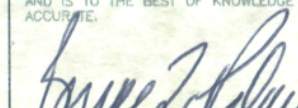
Certificate
of
P.E./U.L. REVIEW
for Control Panel
Compliance

PURSANT TO MN RULE NO. 3800.3620 SUBP. 2A
PURSANT TO OSHA FED CODE OF REGULATIONS SECTION S ELECTRICAL 1910.399 (ii)

MODEL NO. A53 POWER CONDITIONER
REVIEW NO. MM4-26-02
SERIAL NO. WN01042002.A14747x1

BLP
FINAL QUALITY CONTROL INSPECTION

I HEREBY CERTIFY THAT I AM A PROFFESSIONAL ELECTRICAL ENGINEER, REGISTERED IN THE STATE OF MINNESOTA, THAT I HAVE NO FINANCIAL OR OTHER INTEREST IN THE SALE OR MANUFACTURE OF THE SUBJECT EQUIPMENT, AND THAT THE FOREGOING EVALUATION WAS PERFORMED BY ME PERSONALLY, AND IS TO THE BEST OF KNOWLEDGE COMPLETE AND ACCURATE.



DATE: 04/26/02

BRUCE L. PALMER, P. E.
MINNESOTA REGISTRATION NO. 9375

ETI
P. O. BOX 1291
COLUMBIA, MO 65205

Certificate
of
P.E./U.L. REVIEW
for Control Panel
Compliance

PURSANT TO MN RULE NO. 3800.3620 SUBP. 2A
PURSANT TO OSHA FED CODE OF REGULATIONS SECTION S ELECTRICAL 1910.399 (ii)

MODEL NO. A54 POWER CONDITIONER

REVIEW NO. MM11-26-02

SERIAL NO. WN06062001.A11769x1(1-3)

BLP

FINAL QUALITY CONTROL INSPECTION

I HEREBY CERTIFY THAT I AM A PROFFESSIONAL ELECTRICAL ENGINEER, REGISTERED IN THE STATE OF MINNESOTA, THAT I HAVE NO FINANCIAL OR OTHER INTEREST IN THE SALE OR MANUFACTURE OF THE SUBJECT EQUIPMENT, AND THAT THE FOREGOING EVALUATION WAS PERFORMED BY ME PERSONALLY, AND IS TO THE BEST OF KNOWLEDGE COMPLETE AND ACCURATE.

Bruce L. Palmer DATE: 11/12/02

BRUCE L. PALMER, P. E.
MINNESOTA REGISTRATION NO. 9375

ETI
P. O. BOX 1291
COLUMBIA, MO 65205

Certificate of Compliance

P.E./U.L. REVIEW

PER UL STANDARD 508 FOR INDUSTRIAL CONTROL EQUIPMENT, PER UL STANDARD 1449 FOR TRANSIENT VOLTAGE SURGE SUPPRESSORS, AND PER NFPA 79 FOR ELECTRICAL STANDARDS FOR INDUSTRIAL MACHINERY.

Location: **Ujglas Manufacture - Load Center T-6**

Model Number: **A54**

Serial Number: **LT111105.L891x2**

Manufacturer: **ElectroFlow Technologies, Inc.,**
P.O. Box 1291, Columbia, MO 65205

STATE OF MISSOURI
JAMES L. DOVE
NUMBER PE-200201644
PROFESSIONAL ENGINEER

Date: December 27 2005

THE PROFESSIONAL ENGINEER'S SEAL ON THIS DOCUMENT HAS BEEN AFFIXED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 327, RSMo.

ElectroFlow Power Conditioner, Model M51
ETL Order 96102-208
February 8, 1995

Standard: UL 508A

Part 1 - Components

3.1 Unrestricted Components:

Terminal Blocks:
Main input: 600V/760A, UR and CSA

Uninvestigated Components:
Inductor, 3-phase, in series with capacitors.

Current Transformers, proprietary design, three each, one on each leg of inductor Leads provided with supplementary insulation. Current transformers provide low-voltage, low-energy power to LED panel mounted at top of enclosure.

Part II - Enclosure Construction

Custom Enclosure, 12 MSG, Steel, painted. Cover held by cabinet flange and two screws.

Flanges on door comply with configuration H in Table D.

Part III - Electrical Assembly

Components well secured and prevented from shifting and turning. Spacings well maintained, especially at capacitor terminals where terminals exit capacitor posts in a generally parallel orientation to maintain spacings between connectors. Spacings per Table E maintained through air and over surface.

Spacings between current transformer wires and the power wires maintained by spiral wrap and/or securely positioning the small wiring using wire ties.

Field wiring terminates in a UL Listed terminal block, sized for 6AWG wiring.

Grounding terminal provided, UL Listed, CSA Certified, suitable for 6AWG wire. Labeled "GND"

Wire bending space complies with Table H. Wire to input terminals is straight-line path.

Internal wiring rated min. 90C, copper Wiring routed

and/or protected from sharp edges.

Wiring terminals Listed type, well secured.

No control wiring.

Wiring to LED panel 18AWG, no high currents, only power LEDs This complies with Table L.

LED printed wiring assembly protected by limited energy of current transformers.

Power wiring rated for anticipated load:
#6AWG fused at 50A in the facility disconnect switch panel.
#10AWG wiring to capacitors well protected mechanically, therefore not considered to be subject to shorting.

Main Disconnect provided at facility. Rated 60A with 50A fuses in all three phases. Panel labeled "60A Main Disconnect Switch" and "50A Main Fuses".

Low-voltage limited-energy circuits derived in printed wiring assembly by the current transformers. This is a non-investigated component, however powered by the current transformers. This is considered a class 2 circuit. This circuitry does not leave the panel enclosure.

Construction:

Grounding Terminal
Provided terminal to accommodate #6AWG wiring for 50A fused circuit.

Wiring Ampacity:

Power wiring:
Wiring is #6AWG, suitable for 55A. This is presently protected by 50A main disconnect.

Wiring to capacitors:
12.5kVAR -> 15A/conductor. 10AWG OK. Two capacitors total, so 30A maximum anticipated load.

Assume the #10AWG wires are "component leads". Assured

that wires not subject to abrasion or other damage, hence they are acceptable as-is. Table G allows #10AWG internal wiring to be fused at 40A. Fusing at 50A is not a significant overrating if wiring shown to be well protected. Capacitors are internally protected, thereby opening the circuit during pressure build-up within the capacitors.

Required Markings:

1. INPUT FLA

   PROVIDED ON NAMEPLATE: 25kVAR

2. INPUT FUSE PROTECTION: Manual states to size for 25kVAR. Manual also provides guidance, specifying 50A main fuses and 60A main disconnect switch.

   Labeled: USE 60 AMP MAIN DISCONNECT
   USE 50 AMP FUSES

3. GROUNDING TERMINAL: GND

4. NAMEPLATE:

   ELECTENERGY TECHNOLOGIES, INC.
   MODEL M51
   480 V
   The following were added: 60 HZ, 3-PHASE

5. INPUT TERMINALS:

   USE COPPER WIRE RATED 90C.
   TIGHTENING TORQUE 45 IN-LB

Tests:

Dielectric Withstand Test:
2775 VDC for 1 minute between power conductors and enclosure. Passed.

ETL Label applied to unit.

End or report.

2/8/95

overcurrent protection is acceptable for this circuit.

Assume the #10AWG wires are "component leads". Assured that wires not subject to abrasion or other damage, hence they are acceptable as-is.

120V Control Wiring:
18 AWG wiring protected by 3A secondary fuses. Acceptable.

Required Markings:

1. GFCI:

WARNING - USE OF THE FRONT-PANEL CONTROLS IS DEPENDENT UPON THE ADDITIONAL PROTECTION AFFORDED BY THE GROUND FAULT CIRCUIT INTERRUPTER AND THE TRANSFORMER SECONDARY FUSE. DO NOT REMOVE OR DEFEAT THESE PROTECTIVE COMPONENTS.

TEST MONTHLY.

2. FUSES:

CAUTION - FOR CONTINUED FIRE PROTECTION, USE SPECIFIED FUSES.
FUSES - 3A/300V

3. TRANSFORMER PRIMARY OVERCURRENT PROTECTION:

PROVIDE 1.5A PROTECTION PER PHASE. TRANSFORMER INPUT.

4. INPUT FLA

PROVIDED ON NAMEPLATE: 250kVAR

5. INPUT FUSE PROTECTION: Manual states to size for 250kVAR. Manual also provides guidance, specifying 500A main fuses and 600A main disconnect switch.

6. GROUNDING TERMINAL: GND

7. NAMEPLATE:

ELECTENERGY TECHNOLOGIES, INC.
MODEL A55
480 V

ElectroFlow Power Conditioner, Model A55
ETL Order 96102-208
February 8, 1995

The following were added: 60 HZ, 3-PHASE

8. INPUT TERMINALS:

USE COPPER WIRE RATED 90C.
TIGHTENING TORQUE 420 IN-LB

9. MULTIPLE SUPPLY SOURCES:

WARNING - MULTIPLE POWER SUPPLY SOURCES. DISCONNECT ALL POWER PRIOR TO SERVICING.

Tests:

Dielectric Withstand Test:
2775 VDC for 1 minute between power conductors and enclosure. Passed.

ETL Label applied to unit.

End or report.

2/5/95