

## User Instructions

### Double Blank Sensor Kit

Micro Catalog #	Pico Catalog #	Description
SGS40040-K	SGS40040P4-K	NPN
SGS40041-K	SGS40041P4-K	PNP

Note: Whenever any part of the gripper is replaced including pads the sensor will need to be calibrated again.

### 1. NPN/PNP Sensor Technical Data:

Micro Sensor Connector:	4 - Pin One Key (male) Micro Type Connector
Pico Sensor Connector:	4 - Pin (male) Pico Type Connector
Supply Voltage Range:	10 - 30 VDC
Maximum Continuous load current:	100mA (max)
Operating Temperature Range:	0°C to +60°C
Response Time:	50ms max
Indicator Light:	Red
Short Circuit Protection:	Yes
Overload Protection:	Current Limits at 325mA Typ.
Reverse Polarity Protection:	Up to 36 volts DC
Interface:	3 - wire device
Sensor Housing:	Aluminum (2-piece)
Housing Seal:	IP68

### 2. User Interface:



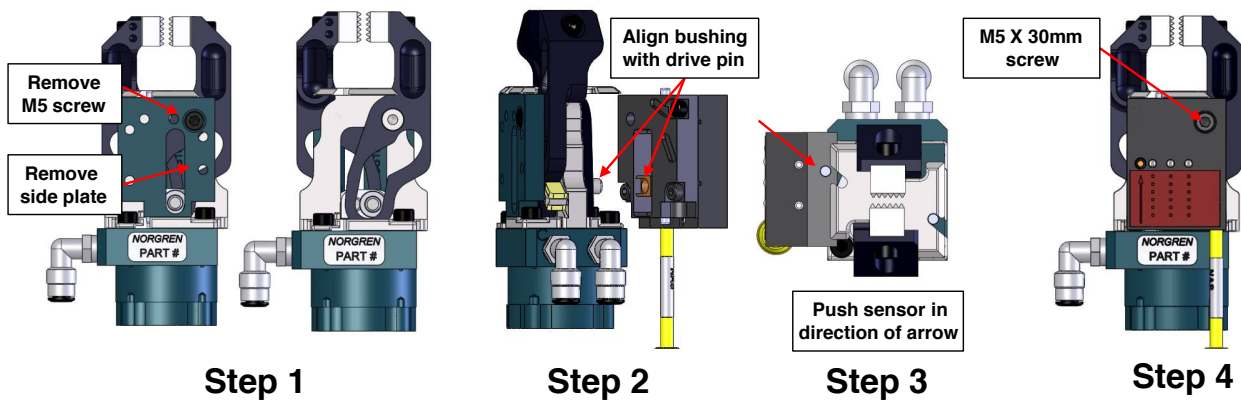
### 3. Installation:

**3.1.** (Step 1) Take off the side plate from the side of the gripper which the sensor is to be mounted to by removing the 5mm screw.

(Step 2) Align the brass bushing in sensor to the drive pin in the gripper.

(Step 3) Keeping the sensor parallel to the side of the gripper, move the sensor close enough so that the dowel pins align with the slots in the frame. From that point the sensor is pushed farther onto the gripper with a motion indicated in the Step 3 figure.

(Step 4) Clean and apply Loctite 262 or equivalent to supplied screw (M5 X 1.0 X 30mm SHCS). Insert screw through sensor and tighten to 72in.-lb.





#### 4. Wiring:

The double blank sensor provides two discrete outputs which are activated based on the material thickness detected each time the gripper closes. Table 1 outlines the various states of the Sensor LED(s), 1 Sheet output and 2 Sheet output.

<b>Table 1</b>			
<b>Gripper state</b>	<b>Red LED(s) state</b>	<b>1 Sheet Output</b>	<b>2 Sheet Output</b>
Un-calibrated	Off	Off	Off
Gripper Closed (no metal)	Off	Off	On
Clamped on 1 sheet	On	On	On
Clamped on more than 1 sheet	Flashing	Off	Off
Gripper Open	Off	Off	Off

These two outputs can be used independently or together. PLC logic can be written to enable the part transfer, stop the part transfer, initiate a double sheet shed routine and provide operator fault warnings depending on the requirements of your application. During calibration the sensor establishes two thresholds which are used to drive the 1 sheet and 2 sheet outputs.

**1 SHEET OUTPUT** – This output will turn on whenever the detected thickness falls between the lower and upper thresholds (a single sheet is present). It will be off while the detected thickness falls below the lower threshold or when the gripper is open.

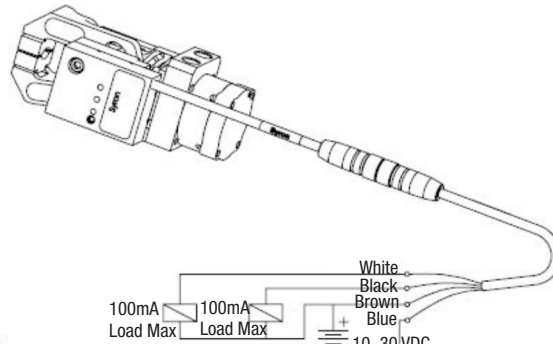
This output can be used by itself with logic written that allows the transfer to proceed if the 1 sheet output turns on, but not proceed if it is off. This approach does not differentiate between a no sheet condition or a multiple sheet condition. The 2 sheet output is required to make this distinction.

**2 SHEET OUTPUT** – This output turns off whenever the gripper detects a material thickness that is greater than the upper threshold as defined above or when the gripper is open. It will be on when below this threshold. The 2 sheet output can be used to stop part transfer and initiate a blank shed or multiple sheet rejection routine.

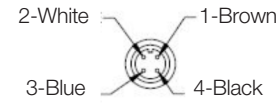
Both outputs can be used together to indicate the following conditions:

- If 1 sheet is on and 2 sheet is on – Allow part transfer to proceed.
- If 1 sheet is off and 2 sheet is on – material is too thin or no part is present.
- If 1 sheet is off and 2 sheet is off – initiate blank shed or blank rejection routine.

## Wiring for NPN Sensors:



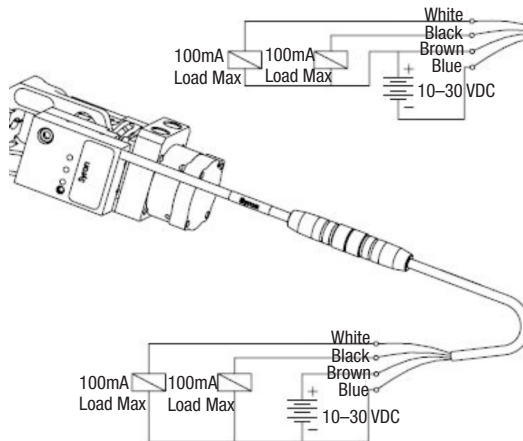
### 4 Pin Male Micro



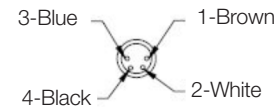
### Connector for PNP/NPN

- 1-V+
- 2-2 Sheet Output
- 3-Common
- 4-1 Sheet Output

## Wiring for PNP Sensors:



### 4 Pin Male Pico



### Connector for PNP/NPN

- 1-V+
- 2-2 Sheet Output
- 3-Common
- 4-1 Sheet Output

## 5. Calibration

### 5.1. Setup

- 5.1.1.** If the sensor has never been calibrated, the Red LED(s) will be off regardless of the position of the jaws. All outputs will be off. Before programming the sensor, the correct set of pads must be installed, and for chisel jaws, the correct jaw must be in place. The pad ranges are listed below.

Single Blank Thickness	Chisel Jaw Movable Jaw Pad Color	Opposing Fixed Jaw Color	Regular/Flange Jaw Moveable Jaw Pad Color	Opposing Jaw Pad Color
0.50mm to 2.0mm	Black (note 1)	Black	Black	Black
2.01mm to 3.5mm	Silver	Black	Silver	Silver
3.51mm to 5.0mm	Black (note 1)	Silver	Gold	Silver
5.01mm to 6.5mm	Silver	Silver	n/a	n/a
6.51mm to 8.0mm	Black (note 1)	Gold	n/a	n/a
8.01mm to 9.5mm	Silver	Gold	n/a	n/a

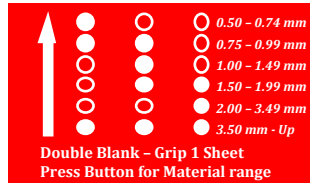
**Note 1:** A shim is required under a black pad when it is installed on a chisel jaw gripper. This shim is included in all black replacement pad kits for the chisel jaw gripper.

- 5.1.2.** The gripper orientation must be adjusted to allow the pads to close flat against the panel. Calibration using small sample sheets allows the sheet to conform to the gripper pad position for accurate calibration. However, calibration using actual panels in the machine requires accurate adjustment of the transfer finger for full closure of the gripper jaws during calibration and in-process measurements.

- 5.1.3.** For best results its is recommended that the blanks be lifted off of the station prior to calibration. This will help to ensure that the gripper has a proper grip on the panel which helps to obtain an accurate calibration point.

## 5.2. Calibration

- 5.2.1.** To program the sensor for a particular material thickness, apply air to the gripper and grip on the material thickness which is to be used for the particular job. With an object such as a small Allen wrench, press the button until the Red LED(s) corresponding to the material range of the job lights as shown on the label.



**5.2.2.** Verify Calibration:

- 5.2.2.1. Close the gripper with no material between the pads. The LED(s) should be off.
- 5.2.2.2. Close the gripper on a single blank of material. The Red LED(s) corresponding to your material range should be on.
- 5.2.2.3. Close the gripper on two blanks of material. The Red LED(s) corresponding to your material range should flash on and off.

### Warning

Improper selection, misuse, age or malfunction of components used in systems can cause failure in various modes. The system designer is warned to consider the failure modes of all component parts and to provide adequate safeguards to prevent personal injury or damage to equipment or property in the event of such failure modes. System designers and end users are cautioned to consult instruction sheets and specifications available from the factory. The system designer/end user is responsible for verifying that all requirements for the application are met.

### Warranty

The products described herein are warranted subject to seller's Standard Terms and Condition of Sale, available at seller's website.

**Proposition 65:** These products may contain chemicals known to the state of California to cause cancer, or birth defects, or other reproductive harm.