EATON

AEROSPACE & COMMERCIAL CONTROLS DIVISION

FIBER OPTIC DISPLAYS
900 SERIES

EATON A World of Applications

Your Bright Ideas Deserve Ours.

Bright displays really do a lot for your bright idea.

For one thing, they make your equipment more functional, because they're easier to read. For another, they enhance its appearance and usefulness.

And when it comes to making bright displays, nobody shines like EATON.

In fact; nearly all of our displays can easily be read in direct sunlight, because they feature incandescent lamps and fiber-optic light transmission. They're the brightest you can buy.

We Really Shine on Selection

Chances are, you'll find just what you need in the following pages. In addition to a wide variety of basic models, there are many configuration alternatives to suit virtually every type of application.

If your specifications call for moisture-proof service, we can meet them. If you prefer fast bulb replacement capability, we've got it. If you need multi-colored lenses, wide-angle readability, compact characters on 0.2 inch centers — you name it, we probably make it.

We also have many built-in decorder/driver circuit package options to make interfacing a snap.

What's more, if you don't see exactly what you need, ask for it. We often manufacture custom configurations for our customers — everything from a simple spacer that allows installation of one of our standard displays in your existing cutouts, to a totally new and unique display.

Glowing Reputation.

We're proud of the reputation we've established with industrial, military and aerospace customers over 30 years.

The displays we manufacture are known for quality and reliability in countless rugged applications including shipboard, nuclear, aircraft, aerospace and telecommunications.

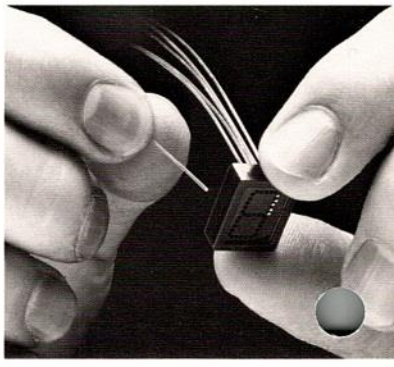
For advanced, state-of-the-art display and control devices that meet the toughest critera, EATON is the name that's up in lights.

Our product lines include the fiber-optic LED and incandescent illuminated displays shown in this catalog, plus solid state voice response systems, lighted and unlighted pushbutton switches, word indicators, indicating fuse holders and custom subassemblies. They're designed, manufactured, assembled and tested at our 100,000 square-foot Costa Mesa, California plant.

EATON maintains sales offices throughout the United States and Europe, in addition to a worldwide network of stocking distributors.

EATON Readouts utilize a special fiber-optic bundle construction.

These "light pipes" provide optimum brightness levels at *lower power levels.* And the slightly rounded dot and bar patterns produce easily-recognizable, alphanumeric characters which *minimize viewer fatigue.*



Typical Fiber Optic Construction

Light sources for the fiber-optic models are incandescent lamps or Light Emitting Diodes. The lamps, capable of up to 20,000 hours average life, create characters in some devices *readable in direct sunlight.* The LED model is primarily intended for indoor use.

While the LED type is available only in red (special colors available on request), EATON lamp-type readouts produce *characters* in a variety of colors. Character color depends upon the filter selected, and different colored filters are often used on the same panel to give certain readouts greater emphasis, or for recognition purposes.

All EATON readouts feature *easy lamp replacement.* To meet varying criteria, some models permit individual lamp replacement while others feature a multi-lamp module to facilitate replacement of all lamps at once.

Many models feature *internal decoder/driver* IC packages to minimize external circuitry requirements. A wide range of terminations, including *plug-in connections,* is available to meet various system requirements.

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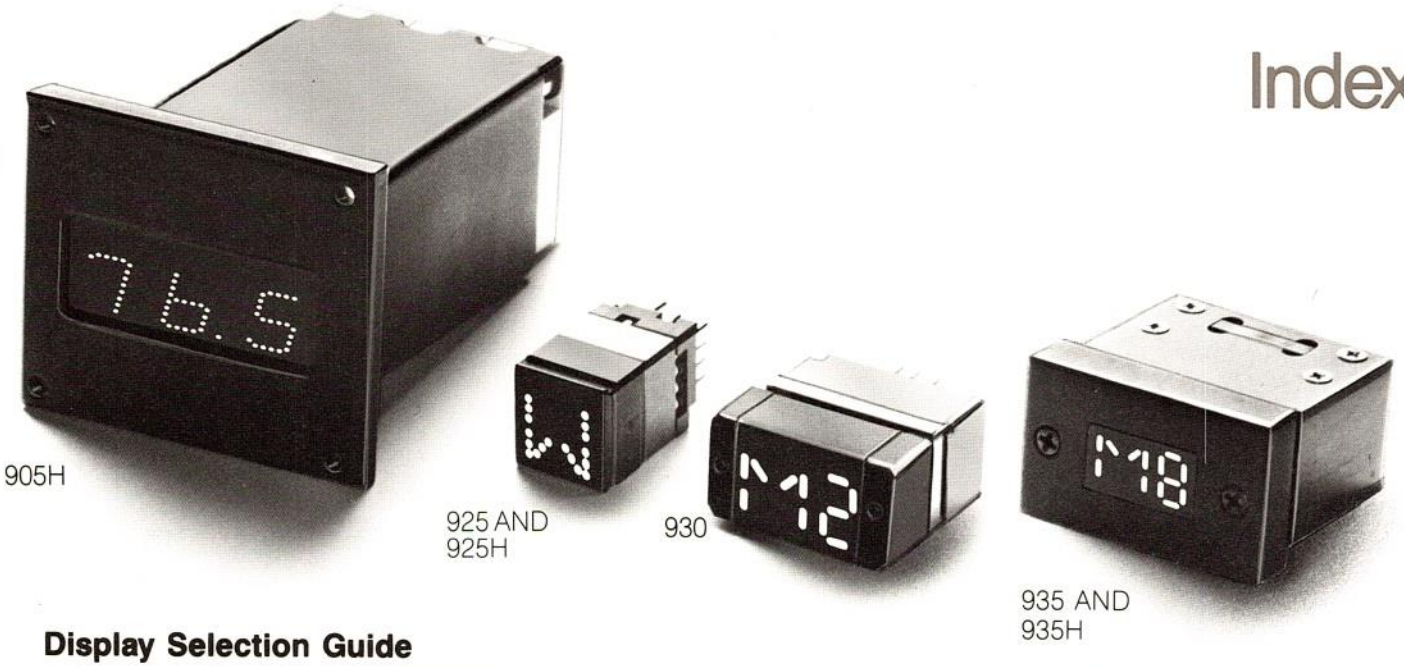


Display Selection Guide

Model	Display	Display Dimensions		Decoders Available	Color Filters Available*	Qualified Mil Spec	Page Number	Ordering Information
905H LED	7-Segment	Height Width Slope	.43(10.9) .25(6.4) 8°	Yes	Red LED Std. Bezel Supplied w/high contrast red filter	MIL-D-28803/1	**5**	**7**
925 **925H**	7-Segment 16-Segment	Height Width (7) Width (16) Slope	.27(6.9) .15(3.8) .27(6.9) 0°	No	Yes A,B,G,R,Y,N (Filters in Bezel)	MIL-D-28803/3 925H Only	**9** **13**	**10** **14**
930	7-Segment 16-Segment	Height Width (7) Width (16) Slope	.32(8.1) .15(3.8) .27(6.9) 0°	No	Yes A,B,G,R,Y,W	—	**17**	**19**
935 **935H**	7-Segment 16-Segment	Height Width (7) Width (16) Slope	.32(8.1) .15(3.8) .27(6.9) 0°	No	Yes A,B,G,R,Y,W (Filters in Bezel)	MIL-D-28803/3 935H Only	**9** **13**	**10** **14**

*Color Codes: A = Amber, B = Blue, R = Red, W = White ("Incandescent"),
G = Green, N = Neutral Gray (For White "Incandescent"), Y = Yellow, (XX) Dimensions in MM

About Displays

Cockpit lighting displays must meet two basic standards on today's aircraft. The displays must be readable in direct sunlight and also during night conditions when the power is reduced. This requires a specially designed display providing uniform light.

EATON's display design is a field proven system used in aircraft and space vehicle cockpits during the past 10 years that is capable of delivering both of these features.

Light sources are low power, T-1 or T-3/4 lamps and a unique fiber optic display system utilizing either dots or bar segments to convey information. The result is the finest state of the art illuminated cockpit displays made today.

"Dimmability"

EATON displays dim uniformly even at the low-voltages required during night conditions. A very common problem with *other* lighting systems is "hot areas or hot spots" that develop when power is reduced or changed. This causes parts of the message displayed to be unevenly lit with relation to other segments. This causes difficulty and hazard to flight crews because an important message can go unseen or be over shadowed by the adjacent display. The EATON dimmable fiber optic displays provide consistent uniformity and visibility at all levels.

NVIS Compatibility

The Series 925, 925H, 930, 935, 935H can be provided with a lens/lamp design that is sunlight readable in 10,000 foot candle ambient light and can be dimmed to meet the NVIS compatibility requirement of Mil-L-85762 A for Green, Yellow and Red colors.

EATON Calibration & Intensity Measurements

Sunlight readability of EATON displays are measured in our photometric laboratory by subjecting them to ambient illumination of 10,000 ft. candles minimum light level, at 5000° ± 500° Kelvin Color Temperature directed at an incident angle of 45° ± 2° to the normal plane of viewing surface.

The contrast ratios are determined by taking three brightness measurements as shown in figure 1.

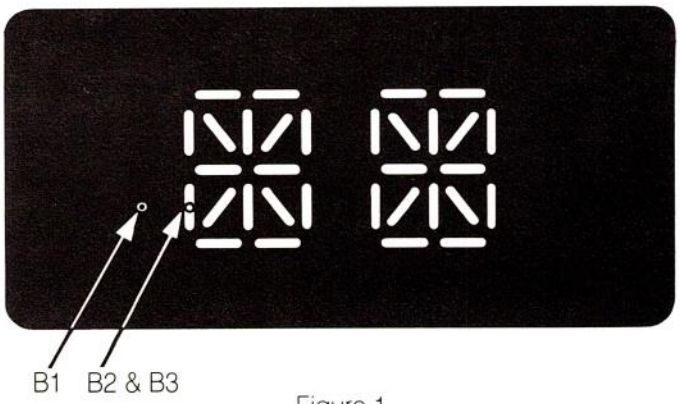


Figure 1

Contrast Ratio Formulas

On/Background contrast, $C_1 = \frac{B2 - B1}{B1}$

Off/Background contrast, $C_2 = \frac{B3 - B1}{B1}$

where B1 is Background luminance
B2 is Display luminance (lighted)
B3 is Display luminance (unlighted)

Lighted segments are sunlight readable when the contrast ratio C_1 of the segment to the background is greater than .6 and the contrast ratio of C_2 of the legend off to the background is less than or equal to .10

905H

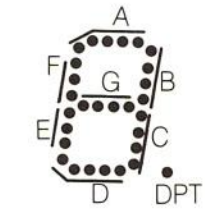
Qualified Mil-D-28803

The 905H was developed for use on destroyers during the 1971 update program. The program specified a large-character readout that would meet stringent shock, vibration, moisture and include decoding capability. The 905H was designed with long life LEDs, 7 segment and 4 segment dot displays and solderless crimp terminals. Versions of the 905H are in use on the Trident Submarine, and in control panels aboard the Spruance Class Destroyers.

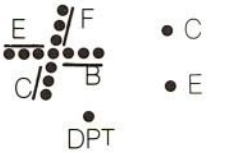
The 905H is a special environmentally protected readout assembly packaged to meet the shock requirements of Mil-S-901C, the vibration requirements of Mil-Std-202, the EMI/RFI requirements of Mil-Std-461, and the splash-proof or moisture-proof requirements of Mil-Std-108. These readout assemblies incorporate the EATON Model 905H Fiber Optic Readout and are available in 1 thru 8 unit assemblies. Each readout unit is designed to meet the new military specifications for segmented readout, Mil-D-28803.

905H Actual Size

A. Characters - 7 segment



Front view of 7-segment display designations for A2



Front view of 4-segment display designations for A8

Front View of Colon Display

A2: Full 7-segment with decimal point
A8: Plus and minus with decimal point

B. Light Source - LED

LEDs are used in the Series 905H fiber optic displays. The power requirements are 15mA @ 5V. The LEDs are red in color with other colors available on special order.

C. Terminations

C1: The solder connections will accept one #20, one #22, one # 24, or two #24 AWG wires.

D. Circuit Packages

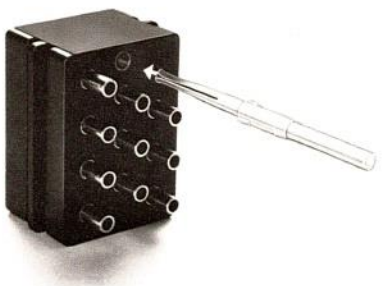
Part Identification of Circuit Packages

D 1 = Circuit not furnished
D10 = 4 line BCD (8-4-2-1) operating temp −55° to +85°C w/o memory
D29 = 4 line BCD (8-4-2-1) operating temp −55° to +85°C with memory

Note: Circuit D10 & D29 Decoder requires a constant 5VDC ± 5% to function. A separate input is required when lamp dimming capability is desired.

Circuit D10 & D29 Decoder requires a constant 5VDC ± 5% to function. A separate input is required when lamp dimming capability is desired.

Circuit D10 & D29 Decimal Point (DPT). The decimal point will operate independently of the seven-segment decoder/driver. One side of the decimal point is internally connected; the other side is connected directly to the decimal point terminal (DPT). No lamp driver is provided.



Connector Block with Crimp or Solder Terminations

905H

Electrical Specifications for Circuit D10

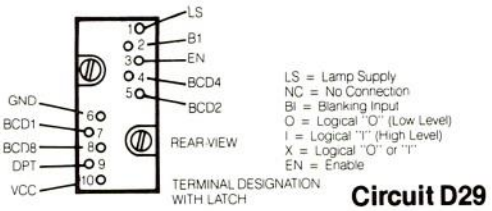
Supply Voltage (V_{CC}) . . . . . 5VDC (+5%)
Supply Current (Less Lamps) . . . . . 103 mA, Max.
Lamp Current, Each (V_{CC} + 5V) . . . . . 20 mA + 10%
Logical "0" level Input Current at (V_{CC} = Max.)
any input except BI/RBO mode (V_{IN} = .4V) . . . . –1.6 mA Max.
Logical "0" level Input Current
at BI/RBO mode (V_{IN} = .4V) . . . . . –4.2 mA Max.
Logical "I" level Input Current at (V_{CC} = Max.)
any input except BI/RBO mode (V_{IN} = 2.4V) . . . . . 40 µA Max.
Logical "0" (Low) Input Voltage . . . . . 0.8V Max.
Logical "I" (High) Input Voltage . . . . . 2.0V Min.
BI/RBO Output Voltage (Low) . . . . . 0.4V Max.
BI/RBO Output Voltage (High) . . . . . 2.4V Min.
Normalized Fan-Out from
BI/RBO mode (for TTL loads) . . . . . 5 Max.
Output Sink Current BI/RBO . . . . . 8 mA Max.

Electrical Specifications for Circuit D29

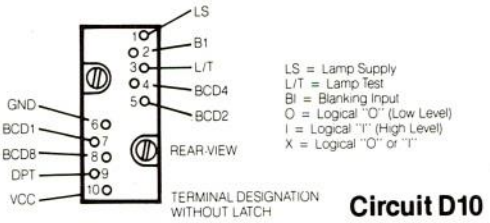
Symbol	Characteristics	Limits			Units	Conditions
		Min.	Typ.	Max.		
V_{CC}	Supply Voltage	4.75	5.0	5.25	V	
V_{IH}	Input HIGH Voltage	2.0			V	Guaranteed Input HIGH Voltage for All Inputs
V_{IL}	Input LOW Voltage			0.8	V	Guaranteed Input LOW Voltage for All Inputs
V_{CD}	Input Clamp Diode Voltage			–1.5	V	V_{CC} = MIN., I_{IN} = – 12 mA, T_A = +25°C
I_{IH}	Input HIGH Current Data EL		20 10	80 40	µA µA	V_{CC} = MAX., V_{IN} = 2.4 V
	Input HIGH Current			1.0	mA	V_{CC} = MAX., V_{IN} = 5.5 V
I_{IL}	Input LOW Current $\overline{EL}$ DATA (Latch Enable LOW) DATA (Latch Enable HIGH) BI(RBO) Used as an input		– 1.1 – 1.1 ±0.0 –2.1	– 1.6 – 1.6 –0.1 –3.2	mA mA mA mA	V_{CC} = MAX., V_{IN} = 0.4 V
I_{CC}	Power Supply Current		76	105	mA	$A_1 = A_2 - A_3 = \overline{EL}$ – 0 V (V_{CC} = MAX. Less)
			70	94	mA	$A_n = A_1 - A_2 = \overline{EL}$ – 0 V (Ouput Lamps Open)
L/S 1/	Lamp Supply Voltage	0		5.25	V	

1/ "0" GND IS MAXIMUM INTENSITY, INCREASING THIS VOLTAGE WILL DECREASE INTENSITY.

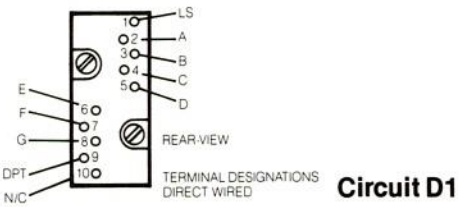
Terminal Designations



Circuit D29



Circuit D10



Circuit D1

Truth Tables

DISPLAY	INPUT								• = SEGMENT LIT							
	DPT	A	B	C	D	E	F	G	A	B	C	D	E	F	G	DPT
0		0	0	0	0	0	0		•	•	•	•	•	•		
1		0	0							•	•					
2		0	0		0	0		0	•	•		•	•		•	
3		0	0	0	0			0	•	•	•	•			•	
4			0	0			0	0		•	•			•	•	
5		0		0	0		0	0	•		•	•		•	•	
6		0		0	0	0	0	0			•	•	•	•	•	
7		0	0	0					•	•	•					
8		0	0	0	0	0	0	0	•	•	•	•	•	•	•	
9		0	0	0			0	0	•	•	•			•	•	
	0															•
∞				0		0					•		•			

Circuit D1

General Specifications

Vibration: Per Mil-Std-202, Method 204, Condition A (10-500 Hz)

Shock: Per Mil-Std-202, Method 207A, Figure 207-4A (Mil-S-901C, Grade A, Class 1, Type C)

Seal: (Drip proof) Per Mil-Std-108
(Immersion) Per Mil-Std-810, Method 512.1, Procedure I

Salt Spray: Per Mil-Std-202, Method 101, Condition B

Moisture Resistance: Per Mil-Std-202, Method 106, (omit step 7a & 7b) 25°C to 65°C, 80-98%, 10 cycles

Circuit D10

DISPLAY	INPUT							OUTPUT							
			B	C	D			• = SEGMENT LIT							
			8	4	2	1									
	DPT	LT					B1	A	B	C	D	E	F	G	DPT
0		1	0	0	0	0	1	•	•	•	•	•	•		
1		1	0	0	0	1	1		•	•					
2		1	0	0	1	0	1	•	•		•	•		•	
3		1	0	0	1	1	1	•	•	•	•			•	
4		1	0	1	0	0	1		•	•			•	•	
5		1	0	1	0	1	1	•		•	•		•	•	
6		1	0	1	1	0	1			•	•	•	•	•	
7		1	0	1	1	1	1	•	•	•					
8		1	1	0	0	0	1	•	•	•	•	•	•	•	
9		1	1	0	0	1	1	•	•	•			•	•	
BLANK		X	X	X	X	X	0								
.	0	X	X	X	X	X	X								•
8		0	X	X	X	X	1	•	•	•	•	•	•	•	

DISPLAY	INPUT							OUTPUT							
			B	C	D			• = SEGMENT LIT							
			8	4	2	1									
	DPT	LT					B1	A	B	C	D	E	F	G	DPT
÷		1	0	0	0	0	1		•	•		•	•		
-		1	0	0	0	1	1		•			•			
.	0	X	X	X	X	X	X								
BLANK		X	X	X	X	X	1								
:		0	X	X	X	X	1		•	•		•	•		

Circuit D29

DISPLAY	INPUT							OUTPUT							
			B	C	D			• = SEGMENT LIT							
			8	4	2	1									
	DPT	EN					B1	A	B	C	D	E	F	G	DPT
÷		0	0	0	0	0	1		•	•		•	•		
-		0	0	0	0	1	1		•			•			
.	1	X	X	X	X	X	X								•
BLANK		X	X	X	X	X	0								

DISPLAY	INPUT							OUTPUT							
			B	C	D			• = SEGMENT LIT							
			8	4	2	1									
	DPT	EN					B1	A	B	C	D	E	F	G	DPT
0		0	0	0	0	0	1	•	•	•	•	•	•		
1		0	0	0	0	1	1		•	•					
2		0	0	0	1	0	1	•	•		•	•		•	
3		0	0	0	1	1	1	•	•	•	•			•	
4		0	0	1	0	0	1		•	•			•	•	
5		0	0	1	0	1	1	•		•	•		•	•	
6		0	0	1	1	0	1			•	•	•	•	•	
7		0	0	1	1	1	1	•	•	•					
8		0	1	0	0	0	1	•	•	•	•	•	•	•	
9		0	1	0	0	1	1	•	•	•			•	•	
BLANK		X	X	X	X	X	0								
.	1	X	X	X	X	X	X								•

Truth Table shown is when enable is low, when enable is high, characters energized prior to enable going high will remain on.

905HW - N A D

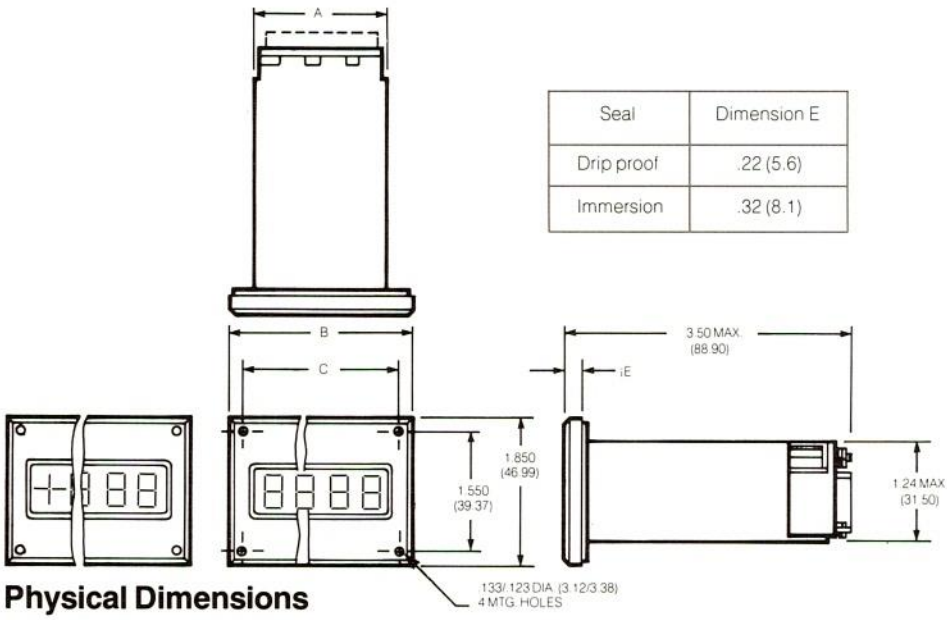
Model Number

Seal
W = Immersion
Omit W for Drip proof Seal

No. of Digits
N1 = 1 Digit
N2 = 2 Digit
N3 = 3 Digit
N4 = 4 Digit
N5 = 5 Digit
N6 = 6 Digit
N7 = 7 Digit
N8 = 8 Digit

Arrangement (1st Digit from Left)
A2 = 7 segment with DPT
A8 = 4 segment with DPT (all other units to the right are A2)
A10 = 2-7 Seg., Colon, 2-7 Seg. (clock)
A11 = 2-7 Seg., Colon, 2-7 Colon, 2-7 Seg. (Clock)

Circuitry
D1 = Circuit not furnished
D10 = 4 line BCD w/o memory
D29 = 4 line BCD with memory



Seal	Dimension E
Drip proof	.22 (5.6)
Immersion	.32 (8.1)

Physical Dimensions

NO. OF UNITS PER ASSEMBLY	A	B	C	WEIGHT OZ. MAX.
1	.62 (15.75)	1.187 (30.15)	.867 (22.02)	3.5
2	1.12 (28.45)	1.687 (42.85)	1.367 (34.72)	5.0
3	1.62 (41.15)	2.187 (55.55)	1.867 (47.42)	7.0
4	2.12 (53.85)	2.687 (68.25)	2.367 (60.12)	8.5
5	2.62 (66.55)	3.187 (80.95)	2.867 (72.82)	10.5
6	3.12 (79.25)	3.687 (93.65)	3.367 (85.52)	12.0
7	3.62 (91.9)	4.187 (106.85)	3.867 (98.22)	14.0
8	4.12 (104.6)	4.687 (119.05)	4.367 (110.92)	16.5

TOLERANCES: .XX = ± .01 .XXX = ± .02

905H

Ordering Information & Cross Reference To MIL-D-28803/1 & MSC Part Numbers

Government Designation	EATON Designation	Description
M28803/1-AA	905H-511	Module only, 4 segment direct wired
-AB	-516	Module only, 4 segment with decoder
-AC	-521	Module only, segment with decoder and latch
-BA	-510	Module only, 7 segment direct wired
-BB	-515	Module only, 7 segment with decoder
-BC	-520	Module only, 7 segment with decoder and latch
-CA	-N1A8D1	Single digit assy, 4 seg. direct wired
-CB	-N1A8D10	Single digit assy, 4 seg. with decoder
-CC	-N1A8D29	Single digit assy, 4 seg. with decoder and latch
-DA	-N1A2D1	Single digit assy, 7 seg. direct wired
-DB	-N1A2D10	Single digit assy, 7 seg. with decoder
-DC	-N1A2D29	Single digit assy, 7 seg. with decoder and latch
-EA	-N2A2D1	2 digit assy, all 7 seg. modules, direct wired
-EB	-N2A2D10	2 digit assy, all 7 seg. modules, with decoder
-EC	-N2A2D29	2 digit assy, all 7 seg. modules, with decoder and latch
-FA	-N3A2D1	3 digit assy, all 7 seg. modules, direct wired
-FB	-N3A2D10	3 digit assy, all 7 seg. modules, with decoder
-FC	-N3A2D29	3 digit assy, all 7 seg. modules, with decoder and latch
-GA	-N4A2D1	4 digit assy, all 7 seg. modules, direct wired
-GB	-N4A2D10	4 digit assy, all 7 seg. modules, with decoder
-GC	-N4A2D29	4 digit assy, all 7 seg. modules, with decoder and latch
-HA	-N5A2D1	5 digit assy, all 7 seg. modules, direct wired
-HB	-N5A2D10	5 digit assy, all 7 seg. modules, with decoder
-HC	-N5A2D29	5 digit assy, all 7 seg. modules, with decoder and latch
-JA	-N6A2D1	6 digit assy, all 7 seg. modules, direct wired
-JB	-N6A2D10	6 digit assy, all 7 seg. modules, with decoder
-JC	-N6A2D29	6 digit assy, all 7 seg. modules, with decoder and latch
-KA	-N7A2D1	7 digit assy, all 7 seg. modules, direct wired
-KB	-N7A2D10	7 digit assy, all 7 seg. modules, with decoder
-KC	-N7A2D29	7 digit assy, all 7 seg. modules, with decoder and latch
-LA	-N8A2D1	8 digit assy, all 7 seg. modules, direct wired
-LB	-N8A2D10	8 digit assy, all 7 seg. modules, with decoder
-LC	-N8A2D29	8 digit assy, all 7 seg. modules, with decoder and latch
-MA	-N2A8D1	2 digit assy, 4 seg. followed by 1, 7 seg., direct wired
-MB	-N2A8D10	2 digit assy, 4 seg. followed by 1, 7 seg., with decoder
-MC	-N2A8D29	2 digit assy, 4 seg. followed by 1, 7 seg., with decoder and latch
-NA	-N3A8D1	3 digit assy, 4 seg. followed by 2, 7 seg., direct wired
-NB	-N3A8D10	3 digit assy, 4 seg. followed by 2, 7 seg., with decoder
-NC	-N3A8D29	3 digit assy, 4 seg. followed by 2, 7 seg., with decoder and latch
-PA	-N4A8D1	4 digit assy, 4 seg. followed by 3, 7 seg., direct wired
-PB	-N4A8D10	4 digit assy, 4 seg. followed by 3, 7 seg., with decoder
-PC	-N4A8D29	4 digit assy, 4 seg. followed by 3, 7 seg., with decoder and latch
-QA	-N5A8D1	5 digit assy, 4 seg. followed by 4, 7 seg., direct wired
-QB	-N5A8D10	5 digit assy, 4 seg. followed by 4, 7 seg., with decoder
-QC	-N5A8D29	5 digit assy, 4 seg. followed by 4, 7 seg., with decoder and latch
-RA	-N6A8D1	6 digit assy, 4 seg. followed by 5, 7 seg., direct wired
-RB	-N6A8D10	6 digit assy, 4 seg. followed by 5, 7 seg., with decoder
-RC	-N6A8D29	6 digit assy, 4 seg. followed by 5, 7 seg., with decoder and latch
-SA	-N7A8D1	7 digit assy, 4 seg. followed by 6, 7 seg., direct wired
-SB	-N7A8D10	7 digit assy, 4 seg. followed by 6, 7 seg., with decoder
-SC	-N7A8D29	7 digit assy, 4 seg. followed by 6, 7 seg., with decoder and latch
-TA	-N8A8D1	8 digit assy, 4 seg. followed by 7, 7 seg., direct wired
-TB	-N8A8D10	8 digit assy, 4 seg. followed by 7, 7 seg., with decoder
-TC	-N8A8D29	8 digit assy, 4 seg. followed by 7, 7 seg., with decoder and latch
-UA	-N5A10D1	5 digit assy, 2-7 seg., 1-colon, 2-7 seg., direct wired.
-UB	-N5A10D10	5 digit assy, 2-7 seg., 1-colon, 2-7 seg., 7 seg. with decoder, colon direct wired.
-UC	-N5A10D29	5 digit assy, 2-7 seg., 1-colon, 2-7 seg., 7 seg. with decoder and latch, colon direct wired
-VA	-N8A11D1	8 digit assy, 2-7 seg., 1-colon, 2-7 seg., 1-colon, 2-7 seg., direct wired.
-VB	-N8A11D10	8 digit assy, 2-7 seg., 1-colon, 2-7 seg., 1-colon, 2-7 seg., 7 seg. with decoder, colon direct wired.
-VC	-N8A11D29	8 digit assy, 2-7 seg., 1-colon, 2-7 seg., 1-colon, 2-7 seg., 7 seg. with decoder and latch, colon direct wired
M28803/1-W	905H-526	Module only, colon, direct wired

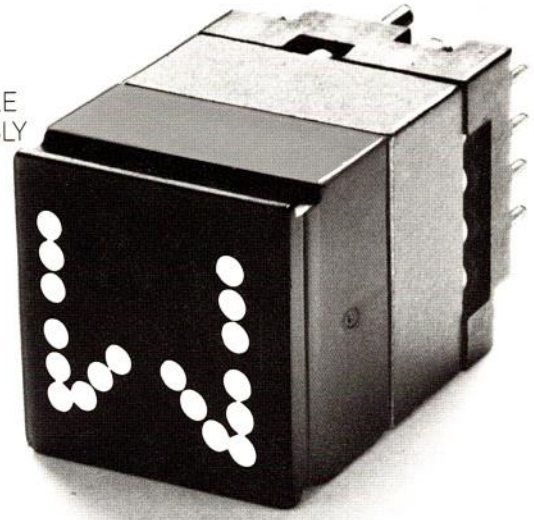
Government Designation	EATON Designation	Description
M28803/1-CD	905HW-N1A8D1	Single digit assy, 4 seg. direct wired
-CE	-N1A8D10	Single digit assy, 4 seg. with decoder
-CF	-N1A8D29	Single digit assy, 4 seg. with decoder and latch
-DD	-N1A2D1	Single digit assy, 7 seg. direct wired
-DE	-N1A2D10	Single digit assy, 7 seg. with decoder
-DF	-N1A2D29	Single digit assy, 7 seg. with decoder and latch
-ED	-N2A2D1	2 digit assy, all 7 seg. modules, direct wired
-EE	-N2A2D10	2 digit assy, all 7 seg. modules, with decoder
-EF	-N2A2D29	2 digit assy, all 7 seg. modules, with decoder and latch
-FD	-N3A2D1	3 digit assy, all 7 seg. modules, direct wired
-FE	-N3A2D10	3 digit assy, all 7 seg. modules, with decoder
-FF	-N3A2D29	3 digit assy, all 7 seg. modules, with decoder and latch
-GD	-N4A2D1	4 digit assy, all 7 seg. modules, direct wired
-GE	-N4A2D10	4 digit assy, all 7 seg. modules, with decoder
-GF	-N4A2D29	4 digit assy, all 7 seg. modules, with decoder and latch
-HD	-N5A2D1	5 digit assy, all 7 seg. modules, direct wired
-HE	-N5A2D10	5 digit assy, all 7 seg. modules, with decoder
-HF	-N5A2D29	5 digit assy, all 7 seg. modules, with decoder and latch
-JD	-N6A2D1	6 digit assy, all 7 seg. modules, direct wired
-JE	-N6A2D10	6 digit assy, all 7 seg. modules, with decoder
-JF	-N6A2D29	6 digit assy, all 7 seg. modules, with decoder and latch
-KD	-N7A2D1	7 digit assy, all 7 seg. modules, direct wired
-KE	-N7A2D10	7 digit assy, all 7 seg. modules, with decoder
-KF	-N7A2D29	7 digit assy, all 7 seg. modules, with decoder and latch
-LD	-N8A2D1	8 digit assy, all 7 seg. modules, direct wired
-LE	-N8A2D10	8 digit assy, all 7 seg. modules, with decoder
-LF	-N8A2D29	8 digit assy, all 7 seg. modules, with decoder and latch
-MD	-N2A8D1	2 digit assy, 4 seg. followed by 1, 7 seg., direct wired
-ME	-N2A8D10	2 digit assy, 4 seg. followed by 1, 7 seg., with decoder
-MF	-N2A8D29	2 digit assy, 4 seg. followed by 1, 7 seg., with decoder and latch
-ND	-N3A8D1	3 digit assy, 4 seg. followed by 2, 7 seg., direct wired
-NE	-N3A8D10	3 digit assy, 4 seg. followed by 2, 7 seg., with decoder
-NF	-N3A8D29	3 digit assy, 4 seg. followed by 2, 7 seg., with decoder and latch
-PD	-N4A8D1	4 digit assy, 4 seg. followed by 3, 7 seg., direct wired
-PE	-N4A8D10	4 digit assy, 4 seg. followed by 3, 7 seg., with decoder
-PF	-N4A8D29	4 digit assy, 4 seg. followed by 3, 7 seg., with decoder and latch
-QD	-N5A8D1	5 digit assy, 4 seg. followed by 4, 7 seg., direct wired
-QE	-N5A8D10	5 digit assy, 4 seg. followed by 4, 7 seg., with decoder
-QF	-N5A8D29	5 digit assy, 4 seg. followed by 4, 7 seg., with decoder and latch
-RD	-N6A8D1	6 digit assy, 4 seg. followed by 5, 7 seg., direct wired
-RE	-N6A8D10	6 digit assy, 4 seg. followed by 5, 7 seg., with decode
-RF	-N6A8D29	6 digit assy, 4 seg. followed by 5, 7 seg., with decoder and latch
-SD	-N7A8D1	7 digit assy, 4 seg. followed by 6, 7 seg., direct wired
-SE	-N7A8D10	7 digit assy, 4 seg. followed by 6, 7 seg., with decoder
-SF	-N7A8D29	7 digit assy, 4 seg. followed by 6, 7 seg., with decoder and latch
-TD	-N8A8D1	8 digit assy, 4 seg. followed by 7, 7 seg., direct wired
-TE	-N8A8D10	8 digit assy, 4 seg. followed by 7, 7 seg., with decoder
-TF	-N8A8D29	8 digit assy, 4 seg. followed by 7, 7 seg., with decoder and latch
-UD	-N5A10D1	5 digit assy, 2-7 seg., 1-colon, 2-7 seg direct wired
-UE	-N5A10D10	5 digit assy, 2-7 seg., 1-colon, 2-7 seg. 7 seg. with decoder, colon direct wired
-UF	-N5A10D29	5 digit assy, 2-7 seg., 1-colon, 2-7 seg. 7 seg. with decoder and latch, colon direct wired
-VD	-N8A11D1	8 digit assy, 2-7 seg., 1-colon, 2-7 seg., 1-colon, 2-7 seg. direct wired
-VE	-N8A11D10	8 digit assy, 2-7 seg., 1-colon, 2-7 seg., 1-colon, 2-7 seg., 7 seg. with decoder, colon direct wired
-VF	-N8A11D29	8 digit assy, 2-7 seg., 1-colon, 2-7 seg., 1-colon, 2-7 seg., 7 seg. with decoder and latch, colon direct wired

—HI-BRIGHT—

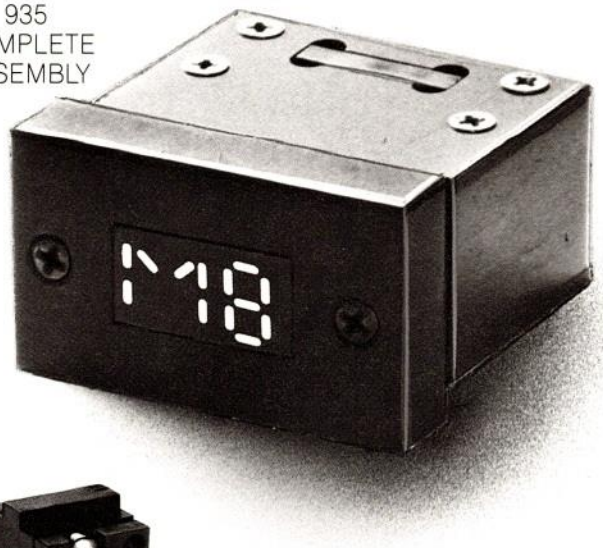
Developed especially for airborne applications, the Model 925/935 is an intensely bright, yet small-character display that is highly readable in bright sunlight. Incandescent lamps are individually replaceable from the front of the panel, and a wide variety of color filters add to its versatility. Dot displays are offered in 7 and 16-segments. The Model 925/935 is employed wherever readability in bright sunlight is a "must."

A complete multi-station readout assembly shall consist of the following: bezel ass'y with lens and panel gasket (see page 12) mounting fail ass'y with connector blocks and terminals (see page 11) plug in readout modules (see page 11) ordering information for one ass'y that contains all of above is shown on page 12.

925
MODULE
ASSEMBLY



935
COMPLETE
ASSEMBLY



Solder or Solderless (crimp)
Terminals

925 / 935

DOT MATRIX

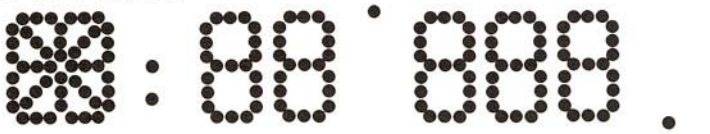
925 Actual Size Character Height: .27

BAR SEGMENT

935 Actual Size Character Height: .32

A. Characters - 16-segment, double 7-segment, triple 7-segment and specials.

925 DOT MATRIX



Front View 16 Segment A6	Front View Colon A15	Front View 2-7 Segment A11	Front View Degree A16	Front View 3-7 Segment A12	Front View Decimal Point A14

935 BAR SEGMENT

Front View 16-Segment A6	Colon A15	Front View 2-7 Segment A11	DEG A16	Front View 3-7 Segment A12	DPT A14

Part Number Codes for Ordering

A 6 - Single 16-segment display
A11 - Double 7-segment display
A12 - Triple 7-segment display
A14 - Decimal point
A15 - Colon
A16 - Degree

B. Light Source - Incandescent

B2-925: B12 - 935
High brightness; Average 6,000 hours life @ 4.5VDC with a display brightness of 2000 foot lamberts.

Colors:

The Fiber Optic Readouts have color filters available to add special emphasis to information displayed on individual unit. Each readout unit may be ordered with only one color and all displays in that unit will appear in the color ordered. It should be noted that color filters will reduce the light output. The light output characteristics shown in this catalog apply only to white incandescent light.

Part Number Codes for Ordering Color Filters:

A: Amber
B: Blue
G: Green
R: Red
Y: Yellow

925 / 935

C. Terminations - Connector block

C : Connector Block not supplied
C3: Connector block with crimp or solder terminals provided with each digit.

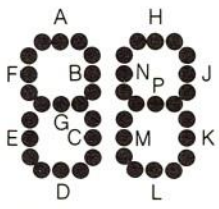
Circuit Packages

None Available

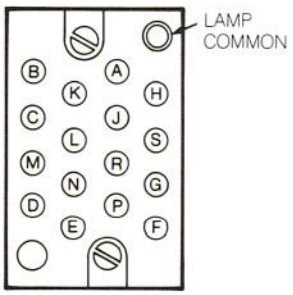
Segment & Terminal Designations

(Designations are the same for 925 and 935)

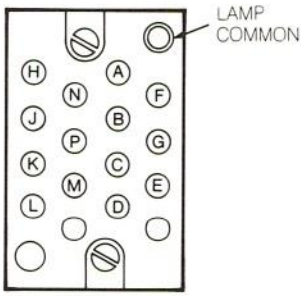
16 Segment Designation



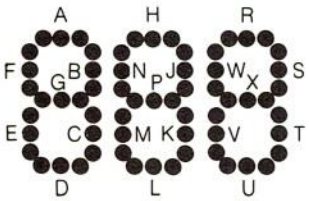
TWO 7-Segment Designations



REAR VIEW Terminations



REAR VIEW Terminations

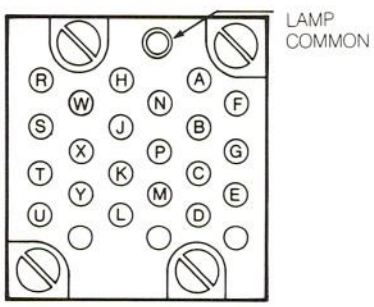


THREE 7-Segment Designations

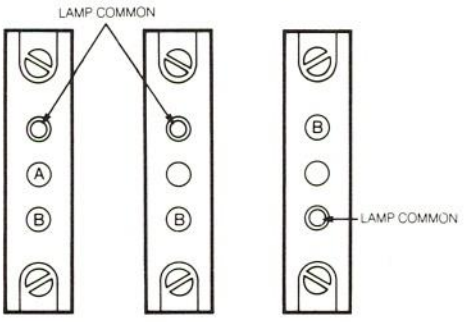
● A
● B

● B

Colon Decimal Point Degree



REAR VIEW Terminations



REAR VIEW Terminations

Specifications
(Sunlight readable display)
Current/Segment: 20ma @ 5VDC
Lamp Life: 6,000 hr. average life @ 4.5VDC
Operating Temp: −55°C to + 85°C
Lamp Replacement: Lamps individually replaceable from panel front w/o special tools
Environment: Designed to meet Mil-D-28803

Ordering Information for Individual Readout Units

Individual readout units may be ordered using the part numbering system shown below. If you prefer a part number for a complete assembly of units, see page 12.

925
935 A B ⚠1 C

Model Number

Character Type
A6 - 16 Segment
A11 - Two 7-segment
A12 - Three 7-segment
A14 - Decimal Point
A15 - Colon
A16 - Degree

Terminal Block & Terminals
C1 - Terminal block & terminals not supplied
C3 - Terminal block and crimp or solder terminals supplied with basic unit

R - Red
G - Green
A - Amber
B - Blue
Y - Yellow

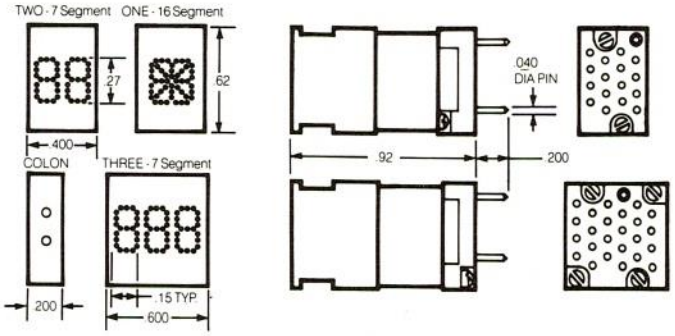
LAMP B2 - High brightness 925
B2 - High brightness 935

⚠1 Omit filter code for white incandescent

NOTE: When modules with color filters are used with a bezel assembly 925/935BZ-□ the bezel lens color N (Neutral Gray) is recommended.

Readout Module Dimensions

(925 Shown)



Mounting Rail, Terminal, Connector Block Dimensions

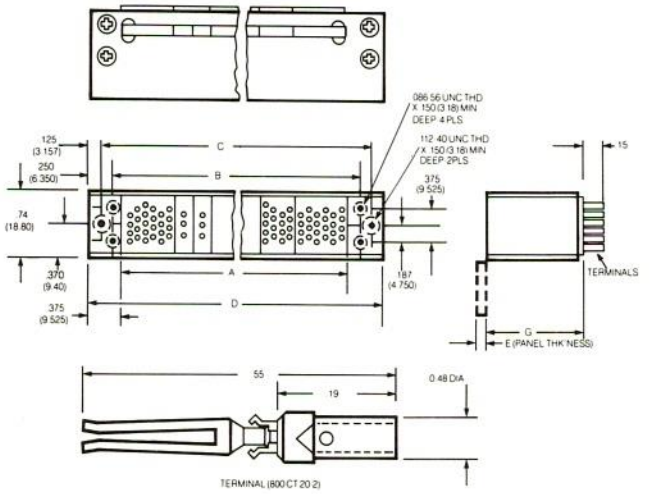


TABLE 1

SYMBOL	DIMENSION
A	DIM. L + .05 (1.27)
B	DIM. L + .300 (7.62)
C	DIM. L + .550 (13.97)
D	DIM. L + .80 (20.32)

TABLE 2

CODE LETTERS FOR TYPE OF CONNECTOR BLOCK	
CODE	TYPE
A	.200 WIDE
B	.400 WIDE
C	.600 WIDE

TABLE 3

MOUNTING RAIL ASSEMBLY PANEL THICKNESS				
CODE	DIM. E		DIM. G	
	INCH	MM	INCH	MM
1	.250	(6.35)	.86	(21.84)
2	.190	(4.83)	.92	(23.37)
3	.125	(3.18)	.99	(25.15)
4	.063	(1.60)	1.05	(26.67)
5	.093	(2.36)	1.02	(25.91)

TOLERANCE
.XX ± .03
.XXX ± .010

TABLE 5

DIMENSION	CALCULATION
E	L + .100 (2.54)
B	L + .300 (7.62)
C	L + .550 (13.97)

Ordering Information for Individual Mounting Rail Assembly

Individual mounting rail ass'ys may be ordered using the part numbering system shown below. If you prefer a part number for a complete assembly of units, see page 12.

925
935 R 1 1.6 BAACB

Model Number

Rail

Panel Thickness
1 = .250
2 = .190
3 = .125
4 = .063
5 = .093

Dimension L
sum from TABLE 4

⚠1 Connector block number, type, and arrangement see table 2. The sequences of the code letters for the connector blocks is written in the order of viewing from left to right.

⚠1 Connector blocks are furnished with the required number of terminals plus two extra.

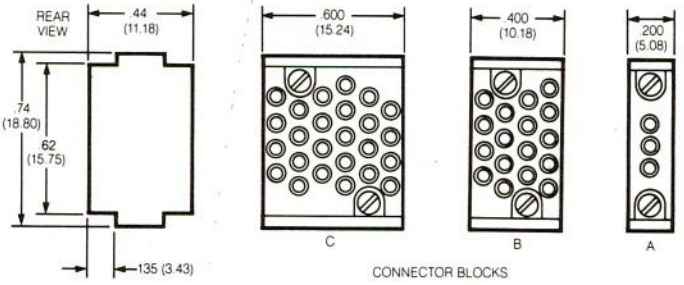
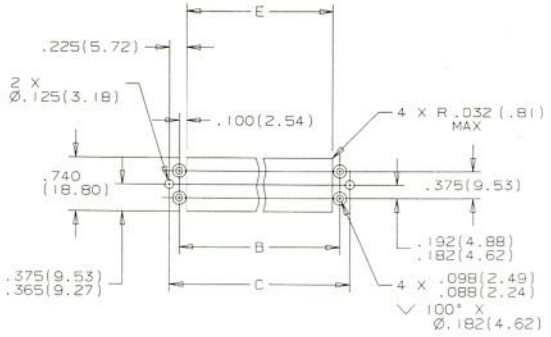


TABLE 4

TYPE OF DISPLAY	DIMENSION L
16 SEG.	MULTIPLY THE NO. OF 16 SEG. X .40 (10.16)
7 SEG.	MULTIPLY THE NO. OF 7 SEG. X .20 (5.08)
COLONS	MULTIPLY THE NO. OF COLONS X .20
DPT	MULTIPLY THE NO. OF DPT X .20
DEG	MULTIPLY THE NO. OF DEG. X .20



PANEL CUT-OUT DIMENSIONS

925/935

Bezel Ordering Information

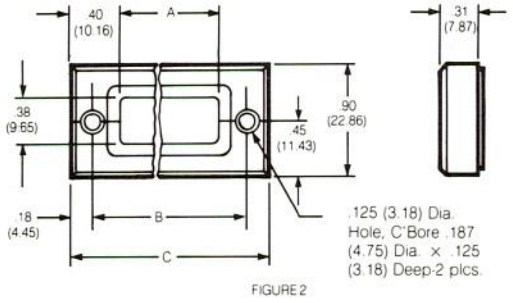


FIGURE 2

925
935 BZ 1.6 N

- 925/935 — MODEL NUMBER
- BZ — BEZEL
- 1.6 — DIMENSION L SUM FROM TABLE 1
- N — LENS COLOR FILTER
  - N = NEUTRAL GRAY
  - Y = YELLOW
  - G = GREEN
  - R = RED
  - B = BLUE
  - A = AMBER

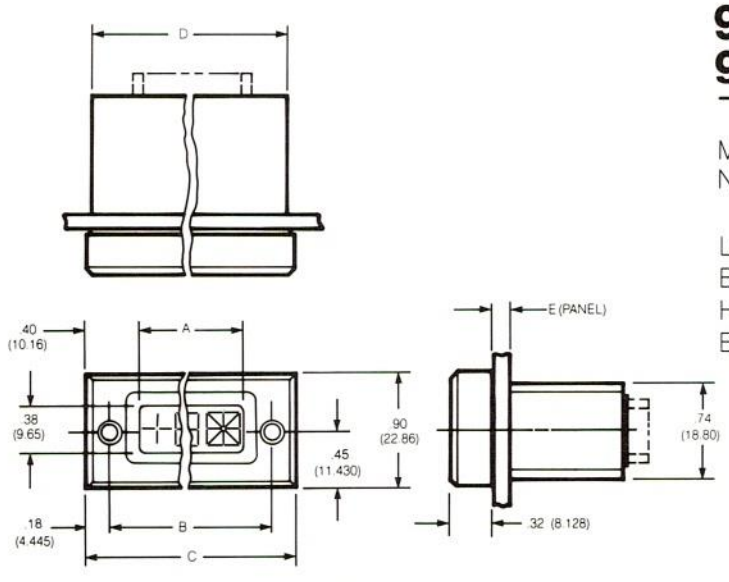
TABLE 1

TYPE OF MODULE	DIMENSION L
16 SEG.	MULTIPLY THE NO. OF 16 SEG. X .40 (10.16)
7 SEG.	MULTIPLY THE NO. OF 7 SEG. X .20 (5.08)
COLONS	MULTIPLY THE NO. OF COLONS X .20 (5.08)
DPT	MULTIPLY THE NO. OF DPT X .20 (5.08)
DEG	MULTIPLY THE NO. OF DEG. X .20 (5,08)

TABLE 2

SYMBOL	DIMENSION
A	DIM. L + .10 (2.54)
B	DIM. L + .550 (13.97)
C	DIM. L + .90 (22.86)

Complete Assembly Dimensions



TYPICAL READOUT ASSEMBLY
FIGURE 1

SYMBOL	DIMENSION
A	DIM. L + .10 (2.54)
B	DIM. L + .550 (13.97)
C	DIM. L + .90 (22.86)
D	DIM. L + .80 (20.32)
E	.250, .190, .125, .093, 0.63

TOLERANCE
.XX ± .03
.XXX ± I .01

Ordering Information for Complete Readout Assemblies (includes bezel, rail and readout modules)

925
935 B1 N 1 BACGYC

- 925/935 — Model Number
- B1 — Lamp B2-925:B12-935 High Brightness
- N — Bezel Lens Color
  - N = Neutral Gray for White (incandescent)
  - R = Red
  - G = Green
  - A = Amber
  - Y = Yellow
  - B = Blue
- 1 — Single Code Indicating Panel Thickness See Table 3 Page 11
- BACGYC — Code indicating number, type and arrangement of modules.
  - A = Colon
  - B = 16 Segment
  - C = Two-7 Segment
  - G = Three-7 Segment
  - Y = Degree
  - Z = Decimal Point

The code letters are written in order of viewing from left to right.

925H/935H

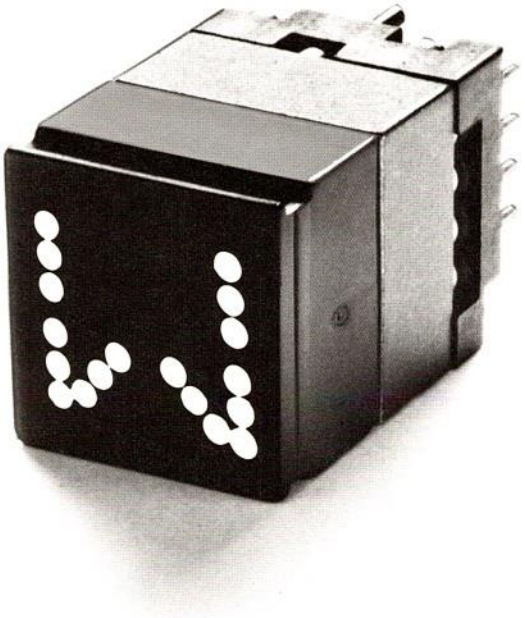
QUALIFIED TO MIL-D-28803/3 and /4

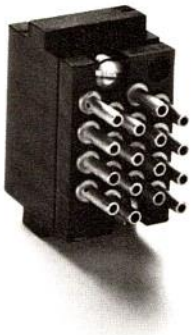
The 925H/935H incandescent display provides optimum brightness for avionic and control panels where high ambient light levels are present.

They feature excellent legibility and readability in direct sunlight and are environmentally protected meeting the shock and vibration requirements of MIL-STD-202, EMI/RFI requirements, and the dripproof, 45°, requirements of MIL-STD-108.

The 925H/935H have a "building block" modular construction for ease of initial readout design, character arrangement and module replacement. Maintainability of the display is simple since incandescent lamps are front panel replaceable without special tools.

Page 14 and 15 describe ordering information for complete and sub assemblies. Page 16 illustrates module types available and the corresponding rear terminations.





925H Actual Size

935H Actual Size

A. Characters

Front View of Decimal Pt., Colon, Degree

Front View of 4-Segment Display

Front View of 7-Segment Display

Front View of Double 7-Segment Display

Front View of Triple 7-Segment Display

Front View of 9-Segment Display

Front View of 16-Segment Display

B. Light Sources — Incandescent

Specifications
Brightness: 300 Ft. Lamberts Minimum
Contrast Ration: 3:1 min in 10,000 foot Candles Ambient
Current/Segment 25ma max @ 5VDC
Lamp Life: 6,000 hr. average life @ 4.5VDC
Operating Temp: $-55°$ to $\pm 85°C$
Storage Temp $-55°$ to $\pm 85°C$
Lamp replacement is accomplished from the panel front without special tools.

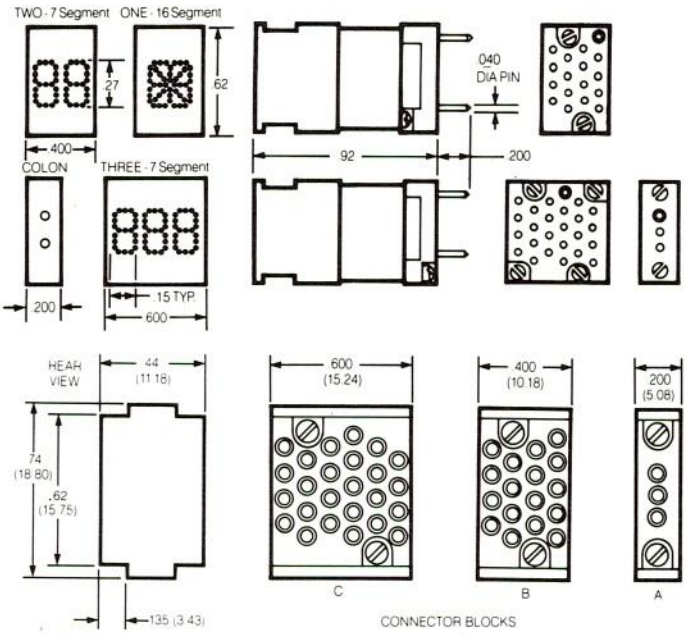
C. Terminations

Solder or crimp type terminals which lock into place in a connector block use standard MS3191 crimp tool (MSC No. 800-3191) and locator (MSC No. 800-3191-L20-2). Each terminal will hold one No. 26 or one No. 28 AWG wire.

Enviornmental Specificaitons:
Vibration: Per MIL-STD-202, method 204, condition A.
Shock: Per MIL-STD-202, method 213, Condition A.
Moisture Resistance: Per MIL-STD-202, method 106 (omit steps 7a & 7b). 25°C to 65°C, 80-98%, 10 cycles.
Salt Spray: per MIL-STD-202, method 101, condition B.
Seal: Per MIL-STD-108, dripproof, 45°, applies to 925HBZ only).

925H/935H

Dimensions - Individual Readout Units - 925H



*935H dimensions are identical except Bar Segment character is as shown on sheet 22.

TABLE 1
Panel Thickness & Segment Type

BAR MATRIX	DOT MATRIX	PANEL THICKNESS
6	1	.250" (6.35mm)
7	2	.190" (4.83mm)
8	3	.125" (3.18mm)
9	4	.063" (1.60mm)
0	5	.093" (2.63mm)

TABLE 2
Module Type

MODULE CODE	MODULE TYPE
A	Module: Colon, Degree or Decimal
B	Module: 16 Segment, Alpha-Numeric
C	Module: 2 - 7 Segment Numeric
D	Module: 4 Segment Sign & 7 Segment Numeric
E	Module: Colon - 7 Segment Numeric
F	Module: 7 Segment Numeric & Colon
G	Module: 3 - 7 Segment Numeric
H	Module: 1 - 4 Seg. Sign & 2 - 7 Seg. Numeric
J	Module: Colon & 2 - 7 Segment Numeric
K	Module: 7 Segment, Colon & 7 Segment
L	Module: 2 - 7 Segment Numeric & Colon
M	Module: 9 Segment
T	Module: N/S (North/South)
U	Module: E/W (East/West)
V	Module: 7 Segment, Decimal, 7 Segment
W	Module: 2 - 75 Segment, 2 Decimals

NOTE: Module types shown in Table 2 correspond to those illustrated on page 16.

Ordering Information

Complete Assembly M28803/3

The 925H/935H can be ordered as a complete assembly using either the EATON part number or the military part number (M28803/3). A complete assembly consists of a bezel assembly, a mounting rail assembly, and any arrangement of plug in modules.

Using EATON part number

925H/935H 1 D C E F B B

- 925H/935H — Model Number
- 1 — Designates .250 panel thickness and segment type (see Table 1)
- D C E F B B — Designates module type and their location in complete unit (see Table 2) as viewed from left to right.

When ordering using the military part number simply replace the EATON model number with military designation as follows:

M28803/3 1 D C E F B B

- M28803/3 — Designates a complete military approved display
- 1 — Designates .250 panel thickness and segment type (see Table 1)
- D C E F B B — Designates module types and their location in the complete assembly (see Table 2)

Sub Assemblies M28803/4

Because of the "building block" modular design of the 925H/935H, spare or replacement modules, terminals, lamps and connector blocks can be ordered individually. Subassemblies can be ordered with EATON part number or the military part number (M28803/4). Table 3, page 15, is a cross reference of EATON part numbers with the equivalent military part number for all subassemblies available.

TABLE 3 — Subassembly Part Numbers

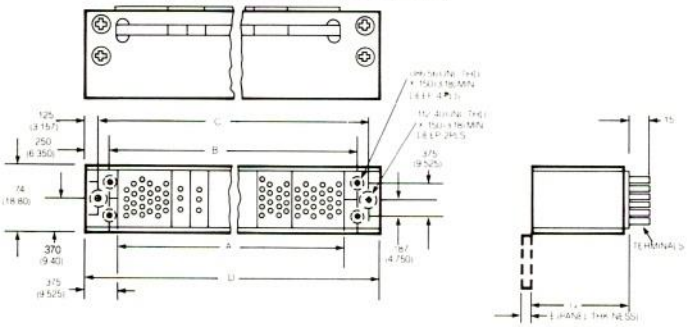
BAR		DOT MATRIX		
EATON Designation	Military Part Number	EATON DESIGNATION	MILITARY PART NO.	DESCRIPTION
235H-A1	M28803/4-A1	925H-A	M28803/4-A	Module: Colon, Degree or Decimal
B1	B1	925H-B	M28803/4-B	Module: 16 Segment, Alpha-Numeric
C1	C1	925H-C	M28803/4-C	Module: 2 - 7 Segmet Numeric
D1	D1	925H-D	M28803/4-D	Module: 4 Segment Sign & 7 Segment Numeric
E1	E1	925H-E	M28803/4-E	Module: Colon & 7 Segment Numeric
F1	F1	925H-F	M28803/4-F	Module: 7 Segment Numeric & Colon
G1	G1	925H-G	M28803/4-G	Module: 3 - 7 Segment Numeric
H1	H1	925H-H	M28803/4-H	Module: 1 - 4 Segment Sign & 2 - 7 Segment Numeric
J1	J1	925H-J	M28803/4-J	Module: Colon & 2 - 7 Segment Numeric
K1	K1	925H-K	M28803/4-K	Module: 7 Segment, Colon & 7 Segment
L1	L1	925H-L	M28803/4-L	Module: 2 - 7 Segment Numeric & Colon
M1	M1	925H-M	M28803/4-M	Module: 9 Segment
N	N	925H-N	M28803/4-N	Module: Connector Block: .200 Wide 1/
P	P	925H-P	M28803/4-P	Module: Connector Block: .400 Wide 1/
Q	Q	925H-Q	M28803/4-Q	Module: Connector Block: .600 Wide 1/
R	R	925H-R	M28803/4-R	Module: Terminal - (Ten to a Bag(
S	S	925H-S	M28803/4-S	Module: Lamp Assembly
T1	T1	925H-T	M28803/4-T	Module: N/S (North/South)
U1	U1	925H-U	M28803/4-U	Module: E/W (East/West)
V1	V1	925H-V	M28803/4-V	Module: 7 Segment, Decimal, 7 Segment
W1	W1	925H-W	M28803/4-W	Module: 7 Segment, Decimal Point, 7 Segment, Decimal Point

1/ Connector blocks are furnished with the required number of terminals plus two extra

Mounting Rail Assembly

When ordering a mounting rail it is necessary to specify the module types so the proper connector types are provided in the assembly. The proper amount of terminals (plus two) are provided with each connector block ordered.

925H-R (M28803/4-R)



MOUNTING RAIL DIMENSIONS TABLE 4

SYMBOL	DIMENSION
A	DIM. L + .05 (1.27)
B	DIM. L + .300 (7.62)
C	DIM. L + .550 (13.97)
D	DIM. L + .80 (20.32)

MOUNTING RAIL ASSEMBLY PANEL THICKNESS (SAME AS TABLE 1, PAGE 14)

CODE	DIM. E	DIM. G
1	.250 (6.35)	.86 (21.84)
2	.190 (4.83)	.92 (28.37)
3	.125 (3.18)	.99 (25.15)
4	.063 (1.60)	1.05 (26.67)
5	.093 (2.63)	1.02 (25.91)

Mounting Rails and Bezels

Mounting rails and bezels can only be ordered separately using the EATON part number as follows:

Bezel Assembly

925H/935H BZ 1.6 R

Model Number

Designates Bezel Assembly

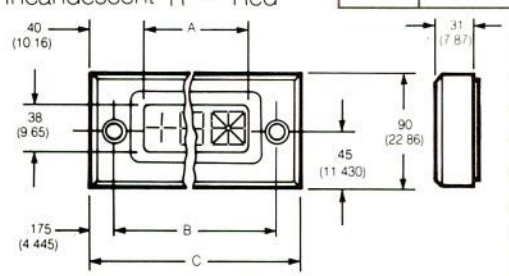
Designates total length (Dimension L) of all modules specified

Designates lens color filter:

N — Neutral Grey (For White Incandescent)
G — Green
A — Amber
B — Blue
R — Red

TABLE 4 — Aggregate Length

TYPE OF MODULE	DIMENSION L
16 SEG.	MULTIPLY THE NO. OF 16 SEG. X .40 (10.16)
7 SEG.	MULTIPLY THE NO. OF 7 SEG. X .20 (5.08)
4 SEG.	MULTIPLY THE NO. OF 4 SEG. X .20 (5.08)
COLON	MULTIPLY THE NO. OF COLON X .20 (5.08)
9 SEG.	MULTIPLY THE NO. OF 9 SEG. X .40 (10.16)
DPT	MULTIPLY THE NO. OF DPT X .20 (5.08)
DEG	MULTIPLY THE NO. OF DEG X .20 (5.08)
NORTH/SOUTH	MULTIPLY THE NO. OF N/S X .20 (5.08)
EAST/WEST	MULTIPLY THE NO. OF E/W X .20 (5.08)
2-7 SEG. & DPT	MULTIPLY THE NO. X .40 (10.16)
2-7 SEG. & 2 DPT	MULTIPLY THE NO. X .60



BEZEL DIMENSIONS

SYMBOL	DIMENSION
A	DIM. L + .10 (2.54)
B	DIM. L + .550 (13.97)
C	DIM. L + .90 (22.86)

TOLERANCE
.XX ± .03
.XXX ± .010

925H/935H R 1 1.6 BAC

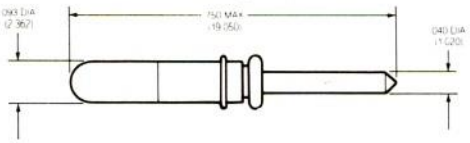
Model Number

Designates Rail Assembly

Designates Panel Thickness. (See Table 1, Page 14)

Designates total aggregate length (Dimension L) of all modules specified (see Table 4)

Designates type of module connector and location (See Table 2) as viewed from left to right (IN ASS'Y.)



925H/935H-S (M28803/4 S) LAMP ASSEMBLY

925H/935H

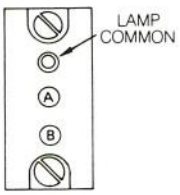
Module Type/Segment & Terminal Designations

MODULE

FRONT VIEW
Colon
Designations

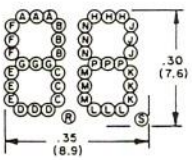
TYPE A

REAR VIEW
Terminations

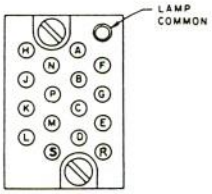


TYPE W

FRONT VIEW

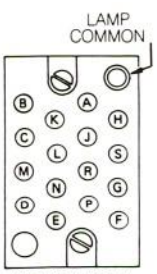


REAR VIEW



TYPE B

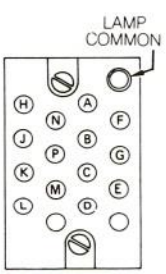
FRONT VIEW
16-Segment
Designations



REAR VIEW
Terminations

TYPE C

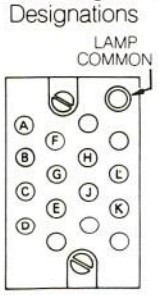
FRONT VIEW
TWO 7-Segment
Designations



REAR VIEW
Terminations

TYPE D

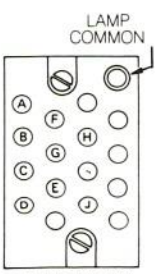
FRONT VIEW
4-Segment and
TWO 7-Segment
Designations



REAR VIEW
Terminations

TYPE E

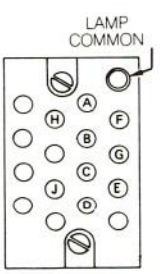
FRONT VIEW
Colon & 7-Seg.
Designations



REAR VIEW
Terminations

TYPE F

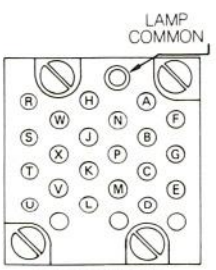
FRONT VIEW
7-Seg. & Colon
Designations



REAR VIEW
Terminations

TYPE G

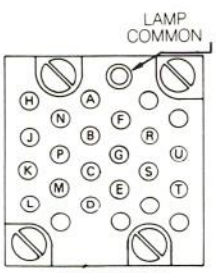
FRONT VIEW
THREE 7-Segment
Designations



REAR VIEW
Terminations

TYPE H

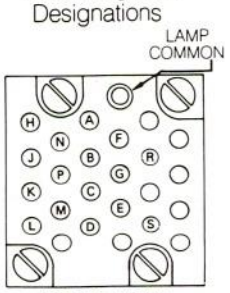
FRONT VIEW
4-Seg. & 7-Seg.
Designations



REAR VIEW
Terminations

TYPE J

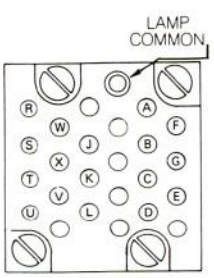
FRONT VIEW
Colon and
TWO 7-Segment
Designations



REAR VIEW
Terminations

TYPE K

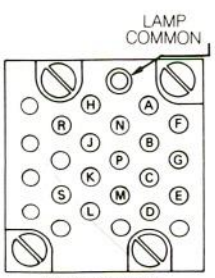
FRONT VIEW
7-Seg., Colon, 7-Seg.
Designations



REAR VIEW
Terminations

TYPE L

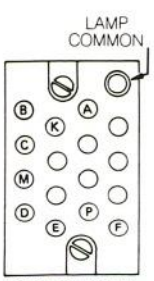
FRONT VIEW
TWO 7-Segment
Designations



REAR VIEW
Terminations

TYPE M

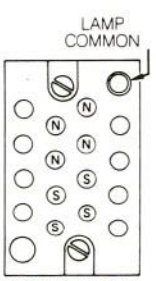
FRONT VIEW
9-Segment
Designations



REAR VIEW
Terminations

TYPE T

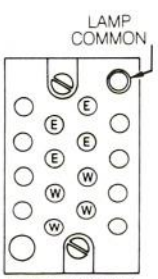
FRONT VIEW
N/S



REAR VIEW
Terminations

TYPE U

FRONT VIEW
E/W



REAR VIEW
Terminations

TYPE V

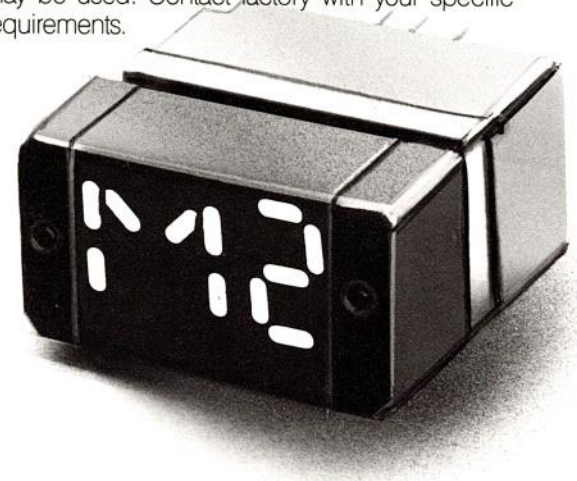
FRONT VIEW
TWO 7-Segment
and Dec. Pt.
Designations

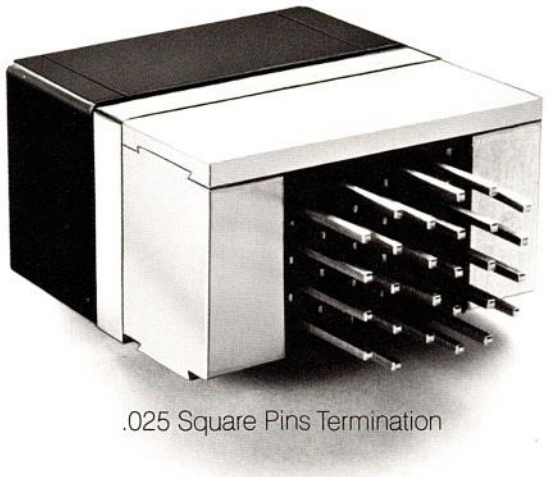
REAR VIEW
Terminations

930

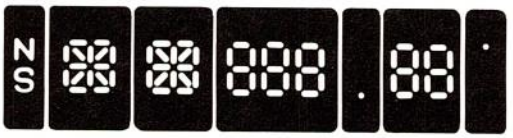
Sunlight Readable Bar Segment

The most versatile fiber optic readout in the EATON line, the Model 930 uses a multiple fiber technique to achieve a solid bar appearance, as well as flexibility in character size. The 930 has a character size of .32" high in 7, 9, & 16 segments. A special feature of the 930 is the use of integral bi pin lamps which are easily replaceable from front of panel. Termination of the unit features .025 square pins for wire wrap, solder, or plug in connector. The 930 offers unlimited design capability; any number of characters or designs can be achieved. Designed for both airborne and ground support applications the model 930 is easily readable in direct sunlight. This model is also available with special lamps to provide displays which are readable at 1 volt for airborne applications where night vision goggles may be used. Contact factory with your specific requirements.





.025 Square Pins Termination

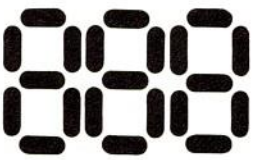


930 actual size

A. Characters

Front View
7-Segment

Front View
2-7 Segment



Front View
3-7 Segment

Front View
16-Segment
Alpha Numeric

Front View
Colon

Front View
Decimal Point

Front View
Degree

Front View
9-Segment

Front View
Plus & Minus

Front View
North/South

Front View
East/West

Part number codes for ordering

A - Colon (.100" wide)
B - Degree (.100" wide)
C - Decimal Point (.100" wide)
D - North/South (N-S) (.200" wide)
E - East/West (E-W) (.200" wide)
F - + or – Display (.200" wide)
G - 7-segment (.200" wide)
H - 16-segment (.400" wide)
J - 2 7-segment (.400" wide)
K - 9-segment (.400" wide)
L - 3 7-segment (.600" wide)

B. Light Sources - Incandescent

B-22: Average 6,000 hours life @ 4.5VDC with a display brightness of 2000 foot lamberts.

930

Colors

The Model 930 EATON Fiber Optic Readouts have color filters available to add special emphasis to information displayed on individual unit. Each readout unit may be ordered with only one color and all displays in that unit will appear in the color ordered. It should be noted that color filters will reduce the light output. The light output characteristics shown in this catalog apply only to white incandescent light. Colors available are red, green, amber, blue, yellow.

Part Number Codes for Ordering Color Filters:

A: Amber
B: Blue
G: Green
R: Red
Y: Yellow
W: White "Incandescent"

Terminations

.025 square pin for solder or wire wrap termination.
.025 square pin mates with berg connector #65039-032 or equivalent.

Circuit Packages

None available.

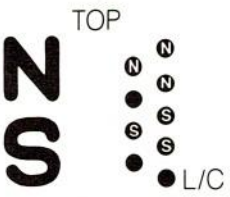
Specifications

Supply voltage - 5VDC (max)
Supply current - 21ma ± 10% @ 5VDC (each lamp)
Brightness: 2000 ft. lamberts @ 4.5v
Contrast Ratio: 2:1 min in 10,000 ft candles ambient (at 4.5V)
Lamp Life: ' 4.5V-average life 6000 hours;
Lamp Replacement: Front panel
Brightness ratio segment-to-segment: 2.5 to 1 maximum with a digit.
Brightness ratio digit-to-digit: 2:1 maximum within an assembly.
Front Lens: Display shall appear obscured in the unlighted condition. In the lighted condition characters shall appear incandescent white.
Viewing Angle: 60° to line perpendicular to lens face.

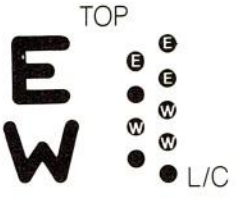
Environmental Requirements

1. Operating Temperature: −55° to +85°C.
2. Storage Temperature: −55° to +85°C.
3. Vibration: Per MIL-STD-202, method 204, condition A.
4. Shock: Per MIL-STD-202, method 213, condition A.
5. Moisture Resistance: Per MIL-STD-202, method 106, (omit steps 7a & 7b)
6. Salt Spray: Per MIL-STD-202, method 101, condition B.

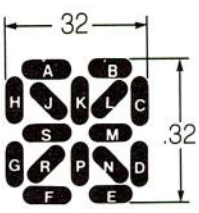
Segment Designations, Terminations



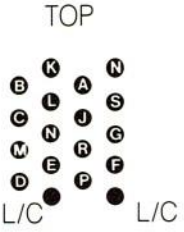
NORTH/SOUTH

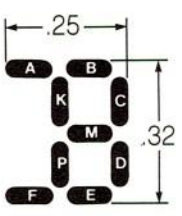


EAST/WEST

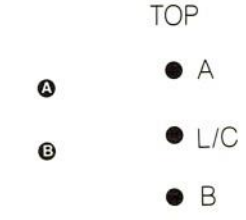


16 SEG

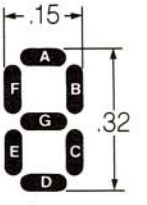




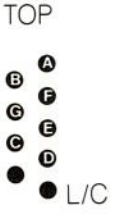
9 SEG

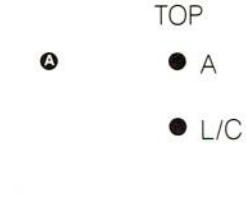


COLON

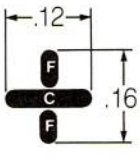


7 SEG

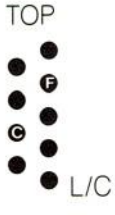


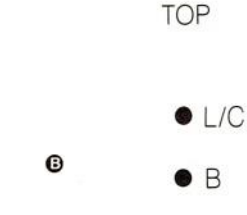


DEGREE



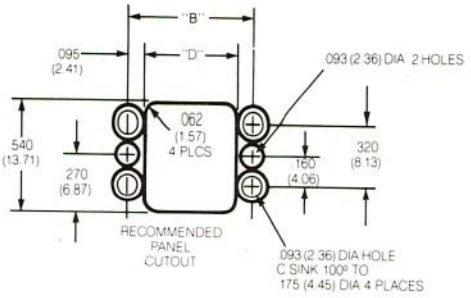
PLUS/MINUS

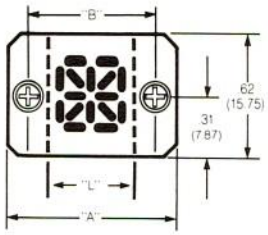


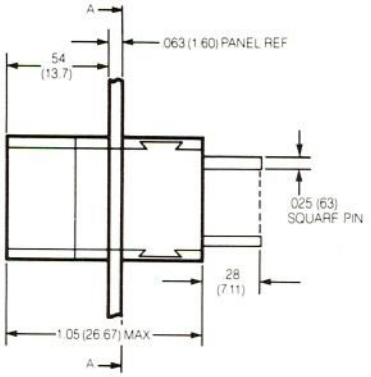


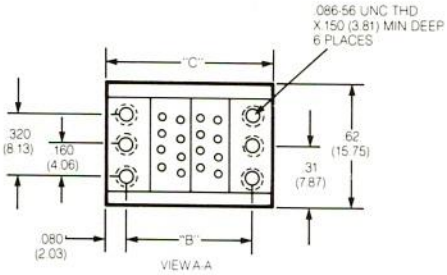
DECIMAL POINT

Ordering Information



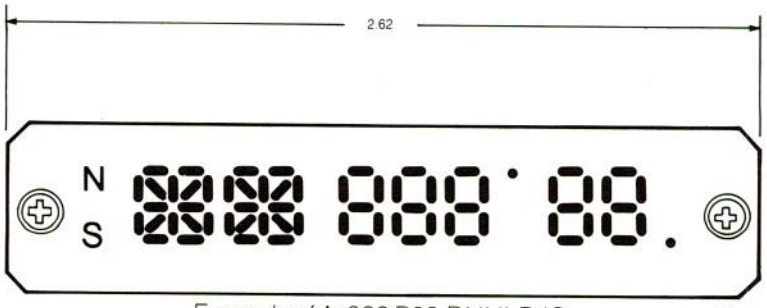




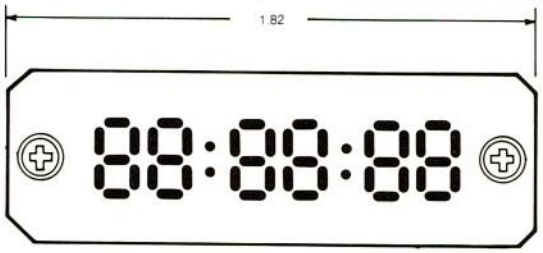


TYPE OF MODULE	DIMENSION "L" (MULTIPLY TYPE X NO. REPO)
7 SEG	.200 (5.08)
9 SEG	.400 (10.16)
16 SEG	.400 (10.16)
DPT	.100 (2.54)
COLON	.100 (2.54)
DEG	.100 (2.54)
+ −	.200 (5.08)
N/S	.200 (5.08)
E/W	.200 (5.08)

SYMBOL	DIMENSION
A	DIM. L + .42 (10.67)
B	DIM. L + .270 (6.86)
C	DIM. L + .43 (10.92)
D	DIM. L + .080 (2.03)



Example of A: 930 B22-DHHLBJC



Example of A: 930 B22JAJAJ

TOLERANCE
.XX ± .03
.XXX ± .010

Assembly Ordering Information

930 B22 DHHJBL

Model Number

B 22 Lamp

Code indicating number, type and arrangement of the display. See Ordering Codes on page 17. The sequence of the code letters for the display is written in order of viewing from left to right.

Note: Due to the multiplicity of assemblies available in combinations of character displays, mounting & terminations, the catalog ordering information here is limited to basic display assemblies. Please contact factory for your special mounting, termination & character requirements.

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