



Chamber 1
Specification and Quotation

To

AVL List GmbH
C/O Eptek
Attn: Haibo Pan
E-mail: longcan@eptek-china.com

Thermotron Model WS-224-CHM-30-30
Solid Temperature Humidity Walk-in Test Chamber

Correspondence to:
Thermotron Industries
291 Kollen Park Drive
Holland, Michigan 49423

Remit to:
Thermotron Industries
P.O. Box 689590
Chicago, IL 60695-9590

Douglas Mahn
Sr. Applications Engineer
Phone: (616) 393-4580

April 8, 2016

Thermotron Quotation No. 414185

INTRODUCTION TO THERMOTRON

With over 50 years of experience, Thermotron is a world-class manufacturer of environmental chambers and an accomplished supplier of turn-key test systems and equipment. All our chambers build on Thermotron's reputation for long life and exceptional reliability.

With a scope of design, manufacture and service, Thermotron has established a quality management system that complies with the International Quality System Standard ISO 9001:2000. Thermotron's equipment calibration program is accredited to the International Standard ISO 17025 and the American National Standard ANSI/NCSL-Z-540-1 by A2LA.

Not only do we offer the highest quality products, we also provide ongoing support designed to keep you up and running long after the initial sale. We can provide local service with an extensive inventory of the parts you might need.

Thank you for allowing us to provide this quotation. We hope we are given the opportunity to build this system for you.

After reviewing the enclosed information, please feel free to contact us with any questions at 616.393.4580. We look forward to assisting you in the future.



WS-224-CHM-30-30 DIMENSIONS

CHAMBER VOLUME: 6.34m³ (224 cubic feet)

WORKSPACE DIMENSIONS: 2.64m (104") wide X 1.57m (62") deep X 1.52m (60") high

OVERALL EXTERIOR DIMENSIONS: 3.05m (120") wide X 4.325m (170") deep X 2.262m (89") high Includes hinged door and door latch. (8800 display will add .42m (17") to width when installed
Certain accessories may increase dimensions, contact factory if required.

WEIGHT: Estimated 4,311 kg (9,485 lbs)

WS-224-CHM-30-30 COMPONENT SIZING

DOOR: One full opening left hand hinged door

WINDOW: One 60.9m (24") W X 60.9m (24") H heated window with wiper, one in door

COOLING: (2) Water-cooled 30 horsepower rated compressors in cascade arrangement

CHAMBER HEAT: 45 kW

HUMIDITY HEAT: 9 kW

CHAMBER CIRCULATOR MOTOR: Two 3 hp

WS-224-CHM-30-30 UTILITY REQUIREMENTS

ELECTRICAL POWER:	380/3/50 *Voltage $\pm 5\%$	150 Full Load Amps (power supply must be hard wired in)
COOLING WATER:	75°F (23.9°C) 85°F (29.4°C) 2 BAR (30 PSI) minimum, 9 BAR(125 PSI) maximum	121 liters/minute (32GPM) 246 liters/minute (65 GPM)
HUMIDITY WATER:	15 LPH (4 GPH), clean, filtered 5 micron water in the range of 50,000 to 3 Meg OHMS CM	

*Dimensions and Facilities Data subject to final design and options purchased

WS-224-CHM-30-30 PERFORMANCE

TEMPERATURE RANGE:	-70°C to +177°C (-94°F to 350°F)	
HUMIDITY RANGE:	20% to 95% RH, limited by a 7°C minimum dewpoint and a maximum dry bulb temperature of +85°C.	
TEMPERATURE CHANGE RATE:	Changes in the supply air temperature as measured at the control sensor +80°C to -25°C empty chamber in 19 minutes or a 5.5°C/min average rate -40°C to -100°C empty chamber in 28 minutes or a 5.0°C/min average rate	
LIVE LOAD CAPACITY:	0°C (32°F) = 6,000w -40°C (-65°F) = 5,000w -54°C (-65°F) = 4,000w Larger live loads can be accommodated if greater than a 10°C rise in supply versus return air is acceptable	
TEMPERATURE CONTROL:	$\pm 1.1^\circ\text{C}$ from control point after stabilization at the control sensor	
HUMIDITY CONTROL:	$\pm 5\%$ RH, from control point after stabilization at the control sensor	

* Performance is based on an ambient condition of 75°F (23.9°C) and 50% RH

* Performance based on an empty chamber and measured at the supply air sensor

CONSTRUCTION

INTERIOR

- Two lights with external switch (through 8800 display)
- Reinforced welded stainless steel interior liner
- Welded stainless steel interior floor capable of supporting a 300 pound (136kg) rolling load
- Stainless steel sheet metal conditioning plenum located in the chamber back wall
- Backward inclined blowers driven from externally located motors with one-piece stainless steel shaft

EXTERIOR

- Welded steel framework construction
- Exterior painted Thermotron Blue
- 8" thick walls with "Ultra-Lite" non-settling fiberglass insulation
- Finish is water-based, air dry Thermotron Blue, sprayed over a cleaned and primed surface
- Two 150mm ports in side wall of chamber for cables
- One 25.4mm in ports side wall of chamber for UUT cooling
- One 100mm port in side wall of chamber
- Two 25.4mm ports in ceiling of chamber for AVL supplied smoke detection system
- Two 25.4mm ports in ceiling of chamber for AVL supplied gas detection system
- One 250mm air exhaust port with damper in ceiling of chamber for AVL supplied ventilation system
- One 250mm air supply port with damper in ceiling of chamber for AVL supplied ventilation system
- Two-way vent, pressure equalization to equalize interior chamber pressure

DOOR AND HARDWARE

- Hinged door provided on the front of the cabinet, allowing access to workspace
- Heavy duty door latches with inside release
- 60.9cm (24") wide X 60.9cm (24") high multi-pane heated window assembly with wiper

GENERAL

- Attached machinery section
- Refrigeration machine quiet package
- Two interior incandescent lights

ELECTRICAL

- One main power supply
- Emergency Stop Button
- Main power electrical disconnect, mounted on electrical compartment door
- All electrical components are contained in an electrical service compartment, whenever possible
- All wiring color coded and identified with numbered labels corresponding to system schematics
- Control panel wiring contained in "Panel Channel" or conduit and is easily accessible
- Circuits are protected with heat limits, fuses or circuit breakers
- System running time displayed on 8800 Programmer/Controller
- Solid state, photo-isolated, zero voltage switching control relays.
- Electrical system complies with NEC (National Electrical Code) and meets NEMA-1 (National Electrical Manufacturers Association) standards.

CONDITIONING SYSTEMS

REFRIGERATION

- A cascade non-CFC refrigeration system
- Chamber utilizes (2) 10 hp rated compressors
- Located in an attached machinery section
- Water-cooled condenser
- Designed to ASHRAE standards
- Discharge/suction pressure transducers for monitoring pressures
- Compressor discharge/suction temperature monitoring
- Insulated cascade compartment with a stainless steel drip pan (includes drain)
- Thermodynamically engineered copper cooling coils with aluminum fins

HEATING

- Nichrome open coil heating elements for faster transitions
- Proportionally controlled by solid state, photo-isolated relay
- Replaceable fusible link, mounted on the heater for positive over-temperature protection of the chamber
- Located behind baffling to prevent direct radiation to test articles in the chamber workspace

AIRFLOW

- Two (2) Blower wheels
- Externally mounted motors with a specifically designed one piece extended stainless steel shaft. Shaft design minimizes
- Bearings located outside temperature conditioned area and totally sealed and life-time lubricated with hi-temp silicone grease
- Temperature conditioning area is separated from the test space by means of a specially designed air distribution system
- Designed to minimize temperature gradients throughout the chamber test area.

HUMIDITY

- Externally located stainless steel humidity vapor generator. The generator incorporates sheath immersion heaters, automatic water supply, over-temperature and low water protection
- Sheath immersion heaters controlled by solid-state, photo-isolated, zero voltage switching control relays
- Thermo-dynamically engineered copper humidity and dehumidification cooling coils with aluminum fins located in the condition plenum
- Refrigerated humidity cooling operated by the high stage refrigeration compressor
- Electronic sensor system
- Humidity water purification system

HUMIDITY SYSTEM REQUIREMENTS

The chamber requires clean 5 micron filtered water with a specific resistance within a range of 50,000 to 3,000,000 Ohms/cm. Water outside the specified range is not acceptable and may cause system failure. Use of this water will void the humidity system warranty.

Your feed water supply must be tested before the chamber is purchased to ensure it meets the specified requirements. We recommend you contact a reputable industrial/commercial water purification company (not a residential water softener company) and install equipment in your facility to meet the chamber's requirements.

Thermotron will supply a small chamber mounted system capable of purifying low volume usage provided your feed water is at a minimum at least 3500 Ohms/cm. With proper maintenance, the chamber-mounted system will purify the feed water supply to the 50,000 to 3,000,000 Ohms/cm purity required by the chamber. **Note- a low resistance feed water supply will result in frequent cartridges changes.**

Feed water purity from city or well sources may vary seasonally or due to problems/changes in the water source. You must periodically re-check water quality and, if necessary, adjust filter and demineralizer change cycles to ensure water supplied to the chamber meets specifications at all times. Water that does not meet specifications will cause system failures and will void the warranty of the humidity system.

The window on humidity chambers may etch. This is normal occurrence. Windows are considered a consumable part; replacements are available through our parts department.

8800 PROGRAMMER CONTROLLER



With a brilliant 12" (30 cm) color touch screen display, the 8800 Programmer Controller makes operation and data collection easier and more reliable than ever before. It has a Windows look and feel to support familiar and robust operations. The 8800 is Ethernet-compatible and web-enabled with an internet-ready front end for virtual anytime/anywhere access. To increase laboratory efficiency and keep older equipment up-to-date, the 8800 Programmer Controller can be retrofitted to existing environmental chambers. With more features than any other controller, user-friendly interface, unparalleled performance and support, the 8800 is the industry's best value.

FEATURES

- Chamber Operation clearly displays helpful run-time information
- Graphing Screen offers expanded capabilities, enhanced programming and reporting
- System Status displays crucial refrigeration system parameters
- Program Entry makes it easy to load, view and edit profiles
- Set Up quick-step wizards make profile entry easy
- Pop-up Refrigeration Charts for handy reference
- Therm-Alarm® provides over & under temperature alarm protection
- Activity Log Screen provides comprehensive equipment history
- Schematic Screen displays actual system temperatures and pressure, simplifying troubleshooting and maintenance
- Web Server allows internet access to equipment via Ethernet
- User-Friendly Pop-up Key Pad makes data entry quick and easy
- Includes:
 - (4) USB Ports-(2)External & (2)Internal
 - Ethernet
 - RS-232
 - 10+ Years Data Storage
 - Product Temperature Control
 - Event Relay Board

TECHNICAL SPECIFICATIONS

- 1-4 independently programmable channels
- Measuring Accuracy: 0.25% of span typical
- Selectable °C or °F temperature scale
- 12" (30 cm) color flat panel touch screen display
- Resolution: 0.1°C, 0.1%RH,
0.01 for other linear applications
- Real time clock included
- Sample Rate: Process variable sampled
every 0.1 seconds
- Proportional Band: Programmable 1.0° to 300°
- Control Method: Digital
- Intervals: Unlimited
- Interval Resolution: 1 sec to 99 hrs,59 min
with 1 second resolution
- Operating Modes: Automatic or Manual
- Program Storage: Unlimited
- Program Loops:
 - Up to 64 loops per program
 - Loops can be repeated up to 9,999 times
 - Up to 64 nested loops are allowed per program
- Outputs:
 - Alarm: Each channel has configurable "Program Value Limits" for over/under programming protection
 - Process: Up to 16
 - System Event: 2 standard; up to 16 (optional)
 - Analog: 2 standard; up to 16 (optional)
- Inputs:
 - Analog: 4 available
 - Inputs 1 & 2: Thermocouple or RTD
 - Inputs 3-8: Thermocouple
- All thermocouples will be brought out to a terminal block for calibration purposes

OPTIONAL 8800 DATA ACQUISITION SYSTEM

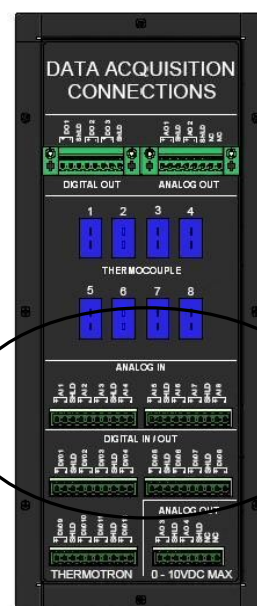
AVAILABLE IN 3 LEVELS:

- Data Acquisition Level: adds additional analog and digital input/output channels
- Thermocouple Level: adds additional thermocouples
- Data Acquisition/Thermocouple Level: provides the most complete option with additional analog and digital input/output channels and additional thermocouples

TIER 2 DATA ACQUISITION LEVEL SPECIFICATIONS

ANALOG INPUT CHANNELS:	8
ANALOG INPUT RANGE:	± 10 V single-ended
ANALOG INPUT RESOLUTION:	11 bit
ANALOG OUTPUT CHANNELS:	2
ANALOG OUTPUT RANGE:	0 – 5 V
ANALOG OUTPUT RESOLUTION:	12 bit
ANALOG OUTPUT CURRENT DRIVE:	5 mA/ ch
DIGITAL OUTPUT CHANNELS:	12
DIGITAL OUTPUT LOGIC LEVELS:	TTL
DIGITAL OUTPUT CURRENT DRIVE:	8.5 mA/ ch

*TIER 2
DATA
ACQUISITION*



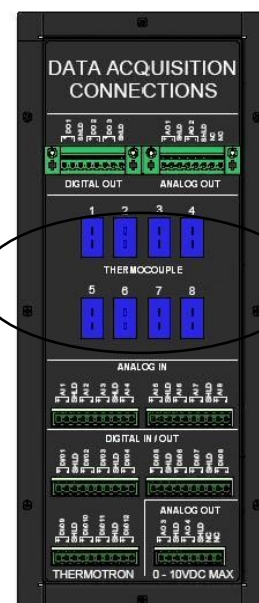
TIER 2 DATA ACQUISITION LEVEL FEATURES

- Pluggable screw terminal connections for quick and easy analog/digital wiring
- Digital outputs capable of manual or programmed profiles that activate product inputs or relays, allowing product to be turned on/off based on chamber data or status info such as operating mode, temperature or humidity
- Analog outputs capable of activating a programmable power supply, product input or retransmit temperature/humidity process to a chart recorder
- Interfaces with the 8800 controller via the DAQ tab located on the touch screen
- Monitor Channel Wizard allows for easy programming of channel information.

TIER 2 THERMOCOUPLE LEVEL SPECIFICATIONS

THERMOCOUPLE CHANNELS:	8
THERMOCOUPLE TYPE:	T
THERMOCOUPLE RANGE:	-200°C to +600°C (-328°F to +1,112°F)
THERMOCOUPLE RESOLUTION:	24 bit

*TIER 2
THERMOCOUPLE*



TIER 2 THERMOCOUPLE LEVEL FEATURES

- Standard jacks and included thermocouples provide easy set up for temperature monitoring
- Allows for monitoring up to 8 additional temperatures
- DAQ tab on the 8800 touch screen lets user individually name temperatures, view temperature trends and graphs
- Data exportable to various Microsoft software applications

GENERAL INFORMATION

SAFETY FEATURES

- Relief Valves on Refrigeration System
- Suction/ Discharge Refrigeration Pressures and Temperatures of Compressors monitored by 8800 Controller
- Inherent Overload Protection on Compressors
- Circulator-Interlock for Heaters and Refrigeration
- Factory Set High Heat Limit
- Heat-Links on Heaters
- Master Heat Contactor- Separate from control contractors
- Machinery Enclosed
- OSHA Approved Fan Guards

PRE-SHIPMENT

After completion of manufacture and prior to shipment, the complete system will be tested to ensure compliance with performance specifications, assembly drawings, and the quality control standards of Thermotron. Our customers are invited to witness the final testing of their equipment prior to shipment. Please make arrangements in advance to allow adequate time to be scheduled in the test cycle.

INSTALLATION

All facilities including but not limited to electrical power, water, drains, compressed air and exhaust to the equipment are the purchaser's responsibility. The purchaser will also be responsible for any building alterations and any rigging to the final location.

It is the responsibility of the customer to make applications, remit fees and secure any and all permits and/or approvals which are required by local, county, state or federal governments concerning the installation and/or start-up of the equipment supplied by Thermotron. Examples include but are not limited to electrical refrigeration, mechanical and building alteration permits and any necessary approvals.

MANUALS

Thermotron will supply a complete set of operation and preventative maintenance manuals. They consist of the following:

- Operation Manual
- Drawings
 - Electrical
 - Refrigeration (chamber only)
 - Cabinet Assembly
- Parts list
 - Electrical
 - Refrigeration (chamber only)
 - Cabinet
- Instrumentation Wiring Diagram
- Major Purchased Components Specifications/Literature
- Preventative Maintenance Program Registration Packet

CALIBRATION

Thermotron is an accredited provider of technical calibrations. New chamber systems receive calibrations that are accredited to the ISO 17025 and ANSI/NCSL Z-540-1 calibration standards by A2LA. New chambers are supplied with "Certificates of Calibration" and are labeled with the appropriate calibration details. This service is provided at no additional cost.

SHIPMENT

Chamber will be skidded.

PRICE SCHEDULE

Thermotron Model WS-224-CHM-30-30 Temperature/Humidity Solid Walk-In Test Chamber, including all equipment as described in preceding pages.

- | | |
|---|---|
| <ul style="list-style-type: none"> • Exterior painted Thermotron blue • Two Interior lights • 152mm (6") thick walls with "Ultra-Lite" non-settling fiberglass insulation • Stainless steel interior • Ports as follows <ul style="list-style-type: none"> ○ Two 150mm ports in side wall of chamber for cables ○ One 25.4mm in ports side wall of chamber for UUT cooling ○ One 100mm port in side wall of chamber ○ Two 25.4mm ports in ceiling of chamber for AVL supplied smoke detection system ○ Two 25.4mm ports in ceiling of chamber for AVL supplied gas detection system ○ One 250mm air exhaust port with damper in ceiling of chamber for AVL supplied ventilation system ○ One 250mm air supply port with damper in ceiling of chamber for AVL supplied ventilation system • Hinged door provided on the front of the cabinet, allowing access to workspace • One 60.9cm (24") W X 60.9cm (24") multi-pane | <ul style="list-style-type: none"> heated window assembly, located in the door • Welded stainless steel interior floor • Back wall mounted conditioning plenum • Cascade refrigeration system • Water-cooled condenser • Humidity System • Solid State Humidity Sensor • Humidity water purification system • Main power electrical disconnect switch • Nichrome heating elements • 8800 controller with 30cm touch screen interface <ul style="list-style-type: none"> ○ 10+ Years Data Storage ○ (4) USB ports ○ Ethernet interface ○ RS-323/485 interface ○ Product temperature control software ○ Paperless recording system • Product Temp Control • Therm-Alarm® • Chamber mounted instrumentation • Factory A2LA Certified Calibration (traceable to NIST) • Set of instruction manuals |
|---|---|

PRICE, FCA HOLLAND, MICHIGAN, USA

(Any applicable taxes or fees are additional)

*****The selection of some options may increase your input power requirements.**

Please consult the factory before figuring your final electrical service.***

ORDER PLACEMENT: Purchase Orders may be sent by e-mail to info@thermotron.com or by fax to 616.392.5643

LEAD TIMES: Lead times are currently estimated to be 24 weeks. The actual lead time assigned to your order will be based on a combination of your desired delivery date, factory load and complexity of equipment. Thermotron will make every attempt to meet your expectations. At order placement, please consult with your Sales Representative and/or Applications Engineer for an accurate lead time.

SHIPMENT METHOD: Equipment will be shipped by ocean-container.

FCA point of Holland, Michigan USA must be on purchase order unless previous arrangements have been made.

VALIDATION PERIOD: This proposal is valid for a period of 30 days, unless otherwise stated from date quoted.

NOTICE:

It is the customer's responsibility to provide over/under temperature limit protection for products being tested. The Thermotron Therm-Alarm® over/under temperature alarm can assist in the temperature protection of products under test. Heat generated by products under test must also be interrupted during chamber off modes or serious damage could result. Contact your sales person for specific safety suggestions

It is Thermotron's understanding that the quoted unit will be used in a non-hazardous process. The unit is not designed for use with or for the purpose of processing hazardous materials. If hazardous materials are involved, please contact the factory for an alternative quote for a properly designed unit. Any applications involving open transmission fluids, oils, etc. need to be examined by the applications group for suitable protection.

OPTIONAL ACCESSORIES

Tier 2 Options (Select only one)

- ◆ **Data Acquisition (DAQ) Level**
8 analog input, 2 analog output, and 12 digital input/output channels. Note: Analog inputs are designed to be used with grounded instruments or isolated outputs.
- ◆ **(8) Thermocouple Level**
8 “T” type thermocouples. **Note:** Measurement Accuracy $\pm 1.717^{\circ}\text{C}$ below 0°C , $\pm .713^{\circ}\text{C}$ above 0°C .
- ◆ **(16) Thermocouple Level**
16 “T” type thermocouples. **Note:** Measurement Accuracy $\pm 1.717^{\circ}\text{C}$ below 0°C , $\pm .713^{\circ}\text{C}$ above 0°C .
- ◆ **Combination Data Acquisition/(8)Thermocouple**.....
Both the Data Acquisition Level and the (8) Thermocouple Level. **See above notes.**

***For further information, please refer to full 8800 description in your quotation.

ADDITIONAL FOUR EVENT RELAY BOARD

Up to 12 relays possible

COMPUTER INTERFACE

Your chamber will include Ethernet and RS-232 as standard equipment.

Optional GPIB/IEEE-488 converter

DRY AIR PURGE, A-6

For reduced moisture operation at low temperature, dew points to -40°F (Lower dew point dryer available, but will reduce flow to chamber. Contact factory for details). Customer to supply plant air, air supply $\frac{1}{4}$ " NPT, 120 PSI (8.2 BAR) maximum, 90 PSI (6.2 BAR) minimum at 1,671 liters/minute.

PORTS,

All ports are nominal size (not exact), constructed of stainless steel, heliarc welded to interior liner. Interior dimensions may be slightly smaller than stated. Price includes plug. Available in following sizes:

7.5cm (3") diameter

10cm (4") diameter

12.5cm (5") diameter

15cm (6") diameter

20cm (8") diameter

1.22m (48") RAMP.....

ADDITIONAL INCANDESCENT LIGHTS, EACH (Two Included).....

PROVISIONS OF SALE

REMIT FUNDS TO: **CHECKS BY US MAIL ONLY:** **CHECKS BY COURIER ONLY:**

Thermotron Industries J.P. Morgan Chase
P.O. Box 689590 131 South Dearborn
Chicago, IL 60695-9590 Floor 6
Chicago, IL 60603
ATTN: Thermotron Industries LBX 689590

PAYMENT TERMS: **50% with order and 50% Secured Prior to Shipment by either Prepayment or Letter of Credit**
(Must appear on the purchase order to process order)
(Subject to credit approval)

SHIPMENT PAYMENT: Collect
(Must appear on the purchase order to process order)

AUTHORIZING
SIGNATURE: *(Must appear on the purchase order to process order)*

PATENTS: Products relating to this quotation may be covered under one or more of the following U.S. patents:
5,268,637; 5,485,078; 5,631,429; 5,804,732; 5,851,790; 5,976,871; 6,044,709; 6,189,329; 6,367,340;
6,446,508; 6,499,307; 6,714,419; 6,976,340; 6,984,974; 7,252,586; 7,784,349;
Canadian Patent No. 2125669; European Patent No. 0609402; Philippines Patent No. 1-1998-00090
Korean Patent No. 10-0680608; Other patents pending.

FUNDS: US DOLLARS

**TERM AND CONDITIONS OF INTERNATIONAL SALES
LETTER OF CREDIT POLICIES AND PROCEDURES**

All international shipments of products manufactured by Thermotron Industries will be sold under the following terms and conditions unless other arrangements have been negotiated in advance with the Credit Manager. ***All stipulations below MUST be clearly stated in a conspicuous place in the body of the letter of credit.***

Beneficiary: Thermotron Industries
291 Kollen Park Drive
Holland, MI, 49423, USA

Place of Expiry: Holland, MI, USA, (In Beneficiaries Country)

Date of Expiry: 60 Days after estimated ship date (See next page)

Drafts: At Sight for 100% of Invoice Value

Currency: US Dollars

Available by: Any Bank – By Negotiation

On Board Holland, MI

IncoTerms: A) FCA Holland, MI, USA “Freight Collect”
B) Port of Loading – Freight Collect - MUST use Thermotron’s Forwarder
C) CIF Port of Entry – MUST use Thermotron’s Forwarder.

Transshipment: Yes

Shipment consigned to: To Order of Applicants BANK only. Do not consign to applicant.

Latest Ship Date: 30 Days after confirmed manufacturing completion date

Documents Supplied for IncoTerms:

A) FCA Holland, MI – Freight Collect

- (Buyers Freight Forwarder Accepted)
- Commercial Invoice/100% of value
- Packing List
- Cargo or Delivery Receipt

B) Port of Loading – Freight Collect

- (Thermotron Freight Forwarder Required)
- Commercial Invoice/100% of value
- Packing List

- Original Airway Bill or Full Set of clean Ocean Bills of Lading
-3 signed copies consigned only "To Order of the Bank"

C) CIF Port of Entry

- (Thermotron Freight Forwarder **Required**)
- Commercial Invoice/100% of value
- Packing List
- Original Airway Bill or Full Set of clean Ocean Bills of Lading
-3 signed copies consigned only "To Order of the Bank"

Confirm or Advise Through:

Fifth Third Bank
Trade Service
5050 Kingsley Drive
MD 1MOCBR
Cincinnati, OH 45263
SWIFT: FTBCUS3C
Telex: 214567

PRE-LETTER OF CREDIT APPROVAL BY THE CREDIT DEPARTMENT:

Prior to issuing a Letter of Credit, a specimen (example) needs to be sent to Thermotron Industries Credit Department for review and approval. Pre-Letter of Credit approval by Thermotron will help reduce discrepancies, bank fees and shipping delays. All letters of credit, wire transfers, or other arrangements must be approved by Thermotron's Credit Department. All inquiries should be address to Credit Manager:

Thermotron Industries
291 Kollen Park Drive
Holland, MI 49423 USA

PH: 1-616-392-1491 X 650
FX: 1-616-393-4652
E-Mail: Credit@thermotron.com

BANK FEES:

All expenses generated outside of the United States of America will be the responsibility of the customer (APPLICANT) through the issuing Bank in the country of origin. Each Letter of Credit must read ***“All Bank charges, discounts and acceptance fees are for the account of the applicant”***. **We will only pay for the charges of one bank in the United States of America. That is the only bank charges we will accept.**

DATES REQUIRED:

The following dates must be adhered to avoid discrepancies and additional costs to our customer:

Letter of Credit ISSUE DATE: The letter of credit must be opened/issued 45 days prior to the scheduled completion date for the equipment for Standard Units and Prior to Start of Manufacture for Custom Designs.

Expected SHIPPING DATE: The shipping date must be at least 30 days after the scheduled completion date for the equipment

PORT DATE: The port date must be at least 30 days subsequent to the 'shipping date' mentioned above. (60 days total per page 1)

EXPIRY DATE (period for presentation of documents): The expiry date for the negotiation through the advising Bank must be a least 21 days subsequent to the PORT DATE.

FORWARDING AGENT FEES:

All forwarding agent fees will be the responsibility of the Applicant/Customer.

INCOTERMS:

All transactions will be quoted FCA, Holland, MI USA. Incoterm must be stated clearly and if other than FCA Holland, MI, USA, must state port or airport and means of transportation desired. **LC terms and conditions must conform to the selcted IncoTerm on the purchase order.**

FREIGHT:

All ocean and air freight will be shipped "FREIGHT COLLECT".

Specified Freight Forwarders or Inland Carriers as a term on the LC are prohibited and will be rejected. Customers preference for Freight Forwarder should ONLY be included on the purchase order or separate correspondence.

INSURANCE:

Insurance, if needed: (1) Original Certificate of Insurance only.

EXPORT CRATING:

All shipments sent ocean freight require an export crate. Shipments sent air freight do not require export crating, however, a special crate may be ordered if the customer desires additional product protection.

Do not specify a forwarder in the Letter of Credit. We will use the forwarder you specify in your e-mails, if they are US Licensed Forwarder or NVOCC or you can use Thermotron's Forwarders. For any IncoTerm other than FCA, Holland, MI, USA, **you must use Thermotron's forwarder.**

We will not supply either original documents or copies of original documents directly to the applicant. They must obtain them from their bank upon presentation of the letter of credit.

LEGALIZATION:

Consulate legalization are not available.

PENALTY CLAUSES:

Penalty for late shipment clauses will generally not be accepted.

PERFORMANCE BOND:

Performance bond requirements will generally not be accepted. All performance acceptance is at Thermotron prior to shipment.

TERMS AND CONDITIONS OF SALE

THERMOTRON INDUSTRIES

A VENTUREDYNE LTD COMPANY

1. ACCEPTANCE, GOVERNING PROVISIONS AND CANCELLATION. This writing constitutes the complete and exclusive statement of the terms and conditions of sale of the products and/or services described herein, and Seller's obligation to sell is expressly conditioned upon assent to these terms and conditions. Buyer will be deemed to have assented to these terms and conditions unless Seller receives written notice of any objection within 5 days of the date Buyer receives this writing. No additional or different specifications will be binding upon Seller unless specifically agreed to in writing; failure of Seller to object to provisions contained in any purchase order or other communication from the Buyer shall not be construed as a waiver of these terms and conditions nor an acceptance of any such provisions. No order accepted by Seller may be cancelled or altered by the Buyer except upon terms and conditions acceptable to Seller, as evidenced by Seller's written consent. In the event of such an approved cancellation by Buyer, Seller shall be entitled to payment for all finished and in-process goods, as well as any costs incurred in the preparation of Buyer's order to the date of cancellation.

2. DELIVERY, CLAIMS AND DELAYS. Delivery of products to a carrier at Seller's plant or other loading point shall constitute delivery to Buyer; and regardless of shipping terms or freight payment, all risk of loss or damage in transit shall be borne by Buyer. Seller reserves the right to make delivery in installments; unless otherwise expressly stipulated herein, all such installments to be separately invoiced and paid for when due per invoice, without regard to subsequent deliveries. Delay in delivery of any installment shall not relieve Buyer of his obligations to accept remaining deliveries. Further, use of the products by the Buyer shall constitute a waiver of any claim for delay.

Claims for shortages or other errors in delivery must be made in writing to Seller within 10 days after receipt of shipment and failure to give such notice shall constitute unqualified acceptance and a waiver of all such claims by Buyer. Claims for loss or damage to products in transit should be made to the carrier and not to Seller.

Seller shall not be liable for any damage as a result of any delay due to any factor or event beyond Seller's reasonable control, including, without limitation, an act of God, act of the Buyer, terrorism, embargo or other governmental act, regulation or request, fire, accident, strike, slowdown, a war, riot, delay in transportation, inability to obtain necessary labor, materials or manufacturing facilities. All such factors and/or events shall extend the delivery date for a period equivalent to the time lost by reason of such factors and/or event, plus thirty (30) days.

3. CHANGES. Seller may at any time make such changes in design and construction of products as shall constitute an improvement in the judgment of Seller. Seller may furnish suitable substitutes for materials unobtainable because of priorities or regulations established by governmental authority or nonavailability of materials from suppliers.

4. PAYMENT. Unless otherwise expressly stated on the face hereof, all prices are subject to change without notice; and the price of products on order but unshipped will be adjusted to the price in effect at the time of shipment. Products are sold F.C.A. Seller's plant unless otherwise stated.

Invoices are due and payable within thirty (30) days of date of invoice ("due date") unless otherwise expressly indicated, and a late payment charge of one and one-half percent (1½%) per month will be added to any invoiced amounts unpaid when due if not prohibited by law, otherwise at the highest lawful contract rate. Buyer shall reimburse Seller, upon demand, for any costs of collection incurred by Seller, including reasonable attorney's fees. Invoices may be submitted as partial shipments are made. If during the period of the contract the financial condition of Buyer does not justify the terms of payment specified, Seller may demand full or partial payment in advance before proceeding with the contract. If shipment is delayed beyond the scheduled date by Buyer, payment shall be due in full when Seller is prepared to make the shipment. If Buyer defaults in any payment when due, then the whole contract price shall immediately become due and payable upon demand, or Seller, at its option without prejudice to other lawful remedies, may defer delivery or cancel this contract.

5. SECURITY INTEREST. Buyer hereby grants to Seller a security interest in the products and the proceeds thereof, to secure payment of all sums to become due the Seller's hereunder, and any other indebtedness owing at any time by Buyer to Seller. The Seller shall have, upon a default in payment, all of the rights and remedies of a secured party under the Uniform Commercial Code. Buyer shall execute and deliver upon Seller's request financing statements to perfect the security interest, and Buyer shall take such further action as shall be necessary or desirable to preserve and protect Seller's security interest.

6. TAXES AND OTHER CHARGES. Any manufacturer's tax, retailer's occupation tax, use tax, sales tax, excise tax, duty, custom, inspection or testing fee, or any other tax, fee or charge of any nature whatsoever imposed by any governmental authority, on or measured by the transaction between Seller and Buyer shall be paid by the Buyer in addition to the price quoted or invoiced. In the event the Seller is required to pay any such tax, fee or charge, Buyer shall reimburse Seller therefore; or, in lieu of such payment, Buyer shall provide Seller at the time the order is submitted with an exemption certificate or other document acceptable to the authority imposing the same.

7. WARRANTIES. Seller warrants products manufactured by it and supplied hereunder to be free from defects in materials and workmanship under normal use and proper maintenance for a period of twelve months from the date of shipment. If within such period any such products shall be proved to Seller's reasonable satisfaction to be defective, such products shall be repaired or replaced at Seller's option. Seller shall be responsible for labor charges in connection with repair or replacement for only a period of 120 days from date of shipment or 90 days from date of installation whichever occurs first, and only for repair or replacement within the continental United States and Canada; all other labor charges shall be billed to Buyer at Seller's then prevailing rates, including travel and lodging expenses. Seller's obligation and Buyer's exclusive remedy hereunder shall be limited to such repair and replacement and shall be conditioned upon Seller's receiving written notice of any alleged defect no later than 10 days after its discovery within the warranty period, and at Seller's option, the return of such products to Seller when such return is feasible. Seller reserves the right to satisfy its warranty obligation in full by reimbursing Buyer for all payments it makes hereunder, and Buyer shall thereupon return the products to Seller. The foregoing warranty is not applicable to (i) accessories and components not manufactured by Seller, which are warranted only to the extent, if any, of the manufacturer's warranty for such accessories and components (but the warranty term for any such warranty shall be the expiration date of such warranty, or twelve months from the date of shipment, whichever is the first to occur), (ii) failures or problems resulting from Buyer's supplied water, (iii) shipping or other damage, or (iv) with respect to the labor portion of the warranty for products sold as replacement parts. Seller shall have the right to remedy such defects. Seller shall be responsible for freight charges for replacement parts only if shipped within the continental United States or Canada, and then only if shipped within 120 days from the date of shipment of such products, or 90 days from the date of installation, whichever occurs first.

THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER EXPRESS AND IMPLIED WARRANTIES (EXCEPT OF TITLE) INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, PERFORMANCE, OR OTHERWISE, and in no event shall the Seller be liable for claims (based upon breach of express or implied warranty, negligence, product liability, or otherwise) for any other damages, whether direct, immediate, incidental, fore-seeable, consequential, or special.

8. NON-LIABILITY FOR DAMAGED APPARATUS. Seller will not be responsible or liable for any damage resulting from improper storage or handling prior to placing the products in service and will not assume any responsibility, expense or liability for repairs made outside its works without proper written consent.

9. PATENTS. Seller will, at its own expense, defend any suits that may be instituted by anyone against Buyer for alleged infringement of any United States patent relating to any products furnished by Seller hereunder, if such alleged infringement consists of the use of such products, or parts thereof, in Buyer's business for any of the purposes for which the same were sold, and provided Buyer shall have made all payments then due hereunder and shall give to Seller immediate notice in writing of any claim of infringement and of the institution of any such suit and transmit to Seller immediately upon receipt all processes and papers served upon Buyer and permit Seller through its counsel, either in the name of the Buyer or in the name of Seller, to defend the same and give all needed information, assistance and authority to enable Seller to do so. In case of a final award of damages in such suit Seller will pay such award but will not be responsible for any compromise made without its written consent. In addition to the foregoing, if at any time Seller determines that there is a substantial question of infringement or in the case any such product is judicially held to constitute infringement and the use of such product is enjoined, Seller may, at its expense, either procure for Buyer the right to continue using the product, or replace the product with non-infringing apparatus, or modify it so that it becomes non-infringing, or remove the product and refund the purchase price and the transportation and installation costs thereof. In no case, shall Seller pay any recovery based on Buyer's savings or profit through the use of the product, whether the use be special or ordinary.

The foregoing states the entire liability of Seller for patent infringement and in no event shall Seller be liable if the infringement is based on the use of the product for a purpose other than that for which sold by Seller. As to any products furnished by Seller to Buyer manufactured in accordance with designs proposed by Buyer, Buyer shall indemnify Seller against any award made against Seller for any patent, trademark or copyright infringement.

10. CONSEQUENTIAL DAMAGES; INDEMNITY. SELLER SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL OR CONTINGENT DAMAGES WHATSOEVER.

Buyer shall indemnify the Seller against any and all losses, damages and expenses (including attorneys' fees and other costs of defending any action) that it may sustain or incur as a result of any claim or negligence, breach of implied warranty, strict liability in tort, or similar claims by Buyer, its successors' and assigns and its customers whether direct or indirect, in connection with the use of products furnished hereunder, including, without limitation, such as may be caused by the negligence of the Seller.

11. SHIPPING WEIGHT. Seller shall not be responsible for the accuracy of shipping weight. Such weights are correct only within the limits necessary for estimating freight. For foreign shipments 20% should be added to approximate shipping weight.

12. STORAGE. If the products are not collected within 15 days after notification to Buyer that they are ready for shipping, for any reason beyond Seller's reasonable control, including Buyer's failure to give shipping instructions, Seller may store such products at Buyer's risk in a warehouse or yard or upon Seller's premises, and Buyer shall pay all handling, transportation and storage costs at the prevailing commercial rate upon submission of invoices therefor.

13. TECHNICAL INFORMATION. Any sketches, models or samples submitted by Seller shall remain the property of Seller, and shall be treated as confidential information unless the Seller has in writing indicated a contrary intent. No use or disclosure of such sketches, models and samples, or any design or production techniques revealed thereby, shall be made without the express written consent of the Seller.