TILT II & QUICK-CHECK®

TRANSFORMER & CAPACITOR TESTERS

WITH AUTOMATIC SELF TEST

Operating & Instruction Manual

HDE®
GREENLEE®

TILT II & QUICK-CHECK

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WITH AUTOMATIC SELF TEST

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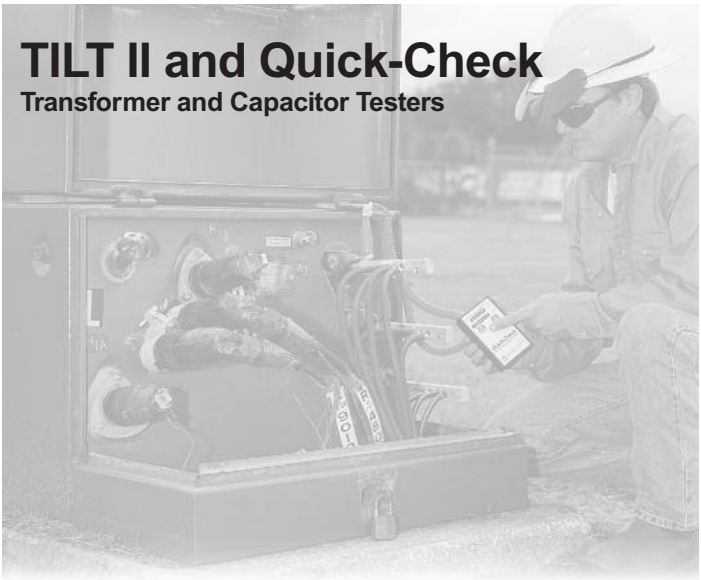


TILT II and Quick-Check

Transformer and Capacitor Testers

IMPORTANT SAFETY INFORMATION

WARNING: The TILT II and Quick-Check Transformer and Capacitor Testers should be used only on equipment known to be deenergized and/or discharged.

CAUTION: Use on the secondary side of transformers may generate high voltages on the primary side. Stay clear of all primary connections while testing.

The Quick-Check Transformer and Capacitor Testers will not leave a significant charge on a capacitor.

OPERATIONAL IMPAIRMENT: If the Testers are used in a manner not described in this instruction manual, the protection and effective operation of this equipment may be impaired.

INTRODUCTION

The TILT II and Quick-Check Transformer and Capacitor Testers are versatile tools for quick and easy checks of transformers and the connections made to them. The Quick-Check Transformer and Capacitor Tester also tests power capacitors and capacitor banks. The transformer connections can include bundled secondaries or a cable run from the transformer to the meter.

In the field, the testers are used to test the primary and secondary sides of new or reworked, single or three phase transformer installations. The Quick-Check Transformer and Capacitor Tester also tests capacitor banks for short or open circuits prior to energizing.

In the shop the testers are used for quick screening of incoming and outgoing transformers (including their internal fuses and breakers). The Quick-Check Transformer and Capacitor Tester also tests capacitors for both shorts or opens. Both testers test 1Ø and 3Ø transformers including PT's and other instrument transformers, and the Quick-Check Transformer and Capacitor Tester tests power capacitors in almost any size.

HOW THEY WORK

The Testers are used in the field for testing connected transformers, their connected primary and secondary leads and the Quick-Check Transformer and Capacitor Tester for power capacitors, individually or in banks, for both shorts or opens. Unlike a simple ohmmeter, the Testers use a high frequency, low voltage signal to measure transformer winding inductance (and power capacitor capacitance) and they can differentiate true shorts from other low resistance windings or connected equipment such as meters. **NOTE:** The TILT II and Quick-Check Transformer and Capacitor Testers will not detect a partially shorted transformer coil or an improper transformer ratio. They will not detect a capacitor with a partial short or open.

PRE-USE INSPECTION

The Testers will automatically perform a self-test of the battery, lights and beeper every time the TEST button is pushed. This self-test takes about one second to complete, after which the tester will begin testing whatever the leads are connected to. This self-test does not test the test leads and internal fuse. To test the leads and fuse, short the test leads together and press the TEST button. A rapidly blinking SHORT light after completion of the normal self-test indicates that the leads and fuse are good.

If the unit fails to operate, check or replace the battery. If this self-test is not completed, the unit will not perform any further testing and must be returned to the factory for service.

TESTING SINGLE PHASE TRANSFORMERS

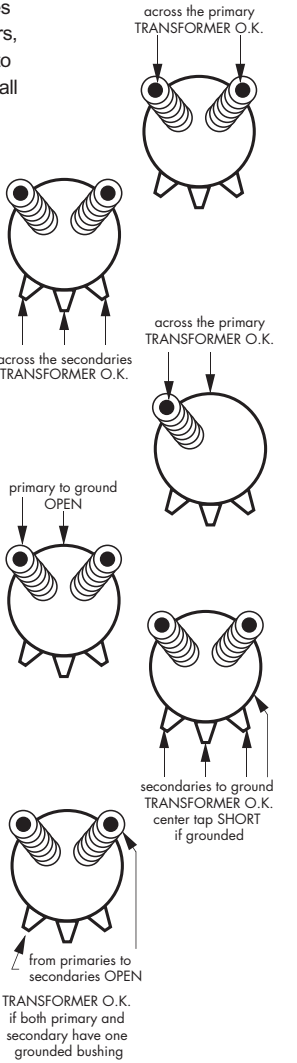
For single phase transformers, use these figures as guidelines to get started. For 3Ø transformers, the test leads are connected from each phase to neutral and across each pair of phases. When all connections are proper and the transformer itself is good, the Tester will beep and show TRANSFORMER O.K. The OPEN indication designates a bad connection or an open transformer winding. A SHORT indication designates a short from phase to neutral or phase to phase in the transformer or the connections to it.

NOTE: Disconnect primaries or remove primary fuses before testing secondaries.

For the Quick-Check Transformer and Capacitor Tester and power capacitors, tests across the two bushings should show CAPACITOR O.K. On a single bushing capacitor tests from bushing to ground will also show CAPACITOR O.K. On a two bushing capacitor, tests from bushing to ground should show OPEN.

As a quick test in the shop, the Testers can be used to screen transformers by checking both primary and secondary windings and connections. Test for SHORTs on both primary and secondary windings and from primary to secondary. Test for OPENs on both primary and secondary windings to check for open windings or open breakers and fuses. Tests for power capacitors with the Quick-Check Transformer and Capacitor Tester are performed across each bushing and from bushing(s) to ground.

Test Connections



TESTING CAPACITORS

These instruments are intended for quick and simple testing of transformers or capacitors and the connections made to them. Do not energize visibly damaged equipment such as a transformer leaking oil or a bulged capacitor even if the Tester gives an O.K. reading.

The Testers are powered by an internal 9V lithium or alkaline battery. It is easily and quickly replaced by removing the battery cover on the back of the unit.

WARNING: The Testers should be used only on equipment known to be deenergized and/or discharged.

CAUTION: Using the Testers on the secondary side of transformers may generate high voltages on the primary side. Stay clear of all primary connections while testing.

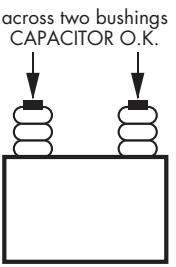
The Quick-Check Transformer and Capacitor Tester will not leave a significant charge on a capacitor.

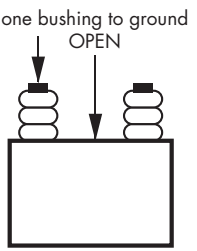
NOTE: For user safety there is a non-replaceable 600V internal fuse inside the instrument. If the instrument is connected to an energized transformer, the fuse will blow. The instrument must then be returned to the factory for repair.

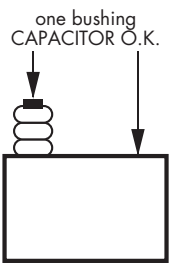
TESTING THREE PHASE TRANSFORMERS

The TILT II and Quick-Check Transformer and Capacitor Testers should be used only on equipment known to be deenergized.
Using the Testers on the secondary side of transformers may generate high voltages on the primary side. Stay clear of all primary connections while testing.

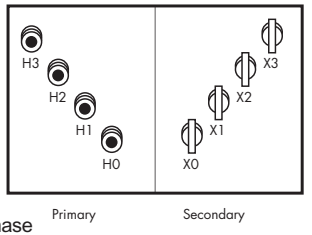
Test Connections for Quick-Check Transformer and Capacitor Testers Only





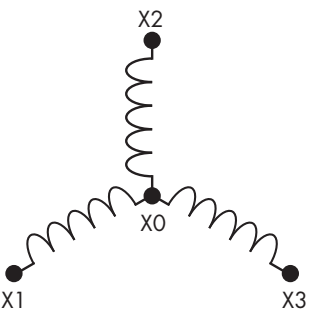


For 3Ø transformers, the test leads are connected from each phase to neutral and across each pair of phases. When all connections are proper and the transformer itself is good, the Tester will beep and show O.K. The OPEN indication designates a bad connection or an open transformer winding. A SHORT indication designates a short from phase to neutral or phase to phase in the transformer or the connections to it.



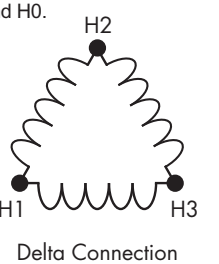
For Y (wye) connections, test the primary and secondary sides of the transformer as follows:

X1 - X2	Transformer O.K.
X2 - X3	Transformer O.K.
X1 - X3	Transformer O.K.
X1 - X0	Transformer O.K.
X2 - X0	Transformer O.K.
X3 - X0	Transformer O.K.
H1 - H2	Transformer O.K.
H2 - H3	Transformer O.K.
H1 - H3	Transformer O.K.
H1 - H0	Transformer O.K.
H2 - H0	Transformer O.K.
H3 - H0	Transformer O.K.
H1 - X1 H2 - X2 H3 - X3	Transformer O.K. if both H0 and X0 are grounded, otherwise OPEN
H0 - X0	SHORT, if both sides are grounded, otherwise OPEN

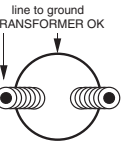


For Δ (delta) connections, test the primary and secondary sides the same as the Y (wye) except omit the connections to X0 and H0.

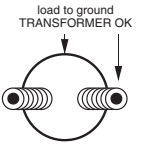
The TILT II and Quick-Check Transformer and Capacitor Testers will not detect a partially shorted transformer coil or an improper transformer ratio. They are intended for quick and simple testing of transformers and the connections made to them.

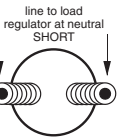


TESTING DISTRIBUTION VOLTAGE REGULATORS



For typical distribution voltage regulators, test using these figures as guidelines. Both the line and load bushings tested to ground should indicate the reading shown in the figures. With the regulator in the neutral position, the line and load are internally connected with the resulting test indicating SHORT.

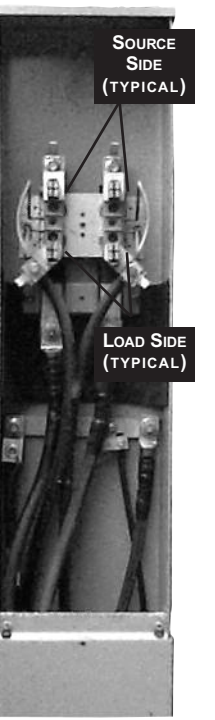




TESTING DISTRIBUTION TRANSFORMERS FROM METER SOCKETS

An overhead or underground distribution transformer can sometimes be more conveniently tested from a meter socket served by that transformer.

The TILT II and Quick-Check Transformer and Capacitor Testers should be used only on equipment known to be deenergized. Test both the load and source sides of the meter socket for the presence of voltage before using the Tester.



Using the Tester on the secondary side of transformers may generate high voltages on the primary side. Stay clear of all primary connections while testing. The Quick-Check Transformer and Capacitor Tester will test the secondary side of a transformer connected to the meter socket. Connect the Tester across the two source side receptacles and from each receptacle to ground and test.

NOTE: This procedure will not work if other loads are connected to the same transformer.

The wiring on the load side of the meter socket going into the main breaker can also be tested for shorts or crossed phases. Connect the Tester across the two load side receptacles and from each receptacle to ground. The absence of shorts or crossed phases will be indicated by an OPEN reading. If the main breaker is not open, connected loads within the building may cause a SHORT or TRANSFORMER O.K. indication.

The meter socket connections shown are typical. Local standards may specify different connections.

CARE AND MAINTENANCE

STORAGE - It is recommended for protection of the TILT II and Quick-Check Transformer and Capacitor Tester that it is stored in the carrying case.

CLEANING INSTRUCTIONS - To clean, wipe with a damp cloth with water. Do not use harsh chemicals or solvents.

DAMAGE - If you suspect any mechanical or electrical damage, do not use and arrange for repair by returning to the factory.

CALIBRATION & TESTING - Regular calibration is not required. There is no calibration adjustment.

REPAIRS

If any damage is found please contact us at 800-435-0786 to arrange for service.

WARNING: Use Only on Equipment Known to be Deenergized and/or Discharged
Automatic self test operates with each use. Check for lights and beeper when green light is on. To test leads and internal fuse, short leads together and verify blinking SHORT light.
Connect the test leads to the device under test. Push the test button and observe the lights. An OK indication verifies no direct shorts or opens. OPEN indicates an open connection or high resistance leakage path. SHORT indicates a very low resistance. Using this tool on the secondary side of transformers may generate high voltages on the primary side. Stay clear of all primary connections while testing. Test transformers across all primary and secondary connections and from primary to secondary. Refer to instructions. Check the battery if unit fails to operate. Replace with 9V alkaline or lithium types. Contains a 600V fuse which is not replaceable. Return to factory for service. Maximum output voltage 6VDC.
DANGER: Failure to follow these directions or the instructions may expose the user to high voltage, severe injury or death.
HD Electric Company, Waukegan IL USA www.HDElectricCompany.com
US Patent 6,130,530 4/16 TL-AST-N, TL-AST-M, QC-AST-N, QC-AST-M

TECHNICAL SPECIFICATIONS

MODELS
TL-AST-N, TL-AST-M, QC-AST-N, QC-AST-M

DIMENSIONS
3.6 in. W x 5.7 in. L x 1.2 in. H (9.1 cm x 14.5 cm x 3.0 cm)

WEIGHT
TL-AST-N / QC-AST-N - 1lb.,1oz. (0.47 kg)
TL-AST-M / QC-AST-M with magnet - 1lb., 2 oz. (0.51 kg)

BATTERY
9V alkaline ANSI 1604A, IEC 6LR61 or 9V lithium ANSI-1604LC

OUTPUT VOLTAGE: 6VDC maximum pulsed at 50Hz nominal

SHORT: $\leq 10\Omega$, varies with battery voltage

OPEN: $\geq 10\Omega$, varies with battery voltage

TRANSFORMER O.K.: minimum inductance 800µH

CAPACITOR O.K.: (Quick-Check Transformer and Capacitor Tester only)
minimum capacitance 0.5µf
maximum capacitance 300µf

AUDIO OUTPUT: 85db at 30cm

ENVIRONMENTAL CONDITIONS
CONDITIONS: Indoor and outdoor use

ALTITUDE: Up to 6,566 ft. (2000M)

OPERATING TEMPERATURE: -20°F to +140°F (-29°C to +60°C)

HUMIDITY: 95% to +60°C (non-condensing)

POLLUTION DEGREE: PD2

ENCLOSURE MATERIAL: ABS UL 94-HB

OVERVOLTAGE CATEGORY: II Non-contact

PRINTED CIRCUIT BOARDS: FR-4 UL 94-V0

BATTERY REPLACEMENT INSTRUCTIONS
To replace the battery, open the compartment on the bottom of the housing. Remove and dispose of the old battery, replacing it with a fresh, new 9-volt lithium or alkaline battery.

MANUFACTURING LOCATION
HD Electric • Southaven, MS, 38672 USA

TERMS AND CONDITIONS OF SALE

HD Electric Company is herein referred to either as "HDE" or "Seller" and the customer or person or entity purchasing goods or services (hereinafter collectively referred to as "Goods") is referred to as the "Buyer". These Terms and Conditions, any price list or schedule, quotation, acknowledgment or invoice from HDE relevant to the sale of the Goods and all documents incorporated by specific reference therein, constitute the complete and exclusive statement of the terms of the agreement governing the sale of Goods by HDE to Buyer. Buyer's acceptance of the Goods will manifest Buyer's assent to these terms and conditions without variation or addition. Any different or additional terms in Buyer's purchase order or other Buyer documents are hereby objected to. HDE reserves the right in its sole discretion to refuse orders.

1. PRICES AND TAXES: Unless a fixed price is quoted, the price at which this order is accepted is subject to adjustment to HDE's price in effect at the time of order. Any current or future tax or governmental charge (or increase in same) affecting Seller's costs or production, sale or delivery or which Seller is otherwise required to pay or collect in connection with the sale, purchase, delivery, storage, processing, use or consumption of Goods (but excluding any tax on Seller's net income or profit) shall be for Buyer's account and shall be added to the price.

2. TERMS OF PAYMENT: Terms are stated on HDE's invoice in U.S. currency. HDE shall have the right, among other remedies, either to terminate this agreement or to suspend further performance under this and/or other agreements with the Buyer in the event Buyer fails to make any payment when due, which other agreements Buyer and Seller hereby amend accordingly, or HDE otherwise deems itself insecure. Buyer shall be liable for all expenses, including attorneys' fees, relating to the collection of past due amounts. Should Buyer's financial responsibility become unsatisfactory to HDE, cash payments or security satisfactory to HDE may be required by HDE for future deliveries and for the goods theretofore delivered. If such cash payment or security is not provided, in addition to HDE's other rights and remedies, HDE may discontinue deliveries. HDE may apply a finance charge for payments made by credit card.

3. SHIPMENT AND DELIVERY: Unless otherwise expressly provided, shipments are made F.O.B. HDE's shipping point. Risk of loss or damage and responsibility shall pass from HDE to Buyer upon delivery to and receipt by common carrier. Any claims for shortages or damages suffered in transit are the responsibility of Buyer and shall be submitted by the Buyer directly to the carrier. Shortages or damages must be acknowledged and signed for at the time of delivery. While HDE will use all reasonable commercial efforts to maintain the delivery date(s) acknowledged or quoted by HDE, all shipping dates are approximate and not guaranteed. HDE reserves the right to make partial shipments. HDE, at its option, shall not be bound to tender delivery of any Goods for which Buyer has not provided shipping instructions. If the shipment of the Goods is postponed or delayed by Buyer for any reason, Buyer agrees to reimburse HDE for any and all handling and storage costs and other additional expenses resulting therefrom. All claims for shipping errors, lost shipments or any other discrepancies must be made within ninety (90) days or they will be disallowed and deemed waived.

4. HDE LIMITED WARRANTY: HDE covers its products with a manufacturer's warranty against defects in material or workmanship for a period of ten years in the case of Capacitor Controls and in all other circumstances for a period of one year, unless otherwise stated by HDE in writing. To take advantage of this warranty, the complete product must be delivered prepaid to HDE or any HDE Authorized Service Center. This warranty shall not apply to any Goods including but not limited to products which: (a) Have been repaired or altered outside HDE's factory (or Authorized Service Center) or in any manner so as, in HDE's judgment, to affect its serviceability or proper operation; (b) Have been subjected by persons other than HDE (or Authorized Service Center) to improper handling, operation, maintenance, repair or alteration; and, (c) Have been subjected to normal wear and tear, misuse, negligence, improper installation or accident. HDE's obligation under this warranty, and the Buyer's exclusive remedy for the breach thereof, shall be limited to, at HDE's option, repair or replacement of any allegedly defective Goods or issuance of credit. HDE requires the return of any allegedly defective Goods, transportation prepaid, before honoring any claim. All returned Goods are subject to inspection, and if examination does not disclose any defect covered by this warranty, replacement of such Goods or issuance of credit for same will not be approved. THE FOREGOING CONSTITUTES HDE'S SOLE WARRANTY RESPONSIBILITY AND BUYER'S EXCLUSIVE REMEDY WHETHER SOUNDING IN TORT, CONTRACT, STRICT LIABILITY OR OTHERWISE, EXCEPT AS OTHERWISE EXPRESSLY SET FORTH IN THIS AGREEMENT. THERE ARE NO OTHER WARRANTIES, EXPRESS OR IMPLIED, WHETHER OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE. No employee, agent, dealer, or other person is authorized to give any warranty on behalf of HDE. This warranty extends only to persons or companies who purchase Goods from HDE for resale.

5. LIMITATION OF REMEDY AND LIABILITY: THE SOLE AND EXCLUSIVE REMEDY FOR BREACH OF ANY WARRANTY HEREUNDER SHALL BE LIMITED TO REPAIR, CORRECTION, REPLACEMENT OR CREDIT UNDER SECTION 4. HDE SHALL NOT BE LIABLE FOR DAMAGES CAUSED BY DELAY IN PERFORMANCE, AND IN NO EVENT, REGARDLESS OF THE FORM OF THE CLAIM OR CAUSE OF ACTION (WHETHER BASED IN CONTRACT, INFRINGEMENT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE), SHALL HDE'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS EXCEED THE PRICE PAID BY BUYER FOR THE SPECIFIC GOODS GIVING RISE TO THE CLAIM OR CAUSE OF ACTION, AND BUYER SHALL INDEMNIFY HDE FOR ANY DAMAGES IN EXCESS THEREOF. BUYER AGREES THAT IN NO EVENT SHALL HDE'S LIABILITY TO BUYER AND/OR ITS CUSTOMERS INCLUDE SPECIAL, INDIRECT, INCIDENTAL, CONSEQUENTIAL OR PUNITIVE DAMAGES OF ANY CHARACTER IN CONNECTION WITH THE SALE, RESALE OR USE OF THE GOODS, WHICH ARE WAIVED BY BUYER AND AS TO WHICH BUYER SHALL INDEMNIFY HDE. The term "consequential damages" shall include, but not be limited to, loss of anticipated profits, business interruption, loss of use of revenue, cost of capital or loss of or damage to property, equipment, or data, or loss of reputation. Further, Buyer shall indemnify and hold HDE harmless from any liability to Buyer, Buyer's employees, workers, contractors or any other persons arising out of Buyer's, and any other persons', use of the Goods. All instructions and warnings supplied by HDE will be passed on to those persons who use the Goods. HDE's Goods are to be used in their recommended applications and all warning labels affixed to the Goods by HDE shall be left intact. It is impossible to eliminate all risks associated with the use of the Goods. Risks of serious injury or death, including risks associated with electrocution, arcing and thermal burns, are inherent in work in and around energized electrical systems. Such risks arise from the wide variety of electrical systems and equipment to which Goods may be applied, the manner of use or application, weather and environmental conditions or other unknown factors, all of which are beyond the control of HDE. HDE does not agree to be an insurer of these risks, and shall have no liability for any claims arising from such risks. WHEN YOU BUY OR USE THESE PRODUCTS, YOU AGREE TO ACCEPT THESE RISKS.

6. EXCUSE OF PERFORMANCE (FORCE MAJEURE): HDE shall not be liable for delays in performance or for non-performance due to acts of God; acts of Buyer; war; fire; flood; weather; sabotage; strikes, labor disputes; civil disturbances or riots; governmental requests, restrictions, allocations, laws, regulations, orders or actions; unavailability of or delays in transportation; default of suppliers; or unforeseen circumstances or events beyond HDE's reasonable control. Deliveries or other performance may be suspended for an appropriate period or cancelled by HDE upon notice to Buyer in the event of any of the foregoing, but the balance of this agreement shall otherwise remain unaffected. If HDE determines that its ability to supply the total demand for the Goods, or to obtain material used directly or indirectly in the manufacture of the Goods, is hindered, limited or made impracticable due to causes set forth herein, HDE may allocate the Goods or such material (without obligation to acquire other supplies of any such Goods or materials) among itself and its purchasers on such basis as HDE determines to be equitable without liability for any failure of performance which may result therefrom.

7. CHANGES: HDE reserves the right to change designs and specifications for standard Goods without prior notice to Buyer, but not with respect to custom Goods being made for Buyer. HDE shall have no obligation to install or make such change in any Goods manufactured prior to the date of such change.

8. ASSIGNMENT: Buyer shall not assign its rights or delegate its duties hereunder or any interest herein without the prior written consent of HDE, and any such assignment, without such consent, shall be void.

9. INSTALLATION: Buyer shall be responsible for receiving, inspecting, testing, storing, installing, starting up and maintaining all Goods.

10. INSPECTION/TESTING: Buyer, at its expense, agrees that it will promptly inspect the Goods upon receipt thereof, and in no event later than thirty (30) days from the date of receipt of the Goods. Buyer shall deliver to HDE within fifteen (15) days of inspection, but in no event later than forty-five (45) days from the date of receipt of the Goods, written notice of any and all deficiencies, defects, variations from specifications or complaints of any kind with respect to the quantity, quality, condition, shipment, performance, price or appearance of the Goods so received by Buyer. In the event no such written notice is received by HDE, Buyer shall be deemed conclusively to have inspected and accepted all such Goods unconditionally and to have waived any and all rights and claims, including without limitation any right to reject the Goods or to claim damages in respect thereof. Buyer may not return goods without first advising HDE of the reasons therefore, obtaining from HDE a material authorization number and observing such instructions as HDE may give in authorizing such return. In the event a return is authorized by HDE, a restocking for any Goods requiring repackaging or maintenance a twenty percent (20%) restocking fee shall be assessed to Buyer in the final credit amount.

11. SERVICES: If this agreement requires HDE to perform or provide any services, HDE (including without limitation its successors, assigns, agents or any person or entity acting at HDE's direction) shall not be responsible for any damages, claims, liabilities or expenses of any nature arising out of such services.

12. U.S. EXPORT CONTROL LAWS: All Goods sold to Buyer by HDE hereunder are subject to U.S. Export Control Laws. Buyer hereby agrees not to re-sell or divert any goods contrary to such laws.

13. COMPLIANCE: Seller/Contractor shall comply with all applicable federal, state or local laws, rules, regulations, or orders. Seller/Contractor shall comply with Executive Order 11246, as amended by Executive Order 11375, and the applicable provisions of the Office of Federal Contract Compliance Programs (OFCCP), 41 CFR Part 60, which are incorporated herein by this reference. Buyer shall comply with all applicable federal, state, or local laws, rules, regulations or orders including but not limited to the Foreign Corrupt Practices Act of 1977, as amended. HDE reserves the right to delay or refuse delivery if requests for reasonable assurances of Buyer's compliance are not tendered as requested.

14. MISCELLANEOUS: These terms and conditions supersede all other communications, negotiations and prior oral or written statements regarding the subject matter hereof. No change, modification, rescission, discharge, abandonment, or waiver of these terms and conditions shall be binding upon HDE unless made in writing and signed on its behalf by its duly authorized representative. No conditions, usage or trade, course of dealing or performance, understanding or agreement purporting to modify, vary, explain, or supplement these terms and conditions shall be binding unless hereafter made in writing and signed by Seller. No modification shall be effected by HDE's receipt or acceptance of Buyer's purchase orders, shipping instruction forms, of other documentation containing terms at variance with or in addition to those set forth herein, all of which are objected to by HDE. Any such modifications or additional terms are specifically rejected by HDE. No waiver by HDE with respect to any breach or default of any right or remedy and no course of dealing, shall be deemed to constitute a continuing waiver of any other breach or default of any other right or remedy, unless such waiver be expressed in writing and signed by HDE. All typographical or clerical errors made by HDE in any quotation, acknowledgment or publication are subject to correction. Validity and performance relating to the interpretation and effect of this agreement shall be governed by the laws of the state of Illinois without regard to its conflict of law principles.

15. DISPUTE RESOLUTION: In the event of any dispute INCLUDING, BUT NOT LIMITED TO, BREACH OF CONTRACT, BREACH OF WARRANTY, CLAIMS BASED IN TORT, NEGLIGENCE, PRODUCT LIABILITY, FRAUD, MARKETING, STATE OR FEDERAL REGULATIONS, ANY CLAIMS REGARDING THE ENFORCEABILITY OF THIS LIMITED WARRANTY, AND THE WAIVER OF CLASS ACTION TRIALS between Buyer and Seller, either may choose to resolve the dispute by binding arbitration, as described below, instead of in court. THIS MEANS IF EITHER BUYER OR SELLER CHOOSE BINDING ARBITRATION, NEITHER PARTY SHALL HAVE THE RIGHT TO LITIGATE SUCH CLAIM IN COURT OR HAVE A JURY TRIAL. DISCOVERY AND APPEAL RIGHTS ARE LIMITED IN BINDING ARBITRATION. Buyer and Seller agree that the proper venue if Arbitration is not so chosen by Buyer or Seller of all actions arising in connection herewith shall be only in the state of Illinois and the parties agree to submit to such jurisdiction. No action, regardless of form, arising out of transactions relating to the agreement, may be brought by either party more than two (2) years after the cause of action has accrued. The U.N. Convention on Contracts for the International Sales of Goods shall not apply to this agreement.

16. CLASS ACTION WAIVER: BINDING ARBITRATION MUST BE ON AN INDIVIDUAL BASIS. THIS MEANS NEITHER BUYER NOR SELLER MAY JOIN OR CONSOLIDATE CLAIMS IN ARBITRATION BY OR AGAINST OTHERS, OR LITIGATE IN COURT OR ARBITRATE ANY CLAIMS AS A REPRESENTATIVE OR MEMBER OF A CLASS OR IN A PRIVATE ATTORNEY GENERAL CAPACITY. ADMINISTRATION OF ARBITRATION: The binding arbitration must be administered by the American Arbitration Association ("AAA") in accordance with its Commercial Arbitration Rules and/or Supplementary Procedures for Consumer-Related Disputes (including proceedings to mitigate costs of travel). This binding arbitration is governed by the Federal Arbitration Act ("FAA") (9 USC §1, et. seq.) and will govern the interpretation and enforcement. The binding arbitration shall be held at a location determined by AAA or at such other location as mutually agreed. In addition to the terms stated above, the following will apply to the binding arbitration: (1) the arbitrator, and not any federal, state, or local court or agency, will have exclusive authority to resolve any dispute relating to the interpretation, applicability, enforceability or formation of this Agreement including any claim that all or any part of this Agreement is void or voidable; (2) the arbitrator shall apply Illinois law consistent with the FAA.

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