



# Safeguarding quality

Milk cooling solutions  
for VMS



Your solution – every day



## DeLaval VMS and its milk cooling solutions

Choose a milk cooling solution that suits your VMS farm and preserves milk quality around the clock.

Automatic milking has brought a new set of challenges for cooling, since it delivers milk to the tank at irregular intervals and flow levels. On top of that, consider what happens when the main storage tank is being emptied and then requires cleaning, while milking stations continue to milk cows on demand.

DeLaval has developed six cooling solutions for the very specific nature of VMS milking.

### 1. DeLaval cooling tank DX range

A superior range of cooling tanks for VMS farms from small to large-scale automatic facilities. The DX range is designed to minimise energy consumption, while providing fast and cost-effective cooling. Gentle agitation from the DeLaval specially designed blade helps retain milk quality.

### 2. DeLaval flow controlled cooling FCC

This unique cooling solution for DeLaval VMS is based on our patented concept of flow controlled cooling. DeLaval VMS notifies the cooling tank of the volume of milk delivered to it, on a real-time basis. The tank then adjusts its cooling capacity to suit that milk volume.

### 3. DeLaval buffer vessel BWV

A buffer solution is designed to accept milk from your VMS while your cooling tank is being emptied and cleaned. It enables your VMS to run 24/7, meaning your cows won't be waiting an hour or more while the VMS is idle. The idea is simple; the new design is cost-effective and clever.

### 4. DeLaval buffer controlled cooling BCC

This solution is available with different buffer tank sizes and cooling approaches. These systems are designed to work non-stop as standalone solutions for your VMS or any automatic milking system.

### 5. DeLaval pre-cooling and heat recovery

Pre-cooling milk through a plate heat exchanger with available water sources is a sustainable method of saving significant amounts of electrical power in cooling milk to storage temperature. Additionally, it provides warm water for other uses.

### 6. DeLaval open tank DXO 200 for diverted milk

If you are choosing a cooler for colostrum milk from the divert milk unit on the VMS, just add our open tank DXO 200. This all-in-one cooling system has its condensing unit right underneath the tank. The diverted milk can simply be collected in the DXO 200 and cooled until it is needed for new calves.



## DeLaval cooling tanks and flow controlled cooling FCC

### Choose a size to suit your farm

DeLaval offers the widest range of closed tanks on the market:

- DXCR from 1100 to 6000 litres: cylindrical shape for smaller dairy farms
- DXCE from 1150 to 12000 litres: oval shape for small and medium sized farms
- DXCEM from 14000 to 32000 litres: hyper-elliptic shape for large dairy farms
- DXVV from 14000 to 23000 litres: vertical tank positioned outside to save space

All DeLaval milk cooling tanks are insulated with high density, environmentally-friendly foam which protects against energy loss from the inside. The heart of the tank – the evaporator – enables fast heat exchange and the shortest possible milk cooling times. All to save your money and to protect the environment.

### New vertical closed cooling tank

DeLaval DXVV is specially designed for the VMS way of milking: accepting small but regular amounts of milk. The bottom agitator helps cool small quantities faster, even just 50 litres. In addition, a vertical tank saves space and construction costs when planning a new facility; yet still gives the convenience of milk room access to all components.

### It's all about communication

DeLaval flow controlled cooling FCC is a unique cooling solution for DeLaval VMS based on our patented concept of milk flow controlled cooling. It avoids problems common to systems not adapted to the realities of automatic milking, such as milk freezing, high plate counts and water residues.

DeLaval FCC links DeLaval VMS stations to the cooling tank via one of our cleaning and control units. They exchange all relevant data and alarms through the cleaning and control unit. The cooling energy used by DeLaval FCC is based solely on the amount of milk being extracted by the DeLaval VMS and pumped over to the milk tank. Everything is communicated to the farmer via the DeLaval VMS display and optional external warning devices.

### Advantages of DeLaval FCC

- Controlled safety – through fully integrated interval cooling, with alarm reporting via the VMS station
- Saves time and effort – automated valves route milk and cleaning water without need for hands-on attention
- Milk quality ensured – milk temperature is reduced greatly without risk of freezing long before the milk level in the tank enables good agitation
- Savings potential – our price-attractive FCC logic reduces compressor running times to the very minimum to save resources

## DeLaval buffer solutions

### Enabling 24/7 operation

On VMS farms, long pauses while the tank is being emptied and cleaned cause production drops due to less time for milking and disturbance in cow traffic. Sometimes, if collection is scheduled in fixed hours, cows are reluctant to visit the milking station even on the days where there is no collection. DeLaval has a range of solutions to match the quantity and level of sophistication needed.

### DeLaval buffer controlled cooling BCC

DeLaval BCC systems collect milk from VMS and then send it batch cooled into the storage or cooling tank. This all happens smoothly within minutes after milking, using a plate cooler and a two-speed pump with flow regulation valve.

The BCC units are available for one to eight VMS or automatic milking system stations and work well with water chillers in various sizes. Only cold milk is delivered to the main tank, so the milk is handled gently with minimal agitation. The risk of milk freezing or incubating bacteria is virtually non-existent.

All cleaning functions are automatic and coordinated with the cleaning of the milking system. At milk collection time, nothing needs to be moved or cleaned manually. The system switches and routes milk and cleaning water by itself.

### Advantages of DeLaval BCC

- Safe, secure working system – with integrated alarm reporting via DeLaval VMS
- Saves time and effort – automated valves route milk and cleaning water without need for hands-on attention
- Full VMS milking capacity – no down time during tank emptying and cleaning
- Milk quality ensured – by quick cooling instantly after extraction and no risk of freezing milk

- Savings potential – pre-cooling reduces cooling costs and saves resources
- Versatility – Extends the milk transport distance enabling more flexible farm layouts

### DeLaval BCC with pre-cooling only

DeLaval BCC can also be set up as a pre-cooling device only. This means that you use just the plate cooler, with cold tap or well water. The milk will come out of the plate cooler some three to four degrees above the water temperature and can be further cooled in the bulk milk tank, via FCC. Where this is legally acceptable, it offers a cost effective VMS buffer cooling solution, since it saves the cost of a chiller.

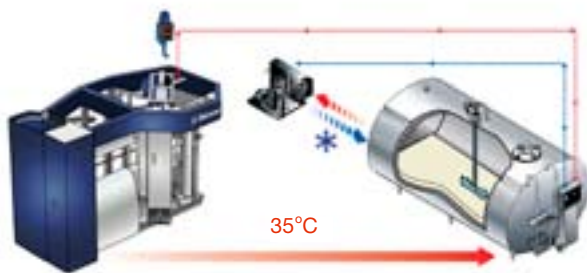
### New buffering solution (BVV) for VMS farms

DeLaval buffer vessel BVV is a cost-effective buffering solution that enables your VMS to run 24/7. Robust and simple, it has all the standard features of a typical buffer unit, but comes as a compact, easy to install unit. It provides everything a small or medium size VMS farm needs in one 600 litre unit.



DeLaval buffer vessel BVV

## Cooling and buffering options for your DeLaval VMS



### 1. DeLaval flow controlled cooling FCC

Direct delivery of milk to the tank. The refrigeration is adjusted to the quantity of milk delivered by VMS. A cost efficient solution without compromising milk quality.



### 2. DeLaval instant milk cooling BCC

Milk is collected and cooled down before it enters the bulk tank. Continue milking during emptying and cleaning of the bulk tank without loss of capacity. The perfect solution for quality milk and peace of mind.



### 3. DeLaval buffer vessel BVV

Milk is automatically diverted from the VMS to the BVV when the storage tank is emptied and cleaned. When available again, BVV delivers its milk to the tank and the VMS initiates cleaning of the BVV.

## Efficient use of energy

Cool your milk while cutting energy consumption and getting warm water that's virtually free.

### Pre-cooling in VMS applications

Pre-cooling via a Plate Heat Exchanger in the VMS delivery line has many sustainable advantages for your farm. Firstly, you save energy and time in cooling, because the PHE rapidly cools milk with available water supplies. That water, which carries the warmth of the fresh milk, can then be used for other purposes. For example, drinking water for your herd, where studies have shown the possibility for better milk yields when cows drink lukewarm water (17°C).

Electrical energy savings are related to temperature reduction. Typically a reduction of milk temperature by 10°C reduces cooling loads by 32%. Energy savings will be slightly less as cooling systems are typically less efficient in lower evaporating temperatures, nevertheless savings of more than 50% are achievable if available water temperature is less than 12°C.

Two units (with stainless steel or aluminium frame) are specifically prepared for easy VMS milk transport line integration. VMS controls flow of cooling through pre-cooler water to maximize cooling effect.

### DeLaval heat recovery system HRS

This system generates warm water between 50°C and 55°C as soon as the milk cooling process begins and this temperature is efficiently maintained in a well-insulated storage tank.

You can put this water to good use in the DeLaval VMS – it requires warm water for teat cleaning and hot water for its main system cleanings. With the appropriate DeLaval heat recovery system, you could save up to two-thirds of the energy required for hot water.

DeLaval heat recovery system includes:

- Plate heat exchanger set for condensing unit
- Water storage tank
- Low energy consumption circulation pump
- Automation to control the system



DeLaval heat recovery system HRS supports DeLaval's commitment to Sustainable Dairy Farming: solutions that meet environmental challenges, respect animal welfare and benefit customers and society.

