TI0415

Milking Clusters
From Dairy Spares Limited

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Alfa Type Milking Clusters

MC 13A/B/C

- Single (4 x 1) or Twin (2 x 2) Pulse
- Medium (20mm) or Large (23.5mm) Bore Liners
- Milk Inlet 12mm, Outlet 16mm or 17mm
- Rubber Air Tube 228mm
- ACR Optional
- Total Capacity 150ml/250ml/330ml
- Claw Weight 780g
- Cluster Weight 2.95kg or 2.25kg

Orbiter Milking Cluster

MC 130A

- Twin (2 x2) Pulse
- Original Large (24mm) Bore Liners
- Milk Inlet 13.5mm, Outlet 16mm
- Original Reinforced Blue Air Tubes 230mm
- ACR Optional
- Total Capacity 340ml
- Claw Weight 650g
- Cluster Weight 2.82kg or 2.14kg

Dairy Spares Milking Cluster

MC 357B

- Twin (2 x2) Pulse
- Medium (20mm) or Large (23.5mm) Bore Liners
- Milk Inlet 12mm, Outlet 16mm
- Rubber Air Tube 228mm
- ACR Optional
- Total Capacity 350ml
- Claw Weight 425g
- Cluster Weight 2.6kg

New Type Harmony Milking Cluster

MC 87A

- Twin (2 x 2) Pulse
- Medium (20mm) Bore Liners
- Milk Inlet 13.5mm, Outlet 16mm
- Rubber Air Tube 228mm
- ACR Optional
- Total Capacity 350ml
- Claw Weight 420g
- Cluster Weight 2.02kg

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Cluster Assembly	Claw Type	Capacity	Liners Type	Orifice	Shell Type	Total Weight
MC13A	MC08 Alfa Type Claw	150ml	ML08I Alfa Large Bore Type liners	23.5mm	TE24 Lightweight Alfa Type	2.25kg
MC13B	MC14 Alfa Type Claw	250ml	ML08I Alfa Large Bore Type liners	23.5mm	TE24 Lightweight Alfa Type	2.25kg
MC13C	MC17 Alfa Type Claw	330ml	ML08I Alfa Large Bore Type liners	23.5mm	TE24 Lightweight Alfa Type	2.25kg
MC19A	MC08 Alfa Type Claw	150ml	ML09 Alfa Medium Bore Type liners	20mm	TE24 Lightweight Alfa Type	2.25kg
MC19B	MC14 Alfa Type Claw	250ml	ML09 Alfa Medium Bore Type liners	20mm	TE24 Lightweight Alfa Type	2.25kg
MC19C	MC17 Alfa Type Claw	330ml	ML09 Alfa Medium Bore Type liners	20mm	TE24 Lightweight Alfa Type	2.25kg
MC130A	MC128A Orbiter Claw	340ml	ML08I Alfa Large Bore Type liners	23.5mm	TE24 Lightweight Alfa Type	2.15kg
MC130E	MC128A Orbiter Claw	340ml	ML09 Alfa Medium Bore Type liners	20mm	TE24 Lightweight Alfa Type	2.15kg
MC357A	MC357 Dairy Spares Claw	350ml	ML09 Alfa Large Bore Type liners	23.5mm	TE24 Lightweight Alfa Type	2.05kg
MC357B	MC357 Dairy Spares Claw	350ml	ML08I Alfa Medium Bore Type liners	20mm	TE24 Lightweight Alfa Type	2.05kg
MC87A	MC187 Alfa Harmony New Type	350ml	ML13 Alfa Harmony Type liners	20mm	TE26 Alfa Harmony Type	2.02kg

The Milking Cluster

The first cluster came into being in 1890 and was no more than a short manifold of pipes that joined the 4 linerless teat cups together. Time and cows stood still for no man and not more than 25 years ago the stainless steel cluster with its rubber claw bung provided the user with a grand claw capacity of 50 to 120ml. To keep up with the modern milking cow, that has been bred in part for its much greater milk yields, the modern claws today now provides a capacity of 250 to 350ml to cope with the much increased flow rates whilst still providing a stable milking vacuum at the teat end.

Even though capacity and overall size has increased, modern materials and production techniques have allowed engineers to keep the ergonomics within manageable bounds. The size and weight of cluster may vary, depending on the range of liners and teat cup shells utilised with any particular claw piece. What advantages does the modern cluster designs offer the end user?

The increased capacity of the claw, allows for greater milk flow rates and reduces milking times. Should the claw bowl have been allowed to flood, it would not only reduce the available vacuum to the teat cups and ncreasing the risk of liner slip, but it would slow down milking. Greater capacity helps prevent cross contamination where milk bounces within the claw from one liner to another increasing the spread of infection.

Improved vacuum stability within the claw and at the teat ends is another advantage. This is achieved by combining increased space within the claw with a smooth internal surface to create minimum turbulence, ensuring the liners open and close efficiently, maximising performance, reducing milking times and stress on the cow. The internal shape and hydrodynamics of the claw have also improved washing by reducing angles and joints that are difficult to clean.

The size of milk entry and exit nipples have increased, or as in the case of the Harmony cluster the entry nipples have been removed with the liners being inserted directly into the claw through 4 holes. Many milk entry nipples even though they have increased in size still have the chamfered end to allow the teat cups to close off the vacuum immediately before application. Others that have squared off nipples or no nipples at all have a reduced thickness area built into the milk tube portion to allow the liner to fold over and close off.

The size of the exit nipple has increased to match the larger bore milk tube, but much greater attention has been paid to its position and angle. The harmony claw is a top unloader, where milk is lifted from the bottom of the claw bowl through a central tube. This allows the milk exit nipple to be at the top of the claw next to the pulse nipples permitting easier cluster alignment. Other designs such as the Dairy Spares claw has a central exit nipple where the claw bowl base is conical towards the exit nipple allowing the milk to leave the claw with maximum efficiency.

The majority of claws have an auto shut off device as part of their construction, as shown below. These usually take the form of an internal bung connected via a shaft to a rubber locking washer outside the claw. There are three valuable reasons for the shut off, to manually shut off the vacuum to the claw, in the event of the cluster being kicked off it helps prevent loss of vacuum and contamination from external dirt being sucked in. The shut off works by the vacuum within the claw passing down the sides of the shut off shaft and holding the locking washer to the outside of the bowl with the shut of bung in the open position. With the drop in vacuum and the sudden airflow caused when the cluster is kicked off, the locking ring no longer seals to the claw and the bung drops back into place closing the vacuum off to the claw. The locking ring can be locked open for plant washing when the internal vacuum level may vary more dramatically.

The diagrams below also illustrate the central air admission plug which is sometimes fitted in place if a fixed air bleed (approx 1 mm). The air bleed admits a controlled volume of air to create pressure differentials within the claw and cause the milk to move away from the claw toward the milk line. It is usually coupled with the automatic cluster remover cord, which as the cluster is pulled off the cow lifts the admission plug to admit a greater volume of air, dissipating any residual vacuum within the claw and reducing the possibility of any machine stripping.