

ENGINEERING SERVICES DEPARTMENT



SPENT SCRUBBING LIQUID TRANSFER PUMP P1514 SPECIFICATION SHEET

Project	NW PlasGas and CWOPG Demonstration Facilities.		Unit Tag Number	P1514		
Datasheet Document No.	ENS-NWPVR-SPE-24014		Revision	3		
Description	Pump P1514 will be used to periodically transfer spent scrubbing solution from the sump tank of the scrubber S1501 to the waste tank T1506 in the Low-Level Waste Plasma Gasification (NW PlasGas) and the Uranium Contaminated Waste Oil Plasma Gasification (CWOPG) Demonstration Facilities. However, the two Facilities will not be operated simultaneously. Therefore, all of the identified equipment will service only one of the Facilities at any given time ^[1] .					
Plant Location	NECSA, Pelindaba, North-West Province					
Equipment Location	NW PlasGas & CWOPG Demonstration Facilities - Inside the process area of Laboratory 150, Building V-H2.					
Safety Classification	SC-3(N) & SC-2(C) ^[a]					
Quality Classification	SC-3(N) & SC-2(C) ^[b]					
FLUID PROPERTIES						
Process fluid	NW PlasGas			CWOPG		
	Spent scrubbing solution containing (% w/w) 63.8% H ₂ O, 4.35% KCl, and 31.8% KHCO ₃ ^[3] during normal operation. Note [f].			Spent scrubbing solution containing (% w/w) 65.3% H ₂ O, 0.016% KF, 0.061% KCl, and 34.6% KHCO ₃ ^[4] during normal operation. Note [f]		
Solids content	Note [e]					
Corrosive due to	KOH (aq) and K ₂ CO ₃ (aq).			KOH (aq), KF (aq) and K ₂ CO ₃ (aq).		
PROPERTIES	UNITS	MINIMUM		NORMAL		MAXIMUM
Operating temperature	°C	18		49.5		60
Fluid density	kg/m ³	1288.5		1270.8		1265.8
Viscosity	Pa.s	8.63 x 10 ⁻⁴		5.16 x 10 ⁻⁴		4.48 x 10 ⁻⁴
Vapor pressure	kPa	2.039		12.327		19.921
HYDRAULIC PROPERTIES						
PARAMETERS	UNITS	MINIMUM		NORMAL		MAXIMUM
Flow rate	m ³ /h	0.93		3.10		3.72
Pump inlet pressure	kPa (a)	85.63		73.54		68.18
Pump outlet pressure	kPa (a)	135.68		155.07		162.80
Differential Pressure	kPa	50.06		81.53		94.62
Required Pump Head	m	3.96		6.54		7.62
NPSH available	m	7.40		6.42		6.00
MECHANICAL PROPERTIES						
Pump type	Air Operated Double Diaphragm Pump ^[d]					
Diaphragm type	Supplier to advise		Diaphragm diameter		Supplier to advise	
Process Connections						
Pipe Suction	Size	25mm	Rating	150#	Flange Spec.	SS, ASTM A182-F304/304L, ASME B16.5
Pipe Discharge	Size	25mm	Rating	150#	Flange Spec.	SS, ASTM A182-F304/304L, ASME B16.6
	Vent	Supplier to advise		Drain	Supplier to advise	
Seal Fluid	Supplier to advise					
Material of Construction	Casing	Supplier to advise		Diaphragm	Supplier to advise	
	Shaft	Supplier to advise		Seal	Supplier to advise	
	Packing	Supplier to advise		Other	Supplier to advise	
ELECTRICAL PROPERTIES						
Electrical (Y/N)	N		Volts	N/A		Phase
					N/A	Hz
						N/A
VENDOR DATA REQUIRED WITH TENDER						
1 Pump technical data			3 Pump dimensions with baseplate			
2 Utility Requirements						
REFERENCE DRAWINGS AND DOCUMENTS						
[1] ENS-NWPVR-PID-24002, P&ID Diagram - NW PlasGas Demonstration Plant Subsystem 15						
[2] ENS-NWPVR-REP-24036, Positive Displacement Pumps Sizing Report for the NW PlasGas demonstration facility						
[3] ENS-NWPVR-CLC-24015, Scrubber Design for the Low-Level Waste Plasma Gasification (NW PlasGas) Demonstration System						
[4] ENS-OWPVR-CLC-24006, Scrubber Design for the Uranium Contaminated Waste Oil Plasma Gasification Project						
NOTES						
[a] SC - Safety Class						
[b] QC - Quality Class						
[c] Supplier to advise on special requirements for installation of pump.						
[d] Air supply available at a maximum pressure of 5.5 bar (g), with a minimum air quality standard of ISO 8573-1:2010 [3:4:1].						
[e] Under abnormal conditions, ash and/or traces of uranium-containing solids (e.g. UO ₃) may be present in the spent solution						
[f] Presence of KOH and/or K ₂ CO ₃ in place of or together with KHCO ₃ is possible under abnormal situations.						
[g] Note to supplier: The air supply pressure regulator, complete with pressure gauge, must be supplied with the pump.						

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Datasheet Document No.	ENS-NWPVR-SPE-24014	Revision	3
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