

DUCIS

微電腦下死點連續沖壓模感測器  
COMPUTORIZED SLUG DETECTOR

SD-902/904

安裝使用說明書  
OPERATION MANUAL

申皓企業有限公司  
DUCIS ENTERPRISE CO., LTD.

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## 目錄

- 一、機台各部名稱
- 二、操作說明
- 三、安裝說明
- 四、操作步驟
- 五、故障檢查及排除
- 六、產品規格
- 七、產品配件
- 八、安裝孔位
- 九、產品保證書保證內容

## Catalogue

- I. Machinery Components
- II. Machinery Operations
- III. Machinery Setups
- IV. Machinery Operating Procedures
- V. Malfunction Inspections & Troubleshooting
- VI. Product Specifications
- VII. Product Accessories
- VIII. Hole Locations for Setups
- IX. Product Warranty

## 產品保證書保證內容

- 1、憑本保證書，自購買日起一年內免費服務。
- 2、保證期間因下列情形而發生故障者，本公司酌收材料工本費。
  - (1) 因天災地變等所導致者。
  - (2) 因人為疏忽，即非機台本身引起，而導致機台故障者。
- 3、如在機台使用上有任何問題，請來電諮詢。
  - (1) 臺北總公司 TEL: 02-2740-2184
  - (2) 東莞長安辦事處 TEL: +86-769-85305425
  - (3) 上海昆山辦事處 TEL: +86-512-57764867

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## Warranty

1. According to product warranty, free services are provided to buyers one year within their purchases.
2. Our company reserves the right to ask for material & production cost if malfunctions are resulted from any of the following conditions.
  - (1) Machinery malfunctions are resulted from natural disasters.
  - (2) Machinery malfunctions are resulted from human error rather than machinery itself.
3. For any questions about the machine, please contact us through the following approaches.
  - (1) Taipei Headquarter TEL: 02-2740-2184
  - (2) Dongguan Chang'an Branch Office TEL: +86-769-85305425
  - (3) Shanghai Kunshan Branch Office: TEL: +86-512-57764867

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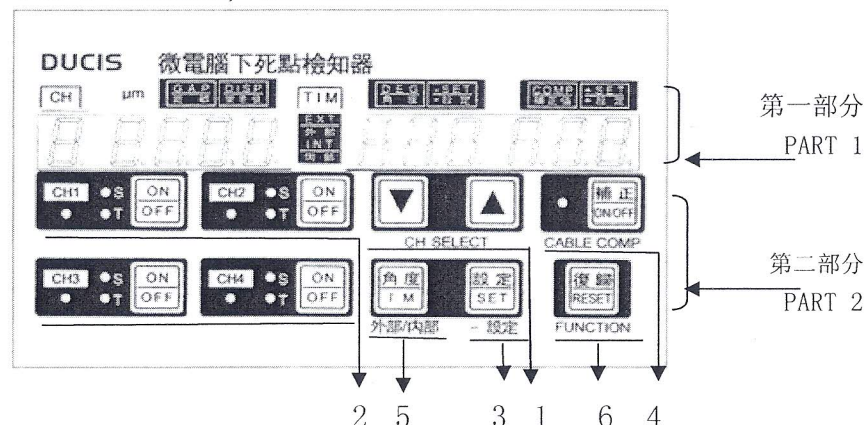
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# I. Machinery Components

## (I) Component Titles:

### 1. Front Operation Panel

- (1) Front operation panel possesses 2 different kinds of categories: 2 channels and 4 channels (respectively represented by CH1~2 & CH1~4).
- (2) For 2 channels, CH3 and CH4 are unavailable.



Part 1: Function Indicator Light (function on once light turns on) Display on the nixie tube.

CH: Channel Display

0.1 $\mu$ m: Light On: Image resolution equals to 0.1 $\mu$ m.;

Light Off: Image resolution equals to 1 $\mu$ m.

(Please refer to detected values for further setting.)

GAP / Gap: Gap width for sensor head must be set as "A".

DISP / Disparity Value: Disparity value is in display.

TIM:

External Degree Light On: External degree is in use.

Internal Degree Light On: Internal degree is in use.

DEG / Degree: Internal degree setting is in display.

- / SET: Negative detected value is in display.

COMP / Compensation Value: Compensation value is in display.

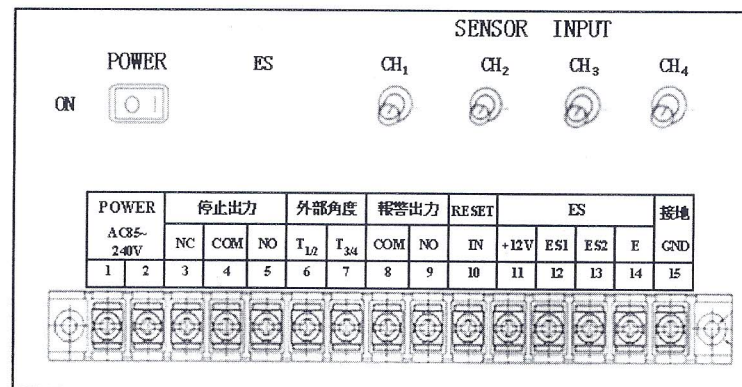
+ / SET: Positive detected value is in display.

### Part 2: Buttons

1. "UP & DOWN" BUTTON The second function is channel selecting.
2. "CHANNEL" (ON/OFF) BUTTON
3. "SET" BUTTON The second function is (-) value setting.
4. "CABLE COMP" BUTTON The second function is cable compensation.
5. "DEGREE" BUTTON The second function is the selection between internal degree and external degree.
6. "RESET" BUTTON The second function is 2nd function assembly button.

## 2. Back Operation Panel

Back operation panel includes connections to sensor, output, power switch and terminal block.



CH1 / CH2 / CH3 / CH4: Signal Input

1 / 2: Power Input AC85~240V

3 / 4 / 5: Control the emergency stoppage of stamping press.

3#NC / 4#COM Normally Closed Control for  
Emergency Series Connection Stoppage

4#COM / 5#NO Normally Opened Control  
for Emergency Parallel Connection Stoppage

6 / 7: External Degree Input:

6: CH1 / CH2 Degree

7: CH3 / CH4 Degree

Normally Opened Point  
(with the other terminal connected to ground)

8 / 9: (Alarm Activation) Normally Opened Point

10: Reset Switch Connection (Normally opened point with the other terminal connected to ground.)

11: +12V Power Supply

12 / 13: Material Extrusion (for no feed inspection)

14: E must be connected to stamping press chassis.

15: Grounding (For the grounding of external degree and reset switch.)

## II. Machinery Operation

1. CH number in display, with number representing current channel contents.

For 4 Channels, either 1, 2, 3, or 4 will be in display.

For 2 Channels, either 1 or 2 will be in display.

Press "UP" or "DOWN" BUTTON to switch between channels.

CH



2. GAP / DISP value in display.

GAP Lights Up: Current display represents the gap between sensory head and sensory body.

DISP Lights Up: Current display represents the disparity value.

For positive number, no positive mark will be revealed.

For negative number, negative mark will be revealed.

GAP DISP  
距離 變差值



3. Degree mode in display.

Indicator light will be lit up for either external degree or internal degree.

TIM  
EXT  
外部  
INT  
内部

Degree mode display

4. Degree / - Setting Display

Internal Degree in Display: Degree value is in display.

Please press the button for more than 3 seconds to turn on the light.

- / Setting: Negative setting requires the combination of "reset button" and "set button" to have the "set" light turned on.

DEG -SET  
角度 設定



5. Compensation Value in display. Red light will be lit up when compensation button is turned off.

Set positive value. Green light will be lit up when compensation button is turned on.

COMP -SET  
補正值 設定



6. ON / OFF

OFF Status: Red light will flash.

(1) Set statistical display for sensory head and sensory body.

(2) Combined with reset button to perform cable compensation.

ON Status: Green light will lit up.

Detector CPU is in normal operation.

補正  
ON OFF

7. Switch Button for Channel Indicator Light

Each channel will independently display on or off.

Status Indicator Light:

CH1 ○ S  
○ ○ T

CH Status  
Indicator Light

"ON/OFF" Since the channel is closed when the button is turned off, inspection function has no effect and thus no light on

"ON/OFF" When the button is turned on, channel corresponding to the connection sensor head will reveal green light. Otherwise, red light will be revealed. When abnormalities are detected during the working process, red light will be lit up. Just click reset button to resume normal operation.

ON  
OFF

(CH ON/OFF) 鍵

"S" Light: Light up when button dead center (BDC) is detected.

"T" Light: Light up when the degree reaches set value.

8. Reset Button

(1) Under abnormalities, please click reset button for clearance. Abnormalities include the following items:

① Stop the machine for chip jumping.

② Stop the machine for no material extrusion.

③ Stop the machine when "OP" lit up, which means that the sensor fails to connect normally.

④ Stop the machine when HI or LO lit up.

(2) Reset button can be used as a function button. Press and hold the reset button before clicking other buttons. Make sure to release both buttons at the same time.

① For cable compensation purpose: Reset Button + Compensation Button

② Negative setting for detected value: Reset Button + Set Button

③ Internal / External Degree Setting: Reset Button + Degree Button

(3) Click reset button during the setting process to eliminate the setting.

復歸  
RESET

Reset Button

9. Degree Setting Button

For setting internal degree: Combined with "UP" and "DOWN" button to change numbers.

角度  
T M

Internal / External  
Degree Button

10. Detected Value Setting Button

Set the positive or negative sign for detected value: Combined with "UP" and "DOWN" button to change numbers.

設定  
SET

Set Button

11. Number Changing Button

UP: Increase the number.

DOWN: Decrease the number.

▽ ▲

Number Changing  
Button

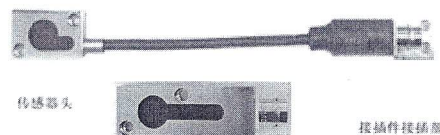
### III、Machinery Setups

#### Sensor Head / Sensor Connection

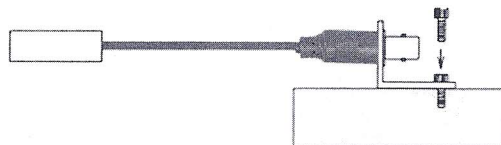
Customers are recommended to purchase spare sensor head and sensor connecting wire.

#### Sensor Head

Please select the sensor head which is suitable for mold setups.



Please fixed it tight.

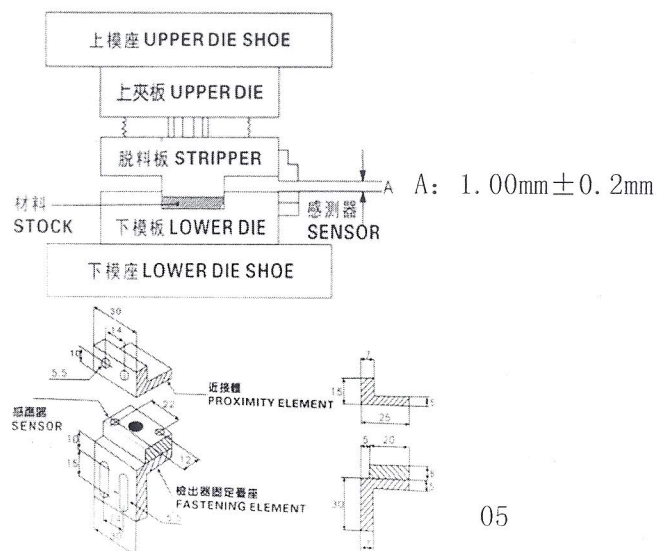


#### Sensor Connecting Wire

Standard lengths for the sensor connecting wire are 3M or 5M (standard acc.: 3M).

#### Sensor Setups:

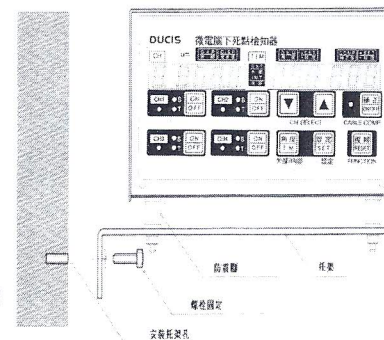
Please install the sensor right next to the stripper. Sensor and fastening element, on the other hand, must be installed right next to the lower die as presented in the chart below:



#### Setups

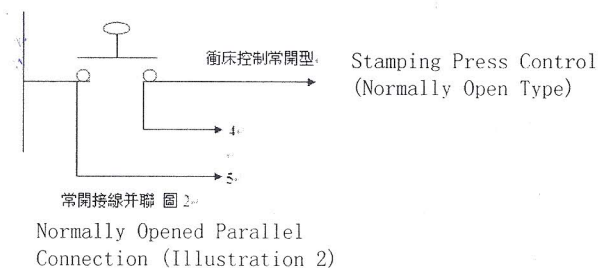
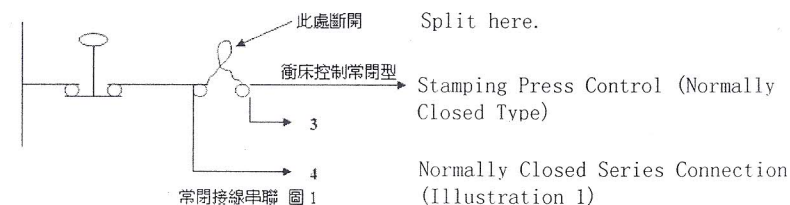
Standard bracket must be installed on the equipment. Please select a place with lower vibration and fewer dust for detector setups. Make sure to keep away from processing oil and metal powder.

Please apply cable wire with more than  $\Phi 0.75$  to connect detector and Stamping Press.



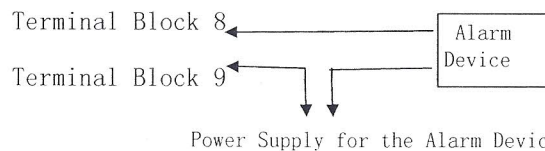
1、Power Supply: Stamping press can be connected to a power supply of 85~240V, but not to 380V.

2、Stop the connection to output circuit.



The following items can be installed as needed.

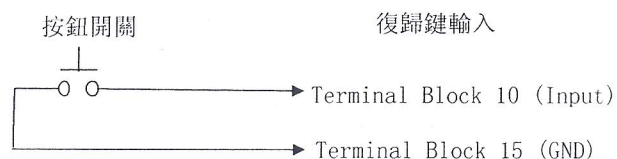
1. Through alarm output connection, alarm devices such as warning light and buzzer can be operated. Please prepare power supply for the alarm devices.



## 2. External Reset

If CPU and Stamping Press CPU are distant from each other, please connect the reset switch to the stamping press's reset system to facilitate convenient operation.

Button Switch / Reset Button Input



## 3. CAM Connecting Wire Installation

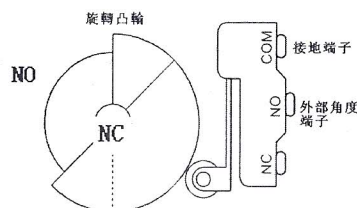
External Degree Connecting Wire: Connect non-voltage point or semiconductor switch to input terminal (6 / 7) and ground terminal (GND) as common terminal.

Note: Connecting wire for limit switch must be changed according to degree timing setting. In addition, while using proximity switch, please pay extra care to NO or NC.

旋轉凸輪: Rotating CAM

接地端子: Grounded Terminal

外部角度端子: External Degree Terminal

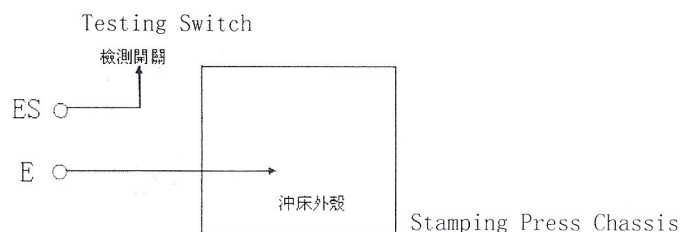


## 4. Material Extrusion / Non-material Connection

Check to see if the switch is connected to input terminal (12 or 13). E represents 14# terminal.

ES and E are connected as presented in the chart below. With high-resistance protection,

CPU damages resulted from stamping press electrical leakage can be avoided.

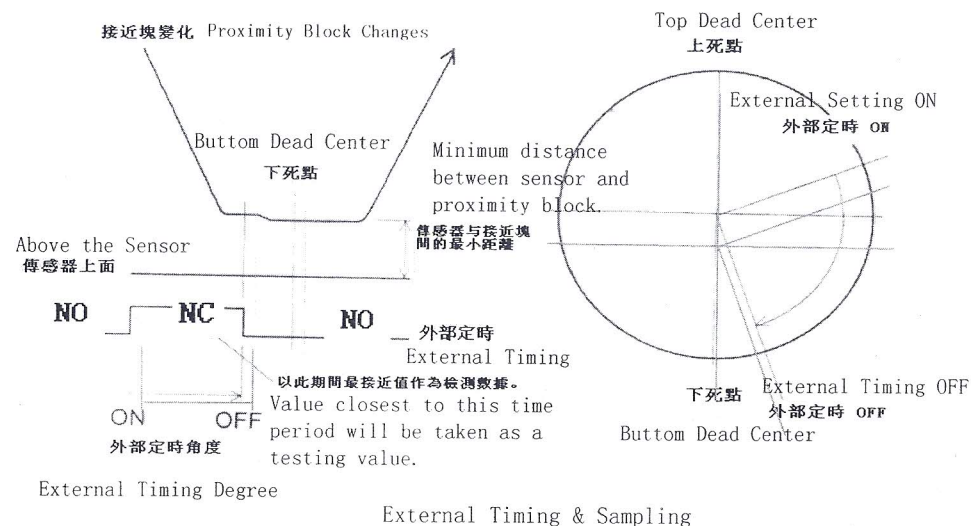


## External Timing

Degree can be set freely through stamping press's rotating CAM. By taking external timing as testing timing, external timing must be set for CPU.

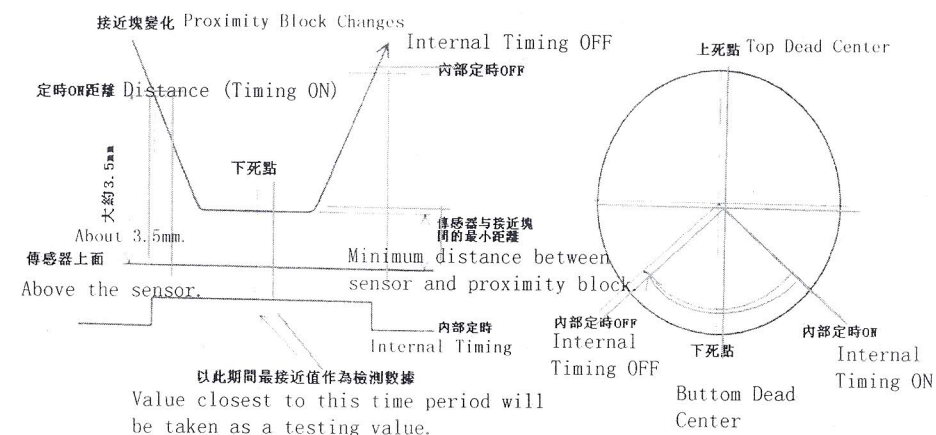
calculated based on accurate time, which must be greater than

10 minutes.



## Internal Timing (Original Setting)

When internal timing is taken as testing timing, button dead center is also taken as signal sampling.



## Internal Timing and Sampling

接近塊變化: Proximity Block Changes

內部定時ON距離: Distance (Internal Timing ON)

大約3.5mm: Approximately 3.5mm

傳感器上面: Above the Sensor

設定角度寬度0.1~99.9: Degree Width 0.1~99.9

當抽樣保持時, 以定時結束時的數值做為檢測數據: When the sampling is maintained, statistics generated at the end of timing is applied as testing statistics.

當極值保持時, 以此期間最接近數值做為檢測數據: When the extreme statistics are maintained, statistics closest to this time period is applied as testing statistics.

內部角度定時: Internal Degree Timing

感應器與接近塊的最小距離: Minimum distance between sensor and proximity block.

上死點: Top Dead Center

內部定時ON: Internal Timing ON

設定角度寬度: Degree Width

內部角度定時OFF: Internal Degree Timing OFF

下死點: Bottom Dead Center

When the original setting equals to the internal setting, the degree setting equals zero.

外部定時: External Setting

角度設定 = 0 Degree Setting = 0

內部定時: Internal Setting

角度設定 ≠ 0 Degree Setting ≠ 0

內部角度定時: Internal Degree Timing

面板顯示: Panel Display; 角度與設定操作: Degree Setting Operation

Internal and External Degree Selection and Setting:

(1) Click "Reset" button and hold.

(2) Click "Degree" button to switch between internal and external degree, with the light lit up once the selection is made.

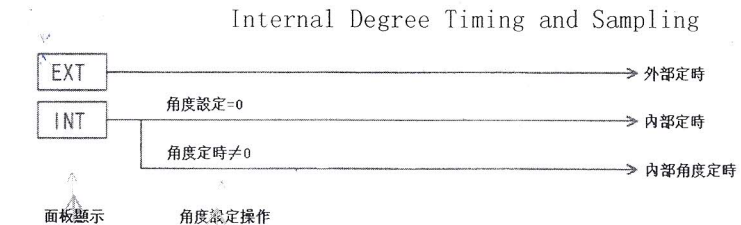
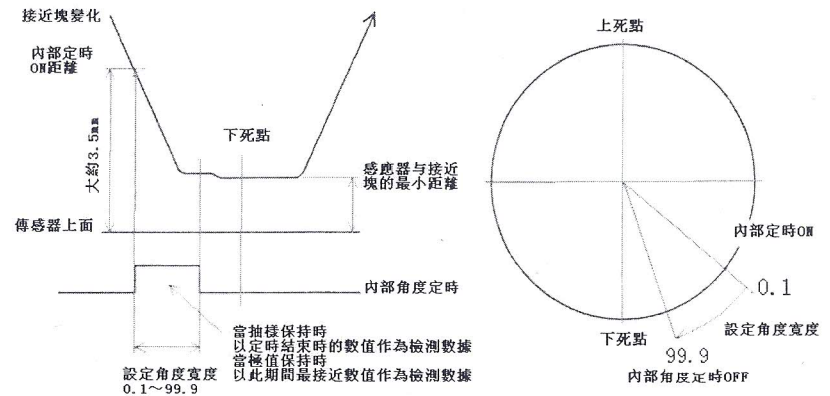
Explanation: Original internal degree is set as zero.

(3) External degree is set by stamping press CAM.

Internal Degree Timing

Even if rotating CAM is not in use, internal degree timing can still be applied for the setting.

timing. Sampling and testing are performed within the degree width, which is approximately 30 degrees.



Internal Degree Setting:

- (1) Press "Degree" button for more than 2 seconds until
- (2) Click "UP" or "DOWN" button to change the
- (3) Click "Degree" button for saving.
- (4) Click "Reset" button once again to return to the homepage.

Note: Degree setting must be located within 0.0~99.9 degrees, with the initial value being 0.0 degree.

#### IV. Machinery Operating Procedure

##### Sensor Head Gap Setting

1. Connect sensor head to the corresponding channel before opening the channel switch. Green light will be lit up. If OP starts to flash, please click "reset" button once.
2. Select channels by clicking "UP" or "DOWN" button. CH1~4 represents the corresponding channel - CH1, CH2, CH3, and CH4, respectively.
3. Compensation  
Click "Compensation" Button, to which red light and light representing the compensation value will flash and lit up.  
Click and hold "reset" button before clicking "compensation" button. Make sure to release both button at the same time.
4. Stamping press will operate until reaching button dead center. Install the adjustable sensor head. Once "gap" lit up, number display must be adjusted to a range between 0.80~1.20. Remember to fix the sensor head tight. Repeat the aforementioned procedures to adjust other channels.
5. If green light is lit up upon clicking "compensation" button, the setting is successfully completed. Please operate four times before normal testing.

Note: Detected Gap A:  $0.1\mu\text{m}$  Range: 0.8~1.2mm

$1\mu\text{m}$  Range: 0.5~2.5mm

##### Detected Value Setting

$\pm$  Value Setting (at the same time): (1) Click "Set" button, to which number display will flash.

- (2) Click "UP / DOWN" button to change number display.
- (3) Click "Set" button again for saving.

Independent setting for single value:

- (1) Click and hold "reset" button before clicking "set" button, to which "-- set" button will start to flash.
- (2) Click "UP or DOWN" button to change number display.
- (3) Click "Set" button again for saving.

Note: Adjust detected number and switch between  $1\mu\text{m}/0.1\mu\text{m}$ .

Switch 0.1 into 1; Detected Value > 20:  $0.2 \rightarrow 19.9 \rightarrow 20 \rightarrow 200$

Switch 1 into 0.1; Detected Value < 1:  $0.2 \leftarrow 0.9 \leftarrow 1 \leftarrow 200$

#### V. Malfunction Inspections & Troubleshooting

Code Status: Code Implications / Troubleshooting Approaches

##### OP Flashes

If OP flashes right after sensor head connection, please click "reset" button.

If OP flashes frequently, signal wire and sensor head might be in poor connection (replacement).

##### H1 or L0

"A" Gap might be too large or too small (reset).

Sensor might be in poor condition (replacement).

Others (repair or maintenance)

##### ES1 / ES2

Appear during material extrusion or non-material inspection.

To eliminate malfunctions resulted from material extrusion or non-material inspection, please click the reset button.

##### SP

Appear when abnormalities are detected during sensor speed testing.

##### OP

Sensor head or signal wire might be interrupted (replacement).

Malfunction Status / Inspection and Troubleshooting Approaches

Poor sensor despite normal setting.

1. Channel switch might not be turned on. Please click channel switch until the green light lits up.
2. Internal / external degree might not be set correctly. Please refer to degree setting cancelation.
3. Compensation button might be turned off (with red light flashing).  
Please switch compensation button on until green light lit up.
4. Check to see if the correct sensor head is in use.  
Number display is flipping without normal frequency.

1. Signal wire might be in poor connection (replacement).

2. Sensor might be in poor condition (replacement).

3. Others (repair or maintenance)

Machine fails to be stopped under abnormalities.

1. See if the emergency stopping wire is becoming loose (fix it back).
2. Others (repair and maintenance)

Light lits up after stamping press stops.

1. Stamping press might be stopped for emergency conditions.
2. Overlapping materials might cause A gap to surpass 2mm. Sensor might not be effective.

Detector might detect some timing abnormalities.

Please do not disassemble the microcomputer detector, or the original

manufacturer might not be able to provide repair or maintenance services.

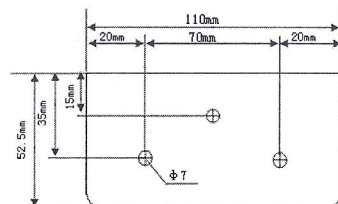
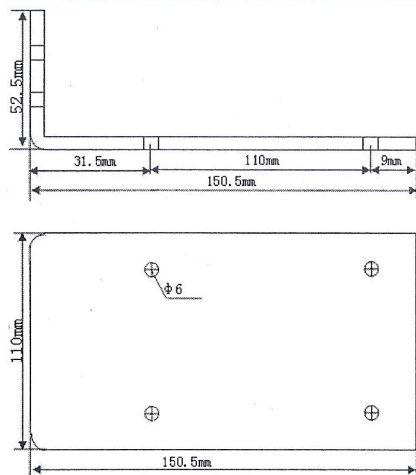
## VI. Product Specifications

Applicable Temperature: 0~50℃		Standard Accessories: Sensor, Sensor Wire (3M), and Copper Block	
Weight	SD-902: 1.85KG	Sensor Head Length: 10CM	
	SD-904: 1.95KG	Connecting Wire Length: 3M and 5M	
Output Signal: Relay Connecting Point (A; B) 240V7A		Sensor Gap Setting:	0.1 μ m Range: 0.8~1.2mm
Power Supply Voltage: AC85V~240V50/60HZ+10%			1 μ m Range: 0.5~2.5mm
Size	164W*94H*152D	Maximum Operating Speed: 4000S.P.M	

## VII. Product Accessories

CODE	SD-902		SD-904	
SD5001	Sensor Head	2pcs	Sensor Head	4pcs
SD007	Sensor Wire	2pcs	Sensor Wire	4pcs
SD009	Upper and Lower Iron Block	2sets	Upper and Lower Iron Block	4sets

## VIII. Hole Locations for Setups



## Product Warranty

### 1. Warranty Period

Warranty period of our company products is one year upon delivery, starting from the date when company products are delivered to the designated location.

### 2. Warranty Scope

During the aforementioned warranty period, should our company products reveal any malfunctioning due to our own responsibility, we will replace or repair the malfunctioning parts without extra charges incurred. However, our product warranty doesn't cover product malfunctioning resulted from the following conditions:

- (1) Product malfunctioning is not resulted from improper conditions, environments, operations, and applications confirmed by this instruction manual or otherwise signed product specifications.
- (2) Product malfunctioning is not resulted from the delivered products.
- (3) Product malfunctioning is resulted from the third party's remodification or repair.
- (4) Product malfunctioning is resulted from the user's incompliance with the instruction manual.
- (5) Product malfunctioning is resulted from our company's technological inadequacy to unforeseen the product defects at the time of product dispatches.
- (6) Product malfunctioning is resulted from natural disaster or manmade disaster, which is not within the scope of our company's responsibility.

In addition, product warranty as stated here covers delivered product alone. Our company is not responsible for damages or losses generated from product malfunctioning.

### 3. Responsibility Limitation

Our company is not responsible for special losses, indirect losses or passive losses generated from our company products.

### 4. Variable Changes

Machinery variables and instruction manual contents may subject to constant changes due to product improvements or other reasons, which will not be disclosed to our customers in the first place.

### 5. Service Scope

Price of the delivered products excludes service charges of the assigned technicians.

We will negotiate over the issues based on your requirements.