**TREATMENT PLANT APPROVAL 06/2025**
*Plumbing and Drainage Regulation 2019*, part 4.

## Approval

1. The **RP** and **SK** variants of the **20A** system (the system), as detailed in the Schedule, are manufactured and supplied by **Neatport Pty Ltd** (ABN 62 063 770 534) trading as Suncoast Waste Water Management ("the manufacturer"), have been assessed in accordance with:
   (a) section 19 of the *Plumbing and Drainage Regulation 2019,* and
   (b) the Queensland Plumbing and Wastewater Code, published on 26 April 2024.
2. A Treatment Plant Approval (TPA) is issued for **Advanced secondary-quality** wastewater treatment with **nutrient reduction** for the system, subject to the manufacturer's compliance with the Plumbing and Drainage Act 2018 and the conditions of approval outlined below.
3. This approval, together with its conditions and the attached Schedule, constitutes the complete TPA document.
4. Any modification to the design, drawings or specifications listed in this approval must be approved by the Chief Executive.

## Conditions of approval

5. The manufacture, installation, operation, service, and maintenance of the system must conform with the conditions of this TPA.
6. This approval applies to the following variants of the 20A system:
   - RP 20A (on ground, partially of fully buried)
   - SK 20A (skid mounted)
7. This TPA applies exclusively to the system and does not cover an optional grease trap installed upstream of the system.
8. The system, when tested by a certification accreditation body in accordance with AS1546.3:2017, was found to comply with the **Advanced secondary quality,** 27 EP/4000 L/day level. The system was also assessed on its ability to **reduce nutrients**. The system must continue to meet the following effluent criteria:
   (a) Advanced secondary quality treatment

**Table 2.1 (Abrev) AS1546.3:2017 Advanced secondary effluent compliance criteria for an STS**

| Parameter | Advanced secondary effluent | |
|---|---|---|
| | 90% of Samples | Maximum |
| $BOD^5$ | ≤ 10 mg/L | 20 mg/L |
| TSS | ≤ 10 mg/L | 20 mg/L |
| *E. coli** | ≤ 10 cfu/100 mL | 30 cfu/100 mL |
| FAC[Þ] | Minimum 0.5 mg/L[†] | N/A |
| Turbidity [§] | N/A | 10 NTU |

* Where disinfection is required
Þ Where chlorine disinfection is required
† Minimum level, not 90% of samples
§ Where UV light is used for disinfection

Treatment Plant Approval
Approved by: Lindsay Walker
Delegated Authority
Department of Energy & Public Works

(b) Nutrient reduction capacity

During the testing of the system, the treated effluent was tested for total nitrogen (TN) and total phosphorus (TP) concentrations. The system has the capacity to reduce the TN and TP concentrations as follows:

- TN an average of 84.30 mg/L to 20.07 mg/L which represents a reduction of **76.19%**
- TP an average of 10.72 mg/L to 4.36 mg/L which represents a reduction of **59.33%**

9. Each system must be serviced in accordance with the Certificate of Conformance, certificate number SMK02608, issued by SIA Global Certification Pty Ltd on 26 May 2025 and details supplied in the owner's operation and maintenance manual.

10. Each system must be supplied with —

    a. a copy of this TPA document
    b. details of the system
    c. instructions for authorised persons for its installation
    d. a copy of the owner's manual to be given to the owner at the time of installation
    e. detailed instructions for authorised service personal for its operation and maintenance.

11. At each anniversary of the TPA date, the supplier must submit to the Chief Executive a list of all systems installed in Queensland during the previous 12 months. Where the Chief Executive is notified of any system failures the Chief Executive may randomly select several installed systems for audit. The Chief Executive will notify the supplier's nominated NATA accredited laboratory which systems are to be audited for $BOD^5$ and TSS. The sampling and testing of the selected systems, if required, is to be done at the supplier's expense. The following results must be reported to the Chief Executive;

    a. Address of premises
    b. Date inspected and sampled
    c. Sample identification number
    d. $BOD^5$ for influent and effluent
    e. TSS for influent and effluent.

12. The Chief Executive may, by written notice, cancel this TPA if the manufacturer/supplier fails —

    a. to comply with one or more of the conditions of approval, or
    b. within 30 days, to remedy a breach, for which a written notice been given by the Chief Executive.

13. This approval may only be assigned with the prior written consent of the Chief Executive.

14. This approval expires on 28 May 2030 unless cancelled earlier in accordance with paragraph 10 above.

Lindsay Walker

Treatment Plant Approval
*Approved by: Lindsay Walker*
*Delegated Authority*
Department of Energy & Public Works

**Director**
Plumbing, Drainage and Special Projects
Date approved: 28 May 2025

Level 15,
53 Albert Street Brisbane
GPO Box 2457, Brisbane Qld 4001
**Website** www.hpw.qld.gov.au
ABN 61 331 950 314

Treatment Plant Approval
*Approved by: Lindsay Walker*
*Delegated Authority*
Department of Energy & Public Works

**TREATMENT PLANT APPROVAL 06/2025**
*Plumbing and Drainage Regulation 2019*, part 4.

**SCHEDULE**

RP-SK 20A

Attachment 1 – SAI Global Certification Certificate SMK02608
Attachment 2 – RP-SK 20A Schematic diagrams
Attachment 3 – RP-SK 20A – Operator's manual

Attachment 1 – SAI Global Certification Certificate SMK02608

intertek SAI GLOBAL

| | |
|---|---|
| **Licence Holder :** | Neatport Pty Ltd |
| **ABN :** | 62 063 770 534 |
| **Trading Name :** | Suncoast Waste Water Management |
| **Licence No :** | SMK02608 |
| **Licence Status :** | Certified |

Certified Product™

View PDF Certificate

| | | | |
|---|---|---|---|
| **Standard(s) Number :** | AS/NZS 1546.3:2008<br>AS 1546.3:2017 | **Standard(s) Title :** | On-site domestic wastewater treatment units - Aerated wastewater treatment systems<br>On-site domestic wastewater treatment units - Secondary treatment systems |
| **Originally Certified :** | 15 Aug 2001 | **Issued Date :** | 26 May 2025 |
| **Currently Certified :** | 26 May 2025 | **Expires :** | 14 Aug 2026 |

**Site Details :**

| | State | Country |
|---|---|---|
| + | QLD | Australia |

**Product Details :**

**Standard - AS/NZS 1546.3:2008 On-site domestic wastewater treatment units - Aerated wastewater treatment systems**

| Model Name | Model ID. | No. of Persons | System Capacity | System Type | Treatment Method | Disinfection Method | Service Interval | Comments / Exclusions | Date Endorsed |
|---|---|---|---|---|---|---|---|---|---|
| OZZI KLEEN | RP-10 | 10 | 4150 L tank design capacity. Treatment capacity 2000L/day. | Aerated Wastewater Treatment System | Aeration | Chlorine | 3 months or as specified by state regulators. | | 27 May 2022 |
| OZZI KLEEN | RP-10A+ | 10 | 4150 L tank design capacity. Treatment capacity 2000L/day. | Aerated Wastewater Treatment System | Aeration | Chlorine | 3 months or as specified by state regulators. | With Alum dosing unit for nutrient reduction. | 20 Dec 2016 |

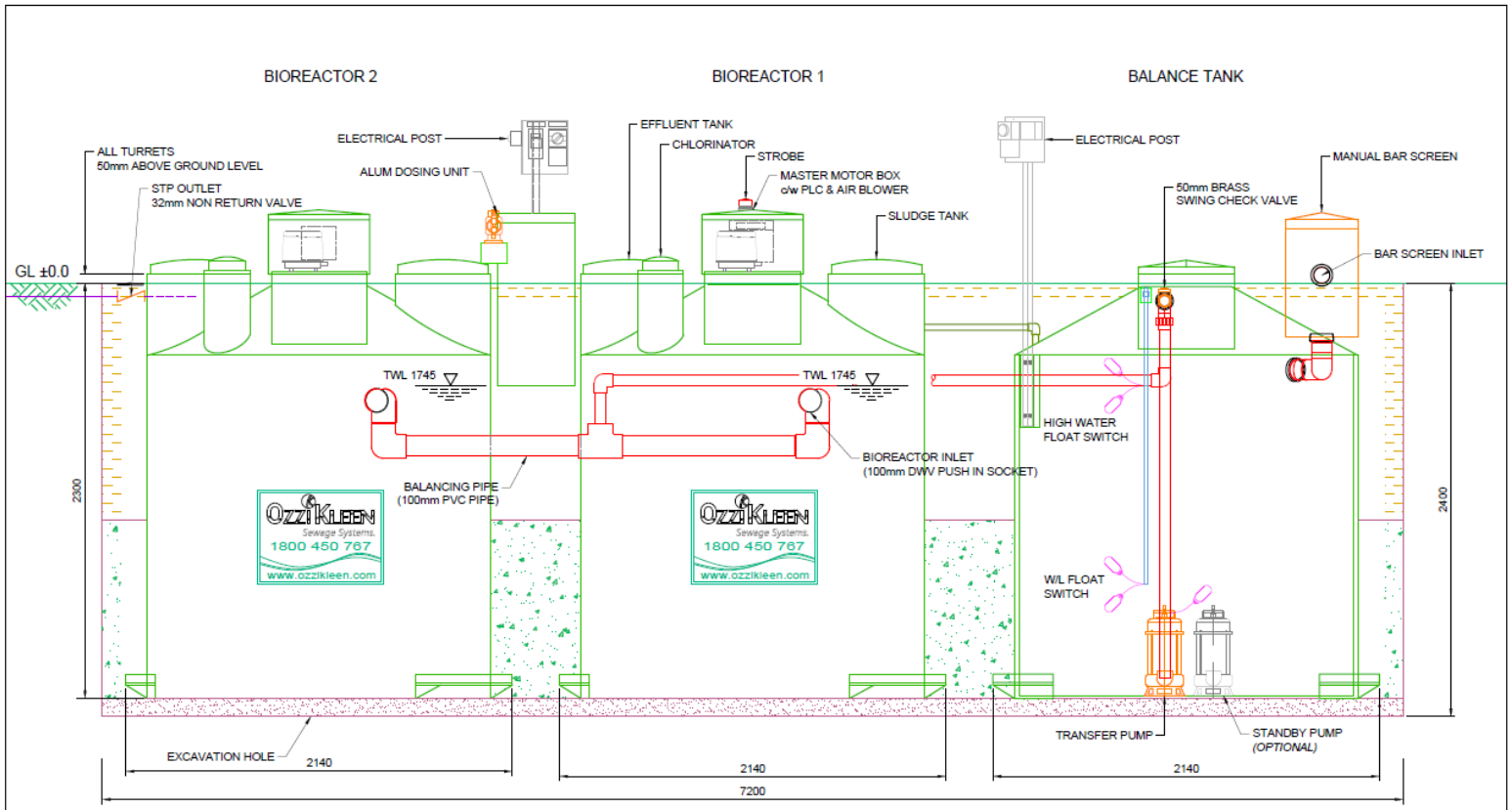
**Standard - AS 1546.3:2017 On-site domestic wastewater treatment units - Secondary treatment systems**

| Brand Name & Model ID | Treatment Capacity (Litre / Day) | Treatment Type | Compliance Type | Disinfection Method | Tank Types and Capacities | Service Interval | Date Endorsed |
|---|---|---|---|---|---|---|---|
| RP 10S | 1500 L/day | Aerated Wastewater Treatment System - N 59%; P 60% | Secondary with Nutrient reduction | Chlorine Tablets | 5300L Roto moulded Polyethylene tank with Alum dosing unit for nutrient reduction | 3 monthly | 27 May 2022 |
| RP 10S+ | 1500 L/day | Aerated Wastewater Treatment System - N 80%; P 61% | Advanced Secondary with Nutrient reduction | Chlorine Tablets | 5300L Roto moulded Polyethylene tank with Alum dosing unit for nutrient reduction | 3 monthly | 27 May 2022 |
| RP-10 | 1500 L/day | Aerated Wastewater Treatment System | Secondary | Chlorine Tablets | 5300L Roto moulded Polyethylene tank | 3 monthly | 27 May 2022 |
| RP10A+ | 1500 L/day | Aerated Wastewater Treatment System - N 82% reduction; P 49% reduction | Advanced Secondary with Nutrient reduction | Chlorine Tablets | 5300L Roto moulded Polyethylene tank with Alum dosing unit for nutrient reduction | 3 monthly | 27 May 2022 |
| RP20A | 4000 L/day | Aerated Wastewater Treatment System N 76.19% reduction; P 59.33% reduction | Advanced Secondary | Chlorine Tablets | 2 x 5000L Roto moulded Polyethylene tank with Alum dosing unit for nutrient reduction. 1 x 5000 Roto moulded Polyethylene tank for aeration. Power consumption @ 4,000 L/day = 5.20kWh/day | 3 monthly | 26 May 2025 |
| RP20A-G | 4000 L/day | Aerated Wastewater Treatment System N 76.19% reduction; P 59.33% reduction | Advanced Secondary | Chlorine Tablets | 2 x 5300L Roto moulded Polyethylene tank with Alum dosing unit for nutrient reduction. 1 x 5000 Roto moulded Polyethylene tank for aeration. With Greasetrap option.. Power consumption @ 4,000 L/day = 5.20kWh/day | 3 monthly | 26 May 2025 |
| SK20A | 4000 L/day | Aerated Wastewater Treatment System N | Advanced Secondary | Chlorine Tablets | Above ground, skid mounted. 2 x 5000L Roto moulded Polyethylene tank with Alum dosing unit for nutrient reduction. 1 x 5000 Roto moulded Polyethylene tank for | 3 monthly | 26 May 2025 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | 76.19% reduction; P 59.33% reduction | | | aeration. Power consumption @ 4,000 L/day = 5.20kWh/day | | |
| SK20A | 4000 L/day | Aerated Wastewater Treatment System N 76.19% reduction; P 59.33% reduction | Advanced Secondary | Chlorine Tablets | Above ground, skid mounted. 2 x 5000L Roto moulded Polyethylene tank with Alum dosing unit for nutrient reduction. 1 x 5000 Roto moulded Polyethylene tank for aeration. Power consumption @ 4,000 L/day = 5.20kWh/day | 3 monthly | 26 May 2025 |
| SK20A-G | 4000 L/day | Aerated Wastewater Treatment System N 76.19% reduction; P 59.33% reduction | Advanced Secondary | Chlorine Tablets | Above ground, skid mounted. 2 x 5000L Roto moulded Polyethylene tank with Alum dosing unit for nutrient reduction. 1 x 5000 Roto moulded Polyethylene tank for aeration. With Greasetrap option. Power consumption @ 4,000 L/day = 5.20kWh/day | 3 monthly | 26 May 2025 |

**TREATMENT PLANT APPROVAL 06/2025**
*Plumbing and Drainage Regulation 2019*, part 4.

Attachment 2 – RP 20A – Schematic diagrams

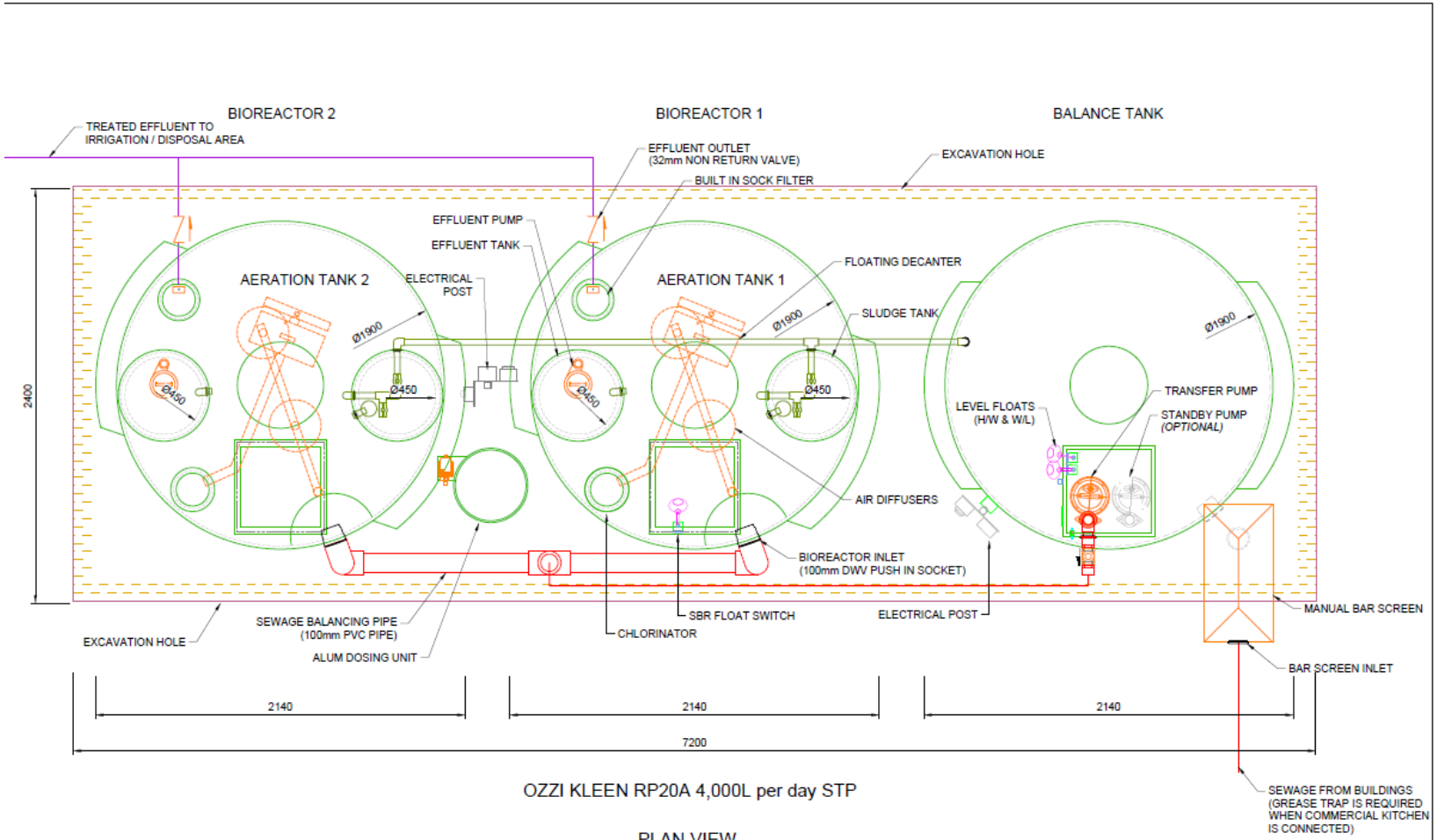



OZZI KLEEN RP20A 4,000L per day SEWAGE TREATMENT SYSTEM

ELEVATION

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | OZZI KLEEN Water & Waste Water | CLIENT | GENERAL | DESIGN MB |
| | | | | 59 INDUSTRIAL AVE KUNDA PARK QLD 4556 PH +61 7 5459 4900 FAX +61 7 5456 4677 www.ozzikleen.com | PROJECT | OZZI KLEEN RP20A AWTS | DRAWN YH |
| | | | | | | | CHKD MB |
| 30/04/25 | ISSUED FOR APPROVAL | 1 | YH | | TITLE | ELEVATION VIEW | DATE 30/04/25 |
| DATE | DESCRIPTION | REV. | BY | Suncoast Waste Water Management | DWG NO. | GD–RP20A–H06 | SCALE NTS |

Treatment Plant Approval
Approved by: Lindsay Walker
Delegated Authority
Department of Energy & Public Works




OZZI KLEEN RP20A 4,000L per day STP

PLAN VIEW

| DATE | DESCRIPTION | REV. | BY |
|---|---|---|---|
| 30/04/25 | ISSUED FOR APPROVAL | 1 | YH |

OzziKleen Water & Waste Water
Suncoast Waste Water Management

59 INDUSTRIAL AVE
KUNDA PARK
QLD 4556
PH +61 7 5459 4900
FAX +61 7 5456 4677
www.ozzikleen.com

| | | | |
|---|---|---|---|
| CLIENT | GENERAL | DESIGN | MB |
| | | DRAWN | YH |
| PROJECT | OZZI KLEEN RP20A AWTS | CHKD | MB |
| TITLE | PLAN VIEW | DATE | 30/04/25 |
| DWG NO. | GD–RP20A–H05 | SCALE | NTS |

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Department of Energy & Public Works

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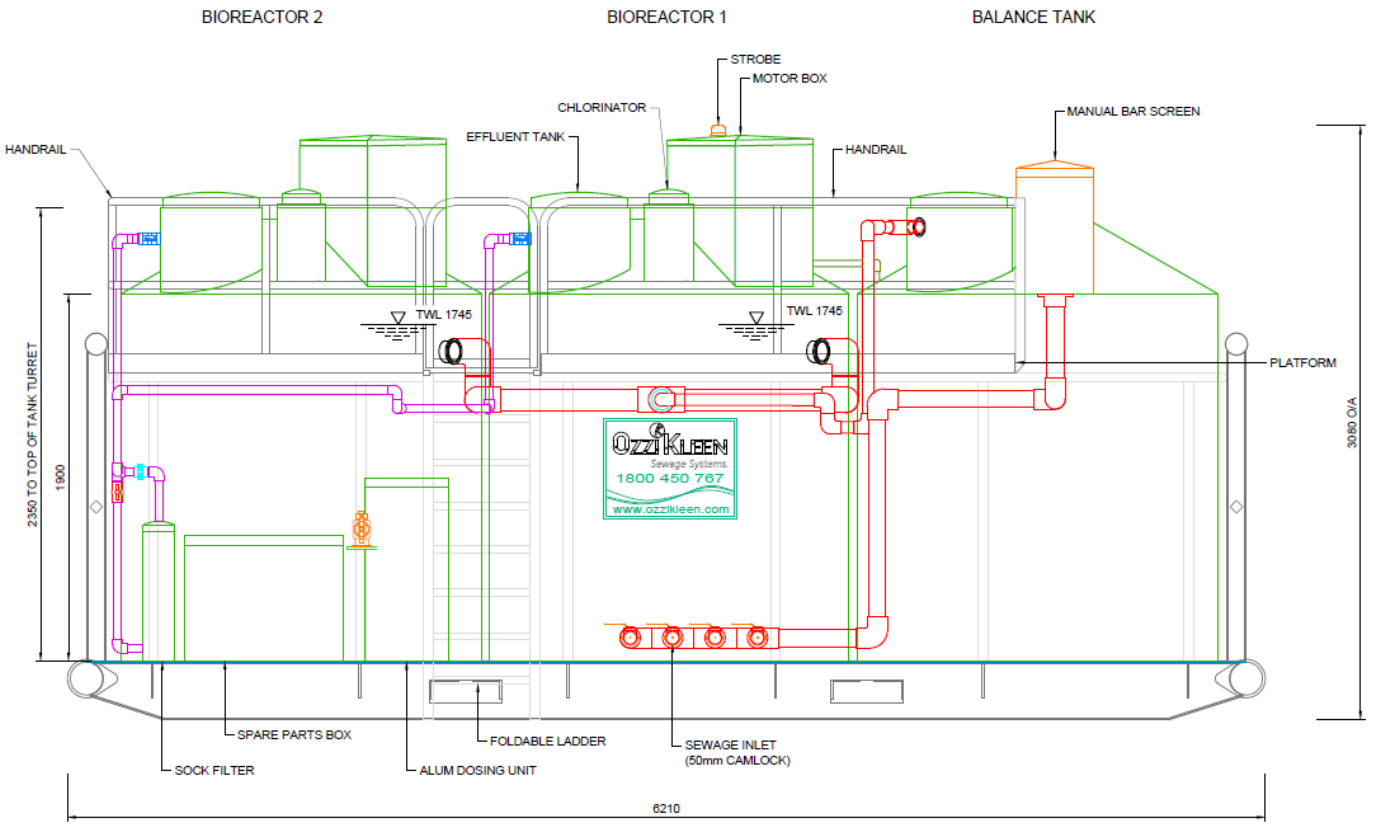
*Plumbing and Drainage Regulation 2019*, part 4.



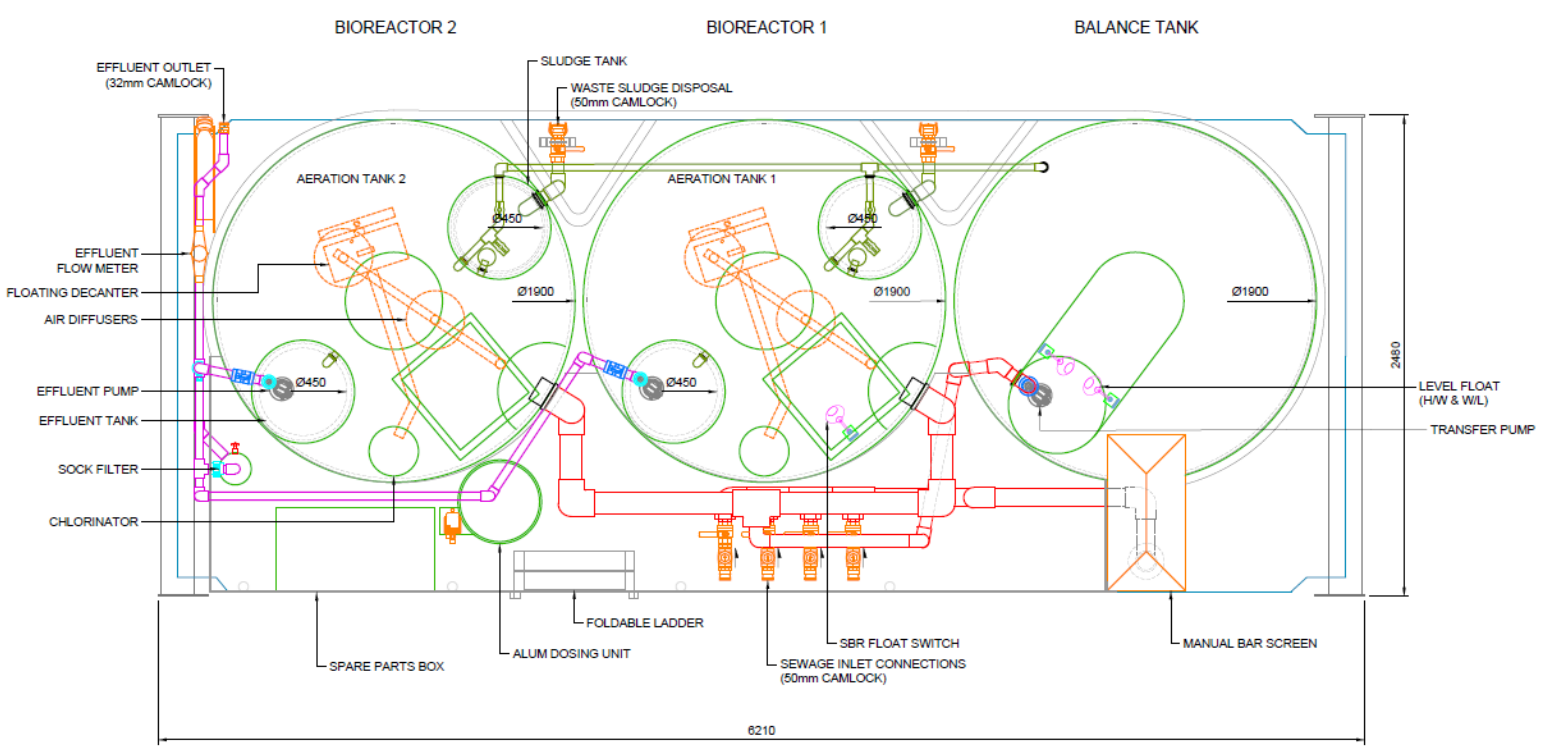

OZZI KLEEN SK20A 4,000 L per day SEWAGE TREATMENT SYSTEM

ELEVATION

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | OZZI KLEEN Water & Waste Water | 59 INDUSTRIAL AVE KUNDA PARK QLD 4556 PH +61 7 5459 4900 FAX +61 7 5456 4677 www.ozzikleen.com | CLIENT: GENERAL | DESIGN: MB |
| | | | | | | | DRAWN: YH |
| | | | | | | PROJECT: OZZI KLEEN SK20A AWTS | CHKD: MB |
| 30/04/25 | ISSUED FOR APPROVAL | 1 | YH | Suncoast Waste Water Management | | TITLE: ELEVATION VIEW | DATE: 30/04/25 |
| DATE | DESCRIPTION | REV. | BY | | | DWG NO.: GD–SK20A–H06 | SCALE: NTS |

Treatment Plant Approval
*Approved by: Lindsay Walker*
*Delegated Authority*
Department of Energy & Public Works

**TREATMENT PLANT APPROVAL 06/2025**
*Plumbing and Drainage Regulation 2019*, part 4.




OZZI KLEEN SK20A 4,000 L per day SEWAGE TREATMENT SYSTEM

PLAN VIEW

| DATE | DESCRIPTION | REV. | BY |
|---|---|---|---|
| 30/04/25 | ISSUED FOR APPROVAL | 1 | YH |

OzziKleen Water & Waste Water
Suncoast Waste Water Management

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www.ozzikleen.com

| | | | |
|---|---|---|---|
| CLIENT | GENERAL | DESIGN | MB |
| | | DRAWN | YH |
| PROJECT | OZZI KLEEN SK20A AWTS | CHKD | MB |
| TITLE | PLAN VIEW | DATE | 30/04/25 |
| DWG NO. | GD–SK20A–H05 | SCALE | NTS |

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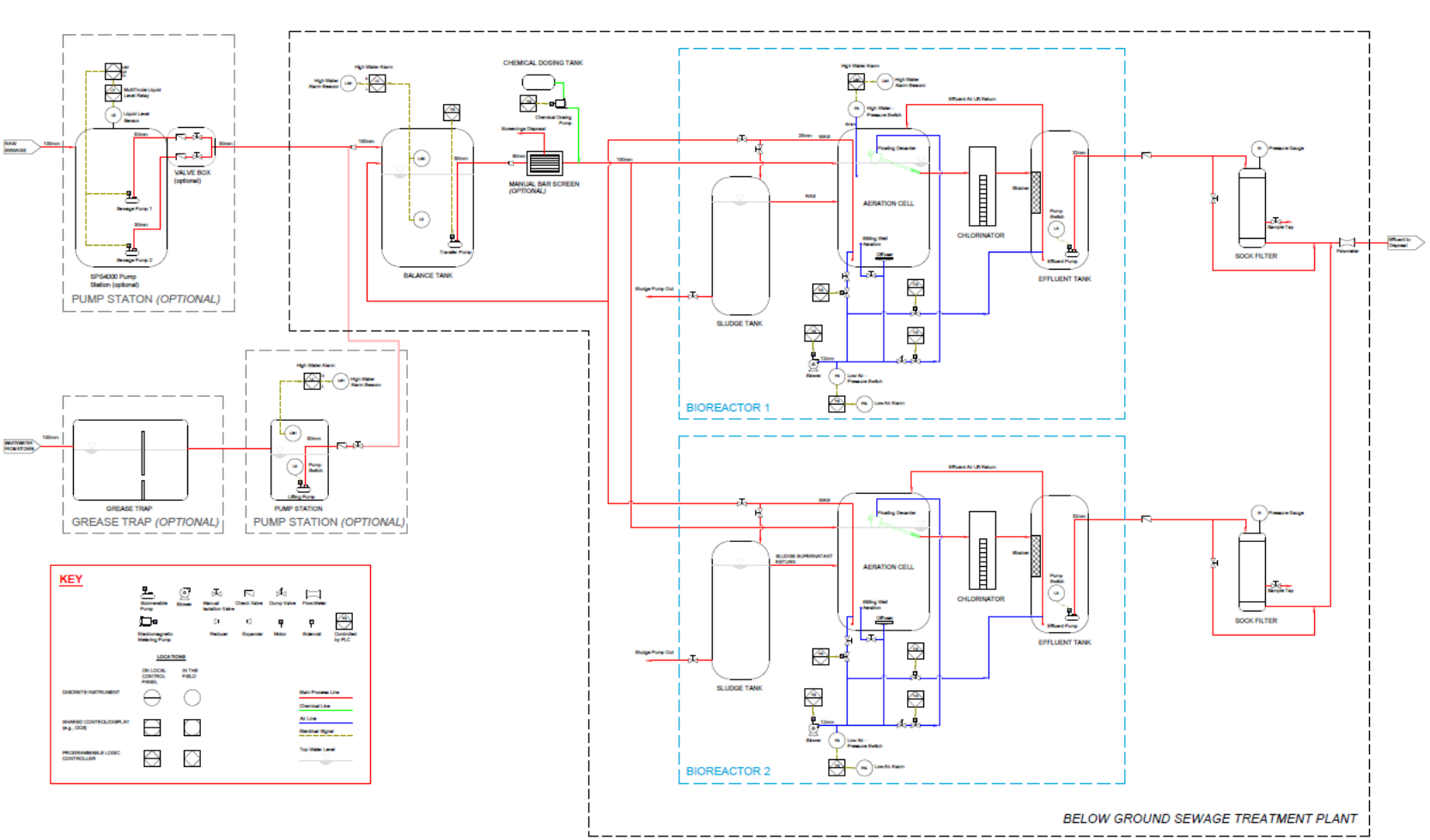


| DATE | DESCRIPTION | REV. | BY |
|---|---|---|---|
| 12/08/24 | ISSUED FOR APPROVAL | 1 | YH |

OzziKleen Water & Waste Water
Suncoast Waste Water Management

| | |
|---|---|
| CLIENT | GENERAL |
| PROJECT | OZZI KLEEN RP20A AWTS |
| TITLE | PIPING & INSTRUMENTATION DIAGRAM |
| DWG NO. | CD-RP20A-H07 |
| DESIGN | MB |
| DRAWN | YH |
| CHKD | MB |
| DATE | 12/08/24 |
| SCALE | NTS |

Treatment Plant Approval
Approved by: Lindsay Walker
Delegated Authority
Department of Energy & Public Works

OzziKleen Water & Waste Water

# OPERATORS MANUAL

## Ozzi Kleen Sewage Treatment Plant

## Skid Mounted Models: SK20A & SK20A-G

## Below Ground Model: RP20A

## (4,000 L/day)

Manufactured by

Suncoast Waste Water Management

www.ozzikleen.com

*Efficiency, Reliability, Simplicity*

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## TABLE OF CONTENTS

## SAFETY INSTRUCTIONS

| | |
|---|---|
|  | Please follow all safety precautions and accident guidelines during installation, use, maintenance and repair of the Ozzi Kleen Sewage Treatment Plant. All local safety precautions and accident prevention guidelines established in the area should also be followed. |
|  | DO NOT ENTER SEWAGE TREATMENT PLANT. Risk of drowning or asphyxiation due to low oxygen environment is present. Ensure all access lids are closed securely after accessing the treatment plant to prevent unauthorized or accidental access. |
|  | WARNING! To reduce the risk of electrical shock, all works requiring access to the control panel must be carried out by a licensed electrical contractor or authorised service professional. |
|  | SLIPPERY WHEN WET! During cleaning, maintenance and repair work the surrounding area may become extremely slippery in some circumstances due to spilled water. Caution is to be taken when walking / standing near the Ozzi Kleen Sewage Treatment Plant when these activities are being conducted. |
|  | The waste water contained in the Ozzi Kleen Sewage Treatment Plant may contain harmful bacteria. Persons coming in contact with waste water must immediately wash and disinfect all exposed areas. Contact your personal physician for all health concerns. |
|  | Use safe lifting techniques when installing/relocating the Ozzi Kleen Sewage Treatment Plant. Ensure that all lifting equipment is in a safe working order and the area is clear of obstructions. |

## TERMS & DEFINITIONS

Abbreviations and symbols used throughout this manual have been provided below:

| ABBREVIATION | DEFINITION |
|---|---|
| Alum | Aluminium Sulphate |
| $BOD_5$ | Biological Oxygen Demand |
| FOG | Fat, Oil and Grease |
| GPO | General Power Outlet |
| LED | Light Emitting Diode |
| MLSS | Mixed Liquor Suspended Solids |
| MSDS | Material Safety Data Sheet |
| PLC | Programmable Logic Controller |
| PVC | Polyvinyl Chloride |
| RCBO | Residual Current Circuit Breaker with Overcurrent Protection |
| RCD | Residual Current Device |
| SBR | Sequential Batch Reactor |
| STP | Sewage Treatment Plant |
| SWWM | Suncoast Waste Water Management |
| TICA | Trichloroisocyanuric Acid |
| TN | Total Nitrogen |
| TP | Total Phosphorus |
| TSS | Total Suspended Solids |
| VAC | Voltage Alternating Current |
| VDC | Voltage Direct Current |
| **SYMBOL** | **DEFINITION** |
| Ø | Diameter |

# SECTION A: GENERAL

## INTRODUCTION

Suncoast Waste Water Management have been designing and manufacturing domestic and commercial sewage treatment plants since 1983, with over 30,000 systems installed and operating throughout Australia and overseas. Suncoast Waste Water Management employs a team of engineers from a range of backgrounds to carry out the design and manufacturing of sewage treatment systems using modern technologies. A comprehensive network of trained and authorised Agents and Distributors has also been established throughout Australia.

The technology developed by Suncoast Waste Water Management is applied to the Ozzi Kleen Treatment System. The Ozzi Kleen Package Sewage Treatment Plant (STP) and Grey Water Treatment System (GTS) use a variation of the Cyclic Extended Aeration Biological Treatment Process (Activated Sludge). In this compact system, flow equalization, biological oxidation, secondary sedimentation, and biological nutrient removal occur in a single cell aerobic process. The Ozzi Kleen Package Sewage Treatment Plant produced, is a quality treatment plant constructed to give many years of service and produce a quality odorless effluent.

## INTERPRETATION

(i) Manufacturer/Supplier includes Neatport Pty. Ltd. A.B.N. 62 063 770 534 trading as Suncoast Waste Water Management and each of their heirs, executors and administrators and permitted assigns which may include individuals, trusts or companies.

(ii) The Purchaser/Owner shall mean the registered proprietor of the property where the Ozzi Kleen Sewage Treatment Plant has been installed together with their and/or each of their heirs, executors, administrators and successors in title.

## STATEMENT

SWWM the manufacturer of the Ozzi Kleen sewage treatment system confirms that the SK20A Sewage Treatment Plant has been designed to treat sewage to the required standards as set by the State Regulatory Authorities. The Sewage discharged to the system should not contain matter such as: plastics, paint, thinners, contents of a portable chemical toilet, or waste from garbage grinders, etc. The Sewage should not contain excessive amounts of harsh cleaners, disinfectants, fabric softeners, fats, oils or grease.

## ENVIRONMENTAL MANAGEMENT

## NOISE EMISSIONS

Ozzi Kleen treatment plants are designed to produce low noise emissions. The majority of mechanical equipment is housed within the motor boxes. Linear diaphragm blowers are selected for their low noise characteristics (as opposed to roots type blowers). Rotating equipment is mounted on rigid base plates and securely fastened to reduce noise from machine vibrations.

## ODOUR EMISSIONS

Odour emissions during normal operation of the treatment plant are extremely low due to the fully aerobic treatment process. The inlet bar screen equipment is manufactured with high side walls to enclose the influent flow as much as possible.

## VISUAL IMPACT

Ozzi Kleen treatment plants are designed to offer minimal visual effect on the surrounding environment. All tanks are available in a range of natural colours. All platforms and equipment support are manufactured from galvanised and painted steel, providing corrosion free surfaces.

## QUALITY SYSTEM

Suncoast Waste Water Management operates under an internal Quality Management System. Quality management documents are available on request.

OZZI KLEEN Water & Waste Water

## WARRANTY STATEMENT

This system is covered under a manufacturer's warranty as per the warranty conditions contained in this manual. The guaranteed service life of this treatment plant is for the period stated providing that the system has been serviced and maintained by persons approved by the manufacturer.

## OZZI KLEEN WARRANTY

1. *Suncoast Waste Water Management warrants to the original purchaser that all equipment manufactured by Suncoast Waste Water Management is free from defect in material and construction at the time of dispatch from the premises of Suncoast Waste Water Management.*
2. *This warranty does not extend to any claim made after a fixed period from the date of sale for the following equipment:*
   - *Poly Tanks* — *15 years*
   - *Air Blower* — *12 months*
   - *Effluent Pump* — *12 months*
   - *Electrical components* — *12 months*
3. *Any claim made in relation to this warranty is limited to the cost of replacement or repair of the equipment or such parts there of claimed defective.*
4. *In the case of ancillary parts not manufactured by Suncoast Waste Water Management such as motors, starters, switches etc., the guarantee or warranty extended to the purchaser will be limited to the guarantee or warranty available to Suncoast Waste Water Management from the manufacturer.*
5. *This warranty is valid only when the equipment has been used in a normal manner and in accordance with the owner's manual and serviced by a duly authorised service person or dealer of Suncoast Waste Water Management.*
6. *This warranty does not cover any equipment that has been improperly installed, misused, neglected, damaged in transport, repaired without the authorisation of Suncoast Waste Water Management or altered in any way from its original condition at the date of purchase.*
7. *All claims for warranty must be done through the retailer or supplier from whom the product was purchased. Proof of purchase must be supplied.*
8. *Adverse operating conditions beyond the control of Suncoast Waste Water Management such as improper voltage, water pressure, excessive ambient temperature, water damage, flooding, or any condition that adversely affects the performance or life of the equipment will render this warranty null and void.*
9. *This warranty is a return to base warranty which means the item must be returned to the manufacturer for repair. An exchange unit can be provided in this case. If replacement or service under this warranty policy is required and distance prevents you calling personally, forward your product freight prepaid to your nearest service agent.*
10. *Any costs incurred to repair a unit that is not covered by warranty will be passed on to the consumer including costs incurred to remove the faulty unit and replace with an exchange part. Suncoast Waste Water Management is not responsible for any costs for goods not covered by this warranty.*
11. *Warranty work will not be performed until the customer has accepted the price quoted for the service call. A minimum charge will be designated by Suncoast Waste Water Management.*

*Warranty does not cover:*

- *Any operational problems due to extraneous matter fats or chemical spills in the sewage*
- *Any parts broken or stolen from within the system due to transport, installation or misuse by any unauthorised persons*
- *Service agent's time for replacement of any faulty parts or cleaning out of treatment system*
- *Service agent's travel expenses (vehicle and travel time)*
- *Service callouts*

OZZI KLEEN Water & Waste Water

WARRANTY CLAIM FORM

# WARRANTY CLAIM FORM

## OZZI KLEEN WASTE WATER SYSTEMS

Date: .....

Name of Claimant: .....

Address: .....

OZZI KLEEN Sewage Treatment Plant Serial Number: .....

Model/Name No of Unit: .....

Serial No: .....

Date of Purchase: .....

Details of Damage: .....

.....

Cause of Damage (if known): .....

.....

PLEASE REFER TO CONDITIONS OF WARRANTY IN THE OWNER'S MANUAL BEFORE NOTIFYING THE MANUFACTURER, SUPPLIER OR AGENT

Signature: ..... Name: .....
(Please print)

Office Use Only:

Unit checked by: .....

Warranty Granted: ☐ Warranty Rejected: ☐

Reason: .....

Neatport Pty Ltd Trading as
Suncoast Waste Water Management
ABN 62 063 770 534
59 Industrial Ave. Kunda Park Qld 4556
Ph (07) 5459 4900 Fax (07) 5456 4677

OZZI KLEEN Waste Water Systems

# SECTION B: PLANT SPECIFICATION

## DESIGN PARAMETERS

### DESIGN CAPACITY

The design capacity for this Sewage Treatment Plant is 4,000 litres per day.

### RAW SEWAGE PARAMETERS & EFFLUENT QUALITY

The stated Advanced Secondary Effluent Quality with nutrient removal performance of the Ozzi Kleen sewage treatment plant will be achieved provided the incoming wastewater parameters meet the following characteristics:

**Table 1. Typical Raw Sewage Parameter & Effluent Quality**

| Parameter | Unit | Influent | Effluent* |
|---|---|---|---|
| Biological Oxygen Demand ($BOD_5$) | mg/L | ≤ 350 | ≤ 10 |
| Total Suspended Solids (TSS) | mg/L | ≤ 350 | ≤ 10 |
| Fat, Oil and Grease (FOG) | mg/L | ≤ 80 | ≤ 10 |
| pH | - | 6.5 - 8.5 | 6.5 - 8.5 |
| Thermotolerant coliforms (E.coli) | cfu/100 mL | - | ≤ 10 |
| Chlorine Residual | mg/L | - | 0.5 – 2.0 |
| Total Nitrogen | mg/L | ≤ 75 | 70% reduction |
| Total Phosphorus | mg/L | ≤ 15 | 29% reduction |

## SK/RP20 SERIES SEWAGE TREATMENT PLANTS

The SK/RP20 series sewage treatment plants consist of a 5,000 L balance tank, a manual bar screen and two individual Ozzi Kleen sewage treatment units mounted on a steel skid. There is also a grease trap on the SK20A-G models.

OZZI KLEEN Water & Waste Water

## OZZI KLEEN MODEL SK/RP20 SERIES SEWAGE TREATMENT PLANT DETAILS

The following diagram provides an overview of the major components of the SK20A, SK20A-G and RP20A sewage treatment plants.

### SK20A & SK20A-G SKID MOUNTED TREATMENT SYSTEMS


Figure 1. SK20A-G Skid Mounted Treatment Plant

## RP20A BELOW GROUND TREATMENT SYSTEMS

The process and system controls of the below ground models are identical to the skid mounted systems, which include a 5,000L balance tank and two bioreactors. Two systems are connected and operated simultaneously. The balance tank should be installed close to the bioreactors, and a SBR signal from the master controller of STP will be connected to the balance tank control board.

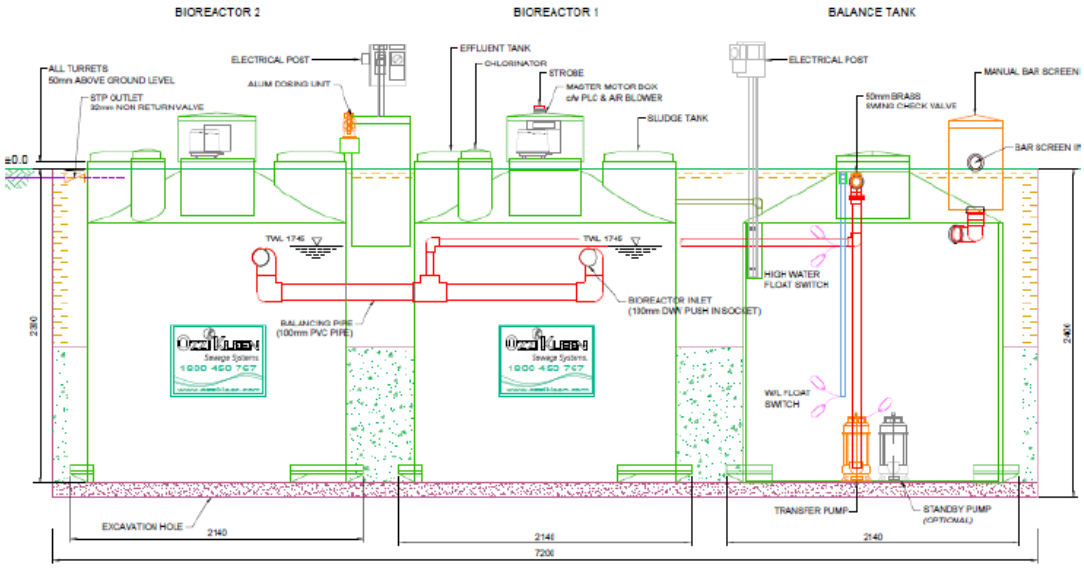


Figure 2. RP20A Below Ground Treatment Plant

## SK/RP20 SERIES SEWAGE TREATMENT UNIT

There are two individual Ozzi Kleen sewage treatment units. These units work with a cyclic aeration process built into a single tank designed to accept and treat the sewage. The waste products in the sewage are completely consumed by naturally occurring bacteria in the oxygen-rich environment in the aeration tank. The system treats the organic waste to produce treated water of a high standard. The unit consists of a round polyethylene tank with an internal effluent compartment and pumping system. As the treatment plant is installed above ground, a sewage pump station would need to be provided to lift the sewage into the treatment plant if pumps are not connected to every line connected to the STP.

### EFFLUENT PUMP AND CONTROLS

The effluent storage compartment of each unit holds approximately 300 litres of water which gives sufficient storage to prevent the effluent pump cycling on and off frequently. The effluent storage compartment has a submersible pump controlled by a float switch that is part of the submersible pump.

## THE OZZI KLEEN TREATMENT PROCESS

### SEWAGE COLLECTION AND DELIVERY

The sewage collection and delivery system generally consist of a sewer system and a pump station.

For skid mounted SK20 systems, a small lifting station (SLS250) and/or a pump station is required to transfer collected wastewater from the sewer network to the inlet of the manual bar screen in the SK20 system, via camlock connections provided on the skid.

For below ground systems (i.e., RP20A), the wastewater is either gravity fed or pumped to the inlet of the manual bar screen in the RP20 systems. If the facility is located away from the STP or if there is insufficient elevation for gravity flow, a sewage pump station will be required to transfer the wastewater from the sewer network to the bar screen inlet.

### PRELIMINARY TREATMENT

#### Screening

The screening device consists of a manual bar screen with 6 mm bars and 6 mm spacing. The raw sewage entering the treatment plant passes through the bar screen which removes large objects from the raw sewage to stop any large, mostly inorganic material from entering the treatment plant. The sewage then flows into the balance tank. Manual bar screens must be cleaned regularly and as often as necessary. This is done by manually

removing the screenings using a rake provided. Screenings removed manually from the bar screen are placed on a perforated tray over the screen box to drain excess water before being disposed. Collected screenings will be cleaned out manually for disposal. A bar screen enclosure is provided with a hinged lid to contain any possible odours.

### FLOW AND ORGANIC LOADING BALANCING

A balancing capacity of 5,000 litres in the balance tank controls the incoming flow of raw sewage enabling balancing of both flow and organic loading to a subsequent stage of the process. The excess volume of incoming sewage during the peak hours, and the incoming flows during settling and decanting cycles will be stored in the balance tank for treatment later. The pressure pipe from the transfer pump in the balance tank is connected into the middle of a distribution pipe to ensure that it will be equally distributed between the two bioreactors.

## SECONDARY TREATMENT

The sewage is then treated in a secondary stage treatment "Bioreactor" which is a suspended growth activated sludge process using Cyclic Extended Aeration process with intermittent decanting. It is treated in a series of batch phases within the Bioreactors to achieve the desired effluent quality.

This system is designed as a Batch Feeding Mode, which allows the raw sewage to enter the bioreactors via the transfer pump in the balance tank only during the feed and aeration cycle of the operation controlled by the PLC controller. During the settling and decant cycles raw sewage cannot be received but stored in the balance tank without any affects to the settling or decanting process.

The treatment operation in each of the bioreactors is automatically controlled by the PLC system in a pre-determined cycle. The treatment can be operated at different cycle times to enable operational flexibility. For normal operation, the operation consists of the following cycles:

### FEED & AERATION CYCLE

Incoming sewage flows into the bioreactor and is mixed with the biomass held in the aeration tanks. This is aerated and oxygenated by diffused air supplied from an air blower when influent is received into the aeration tank. Aeration is provided to meet the process oxygen demand for carbonaceous oxidation, nitrification and for mixing. As aeration takes place and continues, an ideal aerobic environment is formed for micro-organisms and a humus type activated sludge is formed. With this balanced aeration and a good healthy activated sludge, digestion and oxidation of the organic waste occurs. A balance of aeration in relation to the organic/hydraulic load is maintained for a good steady reliable treatment process. BOD oxidation and nitrification also occurs during this phase of operation.

## SETTLING CYCLE

Immediately after the aeration cycle, a settling condition is created to provide solids-liquid separation, which allows a quiet period where the biomass has time to settle. As the biomass is settling it acts as a filter blanket trapping all the waste that is in suspension in the mixed liquor of the aerobic biomass and settles it to the floor. This provides for further carbonaceous oxidation (anoxically), clarification, and denitrification. A zone of clear water is generated at the surface of the aeration tank, which is now acting as a clarifier.

## DECANT CYCLE

After a predetermined settling period a decanting cycle takes place. The floating decanter draws off water from just under the surface to a predetermined level. During the decanting cycle the anoxic treatment process continues carbonaceous oxidation, clarification, and denitrification, and automatically decants highly treated clarified effluent which flows into the chlorinator for disinfection by gravity. The decanting cycle continues drawing off effluent until the electronic process control puts the system back into the aeration cycle.

At the end of the decanting cycle which is the start of the next aeration cycle the blower on timer starts the blower again causing air pressure to purge the liquid from the decanter and an air-lock is created in the decanter's bladder, thus stopping any flow of water and the decanting procedure. Variable duration for each cycle can be chosen for optimum treatment.

## CHLORINATION

The treated effluent from the STP will be disinfected through the chlorinators and effluent chlorine contact tanks. Although the effluent is treated, it contains many types of human enteric organisms that are associated with various waterborne diseases. Disinfection can selectively destruct the disease-causing organisms in the sewage effluent. The chlorinator and the chlorine contract tank are designed to meet the standard secondary effluent quality.

A disinfection process of effluent is carried out using chlorination equipment to treat the final water before discharge. The chlorinator uses tablet chlorine (TICA Trichloroisocyanuric Acid) and is self-compensating for variations in flow. The bottom tablet is submerged at all times and during periods of low flow this ensures sufficient chlorine is released, and during periods of high flow the water level in the chlorinator increases and more tablets are exposed as these are dissolved, more chlorine is released in sufficient quantities to ensure disinfection. A dose rate residual chlorine is maintained in the effluent of between 0.5 and 2.0 mg/l free available chlorine prior to being delivered to the effluent storage or disposal area.

Our system design uses a sufficient effluent chlorine contact time.

## TERTIARY TREATMENT & ADVANCED CONTROLS

### CHEMICAL PHOSPHORUS REMOVAL

A chemical (Aluminium Sulphate, Alum) dosing system is provided on the STP. The dosing of Alum at a controlled rate is for phosphorus removal from the activated sludge. Phosphorus removal takes place within the mixed liquor of the aeration tank with the addition of the flocculating chemical (Aluminium Sulphate), which precipitates and binds the element to the sludge and is removed from the treatment cycle through the exercise of sludge wasting.

### EFFLUENT DISCHARGE

When the liquid has reached the predetermined level in the chlorine contact tanks, the effluent pumps will operate and pump out the effluent through a sock filter then a flow meter to the irrigation or disposal system.

There is an air release valve located on the top elbow of the effluent pump. This allows air into the effluent pipe once the pump has stopped pumping to prevent the effluent pump from siphoning to the irrigation area. If this is allowed to happen, the effluent tube may be damaged due to the extreme water pressure from the main tank pushing onto the walls of the effluent tube, as well as the possibility of allowing air into the effluent pump which could cause an airlock inside the pump. This would cause the effluent pump to run constantly without removing effluent from the treatment plant eventually backing up the STP and burning out the pump.

The effluent pump is controlled by a float switch which is hardwired to the pump. This is held on the side of the pump handle in a special groove designed to hold the float's cable. If the float cable is removed from the groove and left to hang without any support, the float will not turn the pump off due to the float cable being longer than the length of the pump body causing the pump to constantly run dry causing premature failure of the pump. If it is noted that the float has become dislodged from its groove, the pump will need to be removed and the float cable returned to the groove. When installing the cable, ensure that the head of the float hangs vertically before it reaches the bottom of the pump housing to ensure that the pump will turn off before the effluent reaches the bottom of the pump.

## OZZI KLEEN MODEL BS468 MANUAL BAR SCREEN DETAILS


Photo 1. Manual Bar Screen Internal

## SOCK FILTER

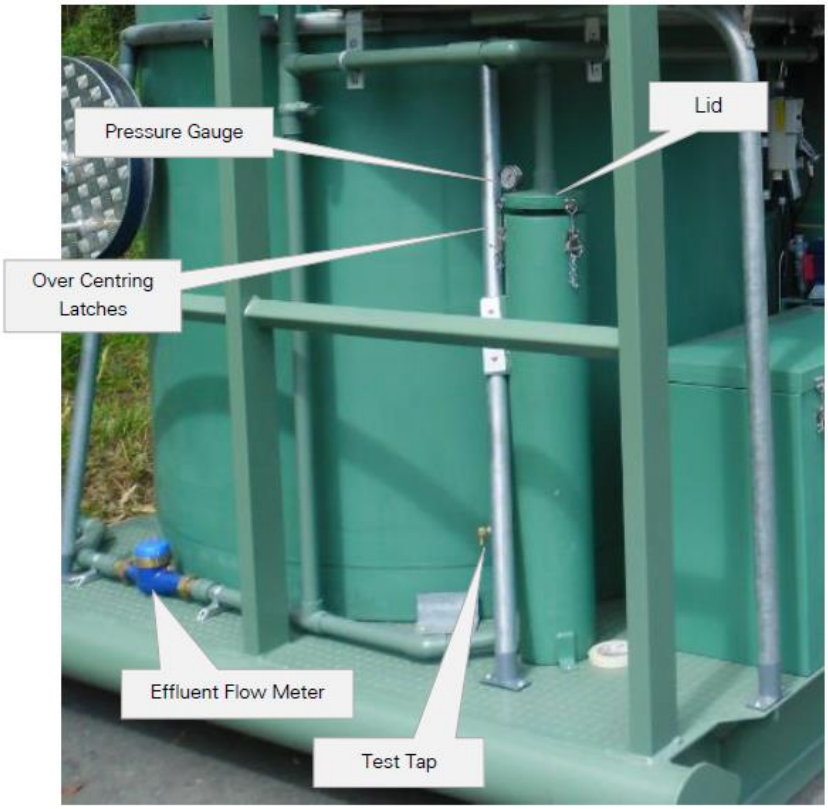


**Photo 2. Sock Filter and Effluent Outlet Pipe Work**

The sock filter serves as the final particle filter, preventing solids picked up by the effluent pump from reaching the irrigation area. The system includes the sock filter housing, a pressure gauge, and the filter sock.

The reading on the gauge will vary depending on several factors, including the type of effluent pump, the length of the irrigation pipework, the number of sprinklers, the type of irrigation used, and whether the irrigation area is uphill or downhill. The gauge should be read, and the pressure recorded each time the skid is moved, set up, or when the irrigation area is installed or relocated, to establish a baseline pressure reading. If the pressure reading is higher than the original baseline, it indicates that the sock filter requires cleaning.

## TO ACCESS/CLEAN THE SOCK FILTER

Disconnect both effluent pumps from the OK1 controller (bottom GPO on the side of the controllers) located in each motor box.

Undo the inline barrel unions and unhook the three over-centring latches on the top of the sock filter by lifting them up. Carefully remove the lid, taking care not to misplace or lose the O-ring located inside the lid insert.

Once the lid is removed, the top of the sock filter will be exposed, which can be removed for inspection and cleaning. Be aware that there is also an O-ring located under the lip on the top of the sock filter itself.

After cleaning, reassemble the filter by placing it back into the housing, ensuring that the O-ring is correctly seated under the lip on the filter and positioned between the top of the sock filter and the housing.

Reinstall the lid to the top of the housing ensuring the O-ring on the lid is located between the top of the sock filter and the lid.

Screw up the inline barrel union, and then clip the over centering latches back into place.

Plug effluent pumps back in and check the sock filter for leaks while effluent pumps are next running. If leaks are found from around the lid area the over centering latches may require adjustment. This is done by undoing the latch and turning the center hook of the latch clockwise. Always adjust the latches equally to keep the lid square to the housing. Adjust two turns at a time and recheck until the leak has stopped. If the leak persists, replace the O-rings with the spare ones found in the parts box located on the skid.

## EQUIPMENT SPECIFICATIONS

Table 2. Equipment Specification for Skid Mounted[1] and Below Ground[2] Systems

| DESCRIPTION | MAKE & MODEL | SERVICE | NO. | RATED POWER OR SIZE | FULL LOAD CURRENT |
|---|---|---|---|---|---|
| **Grease Trap** | | | | | |
| Grease Trap[3] | Ozzi Kleen GT500R | Duty | 1 | 500 L | — |
| Grease Trap Pump[3] | Reefe RVS 155 | Duty | 1 | 180 W 240V / Single Phase | 2.0 A |
| **Balance Tank** | | | | | |
| Manual Bar Screen | Ozzi Kleen BS468 | Duty | 1 | | — |
| Tank | Ozzi Kleen PT4000[1] Poly Tank PT5300[2] Poly Tank | Duty | 1 | 5000 L | — |
| Transfer Pump | Showfou STA-11DS | Duty | 1 | 0.75 kW 240 V | 7.0 A |
| Level Floats | MAC3 Float Switch | Duty | 2 | H/W & Pump Control | — |
| **Aeration Tank** | | | | | |
| Tank | Ozzi Kleen PT4000 Poly | Duty | 2 | Ø1900 x 2800 H | — |
| Air Blower | Rietschle Thomas LP-150HN | Duty | 2 | 130 W 240V / Single Phase | 0.85 A |
| Air Diffuser | GVA Elastox-T Type B | Duty | 4 | 300 mm | — |
| Floating Decanter | Ozzi Kleen FD50 | Duty | 2 | Poly Ø 50 mm | — |
| SBR Float | MAC3 Float Switch | Duty | 1 | | — |
| Solenoid & Dump Valve Assembly | Ozzi Kleen 3 solenoids valves | Duty | 2 | 24 Volts AC | — |
| **Chlorine Contact Tank** | | | | | |
| Contact Tank | Ozzi Kleen PT350 Poly | Duty | 2 | 350 L | — |

[1] Skid mounted model (SK20A & SK20A-G) only
[2] Below ground model (RP20A) only
[3] SK20A-G only

| DESCRIPTION | MAKE & MODEL | SERVICE | NO. | RATED POWER OR SIZE | FULL LOAD CURRENT |
|---|---|---|---|---|---|
| Chlorinator | Ozzi Kleen Poly | Duty | 2 | 1 canister Ø90 | — |
| Basket Strainer | Ozzi Kleen 150 | Duty | 2 | 2000 µm mesh size | — |
| Effluent Pump | Reefe RVS 300 | Duty | 2 | 400 W<br>240V / Single Phase | 4.0 A |
| Waste Sludge Tank | | | | | |
| Sludge Tank | Ozzi Kleen PT350 Poly | Duty | 2 | 350 L | — |
| Pump Out Point | | — | 1 | 50mm camlock MI & ball valve | — |
| Controls and Miscellaneous | | | | | |
| Control Panel | OK 1 with Mitsubishi PLC | Duty | 1 | 240V AC | — |
| Sub Control Board | Ozzi Kleen Sub Board | Duty | 1 | | — |
| Alum Dosing Tank | Ozzi Kleen Poly Tank | Duty | 1 | Ø430 x 900H<br>80 L | — |
| Alum Dosing Pump | IWAKI EWN-B16VCAR | Duty | 1 | 20W 240V single phase, 3.0 L/hr | 0.8A |
| Aluminium Access Ladder[1] | Ozzi Kleen 1500 | Duty | 1 | 750 x 600 x 1800 | — |
| Aluminium Platform[1] | Ozzi Kleen 1900 | Duty | 1 | 4800 x 600 x 1800 | — |
| Sock Filter[1] | Ozzi Kleen Sock Filter with Gauge | Duty | 1 | 100 x 950 mm<br>450 µm mesh size | — |
| Built In Sock Filter[2] | Ozzi Kleen Sock Filter with Gauge | Duty | 2 | 100 x 950 mm<br>120 & 210 µm mesh size | — |
| Chlorine Tablets | Trichloroisocyanuric Acid Tablets | — | — | By client | — |
| Granular Alum | Aluminium Sulphate | — | — | By client | — |

## CONTROLS AND INSTRUMENTATION

### ELECTRICAL CONTROL BOARD

An Ozzi Kleen control board provides the controls for single phase electrical equipment, air blower, solenoids and the effluent pump.

### AERATION TANK

SBR Float (Cell 1)

High Level Alarm

### CHLORINE CONTACT TANK

Holds Chlorine Canister

### OPERATOR INTERFACE

Each system comprises an Ozzi Kleen OK 1 controller. All controls are housed in an enclosure within the OK 1. The treatment processes are controlled by a PLC based controller providing switching for all functions and alarms. This controller is user friendly and adjustment to the treatment processes can be easily made by the operator.

## OK1 SYSTEM CONTROLLER MANUAL FOR SK20A/SK20A-G/RP20A SBR SYSTEMS

Ozzi Kleen OK 1 Controller

### RUN MODE

| Buttons | Function of Buttons when controller is in run mode | |
|---|---|---|
| ← | CYCLE STEP | Press once to forward cycle. |
| ↑ | DECANTER SOLENOID TEST | Press once to activate and press again to deactivate. |
| ↓ | TRANSFER/DOSING PUMP TEST | Press once to activate and press again to deactivate. |
| → | SLUDGE SOLENOID TEST | Press once to activate and press again to deactivate. |
| Ok | MODIFY CYCLES | Press once to activate modifying mode. |
| Esc | RESET | Press Esc to exit modifying screens.<br>Press Esc to reset controller.<br>Press Esc to reset Buzzer Mute time. |

### MODIFYING MODE

| Buttons | Function of Buttons when controller is in modifying mode |
|---|---|
| → | Scroll right through cycle times and alarm counts |
| ← | Scroll left through cycle times |
| + | Increase cycle time |
| - | Decrease cycle time |
| Ok | Stores the cycle time change |
| Esc | Resets and returns the controller into Run Mode |
| ↑ | No function in modifying mode |
| ↓ | No function in modifying mode |
| ↑ ↓ | Reset alarm count |

## START UP

- Turn power on to the system Run Mode.
- If OZZI KLEEN SYSTEM HEALTHY – SK20 - OK1.V3 is seen on the screen the controller is already in run mode.
- If OZZI KLEEN SYSTEM HEALTHY – SK20 - OK1.V3 is not seen on the screen the controller is not in run mode and will need to be put into Run Mode.
- To put controller into run mode follow these steps.
- Press the (Esc button) and the (Ok button) together to bring up **Top Menu**.
- Use the ( ↑ button) or the ( ↓ button) to find the word **Run** press the (Ok button).
- Press the (Ok button) again to start the controller.
- The controller should now be in run mode.

## TO MODIFY CYCLE TIMES

1. The standard factory settings are Aeration 60 mins, Settling 30 mins, Decant 30 mins, Anoxic 0 sec, Sludge Run 0 sec, Dosing 0 sec.
2. To change a cycle time, press the (Ok button) this will bring up your cycle time screens.
3. Use the (← button) or the (→ button) to move to the cycle time you want to change or to the Alarm Count screen.
4. Press the (+ or – button) to change the cycle time. Cycle time will now be flashing.
5. Press the (+ button) or (– button) to increase or decrease the cycle time.
6. When you have the desired time press the (Ok button) to save new setting.
7. Repeat steps 3 – 6 for each cycle time you want to change.
8. To reset Alarm Counts, simply be in the Alarm Count screen and hold the ( ↑ ↓ ) at the same time for 3 seconds, this will zero all alarm counts.
9. When finished modifying cycle times press the (Esc button) to return to the main run screen.
10. You can step the cycle though to the next cycle by pressing the + button until the time is more than the set amount and pressing Ok.

## ALARM AND OPERATION SIGNALS

| | | |
|---|---|---|
| LOW AIR PRESSURE 1 | - | Low air pressure or blower 1 has not started. |
| LOW AIR PRESSURE 2 | - | Low air pressure or blower 2 has not started. |
| LOW AIR PRESSURE 1 & 2 | - | Low air pressure or blowers 1 & 2 have not started. |
| AERATION CELLS HIGH LEVEL | - | Aeration cells 1 & 2 have a high water level. |
| BALANCE TANK HIGH LEVEL | - | Balance tank has a high water level. |
| O | - | Decanter solenoid is open. |
| S | - | Sludge solenoid is open. |
| D | - | Dosing pump run. |
| T | - | Transfer pump run. |
| E | - | Effluent lift solenoid is open. |

## DECANTER SOLENOID CONTROL TIMES

The decanter solenoid will open for 60 seconds at the start of the aeration period to prime the decanter then it will close. The decanter solenoid will open for 10 minutes at the start of the decant period to allow the decanter to sink into the water, and then will close.

## TEST BUTTONS

The test buttons on the OK 1 controller are there so you can test each piece of equipment that is connected to the controller except for the effluent pump as this is not controlled by the controller on a standard system, as it has its own float. You can press the alarm test button and go to where the alarm panel is located and make sure the controller is sending a signal to the alarm panel.

## 4MM AIR LINES

There are two 4mm air lines that come out of the OK 1 controller. The shorter of the two 4mm air lines is for the low air alarm. The longer of the two 4mm air lines is for the high water alarm.

## FUSES

The fuse on the top left of the OK 1 controller protects the transformer from the decanter and sludge solenoids. This is the AC fuse and is 2 amp. If this fuse is blown it is likely that

there is a fault with one of the solenoids, the connection at one of the solenoids is shorting out or the solenoid wires are sitting in water. The Top Right Fuse is the DC Fuse which protects the plc. This is a 1amp Fuse.

## ALARM COUNT

The alarm count is used for the indication of faults for the system since the last site inspection/service. This will give the operator a good overview of any alarms that have been activated. There are 2 pages of alarms on the SK20 OK1 controllers. Once the alarm count has been recorded they can be reset by simply pressing the up and down arrows at the same time for 3 seconds and this will reset the alarm count.

## ALARM TEST

The alarm can be tested in this control system by lifting the high water float in the balance tank to make the alarm strobe activate.

## ALARM STROBE

An alarm strobe is located on the master motor box of the treatment plants, which signals a high water alarm, low air alarm or power failure. An optional upgrade allows for the installation of an audible alarm with a buzzer/mute feature on the STP.

## HIGH WATER ALARM

When the balance tank or aeration tanks reach high water levels, the alarm strobe will activate. The display on the OK1 controller will indicate whether one or both units are in high water (see page 28, Alarm and Operation Signals).

## LOW AIR ALARM

When one or both blowers fail to operate during the aeration cycles, a low air alarm is triggered. The display on the controller will indicate if one or both units are in low air (see page 28, Alarm and Operation Signals).

## BUZZER MUTE FUNCTION (OPTIONAL CONTROL)

The buzzer mute function is activated when the alarm is sounding, and the mute button is pressed on the alarm panel. Once pressed, the buzzer will be muted for 10 hours or until the reset button on the OK1 controller has been pressed.

## ELECTRICAL CONNECTIONS

Internal electrical wirings have been completed for the skid mounted systems.

### LOW VOLTAGE WIRE COLOURS AND VOLTAGES

| | | | |
|---|---|---|---|
| **Core 1** Blue and white | - | Decant solenoid 1 & 2 | 24V AC |
| **Core 1** Green and Yellow | - | Sludge lift solenoid 1& 2 | 24V AC |
| **Core 1** Brown (+) and Purple (-) | - | SBR float | 24V AC |
| **Core 1** Black (+) and Red (-) | - | Balance H/W float | 24V DC |
| | | | |
| **Core 2** Brown and Purple | - | Effluent lift solenoid 1& 2 | 24V AC |
| **Core 2** Yellow (+) and Blue (-) | - | Alarm Strobe | 24V DC |
| **Core 2** Red (+) and Green (-) | - | Blower 2 low air switch | 24V DC |

### SBR WIRING

When SBR control is installed the brown and the purple wires are used for the SBR switch. There will be an additional two pair wire coming out of the control board which will be used for the transfer pump trigger, this will be marked.

## FUNCTION DESCRIPTION OF STP

### AERATION TANK

The aeration tanks are where the treatment process takes place, these tanks run on a cycle time which is controlled by the OK1 controller. Refer to the control section of the Operation Manual.

The prime solenoid is open for the first 60 seconds of the aeration cycle to allow the decanter to rise above the water level. When the first 60 seconds is complete the aeration cycle will continue until the aeration set time has elapsed. If in the aeration cycle the high water probe is covered the cycle will step to the settling / decant cycle to allow for excess water to be removed. Once the aeration time has elapsed the system will go into settling mode for the set time. At this time the aeration tank sits dormant.

Once the settling set time has elapsed the system will go into decant mode, at this time the decant solenoid is opened for 10 minutes to allow the decant float to sink into the water and start transferring effluent across into the contact tank. This will continue to happen until the decant set time has elapsed and the cycle will start again back into aeration.

### ELECTRICAL CONTROL

This system is designed as a Batch Feeding Mode, also known as "SBR" mode, which only pumps the raw sewage from the balance tank to the bioreactors during the feed and aeration cycle of the operation.

The transfer pump in the balance tank will be turned on to feed the two bioreactors at the beginning of the feed and aeration cycle, when the level in the bioreactors reaches a preset level, a "SBR" switch (pressure switch) in the bioreactor will cut power to the transfer pump power outlet causing the transfer pump to stop pumping until the beginning of next feed and aeration cycle. The transfer pump on/off depth is 70 mm which gives a 333 litres feeding volume per cycle, and 4,000 litres per day at 12 cycles of operation.

Cell 1 and Cell 2 will have power continuously (picture 1). The Lift Pump (outlet) will have power continuously and automatically pumps into the balance tank when required (picture 2). The Transfer Pump outlet (picture 4) will only be energised when the SBR switch in cell 2 is down this will then energize the contactor in picture 3 thus bringing on the Lift Pump (outlet) transferring waste into the cells.

## THE SK20A-G (WITH GREASE TRAP) ELECTRICAL INFORMATION


Power Point Location


Grease Trap Lifting Pump Power Point


Mains Power Connection Point


Transfer Pump Power Point

Photo 3. Electrical Mains Connection and Power Points

## SECTION C: PLANT INSTALLATION

### MANUFACTURE

The SK/RP20 system is a package sewage treatment plant with two identical Ozzi Kleen treatment units. Most equipment including tanks, electrical and control boards etc. were manufactured and prefabricated at Suncoast Waste Water Managements workshops in Queensland Australia for transport to site ready for installation. All components will be run-tested prior to transport wherever practical

### DELIVERY

The Ozzi Kleen SK20A/SK20A-G system will be delivered with the following components:

| | |
|---|---|
| 2 x 5000 litres poly tanks – Ozzi Kleen STP's | Ø1900 x 2800 |
| 1 x 5000 litres poly tank – Ozzi Kleen PT4000 | Ø1900 x 2500 |
| 1 x Manual Bar Screen – Ozzi Kleen | 815 x 420 x 650 |
| 1 x Aluminium Ladder – Ozzi Kleen | 1000 x 600 x 1650 |
| 1 x Aluminium Platform – Ozzi Kleen | 5000 x 600 x 1500 |
| 1 x Steel Skid – Ozzi Kleen | 6000 x 2400 x 310 |
| 1 x Alum Dosing Unit | Ø 430 x 950 |
| 1 x Sock Filter | Ø 200 x 700 |
| 1 x Grease Trap *(SK20A-G Only)* – GT500R | 1625 x 500 x 1250 |

Pumps, Blowers, IOM Manual, Pipework, Fittings, Spare Parts and Connections

The Ozzi Kleen RP20A system will be delivered with the following components:

| | |
|---|---|
| 2 x 5000 litres poly tanks – Ozzi Kleen STP's | Ø1900 x 2800 |
| 1 x 5000 litres poly tank – Ozzi Kleen PT4000 | Ø1900 x 2500 |
| 1 x Manual Bar Screen – Ozzi Kleen | 815 x 420 x 650 |
| 1 x Alum Dosing Unit | Ø 430 x 950 |
| 2 x Sock Filters | Ø 200 x 700 |

Pumps, Blowers, IOM Manual, Pipework, Fittings, Spare Parts and Connections

## ON-SITE INSTALLATIONS AND CONNECTIONS

### PUMP STATION – *OPTIONAL*

Install the Ozzi Kleen sewage pump station as per the following instructions:

1. **Excavation**: For the pump station buried below ground, excavate a hole that provides at least 250 mm of clearance between the excavation hole wall and the nearest part of the tank wall.
2. **Bedding Preparation**: Place a minimum 100 mm thick layer of bedding sand at the bottom of the excavation, then compact it before positioning the pump station.
3. **Positioning**: Install the pump station centrally in the excavated hole, ensuring no less than 250 mm clearance from the nearest side.
4. **Partial Filling**: Partially fill the pump station with water before evenly pouring 2 cubic meters of concrete or stabilized sand around the tank.
5. **Backfilling**: Once the concrete or sand has cured, backfill the remaining area around the tank with the excavated soil.

**Additional Components**: Installation of sewage pumps, piping connections, fittings, and the valve box should be carried out according to the SWWM drawings provided separately. For temporary facilities, such as mobile accommodation, where below-ground pump pits are unsuitable, small lifting stations (SLS250 & SLS250A) are available.

### GREASE TRAP - *OPTIONAL*

As mentioned earlier, a grease trap is required for commercial kitchen facilities to remove fat, oil and grease from the kitchen wastewater prior to the STP. SK20A-G has its own grease trap equipped on the skid. The wastewater pipe from the kitchen is connected to the inlet of the grease trap via the small lifting station.

For below ground systems, a separate grease trap is required. Ozzi Kleen has multiple grease trap options to suit the size of the commercial kitchen facilities. Please contact Ozzi Kleen sales team for more information.

## SEWAGE TREATMENT PLANT – SK20 SERIES SKID MOUNTED STP

The following instructions are for the installation of the skid mounted treatment plants (SK20A & SK20A-G). These units are designed as plug-and-play systems, with all internal piping and electrical connections completed, and a full cycle test performed at our factory prior to dispatch. For below ground systems (RP20A), please refer to the next section (page 36).

1. Site Preparation

   The proposed site for the STP should have any vegetation and topsoil removed and a level platform provided of either 150 mm type 2.2 gravel (compacted crusher dust pad) or similar, or 100 mm concrete slab.

   The construction of civil works such as concrete slab or compacted crusher dust pad, fencing, access road, excavations and backfilling for the STP installation is to be provided by others.

2. Skid Placement

   Position the SK20 STP on the assigned location with a firm level concrete pad or crusher dust.

3. Piping connections

   - Connect the delivery pipe (rising main) from the pump station to the raw sewage inlet connection (∅50mm camlock) on the skid and inlet pipe connection to the manual bar screen. There are between 1 and 8 camlock's provided for the raw sewage inlet connections depending on the design ordered.
   - For SK20A-G treatment plants, connect the kitchen waste water pipe to the grease trap inlet connection (Ø50mm camlock). Only kitchen wastewater should be connected to the grease trap. Other waste water passing through the grease trap will render the grease trap inoperable.
   - Attach the ∅32mm camlock for the effluent to the irrigation or disposal system.

4. Electrical Power Supply

   The single phase main electrical power supply for the SK20 provided by others should be connected to the power connection points specified in this manual (refer to Electrician's instructions in page 38), and then the equipment and controls should be test run prior to the commissioning of the STP.

Perform a test run of the equipment and controls prior to commissioning the STP.

Note: Commissioning the STP to be carried out by SWWM personnel.

## SEWAGE TREATMENT PLANT – RP20 SERIES GELOW GROUND STP

This section describes the installation of the below ground sewage treatment plants.

1. Site Selection

   The system is to be installed in a position where local storm water flooding and ponding around the tank will not occur. If the system is installed in a water course or a flood prone area, it will need to be relocated by the installer.

2. Excavation and Base Preparation

   A hole for installation will have to be excavated minimum dimensions of 2400 mm x 7200 mm (rectangular) and 2400 mm deep with a sound base. A minimum 100mm layer of bedding sand is required. If the hole is over excavated, additional bedding sand will be required. Under no circumstances should the material excavated from the hole to be used as bedding for the tank. Only bedding sand should be used.

   Check that the bedding sand base is level and the depth from there to natural ground level is no greater than 2300mm. If the measurement is more than 2300mm add more bedding sand to raise the base. Refer Hydraulic Drawings – RP20A Below Ground Systems(Page 59).

3. Tank Placements

   Install the treatment plants and balance tank as per the drawing provided. 3 tanks are distributed in the excavated hole with no less than 250 mm to the nearest side. Check the inlet height of two bioreactors are same level so that the sewage is filled to the two tanks equally. Ensure that the backfill is placed evenly around the tank. If the system is placed unevenly in the hole so that the tank is near to touching a side of the hole this will not allow even backfill and cause tank instability. If this occurs, it will have to be rectified by the installer.

   NOTE: The treatment plant comes with two lifting lugs on top of the tank suitable for lifting with a chain and D shackle. The tank has a dry weight of approximately 400 kg.

4. Level Consideration

   Install the sewage treatment system so that the base of the green motor box is no less than 50 mm above the natural ground level to avoid surface water entry. If the system is installed too low, it will have to be rectified by the installer.

5. Fill the System with Water

   Before placing any backfill around the tank, fill the treatment plant with water (approximately 4500 litres per tank) or up to the sewer invert of the balance tank. Ensure that all compartments, including the sludge waste and effluent

compartments, are filled. Failure to do so may result in tank instability. If any deflection occurs due to improper filling, it will need to be rectified by the installer.

6. Connect Sewer Pipe

Connect sewer piping to the sewer inlet of the balance tank. The inlet is an Akatherm fitting that requires a standard 100mm DVW pipe for the connection. This plug-in socket has a SBR seal and cannot be glued. Follow these steps for piping connections:

- **Delivery Pipe Connection**: Connect the delivery pipe (rising main) from the external pump station or gravity-fed system from the building to the raw sewage inlet connection of the balance tank. From the balance tank pump outlet, run a 50 mm pressure line to the bar screen inlet (fitted with an 80 x 50 mm bush).
- **Bar Screen Box Connection**: Prepare a 100 mm upright connection pipe for the bar screen box. This pipe connects to the 100 mm tee located in the centre of the balancing pipe of the two bioreactors. Ensure the balancing pipe is level so that the sewage from the balance tank is evenly distributed between the two tanks.

7. Connect Sludge Return Pipe

The sludge return line is installed using 25mm PVC pipe from the sludge lift pipe outlet to the balance tank. Connect the pipe from the PVC connector located on the sludge tank hatch of bioreactor 2 and join them with a tee fitting on the bioreactor 1, and then routed to the roof of the balance tank.

8. Backfill Around Tanks

**High Water Table Areas**: In areas with a high water table, apply 6 cubic metres of stabilized concrete around the base of the system. This ensures stability and prevents tank movement due to groundwater pressure.

**Standard Areas**: If the system is not installed in a high water table area, backfilled earth is sufficient. Use only clean earth for backfilling around the tank. The earth should be free from large lumps of clay, stones, bricks, rubbish, and other foreign objects.

**Partial Backfill and Installation of Additional Components**: Once the excavation hole is partially backfilled (roughly up to the tank shoulders), place the dosing tank, manual bar screen (partially buried) as per hydraulic drawings in page 15 & 16 and continue the rest of the pipe connections

**Bar Screen Installation *(Optional)***: The bar screen is optional for the site where septic tank is installed prior to the balance tank.

- Connect the 100 mm upright pipe from the tee of the balancing pipe to the outlet of the manual bar screen, which is located at the bottom of the box.

- **Transfer Pump Outlet Line**: Connect the transfer pump outlet line from the balance tank to the inlet of the bar screen in 50mm pressure pipe (80 x 50mm reducing bush is fitted to the inlet of the bar screen).
- **Alum Dosing Tube**: Connect the alum dosing tube from the dosing pump to the bar screen box. A gland is provided for hose penetration to ensure a secure connection.
- **Effluent Discharge Connection**: Connect the effluent discharge point (Ø32 non-return valve) of each tank to the irrigation or disposal system.

## ELECTRICIAN'S INSTRUCTIONS

Installation of power to the SK/RP20 must be performed by a licensed electrical contractor in accordance with the current electricity act if the system is to be hard wired. Refer page 61 for Electrical Schematic Diagram - SK20A & SK20A-G Skid Mounted Systems and page 65 for Electrical Schematic Diagram - RP20A Below Ground Systems.

The power supply to the SK/RP20 is a single-phase service and shall be wired in minimum **6 mm²** cable, or as per AS 3008.1.

### Skid Mounted Systems

The power supply cable is brought into the SK20 series STPs from the electrical breakers located under the walkway of the skid (a 32 amp appliance inlet is provided to the skid systems, see photo 3 in page 32). It then run into the side of the tank turret at the top of the tank, referred to as the access manhole, and up through the floor of the motor box housed in the flexible conduit provided. The low voltage alarm wires are to be connected to the terminals inside the small round junction box below the main power outlet if the optional alarm panel is to be used. The external electrical conduit to the system is to be 25 mm.

### Below Ground Systems

For RP20A below ground systems, 32 amp single phase isolator and an RCBO are provided on an aluminium post, the electrical main cable to be hardwired by the onsite electrician.

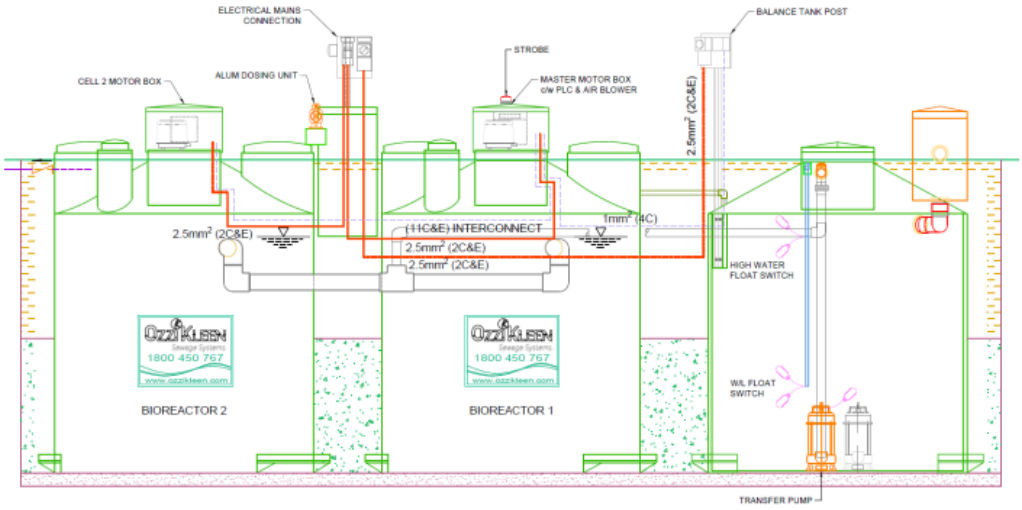


Figure 3. RP20A INTER CONNECTION ELECCTRICAL LAYOUT

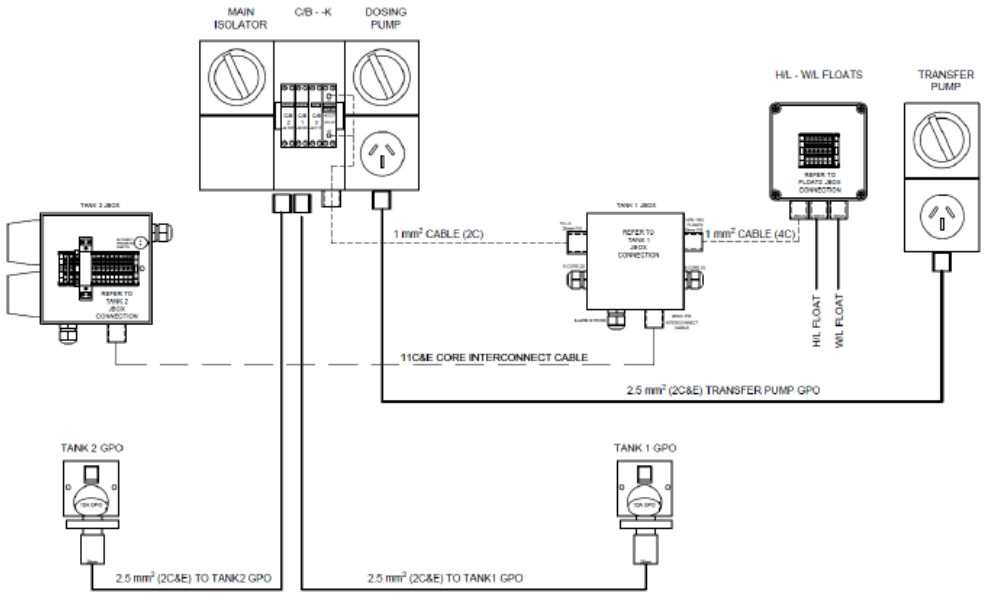


Figure 4. Electrical Connections Required at Installation

The maximum power consumption of the SK/RP20 series STPs is approximately 3000 Watts.

- The air blowers are rated at 130 Watts each.
- The transfer pump is rated at 750 Watts.
- The effluent pumps rated at up to 750 Watts each.
- The grease trap lifting pump is rated at 180 watts *(SK20A-G Only)*.

1. The alarm circuit is supplied from the control board and is 24 V DC that energises a red strobe located on the top of the master motor box.

2. The power supply to the system should come direct from the meter board and should be protected by a 32A circuit breaker and surge protection, as each circuit on the skid is protected by an RCD/MCB further RCD protection is optional.

Note:

The motor compartment on the top of the STP is on a hinged lid and the wiring to this compartment passes through a flexible conduit provided. No external conduit or rigid conduit is to be fastened to the outside of the motor box. If extra flexible conduit is used for wire connection to the system, ensure that there is sufficient length to allow for the tilting of the motor box when it is opened. The power supply cable is connected to a weatherproof outlet provided and the alarm cable is connected to a terminal strip inside the PVC junction box. No other connections are required for this system in standard configuration.

# SECTION D: PLANT OPERATIONS

## COMMISSIONING

Following the installation of the SK/RP20 series STPs, commissioning and testing will commence. The treatment plant has to be commissioned to ensure that the system is set up correctly and is operating and ready for use. The system ***must not be used*** until it is fully commissioned. The Service Provider will carry out commissioning.

## START-UP OPERATION

The operation of the SK/RP20 series STPs is controlled by two individual PLC control systems. The PLC controls all functions of the treatment plant and the setting up of this apparatus is detailed below.

As a start-up procedure the following can be used as a guide, depending on the sewage flows. At this point all settings can only be used as an approximate guide and after several weeks of operation it will become apparent what adjustments will be necessary.

1. Fill up the effluent tanks with potable water to 1500 mm depth.
2. Fill the Sewage aeration tank to 1500 mm level
3. Set up the control setting as per the start-up program table below

**Table 3. Recommended Start-Up Program**

| Program Period | Start Up Procedure | Normal Operation |
|---|---|---|
| Aeration Cycle | 60 Minutes | 60 Minutes |
| Settling Cycle | 30 Minutes | 30 Minutes |
| Decant Cycle | 30 Minutes | 30 Minutes |
| Anoxic Cycle | 0 Minute | N/A[4] |

[4] Anoxic cycle time should be determined by Ozzi Kleen service technician based on the plant's performance at the point of time and effluent quality requirements.

The settling cycle before decanting is a variable period, allowing enough time for the surface layer of clear water to appear before the decanting cycle begins.

The decant cycle can be as long as desired but both settling and decanting times should be calculated together as part of the blower off period.

The aeration period provides mixing within the aeration tank and it is recommended to be no less than 30 minutes blower on time to ensure complete mix of tank contents.

After the initial start up and for several days the effluent could be turbid due to the time required for the biomass and bacterial population to build up. Also during this period there could be large amounts of white foam produced on the surface of the aeration tank. This is caused by the low solids content in the mixed liquor and the higher levels of soapy suds in the new water. This foaming will abate as the treatment process gets going and the biomass develops.

## OPERATING INSTRUCTIONS

The Ozzi Kleen SK20 STP should operate normally and may require a few simple regular checks that should be performed.

- Carry out the services and testing listed in the maintenance schedule and operating testing sections in this manual.
- The chlorine tablets will be depleted as the effluent passes them, there should be sufficient for the period between services once filled. Normally two kilograms of chlorine is placed in each chlorinator in the system at each service. If the tablets have been consumed before the next service, more chlorine tablets will have to be added. Contact the Service Provider for replacement tablets, or obtain from a local supplier (TICA Trichloroisocyanuric Acid) stabilized slow release tablets.
- Keep the area around the treatment plant in a clean state, to avoid any damage to the treatment plant from fires, vehicular traffic etc.

DON'TS: For your own convenience there are a number of ***DON'TS*** that you should be made aware of:

**Do not discharge any items to the treatment plant that cannot be biologically broken down or are not *a source of food for the micro-organisms*** i.e.:

- Plastics, paint, thinners, contents of a portable chemical toilet, or any other foreign matter.
- Large quantities of harsh cleaners, disinfectants, fabric softeners, or any other substances or poisons that would be harmful to your system's ecology. Preferably use bio-degradable products as this will also help the environment).

*NOTE:*

- *If the Treatment Plant biomass has been killed-off, the power disconnected, or any of the above "Don'ts" put into the system, you may need to engage your Service Provider to rectify the problem.*
- *The Treatment Plant is never to be emptied without prior consent by the Manufacturer / Service Provider.*
- *Always unplug the Air Blower before tilting motor box to avoid internal damage.*
- *The Mains power supply is to be left on at all times unless maintenance work is being carried out.*

In the event of power failure, no water will be pumped from the system. During a power failure, the balance tank may fill to the high level.

In the event of operational problems you should contact your Service Provider.

## FOAMING

Foaming may occur with a new system due to laundry suds. The system operates initially with aeration of clean water, so with the addition of soaps it can sometimes cause a foaming effect. The system requires bio-solids and this will take effect in a few days after normal use and will overcome foaming.

This may be avoided by reducing excessive washing activity on a newly commissioned system.

## SYSTEM CONTROL

The treatment process control system is an electronic Ozzi Kleen OK 1 control board, which controls the duty of the air blower and other equipment within the treatment cycle.

The electronic control board is easily adjusted to vary the treatment program. The control board will be set at the factory settings and will have to be setup for normal duty at the time of commissioning. The control board operates the blower on and off at set intervals for aeration, settling, decanting cycles and sludge wasting. A balance of the aeration and decanting cycles must be maintained. The factory setting for the aeration cycle is usually one hour on and one hour off, although this may be varied once an understanding of the treatment processes within the system is gained.

## OPERATION DUTY OF THE CONTROL BOARD

- The Air Blower on-timer operates for the set period, which when it has timed out, activates the settling timer and then the Decanter timer.
- The Decanter timer allows for the decanting duration to take place and should be set to give at least 30 minutes Decanting time.

These timers are adjustable from 0 minutes to 32,000 minutes.

- Sludge timer is for sludge removal from the main aeration tank to the sludge storage tank.

  These timers are adjustable from 0 seconds to 32,000 seconds.

## OPERATION – CYCLIC EXTENDED AERATION PLANT

The Cyclic Extended Aeration Treatment Process is for the treatment of raw sewage using the activated sludge technology, where digestion and oxidation of the waste occurs through three intermittent cycles:

The treatment process must be understood by the Operator to ensure the operating cycle has the right amount of time for oxidation and absorption by the active biomass. Under treatment can lead to the discharge of dissolved solids and produce poor quality effluent, and over treatment can cause undesirable bacterial and fungal growth which could also produce a poor quality effluent.

## OPERATION – SLUDGE CONTROL

As the aeration of incoming sewage continues, the digestion of organic matter and the dissolved solids builds up to produce a biomass that is called activated sludge. The build up of sludge is not equal to the incoming matter as oxidation reduces most of the organic suspended solids. However there can be a gradual build up of suspended solids and this is to be maintained at a satisfactory level within the mixed liquor.

To control the level of suspended solids in the mixed liquor, sludge wasting may be required. Once put into operation the level of biomass remaining is determined at the time of each service using the SV30 test and recorded on the service test report sheet. The amount of sludge wasting is determined by continual testing of the mixed liquor using the settling test to keep the settled solids between 30% to 70% using a 30 minutes settling time (SV30 test).

The emptying of the sludge tank will occur at infrequent intervals i.e. 3 to 12 months. To determine when the sludge holding tank needs to be emptied, observe the supernatant draw off at the discharge pipe (return pipe work from sludge tank). Observation of the discharge water is necessary to determine when the sludge storage tank is full of heavy solids and requires emptying which would be determined at the time of servicing. If there appears to be high solids in the supernatant it would indicate that there is no more settling room in the storage tank.

Sludge wasting may be carried out by timed operation of the sludge cycle which is part of the program in the OK 1 controller. The sludge wasting timer may be adjusted to control the sludge wasting rate. The waste sludge timer will only operate for its set period at the beginning of each aeration cycle. The waste timer setting can be adjusted to regulate the

wasting period so as to maintain the desired level of sludge or suspended matter in the mixed liquor in the aeration tank as per the testing requirements for the control of sewage treatment.

## RELOCATION OF THE TREATMENT PLANT (*SK20 SERIES ONLY*)

The SK20 series sewage treatment plant is designed for easy transportation and relocation, with minimum works required for demobilisation, transportation, re-installation and commissioning.

### SHORT DISTANCE RELOCATION

If the STP is to be relocated within a short distance of no more than 12 hours travel, and the new location is ready to start operating, it is recommended to retain the contents of the aeration tanks which should be mostly thickened sludge after following the decommissioning procedure. This sludge is the active biomass which will re-seed the treatment process when the treatment plant is setup at the new location for a quick re-commissioning of the operation.

The balance tank must be empty and the maximum water level in the two aeration tanks is 1.2 meters when lifting and moving the STP.

## DEMOBILISATION (*SK20 SERIES ONLY*)

- Flush all toilets and run all hand basins to clear influent lines of sewage.

### IF FITTED WITH A PACK DOWN PUMP

- If the system is fitted with a pack down pump, lift the pump from the skid and place on the ground so that the pump is lower than the skid inlet manifold. Install a pipe from the camlock on the manifold that does not have a non return valve fitted to the inlet side of the pump. Then install the pipe from the outlet side of the pump to the cam lock fitting mounted on the side of the bar screen box or balance tank. Open the ball valve on the manifold camlock that the pump is joined to and inspect pipe work for leaks. Plug pump into a GPO, this may need to be run from the building.

Turn on power to the pump and start to disconnect pipe work from the buildings. Lift the pipe towards the skid to empty the pipe into the manifold. Once the pipe is empty shut off the ball valve for the corresponding pipe that has just been emptied and remove pipe. Repeat procedure until all pipes have been disconnected from the STP.

## IF AN SPS OZZI KLEEN PUMP STATION OR LIFTING STATION HAS BEEN INSTALLED

- Run one of the pumps in the pump station, in manual if controlled by control board, or lift floats until the station is completely empty. Then hose down all pumps and internal parts of lifting/pump station. Run the pumps until they suck air and the tank is clean. Reset the controller to auto and prepare the floats for transport to prevent them becoming damaged. Disconnect the lifting/pump station from power and the treatment plant

## IF NOT FITTED WITH ANY TYPE OF PUMP OR LIFTING STATION

- Disconnect or prevent any new influent from entering balance tank

## CONTINUE WITH THE REST OF THE PROCEEDURE ONCE ONE OF THE ABOVE METHODS HAS BEEN CARRIED OUT

- Clean out the bar screen and wash down all internal parts of the bar screen. Place rake inside the bar screen to prevent it being lost in transport.

Open both motor boxes and disconnect the blowers from the OK1 controller (top lead plugged into the GPO on the side of the PLC control panel).

Set Aeration time to 6 minutes, set the settling time to 15 minutes and leave the decant time at 30 minutes.

- Close PLC controller cover, remove screws that hold down the main body of the motor box to the main tank and close the top lid of motor box, then tilt the complete motor box to expose the internals of the main tank. Thoroughly wash down all components inside the main tank.

Continue to run the system with these settings until the balance tank (tank on RHS with attached bar screen) is empty and the system has decanted to the minimum decant level (This is when the decanter arm is sitting level to the water and no more effluent is entering the effluent tube). Once in this state lift, secure the decanter up against the roof of the tank using the chain attached to the decanter. Ensure that the decanter cannot move around during transport or the decanter's flexible joint may be broken or torn and will need to be replaced prior to re-commissioning.

- Close motor box and re-secure hold down screws of motor box to the main tank, but not the top lid screws at this point. Remove the effluent tube lid and ensure that pump has pumped out the effluent to the minimum level, remove, clean and reinstall effluent basket then replace effluent tube lids with screws.

- Reset PLC settings to Aeration Sixty minutes (60) Settling Thirty minutes (30) and Decant Thirty Minutes (30). This is done as per manual. Once PLC has been set plug both blowers back in and turn power off at GPO and screw top motor box lids shut.

- Remove irrigation line and power from the system and store for transport. Inspect and secure any loose items on skid.

- If system is to be decommissioned for more than 72hrs the system will need to be completely pumped out and washed down to prevent failure of system components.

NOTE:

If a better quality sludge is required for re seeding after the re commissioning procedure to produce a better quality effluent in less time, then the following can be carried out.

- When starting the decommissioning program, dose the aeration tank contents with one kilogram of Aluminium Sulphate dissolved in to a solution and mix into the aeration tanks.
- Switch the treatment plant off and allow the system to stand for at least an hour or so. During this period the biomass will quite readily settle to within 500mm of the tank floor.

## RE-INSTALLATION AND COMMISSIONING

1. Position the SK20A treatment plant on the concrete slab or compacted crusher dust pad in the new location.
2. Connect the raw sewerage delivery pipe to the inlet of the camlock on the steel skid.
3. Connect the effluent disposal pipe via the camlock provided on the steel skid, to the effluent storage and/or irrigation/disposal system.
4. A potable water supply tap is to be installed beside the STP for general wash down purpose, and to supply the emergency shower and eyewash when required.
5. The main electrical supply for the STP provided by the client should be connected to the power connection points located on the control board, if the system is not plug and play.
6. Inspect the system for any damage that may have happened during transport. After inspection, if no faults are found, energise the system and inspect all electrical components and settings.

## LONG DISTANCE RELOCATION

If the STP is to be relocated to a long distance or several days on the road it is recommended to empty and clean the aeration tanks and balance tank before transportation to the new location.

If the system has been drained due to an extended storage or travel period, fill each aeration tank to the invert of the inlet then start the commissioning procedure.

## TROUBLE SHOOTING GUIDE

The treatment plant has a visual alarm strobe on top of the motor box, faults will be displayed across the top of the screen of the PLC inside the OK 1 controller.

**Table 4. Trouble Shooting guide**

| OPERATION PROBLEM | CAUSE | REMEDY |
|---|---|---|
| **Alarm activated due to high level in aeration tanks** The alarm light will be activated. | Decanter is not operating correctly due to solenoid valve sticking | Check decanter and piping for blockages |
| | | Clean solenoid valve and observe that it operates. Reassemble valve with care to ensure that diaphragm seals are not damaged |
| | Debris in decanter line | Clear debris by hosing out decant line |
| | Insufficient decanting time | Decanting time should be set for 30 min except where adjusted by the Service Provider (contact Service Provider before adjusting any settings) |
| **Low air pressure** | Broken or damaged air lines to diffusers, ruptured diffuser discs or blower air filter dirty | Check air diffuser operation for excessive bubbling in one spot, indicating a pipe or diffuser rupture |
| **Blower will not operate** | Air blower motor overload | Check for faults and reset overload switch |
| **Air blower runs but no aeration in tank** | Faulty air lines leaking air | Repair air line |
| | Blocked air inlet filter | Replace air filter or clean |
| **Air blower runs continuous** | Settling & Decant timer set to zero not allowing a settling or decanting cycle | Check Settling & Decant timer to be set at least 30 minutes |
| **Decanter not going into decant mode** (drawing off surface water) | Decant time set too short | Set decant time to at least 30 minutes |
| | Decanter solenoid valve not operating | Check control circuit/relays & solenoid for fault |
| **Balance tank high water alarm** | SBR switch not working or SBR float switch adjusted incorrectly | Check SBR switch is installed at the correct height and that system is in aeration. If float is not hanging down after the decant cycle adjust probe until it hangs down after decant cycle. If system has not decanted then SBR switch will not call for sewerage. Inspect system and fix other fault with the treatment system to allow it to decant |
| | Treatment plant not decanting water away | |
| | Balance tank pump not working | |

| OPERATION PROBLEM | CAUSE | REMEDY |
|---|---|---|
| Treatment Plant smelling | Plant disinfected resulting in kill-off of the biomass | Anaerobic fermentation has taken place due to lack of aeration. Contact your Service Provider to determine if pump out and re-commissioning required |
| | Decanter not going into decant mode causing high water levels. | Check decant cycles |
| | Blower on time set too low | Increase blower on time except where adjusted by the Service Provider (contact Service Provider before adjusting any settings) |
| Sludge wasting not occurring | Blockage in the air lift pipe | Flush air lift pipe to clear blockage |
| High pressure in Sock Filter chamber | Blockage present | Check sock filter and outlet pipework for debris. Remove solids from the sock filter and clear blockages (refer to page 19 for sock filter cleaning instructions). |
| All chlorine tablets consistently being consumed in-between services | Influent flow rate has increased | Contact your Service Provider to discuss increasing service frequency and potential system upgrades |
| Grease trap smelling *(SK20A-G Only)* | Grease trap full/blocked | Pump out and clean grease trap (refer to page 20 for cleaning instructions) |
| | Lifting pump not working | Check float switch is not trapped |
| | | Fix or replace lifting pump |

Note: In the unlikely event of a malfunction causing extremely long, high water alarm periods (where the service person cannot attend site quickly) the possibility exists for sludge to carry over from the main aeration tank to the effluent tank. Therefore following high water alarm call outs the effluent tank and irrigation system should be inspected and cleaned out if necessary. If the water level within the main aeration tank has returned to normal operating level it may be possible to clean the effluent tank out by pumping the contents back into the main aeration tank. For problems not listed here, please contact your service provider for further advice.

## TREATMENT PLANT LOG SHEET

**MAINTENANCE RECORD FOR OZZI KLEEN TREATMENT PLANT**

**Model No:** _____ **Serial No:** _____

**DATE OF COMMISSIONING:** _____

**SITE CONTACT:** _____

| SERVICE DATE | SERVICED BY | CHLORINE Residual | CHLORINE Used | S/S | EFFLUENT QUALITY 1 good to 5 coloured | COMMENTS |
|---|---|---|---|---|---|---|
| | | | | % | 1 2 3 4 5 | |
| | | | | % | 1 2 3 4 5 | |
| | | | | % | 1 2 3 4 5 | |
| | | | | % | 1 2 3 4 5 | |
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## SECTION E: PLANT MAINTENANCE

This manual is designed for the manufacturer's approved operators or service providers who with the appropriate training will be forearmed to carry out all of the necessary duties required. All servicing shall be carried out by any person or persons duly authorised in writing by the Manufacturer/Supplier.

The logging of data (service reports and the treatment plant's log book) is also part of the service provider's records, which is a valuable tool for treatment plant operation and fault finding. This data also builds an operating history for the system which will assist in future operating and service procedures and fault finding.

### SERVICE POLICY

All servicing shall be carried out by the person or persons duly authorized in writing by the manufacturer. Licensed service persons other than the Agent or Representative of the manufacturer may hold extended service contracts provided they are duly authorized and trained. The Purchaser/Owner shall provide reasonable access to the treatment plant as necessary to carry out the regular servicing as described in this clause.

The Ozzi Kleen SK20 series STP will require a service every 12 weeks. Chlorine tablets will require replenishing with each service or once depleted. The amount of chlorine replaced will be dependant on the consumption. The system has a capacity for up to 4 kg (20 tablets) of chlorine tablets each chlorinator (2 chlorinators in total).

The servicing includes the testing and reporting to the Local Authority concerned, of the water testing and plant operation.

### TESTING PROGRAM

Water is used as a vehicle to transport waste to the sewage treatment plant. The treatment plant is a system for biologically removing the waste from the water again producing clean clear water which can be reused in a controlled environment. Skilled operation and management of this process will ensure satisfactory treatment. The product must be tested as it goes through each phase of the process to ensure quality control. The monitoring of the effectiveness of various treatment processes, the control of the processes and the efficiency, all depend on data obtained from testing.

The Operator or Service provider should set up operating and maintenance records for maintaining operational treatment and control.

The Operator can draw up a testing time table on a regular basis. It should indicate the date when every sample is taken and tested.

## OPERATING TESTING:

### TESTING REQUIRED

Every service visit, the operator should carry out the following testing:

- pH in the bioreactor;
- Settleability Test SV30;
- Turbidity of effluent;
- Chlorine residual of effluent;
- Settleometer test when necessary.

### TESTING EQUIPMENT REQUIRED

| | | |
|---|---|---|
| • pH test equipment | portable pH meter | 1 |
| • Chlorine Comparator | Swimming pool test kit | 1 |
| • Graduated cylinders | 2000 ml | 2 |
| • Secchi disc | 200 mm wide | 1 |
| • Thermometer | 0 – 100°C | 1 |

### SETTLEABILITY TEST SV30

For the Settleability Test (SV30) procedure, refer to Appendix A: Settleability and Settleometer Test Procedures.

### THE SETTLEOMETER TEST

For the Settleometer Test procedure, refer to Appendix A: Settleability and Settleometer Test Procedures.

### TURBIDITY

Turbidity is measured with the Secchi disc which is a plastic disc usually 150 mm in diameter on a long handle with alternating black and white quadrants. Readings are taken by lowering the disc into the water on a graduated line and noting the depth at which the disc disappears.

## LABORATORY TESTING

At greater intervals, samples of the final effluent should be tested in a laboratory for BOD (Biochemical Oxygen Demand) and TSS (Total Suspended Solids) concentrations. These results will give a more accurate value to determine the quality of effluent being produced. Once a year or when it is requested a test for bacterial count will be asked for. Sampling for this test will be taken in a supplied sterilized container from a designated laboratory from the test tap.

Photo 4. SK20A test tap

Sample : Final Effluent

$BOD_5$
Total Suspended Solids
Thermotolerant Coliforms
pH
Residual Chlorine
Total Nitrogen
Total Phosphorous

## MAINTENANCE RECORD

A Maintenance Record or Treatment Plant Log Sheet, see 50, must be kept at the plant at all times. With each visit to the plant an entry must be recorded including any changes to the operating parameters.

Recording results from repeated tests, changes in operation parameters, plant efficiency, nature of sewage and effluent quality can help when prompt investigation / trouble shooting is required.

## SERVICE TEST REPORT SHEET

An Operator must record all results of testing in the field and any changes to the operation settings within the treatment processes etc. The test report sheet book should contain carbon copies for the following:

- One to Owner
- One to Service Provider's file

OzziKleen Water & Waste Water

## TEST REPORT FORM

Suncoast Waste Water Management
58 Industrial Ave
Kunda Park, QLD 4556
ABN 62 063 770 534
Phone 07 5459 4900
Fax +61 7 5456 4677
Email: commercialservicing@ozzikleen.com

nail to SWWM

Manufactures of: OzziKleen Waste Water Systems

### OZZI KLEEN STP SERVICE REPORT

| | |
|---|---|
| Region: | Company: |
| Site: | Date: |
| Contact: | Sample to Lab: |
| Contact Number: | System Serial Number: |
| Start Time: | File Number: |
| Finish Time: | Travel time to site: |

System Settings & Meter Readings

| | Current Setting | Hrs Run | | Current Setting | Hrs Run |
|---|---|---|---|---|---|
| Aeration Time | | | RAS Pump / Solenoid 1 | | |
| Settling Time | | | RAS Pump / Solenoid 2 | | |
| Decant Time | | | Decant Solenoid | | |
| Transfer Pump 1 | | | Prime Solenoid | | |
| Transfer Pump 2 | | | Effluent Pump 1 | | |
| Bar Screen | | | Effluent Pump 2 | | |
| Blower 1 | | | Drain Pump | | |
| Blower 2 | | | Strainer Pump | | |
| Dosing Pump 1 | | | Clarifier | | |
| Dosing Pump 2 | | | Backwash | | |
| Mixer Pump1 | | | $Cl_2$ Sprinkler | | |
| Mixer Pump 2 | | | | | |
| WAS Pump 1 | | | Flow Meter Reading Inlet (Litres) | | |
| WAS Pump 2 | | | Flow Meter Reading Effluent (Litres) | | |

Service carried out as system O&M:
Sludge Tank pump out required:
Grease Trap pump out required:
DO Probe:

$Cl_2$ supplied kg
Alum supplied kg
pH adjuster supplied kg

On Site Tests

| | Cell 1 | Cell 2 | Cell 3 | Cell 4 | Cell 5 | Cell6 |
|---|---|---|---|---|---|---|
| SV 30 | | | | | | |
| SV | | | | | | |
| Other | | | | | | |

Sludge Blanket – Colour and Condition:

Disposal Area Condition:

Water Clarity
Clear — Turbid

Water Color
No Color — Black

Effluent Field Readings

| | |
|---|---|
| Free Chlorine | Electro-Conductivity (µS/cm) |
| pH | Turbidity (NTU) |
| Dissolved Oxygen(ppm) | Calculated Dissolved Solids(ppm) |
| Water Temp (°C) | |

Ozzi Kleen Commercial Service Report — Document: VCSR13.1

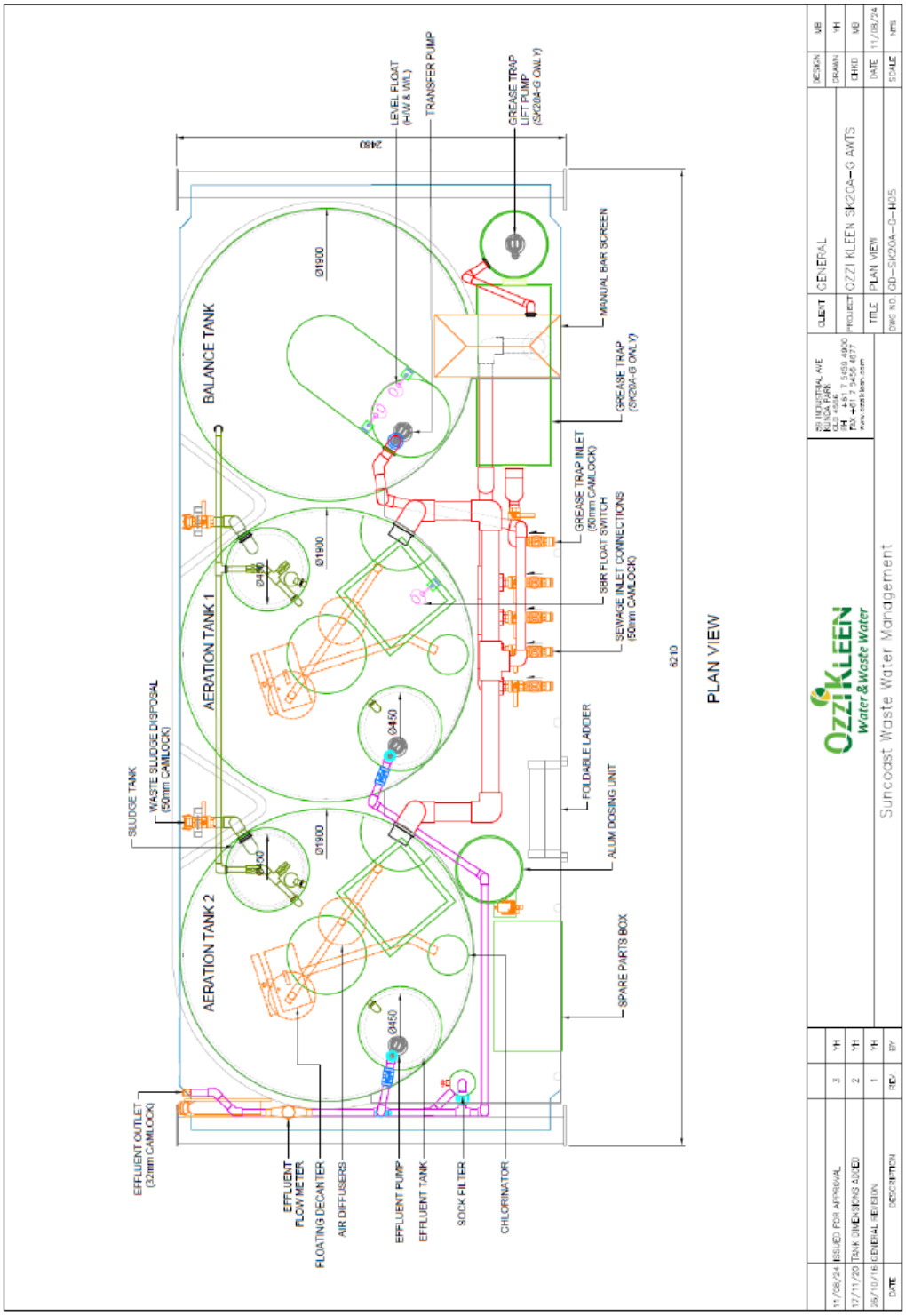
## MAINTENANCE SCHEDULE

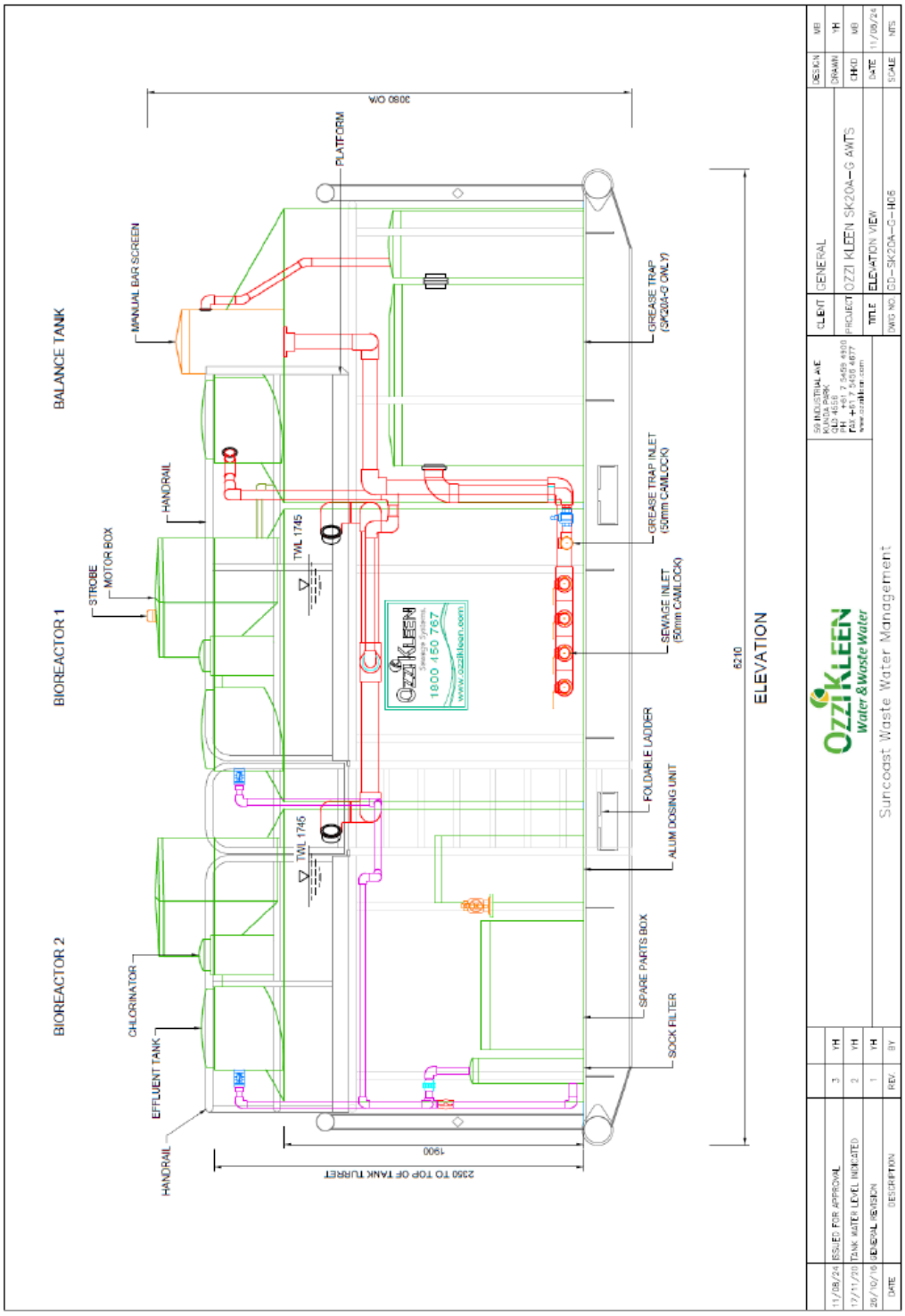
The maintenance schedule for Ozzi Kleen SK/RP20 series is as follows:

| ITEM | DESCRIPTION | LOCATION | FREQUENCY | MAINTENANCE REQUIREMENT |
|---|---|---|---|---|
| 1 | Clean Balance Tank | Balance Tank | Every Month | Hose down chamber. Remove any entrained rags and solids. |
| 2 | Manual Bar Screen | Inlet | Twice per Week | Rake screen bars. Remove entrained rags and solids. Check screenings bin, dose with lime if malodorous. |
| 3 | Switchboard Operation | Motor box | Every Month | Check operation of electrical components in the switchboard. |
| 4 | Check Decant/Prime Solenoids | Motor box | Every Month | Check operation of solenoid valve; verify that it is functioning correctly. |
| 5 | Check Chlorine tablet dispenser | Chlorinator | Every Week | Check operation of tablet dispenser. Check tablet reserves. |
| 6 | Transfer Pump Operation | Balance Tank | Every Month | Check operation of Transfer Pump. Check pump is operating without excessive vibration. If high vibration detected, remove pump and clean impeller. |
| 7 | Effluent Pump Operation | Effluent Tank | Every Month | Check operation of Discharge Pump. Check pump is operating without excessive vibration. If high vibration detected, remove pump and clean impeller. |
| 8 | Check Waste Sludge Level | Waste Sludge Tank | Every Month | Check sludge level in the Sludge Waste Tank. The tank is normally full of liquid. If the sludge level in the tank is full, then empty the tank. |
| 9 | Sludge Blanket & Settled Sludge Level | Aeration Tank | Every 4 - 6 Weeks | Conduct SV30 test on mixed liquor sample. Check the % sludge. Adjust the sludge wasting rate by changing the sludge pump run time. |
| 10 | Clean Effluent Tank | Effluent Tank | Every 3 Months | Drop a pump to the bottom of the effluent tank and return pumped liquid back to aeration tank. |

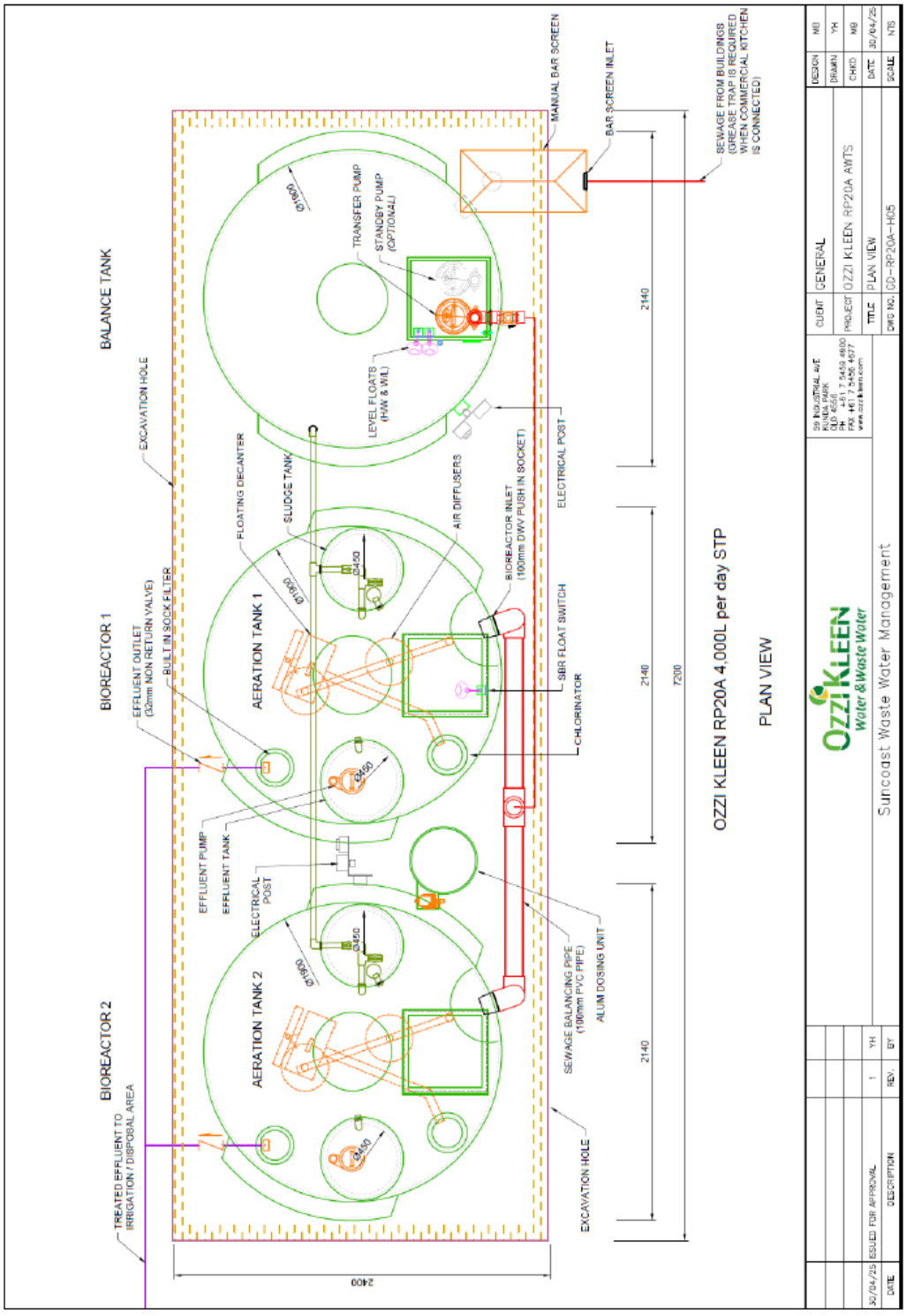
| ITEM | DESCRIPTION | LOCATION | FREQUENCY | MAINTENANCE REQUIREMENT |
|---|---|---|---|---|
| 11 | Balance Tank High Level Alarm | Balance Tank | Every 3 Months | Lift float switch.<br>Alarm will be initiated. |
| 12 | Blower Operation | Motor box | Every 3 Months | Check operation of blower.<br>Check air filter. |
| 13 | Check Aeration Pipework | From motor box to Aeration Tank | Every 3 Months | Check pipework for leaks from Blower discharge through to the diffuser arms. |
| 14 | Check Diffusers | Aeration Tank | Every 3 Months | Check for even pattern of air bubbles over the surface of the Aeration Tank. |
| 15 | Check Aeration Tank High Water Probe | Aeration Tank | Every 3 Months | Push probe into water for 3 sec, forcing the system into settling mode simulating the high Alarm. |
| 16 | Effluent Quality Monitoring | Effluent Tank | Quarterly (DH SA) | Take samples of final effluent for analysis. Check for compliance of $BOD_5$, SS, total Cl and E. coli. |
| 17 | Clean Air Blower Filters | Motor Box | Every Month | Remove covers on blower filter boxes and clean filters |
| 18 | Clean Lifting Pump | Balance Tank | Every 6 Months | Lift pump out of chamber.<br>Remove any entrained rags and solids.<br>Check operation of pump. |
| 19 | Replace Air Blower Filters | Motor Box | Every 12 Month | Remove covers on blower filter boxes remove filters and replace |

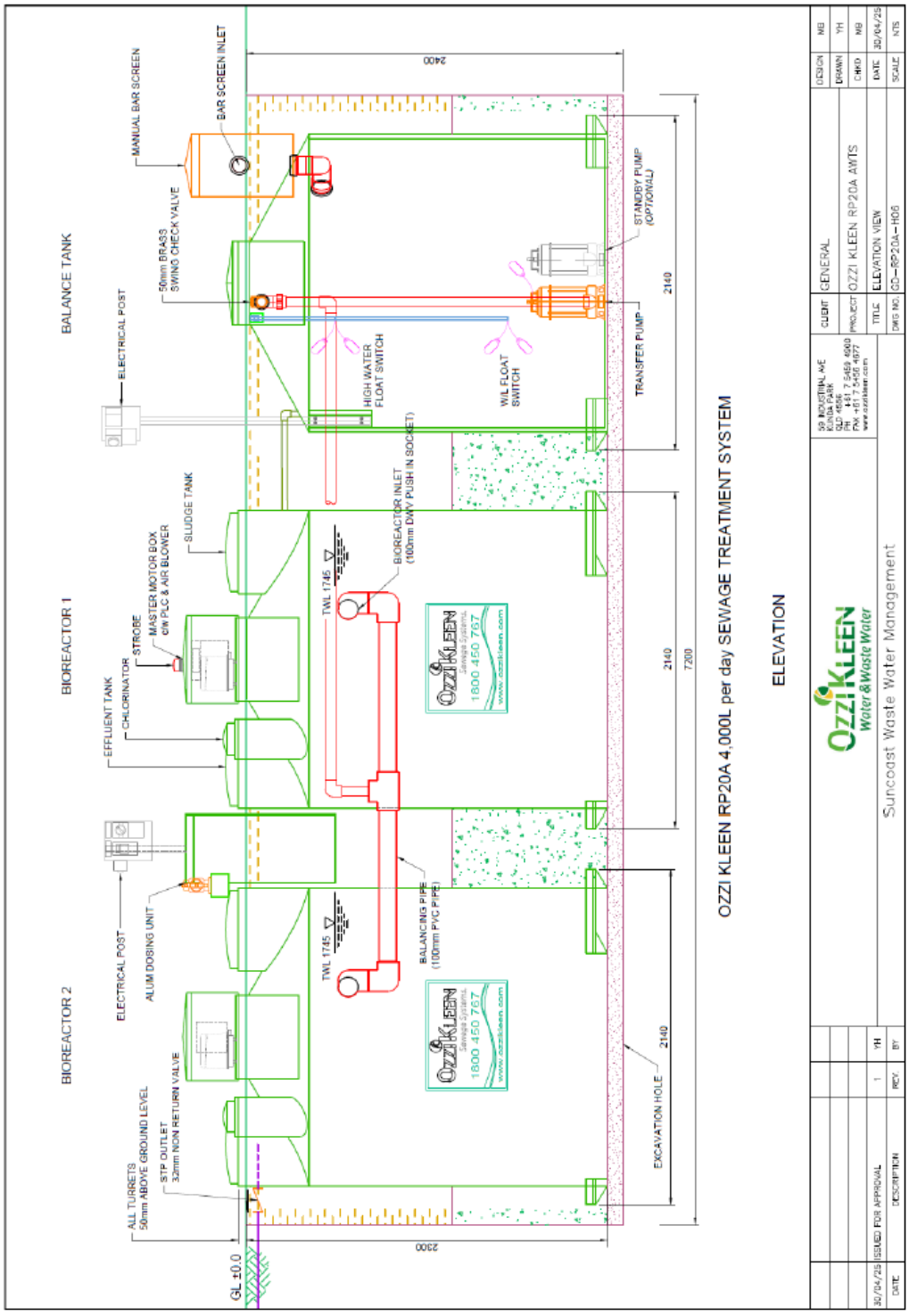
## HYDRAULIC DRAWINGS – SK20A & SK20A-G SKID MOUNTED SYSTEMS



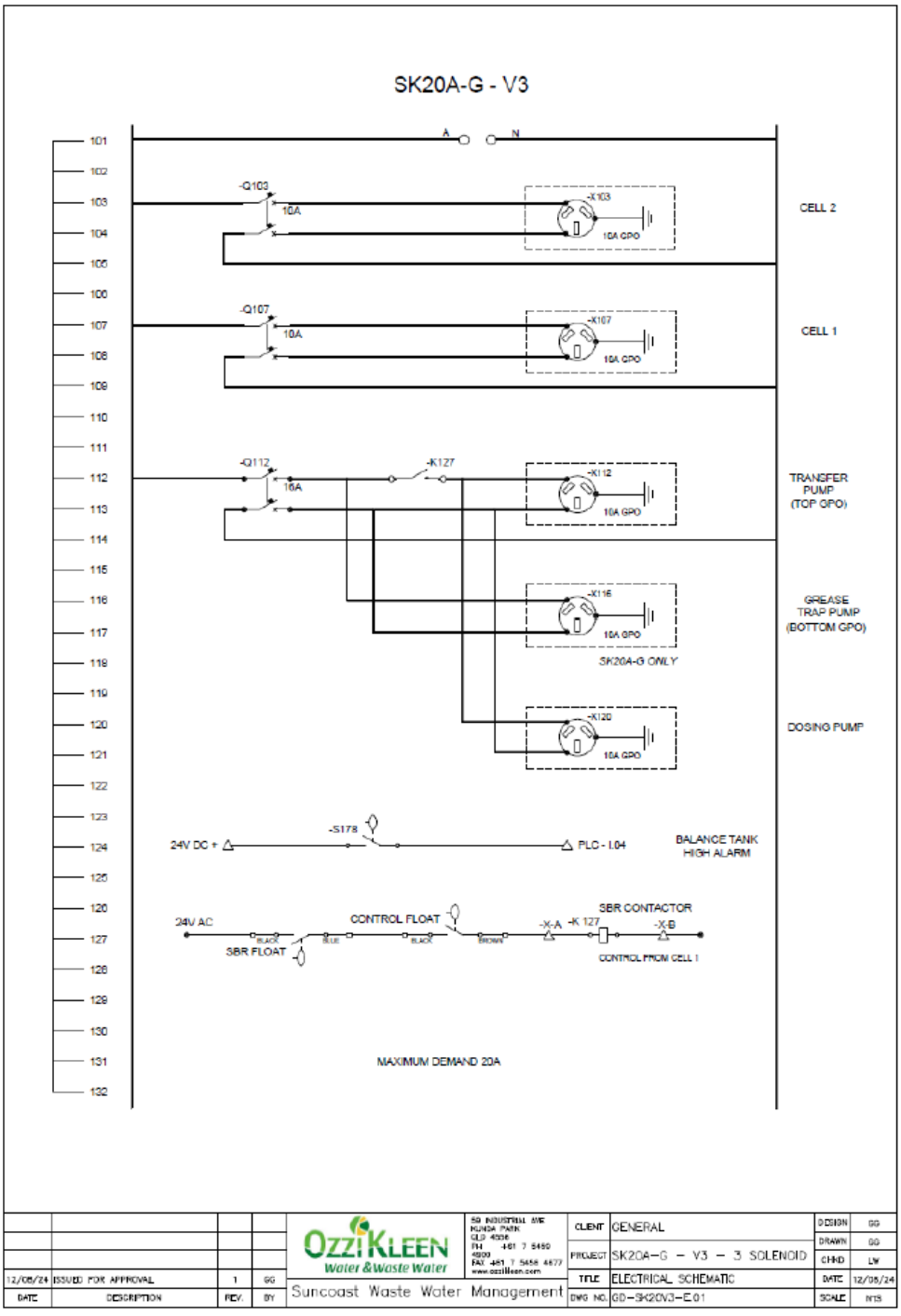


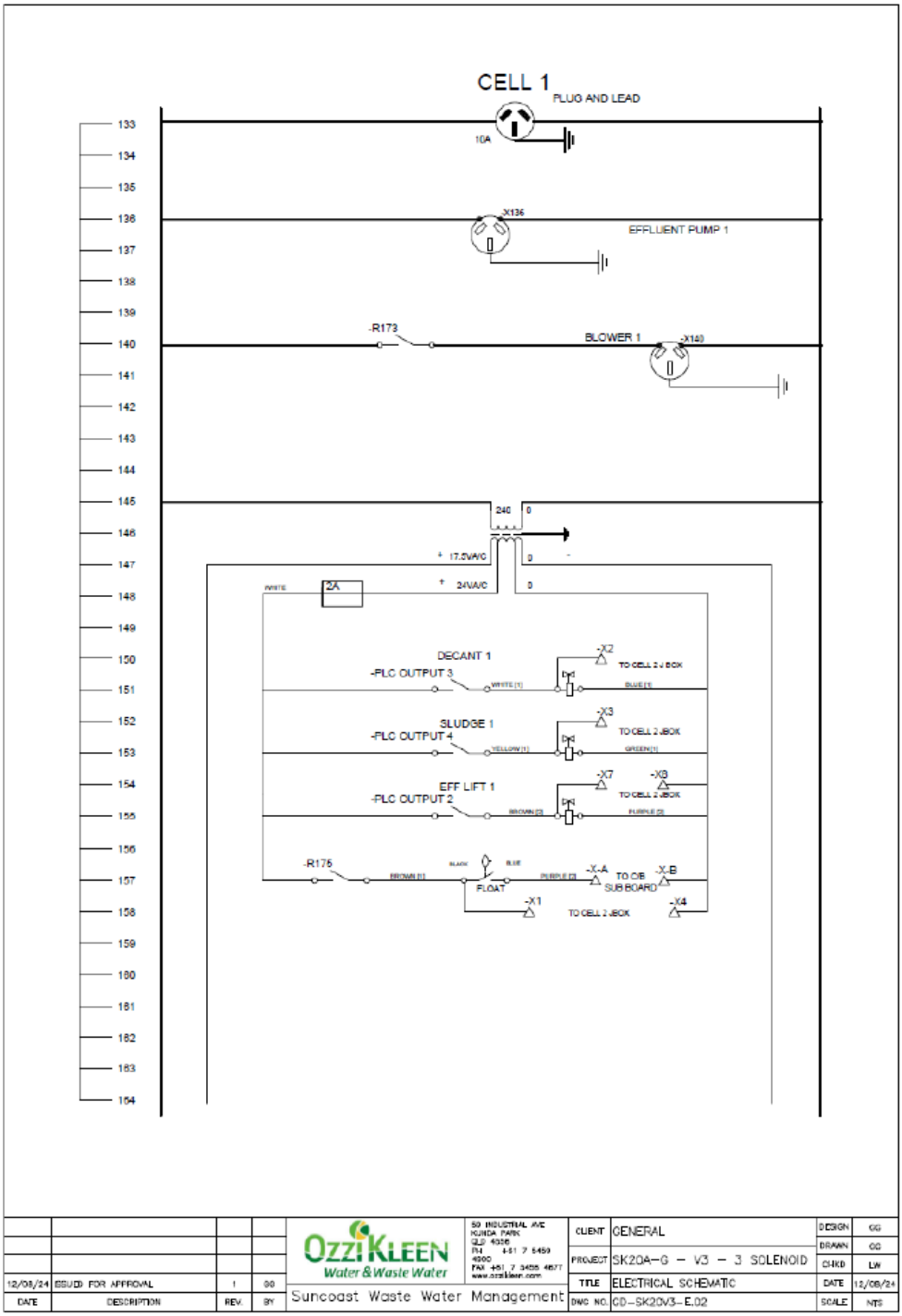
## HYDRAULIC DRAWINGS – RP20A BELOW GROUND SYSTEMS

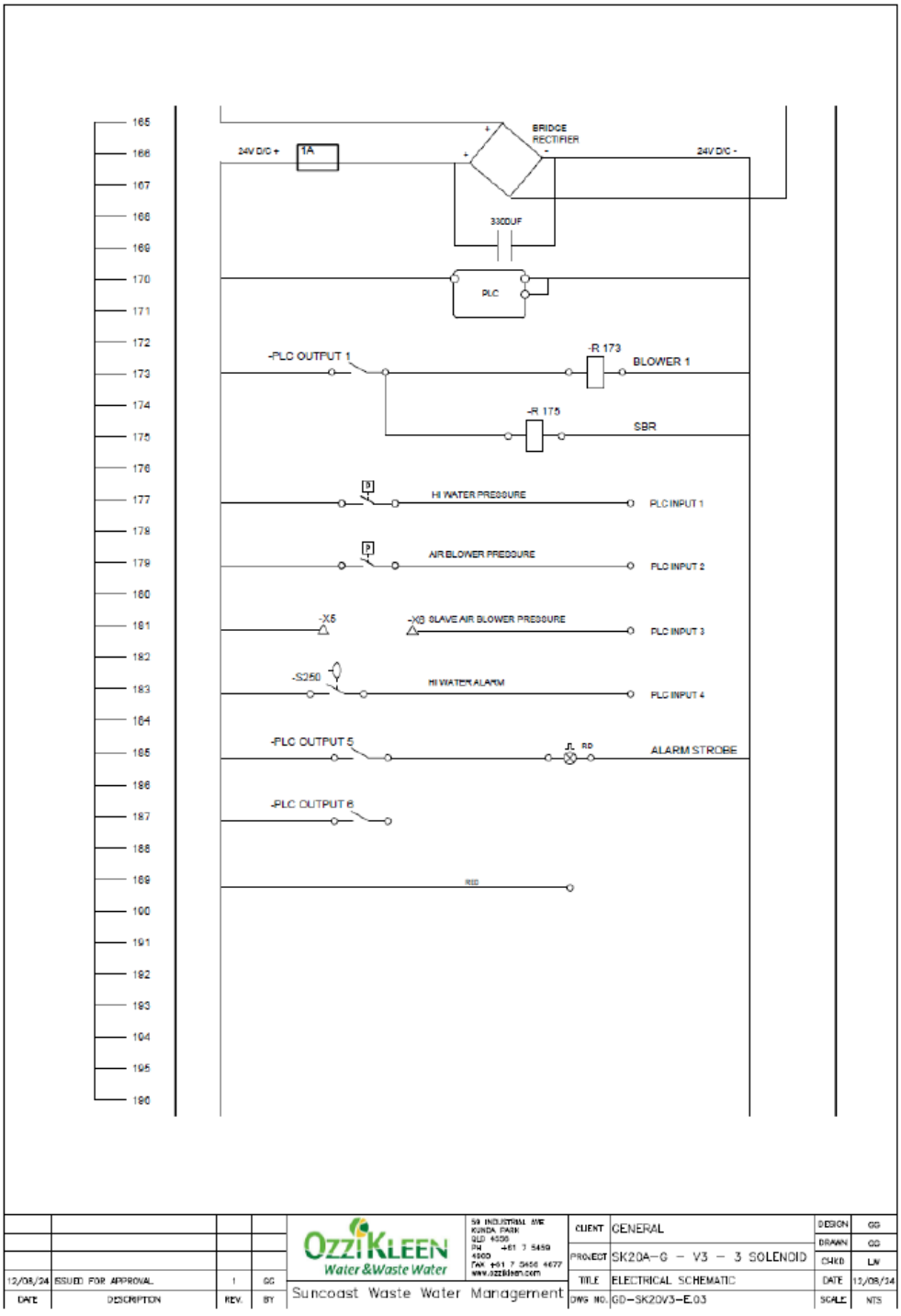


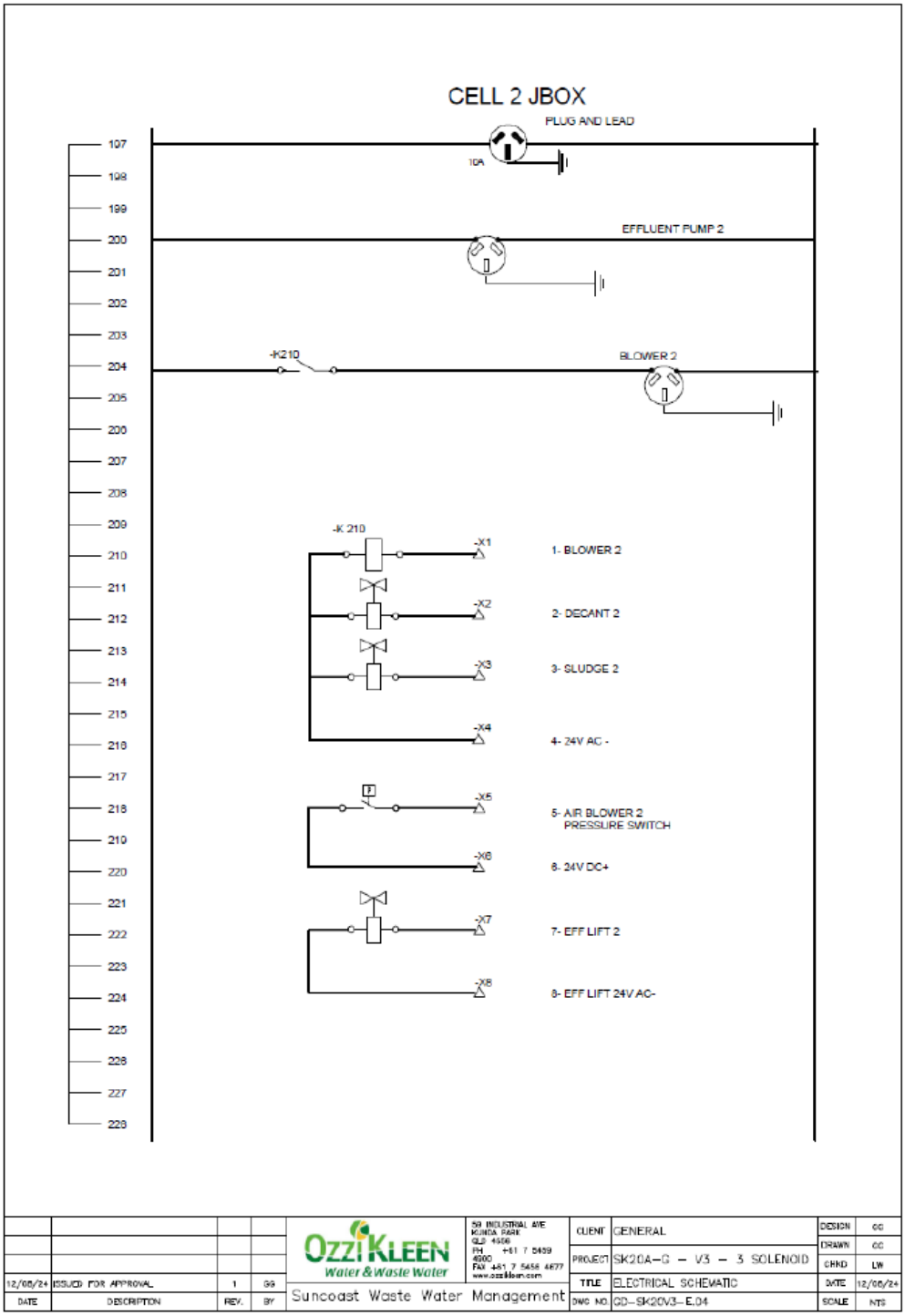


## ELECTRICAL SCHEMATIC DIAGRAM - SK20A & SK20A-G SKID MOUNTED SYSTEMS

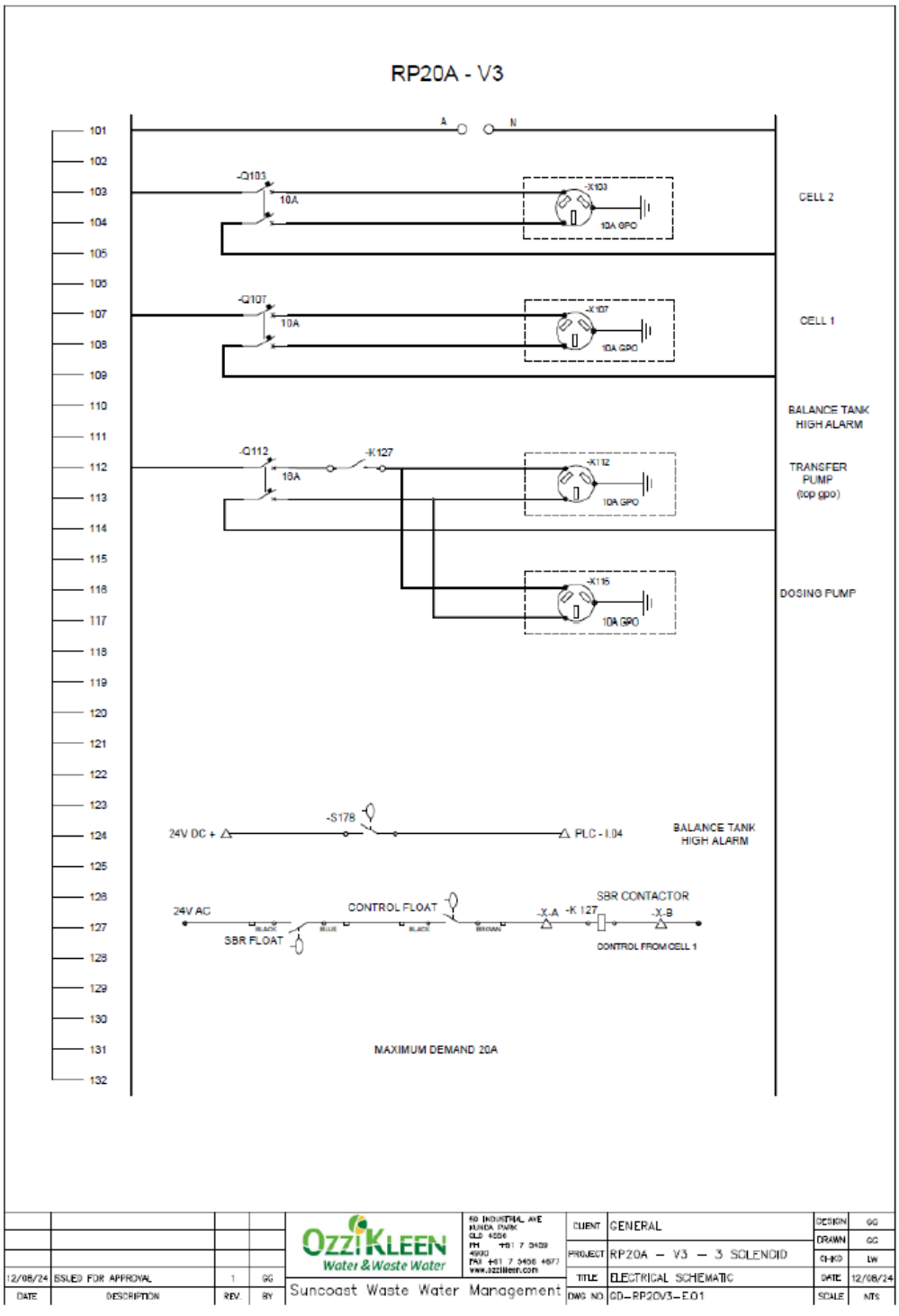


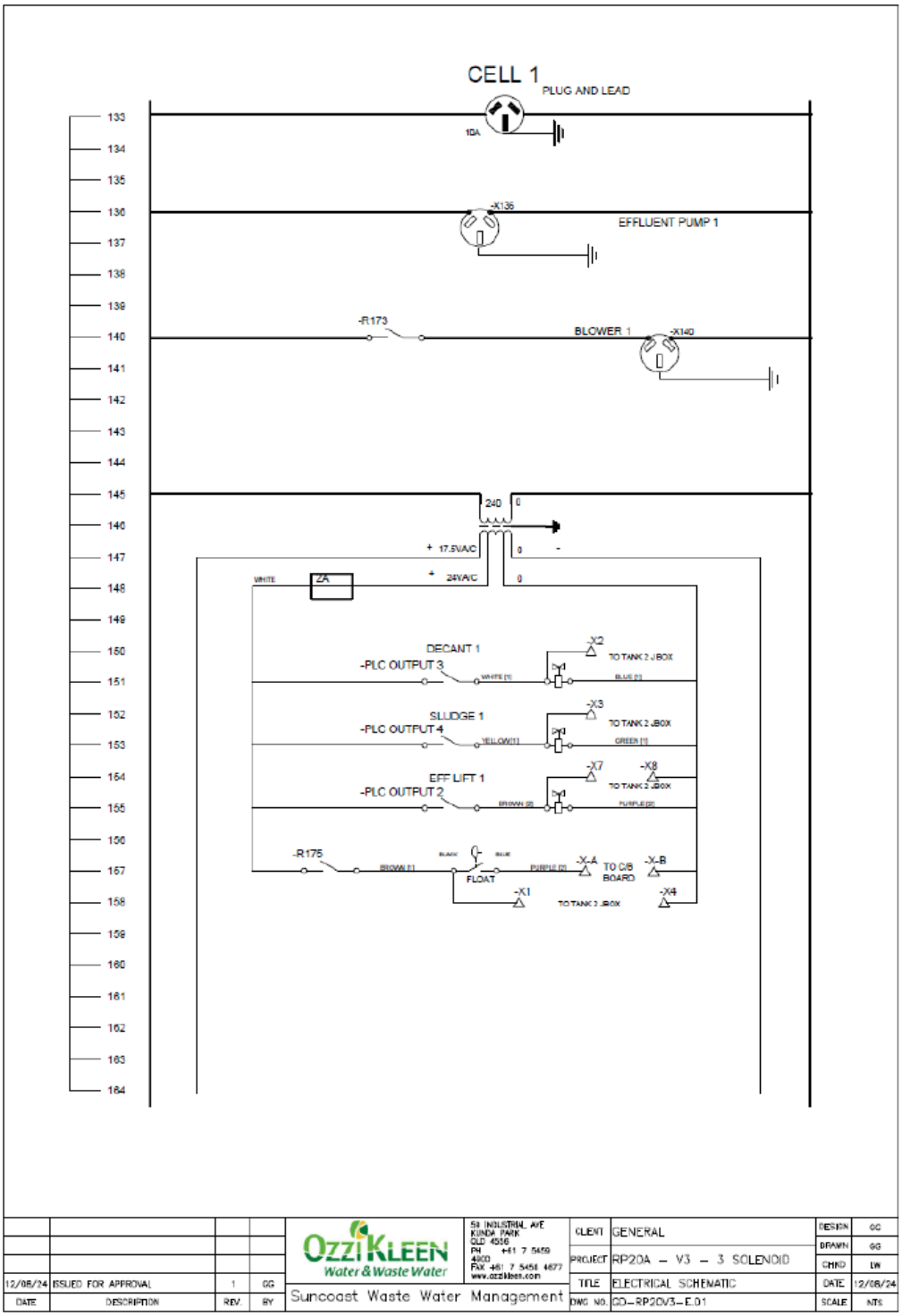




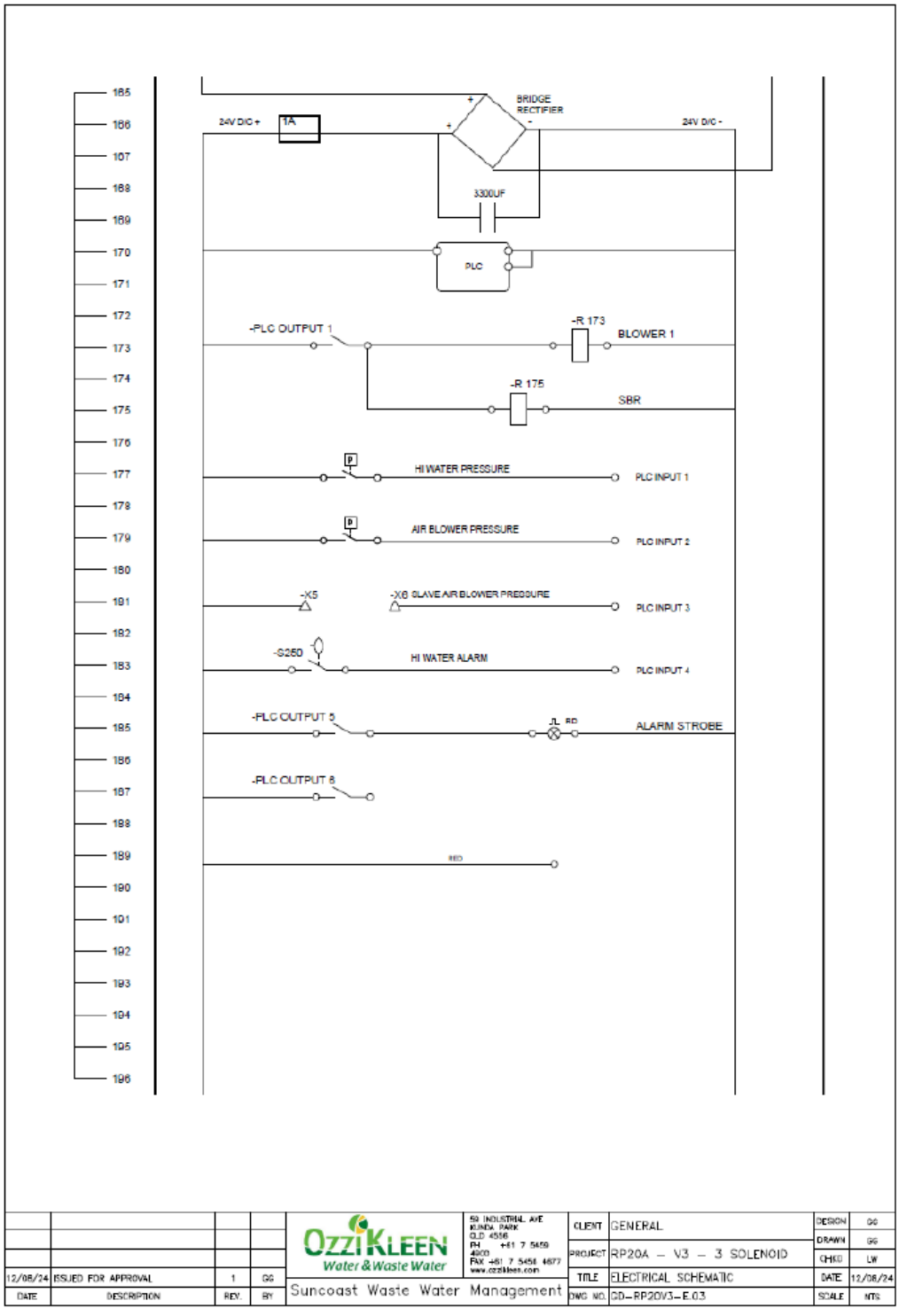


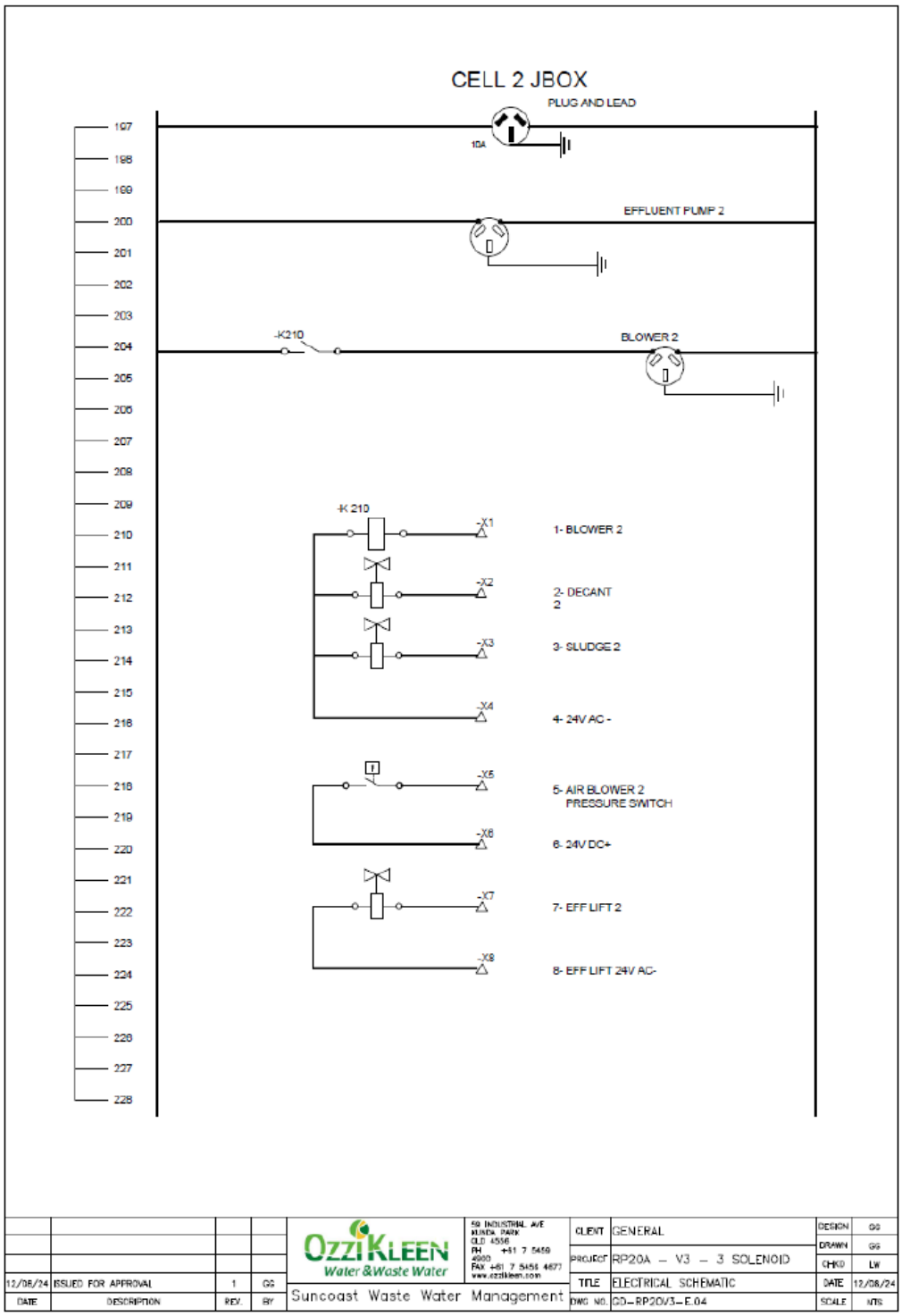
## ELECTRICAL SCHEMATIC DIAGRAM - RP20A BELOW GROUND SYSTEMS






| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | OzziKleen Water & Waste Water | 59 INDUSTRIAL AVE KUNDA PARK QLD 4556 PH +61 7 5459 4600 FAX +61 7 5456 4677 www.ozzikleen.com | CLIENT | GENERAL | DESIGN | GG |
| | | | | | | | | DRAWN | GG |
| | | | | | | PROJECT | RP20A – V3 – 3 SOLENOID | CHKD | LW |
| 12/08/24 | ISSUED FOR APPROVAL | 1 | GG | | | TITLE | ELECTRICAL SCHEMATIC | DATE | 12/08/24 |
| DATE | DESCRIPTION | REV. | BY | | Suncoast Waste Water Management | DWG NO. | GD–RP20V3–E.01 | SCALE | NTS |





# Settleability and Settleometer Test procedures

## 1. Settleability Test

### 1.1 Introduction

Settleability test (SV30) should be carried out which gives the operator an indication of the quality of the biomass/mixed-liquor and its settling performance through observation. The rate at which the sludge settles during a 30 minutes settling test is recorded on a graph to give a picture of what is probably taking place during the settling cycle within the Treatment Plant Bioreactor.

The test should be as follows:-

| PRODUCT | TEST | VALUES |
|---|---|---|
| Activated Sludge | Settleability -30 min. test | 30 - 50% |
| | Mixed Liquor Suspended Solids | 1200 - 3000 mg/l |
| | Temperature | 18 - 25°C |

This test is used to determine the settling performance of the aerated mixed liquor within the main aeration tank, the clarity of the water above the settled biomass and the volume of settled matter within the sample. The test does not indicate an amount of suspended matter in the sample but rather the volume it will occupy after settling. The nature of the activated sludge biomass can change due to different aeration parameters (duration and frequency). Under certain conditions the same volume of sludge (biomass) will change in settling characteristics and settled volume.

The settled volume of the activated sludge mixed liquor and the observation of the settling test used as one of the best methods of determining the effectiveness of the treatment process.

### 1.2 Procedure

A sample of mixed liquor is taken from the aeration tank during the aeration cycle ensuring that there has been at least 10 minutes of operation of the air blower before sample is taken.

Using a 2 litre clear container with a depth of approx 200 mm with 10 equal graduation marks up the side, a full sample is taken and placed in a quiet place to stand for 30 minutes. The settling should be observed every few minutes.

Observe the biomass and look for the separation of the solids from the water this is usually indicated by dark holes or water vents in the sludge as the sludge is settling. Within 5-10 minutes a good settling sludge will have settled to less than 50% of the total volume. After 30 minutes measure the settled sludge volume in percent (SV30). Observe the water above the settled sludge for colour and clarity.

The secchi disc can also be used to determine colour and clarity during the settling cycle in of the treatment process. Submerge the disc into the liquid in the aeration tank, and slowly plunge deeper until the disc disappears, then measure and record the depth. This is a good indicator for determining the settling performance.

## 2. Settleometer Test

### 2.1 Introduction

This test can be used as a supplement the settled sludge volume test (settleability test). The test procedure is simple and requires minimal equipment. It is particularly useful to Operators of small activated sludge plants where there are no facilities for complex laboratory testing.

### 2.2 Apparatus

The apparatus consists of 2 x number graduated glass or clear Perspex 2 litre container/beaker with a depth of approximately 200 mm. Graduations should be at 10% intervals. As the beakers are wide they overcome the "bridging" that can sometimes occur using narrow cylinders for the settled sludge volume test. The beakers are termed "settleometers". A wide paddle - 100 mm wide manufactured from a sheet of plastic or aluminium. This item can be easily fabricated by an Operator.

### 2.3 Procedure

This test should be performed in a shaded location immediately after sampling. The mixed liquor sample should be stirred, poured carefully and rapidly to the 2000 ml mark on settleometer No. 1. Care should be taken to ensure that there is the least possible amount of additional aeration.

Mixed liquor should be poured to the 50% mark on the second settleometer and diluted to the 100% mark with previously collected unchlorinated settled effluent. Clear tap water should not be used for dilution.

Both beakers should be gently stirred to assure thorough mixing then all swirling should be dampened immediately with a wide paddle before the timer is started.

The volume of the settleometer occupied by the settled sludge should be read and recorded every five minutes for the first thirty minutes and then every ten minutes for the second thirty minutes of the sixty minutes settleometer test.

During the first five minutes the Operator should observe how the sludge particles come together while forming a blanket on the bottom.

(i) If the sludge compacts slowly and uniformly while squeezing clear liquid from the sludge mass then it is indicative of a good sludge.

(ii) If tightly knotted sludge particles fall down through a turbid supernatant it indicates that the sludge is in poor condition.

(iii) The Operator should also note how much and what type of floc (sludge particles) if any, remains in the supernatant above the main sludge mass.

*The importance of conscientious, perceptive observation during the first five minutes cannot be over emphasised.*

During these first five minutes the Operator will acquire additional insight into sludge character and quality and as a result he will be in a better position to evaluate what the settleometer test reveals.

At 60 minutes the sludge appearance should again be noted as it will indicate clarifier sludge blanket characteristics. A sludge that begins to rise again by the 60 minutes period may be over-oxidized. After the test is completed the settleometers should remain undisturbed for at least 4 hours. Well oxidized sludge will frequently begin to swell after approx. 90 minutes and will usually float to the surface within two to four hours.

### 2.4 Plotting of Results

A blank settleometer graph is attached in Figure B for use by the Operator. One copy of this graph can be removed from the manual and photocopied. Typical settling curves are outlined in Figure A:

Graph 1
This shows an ideal settling curve for mixed liquor in the extended aeration process. Each plant will have its own optimum mixed liquor settling characteristics based on past operational experience but it will generally follow the trend shown in Graph A1. If the settleometer test shows this curve then operational parameters should remain unchanged unless other process control parameters indicate otherwise.

Graph 2
The two lines show settling curves for undiluted mixed liquor. Both curves are below the ideal settling curve.

Line A - This curve shows that the sludge has settled very rapidly which indicates that it is old sludge which contains a large amount of inorganic solids. Old sludge is usually a very dark brown. The supernatant will probably be slightly turbid in this instance. This condition can be corrected by increasing sludge wastage.

Line B - This curve indicates that sludge settling is not excessively rapid. If the mixed liquor is a light colour as well it may mean that the settled solids level high. This could be due to the plant being lightly loaded and which has low levels of nutrients, and can be confirmed from flow caused by filamentous bacteria which are the scavengers of micro organisms and can survive on low level nutrients where other organisms cannot.
If the plant is not lightly loaded then the condition may be caused by excessive sludge wastage and can be corrected by a gradual reduction in sludge wastage.

Graph 3
Line A - Is the settling curve for the undiluted mixed liquor is the ideal curve. In this situation, information on the settling characteristics of the diluted sample will be useful.
Line B - This indicates that the dilute sample settles much more rapidly than the undiluted mixed liquor sample. This implies that the sludge has good settling properties but there are too many solids in the aeration tank. Sludge wastage should therefore be increased.
Line C - The dilute sample only settles slightly faster than the undiluted sample which indicates that the sludge may be **"bulking"**. In this case the Operator should identify the possible reasons for the sludge bulking. Possible reasons include low dissolved oxygen levels (less than 2 mg/l), hydraulic overloading, low pH or toxic waste in the raw sewage.

Sometimes this condition can occur when the plant is just experiencing start up and the micro-organisms are growing but have not developed a sufficient mass to settle well and the sludge is usually a light brown colour. In this case, sludge wasting should be reduced or eliminated until the micro-organism population produces a good settling floc. This could be due to the plant being lightly loaded and which has low levels of nutrients, and can be confirmed from flow records.

**"Sludge bulking"** (settled sludge that occupies a large volume leaving a shallow clear water zone at the surface of the settled biomass) is mostly caused by filamentous bacteria which are the scavengers of micro organisms and can survive on low level nutrients where other organisms cannot.

The addition of nutrients (blood and bone fertiliser or urea) to the activated sludge mostly helps the situation and stimulates the nitrifying bacteria to a more desirable level.

Sludge bulking may not ever appear in a plant but careful observation of the settling performance of the biomass could indicate this reaction starting to occur.

When the plant is lightly loaded or there appears to be an excessive amounts of water passing through the system the aeration duty should be reduced or the addition of nutrients be applied as above.

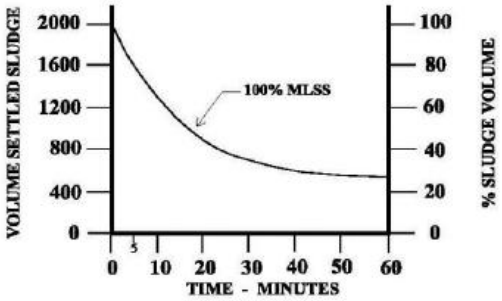
### 2.5 Comparison of Results

Settling curves should be recorded and compared so that trends in sludge settling can be identified and potential problems rectified before they become major.

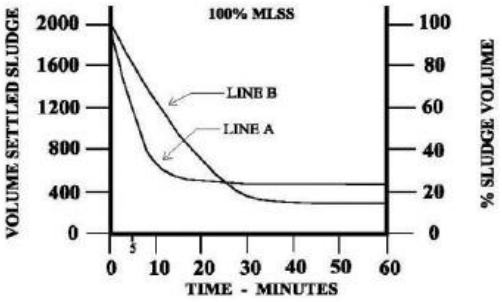
### 2.6 Testing - Frequency

It is suggested that this test is performed at service intervals as a supplement to the settled sludge volume test.

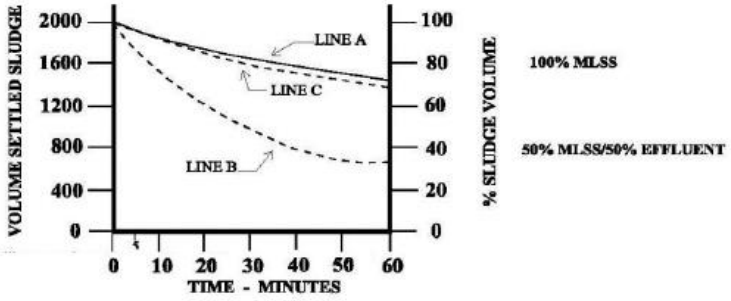
## FIGURE A - TYPICAL SETTLING CURVES




GRAPH 1




GRAPH 2

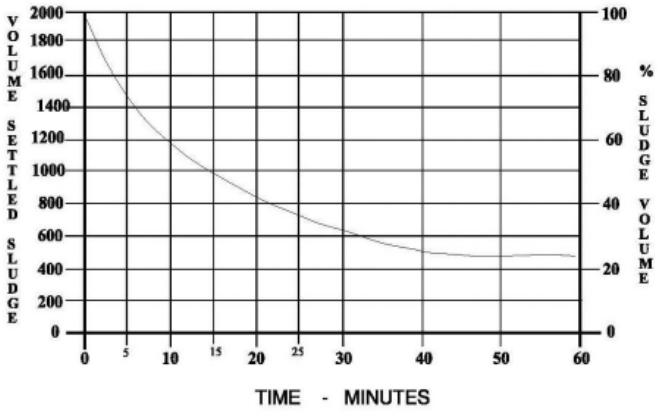



GRAPH 3

19

## FIGURE B - SETTLEOMETER GRAPH

PLANT:..... DATE.....




| | |
|---|---|
| **FLOC DESCRIPTION (E.G. LARGE, MEDIUM OR SMALL FLOC. GRANULAR)** | |
| **SLUDGE COLOUR** | |
| **SUPERNATANT APPEARANCE** | |
| **TYPE OF FLOC IN SUPERNATANT (E.G. CLEAR, TURBID)** | |
| **TIME (MINUTES) WHEN SLUDGE BEGAN TO RISE** | |

## SHOWFOU TRANSFER PUMP SPECS

# SHOWFOU Submersible Sewage Pumps

*Advanced "Shredder Mechanism"*
*Unique "Epoxy Cable Sealing Base" to ensure 100% capability to block the water vapor into the motor from outside.*
*Triplex Seal System - Double Mechanical Seal plus Oil Seal*

## SS / SSA / SST / STA

### FEATURES:

* **Impeller** : Hydrodynamically well-balanced single-vaned semi-open non-clogging type.
* **Mechanical Seal** : Oil-bath type, double mechanical seal & oil seal offers which ensure a longer pump life.
* **Shredder Mechanism** : Surface hardening heat treatment is done on impeller vanes and cutting edges on impeller cover, both of which are the main components of shredder mechanism.
* **Compact and Light-Weight**: Designed to be light, so easy to carry and handle.
* **Quiet** : Dynamic balance adjuster enables pump to run balanced with less noise in addition to underwater operation.
* **Economical** : Long-runable with less maintence cost.

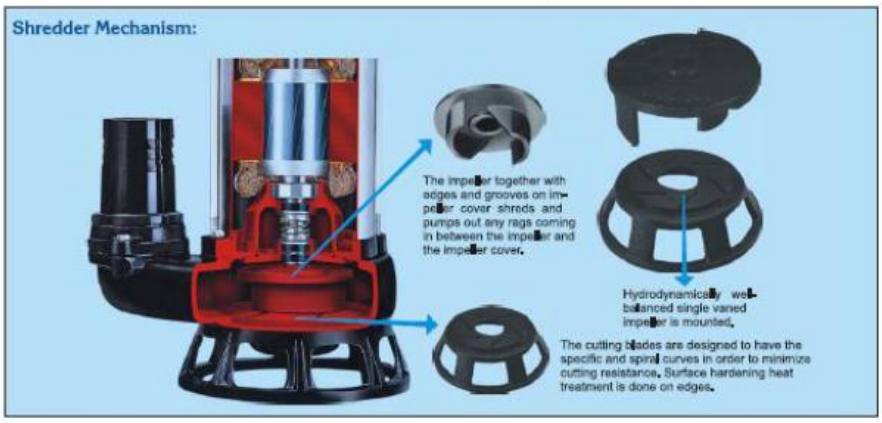
### APPLICATIONS:

Ideal for sewage, industrial & ground water drainage installation in the following fields.

# Sewage pumping stations.
# Sewage treatment plants.
# Septic tanks.
# Collecting & settling sumps.
# Flood & emergency.
# Anywhere drainage of dirty water with rags mixed in.

* **Residential Sites**
  # Residential houses
  # Small groups of houses
  # Flats & apartment
* **Commercial Sites**
  # Restaurants & shops
  # Markets & supermarkets
  # Hospitals
  # Laundries
  # Stations
  # Theaters
  # Garages
* **Industrial Sites**
  # Mills & factories, for pumping slurry, sludge, viscous & dirty water arised during processes.
  # Industrial buildings.
  # Sewage treatment plants.
  # Water purification plants.

Shredder Mechanism:

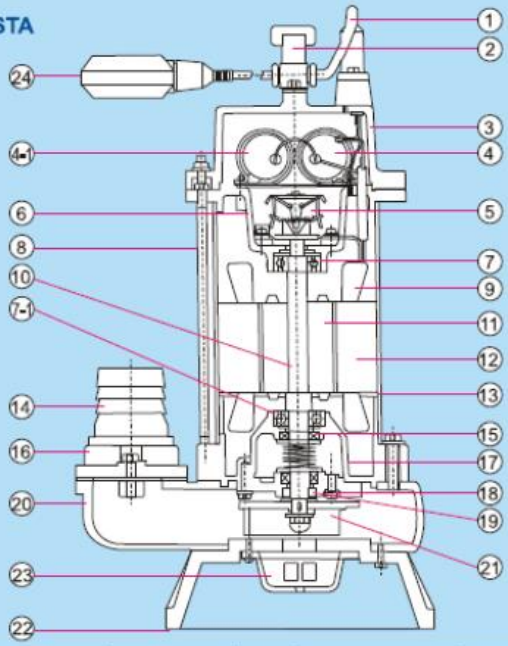



### SOLIDS HANDLING

| TYPE | 111-112-113 | 212-232 | 312-332 | 532 | 732 | 1032 | 1532 |
|---|---|---|---|---|---|---|---|
| Spherical Solid Passage | 25 mm | 28 mm | 28 mm | 32 mm | 26 mm | 26 mm | 30 mm |

■ CONSTRUCTIONS:

SS/SSA/SST/STA




| ITEM NO. | PARTS LIST | MATERIAL | ITEM NO. | PARTS LIST | MATERIAL |
|---|---|---|---|---|---|
| 1 | Cable | V. C. T. | 13 | Motor Casing | Stainless Steel |
| 2 | Handle | Stainless Steel | 14 | Hose Coupling | Plastic/Cast Iron |
| 3 | Motor Head Cover | Cast Iron | 15 | Mechanical Seal | Ceramic Carbon(SS/SSA) Silicon Carbide(SST/STA) |
| 4 | Running Capacitor | μF | | | |
| 4-1 | Starting Capacitor | MFD | 16 | Flange Setter | Cast Iron |
| 5 | Centrifugal Switch | | 17 | Motor Lower Cover | Cast Iron |
| 6 | Upper Bracket | Cast Iron | 18 | Mechanical Seal Cover | Cast Iron |
| 7 | Upper Ball Bearing | | 19 | Oil Seal | Synthetic Rubber |
| 7-1 | Lower Ball Bearing | | 20 | Pump Casing | Cast Iron |
| 8 | Bolt | Stainless Steel | 21 | Impeller | Cast Iron |
| 9 | Coil | | 22 | Suction Cover | Cast Iron |
| 10 | Shaft | Stainless Steel | 23 | Strainer | Plastic |
| 11 | Rotor | Steel Plate | 24 | Floating Switch | Only for SSA / STA |
| 12 | Stator | Steel Plate | | | |

豪陞電機股份有限公司
SHOWFOU ELECTRIC MACHINE CO., LTD.
高雄縣岡山鎮(820)本工路66號
No. 66, Bengong Road, Gangshan
Kaohsiung County 820, Taiwan
Tel No.: (07) 6226590
Fax No.: +886-7-6226593
e-mail:showfou@ms11. hinet. net
http ://www.showfoupump.com

代理商
AGENT

All specifications subject to change without notice.

## REEFE RVS300 EFFLUENT PUMP SPEC

REEFE Pumps for the Future

# RVS 200/300/340

## PREMIUM VORTEX SUMP PUMP

The Reefe Vortex Pump is specifically designed for the most demanding jobs with industrial grade motor insulation (Class 'F') and cast iron impellers. Every pump is factory tested for quality assurance and is ultra-reliable. High quality guaranteed.

### Applications

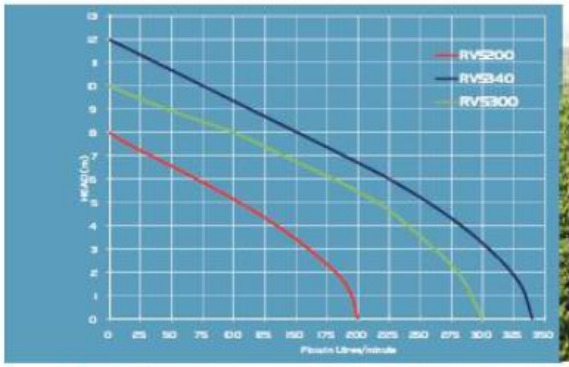
- Grey Water Pits
- Bio-Cycles
- Sullage
- Waste Water
- Pool and Tank Emptying

### Features & Benefits

- Low Power Consumption 250 / 550 watts
- Thermal Overload Protection
- Solids handling 25mm (200) 35mm (340)
- High Performance 200 L/min & 340 L/min
- 10m power cable
- Includes multi-stage hosetail
- The RVS 200 has attractive retail packaging

### Construction

- Stainless Steel Motor Housing & Shaft
- Cast Iron Vortex Impeller
- Dual mechanical seal in oil chamber
- Motor insulation Class 'F'
- Cast iron base and outlet
- Depth adjustable MAC 3 float switch





| RAMDEX CODE | MODEL | POWER | | RATED | | MAXIMUM | | SOLIDS HANDLING | CABLE LENGTH | OUTLET | | WEIGHT | SIZE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | AMPS | WATTS | FLOW (L/min) | HEAD (m) | FLOW (L/min) | HEAD (m) | (mm) | METRES | mm | inch | KG | L x W x H (mm) |
| 8218 | RVS200 | 2.0 | 250 | 130 | 4.0 | 200 | 8 | 25 | 10 | 40 | 1 1/2 | 9 | 190 x 130 x 360 |
| 8232 | RVS300 | 4.0 | 400 | 220 | 5.0 | 300 | 10 | 30 | 10 | 50 | 2 | 10 | 200 x 135 x 285 |
| 8249 | RVS340 | 5.0 | 550 | 225 | 6.0 | 340 | 12 | 35 | 10 | 50 | 2 | 13 | 240 x 150 x 360 |



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## MAC 3 FLOAT SPECS

REGOLATORI ELETTROMECCANICI DI LIVELLO
*ELECTROMECHANICAL LEVEL REGULATORS*

# Mac 3

## Regolatore di livello ad azionamento elettromeccanico
## *Electromechanical level regulator*

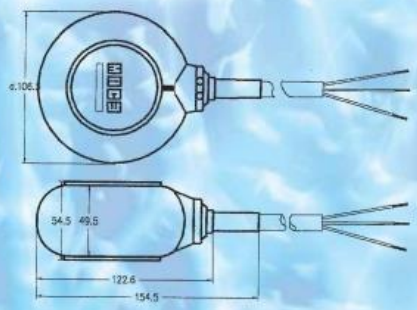
Il regolatore di livello MAC3 è un interruttore a galleggiante che permette l'automazione di apparecchiature elettriche (normalmente pompe, ma anche elettrovalvole, allarmi, saracinesche motorizzate ecc.) al raggiungimento di un livello prefissato. La sua caratteristica essenziale è quella di avere un generoso dimensionamento ed una forma priva di asperità, che ne esalta la possibilità di uso in acque di scarico. L'oggetto è realizzato con due camere stagne, una a protezione dell'altra, per la massima sicurezza del meccanismo interno.

| Caratteristiche | |
|---|---|
| Caratteristiche elettriche | 20(8)A 250V ~ 16(4)A 250V ~ |
| Omologazioni | ENEC/CE<br>10(8)A 250V ~ 10(4)A 250V ~ |
| Temp. di funzionamento | 0° ÷ + 50° C |
| Temp. di immagazzinamento | -20°C ÷ + 80° C |
| Grado di protezione | IP68 |
| Angolo di commutazione | ± 45 |
| Dimensioni | mm 106 x 154 x54 |
| Peso | gr. 250 |
| Volume | cm ³ 430 |
| Resistenza a pressione | 1BAR |
| Contenitore | Polipropilene atossico (PP) |
| Coloranti | Atossici |
| Classe di funzionamento | I e II |
| Cavo standard | PVC 3X1<br>H07RN-F 3G1<br>H07RNF 4G1<br>A07RNF 3X1 |
| Note | Specificare sempre all'ordine se viene utilizzato per svuotamento o per riempimento |

*The MAC3 level regulator is a float switch which allows electrical equipment to start and stop automatically (usually pumps, but also electric control valves, alarms, etc.) when a prefixed level has been reached. The most essential characteristic of this product is its high reliability and its shape which has no edges, for which it is particularly suitable for sewage water.*
*Also of great interest is the fact that it is made with a double liquid proof chamber which assures the maximum reliability of the inside mechanism.*

MAC3 WATER SYSTEMS

| Features | |
|---|---|
| Microswitch electrical features | 20(8)A 250V ~ 16(4)A 250V ~ |
| Approval certificates<br>External marking | ENEC/CE<br>10(8)A 250V ~ 10(4)A 250V ~ |
| Operating temperature | 0° ÷ + 50° C |
| Storage temperature | -20°C ÷ + 80° C |
| Pollution Index | IP68 |
| Switch angle | ± 45 |
| Dimensions | mm 106 x 154 x54 |
| Weight | gr. 250 |
| Volume | cm³ 430 |
| Max depth level | 1BAR |
| Housing | Non-toxic polypropylene (PP) |
| Colouring | Non-toxic |
| Function class | I and II |
| Cable standard | PVC 3X1<br>H07RN-F 3G1<br>H07RNF 4G1<br>A07RNF 3X1 |
| Note | When ordering please specify if needed for filling or emptying function |

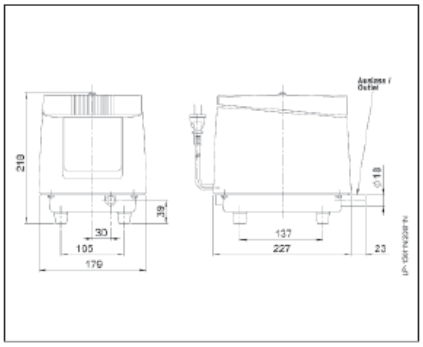



MAC 3 WATER SYSTEMS

## THOMAS AIR BLOWER SPECS

# Linear Diaphragm Pumps LP-150HN, LP-200HN

**Flow at rated pressure** **150 to 200 l/min**




| Pneumatic Data | | |
|---|---|---|
| Description | LP-150HN | LP-200HN |
| Part number | 52500151 | 52500202 |
| Flow at rated pressure | 150 l/min | 200 l/min |
| Rated pressure | 200 mbar | 200 mbar |
| Operating range | 100 to 300 mbar | 100 to 300 mbar |

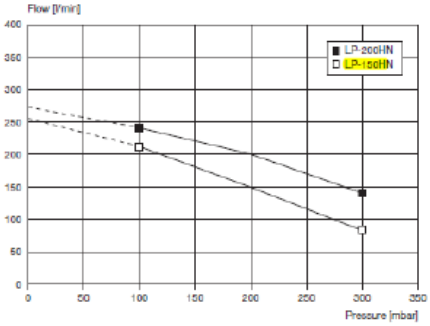
| Electrical Data | | |
|---|---|---|
| Motor type | Linear drive | Linear drive |
| Nominal voltage | 230 V 50/60 Hz | 230 V 50/60 Hz |
| Consumption at free flow | 1,1 A/190 W | 1,45 A/260 W |
| Consumption at rated pressure | 0,85 A/130 W | 1,15 A/200 W |

| General Data | | |
|---|---|---|
| Ambient temperature | -10 to 40 °C | -10 to 40 °C |
| Weight | 8,6 kg | 8,6 kg |
| Outlet diameter | 18 mm | 18 mm |
| Average noise level | 43 dB (A) | 44 dB (A) |

| Service Parts | Part Numbers | |
|---|---|---|
| Chamber block set | 700549 | 700549 |
| Air filter and gaskets kit | 700550 | 700550 |
| Air filter kit | 700551 | 700551 |
| Protective switch | 700552 | 700552 |

Please refer to operation and service manual for additional information.
All listed values are measured at standard atmospheric conditions and at 50Hz.

**Flow Curves**




**Service parts:**

Chamber block set consists of:
2 x Pump head with valves
2 x Diaphragm
2 x Diaphragm ring
2 x Diaphragm nut
2 x Diaphragm washer
1 x Cover plate gasket

Air filter and gaskets kit consists of:
1 x Air cleaner element
1 x Air cleaner gasket
1 x Cover plate gasket
1 x Noise absorbing net
1 x Tank gasket
2 x L-Hose
2 x L-Clamp

Air filter kit consists of:
5 x Air cleaner element
5 x Air cleaner gasket

Protective switch consists of:
1 x Microswitch complete with cover plate
1 x Cover plate gasket

**Supplied as standard:**
Cable/Euro-plug

Air connector (part number 700073) consists of:
1 x Outlet hose, angled, 170/50 mm
2 x Hose clamp

5250... Stock programme



THOMAS
A Gardner Denver Product

OzziKleen Water & Waste Water

## ELASTOX T DIFFUSER DISK SPECS

### Technical information

### Disk air diffuser ELASTOX®-T

GVA.

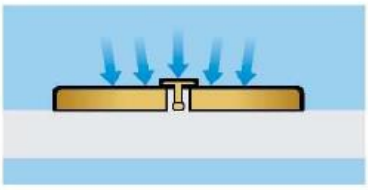
**Application**

The ELASTOX®-T disk air diffuser was developed in 1984 to be applied especially to water and waste water treatment for fine-bubbling compressed-air aeration. Typical applications are the following:

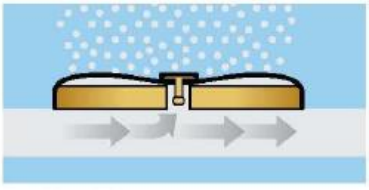
- Preservation aeration of waste water e.g. in balancing tanks
- Oxygenation in activation basins for concentrated nitrification
- Oxygenation for sludge stabilization
- Aeration of rivers and lakes
- $CO_2$ admission for neutralization

**Operational principle**

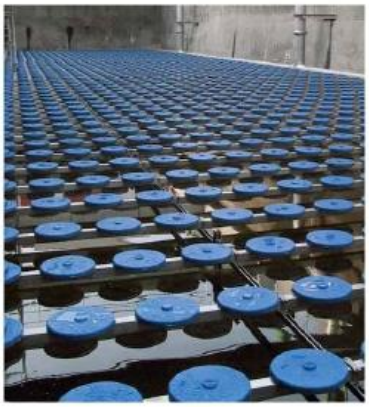
A G1" socket fitting is used for attachment to one of the distributing pipes and to the air feeding component. In idle state, the membrane is flatly lying on the plain supporting disk. Only after the internal air pressure rises above the static pressure of the surrounding water, the membrane will be lifted slightly from the supporting body, thus giving way for the air to expand into the resulting space. The air flows through the perforation of the membrane and enters the liquid in a very fine-bubbling state.



*In idle state*



*Operating condition*



**Intermittent mode of operation**

The structural design has been arranged in such a way that there are even two systems preventing the liquid from flowing back into the air diffuser in case of dropping pressure:

- Due to restoration elasticity, the perforation holes in the membrane will close, while the latter lies flatly on the supporting disk.
- The patented lift limitation device arranged in the central position functions just like a check valve by closing the air feeding openings.

The ELASTOX®-T Spezial air diffuser excels by the unique safety properties of its additionally integrated spring-loaded check valve, not only in intermittent operation mode, but also in case of damage. If the membrane e.g. is defective, the quantity of leaking air is reduced so that, even in case of damaged individual air diffusers, there is no immediate corrective measure necessary in terms of the overall system.

**Design**

The ELASTOX®-T disk air diffuser features a gas outlet surface exclusively arranged in upward direction and comes in two basic design models:

- ELASTOX®-T Standard
- ELASTOX®-T Spezial

The patented central lift limitation feature is a particular component common to both models. It prevents the membrane from balloon-like swelling and thus ensures uniform aeration across the entire air diffuser surface. The pertinent reduced coalescence enables efficient oxygen utilization.

The differing design of the central lift limitation feature is the main distinctive property between the ELASTOX®-T Spezial and Standard model versions.

**ELASTOX®-T Standard**

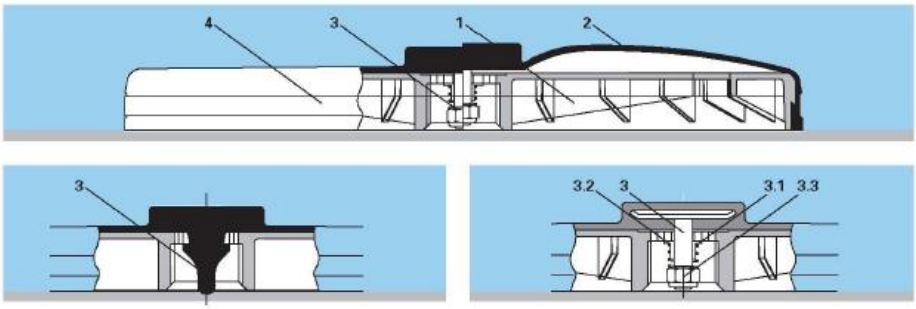
Patented central lift limitation as an integral part of the membrane, at the same time having a non-reverse flow function.

**ELASTOX®-T Spezial**

Patented central lift limitation integrated into the membrane by vulcanizing and simultaneously designed as a spring-loaded check valve.

| Technical data | | gross | net/effective |
|---|---|---|---|
| Diameter | [mm] | 320 | 300 / 70 |
| Gasing area | [cm²] | ~ 800 | ~ 650 |
| Minimum distance | [mm] | ~ 200 | ~ 200 |
| Weight | [kg] | ~ 0.80 | ~ 0.80 |

**Materials**




*ELASTOX®-T Standard* *ELASTOX®-T Spezial*

All materials were selected in such a way that excellent durability properties are achieved as compared with the chemical and biochemical effects to be expected in biological waste water treatment.

As far as resistance to ageing is concerned, the membrane material is of particular importance.

**EPDM** EPDM membrane with extremely low plasticizer content.

**EPDM-MB** EPDM membrane of microbes resistant design; reduced affinity as to biological sedimentation due to a special cross-linked additive.

**SILICONE** Plasticizer-free membrane made of silicone of very good chemical persistence and with excellent anti-adhesive surface properties.

| | | ELASTOX®-T Standard | ELASTOX®-T Spezial |
|---|---|---|---|
| 1 | Supporting body | Polypropylene | Polypropylene |
| 2 | Membrane | EPDM<br>EPDM – MB resistant to microbes | EPDM<br>EPDM – MB resistant to microbes<br>SILICONE |
| 3 | Lift limitation | Analogously to membrane | Steel/stainless steel – integrated by vulcanizing |
| 3.1 | Hull | | Polypropylen |
| 3.2 | Pull-back spring | | Stainless steel |
| 3.3 | Self-locking nut | | Stainless steel |
| 4 | Clamping band | Polypropylene<br>Option: Stainless steel | Stainless steel<br>Option: Polypropylene |

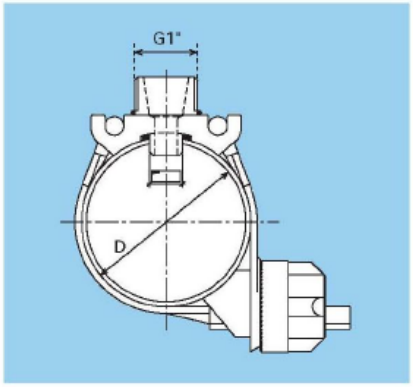
**Perforation**

The membranes can be punched as three different perforation types, enabling the corresponding adaptation to the required air throughput or oxygen content. The distance of pores from each other has accurately been defined and prevents coalescence of air bubbles already during the generation process.

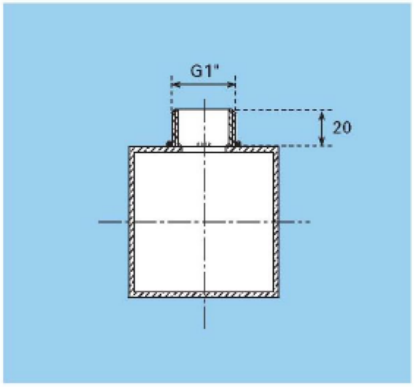
| Characteristics perforation | | Type A | Type B | Type C |
|---|---|---|---|---|
| Air throughput nominal value/max. (rinsing) | [$Nm^3/h$] | 8 / 10 (12) | 6 / 8 (10) | 10 / 12 (14) |
| Density of slits | [per $cm^2$] | 10 | 12 | 12 |
| Slits size | – | fine | extrafine | fine |

**Attachment/installation**

The ELASTOX®-T disk-type air diffusers are attached by using a G1" threaded connection, including sealing by means of an associated O-ring of Ø 32 mm on a corresponding flat area. The bottom distribution systems (aeration grids) can be designed as square, rectangular or round tube structures made of stainless steel or plastic material. The air diffuser can very easily and quickly be mounted on the aeration grids; mounting can be carried out by one person without using special tools.




*Round tube*




*Square/rectangular tube*

The GVA saddle clamp consists of glass-fiber-reinforced PP polypropylene and is equally suitable for mounting on stainless steel or plastic round tubes with nominal sizes of DN 65, 80 and 100.

As suitable threaded connections welding nipples G1" x 20 ISO 228 are be planned. Edge length of the tube must be 50 mm at least.

| Nominal size | Round tube (outer diameter = D) | |
|---|---|---|
| | Plastic | Stainless steel |
| DN 65 | 75 mm | 76.1 mm |
| DN 80 | 90 mm | 88.9 mm |
| DN 100 | 110 mm | 114.3 mm |

**Oxygen admission capacity**

The specific oxygen utilization SOTE [$gO_2/Nm^3 \cdot m$] or the oxygen admission OC [$kgO_2/h$] are also very much dependent on the energy density in the aeration basin concerned, apart from the general aeration concept of

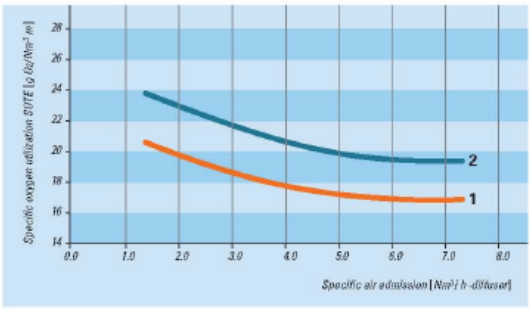
- Full-floor aeration ①
- Aeration with separate circulation e.g. inclined flow aeration
- Partial area aeration, linear aeration (spiral flow)

as well as a great number of further influencing factors.

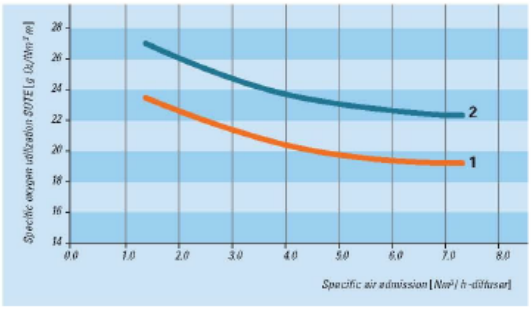
The following description of oxygen utilization is based on an full-floor aeration in clean water under standard conditions and a blow-in depth of 3.75 m. In order to determine the degree of influence of the density of disk arrangement, in each case the number of disk air diffusers has been varied:

1 = Axis distance 1.0 m (~ 6,5 %)
2 = Axis distance 0.5 m (~ 13,0 %)

① *Uniform arrangement on the basin bottom; the relationship of ~ 4:1 between the air admission depth and the air diffuser distance should not be essentially less in order to prevent the creation of cylindrical water flows caused by rising air bubbles.*




*Oxygen utilization in clean water, ELASTOX®-T* ***type A and type C***

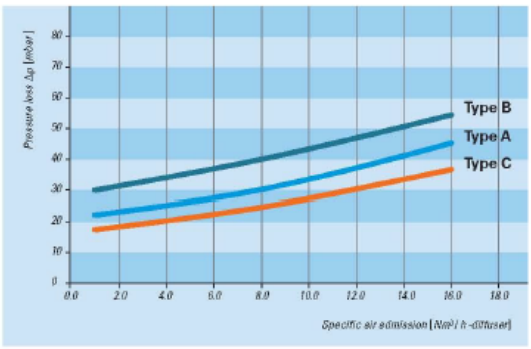



*Oxygen utilization in clean water, ELASTOX®-T* ***type B***

**Pressure loss**

The ELASTOX®-T disk air diffusers excel by their elasticity due to very low basic pressure losses and a slightly bent pressure loss curve, unlike excessively rigid aeration bodies. Thanks to this, the economic effectiveness and general efficiency of this system are enhanced.

The mentioned data refer to all membrane qualities out of EPDM. The pressure loss of the silicone membrane lies in the new condition slightly more highly.

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## EFFLUENT FLOW METER – HR PRODUCT MT-EX32

# PRODUCT SPECIFICATION

***MT-EX SERIES WATER METERS 15mm to 50mm***

Used for measuring the volume of water passing through pipeline in irrigation systems.
As water passes through the meter, water jets make the impeller rotate.
The impeller's rotations are proportional to quantity of water being metered and are magnetically transmitted to the register.

***FEATURES***

- Hermetically vacuum-sealed register
- Magnetic transmission
- Magnetic shield, for external magnetic field protection
- High-flow accuracy
- Solid and robust design
- High scratch resistant glass on register
- Internal Strainer
- ISO 4064 Class B compliance standard (check local standards)

***PULSE REED SWITCH OPTION***

- Reed switch sends electric signals per a preset water quantity
- Data pulse output 1 litre,15mm - 32mm
- Data pulse output 10 litre,40mm - 50mm
- Switching voltage 6 VAC/DC
- Switching current 0.10 Amps max

***OPERATING CONDITIONS***

- Water temperature: up to 50°C
- Pressure rating: PN10

***INSTALLATION RECOMMENDATIONS***

- Inlet requires 10 x pipe diameter of straight pipe
- Outlet requires 5 x pipe diameter of straight pipe
- Follow arrow direction
- Install in horizontal position
- Install a strainer upstream of meter to protect measuring element
- Flush line before installation to remove debris

| ***FLOW DATA*** | | | | | | |
|---|---|---|---|---|---|---|
| SIZE MM | 15 | 20 | 25 | 32 | 40 | 50 |
| **Nominal Flow Lph** | 1500 | 2500 | 3500 | 6000 | 10000 | 15000 |
| **Maximum Flow Lph** | 3000 | 5000 | 7000 | 12000 | 20000 | 30000 |
| **Transitional Flow Lph** | 120 | 200 | 280 | 480 | 800 | 3000 |
| **MinimumFlow Lph** | 30 | 50 | 70 | 120 | 200 | 450 |

Specifications Subject to Change Without Notice - Product Drawings / Images are representative only and are subject to change

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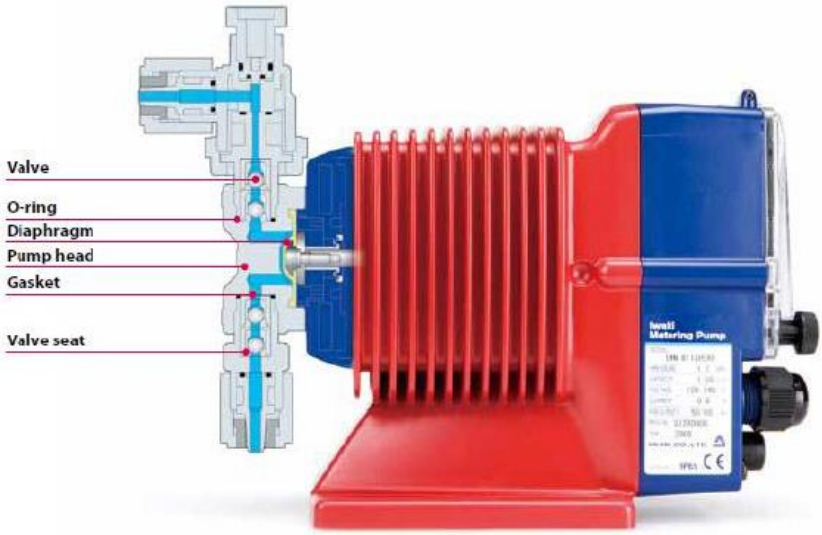
## ALUM DOSING PUMP – IWAKI EWN-B16VCAR

# Technical data

### Construction




### Wet-end materials

| | Pump head | Valve | Valve seat | O-ring | Diaphragm | Gasket |
|---|---|---|---|---|---|---|
| VC | PVC | CE | FKM | FKM | PTFE+EPDM | PTFE |
| VH | | HC | EPDM | EPDM | | |
| PC | GFRPP | CE | FKM | FKM | | |
| PH | | HC | EPDM | EPDM | | |
| FC | PVDF | CE | PCTFE | - | | |
| TC | | | FKM | FKM | | |
| SH | SUS316 | HC | SUS316 | - | | |

### Pump identification

EWN - B 11 VC □ E R □ - □

- **Series symbol** — EWN-R series
- **Drive unit symbol** — Average power consumption B: 20W C: 24W
- **Diaphragm diameter** — Effective diaphragm dia. 09: 8mm 11: 10mm 16: 15mm 21: 20mm 31: 30mm 36: 35mm
- **Wet-end material symbol** — For details, see the table of materials.
- **Connection** — Blank: Ø4 x Ø6 (B09,B11,B16,B21,C16,C21) Ø9 x Ø12 (B31,C31,C36) For other option, please contact us.
- **Power code** — E: With European cord A: With Australian cord
- **Controller function code** — R: Standard type
- **Special version code** — C: High compression type H: High pressure type Y: Viscosity type
- **Special configuration code** — H: High pressure type H2: High pressure type (2MPa)

3

OZZI KLEEN Water & Waste Water


## Specifications of pump

| Model | | B11 | B16 | B21 | B31 | C16 | C21 | C31 | C36 VC/VH/PC/PH | C36 FC/SH/TC |
|---|---|---|---|---|---|---|---|---|---|---|
| Capacity | L/hr | 2.3 | 3.9 | 6.0 | 12.0 | 4.8 | 7.8 | 16.2 | 25.2 | 24.6 |
| | mL/min | 38 | 65 | 100 | 200 | 80 | 130 | 270 | 420 | 410 |
| | mL/shot | 0.05 to 0.1 | 0.09 to 0.18 | 0.14 to 0.28 | 0.28 to 0.56 | 0.09 to 0.22 | 0.14 to 0.36 | 0.3 to 0.75 | 0.47 to 1.17 | 0.46 to 1.14 |
| Rated discharge pressure | MPa | 1.0 | 0.7 | 0.4 | 0.2 | 1.0 | 0.7 | 0.35 | 0.2 | 0.2 |
| Max. pressure | MPa | (1.4) | (0.8) | (0.5) | - | (1.2) | (0.8) | - | - | - |
| Stroke rate | % (spm) | 0.1 to 100 (1 to 360) | | | | | | | | |
| Stroke length range | % (mm) | 50 to 100 (0.5 to 1.0) | | | | 40 to 100 (0.5 to 1.25) | | | | |
| Current | A | 0.8 | | | | 1.2 | | | | |
| Average power consumption | W | 20 | | | | 24 | | | | |

Note 1: Each discharge capacity shown above is at discharge pressure (stroke length 100%, stroke rate 100%) and increases as a discharge pressure reduces.
Note 2: The performance is based on pumping clean water at ambient temperature at rated voltage.
Note 3: Liquid temperature -VC/VH types: -10 to 40°C -PC/PH/FC/SH/TC types: -10 to 60°C
Note 4: Max pressure is not guaranteed under any discharge conditon. Max pressure of PVC type is 1.2MPa. Please contact us for details.

## Specifications of controller

| | | | | |
|---|---|---|---|---|
| Operational mode | MAN | | | 0.1 to 100% stroke rate |
| | EXT | DIV (Dividing) | | /1 to 9999 |
| | | MULT (Multiply) | | ×1 to 9999 |
| | | ANA.R (Analog, rigid) | | 4 to 20, 0 to 20, 20 to 4, 20 to 0 mA |
| | | ANA.V (Analog, varisble) | | 2 points 0.0 to 20.0 mA range 0.0 to 100% stroke rate |
| Display | LCD | 14seg 5digits | | %, ml/m, L/H, GPH, STOP, PRIME, AUX etc |
| | LED | ON | Green | Green lights when power is put and blinks synchronous with stroke. |
| | | STOP | Orange/Red | Orange lights when Pre-STOP is activated, and red when STOP is activated. |
| Keypad | 5 Keys | Start/Stop, ▲ (Up),▼(Down), EXT, DISP | | |
| Control function | | STOP/Pre-Stop | | Pump keeps running when Pre-STOP is activated. Pump stops when STOP is activated. |
| | | Prime | | Pump runs at max. stroke rate while up and down keys are pushed. |
| | | Key lock | | Key can be locked and unlocked. |
| | | Calibration | | Discharge capacity per shot is calculated automatically by operating and stopping pump at calibration mode to make flow rate indication possible. |
| | | Buffer memory | | ON or OFF is selectable. Max. 65535 stroke pulses are put in memory. |
| Input | | Pulse | | Non Voltage contact or open collector, Max. 200Hz |
| | | Current | | DC0 to 20mA (Input resistance 200Ω) |
| | | Level sensor | | No Voltage contact or open collector, 2- steps contact |
| | | AUX | | Pump runs at max.stroke rate while AUX signal is input. |
| Output | | Photo-MOS relay AC/DC24V 0.1A | | |
| | | STOP, Synchronous with stroke | | |
| | | Synchronous with stroke is standard. | | |
| Power Voltage | | 100 to 240 VAC 50/60Hz (90 to 264 VAC) | | |

* Note 1: If the max. stroke rate by calculation exceeds 100% stroke rate because of the relation between the setting and input signal when the pump is in EXT operation, the operation is fixed at Maximum stroke rate speed of manual operation.
* Note 2: By changing the setting, the pump can run when the contact signal comes in.
* Note 3: The max. frequency of input pulse is 200 Hz. ON time of input pulse is 10 to 100 mS.
* Note 4: The max. chargeable voltage to a contact is 12V and current is 0.1mA. If a contact such as relay is used, the minimum application load should be0.1mA or below.

OZZI KLEEN
Water & Waste Water

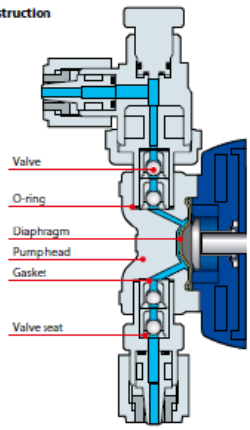
# The pump can be specialized for the need of a special chemical transfer.

## High compression type

### The optimum feeding for gaseous liquids

Increased compression ratio due to minimized dead volume in pump chamber. Suitable for injection of gaseous liquids such as sodium hypochlorite, hydrogen peroxide etc.

**Construction**




**Wet-end material**

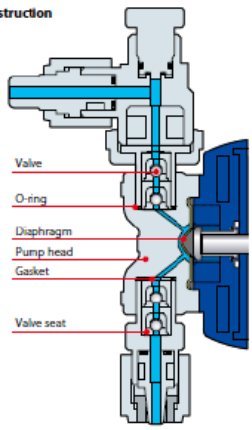
| Material code | VC | VH |
|---|---|---|
| Pump head | PVC | |
| Valve | CE | HC |
| Valve seat | FKM | EPDM |
| Gasket | PTFE | |
| O-ring | FKM | EPDM |
| Diaphragm | PTFE+EPDM | |

## High pressure type

### Suitable for boiler chemical injection

- The high pressure type can handle the maximum discharge pressure of 1.7MPa.
- The 25 and 40mL/min (max. discharge pressure) types are available.
- Capable of boiler chemical injection to the discharge line of a water-supply pump as long as the discharge pressure is 1.7MPa or below.

**Construction**




**Wet-end material**

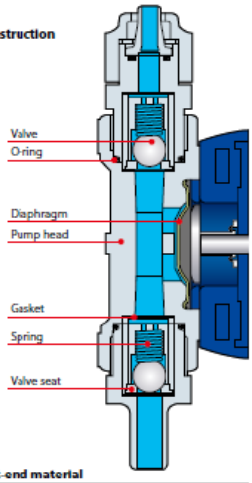
| Material code | PC | PH | SH |
|---|---|---|---|
| Pump head | GFRPP | | SUS316 |
| Valve | CE | HC | HC |
| Valve seat | FKM | EPDM | SUS316 |
| Gasket | PTFE | | |
| O-ring | FKM | EPDM | - |
| Diaphragm | PTFE+EPDM | | |

## Viscosity type

### Suitable for high-polymer coagulant injection

- Suitable for polymer flocculants injection in wastewater treatment. Please contact us for details.

**Construction**




**Wet-end material**

| Material code | PC |
|---|---|
| Pump head | GFRPP |
| Valve | CE |
| Valve seat | FKM |
| Spring | Hastelloy C276 |
| Gasket | PTFE |
| O-ring | FKM |
| Diaphragm | PTFE+EPDM |

**Specifications**

| Model | | High compression type | | | | | |
|---|---|---|---|---|---|---|---|
| | | B09 | B11 | B16 | B21 | C16 | C21 |
| Capacity | L/hr | 0.7 | 1.4 | 2.4 | 3.8 | 3.2 | 4.7 |
| | mL/min | 12 | 23 | 40 | 63 | 54 | 78 |
| | mL/shot | 0.03 to 0.07 | 0.06 to 0.13 | 0.11 to 0.22 | 0.18 to 0.35 | 0.12 to 0.30 | 0.17 to 0.43 |
| Discharge pressure | MPa | 1.0 | 1.0 | 0.7 | 0.4 | 1.0 | 0.7 |
| Stroke rate | % (spm) | 0.1 to 100 (1 to 180) | | | | | |
| Stroke length range | % (mm) | 50 to 100 (0.625 to 1.25) | | | | 40 to 100 (0.6 to 1.50) | |
| Current | A | 0.8 | | | | 1.2 | |
| Average power consumption | W | 20 | | | | 24 | |

| Model | | High pressure type | | High pressure type (7MPa) | Viscosity type |
|---|---|---|---|---|---|
| | | B11 | C16 | B11 | C31 |
| Capacity | L/hr | 1.5 | 2.4 | 1.0 | 9.0 |
| | mL/min | 25 | 40 | 17 | 150 |
| | mL/shot | 0.05 to 0.1 | 0.07 to 0.17 | 0.05 to 0.07 | 0.25 to 0.63 |
| Discharge pressure | MPa | 1.7 | 1.7 | 2.0 | 0.5 |
| Stroke rate | % (spm) | 0.1 to 100 (1 to 240) | | 0.1 to 100 (1 to 240) | 0.1 to 100 (1 to 240) |
| Stroke length range | % (mm) | 50 to 100 (0.5 to 1.0) | 40 to 100 (0.5 to 1.25) | 70 to 100 (0.6 to 0.9) | 40 to 100 (0.5 to 1.25) |
| Current | A | 0.8 | 1.2 | 0.8 | 1.2 |
| Average power consumption | W | 20 | 24 | 20 | 24 |

Note 1: Each discharge capacity shown above is at discharge pressure (stroke length 100%, stroke rate 100%) and increases as discharge pressure reduces.
Note 2: The performance is based on pumping clean water at ambient temperature at rated voltage.

5

OZZI KLEEN Water & Waste Water

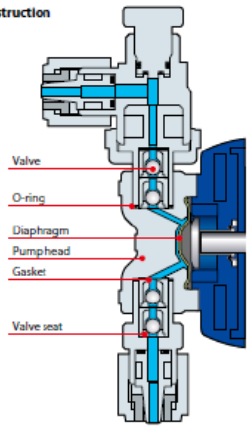
# The pump can be specialized for the need of a special chemical transfer.

## High compression type

### The optimum feeding for gaseous liquids

Increased compression ratio due to minimized dead volume in pump chamber. Suitable for injection of gaseous liquids such as sodium hypochlorite, hydrogen peroxide etc.

**Construction**




**Wet-end material**

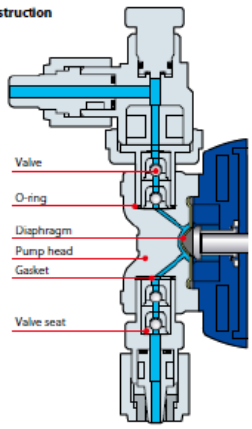
| Material code | VC | VH |
|---|---|---|
| Pump head | PVC | |
| Valve | CE | HC |
| Valve seat | FKM | EPDM |
| Gasket | PTFE | |
| O-ring | FKM | EPDM |
| Diaphragm | PTFE+EPDM | |

## High pressure type

### Suitable for boiler chemical injection

- The high pressure type can handle the maximum discharge pressure of 1.7MPa.
- The 25 and 40mL/min (max. discharge pressure) types are available.
- Capable of boiler chemical injection to the discharge line of a water-supply pump as long as the discharge pressure is 1.7MPa or below.

**Construction**




**Wet-end material**

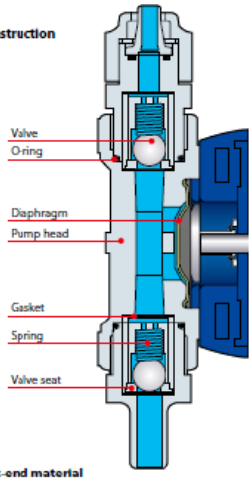
| Material code | PC | PH | SH |
|---|---|---|---|
| Pump head | GFRPP | | SUS316 |
| Valve | CE | HC | HC |
| Valve seat | FKM | EPDM | SUS316 |
| Gasket | PTFE | | |
| O-ring | FKM | EPDM | - |
| Diaphragm | PTFE+EPDM | | |

## Viscosity type

### Suitable for high-polymer coagulant injection

- Suitable for polymer flocculants injection in wastewater treatment. Please contact us for details.

**Construction**




**Wet-end material**

| Material code | PC |
|---|---|
| Pump head | GFRPP |
| Valve | CE |
| Valve seat | FKM |
| Spring | Hastelloy C276 |
| Gasket | PTFE |
| O-ring | FKM |
| Diaphragm | PTFE+EPDM |

**Specifications**

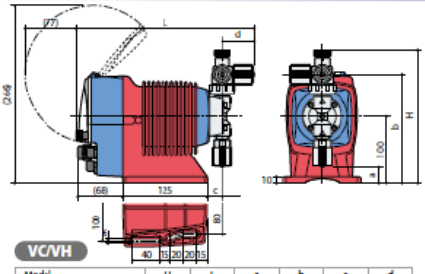
| Model | | High compression type | | | | | |
|---|---|---|---|---|---|---|---|
| | | B01 | B11 | B16 | B21 | C16 | C21 |
| Capacity | L/hr | 0.7 | 1.4 | 2.4 | 3.8 | 3.2 | 4.7 |
| | mL/min | 12 | 23 | 40 | 63 | 54 | 78 |
| | mL/shot | 0.03 to 0.07 | 0.06 to 0.13 | 0.11 to 0.22 | 0.18 to 0.35 | 0.12 to 0.30 | 0.17 to 0.43 |
| Discharge pressure | MPa | 1.0 | 1.0 | 0.7 | 0.4 | 1.0 | 0.7 |
| Stroke rate | % (spm) | 0.1 to 100 (1 to 180) | | | | | |
| Stroke length range | % (mm) | 50 to 100 (0.625 to 1.25) | | | | 40 to 100 (0.6 to 1.50) | |
| Current | A | 0.8 | | | | 1.2 | |
| Average power consumption | W | 20 | | | | 24 | |

| Model | | High pressure type | | High pressure type (2MPa) | Viscosity type |
|---|---|---|---|---|---|
| | | B11 | C16 | B11 | C31 |
| Capacity | L/hr | 1.5 | 2.4 | 1.0 | 9.0 |
| | mL/min | 25 | 40 | 17 | 150 |
| | mL/shot | 0.05 to 0.1 | 0.07 to 0.17 | 0.05 to 0.07 | 0.25 to 0.63 |
| Discharge pressure | MPa | 1.7 | 1.7 | 2.0 | 0.5 |
| Stroke rate | % (spm) | 0.1 to 100 (1 to 240) | | 0.1 to 100 (1 to 240) | 0.1 to 100 (1 to 240) |
| Stroke length range | % (mm) | 50 to 100 (0.5 to 1.0) | 40 to 100 (0.5 to 1.25) | 70 to 100 (0.6 to 0.9) | 40 to 100 (0.5 to 1.25) |
| Current | A | 0.8 | 1.2 | 0.8 | 1.2 |
| Average power consumption | W | 20 | 24 | 20 | 24 |

Note 1: Each discharge capacity shown above is at discharge pressure (stroke length 100%, stroke rate 100%) and increases as a discharge pressure reduces.
Note 2: The performance is based on pumping clean water at ambient temperature at rated voltage.

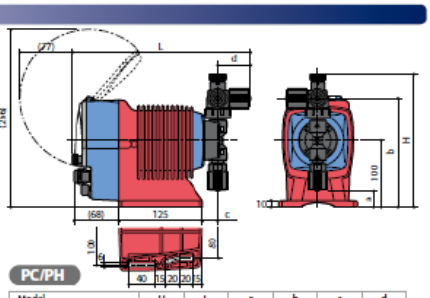
5

## Dimensions in mm



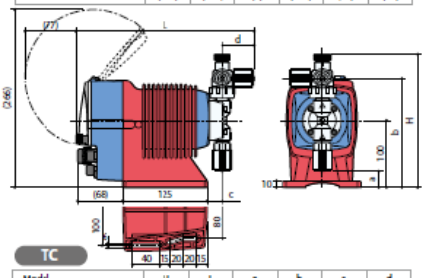
**VC/VH**

| Model | H | L | a | b | c | d |
|---|---|---|---|---|---|---|
| EWN-11, 16, 21 | (199) | (265) | (24) | (164) | (23) | (47) |
| EWN-31 | (212) | (267) | (6) | (177) | (25) | (48) |
| EWN-36 | (211) | (267) | (7) | (176) | (24) | (48) |



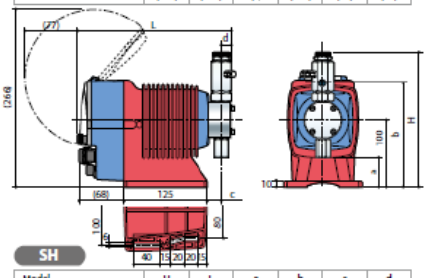
**PC/PH**

| Model | H | L | a | b | c | d |
|---|---|---|---|---|---|---|
| EWN-11, 16, 21 | (199) | (265) | (24) | (164) | (23) | (47) |
| EWN-31 | (212) | (267) | (6) | (177) | (25) | (48) |
| EWN-36 | (211) | (267) | (7) | (176) | (24) | (48) |



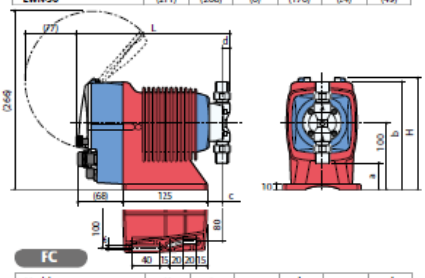
**TC**

| Model | H | L | a | b | c | d |
|---|---|---|---|---|---|---|
| EWN-11, 16, 21 | (198) | (265) | (25) | (163) | (23) | (47) |
| EWN-31 | (211) | (267) | (7) | (176) | (25) | (48) |
| EWN-36 | (211) | (268) | (6) | (176) | (24) | (49) |



**SH**

| Model | H | L | a | b | c | d |
|---|---|---|---|---|---|---|
| EWN-11, 16, 21 | (201) | (232) | (44) | (155) | (22) | (15) |
| EWN-31 | (213) | (233) | (34) | (167) | (23) | (15) |
| EWN-36 | (216) | (233) | (32) | (170) | (23) | (15) |



**FC**

| Model | H | L | a | b | c | d |
|---|---|---|---|---|---|---|
| EWN-11, 16, 21 | (166) | (231) | (40) | (160) | (23) | (13) |
| EWN-31 | (177) | (236) | (23) | - | (25) | (16) |
| EWN-36 | (177) | (235) | (23) | - | (24) | (16) |

• Please contact us for special version.

**www.iwakipumps.jp**

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| Holland | : IWAKI Europa (NL Branch) | TEL: (31)547 293 160 | FAX:547 292 332 |
| Austria | : IWAKI (Austria) GmbH | TEL: (41)26 674 93 00 | FAX:26 674 93 02 |
| Belgium | : IWAKI Belgium N.V. | TEL: (32)13 67 62 00 | FAX:13 67 20 30 |
| Denmark | : IWAKI Nordic A/S | TEL: (45)48 24 1345 | FAX:48 24 2346 |
| Finland | : IWAKI Suomi Oy | TEL: (358)9 7745810 | FAX:9 7742715 |
| France | : IWAKI France S.A. | TEL: (33)1 69 63 33 70 | FAX:1 64 49 92 73 |
| Germany | : IWAKI Europa GmbH | TEL: (49)2154 9254 50 | FAX:2154 9254 55 |
| Italy | : IWAKI Italia S.R.L. | TEL: (39)0444 371115 | FAX:0444 335350 |
| Norway | : IWAKI Norge AS | TEL: (47)66 81 16 60 | FAX:66 81 16 61 |
| Spain | : IWAKI Iberica Pumps, S.A. | TEL: (34)943 630030 | FAX:943 628799 |
| Sweden | : IWAKI Sverige AB | TEL: (46)8 511 72900 | FAX:8 511 72922 |
| Switzerland | : IWAKI (Schweiz) AG | TEL: (41)26 674 93 00 | FAX:26 674 93 02 |
| U.K. | : IWAKI Pumps (UK) Ltd. | TEL: (44)1743 231363 | FAX:1743 366507 |
| U.S.A. | : IWAKI America Inc. | TEL: (1)508 4291440 | FAX:508 429 1386 |
| Argentina | : IWAKI America Inc. (Argentina Branch) | TEL: (54)11 4745 4116 | |

**ASIA / OCEANIA**

( )Country codes

| | | | |
|---|---|---|---|
| Australia | : IWAKI Pumps Australia Pty Ltd. | TEL: (61)2 9899 3411 | FAX :2 9899 2421 |
| China | | | |
| Hong Kong | : IWAKI Pumps Co., Ltd. | TEL: (852)2607 1168 | FAX: 2607 1000 |
| Shanghai | : IWAKI Pumps (Shanghai Co., Ltd. | TEL: (86)21 6272 7502 | FAX: 21 6272 6929 |
| Guangzhou | : GFTZ IWAKI Engineering & Trading Co., Ltd. | TEL: (86)20 8435 0603 | FAX: 20 8435 9181 |
| Beijing | : GFTZ Iwaki Engineering & Trading Co., Ltd. (Beijing office) | TEL: (86) 10 6442 7713 | FAX: 10 6442 7712 |
| Korea | : IWAKI Korea Co.,Ltd. | TEL: (82)2 2630 4800 | FAX: 2 2630 4801 |
| Malaysia | : IWAKIm Sdn. Bhd. | TEL: (60)3 7803 8807 | FAX: 3 7803 4800 |
| Singapore | : IWAKI Singapore Pte Ltd. | TEL: (65)6316 2028 | FAX: 6316 3221 |
| Indonesia | : IWAKI Singapore (Indonesia Branch) | TEL: (62)21 6906606 | FAX: 21 6906612 |
| Taiwan | : IWAKI Pumps Taiwan Co., Ltd. | TEL: (886)2 8227 6900 | FAX: 2 8227 6818 |
| Thailand | : IWAKI (Thailand) Co.,Ltd. | TEL: (66)2 322 2471 | FAX: 2 322 2477 |
| Vietnam | : IWAKI Pumps Vietnam Co., Ltd. | TEL: (84)613 933456 | FAX: 613 933399 |

⚠ Caution for safety use: Before use of pump, read instruction manual carefully to use the product correctly.
Actual pumps may differ from the photos. Specifications and dimensions are subject to change without prior notice. For further details please contact us.

⚠ Legal attention related to export.
Our products and/or parts of products fall in the category of goods contained in control list of international regime for export control.
Please be reminded that export license could be required when products are exported due to export control regulations of countries.

VEGETABLE OIL INK

CAT-E 0049-02 2011.08.2000.SXN

## MSDS CHLORINE TABLETS

**BARRELL CHEMICALS**
Australian made and owned.
Manufacturers of quality cleaning chemicals.
ABN 52 010 872 170
*12 Dennis Little Drive, Glanmire Industrial Estate*
*P.O. BOX 631* *Telephone: 07 5482 4477*
*GYMPIE QLD 4570* *Facsimile: 07 548 2 7011*
*Email: barrellchemicals@bigpond.com*
*Website: www.barrellchemicals.com.au*

### Material Safety Data Sheet
Issue Date: March 2021

### TRICHLOROISOCYANURIC ACID

*This material is hazardous according to criteria of NOHSC.*
*Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail.*

### 1. Identification of the substance/preparation and of the company/undertaking

**Product Name:** TRICHLOROISOCYANURIC ACID


**Supplier:** BARRELL CHEMICALS (ARBAY PTY LTD)
**ABN:** 52 010 872 170
**Street Address:** 12 Dennis Little Drive, GYMPIE 4560 Australia
**Telephone Number:** 07 5482 4477
**Facsimile:** 07 5482 7011
Email: *admin@barrellchemicals.com.au*

### 2. Composition/information on ingredients

**Product Description:** For use in treatment plants and septic systems. Chlorine disinfectant chemical. 90% available chlorine.

| Components | CAS Number | Proportion | Risk Phrases |
|---|---|---|---|
| TRICHLOROISOCYANURIC ACID | 87-90-1 | >99% | R8, R22, R31, R36/37, R50/53 |

### 3. Hazards identification

**Risk Phrases:** Contact with combustible material may cause fire. Harmful if swallowed. Contact with acids liberates toxic gas. Irritating to eyes and respiratory system. Very toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment.
**Poisons Schedule:** S6 POISON

### 4. First-aid measures

**Poisons Information Centre: Ph – Australia 131 126; New Zealand 0800 764 766**
**Inhalation:** Remove victim from area of exposure - avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm.
Keep at rest until fully recovered. If patient finds breathing difficult and develops a bluish Discoloration of the skin (which suggests a lack of oxygen in the blood - cyanosis), ensure airways are clear of any obstruction and have a qualified person give oxygen through a face mask. Apply artificial respiration if patient is not breathing. Seek immediate medical advice.
**Skin Contact:** If skin contact occurs, remove contaminated clothing and wash skin with running water. If irritation occurs seek medical advice.
**Eye Contact:** If in eyes, hold eyelids apart and flush the eye continuously with running water. Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
**Ingestion:** Rinse mouth with water. If swallowed, do NOT induce vomiting. Give a glass of water. Seek immediate medical assistance.
**Notes to physician:** Treat symptomatically.

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Manufacturers of quality cleaning chemicals.
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*Telephone: 07 5482 4477*
*Facsimile: 07 548 2 7011*
*Email: barrellchemicals@bigpond.com*
*Website: www.barrellchemicals.com.au*

**Product Name:** TRICHLOROISOCYANURIC ACID

## 5. Fire-fighting measures

**Specific Hazards:** Oxidizing substance. Non combustible, but will support combustion of other materials.

**Fire-fighting advice:** Non-combustible material. Decomposes on heating emitting toxic fumes, including those of oxides of nitrogen. Fire fighters to wear self-contained breathing apparatus and suitable protective clothing if risk of exposure to products of decomposition. Keep containers cool with water spray. Heating can cause expansion or decomposition of the material, which can lead to the containers exploding. If safe to do so, remove containers from the path of fire.

**Suitable Extinguishing Media:**
Not combustible, however, if material is involved in a fire use: Water spray (large quantities).

**Hazchem Code:** 1W

## 6. Accidental release measures

Shut off all possible sources of ignition. Clear area of all unprotected personnel. Air-supplied masks are recommended to avoid inhalation of toxic material. Wear protective equipment to prevent skin and eye contact and breathing in dust. Work up wind or increase ventilation. Cover with damp absorbent (inert material, sand or soil). Sweep or vacuum up, but avoid generating dust. Collect and seal in properly labelled containers or drums for disposal. DO NOT add small amounts of water to trichloroisocyanuric acid. Collect and transfer to large volume of water - do NOT use a metal container.
If contamination of sewers or waterways has occurred advise local emergency services.

## 7. Handling and storage

**Handling advice:** Avoid skin and eye contact and breathing in dust. Avoid handling which leads to dust formation.

**Storage advice:** Store in a cool, dry, well ventilated place and out of direct sunlight. Store away from sources of heat or ignition. Store away from foodstuffs. Store away from incompatible materials described in Section10. Keep dry - reacts with water, may lead to drum rupture. Calcium hypochlorite (dry or hydrated) and its mixtures are incompatible with, and must be stored away from, dichloroisocyanuric acid, ammonium nitrate; trichloroisocyanuric acid, or any chloroisocyanurate. Ensure pallets are clean and free of oil.
Keep containers closed when not in use - check regularly for spills.

## 8. Exposure controls/personal protection

**Occupational Exposure Limits:**
No value assigned for this specific material by the National Occupational Health and Safety Commission. However, Exposure Standard(s) for decomposition product(s):
Chlorine: Peak Limitation = 3 mg/m3 (1 ppm)

As published by the National Occupational Health and Safety Commission.
Peak Limitation - a ceiling concentration which should not be exceeded over a measurement period which should be as short as possible but not exceeding 15 minutes. These Exposure Standards are guides to be used in the control of occupational health hazards. All atmospheric contamination should be kept to as low a level as is workable. These exposure standards should not be used as fine dividing lines between safe and dangerous concentrations of chemicals. They are not a measure of relative toxicity.

**Engineering Control Measures:**
Ensure ventilation is adequate and that air concentrations of components are controlled below quoted Exposure Standards. Avoid generating and breathing in dusts. Use with local exhaust ventilation or while wearing dust mask. Keep containers closed when not in use.

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*GYMPIE QLD 4570* *Facsimile: 07548 2 7011*
*Email: barrellchemicals@bigpond.com*
*Website: www.barrellchemicals.com.au*

**Product Name:** TRICHLOROISOCYANURIC ACID

**Personal Protective Equipment:**
OVERALLS, SAFETY SHOES, CHEMICAL GOGGLES, GLOVES, DUST MASK.


Wear overalls, chemical goggles and impervious gloves. Avoid generating and inhaling dusts. If dust exists, wear dust mask/respirator meeting the requirements of AS/NZS 1715 and AS/NZS 1716. Always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

## 9. Physical and chemical properties

| | |
|---|---|
| **Physical state:** | Crystalline Powder, Granular, Tablets |
| **Colour:** | White |
| **Odour:** | Chlorine |
| **Molecular Formula:** | C3Cl3N3O3 |
| **Solubility:** | Soluble in water |
| **Specific Gravity:** | 2.07 @20°C |
| **Relative Vapour Density (air=1):** | Not available |
| **Vapour Pressure (20 °C):** | Not available |
| **Flash Point (°C):** | Not applicable |
| **Flammability Limits (%):** | Not available |
| **Solubility in water (g/L):** | 12 @25°C |
| **Melting Point/Range (°C):** | 249 – 253°C |
| **Decomposition Point (°C):** | 225 |
| **pH:** | 2.8 (1% aqueous solution |

## 10. Stability and reactivity

**Stability:** Incompatible with combustible material, alkalis, nitrogen compounds, acids and water. Calcium hypochlorite (dry or hydrated) and its mixtures are incompatible with dichloroisocyanuric acid, ammonium nitrate, trichloroisocyanuric acid, or any chloroisocyanurate.

## 11. Toxicological information

No adverse health effects expected if the product is handled in accordance with this Safety Data Sheet and the product label. Symptoms or effects that may arise if the product is mishandled and overexposure occurs are:

| | |
|---|---|
| **Ingestion:** | Swallowing can result in nausea, vomiting, diarrhea and abdominal pain. |
| **Eye contact:** | An eye irritant. |
| **Skin contact:** | Contact with skin may result in irritation. |
| **Inhalation:** | Material is an irritant to the mucous membranes of the respiratory tract (airways). |
| **Long Term Effects:** | No information available for the product. |
| **Toxicological Data:** | Oral LD50 (rat): 750 mg/kg.<br>EYES: Severe irritant (rabbit). |

**BARRELL CHEMICALS**
Australian made and owned.
Manufacturers of quality cleaning chemicals.
ABN 52 010 872 170
*12 Dennis Little Drive, Glanmire Industrial Estate*
*P.O. BOX 631* *Telephone: 07 5482 4477*
*GYMPIE QLD 4570* *Facsimile: 07548 2 7011*
*Email: barrellchemicals@bigpond.com*
*Website: www.barrellchemicals.com.au*

**Product Name:** TRICHLOROISOCYANURIC ACID

## 12. Ecotoxicological information

Avoid contaminating waterways.
**Aquatic toxicity:** Very toxic to aquatic organisms. May cause long term adverse effects in the aquatic environment.

## 13. Disposal considerations

Refer to Waste Management Authority. Dispose of material through a licensed waste contractor.

## 14. Transport information

**Road and Rail Transport**
Classified as Dangerous Goods by the criteria of the Australian Dangerous Goods Code (ADG Code) for Transport by Road and Rail.

**UN No:** 2468
**Class-primary** 5.1 Oxidizing Agent
**Packing Group:** II
**Proper Shipping Name:** TRICHLOROISOCYANURIC ACID, DRY
**Hazchem Code:** 1W


**Marine Transport**
Classified as Dangerous Goods by the criteria of the International Maritime Dangerous Goods Code (IMDG Code) for transport by sea.

**UN No:** 2468
**Class-primary:** 5.1 Oxidizing Agent
**Packing Group:** II
**Proper Shipping Name:** TRICHLOROISOCYANURIC ACID, DRY
**IMDG EMS Fire:** F-A **IMDG EMS Spill:** S-Q


**Air Transport**
Classified as Dangerous Goods by the criteria of the International Air Transport Association (IATA) Dangerous Goods Regulations for transport by air.

**UN No:** 2468
**Class-primary:** 5.1 Oxidizing Agent
**Packing Group:** II
**Proper Shipping Name:** TRICHLOROISOCYANURIC ACID, DRY


## 15. Regulatory information

**Classification:** This material is hazardous according to criteria of NOHSC.
Xn: Harmful
Xi: Irritant
**Risk Phrase(s):**
R8: Contact with combustible material may cause fire.
R22: Harmful if swallowed.
R31: Contact with acids liberates toxic gas.
R36/37: Irritating to eyes and respiratory system.
R50: Very toxic to aquatic organisms.
R53: May cause long term adverse effects in the aquatic environment.
**Safety Phrase(s):**
S8: Keep container dry.
S24/25: Avoid contact with skin and eyes.

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*Website: www.barrellchemicals.com.au*

**Product Name:** TRICHLOROISOCYANURIC ACID

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39: Wear suitable protective clothing, gloves and eye/face protection.
S41: In case of fire and/or explosion do not breathe fumes.

**Poisons Schedule:** S6 POISON
This material is listed on the Australian Inventory of Chemical Substances (AICS).

## 16. Other information

'Registry of Toxic Effects of Chemical Substances'. Ed. D. Sweet, US Dept. of Health & Human Services: Cincinnati, 2004.
**Reason(s) for Issue:**
5 yearly Revised Primary MSDS

DISCLAIMER

As the ordinary or otherwise use(s) of this product is outside the control of Barrell Chemicals no representation or warranty expressed or applied is made as to the effect(s) of such use(s), including damage or injury, or the results obtained.
Barrell Chemicals warranty is limited to the provided (if any) by the manufacture to the standard of the material and its adherence to the above specifications. Barrell Chemicals expressly disclaims responsibility as to the ordinary or otherwise use(s). Furthermore, nothing contained herein should be considered as a recommendation by Barrell Chemicals as to the fitness for any use. The liability of Barrell Chemicals is limited to the value of the goods and does not include any consequential losses. If clarification or further information is needed, the user should contact Barrell Chemicals at the contact details on page 1.

## MSDS ALUMINIUM SULFATE

CHEMPROD NOMINEES PTY. LTD. A.B.N. 32 982 143 022 / A.C.N 005 032 744 T/A

**OMEGA CHEMICALS**

Manufacturers of Aluminium Sulphate – Suppliers of Industrial Chemicals

"THE ALUM PEOPLE"

**Granular Aluminium Sulphate** **Issued: 4 May 2021** **Version: 4** **Page 1 of 9**

# SAFETY DATA SHEET

## 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

| | |
|---|---|
| **Product Name:** | **ALUMINIUM SULPHATE.** |
| **Other Names:** | Alum, Cake Alum, Granular Aluminium Sulphate. |
| **Manufacturers Product Code:** | Aluminium Sulphate T.I.F |
| **Recommended use of the chemical and restrictions on use:** | Treatment of municipal water supplies, sewage and industrial effluents; paper manufacturing; tanning; chemical intermediate for other aluminium compounds; clarifying oils and fats; antiperspirants; pesticides; fireproofing and waterproofing cloths; waterproofing concrete; catalyst for oil refining. Therapeutic category: Anti-infective. |
| **Supplier:**<br>**ABN:**<br>**Street Address:** | Omega Chemicals<br>32 982 143 022 / A.C.N 005 032 744 T/A<br>55 FITZGERALD ROAD, LAVERTON NORTH, VIC 3026 |
| **Telephone Number:**<br>**Facsimile:**<br>**Emergency Telephone:** | +61 3 8368 8000<br>+61 3 8368 8020<br>1300 131 001 (All Hours)<br>Poisons Information Centre Australia: 131 126 |

## 2. HAZARD IDENTIFICATION

| | |
|---|---|
| **Hazard Classification:** | Classified as Hazardous according to the Globally Harmonised System of Classification and Labelling of Chemicals (GHS) and Safe Work Australia criteria.<br><br>Classified as a Non Dangerous Goods according to the ADG Code. |
| **GHS Classification:** | Eye Irritation – Category 2A<br>Skin Irritation - Category 2<br>Acute Toxicity (Oral) – Category 4<br>Acute Toxicity (Inhalation) – Category 5 |
| **Signal Word (s):** | Warning |

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**Hazard Statement(s):**
H319 Causes serious eye irritation.
H315 Causes skin irritation.
H302 Harmful if swallowed.
H333 Maybe harmful if inhaled.

**Precautionary Statement(s):**

**Prevention Statement(s):**
P102 Keep out of reach of children.
P103 Read label before use.
P234 Keep only in original container.
P261 Avoid breathing dust.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P390 Absorb spillage to prevent material damage.

**Response Statement(s):**
P305+P354+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical advice/attention.
P302+P352 IF ON SKIN: Wash with plenty of soap and water.
P321 Specific treatment (see First Aid Measures on the Safety Data Sheet).
P332+P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing before re-use.
P301+P312 IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell
P330 Rinse mouth.
P390 Absorb spillage to prevent material damage.
P304+P312 IF INHALED: Call a POISON CENTER or doctor/physician if you feel unwell.

**Storage Statement(s):** -

**Disposal Statement(s):** P501 Dispose of contents/container in accordance with jurisdictional regulations.

**Poisons Schedule (SUSMP):** N/A

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

| Ingredients | CAS Number | Proportion: | Hazard Codes |
|---|---|---|---|
| Aluminium Sulphate | 10043-01-3 | 100% | H319, H315, H302, H333 |

## 4. FIRST AID MEASURES

For advice, contact Poisons Information Centre on 131 126 or a Doctor.

**Ingestion:** Immediately rinse mouth with water. **DO NOT** induce vomiting. **Seek medical attention.** Ingested material is not easily absorbed. It reacts with phosphate, forming an insoluble compound which is readily passed out of the body.

**Eyes:** Immediately irrigate with copious quantities of water for at least 15 minutes. Eyelids to be held open. Remove clothing if contaminated and wash skin. **Seek immediate medical attention.**

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**Skin:** Remove all contaminated clothing. Wash skin gently and thoroughly with copious amounts of water. If irritation occurs, seek medical attention.

**Inhalation:** Remove the source of contamination or move the victim to fresh air; avoid becoming a casualty. Remove contaminated clothing and loosen remaining clothing. Allow patient to assume most comfortable position and keep warm. Keep at rest until fully recovered. Seek medical attention.

**Advice to Doctor:** Treat symptomatically.

**Additional Information**

**Aggravated medical conditions caused by exposure:** Prolonged exposure can cause irritation and numbing of the fingers. Inhaled dust may accumulate in the lungs until slowly cleared.

## 5. FIRE FIGHTING MEASURES

**Extinguishing Media:** In case of fire, use an appropriate extinguishing media (foam, carbon dioxide, dry chemical powder) that is the most suitable for surrounding fire conditions. If safe to do so, remove containers from path of fire.

**Hazchem Code:** N/A.

**Specific Hazards arising from the substance or mixture:**

Hazards from Combustion: Product is non-flammable. Forms aluminium oxide and sulphur trioxide at temperatures above 650°C. Hazardous polymerisation is not expected.

Flammability Conditions: Product is a non-flammable solid. It will decompose under fire conditions emitting toxic gases and vapours including oxides of sulphur.

**Special Protective Precautions and Equipment for Fire Fighters:** Fire fighters should wear a self-contained breathing apparatus and full protective clothing along with protective equipment. Prevent fire extinguishing water from contaminating surface water or the ground water system.

## 6. ACCIDENTAL RELEASE MEASURES

**Emergency Procedures/Protective Equipment/Personal Precautions:** Evacuate all unnecessary personnel. Work upwind. Increase ventilation. Avoid dust formation. Personnel involved in the clean-up should wear full protective clothing; self-contained breathing apparatus may be needed for prolonged periods of exposure.

| | |
|---|---|
| **Environmental Precautions:** | Do not allow product to enter drains, sewers, waterways or soil. If contamination of drains has occurred, advise the local emergency services. |
| **Methods and Materials for Containment and Clean Up:** | Carefully vacuum or sweep up spill and place in suitable containers for reuse or disposal. For large spills notify local emergency services. |

## 7. HANDLING AND STORAGE

| | |
|---|---|
| **Precautions for Safe Handling:** | Ensure an eye bath and safety shower are available and ready for use. Use only in a well-ventilated area. Avoid inhalation of dusts, and skin or eye contact. Wear appropriate protective equipment to prevent inhalation, skin and eye contact when mixing and using. Ensure a high level of personal hygiene is maintained when using this product, that is, always wash hands before eating, drinking, smoking or using the toilet. Keep containers sealed when not in use. |
| **Container Type:** | Packaging must comply with requirements of Hazardous Substances (Packaging) Regulations 2001. Store in original packaging as approved by manufacturer. Bags would be suitable. |
| **Conditions for Safe Storage, including any Incompatibles:** | Air and moisture sensitive. Store in a cool, dry, well-ventilated area out of direct sunlight and away from heat, sources of ignition, oxidizing agents and acids. Do not place near structural steel. Avoid dust formation. Keep containers closed when not in use and securely sealed and protected against physical damage. Inspect regularly for deficiencies such as damage or leaks. Do not store with any foodstuffs. |

## 8. EXPOSURE CONTROLS

**Control Parameters:**

| | |
|---|---|
| National Exposure Standards: | Aluminium Sulphate: No specific exposure standard.<br>Aluminium soluble salts (as Aluminium): AU OEL: 2 mg/m$^3$. |
| Biological Limit Values: | No data available |

| | |
|---|---|
| **Appropriate Engineering Controls:** | Select suitable materials for the construction of storage tanks, containers, pipe valves and fittings. Ensure adequate ventilation using a combination of natural and local or general exhaust as appropriate.<br><br>Where dust is generated, particularly in enclosed areas, a local exhaust ventilation system, drawing dust away from workers' breathing zone is required. Keep containers closed when not in use in a well-ventilated area. |
| **Individual Protection Measures, such as Personal** | **Respirator:** If engineering controls are not effective in controlling airborne exposure then an approved respirator with a |

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| | | |
|---|---|---|
| **Protective Equipment (PPE):** | | replaceable particulate/dust filter should be used. |
| | **Eyes:** | Chemical splash goggles or safety glasses with side shields and a full-face shield as appropriate should be used. |
| | **Hands:** | Wear elbow-length gloves of impervious material, PVC or rubber should be suitable. |
| | **Clothing:** | Protective cotton overalls, buttoned at the neck and wrists. |

After using this product always wash hands before smoking, eating, drinking or using the toilet. Wash contaminated clothing and other protective equipment before storage or re-use.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Core Information**

| | |
|---|---|
| **Appearance:** | White lustrous crystals, granules or white powder. This anhydrous salt is hygroscopic (absorbs moisture from the air). |
| **Formula:** | $Al_2(SO_4)_3$ |
| **Odour:** | Odourless. |
| **pH** (1% w/w solution in water): | 3.7 |
| **Vapour Pressure:** | No data available. |
| **Vapour Density:** | No data available. |
| **Melting Point:** | 770°C (Decomposes). |
| **Freezing Point:** | N/A |
| **Solubility (in Water):** | 50% w/w. |
| **Specific Gravity:** | 2.71 (at 25°C). |
| **Flash Point:** | N/A. |
| **Flammability Limits (as Percent Volume in Air):** | **Lower Explosive Limit** N/A.<br>**Upper Explosive Limit** N/A. |
| **Ignition Temperature:** | No data available. |

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**Additional Information**

| | |
|---|---|
| **Specific Heat Value:** | No data available. |
| **Particle Size:** | No data available. |
| **Volatile Organic Compounds Content (VOC):** | No data available. |
| **Viscosity:** | No data available. |
| **Percent Volatile:** | No data available. |
| **Octanol/Water Partition Coefficient:** | No data available. |
| **Saturated Vapour Concentration:** | No data available. |
| **Additional Characteristics:** | Insoluble in alcohol. |
| **Flame Propagation/Burning Rate of Solid Materials:** | No data available. |
| **Properties that may Initiate or Contribute to the Intensity of a Fire:** | No data available. |
| **Potential for Dust Explosion:** | No data available. |
| **Reactions that Release Flammable Gases or Vapours:** | No data available. |
| **Fast or Intensely Burning Characteristics:** | No data available. |
| **Non-Flammables that Could Contribute Unusual Hazards to a Fire:** | No data available. |
| **Release of Invisible Flammable Vapours and Gases:** | No data available. |
| **Decomposition Temperature:** | No data available. |
| **Evaporation Rate:** | No data available. |

## 10. STABILITY AND REACTIVITY

| | |
|---|---|
| **Reactivity:** | Reacts with alkali. |
| **Chemical Stability:** | Stable under normal conditions of storage and handling. |
| **Possibility of hazardous Reactions:** | Reacts with water to produce corrosive sulphuric acid. |
| **Conditions to Avoid:** | Air and moisture sensitive. Keep containers sealed. |

LIQUID ALUM – GRANULATED ALUM – SULPHURIC ACID – CAUSTIC SODA – FERRIC SULPHATE

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| | |
|---|---|
| **Incompatible Materials:** | Avoid contact with mild steel. Keep away from all foodstuffs. |
| **Hazardous Decomposition Products:** | Hazardous decomposition products include oxides of sulphur. |

## 11. TOXICOLOGICAL INFORMATION

**Toxicity Data**

| | |
|---|---|
| **LD50:** | 6207 mg/kg (mouse, oral). |
| **LD50:** | 1930 mg/kg (rat, intrapertioneal). |
| **Neurotoxicity:** | Injection of aluminium salts directly into the brain of animals caused functional and structural damage. |
| **Inhalation:** | Prolonged inhalation of 2 to 4 mg/m$^3$ of aluminium sulphate caused scarring of upper lung tissue. |

**Acute (short term)**

| | |
|---|---|
| **Ingestion:** | May be harmful if swallowed. May cause abdominal pain, nausea and vomiting. Concentrated solutions (over 20%) can cause burns of the mouth, bleeding stomach, incoordination, muscle spasms and kidney damage. |
| **Eye:** | Dusts can cause irritation and inflammation to the eyes. Eye contact will cause tearing, stinging, blurred vision, and redness. Corneal injury may occur if not washed off immediately. Concentrated solutions may cause severe eye damage. |
| **Skin:** | Dust and concentrated solutions can cause irritation especially to open cuts and wounds. Skin contact will cause redness and itchiness. |
| **Inhalation:** | Dust forms sulphuric acid in contact with moisture in air or in tissues; they can cause sore throat, coughing and irritation of nose and throat. High dust concentrations may cause congestion and constriction of airways. |

**Chronic (long term)**

| | |
|---|---|
| **Skin:** | Repeated or prolonged exposure may cause irritation and numbing of the fingers. |
| **Ingestion:** | Repeated ingestion of this product may cause phosphate deficiency which can weaken bones. |

## 12. ECOLOGICAL INFORMATION

| | |
|---|---|
| **Ecotoxicity:** | No data available. |
| **Persistence and Degradability:** | No data available. |

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| | |
|---|---|
| **Mobility:** | No data available. |

**Additional Information**

| | |
|---|---|
| **Environmental Fate (Exposure):** | No data available. |
| **Bio accumulative Potential:** | No data available. |
| **Other Adverse Effects:** | Discharge into the environment must be avoided. Avoid contaminating waterways, drains and sewers. |

## 13. DISPOSAL CONSIDERATIONS

| | |
|---|---|
| **Disposal Methods:** | Dispose of in accordance with all local, state and federal regulations. Refer to appropriate State Waste Disposal Authority. Observe local regulations. After dilution and careful neutralisation, approved liquid waste land fill site may be suitable. |
| **Special Precautions for Landfill or Incineration:** | No data available. |

## 14. TRANSPORT INFORMATION

| | |
|---|---|
| **UN Number:** | None allocated. |
| **UN Proper Shipping Name:** | Aluminium Sulphate. |
| **Dangerous Goods Class:** | None allocated. |
| **Subsidiary Risk:** | None allocated. |
| **Packaging Group:** | None allocated. |
| **Special Precautions for User:** | Irritant. |
| **Hazchem Code:** | N/A. |

## 15. REGULATORY INFORMATION

| | |
|---|---|
| **Poisons Schedule:** | N/A. |
| **EPG:** | N/A. |
| **AICS Name:** | Sulphuric acid, aluminium salt (3:2). |
| **Additional information:** | No data available. |

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## 16. OTHER INFORMATION

**Revision Details**

**Reason for Revision:**

| | |
|---|---|
| Version 1 | 5 year review. Updated to a new format. Additional information added. |
| Version 2 | Alignment to GHS requirements. |
| Version 3 | Reclassify according to Safe Work Australia. |
| Version 4 | GHS 7th Edition. |

**Literature References**

| | |
|---|---|
| **Chemical Rubber Company:** | Handbook of Chemistry and Physics, 85th Edition. |
| **Safe Work Australia:** | Hazardous Substances Information System (HCIS) Exposure Standards and GHS Classifications Data-Base, 7th Edition. |
| **National Transport Commission:** | Australian Code for the Transport of Dangerous Goods by Road and Rail, Volume 7. |

**Abbreviations**

| | |
|---|---|
| **CAS Number:** | Chemical Abstract Service Registry Number. |
| **GHS:** | Globally Harmonized System of Classification and Labelling of Chemicals. |
| **EPG:** | Emergency Procedure Guide. |
| **LD50:** | Lethal Dose 50%: The lowest concentration at which approximately 50% of test animals will die when given the specified dose by mouth. |
| **ADG Code:** | Australian Code for the Transport of Dangerous Goods by Roa Volume 7. |
| **AICS Name:** | Australian Inventory of Chemical Substances Name. |
| **OEL:** | Occupational Exposure Level. |
| **N/A:** | Not Applicable. |

Text

Description automatically generated

**Disclaimer**

This Safety Data Sheet is offered solely for information, consideration and investigation to determine the suitability of various health and safety precautions as may be required under the user's specific conditions and processes. All such conditions and processes are beyond the control of Omega Chemicals.

The information contained herein is based on data available to Omega Chemicals from both our own technical sources and recognised published references and is believed to be both accurate and reliable. Omega Chemicals however provides no warranties, either expressed or implied, and assumes no responsibility for the accuracy or completeness of this information.

Omega Chemicals reserves the right to revise this Safety Data Sheet as information becomes available. The user has the responsibility, by making contact with this company or otherwise to make certain the Safety Data Sheet is the latest issue.



**DOCUMENT END**

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