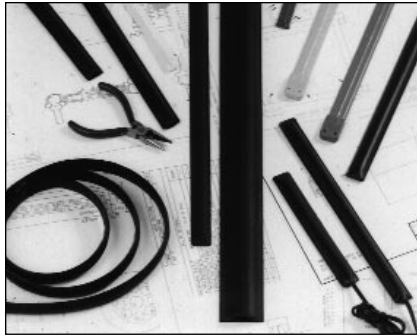


# Controflex® Ribbon Switches



## FEATURES & BENEFITS

- Press-at-any point for ease of actuation.
- Simple design for outstanding reliability.
- CE approved switches.
- Fast, easy installation.
- Long life — millions of actuations at any point.



Controflex Ribbon Switches are the essence of simplicity and reliability. In thousands of applications ranging from general purpose usage to severe environments to critical safety equipment, these products deliver the highest levels of performance.

Our standard models offer a broad range of pressure sensitivities and a wide variety of sheathing materials, switch lengths, end terminating seals, exterior colors and lead wire combinations, as well as substantial resistance to moisture and chemicals. In addition, several models offer enhanced moisture and chemical resistance.

**Easy Installation:** Order Controflex switches pre-cut to fit your specific application. Self-adhesive backing or foam tapes hold and position the switch. For permanent mounting in commercial, vehicle or industrial use, we provide aluminum or PVC extruded channels. Controflex switches are also available in do-it-yourself kits for field fabrication and installation.

**Long Life:** All Controflex switches must meet stringent quality control standards. Each switch is tested for mechanical and electrical reliability. As a result, the design life is three million actuations at any point.

**Fail-Safe Circuitry Option:** For maximum safety, specify our Fail-Safe supervised control circuit. It provides positive indication of normal operation, switch failure, broken connections or loss of power. We recommend it for all industrial safety circuits

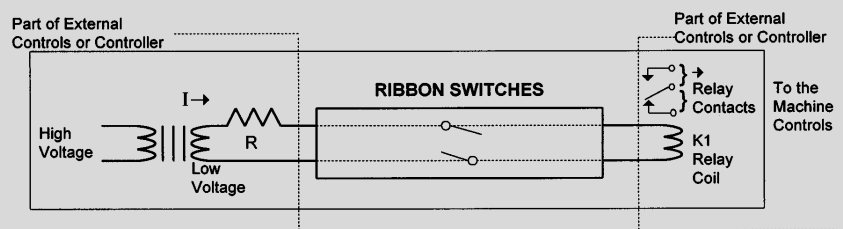
## Simple design delivers uncompromised reliability



Controflex switches are normally open momentary contacts for sensing, control and other low-power applications. They are self-bottoming, so they do not require the linkages, mountings and interfaces other sensing switches need.

Fundamentals of Controflex switch construction (see diagram) consist of a bottom conductor separated by an insulating strip from an upper conductor, all in an insulating housing. Simple pressure completes the electrical contact.

## FAIL-SAFE Supervised Circuit Concept

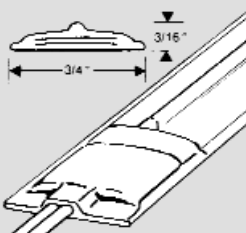
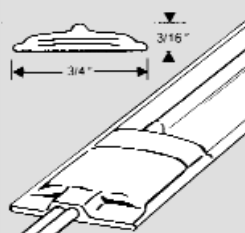
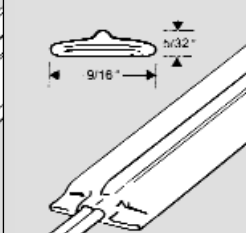
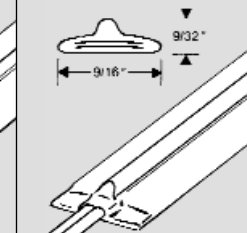
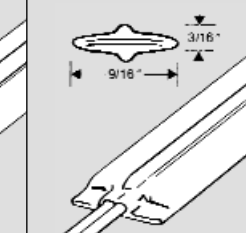


or critical alarm circuits. See Interface Controllers Section for a detailed explanation of the concept. The functional safety of the Tapeswitch fulfills Class 2.2 (category 3 prEN954-1) when used with a suitable, control reliable controller, (such as the PSSU Series).

**Optional Dri-Run Moisture Resistant Cables:** Our custom extruded vinyl cable is designed without fibrous cloth fillers which tend to wick moisture along the cable. The "all-solid" design is rugged and provides longer switch life in most environments. For wet areas, custom "Moisture Trap" Fittings are available.

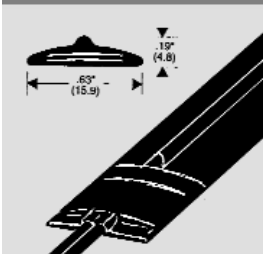
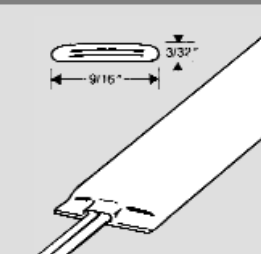
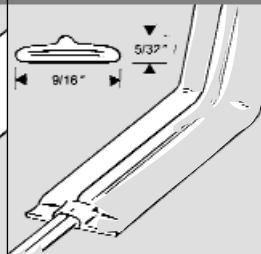
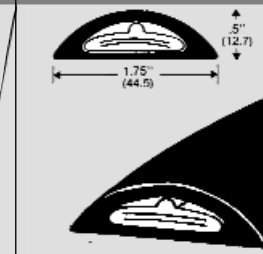
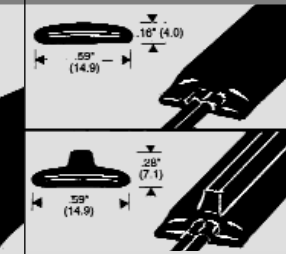
# Controflex® Ribbon Switches

## Product Selection Guide

ControFlex Ribbon Switch	ControFlex Ribbon Switch	ControFlex Ribbon Switch	High Bead ControFlex Ribbon Switch	ControFlex Stainless Steel Ribbon Switch
131-A (Sleeve end) 131-AMT (Block End)	101-B (Sleeve end) 101-BMT (Block End)	121-BP (Welded end only)	141-BPH (Welded end only)	191-S (Welded end only)
<b>Description</b> General purpose switch for foot, hand or mechanical activation. Bends without shorting. Sensitivity decreases at bend.	<b>Description</b> Medium sensitivity general purpose switch. May be bent sharply without shorting and sensitivity at bend is not decreased.	<b>Description</b> Most sensitive switch. Small cross section. Use exposed or under cover.	<b>Description</b> Similar to 121-BP, but with high actuating bead. Suitable for basic leading edge safety switches, covered or uncovered.	<b>Description</b> Stainless steel conductor is ideal for some severe environments, including underwater. Cannot be bent sharply.
<b>Mounting</b> By holes in block ends. Channel #106 or DA-12 double adhesive tape.	<b>Mounting</b> By holes in block ends. Channel #106 or DA-12 double adhesive tape.	<b>Mounting</b> Channel #104 or DA-32 double adhesive tape.	<b>Mounting</b> Channel #104 or DA-32 double adhesive tape.	<b>Mounting</b> DA-32 double adhesive tape.
<b>Activation Force</b> (nominal) 40 oz. (11N) Q See pg. 6	<b>Activation Force</b> (nominal) 12 oz. (3N) Q See pg. 6	<b>Activation Force</b> (nominal) 8 oz. (2N) Q See pg. 6	<b>Activation Force</b> (nominal) 8 oz. (2N) Q See pg. 6	<b>Activation Force</b> (nominal) 12 oz. (3N)Q See pg. 6
<b>Exterior Shell Color</b> PVC-Light Grey	<b>Exterior Shell Color</b> PVC-Yellow or Black	<b>Exterior Shell Color</b> PVC-Light Green or Black	<b>Exterior Shell Color</b> PVC-White, Red or Black	<b>Exterior Shell Color</b> PVC-Beige
<b>Lead wire size/length</b> AWG #18, 18in. (460mm)	<b>Lead wire size/length</b> AWG #18, 18in. (460mm)	<b>Lead wire size/length</b> AWG #22, 18 in. (460mm)	<b>Lead wire size/length</b> AWG #22, 18 in. (460mm)	<b>Lead wire size/length</b> AWG #22, 18 in. (460mm)
<b>Weight</b> .8 oz./ft. (74.4 g/m)	<b>Weight</b> .8 oz./ft. (74.4 g/m)	<b>Weight</b> .7 oz./ft. (65.1 g/m)	<b>Weight</b> .8 oz./ft. (74.4 g/m)	<b>Weight</b> .5 oz./ft. (46.5 g/m)
<b>Bending Radius</b> 1 in. (25mm)	<b>Bending Radius</b> <2 in. (50mm)	<b>Bending Radius</b> 1/2 in. (12mm)	<b>Bending Radius</b> 1/2 in. (12mm)	<b>Bending Radius</b> 2 in. (50mm)
<b>Dielectric Resistance</b> 1000 VAC for 2 minutes	<b>Dielectric Resistance</b> 1000 VAC for 2 minutes	<b>Dielectric Resistance</b> 1000 VAC for 2 minutes	<b>Dielectric Resistance</b> 1000 VAC for 2 minutes	<b>Dielectric Resistance</b> 1000 VAC for 2 minutes
<b>Voltage &amp; Current</b> (Recommended) 28 VAC or VDC at 1.0 A	<b>Voltage &amp; Current</b> (Recommended) 28 VAC or VDC at 1.0 A	<b>Voltage &amp; Current</b> (Recommended) 28 VAC or VDC at 1.0 A	<b>Voltage &amp; Current</b> (Recommended) 28 VAC or VDC at 1.0 A	<b>Voltage &amp; Current</b> (Recommended) 28 VAC or VDC at 1.0 A
<b>Maximum Contact Rating</b> (Not recommended) 140 VAC @ 1A	<b>Maximum Contact Rating</b> (Not recommended) 140 VAC @ 1A	<b>Maximum Contact Rating</b> (Not recommended) 140 VAC @ 1A	<b>Maximum Contact Rating</b> (Not recommended) 140 VAC @ 1A	<b>Maximum Contact Rating</b> (Not recommended) 140 VAC @ 1A
<b>Operating Temp Range</b> 0 °F to 120 °F (-18 °C to 50 °C)	<b>Operating Temp Range</b> 0 °F to 120 °F (-18 °C to 50 °C)	<b>Operating Temp Range</b> 0 °F to 120 °F (-18 °C to 50 °C)	<b>Operating Temp Range</b> 0 °F to 120 °F (-18 °C to 50 °C)	<b>Operating Temp Range</b> 0 °F to 120 °F (-18 °C to 50 °C)
<b>Options</b> Non-standard switch lengths. Non-standard lead lengths. Air Leak test. FAIL-SAFE leads. Adhesive backing. Interconnect joint.	<b>Options</b> Non-standard switch lengths. Non-standard lead lengths. Air Leak test. FAIL-SAFE leads. Adhesive backing. Interconnect joint.	<b>Options</b> Non-standard switch lengths. Non-standard lead lengths. Air Leak test. FAIL-SAFE leads. Adhesive backing. Interconnect joint.	<b>Options</b> Non-standard switch lengths. Non-standard lead lengths. Air Leak test. FAIL-SAFE leads. Adhesive backing. Interconnect joint.	<b>Options</b> Non-standard switch lengths. Non-standard lead lengths. Air Leak test. FAIL-SAFE leads. Adhesive backing. Interconnect joint.
				
131-A (Sleeve end) 131-AMT (Block End)	101-B (Sleeve end) 101-BMT (Block End)	121-BP (Welded end only)	141-BPH (Welded end only)	191-S (Welded end only)

# Controflex® Ribbon Switches

## Product Selection Guide

<b>ControFlex Insert Switch</b>	<b>ControFlex Window Sill Alarm Switch</b>	<b>ControFlex Flex Action Ribbon Switch</b>	<b>ControFlex Serpentine Ribbon Switch</b>	<b>ControFlex Sarlink Ribbon Switch</b>
171-IS (Sleeve End only)	151-BBW (Welded end only)	180 (Welded end only)	161-FS (Welded end only)	107-SLS (No bead) 107-SRS (Bead)
<b>Description</b> Super moisture resistant switch with special DRI-RUN lead and in-line moisture trap. Replacement switch for RBMA Road Switch	<b>Description</b> Low profile, very sensitive switch. Lead wire both ends for easy series connection of multiple windows or FAIL-SAFE connection. Protects open or closed windows. May be covered for concealment.	<b>Description</b> Patented snap action design operated when flexed at any point.	<b>Description</b> Rugged rubber sheath encases special ribbon switch. May be curved while flat on floor in 30in. (762mm) radii. Replacement inserts available.	<b>Description</b> Improved chemical and moisture resistance through use of a special jacket. Improved Temperature range. All ends RF welded
<b>Mounting</b> Insert in RBMA, or fasten to dry roadbed with 6 in. (152mm) wide duct tape.	<b>Mounting</b> DA-32 Double adhesive tape.	<b>Mounting</b> DA-32 Double adhesive tape.	<b>Mounting</b> Floor tile mastic.	<b>Mounting</b> Channel #104 or DA-32 double adhesive tape.
<b>Activation Force</b> (nominal) 160 oz. (44N) Q See pg. 6	<b>Activation Force</b> (nominal) 8 oz. (2N) Q See pg. 6	<b>Activation Force</b> (nominal) 8 oz. (2N) Q See pg. 6	<b>Activation Force</b> (nominal) 80 oz. (22N) Q See pg. 6	<b>Activation Force</b> (nominal) 8 oz. (2N) Q See pg. 6
<b>Exterior Shell Color</b> PVC - Black	<b>Exterior Shell Color</b> PVC - White	<b>Exterior Shell Color</b> PVC - Red	<b>Exterior Shell Color</b> EPDM - Black	<b>Exterior Shell Color</b> Astarex C - Black
<b>Lead wire size/length</b> AWG #18 stranded to #20 solid, 10 ft. (3.05m)	<b>Lead wire size/length</b> AWG #22, each end, 12 in. (305mm)	<b>Lead wire size/length</b> AWG #22, 18in. (460mm)	<b>Lead wire size/length</b> AWG #18, 6 ft.(1.8m)	<b>Lead wire size/length</b> AWG #22, 18 in. (460mm)
<b>Weight</b> .8 oz./ft. (74.4 g/m)	<b>Weight</b> .7 oz./ft. (65.1 g/m)	<b>Weight</b> .7 oz./ft. (65.1 g/m)	<b>Weight</b> 5 oz./ft. (465 g/m)	<b>Weight</b> 107-SLS: .9 oz./ft. (83.7 g/m) 107-SRS: .1oz./ft. (93.0 g/m)
<b>Bending Radius</b> 2 in. (50mm)	<b>Bending Radius</b> 1/8 in. (3mm)	<b>Bending Radius</b> 10° – 15° bend actuates	<b>Bending Radius</b> Do not bend	<b>Bending Radius</b> 2 in. (50mm)
<b>Dielectric Resistance</b> 1000 VAC for 2 minutes	<b>Dielectric Resistance</b> 1000 VAC for 2 minutes	<b>Dielectric Resistance</b> 1000 VAC for 2 minutes	<b>Dielectric Resistance</b> 1000 VAC for 2 minutes	<b>Dielectric Resistance</b> 1000 VAC for 2 minutes
<b>Voltage &amp; Current</b> (Recommended) 28 VAC or VDC at 1.0 A	<b>Voltage &amp; Current</b> (Recommended) 28 VAC or VDC at 1.0 A	<b>Voltage &amp; Current</b> (Recommended) 28 VAC or VDC at 1.0 A	<b>Voltage &amp; Current</b> (Recommended) 28 VAC or VDC at 1.0 A	<b>Voltage &amp; Current</b> (Recommended) 28 VAC or VDC at 1.0 A
<b>Maximum Contact Rating</b> (Not recommended) 140 VAC @ 1A	<b>Maximum Contact Rating</b> (Not recommended) 140 VAC @ 1A	<b>Maximum Contact Rating</b> (Not recommended) 140 VAC @ 1A	<b>Maximum Contact Rating</b> (Not recommended) 140 VAC @ 1A	<b>Maximum Contact Rating</b> (Not recommended) 140 VAC @ 1A
<b>Operating Temp Range</b> 0 °F to 120 °F (-18 °C to 50 °C)	<b>Operating Temp Range</b> 0 °F to 120 °F (-18 °C to 50 °C)	<b>Operating Temp Range</b> 0 °F to 120 °F (-18 °C to 50 °C)	<b>Operating Temp Range</b> 0 °F to 120 °F (-18 °C to 50 °C)	<b>Operating Temp Range</b> 0 °F to 120 °F (-18 °C to 50 °C)
<b>Options</b> Non-standard switch lengths. Non-standard lead lengths. Air Leak test. FAIL-SAFE leads. 170-IS Temporary Road Switch. Same as 171-IS, but without moisture trap.	<b>Options</b> Non-standard switch lengths. Non-standard lead lengths. Air Leak test.	<b>Options</b> Non-standard switch lengths. Non-standard lead lengths. Air Leak test. FAIL-SAFE leads. Moisture trap.180-S (orange color). Similar to 180, but more stiff.	<b>Options</b> Non-standard switch lengths. Non-standard lead lengths. Air Leak test. FAIL-SAFE leads. Adhesive backing.	<b>Options</b> Non-standard switch lengths. Non-standard lead lengths. Air Leak test. FAIL-SAFE leads. Adhesive backing.
				
171-IS (Sleeve End only)	151-BBW (Welded end only)	180 (Welded end only)	161-FS (Welded end only)	107-SLS (No bead) 107-SRS (Bead)

# Controflex® Ribbon Switches

## Do-It-Yourself Switch Kit

### FEATURES & BENEFITS

- Immediate Delivery.
- Easy assembly.
- Excellent for prototyping.
- Customize to any length.
- Ideal for In-house or field assembly.

**Each Do-It-Yourself kit contains:** 50 feet of switch material, 6 molded terminal sets, including 18" of lead wire, a 4 ounce container of 105A vinyl adhesive and easy to follow instructions.

Refer to the chart below for the kit of your choice. Kits can be customized to your specific requirements.

Kit Number	102-AK	102-BK	102-BPK	102-BPHK
Color	grey	yellow or black	light green	white or red
Spec.	same as 131-A	same as 101-B	same as 121-BP	same as 141-BPH

## Accessories

### Bulk Switch Material, 50 ft. (15.2m) rolls

Can be cut to any length with conventional shears. Use terminals #103. Seal with Tapeswitch Sealant #105A. Longer lengths available on special order. Fasten to clean dry surface with DA-12/32 tape or for permanent mounting, use channel #106 or Channel #104. Factory installed adhesive backing available.

**102-A** Same material & specifications as 131-A. Use terminal set #103-A. Channel #106. Adhesive tape DA-12.

**102-B** Same material & specifications as 101-B. Use terminal set #103-B. Channel #106. Adhesive tape DA-12.

**102-BP** Same material & specifications as 121-BP. Use terminal set #103-BP. Channel #104. Adhesive tape DA-32.

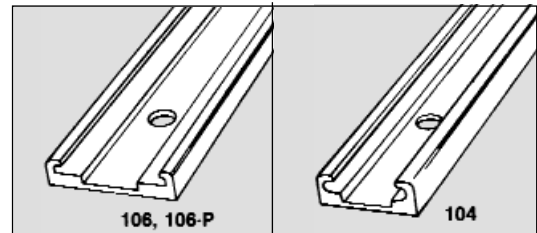
**102-BPH** Same material & specifications as 141-BPH. Use terminal set #103-BPH. Channel #104. Adhesive tape DA-32.

### Contamold Mounting Channels

**106, 106P Contamold Mounting Channel:** 106 is aluminum extrusion, Designed for Controflex styles 131A, 131AMT, 101-B, 101BMT, 102A and 102-B. Switches may be snapped or pressed into channel or slid in from end. Pre-punched 5/32 in. holes, 7 in. on centers, for channels up to 6 ft (1.8m). Standard lengths are 3 ft. (.9m) and 6 ft. (1.8m). 12 ft. (3.6m) lengths available in quantity. Weight: 10 oz. (1.28 kg) for 6 ft. (1.8m)

**106-P** is plastic extrusion. Conforms more easily to curved surfaces. Standard length is 12 ft (3.6m). Weight: 7 oz (.20 kg).

**104 Contamold Mounting Channel for BP:** Aluminum. Designed for Controflex style 141 BPH (also fits style 121-BP). Switch slides in from an end. Pre-punched 5/32 in. holes, 7 in. on centers, for channels up to 6 ft (1.8m). Standard lengths are 3 ft. (.9m) and 6 ft. (1.8m). 12 ft. (3.6m) lengths available in quantity. Weight: 10 oz. (1.28 kg) for 6 ft. (1.8m).



**\*NOTE:** All operating force ratings are nominal, based on force applied with a 4.5mm rod. Total operating force increases with contact area. Ribbon Switch styles sense force up to 30 degrees of dead center. Operating force requirements increase at very low temperatures, except SLS/SRS styles.

# Controflex® Ribbon Switches

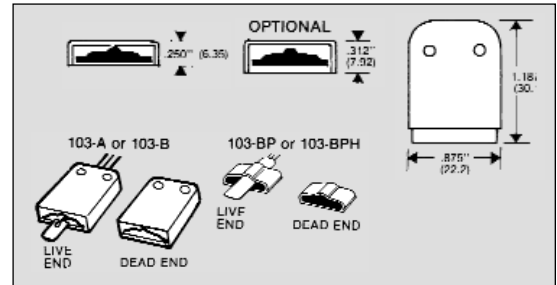
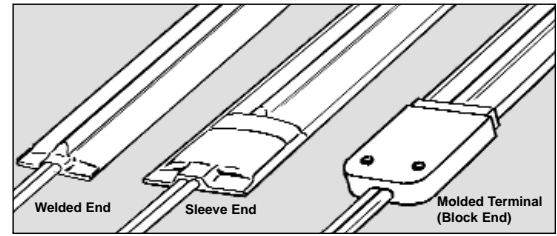
## Accessories (continued)

### End Styles

Ribbon Switches come in a variety of end styles for maximum flexibility.

**Block end:** Molded terminals look neat and allow quick connecting closure with lead wire. Each set includes one dead end, one live end with an 18 in. (460mm) lead wire attached and a tongue connector. No soldering needed. Simply slip tongue connector into the ribbon switch and seal with #105A adhesive.

- 103-A Grey Set
- 103-B Yellow or Black Set
- 103-BP Light Green Set
- 103-BPH White or Red Set



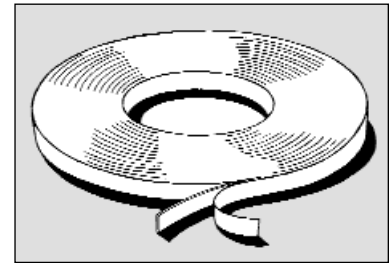
### Adhesives

**105-A (Liquid Vinyl Adhesive):** Quickly bonds terminals and switch. Solvent weld bond achieved. Available in 4 oz. (11 kg) container. Enough to bond 80 terminals.

**Double Adhesive Mounting Strip:** Thick adhesive mount in 50 ft. (15m) rolls. Will not leach plasticizers. Recommended for indoor use. For permanent installation use 104 or 106 channel.

**DA 12** 3/4" (15.2mm) wide, 50 ft. (15m) long. Use with A & B style switches.

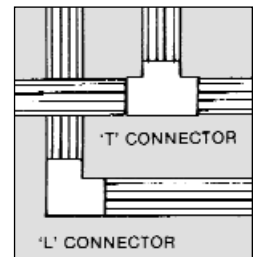
**DA 32** 9/16" (14.3mm) wide, 50 ft. (15m) long. Use with all other styles.



### Connectors

These "T" and "L" fittings connect switch styles A or B switch using self-contained laminar tongue connectors. Seal with Tapeswitch #105A adhesive. Allows do-it-yourself construction of most rectangular patterns.

- 103-TA Grey ("T")
- 103-TB Yellow or Black ("T")
- 103-LA Grey ("L")
- 103-LB Yellow or Black ("L")



### Dri-Run Cable

Custom extruded vinyl cable is designed without fibrous cloth fillers which tend to wick moisture along the cable. The "all-solid" design is rugged and gives longer switch life in most environments.

#18 AWG, 2-conductor cable available in black or grey. Also available are individual lengths custom terminated with a moisture excluding water trap.

