

# INSTALLATION INSTRUCTIONS FOR THE **CURRENT SENSORS** **CSSV1500 SERIES**

**3013-2563**

Issue A

## **⚠ WARNING** **PERSONAL INJURY WARNING**

**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.**

## **1.0 PRODUCT DESCRIPTION**

The CSSV1500 current sensor is based on Hall technology and CANBUS output. It can be used to measure 1500 A rated current using a proprietary digital compensation technology.

## **2.0 SCOPE**

This document provides installation instructions of CSSV1500 for optimal sensor performance. The document provides recommendations of the primary conductor shapes and clear distances in order to avoid any disturbances due to external magnetic fields and ferromagnetic material. To ensure the accuracy of the sensor, Honeywell strongly recommends the customer to install sensor, relay, and copper bar in accordance with this guide, or check the installation with a Honeywell engineer.

The busbar used in the document is made of copper, 22 mm width and 3 mm thickness. The relay used in the test is SCII EVT250-12AD.

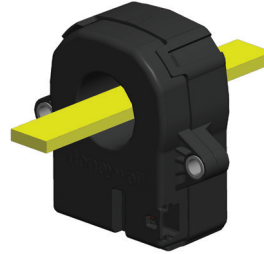
## **3.0 INSTALLATION GUIDE**

### **3.1 Primary conductor shapes**

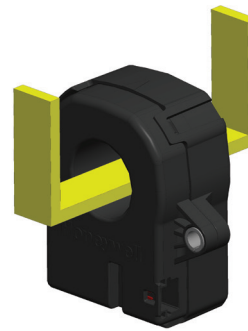
When the primary current flows through the conductor, a magnetic field is generated. The CSSV1500 sensor can sense the magnetic field and convert to current readings.

The primary conductor can be cable or busbar. The long straight copper bar across the center of the sensor's circular hole is accurate positioning. If the primary conductor is not properly installed as shown in Figure 1, the sensor accuracy may be affected.

**Figure 1a. CSSV1500 Optimal Configuration**

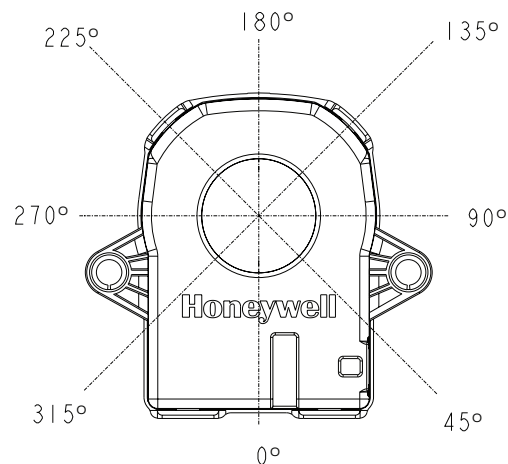


**Figure 1b. CSSV1500 Bad Configuration**

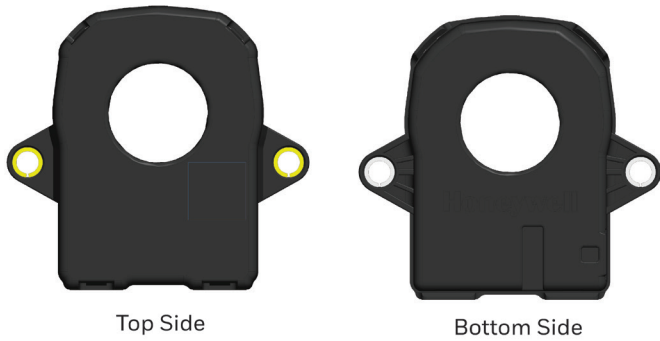


The shape of the primary conductor and clear distance in order to avoid any disturbances will be discussed in the following pages. The angles in test items are defined as Figure 2, and the top and bottom side of current sensor are defined in Figure 3.

**Figure 2. Angle Definition**

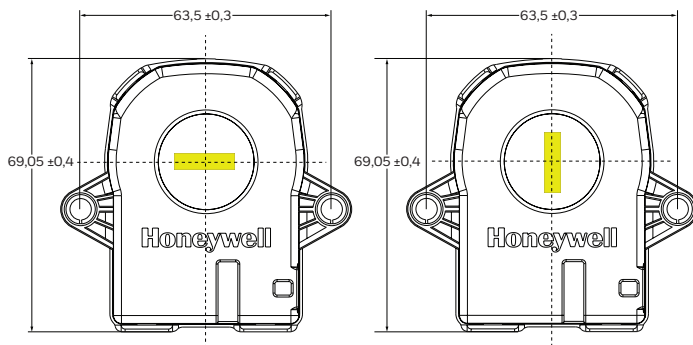


**Figure 3. Current Sensor Side Definition**



Based on test results, Honeywell strongly recommends customers to put the conductor in the center area of the sensor's aperture as shown in Figure 4.

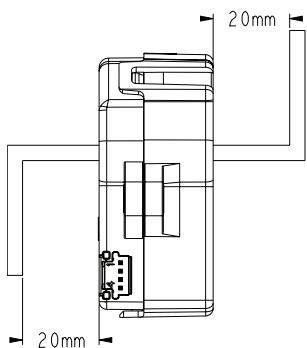
**Figure 4. Busbar Suggested Installation Position**



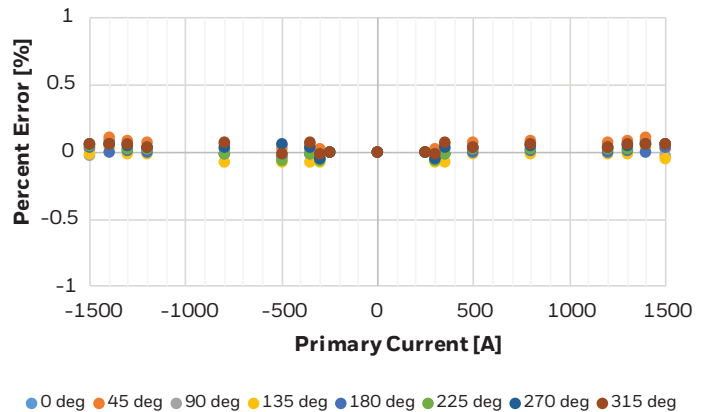
**3.1.1 Z-Shape Conductor**

The Z-shape primary conductor is installed on the current sensor as in Figure 5. According to the above definition of angles, the accuracy of some angles and distances have been tested as shown in Figures 6 and 7.

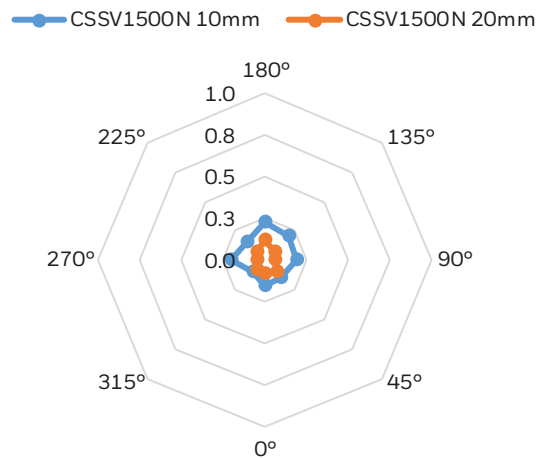
**Figure 5. CSSV1500 with Z-shape Busbar Installation at an Angle of 180° at 20 mm**



**Figure 6. Z-shape Busbar - Current Error at 20 mm**



**Figure 7. Z-shape Busbar Installation - Test Result at Different Angle and Distance**

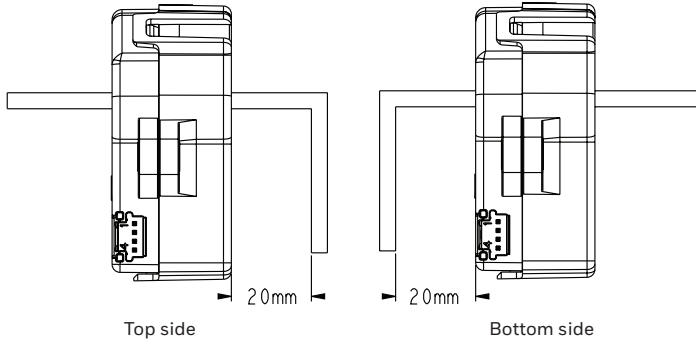


Based on the test results of Z-shape installation, both the distance and the angle of busbar have little influence on the sensor output. To eliminate the thermal effect of the busbar, a distance of more than 20 mm is recommended.

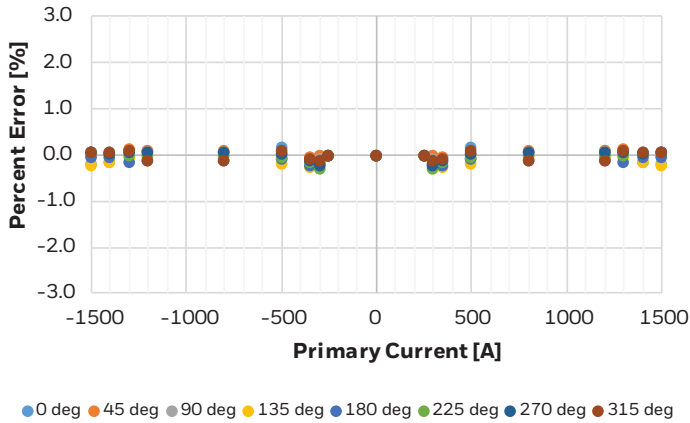
**3.1.2 L-shape conductor**

For the L-shape primary conductor, the distance of the L-shape to sensor and the angle related to current sensor are the two most important parameters, installed as Figure 8. According to the above definition of angles, the accuracy of some angles and distance have been tested as shown in Figures 9, 10, and 11.

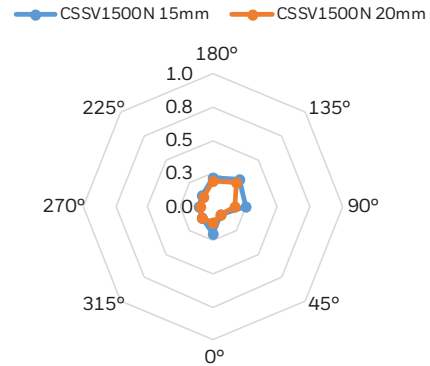
**Figure 8. L-shape Busbar Installation at an Angle of 0° at 20 mm**



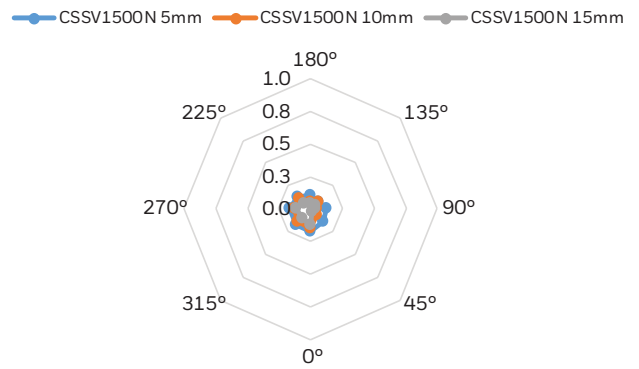
**Figure 9. L-shape Top Side Busbar - Current Error at 20 mm**



**Figure 10. L-shape Top Side Busbar - Installation Test Result at Different Angle and Distance**



**Figure 11. L-shape Bottom Side Busbar - Installation Test Result at Different Angle and Distance**

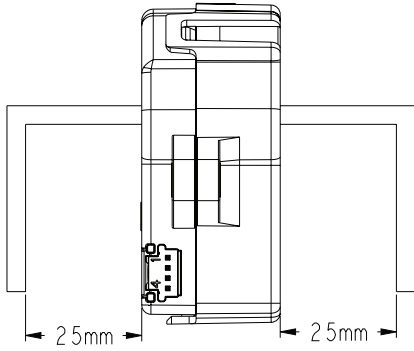


According to the accuracy test of L-shape primary conductor, Honeywell recommends that the distance between the L-shape copper bar and the sensor is greater than 20 mm.

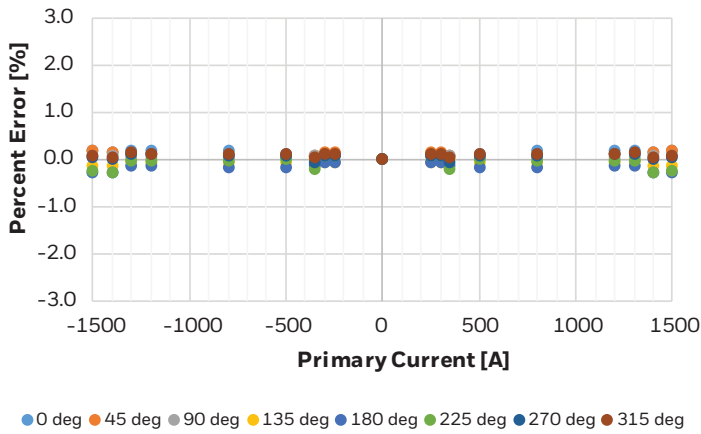
**3.1.3 U-shape conductor**

For the U-shape primary conductor, the distance of the U-shape to sensor and the angle related to current sensor are the two most important parameters. The distance should be greater than 25 mm. Several angles and distances have been tested as shown in Figures 12, 13, and 14.

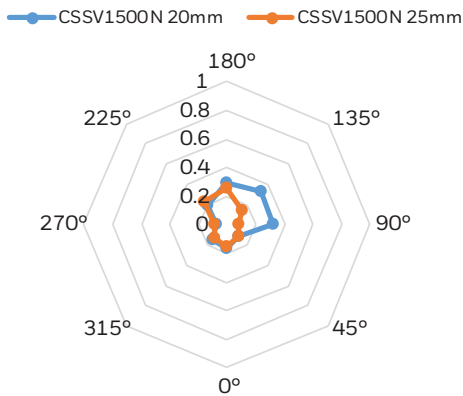
**Figure 12. U-shaped Busbar Installation at an angle of 0°**



**Figure 13. U-shaped Busbar - Current Error at 25 mm**



**Figure 14. U-shaped Busbar - Installation Test Result at Different Angle and Distance**



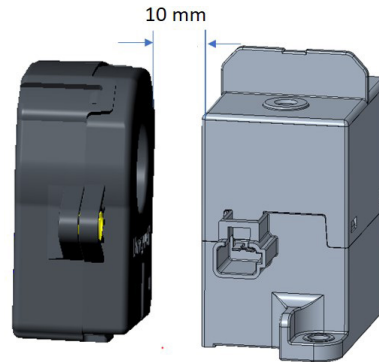
**3.2 Installation Position of Relay**

The nearby ferromagnetic material can change the magnetic field distribution, which may have an impact on accuracy. Ferromagnetic material includes a high voltage relay with built-in permanent magnet, etc.

To ensure that accuracy is not affected, ensure that the top side of the sensor (with QR code surface) deviates from the relay, and the bottom side of the sensor (with connect surface) faces the relay, and keep the distance more than 10 mm. The relay used in the test is SCII EVT250-12AD.

To ensure the accuracy of CSSV1500, Honeywell strongly recommends customers follow this guide when installing sensor, relay, and copper bar, or check the installation with a Honeywell engineer.

**Figure 15. Installation with Relay**



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