Equipment for new build cattle slaughter plant with a capacity of 10 heads per hour

A.1. Summary according drawing no. 61.11.502C,

Pos no.	Q.ty	Product description	Remarks	Price (EUR)
		Cattle slaughter equipment, 10 heads per hour		
G.1.0		**Stunning and debleeding**		
G.1.1	0	Runway (civil construction)	*Local supply*	
G.1.2	1	Cattle stunning box		
G.1.3	1	Receiving frame behind cattle stunning box		
G.1.4	1	Working grid next to stunning box		
G.1.5	12	Safety post		
G.1.6	1	Bleeding hoist for cattle		
G.1.7	1	Bleeding rail incl. 3x manual stops		
G.1.8	1	Working grid for sticking		
G.1.9	0	Blood collecting trough (civil construction)	*Local supply*	
G.1.10	1	Blood pump incl. 25 mtr piping		
G.1.11	0	Blood collecting tank	*Local supply*	
G.2.0		**Transfer and dehiding**		
G.2.1	1	Static working platform for transfer carcass		
G.2.2	0	Funnel for transfer hind feet	*Local supply*	
G.2.3	1	Transfer hoist		
G.2.4	1	Dressing rail incl. 10x manual stop		
G.2.5	1	Working grid for remove horns, head, rodding and front feet		
G.2.6	2	Static working platform for remove udder and pre-dehide high		
G.2.7	0	Funnel for transfer udder	*Local supply*	
G.2.8	2	Static working platform for pre-dehide middle		
G.2.9	2	Static working platform for pre-dehide low		
G.2.10	1	Static working platform for saw brisket		
G.3.0		**Evisceration and inspection**		
G.3.1	2	Pneumatic leg spreading device for removal of white offal and splitting carcass		
G.3.2	1	Static working platform for take out red organs and white offals with paunch chute underneath		
G.3.3	1	Paunch inspection chute		
G.3.4	1	Pneumatic lifting platform for carcass splitting		
G.3.5	1	Splash screen		
G.3.6	1	Static working platform for inspection red organs and white offals		
G.3.7	1	Static working platform for carcass inspection		
G.3.8	1	Static working platform for re-inspection		
G.3.9	1	Transport rail for re-inspection and condemned carcasses incl. switches and bends		
G.3.10	1	Static working platform for lowering condemned carcasses		
G.3.11	2	Static working platform for trim carcass		
G.3.12	1	Weighing system before cooling		

Pos no.	Q.ty	Product description	Remarks	Price (EUR)
G.4.0		**Cooling and quartering**		
G.4.1	1	Transport rail to cooling room and quartering area		
G.4.2	1	Storage rail in cooling room for cattle halves incl. switches, bends and track beams		
G.4.3	0	Quartering hoist	*Local supply*	
G.4.4	1	Transport rail to cooling room for cattle quarters and dispatch area		
G.4.5	1	Storage rail in cooling room for cattle quarters incl. switches, bends and track beams		
G.4.6	1	Weighing system dispatch		
G.5.0		**Cutting and Deboning quarters**		
G.5.1	1	Transport rail to Cutting and Deboning line		
G.5.2	1	Weighing system before Cutting and Deboning		
G.5.3	2	Drop table		
G.5.4	1	Slat belt conveyor for gross & nett meat products incl. CIM cleaning		
G.5.5	6	Deboning tables with PE cutting plate (20 mm thickness)		
G.5.6	1	Turning table at the end of the cutting line		
G.6.0		**White offal treatment**		
G.6.1	1	Table for receiving white offals		
G.6.2	4	Working table for offal treatment with PE cutting plate (20 mm thickness)		
G.6.3	1	Compressed air conveyor for mannure incl. 50 mtr piping		
G.6.4	1	Crushed ice generator incl. control unit and cleaning systemCapacity: 500kg / 24 hour		
G.7.0		**Emergency sheep slaughter line**		
G.7.1	1	Bleeding rail for sheep		
G.7.2	1	Dressing rail for sheep		
G.7.3	1	Transport rail for racks		
G.7.4	1	Manual electrical stunning system for sheep		
G.8.0		**Electrical control**		
G.8.1	1	All equipment is controlled standed alone	*Included*	
G.8.2	0	Cabling	*Local supply*	
G.9.0		**Hygienic equipment**		
G.9.1	16	Apron washing cabinet with knife sterilisation unit mounted on platform or working grid		
G.9.2	2	Apron washer with knife sterlisation unit floor mounted		
G.9.3	2	Hand wash and knife sterilisation unit		
G.10.0		**Working tools**		
G.10.1	1	Stunner non-penetrating incl. 1.000 cartridges		
G.10.2	1	Electro stimulation tool		
G.10.3	1	Cutter for hind feet		
G.10.4	1	Oesophagus rodding tool		
G.10.5	1	Breastbone saw		
G.10.6	6	Air operated dehiding knife		
G.10.7	1	Splitting saw		
G.10.8	1	Vacuum cleaner spinal cord		
G.10.9	1	Quartering saw		

Pos no.	Q.ty	Product description	Remarks	Price (EUR)
G.10.10	1	Suspension for manual tools		
G.10.11	4	Hand tool sterilisation unit for cutters, saws etc.		
G.10.12	1	Hand tool sterilisation unit for splitting saw		
G.11.0		**Means of transport**		
G.11.1	5	Bleeding shackle for cattle		
G.11.2	5	Bleeding shackle for sheep		
G.11.3	200	Cattle dressing hook		
G.11.4	20	Sheep dressing hook		
G.11.5	0	Sheep rack for the storage of 8-12 sheep	*Local supply*	
G.11.6	2	Trolley for empty cattle hooks		
G.11.7	2	Trolley for cattle heads		
G.11.8	2	Trolley for red organs		
G.11.9	15	Trolley 200 ltr		
G.12.0		**Engineering**		
G.12.1	1	Engineering of secondary steel construction		
G.13.0		**Waste water treatment**		
G.13.1	1	Pre-Treatment, including: - Influent pump pit - Screening system - DaFinci® Dissolved Air Flotation system		
G.13.2	1	Biological treatment, including: - Denitrification and aeration basin - BioArt® sludge separation system		
G.13.3	1	Rotary screen scraper and spray installation		
G.13.4	1	Varlog and communication system		
G.13.5	1	Electrical control system for the water treatment system	*Included*	

B. Product & Design data

B.1. Design data

Cattle line

Design specifications:

- Operating hours: 8 hours per day, 5 days per week;
- Environmental conditions: normal and dry, at sea level +1.400 mtr;
- The line is designed for cattle; no veal will be slaughtered;
- Bleeding process on tube-rail 2" with roller hook shackles;
- Slaughtering process on tube-rail 2" roller hooks with stainless steel meat hook;
- Carcass distance in the bleeding area is 1.800 mm (manual rail);
- Carcass distance in the dressing area is 2.400 mm (manual rail).

All shackles and hooks, which transport the carcasses, must have uniform dimensions and quality.

Line capacity:

- Slaughtering of 10 cattle/hour
- Average live weight 400 kg (from 300 up to 520 kg).
- Average dressed carcass weight 220 kg.
- Max. horn dimensions 700 mm (outside).

Transport rail:

Transport rail is 2" galvanized tube rail.
Rail height in dressing area: 4.200 mm.
Rail height in cooling area cattle halves: 3.600 mm.
Rail height in dispatch area cattle quarters: 2.700 mm.

Sheep line

Design specifications:

- Operating hours: approximately 40 sheep/goat per week.
- Environmental conditions: normal and dry, at sea level +1.400 mtr.
- The line is designed for sheep and/or goat.
- Bleeding process on tube-rail 2" with sliding hook shackles.
- Slaughtering process on tube-rail 2" sliding hooks with stainless steel meat hook.
- Cooling process on rack with 8-12 sheep (racks are not scope KJ).

All hooks and racks, which transport the carcasses, must have uniform dimensions and quality.

Line capacity:

- 10-15 sheep / hour (depending on the amount of workers and the skills of the workers)
- Average live weight 35 kg (from 25 up to 40 kg).
- Average dressed carcass weight 25 kg.

Transport rail:

Transport rail is 2" galvanized tube rail.
Rail height in dressing area: 2.250 mm.
Rail height in cooling area: combined with cattle halve cooling.

B.2. Project specifications

B.2.1. Regulations & Standards

E.C. & U.S.D.A regulations
The equipment is in principle built due to the present regulations of the E.C. and U.S.D.A.
The method of slaughtering and building measurements can be, in points, in contradiction with the regulations of the E.C. and/or U.S.D.A., for which MPS cannot be held responsible.

Safety standards
MPS systems comply with the essential health and safety requirements of the Machinery Directive 2006/42/EC.
In case of modifications, revisions, or the reuse of present machinery, installations or parts of machines / installations not delivered by MPS, mentioned standards are not applicable.

Hygiene standards
The design of our systems and equipment is based upon the essential rules of good manufacturing practices in combination with FDA approved components and materials where necessary.

B.2.2. Layout drawing

The mentioned prices are based on the length (of conveyors and rails) and shapes shown in the corresponding drawing.
Changes to this drawing, as well as to the project schedule will influence the prices.

B.2.3. Modifications

The data published herein answer to the most recent information at the moment of publishing, and are subject to future modifications.
KJ reserve the right to modify the construction and the execution of their products at any time without any obligation on their part to modify any equipment delivered before accordingly.

B.2.4. Slaughter line related civil constructions

All slaughter line related civil constructions like machine foundations, platforms, floor pits, collecting gutters, wall and roof passages, etcetera do not belong to the scope of supply mentioned in this order confirmation (as far as not mentioned otherwise).
KJ will provide the drawings showing the basic dimensions and other related information.

B.2.5. Secondary steelwork (main beams)

All main constructions, beams supports and columns in hot dip galvanised steel required for suspension or support will not be supplied and installed by KJ.

Slaughtering area
The KJ conveyors and rails require a support/suspension point at every 2.500 to 3.000 mm. Suspension materials with a maximum distance of 500 mm between the conveyor and the connection/suspension point to the main construction are included in the scope of supply.

B.2.6. Energy connections

Electrical power
All equipment mentioned in this order confirmation is based on an electrical power source of 380V, 50Hz.
Control voltage 24V DC.

C. Description of operation

C.1. Process description and product flow description

Process description according drawing 61.11.502 dated 25th of June 2015.

C.1.1. Cattle slaughtering

Slaughtering and bleeding
- Animals are driven toward the stunning box.
- Let in one by one into the box and after which the animal will be stunned with a non-penetrating stunner.
- Animal will be let out of the box onto a dry landing/shackling plate.
- Hind foot will be shackled and the bleeding shackle and carcass will be hoisted onto the bleeding rail.
- The cattle will be stack at the next station.
- The bleeding shackles are returned manually to the killing area.
- Blood collection trough underneath the killing area is not included in the scope of supply for MPS.

Transfer and dehiding
- At the transfer station both hind feet will be removed, the legs pre-dehided and transferred to dressing hooks. During transfer also the bung is cut loose and sealed. The hind feet will be transferred with a funnel (not scope MPS) into a trolley.
- The carcasses are transferred manual over the rail from working station to working station. Each working station will have a stop to hold the carcass on the same place.
- Next the horns and front feet will be removed and the trachea will be sealed. The head will be removed and hang onto a trolley.
- At the next working station the udders/ male genitals are removed and upper flanks will be pre-dehided. The udder will be transferred with a funnel (not scope MPS) into a trolley.
- Then the carcass will be dehide on several heights. The dehiding will be completely manual. The hide is dropped into a trolley and transported to the hide processing room.
- Next, the breast bone will be split.
- After being dehided the carcass will be transferred manually to the next working station.

Evisceration, inspection and carcass finish
- The carcass will be opened and the paunch/intestine package will be removed and dropped on the paunch inspection chute. Also the red organs will be removed and hung onto an inspection rail (not scope of supply MPS, will be done locally) under gravity for inspection. At the end of the rail will the organs hang onto a trolley.
- At the station here after the carcass will be split into halves from a pneumatic lifting platform.
- Next the carcass, red organs and paunch/intestine packages will be inspected by a veterinarian.
- Suspected carcasses can be railed out and transported to the re-inspection area. Condemned carcasses can be transported to a separate room.
- From the dressing line the carcasses are transported to the scale for weighing.
- The carcasses can be transported to the cooling area or directly to the quartering area.

Cooling and Quartering
- The carcass halves are transported to one of the cooling rooms.
- After cooling the halves are quarterd with help of a hoist (not scope MPS) and a quartering saw.
- The quarters can be transported to the buffer room or directly to the dispatch area or cutting and deboning area.

Cutting and Deboning area
- The quarters are transported above the dropping table. Here the first cuts are made.
- Next the quarter is manually dropped onto the meat belt conveyor.

- The workers will pick the big meat pieces for deboning.
- The bones will be dropped into an empty trolley behind the worker.
- After deboning the raw meat pieces will be dropped back onto the belt conveyor.
- Finally the meat will be dropped from the conveyor on a turning table.

C.1.2. Sheep slaughtering

Slaughtering and bleeding
- Animals are driven toward the sacrifice area
- The sheep are stunned with a manual stunning tong.
- Hind foot will be shackled and the bleeding shackle and carcass will be lifted manually onto the bleeding rail.
- The sheep will be stack at the next station.

Transfer and dehiding
- The sheep are transferred from the bleeding shackle to dressing hooks
- The carcasses are then transferred manually from working station to working station.
- Sheep carcasses will be manually dehided.

Evisceration, inspection and carcass finish
- After dehiding the carcass will be opened and the paunch/intestine package will be removed and dropped into a trolley.
- Next the red organs will be removed and dropped into a trolley.
- From the dressing line the carcasses are transferred to racks (8-12 sheeps per rack). Racks are not scope of supply MPS.
- The carcasses can be transported to the cooling area combined with cattle halves;
- Finally manually transported to the cattle quartering area, where the racks cannot transferred further over a rail system.

Cattle slaughter equipment, 10 heads per hour

C.2. Stunning and debleeding

C.2.1. Runway

Runway to cattle stunning box will be civil construction and therefore local supply.

C.2.2. Cattle stunning box

Type: RBCB-HL+HF+BP-Galv

To restrain individual cattle for stunning

Process description
After the animal has entered the box the entrance door will be closed. The bud pusher moves the animal forward to the head fixation device. The lifting plate and fixation bars in front, lift and restrain the head after which the animal is ready for stunning. After stunning the bud pusher, head fixation and lifter are retrieved, discharge door will be opened and the animal slides out of the box.

Technical description
The sturdy, stainless steel, box is placed on a raised floor. The entrance, with vertical sliding door, is connected to a raised driveway. The sliding doors, bud pusher, head lifter and fixation are pneumatically activated. The pneumatic cylinders of the sliding doors are mainly positioned at the top of the box. Operational valves are situated at the entrance- and stunning side of the box.

Comprising:
- Sturdy box
- Head lifting plate and side fixation
- Vertical sliding door at entrance with bud pusher
- Vertical sliding door at discharge
- Operational valves and compressed air control.
- Required fastening material

Technical data

Carcass weight	: Up to approx. 800 Kg (depending length and shape)
Length	: 2.900 mm
Width (inside - overall)	: 850 – 1.200 mm
Portal height entrance door	: 3.900 mm
Entrance door	: Pneumatically powered
Discharge door	: Pneumatically powered
Pneumatic control components	: Included

The stunning box for cattle is standalone pneumatic controlled.

C.2.3. Receiving frame behind cattle stunning box

For the reception and shackling of stunned cattle.

Technical description
Sturdy, reinforced, folded landing plate. The descending plate will be bedded in concrete which forms one unit with the stunning box support. An upstanding retainer will hold the animal and leave the hind legs free to allow easy shackling.

Technical data

Length	:	2.800 mm
Width	:	1.800 mm
Height	:	± 700 → 300 mm
Execution	:	Stainless steel

C.2.4. Working grid next to stunning box

Stainless steel platform with removable plastic grid next to the stunning box.

Technical description
The platform base consists of a frame with removable plastic floor grids, supported by legs.
The platform bottom has an open construction.

Technical data

Platform surface	:	approximately 6 m^2
Platform height	:	in accordance with work circumstances, maximum height 400 mm
Platform execution	:	Stainless steel

C.2.5. Safety post

To allow personnel to leave the stunning area in event of incorrectly stunned animals and keep these animals inside this area.

Technical description
Thick walled round pillars with closed top poured into the floor with a distance of appr.400 mm between the columns. A number of pillars are removable by placing them into poured in tube section.

Technical data

Pillar diameter	:	3” thick walled tube
Pillar length above finished floor	:	1.400 mm
Number of removable pillars	:	12 Pc.

Example of safety post beside the shackling grid

C.2.6. Bleeding hoist for cattle

Hoist for elevating stunned cattle onto the bleeding rail. The hoist with electric motor is operated by means of a push button switch.

Technical description
The hoist is fixed to a supporting structure. A guide plate is fitted to the tube rail for correct positioning of the bleeding shackle at the tubular track section of the bleeding rail.

Technical data

Type	:	PK 10N-2
Hoisting capacity	:	2.000 kg
Hoisting height	:	4 m
Hoisting speed	:	5 m/min
Electric power consumption	:	1,5 kW

Motor and hoist painted. All steel parts are galvanised.

Bleeding hoist is controlled standalone, customer has to provide power connection.

C.2.7. Bleeding rail incl. 3x manual stops

Declined rail for the bleeding of cattle carcasses.

Technical description
Overhead rail, attached to support beams by means of flat steel consoles. Pneumatically powered rail stops will keep the carcasses separated during bleeding. All steel construction parts are galvanized before assembly.

Technical data

Rail type	:	2” thick walled tube rail (Ø60,4 x 10 mm)
Rail length	:	9 m
Rail stop	:	3 Pc. Manual stop
All steel parts	:	Hot-dip galvanized
Guiding bars/profiles	:	Stainless steel

The rail system is equipped with:
Required galvanized fastening materials

C.2.8. Working grid for sticking

Stainless steel platform with removable plastic grid for sticking the cattle.

Technical description
The platform base consists of a frame with removable plastic floor grids, supported by legs.
The platform bottom has an open construction.

Technical data

Platform surface	:	approximately 2 m^2
Platform height	:	in accordance with work circumstances, maximum height 400 mm
Platform execution	:	Stainless steel

C.2.9. Blood collecting trough (civil construction)

Blood collecting trough will be civil construction and therefore local supply.

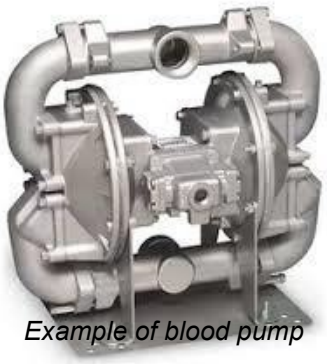
C.2.10. Blood pump incl. 25 mtr piping

To pump blood out of the civil collecting chute and transport it to a storage tank (tank is not included).

Technical description
The installation comprises a diaphragm pump with piping to the sucking point and from the pump to the storage tank. The piping is made of stainless steel and fitted with shut-off valves at both sides and suspension brackets. The pump can be disconnected for cleaning purposes.

Technical data

Pump type	:	Double diaphragm pump, compressed air powered
Pump capacity	:	Up to approx. 500 L/minute (depending routing and air pressure)
Intake / discharge pipe size	:	2” (50 mm)
Compressed air connection	:	¾” (8 bar)
Intake piping till sucking point	:	Included
Transport piping (2” SS) till tank	:	25 m
Automated pump and pipe cleaning	:	Not included
Citrate dosing unit	:	Included



Example of blood pump

C.2.11. Blood collecting tank

Blood collecting tank will be local supply.

C.3. Transfer and dehiding

C.3.1. Static working platform for transfer carcass

Stainless steel static work platform for safe and ergonomic working position, for transfer carcass from shackle to dressing hook.

Technical description

The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by floor mounted columns. This construction allows, within limits, height adjustment of the platform. Where necessary guard rails are installed along the platform edges.
All water is collected in the gutter shaped bottom of the platform with a central drainage connection point. The platform is executed with stairs for safe access.

Technical data

Platform length	:	2.000 mm
Platform width	:	1.200 mm
Platform height	:	in accordance with work circumstances
Platform execution	:	Stainless steel

Example of transfer platforms

C.3.2. Funnel for transfer hind feet

Funnel for hind feet is not scope of supply for MPS.

C.3.3. Transfer hoist

Hoist system to transfer cattle from bleeding shackles to dressing hooks, using an electric hoist.

Technical description
The hoist is suspended to the support beams. The hoist system includes a chain with a hoist plate and a foot operated switch to move the hoist up and down.
All steel parts are galvanised.

Technical data

Hoisting capacity	:	1.000 kg
Hoisting speed	:	5 m/min
Hoisting height	:	3 m
Electric power consumption	:	1 kW

Transfer hoist is controlled standalone, customer has to provide power connection.

Example of hoist for transfer

C.3.4. Dressing rail incl. 10x manual rail stop

For the manual transport and storage of dressinghooks with cattle carcasses. The carcass, suspended on a dressing hook, will be transported manual from working station to working station.

Technical description

Overhead rail, attached support beams by means of flat steel consoles. All construction parts are galvanized before assembly.

Technical data

Rail type	:	2” tube rail (Ø60,4 x 4,5 mm)
Rail length	:	34 m
Support beam length	:	42.5 m
All steel parts	:	Hot-dip galvanized

The rail system is equipped with:

	Required galvanized fastening materials
10	Rail stop, manually operated with pull cord
12	Suspension support, type Y or H
2	Manual revolving rail switch

C.3.5. Working grid for remove horn, head, rodding and front feet.

Stainless steel platform with removable plastic grid, for remove horn, head, rodding and remove front feet.

Technical description

The platform base consists of a frame with removable plastic floor grids, supported by legs.
The platform bottom has an open construction.

Technical data

Platform surface	:	approximately 5.6 m^2
Platform height	:	in accordance with work circumstances, maximum height 400 mm
Platform execution	:	Stainless steel

C.3.6. Static working platform for remove udder and pre-dehide high

Stainless steel static work platform for safe and ergonomic working position, for remove udder and pre-dehide high.

Technical description
The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by floor mounted columns. This construction allows, within limits, height adjustment of the platform. Where necessary guard rails are installed along the platform edges.
All water is collected in the gutter shaped bottom of the platform with a central drainage connection point. The platform is executed with stairs for safe access.

Technical data

Platform length	:	1.800 mm
Platform width	:	1.200 mm
Platform height	:	in accordance with work circumstances
Platform execution	:	Stainless steel

C.3.7. Funnel for transfer udder

Funnel for udder is not scope of supply for MPS.

C.3.8. Static working platform for pre-dehide middle

Stainless steel static work platform for safe and ergonomic working position, for pre-dehide middle.

Technical description
The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by floor mounted columns. This construction allows, within limits, height adjustment of the platform. Where necessary guard rails are installed along the platform edges.
All water is collected in the gutter shaped bottom of the platform with a central drainage connection point. The platform is executed with stairs for safe access.

Technical data

Platform length	:	1.800 mm
Platform width	:	1.200 mm
Platform height	:	in accordance with work circumstances
Platform execution	:	Stainless steel

C.3.9. Static working platform for pre-dehide low

Stainless steel static work platform for safe and ergonomic working position, for pre-dehide low.

Technical description
The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by floor mounted columns. This construction allows, within limits, height adjustment of the platform. Where necessary guard rails are installed along the platform edges.
All water is collected in the gutter shaped bottom of the platform with a central drainage connection point. The platform is executed with stairs for safe access.

Technical data

Platform length	:	1.800 mm
Platform width	:	1.200 mm
Platform height	:	in accordance with work circumstances
Platform execution	:	Stainless steel

C.3.10. Static working platform for saw brisket

Stainless steel static work platform for safe and ergonomic working position, for saw brisket.

Technical description
The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by floor mounted columns. This construction allows, within limits, height adjustment of the platform. Where necessary guard rails are installed along the platform edges.
All water is collected in the gutter shaped bottom of the platform with a central drainage connection point. The platform is executed with stairs for safe access.

Technical data

Platform length	:	1.000 mm
Platform width	:	1.200 mm
Platform height	:	in accordance with work circumstances
Platform execution	:	Stainless steel

C.4. Evisceration and inspection

C.4.1. Pneumatic leg spreading device for removal of white offal and splitting carcass

Device for the spreading of legs suspended from dressing hooks on a static overhead rail. Pneumatically powered, manually controlled. For removal of the white offals and splitting of the carcass.

Technical description
Guide/suspension frame made of double U-profile with transport rail underneath. A hinged hold finger is attached at one side of the frame, while a pneumatically powered carrier with spreading finger moves inside the guide frame. By using the operating valve, the cylinder will be activated. A finger lifter allows the movement of the transport hooks after the slaughter operation is finished and the spreading finger is returned to the starting point.
Galvanized execution, pneumatic components in standard execution.

Comprising:

1 Guide/suspension frame with transport rail; length approx. 1.500 mm
1 Hold finger and movable spreading finger
1 pc of pneumatic cylinder unit
1 pc of pneumatic operating valve and air control unit
1 pc. of valve suspension to rail support beam
Required fastening materials

C.4.2. Static working platform for take out red and removal of white offal with paunch chute underneath

Stainless steel static work platform for safe and ergonomic working position, with paunch chute underneath.

Technical description
The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by floor mounted columns. This construction allows, within limits, height adjustment of the platform. Where necessary guard rails are installed along the platform edges.
All water is collected in the gutter shaped bottom of the platform with a central drainage connection point. The platform is executed with stairs for safe access.

Technical data

Platform length	:	1.000 mm
Platform width	:	1.200 mm
Platform height	:	in accordance with work circumstances
Platform execution	:	Stainless steel
Paunch chute dimensions	:	Approximately length: 1.000 mm, width: 800 mm.
Paunch chute execution	:	Stainless steel

C.4.3. Paunch inspection chute

Stainless steel paunch inspection chute. The white offals has to be transported manual.

Technical data

Chute length	:	approximately 4.000 mm
Chute width	:	800 mm
Chute height	:	approximately 700 mm

C.4.4. Pneumatic lifting platform for carcass splitting

Stainless steel lifting platform for safe and ergonomic working position, for carcass splitting.

Technical description
The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by 2 floor mounted columns. Where necessary, guard rails are installed along the platform edges. All water is collected in de gutter shaped bottom of the platform with a drainage connection point. The platform movement is manually controlled by push buttons mounted in the platform floor.

Comprising:
- set of cylinders and controls
- floor mounted elevating columns
- removable plastic grid
- apron & hand wash cabinet
- knife disinfection unit

Technical data

Lifting height	:	1.500 mm
Lifting capacity	:	160 kg
Platform surface	:	approximately 1 m^2
Platform width	:	approximately 1.200 mm

Pneumatic, hydraulic and electrical components are in standard finish.

Example of splitting of the carcass

C.4.5. Splash screen

Splash screen in front of the carcass splitting station.

Technical description
Stainless steel frame, with integrated stainless steel plates, which will be mounted on the floor and at the upper construction.

Technical data
Height : 3.000 m
Width : 1.600 mm
Including anchor bolts and connection material to the dressing rail.

C.4.6. Static working platform for inspection red organ and white offals

Stainless steel static work platform for safe and ergonomic working position, for inspection red organ and white offals.

Technical description
The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by floor mounted columns. This construction allows, within limits, height adjustment of the platform. Where necessary guard rails are installed along the platform edges.
All water is collected in the gutter shaped bottom of the platform with a central drainage connection point.
The platform is executed with stairs for safe access.

Technical data

Platform length	:	1.000 mm
Platform width	:	1.200 mm
Platform height	:	in accordance with work circumstances
Platform execution	:	Stainless steel

C.4.7. Static working platform for carcass inspection

Stainless steel static work platform for safe and ergonomic working position, for carcass inspection.

Technical description
The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by floor mounted columns. This construction allows, within limits, height adjustment of the platform. Where necessary guard rails are installed along the platform edges.
All water is collected in the gutter shaped bottom of the platform with a central drainage connection point. The platform is executed with stairs for safe access.

Technical data

Platform length	:	1.000 mm
Platform width	:	1.200 mm
Platform height	:	in accordance with work circumstances
Platform execution	:	Stainless steel

C.4.8. Static working platform for re-inspection

Stainless steel static work platform for safe and ergonomic working position, for re-inspection.

Technical description
The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by floor mounted columns. This construction allows, within limits, height adjustment of the platform. Where necessary guard rails are installed along the platform edges.
All water is collected in the gutter shaped bottom of the platform with a central drainage connection point. The platform is executed with stairs for safe access.

Technical data

Platform length	:	1.000 mm
Platform width	:	1.200 mm
Platform height	:	in accordance with work circumstances
Platform execution	:	Stainless steel

C.4.9. Transport rail for re-inspection and condemned incl. switches and bends

For the manual transport and storage of hooks with carcasses for re-inspection and condemned.

Technical description
Overhead rail, attached support beams by means of flat steel consoles. All construction parts are galvanized before assembly.

Technical data

Rail type	:	2” tube rail (Ø60,4 x 4,5 mm)
Rail length	:	24 m
Support beam length	:	30 m
All steel parts	:	Hot-dip galvanized

The rail system is equipped with:
- Required rail curves
- Required galvanized fastening materials

3 Manual revolving rail switch

C.4.10. Static working platform for lowering condemned carcasses

Stainless steel static work platform for safe and ergonomic working position, for lowering condemned carcasses.

Technical description
The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by floor mounted columns. This construction allows, within limits, height adjustment of the platform. Where necessary guard rails are installed along the platform edges.
All water is collected in the gutter shaped bottom of the platform with a central drainage connection point.
The platform is executed with stairs for safe access.

Technical data

Platform length	:	800 mm
Platform width	:	1.200 mm
Platform height	:	in accordance with work circumstances
Platform execution	:	Stainless steel

C.4.11. Static working platform for trim carcass

Stainless steel static work platform for safe and ergonomic working position, for trim carcass.

Technical description
The platform base consists of a frame with raised kick protection edge and removable plastic floor grids, supported by floor mounted columns. This construction allows, within limits, height adjustment of the platform. Where necessary guard rails are installed along the platform edges.
All water is collected in the gutter shaped bottom of the platform with a central drainage connection point.
The platform is executed with stairs for safe access.

Technical data

Platform length	:	2.000 mm
Platform width	:	1.200 mm
Platform height	:	in accordance with work circumstances
Platform execution	:	Stainless steel

C.4.12. Weighing system before cooling

The cattle halve is transported on and off manually.

This system consists of:
- 1 Multi range overhead tube rail scales
- 1 Terminal:
  Digital weight indicator provided with a TCP/IP communication port. The weighing terminal can be connected to an external HOST system to store or process the received data.

Rail scales
Including weigh guiding, length 800 mm. Delivery conform IP 65.

Maximum weight	:	600 kg.

Resolution

0 - 300 kg	:	50 g.
300 - 600 kg	:	200 g.

C.5. Cooling and quartering

C.5.1. Transport rail to cooling room and quartering area

For the manual transport and storage of dressinghooks with cattle halves.

Technical description
Overhead rail, attached support beams by means of flat steel consoles. All construction parts are galvanized before assembly.

Technical data

Rail type	:	2” tube rail (Ø60,4 x 4,5 mm)
Rail length	:	47 m
Support beam length	:	60 m
All steel parts	:	Hot-dip galvanized

The rail system is equipped with:
- Required rail curves
- Required galvanized fastening materials
- 4 Manual revolving rail switch

C.5.2. Storage rail in cooling room for cattle halves incl. switches, bends and track beams

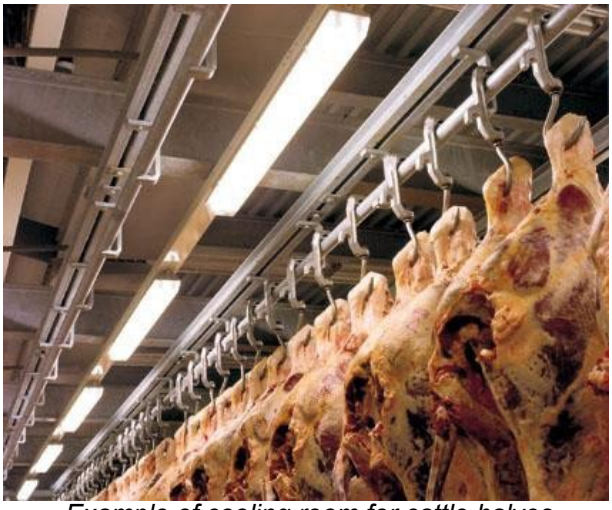
For the manual transport and storage of dressinghooks with cattle halves.

Technical description
Overhead rail, attached support beams by means of flat steel consoles. All construction parts are welded together and galvanized before assembly.

Technical data

Rail type	:	2” tube rail (Ø60,4 x 4,5 mm)
Rail length	:	122 m
Support beam length	:	155 m
All steel parts	:	Hot-dip galvanized

The rail system is equipped with:
- Required rail curves
- Required galvanized fastening materials
- 12 Manual revolving rail switch



Example of cooling room for cattle halves

Example of revolving rail switch

C.5.3. Quartering hoist

Quartering hoist is not scope of supply for MPS.

C.5.4. Transport rail to cooling room and dispatch area

For the manual transport and storage of dressinghooks with cattle quarters.

Technical description
Overhead rail, attached support beams by means of flat steel consoles. All construction parts are galvanized before assembly.

Technical data

Rail type	:	2” tube rail (Ø60,4 x 4,5 mm)
Rail length	:	18 m
Support beam length	:	23 m
All steel parts	:	Hot-dip galvanized

The rail system is equipped with:
- Required rail curves
- Required galvanized fastening materials
- 1 Manual revolving rail switch

C.5.5. Storage rail in cooling room for cattle quarters

For the manual transport and storage of dressinghooks with cattle quarters.

Technical description
Overhead rail, attached support beams by means of flat steel consoles. All construction parts are welded together and galvanized before assembly.

Technical data

Rail type	:	2” tube rail (Ø60,4 x 4,5 mm)
Rail length	:	23 m
Support beam length	:	30 m
All steel parts	:	Hot-dip galvanized

The rail system is equipped with:
- Required rail curves
- Required galvanized fastening materials
- 8 Manual revolving rail switch

C.5.6. Weighing system dispatch

The product is transported on and off manually.

This system consists of:
- 1 Multi range overhead tube rail scales
- 1 Terminal:
  Digital weight indicator provided with a TCP/IP communication port. The weighing terminal can be connected to an external HOST system to store or process the received data.

Rail scales

Including weigh guiding, length 800 mm. Delivery conform IP 65.

Maximum weight	:	300 kg.

Resolution

0 - 300 kg	:	50 g.

C.6. Cutting and Deboning quarters

C.6.1. Transport rail to Cutting and Deboning line

For the manual transport of hooks with cattle quarters to the Cutting and Deboning line.

Technical description

Overhead rail, attached support beams by means of flat steel consoles. All construction parts are galvanized before assembly.

Technical data

Rail type	:	2” tube rail (Ø60,4 x 4,5 mm)
Rail length	:	22 m
Support beam length	:	27.5 m
All steel parts	:	Hot-dip galvanized

The rail system is equipped with:
- Required rail curves
- Required galvanized fastening materials

C.6.2. Weighing system before Cutting and Deboning

The product is transported on and off manually.

This system consists of:
- 1 Multi range overhead tube rail scales
- 1 Terminal:

Digital weight indicator provided with a TCP/IP communication port. The weighing terminal can be connected to an external HOST system to store or process the received data.

Rail scales

Including weigh guiding, length 800 mm. Delivery conform IP 65.

Maximum weight	:	300 kg.

Resolution

0 - 300 kg	:	50 g.

C.6.3. Drop table

Drop table for cattle quarters.

Technical data

Length	:	1.000	mm
Width	:	1.000	mm
Height	:	900	mm
Thickness PE cutting plate	:	30	mm

C.6.4. Slat belt conveyor for gross & nett meat products incl. CIM cleaning

Slat belt conveyor for gross and nett meat products

Technical data

Length	:	5.000	mm
Width	:	900	mm
Height	:	900	mm
CIM cleaning	:	included	

Slat belt conveyor is controlled standalone, customer has to provide power connection.

C.6.5. Deboning tables with PE cutting plate (20 mm thickness)

Working table for deboning cattle quarters.

Technical data

Length	:	1.500	mm
Width	:	600	mm
Height	:	900	mm
Thickness PE cutting plate	:	20	mm

C.6.6. Turning table at the end of the cutting line

Turning table.

Technical data

Width	:	1.800	mm
Height	:	700	mm

C.7. White offal treatment

C.7.1. Table for receiving white offals

Stainless steel table for white offal treatment.

Technical data

Length	:	8.000	mm
Width	:	1.000	mm
Height	:	700	mm
Thickness	:	3	mm

C.7.2. Working table for offal treatment

Stainless steel table for offal treatment.

Technical data

Length	:	1.600	mm
Width	:	1.000	mm
Height	:	700	mm
Thickness	:	3	mm

C.7.3. Compressed air conveyor for mannure

System for conveying manure through a tank and pipe system with the aid of compressed air.

Technical description
All stainless steel collection tank with filling funnel and pneumatically operated shut-off valve.
The collection tank is fully or partially grouted into the floor or placed in a prepared pit.
The required suspension supports and fastening material are galvanized.

Technical data
Collection tank and filling funnel

Tank capacity	:	150 litre
Shut-off valve	:	shut-off valve with pneumatic cylinder
Shut-off valve diameter	:	250 mm
Electrical control system	:	manual and automatic operation with adjustable timer

Electrical and pneumatic components in standard construction.
Electricity and compressed air connections not included. The compressed air conveyor has a small panel to control. Constructional work not included.

Customer has to provide power connection.

Piping for compressed air conveyor
TYPE : RMSCAS

For the transport of manure from a compressed air conveying tank to collecting silos or containers.

Technical description
Stainless steel pipe line with curves and suspension supports.

Technical data

Transport pipe	:	Ø 150 mm
Transport pipe length	:	25 m
Decompression cyclone	:	J pc.

C.7.4. Crushed ice generator incl. control unit and cleaning system

Flake ice machine with integrated condensing unit (air-cooled execution)

Output	:	500 kg / 24 h 1100 lbs / 24 h
Water consumption	:	0,5 m³ /24h
Width	:	776 mm
Depth	:	581 mm
Height	:	996 mm
Condensing unit	:	air-cooled
Refrigerant	:	R 404A, others on demand.
Electrical connection	:	2,29 kW / 3.1 h.p.
Special voltage	:	on demand
Weight	:	180 kg
Water supply	:	¾" external thread; drain water ¾" hose clip.
Water supply temperature	:	+ 16°C (+60,8°F)
Ambient temperature	:	+ 20°C (+68,0°F)

Higher temperatures may lead to reduced ice output.
Min. distance at the left side for evaporator tank removal 400 mm
Min. distance to rear wall for exit air 300 mm.

Electrical control
Control panel inclusive of stainless steel wall support and 5 m cable for remote operation of ON/OFF pushbuttons. With function and error code indication, start/stop function of self-cleaning system MAJA-SCS and automatic residual water outlet

Customer has to provide power connection.

C.8. Sheep emergency slaughter line

C.8.1. Bleeding rail for sheep

Declined rail for the bleeding of sheep carcasses.

Technical description
Overhead rail, attached to support beams by means of flat steel consoles. All steel construction parts are galvanized before assembly.

Technical data

Rail type	:	2” thick walled tube rail (Ø60,4 x 10 mm)
Rail length	:	5.000 mm
Rail stop	:	1 Pc. Manual stop
All steel parts	:	Hot-dip galvanized
Guiding bars/profiles	:	Stainless steel

The rail system is equipped with:
Required galvanized fastening materials

C.8.2. Dressing rail for sheep

For the manual transport and storage of hooks with sheep carcass. The carcasses are transported manual from working position to working position.

Technical description
Overhead rail, attached support beams by means of flat steel consoles. All construction parts are galvanized before assembly.

Technical data

Rail type	:	2” tube rail (Ø60,4 x 4,5 mm)
Rail length	:	6.000 mm
Support beam length	:	8.000 mm
All steel parts	:	Hot-dip galvanized

The rail system is equipped with:
Required rail curves
Required galvanized fastening materials
2 Suspension support, type Y or H

C.8.3. Transport rail for racks

For the manual transport and storage of sheep racks to the cattle slaughter line.

Technical description
Overhead rail, attached support beams by means of flat steel consoles. All construction parts are galvanized before assembly.

Technical data

Rail type	:	2” tube rail (Ø60,4 x 4,5 mm)
Rail length	:	5.000 m
Support beam length	:	7.500 mm
All steel parts	:	Hot-dip galvanized

The rail system is equipped with:
Required rail curves
Required galvanized fastening materials

C.8.4. Manual electrical stunning system for sheep

Manual electrical stunning tool for stunning sheep.

Technical description
Stunner E-Stunners are exclusively working on constant Amperage according to the draft of the new Animal Welfare Regulation.

Technical data

Capacity	:	Up to 50 sheep per hour
Power	:	1,5 A
Weight	:	16kg

Excluding:

- Data cable
- Check system

Example of stunning tong with control box.

C.9. Electrical control

C.9.1. Central switch panel

Equipment is controlled standalone, central switch panel is not required.

C.9.2. Cabling

Cabling between power connection and equipment has to be provided local.

C.10. Hygienic equipment

C.10.1. Apron washing cabinet with knife sterilisation unit mounted on platform

To wash apron & hands between slaughter actions

Technical description
Comprising a splash shield with water supply piping integrated, along one of the sides or in an edge, in the platform. The water flow is controlled by means of a foot operated valve.
Splash shield in stainless steel execution.

Technical data

Splash shield height	:	approximately 1,600 mm
Water supply connection	:	1/2”

C.10.2. Apron washer with knife sterilisation unit floor mounted

To wash apron & hands and decontaminate knives between slaughter actions.

Technical description
Comprising a splash shield with water supply piping and water collecting reservoir covered with a removable plastic grating. The water flow is controlled by means of a foot operated valve.
The unit is placed on the floor or integrated in the floor.
Double jacket basin with plastic knife holder for two knifes, hot water supply valve, flow regulator and drain valve. Stainless steel execution.

Technical data

Splash shield height	:	± 1.600 mm
Water supply connection	:	1/2”
Decontamination basin dimensions	:	175 x 175 x 320 mm
Hot water connection	:	3/8”
Drain connection	:	1”
Hot water supply	:	82°C
No. of decontamination units	:	1 Pc.

Example of apron washing cabinet with knife sterilization unit

C.10.3. Hand wash basin and knife sterilisation unit

To wash hands and decontaminate knives between slaughter actions.

Technical description
Funnel-shaped basin with splash shield build on top of support column. The water flow is controlled by means of a foot/knee operated valve.
Double jacket basin with plastic knife holder for two knifes, hot water supply valve, flow regulator and drain valve.
Stainless steel execution.

Technical data

Hand wash basin dimensions	:	450 x 330 mm
Basin edge height	:	± 900 mm
Water supply connection	:	1/2”
Drain connection	:	1”
Decontamination basin dimensions	:	175 x 175 x 320 mm
Hot water connection	:	3/8”
Drain connection	:	1”
Hot water supply	:	82°C
No. of decontamination units	:	1 Pc.

Handwash basin with knife sterilization unit beside

C.11. Working tools

C.11.1. Stunner non-penetrating

Cylindrical trigger operated non-penetrating concussion stunner suitable for cattle.

Stunner
- Non penetrating bolt ensures compliance with religious slaughtering requirements;
- Ergonomically designed trigger suitable for palm or finger operation;
- .25 calibre;
- Simple to use and easy to maintain;
- Low recoil design – safe to operate.

Example of stunner for cattle.

C.11.2. Electro stimulation tool

Low voltage cattle stimulator by debleeding.

The total delivery comprises:

- Tong to clip on the tip of the cattle nose.
- Electrical control unit
- Remote station

Dimension

Stimulator	:	279 x 279 x 170 mm
Remote	:	279 x 178 x 170 mm
Weight approximately	:	4,5 kg (Including remote station)

Electrical connection

Power consumption	:	50 W
Power connection	:	110/220 Volts, 50Hz
Stimulation voltage	:	21V
Stimulation current	:	0.25 A

Example of electro stimulation tool

C.11.3. Cutter for hind feet

Electric hydraulic powered leg cutter for cattle. Designed for optimum handling and maneuverability.

Delivery includes:

- Leg cutter
- Electric hydraulic power unit
- Balancer

Technical data:

Cutter

Air pressure supply	:	180 bar
Control	:	Pneumatic dual anti-tie down
Cutting cycle time	:	0,8 sec
Blade opening at tips	:	150 mm
Weight	:	± 21 kg

Technical data hydraulic unit

Power consumption	:	7,5 kW
Power supply	:	230/400 Volts, 3 phase 50Hz
Air pressure supply	:	3 bar
Air pressure output	:	180-200 bar
Oil flow rate	:	20 L / min
Oil capacity	:	44 liters
Width	:	450 mm
Height	:	750 mm
Length	:	550 mm
Weight	:	130 kg (without oil)

Balancer

Cable extension	:	2.000 mm
Load range	:	20-30 kg.

Example of hind feet cutter

C.11.4. Oesophagus rodding tool

Rodding tool for closing the oesophagus with an elastic clip.

Comprises:

Rodding tool

- Tool in stainless steel.
- Dispenser
- Cutter
- 5.000 clips.

Example rodding tool

C.11.5. Breastbone saw

A powerful high performance electrical driven breastbone saw for cattle. Small and manoeuvrable machine for optimal handling.

Delivery includes

- Saw with saw-blade
- Transformer
- Balancer

Technical data

Saw

Low voltage	:	42 Volt, IP-65
Motor power consumption	:	1.3 kW (approx. 1,8 HP)
Cutting time	:	approx. 4 sec/animal
Saw blade length	:	300 mm
Weight approx.	:	18.5 kg

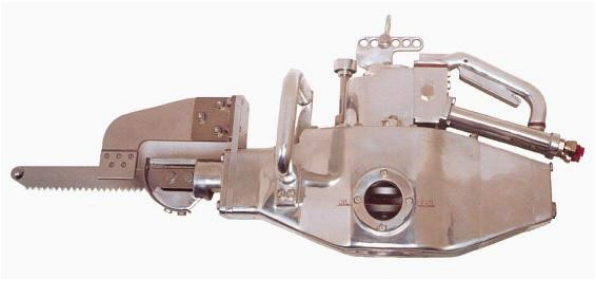
Oil bath lubricated drive mechanism

Transformer

Power consumption	:	2.4 kW (approx. 3,3 HP)
Power supply	:	400 Volts, 3 phase 50 Hz
Air volume	:	0,4 m³ /min
Weight	:	160 kg
Width	:	430 mm
Thickness	:	200 mm
Height	:	530 mm

Balancer

Cable extension	:	2 meters
Load range	:	11 – 20 kg



Example of breastbone saw

C.11.6. Air operated dehiding knife

Pneumatically driven knife for dehiding of cattle.

Technical description:

- Rotating pneumatic knife including one pair of blades
- Air filter-regulator-lubricator
- Hose (5 m) with quick release coupling
- Hanging support

Technical data

Power consumption	:	410 Watt
Operating pressure	:	3,5 bar
Air consumption	:	0,37 m3/min
Control handle	:	Single trigger pneumatic
Knife blade diameter	:	100 / 110 mm
Overall length	:	330 mm
Weight	:	1,3 kg

C.11.7. Splitting saw

Splitting bandsaw for splitting cattle carcasses.

Delivery comprises:

- Splitting saw
- Transformer
- Balancer

Technical data

Saw

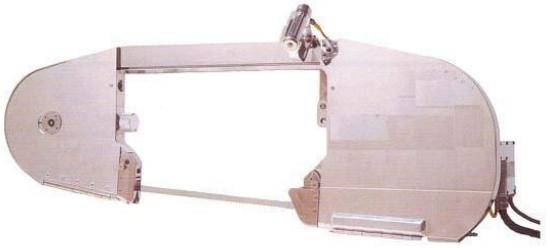
Power consumption	:	2,3 kW (approx. 3,1 HP)
Power supply	:	42 Volts, 3 phase 50 Hz
Water connection 20°C	:	3/8 inch
Distance between the guides	:	500 mm
Weight	:	70 kg

Transformer

Primary side	:	360/380/400/420 Volts 50 Hz
Secondary side	:	42 Volts, 3 phase 50 Hz
Max. output	:	max. 4,8 kW (approx. 6,5 HP)

Balancer

Cable extension	:	3 meters
Load range	:	61 – 70 kg



Example of splitting saw

C.11.8. Vacuum cleaner spinal cord

For the removal of spinalcord, brain, remains of fat and leaflard, lungs of cattle. Vacuum system can be made up from individual components:

- Vacuum tank (stainless steel - available in various sizes)
- Vacuum pump
- Different hoses
- Hand pieces for various applications

Technical data

Length	:	1.500 mm
Width	:	1.200 mm
Height	:	2.070 mm

C.11.9. Quartering saw

TYPE: CIRCULAR SAW.

Electrical driven breaking and quartering saw.

Delivery comprises:

- Breaking saw
- Balancer

Technical data

Saw

Power consumption	:	1.7 kW (approx. 2,3 HP)
Power supply	:	230/400 Volts, 3 phase 50 Hz
Control	:	Electric dual anti-tie down (12V)
Blade diameter	:	230 mm
Adjustable depth of cut	:	0 – 75 mm
Overall length tool	:	610 mm
Weight	:	18,1 kg

Balancer

Cable extension	:	2.000 mm
Load range	:	11 - 20 kg

C.11.10. Suspension for manual tools

Secondary steel construction for the suspension of the hand tool. The balancer whereto the hand tool is attached will be mounted in a movable (one directions) position to the secondary construction.

C.11.11. Hand tool sterilisation unit for cutters etc.

Sterilization unit mounted on the floor.
Sterilization unit in stainless steel execution.
The sterilisers are using hot water from the central water supply without heating.

Technical data:

Hot water connection	:	3/8" / 82°C

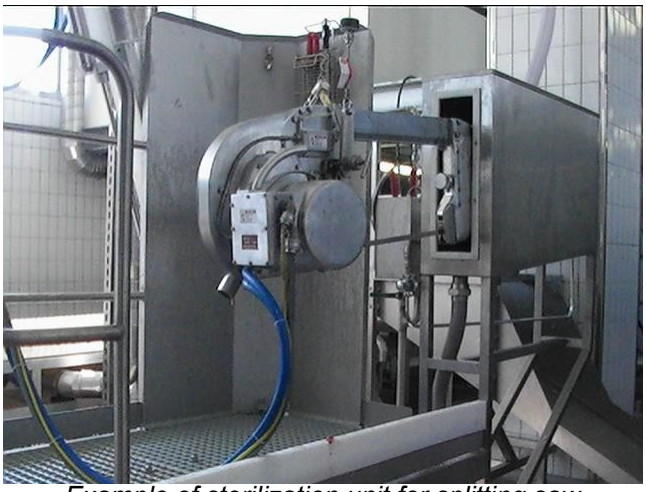
C.11.12. Hand tool sterilisation unit for splitting saw

Sterilization unit mounted on the floor.
Sterilization unit in stainless steel execution.

The sterilisers are using hot water from the central water supply without heating.

Technical data:

Hot water connection : 3/8" / 82°C

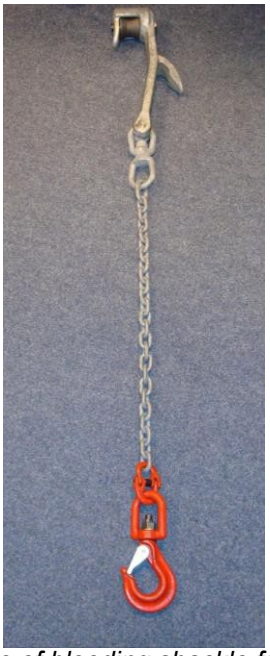


Example of sterilization unit for splitting saw

C.12. Means of transport

C.12.1. Bleeding shackle for cattle

Special cast iron roller hook, bearing roller with ball bearings and hardened shaft, hot dip galvanized chain mounted rotating under the roller hook. Equipped with side hook.



Example of bleeding shackle for cattle

C.12.2. Bleeding shackle for sheep

Galvanized skid with galvanized chain for transport of the sheep after stunning/bleeding until unshackling.

C.12.3. Cattle dressing hook

The roller hooks are made of a special aluminium alloy to reduce the weight of the hook. The galvanized steel roller is mounted with 2 sealed ball bearings on a stainless steel shaft and suitable for tube rail.
Equipped with side hook.
The upper hook is equipped with a dressing hook made out of a 20 mm stainless steel round bar.

Example of dressing hook

C.12.4. Sheep dressing hook

Galvanized slide hook for tube rail.
Stainless steel dressing hook mounted rotating to the upper hook

C.12.5. Sheep rack for the storage of 8-12 sheep carcasses

Sheep rack has to be local supplied.

C.12.6. Trolley for empty cattle hooks

Trolley for the storage and transport of transport hooks

Technical description
The galvanized trolley is equipped with two fixed and two swivel wheels, hand grip, and hook storage rails.

Technical Data:

Loading volume	:	± 130 sliding hooks or ± 76 roller hooks
Dimensions (LxWxH)	:	1.300 x 700 x 1.420 mm

Example of empty hook trolley

C.12.7. Trolley for cattle heads

Trolley for the storage and transport of cattle heads

Technical description
The stainless steel trolley is equipped with two fixed and two swivel wheels, hand grip, and head storage hooks at both sides.

Technical Data:

Loading volume	:	approximately 24 heads
Dimensions (LxWxH)	:	1.650 x 850 x 1.920 mm

C.12.8. Trolley for red organs

Trolley for the storage and transport of red organs

Technical description
The stainless steel trolley is equipped with two fixed and two swivel wheels, hand grip, and storage hooks at both sides.

Technical Data:

Loading volume	:	40 pieces (depends on storage method)
Dimensions (LxWxH)	:	1.650 x 800 x 180 mm

Example of trolley with livers

C.12.9. Trolley 200 ltr

Liftable trolley for the transport of meat products.

Technical description
The stainless steel trolley is equipped with four wheels, hand grip and elevator fittings.

Technical Data:

Max. loading volume	:	200 Liter.
Dimensions	:	760 x 720 x 700 mm

Example 200 ltr car

C.13. Engineering

C.13.1. Engineering of secondary steel construction

Engineering of secondary steel construction above the slaughter line and the cooling and dispatch area.

C.14. Waste water treatment

C.14.1. Process design

G.13.1.1. General production data

Type of industry	Cattle and sheep slaughtering and processing	
Cattle:		
Line speed processing plant	10	animals/h
	80	animals/d
Life weight	400	kg
Water usage	900	l/animal
Pollution load	3.750	gr. COD/animal
Sheep:		
Line speed processing plant	50	animals/week
Life weight	35	kg
Water usage	75	l/animal
Pollution load	200	gr. COD/animal
General:		
Processing time	8 –12	h/d
Wastewater supply (incl. cleaning)	10 – 14	h/d
Production days	5	days/week
Ambient temperature	10 < t < 35	°C
Height above sea level	1.400	m

G.13.1.2. Raw wastewater characteristics

	Solution	
Daily flow	75	m^3/d
Hourly flow	7,5	m^3/h
Maximum hourly flow	12	m^3/h

	Concentration		Load	
COD	4.100	mg/l	300	kg/d
BOD^5_{20}	2.300	mg/l	167	kg/d
TKN	350	mg/l	25	kg/d
$N\text{-}NH_4$	< 50	mg/l	4	kg/d
Oil & grease (APHA standard nr2530C)	800	mg/l	60	kg/d
TSS	1.200	mg/l	90	kg/d
Chloride	< 250	mg/l	19	kg/d
Total phosphor	< 45	mg/l	3	kg/d
Alkalinity	> 200	mg/l	> 15	kg/d
Water temperature	15 – 25	°C		
pH	6 - 8			

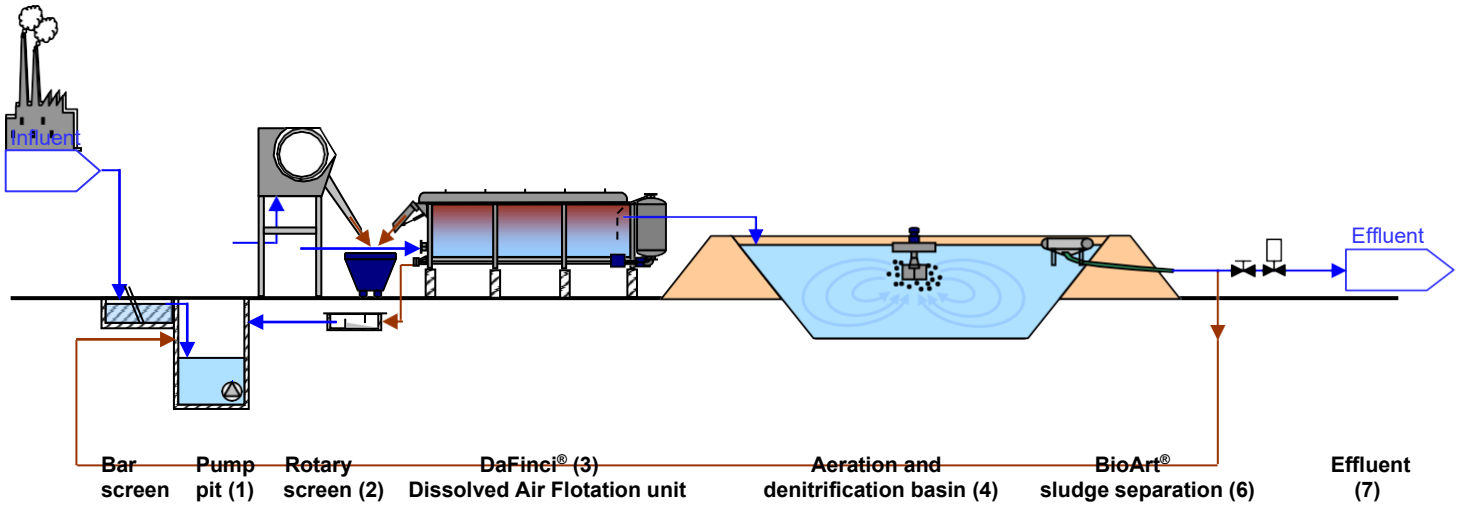
The above stated figures are based on our experience and consideration of production data.and data supplied by the customer. In case the mentioned data does not reflect the actual situation, customer should inform Aqua as soon as possible or Aqua will assume the mentioned data and will it form the basis of the system design.

C.14.2. Solution

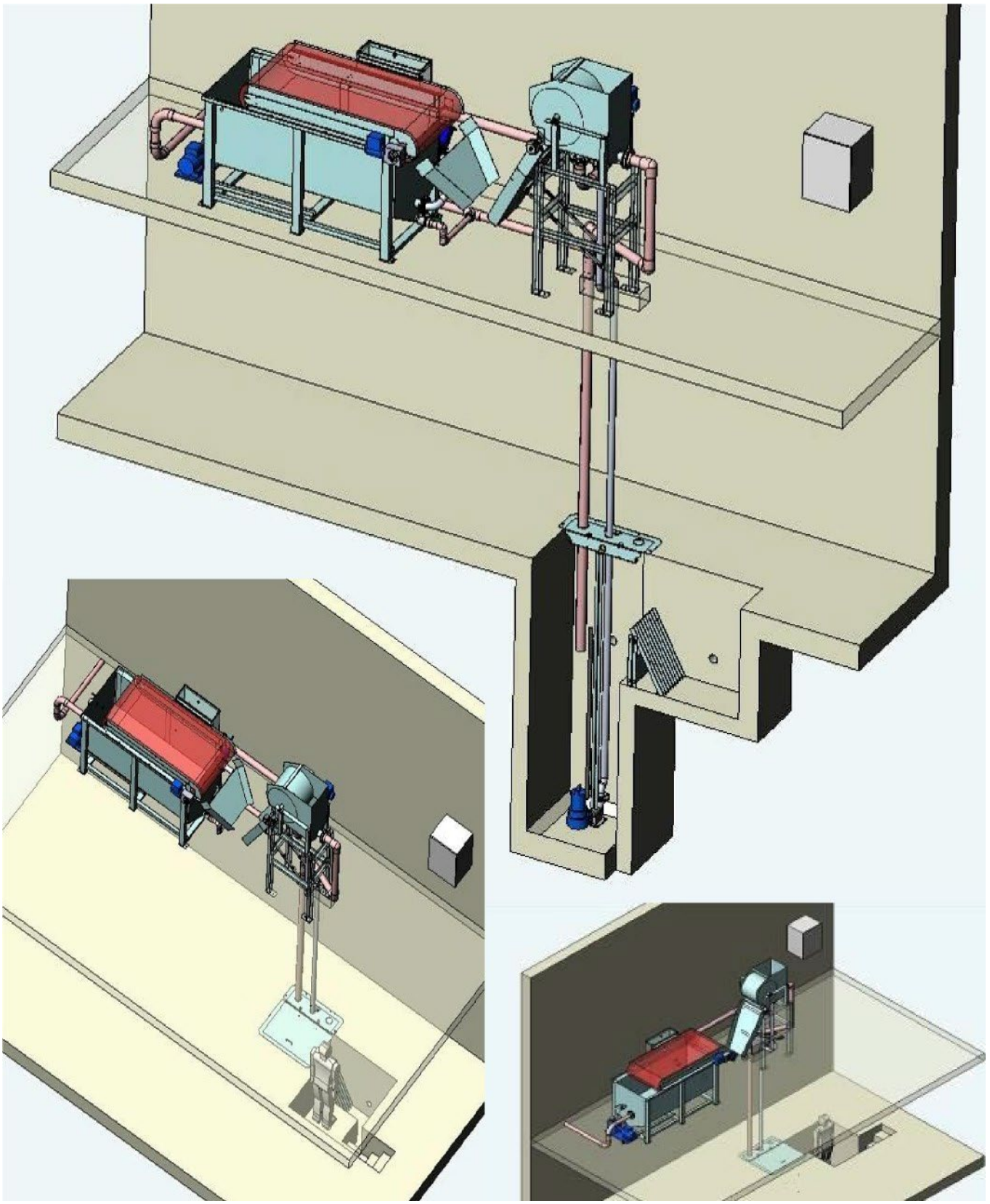
The solution presented in this budget offer consists out of the following main steps: Physical pretreatment and BioArt® Biological treatment

G.13.2.1. Flow diagram

The proposed treatment system can be illustrated in the following flow scheme:



G.13.2.2. Pre-treatment possible layout.



C.14.3. Summarised item description

PRODUCT DESCRIPTION	FUNCTION
PRETREATMENT	
Influent pump pit	
Submersible pump with big free passage Non clog level control system Guide bars for easy mounting and coupling	Supply of collected wastewater from pumppit to treatment plant.
Screening system	
Rotary screen Rotary screen scraper and spray installation. Stainless steel chute and support	Mechanical protection of downstream equipment by removing of coarse solids that could cause clogging or damage.
DaFinci® Dissolved Air Flotation system	
Dissolved Air Flotation cell Recirculation system with air supply device Scraper for removal of flotated sludge Sediment discharge provision Flotated sludge discharge chute	Removal of fine particles and oily substances by separation.
Biological treatment	
Denitrification and aeration basin	
Surface aeration system Denitrification system	Biodegradation of organic pollutants by the activated sludge process.
BioArt® sludge separation system	
Discharge device for treated water Sludge discharge system	Separation of mixed liquor into biosludge and water by means by settling in SBR (sequencing batch reactor) or aeration basin.
Electrical control system	
Central Switch Panel with touchscreen Varlog and communication system	Controls the water treatment process.

C.14.4. System information

Utility requirements	
Electrical connection	400 Volt, 3 Phases
Electrical frequency	50 Hertz
Pressured air	Max. 0,5 $nm^3/hr.@$ 7 bar
Power consumption (excl. options)	240 kWh/d
Installed power (excl. options)	20 kW

Required construction works	
Building for equipment	6,0 x 8,0 x 4,0 m
Foil basin	$13,8^{@45^\circ}$x $13,8^{@45^\circ}$ x 3,5 m

All civil construction works by our directions and for account of client

Required manpower	
Supervision, maintenance etc.	~ 2 man h/d

Sludge from pretreatment	
Dry solids content	10 %
Sludge amount	~0,3 m^3/d

Biological excess sludge	
Dry solids content	2,0 %
Sludge amount	2,5 m^3/d

Total sludge (combined discharge)*	
Dry solids content	3,0 %
Sludge amount	2,9 m^3/d

Expected effluent parameters **	
COD	≤ 150 mg/l
BOD_5	≤ 50 mg/l
TKN	≤ 30 mg/l
FOG	≤ 30 mg/l
SS	≤ 50 mg/l

* The total sludge amount is achieved when the biological sludge is returned to the pretreatment flotation unit.
** The effluent parameters are based on 24hour sampling and proper maintenance.

Colour indications after

C.14.5. Description of the treatment process

The treatment process proposed for the wastewater is described in the next paragraph(s).

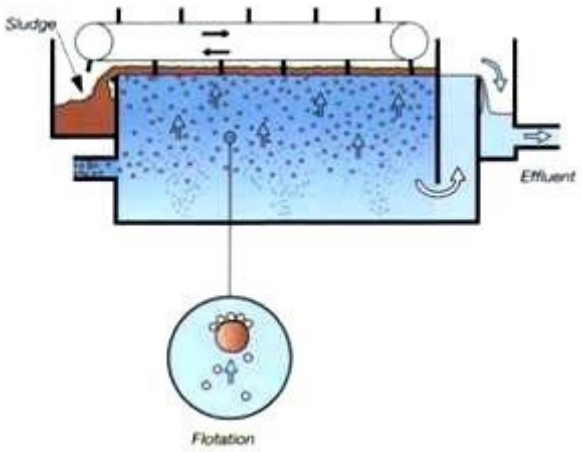
G.13.6.1. Pretreatment

The most challenging form in which pollution can be present in wastewater is the dissolved form. In this case, the pollution can only be removed from the wastewater with great effort. It is therefore essential to prevent dissolving of the pollutants as much as possible. To accomplish this, the water has to be pre-treated as quickly as possible.

The best results are obtained by pre-treating the wastewater by means of pollutant specific pretreatment installations. Pre-treating the wastewater in this way offers another advantage: the different pretreatment installations yield their specific pollutant in a very concentrated, pure form.

G.13.6.2. Physical pretreatment
Physical pretreatment removes sediment, most of the suspended solids and fat, oil & grease (FOG) from the wastewater. To ensure mechanical protection of the system it is usually required to start the treatment with the removal of coarse solids. Should this be required, the wastewater will be pumped over a finely mazed screen to remove the coarse particles. The next stage in physical pretreatment is Dafinci® Dissolved Air Flotation (DAF).

Sand, suspended solids, fat, oil and grease are separated from the wastewater by a DAF unit. The DAF unit creates a multitude of micro-air-bubbles that become attached to similar sized and bigger particles, increasing the buoyancy of these particles. The micro-air bubbles usually range in size between 20 and 40 micron.



Most of the suspended solids and fat particles in the wastewater are bigger and micro air bubbles will eventually attach to them, making the lighter ones rise quickly to the surface of the DAF unit, where a scraper unit removes them. The tendency of heavy solids to settle will hardly be effected by the micro-air-bubbles, they just settle a little slower and accumulate at the bottom of DAF unit.

Complete automatic sediment removal is possible when the bottom gutter of the DAF unit is equipped with a sediment discharge auger. In that case, the auger will periodically start and convey the sediment to the front of the DAF unit where it will be removed by opening of an automatic gate valve. In case the DAF unit is not equipped with a sediment discharge auger it can be drawn by opening a valve.
The flotated sludge can be discharged by gravity via a chute or can be pumped to the next stage (e.g. a sludge dewatering system) using the optional flotated sludge transport equipment.

G.13.6.3. Aerobic biological treatment

The influent enters the biological system during production hours. Before, during and after production hours the wastewater is treated and discharged (24 hours/day).

From the production or pretreatment, the wastewater flows into a 'contact basin' or 'selector' to limit the growth of filamentous bacteria (filamentous bacteria form activated sludge, which is difficult to separate) and stimulate growth of flock bacteria. For the selection process, bacteria require energy, which they can produce under aerobic or anoxic conditions (anoxic = presence of nitrate in the wastewater under oxygen free conditions).

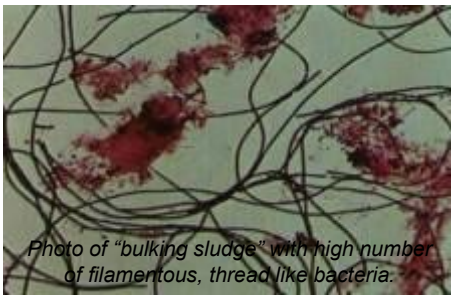


Photo of "bulking sludge" with high number of filamentous, thread like bacteria.

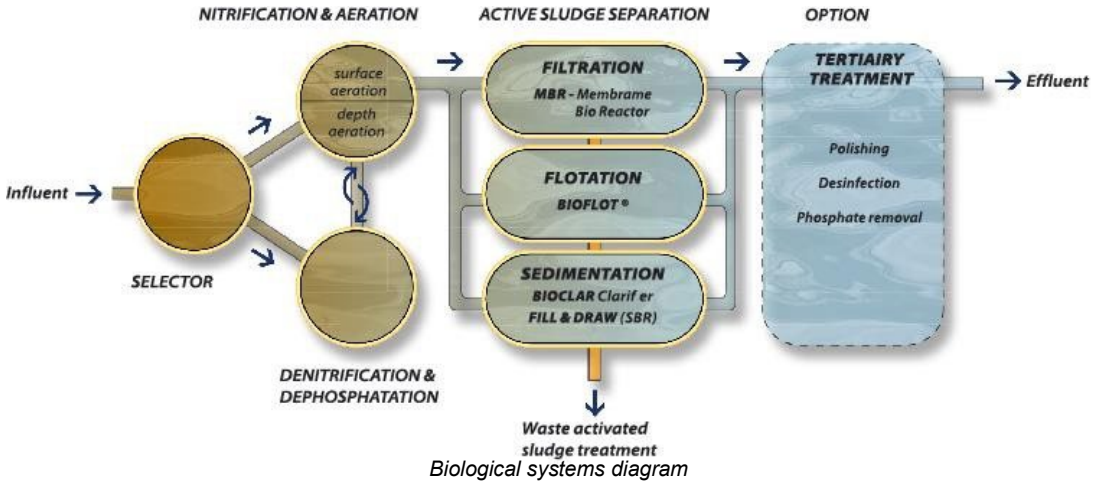
After selection the wastewater will flow into the aeration basin that is filled with an activated sludge-water mixture, the so-called 'mixed liquor'. Activated sludge consists of flocs of bacteria. In the presence of oxygen, the bacteria will decompose the biodegradable constituents in the wastewater. In general the pollutants are composed of carbon, hydrogen and nitrogen bearing compounds. The oxygen is supplied to the wastewater by either depth aeration or surface aeration. The mixed liquor is kept from separating by the mixing action and the turbulence caused by the rising air bubbles. During aeration periods the pollutants will be gradually decomposed (oxidised) by the bacteria. Eventually almost all the pollutants will be converted into carbon dioxide, water and nitrate. These components do not contribute to the BOD_5- and COD level.

A high nitrate concentration is not desired in the effluent as it is an excellent fertiliser and can cause severe algae growth, resulting in extinction of flora and fauna in the stream. Converting the nitrate into nitrogen gas can reduce the nitrogen concentration. This process is called denitrification and takes place in absence of oxygen, in either a separate denitrification basin or in the aeration basin during periods when the aeration has been switched off. Other possible reasons for denitrification are:

- Prevention of floating sludge in sedimentation systems (i.e clarifier).
- Denitrification consumes half of the acids formed during nitrification. As such it could prevent investment in pH control equipment
- It reduces the energy consumption of the system.

The bacteria will only decompose the pollutants to the above-mentioned harmless products if the amount of pollutants (food) per bacteria is kept very low. Under these conditions the bacteria will almost starve and will decompose all the food as much as possible in order to release sufficient energy to keep their life support systems running. They will hardly get enough food in order to grow or multiply. This system of continuous starvation of bacteria is called a low loaded activated sludge system.

In order to keep enough food available per bacteria enabling them to survive, their number has to be kept within certain limits. This is achieved by removing the excess bacteria (the so called 'excess sludge' or 'surplus sludge').



Biological systems diagram

G.13.6.4. Excess sludge removal
Several ways are open for excess sludge removal, viz.

- Separate discharge of biological excess sludge to e.g. a sludge tank. Discharging the excess sludge in this way is convenient when it is applied as a liquid fertiliser for agriculture.
- Dewatering of the excess sludge by a sludge dewatering system.

G.13.6.5. Phosphate removal
In case advanced biological phosphate removal is insufficient to meet the effluent phosphorus demands, a phosphate removal agent will be dosed (lime or soluble ferric or aluminium salts).

G.13.6.6. Effluent disinfection, re-aeration & final discharge
After biological treatment the water can be disinfected to inactivate or kill micro-organisms and viruses. To increase the oxygen concentration in the treated water the effluent can be fed over a cascade for aeration.

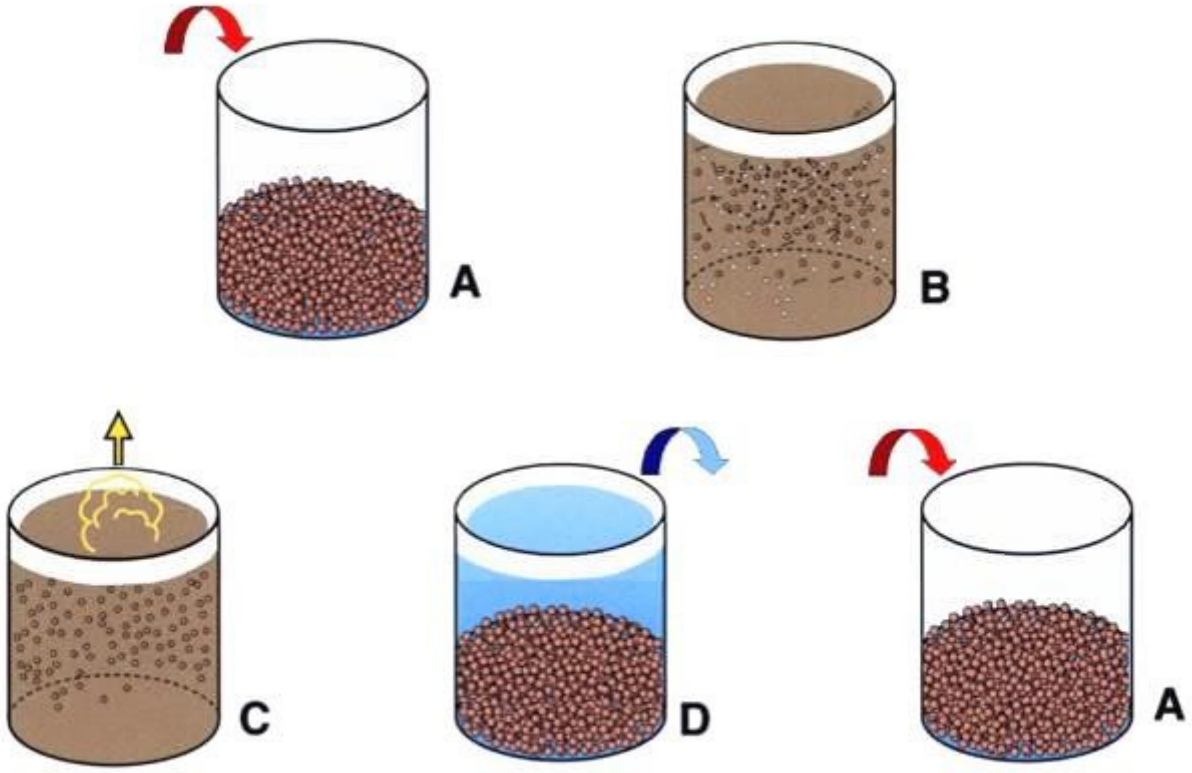
C.14.6. Sludge separation

The activated sludge must be separated from the purified water. The following separation method is applied for the treatment system.

G.13.7.1. AQUA I.W. BioArt®
The AQUA I.W. BioArt® system (see picture below) applies sedimentation to separate the activated sludge from the water. This takes place in the aeration basin after stopping the aeration and mixing system.
After the last effluent drain, the aeration basin is ready to receive raw wastewater **(A)**. Activated sludge is slightly heavier than water and by nature will separate from the water by sedimentation, however a little turbulence is all it takes to keep it in suspension **(B)**. In the aeration basin there usually is plenty of turbulence that prevents this from happening: turbulence caused by the rising air bubbles and/ or mixing action.
To make effluent separation possible, the mixing and aeration is stopped and as a consequence the activated sludge flocs will start to settle **(C)**.

The sludge will accumulate on the bottom of the aeration basin, the clean water on top will be drained off **(D)**. After decanting the clean water (the 'effluent'), the aeration basin will be ready to receive raw wastewater again **(A)**.
A unique feature of this discontinuous process is the exceptional low total nitrogen concentrations that can be obtained compared to continuous effluent separation processes. This, since effluent separation can

allowed proceed when all Kjehdahl nitrogen has been nitrified and all nitrite and nitrate has been denitrified, thus making it (theoretically) possible to discharge 0 mg/l total nitrogen. However, sophisticated on-line water quality monitoring equipment is usually required to actually make this possible.



Features of a AQUA I.W. BioArt® (SBR) system:

- System is easy to operate
- A proven technology
- Low maintenance costs

C.14.7. Physical pretreatment

G.13.8.1. Sediment gutter with bar screen

To protect the equipment from high TSS loads sediment gutter will be installed before the influent enters the pump pit. Secondly the settled sediment in the DAF unit is periodically discharged over the sediment gutter. Due to the high speed (10 m/s), the sediment water flow is decelerated by a baffle plate in order for the sediment to settle. Sediment will settle against the overflow-weir and water will flow over it. The settled sediment can easily be removed.

This option requires the waste water from the factory to enter the waste water treatment installation no lower than 0,25m under floor level or a partial lowered floor section to make sediment removal possible. The sediment gutter should be cleaned once a day to prevent odours.

* Material

Baffle & overflow weir	: Stainless steel
Bar screen	: Stainless steel
Gutter	: Concrete, part of local works

G.13.8.2. Influent pump pit

Equipment required to pump the water to a higher elevation. The pump is fed from a small buffer; the pump pit or lift station. This small buffer is a potential source for undesired effects: it may provide time for heavy solids to settle, light pollutant to float and/ or to agglomerate into bigger solids. These effects can be avoided by keeping the buffer volume as low as possible. The below stated equipment is able to function trouble free in this environment.

The first pump pit contains:

- Centrifugal feed pump with a large free passage to prevent blockage of the pump caused by coarse materials.

Type	: Submersible centrifugal pump
Quantity	1
Output	: 13 m³/h
Power	: 1,9 kW
Material	: Cast iron
Head	: 6 mwc
Water temperature	: Max. 40 °C

- Easy mounting coupling with guide bars which allows quick pump extraction for inspection and cleaning
- Mounting equipment with lifting chain and 10 m electrical cable
- Level sensor with adjustable level points and alarm indication

G.13.8.3. Rotary screen set

Larger solids may represent a significant fraction of the total pollution load. They can cause blockage of important parts of the wastewater treatment and may dissolve quickly making it more difficult to remove them from the wastewater. Hence a screen is applied to remove them from the water.

This screen is largely selfcleaning, making it almost maintenance free in its day to day operation. The self cleaning ability is a result of the shape of the slots and the way the water passes through the screen. The screen's drum consists of single triangular shaped wire which has been spirally wound and welded on support rods to create a drum with wedge shaped slots. The distance between the wires is smallest on the outside and biggest on the inside. The triangular shape of the maze makes it very difficult to block.

The water enters the screen in an inlet compartment. The water then has to pass the screen twice to reach the effluent side of the screen; after the first passage the coarse materials are left behind on the outside of the drum, at the second passage any materials blocking the screen are removed.

The rotary screen set consists of:

- Rotary screen:

Quantity	1
Type	: R500
Capacity	: 13 m³/h
Power	: 0,37 kW
Slot width	: 0,8 mm
Dimensions (l x w x h)	: 0,8 x 1,0 x 1,0 m
Material	: Stainless steel AISI 304
Drum speed	: Manually adjustable by means of a variator

- Stainless steel support with a maximum height of 2,5 meters
- Stainless steel chute to guide the screened material into a container or bin

G.13.8.4. Dafinci® Dissolved Air Flotation (DAF) unit

Free oil and fat is separated from the water by means of Dissolved Air Flotation. To float oil, fat or flocs, a multitude of air bubbles are injected at the bottom of the unit. The air-bubbles adhere to the floating particles forcing the particles to float on the surface. As a result a sludge layer is formed on the water surface which is scraped off by a special designed skimming device. A chute or a sludge pump discharges the scraped off sludge. In case of a chute the sludge is discharged by gravity into e.g. a container. Sediment that is too heavy to be floated will settle at the bottom where it can be drawn from the unit by opening a valve. Optionally, the DAF-unit can be provided with a sediment auger, the auger will thicken and force the sediment automatically out of the unit.

- Dafinci® Dissolved Air Flotation cell
  Specifications of the dissolved air flotation unit are:

Type	: F029/15-24
Dimensions (l x w x h)	: 3,7 x 1,9 x 2,1 m

- Sludge thickening and scraping device
  The flotated sludge gathered at the water surface forms a sludge layer. Through special designed static thickeners inside the DAF-unit, the sludge layer gets thicker. The thicker the sludge layer, the more water will seep out of the top sludge layer and sludge with less water is skimmed off by the scraper device.

Power	: 0,37 kW
Including	: Adjustable variator

- Saturation system
  Effluent water is gathered and together with air pressurised in a so called saturation vessel. As the pressure will rise up to 6 bar, air will dissolve in the water. The air-saturated water is pumped back to the bottom of the DAF unit where under atmospheric conditions specially designed expansion nozzles release a multitude of micro air bubbles from the saturated water. Saturation is achieved by:
  - Saturation pump

Type	: Dry installed centrifugal pump
Power	: 5,5 kW
Material	: Cast iron
Head	: 60 mwc

  - Vessel

Material	: Stainless steel

- Sediment discharge
  Particles with high density can't be floated and will settle on the bottom gutter of the DAF instead. By opening a hand valve at the bottom of the DAF-unit, the water pressure inside presses the sediment out of the unit.

- Sludge discharge chute
  The material that is removed from the wastewater is pushed by a mainly stainless steel scraper mechanism into the sludge disposal module. The sludge disposal module forms a separate part of the DAF unit. It is completely detachable and can be replaced by a sludge discharge compartment with pump (optional).

For discharging floated sludge in a container by gravity a chute is mounted:

Material chute	: Stainless steel

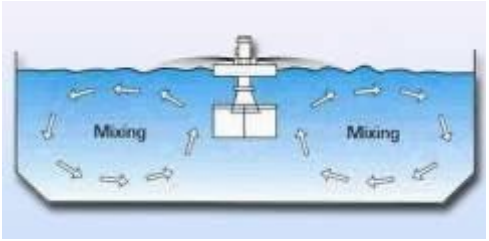
C.14.8. Aerobic biological treatment

G.13.9.1. Combined denitrification and aeration basin

In the aeration basin the activated sludge organisms convert the absorbed BOD/COD.
Aerobic periods are interrupted with anoxic periods to remove the nitrate formed by the nitrification process. Lack of oxygen forces the bacteria to use alternative oxygen sources, such as nitrate (NO_3^-). Nitrate formed in the aeration basin can thus be removed.

G.13.9.2. Floating mixer/aerator

AQUA I.W. mixer/aerator is a unique surface aerator designed for combined mixing and aeration. In it water is pulled through a pipe that extends below the float by a screw impeller and consequently sprayed just a small distance above the water surface.



- By sucking the water from below the float an intense, wide and deep flow pattern is created in the basin that prevents solids from settling in a large area.
- The low spray height tends to destroy foam, keep aerosol odour formation down and result in a low noise output.

The aeration prevents anaerobic conditions & prevents odour.

- Floating mixer/aerator for combined mixing and aerating.

Type	: MA 1100-50
Quantity	1
Power	: 11,0 kW
Material	: Stainless steel
Mounting equipment	: Lifting eyes, mooring eyes, springs

G.13.9.3. Sludge separation system

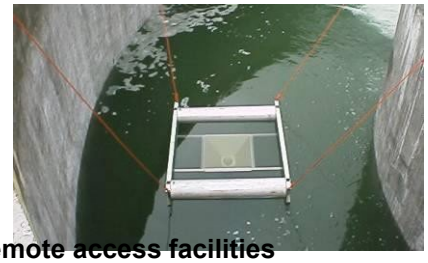
The (biological) sludge has to be separated from the water for 2 reasons:

- The organisms themselves represent a certain BOD/COD value. If they are discharged along with the effluent, most likely the effluent demands will not be met.
- The majority of the organisms must be circulated back into the system to take up and convert pollution again.

G.13.9.4. Floating drain

Effluent discharge system with flexible tube, coupling and necessary manual and automatic valves.

Type	: Floating drain
Quantity	1
Capacity	: 75 m³/h
Material	: Stainless steel

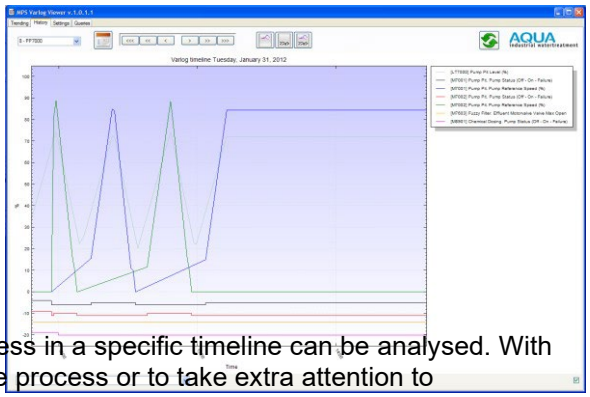


C.14.9. Remote access facilities

The main control panel is equipped with a VPN based remote access connection. This connection allows 24/7 remote assistance from our office. Our helpdesk can be reached 24 hours per day and 7 days per week. The VPN facilities (Cisco or Windows client) have to be available before start-up of the installation.

C.14.10. Varlog, database, analysing and diagnostic tool

The Varlog PC is connected to the PLC and has datalog capacities for PLC connected analogue process values and stores also binary status of process items like pumps, valves and similar items (on-off-failure).
Also all PLC operator panel (HMI) service messages are stored in the Varlog database. For example emergency stop messages, high level errors, pump motor failures, are stored with total stop time and number of times this error occurred.



With preset filters a process trending of a part of the process in a specific timeline can be analysed. With these information a diagnose can be made to optimize the process or to take extra attention to maintenance of a specific part of the installation.
Using the VPN connection also the AQUA I.W. process engineer can use this information for customer service support or give advises for process optimizing issues. The data will be stored for about 2 months.
We suppose that the varlog PC will be installed near the central switch panel in a office room at a desk provided by customer, an alternative office can be used using an local administration Ethernet network.

The delivery consists of:

- Personal computer with standard monitor

- Varlog database and application runtime software
- Connection to the PLC
- Set-up and start-up of the Varlog system

C.14.11. Electrical control system

The electric control system is designed to control the process items which are mentioned in this quotation, with the exception of equipment which contains its own control panel. Engineering of the hardware is according to the standards NEN EN 61439 and the NEN EN IEC 60204.

The control system comprises:
- Central Switch Panel (CSP) with build in PLC
- Operational Software
- Field components

G.13.12.1. Central Switch Panel with touchscreen

The control switch panel contains all components to control the wastewater treatment system. Equipped with a PLC the panel offers all possibilities to check upon and adjust the process.

For adjustments, a touch panel functions as an interface between operator and PLC. The Human Machine Interface (HMI) display shows actual status of pumps, level sensors and displays alarm messages. Besides indicating, the display is also used to alter settings, e.g. level sensor parameters, programmable clock settings, pump-modes (automatically / manually) etc..

The central switch panel is made of coated steel. Wall mounted or floor standing panel. The cabinets are executed according protection class IP55 and have to be placed in a separate control room next to the process area with max 90% humidity at 20°C and a surrounding temperature between 10°C and 35°C.

The CSP comprises:
- Main switch (4 poles) is not fused in CSP
- 24VDC Power supply
- PLC
- I/O cards
- PLC operator panel in the front
- Motor control groups
- Emergency stop, control buttons and signal lamps in front of the CSP
- Emergency stop relay
- All delivered software, specifications and materials are AQUA I.W. standard

G.13.12.2. PLC operator Panel, Human Machine Interface (HMI)

With the PLC operator panel (HMI), which is integrated in the central switch panel, the installation can be monitored and controlled in a simple and operation friendly manner. By using this system the actual values, of all registered process parameters, can be displayed or set points can be changed.
For example:
- pH level
- Oxygen level
- Pump pit level

Benefits of the HMI:
- Solve problems in a single glance! Therefore a high plant availability.
- Errors are quickly identified and can be solved quickly, simple acts are directly removed by the plant

operator, without consulting the maintenance staff.

- Control the process items at the central PLC operator panel. Start/stop (parts of) the installation or chance the status of an item (On-Off-Handmode)

G.13.12.3. Operational software

Advantages of a PLC and HMI based control system are among other things:

- Low malfunction rate
- Operation friendly due to PLC operator panel
- Central access to all parts of the control system for remote access and communication to optional AQUA I.W. Varlog, (PC based Database storage, analysing and diagnostic tool) or SCADA

Examples: