Base Load Power Hub (BLPH)

# TDS - Ultra Filtration Unit - A 50005

Document Number: 123A90-DDL-MAC-DS-50021

Document Class: 2

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| 01 | 12/06/2024 | Accepted for Construction (AFC) | F.Mura | M.Marchetti | D.Lo Sterzo |
| 00 | 14/11/2023 | Issue for Review (IFR) | F.Mura | M.Marchetti | D.Lo Sterzo |
| Rev. | Date | Description | Prepared | Reviewed | Approved |
| | | | | | |


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## Revision / Change Log

| Rev. | Description |
|---|---|
| 00 | ISSUE FOR REVIEW (IFR) |
| 01 | ACCEPTED FOR CONSTRUCTION (AFC) |
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## HOLDS LIST

| No. | Description |
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## General Notes

1) The Ultra Filtration Package also has CIP facilities (to be defined by the package vendor) which refresh the filters. The necessary chemicals required for CIP functionality will be provided by the vendor, and is utilised to in adequate quantities such that restocking during BLPH's 2-year life will not be required. The Ultrafiltration Package is sized to provide nominally 2.0 Sm3/h The ultrafiltration unit is designed to remove all particulates above 0.02- of filtered sea water to meet the demand of the downstream Desalination System. 0.05 µm. The Ultrafiltration Unit has the ability to self-clean via backwash when necessary (i.e. when the pressure drop across it is above the acceptable threshold or the flow through the filter decreases beyond acceptable bounds). This backwash will be disposed via the Brine Discharge Caisson

2) The Ultrafiltraion Unit is includd in the Water Treatment Package A-50000 (WTP) 1

3) WTP Supplyer is the sole responsible of the quality of the final product "Fresh Water" which characteristics shall cope requirements of K559-2254-PM-PLN-003, para 8.3.2 Fresh Water Quality. 1
Said the above, WTP Supplier shall properly select the Ultra Filtration, or equivalent device and fill-in the present data sheet

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APPLICABLE TO: ○ PROPOSAL ● PURCHASE ○ AS BUILT
FOR CROSSWIND UNIT WATER SYSTEM
SITE BLPH - Hollandse Kust Noord (HKN)
SERVICE SEA WATER ULTRA FILTRATION
MANUFACTURER _____ SERIAL NO. _____
NOTE: INFORMATION TO BE COMPLETED BY: ○ PURCHASER ■ MANUFACTURER ☒ PURCHASER OR MANUFACTURER

## OPERATING DATA

○ SOURCE SEA WATER COARSE FILTER PACKAGE
○ NBR OF UNITS _____ ○ REDUNDANCY _____
○ WATER TEMPERATURE: MIN: 1.3 (°C) MAX: 22.6 (°C)
○ FLOW- (each unit) NORMAL DESIGN
SUPPLY: ○ _____ (m³/h) ○ _____ (m³/h)
PRODUCT: ○ _____ (m³/h) ● 2.03 (m³/h)
PRESS: ○ FEED _____ (barG) ○ PRODUCT 7.5 (barG)
○ BACKWASH _____ (barG)
TURBIDITY NORMAL DESIGN
SUPPLY: ○ _____ NTU ○ _____ NTU
PRODUCT: ○ _____ NTU ○ _____ NTU
○ Electrical Area Class: ○ CL _____ ○ Div _____
○ Gr _____ ○ Unusual Conditions _____

## SUPPLIERS SCOPE

| | |
|---|---|
| ○ INLET STRAINERS | ○ FEED PUMPS |
| ○ MEMBRANE SKIDS | ○ CLEANING SLID |
| ○ ON -SKID PIPING AND VALVES | ○ INTERCONNECTING PIPING |
| ○ BACKWASH SKID | ○ BACKWASH PUMPS |
| ○ BACKWASH TANK | ○ INSTRUMENTS AND CONTROLS |
| ○ POST-TREATMENT SYSTEMS | ○ Other |
| ○ _____ | |

## GUARANTEE CONDITIONS

○ MEMBRANE _____ years _____
○ PROD. WATER TURBIDITY - MAX. _____ NTU

## SUPPLIER DESIGN BASIS

UF PERFORMANCE
☐ FLUX RATE _____ (l/m²/hr) ☐ RECOVERY _____ (%)
☐ FEED RATE _____ (m³/h) ☐ BACKWASH RATE _____ (m³/h)
☐ FEED PRESS _____ (barG) ☐ BACKWASH PRESS. _____ (barG)
☐ BACKWASH INTERVAL _____ (min) ☐ BACKWASH WASTE _____ (m³)
☐ BACKWASH DURATION _____ (min)
☐ CLEANING INTERVAL _____ (min) ☐ CLEANING WASTE _____ (m³)
☐ CLEANING DURATION _____ (min)

## MEMBRANE

☒ ELEMENT TYPES ☒ MF ☒ UF
☒ MEMBRANE MATERIAL
○ CONFIGURATION ☒ DEAD END ☒ CROSS FLOW
☒ HORIZONTAL ☒ VERTICAL
☒ LENGTH _____ (mm) ☐ DIAMETER: _____ (mm)
☒ AREA / ELEM _____ (m²) ☐ MODEL NUM. _____
☐ NUM. REQUIRED: _____ ☐ NBR/PV _____

## CHEMICAL INJECTION

| | | | | |
|---|---|---|---|---|
| ☒ COAGULANT | | | | |
| ☒ ACID | ☒ FEED | ☒ BACKWASH | ☒ CLEANING | |
| ☒ CAUSTIC | ☒ FEED | ☒ BACKWASH | ☒ CLEANING | |
| ☒ NaOCl | ☒ FEED | ☒ BACKWASH | ☒ CLEANING | |
| ☒ OTHER | ☒ FEED | ☒ BACKWASH | ☒ CLEANING | |

## ELEMENT HOUSING DETAILS

☐ MANUFACTURER: _____
○ ASME DESIGN ○ ASME CODE STAMP REQUIRED
○ FEED PIPING CONNECTION - ○ END ○ SIDE
○ MATERIAL OF CONSTRUCTION _____ ☐ DESIGN TEMP: _____ (°C)
☐ LENGTH _____ (mm) ☐ HYD TEST PRESS: _____ (barG)
☐ DESIGN PRESS: _____ (barG)

1) WTP Supplier to fill in this page

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## MECHANICAL COMPONENTS

**STRAINER**
- ○ ITEM NUMBER ____ ○ NUMBER OF UNITS ____
- ☐ MANUFACTURER / MODEL NO.: ____
- ☐ DIFF. PRESSURE CLEAN: ____ (bar) DIRTY: ____ (bar)
- ☐ MESH SIZE ____ micron ☐ DIAMETER ____ (mm)
- MATERIALS OF CONSTRUCTION:
- ◯ HOUSING: ____ ◯ STRAINER ____
- BACKWASH ◯ AUTOMATIC ◯ MANUAL
- STRAINER VALVES REQUIRED: ○ VENT ○ DRAIN ○ ISOLATION

**PIPING AND VALVES**

| PIPING | MATERIAL | MATERIAL SPECIAL R'QMTS |
|---|---|---|
| ◯ FEED | | |
| ◯ PRODUCT | | |
| ◯ BACKWASH | | |
| ◯ CLEANING | | |

**RELIEF VALVES**
- ☐ NUMBER PROVIDED: ____ ☐ SET PRESSURE: ____ (psig)
- ☐ MANUFACTURER / MODEL NO.: ____
- ☐ MATERIALS OF CONSTRUCTION:

| VALVES | TYPE | SIZE | M or A | RATING | SPECIAL |
|---|---|---|---|---|---|
| ◯ STRAINER | | | | | |
| ◯ INLET | | | | | |
| ◯ OUTLET | | | | | |
| ◯ BACKWASH | | | | | |
| ◯ CLEANING | | | | | |
| ◯ | | | | | |
| ◯ | | | | | |

◯ **CONNECTIONS**

| | | NO. | SIZE | RATING / FACING / TYPE |
|---|---|---|---|---|
| a | SUPPLY | | | |
| b | PRODUCT | | | |
| c | BACKWASH | | | |
| d | CLEANING | | | |
| e | DRAIN | | | |
| f | | | | |
| g | | | | |
| h | | | | |
| i | | | | |

**UNIT DIMENSIONS AND WEIGHTS**

| DIMENSION (L x W x H) | WEIGHT (SHIP/OPER) |
|---|---|
| ☐ MEMBRANE SKID (ea) (mm) | ☐ MEMBRANE SKID (ea) (kg) |
| ☐ B'WASH SKID (mm) | ☐ B'WASH SKID (kg) |
| ☐ CLEAN. SKID (mm) | ☐ CLEAN. SKID (kg) |
| ☐ ACCESSORIES (mm) | ☐ ACCESSORIES (kg) |
| ☐ | |
| ☐ | |

**SUPPLY PUMP(S)** ○ SPEC ____
- ○ ITEM NUMBER ____ ○ NUMBER OF PUMPS ____
- ☐ MANUFACTURER / MODEL NO.:
- ◯ TYPE: ____ ☐ MULTI-STAGE ____ #
- ☐ RATED FLOW: ____ (m³/h) ☐ HEAD: ____ (m)
- ◯ MATERIALS OF CONSTRUCTION: ____

**MOTOR** ○ SPEC ____
- ○ ITEM NUMBER ____
- ◯ MANUFACTURER: ____
- ☐ POWER ____ (kW) ☐ SPEED ____ (rpm) ☐ SERV. FACTOR ____
- ☐ FRAME SIZE ____ ☐ ENCLOSURE ____
- ○ VOLTS ____ (V) PHASE ____ HERTZ ____

**BACKWASH PUMP** ○ SPEC ____
- ○ ITEM NUMBER ____ ○ NUMBER OF PUMPS ____
- ☐ MANUFACTURER / MODEL NO.:
- ◯ TYPE: ____ ☐ MULTI-STAGE ____ #
- ☐ RATED FLOW: ____ (m³/h) ☐ HEAD: ____ (m)
- ◯ MATERIALS OF CONSTRUCTION: ____

**MOTOR** ○ SPEC ____
- ○ ITEM NUMBER ____
- ◯ MANUFACTURER: ____
- ☐ POWER ____ (kW) ☐ SPEED ____ (rpm) ☐ SERV. FACTOR ____
- ☐ FRAME SIZE ____ ☐ ENCLOSURE ____
- ● VOLTS ____ (V) PHASE ____ HERTZ ____

**ACCESS TO INSTRUMENTS, VALVES AND MANWAYS**
- ○ Specification ____ ○ MANUFACTURER'S STANDARD
- ☐ PLATFORM ☐ WIDTH ____ (mm) ☐ LENGTH ____ (mm)
- ☐ FLOORING ☐ OPEN GATE ☐ CHECKER PLATE
- ☐ HANDRAILS, KNEE RAILS, TOE PLATE
- ☐ LADDER (W/ DROP GATE) ☐ CAGED LADDER ☐ STAIRS
- ☐ SIDE STEP OFF ENTRY ☐ STEP THROUGH ENTRY

**MISCELLANEOUS**
- ○ INSPECTION ○ HYDROTEST
- ○ SPOT RAD. (PER CODE) ○ SPOT RADIOGRAPHY (PER CODE)

**PAINTING / COATING**
- ○ Specification ____ ○ Manufactures Standard

| | EXTERNAL | INTERNAL |
|---|---|---|
| Surface Preparation | | |
| Prime Coat | | |
| Finish Coat | | |

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## Control Panel and Instrument Data Sheet

Scope of Supply

○ PLC, operating software, and instrumentation only (DCS Control) ○ Instrument only
○ Complete Control System including: _____ ○ Other: _____

Operator Panel (MMI)

○ Location ○ Outdoors ○ Sheltered ○ Indoors ○ Mounting ○ Free Standing Console ○ Console Mount
○ Proximity to Demin Unit ○ With the Unit ○ Local Control room ○ Main Control room
Communication with PLC: ☐ **Profinet** ☐ Integral ☐ Hard-wired **with Safety System**
CRT Display: ☐ Screen Size _____ ☐ High Resolution ☐ Colour Graphics ☐ Keyboard Type
CONSOLE: ○ IEC Rating **IP 31 min.** Material **AISI 316**
☐ Dimension s ☐ Length _____ (mm) ☐ Width _____ (mm) ☐ Height _____ (mm)
☐ Weight _____ (kg) ☐ Wall Thickness _____ (mm)
☐ Electrical Load ☐ Power _____ (kW) ○ Volts 230 ○ Phase 1+N+PE ○ Hertz 50
○ Special Provisions ○ Sun & rain shield for display ○ See-through door for display ○ Printer
○ Air conditioner ○ Heater

Programmable Logic Controller (PLC)

☐ Manufacturer _____ ☐ Model No. _____ ○ Location ○ Outdoors ○ Sheltered ○ Indoors
○ Proximity to Unit ○ With the Unit ○ Local Control room ○ Main Control room ○ Other _____
☐ I/O Information

| | Inputs | | Outputs | |
|---|---|---|---|---|
| | Required | Wired Spare | Required | Wired Spare |
| ☐ analog (4-20mA DC) | | | | |
| ☐ discrete (120 VAC) | | | | |
| ☐ discrete (24 VDC) | | | | |
| ☐ isolated discrete (120 VAC, triac) | | | | |
| Total | | | | |

☐ Communication with Operator Console: ☐ RS-232 Port ☐ Integral ☐ Hard Wired
☐ Communication with main DCS: ☐ RS-232 Port ☐ Integral ☐ Hard Wired
☐ Electrical Load ☐ Power _____ (kW) ○ Volts 230 ○ Phase 1+N+PE ○ Hertz 50
☐ Enclosure ○ IEC Rating _____ ☐ Material _____
☐ Dimension s ☐ Length _____ (mm) ☐ Width _____ (mm) ☐ Height _____ (mm)
☐ Number of Compartment _____ ☐ Weight _____ (kg) ☐ Wall Thickness _____ (mm)
◯ Terminal Block Mfr. _____ ☐ Type ☐ Number
○ Special Provisions ○ Ventilation fan ○ Air conditioner ○ Heater
○ Screen and filter ○ Louvers ○ Rain shield over access door
○ Redundant CPU ○ UPS ○ Programming device & software
○ Internal fluorescent lights ○ Light Switch ○ Convenience outlet

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Control Panel and Instrument Data Sheet

DESIGN, MANUFACTURE, AND TESTING SHALL CONFORM TO KBR SPECIFICATION:

Locally Mounted Analysers and Instruments — Electrical Classification ○ CL ○ Div ○ Gr ○ Unclassified

| | ◯ Manufacturer | ☐ Model No | ☐ Qty | ○ Location of Monitoring Points |
|---|---|---|---|---|
| ○ Differential Pressure Transmitters | | | | |
| ○ Differential Pressure Switches | | | | |
| ○ Pressure Transmitters | | | | |
| ○ Pressure Indicators | | | | |
| ○ Temperature Indicators | | | | |
| ○ Temperature Transmitters | | | | |
| ○ Flow Transmitters | | | | |
| ○ Flow Indicators | | | | |
| ○ Level Transmitters | | | | |
| ○ Turbidity Analysers | | | | |
| ○ Conductivity Analysers / Transmitters | | | | |
| ○ pH Analysers / Transmitters | | | | |
| ○ TOC Analysers | | | | |

Control Strategies and Interfaces

○ Service Flow Control — ○ External (by purchaser) Product tank inlet flow regulated by level control; ○ Internal (by supplier) Individual unit effluent valves regulated independently

○ Low Flow Control System: — ○ None; ○ Recirculation

○ Cleaning System Control: — ◯ By, ◯ Manual — Supplied by : ○ Purchaser ○ Supplier

○ Emergency Shutdown: _____

○ Panel Testing: _____

**NOTES:**

**Instruments shall be explosion-proof EEx(d)-certified and be suitable for use in hazardousarea zone 2, gas group 2C (or 2B+H2), Temperature Class T1 max.sui**

**Instrumentation 4-20mA shall be 24 Vdc loop powered Smart HART Revision 7**

**instrumentation that is part of the SIS, including final elements (e.g., valves), shall, as a minimum, be certified for use in a Safety Integrity Level (SIL) 2 SIF with a mi**

**of two of two(2) years (to be developed during HAZOP and LOPA exercises).**

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**CLEANING EQUIPMENT** (One system for the Package)

TYPE - ◯ CLEAN-IN-PLACE ◯ REMOVE FOR CLEANING

☐ NUMBER OF RO TUBES TO BE CLEANED SIMULTANEOUSLY: ____

☐ CLEANING SYSTEM FLOWRATE ____ (m³/h)

SCOPE - ○ SOLUTION TANK ○ CLEANING PUMP ○ PIPING ○ CARTRIDGE FILTER ○ CONNECTORS ○ VALVES ○ SOLUTION HEATER ○ INSTRUMENTATION ○ PLATFORM

**Cleaning Solution Tank** ○ Item Number ____

☐ Dimensions - Diameter ____ (mm) Height ____ (mm)

☐ Volume Nominal ____ (m³) Working ____ (m³)

☐ Wall Thickness ____ (mm)

◯ Corrosion Allowance ____ (mm)

◯ Materials of Construction ____

**Solution Pump**

○ Item Number ____ ○ Number of Units ____

◯ Manufacturer / Model Number ____

☐ Type ____

☐ Rated Flow ____ (m³/h) ☐ Head ____ (bar)

◯ Materials of Construction ____

**Filter** ○ Item Number ____ ○ Nbr of Units ____

◯ Manufacturer / Model Number ____

○ Filter Valves Required: Vent / Drain / Isolation

○ ASME Code stamp (if required)

☐ Delta P - Clean: ____ (bar) Maximum: ____ (bar)

☐ Filter Removal Rating ____ micron

◯ Materials of Construction Housing: ____ Element: ____

**Motor**

○ Item Number ____

◯ Manufacturer ____

☐ Power ____ ☐ Speed ____ (rpm) ☐ Service Factor ____

☐ Frame size ____ Enclosure ____

○ Volts ____ (V) ○ Phase ____ ○ Hertz ____

**Cleaning Solution Immersion Heater**

○ Item Number ____ ○ Number of Units ____

☐ Manufacturer / Model Number ____

☐ Heat Duty: ____ (kW) ☐ Flux Density: ____ (W/in²)

☐ Mounting: ____ ☐ Enclosure ____

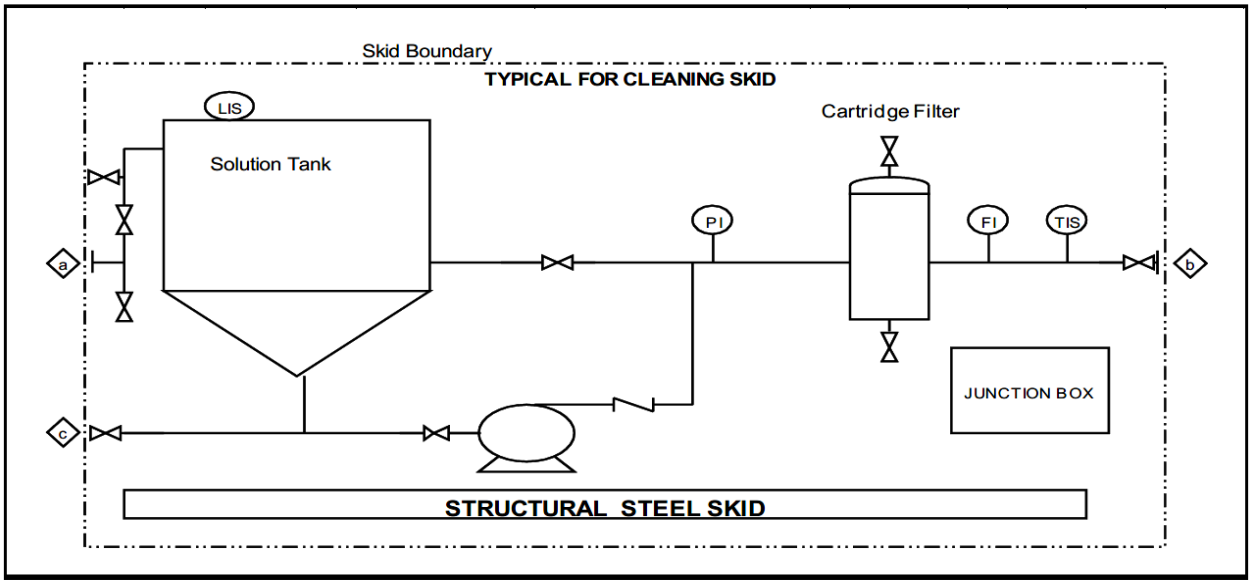
☐ Thermostat ☐ Temperature Control Range: ____

○ Volts ____ (V) ○ Phase ____ ○ Hertz ____

☐ Materials of Construction

| Instruments | Location | Manufacturer |
|---|---|---|
| ◯ Flow Indicator | Filter Discharge | |
| ◯ Pressure Gauge | Pump Discharge | |
| ◯ Level Indicating Switch | Tank | |
| ◯ Thermometer | Tank | |
| ◯ Temp. Indicating Switch | Tank | |

| Miscellaneous | TYPE | MATERIAL | DESCRIPTION | SPECIAL REQUIREMENTS | Connections | | NO. | SIZE | RATING | FACING | TYPE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ◯ PIPING | | | | | a | INLET | | | | | |
| ◯ VALVES | | | | | b | OUTLET | | | | | |
| ◯ CONNECTORS | | | | | c | CONC. | | | | | |




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NOTE: INFORMATION TO BE COMPLETED BY: ○ PURCHASER ☐ MANUFACTURER ◎ PURCHASER OR MANUFACTURER

DESIGN, MANUFACTURE & TESTING SHALL CONFORM TO: KBR SPECIFICATIONS: _____ OTHER: _____

NO. PUMPS REQ'D _____ NO.MOTORS REQ'D _____ ITEM NO. _____ PROVIDED BY: _____ MTD. BY _____

SERVICE _____ NO. TURBINES REQ'D _____ ITEM NO. _____ PROVIDED BY: _____ MTD. BY _____

PUMP MANUFACTURER _____ SIZE AND TYPE _____ NO.STAGES _____

SERIAL NUMBER(s)

## OPERATING CONDITIONS, EACH PUMP

○ LIQUID _____ ○ Flow Rate (m³/h) @ PT NOR. _____ RATED: _____

◎ DISCHARGE PRESSURE: _____ (barG)

○ PT, NOR (°F) _____ MAX _____ ◎ SUCT.PRESS (barG) NOR. _____ RATED: _____

○ SP.GR.AT PT _____ ◎ DIFF.PRESS (barG) NOR. _____ # _____

○ VAP.PRESS. AT PT (mbarA) _____ ◎ DIFF.HEAD (m) NOR. _____ # _____

○ VIS AT PT, (mPa-s) _____ ○ NPSHA AT BOTTOM OF BASEPLATE, (m) _____

○ CORROSION / EROSION CAUSED BY _____

◎ HYD. HP _____

## PERFORMANCE

☐ PROPOSAL CURVE NUMBER _____

☐ (rpm) _____ ☐ MIN. CONT. _____ (m³/h)

☐ EFF.-N/R _____ ☐ BHP -RATED. _____

☐ BHP RATED IMP. NOR. _____

☐ Max. Head Rated Imp. Nor. _____

☐ NPSHR (Water at Bottom of Baseplate), _____ (m)

☐ Rotation (Viewed from Coupling End) _____

☐ Suction Specific Speed _____

## CONSTRUCTION

| NOZZLES | SIZE | RATING | FACING | LOCATION | FINISH |
|---|---|---|---|---|---|
| SUCTION | | | | | |
| DISCHARGE | | | | | |

☐ **CASE** - MOUNT: ☐ HORIZONTAL: ☐ C.L. ☐ FOOT ☐ BRACKET

☐ VERTICAL ☐ INLINE ☐ PIT

- SPLIT: ☐ AXIAL ☐ RADIAL

- TYPE: ☐ VOLUTE: ☐ SINGLE ☐ DOUBLE ☐ DIFFUSER

- PRESSURE: ☐ MAWP _____ (barG) @ _____ (°C)

☐ HYDROTEST _____ (barG)

☐ **IMPELLE**I - DIAIAM: ☐ RATED _____ (m) MAX: _____ (m) MIN: _____ (m)

- TYPE: ☐ CLOSED

- SUCT: ☐ SINGLE ☐ DOUBLE

- MOUNT: ☐ BETWEEN BEARING ☐ OVERHUNG

☐ **BEARING** -TYPE / IDENTIFYING NO. -(OR SIZE)

☐ RADIAL

☐ THRUST

☐ **LUBE** ☐ FLOOD ☐ RING ☐ FLINGER ☐ PRESSURE ☐ GREASE

☐ MIST ☐ PURE ☐ PURGE

☐ **COUPLING:** MANUFACTURER: _____ MODEL: _____ SIZE: _____

SPACER LENGTH: _____

☐ RATED _____ (kW) @ _____ (rpm)

○ DRIVER HALF MOUNTED BY -

○ PUMP MANUFACTURE ○ DRIVER MANUFACTURE ○ PURCHASER

☐ **SHAFT SEALING DATA**

◎ MECHANICAL SEAL: ◎ API CLASS CODE: _____

☐ MANUFACTURER: _____ TYPE: _____

☐ MANUFACTURE CODE: _____

☐ SEAL PLAN _____

☐ **APROX WEIGHT** ☐ PUMP & BASE: _____ (kg)

☐ MOTOR: _____ (kg) TURBINE: _____ (kg)

NOTES _____

## MATERIALS

○ API 610 CLASS

◎ CASING _____

◎ IMPELLER(S) _____

◎ CASE WEAR RINGS: _____

◎ IMPELLER WEAR RINGS: _____

◎ SHAFT: _____

◎ SLEEVE: _____

◎ BASEPLATE: _____

◎ BASEPLATE TYPE: _____

○ BASEPLATE STD. NO. ○ API: _____ ○ ANSI: _____

○ BASEPLATE CONST: ○ STAND. ○ HEAVY DUTY

## AUXILIARY PIPING

○ API CW PLAN: _____ ○ CS ○ SS ○ CU ○ GALV

○ TUBE ○ PIPE ○ SIGHT FLOW

○ OUTLET SHUTOFF VALVE

☐ CW IN _____ (barG) @ _____ (°C)

☐ CW OUT _____ (barG) @ _____ (°C)

☐ FLOW PER PUMP _____ (m³/h)

○ MAX ALLOW DP _____ (barG)

○ PRIMARY SEAL FLUSH PLAN _____

○ PRI. PIPING ○ CS ○ SS ○ TUBE ○ PIPE

○ SEC. PIPING ○ CS ○ SS ○ TUBE ○ PIPE

○ EXTERNAL SEAL FLUSH FLUID _____

_____ (m³/h) _____ (barG) TI PS FI

○ AUXILIARY SEAL QUENCH FLUID _____

_____ (m³/h) _____ (barG) _____ (°C)

○ PIPING ASSEMBLY ○ THREADED ○ FLANGED

○ SEAL WELDED ○ SOCKET WELDED

○ CASE DRAINS: SIZE: _____ (m) ○ PLUGGED ○ FLANGE

○ VENTS: SIZE: _____ (m) ○ PLUGGED ○ FLANGE

## FOR SHOP TESTS

| | REQ | WIT | OBS | BY* |
|---|---|---|---|---|
| HYDRO | ○ | ○ | ○ | |
| PERF. | ○ | ○ | ○ | |
| NPSH | ○ | ○ | ○ | |
| OTHER | ○ | ○ | ○ | |

* I : KBR INSPECTOR, E : KBR ENGINEER, C : CLIENT

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| CROSSWIND | HOLLANDSE KUST NOORD WIND PARK Project<br>Contract No. CW-I-WP4-2023-05 | ROSETTI MARINO |
|---|---|---|
| Document Title: | TDS - Ultra Filtrartion Unit | Sh. 11 of 13<br>Date : 12/06/2024<br>Rev. 01 |

Rev

Applicable to : ○ Proposal ● Purchase ○ As Built | PAGE ____ OF ____ REQ'N NO. N/A

DESIGN, MANUFACTURE & TESTING SHALL CONFORM TO SPECIFICATION :

FOR CROSSWIND | UNIT WATER SYSTEM

SITE BLPH - Hollandse Kust Noord (HKN)

SERVICE SEA WATER ULTRA FILTRATION | DRIVEN EQUIPMENT TYPE | DRIVEN EQUIP. ITEM NO.: | QUANTITY:

MANUFACTURER | MODEL: | SERIAL NO. | FRAME NO:

NOTE: INFORMATION TO BE COMPLETED BY: ○ PURCHASER ☐ MANUFACTURER ◯ PURCHASER OR MANUFACTURER

## OPERATING CONDITIONS (1)

Site Data:

○ Altitude: ○ Less than ____ ○ Other ____ (m)

○ Ambient Temperature: Min/Max ____ / ____ (°C)

Electrical Characteristics:

○ Volts 400 ○ Phase 3 ○ Hertz 50

Starting Voltage: ○ Full ○ Reduced ____ %

○ Volt Dip +10/-20 % ○ Loaded ○ Unloaded

Installation: ○ Indoor ○ Outdoor

Operating Mode ○ Continuous ○ Standby ○ Intermittent ○ Alter.

Electrical Area Classification ____ ○ Unclassified

○ Class ____ ○ Group ____ ○ Division ____

○ Unusual Conditions ○ Dust ○ Fumes

○ Gasses/Vapours ____

○ Ignition Temp ____ (°C) ○ Temperature Code ____

## PERFORMANCE

Nameplate Power ____ (kW) ____ (rpm)

| Load | Current (AMPS) | Efficiency | Power Factor |
|---|---|---|---|
| Full | | | |
| 75% | | | |
| 50% | | | |
| Locked Rotor | | | |

☐ No Load Current: ____ (A)

☐ Starts per Hour: ____ Hot ____ Cold

☐ Full Load Torque: ____ (N-m)

☐ L. R. Torque: ____ %FLT

☐ Breakdown Torque: ____ %FLT

☐ Acceleration Time: ____ (sec)

## CONSTRUCTION FEATURES

Enclosure ○ TEFC ○ WP1 ○ WP2 ○ Explosion Proof ○ Other

Insulation Class ○ B ● F ○ Other ○ Non-Hygroscopic ○ Tropicalized

○ Temperature Rise: ____ (°C) Above ____ (°C) By: ____ @ ____ S.F.

○ NEMA Torque Design ○ A ○ B ○ C ○ D

◯ Locked rotor kVA Code ____

Mounting

○ Horizontal ○ Foot Mounted ○ Flange Mounted

○ Vertical ○ Shaft Up ○ Shaft Down ○ With Canopy

Coupling

○ Supplied By ____ ○ Mounted By ____

○ Suitable for Belt Drive

Bearing type ☐ Ball ☐ Roller ☐ Sleeve

Bearing Lubrication ◯ **Grease** ◯ **Ring Oil** ○ **Oil Mist**

Grease Fitting ◯ **Plugged** ○ **Alemite** ○ **Other**

Bearing Shielding ◯ Single ◯ Double ◯ Sealed for Life

Motor Rotation (facing end opposite shaft extension)

○ CW ○ CCW ○ Bidirectional

Fan ○ Reversible ○ Unidirectional

○ Non-Sparking ○ Aluminium ○ Non-Metallic

Main Terminal Box Location ◯ F-1 ◯ F-2

○ Space Heate **(2)** ☐ ____ (kW)

○ Volts 230 ○ Phase 1P+N+PE ○ Hertz 50

○ Max. Sheath Temperature ____ (°C)

○ Winding Temperature Detectors

○ No. per Phase ____ Type: RTD

○ Bearing temperature Detectors

○ Location ____ Type: ____

○ Separate JB for Space Heaters, Winding/Bearing Detectors

○ Adjustable Frequency Drive

◯ Speed range: From ____ (rpm) to: ____ (rpm)

Materials of Construction

◯ Frame

◯ Junction Box

○ Copper Bar Rotor

○ Stainless Steel Filters

○ Differential Pressure Switch for Inlet Filters

○ Vertical Jackscrews

Ground Connection

○ Drilled and tapped Hole in Conduit Box

○ Ground Lug ☐ Size ____ (mm)

Motor Thrust Load ○ None ○ ____ (N)

Thrust Direction ○ Toward ○ Away

☐ Motor Thrust Rating

Nameplate Material ○ 316 SS ○ Other

## TESTING & MISCELLANEOUS

| Testing | Required | Witness |
|---|---|---|
| Routine Test | ○ | ○ |
| Complete Test | ○ | ○ |
| Noise Test | ○ | ○ |
| Certified Results | ○ | ○ |

☐ Weight Net ____ (kg) Shipping ____ (kg)

Painting ○ Mfr. Std. ○ Other ○ IEEE 841

Noise Design

○ Max sound Pressure Level @ ____ (m) ____ dBA

☐ Expected Sound Pressure Level @ ____ (m) ____ dBA

Notes:

**(1)** Refer to pump DS

**(2)** Vendor to installspace heater if necessary according to enviromental conditions (Ref. IOGP S-703 par. 11.3.6.1)

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## OPERATING CONDITIONS

Service _____

Temperature _____ (°C)

Source of Water _____

Type of Water Treatment _____

Intermediate 1 =

Intermediate 2 =

Intermediate 3 =

## WATER ANALYSIS

| Constituent | | | Water In | Intermediate 1 | Intermediate 2 | Intermediate 3 | Product Water |
|---|---|---|---|---|---|---|---|
| Calcium | (Ca) | (ppm) | | | | | |
| Magnesium | (Mg) | (ppm) | | | | | |
| Sodium | (Na) | (ppm) | | | | | |
| Potassium | (K) | (ppm) | | | | | |
| Total Cations as CaCO3 | | (ppm) | | | | | |
| | | | | | | | |
| Bicarbonate | ($HCO_3$) | (ppm) | | | | | |
| Carbonate | ($CO_3$) | (ppm) | | | | | |
| Hydroxide | (OH) | (ppm) | | | | | |
| Chloride | (Cl) | (ppm) | | | | | |
| Sulphate | ($SO_4$) | (ppm) | | | | | |
| Phosphate | ($PO_4$) | (ppm) | | | | | |
| Nitrate | ($NO_3$) | (ppm) | | | | | |
| Total Anions as CaCO3 | | (ppm) | | | | | |
| | | | | | | | |
| | | | | | | | |
| Total Hardness | | (ppm) | | | | | |
| Phenolphthalein Alkalinity | | (ppm) | | | | | |
| Methyl Orange Alkalinity | | (ppm) | | | | | |
| Total Alkalinity as CaCO3 | | (ppm) | | | | | |
| Iron (Total) | | (ppm) | | | | | |
| Copper (Total) | | (ppm) | | | | | |
| Manganese | | (ppm) | | | | | |
| Aluminium | | (ppm) | | | | | |
| | | | | | | | |
| Carbon Dioxide, Free | | (ppm) | | | | | |
| Silica | | (ppm) | | | | | |
| | | | | | | | |
| Turbidity | | NTU | | | | | |
| Total Suspended Solids | | | | | | | |
| Colour | | Hazen | | | | | |
| Chlorine, Free | | (ppm) | | | | | |
| pH (@ 25°C) | | Units | | | | | |
| Conductivity | | µmhos/cm | | | | | |
| Total Dissolved Solids | | (ppm) | | | | | |
| Total Organic Carbon as TOC | | (ppm) | | | | | |
| Langelier Index | | | | | | | |
| Ryznar Index | | | | | | | |
| Oily Matter | | (ppm) | | | | | |

Notes

1) Blank cells to be filled by supplier according to the expected perfrmances to achieve Fresh Water characteristisc according to K559-2254-PM-PLN-003, para 8.3.2 Fresh Water Quality

Rev 1 1

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## OPERATING CONDITIONS

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Temperature _____ (°C)

Source of Water _____

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Intermediate 2 =

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| Aluminium | | (ppm) | | | | | |
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