

**Mandatory Pre-Qualification requirements for Vortex flow meter W96415002767  
as per TG60665**

**Description:** - The vortex flow meter is used to measure volume flow of De-mineralized water at outlet of bushing in Turbo generators. The vortex flow meters shall be suitable for mounting in horizontal/vertical direction of flow with flanged connections.

**Mandatory Pre-Qualification requirements**

- 1.0** The vendor should be a regular manufacturer of Vortex flow meter with following technical requirements-

Sl No.	Parameter	Value
(i)	Application fluid	DM Water
(ii)	Flow rate	$\leq 25 \text{ m}^3/\text{hr.}$
(iii)	Size	$\leq 1 \text{ inch (NB25)}$
(iv)	Working Pressure	1.5 bar (minimum)
(v)	Measuring accuracy	$\pm 0.75\%$ or better
(vi)	Electrical output	4-20 mA, 2 wire output HART Protocol

- 2.0** In support of above, vendor shall furnish technical details in below mentioned format for at least five (5) nos. of vortex flow meter for the P.O. executed in past 10 years (from date of enquiry) along with P.O. copies meeting requirements as per point no. 1 above.

S. No.	Brief technical details	Data	P.O. Ref. No.	Name & address of customer	Date of supply
	- Application fluid	DM Water			
	- Working pressure				
	-Working Temperature				
	- Flow rate				
	- Material of body/flanges/inside parts				
	-Measuring accuracy				

- 3.0** Vendor to furnish the test certificate for calibration and hydraulic test of vortex flow meter for any one of the P.O. submitted against clause 2. Vendor to also furnish the NABL accreditation details of calibration facility.
- 4.0** Acceptance certificate from one of the vendor's end user of Vortex flow meter to be provided for any one of the P.O. submitted as per clause 2.0. Acceptance certificate should contain information like item details and its application.

**Mandatory Pre-Qualification requirements for Vortex flow meter  
W96415002910(dual sensor) & W96415002902(single sensor) as per TG60665**

**Description:** - The vortex flow meter is used to measure volume flow of De-mineralized water at outlet of stator winding in Turbo generators. The vortex flow meters shall be suitable for mounting in horizontal/vertical direction of flow with flanged connections.

**Mandatory Pre-Qualification requirements**

- 1.0 The vendor should be a regular manufacturer of Vortex flow meter with following technical requirements-

Sl No.	Parameter	Value
(i)	Application fluid	DM Water
(ii)	Flow rate	$\geq 50 \text{ m}^3/\text{hr.}$
(iii)	Working Pressure	1.5 bar (minimum)
(iv)	Measuring accuracy	$\pm 0.75\%$ or better
(v)	Electrical output	4-20 mA, 2 wire output HART protocol
(vi)	No. of sensor	Single/ Dual

- 2.0 In support of above, vendor shall furnish technical details in below mentioned format for at least five (5) nos. of vortex flow meter for the P.O. executed in past 10 years (from date of enquiry) along with P.O. copies meeting requirements as per point no. 1 above.

S. No.	Brief technical details	Data	P.O. No.	Ref.	Name & address of customer	Date of supply
	- Application fluid	DM Water				
	- Working pressure					
	-Working Temperature					
	- Flow rate					
	- Material of body/flanges/inside parts					
	-Measuring accuracy					
	-No. of sensors for flow measurement.					

- 3.0 Vendor to furnish the test certificate of Vortex flow meter for any one of the P.O. submitted against clause 2. Vendor to also furnish the NABL accreditation details of calibration facility.
- 4.0 Acceptance certificate from one of the vendor's end user of vortex flow meter to be provided for any one of the P.O. submitted as per clause 2.0. Acceptance certificate should contain information like item details and its application.

# ELECTRICAL MACHINES ENGINEERING (EME)

## HEEP, BHEL HARIDWAR

From : AGM, EME  
Ref : EME/MCX/001  
Date: 26/04/2019

Shri Ranjan Yadav  
DGM( MCX & PCM-EM)

Subject: Procurement of all the major Equipment and instruments (Pumps, coolers, Filters, Fine filter, Temperature control valve DPR, CPR etc.) from one source for all the units of one project

2A category components are required for manufacturing of Seal Oil system skid, Primary water skid and Gas System Skid for all the power projects.


All customers specify tender requirement i.e. maintaining the Uniformity for the type of equipment & instruments in similar applications, further the mandatory spares are also required to be supplied for each project of the same make as supplied for the main equipment.

In view of the customer preference as mentioned above and also as per sound engineering practice, it is advisable that all the major equipment and instruments as specified in the Annexure-A should be of same make for a particular project including mandatory spares if any.

It is therefore suggested that equipment & instruments (material code wise) for PMD's mentioned as per Annexure A are to be procured from same vendor for a particular project. A note for the same may please be added in the indent.

AGM/EME

26/04/2019

  
R L Vyas 26/4/19  
(AGM/EME-B)


CC: B. K Roy

AGM(PPX-EM)

**ANNEXURE A**

Sl. No.	Description	PMD
1.	Primary Water Pumps	TG113
2.	Seal Oil Pumps	TG122
3.	Seal Oil Cooler	TG182
4.	Primary Water Cooler	TG182
5.	Primary Water Filter	TG112
6.	Fine Filter	TG112
7.	Duplex Oil filter	TG043
8.	Pressure Regulator	TG109
9.	Differential Press. Regulator	TG038
10.	Constant Press. Regulator	TG026
11.	Temperature Control Valve	TG188
12.	Vacuum Pump	TG148
13.	Vortex Flow meter	TG191
14.	Solenoid Valve	TG203
15.	Multiway valve	TG309



MANUFACTURER'S NAME AND ADDRESS		STANDARD QUALITY PLAN					TO BE FILLED BY BHEL		TO BE FILLED BY BHEL			
 BHEL	VENDOR'S NAME	ITEM	<b>FLOW METER</b>		QP NO.	QA/BE/QP/925						
			<b>(Vortex Type)</b>		REV.	00	Date: 07.03.2022					
		Drg. No.	As per PO									
		Spec.	TG60665									
		Spec. Rev.	As per PO					Page 1 of 1				
SL. NO.	COMPONENT & OPERATIONS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORDS	AGENCY			REMARKS
									M	B	N	
1	2	3	4	5	6	7	8	9	D	10		11

<b>1.0 RAW MATERIALS</b>													
1.1	Flange, body, sensor, bluff body and all water contact parts	Chemical composition	Major	Measurement	1 sample/lot	Ord. Drg./Spec.	Ord. Drg./Spec.	MTC	√	P	V	-	
1.2	Electronic housing	Chemical composition	Major	Measurement	1 sample/lot	Ord. Drg./Spec.	Ord. Drg./Spec.	MTC	√	P	V	-	
<b>2.0 FINAL TESTING</b>													
2.1	Visual & Dimensional check	--	Major	Measurement	100%	Ord. Drg./Spec.	Ord. Drg./Spec.	IR	√	P	W	-	
2.2	Hydraulic test	--	Major	Physical	100%	Ord. Drg./Spec.	No leakage	IR	√	P	W	-	
2.3	Calibration test	--	Major	Physical	100%	Ord. Drg./Spec.	Ord. Drg./Spec.	IR	√	P	W	-	
2.4	Electrical output check	--	Major	Electrical	100%	Ord. Drg./Spec.	Ord. Drg./Spec.	IR	√	P	W	-	
2.5	Compliance to technical specification	--	Major	Review	100%	Ord. Drg./Spec.	Ord. Drg./Spec.	COC	√	P	V	-	
2.6	Marking	--	Major	Review	100%	Ord. Drg./Spec.	Ord. Drg./Spec.	-	-	P	V	-	
2.7	Packing	--	Major	Review	100%	Ord. Drg./Spec.	Ord. Drg./Spec.	-	-	P	V	-	

Note: 1. Witness by inspection agency to be random 10% of each material code (minimum 1 pieces per material code) from each lot. However, vendor to carry out 100% tests internally and tests report shall be reviewed by inspection engineer during inspection at Vendor's works. 2. Manufacturer to maintain calibrated instrument having better accuracy than the item under the test. Inspection engineer shall check the same.

Digitally signed  
by Sachin Jain  
Date:  
2023.09.22  
14:43:03 +05'30'

MANUFACTURER/ SUBCONTRACTOR	LEGEND: ORD.: PURCHASE ORDERING, DRG: BHEL APPROVED DRAWING, SPEC: BHEL SPECIFICATION, MTC: MATERIAL TEST CERTIFICATE, T.C.: TEST CERTIFICATE, I.R.: INSPECTION REPORTS, COC: CERTIFICATE OF CONFORMANCE, M: MANUFACTURER / SUBCONTRACTOR B: BHEL / NOMINATED INSPECTION AGENCY, N: CUSTOMER, 'P': PERFORM, 'W': WITNESS, 'V': VERIFICATION, "√" RECORDS IDENTIFIED WITH 'TICK' SHALL BE ESSENTIALLY INCLUDED BY CONTRACTOR IN QA DOCUMENTATION. ALL 'W' INDICATED IN COLUMN 'N' SHALL BE 'CHP' OF CUSTOMER	FOR CUSTOMER USE	APPROVED BY
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