

Annexure - 1

PRODUCT PURCHASING SPECIFICATION
TRANSFORMER ENGINEERING DEPARTMENT
BHEL, JHANSI

Specification No. **JS-22305**

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Rev. 01 Dt.: 28.04.17

SPECIFICATION FOR ONLINE DISSOLVED GAS MONITORING DEVICE

GENERAL: The equipment offered shall be suitable for online dissolved gas monitoring, required for detection of incipient fault in oil filled Transformers.

TYPE-1.(MATERIAL CODE NO. JS-9006281440)

Detection & measurement of gases and dissolved water		Minimum Measurement Range
Online continuous monitoring of dissolved gas content of following gases in mineral insulating oil (Naphthenic/ Paraffinic based oil) to IEC 60296 or equivalent up to 400 KV class Transformers.		
i	H ₂	5 - 2000 PPM
ii	O ₂	30 - 2000 PPM
iii	CH ₄	5 - 2000 PPM
iv	CO	5 - 5000 PPM
v	CO ₂	20 - 20000 PPM
vi	C ₂ H ₄	3 - 2000 PPM
vii	C ₂ H ₆	5 - 2000 PPM
viii	C ₂ H ₂	1 - 2000 PPM
	Dissolved water	0 to 100% RS

TYPE-2.(MATERIAL CODE NO. JS-9006281450) : **DELETED**

TYPE-3.(MATERIAL CODE NO. JS-9006281460)

Detection & measurement of gases and dissolved water		Minimum Measurement Range
Online continuous monitoring of dissolved gas content of following gases in mineral insulating oil (Naphthenic/ Paraffinic based oil) to IEC 60296 or equivalent up to 400 KV class Transformers.		
i	H ₂	5 - 2000 PPM
	Dissolved water	0 to 100% RS

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Vendor to quote separate technical parameters sheet for item no. 1 & 3.

Vendors to confirm all the points as mentioned below. Any deviation/ incomplete offer is liable for rejection.

Cl. No.	Heading	Description	Vendor to confirm in YES or NO.
1	TECHNICAL PARAMETERS		
1.a	Accuracy	(+/-) 10%	.....
1.b	Equivalent concentration	Equipment is capable to measure all the required gases individually (Equivalent hydrogen concentration of gases is not acceptable.)	.....
1.c	sensitivity to H ₂ & C ₂ H ₂	100 %	.....
1.d	Oil temperature range of sensor	0° to 100°C	.....
1.e	Sensor attachment degree of protection	Minimum IP66	.....
1.f	Response time	Maximum 1 Hour	.....
1.g	display frequency	Maximum 1 Hour	.....
1.h	Operating voltage	Single phase 230 volt AC $\pm$ 15%, 50Hz $\pm$ 5%	.....
1.i	Oil Pressure range	0-20 psi	.....
1.j	Display	LCD/ LED digital display at least 4 ½ digits	.....
1.k	Alarm/ trip circuit	Two NO/NC alarm contacts with dual stage adjustable alarm setting provision.(each stage 2 contacts)	.....
2.a	Power failure	Power failure alarm relay shall be supplied as a standard fitting.	.....
2.b	Data Acquisition System (DAS)	The output for DAS/ recorder shall be 4-20 mA isolated.	.....
2.c		The sensor assembly should be robust in design.	.....
2.d		The sensor assembly shall be suitable for operation in tropical site condition	.....
2.e		The sensor assembly should be complete in all respects.	.....
2.f		The sensor assembly shall be suitable for connection to any transformer in service.	

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Cl. No.	Heading	Description	Vendor to confirm in YES or NO.
2.g		Supplier shall provide recommended location (if any) of fixing sensor assembly in the transformer. If yes, provide the location in the drawing.	
2.h		System shall be suitable for operation at -0 to +50 °C ambient temperature & 100% relative humidity	.....
2.i		Data including gas concentration, date and time of measurement shall be stored in memory at a specified frequency mentioned in cl. 1.g with date and time.	.....
2.j		The last gas concentration stored in device database shall be displayed on a high quality LCD display.	.....
		The device shall be driven by a minimum 8-bit microprocessor and operating parameters and data retrieval shall be managed using a PC based control software to be provided with the unit.	.....
2.k		Terminals shall be provided for remote alarm/trip.	.....
2.l		Terminals shall be provided for status information.	.....
2.m		Connection from Junction Box of DGA to Control Room (LAN system) is in the scope of bidder.	.....
2.n		Alternative price for Wi-Fi connectivity via MODEM shall be indicated.	
2.o		The attachment shall be provided with oil sampling port to facilitate oil collection for manual off-line DGA by owner	.....
2.p		25 NB Flange for connection between transformer and DGA equipment is in scope of supply of supplier. PCD = 85 mm, HOLES= 4 X 14 DIA.	.....
2.q		All software/hardware/cables/Computer (desktop/laptop) etc required for successful operation and monitoring the transformer from control room shall be in scope of the bidder	.....
2.r		Distance from transformer to control room will be 300 meter (ONLY FOR EVALUATION)	
2.s		Price for cable/conduit etc to be quoted per meter.	.....
2.t		Calibration of DGA is in the scope of vendor for each On line DGA	.....
2.u		Bidder shall supply additive or consumable etc. (i.e both carrier gas and calibration gas) during its installation and within guarantee period free of cost as and when required at site.	

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Cl. No.	Heading	Description	Vendor to confirm in YES or NO.
2.v		The vendor has to obtain feedback of end customer of their commissioned equipment at every six months during guarantee period and forward same to BHEL.	
3	OTHER DETAILS		
3.a	<i>Scheme and electrical connection</i>	Complete schematic showing the connections of power supply to the digital display unit, terminal marking and wiring termination of alarm & trip contacts shall be furnished along with offer.	Enclosed/Not Enclosed
3.b	<i>electrical connection</i>	Type and size of terminals used in the complete unit shall also be furnished and suitable cable lugs to be supplied.	.....
3.c	<i>Mounting details</i>	Mounting arrangement details to be furnished along with offer	Enclosed/Not Enclosed
3.d	<i>Mounting details</i>	Sufficient length of inlet line tube to monitor and return line tube to transformer shall be supplied.	.....
3.e	Item list	List of the total items in the scope of supply to be enclosed.	Enclosed/Not Enclosed
4	Guarantee Period	A guarantee period is required for 24 months from supply and 18 months from the date of commissioning of the equipment whichever is earlier. The commissioning date shall be the date from which the equipment is in satisfactory operation.	.....
4.a	Addition guarantee period	Some of the customer requires additional guarantee period. For such cases vendor has to give additional guarantee for maximum 60 months from date of commissioning and BHEL shall pay additional charges to vendors. So vendor has to quote incremental cost for every 6 months.	.....
5	INSPECTION & DESPATCH		
5.a		Three sets of inspection, routine, acceptance and calibration test reports, operation and maintenance manual, descriptive catalogue/ leaflets shall be sent along with dispatch document. One set shall be supplied along with the equipment	

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Cl. No.	Heading	Description	Vendor to confirm in YES or NO.
5.b		The DGA has to be sent to different sites by BHEL. Hence supplier shall dispatch each complete set of on line DGA along with accessories transformer wise separately along with packing list, so that items belonging to the packing list can be dispatched for the respective transformer without any sorting. The packing list to contain the description and quantity of each item (Quantity of each item shall be mentioned). All items shall be properly packed in wooden boxes so as to avoid scratches/damage in transit	
6	INSTALLATION, COMMISSIONING & TRAINING	The supplier shall install & commission the equipment's at sites and provide training for operation and maintenance to our ultimate customer at site on intimation of BHEL and obtain commissioning certificate from the end customer / BHEL. Supplier should quote the charges for the same.	.....
7	Query	In case bidder has any query against this tender, same will be given to BHEL within one week from date of issue of enquiry.	

NOTE: Rev 01 issued to modify the measuring ranges of Type-1 model and to delete Type-2 model.