Section 6- Schedule of supply

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1. List of Goods and Related Services

Package Name: Supply of Mechanical Lab equipment's for M.G. Govt. Engineering College Kotla (Jeori) and related items to enhance technical and vocational skills among the youth of Himachal Pradesh HPSDP-DoTE/EC/4

Lot 1: **Fluid Mechanics Lab, Heat Transfer Lab, I C Engines Lab, Strength of Materials Lab, Thermal Lab, Turbo Machinery Lab, Theory of Machine Lab**

Lot 2: **CAD/CAM Lab, Automation and Robotics Lab**

Lot 1: Fluid Mechanics Lab, Heat Transfer Lab, I C Engines Lab, Strength of Materials Lab, Thermal Lab, Turbo Machinery Lab, Theory of Machine Lab					
Sr. No.	**Name of the Item**	**Total Numbers**	**Specification by the supplier (To be filled by the supplier)**	**Detailed information brochure attached at Page No.**	**Pass/Fail (By Purchaser)**
Lab name: Fluid Mechanics Lab					
1.	Notch Apparatus	1			
2.	Impact of Jet apparatus	1			
3.	Vernturimeter & orifice meter Apparatus	1			
4.	Bernoull's Theorem Apparatus	1			
5.	Reynolds Apparatus	1			
6.	Metacentric Height of ship Model	1			
Lab name: Heat Transfer Lab					
7.	Thermal Conductivity of Metal Rod Apparatus	1			
8.	Thermal Conductivity of Insulating Powder Apparatus	1			
9.	Heat Transfer From A Pin-Fin apparatus	1			
10.	Heat Transfer in Natural Convection Apparatus	1			
11.	Heat Transfer in Forced Convection Apparatus	1			
12.	Parallel Flow/Counter Flow Heat Exchanger	1			
13.	Stefan Boltzmann's Apparatus	1			
14.	Heat Transfer Through Composite wall apparatus	1			

Lab name: IC Engines Lab					
15.	To study the construction details of 2 Stroke and 4 Stroke Engines	1			
16.	Cut Section Model of Actual Multi Cylinder Four Stroke Petrol Engine for Plotting Valve Timing Diagram (Motorized)	1			
17.	To study the valve timing diagram of engine. (4 stroke diesel engine) motorized	1			
18.	To perform Test on engine (4 stroke diesel engine). (Computerised)	1			
19.	Multi Cylinder four Stroke Petrol Engine Test Rig With Electric Brake Dynamometer (To perform Load and Morse Test)	1			
20.	Variable Compression Ratio Diesel Engine Test Rig Dynamometer (as applicable)	1			
21.	Exhaust Gas Analyser (Petrol Engine)	1			
22.	Battery, Magneto, Electronic	1			
Lab name: Strength of Materials Lab					
23.	Computerized Universal Testing Machine	1			
24.	Impact Testing Machine (Izod & Charpy)	1			
25.	Brinell Hardness Testing Machine	1			
26.	Rockwell Hardness Testing Machine	1			
27.	Vickers Hardness Testing Machine	1			
28.	Fatigue Testing Machine	1			
29.	Torsion Testing Machine	1			
Lab name: Thermal Lab					
30.	Refrigeration Test Rig	1			
31.	Window Type Air Conditioner Test Rig	1			
32.	Cooling tower test rig	1			
33.	Cut Section Model of Drum Brake Unit (Hydraulic Working)	1			
34.	Cut Section Model of Air Brake System (Non Working)	1			
35.	Model of Lancashire Boiler	1			
36.	Model of Babcock and Wilcox Boiler	1			

Lab name: Turbo Machinery Lab					
37.	Hydraulic Ram Test Rig	1			
38.	Centrifugal pump test Rig (with variable speed)	1			
39.	Reciprocating Pump Test Rig (with variable speed)	1			
40.	Pelton Wheel Turbine Test Rig	1			
41.	Francis Turbine Test Rig	1			
42.	Kaplan Turbine Test Rig	1			
43.	Submersible Pump Test Rig	1			
44.	Centrifugal Compressor Test Rig	1			
Lab name: Theory of Machine Lab					
45.	Cam Analysis Apparatus:	1			
46.	Motorized Gyroscope:	1			
47.	Universal Governor Apparatus:	1			
48.	Static and Dynamic Balancing Machine:	1			
49.	Epicyclic Gear Apparatus:	1			
50.	Corollis Component of Acceleration:	1			
51.	Slider Crank Mechanism:	1			
52.	Four Bar Chain Mechanism:	1			
53.	Double Slider Mechanism:	1			
54.	Universal Vibration Apparatus	1			
Lot 2: CAD/CAM Lab, Automation & Robotics Lab					
Lab name: CAD CAM Lab					
1.	CNC Milling Trainer Machine	1			
2.	Vertical Machining Centre Machine	1			
Lab Name: Automation & Robotics Lab					
3.	SCARA Robot	1			
4.	Six Axis Robotic arm	1			

2. Delivery and Completion Schedule

The delivery period shall start as of *date of Signing the Contract*

Description of Goods or Related Services	Delivery Schedule (Duration)	Location	Required Arrival Date of Goods or Completion Date for Related Services
Furniture and Equipment and Related items **Lot 1:** Fluid Mechanics Lab, Heat Transfer Lab, I C Engines Lab, Strength of Materials Lab, Thermal Lab, Turbo Machinery Lab, Theory of Machine Lab **Lot 2:** CAD/CAM Lab, Automation and Robotics Lab	Within 180 Days from the Signing of the contract.	**Mahatma Gandhi Govt. Engineering College Kotla (Jeori), Tehsil Rampur, Distt. Shimla, Himachal Pradesh. PIN 172101**	Within 180 Days from the Signing of the contract.

3. Technical Specifications

Item No.	Name of Goods or Related Services	Technical Specifications of Item and/or Bureau of Indian Standards (BIS) (if applicable) reference	Features	Accessories	Spare Parts	Documents	Installation and Training	Warranty of Equipments / Parts
Lot 1: Fluid Mechanics Lab, Heat Transfer Lab, I C Engines Lab, Strength of Materials Lab, Thermal Lab, Turbo Machinery Lab, Theory of Machine Lab								
Lab Name: Fluid Mechanics Lab								
1.	Notch Apparatus	• Experimental section Length: 1m • V notch 450, 600 and rectangular made of SS • Cross-section W x H: 400*250x180mm • Supply tank: 70L • Measuring tank 25L • Power consumption: 250W • 230V, 50Hz, 1 phase • Dimensions(approx.): L x W x H: 800-x800 x 10 mm				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
2.	Impact of Jet apparatus	• Jet diameter: 8 mm. • Impact surfaces diameter: 40 mm. • Impact surfaces: 180° hemispherical surface. 120° curve surface. 90° flat surface. • A set of masses of 5, 10, 50 and 100 g. is supplied • Easy and quick coupling system built in. • Dimensions(approx.): L x W x H: 800-x800 x 800 mm				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
3.	Vernturimeter & orifice meter Apparatus	• Manometer range: 0 to 500 mm. of water column. • Number of monomeric tubes: 8. • Orifice plate diameter: 25 mm. • Flow meter: 2to30 l./min. • Venturi dimensions: • Throat diameter: 20 mm. Upstream pipe diameter: 32 mm. Downstream taper: 21°. Upstream taper: 14°. • Orifice Plate dimensions: • Upstream pipe diameter:35mm. Downstream orifice diameter: 19mm. • Easy and quick coupling system built-in • Anodized aluminum structure and panel of painted steel. • DIMENSIONS (approx.): L x W x H: 800-x600 x 600 mm				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

4.	Bernoull's Theorem Apparatus	• Manometer range: 0 to 300 mm of water. • Number of manometer tubes: 8. • Upstream diameter of the throat: 25 mm. • Narrowing: Downstream: 21°, Upstream: 10°. • Easy and quick coupling system built-in • Anodized aluminium/ MS powder coated structure and panel of painted steel. • Dimensions: 800 x 450 x 700 mm. approx. • Hydraulics Bench or Basic Hydraulic Feed System. • DIMENSIONS(approx.): 600-x350 x 550 mm				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
5.	Reynolds Apparatus	• Inner diameter: 16 mm. External diameter: 20 mm. Length: 750 mm. • Water supply tank with level fitting and connection for it's feeding. It has a section that makes it possible to generate a constant pressure at the tank inlet. Capacity: 2.4 ltr. • Dye or vegetable coloring tank with a valve and an injection needle, tankcapacity:0.4 ltr. • Coloring matter injection is regulated with a needle valve. Control valve to adjust the water flow in the experiments. • Easy and quick coupling system built-in. • DIMENSIONS (approx.): 600-x600 x 1000 mm				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
6.	Metacentric Height of ship Model	• Max. Angle of heel: ±13° • Corresponding linear dimension: ±90mm • Pontoon dimensions:Length 350mm,Width 200mm • Overall height 475mm • DIMENSIONS (approx.): 600-x450 x 450 mm				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	1
Lab name: Heat Transfer Lab								
7.	Thermal Conductivity of Metal Rod Apparatus	• Metal Bar Material : Copper, Steel, brass and aluminium • Dia and Length of sample 20mm*20 mm Copper, Steel, brass and aluminium • Insulating shell: Teflon • Cooling Water Jacket • Length: 75 mm, Diameter: 50 mm • Heater: Nichrome Wire. • Water Flow measurement system: By digital Flow meter • Control panel consist of: 20*4 extra large LCD display for display input power (volt , current, watt), flow rate of water, temperatures, and control of input power of heater • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint.				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

8.	Thermal Conductivity of Insulating Powder Apparatus	• Inner Sphere: Dia. - 100 mm. • Outer Sphere: Dia. - 200 mm. • Heater: Nichrome Wire. • Control panel consist of: • 20*4 extra large LCD display for display , input power (volt , current, watt), temperature, and control of input power of heater • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
9.	Heat Transfer From A Pin-Fin apparatus	• Fin: Pin type. • Material: Aluminum, brass • Size: Dia. 20 mm (approx.), Length 150 mm (approx.). • Heater: Band type, Nichrome Wire. • Control panel consist of: • 20*4 extra large LCD display for display, input power (volt , current, watt), temperature, and control of input power of heater. • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint.				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
10.	Heat Transfer in Natural Convection Apparatus	• Test Section: • Diameter: 38 mm (approx). • Length: 500 mm (approx). • Heater: Nichrome Wire. • Control panel consist of: • 20*4 extra large LCD display for display , input power (volt , current, watt), temperature, and control of input power of heater • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint.				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
11.	Heat Transfer in Forced Convection Apparatus	• Flow cross section area 120*120, • Hight: 0 .6m • Blower: Axial fan • Heater: Nichrome Wire. • Air Flow Measurement:vane type anemometer. • Control panel consist of: • 20*4 extra large LCD display for display , input power (volt , current, watt), air flow rate temperature, and control of input power of heater • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint.				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

12	Parallel Flow/Counter Flow Heat Exchanger	• System: Water to Water, concentric tube type • Heat Exchanger: Length 1 (approx.). Insulated with ceramic wool and cladded by aluminum foil. • Outer Tube: Material Copper, ID 20 mm, OD 25 mm (approx.) • Inner Tube: Material Copper, ID 10 mm, OD 12 mm (approx.) • Water Flow Measurement system: digital flow meter • Hot Water Tank: Made of Stainless steel (Insulated with ceramic fiber wool) • Hot Water Circulation: Magnetic Pump • Heaters: Nichrome wire heater (2Nos) • Control panel consist of: • 20*4 extra large LCD display for display , input power (volt , current, watt), Water flow rate temperature. • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint •				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
13	Stefan Boltzmann's Apparatus	• Hemisphere: Dia.- 200 mm (approx.) made of Copper • Jacket: Dia. 250 mm (approx.) made of Stainless Steel • Test Disc Size: 20 mm Dia., 1.5-mm thickness made of Copper • Water Tank: Stainless steel 12 Litres capacity Heater: Nichrome wire immersion heater. • Control panel consist of: • 20*4 extra large LCD display for display , input power (volt , current, watt), temperature, and control of input power of heater • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint •				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
14	Heat Transfer Through Composite wall apparatus	• Slab assembly arranged symmetrically on both sides of heater. • Slab Material (Slab Size) • Cast Iron (250 mm dia & 20mm thick.) • Bakelite (250 mm dia. & 15 mm thick.) • Press Wood (250 mm dia. & 12 mm thick.) • Heater: Nichrome wire. • Control panel consist of: • 20*4 extra large LCD display for display , input power (volt , current, watt), temperatures, and control of input power of heater • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint.				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

Lab name: IC Engines Lab								
15.	To study the construction details of 2 Stroke and 4 Stroke Engines	• Cut Section Model of Actual Single Cylinder Two Stroke Petrol Engine for Plotting Port Timing Diagram • With Carburetor, spark plug etc. Complete with all salient parts sectioned for study of the various components and their function and to plot port-timing diagram on the single cylinder two-stroke petrol engine. • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint.				Catalogue/ Instructional manual/ Wall Chart	No	3
16.	Cut Section Model of Actual Multi Cylinder Four Stroke Petrol Engine for Plotting Valve Timing Diagram (Motorized)	• Specification: Actual Multi Cylinder 4 Stroke petrol Engine, to plot valve-timing diagram on the multi cylinder four stroke Petrol engine With Carburetor, spark plug etc. Complete with all salient parts sectioned for study of the various components and their function • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint.				Catalogue/ Instructional manual/ Wall Chart	No	3
17.	To study the valve timing diagram of engine. (4 stroke diesel engine) motorized	• Valve Timing Diagram Four Stroke Diesel Engine Test Rig • Actual Multi Cylinder 4 Stroke Diesel Engine With injector, fuel pump, fuel filter, lubrication oil pump, air cleaner, silencer, governor, valve mechanism etc. Complete with all salient parts sectioned for study of the various components and their function and to plot valve-timing diagram on the multi cylinder four stroke diesel engine. • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint.				Catalogue/ Instructional manual/ Wall Chart	No	3

18	To perform Test on engine (4 stroke diesel engine). (Computerised)	• Computerised 4 Cylinder 4 Stroke Diesel Engine Test Rig With Data Logging Facility • Type of Engine : Four Cylinder, Four Stroke Water Cooled Diesel Engine • Type of Loading : Electric Brake Dynamometer • Air Intake Measuring System :Air tank fitted with Air Flow Transmitter • Fuel Measuring System: Fuel measuring system consists of a fuel tank, Fuel Sensor. • Combustion Pressure Sensor : Piezoelectric Sensor with low noise cable • Crank Angle Sensor: Resolution 0.5° with TDC pulse • Torque Measurement: Load Cell with Transmitter. • Fuel flow sensor • Temperature Sensor: Temperature Sensors with Transmitters. • Water Flow Measurement: by flow sensor for engine and calorimeter • Exhaust Gas Calorimeter : Pipe in pipe type made of Stainless Steel, • Engine Interface : Load Transmitter, Temperature Transmitter, Air Flow Transmitter, Fuel Flow Transmitter, Combustion Pressure Sensor, Crank Angle, And Water flow rate • High speed Data acquisition system NI USB 6351 up to 1.25MS/s • Fuel measurement and load apply of engine through computer • The whole set-up should be well designed and arranged on a rigid structure painted with industrial PU Paint.				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
19	Multi Cylinder four Stroke Petrol Engine Test Rig With Electric Brake Dynamometer (To perform Load and Morse Test)	• Type of Engine: multi cylinder, four stroke engine, water cooled, self-start, Petrol engine (MPFI), • Type of Loading: Electric Brake Dynamometer with resistive load • Fuel Measuring System: Fuel measuring system consists of a fuel tank, a burette and a three way cock arrangement. • Air Intake Measuring System: Air tank fitted with orifice and water manometer. • Measurement of Heat Carried: It consists of inlet outlet piping away by Cooling water with flow control valve • Water flow measurement: digital flow meter for engine and calorimeter • Control panel: 20*4 extra large digital display for display all temperatures water flow rate and RPM • Exhaust Gas Calorimeter: Made of Stainless Steel including the body & the tube for cooling water circulation and designed to get maximum temperature difference.				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

20.	Variable Compression Ratio Diesel Engine Test Rig Dynamometer (as applicable)	• Computerised 1 Cylinder 4 Stroke Diesel Engine Test Rig With Data Logging Facility • The loading device used is an Eddy Current Dynamometer of matching capacity to load the engine upto 5HP at 1500 RPM. Single Cylinder Four Stroke Water Cooled Vertical Diesel Engine to develop 5 HP @ 1500 RPM. • Air Intake Measuring System: Air tank fitted with Air Flow Transmitter • Fuel Measuring System: Fuel measuring system consists of a fuel tank, Fuel Sensor. • Combustion Pressure Sensor :Piezoelectric Sensor with low noise cable • Crank Angle Sensor : Resolution 0.5° with TDC pulse • Torque Measurement: Load Cell with Transmitter. • Fuel flow sensor • Temperature Sensor: Temperature Sensors with Transmitters. • Water Flow Measurement: by flow sensor for engine and calorimeter • Exhaust Gas Calorimeter: Pipe in pipe type made of Stainless Steel, • Engine Interface: Load Transmitter, Temperature Transmitter, Air Flow Transmitter, Fuel Flow Transmitter, Combustion Pressure Sensor, Crank Angle,And Water flow rate, • High speed Data acquisition system NI USB 6351 up to 1.25MS/s • Fuel measurement and load apply of engine through computer				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
21.	Exhaust Gas Analyser (Petrol Engine)	• To study the effect of Spark Timing & Lambda on Single Cylinder Petrol Engine using Open ECU & perform Exhaust Gas/Smoke analysis of engine • Portable gas analyzer for measuring exhaust gases like CO, HC, CO2, O2, and NOx from petrol, LPG and CNG vehicles. CO, HC and CO2 is measured by NDIR sensor and O2 and NOxis measured by electro chemical sensors. It also measures engine RPM by using vibration, battery and electromagnetic clamp sensors as well as engine oil temperature. n accordance with non-light-disguising infrared absorption method via micro-computer analysis • Gas measured: CO, HC, CO2, O2, and NOx • Measured span: CO: 0-15%vol, HC: 0-15000ppm, CO2: 0-20% vol, O2: 0-25%vol, Nox: 0-10000ppm Chanel Resolution: CO: 0.001%, HC: 1ppm, CO2: 0.01%, O2: 0.01%, Nox: 1ppm • Display: 128*64 Graphical liquid crystal display • Input method: 6 key membrane keyboard • Temperature:-5~400C, humidity: = 95%, Air pressure: 70.0 ~106kPa • Power: AC 220VÂ±10%;50HzÂ±1Hz, rotate speed: 0 ~ 6000rpm				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

22	Battery, Magneto, Electronic	• To study the construction details of Ignition system • IGNITION AND CHARGING SYSTEM typical automobile ignition systems with distributor model, ignition coils, ignition circuit, alternator model, spark plugs model, camshaft and crankshaft sensor circuit and part of engine control unit (related to ignition system). Accessories: • Experiment manual. • Power cord.				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
Lab name: Strength of Materials Lab								
23	Computerized Universal Testing Machine	• Universal Testing Machines for tension, compression, bend, peel testing. Structure : 4 column • Control way : Constant stress uniform deformation constant displacement three closed loop control and program control • MIN/Max. load: 5KN/2000kN, • Load Accuracy: ≤±1% /≤± 0.5% • Load Range: 2%-100%FS /0.4%-100% FS • Load Resolution: 1/300000 • Deformation Measurement Range: 2%~100%FS • Deformation accuracy: ≤±1%/± 0.5% • Displacement resolution: 0.01mm • Displacement error: ≤±0.5% • Clamping method: Hydraulic clamp DIMENSION(Approx.): 800X800X1600 mm				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
24	Impact Testing Machine (Izod & Charpy)	• To determine the anti-impact capability of metal materials under dynamic load. • Maximum Capacity: 300 J / 168 J, • Minimum Scale Graduation: 2 J, Overall Size (Approx.): 1.65 m (H) 1.1 m x 0.45 mx,				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
25	Brinell Hardness Testing Machine	• Measuring range: 8-650HBW • Magnification of the microscope: 20X • Resolution capability of the microscope: 0.005mm • Max measurable height: 230 mm • Max measurable depth: 140 mm				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

26.	Rockwell Hardness Testing Machine	• To determine hardness of the materials. • Hardness Data Indicating: Dial • Rockwell Scale: HRA, HRB, HRC, HRD, HRE, HRF, HRG, HRH, HRR, HRL, HRM, HRK. • Initial Test Force: 10Kg (98N) Total Test Force: 60Kg (588N), 100Kg (980N), 150Kg (1471N). • Specimen Maximum Height Allowed: 170mm (Another height end type, it is 400mm height allowed). • Throat Depth: 140mm • Hardness Value Range: HRA: 20-80; HRB 20-100; HRC 20-70. • DIMENSIONS: (Approx.): 465 X180 X655 mm3				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
27.	Vickers Hardness Testing Machine	• For measuring the hardness of precision metallic parts with wide testing range from soft to hard and their accurate results are widely acclaimed. Test Loads: 5, 10, 20, 30, 50 kgf • Optical Magnification: 70 X • Optical Measuring Range (mm): 0.1 to 1.0 • Maximum Test Height (mm): 200 • Scale Least Count (mm): 0.001 • Throat Depth (mm): 135 • Power Supply: 220 VAC, 50Hz, 1-Phase • DIMENSIONS (Approx.): 585X290 X860 mm*mm*mm				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
28.	Fatigue Testing Machine	• This machine is used to test the fatigue strength of materials and to draw S-N diagram by research institute, laboratories, material manufacturers and various industries. • Max. Bending moment (Kg. cm): 200 • Bending moment adjustable (Kg.cm): 25 - 200 • Ranges: 1 - Kg.cm II - Kg.cm: 25- 125 125-200 • Gripping dia of specimen (mm): 12 • Testing dia of specimen (mm): 8 • Rotating speed in RPM: 4200 • Accuracy of applied bending moment: ±1% • Mechanical Counter: No. of digits Multiplying factor 6 3 • Power required in HP: 0.5 • Main Supply: 3ph 440v 50hz • DIMENSIONS: (Approx.): 1000X500X600 mm3				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

29.	Torsion Testing Machine	• For conducting torsion and twist on various metal wires, tubes and sheet materials. • Max. torque capacity (Nm): 100 • Torque Resolution (Nm): 0.01 • Angle of twist (Degree): 0.1 Torsion speed and direction: 1.5 RPM Reverse • Distance between grips (mm): 0 – 400 • Grips for round bar of dia (mm): 4 – 8; 8 – 12 • Grips for flat bars thickness Width: 2 – 8; 25 • DIMENSIONS: (Approx.): 1200X450X900 mm3				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
Lab name : Thermal Lab								
30.	Refrigeration Test Rig	• Compressor: Hermitically sealed compressor, Reciprocating type. Capacity 1/3 Ton • Refrigerant: R-134-A • Agitator: Compatible capacity. • Condenser: Air cooled compatible to compressor • Condenser Cooling Fan: Compatible capacity with permanent lubricated motor. • Evaporator: Made of Stainless Steel, Insulated with ceramic wool/P.U.F. • Expansion Device: Capillary Tube, Compatible Capacity. • Pressure Gauges: 2 Nos. (For suction & discharge pressure) • Safety Control: Overload and over current protectors for compressor and Time delay circuit with Low/high voltage auto-cut. • Temperature Sensor: RTD PT-100 Type • Control Panel consist of: 20*4 extra-large digital display for measure pressure, temperature volt and current :				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

31.	Window Type Air Conditioner Test Rig	• Compressor: Hermitically sealed compressor, Reciprocating type. Capacity 1 Ton • Condenser : Air cooled compatible to compressor • Condenser cooling fan: Compatible capacity with permanent lubricated motor. • Pressure Gauges: 2 Nos. (For suction & discharge pressure) • Evaporator: Window type, made of copper tube and aluminum fins fitted with compatible capacity fan. • Safety Control: Over load and over current protection for compressor with Time delay circuit & Low/high voltage auto-cut. • Expansion Device: Capillary Tube compatible capacity. • Temperature Sensor: RTD PT-100 Type. • Control Panel consists of: 20*4 extra large digital display for measure pressure, temperature volt and current.				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
32.	Cooling tower test rig	• Cooling tower test rig • Cooling Tower • a) Size : 150 x 150 mm • b) Height : 600 mm • c) Material : SS body with acrylic frame • D) Packing Sheets: Perforated Aluminum corrugated • Blower • a. Capacity: FHP motor with speed variation • Psychometrics Gun • a) Material : Acrylic • Air Flow measurement : U Tube Manometer • a. Material : Glass • b. Size : 300mm • c. Media : Water • Water flow measurement : Rotameter • a. Range : 0 to 5LPM • Calibrated water tank • a. Material : S.S/18 Swg • b. Size : 250 x 250 250 with 2 kw heater and glass wool insulated • Control Panel consists of: 20*4 extra large digital display for measure all temperatures.				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

33	Cut Section Model of Drum Brake Unit (Hydraulic Working)	• This model is made out of original parts such as Two Brake drum assembly, two master cylinder (one sectioned), wheel cylinders (one sectioned), Brake Shoes, etc., the model can be demonstrated by operating the lever provided				Catalogue/ Instructional manual/ Wall Chart	No	3
34	Cut Section Model of Air Brake System (Non Working)	• The model is made out of Original parts such as Air compressor, Unloader valve, foot valve, Booster, Wheel assembly, air tank, control valve etc Suitably sectioned and mounted on a sturdy iron frame.				Catalogue/ Instructional manual/ Wall Chart	No	3
35	Model of Lancashire Boiler	• Model of Lancashire Boiler Steel shell is about 75 cm. Long and 22 cm in diameter. Two large tubes known as fire tubes pass from end to end. At the front end of each tube a furnace fire grating is placed and a door is hinged. Brick work, seating and flues are shown in wood work. The boiler is complete with deadweight safety valve, manhole, mud hole. Chock valve high steam a low water safety valve, steam and water				Catalogue/ Instructional manual/ Wall Chart	No	3
36	Model of Babcock and Wilcox Boiler	• Model of Babcock and Wilcox Boiler • It is a water tube boiler. The shell is 15 cm in diameter and 75 cm in length and is fitted with a super heater and with inclined water tubes over the furnace connected with headers. The model is fitted with stop valve, safety valve, water gauge, steam gauge. Manhole, mudhole, regulating draught door, damper with counter weight and chimney. Seating and brick work are shown in % cod work. The model is: approximately one meter in length 28 cm. In breadth and 77 cm. High.				Catalogue/ Instructional manual/ Wall Chart	No	3
Lab name: Turbo Machinery Lab								
37	Hydraulic Ram Test Rig	• Supply Head 1.0m, Delivery head 4m • Water Circulation 1 HP Pump • Sump tank 140 Ltrs. • Overhead tank capacity 50 Ltrs. • Air vessel suitable capacity • Flow measurement: For waste water- using measuring tank, 30 Ltrs. For useful water- measuring cylinder 1 Ltr. • Stop watch: Electronic • Pressure Gauge: Bourdan type • Tanks material: Stainless Steel				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

38.	Centrifugal pump test Rig (with variable speed)	• Centrifugal pump test Rig (with variable speed) • Pump:Capacity 1 HP, Speed 2800 RPM(max.), Head 12m • Medium Flow: Clear Water • Drive: 1 HP DC motor • Sump Tank :Capacity 110 Ltrs. Approx SS304 • Measuring Tank: Capacity 70 Ltrs. approx. with Piezometer • Stop Watch : Electronic • Pressure Gauge : Bourdon type • Tanks material: Stainless Steel 304 • Energy measurement :Electronic Energy meter • Control Panel consist of : 16*2 extra-large digital display for measure RPM and Dc motor speed control/ Proximity sensor				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
39.	Reciprocating Pump Test Rig (with variable speed)	• Pump: Double acting single cylinder, Capacity 1 HP, Speed 250 rpm, head 5 kg/cm2 • Medium Flow: Clear Water • Drive: 1 HP DC motor • Sump Tank :Capacity 50 Ltrs. approx • Measuring Tank: Capacity 25 Ltrs. approx. with Piezometer Stop Watch : Electronic • Pressure Gauge : Bourdon type • Energy measurement :Electronic Energy meter • Control Panel consist of : 16*2 extra-large digital display for measure RPM and Dc motor speed control/ Proximity sensor • Tanks material: Stainless Steel304				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
40.	Pelton Wheel Turbine Test Rig	• Pelton Wheel Turbine Test Rig • Output Power: 1 HP • Discharhge: 350 LPM • Head: 30m • Speed 1000 RPM • Impeller: Bucket type, Material-Aluminium • Nozzle Material: Stainless steel • Spear Material: Stainless steel • Dynamometer: Rope brake drum type • Sump Tank Capacity: 200 Ltrs. • Water Circulation: Centrifugal Pump, 5 HP, 3 Phase • Discharge Measurement: Venturi meter with differential pressure manometer • Control Panel consist of: Star/Delta starter, 20*4 extra large digital display for measure all RPM, load and pressure. Tanks material: Stainless Steel304				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

41.	Francis Turbine Test Rig	• Output Power: 1 HP • Discharhge: 1000 LPM • Supply Head: 15m • Speed 2200 RPM • Runner: Curved vane type • Dynamometer: Rope brake drum type • Sump Tank Capacity: 200 Ltrs. • Water Circulation: Centrifugal Pump, 5 HP, 3 Phase • Discharge Measurement: Venturi meter with differential pressure manometer • Control Panel consist of: Star/Delta starter, 20*4 extra large digital display for measure all RPM, load and pressure. Tanks material: Stainless Steel304				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
42.	Kaplan Turbine Test Rig	• Kaplan Turbine Test Rig • Output Power: 1 HP • Discharhge: 1000 LPM • Supply Head: 5m • Speed 1500 RPM • Runner: Propeller type water turbine with adjustable blade made of SS • Dynamometer: Rope brake drum type • Sump Tank Capacity: 200 Ltrs. • Water Circulation: Centrifugal Pump, 7.5 HP, 3 Phase • Discharge Measurement: Venturi meter with differential pressure manometer • Control Panel consist of: Star/Delta starter, 20*4 extra large digital display for measure all RPM, load and pressure. • Energy measurement :Digital RPM Indicator with Proximity sensor Tanks material: Stainless Steel304				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
43.	Submersible Pump Test Rig	• Pump: Submersible type, Capacity 1 HP • Medium Flow: Clear Water • Drive: 1 HP DC motor • Sump Tank :Capacity 110 Ltrs. approx • Measuring Tank: Capacity 90 Ltrs. approx. with Piezometer • Stop Watch : Electronic • Pressure Gauge : Bourdon type • Control Panel Comprises of: • Energy measurement :Electronic Energy meter • Tanks material: Stainless Steel304				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

44	Centrifugal Compressor Test Rig	• Product Specification • Motor Power 0.5 hp, 2800 RPM with speed controller • Voltmeter 500 V Ammeter 2 Amp				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
Lab name : Theory of Machine Lab								
45	Cam Analysis Apparatus:	• Cam: Eccentric, tangent, circular. • Follower: Knife edge, roller type & mushroom type. • Variable speed motor coupled to cam shaft of suitable range and various speeds. • A dial gauge. • The unit is mounted on sturdy base. • Control Panel consist of: • 16*2 extra-large digital display for measure and control motor speed • Accessory: Digital Stroboscope				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
46	Motorized Gyroscope:	• Rotor speed: Up to 4000 rpm. • Precession speed: Up to 60 rpm. • Portable tachometer: 1 No. for rotor speed. • Stopwatch: 1 No. for precession speed. • Balancing weights: 1 lot. • Steel ruler: 1 No. • Required for operation • 230V, 50Hz, 1 phase • 230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase • DIMENSIONS: L x W x H (approx.): 600 x 550 x 500 mm • Control Panel consist of: 16*2 extra large digital display for measure and control motor speed				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
47	Universal Governor Apparatus:	• Governors:-Porter; Proell; Hartnell. • Rotor motor: DC motor. • Rotor speed: Up to 400 rpm. • Required for operation • 230V, 50Hz, 1 phase • 230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase • DIMENSIONS: L x W x H (approx.): 600 x 600 x 600 mm • Control Panel consist of: 16*2 extra-large digital display for measure and control motor speed				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

48	Static and Dynamic Balancing Machine:	• Number of imbalance masses: 4 • Total imbalance: 880cmg • Measuring ranges • speed: 0…1400min-1 • Required for operation • 230V, 50Hz, 1 phase • 230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase • DIMENSIONS L x W x H (approx.): 600 x 300 x 600 mm • Control Panel Comprises of: 16*2 extra large digital display for measure and control motor speed				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3
49	Epicylic Gear Apparatus:	• Epicylic Gear Apparatus: • Motor: Variable speed motor, 1 HP. • RPM Measurement: Digital RPM Indicator with proximity switch. • Speed Control Unit: Variable Speed Drive for varying the speed of motor. Rope brake arrangement to measure output torque and holding torque. • Instruction Manual: An English instruction manual will be provided along With the Apparatus Electricity Supply: 220 V AC, Single Phase, 0.5 kW. • Floor Area: 1.5 x 2 m.3 • Control Panel consist of: 16*2 extra large digital display for measure and control motor speed				Catalogue/ Instructional manual/ Wall Chart	No	3
50	Corollis Component of Acceleration	• Water Tank: Made of Stainless Steel • Rotating Arms: 9mm/6mm orifice diameter, Length 300 mm. • Rota meter: 250 to 2500 LPH • Electric Motor: Swinging field, Variable speed. • Pump: FHP for water circulation. • The whole set-up is ingeniously designed and schematically arranged on a powder-coated rigid structure • Control Panel consist of: • 16*2 extra large digital display for measure and control motor speed • Required for operation: Water supply and drain • 230V, 50Hz, 1 phase • 230V, 60Hz, 1 phase; 120V, 60Hz, 1 phase • DIMENSIONS: LxWx H (approx.): 800 x 800 x 1200 mm				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

51.	Slider Crank Mechanism	• Coating Chrome Coating, Material: Mild Steel • Model Board Dimension 400 x 300 mm covered with Plastic beading. This model also comes in motorised version with digital parameters. • Mounted on weather proof Ivory Bakelite Board. • 6" Long Steel Grips for easy carrying around • Large Knobs for easy mechanism moment.				Catalogue/ Instructional manual/ Wall Chart	No	3
52.	Four Bar Chain Mechanism	• Approx Weight 2 Kgs, Connecting Pins: Brass, Finish Chrome • Model Board Dimension 400 x 300 mm • Mounted on weather proof 8 mm thick Ivory Bakelite Board. • 6" Long Steel Grips for easy carrying around • All linkages made of 3 mm thick SS-304 with Chrome coating • Connecting Pins made of Brass • Pen Holes on Linkages Angular and Linear Scale Labels				Catalogue/ Instructional manual/ Wall Chart	No	3
53.	Double Slider Mechanism	• Chrome Coating, • Material Mild Steel • Model Board Dimension 400 x 300 mm				Catalogue/ Instructional manual/ Wall Chart	No	3
54.	Universal Vibration Apparatus	• Apparatus should be suitable to perform the following experiments: • To verify the relation of simple pendulum and compound pendulum & to determine the radius of gyration. • To study radius of gyration of bi-filar suspension. • To study the undamped free vibration of spring mass system. • To study the longitudinal vibration of helical coiled spring. • To study the forced vibration of simply supported beam for different damping. • Undamped torsional vibrations of single rotor system and double rotor system. • To study the damped torsional vibration of single rotor system and to determine the damping co-efficient. • Verification of Dunker ley's Rule. • To study the forced damped vibration of spring mass system **Technical Details:** • Exciter Unit: With FHP DC Motor with Speed Control Facility • RPM measurement: Digital RPM Indicator with Proximity sensor. • Ordinary Chart recorder: For recording Frequency and Amplitude of Vibration. • Stopwatch: Electronic type • The whole set-up should be well designed and arranged on a rigid structure painted with industrial Paint.				Catalogue/ Instructional manual/ Wall Chart	Yes	3

Lot 2: CAD/CAM LAB, Automation & Robotics Lab								
Item No.	**Name of Goods or Related Services**	**Technical Specifications of Item and/or Bureau of Indian Standards (BIS) (if applicable) reference**	**Features**	**Accessories**	**Spare Parts**	**Documents**	**Installation and Training**	**Warranty of Equipments / Parts**
Lab Name: CAD CAM Lab								
1.	CNC Milling Trainer Machine:	• CNC MILLING TRAINER MACHINE: • X – Axis Travel 250 mm • Y – Axis Travel 175 mm • Z – Axis Travel 200 mm • Table Size 500 x 200 mm • Spindle Nose to Table Top 40 – 190 mm • Spindle to Column 110 mm • Spindle Inside Taper BT 30 / BT 40 • Maximum Tool Size Diameter 12 mm, Length 70 mm • Spindle Motor 2 H.P DC Motor with 3000 RPM • Resolution 0.005 mm • Repeatability ± 0.01 mm • Automatic Lubrication Points Provided • Interpolation Linear, Circular • Programmable Feed Rate 0- 800 mm/Min.(X,Y,Z) • Rapid Feed Rate 0- 1200 mm/Min.(X,Y,Z) • Control System PC Based System • Automatic Tool Changer 12 Station (Pneumatic) (Geneva Mechanism) • Lubrication Centralized (Programmable) • Axis Motor Stepper Motor • Mains Supply 230 V AC, 1 Phase For Machine and 3 Phase 415 V AC for ATC • Machine Dimensions Approx. 1200 x 1200 x 1800 mm • Total Weight Approx. 1200 Kg • 12 Station Programmable ATC • Industrial Motion Controller. • Manual Pulse Generator (MPG) • Innovative live View on Screen				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

2.	Vertical Machining Centre Machine:	• CNC MILLING MACHINE • Traverse Linear Axes Min 400 mm in X-Axis,M in 300 mm in Y-Axis, Min 250 mm in Z-Axis • Field of Application:The Machine will be used for Training and Production purpose **Technical data** • Work area dimensions: (approximately) • Linear Traverses: • Min. 400 mm in X-Axis,Min. 300 mm in Y-Axis,Min. 250 mm in Z-Axis • Machine Table: Table: Min 900 x 300 mm • Spindle nose to Table: Min 100 mm - Max 350 mm • Table Load Capacity: Min 225 kg • Machine Spindle & Head Stock • Spindle speed: Min 6,000 rpm with tool adapting support (tool adaptor / tool holder) with BT40 /ISO40 /SK40 taper • Balanced Spindle • Drive System: Belt Drive • Spindle Motor Power: Min 5.5 kW • Oil cooled and permanent spindle lubrication display function at CNC Control Monitor • For spindle – Jacket cooling preferred. • For Head – Jacket cooling preferred • Synchronized with bed temp preferred. • Digital controlled AC Spindle Motor drive • Spindle with hydraulic / pneumatic operated automatic tool changing and through spindle air blow for cleaning while tool change. • Counter balance/or other system to protect Tool Digging during PowerFailure • Coolant system: Tank cap min 150 lit, Adjustable external coolant nozzles, • Axis drives & control, • Digital controlled drive and motors for all axes, • LM Guide ways, • Closed pitch ball screws, • supported at both ends, pre-tensioned				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

		• Rapids X/Y/Z Axis: Min 7 m/min • Feed Rate X/Y/Z Axis: Min 7 m/min • CNC Control Unit features, • Siemens/ Fanuc/ Equivalent • OEM,Three axes simultaneous controllable, • Least increment 0.001mm with decimal input. • Spindle functions S, incl. Spindle Operation. • Feed functions f, G-code & M-code • Tool functions T, Tool length and cutter dia. compensation G-code • 3D cutter compensation • Tool Load Monitoring • Interpolations, • Tool Life Management, Standard A] positioning, B] Linear interpolation, C] Helical,D] Involute E] Polar coordinate F] Cylindrical I/O interface Ethernet, Wi Fi and USB Port • auto discrimination. • Standard cycles as per ISO std. • Control Memory Min. 1 GB • Display of alarm and message • Over travel control • Emergency stop on control panel, • CNC controller to take care of: • Stored pitch error compensation • Backlash compensation for cutting traverse • Backlash compensation for rapid traverse • Friction compensation control • Electronic Thermal Compensation • Feed forward control • Standard cycle (canned) • 15-inch Touchscreen LCD Color Monitor with soft keys. • Swiveling Panel with in-built keyboard, monitor & operating knobs. • Feed control potentiometer 10%. Increments from 0 – 150%. • Spindle speed control potentiometer 10%						

		Increments from 0 – 150%. • Emergency brake knob • Machine hour reading • Spindle load display (KW) • Self-diagnostic function • ACCURACY • Positioning: 0.010 mm • Repeatability: 0.006 mm • Run out: 0.003 mm run out at Spindle Nose • Accessories • Fully enclosed splash guard with slide windows. • Fully encapsulated housing with safety type window. • Automatic Tool Magazine for min. 10 tools with Tool Changer with safety guard. • Tool weight 5 kg • Tool dia. 80 mm • Tool Length 250 mm • Leveling pads • Door safety interlock • Air Gun • Software controlled central lubrication system • Coolant System • Suitable capacity Voltage Stabilizer • Suitable capacity Isolation Transformer • Suitable capacity Air Compressor & Air Dryer • Suitable capacity Panel Air conditioner for CNC cabinet • Work holding Kit: Machine Vise, Clamping Kit • Standard Set of Hand Tools (Allen keys, Screw drivers, Spanners) • First Fill of Coolant Concentrate (qty. as per machine requirement) • Standard Set of Tool Holders, Collets & Cutting Tools, Cutting Inserts • Documentation Each documentation Soft Copy in English (along with machine delivery) • Detailed layout plan and prospect to be given • Operating and Programming instruction						

		• Installation and Commissioning instructions • Quality Test records • Maintenance / repair charts • Preventive maintenance instructions • Lubrication chart & parameter list • Delivery: • Within 6 months from the date of Purchase Order • Installation & commissioning • The complete installation and commissioning must be carried out by the supplier at the destination. Certificate of acceptance is to be signed by customer and supplier. • Training must be provided at destination • Operator training 3 days • Programming training 3 days • Preventive Maintenance training (mechanical, electrical and electronic) 1 day • Service • The authorized Service Partner must be certified by manufacturer and shown in the quotation						
Lab Name: Automation and Robotics Lab								
3.	SCARA Robot	• Axis Count 4 • Arm Length (Arm1+Arm2) 400mm • Rated/Maximum payload 1kg/3kg • Maximum Speed X-Y 4710 mm/sec • Maximum Speed Z 1250 mm/sec • Maximum Speed R 1875 degree/sec • Range of motion J1 +/- 130 degree • Range of motion J2 +/- 146.6 degree • Range of motion Z 150 mm • Range of motion RZ +/- 360 degree • Standard time for a Cycle 0.42 sec • Accuracy of repetition X/Y +/-0.01 mm • Accuracy of repetition Z +/-0.01 mm • Accuracy of repetition R +/-0.01 degree • Motor Power J1 200W • Motor Power J2 200W • Motor Power Z 100W				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

		• Motor Power RZ 100W • Rated/max. pressing Strength(Z) 100/250 N • Max. allowable load Inertia (R) 0.091 / 0.075 kg-m2 • Cable connector for Customer installation 15 Pin D-Sub • Air pipe for customer Installation dia.4 mmX2, dia. 6 mmX1 • Body weight16 kg • Short Cycle time. • High Speed, High Performance, Outstanding joining, High rigidity. • High Repeatability. • Ease of Use. • Low Maintenance • High Operational Safety **Properties.** • Compact Design For Training Purpose. • Industrial Motion Controller. • Teach Pendant Facility. • Programmable Digital I/O. • Latest Technological Platform for Software. • Interactive Programming Software. Powerful 3D simulation, FMS & CIM Compatibility.						
4.	Six Axis Robotic Arm	• Number of Axes: 6 • Max. Working Range 900mm • Max. Payload 7 kg • Motion Range J1: +/- 170 degree • Motion Range J2: +135 / -105 degree • Motion Range J3: +65/ -205 degree • Motion Range J4: +/- 190 degree • Motion Range J5: +/- 120 degree • Motion Range J6: +/- 360 degree • Max. Speed J1: 370 degree/sec • Max. Speed J2: 260 degree/sec • Max. Speed J3: 410 degree/sec • Max. Speed J4: 550 degree/sec • Max. Speed J5: 550 degree/sec • Max. Speed J6: 820 degree/sec				Catalogue/ Instructional manual/ Wall Chart	Yes (Without any cost)	3

		• Max. Composite Speed: 10,600 mm/sec • Allowable Inertia J4 : 0.47 kg-m2 • Allowable Inertia J5 : 0.47 kg-m2 • Allowable Inertia J6 : 0.15 kg-m2 • Allowable moment J4 : 16.6 Nm • Allowable moment J5 : 16.6 Nm • Allowable moment J6 : 9.4 Nm • Repeatability : +/- 0.03 mm • Standard Cycle Time: 0.35 Sec • Installations: Table-top, Ceiling-mount, wall-mount • Build-in Design : With 1 12Pos. Circular connector for sensor connections and 2 Dia.6 pneumatic tubes(one for the embedded 3 sets of solenoid valves, one for extension) • IP Rating: IP40 • Ambient Temperature : 0 – 40 degree • Humidity 20-85 % RH • Vibration 0.5 G • Weight 39 kg • Robot Controller DCV Series • Compact Design For Training Purpose. • Industrial Motion Controller. • Teach Pendant Facility. • Programmable Digital I/O. • Latest Technological Platform for Software. • Interactive Programming Software. Powerful 3D simulation, FMS & CIM Compatibility.						

4. Drawings

Not Applicable