

## Installation Instructions for the HDLS Series Switches

ISSUE 2  
PK 81116

### **⚠ WARNING**

#### **PERSONAL INJURY**

DO NOT USE these products as safety or emergency stop devices or in any other application where failure of the product could result in personal injury.

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

### **MOUNTING**

All Heavy Duty Limit Switches (HDLS) have exactly the same mounting dimensions. Mount by either of two methods: (a) use two #10 screws from the front, or (b) use two #10-32 UNF screws from the back. HDLS offers the advantage of front mount construction. The electrician will find a complete switch, with no parts missing and ample wiring space.

With plug-in construction, wiring and conduit connection is made to the base receptacle. This feature also reduces downtime, since plug-in unit can be removed without disconnecting wiring or conduit.

To mount either switch, merely tighten mounting screws, tighten plug-in unit or cover screws, and make sure conduit section is sealed. Use of sealant (teflon tape, pipe dope, etc.) is recommended to seal conduit connection.

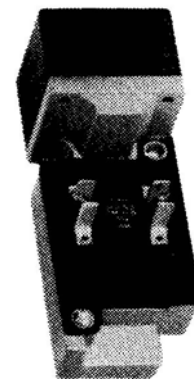
Because of moisture condensation problems, it is not good practice to mount the switch upside down or at the low point of conduit runs.

|                |                                |
|----------------|--------------------------------|
| Sealing        | IP67/68                        |
| Enclosure Type | 1, 3, 3R, 4, 4X, 6, 6P, 12, 13 |

| Rated Operational Voltages (Ue) and Currents (Ie) |        |
|---|--------|
| Ue  | Ie     |
| 120 Vac   | 6 A    |
| 600 Vac   | 1.2 A  |
| 125 Vdc   | 0.22 A |
| 250 Vdc   | 0.11 A |

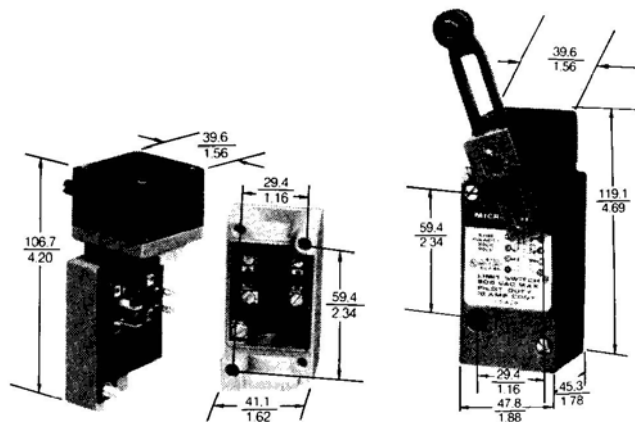
### **WIRING**

Use size #12AWG or smaller solid or stranded wire to connect to the pressure type connector terminals. Spades may be up to .312" wide, rings up to .312" dia. With spade or ring type connections, preinsulated connectors or heat-shrinkable tubing should be used to provide insulation between terminals. Circuit diagram is shown on the nameplate.



It will be easier to wire the double-pole units by connecting lead wires to the terminals nearest the conduit opening first. A grounding screw is located in the housing near the conduit opening.

Switch units with an indicator light in the cover are furnished with the lead wires from the light connected to the normally-open male terminals (#3 and #4) unless otherwise specified on the order. Wires can be unsoldered and reconnected to the normally-closed male terminals or they can be ordered connected to the normally-closed terminals by using a modification code (refer to Catalog 40). Always connect these wires to the same set of terminals used for the load. Across the normally open male terminals (#3 and #4) the light will be On (Fig. 1). Across the normally closed terminals (#1 and #2) the light will be Off.

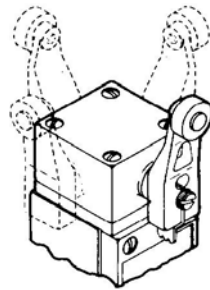


**Single-Pole – Plug-in Type**

**Double-Pole – Non Plug-in Type**

## ADJUSTING INSTRUCTIONS

**Actuator head.** For application flexibility, actuator head may be positioned in any of four directions. Loosen the four captive head screws, place head in the desired position, and then securely tighten the four screws.



### Reversing the roller lever.

Except for the offset roller levers, the roller arm may be reversed to face the roller to the inside or outside of the arm.

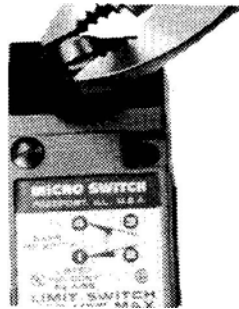
**Positioning Lever.** Lever on rotary actuated units is adjustable through 360° around the shaft. Loosen the screw with a 9/64 inch hexagon key wrench, move lever to desired position and securely tighten the screw until "teller tab" can no longer be moved by hand. Then tighten the screw another 1/8 to 1/4 turn to assure lever is tight on the shaft. Hexagon key wrenches are provided in adjusting tool set LSZ4005 for this purpose.

### Teller Tab



**Adjustable Length Levers.** A hexagon key wrench is required to adjust length of adjustable levers.

**Top Roller Plunger.** Position top roller plunger in desired roller plane by adjusting the head as explained under Actuator Head.



**Side Roller Plunger.** Grasp roller with pliers and rotate it to desired horizontal or vertical plane.

## CHANGING DIRECTION OF ACTUATION

**Side Rotary.** LSM (center neutral) and LSN (maintained) listings operate in both directions and cannot be changed. Listings with the first three letters LSA, LSH, LSL, LSP, LSU, and LSR may be changed to operate clockwise, counterclockwise or both. NOTE: Instructions for adjusting switch operation are cast into the hinged cover (Fig. 2). To change, follow these steps:

1. Loosen the head screws and remove the head from the switch housing.
2. On the bottom of the head, insert a screwdriver in slot provided (Fig. 2) and lift open hinged cover.
3. Referring to Fig. 3, slide cam all the way back, so cam is free to rotate on the shaft.

4. Using a screwdriver or similar tool, rotate cam to desired actuating position (Fig. 4, 5, and 6.)
5. Slide cam all the way forward to its original position, and close hinged cover.
6. Replace operating head on switch housing and securely tighten head screws.

Figure 2

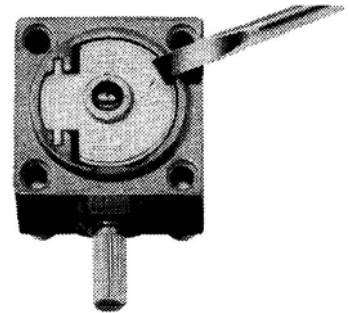


Figure 3

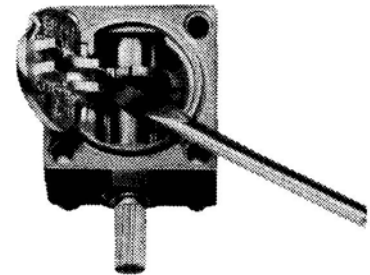


Figure 4

Cam Lobes  
For CW  
For CCW

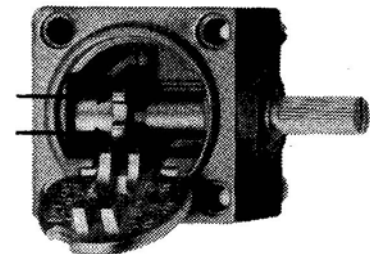


Figure 5

Cam Lobe  
For CW

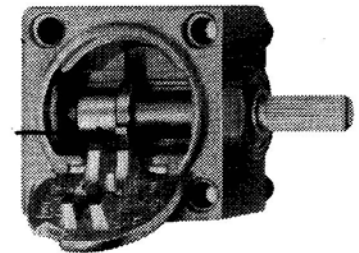
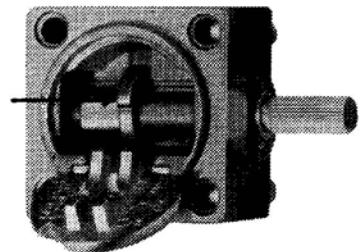


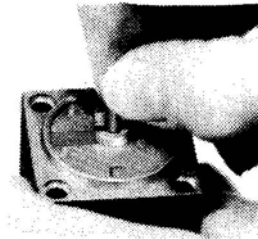
Figure 6

Cam Lobe  
For CCW



**Top Rotary.** Follow these steps to change operating direction of LSB type switches:

1. Loosen head screws and remove head from the switch housing.
2. From bottom of head grasp end of pin plunger and remove pin. It may be necessary to rotate actuating shaft to expose end of pin plunger.
3. Refer to Fig. 8 and select correct pin plunger position for desired direction of actuation.
4. Insert the pin plunger in the position providing desired direction of actuation.
5. Replace the operating head on switch housing and securely tighten head screws.



CW And CCW

CCW Only

CW Only

Plug-in Type

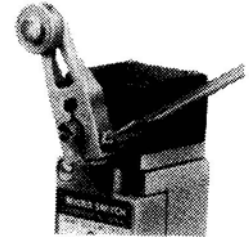
| Catalog Listing* on Switch Nameplate | Complete Plug-in Unit Less Base Receptacle | Plug-in Base Recept. Only | Operating Head Only | Contact Block (Basic Switch Only) |
|--------------------------------------|--|---------------------------|---------------------|-----------------------------------|
| LSA1A                                | LSZ7A1A                                    | LSZ4001                   | LSZ1A               | LSZ3A                             |
| LSA1J                                | LSZ7A1J                                    | LSZ4001                   | LSZ1A               | LSZ3J                             |
| LSA2B                                | LSZ7A2B                                    | LSZ4002                   | LSZ1A               | LSZ3B                             |
| LSB1A                                | LSZ7B1A                                    | LSZ4001                   | LSZ1B               | LSZ3A                             |
| LSC1A                                | LSZ7C1A                                    | LSZ4001                   | LSZ1C               | LSZ3A                             |
| LSC1J                                | LSZ7C1J                                    | LSZ4001                   | LSZ1C               | LSZ3J                             |
| LSD1A                                | LSZ7D1A                                    | LSZ4001                   | LSZ1D               | LSZ3A                             |
| LSD1J                                | LSZ7D1J                                    | LSZ4001                   | LSZ1D               | LSZ3J                             |
| LSD2B                                | LSZ7D2B                                    | LSZ4002                   | LSZ1D               | LSZ3B                             |
| LSE1A                                | LSZ7E1A                                    | LSZ4001                   | LSZ1E               | LSZ3A                             |
| LSE1J                                | LSZ7E1J                                    | LSZ4001                   | LSZ1E               | LSZ3J                             |
| LSE2B                                | LSZ7E2B                                    | LSZ4002                   | LSZ1E               | LSZ3B                             |
| LSF1A                                | LSZ7F1A                                    | LSZ4001                   | LSZ1F               | LSZ3A                             |
| LSF1J                                | LSZ7F1J                                    | LSZ4001                   | LSZ1F               | LSZ3J                             |
| LSF2B                                | LSZ7F2B                                    | LSZ4002                   | LSZ1F               | LSZ3B                             |
| LSH1A                                | LSZ7H1A                                    | LSZ4001                   | LSZ1H               | LSZ3A                             |
| LSH1J                                | LSZ7H1J                                    | LSZ4001                   | LSZ1H               | LSZ3J                             |
| LSH2B                                | LSZ7H2B                                    | LSZ4002                   | LSZ1H               | LSZ3B                             |
| LSJ1A-7A                             | LSZ7J1A-7A                                 | LSZ4001                   | LSZ1JGA             | LSZ3A                             |
| LSJ1A-7M                             | LSZ7J1A-7M                                 | LSZ4001                   | LSZ1JGM             | LSZ3A                             |
| LSJ2B-7A                             | LSZ7J2B-7A                                 | LSZ4002                   | LSZ1JGA             | LSZ3B                             |
| LSJ2B-7M                             | LSZ7J2B-7M                                 | LSZ4002                   | LSZ1JGM             | LSZ3B                             |
| LSK1A-8A                             | LSZ7K1A-8A                                 | LSZ4001                   | LSZ1KHA             | LSZ3A                             |
| LSK2B-8A                             | LSZ7K2B-8A                                 | LSZ4002                   | LSZ1KHA             | LSZ3B                             |
| LSL2C                                | LSZ7L2C                                    | LSZ4002                   | LSZ1L               | LSZ3C                             |
| LSM2D                                | LSZ7M2D                                    | LSZ4002                   | LSZ1M               | LSZ3C                             |
| LSN1A                                | LSZ7N1A                                    | LSZ4001                   | LSZ1N               | **                                |
| LSN2B                                | LSZ7N2B                                    | LSZ4002                   | LSZ1N               | **                                |
| LSP1A                                | LSZ7P1A                                    | LSZ4001                   | LSZ1P               | LSZ3A                             |
| LSP1J                                | LSZ7P1J                                    | LSZ4001                   | LSZ1P               | LSZ3J                             |
| LSP2B                                | LSZ7P2B                                    | LSZ4002                   | LSZ1P               | LSZ3B                             |
| LSR1A                                | LSZ7R1A                                    | LSZ4001                   | LSZ1R               | LSZ3A                             |
| LSR1J                                | LSZ7R1A                                    | LSZ4001                   | LSZ1R               | LSZ3J                             |
| LSH2B                                | LSZ7R2B                                    | LSZ4002                   | LSZ1R               | LSZ3B                             |
| LSU1A                                | LSZ7U1A                                    | LSZ4001                   | LSZ1U               | LSZ3A                             |
| LSV1A                                | LSZ7V1A                                    | LSZ4001                   | LSZ1V               | LSZ3J                             |
| LSV1J                                | LSZ7V1J                                    | LSZ4001                   | LSZ1V               | LSZ3A                             |
| LSV5A                                | LSZ7V5A                                    | LSZ4001                   | LSZ1V               | LSZ3A                             |
| LSV8A                                | LSZ7V8A                                    | LSZ4001                   | LSZ1V               | LSZ3A                             |

## REPLACEMENT PARTS

Should your specific switch catalog listing not appear in this parts list, contact nearest MICRO SWITCH Authorized distributor or MICRO SWITCH sales office.

For ease of making switch adjustments which may be necessary on various switch listings, order LSZ4005 (lever and switch adjusting tool set). This set consists of a special 3/32" open wrench and necessary hexagon key wrenches to adjust all types of levers.

**Hex head screws.** If you prefer to loosen and tighten lever with a pliers or screwdriver, order 15PA164-LS (packet of 50 hexhead screws with screwdriver slot) to replace screws furnished with the lever.



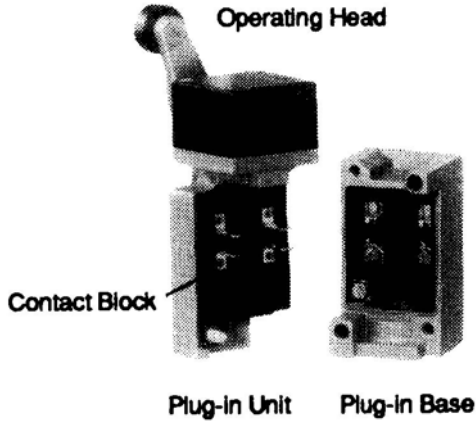
**Replacement Levers.** To order replacement levers, order the same part number that is metal stamped on either lever or lever hub. For other lever variations, refer to HDLS in Catalog 40.

| Non Plug-in Type                    |                     |                                   |
|-------------------------------------|---------------------|-----------------------------------|
| Catalog Listing on Switch Nameplate | Operating Head Only | Contact Block (Basic Switch Only) |
| LSA3K                               | LSZ1A               | LSZ3K                             |
| LSA4L                               | LSZ1A               | LSZ3L                             |
| LSB3K                               | LSZ1B               | LSZ3K                             |
| LSB4L                               | LSZ1B               | LSZ3L                             |
| LSC3K                               | LSZ1C               | LSZ3K                             |
| LSC4L                               | LSZ1C               | LSZ3L                             |
| LSD3K                               | LSZ1D               | LSZ3K                             |
| LSD4L                               | LSZ1D               | LSZ3L                             |
| LSE3K                               | LSZ1E               | LSK3K                             |
| LSE4L                               | LSZ1E               | LSZ3L                             |
| LSF3K                               | LSZ1F               | LSZ3K                             |
| LSF4L                               | LSZ1F               | LSZ3L                             |
| LSG3K                               | LSF1G               | **                                |
| LSH3K                               | LSZ1H               | LSZ3K                             |
| LSH4L                               | LSZ1H               | LSZ3 L                            |
| LSJ3K-7A                            | LSZ1JGA             | LSZ3 L                            |
| LSJ3K-7M                            | LSZ1JGM             | LSZ3 K                            |
| LSJ4L-7A                            | LSZ1JGA             | LSZ3 L                            |
| LSJ4L-7M                            | LSZ1JGM             | LSZ3 L                            |
| LSK3K-8A                            | LSZ1KHA             | LSZ3 K                            |
| LSK4L-8A                            | LSZ1KHA             | LSZ3 L                            |
| LSL4M                               | LSZ1L               | LSZ3 M                            |
| LSM4N                               | LSZ1M               | LSZ3M                             |
| LSN3K                               | LSZ1N               | **                                |
| LSN4L                               | LSZ1N               | **                                |
| LSP3K                               | LSZ1P               | LSZ3 K                            |
| LSP4L                               | LSZ1P               | LSZ3 L                            |
| LSR3K                               | LSZ1R               | LSZ3 K                            |
| LSR4L                               | LSZ1R               | LSZ3 L                            |
| LSU3K                               | LSZ1U               | LSZ3 K                            |

\*Only the listing portion which determines the replacement part is shown. Listings with -7A, -7M, or -8A are complete listings.

\*\*Not user-replaceable.

## REPLACEMENT PARTS - Continued

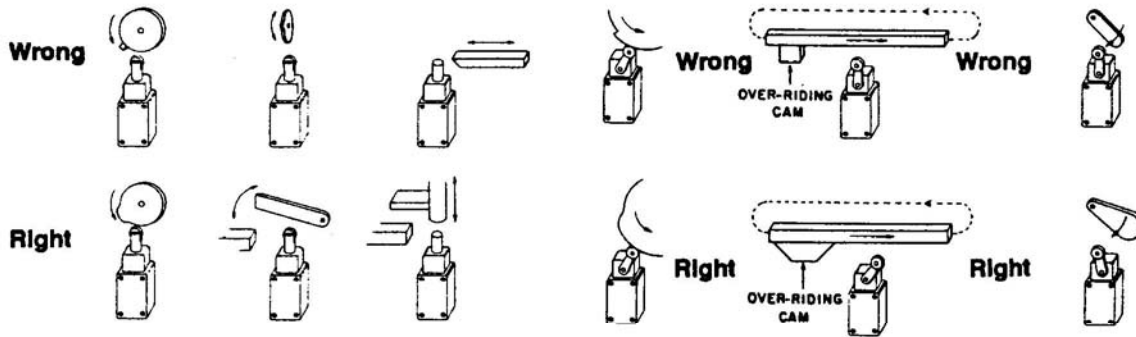


Replacement Parts for gravity return LSS1H, extra/low torque LST1H and two examples of a standard size rotary LSA1A type (LSYAC1A with Viton seals and LSYAB1A low temperature version) are listed below.

| Catalog Listing | Plug-in Units Only | Base Receptacle | Operating Head | Contact Block |
|-----------------|--------------------|-----------------|----------------|---------------|
| LSS1H           | LSZ7S1H            | LSZ4001         | LSZ1S          | LSZ3H         |
| LST1H           | LSZ7T1H            | LSZ4001         | LSZ1T          | LSZ3H         |
| LSYAB1A         | LSZ7YAB1A          | LSZ4001         | LSZ1AB         | LSZ3A         |
| LSYAC1A         | LSZ7YAC1A          | LSA4001         | LSZ1AC         | LSZ3A         |

## PROPER APPLICATION OF LIMIT SWITCHES

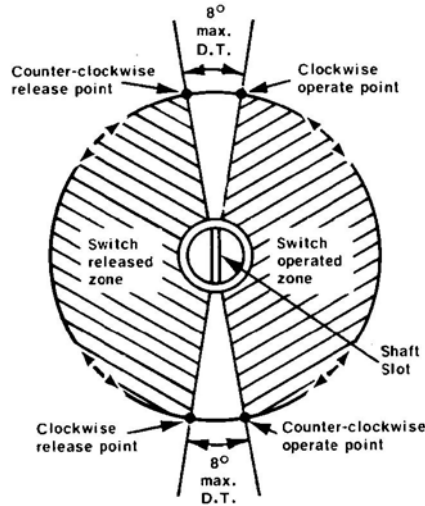
To achieve greatest reliability and longest life possible, limit switches should be installed as outlined in NEMA ICS2-225.



## GRAVITY RETURN HDLS

Listings beginning with LSS are gravity return devices. During installation and setup, note the following:

1. Operate and release points exchange locations when shaft is rotated 180° (Fig. 9).
2. Switch is near operate-release points when shaft slot is parallel to switch's long axis (Fig. 9).
3. The switch should be installed so gravity return of the actuator releases the switch.



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|               |   |
|---------------|---|
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| Latin America | +1-305-805-8188<br>+1-305-883-8257 Fax                    |
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**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

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