



Hubbell Industrial Controls, Inc.

June 1994
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EUCLID™ AC & DC POWER LIMIT SWITCHES SIZE 2, 3, 4, 5, 6, & 6A

General Information

D-C Limit Switches are devices that are used to interrupt the main power circuit, setting up a dynamic braking circuit that quickly stops hook travel with a minimum of drift.

A-C Limit Switches are similar in construction to D-C Limit Switches. The difference is in operation. A-C Limit Switches disconnect two power lines to the hoist motor which then is stopped by a magnetic brake.

- ◆ Positive trigger lock-out
- ◆ Direct action contact opening and closing
- ◆ One-piece movable contacts
- ◆ Exclusive arc transfer action
- ◆ Sturdy housing
- ◆ Safety chain on cover
- ◆ Clearly marked leads
- ◆ Rugged construction
- ◆ Oversize ball bearings

Application

Euclid A-C and D-C Crane Power Limit Switches provide dependable protection against over-hoisting problems such as damage to the trolley frame and hoisting mechanism. In case of over-travel, these Limit Switches disconnect the hoist motor from the line, preventing further hoist motion.

Operation

For dc operation the Power Limit Switch is mounted on the trolley floor of the crane. When the hook block rises into the danger zone, it lifts the suspended reset weight. As the load of the reset weight is removed from the operating lever, the tripping weight (an integral part of the operating lever) operates the switch. Normally closed power contacts are opened, normally open dynamic braking contacts are closed through a resistor. The

motor armature and series brake are disconnected from the supply line. The armature, series field and braking resistor are connected in series. **RESULT:** Setting of the series holding brake and dynamic braking for a quick stop.

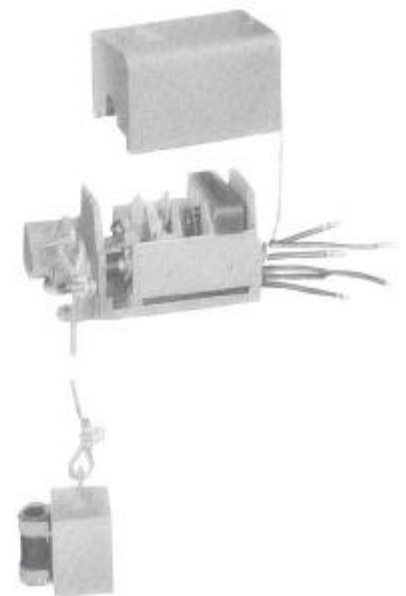
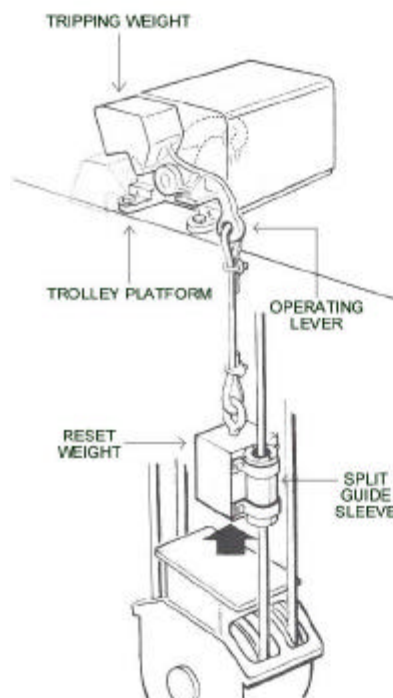
Reversing the crane controller lowers the hook to return the Limit Switch to the "run" position by

means of the suspended reset weight.

For ac operation, when the Power Limit Switch is tripped, the shoe brake is applied and the load is stopped. The load cannot be Hoisted when the Limit Switch is tripped, but Lowering can be performed as usual because the lowering circuit is unaltered.



Breaks power circuit directly
Provides d-c dynamic braking on d-c cranes
Assures positive trip action
Weight tripped and weight reset
Mounts above trolley floor
Tough, light-weight glass fiber cover



Complete Limit Switch assembly



Description

Positive trigger lock-out

Quick make-and-brake contacts, which directly handle the motor circuit, are locked in position until tripped. The roller-type trigger lockouts prevent positively any operation of the Limit Switch until the full power of the high-tensile, oil-tempered, magnafluxed spring is available to assure extremely fast operation for either tripping or re-setting. Operation in any intermediate position of the operating lever is impossible.

Direct contact opening and closing

In the remote possibility of spring failure, the contacts are operated by the direct drive action of the tripping and reset weights. In tripping, as the reset weight causes the trip pin to engage the operating pin to operate the contacts. In resetting, the reset-pin does the job.

One piece movable contacts

The low inertia of these contacts practically eliminates any contact bounce.

Exclusive arc transfer system

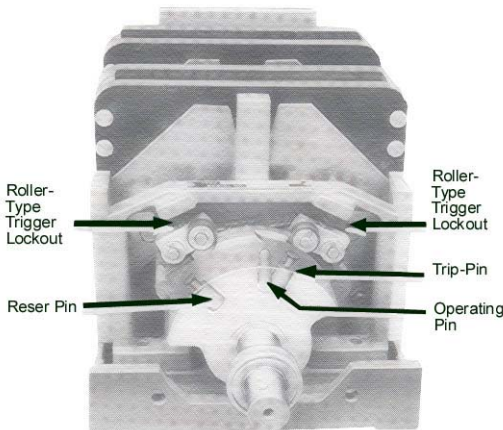
This arc transfer system combined with the shape of the arc chamber allows greater arc interrupting in a smaller space. The arc is confined to a controlled path for more efficient extinguishing. No destructive burning of the contacts can occur as the arc is transferred to the rearmost part of the magnetic blowout coil guards and to the central rod conductor in the arc shield. A smaller Limit Switch is made possible.

Sturdy Housing

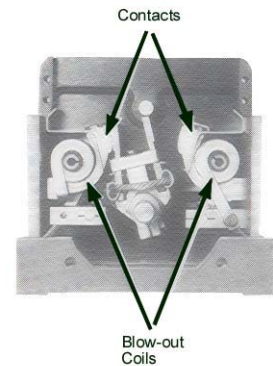
Size 4, 5, 6, & 6A cases are of cast iron. Size 2 and 3 cases are molded fiberglass. The cover is of tough glass-reinforced polyester resin. It is easily removed for ready access to the contacts.

Safety chain

The insulated cover is securely fastened to the case by means of a safety chain to prevent loss when removed from the case.



Shows roller-type trigger lockouts and ghost view of operation pins for direct drive action.



Contacts and magnetic blow-out coils

Clearly marked leads

Flexible leads for external connections extend through snug-fitting neoprene bushings in the back of the cast-iron case. They are clearly marked to speed installation.

Rugged Construction

High-quality materials reduce maintenance. All parts are of non-corrosive materials. Contacts are hard-drawn copper, except for sizes 3 & 6A which use silver faced tips. The shaft is stainless steel. All current-carrying parts are copper or brass. Contact and shunt fastening screws are stainless steel.

Ball Bearings

Four oversize, double-sealed ball bearings are permanently lubricated to minimize friction and reduce maintenance.

Early Break Auxiliary (EBA)

The EBA option is available for crane hoists that are controlled with AC or DC drives. The EBA contacts (DPDT) operate prior to the power contacts, thus providing a signal to turn off the drive before motor power interruption.

Installation

Euclid™ Type 4220 Crane Power Limit Switches are easily field installed.

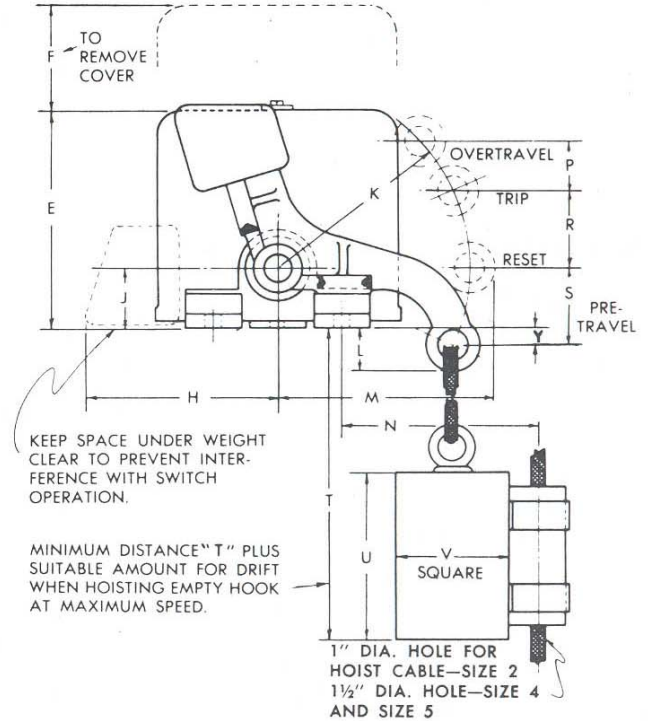
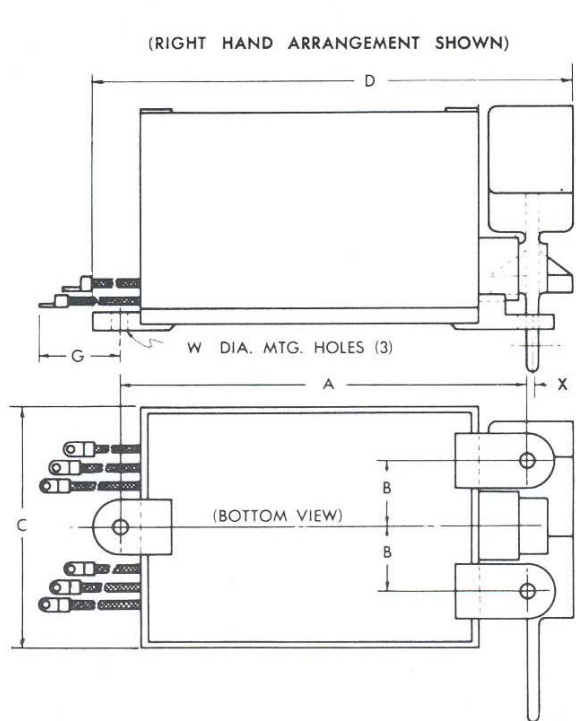
Mount horizontally on top of the trolley frame of the hoist, with mounting feet down. Install the split-sleeve suspended weight guide around the dead-ended cable. A bracket or striker plate may be attached to the hook block, if necessary, to lift the suspended weight when hoisting. Steel cable is furnished for connection the suspended weight to the operating lever.

D-C Units Only

The operating lever is adaptable for either right or left-hand operation. Unless otherwise specified, right-hand operation is furnished. Change in installation for left-hand operation can be made either at the Factory or in the field. Terminal markings only are affected. Refer to wiring diagram for correct connections.

Resistors For D-C Limit Switches

Euclid™ Type K-exclusive continuous wound, corrosion resistant, non-breakable resistors, are specifically designed for use with Euclid™ Type 4220 Hoist Limit Switches. See Price List 4220.



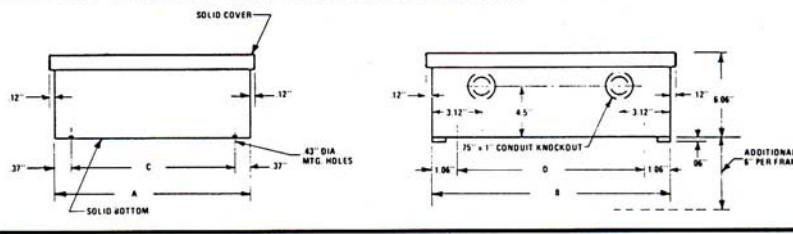
| SIZE | A | B | C | D | E | F | G | H | J | K | L | M | N | P | R | S | T | U | V | W | X | Y |
|--------|----------|-------|--------|--------|--------|--------|---------|-------|-------|--------|-------|--------|---------|---------|---------|---------|----------|-------|-------|------|-------|---|
| 2 & 3 | 9-7/8 | 1-3/4 | 5-1/2 | 12-5/8 | 5-1/2 | 3-7/8 | 8-1/16 | 5-1/8 | 1-5/8 | 4-1/2 | 1/2 | 5-1/4 | 5 | 1-7/16 | 1-7/16 | 1-5/8 | 18 5 | 3-1/2 | 13/32 | 9/16 | 1/4 | |
| 4 | 14-1/16 | 2-1/4 | 8-5/8 | 17-7/8 | 8-1/8 | 7-3/8 | 11-1/4 | 6-3/4 | 2-3/8 | 6-3/4 | 1-1/2 | 7-5/8 | 6-11/16 | 1-3/4 | 3 | 2-1/2 | 21 5-1/2 | 4 | 9/16 | 1/2 | 3/4 | |
| 5 | 18-3/16 | 3 | 12-1/2 | 21-1/4 | 11 | 10-1/4 | 22-5/16 | 9-1/2 | 2-7/8 | 8-3/4 | 2-1/4 | 9-7/8 | 8-3/8 | 3 | 3-11/16 | 3-3/4 | 27 7 | 5 | 9/16 | 5/16 | 1-1/8 | |
| 6 & 6a | 24-13/16 | 7-1/2 | 18-1/4 | 27-3/4 | 16-7/8 | 15 | 22-5/16 | 14 | 3 | 11-1/2 | 2-3/4 | 13-1/2 | 7-1/4 | 2-13/16 | 3 | 2-13/16 | 27 9 | 6 | 13/16 | 7/16 | 1-1/2 | |

NOTE: Catalog dimensions are not to be used for construction purposes. Prints will be furnished upon receipt of your order with your request for prints.

| APPROXIMATE WEIGHT IN POUNDS | | | | | |
|----------------------------------|------|---|-------|---|-------|
| PART NUMBER | SIZE | LIMIT SWITCH WITHOUT CABLE, FITTINGS AND WEIGHT | | LIMIT SWITCH WITHOUT CABLE, FITTINGS AND WEIGHT | |
| | | NET | BOXED | NET | BOXED |
| 4220-71220-001 4220-71221-001 | 2 | 28 | 40 | 50 | 64 |
| 4220-72530-001 4220-72531-001 | 3 | | | | |
| 4220-71240-001 4220-71241-001 | 4 | 70 | 98 | 100 | 128 |
| 4220-71250-001 4220-71251-001 | 5 | 170 | 210 | 225 | 265 |
| 4220-71260-001 4220-71261-001 | 6 | 300 | 360 | 370 | 420 |
| 4220-71260-003 4220-71261-003 | 6a | | | | |

**LIMIT SWITCH RESISTORS
FOR USE WITH DYNAMIC LOWERING CRANE HOISTS
250 VOLTS D.C.**

TOTALLY ENCLOSED NON-VENTILATED COVERS



**DC LIMIT SWITCH RESISTORS
230/250 VDC, ENCLOSED
FOR USE WITH DYNAMIC LOWERING HOISTS**

**Disc.
Sch E37**

| HP RANGE | PART NUMBER | DIMENSIONS | | | | |
|-----------|-------------|------------|--------|--------|--------|-------|
| | | A | B | C | D | E |
| 5 – 10 | 69453-069 | 12.75" | 13.37" | 12.00" | 11.12" | 6.06" |
| 11 – 13.5 | 69453-070 | 15.50" | 13.37" | 14.75" | 11.12" | 6.06" |
| 14 – 26 | 69453-071 | 15.50" | 13.37" | 14.75" | 11.12" | 6.06" |
| 27 – 33 | 69453-072 | 15.50" | 13.37" | 14.75" | 11.12" | 6.06" |
| 34 – 45 | 69453-073 | 15.50" | 13.37" | 14.75" | 11.12" | 6.06" |
| 46 – 65 | 69453-074 | 15.50" | 13.37" | 14.75" | 11.12" | 6.06" |
| 66 – 100 | 69453-075 | 18.25" | 13.37" | 17.50" | 11.12" | 6.06" |
| 101 – 135 | 69453-076 | 21.00" | 13.37" | 20.25" | 11.12" | 6.06" |
| 136 – 200 | 69453-077 | 27.00" | 13.62" | 20.25" | 6.00" | 9.75" |
| 201 – 265 | 69453-078 | 27.00" | 13.62" | 20.25" | 6.00" | 9.75" |

NOTE: Duplex DC Power Limit Switches require two Sets of L.S. Resistors



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