# Concept Design Report for Monserud RA900 WWTP FOG Removal Mechanism

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| Project name | **Monserud RA900 rehabilitation** |
| Project no. | **1350051301** |
| Recipient | **Ringerike Monserud** |
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| Date | **February 16, 2023** |
| From | **Hariprasad CP** |
| Prepared by | **Sreelakshmi C** |
| Checked by | **Hariprasad CP** |
| Approved by | **David Evangelisti** |

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# Table of Contents



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# 1. EXISTING GRIT AND GREASE CHAMBER MECHANISM

This section provides a background on the existing grit and grease chamber mechanism at the Monserud RA900 WWTP and its dimensional details.

## 1.1 Dimensional details of Grit and Grease chamber

The below description provides the dimensional and level details for the existing grit and grease chamber for Monserud RA900 WWTP.

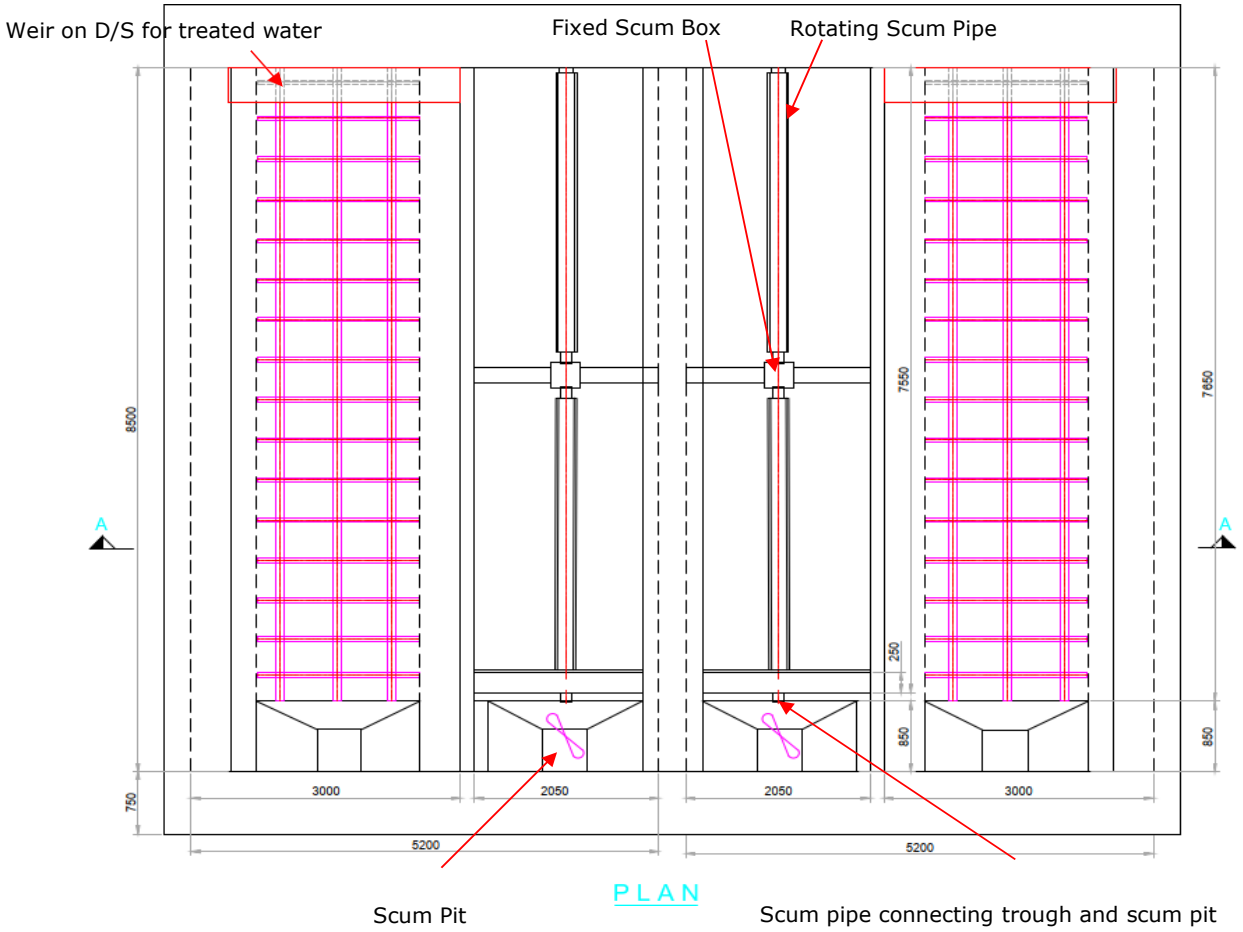



***Fig 1: Plan drawing for existing grit and grease chamber with grit and grease removalmechanism***

The existing process consists of two grit and grease chambers. The grit chamber is 7.65 m long and 3m wide and grease chamber is 7.55 m long and 2 m wide. The grit chamber has bottom scrapers to remove the settled grit and carry it to grit collection pockets on the upstream side of the chamber. The grit collection pocket is 0.85m long and 3 m wide. There is a weir arrangement on the downstream side of grit chamber to collect the treated water. All the dimensions are measured based on the available drawings in pdf and 3D laser scans. A tolerance limit of ± 50 mm can be considered overall.

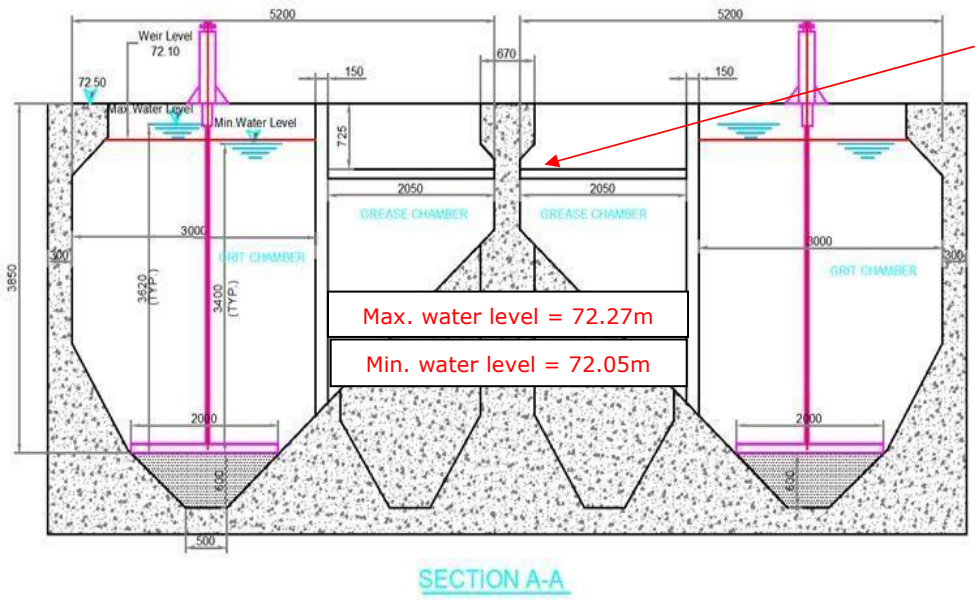
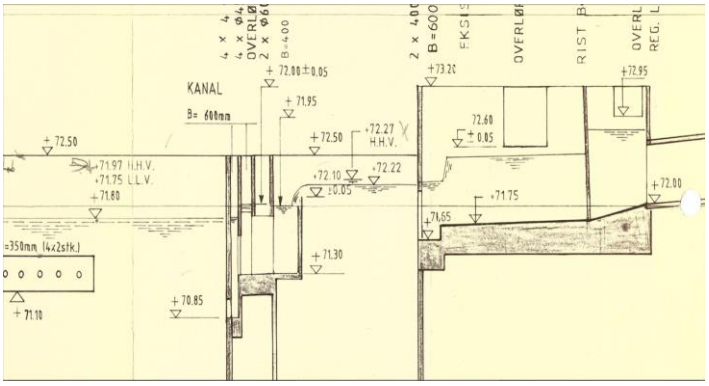



***Fig 2: Section for existing grit and grease chamber with removal mechansim***

The hydraulic profile (Utvidelse RA-Monserud hydraulisk profil 1993) gives following water level data:
Minimum water level = 72.05 m
Water level at $Q_{dim}$= 72.10 m
Water level at 6*$Q_{dim}$ = 72.22 m
Water level at 8*$Q_{dim}$ = 72.27 m
(Refer to hydraulic profile image attached here)

Each grit and grease chamber is designed to handle maximum hydraulic flow of 8*$Q_{dim}$.
Based on this data, we have a water level tolerance of 220 mm (Minimum WL – Maximum WL) in grit and grease chamber.




In the grease chamber, there is a rotating scum pipe mechanism along the length, which collects the scum and transported to the scum pit via a pipe arrangement as shown in the **Fig.1**. The grease removal mechanism is not removing the Fat, Oil and Grease (FOG) efficiently for the varying wastewater incoming flows and levels. Therefore, it is recommended that the related equipment (rotating scum pipe/trough/central collection box) and steel supports shall be decommissioned and replaced by a new mechanism.

Ramboll will carry out the concept design for a new FOG removal mechanism and determine the feasibility of different possible grease removal mechanism installations in the existing civil structure. The feasibility study will include a financial assessment.

# 2. FEASIBILITY STUDY OF FOG REMOVAL MECHANISM

This section provides the feasibility for different possible removal mechanisms for FOG as part of an upgrade.

The feasibility study includes the following options:

a. Chain and Flight Scraper
b. Rotating Scum Pipe
c. Travelling Bridge Scum Scraper
d. Electric Surface Scum Scraper

## 2.1 Chain and Flight scraper:

In this upgrade option, two-shaft chain and flight scraper mechanisms shall be installed for the removal of FOG in the grease chamber.

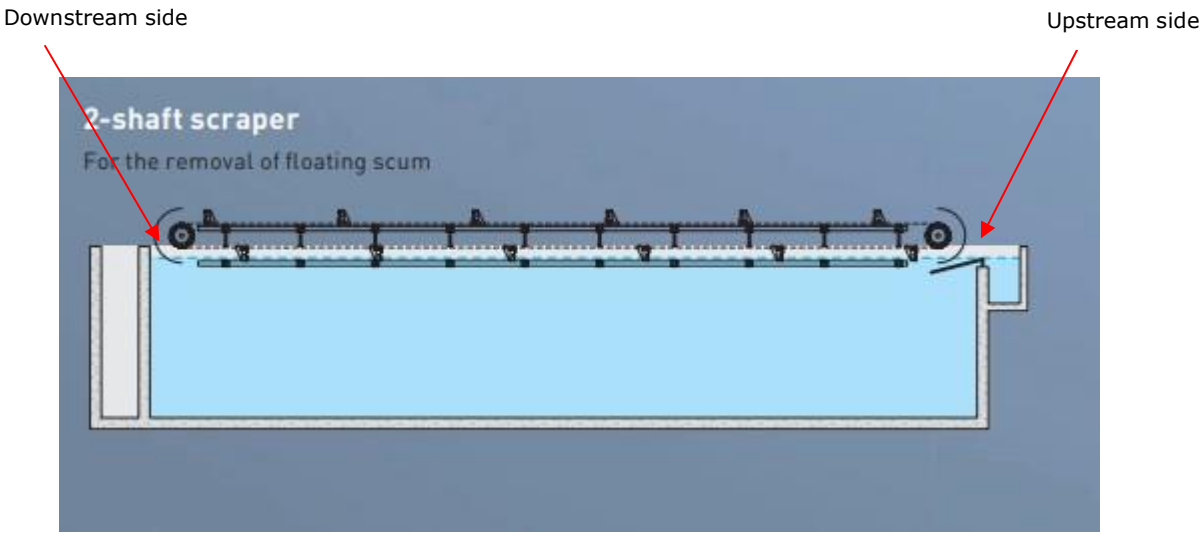



***Fig 3: Typical Sectional view for two shaft mechanism***

This mechanism consists of the following components: scraper flight arrangement, collector chain, shaft assembly, drive assembly, carry/return rails, tensioning shaft assembly, collector chain tensioning device and parallel run control system. All wetted parts are recommended to be produced in Stainless Steel (SS 316) and the scrapers are recommended to be produced in SS 316 or plastic. Plastic scrapers are light weight, economical, and most often utilized nowadays. As a result, the plastic scrapers are chosen as the recommended solution and will be reflected in the CAPEX scoring.

Regarding the upgrade, the existing FOG removal arrangement shall be decommissioned. A new trough is to be installed on the upstream end of the grease chamber as highlighted in **Fig.4**. The new chain and flight scraper mechanism will move forward with the help of a drive and shaft assembly, pushing the FOG to the new trough, and discharge the FOG to the scum pit through the existing pipe. The upgraded grease chamber section is shown in **Fig.5**. The invert level of the new scum trough should match the invert level of the existing scum pipe.

According to vendor, the chain and flight scraper is designed taking 220mm water level variation into consideration. The water level variation is clearly shown in the layout (refer to Annexure 1) we have received from the vendor. In chain and flight scraper mechanism, the rubber lips along with scrapers will facilitate the water level tolerance of 220 mm.

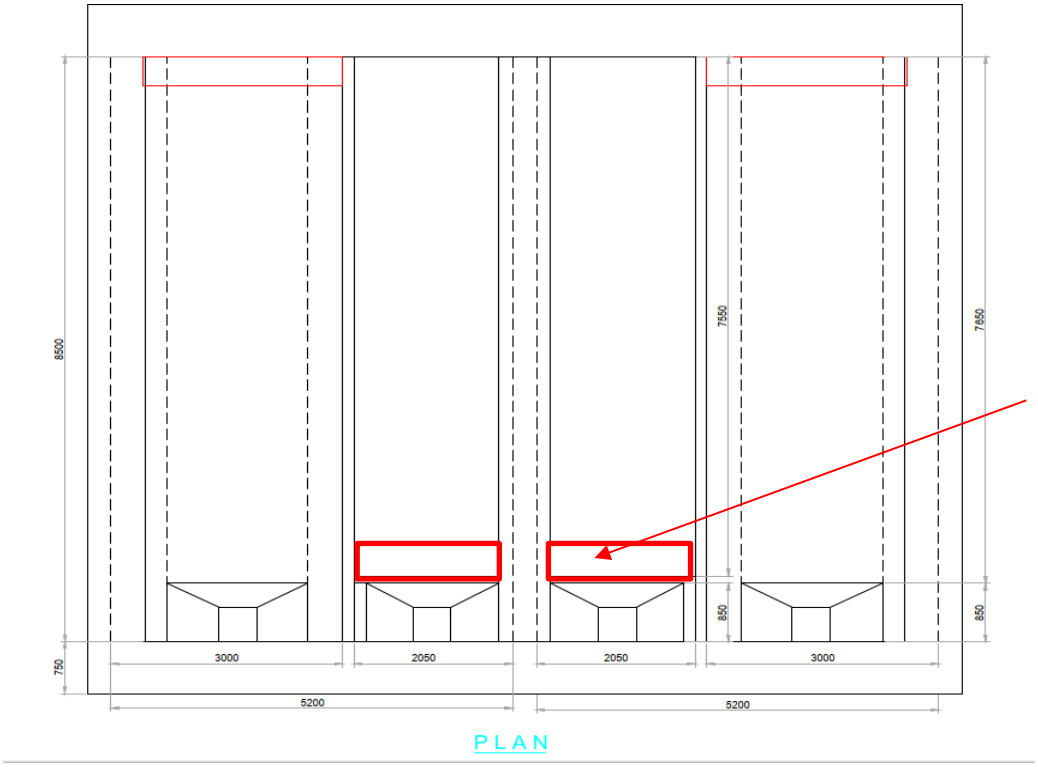



***Fig 4: Plan view of upgraded grit and grease chamber***

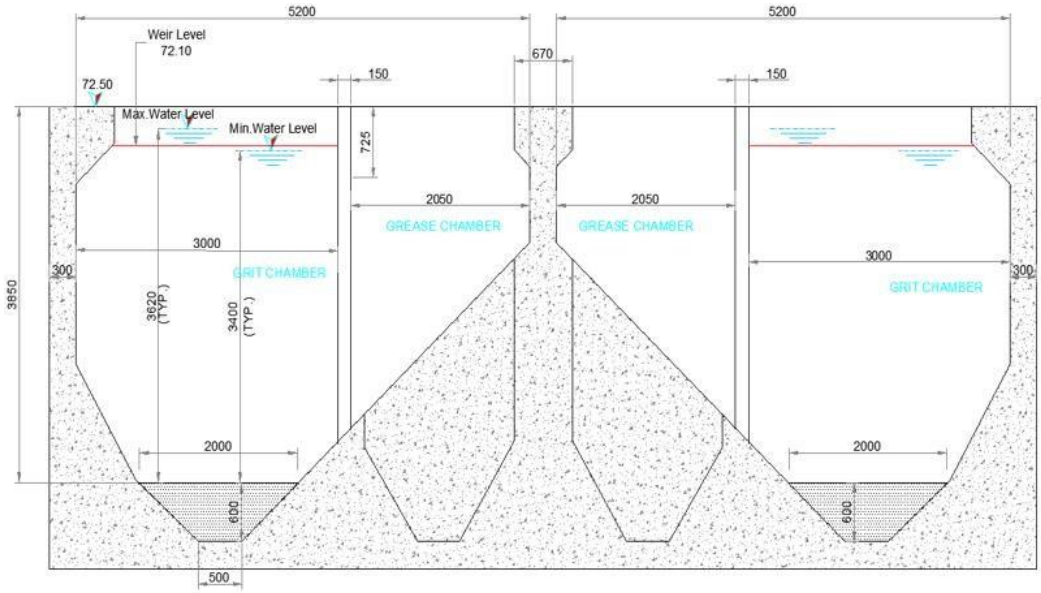



***Fig 5: Section view of upgraded grit and grease chamber***

## 2.2 Rotating scum pipe

A rotating scum pipe is the most common removal mechanism for FOG in older wastewater treatment plants in the Nordic countries. Scum pipes represent one of the simplest and most economical ways to remove FOG and other floating materials from the water surface.

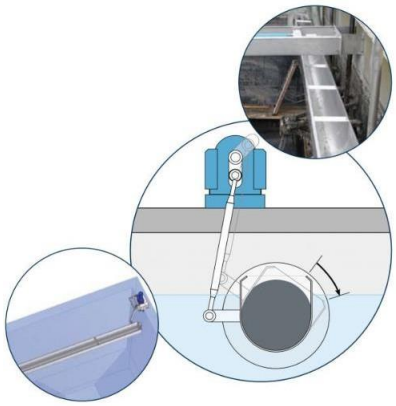


***Fig 6: Typical rotating scum pipe arrangement***

As shown in **Fig.6**, these slotted pipes are automatically angled or rotated precisely to receive the scum, which is decanted by the surface scraper. Its movement can be controlled by a water level gauge in the tank by various methods of manual control such as a lever, hand-wheel, or by electronic control such as an electric actuator. They are generally designed for rectangular tanks. It requires low maintenance and less periodic cleaning than other solutions.

The collected scum is taken out of the tank through the pipe connected to the scum pipe as shown in **Fig.7**. It is possible to have multiple scum pipes in a tank connected to each other in a row, if required.

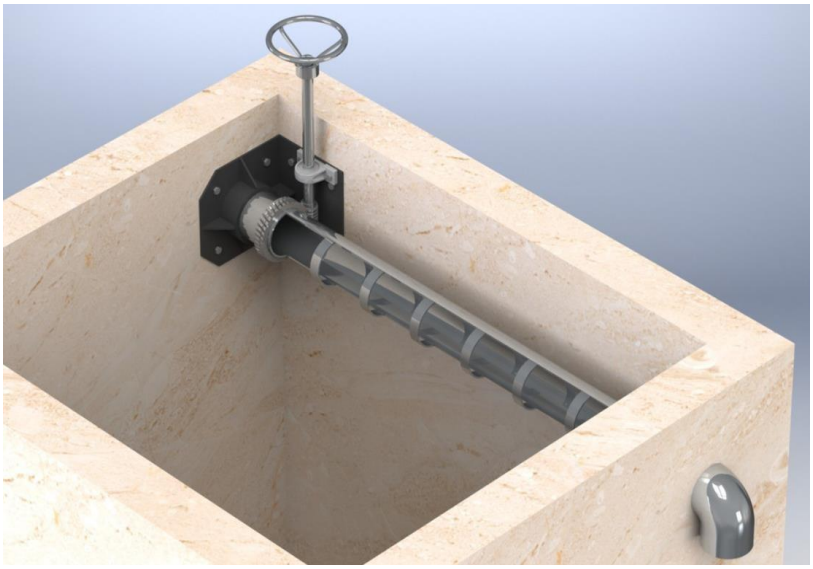


***Fig 7: Rotating pipe scum removal mechanism***

There can be two different scum pipe configurations possible in the existing grease chamber.

**CONFIGURATION 1**:

The first configuration is installing a rotating scum pipe along the width as shown in **Fig.8** at regular intervals. The FOG shall be transferred through a pipe connected to the bottom of the rotating scum pipe to carry it to the scum pit as shown in **Fig. 8**. This mechanism won't cover the entire surface area of the grease chamber and the removal efficiency of the FOG is low for this option.

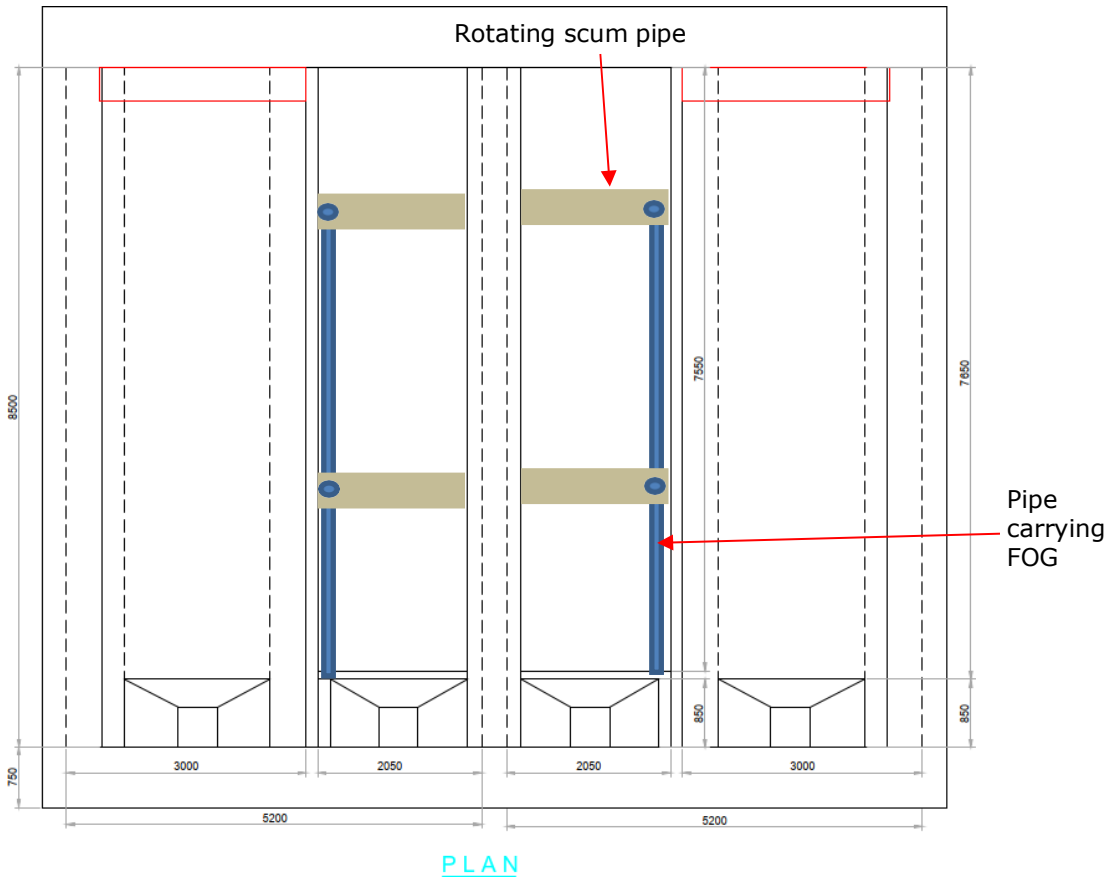



***Fig 8: Rotating scum pipe installation configuration-1 in upgrade***

**CONFIGURATION 2**:

The second possible configuration is a slotted rotating scum pipe which can be installed along the full length of the grease chamber as shown in **Fig.9.** This mechanism also has the same disadvantage as the first configuration in that it does not cover the entire surface area. This results in a less efficient removal of the FOG. In both configurations, excessive water will escape along with the removal of FOG. Therefore, both options will not be considered for further investigation.

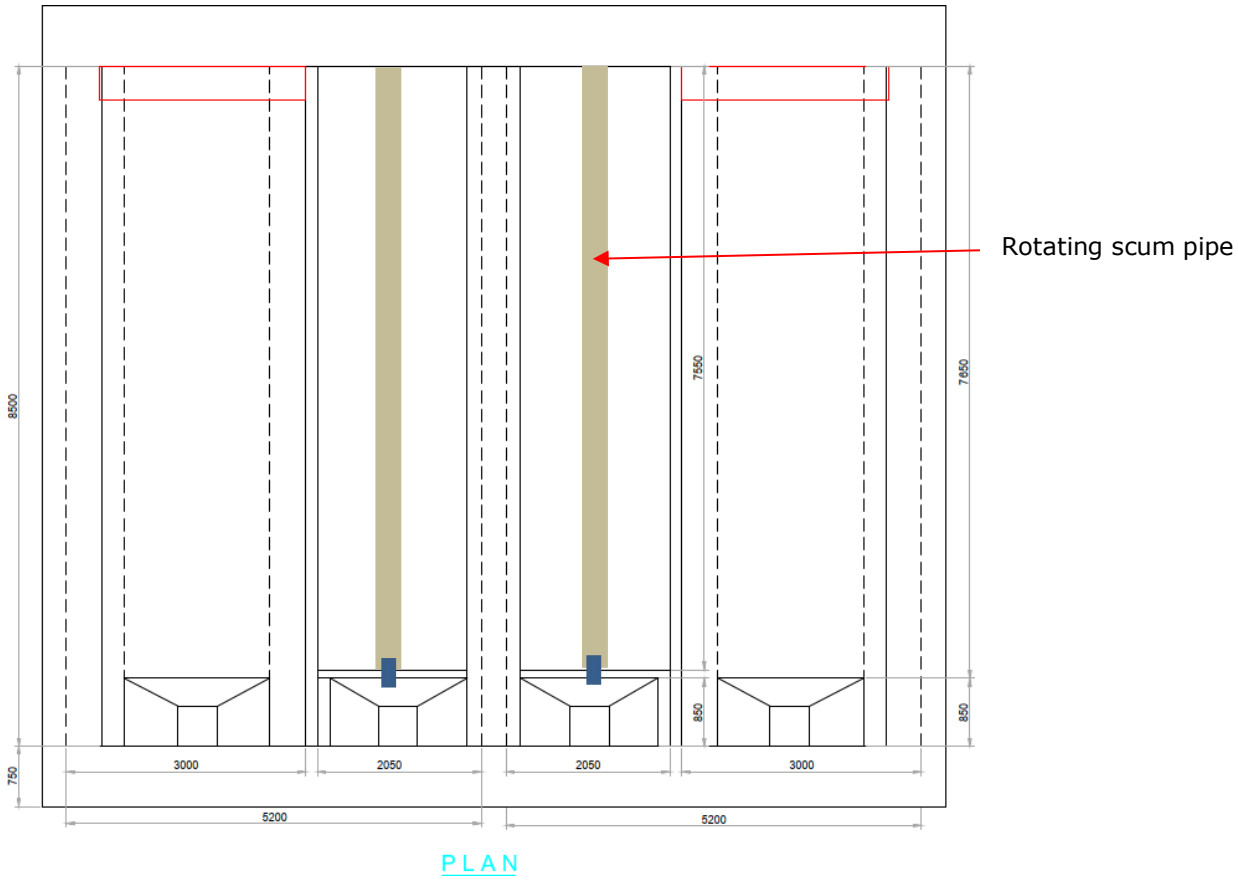



***Fig 9: Rotating scum pipe installation configuration-2 in upgrade***

### 2.3 Traveling bridge for grease removal

Traveling bridges consist of a mobile steel girder in standard section with a walkway surface, a couple of lateral trolleys, grit scraper system, and a couple of gear motors fitted in correspondence with the bridge center line (one gear motor for the transmission of the bridge translation motion and the other one for the surface scraper movement) as shown in **Fig.10**. The grease removal is achieved by means of a surface scraper and the settled grit is removed by a bottom scraper. The bridge is operated by a central gearbox connected to trolley drive wheels. Generally, travelling one way, it conveys the settled grit into the grit collection hopper through the bottom scraper. Running in the opposite direction it collects scum and floating particles by means of a surface scraper. Air injection in the water helps the grease to float at the surface. In our process, since we are going to install the mechanism in an existing civil structure with the scum pit on the upstream side, the skimming and scraping operation will be carried out in the same direction, i.e., with forward movement. As a result, the mechanism needs to be customized for removal of grease and grit.

The building height is not sufficient to provide a walking bridge with adequate man height. The standard travelling bridge mechanism is usually equipped with both grease and grit scraper. Since the existing grit removal mechanism functions well, we can customize the travelling bridge only with surface scraper, and without a walking bridge. The existing grit and grease chamber is enclosed with the aluminum hatches/covers. The scraper is attached to the travelling bridge through the shaft which will travel upstream and downstream. Therefore, we must remove the existing aluminum covers and install special type of odor covers with shaft passing through a flexible rubber material as shown in **Fig.11**.

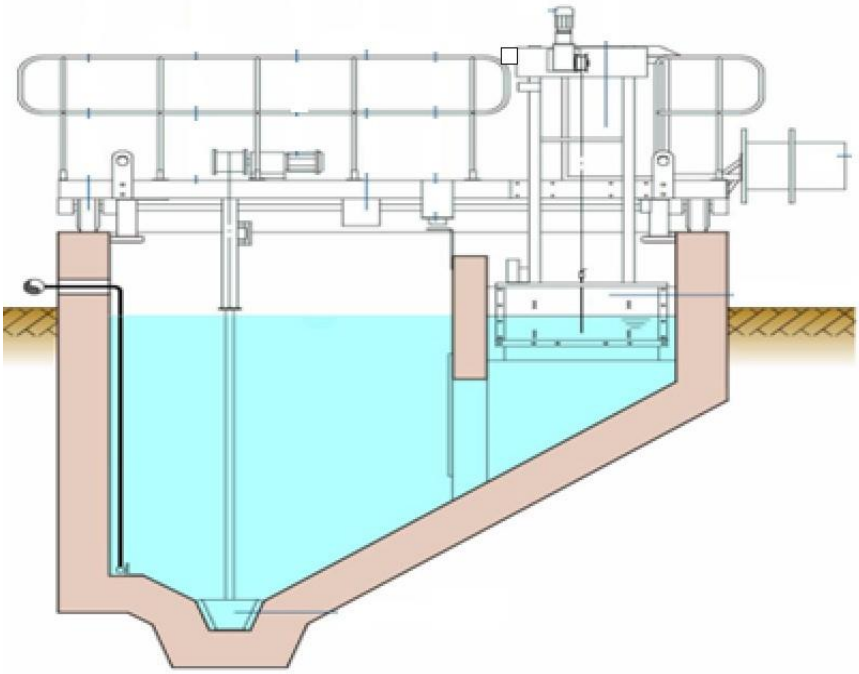


***Fig 10: Typical section view of Grit and Grease Scraper System***

***Fig 11: Odor covers with shaft passing through a flexible rubber material***

## 2.4 Electric Surface Scum Scraper

This mechanism removes scum from the surface without the removal of excessive water. This system is easy to install, reliable, and has few moving parts. The scraper blade draws off FOG from the entire surfacearea of the tank and carries it to a scum beach. The drive bar moves back and forth. The scraper blade is fixed to a sledge (sliding) which is propelled step-by-step by the drive bar. The sledge changes its directionof motion at each end of its travel. For the return movement, the scraper blade swings up to avoid the FOG scraping in the opposite direction. The surface scum scraper is available in electrically or hydraulically powered versions.

This mechanism works better only with scum beach or rotating scum pipe/trough. For installing this mechanism, minimum 400 mm clearance above surface of water is required, which can be difficult for our existing civil structure since the available free board is only 300 mm. With this said, this issue can be solved by installing the railing and support on top of the tank. The related equipment is only available in stainless steel and the installation cost is relatively high. The FOG removal operation is not continuous like the chain and flight mechanism as there is only one surface scraper and during the downstream travel there will be no surface scraping as shown in **Fig.12**.

According to vendor input, the maximum water level tolerance that electric surface scum scraper can handle is 110 mm. As provided in section 1. of this report, the hydraulic levels that will be maintained in grit and grease chamber ranges from 72.10 m (at $Q_{dim}$) to 72.27 m (at 8*$Q_{dim}$). It means, an electric surface scraper will function effectively only when the flow fluctuates between 72.10 m (at Qdim) and lesser than 72.22 m (at 6*Qdim). Beyond this level, FOG removal efficiency will be reduced.

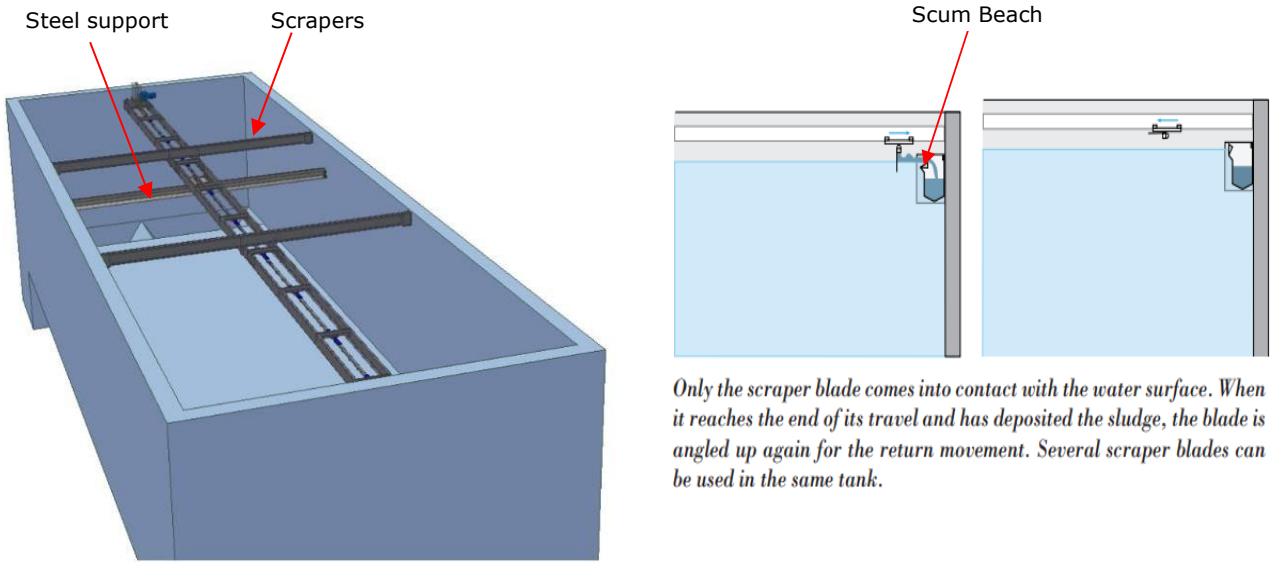



***Fig 12: Electric surface scum scraper***

# 3. MULTI CRITERIA ANALYSIS

Multi criteria analysis (MCA) has been developed to evaluate the different options for FOG removal mechanisms. The scoring is based on qualitative comparison of the sub criteria given in **Table 1**. The overall assessment criteria and score for each of the option is provided.

***Table 1: Multi Criteria Analysis for FOG removal mechanisms***

| Primary Criteria | Sub Criteria | SCORE | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Performance | Removal Efficiency | Very Low | Low | Moderate | High | Very High |
| | Maximum Water Level of Tolerance | 50 mm | 80 mm | 110 mm | 150 mm | 200 mm |
| Economic | CAPEX in Euros | >80,000 | 70,000-80,000 | 60,000-70,000 | 50,000-60,000 | <50,000 |
| | OPEX (Energy Consumption) in Kwh | >1.1 | 0.75-1.1 | 0.37-0.75 | 0.25-0.37 | ≤0.25 |
| | Complexity – Constructability | Very High | High | Medium | Low | Very Low |
| | Complexity – Operability | complicated | High | Medium | Low | Very Low |
| Operation and Maintenance | Ease of operation | Extremely Difficult to operate | Difficult to operate | Moderately Easy to operate | Easy to Operate | Very Easy to Operate |
| | Ease of maintenance | Extremely Difficult to maintain | Difficult to maintain | ModeratelyEasy to maintain | Easy to maintain | Very Easy to maintain |

Based on the above identified criteria, the options proposed for the FOG removal mechanisms were evaluated and the corresponding score has been arrived at and summarized in **Table 2**.
The CAPEX considered for the analysis is equipment and automation cost only, the supervision and other axillary charges are not included.

***Table 2: Weighted Scoring for various FOG removal mechanisms using MCA***

| Primary Criteria | Sub-Criteria | Weightage | Chain and Flight Mechanism | | Travelling Bridge Scraper | | Electric Surface Scum Scraper | |
|---|---|---|---|---|---|---|---|---|
| | | | Score | Weighted Score | Score | Weighted Score | Score | Weighted Score |
| Performance | 1. Removal Efficiency | 20% | 5 | 1 | 4 | 0.8 | 3 | 0.6 |
| | 2. Maximum Water Level of Tolerance | 10% | 5 | 0.5 | 4 | 0.4 | 3 | 0.3 |
| Economic | 1.CAPEX | 20% | 5 | 1 | 1 | 0.2 | 4 | 0.8 |
| | 2.OPEX (Energy Consumption) | 5% | 5 | 0.25 | 4 | 0.2 | 5 | 0.25 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 3.Complexity – Constructability | 15% | 3 | 0.45 | 2 | 0.3 | 3 | 0.45 |
| | 4.Complexity – Operability (Including frequency ofequipment service) | 10% | 4 | 0.4 | 3 | 0.3 | 4 | 0.4 |
| **Operation and Maintenance** | 1.Ease of operation | 10% | 4 | 0.4 | 3 | 0.3 | 2 | 0.2 |
| | 2.Ease of maintenance | 10% | 4 | 0.4 | 2 | 0.2 | 3 | 0.3 |
| **Total** | | **100 %** | | **4.4** | | **2.7** | | **3.3** |

# 4. CONCLUSION

A detailed comparison study has been conducted for four different options (Chain and Flight mechanism, Rotating Pipe Scum removal mechanism, Travelling Bridge mechanism and Electric Surface Scum Scraper) for FOG removal in the existing civil structure. Since rotating scum pipe is least efficient in FOG removal, it is not included in Multi Criteria Analysis (MCA).

Considering the efficiency of FOG removal, economic factors, and the operation and maintenance cost, the chain and flight mechanism (with plastic scrapers) is the most beneficial solution comparedto the travelling bridge scraper and electric surface scum scraper.

# ANNEXURES

# List of Annexures

1. Annexure 1-Chain and Flight Scraper Mechanism Documents
2. Annexure 2-Electric Surface Scum Scraper Mechanism Documents

# ANNEXURE 1: CHAIN AND FLIGHT SCRAPER MECHANISM DOCUMENT

# Quotation

**Quotation No KL221124**

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**Customer: Ramboll**
**Attn: Mr.** Sreelakshmi C
**Project: Monserud WWTP Norway**
**Our reference: Chain & Flight type sludge collector**
**Date: 24.11.2022**

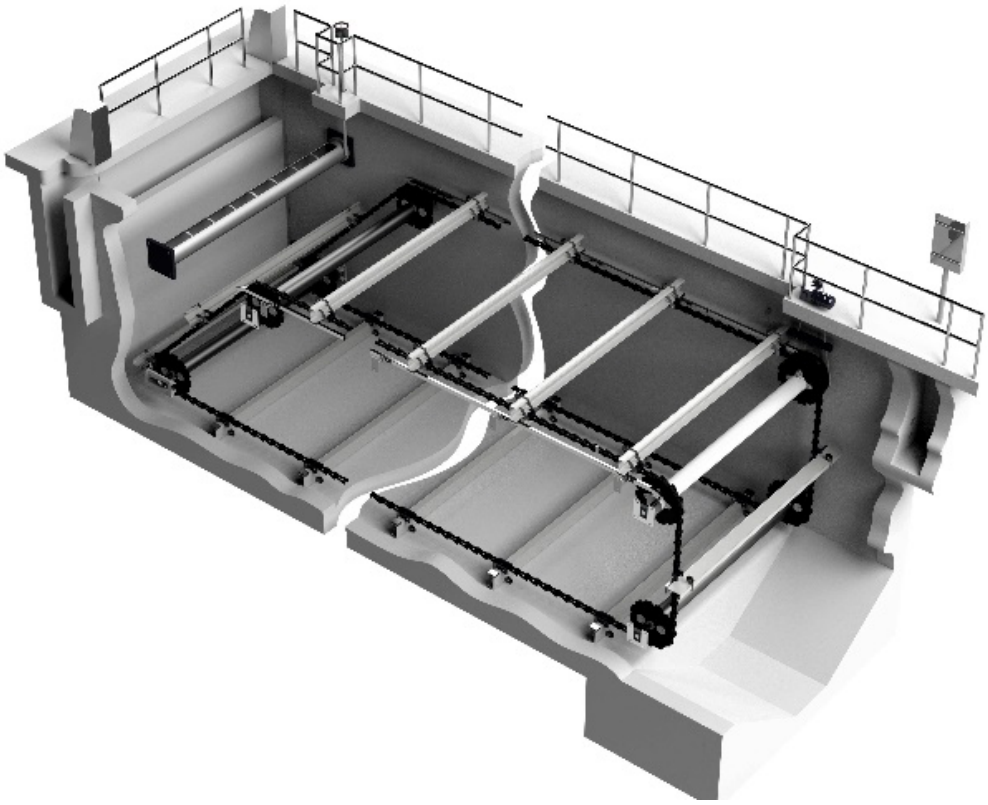
## Budget Quotation

Dear Sir,

Thank you for your inquiry regarding for above referred project.

On following pages, I have the pleasure of offering you our most suitable equipment.

### We would like to offer Merdec Chain & Flight type Sludge Collectors as following:



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**Merdec Oy**
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26100 RAUMA
FINLAND
Tel. +358-(0)40-564 4422
info@merdec.fi

Business ID-code 1104567-7
Registered domicile

www.merdec.fi

# Quotation

**Quotation No KL221124**

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**Option 1**

**Item. 1 2 nos. Surface Sludge Collector (2-shaft design)**

**Tank Dimension**: 7 x 2 (L x W) m

**Scope of supply (for one unit):**
Collector Chain AISI 316 **(pitch 6 inch),** quantity: approx. 20m/systems
Flights AISI 316, 6nos./system, L= 2000mm, H=200mm
Carry and return rails: AISI 316 (2 nos. carry rails and 2 nos. return rails)
Wear Shoes, type Merdec , material UMHWPE
Collector chain tensioner Merdec (tensioning to be done without draining the tank)
ME-720 series Collector chain sprockets Z=8: 2 + 2 nos. (Head Sprockets & Idler Sprockets), material UMHWPE
Bearings sleeves for idler sprockets UMHWPE
Drive shafts and idler tensioning shaft AISI316
Drive and driven sprockets: AISI316
Drive Chain AISI 316, Drive chain tensioner AISI316/PE
Dive motor: VFD - Nord or equivalent, AC 230/400V x 3Ph x 50Hz (to be confirmed), Insulation Class F.
Overload protection: via frequency converter
Protection cover: AISI316
Parallel running control unit (flight monitoring), 2 inductive sensors + adaptors
Hardware AISI316

**Price EUR 20.500,00 - /unit**

***Total for 2 nos. as per above description. EUR 41.000,00 -***

# Quotation

**Quotation No KL221124**

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**Option 2**

**Item. 1 2 nos. Surface Sludge Collector (2-shaft design)**

**Tank Dimension**: 7 x 2 (L x W) m

**Scope of supply (for one unit):**
Collector Chain ME-720S **(pitch 6 inch),** quantity: approx. 20m/systems
Flights ME-E200 6nos./system, L= 2000mm, H=200mm
Carry and return rails: AISI 316 (2 nos. carry rails and 2 nos. return rails)
Wear Shoes, type Merdec , material UMHWPE
Collector chain tensioner Merdec (tensioning to be done without draining the tank)
ME-720 series Collector chain sprockets Z=8: 2 + 2 nos. (Head Sprockets & Idler Sprockets), material UMHWPE
Bearings sleeves for idler sprockets UMHWPE
Drive shafts and idler tensioning shaft AISI316
Drive and driven sprockets: AISI316
Drive Chain AISI 316, Drive chain tensioner AISI316/PE
Dive motor: VFD - Nord or equivalent, AC 230/400V x 3Ph x 50Hz (to be confirmed), Insulation Class F.
Overload protection: via frequency converter
Protection cover: AISI316
Parallel running control unit (flight monitoring), 2 inductive sensors + adaptors
Hardware AISI316

**Price EUR 14.400,00 - /unit**

***Total for 2 nos. as per above description. EUR 28.800,00 -***

**Supervision option**
1 supervisor to attend for 3-5 day on site for supervision for one scraper system.
Local fitter to support in sorting of goods, lifting and handling by buyer.
Cranes etc. tools, PPE etc. necessary permits etc.by buyer.
Our price is excl. travel expenses, transit time and accommodation. The buyer will have to arrange local transportation to site. Language of supervisor: English

**Price: 750 EUR/day**

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info@merdec.fi

Business ID-code 1104567-7
Registered domicile

www.merdec.fi

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**Option 3**

Item. 1 1 nos. Local Control Panel (one panel for two **surface sludge collector** systems)

Rittal cabinet AISI 304 800 x 1000mm
PLC ABB PM5630
7" HMI panel
2 pcs frequency converters for motor control
4 pcs sensors
Electrical drawings
Programming

**Price EUR 18.000,00 - /unit**

**Supervision option**
1 supervisor to attend for 3-5 day on site for supervision for one scraper system.
Local fitter to support in sorting of goods, lifting and handling by buyer.
Cranes etc. tools, PPE etc. necessary permits etc.by buyer.
Our price is excl. travel expenses, transit time and accommodation. The buyer will have to arrange local transportation to site. Language of supervisor: English

**Price: 750 EUR/day**

**NOTE:**
**Supervision/start up commissioning:** Not included. Optional price is given above.
Also Note, site survey and field services or any additional items not explicitly stated in this proposal, or our typical specifications are not included in our bid pricing.

All our equipment conforms to European EU-directives, CE-directives.

**Delivery time:** To be agreed

**Shipping volume:** To be agreed

**Packing:** included

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**Freight:** Not included

**Terms of Payment (proposal):**
50% in advance at placing of order.

50% before shipment

All prices are excl. VAT. All goods remain as our property until full payment has been made.
All non-prepayments will be under irrevocable confirmed Letter of Credit payable at sight at our bank in Finland
Letter of Credit to be confirmed by us prior to issuing.

**Price changes:**
Alloy changes exceeding +/-2% will be adjusted at placing of order.

**Country of Origin:**
Finland

**Terms of Shipment:**
EXW our warehouse in Rauma, in according to Incoterms 2010.

**General Terms and Conditions:**
Manufacturing will be done according to good workmanship. General conditions Orgalime S2012 applies if nothing else is stated in this quotation. These terms and conditions are according to ICC (International Chamber of Commerce) recommendations for international machine supplies.

**Documentation:**
Assembly and O&M manuals will be handed in English in 1 electronical copy acc.to our standard. Following or related documents are not included in our scope of supply, to be agreed separately.

- Welder's certificate, Special welding methods (WPS WPQR etc.)
- Material certificates, Material testing (NDT, PMI etc.)
- QAP/ITP according to our standard or Completing customers record (IDUS etc.)

Note; All OEM supplied equipment incorporated into the Merdec Oy, design, e.g. motor, gear reducer, bearings and other electrical components will be furnished with their factory-applied finish. Any additional coatings by purchaser.

**Warranty**

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12 months from date of delivery. All damaged goods shall be returned to Merdec Oy if nothing else has been agreed to. All freight and customs cost for returned goods is to be paid by the customer. Replacement parts will be sent if no external damage has caused failure. Claims will not be accepted if the damage is caused by external violence or that our O&M manuals has not been obtained correctly. No labour cost for dismounting and replacing damaged goods will be accepted.

**This Quotation is valid for one (1) month after issuing date.**

With Kind Regards,

**Joonas Sihvonen**
**Merdec Oy**

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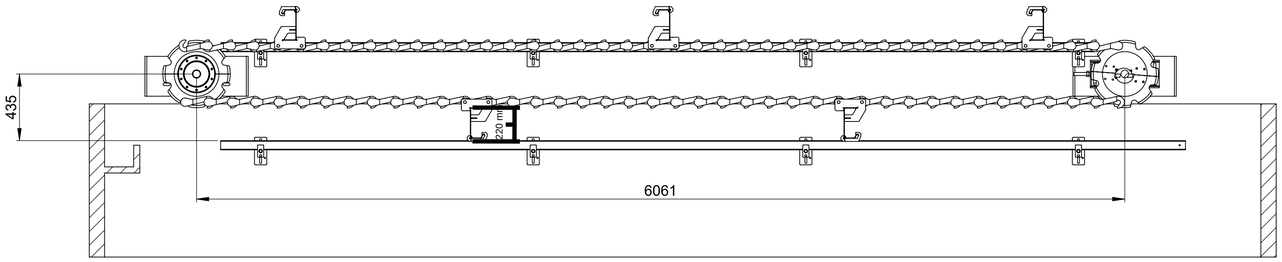
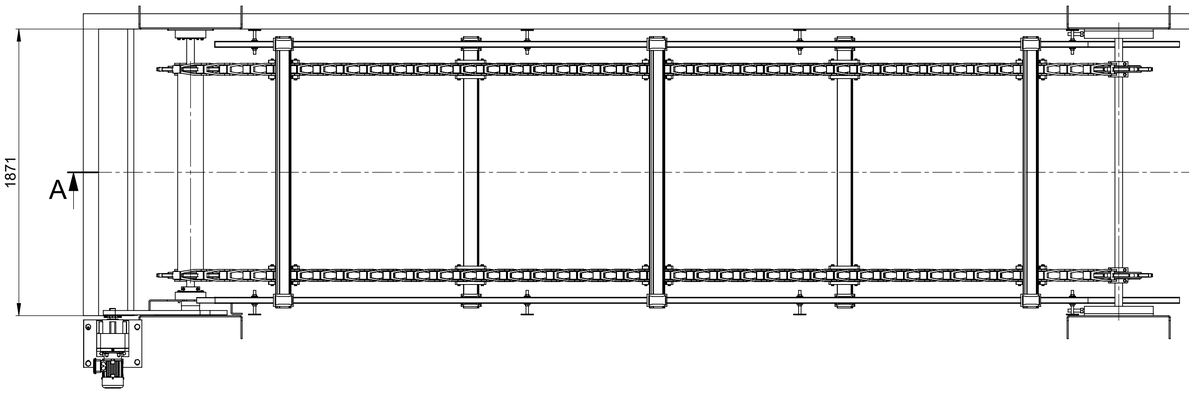
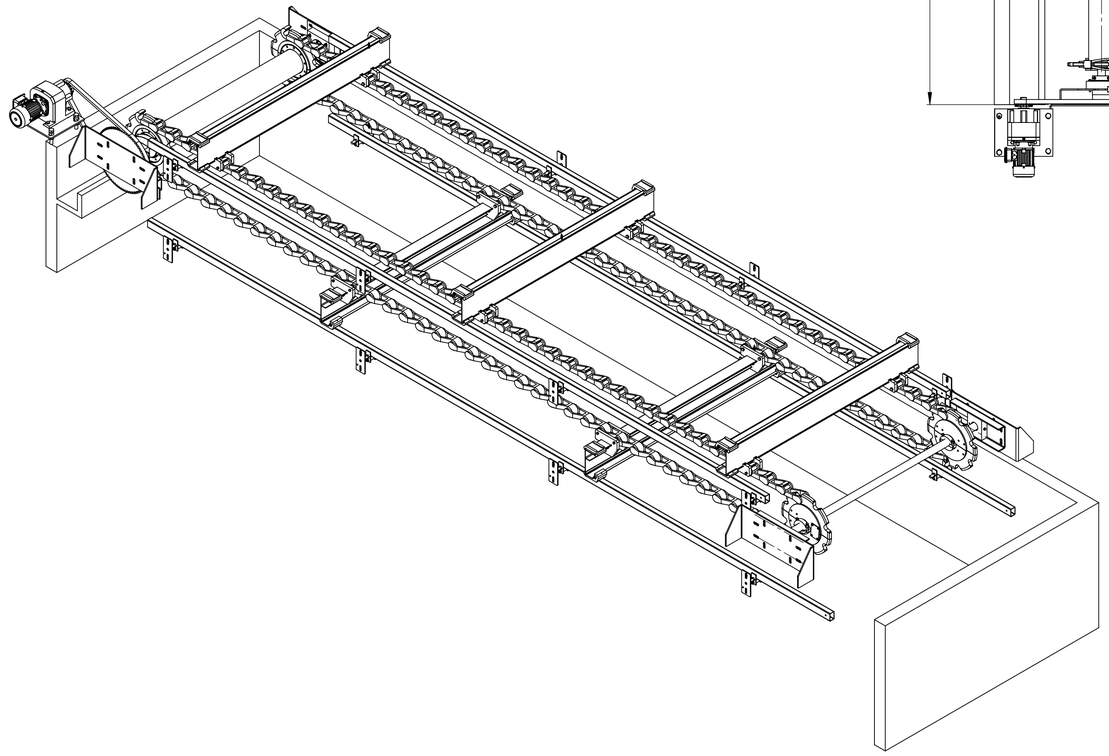



SECTION A-A



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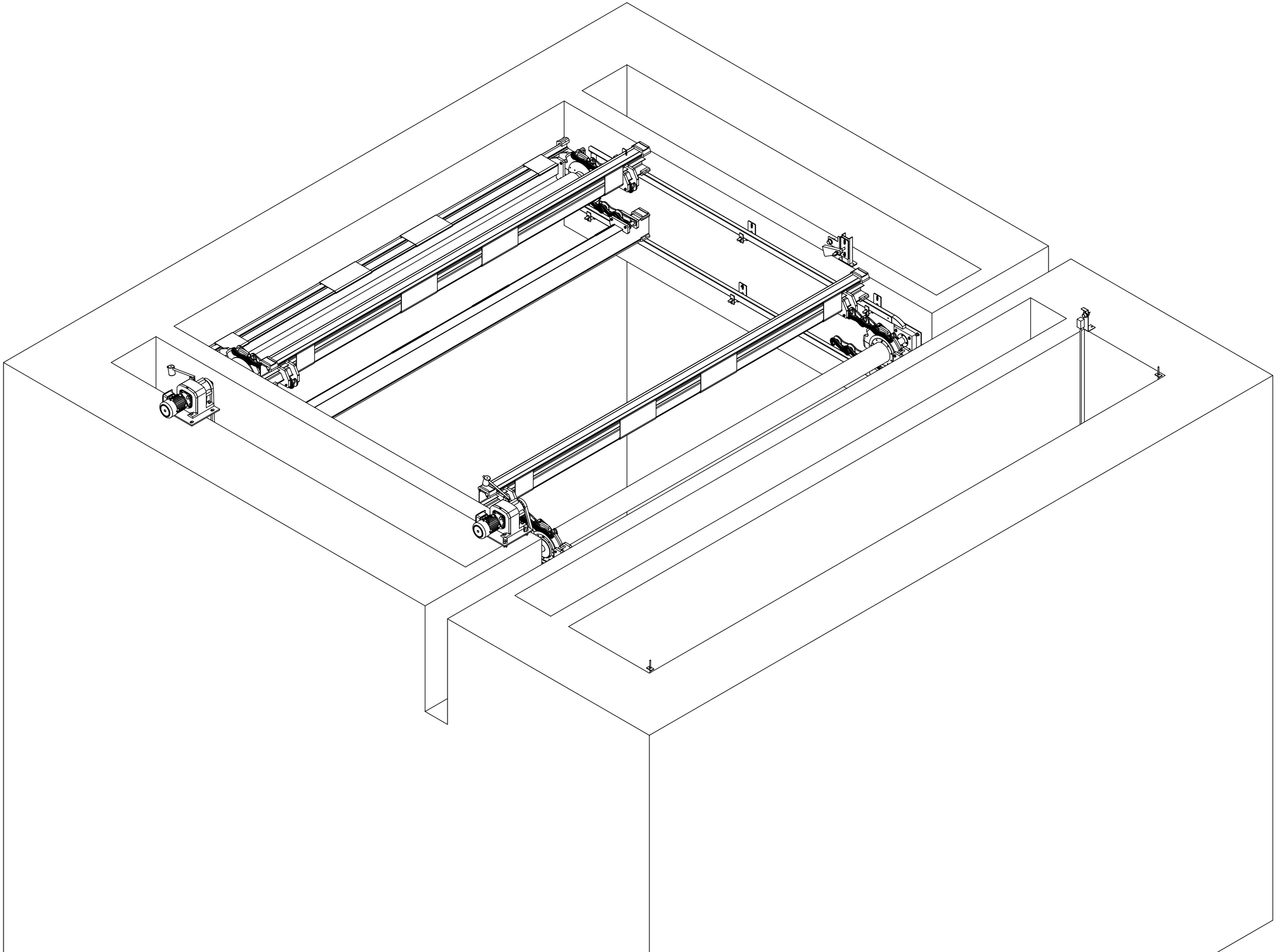
|---|---|---|---|---|---|
| Yleistoleranssi / General tolerances<br>SFS-EN 22768-1, SFS-EN ISO 13920 | | Asiakas / Customer | | Suunnittelija / Designed | Pvm / Date |
| | Massa / Mass | Projekti / Project | | Tarkastaja / Checked | Pvm / Date |
| | Mittakaava / Scale<br>A1 1:20 | Työnumero / Work number | | Tehdään kpl / Quantity manufactured | |
| www.merdec.fi | | Nimitys / Description<br>Lay-out | | Piirustusnumero / Drawing number<br>211-0142 | Rev |

| Rev | Muutos / Change | Pvm / Date | Suunnittelija / Designed |
|---|---|---|---|

OY MERDEC LTD

www.merdec.fi



# ANNEXURE 2: ELECTRIC SURFACE SCUM SCRAPER MECHANISM DOCUMENTS

**TECHNICAL SPECIFICATION**
**Position 1: BOTTOM SLUDGE SCRAPER Z2013 Grit**

| | |
|---|---|
| **Number of scrapers** | Two (2) |
| **Scraper dimension** | 8,5m x 2m (L x W) |
| **Material quality** | ASTM 316 wet parts |
| **Supply voltage** | 3 x 400 V, 50 Hz |
| **Auxiliary voltage** | 24 V DC |

| **Pos.** | **Quantity/scraper** | **Items** |
|---|---|---|
| 1 | 1 pc | Planetary gear motor, 1,1kW, epoxy painted, RAL5002, C4, Gear protection for indoor use |
| 2 | 1 pc | Upper link arm |
| 3 | 1 pc | Angle arm unit |
| 4 | 1 pc | Link arm unit |
| 5 | Approx. 26pcs. | Scraper profiles |
| 6 | 1 pc | Push and pull rod, Ø54x2 |
| 7 | 2 pcs | Pilot rod, Ø54x2; L=2m |
| 8 | 3 rows | Gliding strips (HD 1000 - 6 mm) |
| 9 | 1 set | Flat bars |
| 10 | 1 set | Flat bar diagonals |
| 11 | 2 pcs | Pilot rod, Ø44x2; L=2,5m |
| 12 | 1 set | Assembly material |

**OPTIONS not included in the quotation:**

Mechanical flag indication

Motion detector (electrical)

**Ambient temperature 40°.**

**TECHNICAL SPECIFICATION**

**POSITION 2: Surface scraper Z3906ES2 Grease**

| | |
|---|---|
| **Number of skimmers** | Two (2) |
| **Skimming area** | Approx. 7 x 2,05m (L x W) |
| **Material quality** | ASTM 316 wet part (scraper blade) |
| **Supply voltage** | 3 x 400 V, 50 Hz |
| **Auxiliary voltage** | 24 V DC |
| **Operation** | By electrical gear motor 0,25kW |

The scraper structure is mounted above water surface, with the scraper blade alone in contact with the water. The blade is mechanically folded up above water when scraper has reached the end position of scraping, for return travel above water.
The drive unit is located directly on top of the scraper structure.

**Scraper construction mainly consists of**

| Pos. | Quantity/scraper | Description |
|---|---|---|
| 1 | 1 pc | Start section (6m) incl. electrical drive unit, including protection cover for indoor use. |
| 2 | 1 pc | End section (Approx. 1m) |
| 3 | 1 pc | Sledge S2 |
| 4 | 1 pc | Scraper blade S2 |
| 5 | 1 pcs | Carrying beam (if both scraper ends can be fixed at he wall) |
| 6 | 1 set | Assembly material A4 |

**Drive unit**
Electric reduction gear motor Fabricate Nord, 0,25kW protection class IP 55, Class F. Epoxy painted in RAL5002, C4.

**Note**
**Maximum water level tolerance allowed 80mm.**

**TECHNICAL SPECIFICATION**
**Position 3: Scum beach Z6900 incl. trough, Grease**

| | |
|---|---|
| **Number of beaches** | Two (2) |
| **Material quality** | ASTM316 |
| **Dimension** | L = 2,05m. |

**Quantity/beach**

| | |
|---|---|
| 1 pc | Scum beach with trough |
| 1 set | Assembly/attachment material 316/A4 |

**Notes and remarks:**
Maximum water level tolerance allowed is 80mm.

**ACCORDING TO NORDIC WATER STANDARD**

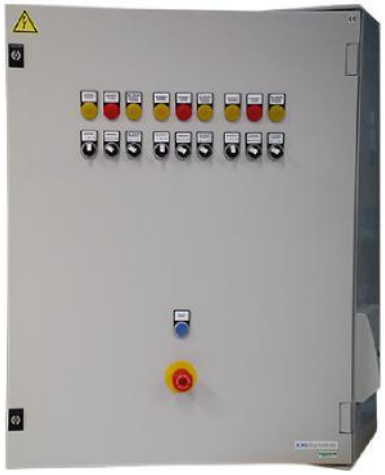
# Electrical Control Panel ECP

The electrical control panel front features ON–OFF selectors and MANUAL–AUTO–REMOTE selectors for each scraper, as well as sum alarm lights and ON mode lights which indicate that a scraper is running. There is also an emergency stop button.

The panel is equipped with a control smart relay that controls the scraper. In the display it is possible to set times and read alarm messages. In auto mode, the display shows the remaining time until start or, if the scraper is running, the remaining run time.

Potential-free contacts for external connection and indication of ON mode and sum alarms are available on terminals. When the selector is in REMOTE mode, the scraper is controlled by a potential-free signal.

Electrical and mechanical design, components, cables, markings etc. are made in accordance with Zickert standard issue.



| **Manufacturing standards** |
|---|
| 2006/95/EC, 2004/108/EC, SS-EN 60204-1 |

| **General specification** | |
|---|---|
| Control smart relay | Schneider Electrics Zelio Logic |
| Enclosure | Schneider Electrics, fibre-reinforced plastic (FRP) |
| Motor protection, fuses, contactors | Schneider Electrics |

| **Electricalspecification** | |
|---|---|
| Supply voltage | 3 x 400/230 V |
| Frequency | 50 Hz |
| Control voltage | 24 V DC |
| Protection class | IP55 |

| **Transport and handling** |
|---|
| Transported in a cardboard box |

| **Documentation** |
|---|
| Declaration of conformity |
| Operation manual |
| Electrical wiring diagram |



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Tel:+46 31 748 54 00 • info@nordicwater.com • www.nordicwater.com

| Options for ECP included in this quote |
|---|
| Cooling fan |
| Surge protection (overvoltage) |

| Options for communication module to supervisory system included in this quote |
|---|
| Modbus RTU RS485 |



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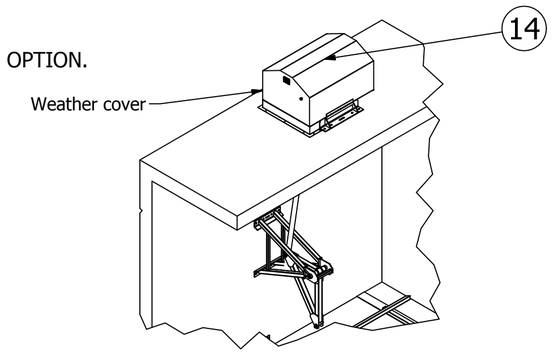
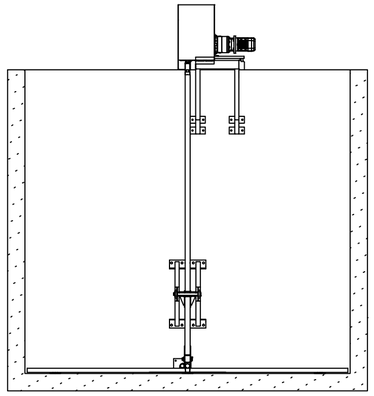
DRIVE UNIT ON FOUNDATION.

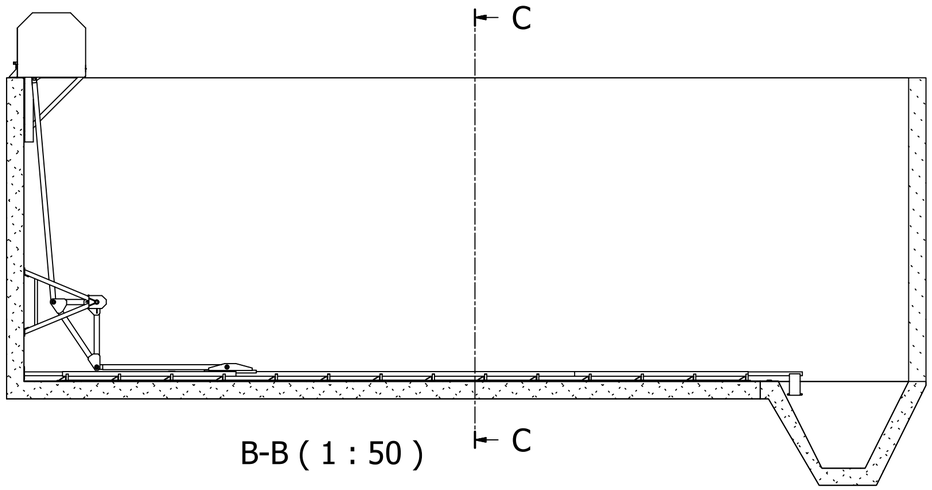
OPTION.

Weather cover



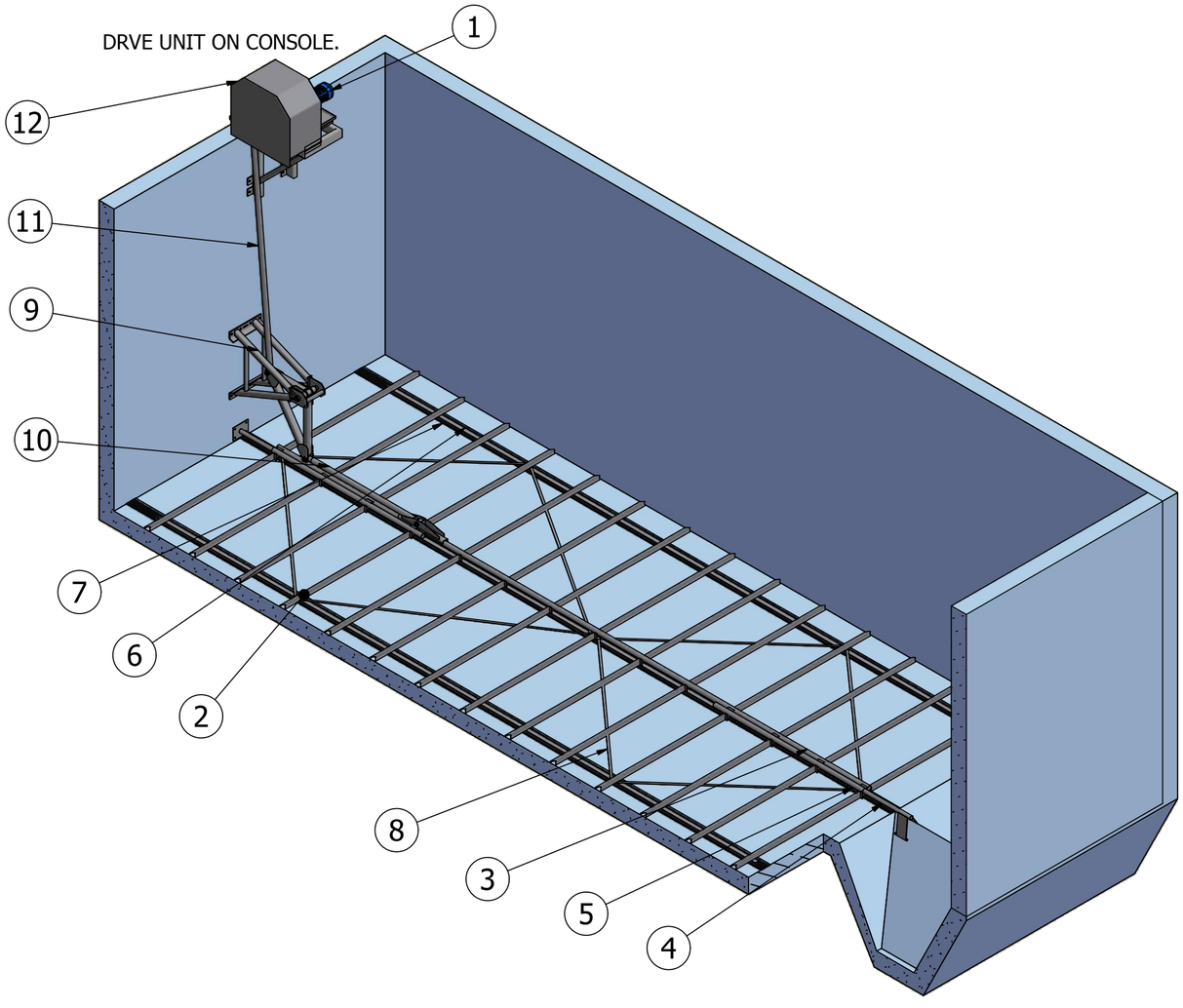



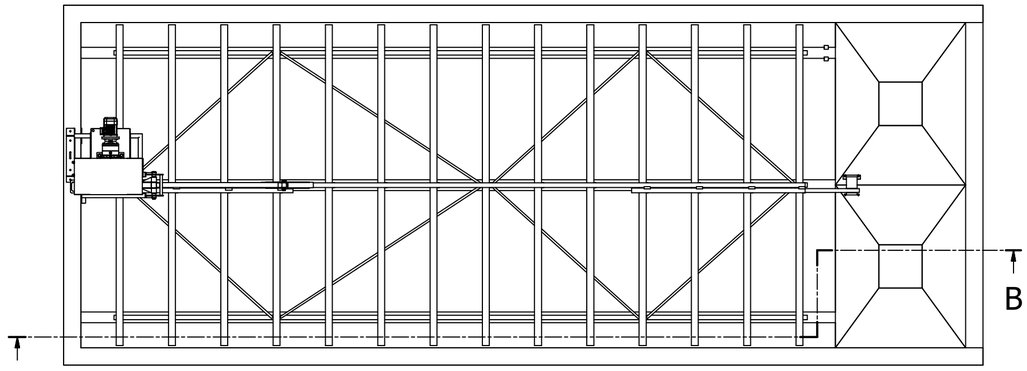
C-C ( 1 : 50 )




B-B ( 1 : 50 )

DRVE UNIT ON CONSOLE.




OPTIONS SEE DRAWING: O2000-7656.

PERMISSIBLE TOLERANCES OF CONCRETE TANK FLOOR, SEE DRAWING: HS3-2104.

SAND COLLECTOR & CROSS COLLECTOR.

| Item | Description |
|---|---|
| 14 | Weather cover (option) |
| 13 | Mounting kit (not shown) |
| 12 | Protection cover |
| 11 | Upper link arm |
| 10 | Link arm unit |
| 9 | Angel arm unit |
| 8 | DIAGONAL PLATTSTÅL/ Diagonale flat bar |
| 7 | Gliding strip |
| 6 | Flat bar |
| 5 | Guide pipe |
| 4 | STYRTAPP/ Pilot |
| 3 | Pull rod |
| 2 | Scraper profile |
| 1 | Planetary gearbox drive |

NORDIC WATER

Electrical bottom sludge scraper

Z2011, 12, 13, 14, 15

3 rows

General Installation Drawing

| | | | |
|---|---|---|---|
| Drawn | Designed | | |
| CH | CH | | |
| Date | | Scale | |
| 2011-10-24 | | 1 : 50 | |

Project

Production Group

Customer

Modul

E

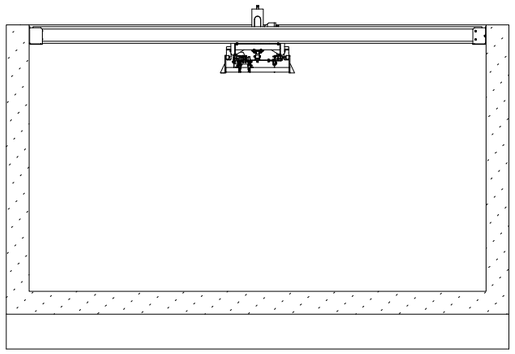
Drawingnumber **O2000-3751**

Revision **1**

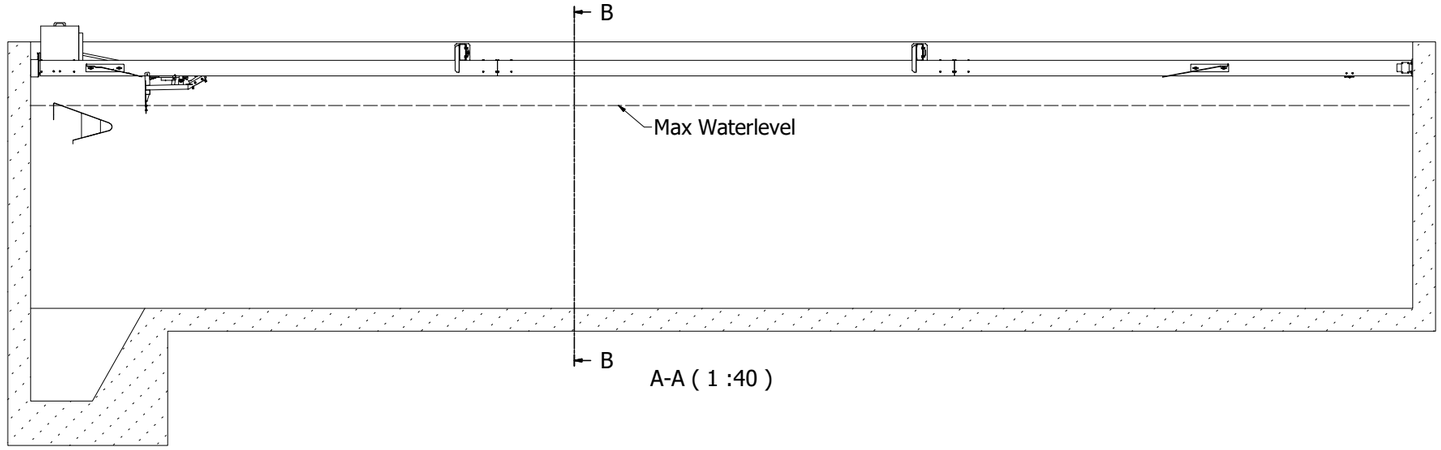
Sheet **1 /1**

Tolerances for linear and angular dimensions without individual tolerance indications acc. to SS-ISO 2768-1-mK. Other measures acc. to digital shape model.
All welding according to ISO 5817:2007. Chamfer all sharp edges.

| Rev | Revision / Change | Date | Sign. |
|---|---|---|---|
| 1 | New design | 2017-11-10 | MSV |

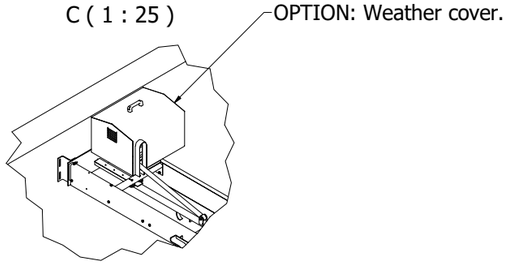


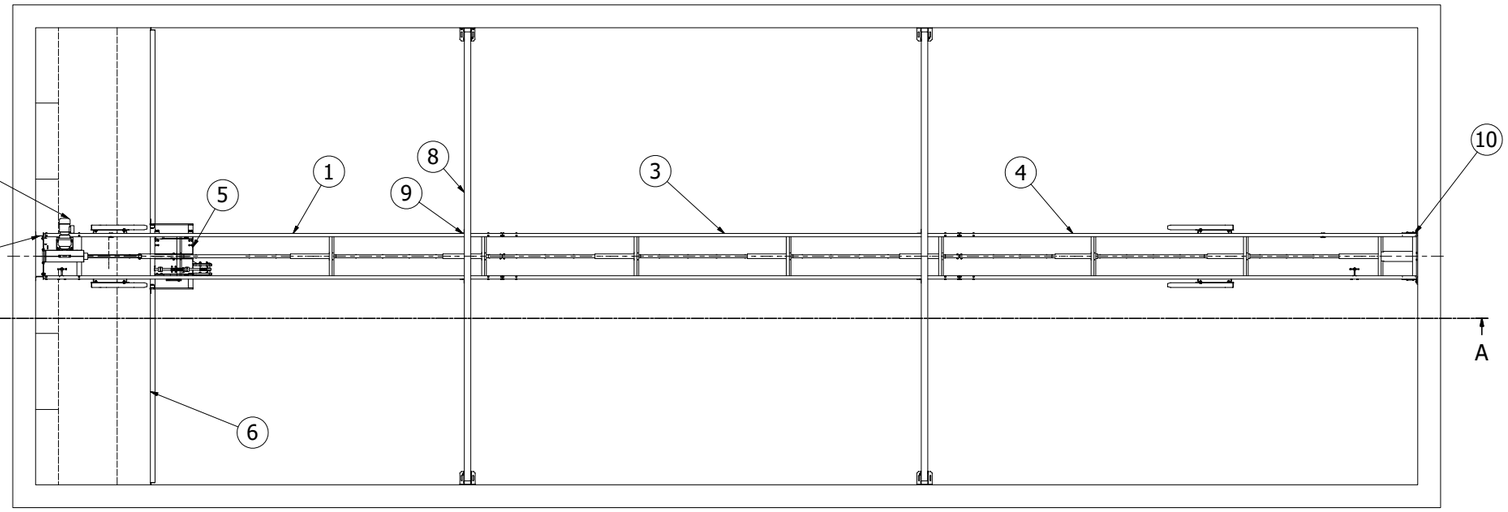
B-B ( 1 :40 )

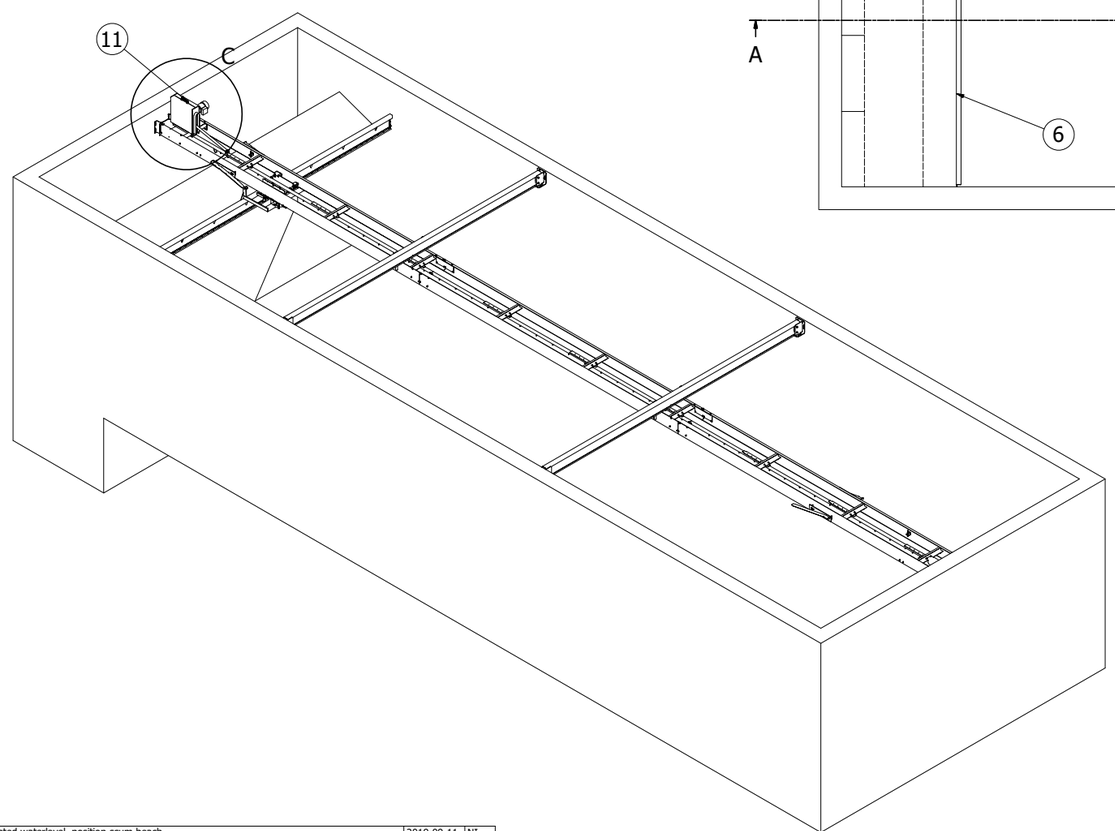



A-A ( 1 :40 )

C ( 1 : 25 )




| Surface scum scraper | |
|---|---|
| Product | Water level variation |
| Z3906 S1 | 50mm |
| Z3906 S2 | 80mm |
| Z3906 S3 | 110mm |

| Item | Description |
|---|---|
| 12 | Mounting kit (not shown) |
| 11 | Protection cover |
| 10 | End bracket |
| 9 | L-section |
| 8 | Carrying beam |
| 7 | Z-profile |
| 6 | Scraper blade |
| 5 | Sled |
| 4 | End section |
| 3 | Middle section |
| 2 | Gear motor |
| 1 | Start section |

| Rev | Revision / Change | Date | Sign. |
|---|---|---|---|
| 2 | Updated waterlevel, position scum beach | 2019-09-11 | NI |
| 1 | Uppdated drawing | 2018-01-08 | MSV |

NORDIC WATER

Electrical surface scum scraper

Z3906ES

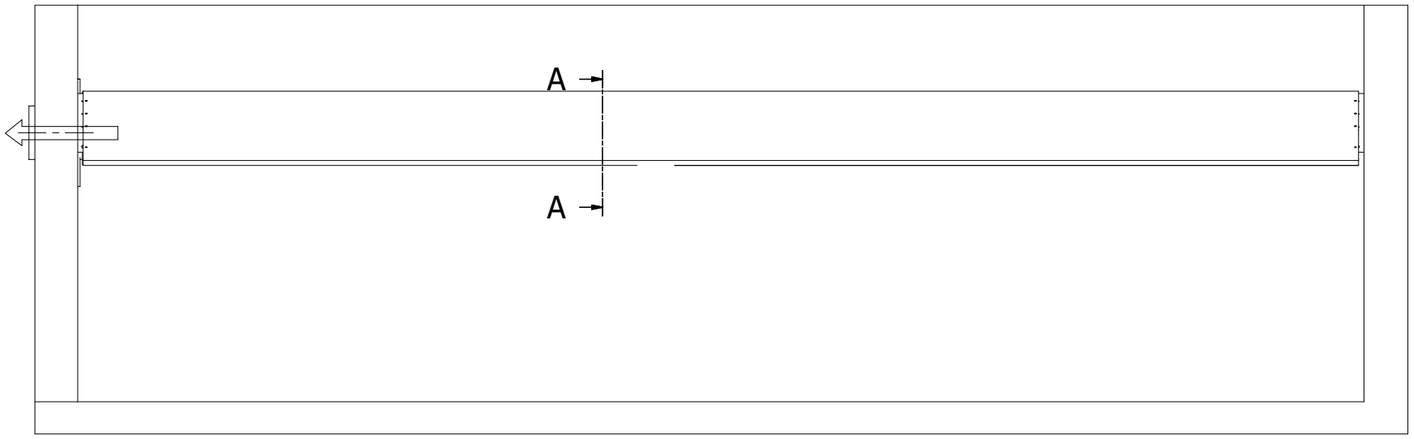
General Tender Drawing

Drawn: AO | Designed: CH | Date: 2012-05-09 | Scale: 1 :40

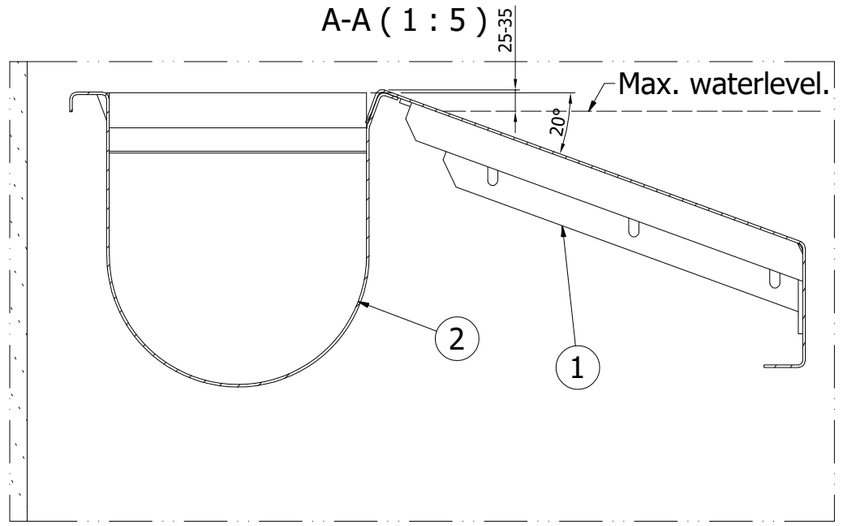
Project | Production Group | Customer | Modul

Drawingnumber: O3906-4533 | Revision: 2 | Sheet: 1 /1

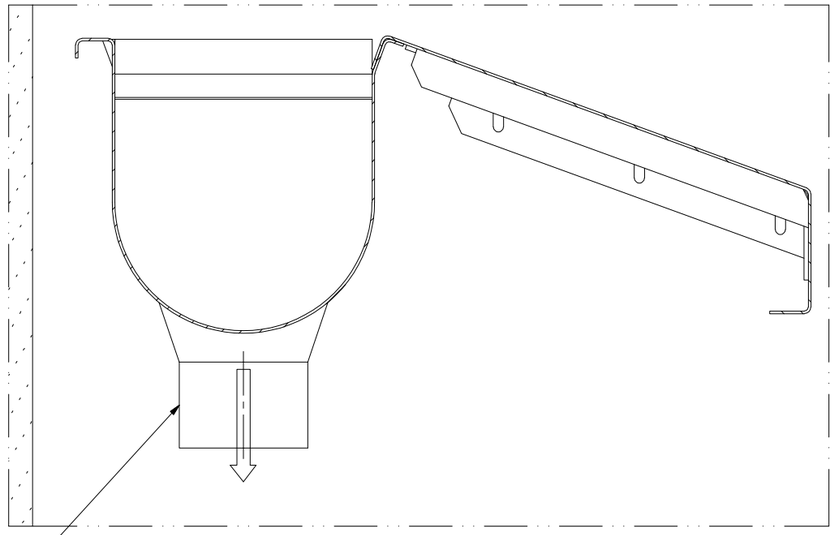
Tolerances for linear and angular dimensions without individual tolerance indications acc. to SS-ISO 2768-1-mK. Other measures acc. to digital shape model. All welding according to ISO 5817:2007. Chamfer all sharp edges.

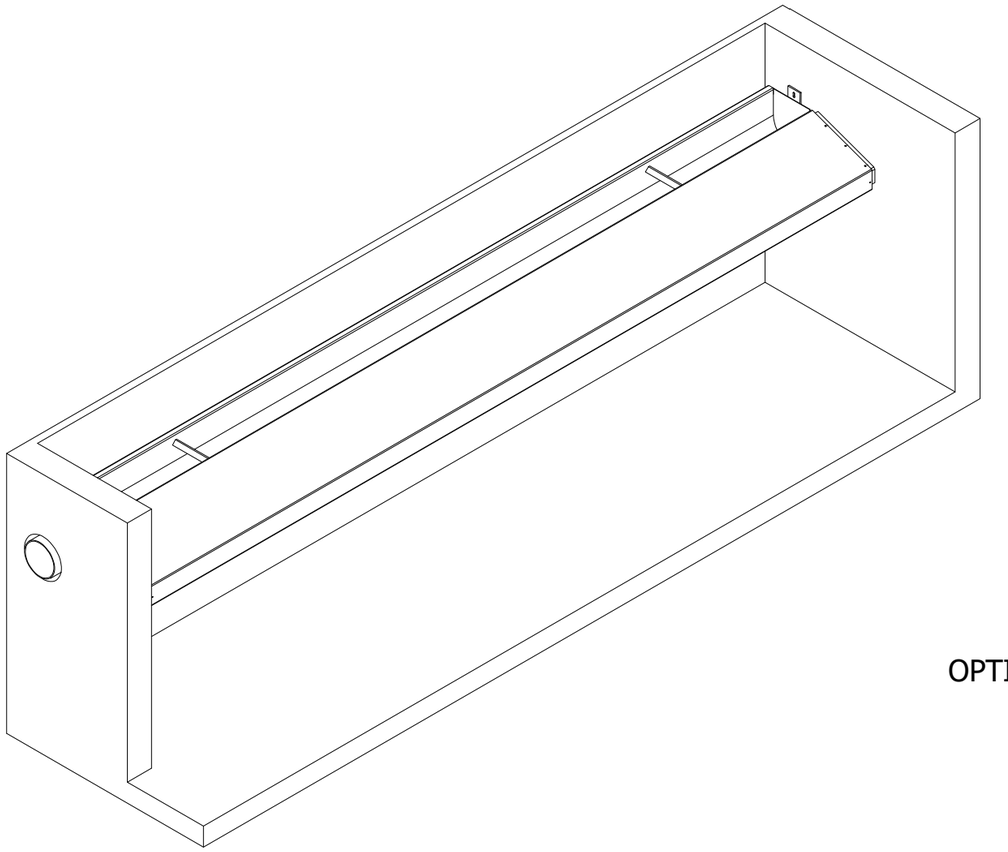



A-A ( 1 : 5 )




B-B ( 1 : 5 )





OPTION: Outlet sleeve.

Max waterlevel variation 50-110 mm.

| Item | Description |
|---|---|
| 11 | |
| 3 | Mounting kit (not shown) |
| 2 | Scum trough |
| 1 | Scum beach |

NORDIC WATER

Project

Customer

**Scum beach incl. trough.**

Z6900

General Tender Drawing

| Drawn | Designed |
|---|---|
| KM | kmenager |
| Date | Scale |
| 2017-05-02 | 1 : 25 |

Production Group

Modul

E

Drawingnumber **O6900-4547**

Revision **2**

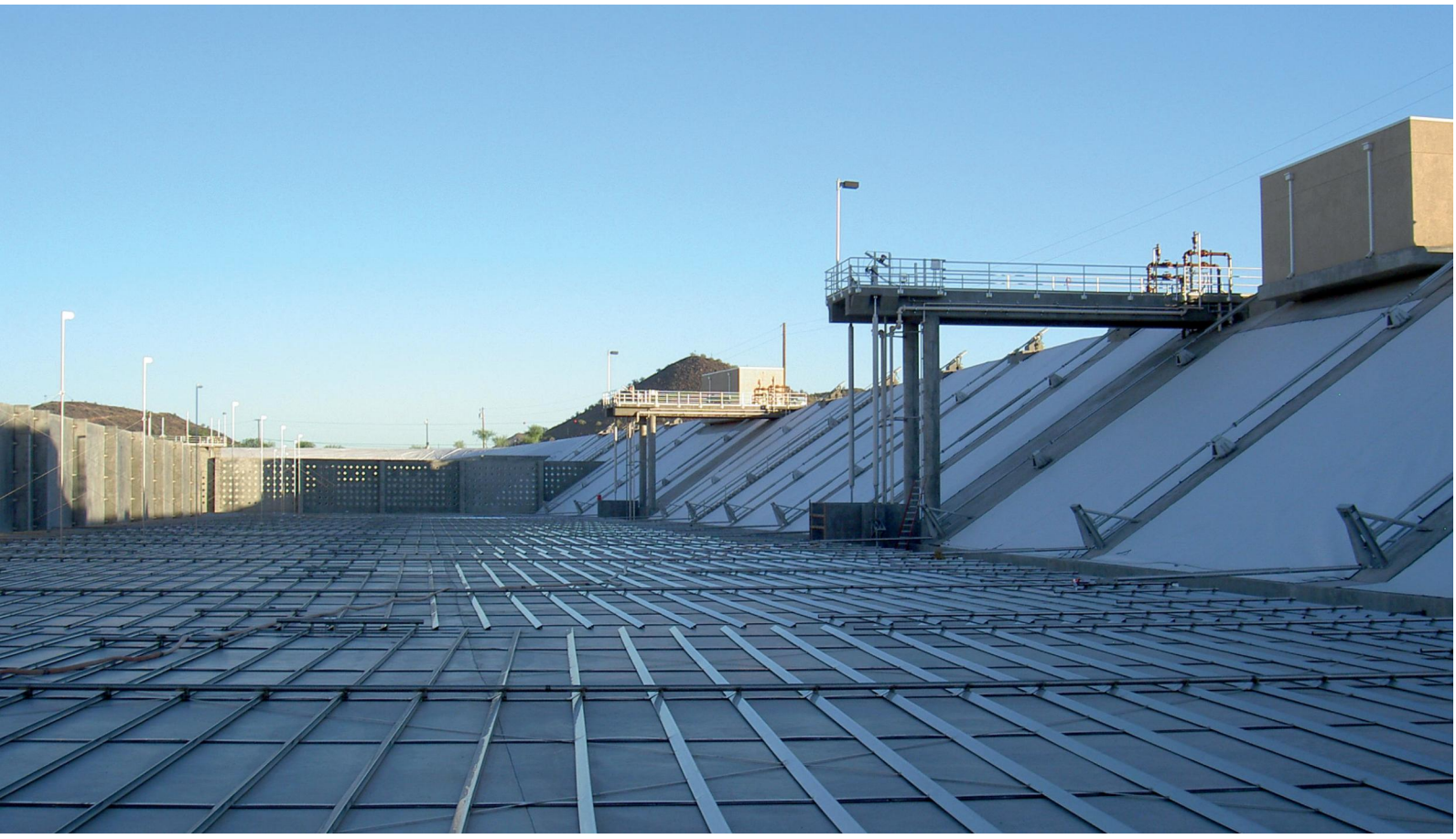
Sheet **1 /1**

Tolerances for linear and angular dimensions without individual tolerance indications acc. to SS-ISO 2768-1-mK. Other measures acc. to digital shape model.
All welding according to ISO 5817:2007. Chamfer all sharp edges.

| Rev. | Revision / Change | Date | Sign. |
|---|---|---|---|
| 2 | Water level tolerance was 100mm. | 2019-10-08 | NI |
| 1 | Uppdated drawing | 2018-01-11 | MSV |

NORDICWATER
A Sulzer Brand

# ZICKERT
# PRICE LIST 2022



# Price list

Document ID: Zickert price list SEK 2022 EN

Revision: 01

Date: 2022-04-14

NORDICWATER
A Sulzer Brand

**Price list terms and conditions:**

The price list is effective from 15th April 2022 to 31st December 2022. All prices are in SEK, excluding VAT, packaging and transport lading. The prices applies to the machines general Technical Specification. The prices are with reservation for misprint and changes in alloy and steel price. We reserve the right to adjust the prices during the stated validity time.



**Terms and conditions:**

| | |
|---|---|
| Payment terms: | Per agreement. |
| Delivery terms: | EXW (Incoterms 2010), Fjärås, Sweden. |
| Delivery time: | Per agreement. |
| Validity: | Prices are valid no later than 6 (six) months after written purchase order or per agreement. |
| Warranty: | 1 (one) year warranty for design, material and workmanship, from start-up date or 18 (eighteen) months from date of shipment, wichever occurs first. |
| Reservations: | The quote is valid according to the conditions above with reservations for increased material costs beyond our control or force majure. |
| General conditions: | Orgalime S 2012 |

NORDICWATER
A Sulzer Brand

# Z2001

For tank depth max. 5 m.

| | | *Product group 10900* | | *Product group 10901* | |
|---|---|---|---|---|---|
| Length (m) | Width (m) | Art.no | EN 1.4301 Price | Art.no | EN 1.4404 Price |
| 5 | 2 | P40000 | 157 700 | P40048 | 175 100 |
| 5 | 3 | P40001 | 159 200 | P40049 | 176 500 |
| 5 | 4 | P40002 | 160 500 | P40050 | 179 400 |
| 5 | 5 | P40003 | 162 000 | P40051 | 180 800 |
| 10 | 2 | P40004 | 166 100 | P40052 | 185 200 |
| 10 | 3 | P40005 | 169 000 | P40053 | 191 000 |
| 10 | 4 | P40006 | 173 300 | P40054 | 193 800 |
| 10 | 5 | P40007 | 176 200 | P40055 | 198 100 |
| 10 | 6 | P40008 | 180 400 | P40056 | 205 400 |
| 10 | 7 | P40009 | 187 600 | P40057 | 214 100 |
| 10 | 8 | P40010 | 197 400 | P40058 | 225 700 |
| 10 | 9 | P40011 | 201 700 | P40059 | 230 100 |
| 15 | 2 | P40012 | 174 800 | P40060 | 198 100 |
| 15 | 3 | P40013 | 180 400 | P40061 | 205 400 |
| 15 | 4 | P40014 | 184 700 | P40062 | 212 700 |
| 15 | 5 | P40015 | 188 900 | P40063 | 218 500 |
| 15 | 6 | P40016 | 194 500 | P40064 | 224 300 |
| 15 | 7 | P40017 | 207 500 | P40065 | 238 700 |
| 15 | 8 | P40018 | 218 700 | P40066 | 254 600 |
| 15 | 9 | P40019 | 224 400 | P40067 | 260 200 |
| 20 | 2 | P40020 | 197 400 | P40068 | 222 700 |
| 20 | 3 | P40021 | 188 900 | P40069 | 219 900 |
| 20 | 4 | P40022 | 198 800 | P40070 | 225 700 |
| 20 | 5 | P40023 | 204 600 | P40071 | 234 300 |
| 20 | 6 | P40024 | 208 800 | P40072 | 243 000 |
| 20 | 7 | P40025 | 230 100 | P40073 | 263 100 |
| 20 | 8 | P40026 | 238 600 | P40074 | 279 100 |
| 20 | 9 | P40027 | 245 700 | P40075 | 286 400 |
| 25 | 3 | P40028 | 203 200 | P40076 | 235 900 |
| 25 | 4 | P40029 | 210 200 | P40077 | 241 600 |
| 25 | 5 | P40030 | 220 200 | P40078 | 251 700 |
| 25 | 6 | P40031 | 227 300 | P40079 | 263 100 |
| 25 | 7 | P40032 | 249 900 | P40080 | 436 600 |
| 25 | 8 | P40033 | 260 000 | P40081 | 309 500 |
| 25 | 9 | P40034 | 269 800 | P40082 | 318 200 |
| 30 | 3 | P40035 | 224 400 | P40083 | 259 000 |
| 30 | 4 | P40036 | 225 800 | P40084 | 259 000 |
| 30 | 5 | P40037 | 233 000 | P40085 | 270 400 |
| 30 | 6 | P40038 | 242 700 | P40086 | 283 400 |
| 30 | 7 | P40039 | 272 800 | P40087 | 315 300 |
| 35 | 3 | P40040 | 234 300 | P40088 | 271 800 |
| 35 | 4 | P40041 | 237 100 | P40089 | 271 800 |
| 35 | 5 | P40042 | 248 500 | P40090 | 286 400 |
| 35 | 6 | P40043 | 260 000 | P40091 | 302 300 |
| 40 | 4 | P40045 | 258 500 | P40093 | 300 800 |
| 40 | 5 | P40046 | 262 600 | P40094 | 306 700 |
| 40 | 6 | P40047 | 276 900 | P40095 | 322 500 |

NORDICWATER
A Sulzer Brand

# Z2001

## HYDRAULIC UNIT

*Product group 10914*

| Hydraulic unit | No. of scrapers | Oil (l) | Art.no | Price |
|---|---|---|---|---|
| Single unit | 1 | 90 | P40999 | 56 100 |
| Double unit | 2 | 120 | P41000 | 87 300 |
| Triple unit | 3 | 230 | P41001 | 134 400 |

*Excluding options.*

## SCRAPER OPTIONS

*Product group 10914*

| Option | Art.no | EN 1.4301 Price | Art.no | EN 1.4401 Price |
|---|---|---|---|---|
| Extended piston rod extension for tank depth above 5 m | – | On request | – | On request |
| Flatbar in 3CR12 60x5 mm (140 SEK /m)<br>*Higher wear resistance* | – | – | – | – |
| Mechanical flag indication | P40962 | 14 700 | P40963 | 16 400 |
| Motion detector<br>*Electrical* | P40964 | 20 000 | P40965 | 22 500 |
| ATEX Zone 1 (hydraulic unit in non-ATEX zone)<br>*II 2G (Gb) Ex IIC T4* | P40966 | 13 000 | P40966 | 13 000 |

## OPTIONS – HYDRAULIC UNIT

*Product group 10914*

| Option | Quantity | Art.no | Price |
|---|---|---|---|
| Weather cover for single and double hydraulic unit EN 1.4301 | 1 per unit | P40970 | 10 200 |
| 1-phase oil cooler incl. cover, mounted on hydraulic unit | 1 per unit | P40971 | 15 400 |
| Oil heater for single and double units, 250 W | 1 per unit | P40972 | 10 700 |
| Weather cover for triple hydraulic unit EN 1.4301 | 1 per unit | P40973 | 27 500 |
| 3-phase oil cooler incl. cover, mounted on unit | 1 per unit | P40974 | 19 300 |
| Oil heater for triple unit, 1000 W | 1 per unit | P40975 | 14 200 |
| Hydrualic oil, 20 l | 1 unit | P40976 | 1 800 |
| Food degree hydraulic oil, 20 l | 1 unit | P40977 | 2 800 |
| Support and cover for oil cooler, stand-alone, additional price | 1 per unit | P40978 | 3 900 |
| Solar fan | 1 per unit | P40979 | 3 700 |
| Pressure transmitter 2–10 V | 1 per scraper | P40980 | 6 200 |
| Anti-condensation heater on motor on hydraulic unit | 1 per scraper | P40981 | 4 000 |
| Oil tray EN 1.4301 | 1 per unit | – | On request |
| 1 pair of hydraulic hoses, chrome plated fittings, 0.5 m | | P40984 | 1 100 |
| 1 pair of hydraulic hoses, chrome plated fittings, 3.0 m | | P40982 | 2 200 |
| 1 pair of hydraulic hoses, chrome plated fittings, 5.0 m | | P40983 | 3 900 |
| Hoses with stainless fittings (option) | | – | On request |

NORDICWATER
A Sulzer Brand

# Z2001

## CONTROL PANEL

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| 1 scraper | P41013 | 31 800 |
| 2 scrapers | P41014 | 43 000 |
| 3 scrapers | P41015 | 56 200 |
| 4 scrapers | P41016 | 69 800 |

## DELIVERY TERMS

| | Price |
|---|---|
| FOB Gothenburg CIF | On request |
| Special packaging | On request |
| Technical assistance | On request |
| Assembly on site | On request |
| Spare parts | On request |

## CONTROL PANEL OPTIONS

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| Heating element in control panel | P40986 | 4 000 |
| Cooling fan in control panel | P40987 | 5 000 |
| Overload voltage protection in control panel | P40988 | 6 300 |
| Relay for wrong phase in control panel | P40989 | 2 800 |
| ATEX relay for inductive sensor | P40990 | 4 100 |
| ATEX relay for overload sensor | P40991 | 7 300 |
| Modbus RS485 communication (price per scraper) | P40992 | 2 700 |
| Motion detector in control panel | P40993 | 3 400 |
| Anti-condensation heater on motor in control panel | P40994 | 2 700 |
| Oil heater in hydraulic unit (1 per unit) in control panel | P40995 | 2 700 |
| Cooler on hydraulic unit (1 per unit) in control panel | P40996 | 5 000 |
| Pressure transmitter 2–10 V on hydraulic unit in control panel | P40997 | 3 300 |
| Stainless enclosure EN 1.4301 for control panel | P40998 | 9 400 |

NORDICWATER
A Sulzer Brand

# Z2002

For tank depth max. 5 m.

| | | *Product group 10902* | | *Product group 10903* | |
|---|---|---|---|---|---|
| Length (m) | Width (m) | Art.no | EN 1.4301 Price | Art.no | EN 1.4404 Price |
| 20 | 3 | P40096 | 214 400 | P40167 | 241 600 |
| 20 | 4 | P40097 | 221 600 | P40168 | 250 300 |
| 20 | 5 | P40098 | 228 700 | P40169 | 260 200 |
| 20 | 6 | P40099 | 234 300 | P40170 | 270 400 |
| 20 | 7 | P40100 | 251 300 | P40171 | 298 000 |
| 20 | 8 | P40101 | 264 200 | P40172 | 308 000 |
| 20 | 9 | P40102 | 269 800 | P40173 | 313 800 |
| 20 | 10 | P40103 | 276 900 | P40174 | 326 900 |
| 20 | 11 | P40104 | 282 500 | P40175 | 334 000 |
| 20 | 12 | P40105 | 289 700 | P40176 | 344 300 |
| 25 | 3 | P40106 | 227 300 | P40177 | 260 200 |
| 25 | 4 | P40107 | 234 300 | P40178 | 270 400 |
| 25 | 5 | P40108 | 242 700 | P40179 | 282 000 |
| 25 | 6 | P40109 | 252 900 | P40180 | 290 700 |
| 25 | 7 | P40110 | 271 200 | P40181 | 331 200 |
| 25 | 8 | P40111 | 285 500 | P40182 | 341 300 |
| 25 | 9 | P40112 | 292 500 | P40183 | 349 900 |
| 25 | 10 | P40113 | 302 400 | P40184 | 361 500 |
| 25 | 11 | P40114 | 311 000 | P40185 | 373 100 |
| 25 | 12 | P40115 | 319 400 | P40186 | 384 700 |
| 30 | 3 | P40116 | 251 300 | P40187 | 277 600 |
| 30 | 4 | P40117 | 248 500 | P40188 | 289 200 |
| 30 | 5 | P40118 | 258 500 | P40189 | 302 300 |
| 30 | 6 | P40119 | 268 400 | P40190 | 313 800 |
| 30 | 7 | P40120 | 295 300 | P40191 | 357 100 |
| 30 | 8 | P40121 | 308 000 | P40192 | 373 100 |
| 30 | 9 | P40122 | 318 000 | P40193 | 384 700 |
| 30 | 10 | P40123 | 326 600 | P40194 | 397 700 |
| 30 | 11 | P40124 | 337 900 | P40195 | 412 100 |
| 30 | 12 | P40125 | 349 400 | P40196 | 422 200 |
| 35 | 3 | P40126 | 262 600 | P40197 | 293 600 |
| 35 | 4 | P40127 | 260 000 | P40198 | 308 000 |
| 35 | 5 | P40128 | 271 200 | P40199 | 322 500 |
| 35 | 6 | P40129 | 282 500 | P40200 | 336 900 |
| 35 | 7 | P40130 | 313 800 | P40201 | 386 100 |
| 35 | 8 | P40131 | 326 600 | P40202 | 402 000 |
| 35 | 9 | P40132 | 339 300 | P40203 | 416 400 |
| 35 | 10 | P40133 | 350 600 | P40204 | 433 600 |
| 35 | 11 | P40134 | 362 000 | P40205 | 448 200 |
| 35 | 12 | P40135 | 374 800 | P40206 | 464 100 |
| 40 | 4 | P40137 | 286 800 | P40208 | 326 900 |
| 40 | 5 | P40138 | 285 500 | P40209 | 344 300 |
| 40 | 6 | P40139 | 299 500 | P40210 | 361 500 |
| 40 | 7 | P40140 | 337 900 | P40211 | 416 400 |
| 40 | 8 | P40141 | 350 600 | P40212 | 433 600 |
| 40 | 9 | P40142 | 366 400 | P40213 | 451 200 |
| 40 | 10 | P40143 | 379 000 | P40214 | 469 800 |

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For tank depth max. 5 m.

| | | *Product group 10902* | | *Product group 10903* | |
|---|---|---|---|---|---|
| Length (m) | Width (m) | Art.no | EN 1.4301 Price | Art.no | EN 1.4404 Price |
| 45 | 4 | P40145 | 301 100 | P40216 | 347 000 |
| 45 | 5 | P40146 | 302 400 | P40217 | 368 800 |
| 45 | 6 | P40147 | 318 000 | P40218 | 386 100 |
| 45 | 7 | P40148 | 359 200 | P40219 | 443 800 |
| 45 | 8 | P40149 | 376 100 | P40220 | 465 600 |
| 45 | 9 | P40150 | 391 900 | P40221 | 484 300 |
| 50 | 4 | P40152 | 313 800 | P40223 | 372 900 |
| 50 | 5 | P40153 | 322 800 | P40224 | 392 000 |
| 50 | 6 | P40154 | 340 000 | P40225 | 414 100 |
| 50 | 7 | P40155 | 387 700 | P40226 | 481 400 |
| 50 | 8 | P40156 | 403 400 | P40227 | 500 600 |
| 55 | 4 | P40157 | 335 700 | P40228 | 406 600 |
| 55 | 5 | P40158 | 354 500 | P40229 | 431 600 |
| 55 | 6 | P40159 | 373 300 | P40230 | 455 100 |
| 55 | 7 | P40160 | 435 300 | P40231 | 528 300 |
| 60 | 4 | P40161 | 353 200 | P40232 | 427 100 |
| 60 | 5 | P40162 | 373 300 | P40233 | 452 100 |
| 60 | 6 | P40163 | 389 000 | P40234 | 481 400 |
| 65 | 4 | P40164 | 363 200 | P40235 | 446 300 |
| 65 | 5 | P40165 | 386 400 | P40236 | 472 600 |
| 65 | 6 | P40166 | 409 200 | P40237 | 500 600 |

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A Sulzer Brand

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## HYDRAULIC UNIT

*Product group 10914*

| Hydraulic unit | No. of scrapers | Oil (l) | Art.no | Price |
|---|---|---|---|---|
| Single unit | 1 | 90 | P41002 | 57 500 |
| Double unit | 2 | 120 | P41003 | 89 700 |
| Triple unit | 3 | 230 | P41004 | 139 800 |

*Excluding options.*

## SCRAPER OPTIONS

*Product group 10914*

| Option | Art.no | EN 1.4301 Price | Art.no | EN 1.4401 Price |
|---|---|---|---|---|
| Extended piston rod extension for tank depth above 5 m | – | On request | – | On request |
| Flatbar in 3CR12 60x5 mm (140 SEK/m)<br>*Higher wear resistance* | – | – | – | – |
| Mechanical flag indication | P40962 | 14 700 | P40963 | 16 400 |
| Motion detector<br>*Electrical* | P40964 | 20 000 | P40965 | 22 500 |
| ATEX Zone 1 (hydraulic unit in non-ATEX zone)<br>*II 2G (Gb) Ex IIC T4* | P40966 | 13 000 | P40966 | 13 000 |
| Z2002 HD design, additional price | P41041 | 7 200 | P41042 | 8 800 |

## OPTIONS – HYDRAULIC UNIT

*Product group 10914*

| Option | Quantity | Art.no | Price |
|---|---|---|---|
| Weather cover for single and double hydraulic unit EN 1.4301 | 1 per unit | P40970 | 10 200 |
| 1-phase oil cooler incl. cover, mounted on hydraulic unit | 1 per unit | P40971 | 15 400 |
| Oil heater for single and double units, 250 W | 1 per unit | P40972 | 10 700 |
| Weather cover for triple hydraulic unit EN 1.4301 | 1 per unit | P40973 | 27 500 |
| 3-phase oil cooler incl. cover, mounted on unit | 1 per unit | P40974 | 19 300 |
| Oil heater for triple unit, 1000 W | 1 per unit | P40975 | 14 200 |
| Hydrualic oil, 20 l | 1 unit | P40976 | 1 800 |
| Food degree hydraulic oil, 20 l | 1 unit | P40977 | 2 800 |
| Support and cover for oil cooler, stand-alone, additional price | 1 per unit | P40978 | 3 900 |
| Solar fan | 1 per unit | P40979 | 3 700 |
| Pressure transmitter 2–10 V | 1 per scraper | P40980 | 6 200 |
| Anti-condensation heater on motor on hydraulic unit | 1 per scraper | P40981 | 4 000 |
| Oil tray EN 1.4301 | 1 per unit | – | On request |
| 1 pair of hydraulic hoses, chrome plated fittings, 0.5 m | | P40984 | 1 100 |
| 1 pair of hydraulic hoses, chrome plated fittings, 3.0 m | | P40982 | 2 200 |
| 1 pair of hydraulic hoses, chrome plated fittings, 5.0 m | | P40983 | 3 900 |
| Hoses with stainless fittings (option) | | – | On request |

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## CONTROL PANEL

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| 1 scraper | P41017 | 31 800 |
| 2 scrapers | P41018 | 43 000 |
| 3 scrapers | P41019 | 56 200 |
| 4 scrapers | P41020 | 69 800 |

## DELIVERY TERMS

| | Price |
|---|---|
| FOB Gothenburg CIF | On request |
| Special packaging | On request |
| Technical assistance | On request |
| Assembly on site | On request |
| Spare parts | On request |

## CONTROL PANEL OPTIONS

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| Heating element in control panel | P40986 | 4 000 |
| Cooling fan in control panel | P40987 | 5 000 |
| Overload voltage protection in control panel | P40988 | 6 300 |
| Relay for wrong phase in control panel | P40989 | 2 800 |
| ATEX relay for inductive sensor | P40990 | 4 100 |
| ATEX relay for overload sensor | P40991 | 7 300 |
| Modbus RS485 communication (price per scraper) | P40992 | 2 700 |
| Motion detector in control panel | P40993 | 3 400 |
| Anti-condensation heater on motor in control panel | P40994 | 2 700 |
| Oil heater in hydraulic unit (1 per unit) in control panel | P40995 | 2 700 |
| Cooler on hydraulic unit (1 per unit) in control panel | P40996 | 5 000 |
| Pressure transmitter 2–10 V on hydraulic unit in control panel | P40997 | 3 300 |
| Stainless enclosure EN 1.4301 for control panel | P40998 | 9 400 |

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| | | *Product group 10904* | | *Product group 10905* | |
|---|---|---|---|---|---|
| Length (m) | Width (m) | Art.no | EN 1.4301 Price | Art.no | EN 1.4404 Price |
| 20 | 3 | P40238 | 184 700 | P40325 | 205 400 |
| 20 | 4 | P40239 | 190 400 | P40326 | 214 100 |
| 20 | 5 | P40240 | 198 800 | P40327 | 224 300 |
| 20 | 6 | P40241 | 204 600 | P40328 | 234 300 |
| 20 | 7 | P40242 | 228 700 | P40329 | 261 900 |
| 20 | 8 | P40243 | 234 300 | P40330 | 271 800 |
| 20 | 9 | P40244 | 241 400 | P40331 | 279 100 |
| 20 | 10 | P40245 | 248 500 | P40332 | 289 200 |
| 20 | 11 | P40246 | 255 600 | P40333 | 298 000 |
| 20 | 12 | P40247 | 261 300 | P40334 | 305 100 |
| 25 | 3 | P40248 | 198 800 | P40335 | 224 300 |
| 25 | 4 | P40249 | 205 900 | P40336 | 234 300 |
| 25 | 5 | P40250 | 214 400 | P40337 | 243 000 |
| 25 | 6 | P40251 | 221 600 | P40338 | 254 600 |
| 25 | 7 | P40252 | 249 900 | P40339 | 293 600 |
| 25 | 8 | P40253 | 260 000 | P40340 | 305 100 |
| 25 | 9 | P40254 | 272 800 | P40341 | 312 400 |
| 25 | 10 | P40255 | 276 900 | P40342 | 326 900 |
| 25 | 11 | P40256 | 284 000 | P40343 | 336 900 |
| 25 | 12 | P40257 | 295 300 | P40344 | 347 000 |
| 30 | 3 | P40258 | 208 800 | P40345 | 240 200 |
| 30 | 4 | P40259 | 220 200 | P40346 | 251 700 |
| 30 | 5 | P40260 | 230 100 | P40347 | 266 100 |
| 30 | 6 | P40261 | 240 100 | P40348 | 279 100 |
| 30 | 7 | P40262 | 275 400 | P40349 | 322 500 |
| 30 | 8 | P40263 | 285 500 | P40350 | 335 600 |
| 30 | 9 | P40264 | 295 300 | P40351 | 348 500 |
| 30 | 10 | P40265 | 303 900 | P40352 | 361 500 |
| 30 | 11 | P40266 | 313 800 | P40353 | 377 500 |
| 30 | 12 | P40267 | 322 300 | P40354 | 386 100 |
| 35 | 3 | P40268 | 221 600 | P40355 | 257 500 |
| 35 | 4 | P40269 | 233 000 | P40356 | 271 800 |
| 35 | 5 | P40270 | 242 700 | P40357 | 286 400 |
| 35 | 6 | P40271 | 257 000 | P40358 | 300 800 |
| 35 | 7 | P40272 | 296 800 | P40359 | 348 500 |
| 35 | 8 | P40273 | 306 700 | P40360 | 367 200 |
| 35 | 9 | P40274 | 321 000 | P40361 | 380 400 |
| 35 | 10 | P40275 | 329 500 | P40362 | 393 300 |
| 35 | 11 | P40276 | 339 300 | P40363 | 412 100 |
| 35 | 12 | P40277 | 362 000 | P40364 | 436 600 |

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| | | *Product group 10904* | | *Product group 10905* | |
|---|---|---|---|---|---|
| Length (m) | Width (m) | Art.no | EN 1.4301 Price | Art.no | EN 1.4404 Price |
| 40 | 4 | P40279 | 248 500 | P40366 | 290 700 |
| 40 | 5 | P40280 | 260 000 | P40367 | 308 000 |
| 40 | 6 | P40281 | 274 000 | P40368 | 326 900 |
| 40 | 7 | P40282 | 318 000 | P40369 | 380 400 |
| 40 | 8 | P40283 | 330 700 | P40370 | 397 700 |
| 40 | 9 | P40284 | 343 500 | P40371 | 416 400 |
| 40 | 10 | P40285 | 363 400 | P40372 | 442 500 |
| 40 | 11 | P40286 | 379 000 | P40373 | 455 400 |
| 40 | 12 | P40287 | 393 200 | P40374 | 474 200 |
| 45 | 4 | P40289 | 261 300 | P40376 | 311 000 |
| 45 | 5 | P40290 | 276 900 | P40377 | 331 200 |
| 45 | 6 | P40291 | 296 900 | P40378 | 353 800 |
| 45 | 7 | P40292 | 344 400 | P40379 | 414 100 |
| 45 | 8 | P40293 | 361 700 | P40380 | 435 900 |
| 45 | 9 | P40294 | 381 900 | P40381 | 462 400 |
| 45 | 10 | P40295 | 400 600 | P40382 | 487 200 |
| 45 | 11 | P40296 | 415 200 | P40383 | 505 000 |
| 45 | 12 | P40297 | 429 300 | P40384 | 528 300 |
| 50 | 4 | P40299 | 279 600 | P40386 | 334 900 |
| 50 | 5 | P40300 | 296 900 | P40387 | 353 800 |
| 50 | 6 | P40301 | 312 900 | P40388 | 378 700 |
| 50 | 7 | P40302 | 364 500 | P40389 | 444 700 |
| 50 | 8 | P40303 | 377 700 | P40390 | 463 800 |
| 50 | 9 | P40304 | 407 800 | P40391 | 497 500 |
| 50 | 10 | P40305 | 428 100 | P40392 | 519 600 |
| 50 | 11 | P40306 | 440 900 | P40393 | 541 700 |
| 55 | 4 | P40307 | 308 500 | P40394 | 367 000 |
| 55 | 5 | P40308 | 328 600 | P40395 | 392 000 |
| 55 | 6 | P40309 | 346 000 | P40396 | 418 300 |
| 55 | 7 | P40310 | 407 800 | P40397 | 491 800 |
| 55 | 8 | P40311 | 435 300 | P40398 | 375 700 |
| 55 | 9 | P40312 | 452 500 | P40399 | 547 400 |
| 55 | 10 | P40313 | 471 300 | P40400 | 591 500 |
| 60 | 5 | P40315 | 344 400 | P40402 | 414 100 |
| 60 | 6 | P40316 | 361 700 | P40403 | 440 300 |
| 60 | 7 | P40317 | 436 600 | P40404 | 531 300 |
| 60 | 8 | P40318 | 458 100 | P40405 | 554 800 |
| 60 | 9 | P40319 | 478 200 | P40406 | 585 500 |
| 65 | 5 | P40321 | 360 400 | P40408 | 435 900 |
| 65 | 6 | P40322 | 381 900 | P40409 | 463 800 |
| 65 | 7 | P40323 | 458 100 | P40410 | 557 600 |
| 65 | 8 | P40324 | 479 800 | P40411 | 591 500 |

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## HYDRAULIC UNIT

*Product group 10914*

| Hydraulic unit | No. of scrapers | Oil (l) | Art.no | Price |
|---|---|---|---|---|
| Single unit | 1 | 90 | P41005 | 61 900 |
| Double unit | 2 | 120 | P41006 | 97 800 |
| Triple unit | 3 | 230 | P41007 | 154 500 |

*Excluding options.*

## SCRAPER OPTIONS

*Product group 10914*

| Option | Art.no | EN 1.4301 Price | Art.no | EN 1.4401 Price |
|---|---|---|---|---|
| Flatbar in 3CR12 60x5 mm (140 SEK /m)<br>*Higher wear resistance* | – | – | – | – |
| Mechanical flag indication | P40962 | 14 700 | P40963 | 16 400 |
| Motion detector<br>*Electrical* | P40964 | 20 000 | P40965 | 22 500 |
| ATEX Zone 1 (hydraulic unit in non-ATEX zone)<br>*II 2G (Gb) Ex IIC T4* | P40966 | 13 000 | P40966 | 13 000 |

## OPTIONS – HYDRAULIC UNIT

*Product group 10914*

| Option | Quantity | Art.no | Price |
|---|---|---|---|
| Weather cover for single and double hydraulic unit EN 1.4301 | 1 per unit | P40970 | 10 200 |
| 1-phase oil cooler incl. cover, mounted on hydraulic unit | 1 per unit | P40971 | 15 400 |
| Oil heater for single and double units, 250 W | 1 per unit | P40972 | 10 700 |
| Weather cover for triple hydraulic unit EN 1.4301 | 1 per unit | P40973 | 27 500 |
| 3-phase oil cooler incl. cover, mounted on unit | 1 per unit | P40974 | 19 300 |
| Oil heater for triple unit, 1000 W | 1 per unit | P40975 | 14 200 |
| Hydrualic oil, 20 l | 1 unit | P40976 | 1 800 |
| Food degree hydraulic oil, 20 l | 1 unit | P40977 | 2 800 |
| Support and cover for oil cooler, stand-alone, additional price | 1 per unit | P40978 | 3 900 |
| Solar fan | 1 per unit | P40979 | 3 700 |
| Pressure transmitter 2–10 V | 1 per scraper | P40980 | 6 200 |
| Anti-condensation heater on motor on hydraulic unit | 1 per scraper | P40981 | 4 000 |
| Oil tray EN 1.4301 | 1 per unit | – | On request |
| 1 pair of hoses for dry installation, chrome plated fittings, 0.5 m | | P40984 | 1 100 |
| 1 pair of hydraulic hoses, 5 m – Teflon *(to be used in water), stainless EN 1.4404 fittings* | | P40985 | 10 900 |

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## CONTROL PANEL

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| 1 scraper | P41021 | 30 600 |
| 2 scrapers | P41022 | 40 000 |
| 3 scrapers | P41023 | 52 000 |
| 4 scrapers | P41024 | 63 800 |

## DELIVERY TERMS

| | Price |
|---|---|
| FOB Gothenburg CIF | On request |
| Special packaging | On request |
| Technical assistance | On request |
| Assembling on site | On request |
| Spare parts | On request |

## CONTROL PANEL OPTIONS

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| Heating element in control panel | P40986 | 4 000 |
| Cooling fan in control panel | P40987 | 5 000 |
| Overload voltage protection in control panel | P40988 | 6 300 |
| Relay for wrong phase in control panel | P40989 | 2 800 |
| ATEX relay for inductive sensor | P40990 | 4 100 |
| ATEX relay for overload sensor | P40991 | 7 300 |
| Modbus RS485 communication (price per scraper) | P40992 | 2 700 |
| Motion detector in control panel | P40993 | 3 400 |
| Anti-condensation heater on motor in control panel | P40994 | 2 700 |
| Oil heater in hydraulic unit (1 per unit) in control panel | P40995 | 2 700 |
| Cooler on hydraulic unit (1 per unit) in control panel | P40996 | 5 000 |
| Pressure transmitter 2–10 V on hydraulic unit in control panel | P40997 | 3 300 |
| Stainless enclosure EN 1.4301 for control panel | P40998 | 9 400 |

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| Length (m) | Width (m) | Product group 10906 Art.no | EN 1.4301 Price | Product group 10907 Art.no | EN 1.4404 Price |
|---|---|---|---|---|---|
| 20 | 3 | P40412 | 193 200 | P40515 | 217 000 |
| 20 | 4 | P40413 | 201 700 | P40516 | 227 100 |
| 20 | 5 | P40414 | 205 900 | P40517 | 235 900 |
| 20 | 6 | P40415 | 214 400 | P40518 | 243 000 |
| 20 | 7 | P40416 | 238 600 | P40519 | 276 200 |
| 20 | 8 | P40417 | 247 100 | P40520 | 284 800 |
| 20 | 9 | P40418 | 249 900 | P40521 | 293 600 |
| 20 | 10 | P40419 | 258 500 | P40522 | 300 800 |
| 20 | 11 | P40420 | 264 200 | P40523 | 309 500 |
| 20 | 12 | P40421 | 272 800 | P40524 | 321 100 |
| 25 | 3 | P40422 | 213 100 | P40525 | 241 600 |
| 25 | 4 | P40423 | 220 200 | P40526 | 250 300 |
| 25 | 5 | P40424 | 228 700 | P40527 | 261 900 |
| 25 | 6 | P40425 | 235 800 | P40528 | 273 400 |
| 25 | 7 | P40426 | 266 900 | P40529 | 311 000 |
| 25 | 8 | P40427 | 275 400 | P40530 | 322 500 |
| 25 | 9 | P40428 | 284 000 | P40531 | 332 700 |
| 25 | 10 | P40429 | 289 700 | P40532 | 344 300 |
| 25 | 11 | P40430 | 299 500 | P40533 | 355 700 |
| 25 | 12 | P40431 | 308 000 | P40534 | 367 200 |
| 30 | 3 | P40432 | 227 300 | P40535 | 259 000 |
| 30 | 4 | P40433 | 233 000 | P40536 | 271 800 |
| 30 | 5 | P40434 | 242 700 | P40537 | 284 800 |
| 30 | 6 | P40435 | 255 600 | P40538 | 298 000 |
| 30 | 7 | P40436 | 288 300 | P40539 | 341 300 |
| 30 | 8 | P40437 | 299 500 | P40540 | 355 700 |
| 30 | 9 | P40438 | 309 600 | P40541 | 367 200 |
| 30 | 10 | P40439 | 321 000 | P40542 | 380 400 |
| 30 | 11 | P40440 | 329 500 | P40543 | 393 300 |
| 30 | 12 | P40441 | 339 300 | P40544 | 404 800 |
| 35 | 3 | P40442 | 235 800 | P40545 | 276 200 |
| 35 | 4 | P40443 | 248 500 | P40546 | 290 700 |
| 35 | 5 | P40444 | 260 000 | P40547 | 305 100 |
| 35 | 6 | P40445 | 271 200 | P40548 | 321 100 |
| 35 | 7 | P40446 | 311 000 | P40549 | 370 100 |
| 35 | 8 | P40447 | 322 300 | P40550 | 384 700 |
| 35 | 9 | P40448 | 333 700 | P40551 | 397 700 |
| 35 | 10 | P40449 | 343 500 | P40552 | 412 100 |
| 35 | 11 | P40450 | 356 200 | P40553 | 429 400 |
| 35 | 12 | P40451 | 376 100 | P40554 | 452 500 |

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| Length (m) | Width (m) | Art.no | EN 1.4301 Price | Art.no | EN 1.4404 Price |
|---|---|---|---|---|---|
| | | *Product group 10906* | | *Product group 10907* | |
| 40 | 4 | P40453 | 269 800 | P40556 | 313 800 |
| 40 | 5 | P40454 | 281 200 | P40557 | 334 000 |
| 40 | 6 | P40455 | 295 300 | P40558 | 348 500 |
| 40 | 7 | P40456 | 337 900 | P40559 | 404 800 |
| 40 | 8 | P40457 | 350 600 | P40560 | 422 200 |
| 40 | 9 | P40458 | 366 400 | P40561 | 438 200 |
| 40 | 10 | P40459 | 384 700 | P40562 | 465 600 |
| 40 | 11 | P40460 | 398 900 | P40563 | 484 300 |
| 40 | 12 | P40461 | 413 000 | P40564 | 501 800 |
| 45 | 4 | P40463 | 284 000 | P40566 | 335 600 |
| 45 | 5 | P40464 | 302 700 | P40567 | 361 100 |
| 45 | 6 | P40465 | 317 100 | P40568 | 378 700 |
| 45 | 7 | P40466 | 367 500 | P40569 | 440 300 |
| 45 | 8 | P40467 | 381 900 | P40570 | 462 400 |
| 45 | 9 | P40468 | 404 900 | P40571 | 491 800 |
| 45 | 10 | P40469 | 419 300 | P40572 | 510 800 |
| 45 | 11 | P40470 | 435 300 | P40573 | 531 300 |
| 45 | 12 | P40471 | 452 500 | P40574 | 547 400 |
| 50 | 4 | P40473 | 305 600 | P40576 | 362 600 |
| 50 | 5 | P40474 | 322 800 | P40577 | 386 100 |
| 50 | 6 | P40475 | 338 800 | P40578 | 408 000 |
| 50 | 7 | P40476 | 390 500 | P40579 | 477 000 |
| 50 | 8 | P40477 | 410 600 | P40580 | 499 000 |
| 50 | 9 | P40478 | 435 300 | P40581 | 531 300 |
| 50 | 10 | P40479 | 452 500 | P40582 | 553 300 |
| 50 | 11 | P40480 | 471 300 | P40583 | 588 600 |
| 50 | 12 | P40481 | 485 600 | P40584 | 597 300 |
| 55 | 4 | P40482 | 335 700 | P40585 | 399 200 |
| 55 | 5 | P40483 | 354 500 | P40586 | 427 100 |
| 55 | 6 | P40484 | 374 700 | P40587 | 447 600 |
| 55 | 7 | P40485 | 415 200 | P40588 | 521 100 |
| 55 | 8 | P40486 | 439 600 | P40589 | 554 800 |
| 55 | 9 | P40487 | 478 200 | P40590 | 584 200 |
| 55 | 10 | P40488 | 497 000 | P40591 | 604 700 |
| 55 | 11 | P40489 | 500 100 | P40592 | 629 700 |
| 55 | 12 | P40490 | 518 500 | P40593 | 639 800 |
| 60 | 5 | P40492 | 371 800 | P40595 | 447 600 |
| 60 | 6 | P40493 | 390 500 | P40596 | 472 600 |
| 60 | 7 | P40494 | 288 300 | P40597 | 547 400 |
| 60 | 8 | P40495 | 465 400 | P40598 | 591 500 |
| 60 | 9 | P40496 | 504 200 | P40599 | 614 800 |
| 60 | 10 | P40497 | 518 500 | P40600 | 641 400 |
| 60 | 11 | P40498 | 528 900 | P40601 | 669 300 |

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| Length (m) | Width (m) | Product group 10906 Art.no | EN 1.4301 Price | Product group 10907 Art.no | EN 1.4404 Price |
|---|---|---|---|---|---|
| 65 | 5 | P40500 | 383 300 | P40603 | 477 000 |
| 65 | 6 | P40501 | 407 800 | P40604 | 502 000 |
| 65 | 7 | P40502 | 462 700 | P40605 | 579 800 |
| 65 | 8 | P40503 | 491 400 | P40606 | 619 300 |
| 65 | 9 | P40504 | 525 800 | P40607 | 653 100 |
| 65 | 10 | P40505 | 550 500 | P40608 | 680 900 |
| 70 | 6 | P40508 | 417 400 | P40611 | 526 800 |
| 70 | 7 | P40509 | 476 900 | P40612 | 609 100 |
| 70 | 8 | P40510 | 506 700 | P40613 | 651 500 |
| 70 | 9 | P40511 | 545 100 | P40614 | 686 900 |
| 75 | 6 | P40512 | 443 000 | P40615 | 556 200 |
| 75 | 7 | P40513 | 502 400 | P40616 | 645 700 |
| 75 | 8 | P40514 | 535 000 | P40617 | 691 200 |

## HYDRAULIC UNIT

*Product group 10914*

| Hydraulic unit | No. of scrapers | Oil (l) | Art.no | Price |
|---|---|---|---|---|
| Single unit | 1 | 90 | P41008 | 64 200 |
| Double unit | 2 | 120 | P41009 | 102 300 |
| Triple unit | 3 | 230 | P41010 | 168 700 |

*Excluding options.*

## SCRAPER OPTIONS

*Product group 10914*

| Option | Art.no | EN 1.4301 Price | Art.no | EN 1.4401 Price |
|---|---|---|---|---|
| Flatbar in 3CR12 60x5 mm (140 SEK /m)<br>*Higher wear resistance* | – | – | – | – |
| Mechanical flag indication | P40962 | 14 700 | P40963 | 16 400 |
| Motion detector<br>*Electrical* | P40964 | 20 000 | P40965 | 22 500 |
| ATEX Zone 1 (hydraulic unit in non-ATEX zone)<br>*II 2G (Gb) Ex IIC T4* | P40966 | 13 000 | P40966 | 13 000 |

# Z2004

## OPTIONS – HYDRAULIC UNIT

*Product group 10914*

| Option | Quantity | Art.no | Price |
|---|---|---|---|
| Weather cover for single and double hydraulic unit EN 1.4301 | 1 per unit | P40970 | 10 200 |
| 1-phase oil cooler incl. cover, mounted on hydraulic unit | 1 per unit | P40971 | 15 400 |
| Oil heater for single and double units, 250 W | 1 per unit | P40972 | 10 700 |
| Weather cover for triple hydraulic unit EN 1.4301 | 1 per unit | P40973 | 27 500 |
| 3-phase oil cooler incl. cover, mounted on unit | 1 per unit | P40974 | 19 300 |
| Oil heater for triple unit, 1000 W | 1 per unit | P40975 | 14 200 |
| Hydrualic oil, 20 l | 1 unit | P40976 | 1 800 |
| Food degree hydraulic oil, 20 l | 1 unit | P40977 | 2 800 |
| Support and cover for oil cooler, stand-alone, additional price | 1 per unit | P40978 | 3 900 |
| Solar fan | 1 per unit | P40979 | 3 700 |
| Pressure transmitter 2–10 V | 1 per scraper | P40980 | 6 200 |
| Anti-condensation heater on motor on hydraulic unit | 1 per scraper | P40981 | 4 000 |
| Oil tray EN 1.4301 | 1 per unit | – | On request |
| 1 pair of hoses for dry installation, chrome plated fittings, 0.5 m | | P40984 | 1 100 |
| 1 pair of hydraulic hoses, 5 m – Teflon *(to be used in water), stainless EN 1.4404 fittings* | | P40985 | 10 900 |

## CONTROL PANEL

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| 1 scraper | P41025 | 30 600 |
| 2 scrapers | P41026 | 40 000 |
| 3 scrapers | P41027 | 52 000 |
| 4 scrapers | P41028 | 63 800 |

## DELIVERY TERMS

| | Price |
|---|---|
| FOB Gothenburg CIF | On request |
| Special packaging | On request |
| Technical assistance | On request |
| Assembling on site | On request |
| Spare parts | On request |

## CONTROL PANEL OPTIONS

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| Heating element in control panel | P40986 | 4 000 |
| Cooling fan in control panel | P40987 | 5 000 |
| Overload voltage protection in control panel | P40988 | 6 300 |
| Relay for wrong phase in control panel | P40989 | 2 800 |
| ATEX relay for inductive sensor | P40990 | 4 100 |
| ATEX relay for overload sensor | P40991 | 7 300 |
| Modbus RS485 communication (price per scraper) | P40992 | 2 700 |
| Motion detector in control panel | P40993 | 3 400 |
| Anti-condensation heater on motor in control panel | P40994 | 2 700 |
| Oil heater in hydraulic unit (1 per unit) in control panel | P40995 | 2 700 |
| Cooler on hydraulic unit (1 per unit) in control panel | P40996 | 5 000 |
| Pressure transmitter 2–10 V on hydraulic unit in control panel | P40997 | 3 300 |
| Stainless enclosure EN 1.4301 for control panel | P40998 | 9 400 |

NORDICWATER
A Sulzer Brand

# Z2011, Z2012

For tank depth max. 5 m.

Including protection cover for moving parts at the drive unit.

| | | *Product group 10908* | | *Product group 10909* | |
|---|---|---|---|---|---|
| Length (m) | Width (m) | Art.no | EN 1.4301 Price | Art.no | EN 1.4404 Price |
| 5 | 2 | P40618 | 194 100 | P40647 | 217 900 |
| 5 | 3 | P40619 | 198 300 | P40648 | 219 400 |
| 5 | 4 | P40620 | 201 300 | P40649 | 222 200 |
| 5 | 5 | P40621 | 202 700 | P40650 | 226 600 |
| 10 | 2 | P40622 | 205 400 | P40651 | 232 400 |
| 10 | 3 | P40623 | 209 700 | P40652 | 236 700 |
| 10 | 4 | P40624 | 212 600 | P40653 | 241 100 |
| 10 | 5 | P40625 | 216 700 | P40654 | 245 300 |
| 10 | 6 | P40626 | 219 600 | P40655 | 249 700 |
| 15 | 2 | P40627 | 216 700 | P40656 | 245 300 |
| 15 | 3 | P40628 | 221 100 | P40657 | 254 000 |
| 15 | 4 | P40629 | 228 200 | P40658 | 259 600 |
| 15 | 5 | P40630 | 231 000 | P40659 | 265 400 |
| 15 | 6 | P40631 | 238 000 | P40660 | 272 700 |
| 20 | 2 | P40632 | 228 200 | P40661 | 266 900 |
| 20 | 3 | P40633 | 232 400 | P40662 | 266 900 |
| 20 | 4 | P40634 | 239 500 | P40663 | 274 000 |
| 20 | 5 | P40635 | 246 500 | P40664 | 284 100 |
| 20 | 6 | P40636 | 253 500 | P40665 | 292 900 |
| 25 | 3 | P40637 | 246 500 | P40666 | 282 700 |
| 25 | 4 | P40638 | 254 900 | P40667 | 292 900 |
| 25 | 5 | P40639 | 263 600 | P40668 | 297 300 |
| 25 | 6 | P40640 | 272 100 | P40669 | 310 200 |
| 30 | 3 | P40641 | 269 200 | P40670 | 304 300 |
| 30 | 4 | P40642 | 266 300 | P40671 | 304 300 |
| 30 | 5 | P40643 | 276 200 | P40672 | 317 400 |
| 35 | 3 | P40644 | 278 900 | P40673 | 317 400 |
| 35 | 4 | P40645 | 278 900 | P40674 | 320 300 |

# Z2011, Z2012

## SCRAPER OPTIONS

*Product group 10914*

| Option | Art.no | EN 1.4301 Price | Art.no | EN 1.4401 Price |
|---|---|---|---|---|
| Extended upper link arm for tank depth above 5 m | – | On request | – | On request |
| Flatbar in 3CR12 60x5 mm (140 SEK/m)<br>*Higher wear resistance* | – | – | – | – |
| Mechanical flag indication | P40962 | 14 700 | P40963 | 16 400 |
| Motion detector<br>*Electrical* | P40964 | 20 000 | P40965 | 22 500 |
| ATEX Zone 1<br>*II 2G (Gb) Ex IIC T4* | P40967 | 32 000 | P40967 | 32 000 |

## DRIVE MOTOR OPTIONS

*Product group 10914*

| Option | Art.no | EN 1.4301 Price | Art.no | EN 1.4401 Price |
|---|---|---|---|---|
| Weather cover, additional price | P40968 | 4 300 | – | On request |
| Anti condensation heater | P40969 | 4 000 | P40969 | 4 000 |
| Paint (other than standard) | – | On request | – | On request |

## OPTIONS – CONTROL PANEL

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| 1 scraper | P41029 | 34 800 |
| 2 scrapers | P41030 | 48 500 |
| 3 scrapers | P41031 | 62 900 |
| 4 scrapers | P41032 | 85 300 |

## DELIVERY TERMS

| | Price |
|---|---|
| FOB Gothenburg CIF | On request |
| Special packaging | On request |
| Technical assistance | On request |
| Assembling on site | On request |
| Spare parts | On request |

## CONTROL PANEL OPTIONS

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| Heating element in control panel | P40986 | 4 000 |
| Cooling fan in control panel | P40987 | 5 000 |
| Overload voltage protection in control panel | P40988 | 6 300 |
| Relay for wrong phase in control panel | P40989 | 2 800 |
| ATEX relay for inductive sensor | P40990 | 4 100 |
| ATEX relay for overload sensor | P40991 | 7 300 |
| Modbus RS485 communication (price per scraper) | P40992 | 2 700 |
| Motion detector in control panel | P40993 | 3 400 |
| Anti-condensation heater on motor in control panel | P40994 | 2 700 |
| Stainless enclosure EN 1.4301 for control panel | P40995 | 2 700 |

NORDICWATER
A Sulzer Brand

# Z2013, Z2014

For tank depth max. 5 m.

Including protection cover for moving parts at the drive unit.

| | | *Product group 10910* | | *Product group 10911* | |
|---|---|---|---|---|---|
| Length (m) | Width (m) | Art.no | EN 1.4301 Price | Art.no | EN 1.4404 Price |
| 5 | 2 | P40676 | 211 100 | P40729 | 230 800 |
| 5 | 3 | P40677 | 212 600 | P40730 | 232 400 |
| 5 | 4 | P40678 | 213 900 | P40731 | 233 800 |
| 5 | 5 | P40679 | 215 500 | P40732 | 236 700 |
| 10 | 2 | P40680 | 219 600 | P40733 | 242 400 |
| 10 | 3 | P40681 | 222 300 | P40734 | 246 800 |
| 10 | 4 | P40682 | 226 700 | P40735 | 251 000 |
| 10 | 5 | P40683 | 229 500 | P40736 | 256 900 |
| 10 | 6 | P40684 | 232 400 | P40737 | 259 600 |
| 10 | 7 | P40685 | 247 900 | P40738 | 271 100 |
| 10 | 8 | P40686 | 252 300 | P40739 | 284 100 |
| 10 | 9 | P40687 | 254 900 | P40740 | 287 100 |
| 15 | 2 | P40688 | 228 200 | P40741 | 256 900 |
| 15 | 3 | P40689 | 235 200 | P40742 | 262 500 |
| 15 | 4 | P40690 | 239 500 | P40743 | 268 300 |
| 15 | 5 | P40691 | 246 500 | P40744 | 272 700 |
| 15 | 6 | P40692 | 249 300 | P40745 | 281 300 |
| 15 | 7 | P40693 | 270 500 | P40746 | 297 300 |
| 15 | 8 | P40694 | 274 800 | P40747 | 314 600 |
| 15 | 9 | P40695 | 281 800 | P40748 | 320 300 |
| 20 | 2 | P40696 | 252 300 | P40749 | 277 000 |
| 20 | 3 | P40697 | 246 500 | P40750 | 275 500 |
| 20 | 4 | P40698 | 253 500 | P40751 | 284 100 |
| 20 | 5 | P40699 | 259 300 | P40752 | 292 900 |
| 20 | 6 | P40700 | 263 600 | P40753 | 303 000 |
| 20 | 7 | P40701 | 289 000 | P40754 | 323 200 |
| 20 | 8 | P40702 | 297 500 | P40755 | 340 500 |
| 20 | 9 | P40703 | 303 100 | P40756 | 349 000 |
| 25 | 3 | P40704 | 259 300 | P40757 | 291 400 |
| 25 | 4 | P40705 | 266 300 | P40758 | 300 100 |
| 25 | 5 | P40706 | 274 800 | P40759 | 311 700 |
| 25 | 6 | P40707 | 283 300 | P40760 | 321 800 |
| 25 | 7 | P40708 | 311 500 | P40761 | 351 900 |
| 25 | 8 | P40709 | 321 500 | P40762 | 369 200 |
| 25 | 9 | P40710 | 327 100 | P40763 | 379 500 |
| 30 | 3 | P40711 | 280 500 | P40764 | 318 800 |
| 30 | 4 | P40712 | 280 500 | P40765 | 318 800 |
| 30 | 5 | P40713 | 289 000 | P40766 | 330 400 |
| 30 | 6 | P40714 | 300 300 | P40767 | 343 400 |
| 30 | 7 | P40715 | 335 500 | P40768 | 377 900 |
| 30 | 8 | P40716 | 339 900 | P40769 | 395 200 |

NORDICWATER
A Sulzer Brand

# Z2013, Z2014

For tank depth max. 5 m.
Including protection cover for moving parts at the drive unit.

| Length (m) | Width (m) | Art.no *Product group 10910* | EN 1.4301 Price | Art.no *Product group 10911* | EN 1.4404 Price |
|---|---|---|---|---|---|
| 35 | 3 | P40717 | 290 400 | P40770 | 331 900 |
| 35 | 4 | P40718 | 289 000 | P40771 | 333 200 |
| 35 | 5 | P40719 | 301 700 | P40772 | 349 000 |
| 35 | 6 | P40720 | 313 000 | P40773 | 363 500 |
| 35 | 7 | P40721 | 351 200 | P40774 | 399 500 |
| 40 | 4 | P40722 | 315 900 | P40775 | 366 300 |
| 40 | 5 | P40723 | 320 200 | P40776 | 367 900 |
| 40 | 6 | P40724 | 329 900 | P40777 | 383 700 |
| 45 | 4 | P40725 | 328 700 | P40778 | 379 500 |
| 45 | 5 | P40726 | 329 900 | P40779 | 385 200 |
| 50 | 4 | P40727 | 339 900 | P40780 | 393 800 |
| 50 | 5 | P40728 | 358 300 | P40781 | 415 400 |

## SCRAPER OPTIONS

*Product group 10914*

| Option | Art.no | EN 1.4301 Price | Art.no | EN 1.4401 Price |
|---|---|---|---|---|
| Extended upper link arm for tank depth above 5 m | – | On request | – | On request |
| Flatbar in 3CR12 60x5 mm (140 SEK/m)<br>*Higher wear resistance* | – | – | – | – |
| Mechanical flag indication | P40962 | 14 700 | P40963 | 16 400 |
| Motion detector<br>*Electrical* | P40964 | 20 000 | P40965 | 22 500 |
| ATEX Zone 1<br>*II 2G (Gb) Ex IIC T4* | P40967 | 32 000 | P40967 | 32 000 |

## DRIVE MOTOR OPTIONS

*Product group 10914*

| Option | Art.no | EN 1.4301 Price | Art.no | EN 1.4401 Price |
|---|---|---|---|---|
| Weather cover, additional price | P40968 | 4 300 | – | On request |
| Anti condensation heater | P40969 | 4 000 | P40969 | 4 000 |
| Paint (other than standard) | – | On request | – | On request |

## OPTIONS – CONTROL PANEL

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| 1 scraper | P41033 | 35 800 |
| 2 scrapers | P41034 | 51 500 |
| 3 scrapers | P41035 | 66 000 |
| 4 scrapers | P41036 | 88 500 |

NORDICWATER
A Sulzer Brand

# Z2013, Z2014

## DELIVERY TERMS

| | Price |
|---|---|
| FOB Gothenburg CIF | On request |
| Special packaging | On request |
| Technical assistance | On request |
| Assembling on site | On request |
| Spare parts | On request |

## CONTROL PANEL OPTIONS

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| Heating element in control panel | P40986 | 4 000 |
| Cooling fan in control panel | P40987 | 5 000 |
| Overload voltage protection in control panel | P40988 | 6 300 |
| Relay for wrong phase in control panel | P40989 | 2 800 |
| ATEX relay for inductive sensor | P40990 | 4 100 |
| ATEX relay for overload sensor | P40991 | 7 300 |
| Modbus RS485 communication (price per scraper) | P40992 | 2 700 |
| Motion detector in control panel | P40993 | 3 400 |
| Anti-condensation heater on motor in control panel | P40994 | 2 700 |
| Stainless enclosure EN 1.4301 for control panel | P40998 | 9 400 |

NORDICWATER
A Sulzer Brand

# Z2015

For tank depth max. 5 m.
Including protection cover for moving parts at the drive unit.

| | | *Product group 10912* | | *Product group 10913* | |
|---|---|---|---|---|---|
| Length (m) | Width (m) | Art.no | EN 1.4301 Price | Art.no | EN 1.4404 Price |
| 5 | 2 | P40782 | 247 900 | P40872 | 269 800 |
| 5 | 3 | P40783 | 252 300 | P40873 | 274 000 |
| 5 | 4 | P40784 | 253 500 | P40874 | 275 500 |
| 5 | 5 | P40785 | 254 900 | P40875 | 277 000 |
| 10 | 2 | P40786 | 256 400 | P40876 | 284 100 |
| 10 | 3 | P40787 | 263 600 | P40877 | 290 000 |
| 10 | 4 | P40788 | 266 300 | P40878 | 294 400 |
| 10 | 5 | P40789 | 270 500 | P40879 | 300 100 |
| 10 | 6 | P40790 | 274 800 | P40880 | 304 300 |
| 10 | 7 | P40791 | 283 300 | P40881 | 313 000 |
| 10 | 8 | P40792 | 287 600 | P40882 | 320 300 |
| 10 | 9 | P40793 | 291 800 | P40883 | 324 600 |
| 10 | 10 | P40794 | 296 100 | P40884 | 336 100 |
| 10 | 11 | P40795 | 301 700 | P40885 | 341 800 |
| 10 | 12 | P40796 | 308 900 | P40886 | 344 800 |
| 15 | 2 | P40797 | 266 300 | P40887 | 295 700 |
| 15 | 3 | P40798 | 276 200 | P40888 | 307 300 |
| 15 | 4 | P40799 | 281 800 | P40889 | 313 000 |
| 15 | 5 | P40800 | 286 100 | P40890 | 321 800 |
| 15 | 6 | P40801 | 291 800 | P40891 | 328 900 |
| 15 | 7 | P40802 | 301 700 | P40892 | 346 100 |
| 15 | 8 | P40803 | 311 500 | P40893 | 351 900 |
| 15 | 9 | P40804 | 315 900 | P40894 | 357 700 |
| 15 | 10 | P40805 | 321 500 | P40895 | 372 100 |
| 15 | 11 | P40806 | 328 700 | P40896 | 379 500 |
| 15 | 12 | P40807 | 337 100 | P40897 | 385 200 |
| 20 | 2 | P40808 | 289 000 | P40898 | 304 300 |
| 20 | 3 | P40809 | 287 600 | P40899 | 324 600 |
| 20 | 4 | P40810 | 296 100 | P40900 | 333 200 |
| 20 | 5 | P40811 | 301 700 | P40901 | 341 800 |
| 20 | 6 | P40812 | 308 900 | P40902 | 349 000 |
| 20 | 7 | P40813 | 321 500 | P40903 | 373 600 |
| 20 | 8 | P40814 | 331 400 | P40904 | 382 300 |
| 20 | 9 | P40815 | 338 400 | P40905 | 390 900 |
| 20 | 10 | P40816 | 347 000 | P40906 | 403 800 |
| 20 | 11 | P40817 | 356 900 | P40907 | 414 000 |
| 20 | 12 | P40818 | 366 800 | P40908 | 421 200 |

NORDICWATER
A Sulzer Brand

# Z2015

For tank depth max. 5 m.
Including protection cover for moving parts at the drive unit.

| | | *Product group 10912* | | *Product group 10913* | |
|---|---|---|---|---|---|
| Length (m) | Width (m) | Art.no | EN 1.4301 Price | Art.no | EN 1.4404 Price |
| 25 | 3 | P40819 | 301 700 | P40909 | 341 800 |
| 25 | 4 | P40820 | 310 200 | P40910 | 353 300 |
| 25 | 5 | P40821 | 320 200 | P40911 | 362 000 |
| 25 | 6 | P40822 | 327 100 | P40912 | 373 600 |
| 25 | 7 | P40823 | 338 400 | P40913 | 402 500 |
| 25 | 8 | P40824 | 354 100 | P40914 | 414 000 |
| 25 | 9 | P40825 | 362 500 | P40915 | 425 600 |
| 25 | 10 | P40826 | 371 100 | P40916 | 439 800 |
| 25 | 11 | P40827 | 379 600 | P40917 | 450 000 |
| 25 | 12 | P40828 | 393 700 | P40918 | 460 000 |
| 30 | 3 | P40829 | 320 200 | P40919 | 369 200 |
| 30 | 4 | P40830 | 324 300 | P40920 | 372 100 |
| 30 | 5 | P40831 | 334 300 | P40921 | 383 700 |
| 30 | 6 | P40832 | 344 200 | P40922 | 396 700 |
| 30 | 7 | P40833 | 358 300 | P40923 | 432 500 |
| 30 | 8 | P40834 | 376 800 | P40924 | 444 200 |
| 30 | 9 | P40835 | 386 500 | P40925 | 458 700 |
| 30 | 10 | P40836 | 396 500 | P40926 | 476 000 |
| 30 | 11 | P40837 | 414 900 | P40927 | 487 500 |
| 30 | 12 | P40838 | 430 600 | P40928 | 499 100 |
| 35 | 3 | P40839 | 329 900 | P40929 | 383 700 |
| 35 | 4 | P40840 | 335 500 | P40930 | 389 400 |
| 35 | 5 | P40841 | 348 500 | P40931 | 405 400 |
| 35 | 6 | P40842 | 359 700 | P40932 | 415 400 |
| 35 | 7 | P40843 | 379 600 | P40933 | 457 100 |
| 35 | 8 | P40844 | 396 500 | P40934 | 476 000 |
| 35 | 9 | P40845 | 409 300 | P40935 | 490 300 |
| 35 | 10 | P40846 | 419 100 | P40936 | 506 300 |
| 35 | 11 | P40847 | 441 900 | P40937 | 520 800 |
| 40 | 4 | P40849 | 362 500 | P40939 | 421 200 |
| 40 | 5 | P40850 | 365 500 | P40940 | 427 000 |
| 40 | 6 | P40851 | 378 100 | P40941 | 444 200 |
| 40 | 7 | P40852 | 400 800 | P40942 | 488 900 |
| 40 | 8 | P40853 | 419 100 | P40943 | 506 300 |
| 40 | 9 | P40854 | 431 800 | P40944 | 524 900 |
| 40 | 10 | P40855 | 455 900 | P40945 | 543 700 |
| 45 | 4 | P40856 | 375 200 | P40946 | 439 800 |
| 45 | 5 | P40857 | 378 100 | P40947 | 452 500 |
| 45 | 6 | P40858 | 401 000 | P40948 | 471 500 |
| 45 | 7 | P40859 | 427 000 | P40949 | 525 500 |
| 45 | 8 | P40860 | 449 900 | P40950 | 543 200 |

NORDICWATER
A Sulzer Brand

# Z2015

For tank depth max. 5 m.

Including protection cover for moving parts at the drive unit.

| | | *Product group 10912* | | *Product group 10913* | |
|---|---|---|---|---|---|
| Length (m) | Width (m) | Art.no | EN 1.4301 Price | Art.no | EN 1.4404 Price |
| 50 | 4 | P40861 | 385 400 | P40951 | 464 200 |
| 50 | 5 | P40862 | 412 600 | P40952 | 475 900 |
| 50 | 6 | P40863 | 428 300 | P40953 | 508 100 |
| 50 | 7 | P40864 | 459 900 | P40954 | 566 700 |
| 50 | 8 | P40865 | 481 700 | P40955 | 585 600 |
| 55 | 4 | P40866 | 408 200 | P40956 | 483 200 |
| 55 | 5 | P40867 | 427 000 | P40957 | 502 100 |
| 55 | 6 | P40868 | 447 100 | P40958 | 531 400 |
| 55 | 7 | P40869 | 480 100 | P40959 | 595 900 |
| 60 | 5 | P40870 | 441 500 | P40960 | 524 200 |
| 60 | 6 | P40871 | 470 100 | P40961 | 559 200 |

# Z2015

## SCRAPER OPTIONS

*Product group 10914*

| Option | Art.no | EN 1.4301 Price | Art.no | EN 1.4401 Price |
|---|---|---|---|---|
| Extended upper link arm for tank depth above 5 m | – | On request | – | On request |
| Flatbar in 3CR12 60x5 mm (140 SEK/m)<br>*Higher wear resistance* | – | – | – | – |
| Mechanical flag indication | P40962 | 14 700 | P40963 | 16 400 |
| Motion detector<br>*Electrical* | P40964 | 20 000 | P40965 | 22 500 |
| ATEX Zone 1<br>*II 2G (Gb) Ex IIC T4* | P40967 | 32 000 | P40967 | 32 000 |

## DRIVE MOTOR OPTIONS

*Product group 10914*

| Option | Art.no | EN 1.4301 Price | Art.no | EN 1.4401 Price |
|---|---|---|---|---|
| Weather cover, additional price | P41043 | 5 700 | – | On request |
| Anti condensation heater | P40969 | 4 000 | P40969 | 4 000 |
| Paint (other than standard) | – | On request | – | On request |

## CONTROL PANEL

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| 1 scraper | P41037 | 37 300 |
| 2 scrapers | P41038 | 55 100 |
| 3 scrapers | P41039 | 70 400 |
| 4 scrapers | P41040 | 93 500 |

## DELIVERY TERMS

| | Price |
|---|---|
| FOB Gothenburg CIF | On request |
| Special packaging | On request |
| Technical assistance | On request |
| Assembling on site | On request |
| Spare parts | On request |

## CONTROL PANEL OPTIONS

*Product group 10915*

| Option | Art.no | Price |
|---|---|---|
| Heating element in control panel | P40986 | 4 000 |
| Cooling fan in control panel | P40987 | 5 000 |
| Overload voltage protection in control panel | P40988 | 6 300 |
| Relay for wrong phase in control panel | P40989 | 2 800 |
| ATEX relay for inductive sensor | P40990 | 4 100 |
| ATEX relay for overload sensor | P40991 | 7 300 |
| Modbus RS485 communication (price per scraper) | P40992 | 2 700 |
| Motion detector in control panel | P40993 | 3 400 |
| Anti-condensation heater on motor in control panel | P40994 | 2 700 |
| Stainless enclosure EN 1.4301 for control panel | P40998 | 9 400 |

NORDICWATER

A Sulzer Brand

# Control Philosophy Zickert Surface scum scraper Z3906ER, and Scum channel Z6300

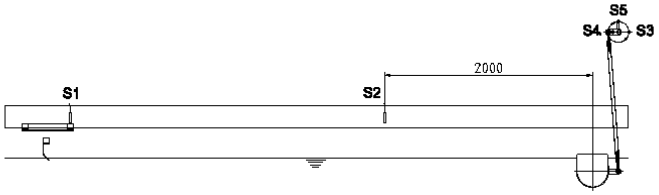
The Surface scum scraper Z3906ER is designed to clean the entire water surface with merely the blade submerged. The scraper pushes the sludge in front of the blade to the scum removal zone, where the scum is collected by a rotating scum channel Z6300. During the return movement, the scraper blade is angled upwards to ensure that sludge does not accompany it. The scraper is operated electrically by a helical gearmotor.

The scraper consists of a longitudinal bridge structure located in the middle of the tank with support beams mounted across the tank. A driving rod moves a sledge with a scraper blade back and forth along the bridge. An eccentric arm is rotated by the gearmotor and the driving rod moves back and forth via a link arm. The clutch fitted to the sledge is designed to gradually move the sledge forward when the blade is down, and to reverse when the blade is up. The average blade speed is approx. 1,5m/min.

The Surface scum scraper is combined with a Rotating scum channel Z6300, which is designed to tilt in two directions. The Scum channel consists of a U shape trough, typically positioned in one end of the tank. The driving gear motor, assembled on the tank wall, rotates an eccentric arm, which will tilt the scum channel.

As the Surface scum scraper pushes the sludge to the Scum channel Z6300, the latter is tilted down towards the scraper blade in order to receive the scum from the scraper, whereupon it tilts in the other direction to collect any scum formed on the other side. When the scum is collected, the channel is tilted upwards to its home position again. The scum pipe is operated by a gear motor.

Assembled on the Surface scum scraper are two inductive sensors: one home position sensor and one scum channel synchronization sensor.
Three inductive sensors are assembled on the Scum channel to register home and tilted positions in both directions. Scum channel in home position is positioned straight up, non-tilted. The two tilted position sensors are positioned with the channel in the fully tilted positions in both directions, respectively.




The scraper dwells in home position during the pause time Pn1. When pause time Pn1 time has expired, the scraper starts to operate until it passes the home position sensor and by the home position delay time Pn2 the scraper thereafter can stop at desired home position. The home position is preferably set so that the scraper blade is positioned in the beginning of its travel or immediately after its scraping travel, with the blade in upfolded position above the water. Home position with submerged blade shall be avoided as scum may accumulate to the blade.
The Scum channel synchronization sensor is located approx. 2m from the scum channel and facilitates synchronization of the Surface scraper and Scum channel operation. As the scraper blade approaches the Scum channel, it passes the sensor which triggers two timers, Stop scraper blade delay time Pn3, and Scum channel start delay time, Pn4.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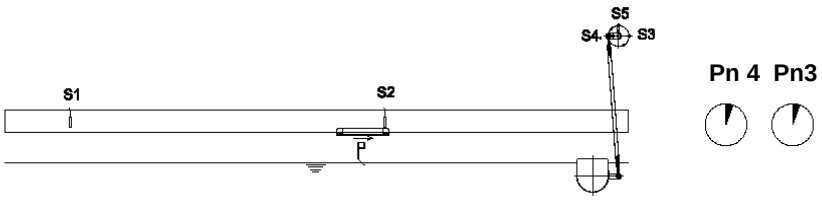
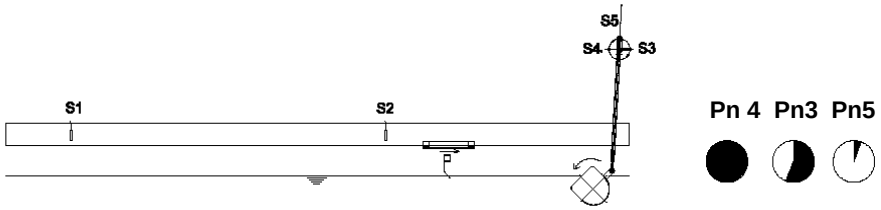
1 (5)

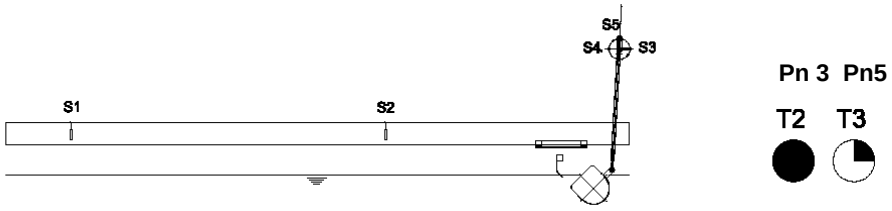



Stop scraper blade delay time Pn3 controls the position in which the scraper blade shall stop to keep the transported scum at the Scum channel, to utilize efficient scum collection from the tank. Pn3 shall be set to the time that elapses from when the scraper blade passes the sensor until it shall stop in the idle position just in front of the Scum pipe. Tilt Scum channel delay time Pn4 regulates the delay time until the scum channel shall start to tilt. Preferably, Pn4 is set to slightly shorter than Pn3 so that scum channel starts to tilt towards the scraper blade before the blade stops.

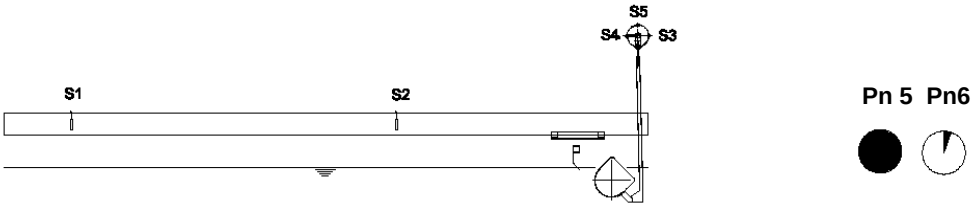
The channel initially tilts down in the direction towards the scraper blade and when the channel reaches the tilted 1st position sensor, the channel will stop and pause during the Scum channel stay tilted time 1st position Pn5.




When Stop scraper blade delay time Pn3 has expired the scraper blade stops in front of the Scum channel.




When Scum channel stay tilted time 1st position Pn5 has expired, the channel starts operating again, to tilt back, passing the neutral home position and tilts in the other direction away from the scraper blade to collect any scum formed on the other side. When the channel reaches the tilted 2nd position sensor, the channel will stop and pause during the Scum channel stay tilted time 2nd position Pn6.




Thereafter the channel starts again, going back to the home position. Note that changes in tilting directions of the channel are mechanically initiated and that the motor rotates in the same direction throughout the scum channel operation cycle.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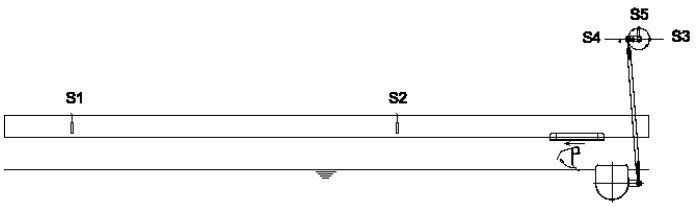


When the channel reaches the home position sensor, the surface scraper starts again, initiating the return travel of the scraper blade, and the scum channel stops until next scum channel operation cycle. If there are excessive amounts of scum in the tank and scum remaining around the scum channel at this point, another scum channel cycle can be programmed.

The scraper and scum channel operation shall be adjusted to manage the scum amounts formed inside the tank. Operation can be controlled locally in the control panel in AUTO mode or by superior system in REMOTE mode.

Zickert Z3900ER has the following electrical components mounted to the scraper:
One electrical motor per scraper incl thermistors
Two inductive sensors, one home position sensor and one scraper blade idle position sensor
OPTION, not included in this project, anti-condensation heater on motor

Zickert Z6300 has the following electrical components mounted to the scum channel:
One electrical motor per scum channel incl thermistors
Three inductive sensors, one home position sensor and two tilted position sensors
OPTION, not included in this project, anti-condensation heater on motor

**Automatic operation (AUTO)**
In Automatic operation, the surface scraper Z3900ER starts when the programmed pause time Pn2 has expired. When the scraper has been operating the programmed run time Pn1, it continues to the home position and stays there during the pause time. The scum channel Z6300 operation is initiated automatically by the surface scraper sequence as described above.

**Manual operation (HAND)**
When the Surface scraper switch is in MANUAL the scraper operates continuously.
When the Scum channel switch is in MANUAL the scum pipe operates continuously.

**Remote operation (REMOTE)**
When the switch is in Remote, the scraper and scum channel is controlled by superior control system. The scraper can run on timers and start when pause time has expired or external signal. Scum channel operation and synchronization with Surface scraper needs to be programmed in the superior control system.


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**Alarm**

Tripped motor breaker for scraper. Scraper stops and alarms.
Tripped motor breaker for scum channel. Scum channel stops and alarms
No motion alarm, surface scraper. If home position sensor has not registered movement within No motion alarm delay time Pn7, scraper stops and alarms.
No motion alarm, scum channel. If home position sensor has not registered movement within No motion alarm delay time Pn8, scum channel stops and alarms.
Home and/or away position sensor failure, scum channel. If more than one position sensor is activated at the same time, either of home or away position sensors is malfunctioning. Scum channel stops and alarms
Emergency stop operated. Scraper stops and alarms.
OPTION, included in this project, motor overheated (if thermistors are connected)


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# Parameter list

Basic standard operational parameters.
Note! This is factory settings and need to be adjusted to meet conditions on site.

| Parameter | Description | Recommended basic setting |
|---|---|---|
| Pn1 | Pause time | Project specific*. |
| Pn2 | Home position delay time | Project specific |
| Pn3 | Stop scraper blade delay time Pn3 | Project specific** |
| Pn4 | Tilt Scum channel delay time | Project specific*** |
| Pn5 | Scum channel stay tilted time 1st position | 2-15 sec**** |
| Pn6 | Scum channel stay tilted time 2nd position | 2-15 sec**** |
| Pn7 | No motion alarm delay time, surface scraper | Project specific***** |
| Pn8 | No motion alarm delay time, scum channel | 60 sec |

**Run and pause time needs to be adjusted to meet scum amounts for each specific tank*
***Shall be set to the time that elapses from sensor to scraper blade end position.*
**** Recommended setting to slightly shorter than Pn4 so that scum channel starts to tilt towards scraper blade before the blade stops.*
***** Can be sett to receive all scum with a minimum of water uptake.*
****** No motion alarm needs to be set at a longer time than it takes for the scraper to complete one run cycle.*


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# Control Philosophy Zickert Surface scum scraper Z3906ES and Scum beach trough Z6900

The Surface scum scraper Z3900ES is designed to clean the entire water surface with merely the blade submerged. The scraper pushes the sludge in front of the blade to a scum beach. During the return movement, the scraper blade is angled upwards to ensure that sludge does not accompany it. The scraper is operated electrically by a helical gearmotor.

The scraper consists of a longitudinal bridge structure located in the middle of the tank with support beams mounted across the tank. A driving rod moves a sledge with a scraper blade back and forth along the bridge. An eccentric arm is rotated by the gearmotor and the driving rod moves back and forth via a link arm. The clutch fitted to the sledge is designed to gradually move the sledge forward when the blade is down, and to reverse when the blade is up. The average blade speed is approx. 1,5m/min.

The Surface scum scraper is combined with Scum beach Z6900 trough.

Assembled on the Surface scum scraper is a home position sensor. The scraper has a run time Pn1, which can be set in minutes or travel cycles, and a Pause time Pn2. When the run time has expired, the scraper continues until it passes the home position sensor and by the home position delay time Pn3 the scraper thereafter can stop at desired home position. The home position is preferably set so that the scraper blade is in the beginning of its travel or immediately after its scraping travel, with the blade in upfolded position above the water. Home position with submerged blade shall be avoided as scum may accumulate to the blade.

The scraper operation shall be adjusted to manage the scum amounts formed inside the tank. Operation can be controlled locally in the control panel in AUTO mode or by superior system in REMOTE mode.

Zickert Z3900ES has the following electrical components mounted to the scraper:
One electrical motor per scraper
One inductive sensor, home position sensor.

**Automatic operation (AUTO)**
In Automatic operation, the scraper starts when the programmed pause time Pn2 has expired. When the scraper has been operating the programmed run time Pn1, it continues to the home position and stays there during the pause time.

**Manual operation (HAND)**
When the switch is in MANUAL the scraper operates continuously.

**Remote operation (REMOTE)**
When the switch is in Remote, the scraper is controlled by superior control system. The scraper can run on timers and start when pause time has expired or external signal.


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**Alarm**
Tripped motor breaker for scraper. Scraper stops and alarms.
Emergency stop operated. Scraper stops and alarms.
No motion alarm. If home position sensor has not registered movement within No motion alarm delay time Pn4, scraper stops and alarms.

# Parameter list

Basic standard operational parameters.
Note! This is factory settings and need to be adjusted to meet conditions on site.

| Parameter | Description | Recommended basic setting |
|---|---|---|
| Pn1 | Run time | Project specific*. |
| Pn2 | Pause time | Project specific*. |
| Pn3 | Home position delay time | Project specific |
| Pn4 | No motion alarm delay time | Project specific** |

**Run and pause time needs to be adjusted to meet scum amounts for each specific tank*
***No motion alarm needs to be set at a longer time than it takes for the scraper to complete on run cycle.*


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**End of the Report**