

MICRO SWITCH™ Cable-Pull Safety Switches

CPS Series

004785

Issue 2

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.

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)
- 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
- 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

DIFFERENTIATION

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

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](#).

MICRO SWITCH™ Cable-Pull Safety Switches, CPS Series

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	2CPS: 25 lb*
Actuation shaft operating force	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	-N
Switch Type	Conduit	Basic Switch Code	Indicator-Pilot Light Code	Without Broken Cable Detection
1CPS Series Single-Head Cable-Pull Safety Switch	A 1/2 NPT	1 1NO/1NC direct acting Switch 1: 1NO/1NC Switch 2: None	A 24 Vdc LED	
	B PG 13.5	2 2NO/2NC direct acting Switch 1: 1NO/1NC Switch 2: 1NO/1NC	B 120 Vac LED	
	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	
	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
Switch Type	Conduit	Contact Mounting Code	Basic Switch Code	Actuation Code	Indicator-Pilot Light 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	A 24 Vdc LED cluster
	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	B 120 Vac LED cluster
	C 20 mm		D 4NC, direct acting Switch 1: 2NC Switch 2: 2NC	3 Maintained, right side No actuation, left side	
	D PF 1/2			4 Maintained, both sides w/o broken cable detection	
				5 Maintained, left side No actuation, right side w/o broken cable detection	
				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.

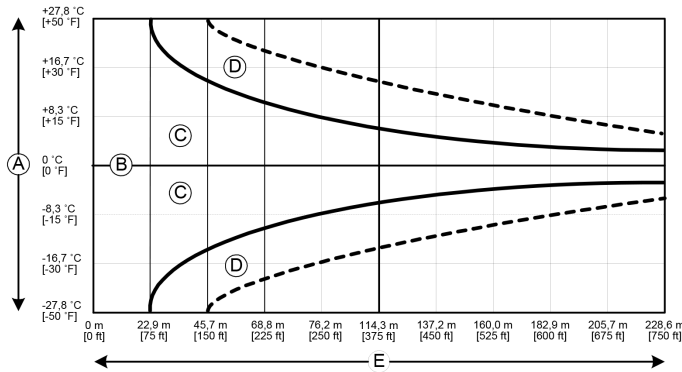
The relative expansion or contraction of the steel actuating cable when the ambient temperature increases or decreases must be taken into account when pre-tensioning a cable pull switch.

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	

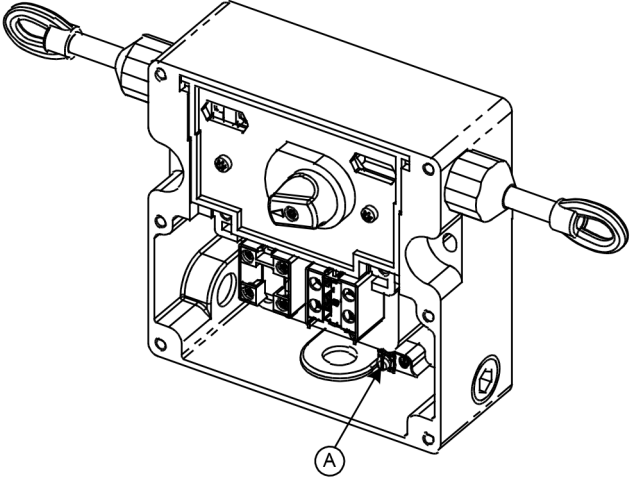
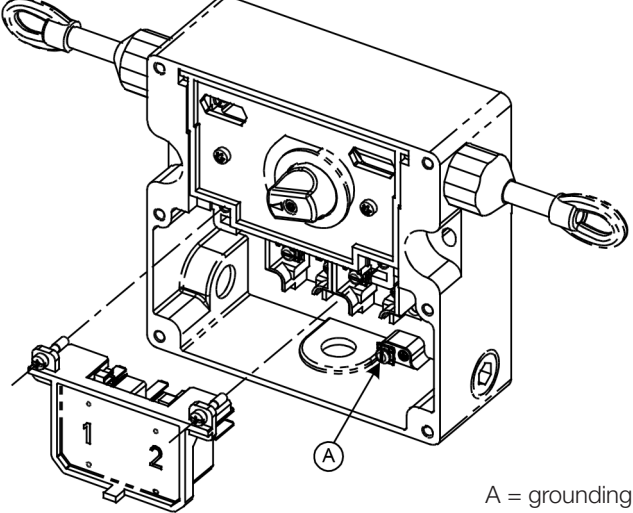
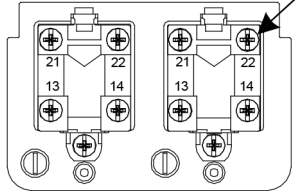
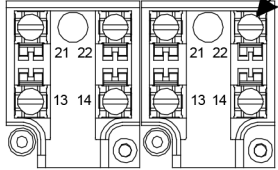
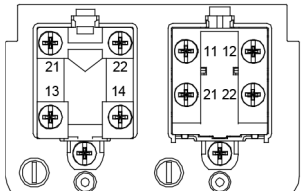
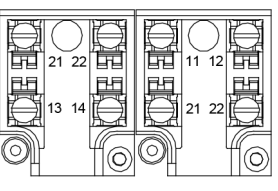
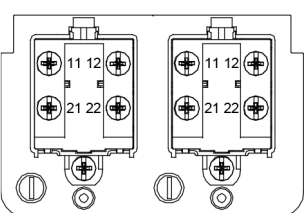
Table 4. 1CPS Contact Blocks

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 Closed □ Contact Open	Contact Material	Pilot Light 24 Vdc LED	Pilot Light 120 Vac LED	Notes	
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				-	