

Installation Guide | Rev. A

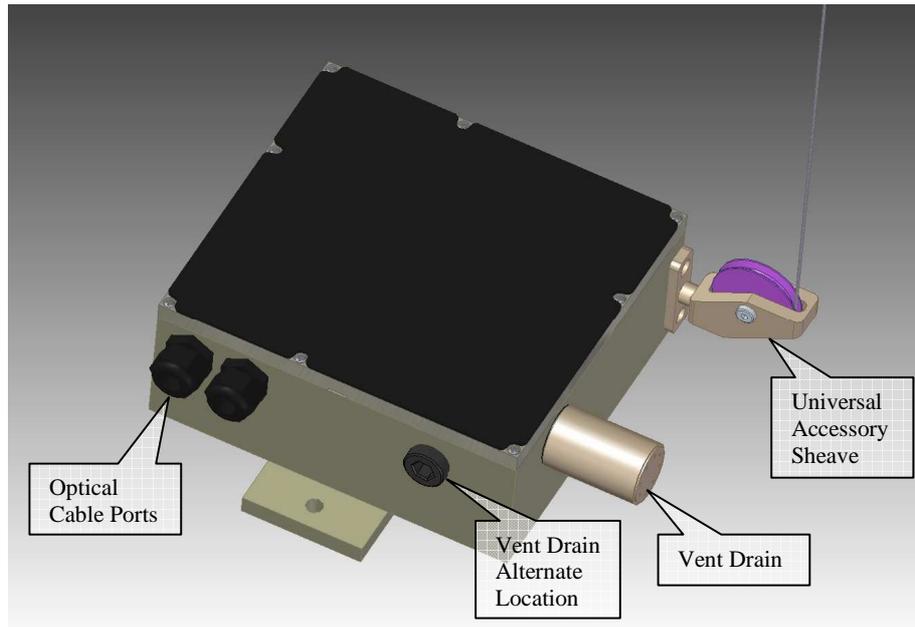
# Optical Displacement Gage | **os5500**

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**Figure 1** – os5500 Displacement Gage with Universal Accessory Sheave

### Introduction:

This installation guide provides details regarding the installation of the os5500 displacement gage. This gage is designed to measure 150, 300 or 450 mm range depending on the version ordered. Figure 1 above shows the gage with the optional Universal Accessory Sheave that will simplify the installation process for many situations. All Gages are supplied with one vent drain and two meters of wire rope as standard.

### Preparation:

**Surface Preparation and Layout** - The surface must be properly prepared prior to mounting the gage. The surface should be clean and flat where the mounting bracket is to be attached. The moving section that is to be monitored should move in a direction near perpendicular to the face of the gage that the wire rope exits from. If there is continuous movement in the moving section and the direction is not perpendicular to the gage face, wear can occur on the wire rope and eventually cause a failure. To accommodate for this type of motion please use the Universal Accessory Sheave (shown in figure 1 above) that is available from Micron Optics.

**Gage Orientation for Wet Environments** - To install the gage in a wet environment, such as outdoors where it can be exposed to rain, it is recommended that the gage be oriented such that the wire rope exits the bottom of the gage to minimize the possibility of water entering over the long term. In this case, locate the drain vent on the bottom side of the gage. If the wire rope needs to measure in a direction other than in the vertical downward direction, please consider using the Universal Accessory Sheave for best long term performance. If the gage needs to be installed in the horizontal orientation, locate the drain vent to the bottom side of the gage. Remove the 1/2" NPT plug with a 3/8" hex key (a 9mm hex key will also work) and swap positions with the drain vent. Be sure to apply sealant to the plug when installing.

**Universal Accessory Sheave** – If ordered this sheave will be shipped separately with the gage. Attach the sheave to the gage using the two screws provided after threading the wire rope through the center hole. Rotate the sheave to the desired orientation then tighten the two screws to secure it in that position.

### Gage Installation:

- Position the gage on the stationary surface to monitor such that the wire rope exit is aligned with the direction of movement. If this is not possible, then use the Universal Accessory Sheave. Please note that the customer can install other sheaves as necessary to perform an accurate measurement.



- Mark the hole locations for the gage then remove the gage and drill two holes. The gage mount will accept 5/16 or M8 screws.
- Secure the gage in place. Tighten to substrate securely to prevent any movement.
- Determine the range of displacement to be measured and the current relative position of the two parts. The midpoint of the measurement range should coincide with the midpoint of the travel of the moving part as much as possible. The os5500 gages have limited over travel per the table below. If the over travel, built into the gauge, can be exceeded, a safety release mechanism should be attached to the end of the wire rope to prevent gage damage. The active measurement range begins in the position with the wire rope fully retracted and is calibrated over the specified travel for that range.

Gage Travel	Over Travel
150 mm	315 mm
300 mm	165 mm
450 mm	15 mm

- Attach the wire rope to the moving substrate. It is recommended to clamp it to the substrate. If a loop is placed on the end of the wire rope, it should be a tight fit over the post (hook) since the loop will have flex in it and cause error in the measurements. To maximize accuracy, strip the FEP jacket off of the wire rope and clamp directly on the stainless steel wire.

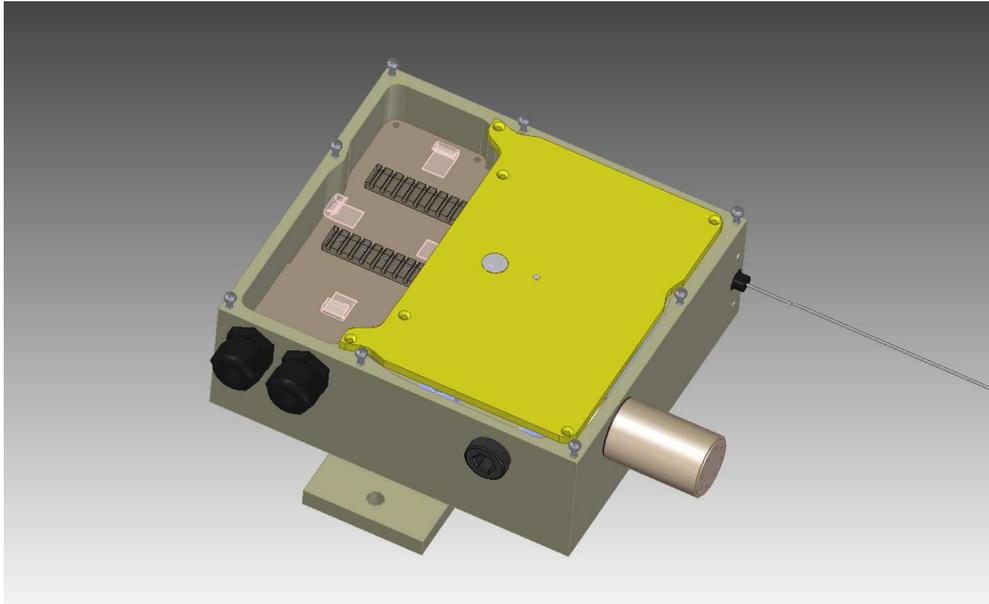
**Mechanical Protection:**

For many installations mechanical protection will be needed to protect the gage from the environment. The gage is rated for IP65 protection and is discussed above. Protection for the wire rope may be needed in harsh environments to protect from ice, snow and animals to insure the best measurement accuracy possible. Suggestions include feeding a portion of the wire rope through a pipe or protect it with a shroud appropriate for the installation conditions.

**Optical Connections:**

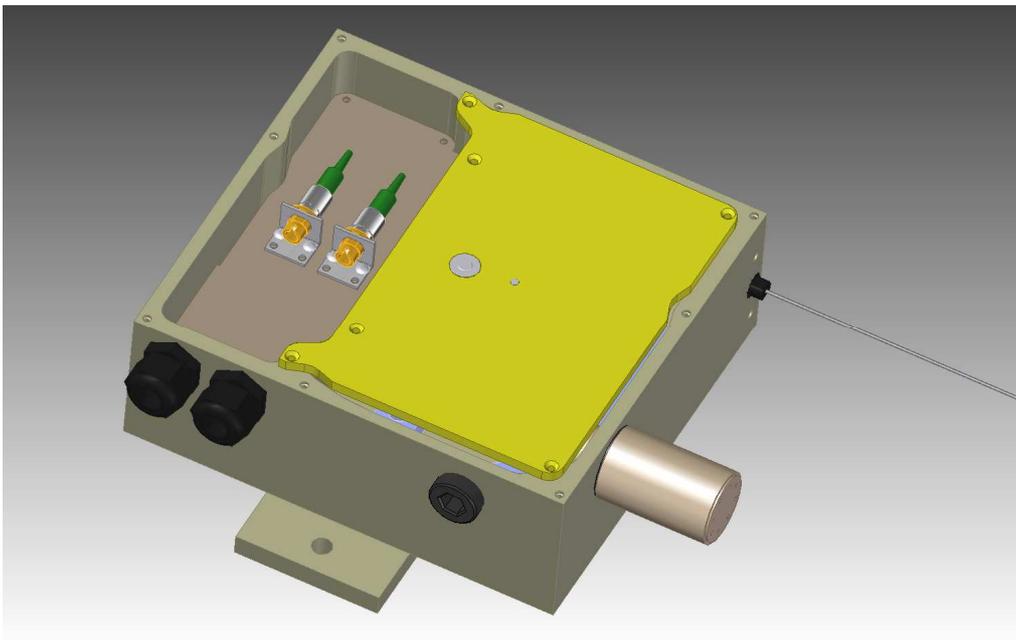
The os5500 gage is a pass through design that allows connection to the gage inside of the enclosure eliminating the need for a separate junction box. To access the connections, remove the eight screws using a #2 Phillips screwdriver.

- Fusion Splice Option FS – This option allows the user to fusion splice the two fiber ends directly to the main cables connecting to other gages (see Figure 1). The cable glands will accept cables from 3 to 7 mm diameter.
  - Remove the cable jacket to expose the desired buffered fibers. Insert the fiber and cable through the glands and tighten using a 22mm or 7/8" wrench. Note that the cable glands are designed to form a seal only. Mechanical clamping or anchoring of the cable should be provided outside of the gage to support the cable.
  - Prepare to splice the fibers. Approximately one meter of buffered fiber on each end is provided for fusion splicing. Based on the installation location and accessibility to a fusion splicer cut off as much excess fiber as possible to minimize the amount of fiber needed to be coiled up inside of the enclosure.
  - Install a splice sleeve on one fiber; prepare the fiber ends and fusion splice. Position the splice sleeve and heat. The splice sleeve should have a shrunk diameter of approximately 3 mm to fit the splice sleeve holder properly.
  - Coil the fiber into the trays insuring that there are no sharp bends in the fiber. Tape may be used as necessary to insure that the fibers are held in place.
  - Install the cover insuring that the o’ring gasket is in place and that no fibers will get pinched. Tighten all screws.



**Figure 2 – Fusion Splice Option**

- FC/APC Connector Option FC – This option allows the user to connect directly to the gage with FC/APC connectors. The connectors will be connected to the FC/APC adapters shown in figure 3.



**Figure 3 – FC/APC Connector Option**

- The cable glands will accept cable diameters from 3 to 7 mm diameter.
  - Remove the cap nuts from the cable glands and remove the cable glands from the gage.
  - Remove the seal using a pin as shown in figure 4 below.



**Figure 4 – Removing Seal with Pin**

- Use a larger pin to open up the end of the gland body to make it easier to reinstall the seal.



**Figure 5 – Cable Gland Body**

- Use a sharp utility knife to slit the seal as shown in figure 6.
- Slip the seal over the cable behind the connector oriented such that the small diameter end is pointed towards the cap. See figure 6 below.
- Remove pin from gland body and Insert connectorized cable.
- Push the seal back into the body. Be sure that the slit is aligned and mated together uniformly and is properly seated in the body. Note that after the seal is pushed in, if the slit does not look well aligned, it is probably not seated properly. Check the other end of the body to verify. Screw on cap by hand.



**Figure 6 – os3155 Weld Locations**

- Insert connector into gage and screw in cable gland. Tighten with wrench.
- Clean and attach connector to gage.

- Clamp cable in gland by tightening gland cap. Once seal makes contact with cable jacket, tighten one full turn to seal gland around cable. Be sure that there is some slack in the cable when tightening.
- Repeat for other cable.
- Install the cover insuring that the o-ring gasket is in place. Snug up all screws first using an alternating pattern then tighten all screws.

Hook up displacement gage to instrument and verify that all optical connections are good. Add mechanical protection for the gage as may be required based on the environment that the gage is installed in.