

GENERAL NOTES

FED. RD. DIV.	STATE	PROJECT	
5	OHIO	T-4030 (13)	

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LAKE COUNTY
LAK-20-14-30
LAK-86-0-25
AND WASHINGTON STREET
AND ST. CLAIR STREET

625 SECONDARY TRAFFIC SIGNAL CONTROLLER, TYPE I

GENERAL

The local controller shall act as secondary controllers in the coordinated system and operate according to the master supervisory functions called for by the master local controller.

The controller shall meet all specifications as outlined in the Institute of Traffic Engineers Technical Report 2 dated 1958.

All component parts shall be of high quality, meeting the acceptable standards of good engineering practices.

The controller shall operate satisfactorily at any temperature between -30°F and +165°F inside ambient.

POWER

The Controller shall be designed to operate from a 115 volt, 60 Hz single phase power source.

The controller shall function satisfactorily at any voltage, within plus or minus 10% of the rated voltage.

The controller shall be rated at 15 amperes signal load capacity but may be expanded up to 50 amperes if specified.

DESIGN

DIAL UNIT

Controllers shall be the expansible type having 3 dial units. The dial units shall be equipped with 60, 70, and 80 second gears.

Each dial unit shall be plug-connected and shall be so constructed that it may be installed or removed without the use of tools.

The timing dial of each dial unit shall be driven by a self-starting sealed, synchronous motor requiring no lubrication. This motor shall have ample torque to drive the dial at constant speeds under all normal operating conditions.

The dial unit shall have a manually operated reset switch for de-energization of the motor.

On the front of each timing dial there shall be a calibrated scale for the setting of each interval of the color sequence. The dial shall at all times show a visual indication of the percentage of the time cycle allocated to each interval.

Each dial shall be equipped with color coded keys which shall snap in and out easily without the use of tools and shall be self-locking.

Each dial unit shall have a visual indication of the time cycle set on the dial.

Each dial unit shall be equipped with a five contact block wired for the following function: Three reset contacts, one split, one interlock and two contacts that may be used as required (additional splits and/or resets.)

TIMER

The timer shall be equipped with a cam unit for opening and closing signal light circuits.

The cam unit shall be equipped with insertable (or Breakoff) lobe type cams for opening and closing the signal contacts. Each cam shall have a minimum of 16 lobe positions. Cams shall be color coded to facilitate identification (i.e., green, yellow or red for signal cams.)

Each timer shall be equipped with a minimum of 6 signal circuits with provision for expansion to a maximum of 29 signal circuits.

The timer shall be hinge mounted so that it may be easily swung out or withdrawn from the cabinet for inspection or maintenance without breaking any electrical connection or without interrupting normal operation of the timer.

The timer shall be plug-connected to the controller panel so that it may be replaced with a similar unit without the necessity of disconnecting or reconnecting individual wires. The plug connections shall be MS type. The MS connector shall have 41 ampere capacity where 12 AWG wire is used and 22 ampere capacity where 16 AWG wire is used.

All printed circuit board control relays shall be plug-in type and completely interchangeable with one another to simplify maintenance requirements.

The timer shall be equipped with indicating lights for cycle, offset, and/or split functions in effect and include test switches to determine cycle and/or split as called for by the master.

PANEL

The controller shall be equipped with a panel assembly mounted on the rear wall of the cabinet for the purpose of terminating field wiring, interconnection wiring and the local power. Also to allow provision of features such as flash transfer.

The panel shall be made of heavy gauge steel and plated with bright zinc chromate.

The panel assembly shall include a fuse for the line side of the power supply, an unfused terminal for the neutral side of the power supply, one terminal for each conductor for the signal light cable and several common terminals for various ground circuits.

The panel assembly shall include switches for manual selection of flashing or manual modes of operation signal shut-down shall also be supplied.

The rear panel of controllers operating as a part of interconnected systems shall be equipped with a fuse for each of the interconnect circuits from the master controller.

Two five position selector switches shall be located within the controller cabinet for manual local selection of dial and/or split. Also, a four position selector switch may be included with the above switches for local reset test.

All field terminals shall be permanently identified. The outgoing signal circuit shall be the same polarity as the line side of the power supply; the common return of the signal circuits shall be of the same polarity as the ground side of the power supply.

Relays used to provide any features (e.g. flash transfer) shall be socket mounted.

CABINET

The controller shall be furnished completely housed in a cast aluminum weather proof cabinet.

The size of the cabinet shall be such as to provide ample space for housing the timer panel and all associated electrical devices which are furnished with the controller.

A hinged door shall be provided permitting complete access to the interior of the cabinet. When closed, the door shall fit tight against a gasket and be provided with a standard lock and key.

FEATURES

FLASHING

The controller shall be equipped with a separate motor driven plug-in flasher to permit substitution of flashing signal indications for normal automatic time cycle operation. Flashing indications shall be at the rate of 50 - 60 flashes per minute with approximately 50% on and 50% off periods.

The flashing contacts shall be equipped with an adequate radio interference filter consisting of at least one choke coil and one capacitor.

The controller shall be wired to provide flashing 'Don't Walk' intervals for pedestrian clearance.

MANUAL CONTROL

The controller shall be furnished with a manual switch and cord for providing the means of substituting local manual operation of the signal lights for the normal automatic interval sequence of the controller.

Manual operation shall provide the same interval sequence as automatic operation.

Payment for Item 625 Signal Controller Secondary, Type I shall be made at the contract unit price bid per each, completely installed, wired, tested, and accepted.

625 SECONDARY TRAFFIC SIGNAL CONTROLLER TYPE II

The Type II controller shall be of the same basic design as the Type I pre-timed secondary controller.

In addition to the design characteristics and features of the Type I controllers, the Type II shall contain a coordinated, actuated phase extender. The phase extender shall be used to semi-actuate the controller or to provide vehicle and/or pedestrian actuated movements as required by the plans.

The phase extender shall be a self-contained accessory package, pre-wired and assembled in a housing of such size that the complete unit will fit on a shelf in the Type II controller housing. The unit shall contain a dial unit similar in all respects to the dials contained in the basic pre-timed Type I controllers. All component parts shall be solid state in design and mounted on a plug-in circuit board.

Pilot lights to indicate the phase in operation shall be included as part of a control and indicating panel. The panel shall also include switches to place the phase extender into normal operation or a maximum timing condition. The switches shall have an off position.

Pilot lights to indicate extensions and switches to place the phase extender on recall shall also be included as part of the control panel.

Payment for Item 625 Signal Controllers Secondary Type II shall be made at the contract unit price bid per each, completely installed, wired, tested and accepted.

625 SECONDARY TRAFFIC SIGNAL CONTROLLER, TYPE III

GENERAL

All signals relating to the control of traffic at a single intersection shall be controlled by a separate controller unit.

TYPE

All controllers used in the system (s) shall be solid state timers using fully digital timing techniques. All timers shall be capable of expansion to a minimum of four phases with four overlaps.

INTERSECTION CONTROL UNITS (LOCAL CONTROLLERS)

Each intersection control unit shall be fabricated of a signal control timing unit, flasher and local flash switch, power disconnect switch, dial coordinating unit, fuse and terminal blocks and all accessory equipment necessary for a complete operating unit all being neatly and accessible installed in a base mounted, weatherproof cabinet of ample dimensions. The local controllers shall be semi-vehicle actuated, three phase full vehicle actuated or four phase full vehicle actuated as indicated on the plans. All controllers in the system (s) shall be capable of being operated in an inter-connected flexible progressive type of system.

1. The timers shall be phase modular using a maximum of one phase module opening for each phase.
2. The timer shall be capable of skipping any phase in the absence of demand and shall serve only phases with actual demand.
3. The controllers shall be furnished with a jack mounted, two circuit flasher with a noise suppressor and manual switch. The flashing sequence shall be in conformance with the Ohio Manual of Uniform Traffic Control Devices.
4. The controllers shall also be equipped with an automatic flashing feature for failure other than power loss. (Pedestrian indication dark.)

POLICE PANEL DOOR

The police panel in the controller door shall contain four double pole, double throw, maintained contact toggle switches which shall control the following functions:

1. "Free Operation" to manually remove the controller from the system and seek its own level of operation.
2. Signal On/Off
3. Automatic/Manual
4. Flasher

TIMER

The timer shall be housed in a compact portable aluminum enclosure with all timing devices, connectors, operating switches, etc., necessary for normal programming located on the timer from panel.

1. All printed circuit boards shall be provided on plug-in assemblies.
2. All connectors shall be round threaded MS type each uniquely keyed to prevent intermixing.
3. All modules and printed circuit board assemblies shall be inter-changeable for like functions but shall be mechanically keyed to prevent insertion of assemblies with unlike functions.
4. Phase and interval sequencing logic circuitry shall be provided on separate plug-in modules removeable from the front.
5. All maintenance shall be accomplished from the front.
6. The power supply shall be removeable from the front.

SIGNAL TIMING

All timing shall be accomplished using digital methods and be derived from the power line frequency for accuracy. The following minimum range of time setting shall be provided of all intervals where required.

1. Walk and Pedestrian Clearance - 5-25 seconds with one second maximum increments.
2. Initial - 0-20 seconds
3. Extension and Yellow Clearance - 1-10 seconds with 0.2 second maximum increments.
4. Red Clearance - 0-10 seconds with 0.1 second maximum increments

All timer setting devices shall be mounted on the front of the timer and clearly marked as to function. No tools or special equipment shall be required to program the timer for operation. Time setting devices shall be push-buttons or similar approved means.

INDICATORS

Indicators shall be provided on the timer front panel to display all function timing and timer terminations. Operating modes in effect shall be indicated.

1. Vehicle calls shall be indicated momentarily on a separate light when received.
2. All indicating lights shall be replaceable and rated for 20,000 hours of operation
3. A switch on the timer front panel shall be provided to de-energize the indicators.