TS-200

Cream Separator

Industrial operating, cleaning and sanitation guidan



DOCUMENT CONTROL

MODEL	TS-200
REVISION	Rev. 1
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STATUS	Controlled document

Prepared and approved by Tessa Dairy Machinery

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OPERATOR NOTE Keep this manual accessible to personnel responsible for operating, cleaning, inspecting or servicing the TS-200.

QUICK REFERENCE

SYSTEM OVERVIEW

Key operating data from this manual, grouped for fast reference.

MODEL	TS-200
NOMINAL CAPACITY	200 gallons per hour
SEPARATOR TYPE	Closed-type centrifugal cream separator
OPERATION	Continuous
MILK FEED	External sanitary pump + regulating flow valve
FLOW MONITORING	Optional ultrasonic flow meter, non-product-contact
DISCHARGE	Cream and skim milk by gravity
OPERATING SPEED	Approx. 7,000 RPM / 50 Hz
ELECTRICAL SUPPLY	Per equipment nameplate
PRODUCT-CONTACT MATERIALS	Food-grade stainless steel

HOW TO FEED THE SEPARATOR

Required arrangement for continuous milk feed.



FEED CONTROL

The sanitary pump transfers milk from the batch pasteurizer to the TS-200. The regulating flow valve between the pump and separator controls inlet flow and is used to fine-tune cream consistency.

RECOMMENDED For improved monitoring, an optional ultrasonic flow meter may be mounted externally on the milk pipe. It does not contact the product and can provide live flow indication when fitted.

1. INTRODUCTION

1. Introduction

1.1 Purpose of This Manual

This Operations and Sanitation Manual has been prepared to provide detailed guidance for the correct use of the **TS-200 Cream Separator**. The document is intended to explain not only *what* actions must be performed but also why they are required to support safe operation, consistent product quality, and long-term equipment reliability.

The manual describes the correct procedures for assembling the separator prior to operation, starting and operating the machine under normal working conditions, shutting it down, and performing the required cleaning and sanitation tasks. In addition, the manual explains how the separator is constructed and how it functions, so that operators can better understand the equipment they are using.

This manual is intended to serve as the **primary reference document** for daily operation of the TS-200 Cream Separator and should be kept accessible to all personnel responsible for operating, cleaning, or inspecting the machine.

1.2 Scope of Application

The instructions and information contained in this manual apply exclusively to the **TS-200 Cream Separator**, which is a closed-type centrifugal cream separator designed for dairy processing applications.

The scope of this manual includes normal assembly, operation, cleaning, sanitation, and routine inspection of the equipment. The procedures described are intended for use in farms, small to medium creameries, and similar dairy environments where reliable and hygienic cream separation is required.

This manual does not cover advanced mechanical repairs, electrical troubleshooting beyond normal operation, or major equipment modifications. Any work of that nature must be carried out only by qualified service technicians or authorized representatives of the manufacturer.

1.3 Intended Users

The TS-200 Cream Separator is designed to be operated by users with practical experience in dairy processing, such as farmers, creamery owners, and dairy plant operators. The machine does not require advanced industrial or engineering training for normal operation; however, all users must be familiar with basic dairy hygiene principles and safe working practices.

Inspection personnel and regulatory authorities may also refer to this manual as a description of the equipment’s intended use, operating principles, and cleaning procedures.

All persons responsible for operating or cleaning the TS-200 must read and understand this manual before using the equipment.

1.4 Equipment Identification

The equipment covered by this manual is identified as follows:

The machine is designated as a **Cream Separator**, model **TS-200**, with a nominal processing capacity of **200 gallons per hour**. It is a closed-type centrifugal separator designed for continuous operation.

Each TS-200 unit is supplied with a permanently affixed **equipment nameplate** mounted on the separator frame. This nameplate contains essential identification information, including the model number, serial number, electrical specifications, and manufacturing date. This information must be referenced whenever technical support, spare parts, or service assistance is requested.

1.5 Responsibilities of Manufacturer and User

The manufacturer is responsible for delivering equipment that meets the stated design specifications and performance criteria when installed, operated, and maintained in accordance with this manual.

The user is responsible for ensuring that the equipment is installed correctly, assembled properly before use, operated only within the limits described in this manual, and cleaned and sanitized according to the recommended procedures. The user is also responsible for complying with all applicable local regulations related to electrical safety, dairy hygiene, and workplace safety.

Unauthorized modifications to the equipment or deviation from the procedures described in this manual may result in unsafe operation, reduced performance, or damage to the machine.

1.6 Manual Revision and Validity

This manual reflects the configuration and design of the TS-200 Cream Separator at the time of issue. Any future changes to the equipment design or operating procedures may require updates to this document.

The current manual details are as follows:

Manual Title: TS-200 Cream Separator - Operations & Sanitation Manual
Revision: Rev. 1
Issue Date: 09/24/2026

The user is responsible for ensuring that the most current version of this manual is available and used during the equipment's operation and maintenance.

2. EQUIPMENT DESCRIPTION

2. Equipment Description

2.1 General Equipment Overview

The **TS-200 Cream Separator** is a closed-type centrifugal separator designed for the continuous separation of cream from milk in dairy processing environments. The machine is engineered to provide reliable separation performance while remaining simple to operate, clean, and maintain by farmers and creamery operators.

The separator is intended for applications where consistent product quality, hygienic handling, and operational reliability are essential. Its construction reflects a balance between industrial separation principles and practical usability, allowing operators without advanced technical training to work confidently with the equipment.

The TS-200 operates as a standalone unit and is typically integrated into a dairy processing line through external milk feeding and gravity-based product discharge.

2.2 Closed-Type Separator Design Concept

The TS-200 is classified as a **closed-type cream separator**, meaning that the separation process takes place entirely within an enclosed bowl assembly. Milk enters the separator through a closed inlet connection and exits through dedicated cream and skim milk outlets without exposure to the surrounding environment.

This closed design offers several important advantages. It significantly reduces the risk of product contamination, improves operator safety by isolating rotating components, and supports compliance with dairy hygiene requirements. The enclosed separation zone also contributes to more stable separation performance by protecting the internal components from external disturbances.

2.3 Main Assemblies and Functional Components

The TS-200 Cream Separator consists of several primary assemblies that work together to achieve effective separation.

The structural frame and housing support the separator and provide a stable base for operation. Inside the housing, a drive motor and transmission system generate and control the rotational motion required for centrifugal separation.

At the core of the machine is the **separation bowl assembly**, which contains the separation head and internal disc stack. This assembly is responsible for creating the centrifugal force that separates cream from milk.

Milk is introduced through the inlet system at the top of the separator. After separation, the two product phases are discharged separately through the **cream outlet** and **skim milk outlet**. Sealing elements and gaskets ensure that product remains contained within the closed system during operation.

The separator is controlled through an external **electrical control panel**, which allows the operator to

2.4 Product-Contact Design and Materials

All components of the TS-200 that come into direct contact with product are manufactured from **food-grade stainless steel**, suitable for dairy processing applications. These components are designed with smooth internal surfaces and minimal crevices to facilitate effective cleaning and sanitation.

The design allows for complete disassembly of product-contact components, including the separation head and outlet assemblies. This enables thorough manual cleaning and inspection, which is essential for maintaining hygienic conditions and consistent separation performance.

The materials and surface finishes used in the TS-200 are compatible with standard dairy cleaning and sanitizing agents approved for use on stainless steel equipment.

2.5 Operating Principle of the TS-200 Cream Separator

The TS-200 Cream Separator operates using the principle of **centrifugal separation**, which relies on the difference in density between milk components.

Milk is normally transferred from the batch pasteurizer to the separator through a sanitary external pump. A regulating flow valve between the pump and separator controls the milk feed entering the TS-200. Milk is introduced only after the separator is fully assembled and at operating speed. For improved monitoring, an optional ultrasonic flow meter may be mounted externally on the milk pipe; its sensors do not contact the product.

During startup, the separation bowl accelerates to an operating speed of approximately **7,000 revolutions per minute (RPM)**. When this speed is reached, a **green indicator light** on the control panel illuminates, signaling that the separator is ready to accept product.

Milk first enters a balancing and distribution chamber that regulates the flow into the rotating separation zone. Inside the separation head, milk passes through a stack of precisely spaced **conical separation discs**. These discs divide the milk into thin layers, greatly increasing the effective surface area for separation.

As the bowl rotates, centrifugal force causes the heavier phase (**skim milk**) to move outward toward the perimeter of the bowl, while the lighter phase (**cream**) migrates inward toward the center. The two phases are then directed to their respective outlets.

The TS-200 is designed for **maximum fat separation**, producing skim milk and full-fat cream continuously during operation.

The separator does **not** contain any internal product pumps. Discharge of cream and skim milk occurs by **gravity only**, which makes correct outlet installation and unobstructed flow essential for stable operation.

3. SAFETY INFORMATION

3. Safety Information

3.1 General Safety Overview

The TS-200 Cream Separator is designed and manufactured to operate safely when installed, assembled, and used in accordance with the instructions provided in this manual. Like all centrifugal processing equipment, the separator contains rotating mechanical components and electrical systems that require a basic level of awareness and responsible operation.

This section describes the general safety principles that must be observed during assembly, operation, cleaning, and maintenance of the separator. Understanding these principles is essential not only to protect the operator, but also to prevent damage to the equipment and to ensure stable and hygienic processing conditions.

Failure to follow the safety instructions described in this manual may result in personal injury, equipment damage, or unsafe operating conditions.

3.2 Operator Responsibility and Safe Working Practices

Safe operation of the TS-200 Cream Separator depends largely on the actions and awareness of the operator. The operator is responsible for ensuring that the machine is used only for its intended purpose and only under the conditions described in this manual.

Before operating the separator, the operator must be familiar with its basic construction, operating principle, and normal behavior during startup, operation, and shutdown. The separator must never be operated by untrained or unauthorized personnel.

Good working practices include maintaining a clean working area around the separator, avoiding distractions during operation, and performing all assembly, cleaning, and inspection tasks carefully and methodically.

3.3 Mechanical Safety Considerations

The TS-200 Cream Separator contains internal components that rotate at high speed during operation. Even after the machine has been switched off, rotating parts may continue to move briefly before coming to a complete stop.

For this reason, the separator must **never** be opened, disassembled, or accessed while it is running or while internal components are still rotating. Operators must always wait until the separator has come to a complete stop before removing covers, outlets, or internal components.

Hands, tools, and foreign objects must be kept away from the separator bowl and internal components at all times during operation. Any unusual noise, vibration, or movement observed during operation must be treated as a warning sign, and the machine must be stopped immediately for inspection.

3.4 Electrical Safety

The TS-200 Cream Separator is powered by an electrical drive system controlled through an external control panel. Electrical safety is critical to prevent injury and equipment damage.

The electrical supply connected to the separator must match the specifications indicated on the equipment nameplate. Proper grounding of the separator and control panel is mandatory and must be carried out in accordance with local electrical regulations.

Electrical cables, connectors, and control components must be inspected regularly for signs of damage. The separator must not be operated if damaged electrical components are observed. Any electrical work beyond normal operation, including repairs or modifications, must be performed only by qualified electrical personnel.

Before performing cleaning, disassembly, or maintenance tasks, the electrical power supply must be switched off and disconnected.

3.5 Safety During Assembly and Disassembly

Assembly and disassembly of the TS-200 Cream Separator involve handling heavy stainless-steel components and precision-machined parts. Care must be taken to avoid injury and to prevent damage to the equipment.

Components must be lifted and placed carefully, without forcing them into position. The separation head and internal parts must always be placed on clean, non-abrasive surfaces when removed from the machine.

Only the tools supplied with the equipment, such as the head stand and Z key, should be used for assembly and disassembly of internal components. Using incorrect tools or excessive force may damage components or create unsafe conditions during operation.

3.6 Safety During Cleaning and Sanitation

Cleaning and sanitation are essential parts of safe operation, but they also introduce specific hazards if not performed correctly.

Before cleaning begins, the separator must be stopped, allowed to come to a complete stop, and fully disconnected from the electrical power supply. Hot product residues or cleaning solutions may cause burns, so components should be allowed to cool before handling if necessary.

Only approved dairy-grade cleaning and sanitizing agents suitable for stainless steel equipment may be used. Abrasive tools, metal brushes, or aggressive chemicals must not be used, as they can damage stainless steel surfaces and create hygiene risks.

3.7 Residual Risks

Even when all instructions in this manual are followed, certain residual risks remain due to the nature of centrifugal separation equipment. These include the presence of rotating mass, electrical

4. INSTALLATION & PRE-OPERATION CHECKS

These risks are minimized through proper equipment design, correct operating procedures, and adherence to the safety guidelines described in this manual. Operators must remain attentive and use good judgment at all times when working with the TS-200 Cream Separator.

4. Installation and Pre-Operation Checks

4.1 Installation Environment and Location

The TS-200 Cream Separator is designed to be installed as a **floor-mounted unit** in an indoor dairy processing environment. The installation location must provide a clean, dry, and well-lit working area that allows safe operation, cleaning, and routine inspection of the equipment.

The separator does **not** require anchoring or bolting to the floor. However, the surface on which it is installed must be solid, stable, and capable of supporting the weight of the machine without flexing or vibration. An uneven or unstable installation surface may negatively affect separation performance and long-term mechanical reliability.

Adequate space must be provided around the separator to allow access to the control panel, product connections, and all components that require regular cleaning or disassembly.

4.2 Leveling and Stability Requirements

Proper leveling of the TS-200 Cream Separator is essential for correct operation. The separator must be positioned level in all directions to ensure stable rotation of the separation bowl and uniform product flow during operation.

Before initial operation, the separator should be checked using a suitable level. If required, adjustable feet or shims may be used to correct minor unevenness in the installation surface. Operating the separator while not level may result in vibration, reduced separation efficiency, or increased mechanical wear.

Leveling should be verified during initial installation and again after relocation or major maintenance work.

4.3 Product Outlet and Discharge Considerations

The TS-200 Cream Separator discharges both cream and skim milk **by gravity only**. The separator does not contain internal product pumps, and product flow relies entirely on correct installation and unobstructed discharge paths.

No fixed minimum elevation difference is specified between the separator outlets and downstream collection vessels; however, the discharge arrangement must remain free-draining and unrestricted. Outlet piping should slope away from the separator and must not contain upward loops, sharp bends, restrictions, or other conditions that create backpressure and interfere with stable separation.

Outlet connections should be supported properly to prevent mechanical stress on the separator outlets during operation.

4.4 Electrical Installation Requirements

The electrical supply connected to the TS-200 Cream Separator must match the specifications indicated on the equipment nameplate. Proper grounding of the separator and control panel is mandatory and must comply with applicable local electrical regulations.

The control panel should be installed in a location where it is easily accessible to the operator during startup, operation, and shutdown. Electrical cables must be routed in a manner that prevents mechanical damage, exposure to moisture, or accidental disconnection.

Before the separator is operated for the first time, all electrical connections must be inspected to ensure they are secure and undamaged.

4.5 Pre-Operation Inspection

Before each start-up, the operator must perform a basic visual and functional inspection of the TS-200 Cream Separator. This inspection is intended to confirm that the machine is ready for safe operation and that no obvious issues are present.

The operator should verify that the separator is clean and fully assembled, that all covers, clamps, and locking elements are correctly installed, and that no tools or foreign objects are present inside the separator body. Inlet and outlet connections should be checked for correct installation and secure attachment.

Any abnormal condition observed during this inspection must be corrected before operation begins. The separator must not be started if damage, improper assembly, or unsafe conditions are identified.

5. ASSEMBLY FOR START-UP

5. Assembly for Start-Up

5.1 General Assembly Overview

Correct assembly of the TS-200 Cream Separator is essential for safe operation, proper separation performance, and protection of internal components. The separator is designed to be assembled in a **specific order**, starting from the internal components and progressing upward to the outlet assembly.

The assembly procedure described in this section applies to initial installation, reassembly after cleaning, and reassembly after inspection. All assembly work must be carried out carefully, using clean hands and clean tools, in order to maintain hygienic conditions inside the separator.

The TS-200 is assembled **from the bottom upward**, beginning with the separation head and ending with the outlet and final mechanical closure. No component should be forced into position at any stage of the assembly process.

5.2 Preparation for Assembly

Before beginning assembly of the separator, several preparatory steps must be completed to ensure safe and correct installation.

The separator must be connected to the electrical power supply, and the main power switch on the control panel must be switched ON. Power is required only for the controlled low-speed rotation used to align the drive axle during installation. The separator must not be in normal operating mode, and hands and tools must remain clear whenever the axle is moving.

The cylindrical separator body must be clean, empty, and completely dry. Any residual liquid, foreign material, or cleaning agent inside the separator body must be removed before assembly begins.

The separation head and all associated components must be placed on a **clean, non-abrasive work surface**. Each component should be visually inspected for cleanliness, damage, or foreign material. Assembly must not proceed if any contamination or damage is observed, as this may compromise both safety and separation performance.

5.3 Assembly of the Separation Head

The separation head is a precision assembly and must be assembled outside the separator body before installation. Assembly of the separation head is performed using the supplied **head stand** and **Z key**, which are designed to hold the components securely and prevent damage during assembly.

The head stand must be placed on a stable workbench. The locking handle of the head stand is opened, and the separation head body is carefully placed into the stand. Once positioned, the locking handle is tightened to secure the separation head body firmly.

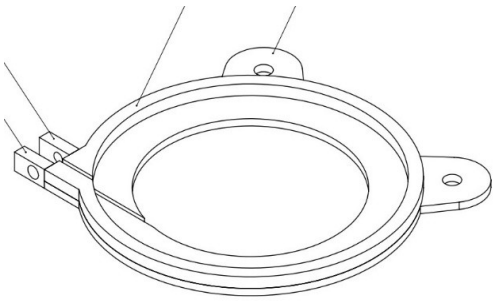
With the separation head secured, the internal insert or support component is installed into the separation head body. This component forms the base on which the separation discs are seated.

The separation discs are then installed **one by one** onto the insert. Each disc must be placed carefully to ensure correct seating, orientation, and alignment. The discs must sit flat and evenly; improper seating may affect separation efficiency and cause imbalance during operation.

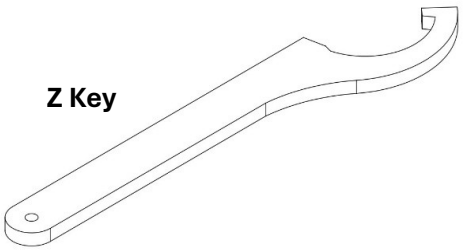
After all discs have been installed, the stainless steel separation head cover is carefully placed over the disc stack. The top nut is then inserted and tightened **clockwise** using the supplied Z key. The nut must be tightened securely, but excessive force must be avoided to prevent damage to the components.

Once the separation head is fully assembled, the locking handle of the head stand is loosened, and the assembled separation head is carefully removed. The separation head is now ready for installation into the separator body.





Head Stand



Z Key

5.4 Installation of the Separation Head

The assembled separation head is the first internal component installed into the TS-200 Cream Separator and forms the mechanical and functional base of the separator.

The separation head is carefully lowered into the cylindrical separator body. Due to the geometry of the drive axle and coupling interface, the separation head may not immediately seat into its final position.

To achieve correct alignment, the operator uses the control panel to rotate the drive axle at **very low speed** by turning the operation knob to the left. As the axle rotates slowly, the separation head will align naturally with the axle and drop fully into position.

Correct installation is confirmed when the separation head begins to rotate slowly and smoothly together with the drive axle. This slow, uniform rotation indicates proper engagement. The separation head must never be forced into position.

5.5 Assembly Verification Checkpoint

After installation of the separation head and before proceeding further, a verification check must be performed.

The operator must confirm that the separation head is fully seated inside the separator body and rotates slowly and smoothly with the drive axle. There must be no abnormal noise, resistance, or wobble observed during slow rotation.

At this stage, **no additional internal components** should be installed. If any irregularity is detected, the procedure must be stopped and the installation corrected before continuing.

5.6 Outlet Assembly and Final Mechanical Closure

Once the separation head has been correctly installed and verified, assembly of the outlet components and final mechanical closure of the separator can begin.

The skim milk outlet is installed first. This component is identified by the **larger central opening facing upward** and is placed directly onto the separation head. The outlet must seat smoothly and evenly without force.

Next, the cream outlet is installed on top of the skim milk outlet. The cream outlet is designed to nest concentrically within the skim milk outlet. Correct alignment must be ensured so that the two components sit evenly together.

The top cover, commonly referred to as the “top hat,” is then placed over the assembled outlet components. The cover must sit evenly on the separator body without gaps or misalignment.

The stainless steel locking ring is installed over the top cover and positioned correctly in its seating groove. Two locking rods with black hand knobs are inserted into the locking ring. The knobs are tightened **alternately and evenly**, compressing and securing the entire bowl and outlet assembly.

After the cream and skim-milk outlet assemblies are installed, the top cover is placed in position and secured with the stainless steel locking ring. The stainless steel end cap is then installed at the top connection and secured using a sanitary clamp.

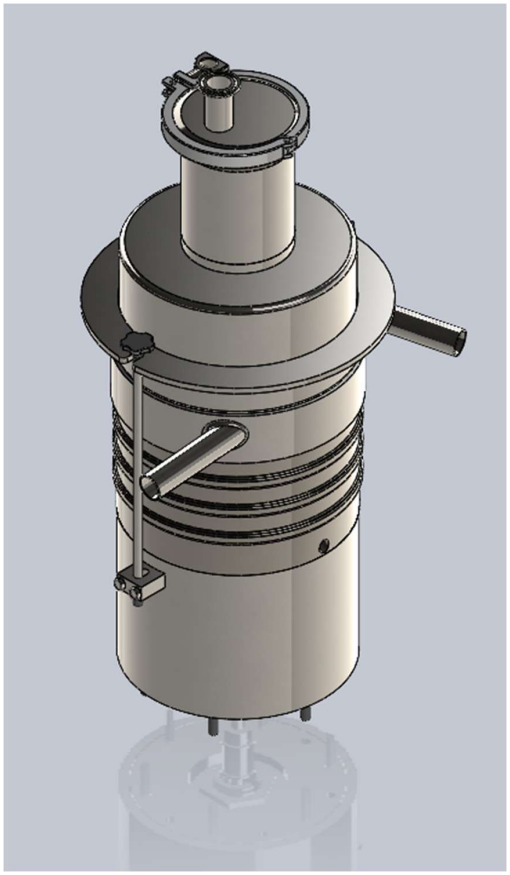
The TS-200 does not use an internal product pump or an internal flow-control floater. Milk feed is controlled externally by the sanitary pump and regulating flow valve. Cream and skim milk discharge from their respective outlets by gravity.

At this point, all mechanical assembly steps are complete and the separator is ready for operational startup.

MILK INLET
FEED CONTROL

Batch pasteurizer
|
Sanitary pump
|
Regulating flow valve
|
Ultrasonic flow meter
(non-product-contact)
|
TS-200 inlet

Flow is displayed on the separator control panel.



6. OPERATION

6. Operation

6.1 General Operating Information

This section describes the normal operating procedure of the **TS-200 Cream Separator** after the equipment has been correctly assembled and verified as described in Section 5.

The TS-200 is designed for **continuous centrifugal separation** of milk into skim milk and cream. Proper operation depends on correct assembly, correct startup sequence, and stable operating conditions throughout the production run.

Operation of the separator must only begin after all assembly steps have been completed, all verification checks have been performed, and the operator has confirmed that the machine is ready for use.

6.2 Conditions Before Startup

Before starting the TS-200 Cream Separator, the operator must ensure that the machine is in a suitable condition for operation.

The separator must be fully assembled, with the separation head, outlet assemblies, locking ring, clamps, and covers correctly installed and secured. Before product is introduced, the sanitary inlet pump and regulating flow valve must also be correctly installed. If an ultrasonic flow meter is fitted, its external sensors and cable connections should be checked before operation.

must be clean, dry, and free of tools or foreign objects that could interfere with safe operation.

Only after these conditions are met may the startup procedure begin.

6.3 Startup Procedure

Startup of the TS-200 Cream Separator must be performed in a controlled and deliberate manner to ensure safe acceleration of the rotating assembly and stable separation conditions.

First, the electrical connection between the separator and the control panel must be completed. The electrical cable is connected using the supplied **quick connector**, which is inserted fully, rotated into the correct position, and tightened to secure the connection. This cable provides power and control signals between the separator and the control panel.

Next, the control panel must be connected to an electrical supply that matches the voltage and electrical specifications shown on the equipment nameplate. The supply must be properly grounded and comply with applicable local electrical requirements.

control panel, is switched to the ON position. This action supplies electrical power to the control panel and prepares the system for operation.

After the control panel is powered, the speed regulator becomes active. The speed regulator knob is normally set to its **maximum position**, which allows the separator to accelerate to its designed operating speed without further adjustment.

As startup begins, the operator should observe the speed display on the control panel. The displayed frequency will increase progressively as the separator accelerates. The target operating frequency is **50 Hz**, which corresponds to the separator's maximum operating speed of approximately **7,000 RPM**.

If, during startup, the displayed frequency does not reach 50 Hz, the operator may turn the speed regulator knob **clockwise** to increase the frequency until the target value is reached. Under normal conditions, no adjustment is required, as the regulator is already set to its maximum position.

When the separator reaches operating speed, a **green indicator light** on the control panel will illuminate. This green light confirms that the separator has reached 50 Hz and that stable operating speed has been achieved.

If the separator fails to reach 50 Hz during startup, the procedure must be stopped and **Tessa Dairy Machinery** must be contacted for further guidance. Failure to reach operating speed is very rare and indicates a condition that requires technical review.

Milk must be introduced into the separator **only after** the green indicator light is illuminated.

6.4 Product Feeding and Normal Operation

Once operating speed has been reached and confirmed, milk may be introduced through the top inlet using the external sanitary pump. In a typical installation, milk is transferred from the batch pasteurizer through the pump and then through a regulating flow valve before entering the TS-200.

The regulating flow valve controls the quantity of milk entering the separator. Adjusting this inlet flow is also an important part of fine-tuning the cream consistency and achieving stable separation conditions.

For improved operating control, an ultrasonic flow meter is recommended as an optional monitoring accessory. When fitted, its sensors clamp to the outside of the milk pipe and do not come into contact with the milk, so the meter does not create an additional product-contact surface. The flow reading can be displayed on the separator control panel, allowing the operator to see the actual inlet flow while making adjustments.

The TS-200 contains no internal product pump. Cream and skim milk discharge continuously by gravity from their respective outlets. During operation, maintain a steady inlet flow within the rated capacity and monitor for unusual noise, vibration, leakage, or irregular discharge.

6.5 Stopping Normal Operation

To stop the normal operation of the TS-200 Cream Separator, the milk feed to the separator must be stopped first. Allowing the separator to run briefly without product helps clear residual milk from the separation zone.

After product feed has stopped, the separator is stopped using the control panel. The operator must allow all rotating components to decelerate and come to a complete stop naturally.

The separator must not be opened or disassembled until all internal motion has fully stopped.

7. CLEANING & SANITATION

6.6 Shutdown After Operation

After operation has been completed and the separator has come to a complete stop, the electrical power may be disconnected if cleaning or disassembly is required.

The separator should then be prepared for cleaning and sanitation as described in **Section 7**. Prompt cleaning after operation is essential to prevent product residues from drying on internal surfaces and to maintain hygienic operating conditions.

7. Cleaning and Sanitation

7.1 General Cleaning and Sanitation Principles

Proper cleaning and sanitation of the TS-200 Cream Separator are essential to ensure hygienic operation, consistent separation performance, and long service life of the equipment. Milk residues left on internal surfaces can lead to bacterial growth, product contamination, and reduced separation efficiency if not removed promptly and thoroughly.

Cleaning and sanitation must be performed after each production run and whenever the separator has been idle for an extended period. The TS-200 is designed to allow complete manual disassembly of all product-contact components so that all internal surfaces can be accessed, cleaned, and inspected.

Only approved dairy-grade cleaning and sanitizing agents suitable for **AISI 304 stainless steel** shall be used.

7.2 Safety Precautions Before Cleaning

Before beginning any cleaning or sanitation procedure, the separator must be brought to a safe condition.

The operator must stop the separator using the control panel and allow all rotating components to come to a complete stop. Electrical power must then be switched off and disconnected from the separator and control panel.

If hot milk or warm cleaning liquids were processed, components should be allowed to cool before handling to prevent burns. The separator must never be cleaned or disassembled while it is rotating or connected to electrical power.

7.3 Cleaning Frequency

The TS-200 Cream Separator shall be cleaned under the following conditions:

- After every production cycle
- At the end of each processing day
- Before restarting production after an extended shutdown

Failure to clean the separator at the required intervals may result in hygiene risks, regulatory non

7.4 Disassembly for Cleaning

Effective cleaning of the TS-200 requires partial disassembly of the separator to expose all product-contact surfaces. Disassembly must be performed in the reverse order of assembly described in Section 5.

The following components are removed first:

The stainless steel end cap and sanitary clamp are removed first. The stainless steel locking ring is then loosened by releasing the two black hand knobs and removed. Next, the top cover, cream outlet, and skim-milk outlet components are removed in sequence.

Next, the top cover (“top hat”) is lifted off, followed by removal of the cream outlet and skim milk outlet components.

Once the outlet components have been removed, the **separation head** can be removed from the separator body. The separation head must be lifted carefully and placed on a clean, non-abrasive surface to prevent damage.

At this stage, the separator body is open and ready for internal cleaning, and the separation head can be fully disassembled as described below.

7.4.1 Disassembly of the Separation Head for Cleaning

Thorough cleaning of the TS-200 requires complete disassembly of the separation head using the supplied **head stand** and **Z key**.

The head stand is placed on a stable workbench or table, and the locking handle is opened. The separation head is carefully placed into the head stand and secured by tightening the locking handle. The head stand holds the separation head firmly and allows safe access to the internal components.

With the separation head secured, the **Z key** is inserted into the top nut. The top nut is loosened by turning the Z key **counterclockwise** and is then removed completely. The stainless steel separation head cover is lifted off carefully.

Once the cover is removed, the separation discs are exposed. These discs may be coated with milk residues or deposits and must be handled carefully to avoid damage.

The separation discs are removed **one by one** or in small groups and placed immediately into a sink or container with potable water to prevent residues from drying on the surfaces. After all discs have been removed, the internal **insert / support component** on which the discs are seated is lifted out and removed.

Any remaining internal components of the separation head are then removed. Once fully disassembled, the separation head body itself can be released from the head stand for cleaning.

7.5 Manual Cleaning Procedure

All product-contact components must be cleaned manually using approved dairy-grade detergents suitable for stainless steel equipment.

Cleaning begins with a warm potable water rinse to remove loose milk residues. A suitable dairy detergent is then applied, and all surfaces are cleaned using **soft brushes only**. Brushes must be non-abrasive and suitable for stainless steel surfaces to avoid scratching or damaging the material.

Special attention must be given to:

- Separation discs and spacers
- Outlet passages
- Sealing and mating surfaces

? Outlet passages and product-contact interfaces

After detergent cleaning, all components must be thoroughly rinsed with potable water until all detergent residues are completely removed.

Abrasive pads, metal brushes, and acidic cleaning agents must **not** be used, as they may damage stainless steel surfaces and compromise hygienic integrity.

7.6 Sanitizing Procedure

After cleaning and rinsing, all product-contact components must be sanitized using an approved dairy-grade sanitizer.

The sanitizer must be applied according to the manufacturer’s instructions, ensuring full contact with all internal and external product-contact surfaces. Required contact times must be observed to ensure effective sanitation.

Unless specifically required by the sanitizer manufacturer, components should not be rinsed after sanitizing.

7.7 Inspection During Cleaning

Cleaning provides an important opportunity to inspect the condition of the separator components.

During cleaning and before reassembly, the operator should inspect all stainless steel surfaces for cleanliness, smooth finish, and signs of damage. Gaskets, seals, and O-rings must be checked for wear, cracking, or deformation and replaced if necessary.

The sanitary inlet connection and outlet interfaces must also be inspected for cleanliness, damage, and unrestricted flow before reassembly.

Any component found to be damaged or excessively worn must be replaced before reassembly and return to operation.

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8. MAINTENANCE & ROUTINE INSPECTION

7.8 Reassembly After Cleaning

After cleaning and sanitizing have been completed, the TS-200 Cream Separator must be reassembled following the assembly procedures described in **Section 5**.

All components must be correctly seated, aligned, and secured before operation. Once reassembly is complete, the separator is ready for startup and operation as described in **Section 6**.

8. Maintenance and Routine Inspection

8.1 General Maintenance Philosophy

The TS-200 Cream Separator is designed for reliable operation with **minimal routine maintenance** when it is operated, cleaned, and assembled correctly. Most issues related to performance or reliability are the result of improper cleaning, incorrect assembly, or operation outside the recommended conditions.

Routine maintenance for the TS-200 focuses primarily on **inspection, cleanliness, and correct handling** rather than complex mechanical adjustments. No special tools or advanced technical skills are required for normal maintenance tasks described in this section.

Any maintenance beyond the scope of this manual must be performed only by qualified service personnel or authorized representatives of the manufacturer.

8.2 Routine Inspection Before Operation

Before each production run, the operator should perform a brief routine inspection to confirm that the separator is in proper working condition.

The inspection should include verification that all components are correctly assembled and secured, including the separation head, outlet components, locking ring, clamps, and covers. The sanitary inlet pump and regulating flow valve should also be checked for secure installation and obvious damage. If an ultrasonic flow meter is fitted, check its external sensors and cables as well.

Electrical cables and connectors should be checked visually for signs of damage, looseness, or wear. The control panel should be clean and dry, with all indicators and controls clearly visible.

Any abnormal condition observed during this inspection must be corrected before operation begins.

8.3 Inspection During Cleaning

Cleaning and sanitation provide an ideal opportunity to inspect the condition of the separator’s internal components.

During disassembly and cleaning, the operator should inspect all stainless steel product-contact surfaces for signs of:

- Excessive wear
- Scratches or surface damage

The separation discs must be inspected individually to ensure that they are clean, flat, and free from deformation. Disc spacers and seating surfaces must be free of burrs, damage, or residue that could affect proper alignment.

Gaskets, seals, and O-rings must be inspected for cracking, deformation, or loss of elasticity. Any seal that does not return to its original shape or shows visible damage must be replaced.

8.4 Inlet Feed-Control Components

The sanitary pump and regulating flow valve form the required external feed-control arrangement for the TS-200. Both should be checked during routine inspection.

The pump and valve must operate smoothly, and all sanitary connections must be secure and leak-free. If the optional ultrasonic flow meter is fitted, its sensors must remain firmly mounted to the outside of the milk pipe and its cable must be protected from damage or moisture. Because the sensors are external, they do not contact the milk and do not require product-contact cleaning.

Any leakage, unstable inlet flow, or inability to regulate the milk feed should be corrected before production resumes. If the optional flow meter is fitted, an unstable or missing flow indication should also be investigated.

8.5 Fasteners, Clamps, and Locking Ring

All mechanical fastening elements must be inspected regularly to ensure safe and secure operation.

The stainless steel locking ring and its locking rods with black hand knobs must be checked for smooth operation and proper tightening. Threads must be clean and undamaged, and tightening must be possible without excessive force.

Sanitary clamps used on the end cap and outlet connections must be inspected for deformation or wear and replaced if necessary. Clamps that cannot be tightened securely must not be reused.

8.6 Electrical Components and Controls

Although the TS-200 does not require frequent electrical maintenance, basic inspection of electrical components is essential.

The electrical cable between the separator and the control panel must be inspected for damage, loose connectors, or signs of overheating. The quick connector must engage fully and lock securely.

The control panel should be inspected to ensure that the main power switch, speed regulator, and indicator lights function correctly. Any abnormal behavior, such as intermittent operation or failure of indicators, must be reported and investigated before continued use.

Electrical repairs or modifications must be performed only by qualified personnel.

8.7 Lubrication and Mechanical Adjustments

The TS-200 Cream Separator does **not** require routine lubrication or mechanical adjustment by the operator as part of normal maintenance.

All critical mechanical components are designed to operate within their specified parameters without user adjustment. Attempting to lubricate, adjust, or modify internal components may result in improper operation or equipment damage.

If unusual mechanical behavior is observed, such as persistent vibration or noise that cannot be resolved through cleaning and correct assembly, the separator must be removed from service and inspected by qualified service personnel.

8.8 Maintenance Records and Documentation

It is recommended that users maintain simple records of cleaning, inspection, and any maintenance performed on the TS-200 Cream Separator. These records may be required for internal quality assurance or regulatory inspections.

Maintenance records should include:

- Date of cleaning and inspection
- Observations or findings
- Replacement of seals or components, if applicable

Proper documentation supports consistent operation and long-term equipment reliability.

8.9 When to Contact the Manufacturer

The operator should contact **Tessa Dairy Machinery** or an authorized service representative under the following conditions:

- Repeated failure to reach operating speed
- Persistent abnormal noise or vibration
- Visible damage to internal components
- Electrical faults or control panel issues
- Any condition not clearly addressed in this manual

Prompt communication helps prevent further damage and ensures safe continued operation.

9. TROUBLESHOOTING & ABNORMAL OPERATION

TROUBLESHOOTING QUICK GUIDE

Stop the machine before inspection whenever abnormal vibration, leakage or unsafe conditions are observed.

CONDITION	POSSIBLE CAUSE	CORRECTIVE ACTION
Separator does not start	No electrical supply; quick connector not secured; control issue	Verify supply and quick connector. If power is present and the machine does not respond, remove from service and contact Tessa.
Does not reach operating speed	Speed regulator not at maximum; electrical or mechanical condition	Confirm the regulator setting. If 50 Hz / approx. 7,000 RPM cannot be reached, stop and contact Tessa.
Excessive noise or vibration	Incorrect bowl/head assembly; improper seating; loose locking components	Stop immediately. Allow full stop, inspect and reassemble. If vibration persists, remove from service.
Irregular product flow	Unstable pump feed; regulating valve adjustment; restricted outlet piping or backpressure	Verify steady pump feed, adjust the regulating valve gradually, and check outlets for bends, restrictions or upward loops.
Poor separation performance	Operating speed not reached; dirty discs; incorrect disc-stack assembly	Confirm full speed before feeding milk. Clean, inspect and correctly reassemble the separation head and discs.
Product leakage	Damaged or incorrectly installed gasket, seal or clamp	Stop the separator. Inspect sealing surfaces, gaskets and clamps; replace damaged components before restart.

STOP IMMEDIATELY	Persistent abnormal vibration, failure to reach operating speed, electrical faults, visible internal damage, or leakage that cannot be corrected.

9. Troubleshooting and Abnormal Operation

9.1 General Approach to Troubleshooting

The TS-200 Cream Separator is designed for stable and reliable operation when assembled, operated, and cleaned in accordance with this manual. Most operational issues that may occur are related to incorrect assembly, incomplete cleaning, improper startup procedure, or unsuitable operating conditions rather than mechanical failure.

When an abnormal condition is observed, the operator should remain calm and follow a systematic approach. In most cases, stopping the separator, inspecting the assembly, and correcting the cause will resolve the issue without the need for technical service.

This section describes the most common abnormal operating conditions, their likely causes, and recommended corrective actions.

9.2 Separator Does Not Start or Does Not Run

If the separator does not start when the main power switch is turned on, the operator should first verify that electrical power is available at the control panel.

The electrical supply should be checked to confirm that the control panel is connected to a functioning power source and that the electrical cable between the separator and the control panel is fully inserted, locked, and tightened using the quick connector.

If power is present but the separator does not respond, the control panel indicators should be observed. Failure of indicator lights or the speed regulator display may indicate an electrical issue that requires qualified electrical inspection.

If the separator does not start despite correct electrical connection, the machine must be taken out of service and **Tessa Dairy Machinery** should be contacted for further guidance.

9.3 Separator Does Not Reach Operating Speed (50 Hz / 7,000 RPM)

Under normal conditions, the TS-200 reaches its operating speed automatically during startup. If the separator does not reach **50 Hz**, the operator should first observe the speed regulator display and confirm that the regulator knob is set to its maximum position.

If the frequency increases but does not reach 50 Hz, the operator may turn the speed regulator knob clockwise to increase the frequency. If the separator still does not reach operating speed, the startup procedure must be stopped.

Failure to reach operating speed is **very rare** and may indicate an electrical or mechanical condition that requires technical review. In such cases, the separator must not be operated, and **Tessa Dairy Machinery** must be contacted before further use.

9.4 Excessive Noise or Vibration During Operation

The TS-200 Cream Separator is designed to operate smoothly with minimal vibration. If unusual noise or vibration is observed during operation, the separator must be stopped immediately.

Common causes include incorrect assembly of the separation head, improper seating of internal components, or incomplete tightening of the locking ring or outlet assemblies.

After stopping the separator and allowing it to come to a complete stop, the operator should disassemble and reassemble the separator following Section 5, paying particular attention to correct seating of the separation head and proper installation of all outlet components.

If abnormal noise or vibration persists after correct reassembly, the separator must be removed from service and inspected by qualified personnel.

9.5 Irregular or Unstable Product Flow

Irregular discharge of cream or skim milk may indicate unstable inlet feed, an improperly adjusted regulating flow valve, restricted outlet piping, or incorrect outlet assembly.

The operator should first verify that the sanitary pump is providing a steady milk feed. The regulating valve should be adjusted gradually while observing the product discharge. If the optional ultrasonic flow meter is fitted, use its live flow indication as an additional reference while adjusting the valve. Outlet connections and piping should also be checked for sharp bends, restrictions, upward loops, or backpressure that could interfere with gravity discharge.

Correcting the inlet-flow or outlet-piping condition typically restores stable product flow.

9.6 Poor Separation Performance

If cream and skim milk separation quality is not satisfactory, the operator should first verify that the separator has reached full operating speed and that the green indicator light is illuminated before product feed begins.

Separation performance may also be affected by incomplete cleaning of the separation discs or incorrect assembly of the separation head. Dried milk residues, misaligned discs, or damaged spacers can reduce separation efficiency.

Disassembling, thoroughly cleaning, inspecting, and correctly reassembling the separation head typically resolves separation performance issues.

9.7 Product Leakage

Product leakage during operation may occur if gaskets, seals, or clamps are incorrectly installed or damaged.

The operator should stop the separator and inspect all sealing surfaces, gaskets, sanitary clamps, and outlet connections. Any damaged or worn seal must be replaced before restarting the separator.

Operating the separator with known leakage is not permitted, as it may create hygiene and safety risks.

9.8 When to Stop Operation Immediately

The separator must be stopped immediately under the following conditions:

- Persistent abnormal noise or vibration
- Failure to reach operating speed
- Electrical faults or control panel malfunction
- Visible damage to internal components
- Product leakage that cannot be corrected immediately

Continuing operation under these conditions may result in equipment damage or unsafe operation.

9.9 Technical Support and Service

If an abnormal condition cannot be resolved using the guidance provided in this section, the separator must be taken out of service and **Tessa Dairy Machinery** must be contacted.

When requesting technical support, the operator should be prepared to provide the model number, serial number, and a clear description of the observed issue. Providing accurate information helps ensure efficient and effective support.

Manufacturer Contact Information

If any issue cannot be resolved using the troubleshooting procedures described in this section, or if the operator is uncertain about the condition or safe operation of the separator, **Tessa Dairy Machinery** must be contacted for assistance.

For technical support, service guidance, spare parts, or documentation questions, please contact:

Tessa Dairy Machinery
Sales & Technical Support
Email: **sales@tessadm.com**
Website: **www.tessadm.com**
Phone (USA): **+1 347-322-0443**
Phone (USA – West Coast): **+1 213-210-4070**

When contacting Tessa Dairy Machinery, please have the following information available:

- Equipment model (TS-200)
- Serial number (as shown on the equipment nameplate)

- Description of the issue or observed behavior
- Operating conditions at the time the issue occurred

Unauthorized repairs or modifications must not be attempted. Operating the separator under unresolved abnormal conditions may result in equipment damage or unsafe operation.