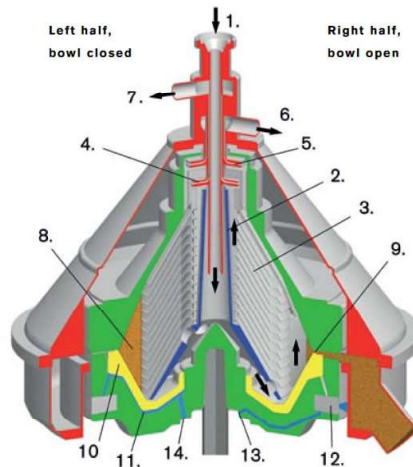


D. Process Description



The product flows into the bowl through feed pipe (1) and into the distributor (2) it undergoes acceleration until it reaches the bowl rotating speed. The distributor (2) conveys the product to the disks stack (3) where the separation between light and heavy phase takes place. Light clarified phase flows to the center of the bowl and heavy phase flows to the bowl outer diameter. They rise in the disks stack and reach the two upper chambers of the bowl. Here two fixed centripetal pumps (4) and (5) convey them under pressure to the outlet pipe lines (6) and (7).

The separated solids are collected in the peripheral part of the bowl (8) and they are periodically and automatically discharged through the discharge holes (9) to maintain the required separation efficiency. The sliding piston (10) is kept in the closed position by the pressure produced by the water in the chamber (11). Injecting the water (13) into the opening valve (12) the chamber (11) is emptied, the piston goes down and the solids are immediately ejected. By interrupting the water (13) and injecting the closing water (14) into the chamber (11), the sliding piston goes back to the closed position.

The periodical solids discharge is carried out automatically by means of a cycle timing unit which controls the opening and closing water solenoid valves.

By setting the timers it is possible to adjust the discharge quantity and the time between each discharge. Two automatic, independent operation cycles may be selected “separation/partial discharge” and “washing/partial discharge”. The discharge of solids collected in the bowl does not involve the stopping of the separating process; actually it takes place at the rated revolving speed and without interrupting the product feeding. The ejected sediments are collected into an outer annular chamber where they are drained away by gravity through a pipe.

The cycle timing unit controls as well the automatic closing of the bowl during the starting-up phase of the separator and allows the presetting for partial discharges manually controlled.

Bowl feeding is carried out through a closed pipe line with outlets of the product under pressure, by means of two centripetal pumps and without seal gaskets between fixed parts and rotating parts. On inlet-outlet pipe lines are inserted valves and instrumentation necessary to control and regulate the separator (micrometric adjusting valves, butterfly valves, sanitary pressure gauge, sample cocks, etc.).

E. Technical Specifications

Centrifuge type self-cleaning skimming separator mod. SE80X-Q3P4
Product warm milk, whey

Technical Specifications		
Milk skimming capacity	l/h	30.000
Whey skimming capacity	l/h	40.000
Milk standardization and cleaning capacity	l/h	40.000
Max residual fat in skim at skimming capacity and optimum conditions	Röse Gotlieb	0,040%÷0,055%

Process Conditions		
Optimal milk skimming range temperature	°C	45 ÷ 55
Optimal whey skimming range temperature	°C	30 ÷ 40
Operating inlet pressure	bar	0,5 ÷ 1,5
Maximum useful skim pressure	bar	3,0
Maximum useful cream pressure	bar	2,5

F. Installation Data

Operating Water		
Total hardness (1°dH=1.79°FH=1.25°eH=17.9ppm CaCO3)	dH	≤ 12° at sep. temp. < 55°C ≤ 6° at sep. temp. > 55°C
pH value		6,5 ±7,5
Salinity (Cl ⁻ ions):	mg/l	≤ 100
Operating water consumption (each partial discharge)	l	10,0
Operating water consumption	l/h	100,0
Minimum feeding pressure for operating liquid	bar	2,0

Air		
Minimum compressed air pressure	bar	6,0
Compressed air consumption	Nm3/h	0,01
Dew Point	°C	-40
Oil		none

Electrical System Features		
Motor power	kW	37,0
Voltage	V	3x400
Frequency	Hz	50
Motor type	asynchronous / 3 ph / 2 poles	
Motor starter and drive	by frequency converter (0÷50Hz)	
Electrical system	3 ph + earth	
Electric motor protection level	IP 55	
Electric panel protection level	IP 55	
Operation	PLC + OP touch-screen 9'	

Construction Features	
Centrifuge type	vertical disc type centrifuge
Transmission	by flat belt
Lubrication	self-lubricant
Anti-vibrations support	rubber shock absorbers

Hydraulic connections:	
Product inlet	DN65 DIN11851
Skim outlet	DN65 DIN11851
Cream outlet	DN40 DIN11851

Solids outlet	Ø 125
Operating water inlet	G 3/4"
Operating water outlet	DN50

Materials	Werkstoff n°	ASTM
Bowl (bowl body, moving ram and bowl hood)	1.4501	F55
Bowl (locking ring)	1.4501	F55
Bowl internal parts and parts in contact with product	1.4301	F304
Bowl cover and cyclone	1.4301	F304
Gaskets	NBR-EPDM	
Machine frame	Casted iron stainless steel coated	

Installation And Maintenance		
Footprint [L x W]	mm	2000x1360
Footprint with skid [L x W]	mm	2120x2570
Weight of bowl	kg	1.050
Weight of separator without bowl	kg	2.250
Weight of unit on skid	kg	3.900
Weight of motor	kg	315/385
Minimum height of hoist for bowl removal	mm	2.800
Maintenance area	m2	12

Weights And Shipping Data		
Weight of separator packing case	kg	2.650
Separator packing case dimensions [L x W x H]	mm	2200x1660x2250
Weight of bowl packing case	kg	1.360
Bowl packing case dimensions [L x W x H]	mm	1150x1000x1180
Weight of electrical panel packing case	kg	390
Electrical panel packing case dimensions [L x W x H]	mm	2200x1100x1000

Weights And Shipping Data (machine complete with skid)		
Weight of separator packing case	kg	3.800
Separator packing case dimensions [L x W x H]	mm	2900x2260x2470
Weight of bowl packing case	kg	1.360
Bowl packing case dimensions [L x W x H]	mm	1150x1000x1180

G. Scope of Supply – Process Equipment

Self-cleaning separator belt driven mod. SE80X-Q3P4

1. Separator



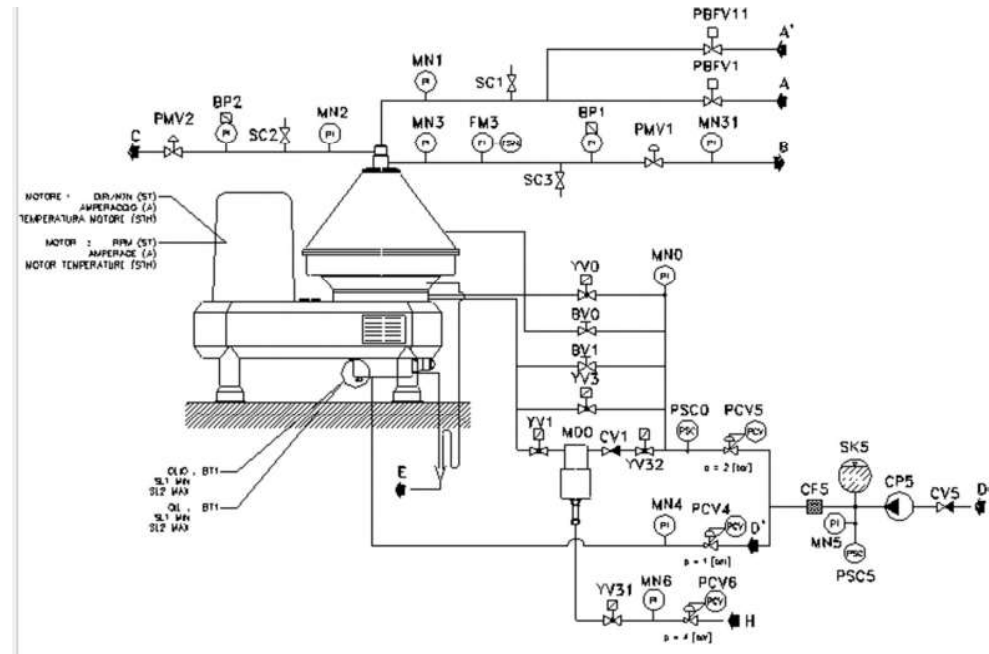
NON-BINDING PICTURE

1.1. Bowl

Self-cleaning bowl; main components and big-lock ring made of Superduplex; other components made of AISI 304. Accurate finishing disks.

1.2. Inlet-Outlet flow unit

Feeding through a closed pipe and products outlets under pressure by centripetal pumps;
P&ID as per drawing below:



1.3. Bowl Covers

Double wall (cooled by water) bowl cover and cyclone (annular chamber collecting the sludge) of stainless steel AISI 304. Easy access to bowl valves for cleaning and gasket replacement.

**1.4. Frame**

Externally clad by AISI 304; motor cover (noise insulation design) and oil plugs of stainless steel AISI 304.

1.5. Electric Motor

37 kW, IP55 protection, class F insulation and thermal overload protection by thermistors.

1.6. Bowl Vertical shaft

Made of AISI 431, driven by pulleys and flat belt; high precision ball bearings cartridge assembling.

1.7. Manual Brake

Acting on driving pulley, with flange and pin made of AISI 304.

1.8. Self-lubricating device

Automatic lubrication of ball bearings from a central bath produced by vertical shaft rotation. Lube oil is cooled by water. Level probes controls high/low oil level.

1.9. Speed Sensor

Inductive speed sensor for rotating speed monitoring.

1.10. Operating Water line and assembly

Solenoid valves and accessories for operating water (pressure reducer, pressure gauge, cartridge filter, hose, etc); surge tank for operating water with stainless steel pump 0,75 kW and tank of 20 liters.

**1.11. Dep - Electro-pneumatic metering device**

Installed on the operating water unit, to allow a precise metering of the opening water in order to reduce product losses by precise and equal partial discharges.

**1.12. Set of Special spanners and tools**

Complete set of tools for separator assembling and dismantling; bowl and mechanical parts tools included.

1.13. Set of Spare Parts

Set of spare parts including:

- n. 1 set of bowl gaskets,
- n. 1 set of bowl valves gaskets,
- n. 1 set of inlet-outlet flow unit gaskets,
- n. 1 set of spacers for inlet-outlet flow unit,
- n. 5 disks,
- n. 1 filter cartridge,
- n. 1 oil tank.

2. Cabinet for power and controls

Cabinet made of AISI 304, type Q3.

**2.1. Starting system**

Frequency converter automatic starter of separator motor by Frequency Converter with regulation of acceleration.

2.2. PLC and HMI

PLC with software for available functions:

- partial discharge
- total discharge
- combination of partial and total discharge
- washing (CIP)

HMI (operator panel) color, touch screen, monitoring:

- working hours
- phase voltage
- amperage
- bowl speed

- discharge times
- outlet pressure
- oil temperature
- critical and non-critical alarms

3. Cabinet for pneumatic components

Cabinet made of AISI 304, IP55 protection, for electro-pneumatic components.

3.1. Electro-pneumatic components

Air-pressure reducer, filter and air-solenoid valves.

4. Accessories

Below devices are essential for the operations and reliability of the separator and so included in the scope of supply:

4.1. Skid P4

Skid made of AISI 304 with rectangular-square pipes and gratings with adjustable feet. The separator, the electric panel, the inlet/outlet components, the surge tank, the operating water accessories, and other accessories, are assembled on the skid and completed with the necessary hydraulic, electric and pneumatic connection in order to have the unit ready for operation (after bowl assembly).



H. Scope of Supply – Documentation

1. Technical Documentation

The following technical documentation will be delivered in one copy in English language:

- machine description
- lifting, transport, storage
- separator start-up
- operation and maintenance manual containing all necessary documentation for separator and each separator component.

2. Installation Documentation

- Overall dimensions and installation plan
- Hydraulic system diagram
- Identification plates and alert stickers
- Pneumatic system diagram (if included in the scope of supply)