



HAYWARD INDUSTRIAL PRODUCTS, INC.
LHB SERIES LIMIT SWITCHBOX
INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS

PLEASE READ THE FOLLOWING INFORMATION PRIOR TO INSTALLING AND USING HAYWARD LHB SERIES SWITCHBOXES. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PRODUCT DAMAGE, PROPERTY DAMAGE, PERSONAL INJURY, OR EVEN DEATH.

1. Hayward Industrial Products, Inc. (Hayward) guarantees its products against defective material and workmanship only. Hayward assumes no responsibility for property damage or personal injury resulting from improper installation, misapplication, or abuse of any product.
2. Hayward assumes no responsibility for property damage or personal injury resulting from chemical incompatibility between its products and the process fluids to which they are exposed. Determining whether a particular PVC, CPVC, or PP product is suitable for an application is the responsibility of the user. Chemical compatibility charts provided in Hayward literature are based on ambient temperatures of 70°F and are for reference only.
3. Hayward products are designed for use with non-compressible liquids.

WARNING

Hayward PVC and CPVC products should NEVER be used or tested with compressible fluids such as compressed air or nitrogen. Use of PVC and CPVC products in compressible fluid applications may result in product damage, property damage, personal injury, or even death.

4. The maximum recommended fluid velocity through any Hayward product is eight feet per second (8 ft/s). Higher fluid velocity can result in damage due to the water hammer effect.
5. Piping systems must be designed and supported to prevent excess mechanical loading on Hayward products due to system misalignment, weight, shock, vibration, and the effects of thermal expansion and contraction.
6. The effect of temperature on plastic piping systems must be considered when the systems are initially designed. The pressure rating of plastic systems must be reduced with increasing temperature. Maximum operating pressure is dependent upon material selection as well as operating temperature. Before installing any Hayward product, consult Hayward product literature for pressure vs. temperature curves to determine any operating pressure or temperature limitations.
7. PVC and CPVC plastic products become brittle below 40°F. Use caution in their installation and operation below this temperature.

WARNING

Hayward PVC and CPVC products should not be used in services with operating temperature below 34°F.

8. Due to differential thermal expansion rates between metal and plastic, transmittal of pipe vibration and pipe loading forces, **DIRECT INSTALLATION OF PLASTIC VALVES INTO METAL PIPING SYSTEMS IS NOT RECOMMENDED**. Wherever installation of plastic valves into metal piping systems is necessary, it is recommended that at least 10 pipe diameters in length of plastic pipe be installed upstream and downstream of the plastic valve to compensate for the factors mentioned above.
9. Published operating torque requirements are based on testing of new valves using clean water at 70°F. Valve torque is affected by many factors including fluid chemistry, viscosity, flow rate, and temperature. These should be considered when sizing electric or pneumatic actuators.
10. Systems should always be depressurized and drained prior to installing or maintaining any Hayward product.

WARNING

All power must be disconnected from its source prior to removing the cover, making any electrical connections, or adjusting the limit switches. Failure to disconnect power may result in product damage, property damage, personal injury, or even death.

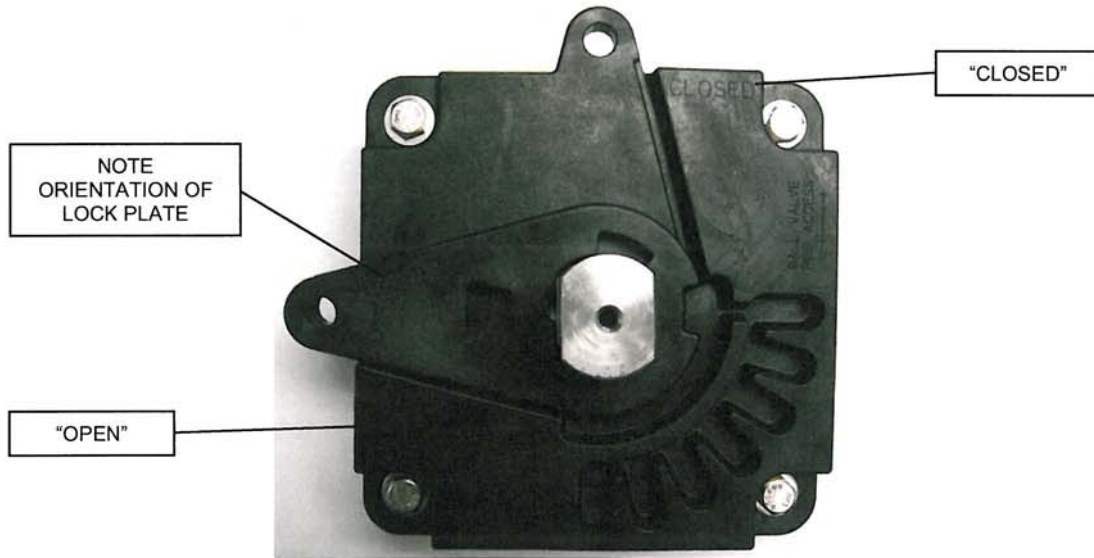
INSTALLATION:

Mounting the switchbox to a valve:

The switchbox is available in two sizes. The LHB-1 Series is designed to fit ½" – 2" TB-Series Ball Valves as well as 2" – 4" BY-Series Butterfly Valves. The LHB-2 Series is designed to fit 2-½" – 6" TB-Series Ball Valves as well as 6" – 8" BY-Series Butterfly Valves. The switchbox will require a mounting kit for adapting to ½" – 2" TB Series Ball Valves. The switchbox will direct mount to all other TB and BY series valves.

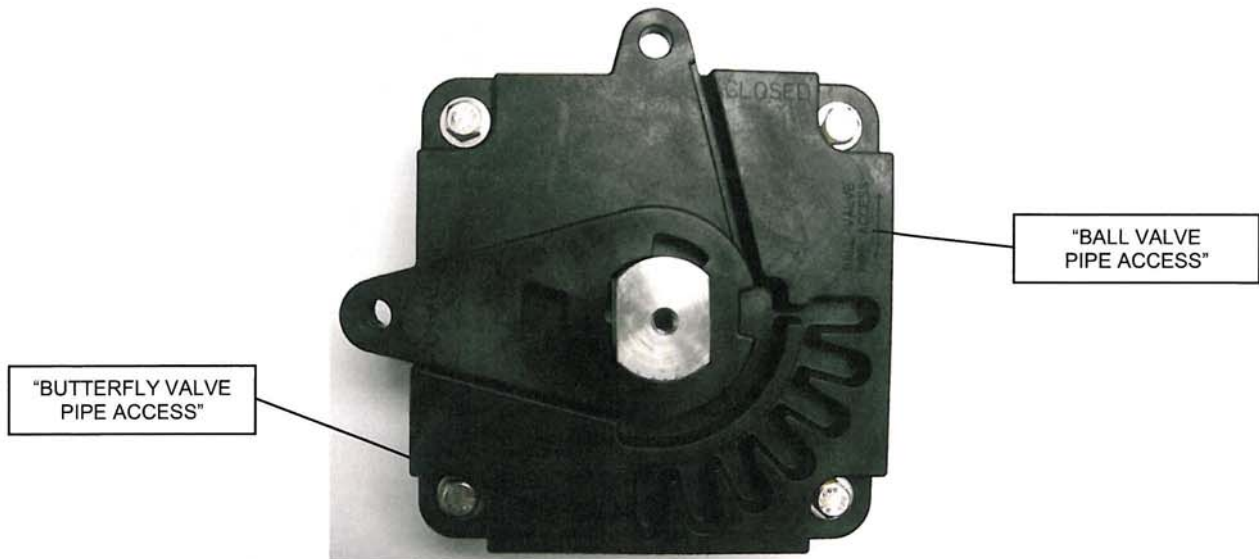
Both sizes of the LHB Series switchboxes are available with ISO 5211 compliant bolt patterns. The LHB-1 Series is available with F05 or F07 bolt patterns. The LHB-2 is available with F07 or F10 bolt patterns. Both sizes of the LHB Series switchboxes are also available with a non-ISO bolt pattern sized to match Hayward BY-Series butterfly valves.

The switchbox is shipped from the factory in the open position. This can be verified by the proximity of the lock plate to the "OPEN" text on the switchbox cover.

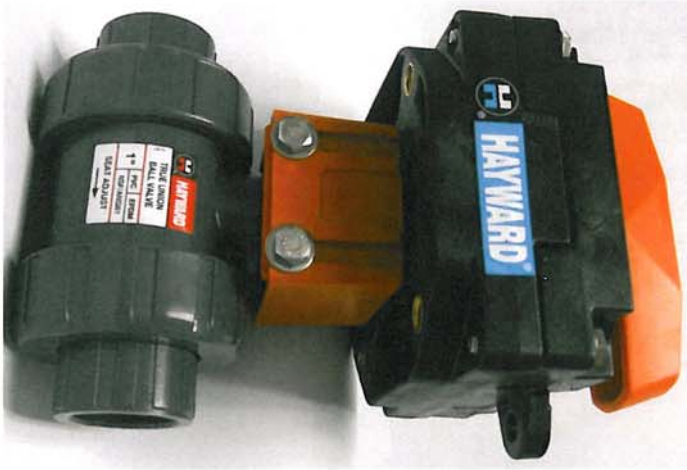


The switchbox should always be installed to the valve with the valve and the switchbox both in the same position (either fully open or fully closed). If this step is not followed, the switchbox will provide inaccurate feedback.

The cover of the switchbox has two arrows perpendicular to each other. The first arrow is labeled "BUTTERFLY VALVE PIPE ACCESS". The second arrow is labeled "BALL VALVE PIPE ACCESS". It is important to note this text and to install the switchbox so that axis of the pipeline parallel to, or in the same direction as, the appropriate arrow. If this step is not followed, the handle will not be oriented correctly with the valve.



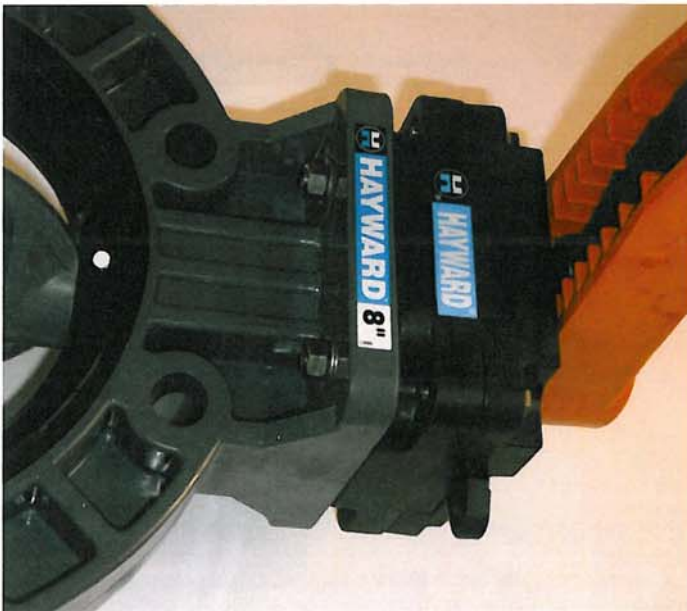
After mounting the switchbox to the valve, the original valve handle can be installed to the top of the switchbox.



LHB-1 Series mounted to Hayward TB-Series ball valve via mounting bracket and ISO 5211 F05 bolt pattern.



LHB-2 Series mounted to Hayward TB-Series ball valve via mounting flange and ISO 5211 F10 bolt pattern.



LHB-2 Series mounted to Hayward BY-Series butterfly valve via mounting flange and non-ISO bolt pattern.

Making electrical connections to the switchbox:

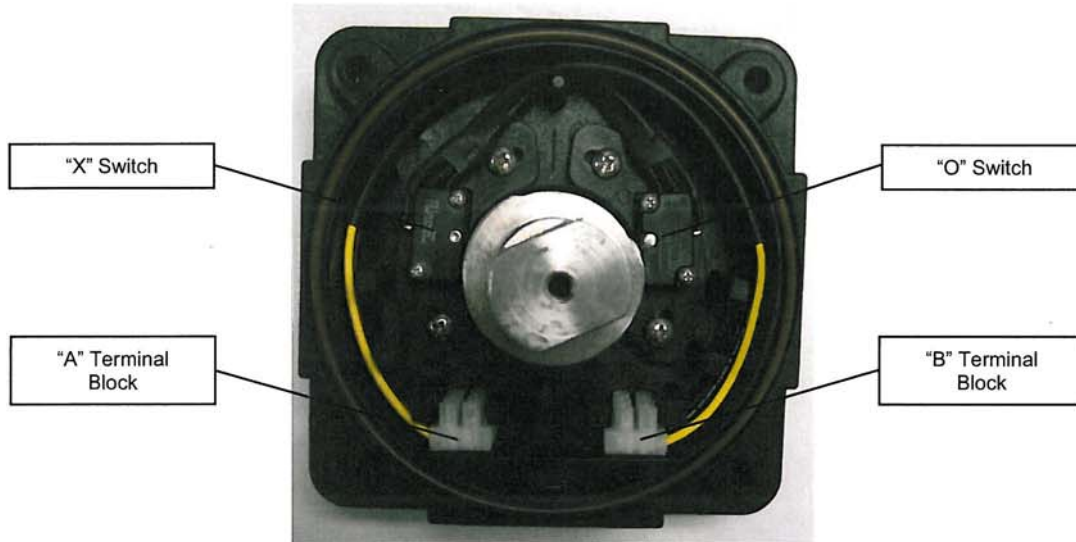
WARNING

All power must be disconnected from its source prior to removing the cover, making any electrical connections, or adjusting the limit switches. Failure to disconnect power may result in product damage, property damage, personal injury, or even death.

To maintain NEMA 4X rating of switchbox, all wiring must enter through the ½" NPT conduit port. The conduit port must be sealed via conduit, cable gland, or other acceptable means.

To access the electrical connections, remove the locking plate from the shaft by gently prying between the locking plate and the cover. Use a 7/16" wrench or socket to remove the four screws that retain the cover and lift the cover off of the base and over the shaft.

The switchbox is shipped from the factory with two limit switches and two terminal blocks. Switch "O" is connected to terminal block "A". Switch "X" is connected to terminal block "B". Switch "O" provides indication that the valve is or is not in the fully open position. Switch "X" provides indication that the valve is or is not in the fully closed position.



Terminal block "A" is tied to switch "O" with three wires. The yellow wire is the common. The red wire indicates that the valve has reached the fully closed position. The black wire indicates that the valve is not in the fully closed position.

Terminal block "B" is tied to switch "X" with three wires. The yellow wire is the common. The red wire indicates that the valve has reached the fully open position. The black wire indicates that the valve is not in the fully open position.

CAUTION

When the valve is between fully open and fully closed, the black wires on terminal block "A" and on terminal block "B" will be energized.

Adjusting the limit switches:

WARNING

All power must be disconnected from its source prior to removing the cover, making any electrical connections, or adjusting the limit switches. Failure to disconnect power may result in product damage, property damage, personal injury, or even death.

The switchbox is shipped from the factory initial settings for limit switch position. However, these are general settings and should be adjusted after installing the switchbox to a valve.

NOTE: If the switchbox is mounted to a valve from the factory, the switches will be adjusted for the valve from the factory and no adjustment is necessary.

To adjust switch "O":

Remove the handle, cover, and locking plate from the base of the switchbox.

Turn the switchbox shaft until the valve is fully closed.

Loosen the adjustment plate retaining screws.

Adjust the switch position until the switch disengages from the shaft (you will hear a faint clicking noise as the switch engages / disengages).

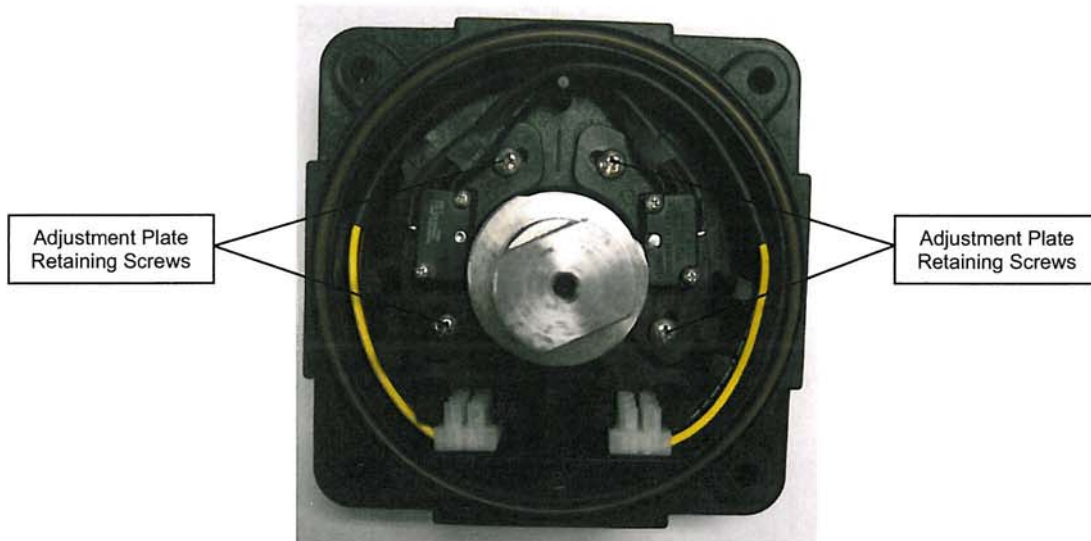
Retighten the adjustment plate retaining screws.

Rotate the shaft to full open and back to full closed to verify that the switch engages / disengages as desired.

Reinstall the handle, cover and locking plate.

To adjust switch "X":

Remove the handle, cover, and locking plate from the base of the switchbox.
Turn the switchbox shaft until the valve is fully open.
Loosen the adjustment plate retaining screws.
Adjust the switch position until the switch disengages from the shaft (you will hear a faint clicking noise as the switch engages / disengages).
Retighten the adjustment plate retaining screws.
Rotate the shaft to fully closed and back to fully open to verify that the switch engages / disengages as desired.
Reinstall the handle, cover and locking plate.

**OPERATION:**

After installation of the switchbox, the valve can be operated as it was prior to installing the switchbox. Rotating the handle fully clockwise will close the valve, rotating the handle fully counter-clockwise will open the valve. If the switchbox is installed on a BY-Series butterfly valve, the latching handle will engage detents on the switchbox.

ENGAGING THE LOCKOUT FEATURE:

To lock the valve in the fully open or fully closed position; rotate the valve to the desired position, then place a padlock, locking hasp, or other locking mechanism through the hole in the locking plate and the corresponding hole on the switchbox cover.

MAINTENANCE:

Minimal maintenance is required. If a switch requires readjustment, this can be completed by following the installation instructions above.

PARTS LIST:

