

Our E-Tender Notice No. IPR/TN/ET/F/19-20/24 dated 7th August, 2019 for Supply, Installation, Commissioning and Site Acceptance Tests including of Training of Nitrogen Trace Analyzer for Helium Gas with Heated Getter type Helium Gas Purifier and Inline Glass Indicating Moisture Trap at IPR as per technical specifications mentioned in our tender documents – 1 System

SECTION - C

TECHNICAL SPECIFICATIONS OF STORES AND DRAWINGS.

Technical specification for supply, installation, commissioning and site acceptance including training of nitrogen trace analyzer for helium gas with heated getter type helium gas purifier and inline glass indicating moisture trap

Scope:

Supply, installation, commissioning and site acceptance including training of plasma emission based nitrogen trace analyzer for helium gas with heated getter type helium gas purifier to remove H₂O, O₂, CO, CO₂, N₂, H₂ and CH₄ impurities from helium gas, inline glass indicating moisture trap to remove H₂O impurities and accessories such as high purity manual two in/out isolation valves, one bypass valve with compression fitting, 1/8 inch stainless steel tubing etc.

The nitrogen trace analyzer will be used for measurement of nitrogen impurity for 1.3kW helium refrigeration cum liquefier plant. The getter type helium gas purifier will be used to remove H₂O, O₂, CO, CO₂, N₂, H₂ and CH₄ impurities from zero gas. The glass indicating moisture trap will be used to remove H₂O from sample, zero and span gas entering in nitrogen analyzer. The detailed specifications are as below.

Item – 1: Trace Nitrogen Analyzer in helium gas, Quantity: 01

Sr. No.	Parameter	IPR Specification
1.	Type of Detector	Plasma Emission Detector
2.	Background	Helium gas
3.	Range of N ₂ impurity in Helium gas	0 - 1 ppm, 0 - 10 ppm, 0 - 100 ppm User-settable, fixed, auto-ranging
4.	Display Resolution	0.1 ppm or better for 0-10 ppm range 1.0 ppm or better for 0-100 ppm range
5.	Accuracy	≤ ±1% of full scale
6.	Drift	≤ ±1% of full scale over 24 hours
7.	Gas Connections at rear end	1/8 inch tubing / compression fitting
8.	Sample flow	25-150 ml/min (SCCM), programmable
9.	Operating Pressure Range	5-10 psig
10.	Integral Auto-calibration valve manifold	Integral auto-calibration valve manifold or Internal sampling system for zero, span and sample gas flow
11.	Analog output for remote monitoring	4-20 mA isolated analog output
12.	Digital output for remote monitoring	Three potential free/dry relay contact for range identification One potential free/dry relay contact for system status /

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		alarm
13.	Remote communication	RS-232 bi-directional serial output / LAN support
14.	Dimensions	3U form factor for standard 19" rack mount
15.	Electrical supply	220±10%VAC, 50±1%Hz
16.	Operating Temperature	10 to 35 °C
17.	Accessories	1/8 inch stainless steel tubing between analyzer, getter type helium gas purifier and moisture trap, ferrules etc. Total Length of 1/8 inch tubing: 10 meter
18.	Calibration and Functional Test Certificate	The analyzer must be calibrated for 0 - 10 ppm or 0 - 100 ppm range at works. Vender must provide functional test certificate for measurement of known sample gas for following range after calibrating the analyser. (a) 0 - 100 ppm and (b) 0 - 10 ppm
19.	Acceptable Leak rate for complete built-in system	≤ 5 x 10 ⁻⁵ mbar-litre/s for complete built-in system and at compression fitting including heated getter type helium gas purifier and inline glass indicating moisture trap
20.	Acceptance Criteria	Vender must submit following certificates / documents to purchaser for approval of despatch clearance by purchaser (a) Calibration certificate for range 0 - 10 ppm or 0 - 100 ppm (b) Functional test certificate for known sample gas measurement for 0 - 100 ppm and 0 - 10 ppm range (c) Functional test certificate for heated getter type helium gas purifier and inline glass indicating moisture trap
21.	Documentation	User's manual describing installation, operation, maintenance & troubleshooting in English language in both hard and soft copy for helium gas with heated getter type helium gas purifier and inline glass indicating moisture trap
22.	Warranty	12 months from the date of acceptance of nitrogen trace analyzer for helium gas with heated getter type helium gas purifier and inline glass indicating moisture trap at IPR
23.	Scope	Supply, installation, commissioning & site acceptance including training of nitrogen trace analyzer for helium gas with heated getter type helium gas purifier and inline glass indicating moisture trap at IPR

Item - 2: Heated getter type helium gas purifier, Quantity: 01

Sr. No.	Parameter	IPR Specification
1.	Getter Type	Alloy of Zr-V-Fe

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2.	Process Gas	Helium gas
3.	Process Gas connection	1/8 inch tubing / compression fittings
4.	Electrical supply	220±10%VAC, 50±1%Hz
5.	Flow Rate Range	25 – 200 ml/min
6.	Maximum Inlet Pressure	≥50 psig
7.	Impurities removed to ppb level	H ₂ O, O ₂ , CO, CO ₂ , N ₂ , H ₂ and CH ₄
8.	High purity manual two in/out isolation valves and one bypass valve with supporting plate of stainless steel	To isolate & bypass getter type helium gas purifier in the event of maintenance or failure

Item - 3: Inline Glass Indicating Moisture trap, Quantity: 01

Sr. No.	Parameter	IPR Specification
1.	Material Type	Molecular Sieve 5A and Moisture indicator
2.	Body Type	Heavy-walled glass body to prevent oxygen and water infusion and internal frit at each end to prevent particulate contamination
3.	Process Gas	Helium gas
4.	Process Gas connection	1/8 inch tubing / compression fittings
5.	Flow Rate Range	25 – 200 ml/min
6.	Maximum Inlet Pressure	≥50 psig

- Vender shall provide consumable and spare parts list for two years of operation for nitrogen trace analyzer, heated getter type helium gas purifier and glass indicating moisture trap.
- Vender shall quote all above three items compulsory as per attached price bids format. The purchase order will not split for individual item(s).

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Compliance Sheet

Compliance Statement for supply, installation, commissioning and site acceptance including training of nitrogen trace analyzer for helium gas with heated getter type helium gas purifier and inline glass indicating moisture trap

Bidder must submit compliance statement dully filled with exact technical values of each specifications (Not with OK, CONFIRM, COMPLY, ACCEPTABLE) alongwith official seal and signature with their offer.

Sr. No.	Parameter	IPR Specification	Vender's Technical Specification
Item – 1:- Trace Nitrogen Analyzer in Helium gas, Quantity: 01			
1.	Type of Detector	Plasma Emission Detector	
2.	Background	Helium gas	
3.	Range	0 - 1 ppm, 0 - 10 ppm, 0 - 100 ppm User-settable, fixed, auto-ranging	
4.	Display Resolution	0.1 ppm or better for 0-10 ppm range 1.0 ppm or better for 0-100 ppm range	
5.	Accuracy	≤ ±1% of full scale	
6.	Drift	≤ ±1% of full scale over 24 hours	
7.	Gas Connections at rear end	1/8 inch tubing / compression fitting	
8.	Sample flow	25-150 ml/min (SCCM), programmable	
9.	Operating Pressure Range	5-10 psig	
10.	Integral Auto-calibration valve manifold	Integral auto-calibration valve manifold or Internal sampling system for zero, span and sample gas flow	
11.	Analog output for remote monitoring	4-20 mA isolated analog output	
12.	Digital output for remote monitoring	Three potential free/dry relay contact for range identification One potential free/dry relay contact for system status / alarm	
13.	Remote communication	RS-232 bi-directional serial output / LAN support	
14.	Dimensions	3U form factor for standard 19" rack mount	
15.	Electrical supply	220±10%VAC, 50±1%Hz	
16.	Operating Temperature	10 to 35 °C	
17.	Accessories	1/8 inch stainless steel tubing between analyzer, getter type helium gas purifier and moisture trap, ferrules etc. Total Length of 1/8 inch tubing: 10 meter	
18.	Calibration and	The analyzer must be calibrated for 0 - 10	

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	Functional Test Certificate	ppm or 0 - 100 ppm range at works. Vender must provide functional test certificate for measurement of known sample gas for following range after calibrating the analyser. (a) 0 - 100 ppm and (b) 0 - 10 ppm	
19.	Acceptable Leak rate for complete built-in system	$\leq 5 \times 10^{-5}$ mbar-litre/s for complete built-in system and at compression fitting including heated getter type helium gas purifier and inline glass indicating moisture trap	
20.	Acceptance Criteria	Vender must submit following certificates / documents to purchaser for approval of despatch clearance by purchaser (a) Calibration certificate for range 0 - 10 ppm or 0 - 100 ppm (b) Functional test certificate for known sample gas measurement for 0 - 100 ppm and 0 - 10 ppm range (c) Functional test certificate for heated getter type helium gas purifier and inline glass indicating moisture trap	
21.	Documentation	User's manual describing installation, operation, maintenance & troubleshooting in English language in both hard and soft copy for helium gas with heated getter type helium gas purifier and inline glass indicating moisture trap	
22.	Warranty	12 months from the date of acceptance of nitrogen trace analyzer for helium gas with heated getter type helium gas purifier and inline glass indicating moisture trap at IPR	
23.	Scope	Supply, installation, commissioning & site acceptance including training of nitrogen trace analyzer for helium gas with heated getter type helium gas purifier and inline glass indicating moisture trap at IPR	
Item – 2:- Heated getter type helium gas purifier, Quantity: 01			
1.	Getter Type	Alloy of Zr-V-Fe	
2.	Process Gas	Helium gas	
3.	Process connection	Gas 1/8 inch tubing / compression fittings	
4.	Electrical supply	220±10%VAC, 50±1%Hz	
5.	Flow Rate Range	25 – 200 ml/min	
6.	Maximum Inlet Pressure	≥50 psig	
7.	Impurities removed to	H ₂ O, O ₂ , CO, CO ₂ , N ₂ , H ₂ and CH ₄	

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	ppb level		
8.	High purity manual two in/out isolation valves and one bypass valve with supporting plate of stainless steel	To isolate & bypass getter type helium gas purifier in the event of maintenance or failure	
Item – 3:- Inline Glass Indicating Moisture trap, Quantity: 01			
1.	Material Type	Molecular Sieve 5A and Moisture indicator	
2.	Body Type	Heavy-walled glass body to prevent oxygen and water infusion and internal frit at each end to prevent particulate contamination	
3.	Process Gas	Helium gas	
4.	Process Gas connection	1/8 inch tubing / compression fittings	
5.	Flow Rate Range	25 – 200 ml/min	
6.	Maximum Inlet Pressure	≥50 psig	

Note: Vendors are requested to provide technical data or values / remarks on all above mentioned specifications along with datasheet and requirements.

Authorised Signatory

Official Seal

Date :-