POWER DELEGATOR

SERIES 7600A POWER DISTRIBUTION UNIT WITH POWER CONDITIONING

GENERAL SPECIFICATIONS

1.0 SCOPE

The following specification describes the features, design, and application of the Series 7600A Line Conditioning and Power Distribution Unit. All systems are designed and manufactured to assure maximum reliability, flexibility, serviceability and performance. The overall function of the Series 7600A is to receive electrical building power, remove transients and noise from that power, and distribute the power through flexible cable and/or receptacles to peripheral equipment and components of the data processing facility.

2.0 GENERAL

The Series 7600A Power Distribution Unit provides the following:

2.1 Complete power conditioning, including transient and noise attenuation, of the power to the computer room from main building electrical systems.

2.3 Single point silver plated ground for all computer room equipment.

2.4 Protection from overload conditions.

2.5 Distribution and protection of electrical power to each computer and peripheral device.

2.6 Monitoring of the electrical power to the computer room.

2.7 Annunciate computer room status (optional).

2.8 Quick installation with junction box interface to building power and flexible cable and/or receptacle interface to the computer system.

3.0 ELECTRICAL CHARACTERISTICS

3.1 PERCENT IMPEDANCE

2% to 5% depending on size.

3.2 PERCENT REACTANCE

1.5% to 4% depending on size.

3.3 HARMONIC DISTORTION

Less than 1% THD added.

3.4 AUDIBLE NOISE

45 db at full rated load.

3.5 COMMON MODE NOISE ATTENUATION

140 db or greater

3.6 TRANSVERSE NOISE ATTENUATION

Transverse Mode noise attenuation is 3 db down at 1000 Hz, 40 db down per decade to below 50 db with a resistive load.

3.7 OPERATING FREQUENCY

57-63 Hertz (60 Hertz Models)

4.0 MAJOR COMPONENTS

The power conditioning and distribution unit as described herein shall consist of two junction boxes, lightening arrestor (optional), flexible input cable, main circuit breaker, triple shield isolation transformer, main output circuit breaker(s), (optional), branch circuit breakers, (optional) power monitor and alarm system (optional).

4.1 JUNCTION BOX

4.1.1 The junction boxes are all steel electrical enclosures for installation under the computer room raised floor.

4.1.2 The power section contains the main power terminal block for each hot line and the service ground and neutral.

4.1.3 The control section contains terminals, for low voltage control, to interface with the Remote Emergency Power Off (REPO) push button, air conditioning, water detectors, Halon, smoke and/or fire detectors, etc.

4.1.4 The junction box can be furnished mounted on an optional nine (9) square foot radio frequency (R.F.) suppression plate. The R.F. suppression plate will be constructed from a highly capacitive construction consisting of two copper plates separated by a dielectric material.

4.1.5 An optional, quick disconnect, power plug (Main power entry) is available on most power sizes.

4.2 MAIN INPUT POWER CABLE

4.2.1 The junction box and the Power Distribution Center will be interconnected by a flexible, water-proof, steel raceway, 12 feet long, having a copper shield grounding conductor wound between the raceway walls.

4.2.2 The flexible raceway will house four (4) conductors on three phase systems and are sized for 125% of the full load current rating.

4.2.3 One copper conductor shall be provided for each hot line, and one service ground.

4.2.4 Single phase systems will have two (2) hot conductors and a ground.

4.0 MAJOR COMPONENTS (continued)

4.3 MAIN CIRCUIT BREAKER

4.3.1 The main input circuit breaker with a rating of no less than 125% of the full load current will be used.

4.3.2 The main circuit breaker will incorporate a low voltage shunt trip mechanism to interface with the units protection circuitry including the Emergency Power Off (EPO) and optional Remote Emergency Power Off (REPO) circuits.

4.3.3 The main circuit breaker is mounted vertically in the main distribution center and has an interrupting capacity of not less than 10,000 A.I.C.

4.4 MAIN TRANSFORMER

4.4.1 The transformer windings are all copper conductor construction.

4.4.2 M-6 grade, grain oriented, stress relieved transformer steel is utilized for minimum losses and maximum efficiency.

4.4.3 Class H (Class 220) insulation is utilized throughout with operating temperatures well below the insulation class.

4.4.4 The transformer has a double copper shield to minimize interwinding capacitance and transient and noise coupling between primary and secondary windings.

4.4.5 All transformers are designed to operate at safe temperatures of less than 150° C (hot spot) above ambient.

4.4.6 Transformer over temperature shut down is provided at 200° C

4.5 OVER CURRENT PROTECTION

4.5.1 Main input circuit breaker protected.

4.6 MANUAL RESTART AND LOSS OF VOLTAGE TRIP

An optional loss of voltage trip and manual restart can be incorporated to shunt trip the main input breaker in the event of low output voltage. The trip point is factory adjusted at approximately 108 Volts line to neutral.

5.0 INTERNAL BUS AND GROUND SYSTEM

5.1 NEUTRAL BUS

The transformer neutral on the secondary wye of the transformer will be rated at 200% of the phase current and connected to the service ground from the building service and to the chassis of the Power Distribution Unit. The transformer neutral will also be connected to a bus for neutral (white) branch circuits. The ground pad is silver plated.

5.2 GROUNDING SYSTEM

The service ground shall be connected to the Power Distribution Unit's chassis, the electrostatic shield of the isolation transformer, the neutral lug of the isolation transformer and terminals at the isolated computer ground bus. The ground pad will be silver plated.

6.0 DISTRIBUTION

6.1 MAIN OUTPUT CIRCUIT BREAKERS (Optional on 50 KVA & smaller)

6.1.1 Each 120/208 VAC panel board section can be protected by an optional main circuit breaker installed between the transformer and the distribution panel per the National Electric Code.

6.1.2 The circuit breaker is rated at not more than 125% of the transformer full-load output current but not greater than the panel board bus rating and it is protecting. The interconnecting cables are sized in accordance with this rating.

6.1.3 The circuit breaker shall have a thermal-magnetic trip device and a minimum of 10,000 amperes interrupting capacity.

6.2 DISTRIBUTION PANEL

6.2.1 The output circuit breaker panel will be vertically mounted and easily accessible through an optional glass door or a sheet metal door .

6.2.2 Additional circuit breakers and flexible cables can be easily added in the field by swinging the hinged door panel away from the output breakers and inserting the circuit breakers and additional flexible output cables from the front of the Power Distribution Center.

6.2.3 Each distribution sub-panel will be factory wired and will have no fewer

than forty two (42) single pole circuit breaker positions.

6.0 DISTRIBUTION (continued)

6.2 DISTRIBUTION PANEL (continued)

6.2.5 The Cabinet is capable of accepting two additional 42 pole panels for a total of 126 poles.

6.2.6 Distribution sub-panel will be capable of accepting any combination of single pole (120V) , two pole (208V, 1 phase) and three pole (208V, 3 Phase) circuit breakers with ratings up to and including 100 amperes.

6.3 BRANCH OUTPUT BREAKERS (Optional)

6.3.1 The output circuit breakers will be thermal magnetic and rated at 10,000 AIC.

6.3.2 The circuit breakers will have three positions to indicate if the breaker is on, off or in the tripped position.

6.3.3 Output circuit breakers will be manually operated and provide a switching position for each output.

6.3.4 All breakers will be clearly marked and identified with the associated output cable.

6.4 OUTPUT DISTRIBUTION CABLES (Optional)

6.4.1 Each cable assembly will be factory assembled and tested.

6.4.2 Cable raceways will be, multi-wall, flexible steel conduit with a plastic waterproof jacket. A copper shielding-grounding conductor will be wound between the steel walls of the flexible conduct.

6.4.3 Conductors in the flexible conduit will be all copper with THHN insulation.

6.4.4 Each cable will contain a parity sized grounding conductor.

6.4.5 Cables shall have a terminal or receptacle for proper interface with each computer component.

7.0 CABINET

7.1 Cable and circuit breaker access will be through the front for ease of adding additional cables and circuit breakers.

7.2 The cabinet is furnished with casters with leveling jacks to fix the unit in position upon installation.

7.3 Cabinet layout is such that the input and output wiring are separated to minimize coupling between the two.

7.4 The cabinet is built out of at least 14 gauge steel.

7.5 Cabinet temperature is minimized at no more than 20° F above ambient with exhaust fans.

7.6 Swinging access doors will have lift off hinges and special fasteners .

7.7 The cabinet has the following separate compartments to optimize safety, Isolation and serviceability.

7.7.1 Breaker panel compartment.

7.7.2 Transformer and Regulator compartment.

7.7.3 Control and monitor compartments.

7.8 Silver plated ground bus is provided.

7.9 Texture baked on paint finish with proper pretreatment is provided.

8.0 RESERVED

9.0 POWER SYSTEM ANALYZER

A microprocessor based Analyzer will be provided and have a 40 character back lit Liquid Crystal Display (LCD), True RMS Metering, Function Key Pad, and a Lighted, Guarded, Emergency Power Off push button.

9.1 MONITORING

The Analyzer has Key Pad Buttons to simultaneously read the following parameters:

9.1.1 Input Voltage Line to Line on all three phases.

9.1.2 Output Voltage Line to Neutral on all three phases.

9.1.3 Output Voltage Line to Line on all three phases.

9.1.4 Output Currents on all three phases.

9.1.5 Frequency, Neutral Current, and Ground Current.

9.1.6 System KW and KVA.

9.1.7 Percent Load per phase.

9.1.8 Alarm Message.

9.1.9 Daily and Monthly KW Hour consumption.

9.1.10 Time and Date.

9.1.11 Power Factor per phase.

9.1.12 Automatic Scan of all Monitoring Parameters.

9.1.13 Alarm Silence.

9.1.14 Set Time and Date.

9.1.15 Programmable Alarm Limits.

9.1.16 Scroll through all alarms or set points

9.0 POWER SYSTEM ANALYZER (continued)

9.2 SYSTEM ALARMS

System alarms and shut downs are incorporated for the following key parameters:

9.2.1 Output Over Voltage

The output over voltage alarm/shut down is user programmable and factory preset at 228 volts to shut down the system when the output voltage is greater than the set point. Alarm Only or Alarm and Shut down is user programmable.

9.2.2 Output Under Voltage

The output under voltage alarm/shut down is adjustable and factory preset at 187 volts to shut down the system when the output falls below the set point. Alarm Only or Alarm and Shut Down is user programmable.

9.2.3 Phase Loss

Upon loss of any one of the phases an alarm will be initiated. Alarm Only or Alarm and Shut Down is user programmable.

9.2.4 Ground Over Current

Upon detection of a ground over current condition an alarm will be initiated.

9.2.9 Output Over Current

Upon detection of an output over current condition an alarm will be initiated.

9.2.10 Neutral Over Current

Upon detection of a neutral over current condition an alarm will be initiated.

9.2.11 Frequency Deviation

An alarm will be initiated should the frequency deviate more than $\pm$ 3 Hertz.

9.2.12 Phase Rotation

An alarm and shut down will be initiated upon detection of incorrect phase rotation.

9.0 POWER SYSTEM ANALYZER (continued)

9.2.13 Building I/O #1 thru I/O #8

Eight optional building I/O circuits can be provided. Each I/O is capable of accepting either a dry N.O. contact or a 120 volt A.C. signal. Each I/O is user programmable to alarm only or alarm and shut down.

9.3 CONTROLS

9.3.1 Alarm Silence

The alarm silence will silence the audible alarm without resetting the alarm message. A visual alarm message will remain lit until the fault is cleared.

9.3.2 Integral Emergency Off

The emergency stop (EPO) is an illuminated and guarded push button to shunt trip the main breaker.

9.3.3 The Analyzer is capable of remotely displaying all monitoring parameters thru an optional RS 232 port to an IBM compatible computer and a Hayes compatible modem.

9.4 ENVIRONMENTAL

9.4.1 Time and Date