Honeywell

ISSUE 5

PK 81593

Installation Instructions for the **MICRO SWITCH™ CLSX Series Explosion-Proof Maintained Cable-Pull Limit Switch**

⚠ WARNING

IMPROPER INSTALLATION

- Consult with local safety agencies and their requirements when designing a machine control link, interface and all control elements that affect safety.
- Strictly adhere to all installation instructions.

Failure to comply with these instructions could result in death or serious injury.

GENERAL INFORMATION (FIGURE 1)

- Explosion-proof switches are designed specifically for use in hazardous location applications. Flame paths within the switch housing cool exploding gases below the auto ignition temperature of the atmosphere
- Complies with NEMA standards: 1, 3, 4, 7, 9, 13. UL listed and CSA certified: Div. 1 & 2, Class I, Groups B, C, & D; Div. 1 & 2, Class II, Groups E, F, & G
- The CLSX explosion-proof maintained cable-pull limit switch is designed for use in emergency stop applications
- Single-head cable pull limit switch is designed to forcibly disconnect a set of direct acting switch contacts
- Direct acting switch contacts are held closed when actuating cables are under proper tension. When cable is pulled, slackened or broken, a cam positively opens the switch contacts
- Switch contacts remain open until switch is reset by manually depressing the reset button located on the actuated operating head
- When direct acting switch contacts open, auxiliary contacts also actuate: open contacts close and closed contacts open
- Head may be positioned in any of four directions

FIGURE 1: MAINTAINED SWITCH

AUXILIARY CONTACTS

- Additional contacts are electrically isolated from the direct acting switch contacts. They are used for monitoring or signaling, i.e., indicators, pilot lights and alarms

MAXIMUM ACTUATING CABLE LENGTH

- Depending upon variations in ambient temperature, maximum cable length is 60 m [200 ft]

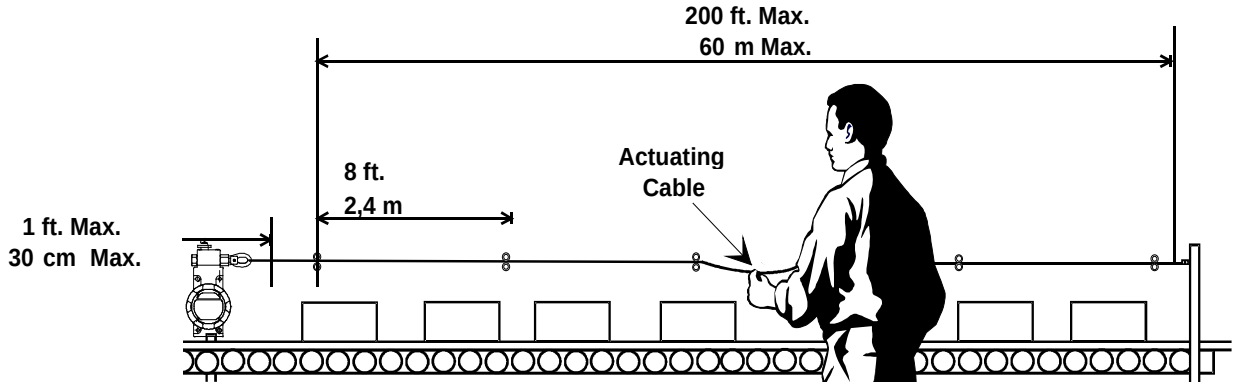
TENSION INDICATOR

- Convenient tension indicator line on switch plunger indicates maximum preset cable tension

OTHER AVAILABLE FEATURES:

- Conduit opening options
- Hardware kits and cables for various length installations

FIGURE 2. INSTALLATION



SWITCH MOUNTING, WIRING AND SEALING

Step 1 - Ensure you have the following:

- Switch
- (2) 1/4-20 or (2) 5/16-18 screws
- #14 AWG to #16 AWG stranded or #16 AWG to #18 AWG solid wire

Step 2 - Mount switch:

CAUTION

SWITCH DAMAGE

Do NOT mount switch upside down or at low point of conduit runs. Condensation problems may develop. **Failure to comply with these instructions may result in product damage.**

- Mount using (2) 1/4-20 screws from front of switch, or with (2) 5/16-18 screws from back of switch. Torque to 43 in-lb to 52 in-lb (4.9 N-m to 5.9 N-m)

Step 3 - Wire switch:

- With a bar or screwdriver in the cover wrenching lugs, loosen and remove circular cover on front of switch
- Connect stranded or solid wire to switch's pressure type connector terminals. (Refer to circuit diagram on switch housing. Diagram depicts switch contacts when cable is at proper tension.) Torque terminal screws and ground screw to 7-9 in-lb (0,8-1 N-m)
- Reassemble cover and tighten securely

Step 4 - Seal conduit connection:

Proper sealing ensures explosion-proof integrity of the conduit system.

- Seal in accordance with National Electrical Code, paragraphs 500-2 and 501-4

⚠ WARNING

IMPROPER SYSTEM PERFORMANCE

- Ensure the attendant circuitry is such that only the momentary interruption of the control circuit cable pull contacts is required to open and hold open the control circuit until such time as both the cable pull switch and the attendant circuitry are manually reset.
- The user is SOLELY RESPONSIBLE for determining the appropriate level of risk warranting this type of circuitry.
- Maintained cable-pull limit switches must be installed in a fashion that complies with all codes and standards that are applicable to the particular application of the device.

Failure to comply with these instructions could result in death or serious injury.

ACTUATING CABLE INSTALLATION

Step 1 - Ensure you have the following* (Figure 2)*:

- Plastic coated aircraft cable 3,18 mm [1/8 in] to 4,76 mm [3/16 in] dia. Use a distinctive color, such as red, to differentiate actuating cable from other wires or cables in the area
- Thimbles, U-bolt clamps
- Cable supports (eyebolts)

Step 2 - Attach cable to switch:

- Ensure cable is fully seated and tightly fitted in the thimble groove
- Attach using two U-bolt clamps. U-bolt clamps should be installed as close as possible to thimble
- Tighten U-bolts to 0,51 N-m [4.5 in-lb] for 3,18 mm [1/8 in] cable and 0,85 N-m [7.5 in-lb] for 4,76 mm [3/16 in] cable

Step 3 - Install cable supports:

CAUTION
SWITCH DAMAGE
Do NOT allow excessive side loads that could bend the switch operating shaft.
Failure to comply with these instructions may result in product damage.

- Install a cable support as close as practical to end of shaft without interfering with switch operation
- If cable tension adjusting turnbuckle is in mid-span of cable, the first cable support should be in line with, and no further than, 30 cm [12 in] from end (eye) of shaft. If adjusting turnbuckle is attached directly to shaft eye, this distance may be increased to 46 cm [18 in]
- Support cable at intervals no greater than 2,4 m [8 ft]

REQUIRED ENDSPRING AND TURNBUCKLE INSTALLATION (Figure 3)
Step 1 - Ensure you have the following
- Endspring, turnbuckle, jam nuts (supplied with switch).
- Thimbles, U-bolt clamps

Step 2 - Install endspring
Reduces effects of ambient temperature fluctuations and provides a measure of protection against excessive force being applied to cable.
- Install an endspring within cable span, preferably at end of cable opposite switch (see Actuating Cable Installation, Step 2)

REQUIRED GROUNDING
The internal grounding terminal must be used for the equipment grounding connection.

Step 3 - Install turnbuckle:
Ensures proper cable tension.

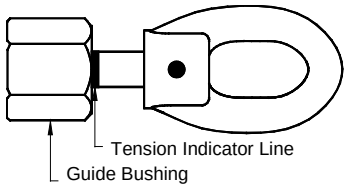
⚠ WARNING
IMPROPER INSTALLATION
Do NOT install turnbuckle too closely to cable supports or other barriers that may hinder proper operation.
Failure to comply with these instructions could result in death or serious injury.

- Install within cable span in same manner as endspring. Use jam nuts to maintain adjustment

REQUIRED CABLE TENSION ADJUSTMENT
Step 1 - Align colored tension indicator line:
- Tighten turnbuckle until colored tension indicator line on switch plunger starts to appear from within switch operating head

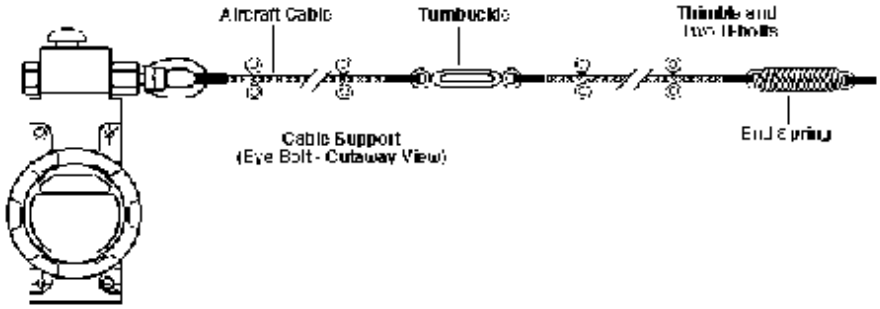
Step 2 - Ensure proper adjustment (Figure 4):
- Ensure tension indicator line is visible and aligned with end of guide bushing on operating head
- Periodically check and adjust cable tension as necessary

Figure 4: Cable Tension at Proper Setting



With endspring installed, switch/cable will operate satisfactorily over a temperature range of ±12 °C [±25 °F], up to maximum cable length of 60 m [200 ft]. Adjust cable tension when ambient temperature is near mid-point of expected temperature extremes.

Figure 3: Switch with Turnbuckle and Endspring



OPTIONAL CORNER INSTALLATION

To route actuating cable around a corner, use a free running pulley with a minimum of 10 cm [4 in] dia. Cable should bend no more than 30 degrees as it passes through cable supports spaced no closer than 15 cm [6 in] apart.

OTHER ADJUSTMENTS

To reposition operating head, loosen the four captive screws, place head in desired position. Securely tighten the four screws to 1,36 N-m to 1,80 N-m [12 in-lb to 16 in-lb].

RECOMMENDED REPLACEMENT

Replace entire switch every 100,000 operations.

WARRANTY/REMEDY

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