Base Load Power Hub (BLPH)

Technical Specification for Water Treatment Package

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Attachment 2	Compliance Status
Attachment 3	ATEX Register
Attachment 4	Master TAG Register

1 INTRODUCTION

1.1 PROJECT OVERVIEW

Crosswind, a Shell and Eneco joint venture, was awarded the tender to develop the offshore Hollandse Kust Noord (HKN) wind farm, located 18.5km off the coast of Netherlands near the town of Egmond aan Zee. The consortium plans to have HKN operational in 2023 with an installed capacity of 759MW generating at least 3.3TWh per year. This is sufficient renewable power to supply more than 1 million Dutch households with green electricity.

Offshore wind farms produce intermittent electricity and balancing these dips and peaks and integrating this electricity into the national energy system requires new technologies. For this reason, the offshore wind farm will include several new technologies that could be implemented at full-scale in the future. The new technologies being explored include a floating solar park, a short-duration battery storage as well as long-term storage via green hydrogen produced by water electrolysis and subsequently consumed in a fuel cell. The combination of these individual measures, herein referred to as the Base Load Power Hub (BLPH) will ensure a continuous power supply regardless of the wind situation.

Project Location

The Hollandse Kust Noord (HKN) wind farm is located 18.5km off the coast of the Netherlands near the town of Egmond aan Zee.

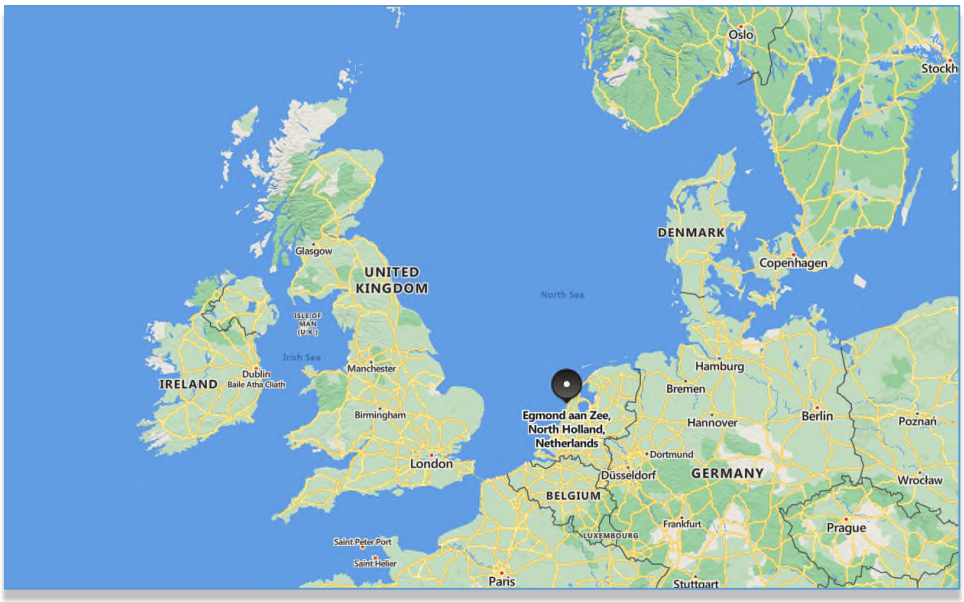


Figure 1 HOLLANDSE KUST NOORD WIND PARK Location Map

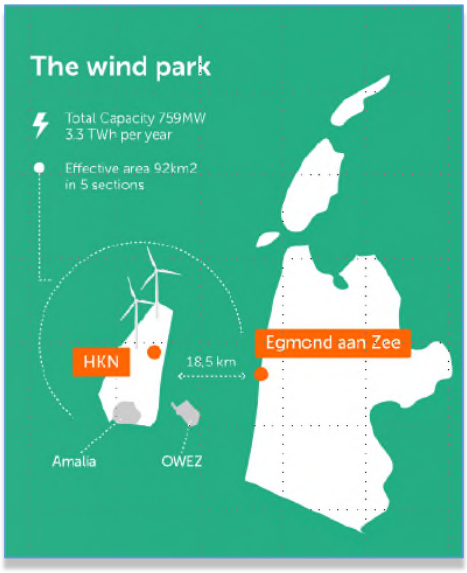


Figure 2 - Wind Park Details

The wind farm will consist of No. 69 x 11.5MW wind turbine generators each to be installed on a dedicated monopile structure. A 70th monopile located on coordinates E 590719.1, N 5841602.3 is reserved for installing the platform accommodating the BLPH. The monopile structure was designed and installed by Van Oord Offshore Wind (VooW) and therefore not part of the BLPH scope.

Project Concept

All components included in the BLPH will be integrated onshore on a topsides and installed in an offshore location within the boundaries of the HKN wind farm. At its simplest, the BLPH will store energy during periods of high electricity generation from renewable sources (a wind turbine generator and the floating solar PV farm) and release it during periods of low generation. In practice. It is expected that the energy stored will supplement generation from renewable sources to ensure that at least 1.0MW of power is exported to the electrical grid regardless of wind/solar availability.

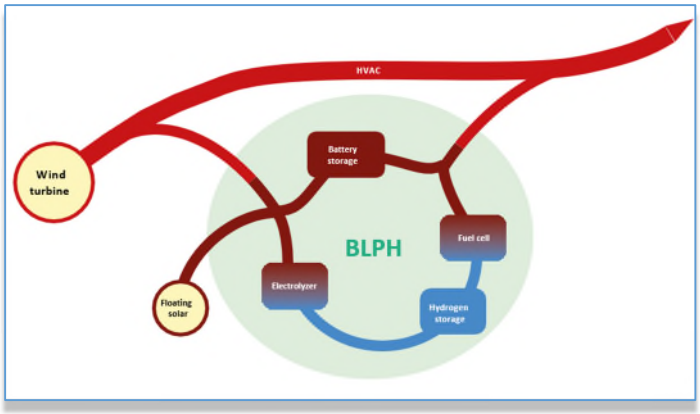


Figure 3 – BLPH Concept

Electricity in the BLPH will be stored in the form of electrons in a battery energy storage system (BESS) as well as converted into green hydrogen via water electrolysis. When the power output from the connecting wind turbine drops to below 1 MWe, the BLPH will return its stored energy to supplement the remaining power output. This will be by discharging the BESS, while stored hydrogen will be converted back into electricity using a fuel cell to extend the discharge duration.

The purpose of the BLPH s to function as a testbed for the integration of energy storage technologies with renewable generation. It is expected that equipment installed on the BLPH will operate as Normally Unmanned Installation for at least two (2) years with no or minimal maintenance and it will have its own independent control room with the ability to communicate with Crosswind's control room.

2 DOCUMENT SCOPE

This specification describes the design, manufacturing, inspection, testing and supply requirements for Water Treatment Package

The Supplier is responsible for the equipment design, quality of materials, and full compliance with the requirements of all the applicable specifications, data sheets, standards, codes, and regulations. Any deviation from the present specification shall be clearly highlighted in writing by SUPPLIER during to the Bid Phase and must be approved in writing by COMPANY/CONTRACTOR before proceeding with any kind of activity.

The package is composed, but not limited to the following items

Sea Water Coarse Filter Package - A-50003
Non-Oxidant Biocide InjectionElectro-Chlorination Unit - A-50002
Ultra Filtration Unit – A-50005
Desalination Unit - A-50007
Fresh Water Pump - P-50009 A/B
UV Water Filter - S-50010
Filtered Seawater Tank-50006
Fresh Water Tank-T-50008

Table 1 - List of Main Items

Vendor is entitled to include additional components, if deemed necessary to ensure the required quality of water, safe and trouble-free operation, low maintenance.

Vendor is also allowed to propose alternative design, on the basis of is own proven experience, that shall be demonstrated with a list of references of previous successful supplies in offshore installations.

2.1 INTERNATIONAL CODES, STANDARDS AND REGULATIONS

Applicable International Codes, Standards, Rules and Regulations, addenda are listed below:

Doc. No.	Description
ASME B31.3	Process Piping
ASME B 16.5 ed. 2020	Pipe Flanges and Pipe Fittings
ASME Section V	Nondestructive examination
2014/68/EU	Directive 2014/68/EU (PED - ''Pressure Equipment Directive'').
ISO 12944 ed. 2018	Corrosion Protection
EN 10204:2004	Metallic products - Types of inspection documents
ISO 9001	Quality Management Standard
2006/42/EC Machinery (MD)	Machinery Directive
2014/34/EU	Equipment and Protective Systems in Potentially Explosive Atmospheres (ATEX)
IEC 60079	Equipment Protection
2014/35/EU Low Voltage (LVD)	Low Voltage Directive
2014/30/EU	Electromagnetic Compatibility
2003/10/EC	Directive on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise)
API 520 Part 1	Sizing, Selection, and Installation Pressure Relieving Devices in refineries – Part 1 Sizing and Selection
API 521	Pressure-relieving and Depressuring Systems
API 526	Flanged Steel Pressure-relief Valves
IEC 60529	Degrees of Protection Provided by Enclosures (IP Code)
IEC 60534	Industrial-Process Control Valves
IEC 61508	Functional safety of electrical/electronic/programmable electronic safety-related systems
IEC 61511	Functional Safety – Safety Instrumented Systems for the Process Industry

Doc. No.	Description
IEC 62443	Cyber Security for Industrial Automation and Control Systems

Table 2 - List of Codes and Standards

The Supplier shall provide the Company/Contractor, with a detailed listing of the Codes, Standards and Regulations complied with in the Supplier's proposal.

Equivalent alternatives may be offered but shall be highlighted in the Supplier's proposal.

Any applicable local Government Regulation, including any additional production / inspection / test / certificate requirement shall be considered by SUPPLIER during Detailed Engineering Phase

2.2 DEFINITIONS

COMPANY or Client (CPY):	Crosswind
CONTRACTOR (CTR):	ROSETTI MARINO S.p.A.
PROJECT:	HOLLANDSE KUST NOORD WIND PARK Project

Table 3 - Definitions

2.3 ABBREVIATIONS

API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ATEX	ATmosphères EXplosibles
ASME	American Society of Mechanical Engineers
CAD	Computer Aided Design
CCS	Central Control System
CTR	Contractor
CP	Connecting Points
CPU Unit	Central Processing Unit
dB(A)	deci Bell (A-weighted)
EC	European Community
EEA	European Economic Area
EN	European Norms
EC	European Council
EU	European Union
GA	General Arrangement
GRP	Glass Reinforced Plastic
HART	Highway Addressable Remote Transducer

HAZOP	HAZard and OPerability analysis
HSE	Health, Safety & Environment
HDD	Hard Disk Driver
HVAC	Heating, Ventilation and Air Conditioning,
Hz	Hertz
EN	European Norms
ID	IDentification
ISO	International Standards Organisation
IT	Information Technology
IEC	International Electrotechnical Commission
ISO	International Standards Organisation
LOPA	Layer of Protection Analysis
LV	Low Voltage
LVD	Low Voltage Directive
mA	milliAmpere
MW	Mega Watt
NDE	Non-Destructive Examination
N	Neutral
PCS	Plant Control System
PE	Protective Earth
PED	Pressure Equipment Directive
P&ID	Piping & Instrumentation Diagram
PLC	Programmable Logic Control
pH	pondus Hydrogenium
PSV	Pressure Safety Valve
PWHT	Post Weld Heat Treatment
RDDS/SMIR	Required Document Data Sheet / Supplier Master Information Register
S	Separate
SIL	Safety Integrity Level
SIS	Safety Instrumented System
SOW	Scope of Work
STD	Standard
SW	Software
TCP/IP	Transmission Control Protocol/Internet Protocol
TN	Terre-Neutre
UCP	Unit Control Panel
USB	Universal Serial Bus
UV	Ultra Violet

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Vac	Volts alternating current
Vdc	Volts direct current
WPQR	Welders Performance Qualification Records
WPS	Welding Procedure Specification
dB(A)	deci Bell (A-weighted)
HVAC	Heating, Ventilation and Air Conditioning,
UV	Ultra Violet
P&ID	Piping & Instrumentation Diagram
PSV	Pressure Safety Valve
CP	Connecting Points
GA	General Arrangement
STD	Standard
CCS	Central Control System
UCP	Unit Control Panel
TCP/IP	Transmission control protocol/Internet protocol
HAZOP	HAZard and OPerability analysis
LOPA	Layer of Protection Analysis)
mA	milliAmpere
SIL	Safety Integrity Leve
PLC	Programmable Logic Control
CPU	Central Processing Unit
IT	Information Technology
SOW	Scope of Work
SW	Software
USB	Universal Serial Bus
HDD	Hard Disk Driver
CAD	Computer Aided Design
3D	Three Dimension

Table 4 - Abbreviations

3 UTILITY AND SITE DATA

The site condition requirements shall be as per Document No: K559-2254-PM-PLN-003 "Basic Design Engineering Package."

4 HAZARDOUS AREA CLASSIFICATION

The complete Unit, associated equipment and components shall be suitable for safe area (unclassified)

5 ACOUSTIC REQUIREMENTS

The Noise Level for each single equipment and/or unit shall not exceed the Noise Limit indicated below:

Noise limit: 85dB(A) max PRESSURE LEVEL at 1 m

6 DESIGN LIFE, RELIABILITY AND MAINTENANCE

The complete Unit associated equipment and components shall be designed for a minimum service life of 2 years, for outdoor operation **(*)**, generally in offshore marine environment and/or as specified on the datasheet and others applicable documents. Thus, equipment components should be of a proven design for reliability and shall require minimum maintenance.

(*) The package is intended to be installed in a container, provided with HVAC system (if Vendor deem HVAC necessary). If it is necessary to place outside the container some components, they shall comply with the above requirements.

7 SCOPE OF SUPPLY

The scope of supply shall include but not be limited to, the following:

The whole Water Treatment Package shall be embedded in a container (size 6700mm (L) x 2500mm (W) x 4500mm (H) provided with own HVAC system, if deemed necessary by vendor, and Fire and Gas Detection System.

The internal layout shall allow space for easy and safe operation of personnel during normal operation and maintenance. If necessary, a monorail shall be installed for easy handling of components.

The container shall be provided with doors and hinged openings for access of personnel and extraction of components during maintenance activities and its accessibility shall be provided on three sides.

A space shall be dedicated to storage of Chemicals.

Containers shall be provided with Junction Boxes for connection with platform electrical plant.

7.1 INCLUSIONS

unit shall be also complete of the following:

1. Interconnecting piping, equipments, instrumentation, valves mounted inside bettery limits of Water treatment skid/package
2. *VOID*
3. Electrical and instrumental cables mounted on skid
4. Cable trays and support for power and control cabling
5. Heat tracing of external components (if any)
6. Local Control panels
7. Nameplates (316L Stainless Steel)
8. Earthing system
9. Steel base-plate (skid) containing all above mentioned equipment/material and
10. Complete with drip pan with flanged drain, access grating, ladders, platforms,
11. Stairs and handrail, if necessary.

12. Coating / painting (where applicable)
13. Lifting lugs
14. Interface Junction Boxes for electrical plant
15. Interface Junction Boxes for control cables.
16. Spare parts for commissioning/start-up
17. Spare partes for 2Y operation
18. Test of the package
19. Certifications
20. Documentation

7.2 EXCLUSIONS

1. Anchor bolts
2. Installation at site
3. Commissioning and Start-up activities

7.3 OPTIONS

Vendor to quote, at separate price, also the following GRP Tanks **(*)**

- T-50006, according to DS 123A90-DDL-MAC-DS-50003
- T-50008, according to DS 123A90-DDL-MAC-DS-50004

Vendor to quote, at separate price, water analyzer to be placed after UV Water filter S-50010

The minimum requirements of the main components shall not be limited to the brief description that follows.

Vendor, according to consolidated previous experiences shall implement the components, and accessories deemed necessary for achieve water characteristics as indicated in Basic Design Engineering Package - K559-2254-PM-PLN-003, also safe and trouble-free operation, and minimize maintenance operations.

(*) In this case, also piping and valves, according to P&ID's listed in Material Requisition.

7.4 MAIN ITEMS

7.4.1 Sea Water Coarse Filter Package - A-50003

Filters design may be manufacturer's standard type. Anyhow Supplier shall follow indications included in the Sea Water Coarse Filter Package Data Sheet

The Coarse Filter Packages consist of self-cleaning automatic backwash filters. The filters will backwash Filter body

1. Quick release filter covers and knobs for easy maintenance.
2. Filter basket
3. Backwash Arm Motor

4. Junction Box
5. Differential Pressure Indicator
6. Solenoid valve at backwash inlet
7. PSV
8. Support Legs
9. All necessary instruments, valves etc. to guarantee the control and safety of equipment.

7.4.2 Electro-chlorination A-50002- [Deleted]Non-Oxidant Biocide Injection

The package shall typically include followingthe following main components. Vendor is allowed to provide components according to previous proven experiences.

1. Non-Oxidant Biocide Dosing Transformer/Rectifier
2. Non-Oxidant Biocide Dosing BlowerPump – Container Inlet
3. Non-Oxidant Biocide Dosing Pump – Sea Water Intake
3. Hypochlorite Solution Dosing Pumps
4. Non-Oxidant Biocide Dosing Pump – Waste Water Tank

Degassing storage tanks

4. Local Control Panel
4. Cl_2 Gas Detector
4. H_2 Gas detector

All necessary instruments, valves etc. to guarantee the control and safety of equipment.

Note: Vendor (PSC) final configuration foresees biocide injection

7.4.3 Ultrafiltration Unit A-50005

1. Feed pump
2. Pre-filtration stage
3. Membranes pack for ultra filtration stage
4. Control Panel
5. All necessary instruments, valves etc. to guarantee the control and safety of equipment.

7.4.4 Desalination Unit - A-50007 A/B

1. High Pressure Pump
2. Vessel

3. Membranes
4. Interconnecting piping, valves and ancillaries
5. Instrumentation
6. Control Panel
7. Anti-scaling Dosing System
8. De-chlorination Dosing Systems

9.8. All necessary instruments, valves etc. to guarantee the control and safety of equipment.

7.4.5 Fresh Water Pump - P-50009 A/B

1. Positive Displacement Gear Pumps provided with: **(*)**
2. Electric Motor
3. Single Mechanical seal
4. Baseplate

(*) Vendor is allowed to propose different type of pump if needed for optimization of the performance of the package.

7.4.6 UV Water Filter - S-50010

1. UV Lamps
2. Control System
3. Containement box (AISI 316)
4. All necessary instrumensinstruments, valves etc. to guarantee the control and safety of equipment.

7.4.7 Water Outlet Monitoring

According to para 7.3 Water quality at the outlet of the package is constantly monitored by the following:

- pH meter
- Temperature measurement
- Hardness measurement
- Conductivity measurement

8 BATTERY LIMITS

The SUPPLIER's limit of supply or terminal points shall be as follows:

- Inlet at Sea Water Coarse Filter Package - A-50003
- ~~Inlet at Electro-chlorination A-50002~~ [Deleted]
- Outlet at UV Water Filter - S-50010
- Electrical Supply at Vendor Junction Boxes and external earthing points, internal distribution and cable management by vendor
- Cable glands of instrument

109 DESIGN BASIS

10.19.1 GENERAL

The package shall meet the process and mechanical design conditions specified on the equipment data sheets.

Fresh Water Characteristics to be produced shall be according to Doc n° K559-2254-PM-PLN-003 - Basic Design Engineering Package , para 8.3.2.

Characteristics Sea Water are according to the following figures:

Composition	Concentration; [mg/l]
Sodium, Na	11150
Potassium, K	420
Calcium, Ca	435
Magnesium, Mg	1410
Barium, Ba	0.1
Striontium, Sr	6.6
Chloride, Cl	20310
Sulphate, SO_4	2800
Bicarbonate, HCO_3	150
TDS	36682

Table 5 - Sea Water Characteristics

Note :

vendor to consider sensitive cases that examines the increase / variation of the critical component concentration by 5 to 10% and identify any impact on the proposed equipment. At all times bearing in mind the maintenance period of six months.

10.39.2 DESIGN REQUIREMENTS

9.2.1 Mechanical Design Requirements

Unless otherwise indicated in relevant Data Sheet, pressure vessels shall be designed in accordance with ASME Section VIII, Division 1.

The Supplier is responsible for ensuring that the pressure vessel and components provided are suitable for the operating conditions stated in the datasheets and/or others applicable documents, and available utility supplies.

Pressure vessels shall be designed for the most severe loads combination, which may be experienced in construction/fabrication, hydrotest, site erection, normal operation, and maintenance activities. The load combinations shall be defined as per applicable design code.

The Supplier shall co-ordinate the complete design and supply of all the equipment and ensures the satisfactory performance of any sub suppliers. Where the Supplier provides equipment that he has not manufactured, he shall ensure that the items are compatible with all other equipment supplied. The Supplier shall be responsible for guaranteeing all equipment including that provided by any sub suppliers.

9.2.2 Piping & Layout

Skid/Package layout shall be developed considering the main following aspects:

- Safety (including accesses and escape routes if any).
- Equipment layout, handling, and maintenance.
- Piping routing optimization and plant operability.

The three points above listed must be always considered together and the indicated order must be intended as a guideline without a specific priority.

Unless otherwise indicated the skid/package access corridors shall be at least 800 mm wide with an overhead of 2.1 m minimum.

Dead end corridors are not permitted: in case that this cannot be avoided the length must be evaluated and subjected to the Contractor approval (5 m maximum is acceptable).

Working floors or elevated platforms longer than 5 m shall have double access: platforms with an overall length less than 5 m can be accessed by vertical ladder. Vertical ladders must be high 6 m max.

Piping valves shall be generally fully accessible from deck or platform. Valve centreline cannot exceed 1.6 m on height from any working floor.

All piping CP's shall be flanged with the face of flange aligned with the skid edge. The piping CP's position shall be clearly indicated, with all dimensions, on Vendor GA drawings.

Flanged connections according to ASME/ANSI at battery limits of the supplied equipment, shall follow Doc n°123A90-DDL-PP-SP-70000-Piping Material Classes

9.2.3 Handling & Maintenance

Skid/package GA drawings must clearly indicate any maintenance area or withdrawal clearance required to handle any part outside skid edges.

Vendor shall clearly indicate any item within skid limit that need to be maintained considering routine, non-routine and breakdown cases.

Permanent lifting devices, such as monorails or padeyes, must be provided by vendor if any handling and/or displacement are foreseen within skid/package supply battery limits before the handled item can be picked up by crane or by other lifting devices already provided on adjacent plant layout.

Proper handling solution will be discussed between Contractor and Vendor according to different situation and layout is subject to contractor approval.

On GA drawing Vendor must clearly indicate weights and dimensions of any part that need to be moved during maintenance according to the three cases mentioned previously above.

9.2.4 Stress Analysis

Piping systems having high pressure and/or high thermal expansion shall be stress evaluated using a certified stress analysis software like CAESAR II by Intergraph, latest revision.

The first selection criteria shall be based on the maximum (and minimum) design temperature of piping line, in conjunction with the pipe diameter.

Transport and occasional loads (wind, earthquake, slug etc.... if applicable) shall be considered as well in stress analysis. Transport accelerations will be agreed with structural department; lacking specific data, the following values will be considered: horizontal +/-0.8 g, vertical +/-0.4g. Reaction forces for opening of PSV or rupture disks will be also considered.

Where the calculated stress exceeds the allowable values, common limiting stress criteria will be used such as improving the piping layout flexibility, inserting proper "loops" and avoiding additional expansion joints as far as possible or modifying the supports position and type. Solutions can be combined to obtain the best result.

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Once the piping stress has been verified, an additional check must be made as to forces and moments resulting on "anchors" corresponding to equipment nozzles. This will be checked with allowable values specified by vessel and/or machines suppliers.

The equipment supplier shall provide sufficient local reinforcement where necessary to maintain local stresses within the limits specified by design code for that equipment. For this purpose, stresses shall be calculated for relevant nozzles loads plus intensified pressure stresses at the nozzle according to relevant codes.

Equipment nozzles shall be designed to withstand forces and moments from thermal expansion, dead piping weights and transport loads.

Flange connections shall conform to ASME B16.5 Code.

9.2.5 Piping Supports

Piping within each skid/package shall be fully supported by Vendor according to STD Vendor.

Piping supports shall be designed considering transportation and installation phases also: temporary supports shall be added as necessary and clearly identified on documents, with specific notes, if needed to be removed after installation.

Close to each piping CP there shall be an anchor point in way that no significant loads are transmitted to piping systems off-skid. If it is not possible to have an anchor point close to the piping CP, piping shall be supported and guided as necessary within the package such that the interface nozzle will accept the loads listed for the flange of the relevant size and rating. Vendor shall provide thermal expansion movements at the related piping CP.

As general rule piping cannot be supported from another line unless the distance from the closest structure is too big and become not convenient and/or feasible to add an extensive structural support. Pipe supports between different piping lines are subject to contractor approval.

Permanent lifting devices such as monorails must be never used to support piping, cable trays or other items.

Skid piping and supports shall be designed so that all piping stresses and movements are absorbed within the skid and no loads are transmitted to the mating pipework.

9.2.6 Electrical Design Requirements

Refer to documents

123A90-DDL-EL-SP-20085 Technical Specification for Electrical Requirement in Packaged Units

123A90-DDL-EL-SP-20084 - Technical Specification for LV Motors

9.2.7 Instrumentation and control Design Requirements

For Instrumentation and control requirements the supplier shall follow the instruction within the following documents:

123A90-DDL-IN-SP-40094: "Instrumentation for Package Unit Specification"

123A90-DDL-IN-DD-40029: "Automation Detailed Design and Construction Package"

9.2.8 Civil and structural requirements

Structural baseframe/package/supports according to:

K559-2254-PM-PLN-003: "Basic Design Engineering Package"

Design load:

123A90-DDL-ST-SP-900018: "Structural Material Specification" (Par. 5, Class DC4)

Vendor construction and architectural finishing type is permitted if it meets all the above requirements, subject to our approval.

The package shall be provided with No. 4 support/fixing points, preferably at the corners.

The package shall be provided with adequate lifting points such that no spreader bar is required.

The package (architectural enclose) shall meet the acoustic requirements as stated in Sec. 5.

All welds must be continuous and sealed (no point or alternating welds permitted)

9.2.9 Cyber security basic requirements

Cyber security scope of supply is to provide a basic list of cyber security activities in according with CPY's requirements and with IT best practices. It involves all equipment with data interfaces such as (but not limited to):

- IT devices such as laptops, workstations, servers and so on
- Networking devices such as hubs, switches, routers and so on
- Industrial devices such as PLCs, CPUs and so on

This paragraph describes the general requirements for cyber security so it could be applicable only partially to the supply. Vendor shall inform CTR of what it is really deliverable as per relevant Scope of supply.

Activities to be carried out can be summarized as it follows:

- Asset inventory / Vendor shall provide all hardware & software specification to identify, within its supply, all possible equipment which can be exposed to a cyber attack

Activity / Deliverable description: Vendor shall fulfill the table as per *attachment Asset inventory*

Deliverable: "IT Asset Inventory list" document (encrypted) *

- Protection of access data / Vendor shall protect access data (not limited to login credentials such as username/password but including all useful access information such as IP addresses, ports, etc.)

from unauthorized access. The distribution of these information shall be restricted (E.G. login credentials to data equipment should not be included into user manuals).

Activity / Deliverable description: Vendor shall extrapolate access data from the standard documentation to provide with its SOW. Vendor shall fulfill the table as per *attachment IP address & Access Credential List*

Deliverable: "IP address & access credential list" document (encrypted) *

- Patching management & software maintenance methodology / Vendor shall provide, referring to supplied assets, a safe methodology for mentioned activities. This is valid for all provided softwares such as Operating Systems, Server SWs, Client SWs, etc.

Activity / Deliverable description: Vendor shall provide a document containing this methodology

Deliverable: "SW patching & maintenance procedure" document (encrypted) *

- Disaster recovery procedure / Vendor shall provide, referring to supplied assets, all information necessary for a restore of the systems starting from the supplied "systems backups".

Activity / Deliverable description: Vendor shall provide a document containing this procedure

Deliverable: "SW disaster recovery procedure" document (encrypted) *

- Backup register / Vendor shall provide, referring to supplied assets, all information relevant to the supplied SW backups. This is valid for all provided softwares such as Operating Systems, Server SWs, Client SWs, etc.

Activity / Deliverable description: Vendor shall provide a document containing the backup register. The backup register shall contain (as minimum): project ID, system, equipment, operator name, backup date, description, backup filename

Deliverable: "SW backup register" document (encrypted) *

- Systems Backup / Vendor shall provide, referring to supplied assets, a collection of all SW backups, SW images useful to restore the supplied systems in case of damage. If a SW backup is technically not deliverable, at least a document with images/text of the configuration shall be provided

Activity / Deliverable description: Vendor shall provide a physical support (USB key or USB HDD depending the size of the backup) containing the collection of the backups. All provided backups shall be listed and detailed into the Backup register (see above) and how to install them shall be explained in the Disaster recovery procedure (see above).

Note: USB key or USB HDD shall be supplied to CTR encrypted and password for decryption shall be distributed separately

- Physical hardening / Vendor shall provide, referring to supplied assets, data equipment where all spare data ports (USB, Ethernet and so on), actually not to be used, are inoperative

Activity / Deliverable description: Vendor shall disable (at the configuration level if possible) all spare data ports and install data port blockers (its key to unlock them will also be supplied to CTR). See examples:

*** = these documents shall be part of the supply and included into the relevant document list**

1.1 ⇒ ATTACHMENT / Asset Inventory Form

Asset Inventory (example)

Equipment Definition					Network				Software				Management / Support				Maintenance / Additional	Associated SW				
System	TAG	Item Description	Item Brand	Item Model	Serial Number	IP Address	MAC Address	Software Version(s)	Licenses Feature(s)	Services / Comm. Port(s)	USB Storage Port(s)	R232 / Console Port	Other Interfaces	Keys	Adapters	Special Cables	Programming Tools / SW	Description	Supplier	Version	License Keys / Accounts	Operating System
IOPPS	TAG-1	Control Logic PLC	Allen Bradley	ENT-XXXX	AAHHHD DDEE	10.22.55.66 / 255.255.255.0	AA:BB:CC:DD:EE:FF	1.2.3.4	NO	TCP/222 2 / HTTP/80, TCP/502	YES (1)	NO	NO	Program Logic Key	NO	NO	Factory Talk Studio	Studio 5000	Rockwell	20.0.0.0	-	-

1.2 ⇒ ATTACHMENT / IP Address List

IP Address List (example)

Equipment Tag	Equipment Description	Assigned IP	Decimal Mask	Gateway	DNS	DHCP	NTP	REV
19-VHF-MAR-TRX-01	Marine RX 1	10.40.18.1	255.255.255.192	10.40.18.62	-	-	10.40.18.62	02

1.3 ⇒ Access Credential List

Access Credential List (example)

Equipment Tag	Equipment Description	Port	User	PSWD	Access level	Note
19-VHF-MAR-TRX-01	Marine RX 1	-	Admin	1adRM01	Administrator	-
19-VHF-MAR-TRX-01	Marine RX 1	-	Read	2roRM01	Read only	-

1110 ELECTRICAL

2 opposite angle point Grounding connection

unique interfaces point for supply power (400Vac – 3Ph+N+PE – 50Hz – TN-S)

All necessary documents for calculation, list, etc for electrical system of package

11.110.1 CIVIL / STEEL STRUCTURE

Foundation anchor bolts holes for package and for skirt or legs of Air receiver:

CONTRACTOR will perform all calculation for foundation/structure design on the basis

of the Loads qualified by SUPPLIER.

On the basis of the project standard, SUPPLIER shall specify the proper anchor bolts

(provided by others) for package unit/equipment installation.

11.210.2 INSTUMENTATION

The package shall be supplied complete with all instrumentation fully piped, wired and tested to ensure safe, reliable, maintainable and effective operation.

Local interfaces are to be included in the Vendor's Supply (e.g. interface Junction Boxes).

The communication protocol between the CCS and the Package UCPs shall be in accordance with IEC 61158, preferably Profinet (alternatively Modbus TCP/IP).

All Safety System communications between Safety system and UCPs shall be 4-20mA Smart HART revision 7 protocol.

The communications (4-20mA) between UCP and Safety System shall be through relays (SIL 2 minimum Certified) installed inside UCPs.

In general, any 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 with a minimum proof test interval of two (2) years (to be developed during HAZOP and LOPA exercises).

Transmitters sharing control and trip initiations shall not be permitted.

Hardwired signals to trip package equipment shall be from the safety system.

Hardwired Digital Output from Safety System to UCP shall be through relays SIL 2 minimum certified, installed inside UCP, powered 24 Vdc by Safety system.

Hardwired Digital input from UCP to Safety System shall be through relays SIL 2 minimum certified, installed inside UCP, powered 24 Vdc by UCP (free voltage contact to safety system).

Hardwired Digital input from UCP to PCS shall be through relays, installed inside UCP, powered 24 Vdc by UCP (free voltage contact to PCS)."

1211 DIGITAL DOCUMENTS REQUIREMENTS

3D CAD MODEL FROM SUBCONTRACTORS & SUPPLIERS

As part of the scope of supply, the SUPPLIER shall develop and deliver a 3D model of the supplied equipment to be integrated by CONTRACTOR in the overall 3D model of the Plant.

Package equipment shall be modelled in sufficient detail to facilitate the review of access to all components and instrumentation for operation and maintenance, ergonomic design, piping, instrument and electrical connections.

All interfaces including nozzles and tie-ins shall be detailed and identified, as per the following example, with the same level of detail of the CONTRACTOR's overall 3D model of the Plant:

As a general requirement, model information for all package equipment shall contain information and details to ensure overall design integrity of the plant and to support inspection and maintenance programs. SUPPLIER is requested to specify in the offer which items will be modelled and with which tool, considering the selected 3D model SW for the Project is Aveva E3D 3.1.

It may be tolerated to receive 3D CAD Model of equipment or packages in an exchange format compatible with Aveva E3D, provided that the equipment or package hasn't process functionality and is not represented on a P&ID .

The exchange format shall be one of the following:

- AutoCAD Files (.dwg dxf)

- Autodesk DWF Files (.dwf*.dwfx)
- Inventor Files (*.ipt, *.iam)
- Revit Files (*.rvt, *.rfa)
- Rhino Files (*.3dm)
- SolidEdge Files (*.par, *.asm, *.pwd,*.psm)
- SolidWorks Files (*.sldprt, *.sldasm, *.sldfpp, *asm)
- STEP Files (*.stp, *.step, *.stpz, *.stp.z) / STEP XML (*.stpx, *.stepxz, *.stpxml)

In the other cases, i.e. for packages/skids with tagged objects on P&ID, the Aveva E3D is the preferred option.

Any deviation must be specified and agreed with CONTRACTOR.

Supplier's Data Management

As per COMPANY contractual requirement, all plant main assets and all assets with high impact on operation & maintenance activities must be tagged as per the below specification:

123A90-PML-DIG-PRO-00002 Equipment and System Tag Numbering

For example, all items shown on SUPPLIER's P&IDs must have a project specific tag, as well as any other major component even if P&ID doesn't exist.

Asset Register

SUBCONTRACTOR will develop and deliver a complete Asset Register consistent with the information in process flow diagrams, equipment drawings and maintenance manuals, for loading into COMPANY Asset and Maintenance Management Systems.

This Asset Register will contain a list of all Production Assets split over Process Assets (e.g. process, process support, utility, materials handling, etc.) and Non-Process Assets (e.g. buildings, special tools, personnel movement related, etc.), together with below information, ref to documentation and data, including:

1. Item Tag
2. Description
3. Location in the plant
4. Manufacturer
5. SUBCONTRACTOR
6. Model
7. Specifications project number
8. Maintenance item & plan project number
9. Criticality (HSSE, Production or other)

PURCHASER will submit to SUBCONTRACTOR during the PO execution phase an excel template with the list of concerned tags. It shall be SUBCONTRACTOR duty to validate the tag list and return to PURCHASER the filled list.

1312NAMEPLATES

10. Manufacturers name.
11. Manufacturers serial number.
12. Purchasers order number and item number
13. Manufacturers type designation (if applicable)
14. Tag number (if applicable)
15. Operating Process Conditions
16. Design Process Conditions
17. Weights
18. PED CERTIFICATION
19. Hazardous area classification (if applicable)

Nameplates shall be made of stainless steel AISI 316L with the information being punched or engraved on.

1413EC DECLARATION OF CONFORMITY AND CE MARKING

As per scope of supply, Supplier shall be subjected to the Conformity Assessment according to the applicable EU as Manufacturer of each of the below mentioned Items to be considered as Products to be placed on the EU Economic Area (EEA).

1514PAINTING

Surface preparation and Painting as per 123A90-DDL-MAT-SP-60006_00 Coating and Painting spec

1615MATERIALS

If not otherwise specified in Data Sheet, materials used shall be new and shall be exclusively those listed in the relevant tables of the applicable Design Code. Materials quality shall be as specified in the datasheets. However, the supplier shall confirm the suitability of specified materials in accordance with the process conditions, environmental conditions, design codes and good industry practice. The use of different

materials from the specified ones shall require the written approval of the Company/Contractor during to the Bid Phase.

All Carbon Steel Materials shall be supplied in fully killed and normalized conditions. Low temperature materials shall be supplied with impact test at the minimum design temperature.

If not otherwise specified in Data Sheet, maximum carbon content on ladle analysis and maximum carbon equivalent base on ladle analysis shall be maintained in the suitable range as per applicable materials standards to assure the metal weldability.

All Stainless-Steel Materials for the pressure parts shall be supplied with relevant intergranular corrosion test certificate

Plate material shall not be used for flanges. Only forged materials shall be used for nozzle and manholes flanges.

Gaskets containing asbestos shall not be allowed.

Materials substitution during manufacturing activities is forbidden.

Materials shall be certified EN 10204 type 3.1 for pressure parts and type 2.2 for other parts.

1716FABRICATION

17.116.1 GENERAL REQUIREMENTS

Prior to commencement of manufacture, the Supplier shall submit fabrication drawings and welding, heat treatment, Coating, NDT and final testing procedures for Company/Contractor review and approval.

Upon completion of construction, testing, and final acceptance the Supplier shall provide as- built drawings.

All welds joining pressure-containing parts and welds which are subjected to mechanical loading, shall be made in accordance with a dedicate WPS/PQR which complies with ASME Section IX. A separate WPS shall be defined for weld repairs, including all relevant details about the repair procedure.

Testing shall be carried out on welds in their final condition (after post weld heat treatment if applicable). The test records shall be verified by the Company/Contractor inspector.

Welders/operators employed on the fabrication of pressure vessels within the scope of this specification shall be qualified in accordance with ASME IX. The WPQR shall be verified by the Company/Contractor before starting of fabrication activities.

The vessel or parts of the vessel that require PWHT shall be supported and protected so that deformation cannot occur. Machined surfaces, flange faces, etc., shall be protected from oxidation during heat treatment. No welding, hammering or deformation is permitted after PWHT.

17.216.2 QUALIFICATION OF WELD PROCEDURES

Welding procedures that are used, qualified by a previously Recognized Authority approved by the Company/Contractor at Supplier's expense, shall be approved by the Company/Contractor and shall follow the codes referred to in the drawings or specifications and by the laws in force in the locality where the vessel is to be installed.

Welds on pressure vessels shall be carried out by welders or welding operators suitably qualified for the welding procedure, the filler material used and the position of the welds to be made.

All welding parameters detailed in the ASME IX WPS format shall be measured during weld procedure qualification. Each welding pass shall be monitored for Volts, Amps, travel speed and arc time and an average Heat Input calculated.

Preheat and interpass temperatures shall be continuously monitored throughout the qualification.

1817INSPECTION AND TESTING

18.117.1 GENERAL

The responsibility for inspection and testing rests in the Supplier scope of work. However, the Company/Contractor reserves the right to inspect the vessels at any time during fabrication to ensure that the materials and workmanship are in accordance with the specification and drawings.

Inspection and testing shall be carried out by the Supplier in accordance with the quality inspection and testing plan submitted by the Supplier and approved by the Company/Contractor.

Material certificates shall be available at the time of inspection. The material markings shall be stamped on the material used for the pressure vessels and *shall be ringed in white*.

18.217.2 VISUAL INSPECTION

The pressure vessel shall be visually inspected to assure conformity with the approved design drawings, datasheets, and specifications. The visual inspection shall be in accordance with the approved test and inspection plan and will include the following as a minimum:

1. dimensional check.

2. surface quality.
3. paint quality.
4. execution of appurtenances.
5. die-stamped identification.
6. marking and shipping requirements.

18.317.3 SUPPLIERS QUALITY SYSTEM

The Supplier's quality control system shall be in accordance with the applicable codes. Moreover, the following requirements shall be met:

1. Identification of the materials used in the fabrication of the vessel or parts thereof ensuring that parts taken from semi-finished materials are punch marked.
2. Welding procedure qualifications and qualifications of manual welders and automatic welding machine operators shall be available before beginning fabrication.
3. Employers' approval of any type of repair.
4. Availability of documents for repairs attesting that they have been carried out using appropriate methods required by the codes and specifications.
5. Availability of documents relating to all heat treatment performed on the vessel or parts thereof.
6. Availability of documents relating to non-destructive tests performed on the vessel or parts thereof. If the results of examinations and inspections show defects, the Supplier shall take the necessary corrective action. In the event of serious or systematic deficiencies or of difficulty in interpreting the result of checks the Supplier shall carry out
7. additional examinations and consider alternative tests and inspection. In particular:
8. Ultrasonic examination of welds where radiographs are difficult to interpret.
9. Re-qualification of the welding procedure if there are systematic defects.

18.417.4 INSPECTION AND TESTS

INSPECTION AND TEST TABLE	
LEGEND	
Involved Parties: CTR: Contractor CPY: Company SUP: Supplier	**Code of intervention:** H: Hold point (binding presence) W: Witnessed point (not binding presence) R: Check of the certificate and/or documents

No.	Description of tests and checks	Code of intervention			Notes
		SUP	CTR	CPY	
1.	Drawings, Data Sheets & calculations approval check		R	R	
2.	Review of mills certificates concerning the components of the unit as specified in the Supply spec.		R	R	Origin certificate required
3.	Test procedure approval check		R	R	
	Vessels & Filters				
4.	Welding procedures and welders qualification (WPS+WQP+PQR) approval check		R	R	
5.	NDT procedure approval check		R	R	
6.	Check of Material Certificates and Traceability, NDT reports and Hydrotest Certificate		R	R	
	Pumps				
7.	Check of Pump Type Test Certificate		R	R	
8.	Check of Electric Motor Type Test Certificate		R	R	
9.	Check of degree of protection certificate and/or intrinsically safe mode (if applicable)		R	R	
10.	"Environmental test" as per IEC code certificate check (if required)		R	R	
	Complete Unit				
11.	Check approval of the testing procedure for mechanical running and functional tests		R	R	
12.	Check of calibration certificates of standard instruments or equipment used for tests		R	R	
13.	Visual & Dimensional check. Check of assembly of components placing and accessibility for maintenance and removal		H	W	
14.	Unit nameplate check (data, identification and readiness)		H	W	
15.	Components check, name plates and identification numbers check		H	W	

No.	Description of tests and checks	Code of intervention			Notes
		SUP	CTR	CPY	
16.	Painting inspection (type, colour, surface preparation, primer, final, dry film thickness and certifications)		W	R	Only R of certificates for Intermediate inspection
17.	Disposal and functional check of auxiliaries systems		W	W	
18.	Unit mechanical running and functional test		H	W	
19.	Unit performance test		H	W	
20.	Check noise and vibrations of unit		H	W	
21.	Unit Control Panel Functional Test		H	W	
22.	Leakage test (where applicable)		H	W	
23.	Weight control		R	R	
24.	Spare parts check (type, quantity and labeling)		W	R	
25.	Packing, marking and packing list check		H	R	
26.	Check of ATEX / PED Certificates		R	R	
27.	Final documentation and Conformity / testing certificates review (Data Book)		R	R	

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ATTACHMENT 1

SMIR - REGISTRO DOCUMENTI / *SMIR - SUPPLIER MASTER INFORMATION REGISTER* 123A90-DDL-MAC-SP-50017_ATTACHMENT 1

	Ordine n°/*order nr.*			Fornitore/*Supplier* :							VENDOR TO INDICATE NUMBER OF WEEK FROM ORDER PLACEMENT IF DIFFERENT FRO RM REQUEST								
	data / *dated:*			Codice F./ *S. Code:*															
	Commessa / *Job:*			Indirizzo/ *address* :															
	Descrizione / *Description*	WATER TREATMENT PACKAGE		Persona di riferim./ *contact person:*															
	Macrofase / *Phase*										first issue date (8)								

Pos.	Document nr. Client (1)	Doc Client Rev. (1)	Document nr. Internal	Document nr. Internal Rev. (2)	Document nr. Supplier (3)	Doc Supplier Rev. (3)	SMIR -SUPPLIER MASTER INFORMATION REGISTER AIR COMPRESSOR AND DRYER SYSTEM	Disciplina / *Discipline* (5)	Blocco Classe / *Class Block* (6)	Docum. Format (7)	PROPOSED BY RM	PROPOSED BY VENDOR	Third Party Approval (I/A)	KEY Document Ingegneria	Documents subject to liquidated damages	Document Approval (I/A)
							CONTROL DOCUMENTS									
1							SMIR - SUPPLIER MASTER INFORMATION REGISTER	Eng-Mechanical			2-WEEKS					A
2							SUB-SUPPLIER AND SUB-CONTRACTOR LIST	EXP			2-WEEKS					A
3							FABRICATION / PRODUCTION SCHEDULE	EXP			2-WEEKS (Y)				X	I/A
							QUALITY DOCUMENTS									
4							INSPECTION TEST PLAN (ITP)	QUA			2-WEEKS				X	A
							ENGINEERING DOCUMENTS									
5							SYSTEM/PACKAGE FUNCTIONAL DESCRIPTION	Eng-Mechanical			2-WEEKS (Y)					I
6							STATIC AND DYNAMIC LOADS AT PACKAGE SUPPORT BASEFRAME	Eng-Mechanical			2-WEEKS			X	X	A
7							PACKAGE CAUSE EFFECT MATRIX /LOGIC DIAGRAMS	Eng-Mechanical								A
8							GENERAL ARRANGEMENT AND DIMENSIONAL OUTLINE DRAWINGS (INCLUDING : NAMEPLATE, BASEFRAME, FOUNDATION LOADS, NOZZLES LOADS, NOZZLES LIST, BATTERY LIMITS) -LAY OUT OF THE CONTAINER	Eng-Mechanical			4-WEEKS (Y)			X	X	A
9							GENERAL ARRANGEMENT - SEA WATER COARSE FILTER	Eng-Mechanical			4-WEEKS (Y)			X		A
10							GENERAL ARRANGEMENT - ELECTROCLORINATION UNIT	Eng-Mechanical			4-WEEKS (Y)			X		A
11							GENERAL ARRANGEMENT - DESALINATION PACKAGE	Eng-Mechanical			4-WEEKS (Y)			X		A
12							GENERAL ARRANGEMENT - FRESH WATER PUMP	Eng-Mechanical			4-WEEKS (Y)					I
13							GENERAL ARRANGEMENT - ULTRAFILTRATION UNIT	Eng-Mechanical			4-WEEKS (Y)					
14							GENERAL ARRANGEMENT - UV PACKAGE	Eng-Mechanical			4-WEEKS (Y)					
15							EQUIPMENT SECTIONAL DRAWING WITH BILL OF MATERIAL	Eng-Mechanical			8-WEEKS					I
16							PACKAGE 3D MODEL DRAWING AND ELECTRONIC FILE	Eng-Mechanical			4-WEEKS (10)				X	A
17							MAIN COMPONENT CROSS SECTIONAL DRAWING AND BILL OF MATERIAL (9)	Eng-Mechanical			8-WEEKS					I
18							PACKAGE PIPING SCHEMATICS AND BILL OF MATERIALS	Eng-Mechanical			8-WEEKS			X		A
19							PACKAGE BLOCK DIAGRAM	Eng-Mechanical			8-WEEKS					I
20							PACKAGE WIRING DIAGRAM - ELECTRICAL	Eng-Mechanical			8-WEEKS			X	X	A
21							PACKAGE WIRING DIAGRAM - INSTRUMENT	Eng-Mechanical			8-WEEKS			X	X	A
22							PACKAGE INTERCONNECTING DIAGRAM	Eng-Mechanical			8-WEEKS			X	X	A
23							PACKAGE ELECTRIC AND INSTRUMENTATION CONNECTION DIAGRAM OF JB AND LOCAL BOARD	Eng-Mechanical			8-WEEKS			X	X	A
24							PACKAGE EARTH GROUNDING DRAWINGS AND DIAGRAMS	Eng-Mechanical			8-WEEKS					I
25							PACKAGE INSTRUMENTS POSITION AND CABLES RUNNING LAYOUT	Eng-Mechanical			8-WEEKS					I
26							PACKAGE STRUCTURAL CALCULATION REPORT	Structural			8-WEEKS					I
27							PACKAGE STRUCTURAL DETAIL DRAWINGS INCLUDED FIXING POINTS and LIFTING POINTS	Structural			8-WEEKS			X		I/A
28							PACKAGE WALLS & ROOF DETAIL DRAWINGS INCLUDED DETAILS	Structural			8-WEEKS					I
29							PACKAGE ARCHITECTURAL DRAWINGS	Architectural			8-WEEKS					I
30							LAYOUT OF PACKAGE CONTROL PANELS	Eng-Mechanical			10-WEEKS					I
31							PACKAGE WEIGHT DATA SHEET	Eng-Mechanical			10-WEEKS			X		A
32							MOTORS DATA SHEETS	Eng-Mechanical			8-WEEKS			X	X	A
33							DATA SHEET - SEA WATER COARSE FILTER	Eng-Mechanical			8-WEEKS (Y)			X	X	A
34							DATA SHEET -ELECTROCLORINATION UNIT	Eng-Mechanical			8-WEEKS (Y)			X	X	A
35							DATA SHEET - DESALINATION PACKAGE	Eng-Mechanical			8-WEEKS (Y)					I
36							DATA SHEET - FRESH WATER PUMP	Eng-Mechanical			8-WEEKS (Y)					I
37							DATA SHEET - ULTRAFILTRATION UNIT	Eng-Mechanical			8-WEEKS (Y)					
38							DATA SHEET - ADDITIONAL COMPONENTS OTHER THAN ABOVE (VENDOR TO SPECIFY)	Eng-Mechanical			8-WEEKS (Y)					
39							PACKAGE EQUIPMENT NOISE DATA SHEET	Eng-Mechanical			8-WEEKS			X	X	A
40							INSTRUMENT DATA SHEETS	Eng-Mechanical			8-WEEKS					I
41							VALVES DATA SHEETS	Eng-Mechanical			8-WEEKS					I
42							PERFORMANCE CHART AS APPLICABLE TO PACKAGE COMPONENTS	Eng-Mechanical			8-WEEKS			X	X	A
43							ELECTRICAL LOAD LIST	Eng-Mechanical			8-WEEKS			X		A
44							INPUT/OUTPUT LIST	Eng-Mechanical			8-WEEKS			X		A
45							UTILITIES CONSUMPTION LIST	Eng-Mechanical			8-WEEKS					I
46							PACKAGE INTERFACES MAP AND LIST (TERMINAL STRIPS, FLANGES, PIPES, ETC)	Eng-Mechanical			8-WEEKS			X		A
47							INSTRUMENT LIST WITH SET POINTS/CONTROL/ALARM/SHUTDOWN	Eng-Mechanical			8-WEEKS			X		A
48							CABLES LIST	Eng-Mechanical			8-WEEKS					I
49							PACKAGE P&ID	Eng-Mechanical			10-WEEKS (Y)			X	X	A
50							PAINTING SPECIFICATION	Eng-Mechanical			10-WEEKS			X		A
51							HYDROSTATIC AND OR PNEUMATIC TEST PROCEDURE	Eng-Mechanical			10-WEEKS					I
52							FAT (FINAL ACCEPTANCE TEST) PROCEDURES	Eng-Mechanical			10-WEEKS					I
53							HVAC CALCULATION OF HEAT BALANCE, EQUIPMENT SIZING, AIR AND LIQUID FLOW REQUIREMENTS	Eng-Mechanical			2-WEEKS			X	X	A
54							HVAC SUPPORTING DESIGN	Eng-Mechanical			3-WEEKS			X	X	A
55							HVAC DUCTS PRESSURE LOSSES CALCULATION	Eng-Mechanical			2-WEEKS			X	X	A
56							HVAC SYSTEMS NOISE CALCULATION	Eng-Mechanical			3-WEEKS			X	X	A
57							HVAC SUPPORTING DRAWINGS	Eng-Mechanical			3-WEEKS				X	I
58							HVAC LAYOUT & SECTIONAL DRAWINGS, INCLUDING POSITION OF EQUIPMENT, LOCAL CONTROL PANEL, JUNCTION BOXES	Eng-Mechanical			3-WEEKS			X	X	A
59							HVAC MODULE PENETRATION DETAIL DRAWINGS	Eng-Mechanical			2-WEEKS					I
60							HVAC CABLE ROUTING	Eng-Mechanical			3-WEEKS					I
61							HVAC MECHANICAL EQUIPMENT DRAWINGS	Eng-Mechanical			3-WEEKS				X	I
62							HVAC INSTALLATON DRAWINGS	Eng-Mechanical			3-WEEKS			X	X	I
63							HVAC MECHANICAL AND ELECTRICAL EQUIPMENT DATA-SHEET	Eng-Mechanical			2-WEEKS			X	X	A
64							HVAC ELECTRICAL AND I&C CABLES DATA-SHEET	Eng-Mechanical			2-WEEKS			X	X	A
65							HVAC INSTRUMENTATION DATA-SHEET	Eng-Mechanical			2-WEEKS			X	X	A
66							HVAC ELECTRICAL LOAD LIST	Eng-Mechanical			2-WEEKS			X	X	A
67							HVAC DESIGN AND CONTROL PHILOSOPHY	Eng-Mechanical			2-WEEKS			X	X	A
68							HVAC SYSTEM TECHINCAL SPECIFICATION, INCLUDING EQUIPMENT SPECIFICATIONS	Eng-Mechanical			2-WEEKS			X	X	I
69							HVAC EQUIPMENT LIST	Eng-Mechanical			2-WEEKS			X	X	I
70							HVAC INSTRUMENTATION LIST	Eng-Mechanical			2-WEEKS			X	X	I
71							HVAC P&ID	Eng-Mechanical			2-WEEKS			X	X	A
72							HVAC MTO	Eng-Mechanical			4-WEEKS			X	X	I
73							HVAC SET-POINT LIST, I/O LIST, ALARMS & TRIPS LIST, PROFINET LIST	Eng-Mechanical			4-WEEKS			X	X	A
74							HVAC SPECIFICATION FOR ERECTION, MECHANICAL COMPLETION AND COMMISSIONING	Eng-Mechanical			4-WEEKS			X	X	A
75							HVAC POWER AND CONTROL PANEL LAYOUT DIAGRAMS	Eng-Mechanical			4-WEEKS			X	X	A
76							HVAC INTERCONNECTION LAYOUT DIAGRAMS	Eng-Mechanical			4-WEEKS			X	X	A
77							HVAC REFRIGERATION PIPING / TUBING PRESSURE TEST PROCEDURE	Eng-Mechanical			4-WEEKS					I
78							HVAC DUCT LEAKAGE TEST PROCEDURE	Eng-Mechanical			4-WEEKS					I
#RIF!							HVAC FAT PROCEDURE	Eng-Mechanical			4-WEEKS			X	X	A
#RIF!							HVAC SAT PROCEDURE	Eng-Mechanical			4-WEEKS			X	X	A
#RIF!							HVAC INSTALLATION MANUAL	Eng-Mechanical			4-WEEKS					I
#RIF!							HVAC OPERATIONAL AND MAINTENANCE MANUAL	Eng-Mechanical			5-WEEKS					I
#RIF!							HVAC ADJUSTING AND BALANCING TEST PROCEDURE	Eng-Mechanical			4-WEEKS			X	X	A
#RIF!							HVAC COMMISSIONING PROCEDURE	Eng-Mechanical			5-WEEKS					I
#RIF!							HVAC COMMISSIONING REPORT	Eng-Mechanical								
							CERTIFICATES									
53							PERFORMANCE TEST CERTIFICATES	CERT			1-WEEKS (11)					
54							FACTORY ACCEPTANCE TEST CERTIFICATE	QUA			1-WEEKS (11)					I
55							MANUFACTURERS RECORD BOOK (FINAL DOSSIER)	CERT			2-WEEKS (11)				X	A
56							MANUFACTURERS RECORD BOOK (FINAL DOSSIER) - INDEX	QUA			6-WEEKS					A
57							CERTIFICATION DOSSIER (INCLUDING ALL TEST CERTIFICATES)	CERT			2-WEEKS (11)					
58							PURCHASER RELEASE NOTE	EXP			8-WEEKS					I
59							CERTIFICATION MATRIX (ATEX, PED, ANY OTHER CERTIFICATION REQUIRED BY THE STATUTORY DIRECTIVES)	QUA			6-WEEKS					A
60							ATEX REGISTER	Eng-Mechanical			8-WEEKS					A
61							DECLARATION OF CONFORMITY (SUPPLIER)	QUA			6-WEEKS					I
							SPARES & MAINTENANCE DATA									
62							SPECIAL TOOLS LIST FOR ERECTION AND MAINTENANCE	Eng-Mechanical			6-WEEKS					I
63							INSTALLATION, OPERATING AND MAINTENANCE MANUAL INDEX	Eng-Mechanical			6-WEEKS				X	I
64							INSTALLATION, OPERATING AND MAINTENANCE MANUAL (INCLUDING SITE ERECTION INSTRUCTIONS AND PROCEDURES)	Eng-Mechanical			6-WEEKS				X	I
65							HVAC SPARE PARTS LIST (2 years)	Eng-Mechanical			6-WEEKS				X	I
66							HVAC SPARE PARTS LIST FOR COMMISSIONING	Eng-Mechanical			6-WEEKS				X	I
							HANDLING, SHIPPING & SITE INSTALLATION									
65							PRESERVATION AND PACKAGING PROCEDURE	LOG			6-WEEKS					I

Notes:

(1) Numero documento Cliente
Document number assigned by final Client

(2) Numero documento interno
Document number internal

(3) Numero documento Fornitore (assegnato dal Fornitore)
Document number assigned by Supplier

(4) Assegnare il Titolo del documento (assegnato dal Fornit
Fill in the document title (to be assigned by Vendor)

(5) Specific are la disciplina (compilato da Rosetti)
Quality dep., Expediting. Dep., Commissioning dep., Engineering dep.

(6) Blocco Classe: Specifica, Disegno, Report, Data Sheet, etc. (compilato da Rosetti
Procedure, list, drawing, data sheet, etc. (to be filled by Rosetti)

(7) A4, A3, A1 (compilato dal Fornitore)
A4, A3, A1 (Supplier)

(8) Data prevista per l'emissione del documento (compilato dal Fornitore)
Foreseen date for the first issue (Supplier)

(9) Exploded drawing in case cross section is not available

(10) To be released at each revision of GA

(11) After Test

(Y) to be included in the offer as typical drawing - Overall GA shall show expected dimensions and total weight

STATEMENT OF COMPLIANCE	

List of proposed deviations

All deviations shall be clearly stated on this sheet, with reference to VENDOR's quotation. Each proposed deviation shall be supported by a Deviation Request Form.
A proposed deviation is accepted if the related Deviation Request Form as been reviewed by Purchaser and APPROVED by COMPANY before the

Item #	Subject	Proposed deviation description + reference to the section of the Requisition and SPECIFICATIONS concerned by the deviation

Remarks :

Date : Signature :

Name : Function :

Purchaser	**XXX**	**Requisition no**	**XXX**
PO number	**XXX**	**Sheet**	**1 of 1**
Project	**123A90**	**Rev.**	**XX**

ATTACHMENT 2

ATTACHMENT 3

123A90-DDL-MAC-SP-50017_ATT_3

CROSSWIND ROSETTI MARINO

Revision	Discipline	Tag Number	Description	Location	Manufacturer	Model/Type/ Catalogue Number	Serial N°	ATEX Certification/Marking	Reference Document	ATEX certificate number	Notes / Comments
01	ELE	18-AL-3401	Actuator Louver	Lower Deck	Schischek	EX MAX – 5 .BF		Ex d [ia] IIC T6,T5 and T4	AR-VPL-10-DR03-000233	PTB 04 ATEX 1028X	

EXAMPLE

INSTRUCTIONS/NOTES:

1_Coloumn "Revision" will change when info in the row should be change

2_ Coloumn "Location" owner is CTR (RM) and not the Vendor

3 _ For All Vendors of : Lightings,Fire&Gas Sensors,Junction Boxex ; Vendor will fill only column of "Serial Number" , the Column "Tag Number" the owner will be CTR(RM) during Pre commissioning activities

4_Column "Reference Document" the owner are Vendor (where applicable) anche CTR (RM).

ATTACHMENT 3

Tag Number	Tag Description	Physical Class Name	Location	System Code	Purchase Order Number	Vendor Company Name	Manufacturer Company Name	Model Number	Equipment Manufacturer Serial Number	Model Part No	Hazardous Area Equip Relevant	Hazardous Area Classification	Remarks	Rev

ATTACHMENT 4