

AM-312													SHEET 1 OF 8	
TABLE 1														
PERCENT OF RATED CURRENT VS. TRIPPING TIME IN SECONDS AT 25°C														
DELAY		100%	135%	150%	200%	400%	600%	800%						
INSTANT		NO TRIP 1 HOUR	.100 MAX.	.100 MAX.	.100 MAX.	.100 MAX.	.100 MAX.	.100 MAX.						
FAST		NO TRIP 1 HOUR	.3 - 7.0	.2 - 5.0	.1 - 2.0	.03 - .50	.005 - .30	.003 - .150						
SLOW		NO TRIP 1 HOUR	3.0 - 70	2.0 - 40	1.0 - 15	.10 - 4.0	.005 - 2.0	.003 - .800						
NOTES: 1. TRIP TIME CALIBRATION IS PERFORMED IN THE VERTICAL PLANE (NORMAL VERTICAL MOUNT) WITH NO PRELOAD.														
TABLE 11														
DCR														
CURRENT RATING IN AMPERES		DC RESISTANCE							DC RESISTANCE					
		.100							.274					
		.500							9.77					
		1.00							2.31					
		2.00							.465					
		3.00							.261					
		4.00							.156					
		5.00							.091					
		7.50							.053					
		10.0							.023					
		12.5							.020					
		15.0							.010					
		20.0							.008					
		25.0							.004					
		30.0							.003					
NOTE: DC RESISTANCE IS MEASURED AFTER 1 HOUR AT 100% RATED CURRENT USING THE VOLTMEETER-AMMETER METHOD.														
TOLERANCE: .100-2.5 AMPS ±20% 2.6-20 AMPS ±25% 20.1-30 AMPS ±50%														
1. THIS SPECIFICATION DESCRIBES AIRPAX SNAPAK MAGNETIC CIRCUIT BREAKERS WITH INVERSE TIME DELAY AND TRIP FREE CHARACTERISTICS.														
2. DELAY TIME: SEE TABLE 1.														
3. RESISTANCE: SEE TABLE 11.														
4. CURRENT AND VOLTAGE RATINGS: DC ONLY														
		CURRENT		MAX. VOLTAGE		INTERUPT								
.1 AMPS - 30 AMPS		80VDC		600A										
.1 AMPS - 30 AMPS		65VDC		1000A										
5. SHORT CIRCUIT RUPTURE CAPACITY: 1000 AMPERES AT 65VDC, 600 AMPERES AT 80VDC														
6. HIGH-LOW TEMPERATURE OPERATION: CIRCUIT BREAKERS SHALL OPERATE FROM -40°C TO +85°C.														
7. DIELECTRIC STRENGTH: CIRCUIT BREAKERS SHALL WITHSTAND 1500 VOLTS 60 HZ FOR 60 SECONDS BETWEEN ALL ELECTRICALLY ISOLATED TERMINALS OR 1800V AC FOR 1 SECOND.														
8. INSULATION RESISTANCE: SHALL NOT BE LESS THAN 100 MEGOHMS AT 500V DC.														
9. SHOCK: CIRCUIT BREAKERS WITHSTAND SHOCKS OF 75G WITHOUT TRIPPING WHILE CARRYING FULL RATED CURRENT PER MIL-STD-202C. METHOD 213, TEST CONDITION 1. INSTANT TRIP BREAKERS ARE TESTED AT 80% OF RATED CURRENT.														
10. VIBRATION: TESTS ARE PERFORMED IN ACCORDANCE WITH MIL-STD-202C, METHOD 204, TEST CONDITION A. TIME DELAY BREAKERS WITHSTAND 10G WITHOUT TRIPPING WHILE CARRYING FULL RATED CURRENT. INSTANT TRIP BREAKERS ARE TESTED AT 80% OF RATED CURRENT.														
11. ANY LINKAGE USED TO ACTUATE A CIRCUIT BREAKER MUST ACCOMMODATE FULL, UNRESTRICTED HANDLE TRAVEL AT BOTH HANDLE EXTREMES (ON-OFF, OFF-ON). IF NOT, OVERLOAD PROTECTION COULD BE COMPROMISED.														
12. ENDURANCE: 1000 SWITCHING OPERATIONS AT RATED CURRENT AND VOLTAGE.														
13. INRUSH - PULSE TOLERANCE: CIRCUIT BREAKERS SHALL WITHSTAND WITHOUT TRIPPING A SINGLE PULSE OF 8 MILLISECONDS DURATION, HALF SINE WAVE CONFIGURATION AND A PEAK AMPLITUDE PER TABLE BELOW.														
		RATING		WITH INERTIA WHEEL		WITHOUT INERTIA WHEEL								
21-30 AMPS		12X		8X										
		12X		6X										
14. AUXILIARY SWITCH RATINGS:														
		UL		VDE										
SILVER		.5 AMPS/80V DC		1 AMP/50V DC										
GOLD		.1 AMPS/80V AC		.1 AMP/32V DC										
15. HANDLE & BODY MATERIAL: HANDLES, RODS AND BUTTONS ARE POLYCARBONATE. COLORS AND MARKINGS ARE LISTED IN FOURTH DISCUSSION, SHEET 4. THE UPPER BODY MATERIAL IS POLYCARBONATE AND THE LOWER BODY IS BLACK POLYESTER.														
16. CIRCUIT BREAKER CONFIGURATIONS ARE UL LISTED, CSA CERTIFIED AND TUV OR VDE APPROVED. SEE AIRPAX SPECIFICATION AM-327.														
17. RECOMMENDED TORQUE SPECIFICATION: 3/8"-32 PLASTIC BUSHING IS 10-15 INCH POUNDS. 8-32 AND M4 SCREW TERMINALS 10-13 INCH POUNDS. 10-32 AND M5 SCREW TERMINALS 14-15 INCH POUNDS. (NOTE: WHERE APPLICABLE, MECHANICAL SUPPORT MUST BE PROVIDED TO TERMINALS WHILE APPLYING TORQUE.)														
18. ALL UNITS WILL BE IDENTIFIED WITH A WARNING LABEL INDICATING "POLARITY SENSITIVE DEVICE". THE LINE TERMINAL #1 MUST BE CONNECTED TO THE NEGATIVE LEAD AND THE LOAD TERMINAL #2 MUST BE CONNECTED TO THE POSITIVE LEAD.														
19. REQUIRED DISTANCE FROM VENT AREA OF BREAKER TO GROUNDED METAL, UNINSULATED BUS BARS OR CONDUCTORS TO BE 1.0 INCH.														
REVISIONS														
M 59086														
REWORKING: WAS: 4" SIZE; ADDED SCREW TERMINALS IN 5TH DEC. SHT. 2 & ADDED SHT FOR SCREW TERMS; SHT. 1, ADDED *OR TUV* TO NOTE 16 CH.11/2/10														
N 61847														
ADDED SHT. FOR TUV & CCC (SHT.3); REMOVED NOTE 14, AUX SW.; SHT. 2; REVISED 5TH DEC.; SHT. 6 REVISED; REMOVED TOGGLE, ADDED NOTE 2, DESCRIP VS NON-DESCRIP CH.1/24/11														
P 62666														
SHT. 2 & 3, 1ST DEC. ADDED '6' SERIES W/GOLD AUX SW CH.2/14/11														
R 66123														
SHT. 2; 1st DEC. ADDED *NO AUX. SW.* TO S. 3rd DEC. REVISED ZERO PLACEMENTS IN TABLE REVISED & ADDED 2ND DESCRIP P/N TO SHT. 2; SHT. 3; 1st DEC. ADDED *NO AUX. SW.* TO S. 3rd DEC. REVISED ZERO PLACEMENTS TO SOME AMPERAGE IN TABLE. REVISED DESCRIP P/N TO SHT. 3 CH.6/15/11														
SNAPAK SPECIFICATION 489A														
THIRD ANGLE PROJECTION														
INTERPRET DRAWING PER ANSI Y14.3M-1982														
INCH [MM]														
TOLERANCE UNLESS NOTED INCH ±.015 MM ±.38 ANGLES ±5°														
FINISH														
SCALE														
REVISION														
AM-312														
SHEET 1 OF 8														
C-1012 7/00 35469														

FIRST DECISION	
HANDLE	POLES
CPP PUSH-PULL	1 SINGLE
CPR PUSH-TO-RESET	5 AUXILIARY SWITCH
CR ROCKER	6 AUXILIARY SWITCH

CONFIGURATION	
1 SERIES CIRCUIT BREAKER	TERMINALS
SERIES W/ SILVER *	NONE QUICK CONNECT
5 AUXILIARY SWITCH	SCREW
SERIES W/ GOLD *	SINGLE POLE
AUXILIARY SWITCH	SERIES (-1) ONLY.

S	NO AUX. SWITCH.
	SCREW TERMINAL
	(FIFTH DECISION
	OPTION REQUIRED
	WHEN *S* IS
	SPECIFIED.)

* SEE NOTE 14 ON PAGE 1 FOR SWITCH RATING

SECOND DECISION	
-51	FAST DC
-52	SLOW DC
-59	INSTANT DC
-51F	FAST WITH INERTIA
-51F	WHEEL DC
-52F	SLOW WITH INERTIA
-52F	WHEEL DC

FOURTH DECISION	
(SEE SHEET 4)	

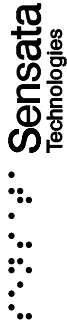
V = VDE & CCC APPROVED
AREAS ENCLOSED WITH BOLD
LINES DENOTE VDE APPROVAL
OPTIONS. THIS APPROVAL RE-
QUIRES THE ADDITION OF A
V AT THE END OF THE PART
NUMBER. THE V WILL BE
ADDED TO ANY PART NUMBER
FORMED ENTIRELY FROM BOLD
OUTLINED DECISIONS. IF NON-
BOLD OUTLINED AREAS ARE
SELECTED, THE UNIT WILL
NOT BE VDE APPROVED, BUT
OTHER APPROVALS STILL
APPLY.

CR11-52-5.00A-B01CV-V
CR11S-52-5.00A-B01CV-C

THIRD DECISION	
RATED CURRENT (CIRCUIT BREAKER)	
USE THREE NUMBERS TO PRINT REQUIRED CURRENT VALUE BETWEEN .100 AMPS MINIMUM AND 30.0 AMPS MAXIMUM.	
BREAKERS REQUIRING VDE/CCC APPROVAL ARE LIMITED TO THESE AMPERAGES.	
.100	1.50 10.0 20.0
.250	2.00 11.0 25.0
.300	2.50 12.0 30.0
.400	3.00 12.5
.500	4.00 13.0
.600	5.00 14.0
.750	6.00 15.0
.800	7.00 16.0
.900	7.50 17.5
1.00	8.00 18.0
1.25	9.00 19.0

FIFTH DECISION	
SCREW TERMINAL OPTIONS	
C	8-32, TABS, STRAIGHT
D	8-32, FLAT, STRAIGHT
F	M4, TABS, STRAIGHT
H	M4, FLAT, STRAIGHT

DECISION FROM FIFTH DECISION
REQUIRED ONLY WHEN -S IS
SPECIFIED IN FIRST DECISION.

	
POWER CONTROLS CAMBRIDGE, MD USA	
DRAWN C.H.	APPROVED B.H.
CHECKED P.A.Y.	DATE 4/12/05
213	
THIRD ANGLE PROJECTION PER ANSI Y14.3M-1982	
INTERPRET DRAWING INCH [MM]	
TOLERANCE UNLESS NOTED	
INCH ±.015 MM ±.38	
ANGLES ±5°	
MATERIAL	
FINISH	
SCALE	
AM-312	
SHEET 2 OF 8	
REVISION R	

REVISIONS
M 59086
N 61847
P 62666
R 66123

HANDLE		POLES	CONFIGURATION	FIRST DECISION
CPP	PUSH-PULL	1 SINGLE POLE	1 SERIES CIRCUIT BREAKER	
CPR	PUSH-TO-RESET		5 SERIES W/ SILVER * AUXILIARY SWITCH	
CR	ROCKER		6 SERIES W/ GOLD * AUXILIARY SWITCH	

SECOND DECISION	
-51	FAST DC
-52	SLOW DC
-59	INSTANT DC
-51F	FAST WITH INERTIA WHEEL DC
-52F	SLOW WITH INERTIA WHEEL DC

FOURTH DECISION
 (SEE SHEET 4)

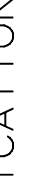
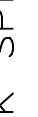
T = TUV & CCC APPROVED
AREAS ENCLOSED WITH BOLD
LINES DENOTE TUV APPROVAL
OPTIONS. THIS APPROVAL RE-
QUIRES THE ADDITION OF A
T AT THE END OF THE PART
NUMBER. THE T WILL BE
ADDED TO ANY PART NUMBER
FORMED ENTIRELY FROM BOLD-
OUTLINED DECISIONS. IF NON-
BOLD OUTLINED AREAS ARE
SELECTED, THE UNIT WILL
NOT BE TUV APPROVED, BUT
OTHER APPROVALS STILL
APPLY.

CR11S-52-5.00A-B01CV-C-T

THIRD DECISION	RATED CURRENT (CIRCUIT BREAKER)	USE THREE NUMBERS TO PRINT REQUIRED CURRENT VALUE BETWEEN .100 AMPS MINIMUM AND 30.0 AMPS MAXIMUM.
.100	1.50	10.0
.250	2.00	11.0
.300	2.50	12.0
.400	3.00	12.5
.500	4.00	13.0
.600	5.00	14.0
.750	6.00	15.0
.800	7.00	16.0
.900	7.50	17.5
1.00	8.00	18.0
1.25	9.00	19.0

FIFTH DECISION	
	SCREW TERMINAL OPTIONS
C	8-32, TABS, STRAIGHT
D	8-32, FLAT, STRAIGHT
F	M4, TABS, STRAIGHT
H	M4, FLAT, STRAIGHT

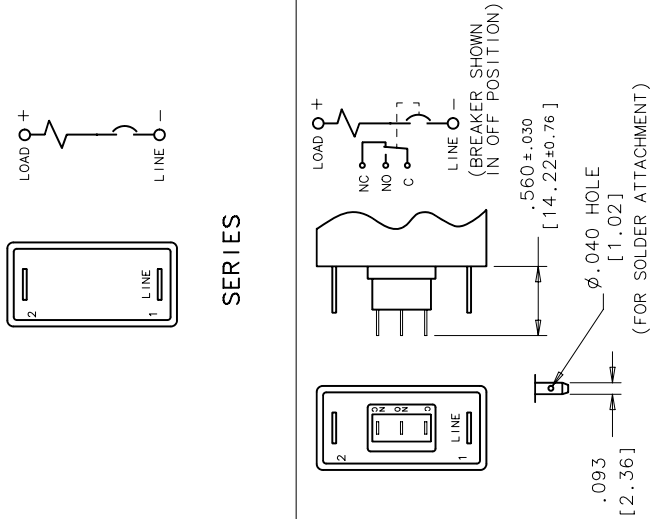
DECISION FROM FIFTH DECISION
REQUIRED ONLY WHEN -S IS
SPECIFIED IN FIRST DECISION.

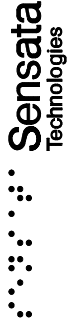
		SNAPAK SPECIFICATION 489A	
POWER CONTROLS CAMBRIDGE, MD USA		MATERIAL	
THIRD ANGLE PROJECTION			
INTERPRET DRAWING PER ANSI Y14.5M-1982		INCH [MM]	
TOLERANCE UNLESS NOTED		FINISH	
INCH $\pm .015$		SCALE	
MM $\pm .38$		AM-312	
ANGLES $\pm 5^\circ$		SHEET 3 OF 8	
213		REVISION R	

A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	U	V	Mx	T
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1. SINCE THE TIME DELAY IS SOMEWHAT ATTITUDE SENSITIVE, ALL TRIP CURVES AND CURRENTS ARE SPECIFIED WITH THE BREAKER MOUNTED IN THE NORMAL VERTICAL POSITION WITH NO PRELOADING.
2. TO ALLOW FOR INSTALLATION CLEARANCES, THE MINIMUM RECOMMENDED DISTANCES BETWEEN CENTERS OF PANEL OPENINGS SHOULD BE: .805 [20.45] FOR ROCKERS AND .750 [19.05] FOR PUSH-PULL AND PUSH-TO-RESET.
3. SPACE IS AVAILABLE ON THE CIRCUIT BREAKER LABEL FOR A CUSTOMER PART NUMBER UP TO 12 DIGITS.
4. CHEMICAL RESISTANCE: PLASTIC HANDLE AND CASE MAY BE CLEANED WITH DETERGENTS OR ALCOHOLS. ORGANIC SOLVENTS ARE NOT RECOMMENDED AS THEY ATTACK PLASTIC. CLEANING SOLUTIONS SHOULD BE EXPOSED TO OUTSIDE SURFACES ONLY. SPECIAL ATTENTION SHOULD BE GIVEN WHEN SOLVENTS ARE USED TO REMOVE EXCESS FLUX FROM TERMINALS. NO OILS OR LUBRICANTS SHOULD BE INTRODUCED INTO HANDLE OPENINGS.
5. SPECIAL ATTENTION SHOULD BE GIVEN TO TERMINAL CONNECTIONS ON BREAKERS ABOVE 10.0 AMPS. USE OF TIGHTLY GRIPPING PUSH-ON CONNECTORS OR SOLDER CONNECTIONS ARE RECOMMENDED.
6. PUSH-PULL IS AVAILABLE WITH A BLACK BUTTON WITH A WHITE INDICATING BAND. PUSH-TO-RESET IS ONLY AVAILABLE WITH A WHITE INDICATING SHAFT. ORIENTATION OF AMPERAGE MARKINGS MUST BE SPECIFIED IN THE 4th DECISION. (REF. SHEET 4)
7. PUSH-PULL AND PUSH-TO-RESET HAVE ONE (1) HEX NUT INSTALLED AS STANDARD HARDWARE FOR BACK PANEL AND ONE (1) PANEL NUT AS STANDARD FOR FRONT PANEL HARDWARE.

CONFIGURATIONS (SINGLE POLE)

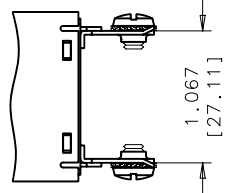


 POWER CONTROLS CAMBRIDGE, MD USA		SNAPAK SPECIFICATION 489A	
THIRD ANGLE PROJECTION PER ANSI Y14.3M-1982		MATERIAL	
TOLERANCE UNLESS NOTED		FINISH	
DRAWN C.H.		APPROVED B.H.	
CHECKED P.A.Y.		DATE 4/12/05	
213		SCALE FULL	
AM-312		REVISION SHEET 5 OF 8 R	

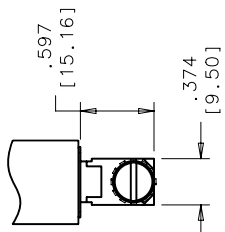
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SCREW TERMINALS

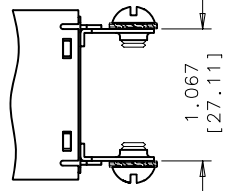
REVISIONS	
M	59086
N	61847
P	62666
R	66123



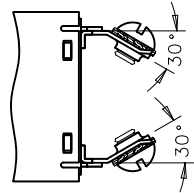
STRAIGHT TERMINALS
(SEE NOTE 2)
(8-32, TABS SHOWN)



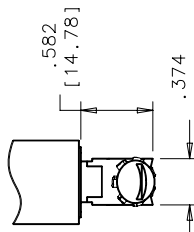
STRAIGHT TERMINAL
(SEE NOTE 2)
(M5, FLAT SHOWN)



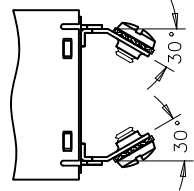
INALS
(N)



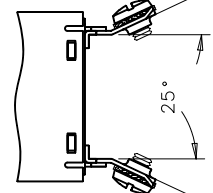
BENT-IN TERMINALS
(SEE NOTE 2)
(10-32, TABS SHOWN)



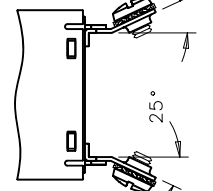
BENT-IN TERMINAL
(SEE NOTE 2)
(8-32, FLAT SHOWN)



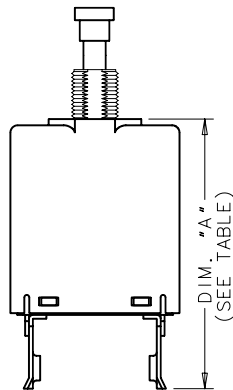
NALS
(NMN)



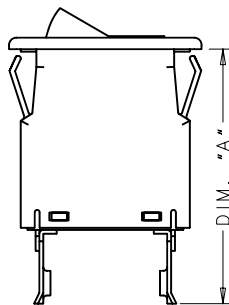
BENT-OUT TERMIN
(SEE NOTE 2)
(M4, FLAT SHOWN)



INSTRUMENTAL



PUSH BUTTON
(SCREW & LOCKWASHER
REMOVED FOR CLARITY.)



ROCKER
(SCREW & LOCKWASHER
REMOVED FOR CLARITY.)

SNAPAK SPECIFICATION
489A

	THIRD ANGLE PROJECTION
INTERPRET DRAWING PER ANSI Y14.5M-1982	
INCH	[MM]
TOLERANCE UNLESS NOTED	
INCH $\pm .015$	
MM $\pm .38$	
ANGLES $\pm 5^\circ$	

DRAWN	C. H.	APPROVED	B. H.
CHECKED	P. A. Y.	DATE	4/12/05
213			

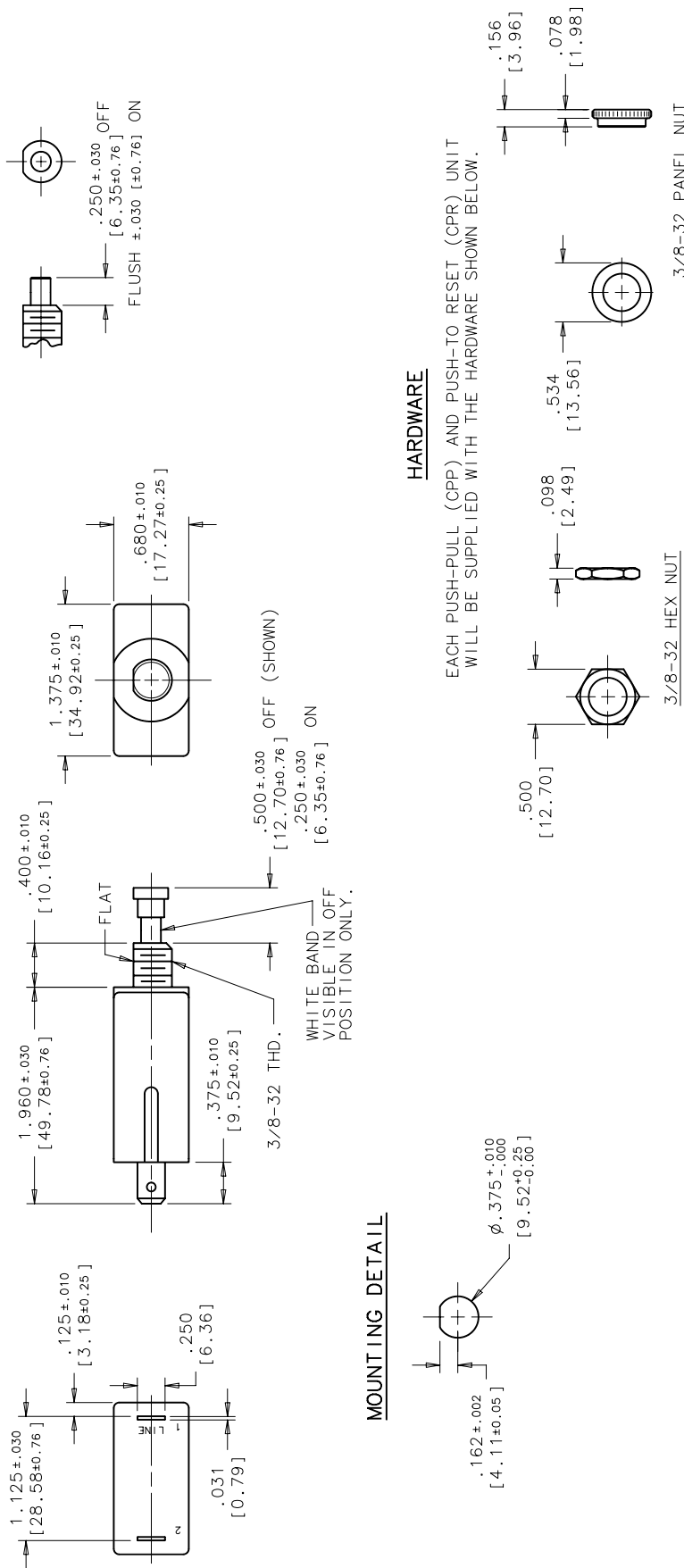
PUSH BUTTON	STRAIGHT	2.180 [55.37]
	BENT-IN (TABS)	2.166 [55.02]
	BENT-IN (FLAT)	2.145 [54.48]
	BENT-OUT	2.158 [54.81]
ROCKER	STRAIGHT	2.058 [52.27]
	BENT-IN (TABS)	2.044 [51.92]
	BENT-IN (FLAT)	2.023 [51.38]
	BENT-OUT	2.036 [51.71]
HANDLE STYLE	TERMINALS	DIM. "A" *

A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	U	V	Mx	T
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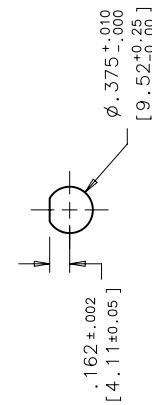
REVISIONS	
M	59086
N	61847
P	62666
R	66123

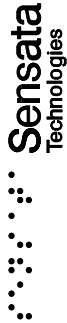
PUSH-PULL ACTUATION

PUSH-TO RESET ACTUATION

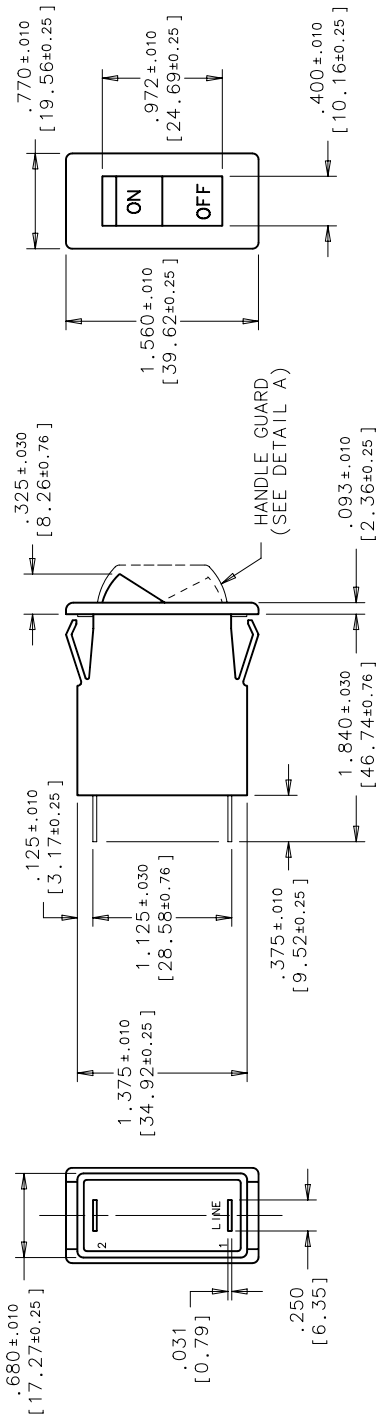


MOUNTING DETAIL

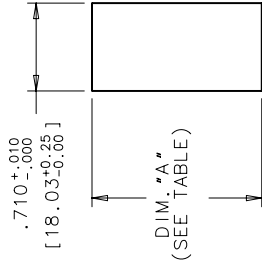


 POWER CONTROLS CAMBRIDGE, MD USA		SNAPAK SPECIFICATION 489A	
THIRD ANGLE PROJECTION PER ANSI Y14.3M-1982		MATERIAL	
TOLERANCE UNLESS NOTED		FINISH	
DRAWN C.H.		APPROVED B.H.	
CHECKED P.A.Y.		DATE 4/12/05	
213		SCALE FULL	
		AM-312	
		REVISION SHEET 7 OF 8 R	

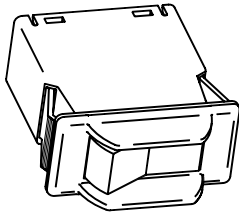
A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	R	S	U	V	W	X	Y	Z
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MOUNTING DETAILS
TOLERANCE FOR MOUNTING ±.005 [0.13]
UNLESS NOTED OTHERWISE.



.125 [3.18]	1.460 [37.08]
.093 [2.36]	1.420 [36.07]
.062 [1.57]	1.385 [35.18]
PANEL THICKNESS	DIM. "A"



DETAIL A

Sensata Technologies		THIRD ANGLE PROJECTION PER ANSI Y14.3M-1982		SNAPAK SPECIFICATION	
POWER CONTROLS CAMBRIDGE, MD USA		INTERPRET DRAWING PER ANSI Y14.3M-1982		MATERIAL	
DRAWN C.H.		TOLERANCE UNLESS NOTED		FINISH	
CHECKED P.A.Y.		INCH ±.015 MM ±.38		SCALE FULL	
DATE 4/12/05		ANGLES ±5°		AM-312	
213		SHEET 8 OF 8		REVISION R	

A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	U	V	W	T
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