



DIE SENSOR SPECIFICATIONS

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Document No.: S02.025

Issue Date: 13 Nov 2009

Revision: 8

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RESPONSIBLE	NAME	TITLE	SIGNATURE
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Approver	Buck Wiggins	Engineering Manager	

ISSUE DATE	REV. #	PAGE #	REASON FOR REVISION
11 Jan 2005	0	All	Initial Release
27 June 2005	1	All	Added Installation Instructions and Changed Format For Progressive Dies.
14 July 2005	2	10	Corrected wiring orders for quick connect.
19 July 2005	3	All	Added Installation Instructions and Changed Format For Tandem and Transfer Dies.
10 May 2006	4	27	Added torsion springs to parts list for sensor lever.
26 July 2006	5	All	Complete rewrite
21 Sept 2006	6	17	Updated contact information and added junction box connector.
13 March 2008	7	3	Update 8 port "J" box for P3000 press.
13 Nov 2009	8	12 & 17	Added page 12 and removed Spartan Ind. from page 17.



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Progressive Dies:

- 1) Sensor wirers are to be protected by protective covering.
- 2) All sensors will be mounted in removable steel blocks and doweled in place.
- 3) End of strip sensor will be designed buy the tool vendor with SSP tool engineer support and use one standard 8mm diameter inductive sensor with 2mm sensing range.
- 4) Part exit sensors will be mounted in removable steel blocks with access to sensitivity adjustment. Parts exit sensors are **not** to be mounted to part exit chutes.
- 5) Cams that do not have positive returns will need to be sensed for cam return. These 8mm sensors will be sensing the back end of the cam slide.
- 6) When in die tapping, stud and nut staking is used, sensors will be added to confirm that nuts and studs are present. These sensors will be mounted in removable steel blocks. All tapping, stud and nut staking operations will be reviewed by SSP to ensure proper application.
- 7) Dies requiring sensors on upper die shoes are to have a junction box mounted on the upper front die shoe for those sensors.
- 8) Tool builder per SSP specifications will install and test all sensors. SSP will provide power supply test box. Job must run at rate during HLC at SSP.
- 9) The final strip must be shipped with the die without distortion or damage.
- 10) SSP will approve final sensor type and location at die design review.



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Junction Box:

Junction boxes are to be designed into every die design to ensure proper clearance and positioning. Junction boxes will be mounted on front side of the die. Every junction box has four (4) sensor connections for Progressive and Tandem dies. **One eight (8) port junction box for each Transfer die in the set. Each eight (8) port "J" box shall be mounted vertical to front of lower die set with indicator lights towards press viewing window on operator side.**

Wiring Order:

Progressive Dies (4 port junction box):

- Port #1 Strip in position.
- Port #2 Pitch Notch.
- Port #3 Part exit front side.
- Port #4 Part exit back side.

Tandem Dies (4 port junction box):

- Port #1 front of die.
- Port #2 back of die.

Transfer Dies (8 port junction box) (one on each die in the set):

- Port #1: **Left front cam return.**
- Port #2: **Right front cam return.**
- Port #3: **Left rear cam return.**
- Port #4: **Right rear cam return.**
- Port #5: **Left front part in die.**
- Port #6: **Right front part in die.**
- Port #7: **Left rear part in die.**
- Port #8: **Right rear part in die.**



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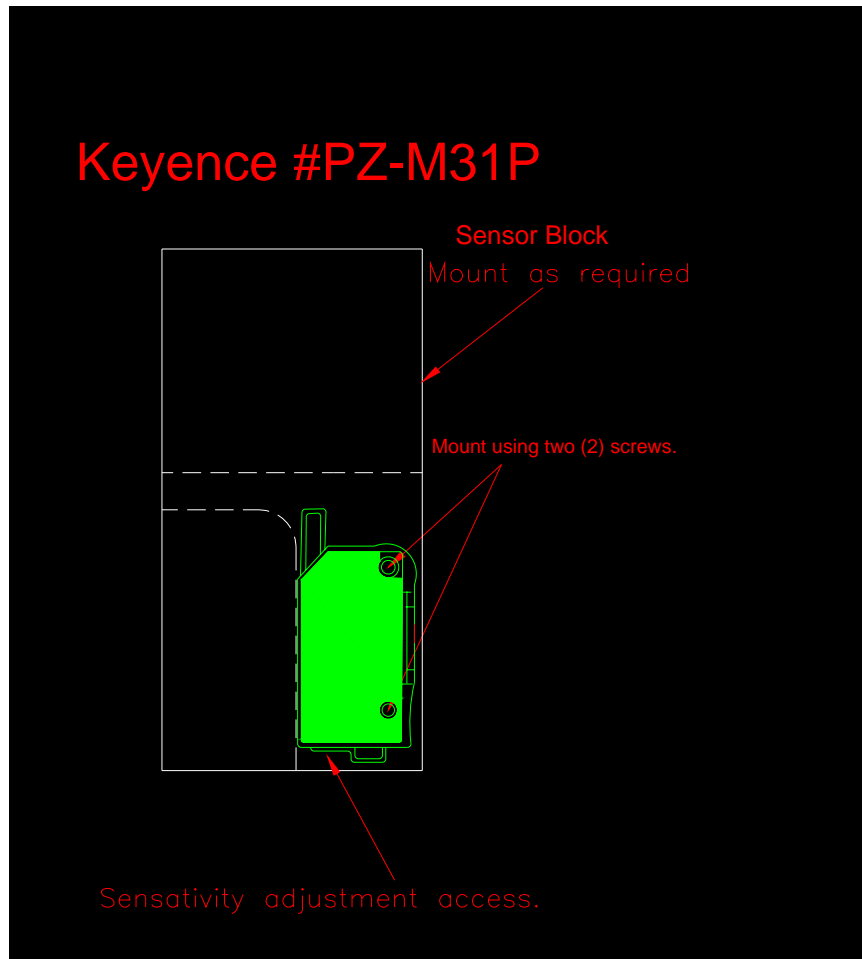
Progressive die part out sensor.

Keyence #PZ-M31P (Diffuse)

- Part exit sensors are used to ensure parts have exited the die correctly.
- These sensors will be mounted in removable steel blocks.
- Part exit sensors are not to be mounted to part chutes.
- These blocks will be mounted in the die shoe.

Installation:

- Mount sensor using two screws with sensitivity adjustment accessible.





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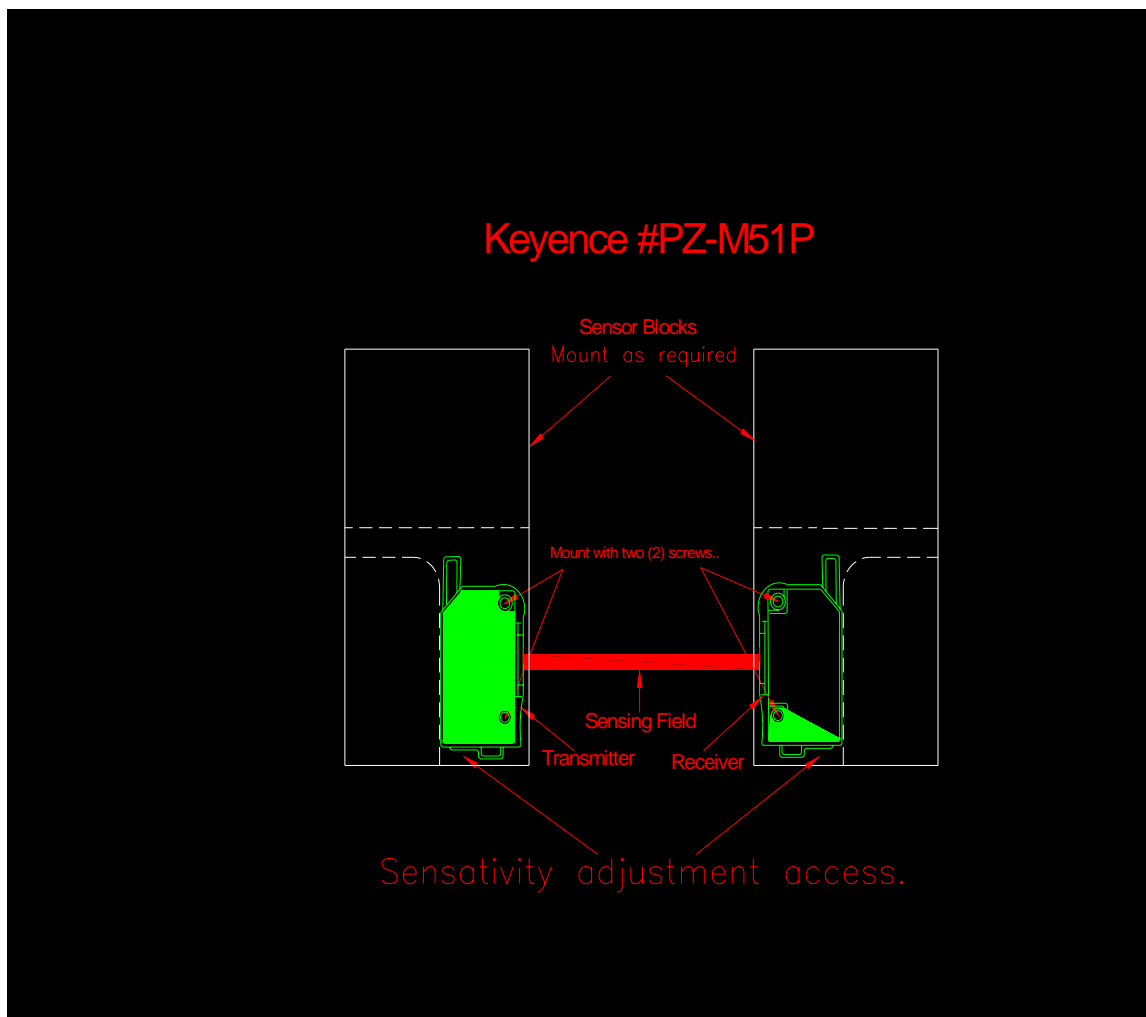
Progressive die part out sensor.

Keyence #PZ-M51P (Thru-Beam)

- Part exit sensors are used to ensure parts have exited the die correctly.
- These sensors will be mounted in removable steel blocks.
- Part exit sensors are not to be mounted to part chutes
- These blocks will be mounted in the die shoe.

Installation:

- Mount sensor using two screws with sensitivity adjustment accessible.





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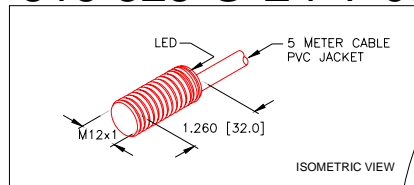
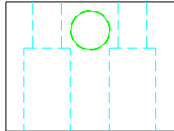
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Progressive die

Cam return sensing:

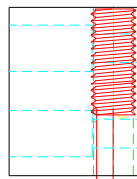
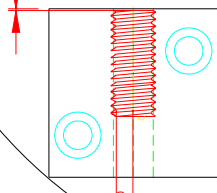
- Cams with positive returns do not need a cam return sensor.
- Sensors will be used to ensure Cams have returned properly.
- These sensors will be installed into typical sensor blocks.
- Mount the sensor block at the cam return position.

Balluff #BES 516-325-G-E4-Y-05



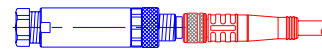
Note: Sensor must be recessed a minimum of .020 below face of block.

.020 [0.5]

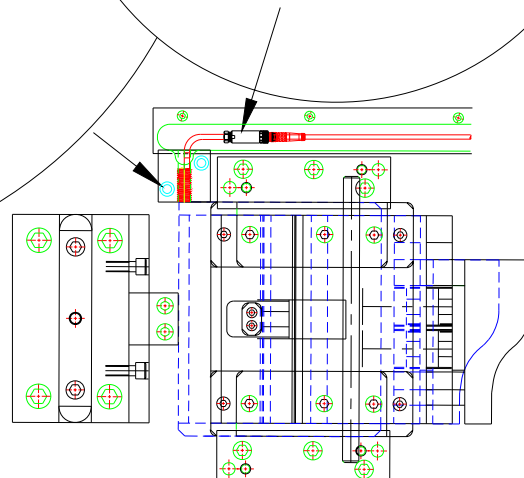


Shown: A male quick connect and a female ended sensor cable.

Turck #BS 5133-0



Turck #PKG 3M-5





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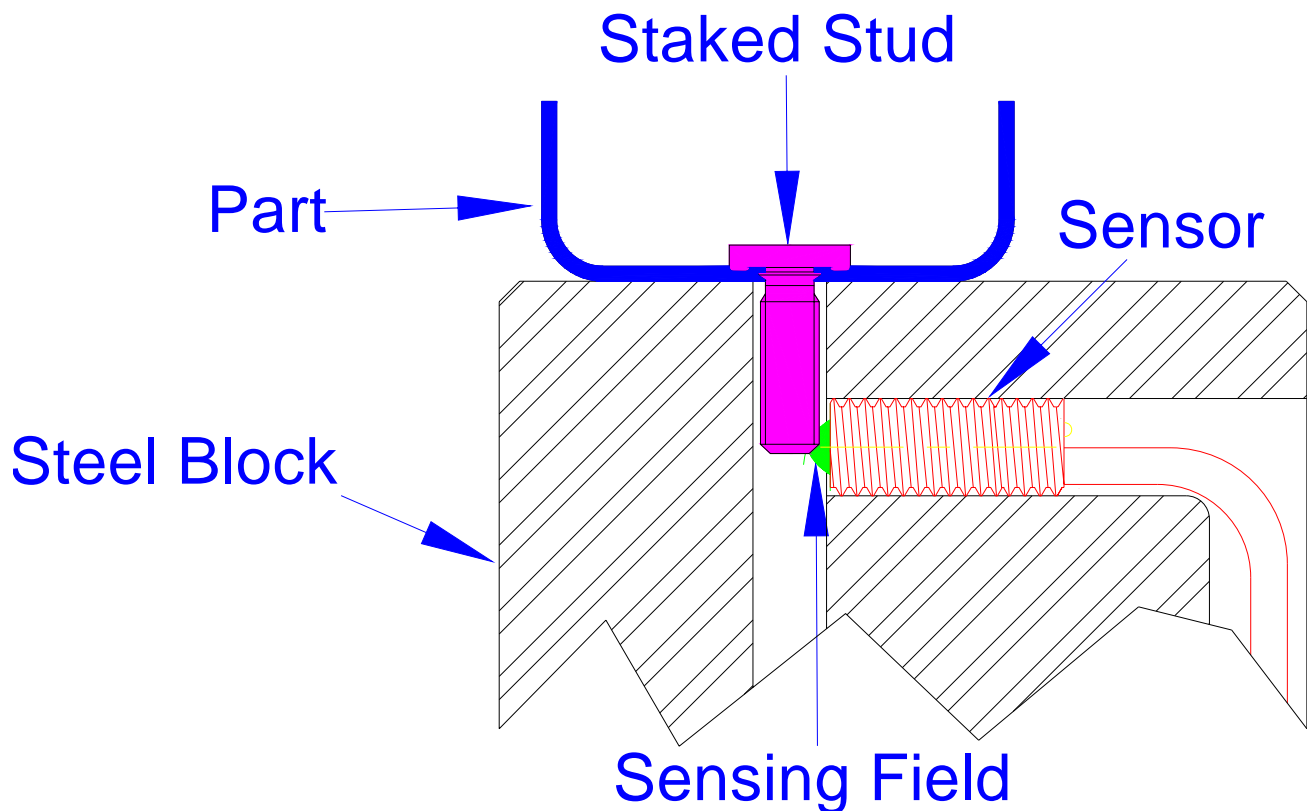
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Progressive Die

In Die Staking and Tapping

- When **in die** tapping or nut and stud staking is used, sensors will be added to confirm that nuts and studs were staked properly. These sensors will be mounted in removable steel blocks.
- All tapping, stud and nut staking operations will be reviewed at SSP to ensure proper application.





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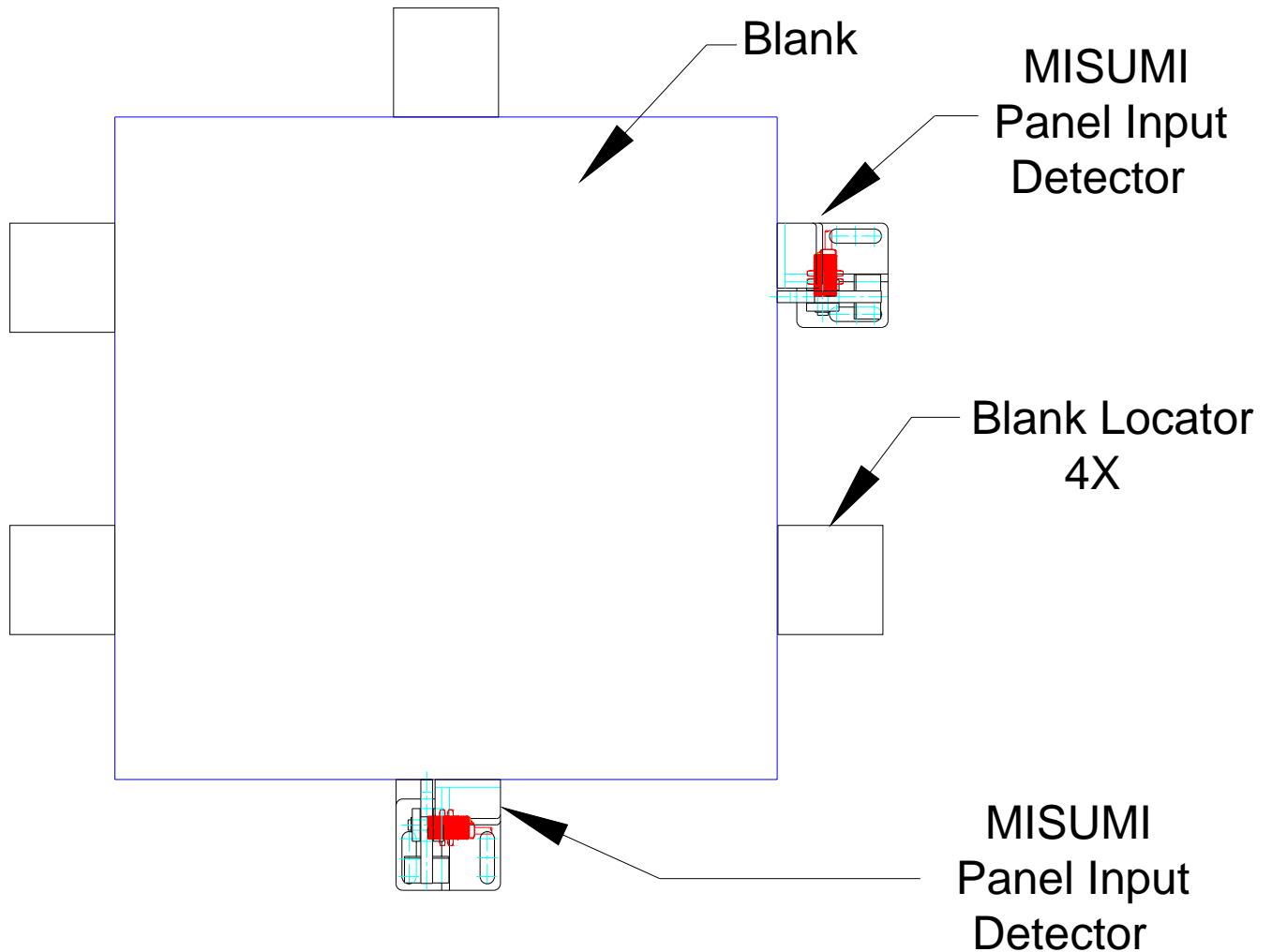
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DRAW DIES

- Draw dies will use two MISUMI panel input detectors for sensing proper positioning of the blank.
- The panel detectors will face perpendicular on opposite corners of the die.





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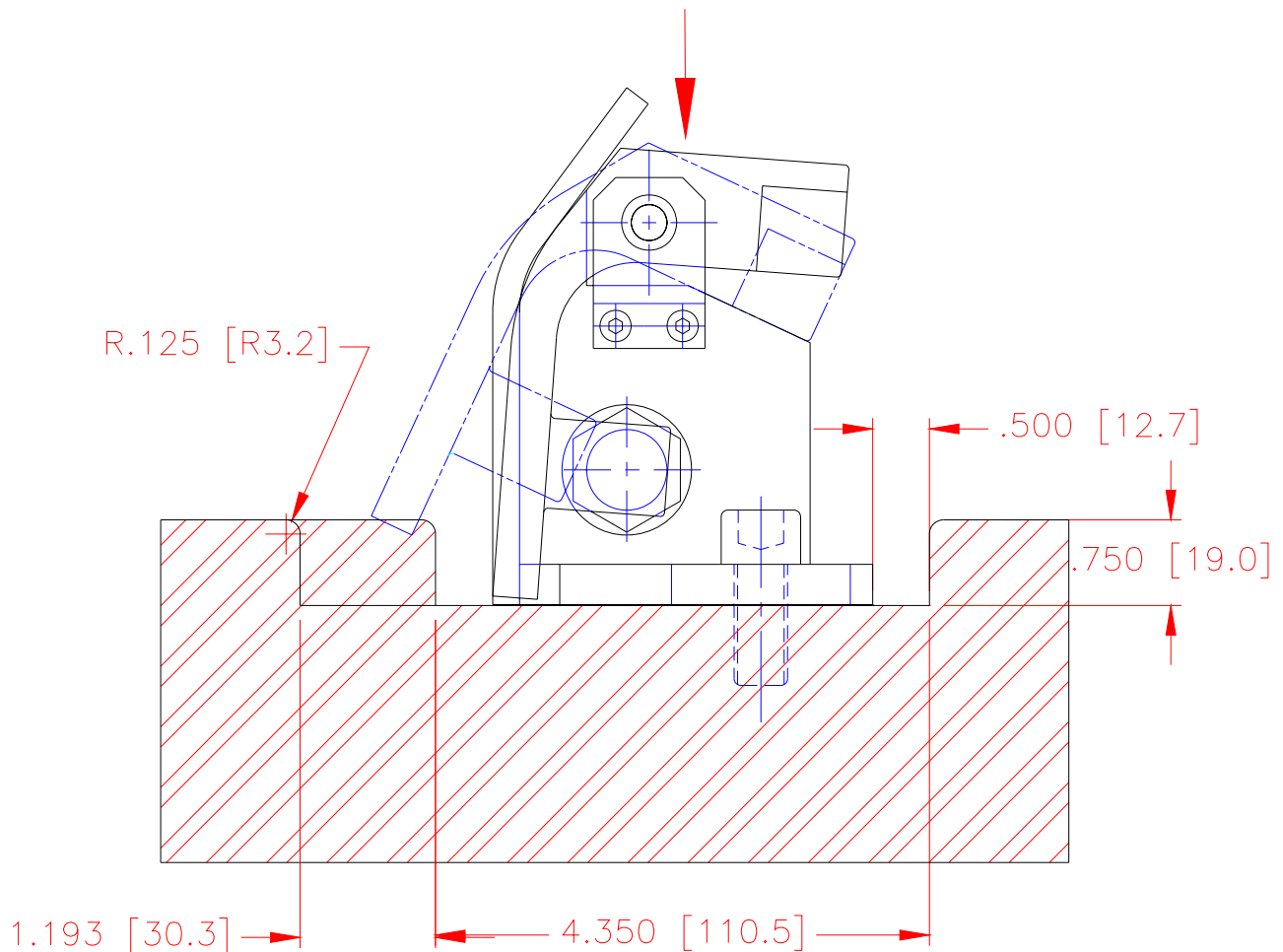
Draw Dies

- The MISUMI panel detectors will require a 3/4" milled pocket.
- This pocket will have a minimum of 1/8" radius around it to prevent slivers.
- The clearance pocket in the upper will require the same radius.
- Tool Builder per SSP specifications will install all sensors.

Installation:

- Install the Balluff 18mm diameter sensor #BES 516-326-G-E4-Y-05.
- Ensure the lever will not hit the sensor.
- Loctite the sensor nuts on sensor.

MISUMI #PACOAN-L-75-M12





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Trim, Flange, Pierce, and Restrike Dies

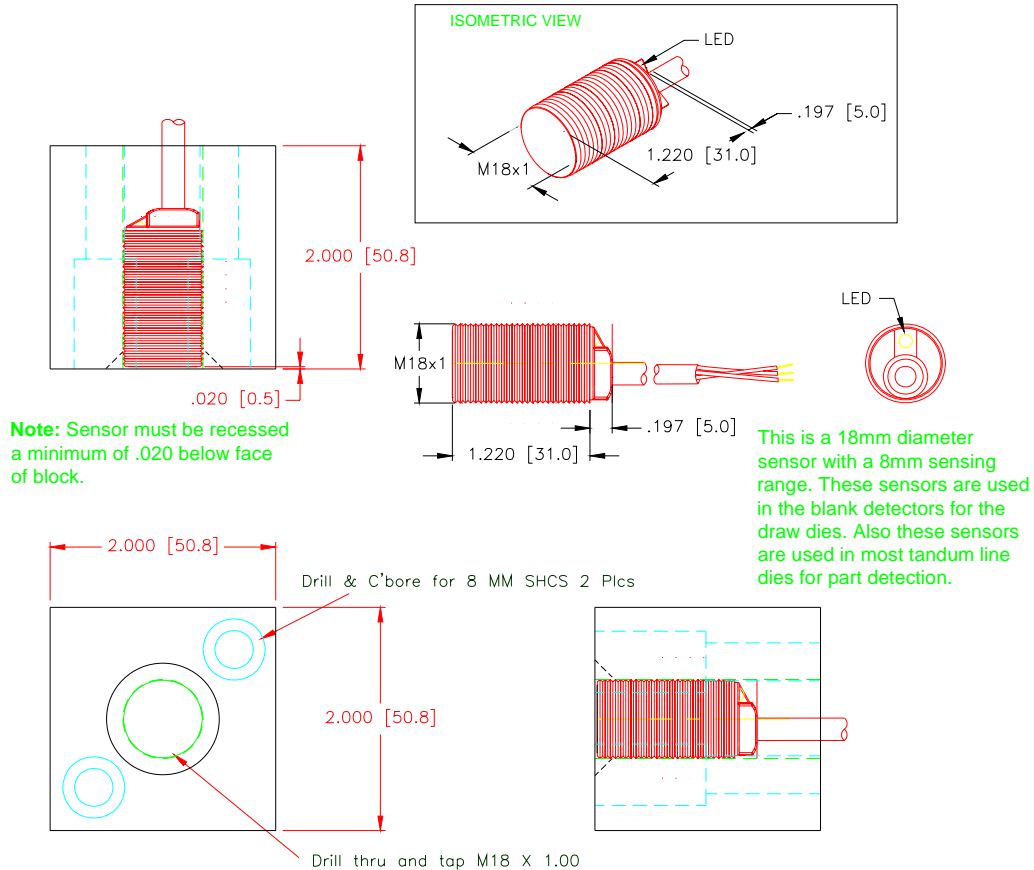
Sensors in die:

- Sensor blocks are to be designed in the die perpendicular on opposite corners of the die.
- Two sensor blocks are required per part per die.
- These sensor blocks are to fit the part contour.

Installation Instructions:

- Installing sensors in steel blocks will protect and save the sensors.
- Inductive sensors will be recessed a minimum of .020" below the face of the sensor block.
- Lock sensor into place with a nylon faced set screw.

BALLUFF BES 516-326-G-E4-Y-05





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Trim, Flange, Pierce, and Restrike Dies (Alternate Sensor Method)

Syron Product #: SPS11-XXX

www.syron.com

Sensors in die:

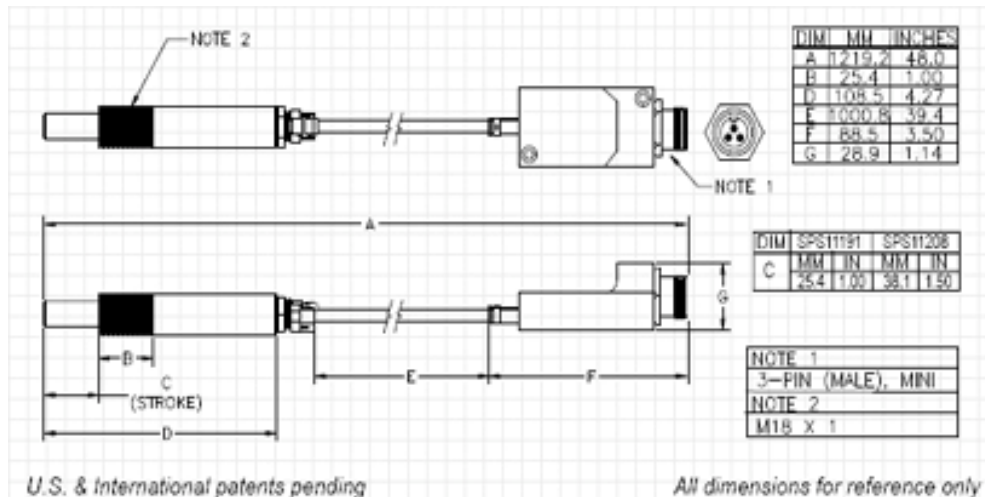
- Sensor blocks are to be designed in the die perpendicular on opposite corners of the die.
- Two sensor blocks are required per part per die.
- These sensor blocks are to fit the part contour.

Installation Instructions:

- Installing sensors in steel blocks will protect and save the sensors.
- Lock sensor into place with a nylon faced set screw.

Die Probe Sensor - 2 Wire Output with 1 or 1.5 Inch Spring Travel

Spring loaded proximity switch for in-die part presence detection. The proximity switch detects the part over a 2mm sensing range. The spring mount allows the sensor to follow part movement during the forming process. Typical applications include detection of parts on lifters or web progression in progressive dies.





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Trim, Flange, Pierce, and Restrike Dies

Sensors in lifters:

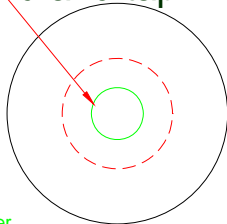
- When part lifters are used in the dies, sensors will be installed in two of the lifters.
- Lifters will need to follow the contour of the part.
- Design lifters in the die perpendicular on opposite sides of the die.
- The sensor cables will be traveling in this application, design die accordingly.

Installation Instructions:

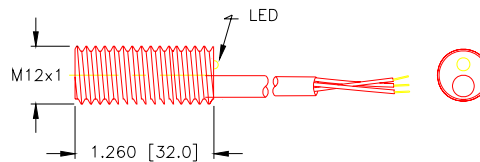
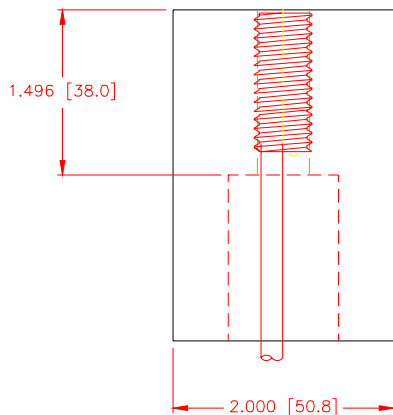
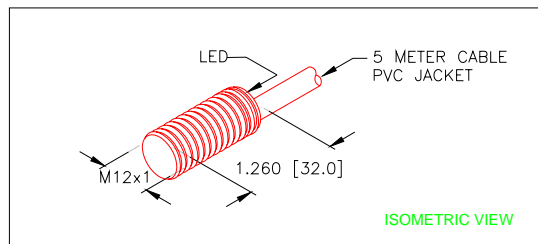
- Installing sensors in lifters will protect and save the sensors.
- Inductive sensors will be recessed a minimum of .020" below the face of the sensor block.
- Lock sensor into place with a nylon faced set screw.

Balluff #BES 516-325-G-E4-Y-05

Drill thru and tap M12 X 1.00



Note: This is a lifter used in transfer dies.



This is a 12mm diameter sensor with a 4mm sensing range. These sensors are typically used in lifters for transfer dies and for cam detection,



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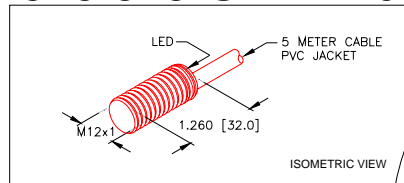
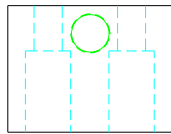
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Trim, Flange, Pierce, and Restrike Dies

Cam Return Sensing:

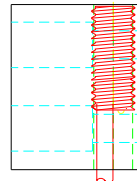
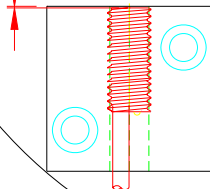
- Cams with positive returns do not need a cam return sensor.
- Sensors will be used to ensure Cams have returned properly.
- These sensors will be installed into typical sensor blocks.
- Mount the sensor block at the cam return position.
- All aerial cams are to be sensed for cam return.

Balluff #BES 516-325-G-E4-Y-05



Note: Sensor must be recessed a minimum of .020 below face of block.

.020 [0.5]

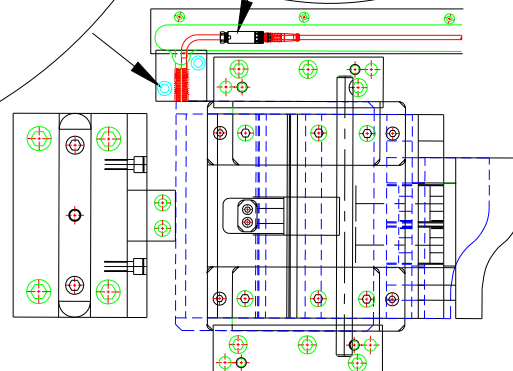


Shown: A male quick connect and a female ended sensor cable.

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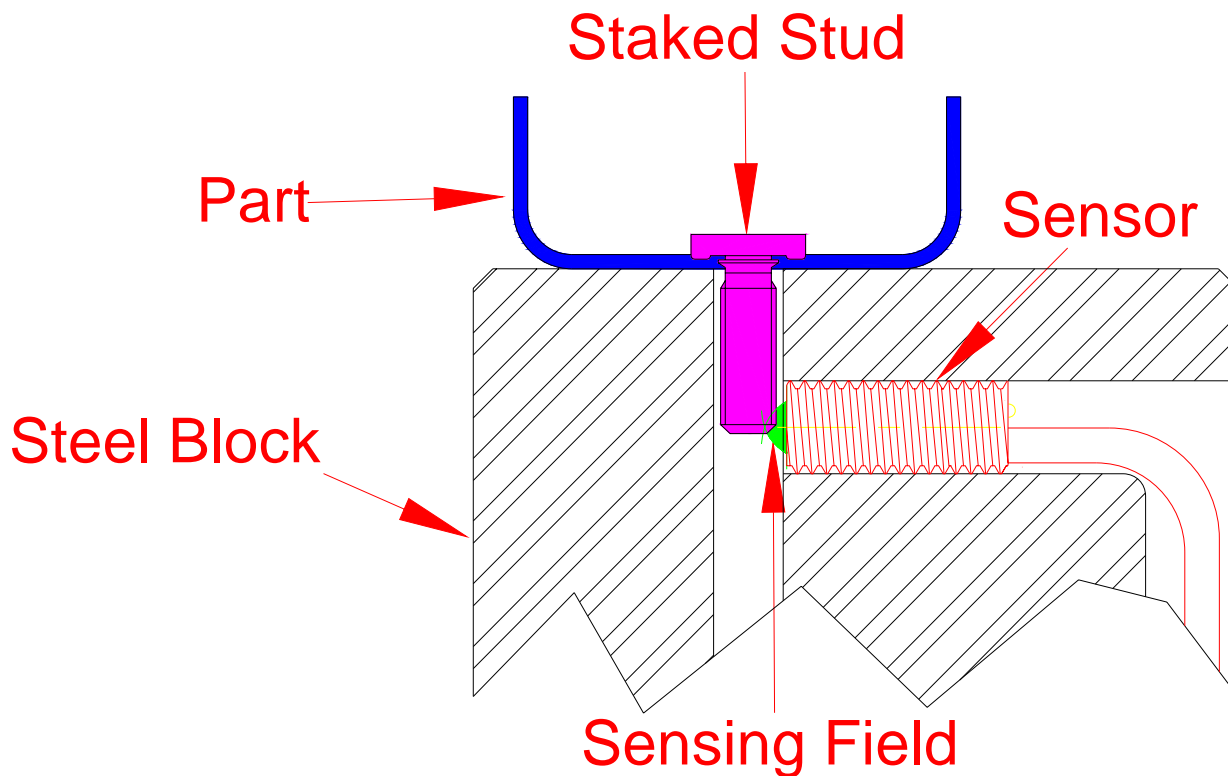
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Trim, Flange, Pierce, and Restrike Dies

In Die Staking:

- When nut and stud staking is used, sensors will be added to confirm that nuts and studs were staked properly. These sensors will be mounted in removable steel blocks.
- All stud and nut staking operations will be reviewed at SSP to ensure proper application.





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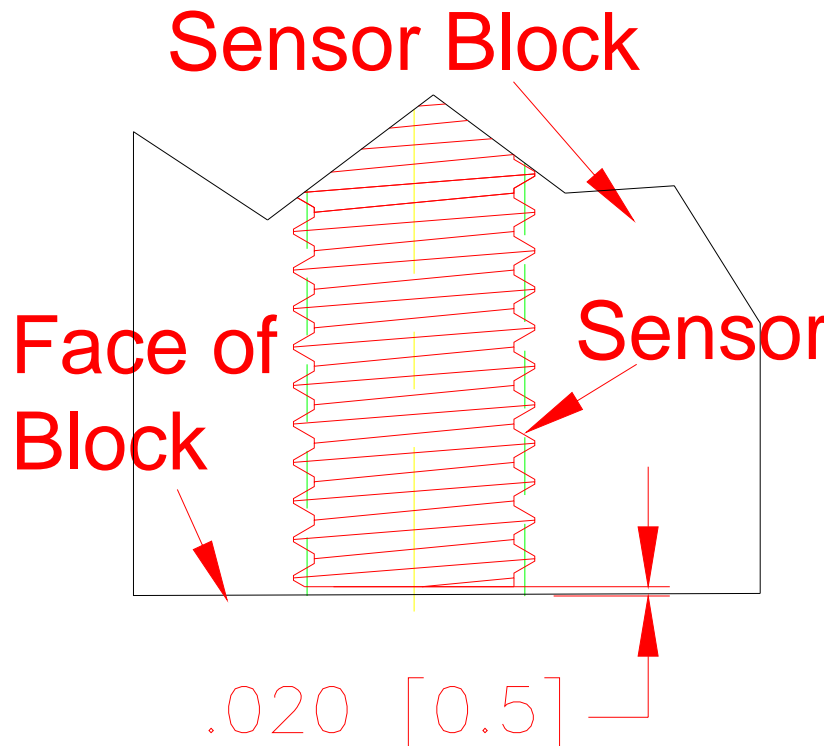
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Sensor Installation Instructions:

- Tool builder per SSP specifications will install all sensors.
- Sensors will be mounted in removable steel blocks.
- Installing sensors in steel blocks will protect and save the sensors.
- Inductive sensors will be recessed a minimum of .020" below the face of the sensor block.
- Thread the sensor into the tapped hole approximately .020" below the face of block.
- Lock sensor into place with a nylon faced set screw.





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Installing Connectors:

- Quick connectors will be installed to sensors for easy removal of sensor blocks.
- Install connector a maximum of 12" away from sensor.
- Follow illustration for connector and wire assembly.

