



TECHNICAL SPECIFICATION

01. The scanned copy of this annexure (original downloaded) duly completed and seal signed by the bidder must be uploaded otherwise bid should not be considered. Any supplementary information may be uploaded separately.
02. The samples where-ever mentioned in specifications must be submitted in this Directorate along with physical submission of DD's of EMD etc, otherwise concerned item will not be considered for technical evaluation.
03. Scanned Copies of Original Literature/Leaflets/Catalogue etc. must be enclosed in support of your Make and Specifications otherwise concerned items will not be considered for Technical Evaluation.
04. The delivery period will be 90 Days.
05. The Material will be Supplied F.O.R. District Level Industrial Training Institutes / Concerning Industrial Training Institutes as per enclosed List.
06. Authorization Certificate of manufacturer where-ever mentioned in specifications must be submitted in prescribed format (Annexure-L) otherwise concerned item will not be considered for Technical Evaluation.
07. All the required literature/ leaflets/Catalogues, authorisation certificates must be submitted with the tender and these will not be demanded by the department after receipt of tender.

Item No. : 07/2018-19 Due Date : 20.08.2018

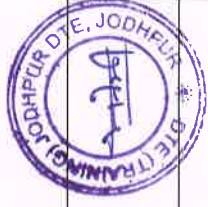
Name of Tenderer :

Name of Item : ELECTRICAL MOTORS

S. No.	Specifications	Qty.	Make & model	(*) Specify variation in Specification if any, otherwise write "No variation" / as per Specification.
01	D.C. Series Motor Coupled with Spring Balance Load 2.5 KW, 220 Volts :- Motor Series D.C. coupled with Mechanical load , 2.5 KW, 220 Volt, with suitable starter, Continuous rating,. Class "F" type insulation, body should be spray painted, all terminal should come out at terminal box for laboratory experiments. Motor Should be foot mounted and energy efficient	76 Nos.		
02	Motor Shunt D.C. 220 Volts 2.5 KW :- Motor Shunt D.C., 2.5 KW 220 Volt class. "F" insulation, Fan cooled, body should be spray painted. Motor Should be foot mounted and energy efficient, with 3 point D.C. starter.	121 Nos.		



03	<p>Motor Compound D.C. 220 Volts with Starter and Switch 2.5 KW :- Technical Data : DC compound motor with inter pole, Continuous rating, 2.5 KW 220Volt. D.C., Screen protected fan cool, Class 'F' insulation. Motor Should be foot mounted and energy efficient. Starter - Four point starter of suitable capacity having no load coil & over load protected devices with shunt field speed regulator.</p>	122 Nos.	
04	<p>A.C. Squirrel Cage Motor with Star Delta Starter and Triple Pole Iron Clad Switch Fuse with Mechanical Load, 5 HP, 3-Phase, 415 V, 50 Hz :- Capacity: 5 HP Voltage: 415 V ± 6% Frequency : 50 Hz ±3% Class of Insulation : B and above Speed : 1440 RPM Copper wound, To tally enclosed, Horizontal foot mounted internal fan cooled. The control panel should be provided to fit the instrument mention below</p> <ol style="list-style-type: none"> 1. Star delta starter (automatic) 2. MCB Triple pole 16 amp 3. Digital AC Ammeter 0-15 amp 96 x 96 mm size. 4. Digital AC Volt Meter 0-500 Volt 96 x 96 mm size. 5. Indicating Lamps LED Type 22.5 mm size for all three phases <p>All panel accessories (MCB, Meters & Indicators) should be of standard quality make.</p> <p>Control Panel Board :- The Control panel should be high grade FRB with 1200 x 600 x 150 mm will be fitted on the dark brown color Bakelite hylam sheet thickness of 6mm and above with duly marked engraved printed circuit termination and also back door of the panel will have lock facility for safety of the panel. Educational type panel board for above mentioned equipments & accessories with required brass terminals & should be fitted neatly spared & back side properly wired up and necessary arrangement will be made to kept the panel on 32 x 32 x 6 mm of M.S fabricated frame with four legs. Top height of panel frame from ground level should be 1.85 mtr. With</p>	85 Nos.	



	<p>panel foundation setting depth not less than 30 cm having projected legs. Painted with red oxide & machine gray color all equipment, accessories & terminals should be fitted on front side of panel & marked properly.</p>		
05	<p>Motor 5 HP 400V, 3 Ph. 50 Cycles, A.C. Phase, Wound Slip Ring Motor with Starter and Switch :- Electric motor 3 phase slip ring screen protected 5 HP, 400/440 volts, 50 Hz, 1440 RPM, rating continuous. All the Nine terminals of starter & rotor winding should be brought out on terminal plate. The starter winding's connection should be specified for star or Delta with working voltage (440/230). Slip ring wound motor starter:- Rotor resistance type starter with DOL Start system for starter of above motor and rotor starter with 3 step resistance including 3 contactor 415 V., 2 timer (on delay) 0-30 seconds. all switch gears should be fitted in suitable mounting box. Motor should be foot mounted and energy efficient fan cooled.</p>	76 Nos.	
06	<p>A.C. Series Type Motor 1 HP, 240 V, 50 Hz :- Continuous rating, rated output-1 HP, rated voltage-230 V \pm 4%, Single phase, 50 Hz \pm 3 %, class of insulation-B .Motor have facility for adjustable brush axis to run motor in any direction and at adjustable speed, rated power factor- 0.85 to 0.95, Totally enclosed fan cooled type, brass terminal box, the whole body should be beautifully spray painted. Motor Should be foot mounted and energy efficient. Two Nos. of Spring balance mechanical load. Friction brake Type should be provided with fixed on the motor base plate</p>	78 Nos.	
07	<p>Motor 1 HP 230 Volt 50 Cycles, Single Phase Capacitor with Starter Switch :- Technical data : Capacitor starter, Capacitor run motor. Continuous rating 1 HP, Phase-1, Voltage 230 V \pm 4 %, AC 50 Hz \pm 3 %, speed -1440 RPM. Totally enclosed type, Robust body should be spray painted, insulation class 'F' type. Motor Should be foot mounted and energy efficient fan cooled. and single Phase D.O.L. Starter</p>	85 Nos.	
08	<p>Universal Motor with Starter/Switch 240 V, 50 Hz, 1 HP :- Universal motor 1 HP 230 V \pm 4 %, 50 Hz. \pm 3 %, AC/DC, Speed 3000 RPM insulation class 'F', Brush adjust arrangement, internally fan cooled, speed arrangement in pole winding controlled by suitable switch. Motor Should be foot mounted and energy efficient.</p>	76 Nos.	



09	<p>Stepper Motor with Digital Controller :- DC Stepping Motor (brush less)</p> <ol style="list-style-type: none"> 1. Type – hybrid rotor 2. Phase – 2/4 (energized holding) 3. Step angle – $1.8^\circ \pm 0^\circ$ (Non cumulative) 4. Torque – 8.4 kg-cm 5. Insulation class – ‘B’ 6. Mounting – Flange 7. Number of Leads – Six 8. Step/Revolution – 200 9. Power requirement – 60 VDC 10. CONTROLLER – Digital type Power Drives- <ol style="list-style-type: none"> 1. Input – 220-250 VAC, 50 Hz 2. Output – 60 VDC <p>Note:-</p> <ol style="list-style-type: none"> 1. Power drives should be able to drive the stepping motor & accept input logic. It consist amplifier mode & AC to DC converter. 2. Amplifier module : the module should have proper PCB with quality components including power transistors/ MOSFET's with proper heat sinks, current control circuit essential connection for power, logic signals, inputs, motor etc. these all should be provided in M.S. cabinet with cooling fan. 3. Main ON/OFF, Manual Pulsar, Forward/Reverse Rotation Switch, High/Low variation clock for speed. 	93 Nos.	
10	<p>Shaded Pole Motor Fractional HP, 240 V, 50 Hz :- Shaded pole motor Rating - 1/6 HP, four pole Voltage rating - 230 V AC $\pm 4\%$ Insulation – Class B Speed - 1440 RPM Motor should be Copper wound.</p>	93 Nos.	



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Synchronous Motor with accessories like Starter, Excitation Arrangements, 3 Phase, 3 HP, 440V, 50Hz, 4 Pole :-

3 Phase Synchronous motor

Rating - 3 HP

Voltage rating - 415 V AC, 50Hz

Speed - 1500 RPM, 4pole

Type - Auto Synchronous

Insulation - Class B and above

Degree of protection IP-55

Horizontal Foot Mounted, Energy Efficient copper wound & internal fan cooled.

Field Excitation, 120Volt DC, Type.

Mechanical load -

Dynamometer type set having two Nos. 6" dial type spring balances

Mechanical load should be provided with fixed on the motor Base plate.

The control panel should be provided to fit the instrument mention below -

1. DOL Starter - 3 HP
2. MCB Three pole 16 amp
3. Digital AC Ammeter 96 x 96 mm size.
4. Digital AC Volt meter 96 x 96 mm size.
5. Indicating Lamp LED Type 22.5 mm size for all three phases.
6. With inbuilt DC Excitation, Variable Rheostats with all accessories.

All panel accessories (MCB, Meters & Indicators) should be of standard quality make.

Control Panel Board :-

The Control panel should be provided with powder coated M.S. fabricated box (Sheet thickness should be 20 SWG and above) with 1200 x 600 x 150 mm will be fitted on the dark brown color Bakelite hylam sheet thickness of 6mm and above with duly marked engraved printed circuit termination and also back door of the panel will have lock facility for safety of the panel. Educational type panel board for above mentioned equipments & accessories with required brass terminals & should be fitted neatly spared & back side properly wired up and necessary arrangement will be made to kept the panel on 32 x 32 x 6 mm of M.S fabricated frame with four legs .Top height of panel frame from ground level should be 1.85 mtr. With

85 Nos.

