APV
AN SPX BRAND

APV from A-Z

SPX®

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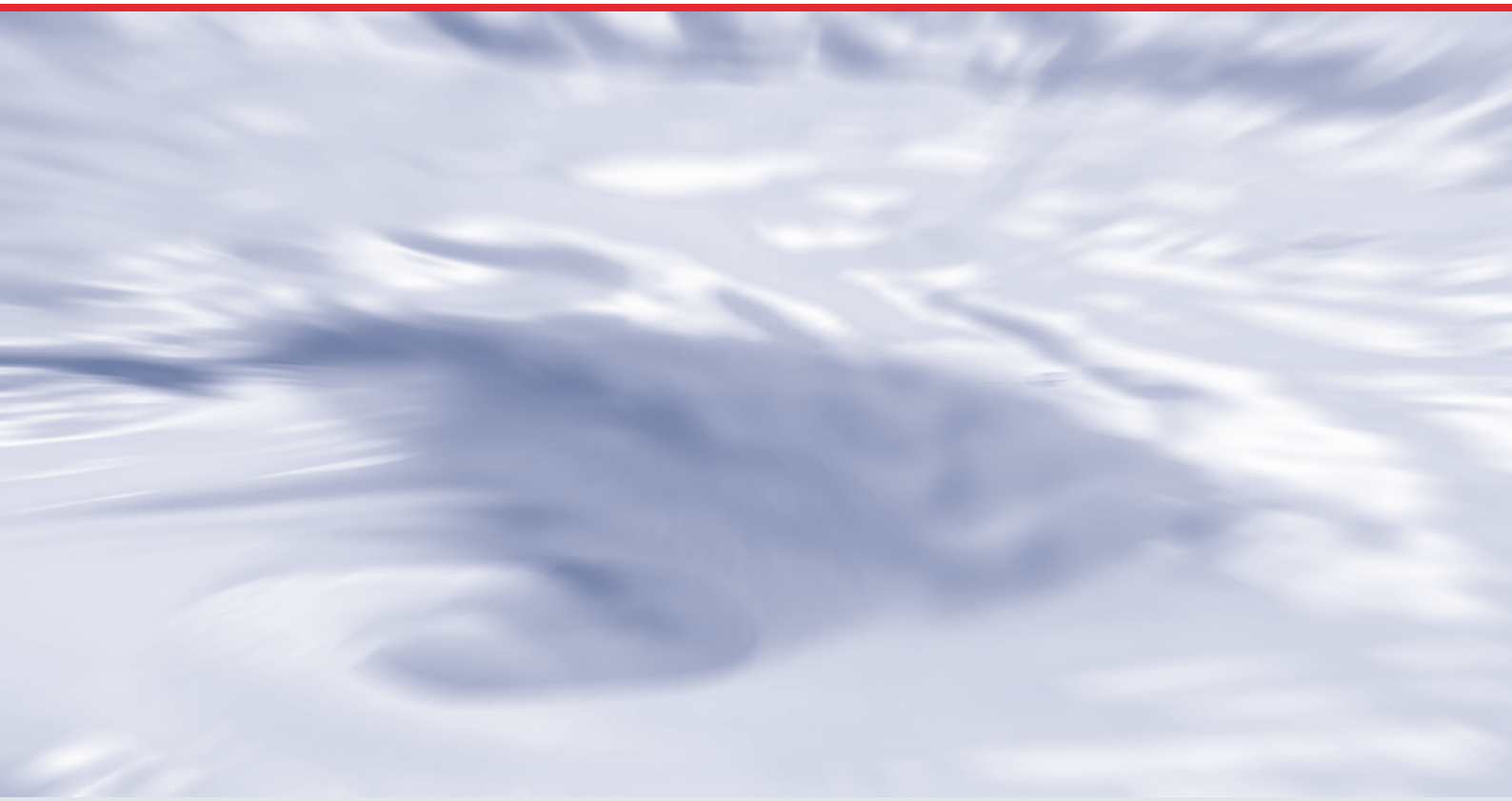
APV in brief



Vision and commitment

APV, part of SPX Corporation, is a global supplier of process engineering and automation solutions to the dairy, food, beverage, marine, pharmaceutical and healthcare industries. From the supply of engineered components to complete process engineering and design, it specialises in helping its customers improve their plants' performance and profitability, which is maintained throughout the lifetime of support services, carefully tailored to its customers' needs.

We are committed to helping our customers all over the world to improve the performance and profitability of their manufacturing plant and processes. We achieve this by offering advanced technology products and processing plants supported by world-leading applications and development expertise, and a finely meshed customer service and spare parts network. All APV sites are ISO 9001 certified.

Customer focus

Founded in 1910, APV has pioneered groundbreaking technologies over nearly a century, setting the standards of the modern processing industry.

Research and development based on customer needs and our own ability to foresee their future needs continue to drive the company's growth.

Designed to perform

This product catalogue is designed to make it easier for you to identify the components, products and process solutions you need in order to drive your own business forward.

Common to all APV products are uncompromising design and engineering, full compliance with all relevant international standards, long service life, production efficiency, and cost-effective performance – when performance really counts.

For further information on APV and our services, please contact your local APV company. Addresses and telephone numbers are listed on www.apv.com

APV Customer Service

Keeping process plant at peak performance

> APV's worldwide network of skilled support teams is dedicated to helping you ensure that your plant facilities are available when needed. We achieve this through a round-the-clock service with planned maintenance, repair, emergency call out, and genuine APV spare parts.

Our focus is always on prediction and prevention. We work with you to perform cost-effective plant maintenance and help you avoid costly unscheduled downtime. Proactive service solutions and a high level of support maximise plant performance and improve return on investment.

APV supply

- Genuine, high-quality and reliable process components with a long service life
- Innovative process engineering solutions based on experience gained from thousands of successful projects

- Leading-edge automation and information management
- Comprehensive after-market services developed to meet the changing and diverse needs of customers all over the world

Areas

- Dairy industry – UHT, cheese equipment, plate heat exchangers, homogenisers, membranes, pumps and valves
- Brewery - process equipment, pumps, valves and plate heat exchangers
- Beverage - process equiment, pumps, valves and plate heat exchangers
- Pharmaceutical – pumps, valves, mixers, plate heat exchangers and homogenisers
- Food industry – process equipment, pumps, valves and homogenisers
- District heating, marine – plate heat exchangers
- Chemical – homogenisers
- Healthcare – homogenisers
- Biotechnology – homogenisers

APV maintenance contracts

APV maintenance contracts are tailored to your specific requirements. You can choose any level from basic service and maintenance to comprehensive application programmes that help you achieve measurable plant improvements.

APV maintenance services

APV maintenance services are based on a comprehensive range of advanced testing and refurbishment programmes. These are specifically designed to safeguard product quality and optimise production levels. In addition, they support traceability, environmental and quality control regulations as well as minimising waste.

APV's maintenance centres also perform cleaning and regasketing of plate heat exchangers, restoring their original specified performance level. Alternatively we can supply a complete set of replacement plates for installation during a scheduled production stop, thus maximising production time.

Genuine spare parts that will not let you down

APV has a worldwide reputation for the quality of its products and plants. By insisting on genuine APV plants made from the highest quality materials under stringent quality control procedures, you can maximise service life and the reliability and performance of your plant.

Non-genuine parts may not meet the quality standards of the original design, and can even malfunction. This can result in diminished product quality as well as higher costs and downtime in the longer term.

Upgrades and replacements

APV pumps, valves, heat exchangers and homogenisers are critical components. Upgrading to newer models can result in a significant performance increase that is visible on the bottom line.

Advice on upgrades is available from APV's technical team.

Training courses

APV's training services range from standard product training to special programmes targeting your specific requirements. The aim is always to provide you with the knowledge required to achieve a smooth and efficient start-up, and the necessary skills to ensure long-term efficiency.

APV's services include

- Customer help line
- Technical and application support
- Heat exchanger testing and refurbishment
- 24/7 process and automation service
  - On-site or remote trouble shooting
  - Bonded stock agreements
  - Maintenance agreements
  - Predictive maintenance packages
- Plant optimisation and improvement partnerships
- Genuine APV spares
- Homogeniser aftermarket support

see also pages 45, 46 and 47

Automation & Performance Service Solutions - APV FactoryExpert

Current markets are very challenging for food and beverage producers. They are under enormous pressure to remain competitive. Expectations are high and becoming more difficult to meet. Greater production versatility, consistently high quality products, strict hygiene together with lower production cost are critical in a customer-driven environment.

In addition, high efficiency, accurate control of production processes and compliance with food handling regulations such as food safety and traceability is a “MUST” in today’s modern plant.

FactoryExpert is APV Automation & Performance Services. It combines innovative solutions with reusable engineering applications on open platforms to meet our customer automation specifications.

We offer state-of–the-art automation solutions and services designed to international standards based on in-depth process knowledge together with manufacturing know-how and engineering expertise that meet regulatory requirements. FactoryExpert enables customers to extend their performance gains across their business.

APV FactoryExpert is vendor independent, it can include, for example control systems and human machine interfaces (HMIs) from Siemens, Rockwell, Mitsubishi, Wonderware, etc. This enables true versatility in our solutions.

APV FactoryExpert Value Streams

APV FactoryExpert comprises five strategic value streams to meet our customers’ automation and manufacturing execution needs.

- **Automation Service** for customers' existing automation equipment offering maintenance and support programmes, spare parts, etc… maintaining and improving condition to maximise plant uptime

- **Automation Migration** for our customers with an installed base of ageing and obsolete automation equipment which can no longer adequately support their business. Furthermore, **Automation upgrade** for systems that require additional functionality to meet automation and control requirements.

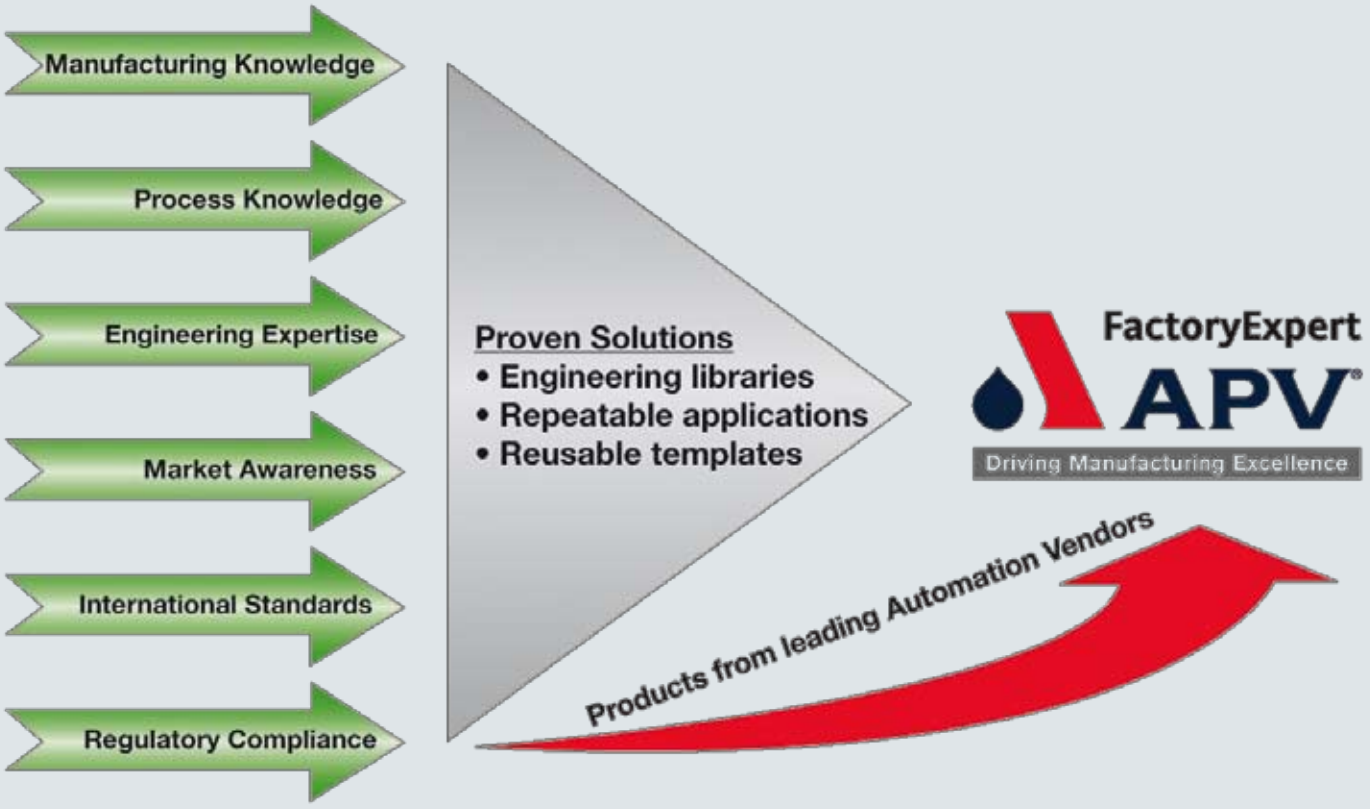
- **Automation Systems** consisting of PLC and HMI as part of our project offering. These can be in the form of a single skid unit through to a plant wide automation solutions

- **MES Applications** targeting manufacturing and equipment performance, production execution, quality and tracking. We offer a scaleable suite of engineered applications designed to deliver the right information, at the right time, to the right people, in the right context to drive future actions in our customers' organisations to drive manufacturing excellence

- **ERP Integration** solutions that link and integrate the plant floor automation systems to our customer's enterprise or business layer

We also offer **Performance Services** to ensure that our customers are gaining the maximum business benefit from their investment in automation.

APV is a leading provider of integrated process control and information systems. We have with a tradition of more than 30 years of proven experience successfully supplied engineered solutions into the global marketplace.



Research and development – APV Innovation Centre

> The APV Innovation Centre cooperates closely with APV companies and customers around the world in order to provide a constant stream of innovative, world-class solutions that add decisive competitive value to the businesses of our customers.

Located in Central Jutland, the heart of Danish dairy farming country, the Centre is the focal point of APV's dairy process development activities. The APV Innovation Centre extends its reach far beyond this, however, offering a raft of services for the food industry in the broadest possible sense. These include after sales service, laboratory analyses, technical information and training of APV employees and APV customers.

The APV Innovation Centre leverages the extensive industry experience and expertise of a permanent staff of food technologists, process engineers and production engineers together with knowledge gained over many years throughout the worldwide APV Group to contribute actively to all types of development, testing and application of APV equipment, systems and processing lines. All facilities and services are designed to provide added value by minimising waste and energy requirements, or by converting commodity ingredients into new, competitive products.

Important keywords for the Centre are innovation, optimum plant dimensioning, high-quality products, and up-to-date knowledge of market requirements. The trials are custom-tailored and can be performed in the Innovation Centre or on customer site. All work on behalf of individual customers is subject to the strictest confidentiality and the highest standards of customer service.

Projects

Dedicated project management for on-time, on-budget installation and maximum performance from day one

APV's project management organisation handles small, mid-size and large-scale projects for customers all over the world in the dairy, food, beverage, juice, brewing, chemical and industrial fermentation industries.

Smaller projects such as pilot plants, single processing lines and upgrades are typically handled by our local engineers and project management organisations. Larger assignments such as green field projects and advanced technology applications may require additional highly specialised or extensive engineering and manpower resources. These projects are thus normally handled by one of our regional engineering centres in Denmark, France, the UK, the USA or Australia.

APV project management is committed to completing projects on time, on budget and according to specification with minimum impact on other production. We combine the flexibility, familiarity and fast response of local resources with the full power of APV's global knowledge assets to ensure the best possible result for our customers in terms of time-to-production, quality, performance and ROI.

APV project management also means knowledge sharing with our local organisations and partners to ensure the necessary rapid and effective follow-up and support that will help our customers to sustain and extend their competitive position.

APV product range

> The APV product portfolio includes a wide range of pumps, valves, heat exchangers, mixers and homogenisers, designed to operate at maximum efficiency in today's modern process plants.
Engineering excellence, innovative design and stringent quality control ensure that the APV range complies with the highest hygiene standards.

The necessity to deliver consistently safe, high-quality end-products requires manufacturers to make plant hygiene a top priority. APV's process products are designed for easy and effective cleaning/CIP, whilst minimising the use of valuable resources such as energy.
Many APV products have built-in intelligence for improved efficiency and total integration with modern control and automation systems. APV can provide components and equipment that meet international standards such as 3A, PMO, USDA, ASME, EHEDG, FDA and the European CE Mark. APV is also helping its customers meet new food safety legislation such as EC 178/2002.

Heat exchangers

Heating and cooling efficiency for a wide variety of industries and applications

Heat exchangers are at the heart of many processes in the food and beverage industries as well as in the industrial, energy and marine sectors. APV offers a comprehensive range of efficient, durable and economic heat transfer solutions for any duty, including acid, gasses, oils, fats, detergents and milk, and for processes characterised by extreme pressure, vacuum, pressure drop limitation or high heat recovery.

The APV range includes gasketed, semi- and fully welded, and brazed plate heat exchangers, direct infusion and injection heat exchange as well as tubular and scraped surface heat exchangers.

Gasketed plate heat exchanger - Paraflow

Gasketed plate heat exchangers

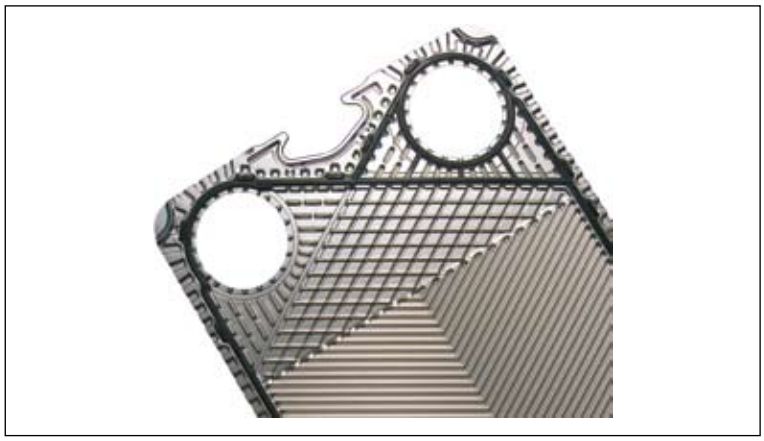
Specifications	
Field of application	Widely used for heating, cooling, pasteurizing and heat recovery in hygienic and industrial applications including food and beverage industries, chemical, petrochemical, oil and gas, power, energy, other industrial sectors, and marine applications
Description	Plate heat exchangers with loose, gasketed plates compressed in a frame. Designed for superior heat transfer coefficients, compact installation, and highest possible efficiency and optimum run-time. ParaFlow heat exchangers are available in various plate designs, plate types, corrugation patterns and sizes to match customer requirements
Material	Plates: AISI 316, AISI 304, Titanium, and most alloys Gaskets: NBR per, EPDM, FKM, and others Frames: Stainless steel or painted Carbon steel
Temperature	Rubber gaskets: -35 - 180°C (-31 - 356°F) Graphite gaskets: -20 - 250°C (-4 - 482°F)
Pressure	0 - 25 bar gauge (0 - 362 Psi)
Transmission area/duty	Up to 3,800 m² (40,903 ft²)
Maintenance access	Full access for cleaning and inspection

Advantages

- Compact and durable designs
- High efficiency due to full countercurrent flow
- Resistant to thermal stress
- Glue-free gaskets
- Possibility of combining different gasket materials for cost-effective solutions
- Easy to clean

EnergySaver plate type

Best heat transfer value for money with less pumping of cooling or heating water



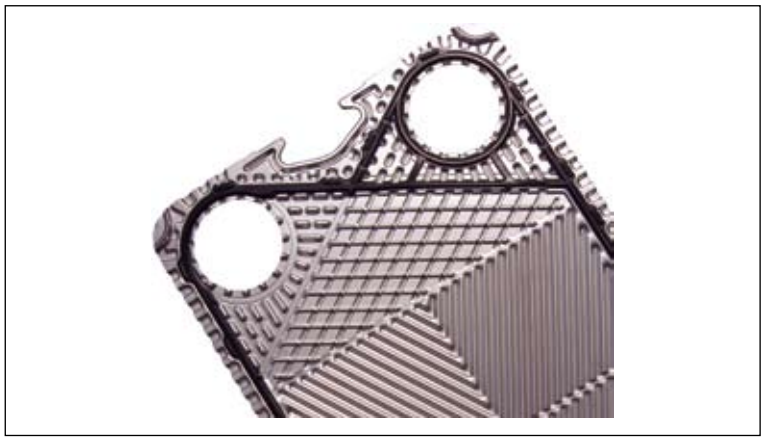
Advantages

- Superior heat transfer efficiency
- Compact and durable designs
- Glue-free gaskets
- Easy to clean

Specifications	
Field of application	For processing low-viscosity media. Designed for high thermal efficiency with a very close temperature approach
Description	Plate with narrow gap and many contact points to secure high thermal efficiency
Material	Plates: AISI 316, AISI 304, Titanium and most alloys Gaskets: NBR per, EPDM, FKM, and others
Temperature	Rubber gaskets: -35 - 180°C (-31 - 356°F) Graphite gaskets: -20 - 250°C (-4 - 482°F)
Pressure	25 bar gauge (362 Psi)
Transmission area/duty	Up to 3,800 m² (40,903 ft²)
Maintenance access	Full access for cleaning and inspection

DuraFlow plate type

For continuous process and long run time



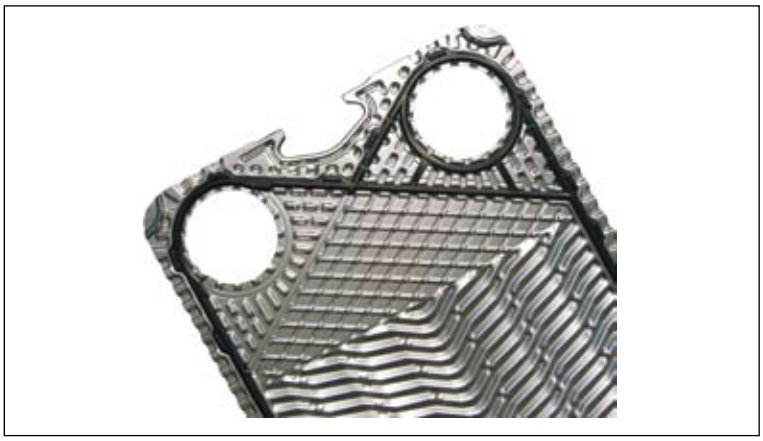
Specifications	
Field of application	For medium or high viscosity media
Description	Plate with wide gap and reduced number of contact points to ease the flow of viscous products and products containing small particles. Designed for continuous, durable flow and long run time
Material	Plates: AISI 316, AISI 304, Titanium and most alloys Gaskets: NBR per, EPDM, FKM
Temperature	-35 to 180°C (-31 - 356°F)
Pressure	0 - 16 bar gauge (0 - 232 Psi)
Transmission area/duty	Up to 1,800 m² (19,375 ft²)
Maintenance access	Full access for cleaning and inspection

Advantages

- Excellent heat recovery
- Gentle product treatment
- Long run time

EasyFlow plate type

When you need extra gentle product treatment and superior run time



Advantages

- Excellent heat recovery
- Gentle product treatment
- Long run-time

Specifications	
Field of application	For media containing fibres or pulp, requiring highest possible heat recovery without blocking
Description	Wide gap plate with reduced number of contact points to ease the flow of viscous products and products containing fibres or pulp. Designed for continuous, durable flow and long run time
Material	Plates: AISI 316, AISI 304, Titanium and most alloys Gaskets: NBR per, EPDM, FKM, and others
Temperature	-35 - 180°C (-31 - 356°F)
Pressure	0 - 16 bar gauge (0 - 232 Psi)
Transmission area/duty	Up to 300 m² (3,229 ft²)
Maintenance access	Full access for cleaning and inspection. Sediments can be CIP cleaned

Gasketed plate heat exchanger - DuoSafety

Double wall plate design for reduced risk of intermixing

Advantages

- Reduced risk of intermixing of fluids
- 100% visual inspection possible
- Good thermal efficiency
- Combined plate designs and material for optimised solution
- No welds

Specifications	
Field of application	When added security against intermixing is needed in the unlikely event of plate failure or corrosion. Widely used in hygienic applications
Description	Double wall consisting of 2 layers of plates per flow plate in order to drain any fluid from leakage to the atmosphere. For use in gasketed plate heat exchangers
Material	Plates: AISI 316, Titanium and other alloys Gaskets: NBR per, EPDM, FKM
Temperature	-35 - 180°C (-31 - 356°F)
Pressure	0 - 16 bar gauge (0 - 232 Psi)
Transmission area/duty	Up to 400 m² (4,305 ft²)
Maintenance access	Full access for cleaning and inspection

Gasketed plate heat exchanger - Hygienic frames

Extendable frames to meet stringent hygienic requirements

Specifications	
Field of application	Hygienic applications mainly in dairy and beverage business
Description	Solid or claded stainless steel frames. Available in either tie bar or spindle design
Pressure	0 - 25 bar gauge (0 - 362 Psi)
Connections	20 mm - 150 mm (3/4" - 6")

Advantages

- Designed to meet high quality and hygienic standards
- Tie bars are removed horizontally sideways without removing the nuts, enabling quick dismantling

Gasketed plate heat exchanger - Self-closing frames

Automatic self-closing frames for hygienic applications

Specifications	
Field of application	Hygienic applications requiring frequent and easy opening of the frame without moving or removing any components
Description	Stainless steel clad frames. Intelligent PLC control to reduce operator error
Pressure	0 - 13 bar gauge (0 - 188 Psi)
Connections	50 mm - 100 mm (2" - 4")

Advantages

- Fully automated frame for easy opening and closing at the push of a button – minimum operator involvement
- Intelligent PLC ensures proper opening and closing preventing damage due to plate misalignment or over-compression
- Total run time display since the last opening enables optimum maintenance planning

Gasketed plate heat exchanger - Industrial frames

Wide range of extendable frames to meet various quality needs

Specifications	
Field of application	Heating, cooling and heat recovery applications in the industry and energy segment for any duty including water, seawater, glycol, acid, gasses, oils, fats and detergents
Description	Industrial frames in painted carbon steel. Available in either tie bar or spindle design
Pressure	0 - 25 bar gauge (0 - 362 Psi)
Connections	20 mm - 500 mm (3/4" - 20")

Advantages

- Powder coating provides a strong surface of the head and follower
- Tie bars are removed horizontally sideways without removing the nuts, enabling quick dismantling
- Meet most industrial design standards, e.g. ASME, U-Stamp and PED Cat. IV (heavy duty approval)

Semi-welded plate heat exchanger - ParaWeld

Welded plate pairs design

Specifications	
Field of application	Widely used for single and two-phase heat transfer in refrigeration, chemical, industrial and petrochemical markets. Designed with welded channels allowing handling of aggressive fluids
Description	Corrugated plates welded in pairs. Pairs are separated by gaskets (welded pairs on process side, normal gasket technology on the secondary side)
Material	Plates: AISI 316, AISI 304, Titanium, C2000, and most alloys Gaskets: NBR, EPDM, FKM, and other types
Temperature	Rubber gaskets: -45 - 250°C (-49 - 482°F)
Pressure	0 - 35 bar gauge (0 - 507 Psi)
Transmission area/duty	Up to 2,000 m^2 (21,528 ft^2)
Maintenance access	Welded side: Cleaning by circulation of cleaning fluids (CIP) Gasketed side: Full access for cleaning and inspection

Advantages

- High efficiency due to full countercurrent flow
- Reduced risk of leakage
- Resistant to thermal stress
- Compact and space-saving design
- Possibility to combine different gasket materials for cost-effective solution

Plate evaporator

Rising/falling film plate evaporator

Specifications	
Field of application	Food, juice and dairy products such as skim milk, meat and vegetable broths, coffee, fruit juice, sugar and gelatin
Description	Rising and falling film type evaporative exchanger with vapor/liquid separators designed for vacuum service. There are two size plates available for small to medium plants. Can be arranged in single or multiple effects for steam efficiency. Excellent choise for purees and other pulpy products. Suitable for products up to 600 cps
Capacity	100 - 10,000 kg/h water removal
Product temperature	26 - 100°C (78.8 - 212°F)
Pressure	0.034 - 2 bar (0.5 – 29.001 Psi)
Dimensions	Capacity dependent. Small systems can be designed for 3 m height
Options	Complete process integration and automation. Aroma recovery available for juice plants

Advantages

- Enhanced quality of food products
- Low head room requirement
- Easy accessed for cleaning
- Flexibility in capacity by adding plates

Plate evaporator

Falling film plate evaporator

Specifications	
Field of application	Food, juice and dairy products such as skim milk, meat and vegetable broths, coffee, fruit juice, sugar and pharmaceuticals
Description	Falling film type evaporative exchanger with vapor/liquid separators designed for vacuum service. There are three size plates available for medium to large plants. Can be arranged in single or multiple effects or MVR for high thermal efficiency. Excellent choise for making concentrates requiring absolute highest product quality
Capacity	500 - 25,000 kg/h water removal
Product temperature	26 - 100°C (78.8 - 212°F)
Pressure	0.034 - 2 bar absolute (0.5 – 29.001 Psi)
Dimensions	Capacity dependent
Options	Complete process integration and automation. Aroma recovery available for juice plants

Advantages

- Shorter residence time and improved product quality compared to traditional falling film evaporators
- Rapid start-up and minimum wastage at shut-down due to low liquid hold-up
- Flexible capacity to meet varying duty requirements
- Economic processing of small batches
- Low height requirements (< 6 m) - will usually fit within a standard building - providing savings in installation costs

Plate and shell heat exchanger - ParaShell

For high temperatures or high pressures

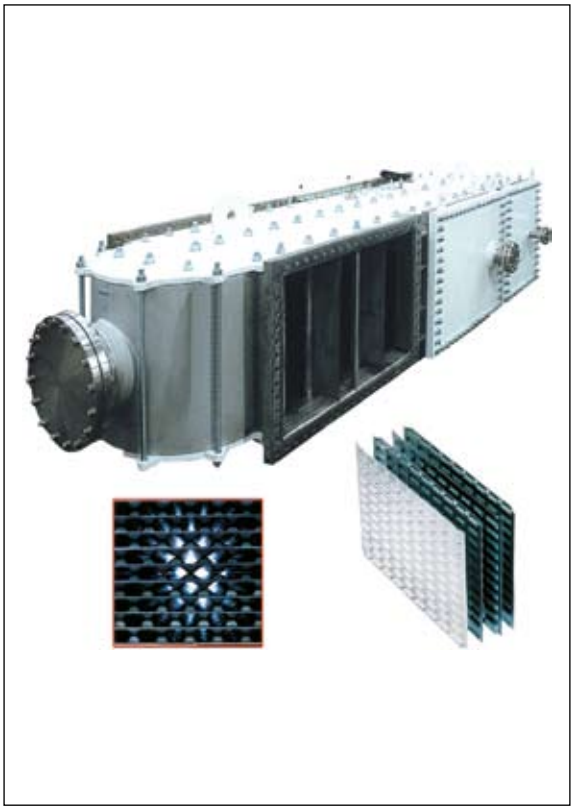
Specifications	
Field of application	For duties at high temperatures or pressures, frequently applied as an evaporator, condenser or heat exchanger for media where gaskets should be avoided. Strong construction excellent for steam duties
Description	A fully-welded, gasket-free heat exchanger combining highly efficient plates and a strong cylindric vessel construction
Material	Plates: AISI 316L, or most alloys Vessel: AISI 316L or carbon steel
Temperature	-30 - 300°C (-22 - 572°F)
Pressure	0 - 40 bar gauge (0 - 580 Psi)
Transmission area/duty	Up to 14 m² (150 ft²)
Maintenance access	Openable version can be high-pressure cleaned on one side. Further cleaning by circulation of cleaning fluids (CIP)

Advantages

- Very resistant to pressure shocks
- Compact design
- High efficiency
- Cost-effective

Fully welded plate heat exchanger - Hybrid

For high temperatures and high pressures



Specifications	
Field of application	For heating, cooling, condensing and evaporating. Typically used for high temperature and high pressure duties, e.g. in power, chemical, petrochemical and sugar industries
Description	A fully-welded, gasket-free heat exchanger combining highly efficient plates and a strong vessel construction. The asymmetric and flexible design allows extremely low pressure drop if required. Can be fully customised to meet individual needs
Material	Plates: AISI 316L or most alloys Vessel: AISI 316L or carbon steel
Temperature	-200 - 900°C (-328 - 1,652 °F)
Pressure	-1 - 60 bar gauge (-14 - 870 Psi)
Transmission area/duty	Up to 8,000 m² per unit (86,111 ft²)
Maintenance access	Full accessibility for cleaning and inspection without removal of piping. Further cleaning by circulation of cleaning fluids (CIP)

Advantages

- High efficiency
- High capacity
- Low pressure drop
- Extremely flexible
- Easy cleaning and inspection
- Low maintenance costs
- Space saving

Brazed plate heat exchanger - ParaBrazed

Compact brazed plate heat exchangers

Specifications	
Field of application	A comprehensive range of compact brazed plate heat exchangers for HVAC applications. Especially suited for water heaters, district heating units, gas boilers, and solar heating
Description	Plate heat exchanger without gaskets. The plates are joined by copper soldering
Material	AISI 316L (and copper)
Temperature	-50 - 195°C (-58 - 383 °F)
Pressure	0 - 30 bar gauge (0 - 435 Psi)
Transmission area/duty	Up to 75 m² (0 - 807 ft²)
Maintenance access	Cleaning by circulation of cleaning fluids (CIP)

Advantages

- Very compact
- Large temperature span
- Wide pressure range
- Economic and efficient

District heating and cooling solutions

Pre-built district heating and cooling units

Specifications	
Field of application	Customer or standard designed pre-built units for central heating, central cooling and instantaneous hot water heating solutions
Description	Modular installation mounted on a skid consisting of heat exchangers together with pumps, valves, instruments, safety equipment and automation such as PLC and/or frequency converters
Material	Plate heat exchanger types: Gasketed, brazed, plate and shell Pipes and fittings: According to customer specifications
Temperature	Up to 200°C (392 °F)
Pressure	10 - 25 bar gauge (145 - 362 Psi)
Transmission area/duty	Up to 50 MW (170,601,883 Btu/h)
Maintenance access	All vital components are easily exchangeable

Advantages

- Designed for easy and time-saving installation and commissioning
- Pressure and functional testing before shipment
- Internal wiring done at factory
- Easy to install
- Tailor made solutions
- 20+ years experience

District heating solutions - Compakva

Instantaneous compact water heaters and district heating units - innovative technology and design

Specifications	
Field of application	For heating of domestic tap water and for direct and indirect heating
Description	The series of Compakva units ranges from a simple water heater, consisting of a multi-functional block, a plate heat exchanger and thermostatic valve to more advanced district heating units with additional equipment including two plate heat exchangers, pump, expansion vessel, and thermometer
Material	Stainless steel AISI 316 and red bras
Temperature	Up to 130°C (266 °F)
Pressure	Up to 16 bar gauge (232 Psi)
Transmission area/duty	1 - 8 homes
Maintenance access	The plate heat exchanger is bolted together enabling easy cleaning and replacement. Copper has not been used in the plate heat exchanger, which reduces the risk of galvanic corrosion that can cause leakage

Advantages

- The smallest unit of its type - up to 30% less space requirement
- High thermal efficiency
- Low operating costs
- Low power consumption
- Easy to mount and clean

Tubular heat exchanger - ParaTube

Tubular heat exchangers for single or multi-purpose product processing

Specifications	
Field of application	For food and beverage applications processing products with particles, products sensitive to texture changes, and high-viscosity products, e.g. pulpy juices, sauces and soups, dairy products like milk and yoghurts, purées and concentrated juices, desserts
Description	Tubular heat exchanger with corrugated and smooth or straight tubes. Available types include: Double tube, Triple tube, Quadruple tube or Multi-tube
Material	AISI 304L, AISI 316L, Duplex SAF 2205, SAF 2507, and other alloys
Temperature	-30°C - 300°C (-22 - 572 °F)
Pressure	0 up to 100 bar gauge (1,450 Psi)
Transmission area/duty	Up to 73 m² in one standard module (786 ft²)
Maintenance access	Full inspection on product side in all versions. Further cleaning by circulation of cleaning fluids (CIP)

Advantages

- High flexibility in design to match multi-purpose line or plant
- Wide product range to cover almost any challenge in product processing
- Easy and low-cost maintenance (universal gaskets)

Water desalination unit - WDU

Fresh water generator with prolonged service life

Specifications	
Field of application	For the desalination of sea water, the production of potable water, and fresh utility water
Description	The water desalination unit is a single stage plate type based evaporator and condenser, separated by stainless steel demister
Material	Plates (evaporator and condenser): Titanium Vessel: AISI 316L, with SMO 254 reinforcement
Temperature	Jacket water: 70 - 90°C (160 - 190°F) Also available for steam injection Sea water: 0 - 32°C (32 - 90°F)
Pressure	6 bar gauge (87 psi)
Transmission area/duty	Up to 60 m³/24 h (16,000 U.S. g/24 h)
Maintenance access	Full access for cleaning and inspection

Advantages

- Reduced heat consumption due to pre-heating of feed water
- Reduced maintenance costs
- Prolonged service life thanks to extensive use of non-corrosive materials
- Reduced installation costs
- Reduced fouling due to pre-installed and adjustable chemical dosing unit
- Automatic feed water dosing valve securing optimized fresh water production

Scraped surface heat exchanger - VT+

Light and medium duty heat exchanger

Specifications	
Field of application	Dairy and food industries
Description	Vertical cylinder arrangement mounted on a base console with gear motor. The dasher top bearing is inside the product area, whilst the gear motor supports the dasher bottom. This means that there is only one shaft seal for each SSHE cylinder. Heat transfer surfaces: Cylinder size 422: 0.19 m² (2.1 ft²) Cylinder size 460: 0.44 m² (4.7 ft²) Cylinder size 660: 0.68 m² (7.3 ft²) Cylinder size 680: 0.87 m² (9.4 ft²)
Capacity	Dependent upon product and application, but typically up to 3,000 or 5,000 kg/h (6.600 - 11.000 lbs/h)
Temperature	Working temperature up to 150°C (300°F)

Advantages

- Best solution for treatment of viscous and heat-sensitive products
- Capable of handling products with large particles
- Long running time between CIP when processing heat-sensitive products
- Suitable for aseptic operation
- EHEDG-tested and approved

Scraped surface heat exchanger - HDRT and HEXRT

Heavy-duty (HD) and heavy-duty extra (HEX) heat exchanger

Advantages

- High-precision machined and polished Duplex quality and Bimetal cylinders
- Also suitable for evaporative refrigerants (R717 and R404a etc.)
- Product pressure up to 30 bar (435 Psi)
- Various dasher diameters, scraper blade types and configurations, as well as powerful dasher motors

Specifications	
Field of application	Heating, cooling, crystallising and freezing in the dairy, food and other process industries
Description	HDRT and HEXRT heat exchangers are designed to handle high-viscosity products in heating, cooling, crystallising and freezing applications. They feature a horizontal cylinder arrangement based on a rigid construction with demountable cylinder end doors and strong bearings outside the product area to support each dasher end. The RT appellation means that the gear motor is flanged direct on to the SSHE cylinder module. Heat transfer surfaces: Cylinder size 648: 0.55 m² (5.9 ft²) Cylinder size 672: 0.84 m² (9.0 ft²)
Capacity	Dependent on product and application, but typically up to 3,000 or 5,000 kg/h (6,600 - 11,000 lbs/h)
Temperature	Working temperature up to 150°C (300°F)

Scraped Surface Heat Exchanger - HT 680

Light and medium duty SSHE

Specifications	
Field of application	Dairy and food industries
Description	Horizontal cylinder arrangement mounted on a frame. The dasher is supported in both ends outside the product area, which makes the dasher pressure balanced. The heat exchanger type HT 680 is designed according to the EHEDG and 3A requirements. Approval is still pending. Heat transfer surface: 0.87 m² (9.4 ft²)
Capacity	Up to 3,000 or 5,000 l/h (6,600 – 11,000 lbs/h) depending on duty and temperature
Temperature	150°C (300°F)

Advantages

- Shaft seals are standard APV pump type for easy maintenance.
- Product and service connections do not need to be disconnected for maintenance.

Mixing and blending

Specialist mixing and blending systems for a wide variety of industries and processes

Stirring, mixing, and blending of products are fundamental operations in liquid processing, for example in the dairy, food, beverage and cosmetics industries. Often a fluid consists of components that are either dissolved, or contain a dispersion of particles of different sizes. A good example of a product consisting of a mixture of dispersed components is milk, which consists of fat, protein, carbohydrates, minerals, and water.

The fastest way of achieving dispersion is to use a mechanical shear force.

Mixing and blending is an APV core technology. APV offers complete mixing and blending systems, including fluid agitators, batch and continuous mixers to blenders, for the processed food, beverage, dairy, healthcare, oil, chemical and water treatment industries. The Flex-Mix family includes a range of various mixers as presented below.

Flex-Mix liquiverter

Mixing of liquid/liquid, liquid/powder and liquid/particulates

Specifications	
Field of application	Milk, juices, desserts, pulp, purée, fruit fillings and preserves, baby food, dairy products, ketchup, sauces
Description	Manual unit designed for batch mixing, inline mixing over one or more hydration tanks, or continuous mixing, with optional integration in fully automated production. Available as standard unit or with a high-shear mixing option
Standard sizes/ capacity	Available with different mixer heads and tank sizes of: 250, 500, 1,000, 2,000 and 3,000 l (65, 130, 260, 530, 800 U.S. g)
Temperature profile/ range	-10 - 110°C (14 - 22 PSI)
Pressure	0 - 0.5 bar

Advantages

- Simple but versatile
- Flexibility at low CAPEX
- Large dissolution capacity due to free vortex and square shape
- Fully drainable for improved hygine and minimum waste
- Direct drive reduces spare parts wear
- Flushed double mechanical shaft seal availale in mateiral of customer's choice, depending on application
- Easy to maintain

Flex-Mix instant

Vacuum mixing for recombination and high shear emulsification

Advantages

- Unique high shear mixing enables a high powder intake
- Air is efficiently removed during mixing prolonging running time and ensuring consistent quality
- Allows a closed, continuous production, resulting in higher throughput and reduce dust issues
- Handles a large number of formulations - flexible

Specifications	
Field of application	Milk, juices, desserts, purée, baby food, dairy products, sauces
Description	Designed for batch mixing, inline mixing over one or more hydration tanks or continuous mixing in closed systems with vacuum powder transport
Standard sizes/ capacity	Available with different mixer heads tank sizes of: 500, 1,000, 2,000 and 3,000 l (130, 260, 530, 800 U.S. g). Powder capacity up to 20,000 kg/h (40,000 lbs/h) depending on powder type
Temperature profile/ range	-10 - 110°C (15 - 210°F)
Pressure	-1.0 - 0.5 barg (0 - 22 psi)

Flex-Mix processor

Multi-flexible mixing and processing system for formulated and complex products

Advantages

- Gentle agitation, internal circulation
- High shear mixing for emulsification
- Handles paticulate inclusion
- Heating via jacket or direct steam injection
- Closed system with vacuum/flash options
- Quick batch preparation (flip-flop)

Specifications	
Field of application	Particulated liquid food, fruit fillings and preserves, candy and confectionery, baby food, soups, ketchup, mayonnaise, dressings, processed cheese, cream cheese, cheese spreads, desserts, creams, lotions, gels
Description	Sanitary batch process with processing and cooling in a time frame similar to that of a continuous process. Special mixing agitator design for gentle processing and protection of product integrity. Optional high shear mixing unit for emulsification. Individual process step combinations
Standard sizes/ capacity	250, 500, 1,000, 2,000 and 3,000 (65, 130, 260, 530, 800, 1,300 U.S. g)
Temperature profile/ range	-10 - 110°C (15 - 210°F) (143°C pressure vessels only) (289°F)
Pressure	-1 - 0.5 barg (0 - 22 psi) (3 barg for pressure vessels only) (60 psi)

Power-Mixer

Aseptic in-line mixer designed for liquid/liquid and liquid/gas dispersion technology

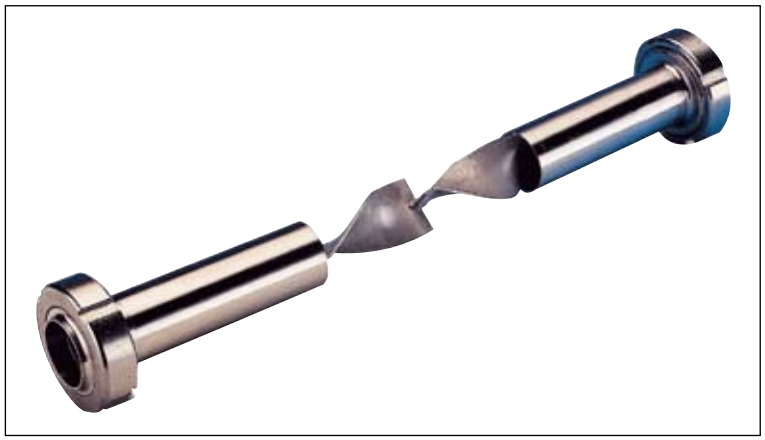
Advantages

- Aseptic aeration
- Emulsification
- Continuous mixing
- PLC standard in all aseptic systems
- Operator-friendly, smooth and trouble-free operation
- Pre-assembled and factory-tested

Specifications	
Field of application	Desserts, butter spreads, pulp, purée, fruit fillings and preserves, candy and confectionery, baby food, dairy products, mayonnaise, dressings, cheese spreads, emulsions, creams, lotions, gels
Description	High shear, stand-alone, in-line mixer, suitable for processing liquid/liquid and liquid/gas dispersions. Optional aseptic mixing
Standard sizes/ capacity	PM750 250 - 1,100 kg/h (550 - 2,400 lbs/h) PM1150 600 - 2,100 kg/h (1,320 - 4,600 lbs/h) PM1550 750 - 3,100 kg/h (1,650 - 6,800 lbs/h) PM2250 2,500 - 5,100 kg/h (5,500 - 11,200 lbs/h)
Temperature profile/ range	-10 - 150°C (14 - 300°F)

Mixer - TPX

An inline static mixer



Specifications	
Field of application	Designed for blending of liquids with a max. viscosity of approx. 20 cP. E.g. fat/recombined skimmed milk and cream/milk
Description	The mixer consists of a number of helical blending elements mounted in a stainless steel tube
Capacity	Dependent on the medium. Available in size: DN40-80 1.5

Advantages

- 3A certified
- Low-cost mixing alternative - no tank is required
- Reliable mixing directly in the pipes
- Easy to maintain
- Fast and easy CIP-cleaning

Mixer TPM+

A reliable powder mixer

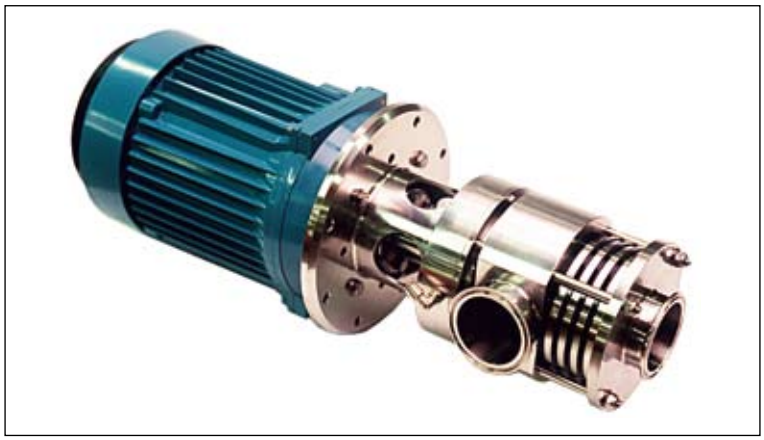
Specifications	
Field of application	When powder/granulates is first added to and then dissolved in a liquid
Description	Powder is added to the mixer via a butterfly valve. The valve controls the flow of powder and prevents air entering the mixer
Capacity	Dependent on the medium
Sealing material	EPDM, FPM
Max. flow	TPM+1: 25,000 l/h (6,500 U.S. g/h) TPM+2: 50,000 l/h (13,000 U.S. g/h)
Temperature profile/ range	Max. product temperature during mixing is 60°C (140°F)
Max. head	1.5 bar (22 psi)

Advantages

- Easy to maintain - the shaft seals are changed easily
- Reliable design due to the sturdy construction
- Hygienic, CIP-friendly design
- Reduced maintenance costs, when other APV pumps are being used. The shaft seals are identical to the ones used in W+/WS

DarMix+

In-line mixer for mixing of butter and butter blends



Specifications	
Field of application	Butter, butter spreads, dairy blend
Description	Compact and highly efficient in-line mixer. Mixing intensity (rpm) controlled by a frequency converter
Temperature	8 - 18°C (46,4 - 64,4°F)

Advantages

- Applicable for high- and low-viscosity products
- Ensures a homogeneous product
- No product contacting bearings
- Compact design
- Cleaning simultaneously with the pipeline

Deaerators

Enhancing product quality and storage stability with more cost-efficient production and improved process control

The presence of undesired air and gases in liquid food products frequently leads to deterioration in product quality in physical, chemical and sensory terms.

All product processing, which for example includes pumping and various mixing processes, will automatically disperse or/and incorporate air into the mixture. In addition, some raw materials contain gases, most of which are not desirable.

The main objectives for air elimination, deaeration and deodorizing of food products are: improved product quality, increased shelf life and storage stability, reduction of overall production costs, and improved process control

APV has produced air eliminators, deaerators and deodorizing equipment for the liquid food industry for more than 45 years, and installed over a thousand plants world-wide.

Deaerator - VFJ/VFN

Efficient deaeration of liquid food products

Specifications	
Field of application	Milk, juices, desserts, pulp, purée, fruit fillings and preserves, baby food, dairy products, ketchup, sauces
Description	The deaerators VFJ and VFN include a number of adaptations, including an improved aroma recovery system, designed to meet the demands of both new and existing customers. This modern, optimised processing technique with integrated aroma recovery provides improved retention of colours and volatile flavour components
Standard size/ Capacity	250 - 3,999 l/h (65 - 1,059 U.S. g/h) 4,000 - 9,999 l/h (1,060 - 2,639 U.S. g/h) 10,000 - 22,000 l/h (2,640 - 5,809 U.S. g/h) 22,001 - 39,999 l/h (5,810 -10,569 U.S. g/h) 40,000 - 55,999 l/h (10,570 -14,800 U.S. g/h)
Temperature area	From -10 up to 110°C (14 - 200°F)
Pressure	-1 barg/0.5 barg (0 - 22 PSI)

Advantages

- New, superior aroma-recovery system
- Automatic parasol regulating valve
- Improved hygiene
- Reduced commissioning costs
- Operator-friendly
- Preassembled and factory-tested

VFN E-VAP concentrator

Increasing total solids level in liquid food products

Specifications	
Field of application	Milk, desserts, dairy products
Description	The VFN E-VAP is designed to increase total solids by a few per cent by re-circulating the product across the VFN E-VAP unit several times. The VFN E-VAP Concentrator is a stand-alone unit with PLC, enabling the operator to load a recipe with a target set point for the total solids level
Standard size/ Capacity	Size A: Max 180 kg vapour/h (400 lb vapour/h) Size B: Max 410 kg vapour/h (900 lb vapour/h) Size C: Max 730 kg vapour/h (1,600 lb vapour/h) Size D: Max 1,650 kg vapour/h (3,640 lb vapour/h) Size E: Max 2,930 kg vapour/h (6,490 lb vapour/h) Size F: Max 4,592 kg vapour/h (10,120 lb vapour/h) Size G: Max 6,620 kg vapour/h (15,600 lb vapour/h)
Temperature area	From -10 up to 95°C (14 - 200°F)
Pressure	-1 barg/0.5 barg (0 22 PSI)

Advantages

- Fresh taste and odour
- Increased viscosity in milk applications
- Smooth and creamy texture in fermented products
- Increased serum stability
- Operator-friendly
- Preassembled and factory-tested

Cold water deaeartion - Derox

Improve your beer and juice quality with the Derox deaerator

Specifications	
Field of application	Beverage and brewery industry
Description	Deaeration can be performed by two different systems - cold (Derox) or hot (Derox+) deaeration. Derox cold deaeration achieves low oxygen levels with low capital outlay and running costs
Capacity	30 - 1,500 hl/h (8,000 - 40,000 U.S. g/h)

Advantages

- Constantly low oxygen content of 50 ppb at 12°C (54°F)(below 30 ppb at >20°C (68°F), measured as a standard deviation)
- Continuous monitoring for required specification
- Low running costs
- Easy integration with existing lines
- Space-saving design (high capacity/m²)
- Variable capacity and high turn down
- Independent of water inlet temperature (optional)
- Variable deaeration levels
- No rings and plates inside vacuum tanks
- Fully CIP-cleanable

Hot water deaeration - Derox+

Improve your beer and juice quality with the Derox deaerator

Specifications	
Field of application	Beverage and brewery industry
Description	Deaeration can be performed by two different systems - hot (Derox+) or cold (Derox) deaeration. The Derox+ hot deaeration system heats the water to a high temperature, which reduces the risk of infection and helps remove contaminants
Capacity	50 - 400 hl/h (1,300 - 10,600 U.S. g/h)

Advantages

- Constantly very low oxygen content (below 20 ppb, measured as a standard deviation)
- Continuous monitoring for required specification
- Continuous removal of undesirable THF gases
- Low running costs
- Easy integration with existing lines
- Space-saving design (high capacity/m²)
- High turn down ratio (down to 25% of nominal capacity)
- Independent of water inlet temperature
- No rings and plates inside vacuum tanks
- Deaerated water is pasteurised
- Fully CIP-cleanable

Homogenisers

APV is recognized as the world leader in homogenisation. APV Rannie and Gaulin homogenisers are widely used in the dairy, beverage and food industries. They are also used in the production of pharmaceutical and healthcare products, and in some biotech and chemical applications.

APV offers a wide range of homogenisers including laboratory, pilot plant, and production models, with hundreds of innovative solutions for even the most highly specialised application. Whatever your process requirements, we can deliver a homogeniser customized specifically for them. APV homogenisers are available in capacities up to 50,000 l/h and at operating pressures as high as 2,000 bar.

Options include a range of homogenising valves and materials, and the availability of soundproof cabinets to reduce noise emissions in higher capacity models.

- All our homogenisers are 3A approved
- All our homogenisers sold within the EU meet the European CE standard
- All our homogenisers can be designed with FDA approved packings.
- APV homogenisers support the EHEDG

High-pressure homogeniser Rannie 5/Gaulin 5

Highly efficient homogeniser for a wide range of applications

Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	3-plunger homogeniser, equipped with a Mono-Block or a Three-Piece valve housing. Large selection of standard options as well as special options. Materials for plungers, packings, pump valves, valve seats and seals are custom-selected for your application
Capacity	Rannie: 80 - 900 l/h (20 - 240 U.S. g/h) Gaulin: 180 - 850 l/h (50 - 225 U.S. g/h)
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Rannie: 200 -1,000 bar (2,900 - 14,500 psi) Gaulin: 210 - 600 bar (3,045 - 8,700 psi)
Dimensions	Single-stage homogeniser l x w x h (mm): Rannie: 1,260 x 720 x 1,200 Gaulin: 1,230 x 710 x 1,200
Options	Two-stage arrangement, hydraulics (man/aut), homogenising valves and plungers available in a choice of materials, aseptic design, motor starter, high-pressure outlet, plunger lubrication, control cabinet

Advantages

- Low maintenance costs
- Environmentally friendly design
- Service-friendly
- Easy to operate

High-pressure homogeniser Rannie 15/Gaulin 15

Highly efficient homogeniser for a wide range of applications

Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	3-plunger homogeniser, equipped with a Mono-Block or a Three-Piece valve housing. Large selection of standard options as well as special options. Materials for plungers, packings, pump valves, valve seats and seals are custom-selected for your application
Capacity	Rannie: 100 - 3,300 l/h (25 - 870 U.S. g/h) Gaulin: 450 - 3,000 l/h (120 - 790 U.S. g/h)
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Rannie: 150 - 1,500 bar (2,175 - 21,750 psi) Gaulin: 170 - 600 bar (2,500 - 8,700 psi)
Dimensions	Single-stage homogeniser l x w x h (mm): Rannie: 1,390 x 1,290 x 1,820 Gaulin: 1,440 x 1,290 x 1,730
Options	Two-stage arrangement, hydraulics (man/aut), homogenising valves and plungers available in a choice of materials, aseptic design, motor starter, high-pressure outlet, plunger lubrication, control cabinet

Advantages

- Low maintenance costs
- Environmentally friendly design
- Service-friendly
- Easy to operate

High-pressure homogeniser Rannie 24/Gaulin 24

Highly efficient homogeniser for a wide range of applications

Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	3-plunger homogeniser, equipped with a Mono-Block or a Three-Piece valve housing. Large selection of standard options as well as special options. Materials for plungers, packings, pump valves, valve seats and seals are custom-selected for your application
Capacity	Rannie: 500 - 5,200 l/h (130 - 1,370 U.S. g/h) Gaulin: 700 - 10,200 l/h (185 - 2,690 U.S. g/h)
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Rannie: 150 - 1,000 bar (2,175 - 14,500 psi) Gaulin: 70 - 600 bar (1,015 - 8,700 psi)
Dimensions	Single-stage homogeniser l x w x h (mm): Rannie: 1,390 x 1,290 x 1,820 Gaulin: 1,440 x 1,290 x 1,730
Options	Two-stage arrangement, hydraulics (man/aut), homogenising valves and plungers available in a choice of materials, aseptic design, motor starter, high-pressure outlet, plunger lubrication, control cabinet

Advantages

- Low maintenance costs
- Environmentally friendly design
- Service-friendly
- Easy to operate

High-pressure homogeniser Rannie 37/Gaulin 37

Highly efficient homogeniser for a wide range of applications

Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	3-plunger homogeniser, equipped with a Mono-Block or a Three-Piece valve housing. Large selection of standard options as well as special options. Materials for plungers, packings, pump valves, valve seats and seals are custom-selected for your application
Capacity	Rannie: 1,000 - 8,200 l/h (265 - 2,170 U.S. g/h) Gaulin: 1,600 - 11,200 l/h (420 - 2,960 U.S. g/h)
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Rannie: 150 - 1,000 bar (2,175 - 14,500 psi) Gaulin: 100 - 600 bar (1,450 - 8,700 psi)
Dimensions	Single-stage homogeniser l x w x h (mm): Rannie: 1,470 x 1,290 x 1,800 Gaulin: 1,540 x 1,290 x 1,720
Options	Two-stage arrangement, hydraulics (aut), homogenising valves and plungers available in a choice of materials, aseptic design, motor starter, high-pressure outlet, plunger lubrication, control cabinet

Advantages

- Low maintenance costs
- Environmentally friendly design
- Service-friendly
- Easy to operate

High-pressure homogeniser Rannie 55/Gaulin 55

Highly efficient homogeniser for a wide range of applications

Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	3-plunger homogeniser, equipped with a Mono-Block or a Three-Piece valve housing. Large selection of standard options as well as special options. Materials for plungers, packings, pump valves, valve seats and seals are custom-selected for your application
Capacity	Rannie: 600 - 12,500 l/h (160 - 3,300 U.S. g/h) Gaulin: 2,600 - 16,000 l/h (685 - 4,230 U.S. g/h
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Rannie: 150-1,500 bar (2,175 - 21,750 psi) Gaulin: 100-600 bar (1,450 - 8,700 psi)
Dimensions	Single-stage homogeniser l x w x h (mm): Rannie: 1,650 x 1,380 x 1,820 Gaulin: 1,720 x 1,380 x 1,680
Options	Two-stage arrangement, hydraulics (aut), homogenising valves and plungers available in a choice of materials, aseptic design, motor starter, high-pressure outlet, plunger lubrication, control cabinet

Advantages

- Low maintenance costs
- Environmentally friendly design
- Service-friendly
- Easy to operate

High-pressure homogeniser Rannie 110T/Gaulin 110T

Highly efficient homogeniser for a wide range of applications

Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	3-plunger homogeniser, equipped with a Mono-Block or a Three-Piece valve housing. Large selection of standard options as well as special options. Materials for plungers, packings, pump valves, valve seats and seals are custom-selected for your application
Capacity	Rannie: 2,500 - 21,000 l/h (660 - 5,544 U.S. g/h) Gaulin: 5,000 - 21,000 l/h (1,320 - 5,544 U.S. g/h)
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Rannie: 150 - 1,000 bar (2,175 - 14,500 psi) Gaulin: 150 - 600 bar (2,175 - 8,700 psi)
Dimensions	Single-stage homogeniser l x w x h (mm): Standard machine: 2450 x 1620 x 1450 mm Width extension: 2650 x 1620 x 1450 mm Pacmed in crate: 2750 x 1750 x 1825 mm
Options	Two-stage arrangement, hydraulics or manual, homogenising valves and plungers available in a choice of materials, aseptic design, motor starter, high-pressure outlet, plunger lubrication, control cabinet

Advantages

- Low maintenance costs
- Environmentally friendly design
- Service-friendly
- Easy to operate

High-pressure homogeniser Rannie 132Q/Gaulin 132Q

Highly efficient homogeniser for a wide range of applications

Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	5-plunger homogeniser, equipped with a Mono-Block or a Three-Piece valve housing. Large selection of standard options as well as special options. Materials for plungers, packings, pump valves, valve seats and seals are custom-selected for your application
Capacity	Rannie: 7,000 - 30,000 l/h (1,850 - 7,920 U.S. g/h) Gaulin: 16,000 - 34,000 l/h (4,225 - 9,000 U.S. g/h)
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Rannie: 150 - 600 bar (2,175 - 8,700 psi) Gaulin: 100 - 210 bar (1,450 - 3,045 psi)
Dimensions	Single-stage homogeniser l x w x h (mm): Rannie: 3,190 x 1,890 x 1,590 Gaulin: 2,860 x 1,890 x 1,640
Options	Two-stage arrangement, hydraulics (aut), homogenising valves and plungers available in a choice of materials, aseptic design, motor starter, high-pressure outlet, plunger lubrication, control cabinet

Advantages

- Low maintenance costs
- Environmentally friendly design
- Service-friendly
- Easy to operate

High-pressure homogeniser Rannie 132T/Gaulin 132T

Highly efficient homogeniser for a wide range of applications

Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	3-plunger homogeniser, equipped with a Mono-Block or a Three-Piece valve housing. Large selection of standard options as well as special options. Materials for plungers, packings, pump valves, valve seats and seals are custom-selected for your application
Capacity	Rannie: 4,000 - 22,000 l/h (1,060 - 5,810 U.S. g/h) Gaulin: 7,400 - 19,500 l/h (1,950 - 5,150 U.S. g/h)
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Rannie: 200 - 1,000 bar (2,900 - 14,500 psi) Gaulin: 210 - 600 bar (3,045 - 8,700 psi)
Dimensions	Single-stage homogeniser l x w x h (mm): Rannie: 3,010 x 1,580 x 1,720 Gaulin: 3,030 x 1,580 x 1,640
Options	Two-stage arrangement, hydraulics (aut), homogenising valves and plungers available in a choice of materials, aseptic design, motor starter, high-pressure outlet, plunger lubrication, control cabinet

Advantages

- Low maintenance costs
- Environmentally friendly design
- Service-friendly
- Easy to operate

High-pressure homogeniser Rannie 185Q/Gaulin 185Q

Highly efficient homogeniser for a wide range of applications

Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	5-plunger homogeniser, equipped with a Mono-Block or a Three-Piece valve housing. Large selection of standard options as well as special options. Materials for plungers, packings, pump valves, valve seats and seals are custom-selected for your application
Capacity	Rannie: 10,000 - 45,000 l/h (2,600 - 11,800 U.S. g/h) Gaulin: 20,000 - 50,000 l/h (5,300 - 13,200 U.S. g/h)
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Rannie: 150 - 650 bar (2,175 - 9,500 psi) Gaulin: 100 - 250 bar (1,450 - 3,625 psi)
Dimensions	Single-stage homogeniser l x w x h (mm): 3,480 x 2,150 x 1,710
Options	Two-stage arrangement, hydraulics (aut), homogenising valves and plungers available in a choice of materials, aseptic design, motor starter, high-pressure outlet, plunger lubrication, control cabinet

Advantages

- Soundproof cabinet
- Low maintenance costs
- Environmentally friendly design
- Service-friendly
- Easy to operate

High-pressure homogeniser Rannie 315

Highly efficient homogeniser for a wide range of applications

Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	3-plunger homogeniser, equipped with a Three-Piece valve housing. Large selection of standard options as well as special options. Materials for plungers, packings, pump valves, valve seats and seals are custom-selected for your application
Capacity	Rannie: 8,000 - 35,000 l/h (2,115 - 9,245 U.S. g/h)
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Rannie: 250 - 1,000 bar (3,625 - 14,500 psi)
Dimensions	Single-stage homogeniser l x w x h (mm): Rannie: 3,810 x 2,120 x 1,910
Options	Two-stage arrangement, hydraulics (aut), homogenising valves and plungers available in a choice of materials, aseptic design, motor starter, high-pressure outlet, plunger lubrication, control cabinet

Advantages

- Low maintenance costs
- Environmentally friendly design
- Service-friendly
- Easy to operate

Homogeniser soundproof cabinet

A noise reduction of 6 dB(A) provides a greatly improved working environment

Specifications	
Field of application	From the dairy to the pharmaceutical industries
Description	The soundprof cabinet has been designed to reduce noise emissions from higher capacity homogenisers to a point where hearing protection is no longer required. The noise levels are not significant in homogenisers smaller than 37 kW. Made in stainless steel with internal insulation
Dimensions	The noise levels are not significant in homogenisers smaller than 37 kW. l x w x h (mm) 37 kW: 1,770 x 1,300 x 1,925 90 kW: 2,850 x 1,395 x 1,750 185 kW: 3,480 x 2,150 x 1,710 315 kW: 3,990 x 2,150 x 1,830

Advantages

- Sound level 72-79 dB(A) depending on capacity and pressure
- Reduced noise level
- Improved working environment

Laboratory homogenisers APV-1000 and APV-2000

Compact, versatile design specifically developed for R and D laboratories

Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	You can achieve fully reproducible results for emulsions, dispersions or cell disruption that can be applied to full-scale production. The homogeniser provides the desired mean particle size and uniform distribution you need to help you improve existing products and develop new ones
Capacity	APV-1000: 22 l/h (6 U.S. g/h) - min. test sample 150 ml APV-2000: 11 l/h (3 U.S. g/h) - min. test sample 100 ml
Pressure	APV-1000: 1,000 bar (14,500 psi) APV-2000: 2,000 bar (29,000 psi)
Dimensions	l x w x h (mm): 818 x 370 x 620
Options	Two-stage arrangement, two-stage homogenising valve in ceramics or tungsten carbide (option), air operated pressure feeder assembly, explosion-proof design, aseptic cylinder design, digital gauge and gauge adapter for second stage pressure readout

Advantages

- Smooth, quiet and reliable operation
- Small footprint - suitable for benchtop location
- Field-replaceable and reversible tungsten carbide pump valve seats
- Easy-to-read digital pressure display and electronic pressure safety system

Laboratory homogenisers

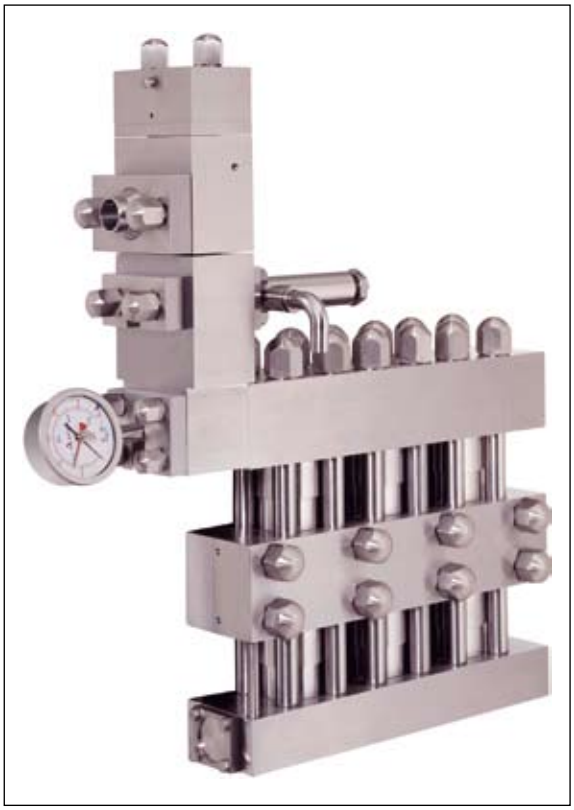
15MR and 31MR

Specifications	
Field of application	Chemical, food, dairy, cosmetic and pharmaceutical industries
Description	Single-plunger unit, 2-1/8" stroke, positive displacement; ball valve cylinder; removable, tapered, Tungsten Carbide ball valve seat; adjustable-screw packing assembly; three-way valve and bypass assembly with stainless steel tubing; a one-gallon, 316 stainless steel feed tank. Cylinder and wetted parts 316 stainless steel. The motor is 3 hp, 3 phase, 1800 rpm, open drip-proof
Capacity	15MR: 57 l/h (15 U.S. g/h) 31MR: 117 l/h (31 U.S. g/h)
Product temperature	Up to 175°C (350°F). With additional minor modifications it can be operated to 230°C (450°F)
Pressure	15MR: to 10,000 psi 31MR: to 3,500 psi
Dimensions	Height: 24" (610 cm) Width: 36" (914 cm) Depth: 38" (965 cm) Weight (uncrated): 159 kg (350 lbs)
Options	Pressure feeder Sterile processing Cored cylinder block

Advantages

- Specifically designed for laboratory or pilot plant use
- Can be supplied with a single-stage homogenising valve assembly or a two-stage valve assembly
- Can be equipped with the CD valve

Rannie Three-Piece valve housing

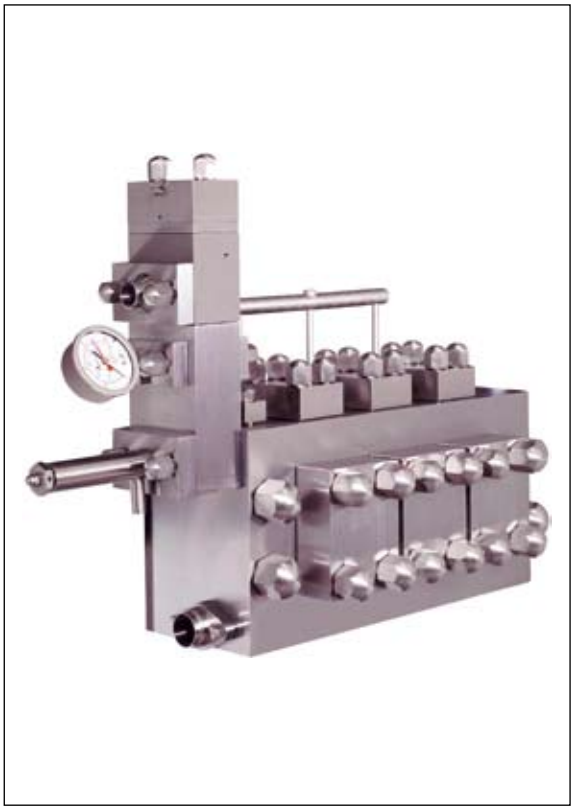


Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	Reliable Three-Piece valve housing in hygienic design
Capacity	80 - 45,000 l/h (21 - 11,800 U.S. g/h)
Pressure	Up to 1,500 bar (21,750 psi)
Options	Poppet or ball valves, aseptic design

Advantages

- Low costs of spares
- Low maintenance costs
- Reduced downtime during service/maintenance
- Production flexibility
- Service-friendly

Gaulin Mono-Block valve housing



Specifications	
Field of application	Dairy, food, cosmetic, chemical, pharmaceutical, and biotech products
Description	Reliable Mono-Block valve housing in hygienic design
Capacity	180 - 50,000 l/h (48 - 13,200 U.S. g/h)
Pressure	Up to 600 bar (8,700 psi)
Options	Poppet or ball valves, aseptic design

Advantages

- Low costs of spares
- Low maintenance costs
- Reduced downtime during service/maintenance
- Production flexibility
- Service-friendly

Homogenising valve - LW

Highly efficient homogenising effect with low power consumption

Specifications	
Field of application	Non-abrasive products. Max. 13% fat
Description	Homogenising valve with a build-in second stage. As standard available in Stellite, chromium-coated
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Up to 250 bar (3,625 psi)

Advantages

- Highly efficienct
- Eliminates the need for a second stage in most cases

Homogenising valve - XFD

Typically used as a single-stage valve or as the first-stage valve in a two-stage configuration

Specifications	
Field of application	All products
Description	Single stage or two-stage homogenisation. As standard available in Stellite
Capacity	Up to 36,000 l/h (9,500 U.S. g/h)
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Options	Available in Tungsten carbide

Advantages

- High efficiency
- Eliminates need for second stage in most cases

Homogenising valve - SEO

A flat, conical homogenising valve

Specifications	
Field of application	Abrasive products
Description	Single-stage or two-stage homogenisation. As standard available in Ceramic
Product temperature	Standard 105°C - up to 180°C (221 - 356°F)
Pressure	Above 600 bar (8,700 psi)
Options	Available in Stellite and Tungsten carbide

Advantages

- Same homogenising effect as the LW valve at slightly higher pressures
- High pressure

Homogenising valve - Micro-Gap

Patented valve for optimum performance in milk processing

Specifications	
Field of application	Milk products
Description	As standard available in Stellite
Pressure	Up to 190 bar (2,755 psi)

Advantages

- Less operating pressure required to achieve desired particle size
- Increased product stability
- Lower energy costs
- Lower maintenance costs

The UFO - Unit for filtration of oil

Improve the efficiency and extend the life of your homogeniser

Specifications	
Field of application	Treatment of oil in all types of gear and crank units
Description	A separate unit, which connects easily to the oil sump on gears and cranks. Enclosed in a stainless steel cabinet. Contains all the necessary equipment for separation of water from the oil and fine filtration of oil. Can easily be applied to all types of homogenisers, pumps and gears, including equipment from other suppliers
Capacity	Pump flow: 0.9 l/h (0.25 U.S. g/l)
Dimensions	h x w x l (cm): 90 x 37 x 22 Weight, excl. oil: 30 kgs

Advantages

- Extends the durability of the oil
- Extends the life of oil-lubricated parts such as bearings, gearwheels, bushings, etc.
- Continuous operation or connection to the main motor
- Improved operation for all other filters in the system
- Prepared for post-mounting

Genuine homogeniser spare parts and kits

Genuine APV parts that maximise the working life of your homogeniser

Non-genuine parts may not meet the quality standards of the original design. As a result, long-term costs are likely to be higher and plant downtime may increase. Non-genuine spares can also malfunction and risk compromising product quality.

APV uses carefully selected homogeniser parts suppliers on an exclusive basis. This means that nobody else can offer genuine APV homogeniser parts.

APV supplies Mono-Block or Three-Piece valve housings within 15-20 working days. In the case of a breakdown, standard parts can be delivered in three to five days.

APV also supports legacy equipment, still supplying spares for example, for machines manufactured in 1938.

Benefits

- Extensive stocks of guaranteed genuine APV spare parts
- 24 hour, 7 days-a-week response
- Reduced delivery times on APV's top selling 80 items

To find out how we can assist you in optimising your homogeniser spare parts planning and deliveries, please call your local APV office.

Homogeniser after market support

Maximising the working life of your homogeniser

APV can rebuild your homogeniser to optimise performance, configure it for new process needs, or adapt it to a new application.

We train our service engineers at special APV training centres, and “hands-on” at customer sites.

Benefits

- Scheduled maintenance
- Service contracts
- Availability of critical original parts complying with stringent quality standards
- Technical and application support
- High standards of repair
- Maintenance/servicepackagesdedicated to your individual needs
- Homogeniser health checks and monitoring
- Valve skimming, refurbishment, and upgrades

To find out how we can assist you in getting even more out of your APV homogeniser, please call your local APV office.

Validation support package

Compliance with validation and documentation requirements in different countries

Standard package

- Standard operation procedures
- Sequential control
- Material certificates for product contacting parts according to 2.2 (EN 10204), metallic parts only
- Standard operation procedures (manual)
- Calibration certificates for pressure gauges
- P and ID diagram
- FAT (Test operation according to systems standard test table and function/alarm check table)
- Certificate of sound measurement
- List of motors
- Wiring diagram

Extended version

- Material certificates for product contacting metallic parts acc. to 3.1 (EN 10204)
- Material certificates for product contacting non-metallic parts acc. to 2.2 (EN 10204), except packings

Delivery of the above in the form of final documents is dependent on FAT test approval.

Additional documentation

- Certificates for compliance with relevant FDA regulations, e.g. part 21 CFR 177.2600
- Surface measuring and registration
  - Drawings of measured items and results
  - Only metallic parts

Five-year Homogeniser Assurance Programme

Total protection for maximum productivity

Our unique five-year warranty is more than simply an indication of the reliability of our Rannie and Gaulin homogenisers. It is also a decisive business advantage for our customers, who can rely on their equipment to continue to function efficiently for many years to come.

Please contact your local APV office for detailed brochure.

Benefits

- Support of experts in over 42 countries worldwide
- Total support contract
- Five year extended warranty
- Genuine spares
- Wear parts on site within 72 hours
- Emergency service response – 24 hours / 365 days
- Annual planned maintenance visit
- Recommended wear parts replacement scheme
- Technical phone support

Pumps

APV pumps have a proven track record of more than 125 years of experience in pump design and manufacture. APV was one of the first suppliers of machinery to the Danish dairy industry at the end of the nineteenth century.

Today we are the preferred pump supplier of thousands of companies all over the world in the brewery, dairy, food, beverage, chemical, healthcare, and pharmaceutical industries.

Our pump range comprises centrifugal pumps, self-priming pumps, and rotary lobe pumps. Each category includes a wide range of different pumps developed as a result of close collaboration with our customers - because everyone has different needs. A team of R and D experts conceptualise, design and develop innovative pump solutions in close collaboration with our customers and sales force. APV pumps are made at our own factories based on Lean Manufacturing quality standards.

The majority of APV pumps meet the hygienic standard of the European "EHEDG" organisation and the American 3A standard. We can also supply ATEX-approved pumps and pumps with a 3.1 certificate, ensuring full traceability.

Service and maintenance needs are an integrated part of pump design at APV. This is why our pumps are always very easy to maintain without any or just a few tools. Efficiency is another critical aspect of pump design in order to reduce energy consumption and prolong service life, thus minimising total cost of ownership.

All our pumps are available with a variety of options, making them very flexible and ensuring that there will always be a suitable pump for every need. Our unique, easy-to-use sizing programme makes it a simple matter to find the right pump.

Centrifugal pump - W+

The most reliable pump in the world

Advantages

- EHEDG certificate
- 3A version as an option
- Extremely reliable in operation
- Versions with surface roughness Ra ≥ 0.8 microns or Ra ≥ 0,5 microns available
- Low power consumption

Specifications	
Field of application	All industries. The flexible design and the many variants makes it ideal for nearly all applications
Description	The pump is based on a unique hydraulic design which combines maximum efficiency with the highest hygiene standards
Sealing material	EDPM, FPM, PTFE Coating
Flow capacities	Up to 650 m³/h (50 Hz) (2,900 USgpm) Up to 800 m³/h (60 Hz) (3,500 USgpm)
Pressure capacity	0.2 - 15 bar @ 50 Hz(500 ft)

- Low noise level
- CIP and SIP capable
- Very easy to maintain - shaft seal can be visually inspected for leaks
- Minimum down time
- Competitive price

Centrifugal pump - V²

A reliable pump with a strong construction at an affordable price

Specifications	
Field of application	All industries. Especially suitable for low-viscosity products
Description	A reliable efficient pump featuring a four-blade, fully open, non-clog impeller
Sealing material	NBR, EPDM, FPM
Flow capacities	Up to 150 m³ (650 USgpm) @ 60 Hz
Pressure capacity	9 bar @ 60 Hz (300ft)

Advantages

- 3A certificate
- Easy to maintain - few seals and few parts
- The strong construction ensures long service life

Centrifugal pump - PUMA+

Reliable in standard duty applications

Specifications	
Field of application	Typical applications are liquid transfer in dairies and breweries, mixing in soft drink applications, food processing and CIP systems
Description	Single stage pumps designed with maintenance in mind. Servicing is fast and easy. The front-loading shaft seal can be replaced without removing the back plate. All pump sizes in the PUMA+ range are fitted with the same superior shaft seal used in the premium W+ pumps. Designed in accordance with EHEDG guidelines, the hygienic level is first-class
Sealing material	EPDM, FPM
Flow capacities	Up to 135 m³ (585 USgpm) 50 Hz
Pressure capacity	Up to 7,8 bar @ 50 Hz (260ft)

Advantages

- Easy maintenance
- Competitive price
- Share wearing parts with the premium W+ pumps

Self-priming pump - Ws+

Patented, revolutionary pump

Specifications	
Field of application	All industries
Description	The Ws+ pump works according to the water ring principle. It is equipped with an open impeller to ensure a flexible flow range, and its self-priming effect is obtained by an air screw mounted on the inlet
Sealing material	EPDM, FPM
Flow capacities	Max. 90 m³/h (50 Hz) Max. 110 m³/h (60 Hz)
Pressure capacity	Max. 6 bar @ 50 Hz (200 ft)

Advantages

- EHEDG-certified
- 3A version as an option
- Operates over a flexible flow range ensuring performance is optimised to individual applications
- Versions with surface roughness Ra ≥ 0.8 or Ra ≥ 0.5 available
- Low power consumption
- Very low noise level
- Equally suitable for product and CIP liquid
- CIP and SIP capable
- Most spare parts identical to those of the standard W+ range

Rotary lobe pump - DW

High-quality rotary lobe pump

Specifications	
Field of application	All industries. For high-viscosity products and/or sensitive products that require a gentle handling
Description	The pump runs completely pulse-free and without internal cavitation when handling high-viscosity products. It ensures a consistent process flow, and safeguards valves and other equipment through pressure surges
Sealing material	EPDM, FPM, KKPM
Flow capacities	3 - 1,016 litres/100 revs
Pressure capacity	0 - 30 bar (0 - 435 psi)

Advantages

- EHEDG and 3A certified
- EHEDG-approved relief valve as an option
- Easy maintenance - easy access to front-loaded mechanical seals
- High volumetric efficiency
- Flexible design - Inlet/outlet port orientation easy to change on site
- No painted surfaces - all external surfaces in stainless steel
- Low NPSH requirements
- CIP and SIP capable

Rotary lobe pump - R

Unique pump with rubber rotors

Specifications	
Field of application	All industries.Especially suitable for high-viscosity products or where daily disassembly is required for cleaning and inspection
Description	The APV R series rotary pumps incorporate long life, sanitary stainless steel, wetted parts with versatile, resilient rotors and heavy duty gear case
Sealing material	NBR, EPDM, FPM, CR (Neoprene)
Flow capacities	Up to 54 m³/h (240 USgpm)
Pressure capacity	6.8 - 10 bar (100 - 140 psi)

Advantages

- Compact design - easy to install in any application
- Flexible design - different rotors and inlets for a wide range of applications
- Easy disassembly and clean up
- Minimum maintenance and down time
- Interchangable components
- No timing or shimming required
- All product contact parts are 316l stainless steel

Valves and control units

APV valves and control units are installed at companies in many different industries all over the world. While installations in the brewery and dairy industries run into many thousands, they are also a common sight in the food, beverage, chemical and pharmaceutical industries.

APV offers a very wide range of hygienic valves comprising nearly 20 different valve series - from simple butterfly valves to state-of-the-art mixproof valves.

All APV valves are the result of an intensive design and development pro-cess by our own R and D experts in close cooperation with our customers in order to ensure that they are always geared to customer needs.

APV valves, including 3.1 certified valves, are made by highly skilled employees at our own premises where Lean Manufacturing quality standards have been adopted throughout. All valves meet the hygienic applications standard, and most even the strict EHEDG and the American 3A standards.

One of the characteristic features of APV valves is the ball-shaped housing, which effectively prevents sump and dome, thus optimising valve cleanability and reducing CIP-time. In addition, the ball-shaped housing ensures very gentle product handling.

Another feature is the stability of all APV actuators which enables us to provide a five-year guarantee on these.

Valve sealing materials are all FDA-approved. All valves have crevice-free sealing, which means that there is no gap between the seal material and the seal groove where product can get trapped. Also, all our seals are marked profile seals, making it very easy to identify the genuine seal and to order spares.

DELTA CU valve control units are available in conventional wired configurations as well as in network systems based on either ASi-bus, DeviceNet or Profibus fieldbuses. DELTA CU control units are very robust, easy to maintain, and designed to operate in tough environments. Signal data are easily visible on an exterior LED panel.

Butterfly valve - DELTA SV/SVS

A reliable, easy-to-use stop valve

Specifications	
Field of application	All industries
Sealing material	EPDM, HNBR, FPM, VMQ
Description	The valve is a simple butterfly valve, which can be delivered with a manual handle or pneumatic actuator. The SV valve is a clamped/bolted version whereas the SVS valve is a flanged version for lenghthy or fixed pipeline installations
Size	DELTA SV: DN25 - 100 and 1" - 4" DELTA SVS: DN25 - 250 and 1" - 4"
Max. line pressure	10 bar (140 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- Cost-effective design
- Compact design that requires less space
- Easy to maintain
- Simple change of operating type

Single-seat valve - DELTA SW4

Highly versatile single-seat valve

Specifications	
Field of application	All industries
Description	A standard single-seat valve available in on/off, change-over, and tank-outlet versions. Many options available e.g. stroke limiter, oil dampening cylinder, steam barrier etc.
Sealing material	EPDM, HNBR, VMQ, FPM, HNBR
Size	DN10-150 1/2" - 6"
Max. line pressure	10 bar (145 psi) (DN10 - 20: 5 bar) (72 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- EHEDG tested
- 3A approved
- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- Easy to maintain due to the low weight, few seals and maintenance-free actuator
- Reduced maintenance costs due to the metallic stop and longer-lasting seals
- Attractive price
- Flexible design due to interchangable actuators to handle different product pressures
- Available with a 31B certificate

Single-seat valve - DELTA M4/MP4

Aseptic single-seat valve

Specifications	
Field of application	All industries. For aseptic applications
Description	An aseptic single-seat valve available in on/off, change-over, and tank-outlet versions
Sealing material	EPDM, HNBR
Size	DN25 - 100 1" - 4"
Max. line pressure	5 bar (72 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- EHEDG tested
- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- Flat membrane design for easy maintenance
- Leakage detection on housing lid minimises product loss
- Reduced spare part costs - long membrane service life

Mixproof valve - DELTA DA3+

Extensive CIP of all product-contact parts, including shaft seals

Specifications	
Field of application	All industries
Description	The valve has two valve stems and two valve seats for ultimate separation of two products. The seat lifting function and separate spraying of the leakage chamber ensures a complete and reliable cleaning
Sealing material	EPDM/PTFE, HNBR/PTFE, FPM/PTFE, SILICON/PTFE
Size	DN40 - 150 1.5" - 4" and 6"
Max. line pressure	10 bar (145 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- EHEDG tested
- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- Water-hammer safe design ensures no product mixing
- Compact design - valve requires less space
- Easy to maintain due to the low weight and the fact that no compressed air is required for service
- The inside is electropolished (Ra 0.8)
- Comprehensive cleaning of all product-wetted parts including shaft seal, seat seal and leakage chamber
- Easy to identify any leakage

Mixproof valve - DELTA DE3

A waterhammer-safe and cost-effective valve

Specifications	
Field of application	All industries
Description	The valve has two valve stems and two valve seats for ultimate separation of two products. It is available in on/off, change-over, and tank-outlet versions. Stands out for application that do not require a seat lifting device
Sealing material	EPDM, HNBR, FPM
Size	DN40 - 150 1.5" - 4" and 6"
Max. line pressure	10 bar (87 psi)
Min. control air pressure	6 bar (72 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- EHEDG tested
- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- Water-hammer safe design ensures no product mixing
- Compact design - valve requires less space
- Easy to maintain due to the low weight and the fact that no compressed air is required for service
- Leakage chamber is cleaned by built-in spray nozzle

Mixproof valve - DELTA DKR

A cost-effective hygienic double seat ball valve

Specifications	
Field of application	All industries. For safe media separation and pigging systems
Description	A ball valve with two seat seals to ensure timely discovery of leakages. The throughflow openings are absolutely smooth and correspond to the pipe diameter
Sealing material	EPDM/PTFE, FPM/PTFE, HNBR/PTFE, VMQ/PTFE
Size	DN25 - 125 1" - 4"
Max. line pressure	DKR: 10 bar (145 psi) DKRH: 100 bar (1450 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- EHEDG tested
- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- Compact design - valve requires less space
- Easy to maintain - very simple seal changes
- Water-hammer safe design ensures no product mixing
- Easy to identify any leakage
- Suitable for pigging system applications
- Leakage chamber will be cleaned by CIP/SIP

Mixproof valve - DELTA SD4/SDM4

A true aseptic mixproof valve

Specifications	
Field of application	All industries. For aseptic applications and safe media separation
Description	The DELTA SD4 valve is a standard safe flow valve whereas the DELTA SDM4 is the aseptic version with a flat TFM membrane as a sterile barrier. Also available in a tank-outlet version
Sealing material	EPDM, HNBR, TFM diapragm
Size	DELTA SD4: DN25-100 and 1" - 4" DELTA SDM4: DN40-65 and 1.5" - 2.5"
Max. line pressure	DELTA SD4: 10 bar (145 psi) DELTA SDM4: 5 bar (72 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- EHEDG tested
- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- Compact design - requires less space
- Easy to maintain due to the low weight
- Optional electronic leak detection

Mixproof valve - DELTA DSV

A unique mixproof butterfly valve for CIP-applications

Specifications	
Field of application	All industries. Especially for CIP-applications
Description	The valve combines all the advantages of the simplicity of a butterfly valve with sophisticated mixproof technology
Size	DN50 - 125 3"; EPDM, HNBR
Max. line pressure	DN50 - 65: 5 bar (72 psi) DN80 - 125: 6 bar (87 psi)
Min. control air pressure	10 bar (145 psi) (DN125: 6 bar) (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- One valve can replace two standard butterfly valves
- Compact design - valve requires less space
- Easy to identify any leakage
- Easy changing of the seals

Mixproof valve - DELTA SWcip4

A mixproof valve especially for CIP-applications

Specifications	
Field of application	All industries - especially CIP-applications
Description	The valve which is just right for applications which require safe liquid separation, but not necessarily seal cleaning. Built on the principles of the DELTA SW4 and DELTA SD4 valves
Sealing material	EPDM
Size	DN25 - 100 1" - 4"
Max. line pressure	10 bar (145 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°F (284°F)

Advantages

- Profile seals that eliminate gaps and ease ordering of spares due to ID-numering
- Easy to maintain due to the low weight, few seals and maintenance-free actuator
- Reduced maintenance costs due to the metallic stop and longerlasting seals
- Attractive price
- Flexible design due to interchangable actuators to handle different procuct pressures

Mixproof valve - DELTA DF+2

PMO approved mixproof valve

Specifications	
Field of application	Dairy applications in the US
Description	The valve is specifically designed for 3A applications and to meet the needs of milk plants and related Grade A processes which must conform to FDA/PMO (Pasteurized Milk Ordinance). The double seat design allows for the safe (i.e. mixproof) separation of product and CIP solutions within a single valve
Sealing material	VMQ (Silicone), EPDM, HNBR, and FPM (Viton)
Size	1.5", 2", 2.5", 3", 4" and 6" OD Tube
Max. line pressure	75 psi (5 bar) (150 psi available) (10 bar)
Min. control air pressure	84 psi (5.8 bar)
Sterilisation temperature	275°F (135°C)

Advantages

- PMO approved
- Valve yoke provides thermal isolation and allows visual inspection of upper stem seal
- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- Easy to maintain, low weight
- Optional seat lifting actuator
- Specially designed feedback switch assembly to detect upper and lower valve disc positions
- Specially design spray nozzle ensures complete cleaning of leakage chamber during CIP

Regulating valve - DELTA RG4

When precise regulation is critical

Specifications	
Field of application	All industries. For hygienic applications with flexible Kvs values. For aseptic applications the valve can be supplied with PTFE membrane, stainless steel bellow or steam barrier
Description	The valve is designed for continuous flow control. It is equipped with a diaphragm actuator and positioner
Sealing material	EPDM, FPM, HNBR, VMQ
Size	DN25-150 1" - 4" PN 25 - DN25 - 65 PN 16 - DN80 - 100 PN 10 - DN125 - 150
Max. line pressure	16 bar (232 psi)
Min. control air pressure	4 bar (58 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- 3A approved
- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- Flexible design - the shaft and seat can be changed to accommodate changed Kvs values (fully developed block building system)
- Easy to maintain - the valve insert can be lifted out completely
- Optional noise reduction valve available

Regulating valve - DELTA RGE4

Cost-effective valve

Specifications	
Field of application	All industries.For hygienic applications with fixed Kvs values
Description	The valve is designed for continuous flow control. It is equipped with a diaphragm actuator and positioner
Sealing material	EPDM, HNBR, FPM, VMQ
Size	DN25-100 1" - 4" PN 25 - DN25 - 65 and 1" - 2.5" PN 16 - DN80 - 100 and 3" - 4"
Max. line pressure	16 bar (232 psi)
Min. control air pressure	4 bar (58 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- 3A approved
- Profile seals than eliminate gaps and ease ordering of spares due to ID-numbering
- Attractive price
- Easy to maintain - the valve insert can be lifted out completely
- Steam barrier for aseptic application can be supplied as an option

Process valve - DELTA CPV

Constant pressure valve

Specifications	
Field of application	All industries. For applications where a constant product pressure is a must
Description	To keep a constant pressure, the free flow section at the valve seat is reduced or enlarged by the valve cone. Via the valve shaft, the cone is connected to a regulating membrane, which will be backed up with air at a set pressure
Size	DN25 - 50 2"
Max. line pressure	6 bar (87 psi)
Min. control air pressure	7 bar (101 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- Capable of working in both flow directions (upstream and downstream)
- Precise valve cone control with multi-layer flat membrane design
- Minimum product loss because of the leakage detection

Process valve - DELTA SI2

Spring-loaded full stroke safety valve

Specifications	
Field of application	All industries. Safeguarding of vessels or tanks against overpressure
Description	The standard valve comes with pneumatic seat lift actuator
Sealing material	EPDM, HNBR, VMQ, FPM
Size	DN25 - 100
Max. line pressure	10 bar (145 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- Easy to maintain - seals can be replaced without removing the lead seal
- Reduced maintenance costs - only a few replaceable seals
- Prepared for the future - TÜV-approved for gas and liquid applications

Process valve - DELTA KHV

Single-seat ball valve

Specifications	
Field of application	All industries. For non-hygienic applications, e.g. steam or glycol
Sealing material	PTFE
Size	DN10 - 80
Max. line pressure	10 bar (145 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- Cost-effective, shut-off valve

Process valve - DELTA PR/PRD

Reliable sampling valve

Specifications	
Field of application	All industries. For bacteriologically safe samples, which can be taken directly from the pipeline or the tank
Sealing material	EPDM, HNBR, FDM, VMQ
Size	DN25 - 100 1" - 4"
Max. line pressure	10 bar (145 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- Easy to maintain - only a few replaceable seals
- Large handle for easy manual opening and closing
- Reliable design - perfect match between the internal valve diameter and the pipe cross-section eliminates pressure drop

Process valve - DELTA RUF

Reliable non-return valve

Specifications	
Field of application	All industries. Used when backflow of the product in pipelines must be avoided
Description	The valve opens as soon as the pressure under the valve seat exceeds the counter pressure. When the pressure is balanced, the valve closes by spring action, which means that in case of a pressure increase, the valve closes on the spring side
Sealing material	EPDM, HNBR, VMQ, FPM
Size	DN25 - 150 1" - 4"
Max. line pressure	10 bar (145 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering
- Easy to maintain - the inter-flange design means that the valve can easily be removed from the line
- Flexible design - the valve can be horizontally or vertically positioned
- Reduced maintenance costs - the bearing is very robust and reliable and the valve consists of only a few parts

Process valve - DELTA VPN

Cost-effective non-return valve

Specifications	
Field of application	All industries. When backflow of the product in pipelines must be avoided
Sealing material	EPDM, NBR, FPM
Size	DN25 - 100 1" - 4"
Max. line pressure	10 bar (145 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- 3A certified
- Flexible design - the valve can be horizontally or vertically positioned
- Reduced maintenance costs - the valve consists of only a few parts

Process valve - DELTA UF/UFR

Reliable pressure relief valve

Specifications	
Field of application	All industries. To keep a system under a certain operation pressure
Sealing material	EPDM, HNBR, VMQ, FPM
Size	DN25 - 100 1" - 4"
Max. line pressure	10 bar (145 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- 3A approved
- Profile seals that eliminate gaps and ease ordering of spares due to ID-numbering.
- Hygienic design - can be supplied with seat lift actuator with feed-back switches
- Easy to maintain - the seat-lift actuator is maintenance-free and features only a few replaceable gaskets
- Fast and easy CIP-cleaning - the seat-lift actuator ensures a full opening
- Reduced maintenance costs due to metallic stop
- Longer-lasting seals

Process valve - DELTA VRA/VRAH

Reliable vacuum valve

Specifications	
Field of application	All industries. For protection of installations against underpressure
Sealing material	EPDM, FPM, VMQ
Size	DN25 - 150
Max. line pressure	10 bar (145 psi)
Min. control air pressure	6 bar (87 psi)
Sterilisation temperature	135°C (284°F)

Advantages

- Gas tight
- Precise pick-up accuracy
- Drip tray - no splashing or dripping during cleaning

Control unit - DELTA CU direct connect

Flexible and robust solution

Specifications	
Field of application	All industries. For use in applications with conventional in-/output wiring technology
Description	The control unit is directly mounted onto the valve actuator. An inside solenoid valve switches the air supply to the actuator either on or off
Sensors	Feedback for open/closed position
Temperature range	-20 - 70°C (-42 - 147°F)
Protection class	IP 67
Supply voltage	24 - 48 V DC/24 V AC/110 V AC

Advantages

- Fits all valves including those of many other suppliers
- Robust design for use in tough environment
- Easy maintenance without any tools
- Clear LED indication for quick overview

Control unit - DELTA CU AS-interface

Flexible and robust for tough environments

Specifications	
Field of application	All industries. For use in applications with AS-interface fieldbus technology
Description	A network that connects sensors and actuators and where a single cable transmits the signal and provides the components with power. Up to 62 valves on a single AS-i cable
Sensors	Feedback for open/closed position
Temperature range	-20 - 70°C (-42 - 147°F)
Protection class	IP 67
Supply voltage	26.5 - 31.5 V DC

Advantages

- Fits all valves including those of many other suppliers
- Robust design for use in tough environment
- Easy maintenance without any tools
- Clear LED indication for quick overview
- Open bus system - independent of specific suppliers
- Cost-effective alternative to the intelligent valvenet network
- Can be integrated into a valvenet network via gateways
- Low installation costs
- Provides useful information via the PLC system

Control unit - DELTA CU Valvenet DeviceNet

Programable intelligent control

Specifications	
Field of application	All industries. For use in applications with DeviceNet fieldbus technology
Description	A network that connects sensors and actuators and where a single cable transmits the signal and provides the components with power. Up to 64 valves on a single DeviceNet cable
Sensors	Feedback for open/closed position
Temperature range	-20 - 70°C (-42 - 147°F)
Protection class	IP 67
Supply voltage	11 - 25 V DC

Advantages

- Fits all valves including many from other suppliers
- Robust design for use in tough environment
- Easy maintenance without any tools
- Clear LED indication for quick overview
- Open bus system - independent of specific suppliers
- Intelligent system that provides information such as number of strokes, opening/closing times, power consumption, pulsation etc.

Control unit - DELTA CU Valvenet Profibus

Programable intelligent control exclusively supplied by APV

Specifications	
Field of application	All industries. For use in applications with Profibus DP fieldbus technology
Description	A network that connects sensors and actuators and where a single cable transmits the signal and provides the components with power. Up to 119 valves on a single Profibus cable
Sensors	Feedback for open/closed position
Temperature range	-20° - 70°C (-42 - 147°F)
Protection class	IP 67
Supply voltage	24 V DC

Advantages

- Fits all valves including many from other suppliers
- Robust design for use in tough environment
- Easy maintenance without any tools
- Clear LED indication for quick overview
- Open bus system - independent of specific suppliers
- Intelligent system that provides information such as number of strokes, opening/closing time, power consumption, pulsation etc.

Fittings

In modern applications, optimum hygiene and bacteriological safety place critical demands on all components

APV offers a wide range of hygienic fittings and accessories including a complete package of pipe installation components, and a complete range of filters and connections. A detailed listing can be found in the APV fittings catalogue.

Filters

Filters are available in stainless steel (AISI 316L) in a wide range of standard sizes. The external surface is wheelblasted while the inside is de-scaled. Filters feature a clamp cover for easy removal of the cylindrical strainer insert.

Steam injectors

In some applications, it may be beneficial to heat up liquids such as hot water circulating around a pasteurizer.
APV can supply steam injectors in standard sizes for these purposes.

In-line measuring equipment

Real-time process and product data has become a critical parameter to ensure quality and optimise performance and profitability. APV offers a wide range of in-line measuring equipment, including:

- Sight glasses – made of a special see-through glass, which gives a quick, visual status on the product
- Pressure gauge – for a precise status of product pressure
- Thermometer – for a quick, visual status of product temperature

The equipment is integrated into our famous ball-shaped housings, providing the advantages of smooth internal surfaces that ensure gentle product handling, and no sump or dome.

Connections

Connections are available in standard and EHEDG-certified aseptic versions in a range of standard sizes.

The generously designed seal base allows easy handling of the seal during installation and maintenance work, and the stress-free seal construction ensures long seal service life.

All of our profile seals are marked with order data such as material and order number for easy identification and ordering of spares.

APV technology range

Helping you get your products to market faster

> APV process units mean faster, safer and more flexible solutions for your process plant.

All APV process units leverage APV's process know-how and experience in both engineering and automation to meet top performance criteria.

Based on a standardised platform that ensures product consistency in any installation, all APV process units can be customised to meet local regulations. Pre-assembled, pre-wired and pre-tested, they come production-ready to help you get your products to market faster.

Extensive wet and dry tests are carried out at APV's ultra-modern, ISO 9001 certified factories. The control system is also integrated with the mechanical components at this point, resulting in reduced installation and commissioning costs for you.

Beverage

Powerful solutions for flexibility and short time-to-market

The Beverage sector covers a series of different application areas including the production of juice, syrup concentrates, engineered waters, ready-to-drink (RTD) teas and other carbonated and non-carbonated soft drinks as well as Dairy Free - Dairy Analogues such as Soymilk. Using dairy free alternatives as a raw material creates opportunities to develop a wide range of value-added products with higher profit margins. Likewise, dairy free alternatives can provide financial, physical, chemical, and nutritional advantages in many traditional beverage products.

APV has a long history within the Beverage Industry and a wealth of experience gained from cooperation with customers and deliveries worldwide. Today many global brands are produced on APV Technologies. In addition to products, parts and service APV offers a wide range of technologies and skid mounted systems including Mixing and Blending, Dearation, Aseptic and non-aseptic heat treatment, evaporation, distillation and general processing technology as reception lines, tank sections and cleaning-in-place (CIP). Furthermore APV offers complete projects including Automation and performance solutions.

The Beverage Industry is increasingly centered on a small number of manufactures who have developed strong markets for their branded soft drinks. APVs skills in transferring standardised process systems around the world have helped producers ensure consistent product quality.

Every beverage processing unit can be supplied as a stand-alone system, ideally equipped for smooth and trouble free operation and suitable for integration into a central control system. But the maximum benefit will be gained with a combination of units which have specifically designed to operate together for optimum performance, both from a mechanical and control perspective.

The many reference installations demonstrate APV capabilities to provide complete installations. Equally, APV offer cost-effective improvements to selected unit operations in existing production lines. APV's in-depth knowledge and active involvement in the development of the world's Beverage Industry, combined with proven experience in project management of major capital projects, makes APV the ideal partner for the design and installation of state-of-the-art Beverage processing equipment.

Continuous sugar dissolver - CSD

Optimum flexibility and great cost saving potential

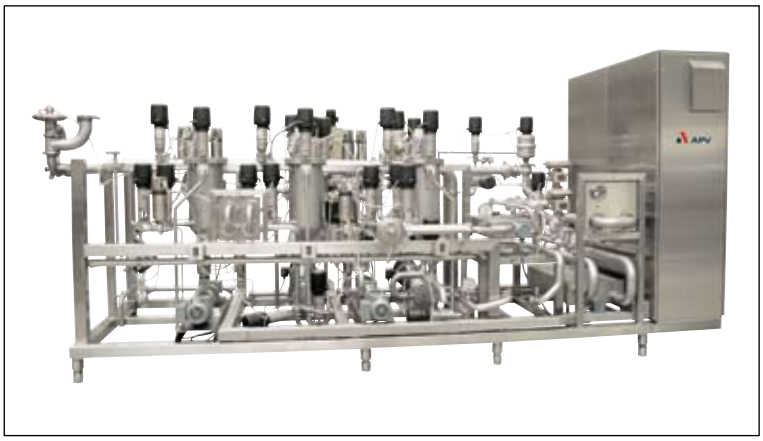
Specifications	
Field of application	Beverages
Description	The CSD is a fully automatic sugar syrup blending system, which can readily be integrated with any APV beverage process unit. Capable of producing sugar syrup up to 72°C (162°F) Brix
Capacity	5,000 - 50,000 l/h (1,000 - 15,000 U.S. g/h)

Advantages

- An accuracy of <+ 0.1°Brix in the final product (measured as a standard deviation)
- Blending control takes place via Brix analyses
- The jet mix principle is used for optimum dissolving in the dissolver tank
- A more precise and consistent product, resulting in savings in raw ingredient consumption
- Flexible and fully automatic system
- Fast settling time
- High accuracy level
- Designed for low maintenance and energy costs

Intelligent multi component blender - MultiMaster

New dimensions of flexibility and efficiency in multi-component blending



Specifications	
Field of application	Juice beverages, diet beverage products, soft drinks, carbonated soft drinks. Premix of syrups, flavoured dairy beverages, tea beverages, alcohol based beverages
Description	Fully automatic, continuous blending system designed for optimum yield and flexibility, and integration with any APV beverage process unit. Standard storage and handling of up to 30 different recipes. Special valve selection and short pipe layout. Nitrogen back flush of concentrates to the source vessel further improves the product yield
Capacity	5,000 - 55,000 l/h (1,000 - 15,000 U.S. g/h)

Advantages

- An accuracy of <+ 0.1% by weight of total ingredient mass (measured as a standard deviation)
- Continuous blending system for more precise and consistent product and raw materials savings
- Fully automatic, reducing manpower requirements
- Inline dosing and high accuracy eliminate need for buffer tank analyses
- Direct forwarding of product to the pasteuriser and on to the filler
- Extended recipe handling eliminates production errors
- Settling time after shut down under 10 seconds
- Low maintenance and energy costs

BrixMaster/extended BrixMaster - Brix standardisation

New dimensions in flexibility and efficiency in blending

Specifications	
Field of application	Juice beverages, diet beverage products, alcohol based beverages
Description	Fully automatic, two-stream or multi-stream blending system that integrates easily with any APV beverage process unit. The standard Brix-Master can store and handle up to 30 different recipes. Suitable for diet product processing. Simple conversion of the basic two-stream BrixMaster for added versatility
Capacity	5,000 - 30,000 l/h (1,000 - 8,000 U.S. g/h)

Advantages

- Accuracy of <+ 0.05°Brix in the final product (measured as a standard deviation)
- Continuous blending for precise and consistent product and raw materials savings
- Product loss eliminated by leading recovered off-Brix product back to the BrixMaster
- Fully automatic, reducing manpower requirements
- Settling time after shut down under 10 seconds
- In-line dosing and high levels of accuracy eliminate need for buffer tank analyses
- Performance independent of product temperature variations and fibre content
- Direct forwarding of product to the pasteuriser and on to the filler
- Extended recipe handling eliminates production errors
- Low maintenance and energy costs

Carbonation - CarboMaster

Cost-effective, accurate and flexible CO_2 dosing

Specifications	
Field of application	All types of beverage
Description	The heart of the CarboMaster unit is the patented CO_2 injector, which injects liquid into the gas rather than traditional injection of gas into liquid. This achieves faster dissolution with tight CO_2 binding to the beverage. While a measuring instrument can be used to monitor CO_2 addition and to control the dosing set-point, mass flow measurement for the gas provides superior accuracy, typically + 0.1 g/kg CO_2 in the beverage
Capacity	5,000 - 70,000 l/h (1,000 - 20,000 U.S. g/h)

Advantages

- Accuracy of + 0.1 g/kg CO_2 in the beverage (measured as a standard deviation)
- 100% utilisation of CO_2
- Fully automatic version available for reduced manpower
- Low maintenance costs and efficient operation
- Flexible production
- Fixed injector unit capacity normally variable within 10%, variable injector unit capacity variable down to 25% of nominal capacity
- Carbonation levels up to 10 g/kg CO_2
- Optimisation for different CO_2 levels at different temperatures and pressures
- Full CIP capability including patented CO_2 injector

Soymilk processing plants

Standard and tailor-made soymilk processing lines

Specifications	
Field of application	Soymilk, soy yoghurt, frozen desserts, puddings, custards, sauces, mayonnaise, salad dressings, spreads, powders
Description	Individual process units and complete, turnkey plants
Capacity	1,000 - 12,000 l/h (265 - 3,170 U.S. g/h)

Advantages

- Tried and tested design
- High-quality end-products
- Excellent product quality
- Automated operation
- Operator-friendly
- High uptime
- Large installed base/experience
- Technology leadership

Soymilk pilot plant facility

Upscalable application development and testing at APV's Innovation Centre

Specifications	
Field of application	Soymilk and other cereal-based products
Description	Complete pilot plant with APV applications and process engineering support
Capacity	100 - 450 l/h (25 - 120 U.S. g/h)

Advantages

- Production-scalable process development, testing and optimisation
- Two-stage grinding and grinding liquid supply NaHCO3 mixing and dosing
- Okara separation
- Enzyme inactivation and deodorisation
- UHT treatment, homogenisation, aseptic filling

Brewery

Helping to set the standards of tomorrow's breweries

APV has been a leading supplier to the brewing industry for over 80 years and has developed more key technologies together with customers. This strong cooperation and experiences gained from deliveries worldwide means that many global brands are produced using APV Technologies today.

APV offers a series of technologies, skid mounted systems, products, parts, spares and service for the Brewery Industry. The unit systems include wort cooling, aeration and yeast dosing, yeast propagation, beer pasteurization, carbonation, nitrogenation, water dearation and high gravity brewing. Furthermore APV supply evaporation, distillation and dialysis for de-alcoholisation and other General Processing Technology like heat transfer, tank sections and cleaning-in-place (CIP). The highest quality and optimisation of production performance can be achieved by help of APV Factory Expert automation solutions.

Every Brewery processing systems can be supplied as a stand-alone system, ideally equipped for smooth and trouble free operation and suitable for integration into a central control system. But the maximum benefit will be gained with a combination of systems which have specifically designed to operate together for optimum performance, both from a mechanical and control perspective.

The many reference installations demonstrate APV capabilities to provide key technologies required for main brewery processes. Equally, APV offer cost-effective improvements to selected unit operations in existing production lines. APV's in-depth knowledge and active involvement in the development of the world's Brewery Industry, makes APV the ideal partner for the design and installation of state-of-the-art Brewery processing equipment.

Wort cooling, yeast dosing and wort aeration - WortMaster

Economical production by minimising production time and the use of additives

Specifications	
Field of application	Brewery
Description	The WortMaster product range comprises wort cooling, yeast dosing and wort aeration units. In addition to fast and efficient wort cooling, Designed for easy integration with existing lines, WortMaster units enable effective and accurate in-line dosing of yeast and oxygen using the patented APV gas injector
Capacity	50 - 1,200 hl/h (1,000 - 30,000 U.S. g/h)

Advantages

- Constant monitoring and improved regulation of the process
- Repeatable fermentation performance
- Higher accuracy in yeast and oxygen dosing
- Reduced fermentation time
- Turn down ratio to 25% of nominal capacity
- Constant yeast/oxygen ratio, regardless of flow
- Fully CIP-cleanable
- Traceable production data

In-line blending - BlendMaster

Adds new dimensions to accurate standardising and efficiency

Specifications	
Field of application	Brewery
Description	The BlendMaster range covers units designed for continuous in-line blending of liquid components. It ensures precise recipe conformity, regardless of whether two or more liquid components are combined. The BlendMaster is used, for example in high gravity brewing and in combination with other unit types like the CarboMaster or the HGB Master
Capacity	50 - 1,200 hl/h (1,000 - 30,000 U.S. g/h)

Advantages

- Ensures exact conformity with the specified recipe
- High calibration stability
- High-precision blending
- Space-saving design (high capacity/m²) (sq. feet)
- Continuous monitoring and regulation of the combined product
- Automatic switch-off, if offset exceeds the limit
- Easy change of recipe for fast product change
- Turn down ratio 25% of nominal capacity
- Blending ratio 1:10 to 1:2

Carbonation and nitrogenation - CarboMaster

Cost effective, accurate and flexible gas-dosing

Specifications	
Field of application	Brewery
Description	The CarboMaster range comprises units for continuous in-line injection and dissolving of gasses such as CO_2 and N_2, using the patented APV gas injector to ensure precise and uniform injection. The CarboMaster can be integrated with other unit types, including the BlendMaster and the HGB Master
Capacity	50 - 1,200 hl/h (1,000 - 30,000 U.S. g/h)

Advantages

- High dosing accuracy (+/- 0.05 g gas/kg product)
- Injection independent of inlet temperature and pressure
- No gas losses
- Space-saving design
- Holding time not necessary
- Turn down to 25% of nominal capacity
- Injects and dissolves up to 10 g gas/kg product
- Constant monitoring and control of final product
- Fully CIP-cleanable

High gravity brewing - HGB Master

A compact three-in-one unit that deals you all the aces in the pack

Specifications	
Field of application	Brewery
Description	The HGB Master combines water deaeration (Derox), inline blending (BlendMaster) and carbonation (CarboMaster) into a single, all-inclusive process. The HGB Master ensures a cost-effective high gravity brewing process combined with very high production flexibility. And is designed for easy integration with existing lines
Capacity	50 - 1,200 hl/h (1,000 - 30,000 U.S. g/h)

Advantages

- Constantly low oxygen content 50 ppb at 12°C (below 30 ppb at >20°C) (measured as a standard deviation)
- Continuous monitoring for required specification
- Exact conformity with the specified recipe
- High calibration stability
- High dosing accuracy (+/- 0.05 g gas/kg product, measured as a standard deviation)
- Injection independent of inlet temperature and pressure low running costs
- High precision blending
- Space-saving design (high capacity/m²)
- No gas losses
- Holding time not necessary
- Variable capacity
- Independent of water inlet temperature (optional)
- Variable deaeration levels
- Easy change of recipe for fast product changeover
- Turn down ratio 25% of nominal capacity
- Blending ratio 1:10 to 1:2
- Injects and dissolves up to 10 g gas/kg product
- No rings and plates inside vacuum tanks
- Constant monitoring and control of final product
- Automatic switch-off, if offset exceeds the limit
- Fully CIP-cleanable

Controlled beer pasteurisation - PU pasteuriser

Gentle and accurate heat treatment that protects delicate aromas and flavour

Specifications	
Field of application	Brewery
Description	The PU pasteuriser enables continuous, gentle and effective heat treatment of beer and other carbonated drinks. The PU pasteuriser ensures precision temperature control at high working pressures
Capacity	50 - 500 hl/h (1,000 - 10,000 U.S. g/h)

Advantages

- Very high accuracy (computer controlled PU regulation)
- Low ΔT between product and heating media
- Large heat regeneration (up to 94%) with low-temperature filling
- Waste-saving design (beer/water zone)
- Turn down ratio 40% of nominal capacity
- Constant overpressure downstream
- Constant monitoring and control of final product

Dealcoholisation plant for beer

APV Dialysis System - continuous dealcoholisation

Advantages

- No thermal or mechanical stress to beer
- Reduction of alcohol volume from 4,7% ≤ 0,5%
- Operation temperature of ≤ 10°C.
- No dilution
- Excellent beer quality (as near as possible to beer)
- Proven technology
- Turn-Key Delivery
- Long operation times

Specifications	
Field of application	Brewery
Description	The plant consists of six operational units: ▪ the Dialysis membrane modules ▪ a stripper column for thermal alcohol reduction ▪ steam generator unit ▪ feeding unit ▪ diafiltration unit ▪ CIP-Unit The method of dialysis operates on the cross flow principle. In this case, a beer to be de-alcoholised flows through the hollow fibre membrane, whereas a dialysate (thermally treated beer) is feeded to cross flow on outer side of the membrane. The alcohol passes over to dialysate by the power of concentration gradient - drop between beer and dialysate - and is removed in a vacuum rectifier. The de-alcoholised dialysate is feeded at closed cycle to membrane again.
Capacity	20 hl/h

Butter

Adding value to products and production systems

APV has specialist experience in the supply of equipment for the manufacture of butter, margarine and low fat spreads. For many years APV has designed and engineered plants world-wide to produce a continuing variety of products in response to market demands. APV has successfully developed a new range of processes capable of producing high added-value, low fat spreads.

Today, our scope of supply for butter making includes: cream treatment, complete butter plants, upgrade of existing plants, butter buffer and butter pumping systems, butter packaging, blending of diffe-rent types of butter, butter reworking and butter melting.

Continuous butter making machine - HCT

Six different sizes, each with a wide capacity range

Specifications	
Field of application	Butter
Description	Semi-automatic in production, fully automated CIP
Capacity	500 - 12,000 kg/h (1,100 - 26,450 lbs/h)

Advantages

- Built-in cream pre-heater
- Built-in butter milk cooling
- Low air content in final product
- Advanced dosing system for water, salt and culture
- Internal CIP system
- Factory tested before shipping
- Each machine size has a wide capacity range

Butter buffer tank - HRS+

Acts as a buffer tank, for example between a butter making machine and one or more packaging machines

Specifications	
Field of application	Butter, butter spreads, dairy blends
Description	Closed tank with two transport augers. Outlet connections for one or more butter pumps
Capacity	1,500 - 2,500 - 4,000 - 5,500 - 7,000 kg (3,300 - 5,500 - 8,800 - 12,100 - 15,400 lbs)

Advantages

- Inclined bottom for reduced water consumption during CIP
- Reduced CIP time
- Replaceable plain bearing on augers
- No auger joints in product area
- Re-inforced design
- 1 - 4 butter pumps

Butter silo - HCS

Acts as a buffer tank, for example between a butter making machine and one or more packaging machines

Specifications	
Field of application	Butter, butter spreads, dairy blends
Description	Closed tank without transport augers. Outlet connections for one or more butter pumps
Capacity	900 and 1,800 kg (1,980 and 3,960 lbs)

Advantages

- No augers
- No additional working of the product
- 1 - 5 butter pumps

Butter packaging line - FMG

Fully automatic butter bulk packer for 20, 25 and 31 kg (44, 55 and 68,3 lbs) cartons

Specifications	
Field of application	Butter
Description	Fully automatic packaging machine including carton former, tare scale, filling heads, precision dosing, internal check weighing, and liner closing. Control system includes data collection of each carton filled. Post-production generation of production and CIP reports
Capacity	FMG-1: Max 180 cartons/h (3,600 - 5,580 kg/h) (7,930 - 12,300 lbs/h) FMG: Max 290 cartons/h (5,800 - 8,990 kg/h) (12,780 - 19,820 lbs/h) FMG+: Max 440 cartons/h (8,800 - 11,000 kg/h) (19,400 - 24,250 lbs/h)

Advantages

- Stainless steel throughout
- Single, compact unit
- Accurate filling for less give-away of butter
- Available with a troubleshooting system to reduce the down time
- Advanced control system with data collection
- Factory tested before shipping
- Each machine size has a wide capacity range
- FMG+ is capable of packing two different carton sizes at the same time

Butter packaging line - CAF

Semi-automatic butter bulk packer for 5 to 25 kg (11 to 55 lbs) cartons

Specifications	
Field of application	Butter
Description	Semi-automatic packaging machine including transport system, filling heads, precision dosing and internal check weighing. The control system includes data collection of each carton filled. Production and CIP reports can be created after production
Capacity	CAF-1: Max 145 cartons/h (725 - 3,625 kg/h) (1,600 - 7,990 lbs/h) CAF-2: Max 270 cartons/h (1,350 - 6,750 kg/h) (2,970 - 14,880 lbs/h)

Advantages

- Stainless steel throughout
- One compact unit
- CAF-2 can pack two different carton sizes at the same time
- Accurate filling - less give away of butter
- Advanced control system with data collection
- Factory tested before shipping
- Each machine has a wide capacity range

Dairy blend plant

Plant for manufacture of spreadable butter products by mixing butter with a vegetable oil etc.

Specifications	
Field of application	Butter spreads, dairy blends
Description	Fully automatic system for mixing butter with a vegetable oil to make a product that is spreadable straight from the refrigerator
Capacity	500 - 2,500 kg/h or 2,000 - 7,000 kg/h (1,100 - 5,500 lbs/h or 4,400 - 15,430 lbs/h)

Advantages

- No vegetable oil residues in the buttermilk
- Great flexibility for oil injection of unsaturated and saturated oils
- Simultaneous injection of several oil types
- Flexible end-product range
- Total fat content in final product typically 60 - 80%
- Vegetable oil content - typically 20 - 30%
- Stand-alone system, factory tested before shipping
- Advanced control system for end-product versatility and uniformity
- Each machine has a wide capacity range
- APV patented process

Low fat butter plant

Plant for manufacture of a spreadable low-fat butter product by mixing butter with a water phase

Specifications	
Field of application	Butter spreads, dairy blends
Description	Fully automatic system for mixing butter with a water phase in order to make a low-fat product that is spreadable straight from the refrigerator
Capacity	500 - 2,500 kg/h (1,100 - 5,500 lbs/h)

Advantages

- Great flexibility for injection of a water phase
- Flexible end-product range
- Total fat content in final product typically 25 - 60%
- Water phase typically 50%
- Stand-alone system, factory tested before shipping
- Advanced control system for end-product versatility and uniformity
- Wide capacity range
- APV patented process

Butter mixing plant

Mixing of tempered butter or margarine with different types of powder and liquid ingredients

Specifications	
Field of application	Butter, dairy blends, margarine
Description	Fully automatic, continuous system for mixing butter with powder ingredients to obtain a uniform end-product. Liquid ingredients can also be added to the formulation
Capacity	500 - 5,000 kg/h (1,100 - 11,000 lbs/h) depending on application

Advantages

- A continuous, closed system for a uniform end-product
- Low mixing temperature, minimising the risk of bacteriological issues
- CIP and sanitising without dismantling
- Stand-alone system, factory tested before shipping
- Advanced control system for end-product versatility and uniformity
- Wide capacity range

Butter reworking plant

Reworking of tempered bulk butter

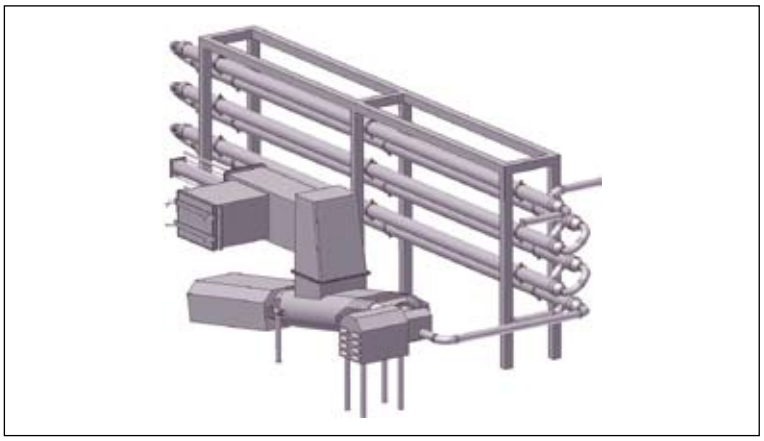
Specifications	
Field of application	Butter
Description	Fully automatic, continuous system for reworking bulk butter
Capacity	500 - 5,000 kg/h (1,100 - 11,000 lbs/h), depending on application
Temperature	Minimum product temperature 3°C (37,4°F)

Advantages

- CIP and sanitising without dismantling
- Continuous, closed system minimising the risk of bacteriological issues
- Available with a vacuum chamber for vacuum treatment of the product
- Precise dosing of water, salt, culture etc. to ensure a uniform end-product
- Stand-alone system, factory tested before shipping
- Advanced control system for end-product versatility and uniformity
- Wide capacity range

Butter melting plant

Melting or tempering of bulk butter



Specifications	
Field of application	Butter, margarine
Description	Fully automatic, continuous system for reworking and tempering/ melting of bulk butter
Capacity	500 - 6,000 kg/h (1,100 - 13,230 lbs/h), depending on application
Temperature	From 3°C (37,4°F) and up to a specified end temperature, depending on application

Advantages

- CIP and sanitising without dismantling
- Continuous, closed system minimising the risk of bacteriological issues
- Stand-alone system, factory tested before shipping
- Advanced control system for end-product versatility and uniformity
- Wide capacity and end temperature range
- Less floor space required compared to traditional melting tanks

Butter pilot plant facililty

Upscalable application for development and testing at APV's Innovation Centre

Specifications	
Field of application	Butter, butter spreads, dairy blends, margarine and other butter based products
Description	Complete pilot plant with APV applications and process engineering support
Capacity	300 - 1,500 kg/h (660 - 3,300 U.S. g/h)

Advantages

- Production-scalable process, development, testing and optimisation
- Highly flexible pilot plant enabling several product trials per day

Cheese plant logistics and cheese technology

As a leading global supplier of complete cheese plants to the dairy industry, APV offers a comprehensive selection of flexible and cost-effective solutions for virtually all cheese types and sizes with wide-ranging moisture content and fat in dry matter.

CheeseMaster plant

The CheeseMaster line is an automated, standard processing line for manufacturing all variations of EPC cheeses (European Pressed Cheese) - hard and semi-hard, round and rectangular, round eyed and with irregular eyes - in sizes from 1 kg to 50 kg (2.2 to 110 lbs/h) or more.
The CheeseMaster line has a proven track record for its outstanding performance and yield.

CheddarMaster and MozzarellaMaster

The famous CheddarMaster system is widely used for the manufacture of all types of Cheddar and dry salted cheeses. The CheddarMaster system is available both as a tower and all belt system with capacities from one to 10 tons per hour.
Based on the same technology as the CheddarMaster, the MozzarellaMaster handles Mozzarella or pizza cheese recipes.

SoftCurd Cottage cheese line

The SoftCurd cottage cheese line is made for cottage cheese with or without cream. The capacity ranges from 900 kg/batch to 2700 kg/batch dry Cottage cheese and approx. 1,600 kg/batch to 4,900 kg/batch creamed Cottage cheese . The concept of the SoftCurd line has proven it self successfully many decades.

Customisation and support

APV cheese process technology is the result of many years of experience and close co-operation with cheese manufacturers throughout the world.

Our experience and wide range of technologies means that we can configure and customise a world-class solution for a particular cheese production line, and provide all necessary support and service.

A dedicated team of specialists

- World-class innovation, engineering, sales and service competence
- Powerful and versatile technology platform
- Pioneers in innovative dairy applications and engineering solutions
- Advanced process automation solutions
- Innovation centre and pilot plant service

Cheese vats - CurdMaster a vertical double O vat

Vertical double O type

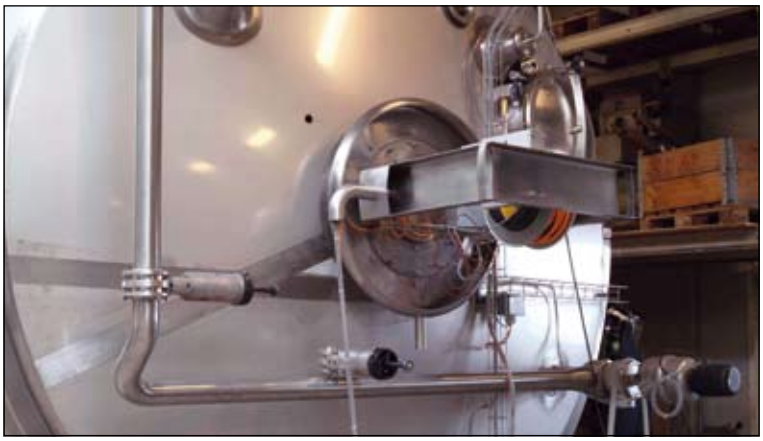
Specifications	
Field of application	Cheese plants
Description	Cheese vats including various options to fit any type of cheese production
Capacity	Up to 30,000 l (8,000 U.S. gal)
Temperature	Dependent on individual cheese types

Advantages

- Fast foamless filling
- Rapid mixing of all added components including rennet
- Gentle and precise cutting
- High yield
- Fast whey draw
- Controlled and fast heating and cooling
- Vertical vat with 2 outlets for fast emptying
- Efficient and gentle stirring
- Horizontal tank for very low product level
- Fully automated with touch screen
- CIP cleanable vats

SoftCurd cheese vat type OCC horizontal

Cottage cheese production



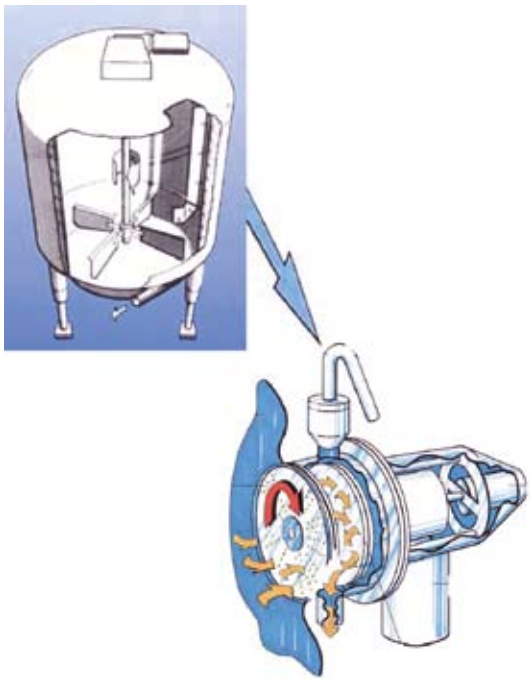
Specifications	
Field of application	Mainly cottage cheese plants
Description	Horizontally enclosed cheese vat, filled only up to below the central, horizontal shaft. Two sets of cutting tools for vertical and horizontal cutting to create uniform curd cubes, followed by proven high-quality, downstream system for whey draining, washing and cooling, curd draining and creaming
Capacity	Tank size from 6,000 l to 18,000 l (1,585 - 4,755 U.S. gal) filling volume. Line capacity up to 5,000 kg (11,000 lbs) cottage cheese per hour
Temperature	PLC controlled cottage cheese cooking programme

Advantages

- Enclosed cheese tank with horizontal and vertical cutting tools
- Horizontal cutting frame parked outside product area when not in use
- Dedicated stirring shovels for gentle curd agitation
- Unique soft curd agitation programme
- Low product level
- Well-proven downstream equipment
- Fully CIP cleanable equipment
- High product quality and hygiene standard
- Tank also applicable for Blue Cheese, Feta and other cheeses

CurdFinishing tank special

Final stirring and second whey draw between the cheese vats and the Pre-Press system



Specifications	
Field of application	Cheese plants
Description	The CurdFinishing tank is used for gentle final agitation as well as for the second whey draw which can be performed without stopping the agitator. This will minimise the lumps in the cheese mass to be pre-pressed which again will give a better cheese base without irregular holes
Capacity	Any
Temperature	Process-dependent

Advantages

- Improved cheese quality - better cheese base with minimum lumps and no irregular holes
- Shorter cheese processing time
- Very gentle, efficient and homogeneous agitation to eliminate feed variations in the Pre-Press system
- Continuous whey suction system enabling whey draw from the tank without stopping the agitator
- Separate in- and outlets
- Tangential inlet
- Enables high concentration of cheese curd before emptying to the Pre-Press system

FinesSaving tank

For recovery and reintroduction of cheese fines into the cheese

Specifications	
Field of application	Cheese plants
Description	During the second whey draw, the cheese fines in the whey are sedimented in a FinesSaving tank.The sediment fines will constantly be moved to prevent fines lumps before forwarding to the Pre-Press where they are distributed in the cheese mat and between the cheese grains
Capacity	Any
Temperature	Process-dependent

Advantages

- Increased yield through recovery and reintroduction of cheese fines
- Ability to flush out the filling line with clear whey
- Elimination of any increased fines losses from the second whey draw
- Improved cheese quality in connection with the second continuous whey draw
- Quick filling of the bottom of the Pre-Press with clear whey
- Less fines sediment in the bottom of the Pre-Press

OPD Pre-Press

Flexible pre-pressing of all kinds of semi-hard and hard cheese types

Specifications	
Field of application	Cheese plants for production of semi-hard and hard cheeses from about 2.0 kg to 100 kg (4.4 to 220 lbs)
Description	Pre-pressing of all types of semi-hard and hard cheese in all sizes and shapes within a frame of 1,200 x 1,200 mm (47.2 x 47.e inch). Available with a number of cheese production optimisation features such as laser scanning and adjustable knives
Capacity	5,000 - 20,000 l/batch (1,320 - 5,280 U.S. g/batch) Maximum batch size 13,000 x 1,700 x 200 mm (512 x 67 x 8 inch)
Temperature	Dependent on cheese type

Advantages

- Flexible Pre-Press for all cheese types and a wide range of sizes and shapes
- Adapts easily to variations in fat and water content
- Physical separation between the individual batches for clear batch identification
- Fewer cheese vats required
- Easy change of cheese dimension and shape
- Same unit can make Gouda- and Tilsit-type cheeses
- Long running time between CIP cleaning
- Higher yield
- Uniform water content
- High weight accuracy due to uniform curd distribution, laser scanning and adjustable knives

Mould fillers

Flexible filling solutions for cheeses of various dimensions and shapes, and with different structures and firmness

Specifications	
Field of application	Cheese plants
Description	Filling of pre-pressed cheeses. Simultaneous filling of more than one cheese depending on the capacity requirements of the processing line
Capacity	Up to about 5,000 cheeses per hour
Temperature	Process-dependent

Advantages

- Gentle handling of the cheeses
- Possibilities for laser controlled filling for accurate placement of the cheeses in the moulds (large cheeses)
- Can fill up to 24 cheeses in the same operation
- All fillers are tailor-made according to cheese type
- Choice of filling heads and filling systems
- Choice of type and amount of filling heads
- Several filling tools can be integrated in the automatic filler or changed for production of various dimensions and shapes of cheeses
- Optional: Fully CIP cleanable filling unit
- Operation with single or multiple moulds

SaniPress system

Highly flexible system for final pressing of semi-hard and hard cheeses

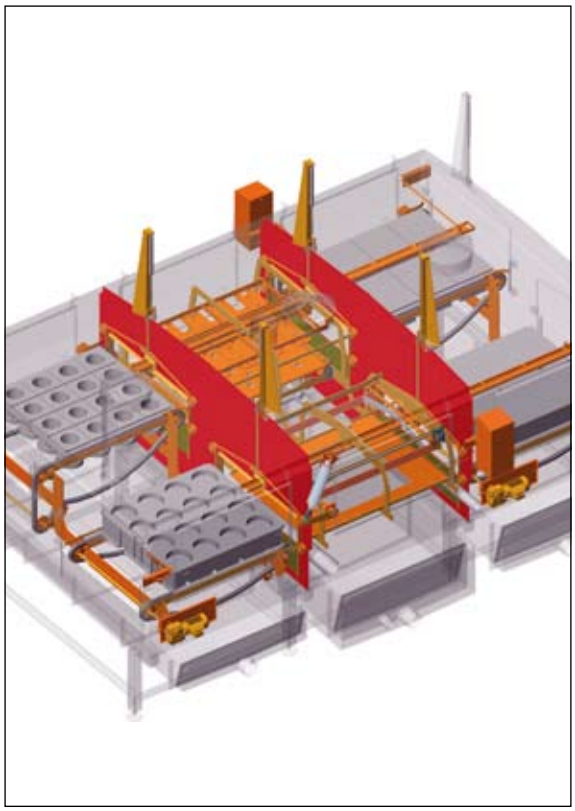
Specifications	
Field of application	Cheese plants
Description	Pressing takes place in closed tunnels by means of a diaphragm pressing on the entire surface of the mould lid
Capacity	Tailored to cheese processing line
Temperature	Dependent on individual cheese types

Advantages

- Even pressing of cheeses in individual moulds or multiple moulds without using spring-loaded lids
- A specific pressure of 400 g/cm² (5.7 lbs/sq.in.) is achieved at only 0.3 bar (4.3 lbs/sq.in. air pressure)
- Optional available with pressing cylinders
- Applicable to a wide variety of cheese types
- Applicable to a wide variety of shapes and sizes
- Integrated mould storage
- Collecting of whey and CIP liquid

Cheese mould washer

Special, patented design for cleaning micro-perforated plastic cheese moulds



Specifications	
Field of application	Cheese plants
Description	The cheese mould washer consists of three sections - pre-rinse, pressure washing and final rinse. Cheese particles and whey residues are removed by simple flushing in the pre-rinse section. The moulds are fixed in an upside down position in the pressure washing section and detergent is circulated through the micro-perforation. Finally the moulds are rinsed with fresh water, which is recycled to the pre-rinse section
Capacity	Adapted to the individual cheese plant
Temperature	75°C (167°F) in the pressure washing section

Advantages

- Patented pressure washing system for efficient cleaning of all micro-perforated drain channels, thus preserving the whey draining capacity of the moulds

Mould emptier system

Compressed air or vacuum emptying, depending on size and shape of the cheeses

Advantages

- Customised to individual cheese types, shapes and sizes
- Additional emptying tools can be integrated in the automatic filler or changed to accommodate various cheese shapes and sizes
- Choice of two methods enables the optimum solution for any cheese type
- Works with single and multiple moulds
- Available with full CIP cleaning

Specifications	
Field of application	Cheese plants
Description	Compressed air emptying: The moulds are turned 180° and fixed after which the cheese is released by blowing compressed air through the micro-perforated holes in the bottom and sides of the mould. Vacuum emptying: Specially designed, fixed vacuum heads on the mould are lowered on to the cheese. The cheese is liftet out of the mould
Capacity	Adapted to the individual cheese plant
Temperature	Dependent on cheese types

Rack filler

Gentle loading of cheeses on the rack

Advantages

- Specially designed rack filling system with filling below water level for gentle treatment of soft, pressed cheeses
- Flexible to accommodate various cheese sizes and shapes

Specifications	
Field of application	Cheese plants
Description	Pressed cheeses are conveyed on a belt conveyor from the mould emptier to rack filler where they are loaded on the roller conveyor in the rack loading vat. After the roller conveyor is lowered below water level, the rack elevator pulls an empty rack from the rack storage system, and places it with the lowest shelf in the loading position on a level with the roller conveyor. One shelf is loaded at a time by means of a pneumatically controlled pushing device, after which the rack elevator steps the rack to the next position. When the rack is loaded and all cheeses under liquid, the rack is pulled out of the elevator to the position for crane collection to the brining vat
Capacity	Adapted to the individual cheese plant
Temperature	Dependent on the various cheese types

Rack brining system

For round and rectangular hard and semi-hard cheeses - water cooling and brining

Specifications	
Field of application	Cheese plants
Description	A flexible modular system made of stainless steel (AISI316) consisting of brining racks, cooling/brining vats, and an overhead crane for rack conveyance. The brining racks consist of a frame with perforated profiled shelves equipped with safety gratings, as well as grip fittings for crane transportation and for hanging from the edge of the vat. The cooling/brining vats are made of stainless steel, and the edge of the vats feature rack fittings to make sure the racks do not touch the vat during lowering/lifting. The overhead crane is mounted on epoxy-covered steel pillars and covers the area containing the loading/unloading systems and the cooling/brining vats. It features a special gripper that fits closely with the grip fittings on the racks, and a semi- or fully automatic PLC system
Capacity	Adapted to the individual cheese plant
Temperature	Dependent on the individual cheese process

Advantages

- Highly flexible to accommodate various cheese types, sizes and shapes
- Suitable for both cheese cooling and cheese brining
- Available with full CIP to enable full batch control

Brine handling

Ensures forward flow of clean, saturated brine at the right temperature to the brine vats

Specifications	
Field of application	Cheese plants
Description	The brine handling system consists of brine storage, salt storage and salt dosing system, MF plant for brine cleaning, plate heat exchanger for temperature adjustment, and a forward flow and return system. The brine storage system consists of a tank for brine returned from the brining plant, and a tank for cleaned, saturated brine. The returned brine is pumped through the salt dosing system where the salt content is adjusted, and through the MF plant for cleaning. Finally the cleaned, saturated brine is stored in the relevant tank prior to temperature adjustment in the plate heat exchanger and forwarding to the brining vats
Capacity	Tailored to the individual brining plant
Temperature	Dependent on the actual cheese types

Advantages

- Forward flow to each brine vat of clean, saturated and temperature-adjusted brine, enabling real batch traceability
- The system is fully CIP cleanable
- Automatically controlled
- Cheese brine of high hygienic standard

Rack unloader and rack washer

Automatic unloading of brined cheeses to cheese conveyance system prior to rack cleaning

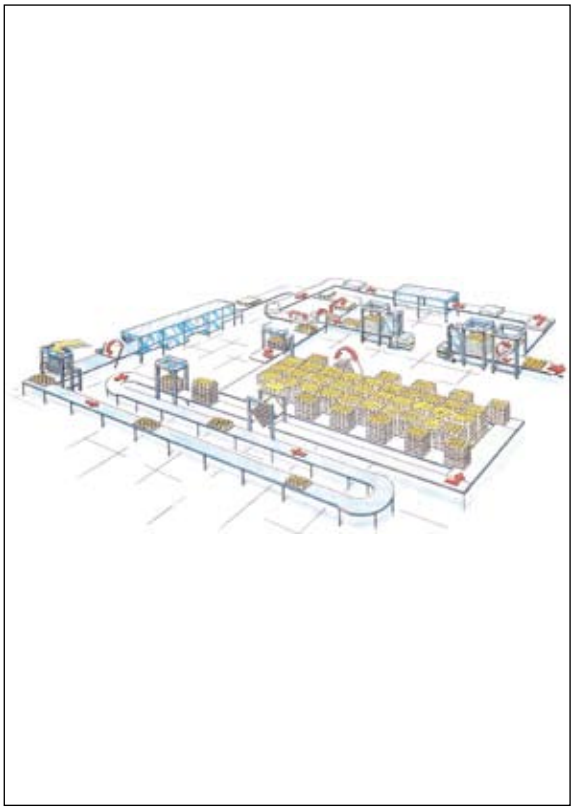
Specifications	
Field of application	Cheese plants
Description	The automatic unloading system consists of an elevator with a slat conveyor and a pneumatically controlled cheese pushing device, a chain conveyor positioning the rack for unloading, and a gripping device to lift the safety grating during unloading. After unloading, the rack is conveyed by the chain conveyor to the washing cabin. Unloading and rack washing are controlled by an integrated PLC system
Capacity	Tailored for the actual brine plant
Temperature	Dependent on the various cheese types

Advantages

- Highly flexible unloading system for a wide variety of cheese types, shapes and sizes
- Precise positioning of cheese pushing device
- Assurance that all racks are cleaned after each circulation - fresh cheeses always loaded on clean racks
- The system is fully controlled by a PLC system

Mould handling/stacking, turning, de-stacking and washing

Continuous process to ensure correct cheese acidification conditions and time



Specifications	
Field of application	Cheese plants
Description	The filled block forms from the ContiFiller arrive at the mould stacker where they are stacked to a pre-set height. The mould stack is conveyed forward to the acidification lines, where it remains for a pre-set acidification time. During acidification the stacks can be turned as required by the recipe. After acidification, the mould stacks are conveyed to the de-stacker and de-moulder, where the cheeses are unloaded from the moulds and forwarded to the brine system. The empty moulds are conveyed to the mould washer after which they are ready for a new cycle
Capacity	Adapted to individual cheese plant
Temperature	Dependent on the various cheese types

Advantages

- Highly flexible for handling of block moulds from 100 g up to 5 kg (3.5 ounce - 11 lbs)
- Fully automatic PLC system
- Optional full CIP

CheddarMaster - tower system

High-performance, high-quality curd draining, cheddaring, milling, salting and mellowing

Specifications	
Field of application	Cheddar and other dry salted cheese plants
Description	Batch and continuous curd draining, cheddaring, milling, salting and mellowing system
Capacity	1,000 - 9,000 kg/h (2,200 - 20,000 lbs/h) cheese curd
Temperature	Potentially no or very low temperature loss during holding time

Advantages

- Superior for handling non-continuous curd flow
- Proven capacity of 9,000 kg/h (20,000 lbs/h) cheddar curd
- Rapid filling facility - fewer and larger cheese tanks required
- Batch filling - continuous discharge
- High salting accuracy by volume or weight control
- No thin walled hollow bodies
- No curd and whey build-up in the machine
- Customised solutions based on standardised modules
- Easy recipe control and recording of process parameters
- Patented belt edge sealing to machine wall
- High-velocity, low-volume CIP philosophy
- High production flexibility and product quality
- Cost effective on small capacities
- 3A sanitary standard

CheddarMaster - all belt system

High-volume continuous curd draining, cheddaring, milling, salting and mellowing

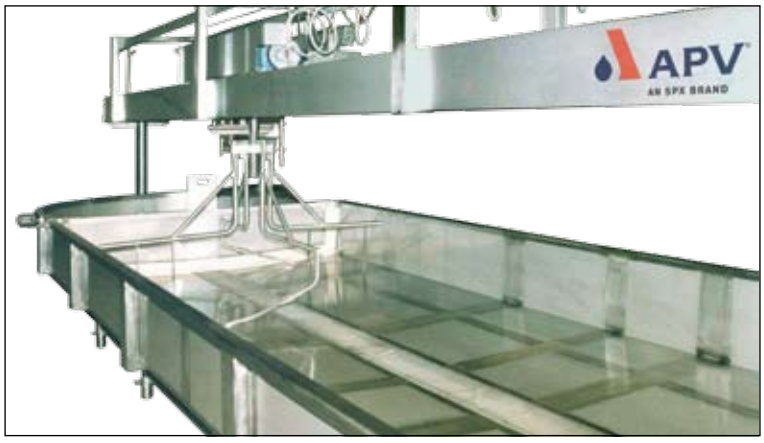
Specifications	
Field of application	Cheddar and other dry salted cheese plants
Description	Continuous curd draining, cheddaring, milling, salting and mellowing system
Capacity	1,000 - 12,000 kg/h (2,200 - 26,500 lbs/h) cheese curd
Temperature	Potentially no or very low temperature loss during the holding time

Advantages

- Superior for handling continuous curd flow
- Preferred high capacity system
- Proven capacity up to 12,000 kg/h (17,600 lbs/h) cheddar curd
- Continuous operation - wide range of configurations
- High salting accuracy by volume or weight control
- No thin-walled hollow bodies
- No curd and whey build-up in the machine
- Customised solutions based on standardised modules
- Easy recipe control and recording of process parameters
- Easy vat ID
- Patented belt edge sealing to machine wall
- High-velocity, low-volume CIP philosophy
- High production flexibility and product quality
- 3A sanitary standard

Cheddar Table - CT

Efficient stirring and fast draining with minimum loss



Specifications	
Field of application	Cheddar & Pasta Filata cheese plants.
Description	Cheddar table to fit to the amount of Curd from a Curd-Master. In the Cheddar table the curd is being drained, matted, milled, salted and mellowed.
Capacity	600 to 2200 kg of dry curd. (Standard sizes: 1500 mm or 1750 mm in width and with 6 lengths)

Advantages

- Simple and study stainless steel design which has proven track record
- Fast draining with minimum loss of fines.
- Efficient stirring with good salt distribution
- No pockets of unstirred curd
- Sanitary Agitator design securing no oil drips into curd
- Variable speed with infinite speed regulation and reduced maintenance.
- Table bottom inclined towards central whey drain
- Single walled or double walled for hot water heating
- Various tools for stirring, leveling and cutting
- Programmable curd unloading by trips
- CIP cleaning of all pipelines

MozzarellaMaster - dry curd system

Continuous Mozarella/pizza cheese curd draining and matting

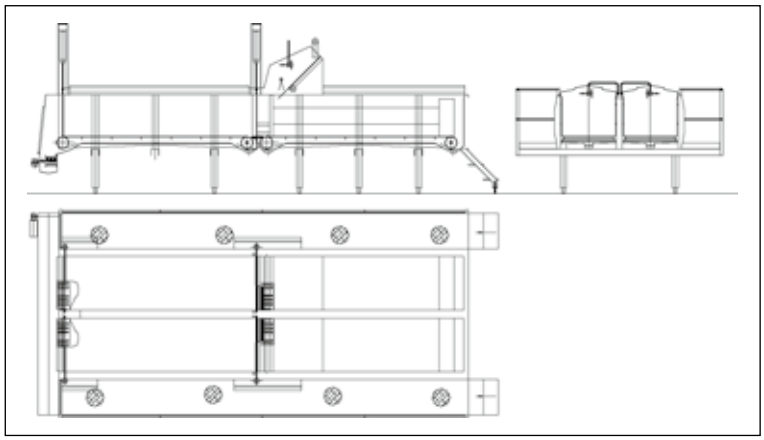
Specifications	
Field of application	Pizza cheese and Pasta Filata plants
Description	Continuous curd draining and matting system, and potential milling, salting and mellowing system
Capacity	1,000 - 8,000 kg/h (2,200 - 17,600 lbs/h) cheese curd
Temperature	Potentially no or very low temperature loss during the holding time

Advantages

- Superior for handling continuous curd flow
- Curd matting above whey level
- Capacity up to 8,000 kg/h (17,600 lbs/h) pizza cheese curd
- Preferred dry curd system for low-moisture Mozzarella/pizza cheese types
- No thin-walled hollow bodies
- No curd and whey build-up in the machine
- Customised solutions based on standardised modules
- Easy recipe control and recording of process parameters
- Easy vat ID
- Patented belt edge sealing to machine wall
- High-velocity low-volume CIP philosophy
- Optional curd washing facilities
- High production flexibility and product quality
- 3A sanitary standard

MozzarellaMaster - batch system for SoftCurd

Batch curd draining and matting for soft curd Mozzarella cheese



Specifications	
Field of application	Mozzarella and Pasta Filata plants
Description	Batch curd draining and matting system for curd acidification below or above whey level
Capacity	Up to 2,000 kg (4,400 lbs) curd per batch
Temperature	Uniform temperature in the curd mat

Advantages

- Designed for soft curd Mozzarella production
- Superior for non-continuous curd flow
- Provides quick fill and buffer facilities
- Proven design based on OPD technology
- High production flexibility and product quality
- High uniformity of curd moisture
- Controlled whey level
- Gentle curd treatment for improved yield
- Facilities both for soft and dry curd production
- Easy recipe control and recording of process parameters
- Enclosed fully CIP cleanable system
- Easy vat ID
- Optional curd washing facilities

Dry salted EPC system

Continuous production of high-quality, dry salted Cheddar, Gouda cheese types, Grana and Pasta Filata cheese types

Specifications	
Field of application	Manufacture of dry salted cheese types
Description	Based on CheddarMaster tower and all belt systems. Batch and continuous based curd draining, washing, cheddaring, milling, salting and mellowing system
Capacity	1,000 - 9,000 kg/h (2,000 - 20,000 lbs/h) cheese curd
Temperature	Potentially no or very low temperature loss during the holding time

Advantages

- Easy recipe control and recording of process parameters
- High salting accuracy by volume or weight control
- No brining facilities required
- BlockFormer or HP SaniPress for block moulding
- Variable cheese block shape and weight using HP SaniPress system
- High accuracy block shape (± 20 g) (± 0.7 ounce) - ideal for fixed weight portioning
- Easy add-on for pizza cheese production
- Competitive supply to ingredients industry capital requirement reduced by 30% or more compared to traditional EPC (Gouda) plants
- Reduced production, maintenance and building cost
- 3A sanitary standard

Membrane filtration technology

Proven systems and dedicated specialists

As a leading global provider of membrane technology to the dairy industry, APV offers a wide range of membranes, membrane systems and dairy membrane applications.

Proven membranes and systems

Membranes are available in a number of physical configurations, each offering a range of advantages in terms of technical performance, price and operating costs.
The most common membrane configurations for dairy applications are:

- RO, RO Polisher and NF: spiral-wound systems with organic polymer membranes
- UF: spiral-wound systems or plate-and-frame systems with organic polymer membranes
- MF: tubular systems with ceramic membranes as well as spiral-wound systems with organic polymer membranes

APV offers a wide range of system solutions. These comprise stand alone units, unitised and automated systems delivering optimal control and performance, and complete integrated in-line systems featuring pre- and post-treatment for integration into new and existing customer process lines.

APV membrane filtration technology is the result of many years of experience and close co-operation with world-leading manufacturers of membranes and cleaning agents. Our experience and access to a wide selection of technology options means that our specialists can always offer the best membranes for a particular application as well as dedicated support and service.

A dedicated team of specialists

- World-class innovation, engineering, sales and service competences
- 3 decades of experience - 1,000 references
- Strong know-how platform
- Pioneers in innovative dairy applications and engineering solutions
- Innovation centre and pilot plant service
- Customer service on customer terms
- World-wide expertise and local contacts

Microfiltration (MF) system

Debacterisation, fractionation and clarification with ceramic and polymer membranes

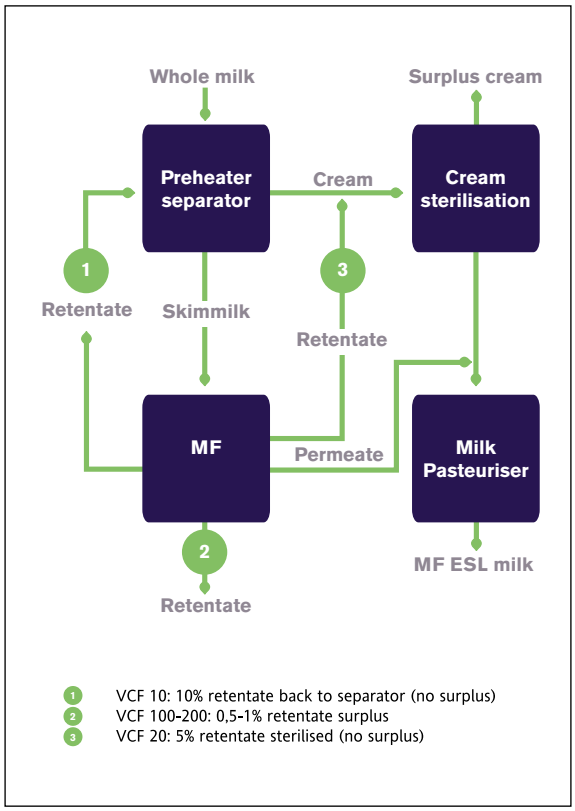
Specifications	
Field of application	Skim milk, whey, cheese milk, cheese brine
Description	Microfiltration is based on a membrane with a very open structure allowing most dissolved substances to pass whereas non dissolved particles, bacteria, spores and fat globules are rejected. Depending on the specific application, membranes and process parameters are chosen to secure optimal performance of the plant
Capacity	5,000 l/h - 50,000 l/h (1,300 - 13,000 U.S. g/h)
Temperature	50°C (122°F) for ceramic and 10°C (50°F) for SW

Advantages

- Proven components and system design
- Very robust ceramic membranes
- Long lifetime of the ceramic membranes
- New generation GP membranes
- Future option for SW polymer membranes
- Very high quality and reliably engineered system
- Pre-assembled in our workshop
- Operator- and maintenance-friendly

MF debacterisation

Effective removal of bacteria and spores



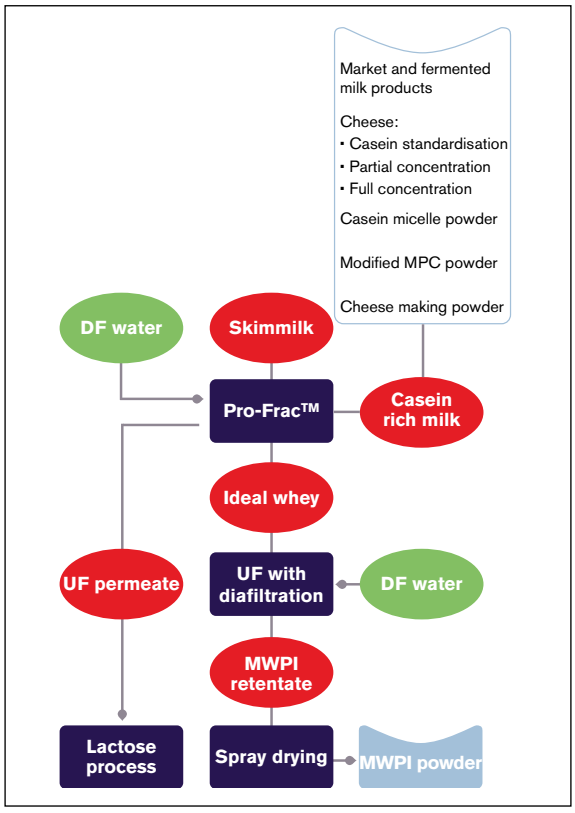
Specifications	
Field of application	Debacterisation of cheese milk, ESL milk and milk/whey powder. Further clarification of cheese brine using SW membranes
Description	Microfiltration for debacterisation in the dairy industry is used for reduction of bacteria and spores. In cheese milk production, microfiltration replaces the addition of nitrate. In market milk production, microfiltration is used to extend shelf life and produce value added milk, and in powder milk production, it is used to reduce the content of spores and thermofilic bacteria in the powder
Capacity	5,000 l/h - 50,000 l/h (1,300 - 13,000 U.S. g/h)
Temperature	50°C (122°F) for ceramic and 10°C (50°F) for SW (cheese brine)

Advantages

- Optimised removal of bacteria and spores
- Various operation concepts (see diagram)
- Proven process and system design
- Nitrate-free cheese
- Long-life ESL milk
- High-quality milk/whey powder
- High-quality cheese brine
- The MF process can be implemented in various parts of the dairy industry

MF fractionation - Pro-Frac™

Extracting more value from milk



Specifications	
Field of application	Protein fractionation of skim milk for: Protein/casein standardisation of cheese milk, high-casein milk powder and milk drinks
Description	The MF process for fractionation has been developed during recent years, concurrently with the development of new membranes with relevant pore sizes. The different size of whey proteins and casein makes it possible to use the membrane technology for fractionation. The purpose of fractionation is to standardise casein, e.g. in cheese making
Capacity	5,000 l/h - 50,000 l/h (1,300 - 13,000 U.S. g/h)
Temperature	50°C (122°F) for ceramic and 10°C (50°F) for SW polymer

Advantages

- Proven process and system based on ceramic membranes
- Very robust, long-life ceramic membranes
- Proven APV UTP system (uniform trans-membrane pressure) - alternative: GP membranes
- Future options for polymer membranes
- Casein standardisation of cheese milk
- High casein milk powder and milk drinks
- High-value WPI from 'Ideal whey'

Ultrafiltration (UF) SW and P & F systems

For milk and whey protein concentration

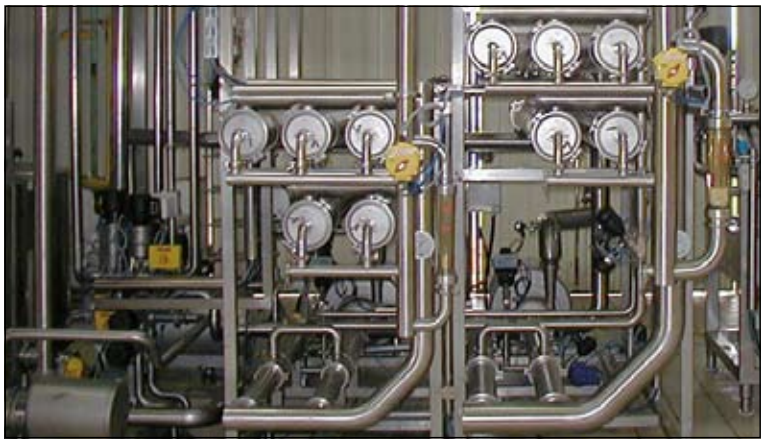
Advantages

- Proven components and system design
- Proven membranes for any dairy application
- High performance and long membrane lifetime
- High-quality engineering, standardised system
- Speed controllers on all motors
- Optimised utility consumption
- Pre-assembled in our workshop
- Operator- and maintenance-friendly

Specifications	
Field of application	Protein standardisation, milk protein concentration (MPC), UF cheese and whey protein concentration (WPC)
Description	Ultrafiltration for concentration of milk or whey is widely used in the dairy industry. UF concentration is used as a concentration step in the process of making different whey or milk powder products. Also different fresh cultured cheeses like cream cheese, Feta and Queso Fresco can be produced by UF concentration with a substantially higher yield
Capacity	Flexible from 1,000 l/h (250 U.S. g/h) to more than 100,000 l/h (25,000 U.S. g/h)
Temperature	50°C (122°F), more commonly 10°C (50°F) for quality reasons

UF protein standardisation and concentration

Improving product quality and profitability



Specifications	
Field of application	Cheese milk, protein milk drinks, milk powder, yoghurt and dairy desserts
Description	By means of UF whole milk or skim milk is separated into a protein rich fraction and a protein free fraction. By controlling the exact amount of protein in a certain amount of milk, the protein content can be increased or decreased
Capacity	Variable, but typically 5,000 l/h and 75,000 l/h (250 and 25,000 U.S. g/h)
Temperature	50°C (122°F), more commonly ≤10°C (50°F) for quality reasons

Advantages

- Proven system and process
- Different concepts and optimal integration
- Cheese milk: constant protein - better control of process and constant/higher cheese quality - and less rennet
- Protein and calcium enriched milk drinks
- Improvement of texture of yoghurt and desserts
- Milk powder: improved profitability and quality

UF cheese systems

High yield and quality cheeses

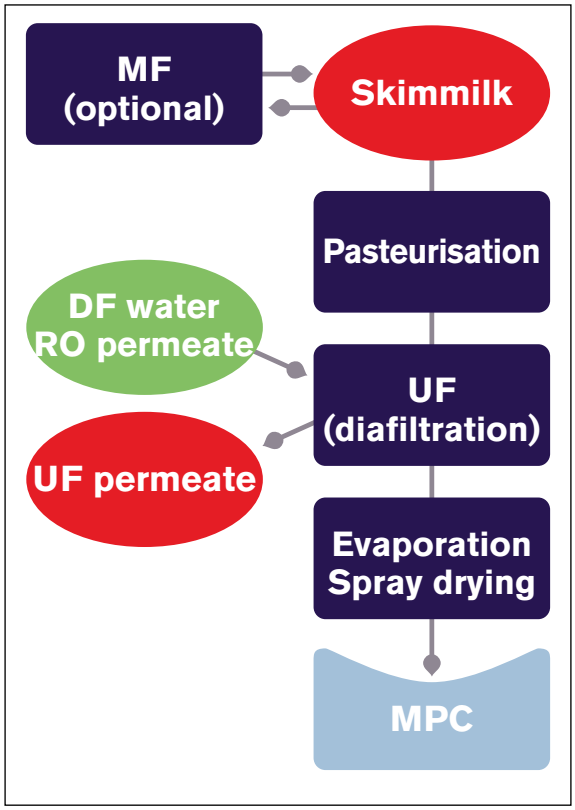
Specifications	
Field of application	White cheese like Feta and Domiati, Queso Fresco like Burgos, Quesillo and Panella, fresh cultured like Quarg, cream cheese etc.
Description	UF is a well-established and proven technology for a wide variety of fresh cultured cheeses. The UF based cheese process is a continuous process with increased yield compared to traditional cheese processing. The UF technology secures a more homogenous product with stabilising effect from the whey proteins. Furthermore, the process gives the flexibility of producing different kinds of cheeses on the same equipment
Capacity	Variable, but typically 3,000 l/h - 20,000 l/h (800 - 5,000 U.S. g/h)
Temperature	50°C (122°F) and 45 - 5°C (113 - 41°F) for fermented milk

Advantages

- Proven membranes for various milk applications
- High performance and long membrane lifetime
- High quality engineering, standardised system
- Proven process/UF cheese technology
- High yield and product quality
- Increased profitability
- Large number of references
- Complete line with pre-treatment and post-treatment (e.g. MF debacterisation for Feta)

UF milk protein concentrate - MPC and MPI

Tailored milk proteins for the food industry



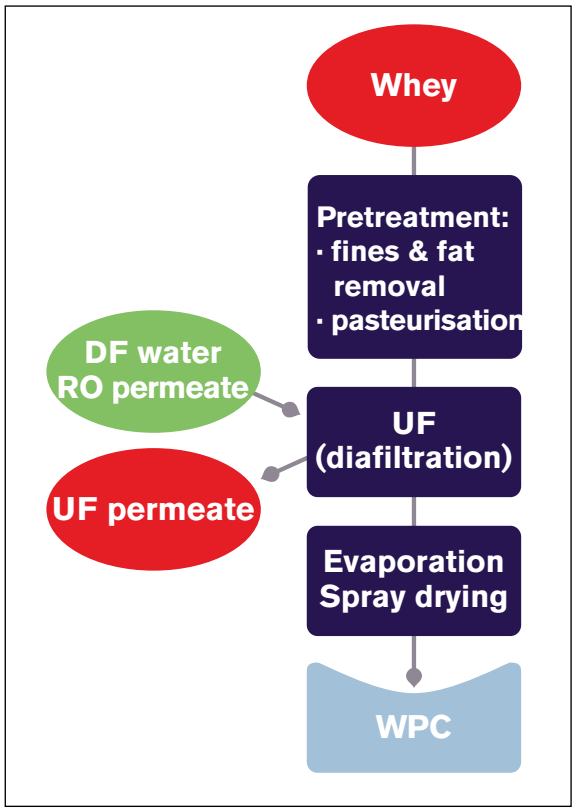
Specifications	
Field of application	Skim milk for: MPC 50, 60, 70, 80, 85 and MPI 90
Description	Milk protein concentrate is produced by using ultrafiltration to concentrate skim milk. The result is a product with a high content of protein and a low content of lactose and ashes. MPC and MPI are made in various grades from MPC 50 to MPI 90 and are used in for instance processed cheeses and a wide range of other food applications
Capacity	Variable, but typically 10,000 l/h - 35,000 l/h (2,500 - 10,000 U.S. g/h)
Temperature	50°C (122°F), more commonly 10°C (50°F) for quality reasons

Advantages

- Proven membranes for MPC
- High performance and long membrane lifetime
- High quality engineering, standardised system
- Proven process technology
- High degree of flexibility
- Complete line with pre-treatment and post-treatment

UF whey processing

Adding value to your whey



Specifications	
Field of application	Sweet and acid whey for various whey protein grades from WPC 35 to 85 and WPI 90
Description	Membrane filtration is widely used when processing value added whey protein concentrates (WPC and WPI). The configuration/design of the UF systems gives the possibility of producing a wide range of WPC products on the same plant. By adding water (diafiltration) into the UF system it is possible to concentrate the whey to WPC 85, which means that 85% of the total solids is protein
Capacity	Variable - typically from 5,000 - 100,000 l/h (13,000 - 26,000 U.S. g/h)
Temperature	50°C (122°F) or more commonly 10°C (50°F) for quality reasons

Advantages

- Proven membranes for various whey types/qualities
- High performance and long membrane lifetime
- High-quality engineering, standardised system
- Proven process technology
- Optimised flexibility
- In-line process: UF, NF/RO, RO polisher
- High solids WPC
- Large number of references

Nanofiltration system (NF)

For concentration and partial demineralisation

Specifications	
Field of application	Whey, UF permeate and skim milk
Description	Nanofiltration is a RO process in which a more open membrane allows small monovalent ions such as sodium and chloride to pass. This means that NF combines concentration (like RO) and partial demineralisation. The NF process can be used for a wide range of applications in the dairy industry, e.g. demineralisation of whey, milk and permeate from UF of milk or whey.
Capacity	Variable, but typically 5,000 l/h - 100,000 l/h (1,300 - 26,000 U.S. g/h)
Temperature	≈ 30°C (86°F) or more commonly 10 - 12°C (50 - 53,6°F) for quality reasons

Advantages

- Proven components and system design
- Proven membranes for NF dairy applications
- Optimised performance and long membrane lifetime
- In-line UF, NF, RO polisher
- High-quality engineering, standardised system
- Optimised utility consumptions
- Pre-assembled in our workshop
- Operator- and maintenance-friendly

Reverse osmosis (RO)

For concentration

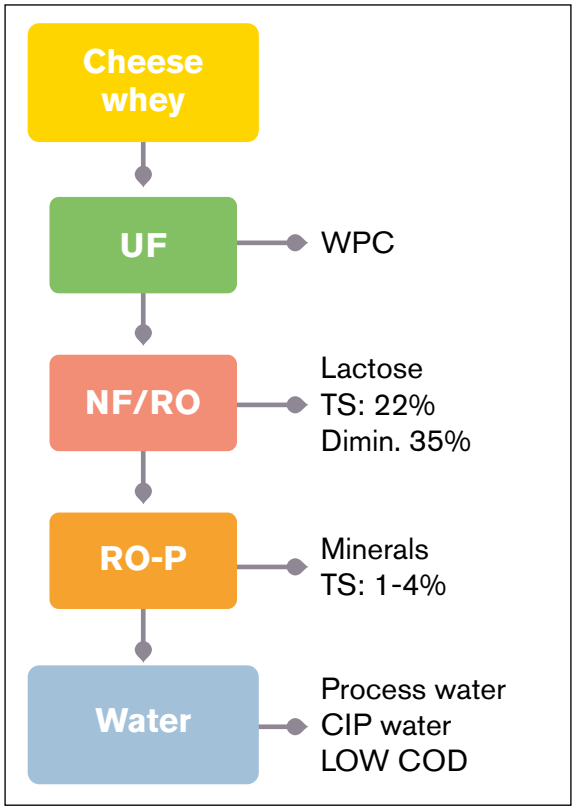
Specifications	
Field of application	Whey, UF permeate, skim milk, whole milk and white water, sweet buttermilk
Description	Reverse Osmosis filtration is based on a very dense membrane that rejects virtually all substances except water. This is possible due to a very high system pressure. RO is used for concentration of liquids to higher solids levels, depending on application. The purpose of RO can be to pre-concentrate prior to evaporation, to minimise transport costs or to increase capacity in different dairy processes.
Capacity	Variable, but typically 5,000 l/h - 100,000 l/h (1,300 - 26,000 U.S. g/h)
Temperature	≈ 30°C, (86°F) more commonly 10 - 12°C (50 - 50 - 57,2°F) for quality reasons

Advantages

- Proven components and system design
- Proven membranes for RO dairy applications
- High performance and long membrane lifetime
- In-line process: UF, RO, RO polisher
- High-quality engineering, standardised system
- Optimised utility consumptions
- Pre-assembled in our workshop
- Operator- and maintenance-friendly

RO polishing system (RO-P)

A dairy-environmental process



Specifications	
Field of application	NF or RO permeate and evaporator condensate to produce process water and lower the COD level
Capacity	Variable, but typically 5,000 l/h - 80,000 l/h (1,300 - 26,000 U.S. g/h)
Temperature	≈ 30°C (86°F), more commonly 10 - 14°C (50 - 57,2°F) for quality reasons

Advantages

- Proven components and system design
- Proven 8" membranes for RO-P dairy applications
- Optimised performance and long membrane lifetime
- In-line process: UF, NF/RO, RO Polisher
- High-quality water - low COD level
- High-quality engineering, standardised system
- Optimised utility consumption
- Pre-assembled in our workshop
- Operator- and maintenance-friendly

APV LeanCreme™ process

Microparticulation of whey

Advantages

- A unique new process ensuring optimal distribution of particle size
- Ensures superior taste in low-fat products
- Excellent functional properties
- Ability to vary particle sizes
- Fast pay-back, high ROI
- Proven, high-quality system design
- Evaporation and spray-dry options
- Increased yield

Specifications	
Field of application	WPC 35, 60 and 80 from sweet whey, lactic acid and HCl casein whey
Description	The APV LeanCreme™ process is a combined thermal and mechanical process using a shear agglemerator to produce LeanCreme™ (particulate). APV LeanCreme™ is based on a UF process for concentration of whey. The concentrated whey is then microparticulated by the shear agglomerator and a product with a unique particle size distribution and excellent functionality is “formed”. The LeanCreme™ is a natural ingredient which can be used in various dairy and food applications, especially for low fat products, with improved quality and profitability as a result
Capacity	500 - 3,000 l/h (130 - 800 U.S. g/h)

Membrane and after market service

Maximising uptime, minimising costs

Specifications	
Field of application	APV’s established base of membrane plants
Description	The membrane is the heart of the filtration process and decisive for the performance and the profitability of the process. APV can support you with membrane replacement, membranes and on-site service
Capacity	Spiral wound (SW) 8”, spiral wound 6”, spiral wound 4”, hollow fibre (HF), plate and frame, ceramic tubular, tubular organic

Advantages

- Expert advice on choice of membrane type
- Fast delivery of replacement membranes
- Regular service visits
- Troubleshooting
- Cleaning procedures
- Operator training, practical and theoretical
- Process optimisation

UHT treatment

APV is a world leader in UHT technology with a comprehensive portfolio of tried and tested UHT plant solutions comprising plate, tubular, injection and infusion UHT plant technologies.

In addition to these basic technologies, variations such as scraped surface heat exchanger, high heat infusion and combi UHT plants are available as well as Add-On, Pure-Lac™, ESL, aseptic tanks, UHT pilot plants and Instant Infusion.

The UHT R and D centre based in Silkeborg, Denmark, operates a UHT pilot plant capable of running all the main UHT systems. This pilot plant is used for product testing and new process development as well as by our customers wishing to test new processes and optimize existing process parameters with the assurance of production scalability.

APV introduced UHT infusion technology in 1960 and is today the world leader with a market share of some 90 percent

Today we offer four main infusion systems: Infusion UHT, 143°C (289°F) for 3 sec.; Infusion Pure-Lac™, 135°C (275°F) for 0.5 sec.; Instant Infusion, 135°C (275°F) for as little as 0,1 sec.; High Heat Infusion, 152°C (306°F) for 1 - 3 sec, giving an Fo of 40 - 70.

Infusion UHT plant - SDH

Flexible handling of a wide range of traditional, direct UHT products

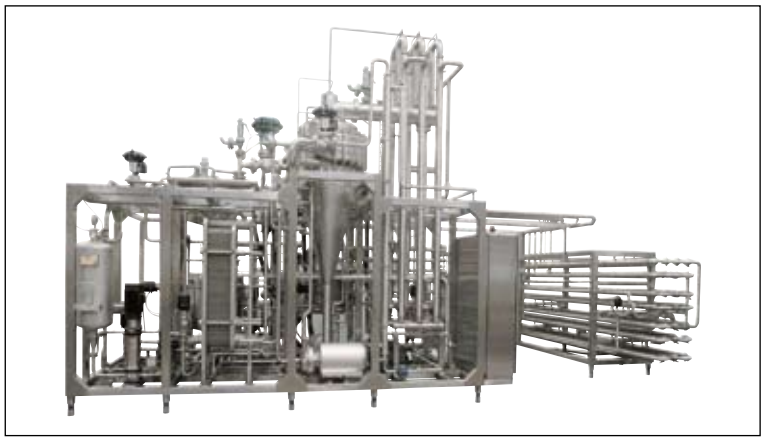
Specifications	
Field of application	Milk, flavoured milk, coffee cream, cream, ice cream mix, custard, milk shake
Description	A UHT plant designed for very fast heat treatment, with an efficient bacteria spore kill rate and a very low chemical change to the product. Often named the most gentle UHT treatment on the market
Capacity	2,000 - 30,000 l/h (550 - 8,000 U.S. g/h)
Temperature	5-75-142-75-25°C (41-167-288-167-77°F)

Advantages

- Gentle and accurate heating in the infusion system
- Fast heating 600°C/sec.
- Accurate holding time
- Superior product quality
- High product flexibility
- Low fouling rate
- Long operating time between CIP
- Operator friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, PMO, 3A

Injection UHT plant - SDI

Flexible handling of a wide range of traditional, direct UHT products



Specifications	
Field of application	Milk, flavoured milk, coffee cream, cream, ice cream mix, custard, milk shake
Description	A UHT plant designed to give a very fast heat treatment, with an efficient bacteria spore kill rate and very low chemical change to the product
Capacity	2,000 - 30,000 l/h (550 - 8,000 U.S. g/h)
Temperature	5-75-142-75-25°C (41-167-194-280-167-77°F)

Advantages

- Gentle and accurate heating in the infusion system
- Fast heating 300°C/sec.
- Superior product quality
- High product flexibility
- Low fouling rate
- Long operating time between CIP
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, PMO, 3A

Tubular UHT plant - STH

Flexible handling of a wide range of traditional, indirect UHT products

Specifications	
Field of application	Milk, flavoured milk, coffee cream, cream, ice cream mix, custard, milk shake
Description	Robust and flexible UHT plant. Back pressure tolerance up to 60 bar and heat regeneration of approx. 85%
Capacity	2,000 - 30,000 l/h (550 - 8,000 U.S. g/h)
Temperature	5-75-90-138-75-25°C (41-167-194-280-167-77°F)

Advantages

- High up-time
- Flexible product range
- Easy inspection of product and medium surface
- High pressure tolerance
- Low energy cost
- Low maintenance cost
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, PMO, 3A

Plate UHT plant - SIH

Flexible PHE-based heat treatment of a wide range of traditional, indirect UHT products

Specifications	
Field of application	Milk, flavoured milk, coffee cream, cream, ice cream mix, milk shake, tea, coffee, juice, etc.
Description	A UHT plant designed for cost efficient running and a heat regeneration of up to 96%
Capacity	2,000 - 30,000 l/h (550 - 5,500 U.S. g/h)
Temperature	5-75-90-138-75-25°C (41-167-194-280-167-77°F)

Advantages

- High energy recovery, giving low running cost
- Flexible low viscosity product range
- Low pressure drop
- Pare Clip gaskets (non-glue)
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, PMO, 3A

Scraped surface heat exchanger UHT plant - SSHE

For heat treatment/UHT of products with very high viscosity and/or particle content

Specifications	
Field of application	High-viscosity products
Description	A UHT plant designed for robust and flexible running of products with very high viscosity for which a tubular or plate UHT plant is not suitable
Capacity	200 - 20,000 l/h (550 - 5,500 U.S. g/h)
Temperature	5-75-90-138-75-25°C (41-167-194-280-167-77°F)

Advantages

- Effective processing of high-viscosity products and products containing particles
- Operator-friendly
- Pre-assembled and factory-tested

High heat infusion steriliser - SHH

Flexible heat treatment of a wide range of traditional direct UHT products

Specifications	
Field of application	Milk, flavoured milk, coffee cream, cream, ice cream mix
Description	A UHT plant designed to give a very high kill rate of bacteria spores (Fo 40 to 70) and higher heat regeneration (approx. 65%) than a conventional infusion plant
Capacity	2,000 - 30,000 l/h (550 - 8,000 U.S. g/h)
Temperature	5-90-60-125-150-75-25°C (41-194-140-257-302-167-77°F)

Advantages

- Kill rate over Fo 40
- Increased operating time
- High recovery (up to 72%)
- Reduced maintenance costs
- Efficient deaeration prior to heating
- Non-aseptic flavour dosing of the vacuum chamber possible
- Destruction of heat resistant spores (HRS)
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, PMO, 3A

Combi UHT plant - Combi

Ultra-versatile handling of a wide range of traditional indirect and direct UHT products

Specifications	
Field of application	Milk, flavoured milk, coffee cream, cream, ice cream mix, milk shake, tea, coffee, juice
Description	Versatile UHT treatment using a choice of UHT systems - tubular, infusion, ESL and high heat infusion in the same plant. Able to combine all APV UHT plant technologies
Capacity	2,000 - 30,000 l/h (550 - 8,000 U.S. g/h)
Temperature	5-75-90-138-75-25°C (and others) (41-167-194-280-167-77°F)

Advantages

- Very high degree of flexibility, towards products and temperature profile
- Can run both direct and indirect UHT
- Can also run ESL/Pure-Lac™
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, PMO, 3A

Add-on UHT plant - Add-On

Add-On, direct and indirect UHT system for an existing pasteuriser

Specifications	
Field of application	Milk, flavoured milk, coffee cream, cream, ice cream mix, milk shake, tea, coffee, juice
Description	A UHT plant designed to be added on to an existing heat treatment plant (pasteuriser or UHT)
Capacity	2,000 - 30,000 l/h (550 - 8,000 U.S. g/h)
Temperature	5-75-90-138-75-25°C (and others) (41-167-194-280-167-77°F)

Advantages

- Very high degree of flexibility
- Direct and indirect UHT
- Low investment
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, PMO, 3A

Bactofugate steriliser - SSU

An infusion UHT system designed to sterilise bactofugate

Specifications	
Field of application	Bactofugate and whey cream
Description	A UHT bactofugate sterilisation plant with extra long running time between CIP cleaning
Capacity	200 - 5,000 l/h (55 - 8,000 U.S. g/h)
Temperature	50-140-(50)°C (cooling direct in the main product) 122-284-(122)°F

Advantages

- Over 10 hours between CIP
- High spore kill rate in bactufugate
- Low chemical change
- Operator-friendly
- Pre-assembled and factory-tested

Infusion Pure-Lac™ plant - Pure-Lac™

Pure-Lac™ the new milk with protected freshness and extended shelf life

Specifications	
Field of application	Milk, flavoured milk, coffee cream, cream, ice cream mix, milk shake
Description	Infusion plant with very fast heat treatment involving pasteurisation for 0.5 seconds at 135°C (275°F)
Capacity	2,000 - 30,000 l/h (550 - 8,000 U.S. g/h)
Temperature	5-75-135(0.5 sec)-75-5°C (41-167-275(0.5 sec)-167-41°F)

Advantages

- Gentle and accurate heating in the infusion system
- Fast heating 600°C/sec.
- Accurate holding time
- High bacteria spore kill rate
- Superior product quality - low chemical change, pasteurised milk flavour
- Shelf life up to 45 days
- High product flexibility
- Low fouling rate
- Long operating time between CIP
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, PMO, 3A

Infusion ESL plant - ESL

ESL - the new milk with protected freshness and extended shelf life

Specifications	
Field of application	Milk, flavoured milk, coffee cream, cream, ice cream mix, milk shake
Description	Infusion plant with very fast heat treatment involving pasteurisation for 0.5 seconds at 129°C (264°F)
Capacity	2,000 - 30,000 l/h (550 - 8,000 U.S. g/h)
Temperature	5-75-129(0.5 sec)-75-5°C (41-167-264(0.5 sec)-167-41°F)

Advantages

- Gentle and accurate heating in the infusion system
- Fast heating 600°C/sec.
- Accurate holding time
- High bacteria spore kill rate
- Superior product quality - low chemical change, pasteurised milk flavour
- Shelf life up to 45 days
- High product flexibility
- Low fouling rate
- Long operating time between CIP
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, PMO, 3A

Instant infusion plant - SII

Ultra-short, high-temperature treatment with precision-controlled holding time

Specifications	
Field of application	Baby food, milk concentrate (max 58% TS) for spray drying
Description	Infusion plant designed for very fast heat treatment and ultra-short, precision-controlled holding time
Capacity	2,000 - 30,000 l/h (550 - 8,000 U.S. g/h)
Temperature	75-140(0.09 sec)-75°C (167-284(0.09 sec)-167°F)

Advantages

- Gentle and accurate heating in the infusion system
- Fast heating 600°C/sec.
- Efficient bacteria spore kill rate
- Up to 70% less vitamin loss
- Precision-controlled holding time down to 0.09 sec.
- Very low chemical change
- Superior product quality
- High product flexibility
- Low fouling rate
- Long operating time between CIP
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, 3A

Multipurpose UHT pilot plant - SPP

The most flexible pilot UHT plant on the market

Specifications	
Field of application	All liquid food products
Description	Up to five heating systems - plate, tubular, injection, infusion and SSHE UHT, or any combination. Also runs Pure-Lac™ and ESL
Capacity	80 - 150 l/h (designed for 100 l/h) (21 - 40 U.S. g/h (27 U.S. g/h)
Temperature	5-75-140-75-20°C (41-167-284-167-68°F)

Advantages

- Very reliable system for product trials before upscaling to commercial production
- Highly flexible
- Quick and easy installation
- One unit with small footprint
- Operator-friendly
- Pre-assembled and factory-tested

Sterile technology

Technology and technical expertise for large-scale production under sterile or aseptic conditions

Specifications	
Field of application	Chemical, dairy, food, pharmaceutical industries
Description	Industrial fermentation for a wide range of products, based on APV's long history in UHT-applications. Since the inception of its first loop fermenter in 1998, APV has developed and implemented continuous and batch fermentation processes requiring sterile conditions
Capacity	Industrial fermentation applications from pilot-scale to production-scale

Advantages

- Wide range of end-products
- Experience in long-term (30 days plus) industrial fermentation applications
- Loop or batch fermentation
- Solid experience from many years of aseptic technology applications
- Specialised in application of customer-owned processes

Processing lines for production of ESL products

Flexible, precise and cost-effective processing

Specifications	
Field of application	Milk, cream and other dairy and food products
Description	Fully automatic processing based on UHT, PHE, THE, SSHE, membrane filtration etc., depending on the product
Capacity	Any
Temperature	70 - 140°C (160 - 280°F), depending on product and pH

Advantages

- Optimum process control and safety
- Higher number of running hours between CIP
- Easy CIP
- High heat recovery
- Operator-friendly control system
- Low running costs
- Low maintenance costs
- Improved product quality
- Improved flavour
- Combination of the ESL methods to tailor shelf life and flavour
- ESL processing lines can be combined with traditional pasteurisation lines for milk and cream

Aseptic tank - SST

Aseptic tank system with PLC system

Specifications	
Field of application	All UHT-treated liquid aseptic products
Description	Modular design comprising tank body, valve battery, CIP system and PLC system, and controlled from the UHT plant
Capacity	2,000 - 30,000 l (550 - 8,000 U.S. g)

Advantages

- Modular system
- Easy and fast installation
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, 3A

Aseptic tank - SPT

Aseptic tank system with PLC system

Specifications	
Field of application	All UHT-treated liquid aseptic products
Description	Small aseptic tank for the pilot UHT plant.
Capacity	500 l (132 U.S. g)

Advantages

- Mobile tank, easy to move
- Easy and fast installation
- Operator-friendly
- Pre-assembled and factory-tested

Processed foods

A taste for success on the terms of the customer and his market

APV supplies a wide range of equipment for processing sauces, soups, dressings, jams, fats and spreads, ready meals, desserts and baby foods as well as ingredients and additives such as blood plasma, gelatine, starch, pectin and gums

APV's in-depth knowledge and processing equipment innovations serve to help customers in both established and developing markets.

In the established market of Europe and America, APV processes can be employed for the preparation, composition, preservation and packaging of new and improved product lines. In Central and Eastern Europe, Asia and the Far East where consumer demand is growing, APV is helping manufacturers establish fast-selling lines to meet wide-ranging tastes.

Innovation has enabled APV to create a range of products, which give manufacturers the building blocks to design and develop solutions specific to their needs. APV also offers a number of standardised systems based around strengths in mixing, blending, concentration, homogenisation and a variety of thermal processes.

Prepared food unit

A new compact continuous processing unit for fine foods

Specifications	
Field of application	Mayonnaise, sauces, ketchup, dressings, creams, lotions and gels, etc.
Description	APV's continuous unit for processing of sauces, mayonnaise and dressings prepared from vegetable oil, egg yolk (or other emulsifiers) and vinegar is designed for products requiring a "hot process" enabling the hydrocolloids to gelatinise and for products not requiring any heating at all, so called "cold manufacturing technique". This new, compact and continuous processing unit offers a number of plant configurations, each of which ensures constant product quality and increased yield while cutting costs to a minimum
Capacity	250 - 10,000 l/h (60 - 2,600 U.S. g/h)

Advantages

- Fresh taste and odour
- Smooth and creamy texture
- Constant product quality
- Safe production
- Operator-friendly
- Preassembled and factory-tested
- Saves raw materials

General processing technology

Linking APV key technologies together

General Processing Technology (GPT) is the portfolio of technologies which links APV Key technologies together in processing lines. It involves a series of essential building blocks from reception of raw materials, pre-treatment before further processing, tank sections, output of final end products and cleaning of processing lines.

The APV technology portfolio includes a wide range of building blocks (products, units and skids) such as Heat Transfer (aseptic, non-aseptic), Membrane Filtration, Cheese, Butter, Distillation and Evaporation, Dearation, Blending and Mixing technologies designed to operate at maximum efficiency in modern processing lines within Dairy, Food, Beverage, Brewery and other industries around the world. GPT is designed for applications within these Industries. With this background, GPT is setting up standards for Projects creating an opportunity for APV to integrate our technologies adapted to specific market demands and applications. This will position APV as a leader in highly attractive, value added concept solutions and benefits to our customers.

The portfolio behind APV GPT is based on many years of experience and thousands of project references around the world.

By using Reusable Engineering APV aim to be more profitable. Further design objectives are energy savings and reduced waste products - all offering higher profitability and reduced impact on the environment. Safety is paramount and all APV GPT systems are designed for sanitary conditions and made cleanable. All food legislations can be adhered to with APV GPT.

By linking up with state-of-the-art Automation APV delivers fully automatic solutions with opportunity to support full traceability with registration of production parameters from receiving of raw materials to delivering the end products.

Reception lines

Tailor-made functional reception lines for liquid products

Specifications	
Field of application	Milk, cream, whey, concentrates, oils, chemicals etc.
Description	Flexible, manual to fully automated handling of a wide range of products used in the dairy and food industries
Capacity	Any
Temperature	Product can be cooled or heated to the required temperature

Advantages

- High sanitary standard solution, fully CIP cleanable
- Optimal functions to protect product quality and functionality
- Reduced maintenance costs
- Pipeline, valve dimensions and gentle pumping protect fat globule integrity in milk
- Capacity and volume measurements
- Filters to remove particles
- Start/stop function to prevent pumping without product
- Safe, low pressure loss cooler/heater for temperature adjustment

Processing line for milk and cream

Flexible, cost-effective production

Specifications	
Field of application	Milk and cream of various compositions
Description	Pasteurisation, homogenisation, deaeration, fat and protein standardisation etc. of all kinds of milk and cream to meet all international standards
Capacity	Any
Temperature	Any required temperature range/ holding time for any product

Advantages

- High flexibility
- Production safety
- Low heat influence on the product
- High degree of heat recovery
- Accurate temperature control
- High number of running hours between CIP
- CIP capacity on pasteurisers the same as product capacity
- Less product waste/less waste water load
- Less water, energy and chemical consumption for CIP
- Shorter CIP time

CompoMaster - KCC

Unit for automatic standardisation of fat content in milk and cream

Specifications	
Field of application	Milk and cream
Description	The CompoMaster is designed for operation together with a milk separator. The fat content of the raw milk is determined automatically using density transmitters after which the CompoMaster fully controls the on-line standardising process
Capacity	7,000 l/h - 60,000 l/h (1,800 - 16,000 U.S. g/h)
Temperature	Milk separation at 55 - 65°C (130 - 150°F)

Advantages

- High standardisation accuracy
- Fast control responce to fat set point changes
- Automatic determination of fat content
- Advanced designs for in-line standardisation of fat, protein and solids
- Delivered as a skid-mounted unit ready for installation and commissioning
- Available as stand-alone unit or as unit for full integration into complete milk processing systems

Pasteurisation plant - HPD (plate)

General plate pasteurisation plant for the dairy and related industries

Specifications	
Field of application	Milk, flavoured milk, coffee cream, cream, ice cream mix, milk shake, tea, coffee, juice, etc.
Description	The plant is designed for cost efficient running, delivering up to 96% heat regeneration. The plant is made as a unit
Capacity	100 - 30,000 l/h (27 - 8,000 U.S. g/h)
Temperature	5-72/85-5°C (41-162/185-41°F)

Advantages

- High energy recovery for low operating cost
- Flexible low-viscosity product range
- Low pressure drop
- Pare Clip gaskets (non-glue)
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, PMO, 3A

Pasteurisation plant - HTP (tubular)

General tubular pasteurisation plant for the dairy and related industries

Specifications	
Field of application	Milk, flavoured milk, coffee cream, cream, ice cream mix, milk shake, tea, coffee, juice, etc.
Description	The plant is designed for cost efficient running with a heat regeneration of up to 90%. It is further designed for robust running and can stand pressure drops of up to 60 bar. The plant is made as a unit
Capacity	100 - 30,000 l/h 27 - 8,000 U.S. g/h
Temperature	5-72/85-5°C 41-162/185-41°F

Advantages

- Can run fibres and particles
- High energy recovery, giving low running cost
- Flexible low viscosity product range
- Low pressure drop
- Operator-friendly
- Pre-assembled and factory-tested
- As option designed according to ASME, PMO, 3A

Clarifying, skimming and pasteurisation of whey products

Systems for recovery of valuable components in the whey

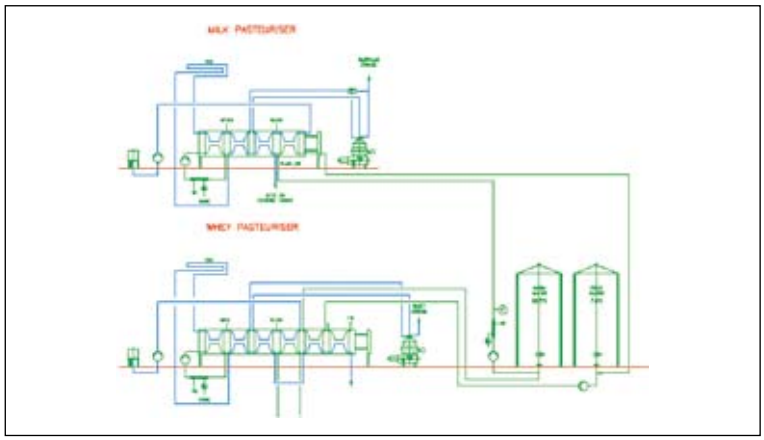
Specifications	
Field of application	Whey from cheese and fermented milk production
Description	Manual to fully automated clarification to recover and systems to rework cheese fines, skimming to recover and systems to rework whey cream, and pasteurisation
Capacity	Any
Temperature	Flexible for value optimisation of whey components

Advantages

- Secure sanitary recovery of valuable whey components
- Cross-energy recovery between milk and whey to optimise total energy recovery
- Treatment and reworking of valuable recovered whey components
- Protection of product integrity and functionality
- Quality assurance in end-product containing reworked whey components
- Fully automated lines with full traceability
- Optimal recovery of valuable components
- Long running hours between CIP

Energy recovery and reuse (recycling) systems

Driving down running costs



Specifications	
Field of application	The dairy and food industries
Description	Heat recycling based on one or more tanks to accommodate varying temperature levels at different production steps
Capacity	Any
Temperature	Can be used at all temperature levels

Advantages

- High sanitary, safe energy recovery
- Short pay-back time
- Totally CIP cleanable systems
- Optimisation of energy recovery by combination with heat pump
- Closed water loops working with preserved water media
- Fully automated volume and energy-balanced control
- System can be based on two temperature levels/tanks, warm at the top and cold at the bottom. Tanks are designed to eliminate turbulence in tank.
- Systems for low cost energy balancing
- Can be delivered with safe ParaFlow system between product and energy media, independent of the sanitary level of the energy media system

Standard CIP units

Reduced downtime with flexible and cost-effective CIP

Specifications	
Field of application	The dairy, food, beverage, brewery, bio/pharma industries
Description	CIP units for efficient cleaning of pipeline systems, tanks and processing plants with a choice of tank sizes depending on requirements
Capacity	One to three independent lines with individual capacities depending on throughput and pressure
Temperature	Flexible temperature adjustment with heating in tanks or on forward lines

Advantages

- Manual to fully automatic units specially designed for optimal CIP
- Disinfection/sterilisation by means of hot water or cold sanitiser
- Low consumption of water, energy and chemicals
- Re-use of chemicals
- Selection of options
- Standard units including standard control system for lowest possible capital investment
- Control system: In Touch - Siemens, In Touch - Allan Bradley

CIP plants

Customised cleaning and disinfection of virtually any equipment

Specifications	
Field of application	Efficient CIP cleaning of tanks, pipeline systems and machinery and equipments in the dairy, food, beverage, brewery, bio/pharma industries
Description	CIP plants with one or many independent CIP circuits, and tailored to virtually any requirement
Capacity	Individual for each CIP circuit
Temperature	Individually adjustable for each circuit with disinfection temperatures up to 125°C (260°F)

Advantages

- Fully automated and customised to specific needs
- Low consumption of water, energy and chemicals
- Efficient waste recovery
- Low waste water load
- More efficient cleaning for shorter cleaning time
- Selection of options including sterilisation loops and make up loop
- Elimination of water hammering
- Standard control systems to limit capital investment
- Multiple CIP cleaning programs
- Control Systems: In Touch - Siemens, In Touch - Allan Bradley
- Proven technology and systems

Fermented and acidified products

There are a wide range of cultured milk products on the market, containing lactic acid bacteria which are produced using APV Technologies.

Product capabilities include

- Drinking yoghurt
- Ymer
- Acidophilus products
- Bifidus products
- AB products
- Speciality cultured products with probiotics
- Kefir
- Cultured drinks containing lactobacillus bacterias with or without probiotic properties
- Buttermilk drinks
- Laban drinks

In terms of volume, yoghurt is the single most important type of cultured milk product. The general term yoghurt, however, covers a wide variety of products marketed under many different names and which can be produced from fresh cow milk, dairy-free dairy analouge's such as soymilk or 100% reconstituted milk. Each stage of yoghurt manufacture requires careful selection and control of raw materials, processing conditions, and equipment. APV's wide-ranging experience in this field ensures consistent high-quality products.

The focus on healthy products has increased significantly during the last 10-20 years, and yoghurt and other cultured milk products have long been known to have beneficial health properties. This has led to a rapid increase in the consumption of cultured milk products and to the development of a multitude of new products.

APV's in-depth knowledge and active involvement in the development of the world's yoghurt industry for more than 60 years, combined with proven experience in project management of major capital projects, makes us the ideal partner for the design and installation of state-of-the-art yoghurt processing equipment.

Yoghurt milk standardisation

Accurate blending, deaeration, homogenisation and pasteurisation prior to fermentation

Advantages

- Accurate blending of all raw materials
- Optimised use of all possible raw materials
- Easy batch control
- Can produce all kinds of blends for cultured products production
- Possibilities for reuse of reclaimed product/water mixes
- Very flexible and functional
- Efficient powder dispersion, good hydration, limited foaming in cold way
- Evaporation means no external contribution
- Process cell concept for traçability

Specifications	
Field of application	Yoghurt and other cultured milk products
Description	Pre-pasteurised milk with adequate fat content is standardised in dry matter either by concentration using an APV plate evaporator or by mixing with other ingredients (like concentrates, powder milk, sugar, cream) using the APV FlexMix, TPM or APV FlexMix Liquiverter. Alternatively yoghurt milk is recombined using water, milk powder, butter oil, sugar and/or other ingredients. The blend is then processed further using the APV Pasteuriser System. For more details on the APV Pasteuriser System refer to the next page
Capacity	Any
Temperature	Mixing at 5-20°C (41-68°F)

Yoghurt milk pasteurisation

Fully automatic, integrated and flexible continuous processing line - from yoghurt milk to fermentation tank

Advantages

- Flexibility to produce a wide range of fermented products
- Concept will secure hygiene with pressure continuous control
- Shorter incubation time with deaeration
- High heat recovery
- Direct culture injection as an option

Specifications	
Field of application	All yoghurt and fermented milk processing lines
Description	Standardised yoghurt milk is pasteurised through an APV Pasteuriser based on a plate heat exchanger system with a holding time of 6 minutes at pasteurisation temperature to manage texture of final product. The standard design includes dearation, homogenisation and flexibility for temperature outlet. Cold outlet at 5°C for set yoghurt and warm outlet at 42/45°C for stirred yoghurt
Capacity	500/20,000 l/h (132 - 5,500 U.S g/h)
Temperature	Pasteurising temperature: 95°C - 115°C (203 - 239°F)

Stirred/drinkable yoghurt production

Fermentation and coagulation in ultra clean incubation tanks: texture creation.

Advantages

- Accurate dosing systems for fruit, juices etc.
- Gentle mixing of product and fruit, juices etc. to protect flavour and nutritional content
- Fully automated lines and traceability
- Designed to preserve texture
- Optimisation of recipe cost
- Losses are reduced to a minimum
- Controlled acidification

Specifications	
Field of application	Yoghurt and fermeted milk
Description	Pasteurised yoghurt milk at a temperature of 42/45°C is forwarded to the ultra clean incubation tanks for fermentation with an appropriate starter culture. Acidification is stopped by cooling the product through an APV plate cooler. The product is then forwarded to an ultra clean storage tank at a temperature of 20/25°C prior to forwardint to the filling machine
Capacity	Any
Temperature	Fermentation temperatures normally between 42 and 45°C (102 - 115°F)

Set yoghurt production

Fermentation and coagulation in cups: texture creation

Specifications	
Field of application	Traditional yoghurt production
Description	Processed yoghurt milk is forwarded cold to a ultra clean buffer tank where starter culture is added. The milk is forwarded via a heater to the filling machine. The filled yoghurt is incubated in hot room until the pH has reached the required level, after which the set, coagulated yoghurt is cooled down. The product can be sweetened and/or flavoured before filling
Capacity	Any
Temperature	Fermentation temperatures normally between 42 and 45°C (102-115°F)

Advantages

- Ultra-clean dosing of starter cultures
- Accurate and adjustable filling temperatures
- Accurate dosing systems for juices, flavours etc.
- High sanitary (ultra-clean) total solution
- Fully automated lines incl. traceability
- No-waste double seat valves
- Ultra-clean buffer tank systems
- SAFE online PHE heating systems with heating media buffer incl. temperature control

Fresh cultured cheeses

Processing line with or without whey separation for production of various kinds of fresh cultured cheeses

Advantages

- Ultra-clean processing methods
- High yield through optimum utilisation of raw materials
- Low running costs
- All processes CIP cleanable
- Precision process control for higher product quality
- Can be combined with aerator features for production of fresh cultured cheese desserts
- UF has no whey separation, only permeate
- CHEASLY has no whey separation, cheese yield 100%

Specifications	
Field of application	Fresh cultured cheeses
Description	Fresh cultured cheeses can be produced either by centrifugal separation of whey, separation of permeate by ultrafiltration or by using the APV CHEASLY concept. The first two systems are based on pasteurised milk while the APV CHEASLY concept is based on batch mix preparation of milk protein concentrate and therefore does not involve whey or permeate separation.
Capacity	Any
Temperature	Pasteurisation and fermentation temperature pending the selected product

Starter culture production

Starter culture production plants for the dairy industry

Specifications	
Field of application	Fermentation processes in the dairy industry
Description	Manual to fully automatic plant for production of cultures
Capacity	Any
Temperature	Fermentation temperatures depend on the bacteria (yeast and moulds) used in the fermentation process. Cleaning and sterilisation temperatures according to individual process demands

Advantages

- Safety and high hygienic standards
- Systems for both liquid and dry raw materials
- All systems CIP cleanable and "sterilisable"
- Precision temperature control
- Possibilities for continuous pH control and adjustment
- Proper agitation
- Safe inoculation system
- Product-adaptable hygiene/sterility levels
- Sterile air overpressure
- Special dimensioning of culture tanks for quick in- tank cooling after fermentation

Fresh dairy desserts

There are a wide range of fresh dairy desserts on the market which are produced using APV Technologies.

Product capabilities include

Non-cooked desserts such as

- Flavoured jellified desserts, flans (hot filling, jellification in cup)
- Dessert creams (hot/cold filling), whipping creams
- Rice pudding, rice/semolina in milk
- Custards
- Sweet sauces
- Chocolate puddings
- Aerated products

And desserts cooked in ovens

- Baked cream, crème caramel, crème brûlée, crème catalane

The majority of dessert products are heavily thickened with starch or other hydrocolloid, sweetened, coloured and flavoured. They may also have some dairy content, dairy-free dairy analogues such as soymilk and/or vegetable oil and other ingredients.

For most main stream products, APV Technologies can easily be adapted. It is particularly important to select the correct processing equipment to suit individual ingredients. In some cases, a final whipping stage can be needed to produce a lighter, aerated product. This can for example be achieved using the new APV FlexMix PowerMixer.

APV has more than 60 years of experience in the supply of equipment for the manufacture of dessert products of various types for key players in many countries. The many reference installations demonstrate APV capabilities to provide complete installations. Equally, APV offer cost-effective improvements to selected unit operations in existing production lines. APV's in-depth knowledge and active involvement in the development of the world's fresh dairy dessert industry, combined with proven experience in project management of major capital projects, makes us the ideal partner for the design and installation of state-of-the-art fresh dairy dessert processing equipment.

Fresh dairy desserts

Production of fresh dairy desserts based on dairy products mixed with multiple ingredients

Specifications	
Field of application	Fresh dairy desserts
Description	Fresh dairy desserts can be divided into non-cooked desserts such as flavoured jellified desserts, flans, dessert creams, whipped desserts, rice pudding, rice/semolina in milk and desserts cooked in ovens such as baked cream, crème caramel, crème brûlée and crème catalane. Both processes are based on preparation of the mix using either the APV Flex-Mix or APV Flex-Mix Instant which involves rehydration and pasteurisation/sterilisation before further processing
Capacity	Any
Temperature	Mixing temperature: 10 - 70°C (50 - 158°F) Pasteurisation/sterilisation: 125/135°C (257/275°F) Filling temperatures: 10 - 70°C (50 - 158°F)

Advantages

Non cooked desserts

- Hot mixing for easy dissolving
- Indirect plate steriliser for texture preservation, products flexibility and investment cost
- Hot filling for bacteriological safety
- Rice in milk batch cooking and sterilisation for rice grain integrity preservation

Cooled desserts

- Cooking in oven will pasteurise the final product.

Recombined dairy products

Specialist recombination system for a wide variety of dairy applications

The growing demand for innovating new applications has increased consumer interest in a wide variety of dairy products based on recombination technology.

APV has extensive experience in the design of systems for recombined dairy products. The manufacture of these products has been known for many years and different processes and items of equipment have been developed.

In general, recombined milk products are used for a variety of end-products from low to high viscosities. The preparation of recombined dairy products can be broken down into raw material handling, weighing and mixing, filtration, deareation, homogenisation and pasteurisation. If these steps are carried out correctly, and the proper raw materials have been used, the further processing in the manufacture of each product follows the standard method when manufacturing the product from fresh milk.

APV's in-depth knowledge and active involvement in the development of the world's dairy industry, combined with proven experience in project management of major capital projects, makes APV the ideal partner for the design and installation of state-of-the-art recombined milk processing equipment. The world-class development facilities in our Test Center give our customers the opportunity to try different applications on our mixing equipment and additional processing solutions.

Mixing and blending is one of APV's core technologies and with the FlexMix™ Technology integrated with APV General Processing Technology and Automation Technologies we will be able to meet every aspect of customer requirements.

Ice cream processing plants

Cost-effective processing with superior flavour and mouth feel

Specifications	
Field of application	Ice cream manufacturing
Description	Manual to fully automatic plants for production of ice cream mix ready for final freezing and portioning of ice cream
Capacity	Any
Temperature	All temperature requirements can be met

Advantages

- Optimised mixing temperature for efficient post-pasteurisation
- Optimal use and recovery of energy
- Fully automatic handling of both dry and liquid raw materials for accurate composition of the final ice cream mix
- High bacteriological standard in the final ice cream mix
- Flavour protection and improvement in the ice cream mix
- Efficient aeration of ice cream mix before freezing to improve mouth feel and flavour as well as yield/overruns
- Fully automated lines with full traceability
- No-waste double seat valves

Production of ready-to-use/liquid baby food and infant formula

Uniform and safe, multi-ingredient products

Specifications	
Field of application	Baby food and infant formula
Description	Dustless, multi-ingredient mixing and dissolving process for uniform composition and without risk of contamination
Capacity	Any
Temperature	UHT temperature level to meet necessary kill rate (S9)

Advantages

- Use of instant infusion for heat treatment with effective protection of nutrients, vitamins and flavour
- Efficient mixing, dearation and homogenisation for consistent product uniformity
- Efficient deaeration to optimise subsequent heat treatment
- Ultra-hygienic and safe solutions
- Wide product flexibility on the same line
- Highly efficient, dust-free mixing
- Multi hygiene zone processes

Recombined dairy products

Complete process lines, tailor-made for individual requirements

Specifications	
Field of application	Milk, flavoured milk, yoghurt, yoghurt drinks, Laban, quarg, sweetened condensed milk, condensed milk, soft cheese, ice cream, desserts, baby food
Description	Complete processing lines from manual to automatic, incorporating an efficient mixing system
Capacity	Any
Temperature	Temperature depends on individual process requirements

Advantages

- Leading in recombination technology
- Complete solution with very attractive cost
- High production efficiency and an excellent product consistency
- Tailor-made solution
- Automatic solution with recipe mixing, full traceability, prepared for regulative compliance demand
- Solution of high sanitary standard for pasteurised, ESL or LL products
- High-quality end products

Sweetened condensed milk (SCM)

Complete process lines, customised to individual client needs

Specifications	
Field of application	Sweetened condensed milk (SCM), condensed milk, recombined SCM, recombined condensed milk, including coffee cream
Description	Complete processing line from manual to full automation including complete filling lines
Capacity	500 - 25,000 kg/h (1,000 - 50,000 lbs/h)

Advantages

- APV is a world leader in SCM technology
- Complete, highly cost-effective solution
- High production efficiency and excellent product consistency
- Product quality complying with international standards
- Uniform consistency for reliable functionality
- Production efficiency for highly competitive unit production cost
- A quality solution in all aspects - components, process, SCM/condensed milk expertise, engineering, automation, execution and service
- Strong reference list
- Automatic solution with recipe mixing, full traceability, prepared for regulative compliance demands

Milk shakes and other milk drinks

Complete production lines for powder mixing and hydration, and heat treatment

Specifications	
Field of application	Milk shakes, milk drinks
Description	Mixing of milk powders, cocao powders, emulsifiers and stabilisers with milk or water to a liquid base
Capacity	Any
Temperature	Temperature range at each processing step, dependent on powder dissolving and hydration requirements, and final product shelf life

Advantages

- Precision powder handling and dosing
- Dust-free powder mixing and dissolving
- Optimum end-product flavour and functionality
- Fully automatic systems for consistent composition
- Precision temperature control of hydration and processing
- Full traceability options from powders to final packed product

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

10000-03-07-2008-GB