

for DC+ and DC- or 12 VDC power, walk output, and don't walk output. The outputs shall be connected to the pushbutton assembly by a four wire cable. The unit shall be fused using two 0.5 amp fuses or mov 5 joules.

Warranty:

The manufacturer shall warrant the pedestrian pushbutton unit against defects and workmanship for a period of at least five years from the date of shipment. The warranty shall be assigned to the city of Topeka.

X. Controller Cabinets:

The Controller cabinet shall be of the Model specified in the major items of the equipment list shown on the Traffic Signal Quantities sheet. The cabinet shall, at a minimum, come equipped with the electronic equipment as shown in the same list. The Controller cabinet shall be natural aluminum, unless specified to be painted black in the Plan. All electronic equipment shall meet the requirements of the TSCES as modified below.

XI. 333SD - ITS Type 3 Traffic Signal Cabinet:

The Controller Cabinet shall be a Model 333SD-ITS Type 3. The 333SD-ITS Type 3 cabinet shall include a base extension assembly. Each cabinet shall have anchor bolts in accordance with FHWA-IP-78-16 Specification.

Quantity

- 4 EA - Internal (Front/Back) Fluorescent Lamps
- 2 EA - New York 330 Pull-out Drawer Assembly
- 4 EA - Fan Panel Assembly
- 1 EA - Transient Voltage Surge Suppression System (SHA-1210)
- 2 EA - Split Input Files with Lead Edged Plastic Card Guides
- 1 EA - Output File with Lead Edged Plastic Card Guides (No Phoenix Connectors)
- 1 EA - Red Monitor Kit Assembly
- 1 EA - Traffic UPS (See Specifications)
- 2 EA - Cabinet Lifting Plates (Mounted on the sides of the cabinet)

Cabinet Dimensions: 54" x 44.5" x 26"
Cabinet shall have 4 doors and Corbin #2 Locks and Keys

The left side of the 333SD-ITS Cabinet Assembly shall have shelves assembled to the EIA Rack Assembly to house additional equipment, such as, but not limited to, Video Detection, Standby Uninterrupted Power Supply and Communication Equipment. All Cabinets shall have a protective shield over the circuit breakers to prevent them from being accidentally turned off. The shield shall be mounted in such a way that the switches are still readily visible to the technician and can be turned on or off.

Input and Output Files

The input file shall be split (44 Pin) and contain upper and lower lead edged plastic card guides. The Output file shall have 8 "Flash programming jumper blocks", one for each of the 8 phases and shall contain upper and lower lead edged plastic card guides.

Traffic Uninterrupted Power Supply (UPS)

The 333SD-ITS shall have a UPS as specified below and shall be rack mounted in the left cabinet.

1. Performance Requirements:

- (a) The traffic UPS shall be capable of producing simultaneously-fully generated, conditioned and true Sine wave, standby and continuous AC outputs.
- (b) Suggested Operating mode for respective outputs during power failure - continuous output provided for signal controllers and modems; stand by output provided for signals in flash mode operation (optional delay timer available for short-term battery run under full cycling operation).
- (c) Up to the maximum rating, the traffic UPS shall be capable of running any combination of signal heads, whether incandescent, LED or neon, by any manufacturer, regardless of power factor, without overdriving the poorer power factor LED heads which may cause early degradation, low luminosity or early signal failure.
- (d) Upon loss of utility power, the traffic UPS shall insert battery power into the system via a supplied power interface module (PIM). In case of UPS failure and/or battery depletion, the PIM will ensure that the UPS will drop out and, upon return of utility power, the traffic control system will default to normal operating mode.
- (e) The Power Interface Module shall enable removal and replacement of the traffic UPS without shutting down the traffic control system ("Hot Swap" capability). Connectors shall be equipped with a "Safety Interlock" feature.

- (f) For 2070 or "California" style cabinets, upon loss of power, the traffic UPS shall actuate the existing Flash Transfer Relays (FTR) and Mercury contactor (MC) to force the traffic control system into flash mode operation.
- (g) Existing flasher modules and flash transfer relays shall be utilized.
- (h) To facilitate emergency crews and police activities, the traffic UPS shall be compatible with police panel functions ("signals off" switch must kill power to the field wiring even when UPS/Battery Power is on).
- (i) The traffic UPS shall not duplicate or take over flash operation or flash transfer relay functions.
- (j) The traffic UPS shall be capable of providing continuous, fully conditioned, regulated, sinusoidal (AC) power to selected devices such as signal controllers, modems, communication hubs, NTCIP adapters and video/radar equipment.

2. Major Components of UPS:

The traffic UPS shall consist of 3 major components - the Electronics Module, the Power Interface Module and the Battery System.

A. The Electronics Module:

The Electronics Module shall consist of the following:

- (1) True Sine wave, high frequency inverter utilizing IGBT technology.
- (2) 3-stage, temperature compensated, battery charger
- (3) For connection from the Electronics Module to the Power Interface Module and the Battery System, dedicated harness shall be provided with quick release, keyed, circular connectors and braided nylon sleeves over all conductors.
- (4) Local and remote control of UPS functions.
- (5) Local and remote communications capabilities.
- (6) Be capable of accepting an NTCIP-ready adapter.
- (7) Separate Power Interface Module (PIM) for inserting power safely and reliably.
- (8) Physical Specifications:
Rack Mount: Width = 19", Depth = 12", Height = 3.5" (2U)
Shelf Mount: Width = 19", Depth = 12", Height = 3.5"
Wall Mount/Unistrut Rail Mount: Width = 6.9", Depth = 9.5", Height = 16"
Separate Power Interface Module: Width = 6", Depth = 2.8", Height = 9"

B. The Power Interface Module:

- (1) Input Specifications:
Nominal Input Voltage: 120 VAC, Single Phase
Input Voltage Range: 86 VAC to 140 VAC
Input Frequency: 50 or 60 Hz (± 5%)
Input Configuration: 3 Wire (Hot, Neutral and Ground)
Input Current (Maximum Draw): 7.2 amps, Power-factor corrected
Input Protection: Input Fuse (12 amps)
- (2) Output Specification:
Nominal Output Voltage: 120 VAC, Single Phase
Power Rating: 1 KVA (1000 VA/700W)
Output Voltage Regulation: ± 2% for 100% Step Load Change and from high battery to low battery condition.
Output Frequency: 50 or 60 Hz (± 5%)
Output Configuration: Keyed, Circular Connectors and Duplex Receptacle
Output Wave Form: True Sine wave
Overload Capability: 110% for 10 minutes, 200% for half second.
Fault Clearing: Current Limit and Automatic Shutdown
Short Circuit Protection: Current Limit and Automatic Shutdown
Efficiency: 85% at Full Load
Load Power Factor: 0.7 Lagging Through Unity to 0.7 Leading

C. The Battery System:

- (1) The battery shall be comprised of extreme temperature, deep cycle, AGM/VRLA (absorbed glass mat/ valve regulated lead acid) batteries that have been field proven and tested by the U.S. Military.
- (2) The battery system shall consist of one or more strings (typically 4 or 6 batteries per string) of extreme temperature, deep cycle, AGM/VRLA batteries.
- (3) Batteries shall be certified to operate at extreme temperatures from -40° C to +74°C.
- (4) The batteries shall be provided with appropriate interconnect wiring and a corrosion-resistant mounting tray and/or brackets appropriate for the cabinet into which they will be installed.
- (5) The interconnect cable shall be protected with abrasion-resistant nylon sheathing.
- (6) The interconnect cable shall connect to the Base Module via a quick-release circular connector.

- (7) For purposes of safety and proper operation, the circular battery connector shall have interlocking pins to prevent turn-on if batteries are not connected, and to shut off the UPS should the batteries be disconnected.
- (8) Battery construction shall include heavy-duty, inter-cell connections for low-impedance between cells, and heavy-duty plates to withstand shock and vibration.
- (9) The top cover shall use tongue and groove construction and shall be epoxied to the battery case for maximum strength and durability.
- (10) An optional lifting handle shall be available on battery modules.
- (11) The Battery system shall meet the following requirements:
(a) shall be certified and field proven to meet or exceed NEMA temperature standards from -40° C to +74° C.
(b) Ampere: see Table 1 for Hour Ratings
(c) Hydrogen gas emissions must meet Mil-Spec #MIL-B-8565J
(d) Dimensions: see Table 1
(e) Weights: see Table 1

3. Mounting Configuration:

2070 Style - mounting method shall be 19" rack mount. Shelf angled or rails, typically supplied by others, are available as optional accessories.

4. Environmental Specifications

- (a) The UPS shall meet or exceed NEMA temperature standards from -40° C to +74° C.
- (b) The UPS shall be certified and field proven to meet or exceed NEMA temperature standards. A certificate of compliance shall be made available upon request.

5. Communications, Controls and Diagnostics

- (a) Communications to the UPS shall be provided by RJ-45 Ethernet connectors, connected to the Ethernet switch in the signal cabinet.
- (b) Front Panel Controls: Power On, Cold (DC) Start, Alarm Silence, Battery Test, Bypass Breaker, and DC/Battery Breaker.

6. Reliability

- (a) Calculated MTBF is 100,000 hours based on component ratings.
- (b) When Bypass and Power Interface Module are included, System MTBF increases to 150,000 hours.

7. Options

- (a) Battery tray to hold 6 OP72A batteries, up to 4 OP72B or OP72C batteries, and up to 3 OP72D batteries. Tray is 19" wide for use in 2070 type cabinets and mounts on standard Retma rails.
- (b) Swing-out battery box, mounts on right rail inside back door of 2070 type cabinets. Box is designed to hold 6 OP72A batteries, up to 4 OP72B or OP72C batteries and up to 3 OP72D batteries.
- (c) Service Pedestal - shall be available as a mounting option.
- (d) Adjustable delay-timer to provide up to 10 hours of full cycling while on battery before switching to flash mode (only available where 100% low-power/LED signals and PED heads are used). Batteries must be sized properly to fully utilize this feature.
- (e) One-shot ground pulse to trigger external start upon return of AC power.
- (f) Enhanced battery charger provides accelerated charging capacity (contact factory for details and proper application)

8. A light shall be mounted on top of the cabinet that will be on indicating when signal is operating in battery back-up.

9. Warranty:

Standard warranty terms for a period of minimum one-year shall cover all components of the UPS including the battery system, all parts and labor.

TABLE 1								
	Volts/ A-hrs.	ESTIMATED RUNTIME (assumes 77°F/25°C, to 1.75 volts per cell).			Unit Weight (Kg.)	Overall Dimensions Per Battery Inches (cm.)		
		200 Watts	400 Watts	800 Watts		Length L	Width W	Height H
	12 VDC 16 A-h	3.5 Hrs	1.73 Hrs	52 Min.	14.7 (6.7)	7.27 (18.46)	3.11 (7.89)	6.67 (16.93)
	12 VDC 31 A-h	8.8 Hrs	3.8 Hrs	1.8 Hrs	23 (10.5)	7.68 (19.51)	5.15 (13.08)	7.22 (18.34)
	12 VDC 39 A-h	11.3 Hrs	5.5 Hrs	2.3 Hrs	29 (13.2)	7.68 (19.51)	5.15 (13.08)	8.50 (21.59)
	12 VDC 48 A-h	13.7 Hrs	6.7 Hrs	2.9 Hrs	32 (14.5)	9.41 (23.90)	5.22 (13.26)	9.35 (23.75)

*OP72X battery sets include six (6) batteries per set. Wired in series, each set provides 72 VDC.

NO.	DATE:	REVISION	BY:	APP'D
3	10/30/20	MAJOR REVISIONS	SU	KRE
2	07-06-10	ADD CONTROLLER SPEC UNDER IX	KAP	LGV
1	01-14-08	ADD 333SD-ITS CONTROLLER DETAIL	KAP	LGV

DRAWN BY: Shoeb Uddin
APP'D BY: Kristi Ericksen



**STANDARD DETAILS
DT - 111**

**TRAFFIC SIGNAL
SPECIFICATIONS**

DATE: _____
PAGE: _____ OF _____
PROJECT: _____