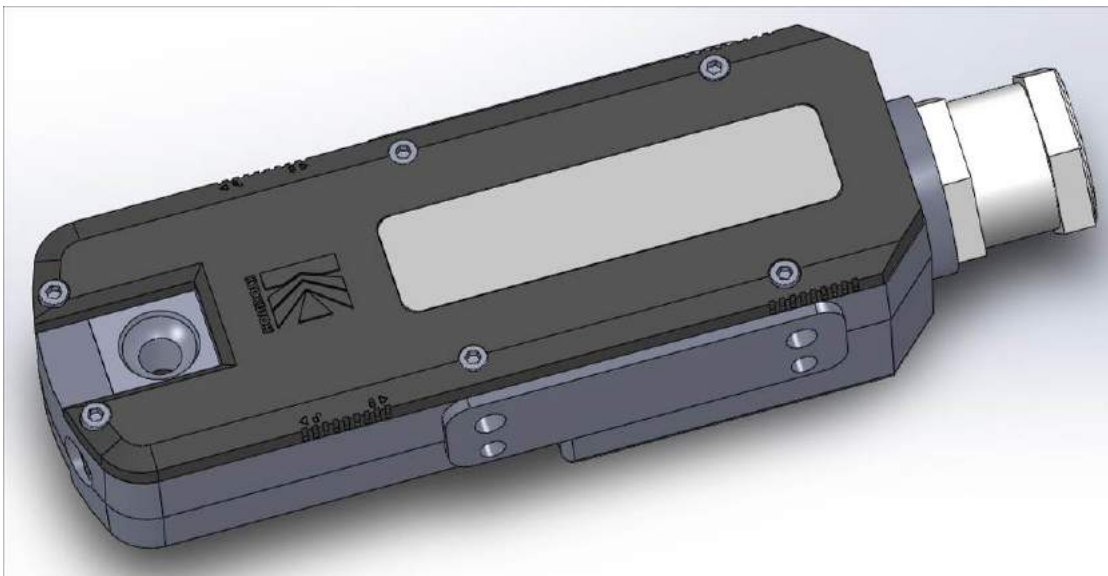


Cap tips sensor for spot welding (FIXA2) Instruction Manual



Please make sure whether dressing condition of the cutter is fine.

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Caution

※ Please read caution before using this product.

The purpose of the tip sensor is to assure proper function of Auto tip dresser in an automated production environment. Only electrode with dirt is under “Threshold value” and will result in OK signal. Please use this tip sensor with Kyokutoh auto tip dresser.

※ Even after using this product, please keep this manual.

- Please do NOT modification or disassemble the product.
- Please consider safety condition such as peripheral device and welding gun power are off.
- Please turn off the power for exchanging spare parts or maintenance.
- Please connect wiring by qualified person
- Cannot operate FIXA2 properly if installation method is NOT correct.
- Please do NOT apply electric current while detecting



We do not accept any liability for damage to property and persons that results from improper, non-conformance use of our equipment or from faulty installation or improper maintenance.

1 Product description

1.1 Product specification

Power Volt DC		12 – 24
Power		Blow 3W
Control output	Maximum voltage	Below DC24V
	Maximum load	20mA
	Output	Open collector
Air supply 「MPa」		0.4 – 0.6
Environmental Resistance	Operating ambient Luminance	Incandescent lamp : Less than 20,000Ix Sunlight : Less than 30,000Ix
	Operating ambient temperature	– 0 °C ~ + 4 0 °C (No freezing)
	Opearating ambient humidity	3 5 ~ 7 5 % R H (No condensation)
This product is a accurate instrument. Please install in the place where meets above condition.		

1.2 Description of function

- Able to avoid dressing defect by regular detecting with this prodcet.
- Reflection amount of upper and lower tip is judged as normal or abnormal
- Undressed tip face reflect not enough light quantity
- Please pressurize FIXA2 less than 200 kgf for detecting
(High-speed pressurization by air gun could deteriorate durability.)
- Tip face is judged either OK or NG by signal from FIXA2
- Able to set borderline whether OK or NG by user freely
- This product requires periodic cleaning

1.3 Model type

(Basic type)

FIXA2—Sensor type (NPN/PNP) — Upper cap tips — Lower cap tips

Ex.) Tip shape : Upper Dia ϕ 16 · Spot face ϕ 6-8R Lower Dia ϕ 16 · Flat face

For NPN

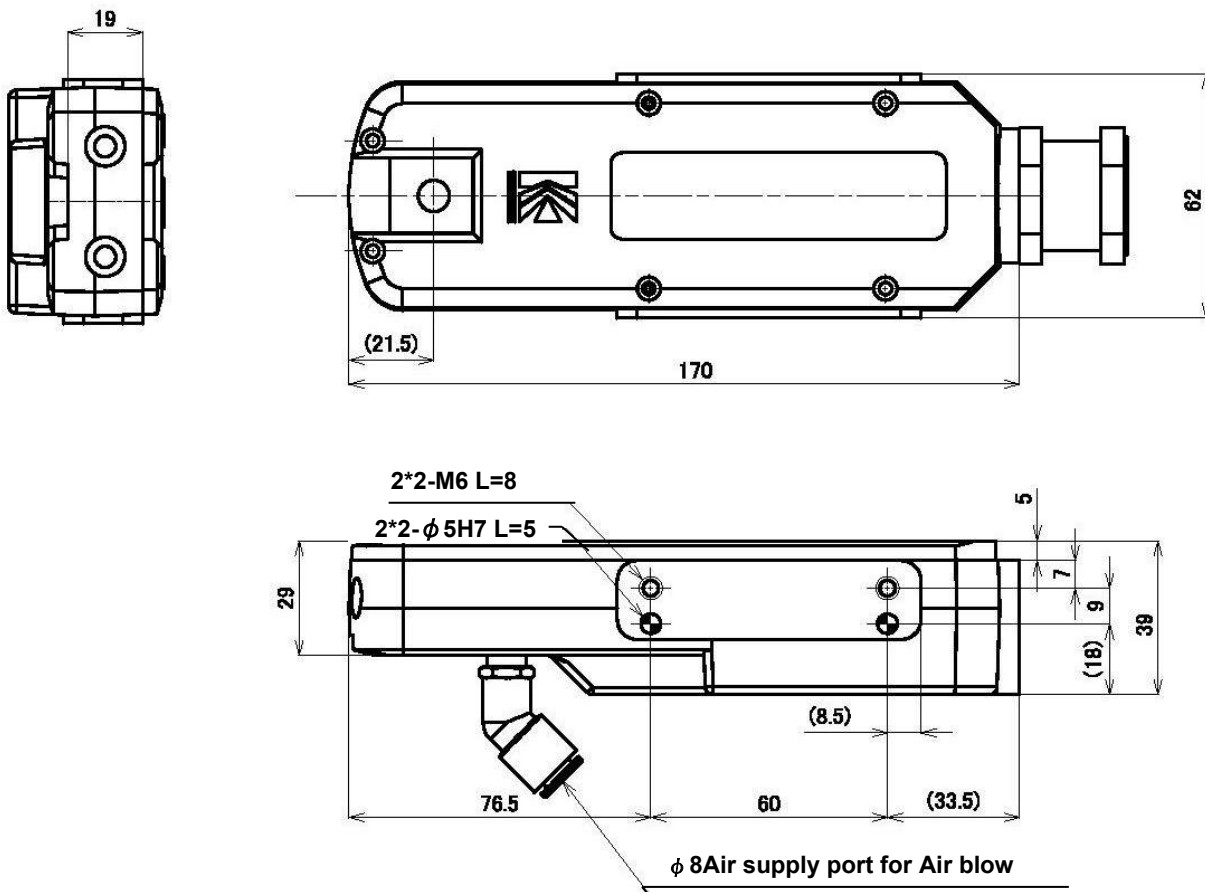
⇒ **FIXA2-NPN-1668R-16F**

Ex.) Tip shape : Upper Dia ϕ 16 · Spot face ϕ 6-30° Lower Dia ϕ 13 · Spot face ϕ 6-6.5R

For PNP

⇒ **FIXA2-PNP-16630P-13665R**

* We do have some brackets for our dressers as an optional item. Please feel free to contact our sales for special requirement or any other purpose.



2 Connection and Control

This product is optional item of Auto tip dresser.

Please read user manual before using

- Please install this product on auto tip dresser correctly.

Using equalizing system for shock control is recommended.

- Please do NOT place this product near the place where cable, holes and robot parts are positioned.
- Please avoid to interfere with cables, air hose and gun. It may cause cable damage.

Also air circuit can be damaged if air nipple is closed tightly.

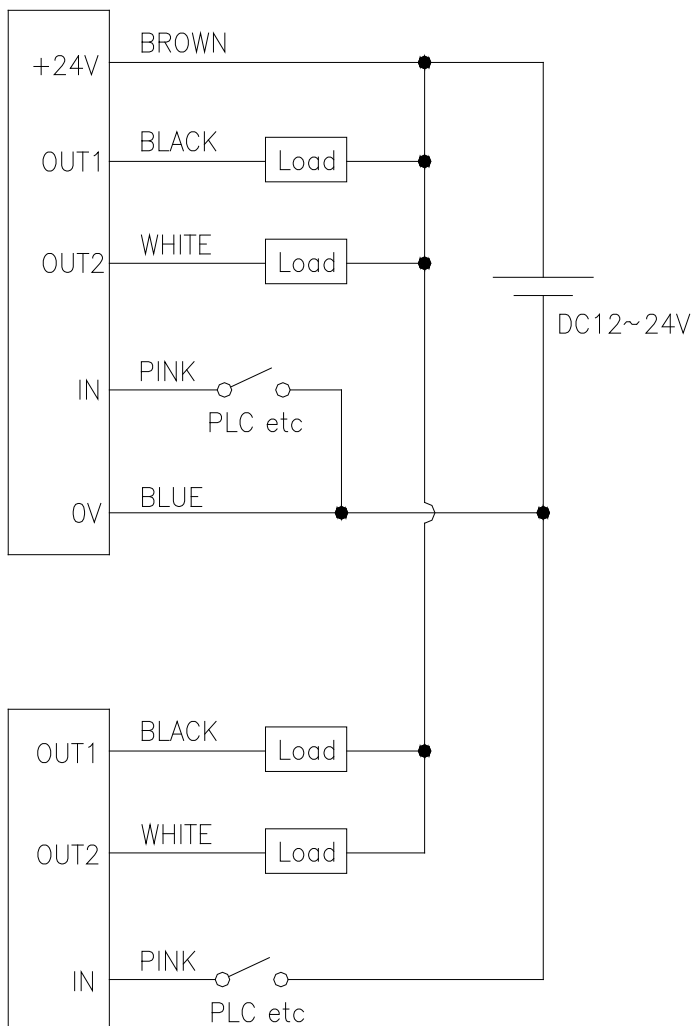
Installing position

- Please use air blow unit when using FIXA2.
- Please do not supply air without filter because this sensor is not strong enough to oil and unclean environment. Clean air is required.
- Please avoid the spatter and the water when you use FIXA2.

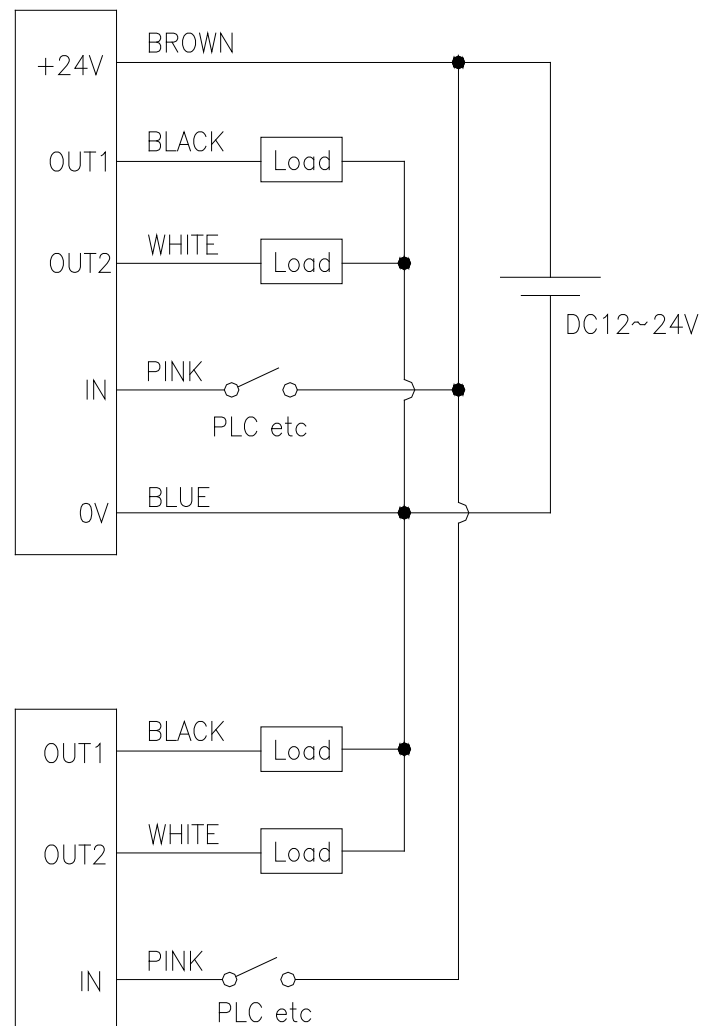
2.2 Wiring diagram

- * Please turn off the power before wiring.
- * Please connect wiring with qualified person.

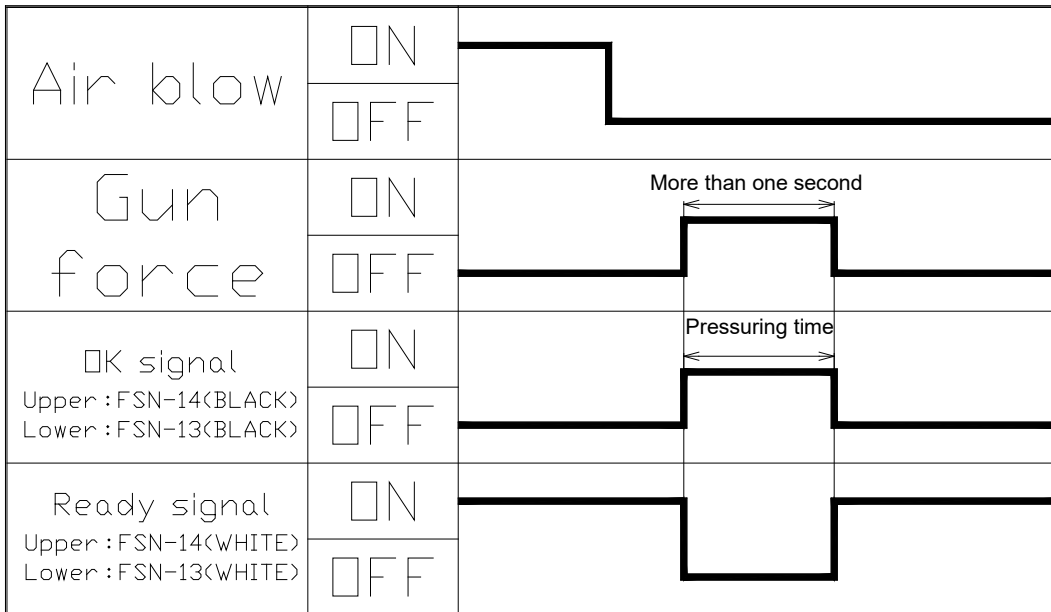
<NPN>



<PNP>



2.3 Timing chart (OK)



- ① Please set FIXA2 judge by signal only during pressurizing.
- ② Please check OK and Ready lamp status before gun forcing.
- ③ Green lights indicates OK sign

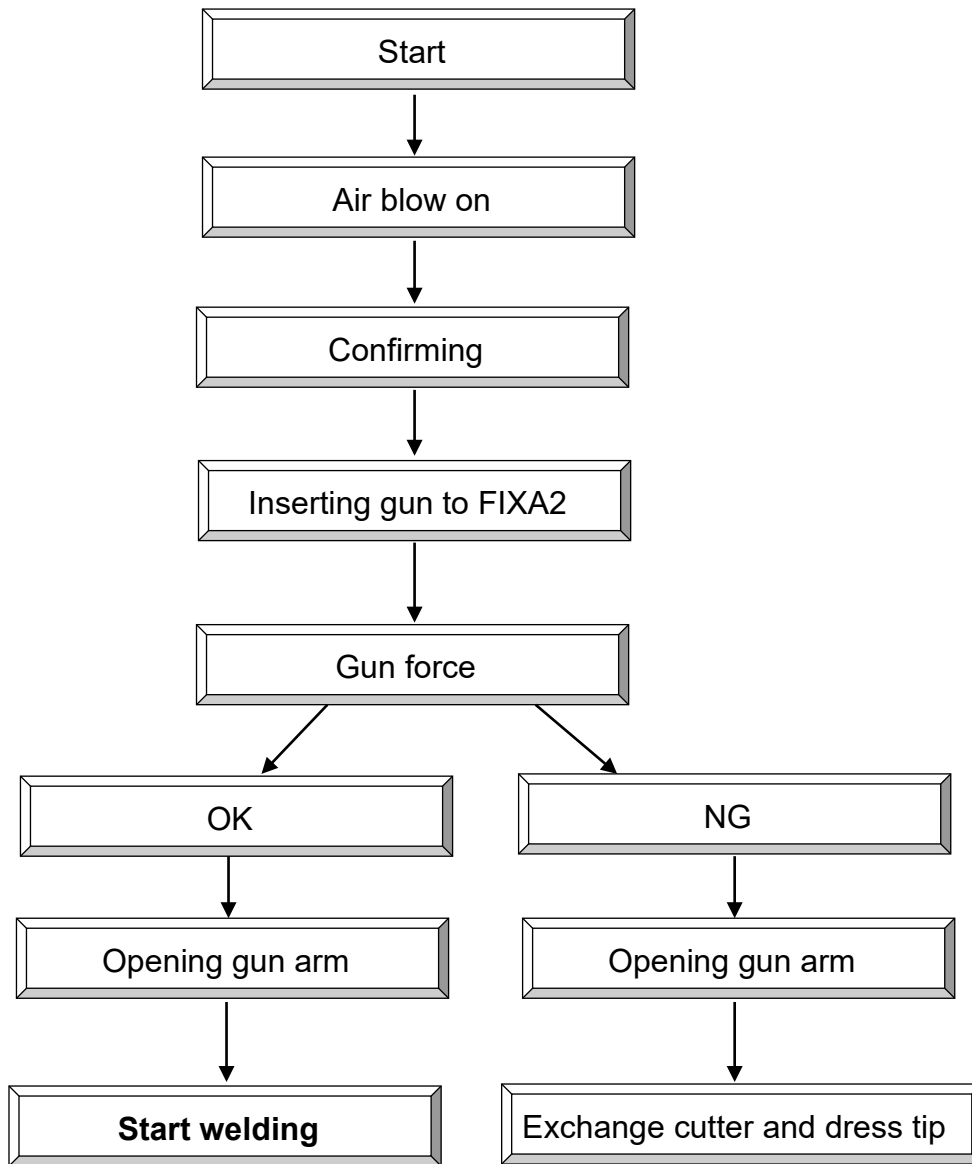
Precaution statement

- Please arrange gun teaching that tips face fits on FIXA2 vertically.
If tip and sensor can NOT be faced, please try to make tip face as vertical as possible that reaches maximum threshold value 4,096.
- Please set gun force less than 200kfg for detecting

<Signal output pattern>

Gun force		ON		More than one second
		OFF		
OK for both side	OK signal upper FSN-14(BLACK)	ON		
		OFF		pressuring time
	OK signal lower FSN-13(BLACK)	ON		
		OFF		pressuring time
	Ready mode upper FSN-14(WHITE)	ON		
		OFF		pressuring time
Ready mode lower FSN-13(WHITE)	ON			
	OFF		pressuring time	
OK Upper NG Lower	OK signal upper FSN-14(BLACK)	ON		
		OFF		pressuring time
	OK signal lower FSN-13(BLACK)	ON		
		OFF		pressuring time
	Ready mode upper FSN-14(WHITE)	ON		
		OFF		pressuring time
Ready mode lower FSN-13(WHITE)	ON			
	OFF		pressuring time	
OK for both side, but the Upper sensor is NOT clean	OK signal upper FSN-14(BLACK)	ON		
		OFF		pressuring time
	OK signal lower FSN-13(BLACK)	ON		
		OFF		pressuring time
	Ready mode upper FSN-14(WHITE)	ON		
		OFF		pressuring time
Ready mode lower FSN-13(WHITE)	ON			
	OFF		pressuring time	
OK Upper NG Lower, and Upper sensor is NOT clean	OK signal upper FSN-14(BLACK)	ON		
		OFF		pressuring time
	OK signal lower FSN-13(BLACK)	ON		
		OFF		pressuring time
	Ready mode upper FSN-14(WHITE)	ON		
		OFF		pressuring time
Ready mode lower FSN-13(WHITE)	ON			
	OFF		pressuring time	

2.4 Flow chart



3. Adjustment

3.1 Automatic Setting threshold value

- * Clean the sensor before setting threshold value.
- * Please do NOT scratch or damage the sensor.
- * Prepare dressed tip and same type of new tip which did NOT get oxidized
- * Set the threshold value by pressurizing FIXA2 with gun arm.
- * Gun force less than 200 kgf required.

① Please set the FIXA2 after wiring

② Please stop the robot with new cap tip after pressurizing

- * **Cap tips have to face the sensor vertically.**

If tip and sensor can not be faced, pelase try to make tip face as vertical as possible that reaches maximum threshold value 4,096.

Please do NOT use FIXA2 if measured new tip value is less than 3000, It may be malfunction.

③ Input threshold signal “FSN-13(PINK)/FSN-14(PINK) more than 0.1 second 1 pulse signal) which can be set by pushing Ready button (Theshold value Setting) too.

④ Evacuate robot from the tip sensor.

Setting threshold values is completed.

Originally reflection amount of cap tips is 50 %.

Once reflected light amount shows more than threshold vale, OK signal will output.

Before using FIXA2, please try to put NG cap tips to confirm there is no OK signal.

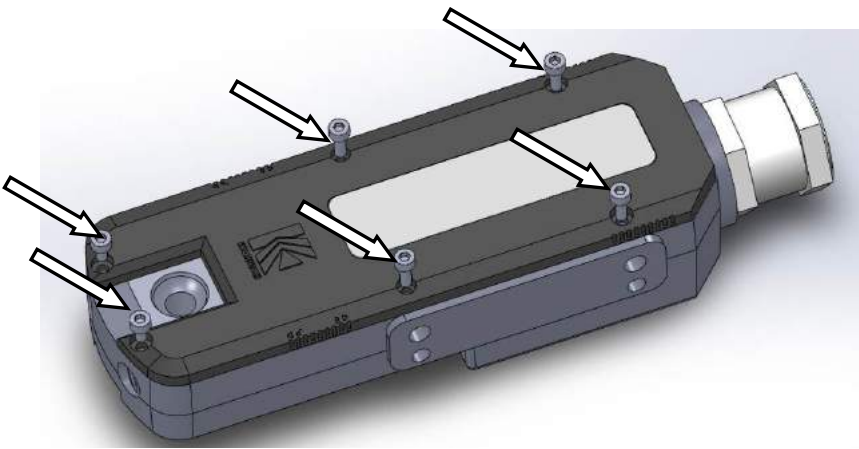
3.2 Manual setting threshold value

In case of Automatic setting for threshold value, OK signal output when new cap tip' s reflected amount is more than 50%.

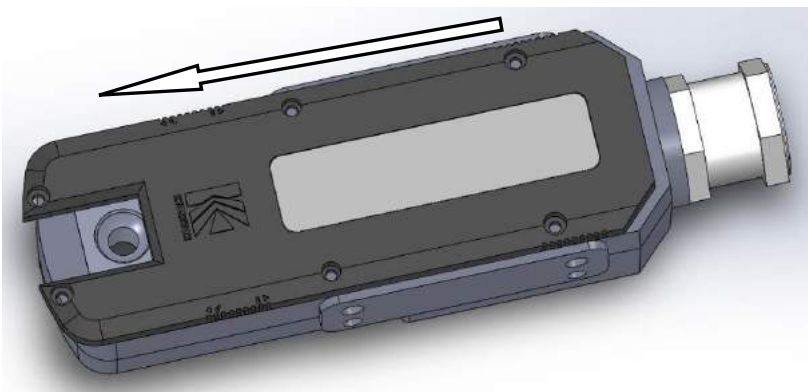
The setting values can be adjustable manually.

- ① Remove 6 pcs of screws from upper cover.

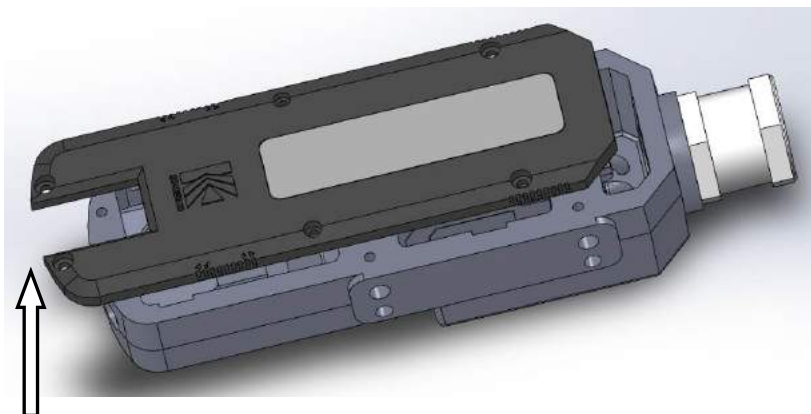
(2 pcs of M3*5L/4pcs of M3*8L)



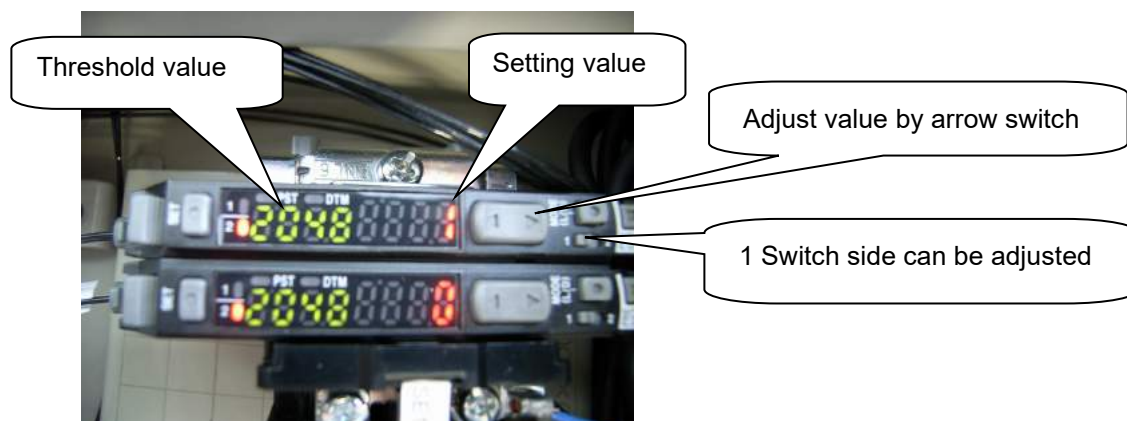
- ② Slide the upper cover to the following direction.



③Remove the upper cover.



④Changing threshold value by pushing arrow switch after confirming switch 1 is on.

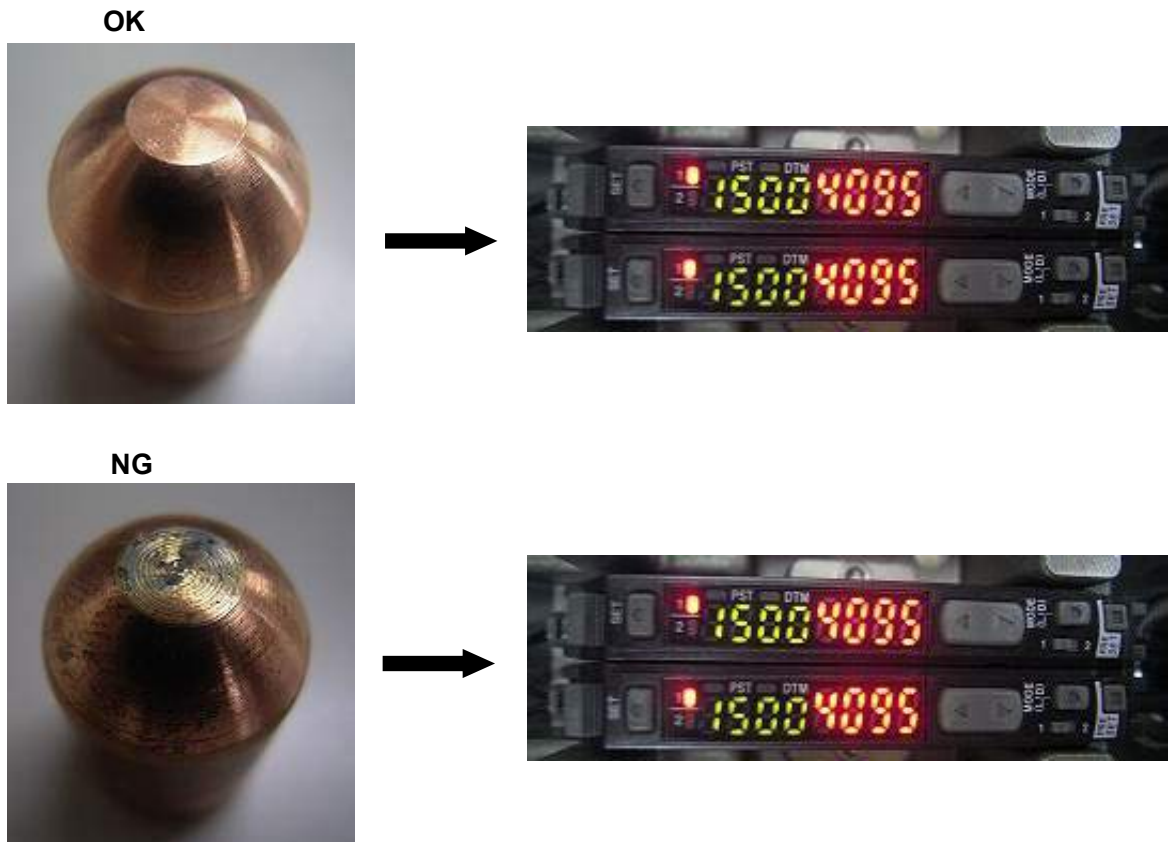


* There can be small value difference depending on the machine due to individual specificity. Please confirm setting value respectively.

* In case of threshold value less than 1,000, Cleaning sign (ref. next page 3.3) will not function properly due to ready signal.

3.3 Indistinguishable due to less difference of value between OK and NG cap tips

(Example)



Like upper image, if the NG cap tip was measured but had little or no difference in the numerical value from the OK cap tip, set up in the following order written below.

- ① Insert NG cap tip on a robot, stop the gun in a pressurized state.
- ② Press **S E T** by pushing **M O D E** at a same time. **S E T** must be pushed in less than 1 second after **M O D E** is pressed.



By the setting written above, the measured value will be lower than the original setting.

Then, reset the threshold manually .

Setting

- ① When holding down **MODE**, the display will show “L-on” . When this happens, wait for the display to go back to the original, then set up once again.



- ② If you release **MODE** before pushing **SET**, “FinE (flashing)” will appear. When this happens, press **MODE** 9 times continuously. Wait for the display to go back to the original, then set up once again.



※ For initialization, press **MODE+SET** once again.

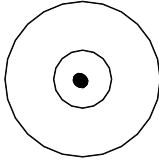
3.4 Output signal pattern for detecting

Signal	Condition
OK signal	Cap tip is dressed well.
No OK signal	Cap tip is NOT dressed well.
Ready signal and OK signal output	Tip is dressed, but sensor is NOT clean. Please clean the sensor
Ready signal output, No OK signal	A.Cap tip is NOT reached to the sensor. B.Sensor needs to be cleaned. C.Cap tip is dressed well
Neither of ready signal nor OK signal output	A. Cap tip is not dressed well B.No power

4. Detecting range

- Remained alloy block reflection of tip face and sensor does not output OK signal.

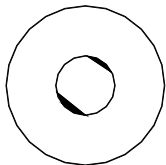
The sensor detects error as below.



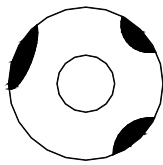
Dirt in the middle of tip

Note : The sensor is detecting at the central part of tip face only.

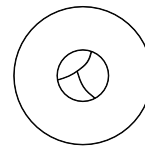
Therefore the errors below CANNOT be found.



Dirt on outer side of tip spot



Dirt on circumference





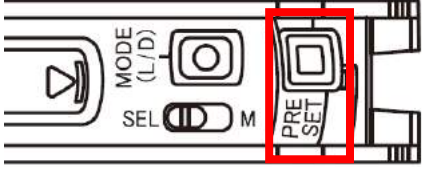


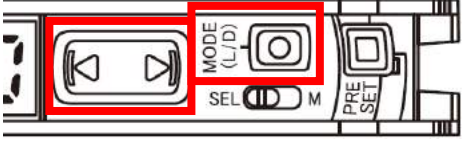
Asperity or scratch of tip surface

5. Trouble shooting

- Please read safety caution before using the FIXA2.
- In order to fix FIXA2 easily, please record its model type, date and place if there is any trouble.
- Repeated trouble can be considered as big problem such as attrited parts.

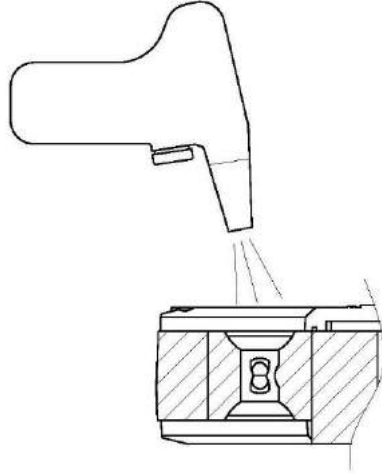
	Trouble	Cause	Countermeasure
(1)	No OK signal even though tip condition is good during detecting. (Ready signal is not even on.)	<ul style="list-style-type: none"> • Threshold values is too high • Tip is not reached to sensor • Sensor is NOT clean • Air from Air blow is NOT clean • Sensor is NOT positioned properly • Wrong PLC setting 	<ul style="list-style-type: none"> • Check the threshold value • Confirm Robot teaching. • Clean up the FIXA2 according to the manual. • Remove oil and dust from air supply. • Check the cable or power. • Check the PLC setting.
(2)	Ready signal but OK signal when detecting even though tip condition is good.	<ul style="list-style-type: none"> • Threshold values is too high • Sensor is NOT clean • Sensor is NOT positioned properly • Air from Air blow is NOT clean • Wrong PLC setting 	<ul style="list-style-type: none"> • Check the threshold value • Clean up the FIXA2 according to the manual. • Check the cable or power. • Remove oil and dust from air supply. • Check the PLC setting.
(3)	Tip condition is good but OK signal and ready signal are output.	<ul style="list-style-type: none"> • Sensor is NOT clean • Air from Air blow is NOT clean • Threshold value is too low • Wrong PLC setting 	<ul style="list-style-type: none"> • Clean up the FIXA2 according to the manual. • Remove oil and dust from air supply. • Please set threshold value by new tip. • Check the PLC setting.
(4)	OK signal output with bad condition of the tip.	<ul style="list-style-type: none"> • Threshold value is too low. • Threshold value is set by oxidized tip. • Wrong PLC setting 	<ul style="list-style-type: none"> • Check the threshold value . • Set threshold vale by new tip • Check the PLC setting.
(5)	No ready signal even in the ready mode.	<ul style="list-style-type: none"> • No power • Wrong PLC setting • FIXA2 is broken. 	<ul style="list-style-type: none"> • Turn on the power • Check the PLC setting • Please contact us.

■ Trouble-shooting by incorrect operation

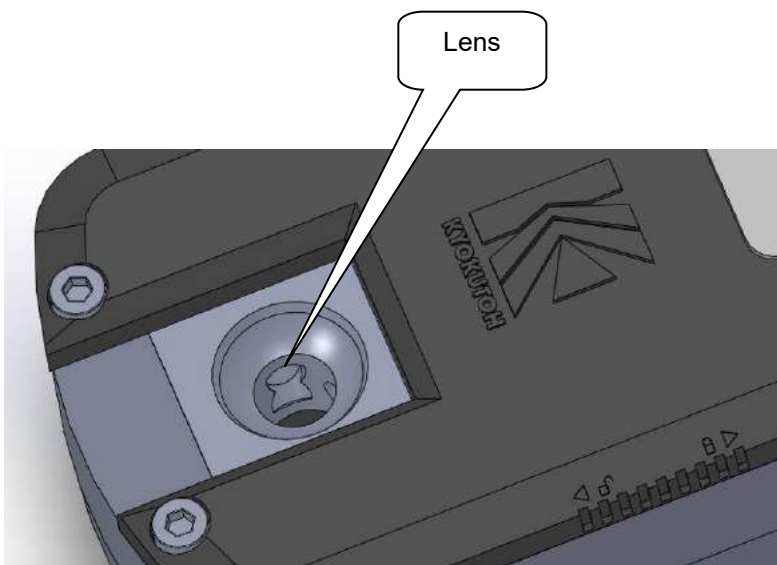
	Situation	Countermeasure
(1)	<p>Switched to PST (PRESET) mode by mistake.</p> <p>*Lights up when PST mode is activated.</p>  <p>*When un-activated (ordinary time)</p> 	<ul style="list-style-type: none"> Cancel by long push of the PRESET button. 
(2)	<p>Switched to Key-Lock mode and disabled all key operation by mistake.</p> <p>*The screen will return to reflection amount screen after the word "LOC" appears.</p> <p>All key operation will be unavailable.</p>  <p>*Un-activated</p> <p>The screen will return to reflection amount screen after the word "unL" appears.</p> 	<ul style="list-style-type: none"> Cancel by long push of the MODE button and the arrow button at the same time (at least 3 seconds). 

6. Cleaning

- Maintain the sensor part of FIXA2 with clean air regularly
- Please do NOT use the air including oil mist for maintenance. It may cause malfunction due to oil attached.



- 4 lens are built into right, left, up and down side of the FIXA2.
- Please use Q-tip for cleaning lens.
- Please do NOT scratch the lens during maintenance.



7. Warranty

1. Warranty Period

We warrant the product one year after the products are shipped to customer.

2. Coverage

(1) For failure occurred within warranty period, we will repair or replace the product for new one with free of charge. However we are not able to take a responsibility for troubles below even within terms of warranty. Furthermore, even after replacing or repairing the product, the starting date of warranty period is purchase date.

- ① Failure or usage other than listed in the instruction manual
- ② Any failure occurred by disaster such as fire, earthquake and flood
- ③ Breakdown occurred by no regular maintenance.

8.Contacts

Contact us if there is any damage or machine defects in our products.



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