SWA-01, Installation procedure

Introduction

The aim of this document is to describe the installation procedures applicable for installation of the SWA-01 strain sensor on a surface of a monitored object.

The document is focused on the spot-welding method which is the primary and recommended method for achieving a long term stable bond between the monitored structure and the SWA-01 sensor.

Other installation possibilities are mentioned in the last chapter.

Installation requirements

Instruments & Tools

- Standard spot welding machine (capable of 35 – 50J) for 0.2mm stainless steel plates. Typically this works well with regular spot welders used for electrical gauges.
- FBG interrogator (optional)

Installation time

Typical spot welded installation time of SWA-01 sensor: **between 5-10min** (surface preparation not taken into account).

Installation sequence

This sequence is described in next chapters in more details. Time indicates estimated time efforts.

(1) Surface preparation for spot welding [5 minutes] [1)]

(2) Spot welding of the sensor to the surface [5 minutes]

[1)] Time for completing highly depends on the surface of the monitored object.

(1) Surface preparation for spot welding

Regardless of the installation method, it is advisable and in some cases even necessary to properly treat the surface of SWA-01 and the surface to which the sensor should be applied. This process includes mechanical cleaning of the surface using abrasive materials and removing any paint, rust, debris or similar imperfection from the surface.

Chemical treatment of the surface is advice 20min before the installation to avoid of creation of oxide layers on the mechanical treated surface.

Recommended cleaning solvents (not included inside packaging):

- Loctite 7061
- Loctite 7063

(2) Spot welding of the sensor to the surface

Primary and recommended installation method for SWA-01 is spot-welding. The base of the SWA-01 sensor is made from a 0.2mm thick SS304 metal sheet material allowing the usage of common spot-welding tools.

Necessary spot welding area of the sensor are shown in Figure 1 – green area. Follow the number order of spot welds as shown in Figure 1. One side can typically contain 8-10 spot welds as minimum, so around 16-20 spot welds for both green areas together.
Additional spot-welds are recommended in red areas to ensure the sensor is securely mated over its entire length with measured object. You can apply 2-3 spot welds per red section, so additional 4-6 spot welds for all red areas together.

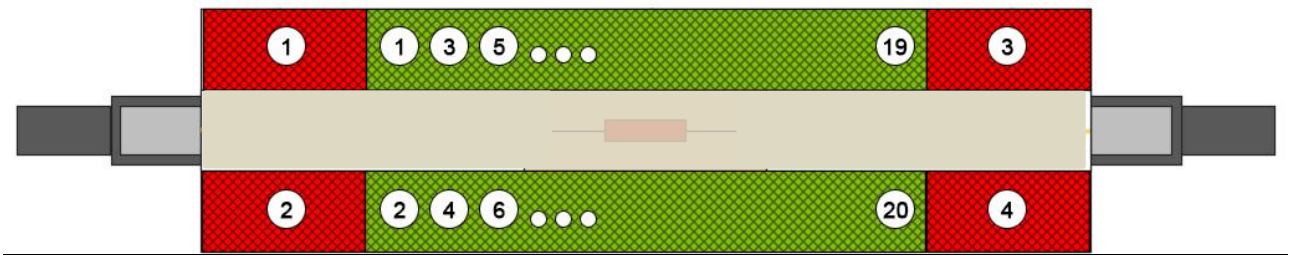

Figure 1: Recomended area of spot-weld.

Other possible installation methods

While the spot welding is the recommended installation method, other methods can be applied to secure the sensor on the surface of measured object.

Chemical installation (glue bonding)

Chemical installation is based on using an adhesive that bonds the sensor with the measured surface. The glue is not supplied with the sensor.

The selection of the right glue highly depends on the material of the surface and environmental conditions. Special curing procedures such as elevated temperature, pressure or air humidity can be required by using such adhesives.

The glue has to be applied on the whole bottom metal area of the SWA-01.

After curing the adhesive the sensor is ready to measure. Small wavelength shift can occur during bonding but shouldn't exceed ±150pm.

Additional protection

Depending on the environment and installation conditions it's recommended to protect the sensor after installation to ensure appropriated mechanical protection and also to ensure continues long term performance

There is no straightforward guide how and with what material should the sensor be protected but in general, materials from the "STOPAQ" series are highly recommended to be used as the additional coverage.

For more information contact our sales team at sales@sylex.sk

* Specifications are subject to change without notice