

MS24166L  
 5 October 2020  
 SUPERSEDING  
 MS24166K  
 5 April 2018

DETAIL SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, 50 AMPERES, 1 PST,  
 (N.O.) TYPE II, NONHERMETICALLY SEALED

This specification is approved for use by all Departments  
 and Agencies of the Department of Defense.

The requirements for acquiring the relay described herein shall  
 consist of this specification and the latest issue of [MIL-PRF-6106](#).

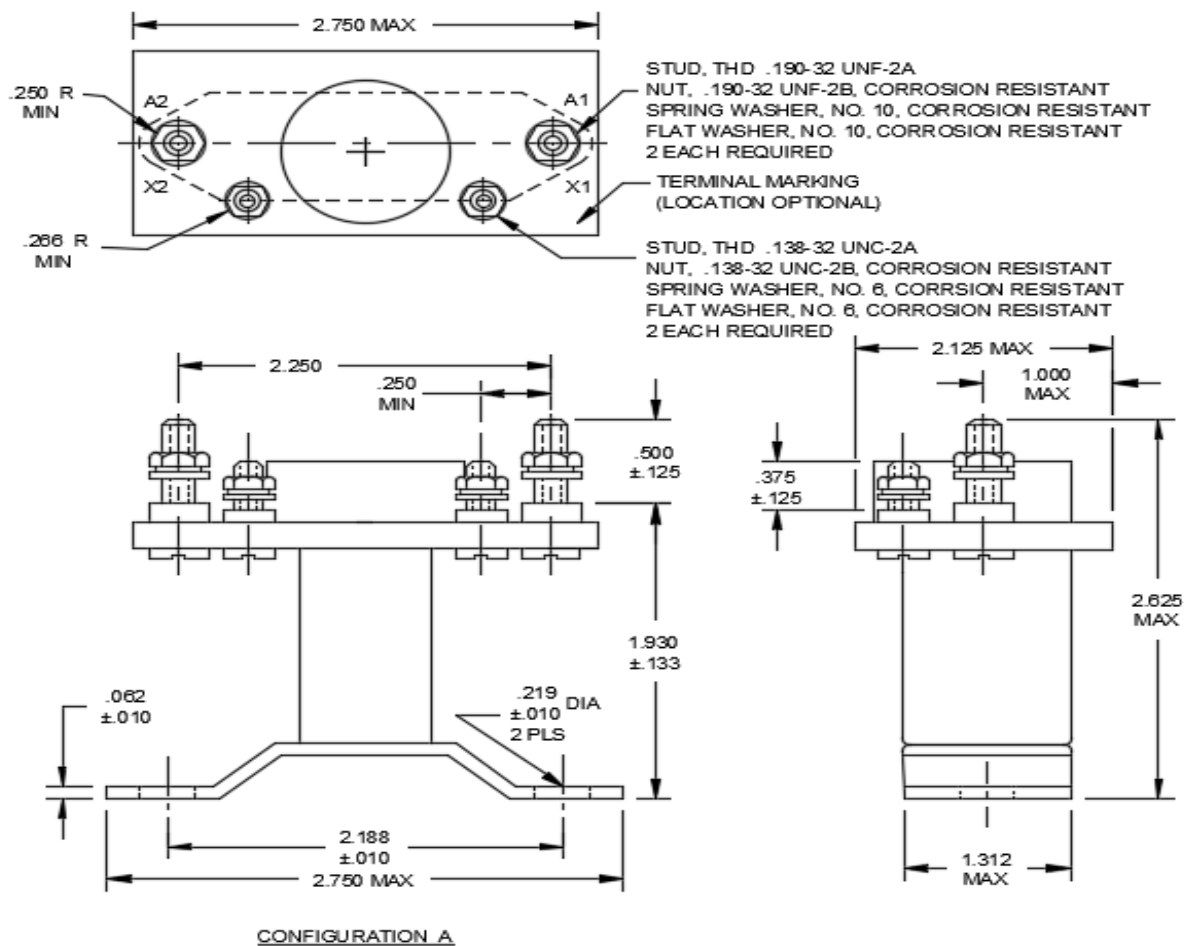
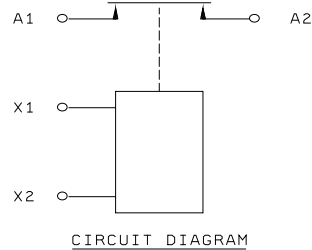
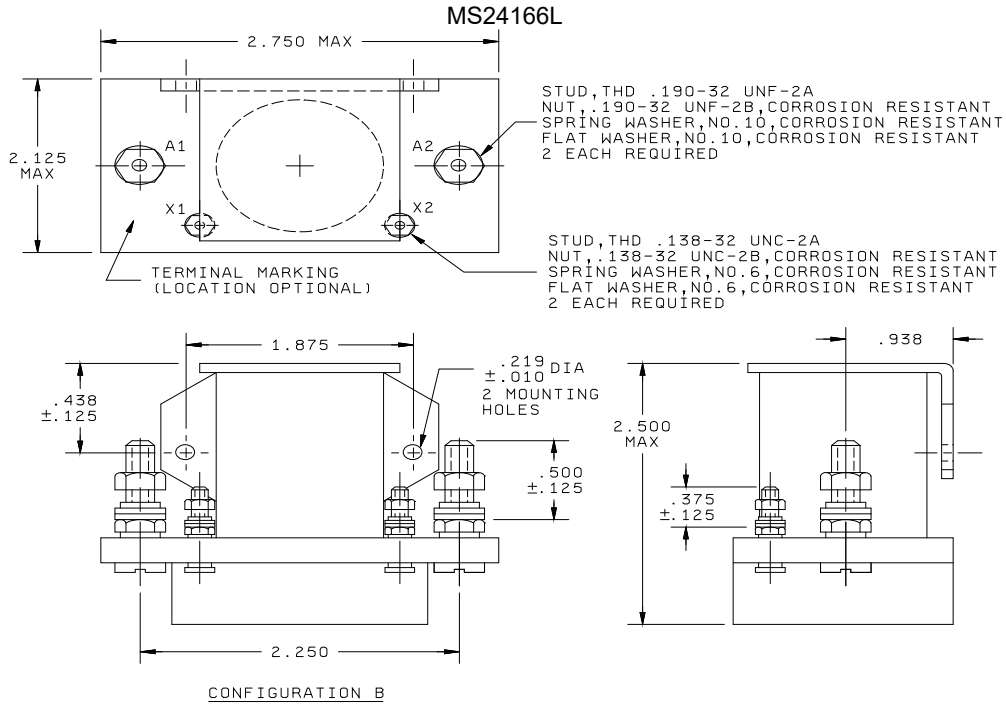


FIGURE 1. Configurations and dimensions.





Inches	mm	Inches	mm
.010	0.25	.938	23.83
.062	1.57	1.000	25.40
.093	2.36	1.312	33.32
.125	3.18	1.875	47.63
.133	3.38	1.930	49.02
.219	5.56	2.125	53.98
.250	6.35	2.188	55.58
.266	6.76	2.250	57.15
.375	9.53	2.625	66.68
.438	11.13	2.750	69.85
.500	12.70		

**NOTES:**

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is  $\pm 0.031$  (0.79 mm).
4. An additional flat washer may be used for terminal seat.
5. Terminal temperature rise under continuous current conditions is 95°C. Intermediate current shall be conducted at 71°C.
6. In the event of a conflict between the text of this specification and the references cited herein, this specification shall take precedence.
7. Referenced Government documents of the issue listed in that issue of the Acquisition Streamlining and Standardization Information System (ASSIST) specified in the solicitation forms a part of this standard to the extent specified herein.
8. Shape of relay is optional within the envelope dimensions shown.
9. Cadmium or cadmium compounds are prohibited on external hardware.
10. Spring washer on drawing is a spring lock washer.

**FIGURE 1. Configurations and dimensions - Continued.**

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## REQUIREMENTS:

Configurations and dimensions: See [figure 1](#).

Dash numbers and general characteristics: See [table I](#).

Contact data:

Rated contact Load: See [table II](#).

Maximum contact drop, initial: 0.150 V.

After life test: 0.175 V.

Overload current (NO): 400 amperes.

Rupture current (NO): 500 amperes.

Operating characteristics (see [table III](#)):

Duty rating: Continuous.

RFI specification: [MIL-STD-461](#) (applicable to coil circuits of ac operated relays).

Electrical data:

Minimum insulation resistance:

Initial: 100 megohms.

After life or environmental test: 50 megohms.

Dielectric strength:

Sea level, 2-5 seconds:

	Initial		After life tests	
	28 V dc	115 V ac	28 V dc	115 V ac
Coil to case:	1,250 V rms	N/A	1,000 V rms	N/A
Aux. contacts:	1,250 V rms	N/A	1,000 V rms	N/A
All other points:	1,250 V rms	N/A	1,000 V rms	N/A

Altitude, 1 minute.

	Initial	
	28 V dc	115 V ac
Coil to case:	500 V rms	N/A
Aux. contacts:	500 V rms	N/A
All other points:	500 V rms	N/A

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## Environmental characteristics:

Temperature range: -55°C to +71°C.

Maximum altitude rating: 50,000 feet.

Shock, g-level: 25 g's.

Duration: 6-9 ms.

Maximum duration contact opening: 2 ms.

Vibration levels, sinusoidal: See [table IV](#).

Vibration, random: N/A.

High shock: N/A.

Acceleration: 10 g's.

Qualification by similarity: See [MIL-PRF-6106](#).

Part or Identifying Number (PIN): MS24166- (plus applicable dash number from [table I](#)).

TABLE I. Dash numbers and general characteristics.

PIN MS24166-	Type	Coil	Terminal type	Mounting or mating socket	Maximum weight (pounds)
D1 <a href="#">1/</a>	II	dc	Stud	Bracket - bottom	0.6
D2 <a href="#">2/</a>	II	dc	Stud	Bracket - side	0.6

[1/](#) For Government logistics support, MS24166-D1 shall be used in lieu of AN3350-2.

[2/](#) For Government logistics support, MS24166-D2 shall be used in lieu of AN3350-1.

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TABLE II. Rated contact load (amperes per pole) case grounded.

Type of load	Life operating cycles x 10 <sup>3</sup>	28 V dc				115 V ac, 1 phase				115/200 V ac, 3 phase <sup>1/</sup>			
		Main		Aux		Main		Aux		Main		Aux	
		NO	NC	NO	NC	400 Hz	60 Hz	400 Hz	60 Hz	400 Hz	60 Hz	400 Hz	60 Hz
Resistive	50	50											
Inductive	10	50											
Motor	50	50											
Lamp	50	25											
Transfer load <sup>2/</sup>													
Mechanical life (reduced current)	100	12.5											
Mixed loads	50	5											

<sup>1/</sup> Absence of value indicates that relay is not rated for 3 phase applications.

<sup>2/</sup> Transfer load indicates that relay is suitable for transfer between unsynchronized ac power supplies at the rating indicated.

TABLE III. Operating characteristics.

PIN MS24166-	Coil data										Time - (milliseconds maximum)								
	Coil	Rated			Max		Max pick-up voltage			Hold voltage <sup>2/</sup>	Drop-out voltage <sup>2/</sup>	Operate <sup>3/</sup>	Release <sup>4/</sup>	Bounce					
		Volts <sup>1/</sup>	Freq. (Hz)	Res $\Omega$ +10% -15%	Volts	Am-pere	Nor-mal <sup>2/</sup>	High temp test	Cont Current test					Main	Aux	NO	NC	NO	NC
D1	X1,X2	28	dc	94	29	.35	18	21	22.5	7.0	1.5	20	10	5.0					
D2	X1,X2	28	dc	94	29	.35	18	21	22.5	7.0	1.5	20	10	5.0					

<sup>1/</sup> CAUTION: Use of any coil voltage less than rated coil voltage will compromise the operation of the relay.

<sup>2/</sup> Over the temperature range.

<sup>3/</sup> With rated coil voltage.

<sup>4/</sup> From rated coil voltage.

TABLE IV. Vibration levels (sinusoidal).

5-10 Hz	10-55 Hz	55-250 Hz	250-500 Hz	500-1500 Hz
0.08	.06 DA	2 g's	2 g's	N/A

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The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the previous issue. Referenced documents.

In addition to [MIL-PRF-6106](#), this document references the following:  
[MIL-STD-461](#)

Custodian activities:

Navy - AS  
Air Force - 85  
DLA - CC

Preparing activity:  
DLA - CC

(Project 5945-2020-052)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil/>.