



*Achieving  
Excellence through  
Commitment to Quality*



**DURAKOOL**

**Switches & Sensors**

## Mission Statement

American Electronic Components, Inc., is a designer and manufacturer of electrical and electronic components focused on niche markets for sensors, switches, and relays. The Company is dedicated to providing the highest quality components and service which exceed the needs and wants of its customers. We are growth oriented and practice integrity and fairness when dealing with all stakeholders of the business. We will continue our leadership position and display a marketing orientation while satisfying customers with products that complement our existing sensor, switch, and relay technology. AEC is committed to earning a profit, so the Company will remain financially strong and perpetuate this philosophy.

## Lab Accreditation



The AEC Quality Assurance Laboratory is accredited by the American Association for Laboratory Accreditation (A2LA). A2LA is important to AEC and its customers since it allows us to perform timely design validation, product validation, and continuous conformance evaluation on our products. This accreditation is a critical asset and demonstrates AEC's continuing commitment to the pursuit of quality.

## Features

Hermetically Sealed	Contacts are impervious to external contaminants
Self-renewing contacts	No contacts to clean or adjust
Reliable	Liquid mercury contacts
Long Life	Superior performance over conventional contacts
Low Contact Resistance	Stable over life
Metal Construction	Unlike glass, virtually indestructible



Glass Breaks — Metal Bounces

## Options

Durakool switches and sensors are available in normally-open or normally-closed contact forms, and in sizes for milli-amp signal loads to 25-amp power switching loads. They are available in single-throw and double-throw designs and can be insulated or non-insulated.

**This catalog contains standard parts, but custom designs are available.**

## Applications



A sensor automatically shuts off a laptop computer when the screen is closed.



A motion sensor automatically shuts off an iron after a period of inertia.

Today's growing use of microprocessors with printed circuit boards in appliance, automotive, communication and other fields is creating many new applications uniquely suited to Durakool switches and sensors. Worldwide efforts focusing on product safety are opening many new motion, position, and tip-over applications, such as shut-offs for area space heaters.

Durakool switches have proven themselves in a wide variety of applications. Some of these include:

- ▲ Microprocessor control
- ▲ Convenience lights in automobile trunks, glove boxes, etc.
- ▲ Convenience lamps in freezer lids
- ▲ Pump floats
- ▲ Motor or lamp control in dirty environments
- ▲ Indication of position or inclination
- ▲ Triggers for alarm/security systems
- ▲ Machine limit switches
- ▲ Remote control of relays/solenoids
- ▲ Electronic games and toys
- ▲ G-Force/Inertia

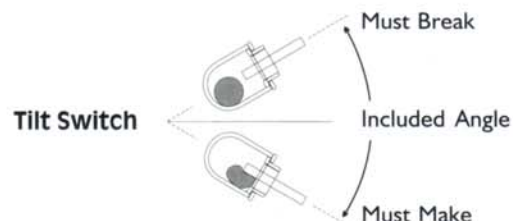
## DURAKOOL Non-Insulated Tilt and Position Switches

Durakool tilt switches "make" when the electrode is tilted below horizontal and "break" when tilted above horizontal. Total travel from "make" to "break" is the "Maximum Included Angle" shown below. The component to which the switch is

attached must have a total tilt angle greater than the "Maximum Included Angle" for proper operation. "G" series switches are mercury-to-mercury; "A" series are mercury-to-metal.

TYPE/SERIES	A $\frac{1}{2}$ S	A $\frac{1}{2}$ N	A $\frac{1}{2}$	AIS	AIN	G5N	G8N	G10N
PART NUMBER	4929	5002	4859**	AIS-017	20144	3822	3825	3765
Must Make/Break Angle* Max. Included Angle	-7°/+7° —	— 15°	-2°/+15° —	— 16°	-1°/+1° 1.5°	— 11°	— 11°	— 9°
Note: Switches are pictured in normally closed position.								
*Make/break angles are electrode + (above)/ - (below) 0° horizontal reference.								
ELECTRICAL RATINGS								
AC Amps, 60Hz								
120V	—	1.0	—	*	1.0	7.0	15.0	25.0
240V	—	0.4	—	*	0.7	5.0	11.0	19.0
480V	—	—	—	*	—	—	8.0	13.0
DC Amps								
120V	#	0.5	—	*	0.5	5.0	8.0	13.0
240V	#	0.4	—	*	0.4	4.0	6.0	10.0
Tungsten Lamp (120V, 60Hz), Watts	—	60	—	75	100	700	1000	1700
Motor Load, Horsepower								
AC 60Hz, 120-480V	—	—	—	—	—	0.33	0.50	1.0
DC, 120-240V	—	—	—	—	—	0.25	0.33	0.5
Contact Resistance Milliohms (Typical)	—	80	150	30	200	3	3	3
Standoff Voltage, Contact to contact	—	1250	—	1500	1500	1500	2500	3000
ENGLISH DIMENSIONS								
Lbs./100 pcs.	—	0.33	—	0.68	1.10	1.88	4.59	5.62
Body Length, in. (less leads)	0.25	0.39	0.39	0.52	1.00	1.36	1.68	1.90
Max. Diameter, in.	0.27	0.27	0.27	0.34	0.389	0.42	0.50	0.62
METRIC DIMENSIONS								
Kg/100 pcs.	—	0.15	—	0.31	0.50	0.85	2.08	2.55
Length, cm	0.99	1.91	1.94	1.52	2.50	3.97	4.74	5.36
Max. Diameter, cm	0.67	0.67	0.67	0.85	0.90	1.06	1.27	1.56
Finish	Tin	Tin	Nickel**	Cadmium	Rust Inhibited	Rust Inhibited	Rust Inhibited	Rust Inhibited

# 0.5 Amps @ 12 VDC Max.  
 \* 1 Amp, 6-24V, AC/DC  
 \*\*Also Available Tin Plated (Part Number 4954)








## **DURAKOOL** Insulated Tilt and Position Switches

TYPE/SERIES	A1/2	A1	G5Z	G8Z	G10Z
<b>PART NUMBER</b> PVC Cotton Neoprene Silicone	(Select by Type and Leadwire Insulation)				
	A1/2-001	— A1-001 A1-002 A1-003	— G5Z-001 G5Z-002 G5Z-003	— G8Z-001 G8Z-002 G8Z-003	— G10Z-001 G10Z-002 G10Z-003
<b>Max. Included Angle*</b> *Switching occurs when body axis is near horizontal.	15°	15°	11°	9°	9°
					
<b>ELECTRICAL RATINGS</b>					
AC Amps, 60Hz					
120V	1.0	1.0	7.0	15.0	25.0
240V	0.4	0.7	5.0	11.0	19.0
480V	—	—	—	8.0	13.0
DC Amps					
120V	0.5	0.5	5.0	8.0	13.0
240V	0.4	0.4	4.0	6.0	10.0
Tungsten Lamp (120V, 60Hz), Watts	60	100	700	1000	1700
Motor Load, Horsepower					
AC 60Hz, 120-480V	—	—	0.33	0.50	1.0
DC, 120-240V	—	—	0.25	0.33	0.5
Contact Resistance Milliohms (Typical)	30	30	3	3	3
Standoff Voltage, Contact to contact Contact to ground	1250 1500	1500 5000	1500 5000	1500 5000	3000 5000
<b>LEADWIRE INFORMATION</b>					
Length, in.	6	6	6	6	6
Terminal	Spade	Ring	Ring	Ring	Ring
Hole Diameter	0.142	0.170	0.170	0.203	0.203
Machine Screw Size	#6	#8	#8	#10	#10
<b>ENGLISH DIMENSIONS</b>					
Lbs./100 pcs.	0.99	3.04	4.45	8.64	13.05
Body Length, in. (less leads)	0.96	1.31	1.81	2.03	2.38
Max. Diameter, in.	0.38	0.50	0.52	0.75	0.84
<b>METRIC DIMENSIONS</b>					
Kg/100 pcs.	0.45	1.38	2.02	3.92	5.92
Length, cm	2.44	3.33	4.60	5.15	6.03
Max. Diameter, cm	0.95	1.27	1.37	1.91	2.14
<b>MOUNTING CLIP</b>					
Single	—	122	122	122	122
Double	—	2023	2023	2008	2009

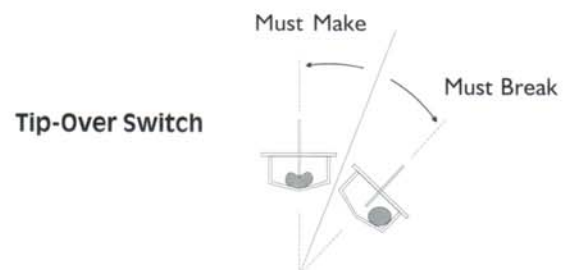
Not all part numbers are shown within a series. Angle specifications are dependent on rotation rates and electrical load parameters. For additional information, contact AEC Sales

## DURAKOOL Tip-Over and Motion Switches

Durakool Tip-Over switches are specified by the angle of travel away from the vertical required to "make" or "break" the contact. The operating angle designed for the installation must be larger than this specification to ensure proper switch action.



TYPE/SERIES	TO3	TO8	TO8	TO8	A $\frac{1}{2}$ S	A $\frac{1}{2}$ S
PART NUMBER	TO3-1016 See Note 1	TO8-2009	20176	4539	4770	20243
Max. make/break angle (from 0° vertical reference)	10°/45°	12°/30°	10°/35°	25°/72°	15°/130°	Motion/vibration activated
Note: Switches are pictured in normally closed positions.						
ELECTRICAL RATINGS						
AC Amps, 60Hz 120V 240V DC Amps	12.5 6.0 —	1.7 0.75 1 (12VDC)	1.7 — —	1.7 — —	— — 0.5 (12VDC)	— — 0.5 (12VDC)
Tungsten Lamp (120V, 60Hz), Watts	1500 (Resistive)	—	—	—	—	—
Motor Load, Horsepower AC 60Hz, 120-240V	0.167	—	—	—	—	—
Contact Resistance Milliohms (Typical)	Meets UL Heat Rise Specification	5 Ohms @ 5 Volts/10mA*	Varied by Application	0.02 Ohms @ 1 Volt/10mA*	20 Ohms @ 1mA max.*	1 Ohm @ 5 Volts/ 1mA max.*
Standoff Voltage, Contact to Contact	1240	500	1240	500	—	200
ENGLISH DIMENSIONS Lbs./100 pcs. Body Length, in. (with leads) Max. Diameter, in.	3.20 0.87 0.94	1.7 .44 .477	0.77 1.08 0.60	0.77 0.65 0.60	— 0.84 0.27	0.31 0.627 0.31
METRIC DIMENSIONS Kg/100 pcs. Length, cm Max. Diameter, cm	1.45 2.21 2.40	0.76 1.13 1.22	0.35 2.74 1.52	0.35 1.65 1.52	— 2.12 0.67	0.13 1.6 0.79
Finish	Nickel	Acid Tin	Acid Tin	Nickel	Acid Tin	Acid Tin

Note 1: TO3-1015 = 1/4" Male Quick Connect Center Elect. Mounting Terminal  
TO3-1016 = 1/4" Male Quick Connect Center Elect., 1/4" Female 180°  
TO3-1026 = 1/4" Male Quick Connect Center Elect., 1/4" Male 180°  
\*Varies by application





Not all part numbers are shown within a series. Angle specifications are dependent on rotation rates and electrical load parameters. For additional information, contact AEC Sales

## **DURAKOOL** Specialty Switches

TYPE	Single-pole	Wide Angle
PART NUMBER	20110	5199
Max. Included angle (from 0° vertical reference)	30° 	20° 
DESCRIPTION	Must make between 45° and 75° from vertical.	Must make between 50° and 70° from vertical.
ELECTRICAL RATINGS		
AC Amps, 60Hz 12 VDC	10 mA (max) all voltages	10 mA (max) all voltages
ENGLISH DIMENSIONS Lbs./100 pcs. Body Length, in. (with leads) Max. Diameter, in.	0.33 0.74 0.31	0.32 0.52 0.31

## **DURAKOOL** Ball Switches

TYPE	Single-pole	Single-pole
PART NUMBER	20518	20274
Max. Included angle (from 0° horizontal reference)	± 5° 	± 8° 
DESCRIPTION	Plated ball suitable for tip or tilt applications.	High current ball tilt switch, noise dampened.
ELECTRICAL RATINGS		
AC Amps, 60Hz 13.5 VDC	5 mA (max)	1 A (max)
ENGLISH DIMENSIONS Lbs./100 pcs. Body Length, in. (with leads) Max. Diameter, in.	0.31 0.74 0.31	4.0 0.99 0.64

American Electronic Components specializes in the design and manufacture of electronic, electrical, and mechanical components. AEC's products are shipped worldwide for a diverse set of markets which include automotive, consumer electronics, appliance, industrial control, and outdoor power equipment manufacturers. For more information, contact the AEC Sales Department



### ◀ Hermetic Seals

HERMASEAL Glass-to-Metal Hermetic Seals,  
Feedthrus & Deep Vacuum Brazing

### Relays ▶

Hermetically sealed high power relays  
10-150 amps for general and high voltage  
use.



### ◀ Switches

Hermetically sealed tilt and tip-over  
switches for appliance, automotive,  
security, and safety use.



### Electromechanical ▶

Starter solenoids for outdoor power  
equipment and solenoids for automotive  
seatbelt retractors.



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