

TO: _____

Specification No. S-1612-01

Specification Draft 3

Product name: Electrochemical CO (carbon monoxide) sensor
Model number: EC-570
Customer model number: _____

Confirmation

Via:

March 5, 2018

Nissha FIS, Inc.

3-36-3, Kitazono, Itami, Hyogo, JAPAN

Approved	Confirmed	Created
 松 18. 03. 09 本平	 稲 18. 03. 09 澤	 大 18. 03. 09 西

Submitted	Copies
Returned	Copies

	Obsoleted number	Issued on	Remarks

Specification		Nissha FIS, Inc.																																													
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Model number: EC-570	Customer model number:	S-1612-01																																													
<p>2. Scope This specification applies to electrochemical CO (carbon monoxide) sensor, EC-570.</p>																																															
<p>3. Product name/Model number</p> <p>Product name: Electrochemical CO sensor Model number: EC-570 Customer model number:</p>																																															
<p>4. Recommended conditions</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Symbol</th> <th>Conditions</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>Detection concentration range</td> <td></td> <td>0 to 5,000 ppm of CO</td> <td></td> </tr> <tr> <td>Operating temperature and humidity range</td> <td>T_{op}</td> <td>-10 to 50C 15 to 90%RH</td> <td>Without dew condensation</td> </tr> <tr> <td>Atmospheric pressure</td> <td>P</td> <td>1 atm±10%</td> <td></td> </tr> <tr> <td>Load resistor</td> <td>R_L</td> <td>10ohm±1%</td> <td></td> </tr> <tr> <td>Bias voltage</td> <td>V</td> <td>0mV</td> <td></td> </tr> <tr> <td>Storage temperature range</td> <td>T_{ST}</td> <td>0 to 20C</td> <td></td> </tr> <tr> <td>Storage period</td> <td></td> <td>6 months</td> <td></td> </tr> <tr> <td>Mounting direction</td> <td></td> <td>Any direction</td> <td></td> </tr> <tr> <td>Soldering</td> <td></td> <td>Edge temperature of soldering iron: Below 350C Soldering time: Below 3 sec per pin Maximum repeated soldering: 2 times after the soldered temperature returns to room temperature.</td> <td>Hand soldering</td> </tr> <tr> <td>Others</td> <td></td> <td colspan="2">Should not be influenced by halogens, organic solvents, etc.</td> </tr> </tbody> </table>				Parameter	Symbol	Conditions	Remark	Detection concentration range		0 to 5,000 ppm of CO		Operating temperature and humidity range	T _{op}	-10 to 50C 15 to 90%RH	Without dew condensation	Atmospheric pressure	P	1 atm±10%		Load resistor	R _L	10ohm±1%		Bias voltage	V	0mV		Storage temperature range	T _{ST}	0 to 20C		Storage period		6 months		Mounting direction		Any direction		Soldering		Edge temperature of soldering iron: Below 350C Soldering time: Below 3 sec per pin Maximum repeated soldering: 2 times after the soldered temperature returns to room temperature.	Hand soldering	Others		Should not be influenced by halogens, organic solvents, etc.	
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Specification

Product name: Electrochemical CO sensor
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Nissha FIS, Inc.

Specification No.

S-1612-01

5. Characteristic measurement conditions

Parameter	Condition	Remark
Temperature and humidity	20±3°C, 65±10%RH	
Measurement gas	Clean air Carbon monoxide (purity: more than 99%)	
Circuit	<p>R2: 10ohm R3: 11.8kohm R4: 17.8kohm TH: NTC thermistor, R25=10kohm, B constant=3435K</p>	Pre-heating time: 5 min.

6. Sensitivity characteristic

	Parameter	Rating	Remark
1	Output current	20±5nA/ppm	CO, 20°C65%RH
2	Base line	±0.2μA	
3	Response	Within 10 sec	T ⁹⁰
4	Repeatability	±2%	
5	Output at -10°C	13nA/ppm	Temporary
6	Output at 50°C	27nA/ppm	Temporary

Note: The above characteristic is based on "4. Recommended conditions" and "5. Characteristic measurement conditions".

Specification		Nissha FIS,Inc.
Product name: Electrochemical CO sensor		Specification No.
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7. Mechanical characteristics

No.	Parameter	Contents, conditions	Tentative specifications
1	Tensile strength	Cap's tensile strength	More than 9.8N(1kgf)
2	Vibration	Acceleration: 12.7m/s ² (1.3G) Frequency range: 5 to 500Hz Changing the sweep: Logarithmic Direction of vibration: 3 dimensions (X, Y, Z) Duration of sweep: 40 minutes Duration: 66 hours of each direction	Should satisfy "6. Sensitivity characteristic"
3	Drop and impact	Free drop from a height of 60cm Floor material: Concrete Number of drops: 3 times	Should satisfy "6. Sensitivity characteristic"

8. Related documents

- (1) Sensor drawing: attached
- (2) Packaging: Separately specified when mass production starts.
- (3) Inspection certificate: Separately specified when mass production starts.

9. Quality assurance

Separately specified when mass production starts.

10. Handling of this specification

This specification shall be exchanged between customer and Nissha FIS,Inc.
Other contents than specified in this specification shall be decided through mutual consultation between both parties.
All or a part of this specification shall not be disclosed to any third parties without advance consent of the other party.

Specification

Nissha FIS, Inc.

Product name: Electrochemical CO sensor

Specification No.

Model number: EC-570

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S-1612-01

11. Other information

1) Handling notes

- Gas sensitivity measurement should be made under clean air without noise gases.
- Avoid storage at high temperature and low humidity below 30%RH. Store the sensor whose electrode pins should be connected at low temperature and usual humidity.
- If the sensor is left at humidity lower than 30%RH for a long time, store the sensor in the package which is correctly sealed.
- When soldering the sensor, keep the recommended soldering conditions. Avoid reflow soldering and soldering bath.
- Do not apply voltage directly to electrode pins.
- Do not bend pins. Do not apply excess vibration, shock, or load.
- If sensor housing is damaged, do not use the sensor.
- Do not disassemble the sensor. If disassembled, you could be injured by electrolyte leakage.
- Do not blow organic solvents, paints, chemical agents, oils, or high concentration gases onto the sensor.

2) Lot number

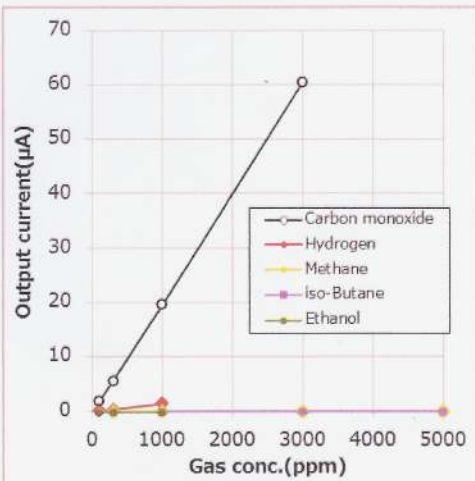
The label below is put on the side of sensor.

Label contents should be finally specified when mass production starts.

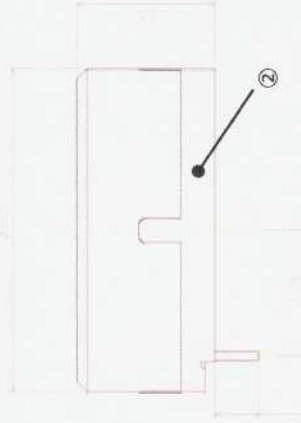
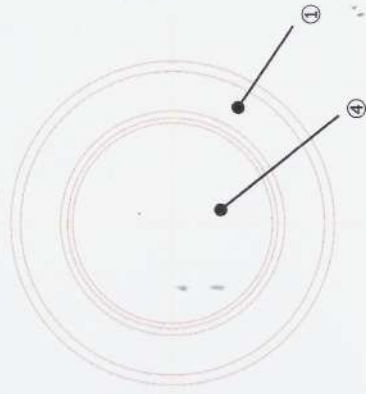
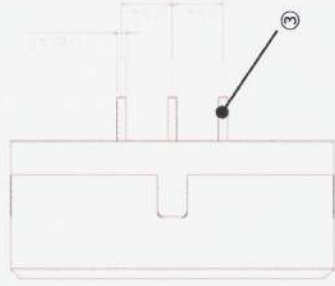
CO 16ZXX
EC-570 FIS

XX: Sensor Number

3) Reference: Sensitivity characteristic



Gas	Concentration (ppm)	Corresponding CO concentration
CO	100	100
H ₂	1000	69
Methane	10000	0
Isobutane	10000	0
Ethanol	1000	0



No.	Part	Material
1	Cap	ABS
2	Base	PPE
3	Pin	Brass (Gold plated nickel)
4	Filter	Polyester nonwoven fabric/PTFE

3	Material				
2	Finish				
1	Part Name				外観寸法図
Design By	Design Date	Appr By	Date	Qty	
井山	2016.11.22	井山	2016.11.22	5	
Check By	Check Date	Scale			
木西	2016.11.22	5/1		1	
Appr By	Date	Model			
		EC-570(原)			
Drawn #	16.22	Company	FIS エフアイエス株式会社		
			A3		

公差	最大	最小	公差	最大	最小
±0.1	3.00	2.90	±0.05	4.00	3.95
±0.05	5.00	4.95	±0.05	6.00	5.95
±0.05	10.00	9.95	±0.05	15.00	14.95
±0.05	20.00	19.95	±0.05	30.00	29.95
±0.05	40.00	39.95	±0.05	60.00	59.95
±0.05	80.00	79.95	±0.05	100.00	99.95