



VTC-4 HALT/HASS Chamber Specifications



VTC-4 Chamber



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SYSTEM FEATURES

HALT/HASS Chamber: Up to 100 Grms with markedly improved Air Consumption/Grms. U.S. Patent Pending

This new and improved system is based on 15 years of continuous development and combines rapid thermal cycling of products under test with six-degree-of-freedom (6DoF), singularly, or in combination.

HighRate™ Heating System: 3 phase solid-state Infitrol™ proportional control of balanced electric heaters wire balanced system.

- Optional Solid Rod Heaters for extended High Temperature testing

HighRate™ Liquid Nitrogen Cooling System: Direct atomization in control plenum, Infitrol™ proportional control and redundant solenoid safety valve.

Adjustable Air Flow Plenum: For directing airflow to product. Minimum four (4) 3" Diameter. (75mm) ports on each side of chamber for distributed airflow to product

Vibration Table and Vibrators:

- Vibration Table with ceramic surface thermally insulates table surface from vibration table base for improved temperature cycling and vibrator life.
- Vibration enhancing mounting standoff for improved vibration energy transfer and air circulation under test specimen.
- LubeMist™ lubricated vibrators with adjustable ball valves, one for each pneumatic vibrator for low G-level performance using fewer vibrators. SoftStart™ designed vibrators minimize starting shock to products.
- Three (3) year unconditional warranty for Vibration Table and Vibrators.



SUMMARY FEATURES

CHAMBER FEATURES	Hanse
Pressurized plenum	X
Proportional heating , cooling, and vibration 4-20ma	X
SCR heater control fused and breaker isolated	X
Breakers on all 480v 3 phase lines	X
All instruments and related boards fused	X
Watch Dog circuit available on request	X
Front panel display	X
Programmable maintenance display optional	X
Interlocked safeties doors, fans, heat, cool, vibration	X
Balanced heater system	X
3 phase legs monitored for voltage and phase	X
Fans monitored for running	X
Heaters interlocked with fans	X
Timer to hold heat off until fans are on full	X
Electrical UL labeled and CSA components	X
Chamber vented by one 4" vent on top	X
Positive dry air purge kept in chamber	X
Two 20" x 20" Windows	X
Optional window on side	X
Halogen 120VAC lights (2)	X
FM approved High limit on/off control limit user set able	X
Manual door latch standard	X
Galvanized External Liner	X
Oversized hinges for door stability	X
All terminals and wires clearly labeled	X
2# charcoal polyester port plugs: noise/thermal isolation	X
Full set of wiring schematics	X
Manuals that included manufacturers data sheets	X



VIBRATION FEATURES	Hanse
Range of vibration 0 to 100 g's (25-30°C).	X
Easy self starting vibrators	X
Self oiling vibrator system	X
High temp hose with bulk head	X
Easy removable hose [SAE flare]	X
Ball valve control on each vibrator	X
Harden piston for long life and low wear	X
Low air consumption vibrator	X
Vibrators work in -100 to +200 deg C environment	X
Normal shop air acceptable	X
Balanced vibrators for load size	X
Vibrators retrofit able to other systems	X
Three (3) size vibrators available	X
Precision air control regulators	X
Insulated vibration table	X
Stainless steel mounting insert 3/8-16	X
Full table surface no restrictions	X
Ceramic cover for insulation	X
Gasket around table from environmental compartment	X
3 year unconditional warranty on table & vibrators	X



1. PERFORMANCE

1.1. Temperature

1.1.1. **Range:** -100° to +200° C

1.1.2. **Product Change Rate:** 70° C/min (-65° to +100° C with 50lb Aluminum Fin Coil Load).

1.1.3. **Stabilization:** ± 1° C after stabilization. (Stabilization < 2 minutes).

1.1.4. **Cooling:** Liquid Nitrogen (LN2) direct injection.

1.1.5. **Heating:** 48 KW Nichrome wire heaters, SCR controlled.

1.1.6. **Thermocouples:** One (1) air, one (1) for specimen.

1.2. Vibration

1.2.1. **Tri-Axial:** Six-Degree-of-Freedom (6DoF) Vibration, non-coherent broadband vibration 10-10,000Hz, up to 100 Grms, at 25° to 30°C with unloaded table. 90% of vibration energy in 5-4000Hz for maximum low energy in low frequency range.

1.2.2. **Table:** 24" x 24" (610mm x 610mm) with twenty (20) 3/8-16 (M10) standoff mounting inserts.

1.2.3. **Accelerometers:** One (1) Model Dytran 3030B5, 500 Grms Range with cable and three axes mounting block.

1.2.4. **Vibration Actuators:** Two (2) Large and Two (2) Medium pneumatically actuated. Table vibration, ± 1 Grms within one (1) minute of settling.

1.2.5. **Maximum Load:** 700 lbs.(317 kg)

2. Chamber Construction

2.1. **Interior:** 30"W x 30"D x 36"H (762mm x 762mm x 910mm)

2.2. **Exterior:** 53"W x 42.75"D x 101.5"H (1524mm x 1118mm x 2413mm)

2.3. **Doors:** Two (2). One full opening both front and back.

2.4. **Windows:** Two (2) Tempered Multipane. 20" x 20" (508mm x 508mm) in each door.

2.5. **Light:** Two (2) lights

2.6. **Ports:** Two (2) 6"dia. (150mm) for customer use.

2.7. **Insulation:** Hanse's exclusive multilayer staggered insulation for superior thermal and noise insulation.

2.8. **Sound Level:** Nominal 73 dbA @ 1 meter

2.9. **Weight:** 1,900 lbs (862 kg)



3. Instrumentation

- 3.1. Hanse View™ Programmable Temperature and Control:** Programmable temperature ramps. Closed loop cascade temperature control of product under test including RS232/422/485 serial interface. HALT step-stress templates included for easy HALT chamber programming.
- 3.2. Thermocouples:** One (1) for temperature control and one (1) for product response.
- 3.3. Programmable Vibration Control:** Programmable vibration ramps, Grms level, and test duration all synchronized with the temperature controller.
- 3.4. Accelerometers:** One (1) accelerometer, cable and 3 axes mounting block provided. Four (4) channel GRMS meter capability to allow a total of four (4) accelerometers to be monitored simultaneously. Optional analysis package allows up to 12 accelerometers to be monitored.
- 3.5. Serial Ports:** RS232/485 MODBUS

4. Software

- 4.1. HanseView™:** For temperature and vibration programming and control.

5. Safety

- 5.1. Door Interlocks:** Door Interlocks shut off system operation.
- 5.2. Emergency Power Off (EPO):** EPO activation shuts off system operation
- 5.3. Over/Under Limit:** FM approved limit with stand-alone sensor placed in air.

6. Utilities

- 6.1. Electric:** 480V 3 Ph 60 FLA
- 6.2. Liquid Nitrogen:** 1" (25mm) Supply 40/50 psig
- 6.3. Compressed Air:** 3/4" (19 mm) Supply 100 psig, 35 SCFM
- 6.4. Exhaust Ports:** One (1) 4" (100mm) Dia. vented to outside.

7. Installation

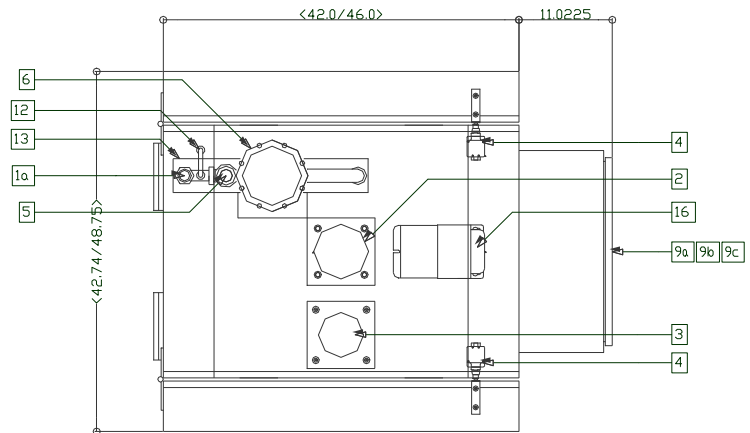
- 7.1.** The customer is responsible for unloading system and rigging into place.
- 7.2.** Utilities and services necessary for system operation, electrical, LN2, compressed air, exhausts, etc. shall be provided by customer and connected to the system.
- 7.3.** Any leasehold improvements or building alterations are the responsibility of the customer.



8. Options

- 8.1. Humidity:** Direct Injection, 10 to 85% RH from 25° to 65° C, Capacitance Sensor.
- 8.2. HanseView™ Vibration Analyzer:** Control/Analyzer/Data Logger with 4 Accelerometer channels.
 - 8.2.1. Additional Accelerometer Channels:** Additional four (4) Accelerometer channels up to a total of eight (12). Includes Current Source.
 - 8.2.2. Additional 14 thermocouples:** Total of 16 monitored (1 dedicated plenum air, 1 specimen). Data is integrated into HanseView™ Control or Analyzer.
- 8.3. Additional Accelerometer:** Model Dytran 3030B5, 500 Grms Range with cable.
- 8.4. Additional Mounting Block:** Three axes.
- 8.5. Communication Ports:** IEEE 488 GPIB and optional Ethernet TCP/IP.
- 8.6. Vibration Fixtures:** Specially designed for HALT/HASS applications.
- 8.7. LN2 System:** Complete installation, piping and controls.
- 8.8. Stand-Alone:**
 - 8.8.1.** Temperature Cycling Chambers
 - 8.8.2.** Six- degree-of-vibration (6dof) Vibration Tables

Note: Specifications are subject to change without notice.



TOP VIEW

Keynotes

- 1A LN2 SUPPLY ENTRY
- 1B ELECTRICAL POWER ENTRY
(100 FLA @ 480V 3PH)
- 1C COMPRESSED DRY AIR
(3/4" NPT @ 100 PSIG - 34 CFM)
- 2 3/4 HP CIRCULATOR MOTOR (1)
- 3 EXHAUST PORT
(1 @ 4" DD EA)
- 4 DDR INTERLOCK SWITCH
- 5 LN2 SAFETY VALVE
- 7 VIEWING WINDOW
(2 @ 20" X 20")
- 8 PORT WITH HINGED DDR
(6" DIA.)
- 9A HIGH POWER ENCLOSURE
- 9B CONTROL ENCLOSURE
- 9C PNUMATIC ENCLOSURE
- 10 PLENUM AREA
- 11 VIBRATION TABLE
- 12 LN2 PRESSURE RELIEF VALVE
- 13 DRIP PAN
- 14 LOCKING CASTERS
- 15 WORK SPACE LIGHT
- 16 ELECTRICAL TRANSFORMER
- 17 PNUMATIC DDR CLOSER

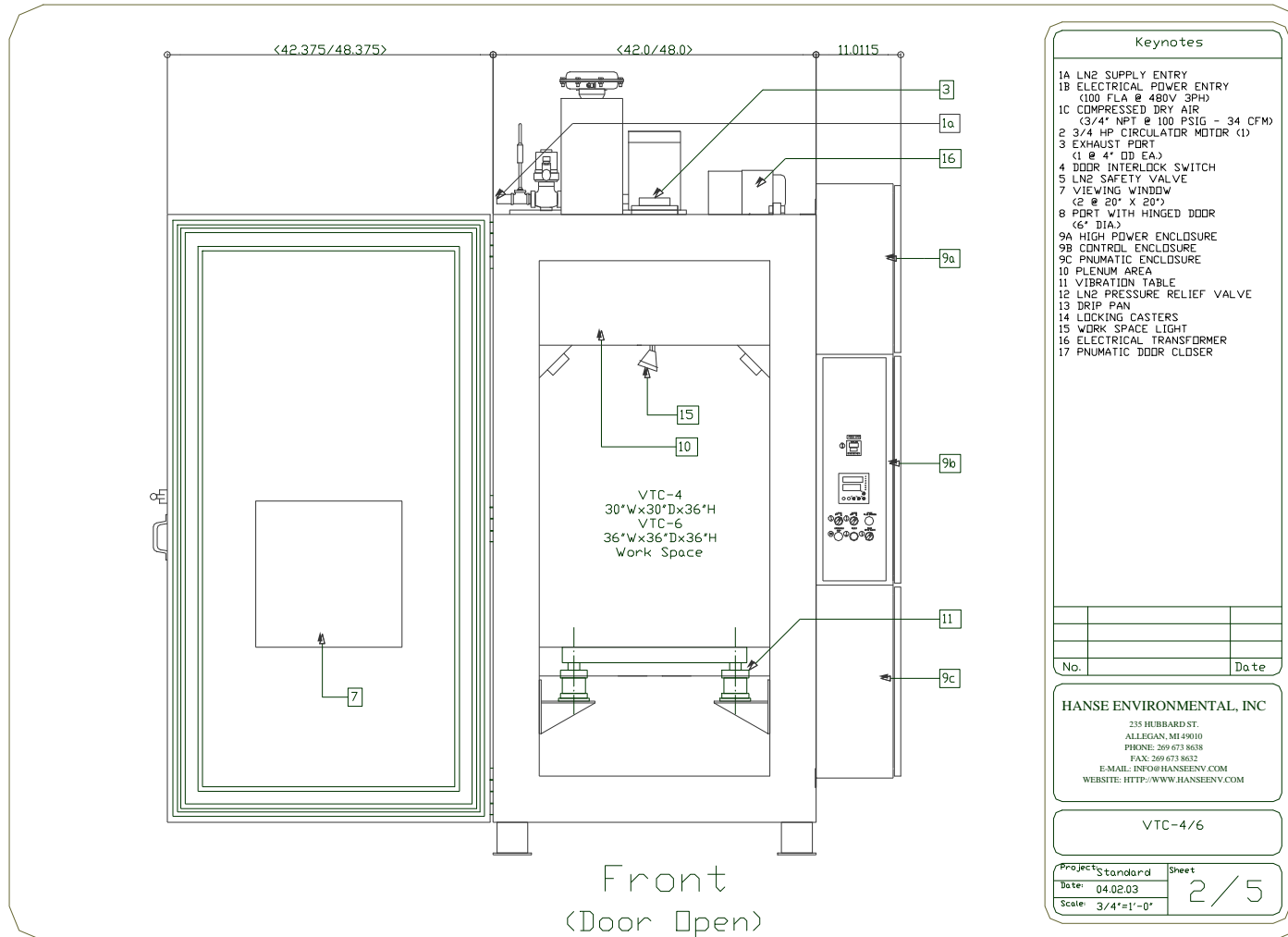
No.	Date

HANSE ENVIRONMENTAL, INC
235 HUBBARD ST.
ALLEGAN, MI 49010
PHONE: 269 673 8638
FAX: 269 673 8632
E-MAIL: INFO@HANSEENV.COM
WEBSITE: HTTP://WWW.HANSEENV.COM

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Date:	04.02.03	1 / 5
Scale:	3/4"=1'-0"	

Top View



Keynotes

- 1A LN2 SUPPLY ENTRY
- 1B ELECTRICAL PDWER ENTRY
(100 FLA @ 480V 3PH)
- 1C COMPRESSED DRY AIR
(3/4" NPT @ 100 PSIG - 34 CFM)
- 2 3/4 HP CIRCULATOR MOTOR (1)
- 3 EXHAUST PORT
(1 @ 4" DD EA)
- 4 DOOR INTERLOCK SWITCH
- 5 LN2 SAFETY VALVE
- 7 VIEWING WINDOW
(2 @ 20" X 20")
- 8 PORT WITH HINGED DOOR
(6" DIA.)
- 9A HIGH POWER ENCLOSURE
- 9B CONTROL ENCLOSURE
- 9C PNUMATIC ENCLOSURE
- 10 PLENUM AREA
- 11 VIBRATION TABLE
- 12 LN2 PRESSURE RELIEF VALVE
- 13 DRIP PAN
- 14 LOCKING CASTERS
- 15 WORK SPACE LIGHT
- 16 ELECTRICAL TRANSFORMER
- 17 PNUMATIC DOOR CLOSER

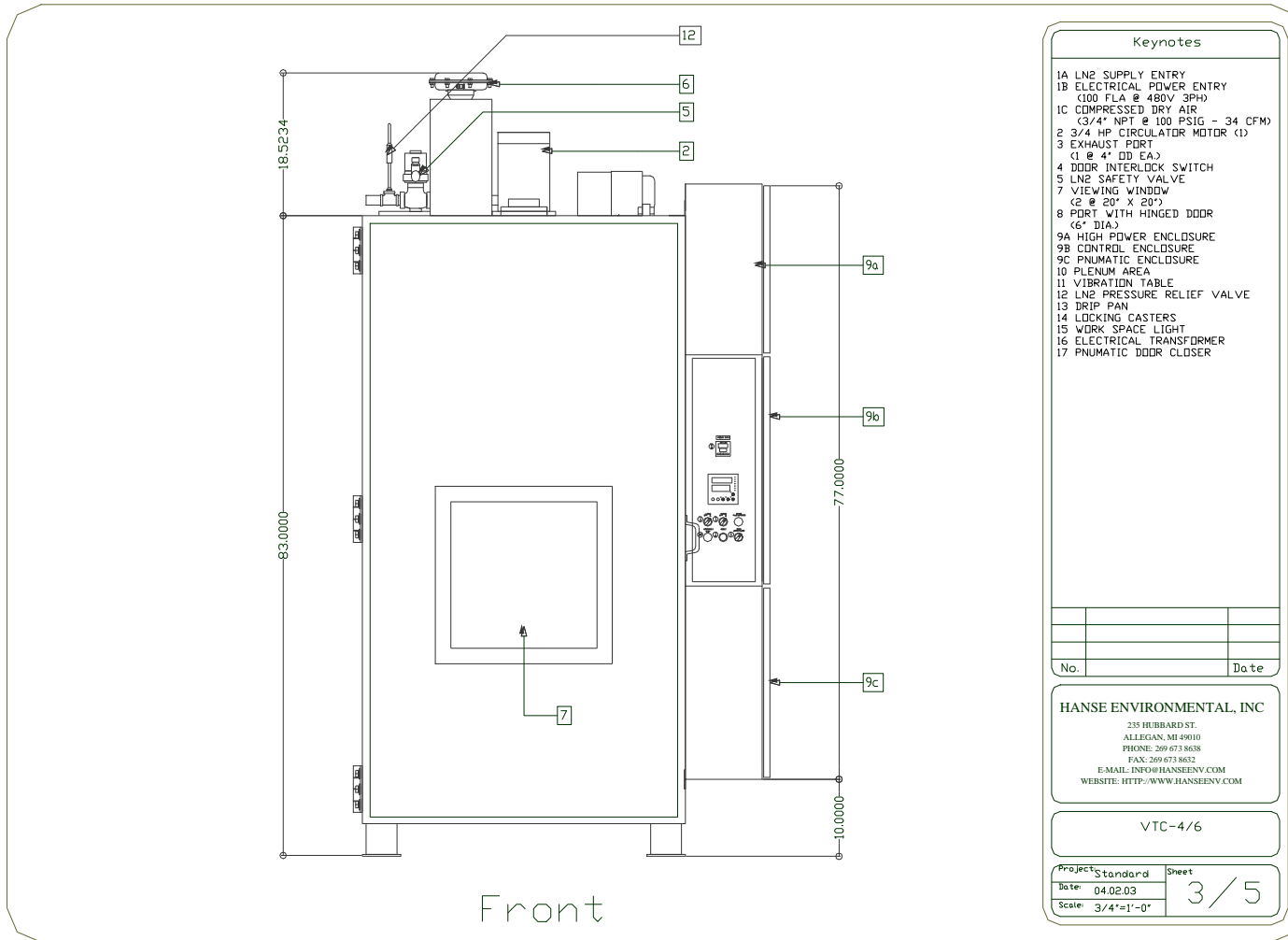
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Project Standard	Sheet
Date: 04.02.03	2 / 5
Scale: 3/4"=1'-0"	

Front View Door Open



Front

Front View

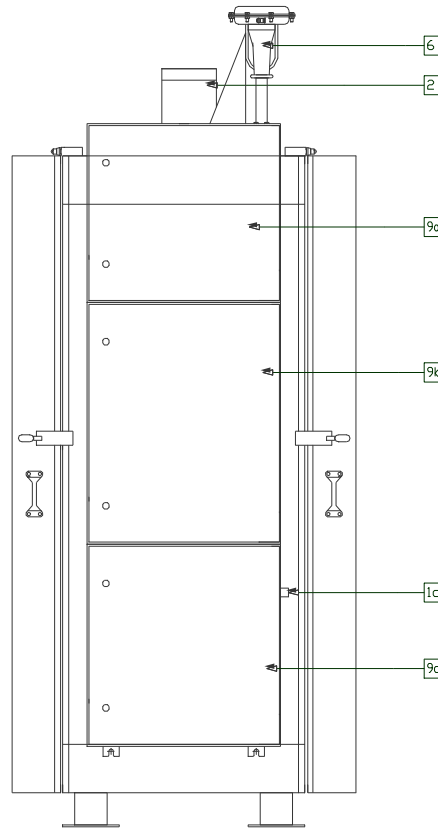
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1C	COMPRESSED DRY AIR (3/4" NPT @ 100 PSIG - 34 CFM)
2	3/4 HP CIRCULATOR MOTOR (1)
3	EXHAUST PORT (1 @ 4" DD EA)
4	DDDR INTERLOCK SWITCH
5	LN2 SAFETY VALVE
7	VIEWING WINDOW (2 @ 20" x 20")
8	PORT WITH HINGED DDOR (6" DIA)
9A	HIGH POWER ENCLOSURE
9B	CONTROL ENCLOSURE
9C	PNUMATIC ENCLOSURE
10	PLENUM AREA
11	VIBRATION TABLE
12	LN2 PRESSURE RELIEF VALVE
13	DRIP PAN
14	LOCKING CASTERS
15	WORK SPACE LIGHT
16	ELECTRICAL TRANSFORMER
17	PNUMATIC DOOR CLOSER

No.	Date

HANSE ENVIRONMENTAL, INC
 235 HUBBARD ST.
 ALLEGAN, MI 49010
 PHONE: 269.673.8638
 FAX: 269.673.8632
 E-MAIL: INFO@HANSEENV.COM
 WEBSITE: HTTP://WWW.HANSEENV.COM

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Scale:	3/4"=1'-0"	



Right View

Right View

Keynotes	
1A	LN2 SUPPLY ENTRY
1B	ELECTRICAL POWER ENTRY (100 FLA @ 480V 3PH)
1C	COMPRESSED DRY AIR (3/4" NPT @ 100 PSIG - 34 CFM)
2	3/4 HP CIRCULATOR MOTOR (1)
3	EXHAUST PORT (1 @ 4" OD EA)
4	DOOR INTERLOCK SWITCH
5	LN2 SAFETY VALVE
7	VIEWING WINDOW (2 @ 20" x 20")
8	PORT WITH HINGED DOOR (6" DIA)
9A	HIGH POWER ENCLOSURE
9B	CONTROL ENCLOSURE
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