



Boiler Auxiliary Plant , Bharat Heavy Electricals  
Limited , Ranipet Tamilnadu- 632406

Purchase Department

Enquiry No: BAP/PUR/ROTA METER dt.17.07.2015  
Due on: 07.08.2015

Item: Rota Meter with isolation valves on both ends.

**Synopsis :**

**(i) Annexure-I**

Pre-Qualification Requirement

Description of item , Quantity details and Relevant specification

**(ii) Annexure-II : General terms and conditions of tender**

**(iii) Annexure-III : Commercial terms and conditions Annexure, MSME split provision & CA certificate format.**

**Contact Details**

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**Annexure-I To Open Tender ref: BAP/PUR/ROTA METER dt.17.07.2015**

**For Supply Of "ROTA METER" , Due on : 07.08.2015**

**Pre-Qualification Requirement**

**(1) Vendor should be a manufacturer of this item.**

**(2) Vendor should have supplied at least 15 nos of Rota meter for past two years. Purchase order copies for the supply made in the past two years should be enclosed along with technical-commercial offer.**

**Offers of such vendors will be considered at our end who meets the above two requirements.**

**Annexure-I To Open Tender ref: BAP/PUR/ROTA METER dt.17.07.2015**

**For Supply Of "ROTA METER" , Due on : 07.08.2015**

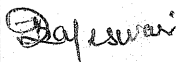


**Description of Item, Qty, Drawing and Relevant Specification**

<b>SI No</b>	<b>Description of Itrm</b>	<b>Qty</b>	<b>Unit</b>	<b>Delivery Required</b>
01	Rota Meter with flow rate 0-300 LPM for 1" (one inch) pipe line along with isolation valve on both ends for flow measurement of ammonia gas in an Ammonia Injection system.	<b>08</b>	<b>No</b>	04 Nos - 24.06.2016 04 Nos - 24.02.2017
02	Rota Meter with flow rate 0-500 LPM for 1 & 1/2" (One & Half inch) pipe line along with isolation valve on both ends for flow measurement of ammonia gas in an Ammonia Injection system.	<b>04</b>	<b>No</b>	02 Nos - 24.06.2016 02 Nos - 24.02.2017

**Specification to be followed : TEP:AI:ROTAMETER:REV 01 dt.17.07.2015**

## TECHNICAL SPECIFICATION FOR ROTAMETER

TEP:AI:ROTAMETER:Rev 01

NAME		DESIGNATION	SIGN	DATE.
PREPARED	K.RAJESWARI	Asst. Engineer I		20.06.15
CHECKED	ADARSH VERMA	Engineer		20.06.15
APPROVED	C.GANESH	DGM <del>SM</del> /AQCS		20.06.15
<b>ISSUED BY</b>				
<b>EDC – AQCS</b>				
<p>REVISION NO : 01, Dated: 17.07.15</p> <p><i>Sl. No.18 of design requirement modified.</i></p>				

PREPARED

CHECKED

APPROVED

## TECHNICAL SPECIFICATION FOR ROTAMETER

TEP:AI:ROTAMETER:Rev 01

**01. Scope:** Scope includes supply of Rota meter for flow measurement of ammonia gas in a Ammonia injection system along with the isolation valves on both ends.

**02. Application:** Ammonia Flue Gas conditioning System (AFGCS) is used to enhance the performance of the ESP in coal fired boilers. Ammonia gas is diluted and injected into the flue gas before the ESP. Ammonia gas (of industry grade pure) is taken from cylinder and reduced to a pressure level of 2 kg/cm<sup>2</sup> and diluted with air (from a blower) and injected into the flue gas. A pressure regulating valve is used for reducing the pressure and a flow control valve is used for controlling the flow rate of ammonia before it mixes with air. AFGCS is a continuous working system for the purpose of pollution control. The offered Rota meter is to be used in a Ammonia Injection system envisaged in a electrostatic precipitator inlet duct. Ammonia Vapor pressure is reduced to 2kg/Cm<sup>2</sup> by a pressure-reducing valve in the pipeline. The ammonia vapor goes to the discharge of the Air blower, where the ammonia is getting mixed with air maintaining the ammonia concentration of 0.5% to 1.5%. Ammonia flow is maintained by controlling through a needle valve and measured by Rota meter. Then a distributor injects this ammonia air mixture in the flue Gas duct before the Electrostatic precipitator.

**03. Location of the Plant:** Refer Enquiry

**04. Design Requirement:**

SI No.	Name of Instrument	Magnetic Rotameter – Ammonia Gas
01	Service	Ammonia (1") Air with 1.5% Ammonia(V/V)1 1/2" / Temperature: 30 to 60 deg C
02	Type	On-line, Magnetic, Direct Reading Metal tube(tapered mounted vertically)
03	Quantity	6nos (4no--1" and 2 nos.-- 1 1/2")
03	Flow rate	0-300LPM -- 4nos(1" pipe line) 0-500LPM -- 2 nos.(1 1/2" pipe line)
04	Case	Water & Weather Proof of IP 67
05	Body Material	SS 316
06	Float material	SS 316
07	Tube Material	SS316
08	Packing	Teflon
09	Repeatability	+/- 1% of full range
10	Accuracy	+/- 2% of Instantaneous Value
11	Operating Pressure	0-4 kg/cm <sup>2</sup>
12	End connections :	Flanged. Flanges(RF) as per ANSI standard. ANSI B 16.5 RF 300. SS with necessary Teflon gaskets and fasteners.
13	Inlet Connection Orientation	Down
14	Outlet Connection Orientation	Up
15	Mounting	Field- In line in the process pipeline, vertical with flow upwards.
16	Line size	One inch (1 ")--4nos; One and half( 1 1/2") 02nos.
17	Name Plate / Tag no.	Required / SS
18	Isolation valve at both ends	Rota meter complete with SS 316 isolation valves (Flanged end connection (including handles). Two numbers of Counter Flanges shall be provided for connecting valves with pipe for each rotameter.

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*Deyenari*

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## TECHNICAL SPECIFICATION FOR ROTAMETER

TEP:AI:ROTAMETER:Rev 01

- The offered Rota meter body and internals should meet the service conditions of the liquid. MOC should avoid: copper, Zinc, copper alloys and galvanized surfaces in the construction of instrument. Mounting brackets for the offered Rota meters are also in the scope of the vendor.

### 05. Properties and Characteristics of Ammonia:

Physical State	: Gas, Liquid under pressure
Colour	: Colorless
Odour	: Pungent
Corrosivity	: In presence of moisture, corrosive to copper, Zinc, copper alloys and galvanized surfaces
Water solubility	: Highly soluble
Boiling Point	: - 33.3 Deg C at atm. pressure
Melting point	: - 77.7 Deg C
Specific Gravity	: 0.63( at + 4 Deg C)
Vapour density	: 7.55 kg/m <sup>3</sup> (at 24 Deg C)
Vapour Pressure	: 10 atm at 25.7 Deg C

### 06. Documents to be submitted along with the offer:

- a. Catalogue for the offered Rotameter.
- b. Material specification for the components.
- c. Alternatives suggested if any to meet the application/design requirement.
- d. Deviations from the technical specification if any, should be spelt clearly for evaluation of the offer.

### 07. Inspection and testing :

- a. Dimensional Checks of the offered Rota meter
- b. Material test certificates the various components as per the approved drawing.
- c. Component should be inspected and pressure tested -- Body and Seat at a pressure of 1.5 times the nominal pressure in a medium of air.
- d. Calibration Test
- e. Hydrostatic test

### 08. Documents to be furnished by the vendor after receipt of Purchase Order:

- i) Quality Assurance Plan for approval
- ii) Detailed dimensional general arrangement drawing of the Rotameter. This drawing shall indicate all the design data and information like material, for dis-assembly, weight, part nos, test pressures, statutory or ant special requirements, sizes, quantities.

**09. Painting:** Painting shall be as per the relevant CQR for this project.

**10. Packing:** The vendor shall pack the item such that the equipments shall not get damaged during transport, storage and handling. The packing materials shall withstand long storage, kept inside covered area. BHEL PO.NO., Item Name, Quantity, Vendor Name and Consignee details shall be furnished on the packing. The individual items are to be numbered and tagged in the part items and should linked to the erection drg parts list for easy reference and identification of the parts.

*B. S. Swar*  
PREPARED

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12/09/15  
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12/09/15  
APPROVED

