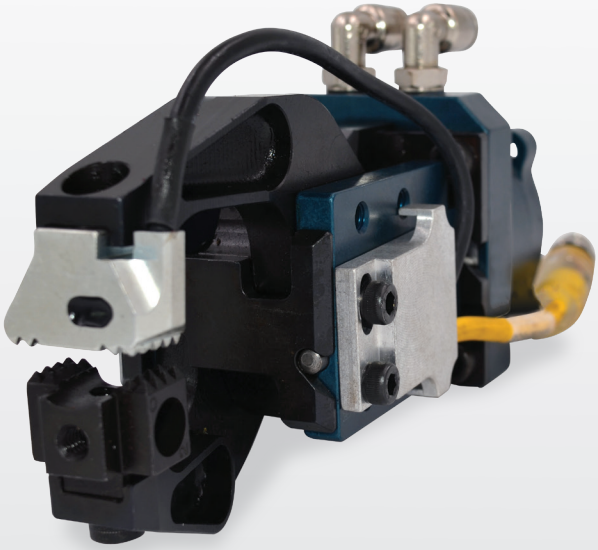
IMI NORGREN

Auto In-plant

PGS20 and PGS42 Series Grippers
User instructions



Engineering GREAT Solutions

IMI Precision Engineering

Table of contents

For internal use only

Revisions record

Revisions	ECN. NO.	BY	DATE
REL	25489	MGF	11/13/08
001	25792	MS	06/23/09
002	25824	MGF	08/04/09
003	25881	RRH	09/25/09

DRAWN	DATE
MFG	10/03/08
CHECKED	**DATE**
RRH	10/05/09
DES ENG	**DATE**
JA	10/03/08
APPR,	**DATE**
DAM	10/05/09

I. Scope:

This document instructs the operator how to use the IMI Norgren PGS20 and PGS42 Grippers. This user instruction covers basic gripper set-up and operation, including: port sizes and function, manual unlocking of jaws, jaw replacement, setting jaw open angle, and accessory mounting.

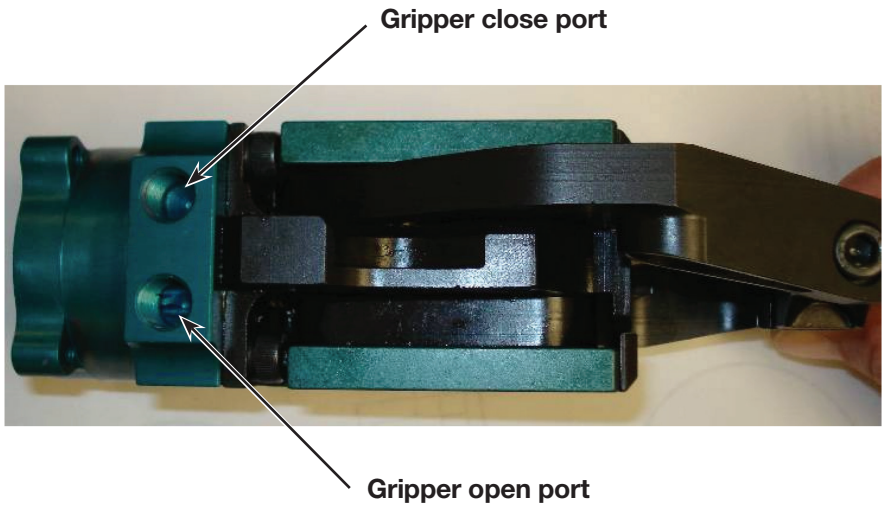
II. Applicable Documents:

12686SP – Sales Page – PGS20RXXXXXXXXX (Regular Jaw)
12687SP – Sales Page – PGS20FXXXXXXXXX (Flange Jaw)
12688SP – Sales Page – PGS20C/D/EXXXXXXXXX (Chisel Jaw)
12689SP – Sales Page – PGS20S/T/UXXXXXXXXX (Shovel Jaw)
12647SP – Spare Parts List for PGS20 Gripper Series
13213SP – Sales Page – PGS42RXXXXXXXXX (Regular Jaw)
13227SP – Sales Page – PGS42C/D/EXXXXXXXXX (Chisel Jaw)
13284SP – Sales Page – PGS20S/T/UXXXXXXXXX (Shovel Jaw)
13291SP – Sales Page – PGS42FXXXXXXXXX (Flange Jaw)
13214SP – Spare Parts List for PGS42 Gripper Series

III. Procedures:

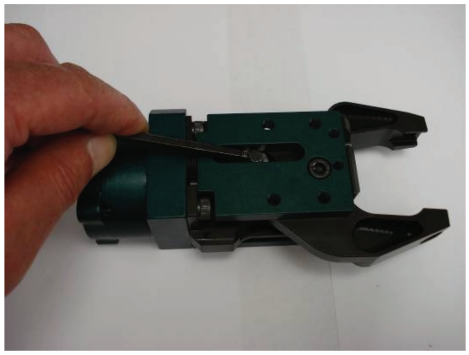
A. Port Size and Operation

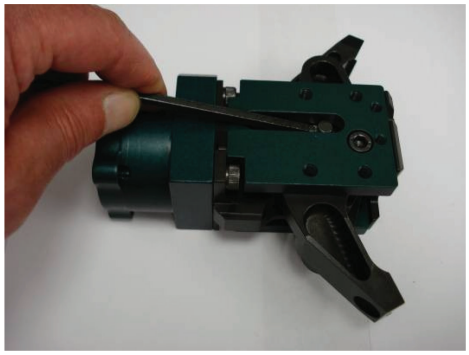
1. Ports are available in 1/8" NPS or 1/8 Rc. The closed port is marked with a “C”.



B. Gripper Unlock

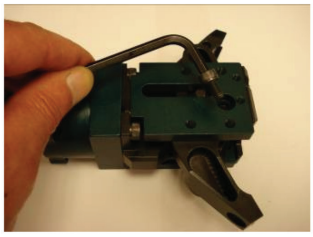
1. Release jaw by using a hex key or straight blade screwdriver and pushing on drive pin through slot in side plate

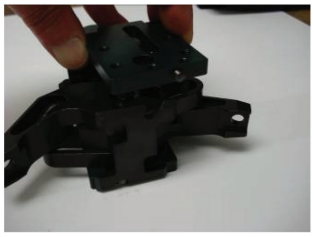




C. Upper Jaw Removal

1. Unlock gripper as shown in step B and remove pad(s) from existing jaws. Set aside for re-assembly.
2. Top jaw should be removed first. Remove SHCS from side plate or indirect sensor. Slide side plate/sensor retaining pins out of slots in the gripper frame and remove side plate/sensor from gripper. Set SHCS and Side Plate or Sensor aside for re-assembly

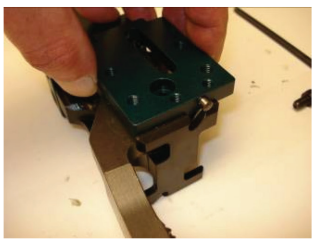
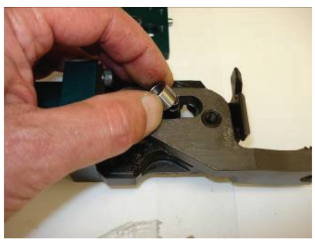




3. Pull jaw upward and off of frame boss and bushing. Remove bushing from cylinder rod and set parts aside. Flip gripper over to remove lower jaw.



D. Lower Jaw Removal

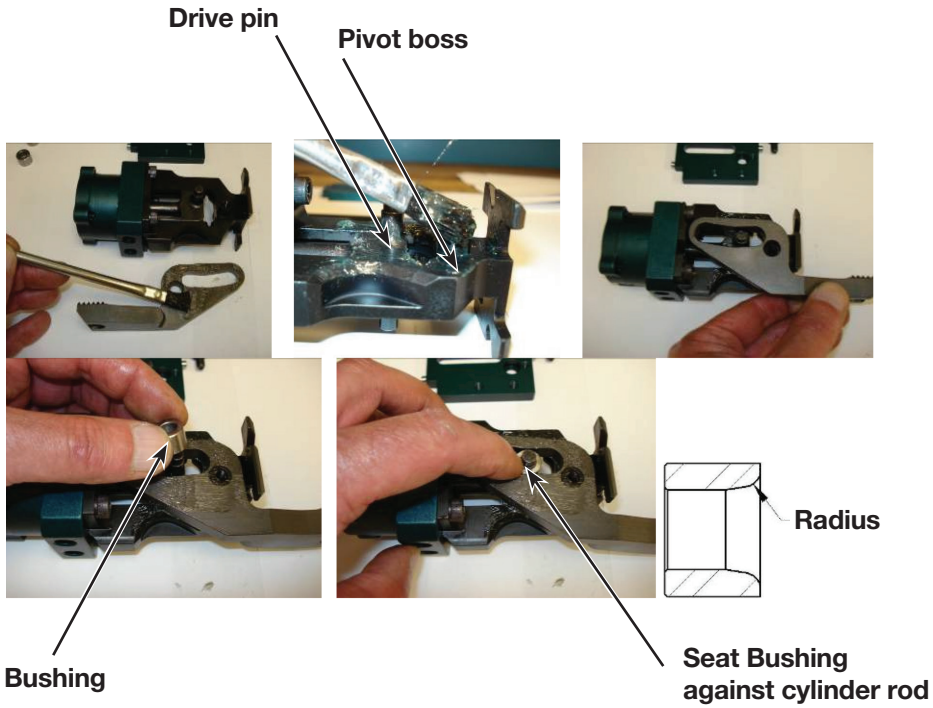
1. Remove side plate following procedure outlined in earlier section C-2. Some lower jaws (13111, Lower Flange jaw & 13113, 0 degree. Regular jaw) will require that the cylinder rod be fully extended and bushing removed prior to removing these jaws. With the cylinder rod in the fully extended position, and bushing removed, pull lower jaw off of frame boss.


E. Jaw Replacement

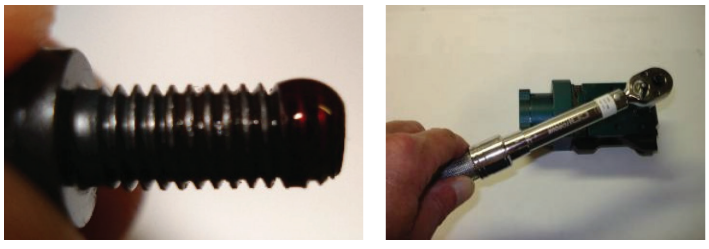
Applicable jaws: (13102, 13113, 13114, 13111, 13100, 13100-01, 13100-02, 10607, 10607-01, 10607-02, 13112, 13112-01, 13112-02, 13978 & 13987)

1. **For lower jaws:** Apply Mobilux grease or equivalent to both flat surfaces of cam, as well as the surface of the frame core, pivot boss, and drive pin. Align pivot hole in cam with boss and drive pin with the bottom side of the cam slot. Slide jaw over boss and onto gripper. Place bushing over pin and into cam slot **radii side facing cylinder rod**. Seat bushing firmly against cylinder rod and ensure that the bushing rotates freely.



2. **Install side (cam retainer) plate:** With the Side Plate approximately parallel to the gripper frame, align pins of side plate with slots in frame. Side plate will slide diagonally toward gripper frame as pins follow the slots in the frame. Continue to move side plate toward frame until guide pins are fully seated in the frame slots.

3. Clean M6 X 10 mm SHCS for side plate. Apply liquid Loctite 262 or equivalent to pivot hole in frame. Insert screw through side plate and into frame. Tighten M6 SHCS to **120 in-lb**.

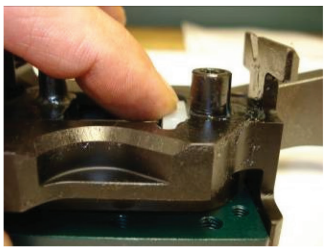


F. Setting Jaw Open Angle (if required)

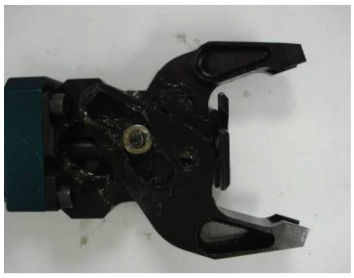
1. The PGS20 gripper has three possible jaw open positions; full open (no bumper), 45 degrees, and 22 degrees. Jaw open angle is set by installing the appropriate bumper into the frame in the slots provided, prior to installing the upper cam. Two bumpers are available for the gripper a thin bumper marked “45” (13150) provides a 45 degree stop, and a thick bumper marked “22” (13152) for 22 degree stop angle.
2. To set the open stop angle, remove SHCS from side plate or indirect sensor, and remove side plate/sensor as described in step C)-2). Set SHCS and Side Plate/Sensor aside for re-assembly. Remove jaw from gripper. Locate and insert the appropriate bumper into the slots provided near the front of the gripper frame by sliding the bumper sideways into the slots until it is fully seated, and flush with the side of the frame core.

22° Open Jaw Angle Uses
22 degree (thick) stop

45° Open Jaw Angle Uses
45 degree (thin) stop



Full Open Jaw Angle
Bumper not used



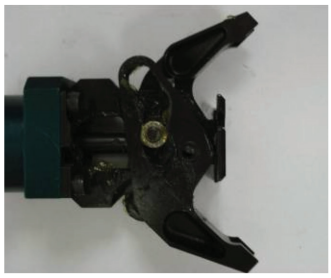
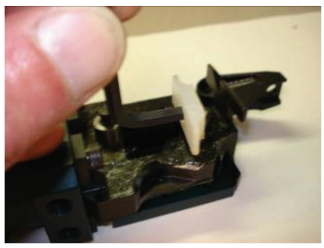
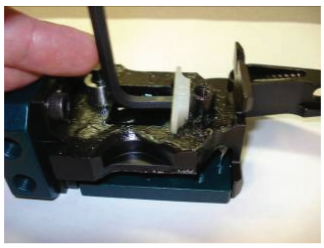


Figure 1

3. To remove the jaw open stop insert a 5mm hex wrench into the hole provided in the stop bumper. Pull up on the bumper until it is clear of the gripper frame.





4. **For upper jaws:** Flip gripper over and apply Mobilux grease or equivalent to both flat surfaces of cam, as well as the surface of the frame core, pivot boss, and drive pin. Insure the jaw open stop is installed if required per section F. Align pivot hole in cam with boss and drive pin with the bottom side of the cam slot. Slide jaw over boss and onto gripper. Place bushing over pin and into cam slot **radii side facing cylinder rod**. Seat bushing firmly against cylinder rod.

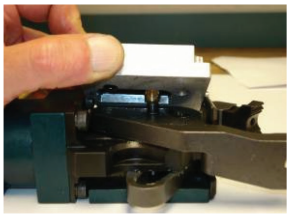


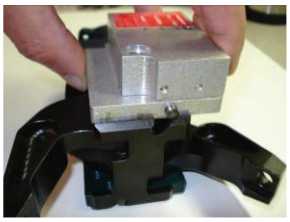


G. Installing an Indirect Sensor

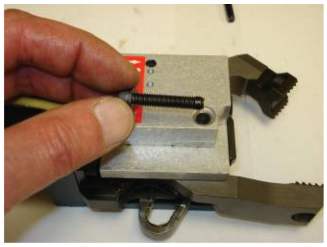
1. **Installing an Indirect Sensor:** An Indirect Sensors mounts in place of one of the standard side plates. Move brass bushing in sensor to align with drive pin in gripper. This must be done to correctly install sensor. Align pins of sensor with slots in frame. Sensor will slide diagonally toward gripper frame as pins follow the slots in the frame. Continue to move sensor toward frame until guide pins are fully seated in the frame slots. As the sensor seats into the frame, **make sure bushing and drive pin are still aligned**.

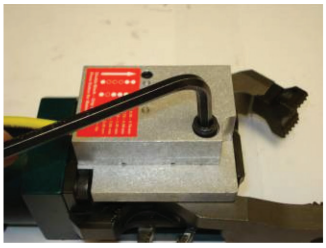
   Note: Whenever any part of the gripper is replaced






2. Clean M6 X 30 mm SHCS for sensor. Apply liquid Loctite 262 or equivalent to pivot hole in frame. Insert screw through sensor and into frame. Tighten the M6 SCHS **120in-lb**.



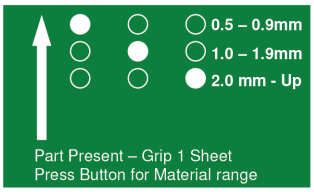


H. Calibrating In-Direct Sensor

Sensor must be calibrated whenever any part of the gripper is replaced including pads.

1) Part Present

a) 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 corresponding to the material range of the job lights as shown on the label.



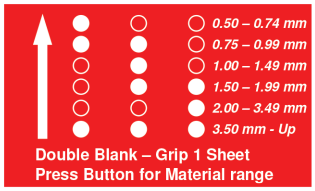
b) Verify calibration:

(1) Close the gripper with no material between the pads. The LED should be off.

(2) Close the gripper on a single blank of material. The Red LED corresponding to your material range should be on.

2) Double Blank

a) 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.



b) Verify calibration:

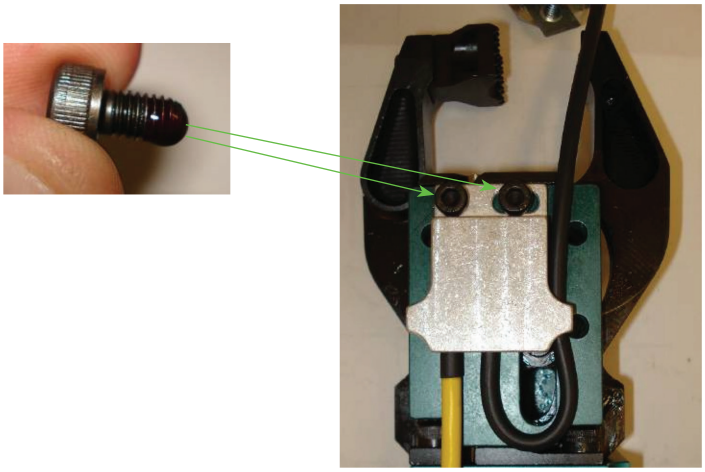
(1) Close the gripper with no material between the pads. The LED(s) should be off.

(2) Close the gripper on a single blank of material. The Red LED(s) corresponding to you material range should be on.

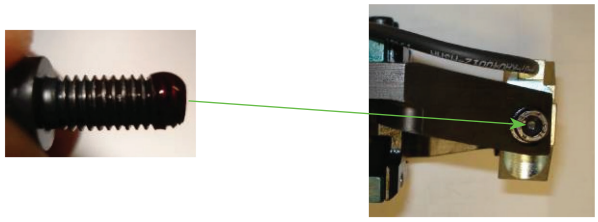
Note: double blank sensor not available on flange jaw gripper

I. Installing an In-Pad Sensor

1) If an **In-Pad Sensor** is to be installed, it goes on top of the side plate assembly. Wrap sensor cable through holder and align holes on side plate. Clean and apply liquid Loctite 262 or equivalent to 2X M5 X 10 mm SHCS and thread thru sensor into side plate. Tighten both SHCS to **36in-lb**.

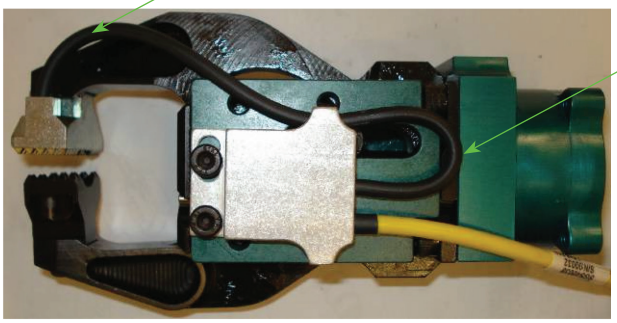


2) Apply liquid Loctite 262 or equivalent to sensor bolt, place thru jaw and tighten **120in-lb**.



J.

Cable should follow the contour of the gripper jaw

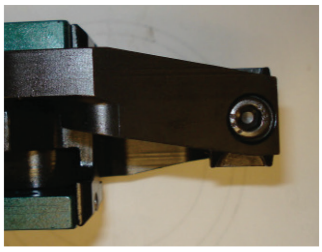
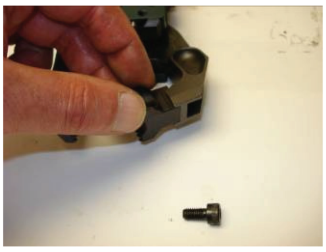


Cable storage loop can be adjusted with a push/pull motion to provide more or less cable slack in gripper jaw area.

Pad Replacement

1) Unlock jaws on gripper as outlined in section B & open jaws to get access to pads. Side plates or sensors **DO NOT** need to be removed.

2) Remove M6 X 10 mm SHCS from jaw then remove pad.


3) Apply liquid Loctite 262 or equivalent to M6 X 10 mm SHCS and insert into one of the jaws. Insert replacement pad into the opposite side of the jaw. Thread SHCS into pad and tighten to 120in-lb. Repeat step for other jaw. Chisel and Shovel jaws only require one pad


IV. Cleaning and Maintenance:

A) Remove excess grease from outer surfaces of gripper.

B) No required maintenance.

V. Specifications:

Gripper	Throat Depth	Flange Height	Working Pressure	Grip Force	Actuation Time
PGS20C/S	1.24 (31.6 mm)	1.49 (37.8 mm)	60psi (413kPa) Min. – 100psi (689 kPa) Max.	Up to 450lbs (200kgf) @ 80psi (551kPa)	.050±.010 sec close / <.090 sec open
PGS20D/T	1.24 (31.6 mm)	1.49 (37.8 mm)	60psi (413kPa) Min. – 100psi (689 kPa) Max.	Up to 450lbs (200kgf) @ 80psi (551kPa)	.050±.010 sec close / <.090 sec open
PGS20E/U	1.24 (31.6 mm)	1.49 (37.8 mm)	60psi (413kPa) Min. – 100psi (689 kPa) Max.	Up to 450lbs (200kgf) @ 80psi (551kPa)	.050±.010 sec close / <.090 sec open
PGS20F	1.65 (42.0 mm)	1.42 (36.1 mm)	60psi (413kPa) Min. – 100psi (689 kPa) Max.	Up to 450lbs (200kgf) @ 80psi (551kPa)	.050±.010 sec close / <.090 sec open
PGS20R	1.20 (30.6 mm)	1.82 (46.2 mm)	60psi (413kPa) Min. – 100psi (689 kPa) Max.	Up to 450lbs (200kgf) @ 80psi (551kPa)	.050±.010 sec close / <.090 sec open
PGS42C/S	1.24 (31.6 mm)	1.49 (37.8 mm)	60psi (413kPa) Min. – 100psi (689 kPa) Max.	Up to 900lbs (400kgf) @ 80psi (551kPa)	.063±.010 sec close / <.100 sec open
PGS42D/T	1.24 (31.6 mm)	1.49 (37.8 mm)	60psi (413kPa) Min. – 100psi (689 kPa) Max.	Up to 900lbs (400kgf) @ 80psi (551kPa)	.063±.010 sec close / <.100 sec open
PGS42E/U	1.24 (31.6 mm)	1.49 (37.8 mm)	60psi (413kPa) Min. – 100psi (689 kPa) Max.	Up to 900lbs (400kgf) @ 80psi (551kPa)	.063±.010 sec close / <.100 sec open
PGS42F	1.65 (42.0 mm)	1.42 (36.1 mm)	60psi (413kPa) Min. – 100psi (689 kPa) Max.	Up to 900lbs (400kgf) @ 80psi (551kPa)	.063±.010 sec close / <.100 sec open
PGS42R	1.20 (30.6 mm)	1.82 (46.2 mm)	60psi (413kPa) Min. – 100psi (689 kPa) Max.	Up to 900lbs (400kgf) @ 80psi (551kPa)	.063±.010 sec close / <.100 sec open

Without In-Pad Sensor

Chisel jaw / shovel jaw			Regular / flange jaw	
Material thickness	**Pad color**	**Fixed jaw color**	**Jaw 1 pad color**	**Jaw 2 pad color**
0.50 mm to 2.50 mm	Black	Black	Silver	Black
2.51 mm to 4.50 mm	Silver	Black	Silver	Silver
4.51 mm to 6.50 mm	Black	Silver	Silver	Gold
6.51 mm to 8.50 mm	Silver	Silver	n/a	n/a
8.51 mm to 10.50 mm	Black	Gold	n/a	n/a

With In-Pad Sensor

Chisel jaw / shovel jaw			Regular / flange jaw	
Material thickness	**Shim usage**	**Fixed jaw color**	**Jaw 1 pad color**	**Jaw 2 pad color**
0.50 mm to 2.50 mm	Shim	Black	In-Pad (Silver)	Black
2.51 mm to 4.50 mm	No Shim	Black	In-Pad (Silver)	Silver
4.51 mm to 6.50 mm	Shim	Silver	In-Pad (Silver)	Gold
6.51 mm to 8.50 mm	No Shim	Silver	n/a	n/a
8.51 mm to 10.50 mm	Shim	Gold	n/a	n/a

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.

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

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