

TS120 Vertical Thermal Shock Test Chamber



FEATURES

Cabinet Items

- Outside chamber color: gray white (RAL 9002)
- Stainless steel interior walls
- Stainless steel transfer basket
- One (1) stainless steel shelf with 8mm mesh, height adjustable
- One (1) full opening locking front door for hot zone of chamber, left-hand hinged
- One (1) window in door
- Traveling port, travels with basket
- Six (6) levelling feet
- Electric basket transfer system with safety interlocks and guards

Electrical Items

- Power Requirements: 480V-60Hz, 3/PE
- ETL (UL STD 508A) approved main power panel
- Halogen interior light with protective cover in hot zone
- Main power disconnect switch
- Door safety limit switches, one (1) per door to prevent basket movement when door is opened

Instrument Items

- Weiss Technik SIMPAC® controller with 8" (203mm) touchscreen
- Normal Mode, Time Optimized Mode, and Energy Savings Mode
- Ethernet Interface and USB Data Logging Ports
- Temperature control via moveable sensor in the transfer basket
- Digitally adjustable high temperature / low temperature fuse in specimen basket

Refrigeration Items

- Reciprocating cascade machinery module with a water-cooled condenser, utilizing environmentally-conscious refrigerants (R-449A / R-23)
- R-449A Low GWP refrigerant, meets EU Reg. No. 517/2014 requirements, reduces CO2 equivalent emissions by ~65% compared to R-404A
- Integrated compensation system to enable continuous running for 1000+ cycles without defrosting

Other

- Installation drawings and operator maintenance manuals (electronic copies)

Specifications

DIMENSIONAL DATA

Test Space Volume:	4.4 ft ³	(125L)
Test Space Dimensions: (clear usable workspace)	18.5 " width	(470mm)
	25.6 " depth	(650mm)
	16.1 " height	(409mm)
Overall Dimensions: (approximate)	38.25 " width	(972mm)
	92.5 " depth	(2350mm)
	96.5 " height	(2451mm)
Window:	14 " width	(356mm)
	14 " height	(356mm)
Traveling Port:	3 " ID	(76mm)
Maximum Basket Capacity: (customer is responsible for securing load)	110 lbs	(50kg)
Maximum Shelf Capacity: (up to 5 shelves can be ordered)	8.8 lbs	(4kg)
Chamber Weight: (approximate)	2200 lbs	(1000kg)

NOTE 1: All dimensions are nominal and may not include ancillary equipment attached to chamber as required.

NOTE 2: In the constant effort to improve our product Weiss Technik reserves the right to make construction or design changes without notice or obligation.

Specifications

PERFORMANCE DATA - TEMPERATURE

Temperature Range:

-80°C to +70°C (cold zone)
+50°C to +220°C (hot zone)

Basket Transfer Speed:

10 seconds or less

Temperature Fluctuation:

±0.3°C to ±1.0°C
measured at control sensor between -40°C to +85°C after stabilization

Temperature Homogeneity:

±0.5°C to ±2.0°C
between -65°C to +200°C after stabilization

Zone:

Hot Zone Heat Up:
Cold Zone Cool Down:
Cold Zone Heat Up:

Temperature Ramp Rates

14°C/minute
6.3°C/minute
3.0°C/minute

*Note: Measured at control sensor in an empty chamber
per IEC 60068-3-5*

Specification: MIL-STD 883J 1010.8:

Test Condition D (+200°C to -65°C)

Recovery Time

15 minutes

Weight of Product

26.4lbs (12kg),
distributed over 3 shelves,
measurement in specimen

Test Standards Met:

DIN 40 046, page 14, test Na
IEC-60068-2-14, Test Na, transfer time < 10 seconds
MIL-STD 810E, method 503
MIL-STD 883J, method 1010.8, tests A, B, C, D, F
JEDEC standard JESD 22-A1068

NOTE 1: Test conditions according to MIL-STD 883J 1010.8, product weight is calculated with circuit boards. Weight of aluminum, steel, or plastic products will vary.
NOTE 2: Performance is based at 60Hz, operation at 50Hz will be reduced by approximately 5%
NOTE 3: Above performances are based on laboratory conditions at +24°C, with cooling water inlet temperature and flow rate according to requirements.
NOTE 4: For extended low temperature operations, please inform your sales representative.
NOTE 5: Control sensor is located in supply air unless otherwise noted.
NOTE 6: Optional items may impact chamber performance.
NOTE 7: Gradient testing (if specified above) is done at +85°C and -40°C; if gradients are required at any other temperatures, please consult your sales representative.
NOTE 8: The test standards require that the specimen mass and surface area are within the scope of the power capacity of the testing device.
NOTE 9: Optional equipment may be necessary for unusually rigorous test requirements.
NOTE 10: The test standards given are neither binding nor complete, and are cited without liability.
NOTE 11: Factory calibrated values are -40°C in the cold zone and +125°C in the hot zone.

Specifications

FACILITIES & UTILITIES DATA

Heat of Rejection:
(into surrounding air)

Maximum 0.8kW

Note: Heat of rejection is based on an ambient temperature of +25°C, without specimen, additional equipment, or heat compensation.

Heat of Rejection:
(into cooling water)

Maximum 15kW

Note: Heat of rejection is based on an ambient temperature of +25°C, without specimen, additional equipment, or heat compensation.

Energy Consumption:

Approx. 200kW/24hr

Note: Applicable for tests according to MIL-STD 883J, method 1010.8, test B with 26.4lbs (12kg) of ICs with a 30 minute cycle time.

Ambient Operating Conditions:

+10°C to +35°C, maximum 75%RH

Note: The chamber should be protected against direct sunlight and is not to be installed next to heat sources.

Maximum Storage Temperature:

+55°C

Noise Level:

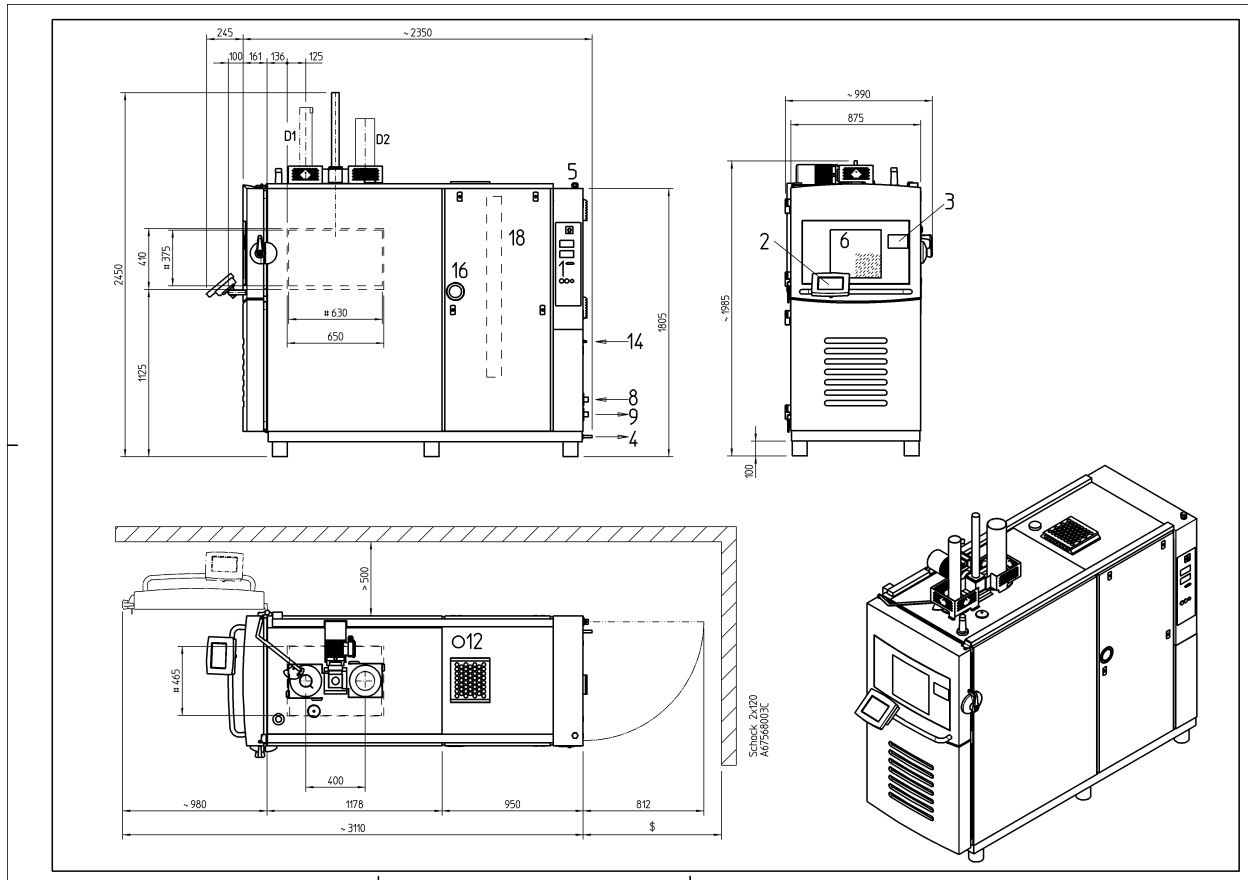
Approx. 58dBA @ 5ft height and 3ft distance (1525mm height and 914mm distance) in front of chamber

Drainage:

½" (12mm) hose connection, back pressure-free

Specifications

GENERAL ARRANGEMENT (DIMENSIONS IN MM)



- D1 Entry port installed in basic design Ø 80 mm in ceiling (stainless steel pipe)
- D2 Further entry port in the ceiling Ø 125 mm (option)
- 1 Main switch panel
- 2 Control unit >Colour Touch Panel<
- 3 Controlpad*
- 4 Connection for test space drain
- 5 Electrical connection, cable length approx. 3.5m
- 6 Door with window
- 8 Cooling water inlet (option)
- 9 Cooling water outlet (option)
- 12 Pressure compensation opening LN₂ (option)
- 14 Connection for compressed air / nitrogen inerting (GN₂)
- 16 LN₂ connection (option)
- 18 Expansion bag
- \$ Safety clearance according to IEC 60364-729 (VDE 0100 Part 729)
- ~ Overall dimensions

Specifications



SIMPAC is a self-monitoring, digital, 32-bit measuring and control system designed especially for use in environmental test systems. Thanks to its computing efficiency, SIMPAC excels in process technology requirements. Input is facilitated by the included color touch panel.

SIMPAC handles all functions necessary for control and programming. In addition to temperature and humidity control, it contains an efficient Software PLC which coordinates and monitors all functions and provides information on operating failures.

Touch Panel	auto dimming, LED display of operation status (red/green)
Program memory	100 programs maximum
Program controller	start parameters for programs: immediate, delayed, real time, pause
PID controller	special control algorithms defined according to test tasks
Segments	100 per/program maximum
Program cycles/ Loops	9999 maximum/ (250 nested)
Switch outputs (digital)	4 (potential-free contacts)
Password protection	two levels, to prevent accidental settings
Limit value monitoring system	for temperature and humidity
Diagnostic system	for information on operating times and possible operating failures
Serial interface (Option)	for connection to a host computer system (e.g., notebook operating panel or optional S!MPATI* software) or for 3 rd -party networking
TCP/IP Ethernet interface	for communication via optional S!MPATI* software
Multi-Languages Display	10 languages (selectable) including English, Chinese, German, French, Italian, Korean, Russian, Polish, Czech and Spanish



REMOTE ACCESS SOFTWARE (OPTIONAL)

- Control test profiles
- Store and display measured data
- Create test programs via graphics editor
- Network up to 99 chambers
- Connect to other measuring devices
- Capture irregularities and possible malfunctions during a test
- Print out captured data in graph form
- Copy captured data for evaluation in other programs
- Calculate gradients of process variables and test in a coherent, clear, and concise manner
- Navigate through different user levels
- Analyze with illustrative graphics and calculating options
- Operate remotely via an internet-connected PC, laptop or smart device
- Compatible with Windows 7 and above
- Includes license for operation of one (1) unit

The delivery of software is subject to the following terms of a license:

1. **RIGHT OF USE:** *The purchase of any software does not imply ownership of the same. You only acquire a non-exclusive right of use for an unlimited period of time. You are not allowed to copy the software or documentation, except for data back-up, or to pass it onto a third party. We are solely entitled to all rights, particularly copyrights for the software and the documentation. The source code is not included in our scope of supply.*
2. **WARRANTY:** *Twelve months starting from the date of delivery. We guarantee that the software does not contain any reproducible errors. Inform us immediately about any software defects. We do not give any warranty for fulfillment of the software as regards to any special requirements you may have.*
3. **NON-LIABILITY:** *We are not liable for any non-reproducible faults, damages resulting from the latter, or any other claims-particularly regarding consequential damages resulting from the delivered software.*
4. **SUPPORT:** *Included with the software license are two (2) hours of training for up to four (4) customer personnel. The training will consist of hardwiring one chamber and review of the basic functions of the SIMPATI operation by a qualified Weiss-Technik service team-member. Training must be conducted at the time of start-up of the chamber. The customer is responsible for loading software on their own PC prior to start-up and any IT support required outside of the chamber.*



VISUAL DOCUMENTATION SYSTEM (OPTIONAL)

Test items placed in our environmental test systems are subjected to thermal and mechanical stress during test sequences. The recorded visual damage and the collected data allow for valuable conclusions to be drawn regarding the test material and its properties. Sometimes the exact timing of a material change can be difficult to define, but this problem can be solved with our visual documentation system, S!MPATI TimeLabs.

S!MPATI TimeLabs

- Add-on to S!MPATI software.
- Camera package available.
- View the test subject during the test phase.
- New and unique in-application flexibility.
- Data-protected documentation of test sequences adds security to your production.
- Easy installation and operation.
- Simultaneous documentation of images and measured data.
- Up to 1,500 images can be stored in each archive and file.
- Compatible with up to six (6) HD-quality cameras.
- Thermal-imaging cameras can be jointly operated.
- Upgradeable even in existing systems.
- Internal and external installation of camera possible at any time.

Never miss a moment

Digital camera images are generated by the TimeLabs software at set intervals and filed in a general archives folder, correlating with the capture of traditional measured data. A combined analysis of measured data and images brings new and valuable findings to light, especially about when a specific event has occurred.

Individual setup

It does not matter what type of camera the images come from or by what interface they reach the computer. Whether smart phone, laptop camera, endoscope, microscope, webcam or thermal imaging camera – all digital and even analogue cameras can be used to capture measured data.

S!MPATI TimeLabs documents the following:

Electronics

- Functional impairments
- LED/LCD display reactions

Thawing

- Surface condensation
- Moisture build up

Mechanics/motion

- Fan standstill
- Flap operation
- Valve operation

Corrosion

- Process progress

Liquid level

- Changes to fill level

Temperature

- Progress

And Much More . . .

CHAMBER OPTIONS

Wire mesh shelf made of stainless steel, mesh width 3 mm for 120 l

Ordering code: 64568911

For placing the test specimens, further wire mesh shelves can be inserted. Max. load per shelf 4 kg. Max. 5 wire mesh shelves are possible.

Insert shelf made of stainless steel (closed surface)

Ordering code: 64568912

For placing of heavy test specimens an insert shelf made of stainless sheet steel can be used, max. load 20 kg.

GN2 / Compressed air connection

Ordering code: 64624956

For operation with an on-site compressed air dryer or for the insert of an inert gas into the warm and cold chamber.

The function can be activated/ deactivated via the colour touch-panel or the software S!MPATI®. The installation room has to be well ventilated during operation of GN2.

Danger of suffocation.

To be customer-provided on site:

- connection with quick coupler DN 7.2
- GN2/compressed air connection with 6 to 12 bar g
- firm contamination according to class 2: max. particle size 1 µm
- compressed gas temperature +2 °C to +50 °C
- total oil content (liquid & gaseous) = 0.01 mg/m³
- compressed air quality according to ISO 8573-1

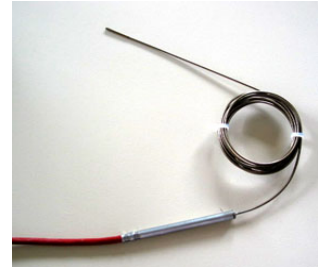
Temperature measuring at the test specimen

Ordering code: 64571930

Additional movable temperature measurement sensor Pt 100 with flexible cable for temperature measurement in the cradle or at the test specimens. The measured values can be called up via the interfaces or displayed at the operating panel.

Up to 5 measuring sensors are possible, however for more than one sensor the optional accessory "Analogue transducer card I/O", ordering code 64624932 is necessary.

The sensors are placed into the cradle through the access port.



Analogue transducer card I/O I

Ordering code: 64571932

For processing and output of analogue measuring signals 5 outputs 0 to 10 V and 4 inputs for Pt 100 are available. Outputs are accessible via D-sub miniature-sockets, inputs via plugs/sockets. The transducer card performs output of 5 analogue signals on printer and operation of 4 free measuring sensors.

Insulation voltage of inputs against earth is 1000 V-DC.

Note:

Temperature shock test chambers, 5 analog outputs actual values temperature hot chamber, cold chamber, cradle sensor, test specimen sensor, one free temperature measuring sensor.

Variable transfer time ("soft shock") /P

Ordering code: 64571958

In the standard model, the transfer time of the cradle (alternating between hot and cold chamber) about 10 seconds.

A variable transfer time has the advantage that the stress can be dosed for the test specimen.

This is then important when the chambers will be used for screening applications. Often, the perfect stress has to be determined first.

This option makes it easier for the user to determine the perfect stress condition.

Function:

The cradle has five stages between the hot/cold chamber.

The dwell time at each stop can be varied within limits of 3 seconds to 120 seconds.

The function can be activated through a digital channel on the touch panel.

Temperature extension in the hot chamber to +250 °C

Ordering code: 64571959

Due to the strong thermal stress of the chamber a regular inspection with the necessary service is required.

Flexible operation at programme BREAK

Ordering code: 64624945

Function for flexible operation of the test cabinet during interruption of programme.

Digital switch channels can be switched off or on. Nominal values can be changed.

If the programme is continued, the changed conditions are reset.

Specifications

CABINET DESIGN

Internal Liner

The chamber liner is constructed of stainless steel. All chamber liner seams are heliarc welded to minimize moisture and air penetration in to the chamber during low temperatures. Support pieces are welded to the outside of the liner for rigidity. Liners are designed with expansion joints, where required, to allow for thermal expansion during temperature cycling operation.

The basket, protected by removeable grids, is raised and lowered by an electric ball screw spindle drive. The basket has fittings for inserting shelves.

Exterior Materials

The cabinet frame construction is of structural steel covered with sheet metal panels. Access panels are provided, where appropriate, for servicing the components and sub-systems of the chamber. The standard exterior finish of a Weiss-Technik chamber is a corrosion resistant cream colored paint. Other choices of color are available.



Door and Hardware

A full opening, left-hand hinged hot zone door is provided on the chamber. The hinges and door latches are heavy duty. When open, full access to the chamber workspace is provided. The cold zone can be accessed via the service door, but is typically only used for maintenance.

Gaskets

All doors use a continuous double gasket to assure a moisture tight seal. All gasket materials are silicone.

Access Port

The primary access port is a travelling port that travels with the basket.

Interior Light

An interior light, controlled from an external source, is provided for customer convenience.

Viewing Window

A heated multi-pane viewing window is provided in the hot zone door. The window is constructed with desiccant filled separator frames to insure continued dryness between the panes.



Customer Facility

Customer is responsible to ensure floor is level to within ± 0.25 " per 10 feet (± 6.35 mm per 3.05m) in order for the chamber to be installed properly.

Note: Weiss Technik's equipment is not designed nor built to be silicone free. If this is a requirement, please notify your sale representative, as additional costs and changes to standard design practices will be needed.

ELECTRICAL DESIGN

Electrical Power System

The electrical system is designed to operate on one primary power source. Preliminary current requirements and minimum service sizes are contained in the utilities section of this proposal. Detailed utility data will be provided with acceptance documentation. Please verify utility requirements with Weiss-Technik Engineering Department prior to installation.

Electrical Standards Compliance

The electrical system is designed to comply with NEMA 1, NEC, and UL508A standards. CE is available upon request. The electric panel and operating panel are both IP54 rated.

Back Panel

All electrical components are pre-wired on an electrical insert panel. All control wires are connected to the control terminal strip on the electrical panel. No control wiring is connected directly from one component to another. All components are connected to the terminal strip. All wiring is color coded and numbered with labels. All wiring is routed in panel channel for ease of future modification.

Function Switches

Manual function switches with identifying labels are provided.

Electrical Heaters

Open coil, Nichrome heating elements with ceramic insulators are provided. Heater frames are constructed of stainless steel. The heaters are located behind baffling to prevent direct heat radiation into the test space. Fusible heat links are incorporated as standard for additional protection.

REFRIGERATION DESIGN

For applications with temperatures to -35°C (-31°F), a single-stage, one compressor, refrigeration system is utilized. For applications with temperatures to -73°C (-100°F), a cascade, two compressors, refrigeration system is utilized. Commercial type semi-hermetic reciprocating compressors are provided, which are readily available from either Weiss Technik or your local refrigeration wholesaler. The system is designed with a water-cooled condenser as standard and a remote or local air-cooled condenser is available as an option.

A refrigerant injection system is used to maintain suction temperatures compatible with compressor design which insures long compressor life. The refrigeration bypass system works in conjunction with the injection system to maintain a positive suction pressure.

The cooling coils are constructed of dehydrated refrigeration copper tubing with thermo-dynamically engineered aluminum fins, providing maximum thermal capacity per cubic foot of circulated air.

All soldered connections are made with silphos or silver solder; no soft solder is used. To insure a clean system, a gaseous nitrogen purge is utilized during the soldering process. This eliminates all contaminants that are normally found in a system after manufacturing is completed.

Where needed, "vibrasorb" clamps are used to minimize vibration problems. All refrigeration compartments are manufactured with a stainless steel floor pan. There is a drain routed to the compressor drip pan to remove condensation in the machine compartment. Refrigeration lines that may collect moisture through condensation are insulated to eliminate water problems.

The following features are standard:

- ASME Certified Vapor Tank and Condenser
- Oil Separator on both stages (if applicable)
- High/Low Pressure Transducers / Switches
- Oil Pressure Transducers / Switches
- Liquid Line Dryers/Sight-glass on High Stage System
- Automatic Water Regulating Valves
- Solder in place components to minimize flare joints
- "Environmentally Conscious" Refrigerant
 - R-449A, used in single stage refrigeration
 - R-449A and R-508B or R-23, used in cascade refrigeration
 - **Do not** contain CFCs (chlorofluorocarbon)
 - SDS (Safety Data Sheets) are available upon request

Low Global Warming Potential Refrigerants

“Because Environmental Testing should not harm our Environment”

Weiss Technik is the first test chamber manufacturer to offer Low Global Warming Potential (GWP) refrigerants as a widespread testing solution for the North American market.

R-404A and similar hydrofluorocarbons (HFCs) have been determined to have high GWP values, and international agreements such as European Union Regulation No. 517/2014 (F-Gas) and the Montreal Protocol aim to phase down these compounds, which is why users need an alternative.

Weiss Technik offers R-449A as a low GWP option for new test chamber inquiries and R-452A as a low GWP drop-in replacement for existing test chambers.

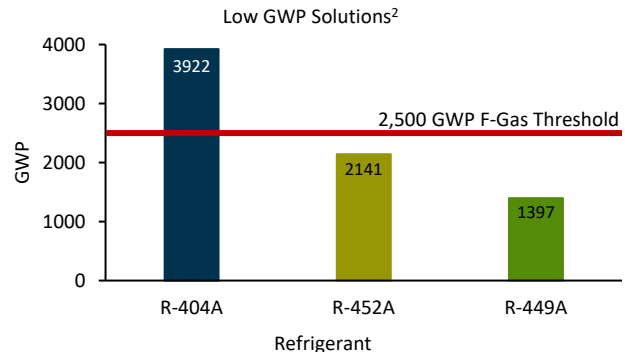
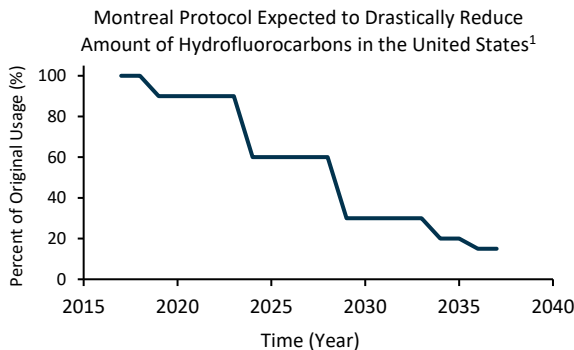
R-449A can reduce CO₂ equivalent emissions by ~65% with its 1,397 GWP value (compared to 3,922 for R-404A)

R-449A is also available with LEEF Technology. Please contact your sales representative for more information.



Customer Benefits

- R-449A avoids expected price increases and availability issues associated with R-404A
- Solutions are available for both existing and new test chambers
- R-449A provides the same performance and reliability as R-404A
- Supports low carbon footprint initiatives for intracompany policies



1) http://www.epa.gov/sites/production/files/2016-11/documents/newberg_kigaliamend_122016.pdf

2) http://www.ecr-nederland.nl/files/documentatie_tecumseh_guidelines_r449a_r452a_gb.pdf

SAFETY DEVICES

Cabinet

- On chambers large enough to walk in to, a primary door release will be provided on the inside of the chamber. This will override the chamber door latched, even when locked.

Electrical

- Inherent overload protection of each compressor is included.
- A master heat contactor in the electrical circuit provides protection against burned contacts or a faulty instrument. This contactor will be de-energized if any normal safety device opens.
- The circulators and heaters are interlocked. If the circulator switch is off, or if a limit is tripped, the heating and cooling systems will become inoperative.
- A non-adjustable high temperature switch de-energizes the chamber heaters if maximum design operating temperature is exceeded. This switch operates a master heat power contactor which cycles only with the limit switch, minimizing the possibility of burned closed contacts. The heater element assembly is equipped with high temperature fusible links as an additional safeguard against overheating.

Refrigeration

- With the use of high/low pressure sensors, the controller monitors the refrigeration system and compressors. If the refrigeration system begins running in a manner that might be harmful to the compressors, the system will go in to an alarmed state and require attention.
- There is a high pressure relief valve in the refrigeration system. If the system pressure exceeds 400 PSIG, this valve will relieve the system.
- The compressor head fans are guarded, this provides protection from moving components if maintenance panels are removed during operation of chamber.

WARNING!

Do NOT place flammable, explosive, or thermally-reactive substances or devices inside the test chamber!

WARNING!

Do NOT place substances that can give off toxic gases when heated inside the test chamber!

WARNING!

**This chamber is NOT designed for live subjects (human, animal, etc.)
NOR for perishable items (food, medicines, etc.).
Never place any of these inside the test chamber!**

Note: If these substances or items are to be tested, notify your sales representative prior to quotation. Weiss Technik North America is not liable wholly or in-part for damages to, or caused by, items placed inside the chamber.

MANUFACTURING & DELIVERY PROCESS

Pre-Shipment Test

Prior to shipment, and when appropriate, based on chamber design, all chambers are tested to assure compliance to the purchase specification. This test data is available to the customer upon request.

Final Design Drawings (custom chambers only)

After receipt of the purchase order, a design drawing will be sent to the customer prior to manufacturing. This drawing will contain all final chamber dimensions, all port locations and purchased accessories. Drawing approval must be sent to Weiss Technik Engineering Department before production of the chamber. Any changes made to the design drawing might result to additional cost or delay in delivery.

Electronic Manual

Electrical, Refrigeration and Assembly drawings are included in the chamber at shipment. An electronic equipment manual is e-mailed to the buyer and/or technical contact and includes, at a minimum, the following:

- Overall assembly drawing
- Electrical and refrigeration schematic
- Recommended spare parts list
- Test data and calibration certificate
- Material safety data sheets
- Start up and operation guides, with troubleshooting and maintenance guides

Instrument manuals and additional literature can be downloaded from our website, <http://www.weiss-na.com/>

STANDARD INSTALLATION AND/OR START-UP (if applicable)

Weiss Technik NA is responsible for the following:

- Full time, on-site project supervisor
- Daily clean-up of job site and trash removal to customer-supplied dumpster
- A \$2,000,000 liability insurance policy and required worker's compensation insurance
- Provide layout drawings for the test chamber
- All labor and hand tools to set up and/or install the test chamber and associated peripherals
- Interconnect, leak-check, evacuate, charge the refrigeration system, and terminate the electrical/control system among the following as applicable:
 - Roll-up machinery package
 - Remote instrument console
 - Remote machinery package
 - Instrument enclosure
 - Remote air-cooled condenser
 - Test chamber
- Installation and start-up of the chamber will consist of the WNA Site Validation Test Profiles and verifying that all items listed on the signed Order Acknowledgment are delivered. Any additional required testing must be noted in the Customer Acceptance Test requirement form at time of order placement.
- Coordinate basic training, function, and any software integration of equipment (maximum of 4 hours at time of commissioning). Any additional training or re-training that is needed can be quoted upon request. If a subsequent trip is required to complete the training, additional charges will apply.

Customer is responsible for the following:

- Off-loading of all shipped equipment from the freight carrier and rigging to final location prior to service engineer arrival
- Obtaining building permits, licenses, inspections, and paying fees required by government entities
- Ensuring the floor is level to within $\pm 0.25"$ per 10 feet ($\pm 6.35\text{mm}$ per 3.05m) in order for the chamber to be installed properly
- Providing labor, material, and tools for installation and final connection to the following main utilities as applicable:
 - Main electrical power
 - Process cooling water
 - Water for humidity system
 - Compressed air
 - Condensate drain(s)
 - Necessary venting/exhaust
 - Electrical power for receptacles
 - Electrical power for chamber emergency lighting

Specifications

- Providing access to a dumpster to facilitate trash removal from job site
- Performing any building modifications, including any roof and/or wall penetrations, as well as the final sealing of those penetrations
- Weiss Technik NA service personnel are non-union; if there is a union conflict, Weiss Technik NA will renegotiate the existing installation agreement and customer may be responsible for additional costs
- Any delays or work stoppages that occur due to the customer or facility may result in additional costs
- Any parts or interconnect materials exceeding the amount specified in the quotation will have an additional cost, and the customer will be responsible to reimburse Weiss Technik NA accordingly

Additional Notes:

- Installation and/or start-up must take place within 1 year of shipment
- Standard working hours of our service engineers are Monday through Friday from 8am to 5pm. If work needs to be performed after standard working hours, additional charges will apply
- Installation and/or start-up must be completed in one trip, unless quoted and noted otherwise
- If a subsequent trip is required to complete the work, due to negligence of the customer (i.e. utilities not prepared, facilities not ready, chamber not situated, etc.) then additional charges will apply
- If a subsequent trip is required due to chamber malfunction, there will be no additional charges

CALIBRATION

Weiss Technik is an A2LA (ISO/IEC17025) accredited calibration laboratory.

If calibrations are required on-site, please consult Weiss Technik or our sales representative for pricing. Your company may require an on-site calibration before your new chamber can be put into use.

If additional calibrations are a requirement for your company, Weiss Technik would be pleased to provide a quotation for the calibration service(s) during the start-up and/or installation, or at a later time. Several different levels of calibration are available to you as described below:



- On-site electronic instrument calibration as performed at the factory.
- Complete chamber calibration with a single point or with multiple test points within the workspace upon request.
- Electronic humidity sensor calibration. This would be performed in accordance with the manufacturer's calibration procedure.
- If you have a specific calibration requirement that is a part of your internal procedures, Weiss Technik would be pleased to evaluate your specific needs, calibration procedures, references and provide the necessary calibration service too.



QUALITY CONTROL

Since 1994, Weiss Technik North America is an ISO 9001: 2015 and ISO 17025/A2LA certified company; and takes pride in the quality of our products, manufacturing process, and employee involvement. Our products undergo a rigorous inspection from incoming materials through assembly, calibration, final product testing, and approval; this is coupled with industry standard defect-tracking and root-cause analysis. Weiss Technik has a committed Lean culture to show Continuous Improvement within our organization, and we improve efficiency and reduce waste through analytical and creative ways in every area. We strive to be the premier supplier of environmental test chambers in the world, and exceed our customers' expectations in technical knowledge, professional expertise and service performance.

Customer Service is our highest priority.



LIMITED WARRANTY - CONTIGUOUS UNITED STATES

The seller, Weiss Technik North America, Inc. (“WNA”), warrants to the buyer identified in the WNA Order Acknowledgement (the “**Buyer**”) that the equipment and materials manufactured under this contract (“**Equipment and/or Materials**”) shall be in accordance with the WNA Order Acknowledgement. If any part of the Equipment and/or Materials is determined by WNA, after timely notice from the Buyer, to be not in accordance with the WNA Order Acknowledgement (a “**Nonconforming Good**”), then subject to the limitations, exceptions and/or conditions set forth herein, the limited warranty (the “**Limited Warranty**”) described below is applicable.

LIMITED WARRANTY

The Limited Warranty period begins with the date of shipment of the Equipment and/or Materials. The Limited Warranty expires 12 months after shipment, but such time frame is superseded by the alternative period provided for in the WNA Order Acknowledgement, if any. As a precondition to any recovery under this Limited Warranty, Buyer must notify WNA within 30 days of determining (or within 30 days of when such determination reasonably should have been made) that the Equipment and/or Materials constitute Nonconforming Goods. If a claim is timely made, WNA will exchange and install replacement Equipment and/or Materials for the Nonconforming Good without charge, during normal business hours. Normal business hours are Monday through Friday from 8am to 5pm. If work needs to be performed after standard working hours, additional charges will apply. If WNA’s labor is not required, then WNA will furnish replacement Equipment and/or Materials for the Nonconforming Good, F.O.B. Weiss Technik North America, Inc., Grand Rapids, Michigan. All shipping charges, taxes and fees are the responsibility of the Buyer. If the Nonconforming Good must be returned, a Return Authorization document will be issued and must accompany the Nonconforming Good to receive full credit.

LIMITATION OF LIABILITY/EXCLUSIVE REMEDY

The Limited Warranty set forth above is the Buyer’s exclusive remedy for any claim relating to the Equipment and/or Materials. WNA shall not be liable to the Buyer or any other person or entity for damages of any kind relating to the Equipment and/or Materials, including, without limitation, direct, indirect, special, incidental, consequential or punitive damages, lost business and/or lost profits, whether such damages are direct or indirect, or in connection with the use or inability to use the Equipment and/or Materials for any purpose whatsoever, irrespective of whether the claims or actions for such damages are based upon contract, tort, negligence, strict liability, warranty or otherwise.

EXCEPTIONS TO LIMITED WARRANTY – CONTIGUOUS UNITED STATES

The following are exceptions to the Limited Warranty:

- Refrigerants are not warranted - no warranties are extended by the manufacturers; therefore, no warranty is extended by WNA. The customer is responsible for recycling, reclamation and/or disposal of any refrigerant gases, including any additional fees.
- The Limited Warranty is void if WNA has not received full payment for the Equipment and/or Materials.
- The Limited Warranty is only valid if all service and preventive maintenance on the Equipment and/or Materials is performed by WNA service personnel or their authorized representatives.
- The Limited Warranty is void if installations, start-ups (commissioning), moves, modifications and/or repairs have been carried out on the Equipment and/or Materials by persons or organizations without the written authorization of WNA.
- The Limited Warranty is void if any replacement parts from vendors other than WNA have been used on or with the Equipment and/or Materials without the written authorization of WNA.

DISCLAIMER OF WARRANTIES

EXCEPT AS EXPRESSLY SET FORTH HEREIN, WNA DISCLAIMS ALL WARRANTIES IN CONNECTION WITH THE EQUIPMENT AND/OR MATERIALS, EXPRESS OR IMPLIED, AS TO ANY MATTER WHATSOEVER, INCLUDING WITHOUT LIMITATION DESCRIPTION, QUALITY, DESIGN, PERFORMANCE, SPECIFICATIONS, CONDITION, MERCHANTABILITY, AND FITNESS FOR ANY PARTICULAR PURPOSE. NO PERSON IS AUTHORIZED BY WNA TO MAKE WARRANTIES OR ASSUME ANY LIABILITY FOR WNA WITH RESPECT TO THE EQUIPMENT AND/OR MATERIALS. ORAL STATEMENTS DO NOT CONSTITUTE WARRANTIES AND SHALL NOT BE RELIED ON BY THE BUYER AND ARE NOT PART OF THIS AGREEMENT. WNA'S WARRANTY OBLIGATIONS AND THE BUYER'S REMEDY ARE SOLELY AS STATED IN THIS AGREEMENT.

LIMITED WARRANTY – INTERNATIONAL (EXCEPT CANADA & MEXICO)

The seller, Weiss Technik North America, Inc. (“WNA”), warrants to the buyer identified in the WNA Order Acknowledgement (the “**Buyer**”) that the equipment and materials manufactured under this contract (“**Equipment and/or Materials**”) shall be in accordance with the WNA Order Acknowledgement. If any part of the Equipment and/or Materials is determined by WNA, after timely notice from the Buyer, to be not in accordance with the WNA Order Acknowledgement (a “**Nonconforming Good**”), then subject to the limitations, exceptions and/or conditions set forth herein, the limited warranty (the “**Limited Warranty**”) described below is applicable.

LIMITED WARRANTY

The Limited Warranty period begins with the date of shipment of the Equipment and/or Materials. The Limited Warranty expires 15 months after shipment, but such time frame is superseded by the alternative period provided for in the WNA Order Acknowledgement, if any. As a precondition to any recovery under this Limited Warranty, Buyer must notify WNA within 30 days of determining (or within 30 days of when such determination reasonably should have been made) that the Equipment and/or Materials constitute Nonconforming Goods. If a claim is timely made, WNA will furnish replacement Equipment and/or Materials for the Nonconforming Good EXW (Incoterms 2010) Weiss Technik North America, Inc., Grand Rapids, Michigan. All shipping charges, taxes and fees are the responsibility of the Buyer. If the Nonconforming Good must be returned, a Return Authorization document will be issued and must accompany the Nonconforming Good to receive full credit.

LIMITATION OF LIABILITY/EXCLUSIVE REMEDY

The Limited Warranty set forth above is the Buyer’s exclusive remedy for any claim relating to the Equipment and/or Materials. WNA shall not be liable to the Buyer or any other person or entity for damages of any kind relating to the Equipment and/or Materials, including, without limitation, direct, indirect, special, incidental, consequential or punitive damages, lost business and/or lost profits, whether such damages are direct or indirect, or in connection with the use or inability to use the Equipment and/or Materials for any purpose whatsoever, irrespective of whether the claims or actions for such damages are based upon contract, tort, negligence, strict liability, warranty or otherwise.

EXCEPTIONS TO LIMITED WARRANTY – INTERNATIONAL (EXCEPT CANADA & MEXICO)

The following are exceptions to the Limited Warranty:

- Refrigerants are not warranted - no warranties are extended by the manufacturers; therefore, no warranty is extended by WNA. The customer is responsible for recycling, reclamation and/or disposal of any refrigerant gases, including any additional fees.
- The Limited Warranty is void if WNA has not received full payment for the Equipment and/or Materials.
- The Limited Warranty is only valid if all service and preventive maintenance on the Equipment and/or Materials is performed by WNA service personnel or their authorized representatives.
- The Limited Warranty is void if installations, start-ups (commissioning), moves, modifications and/or repairs have been carried out on the Equipment and/or Materials by persons or organizations without the written authorization of WNA.
- The Limited Warranty is void if any replacement parts from vendors other than WNA have been used on or with the Equipment and/or Materials without the written authorization of WNA.

DISCLAIMER OF WARRANTIES

EXCEPT AS EXPRESSLY SET FORTH HEREIN, WNA DISCLAIMS ALL WARRANTIES IN CONNECTION WITH THE EQUIPMENT AND/OR MATERIALS, EXPRESS OR IMPLIED, AS TO ANY MATTER WHATSOEVER, INCLUDING WITHOUT LIMITATION DESCRIPTION, QUALITY, DESIGN, PERFORMANCE, SPECIFICATIONS, CONDITION, MERCHANTABILITY, AND FITNESS FOR ANY PARTICULAR PURPOSE. NO PERSON IS AUTHORIZED BY WNA TO MAKE WARRANTIES OR ASSUME ANY LIABILITY FOR WNA WITH RESPECT TO THE EQUIPMENT AND/OR MATERIALS. ORAL STATEMENTS DO NOT CONSTITUTE WARRANTIES AND SHALL NOT BE RELIED ON BY THE BUYER AND ARE NOT PART OF THIS AGREEMENT. WNA'S WARRANTY OBLIGATIONS AND THE BUYER'S REMEDY ARE SOLELY AS STATED IN THIS AGREEMENT.

LIMITED WARRANTY NON-CONTIGUOUS UNITED STATES, CANADA & MEXICO

The seller, Weiss Technik North America, Inc. (“WNA”), warrants to the buyer identified in the WNA Order Acknowledgement (the “**Buyer**”) that the equipment and materials manufactured under this contract (“**Equipment and/or Materials**”) shall be in accordance with the WNA Order Acknowledgement. If any part of the Equipment and/or Materials is determined by WNA, after timely notice from the Buyer, to be not in accordance with the WNA Order Acknowledgement (a “**Nonconforming Good**”), then subject to the limitations, exceptions and/or conditions set forth herein, the limited warranty (the “**Limited Warranty**”) described below is applicable.

LIMITED WARRANTY

The Limited Warranty period begins with the date of shipment of the Equipment and/or Materials. The Limited Warranty expires 12 months after shipment, but such time frame is superseded by the alternative period provided for in the WNA Order Acknowledgement, if any. As a precondition to any recovery under this Limited Warranty, Buyer must notify WNA within 30 days of determining (or within 30 days of when such determination reasonably should have been made) that the Equipment and/or Materials constitute Nonconforming Goods. If a claim is timely made, WNA will furnish replacement Equipment and/or Materials for the Nonconforming Good EXW (Incoterms 2010) Weiss Technik North America, Inc., Grand Rapids, Michigan. All shipping charges, taxes and fees are the responsibility of the Buyer. If the Nonconforming Good must be returned, a Return Authorization document will be issued and must accompany the Nonconforming Good to receive full credit.

LIMITATION OF LIABILITY/EXCLUSIVE REMEDY

The Limited Warranty set forth above is the Buyer’s exclusive remedy for any claim relating to the Equipment and/or Materials. WNA shall not be liable to the Buyer or any other person or entity for damages of any kind relating to the Equipment and/or Materials, including, without limitation, direct, indirect, special, incidental, consequential or punitive damages, lost business and/or lost profits, whether such damages are direct or indirect, or in connection with the use or inability to use the Equipment and/or Materials for any purpose whatsoever, irrespective of whether the claims or actions for such damages are based upon contract, tort, negligence, strict liability, warranty or otherwise.

EXCEPTIONS TO LIMITED WARRANTY NON-CONTIGUOUS UNITED STATES, CANADA & MEXICO

The following are exceptions to the Limited Warranty:

- Refrigerants are not warranted - no warranties are extended by the manufacturers; therefore, no warranty is extended by WNA. The customer is responsible for recycling, reclamation and/or disposal of any refrigerant gases, including any additional fees.
- The Limited Warranty is void if WNA has not received full payment for the Equipment and/or Materials.
- The Limited Warranty is only valid if all service and preventive maintenance on the Equipment and/or Materials is performed by WNA service personnel or their authorized representatives.
- The Limited Warranty is void if installations, start-ups (commissioning), moves, modifications and/or repairs have been carried out on the Equipment and/or Materials by persons or organizations without the written authorization of WNA.
- The Limited Warranty is void if any replacement parts from vendors other than WNA have been used on or with the Equipment and/or Materials without the written authorization of WNA.

DISCLAIMER OF WARRANTIES

EXCEPT AS EXPRESSLY SET FORTH HEREIN, WNA DISCLAIMS ALL WARRANTIES IN CONNECTION WITH THE EQUIPMENT AND/OR MATERIALS, EXPRESS OR IMPLIED, AS TO ANY MATTER WHATSOEVER, INCLUDING WITHOUT LIMITATION DESCRIPTION, QUALITY, DESIGN, PERFORMANCE, SPECIFICATIONS, CONDITION, MERCHANTABILITY, AND FITNESS FOR ANY PARTICULAR PURPOSE. NO PERSON IS AUTHORIZED BY WNA TO MAKE WARRANTIES OR ASSUME ANY LIABILITY FOR WNA WITH RESPECT TO THE EQUIPMENT AND/OR MATERIALS. ORAL STATEMENTS DO NOT CONSTITUTE WARRANTIES AND SHALL NOT BE RELIED ON BY THE BUYER AND ARE NOT PART OF THIS AGREEMENT. WNA'S WARRANTY OBLIGATIONS AND THE BUYER'S REMEDY ARE SOLELY AS STATED IN THIS AGREEMENT.