

	PRODUCT STANDARD HYDRO PROJECTS ENGINEERING	44154159051
		Rev. 00
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<u>PURCHASE SPECIFICATION OF LEVEL CONTROLLER FOR TGB</u> <u>(CAPACITANCE TYPE)</u>		

1. DESCRIPTION:

Level controller (capacitance type) is required for measuring the continuous oil level in the Turbine guide bearing sump. The instrument should meet the highest standards of measurement technique.

2. APPLICATION:

The level controller with level switching contacts shall be used for measuring the oil level of Turbine Guide Bearing sump. The level switching contacts shall be used for machine starting interlock, alarms in the SCADA system.

3. SPECIFICATION & SCOPE OF SUPPLY:

Main supply: Each set of level controller shall consist of:

- | | | |
|--|---|-----------|
| A. Level probe cum transmitter | - | 1 No. |
| B. Digital indicator cum power supply unit | - | 1 No. |
| C. Screen cable | - | 50 Meters |

Spare supply: (If applicable, refer Annexure-A) each set of level controller shall consist of:

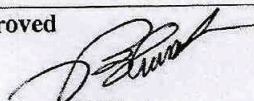
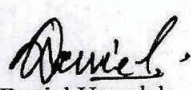
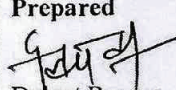
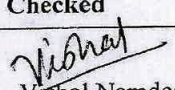
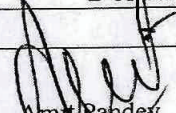
- | | | |
|--|---|-------|
| A. Level probe cum transmitter | - | 1 No. |
| B. Digital indicator cum power supply unit | - | 1 No. |

Note: Total quantity required for Main and Spare supply, Please refer Annexure-A to specification 44154159051.

3. A) LEVEL PROBE CUM TRANSMITTER:

The probe cum transmitter shall measure the level in the Turbine guide bearing sump and provide the corresponding level output to the indicator unit.

- | | | |
|-------------------------------|---|---|
| (a) Probe type | : | Fully insulated (Teflon insulation) rod type probe |
| (b) Probe transmitter housing | : | Weather proof cast aluminum housing with cable entry of ½" BSP / NPT with cable gland |
| (c) Material of probe | : | Stainless steel |
| (d) Reference probe | : | Co-axial reference probe (SS material) should be provided |

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					02.07.2018

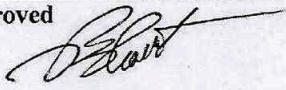
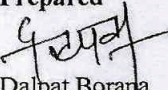
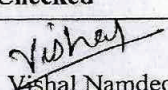
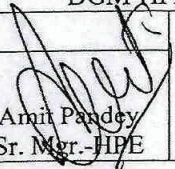
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<u>PURCHASE SPECIFICATION OF LEVEL CONTROLLER FOR TGB</u> <u>(CAPACITANCE TYPE)</u>		

- (e) Probe length : Refer Annexure-A to specification 44154159051
- (f) Process connection : Refer Annexure-A to specification 44154159051
- (g) Application media : Turbine Oil (ISO VG-46 / ISO VG-68)
- (h) Media temperature : 0 to 70 Deg C
- (i) Ambient temperature : 0 to 50 Deg C
- (j) Level probe cum transmitter shall be part of level probe housing.
- (k) The housing of level probe cum transmitter shall have integral (LED /LCD) type display unit with integrated push buttons for calibrating the range of level measurement.
- (l) Output signal : 4-20 mA DC corresponding to calibrated span
(Adjustable) suitable for electrical load of minimum 500 Ohm.
- (m) Accuracy : $\pm 0.5\%$ or better, For calibrated span including linearity, hysteresis and repeatability
- (n) Loop power supply : 24 VDC (Shall be derived from digital indicator cum power supply unit)
- (o) Connection : Two wire system
- (p) Protection class : IP67
- (q) The instrument shall work against oil charging (oil splashing) in the turbine guide bearing housing within accuracy

3. B) DIGITAL INDICATOR CUM POWER SUPPLY UNIT:

Digital indicator cum power supply unit should supply necessary power to the level probe cum transmitter and 4-20 mA output signal of transmitter will be fed to digital indicator by screened cable. The Digital Indicator will show the reading in terms of mm. Digital indicator should have minimum 4 digit indications and should be flush panel mounting type.

- (a) Mounting & cutout size : Refer Annexure-A to specification 44154159051
- (b) Display : 4 / 5 Digits LED / LCD type
- (c) Input signal : 4 -20 mA DC (From level transmitter)
- (d) Transmitted power supply : 24 VDC loop power supply to level probe transmitter
- (e) Re-transmitter output : Separate one no. 4-20 mA output for retransmission
- (f) Scale reading : 0 to calibrated length (max. up to the probe length)

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- (g) Configuration push buttons : Push buttons should be provided for configuration change, range setting and setting of relays set point in the display unit
- (h) Auxiliary power supply : 240 VAC $\pm$ 10%, 50 Hz
- (i) Relay output : 4 Nos. (Change over type, SPDT contacts), For Alarms and machine starting interlocks, Setting of each relay should be adjustable between the full calibrated range
- (j) Relay contact rating : 5A / 240 VAC, 0.2 A / 220 VDC
- (k) Relay indicating : LED indication for operation of each relay should be provided
- (l) Accuracy : $\pm$ 0.2 %
- (m) Ambient temperature : 0 to 50 Deg C
- (n) Description : "Digital indicator for Oil level in Turbine guide bearing" should be provided on the indicator unit

NOTE: - LEVEL PROBE CUM TRANSMITTER (3.A) & DIGITAL INDICATOR CUM POWER SUPPLY UNIT (3.B) MUST BE OF SAME MAKE.

3. C) SCREEN CABLE FOR LEVEL PROBE CUM TRANSMITTER:

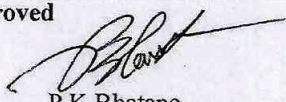
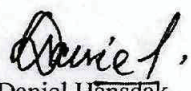
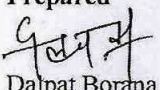
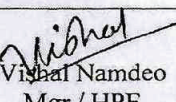
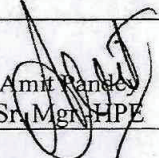
The screen cable is required for connecting the level probe cum transmitter with the digital indicator cum power supply unit.
 1100/ 660 V, un-armoured, PVC insulated, multistrand, 2/3 core (whichever is applicable for connecting transmitter with digital indicator) 1.5 mm² screen cable.

4. DOCUMENTS TO BE FURNISHED:

Along with offer:

- (a) Catalogues giving all the technical particulars with model code
- (b) List of deviations, if any. Otherwise it shall be understood that the vendor is meeting all the requirements specified by us.

Vendor to note that if above documents are not furnished along with the offer; the offer shall be liable for outright rejection.

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			Prepared	Checked	Date of issue (Rev 00)	
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After placement of order:

- Supplier has to submit the drawing showing over all dimensions, mounting details, sectional elevation and constructional details of level probe cum transmitter and digital indicator cum power supply unit for our approval.
- Supplier has to submit the O&M manual of level probe cum transmitter and digital indicator cum power supply unit for our reference.

At the time of supply:

- 2 copies of test certificates / Calibration certificate and guarantee certificates should be submitted to indenter. One copy of the above documents shall be put inside the case/ package.
- Shipping / packing lists of the level controller unit should be submitted to indenter and also put inside the case / package.

5. TEST CERTIFICATES:

- Calibration certificates issued by an ISO 17025 accredited and certified Lab for each level transmitter and digital indicator unit are required.

6. INSPECTION & TESTING:

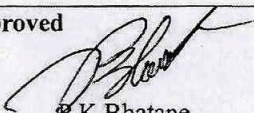
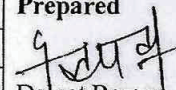
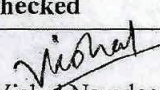
Functional test of level transmitter and digital display unit is to be carried out and certificate for the same to be furnished.

7. GUARANTEE:

The item must be guaranteed for trouble free operation, good workmanship for a period of 18 months from the date of dispatch.

8. PACKAGING:

"Each level probe cum transmitter unit" and "Digital indicator cum power supply unit" shall be packed separately in individual carton with silica gel, adequate cushioning material and water proof cover to avoid the movement of the internals and ensure that the instrument is capable of withstanding the transit conditions without damages.

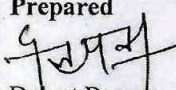
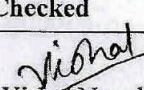
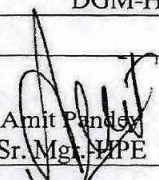
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9. **IDENTIFICATION:**

Each equipment shall be identified with the following information.

1. Manufacturer's name or identification.
2. Manufacturer's model no. or serial no.
3. Project Name

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					02.07.2018



Bharat Heavy Electricals Limited, Bhopal
Hydro Projects Engineering

**Level controller (capacitance type) for oil
level measurement in TGB sump**

**ANNEXURE-A
to Specification No.
44154159051**

1. PI NO.: 241595365/ Dated 06.12.2019

2. SCOPE OF SUPPLY:

2.1) Main Supply:

Level controller for TGB as per main supply defined against clause 3 of specification 44154159051.

SL. NO.	Project	Qty. (Set)	Level probe cum transmitter		Digital indicator cum power supply unit	Remarks
			Process connection	Probe length (From mounting surface)	Suitable for Panel cutout size	
i	TURIAL-HEP	1	1-1/2" BSP	310 mm	Refer sketch : HPE-GC-400	HT4395267009

2.2) Spare Supply:

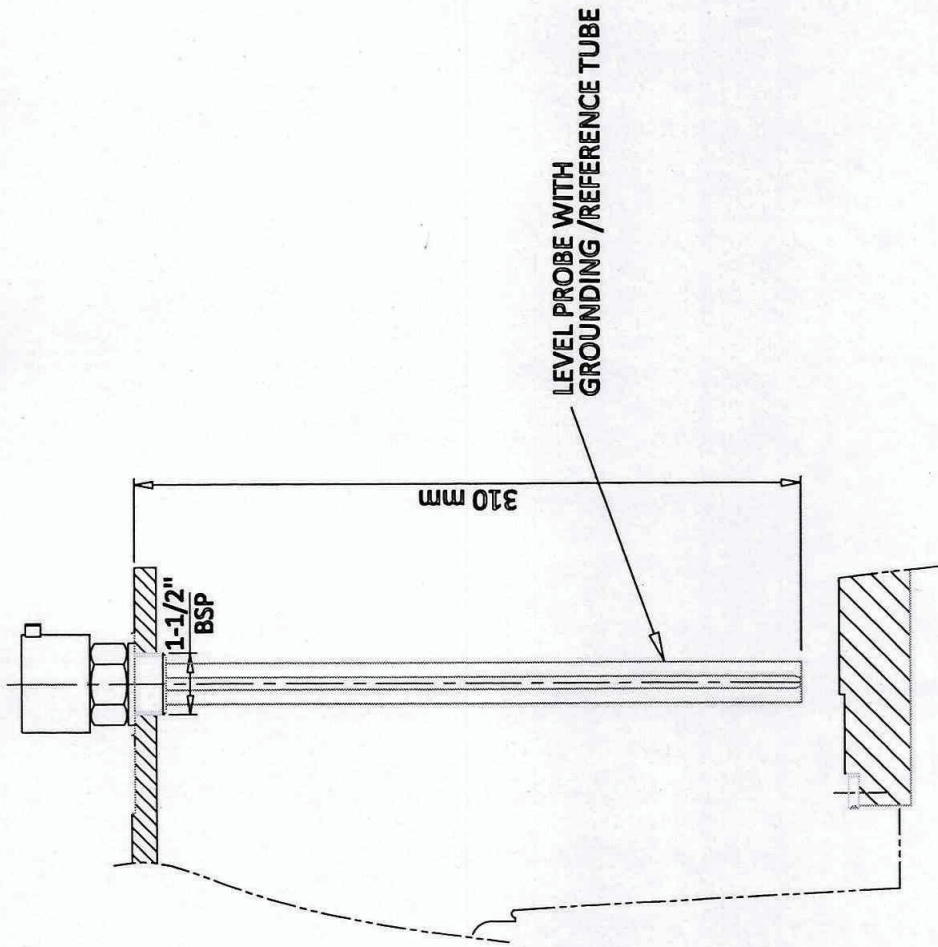
Level controller for TGB as per spare supply defined against clause 3 of specification 44154159051.

SL. NO.	Project	Qty. (Set)	Level probe cum transmitter		Digital indicator cum power supply unit	Remarks
			Process connection	Probe length (From mounting surface)	Suitable for Panel cutout size	
i	-	-	-	-	-	-

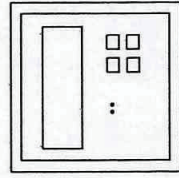
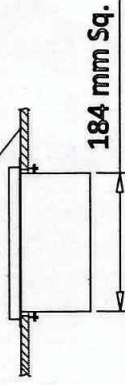
Aravind
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बी.एच.ई.एल., भोपाल / BHEL, BHOPAL



EXISTING MOUNTING PLATE



LEVEL CONTROLLER
DIGITAL INDICATOR

(EXISTING CUT OUT : 184 mm X 184 mm)

NOTE:- Please note that the existing cut-out dimensions of level controller for TGB for Tuirial-HEP is 184 mm x 184 mm. Supplier may offer standard dimension of the instruments as 92 mm x 92 mm with suitable adapter (metallic enclosure) to suit the above existing cut-out dimensions (184 mm x 184 mm).

ITEM : LEVEL CONTROLLER FOR TGB OIL

PROJECT : TUIRIAL- HEP

SKETCH NO. : HPE-GC-400 REV. 00