 years, or have it replaced when the pump forms a mist of oil.
3. Regularly warm up the pump:
 - ± 5 min before producing (beginning of the day)
 - ± 5 min after production (at the end of the day)
4. Check the oil level every day and fill, if necessary fulfil with oil level
5. Replace the oil every six months, or after the "oil" message is displayed while the machine is starting up. After the oil has been changed this message can be cancelled by pressing the stop key for 5 seconds.
6. With a new machine the 'oil' message appears for the first time after 100 hours of operation. This message then appears after the set number of oil cycles or hours. (see 'special functions program vacuum packaging machine').

8.4.1 Warming up (beginning of the day)

1. Switch on the machine using the main switch.
2. Warm up the pump for 5 minutes, before beginning the first packing cycle.

8.4.2 Filling with oil

No.	Description
A	Oil filler cap
B	Oil gauge
C	Oil drain

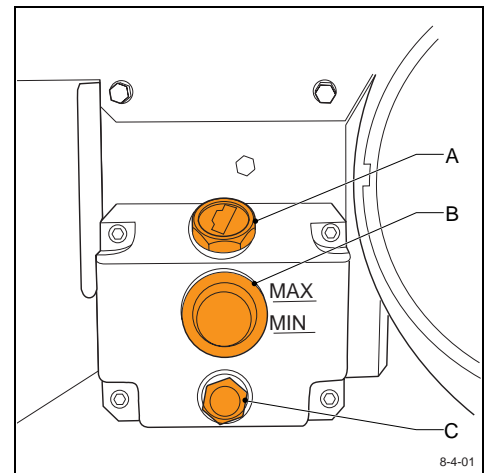


ATTENTION

Make sure that the vacuum chamber is decompressed (the lid is open) before changing the oil.

The pump should be filled with oil as follows:

1. Remove the oil filler cap (A).
2. Fill the pump with oil till the max-mark on the side glass. (B). Use oil in accordance with DIN 51506, lubricating oil group VC, see under 'technical specifications'. When in doubt consult your dealer.
3. Close the oil filler opening with the oil filler cap.
4. Reset the "Oil"-message. Press the stop key for 5 seconds. The machine will start again.
5. Check the oil level after a few packing cycles and fill up oil if necessary.



8.4.3 Changing the oil

Changing the oil should be done as follows:

1. Warm up the pump.
2. Switch off the machine.
3. Decompress the vacuum chamber (the lid is open)



ATTENTION

The operating temperature of the pump is 70 °C or more. Use gloves when working on the pump, or let the pump cool down sufficiently if it is too warm.

4. Drain off the oil by removing the drain plug (C).



ATTENTION

Collect the oil to have it processed according to the locally applicable regulations.

5. Replace the drain plug if the pump is empty.
6. Let the pump run for a maximum of 2 seconds.
7. Now drain the oil again.
8. Fill the pump with the correct oil.



ATTENTION

- Reduce the oil indicator by a ½ when moisture products are packed. For the standard settings, see table 4: special functions program vacuum packaging machines'.
- If the oil is contaminated or contains too much liquid, it is necessary to reduce the initial positions of the oil change indicator, see 'special functions program vacuum packaging machine'.

8.5 Maintenance conveyor

The conveyor should be maintenance as follows:

- The conveyor should be cleaned every day.
- The sensors and mirrors should also be cleaned every day with a clean cloth, so that the sensors can take care of the correct message to the other machines, which are connected, to the installation.

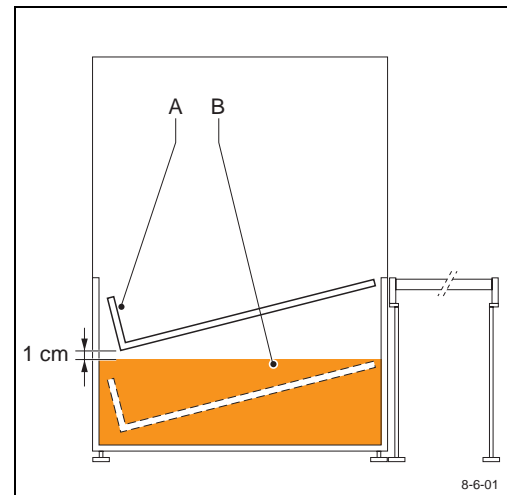
Remarks:

- The motor and the reduction gearbox of the conveyor are maintenance free.
- It is not necessary to re-tighten the conveyor belt.

8.6 Maintenance dip tank

In order to have the dip tank working well it is necessary to check the following:

- **Water level:**
this should be checked every day and if necessary filled by: the water level should be till 1 cm. under the grate.
- **Water temperature:**
check daily and in case of deflections contact the dealer.
- **Water:**
refresh weekly. If the dip tank is empty, it should be cleaned as well.
- **Grate:**
Clean with a wet cloth at the end of the production.
- **Compressed air pressure:**
check daily to prevent that this will be too low, which will effect the working of the machine in a negative way.
- **Vapour:**
This may not be blocked and therefore should be checked every month and if necessary be cleaned.



8.6.1 Drapes

The shrink tank is equipped with drapes on both sides. The function of those drapes is to keep the vapour inside the machine.

- Check the drapes regularly and, if necessary, replace them. Broken drapes do not seal the shrink tank anymore. Because of this, the machine will use more energy.

8.6.2 Heating elements

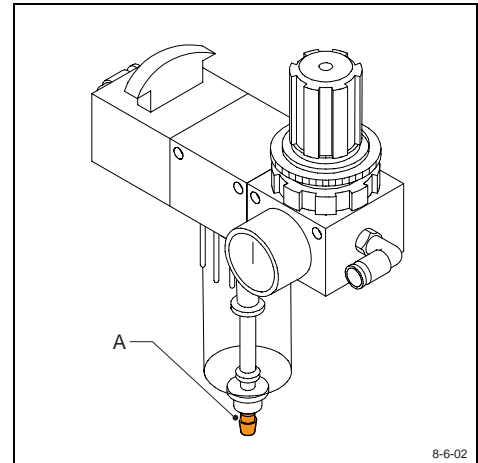
The dip tank contains heating elements, which will have calcium deposit. Calcium deposit shortens the economic life of the elements and requires extra energy for heating up.

- Check the elements monthly for possible calcium deposit and clean them with a substance that is not harmful for food. Consult your dealer if necessary.

8.6.3 Water separator dip tank

Compressed air might contain moisture, which damages the pneumatic cylinders. Therefore you have to draw off the moisture from the compressed air system every month. Therefore follow up the following steps.

1. Open the valve (A) of the water separator and collect the possible collected moisture.
Make sure that the reservoir will be completely empty.
2. Close the valve afterwards.



8.6.4 Pneumatic cylinder

The machine is equipped with a pneumatic cylinder for automatically moving of the grate.

- Let the pneumatic cylinder check by the dealer every 5 years and, if necessary, replace them.

8.7 Connection cables in general

- Check all cables regularly for damages. Replace a damaged cable immediately by the dealer.



DANGER

Take the plug out of the wall socket before checking the cable connection.

8.8 Vacuum hoses and wires

Check once a year the condition of the vacuum hoses and wires for snags cracks and porosity and replace if necessary.

9 PROBLEMS AND MESSAGES

Check in case of problems first with the help of a problem table if you can solve it by yourselves.



WARNING

During problem solving:

- Make sure there is sufficient illumination.
- Do not carry out service, maintenance or repair work on the machine when it is indicated that the dealer should do it.
- Always have a qualified Turbovac dealer to carry out the repair and maintenance work.



DANGER

During solving a problem:

- Always switch of the machine concerned at the main switch and / or remove the plug from the socket during maintenance work.
- Lock the main switch of the machine concerned with a padlock.

9.1 Problems vacuum packaging machine



WARNING

Make sure that the vacuum chamber is decompressed (the lid is open) when you solve the problems.

Problem	Cause	Remedy
Machine does not work	The plug is not in the socket	Put the plug in the socket
	(Earth leaking) protection in the meter cupboard has tripped.	Check the meter cupboard
	Defective fuse(s) in the meter cupboard.	Check the meter cupboard.
	A fuse in the machine is broken.	Consult your dealer.
	The protection of the machine is switched off.	Consult your dealer.
The vacuum pump does not come up to speed.	The oil is too thick or contaminated.	Replace the oil with another oil; see under "changing oil".
	The pump runs on 2 phases.	Check the supply. Consult your dealer if the power supply is good.
The vacuum in the packing is insufficient.	The settled vacuum level is too high.	Decrease the vacuum level.
	Bad packing quality is used.	Select a better quality.
	The product damages the bag.	Take a new bag and set a higher value for soft-air.
	There is insufficient room between the sealing beam and the counter beam.	Check the position of the seal beam.
	The vacuum hose is leaking.	<ul style="list-style-type: none"> • Check the connections between the pump and the machine. • Check the hose.
The seal is leaking.	The seal is badly melted.	Increase the seal time and / or install 'extra seal pressure'
	The seal is burnt.	Decrease the sealing time.
	The opening of the vacuum bag is contaminated.	Clean the bag, or take a new clean bag and make sure that the opening stays clean.
	The seal is dirty.	Clean the sealing beam.
	The teflon tape of the seal beam is damaged.	Replace the teflon tape.
	The silicon rubber in the counter beam is damaged.	Replace the silicon rubber.

Problem	Cause	Remedy
The machine does not seal.	The bag was not correctly placed on the seal beam.	Put the opening of the vacuum bag properly on the seal beam.
	The seal wire is broken.	Replace the seal wire.
	The seal transformers are switched off by the thermal protection.	Work slower with the machine, or shorten the seal time. Wait until the protection while switch on again (this can take half an hour). If possible let the dealer install extra sealing pressure if working slower, or with shorter sealing times, is not possible.
	The seal transformers are switched off by the short circuit protection.	There is a short circuit in the sealing system. Let the dealer repair the short circuit and replace the transformer.
The lid does not automatically switch over to the other vacuum chamber	There is no compressed air.	Check the compressed air system.
	The compressed air pressure is too low.	Check the adjustments of the reducing valve.
	The air cylinder is defect.	Repair or replace the air cylinder.
The tilling conveyor will not come up.	There is no compressed air.	Check the compressed air system.
	The compressed air pressure is too low.	Check the adjustment of the reducing valves.
	The air cylinder is defect.	Repair or replace the air cylinder.

9.2 Messages vacuum packaging machine

Reports	Cause	Remedy
“oil” message appears at start-up.	The oil counters have reached the set maximum.	Replace the oil and then “reset” the oil counters.
During vacuuming the message “toU” appears (the machine does not achieve the adjusted vacuum pressure)	The moist in the product will evaporate.	Increase the vacuum level to such a level that the moisture will not evaporate.
	The vacuum chamber is leaking.	Check the lid rubber. Replace if necessary. Consult your dealer if the vacuum chamber continues to leak.
	There is not enough oil in the pump.	Fill up with (the correct) oil.
	The oil in the pump is contaminated.	Change the oil.
	The pump oil filter is blocked.	Have the dealer replace the oil filter.
During soft-air the message “toS” appears.	The soft air system in the machine is broken or blocked.	Consult your dealer.
Message “E01”	One control output is overloaded.	Switch off the machine. Consult your dealer.
Message “E03”	The sensor is broken or the connection between the sensor and the vacuum chamber is blocked.	Switch the machine to time control to be able to continue working, see 'special functions program vacuum packaging machine'. Consult your dealer.
Message “E04”	The sensor is broken.	Switch the machine to time control to be able to continue working, see 'special functions program vacuum packaging machine'. Consult your dealer.

9.3 Messages conveyor

Message	Cause	Remedy
Machine does not convey	The electric connection with the vacuum packaging machine is not correct.	Check and if necessary correct is.
	(Earth leaking) protection in the meter cupboard has tripped.	Check the meter cupboard.
	A defective fuse in the meter cupboard	Check the meter cupboard.
	The conveyor belt is broken.	Repair the conveyor belt and tighten the belt according chapter conveyor belt
The conveyor belt does not stop if the dip tank is working.	Sensor 1 is not well adjusted.	Adjust the sensor again.
	Sensor 1 is defect.	Replace the sensor and adjust it correctly.

9.4 Messages dip tank

Message	Cause	Remedy
The water does not reach the temperature.	The plug is not in the socket.	Put the plug in the socket.
	(Earth leaking) protection in the meter cupboard has tripped	Check the meter cupboard.
	Defective fuse(s) in the meter cupboard	Check the meter cupboard.
	A fuse in the machine is broken	Consult your dealer.
	The thermostat is defect.	Consult your dealer.
	The heating element is defect.	Consult your dealer.
The dip plateau does not move.	The compressed air is not connected.	Connect the compressed air.
	The pressure of the compressed air is too low.	Adjust the pressure with the reducing valve.
	The pressure of the compressed air circuit is too low.	Adjust the pressure to the required level.
	The air cylinder is defect.	Replace the air cylinder.
	Sensor 2 is not correctly adjusted.	Adjust sensor 2 again.
	Sensor 2 is defect.	Replace the sensor and adjust it correctly.

10 TECHNICAL DATA

10.1 Technical data vacuum packaging machine

General data	
Final pressure	less than 3 mbar
Maximum leakage	0,1 mbar/s
Sensor accuracy	± 2 mbar for a pressure less than 300 mbar. ± 10 mbar for a pressure greater than 300 mbar.

Sizes and weight	
Length	2020 mm
Width	920 mm
Height	1230 mm
Weight	472 kg
Dimensions and weight of the packed machine	
Height	1470 mm
Length	2240 mm
Width	1100 mm
Weight	582 kg

General information		
Vacuum chambers	Height	200 mm
	Width	810 mm
	Depth	680 mm
Seal configuration	Nett seal length	810 mm
Working height		930 mm

Compressed air	
Maximum permissible voltage pressure	6 bar
Air pressure	2 bar
Connection	Hose pillar 8 mm

External seal pressure connection (optional)	
Maximum permissible pressure	1 bar
Composition	Dry compressed air
Connection	Hose pillar

Ambient conditions	
Ambient temperature	+ 5 tot + 30° C
Transportation temperature	- 25 tot + 55° C
Humidity	30% tot 95% (without condensation)
Positioning	See 'installation'

10.2 Technical data vacuum pump

Type		
Capacity	50 Hz	250 m ³ /h
	60 Hz	300 m ³ /h
Final pressure		0,5 mbar
Oil quantity		6,5 l
Weight vacuum pump		190 kg
Noise	50 Hz	72 dB(A)
	60 Hz	74 dB(A)
Weight unpacked		196 kg
Weight packed		225 kg

Recommended kinds of oil (DIN 51506; VC)	With a surrounding temperature of
VM 068	5 - 12° C
VM 100	12 - 30° C
VS 100, or VE 101	30 - 40° C

10.3 Technical data conveyor

Dimensions and weight	
Length	2850 mm
Width	650 mm
Height	920 mm
Weight	187 kg
Dimensions and weight of the packed machine	
Length	3000 mm
Width	900 m
Height	950 mm
Weight	217 kg

10.4 Technical data dip tank

Dimensions and weight	
Length	950 mm
Width	830 mm
Height	1620 mm
Weight	265 kg
Dimensions and weight of the packed machine	
Length	1200 mm
Width	1200 mm
Height	2050 mm
Weight	297 kg

General information		
Dip table	Length	800 mm
	Width	560 mm
Contents dip tank		250 l
Capacity water		175 l
Connection vapour outlet		Ø 104 mm
Connection draw-off tapp		1" (core wire)

Compressed air	
Maximum permissible voltage pressure	6 bar
Air pressure	6 bar
Connections	Hose pillar 8 mm

10.5 Technical data installation

General information	
Cycle time	25 – 30 sec
Air use	100 l/min

10.6 Technical data general

Electrical connections	
Tension, Power, Frequency	See the identification plate, see 'identification of the machine'.
Maximum permissible voltage variance	- 10% tot + 10%



- Voltage data are not mentioned in this statement, as they are depending on the electricity supply in the country for which the machine is meant. The voltage data are mentioned on the identification plate of the machine (see fig. 0-01).
- Dimensions and weight are valid for machines in the standard (simplest) execution.

11 CE DECLARATION

CE DECLARATION OF CONFORMANCE

(According to annex II A of the machine guideline)

We, HFE vacuum systems b.v.
Het Sterrenbeeld 36, 5215 ML 's-Hertogenbosch,
The Netherlands

Declare totally on our own responsibility that the products:

- | | |
|-------------------------------------|---------------------|
| • Vacuum packaging machine Turbovac | APM-1000 |
| • Dip tank Turbovac | ADT-TV |
| • Conveyor Turbovac | CS-TV 285/50 |

To which this declaration refers, comply with the following standards:

- **EN 60204-1: 1997;**
- **EN 60335-1: 1994;**
- **EN 55014, EN 60555-2 and EN 60555-3**
- **EN 55014-2 carried out using the values of the EN 50082-2**

According to the determinations of:

- the machine guideline 89/392/EEG, amended guidelines 91/368/EEG, 93/44/EEG, 93/68/EEG
- the low voltage guideline 73/23/EEC, amended by guideline 93/68/EEG
- the EMC-guideline 89/336/EEC, amended by guidelines 92/31/EEG, 93/68/EEG

A. van der Velden
Managing director



The Netherlands, May 2002