Base Load Power Hub (BLPH)

TDS - H2 Storage Vessel - V-25001A-F

Document Number: 123A90-DDL-MAC-DS-50027

Document Class: 2

02	21/06/2023	Accepted for Construction (AFC)	FM	MM	DL
01	21/11/2023	Accepted for Construction (AFC)	FM	MM	DL
00	29/08/2023	Issue for Review (IFR)	FM	MM	MD
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)
02	Accepted for Construction (AFC)

HOLDS LIST

No.	Description
1	
2	
3	
4	

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(*) In case of order, this page shall be separated from this data sheet, then shall be issued as a separate Vendor's document, like the Vessel Datasheet as well.

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DESIGN DATA

Rev							
2	Design Conditions	Internal	40	barg	at	-10 /80 °C	
		External	FV	bar	at	-10 /80 °C	
2	Volume		95.44 m3 T/T excluding heads, 1 vessel total volume to be updated according to heads (by VENDOR)	m3			
	Dimension (Nominal)		2.8 ID x 15.5 T/T m				
2	Minimum Design Metal Temp		-29	°C (MDMT)	at	0 barg	
2	Operating Conditions	Internal	0	barg	at 30 barg	@ -8,4 ÷ 20 °C	
2	Corrosion Allowance		0	mm			
2	Fluid / MW		Hydrogen / 2.016 (see VM 14)				
1	PWHT Required		Per ASME Sect VIII Div 2 Class 2	**Service PWHT** Yes			
	Radiography Requirements		100%				
	Shop Hydrotest Pressure		Per Code				
	Field Hydrotest Pressure		TBC				
	Painting Per		TBC				
	Insulation		N/A	mm			
	Fireproofing		N/A	mm			
2	Erection Weight		0	kg (Includes)			
2	Empty Weight		(by vendor)	kg (Start-Up Ready) - Estimated			
2	Operating Weight			kg -			
2	Test Weight		0	kg			
	Vessel Designed For Wind		1 Year Return, 3 sec. gust = 35 m/sec, 100 Year Return, 3 sec. gust = 45 m/sec				
	Vessel Designed For Earthquake		N/A				
	Moment At POS	Wind:	0	N-M			
	Shear Force At POS	Wind:	0	N			
	Moment At POS	Earthquake:	0	N-M (Operating)	0	N-M (Empty)	
	Shear Force At POS	Earthquake:	0	N (Operating)	0	N (Empty)	

DESIGN CODE & MATERIAL SPECIFICATIONS

Rev					
	Construction Code	2004 ASME Section VIII Div.1 With Latest Addenda Code Stamp	Yes	National Board Registration	Yes
2	**Materials for Pressure Components and Parts Welded to Pressure Components:**		**(CEQ) is 0.35.max**		
1	Shell and Heads	SA-516-60	Thickness (mm) by vendor		
	Standard ANSI Weld Neck and LWN Flanges	SA-105			
	Fittings	General Note VM-8			
	Self-Reinforcing & Special Forgings	SA-765-II			
	Nozzle Necks	SA-106-B			
	Shell Attachments	Plate (Including Wear Plate)	SA-516-60		
		Pipe	SA-106-B		
		Structural Shapes	A-36		

Materials for Parts Not Welded to Pressure Components:

Saddles		A-36
Plate		A-516-60
Pipe		A-106-B
Pressure Bolting		SA-193-B7 / SA-194-2H
Internal Bolting		A-193 Gr B6 / A-194 Gr 6
Internal Piping		Carbon Steel
Other Internals		Carbon Steel
Gaskets	Pressure Gaskets	1/16" Flexible Graphite w/ 304 S.S. Insert
	Non-pressure Gaskets	1/16" Flexible Graphite w/ 304 S.S. Insert

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Rev	GENERAL NOTES
	VM-1. All materials shown on this data sheet are to be furnished and installed by the Vessel Supplier unless otherwise noted. VM-3. Substitutions of materials will not be allowed without ROSETTI MARINO prior approval. This approval can only be obtained at the time Vessel Supplier submits his quotation. VM-4. The inside diameter of manholes shall be equal to the size specified in the table of connections for 18" (450 mm) and smaller size manholes. Manholes size 20" (500 mm) and larger may have a minimum inside diameter 25 mm less than the nominal size listed in the table of connections. VM-5. Manholes and handholes shall be furnished with blind flange, bolts and gasket. Each manhole shall be provided with a davit or hinge and internal manhole grip. VM-6. Internal ladder rungs shall be provided below the manway.
2	VM-7. DELETED.
2	VM-8. Vessel Supplier to provide vessel grounding lugs per its own standard for ROSETTI MARINO evaluation VM-9. In addition to meeting Code requirements for fittings, piping fittings shall be made from a material specification listed for plate, forging, or pipe pressure components on page 1 of this data sheet.
1	VM-9 Regarding pressure retaining parts, vendor is allowed to propose equivalent/similar material, according to other international Codes, i.e. DIN/EN or other internationally recognized CODE, provided that Carbon Equivalent value (CEQ) is 0.35.max
	VM-10 total number of vessels is 6 (six) – V-25001 A/B/C/D/E/F VM-11 For hydrogen vessel fatigue design, Contractor should expect that the number of full charge/discharge cycles (from full to empty) will be 180 during the year. In other words, it is expected that: - Fuel cell will utilise the full hydrogen inventory from the storage vessels 180 times per year (full discharge). Electrolyser will fully recharge the hydrogen vessels (from empty to full) 180 times per year (full charge)
2	VM-12 DELETED
1	VM-13 Max hardness in base metal shall be 235 HV10 - Steel shall be HIC resistant to ISO 15156-2 - Impact testing shall be at -46°C for base metal and weld metal in H2 service regardless of MDMT - Phosphorus maximum to be 0.015% (from EIGA 121/14) - Max strength 355Mpa yield - max CE of 0.35 should ideally be by product analysis not ladle analysis
1	VM-14 H2 physical properties at 15°C and 30 barg:

Pressure	barg	30
Temperature	°C	15
Inlet Density	kg/m^3	2.58
Compressibility Factor (Z)	-	1.01
Viscosity	cP	0.0086
Specific Heats Ratio (Cp/Cv)	-	1.42
Molecular Weight	-	2

1	WM-15 Area Classification Zone 1 IIB T1 + H2

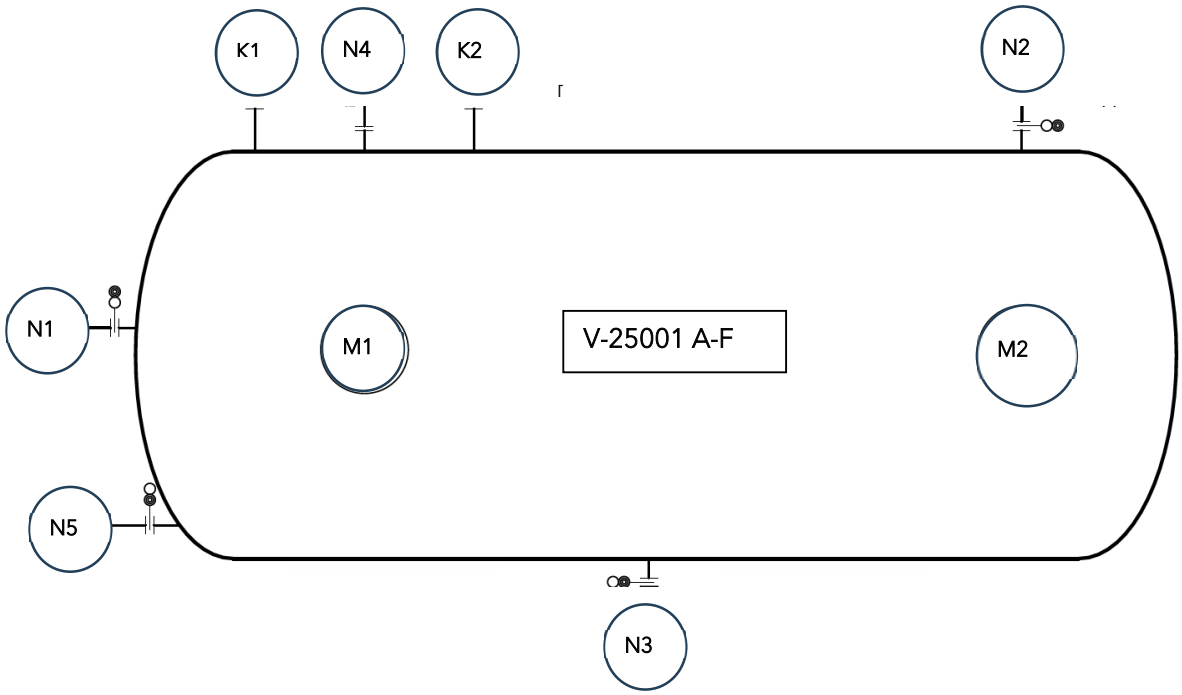
NOZZLES TABLE

General Notes for Table of Connections:.

A. Connections shown in sketch are diagrammatic only. True location will be shown on Vendor Data Gen Arrangement Drawing
B. Unless otherwise noted the dimensions from the face of flange to inside shall comply with Table 4 of Doc n° 123A90-DDL-MAC-50026
C. All pressure connections are to be flanged.
D. DELETED
E. DELETED
F. DELETED
G. Flanges over 24" shall be per ASME B16.47 Series B.
H. All flange faces shall have a stock finish.
J. For specific notes to TABLE OF CONNECTIONS see next page.

	Mark	Size	Rating	Face	Service	Elevation	Dim"A"	Specific Notes
	N1	1”	300#	RF	hydrogen inlet			
	N2	1”	300#	RF	hydrogen outlet			
1	N3	1”	150#	RF	drain			
	N4	3”	300#	RF	PSV connection			
	N5	1”	300#	RF	Nitrogen purging			
	K1	2”	300#	RF	pressure transmitter for ESD			TBC
	K2	2”	300#	RF	pressure transmitter for control			TBC
	M1	24”	300#	RF	manhole			see general note VM-3
	M2	24”	300#	RF	manhole			see general note VM-3

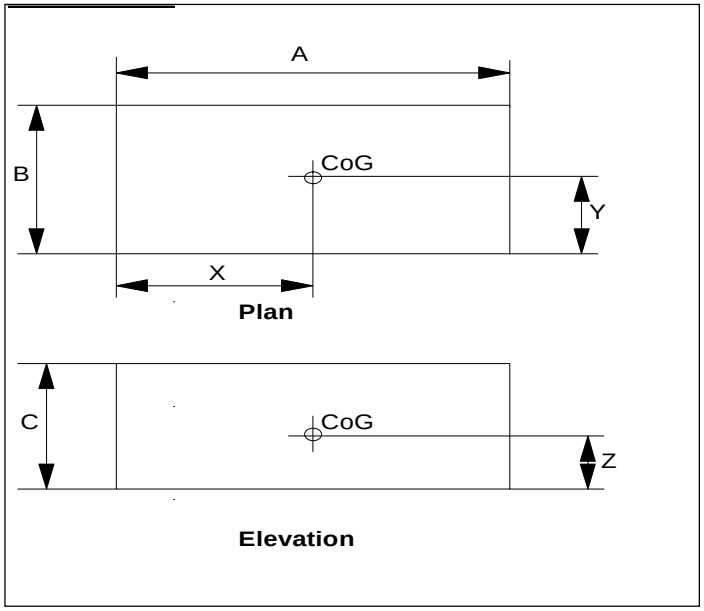
Rev	SPECIFIC NOTES TO TABLE OF CONNECTIONS (All Notes Listed Hereunder Shall Apply Only If Called For By Number In The Table Of Connections)
	1 Use this information for quotation purpose only. 2 Supply blind flange, bolts and gasket. 3 Elevation is given to the face of flange. 4 Nozzle size listed is minimum inside diameter of nozzle neck. 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

Rev	VESSEL SKETCH
2	
1	1 NOZZLE POSITION IS INDICATIVE AND SHALL BE CONFIRMED DURING DETAILED ENGINEERIN PHASE 2 THE SKETCH IS ABTRACT FROM P&ID K559-2254-PR-PID-006 3 COG TO BE INDICATED BY VENDOR AFTER ORDER IN THE ATTACHED DATA SHEET IN CASE OF ORDER

WEIGHT DATA (kg)

		Areas for input by Supplier
Dry Weight	(I)	kg
Content	(II)	kg
Operating Weight	(I+II)	kg
Auxiliaries' weight, included in I (specify under Notes)		kg
Test weight, i.e. filled with water		kg
Transport weight		kg

CENTRE OF GRAVITY (CoG) DATA FOR INSTALLED DRY CONDITION



Overall dimensions	
A =	mm
B =	mm
C =	mm

CoG location (mm)	
X =	mm
Y =	mm
Z =	mm

NOTES

WEIGHT AND CoG STATUS (TICK OFF AS APPROPRIATE)

☐ Estimated ☐ Calculated

☐ Catalogue data ☐ Weighed

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