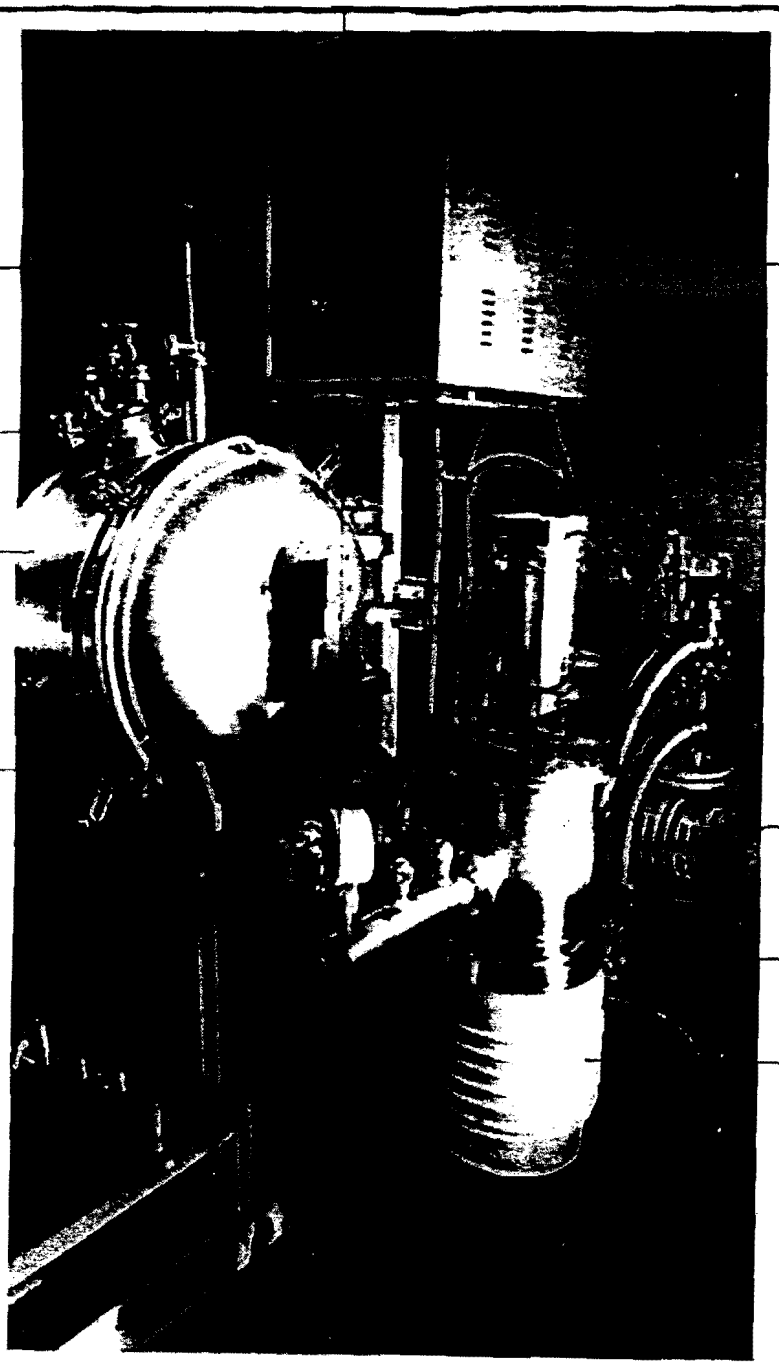
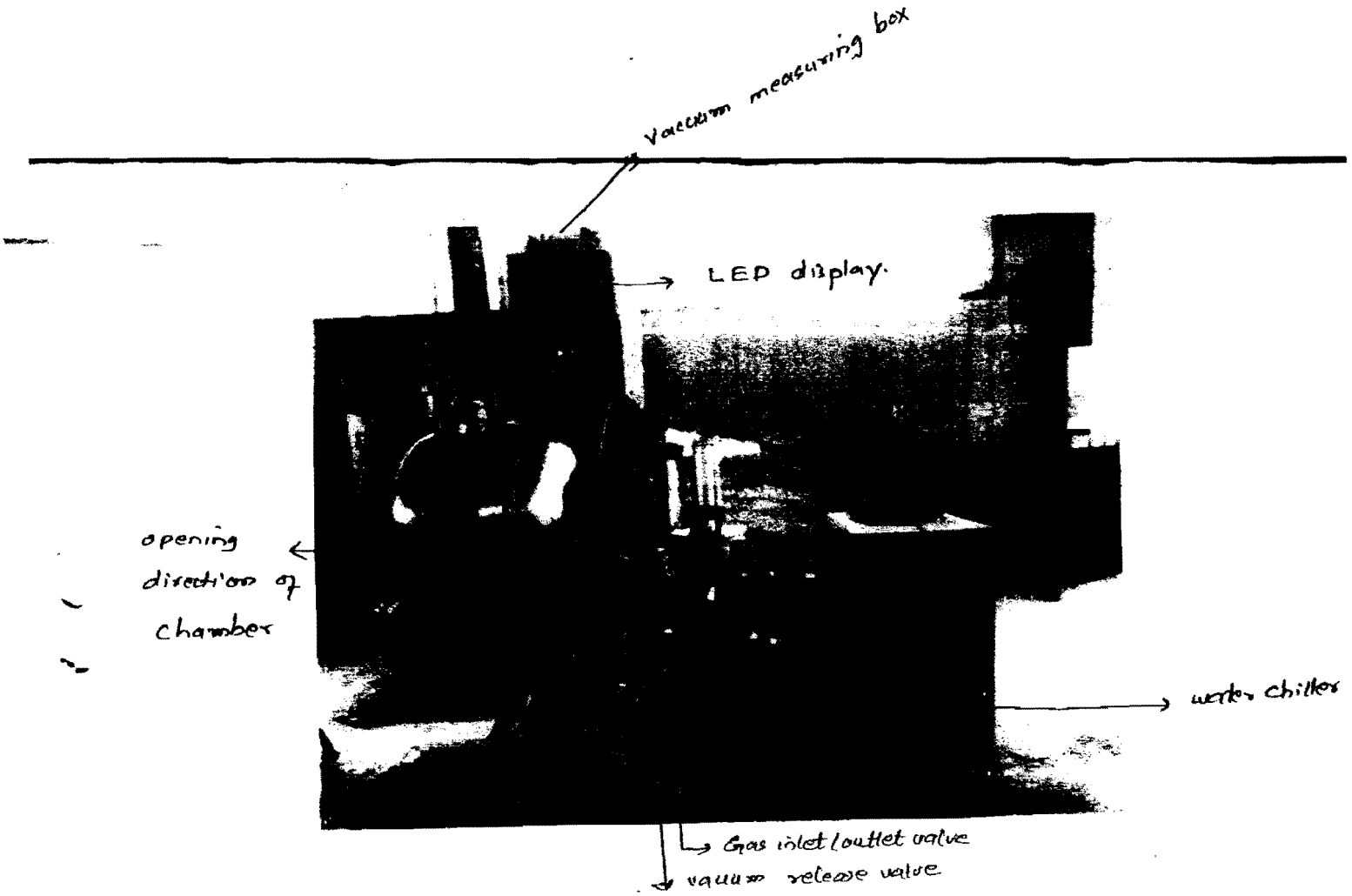
Tilting Type Melting/Casting Furnace (Complete unit)

S. No.	Title	Description
1	**Equipment Main features**	▪ Vacuum Induction Melting/Casting Tilting Type Furnace (Complete unit) ▪ Type of Furnace: Tilting Type **Horizontal Opening** as per sketch. ▪ Melting Capacity: 1.2 to 1.5 kg of steel ▪ Working Temperature: Crucible: 2000°C min. ▪ Ultimate Vacuum: ≥ 5.0×10^{-5} mbar (Cold state) ▪ Overall sketch of equipment is attached. (Annexure D)
2	**Furnace Body**	Double Walled Stainless Steel Water Cool (As per requirement of induction coil, metal pouring tilting device & internal heat of the chamber etc.). OD = 540 mm, ID = 500 mm, H = As per requirement of induction coil and pouring device. ▪ Pouring mechanism: tilting type ▪ Cooling water connections must be provided. ▪ Charging: Side charging through door opening ▪ Vision Port at front side for viewing melt and to detect the temperature by radiation pyrometer etc. ▪ Metal mixing mechanism at the top of the furnace through vacuum tight port. ▪ Feed through for connecting power supply to crucible coil ▪ Feed through for tilting mechanism, for thermocouples (crucible and mold temperature measurement) ▪ No paint on furnace body ▪ Sketch of furnace chamber is attached. (Annexure E) » Vacuum release valve and inert gas inlet/outlet valves.
3	**Pumping System**	▪ Ultimate vacuum ≥ 5.0×10^{-5} mbar (Cold state) ▪ Fully automatic and manual control for pumping and vacuum measuring system with necessary interlocking. ▪ Vacuum measuring device ▪ Fore line and bypass valves (electro pneumatic), bellows & pipes should be according to vacuum requirement. ▪ All valves, gauges, bellows & pipes should be of stainless steel. ▪ **Vacuum pumps (Mechanical, booster and high vacuum diffusion pump) should be made of Europe only (preferably LEYBOLD Germany) and compatible with the system.**
4	**M.F Generator**	▪ Type of Generator: MIF , Solid State, IGBT based circuit ▪ Rating: 15 KW ▪ Frequency: 10-15 KHz ▪ Voltage: 220/380 V ▪ Power should be digitally displayed and increase or decrease by factor of 0.1 kw.
5	**Thermocouple**	▪ Thermocouple should be easily inserted or removed from the crucible by the operator as and when required.
6	**Control**	▪ Preferably PLC based with manual and automatic control
7	**Electrical Safety**	▪ Protection against over voltage, over current, surges and non-availability of water circulations to coils
8	**Display Parameters**	▪ Input & output power, voltage, current, temperature and frequency are digitally displayed.
9	**Crucible**	▪ Crucible Dimensions: OD = 80 mm H = 100 mm ▪ Furnace should be suitable for crucibles made of graphite, silicon carbide, alumina, magnesia and zirconia etc.
10	**Induction Coil**	▪ Dimensions: OD = 105 to 110 mm ID = 85 mm H = 110 mm Nos. of turn = As suitable ▪ With tilting mechanism ▪ Rough sketch of coil is attached. (Annexure F)
11	**Cooling System**	▪ Closed type cooling device according to the requirement of the system. Cooling system should also include water distributor, water collector, and connecting pipeline for cooling water.
12	**Compressor**	▪ A smart compressor unit should be provided along with unit according to the requirement of the system.
13	**Spare Parts**	Spares for 2 to 3 years trouble free operation (IGBT power module, Main board for power supply, vacuum pump oil for mechanical, roots and diffusion pumps, induction coil, crucibles, thermocouples, sealing rings, vacuum stop leak compound, glass for inspection hole, high vacuum gauge head, low vacuum gauge head etc. Complete list should be provided along with quotation).
14	**Documents/ Drawings**	▪ Furnace layout, complete drawing of furnace body, coil, generators, pumps, technical/maintenance manuals and brochures in English etc.
15	**Inspection**	Inspection: Pre-shipment inspection will be carried out at seller's premises. Two engineer of buyer will conduct inspection at seller's location.
16	**Make**	China, Korea or Europe (In case furnace is made of china, then vacuum pumping system should be made of Europe.)

Annexure-D


water cooled
thermocouple sleeve + Rod
viewing glass
Furnace chamber
chamber locking
Generator
IGBT Based Circuit
Roots pump.
Mechanical pump.
Diffusion pump.

Annexure-D


Vacuum measuring box
LED display
opening direction of Chamber
water chiller
Gas inlet/outlet valve
vacuum release valve

Annexure 'E'

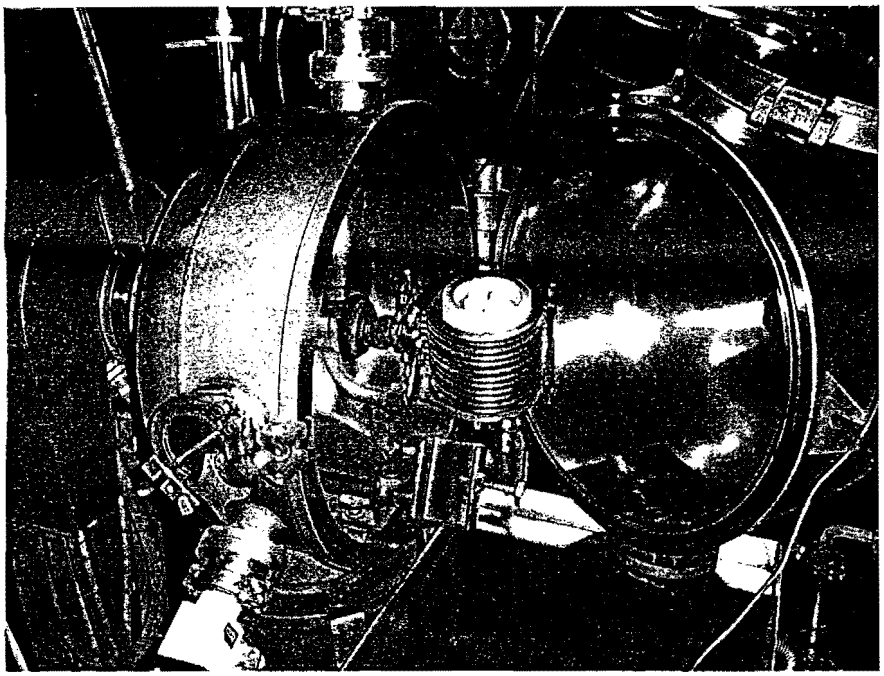


Fig: Vacuum Induction Furnace Chamber

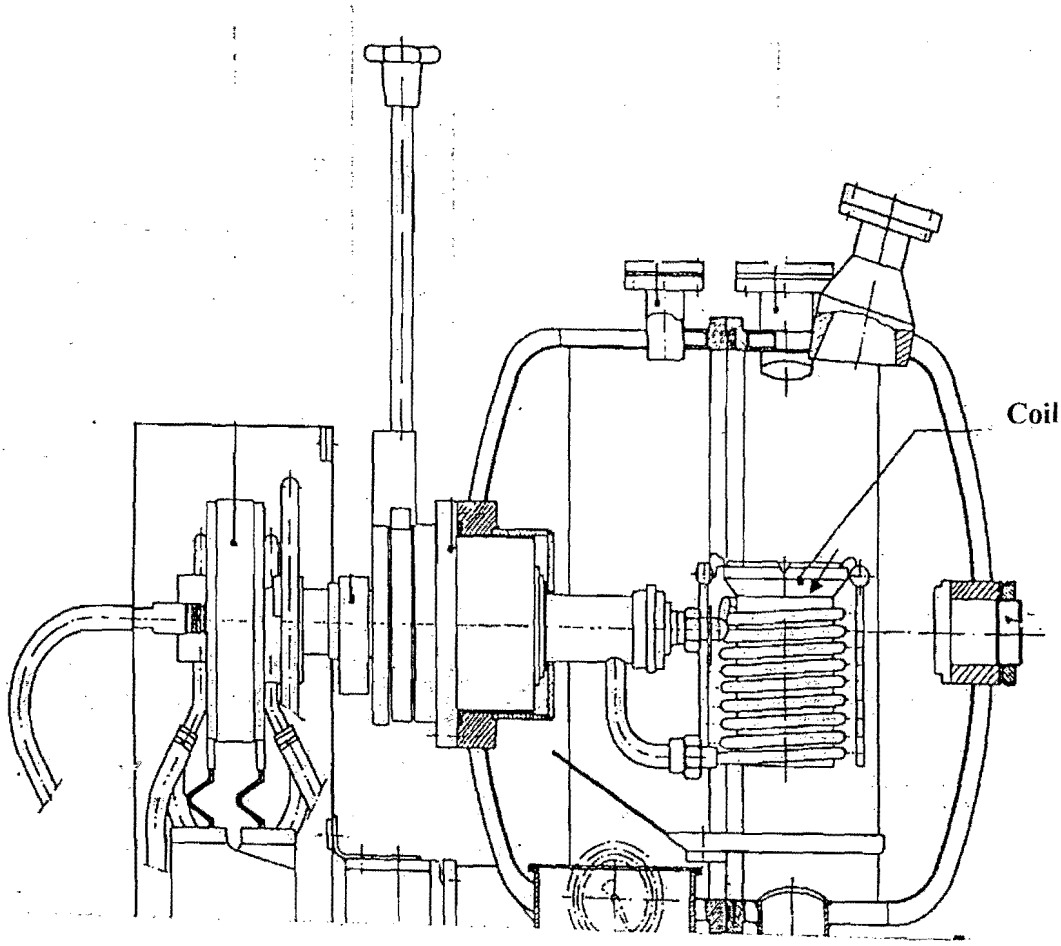


Fig: Coil inside the Vacuum Induction Furnace Chamber