

MICRO SWITCH Cable-Pull Safety Switches

CPS Series

004785

Issue 6

Datasheet



DESCRIPTION

Honeywell's MICRO SWITCH CPS Series Cable-Pull Safety Switches provide a readily accessible emergency stop signal, a cost-effective means compared to using multiple emergency stop push-buttons. The CPS Series Cable Pull Safety Switch's internal mechanism latches on both slackened cable (push) and pulled cable.

The 1CPS is intended for use in applications where the cable span is 76 m [250 ft] or shorter. It is an economical solution for shorter runs or zone protection typical to automated systems. The 2CPS Series is intended for use in very long cable runs of 152 m [500 ft] or shorter, such as long conveyor lines found in warehouses.

A line in the midpoint of the cable tension window indicates proper cable tension, providing easy set-up. The direct opening switch contacts are held closed when the actuating cable is under proper tension and the reset knob is set to the RUN position. When the actuating cable is pulled, slackened, or broken, a cam positively opens the NC (Normally Closed) switch contacts. The snap-action operation causes the switch contacts to change state and mechanically latch almost simultaneously when the cable is pulled, slackened, or broken. The NC switch contacts remain open until the CPS is reset by properly tensioning the cable and manually rotating the reset knob.

When the direct opening switch contacts open, the auxiliary contacts also actuate (open contacts close). The auxiliary contacts are electrically isolated from the direct-opening switch contacts. These NO (Normally Open) contacts may be used for monitoring or signaling.

DIFFERENTIATION

- Internal mechanism latches on both slackened cable (push) and pulled cable

FEATURES

- Direct opening action of NC (Normally Closed) contacts
- 2CPS: 2NO/2NC, 1NO/3NC, or 4NC contact configurations
- 1CPS: 1NO/1NC, 2NO/2NC, 1NO/3NC, or 4NC contact configurations
- Typical cable span of 76 m [250 ft] in an environment with a temperature change of $\pm 17^\circ\text{C}$ [$\pm 30^\circ\text{F}$]. Longer spans are possible depending upon temperature change and installation
- Choice of three actuator configurations (2CPS)
- Removable contact block version available (2CPS)
- J-hook turnbuckle included (2CPS)
- E-stop option (1CPS)
- Low profile reset and new indicator options (2CPS)
- Large wiring cavity with straight-through wiring
- Models available without broken cable, slack-cable detection
- 24 Vdc or 120 Vac bright, multi-cluster high-intensity LED status indicator light available on 2CPS. Single LED on 1CPS. Low profile LED (2CPS) and emergency stop button (1CPS) options also offered
- Gold-plated contacts are standard on 2CPS, available on 1CPS
- Electrostatic, epoxy-coated, die-cast zinc housing
- Optional hardware packets available

POTENTIAL INDUSTRIAL APPLICATIONS

- Long conveyor systems found in warehouses and distribution centers
- Conveyor systems with a high amount of vibration
- Conveyor systems that experience wide temperature swings
- Long conveyor systems where easy-through wiring, or highly visible trip status, is required
- Perimeter guarding in hose-down conditions
- Packaging equipment
- Assembly lines

VALUE TO CUSTOMERS

- Cost-effective means of providing an emergency stop signal compared to multiple emergency stop push buttons
- Capability enhances productivity by minimizing nuisance stops due to variations in temperature, stretch of cable over time, or other application variables
- Direct opening of normally closed contacts when cable is actuated

PORTFOLIO

The CPS Series is the largest switch in Honeywell's MICRO SWITCH line of safety switches. For more details on the extensive line of Honeywell safety switches, [click here](#).

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Table 1. Specifications

Characteristic	Parameter
Description	cable-pull safety switches
Switching options	1NO/1NC direct acting 2NO/2NC direct acting 1NO/3NC direct acting 4NC direct acting
Sealing	IP67, NEMA 1, 4, 12, 13
Contacts	silver, gold plated over silver
Conduit/Connectors	1/2 NPT, PG 13.5, 20 mm, PF 1/2; Brad Harrison 10-pin conductor
Force to maintain actuation shaft	1CPS & 2CPS: 25 lb*
Actuation shaft operating force	1CPS & 2CPS: 40 lb*
Operating temperature	-40 °C to 80 °C [-40 °F to 176 °F]
Storage temperature	1CPS: -40 °C to 85 °C [-40 °F to 185 °F]
Mechanical endurance	1 million operations
Rated thermal current (I_{th})	10 A
Rated impulse withstand (U_{imp})	2500 V
Rated insulation voltage (U_i)	300 V
Useable gold-plated current	1 mA to 50 mA, 60 Vdc max./125 Vdc max.
Pollution degree	3
Conditional short circuit current	1000 A
Short circuit protective device (type/maximum rating)	Class J fuse (10 A/600 V)
Shock	15 g per IEC 68-2-27
Vibration	10 Hz to 500 Hz, 5 g per IEC 68-2-6
Approvals	UL, CSA, CE, SIL
Standards	<ul style="list-style-type: none"> • UL Listed per File E37138 against UL508 • CSA Certified per File 57323 against CSA C22.2 No. 14 • CE mark: The CPS complies with Low Voltage Directive 2006/95/EC; Machinery Directive 2006/42/EC only as the directives relate to the components being used in a safety function; EN 60947-1; EN 60947-5-1; EN 60947-5-5 • SIL: MCTF (Mechanical Life): >1,000,000 cycles with single-sided confidence limit of 100 %. MCTF (Electrical Life): >25,000 cycles with single-sided confidence limit of 87.5 %. Highest SIL Capability: SIL3 (HFT:1), IEC 61508-2: 2010. Proof Test Interval: 1 Year

* Incline measures, and not typical for manual trip

Table 2. Electrical Ratings

ac		dc	
A300 Ue	AC15 Ie	Q300 Ue	DC13 Ie
Volts	Amps	Volts	Amps
–	–	24	2.8
120	6	125	0.55
240	3	250	0.27

I_{th} = 10 A

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Figure 1. 1CPS Product Nomenclature and Order Guide

1CPS	A	1	A	Emergency Stop	-	Modification Code
Switch Type	Conduit	Basic Switch Code		Indicator-Pilot Light Code		
1CPS Series Single-Head Cable-Pull Safety Switch	A 1/2 NPT	1 1NO/1NC direct acting Switch 1: 1NO/1NC Switch 2: None	5 1NO/1NC direct acting, gold contacts Switch 1: 1NO/1NC Switch 2: None	(None) No indicator light	(None) No emergency stop	F01 10-pin Brad Harrison connector on bottom, actuator to right
	B PG 13.5	2 2NO/2NC direct acting Switch 1: 1NO/1NC Switch 2: 1NO/1NC	6 2NO/2NC direct acting, gold contacts Switch 1: 1NO/1NC Switch 2: 1NO/1NC	A 24 Vdc LED	1 with emergency stop	F02 10-pin Brad Harrison connector on bottom, actuator to left
	C 20 mm	3 1NO/3NC direct acting Switch 1: 1NO/1NC Switch 2: 2NC	7 1NO/3NC direct acting, gold contacts Switch 1: 1NO/1NC Switch 2: 2NC	B 120 Vac LED		F03 10-pin Brad Harrison connector on bottom, actuator to top
	D PF 1/2	4 4NC direct acting Switch 1: 2NC Switch 2: 2NC	8 4NC direct acting, gold contacts Switch 1: 2NC Switch 2: 2NC			

NOTE: Not all combinations of model code are available. Please contact your Honeywell provider/representative for assistance.

Figure 2. 2CPS Product Nomenclature and Order Guide

2CPS	A	1	A	1	A	A
Switch Type	Conduit	Contact Mounting Code	Basic Switch Code	Actuation Code	Indicator-Pilot Light Code	Accessory Switch Code
2CPS Series Dual-Head Cable-Pull Safety Switch	A 1/2 NPT	1 Standard: contact block mounted to housing	A 2NO/2NC, direct acting Switch 1: 1NO/1NC Switch 2: 1NO/1NC	1 Maintained, both sides	(None) No indicator	(None) No acc. switch
	B PG 13.5	2 Removeable: contact blocks with receptacles	B 1NO/3NC, direct acting Switch 1: 1NO/1NC Switch 2: 2NC	2 Maintained, left side No actuation, right side	A 24 Vdc LED cluster	1 1NO, momentary
	C 20 mm		D 4NC, direct acting Switch 1: 2NC Switch 2: 2NC	3 Maintained, right side No actuation, left side	B 120 Vac LED cluster	2 1NC, momentary
	D PF 1/2			4 Maintained, both sides w/o broken cable detection	C 24 Vdc LED cluster, low profile	3 1NO, maintained
				5 Maintained, left side No actuation, right side w/o broken cable detection	D 120 Vac LED cluster, low profile	4 1NC, maintained
				6¹ Maintained, right side No actuation, left side w/o broken cable detection		

NOTE: Not all combinations of model code are available. Please contact your Honeywell provider/representative for assistance.

¹ Not valid on 4NC switches

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TEMPERATURE-SPAN DISTANCE APPLICATION INFORMATION

Cable-pull switches featuring broken cable detection require pre-tensioning in order to enable the RUN condition.

The relative expansion or contraction of the steel actuating cable when the ambient temperature increases or decreases must be taken into account when pre-tensioning a cable pull switch.

The change in cable length with change in temperature can cause significant nuisance shut downs on longer runs.

Install the system when the temperature is at the mid point of the extremes. If a warehouse has a low temperature of 15.6 °C [60 °F] and a high of 32.2 °C [90 °F], set up the system at the midpoint 23.9 °C [75 °F].

Use an endspring or another CPS at the opposite end of the cable span to double the temperature tolerance and to meet the requirements of EN 418.

Figure 3. Total Temperature Variation vs. Cable Span Distance



- A = Total temperature variation
- B = Setup point - Ideally at middle of temperature extremes
- C = Cable Pull Switch usable temperature span without endspring or second CPS
- D = Cable Pull Switch usable temperature span with endspring or second CPS
- E = Cable span distance

Table 3. Circuitry Charts

Circuitry	Chart
1NO/1NC	
2NO/2NC	
1NO/3NC	
4NC	

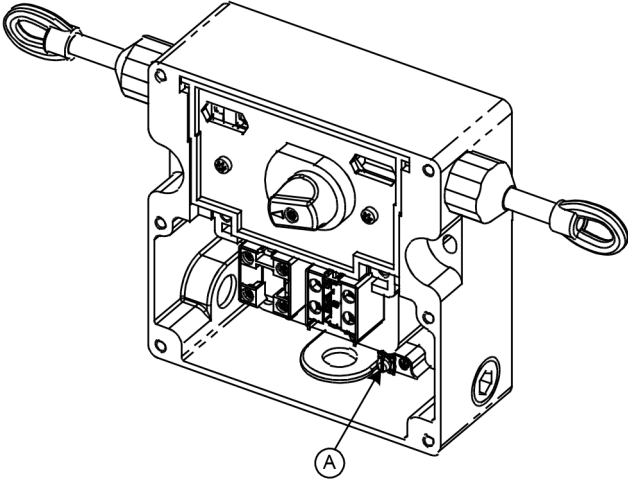
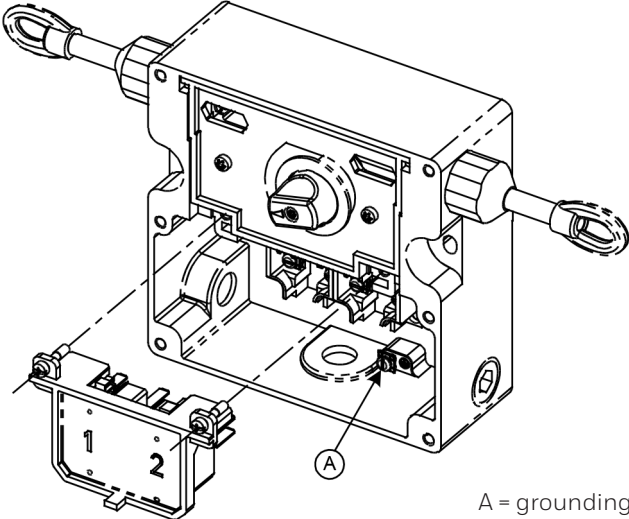
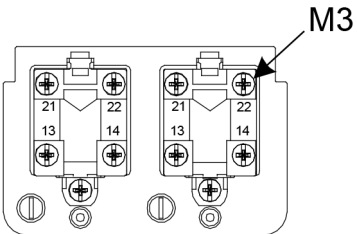
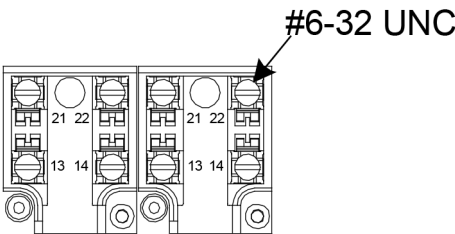
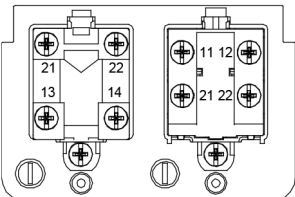
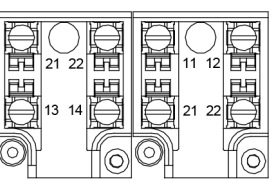
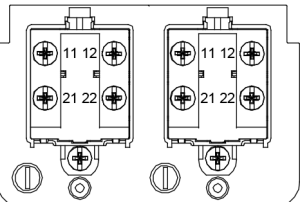
Table 4. 1CPS Contact Blocks

1NO/1NC		1NO/3NC	
2NO/2NC		4NC	

① = grounding screw

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Table 5. 2CPS Contact Blocks

Contact Block Mounted to Housing	Removable Contact Blocks with Heavy-Duty Wiring Receptacles
 <p>A = grounding screw</p>	 <p>A = grounding screw</p>
<p>2NO/2NC</p>  <p>M3</p>	<p>2NO/2NC</p>  <p>#6-32 UNC</p>
<p>1NO/3NC</p> 	<p>1NO/3NC</p> 
<p>4NC</p> 	

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Table 6. 1CPS With Broken Cable Detection Order Guide

Catalog Listing	Conduit	Switching	Bar Chart		Contact Material	Pilot Light 24 Vdc LED	Pilot Light 120 Vac LED	Notes		
			■ Contact Closed	Contact Open						
1CPSA1	1/2 in NPT	1NO/1NC			silver alloy			-		
1CPSA1A	1/2 in NPT	1NO/1NC			silver alloy	✓		-		
1CPSA1B	1/2 in NPT	1NO/1NC			silver alloy		✓	-		
1CPSA5	1/2 in NPT	1NO/1NC			gold-plated			-		
1CPSC1	20 mm	1NO/1NC			silver alloy			-		
1CPSC1A	20 mm	1NO/1NC			silver alloy	✓		-		
1CPSC5	20 mm	1NO/1NC			gold-plated			-		
1CPSA2	1/2 in NPT	2NO/2NC					silver alloy			-
1CPSA2A	1/2 in NPT	2NO/2NC					silver alloy	✓		-
1CPSA2B	1/2 in NPT	2NO/2NC					silver alloy		✓	-
1CPSA6	1/2 in NPT	2NO/2NC					gold-plated			-
1CPSA6A	1/2 in NPT	2NO/2NC					gold-plated	✓		-
1CPSA6B	1/2 in NPT	2NO/2NC					gold-plated		✓	-
1CPSC2	20 mm	2NO/2NC					silver alloy			-
1CPSC2A	20 mm	2NO/2NC	silver alloy	✓				-		
1CPSC2B	20 mm	2NO/2NC	silver alloy				✓	-		
1CPSC6	20 mm	2NO/2NC	gold-plated					-		
1CPSC6A	20 mm	2NO/2NC	gold-plated	✓				-		
1CPSA3	1/2 in NPT	1NO/3NC					silver alloy			-
1CPSA3A	1/2 in NPT	1NO/3NC					silver alloy	✓		-
1CPSA3A-F01	1/2 in NPT	1NO/3NC					silver alloy	✓		10-pin Brad Harrison connector; actuator to right
1CPSA3A-F02	1/2 in NPT	1NO/3NC			silver alloy	✓		10-pin Brad Harrison connector; actuator to left		
1CPSA3B	1/2 in NPT	1NO/3NC			silver alloy		✓	-		
1CPSA7	1/2 in NPT	1NO/3NC			gold-plated			-		
1CPSC3	20 mm	1NO/3NC			silver alloy			-		
1CPSC3A	20 mm	1NO/3NC			silver alloy	✓		-		
1CPSC7	20 mm	1NO/3NC			gold-plated			-		
1CPSA4	1/2 in NPT	4NC					silver alloy			-
1CPSA4B	1/2 in NPT	4NC					silver alloy		✓	-
1CPSA8	1/2 in NPT	4NC					gold-plated			-
1CPSC4	20 mm	4NC					silver alloy			-
1CPSC8	20 mm	4NC					gold-plated			-

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Table 7. 1CPS Without Broken Cable Detection Order Guide

Catalog Listing	Conduit	Switching	Bar Chart ■ Contact Closed □ Contact Open	Contact Material	Pilot Light 24 Vdc LED	Pilot Light 120 Vac LED	Notes
1CPSA1-N	1/2 in NPT	1NO/1NC		silver alloy			-
1CPSA1A-N	1/2 in NPT	1NO/1NC		silver alloy	✓		-
1CPSA1B-N	1/2 in NPT	1NO/1NC		silver alloy		✓	-
1CPSA2-N	1/2 in NPT	2NO/2NC		silver alloy			-
1CPSA2B-N	1/2 in NPT	2NO/2NC		silver alloy		✓	-
1CPSA4B-N	1/2 in NPT	4NC		silver alloy		✓	-

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Table 8. 2CPS With Broken Cable Detection and Silver Alloy Contacts Order Guide

Catalog Listing	Conduit	Switching	Bar Chart ■ Contact Closed □ Contact Open	Standard Contact Block	Removeable Contact Block	Actuation	Pilot Light LED	Notes
2CPSA1A1	1/2 in NPT	2NO/2NC		✓		Both		
2CPSA1A1A	1/2 in NPT	2NO/2NC		✓		Both	24 Vdcdc	
2CPSA1A1A-FW	1/2 in NPT	2NO/2NC		✓		Both	24 Vdc	10-pin Brad Harrison connector
2CPSA1A1B	1/2 in NPT	2NO/2NC		✓		Both	120 Vac	
2CPSA1A2	1/2 in NPT	2NO/2NC		✓		Left only		
2CPSA1A2A	1/2 in NPT	2NO/2NC		✓		Left only	24 Vdc	
2CPSA1A2A-FW	1/2 in NPT	2NO/2NC		✓		Left only	24 Vdc	10-pin Brad Harrison connector
2CPSA1A2B	1/2 in NPT	2NO/2NC		✓		Left only	120 Vac	
2CPSA1A3	1/2 in NPT	2NO/2NC		✓		Right only		
2CPSA1A3A	1/2 in NPT	2NO/2NC		✓		Right only	24 Vdc	
2CPSA1A3A-FW	1/2 in NPT	2NO/2NC		✓		Right only	24 Vdc	10-pin Brad Harrison connector
2CPSA1A3B	1/2 in NPT	2NO/2NC		✓		Right only	120 Vac	
2CPSA2A1	1/2 in NPT	2NO/2NC			✓	Both		
2CPSA2A1A	1/2 in NPT	2NO/2NC			✓	Both	24 Vdc	
2CPSA2A1B	1/2 in NPT	2NO/2NC			✓	Both	120 Vac	
2CPSA2A2	1/2 in NPT	2NO/2NC			✓	Left only		
2CPSA2A2A	1/2 in NPT	2NO/2NC			✓	Left only	24 Vdc	
2CPSA2A2B	1/2 in NPT	2NO/2NC			✓	Left only	120 Vac	
2CPSA2A3	1/2 in NPT	2NO/2NC			✓	Right only		
2CPSA2A3A	1/2 in NPT	2NO/2NC			✓	Right only	24 Vdc	
2CPSA2A3B	1/2 in NPT	2NO/2NC			✓	Right only	120 Vac	
2CPSC1A1	20 mm	2NO/2NC			✓	Both		
2CPSC1A1A	20 mm	2NO/2NC			✓	Both	24 Vdc	
2CPSC1A2	20 mm	2NO/2NC			✓	Left only		
2CPSC1A2A	20 mm	2NO/2NC			✓	Left only	24 Vdc	
2CPSC1A3	20 mm	2NO/2NC			✓	Right only		
2CPSC1A3A	20 mm	2NO/2NC			✓	Right only	24 Vdc	
2CPSC2A1A	20 mm	2NO/2NC			✓	Both	24 Vdc	

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Table 8. 2CPS With Broken Cable Detection and Silver Alloy Contacts Order Guide, continued

Catalog Listing	Conduit	Switching	Bar Chart ■ Contact Closed □ Contact Open	Standard Contact Block	Removeable Contact Block	Actuation	Pilot Light LED	Notes	
2CPSA1B1	1/2 in NPT	1NO/3NC	<p>Bar chart diagram for 2CPSA series switches. It shows two rows of switches: Left Switch 21-22 and Right Switch 11-12. The bar chart indicates contact states for different cable tensions: Slackened cable, Proper cable tension, and Pulled cable. Dimensions are provided in inches and millimeters for each segment.</p>	✓		Both			
2CPSA1B1A	1/2 in NPT	1NO/3NC		✓		Both	24 Vdc		
2CPSA1B1A-F01	1/2 in NPT	1NO/3NC		✓		Both	24 Vdc	10-pin Brad Harrison connector	
2CPSA1B1B	1/2 in NPT	1NO/3NC		✓		Both	120 Vac		
2CPSA1B2	1/2 in NPT	1NO/3NC		✓		Left only	120 Vac		
2CPSA1B2A	1/2 in NPT	1NO/3NC		✓		Left only	24 Vdc		
2CPSA1B2A-F01	1/2 in NPT	1NO/3NC		✓		Left only	24 Vdc	10-pin Brad Harrison connector	
2CPSA1B2B	1/2 in NPT	1NO/3NC		✓		Left only	120 Vac		
2CPSA1B3	1/2 in NPT	1NO/3NC		✓		Right only			
2CPSA1B3A	1/2 in NPT	1NO/3NC		✓		Right only	24 Vdc		
2CPSA1B3A-F01	1/2 in NPT	1NO/3NC		✓		Right only	24 Vdc	10-pin Brad Harrison connector	
2CPSA1B3B	1/2 in NPT	1NO/3NC		✓		Right only	120 Vac		
2CPSA2B1	1/2 in NPT	1NO/3NC			✓	Both			
2CPSA2B1A	1/2 in NPT	1NO/3NC			✓	Both	24 Vdc		
2CPSA2B1B	1/2 in NPT	1NO/3NC			✓	Both	120 Vac		
2CPSC1D1A	20 mm	4NC		<p>Bar chart diagram for 2CPSC1D1A switch. It shows Left Switch 11-12 and Right Switch 21-22. The bar chart indicates contact states for different cable tensions: Slackened cable, Proper cable tension, and Pulled cable. Dimensions are provided in inches and millimeters for each segment.</p>	✓		Both	24 Vdc	

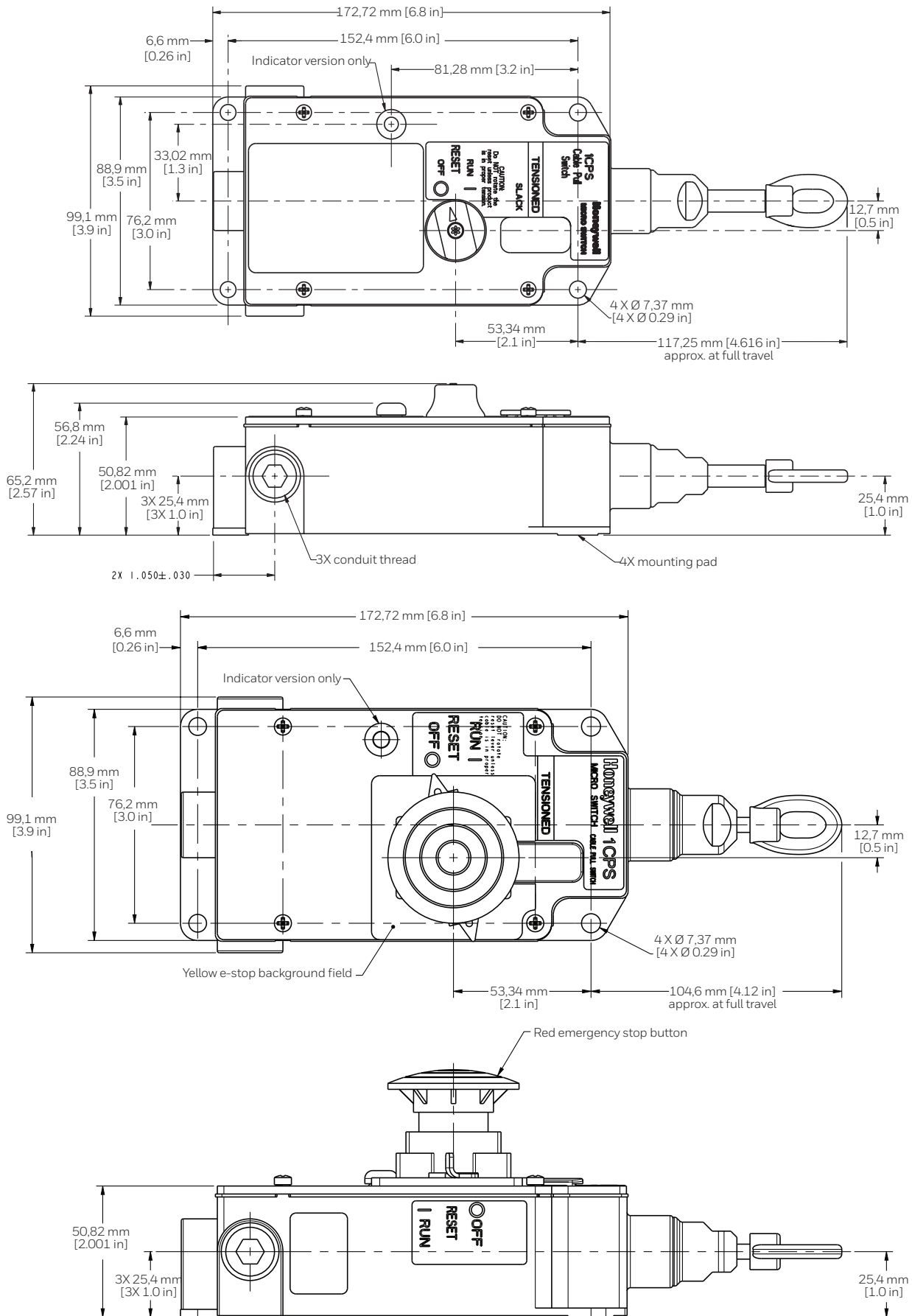
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Table 9. 2CPS Without Broken Cable Detection and With Silver Alloy Contacts Order Guide

Catalog Listing	Conduit	Switching	Bar Chart ■ Contact Closed □ Contact Open	Standard Contact Block	Removeable Contact Block	Actuation	Pilot Light LED	Notes
2CPSA1A4	1/2 in NPT	2NO/2NC		✓		Both		
2CPSA1A4B	1/2 in NPT	2NO/2NC		✓		Both	120 Vac	
2CPSA1A5B	1/2 in NPT	2NO/2NC		✓		Left only	120 Vac	
2CPSA1A6B	1/2 in NPT	2NO/2NC		✓		Right only	120 Vac	
2CPSA2A4A	1/2 in NPT	2NO/2NC			✓	Both	24 Vdc	
2CPSA2A4B	1/2 in NPT	2NO/2NC			✓	Both	120 Vac	
2CPSC1A4-F02	20 mm	2NO/2NC			✓		Both	

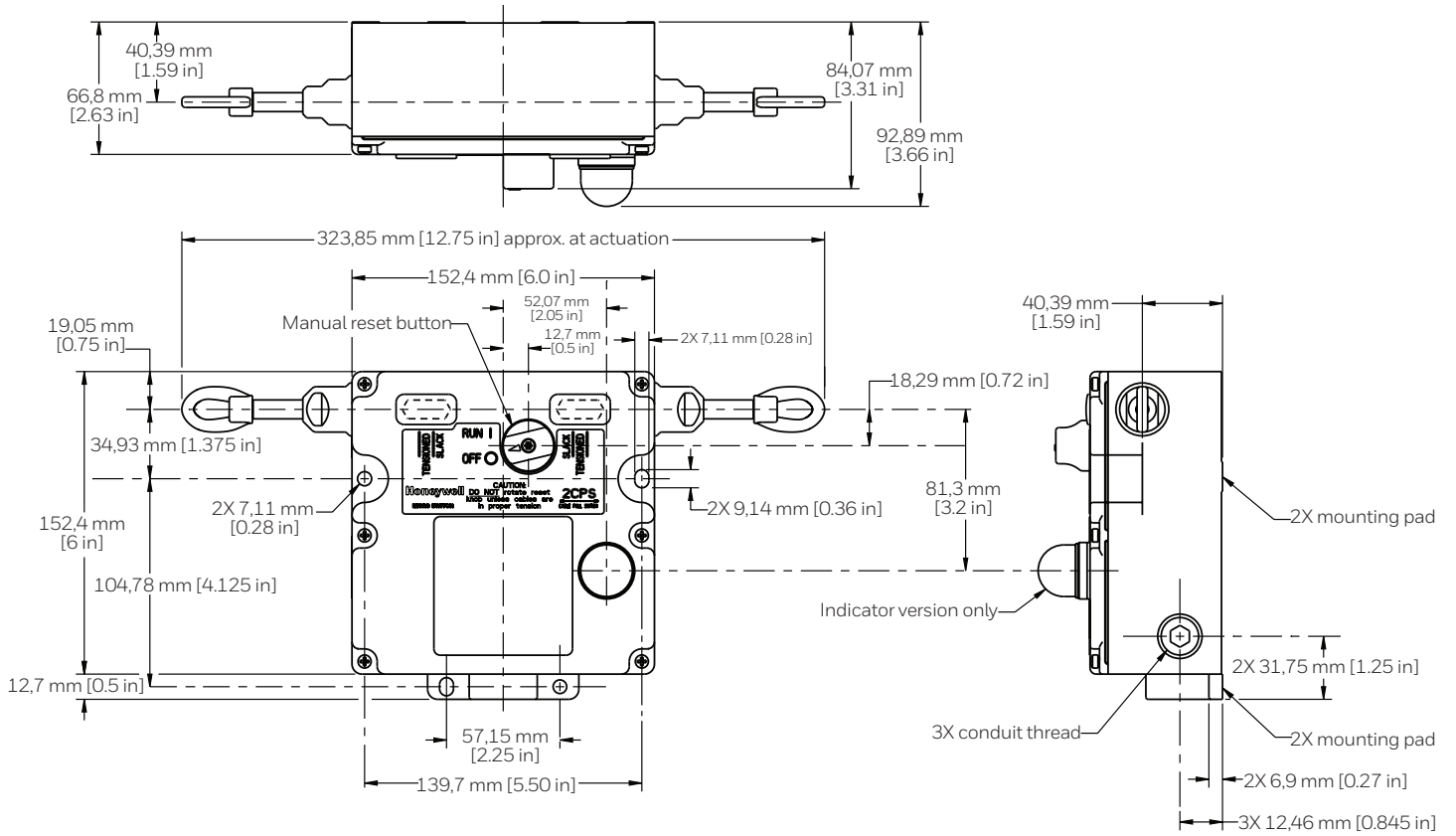
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Figure 4. 1CPS Dimensional Drawing



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Figure 5. 2CPS Dimensional Drawing

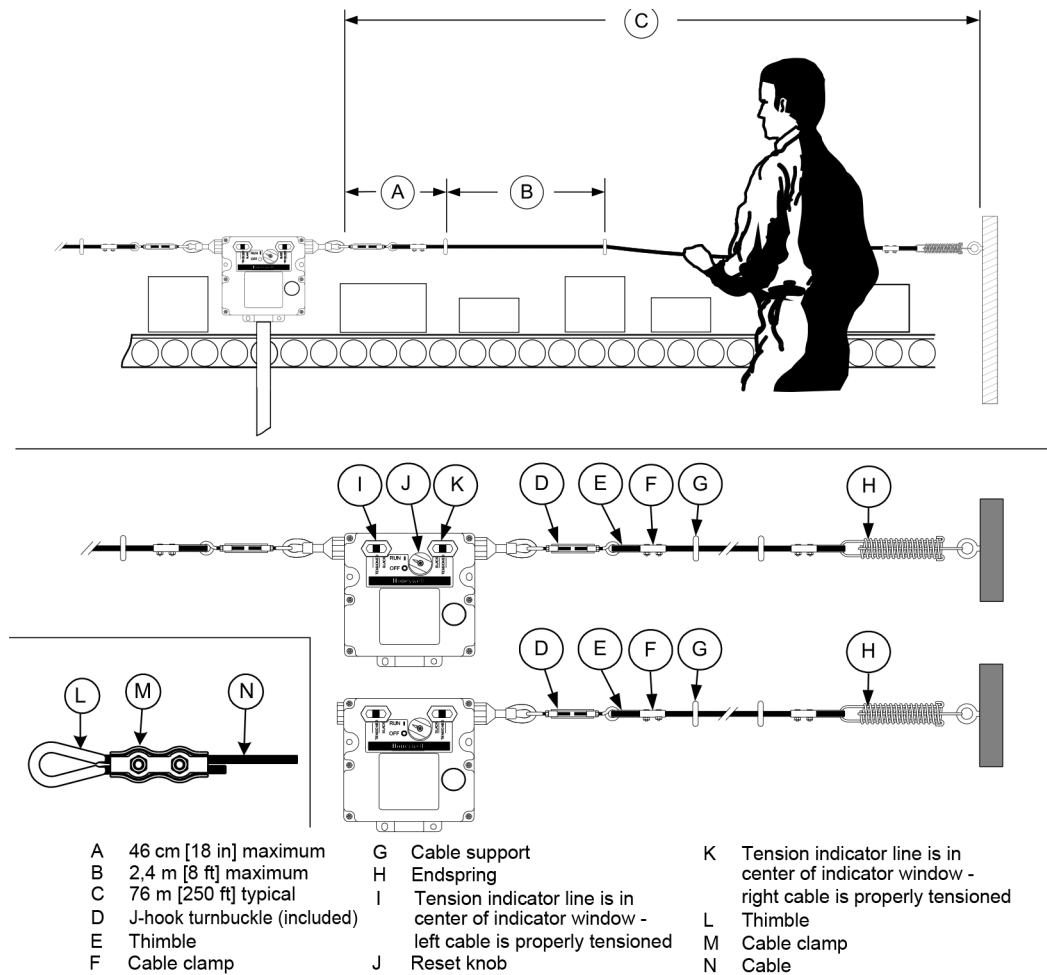


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Figure 6. 1CPS Application Information



Figure 7. 2CPS Application Information

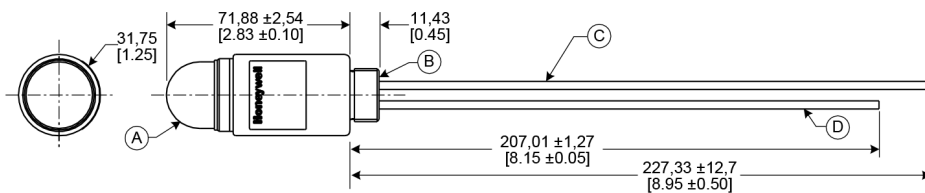


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Table 10. Accessories/Hardware Packets

Catalog Listing	Accessory
CLSZC1	Cable - 7,6 m [25 ft] length
CLSZC2	Cable - 15,2 m [50 ft] length
CLSZC3	Cable - 30,5 m [100 ft] length
CLSZC4	Cable - 45,7 m [150 ft] length
CLSZC5	Cable - 61 m [200 ft] length
CLSZC7	Cable - 76,2 m [250 ft] length
CLSZTC	(2) Thimbles (2) Low-profile duplex cable clamps
CLSZ1S	(1) Draw-bar endspring
CPSZ1E	M6 x 1 x 60 mm eyebolt
CPSZ1S	(1) Draw-bar endspring
CPSZK1	(1) J-hook turnbuckle with lock nuts (2) Thimbles (2) Low-profile duplex cable clamps (16) Sets of cable supports [(16) 1/4-20 eye bolts, (32) 1/4-20 nuts, (32) flat washers, (16) lock washers]
CPSZK2	European hardware packet (1) J-hook turnbuckle with lock nuts (2) Thimbles (2) Stainless steel cable clamps (16) Sets of cable supports [(16) 1/4-20 eye bolts, (32) 1/4-20 nuts, (32) flat washers, (16) lock washers]
CPSZTB	J-hook turnbuckle with lock nuts (included with 2CPS)
CPSLED24	Multi-cluster LED accessory - 24 Vdc (conduit mount)
CPSLED120	Multi-cluster LED accessory - 120 Vac (conduit mount)
CPS-BRACKET	Mounting bracket (to be used with 1CPS or 2CPS)

Figure 8. CPSLED Dimensional Drawing



- A Multi-LED red pilot light
- B 1/2-14 NPSM Thread
- C 18 AWG red PVC insulation
- D 18 AWG black PVC insulation

Figure 9. CPS-Bracket

