



August 17, 2010

No. V-8363A

Messrs.

SPECIFICATIONS

Oxygen sensor

Model: FCX - UC

RoHS compliance model, Ceramic base.

Project:

Reference:

Distributed by:
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Fujikura Ltd.

Specifications of Oxygen Sensor Unit

V-8363A

1. General:

This document describes the customized specifications of a ceramic oxygen sensor unit, FUJIKURA FCX-UC.

Table shown below is revision records of this specification

V				
IV				
III				
II				
I	Aug.17th,2010	M. Hashimoto	Revised the marking format	(A)
Est.	11-30-2006	H. Nishida		
	Date	Name	Comments	Remark

<u>Model</u>	<u>FCX-UC (RoHS compliance model, Ceramic base)</u>
1. Measuring Gas	Oxygen
2. Measurement Method	Limiting current method using Zirconia Solid-Electrolyte
3. Dimension and weight	Please see the drawing 9-760-001, Approx. 7g
4. Measurement Range	0.1 to 25 %O ₂
5. Output current (I _L)	60 ~ 80uA in free air , 1.3V sensing voltage (Vs), 1.5W heating Theoretical output is given by following equation. $I_L = - ([A] / 0.2357) \times \ln (1 - [O_2\%] / 100) \text{ ----(1)}$ [A] = Output current in 21.0% O ₂ (uA) [O ₂ %] = Oxygen concentration (vol.%)
6. Accuracy	within +/- 0.5%O ₂
7. Response Time	within 30 sec. (90% value)
8. Life time	3 years in free air, continuous Vs
9. Heater	Power consumption: 1.5WDC +/- 5% Voltage(Vh) for 1.5W: 1.7~3.0VDC (individual for each sensor) Warm up rate: Maximum 40mV/sec
10. Sensing element	Recommended Vs=1.3V for free air
11. Operating temperature	-10 ~ 50 degC
12. Storage temperature	-40 ~ 120 degC
13. Humidity	0 ~ 85 RH ... Without condensation
14. Ambient pressure	0.5 ~ 5 atm

15. Vibration resistance	JIS C 5025 class A Maximum 9G
16. Warranty	Within one year after shipment
	For further information, please feel free to contact us.

Output current of FCX-UC

	1	2	3	4	5	10	15	20	25	%O2
min	2.6	5.1	7.8	10.4	13.1	26.8	41.4	56.8	73.2	uA
max	3.4	6.9	10.3	13.9	17.4	35.8	55.2	75.7	97.6	uA

Marking



UC: FCX-UC

Ex. C8N001 : Year(2006), Month(August), serial number 001.

1st digit number (or alphabet) shows YEAR

----- * Remark (A)

Examples;

2008->A	2018->8,	2028->A,	2038->8
2009->B,	2019->9,	2029->B,	2039->9
2010->C,	2020->0,	2030->C,	2040->0
2011->D,	2021->1,	2031->D,	-
2012->E,	2022->2,	2032->E	* 20 years cycle.
2013->F,	2023->3,	2033->F	
2014->G,	2024->4,	2034->G,	
2015->H,	2025->5,	2035->H	
2016->I,	2026->6,	2036->I	
2017->J,	2027->7,	2037->J	

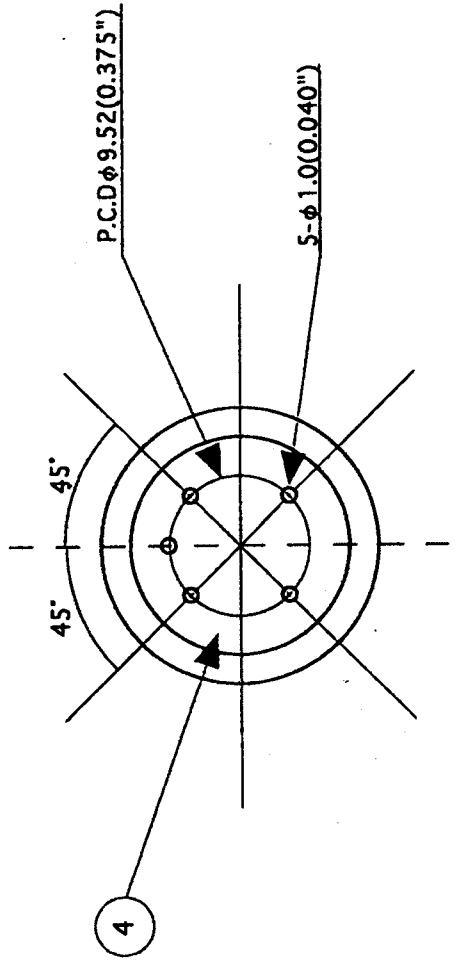
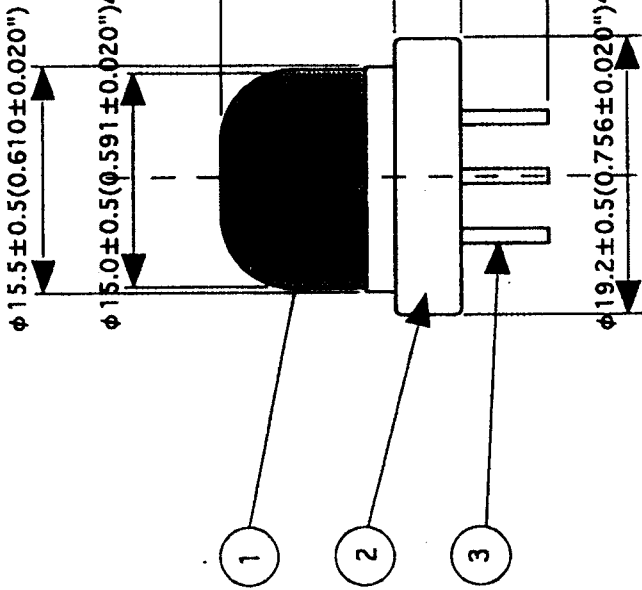
2nd digit number (or alphabet) shows Month

Ex. Jan.->1. Feb.->2, Mar.->3,,,,,,,,,Oct.->X, Nov.->Y, Dec.->Z

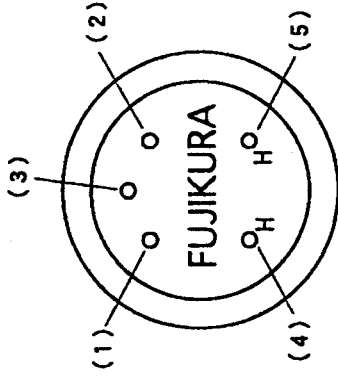
3rd digit alphabet is always "N"

Last three digit number shows Serial number of production.

Ex. 001, 002, -----, 999.



△ 接続図: Connection Diagram



- (1) V s (+) : センサ出力端子 (+) : Sensing terminal(+)
- (2) V s (-) : センサ出力端子 (-) : Sensing terminal(-)
- (3) NC : 未使用端子 : Non-connected terminal
- (4) V H (+) : ヒータ電圧端子 (+) : Heater terminal(+)
- (5) V H (-) : ヒータ電圧端子 (-) : Heater terminal(-)

Ceramics		C	
ステマ	数量	材料	数量
4 STEM	1	Nickle	5
3 ポストピン		Brass	1
2 リング		SUS316	1
1 メッシュカバー		材質	数量
PART NO.	NAME OF PARTS	MAT'L	QTY
REMARKS			

承認者: 原
 検査者: 彦
 設計者: 彦
 製図者: R.Nagano

名称: OXGEN SENSOR ELEMENT
 外形寸法: OUTLINE DIMENSIONS
 (Model: FCX-U, UW, UL, UC, UWC, ULC)

図面番号: 9-760-001
 図面番号: DRAWING NO.

承認日: 1997.11.04
 設計日: 1996.11.25

承認者: 原
 検査者: 彦
 設計者: 彦
 製図者: R.Nagano

MARK	変更 REVISIONS	DATE	BY
△	Sensor stem material: Plastic -> Ceramics	SEP 7, 2006	H. N
△	誤記訂正(ピン配置) Correct of Mistakes(Pin arrangement)	97/ 11/04	水野
△	寸法見直し(インチ表示表記)	96/ 11/25	水野

フジクラ
 FUJIKURA Ltd.
 Tokyo, Japan

Precautions Relating to the Use of the Fujikura Oxygen Sensor

Carefully read the following before using the oxygen sensor and analyzer.

1. Applications for medical appliances, life-support equipment and low oxygen detectors

- (1) Fujikura products are not designed, intended or approved for use as components of surgical or life support systems, or other applications that may cause injury or death as a result. In unapproved applications or uses where the customer implies, directly or indirectly, resultant injuries or deaths are due to Fujikura, Fujikura affiliates and agencies (citing for example, a design or manufacture fault), Fujikura, Fujikura affiliates and agencies shall be free from responsibility relating to any claims, costs, losses, and compensation.
- (2) When a Fujikura product is to be used in medical appliances and oxygen detectors other than those mentioned above, it is strongly advised that fail-safe designs are established. Fujikura should be consulted for the necessary information.

2. Service life and guarantee period

- (1) The end of service life shall be defined as the time when the output no longer meets the specified precision.
- (2) The guarantee period is for one year from the date of shipment. During the guarantee period, should defects occur under normal conditions of use as specified in the manual and within the service life, the product will be repaired or replaced without charge. However, a repair or replacement fee will be charged in the following cases.

Defect or damage due to inappropriate transportation or handling after delivery.

Defect or damage caused by misuse, abuse or careless handling.

Defect or damage due to unauthorized repairs or changes in configuration

Damage to the cosmetic appearance caused during use

Damage from fire, earthquake, flood or other natural disasters and abnormal

voltage.

3. Operational precautions

3.1 Measurement of atmospheric gases

(1) Calibration gas

The sensor should be adjusted with a calibration gas that is a mixture of nitrogen, N₂ (or Argon, Ar) and oxygen, O₂. Other balance gases may result in incorrect measurements.

(2) Combustible gases

An atmosphere containing combustible gases such as methane, alcohol, hydrogen and carbon monoxide may cause errors in measurement. Since the sensor element functions at 450°C, gases that ignite below that temperature must not be used.

(3) Silicon gases

Never use silicon gases containing siloxane, as these gases react with the sensor and produce oxides, destroying the performance of the sensor over a very short period.

(4) Fluorocarbons

Do not use freons and others that contain halogens (F, Cl and Br), as these gases react with materials inside the sensor and damage the performance.

(5) Sulfur oxides and hydrogen

Never use sulfur oxides (SO_x) and hydrogen (H₂), as they react with the sensor and destroy the performance of the sensor over a very short period.

3.2 Operating conditions

(1) Dust and oil mist

Employ a filter system to eliminate dust and oil mists that clog the sensor and analyzer filter, resulting in problems, measurement errors and incorrect responses.

(2) Water and condensation moisture

Contact of the sensor with water may destroy the sensor. Exclude water from the system.

3.3 Others

(1) There is a risk to burns, since the sensor mesh is heated to 50 - 80°C while the sensor is in operation.

(2) Do not subject the sensor to a shock of 10G or greater which may cause breaks in the wiring and cracks in the sensor chip.

(3) The sensor element is made of a ceramic material. Never expose it to heat suddenly as this could destroy the element.

4. Others

Any product described in the catalogues may be altered without prior notice to improve reliability, function or design.

Fujikura is not responsible for any incidents due to application of products and circuits described in the catalogues. No Fujikura patents or rights are licensed to a third party.