Instruction manual

milk cooling tank

VM/DX

iControl

196403 - September 2015

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About this manual

The importance of milk cooling tanks

The company PACKO INOX N.V. thanks you for choosing one of its products. It hopes it may also count you as one of its satisfied customers. That is why it does everything possible to inform and be of service to you as well as possible.

The milk cooling tank is an important link between milk as a natural product, collected at the dairy farm, and the dairy products which are made from it at the dairy factory.

The main objective of cooling is that the milk can be kept 2 to 3 days, without loss of quality. That is why it is necessary to get the fresh milk into the milk cooling tanks as quickly and cleanly as possible and start cooling straight away.

In this manual you will find …

This manual was drawn up to make you familiar with the use of the milk cooling tank. You will find:

- A description of how the system works.
- Procedures for the correct operation and maintenance of the system.
- Procedures for solving small problems.
- Safety instructions.

Please read this manual carefully before you start to use the machine. A minimum of effort beforehand reading the instructions guarantees you a maximum return on and a long life of your investment.

Continued on next page

About this manual, *Continued*

Use of the icons

A number of icons are used in this manual, to draw your attention to, for example, safety information. The table below provides an overview of the icons used and what they mean:

Icon	Meaning	Description
	Remark	A remark provides additional information about a certain topic. The information in a remark is not invaluable, but can be useful.
	Attention!	If you do not follow the directions precisely, then: • The system can be damaged (in this case, damage is not covered by the warranty) • The quality of the milk can be affected.
	Warning!	A warning draws your attention to a possible danger or risk of personal injury.

Procedures

The procedures in this manual have been divided into numbered steps. The steps should be carried out in the order described.

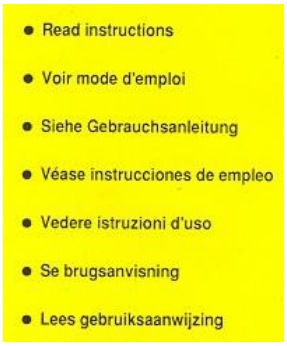
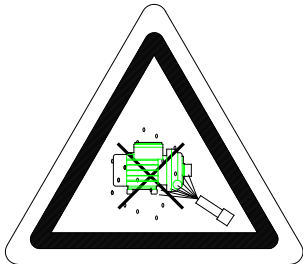
Changes

The company PACKO INOX N.V. reserves the right to make changes to the manual at any time and without prior notice.

Safety instructions

Stickers

The stickers below can be fixed on to your tank to assure the safety of the use of the tank. They cannot be removed according to the CE regulations:

Sticker	Instructions
	The machine or part of it, are built according to the CE regulations.
	You are invited to read the instructions.
	Danger : machinery connected to electrical network
	Do not spray water on the motor.
	Do not spray water on the pump.

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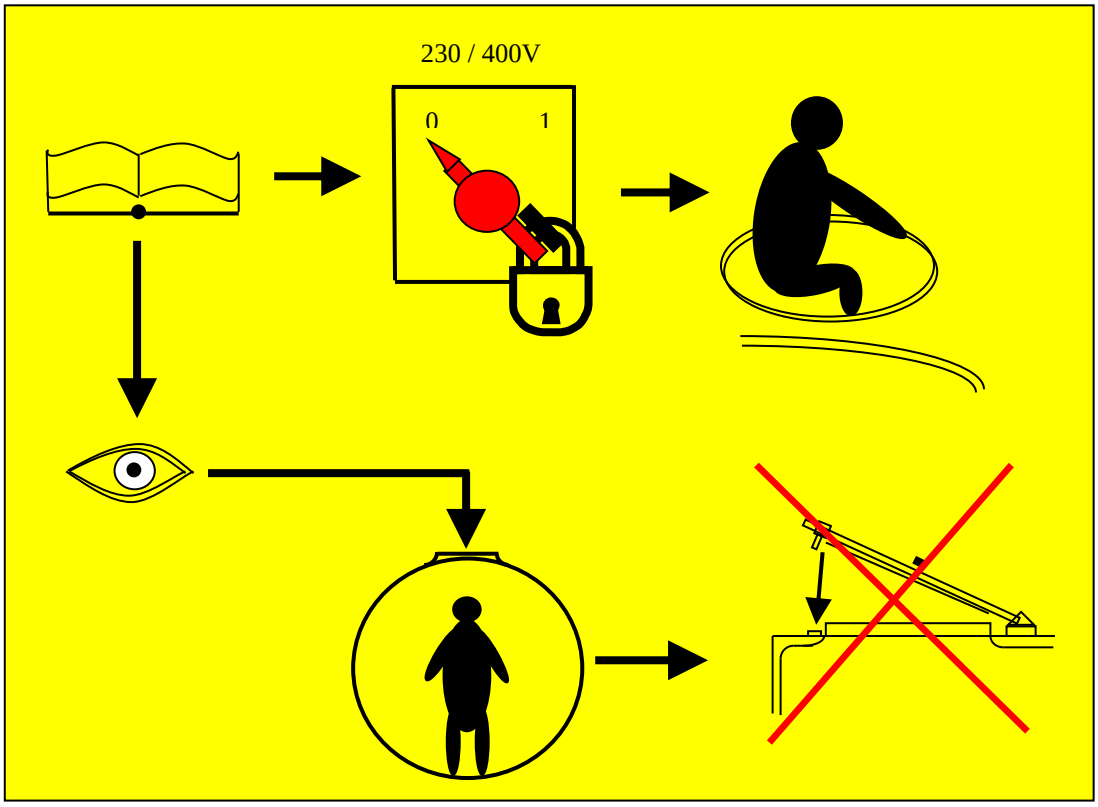
Safety instructions, *Continued*

Stickers
(continued))

Sticker	Instructions
	Switch off and lock the main switch before entering the tank. Insure there is nobody in the tank before closing the manhole cover.

Maintenance and repairs

Only **trained personnel** may carry out maintenance or repairs.

Electricity

Before doing the following, turn the **main switch** to 0 or OFF and lock it:

- Before opening the electrical control box of the tank.
- Before the servicing of the milk cooling tank.
- Before checking the agitator blades, spray balls or the inner vessel.
- In case of electrical or mechanical faults, inform the installer immediately.

Make sure that your hands are **dry** when you use the buttons.

Continued on next page

Safety instructions, *Continued*

Being in the tank

If someone has to get into the tank for specific work, this should be done under **supervision**, and only when the **power has been switched off**. It must not be possible for the agitator to start. That is why you should always turn the main switch to 0 or OFF and lock it.

Cleaning

Never spray water under high pressure at the milk cooling tank.

Keep cleaning agents away from children and animals. Read the packaging or the instructions carefully and always follow the **safety instructions**.
Wear protective **gloves** and **safety goggles** whilst using the cleaning agents.

Cooling unit

Never sit, lean or place any foreign objects on the cooling unit.

Do not put anything in front of the condenser. This will reduce air circulation and affect cooling efficiency.

General

- **Only** use the tank **for milk**. The tank is not suitable for other fluids or solids.
- Do not put anything on the tank.
- Always wear sturdy, anti-slip footwear when using the **steps**.
- Always hold the **handle** of the manhole lid when opening or closing the manhole to insure your hands cannot get caught between the tank and the lid.

General description

Overview

Introduction This chapter introduces your milk cooling tank.

Contents

About your milk cooling tank

General specifications

- The average sound level of the tank (excl. cooling unit) in the working area is less than 70 dBa.
- Electrical connections:

  Tank: 200 – 240V / 50-60 Hz nominal

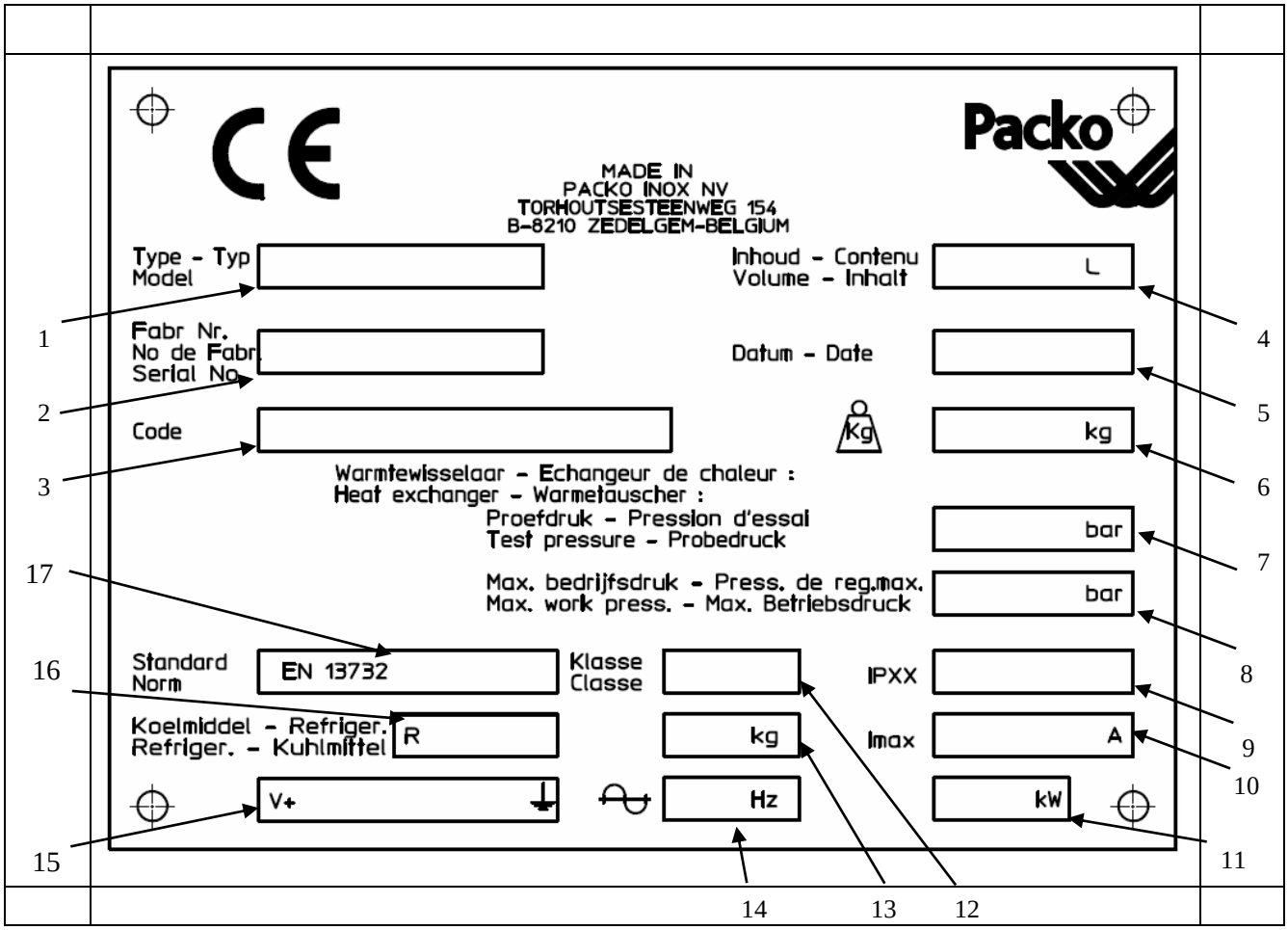
  No harmonic interferences

  Condensing unit: - Single-phase : 230 V / 50-60 Hz nominal

  - Three-phase: 3 x 400 V / 50-60 Hz nominal (3Ph+N)
- A protection against low voltage must be installed
- Ambient conditions : ambient temperature :

  The tank is operational between -10°C and + 50°C

  The tank can be stored between -20°C and + 70°C
- On the tank a fabrication plate is installed on which you find the following information :



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About your milk cooling tank, *Continued*

General specifications *(continued)*

Item	Function	Item	Function
1	Type of tank: e.g. REM/DX	**10**	Max. operating current (A)
2	Serial number	**11**	The absorbed power (kW)
3	Internal code	**12**	Performance class of the tank (e.g. 2BII)
4	Nominal volume of the tank (L)	**13**	Nominal kg cooling agent to be charged to the cooling unit
5	Fabrication date	**14**	Frequency (Hz)
6	Weight of the tank (kg)	**15**	Voltage (e.g. 3 x 400 V + N)
7	Test pressure of the heat exchanger (bar)	**16**	Type of cooling agent (e.g. R404A)
8	Working pressure of the heat exchanger (bar)	**17**	Manufactured according European standard. (e.g. EN13732)
9	Protection grade of the control cabinet (e.g. IP24)		

About your milk cooling tank

Your installation is a milk cooling tank of the closed type with cooling by means of Direct Expansion (DX). It is a compact and complete installation, suitable for cooling and storing freshly collected milk equipped with the iControl operating system.

The milk cooling tank has systems to:

- Automatically keep the milk at the right temperature.
- Keep the milk homogenous.
- Clean the inside of the tank automatically and hygienically.

Cooling

At the beginning of the first milking, you must start the cooling. From then onwards the automatic cooling system keeps the milk at the right temperature.

The objective of cooling the milk is:

- To maintain optimum quality of the milk.
- To keep the milk for a longer period of time.

For more information about the automatic and accelerated start of cooling, see "Additional information".

Continued on next page

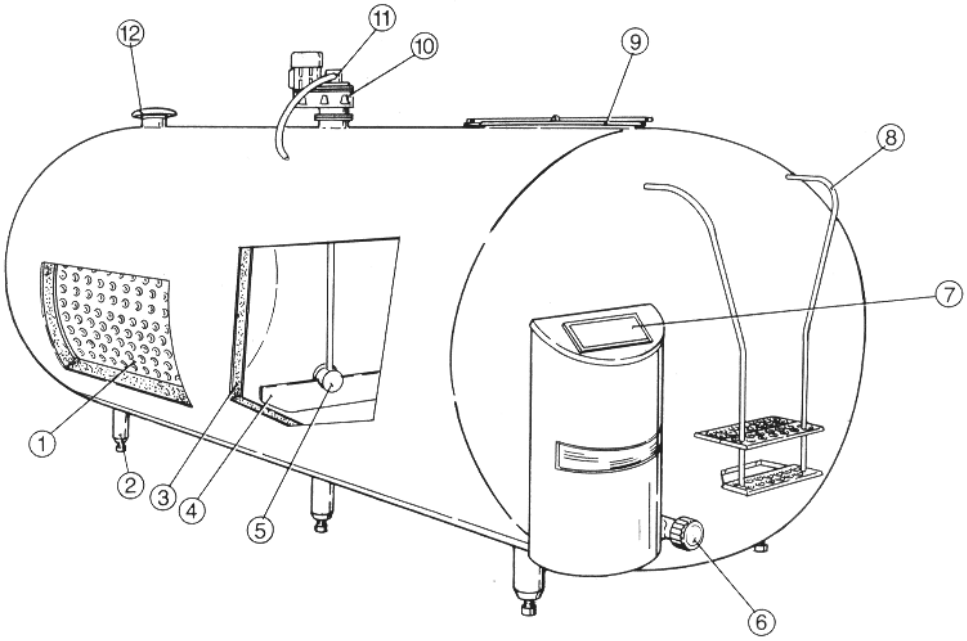
About your milk cooling tank, Continued*Continued*

Agitation	The automatic agitation system ensures that the milk is stirred during cooling. You can also agitate the milk manually. For more information about agitation, see "Additional information".
Cleaning	As it is difficult or even impossible to manually clean a closed tank, all closed tanks are equipped with an automatic cleaning system. For more information about cleaning, see "Additional information".

Parts of the closed milk cooling tank

Illustration

The drawing below shows the most important parts of the milk cooling tank.



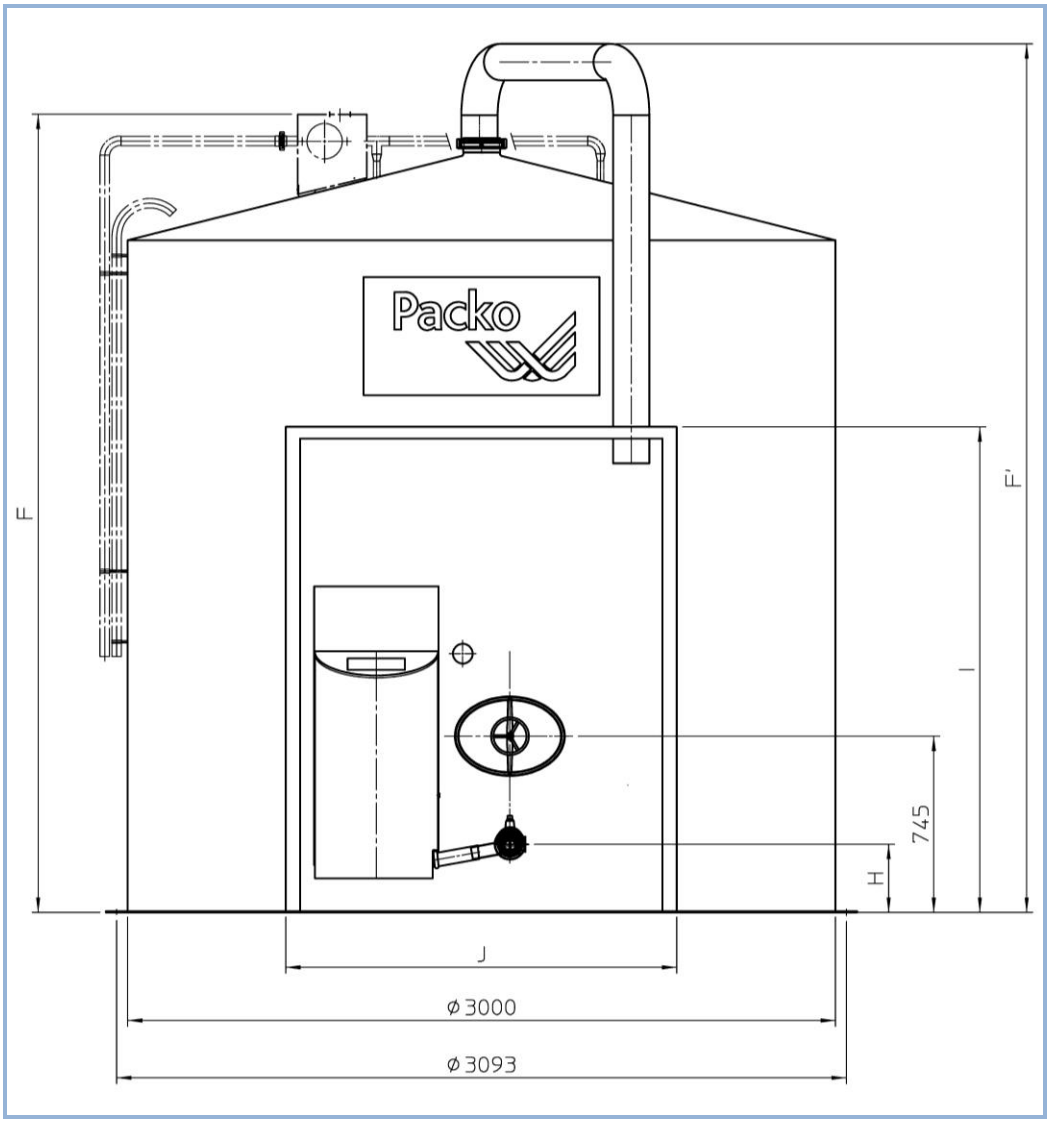
The shape of the tank and the control panel may be round or oval, depending on the type.

Parts

The table below provides an overview of all the parts:

Part	Description
1	Evaporator
2	Adjustable legs
3	Insulation layer
4	Agitator
5	Spray ball
6	Milk outlet
7	Control panel
8	Steps
9	Manhole, manhole cover with milk inlet opening
10	Agitator motor
11	Pressure pipe for cleaning
12	Vent (the vent hole can be used as a milk inlet)

Table of measurements and weights of the VM/DX model



Model	**Max. Cap** with top manhole	**Max. Cap** without top manhole	**F**	**F'**	**H**	**I**	**J**	**Weight** With control unit & alcove	**Weight** Without control unit & alcove
	Litres	*Litres*	*mm*	*mm*	*mm*	*mm*	*mm*	*kg*	*kg*
12000	12622	13117	2850	3160	260	2050	1640	2043	1820
15500	16123	16618	3380	3690	260	2050	1640	2153	1930
18000	18587	19082	3755	4065	260	2050	1640	2263	2040
21000	21658	22153	4220	4530	260	2050	1640	2393	2170
25000	25787	26282	4840	5150	260	2050	1640	2543	2320
30000	30985	31480	5630	5940	260	2050	1640	2818	2595
35000	36104	36599	6405	6715	260	2050	1640	3033	2810

☞ 6 fixation holes Ø 30 mm, evenly spread over the circumference (6 x 60°) – fitting material not included

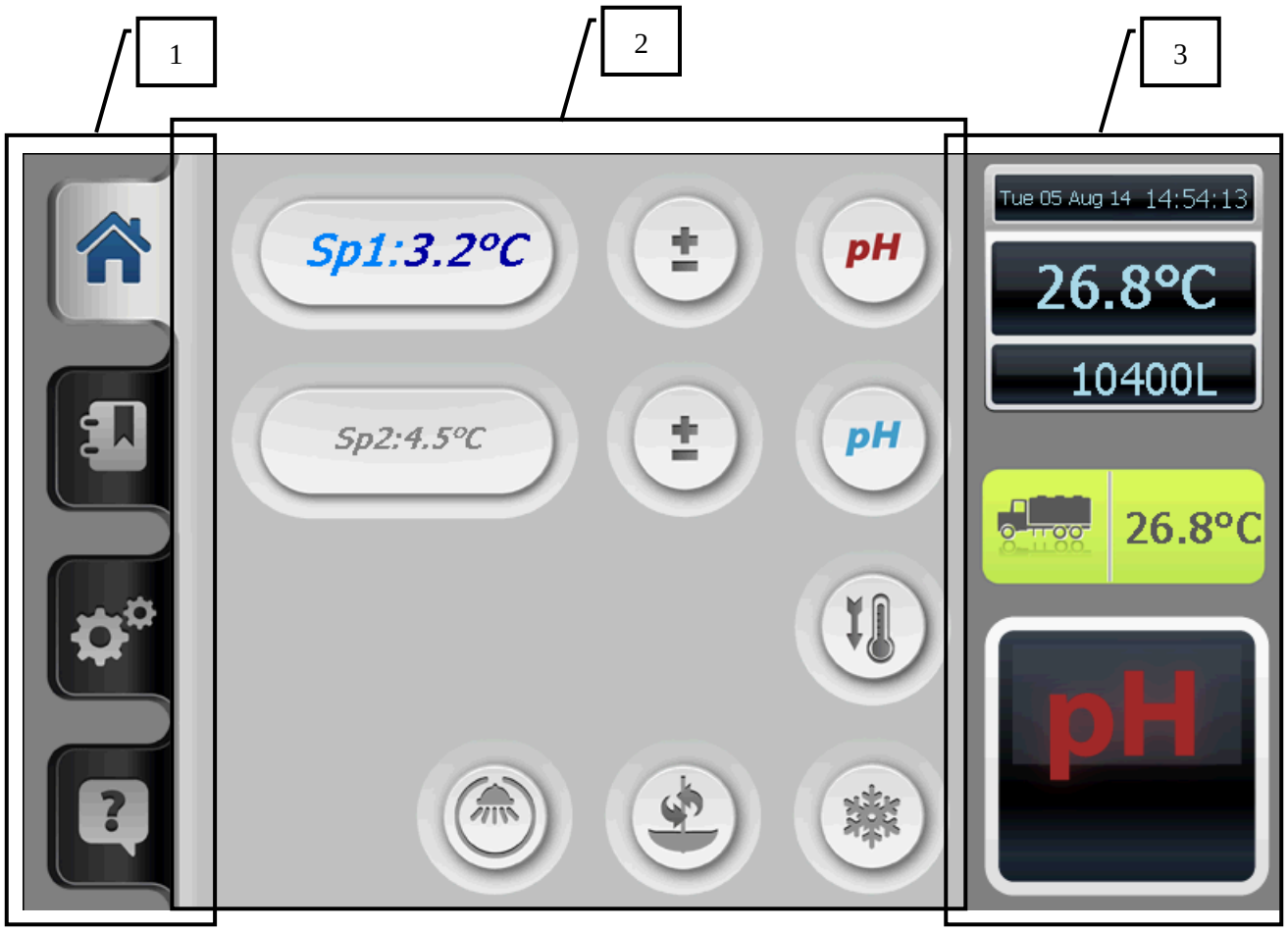
Options

Automatic dosing	With the automatic dosing, the system ensures that the right amount of cleaning agent is automatically taken into the cleaning water. The alternation of cleaning products occurs automatically
ECO-WASH	This is an automatic cleaning system that reduces the cleaning time to 50% of the standard automatic cleaning system. Another advantage is the reduction of the water consumption. ECO-WASH is only used in combination with automatic-dosage.
Manual cooling	Your milk cooling tank can be equipped with timers that allow you to manually activate cooling in case of a breakdown of all automatic functions.
Separation of the rinse waters	With the standard outlet, all the cleaning water runs into the sewer. A second drain valve can be fitted to allow the milky water remains of the first rinse be piped to a separate drain.
Second detergent container	Using the second detergent container, allows you to add a disinfectant to the final rinse water.
More information?	If you would like more information about one of the options, please consult your after-sales department.

The iControl control panel

You can operate all functions of the cooling tank easily via the control panel. The panel consists of a high resolution 7” touch screen.

We differentiate three areas in the screen.



1 Tabs: Home – Logging – Settings - Help

2 Function screen: this displays the active cycle; if no cycle is active then the basis screen is displayed

3 Status screen: this displays the following:

- Date and time
- Actual temperature product sensor
- Actual temperature Oculus sensor
- Cleaning product to be taken or active cycle
- In option: volume indication

Use of the keys

In order to select a function, you must always keep the relevant key pressed in for 3 seconds. This avoids a function being started up ‘by accident’.

If the iControl does not display a clear, illuminated screen, briefly press a key in order allow the screen to light up, then the desired function may be selected by pressing for at least 3 seconds.

Components

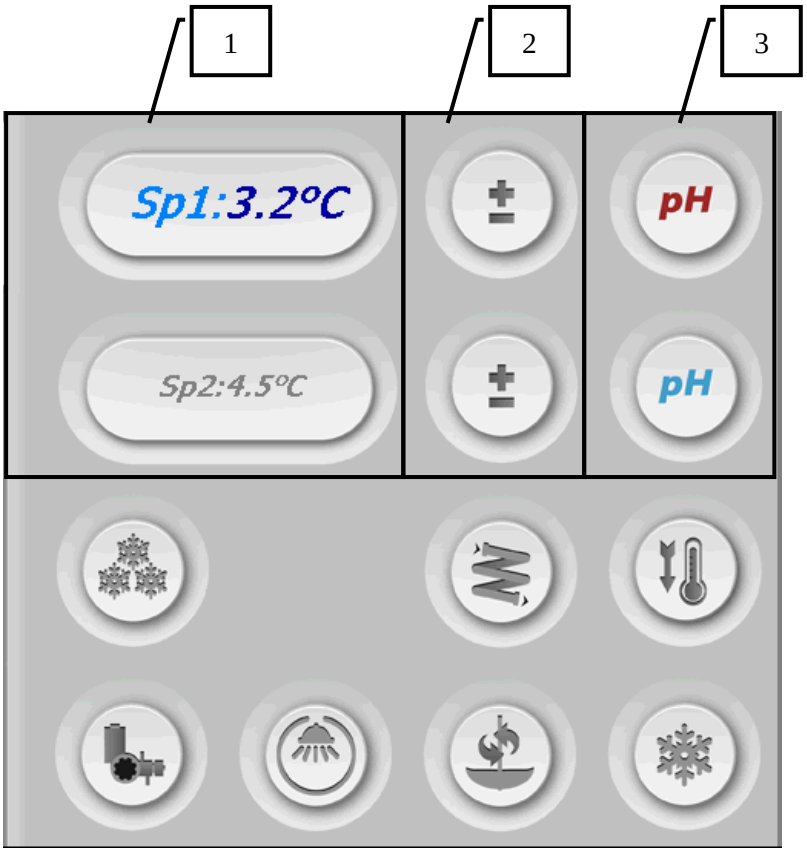
Home tab

Logging tab

Settings tab

Help tab

The following table gives an overview of all components of the function screen:



Nr.	Component	Description
1	Sp1 Sp2	• The two possible set points : Sp1/Sp2 with their value (the active set point is displayed in colour)
2		• Adjustment of the set points
3	pH	• Selection keys for the select of the cleaning product that will be used for the following cleaning.
4		• Cooling
		• Cleaning
		• Stirring • Pressing 1x starts the agitator for a short time. • Pressing 2x starts the agitator for a long time.
		• Deep cooling

Nr.	Component	Description
		• Instant cooling, this key is only visible if the relevant parameters have been activated.
		• Precooling, this key is only visible if the relevant parameter is activated.
		• Opening or closing pneumatic exhaust valve, this button is only visible if the relevant parameter is activated.
		• Stopping robot and cooling, this key is only visible if the relevant parameter is activated and if the cooling is active.
		• Off key, sets the control into standby. This key is only visible if a cycle is active.

The iControl control panel, *Continued*

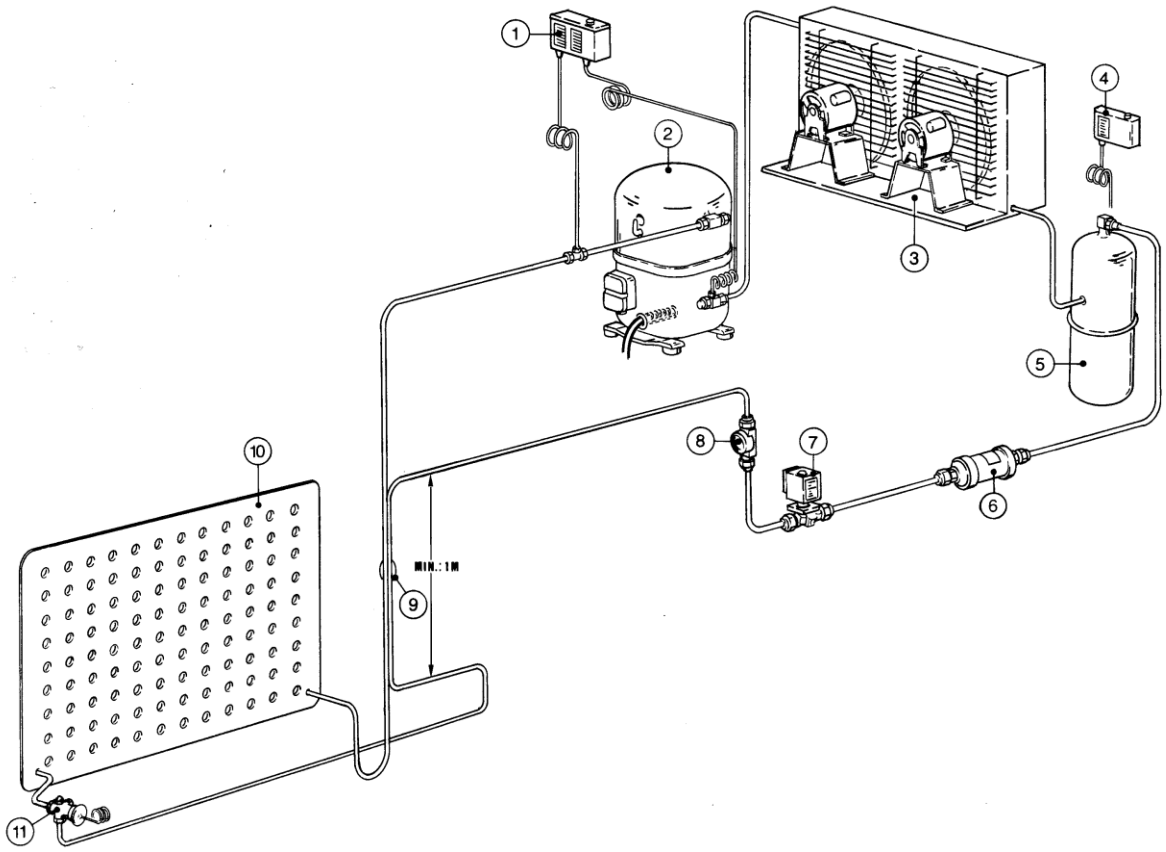
Operation

The table below describes how the DX cooling system works.

Phase	Description
1	The compressor (2) extracts the gaseous cooling agent under low pressure from the evaporator (10), and forces it under high pressure and high temperature to the condenser (3).
2	The ventilator blows air over the cooling fins of the condenser, so that the gas condenses into a fluid at a low temperature.
3	The fluid created in this way leaves the condenser under high pressure.
4	The thermostatic expansion valve (11) injects the fluid into the evaporator (10).
5	The fluid in the evaporator takes the heat from the milk in the tank and evaporates. This is how the milk is cooled.
6	The compressor (2) extracts the gas created and the cycle starts again.

The DX cooling system

Schedule The drawing below shows the DX cooling system schematically:



Parts The table below provides an overview of the parts of the DX cooling system:

No	Description	No	Description
1	High and low pressure switch	**7**	Solenoid valve
2	Compressor	**8**	Sight-glass
3	Air-cooled ventilator condenser	**9**	Heat Exchanger (option)
4	High-pressure switch (option)	**10**	Evaporator
5	Liquid receiver	**11**	Thermostatic expansion valve
6	Filter drier		

Continued on next page

The DX cooling system, *Continued*

Operation

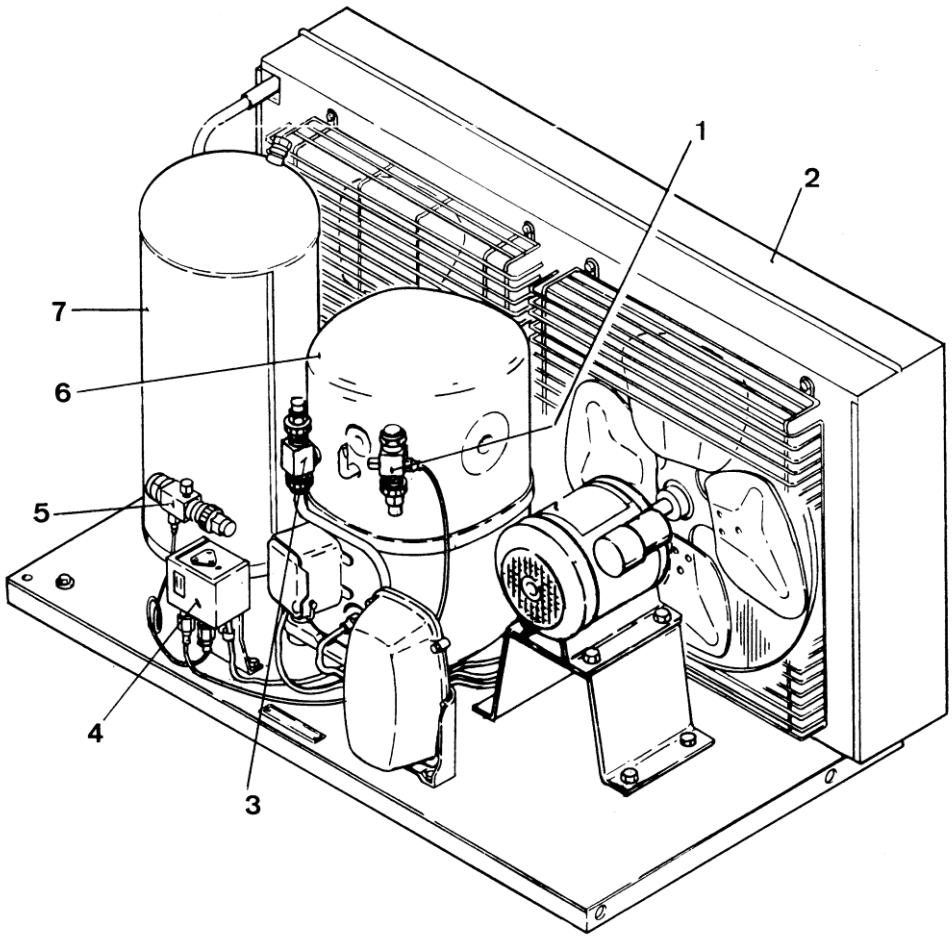
The table below describes the operation of the DX cooling system.

Phase	Description
1	The compressor (2) sucks the refrigerant at low pressure from the evaporator (10) and compresses it at high pressure and high temperature to the condenser (3).
2	The ventilator blows air over the cooling ribs of the condenser, in order to condense the gas and form liquid at low temperature.
3	The resulting liquid leaves the condenser under high pressure.
4	The thermostatic expansion valve (11) sprays the liquid into the evaporator (10).
5	The liquid contained in the evaporator absorbs the heat from the milk in the tank and evaporates. In this manner the milk is cooled.
6	The compressor (2) collects the resulting gas and the cycle starts all over again.

The cooling unit

Illustration

The drawing below shows the most important parts of a cooling unit supplied by Packo. As not all the parts are standard, you will perhaps not find all of them in your cooling unit.



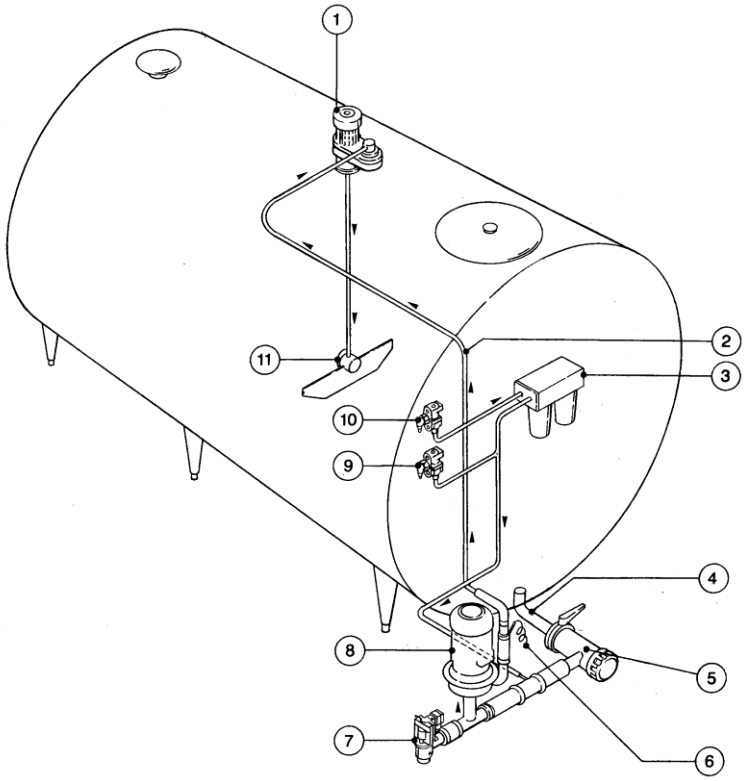
Parts

Element	Function
1	Suction valve
2	Condenser
3	High-pressure valve
4	High and low-pressure switch
5	Liquid receiver valve
6	Compressor
7	Liquid receiver

The standard automatic cleaning system

Picture

This drawing represents the standard automatic cleaning system.



Parts

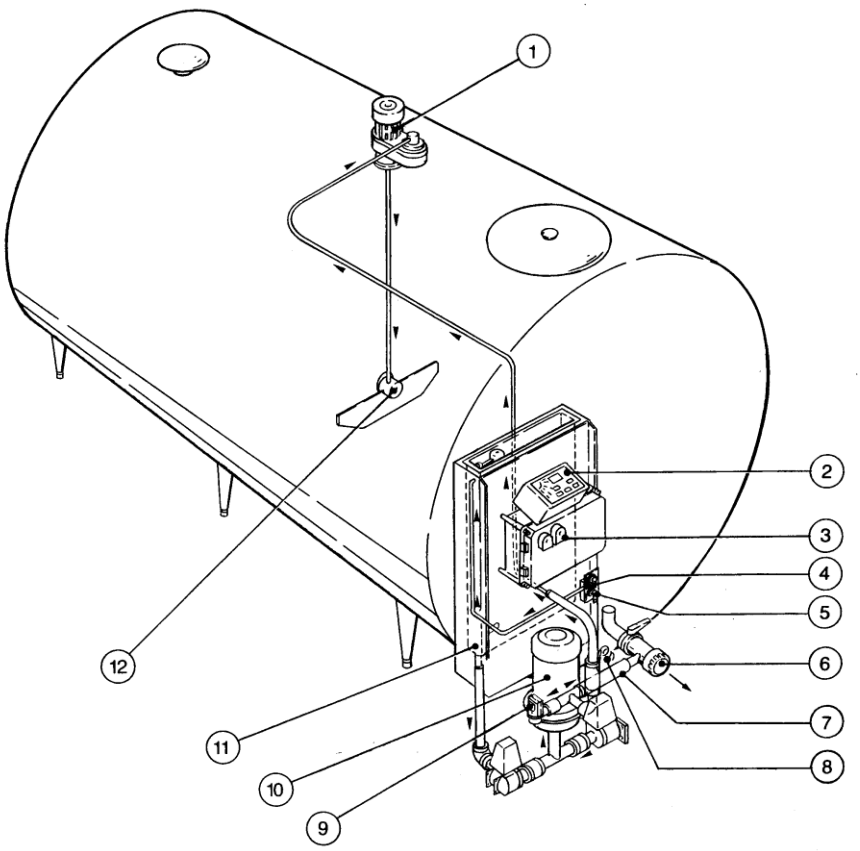
The table below provides an overview of the parts of the standard cleaning system. The arrows indicate the flow of the cleaning water.

N°	Description	N°	Description
1	Agitator motor with rotating water coupling	**7**	Dump valve
2	Pressure pipe	**8**	Cleaning pump
3	Water box with dozing pumps	**9**	Water valve with connector for cold water
4	Outlet tank	**10**	Water valve with connector for hot water
5	Self washing outlet	**11**	Roto-Jet Spray ball
6	Level sensor for the cleaning water		

The ECO-WASH automatic cleaning system

Picture

This drawing represents the ECO-WASH automatic cleaning system.



Parts

The table below provides an overview of the parts of the standard cleaning system. The arrows indicate the flow of the cleaning water.

N°	Description	N°	Description
1	Agitator motor with rotating water coupling	**7**	Suction pipe of the cleaning pump
2	The iControl control panel	**8**	Level sensor of the cleaning water
3	The dosage pumps for the cleaning agent.	**9**	Dump valve
4	Water valve with connector for hot water	**10**	Cleaning pump
5	Water valve with connector for cold water	**11**	Water reservoir
6	Milk outlet (optional self-cleaning outlet)	**12**	Roto-Jet Spray ball

Normal use

Overview

Introduction

This chapter describes the general operating procedures. They have been divided into numbered steps. The steps must be carried out in the order described.

Contents

Starting cooling for the first milking

Attention

To take effect, a button must always be pressed for 3 seconds. This prevents a function being started up accidentally.

Warning

- With milkings <10% of the tank volume, do not start the cooling unit before the end of the milking. This will avoid freezing the milk.
- Do not start the cooling unit when the tank is empty.

How to start the cooling

To start the cooling for the first milking, follow the steps below:

Step	Action
1	Press the “off” key  . Other functions (such as cleaning) are stopped and the system prepares for cooling. tanks DX : It is possible that the cooling unit works briefly
2	Check that the inside of the tank is clean.
3	Check that the rinse water has been drained from the tank.
4	Close the outlet valve.
5	Close the manhole cover.
6	Attach the blank cap to the milk outlet and remove the detergent container(s) if temperature drops below zero degrees.
7	Check whether the vent has been fitted.
8	Remove the rubber bung from the milk inlet opening and attach the milk supply pipe.
9	If necessary, choose the temperature set point (see "Temperature setpoints").
10	Press the “cooling” key once  .
11	Let the milk run into the tank. The cooling will start automatically when the preset delay has passed.
12	When all the milk has run into the tank, remove the milk supply pipe to clean it thoroughly and put the rubber bung back in the milk inlet.
13	Check the temperature when the work has finished and before leaving the milking parlour.

Second and subsequent milkings

Attention

To take effect, a button must always be pressed for a second. This prevents a function being started up accidentally.

Cooling control

Check if the cooling is still active. If not, follow the procedure for starting a first milking.

Restart

To speed up the cooling reboot, follow this procedure

What to do?

For a second or subsequent milking, follow the steps below:

Step	Action
1	Press the "stir" key  twice to stir the milk in the tank during the adjusted time (P2.2) (standard = 30 min.). On the display is indicated that the agitator the activated. This ensures that the fresh, warm milk is mixed more quickly with the milk, which has already been cooled.
2	Remove the rubber plug from the milk inlet opening and attach the milk supply pipe.
3	Let the fresh milk run into the tank. The cooling starts when the temperature of the milk reaches the upper limit. (Upper limit = set point (P1.1 or P1.2) + differential (P1.4)).
4	When the milk has run into the tank, remove the milk supply pipe, clean it thoroughly and place the rubber plug back in the milk inlet.

Continued on next page

Second and subsequent milkings, *Continued*

Accelerated start of the cooling

You can also give the cooling an accelerated start for a subsequent milking. The cooling starts immediately, without taking the timer into account and before temperature of 4°C.

*With DX-tanks, you may **not** use the accelerated start of the cooling if the tank is filled with less than 10 %. (Danger of Freezing)*

How to start the accelerated cooling (Deep Cooling)

To start the accelerated cooling, follow the steps below:

Step	Action
1	Press the deep cooling button twice  . The cooling starts immediately. The time for the deep cooling is indicated on the display.
2	Remove the rubber plug from the milk inlet and attach the milk supply pipe.
3	Let the fresh milk run into the tank.
4	When all the milk has run into the tank, remove the milk supply pipe, clean it thoroughly and place the rubber bung back in the milk inlet.

Emptying the tank

Attention

To take effect, always press key for a second. This prevents the function being started accidentally.

Collecting the milk

To empty the tank, follow the steps below:

Step	Action
1	Press the “off” key  , by automatically milking press the  button. This stops the cooling.
2	If the amount of milk in the tank has to be determined with the dipstick, take the following steps:
3	Press the “stir” key once to stir the milk in the tank during the adjusted time (P2.1) (standard = 2 min.). ‘Manual agitation’ is flickering on the screen.
4	Check whether the vent is mounted on the tank. If not, open the manhole cover.
5	Remove the screw cap of the milk outlet.
6	Attach the suction pipe of the tanker to the outlet pipe of the milk-cooling tank.
7	Open the outlet valve and start emptying the tank.
8	When the tank is empty, remove the suction pipe of the tanker.
9	Clean the tank as described in the following chapters: "Cleaning with the standard system" or "Cleaning with automatic dosing".

Step	Action
1	Wait until the milk is still.
2	Read the dipstick on the milk outlet side.
3	Determine the amount of milk using the calibration chart.

Cleaning with the standard system

Attention

To take effect, a button always has to be pressed for 3 seconds. This prevents a function being started up accidentally.

Hot water

 Before starting the cleaning programme check:

- Whether there is sufficient hot water: The total quantity of needed warm water for a complete cleaningcycle is 2 % of the tank content.
- The temperature of the water: this depends on the cleaning agent used. Check the instructions or label of the cleaning product.

Starting cleaning

To clean the inside of a milk cooling tank, follow the steps below:

Step	Action
1	Press the “off” key  or the  button.
2	Screw the special wash cap to the milk outlet or attach the rubber connection with the cleaning pump to the outlet.
3	Check that the hot and cold water taps are open. Ensure that there are no leaks.
4	Close the manhole cover.
5	Check that the vent and the rubber bung are fitted.
6	Open the valve on the milk outlet.
7	Fill the detergent container with the right amount of cleaning agent.(manual dosing) • Follow the instructions enclosed or on the packaging of the cleaning agent. Bear in mind that the amount of water is approximately equal to 1 % of the tank content, but with a minimum of 25 litres. • Make sure the alkaline cleaning agent is not too old. It should not be older than 6 months after the purchase date.
8	If your system has a second detergent container, it should also be filled with the correct amount.
9	Press the “cleaning” key  . The actual step + next step of the cleaning appears on the display.
10	See "After cleaning" for further use.

Cleaning with automatic dosing and/or ECO-WASH

Attention

To take effect, the button must always be pressed for 3 seconds. This prevents a function being started up accidentally.

Hot water

Before starting the cleaning programme, please check:

- Whether there is sufficient hot water: The total quantity of needed warm water for a complete cleaningcycle is 2 % of the tank content.
- The temperature of the water: depends on the cleaning agent used. Check the instructions or packaging of the cleaning product.

Cleaning agent

Before starting the cleaning programme, check the following:

- That there is still sufficient cleaning agent in the drums. Follow the instructions enclosed or on the packaging of the cleaning agent. Bear in mind that the amount of water is approximately equal to 1 % of the tank content, but with a minimum of 25 litres.
- That the alkaline cleaning agent is not too old. It may not be older than 6 months after the purchase date.

Start cleaning

To clean a milk tank with automatic dosing, proceed as follows:

Step	Action
1	Press the “off” key  or the or the  button.
2	Screw the special wash cap to the milk outlet or attach the rubber connection with the cleaning pump to the outlet.
3	If you want to change the cleaning product for the next cleaning cycle compared to the set-ups, you have to press the button of the desired detergent PH red  or PH blue  . The selected cleaning product will be shown in larger characters.
4	Check that the hot and cold water taps are open. Ensure that there are no leaks.
5	Close the manhole cover.
6	Check whether the vent and the rubber bung are applied.
7	Open the valve on the milk outlet.
8	Press the “cleaning” key  . The actual step + next step of the cleaning appears on the display.
9	See "After cleaning" for further use.

After cleaning

Attention

To take effect, you must always press a button for a second. This prevents a function from being started up accidentally.

Starting a second cleaning cycle

For one reason or another it can be necessary to carry out a second cleaning cycle. Follow the steps below:

Step	Action
1	Confirm the messages on the display.
2	Press the “cleaning” key  .

Preparing for a new milking

Before you put milk in an empty and cleaned tank, follow the steps below:

Step	Action
1	Check that the cleaning cycle has ended. A mention ‘cleaning OK’ indicates that the cleaning went fine. In case of the mention ‘cleaning not OK’, you have to follow up the error message and start the cleaning all over again.
2	To confirm the mention cleaning, press the red surface. 
3	Check that the tank is completely empty. If not, let the remaining rinse water run out to the sewer via the outlet tap.
4	Check that the inside of the tank is completely clean.
5	Check that the manhole cover and the seal are clean. If not, they have to be cleaned by hand.
6	Close the outlet tap.
7	Close the manhole cover.
8	Check that the vent and the rubber bung are applied.
9	Attach the special wash cap to the milk outlet and if necessary remove the detergent container(s).

The system is now ready to receive new milk.

Additional information

Cooling, stirring, cleaning

On the pages hereafter you will find additional, general information about cooling, stirring and cleaning:

Taking the milk cooling tank out of service

When, after many years of faithful service, your milk cooling tank has to be replaced, it should be taken out of operation and dismantled in accordance with the local regulations.

Contents

About cooling

Delay

When you start the automatic cooling for the first milking, the system does not always immediately start cooling. A time delay set by the installer, ensures that the cooling may start later. This prevents the first batch of milk you put in the tank from freezing (DX only).

If you want to set the delay to another value, contact your after-sales department.

Automatic cooling

The automatic cooling system works as follows:

Phase	Description
1	When you activate the cooling, the timer starts to run.
2	After the set delay (P1.6), the cooling starts. The agitator also starts.
3	As soon as the milk has reached the set point, the cooling will stop (see "Temperature setpoints"). The agitator continues for another two minutes.
4	As long as the cooling is inactive, the agitator will turn at regular intervals to keep the milk homogenous.
5	As soon as the temperature of the milk has exceeded the set point and the adjusted tripping-safety-time has passed, the cooling starts again.
6	When you press the off button, both cooling and agitation stops immediately.

Manual cooling (option)

The manual cooling system works as follows:

Stage	Description
1	The cooling is activated when you set a cooling period using the timer. The agitator runs continuously.
2	The cooling and agitation stops when the set time is elapsed.

See detailed info p. 45

Accelerated start of cooling

Immediate cooling

For deep cooling, the cooling starts immediately. There is no delay. The cooling can be given an accelerated start for the second or subsequent milkings.

 With DX-tanks, you may ***not*** *use the accelerated start of the cooling if the tank is filled with less than 10 %.*

Operation

The accelerated start of the cooling works as follows:

Phase	Description
1	The moment you activate the deep cooling, it immediately starts to work. The agitator also operates.
2	After a period set by the installer (P1.9), or when the temperature of the milk is 1.9 °C, the cooling stops. The agitator continues for another two minutes.

Temperature set points

Two set points

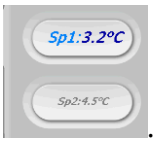
You can choose from two temperature set points. In this way, you can use the same tank for storing milk for different applications.

Set points SP1 and SP2 are set as standard at respectively 3,2°C and 4,5°C.

You may also want to use the tank to store milk at different temperatures, then change the parameter P1.1 and/or P1.2 (contact your service after sales)

Choosing the Set point

Before starting refrigeration, the set point is selected as follows:

Step	Action
1	Press min. 3 seconds on the desired set point  . The selected set point is the one who is largest and in colour on the screen.

About agitation

Why agitate the milk?

Agitating the milk ensures that:

- There is a maximum heat transfer.
- The milk does not freeze (DX).
- The milk remains homogenous and no layer of cream forms.

Operation

The agitator works as follows:

Step	Action
1	The agitator turns when the cooling works.
2	When the milk is at the right temperature and the cooling stops, the agitator continues stirring for another 2 minutes.
3	When the milk is cooled there is a resting period of 13 minutes.
4	Then the agitator turns for another 2 minutes and so on.

Duration of the rest period

Your installer can set the duration of the rest-period.

Agitating Manually

You can also switch on the agitation manually. You do this:

- If the automatic system is faulty.
- Before you take a sample of the milk.

You can set the agitation time via parameter P2.7 and P2.8 (see “Setting the temperature controller” in the installation manual). These are set as standard on respectively 2 and 30 minutes.

How to stir manually

The steps below should be followed to switch the agitator on manually:

Step	Action
1	• To stir the milk for two minutes (P2.1), press the “stirring” key once  . • To stir the milk for 30 minutes (P2.2), press the “stirring” key twice in succession.

About cleaning the milk cooling tank

Why clean it?

Thoroughly cleaning and disinfecting the tank guarantees:

- Hygienic storage and therefore higher quality milk.
- An optimum return of the cooling system.
- A longer life of the system.

Automatic cleaning system

It is difficult or impossible to manually clean a closed tank. That is why closed tanks are always fitted with automatic cleaning systems. The cleaning system:

- Removes all traces of milk from the tank.
- Removes milk stone from the tank walls (with an acid cleaning agent).
- Disinfects the tank.

When to clean

You must clean the tank before you put fresh milk in it:

- After every collection.
- If you have not used the tank for a week or more.

Operation of the automatic cleaning system

The tank is cleaned in phases:

Phase	Description
1*	A first pre-rinse with cold water removes the remains of milk. If your system has a second outlet valve, the rinse water is discharged separately.
2	A second pre-rinse with hot water removes remains of milk and preheats the tank.
3	The main cleaning is carried out with hot water and the cleaning agent of your choice. This treatment gives you a clean and hygienic tank.
4*	The tank is rinsed first time with cold water.
5	Second rinsing is again with cold water. This phase is made redundant by the ECO-WASH.

* With ECO-WASH these two phases are pump flushes. The cleaning pump is turned off and on several times.

Cleaning agents

Choice of cleaning agent

There are two types of cleaning product for the inside of the milk-cooling tank:

- Base (alkaline): cleans and degreases.
- Acid: cleans and removes milk stone.

When acid or base?

PACKO INOX N.V. advises:

- To alternate with acid and alkaline products.
- Or to use an acid one at least once a week.

Warning


Never mix alkaline products with acids or products containing chlorine. Mixing them will cause a chemical reaction resulting in poisonous gases!

Recommended products

PACKO INOX N.V. recommends the following cleaning agents:

Type	Name	Art. no.	content
Alkaline	FULL CLEAN DA	36861	23 kg
Acid	FULL CLEAN S	36860	25 kg


Never use an alkaline cleaning agent, which is older than 6 months after the purchase date.


Never use a foam forming product.

Dose

Follow the instructions either on or with the product. Note that for automatic cleaning the amount of water is approximately equal to 1 % of the tank content, but with a minimum of 25 litres.

Example:

- For a 2,000 litre tank, the amount of cleaning water is 25 litres.

Automatic dosing

In case of automatic dosing, the drums of cleaning agent should be connected as follows:

- Connect a drum with an alkaline product to the blue hose.
- Connect a drum with an acid product to the red hose.

Maintenance and troubleshooting

Overview

Introduction

This chapter provides you with guidelines for maintenance and will help you to look for a solution if problems occur.

Contents

Maintenance and checks

Introduction

Regular and preventive maintenance:

- prevents loss of milk quality;
- guarantees a long life of the system;
- guarantees optimum return of the cooling unit;
- prevents defects and repairs.

 **Let your tank be maintained by qualified personnel of the after-sales-service.**

Cleaning the outside

Clean the outside of the milk cooling tank every week. Use a kitchen cleaning agent (CIF 500 ml, part number 90282). Always rinse thoroughly afterwards with pure water (= drinking water) and dry.

 *Never use cleaning agents which contain chlorine, or the products for internal cleaning. These can harm or damage the cooling tank.*

Cleaning the inside

Clean the tank every time milk has been collected.

Clean the tank at least once a week with an acid cleaning agent to remove milk stone.

 *Wear protective gloves and safety goggles whilst using the cleaning agents.*

Cleaning the condenser

Too much dust on the fins of the condenser hinders good cooling. Regularly (e.g. every month) remove the dust from the fins of the condenser with a brush or an air compressor.

If the fins are damaged and pressed flat, you can put them back in place using a specially designed comb (part number 95820).

Checks

The list below provides an overview of all the checks that should be carried out regularly:

- Check the milk temperature at the end of each milking and when leaving the milking room.
- Check the milk outlet pipe and complete tank after each cleaning.
- Check all the water supply pipes, valves and taps for leaks.
- Check the oil level of the compressor using the sight-glass. The level should be at least 1/4 of the sight-glass.
- Check the sight-glass in the cooling circuit. You should not be able to see any vapour bubbles.
- Check the operation of the agitator.
- For IB-tank only: check if there is sufficient water in the ice water reservoir: ±1 cm below the overflow pipe.

Solving problems

What to do in case of a problem

You can solve a lot of problems yourself using the information in this chapter.

Electrical or cooling technical repairs may ONLY be carried out by trained staff. In that case, contact the after-sales department.

After-sales department

It is best to give the after-sales department the following information so that it can help you as quickly as possible:

- The manufacture number – see identification plate.
- The type and content of the system – see identification plate.
- Options (example: automatic dosing, extra discharge, etc.).
- As clear a description of the problem as possible.
- How long and how often the problem occurs.

Safety fuses

There is a spare for every type of safety fuse in the switch box. If you have used a safety fuse, get a replacement spare as quickly as possible from the after-sales department

***Always** replace a safety fuse with a new safety fuse of **exactly the same type**. **Never** bridge a safety fuse.*

Direction of rotation of the motors

Always check the rotation direction of all the motors when work has been carried out to the electrical installation. The rotation direction is indicated by an arrow.

If the rotation direction does not correspond, contact the after-sales department.

Cooling compressor

As a result of a built-in safety feature, the cooling unit may start up for a very short time when the cooling is inactive.

Manual cooling

If your milk cooling tank is equipped with the manual cooling option you can, in case of a breakdown of all automatic functions, activate the cooling manually for a short period of time.

Overview of general breakdowns and their solutions

Cooling does not start

Cause	Solution
Delay for the first milking.	Wait until the delay has expired (set by the installer), then the cooling will start automatically.
Safety fuse is blown.	Replace the safety fuse. You will find a spare one in the switch box.  *Use a safety fuse of **exactly** the same type. Put the main switch to the O or OFF position and interlock it.*
Thermal safety is on: 'Breakdown cooling unit / ice water pump 1!' is appearing on the screen.	Wait until the thermal switch mechanism has cooled down sufficiently. Then the warning notice will go away and the cooling will start by itself. Press OFF to clear the warning. If this happens repeatedly, inform your after-sales department.
Thermal safety breakdown	Replace the thermal relay.  *Use a thermal relay of **exactly** the same type. Put the main switch to the O or OFF position and interlock it.*
Short-circuit.	Call the after-sales department.

Cooling of the milk tank does not work

Cause	Solution
Cooling has not been activated.	Switch cooling on.
For IB-tanks only: not enough ice or ice water pump faulty	Contact your after-sales department

Continued on next page

Overview of general breakdowns and their solutions,
Continued

Agitator does not work

Cause	Solution
Safety fuse is blown.	Replace the safety fuse. You will find a spare one in the switch box.  *Use a safety fuse of **exactly** the same type. Put the main switch to the O or OFF position and interlock it.*
Thermal safety is on. 'Breakdown agitation 1 Breakdown agitation 2 Breakdown agitation 3!' is flickering on the screen.	Wait until the thermal switch mechanism has cooled down sufficiently. Then the warning notice will go away and the agitation will start by itself. If this happens repeatedly, inform your after-sales department.

Oil level of the compressor too low	Immediately inform the installer or the after-sales department.
Vapour bubbles in the sight-glass	Immediately inform the installer or the after-sales department.

Overview of breakdowns of the automatic cleaning and their solutions

Cleaning pump does not work

Cause	Solution
Safety fuse is broken.	Replace the safety fuse. You will find a spare one in the switch box.  *Use a safety fuse of **exactly** the same type. Put the main switch to the O or OFF position and interlock it.*
Thermal safety is on. 'Breakdown cleaning pump!' is appearing on the screen.	Wait until the thermal switch mechanism has cooled down sufficiently. Then the warning notice will go away and the cleaning pump will start by itself. If this happens repeatedly, inform your after-sales department.

Insufficient water supply

Cause	Solution
Water supply taps are not (fully) open.	Open the supply taps (fully).
Sieve filters in the connection points for hot and/or cold water are dirty.	Clean the sieve filters.

Tank is not clean after cleaning

Cause	Solution
The temperature of the water is too low. 'Cleaning temperature not long enough high!' is appearing on the screen.	Check water supply and the boiler. Press the confirmation button and start a new cleaning session.
The Roto-jet is blocked.	Remove the Roto-Jet, clean it and close it. Start a new cleaning cycle.  *Place the main switch to O or OFF and interlock it before entering the tank.*

Continued on next page

Overview of breakdowns of the automatic cleaning and their solutions, *Continued*

Tank is not clean after cleaning *(continued)*

Cause	Solution
None or too little cleaning agent. 'Detergent almost empty!' is blinking on the screen. (Option)	• Fill the detergent container with the right amount of cleaning agent. See "Cleaning agents". Press the confirmation button and start a new cleaning cycle. • If your system is equipped with automatic dosing, check whether the dosing pump is working and whether there is sufficient cleaning agent in the drums. Press the confirmation button and start a new cleaning cycle.
Wrong cleaning agent.	See 'Cleaning agents' p.38 for recommended cleaning agents.
Cleaning agent is too old. Some cleaning agents, especially those containing chlorine, lose their washing power over time. Use them up to a maximum of 6 months after the purchase date.	Press the confirmation button and start a new cleaning session with new cleaning agent.
There is no pressure in the Roto-Jet.	• Contact your after-sales department • The cleaning product may be foaming in which case the level of water intake may be too low. Use the products recommended by Packo.

Overview of the error messages on the iControl-screen

A statement is flickering on the iControl-screen

Cause	Solution
'Breakdown cooling unit / ice water pump 1!' Thermal safety is on	Press the OFF button. If this happens repeatedly, inform your after-sales department.
'breakdown agitation 1, agitation 2, agitation 3!' Thermal safety is on	Press the OFF button. If this happens repeatedly, inform your after-sales department.
'breakdown cleaning pump!' Thermal safety is on	Press the OFF button. If this happens repeatedly, inform your after-sales department.
'breakdown temp. sensor 1, temp. sensor 2!'	Press the OFF button. If this happens repeatedly, inform your after-sales department.
'Temp. too low!' the temperature of the milk is lower than the minimum milk temperature (A.9)	Press the OFF button. The cooling will start as soon as the temperature has reached the set point. If this happens repeatedly, inform your installer or after-sales department.
or the temperature of the cleaning water has not been reached during the cycle of warm water with product (B.5). The cleaning will continue until the end of the cycle.	Check the warm water circuit. Confirm with the ENTER button and start the cleaning again. If this happens repeatedly, inform your installer or after-sales department.
'Detergent almost empty!' (option) No detergent or too little. The tank is not clean	Replace the drum(s). Press the OFF button and start a new cleaning cycle.
'alarm cooling time!' The cooling lasts longer then the adjusted time (A.8). So the set point is not reached. Nonetheless the cooling continues.	Immediately inform the installer or the after-sales department.
'electricity breakdown' An electricity breakdown has been registered. As soon as power has been re-established, the function in progress will continue automatically.	Press the OFF button

Manual cooling (option)

Warning

The manual cooling function is only to be used in case of a breakdown of all automatic functions and under permanent supervision!

Manual cooling

Proceed as follows to start up manual cooling:

Step	Action
1	Remove the protective cover from the operator console.
2	Set the desired cooling time using the timer  . Mind that the cooling will not stop automatically when the set point temperature is reached - in DX tanks there is danger of freezing. Do not set too long a cooling time and regularly check the milk temperature.