	PRE-QUALIFICATION REQUIREMENTS FOR VENDOR REGISTRATION	PE-TS-434-145-I916
		REVISION NO. 00 DATE 10.05.2022
	PROJECT: 3X800MW PVUNL PATRATU TPP PHASE-I	SHEET NO. 1 OF 1

PACKAGE: **ELECTROMAGNETIC FLOWMETER**

1.0	
a.	Bidder should be Original equipment manufacturer (OEM) for ELECTROMAGNETIC FLOWMETER.
b.	In case bidder is not OEM, evaluation shall be done as following: 1 If bidder happens to be Indian subsidiaries of foreign OEM, then the credentials of the foreign OEM can also be considered for meeting PQR. 2 If bidder happens to be Authorized channel partner or having a valid collaboration agreement / licensing agreement with some other company or being a Joint Venture Company, then the credentials of collaborator / licensing company / Principal company /JV partner can also be considered for meeting PQR as per scope of the work. The scope matrix shall include their respective roles including design vetting, manufacturing of critical component and warranty/guarantee. If bidder(s) qualifies on the basis of credentials of his principal/JV partner/ Collaborator etc., then the principal/JV partner/Collaborator shall be responsible for overall design vetting and warranty/guarantee of the package.
2.0	The Product being offered by the bidder should be in use successfully in power plant or any other industrial application for at least 1 (One) year. Bidder to submit either of following supporting documents for the product: a. Copy of minimum 1 (One) Performance Certificate from end user / customer certifying that product has been running satisfactorily for 1 (One) year from date of commissioning to the date of application. The certificate should clearly indicate date of commissioning, date of issue of certificate and name/designation of the certificate issuer. Copy of purchase order & technical parameter to be attached along with the performance certificate. OR b Copy of repeat orders from minimum **1 (One)** purchaser. Order received by bidder from same purchaser with a gap of minimum **2 (Two)** years shall be considered as repeat order. Copy of technical parameters for each order to be attached.
3.0	Bidder to furnish experience list of last 5 years indicating customer name, purchase order reference, item supplied & year of supply to establish the continuity of business.
4.0	Bidder to submit all documents in English. If documents submitted by bidder are in language other than English, a self-attested English Translated document should also be submitted.

PREPARED BY	REVIEWED BY	APPROVED BY
ATUL RANJAN DY. MGR.	MAYANK KESHARWANI SR. MGR.	SURESH CHAND SHARMA DGM

TECHNICAL SPECIFICATION
FOR
ELECTROMAGNETIC FLOWMETER

TECHNICAL SPECIFICATION

FOR

ELECTROMAGNETIC FLOWMETER

3 x 800 MW PVUNL PATRATU TPP PHASE-I

VOLUME - IIB

SECTIONS-A, C & D

SPECIFICATION No: PE-TS-434-145-I916A

BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT DIVISION
NOIDA, INDIA

SECTION – A

SCOPE OF ENQUIRY

SCOPE OF ENQUIRY

1.0 SCOPE

1.1 This specification covers the Design, Manufacture, calibration, Inspection and Testing at manufacturer's works, proper packing for transportation and delivery to site of the electromagnetic flow meter with accessories as mentioned in different sections of this specification for 3X800 MW PVUNL Patratu Thermal Power Plant.

1.2 The quality plan enclosed, forms the minimum requirement but not limited to be adhered to by the bidder. Bidder to sign and stamp the same and submit along with the offer as an acceptance.

1.3 Scope of supply shall be electromagnetic flow meter along with accessories as indicated in specification

1.4 Following formats to be signed, stamped with company seal and submitted:
a) Complete offer including calculation sheets, catalogues, etc.
b) Quality Plan
c) Datasheets A & B, duly filled

2.0 GENERAL TECHNICAL INSTRUCTIONS

2.1 It is not the intent here to specify all the details of design and manufacture. However, the equipment shall conform in all respects to high standard of design, engineering and workmanship and shall be capable of performing the required duties in a manner acceptable to the customer / consultant, who will interpret the meaning of drawing and specification and shall be entitled to reject any component or material which in his judgment is not in full accordance herewith.

2.2 The omission of specific reference to any component / accessory necessary for the proper performance of the equipment shall not relieve the supplier of the responsibility of providing such facilities to complete the supply within the quoted prices.

2.3 BHEL's/Customer's representative shall be given access to the shop in which the equipment is being manufactured or tested and all test records shall be made available to him.

2.4 The equipment covered under this specification shall not be dispatched unless the same have been finally inspected, accepted and Material Dispatch Clearance Certificate (MDCC) is issued by BHEL.

SECTION-C

- **SPECIFIC TECHNICAL REQUIREMENT**
- **CUSTOMER'S SPECIFICATION**

SPECIFIC TECHNICAL REQUIREMENTS

The technical requirements in this section are specific for this project and shall override the specification under Section-D in case of any contradiction.

1.0 Bidder to furnish necessary credentials & performance certificate as per PQR (Doc. No. PE-PQ-999-145-I008) for Electromagnetic Flowmeter. Further, Bidder to furnish filled format for Provenness criteria, attached in the specification.

2.0 Flange and counter flange for assembly of instrument on pipe shall be in bidder's scope.

3.0 Bidder to note that duly filled up Data Sheet-B, Quality Plan, Format enclosed in Section-D of Volume IIB, to be signed and stamped and submitted with the bid.

4.0 Bidder Presence is required at site for 2 days each time (2 times) for any site support requirement (for supervision). All the expenses like boarding, lodging and travel, Air fare etc. shall be in bidder's scope.

5.0 DOCUMENTATION:

(A) Along with the bids: No separate documentation required at the time of bids except the Catalogue, PQR document, Proven ness certificate, duly filled Datasheets & Stamped QAP

(B) After the award of contract: 10 sets of the following documents to be enclosed along with the contract documents for approval:

a) Datasheet C completely filled-up.

b) Quality plan duly signed and stamped.

c) Calculation Sheet.

d) Assembly dimensional drawings.

e) GA Drawing.

(C) Final documentation: The documentation as listed below shall be submitted as a part of final documentation.

1. Approved final drawings/data sheets, – 10 sets
2. All Test certificates – 10 sets.
3. Operation & Maintenance Manuals for Electromagnetic flow meter – 10 sets } with 2 CD-ROMS
4. Assembly drawings and QP for approval – 10 sets.
5. "As built" drawings – 10 sets.

6.0 In case during erection/commissioning of the Electromagnetic flowmeter, any spares are required which have not been specified in the Start-up/commissioning spares list, the same will have to be supplied by the vendor free of cost.

7.0 NOT APPLICABLE

8.0 Canopy shall be required for all outdoor electromagnetic flowmeter and same shall be in bidder's scope.

9.0 In case of any discrepancy in Specific Technical Requirement and Equipment specification, Specific Technical Requirement shall prevail.

10.0 Electromagnetic flowmeter shall be of Hart compatible.

	TECHNICAL SPECIFICATION FOR ELECTROMAGNETIC FLOWMETER 3X800MW PVUNL PATRATU TPP PHASE-I	SPEC NO.: PE-TS-434-145-I916A	
		VOLUME II B	
		SECTION C	
		REV. NO. 00	DATE : 27.07.2021
		SHEET	OF

COMPLIANCE CERTIFICATE

We shall comply with the following:

1. All the requirements as stated in Technical Specification / Specific Technical requirement / Data sheets / Drawings, BHEL quality plan etc. as enclosed in the tender, shall be fully complied **without any deviation.**

2. BHEL Quality Plan (enclosed with the specification) duly signed and stamped is submitted herewith **without any deviation.**

3. Sizing, Data Sheet-C in line with Data sheet-A of specification, dimensional drawings / Electromagnetic flowmeter (EMF) erection details, etc shall be submitted for BHEL/Customer review and approval, to reach BHEL within 15 days after receipt of LOI.

4. Selection of EMF sensors, mounting accessories, Electronics etc. are our (bidder's) responsibility. Any change in selection of type of sensor, electronics etc., if desired by BHEL / Customer during approval of the documents after award of contract, without major changes in process parameters as per tender Specification, shall be carried out without any commercial implication and time delay.

5. BHEL / Customer reserves the right to accept/rejects any variation to the specification.

(To be Signed & Stamped by the Bidder)

Signature with date	
Name	
Company seal	

CLAUSE NO.	TECHNICAL REQUIREMENTS

19.05.00 **Electronic Flow-Meter**

The electronic flow meter shall include flow sensor and flow indicator cum integrator / totaliser and shall include all required accessories for satisfactory operation. The flow meter shall be based on full bore electromagnetic principle and shall be electronic type of proven design, make and model acceptable to the owner.

The Bidder shall submit all necessary technical literature and details of selection criteria of the instrument offered to substantiate the model selected. The Bidder shall also furnish list of similar installation along with feed back on satisfactory performance of the instruments.

The flow meter shall meet or exceed the following requirement :

(a)	Output	:	4-20 mA DC Isolated output
(b)	Accuracy	:	± 0.5% of calibrated span or better *
(c)	Repeatability	:	± 0.2% of calibrated span or better
(d)	Power Supply	:	240V AC ± 10%, 50 HZ ± 5%/ 24 V DC, to be arranged by the contractor.
(f)	Protection class	:	IP-55
(e)	Flow tube		SS304
(f)	liner		Hard Rubber

The flow meter shall provide local indication for instantaneous flow. It should also be possible to get local display for daily and monthly discharge. The flow meter shall indicate totaliser/ integrator to get the daily and monthly discharge as stated above.

SECTION-D

- **EQUIPMENT SPECIFICATION**
- **DATA SHEETS – A & B**
- **QUALITY PLAN**
- **BOQ-MAIN SUPPLY**

1.0 SCOPE

This specification covers the Design, Manufacture, Calibration, Inspection and Testing at the manufacturer's works, proper packing for transportation and delivery to site of Electromagnetic Flow Meter for use in Utility/Captive Power Station/Combined Cycle Station.

2.0 CODES AND STANDARDS

2.1 All the equipment specified herein shall comply with the requirements of the latest issue of the relevant National and International standards.

2.2 The Electromagnetic Flow Meters shall be of proven reliability, accuracy and repeatability requiring a minimum of maintenance. The Design and Materials used for the components shall also comply with the relevant National and International standards.

3.0 TECHNICAL REQUIREMENT

The Electromagnetic Flow Meters and the accessories shall be suitable for continuous operation under an ambient temperature of 0-55°C for Transmitter and (-) 20 to 100°C for Transducer and Relative Humidity of 5-100% unless specified otherwise in volume IIB Section-B or Section-C.

All accessories required for mounting/erection of these instruments shall be furnished as necessary for completeness of the system.

3.1 Accessories: All mounting hardware like clamping fixtures, mechanism to remove the sensors on line, interconnecting screened cables between Transducer & Transmitter, Cable Glands etc. is required to be supplied. Weather canopy for protection from direct sunlight and direct rain shall also be offered as an option. Material of all fittings shall be SS-316.

4.0 GUARANTEE AND PERFORMANCE

The guarantee of flow measuring assembly shall be 18 months from the date of dispatch or 12 months from commissioning whichever is earlier.

5.0 TEST & INSPECTION

5.1 The bidder shall adopt suitable quality assurance plan to ensure that the equipment's offered will meet the specification requirements in full.

5.2 The Quality Plan shall be discussed and finalized with the technically accepted bidders before opening the price bid. The stages where the purchaser would like to be associated for witnessing or verification would be indicated by the purchaser in the Quality Plan before approval.

5.3 Inspection will be conducted by BHEL and/or their authorized representatives as per the agreed inspection schedule. The inspection schedule will be submitted by the bidder for BHEL's approval at contract stage. The cost of all tests and inspections will be deemed to have been included in the bid. For all the type tests "Type Test Certificates" as per agreed Quality Plan shall be furnished. In the absence of the same, such Type Tests shall be arranged at the Vendor's works in the presence of BHEL and/or their authorized representatives or in independent Test House/Laboratory approved by BHEL.

6.0 SPARES AND CONSUMABLES

6.1 Commissioning Spares and consumables

As part of the main equipment supply, the bidder shall supply all commissioning spares and consumables required during Start-up,

6.2 Recommended Spares

The bidder shall furnish a list of Recommended Spares along with the normal service expectancy period and frequency of replacement; quantities recommended for 3 years operation along with unit rate against each item to enable BHEL/BHEL's Customer to place a separate order later, if required.

6.3 Special Tools & Tackles

The bidder shall furnish a list of Special Tools & Tackles included in the bid.

7.0 DRAWINGS & DOCUMENTS

7.1 The offer shall include the following in 4 copies each.

i. Technical data sheet for each flow measuring device assembly in the Pro forma enclosed under Data Sheet-B.
ii. Catalogue/Technical literature.
iii. Assembly drawing with dimensional details.

7.2 4 copy each of the following along with 2 CDs to be furnished after award of contract for owner approval.

i. Technical Data Sheet-C.
ii. Sizing Calculations.
iii. Assembly drawing with dimensions.
iv. Installation drawing.

8.0 FOR INFORMATION

8.1 Storage and Commissioning Instruction
8.2 O&M are to be supplied as specified.

9.0 PACKING & MARKING

9.1 Each item shall be properly packed with adequate protection against friction, stresses, vibration & shock during transportation. Each packing box shall have marking as per Purchase Order.

9.2 Each assembly shall be identified with the following information.
- Tag No.
- Service.
- Line size & thickness.
- Direction of flow.

10.0 APPLICABLE DATA SHEETS

This document shall be read in conjunction with following data sheets.

1. Data Sheet - A & B : Data sheet no. PES-145-27-DS1-0A

SECTION-D

DATA SHEETS - A&B

FORM NO. PEM-6666-0

	DATA SHEET FOR ELECTRO-MAGNETIC FLOW METER	SPEC NO.: PE-TS-405-145-I916A	
		VOLUME II B	
		SECTION D	
		REV. NO. 00	DATE : 23.12.22
		SHEET 1	OF 4

Tag No. 00GAA00CF003 Data Sheet No. PES-145-27-DS1-0A

DATA SHEET – A & B

	DATA SHEET – A (TO BE FILLED BY PURCHASER)		DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL	PROJECT	**3 x 800 MW PVUNL PATRATU TPP PHASE-I**	.....
	OFFER REFERENCE	Bidder to indicate	.....
	TAG NO.	00GAA00CF003	.....
	SERVICE:	RAW WATER MAKE-UP LINE-1 (DAM END)	.....
	MAKE : MODEL	Bidder to indicate	
TECHNICAL	PRINCIPLE	Full Bore Electromagnetic	.....
	FLOW MEASUREMENT	Instantaneous flow rate as well as totalized flow	.....
	OUTPUT	Isolated 4-20 mA DC	.....
	FLOW TUBE	SS304	.....
	ELECTRODE	SS316	.....
	ACCURACY	± 0.5%	.....
	REPEATABILITY	± 0.2% of calibrated span	.....
	RANGEABILITY	10:1	.....
	DISPLAY/INDICATION	LCD with Internal keypad (Flow rate of totalization).	.....
	OPERATING VOLTAGE	[■] 240V AC [] 24 VDC [] 110 VAC	.....
	TOTALIZING FACILITIES	[■] YES [] NO	.....
	ENCLOSURE	IP-65	.....
	PROCESS END CONNECTION	Inline Flanged (with matching Flange)	.....
	LINER	Hard Rubber	
PROCESS DATA	FLUID	RAW WATER	.....
	RATE OF FLOW (CuBM/HR)	NORMAL : 1605, MAX: 2000	.....
	UPSTREAM WORKING PRESS (Kg/cm2g)	3.0	.....
	DESIGN PRESS (Kg/cm2g)	3.5	.....
	NORMAL TEMP (Deg C)	36	.....
	MAXIMUM TEMP (Deg C)	60	.....
	PIPE LOCATION	UNDERGROUND	.....
PIPE LINE DATA	PIPE SIZE (OD x THK) mm	813 mm x 8.0 mm	.....
	PIPE MATERIAL	CARBON STEEL, IS:2062. ROLLED & WELDED CONFIRMING TO IS 3589	.....
	AVAILABLE PIPE STRAIGHT LENGTH	UPSTREAM : 8D	.....
		DOWNSTREAM : 4D	.....

	DATA SHEET FOR ELECTRO-MAGNETIC FLOW METER	SPEC NO.: PE-TS-405-145-I916A	
		VOLUME II B	
		SECTION D	
		REV. NO. 00	DATE : 23.12.22
		SHEET 2	OF 4

NOTE: -

1) Accessories like ½" NPT cable gland, Transducer cable (length 20m), gasket, all process end connection hardware, SS nameplate etc. shall be provided.
2) Double compression type nickel plated brass cable gland.
3) Remote Transmitter:
    i) Enclosure Material – Die Cast Aluminium (incase PP offered, suitable metal enclosure/housing shall be provided. Since it is located in the field.
4) Flow meter with LCD screen backlight based local display and keypad. If required, Transmitter shall be suitably located away from the sensor for better access and visibility. Daily & Monthly Display can also be obtained by using a Data Logger mounted locally.
5) EMF shall be installed in the PIT (please refer Annexure –A for more details) as the pipe is underground, proper selection of all component shall be ensured for satisfactory operation of EMF.
6) Insulating Gasket, Sleeves and washers (please refer Annexure –B for more details) for Cathodic protection for electrical isolation is in bidder scope.

FORM NO. PEM-6666-0

	DATA SHEET FOR ELECTRO-MAGNETIC FLOW METER	SPEC NO.: PE-TS-405-145-I916A	
		VOLUME II B	
		SECTION D	
		REV. NO. 00	DATE : 23.12.22
		SHEET 3	OF 4

Tag No. 00GAA00CF004 Data Sheet No. PES-145-27-DS1-0A

DATA SHEET – A & B

	DATA SHEET – A (TO BE FILLED BY PURCHASER)		DATA SHEET – B (TO BE FILLED UP BY BIDDER)
GENERAL	PROJECT	**3 x 800 MW PVUNL PATRATU TPP PHASE-I**	.....
	OFFER REFERENCE	Bidder to indicate	.....
	TAG NO.	00GAA00CF004	.....
	SERVICE:	RAW WATER MAKE-UP LINE-2 (DAM END)	.....
	MAKE : MODEL	Bidder to indicate	
TECHNICAL	PRINCIPLE	Full Bore Electromagnetic	.....
	FLOW MEASUREMENT	Instantaneous flow rate as well as totalized flow	.....
	OUTPUT	Isolated 4-20 mA DC	.....
	FLOW TUBE	SS304	.....
	ELECTRODE	SS316	.....
	ACCURACY	± 0.5%	.....
	REPEATABILITY	± 0.2% of calibrated span	.....
	RANGEABILITY	10:1	.....
	DISPLAY/INDICATION	LCD with Internal keypad (Flow rate of totalization).	.....
	OPERATING VOLTAGE	[■] 240V AC [] 24 VDC [] 110 VAC	.....
	TOTALIZING FACILITIES	[■] YES [] NO	.....
	ENCLOSURE	IP-65	.....
	PROCESS END CONNECTION	Inline Flanged (with matching Flange)	.....
	LINER	Hard Rubber	
PROCESS DATA	FLUID	RAW WATER	.....
	RATE OF FLOW (CuBM/HR)	NORMAL : 1605, MAX: 2000	.....
	UPSTREAM WORKING PRESS (Kg/cm2g)	3.0	.....
	DESIGN PRESS (Kg/cm2g)	3.5	.....
	NORMAL TEMP (Deg C)	36	.....
	MAXIMUM TEMP (Deg C)	60	.....
	PIPE LOCATION	UNDERGROUND	.....

	DATA SHEET FOR ELECTRO-MAGNETIC FLOW METER	SPEC NO.: PE-TS-405-145-I916A	
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		SECTION D	
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PIPE LINE DATA	PIPE SIZE (OD x THK) mm	813 mm x 8.0mm	.....
	PIPE MATERIAL	CARBON STEEL, IS:2062. ROLLED & WELDED CONFIRMING TO IS 3589	.....
	AVAILABLE PIPE STRAIGHT LENGTH	UPSTREAM : 8D DOWNSTREAM : 4D	.....

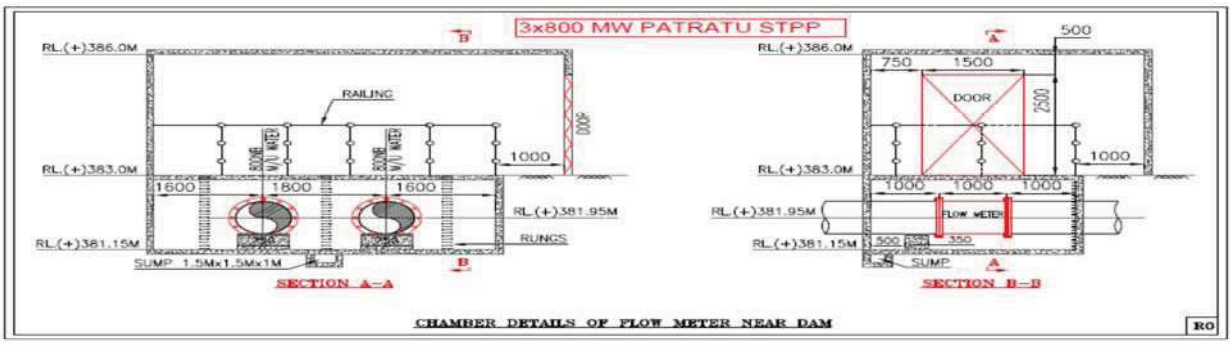
NOTE: -

1) Accessories like ½" NPT cable gland, Transducer cable (length 20m), gasket, all process end connection hardware, SS nameplate etc. shall be provided.
2) Double compression type nickel plated brass cable gland.
3) Remote Transmitter:
   ii) Enclosure Material – Die Cast Aluminium (incase PP offered, suitable metal enclosure/housing shall be provided. Since it is located in the field.
4) Flow meter with LCD screen backlight based local display and keypad. If required, Transmitter shall be suitably located away from the sensor for better access and visibility. Daily & Monthly Display can also be obtained by using a Data Logger mounted locally.
5) EMF shall be installed in the PIT (please refer Annexure –A for more details) as the pipe is underground, proper selection of all component shall be ensured for satisfactory operation of EMF.
6) Insulating Gasket, Sleeves and washers (please refer Annexure –B for more details) for Cathodic protection for electrical isolation is in bidder scope.

ANNEXURE -A

1237513/2023/PS-PEM-C_I

Layout details of Pits required for Electromagnetic Flowmeters will be as indicated below:



INSULATION KIT GASKET

Currently, we design, manufacture & supply Flange Insulating Kit Gasket in three types, TYPE-E for full face flanges, TYPE-F for raised face flanges and TYPE-D gaskets specifically designed to fit into the grooves of RTJ Flanges. Our "Spiraget" Flange Insulation Kit Gasket will comprise of:

For type "E" and type "F"

a. One central gasket of suitable thickness in flat section.
b. One full length insulating sleeve per bolt / Integral Washer Sleeve.
c. Two insulating washers per bolt.
d. Two metallic washer electro plated.

Given below are details regarding choice of materials of construction:

	Insulation Gasket	Insulation Sleeve	Insulation Washer	Plated Washer
Standard	Neoprene faced Phenolic	Reinforced Phenolic	Reinforced Phenolic	Electro plated steel washer
Special	Neoprene faced Phenolic	Nylon	Nylon	– do –
	– do –	Mineral filled Nylon	Mineral filled Nylon	– do –
	– do –	Polyethylene	Polyethylene	– do –
	Glass Reinforced Epoxy (G-10)	Glass Reinforced Epoxy (G-10)	Glass Reinforced Epoxy (G-10)	– do –

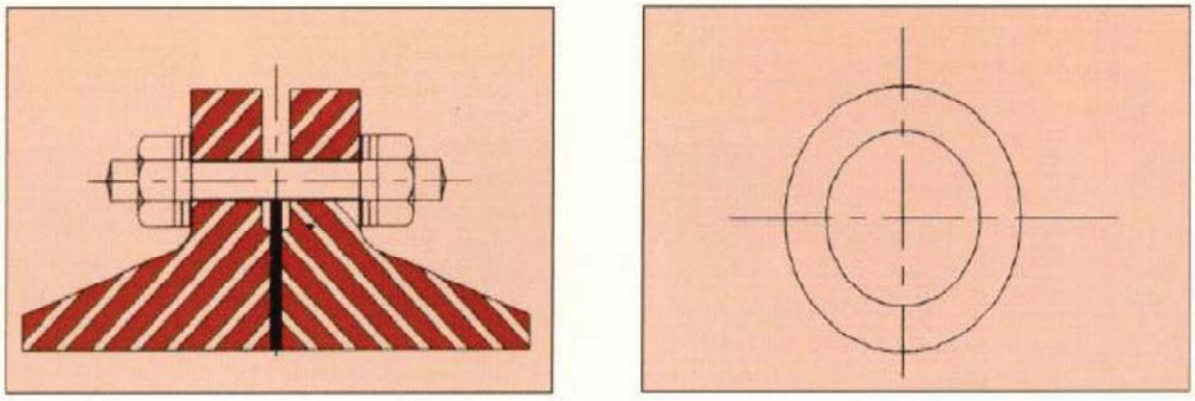
Properties of materials used in Flange Insulation Gaskets kits

Material	Dilectric Strength Volts/MIL	Water Absorption (%)	Max. Cont. Operating Temp. (Deg.C.)
Polyethylene	450	0.01	41
Phenolic	400-500	1.1	107
Nylon	500	1.5	110
Glass Reinforced Epoxy	550	0.05	176

TYPE F RAISED FACE FLANGES

Available for use in ANSI B16.5, API, BS & DIN Standard

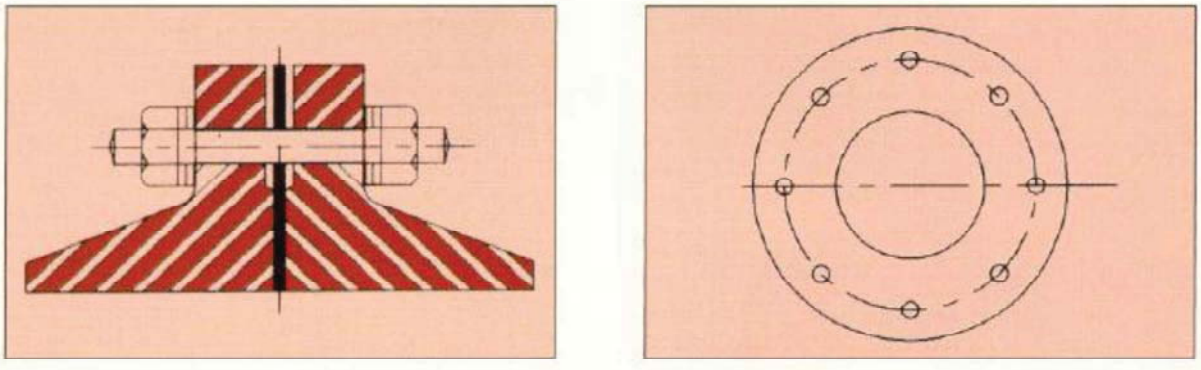
In this type, the central gasket is designed to be located inside the flange bolt circle and sits fully on the raised face portion of the flange. This type of gaskets will be supplied in all the materials shown in Table.



TYPE E FULL FACE FLANGES

Available for use in ANSI B16.5, API, BS & DIN Standard

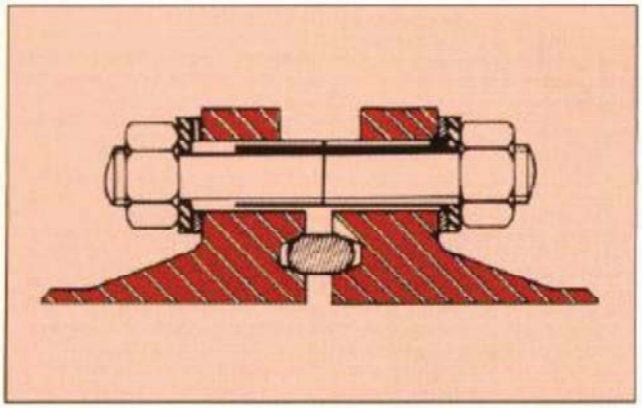
In this type, the central gasket has its outside diameter as equal to that of flange outside diameter and precision cut bolt holes. This design helps easy alignment of the gaskets during installation. Type "E" gaskets are available in Neoprene faced reinforced phenolic material or other materials in Table.

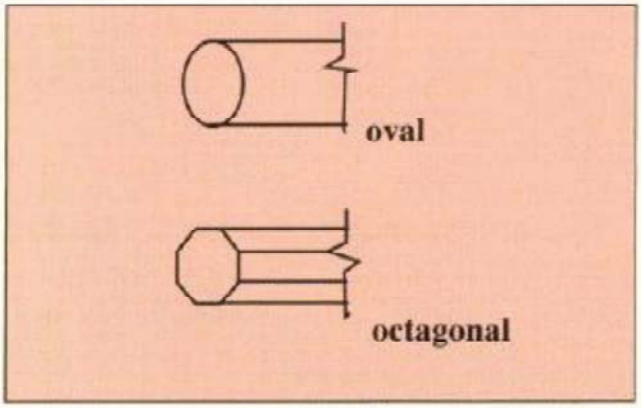


TYPE D FULL FACE FLANGES

Available for use in ANSI B16.5, API, BS & DIN Standard

In this type the gaskets available in fabric reinforced Phenolic. Avaliable in basic **'oval & octagonal'** type. This type has the contact faces with oval shape. It provides a high reliablity seal. These gaskets comply with ASME B - 16.20.





FORM NO. PEM-6666-0

	DATA SHEET FOR ELECTRO-MAGNETIC FLOW METER	SPEC NO.: PE-TS-405-145-I916A	
		VOLUME II B	
		SECTION D	
		REV. NO. 00	DATE : 23.12.22
		SHEET 1	OF 4

Tag No. ..... Data Sheet No. PES-145-27-DS1-0A

DATA SHEET – C

DATA SHEET – C (TO BE FILLED BY VENDOR)		
GENERAL	PROJECT OFFER REFERENCE TAG NO. SERVICE: MAKE : MODEL	
TECHNICAL	PRINCIPLE FLOW MEASUREMENT OUTPUT FLOW TUBE ELECTRODE ACCURACY REPEATABILITY RANGEABILITY DISPLAY/INDICATION OPERATING VOLTAGE TOTALIZING FACILITIES ENCLOSURE PROCESS END CONNECTION LINER	
PROCESS DATA	FLUID RATE OF FLOW (CuBM/HR) UPSTREAM WORKING PRESS (Kg/cm2g) DESIGN PRESS (Kg/cm2g) NORMAL TEMP (Deg C) MAXIMUM TEMP (Deg C) PIPE LOCATION	
PIPE LINE DATA	PIPE SIZE (OD x THK) mm PIPE MATERIAL AVAILABLE PIPE STRAIGHT LENGTH	

FORM NO. PEM-6666-0

SECTION-D

QUALITY PLAN

MANUFACTURER / BIDDER / SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO:	DATE:
	CUSTOMER :		QP NO.: PE-QP-999-145-I011 Rev No. : 01	DATE: 27.10.2020
	PROJECT:		PO NO.:	DATE:
	ITEM: ELECTRO MAGNETIC FLOW METER	SYSTEM: C&I	SECTION:	SHEET 1 of 3

S No.	Component & Operations	Characteristics	Class	Type of Check	Quantum of check		Reference document	Acceptance norms	Format of record	Agency			`
1	2	3	4	5	6		7	8	9	*	**		10
					M	C/N				D	M	C	N
1.1	**RAW MATERIAL**												
	a) Meter Body b) Tube c) Electrodes d) Earthing Ring e) Electronic Board f) Cable Gland g) Liner	Physical, Chemical properties	MA	Physical, Chemical tests	1/Heat	----	Approved Drg / Data Sheet	Approved Drg / data Sheet	Test Certificate	√	P, V	V	-	
		Dimensions	MA	Measurement	100%	-----	Approved Drg / Data Sheet	Approved Drg / Data Sheet	Inspection Reports	√	P,V	V	-	
1.2	**FLANGES (WITH MATCHING FLANGES)**												
	a) Forgings	Chemical, Mech Properties, & Heat Treatment	MA	Chemical, Mech Properties, & Heat Treatment	100%	----	ANSI B 16.34	ANSI B 16.34	MTC & HT certificate	√	P, V	V	-	
	b) Machining	Dimensions	MA	Measurement	100%	----	Approved Drg / Data Sheet	Approved Drg / Data Sheet	Inspection Reports	√	P, V	V	-	
2.0	**IN-PROCESS**												
	Machining of Components and Assembly	Dimension	MA	Measurement	100%	----	Approved Drg / Data Sheet	Approved Drg / data Sheet	Inspection Reports	√	P, W	V	-	
		Surface finish	MA	Visual	100%	----	---	Mirror Finish	---	√	P, W	V	-	
3.0	**ASSEMBLY (INCLUDING ELECTRONIC COMPONENT) and FINAL INSPECTION**												
	Complete Assembly	Overall dimensions	MA	Measurement	100%	100%	Approved Drg / Data Sheet	Approved Drg / data Sheet	Inspection Reports	√	P, W	W	-	
3.1		a) Marking b) Tag no. c) Direction of flow d) Model no. e) Display f) Process end connection, g) Canopy	MA	Visual	100%	100%	Approved Drg / Data Sheet	Approved Drg / data Sheet	Inspection Reports	√	P, W	W	-	Refer Note 9

BHEL						BIDDER/ SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING			QUALITY			Sign & Date		Doc No:			
	Sign & Date	Name		Sign & Date	Name	Seal			Sign & Date	Name	Seal
Prepared by:	Prag Jain M Kesharwani	PRAG JAIN /MAYANK KESHARWANI	Checked by:	KUNDAN PRASAD	KUNDAN PRASAD			Reviewed by:			
Reviewed by:	Suresh Sharma	SURESH SHARMA	Reviewed by:	RITESH KUMAR JAISWAL	RITESH KUMAR JAISWAL			Approved by:			

MANUFACTURER / BIDDER / SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO:	DATE:
	CUSTOMER :		QP NO.: PE-QP-999-145-I011 Rev No. : 01	DATE: 27.10.2020
	PROJECT:		PO NO.:	DATE:
	ITEM: ELECTRO MAGNETIC FLOW METER	SYSTEM: C&I	SECTION:	SHEET 2 of 3

S No.	Component & Operations	Characteristics	Class	Type of Check	Quantum of check		Reference document	Acceptance norms	Format of record	*	**			Remarks
1	2	3	4	5	6		7	8	9	D	M	C	N	10
					M	C/N								
3.2	Electronic Functional Test	a) Power supply b) Output c) Accuracy d) Repeatability e) Range ability f) * HART compatibility	MA	Electrical	100%	100%	Approved Drg / Data Sheet	Approved Drg / Data Sheet	Inspection Reports	√	P, W	W	-	* If Applicable
3.3	Electro Magnetic Flow Meter	Calibration	MA	Performance test	One per type	---	Approved Data Sheet	Approved Data Sheet	Test Certificate	√	P, W	V	-	Refer Note 2
		Painting	MA	Visual	100%	---	Manufacturer standards	Manufacturer standards	Inspection Reports / Manufacturer records	√	P, W	V	-	
4.0	**ACCESSORIES**													
	Mounting Accessories	Quantity Verification	MA	Visual	100%	100%	Approved Drg / Data Sheet	Approved Drg / Data Sheet	Inspection Reports	√	P, W	W	-	Quantity to be checked physically Refer Note 9
	commissioning spares	Quantity Verification	MA	Visual	100%	100%	Approved Drg / Data Sheet	Approved Drg / Data Sheet	Inspection Reports	√	P, W	W	-	If applicable
5.0	**PACKING & DISPATCH**													
	Electro Magnetic Flow Meter	Soundness of Packing against transit damage	MA	Visual	100%	100%	Tech. Spec / Manufacturer standards	Tech. Spec / Manufacturer standards	---	√	P	W	-	Refer Note 10

BHEL						BIDDER/ SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING			QUALITY			Sign & Date		Doc No:			
	Sign & Date	Name		Sign & Date	Name	Seal			Sign & Date	Name	Seal
Prepared by:	Prag Jain	PRAG JAIN /MAYANK KESHARWANI	Checked by:	KUNDAN PRASAD	KUNDAN PRASAD			Reviewed by:			
Reviewed by:	Suresh Sharma	SURESH SHARMA	Reviewed by:	RITESH KUMAR JAISWAL	RITESH KUMAR JAISWAL			Approved by:			

	MANUFACTURER / BIDDER / SUPPLIER NAME & ADDRESS	STANDARD QUALITY PLAN		SPEC. NO:	DATE:
		CUSTOMER :		QP NO.: PE-QP-999-145-I011 Rev No. : 01	DATE: 27.10.2020
		PROJECT:		PO NO.:	DATE:
		ITEM: ELECTRO MAGNETIC FLOW METER	SYSTEM: C&I	SECTION:	SHEET 3 of 3

NOTE:

1. Minimum 2 coats of primer paint to be applied before dispatch (Painting thickness shall be as per Manufacturer's standard)
2. CALIBRATION Test to be carried out at IIT-DELHI / FCRI or NABL approved laboratory.
3. BHEL reserves the right to conduct repeat tests, if required.
4. In case of foreign supplier, all test certificates shall be furnished by the supplier, duly witnessed / verified by supplier's TPI.
5. Project specific Quality Plan to be developed based on customer requirement.
6. Latest revision/ year of issue of all the standards (IS/ ASME/ IEC etc.) Indicated in QP shall be referred.
7. Quantum of check by BHEL / BHEL nominated inspection agency shall be indicated during project specific enquiry.
8. Enclosure Degree of Protection certificate/Lab test report shall be checked as per IS/IEC 60529:2001. IP class shall be as per approved data sheet.
9. Material of all the fittings shall be as per approved Data Sheet.
10. Following to be noted for packing:
    a) Material shall be packed suitably in order to avoid damage during transit and also during storage at site.
    b) Photographs of items duly placed inside the box just before the final packing and Photographs of the box just before dispatch to be sent to BHEL purchase group for review before issuing MDCC.
    c) Clearance for dispatch will be given only after receipt of the photos
    d) Sea worthy packing shall be provided, if called for in the Data Sheet. Acceptance norms shall be in line with technical / packing specification.

LEGEND:

*RECORDS, INDENTIFIED WITH "TICK"(√) SHALL BE ESSENTIALLY INCLUDED BY SUPPLIER IN QA DOCUMENTATION, D: DOCUMENTATION
** M: SUPPLIER/ MANUFACTURER/ SUB-SUPPLIER, C: MAIN SUPPLIER/ BHEL/ THIRD PARTY INSPECTION AGENCY, N: CUSTOMER,
P: PERFORM, W: WITNESS, V: VERIFICATION, AS APPROPRIATE, MA: MAJOR, MI: MINOR, CR: CRITICAL.#

BHEL						BIDDER/ SUPPLIER		FOR CUSTOMER REVIEW & APPROVAL			
ENGINEERING			QUALITY			Sign & Date		Doc No:			
	Sign & Date	Name		Sign & Date	Name	Seal			Sign & Date	Name	Seal
Prepared by:	Prag Jain M Kesharwani	PRAG JAIN /MAYANK KESHARWANI	Checked by:	KUNDAN PRASAD	KUNDAN PRASAD			Reviewed by:			
Reviewed by:	Suresh Sharma	SURESH SHARMA	Reviewed by:	RITESH KUMAR JAISWAL	RITESH KUMAR JAISWAL			Approved by:			

SECTION-D

BILL OF QUANTITY

	Technical specification for **ELECTROMAGNETIC FLOW METER** **3X800MW PVUNL PATRATU TPP PHASE-I**	SPECIFICATION NO. **PE-TS-434-145-I916A**
		VOLUME **II-B**
		SECTION **D**
		REV. NO. 00 / DATE 23.12.2022
		SHEET 1 OF 2

BILL OF QUANTITY

(A) ELECTROMAGNETIC FLOWMETER				
S. No.	**KKS**	**SERVICE/ ITEM DESCRIPTION**	**FLUID**	**Quantity for 3 Units (in Nos.)**
1	00GAA00CF003	RAW WATER MAKE-UP LINE-1 (DAM END) FLOW	RAW WATER	1
2	00GAA00CF004	RAW WATER MAKE-UP LINE-2 (DAM END) FLOW	RAW WATER	1

(B) SUPERVISION CHARGE		
S. No.	**SERVICE/ ITEM DESCRIPTION**	**Quantity for 3 Units (in Man-days)**
1	SUPERVISION FOR SITE SUPPORT AT SITE (MAXIMUM MANDAYS) #	4

 # SUPERVISION CHARGES INCLUDES BOARDING, LODGING AND TRAVEL TIME (TO AND FRO) and TRAVEL FARE.

PROVENESS CERTIFICATE

Sl.No.	Item Description	Plant No.1
5.00.00	**INSTRUMENTS (PRIMARY & SECONDARY)**	
	(i) Type of Instrument	
	(ii) Make / Model	
	(iii) Name of Power Station (Location & Address)	
	(iv) Unit Size (MW)	
	(v) Commissioning date	
	Whether above instruments have atleast one (1) year satisfactory operation in one (1) power station having unit rating of 200 MW or above.	Yes/No
	(vi) Client's certificate attached	Yes/No

Signature of authorized signatory.....

	PRE-QUALIFICATION REQUIREMENTS FOR VENDOR REGISTRATION	PE-TS-434-145-1916A
		REVISION NO. 00 DATE 10.05.2022
	PROJECT: 3X800MW PVUNL PATRATU TPP PHASE-I	SHEET NO. 1 OF 1

PACKAGE: **ELECTROMAGNETIC FLOWMETER**

1.0	
a.	Bidder should be Original equipment manufacturer (OEM) for ELECTROMAGNETIC FLOWMETER.
b.	In case bidder is not OEM, evaluation shall be done as following: 1 If bidder happens to be Indian subsidiaries of foreign OEM, then the credentials of the foreign OEM can also be considered for meeting PQR. 2 If bidder happens to be Authorized channel partner or having a valid collaboration agreement / licensing agreement with some other company or being a Joint Venture Company, then the credentials of collaborator / licensing company / Principal company /JV partner can also be considered for meeting PQR as per scope of the work. The scope matrix shall include their respective roles including design vetting, manufacturing of critical component and warranty/guarantee. If bidder(s) qualifies on the basis of credentials of his principal/JV partner/ Collaborator etc., then the principal/JV partner/Collaborator shall be responsible for overall design vetting and warranty/guarantee of the package.
2.0	The Product being offered by the bidder should be in use successfully in power plant or any other industrial application for at least 1 (One) year. Bidder to submit either of following supporting documents for the product: a. Copy of minimum 1 (One) Performance Certificate from end user / customer certifying that product has been running satisfactorily for 1 (One) year from date of commissioning to the date of application. The certificate should clearly indicate date of commissioning, date of issue of certificate and name/designation of the certificate issuer. Copy of purchase order & technical parameter to be attached along with the performance certificate. OR b Copy of repeat orders from minimum **1 (One)** purchaser. Order received by bidder from same purchaser with a gap of minimum **2 (Two)** years shall be considered as repeat order. Copy of technical parameters for each order to be attached.
3.0	Bidder to furnish experience list of last 5 years indicating customer name, purchase order reference, item supplied & year of supply to establish the continuity of business.
4.0	Bidder to submit all documents in English. If documents submitted by bidder are in language other than English, a self-attested English Translated document should also be submitted.

PREPARED BY	REVIEWED BY	APPROVED BY
ATUL RANJAN DY. MGR.	MAYANK KESHARWANI SR. MGR.	SURESH CHAND SHARMA DGM