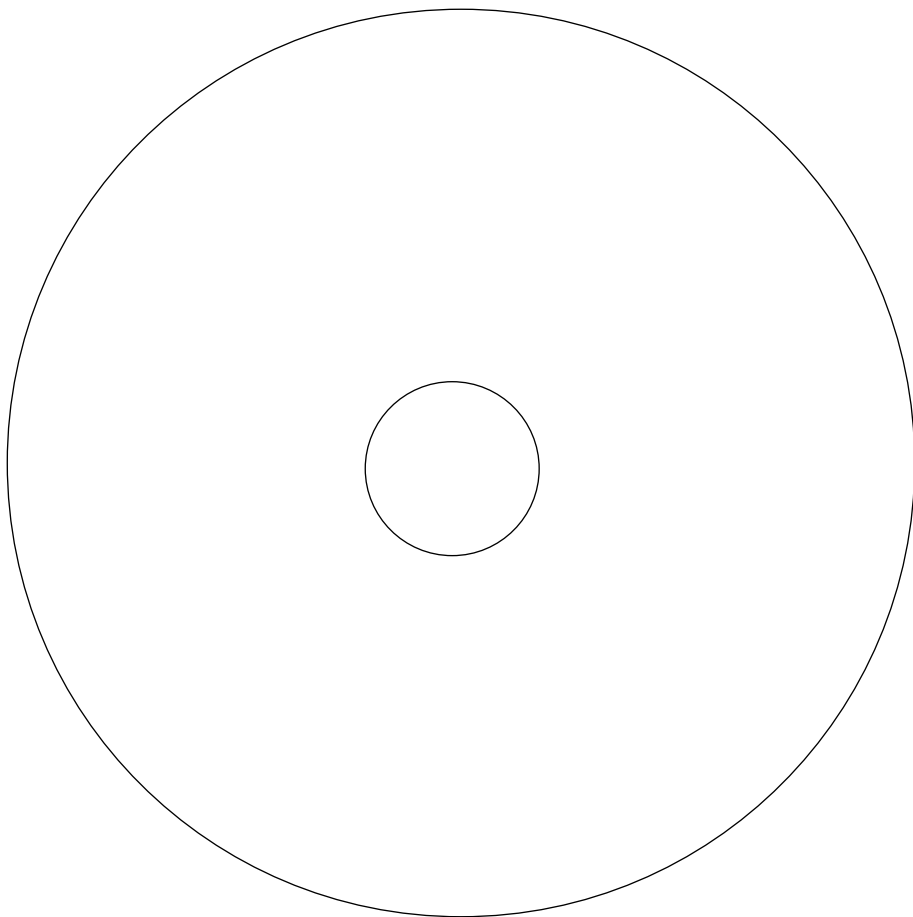
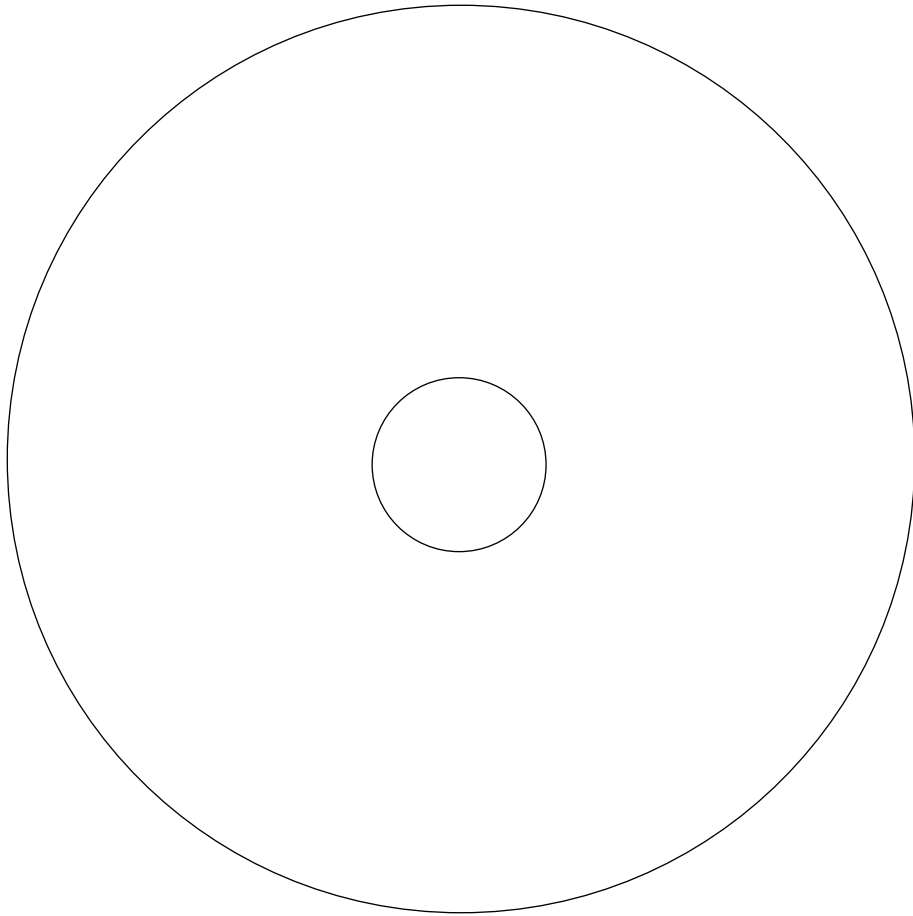


Rotary milking planning guide

DeLaval Parallel Rotary PR1500 and PR2100





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Welcome to the DeLaval Parallel Rotary PR1500 & PR2100 planning guide

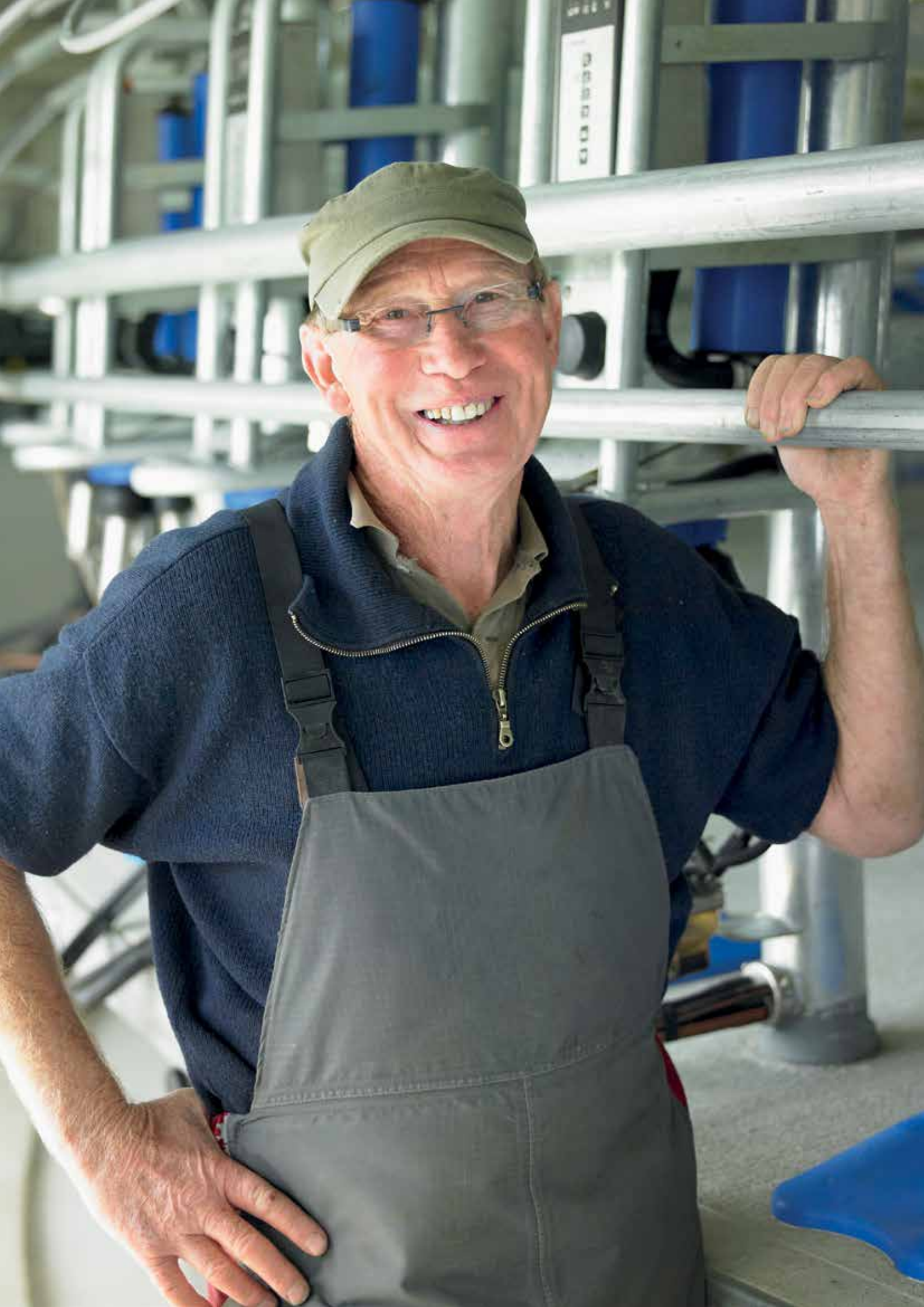
This planning guide is intended to be a reference point for the dairy farmer who is planning to build a new, or upgrade an existing, rotary dairy. The information, ideas and technologies contained in this planning guide come from DeLaval experience in building well over 3,000 rotary milking systems worldwide.

Building a rotary dairy is a large investment in both time and resources. Spending time using quality information in the planning stages will help to ensure that you make the right decisions for achieving an end result that should meet your needs well into the future.

Whether you are milking 200 or 2,000 cows, DeLaval Parallel Rotary PR1500 & PR2100 provide optimal milking efficiency, enabling you to have better control of your dairy farming business.

If you require further information when planning your new rotary dairy, please contact your local DeLaval representative.





Why milk with a rotary?

In a rotary dairy the cow walks onto a rotating platform. Platform rotation moves the cow to the operator position. The operator can then perform the necessary tasks to milk the cows properly. After milking, the cow exits the milking parlour. Cows are constantly entering and exiting the rotary dairy. This continuous flow is the main contributor to the high parlour throughput.

Rotary milking system benefits

Rotary dairy milking is a proven concept. Rotary parlours are the most labour efficient milking parlours for dairies requiring a high cow throughput per hour. Cows are very calm, have their own space and seem to enjoy the ride. It is very important to note that the milking routine is the same for every cow, every day.

Rotary dairy operators are positioned in one location for the task being performed and this is like an assembly line. The operators will only leave their station to attend to a cow or machine with a problem.

The rotary dairy's continuous cow flow makes it possible for the operator to work without any interruptions. This is because the operator does not assist the cow flow and can totally concentrate on essential milking tasks. Rotary dairies provide safe and consistent working conditions for the operator, as well as quality milking and the efficiency of continuous motion. Platform entry, pre-milking work routine, milking unit attachment and cow exit are always constant in a well functioning rotary dairy.

DeLaval Parallel Rotary PR1500 & PR2100 offer the following features and benefits:

- Cows have a very short walking distance into the stall
- Cows are brought to the operator. The operator does not waste time walking from cow to cow.
- Operating the platform continuously at a constant speed controls the pace of the operators
- Each cow is provided with equal time for milk out
- Group size is not important. There is no problem with extra cows or short loads.
- Each cow has her own stall. This stall looks the same at every milking.
- The cow is not affected by movements or disturbances caused by the cow in an adjacent stall
- New cows learn the routine easily. They simply follow the previous cow onto the platform.
- Rotary parlours fit very well into dairy layouts. Cow traffic management is very easy with single entry and exit lanes. The single exit lane makes cow drafting to a treatment area very easy.

Planning

Building a new dairy is somewhat like building a new house. Some people swear they will never do it again, others get exactly what they want and more are reasonably pleased but would do it better the second time around.

Project planning

Where you fit into this picture is probably a reflection of knowing what you want and having a well planned and managed project. Sounds easy? We probably all believe we can plan and manage well, but problems will occur when planning a new dairy.

First, it is not an easy task to know what you want or need. You will start out with a reasonably clear picture in your mind, but almost everybody you speak to will have a different view. There are a range of options to consider from yard design, colours, cladding, number of bails, drafting gate system, automation, computerised herd management tools, milking clusters and type of electrical switches to location of refrigeration units and voltage control methods. The list goes on. Making all the decisions might sound like a daunting task, but it can be enjoyable and very rewarding.

Remember that it is likely somebody will be milking in your new dairy for the next 20 years (12,000 milkings or 24,000 hours), so the success or failure of your planning will be a constant reminder! One of the secrets for enjoying the challenge and doing it well is to start early. This gives you the chance to look at the options, consider the arguments and make the decisions that best suit you. Knowing what you want and why makes it much easier for contractors to deliver to your expectations. They know what to do, to what standard and for how much.

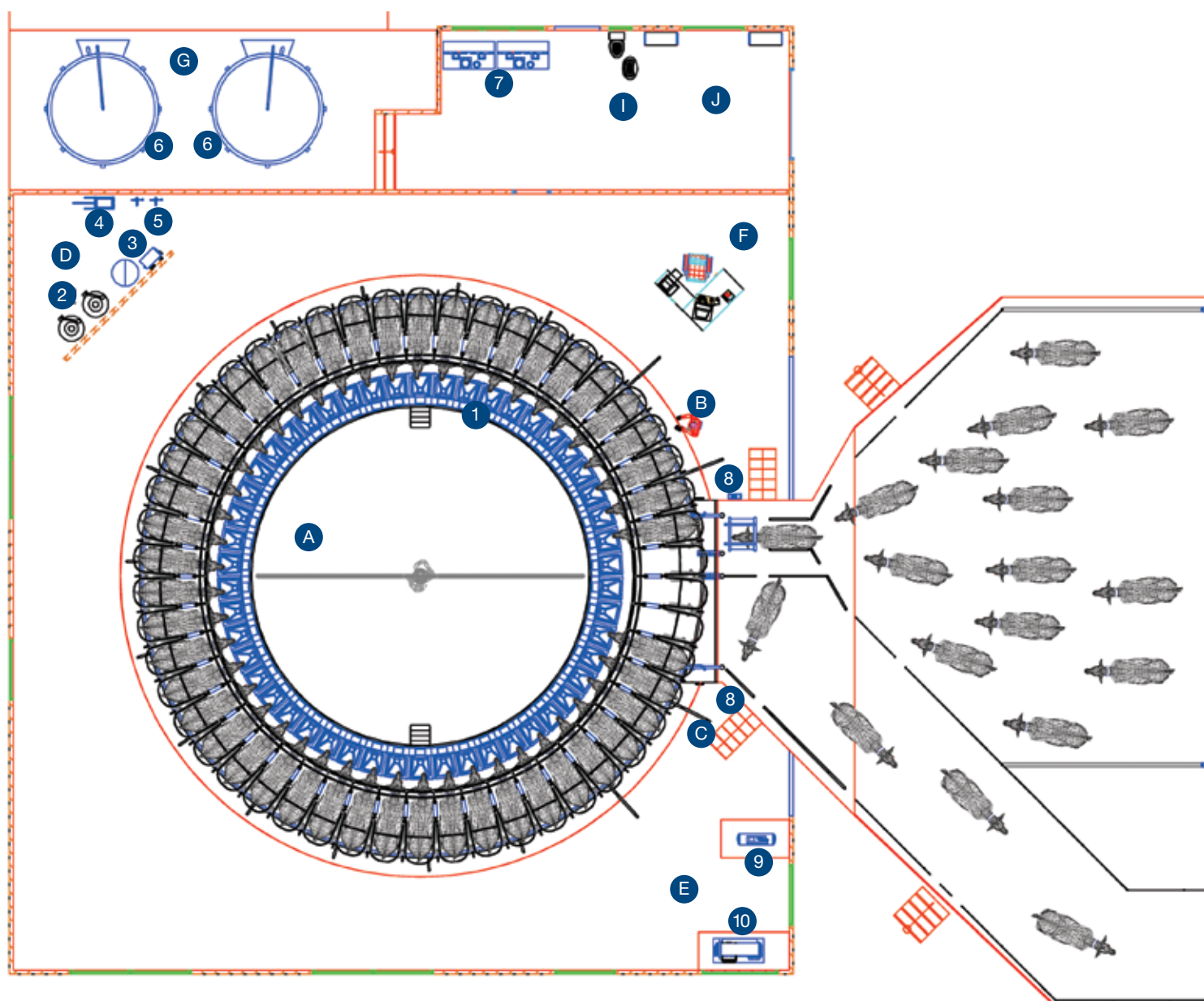
This sounds like common sense but in many cases it doesn't happen. To help ensure it works for you, the project's main planning points are listed here with some guideline times.

Planning	22 weeks
Discussion and preparation of preliminary plans	4 weeks
Collect price estimates	2 weeks
Preliminary budget/loan approval	3 weeks
Preparation of final plans and specifications	6 weeks
Collect and finalise quotations	4 weeks
Finalise finance and construction approvals	3 weeks
Construction	16 weeks
Site preparation	
Building and yard construction	
Platform construction	
Milking equipment installation	
Electrical installation	
Water pumps and reticulation	
Painting	
Commissioning and training	1 week
Total Time	39 weeks

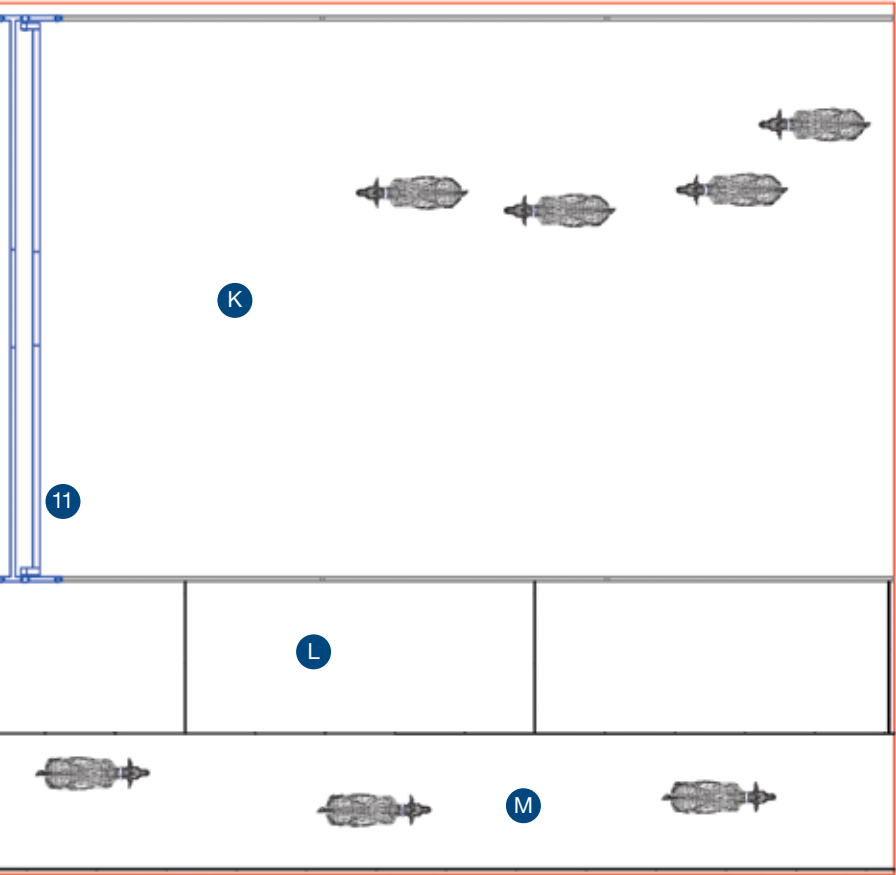
The above times are indicative and are based on our vast experience of managing successful projects. These times do not include alterations/construction of races, tanker roads and other additional services.



Sample rotary plan



Legend	
A. MILKING AREA	1. 50 BAILS EXTERNAL PARALLEL ROTARY WITH FEEDING
B. CUPS ON	2. WATER HEATERS
C. CUPS OFF	3. CLEANING UNIT
D. WASHING	4. PLATE HEAT EXCHANGER
E. MACHINE ROOM	5. FILTERS
F. OFFICE	6. MILK SILOS
G. SILO PAD	7. CONDENSING UNITS
H. TANKER PAD	8. WATER HOSE
I. TOILET	9. AIR COMPRESSOR
J. STORAGE	10. VACUUM PUMP
K. HOLDING AREA	11. CROWD GATE
L. SEPARATION PENS	
M. EXIT RACE	



Key points to consider

When planning your rotary system, the most important thing to consider is where you want to be in the future. You need to visualise how you want to run your dairy and what size your operation will be. You can start planning when you have a good understanding of your future requirements.

Primary considerations

How long do you plan to operate your dairy each day? The answer to this question will depend on:

- How many cows do you plan to milk (including expansion plans)?
- How many times will you milk your cows each day?
- What is the average milking time of your herd or specific groups of cows?
- What working routine do you require?
- How many operators do you plan to use in your dairy?

When you have the preliminary answers to these questions, you can calculate what size dairy you need.

Budget considerations

When you know what dairy size is required to meet your needs, you can start costing your project. How much will the dairy cost? Are you upgrading an existing facility and how much of that facility can be re-used?

Labour considerations

Another important factor to consider when building your new dairy is labour. Labour is an ongoing expense. In many cases automatic cluster removers or a complete herd management system will support you in reducing additional labour demands. In the table we describe the labour requirement differences between batch parlours (herringbones and parallels, with lowline and midline milking) and rotary parlours.

Site planning

Cow flow is critical to performance and throughput, so the site layout must support free flowing cow traffic. Compromises are often made in this area, without a clear understanding of the impact on parlour performance. Such compromises would not have been made if the impact was fully understood during the planning stage.

Operator and cow environment

This is a very important subject. A good working environment will improve cow and operator performance. Consider what can make it more comfortable for the cows and operator.

Number of clusters	Number of milkers	
	Batch parlours*	Rotary
24 – 32	2	2
34 – 48	3	2
50 – 60	4	2
70 – 80	6	3

Note: This table is based on automatic cluster removers being installed. This table is indicative only, as variations will occur based on different milking routines and the milk out times of the cows.

* Herringbones and parallels, with lowline and midline milking.



Sizing the rotary system

When designing a rotary dairy, the number of stalls should be chosen to match the expected working routine time required for complete milk out of the cows.

Basic working routines

The working routines in a rotary dairy consist of mainly essential milking tasks. The working routine for the entry operator(s) consists of udder preparation and cluster attachment. The exit operator's working routine consists of removing the cluster manually if no automatic cluster remover system is used, plus checking the udder and either teat dipping or teat spraying it. When cow traffic is well planned, cow entry and exit requires no assistance from the milking operators.

Balanced work routines

To achieve high throughputs the milking work routine elements should be balanced for the entry and exit operators. The time each operator spends with each cow should be similar. Without a balanced routine either the entry or exit milker will be idle for a period of time between each cow.

Rotary platform sizing

The correct sizing of a rotary will result in:

- Reaching the expected throughput (cows per hour)
- Matching the expected work routine time with the expected milking time
- Using minimal labour
- Not over capitalising your investment
- Not stressing the operators and cows

You can approach the sizing of a rotary from different points of view, depending on your objectives. The result of the "optimum number of stalls" calculations will always be the same, but the way you achieve this result can be different.

The platform should be sized so that the number of stalls matches the expected work routine and the expected milk out time of the herd. With more than one operator, it is the working routine time of the slowest operator that will influence the platform size and the rotation speed.





Optimum number of stalls

Generally rotary dairies are planned with a minimum stall time of 10 seconds, even for the most agile herds. Higher producing herds may require a minimum stall time of 15 – 20 seconds.

There are a number of non-milking stalls (NMS) on a rotary platform at any one time. These are the stalls passing the entry, exit and operator positions that are unavailable to milk cows. Normally there are five NMS.

Using the principal outlined here, the optimum number of stalls (N) in a rotary can be calculated as follows:

$$N = \frac{AMT \times 150\%}{WRT} + NMS$$

The steady state throughput (SST) or actual milking routine in the parlour per hour can be calculated as follows:

$$SST = \frac{3,600}{WRT}$$

The rotation time (RT) in minutes can be calculated as follows:

$$RT = \frac{N \times WRT}{60}$$

WRT = Working routine time
AMT = Average milking time
N = Number of stalls
NMS = Non-milking stalls
SST = Steady state throughput

The ideal size of rotary dairies with one entry operator

WRT (sec)	Average milk out time per cow (min)												Steady state throughput (cows per hour)	Number of cows				
		5.0		6.0		7.0		8.0		9.0		10.0		100	250	500	750	1,000
	Milk out time required for slowest cow (min)													Steady state milking session Time (hr)				
		7.5		9.0		10.5		12.0		13.5		15.0						
	Ideal number of stalls and rotation time (min)																	
7	80	9.3											514	0.2	0.5	1.0	1.5	1.9
8	70	9.3	80	10.7									450	0.2	0.6	1.1	1.7	2.2
9	60	9.0	70	10.5	80	12.0							400	0.3	0.6	1.3	1.9	2.5
10	50	8.3	60	10.0	70	11.7	80	13.3					360	0.3	0.7	1.4	2.1	2.8
13	40	8.7	50	10.8	60	13.0	60	13.0	70	15.2	80	17.3	277	0.4	0.9	1.8	2.7	3.6
15	36	9.0	40	10.0	50	12.5	60	15.0	60	15.0	70	17.5	240	0.4	1.0	2.1	3.1	4.2
20	28	9.3	32	10.7	38	12.7	50	16.7	50	16.7	50	16.7	180	0.6	1.4	2.8	4.2	5.6
25	24	10.0	28	11.7	30	12.5	34	14.2	38	15.8	50	20.8	144	0.7	1.7	3.5	5.2	6.9
30	20	10.0	24	12.0	26	13.0	30	15.0	32	16.0	36	18.0	120	0.8	2.1	4.2	6.3	8.3
35	18	10.5	20	11.7	24	14.0	26	15.2	28	16.3	32	18.7	103	1.0	2.4	4.9	7.3	9.7
40	16	10.8	20	13.3	22	14.7	24	16.0	26	17.3	28	18.7	90	1.1	2.8	5.6	8.3	11.1
50			16	13.3	18	15.0	20	16.7	22	18.3	24	20.0	72	1.4	3.5	6.9	10.4	
60					16	16.0	18	18.0	20	20.0	20	20.0	60	1.7	4.2	8.3		

Notes:

- WRT for the slowest operator.
- Longer WRT may be needed for less agile herds at entry and exit.
- Five NMS used for one entry operator.
- Throughputs and milking session times are approximate. They assume a steady state, no stoppages and slow cow milking times no more than fifty percent above average milking time.
- SST milking time excludes shutdown rotation, set-up and cleaning time.
- Where the calculated number of stalls falls between two available sizes, the next largest size has been chosen. This may give a slight over capacity, but it ensures the required WRT and milk out times can be met.

Milking time

The average milking time of your herd will vary depending on the breed, time of year, feeding regime and so on. It is important to know the milking time for each individual cow. In the tables provided in this planning guide, a correction factor of 1.5 has been included to account for slow milking cows.

In other words, if we select an average milking time of six minutes, the calculation will assume that the slowest cows do not exceed a milking time of nine minutes ($6 \times 1.5 = 9$). If there are an excessive number of slow milking cows in the herd or group, a higher milking time may need to be selected.

It is very important to understand the effect of a slow milking cow. A cow with a milking time of 13 minutes could slow the entire milking down. To minimise this disruption the slow cow should be sent on a second rotation.

The solution to the problem is calculating an accurate average milking time and grouping the herd so that cows with long milking times are milked separately from the faster milking herd.

Number of operators (staff cost)

In general terms an efficient way to increase throughput is to reduce the working routine. A quick cross-reference to the calculation table will show that if the working routine is cut in half, the throughput will double.

While the theory is correct, it is very often not the case in practice. For the theory to hold true, the working routine

must be balanced between the operators. The duties performed by the operators sharing various attachment duties will seldom balance exactly and the time taken by the operator with the longest work routine must be used in the calculation.

Adding extra milkers significantly improves parlour throughput if the rotation time is reduced.

Milking routine and its impact

As previously discussed, a reduction or increase in working routine time has a direct effect on rotary parlour throughputs. In some extreme cases a critical working routine time – perhaps with either pre- or post-milking teat dipping or spraying – can mean the selected rotary dairy size is outside the DeLaval Parallel Rotary PR1500 & PR2100 range.

In some cases the routine may exclude the selection of a rotary dairy, regardless of size. If this is the case and high throughputs are required, look seriously at the selected work routine.

The critical factor here is that the working routine for each operator needs to be as closely balanced as possible. So no matter if you are considering two entry milkers and one exit milker or any other combination, the work routine for the shared milking work needs to be balanced as closely as possible.

Factors to consider for achieving high throughputs

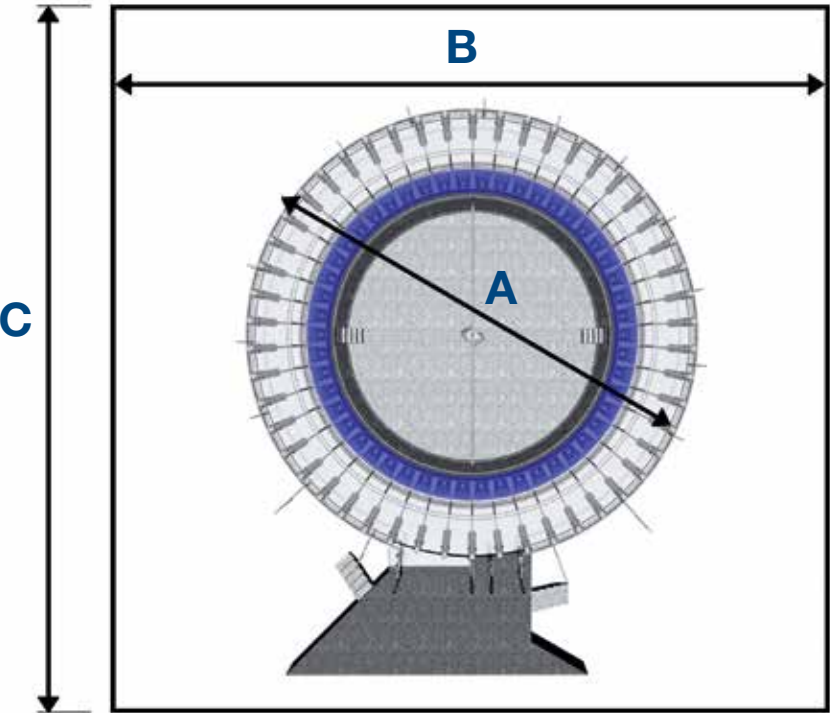
- **Adjusting rotation time** – The speed of the platform must be adjusted to suit the milk out time of the different cow groups, the herd and seasonal variations.
- **Grouping** – For better management of feeding and cow breeding, cows can be grouped according to daily production or stage in lactation. We can group large herds based on milk out time and time increases in throughput.
- **Double rotations** – It is possible to prevent slower milking cows from leaving the platform before they have finished milking. This is achieved by using a manual or automatic cow retention device to ensure these cows stay on the platform for a second rotation and complete their milk out.
- **Avoid interruptions in the rotation** – It is necessary to match the rotation time to the operator's capacity.
- **Time savings in clean-up and set-up** – One of the many advantages of a rotary is that after the last cluster is attached to the last cow, the entry operator(s) are free to begin clean up tasks. This only leaves cleaning of the milking machine and part of the dairy after the last cow finishes milking. Similarly, in a rotary with an exit operator, during the first rotation this operator can be completing some of the set-up tasks.

Planning for operator safety

All DeLaval Parallel Rotary PR1500 & PR2100 platforms are supplied with a complete safety package. This package optimises the safety of both the operator and the cow. Included in this package are non-latching type reverse buttons, where the operator must keep his or her finger on the button when reversing the platform. Safety switches and full hazard warning signs are also included as standard.



DeLaval Parallel Rotary PR1500 & PR2100 platform dimensions



	A		B		C	
Number of stalls	Platform diameter (m)		Building width (m)		Building length (m)	
	680 stall width	730 stall width	680 stall width	730 stall width	680 stall width	730 stall width
30	8.6	9.1	10.8	11.3	11.2	11.7
34	9.7	10.2	11.9	12.4	12.3	12.8
40	11.3	12.0	13.5	14.2	13.9	14.6
44	12.4	13.1	14.6	15.3	15.0	15.7
50	14.1	14.9	16.3	17.1	16.7	17.5
54	15.2	16.0	17.4	18.2	17.8	18.6
60	16.8	17.7	19.0	19.9	19.4	20.3
64	17.9	18.9	20.1	21.1	20.5	21.5
70	19.5	20.6	21.7	22.8	22.1	23.2
80	22.3	23.5	24.5	25.7	24.9	26.1

Circular yard size						
Number of cows			Yard area	Backing gate length (m)		
J	FXJ	F	m ²	½ circle	¾ circle	Full circle
180	150	129	180	10.70	8.80	7.60
200	167	143	200	11.30	9.20	8.00
220	183	157	220	11.90	9.70	8.40
240	200	171	240	12.40	10.00	8.80
260	217	186	260	12.90	10.50	9.10
280	233	200	280	13.40	10.90	9.50
300	250	214	300	13.90	11.30	9.80
320	267	229	320	14.30	11.70	10.00
340	283	243	340	14.70	12.00	10.40
360	300	257	360	15.20	12.40	10.70
380	317	271	380	15.60	12.70	11.00
400	333	286	400		13.10	11.30
450	375	321	450		13.80	12.00
500	417	357	500		14.60	12.60
530	442	379	530		15.00	13.00
570	475	407	570		15.50	13.45
620	517	443	620			14.00
660	550	471	660			14.50
700	583	500	700			14.90

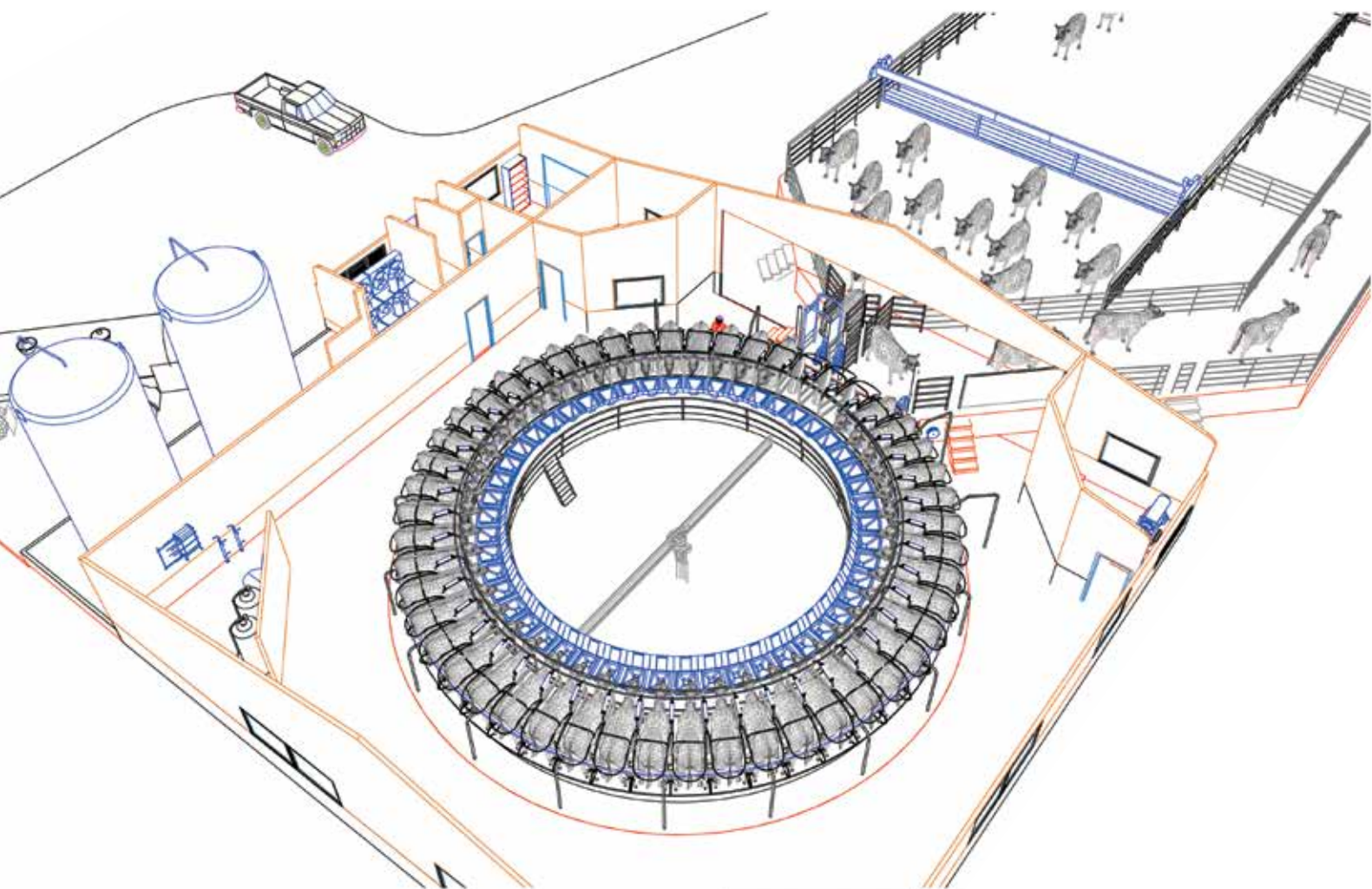
Rectangular yard size								
Number of cows			Yard area	Yard length (m)				
J	FXJ	F	m ²	8	9	10	11	12
180	150	129	180	22.50	20.00	18.00	16.40	15.00
200	167	143	200	25.00	22.20	20.00	18.20	16.70
220	183	157	220	27.50	24.50	22.00	20.00	18.30
240	200	171	240	30.00	26.70	24.00	21.80	20.00
260	217	186	260	32.50	28.90	26.00	23.80	21.70
280	233	200	280	35.00	31.10	28.00	25.50	23.30
300	250	214	300		33.30	30.00	27.30	25.00
320	267	229	320		35.60	32.00	29.10	26.70
340	283	243	340			34.00	31.00	28.30
360	300	257	360			36.00	32.70	30.00
380	317	271	380			38.00	34.60	31.70
400	333	286	400				36.40	33.30
450	375	321	450				40.90	37.50
500	417	357	500				45.50	41.70
530	442	379	530					45.80
570	475	407	570					50.00
620	517	443	620					54.20
660	550	471	660					58.30
700	583	500	700					

J = Jersey cows FXJ = Friesian/Jersey Cross F = Friesian

DeLaval Parallel Rotary PR1500 & PR2100 foundations

Good dairy planning is essential because the rotary platform is totally integrated into the dairy building and requires a number of specific services such as power and water. In addition to the specific dairy requirements, it is necessary to consider overall cow traffic as this is a critical factor to operating an efficient dairy.

A complete set of planning materials are supplied with each DeLaval Parallel Rotary PR1500 & PR2100 milking solution. Foundation, drainage and electrical ducting drawings are provided to ensure your builder and electrician can complete their part of the project efficiently and on time. A comprehensive set of operating and maintenance instructions are also supplied.





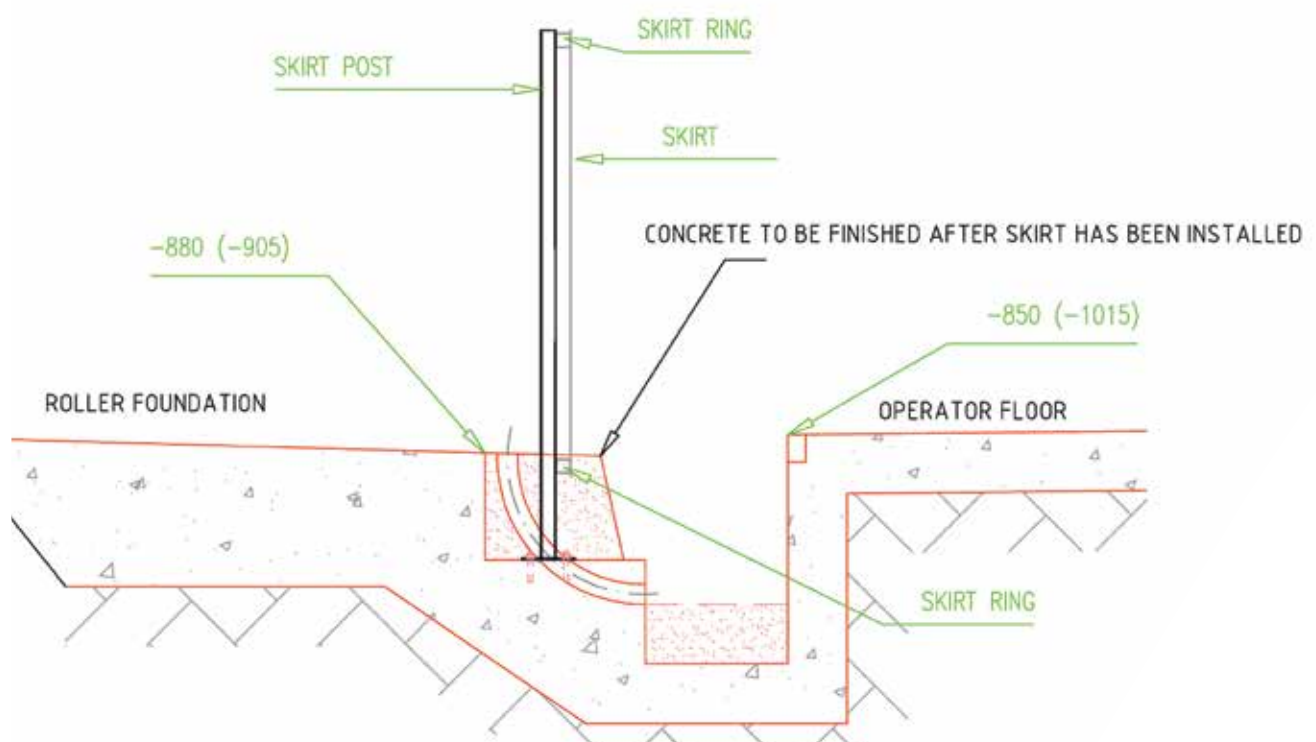
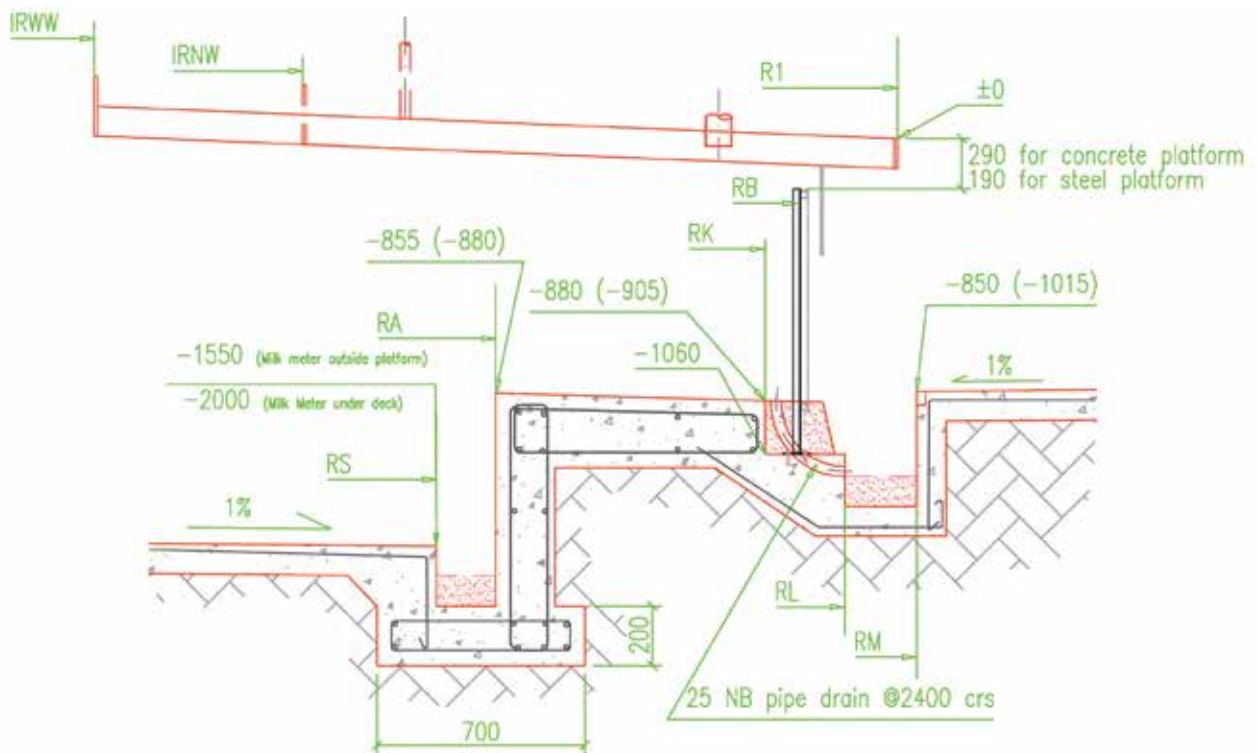
Internal excavation phase

The initial excavation phase has been completed and work has started on the critical pit/roller foundation.

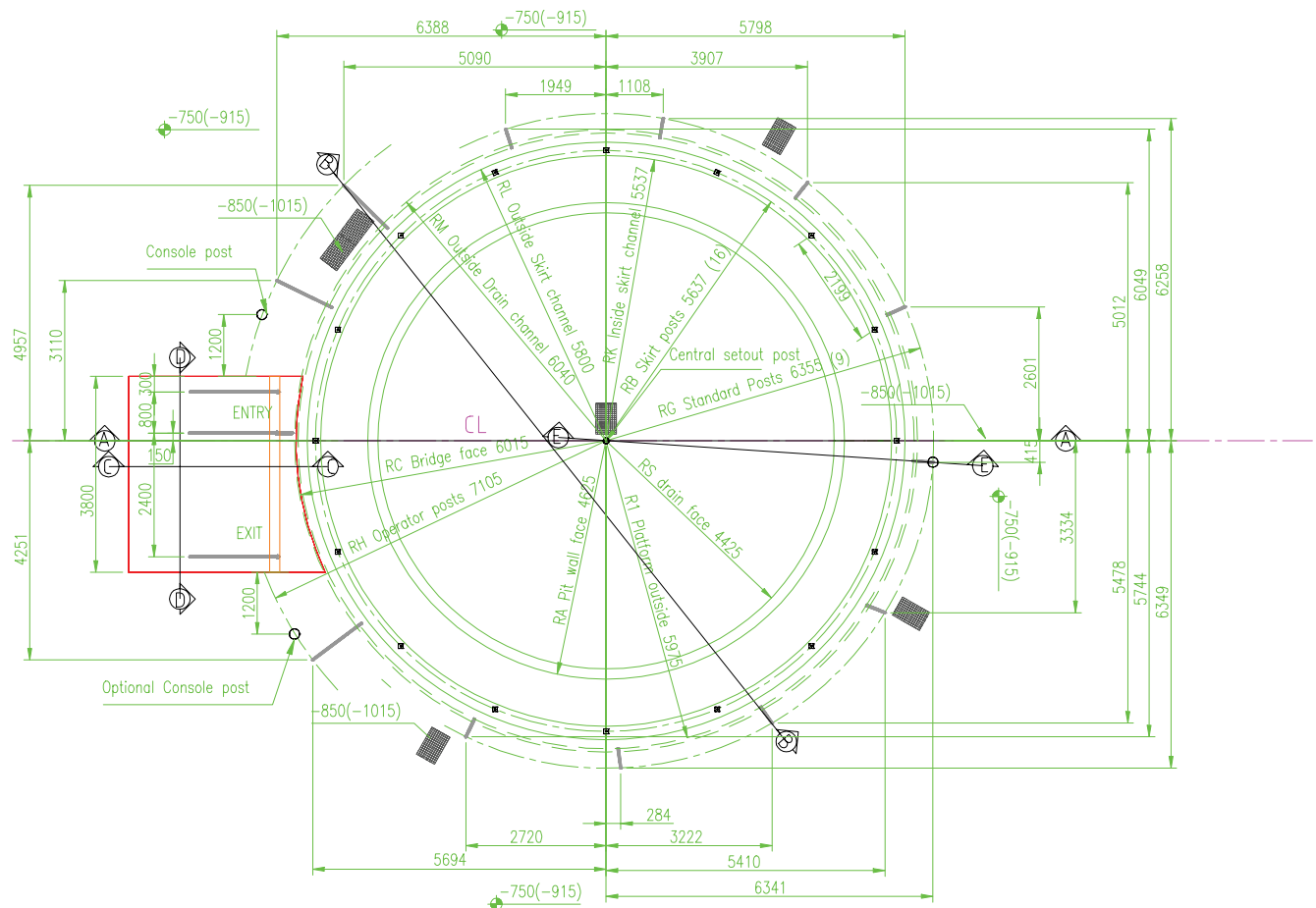


Foundation and service duct preparation

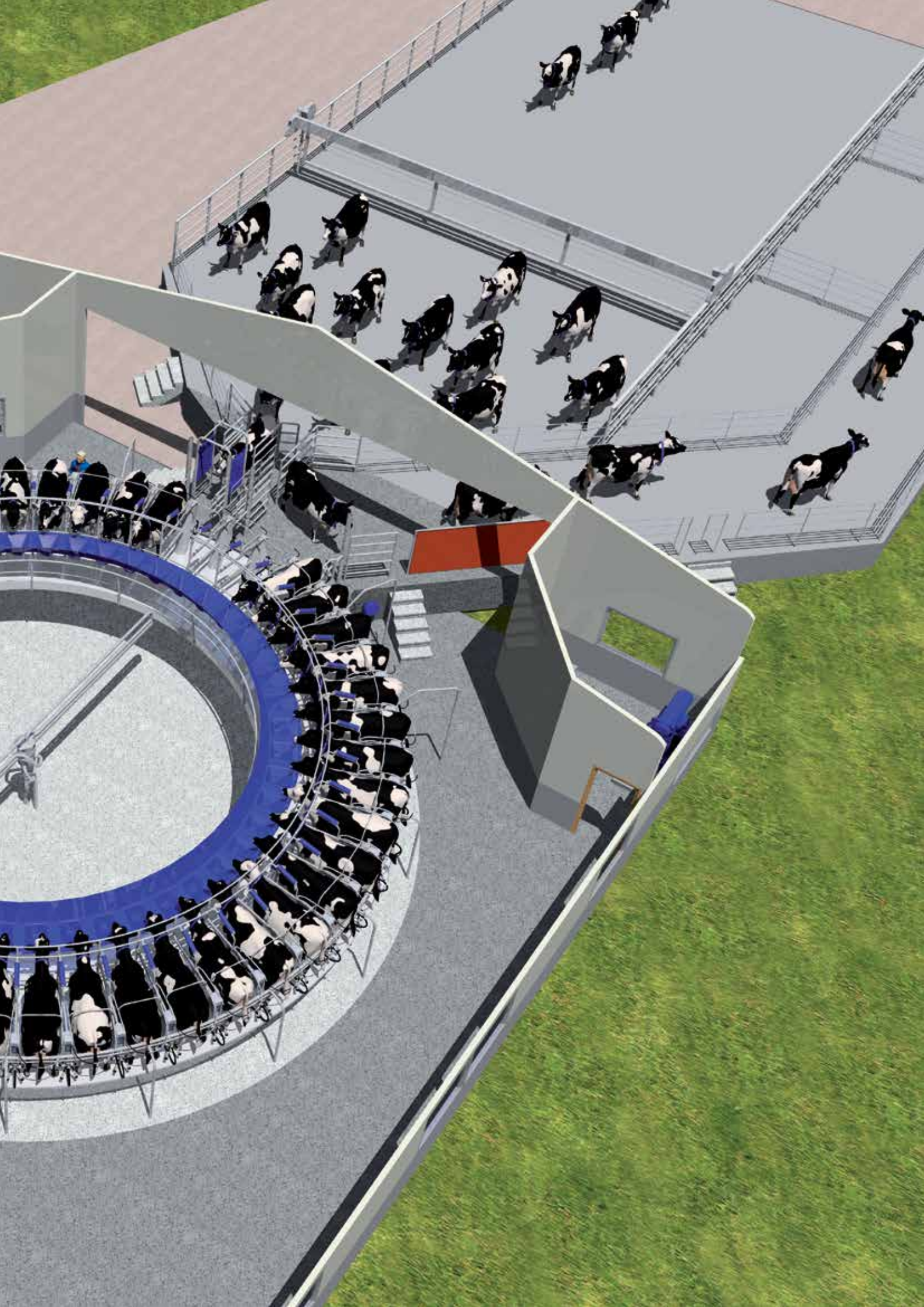
Once the pit wall has been completed, it is necessary to lay all the service ducts in the correct position before the concrete floor is poured. Future requirements for ducting should also be considered at this stage.



DeLaval Parallel Rotary PR1500 & PR2100 typical foundation plan







System integration

A DeLaval parallel rotary platform and a DeLaval milking machine fit together like a hand and glove. Because the platform and the milking machine are designed to work together, they provide a seamless milking operation. It is this seamless integration that gives the complete system improved cluster alignment, low stable vacuum and the easy adaptation of automation equipment. Overall, this solution gives superior milking performance.

DeLaval Parallel Rotary PR1500 & PR2100 platforms and DeLaval milking equipment have been designed to keep equipment protected from the harsh milking environment, while being easily accessible for routine maintenance. DeLaval Parallel Rotary PR1500 & PR2100 bails have been designed to allow you to take full advantage of current and future advancements in milking equipment and herd management technology.

Platform options

Parallel Rotary PR1500

A galvanised steel pipe or bow bail specifically designed to future proof your investment. The bail's low profile yet sturdy construction promotes superior cow flow, on and off the platform while evolving with your demands. Start with a pulsation only system, add automatic cluster removers or go through to full herd management. The PR1500 really can grow with you. The low milk tube connection point allows for excellent cluster alignment.

Parallel Rotary PR2100

A galvanised cabinet bail engineered to interface the herd management system with the milking operator. The bail's low profile yet sturdy construction promotes superior cow flow, on and off the platform. The low milk tube connection point allows for excellent cluster alignment.

Deck materials

You can choose between three different deck materials:

- Concrete
- Steel
- SuperDek

Concrete

The concrete deck is 100 mm thick and consists of 40 Mps, high performance MICROPOZ™ reinforced concrete. Concrete is an acceptable deck material for this application, but consideration should be given to the required duty of the platform when making this decision. The concrete deck will provide good service in moderate duty operations, but concrete is not flexible so some cracking may occur.

Benefits of a concrete deck platform include:

- Quiet milking environment
- Good cow flow from concrete bridge to concrete platform
- Does not need sanding and painting

Steel

The steel deck is made of 5 mm thick, mild steel chequer plate. The top side is sandblasted and primed for protection. A special epoxy coating is applied to extend the steel deck's life. The steel deck platform will provide good service in heavy duty operations.

Benefits of a steel deck platform include:

- Proven material for 700 kg cows
- Lightweight to reduce load on rollers and drive units
- Easy to modify/upgrade

SuperDek

SuperDek is a high chromium alloy steel that has the appearance and qualities of stainless steel. SuperDek is corrosion resistant and virtually maintenance free. The SuperDek platform will provide good service in heavy duty operations.

Benefits of a steel deck platform include:

- Proven material for 700 kg cows
- Lightweight to reduce the load on rollers and drive units
- Does not require expensive surface coatings



DeLaval Parallel Rotary PR1500 bail with concrete deck.



DeLaval Parallel Rotary PR2100 bail with SuperDek platform with mats.

DeLaval Parallel Rotary PR1500 & PR2100 features

Rollers

The DeLaval Parallel Rotary PR1500 & PR2100 platform utilises the unique tapered roller system to minimise friction, service and operating costs. The robust roller is 200 mm in diameter, with a large axle – complete with two sealed deep groove ball bearings, hot-dipped galvanised to resist corrosion and a high density rubber damper to distribute load evenly.

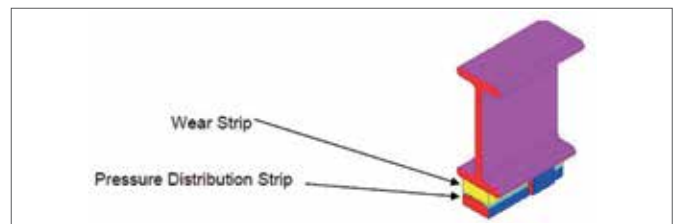
Because the I beam (or track) is curved, point A and point B are travelling different distances – therefore at different speeds – across the roller, while the surface of the roller is travelling at a constant speed.

This causes the I beam to scuff across the surface of the roller. Lubrication goes some way to minimise the loads and wearing caused by the scuffing effect of the I beam on the roller.

The DeLaval system uses tapered rollers (exaggerated in this drawing for demonstration). As the roller is tapered, point A and point B are travelling at the same speed. This eliminates the scuffing effect of the I beam on the roller.

Drive unit

A heavy duty pinch wheel drive system, with twin drive wheels and geared motors with a central pivot arrangement provides reliable service in the most demanding circumstances. The drive unit has full height and level adjustment to simplify installation and make servicing easier. Platform efficiency is such that only two 0.75 kW electric motors are required for most platform installations.



Drive unit

Tapered roller

Track

The track is the platform's main structural element, doubling as the running surface on top of the roller system. The track design includes a wear-strip as standard to prolong the life of the I beam track. The wear strip can be replaced without removing the entire track.

When a platform is operating in a high duty application, a floating Pressure Distribution Strip will be installed between the fixed wear strip and the rollers.

Track lubricator

A track lubricator is installed to ensure that the correct lubrication is applied to the track and rollers. This lubrication is vital to ensure trouble free operation of the platform.



Track lubricator



Track with side location rollers

Milking

Clusters

DeLaval has a range of milking clusters to suit different flow rates and operator handling preferences. The DeLaval milking cluster MC22 combines simple handling with unique design, to benefit both the cow and the milker. The size of the claw fits your hand well, which means easy handling for the milker. The 10 mm milk inlet and 16 mm claw outlet size promotes fast milk evacuation from the teat end and claw.

The DeLaval milking cluster MC31 is designed and engineered to deliver optimal performance from milking to milking. MC31 handles higher milk flows than most other clusters by utilising a bottom unloading design.

A 250 ml standard or 330 ml heavy duty option claw with a big milk outlet handles high milk flows efficiently and safely, minimising unwanted cross-flows and milk plugs. Vacuum fluctuations are reduced under high milk flows by 12 mm claw milk inlets.

The DeLaval milking cluster MC53 is engineered to meet the high flow rates of fast milking cows. This durable, proven cluster is designed to offer both milker and cow comfort. MC53 combines stainless steel shells with a patented TF (Top Flow) technology claw and is designed to reduce vacuum fluctuations at high milk flows. MC53 is only available on the DeLaval Parallel Rotary PR2100.

Pulsation

Based on well proven design, the DeLaval electronic pulsator EP100B provides optimal performance, high reliability and maximum durability. For minimum wear and low power consumption, this pulsator uses low-energy (12 or 24 volts options) with vacuum-operated diaphragm valves. The minimal movement of these valves means rapid and precise action and a long service life.

Cow locators

DeLaval cow locators are a sound investment. Fixed to the platform deck, the cow locators encourage the cows to spread their hind legs for easy cluster attachment, resulting in optimum cluster alignment for a cleaner milk out.

The aerodynamic shape ensures they do not inhibit flushing the platform deck to keep the platform clean. With hind legs correctly spread, teat spraying accuracy is improved.



MC22



MC31



MC53



Cow locators

Vacuum systems

DeLaval vacuum pump LVP

DeLaval vacuum pump LVP is designed for the farmer who demands the utmost in performance. These vacuum pumps provide reliability without sacrificing performance, especially when you have long operating times. Three options are available; 3,000, 4,500 and 6,000 litre capacity.

The LVP pump head includes two eight-shaped lobes, rotating in opposite directions. With every rotation, a constant volume of air is transferred. Unique to the DeLaval LVP is the discharge plenum chamber, situated at the pump head outlet. This special feature gives you a smoother and quieter operation. The maintenance requirement has been kept to an absolute minimum with this head design, which helps keep operating costs low. Each pump head is also equipped with a cleaning device. Any residue can be quickly and simply removed, eliminating the need for dismantling.

As the closely aligned lobes never touch, no lubricant is required within the pump unit itself. The highly efficient interceptor filter protects your investment even further by filtering out particles larger than 10 microns, which can be harmful for the pump. These aspects mean high operating efficiency under tough conditions, saving you from downtime and maintenance costs.

DeLaval vacuum regulation MVR

A stable and accurately controlled vacuum promotes good udder health, rendering it highly desirable in all milking installations.

DeLaval vacuum regulator MVR achieves this thanks to servo-controlled regulation combined with a unique and patented valve design. The vacuum regulator MVR system handles up to 13,500 litres of air per minute and vacuum levels from 30 – 60 kPa. A simple-to-replace air filter protects the regulator and vacuum pump components from harmful particles, prolonging their working life.

DeLaval vacuum regulation VSD100

The highly efficient DeLaval Vacuum Pump VSD100 can not only cut your energy costs by up to 70%, but also dramatically reduce noise levels at the same time.

DeLaval VSD100 utilises advanced technology to create a more gentle milking environment. You – and your cows – will appreciate the lowered noise levels.

More accurate vacuum control can also mean improved udder health and milking performance. The VSD100 will reduce wear and tear, extending the life of your vacuum pump and motor by quickly and smoothly responding to the fluctuating vacuum demands of everyday milking.



LVP



MVR



VSD100

Cleaning and hygiene

Gaining adequate cleaning turbulence through slug formation and the precise control of air injection is important to effectively and consistently clean your milking installation.

DeLaval rubber cup jetters are fitted with a unique check valve mechanism and four adjustable flow settings to allow the correct flow of wash water, regardless of the cleaning vacuum. These jetters are mounted in the dummy bail, which helps keep them protected and clean.

DeLaval candle cluster cleaners self support most cluster types without the need for a claw bracket. With the choice of two seal sizes, either large or small head liners can be washed without damage to the liner mouthpiece or head. This is particularly important for the Harmony range of soft-lip liners.

DeLaval candle cluster cleaners are only available on the DeLaval Parallel Rotary PR2100.

The DeLaval Cleaning Unit C200 helps ensure that the essential factors – water temperature, detergent, turbulence and cleaning duration – are automatically controlled in a consistent way, every wash.

The DeLaval C200 is easy to use. Push the button and the unit will automatically and consistently clean your shed, regardless of who is performing the wash. The electronically controlled system dispenses liquid chemicals, optimises the wash settings and, as a safe guard, has built in alarms to bring faults to your attention.



C200



CCS jetter



Candle jetter

Milk transport

The gentle handling of milk within the milk transport system is vital to ensure the highest quality milk. Controlled milk pumping using DeLaval centrifugal milk pumps ensures that milk enters the bulk milk tank in the best possible condition.

DeLaval receivers and milk pumps

Manufactured to the highest standards, DeLaval stainless steel milk receivers include the milk pumps as part of the integrated solution. Simple in their design, the DeLaval range of pumps require minimal maintenance to ensure trouble free operation. Two pump sizes capably handle milk and wash water requirements, ensuring efficient milk transportation from the receiver to the bulk milk tank.

These purpose-built milk pumps are flow controlled with a variable speed controller. The DeLaval range offers outstanding pumping performance and reliability. Automatic drains can be fitted to simplify routines in the dairy.

Variable speed milk pump controller

DeLaval has the ability to match the milk pump performance with your cows milk letdown, greatly improving efficiencies of milk filtering and cooling. The DeLaval variable speed controller automatically optimises the speed of the milk pump to maintain the lowest possible milk flow rate through the milk filter and milk cooler, letting you make the maximum saving with your plate heat exchanger.

DeLaval air purge

The DeLaval air purge aids in recovering the milk left in the milk delivery line, which is normally lost at the end of milking. Utilising compressed air, the milk is pushed through the delivery line from close to the receiver, out through the filter to the bulk milk tank. An efficient payback is assured.



Receiver

Milk filters

Top quality milk must not contain any foreign particles. That is why the milk filter is an important link in the chain of quality milk production. It is imperative that your milk is filtered effectively during milking.

DeLaval milk filter MF40

Proven performance from this compact filter provides farmers with optimal milk filtration. Known for how easy it is to change socks, this robust milk filter has great performance. The unique bayonet quick coupling is supplied with 50 mm connections. The DeLaval MF40 is rated for 350 clean cows and can be single, double or triple stacked for larger herds.

DeLaval milk filter MF85

The DeLaval milk filter MF85 provides premium filtration with a unique design. Using a revolutionary filtering technique where the milk flows from the inside to the outside, foreign matter is trapped inside the sock, eliminating residues passing through to the PHE. This design maximises the performance of the milk filter to retain milk quality. The modular design allows easy expansion to increase filtering capacity as farm production grows and can be installed in modules of 1 – 4 filters. Each MF85 is rated for 400 clean cows.



MF40



MF85

DeLaval milk filter MF100

The DeLaval milk filter MF100 is specifically designed for large herds and farmers who want to future proof their investment. Rated at 880 clean cows per filter, the MF100 can be installed as a single unit or in a module of two. Its simple yet effective design eliminates bypass, giving you the peace of mind that your milk filtering needs are well taken care of.



MF100

DeLaval M6 plate heat exchanger

The DeLaval M6 plate heat exchanger (PHE) is an easy way for you to reduce cooling time and save energy and expense in the day to day operation of your farm. The M6 PHE cools milk quickly and efficiently and when sized correctly, can save you up to 60% of your refrigeration costs. Rapid cooling of milk preserves milk quality. Clip in gaskets and 316 stainless steels plates ensure maximum efficiency in this large capacity heat exchanger.

DeLaval energy recovery system ERS

Energy efficiency can mean profitability. The ERS unit recovers heat removed from milk and stores it as hot water. By utilising the very latest in heat transfer technology, the ERS operates more quickly, thoroughly and consistently than other heat-recovery units. The ERS works in concert with your refrigeration and water-heating equipment, allowing them to work more efficiently too.

The ERS helps reduce energy costs two ways. First, the ERS unit can recover up to 60% of heat removed from milk in the cooling process and convert it to virtually cost-free hot water for use in your cleaning cycle.



M6



ERS

Automation

Automatic cluster removers (ACRs) give the milker the flexibility to do the right things right – every time.

DeLaval MPC150 automatic cluster removers

The DeLaval milking point controller MPC150 offers better control of your milking operation. Far more than just cluster removal, DeLaval milking point controller MPC150 provides for hassle free milking and increased productivity.

The MPC150 gives you the opportunity to choose the functions you need, to milk your cows the way you want. These milking point controllers are designed to execute precision milking and to provide consistent, accurate cluster removal at every milking point.

DeLaval MPC580 automatic cluster removers

The DeLaval milking point controller MPC580 is designed to help you maximise production with a consistent, efficient milking routine. It provides accurate data on every cow, clear messages and alerts; and automatically records data, with little need for manual input when connected to the integrated ALPRO™ herd management system. The true future proofed solution when it comes to ACRs.



MPC150



MPC580

Herd management systems

The right decision at the right time

A herd management tool is essential for all farmers who are interested in maximising production and profits. DeLaval ALPRO™ herd management system is a modular concept that allows you to manage drafting, feeding, weighing, animal health, milking and breeding as one integrated business operation. This optimum herd management solution keeps track of each animal, monitors trends, predicts problems and evaluates options. ALPRO™ provides full access to the daily information essential for successfully running a modern dairy farm.

Drafting cows

In day to day farming there are a number of reasons for separating a cow, which can be achieved with the DeLaval Sort Gate DSG3. Medical treatment, artificial insemination, hoof treatment, dry-off or simply changing a group are day to day tasks. Automatic sorting is possible when herd management information and automatic cow identification are available. This is integrated into the software and hardware of the ALPRO™ system. Cows can be drafted through automatic criteria from the system or on demand during milking.



ALPRO™



DSG3

Feeding for profit

Cows' requirements, grass availability and grass quality tend to vary every season. This is when supplementation inside or outside the milking parlour becomes a key strategy for improving yield and milk solids. In today's pasture based dairy farming, nutritional aspects are being considered more and more by farmers, veterinarians and dairy consultants.

The ALPRO™ system is an excellent tool for accurately helping you supplement your herd according to its specific needs and production targets. Feed your animals the appropriate amount of concentrate feed while the cows are being milked (in-parlour feeding).

AWS100

When you know weights and weight trends for each cow, you can use this (along with other data) to get a more complete picture of an individual cow, a group of cows or your complete herd. DeLaval AWS100 is a walk-over, electronic animal-weighing and data recording solution that links to the DeLaval Herd Management software ALPRO™, which will turn the data into useful weight management information.

The power and control of yield recording

Knowledge is a powerful tool, especially when it helps you anticipate what will happen next. The ALPRO™ system gives you total control over each cow's yield. If any cow deviates from its usual production, you will know at once.

Having all the information allows you to make the right decisions at the right moment, rather than when it's too late. Receiving timely, accurate information from the ALPRO™ system means you can immediately solve problems involving cows that are sick or yielding less milk than usual. Daily milk yield measurements minimise your production losses and improve your profitability.

The ALPRO™ system is the dairy farmer's best decision making tool. It provides rapid access to correct information, which makes it easy for you to make the right decisions. This saves working time and increases profitability.



MC27BC



AWS100



DeLaval service

DeLaval InService™

DeLaval has over 125 years of experience and a long tradition of innovation. Efficiency, quality, profitability and control are themes that have inspired us. Just as our products are in the forefront of innovation, so is our service offer. We know that as every farm is unique and has specific needs, the service needs must be individually assessed. InService™ is a complete service programme that allows farmers to choose a service solution that suits their individual needs. DeLaval InService™ technicians have extensive hands on experience, with expert knowledge of our systems, equipment and range of original parts.

InService™: quality, performance and reliability.

After sales support

DeLaval supply agreements help you to manage your dairy consumables' requirements. Today's dairy farmers face growing pressure on their time and resources. For DeLaval, helping dairy farmers to optimise profits through efficiencies is primary to our business. DeLaval has created this programme as a consultation between you, the farmer, and your local DeLaval team, to supply a range of products and services over the year.

Every part of this programme is tailored for each individual farmer and provides flexibility based on your dairying demands. Milk filter sleeves and socks, liners and tubes, teat care products, acid and alkaline detergents are just some of the many examples of the aftermarket products available through DeLaval.



Conclusion

In this planning guide we have presented DeLaval Parallel Rotary PR1500 & PR2100 milking solutions. We have focused on a number of key elements and components that we believe are interesting and important to our customers. We have highlighted the benefits of certain aspects of the system and encourage you to investigate these issues and any other points of interest you may have.

Any new dairy – especially a rotary dairy – is a major project with a long-term future. Here at DeLaval we have all the information and resources to help you plan your installation and optimise performance and efficiencies. We also have all the necessary plans, detailed drawings and information to equip you to run your project right from the first planning stages to the final implementation. DeLaval project managers and support staff are well trained and ready to assist you, wherever you are located.

We realise that customer needs are varying and extensive. We have developed the DeLaval Parallel Rotary PR1500 & PR2100 to cater for a wide range of needs and are certain we can meet your requirements, but we recognise that we may not have addressed all your concerns in this planning guide. Should you have any further requirements please contact your nearest DeLaval representative who will be happy to answer any questions you may still have.



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