ORIGINAL HENKELMAN VACUUM SYSTEMS

Vacuum Packaging Machine

Marlin, Falcon, Polar

User Manual

Art No. 0895011

Original Instructions for Use

4.1.1 Overview of the Main Components

The figure below shows the main components of the Marlin. The model shown may differ from your machine.

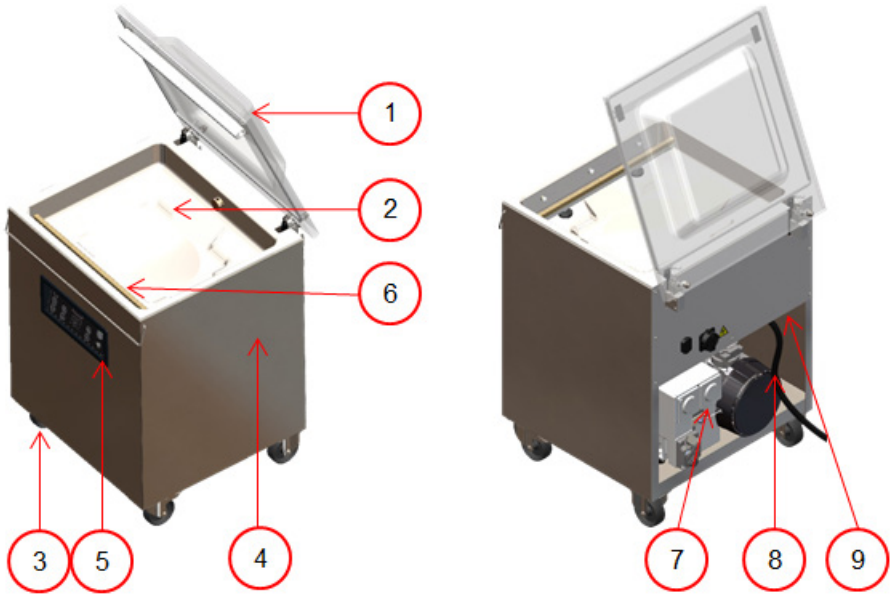

Figure 3: Overview of the Main Components

1. **Lid**
   The lid closes the vacuum chamber during the application of the vacuum. A rubber is mounted in the lid to ensure proper closing. On machines with two vacuum chambers, the lid can be moved from position 1 to position 2 manually. In these machines, the sealing bars and suction inlet for the vacuum are included in the lid.
2. **Vacuum chamber**
   The products to be packaged are placed on the work surface with the openings of the vacuum bags on the sealing position. On machines with two vacuum chambers, the already packaged product can be removed and new products can be placed on the free work surface during the vacuuming and sealing process.
3. **Castor with brake**
   The machines are fitted with four castors with brake. This allows for easy moving of the machine to a different location.
4. **Machine housing**
   The machine housing contains all the components necessary for the functioning of the machine.
5. **Control panel**
   This serves to operate the available control functions. Depending on your model, your machine will have the 10-Programme Control System (10-PCS) or the Advanced Control System (ACS).
6. **Seal system**
   Depending on the model, one, two or three sealing bars are mounted in the vacuum chamber. These close the vacuum bag.
7. **Vacuum pump**
   The vacuum pump creates the vacuum.

8. **Power connection and cable**
   This serves to connect the machine to the power supply. The machine is supplied without an electrical plug.
9. **Seal pressure connector (optional)**
   Where the standard model makes use of atmospheric pressure to press the seal bar onto the vacuum bag during the sealing process, it is also possible (optional) to connect to an external source in order to obtain a higher sealing pressure.

4.2 Falcon series

All Falcon models are equipped with an aluminium vacuum chamber and aluminium lid. Furthermore, the lid has a viewing window to monitor the packaging cycle.

Available with single or double vacuum chamber

- Standard with 10 program memory
- Standard Time control
- Free options: Cut-off and Wide seal
- Full option
- Aluminium lid with sight glass
- Standard Double seal

Pressure	≥ 5 bar - ≤ 10 bar / ≥ 72.5 Psi - ≤ 145 Psi
Flow	≥ 100 l/min.

Figure 9: Hose connection for compressed air

5.3 Prior to the First Use

See *Vacuum Pump maintenance* on page 73 for more information how to perform these steps.

Prior to the first use, the following steps must be performed:

Failure to do so may result in unrepairable damage to the machine.

1. Check the oil sight glass to see if the amount of oil in the pump is sufficient.
2. Optional: If the amount of oil in the pump is insufficient, refill it.
3. Start up the machine. See *Operation* on page 31 for more information.

6 Operation

Depending on the configuration of the vacuum packaging machine it is equipped with one of the following control systems:

- 10-Programme Control System (10-PCS)
- Advanced Control System (ACS)

Read the appropriate section how to operate the vacuum packaging machine.

- All persons responsible for the operation of this machine must at least fully read and understand the chapters *Safety* on page 11 and *Operation* on page 31.
- Failure to follow or disregard of the safety instructions may result in serious injury.

6.1 10-Programme Control System (10-PCS)

6.1.1 Operating Elements

The 10-programme control system allows the machine to be operated and programmes to be changed.

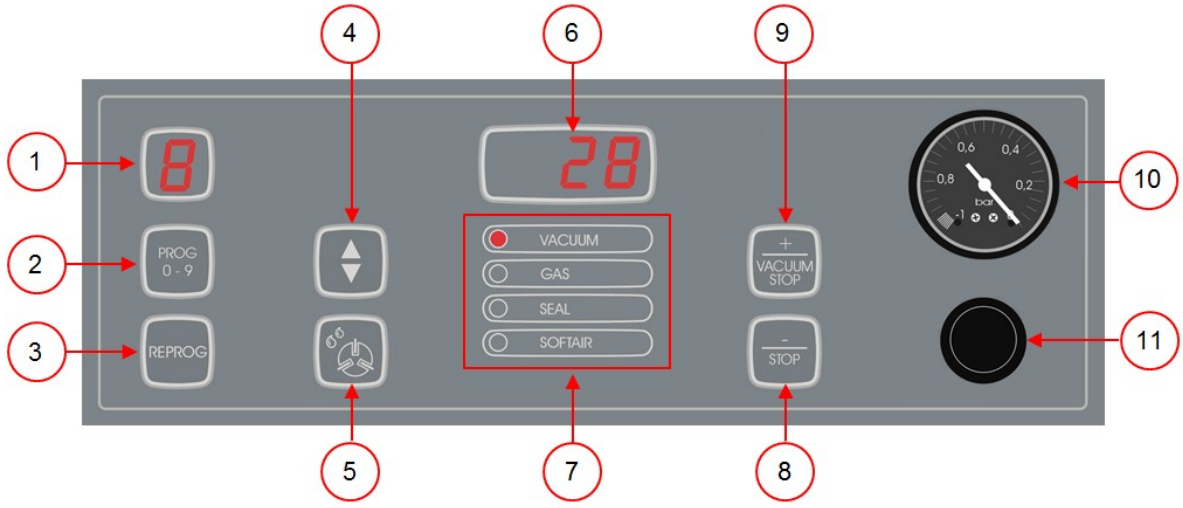

Figure 10: Control Panel of the 10-Programme Control System

1. **Programme display**
   Shows the selected programme.
2. **PROG 0 – 9 button**
   This is used to select the desired programme.
3. **REPROG button**
   This is used to enable the programming mode. The parameters can be changed using the **Cursor key**, the **– / STOP** button and the **+ / VACUUM STOP** button.
4. **Cursor key**
   This key is used to operate the functions of the parameter display and function display.

5. **Pump cleaning programme button**
   This is used to activate the pump cleaning programme. Moisture can be absorbed by the oil when the pump is running only short cycles or when you are packaging moisture-containing products. This programme removes moisture from the oil of the vacuum pump. See *Running the Pump Cleaning Programme* on page 67 for instructions.
6. **Parameter display**
   This display shows the current value of the active function during the programme cycle or the set value of the selected function when the machine is inactive. A red dot will light up in the bottom right if the Vacuum+ option is enabled.
7. **Function display**
   The LED light in front of the function lights up if the function is active during the programme cycle or if the function is selected in the programming mode.
8. **– / STOP button**
   This is used to interrupt the entire cycle during a packaging cycle. All functions are skipped and the cycle is terminated. In the programming mode, the value of the selected parameter can be lowered using this button.
9. **+ / VACUUM STOP button**
   This stops the active function and proceeds to the next programme step. In the programming mode, the value of the selected parameter can be increased using this button.
10. **Vacuum meter**
    Shows the pressure in the vacuum chamber. A value of -1 bar corresponds to 99% vacuum.
11. **On/Off button**
    Serves to turn the control panel on or off.

6.1.2 Starting the Machine

1. Plug in the machine.
2. Turn the main switch to the ON position (see *Electrical Installation* on page 89) to turn on the machine.
3. Press the on/off button on the control panel to enable the operation.

3 dashes may be shown on the display during the first start-up or ventilation. This means that the machine needs to be decompressed. In this case, open the lid to decompress the machine.

6.1.3 Starting the Packaging Cycle

The machine must be started in accordance with *Starting the Machine* on page 32 before starting a packaging cycle.

1. Select the desired programme.
   Press the **PROG 0 – 9** button
2. Put the product/products in place.
   a. Put the product/products in the vacuum bag.
   b. Place the vacuum bag in/on the vacuum chamber. Make sure the opening(s) is/are correctly placed with regard to the seal position(s).
3. Close the lid.
   The packaging cycle will start.

6.1.4 Proceeding to the Next Step in the Cycle

For some products, it may be necessary to proceed to the next step in the packaging cycle before the vacuum time or the vacuum level has been reached.

1. Proceed to the next step in the cycle.

   Press the **+ / VACUUM STOP** button.

   The next step will be started.

6.1.5 Terminating a Programme

Programmes such as the packaging programme or the pump cleaning programme can be terminated at any time.

1. Terminate the programme.

   Press the **– / STOP** button.

   The programme will be terminated and the vacuum chamber is decompressed.

6.1.6 Changing the Programme Settings

10 programmes are available. Programmes 1 – 9 can be adjusted by the user. Programme 0 is intended for servicing purposes only. This section describes the units and limits of the parameters and how parameters can be adjusted.

See *Operating Elements* on page 31 for an overview of the operating elements of the 10-PCS.

1. Press the **PROG 0 – 9** button to select the programme you wish to change.
2. Press the **REPROG** button to select the programming mode.
   The function display will start flashing.
3. Use the **Cursor key** to scroll to the desired parameter.
   The LED in front of the selected function will light up.
4. Press the **– / STOP** button and the **+ / VACUUM STOP** button to adjust the value.
5. Press the **REPROG** button to activate the new parameter.
   The function display will stop flashing.

6.1.6.1 Vacuum

During the cycle, the air is removed from the chamber until the set time or pressure has been reached, depending on the selected model (time-controlled or sensor-controlled).

1. Press the **PROG 0 – 9** button to select the programme for which you wish to set the Vacuum option.
2. Press the **REPROG** button to select the programming mode.
   The function display will start flashing.
3. Use the **Cursor key** to scroll to the parameter Vacuum.
   The LED in front of the selected function will light up.
4. Press the **– / STOP** button or the **+ / VACUUM STOP** button to adjust the value.
5. Press the **REPROG** button to activate the new parameter.
   The function display will stop flashing.

6.1.6.2 Vacuum (automatic)

During the cycle, the air is removed from the chamber until the set time or pressure has been reached, depending on the selected model (time-controlled or sensor-controlled).

To programme the vacuum level automatically:

1. Press the **PROG 0 – 9** button to select the programme for which you wish to set the Vacuum option.
2. Press the **REPROG** button to select the programming mode.
   The function display will start flashing.
3. Close the lid.
   The vacuum cycle starts to run.
4. Press the **+ / VACUUM STOP** button when the desired vacuum level has been reached.
   The cycle will continue to the next phases.
5. When the cycle is finished, press the **REPROG** button to save the settings.

6.1.6.3 Vacuum+ (optional)

If air is trapped in the product, it may be desirable to extend the vacuuming time after the maximum vacuum has been reached. This to allow entrapped air to escape from the product.

The Vacuum+ time is set in seconds. If a Vacuum+ time has been set, a dot will appear in the bottom right of the parameter display.

1. Press the **PROG 0 – 9** button to select the programme for which you wish to set the Vacuum+ option.
2. Press the **REPROG** button to select the programming mode.
   The function display will start flashing.
3. Use the **Cursor key** to scroll to the parameter Vacuum.
   The LED in front of the selected function will light up.
4. Press the **+ / VACUUM STOP** button to adjust the value to maximum.
5. Press the **Cursor key** once to select the Vacuum+ parameter.
   The parameter display indicates OFF. The LED of the function display will remain on Vacuum.
6. Press the **– / STOP** button and the **+ / VACUUM STOP** button to adjust the value of Vacuum+.
   When setting a value, a dot will appear in the bottom right of the parameter display.
7. Press the **REPROG** button to activate the new parameter.
   The function display will stop flashing.

6.1.6.4 Gas (optional)

For the protection of the product, it may be desirable to insert a gas into the packaging after vacuuming. Optionally, the machine can be equipped with a gas flush system.

See *Technical Data* on page 82 for the connection details.

Never use a gas mixture containing more than 20% oxygen or other explosive gases. This may cause life-threatening explosions.

The insertion of gas lowers the seal pressure. The minimum final pressure (after the insertion of gas) must be 30% (300 mbar/0.3 on vacuum meter) to ensure proper sealing.

1. Press the **PROG 0 – 9** button to select the programme for which you wish to set Gas.
2. Press the **REPROG** button to select the programming mode.
   The function display will start flashing.
3. Use the **Cursor key** to scroll to the parameter Gas.
   The LED in front of the selected function will light up.
4. Press the **+ / VACUUM STOP** button to adjust the value.
5. Press the **REPROG** button to activate the new parameter.
   The function display will stop flashing.

6.1.6.5 Gas+ (optional)

The Gas+ option only applies if the machine is equipped with the gas option. For some products it may be desirable to insert additional gas into the packaging to create a "balloon packaging". This allows for a better protection of a fragile product. The recommended value for Gas+ is 0.7 seconds.

If the Gas+ option is enabled, a dot will appear in the bottom right of the programme display. If the Gas+ option is enabled, this will apply to all programmes for which gas has been set.

To enable the Gas+ option on your machine, please contact your supplier.

6.1.6.6 Liquid Control (optional)

The Liquid Control option can be enabled or disabled for each programme. If the Liquid Control option is enabled, the machine will vacuum until the maximum vacuum is reached (99%). If the product reaches the boiling point before the maximum vacuum is reached, the machine will proceed to the next step of the cycle.

1. Press the **PROG 0 – 9** button to select the programme for which you wish to set Liquid Control.
2. Press the **REPROG** button to select the programming mode.
   The function display will start flashing.
3. Press the **PROG 0 – 9** button until H2O is shown on the parameter display.
   The parameter display indicates H2O.
4. Press the **REPROG** button to activate the new parameter.
   The function display will stop flashing.

The Liquid Control function prevents excessive fluid from being drawn out of the product. This means that if the product reaches the boiling point, the machine will proceed to the next step of the cycle. Depending on the moisture content, the manner in which moisture is bound, the available surface for evaporation and the temperature, the end vacuum percentage might be limited and there might be too much residual oxygen content present in the package. If the product/process requires packaging with a low residual oxygen content, despite the high moisture content, there are two options:

1. Lower the product temperature. This allows for a deeper vacuum to be reached before the product reaches the boiling point.

2. Use the Liquid Control+ option.

6.1.6.7 Liquid Control+ (optional)

The Liquid Control+ time is set in seconds. This is the time the vacuuming will continue after detection of the evaporation point.

You can only set Liquid Control+ if Liquid Control has been set to the maximum. To set the Liquid Control+ option, follow the steps below:

1. Press the **PROG 0 – 9** button to select the programme for which you wish to set Liquid Control +.
2. Press the **REPROG** button to select the programming mode.
   The function display will start flashing.
3. Press the **PROG 0 – 9** button until H2O is shown on the parameter display.
   The parameter display indicates H2O.
4. Press the **Cursor key** once to select the Liquid Control+ parameter.
   The parameter display indicates OFF. The LED of the function display will remain on Vacuum.
5. Press the **– / STOP** button and the **+ / VACUUM STOP** button to adjust the value of Liquid Control+.
   When setting a value, a dot will appear in the bottom right of the parameter display.
6. Press the **REPROG** button to activate the new parameter.
   The function display will stop flashing.

6.1.6.8 Red Meat (optional)

The Red Meat option is especially designed for the packaging of fresh meat. Degassing the product during the vacuuming process may result in the formation of air pockets inside the package. The Red Meat option prevents degassing of the product during and after the sealing phase.

The Red Meat option can be set for each programme individually. If the Red Meat option is enabled in a programme, it will not be possible to enable the Soft-air option in that programme.

When selecting this option, a parameter to set the "expansion reduction time" will appear. This is indicated by a flashing LED in front of the Soft-air option in the function display. It is recommended not to change this setting. Please contact your supplier for this.

To enable the Red Meat option on your machine, please contact your supplier.

6.1.6.9 Multi-Cycle Vacuum (optional)

The Multi-Cycle Vacuum option allows you to vacuum and insert gas in up to 5 steps. This provides an additional reduction in the oxygen content. This function is useful only for very specific applications, which set very special demands on the residual oxygen content or the maximum allowed vacuum. This option will not result in any appreciable benefit in the food industry.

To enable the Multi-Cycle Vacuum option on your machine, please contact your supplier.

1. Press the **PROG 0 – 9** button to select the programme for which you wish to set Multi-Cycle.
2. Press the **REPROG** button to select the programming mode.
   The function display will start flashing.

3. Use the **Cursor key** to scroll to the parameter Vacuum.
   The LED in front of the selected function will light up.
   The right-side character of the parameter display indicates which vacuuming step you are programming.
4. Press the **– / STOP** button and the **+ / VACUUM STOP** button to adjust the value of Vacuum.
5. Use the **Cursor key** to scroll to the parameter Gas.
   The LED in front of the selected function will light up.
6. Press the **– / STOP** button and the **+ / VACUUM STOP** button to adjust the value of Gas.
7. Repeat steps 3 and 4 if an additional vacuuming step is desired.
8. Press the **REPROG** button to activate the new parameter.
   The function display will stop flashing.

6.1.6.10 Seal

This is the time that the sealing wire and/or the cut-off wire are heated. The longer the time, the more heat is transferred to the bag.

As an option, the machine can be equipped with a Seal 1-2 option. This means the seal wire is activated separately from the cut-off wire. This way the cut-off wire can be activated a bit longer, to cut through thicker bags.

To set the Seal option, follow the steps below:

1. Press the **PROG 0 – 9** button to select the programme you wish to change.
2. Press the **REPROG** button to select the programming mode.
   The function display will start flashing.
3. Use the **Cursor key** to scroll to the parameter Seal.
   The LED in front of the selected function will light up.
4. Press the **– / STOP** button and the **+ / VACUUM STOP** button to adjust the value.
5. Press the **REPROG** button to activate the new parameter.
   The function display will stop flashing.

To change the Cut-off time:

6. Press the **Cursor key** again. The LED in front of Seal will still be lit. Repeat steps 4 and 5.

6.1.6.11 Soft-Air (optional for the Falcon)

This is the time that air is softly released into the chamber after sealing has taken place.

To set the Soft-air function, follow the steps below:

1. Press the **PROG 0 – 9** button to select the programme you wish to change.
2. Press the **REPROG** button to select the programming mode.
   The function display will start flashing.
3. Use the **Cursor key** to scroll to the parameter Soft-air.
   The LED in front of the selected function will light up.
4. Press the **– / STOP** button and the **+ / VACUUM STOP** button to adjust the value.
5. Press the **REPROG** button to activate the new parameter.
   The function display will stop flashing.

6.1.6.12 External Vacuum (optional)

The External Vacuum function allows special food containers to be vacuumed outside the machine. Depending on whether the machine is time or sensor-controlled, the vacuum value is set in seconds or %.

External Vacuum is only available on the Marlin series.

With the External Vacuum programme, you can programme as with any other programme. Check in advance whether the relevant food container can withstand and hold a vacuum.

To select the External Vacuum option, follow the steps below.

1. Select the External Vacuum programme.
   a. Press the **Pump Cleaning Programme** button.
      The display will show "C".
   b. Press the **Cursor key**.
      The display will show "E".
2. Programme the External Vacuum programme according to the steps specified in *Changing the Programme Settings* on page 33.
3. Connect the external vacuum hose to the machine by placing the adapter over the suction inlet (1) in the vacuum chamber.
4. Connect the external vacuum hose to the packaging.
   a. Connect the adapter (3) of the external vacuum hose to the valve of the packaging.
   b. Slide the sliding valve (2) towards the hose (closed position).

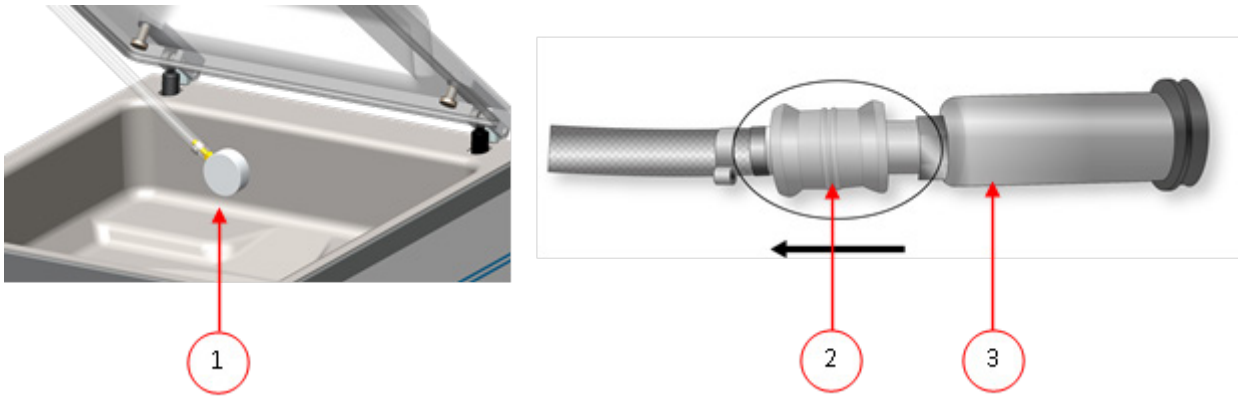

Figure 11: External Vacuum Adapter Set (10-Programme Control System)

5. Press the **+ / VACUUM STOP** button to start vacuuming.
   The packaging is vacuumed until the programmed value is reached.
6. Slide the sliding valve of the adapter towards the packaging (open position) and remove the external vacuum hose from the packaging.

6.1.6.13 Sleeper Option

If the Sleeper option is enabled, the pump will automatically shut off after the set time has elapsed and the machine is not in use during this period. The pump will automatically start again once a new vacuum cycle is started.

By default, the Sleeper option is set to 10 minutes. If you wish to change this time, please contact your supplier.

The Sleeper option cannot be set to less than 1 minute.

6.1.7 Example programmes

The vacuum packaging machine is equipped with sample programmes with pre-set parameters. It is possible to optimise a programme for your products by modifying the parameters.

Prog	Vacuum	Vacuum+	Seal	Soft-air	Type of product
1.	99%	OFF	2.2 s	3 s	Solid products
2.	97%	N/A	2.2 s	OFF	Liquids/liquid-containing products
3.	99%	OFF	2.2 s	8 s	Fragile/sharp products
4.	99%	4 s	2.2 s	3 s	Product that may contain entrapped air

Set as sensor-controlled										
Prog no.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Vacuum	99%	97%	99%	99%	80%	90%	50%	90%	60%	99%
Vacuum+	OFF		OFF	4 s						15
Gas	OFF	OFF	OFF	60%	50%	80%	OFF	80%	30%	OFF
Seal	2.2 s	2.2 s	2.2 s	2.2 s	2.5 s	2.5 s	2.5 s	2.5 s	2.5 s	2.5 s
Seal 2	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s
Soft-air	3 s	OFF	8 s	3 s	OFF	OFF	2 s	OFF	OFF	3 s

Set as controlled by Liquid Control sensor										
Prog no.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Vacuum	99%	97%	99%	99%	H2O	90%	50%	90%	60%	99%
Vacuum+	OFF		OFF	4 s						15
Gas	OFF	OFF	OFF	60%	50%	80%	OFF	80%	30%	OFF
Seal	2.2 s	2.2 s	2.2 s	2.2 s	2.5 s	2.5 s	2.5 s	2.5 s	2.5 s	2.5 s
Seal 2	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s
Soft-air	3 s	OFF	8 s	3 s	OFF	OFF	2 s	OFF	OFF	3 s

Set as time-controlled										
Prog no.	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Vacuum	25 s	20 s	15 s	10 s	30 s	25 s	20 s	20 s	15 s	30 s
Gas	OFF	OFF	OFF	OFF	5 s	5 s	10 s	15 s	15 s	OFF
Seal	2.2 s	2.2 s	2.2 s	2.2 s	2.5 s	2.5 s	2.5 s	2.5 s	2.5 s	2.5 s
Seal 2	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s	3.5 s
Soft-air	3 s	OFF	8 s	3 s	OFF	OFF	2 s	OFF	OFF	3 s

6.1.8 Guideline for Function Values

For each function, values can be set if you are authorised as an owner. In order to understand the consequence of the set value, the table below explains the consequences of giving a low or high value for each function.

For the values in the table below, the following rule of thumb applies to setting a value in mbar. These values may vary slightly, depending on the humidity.

- 99.8% = 2 mbar
- 0% = 1013 mbar

Function	Range	Conditions
Vacuum	0 – 99%	Rule of thumb: the higher the vacuum, the less oxygen remains in the package and the longer the shelf life of the product. There are exceptions to this rule.
Vacuum+	0 – 99%	This is the time the vacuuming will continue after the maximum vacuum has been reached. This to allow entrapped air to escape from the product. Please note that the vacuum must be set to the maximum.
Gas	30 – 98%	For some products it may be desirable to insert gas into the packaging to increase the shelf life of the product.
Gas+	0.1 – 1 second	For some products it may be desirable to insert additional gas into the packaging to create a "balloon packaging". This allows for a better protection of a fragile product. The recommended value for Gas+ is 0.7 seconds.
Red meat	0.1 – 1 second	When packaging large pieces of fresh meat, the product continues to degas during the sealing phase. Since the opening of the vacuum bag is already closed, air pockets may form inside the package after decompressing. This function prevents these air pockets.

Function	Range	Conditions
Liquid Control	0 – 99%	If the pressure is reduced, the boiling point of liquids will be decreased. As a result of this law of nature, a product may start boiling. In addition to contamination of the machine, this will reduce the weight and quality of the product to be packaged. By enabling the Liquid Control function, this special sensor will detect the evaporation point, and the programme will stop vacuuming and proceed to the next step in the packaging process. The value that can be set is the maximum achievable vacuum value. Please keep in mind that this maximum vacuum value can only be achieved as long as the product does not start boiling.
Liquid Control+	1 – 99 second	This is the time the vacuuming will continue after detection of the evaporation point. Because of the evaporation, a minor shock wave may occur, pushing all remaining air from the bag. The best way to determine the right time is trial and error.
Multi-Cycle Vacuum	0 – 99%	If the value for the Vacuum+ time is insufficiently effective for the entrapped air to escape, the Sequential Vacuum/Multi-Cycle Vacuum Step must be enabled. In maximum five steps, vacuuming is alternated with maintaining time. Each step increases the vacuum reached in the previous step.
Seal time 1-2 cutting time	0.1 – 4.0 seconds	This is the time that the sealing wire and/or the cut-off wire are heated. The longer the time, the more heat is transferred to the bag.
Soft-air	0 – 99 seconds	This is the time that air is softly released into the chamber after sealing has taken place. The best way to determine the right time is trial and error.
Cleaning of the pump	15 minutes	Fixed value.
Sleeper option	1 – 100 minutes	This is the time the pump will continue running after running a cycle. This maintains the pump at operating temperature and prevents unnecessary starting and stopping of the pump, which causes additional wear of the pump.

The vacuum in the chamber must be at least 30% at the moment of sealing.

If the pressure is reduced, the boiling point of liquids will be decreased; see *Vapour Pressure Curve of Water* on page 91 . As a result of this law of nature, a product may start boiling. In addition to contamination of the machine, this will reduce the weight and quality of the product to be packaged.

When packaging moisture-containing products, such as soups and sauces, it is important to closely monitor the vacuuming process. The moment bubbles are formed or the product starts to bubble, you should immediately proceed to the next step in the cycle. See *Proceeding to the Next Step in the Cycle* on page 33

By letting products cool down sufficiently prior to starting the vacuuming process, a higher vacuum can be achieved.

If the machine is equipped with the Liquid Control option, the control will automatically proceed to the next step if the product starts boiling.

When packaging moisture-containing products, it is important to run the pump cleaning programme at least once a week. When moisture-containing products are vacuumed on a daily basis, it is recommended to run the pump cleaning programme at the end of the day.

6.2 Advanced Control System (ACS)

The ACS is more than a control system. It includes unique features, special options and intelligent functions that add significant value to your vacuum packaging operations.

STANDARD ACS FEATURES

- LCD panel
- Software in 5 languages
- 20 program memory
- USB connection to upload programs
- Standard Sensor control
- Label printer compatibility
- HACCP compliance
- Secured multi-level access
- *Online programming*

6.2.1 Operating Elements

The ACS control panel allows the machine to be operated and programmes to be changed.

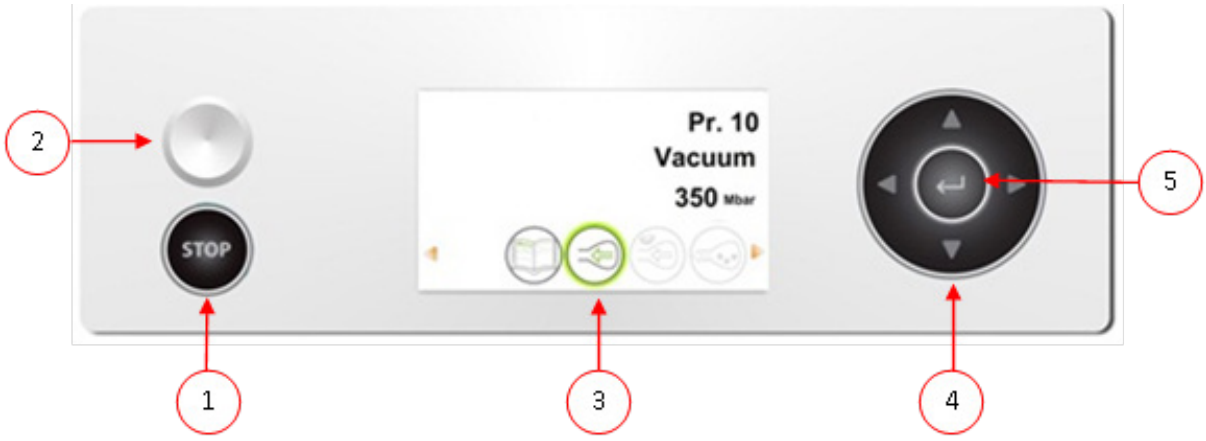

Figure 12: Control Panel of the Advanced Control System (ACS)

1. **STOP button**
   This is used to interrupt the entire cycle during a packaging cycle. All functions are skipped and the cycle is terminated.
2. **On/Off button**
   Serves to turn the control on or off.
3. **Display**
   The display has four possible modes: See *Figure 13: Possible Display Modes* on page 43 and *Figure 14: Possible Display Modes* on page 44.

   - **Start-up mode**: displays the current date and time when starting the machine. It also displays the installed software version. The user cannot take any action.
   - **Navigation mode**: displays a programme and its functions. The user can navigate through the various programmes and view the current settings of each function.
   - **Setting mode**: the user can view and adjust all settings, provided the user is logged in as the owner.
   - **Cycle mode**: once the machine starts a packaging cycle, animations of the functions are displayed along with the current value of the function.
4. **Cursor keys ▲, ▼, ◄ and ►**
   These are used to navigate through the functions. The ► button stops the active function and proceeds to the next cycle step. See *Proceeding to the Next Step in the Cycle* on page 48.
5. **Enter**
   This activates/confirms the selected value.

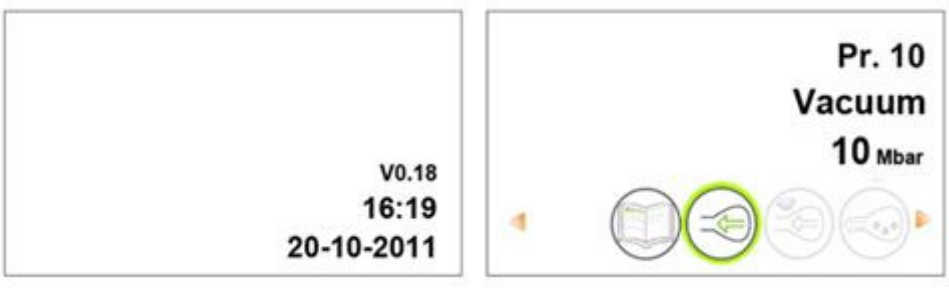

Figure 13: Possible Display Modes

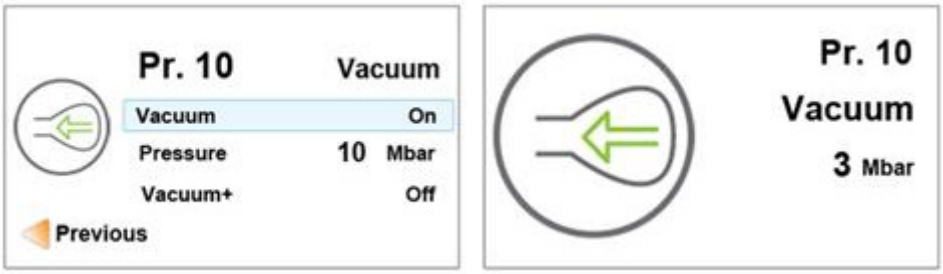

Figure 14: Possible Display Modes

6.2.1.1 Changing the ACS Settings

To prevent unauthorised changing of the settings and adjustments, there are different levels of authorisation: user and owner. Authorisation codes for users or owners allow access to the various levels. User access to change the settings of the machine is limited. The default user code is 0000. Users can only activate the printer via the printer icon in the navigation mode.

Owners of the machine are authorised to change the machine settings as well as all function settings. An owner code is requested when the menu icon is selected in navigation mode. This owner code is 1324. When the owner code has been entered, the machine settings menu will be opened. When logged in, the function settings can also be changed. To do so, return to the navigation mode by pressing ◂.

The machine remembers the last authorisation code used, even when the machine has been turned off. Therefore, it may be necessary to manually change the authorisation setting when you are done.

The basic functions below allow you to adjust the machine and/or function settings:

What to do?	Action
Selecting a different setting	Press ▲ or ▼.
Editing the selected setting	Press **Enter**.
Adjusting a variable	Press ▲ or ▼.
Conforming a variable	Press **Enter** once the desired variable has been found.
Return to the navigation mode	Press ◂ when all settings have been set to return to the navigation mode.

Figure 15: Overview of the Menus on page 45 shows all possible settings for all functions.

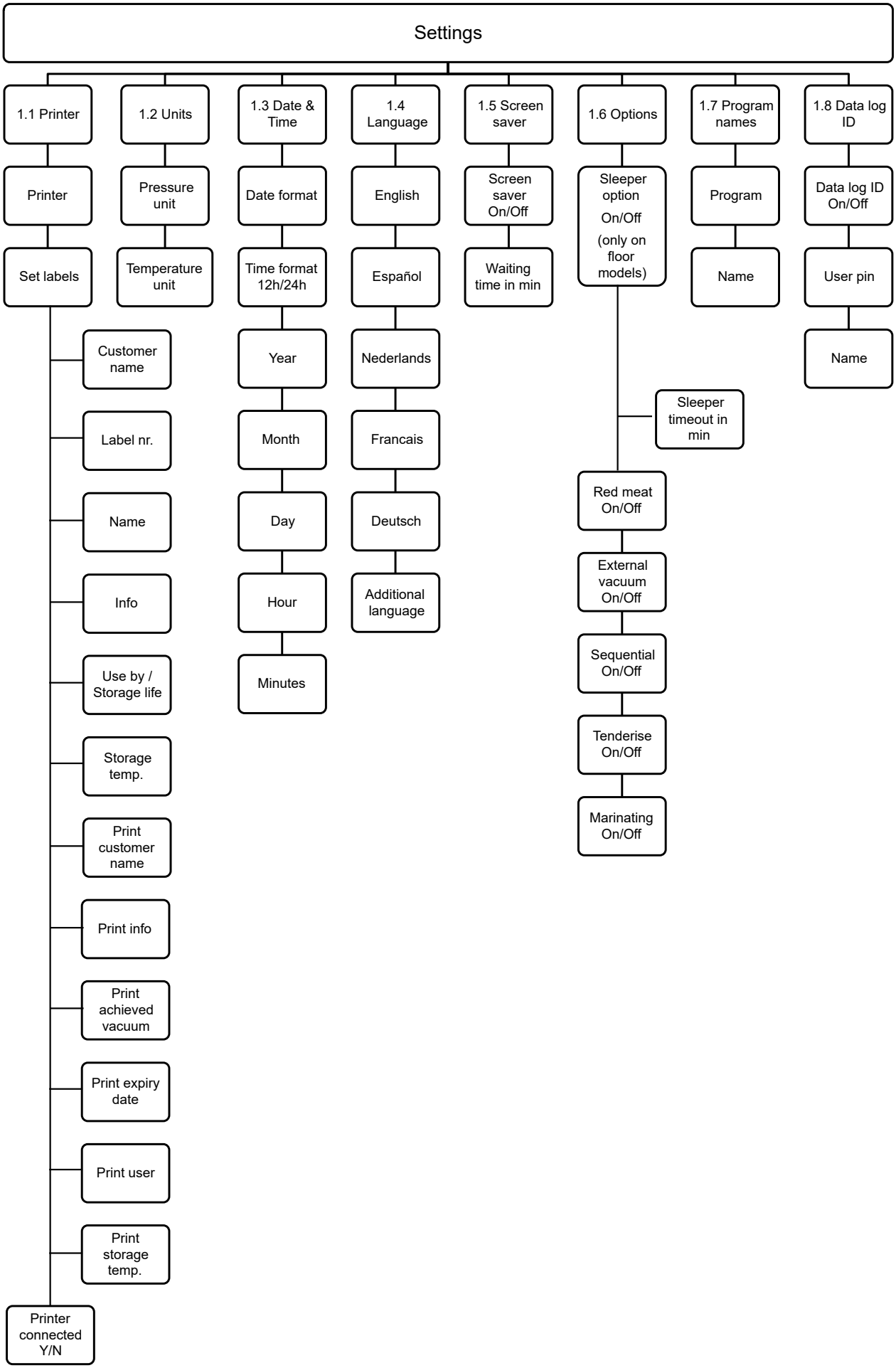

Figure 15: Overview of the Menus

6.2.1.2 Importing/Exporting Data

Data such as programmes and labels can be imported and exported via the USB connection.

6.2.1.3 Data Log ID

The control system is provided with the option to store the production information. The data log is stored in lined entries. Each entry consists of:

- Date
- Time
- User initials
- Selected programme and settings
- Selected label
- Number of cycles

A new entry is stored when:

- A different user logs in.
- The programme or programme settings are changed.

The data log is stored as a .txt file. You can then export the data log to a USB stick, see *Exporting Data Log* on page 47.

6.2.1.3.1 Setting and Using the Data Log ID

This setting is disabled by default. This option can be enabled after logging in using the owner code. 5 possible users can be set:

- Owner
- Four other users:
  - User 2: 3821
  - User 3: 5718
  - User 4: 6982
  - User 5: 9217

1. Log in using the owner code (1324).
   You will be granted access to the relevant settings.
2. Within the menu, go to **Settings** > **Data log ID** and select **ON**.
   From this moment on, the data will be logged.
3. Assign initials to the user codes (maximum 2 characters).
   a. At **User**, select the desired user code.
   b. Enter the initials of the user at **Name**.

   The initials of the user will be displayed in the data log.

The initials of the user must be set. If this is not the case, it cannot be traced who operated the machine.

6.2.1.3.2 Exporting Data Log

The memory can store up to 100 entries. If the memory is full, you will receive a message. The data log will first need to be exported before you can continue your work. You can export the data at any time. Only the owner can export data. After exporting the data, the memory will be erased automatically.

Avoid undesired delay during production by downloading the data log at fixed times.

1. Log in using the owner code (1324).
   You will be granted access to the relevant settings.
2. Within the menu, go to **Import/Export** and select **Export**.
3. Insert a USB stick into the USB port.
   Various options will appear on the screen.
4. Select **Export Data log**.
   The log will be downloaded to the USB stick and the memory is erased.

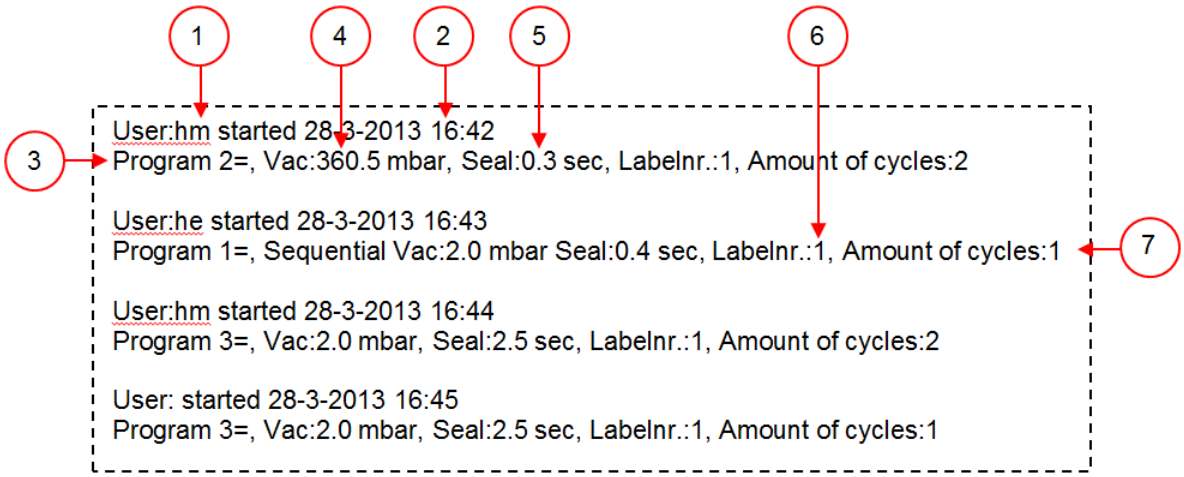

Figure 16: Example of an Exported Data Log

1. **User Initials**
   The initials of the person who logged in. If no initials were entered in the settings, nothing will be shown here. See the example in the bottom line of *Figure 16: Example of an Exported Data Log* on page 47.
2. **Start Time and Date**
   Start time and date of the production.
3. **Programme**
   The programme number used.
4. **Vacuum**
   The maximum achieved vacuum of the package.
5. **Seal Time**
   The seal time used.

6. **Label Number**
   The label that was printed for this package.
7. **Number of Cycles**
   The number of cycles run from the start time.

6.2.2 Starting the Machine

1. Plug in the machine.
2. Turn the main switch to the ON position (see *Electrical Installation* on page 89) to turn on the machine.
3. Press the on/off button on the control panel to enable the operation.

6.2.3 Starting the Packaging Cycle

The machine must be started in accordance with *Starting the Machine* on page 48 before starting a packaging cycle.

1. Select the desired programme.
   Press the ► button or the ▼ button.
2. Put the product/products in place.
   a. Put the product/products in the vacuum bag.
   b. Place the vacuum bag in/on the vacuum chamber. Make sure the opening(s) is/are correctly placed with regard to the seal position(s).
3. Close the lid.
   The packaging cycle will start.

6.2.4 Proceeding to the Next Step in the Cycle

For some products, it may be necessary to proceed to the next step in the packaging cycle before the vacuum time or the vacuum level has been reached.

1. Proceed to the next step in the cycle.
   Press the ► button.
   The next step will be started.

6.2.5 Changing the Programme Settings

Users can view the machine programmes and activate the functions in the navigation mode. This is the mode that appears immediately after start-up.

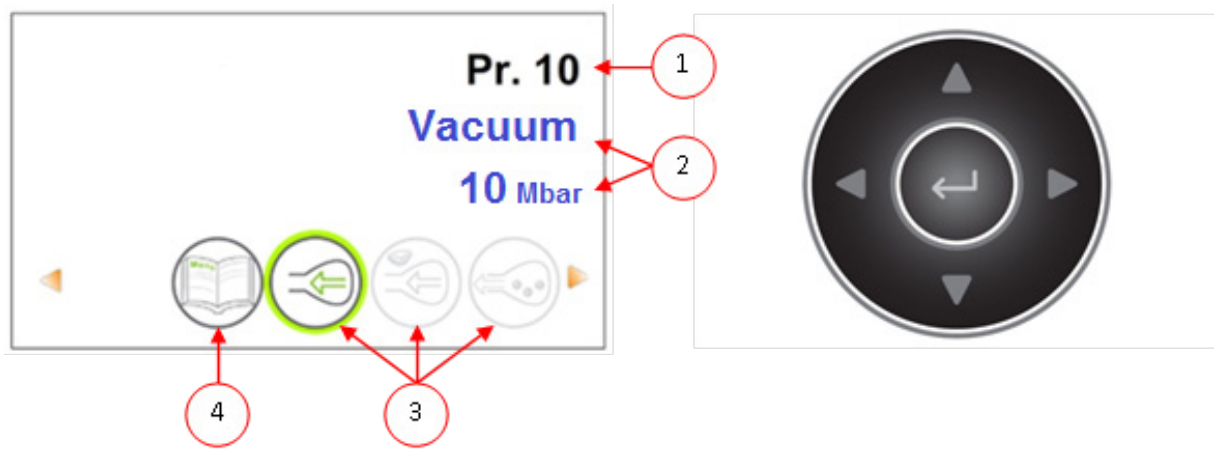

Figure 17: Screenshot of the navigation mode and the operating buttons of the ACS

No.	Element	Explanation
1.	Programme number/name	The programme shows the currently selected, pre-set programme. By switching to a different programme, other functions will be activated. The programme selection depends on the product being packaged.
2.	Functions	These functions are active or inactive. If a function is active, it is displayed in a blue shade. If a function is inactive, it is displayed in a grey shade.
3.	Function active/inactive	The selected function is marked with a green circle. The name and current value of this function will appear on the screen. If the + functions are activated, the + is indicated in colour. If these functions are not active, they are displayed in a grey shade.
4.	Menu	The machine settings can be adjusted via the Menu pictogram at the left of the function overview.

1. Press the ▲ or ▼ buttons to select the desired programme.
2. Press the ◄ or ► buttons to view the functions.
3. After selecting the desired function, press **Enter** to view and adjust the function settings.

   Users can view the pre-set configuration and the owner is also authorised to change it.
4. Select the Machine Settings menu and press **Enter** to adjust the machine settings.

   This menu can only be accessed by the owner. See *Guideline for Function Values* on page 62 for the possible limit values of the function values.

6.2.5.1 Programming the ACS Control Using the PC

You can import labels and programmes from a USB stick by inserting the stick into the USB port of your machine. You can create the data to be imported using the online software that is available on: *http://acs-configurator.com*.

Before you set-up the next programme or label, please make sure you have saved the previous one.

Follow the steps below:

1. Click on the link of the LX Software.
2. Click on the **Programmes** or **Labels** button, to start your settings. You can also click on **Select a file to import** to import existing programmes and/or labels from the machine.
3. Enter the necessary information.
4. Click on **Save** to save the programme or label.

   Each programme and label should be stored separately using the **Save** button.

After saving the programmes and labels into the configurator, you can save the file with the labels or programmes on your computer or directly on a USB stick:

5. Click on **Save all programmes/labels** to export programmes or labels.
6. Choose **Save as** to save the file on the correct location.

Do not change de name of the files labels.txt and programs.txt. Otherwise the machine will not be able recognise the files.

Use an empty USB stick to export the files to your machine.

To import the programmes and labels into the machine, follow the steps below:

7. Insert a USB stick into the USB port of the machine.
8. In the menu, go to **Import/Export** and import the data.

Your machine must be equipped with the chosen options, since not all options are standard on our machinery.

6.2.5.2 Functions

The built-in functions of the machine can be enabled or disabled by the owner under Settings. See *Changing the ACS Settings* on page 44. The options of the various programmes can then be programmed.

6.2.5.3 Vacuum

During the cycle, the air is removed from the chamber until the set pressure has been reached (sensor-controlled).

To set the vacuum level, follow the steps below:

1. Press the cursor keys ◄ and ► and select the programme Vacuum.
2. Press **Enter** to open the menu.

3. If Vacuum is not enabled, enable it. Press **Enter** and use the cursor keys ▲ and ▼ to turn ON Vacuum. Press **Enter**.
4. Use the cursor keys ▲ and ▼ to go to the value for the Vacuum and press **Enter**.
5. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
6. Press the cursor key ◄ to return to the menu.
7. Close the lid to start the vacuum cycle.

6.2.5.4 Vacuum (automatic)

During the cycle, the air is removed from the chamber until the set pressure has been reached (sensor-controlled).

To set the vacuum level automatically, follow the steps below:

1. Press the cursor keys ◄ and ► and select the programme Vacuum.
2. Press **Enter** to open the menu.
3. If Vacuum is not enabled, enable it. Press **Enter** and use the cursor keys ▲ and ▼ to turn ON Vacuum. Press **Enter**.
4. Use the cursor keys ▲ and ▼ to go to the value for the Vacuum and press **Enter**.
5. Close the lid.
   The vacuum cycle starts to run.
6. When you reached the desired vacuum level, press the cursor key ► to go to the next phase of the packaging cycle.

When the cycle is finished, a message will appear.

7. If you want to save, press **enter** to confirm.

6.2.5.5 Vacuum+ (optional)

If a lot of air is trapped in the product, it may be desirable to extend the vacuuming time after the maximum vacuum has been reached. This to allow entrapped air to escape from the product.

You can only set Vacuum+ if Vacuum has been set to at least 99%. To set the Vacuum+ option, follow the steps below:

1. Set the value of the Vacuum to at least 99% as described in *Vacuum* on page 50.
2. Enable Vacuum+. Use the cursor keys ▲ and ▼ to go to the value for the Vacuum+ and press **Enter**.
3. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
4. Press the cursor key ◄ to return to the menu.
5. Close the lid to start the vacuum cycle.

6.2.5.6 Gas (optional)

For the protection of the product, it may be desirable to insert a gas into the packaging after vacuuming. Optionally, the machine can be equipped with a gas flush system.

See *Technical Data* on page 82 for the connection details.

Never use a gas mixture containing more than 20% oxygen or other explosive gases. This may cause life-threatening explosions.

The insertion of gas lowers the seal pressure. The minimum final pressure (after the insertion of gas) must be 30% (300 mbar) to ensure proper sealing.

To set the Gas function, follow the steps below:

1. Press the cursor keys ▲ and ▼ and select the programme Gas.
2. Press **Enter** to open the menu.
3. If Gas is not enabled, enable it. Press **Enter** and use the cursor keys ▲ and ▼ to turn ON Gas. Press **Enter**.
4. Use the cursor keys ▲ and ▼ to go to the value for Gas and press **Enter**.
5. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
6. Press the cursor key ◄ to return to the menu.
7. Close the lid to start the vacuum cycle.

6.2.5.7 Gas+ (optional)

The Gas+ option only applies if the machine is equipped with the gas option. For some products it may be desirable to insert additional gas into the packaging to create a "balloon packaging". This allows for a better protection of a fragile product. The recommended value for Gas+ is 0.7 seconds.

To set the Gas+ option, follow the steps below:

1. Set the value of Gas in accordance with *Gas (optional)* on page 51.
2. Enable Gas+. Use the cursor keys ▲ and ▼ to go to the value for Gas+ and press **Enter**.
3. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
4. Press the cursor key ◄ to return to the menu.
5. Close the lid to start the vacuum cycle.

6.2.5.8 Liquid Control (optional)

The Liquid Control option can be enabled or disabled for each programme. If the product reaches the boiling point before the set vacuum is reached, the machine will proceed to the next step of the cycle.

To set the Liquid Control option, follow the steps below:

1. Press the cursor keys ◄ and ► and select the programme Liquid Control.
2. Press **Enter** to open the menu.
3. If Liquid Control is not enabled, enable it. Press **Enter** and use the cursor keys ▲ and ▼ to turn ON Liquid Control. Press **Enter**.
4. Use the cursor keys ▲ and ▼ to go to the value for Liquid Control and press **Enter**.
5. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
6. Press the cursor key ◄ to return to the menu.
7. Close the lid to start the vacuum cycle.

The Liquid Control function prevents excessive fluid from being drawn out of the product. This means that if the product reaches the boiling point, the machine will proceed to the next step of the cycle. Depending on the moisture content, the manner in which moisture is bound, the available

surface for evaporation and the temperature, the end vacuum percentage might be limited and there might be too much residual oxygen content present in the package. If the product/process requires packaging with a low residual oxygen content, despite the high moisture content, there are two options:

1. Lower the product temperature. This allows for a deeper vacuum to be reached before the product reaches the boiling point.
2. Use the Liquid Control+ option.

6.2.5.9 Liquid Control+ (optional)

The Liquid Control+ time is set in seconds. This is the time the vacuuming will continue after detection of the evaporation point.

You can only set Liquid Control+ if Liquid Control has been set to the maximum (99.8%). To set the Liquid Control+ option, follow the steps below:

1. Set the value of Liquid Control to the maximum (99.8%) as described in *Liquid Control (optional)* on page 52.
2. Enable Liquid Control+. Use the cursor keys ▲ and ▼ to go to the value for Liquid Control+ and press **Enter**.
3. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
4. Press the cursor key ◄ to return to the menu.
5. Close the lid to start the vacuum cycle.

6.2.5.10 Red Meat (optional)

When packaging large pieces of fresh meat, the product continues to degas during the sealing phase. Since the opening of the vacuum bag is already closed, air pockets may form inside the package after decompressing. This function prevents these air pockets.

To set the Red Meat option, follow the steps below:

1. Press the cursor keys ◄ and ► and select the programme Red Meat.
2. Press **Enter** to open the menu.
3. If Red Meat is not enabled, enable it. Press **Enter** and use cursor key ▲ and ▼ to turn ON Red Meat. Press **Enter**.
4. Use the cursor keys ▲ and ▼ to go to the value for the Ventilation Time and press **Enter**.
5. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
6. Use the cursor keys ▲ and ▼ to go to the value for the Pause Time and press **Enter**.
7. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
8. Press the cursor key ◄ to return to the menu.
9. Close the lid to start the vacuum cycle.

A Red Meat+ function is also available. It works the same as the Vacuum+ function (see *Vacuum+ (optional)* on page 51).

6.2.5.11 Sequential Vacuum (optional)

The Sequential Vacuum option allows you to vacuum in up to 5 steps, alternating vacuuming steps with maintaining periods. Each step increases the vacuum reached in the previous step.

To set the Sequential Vacuum option, follow the steps below:

1. Press the cursor keys ◄ and ► and select the programme Sequential Vacuum.
2. Press **Enter** to open the menu.
3. If Sequential Vacuum is not enabled, enable it. Press **Enter** and use the cursor keys ▲ and ▼ to turn ON Sequential Vacuum. Press **Enter**.
4. Use the cursor keys ▲ and ▼ to go to the value for the Vacuum 1 and press **Enter**.
5. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
6. Use the cursor keys ▲ and ▼ to go to the value for the Time 1 and press **Enter**.
7. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
8. Repeat steps 4 to 7 for the other Vacuum steps (2 to 5) and Times (2 to 5). At each Vacuum step, the value must be higher than that of the previous step.
9. Press the cursor key ◄ to return to the menu.
10. Close the lid to start the vacuum cycle.

6.2.5.12 Marinating (optional)

This function is especially designed to accelerate the marinating of a product. This programme allows definition of up to 5 vacuuming steps with intermediate ventilation steps.

The vacuuming steps have a fixed vacuum value of 80%, except for the last step. The last vacuuming step has an adjustable value of up to 99.8%. This also allows setting Vacuum+. The intermediate ventilation steps have a fixed value of 42%. After the last step, sealing takes place. To set the Marinating option, follow the steps below:

1. Press the cursor keys ◄ and ► and select the Marinating programme.
2. Press **Enter** to open the menu.
3. If Marinating is not enabled, enable it. Press **Enter** and use the cursor key ▲ and ▼ to turn ON Marinating. Press **Enter**.
4. Use the cursor keys ▲ and ▼ to go to the value for the Vacuum of the last step and press **Enter**.
5. Use the cursor keys ▲ and ▼ to go to the number of steps and press **Enter**.
6. Use the cursor keys ▲ and ▼ to set the number of steps and press **Enter**.
7. Press the cursor key ◄ to return to the menu.
8. Close the lid to start the vacuum cycle.

> Vacuuming will take place in the set number of steps of 80% vacuum and 42% ventilation. Then vacuuming will continue until the set vacuum of the last step. If, for instance, 3 steps have been set with an end vacuum of 90%, vacuuming will take place as follows: 80% -> 42% -> 80% -> 42% -> 80% -> 42% -> 90%.

It is also possible to enable Liquid Control. This function will then only be active during the last vacuuming step. If, for instance, 3 vacuuming steps have been defined, Liquid Control will be active during the third step. Liquid Control+ is also possible here, see *Liquid Control+ (optional)* on page 53.

6.2.5.13 Tenderising (optional)

This feature has been designed to keep the chamber at a pre-determined vacuum level for a certain time. This is done to tenderise or degas the product.

To set the Tenderising option, follow the steps below:

1. Press the cursor keys ◄ and ► and select the programme Tenderising.
2. Press **Enter** to open the menu.
3. If Tenderising is not enabled, enable it. Press **Enter** and use the cursor keys ▲ and ▼ to turn ON Tenderising. Press **Enter**.
4. Use the cursor keys ▲ and ▼ to go to the value for the Tenderising and press **Enter**.
5. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
6. Use the cursor keys ▲ and ▼ to go to the value for the Tenderising Time and press **Enter**.
7. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
8. Use the cursor keys ▲ and ▼ to go to the value for Accuracy and press **Enter**.
9. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
10. Press the cursor key ◄ to return to the menu.
11. Close the lid to start the vacuum cycle.

6.2.5.14 Jars (optional)

Fast program specially designed for vacuum sealing jars. Seal and soft-air phase are shut off during this program.

During the cycle, the air is removed from the chamber until the set pressure has been reached. During the fast decompression the lids are being closed. It can also be combined with liquid control, if this is the case, set the values in the liquid control programme (sensor-controlled).

To set the vacuum level, follow the steps below:

1. Press the cursor keys ◄ and ► and select the programme Jars.
2. Press **Enter** to open the menu.
3. If Vacuum is not enabled, enable it. Press **Enter** and use the cursor keys ▲ and ▼ to turn ON Vacuum. Press **Enter**.
4. Use the cursor keys ▲ and ▼ to go to the value for the Vacuum and press **Enter**.
5. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
6. Press the cursor key ◄ to return to the menu.
7. Close the lid to start the vacuum cycle.

6.2.5.15 Seal

This is the time that the sealing wire and/or the cut-off wire are heated. The longer the time, the more heat is transferred to the bag.

As an option, the machine can be equipped with a Seal 1-2 option. This means the seal wire is activated separately from the cut-off wire. This way the cut-off wire can be activated a bit longer, to cut through thicker bags.

To set the Seal option, follow the steps below:

1. Press the cursor keys ◄ and ► and select the programme Seal.

2. Press **Enter** to open the menu.
3. Use the cursor keys ▲ and ▼ to go to the value for the Sealing Time and press **Enter**.
4. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.

When Seal 1-2 is activated, the cut-off time cannot be set lower than the seal time.

5. Press the cursor key ◄ to return to the menu.
6. Close the lid to start sealing.

6.2.5.16 Soft-Air (optional for the Falcon)

This is the time that air is softly released into the chamber after sealing has taken place.

To set the Soft-air function, follow the steps below:

1. Press the cursor keys ▲ and ▼ and select the programme Soft-air.
2. Press **Enter** to open the menu.
3. If Soft-air is not enabled, enable it. Press **Enter** and use the cursor keys ▲ and ▼ to turn Soft-air ON. Press **Enter**.
4. Use the cursor keys ▲ and ▼ to go to the value for the Soft-air time and press **Enter**.
5. Set the desired value using the cursor keys ▲ and ▼ and press **Enter**.
6. Press the cursor key ◄ to return to the menu.
7. Close the lid to start sealing.

6.2.5.17 External Vacuum (optional)

The External Vacuum function allows special food containers to be vacuumed outside the machine. The packaging is vacuumed until a vacuum of 99.8% is reached.

External Vacuum is only available on the Marlin series.

Check in advance whether the relevant food container can withstand and hold a vacuum.

To select the External Vacuum option, follow the steps below:

1. Connect the external vacuum hose to the machine by placing the adapter over the suction inlet (1) in the vacuum chamber.
2. Connect the external vacuum hose to the packaging.
   a. Connect the adapter (3) of the external vacuum hose to the valve of the packaging.
   b. Slide the sliding valve (2) towards the hose (closed position).

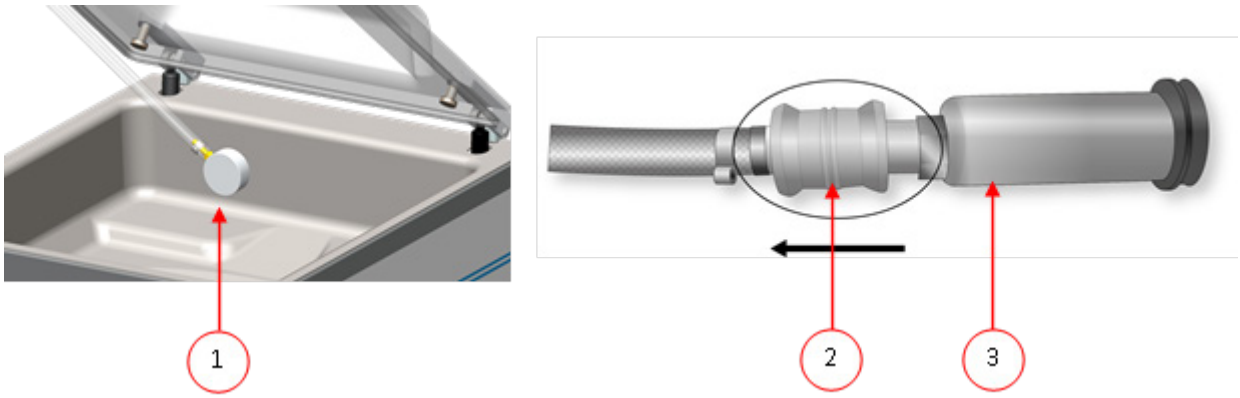

Figure 18: External Vacuum Adapter Set (ACS)

3. Press the cursor keys and select the programme External Vacuum to start vacuuming.
   The packaging is vacuumed until the maximum vacuum is reached.
4. Slide the sliding valve of the adapter towards the packaging (open position) and remove the external vacuum hose from the packaging.

6.2.5.18 Sleeper Option

If the Sleeper option is enabled, the pump will automatically shut off after the set time has elapsed and the machine is not in use during this period. The pump will automatically start again once a new vacuum cycle is started.

By default, the Sleeper option is set to 10 minutes. If you wish to change this time, please contact your supplier.

The Sleeper option cannot be set to less than 1 minute.

6.2.5.19 Dealer Information

If dealer information is entered into the machine, this will be displayed on the start-up screen.

6.2.6 Terminating a Programme

Programmes such as the packaging programme or the pump cleaning programme can be terminated at any time.

1. Terminate the programme.

   Press the **– / STOP** button.

   The programme will be terminated and the vacuum chamber is decompressed.

6.2.7 Printer

A printer can be connected to the machine to print package labels.

6.2.7.1 Connecting a Printer

To connect a printer to the machine, follow the steps below:

1. Connect the printer to the mains supply.
2. Connect the printer to the USB connector on the machine.
3. Turn on the printer.

4. Select the correct printer in the machine menu.
    a. Open the menu.
    b. Enter the owner code 1324.
    c. Go to **Settings**.
    d. Go to **1.1 Printer**.
    e. Select **ZD410**.
    f. Press the cursor key ◂ to return to the menu.

6.2.7.2 Creating a Label

To create a label, perform the steps below:

1. Open the menu.
2. Enter the owner code 1324.
3. Go to **Settings**.
4. Go to **1.1 Printer**.
5. Go to **Labels**.
6. Enter the desired information.
    1. Customer name
    2. Label number
    3. Name
    4. Info
    5. Use by / Storage life
    6. Storage temperature
    7. Print customer name Y/N
    8. Print info Y/N
    9. Print achieved vacuum Y/N
    10. Print expiry date Y/N
    11. Print user Y/N
    12. Print storage temperature Y/N

Once the printer is selected and the required information for the label is entered, the printer can be activated on each separate programme. To do this, go to the main menu, all the way to the right. Here you can enable or disable the printer and select the label number you require. You can also select the number of labels you require per cycle.

If you require an additional label after the complete cycle has ended and all labels have already been printed, select the **Print extra label** option. This will print the last printed label again.

6.2.7.3 Replacing a Printer Roll

Follow the steps below to place the label roll in the printer.

Despite the inner diameter of the label roll being bigger than the holder, the roll can be used without any issues.

**For different temperatures, please contact your dealer.

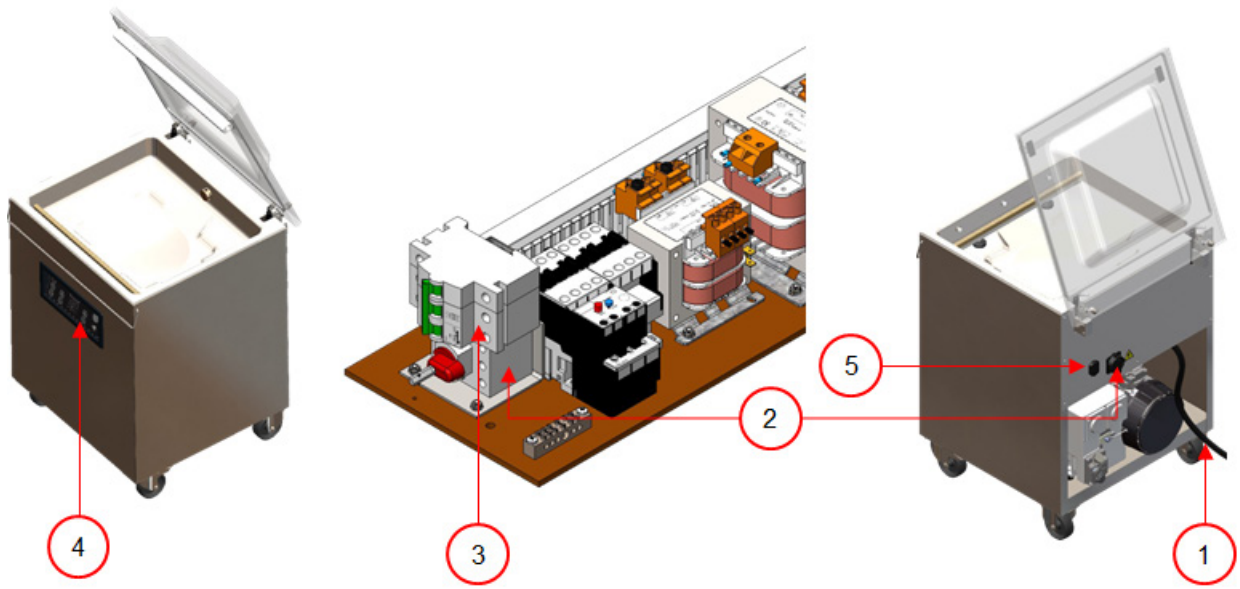

Figure 33: Overview of the Electrical Installation

1. **Power connection and cable**
   This serves to connect the machine to the power supply. The machine is supplied without an electrical plug.
2. **Main switch**
   This switch is used to switch the machine ON and OFF.
3. **Circuit breaker**
   Protects against overload or a short circuit. Also see *Troubleshooting and Error Codes* on page 77.
4. **Control panel**
   This serves to operate the control functions. Depending on your model, your machine will have one of the following control options:

   - *Operating Elements* on page 31
   - *Operating Elements* on page 43
5. **USB connector (only in case of ACS control)**
   The USB connector is located on the side of the control box, which is located behind the rear wall. Reaching the USB connector requires removing the rear wall.

After opening the cover of the USB connector, the machine is no longer waterproof (IP65).

The USB connector enables the import and export of data.