SECTION 3 - TECHNICAL SPECIFICATION

3 TECHNICAL SPECIFICATION

Technical Specification Document:	VN1468HV01
Customer Interface Drawing:	CNZ331842F

3.1 Dimensions and Specifications

Length of bore of cryostat:	839±3mm
Height of system without legs:	1288mm
Floor to base of bottom plate:	762mm
Height including legs:	2050mm
Diameter of cryostat (excl. flange):	810mm
Max. diameter of cryostat (incl. flange):	860mm
Room temperature clear bore (without shims):	54mm minimum along length
Room temperature bore-tube material:	Copper or Brass
Centre of field to base of bottom plate:	320±3mm
Hook height requirement SWOBTR (bung transportable):	Lift from below

Minimum ceiling heights with 762mm system height from floor:

For standard demountable current leads	2936mm
For standard helium siphon	2886mm
Using special low-ceiling height service leads and split siphon:	2610mm (approx.)

System weights

Magnet in cryostat:	450kg
Cryogens (when full):	100kg (approx.)
Anti-vibration legs:	150kg (approx.)

3.2 Liquid Helium Cryogen Details

Minimum. helium level for normal operation:	0%
Minimum helium level for energising or shimming	76%
Siphon leg diameter	0.5" (12.7mm)
Volume required for installation: (Includes cooling magnet to 4.2K after nitrogen pre-cool, filling helium reservoir after energisation.)	400 litres (approx)
Recommended refill volume during normal operation:	95 litres (nominal)
Hold-time during normal operation (static magnetic field, leads withdrawn):	Greater than 270 days

3.3 Liquid Nitrogen Cryogen Details

Total volume of nitrogen required for installation:	500 litres (approx.)
(a) For pre-cool of magnet:	350 litres (approx)
(b) For cool and fill of nitrogen can:	150 litres (approx.)
Volume of reservoir	62.5 litres
Refill volume	58 litres
Hold-time in static condition	Greater than 14 days

3.5 Magnet Specifications

Magnet type:	Compensated self-screened solenoid
Central field:	9.39 Tesla (400 MHz ^{1}H)
Field stability:	Less than 0.02 ppm/hour drift (8 Hz/hour ^{1}H)
Design operating current:	97.4 Amps (nominal)
Typical time to energise magnet to full field:	Less than 160 minutes
Design Inductance:	38.1H

Design 5 Gauss positions are given on the Customer Interface Drawing (CNZ331842F)

3.6 Superconducting Shim Coils

These coils are positioned on a separate former surrounding the main coil in the helium reservoir. Each coil set is fitted with a superconducting switch for persistent mode operation.

Coil Details:-

Shims provided:	B0, Z1, Z2, Z3, X, Y, ZX, ZY, XY, X2-Y2
Nominal maximum recommended current:	20 Amps (25 Amps for Z1 & Z2)
Coupling:	All shims (apart from B0) are designed to be de-coupled from main coil
Orthogonality:	All shims are designed to be fully orthogonal
'X' axis alignment:	Nominally coincident with line through the two main service turrets

3.7 Switch Currents

All magnet and shim switches require 60 to 100mA to operate (90mA suggested nominal value to use), e.g. using 30V supply.

3.8 Energisation Direction

The magnet is energised such that the North is at the top of the magnet, and the South is at the bottom. This is defined by the procedure below: