

## Preventive Maintenance of the Wedholms Milk Cooling Tank

To ensure an optimal functionality and a long lifetime of your Wedholms milk cooling tank, and to prevent unforeseen downtime of the system, we recommend you to follow our service instructions for preventive maintenance of the tank and the cooling system. Some maintenance tasks can be performed by the milk supplier and others by a common service technician. However, some maintenance tasks must be done by an authorized cooling technician. Within the European Union, it is statutory to perform a leakage test once a year, for cooling systems that contain between 5 and 49,9 tons of CO<sub>2</sub>-equivalents. The leakage test must be performed by an authorized cooling technician. It is the responsibility of the owner of the cooling system to ensure that the leakage test is done.

### Operation and Maintenance Instructions for the Milk supplier

The important task of the milk cooling tank is to cool and store the milk until collection and further processing. Wedholms milk cooling tanks are delivered either with an attached or a separate cooling unit. Tanks with an attached cooling unit are tested for pressure, denseness and functionality in factory. For tanks with separated cooling units, tank and cooling unit are tested for pressure and denseness stand alone in factory, and the whole system is function tested on farm after installation.

How to operate the milk cooling tank is shown in the instructions for the control unit, which are delivered together with electrical drawings together with the tank. Make sure that manuals and operating instructions are stored in a protected place, close to the tank. The tank has a type sign showing manufacturing year, serial number, type of refrigerant, amount of refrigerant (On attached tanks) and maximum test pressure. **The serial number is tank specific.**

### Temperature and Ventilation of the Milk room

The tank and the cooling unit must be placed in a well-ventilated room with a minimum temperature of 5°C and a maximum temperature according to the performance value for the cooling class of the tank. An ambient temperature below or above the recommended interval will affect the efficiency of the tank negatively.

- High milk room temperature results in a prolonged cooling time and increased power consumption.
- Low milk room temperature might cause ice formation in the tank and a prolonged cooling time.
- Low milk room temperature might also cause damage on components of the tank, the cooling system or the control unit.

Cooling class	Minimum milk room temperature	Maximum milk room temperature for dimensioned cooling capacity	Maximum milk room temperature for safety of system
<b>A</b>	5°C	38°C	43°C
<b>B</b>	5°C	32°C	38°C
<b>C</b>	5°C	25°C	32°C

### Care and Maintenance

To ensure a good function of the milk cooling system, the milk supplier is recommended to carry out a daily inspection of the tank by checking the control unit. Check that the steering and agitation work without interference. Also check the air intake of the cooling unit regularly.

The owner is responsible for the maintenance of the tank. Preventive maintenance once a year is recommended to optimize the cooling. Note! Interventions in refrigerant circuits must be performed by a

certified cooling technician. If intervention is made in refrigeration circuits, the discharge of refrigerant must not occur directly into the environment. Necessary protective equipment must be used.

In order to make an optimal cleaning result possible, the water and milk must be free from sand, straw, saw dust and other foreign substances. Wedholms therefore recommend the use of filter. Always use a milk filter in the milking system, to ensure that the milk is free from foreign substances. If there is contamination in the cleaning water, it might affect the functionality of the cleaning spray head and thus make a satisfying cleaning result impossible. Regularly check that the milk tank, including the outlet, is thoroughly clean after cleaning.

#### Preventive Maintenance Milk supplier

1. Make sure the cooling unit and condenser are kept clean and that they are not used as a drying rack as the condenser risks to not get rid of the excess heat.
2. Once a month, the condenser should be checked for cleanliness. The cleaning should be carefully done with a soft brush to not destroy the thin aluminum slats. Also check that the supply air and extract air in the room, in which the condenser is operating, are satisfying.
3. Check all water intake filters and clean if necessary.
4. Check any alarms from the control system daily. Contact service technicians if necessary.
5. Regularly check that the tank is properly cleaned.

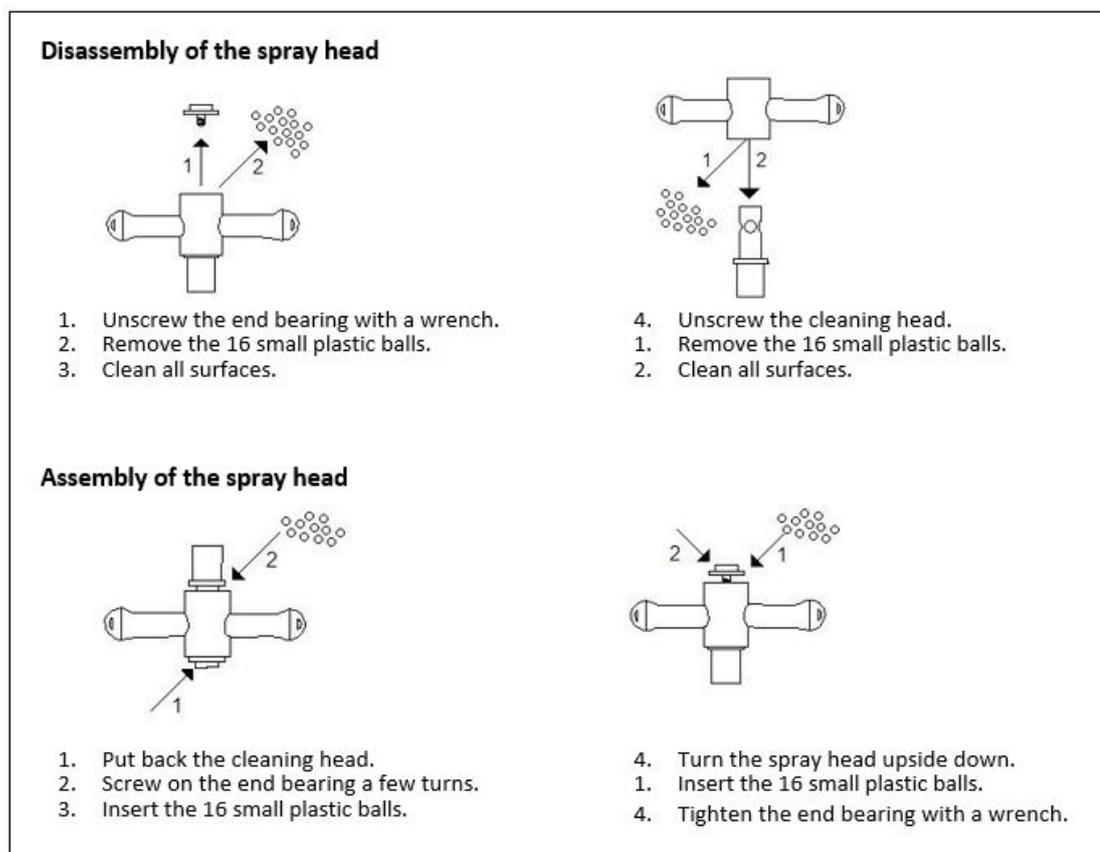
<h1>Service Protocol</h1>				Control done	Not applicable	See note/recommendation	Conventional tank	Robotic tank
Tank Serial No.: _____								
Date: _____								
Service Company: _____								
Service Technician: _____								
<b>Cleaning</b>	Replace dosing hoses, check flow and function test. Alkaline: Annual replacement; Acid: Replace every second year.				X	X		
	Detergent supply hoses, containers to pump: Check for blockages and hardening. Function test. Rinse with warm water. Replacement after two years recommended.				X	X		
	Visually inspect the protective tubes of the detergent hoses for damage. Replace or shorten if necessary.				X	X		
	Check fastening nuts for level electrodes on detergent hoses for tightness.				X	X		
	Control and clean water intake filter.				X	X		
	Check water valves and function test.				X	X		
	Check hot water inlet temperature and note in maintenance report.				X	X		
	Function test the drain valve.				X	X		
	Function test cleaning pump.				X	X		
	Control that the cleaning spray head spins with minimum friction. Clean if necessary (See point 1).				X	X		
	Visual control of all rubber hoses for cracks and damages. Replace if necessary.				X	X		
	Function test level sensor.				X	X		
	Function test heater (Note! Do not check heater longer than 1-2 seconds).				X	X		
	Function test home consumption button (See point 2).					X		
	Check ratio of detergent vs water volume.				X	X		
	Check the frequency of acid cleaning based on water hardness.				X	X		
	Function test the cleaning.				X	X		
	Check that the inside of the tank is completely clean after cleaning.				X	X		
Function test solenoid valve.					X			
Function test conductivity sensor.					X			
Function test pneumatic motor.					X			
<b>Outlet</b>	Check the seal of the main butterfly valve for cracks or damage. Replace if necessary.				X	X		
	Check flange seal of robotic flap valve for cracks or damage. Replace if necessary.					X		
	Visually inspect the outlet for dirt / milk residues. If necessary, check the water temperature of the pre-rinse.				X	X		
	Test the closure function of the throttle valve.				X	X		
	Visually inspect robot connection for dirt / residues.					X		
	Visually inspect outlet cap for damage.				X	X		
	Check all sealings for damage or cracks. Replace if necessary.				X	X		
<b>Agitator</b>	Function test agitator.				X	X		
	Small RW engine: Check neoprene sleeve for freewheel. Visual inspection.				X	X		

Control unit	Go through the Error log and take measures if necessary.				X	X
	WMMC / Nautilus; Clear memory (see point 3).				X	X
	Argos / Nautilus 2; Replace batteries every third year.				X	X
	Argos / Nautilus 2; Save all data in Navigator and check for deviations.				X	X
	Function test agitator.				X	X
	Function test pneumatic motor.					X
	Go through settings and make changes if necessary.				X	X
Cooling system	Control high and low pressure and temperature.				X	X
	Listen for aberrant sounds.				X	X
	Leakage control of the cooling system (See point 4).				X	X
	Check oil level in the compressor.				X	X
	Check refrigerant filling using the sight glass.				X	X
	Control that the condenser is free of dirt. Clean if necessary.				X	X
	Visual control corrosion and suspension of tubes.				X	X
	Control milk temperature and calibrate temperature sensor if necessary.				X	X
	Optimize cooling (Cooling times, ventilation, condenser placement, speed regulator and heat exchanger).				X	X
Electr.	Check that the power supply terminal blocks on the contactors and in the terminal block on the bottom of the cabinet are tightened.				X	X
	Check the function of the motor protection switch.				X	X

Hot water temperature, inlet (°C)	
Notes/Recommendations	

## 1. Maintenance of the cleaning spray head

When using powder detergent, or if there is a risk of sand-blended cleaning water on the farm, annual maintenance of the cleaning spray head is recommended to maintain an optimum cleaning function. See the following instruction for maintenance. Be careful about the small plastic balls.



## 2. Function test of the home consumption button

- Check pressure reducer, minimum pressure setting approximately 3 bar.
- Control and push button; check opening area of the flap valve.
- Control air solenoid valve; remove air hose and blow through once.

## 3. Clear memory in WMMC

Go to Menu 8E. INFORMATION, then WEDHOLMS.COM, press and hold ON until INFORMATION is shown in the display.

## 4. Leakage control of the cooling system

The legally required, yearly control of the cooling system includes:

- Leak detection of the refrigerant system: Compressors, condensers, evaporators, heat exchangers, expansion valves, shut-off valves, pressure protection / pressure limiting equipment, pipes, attachment points, flanges and fixed joints.
- Check for damage and corrosion: Compressors, screwed / fixed connections, condensing unit, evaporator, heat exchanger, vessels, attachment points and pipes.
- Control of refrigerant filling using the sight glass.
- Control of oil level in the compressors.
- Function test of the safety system.
- Control operating data of the system. Pressure, temperature and energy supply. Entry of the results in the plant's operating log.