



# भारत हेवी इलेक्ट्रिकल्स लिमिटेड

(भारत सरकार का उपक्रम)

## BHARAT HEAVY ELECTRICALS LIMITED

(A Govt. of India Undertaking)

TCN - 07

Ref: PSER:SCT:SRG-M1517:TCN-07

Date: 13-03-2014

Sub	Tender change notice (TCN) 07	
Job	Design, Engineering, Manufacturing, Supply/Delivery, Storage, Erection, Commissioning, Trail run, handing over to customer, etc of Compressed Air System for 2x660 MW, Stage-V, Unit # 7 & 8, RRVUNL, Suratgarh Super Critical TPS, Rajasthan.	
Ref	1.0	Tender no PSER:SCT:SRG-M1517:14
	2.0	BHEL's NIT, vide reference no PSER:SCT:SRG-M1517:3594, dated 30-01-2014.
	3.0	BHEL's TCN-01, vide reference PSER:SCT:SRG-M1517:TCN-01, dated 17-02-2014.
	4.0	BHEL's TCN-02, vide reference no PSER:SCT:SRG-M1517:TCN-02, dated 20-02-2014.
	5.0	BHEL's TCN-03, vide reference no PSER:SCT:SRG-M1517:TCN-03, dated 27-02-2014
	6.0	BHEL's TCN-04, vide reference no PSER:SCT:SRG-M1517:TCN-04, dated 04-03-2014.
	7.0	BHEL's TCN-05, vide reference no PSER:SCT:SRG-M1517:TCN-05, dated 05-03-2014.
	8.0	BHEL's TCN-06, vide reference no PSER:SCT:SRG-M1517:TCN-06, dated 10-03-2014.
	9.0	All other pertinent issues till date.

With reference to above, following points/ documents, relevant to tender, may please be noted and complied with while submitting offer.

- 1.0 Extension of due date of submission of offer from **14-03-2014** to **18-03-2014 (15:00 Hrs)**.
- 2.0 Revised Price Schedule, VOLUME-III-R-1 attached superseding PRICE SCHEDULE VOLUME-III-R-0 issued earlier along with NIT. Bidder shall quote as per this revised Volume-III, Rev-1 only.
- 3.0 Clarification to bidder's queries as per attached Annexure-A.
- 4.0 Amendment-02 to technical specification as per attached Annexure-B.
- 5.0 Revised 'No deviation certificate' as per enclosed Annexure-2. Bidder shall submit no deviation certificate as per enclosed format only.
- 6.0 All other terms & conditions shall remain unchanged.

Thanking you,

Yours faithfully,  
for BHARAT HEAVY ELECTRICALS LTD

SR.ENGR (SCT)

Encl

- 1.0 As above.

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)

POWER SECTOR EASTERN REGION, DJ-9/1, SECTOR-II, SALT LAKE CITY, KOLKATA - 700 091

फैक्स/Fax : (033) 23211960

फोन/Phone : बोर्ड/EPABX : 23211691, 23211798, 23211796

**FORMAT FOR NO DEVIATION CERTIFICATE**  
**(To be submitted in the bidder's letter head)**

BHARAT HEAVY ELECTRICALS LIMITED,  
 Power Sector - Eastern Region,  
 Plot no 9/1, DJ Block, Sector – II, Salt Lake City,  
 Kolkata – 700 091

Sub	No Deviation Certificate.	
Job	Design, Engineering, Manufacturing, Supply/Delivery, Storage, Erection, Commissioning, Trail run, handing over to customer, etc of Compressed Air System for 2x660 MW, Stage-V, Unit # 7 & 8, RRVUNL, Suratgarh Super Critical TPS, Rajasthan.	
Ref	1.0	Tender no PSER:SCT:SRG-M1517:14
	2.0	BHEL's NIT, vide reference no PSER:SCT:SRG-M1517:3594, dated 30-01-2014.
	3.0	BHEL's TCN-01, vide reference PSER:SCT:SRG-M1517:TCN-01, dated 17-02-2014.
	4.0	BHEL's TCN-02, vide reference no PSER:SCT:SRG-M1517:TCN-02, dated 20-02-2014.
	5.0	BHEL's TCN-03, vide reference no PSER:SCT:SRG-M1517:TCN-03, dated 27-02-2014
	6.0	BHEL's TCN-04, vide reference no PSER:SCT:SRG-M1517:TCN-04, dated 04-03-2014.
	7.0	BHEL's TCN-05, vide reference no PSER:SCT:SRG-M1517:TCN-05, dated 05-03-2014.
	8.0	BHEL's TCN-06, vide reference no PSER:SCT:SRG-M1517:TCN-06, dated 10-03-2014.
	9.0	BHEL's TCN-07, vide reference no PSER:SCT:SRG-M1517:TCN-07, dated 13-03-2014.
	10.0	All other pertinent issues till date.

Dear Sirs,

With reference to above, this is to confirm that as per tender conditions, we have visited site before submission of our offer and noted the job content & site conditions etc. We also confirm that we have not changed/ modified the tender documents as appeared in the website/ issued by you and in case of such observance at any stage, it shall be treated as null and void.

We hereby confirm that we have not taken any deviation from tender clauses together with other references as enumerated in the above referred NIT. We hereby confirm our unqualified acceptance to all terms & conditions, unqualified compliance to technical specification, integrity pact (if applicable) and acceptance to reverse auctioning process.

In the event of observance of any deviation in any part of our offer at a later date whether implicit or explicit, the deviations shall stand null & void.

We confirm to have submitted offer in accordance with tender instructions and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

पावर सेक्टर पूर्वी क्षेत्र (मुख्यालय)

POWER SECTOR EASTERN REGION DJ-9/1, SECTOR-II, SALT LAKE CITY, KOLKATA - 700 091

फैक्स/Fax : (033) 23211960

फोन/Phone : बोर्ड/EPABX : 23211691, 23211798, 23211796

S. No	Page No in Tender Amendment	Clause as per Tender Amendment	Bidder's Query	BHEL's Clarification/Reply
1	41 & 42	<p>1.2.3 The vibration monitoring system shall be complete with proximity type vibration sensors, signal conditioning cards, amplifiers, special cables, vibration monitor (if required) etc. together with all necessary equipment and accessories.</p> <p>1.2.5 For bearings of high speed machines (= / &gt;1500 rpm) accelerometer type sensor and for low speed machines (&lt;1500 rpm) velocity type sensor shall be provided. Necessary, one or two stage integrators for obtaining vibration measurement in terms of displacement shall be provided in the system.</p>	Please clarify what type of sensors are to be used, proximity or velocity / accelerometer type?	The vibration monitoring & analysis system including sensors are provided by BHEL-EDN, bidder to provide necessary pad of dimension 80x80x10 mm for mounting of sensors and key phasor slot of dimension 30x15x3mm for each motor & compressor Driven and Non Driven end in each X & Y direction. Dimension indicated are tentative, shall be finalised during detail engineering
2	42	1.2.7 Vibration monitoring system shall provide the vibration measurement in the form of 4-20 mA DC signal to be directly connected by hardwired cable to plant DCS for monitoring. Limit value generation (soft) for alarm and protection applications for the auxiliaries and their drive equipment shall be carried out in DCS or applicable control system.	Referred clause and subsequent clauses suggest that there is one common monitoring system for the whole plant. Therefore we understand our scope of supply is of vibration probes only which shall be connected to the Plant DSC. Plant DSC and all related accessories and system are in buyer / BHEL scope.	
3	42	1.2.8 Vibration monitoring and analysis system shall be an independent microprocessor based system (PC based). The system shall be interfaced with unit DCS system through redundant communication link. The system shall interface with plant DCS for any process signals which may be required to perform condition monitoring functions through soft link.	Please note in this clause, it is mentioned one system shall be connected to DCS which will process all signals that require condition monitoring. Since the system is not specific for the compressed air system, we understand this is in Buyer / BHEL scope and not in compressor Vendor scope.	

S. No	Page No in Tender Amendment	Clause as per Tender Amendment	Bidder's Query	BHEL's Clarification/Reply
4	42	1.2.15 The vibration monitoring and analysis system is illustrated in Dwg. No. TCE.5750A-580-SK-01.	The referred drawing no is not available in the amendment. Request you to kindly provide same to give a better understanding of vendor scope.	
5	48	Annexure 1 to Amendment 1 : Guidelines for Allocation of Price in BBU	Earlier Price bid format as per VOL-III_A_M1517, supply price Breakup Volume III, Sch 3 had a clear line item under Sr. No. 1.1.12 which required supply price breakup for online vibration monitoring system of all motors. The revised Price bid format as per Annexure 1 to Amendment 1 does not have any line item for same. Please clarify regards same.	The Guidelines for allocation of price in BBU in the amendment 1 is for the detail engineering stage only and as such "Price bid format as per VOL-III,R-1, supply price Breakup Volume III" shall be referred to.

<b>VOLUME-III PRICE SCHEDULE, REV-1</b>	
<b>Design, engineering, manufacturing, supply, erection, commissioning etc of Compressed Air System for 2x660MW RRVUNL, U#7&amp;8, Stage V, Suratgarh Project, Rajasthan.</b>	
<b>TENDER DOCUMENT NO - PSER:SCT:SRG-M1517:14</b>	
<b>PREAMBLE</b>	
1	This preamble forms part of tender document and schedule of items. The tenderer should read this preamble carefully in rates for various items. Clauses under this preamble shall be read in conjunction with Volume-IB, ID, IE , Volume – IF and other tender sections as applicable.
2	The work shall be carried out strictly as per specifications, description of the items in these schedule and / or engineer's instructions.
3	Items of work provided in this schedule but not covered in this specification shall be executed strictly as per instruction of the engineer.
4	Unless specifically mentioned otherwise in the tender document, the tenderer shall quote for the finished items and shall provide for the complete cost towards power, fuel, tools, tackles, equipment, constructional plants, temporary works, labour, dismantling of all temporary piping, structures, valves, pumps, tanks & other misc. equipment, strengthening of roads/culverts/bridges etc. including arranging all clearances etc. required for carrying out different activities & tests, materials, levies, taxes(except service tax), transport, layout, repairs, rectification, maintenance till handing over, supervisions, colonies, shops, establishments, overheads, profits and all incidental items not specifically mentioned but reasonably implied and necessary to complete the work according to the complete tender document and this schedule.
5	The quantities of the various items mentioned in this schedule of items are approximate, based on very preliminary information and may vary to any extent or be deleted altogether. The quoted rates of each item will remain firm throughout the period of execution including extension, for reasons whatsoever, as long as variation in the total value of work executed under any part of this contract including extra items, if any but excluding any price variation remains, within thirty percent ( $\pm 15\%$ ) of the awarded price as per LOI .
6	Prior written approval of BHEL shall be sought by the contractor in case quantity variation of any item crosses +50% (plus fifty percent) limit during execution and approval to be obtained before execution of further quantity for this item.
7	In case Sealed /Paper Price Bids are opened for finalisation of the tender, for any Item Rate/BOQ based contract, possibility of variation of quantity/ addition/deletion of items can not be ruled out. Under such circumstances, after execution of work, if it is observed that standing as L-1 is changed based on actual quantity executed, the bidder shall give suitable rebate to maintain your standing as L-1. Since this aspect can be assessed at the end of execution, necessary adjustment will be effected at the end of execution in final bill.This condition shall not be applicable where the tender is finalised through Reverse Auction.
8	BHEL reserve the right to rationalize the rates, quoted by L-1 bidder against unit rate items and/ or other optional items with respect to item-wise lowest rates (amongst the participating bidders), before placement of order.
9	The rates quoted shall be inclusive of cleaning of site of any vegetation, dressing , clearing of old structures and leveling etc. including fixing of grid pillars, benchmarks etc. required for commencement of site activities. No separate payment will be made towards the same.
10	Rates shall be quoted in figures and in words in clear legible writing. No overwriting is allowed. All scoring and cancellations should be countersigned and in case of illegibility the interpretation of engineer shall be final. All entries shall be in English language.
11	All works item wise shall be measured upon completion and paid for at the rates quoted and accepted as per BHEL approved payment schedule/billing break-up.
12	The tender shall be deemed to have visited site and made himself aware of all the site conditions, studied the specifications and details of work to be done within the time schedule attached and to have acquainted himself of the conditions prevailing at site.
13	No splitting of the job is envisaged. Decision of BHEL in this regard shall be final and binding to the bidders.
14	Engineer's decision shall be final and binding on the contractor regarding clarification of items in the schedule with respect to the other sections/volumes of the contract.
15	In case of tender for Civil and/or Structural works , the Non-schedule items are not quoted by the bidder, it will be treated at par with rate of corresponding item of CPWD/PWD/DSR schedule as prescribed in the tender/BOQ cum Rate Schedule.
16	Size and weights of various items are mentioned in the attached BOQ cum rate/price schedule for reference purpose only & these shall not be taken into consideration for quoting/calculating amount in the rate schedule. These shall be utilised as per relevant sections of tender. Bidders shall quote for each item in the rate column, taking unit as mentioned in the quantity column. Rates shall be filled in both figures and words. Amount shall be calculated based upon these rates multiplied by the mentioned quantity for the respective items.
17	Bidder's GRAND Total price will be shall be considered for evaluation unless stated otherwise.
18	In case of BOP packages, if Bidder does not quote/indicate the price for freight chagses against indicated rate schedule, the same shall be considered as 2% of basic price and adjusted with the total quoted price against each item keeping the total quoted price unaltered.

<b>VOLUME-III PRICE SCHEDULE, REV-1</b>				
<b>Design, engineering, manufacturing, supply, erection, commissioning etc of Compressed Air System for 2x660MW RRVUNL, U#7&amp;8, Stage V, Suratgarh Project, Rajasthan.</b>				
<b>TENDER DOCUMENT NO - PSER:SCT:SRG-M1517:14</b>				
<b>SCH-1 - TOTAL PRICE</b>				
<b>SL NO</b>	<b>DESCRIPTION</b>	<b>QUANTITY</b>		<b>TOTAL PRICE (Rs)</b>
1.0	Total lumpsum firm prices for Equipment & Services as Specified, Comprising Design, Engineering, Manufacture, Inspection & Testing at Manufacturer's Works, Painting at Manufacturer's Works, Duly packed for Transportation, Delivery to Site of Compressed Air System including supply of erection materials, mandatory spares, consumables as required to complete the compressed air plants/equipments installation, maintenance tools & tackles for total scope defined in Specification No. PE-TS-392-555-A001 and terms & conditions of tender taking into account all clarifications, confirmations and agreements till the date of submission of offer for Compressed Air System for 2x660MW RRVUNL, U#7&8, Stage V, Suratgarh Project, Rajasthan.	1	LOT	
<b>NOTE</b>				
1.0	Bidder to note that total price indicated above at 1.0 shall be considered for evaluation as such, shall be complete in all respect for the full scope and terms & conditions of tender.			
2.0	Bidder's total price under sl no 1.0 above shall match with total price of SCH-2. Bidder to furnish break-up of total price (1.0 above of this SCH-1) into other schedules in the following manner.			
2.1	SCH-2 - Total price break-up.			
2.2	SCH-3 - Supply price break-up.			
2.3	SCH-4 - Service price break-up.			
2.4	SCH-5 - Import components. -Bidder to include list of imported items as a separate Annexure in the Technical Offer.			
3.0	Any item as per scope of work if not included & quoted above and shown separately will not be taken cognizance of and offer shall be liable for rejection. Bidder must submit prices duly filled in signed & stamped on every page without any ambiguity. The price shall be written against each item. Term such as 'refer covering letter' etc are not acceptable. Extra sheet may be attached if the space provided is not sufficient.			
4.0	Offer is liable to be rejected in case bidder fail to furnish item-wise break-up as desired in various schedules and submit price bid complete in all respects.			
5.0	Bidder shall attach separate sheets to furnish item-wise price break-up wherever specified in various schedules of this volume.			
6.0	Rate/ price of any item for single unit will be derived on pro-rata basis of quoted/ accepted rates/ price under respective schedules.			
7.0	Successful bidder shall submit billing schedule based on accepted price, indicating various components, for BHEL's approval to facilitate progressive payment as per tender terms. Unless otherwise bidder indicates separately, 2 % of total price will be considered as freight component to facilitate progressive payment.			
8.0	In case any bidder indicate against any item of the schedule as 'Not applicable/ Not required' due to particular design offered by the bidder, the bidder should provide item applicable to offered design with quantities generally in line with the approach followed in list. However, such item, if found to be required by customer at a later date after finalisation of contract, the bidder shall provide such item at no additional cost to BHEL/ customer.			
9.0	Bidder total price/ supply price must be inclusive of import component, if any. However, bidder shall specify import component separately in the relevant schedule based on which BHEL/CUSTOMER shall arrange PAC for the imported items limited to the CIF values indicated.			
10.0	Bidder to include list of imported items as a separate Annexure in the Technical Offer.			

VOLUME-III PRICE SCHEDULE, REV-1								
Design, engineering, manufacturing, supply, erection, commissioning etc of Compressed Air System for 2x660MW RRVUNL, U#7&8, Stage V, Suratgarh Project, Rajasthan.								
TENDER DOCUMENT NO - PSER:SCT:SRG-M1517:14								
SCH-2 - TOTAL PRICE BREAK-UP								
SL NO	DESCRIPTION	QUANTITY	TOTAL PRICE (Rs)					
			BASIC	CST	VAT	ENTRY TAX	FREIGHT	TOTAL
<b>BREAK-UP OF TOTAL PRICE AT SL NO 1.0 OF SCH-1.</b>								
1.1	Total lumpsum pice for supply part, comprising of design & engineering, manufacture, inspection & testing at manufacturer's works, painting at manufacturer's works,duly packed for transportation,delivery to site etc for complete Compressed Air System Package including supply of erection materials, mandatory spares,consumables as required to complete the compressed air plants/equipments installation, maintenance tools & tackles for total scope defined in Specification No. PE-TS-392-555-A001 and terms & conditions of tender taking into account all clarifications, confirmations and agreements till the date of submission of offer for Compressed Air System for 2x660MW RRVUNL, U#7&8, Stage V, Suratgarh Project, Rajasthan.	1	LOT					
1.2	Total lumpsum pice for service part, comprising of receipt, unloading, storage & handling at site, erection, Testing, commissioning, carrying out PG/ acceptance tests at site, final painting, handing over etc for complete Compressed Air System Package in line with drawings/ documents/test procedures approved by BHEL/customer, complete with all accessories for total scope defined in technical specification Specification No. PE-TS-392-555-A001 and terms & conditions of tender taking into account all clarifications, confirmations and agreements till the date of submission of offer for Compressed Air System for 2x660MW RRVUNL, U#7&8, Stage V, Suratgarh Project, Rajasthan.	1	LOT					
<b>TOTAL</b>								

**VOLUME-III  
PRICE SCHEDULE, REV-1**

**Design, engineering, manufacturing, supply, erection, commissioning etc of Compressed Air System for 2x660MW RRVUNL, U#7&8, Stage V,  
Suratgarh Project, Rajasthan.**

**TENDER DOCUMENT NO - PSER:SCT:SRG-M1517:14**

**SCH-3 - SUPPLY PRICE BREAK UP**

SL NO	DESCRIPTION	QUANTITY		TOTAL PRICE (Rs)					
				BASIC	CST	VAT	ENTRY TAX	FREIGHT	TOTAL
<b>BREAK-UP OF SUPPLY PRICE AT SL NO 1.1 OF SCH-2</b>									
1.1.1	<b>Instrument Air Compressor (oil free Screw)</b> Each of 36 NM <sup>3</sup> /Minute capacity at 8.8 kg/cm <sup>2</sup> (g) consisting Electric motor to drive the compressor with accessories, Suction filter and silencer, Inter Cooler, After Cooler with moisture separators, automatic drain traps, instruments, Control panel etc.	4	Nos						
1.1.2	<b>Air Dryer (HOC Type)</b> Air Drying Plant of 54 NM <sup>3</sup> /min and to match instrument air compressor with all instruments and controls as specified.	4	Nos						
1.1.3	<b>Service Air Compressor (oil free Screw)</b> Each of 36 NM <sup>3</sup> /Minute capacity at 8.8 kg/cm <sup>2</sup> (g) consisting Electric motor to drive the compressor with accessories, Suction filter and silencer, Inter Cooler, After Cooler with moisture separators, automatic drain traps, instruments, Control panel etc.	4	Nos						
1.1.4	Compressor house & Unit air receiver of 10 M <sup>3</sup> capacity with each having Pressure switches, Relief valve, Drain connection with automatic trap stations and other accessories as specified.	8	Nos						
1.1.5	Inter connecting cooling water and compressed air piping as specified including fittings and valves, etc. for complete compressed air system.	1	Lot						
1.1.6	Drain piping up to the nearest drain point	1	Lot						
1.1.7	Field instruments as specified	1	Lot						
1.1.8	Electronic Dew point meter	4	Nos						
1.1.9	Interface module for the overall control of compressed air system through DDCMIS	1	Lot						
1.1.10	Cable lugs, glands, etc for Compressed Air System equipment as required.	1	Lot						

VOLUME-III PRICE SCHEDULE, REV-1									
Design, engineering, manufacturing, supply, erection, commissioning etc of Compressed Air System for 2x660MW RRVUNL, U#7&8, Stage V, Suratgarh Project, Rajasthan.									
TENDER DOCUMENT NO - PSER:SCT:SRG-M1517:14									
SCH-3 - SUPPLY PRICE BREAK UP									
SL NO	DESCRIPTION	QUANTITY		TOTAL PRICE (Rs)					
				BASIC	CST	VAT	ENTRY TAX	FREIGHT	TOTAL
<b>BREAK-UP OF SUPPLY PRICE AT SL NO 1.1 OF SCH-2</b>									
1.1.11	Any other item not indicated above, but required to complete Compressed Air package as per system requirements.	1	Lot						
1.1.12	Pads for mounting of sensors for vibration monitoring and analysis system as specified.	1	Lot						
1.1.13	Total lump sum prices for Maintenance Tool & Tackles (bidder to furnish item wise prices separately along with the price bid).	1	Lot						
1.1.14	Total lump sum prices for commissioning spares (bidder to furnish lists of spares with item wise prices separately along with the price bid).	1	Lot						
1.1.15	Total lumpsum prices for mandatory spares as specified for compressed air System. (Bidder to furnish unit prices for each item in the Mandatory spares list separately along with the price bid).	1	Lot						
<b>TOTAL</b>									

**VOLUME-III  
PRICE SCHEDULE, REV-1**

**Design, engineering, manufacturing, supply, erection, commissioning etc of Compressed Air System for  
2x660MW RRVUNL, U#7&8, Stage V, Suratgarh Project, Rajasthan.**

**TENDER DOCUMENT NO - PSER:SCT:SRG-M1517:14**

**SCH-4 - SERVICE PRICE BREAK UP**

SL NO	DESCRIPTION	QUANTITY	TOTAL PRICE (Rs)
<b>BREAK-UP OF SUPPLY PRICE AT SL NO 1.1 OF SCH-2</b>			
1.1.1	<b>Instrument Air Compressor (oil free Screw)</b> Each of 36 NM <sup>3</sup> /Minute capacity at 8.8 kg/cm <sup>2</sup> (g) consisting Electric motor to drive the compressor with accessories, Suction filter and silencer, Inter Cooler, After Cooler with moisture separators, automatic drain traps, instruments, Control panel etc.	4	Nos
1.1.2	<b>Air Dryer (HOC Type)</b> Air Drying Plant of 54 NM <sup>3</sup> /min and to match instrument air compressor with all instruments and controls as specified.	4	Nos
1.1.3	<b>Service Air Compressor (oil free Screw)</b> Each of 36 NM <sup>3</sup> /Minute capacity at 8.8 kg/cm <sup>2</sup> (g) consisting Electric motor to drive the compressor with accessories, Suction filter and silencer, Inter Cooler, After Cooler with moisture separators, automatic drain traps, instruments, Control panel etc.	4	Nos
1.1.4	Compressor house & Unit air receiver of 10 M <sup>3</sup> capacity with each having Pressure switches, Relief valve, Drain connection with automatic trap stations and other accessories as specified.	8	Nos
1.1.5	Inter connecting cooling water and compressed air piping as specified including fittings and valves, etc. for complete compressed air system.	1	Lot
1.1.6	Drain piping up to the nearest drain point	1	Lot
1.1.7	Field instruments as specified	1	Lot
1.1.8	Electronic Dew point meter	4	Nos
1.1.9	Interface module for the overall control of compressed air system through DDCMIS	1	Lot
1.1.10	Cable lugs, glands, etc for Compressed Air System equipment as required.	1	Lot
1.1.11	Any other item not indicated above, but required to complete Compressed Air package as per system requirements.	1	Lot
1.1.12	Pads for mounting of sensors for vibration monitoring and analysis system as specified.	1	Lot
<b>TOTAL</b>			

VOLUME-III PRICE SCHEDULE, REV-1		
Design, engineering, manufacturing, supply, erection, commissioning etc of Compressed Air System for 2x660MW RRVUNL, U#7&8, Stage V, Suratgarh Project, Rajasthan.		
TENDER DOCUMENT NO - PSER:SCT:SRG-M1517:14		
SCH-5 - IMPORT COMPONENTS		
SL NO	DESCRIPTION	AMOUNT
1.0	Total import content CIF values [in terms of Currency (^Euro/ US \$ )and correspondingly in INR as on date) included in total price/ supply price in SCH-1/ SCH-2/ SCH-3. (Bidder shall furnish item-wise list of imported items envisaged below)	(i) Currency (Euro/ US \$): _____  (ii) Rate of exchange assumed/ considered: _____

VOLUME-III PRICE SCHEDULE, REV-1						
Design, engineering, manufacturing, supply, erection, commissioning etc of Compressed Air System for 2x660MW RRVUNL, U#7&8, Stage V, Suratgarh Project, Rajasthan.						
TENDER DOCUMENT NO - PSER:SCT:SRG-M1517:14						
SCH-6- GPC						
S.No. (1)	Description of Equipments (2)	Nos. of Equipments (3)		Total Guaranteed Power Consumption for Each Equipment at Motor Input Terminals & control Panel (4)	Duty Factor (5)	Total (KW) (6) = (3A)*(4)*(5)
		Working (3A)	Standby (3B)			
1	Serve Air Compressor (Oil free Screw type) 36 NM3/min at 8.8 Kg/cm2 pressure	2	2		1	
2	Instrument Air Compressor (Oil free Screw type) 36 NM3/min at 8.8 Kg/cm2	2	2		1	
3	Air Drying Plant Unit (Conventional Twin Tower type/ Rotary drun type as applicable)	2	2		1	
					<b>TOTAL</b>	
Note :						
1	Estimated Power Consumption Figure for the compressed air system (For Working Drives Only) considered is <b>1380 KW</b> (For station)					
2	Bidders Guaranteed power consumption at motor input terminals ( Not Shaft Power) including power for control panel as furnished in guranteed schedule shall be demonstrated by the successful bidder during performance testing at works/site.					
3	In case the successful bidder fails to establish / prove the guaranteed values of power consumption (base figure of auxiliary power consumption) on actual performance testing at the manufacturing works / site, penalty @ (INR) 450000/- per kW increase in power consumption figure shall be levied.					



AMMENDMENT ON TECHNICAL SPECIFICATION FOR  
COMPRESSED AIR SYSTEM  
2X660 MW SURATGARH SUPER CRITICAL TPS,  
STAGE - V UNIT 7& 8

SPECIFICATION NO. PE-TS-392-555-A001

AMMENDMENT NO 1

Rev 00

03.03.2014

Page 1 of 1

# SURATGARH STPP

(2x660 MW)

## AMENDMENT No. 2

(TECH SPEC No. PE-TS-392-555-A001)

## COMPRESSED AIR SYSTEM



**AMMENDMENT ON TECHNICAL SPECIFICATION FOR  
COMPRESSED AIR SYSTEM  
2X660 MW SURATGARH SUPER CRITICAL TPS,  
STAGE - V UNIT 7 & 8**

SPECIFICATION NO. PE-TS-392-555-A001

AMMENDMENT NO 1

Rev 00

03.03.2014

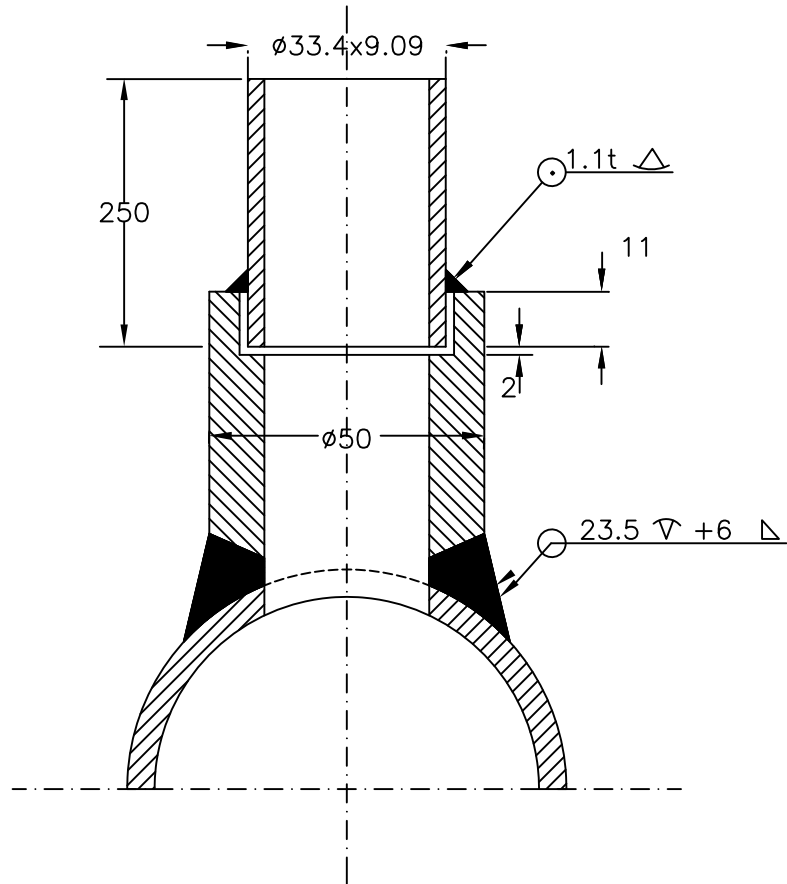
Page 1 of 1

The following modifications with respect to Project Specific Technical Specification for COMPRESSED AIR SYSTEM Technical specification no PE-TS-392-555-A001 shall apply.

Bidder to note that existing clauses as appearing in the specification stands deleted and clauses mentioned in "Modified to" column shall be applicable and complied by the bidder.

**1.0 MODIFIED CLAUSES.**

Sl no	Volume No	Section/Description	Clause no	Page no	Existing	Modified to
1.	Amendment No-1	Table-13	1.0	SHEET 1 OF 40 to 4 OF 40	Vibration Monitoring and Analysis System	The vibration monitoring & analysis system including sensors are provided by BHEL-EDN, bidder to provide necessary pad of dimension 80x80x10 mm for mounting of sensors and key phasor slot of dimension 30x15x3mm for each motor & compressor Driven and Non Driven end in each X & Y direction. Dimension indicated are tentative, shall be finalised during detail engineering. Accordingly all other references in the technical specification pertaining to the vibration monitoring and analysis system shall be treated as null and void and shall be replaced by above clause.
2	IIB	Sec 2.4.0		210-216	Instrument Stub Details Rev.01	Instrument Stub Details Rev.02



**NOTE :**

1. MATERIAL OF THE BOSS AND NIPPLE SHALL BE THE SAME AS THE PIPE INTO WHICH IT IS WELDED AND CONFORM TO ANSI B16.11.
2. THE LENGTH OF NIPPLE SHOULD BE 250 MM.
3. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE INDICATED
4. EDGE HOLE MUST BE CLEAN AND SQUARE OR ROUNDED SLIGHTLY ( 1/64" RADIUS) FREE FROM BURRS, WIRE EDGES OR OTHER IRREGULARITIES
5. STUB LENGTH SHALL BE 64mm UPTO 200Nb PIPE, 45mm ABOVE 200Nb PIPE SIZE.

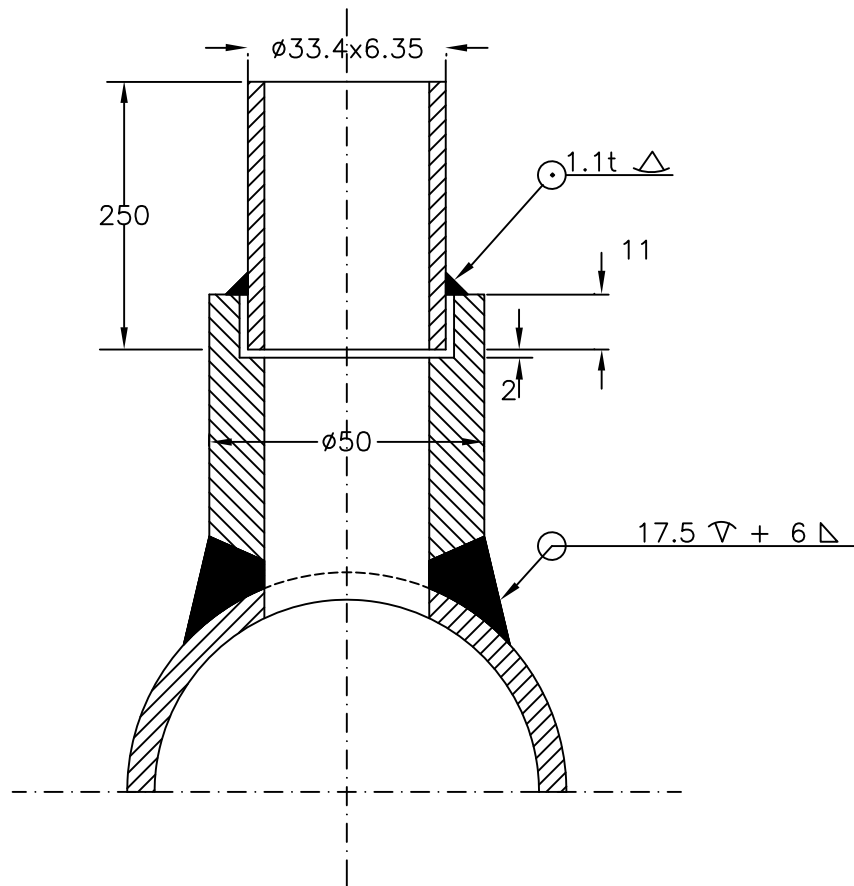


TITLE :  
**INSTRUMENT STUB DETAILS  
 FOR PRESSURE MEASUREMENT**

(TEMP > 500 DegC AND CLASS 9000 #)

DRG. NO.  
**PE-DG-392-145-1101**  
 REV. 02  
 SH. 02 OF 08 SHS.





**NOTE :**

1. MATERIAL OF THE BOSS AND NIPPLE SHALL BE THE SAME AS THE PIPE INTO WHICH IT IS WELDED AND CONFORM TO ANSI B16.11.
2. THE LENGTH OF NIPPLE SHALL BE 250 MM.
3. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE INDICATED
4. EDGE HOLE MUST BE CLEAN AND SQUARE OR ROUNDED SLIGHTLY ( 1/64" RADIUS) FREE FROM BURRS, WIRE EDGES OR OTHER IRREGULARITIES
5. STUB LENGTH SHALL BE 64mm UPTO 200Nb PIPE, 45mm ABOVE 200Nb PIPE SIZE.

01

02

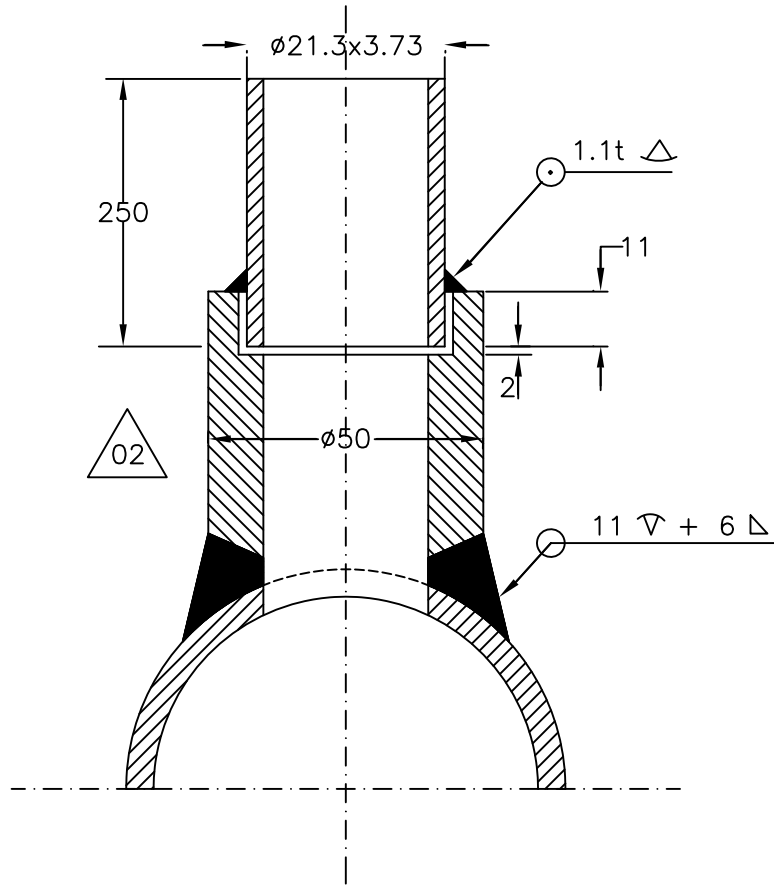


TITLE :  
**INSTRUMENT STUB DETAILS  
 FOR PRESSURE MEASUREMENT**

(APPLICABLE FOR TEMP < 500 DegC, CLASS 6000#)

DRG. NO.  
**PE-DG-392-145-1101**  
 REV. 02  
 SH. 03 OF 08 SHS.

01



**NOTE :**

1. MATERIAL OF THE BOSS AND NIPPLE SHALL BE THE SAME AS THE PIPE INTO WHICH IT IS WELDED AND CONFORM TO ANSI B16.11.
2. THE LENGTH OF NIPPLE SHALL BE 250 MM.
3. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE INDICATED
4. EDGE HOLE MUST BE CLEAN AND SQUARE OR ROUNDED SLIGHTLY ( 1/64" RADIUS) FREE FROM BURRS, WIRE EDGES OR OTHER IRREGULARITIES
5. STUB LENGTH SHALL BE 64mm UPTO 200Nb PIPE, 45mm ABOVE 200Nb PIPE SIZE.

01

02



TITLE :  
**INSTRUMENT STUB DETAILS  
 FOR PRESSURE MEASUREMENT**

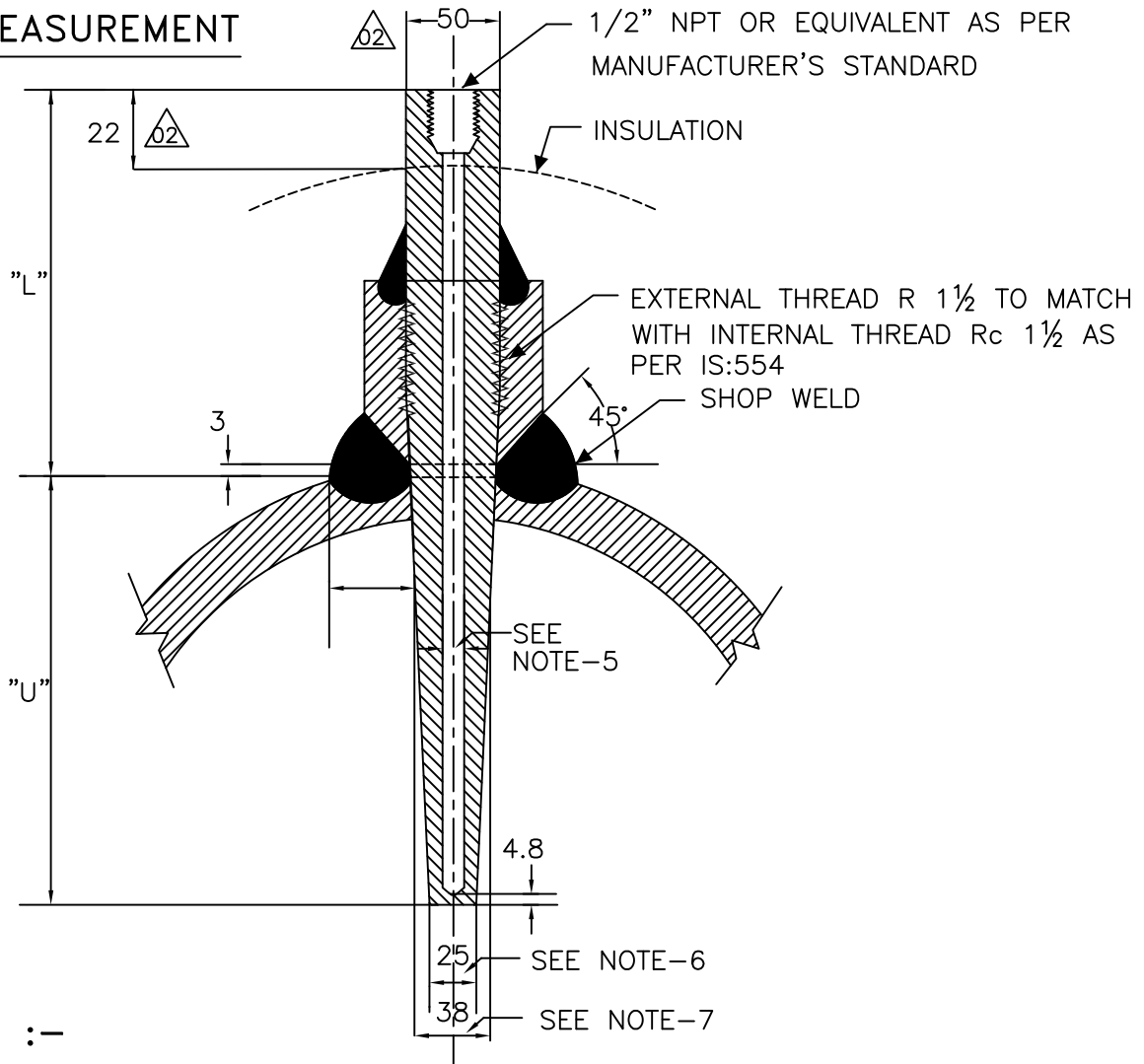
01

DRG. NO.  
**PE-DG-392-145-1101**

REV. 02

(SYSTEM PRESS UPTO 40Kg/Cm<sup>2</sup>, TEMP < 400 Deg C ) SH. 04 OF 08 SHS.

## TEMP. MEASUREMENT



### NOTES :-

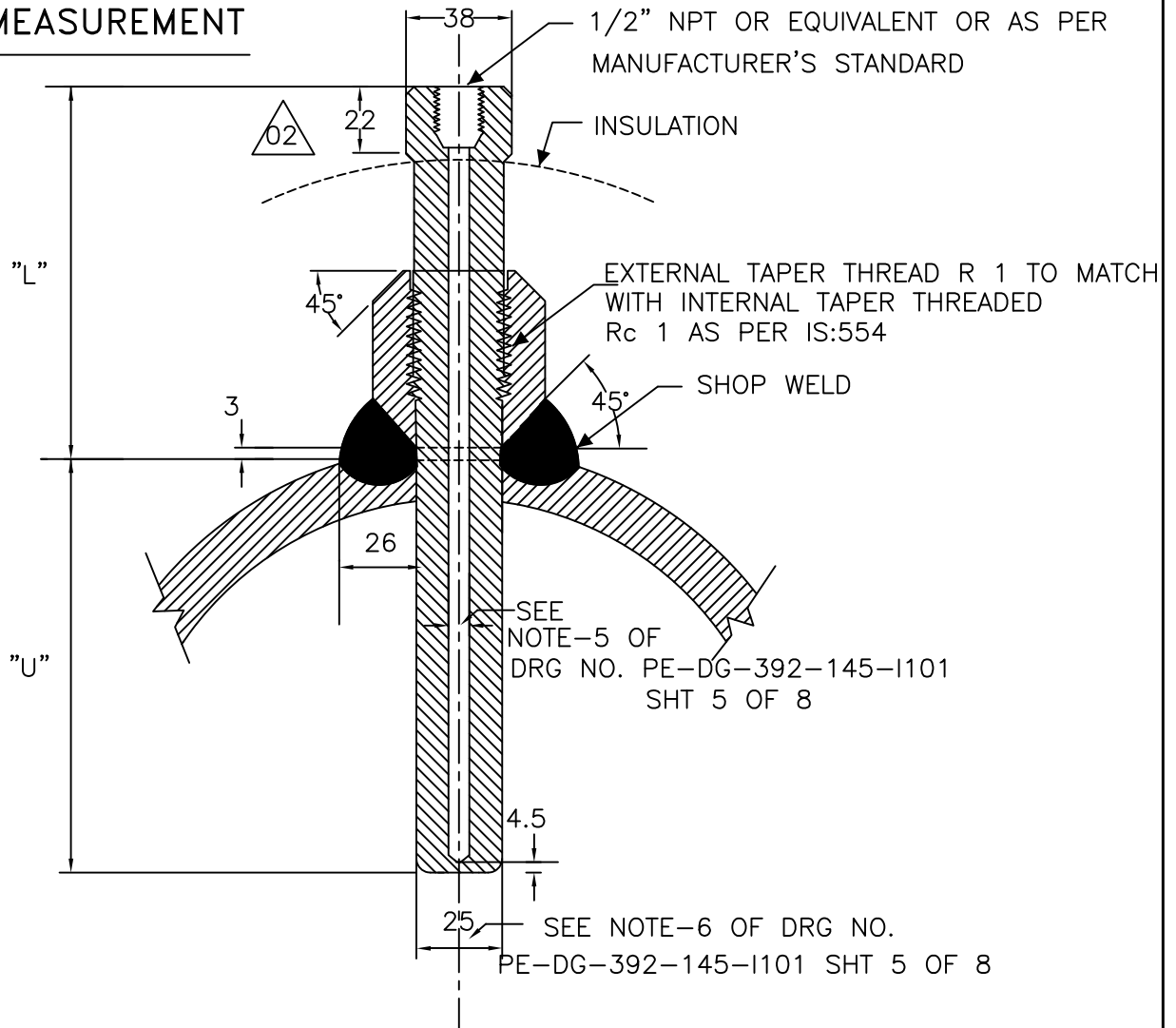
1. THIS TYPE OF TEMPERATURE BOSS SHALL BE USED FOR THE PROCESS PRESS EQUAL/ ABOVE 40 KG/CM<sup>2</sup>(g).
2. THE MATERIAL OF THE BOSS SHALL BE SIMILAR TO PIPING MATERIAL.
3. MATERIAL OF THE THERMOWELL SHALL BE OF 316SS.
4. THERMOWELL SHALL BE DRILLED BAR STOCK TYPE.
5. INTERNAL BORE OF THE THERMOWELL SHOULD BE SELECTED BASED ON THE NORMAL SIZE OF THE SENSING ELEMENT AS PER ASME PTC-19.3.
6. THE BOTTOM DIAMETER OF THE THERMOWELL TYPICALLY SHOWN HERE SHALL BE SUBJECT TO VARIATION BASED ON THE INTERNAL BORE OF THERMOWELL AND THICKNESS OF THERMOWELL MATERIAL TO WITHSTAND THE PROCESS PRESS AND TEMP AS PER ASME PTC-19.3.
7. THERMOWELL SHALL BE SUITABLE TO MATCH THE STUB DIMENSIONS AS PER Rc 1 1/2.
8. THE 'U' & 'L' DIMENSIONS SHALL BE SELECTED BASED ON PARTICULAR APPLICATION.
9. ORIENTATION OF STUB ON VERTICAL/ HORIZONTAL PIPES SHALL BE 90° TO THE CENTRE LINE OF THE PIPES, FOR PIPE SIZE LARGER THAN 4". HEIGHT OF STUB SHALL BE 64mm FOR PIPE OD < 200nb AND 45mm FOR PIPE OD ≥ 200Nb.
10. R 1 & Rc 1 SPECIFIES THE DESIGNATIONS OF THREAD SIZE AS PER IS:554.



TITLE :  
**INSTRUMENT STUB DETAILS (TEMP)**  
 (APPLICABLE FOR PIPE SIZE ABOVE 4")  
 [ PROCESS PRESS EQUAL/> 40 Kg/Cm<sup>2</sup> (g) ]

DRG. NO.  
**PE-DG-392-145-1101**  
 REV. 02  
 SH. 05 OF 08 SHS.

# TEMP. MEASUREMENT



## NOTES :-

1. THIS TYPE OF TEMPERATURE BOSS IS APPLICABLE FOR THE PROCESS PRESS/ TEMP. BELOW 40 KG/CM2(g)/400°C.
2. FOR PRESS. TIGHT JOINTS THE BOSS SHOULD HAVE INTERNAL TAPERED PIPE THREAD Rc 1 AS PER IS:554. THE LENGTH OF THREAD ENGAGEMENT SHOULD BE AS PER ABOVE STANDARD.
3. SEE NOTES-2 TO 9 IN SHT. 5 OF 8 OF THIS DRG.
4. R 1 & Rc 1 SPECIFIES THE DESIGNATIONS OF THREAD SIZE AS PER IS:554.



TITLE :

INST. STUB DETAILS (TEMP)  
(APPLICABLE FOR PIPE SIZE ABOVE 4")

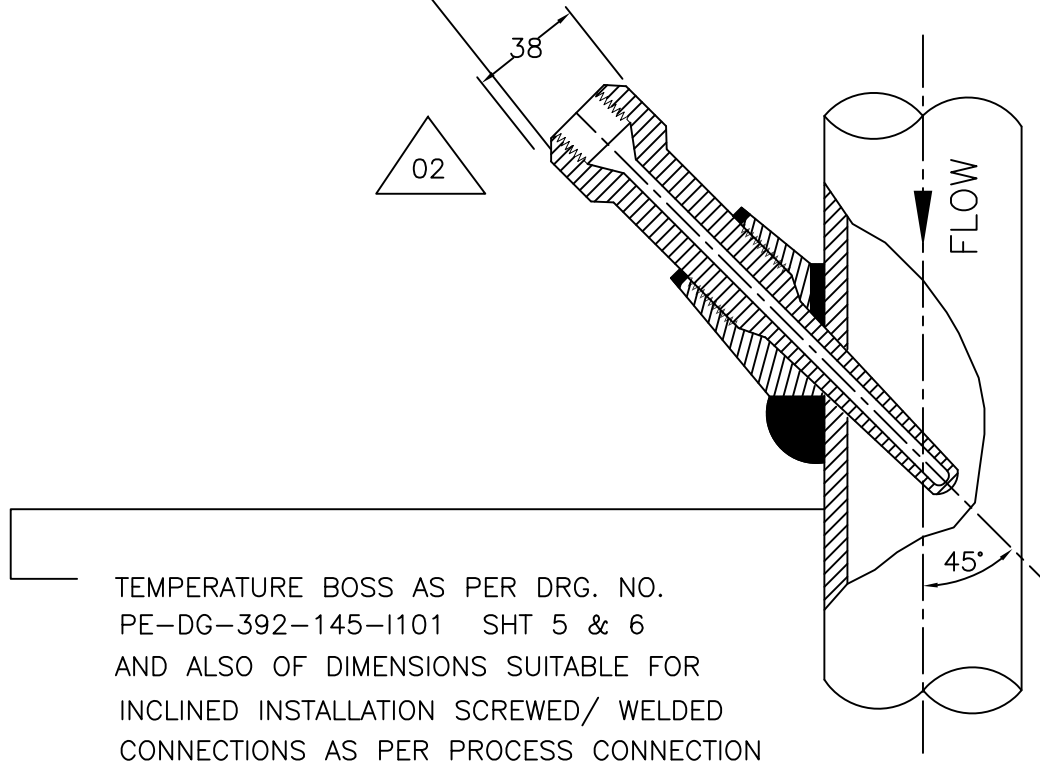
DRG. NO.

PE-DG-392-145-I101

REV. 02

[PROCESS PRESS < 40 Kg/Cm2 (g), TEMP < 400 °C] SH. 06 OF 08 SHS.

THERMOWELL SUITABLE FOR THE BOSS  
 AS PER DRG. NO.  
 PE-DG-392-145-1101 SHT 5 & 6



**NOTES :-**

1. INCLINED INSTALLATION OF THERMOWELL SHALL BE APPLICABLE FOR 4" AND SMALLER LINE SIZE BUT LIMITED TO MIN. 3" LINE SIZE.
2. FOR 3" AND SMALLER LINE SIZE NECESSARY EXPANDER OF 4" SIZE OF MAIN PIPING SPECIFICATION SHALL BE USED.
3. THIS TYPE OF INSTALLATION IS APPLICABLE FOR HORIZONTAL AND VERTICAL PIPE SECTION.
4. FOR STEAM SERVICES EXPANDER SECTION MAY BE USED ONLY IN VERTICAL RUN.
5. THE EXPANDER SECTION SHALL BE OF ADEQUATE LENGTH (ATLEAST 3-4 TIMES DIA OF THE MAIN PROCESS PIPE AT BOTH SIDE OF INSTALLED THERMOWELL).



TITLE :

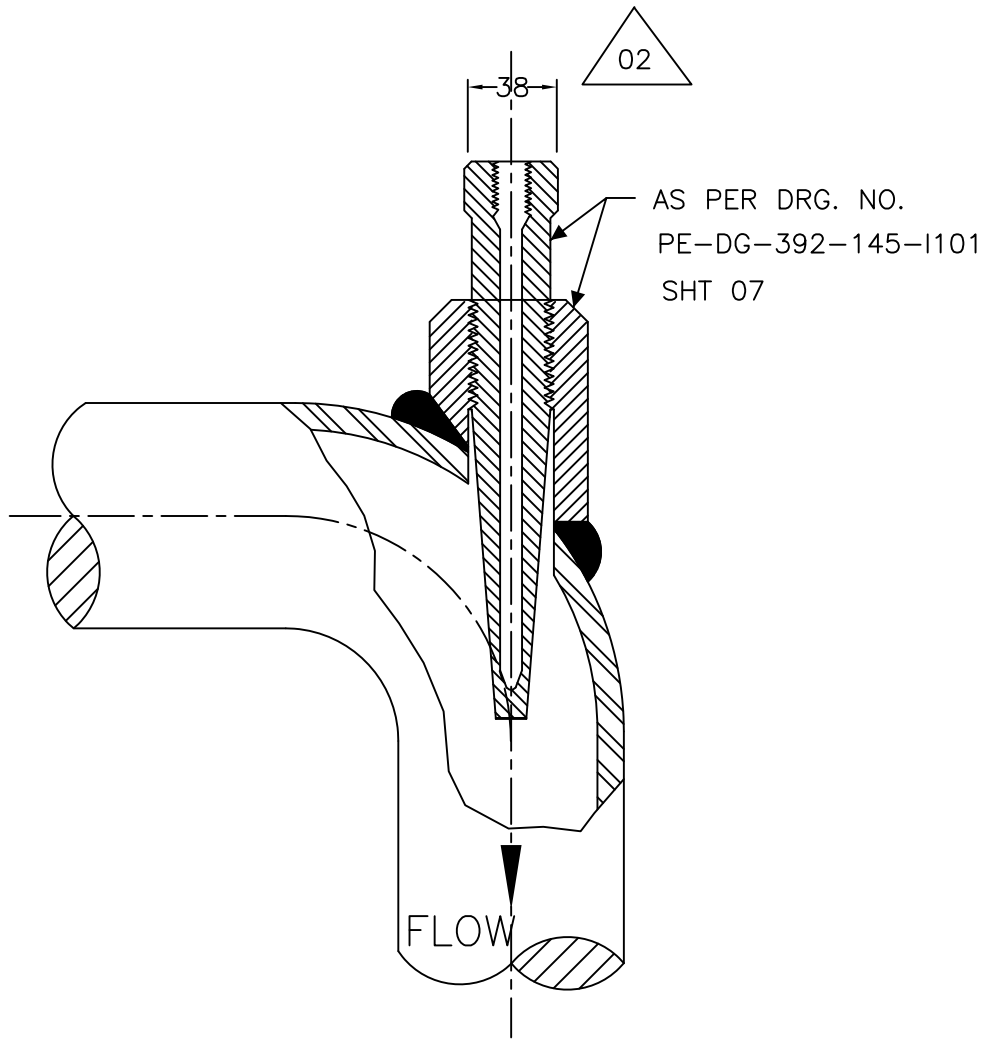
THERMOWELL INSTALLATION

DRG. NO.

PE-DG-392-145-1101

REV. 02

SH. 07 OF 08 SHS.



**NOTES :-**

1. FLOW INSTALLATION OF THERMOWELL SHALL BE APPLICABLE FOR 4" AND SMALLER LINE SIZE BUT LIMITED TO MINIMUM 3" LINE SIZE. THIS DETAIL IS APPLICABLE FOR THERMOWELL INSTALLATION IN BEND PIPES. △ 02
2. FOR 3" AND SMALLER LINE SIZE NECESSARY EXPANDER OF ELBOW FORM (AS SHOWN) OF 4" SIZE SHALL BE USED.
3. ELBOW EXPANDER SECTION IN HORIZONTAL PLANE TO BE USED FOR LIQUID SERVICE. FOR STEAM SERVICES EXPANDER SECTION TO BE USED IN VERTICAL PLANE.



TITLE :



**THERMOWELL INSTALLATION  
(IN BEND PIPES)**

DRG. NO.

**PE-DG-392-145-1101**

REV. 02

SH. 08 OF 08 SHS.