iVL Range Installation and Operating Manual

Introduction

This document provides necessary information for the installation and commissioning of the iVL Range linear electric actuator. Each unit is shipped from the factory with initial calibration of cams and switches completed for ranges between 0 to 100 mm of linear travel . However, these are general settings and serve as a starting point for proper calibration of the actuator in its real-world application.

Only competent and trained personnel should install, maintain and operate iVL actuators. Any work related to an actuator must be carried out in accordance with this manual, accompanied manuals and related codes and regulations. Local workplace health and safety rules should always be followed.

NOTE: Throughout the documentation we reference EXTEND/DOWNWARD travel as moving CLOSE and RETRACT/UPWARD travel as moving OPEN.

NOTE: It is recommended to supply Innovative Actuation Incorporated with the exact linear travel requirements of the valve so that an accurate mechanical position indicator can be provided.

Receiving/Inspection

1. Carefully inspect for shipping damage. Damage to the shipping carton is usually a good indication that it has received rough handing. Report all damage immediately to the freight carrier and your seller.
2. After unpacking the product and information packet, please take care to save the shipping carton and any packing material in case of product return or replacement. Verify that the item on the packing list or bill of lading is the same as your own documentation. If there is any discrepancy, please contact the seller.

Storage

1. If the actuator cannot be installed immediately, store it in a clean dry environment. The actuator must be protected from excess moisture and dust until you are ready to connect the electrical cables. The actuator should not be installed outside unless it is powered up and has the proper conduit connections.
2. If the actuator has to be installed but cannot be wired, please don't remove the plastic cable entry plugs. When the actuator is wired, it is recommended to replace with water-proof conduit fittings.
3. Storage temperature should be within the standard operating temperature range of the actuator.

Check Points before proceeding to the installation of actuator to valve or damper

1. Check the actuator nameplate for the output thrust of the actuator. The output thrust should be a minimum of 30% greater than the actual maximum requirement of the valve.
2. Check to ensure that the enclosure rating is suitable for the area of installation.
3. Check the wiring diagram as per the wiring diagram code on the nameplate and confirm that it meets with the electrical requirements.
4. Check the actuator nameplate for correct voltage prior to wiring.

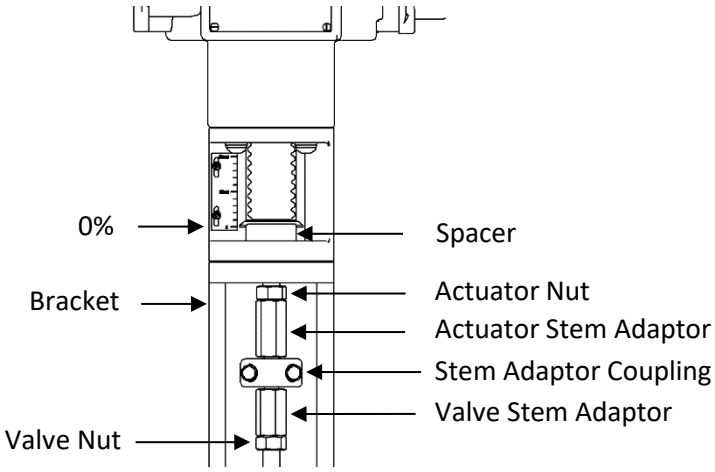
Actuator Installation

1. The actuators have been factory calibrated to operate between 0 to 50mm for the smaller units and 0 to 100mm for the larger units. **The linear products will not require recalibration of any travel limit settings. The downward travel (CLOSE) is stopped when either the maximum thrust value is reached or the CLOSE limit switch is tripped. The upward travel (OPEN) is stopped when the OPEN limit switch is tripped or when the maximum thrust valve is reached.**

NOTE: It is recommended to supply Innovative Actuation Incorporated with the exact linear travel requirements of the valve so that an accurate mechanical position indicator can be provided.

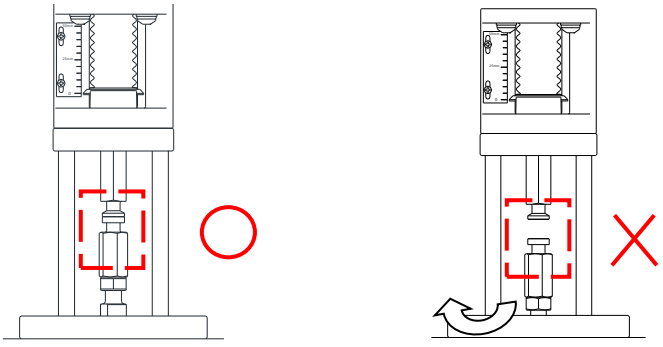
2. The actuators are shipped in the FULLY downward position.
3. Fully CLOSE the valve or damper to which the actuator is to be mounted. Remove valve/damper mechanical stops. Do not remove the nuts on the valve stem.
4. Assemble necessary adaption components and attach the actuator flange to the valve or damper flange.
5. Tighten mounting bolts, making sure actuator stem is aligned with the valve stem.

6. Manually rotate the actuator handwheel clockwise until it is at the FULLY downward (CLOSE) position. The mechanical indicator should be at 0%. **Do NOT go beyond 0% on the mechanical position indicator**. (See below for instructions on Manual Override)



7. ***Do NOT remove the spacer before completing the installation procedure.*** Loosen the screws of the Stem Adaptor Coupling, remove it, and place it aside. Rotate the Valve Stem Adaptor into the valve's stem as far as it can go. **Do not rotate the Actuator Stem Adaptor at this time.**

8. Confirm the position of connecting stem adaptors.



Correct

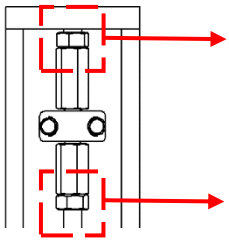
Wrong

<u>Solution</u>: Rotate the Valve Stem Adaptor in the CW direction until the bottom adaptor touches the surface of Actuator Stem Adaptor.

Caution: The length of the Valve Stem Adaptor thread engagement must at least exceed the diameter of the valve stem. If not, please adjust the Actuator Stem Adaptor.

9. Replace and tighten the Stem Adaptor Coupling. **Note: The required force to lock both sides of the bracket should be the same.**

10. Mutually tighten the Valve Nut and the Valve Stem Adaptor then the Actuator Nut and Actuator Stem Adapter.



11. The spacer can now be removed.
12. Remove the cover and make the electrical connections as per the wiring diagram.
13. Connect the ground wire to PE inside the electric actuator.
14. Replace cover and secure covers screws.
15. Utilize the handwheel to check for unobstructed manual operation from fully DOWN to fully UP positions. (See below for instructions on Manual Override)
16. Do NOT apply power at this time. See Commissioning below.
17. Check below explanation of Duty Cycle. The intended service should not go above the maximum duty cycle as noted on the actuator nameplate.

Installation Notes

• These actuators are designed to be used between a horizontal and upright position. Do NOT mount the assembly with the actuator top below a horizontal position.
• When installing conduit, use proper techniques for entry into the actuator. It is preferred to have the conduit entries facing downward. Use drip loops to prevent conduit condensate from entering the actuator. Use proper fittings to maintain the NEMA 4X integrity of the housing. Seal (pot) the conduit entries.
• Use proper wire size to prevent actuator failure.
• All terminals accept 12-18AWG solid/stranded wire.
• Do not touch any components on the PCB with metal tools or bare hands.
• The internal heater is to be used in ALL applications.
• Do NOT install the actuator outdoors or in humid environments unless it is powered up and the heater is functioning.
• Do NOT parallel wire multiple actuators together without utilizing isolation relays! If this is your intention, please contact Innovative Actuation Incorporated for a multiple actuator parallel wiring diagram.

Duty cycle

Duty cycle is the percent of time that an actuator spends running as a fraction of the total time. Duty Cycle is directly related to heat; excessively repositioning an actuator typically results in motor overheating which can cause permanent damage and/or reduced service life.

Duty cycle can be calculated as follows:
(example iVL-A range actuator running 83 seconds ON and 120 seconds OFF)
Runtime = 83s, Total time = 83s + 120s = 203s, therefore this duty cycle would be 41% (83/203). Standard duty with iVL range actuators is 75% so it is within the allowed limit.

Commissioning
This procedure will assume that the actuator is installed correctly both mechanically and electrically with correct power and has been manually cycled.

1. Electrically test Full OPEN (Upward) and CLOSE (Downward) Positions
    - **A. Apply power to terminals as shown on the wiring diagram to OPEN valve or damper.**
        - I. The actuator will drive to the full OPEN (Upward) position (as viewed from ABOVE the actuator).
        - II. The mechanical indicator should point to 100%.
    - **B. Apply power to terminals as shown on the wiring diagram to CLOSE valve or damper.**
        - I. The actuator will drive to the full CLOSE (Downward) position (as viewed from ABOVE the actuator).
        - II. The mechanical indicator should point to 0%.

Manual Override (iVL Range)

1. A handwheel is supplied to be used as a manual override.
2. The handwheel is engaged by pressing it inward. This will prevent electrical operation.
3. The handwheel is disengaged by pulling it outward.
4. Clockwise rotation closes the valve or damper.
5. Counter clockwise rotation opens the valve or damper.
6. The handwheel does not rotate when the actuator motor is running.
7. Do NOT utilize any mechanical advantage devices to rotate the handwheel (pipes, wrenches, extension bars, etc.).

CAUTION

After users press the handwheel toward actuator to operate manually, remember to pull handwheel out again so the actuator can be operated electrically. If users do not pull out completely, the linear actuator will not operate electrically.