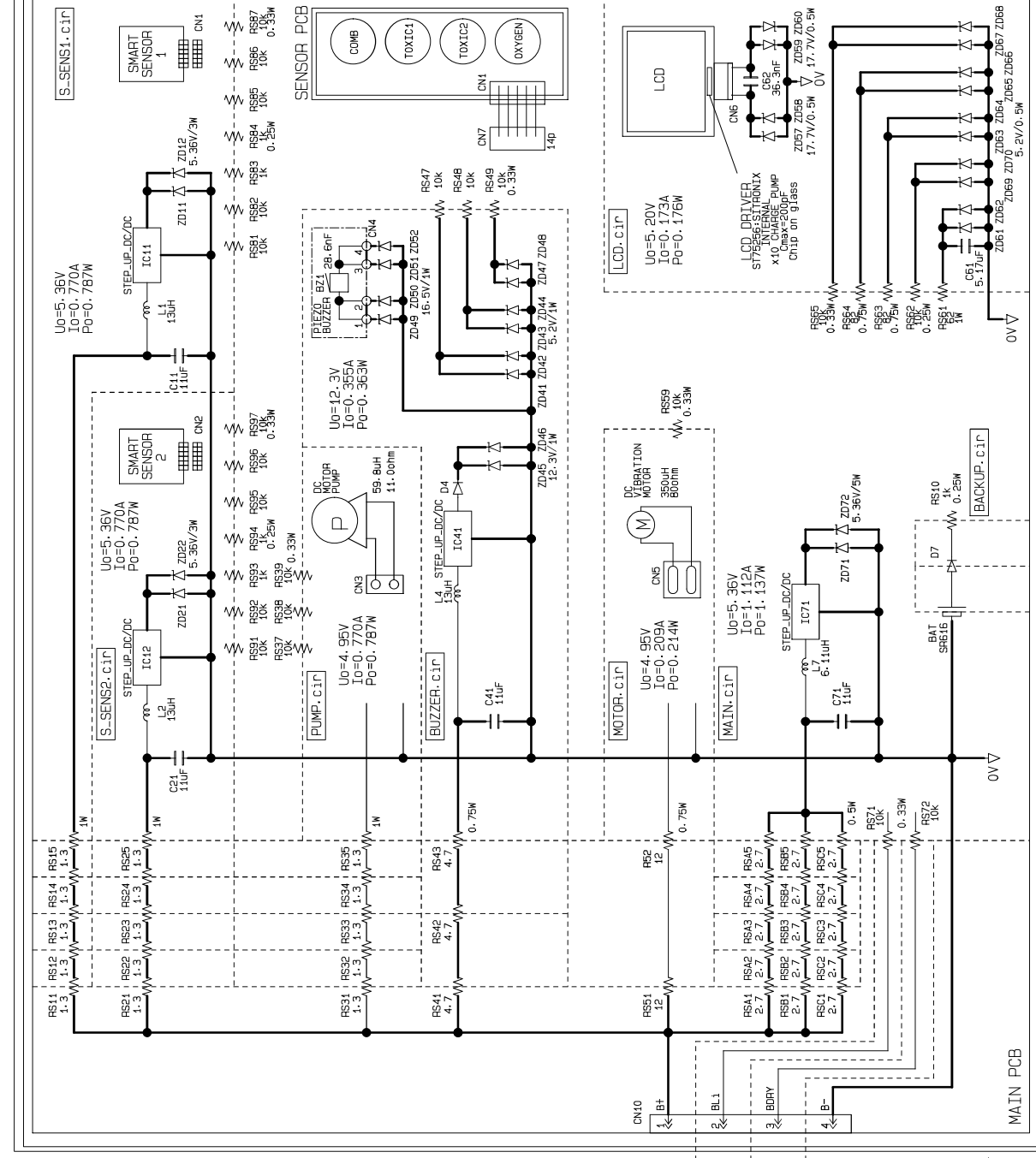
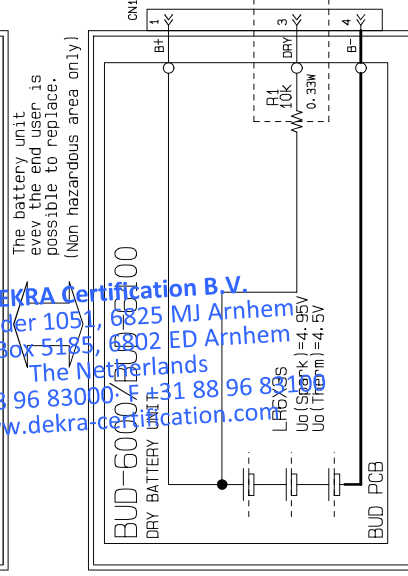
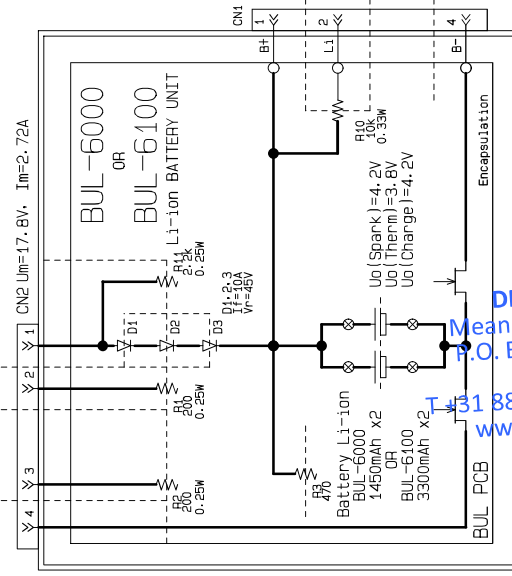
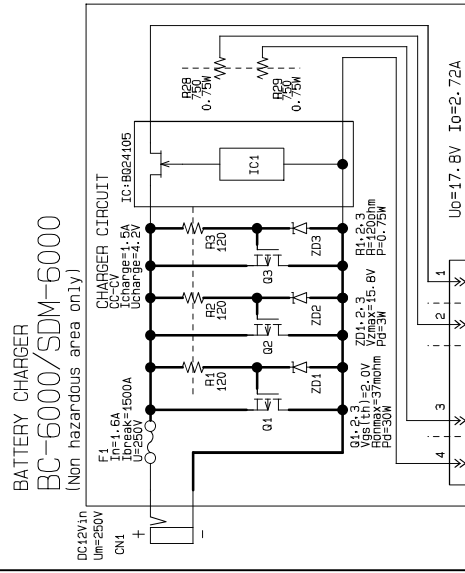


1	2	3	4	5	6	7	8	9	10	11	12	13	14						
		DRAWING NAME		DRAWING No.		REV	DATE				DRAWING NAME		DRAWING No.		REV	DATE			
	01	BLOCK DIAGRAM FOR MODEL GX-6000		E3-6991-5393-30-01K		1	2023.1.20			31	T- 3/4 BPA LAMP OL-8270BPA		E4-6991-5129-60-01K		0	2012.2.24			
	02	DIAGRAM FOR I.S. KEEP FOR MODEL GX-6000		E3-6991-5361-10-01K		3	2023.1.20			32	SMART SENSOR Type-PIS		M4-4830-01-01K		1	2015.3.25			
	03	OUTER STRUCTURE GX-6000		M3-4777-01-01K		1	2023.1.20			33	PIS SENSOR PCB		E4-6991-5387-30-01K		2	2015.3.25			
	04	MAIN UNIT GX-6000		M2-4777-01-01K		3	2024.1.25			34	PIS DIGITAL PCB		E3-6991-5388-10-01K		1	2015.3.25			
	05	SCHEMATIC MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-01K		0	2014.7.14			35	BUL-6000		M3-4777-03-01K		0	2014.7.28			
	06	SCHEMATIC MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-02K		0	2014.7.14			36	BUL PCB		E3-6991-5389-80-01K		1	2014.9.5			
	07	SCHEMATIC MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-03K		0	2014.7.14			37	BUD-6000 / BUD-6100		M3-4777-04-01K		2	2023.1.20			
	08	SCHEMATIC MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-04K		0	2014.7.14			38	BUD PCB		E4-6991-5390-50-01K		1	2014.9.5			
	09	SCHEMATIC MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-05K		0	2014.7.14			39	DIAGRAM FOR I.S. KEEP FOR MODEL BC-6000 / SDM-6000		E4-6991-5395-80-01K		1	2014.9.5			
	10	PARTS LIST OF MAIN PCB		PLT-6991-5372-80 (1/4)		0	2014.7.14			*	40	LABEL		M4-4777-33-05K		4	2024.6.13		
	11	PARTS LIST OF MAIN PCB		PLT-6991-5372-80 (2/4)		3	2014.12.16				41	LABEL BC-6000 / SDM-6000		M4-4777-01-02K		0	2014.7.28		
	12	PARTS LIST OF MAIN PCB		PLT-6991-5372-80 (3/4)		1	2014.11.5				42	SCHEMATIC CHARGER PCB FOR MODEL BC-6000		E3-6991-5255-80-01K		0	2014.12.16		
	13	PARTS LIST OF MAIN PCB		PLT-6991-5372-80 (4/4)		2	2024.6.4				43	CHARGER PCB FOR MODEL BC-6000		E3-6991-5255-80-01A		1	2023.3.8		
	14	MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-01A		0	2014.7.14				44	SCHEMATIC CHARGER PCB FOR MODEL SDM-6000		E3-6991-5445-60-01K		1	2015.3.5		
	15	MAIN PCB FOR MODEL GX-6000		E3-6991-5372-80-02A		0	2014.7.14				45	CHARGER PCB FOR MODEL SDM-6000		E3-6991-5445-60-01A		2	2015.6.12		
	16	SCHEMATIC SENSOR PCB FOR MODEL GX-6000		E3-6991-5373-50-01K		1	2014.11.5				46	SMART SENSOR Type-OSS		M4-4080-01-01K		0	2015.2.24		
	17	PARTS LIST OF SENSOR PCB		PLT-6991-5373-50 (1/1)		2	2014.12.16				47	OSS SENSOR PCB		E4-6991-5457-00-01K		0	2015.2.24		
	18	SENSOR PCB FOR MODEL GX-6000		E4-6991-5373-50-01A		1	2014.11.5				48	OSS DIGITAL PCB		E3-6991-5458-70-01K		0	2015.2.24		
	19	SENSOR to MAIN WIRE FOR MODEL GX-6000		E4-6991-5382-70-01K		0	2014.7.14				49	OXYGEN SENSOR		M4-4080-01-02K		0	2015.2.24		
	20	PUMP RP-12		M4-4181-61-01K		3	2013.1.29				50	BC-6000		M3-4777-02-01K		1	2015.3.27		
	21	Buzzer BZ-9K		E4-6991-5008-70-01K		0	2011.2.28				51	SDM-6000		M3-4395-23-01K		1	2015.3.27		
	22	COMBUSTIBLE GAS SENSOR NC SENSOR		M3-4462-64-05K		3	2012.4.17				52	BUL-6100		M3-4777-38-01K		0	2023.1.20		
	23	TOXIC GAS SENSOR		M4-4084-92-03K		0	2014.7.30				*	53	Safety_Info		-		14	2024.6.13	
	24	OXYGEN SENSOR		M4-4080-82-07K		0	2014.7.30												
	25	SMART SENSOR Type-ESS		M4-4486-01-01K		0	2014.7.30												
	26	TOXIC GAS SENSOR		M4-4084-30-08K		0	2014.7.30												
	27	ESS SENSOR PCB		E3-6991-5384-10-01K		0	2014.7.14												
	28	SMART SENSOR Type-DES		M4-4630-20-01K		0	2014.7.24												
	29	DES SENSOR PCB		E3-6991-5385-90-01K		1	2015.5.25												
	30	DES DIGITAL PCB		E3-6991-5386-60-01K		1	2015.2.24												

注 記 NOTES				改版担当者 REV. BY		改版日 REVISED		名 称 NAME	
40,53				REV. BY		2024.6.13		INDEX	
改版回数 REV.		16		総頁数 PAGES		1		古舘優作	
承認 APPROVED		石橋勝		検討 CHECKED		北村正英		作成日 DATE	
		DEKRA Certification B.V. Meander 1091, 6825 MJ Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands				2015.3.6		図 番 DWG. NO.	
								E3-6991-5470-70-01K	
RIKEN KEIKI				理研計器株式会社				機密情報 / CONFIDENTIAL	



注 記 NOTES BUL-6100/BUO-6100	改版担当者 REV. BY 木村司	改版日 REVISED 2023. 1. 20
改版回数 REV. 3	発行枚数 PAGES 1	作版日 DATE 2014. 6. 23
承認 APPROVED 石橋勝	校 討 CHECKED 北村正英	製 図 DRAWN 小野圭

(MEMO)

1. --- marks means SEPARATE

2. — marks means INFALLIBLE CONNECTION

Technical drawing showing three views of a device (likely a battery unit) with dimensions and labels.

Top View:

- Overall width: 201
- Overall height: 70
- Label A points to a central rectangular area.
- Dimension 54 indicates the distance from the top edge to the start of the main body.
- Dimension 31 indicates the width of the main body.
- Dimension 11 indicates the thickness of the main body.

Front View:

- Overall width: 6
- Overall height: 17
- Label D points to a small rectangular area on the left side.
- Dimensions 14, 14, and 14 indicate the widths of different sections.

Bottom View:

- Overall width: 21
- Overall height: 19
- VIEW A is indicated at the bottom center.

Main Unit:

- M2-4777-01-01K

Battery Unit:

- BUL-6000
- M3-4777-03-01K
- OR
- BUD-6000/BUD-6100
- M3-4777-04-01K
- OR
- BUL-8100
- M3-4777-38-01K

Table:

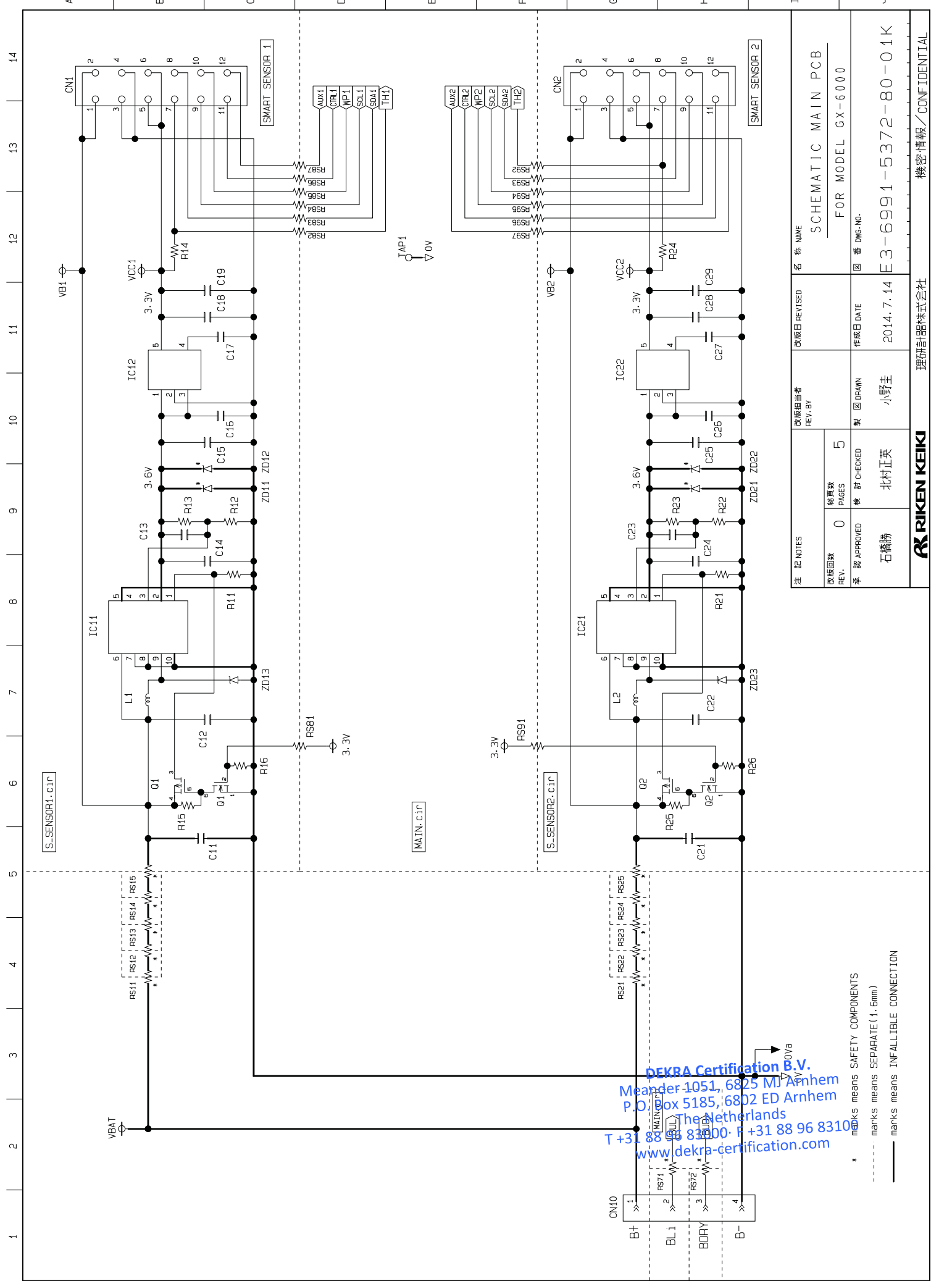
表面処理 TREAT.	許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME
材 質 MAT.	検 討 CHECKED	1 : 1	第一角法 First Angle Projection	OUTER STRUCTURE GX-6000
承認 APPROVED	近藤晴彦 Hirofumi Endo	製 図 DRAWN	作成日 DATE	図 番 DWG.NO.
青良治 Aoyama		海野裕作 Hiroyasu Ueno	2014. 7. 18	

RIKEN KEIKI

機密情報 / CONFIDENTIAL

M3-4777-01-01.K

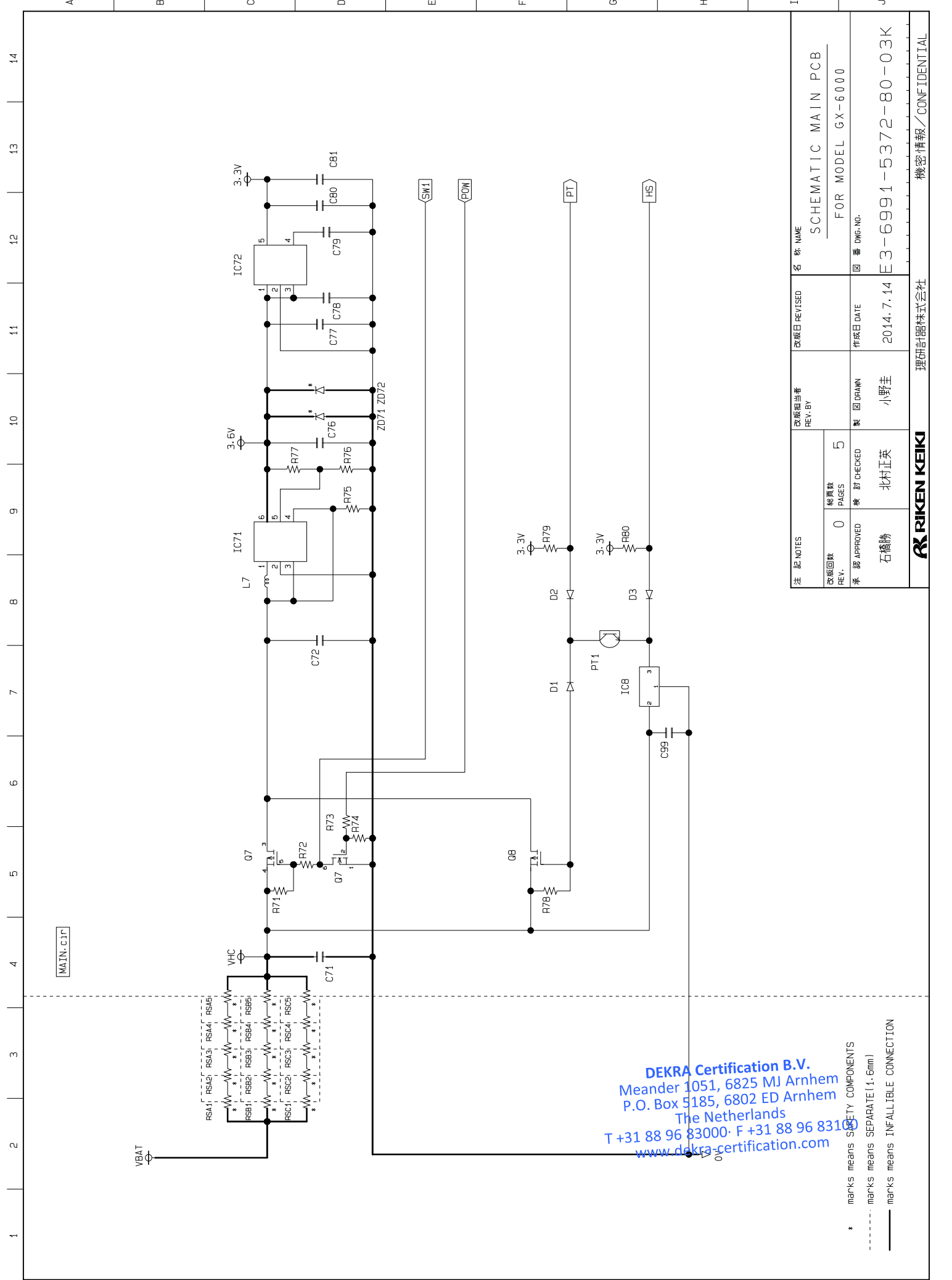
PROTECTION GRADE-MORE THAN IP 20

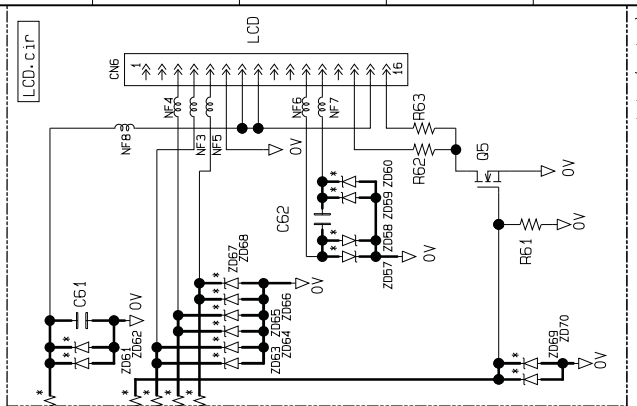
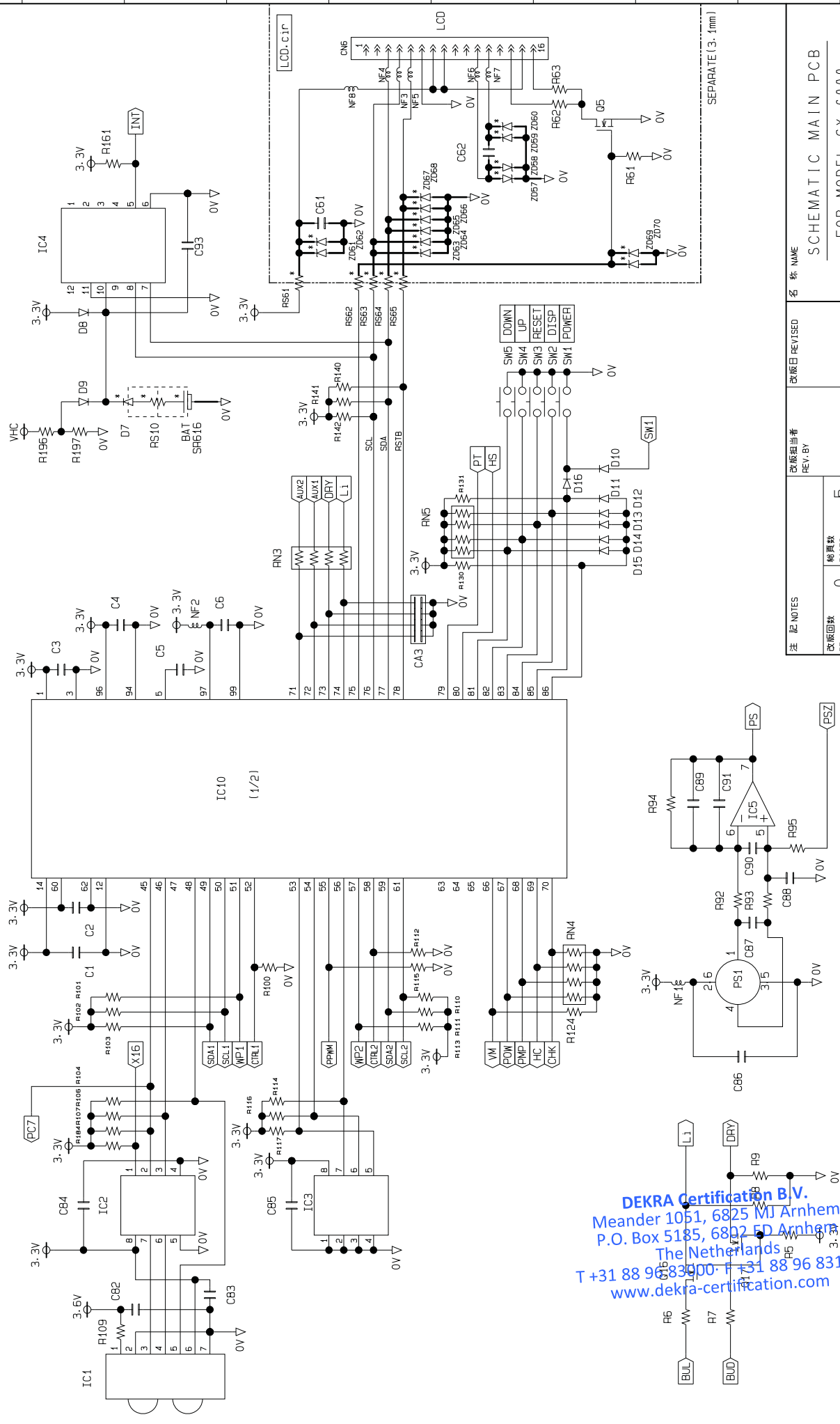



注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
改版回数 REV.	総頁数 PAGES	5		SCHEMATIC MAIN PCB
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	FOR MODEL GX-6000
石橋勝	北村正英	小野圭	2014.7.14	図 番 DWG. NO.
E3-6991-5372-80-01K				
機密情報 / CONFIDENTIAL				

理研計器株式会社

RIKEN KEIKI





注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
改版回数 REV.	0	納頁数 PAGES	5	SCHEMATIC MAIN PCB FOR MODEL GX-6000
承認 APPROVED	校 計 CHECKED		製 図 DRAWN	
石橋 勝	北村正英	小野生		E3-6991-5372-80-04K
				理研計器株式会社
				機密情報 / CONFIDENTIAL

DEKRA Certification B.V.
Meander 1051, 6825 MJ Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
T +31 88 96 833000 F +31 88 96 83100
www.dekra-certification.com

* marks means SAFETY COMPONENTS
----- marks means SEPARATE (1.5mm)
———— marks means INFALLIBLE CONNECTION



Mark of drawing	Kind of parts	Rating/Model of parts	Remarks
IC1	IC (IrDA module)	RPM841-H16	m
IC2	IC (IrDA encoder/decoder)	TIR1000IPW	m
IC3	IC (FRAM)	MB85RC256	m
IC4	IC (RTC)	RX-8564LC	m
IC5,9	IC (OPAMP)	S-89713B-K8T2	m
IC6	IC (Serial flash memory)	AT45DB081E-MHN	m
IC7	IC (Digital MEMS Accelerometer)	ADXL343	m
IC8	IC (Hole IC)	S-5716A -M3T1	m
IC10	IC (CPU)	R5F5210BBDFP	m
IC11,21	IC (DC/DC Converter)	TPS61020	m
IC71	IC (DC/DC Converter)	LTC3526	m
IC12,22,72	IC (Voltage regulator)	TPS73133	m
IC31	IC (Voltage regulator)	TPS79901	m
IC41	IC (DC/DC Converter)	TPS61041DRV	m
IC42	IC (Comparator)	TS3702IPT	m
IC51	IC (Voltage regulator)	S-1200B30-M5T1	m
Q1,2,4,7	N+Pch FET	NTLJD3119C	m
Q3	N-ch FET	SSM3K123TU	m
Q5,10-17	N-ch FET	SSM3K36TU or RUF025N02	m
Q8	P-ch FET	SSM3J130TU	m
NOTE	m marked parts are mounted or not. DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands T +31 88 96 83000 F +31 88 96 83100 www.dekra-certification.com		
REV.	0	NAME	PARTS LIST OF MAIN PCB
DATE	2014.7.14	DWG.No.	PLT-6991-5372-80 (1/4)
RIKEN KEIKI CO., LTD.			

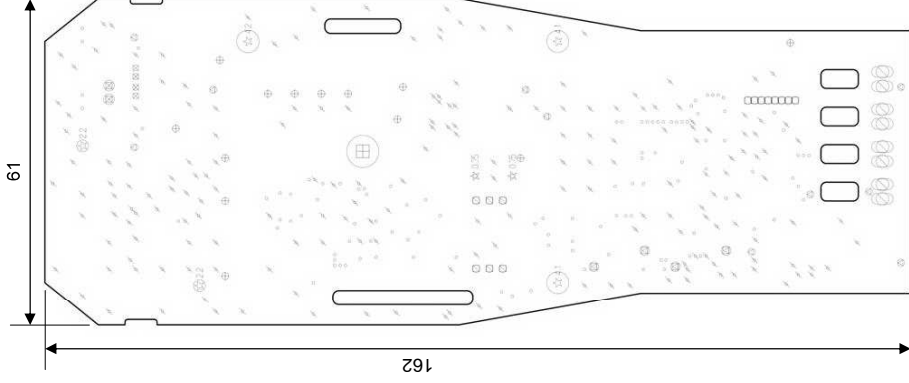
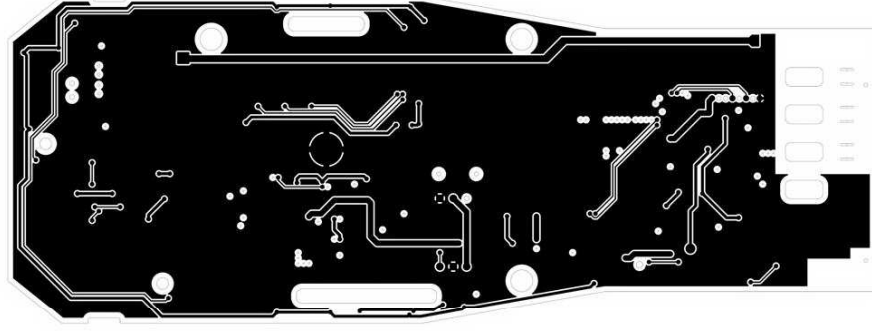
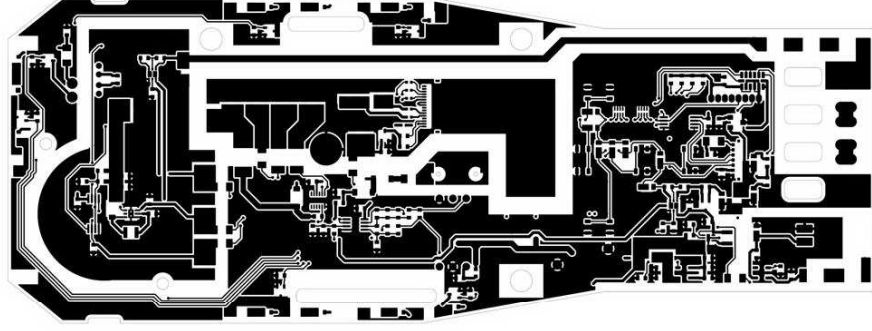
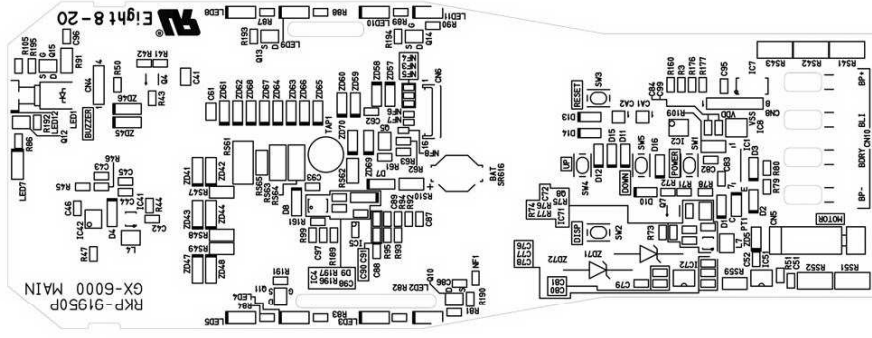
Mark of drawing		Kind of parts		Rating/Model of parts	Remarks
D1-3,10-16		Schottky barrier diode		RB160VA-40	m
D7		Schottky barrier diode		MMSD301, ON Semiconductor Vr = 30 V, If = 0.2 A	*
D4,8,9		Schottky barrier diode		MMSD301	m
ZD5		Zener diode		TFZ 5.1B	m
ZD61-70		Zener diode		TFZ 5.1B , ROHM Vz = 4.94 - 5.20V , 0.5W	*
ZD11,12,21,22		Zener diode		1SMB5918B, ON Semiconductor Vz = 4.84 - 5.36 V, 3W	*
ZD13,23		Zener diode		TFZ 6.8B	m
ZD41,42,43,44,47,48		Zener diode		KDZ4.7B , ROHM Vz = 4.70 – 5.20V , 1W	*
ZD45,46		Zener diode		KDZ11B , ROHM Vz = 11.0 – 12.3V , 1W	*
ZD49,50,51,52		Zener diode		KDZ15B , ROHM Vz = 14.7 – 16.5V , 1W	*
ZD57,58,59,60		Zener diode		TFZ 18B , ROHM Vz = 16.82 – 17.70V , 0.5W	*
ZD71,72		Zener diode		1N5338BG , ON Semiconductor Vz = 4.84 - 5.36 V, 5W	*
LED1		LED Lamp		HLMP-NW50 or NSPW300DS	m
LED2,3,4,5,7,8,9,10,11		LED Lamp		1105W	m
LED12		LED Lamp		HSMZ-C110	m
R1-3,5-9,11-16,21-26, R31-35,41-47,50,51, R61-63,71-84,86-90, R92-107,110-117,124, R130,131,140-142,160, R161,174,176,177, R182-186,189-199		Chip fixed resistor or Chip jumper		10 ohm-10M ohm / 1%, 0.1W or 50m ohm max, 1A (1608)	m
R48,49,91,109		Chip fixed resistor		2.2 ohm-100k ohm / 1%, 0.25W (3216)	m
RN1,2,3,4,5,6		Chip fixed resistor array		100 ohm-1M ohm x4 / 5%, 0.1W (1608 x 4)	m
NOTE	* marked parts are for safety. m marked parts are mounted or not. () Parts size code				
REV.	3	NAME	PARTS LIST OF MAIN PCB		
DATE	2014.12.16	DWG.No.	PLT-6991-5372-80 (2/4)		
RIKEN KEIKI CO., LTD.					

DEKRA Certification B.V.
 Meander 1051, 6825 MJ Arnhem
 P.O. Box 5185, 6802 ED Arnhem
 The Netherlands
 T +31 88 96 83000 F +31 88 96 83100
www.dekra-certification.com

Mark of drawing	Kind of parts	Rating/Model of parts	Remarks
RS11-15,21-25,31-35	Chip fixed resistor	RK73HW3ATTE1R30F, KOA 1.3ohm / 1%, 1W	*
RS37-39,47-49,59,62, R65,71,72,81,82,85-87, R91,92,95-97	Chip fixed resistor	ESR18EZPD1002, ROHM 10k ohm / 0.5%, 0.33W	*
RS10,83,84,93,94	Chip fixed resistor	MCR18EZPF1001, ROHM 1k ohm / 1%, 0.25W	*
RS41,42,43	Chip fixed resistor	RK73HW2HTTE4R70F, KOA 4.7 ohm / 1%, 0.75W	*
RS51,52	Chip fixed resistor	RK73HW2HTTE12R0F, KOA 12 ohm / 1%, 0.75W	*
RS61	Chip fixed resistor	RK73HW3ATTE62R0F, KOA 62 ohm / 1%, 1W	*
RS63,64	Chip fixed resistor	RK73HW2HTTE82R0F, KOA 82 ohm / 1%, 0.75W	*
RSA1-5,RSB1-5, RSC1-5	Chip fixed resistor	RPL18T2R7F, TAIYOSHA 2.7 ohm / 1%, 0.5W	*
C1-6,12,16,18,22,26, C28,32,42,46,78,80, C82,84-89,92,94,95, C97-99	Chip multilayer capacitor	0.1uF / 10% , 50V	m
C7,8,13,23,34,43, C90,91	Chip multilayer capacitor	10pF-1000pF / 10% , 50V	m
C9,17,27,79	Chip multilayer capacitor	0.01uF / 10% , 50V	m
C11,21,41,71	Chip multilayer capacitor	10uF / 10% , 10V	m
C14,24,51,52,72,77, C83,93,96	Chip multilayer capacitor	1uF / 10% , 25V	m
C15,19,25,29,31,33	Chip multilayer capacitor	2.2uF / 10% , 16V	m
C44	Chip multilayer capacitor	0.47uF / 10% , 25V	m
C45	Chip multilayer capacitor	0.22uF / 10% , 25V	m
C61,76,81	Chip multilayer capacitor	4.7uF / 10% , 16V	m
C62	Chip multilayer capacitor	33000pF / 10% , 50V	m
CA1,2,3	Chip multilayer capacitor array	0.01uF x4 / 20%, 50V	m
NOTE	* marked parts are for safety. m marked parts are mounted or not. <div> DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands T +31 88 96 83000 F +31 88 96 83100 www.dekra-certification.com </div>		
REV.	1	NAME	PARTS LIST OF MAIN PCB
DATE	2014.11.5	DWG.No.	PLT-6991-5372-80 (3/4)
RIKEN KEIKI CO., LTD.			

Mark of drawing	Kind of parts	Rating/Model of parts	Remarks
L1,2,4	Chip multilayer inductor	10uH / 30% (2520)	m
L7	Chip multilayer inductor	4.7uH / 30% (2520)	m
PT1	Photo transistor	PS1192HB	m
PS1	Pressure sensor	P-2000-101G	m
X1	Crystal	DSX321, 14.7456MHz	m
NF1,2	Noise filter	BLM18AG151	m
NF3-8	Noise filter	BLM15HD182	m
BAT	Silver oxide battery	SR616SW / Sony	*
LCD	LCD Module	BTD-128160B-FBWB / YEEBO	D
MOT	Vibration motor	A3BE-MT4 / SICOH	D
NOTE	* marked parts are for safety. m marked parts are mounted or not. D marked parts, refer to datasheet () Parts size code		
REV.	2	NAME	PARTS LIST OF MAIN PCB
DATE	2024.6.4	DWG.No.	PLT-6991-5372-80 (4/4)
RIKEN KEIKI CO., LTD.			

DEKRA Certification B.V.
 Meander 1051, 6825 MJ Arnhem
 P.O. Box 5185, 6802 ED Arnhem
 The Netherlands
 T +31 88 96 83000 F +31 88 96 83100
www.dekra-certification.com



SILK PRINT FOR PARTS SIDE

PARTS SIDE

INNER LAYER(2 LAYER)

VIA HOLES FOR PARTS SIDE

MARK	DIAGRAM	HOLE
○	φ 0.3	1-4VIA
／	φ 0.3	1-2VIA
×	φ 0.5	1-4VIA
△	φ 0.7	1-4VIA
+	φ 0.7	1-2VIA
□	φ 0.85	1-4VIA
□	φ 0.9	1-4VIA
⊗	φ 0.9	1-4VIA
⊗	φ 1.2	1-4VIA
⊕	φ 4.1	1-4VIA
⊗	φ 4.2 × 2.4	1-4VIA
※0.75	φ 0.75	NTH
※2.2	φ 2.2	NTH
※4.1	φ 4.1	NTH
※4.2	φ 4.2	NTH

All drawings are view of parts side

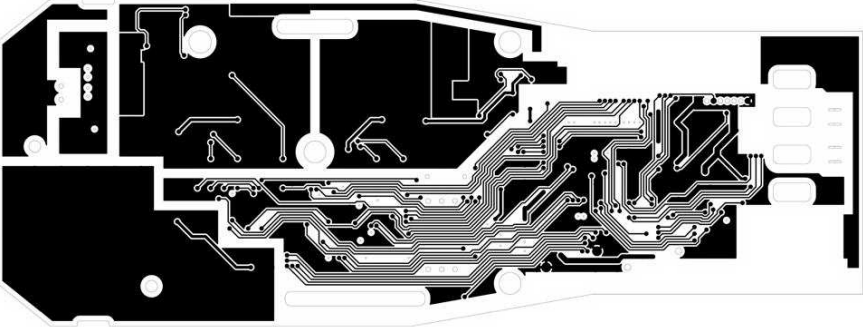
SCALE 1:1

SPECIFICATION FOR PCB

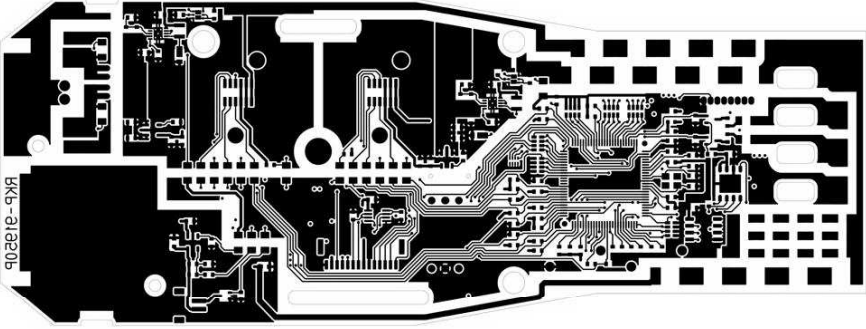
- PCB No. : RKP-919508
- Material : Glass epoxy
- Thickness : 1.6mm
- Layer number : 4
- Thickness copper film : 35um
- Surface : 35um , inner 35um
- Copper thickness of the vias : 35um above.
- Minimum conductor width : 0.2mm
- CTI : 100 above

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名称 NAME
改版回数 REV.	0			
承認 APPROVED	石橋勝	製 図 DRAWN 小野圭	作成日 DATE 2014.7.14	図 番 DWG. NO.
検討 CHECKED	北村正英			
総頁数 PAGES	2	MAIN PCB FOR MODEL GX-6000		
		E 3 - 6 9 9 1 - 5 3 7 2 - 8 0 - 0 1 A		
RIKEN KEIKI		機密情報 / CONFIDENTIAL		

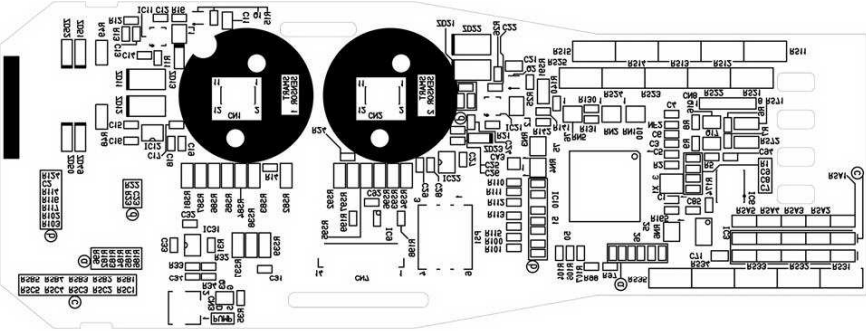
1 2 3 4 5 6 7 8 9 10 11 12 13 14



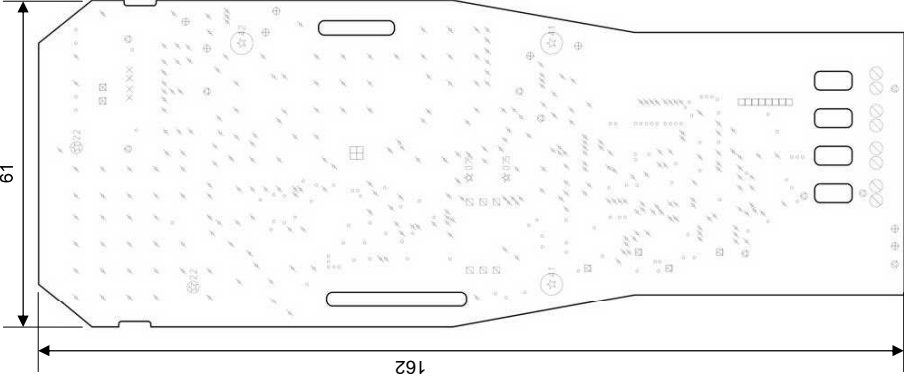
INNER LAYER(3 LAYER)



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



VIA HOLES FOR SOLDERING SIDE

MARK	DIAGRAM	HOLE
○	0.3	1-4VIA
○	0.3	3-4VIA
×	0.5	1-4VIA
△	0.7	1-4VIA
+	0.7	3-4VIA
□	0.85	1-4VIA
⊗	0.9	1-4VIA
⊗	0.9	1-4VIA
⊗	1.2	1-4VIA
⊗	4.1	1-4VIA
⊗	0.4×2.4	1-4VIA
⊗	0.75	NTH
⊗	2.2	NTH
⊗	4.1	NTH
⊗	4.2	NTH

All drawings are view of parts side

SCALE 1:1

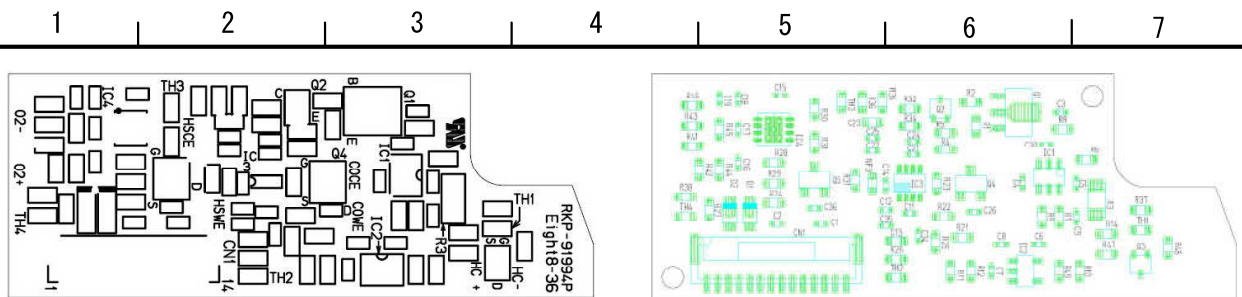
- SPECIFICATION FOR PCB**
- PCB No. : RKP-51950P
 - Material : Glass epoxy
 - Thickness : 1.6mm
 - Layer number : 4
 - (2+2 BVH , Between layer #2 and #3 is 0.6mm.)
 - Thickness copper film
 - Surface : 35um , Inner 18um
 - Copper thickness of the via's : 35um above.
 - Minimum conductor width : 0.2mm
 - CTI : 100 above

注 記 NOTES		改版担当者 REV.BY	改版日 REVISED	名 称 NAME
改版回数 REV.	0	総頁数 PAGES	1	MAIN PCB FOR MODEL GX-6000
承認 APPROVED	石橋勝	検討 CHECKED	製 図 DRAWN	
北村正英		小野圭	作成日 DATE	國 番 DWG. NO.
			2014.7.14	E 3 - 6 9 9 1 - 5 3 7 2 - 8 0 - 0 2 A
RIKEN KEIKI 理研計器株式会社 機密情報 / CONFIDENTIAL				



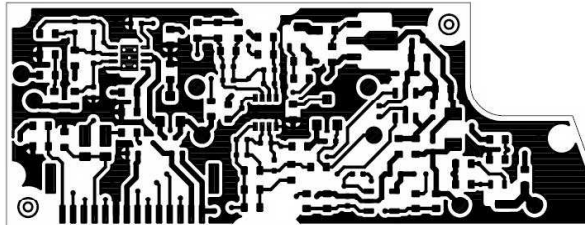
Mark of drawing	Kind of parts	Rating/Model of parts	Remarks
IC1	IC (A/D Converter)	ADS1110A0IDBV	m
IC2	IC (OPAMP)	OPA333AIDBV	m
IC3	IC (OPAMP)	OPA2379AIDCN	m
IC4	IC (OPAMP)	OPA2333AIDR	m
Q1	PNP Transistor	2SB1115	m
Q2	NPN Transistor	2SD2700	m
Q3	N-ch FET	SSM3K123TU	m
Q4,5	N-ch J-FET	2SK209	m
D1,2	Schottky barrier diode	RB160VA-40	m
R1,2,4-12,14,22-30, R32-38,41-47, TH1,2,3,4	Chip fixed resistor or Chip jumper or Chip thermistor	3.3 ohm-10M ohm / 1%, 0.1W or 50m ohm max, 1A or (1608) Rt25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1608)	m
R3	Chip fixed resistor	1 ohm - 100 ohm / 1%, 0.25W (3216)	m
NF3,R21,R31	Noise filter	BLM18AG151	m
C1,2,3	Chip multilayer capacitor	1uF / 10%, 10V	m
C4-8,14-16,19	Chip multilayer capacitor	0.1uF / 10%, 25V	m
C9,11,12,17,18,21,22 C24,25,26,34,35,36	Chip multilayer capacitor	10pF-1000pF / 10%, 50V	m
C13,23	Chip multilayer capacitor	4.7uF / 10%, 10V	m
C30	Chip multilayer capacitor	0.01uF / 10%, 25V	m
NOTE	* marked parts are for safety. m marked parts are mounted or not. () Parts size code		
REV.	2	NAME	PARTS LIST OF SENSOR PCB
DATE	2014.12.16	DWG.No.	PLT-6991-5373-50 (P/1)
RIKEN KEIKI CO., LTD.			

DEKRA-Certification B.V.
 Mespender 1051 - 6825 MJ Arnhem
 P.O. Box 5185, 6802 ED Arnhem
 The Netherlands
 T +31 88 96 83100 F +31 88 96 83100
 www.dekra-certification.com

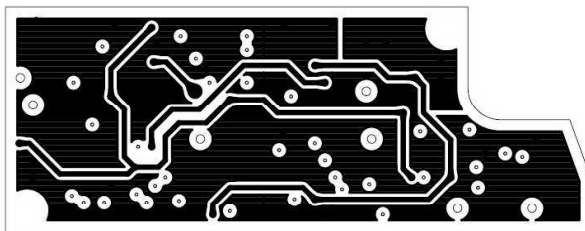


SILK PRINT FOR PARTS SIDE

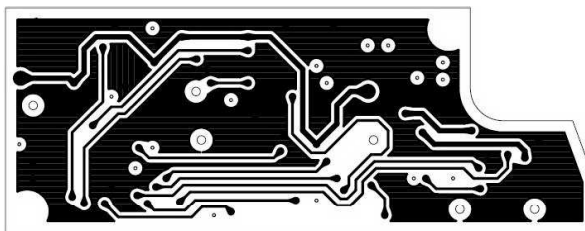
PARTS REFERENCE



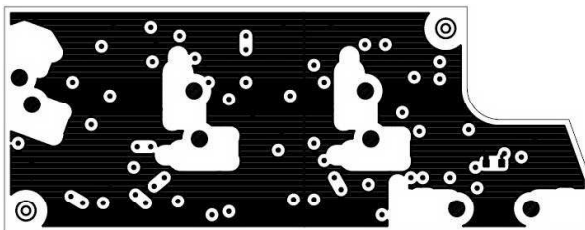
PARTS SIDE



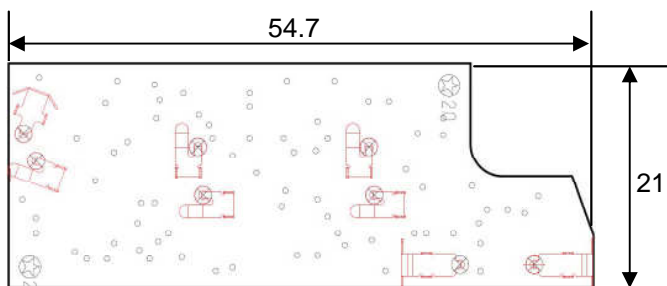
INNER LAYER(2 LAYER)



INNER LAYER(3 LAYER)



SOLDERING SIDE



VIA HOLES FOR SOLDERING SIDE

SPECIFICATION FOR PCB

- PCB No. : RKP-91994P
- Material : Glass epoxy
- Thickness : 1.0mm
- Layer number : 4
- Thickness copper film
Surface : 35um , Inner : 35um
- Copper thickness of the via's : 35um above.
- Minimum conductor width : 0.2mm
- CTI : 100 above

MARK	DIAGRAM	HOLE
o	φ 0.3	1-4VIA
X	φ 0.8	1-4VIA
☆2.0	φ 2.0	NTH

DEKBA Certification B.V.
All drawings are view of parts side
Meander 1051, 3825 Middenweg
P.O. Box 5185, 6801 EA Arnhem
The Netherlands
T +31 88 96 83100 F +31 88 96 83100
www.dekba-certification.com

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
Add C26,C30,C36		小野圭	2014.11.5	SCALE 1/2
改版回数 REV.	総頁数 PAGES	小野圭	2014.11.5	名称 NAME
1	1	小野圭	2014.11.5	名称 NAME
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
石橋勝	北村正英	小野圭	2014.7.14	E 4 - 6 9 9 1 - 5 3 7 3 - 5 0 - 0 1 A

1 2 3 4 5 6 7

A

B

C

D

E

F

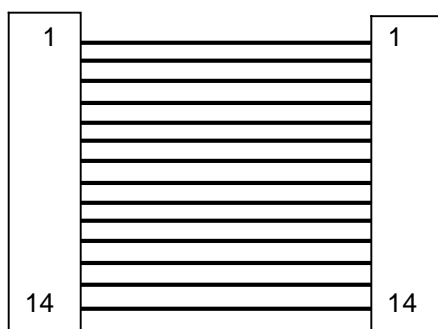
G

H

I

CN1
CONNECTOR
Model : NSHR-14V-S
Manufacturer : JST

CN2
CONNECTOR
Model : NSHR-14V-S
Manufacturer : JST



Wire : UL1571 AWG30
Maximum wire length : 40mm

DEKRA Certification B.V.
Meander 1051, 6825 MJ Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
T +31 88 96 83000 F +31 88 96 83100
www.dekra-certification.nl
SENSOR to MAIN WIRE

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME FOR MODEL GX-6000
改版回数 REV.	0			
総頁数 PAGES	1	製 図 DRAWN	作成日 DATE	図 番 DWG. NO. E 4 - 6 9 9 1 - 5 3 8 2 - 7 0 - 0 1 K
承 認 APPROVED	検 討 CHECKED			
石橋勝	北村正英	小野圭	2014.7.14	

	1	2	3	4	5	6	7	
寸法 許容差	1000以上	1.2	0.7	1.2	2.5			
	500以上1000未満	2.0	1.0	0.5	1.6			
	260以上500未満	0.8	0.4	0.3	0.6			
	120以上260未満	1.2	0.6	0.3	0.8			
	50以上120未満	0.4	0.2	0.4	0.6			
	18以上50未満	0.3	0.15	0.3	0.4			
	18未満	0.2	0.1	0.2	0.4			
	中級	0.1	0.1	0.1	0.1			
	精級	0.1	0.1	0.1	0.1			
	公差	0.1	0.1	0.1	0.1			
<p>△</p> <p>SPECIFICATION OF MOTER</p> <p>L=59.8μH(max) [CASE1]</p> <p>R=11Ω(min) [CASE2]</p> <p>CASE1 : One commutator segment contact the brush.</p> <p>CASE2 : Two commutator segments contact the brush.</p> <p>17.5</p> <p>25.5</p> <p>36.35</p> <p>MOTOR</p> <p>A12B-09-SS</p> <p>A12B-09-S-X △</p> <p>C.I.KASEI CO.,LTD.</p> <p>CABLE LENGTH</p> <p>LESS THAN 48mm</p> <p>Wall thickness</p> <p>of insulation:0.25mm</p> <p>CONNECTOR</p> <p>ZHR-2</p> <p>JST Mfg. Co., Ltd.</p> <p>17.5</p> <p>25.5</p> <p>36.35</p> <p>MOTOR</p> <p>A12B-09-SS</p> <p>A12B-09-S-X △</p> <p>C.I.KASEI CO.,LTD.</p> <p>CABLE LENGTH</p> <p>LESS THAN 48mm</p> <p>Wall thickness</p> <p>of insulation:0.25mm</p> <p>CONNECTOR</p> <p>ZHR-2</p> <p>JST Mfg. Co., Ltd.</p>								
表面処理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME			
材 質 MAT.					PUMP			
承認 APPROVED		検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.			
田島秀二		近藤晴彦	青良治	2011. 2. 24	M4-4181-61-01K			
RIKEN KEIKI 理研計器株式会社 機密情報 / CONFIDENTIAL								

1 2 3 4 5 6 7

A

B

C

D

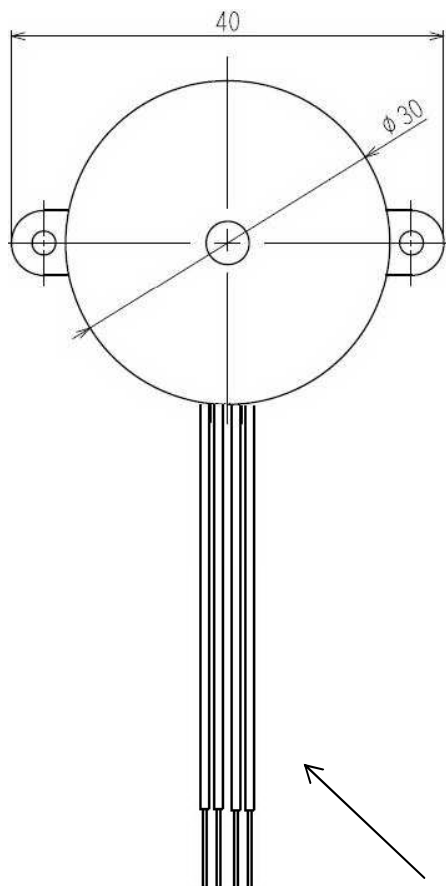
E

F

G

H

I



Cable: UL1571, AWG32
Maximum length : 45mm

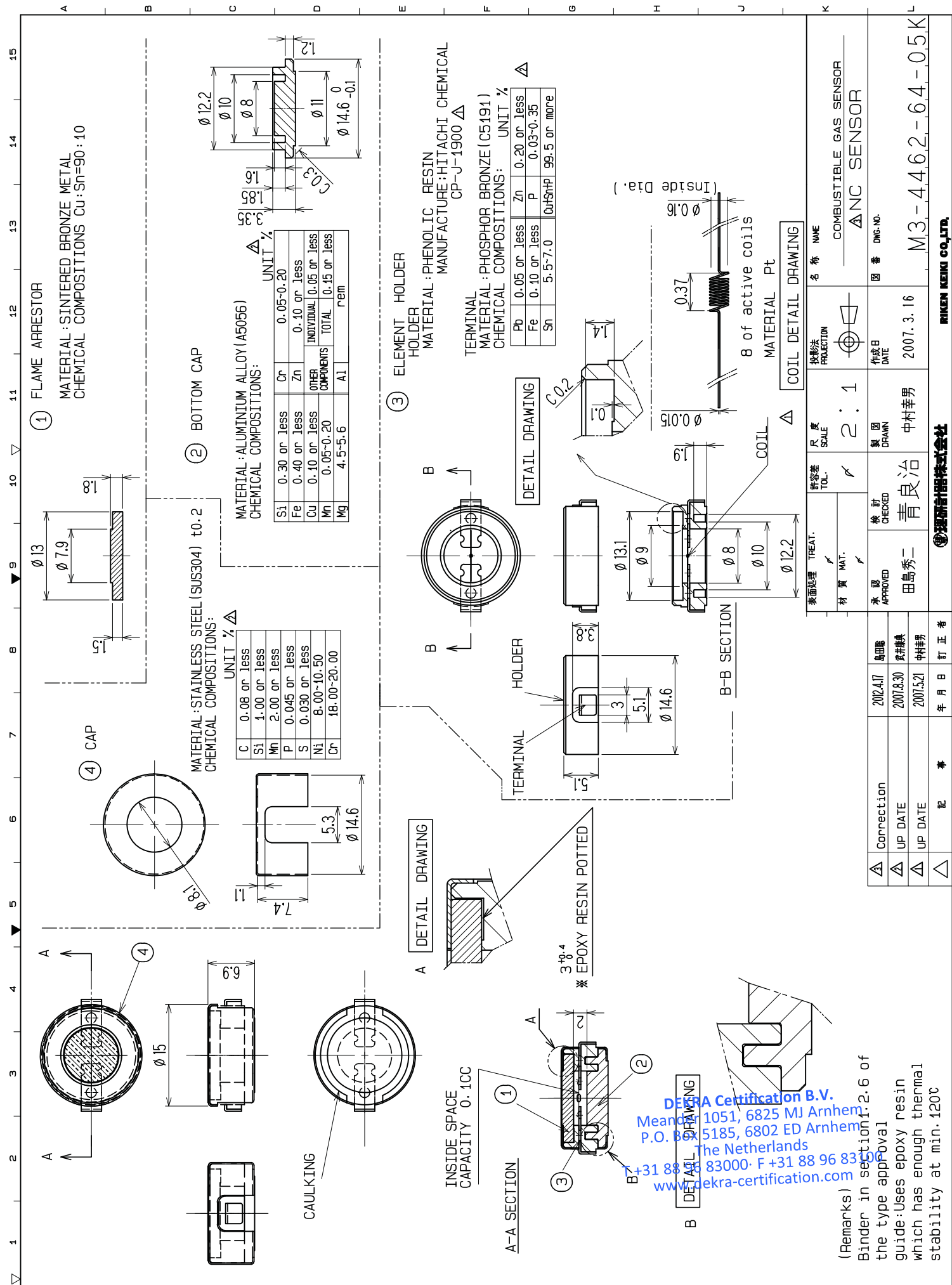
Piezo elements : M274C4
Manufacturer : NIHON CERATEC
Capacitance : 22 nF / 30%

DEKRA Certification B.V.
Meander 1051, 6825 MJ Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
T +31 88 96 83000 F +31 88 96 83100
www.dekra-certification.com
Buzzer

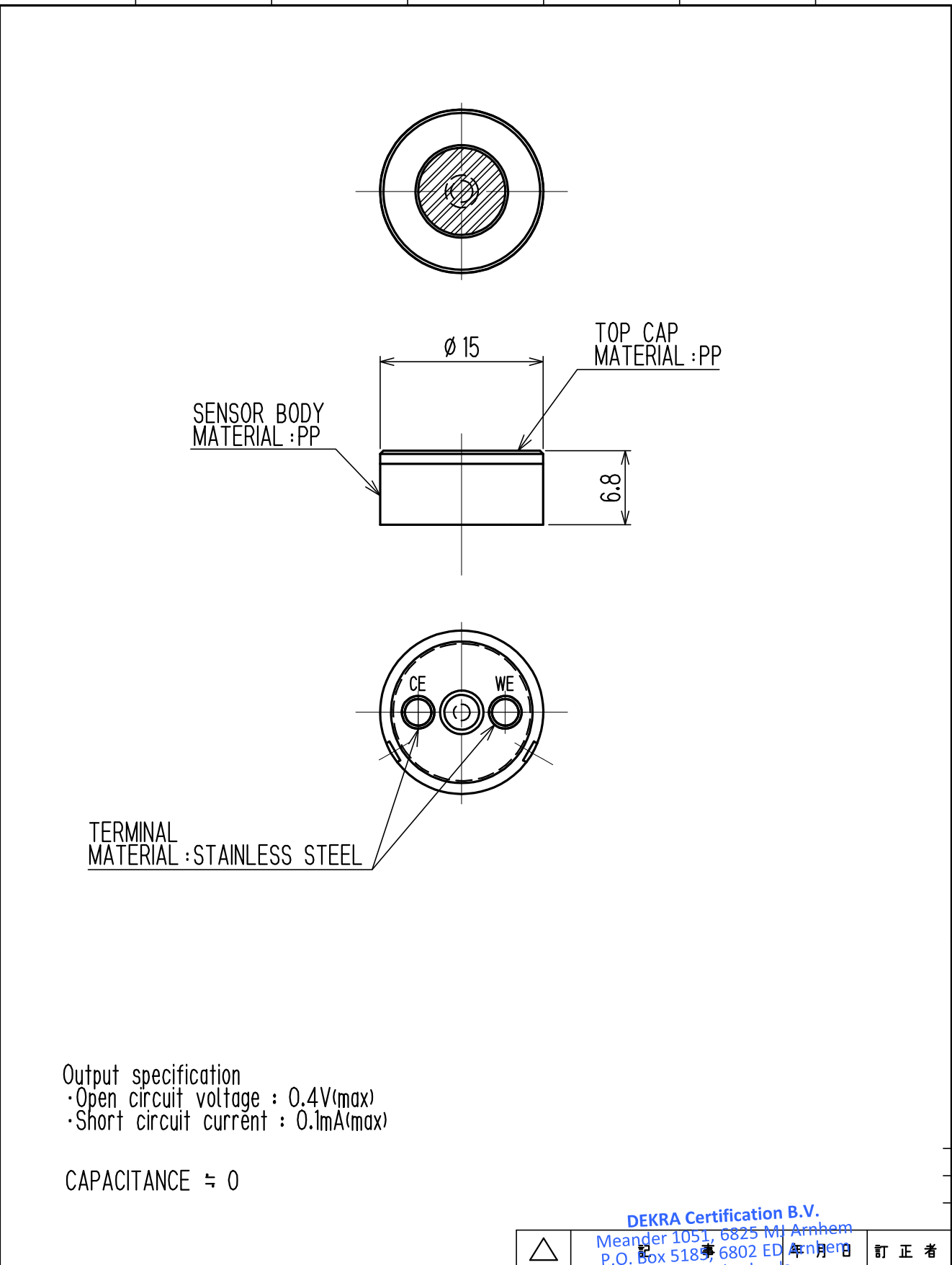
SCALE $\sqrt{2:1}$

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME BZ-9K
改版回数 REV.	0			
総頁数 PAGES	1	製 図 DRAWN	作成日 DATE	図 番 DWG. NO. E4-6991-5008-70-01K
承認 APPROVED	石橋勝			
検 討 CHECKED	北村正英	小暮晋祐	2011.02.28	

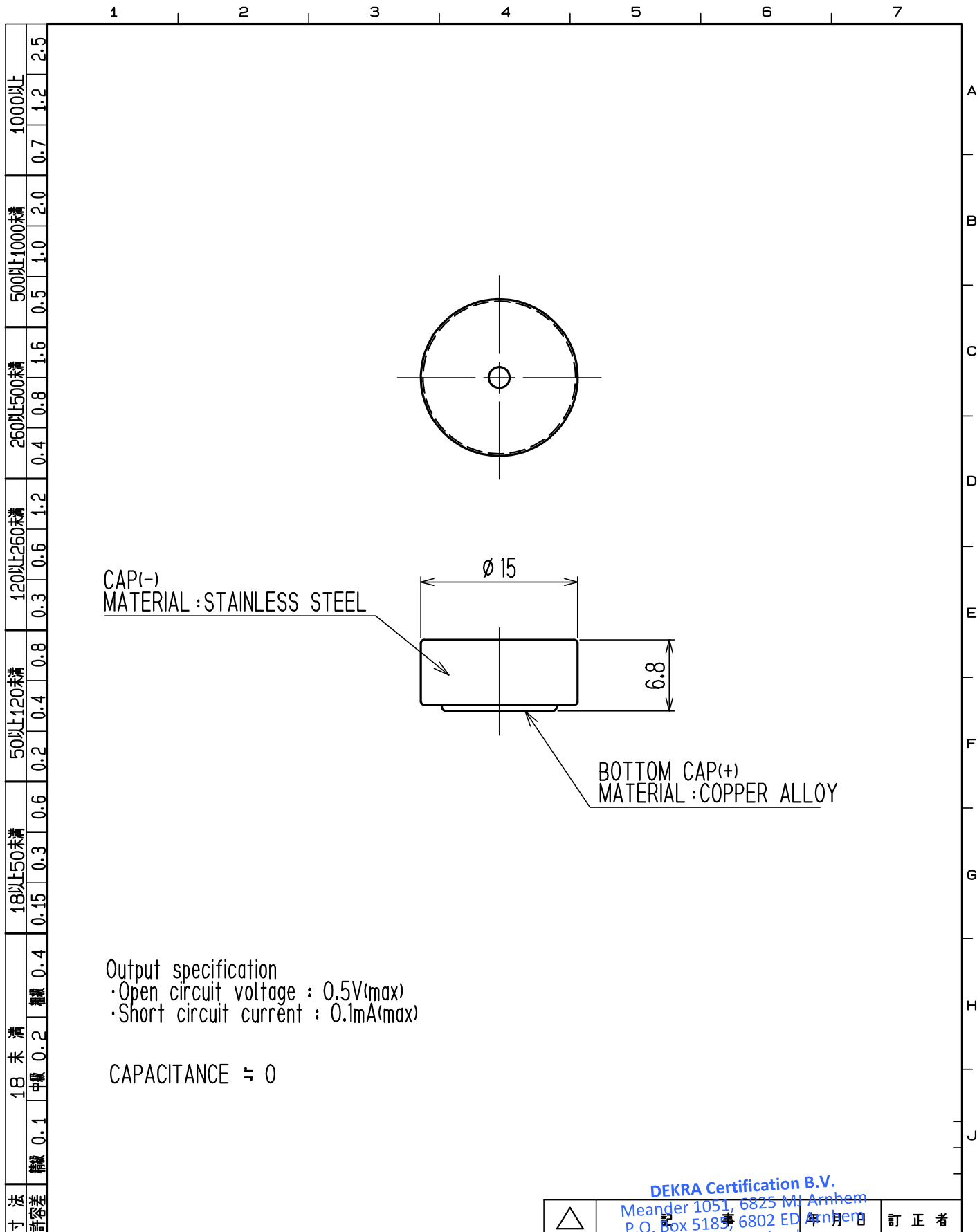
寸法	1日未満	18日以上50未満	50日以上120未満	120日以上260未満	260日以上500未満	500日以上1000未満	1000以上
粗級	0.4	0.6	0.8	1.2	1.6	2.0	2.5
中級	0.2	0.3	0.4	0.6	0.8	1.0	1.2
精級	0.1	0.15	0.2	0.3	0.4	0.5	0.7
寸法							



寸法	18未満	18以上50未満	50以上120未満	120以上260未満	260以上500未満	500以上1000未満	1000以上
公差	±0.1	±0.2	±0.3	±0.4	±0.5	±0.7	±1.0



表面処理 TREAT.	許容差 TOL.	尺度 SCALE	投影法 PROJECTION	名称 NAME
材質 MAT.		2 : 1		DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem P.O. Box 5189, 6802 ED Arnhem The Netherlands T +31 88 96 83000 F +31 88 96 83100 www.dekra-certification.com
承認 APPROVED	検討 CHECKED	製図 DRAWN	作成日 DATE	図番 DWG. NO.
青良治	近藤晴彦	海野裕作	2014. 7. 30	M4-4084-92-03K
RIKEN KEIKI		理研計測株式会社		機密情報 / CONFIDENTIAL



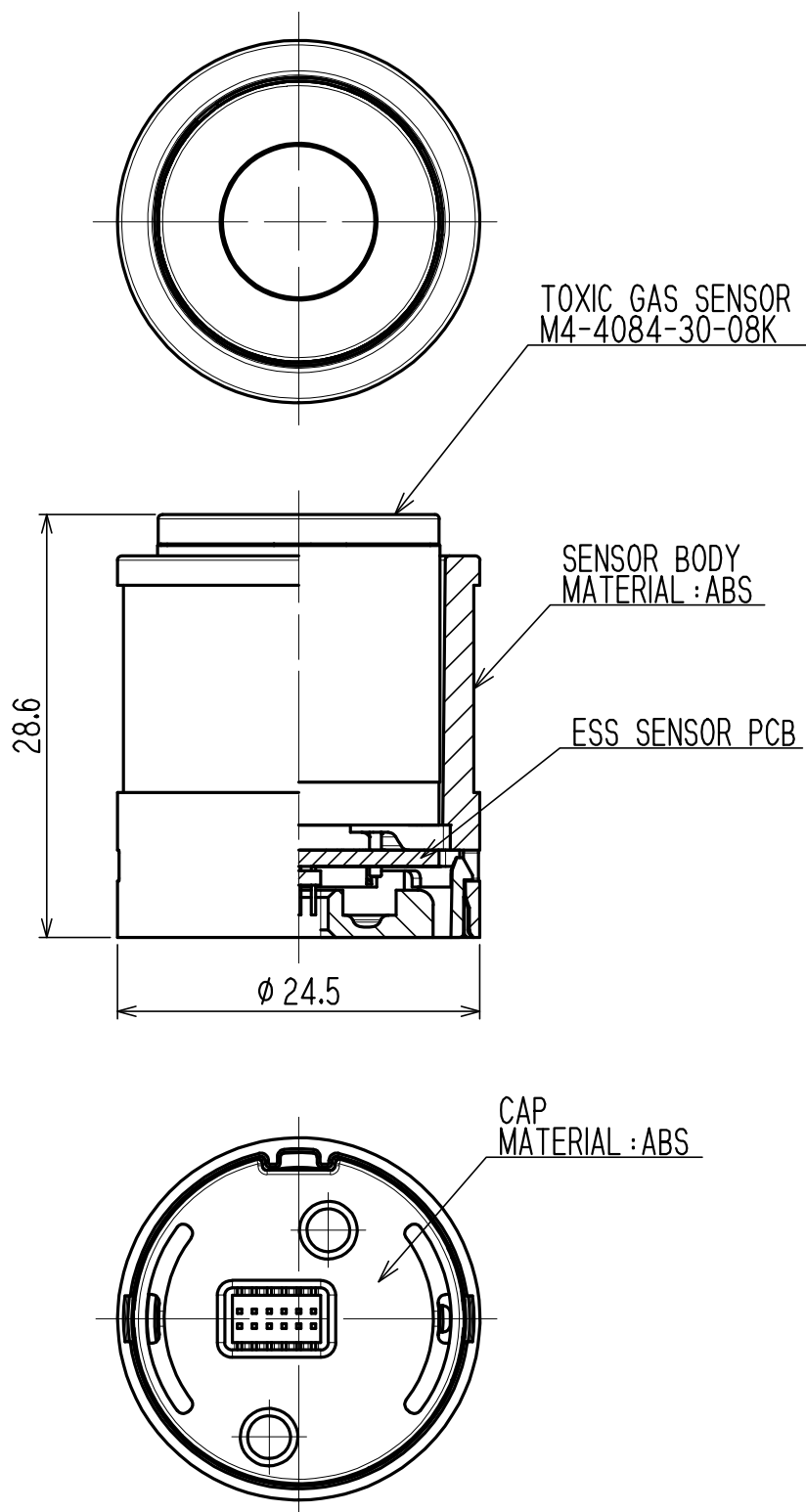
表面処理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME	
材 質 MAT.					OXYGEN SENSOR	
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.		
青良治	近藤晴彦	海野裕作	2014. 7. 30	M4-4080-82-07K		

DEKRA Certification B.V.
Meander 1051, 6825 MJ Arnhem
P.O. Box 5189, 6802 ED Arnhem
The Netherlands
T +31 88 96 83000 F +31 88 96 83100
www.dekra-certification.com

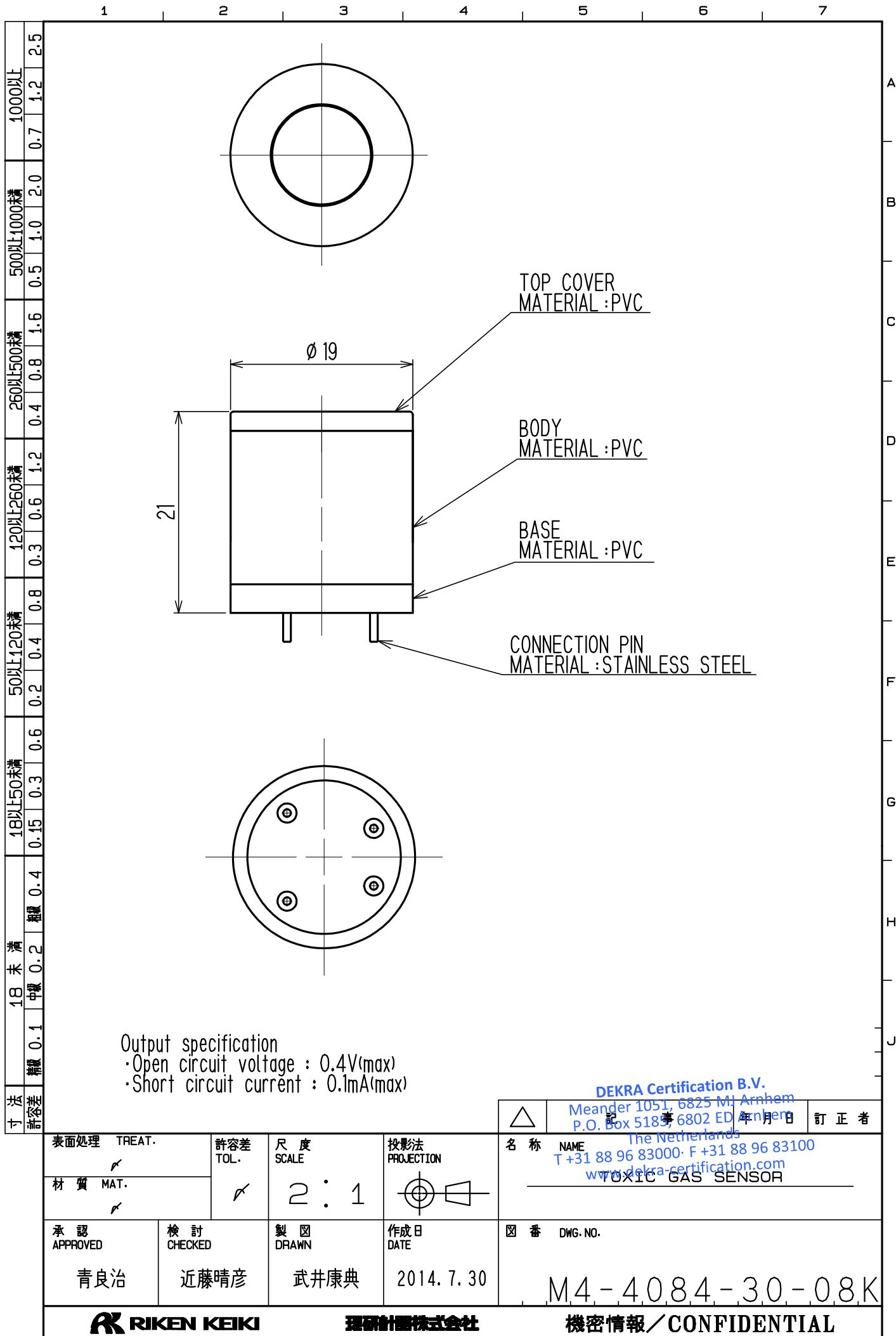
△ 記 年 月 日 訂 正 者

RIKEN KEIKI 理研計測株式会社 機密情報 / CONFIDENTIAL

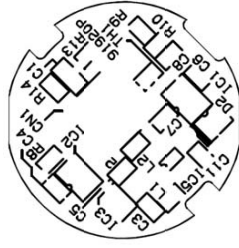
寸 法	18 未 満		18以上50未満		50以上120未満		120以上260未満		260以上500未満		500以上1000未満		1000以上							
	精 0.1	中 0.2	粗 0.4	0.15	0.3	0.6	0.2	0.4	0.8	0.3	0.6	1.2	0.4	0.8	1.6	0.5	1.0	2.0	0.7	1.2



表面处理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME The Netherlands T +31 88 96 83000 F +31 88 96 83100 tym@depra-certification.com
材 質 MAT.					
承認 APPROVED		検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
青良治					
近藤晴彦		武井康典	2014. 7. 30	M4-4486-01-01K	
RIKEN KEIKI		理研計測株式会社		機密情報 / CONFIDENTIAL	



1 2 3 4 5 6 7 8 9 10 11 12 13 14



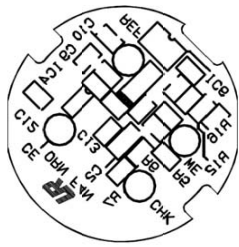
SILK PRINT FOR PARTS SIDE



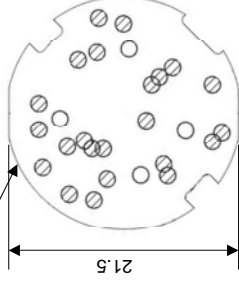
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

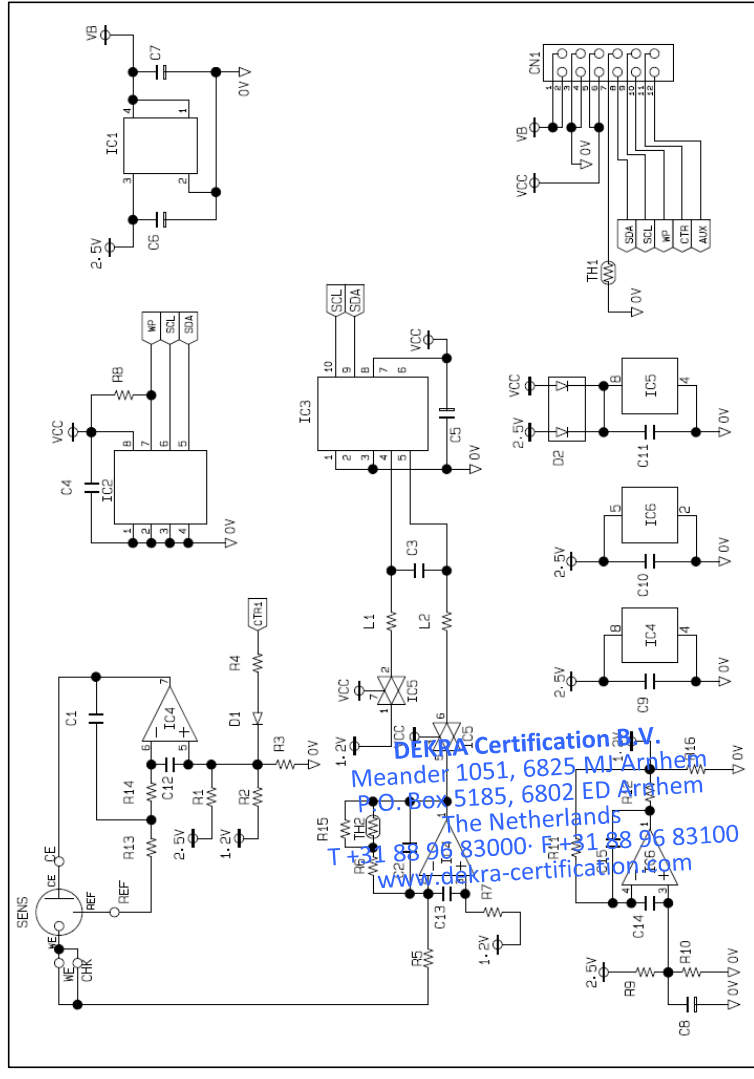
MARK	DIAGRAM	HOLE
①	φ0.3	TH
○	φ1.0	TH

SPECIFICATION FOR PCB

- PCB No. : RKP-91920P
- Material : Glass epoxy
- Thickness : 1.2mm
- Layer number : 2
- Thickness copper film : 18um
- Minimum conductor width : 0.2mm
- CTI : 100 above

All drawings are view of parts side

SCALE 2:1



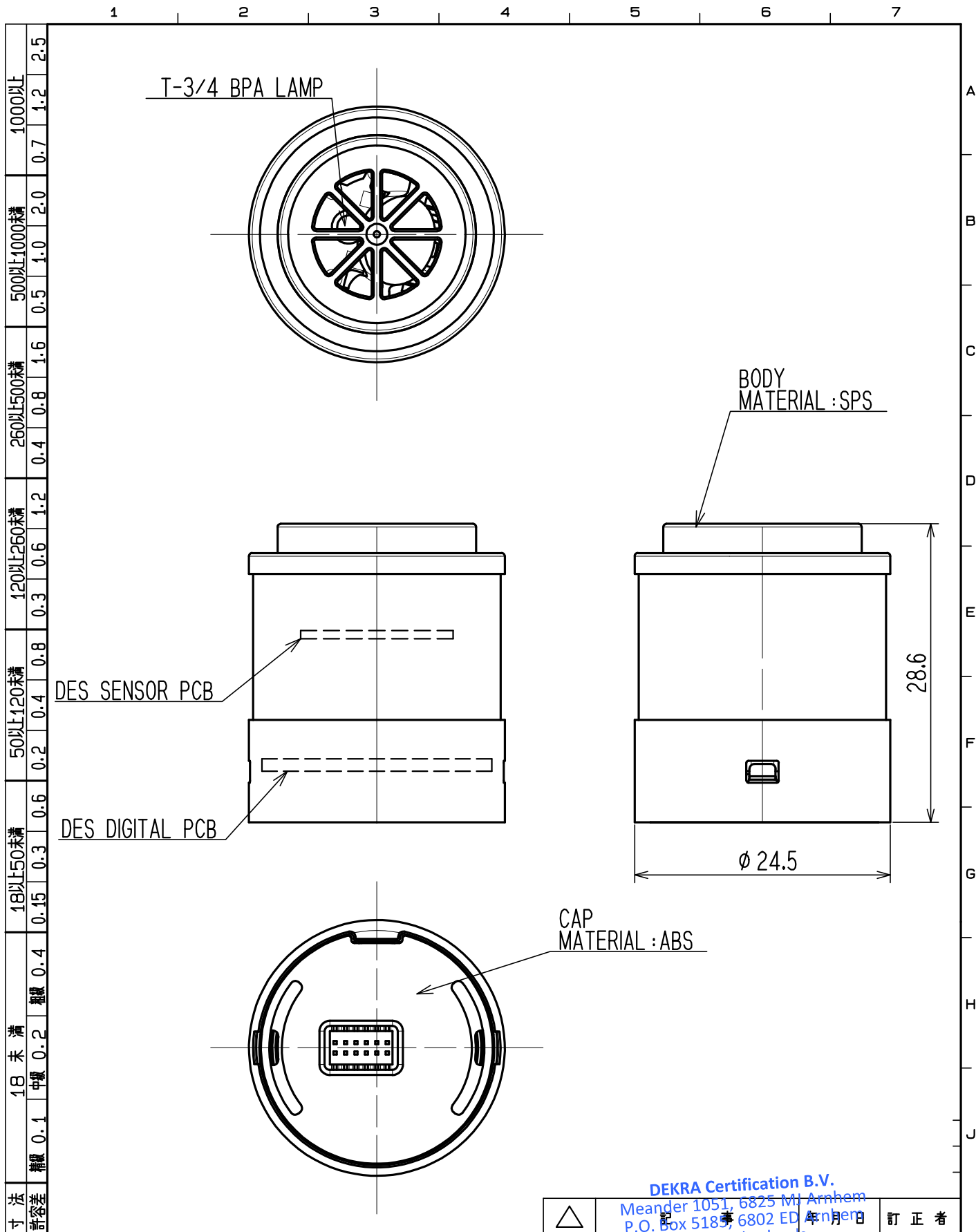
SCHEMATIC

PARTS LIST

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Voltage regulator)	S-1313D25-N4T1	m
IC2	IC (EEPROM)	S-24C16CH8T1	m
IC3	IC (A/D Converter)	ADS1114IRU	m
IC4	IC (OPAMP)	LT6004CMS8	m
IC5	IC (Logic)	HD74ALVC2G66	m
IC6	IC (OPAMP)	AD8500AKS	m
D1	Diode	1SS355	m
D2	Diode array	RB480Y (2elements)	m
TH1	Chip thermistor	R125 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	m
R1-16	Chip fixed resistor or Chip jumper	10 ohm ~ 1M ohm / 1%, 0.063W or 50m ohm max.1A (1005)	m
C1,2	Chip multilayer capacitor	10uF / 10%, 6.3V	m
C4,5,6,7,9,10,11	Chip multilayer capacitor	0.1uF / 10%, 16V	m
C3,8,12,13,14	Chip multilayer capacitor	10pF-1000pF / 10%, 50V	m
C15	Chip multilayer capacitor	1uF / 10%, 10V	m
	Chip fixed resistor or Chip jumper or	10 ohm ~ 1M ohm / 1%, 0.063W or 50m ohm max.1A (1005) or	m
L1,2	Noise filter	BLM15HD182	m

m marked parts are mounted or not

注 記 NOTES	改版担当者 REV.BY	名称 NAME
改版回数 REV. 0	総頁数 PAGES 1	ESS SENSOR PCB
承認 APPROVED	検 討 CHECKED	製 図 DRAWN
石橋勝	北村正英	小野圭
		作 成 日 DATE
		2014.7.14
		國 番 DWG.NO.
		E3-6991-5384-10-01K
理研計器株式会社		
機密情報 / CONFIDENTIAL		

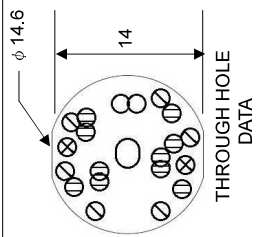


表面処理 TREAT.		許容差 TOL.	尺度 SCALE	投影法 PROJECTION	名称 NAME Meander 1051, 6825 Mj Arnhem P.O. Box 5185 6802 ED Arnhem The Netherlands T +31 88 96 83000 F +31 88 96 83100 www.dekra-certification.com	年月日 訂正者
材質 MAT.						
承認 APPROVED	検討 CHECKED	製図 DRAWN	作成日 DATE	図番 DWG. NO.		
青良治	武井康典	近藤晴彦	2014. 7. 24	M4-4630-20-01K		
RIKEN KEIKI		理研計測株式会社		機密情報 / CONFIDENTIAL		

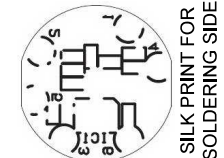
1 2 3 4 5 6 7 8 9 10 11 12 13 14

SPECIFICATION FOR PCB
•PCB No. : RKP-91936P
•Material : Glass epoxy
•Thickness : 0.8mm
•Layer number : 4
•Thickness copper film : 18um
•Minimum conductor width : 0.2mm
•CTI : 100 above

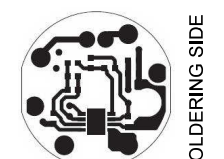
MARK	DIAGRAM	HOLE
①	φ0.3	TH
○	φ0.5	TH
⊗	φ0.8	TH
⊗	φ1.7	NTH



THROUGH HOLE DATA



SILK PRINT FOR SOLDERING SIDE



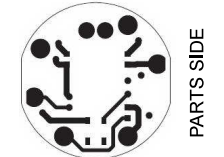
SOLDERING SIDE



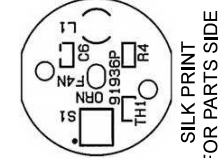
Lay.3



Lay.2



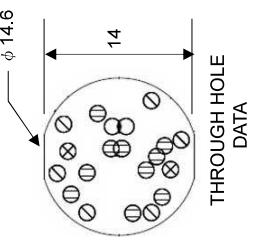
PARTS SIDE



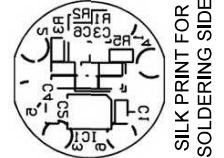
SILK PRINT FOR PARTS SIDE

SPECIFICATION FOR PCB
•PCB No. : RKP-91834P
•Material : Glass epoxy
•Thickness : 0.8mm
•Layer number : 2
•Thickness copper film : 18um
•Minimum conductor width : 0.2mm
•CTI : 100 above

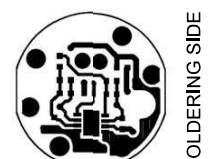
MARK	DIAGRAM	HOLE
①	φ0.3	TH
○	φ0.5	TH
⊗	φ0.8	TH
⊗	φ1.7	NTH



THROUGH HOLE DATA



SILK PRINT FOR SOLDERING SIDE



SOLDERING SIDE



PARTS SIDE



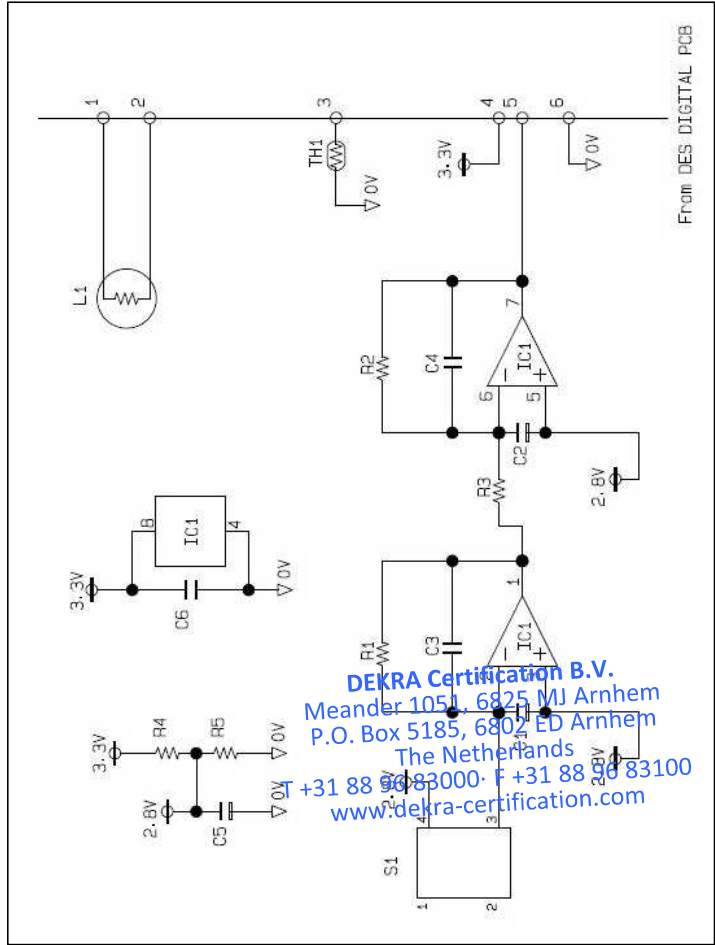
SILK PRINT FOR PARTS SIDE

All drawings are view of parts side
SCALE 2:1

PARTS LIST

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
S1	IR Sensor	IR1011	
IC1	IC (OPAMP)	LTC2055HDD	m
TH1	Chip thermistor	RT25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	m
R1,2,3,4,5	Chip fixed resistor or Chip jumper	10 ohm - 1M ohm / 1%, 0.063W or 50m ohm max, 1A (1005)	m
C1,2	Chip multilayer capacitor	10pF-1000pF / 10%, 50V	m
C3	Chip multilayer capacitor	0.01uF / 10%, 25V	m
C4,5,6	Chip multilayer capacitor	0.1uF / 10%, 25V	m
L1	T-3/4 BPA LAMP	OL-8270BPA refer to E4-6991-5129-60-01K	m

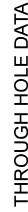
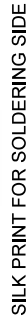
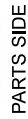
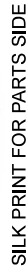
m marked parts are mounted or not





SCHEMATIC

注 記 NOTES	改版担当者 REV. BY	名称 NAME
Add RKP-91936P	小野圭	DES SENSOR PCB
改版回数 REV.	1 PAGES	2015.5.25
承認 APPROVED	検討 CHECKED	作成日 DATE
石橋勝	北村正英	2014.7.14
製 図 DRAWN	小野圭	國 番 DWG. NO.
		E3-6991-5385-90-01K

理研計器株式会社
機密情報 / CONFIDENTIAL



MARK	DIAGRAM	HOLE
	ϕ 0.3	TH
	ϕ 0.9	TH

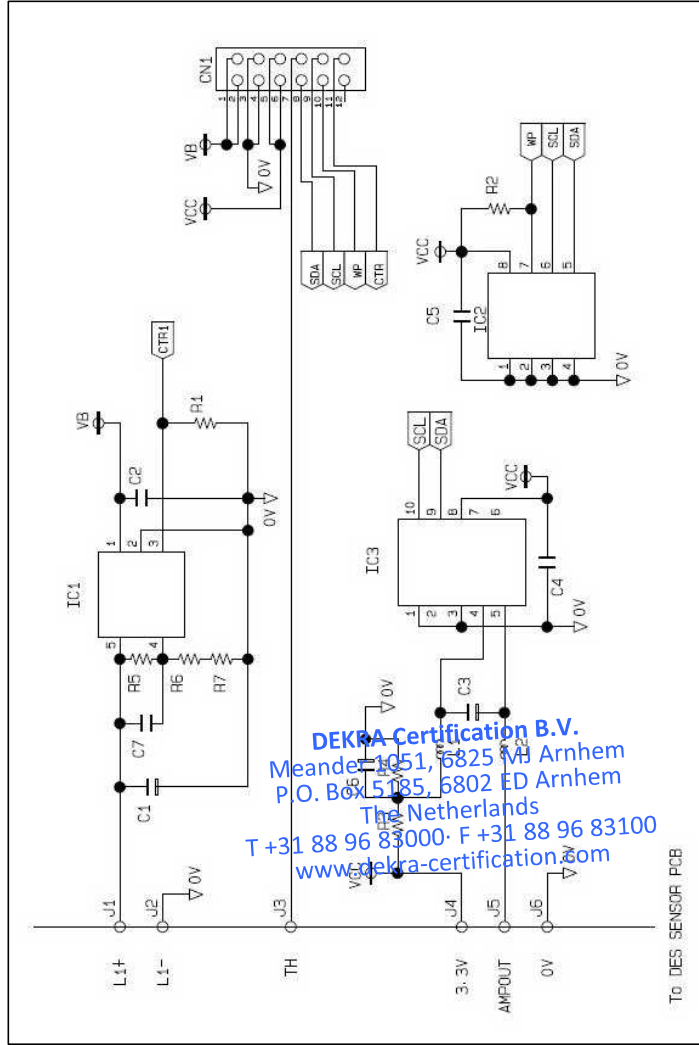
- CTI : 100 above

SCALE 2:1

PARTS LIST


Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Voltage regulator)	TPS73201DBV	m
IC2	IC (EEPROM)	S-24C16CJ48T1	m
IC3	IC (A/D Converter)	ADS1114IRU	m
R1,2,3,4,5,6,7	Chip fixed resistor or Chip jumper	10 ohm – 1M ohm / 1%, 0.063W or 50m ohm max, 1A (1005)	m
C1,2	Chip multilayer capacitor	4.7uF / 20%, 6.3V	m
C3,4,5,6	Chip multilayer capacitor	0.1uF / 10%, 25V	m
C7	Chip multilayer capacitor	1uF / 10%, 10V	m
L1,2	Chip fixed resistor or Chip jumper or Noise filter	10 ohm – 1M ohm / 1%, 0.063W or 50m ohm max, 1A (1005) or BLM15HD182	m

m marked parts are mounted or not



SCHEMATIC

注 記 NOTES		C1、C2 change	改版担当者 REV. BY	改版日 REVISED	名 称 NAME
改版回数 REV.	1	総頁数 PAGES	小野圭	2015.2.24	DES DIGITAL PCB
承認 APPROVED	石橋勝	CHECKED	製 図 DRAWN	作成日 DATE	
		北村正英	小野圭	2014.7.14	図 番 DWG. NO.
					E3-6991-5386-60-01K

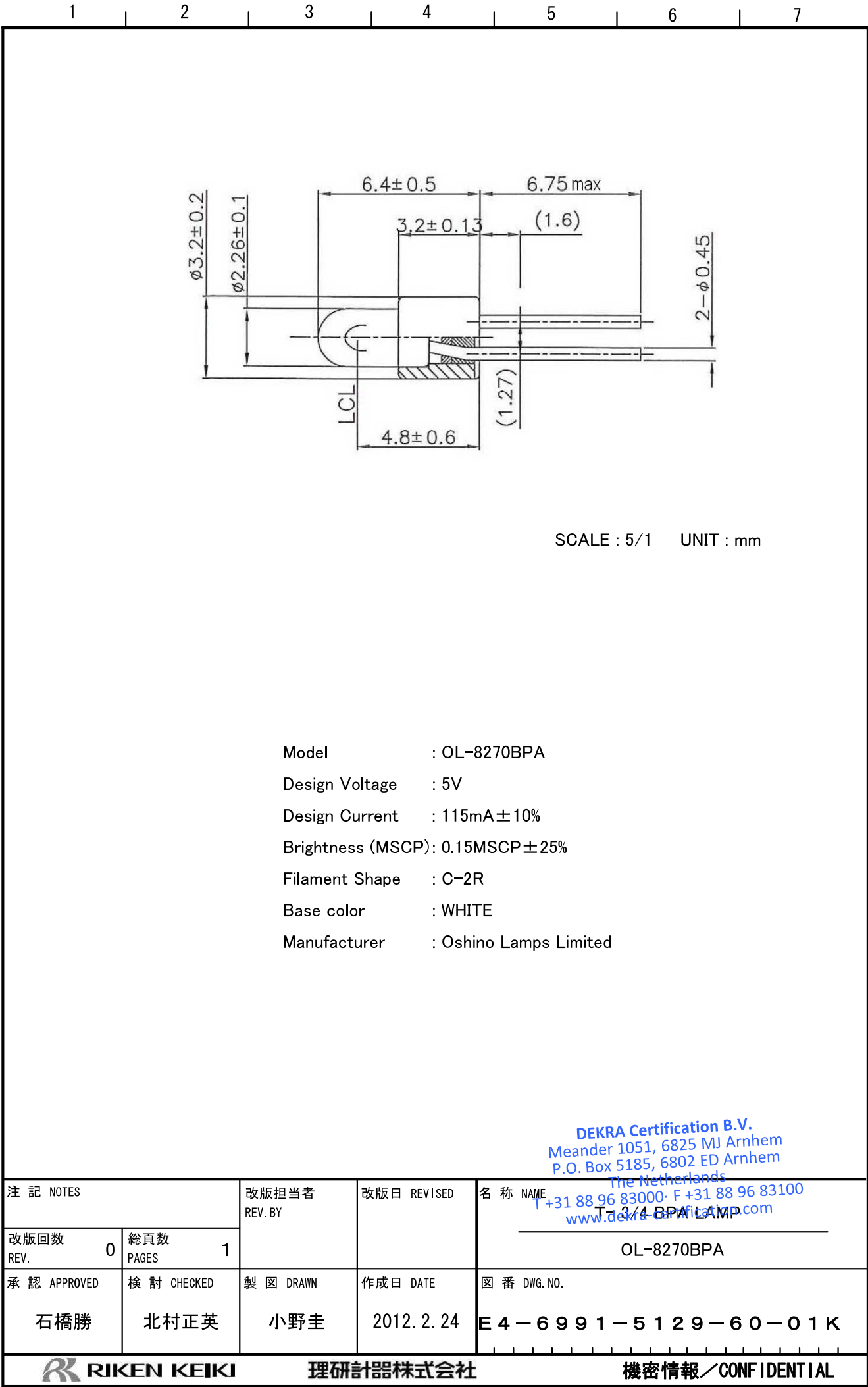


RIKEN KEIKI



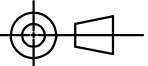


理研計器株式会社

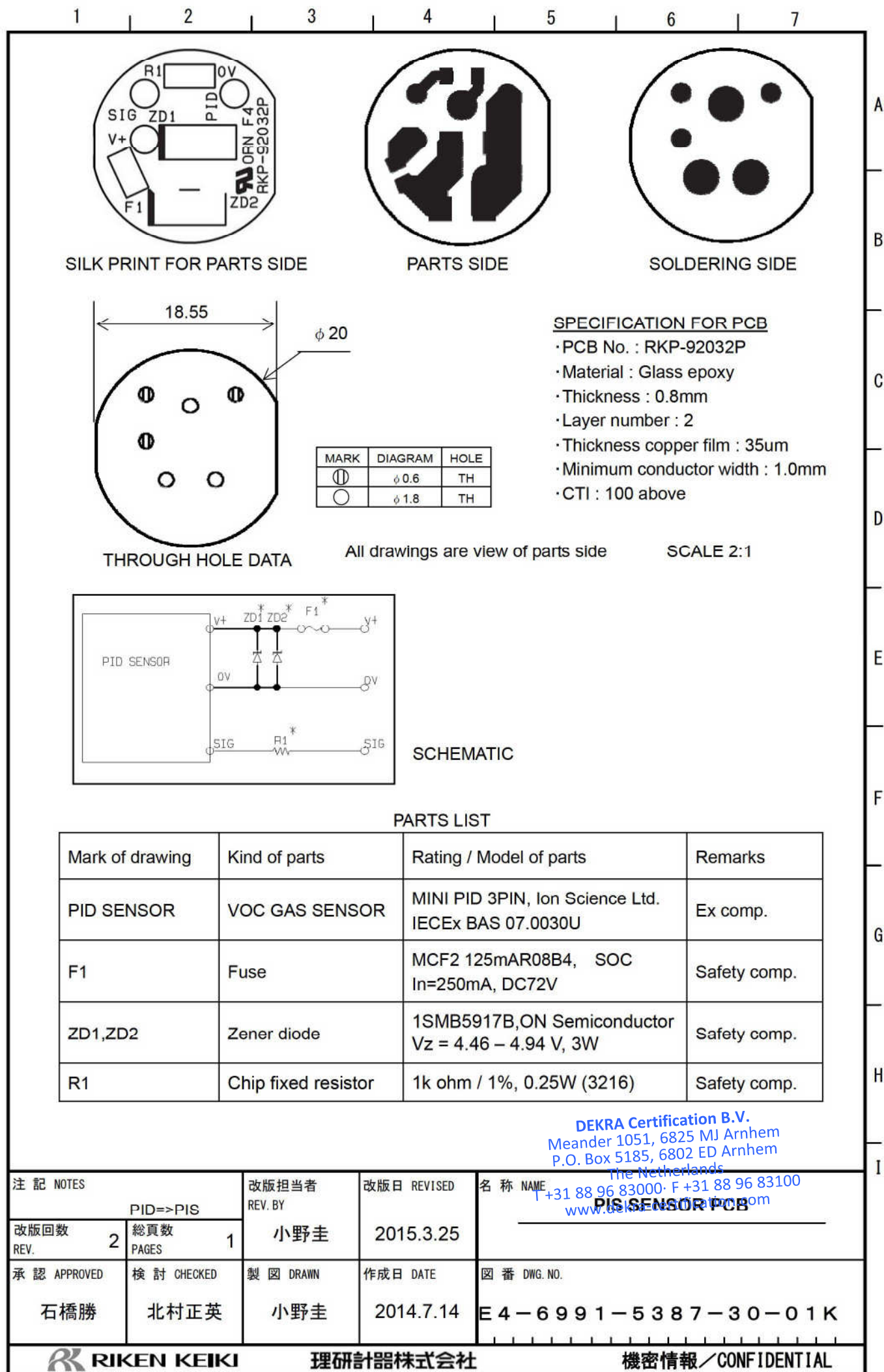
機密情報 / CONFIDENTIAL

機密情報 / CONFIDENTIAL

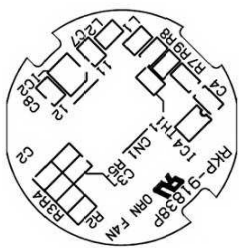


寸法	18 未満		18以上50未満		50以上120未満		120以上260未満		260以上500未満		500以上1000未満		1000以上							
	精細 0.1	中級 0.2	粗大 0.4	0.15	0.3	0.6	0.2	0.4	0.8	0.3	0.6	1.2	0.4	0.8	1.6	0.5	1.0	2.0	0.7	1.2

表面処理 TREAT. 		許公差 TOL. 	尺度 SCALE 2 : 1	投影法 PROJECTION 	名称 NAME The Netherlands T +31 88 96 83000 F +31 88 96 83100 www.pedra-certification.com		訂正者 武井康典
材質 MAT. 					名称 NAME The Netherlands T +31 88 96 83000 F +31 88 96 83100 www.pedra-certification.com		訂正者 武井康典
承認 APPROVED	検討 CHECKED	製図 DRAWN	作成日 DATE	図番 DWG. NO.			
青良治	近藤晴彦	武井康典	2014. 7. 30	M4-4830-01-01K			
 RIKEN KEIKI				理研計測株式会社			機密情報 / CONFIDENTIAL



1 2 3 4 5 6 7 8 9 10 11 12 13 14



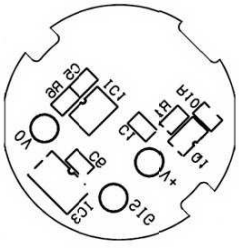
SILK PRINT FOR PARTS SIDE



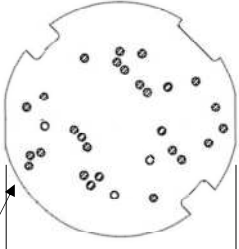
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

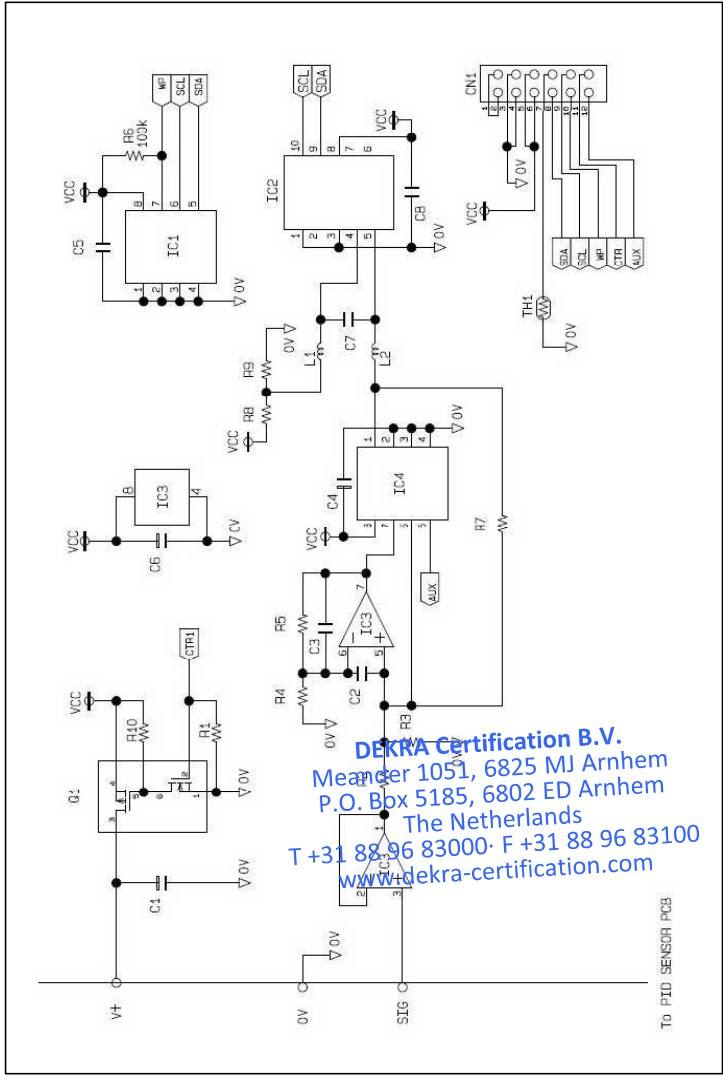
MARK	DIAGRAM	HOLE
①	φ0.3	TH
○	φ1.0	TH

SPECIFICATION FOR PCB

- PCB No. : RKP-91838P
- Material : Glass epoxy
- Thickness : 1.2mm
- Layer number : 2
- Thickness copper film : 18um
- Minimum conductor width : 0.3mm
- CTI : 100 above

All drawings are view of parts side

SCALE 2:1



SCHEMATIC

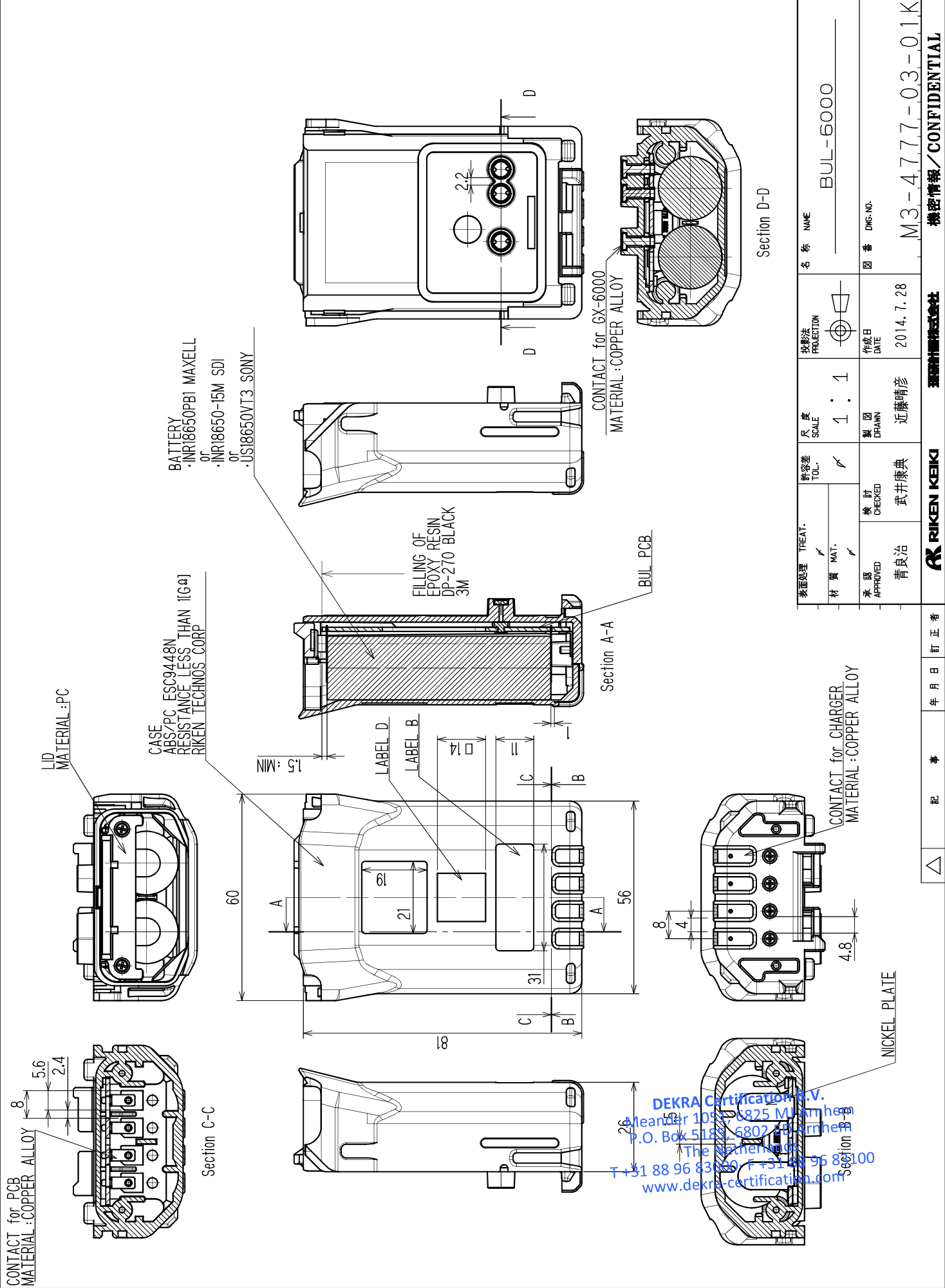
PARTS LIST

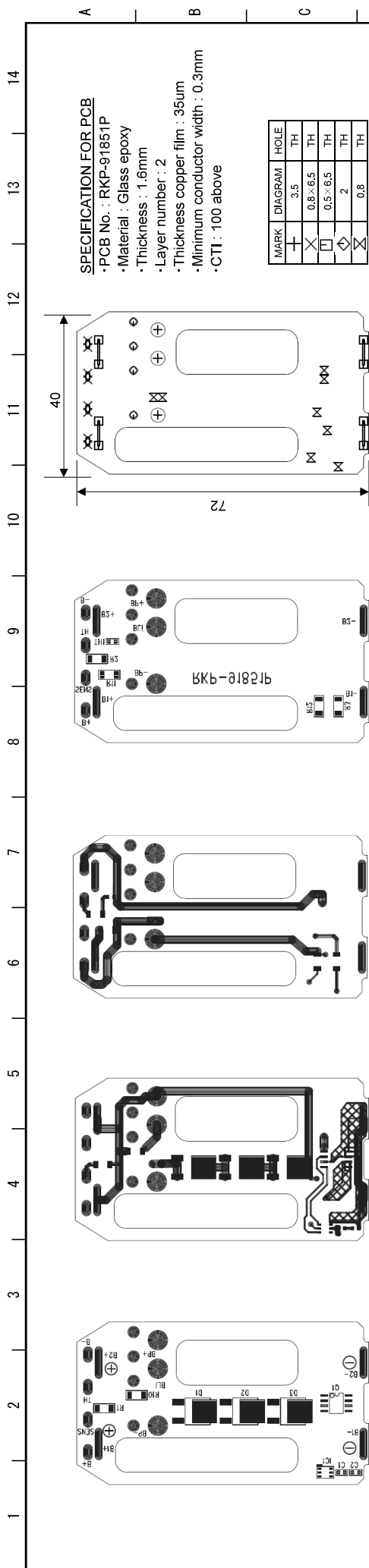
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (EEPROM)	S-24C16CH8T1	m
IC2	IC (A/D Converter)	ADS1114IRU	m
IC3	IC(OPAMP)	OPA2378AIDCN	m
Q1	N+P-ch FET	EM6M2	m
TH1	Chip thermistor	RT25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	m
R1-10	Chip fixed resistor or Chip jumper	10 ohm - 1M ohm / 1%, 0.063W or 50m ohm max,1A (1005)	m
C1,2,4,5,6,7,8	Chip multilayer capacitor	0.1uF / 10%, 16V	m
C3	Chip multilayer capacitor	10pF-1000pF / 10%, 50V	m
L1,2	Chip fixed resistor or Chip jumper or Noise filter	10 ohm - 1M ohm / 1%, 0.063W or 50m ohm max,1A (1005) or BLM15HD182	m

m marked parts are mounted or not

注 記 NOTES		PID=>PIS	改版担当者 REV. BY	改版日 REVISED	名 称 NAME
改版回数 REV.	0	総頁数 PAGES	1	2015.3.25	PIS DIGITAL PCB
承認 APPROVED	石橋勝	検討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
		北村正英	小野圭	2014.7.14	E3-6991-5388-10-01K
RIKEN KEIKI			理研計器株式会社		
			機密情報 / CONFIDENTIAL		

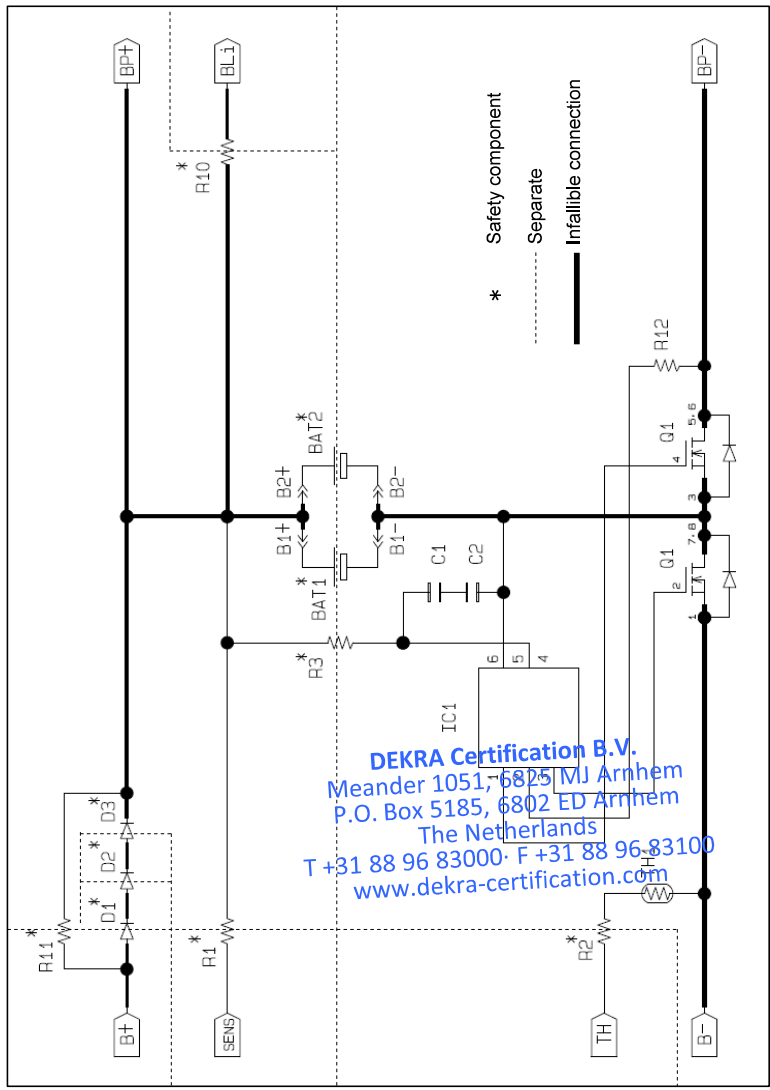
粗級	0.4	0.6	0.8	1.2	1.6	2.0	2.5
中級	0.2	0.3	0.4	0.6	0.8	1.0	1.2
精級	0.1	0.15	0.2	0.3	0.4	0.5	0.7
寸法	1日未満	1日以上50未満	50以上120未満	120以上260未満	260以上500未満	500以上1000未満	1000以上
入	イ	ロ	ハ	ニ	ホ	ヘ	コ





SILK PRINT FOR PARTS SIDE SOLDERING SIDE THROUGH HOLE DATA

All drawings are view of parts side
SCALE 1:1



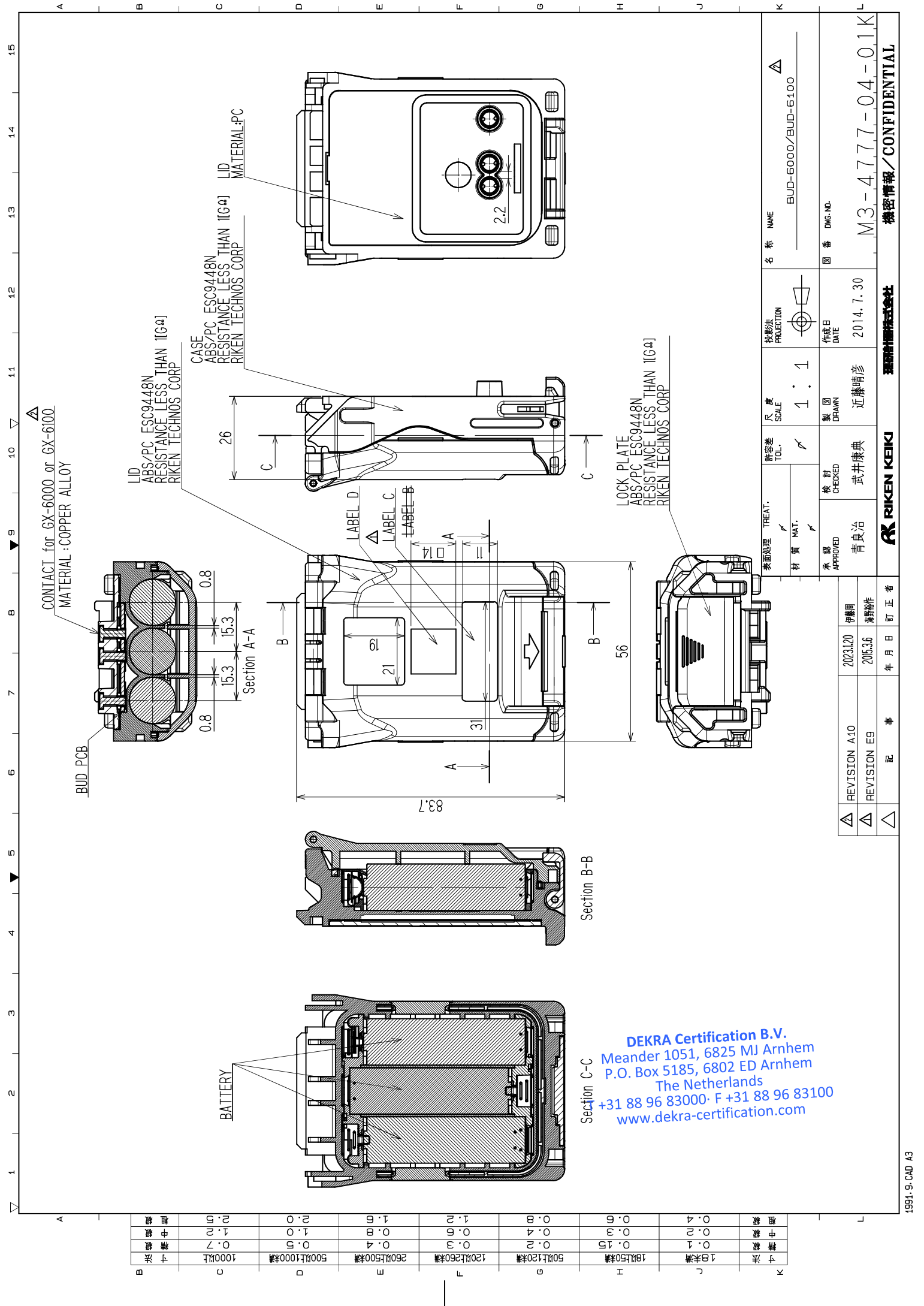
SCHEMATIC

PARTS LIST

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Protection IC)	S-8261	
Q1	FET	FDS6961A	
D1,2,3	Schottky barrier diode	MBRD1045, On semiconductor Vr = 45V, If = 10A	*
R1,2	Chip fixed resistor	MCR18EZP_2000, ROHM or RK73H2BT_2000, KOA 200ohm / 1%, 0.25W	*
R3	Chip fixed resistor	MCR18EZP_4700, ROHM or RK73H2BT_4700, KOA 470ohm / 1%, 0.25W	*
R10	Chip fixed resistor	MCR18EZP_1002, ROHM or RK73H2BT_1002, KOA 10k ohm / 1%, 0.25W	*
R11	Chip fixed resistor	MCR18EZP_1002, ROHM or RK73H2BT_1002, KOA 2.2k ohm / 1%, 0.25W	*
R12	Chip fixed resistor	200Q-10KQ / 1%, 0.25W (3216)	
C1,2	Chip multilayer capacitor	0.1uF / 10%, 50V	m
TH1	Chip thermistor	RT25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	

m marked parts are mounted or not

注 記 NOTES		改版日 REVISED	名称 NAME
改版回数 REV.	1	2014.9.5	BUL PCB
総頁数 PAGES	1		
承認 APPROVED	石橋勝	製 図 DRAWN	國 番 DWG. NO.
検討 CHECKED	北村正英	作成日 DATE	
		2014.7.14	E3-6991-5389-80-01K
理研計器株式会社		機密情報 / CONFIDENTIAL	



寸法		18未満	18以上50未満	50以上120未満	120以上260未満	260以上500未満	500以上1000未満	1000以上
公差		0.1	0.15	0.2	0.3	0.4	0.5	0.7
公差		0.2	0.3	0.4	0.6	0.8	1.0	1.2
公差		0.4	0.6	0.8	1.2	1.6	2.0	2.5

寸法	18未満	18以上50未満	50以上120未満	120以上260未満	260以上500未満	500以上1000未満	1000以上
公差	0.1	0.15	0.2	0.3	0.4	0.5	0.7
公差	0.2	0.3	0.4	0.6	0.8	1.0	1.2
公差	0.4	0.6	0.8	1.2	1.6	2.0	2.5

DEKRA Certification B.V.
Meander 1051, 6825 MJ Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
+31 88 96 83000 F +31 88 96 83100
www.dekra-certification.com

REVISION A10	2023.12.0	伊藤 剛
REVISION E9	2016.3.6	崎野 裕作
記 事	年 月 日	訂 正 者

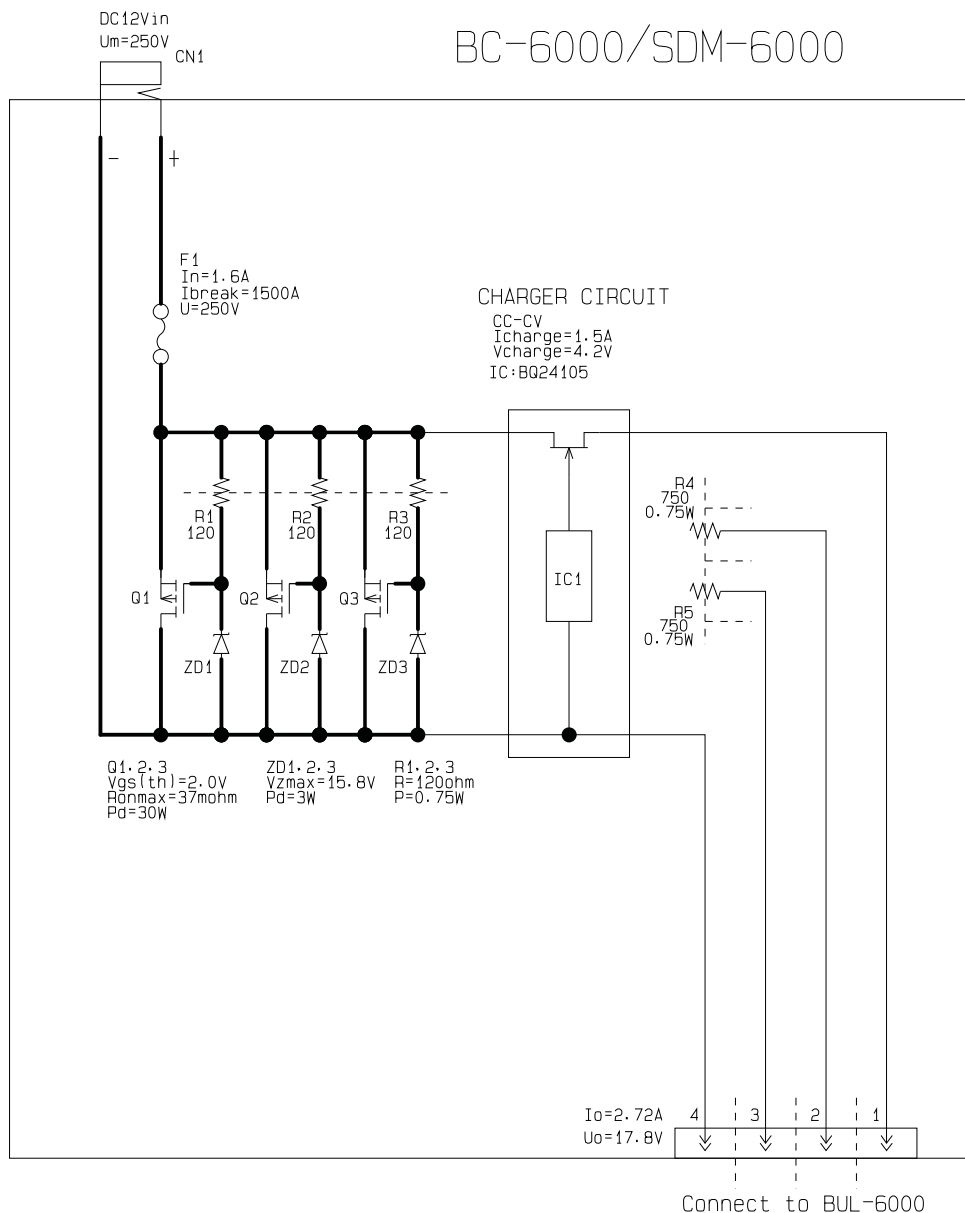
表面処理	TREAT.	許容差	TOL.	尺 度	SCALE	投影法	PROJECTION	名 称	NAME
材 質	MAT.	材 質	MAT.	1 : 1	1 : 1	第一角法	第一角法	BUD-6000/BUD-6100	BUD-6000/BUD-6100
承認	APPROVED	検討	CHECKED	製 図	DRAWN	作成日	DATE	図 番	DWG. NO.
青 良 治	青 良 治	武 井 康 典	武 井 康 典	近 藤 晴 彦	近 藤 晴 彦	2014. 7. 30	2014. 7. 30	M3-4777-04-01	M3-4777-04-01

機 密 情 報 / CONFIDENTIAL	理 研 計 画 有 限 公 司	RIKEN KEIKI
------------------------	-----------------	-------------

1	2	3	4	5	6	7												
SILK PRINT FOR PARTS SIDE		PARTS SIDE		SOLDERING SIDE		THROUGH HOLE DATA												
<p>All drawings are view of parts side SCALE 1:1</p>																		
<p>SPECIFICATION FOR PCB</p> <ul style="list-style-type: none"> •PCB No. : RKP-91954P •Material : Glass epoxy •Thickness : 1.2mm •Layer number : 2 •Thickness copper film : 35um •Minimum conductor width : 1.6mm •CTI : 100 above 				<table border="1"> <tr> <th>MARK</th> <th>DIAGRAM</th> <th>HOLE</th> </tr> <tr> <td>/</td> <td>φ 0.8</td> <td>TH</td> </tr> <tr> <td>X</td> <td>φ 3.7</td> <td>TH</td> </tr> <tr> <td>☆22</td> <td>φ 2.2</td> <td>NTH</td> </tr> </table>			MARK	DIAGRAM	HOLE	/	φ 0.8	TH	X	φ 3.7	TH	☆22	φ 2.2	NTH
MARK	DIAGRAM	HOLE																
/	φ 0.8	TH																
X	φ 3.7	TH																
☆22	φ 2.2	NTH																
SCHEMATIC																		
PARTS LIST																		
Mark of drawing		Kind of parts	Rating / Model of parts		Remarks													
R1		Chip fixed resistor	MCR18EZP_1002, ROHM or RK73H2BT_1002, KOA 10k ohm / 1% , 0.25W		Safety comp.													
<p>DEKRA Certification B.V. Meander 1051, 6825 MJ Arnhem P.O. Box 5185, 6802 ED Arnhem The Netherlands +31 88 96 83000 F +31 88 96 83100 www.dekra.com</p>																		
注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME														
改版回数 REV.	1	総頁数 PAGES	1	小野圭														
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.														
石橋勝	北村正英	小野圭	2014.7.14	E 4 - 6 9 9 1 - 5 3 9 0 - 5 0 - 0 1 K														
<p>RIKEN KEIKI 理研計器株式会社 機密情報 / CONFIDENTIAL</p>																		

BATTERY CHARGER

BC-6000/SDM-6000



(MEMO)

1. - - - - marks means SEPARATE

2. ——— marks means INFALLIBLE CONNECTION

DEKRA Certification B.V.
Meander 1051, 6825 MJ Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands

T +31 88 96 83000 F +31 88 96 83100
www.dekra-certification.com

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
改版回数 REV.	1	小野圭	2014. 9. 5	DIAGRAM FOR I. S. KEEP
承認 APPROVED	検討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
石橋勝	北村正英	小野圭	2014. 7. 30	E 4-6991-5395-80-01K

寸法	18未満	18以上50未満	50以上120未満	120以上260未満	260以上500未満	500以上1000未満	1000以上
許容差	±0.1	±0.2	±0.4	±0.6	±0.8	±1.0	±1.2

GX-6000(LABEL A)

MODEL GX-6000

INST.No.

RIKEN KEIKI Co., Ltd.

2-7-6, Azusawa, Itabashi-ku, Tokyo, 174-8744, Japan

BUL- (LABEL B)

MODEL BUL-

INST.NO.

RIKEN KEIKI Co., Ltd./2-7-6, Azusawa,
Itabashi-ku, Tokyo, 174-8744, Japan

WARNING

Do not charge battery in haz.loc.

BUD- (LABEL C) :6000 OR
6100

MODEL BUD-

INST.NO.

RIKEN KEIKI Co., Ltd./2-7-6, Azusawa,
Itabashi-ku, Tokyo, 174-8744, Japan

WARNING Use only battery types

△ LR6T(JE) TOSHIBA or MN1500 DURACELL

:6000 OR
6100

GX-6000, BUL- , BUD- (LABEL D)



XXXX



II 1 G Ex ia IIB T4...T3 Ga

DEKRA 24 ATEX 0016

IECEx DEK 24.0014

-20℃≤Ta≤+50℃

WARNING

Read manual for safety info.

Do not open in haz.loc.

II C/II B △

0344

0016X △

XXXXX

XXXX

△

~~GX-6000/GX-6100~~

△	Correction	2024.6.13	河原井英樹
△	Correction	2024.5.24	河原井英樹
△	Correction	2024.4.17	河原井英樹
△	Correction	2024.2.13	河原井英樹
△	Option Certification By Meander 1051, 6825 Mj, Antwerp P.O. Box 518 寧 6802 ED Antwerp The Netherlands T +31 88 96 83000 F +31 88 96 83100 www.dekra-certification.com		
△	訂正者	年月日	

表面处理 TREAT. 材質 MAT.	許容差 TOL.	尺度 SCALE 4 : 1	投影法 PROJECTION 	名称 NAME T +31 88 96 83000 F +31 88 96 83100 www.dekra-certification.com LABEL GX-6000
承認 APPROVED 武井康典	検討 CHECKED 澤田大亮	製図 DRAWN 河原井英樹	作成日 DATE 2024. 1. 18	図番 DWG. NO. M4-4777-33-05K

RIKEN KEIKI

理研計機株式会社

機密情報 / CONFIDENTIAL

	1	2	3	4	5	6	7	
1000以上								A
500以上1000未満								B
260以上500未満								C
120以上260未満								D
50以上120未満								E
18以上50未満								F
18未満								G
0.1								H
0.2								J
0.4								
0.6								
0.8								
1.2								
1.6								
2.0								
2.5								

60

25

警告 WARNING

・本来の使用目的以外の使用はしないでください。
・Do not use for any purpose other than original intended use.
・落下や水は故障の原因となります。
・Protect from impact and moisture.
・充電は非危険場所にて行なってください。
・Not for use in hazardous area.
・指定のACアダプタを使用してください。
・Use only with exclusive AC adaptor.

注意 CAUTION

・ご使用前に取扱説明書を必ずお読みください。
・Read and understand operation manual before use.

40

20

MODEL _____
INST. No. _____
DATE _____
CE DC INPUT : 12V= 0.8A
DC OUTPUT : 6V= 1.6A
RIKEN KEIKI Co.,Ltd. JAPAN

“BC-6000”
or “SDM-6000”

DEKRA Certification B.V.

Meander 1051, 6825 MJ Arnhem
P.O. Box 5189, 6802 ED Arnhem
The Netherlands
T +31 88 96 83000 F +31 88 96 83100
www.dekracertification.com

年月日

訂正者

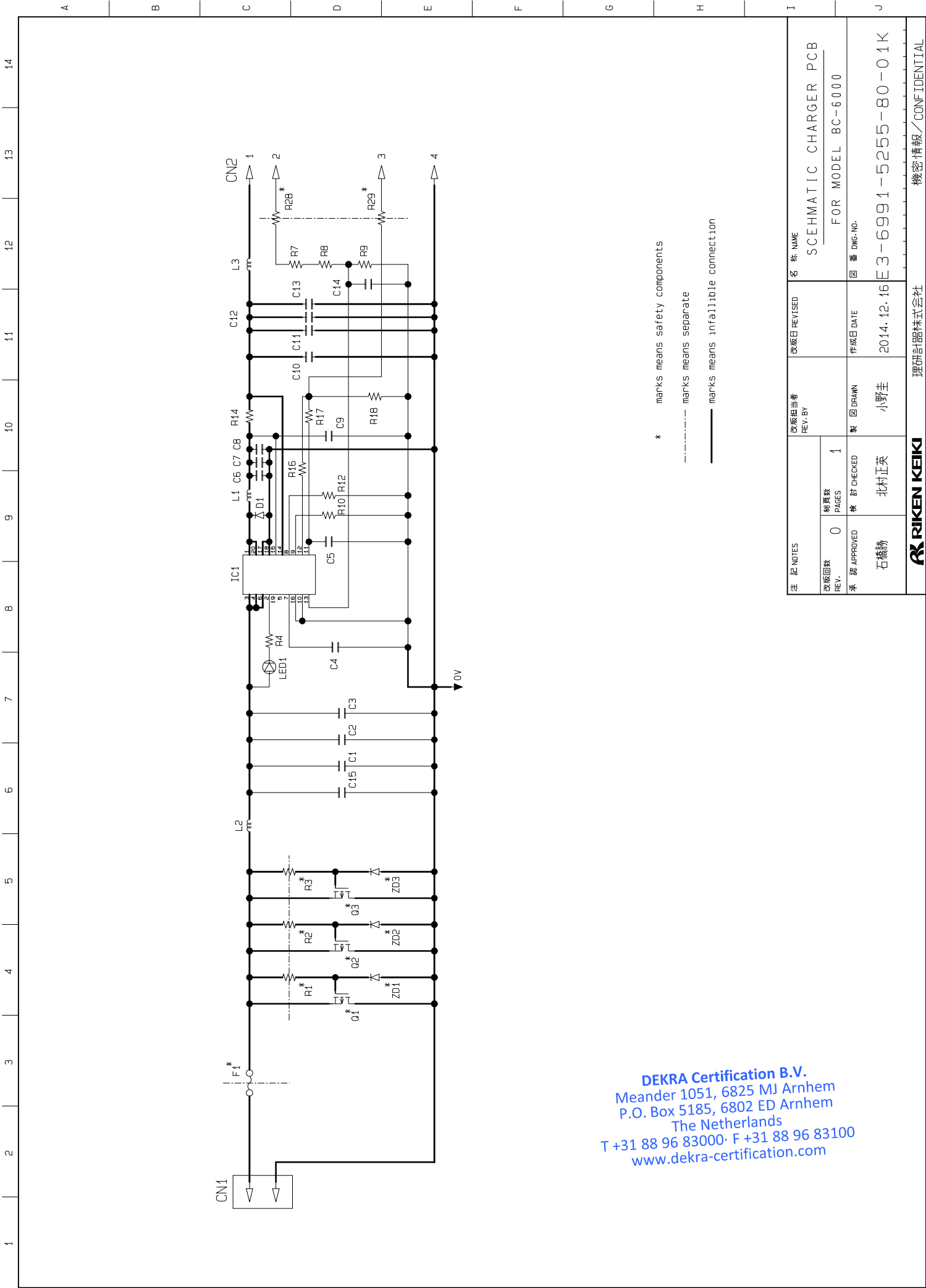
表面処理 TREAT.	許容差 TOL.	尺度 SCALE	投影法 PROJECTION	名称 NAME
材質 MAT.		1 : 1		BC-6000/SDM-6000
承認 APPROVED	検討 CHECKED	製図 DRAWN	作成日 DATE	図番 DWG. NO.
青良治	武井康典	近藤晴彦	2014. 7. 28	M4-4777-01-02K

RIKEN KEIKI

理研計測株式会社

機密情報 / CONFIDENTIAL

1991.9. CAD A4



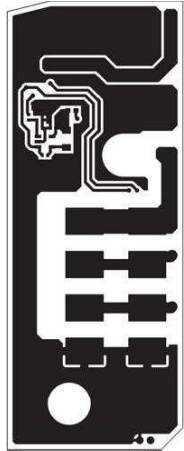
1 2 3 4 5 6 7 8 9 10 11 12 13 14

PARTS LIST

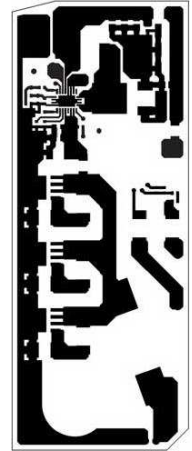
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Battery charger)	BQ24105RHLR	
IC2	IC (Comparator)	TL331	
D1	Schottky barrier diode	MBRD1045	
F1	Fuse	021601.6P Littelfuse In=1.6A, Ibreak=1500A@250Vac	*
Q1,Q2,Q3	P-ch MOSFET	TPCA8507-H TOSHIBA Ron_max=37mΩ , Pd=30W	*
ZD1,ZD2,ZD3	1SMB5929B	1SMB5929B ON Semiconductor VZ= 14.25V ~15.75V, Pd=3W	*
R1,R2,R3	Chip fixed resistor	RK73HW2H_1200F KOA 120Ω/1%, 0.75W	*
R7,R8,R9,R10,R12, R16,R17,R18,R30, R31,R33	Chip fixed resistor or Chip jumper	100Ω- 4.7MΩ/1% , 0.063W (1005) or 50mΩ max. 1A	m
R14	Chip fixed resistor	0.068Ω - 0.2Ω/1% , 0.25W (3216)	
R15	Chip fixed resistor or Chip jumper	100Ω- 1MΩ/1% , 0.1W (1608) or 50mΩ max. 1A	m
R28,R29	Chip fixed resistor	RK73HW2H_7500F KOA 750Ω/1%, 0.75W	*
R32,	Chip fixed resistor or Chip jumper	100Ω- 1MΩ/1% , 0.125W (3216) or 50mΩ max. 1A	m
C1,	Chip multilayer capacitor	1uF / 10%, 25V	m
C3,	Chip multilayer capacitor	22uF / 10%, 25V	m
C11,C12,C13	Chip multilayer capacitor	47uF / 10%, 16V	m
C5,C9, C14,C15, C16,C17	Chip multilayer capacitor	0.1uF / 10%, 25V	m
C2,C6,C7,C8,C10	Chip multilayer capacitor	10uF / 10%, 16V	m
C4,	Chip multilayer capacitor	0.22uF / 10%, 10V	m
L1	Inductor	10uH / 20%	m
NF1,NF2	Chip ferrite beads	BLM31PG391	m

* marked parts are for safety

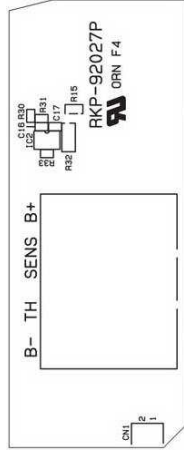
m marked parts are mounted or not



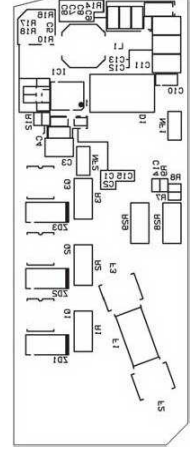
SOLDERING SIDE



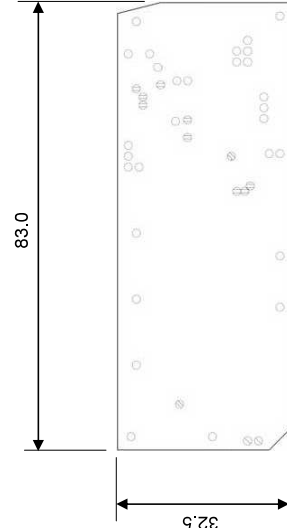
PARTS SIDE



SILK PRINT FOR SOLDERING SIDE



SILK PRINT FOR PARTS SIDE



All drawings are view of soldering side

SCALE 1:1

SPECIFICATION FOR PCB

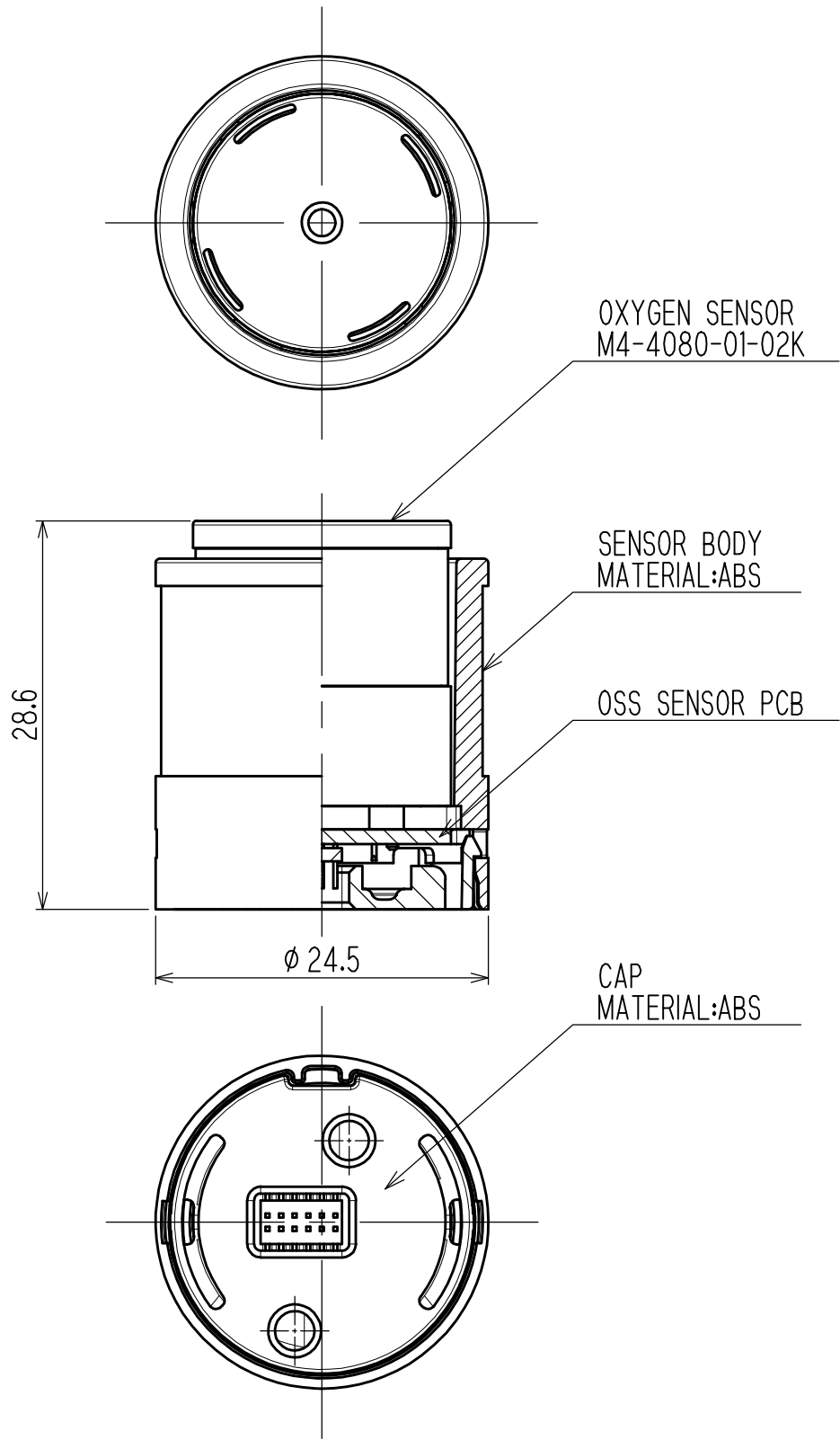
- PCB No. :RKP-92027P
- Material : Glass epoxy
- Thickness : 1.6mm
- Layer number : 2
- Thickness copper film : 35um
- Copper thickness of the via's : 35um above.
- Minimum conductor width : 0.3mm
- CTI : 175 above

DEKRA Certification
Meander 1051A 6821 M Arnhem
P.O. Box 5185, 6800 AD Arnhem
The Netherlands
T +31 88 96 83000: F +31 88 96 83100
www.dekra-certification.com

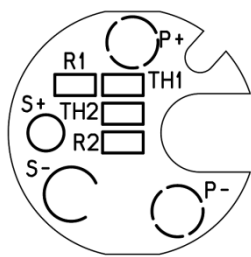
MARK	HOLE
Ø4.4	TH
Ø0.7	TH
Ø0.8	TH
Ø5.6	NTH

注 記 NOTES	改版担当者 REV. BY	改版日 REVISED	名 称 NAME
改版回数 REV. 2	小野圭 1	2015.6.12	CHARGER PCB
承認 APPROVED 石橋勝	検討 CHECKED 北村正英	作成日 DATE 2014.12.15	FOR MODEL SDM-6000
製 図 DRAWN 小野圭		國 番 DWG. NO. E3-6991-5445-60-01A	
RIKEN KEIKI 理研計器株式会社		機密情報 / CONFIDENTIAL	

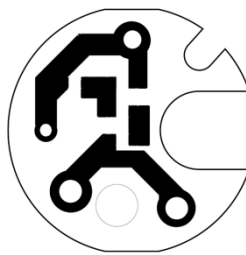
寸法	精細	0.1	中級	0.2	粗級	0.4	18以上	18未満	50以上	50未満	120以上	120未満	250以上	250未満	500以上	500未満	1000以上
許容差	精細	0.1	中級	0.2	粗級	0.4	0.15	0.3	0.6	0.2	0.4	0.8	0.3	0.6	1.2	0.5	1.0
																	2.5



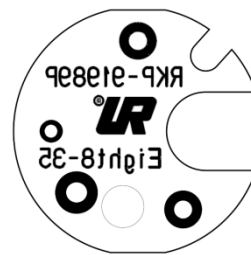
表面処理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME	
材 質 MAT.					The Netherlands T +31 88 96 83000 F +31 88 96 83100 www.dekra-certification.com	
			2 : 1		SMART SENSOR Type-OSS	
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.		
青良治	武井康典	武田直樹	2015. 2. 24	M4-4080-01-01K		
RIKEN KEIKI		理研計測株式会社		機密情報 / CONFIDENTIAL		



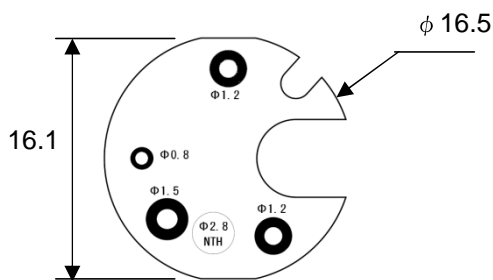
SILK PRINT FOR PARTS SIDE



PARTS SIDE



SOLDERING SIDE



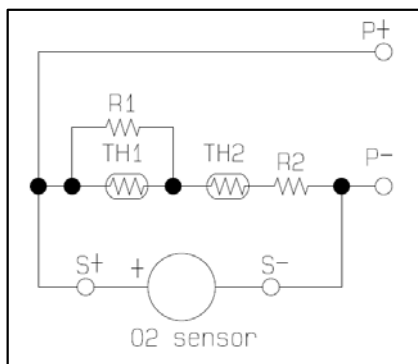
THROUGH HOLE DATA

SPECIFICATION FOR PCB

- PCB No. : RKP-91989P
- Material : Glass epoxy
- Thickness : 0.8mm
- Layer number : 2
- Thickness copper film : 35um
- Minimum conductor width : 0.5mm
- CTI : 100 above

All drawings are view of parts side

SCALE 2:1



SCHEMATIC

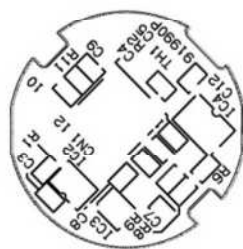
PARTS LIST

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
O2 SENSOR	OXYGEN SENSOR	Refer to M4-4080-01-01K	
R1,2	Chip fixed resistor or Chip jumper	10 ohm – 1M ohm / 1%, 0.1W or 50m ohm max, 1A (1608)	m
TH1,2	Chip thermistor	Rt25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1608)	m

m marked parts are mounted or not

DEKRA Certification B.V.
Meander 1051, 6825 MJ Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
T +31 88 96 83000 F +31 88 96 83100
www.dekra.nl

注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME O2 SENSOR PCB
改版回数 REV.	0			
総頁数 PAGES	1	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
承認 APPROVED	検 討 CHECKED			
石橋勝	北村正英	小野圭	2015.2.24	E 4 - 6 9 9 1 - 5 4 5 7 - 0 0 - 0 1 K



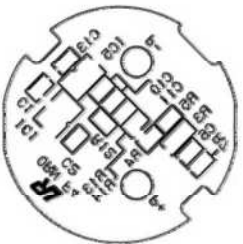
SILK PRINT FOR PARTS SIDE



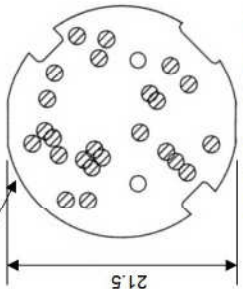
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

MARK	DIAGRAM	HOLE
	$\phi 0.3$	TH
	$\phi 1.0$	TH

SPECIFICATION FOR PCB

• PCB No. : RKP-91990P

- Material : Glass epoxy

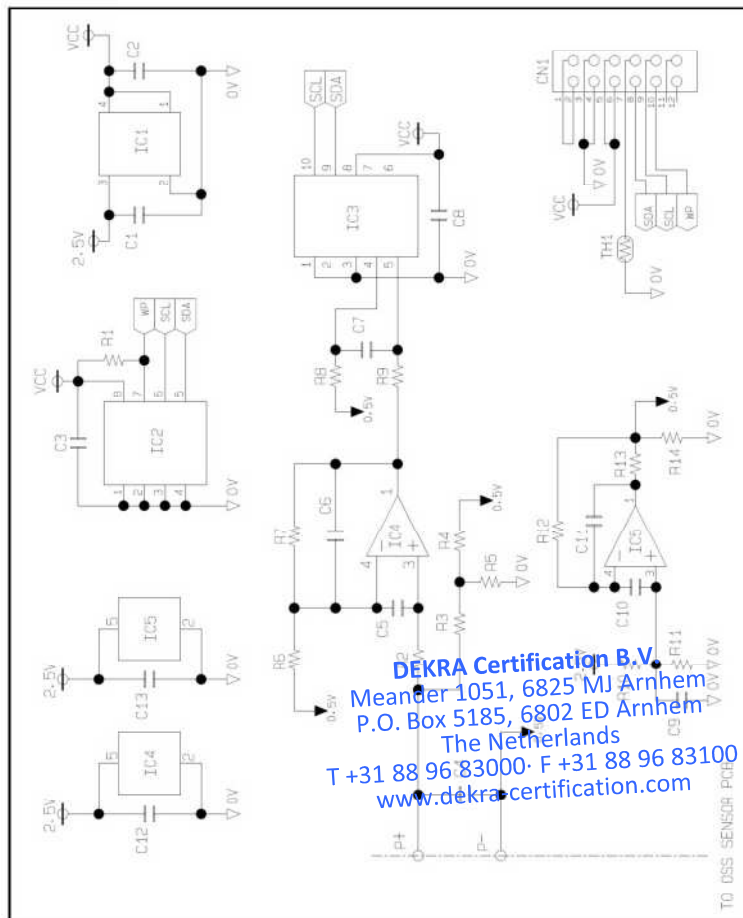
• Thickness : 1.2mm

• Layer number : 2

• Thickness copper film : 18um

- Minimum conductor width : 0.3mm

•CTI : 100 above



TO OSS SENSOR PCA

SCHEMATIC

PARTS LIST			
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Voltage regulator)	S-1313D25-N4T1	m
IC2	IC (EEPROM)	S-24C16CI-I8T1	m
IC3	IC (A/D Converter)	ADS1114IRU	m
IC4	IC (OPAMP)	OPA333AIDBV	m
IC5	IC (OPAMP)	AD8500AKS	m
TH1	Chip thermistor	RT25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	m
R1-14	Chip fixed resistor or Chip jumper	10 ohm – 1M ohm / 1%, 0.063W or 50m ohm max, 1A (1005)	m
C1,2,3,8,12,13,	Chip multilayer capacitor	0.1uF / 10%, 25V	m
C4	Chip multilayer capacitor	0.01uF / 10%, 25V	m
C5,7,10	Chip multilayer capacitor	10pF-1000pF / 10%, 50V	m
C6,11	Chip multilayer capacitor	1uF / 10%, 10V	m
C9	Chip multilayer capacitor	100pF-6800pF / 10%, 50V	m

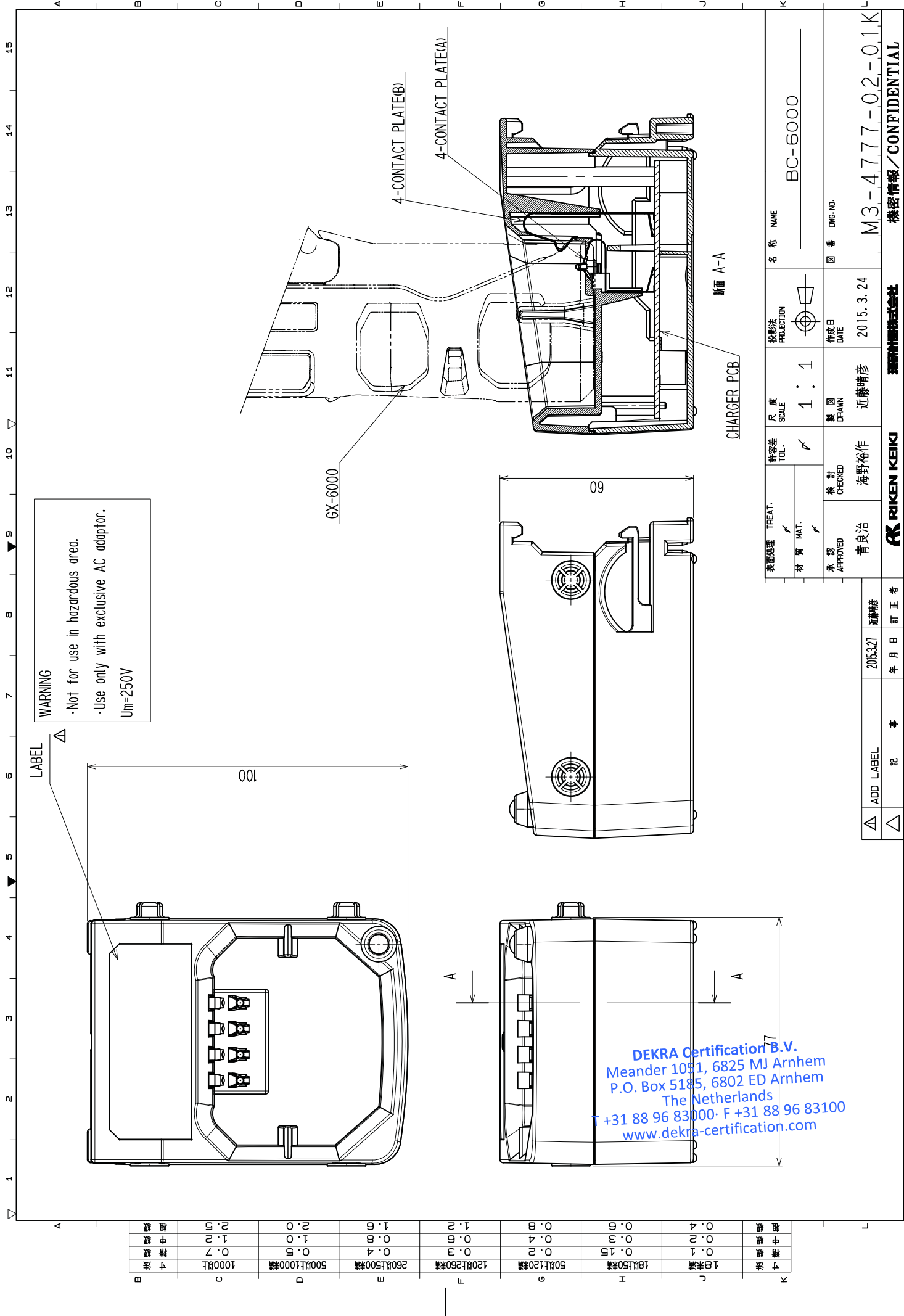
marked parts are mounted or not

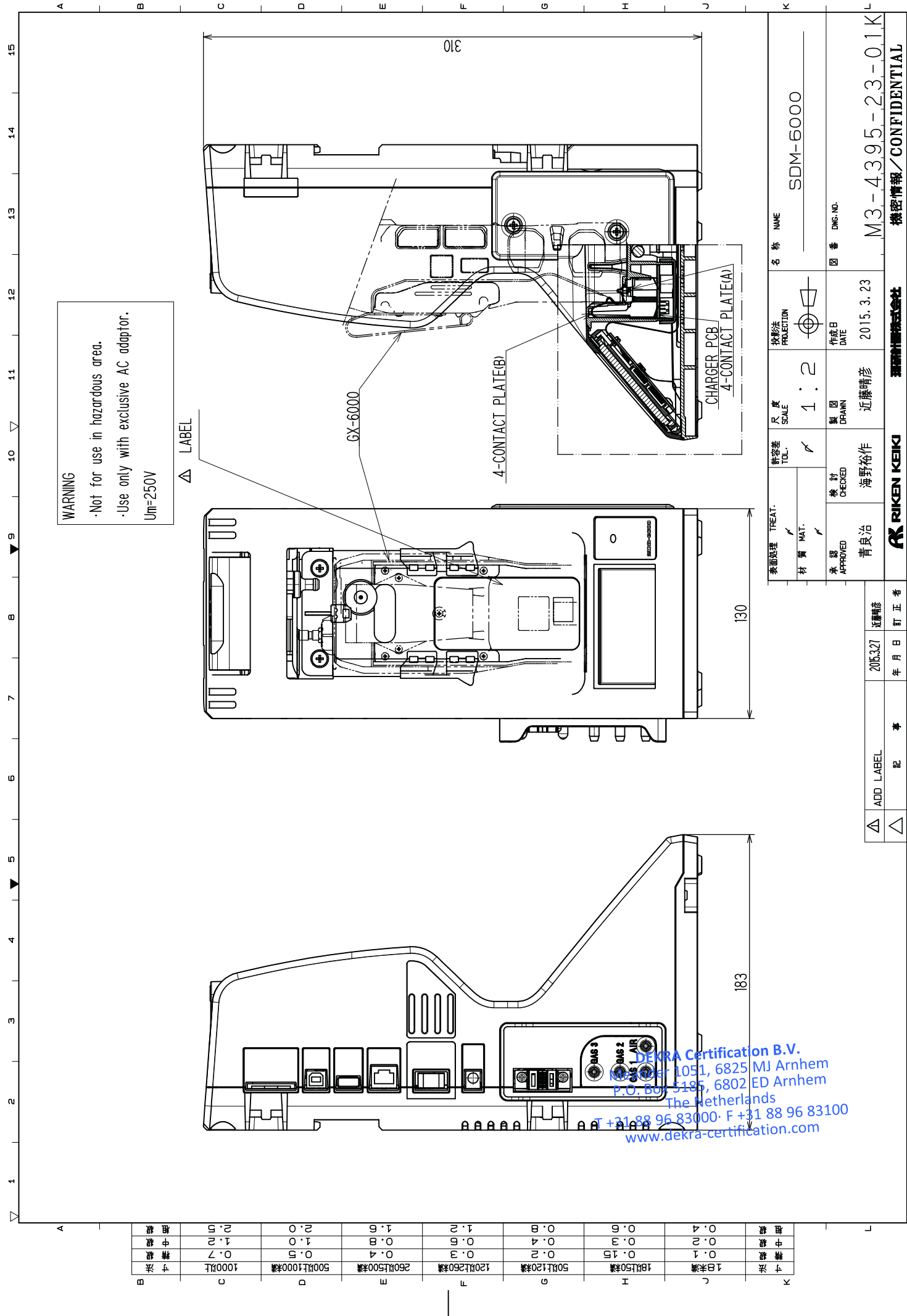
注 記 NOTES	改版回数 REV.		0	総頁数 PAGES	1	改版担当者 REV. BY	改版日 REVISED	名 称 NAME	OSS DIGITAL PCB		
	承認 APPROVED	石橋勝	検討 CHECKED	北村正英							
						製 図 DRAWN	小野圭	作成日 DATE	2015.2.24	図 番 DWG. NO.	E 3 - 6 9 9 1 - 5 4 5 8 - 7 0 - 0 1 K
										機密情報 / CONFIDENTIAL	
RIKEN KEIKI										理研計器株式会社	

寸法	18未満	18以上50未満	50以上120未満	120以上260未満	260以上500未満	500以上1000未満	1000以上
公差	精 0.1 粗 0.2	中 0.2 粗 0.4	粗 0.4 中 0.6	0.2 0.4 0.6 0.8	0.3 0.6 1.2	0.4 0.8 1.6	0.5 1.0 2.0
							0.7 1.2 2.5

Output specification
 ・Open circuit voltage : 0.5V(max)
 ・Short circuit current : 0.1mA(max)

表面処理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME OXYGEN SENSOR
材 質 MAT.					
承認 APPROVED 青良治	検 討 CHECKED 武井康典	製 図 DRAWN 武田直樹	作成日 DATE 2015. 2. 24	図 番 DWG. NO. M4-4080-01-02K	





WARNING
-Not for use in hazardous area.
-Use only with exclusive AC adaptor.
Um=250V

名称	NAME	SDM-6000	
投影法	PROJECTION		
尺度	SCALE	1:2	
公差	TOL.	ϕ	
製図	DRAWN	近藤晴彦	
作成日	DATE	2015.3.23	
承認	APPROVED	青良治	
検討	CHECKED	海野裕作	
図番	DWG. NO.	M3-4395-23-01K	
機密情報 / CONFIDENTIAL		RIKEN KEIKI	

表面処理	THEAT.	2015.3.27	近藤晴彦
材質	MAT.	年月日	訂正者
承認	APPROVED	年月日	訂正者
検討	CHECKED	年月日	訂正者

DEKRA Certification B.V.
Kraaijeveld 1051, 6825 MJ Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
T +31 88 96 83100 F +31 88 96 83100
www.dekra-certification.com

[illegible]

Safety information

The GX-6000 can measure up to six gases with six sensors.

Standard unit measures four gases with four sensors for general combustible gases (LEL), Oxygen (O₂), Hydrogen Sulfide (H₂S) and Carbon Monoxide (CO).

Other remaining two slots are for Smart Sensors which consist of sensor part and circuit board and are connected with apparatus through digital signal output to various sensors. Four different types of detection principle are applied for Smart Sensors and up to two sensors can be mounted into the GX-6000.

Just like GX-6000, GX-6100 can measure up to six gases with six sensors.

The combustible gas sensor (LEL) for GX-6100 satisfies the requirement. Moreover, Hotwire Semiconductor Sensor can be installed, making it possible to measure a range of combustible gas ppm. And with a Thermal Conductivity Sensor, %VOL of combustible gases can be measured. GX-6100 can measure a range of ppm, LEL, and %VOL of combustible gases with a use of these three sensors.

Gas is sampled by a built-in micro pump.

Either alkaline battery unit "BUD-6000/BUD-6100" or lithium-ion battery unit "BUL-6000/BUL-6100" can be installed into GX-6000 and GX-6100.




Structure of battery unit allows end users to replace it by themselves.

It is supposed to replace the battery unit, alkaline battery, and charge the rechargeable battery at non-hazardous area. Also, Charging BUL-6000/BUL-6100 should be done with a specific model, BC-6000 or SDM-6000.

BC-6000 is a battery charger for both GX-6000 and GX-6100.







SDM-6000 is a docking station for charging and calibration for both GX-6000 and GX-6100.

Specification for safety

GX-6000 Ex code T class	Ambient temperature range for use	Battery
Ex ia IIB T4 Ga  II1G Ex ia IIB T4 Ga	-20°C to +50°C	BUL-6000 / BUL-6100
Ex ia IIB T4 Ga  II1G Ex ia IIB T4 Ga	-20°C to +50°C	BUD-6000 / BUD-6100 LR6T(JE) (TOSHIBA)
Ex ia IIB T3 Ga  II1G Ex ia IIB T3 Ga	-20°C to +50°C	BUD-6000 / BUD-6100 MN1500 (DURACELL)

- Ambient temperature range during battery charging : 0°C to +40°C

DEKRA Certification B.V.
Meander 1051, 6825 MJ Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands
T +31 88 96 83000 • F +31 88 96 83100
www.dekra-certification.com

GX-6100 Ex code T class	Ambient temperature range for use	Combustible gas sensor	Battery
Ex da ia IIB T4 Ga  II1G Ex da ia IIB T4 Ga	-20°C to +50°C	Mounted	BUL-6100 / BUL-6000
Ex ia IIB T4 Ga  II1G Ex ia IIB T4 Ga	-20°C to +50°C	Not Mounted	BUL-6100 / BUL-6000
Ex da ia IIB T4 Ga  II1G Ex da ia IIB T4 Ga	-20°C to +50°C	Mounted	BUD-6100 / BUD-6000 LR6T(JE) (TOSHIBA)
Ex ia IIB T4 Ga  II1G Ex ia IIB T4 Ga	-20°C to +50°C	Not Mounted	BUD-6100 / BUD-6000 LR6T(JE) (TOSHIBA)
Ex da ia IIB T3 Ga  II1G Ex da ia IIB T3 Ga	-20°C to +50°C	Mounted	BUD-6100 / BUD-6000 MN1500 (DURACELL)
Ex ia IIB T3 Ga  II1G Ex ia IIB T3 Ga	-20°C to +50°C	Not Mounted	BUD-6100 / BUD-6000 MN1500 (DURACELL)

- Ambient temperature range during battery charging : 0°C to +40°C

Electrical data

- Power supply of Li-ion battery unit : BUL-6000
Two parallel connected Li-ion cells used in battery pack BUL-6000 are from type Maxell INR18650PB1 or SDI INR18650-15M or SONY US18650VT3.
- Power supply of Li-ion battery unit : BUL-6100
Two parallel connected Li-ion cells used in battery pack BUL-6100 are from type PANASONIC NCR18650GA.
- Um=250V.
- Power supply of alkaline battery unit : BUD-6000 and BUD-6100
Powered by three series AA size alkaline batteries, model LR6T(JE) by TOSHIBA or model MN1500 by DURACELL

Certificate numbers

- IECEx Certificate number : IECEx DEK 24.0014
- ATEX Certificate number : DEKRA 24 ATEX 0016

List of standards

- | | |
|-----------------------|-------------------------|
| • IEC 60079-0 : 2017 | • EN IEC 60079-0 : 2018 |
| • IEC 60079-1 : 2014 | • EN 60079-1 : 2014 |
| • IEC 60079-11 : 2011 | • EN 60079-11 : 2012 |

DEKRA Certification B.V.
 Oudegracht 20, 6825 MJ Arnhem
 P.O. Box 5185, 6802 ED Arnhem
 The Netherlands
 T +31 88 96 83000 F +31 88 96 83100
www.dekra-certification.com

Specific conditions of “X”-mark:

NO

WARNING

- Do not charge in hazardous location.
- Do not charge it except by genuine charger.
- Do not replace battery unit in hazardous location.
- Do not replace dry batteries in hazardous location.
- Do not attempt to disassemble or alter the instrument.
- Use only with connected alkaline aa battery, type LR6T(JE) manufactured by TOSHIBA, or type MN1500 manufactured by DURACELL
- The combustible gas sensor NCR-6309, to measure LEL, is the only part of this Gas Monitor system with flame - proof construction.
- This product is an explosion-proof product and is not to be disassembled or modified with the exception of specified parts.
- NCR-6309 must not be exposed to ultraviolet light.
- This product integrates a sensor having flameproof construction.
- If assembly is not performed as specified, explosion protection performance will be compromised. When replacing the sensor and filter, properly install genuine parts and torque to specification.
- The re-adjustment and parts replacement etc including the gas calibration shall be contacted to our nearest agent or RIKEN KEIKI Co., Ltd.

INST. No. 0 0 0 0 0 0 0 0 0 0

A B C D E

A: Manufacturing year (0-9)

B: Manufacturing month (1-9, XYZ for Oct. - Dec.)

C: Manufacturing lot

D: Serial number

E: Code of factory

**RIKEN KEIKI Co., Ltd.**

2-7-6, Azusawa, Itabashi-ku, Tokyo, 174-8744, Japan

Phone : +81-3-3966-1113

Fax : +81-3-3558-9110 GIII

E-mail : intdept@rikenkeiki.co.jpWeb site : <http://www.rikenkeiki.co.jp>

DEKRA Certification B.V.
 Meander 1051, 6825 MJ Arnhem
 P.O. Box 5185, 6802 ED Arnhem
 The Netherlands
 T +31 88 96 83000 F +31 88 96 83100
www.dekra-certification.com