

**\*\*Movement / Vibration Modules**

Due to the unique features of these modules and the wide range of motion and vibration they may be subjected to, we suggest actual testing of these particular models to determine the suitability of the module for each application.

**MS24A/30**

This non-mercury sensor has been designed to detect movement or vibration. The sensor will react when disturbed by giving an intermittent change of state (ie n/o to n/c or vice versa). The time taken to settle depends on the amount of energy absorbed by the sensor; the settled state will normally be closed. The sensors contacts, when undisturbed, are normally closed, however it is possible to mount the switch with contacts open therefore we recommend that applications look for change of state not contact open or closed. This product offers additional sensitivity adjustment via an internal potentiometer. The output is referenced to 0V and can drive a transistor or similar device.

**MS24P/10**

This non-mercury sensor has been designed to detect movement or vibration. The sensor will react when disturbed by giving an intermittent change of state (ie n/o to n/c or vice versa). The time taken to settle depends on the amount of energy absorbed by the sensor; the settled state will normally be closed. The sensors contacts, when undisturbed, are normally closed, however it is possible to mount the switch with contacts open therefore we recommend that applications look for change of state not contact open or closed.

**CW60A/30**

This sealed tilt sensor has a differential angle of 15° Degrees. The output signals are logic levels with a degree of de-bouncing applied. The amount of debounce is adjustable via a potentiometer. The output signal can be used to drive a transistor if required.

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# Non Mercury Switches



**DESCRIPTION**

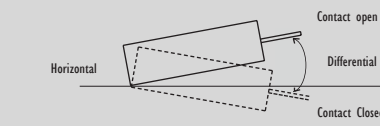
The products included in this catalogue are all designed to detect motion or movement. Forms of movement are: Tilt, Rotation, Vibration, Shock or Acceleration. Many of these can also be supplied for surface mount applications.

**Tilt Switches**

These operate when tilted from the horizontal position. The switch movement required to cause contact change is called the differential angle. It is very important when designing a tilt switch to allow for the differential angle and understand that when in the horizontal position the switch contact may be open or closed.

**Tilt Switch Modules**

A Tilt Switch can be located inside a sealed (usually plastic) enclosure. Flying leads are provided for easy connection.

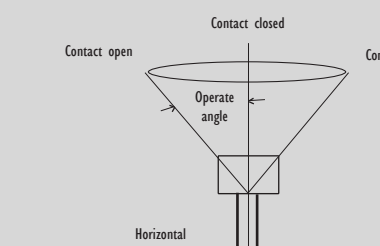
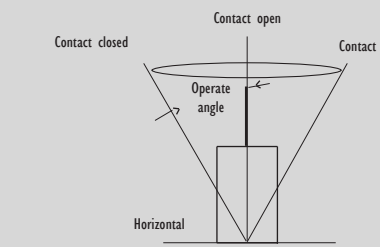


**Tip-Over Switches**

These operate when the switch is tilted from the vertical position. The angle through which the switch has to move before operating is called the operating angle. Many of these switches are omni-directional. Please state whether you require normally open or closed when ordering.

**Tip-Over Switch Modules**

A Tip-Over Switch can be located inside a sealed (usually plastic) enclosure. Flying leads are provided for easy connection.



**Acceleration Sensors**

These switches can have a normally open, or normally closed contact which will open or close when the switch reaches the acceleration activation level.

Direction of acceleration to close contacts



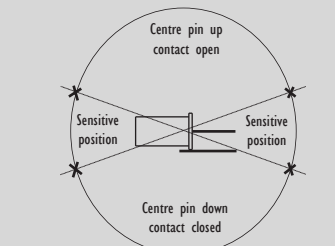
**Movement and Vibration Switches**

When correctly positioned the switch contacts will react by giving an intermittent change of state when subjected to movement or vibration.

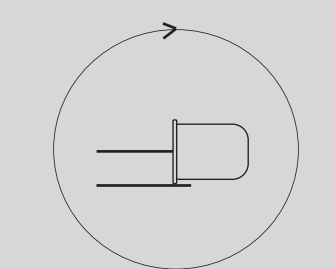
**Movement and Vibration Switch Modules**

A Movement or Vibration switch can be located in a sealed (usually plastic) housing.

**Position Sensitive**



**Non Position Sensitive**



NON MERCURY SWITCHES

\*use either part number  
\*\*more detailed information over page

Options / Features	<ul style="list-style-type: none"> <li>Hermetically Sealed</li> <li>Change-over</li> <li>Make before break</li> </ul>	<ul style="list-style-type: none"> <li>Hermetically Sealed</li> <li>Inert gas filled</li> </ul>	<ul style="list-style-type: none"> <li>Automotive Lamp Switch</li> </ul>	<ul style="list-style-type: none"> <li>CW1300-0 (1 Electrode)</li> <li>CW1300-1 (2 Electrodes)</li> <li>Surface mount version available</li> </ul>	<ul style="list-style-type: none"> <li>CW1600-0 (1 Electrode)</li> <li>CW1600-3 (2 Electrodes)</li> </ul>	<ul style="list-style-type: none"> <li>Change-over contacts</li> </ul>	<ul style="list-style-type: none"> <li>Use also as a Movement / Vibration sensor</li> </ul>	<ul style="list-style-type: none"> <li>Hermetically Sealed</li> <li>Inert gas filled</li> </ul>	<ul style="list-style-type: none"> <li>Omni-Directional</li> </ul>	<ul style="list-style-type: none"> <li>Omni-Directional</li> </ul>	<ul style="list-style-type: none"> <li>Omni-Directional</li> </ul>	<ul style="list-style-type: none"> <li>Omni-Directional</li> <li>CW1745-0 (1 Electrode)</li> <li>CW1745-1 (2 Electrodes)</li> </ul>	<ul style="list-style-type: none"> <li>Compact Tip-Over switch</li> </ul>	<ul style="list-style-type: none"> <li>AS1303-0 (1 Electrode)</li> <li>AS1303-1 (2 Electrodes)</li> </ul>	<ul style="list-style-type: none"> <li>Also available: 2.0 - 4.9G (ASLS 2.0)</li> <li>10.0 - 14.9G (ASLS 10.0)</li> <li>15.0 - 19.9G (ASLS 15.0)</li> <li>Surface mount version available</li> </ul>	<ul style="list-style-type: none"> <li>Gold plated contacts</li> <li>Omni-Directional</li> <li>Omni-Directional</li> <li>Silver available</li> </ul>	Options / Features	<ul style="list-style-type: none"> <li>Gold plated contacts</li> <li>Omni-Directional</li> <li>2 ball version available (less sensitive)</li> <li>Silver available</li> </ul>	<ul style="list-style-type: none"> <li>Encapsulated</li> </ul>	<ul style="list-style-type: none"> <li>With steel mounting bracket</li> </ul>	<ul style="list-style-type: none"> <li>Encapsulated</li> </ul>	<ul style="list-style-type: none"> <li>Robust construction</li> </ul>	<ul style="list-style-type: none"> <li>Robust construction</li> </ul>	<ul style="list-style-type: none"> <li>Adjustable to minimise contact bounce</li> </ul>	<ul style="list-style-type: none"> <li>Low cost compact size</li> </ul>	<ul style="list-style-type: none"> <li>1 Amp switching</li> </ul>	<ul style="list-style-type: none"> <li>Low cost easy fitting</li> </ul>	<ul style="list-style-type: none"> <li>Omni-Directional</li> </ul>	<ul style="list-style-type: none"> <li>Omni-Directional</li> </ul>	<ul style="list-style-type: none"> <li>MS24/AU2400-1 contained</li> <li>Omni-Directional</li> <li>Fully encapsulated and sealed</li> <li>Sensitivity adjustable</li> </ul>	<ul style="list-style-type: none"> <li>MS24/AU2400-1 contained</li> <li>Omni-Directional</li> <li>Logic and Master output</li> <li>Sensitivity adjustable</li> <li>Supply Voltage 9 - 24VDC</li> </ul>	<ul style="list-style-type: none"> <li>MS24/AU2400-1 contained</li> <li>Omni-Directional</li> <li>Fully encapsulated and sealed</li> </ul>																																													
Description	Tilt Switch								Tip-Over Switch							Acceleration Switch	Movement / Vibration Switch	Description	Movement / Vibration Switch	Tilt Module										Tip-Over Module		Movement / Vibration Module																																													
Type	AG1020-0	AU2100-0	AG3011-0	CW1300-0	CW1600-0	CW1620-3	CW1800-0	SI234	AG1260-0	CW1430-0	CW1718-0	CW1745-0	SI261	AS1303-0	ASLS 5.0	MS24/AU2400-1*	Type	MS24M/AU2401-1*	AG3011-70	AG3011-90	CN111-70	CN111-90	SI039CW/CW1300-90*	**CW60A/30	CW60S/15	SI016CW	TSW 30/60	CW1740-70	TTS 60/15	MS24A/30**	VHS-S4-P2A0-002	MS24P/10**																																													
Contact Form / Style	Change-over SPDT break before make	Dependent on mounting	Dependent on mounting	Dependent on mounting	Dependent on mounting	Change-over	Dependent on mounting	Change-over break before make	Normally Open	Normally Open	Normally Closed	Normally Closed	Dependent on mounting	Normally Open	Normally Open	Non position sensitive	Contact Form / Style	Non position sensitive	Dependent on mounting	Dependent on mounting	Dependent on mounting	Dependent on mounting	Dependent on mounting	Dependent on mounting	Dependent on mounting	Dependent on mounting	Dependent on mounting	Normally Closed	Normally Closed	Dependent on mounting	Open Drain	Dependent on mounting																																													
Switching Voltage Max.	24VDC	50VAC	24VDC	60VDC/AC	60VDC/AC	60VAC	60VDC/AC	60VAC	60VAC	60VAC	60VAC	60VAC	60VDC/AC	24VDC	24VDC	24VDC	Switching Voltage Max.	24VDC	24VDC	24VDC	60VDC	60VDC	60VAC	60VAC	60VDC/AC	120VAC	60VAC	60VAC	5VDC	30VDC	N/A																																														
Switching Current Max. A	I at 6 - 24VDC	0.15	I at 6 - 24VDC	0.25	0.10	0.10	0.10	0.2	0.25	0.1	0.25	0.25	0.25	0.25	0.25	0.25	Switching Current Max. A	0.20	I	I	I	I	0.25	0.25	0.1	1.0	0.25	0.25	0.04	2	N/A																																														
Switching Capacity Max. VA	25	2.0	25	3	3	0.3	3	3	3	3	3	3	3	3	3	5	Switching Capacity Max. VA	5	25	25	14	14	3	3	3	25	3	3	N/A	N/A	5																																														
Switching Angle (Tilt Switches) Max. °	15	15	15	15	15	-	15	35	60	60	18	45	60	3G - 9G	5G - 9.9G	0.2G	Switching Angle (Tilt Switches) Max. °	0.4G	20	10	10	10	15	15	15	15	16	100	5	0.4G	0.4G	0.4G																																													
Differential Angle (Tip-Over Switches) Max. °																	Differential Angle (Tip-Over Switches) Max. °																																																												
Activation level (Acceleration Switches) Max. G																	Activation level (Acceleration Switches) Max. G																																																												
Contact Resistance Max. Ohms	10	30	3	30	100	400	100	10	5	5	15	5	30	20 AT 2G Overdrive	10	5	Contact Resistance Max. Ohms	Less than 10	3	3	-	-	10	10	10	3	30	30	N/A	0.3	5																																														
Operating Temperature Max. °C	-37 +100	-37 +100	-37 +100	-37 +100	-37 +100	-37 +100	-37 +100	-37 +100	-37 +100	-37 +100	-37 +100	-37 +100	-37 +100	-37 +100	-37 +100	-35 +100	-37 +100	Operating Temperature Max. °C	-37 +100	-20 +70	-20 +70	-40 +100	-40 +100	-20 +70	-20 +70	-20 +85	-20 +70	-20 +85	-20 +70	-20 +70	-10 +70	-10 +70	-20 +70																																												
Storage Temperature Max. °C	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	-40 +125	Storage Temperature Max. °C	-40 +125	-25 +70	-25 +70	-40 +100	-40 +100	-20 +75	-25 +70	-20 +105	-25 +75	-20 +105	-25 +75	-25 +70	-10 +75	-10 +75	-20 +75																																													
Case Material	Steel Tin Plated	Nickel Gold Plated	Steel Tin Plated	Nickel Tin Plated	Nickel Tin Plated	Steel Tin Plated	Steel Tin Plated	Steel Gold Plated	Nickel Tin Plated	Steel Tin Plated	Steel Tin Plated	Steel Tin Plated	Nickel Gold Plated	Nickel Gold Plated	Nickel Gold Plated	Nickel Gold Plated	Case Material	Steel Gold Plated	ABS	ABS	ABS	ABS	ABS	Polypropylene	Polypropylene	ABS	Nylon 66	ABS	ABS	ABS	ABS	ABS																																													
Mounting Clip / Cable	-	-	-	IA	-	-	-	-	33	-	-	-	IA	IA	IA	3B	Mounting Clip / Cable	3B	2 x 18 AWG Neoprene insulated	2 x 18 AWG Neoprene insulated	2 x 26 AWG PVC insulated	2 x 26 AWG PVC insulated	2 x 0.14mm <sup>2</sup> PVC insulated	3 x 0.14mm <sup>2</sup> PVC insulated	2 x 0.22mm <sup>2</sup> PVC insulated	2 x 0.52mm <sup>2</sup> round Silicone (with eyelets)	2 x 0.14mm <sup>2</sup> PVC insulated	2 x 17 AWG Silicon Rubber Insulated	2 x 0.14mm <sup>2</sup> PVC insulated	3 x 0.14mm <sup>2</sup> PVC insulated	4 x 0.22mm <sup>2</sup> PVC insulated	2 x 0.22mm <sup>2</sup> PVC insulated																																													
<p>AWG to mm<sup>2</sup> Cross Reference table</p> <table border="1"> <tr><th>AWG</th><th>mm<sup>2</sup></th></tr> <tr><td>30</td><td>0.05</td></tr> <tr><td>28</td><td>0.08</td></tr> <tr><td>26</td><td>0.14</td></tr> <tr><td>24</td><td>0.25</td></tr> <tr><td>22</td><td>0.34</td></tr> <tr><td>21</td><td>0.38</td></tr> <tr><td>18</td><td>0.75</td></tr> <tr><td>17</td><td>1.0</td></tr> <tr><td>16</td><td>1.5</td></tr> <tr><td>14</td><td>2.5</td></tr> <tr><td>12</td><td>4</td></tr> <tr><td>10</td><td>6</td></tr> <tr><td>8</td><td>10</td></tr> <tr><td>6</td><td>16</td></tr> <tr><td>4</td><td>25</td></tr> <tr><td>2</td><td>35</td></tr> <tr><td>1</td><td>50</td></tr> <tr><td>2/0</td><td>70</td></tr> <tr><td>3/0</td><td>95</td></tr> <tr><td>4/0</td><td>120</td></tr> <tr><td>350MCM</td><td>150</td></tr> <tr><td>350MCM</td><td>185</td></tr> </table>	AWG	mm <sup>2</sup>	30	0.05	28	0.08	26	0.14	24	0.25	22	0.34	21	0.38	18	0.75	17	1.0	16	1.5	14	2.5	12	4	10	6	8	10	6	16	4	25	2	35	1	50	2/0	70	3/0	95	4/0	120	350MCM	150	350MCM	185																															
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