

INCH-POUND

MIL-PRF-8805 /68L

7 January 2008

SUPERSEDING

MIL-PRF-8805 /68K

20 June 2006

PERFORMANCE SPECIFICATION SHEET

SWITCHES, SENSITIVE, SPDT, 4 AMPERES, HERMETIC SEAL

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

The complete requirements for acquiring the switch described herein shall consist of this specification and the latest issue of MIL-PRF-8805.

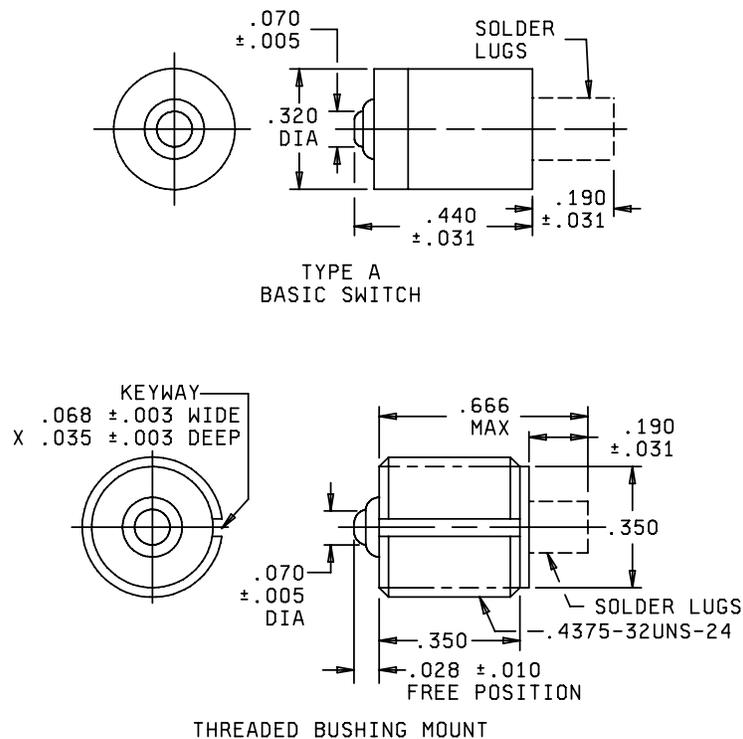


FIGURE 1. Dimensions and configuration

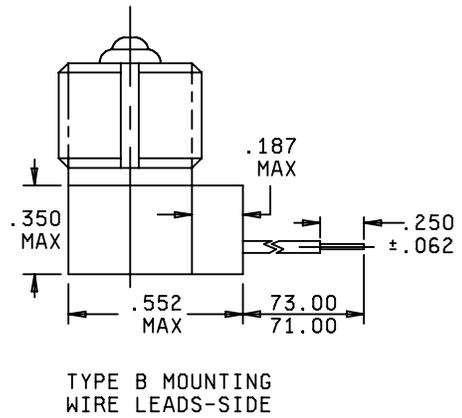
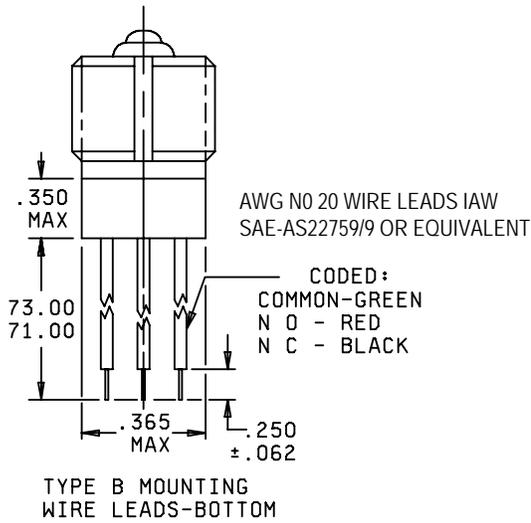
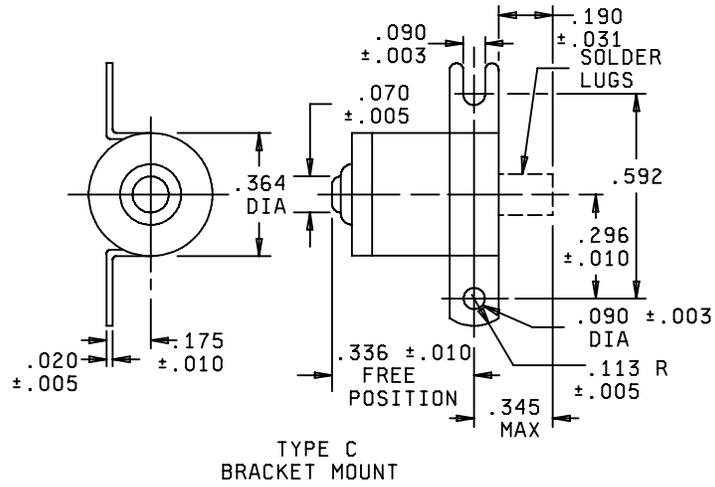
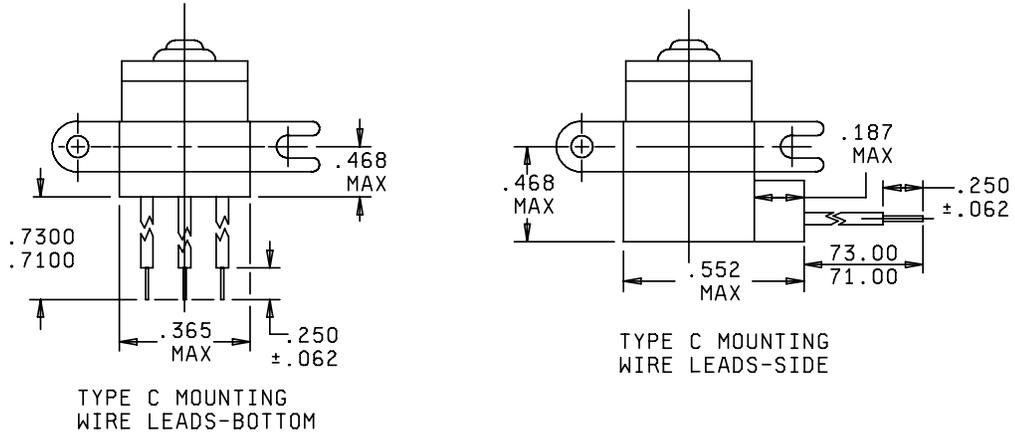


FIGURE 1. Dimensions and configurations – continued.



Inches	mm	Inches	mm
.003	0.08	.250	6.35
.005	0.13	.296	7.52
.010	0.25	.320	8.13
.020	0.51	.336	8.53
.028	0.71	.345	8.76
.031	0.79	.350	8.89
.035	0.89	.364	9.25
.062	1.57	.4375	11.11
.068	1.73	.440	11.18
.070	1.78	.468	11.89
.090	2.29	.592	15.04
.113	2.87	.666	16.92
.175	4.45	71.00	1803.40
.187	4.75	73.00	1854.20
.190	4.83		

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ± 0.015 (0.38 mm).
4. Dimensions of switches with wire leads are the same as switches with solder lugs except as shown.

FIGURE 1. Dimensions and configurations – continued.

REQUIREMENTS:

Dimensions and configurations: See figure 1.

Enclosure design: 5 (hermetic). Seal test in accordance with method 112, test condition C, procedure IV of MIL-STD-202. Gross leak test condition B except water instead of silicone oil.

Temperature characteristic: 2 (-65°C to +125°C).

Shock type: M (100 G, test condition 1, method 213 of MIL-STD-202).

Vibration grade: 3 (10 to 3000 Hz swept sinusoidal). In addition, the specified random vibration screening requirement is applicable to high reliability parts (PIN's M8805/68-029 through -035).

Materials:

PIN's M8805/68-022 through -028 (general military usage): In accordance with MIL-PRF-8805.

PIN's M8805/68-029 through -035 (high reliability parts): In accordance with MIL-PRF-8805 with additional material requirements as specified below:

Outgassing: When tested as specified in ASTM-E595, plastic potting compound, elastomer seals and marking ink shall meet the following outgassing requirements:

Samples to be tested shall have been processed in the same manner as that used in production of the qualification lot.

Total mass loss (TML): Shall not exceed 1.0 percent of the initial specimen mass.

Collectable volatile condensable material (CVCM): Shall not exceed 0.1 percent of the initial specimen mass.

Restricted materials: Cadmium, zinc or pure tin plating shall not be used on any internal or external parts of the switch. Use of tin-lead (Sn-Pb) finishes are acceptable provided that the minimum lead content is 3 percent. The use of magnesium alloy is prohibited.

Weight:

Type A: .05 ounce maximum.

Type B: .16 ounce plus .10 ounce per lead per foot maximum.

Type C: .16 ounce plus .10 ounce per lead per foot maximum.

Operating characteristics:

Actuating force: 30 ounces maximum (at standard temperature and pressure, 21°C and 14.7 psia).

Releasing force: 4 ounces minimum (at standard temperature and pressure, 21°C and 14.7 psia).

Movement differential: .005 inch (0.13 mm) maximum.

Pretravel: .009 inch (0.23 mm) maximum.

Overtravel: .002 inch (0.05 mm) minimum.

Terminal strength: 2 pounds maximum (solder terminal only).

Contact resistance:

Solder terminals: 40 milliohms maximum.

Wire leads: Add 11 milliohms maximum per lead per foot.

Dielectric withstanding voltage:

Sea level: 1,050 V rms terminal to case, 800 V rms terminal to terminal, 500 V rms after electrical life.

Altitude (70,000 feet).

300 V rms (solder terminals only).

1,050 V rms terminal to case (wire lead termination).

800 V rms terminal to terminal (wire lead termination).

500 V rms after electrical life.

Random vibration (Applicable to PIN's M8805/68-029 through -035 only): In accordance with MIL-PRF-8805 and MIL-STD-202, method 214, test condition I, test condition letter B, with the following details and exceptions:

Power spectral density (PSD): +3 db/octave, 20-80 Hz; 0.04 G²/f, 80-350 Hz flat; -3 db/octave, 350-2000 Hz. Tolerance for the PSD shall be +1.5 db, -3 db for the 20 to 1000 Hz band; +1.5 db, -4 db for the 1 kHz to 2kHz band. The overall rms G shall be recorded for each run, and shall be within +10 percent, -15 percent of the specified curve for each acceptance.

Duration of the first test shall be 1 minute minimum in each of three mutually perpendicular directions, one of which shall be in the direction of actuator movement.

Contact stability shall be continuously monitored during vibration for contact-to-contact and contact-to-case chatter. There shall be no opening or closing in excess of 10 microseconds.

Mechanical endurance: 50,000 cycles.

Electrical endurance: 25,000 cycles.

Intermediate current: 25,000 cycles.

Low level circuit: 25,000 cycles.

Electrical ratings: Sea level and 70,000 ft at 28 V dc; 4 amperes resistive load, 1 ampere Inductive load, and 2 amperes lamp load.

Short circuit: 20 times rated resistive load (SAE-AS33201; PIN MS3320-7 ½, or equivalent used for circuit protection).

Radiographic inspection (Applicable to PIN's M8805/68-029 through -035 only):

Switches shall be radiographically inspected in accordance with method 209 of MIL-STD-202 for solder migration, loose parts and assembly anomalies. The radiographic sensitivity shall be sufficient to detect internal contamination or extraneous material equal to or greater than 0.001 inch in its major diameter. Two views shall be taken (side view and end view) in each actuator position (released and full overtravel).

Run-in (Applicable to PIN's M8805/68-029 through -035 only): Each switch shall be fully activated with following conditions:

Normally open and normally closed contacts shall be individually loaded.

Contact load: .1 ampere +0, -0.1 ampere resistive.

Open circuit load voltage: 10 to 50 mV dc.

Temperature: +25°C ±5°C ambient.

Cycles and rate: 250 cycles minimum at a rate of 20 cycles per minute maximum with nominally equal "on" and "off" times.

Monitoring: The monitoring equipment shall record the number of failures or discontinue the test if a failure occurs (failure of a contact to open or close its individual circuit in proper sequence).

QUALIFICATION:

Group submission: See table II.

Table II Qualification inspection group submission.

Inspection	Basic Switch	Additional Inspections	Extent of Approval
Qualification inspection table of MIL-PRF-8805	M8805/68-023 (all sample units)	M8805/68-022, 024, 025, 026, 027, and 028: (2 sample units each) Visual and mechanical inspection Terminal strength	All part numbers
Certification to material requirements	M8805/68-029 through -035		

Group A Inspection:

M8805/68-022 through -028: In accordance with MIL-PRF-8805.

M8805/68-029 through -035: Each switch shall be screened in accordance with the requirements of table III in the order listed, except that the seal testing may be performed out of the specified sequence. In addition, a sample of three switches shall be taken from the screened lot and tested in accordance with table IV in the order listed.

Table III. Screening requirements for high reliability parts.

100 percent inspection
Radiographic inspection
Run-in
Dielectric withstanding voltage
Insulation resistance
Contact resistance
Seal

Table IV Quality conformance inspection for high reliability parts.

3 samples from each screened lot
Random vibration
Radiographic inspection
Dielectric withstanding voltage
Insulation resistance
Contact resistance
Seal

Part or identifying number (PIN). See table V.

Substitution information: See table VI.

Table V. PIN;s and configuration.

PIN	Resistive load rating	Type mounting	Terminals	Application
M8805/68-022	4 Amp	A	Solder	General Military Applications
M8805/68-023	4 Amp	B	Solder	
M8805/68-024	4 Amp	B	Wire lead – bottom	
M8805/68-025	4 Amp	B	Wire lead – side	
M8805/68-026	4 Amp	C	Solder	
M8805/68-027	4 Amp	C	Wire lead – bottom	
M8805/68-028	4 Amp	C	Wire lead – side	
M8805/68-029	4 Amp	A	Solder	High Reliability Parts <u>1/</u>
M8805/68-030	4 Amp	B	Solder	
M8805/68-031	4 Amp	B	Wire lead – bottom	
M8805/68-032	4 Amp	B	Wire lead – side	
M8805/68-033	4 Amp	C	Solder	
M8805/68-034	4 Amp	C	Wire lead – bottom	
M8805/68-035	4 Amp	C	Wire lead – side	

1/ High reliability parts are subjected to increased levels of screening and quality conformance inspection as specified in tables III and IV.

TABLE VI. Substitution information for canceled PIN's.

Canceled PIN M8805/68-	<u>1/</u> Substitute PIN M8805/68-	Canceled PIN M8805/68-	<u>1/</u> Substitute PIN M8805/68-	Canceled PIN M8805/68-	<u>1/</u> Substitute PIN M8805/68-
001	022	008	022	015	029
002	023	009	023	016	030
003	024	010	024	017	031
004	025	011	025	018	032
005	026	012	026	019	033
006	027	013	027	020	034
007	028	014	028	021	035

1/ The canceled PIN's are no longer procurable. Substitute PIN configurations are rated at 4 amperes for 25,000 cycles.

Referenced documents. In addition to MIL-PRF-8805, this document references the following:

MIL-STD-202
SAE-AS22759/9
SAE-AS33201
ASTM-E595

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Custodians:

Army - CR
Navy - EC
Air Force – 11
DLA - CC
Other – NA

Preparing activity:

DLA – CC

(Project 5930-2008-001)

Review activities:

Army - AV, AR
Navy - AS, MC, OS, SH
Air Force - 19, 99

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 <http://assist.daps.dla.mil/>