Kerala State Homoeopathic Co-Operative Pharmacy Ltd.
(sponsored by government of Kerala & aided by govt. of India)
Office: Pathirappally, Alappuzha, Kerala, India - 688 521

Phone : 477 2258012
:477 2258665
Fax : 0477 2258012

Website : www.homcokerala.com | Email : homcokerala@gmail.com

Supplier's Copy

USER REQUIREMENT SPECIFICATION

Name of the Company	**:**	
Contact Person	**:**	
Address	**:**	
Contact Details	**:**	
Department	**:**	*Utility – Ground Floor*
Equipment and Code No.	**:**	1) *IBR -Steam Boiler - Dual Fuel, Gas fired* 2) *Steam pipe line with insulation, water &oil tanks, Chimney and other items with supply & Installation at site*
Name of work	**:**	Supply, Installation, Commissioning & Validation of IBR steam boiler of capacity 750 kgs/hr, with all mountings, accessories, control, and supply and installation of Steam pipe line with insulation and all accessories, water tanks, chimney etc., at M/s. HOMCO –Kerala at ground floor as per the proposed location layout.
Ref. No.	**:**	
Date	**:**	
Enclosures	**:**	
Qty.	**:**	***2 Nos.***

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STEAM BOILER (IBR)

GAS FIRED, capacity : 750 KGS/HR AT 10.54 KGS/CM2

ANNEXURE- I : BASIC DETAILS OF THE MACHINE

DESCRIPTION (To be specified by the supplier, if any variation)		
Scope	:	Supply, Installation, Commissioning & Validation of compact & packaged design IBR Seam boiler, Gas fired (Dual burner) along with all mountings, accessories, controls, Steam pipe line with insulation and required accessories water & oil day tanks, pumps and internal connection between two boiler, pipe and valve along with boiler insulation, chimney and chimney connection from both boiler to chimney, cables from boiler panel to boiler and its control etc., required to run the both boiler at M/s. HOMCO –Kerala
Model	:	*
Type	:	• Horizontal • Shell type fully packaged • 3-Pass smoke tube design, automatically controlled *
Design code	:	IBR 1950 with latest amendments *
Max. Steam Output (F&A 100°C)	:	750 kg/hr. *
Steam pressure	:	10.54 kg/cm2 *

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DESCRIPTION (To be specified by the supplier, if any variation)		
Thermal efficiency (on NCV)	:	• Minimum 89% @ full load of 750 kg/hr * • Minimum 88% @ 50% load of 375 kg/hr*
Thermal efficiency basis		As per BS 845 Part 1 Indirect method and the efficiency tolerances shall be +/-2%.*
NCV of fuel (natural Gas NG) NCV of fuel (HSD) (Net Calorific Value NCV)	:	• 8500 kcal/m^3* • 10200 kcal/kg
Maximum Steam Temperature	:	185°C *
Output Steam Condition	:	Dry And Saturated
Steam Dryness Fraction	:	0.98 (Commercial Dry) *
MOC **(Material of Construction)**		
Shell	:	Carbon Steel SA515/516 Gr.60/70 or equivalent *
Tubes	:	Carbon Steel ERW – BS 3059 PART I, ST 320 *
Front door	:	Ceramic fiber blanket with SS sheet
Rear Door	:	Hysil blocks with kynex HG/Insulyte 7
Furnace ring /Burner ring	:	Hysil block with insulyte 7
Insulation and cladding	:	Boiler should be completely insulated in factory with LRB mattresses and cladding with 24 SWG aluminum stucco sheet
The equipment should be smooth finished without any sharp edges and crevices		

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ANNEXURE – II & III	**:**	**DESIGN & PROCESS CONTROL FEATURES** **For Boilers**

DESCRIPTION (To be specified by the supplier, if any variation)		
Design requirement		• The fire tubes in the tubes nest should be plain without any restriction inside, and it should be easily accessible from inside as well as outside for inspection and maintenance. It should be tightly expanded in the tube plate and seal welded. All tubes should be as per IBR BS 3059 ERW & strength-welded to tube plates. *
		• All working parts of the boiler should be accessible for ease of inspection and maintenance. On the shell, one elliptical man door and on tube plate one mud hole must be provided. Access to the combustion chamber should be through bolted refractory lined access door whereas tube nest should be exposed through hinged mounted front door. *
		• The insulated cylindrical shell of the boiler should be skid mounted with insulation and cladded. A movable ladder shall also be provided which can be moved as per convenience. site insulation and cladding will not be allowed. *
		• Boiler and accessories shall be mounted on a single base frame. Individual systems such as feed water pump etc. may be on separate base plates welded to the boiler base frame. * • The boiler shall not require any special foundation. It should be able to be mounted on simple PCC foundation*

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DESCRIPTION (To be specified by the supplier, if any variation)		
Fuel Oil System		• Should be suitable for handling the fuel specified. Burner shall be mono-bloc type. Oil pump and FD fan is driven by the same motor. *
Combustion System		• Should consists of a forced draft combustion air blower with motor, mechanical atomizer burner assembly, photocell operated safety device, ignition electrodes, transformers, etc. Burner assembly should be bolted on combustion chamber and that the burner should lit only when the entire burner assembly must be fitted and will be in a closed position, ready for operation. Pressure jet atomization should be provided. The burner should be capable of firing oil of viscosity upto 3500 Red. Sec. at 100 deg. F. Spring loaded explosion door & fusible plug provided for ultimate safety. The entire assembly should be engineered in such a way that burner should moves along with the door when the door is opened for tube cleaning. Burner must be with turn down ratio 1:2 minimum*

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DESCRIPTION (To be specified by the supplier, if any variation)		
Burner Sequence Control	:	On Switching, a burner should not result immediately in a flame. The burner should start in a sequence which can be described as under: Initial Reference Position (closed damper position) * 1. Pre purge (full damper position) 2. Secondary flame check 3. Ignition 4. Solenoid valve open for Ignition load 5. Flame safety check 6. Burner firing increased to Partial load 7. Burner Modulation between Partial load and full load 8. Burner off on flame failure/load limit 9. Burner post-purge All the above sequence should be controlled by **ICM** (Intelligent Combustion Manager) It should be with in built programme for : • Load controller* • Gas valve proving (In case of Dual oil/Gas firing) *
Gas Operation	:	The Air to Fuel Ratio should impacted by changes in the air density (volume). The air density impacted with respect to ambient temperature and altitude should be auto-corrected through the changes in air pressure (which is impacted by density and altitude variation). The change in Air Pressure should be translated to the Gas Ratio Controller through via a pneumatic arm. Ratio Control should be the 3rd Generation Technology for modulation and it must has advantages of linear control over non-linear in case of damper. *

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DESCRIPTION (To be specified by the supplier, if any variation)		
Feed water system	:	• 2 nos. electrically driven vertical centrifugal multistage pumps should be mounted on the boiler frame itself with motor capable of using feed water at temperature of 120 deg C with all SS internals, interconnected pipework between pumps and feed check valves. Feed water day tank should be placed at an elevation of 3.5 m approx. from finished floor level. *
Blow down system	:	• TDS based Automatic Blowdown Control System with pneumatically actuated valve for efficient control of TDS level within the boiler shell should be included and installed in parallel to the manual blowdown valve. * (2 nos.)

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ANNEXURE - IV	**:**	**OPERATIONAL & CONTROL FEATURES** **For Boilers**

DESCRIPTION (To be specified by the supplier, if any variation)		
Controls	**:**	The electro-mechanical control system should be provided. The relay-based control panel should be mounted on the boiler. This panel should be IP protection of IP 54. * (i) Interlocking of the feed water pumps and water level in the boiler (ii) Audio–visual alarm for danger level of water in the boiler and also for flame failure. (iii) Programmer controller to ensure sequence of boiler start-up after ensuring required temperature and pressure of oil, air etc. (iv) MCB's and contactors should be provided for all electrical drives for the boiler (v) Pilot lamp to indicate operating status of the various equipment. (vi) Complete internal wiring to ensure power supply at a single point on the panel. (vii) Indicating lamps/ Audio alarm should be provided for the following parameters - - Low water level in the boiler - Burner flame failure - Feed water pumps failure - Damper closed position (viii) Pressure switch should be provided for burner interlock. *
Accessories	**:**	FD fan with drive motor *
		Multistage feed pumps with motors (1 working +1 standby) *
		Oil firing equipment*
		Oil pump with drive motor*

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DESCRIPTION (To be specified by the supplier, if any variation)		
Mountings & Fittings		Main steam stop valve*
		Safety valve *
		Feed check valve *
		Auxiliary valve *
		Blowdown valve with Automatic Blowdown Control System *
	:	Isolating valve for water level controllers *
	:	Isolating valve for pressure switches and pressure gauge*
	:	Drain valve for water level controller *
	:	Sight glass assembly*
Gas train and accessories		Gas inlet ball valve*
		Gas pressure switch*
		Gas filter*
		Safety valve (Shut off valve) *
		Gas main & pilot burner pressure regulator*
		Pressure gauges with isolation valve *
		Gas outlet to main & pilot burner pipe ball valve*

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DESCRIPTION (To be specified by the supplier, if any variation)		
Instrumentation	:	
Water level controllers	:	2 No, for feed pump operation and low water level alarm*
Over-ride controller	:	1 no, for lockout under extra low water level alarm*
Steam pressure gauge with cock	:	1 no, for display of boiler steam pressure*
Water level gauge assembly	:	2 no, for display of water level in the boiler*
Switch gears, relays, connectors	:	1 set, for individual controls of equipment through control panel*
Audio / visual alarm	:	1 set, In case of unsafe operation for lockout under extreme conditions*
Pressure & temp gauge with thermostat	:	1 set, for burner operation*
Control panel	:	1 no. for housing above instruments and switchgears*
Steam to fuel ratio and Online Boiler Efficiency monitoring system	:	1 no, To monitor and display the boiler efficiency on-line, using necessary Steam & Gas Flow Meter, instrumentation and hardware. Steam Flow & Gas Flow Meters should be common for since Boilers are 1 working and 1 standby*
Guarantees	:	The boiler supplier should guarantee the following: • The boiler should be guaranteed for trouble free operation for a period of 12 months form the date of handing over. * • Performance guarantee runs should be conducted as per BS 845 part I – 1987 indirect test method – after one month of continuous trouble-free operation. * • Any defect due to faulty material / bad workmanship should be rectified free of cost to the entire satisfaction of the purchaser. *

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DESCRIPTION (To be specified by the supplier, if any variation)
Feed Water qualification required to feed water to boiler **(As per IS 10392-1982 Standard) ***
Hardness <5 ppm * ➢ Dissolved O_2 0.1 ppm (Max.) * ➢ pH value 8.5 to 9.5* ➢ Free Co_2 Nil* ➢ Bound Co_2 < 5ppm* ➢ TDS 400 ppm (max) * **Pressure:** 0.3 to 0.5 kg/cm^2(g) * Feed water temperature at the inlet of feed water service tank: 30 to 50°C*
Fuel oil at the inlet flange of gas train: Quality: ➢ LPG conforming to IS 4576 standards * ➢ LPG net calorific value (NCV) = 10900 kcal/kg*
Pressure at inlet flange of gas train For LPG/ NG ➢ Min.: 1kg/cm^2(g) * ➢ Max.: 5kg/cm^2(g) *

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ANNEXURE – II & III (A) : DESIGN & CONTROL FEATURES & BOQ For STEAM PIPE LINE & ACCESSORIES

DESCRIPTION

(To be specified by the supplier, if any variation)

FEED WATER, OIL (HSD) and GAS (NG) Supply

Description	Qty.	Unit
Supply, installation, testing & commissioning of following with all required items at site.		
FEED WATER DAY STORAGE TANK		
Capacity: 1500 liters. Should be made from 8mm thick MS plate : Approximate Dimension (L X B X H):-1100 mm x 1100 mm x 1200 mm along with all necessary support, structure etc. required to installation at site with inlet ,outlet water connections nozzels,valves , insulation with cladding and following accessories. Insulation shall be paid in insulation BOQ item.	1	No
Level Indicator + 3- Level Switch with Control panel at feed water Tank, Operating pressure & Temperature should be, Atm & 99 deg C, End connection size and rating = 25 NB ANSI 150# along with 2 no's of Piston type isolation valve, The system should have color flips and magnetic float arrangement to indicate the level in the tank. Approximate Length: 750 mm long	1	No.
On-Off Piston Actuated valve with Solenoid valve, Angle type, SS 316L, Actuation type = Bi -Directional 90 mm Actuator, Body= AISI 316 L, Bonnet= AISI 316L, Plug=AISI 316 L, Ends; Screwed BSPT. Proposed Size: 40 NB	1	No.
OIL (High Speed Diesel - HSD) DAY STORAGE TANK		
Oil day storage tank (MOC : MS) Capacity 990 L using 8 mm MS plate for the maximum volume of 990 liters and in the following approximate dimension :- (L X W X H) :- (1 mX1 mX0.9m)Tank should be fabricated in such a way that the maximum volume is only 990 liters, along with all necessary nozzles, valve , accessories & supporting structural to install at site.	1	No.

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DESCRIPTION

(To be specified by the supplier, if any variation)

Description	Qty.	Unit
Natural Gas (NG) Required pipe , valve , nozzles and connection till boiler from the point of supply along with all support and accessories required at site (From meter to boiler)	1	Set
Gas Train , as per requirement of both boiler to supply NG to boiler burner , along with all support and accessories	2	Set
Valves for Boiler Make up Water /Boiler Feed Water Lines / Diesel Lines.		
CS Ball Valves :-800# ,Full Bore , Flanged ANSI 150 #		
15 NB	8	Nos.
25 NB	1	No.
40 NB	6	Nos.
50 NB	3	Nos.
Non Return Valve:- CS Check Valve -800# -Forged Body A105 -SW Ends		
25 NB	2	Nos.
Strainer:- CI -Y Type 80 Mesh, Flanged ANSI 150 #		
40NB	4	Nos.
Supply installation testing & commissioning of Bucket type Duplex filter 120 mesh		
25 NB	2	Nos.
Supply installation testing & commissioning Chemical Dosing Tank: - HDPE dosing tank of 500 Liter capacity.	1	No.
Chemical Dosing pump:- MOTORIZED Chemical Dosing Pump of required flow rate as per design parameters	1	No.
Supply installation testing & commissioning Oil Header: - Supply fabrication painting, testing and commissioning of 200 NB Oil Header using Astm A 106 - Sch 40 pipes. Approximate length shall be 1 meter per header.	2	Nos.
Water softner plant with chemical dosing for boiler feed water with all accessories - (To be arranged by the client)	-	-

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DESCRIPTION

(To be specified by the supplier, if any variation)

Description	Qty.	Unit
STAEM DISTRIBUTION PIPES & FITTINGS (FOR IBR & NON-IBR LINE):		
Supply, installation, testing & commissioning of following items for steam supply with all required items at site.		
PIPE :		
CS pipes ASTM A 106 Grade- B, Schedule 40 with same specification elbows, flanges including gaskets, nuts bolts and washers, all pipe fittings, painting etc. complete as required for the satisfactory functioning. All items should be conforming to IBR norms. Pipe Sizes for header, sub header and Branch for the following dimensions.		
15 NB	48	mtr
20 NB	126	mtr
25 NB	138	mtr
40 NB	354	mtr
50 NB	150	mtr
80 NB	24	mtr
100 NB	12	mtr
Piston Valves		
Design code;API 602, BS EN ISO 15761 (BS 5352), class 800# , Body material of ASTM A 105, piston: ASTM A 276 TP 304, Sealing ring ; SS reinforced graphite, Leakage class ; Class VI- soft seat, SW Ends as per approved makes only., of following sizes :		
15 NB	8	Nos.
Design code; API 602, BS EN ISO 15761 (BS 5352), class 150# , Body material of ASTM A 216 Gr.WCB, Piston; ASTM A 351 CF8, Sealing ring ; SS reinforced graphite, Leakage class ; Class VI- soft seat, Flanged to ANSI B-16.5 ASA 150# as per approved makes only, for following sizes:		
40 NB	3	Nos.
50 NB	1	Nos.

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DESCRIPTION (To be specified by the supplier, if any variation)		
Description	**Qty.**	**Unit**
Non-Return Valves		
Disc Check Valve (Wafer Type), Body material of Austenitic stainless Steel (ASTM A 351 CF8M), Metal to Metal Seating, Standard Spring Austenitic Stainless Steel (IS 4454: IV:GR. 3 SS316), Suitable for installation between flanges confirming to dimensions standard : ANSI B-16.5 ASA 150# for following sizes:		
15 NB	2	Nos.
40 NB	2	Nos.
IBR Balanced Pressure Thermostatic Air Vent		
Dial : No, Material Pipe (1No)- ASTM A 106 Gr-B, Trap (1No)- Balanced Pressure Trap SA 105, Long Bend (2Nos)- ASTM A 106 Gr.B, Air bottle (1 No)- ASTM A 106 Gr.B. Dial Thermometer(1), with Root valve (1), Piston, class ; 800#, Body : ASTM A 105, Piston : ASTM A 276 TP 304, Ends : Socket welded		
15 NB	11	Nos.
Pressure Reducing Station (PRS)		
Inlet pressure ; 10.55 bar g , Outlet pressure; 3.5 bar g / 6 bar g, pneumatic (Roboteer) Type, Non-Ex proof, Standard ; MOC, Moisture Separator - Dryer Type (01 No.) - Cast Iron, Compact steam trapping station - 01 No - Forged carbon steel, Stop Valve/ Inlet/ Piston Type - 01 No. - Cast steel / Forged Carbon Steel, Strainer/ `Y' type- 01 No. - Cast iron, Pressure reducing Valve - 1 No. - Cast Steel , Safety Valve/ Full lift type- 01 No - Cast Steel / Cast Iron , Pressure Gauge/ Dial Type/ Inlet & Outlet - 01 No. each- SS, Interconnecting Pipe Work/ Carbon Steel - 01 No. each - Carbon steel seamless A 106 for Minimum Air pressure ; 4 to 6 bar g, Air quality -; Dust / oil / water free for the following dimensions :		
PRS design pressure bar g; 10.5, Max. Steam Inlet press; 9, Min Steam Inlet press. 8, Steam Outlet press. Barg; 3.5, Max. Steam Flow kgs/hr = 750, Inlet flanged to ANSI B 16.5, ASA 150#, Outlet flanged to ANSI B 16.5, ASA 150#		
50 X 80	1	No.

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DESCRIPTION (To be specified by the supplier, if any variation)		
Description	**Qty.**	**Unit**
PRS design pressure barg ; 10.5, Max. Steam Inlet press; 9, Min Steam Inlet press. ; 8, Steam Outlet press. Barg;6, Max. Steam Flow kgs/hr; 240, Inlet flanged to ANSI B 16.5, ASA 150#, Outlet flanged to ANSI B 16.5, ASA 150#		
25 X 40	1	No.
Pressure gauges		
Type =Bourdon, Steam pressure = 10 kg/sq cm g, Range ; 0 - 25.0 kg/ sq.cm.g, Material spec = SS, 150 MM Dial, Ends; Screwed 1/2" BSPT thread, with syphon pipe Q pigtail type		
15 NB	1	No.
Type =Bourdon, Steam pressure = 6 kg/sq cm g, Range ; 0 - 10.0 kg/ sq.cm.g, material spec = SS, 150 MM Dial, Ends = Screwed 1/2" BSPT thread, with syphon pipe Q pigtail type		
15 NB	1	No.
Type = Bourdon, Steam pressure = 3.5 kg/sq cm g, Range ; 0 - 6.0 kg/ sq.cm.g, material spec = SS, 150 MM Dial, Ends; Screwed 1/2" BSPT thread, with syphon pipe Q pigtail type		
15 NB	4	No.
Temperature control module (TCM)		
Type of operation = PID based with I/P converter + positioner, Type of valve = Globe type, Body material = SG cast Iron, class =150#, Inlet steam pressure = 6 bar-g and 3.5 bar-g, Actuation type = fail to close, Non-EX proof, Should be supplied with = Controller type = PID, Temperature sensor (Bimetallic type- SS 304) with thermowell, Standard/Type: Comprising of following components: Stop Valve/ Inlet/ Piston Type- 01 No = Forged ASTM A105, Stop Valve/ By-pass/ Piston Type- 01 No. = Forged ASTM A105, Strainer/ `Y' type- 01 No.= Cast Iron, Temp. Control valve - 1 No. = SG Iron, Stop Valve/ Outlet/ Piston Type- 01 No. = Forged ASTM A105, Vacuum breaker-01No. = Stainless steel ASTM A 276-15NB-Screwed BSPT, Interconnecting Pipe Work/ Carbon Steel - 01 No. each; Carbon steel A 106 Sch 40 with A 105 Mating Flanges , Ends: Flanged to ANSI B 16.5, ASA 150#		

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DESCRIPTION (To be specified by the supplier, if any variation)		
Description	**Qty.**	**Unit**
Max. Steam inlet press =Barg 6 bar g, Min steam inlet press. Barg = 5.5 bar g, Max. steam flow kgs/hr =170 kg/hr,		
25 NB	2	Nos.
Max. Steam inlet press. Barg 3.5 bar g, Min steam inlet press. Barg ; 3 bar g, Max. steam flow kgs/hr; 50 kg/hr,		
20 NB	3	Nos.
Max. Steam inlet press. Barg 3.5 bar g, Min steam inlet press. Barg ; 3 bar g, Max. steam flow kgs/hr; 125 kg/hr,		
25 NB	4	Nos.
Max. Steam inlet press. Barg 3.5 bar g, Min steam inlet press. Barg ; 3 bar g, Max. steam flow kgs/hr; 180 kg/hr,		
40 NB	1	No.
Insulation		
Thermal insulation for the all the pipes, valves etc., in as above, LRB mattress tubing/mineral wool of 120 kg/m3 along with wire netting of 3/4'' X 24 SWG; 51 mm thick, aluminum foils of 0.55 mm Thick, (grade 8011/H14), binding material, self-tapping screws etc. including the cost of aluminum cladding materials with all necessary auxiliary materials complete as required. The measurement must be on and as per finished surface area as per prevailing norms	380	Sq. mtr.
STRUCTURAL FOR STEAM PIPE LINE & FITTINGS		
Structural steel permanent pipe supports inside and outside the building, hangers, pipe clamps, brackets for valves, bolts, nuts, washers etc. and other structural work required for pipe support with painting as specified. Hanging supports as required should be provided…	3000	Kgs
STRUCTURAL OF ROOF WORKS FOR PRESSURE REDUSING STATION (PRS)		
Roof work for PRS at the terrace using Aluminum sheets of approved makes. Rates shall include supply & installation of Roofing for PRS in a way that the PRS are completely shielded from rain. Roofing structural supply and installation should also be included in this item.	2	Nos.

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DESCRIPTION (To be specified by the supplier, if any variation)		
Description	**Qty.**	**Unit**
CIVIL CORE CUTTING		
Utilize appropriate tools to facilitate the precise cutting of civil cores cutting or walls for pipeline routing of required sizes, while ensuring the removal of debris to designated areas and the proper filling of holes using appropriate materials as instructed.	5	Sq. mtr.
CONDENSATE PIPES & FITTINGS (FOR IBR & NON IBR LINE) :		
Supply, installation, testing & commissioning of following items for steam supply with all required items at site.		
NON IBR PIPE :		
CS pipes ASTM A 106 Grade- B, Schedule 40, including, nuts bolts and washers, all pipe fittings, elbows, gaskets, flanges, painting etc. complete as required for the satisfactory functioning. Pipe Sizes for header, sub header and Branch for the following dimensions.		
20 NB	60	mtr
25 NB	200	mtr
40 NB	70	mtr
50 NB	70	mtr
De-aerator Head with Assembly:		
Operating pressure; 1, Boiler Capacity; 750 kg/hr, Feed Water Tank Depth; 1200 mm (L-1000 X B-1000 X H- 1200), Mixing unit - AISI 304, Immersion Tube - AISI 304, with Air vent, Vacuum Breaker, Equal Tee & Nipple; 50 NB condensate inlet- Flanged to ANSI B-16.5 ASA 150#, 50 NB Flash steam inlet- Flanged to ANSI B-16.5 ASA 150#, 40 NB Make-up water inlet- Flanged to ANSI B-16.5 ASA 150 #		
150 NB	1	No.

*** To be specified and confirm by the supplier as per their equipment design**

HOMCO

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Office: Pathirappally, Alappuzha, Kerala, India - 688 521

Phone : 477 2258012
:477 2258665
Fax : 0477 2258012

Website : www.homcokerala.com | Email : homcokerala@gmail.com

DESCRIPTION (To be specified by the supplier, if any variation)		
Description	**Qty.**	**Unit**
Steam Operated Pumping Trap Skid with all Accessories & piping		
MOC = SG Iron, Inlet condensate pressure max.; 4.5 bar g, Inlet Ends = Screwed BSPT size 20 NB, Outlet Ends = Screwed BSPT size 20 NB, Items included in the condensate inlet/outlet, steam Exhaust & Balancing Lines = 20 NB inlet & outlet ball valve- 2 No., 20 NB inlet strainer- 1 No., 15 NB ball valve- 1 No. Items included in the motive steam line - motive steam pressure: 3.5 bar g, 15 NB piston valve - 1 No., 15 NB strainer -1 no., 15 NB thermodynamic trap -1 no. All the above components with interconnecting piping shall be mounted in a single skid frame skid condensate inlet 20 NB flanged to ANSI 150#, Skid condensate outlet 20 NB screwed BSPT. NOTE; Minimum Installation Head needed from Equipment outlet is 530 mm		
20 X 20	7	Nos.
Single Orifice float Trap module		
Class = 150#, MOC = cast iron (IS 210 FG 260), Trap inlet pressure= 2, Back pressure = 0.5, Standard/Type = Assembly consisting following items- single orifice float trap = 01 No., Type = With thermostatic Air vent strainer (cast iron- 20 mesh) = 01 No., Disc check valve (stainless steel)=01 No., Piston valve = 02 Nos (Bypass & Inlet valve)- forged carbon steel closed loop, Outlet isolation valve to be provided after Disc check valve, Ends = Flanged to ANSI B- 16.5 ASA 150 #		
20 NB (Selected DP for trap= 4.5 bar g)	1	No.
20 NB (Selected DP for trap= 10 bar g)	2	Nos.
Outlet Isolation Valve - (after Disc Check Valve) (Loose supply - yes)		
Standard/Type: Piston, Grade/Class: 800#, Material Specification, Body: ASTM A 105, Piston: ASTM A 276 TP 304, Ends: Socket welded	3	Nos.

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DESCRIPTION (To be specified by the supplier, if any variation)		
Description	**Qty.**	**Unit**
Thermodynamic Trap Module		
Condensate Recovery Module, Class; 600#, Body: ASTM A-105 With inbuilt upstream / bypass / vent / test / downstream valves, Bonnet: ASTM A-105, Piston valves: Bonnet - ASTM A 105, Iso-tub: SS304, Ends; Flanged ANSI 150#		
15 NB	17	Nos.
With Root Valve and Outlet Valve		
Standard/Type: Piston, Grade/Class: 800#, Material Specification, Body: ASTM A 105, Piston: ASTM A 276 TP 304, Ends: Socket welded with main Pipe		
15 NB	34	Nos.
Non-Return Valve		
Type: Disc Check Valve (Wafer Type) , Material Specification , Body : Austenitic stainless Steel (ASTM A 351 CF8M) ,Disc : Austenitic stainless Steel (ASTM A 351 CF3M) , Seat : Metal to Metal Seating , Standard Spring : Austenitic Stainless Steel (IS 4454:IV:GR. 3 SS316) , Installation: Suitable for installation between flanges confirming to dimensions standard : ANSI B-16.5 ASA 150#	17	Nos.
STRUCTURAL FOR CONDENSATE PIPE LINE & FITTINGS		
Structural steel permanent pipe supports inside and outside the building, hangers, pipe clamps, brackets for valves, bolts, nuts, washers etc. and other structural work required for pipe support with painting as specified. Hanging supports as required shall be provided.	2000	Kgs

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DESCRIPTION (To be specified by the supplier, if any variation)		
Description	**Qty.**	**Unit**
CHIMNEY		
Supply, installation, testing & commissioning of following items for steam supply with all required items at site.		
Mild Steel conical Chimney 1000 Mm Dia Bottom 230 mm Dia Top, 25 Mtr Height For One Ton CNG fired boiler using appropriate thickness plates of 6 mm thick to 12 mm thick sections as required in IS 6533 standard. Rates shall include supply of chimney as per design dimensions, ladder, platform , Foundation bolts if required etc., Lightning arrestor, Aviation lamp if required, etc.	1	No.
Supply installation testing & commissioning Flue gas Ducting: - Ducting from Boiler to chimney of minimum ID 190 mm and appropriate thickness using rolled plate or pipe.	24	Mtr.
Supply installation testing & commissioning Metallic Expansion Bellows: - MS/ SS expansion bellows of ID 190 mm.	2	Nos.
ELECTRICAL		
Electrical cables and other accessories to connect with control panel and other utility connection nozzles , valve and other accessories	1	Lot

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ANNEXURE – V & VI : Safety & ELECTRICAL DETAILS

DESCRIPTION (To be specified by the supplier, if any variation)		
Controls and safety	:	
Pressure switch	:	2 no, for firing positions of burner*
Photo resistant cell	:	1 no, flame failure and audio-visual alarm*
Temperature controller	:	1 no, to control oil temperatures in burner heater before nozzle with audio visual alarm and burner trip*
Sequence controller	:	1 no, to control sequence of firing, pre-purging etc. *
Modulating mechanism	:	1 no, stepped modulation*
Low oil pressure switch	:	1 no, to trip burner with audio visual alarm*
Level controller	:	2 no, to regulate feed water pump operation & trip burner in case of very low level with audio visual alarm *
Safety Interlocks		

Unsafe Condition	Instrument for action	Action
High water level	Level controller No. 1	Feed water pump trip. *
Low water level	Level controller No. 1	Alarm & Burner Shut down*
Extra low water level	Level Controller No. 2 (Overriding controller)	Alarm & lock-out*
Flame failure	Photocell	Alarm & burner trip*
Boiler high pressure	Safety valves	Lift & discharge*

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DESCRIPTION (To be specified by the supplier, if any variation)		
Electrical Panel		
• The control panel must be a part and parcel of boiler/boiler package. It should contain all necessary switchgears, safety alarms/interlocks and burner management system and is to be mounted on the boiler itself eliminating any cabling requirement at site. *		
• Boiler should be complete with all necessary electrical cabling from the control panel till burner / FW pumps etc. Power cables should be 1100 V grade, PVC insulated & PVC overall sheathed. * • All motors must conform to squirrel cage induction motors, TEFC, IP-55, class 'F' insulation. *		
MCC (Motor Control Centre) Cum Control Panel		
• A MCC cum control panel, complete with main isolator switch, starters, auxiliary contactors, relays, fuses, rotary switches, indicating lamps, isolator, hooters with programmer and combustion safety relay. The panel should be completely pre wired and factory tested. It should be mounted on the boiler itself and shall not require any separate foundation. The control panel IP protection class should be of IP 54 min. *		
Standard Operating Frequency	:	50 Hz
Standard Operating Voltage	:	230 / 415V*
Total power consumption	:	*
Motor Details with rpm	:	*
PLC and HMI details (If provided)	:	*
VFD details (If provided)	:	*

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DESCRIPTION (To be specified by the supplier, if any variation)		
Major Cabling details		
For Main supply (In client's scope)	:	Required cable details to be provided by vendor*
For Main drive motor	:	
End connection details	:	MCB or Socket should be with equipment*
Earthing requirement	:	Arrangement should be with system *
An Isolator Circuit breaker	:	To be supplied with machine at power supply in point of appropriate capacity by vendor. *
Cable length with equipment	:	To be indicated by vendor *
Any other detail not mentioned above, but required also to be informed & included in the scope of supply by the vendor.		
Client will provide & connect the required cable in to vendor's panel only. *From machine panel to machine and its other accessories and controls, to be supplied and connected by vendor at site.*		

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DESCRIPTION (To be specified by the supplier, if any variation)
Miscellaneous:
❖ Wiring between Panel and the Machine should be in the Scope of Vendor. The exact measurements shall be taken by visiting the site. * ❖ The Incomer to the Operating Panel shall be provided by HOMCO, however any Cable Trays or SS 304 Conduits required for the same shall be provided by the Vendor. *
❖ Cable routing from Operating Panel to the Machine shall be done as per cGMP i.e. routing through Cable Trays outside Clean Room Areas and SS 304 Conduits inside Clean Room Areas. * ❖ All the Component Makes should match the Approved Makes list provided. * ❖ Any deviation from this should be documented and communicated to HOMCO. * ❖ All Calibration Certificates are to be produced during Installation of Machine, without which the Installation is deemed incomplete. All the Certificates should be Traceable to National / International Standards. * ❖ The Validity of Calibration shall be minimum 9 months and maximum 12 months from the date of Installation. * ❖ All the Signal Cables should be shielded to avoid interference. * ❖ Complete Earthing of Equipment. * ❖ Complete covering of Electrical Cables and Other Connections. *

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ANNEXURE - VII : UTILITY REQUIREMENT

DESCRIPTION (To be specified by the supplier, if any variation)		
Water	:	*
Compressed Air	:	*
Water	:	*
NG/LPG	:	*
Oil	:	*
Any other	:	*

Note: All necessary and required utilities with any filters along with required housing and accessories should be provided by vendor.

*** To be specified and confirm by the supplier as per their equipment's design requirement with pressure and flow rate along with any valve, pipe / nozzles size required alongwith scope of supply.**

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ANNEXURE - VIII : CLEANING TECHNIQUE

DESCRIPTION (To be specified by the supplier, if any variation)		
Mode of machine cleaning	:	*
Use of Lubricants	:	*
All contact parts should be easily dismantled and cleanable.		
Easy washing and cleaning facility should be available		
Drain points: Vendor should specify the pipe size and location of drain points if required as per their system's drain requirement with pipe /nozzle size, valve etc.*		

*** To be specified and confirm by the supplier as per their equipment design**

ANNEXURE - IX : MECHANICAL DETAILS

DESCRIPTION (To be specified by the supplier, if any variation)		
Dimension (In mm)	:	*
Net Weight (In Kgs.)	:	*
Type of Packing	:	*
Case Dimension (In mm)	:	*
Gross Weight (In Kgs.)	:	*
Foundation details if required	:	*

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ANNEXURE - X	**:**	**LIST OF ANCILLARY / ACCESSORIES / OPTIONAL ITEMS**

DESCRIPTION

(To be specified by the supplier, if any variation)

Vendors should inform, provide details and consider scope of supply for the following:

- Recommended Spares part list
- Essential Spares (For 1 year)
- If any items required but not included in URS, to be mentioned and submitted with unit rate and quantity * (And it can be informed to client during pre-bid meeting or before PO/WO)
- Any other ancillary or accessories or optional items not mentioned above but required for successful operation should also to be informed in advance before PO/WO
- *Any other ancillary, or accessories or optional items not mentioned also to be quoted*
- *Details of Bought out components to be specified.*

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ANNEXURE - XI	:	TRAINING REQUIREMENT

- Training to all concern of M/s. HOMCO, Kerala for the Installation, Operation, Maintenance of IBR steam boilers provided by vendor and training record should be documented.
- Testing of control panel should be carried out in presence of customer/Client's representative at the place of manufacturer before delivery.
- Vendor shall support client in execution of all the Qualification Phases.

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ANNEXURE - XII : APPROVED MAKES

Boiler	:	Forbes Marshall / Thermax / Texmaco*
Feed water pump	:	Wilo/Grundfos*
Fuel oil pump	:	Neels/Entees/Suntec*
Burner	:	Forbes Marshall/ Oilon / Weishaupt*
Blower, Sequence controller, Photocell	:	Forbes Marshall/ Oilon / Weishaupt*
Motor		LHP / Crompton / Siemens / OEM Std*
Main steam stop valve, Isolation valve, Steam and water valve, non-return valve		Forbes Marshall/L&T*
Safety Valve		Fainger Lesser/Sempell/ Forbes Marshall*
Blow down valve		Levcon / Forbes Marshall / OEM Std*
Level indicator and level controller		Techtrol / Forbes Marshall / OEM Std*
Pressure switch		Danfoss*
Pressure gauge and steam flow meter		Forbes Marshall / Krohne*
Automatic blow down control system		Forbes Marshall / Krohne*
Electrical switch gears		L&T / Siemens*
Cables	:	Polycab/ Finolex *

- ***Any other components, not mentioned above, to be specified by the vendor.***
- ***All the Component Makes should match with the Approved Makes listed above. Any deviation from this should be documented and communicated to HOMCO and Pharma Consultant during tender formalities.***

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ANNEXURE - XIII : DOCUMENTATION

List of all Documents to be supplied along with equipment [AS APPLICABLE]

Sr. No.	Document to be supplied	Qty	Remarks
1	Design and operational qualification	2 sets	
2	SAT/FAT procedures	2 sets	
3	Operation manual	2 sets	
4	Maintenance manual	2 sets	
5	Spare parts manual	2 sets	
6	All engineering drawings (GA drawings)	2 sets	
7	List of instruments	2 sets	
8	Calibration certificates	2 sets	
9	Warranty / Guarantee	2 sets	
10	List of all components with referencing	2 sets	
11	Civil foundation drawings- If required	2 sets	
12	Pre installation requirements	2 sets	
13	Installation requirements	2 sets	
14	Installation manual	2 sets	
15	Technical literature, data sheets and equipment catalogues	2 sets	
16	DQ, IQ, PQ documents.	2 sets	
17	Calibration Report of all sensors, controllers, PLC, transmitters, indicators etc.	2 sets	
18	Test Certificates of all material of construction	2 sets	
19	Test Certificates of the software used in machine control / monitoring system.	2 sets	

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ANNEXURE - XIV : TERMS AND CONDITIONS

Delivery Period	:	*
Payment Terms	:	As mentioned in tender.
Packaging and Forwarding	:	**By Vendor**
Un-loading at site	:	By vendor /Supplier (If required, help for the arrangements of unloading can be done by client) Installation in position by the vendor under the client's **supervision**
Excise / Taxes /GST	:	*
Material for Trial arrangement	:	* (To be arranged by client)
Installation and Commissioning	:	**By Vendor**
Response to URS and submission of quotation	:	Within 1 week
Submission of detail functional design specification and schematic drawings	:	Within a week after order finalization
Submission of FAT / SAT specification	:	2 weeks before FAT
Submission of IQ AND OQ documents	:	With equipment delivery
Drawings / diagrams	:	With equipment delivery
The supplier should notify customer 2 weeks in advance of the beginning of FAT		
Catalogue, Equipment drawing, List of clients and year of establishment to be submitted alongwith quotation.		
Any other terms, not mentioned above, also to be specified.		

*** To be specified by the supplier**

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ANNEXURE - XV : ABBREVIATION

1.	URS	:	User Requirement Specification.
2.	KSDPL	:	Kerala State Drugs & Pharmaceuticals Ltd.
3.	DQ	:	Design Qualification
4.	IQ	:	Installation Qualification
5.	OQ	:	Operational Qualification
6.	PQ	:	Performance Qualification
7.	SS	:	Stainless Steel
8.	RHS	:	Right Hand Side
9.	MOC	:	Material of Construction
10.	KW	:	Kilo Watt
11.	HP	:	Horse Power
12.	RPM	:	Rotation Per Minute
13.	FLP	:	Flame Proof
14.	cGMP	:	Current Goods Manufacturing Practices
15.	O&M	:	Operation and Maintenance
16.	GA	:	General Arrangement
17.	SLD	:	Single Line Diagram
18.	HOD	:	Head of Department
19.	QA	:	Quality Analysis
20.	MRP	:	Maximum Retail Price
21.	NMT	:	Not more than
22.	VFD	:	Variable frequency drive
23.	LPG	:	Liquefied petroleum Gas

Any other details, not mentioned in Annexure I to XIII, to be specified in the quotation/specification by the vendor.