

DESCRIPTION

The turn-arrow signal section shall display either a green or a yellow (non-overlapping) directional arrow when illuminated and shall be completely blank otherwise. It shall be assembled in a weatherproof standard case for a 12 inch round signal and attached at the bottom of a red, green, yellow signal display head. It shall be driven by load relays located in an associated intersection cabinet.

The turn-arrow signal section shall be capable of operation by means of remote switch closures. The switch closure shall result in the application of 10.8 volt, 60 hertz power to one or the other of two lamps internal to the signal section housing. One lamp, when so energized, shall cause the signal section to display a green left-turn arrow. The other lamp, when similarly energized, shall cause the signal section to display a yellow left-turn arrow. The arrows shall appear as green or yellow dots forming a dual indicator row display arrow on a black background. (The two color displays shall be of essentially equal light intensity.) When not energized, the sign shall appear only as a uniform black background.

CONSTRUCTION DETAILS:

The turn-arrow signal section shall be contained in a housing constructed of aluminum or polycarbonate. Signal section shall have housing finished in Federal yellow. Before applying this finish in accordance with Federal Specification TT-E-527, latest addition, Class B (baking), the housing shall be prepared by cleaning; applying a phosphate coating (Bondrite #723, or equivalent); followed by a sealing solution (Parcolene #3, or equivalent).

The housing shall be of weatherproof design to prevent direct entry of dust or water. The housing and mounting hardware shall be designed to meet all operating requirements under wind loadings of 30 pounds per square foot and snow and ice loading of 10 pounds per square foot.

The housing shall be a housing for a standard 12-inch round signal head and shall be designed for display of the 12" turn-arrow signal face. The weight of the complete assembled turn signal section shall not exceed 20 pounds. The assembled turn signal section shall be designed for attachment at the bottom of an overhead red, green, yellow, traffic signal display head. All necessary mounting hardware shall be provided with each turn arrow signal section supplied. Protective gaskets shall be used at each mating surface to assure weatherproof integrity.

The signal section housing shall incorporate a head or cut-away visor to minimize any adverse effect on visibility caused by sunlight shining on the front of the signal section.

Provisions shall be made in the housing for entry of power leads through the standard 1 ½ inch NPT nipple fitting.

The housing shall be designed to permit easy access for installation or servicing via a hinged door. The door shall be provided with a sealing gasket to maintain weatherproof integrity. No tools other than a screwdriver shall be required for access.

Mounting provisions shall be made within the housing for all internally mounted components such as lamps, transformers, terminal strips, etc. Screw type terminal strips with a minimum of 3 separate terminals shall be provided.

All components except lamps shall be designed to operate for a minimum of 10 years under normal operation conditions.

The signal face shall be a 1/8 inch sheet of black anodized aluminum.

The illuminated turn-arrow shall be clearly visible at a distance of 200 feet under daytime or nighttime conditions by a driver with 20/20 vision.

The signal section face shall be securely fastened to the back of the housing door. It shall be easily accessible for cleaning or replacement with no tools other than a screwdriver.

A Quartz, halogen lamp with internal multi mirrored reflector rated at 43 watts at 10.8 volts AC shall be provided for each color arrow to be displayed. Each lamp shall have a 10,000 hour manufacturer rated average life under the conditions of normal sign operation.

Individual transformers shall be used to reduce the incoming 115 volt, 60 Hz power to 10.8 volts, 60 Hz for direct application to the lamps. Each transformer shall be rated at 48 volt amps under the environmental conditions described later in these specifications.

The fiberoptic bundles shall be neatly mounted on a flat black protective panel which shall be attached to the rear of the signal section face. The bundles shall be positioned between face and protective panel as a protective measure. All other signal section components -- transformers, lamps, filters, terminal strips, etc. -- shall be fastened to the rear of the protective panel. All components shall be easily accessible for servicing or replacement.

The turn-arrow signal section shall operate from a 115 volt, 60 Hz single phase power source. Total power is not to exceed 50 watts.

In the event of restoration of power after an interruption, proper operation of the signal section will recommence immediately for all conditions of operation.

Primary power lead-in wire and internal hook-up shall be of a size consistent with current requirements and acceptable voltage drops. Primary power wire should not be less than 8 AWG and hook-up wire not less than 14 AWG.

All wire must conform to MIL-W-16878D type B, vinyl-nylon jacket and shall use stranded copper conductor.

The signal section shall not be damaged or display electrical breakdown or arc over when subjected to a potential of 1200 volts rms, 60 hertz applied between each insulated terminal and ground.

The measured insulation resistance shall be 100 megohms or greater with a potential of 500 volts DC applied between each insulated terminal and ground.

Gas discharge surge protection devices shall be installed on the intersection cabinet backpanel for individual lead-ins to each signal section terminated at the cabinet.

OPTICAL REQUIREMENTS:

Non-lensed fully bias randomized bifurcated fiber-optic bundles shall be used to provide a 60 degree, total viewing angle looking perpendicular to signal face. Fifty four individual 0.140" diameter (nominal) bundles shall be used to form the arrow legend. The same bundles shall be used to display either message. The borderline arrow indicators shall be comprised of a dual row of fiber bundles in total conformance with ITE standards for arrow lenses regarding stroke width and shape.

In order to help balance the intensity between colors, provisions shall be made in the construction of the signal to supply approximately 50% more light to the green arrow indication than supplied to the amber arrow indication.

Maximum fiber breakage per fiber bundle shall not exceed 3%.

All optical surfaces shall be polished smooth to a minimum 8 micron finish for maximum output and bundle to bundle consistency.

A minimum of two (2) spare fiberoptic bundles shall be required and built into the unit.

Fiberoptics shall be glass bundles assembled on a flat black matrix panel with mechanical protection for the assembly. The glass fibers at the input and output ends shall be ground smooth and optically polished for maximum light transmission. Matrix panel to have flat black non-reflective finish to minimize legibility of the arrow when not illuminated.

To eliminate long term condensation effects of thermal cycling, individual fiberoptic bundles shall not be jacketed or encased. Lamps shall be mounted horizontally to prevent their collecting water from condensation or possible gasket leaks.

The front panel shall be fully rotatable to indicate the desired arrow direction when installed.

No moving parts are permitted.

Fiberoptics shall be protected by a black ABS plastic vacuum formed sculptured cover to

ITEM C686.8104 SPECIAL TURN SIGNAL SECTION – DRDI (DUAL ROW DISPLAY INDICATOR)

eliminate the possibility of damage when installing or re-lamping. To avoid confusion, identical lamp shall be used for each message. Electrical connection shall be provided by a barrier type terminal strip for connecting field wires.

All fiberoptics, transformers and lamps shall be mounted on the door of the unit. All screws, washers, nuts and bolts shall be corrosion-resistant stainless steel. All components shall be readily accessible when the door is opened. The only tool required for maintenance shall be a standard screwdriver.

QUALITY CONTROL:

A plug sample shall be taken from every run of fiber used for sign production. The plug samples shall be finish processed on one end and then tested for roundness of fiber, core to clad fusion, size and optical transmission before the fiber is released for use in production. All optical fiber utilized in the production of the fiberoptic unit shall be tested for:

- a. Core to clad fusion
- b. Size (.002" nominal)
- c. Roundness of fiber
- d. Optical transmission
- e. Brittleness

The manufacturer shall provide, in writing, a certificate of compliance stating that testing has been performed on the optical fiber, and that all fiber used in the product was produced in-house using strict quality control procedures.

METHOD OF MEASUREMENT:

Each turn-arrow signal section in place and accepted by the ENGINEER will be measured as a single unit.

BASIS OF PAYMENT:

Payment for each turn-arrow signal section shall be made for the measured quantity as the contract price per each; which price shall be full compensation for furnishing, transporting, installing and adjusting all materials including but not limited to any necessary modifications to any existing signal hardware and readjustment of signal span wire to achieve proper signal head mounting height in conformance with NYS MUTCD, and for all labor, tools, materials, equipment and incidentals necessary to complete the work in accordance with the plans and specifications.

Payment will be made under:

<u>Item No.</u>	<u>Item</u>	<u>Pay Unit</u>
C686.8104	Special Turn Signal Section – DRDI (Dual Row Display Indicator)	EA