

PERCENTAGE PRICE SCHEDULE					
NUMBER #	TEXT #	NUMBER #	TEXT #	NUMBER	NUMBER #
Sl. No.	Item Description	Quantity	Units	Estimated Rate in Rs. P	TOTAL AMOUNT WithTaxes in Rs. P
1	2	3	4	5	6
1.0	<p>Design, Supply, Installation, Testing and commissioning of ETC (Evacuated Tube Collector) type solar water heating system complete with Borosilicate glass 3.3 glass material ETC tubes tripple layer aluminum nitrite coating material collector with SS 316 manifold , the manifold inner material Thickness 0.6 mm Outer material Thickness 0.45 mm and Powder coated steel for outer manifold with suitable flow rate and capacity of insulated pre heater storage solar tank in SS316 construction with minimum 2 mm thick shell and cone and outer, Outer cladding /cove is aluminum , thickness of cone and shell minimum 20 SWG,. The tank shall be insulated with minimum 100 mm thickness and density of 48kg/cum having approx. K value of 0.03W/mk and R Value 3.34 Sqm.deg.C/W to withstand a temp. of 250deg.c and then protected from the external surface with suitable aluminum cladding. All sockets and internal fittings of the tanks should be of stainless steel. Thin polythene sheet shall be used as covering between the glass wool and the cladding sheet besides the retaining material such as chicken mesh etc. Aluminum sheet of thickness 24 SWG shall be used for cladding the tank insulation. The storage tank shall be properly installed at site using Epoxy Paint coated appropriate size angle iron stands, girder, cement concrete pedestals of 1:2:3 ratio or any other specific provision suitable to site.To ensure the stability against heavy storm etc. but not less than 1'x1'.x6" dimensions. External of the tank should be properly insulated so that hot water temperature does not decrease by more than 5 deg.C in about 16 hrs. The tank shall be provided with electrical backup of 2 x 2.0 KW heating elements as per the specifications based. Required electrical panel cost including cabling work for the entire system shall be included in the system cost. The piping connecting between the panels and tanks shall be included in the cost including all the Taps, Valves, NRV, Air Release Valves, Expansion tanks, Drain tanks, Circulation Pumps for glycol for larger systems above 600 LPD, Temperature Gauges, Thermostat for Heater Cutoff, Strainers, safety valves for hot water storage tanks, etc. as per the standard design. All the pipes to be used shall be CPVC schedule 80 as per IS 15778 insulated with 25mm thick insulation of 48kg/cu.m. density and K value+0.03W/MK R value+1.67 sq.m. C/W to withstand and temp. of 250 deg. C. Thin plastic sheet shall be used as covering between glass wool and aluminum cladding besides other retaining material like chicken mesh etc.26 SWG thick aluminum sheet shall be used for cladding the insulated pipe.The pipe shall be properly supported using Epoxy painted MS Stands or CC pedestal. The panels and tanks shall be connected in series and parallel to achieve the required size . 300 LPD SYSTEM.</p> <p>The piping job will be included for approximately distance upto 10 meter (Maximum distance) between Heat pump and Hot water tank including internal piping and valves.</p> <p>This is including of Defect Liblity Period (DLP) with onsite support during 1st year after completion certification by the Nalanda University : DLP for 01 year with AMC and onsite support including all consumables/materials and repair and replacement of defective items, required to run the system, routine and preventative maintenance to be included in the quoted cost.</p>	45	Set	123760.98	55,69,244.19
2.0	<p>Design, Supply, install, testing and commissioning of Packaged type AIR TO WATER HEAT PUMP as per the following sizes and arrangements including all the required valves and appurtenances required for the working of the heat pump effectively. The Unit shall be completely factory assembled. The system shall capable of connecting to a storage Tank (Supply and arranged by Client through another contractor) to which the hot water generated shall be stored. These units shall be completely factory assembled including the Rotary / Scroll Compressor(s), Cooler, Condenser, evaporator, internal refrigerant pump, thermostat for autocut and Microprocessor Control Panel etc. with R410A / 134A (Environment Friendly) Refrigerant. The heat pump shall have the minimum hot water flow per hour as per the size specified below in normal heat pump mode without any additional heating element.</p> <p>The heat pump shall be capable of generating hot water in the ambient temperature of 0 Degrees Celsius. The Control panel shall be capable of setting the temperature of the outlet water and shall also be able to control the hot water recirculation pump between the external storage and the heat pump. The Heat Pump should be capable of operating at 53°C inlet and 55°C outlet hot water (condenser circuit) temperatures when evaporator outlet temperature is at 7 degree C inlet 12 degree C .</p> <p>The required panels and other equipment's along with the heat pump shall be supplied by the heat pump manufacturer including the required thermostats, temperature probes, temperature and pressure relief valve for the heat pump as well as the external storage units. all the control valves and check valves as required at the inlet and out let of the heat pump, Inlets and outlet of the hot water storage tanks, required control valves and check valves for the recirculation pump, and other required pressure gauges, balancing valves, thermometers etc. complete as required to the satisfaction of Engineering in Charge.</p> <p>All the pipes to connect between Heat pump and Hot water storage tank shall be CPVC schedule 80 as per IS 15778 insulated with 25mm thick insulation of 48kg/cu.m. density and K value+0.03W/MK R value+1.67 sq.m. C/W to withstand and temp. of 250 deg. C. Thin plastic sheet shall be used as covering between glass wool and aluminum cladding besides other retaining material like chicken mesh etc.26 SWG thick aluminum sheet shall be used for cladding the insulated pipe.The pipe shall be properly supported using Epoxy painted MS Stands or CC pedestal. The piping job will be included for approximately distance upto 10 meter (Maximum distance) between Heat pump and Hot water tank including internal piping and valves. This is including of DLP with onsite support during 1st year after completion certification by the Nalanda University . DLP for 01 year with AMC and onsite support including all consumables/materials and repair and replacement of defective items, required to run the system, routine and preventative maintenance to be included in the quoted cost. • Contractor ensure the system shall have the control wiring in control/ starter panel - that Heat pump running will start only after start of circulation pump i.e. stage control operation of accessories.</p> <p>• The system shall have timer-based operation and/or temperature-controlled operation of circulation pumps. The design of the interlockings and operations shall be submitted with all aforementioned option for approval by the University. The system shall have the manual operation facility to handle operations in situation of any exigency towards timer and/or thermostat etc. as per the approval of the University.</p> <p>Refrigerant : R410A / R134A Type of Compressors: Scroll / Rotary Hot water outlet temperature : 55 °C Approx. Heating Capacity - Heat Pump Mode: 7.0 KW (From 25 degC to 55 deg C at 25 deg C air ambient temp.) Heat Pump Operation Ambient Temperature Range - 0 to 48 °C</p>	8	Set	192874.97	15,42,999.79
3.0	<p>Design,Supplying, installing, testing and commissioning of Packaged type AIR TO WATER HEAT PUMP as per the following sizes and arrangements including all the required valves and appurtenances required for the working of the heat pump effectively. The Unit shall be completely factory assembled. The system shall capable of connecting to a storage Tank (Supply by Client) to which the hot water generated shall be stored. These units shall be completely factory assembled including the Rotary / Scroll Compressor(s), Cooler, Condenser, evaporator, internal refrigerant pump, thermostat for autocut and Microprocessor Control Panel etc. with R410A / 134A (Environment Friendly) Refrigerant. The heat pump shall have the minimum hot water flow per hour as per the size specified below in normal heat pump mode without any additional heating element.</p> <p>The heat pump shall be capable of generating hot water in the ambient temperature of 5 Degrees Celsius to the required capacity. The Control panel shall be capable of setting the temperature of the outlet water and shall also be able to control the hot water recirculation pump between the external storage and the heat pump. The Heat Pump should be capable of operating at 53°C inlet and 55°C outlet hot water (condenser circuit) temperatures when evaporator outlet temperature is at 7 degree C inlet 12 degree C .</p> <p>The required panels and other equipment's along with the heat pump shall be supplied by the heat pump manufacturer including the required thermostats, temperature probes, temperature and pressure relief valve for the heat pump as well as the external storage units. all the control valves and check valves as required at the inlet and out let of the heat pump, Inlets and outlet of the hot water storage tanks, required control valves and check valves for the recirculation pump, and other required pressure gauges, balancing valves, thermometers etc. complete as required to the satisfaction of Engineering in Charge.</p> <p>All the pipes to connect between Heat pump and Hot water storage tank shall be CPVC schedule 80 as per IS 15778 insulated with 25mm thick insulation of 48kg/cu.m. density and K value+0.03W/MK R value+1.67 sq.m. C/W to withstand and temp. of 250 deg. C. Thin plastic sheet shall be used as covering between glass wool and aluminum cladding besides other retaining material like chicken mesh etc.26 SWG thick aluminum sheet shall be used for cladding the insulated pipe.The pipe shall be properly supported using Epoxy painted MS Stands or CC pedestal. The piping job will be included for approximately distance upto 10 meter (Maximum distance) between Heat pump and Hot water tank including internal piping and valves. This is including of DLP with onsite support during 1st year after completion certification by the Nalanda University . DLP for 01 year with AMC and onsite support including all consumables/materials and repair and replacement of defective items, required to run the system, routine and preventative maintenance to be included in the quoted cost. • Contractor ensure the system shall have the control wiring in control/ starter panel - that Heat pump running will start only after start of circulation pump i.e. stage control operation of accessories.</p> <p>• The system shall have timer-based operation and/or temperature-controlled operation of circulation pumps. The design of the interlockings and operations shall be submitted with all aforementioned option for approval by the University. The system shall have the manual operation facility to handle operations in situation of any exigency towards timer and/or thermostat etc. as per the approval of the University.</p> <p>Refrigerant : R410A / R134A Type of Compressors: Scroll / Rotary Hot water outlet temperature : 55 °C Approx. Heating Capacity - Heat Pump Mode: 10.0 KW Heat Pump Operation Ambient Temperature Range - 0 to 48 °C</p>	45	Set	3,03,089.24	1,36,39,015.96
4.0	<p>Design, Supplying, installing, testing and commissioning of Packaged type AIR TO WATER HEAT PUMP as per the following sizes and arrangements including all the required valves and appurtenances required for the working of the heat pump effectively. The Unit shall be completely factory assembled. The system shall capable of connecting to a storage Tank (Supply by Client) to which the hot water generated shall be stored. These units shall be completely factory assembled including the Rotary / Scroll Compressor(s), Cooler, Condenser, evaporator, internal refrigerant pump, thermostat for autocut and Microprocessor Control Panel etc. with R410A / 134A (Environment Friendly) Refrigerant. The heat pump shall have the minimum hot water flow per hour as per the size specified below in normal heat pump mode without any additional heating element.</p> <p>The heat pump shall be capable of generating hot water in the ambient temperature of 5 Degrees Celsius to the required capacity. The Control panel shall be capable of setting the temperature of the outlet water and shall also be able to control the hot water recirculation pump between the external storage and the heat pump. The Heat Pump should be capable of operating at 53°C inlet and 55°C outlet hot water (condenser circuit) temperatures when evaporator outlet temperature is at 7 degree C inlet 12 degree C .</p> <p>The required panels and other equipment's along with the heat pump shall be supplied by the heat pump manufacturer including the required thermostats, temperature probes, temperature and pressure relief valve for the heat pump as well as the external storage units. all the control valves and check valves as required at the inlet and out let of the heat pump, Inlets and outlet of the hot water storage tanks, required control valves and check valves for the recirculation pump, and other required pressure gauges, balancing valves, thermometers etc. complete as required to the satisfaction of Engineering in Charge.</p> <p>All the pipes to connect between Heat pump and Hot water storage tank shall be CPVC schedule 80 as per IS 15778 insulated with 25mm thick insulation of 48kg/cu.m. density and K value+0.03W/MK R value+1.67 sq.m. C/W to withstand and temp. of 250 deg. C. Thin plastic sheet shall be used as covering between glass wool and aluminum cladding besides other retaining material like chicken mesh etc.26 SWG thick aluminum sheet shall be used for cladding the insulated pipe.The pipe shall be properly supported using Epoxy painted MS Stands or CC pedestal. The piping job will be included for approximately distance upto 10 meter (Maximum distance) between Heat pump and Hot water tank including internal piping and valves. This is including of DLP with onsite support during 1st year after completion certification by the Nalanda University . DLP for 01 year with AMC and onsite support including all consumables/materials and repair and replacement of defective items, required to run the system, routine and preventative maintenance to be included in the quoted cost. The Contractor ensure the system shall have the control wiring in control/ starter panel - that Heat pump running will start only after start of circulation pump i.e. stage control operation of accessories.</p> <p>• The system shall have timer-based operation and/or temperature-controlled operation of circulation pumps. The design of the interlockings and operations shall be submitted with all aforementioned option for approval by the University. The system shall have the manual operation facility to handle operations in situation of any exigency towards timer and/or thermostat etc. as per the approval of the University.</p> <p>Refrigerant : R410A / R134A Type of Compressors: Scroll / Rotary Hot water outlet temperature : 55 °C Approx. Heating Capacity - Heat Pump Mode: 17.0 KW (From 25 degC to 55 deg C at 25 deg C air ambient temp.) Heat Pump Operation Ambient Temperature Range - 0 to 48 °C</p>	5	Set	4,61,522.26	23,07,611.29

5.0	Design,Supply, Installation, Testing and Commissioning of Hot water recirculation pump with temperature sensor based operation with inbuilt thermostat, suitable for handling of hot water up to 100 degree centigrade installed between the hot water storage and heat pump so that the recirculation happens in the hot water supply line when the water temperature in the line drops by 5 degrees Celsius from the designed hot water temperature. The Pump shall have stainless steel Body, shaft and impellor and shall be external grade that can be installed in open condition in terrace. The Pump shall be installed at terrace level. The rate shall be inclusive of Non return valve, Gate valve, Temperature gauge, and all the required CPVC piping work to connect the pump to the storage tank and the heat pump. The rate shall also be inclusive of all the cables and starters required for the operation of the pump and all the tools, tackles and accessories, required to complete the SITC work to the satisfaction of the Engineer In Charge. • Contractor ensure the system shall have the control wiring in control/ starter panel - that Heat pump running will start only after start of circulation pump i.e. stage control operation of accessories. The piping job will be included for approximately distance upto 10 meter (Maximum distance) between Heat pump and Hot water tank including internal piping and valves. This is including of DLP with onsite support during 1st year after completion certification by the Nalanda University . DLP for 01 year with AMC and onsite support including all consumables/materials and repair and replacement of defective items, required to run the system, routine and preventative maintenance to be included in the quoted cost. • The system shall have timer-based operation and/or temperature-controlled operation of circulation pumps. The design of the interlockings and operations shall be submitted with all aforementioned option for approval by the University. The system shall have the manual operation facility to handle operations in situation of any exigency towards timer and/or thermostat etc. as per the approval of the University. Flow = 6 Cum per Hour Head = 15 meter	58	Set	48,218.74	27,96,687.11
6.0	Design,Supply, Installation, Testing and Commissioning of Hot water recirculation pump with timer based operation as required, suitable for handling of hot water up to 100 degree centigrade installed in the hot water return line so that the recirculation happens as per the set timer. The Pump shall have stainless steel Body, shaft and impellor and shall be external grade that can be installed in open condition in terrace. The Pump shall be installed inline with the hot water recirculation line and shall be installed at terrace level. The rate shall be inclusive of Non return valve, Gate valve, Temperature gauge, and all the required CPVC piping work to connect the pump to the existing return line. The rate shall also be inclusive of all the cables and starters required for the operation of the pump and all the tools, tackles and accessories, required to complete the SITC work to the satisfaction of the Engineer In Charge. The piping job will be included for approximately distance upto 10 meter (Maximum distance) between Heat pump and Hot water tank including internal piping and valves. This is including of DLP with onsite support during 1st year after completion certification by the Nalanda University . DLP for 01 year with AMC and onsite support including all consumables/materials and repair and replacement of defective items, required to run the system, routine and preventative maintenance to be included in the quoted cost. Flow = 6 Cum per Hour Head = 15 meter	103	Set	48,218.74	49,66,530.56
7.0	The rate contract in case of requirement will be beyound the 10 meter of pipe length battery limit for Providing and fixing Chlorinated Polyvinyl Chloride (CPVC) pipes SDR 11 / CPVC schedule 80 Pipes to connect between Heat pump and Hot water storage tank shall be CPVC schedule 80 as per IS 15778 insulated with 25mm thick insulation of 48kg/cu.m. density and K value+0.03W/MK R value+1.67 sq.m. C/W to withstand and temp. of 250 deg. C. Thin plastic sheet shall be used as covering between glass wool and aluminum cladding besides other retaining material like chicken mesh etc.26 SWG thick aluminum sheet shall be used for cladding the insulated pipe.The pipe shall be properly supported using Epoxy painted MS Stands or CC pedestal. 40 mm Dia.	0.5	Meter	648.60	324.30
8.0	50 mm Dia.	1	Meter	903.50	903.50
9.0	65 mm Dia.	1	Meter	1,552.30	1,552.30
10.0	80 mm Dia.	1	Meter	1,965.85	1,965.85
11.0	CAMC: 2nd year after completion certification by the owner and/OR his representative : Comprehensive maintenance for the installed systems including routine maintenance, preventive maintenance, breakdown maintenance, repair and replacement of defective or damaged or worn-out items for the specified years after the DLP period of 01 year as per completion certified by Nalanda University.	1	Job	7,70,662.76	7,70,662.76
12.0	CAMC: 3rd year after completion certification by the owner and/OR his representative : Comprehensive maintenance for the installed systems including routine maintenance, preventive maintenance, breakdown maintenance, repair and replacement of defective or damaged or worn-out items for the specified years after the DLP period.	1	Job	7,70,662.76	7,70,662.76
TOTAL AMOUNT					3,23,68,160.37
Name of the Contractor					
Address					
Estimated cost			Percentage rate below or above or at par the estimated cost	% in Figures	Total Cost
32368160.37					-
Grand Total		32368160.37			-
					-100.00