

Section
B

SIGNALS

Position Light Signals



Union Switch & Signal Co.
Swissvale, Pa.

UNION SWITCH & SIGNAL CO.

PREFACE

A system of cataloging necessitates very liberal assignment of plate numbers to permit of future listing of parts logically and in harmony with past practice. The Sectional loose-leaf system adopted by this Company in 1911, although meeting most demands, does not allow of sufficient expansion. All catalogs issued from December 1920 will be compiled on a new method of classification of apparatus. Piece numbers will be an important feature of the ordering reference.

Part catalogs will be printed as soon as possible after new material is developed or old material is redesigned, and ultimately the information given in pamphlet form will be reprinted and grouped under proper classifications in loose-leaf binders. Old catalogs will remain in vogue until they are completely incorporated under the new system. It will be noted in the following classification outline that material cataloged in former sections A, B and C will retain the same prefix letter; but will form a subdivision of a more general classification.

MAIN CLASSIFICATIONS

Section

- A—Interlocking Machines.
- B—Signals.
- C—Switch and Lock Movements, Layouts and Ground Material.
- D—
- E—Relays, Indicators and Locks.
- F—Transformers, Reactors, Resistors and Impedance Bonds.
- G—
- H—
- I—
- J—Circuit Controllers.
- K—Highway Crossing Protective Devices.
- L—Housings.
- M—Insulated Rail Joints.
- N—Automatic Train Control and Stops.
- O—
- P—Bond Wires, Trunking, Lightning Arresters, Terminals, Electro-Pneumatic Fittings, and Accessories. (Power Generators and Distributing Apparatus.)
- R—Car Retarders.
- S—Rectifiers.

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POSITION LIGHT SIGNALS

Position light signals present aspects and give indications by means of rows of lights corresponding to the positions occupied by the blades of semaphore signals; light indications being visible during both day and night.

Types:

Both high and dwarf position light signals are available. The high signals may be mounted upon a ground mast, a signal bridge or a bracket post. The dwarf signals may be mounted upon a foundation or by means of a wall bracket.

Aspects and Indications:

A high signal may give indications of one arm, one arm with marker, two arm, or any other combination desired. Dwarf signals ordinarily provide indications of but one arm. Each blade equivalent may be made to assume one, two, three or four distinct positions. A typical scheme of aspects and indications illustrating the flexibility of the position light signal is shown on the next page.
















Detail Design:

The position light high signal is comprised of rows of light units, each consisting of three units mounted on pipe supports extending radially from a central hub, all being applied to a 5" pipe mast. A background is also provided.

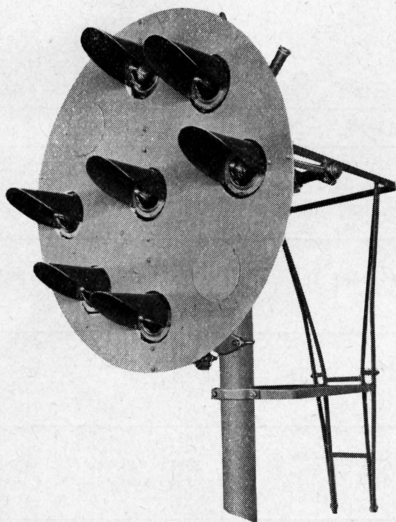
The background is of maximum effectiveness for minimum size and weight. It is made of sheet iron and is held in fixed relation to its pipe supports by means of substantial brackets. The supports are of pipe, threaded and fitted into a hub casting. Cast iron lamp units are mounted on the pipe supports in such manner that the hoods project through the circular holes in the background. The lamp units are mounted on 18" center lines, radially. Cover plates are used for blanking out openings in the background not required for a given set of indications.

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POSITION LIGHT SIGNAL.

	ASPECTS.		INDICATIONS.	NAME.
	HIGH	DWARF		
1			Stop	Stop Signal.
2			Stop-Then proceed at slow speed with caution.	Stop and Proceed Signal.
3			Proceed at slow speed prepared to stop.	Slow Speed Signal.
4			Proceed with caution prepared to stop short of train or obstruction.	Permissive Signal.
5			Proceed at slow speed with caution prepared to stop short of train or obstruction.	Caution Slow Speed Signal.
6			Proceed at restricted speed.	Clear Restricting Signal.
7			Approach next signal prepared to stop.	Approach Signal.
8			Approach next signal at restricted speed.	Approach Restricting Signal.
9			Proceed	Clear Signal.
10			Proceed at slow speed	Clear Slow Speed Signal.
11			Approach home signal with caution.	Caution Signal
12			Take Siding.	Take Siding Indicator.

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POSITION LIGHT SIGNAL
(Front View)

The signals are attached to the mast by means of U-bolt clamps. A standard signal platform with an extended hand rail and standard ladder provides ready access to the lamp units and terminal box. The lamp units of bridge signals are so located as to make ladders and platforms unnecessary.

All parts are accessible, side doors being provided on both sides of the lamp units. These are opened by merely turning thumb screws. All wires are brought to terminals in a centrally located terminal box which is provided with easily

opened doors. A flexible conduit connector provides for changes in signal alignment without interference with wiring. The complete signal unit is assembled, ready for clamping to the signal mast prior to shipping; all lamp units being connected by insulated wires to terminals in the terminal box.

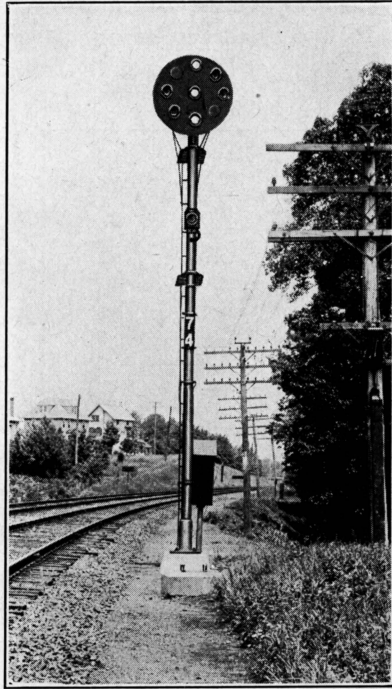
Lamp Unit:

The lamp unit consists of a cast iron case having a door on either side. Each unit has a separate supporting bracket being attached thereto by four bolts. These bolts provide for universal adjustment in aligning the lamp, through the medium of a ball and socket joint. A $5\frac{3}{8}$ " inverted toric lens is supplemented by a cover glass of special "no-glare" composition which gives the light transmitted a slight yellowish tinge, rendering it more distinct and providing greater fog penetration. But one lamp is required for each lens. Should one lamp in any line burn out, there still remain two luminous units which provide a satisfactory signal indication. A mirror reflector is mounted so as to deflect some of the rays of light downward thus providing a good short range indication. This effect is further aided by the use of a toric lens. Phantom indications are avoided by the use of the conical cover glass which has a frosted tip, and the paint-

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ing black of a portion of the inside lens surface steps. A sheet iron hood shields the lens from the direct rays of the sun.

The lamp receptacle is accurately located by jig and cemented in place in order that lamps which have their filaments properly located with respect to the lamp bases can be used interchangeably. The lamp filament is $\frac{1}{4}$ inch long and is disposed horizontally at right angles to the optical axis. The lamps are specially based thus allowing renewal without adjustment of lamp unit or lens. The lamps are normally burned considerably under their rated voltage in order to provide long life. The ratings of these lamps are given below:



**POSITION LIGHT HIGH
GROUND SIGNAL**

LAMPS FOR POSITION LIGHT SIGNALS

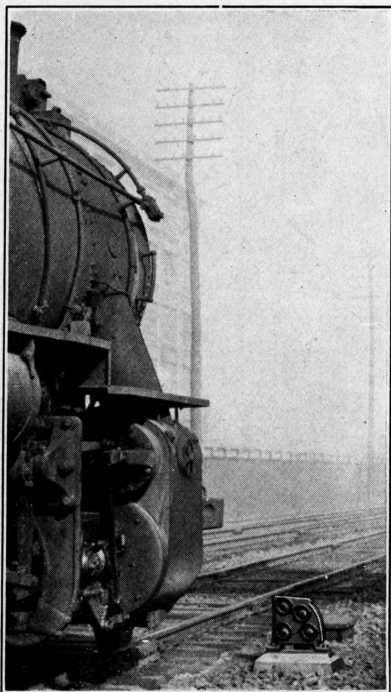
	Per Lamp				
	Rated			Recommended	
	Volts	Watts	C. P.	Volts	Watts
High Signal	12.0	7.5	7	11.0 to 11.5	6.3 to 6.9
Dwarf Signal	6-8.0	16.8	21	4.0	5.5

High signals require three lamps burning.
Dwarf signals require two lamps burning.

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Dwarf Signal:

The dwarf signal consists of a single cast iron case with four openings for lenses. By means of doors on two sides, ready access can be had to all wire terminals and lamps. The lenses are located on $8\frac{1}{16}$ " center lines, radially from the pivot unit.



**POSITION LIGHT DWARF
SIGNAL**

This signal is ordinarily given a bias in mounting to favor the engineman who, in his cab, is considerably above the horizontal plane in which the dwarf signal is located. On account of a short range only being required of dwarf signals, no particular attempt is made to secure an accurate location of the lamp with respect to its lens. The lens is frosted in order to provide a better diffusion of light.

Power Supply:

Power for a light signal installation is ordinarily obtained in the form of alternating current. There are several reasons for using this in connection with railway signaling. The advantages in many cases warrant the installation of a transmission line so that power for the illumination of position light signals is often available without any additional expense being as-

sumed. Energy may then be supplied the position light signals by simply installing transformers at the required locations.

In the few sections where a satisfactory source of alternating current power is not available, it may prove necessary to supply energy for position light signals from primary or storage batteries. It is well known that battery energy is considerably more expensive than is alternating current, and for this reason, control circuits

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should be installed providing for the light signal to be illuminated only upon the approach of trains. This circuit is simple and can be installed without any very great additional expense.

Ordering References:

In the catalog section following, an effort has been made to give ordering references for complete assemblies and details of such types of position light signals as have already been supplied in large quantities. Those using position light signals differing only in minor details, will find ordering references for the majority of parts.



POSITION LIGHT SIGNALS