



APV GoldStream System RO System

The APV GoldStream System integrates high quality sanitary components that are designed to work together to deliver a predictable return on investment. The plant employs proven reverse osmosis (RO) technology to separate and concentrate milk residues back to their original compositions or higher. The APV GoldStream System is available in four different sizes/capacities. The pre-engineered standard skidded systems are based on proven components, membranes and control instruments and uncompromised quality materials like Stainless Steel in AISI 316 whilst meeting the highest hygienic standard.

Application

The APV GoldStream System is designed for recovery of milk and usable water from so called "white water" (mix of milk and water made at the first water flush of dairy equipment during CIP cleaning process). The white water can contain raw milk from road tankers and milk silos or pasteurised milk from pipes, pasteurisers, storage tanks and other processing equipment. The APV GoldStream System is based on proven reverse osmosis (RO) technology which enables effective processing of collected white water by concentrating milk components back to their original compositions or higher depending on the use of the recovered milk.

The APV GoldStream System enables use of the recovered milk for cheese, yoghurt, ice cream and flavoured milk, but not for natural drinking milk. The water component (permeate) can be used immediately for CIP or polished using the same RO system to produce high quality soft water at very low COD level for use as process, boiler or cooling water and top up in CIP systems.

Capacity

Four standard sizes with nominal capacities of: 5, 15, 30 and 45 m³ of white water per day (batch operation), based on diluted whole milk and 10 hours production time at 5-10°C.

Process description

The APV GoldStream System concept employs batch RO concentration of diluted milk components in a white water storage tank.

The white water feed is led from a batch-storage tank by an external feed pump to the RO base line and further into the RO loop system. Here the feed is separated into two phases – a retentate phase (milk concentrate) and a permeate phase (water). The retentate is led to the external batch-storage tank for further recirculation until the calculated amount of permeate is removed and the desired Total Solids (TS) in the retentate is obtained. The permeate is led to the RO balance tank and pumped to an external permeate storage tank or alternatively led to a drain.

The collected permeate can be polished (reduction of COD by a factor of approximately 10) using the same RO system.

After final processing the RO plant is cleaned according to the pre-defined CIP program and the recommended CIP procedure. Detergents are dosed manually. An automatic CIP system is available as an option.

Besides white water processing the GoldStream RO plant can be used for polishing of RO/NF permeates or condensate resulting in very high quality demineralised soft water (COD level of approximately 10 ppm) which can be used in a variety of applications.

Standard design

- Batch processing at 5-10°C
- Operating time: 10 hours between CIP
- Skid mounted system for Plug and Produce solution
- All parts in contact with product made of stainless steel AISI 316L / DIN1.4404
- Hygienic dairy processing standard based on 8" Spiral Wound RO membranes
- EHEDG APV Brand Process Equipment (Valves, Pumps & Fittings)
- EHEDG Sanitary Endress & Hauser Instrumentation (Temperature, Pressure, Level & Flow) for process control
- Indicators for process monitoring
- Integrated closed balance tank for permeate and internal CIP process
- Stainless steel safety filter introduced to protect membranes against small mechanical impurities
- High pressure APV brand pumps (standard) or Grundfos (option)
- Integrated Tubular Heat Exchangers for product cooling and CIP heating
- Stainless steel utilities control valves
- Manual service shut-off valves included
- Automatic system for pump seals flush
- All pumps controlled via skid mounted frequency converters by Danfoss 300 series (IP66)
- Skid mounted stainless steel control and MCC panel
- Semi-automatic self-contained control system with Siemens MP277 10" operating panel and defined signal interface – tried and tested system
- PLC controlled CIP program for both manual (standard) and automatic (optional) CIP chemicals dosing
- Cabled and tested, ready for Plug and Produce

Design option

- Grundfos high pressure pumps
- Sanitary, APV Double Seat Leak-Proof Valves
- Automatic CIP chemicals dosing system
- Communication link for remote control of the plant from an external control system
- Communication link to an external control system for data collection from the plant
- Additional operator SCADA system consisting of a Wonderware Intouch PC for operator room placement. This enables remote operation, easy plant overview, surveillance and plant data collection including trend curve screens for easy production optimisation and trouble shooting
- Allen-Bradley CompactLogix PLC and Rockwell PanelView 600 Touch HMI Panel



APV GoldStream RO Skid

Technical Data – APV GoldStream RO system (refer to production at 10°C)

	Units	GoldStream RO5	GoldStream RO15	GoldStream RO30	GoldStream RO45
Daily white water volume	m ³	5	15	30	45
Production temperature	°C	5-10	5-10	5-10	5-10
Time between CIP (approx.)	h	10	10	10	10
CIP temperature	°C	50	50	50	50
Installed power	kW	31/19 ²⁾	44/32 ²⁾	61/49 ²⁾	76/75 ²⁾
Permeate outlet pressure, max.	bar	3	3	3	3
Feed pressure at unit inlet, min.	bar	2	2	2	2
External feed pump capacity, min.	l/h	5.000	15.000	30.000	45.000
Flushed seal water capacity (3 bar)	l/h	200	200	200	200
Steam consumption - CIP (3 bar)	kg/h	170	180	300	350
CIP Process water capacity - flush (3 bar)	l/h	10.000	20.000	30.000	40.000
Ice water capacity – production (3 bar, 2°C)	l/h	11.000	7.000	12.000	15.000

2) For Grundfos high pressure pump option

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For more information about our worldwide locations, approvals, certifications, and local representatives, please visit www.apv.com.

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