**ANNEXURE - 1**

ENQUIRY NO : CeNS/2016-17/SA/F06

**Technical specification for Gas Manifold Panel ' for Gas sensing system**

1. **Product Description:**

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This is referred as a Gas Manifold assembly which consists of Pressure reducing regulators, Filters, Check Valve and Flexible hoses. The assembly consists of branches which encompass the regulator, filter, check valve and hose component where each branch will be utilized independently for inert, Flammable, High Purity and toxic media. The gas manifold should be designed using the components with specifications given below.

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| --- | --- | --- | --- |
| **S.N.** | **Description** | **Material Type** | **Qty** |
| 1 | IS 3224 standard cylinder connection considered (Ar, N2, CO, H2, CH4, NO, O2) | - | 9 |
| 2 | CGA standard Cylinder connection considered. (NH3) | - | 1 |
| 3 | [Stainless Steel Poppet 6000 psig (413 bar) Check Valve, 1/8 in. International Standard Tube Fitting, 1 psig (0.07 bar)](http://www.swagelok.com/en/catalog/Product/Detail?part=SS-CHS4-1) | 316 SS | 8 |
| 4 | [Stainless Steel Poppet 6000 psig (413 bar) Check Valve, 1/8 in. International Standard Tube Fitting, 1 psig (0.07 bar)](http://www.swagelok.com/en/catalog/Product/Detail?part=SS-CHS4-1), SC11 cleaned | 316SS | 1 |
| 5 | [Stainless Steel Poppet 6000 psig (413 bar) Check Valve, 1/8 in. International Standard Tube Fitting, 1 psig (0.07 bar)](http://www.swagelok.com/en/catalog/Product/Detail?part=SS-CHS4-1) | 316 SS | 1 |
| 6 | FM series metal flexible hose, 1/4 in. Tube Adapter ends, 65.in Overall Length. | 316 SS | 2 |
| 7 | XT series PTFE flexible hose, 1/4 in. Tube Adapter ends, 65.in Overall Length. | 316 SS | 8 |
| 8 | Stainless Steel Tee-Type Particulate Filter, 1/4 in. International Standard Tube Fitting, 7 Micron Pore Size | 316 SS | 7 |
| 9 | Stainless Steel Tee-Type Particulate Filter, 1/4 in. International Standard Tube Fitting, 7 Micron Pore Size SC11 Cleaned. | 316 SS | 1 |
| 10 | [Stainless Steel All-Welded In-Line Filter, 1/4 in. International Standard Tube Fitting, 7 Micron Pore Size](http://www.swagelok.com/en/catalog/Product/Detail?part=SS-4FW-7) | 316 SS | 2 |
| 11 | [Stainless Steel 1-Piece 40 Series Ball Valve, 0.6 Cv, 1/4 in. International Standard Tube Fitting](http://www.swagelok.com/en/catalog/Product/Detail?part=SS-42GS4) | 316 SS | 9 |
| 12 | KPR Series regulator, 316 SS Body Material, Max Inlet Pressure: 248 bar, Outlet Range: 0 to 6.8 bar, 1/4 in FNPT I/L & O/L ports, PCTFE seat material, Cv: 0.02, Alloy X-750 diaphragm, sensing mechanism, No vent, Knob handle. | 316 SS | 5 |
| 13 | KPR Series regulator, 316 SS Body Material, Max Inlet Pressure: 248 bar, Outlet Range: 0 to 6.8 bar, 1/4 in FNPT I/L & O/L ports, PCTFE seat material, Cv: 0.02, Alloy X-750 diaphragm, sensing mechanism, Captured vent, Knob handle. | 316 SS | 2 |
| 14 | KPR Series regulator, 316 SS Body Material, Max Inlet Pressure: 68.9 bar, Outlet Range: 0 to 6.8 bar, 1/4 in FNPT I/L & O/L ports, PCTFE seat material, Cv: 0.02, Alloy X-750 diaphragm, sensing mechanism, No vent, Knob handle. | 316 SS | 1 |
| 15 | KPR Series regulator, 316 SS Body Material, Max Inlet Pressure: 34.4 bar, Outlet Range: 0 to 6.8 bar, 1/4 in FNPT I/L & O/L ports, PCTFE seat material, Cv: 0.02, Alloy X-750 diaphragm, sensing mechanism, No vent, Knob handle. | 316 SS | 1 |
| 16 | KPR Series regulator, 316 SS, ASTM G93 Level E-cleaned Body Material, Max Inlet Pressure: 248 bar, Outlet Range: 0 to 6.8 bar, 1/4 in FNPT I/L & O/L ports, PCTFE seat material, Cv: 0.02, Alloy X-750 diaphragm, sensing mechanism, No vent, Knob handle. | 316 SS | 1 |
| 17 | Industrial Pressure Gauge,Bayonet Ring, 63 mm dial size, 0 to 250 bar dial range, psi secondary reading, Center Back Mount, 1/4 in. Tube Adapter End | 316 SS | 7 |
| 18 | Industrial Pressure Gauge,Bayonet Ring, 63 mm dial size, 0 to 10 bar dial range, psi secondary reading, Center Back Mount, 1/4 in. Tube Adapter End | 316 SS | 9 |
| 19 | Industrial Pressure Gauge,Bayonet Ring, 63 mm dial size, 0 to 100 bar dial range, psi secondary reading, Center Back Mount, 1/4 in. Tube Adapter End | 316 SS | 1 |
| 20 | Industrial Pressure Gauge,Bayonet Ring, 63 mm dial size, 0 to 40 bar dial range, psi secondary reading, Center Back Mount, 1/4 in. Tube Adapter End | 316 SS | 1 |
| 21 | Industrial Pressure Gauge,Bayonet Ring, 63 mm dial size, 0 to 250 bar dial range, psi secondary reading, Center Back Mount, 1/4 in. Tube Adapter End | 316 SS | 1 |
| 22 | Industrial Pressure Gauge,Bayonet Ring, 63 mm dial size, 0 to 10 bar dial range, psi secondary reading, Center Back Mount, 1/4 in. Tube Adapter End | 316 SS | 1 |
| 23 | SS Tubing 1/4 in OD x 0.035 in WT(SS-T4-S-035-6ME) | 316L / 316 SS | As Needed |
| 24 | SS Tubing 1/8" OD x 0.028" WT (SS-T2-S-028-6ME) | 316L / 316 SS | As Needed |
| 25 | [Stainless Steel 1-Piece 40 Series Ball Valve, 0.2 Cv, 1/8 in. International Standard Tube Fitting](http://www.swagelok.com/en/catalog/Product/Detail?part=SS-42GS4) | 316 SS | 9 |
| 26 | [Stainless Steel Integral Bonnet Non-Rotating Stem Valve, 0.27 Cv, 1/4 in. International Standard Tube Fitting](http://www.swagelok.com/en/catalog/Product/Detail?part=SS-14DKS4), SC11 cleaned | 316 SS | 1 |
| 27 | [Stainless Steel 1-Piece 40 Series Ball Valve, 0.2 Cv, 1/8 in. International Standard Tube Fitting](http://www.swagelok.com/en/catalog/Product/Detail?part=SS-42GS4) | 316 SS | 1 |
| 28 | 200 Series Fittings | 316 SS | As Needed |
| 29 | 400 Series Fittings | 316 SS | As Needed |
| 30 | Witt-Flash Back Arrestor | - | 1 |
| 31 | 3mm thick Plate Wall Mountable type Panel, Tube Supports and Valve Bracket | 304 SS | As Needed |

1. **Specifications:**
	1. All valves and fittings used in the Assembly should be International Standard stainless steel valves and fittings.
	2. All NPT connections should be made using PTFE tape.
	3. The tubing used in this arrangement should be standard 1/8"OD x 0.028" WT & 1/4"OD x 0.049" WT 316/316L stainless steel seamless tubing.
	4. The assembly will have to be mounted on a 304/ 316 SS Wall mountable type panel with 3 mm thickness.
2. **Testing**

The assembly should be pressure tested with Argon at Inlet pressure of 34.4 bar for duration of 5 mins. All ports will be sprayed with liquid leak detector SNOOP and observed for any bubble formation.

1. **Cleaning / Processing**

SC-10 (International Standard Standard Cleaning) or SC-11 (International Standard Special Cleaning) should be provided prior to assembly for all individual manufactured components.

1. **Shipping and Handling**

The complete Gas Manifold Assembly should be shipped to the Customer site with appropriate packaging to protect from damage during transport.

1. **Misc:**

1. The assembly must be installed by an OEM or its channel partner. The personnel conducting the installation should be formally certified by OEM and should have relevant certification. A copy of certification should be produced when requested.

2. Vendor should have local presence and conduct all the assembling activity at their facility in Bangalore.

3. Vendor should maintain substantial inventory of offered tubing’s and 60% of the offered components.

4. Vendor should be available at customer premise to address any issue/ concern within 8 working hours.

5. Vendor should be able to provide CAD drawing for the complete assembly for our approval further to order placement. Assembling activity should begin further to receipt of our approval.

6. Vendor should provide limited life time warranty against manufacturing defects for material and workmanship for components and installation.

7. Vendor must have a very broad experience in the fabrication of high precision and high end gas handling units. They must have a history of supplying such high end instruments in various prestigious research institutions and companies such as IITs, IISc, NITs, etc.

8. The MFCs will be provided from our end to the gas manifold manufacturing company, who gets the tender, while assembling the mentioned gas manifold unit.

9. The vendor shall have the ability to conduct Leak Audits and a record of having completed more than 30 audits in the previous 12-month period.

10. All the assembling activity should be as per ISO 9001 standards.

11. The vendor should also co-ordinate with the gas sensing chamber supplier (identified by us) for final integration of the gas manifold with the chamber and testing.