

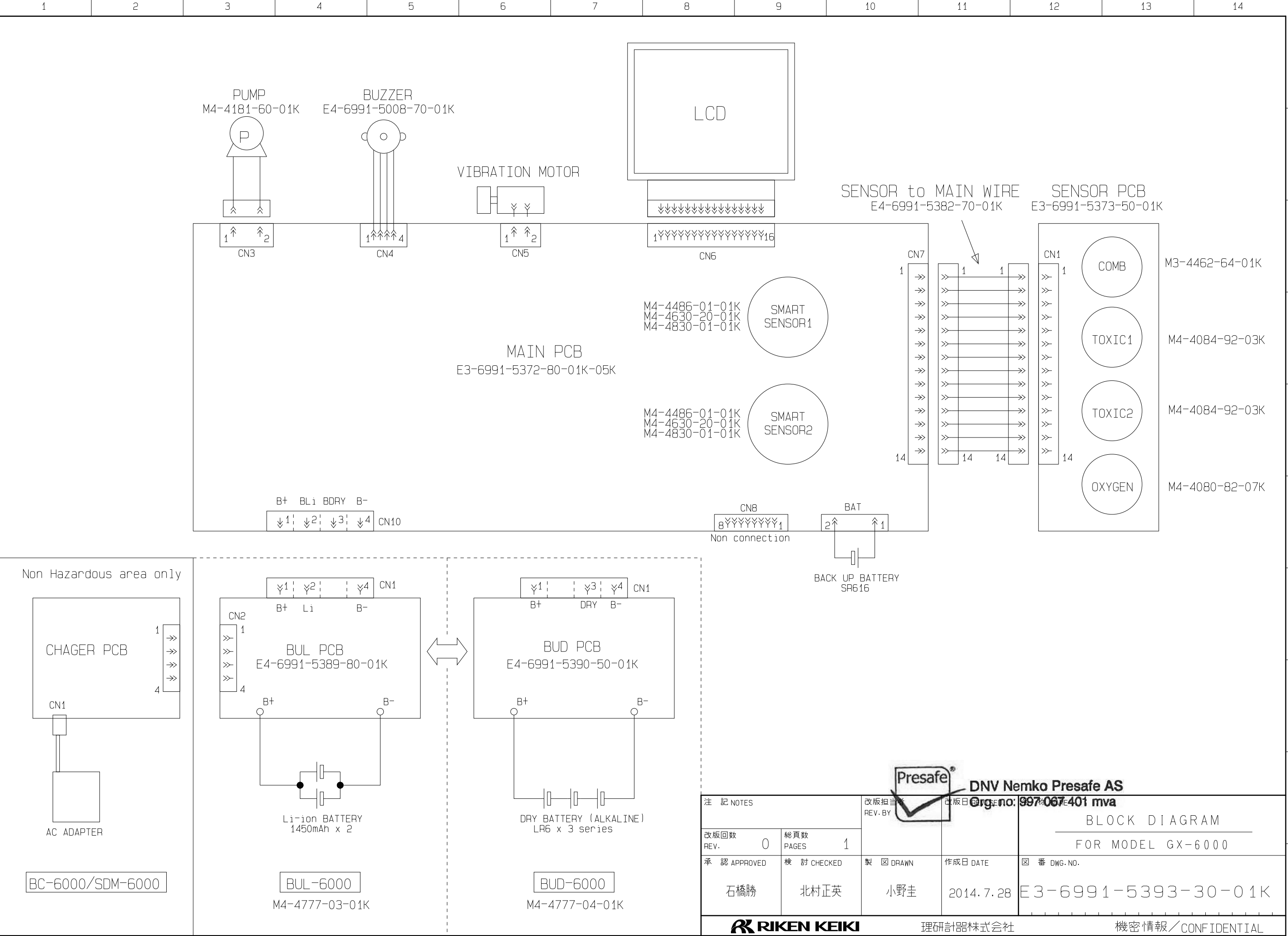
		DRAWING NAME	DRAWING No.	REV	DATE
	01	BLOCK DIAGRAM FOR MODEL GX-6000	E3-6991-5393-30-01K	0	2014.7.28
	02	DIAGRAM FOR I.S. KEEP FOR MODEL GX-6000	E3-6991-5361-10-01K	2	2014.12.16
	03	OUTER STRUCTURE GX-6000	M3-4777-01-01K	0	2014.7.18
	04	MAIN UNIT GX-6000	M2-4777-01-01K	1	2014.9.30
	05	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-01K	0	2014.7.14
	06	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-02K	0	2014.7.14
	07	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-03K	0	2014.7.14
	08	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-04K	0	2014.7.14
	09	SCHEMATIC MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-05K	0	2014.7.14
	10	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (1/4)	0	2014.7.14
	11	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (2/4)	3	2014.12.16
	12	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (3/4)	1	2014.11.5
	13	PARTS LIST OF MAIN PCB	PLT-6991-5372-80 (4/4)	0	2014.7.14
	14	MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-01A	0	2014.7.14
	15	MAIN PCB FOR MODEL GX-6000	E3-6991-5372-80-02A	0	2014.7.14
	16	SCHEMATIC SENSOR PCB FOR MODEL GX-6000	E3-6991-5373-50-01K	1	2014.11.5
	17	PARTS LIST OF SENSOR PCB	PLT-6991-5373-50 (1/1)	2	2014.12.16
	18	SENSOR PCB FOR MODEL GX-6000	E4-6991-5373-50-01A	1	2014.11.5
	19	SENSOR to MAIN WIRE FOR MODEL GX-6000	E4-6991-5382-70-01K	0	2014.7.14
	20	PUMP RP-12	M4-4181-61-01K	3	2013.1.29
	21	Buzzer BZ-9K	E4-6991-5008-70-01K	0	2011.2.28
	22	COMBUSTIBLE GAS SENSOR NC SENSOR	M3-4462-64-05K	3	2012.4.17
	23	TOXIC GAS SENSOR	M4-4084-92-03K	0	2014.7.30
	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	0	2014.7.14
	30	DES DIGITAL PCB	E3-6991-5386-60-01K	1	2015.2.24

		DRAWING NAME	DRAWING No.	REV	DATE
	31	T- 3/4 BPA LAMP OL-8270BPA	E4-6991-5129-60-01K	0	2012.2.24
	32	SMART SENSOR Type-PIS	M4-4830-01-01K	1	2015.3.25
	33	PIS SENSOR PCB	E4-6991-5387-30-01K	2	2015.3.25
	34	PIS DIGITAL PCB	E3-6991-5388-10-01K	1	2015.3.25
	35	BUL-6000	M3-4777-03-01K	0	2014.7.28
	36	BUL PCB	E3-6991-5389-80-01K	1	2014.9.5
	37	BUD-6000	M3-4777-04-01K	1	2015.3.6
	38	BUD PCB	E4-6991-5390-50-01K	1	2014.9.5
	39	DIAGRAM FOR I.S. KEEP FOR MODEL BC-6000 / SDM-6000	E4-6991-5395-80-01K	1	2014.9.5
	40	LABEL	M4-4777-01-01K	2	2015.3.18
	41	LABEL BC-6000 / SDM-6000	M4-4777-01-02K	0	2014.7.28
	42	SCHEMATIC CHARGER PCB FOR MODEL BC-6000	E3-6991-5255-80-01K	0	2014.12.16
	43	CHARGER PCB FOR MODEL BC-6000	E3-6991-5255-80-01A	0	2014.12.16
	44	SCHEMATIC CHARGER PCB FOR MODEL SDM-6000	E3-6991-5445-60-01K	1	2015.3.5
	45	CHARGER PCB FOR MODEL SDM-6000	E3-6991-5445-60-01A	1	2013.3.5
	46	SMART SENSOR Type-OSS	M4-4080-01-01K	0	2015.2.24
	47	OSS SENSOR PCB	E4-6991-5457-00-01K	0	2015.2.24
	48	OSS DIGITAL PCB	E3-6991-5458-70-01K	0	2015.2.24
	49	OXYGEN SENSOR	M4-4080-01-02K	0	2015.2.24
*	50	BC-6000	M3-4777-02-01K	1	2015.3.23
*	51	SDM-6000	M3-4395-23-01K	1	2015.3.23

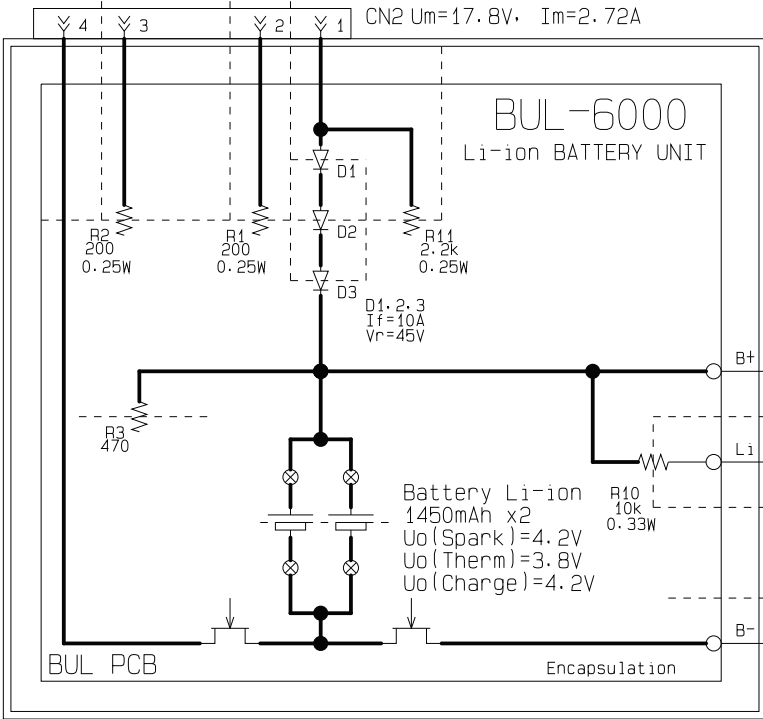
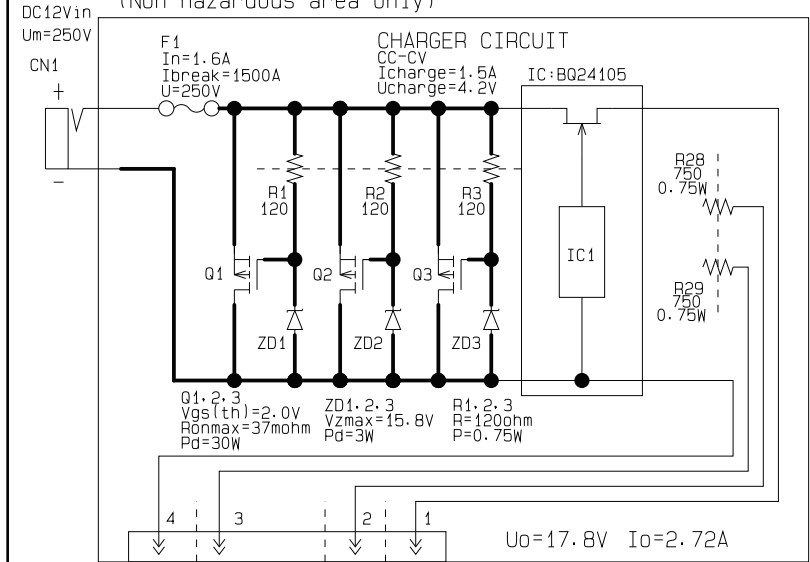


DNV Nemko Presafe AS  
Org. no: 997 067 401 mva

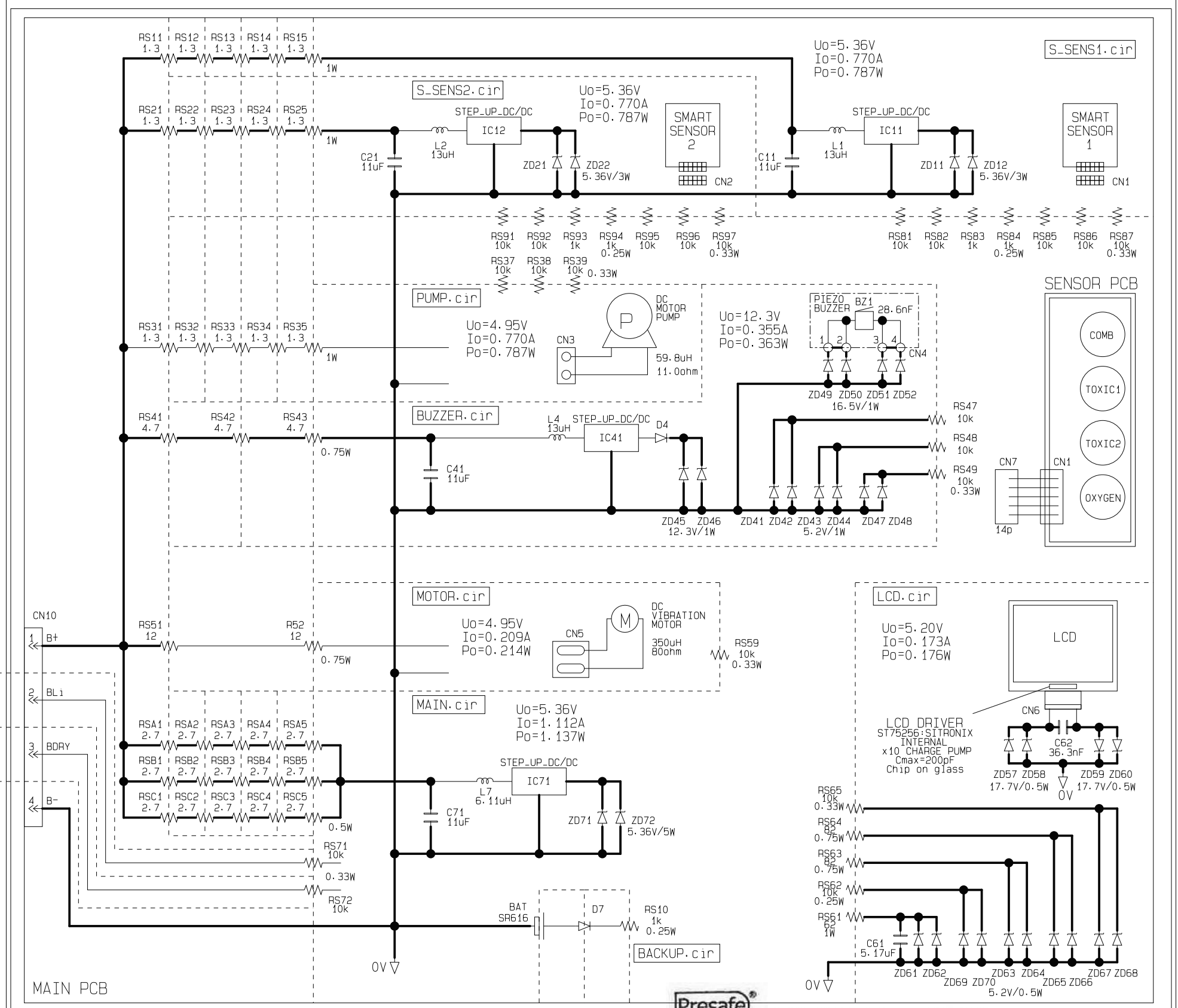
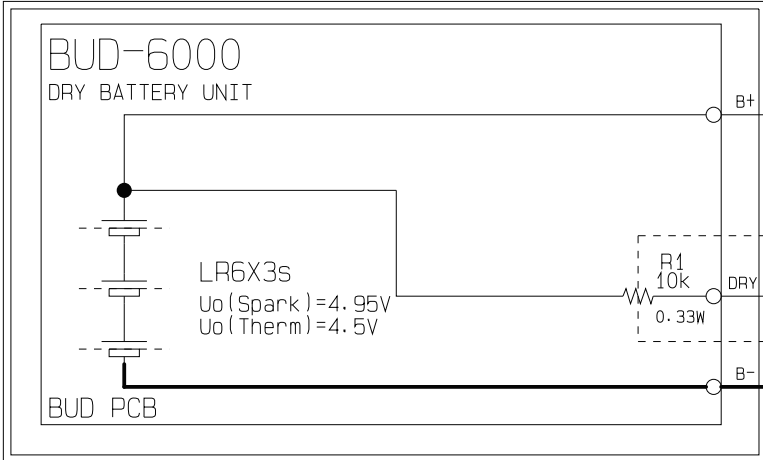
注 記 NOTES		改版担当者 REV. BY	改版日 REVISED	名 称 NAME
No.50,51		小野圭	2015.3.27	INDEX
改版回数 REV.	2			GX-6000
総頁数 PAGES		小野圭	2015.3.6	図 番 DWG. NO.  E 3 - 6 9 9 1 - 5 4 7 0 - 7 0 - 0 1 K
1				
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	
石橋勝	北村正英	小野圭	2015.3.6	
_ _				



BATTERY CHARGER  
BC-6000/SDM-6000  
(Non hazardous area only)



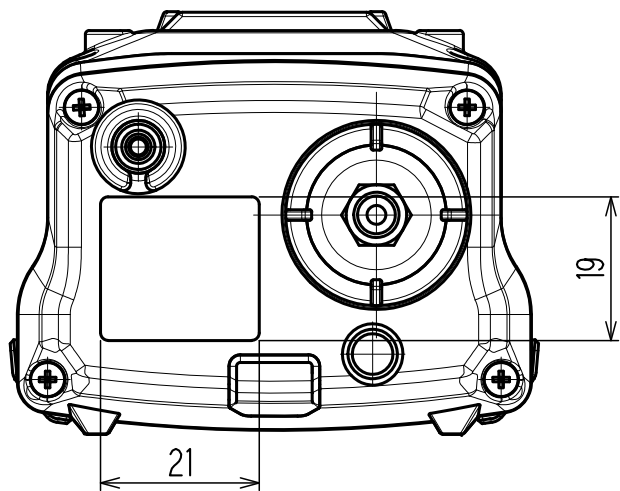
The battery unit  
even the end user is  
possible to replace.  
(Non hazardous area only)



(MEMO)  
1. --- marks means SEPARATE  
2. — marks means INFALLIBLE CONNECTION

注 記 NOTES RS78→RS71, RS79→RS72		改版担当 REV. BY	改版日 REV. DATE	Org no: 997067401 mva	
改版回数 REV.	2	総頁数 PAGES	1	小野圭	2014. 12. 16
承認 APPROVED	石橋勝	検討 CHECKED	北村正英	製図 DRAWN	小野圭
				作成日 DATE	2014. 6. 23
				図番 DWG. NO.	E3-6991-5361-10-01K

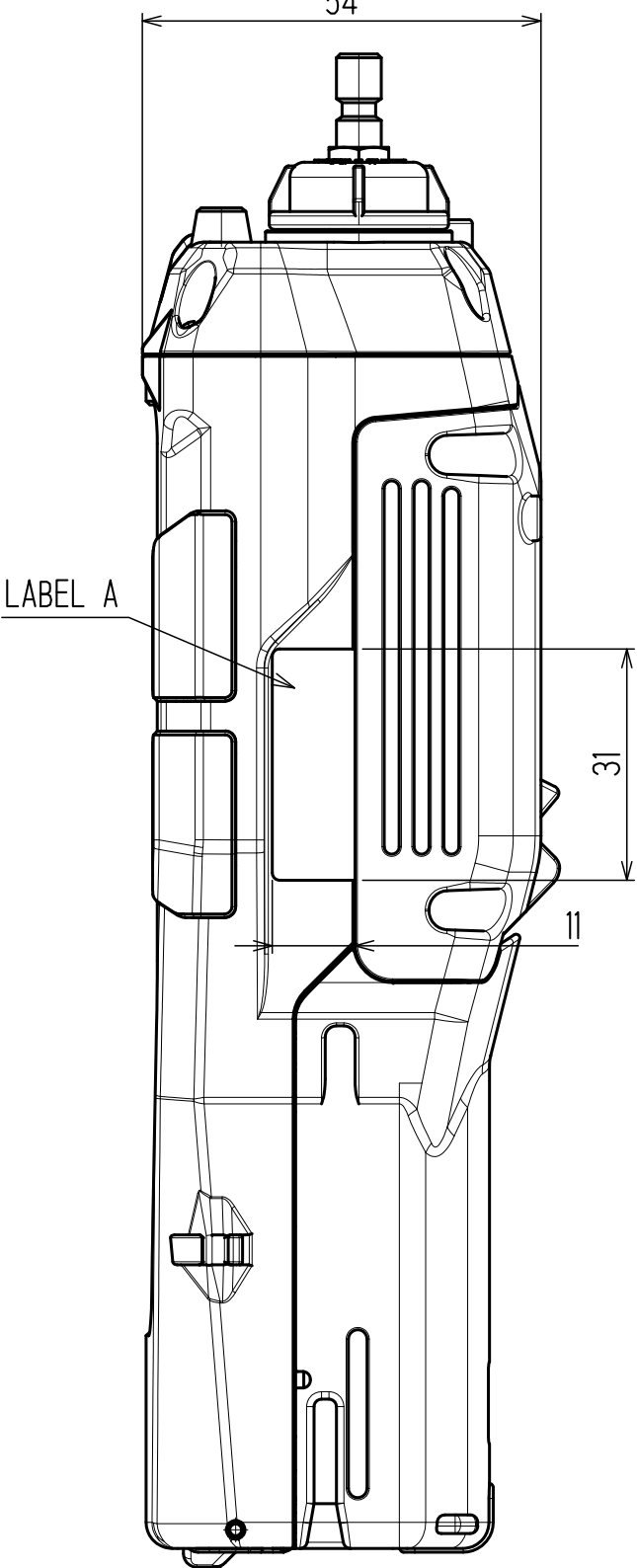
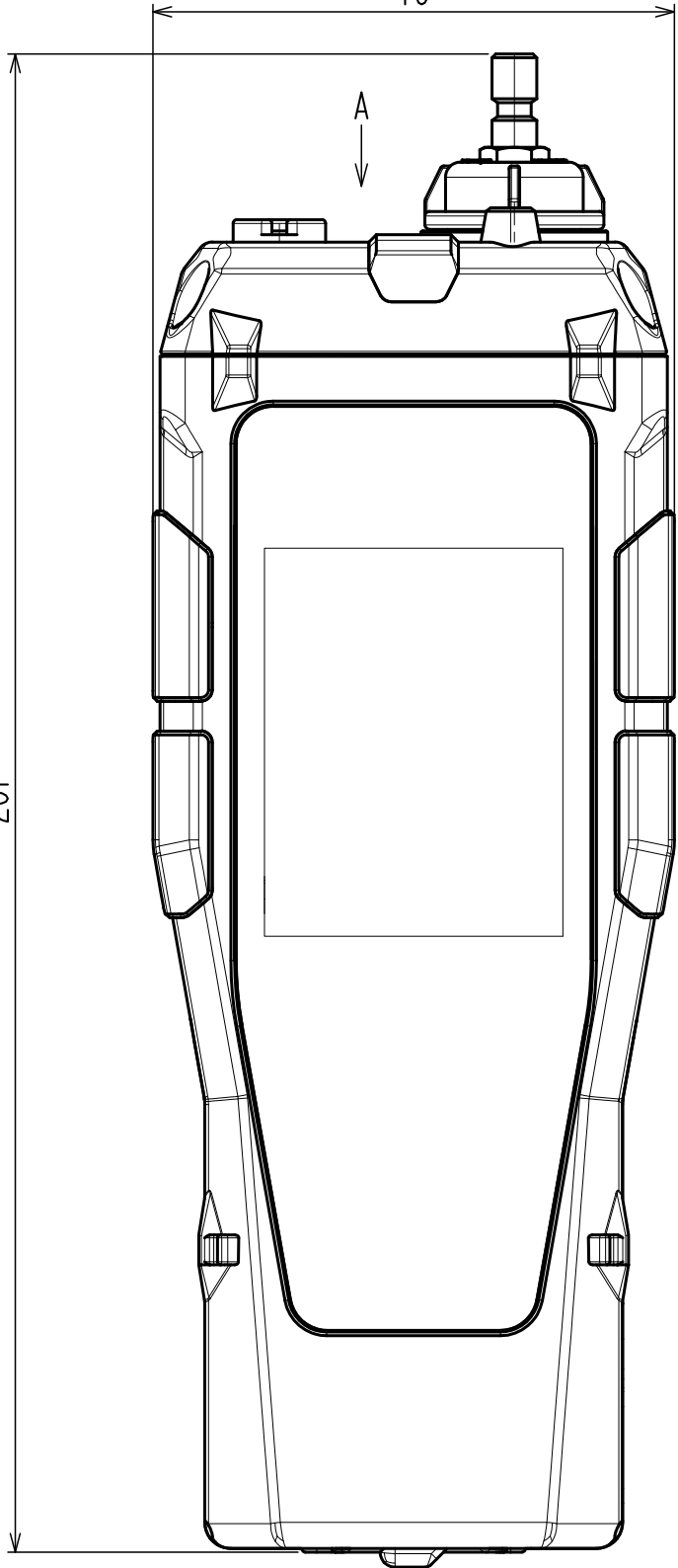
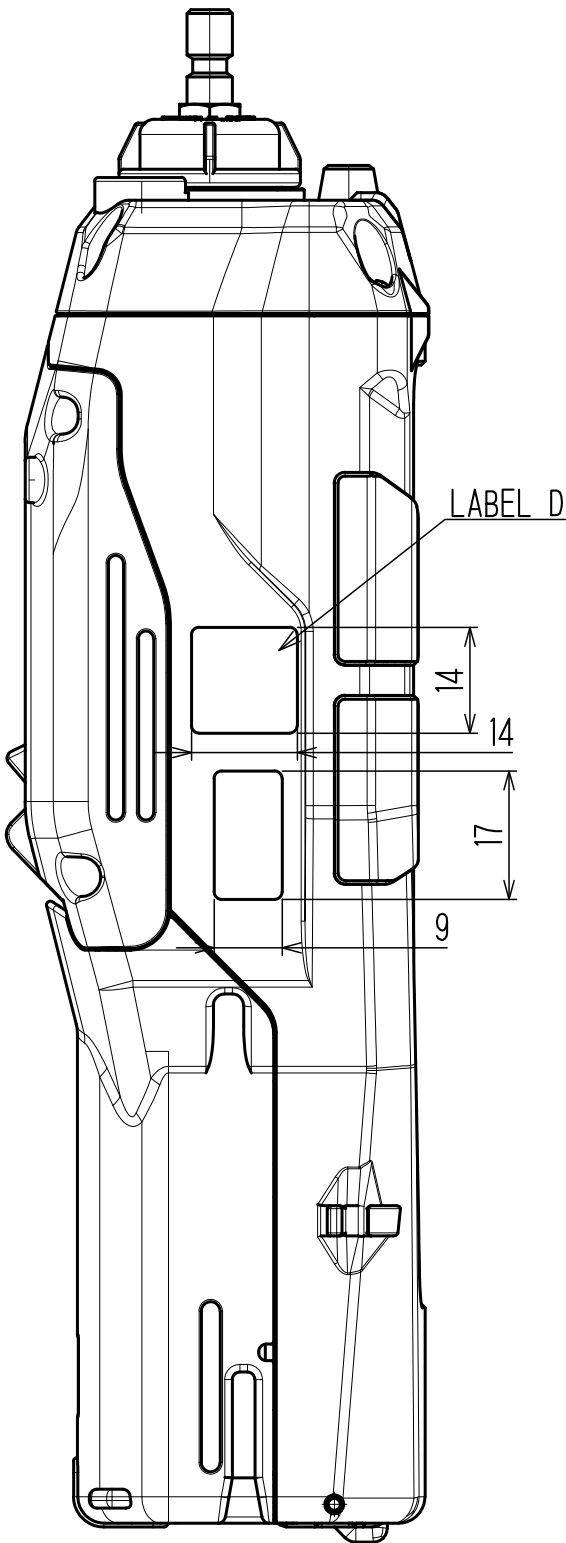
寸法	D				E				F				G				H				I				J				K			
	1000以上				500以上1000未満				260以上500未満				120以上260未満				50以上120未満				18以上50未満				1以下				18以下			
	0.7				0.5				0.4				0.3				0.2				0.15				0.1				0.05			
	2.5				2.0				1.6				1.2				0.8				0.6				0.4				0.2			
精度	0.7				0.5				0.4				0.3				0.2				0.15				0.1				0.05			
中級	1.2				1.0				0.8				0.6				0.4				0.3				0.2				0.1			
粗級	2.5				2.0				1.6				1.2				0.8				0.6				0.4				0.2			



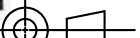
VIEW A

MAIN UNIT  
M2-4777-01-01K

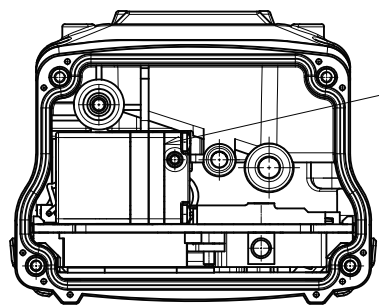
BATTERY UNIT  
BUL-8000  
M3-4777-03-01K  
OR  
BUD-8000  
M3-4777-04-01K



PROTECTION GRADE:MORE THAN IP 20

表面処理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	Dwg. no. 997067401 mva
材 質 MAT.					
			1 : 1		OUTER STRUCTURE GX-6000
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. 18	M3-4777-01-01K	

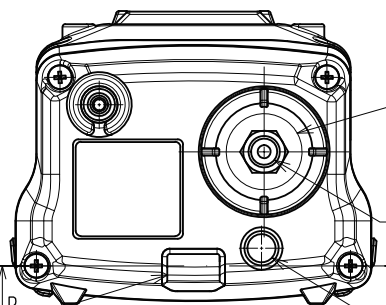
1 2 3 4 5 6 7 8 9 10 11



PUMP  
M4-4181-61-01K

ALARM LAMP  
MATERIAL:PC  
SURFACE AREA:120mm<sup>2</sup>

(FIGURE WITHOUT TOP COVER)

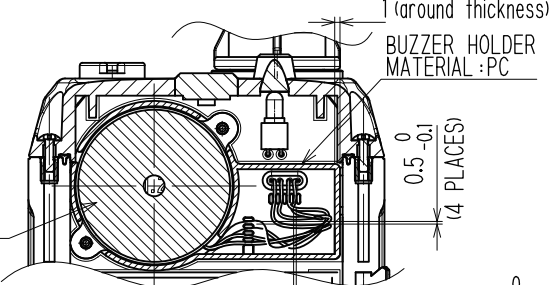


FILTER CASE  
MATERIAL:PC  
SURFACE AREA:397mm<sup>2</sup>

NIPPLE  
MATERIAL:STAINLESS STEEL

BUZZER  
E4-6991-5008-70-01K

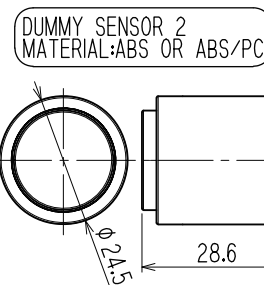
ALARM LAMP  
MATERIAL:PC  
SURFACE AREA:60cm<sup>2</sup>



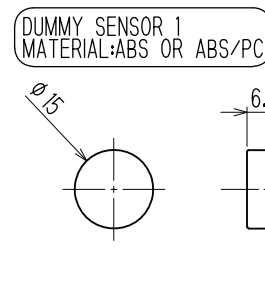
B-B SECTION

(CABLE CLAMPING FOR BUZZER)

1 (around thickness)  
BUZZER HOLDER  
MATERIAL:PC  
0.5 0  
-0.1  
(4 PLACES)  
0.5 0  
-0.1  
(4 PLACES)

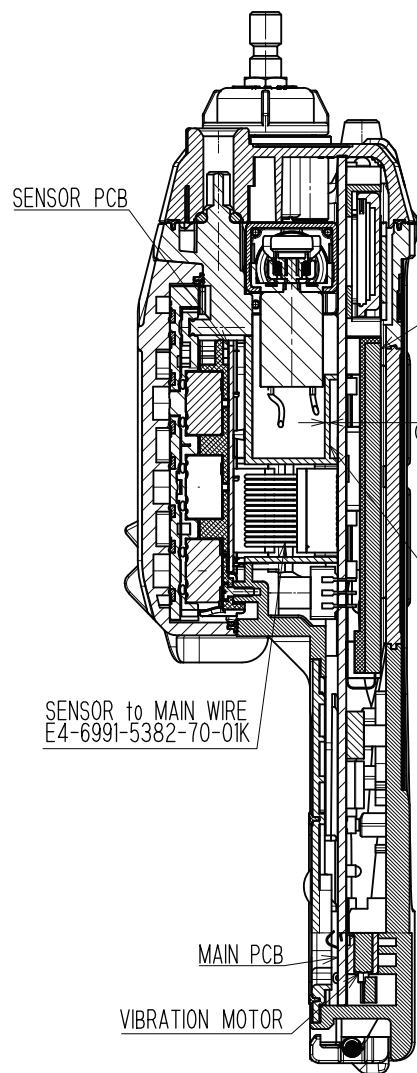


DUMMY SENSOR 2  
MATERIAL:ABS OR ABS/PC



DUMMY SENSOR 1  
MATERIAL:ABS OR ABS/PC

A-A SECTION



SENSOR PCB

LCD

1 (around thickness)

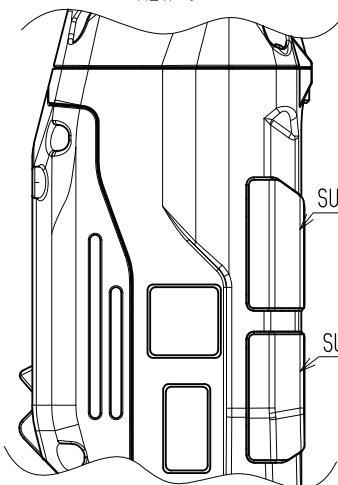
PUMP CASE  
MATERIAL:PC

SENSOR to MAIN WIRE  
E4-6991-5382-70-01K

MAIN PCB

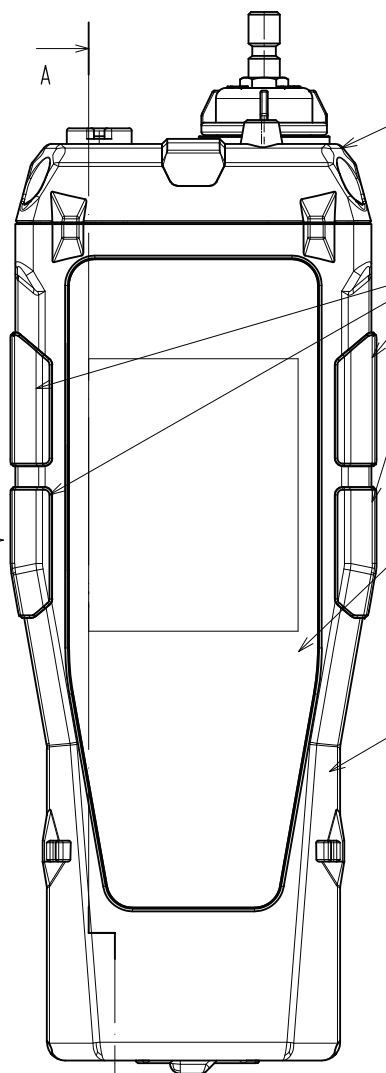
VIBRATION MOTOR

VIEW C



SURFACE AREA:290mm<sup>2</sup>

SURFACE AREA:290mm<sup>2</sup>



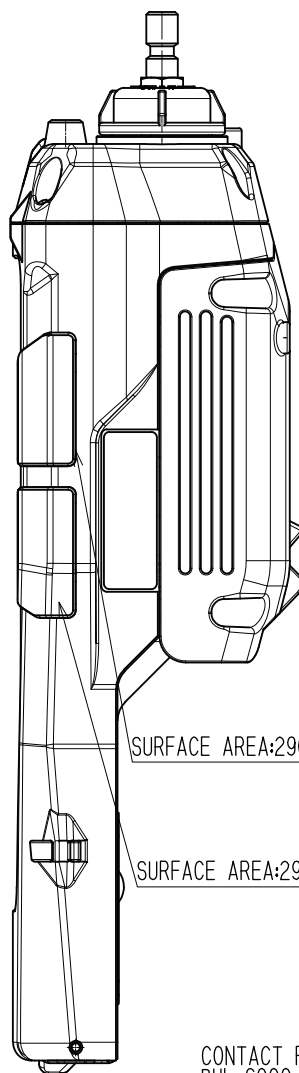
TOP COVER  
ABS/PC ESC9448N(BLACK)  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP

ALARM LAMP  
MATERIAL:PC

PANEL SHEET

△ PET ST-PET  
RESISTANCE LESS THAN 1[GΩ]  
ACHILLES CORP  
OR  
PET 300R  
RESISTANCE LESS THAN 1[GΩ]  
TOYOBO CO LTD

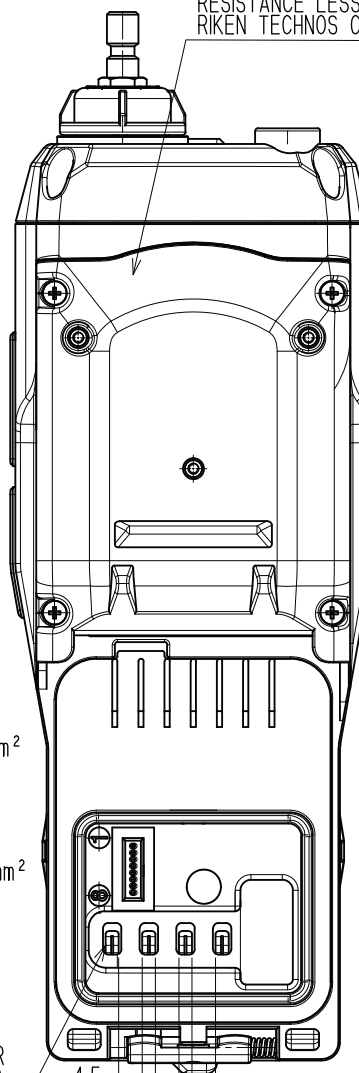
HOUSING  
ABS/PC ESC9448N(BLACK)  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP



SURFACE AREA:290mm<sup>2</sup>

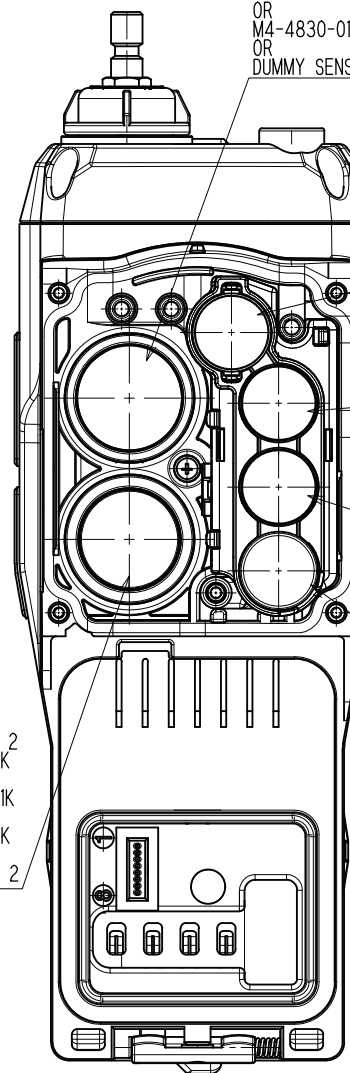
SURFACE AREA:290mm<sup>2</sup>

CONTACT FOR  
BUL-6000 OR  
BUD-6000



SENSOR COVER  
ABS/PC ESC9448N(BLACK)  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP

SMART SENSOR 2  
M4-4486-01-01K  
OR  
M4-4630-20-01K  
OR  
M4-4830-01-01K  
OR  
DUMMY SENSOR 2



SMART SENSOR 1  
M4-4486-01-01K  
OR  
M4-4630-20-01K  
OR  
M4-4830-01-01K  
OR  
DUMMY SENSOR 2

COMBUSTIBLE  
GAS SENSOR  
M3-4462-64-05K  
OR  
DUMMY SENSOR 1

TOXIC  
GAS SENSOR 1  
M4-4084-92-03K  
OR  
DUMMY SENSOR 1

TOXIC  
GAS SENSOR 2  
M4-4084-92-03K  
OR  
DUMMY SENSOR 1

OXYGEN SENSOR  
M4-4080-82-07K  
OR  
DUMMY SENSOR 1

(FIGURE WITHOUT SENSOR COVER, SENSOR PACKING)



DNV Nemko Presafe AS  
Org. no: 997 067 401 mva

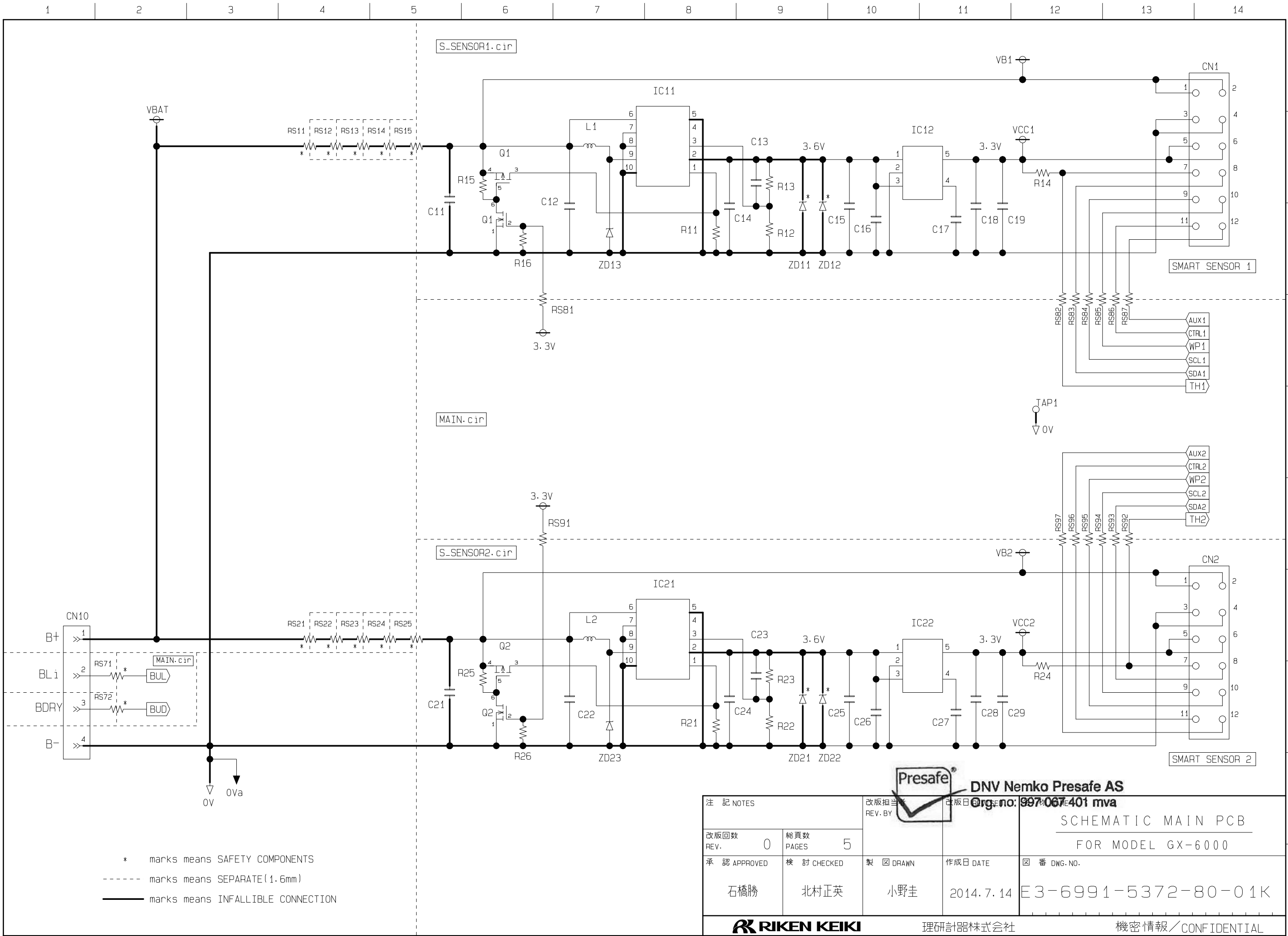
表面处理 TREAT.	許容差 TOL.	尺度 SCALE	投影法 PROJECTION	名称 NAME
材質 MAT.		1 : 1		MAIN UNIT GX-6000
承認 APPROVED	検討 CHECKED	製図 DRAWN	作成日 DATE	図番 DWG. NO.
青良治	近藤晴彦	海野裕作	2014. 7. 22	M2-4777-01-01K

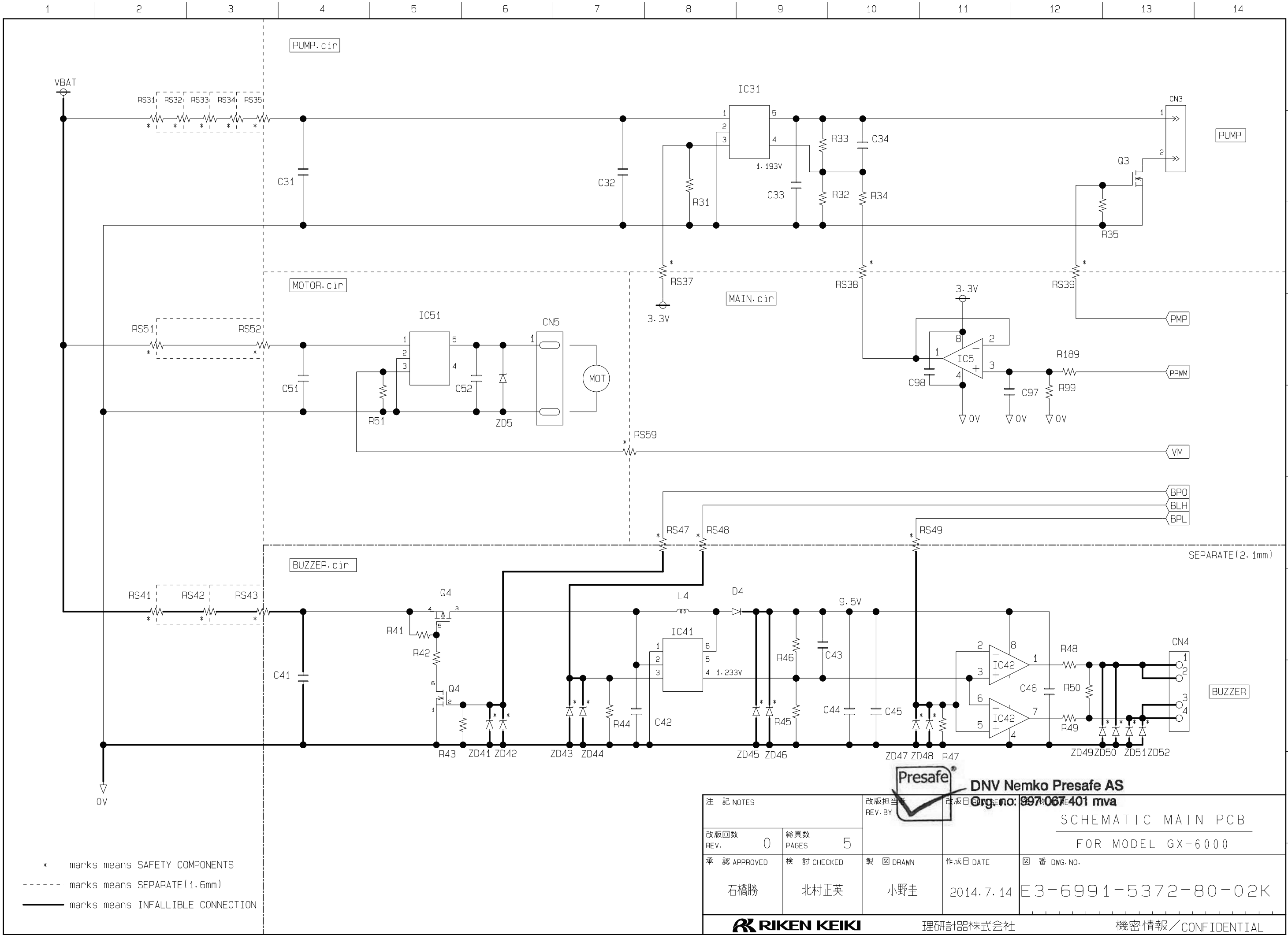
ADD PANEL SHEET C5	2014.9.30	海野裕作
記事	年月日	訂正者

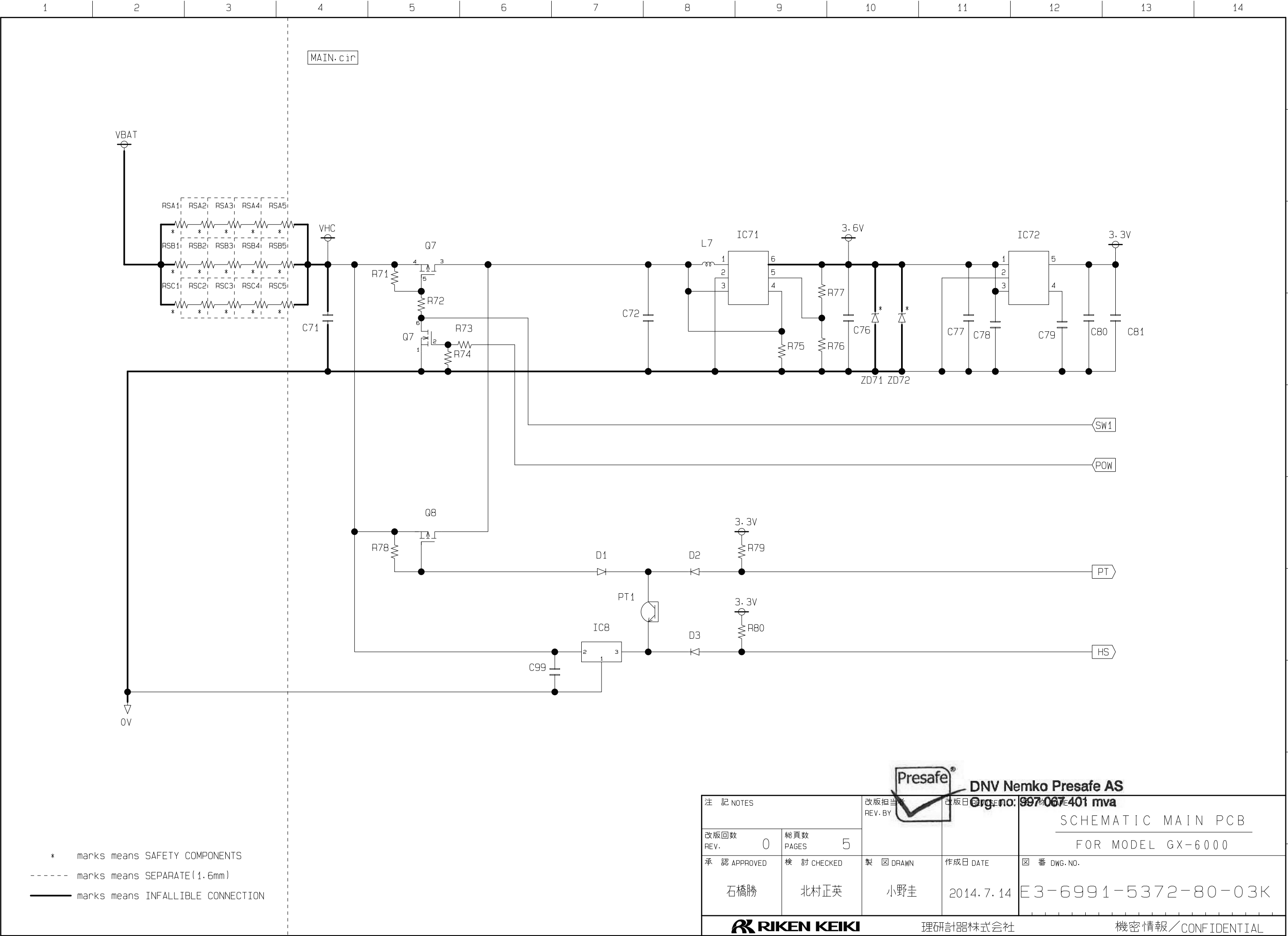
RIKEN KEIKI

理研計測株式会社

機密情報/CONFIDENTIAL













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.			<div><div><div>Presafe®</div><div></div></div><div>DNV Nemko Presafe AS Org. no: 997 067 401 mva</div></div>
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.			



**DNV Nemko Presafe AS**  
Org. no: 997 067 401 mva

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.



**DNV Nemko Presafe AS**  
Org. no. 997 067 401 mva

REV.

1

NAME

PARTS LIST OF MAIN PCB

DATE

2014.11.5

DWG.No.

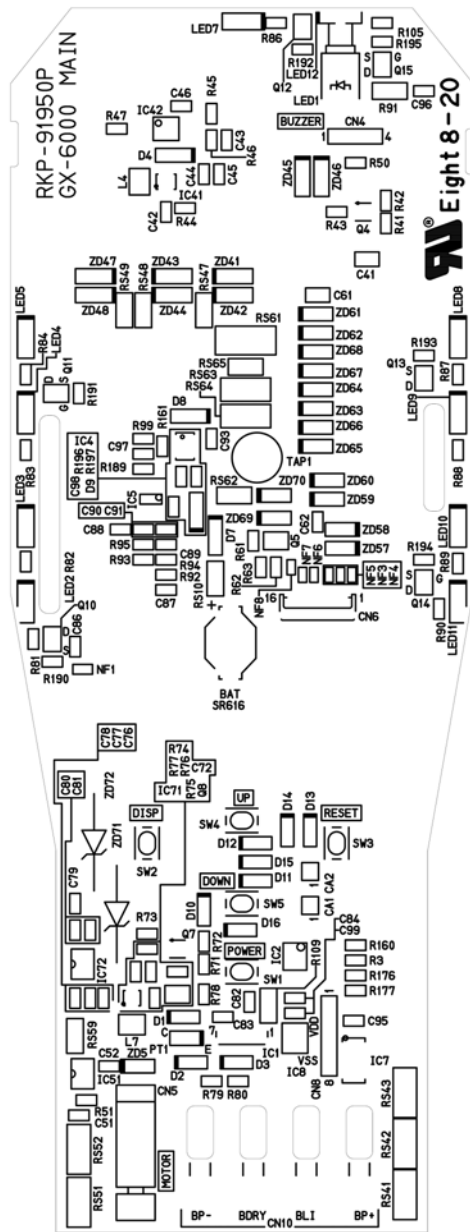
PLT-6991-5372-80 (3/4)

RIKEN KEIKI CO., LTD.

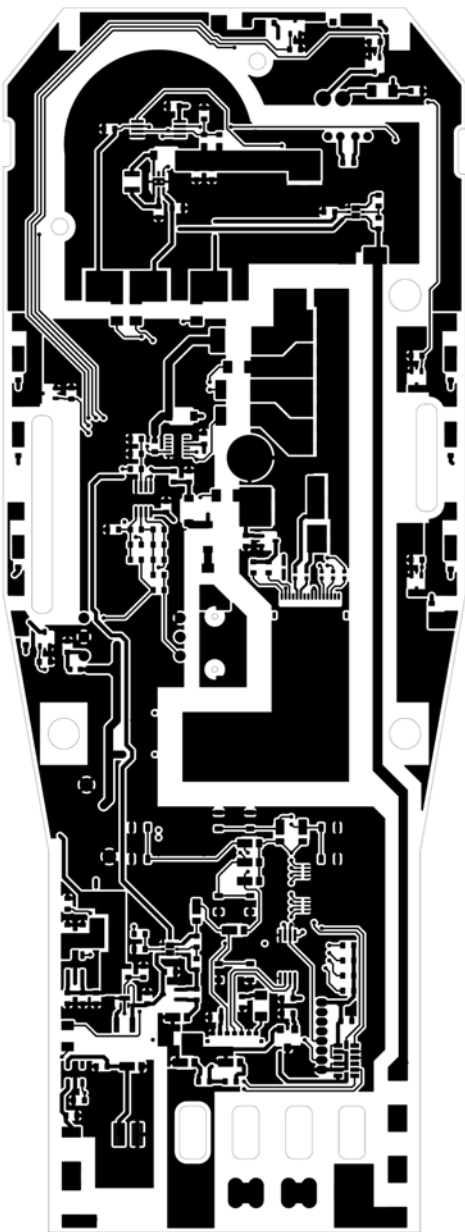
Mark of drawing	Kind of parts	Rating/Model of parts	Remarks
L1,2,4	Chip multilayer inductor	10uH / 30% (2520)	m
L7	Chip multilayer inductor	4.7uH / 30% (2520)	m
PT1	Photo transistor	PS1192HB	m
PS1	Pressure sensor	P-2000-101G	m
X1	Crystal	DSX321, 14.7456MHz	m
NF1,2	Noise filter	BLM18AG151	m
NF3-8	Noise filter	BLM15HD182	m
BAT	Silver oxide battery	SR616SW / Sony Vmax = 1.65V , Vtyp = 1.55V	*
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.	0	NAME	PARTS LIST OF MAIN PCB
DATE	2014.7.14	DWG.No.	PLT-6991-5372-80 (4/4)
RIKEN KEIKI CO., LTD.			



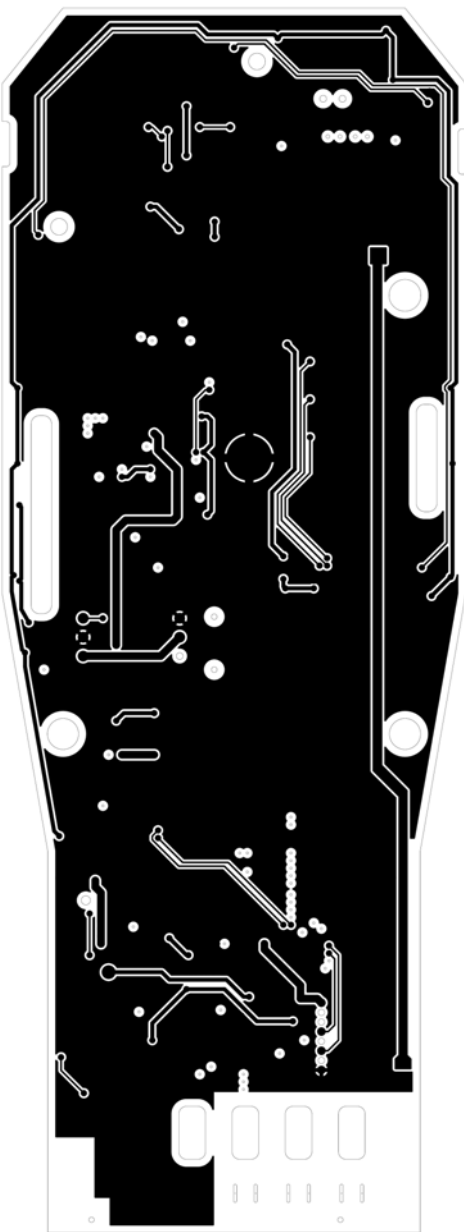
**DNV Nemko Presafe AS**  
Org. no: 997 067 401 mva



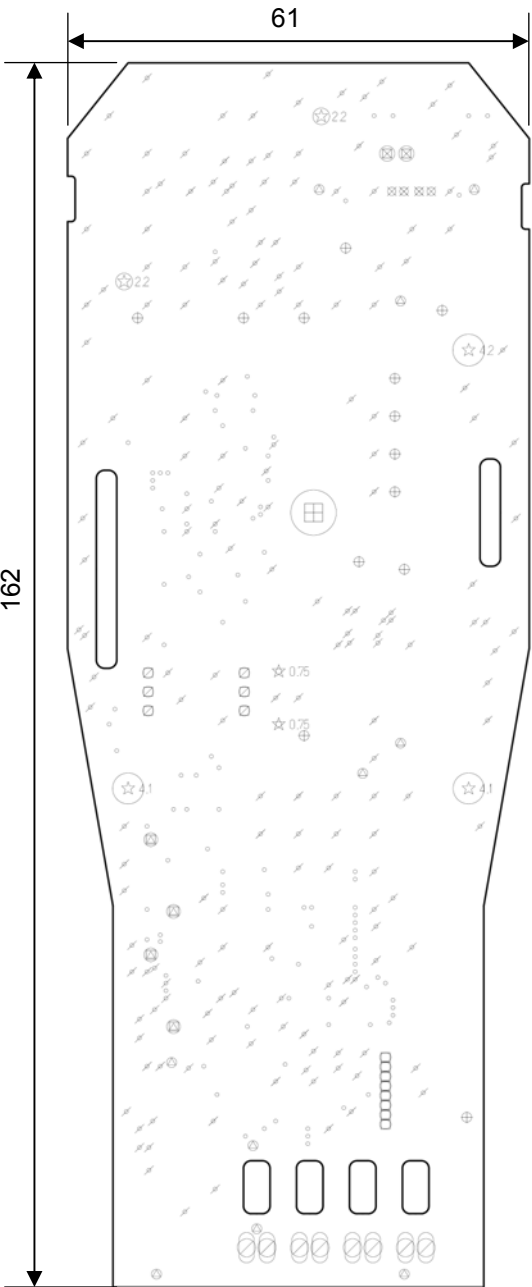
SILK PRINT FOR PARTS SIDE



PARTS SIDE



INNER LAYER(2 LAYER)



VIA HOLES FOR PARTS SIDE

SPECIFICATION FOR PCB

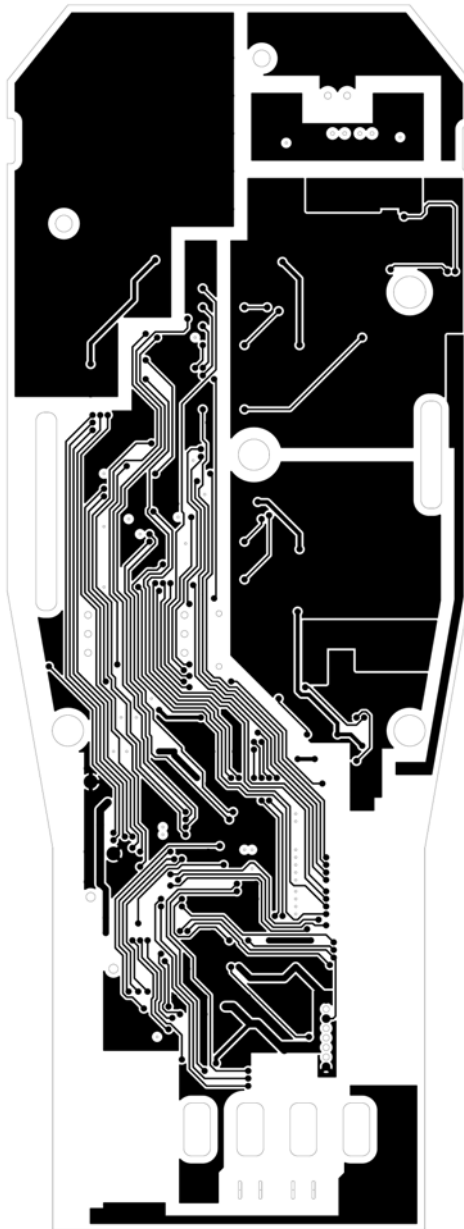
- PCB No. : RKP-91950P
- Material : Glass epoxy
- Thickness : 1.6mm
- Layer number : 4  
(2+2 BVH , Between layer#2 and #3 is 0.6mm.)
- Thickness copper film  
Surface : 35um , Inner : 35um
- Copper thickness of the via's : 35um above.
- Minimum conductor width : 0.2mm
- CTI : 100 above

All drawings are view of parts side

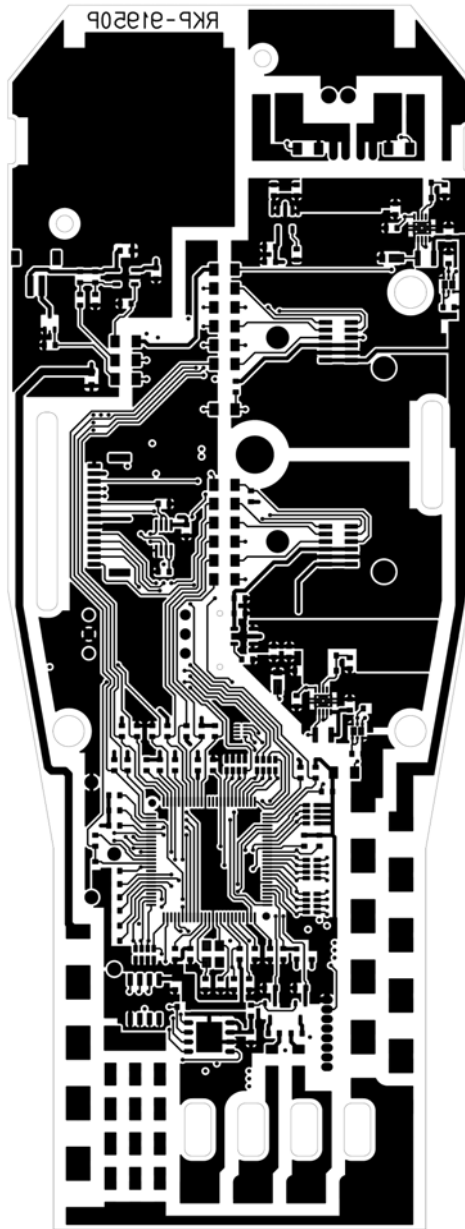
SCALE 1:1

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 4.1	1-4VIA
⊞	φ 0.4×2.4	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

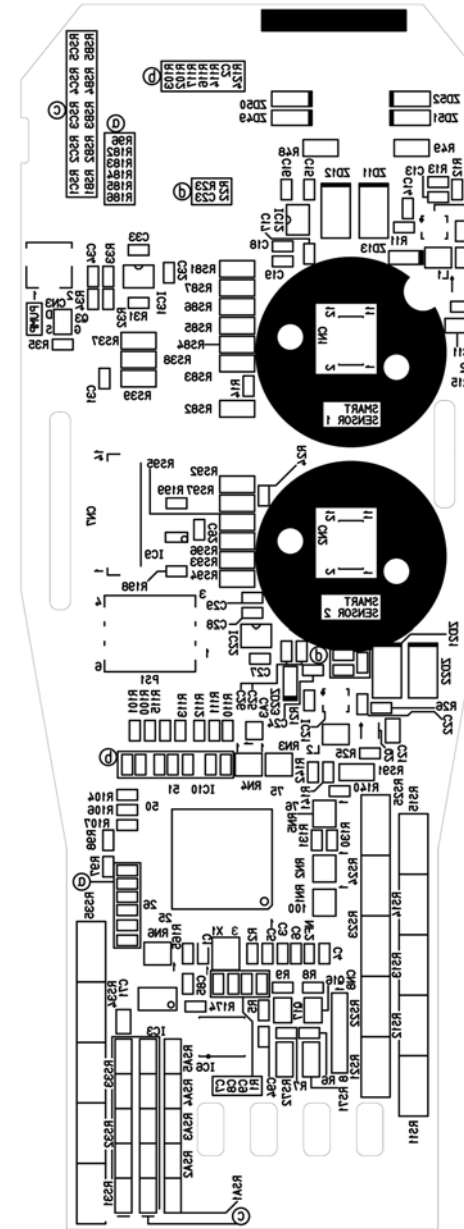
注 記 NOTES		改版担当 改版日 REV. BY		Presafe® DNV Nemko Presafe AS Org. n° 997 067 401 mva	
改版回数 REV.	0	総頁数 PAGES	2	MAIN PCB FOR MODEL GX-6000	
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.	
石橋勝	北村正英	小野圭	2014.7.14	E 3 - 6 9 9 1 - 5 3 7 2 - 8 0 - 0 1 A	
RIKEN KEIKI 理研計器株式会社 機密情報 / CONFIDENTIAL					



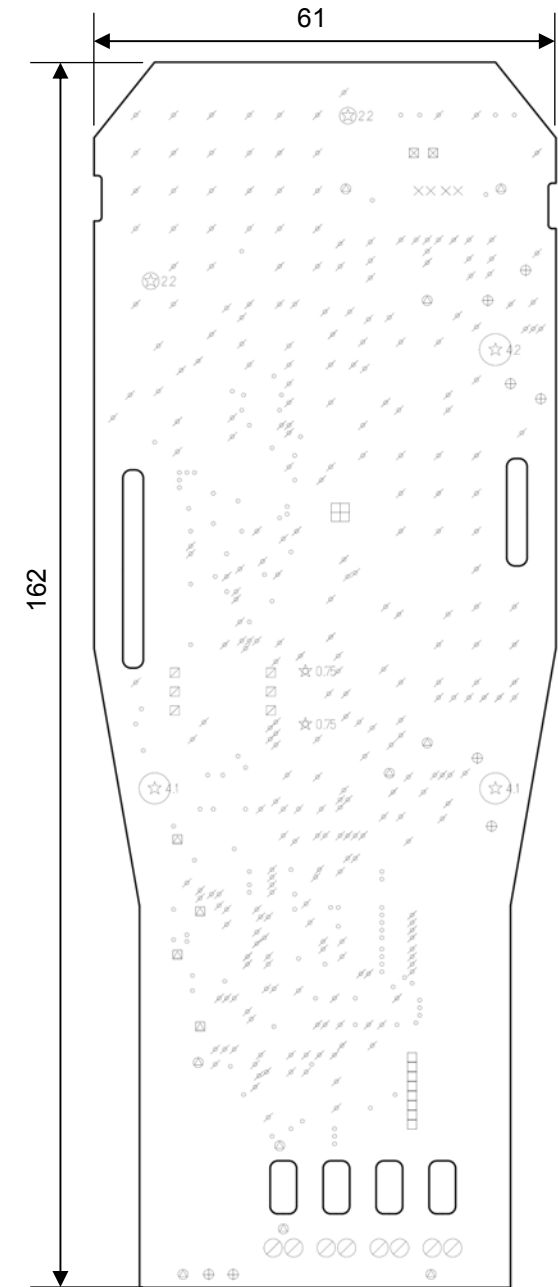
INNER LAYER(3 LAYER)



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



VIA HOLES FOR SOLDERING SIDE

SPECIFICATION FOR PCB

- PCB No. : RKP-91950P
- 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 : 35um
- Copper thickness of the via's : 35um above.
- Minimum conductor width : 0.2mm
- CTI : 100 above

All drawings are view of parts side

SCALE 1:1

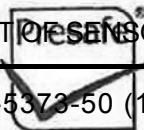
MARK	DIAGRAM	HOLE
○	φ 0.3	1-4VIA
／	φ 0.3	3-4VIA
×	φ 0.5	1-4VIA
△	φ 0.7	1-4VIA
+	φ 0.7	3-4VIA
□	φ 0.85	1-4VIA
⊠	φ 0.9	1-4VIA
⊞	φ 0.9	1-4VIA
⊞	φ 1.2	1-4VIA
⊞	φ 4.1	1-4VIA
⊞	φ 0.4×2.4	1-4VIA
☆0.75	φ 0.75	NTH
☆2.2	φ 2.2	NTH
☆4.1	φ 4.1	NTH
☆4.2	φ 4.2	NTH

注 記 NOTES		改版担当者 REV. BY	改版日 REV. DATE	Presafe® DNV Nemko Presafe AS Org. n° 997 067 401 mva	
改版回数 REV.	0	総頁数 PAGES	1	MAIN PCB	
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 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					

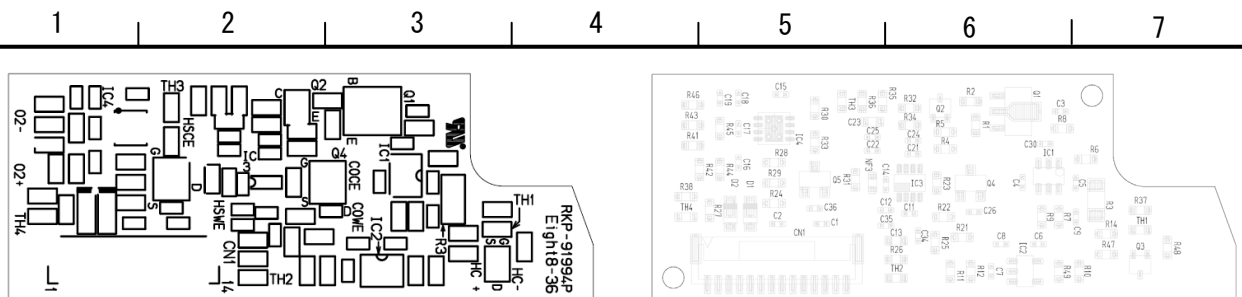




Mark of drawing	Kind of parts	Rating/Model of parts	Remarks
IC1	IC (A/D Converter)	ADS1110A0IDBV	m
IC2	IC (OPAMP)	OPA333AIDBV	m
IC3	IC (OPAMP)	OPA2379AIDCN	m
IC4	IC (OPAMP)	OPA2333AIDR	m
Q1	PNP Transistor	2SB1115	m
Q2	NPN Transistor	2SD2700	m
Q3	N-ch FET	SSM3K123TU	m
Q4,5	N-ch J-FET	2SK209	m
D1,2	Schottky 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 (1/1)
RIKEN KEIKI CO., LTD.			

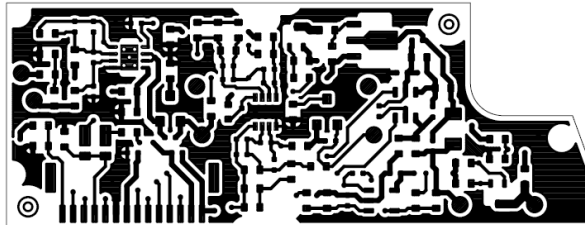


**DNV Nemko Presafe AS**  
 Org. no: 997 067 401 mva

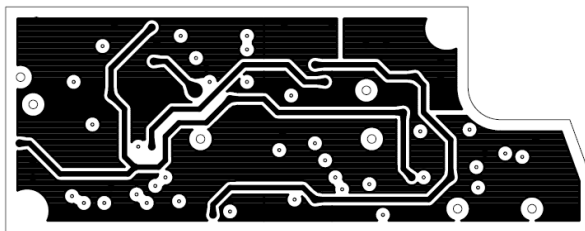


SILK PRINT FOR PARTS SIDE

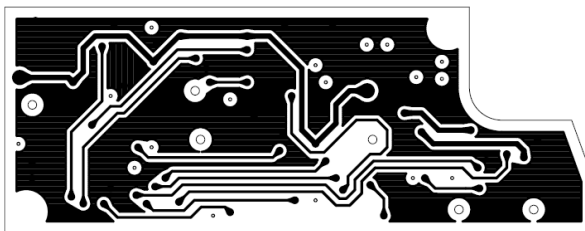
PARTS REFERENCE



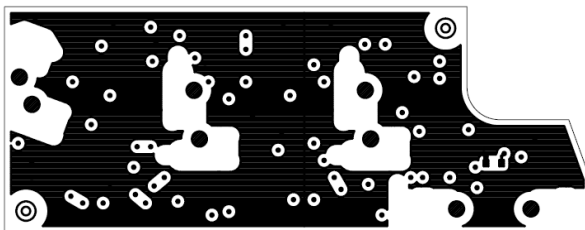
PARTS SIDE



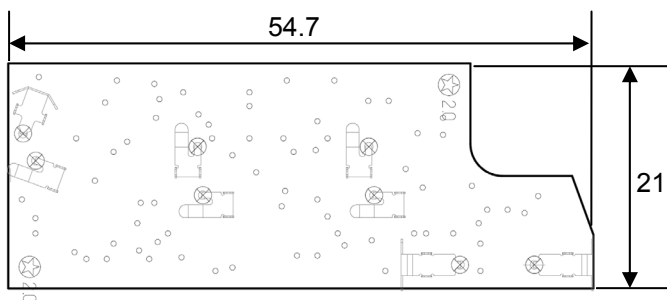
INNER LAYER(2 LAYER)



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

All drawings are view of parts side



SCALE =  $\sqrt{2} \times 1$   
**DNV Nemko Presafe AS**  
 Org. no: 997 067 401 mva  
**SENSOR PCB**

**FOR MODEL GX-6000**

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	
改版回数 REV.	1	総頁数 PAGES	1	
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

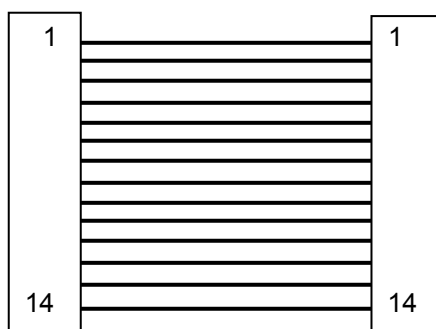
G

H

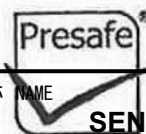
I

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

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



Wire : UL1571 AWG30  
Maximum wire length : 40mm



DNV Nemko Presafe AS  
Org. no: 997 067 401 mva  
SENSOR to MAIN WIRE

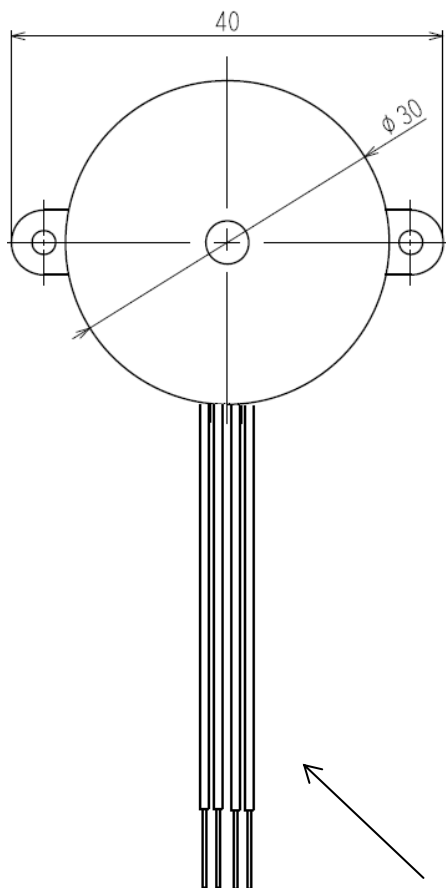
FOR MODEL GX-6000

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	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	2014.7.14	E 4 - 6 9 9 1 - 5 3 8 2 - 7 0 - 0 1 K



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%



SCALE  $\sqrt{2}:1$   
**DNV Nemko Presafe AS**  
Org. no: 997 067 401 mva  
Buzzer

BZ-9K

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	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
承認 APPROVED	検 討 CHECKED			
石橋勝	北村正英	小暮晋祐	2011. 02. 28	E 4 - 6 9 9 1 - 5 0 0 8 - 7 0 - 0 1 K

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

INSIDE SPACE  
CAPACITY 0.1CC

A-A SECTION

B DETAIL DRAWING

(Remarks)  
Binder in section1.2.6 of  
the type approval  
guide:Uses epoxy resin  
which has enough thermal  
stability at min.120℃

A DETAIL DRAWING

3<sup>+0.4</sup><sub>-0</sub>  
※ EPOXY RESIN POTTED

TERMINAL HOLDER

B-B SECTION

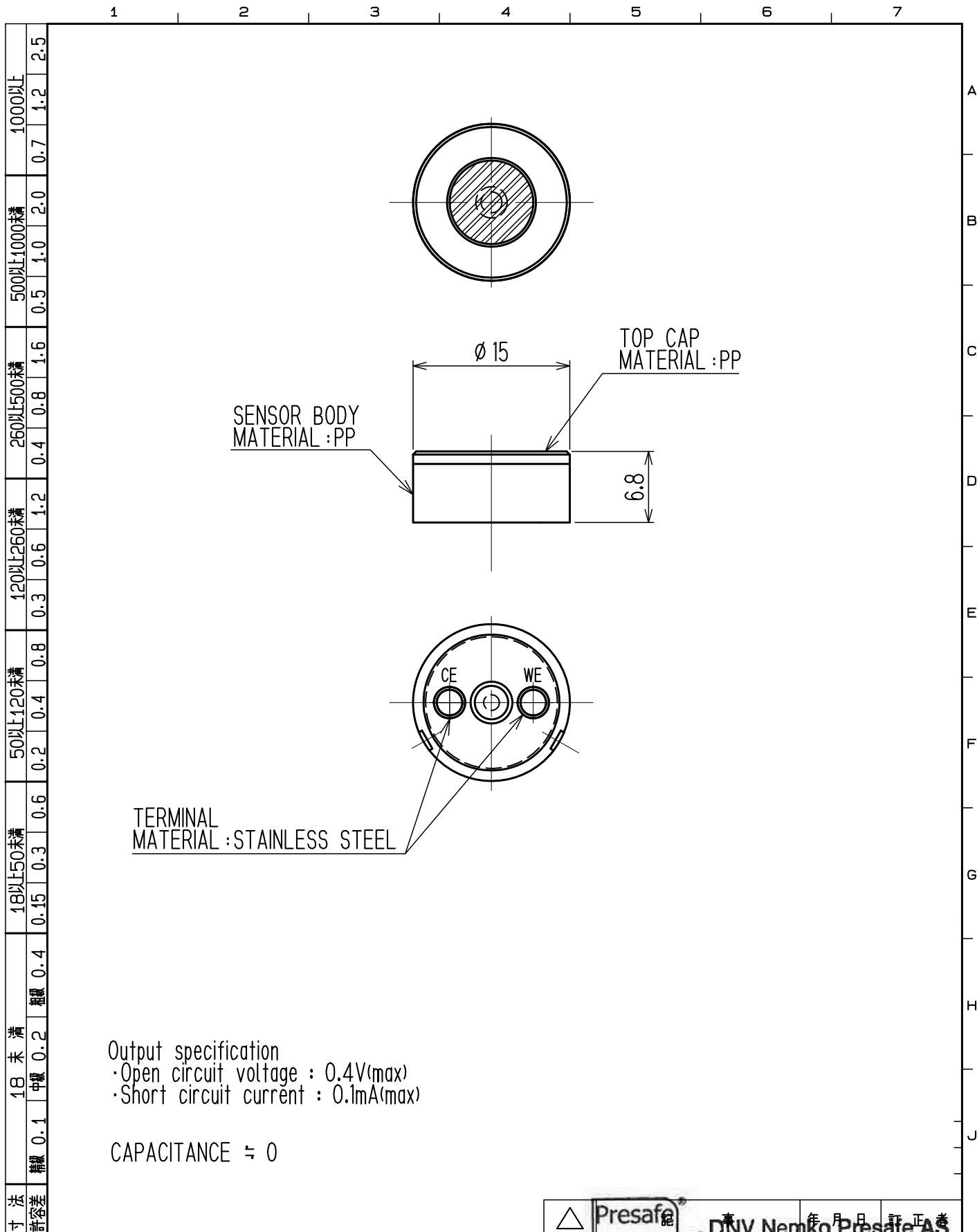
DETAIL DRAWING

COIL

8 of active coils  
MATERIAL Pt

DETAIL DRAWING  
Presafe DNV Nemko Presafe AS  
Org. no. 997067401 mva

表面処理 TREAT.	許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	COMBUSTIBLE GAS SENSOR △ NC SENSOR
材 質 MAT.		2 : 1		
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.
田島秀二	青良治	中村幸男	2007. 3. 16	M3-4462-64-05K
理研計器株式会社 RIKEN KEIKI CO.,LTD.				

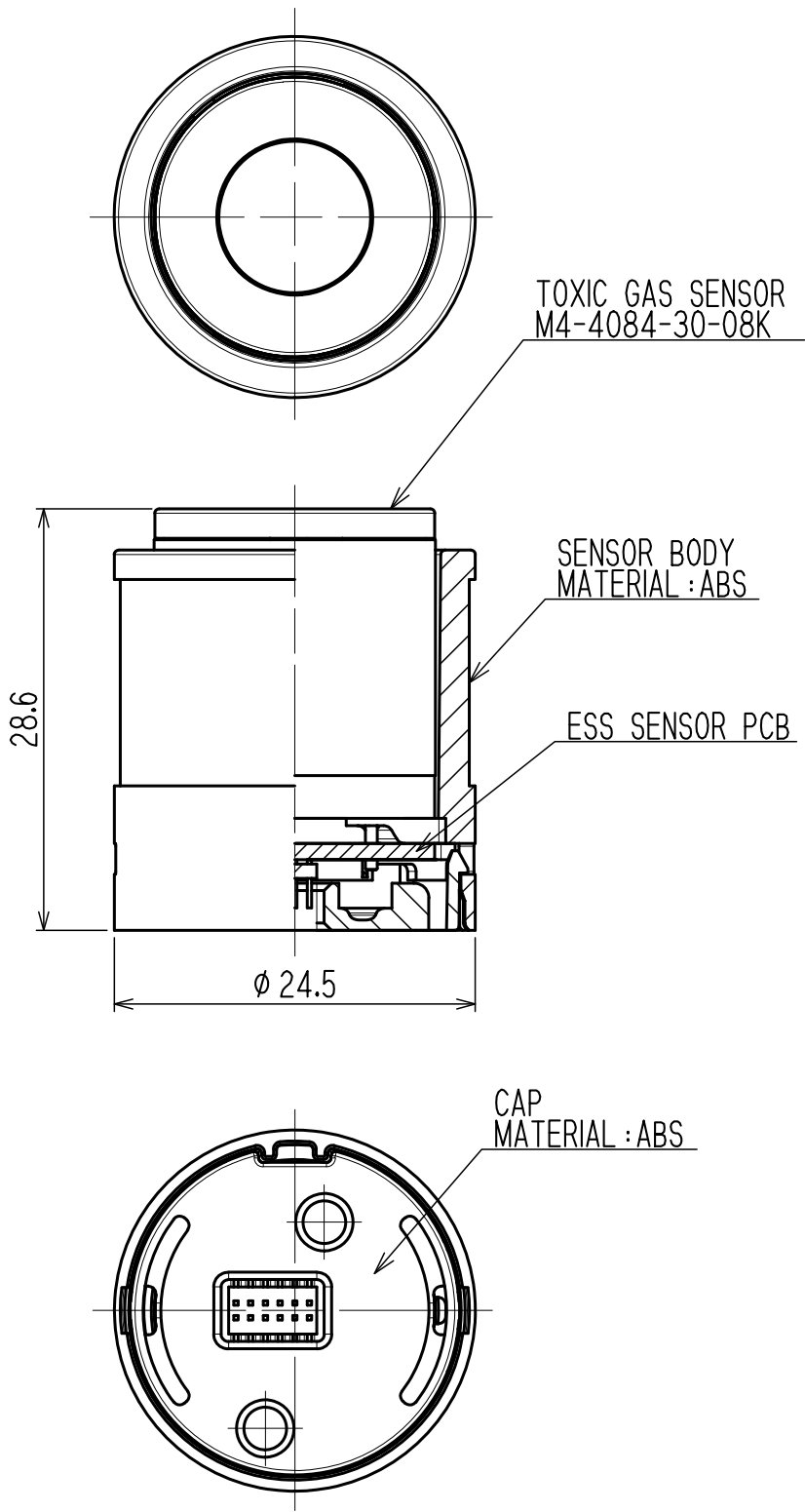


寸法 公差 18 未満 0.1 精度 0.2 中級 18 以上 50 未満 0.15 精度 0.3 粗級 50 以上 120 未満 0.2 精度 0.4 粗級 120 以上 260 未満 0.3 精度 0.6 粗級 260 以上 500 未満 0.4 精度 0.8 粗級 500 以上 1000 未満 0.5 精度 1.0 粗級 1000 以上 0.7 精度 1.2 粗級 2.5		表面処理 TREAT. 材質 MAT. 承認 APPROVED 青良治		許容差 TOL. 検 討 CHECKED 近藤晴彦		尺 度 SCALE 2 : 1 製 図 DRAWN 海野裕作		投影法 PROJECTION 作成日 DATE 2014. 7. 30		<div> <div> <div>△</div> <div>Presafe</div> </div> <div> <div>名称 NAME</div> <div>TOXIC GAS SENSOR</div> </div> </div> <div> <div>青良治</div> <div>近藤晴彦</div> <div>海野裕作</div> <div>2014. 7. 30</div> </div> <div> <div>作成日 DATE</div> <div>図 番 DWG. NO.</div> </div> <div> <div>2014. 7. 30</div> <div>M4-4084-92-03K</div> </div>	
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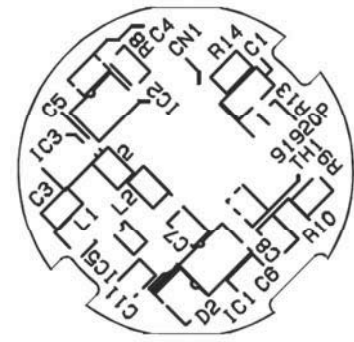


寸法	精細	中級	粗級	18未満	18以上50未満	50以上120未満	120以上260未満	260以上500未満	500以上1000未満	1000以上
許容差	0.1	0.2	0.4	0.15	0.3	0.6	0.8	1.2	2.0	2.5

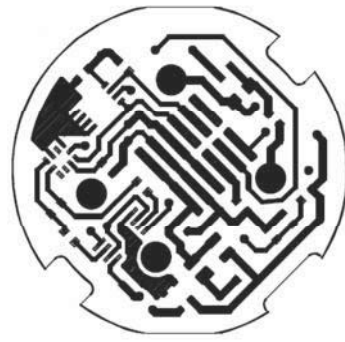


表面処理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	名 称 NAME Org. no: 997 067 401 mva SMART SENSOR Type-ESS
材 質 MAT.					
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.	
青良治	近藤晴彦	武井康典	2014. 7. 30	M4-4486-01-01K	
RIKEN KEIKI		理研計測株式会社		機密情報 / CONFIDENTIAL	

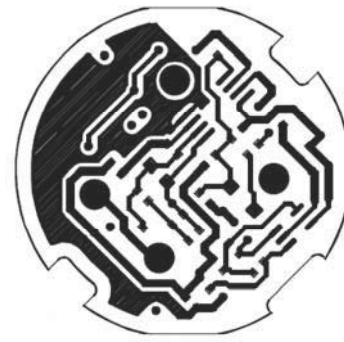




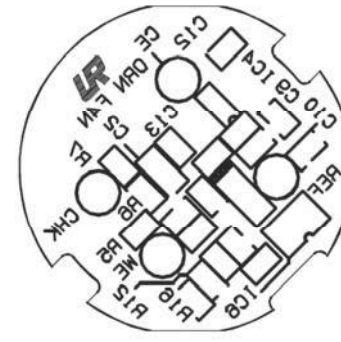
SILK PRINT FOR PARTS SIDE



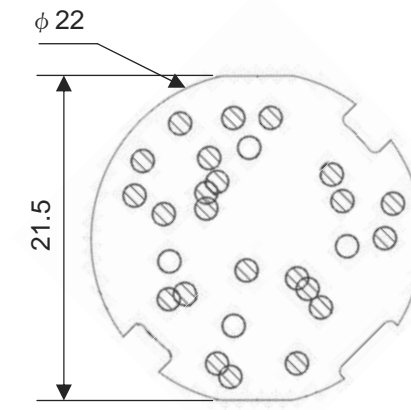
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

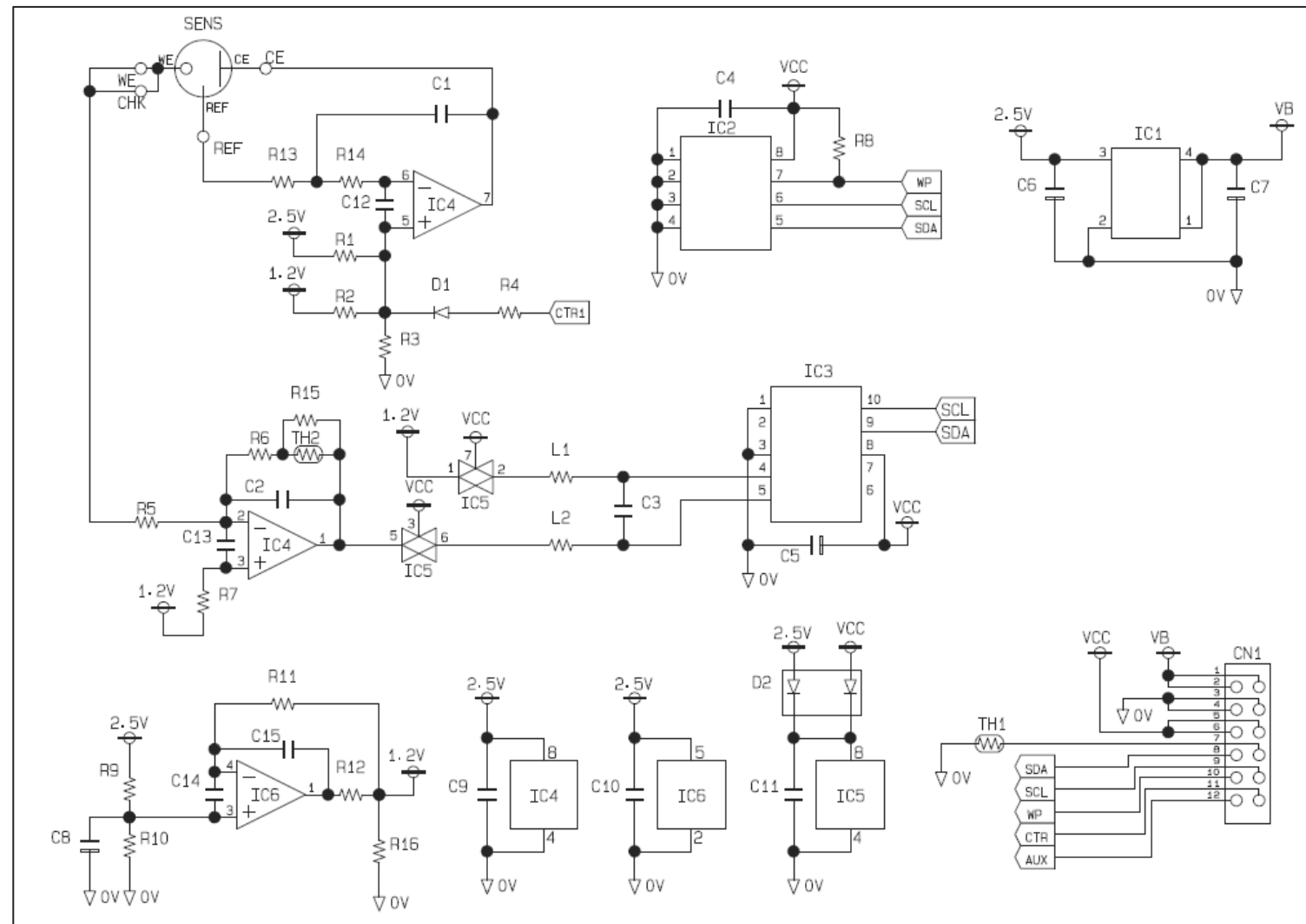
MARK	DIAGRAM	HOLE
①	φ 0.3	TH
○	φ 1.0	TH

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



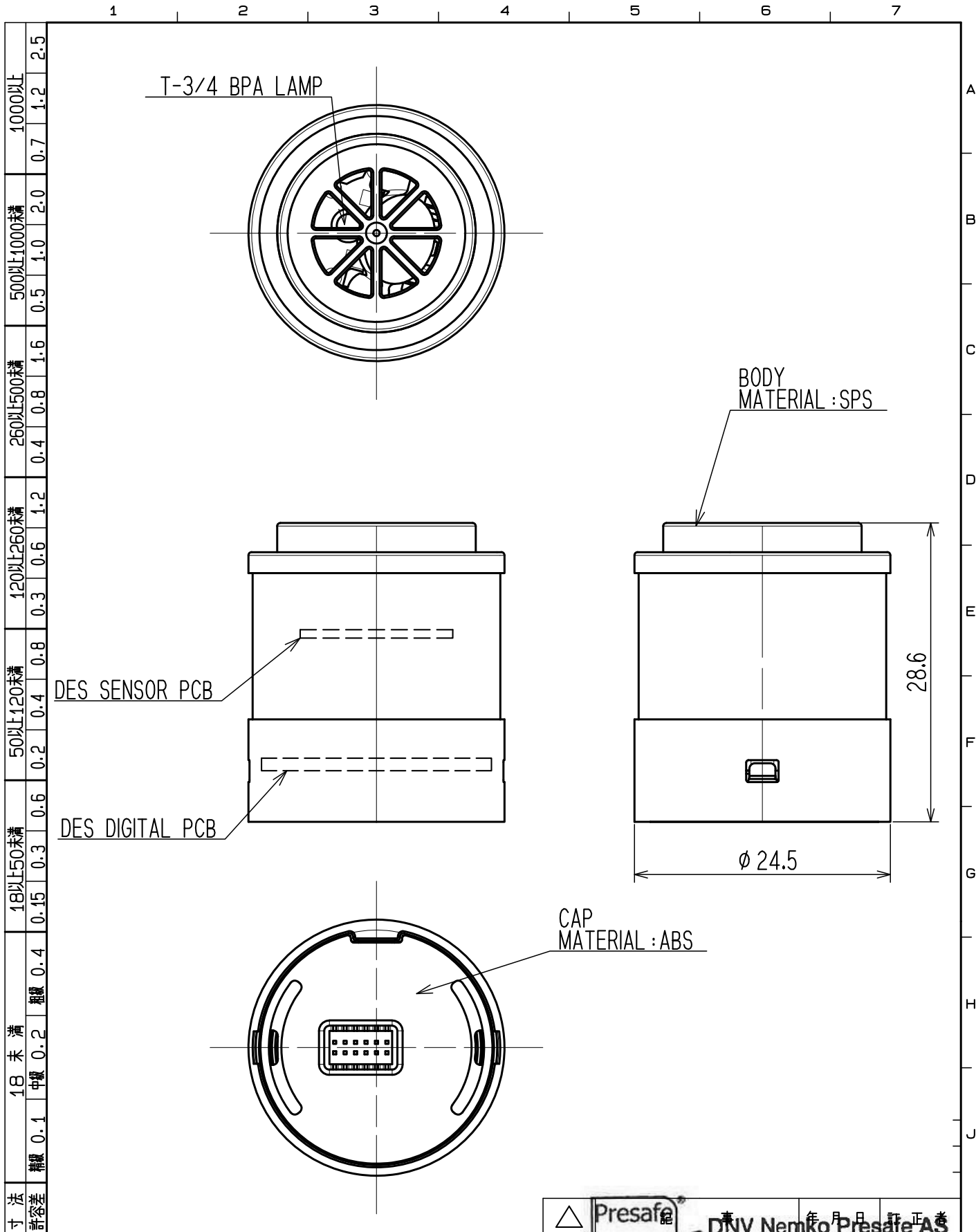
SCHEMATIC


PARTS LIST

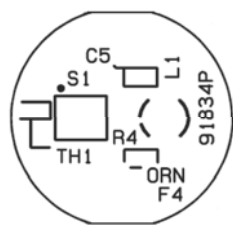
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Voltage regulator)	S-1313D25-N4T1	m
IC2	IC (EEPROM)	S-24C16CI-I8T1	m
IC3	IC (A/D Converter)	ADS1114IRU	m
IC4	IC (OPAMP)	LT6004CMS8	m
IC5	IC (Logic)	HD74ALVC2G66	m
IC6	IC (OPAMP)	AD8500AKS	m
D1	Diode	1SS355	m
D2	Diode array	RB480Y (2elements)	m
TH1	Chip thermistor	Rt25 = 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
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		改版担当 改版日 REV. BY		Presafe® DNV Nemko Presafe AS Org. n° 997 067 401 mva ESS SENSOR PCB	
改版回数 REV.	0	総頁数 PAGES	1	承認 APPROVED	図 番 DWG. NO.
承認 APPROVED	石橋勝	検 討 CHECKED	北村正英	製 図 DRAWN	作成日 DATE
				小野圭	2014.7.14
E 3 - 6 9 9 1 - 5 3 8 4 - 1 0 - 0 1 K		理研計器株式会社		機密情報 / CONFIDENTIAL	



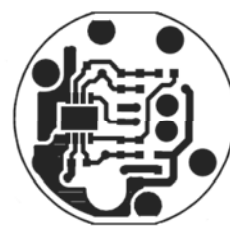
表面処理 TREAT.		許容差 TOL.	尺 度 SCALE	投影法 PROJECTION	 DNV Nemko Presafe AS Org. no: 997 067 401 mva SMART SENSOR Type-DES
材 質 MAT.					
承認 APPROVED	検 討 CHECKED	製 図 DRAWN	作成日 DATE	図 番 DWG. NO.	
青良治	武井康典	近藤晴彦	2014. 7. 24	M4-4630-20-01K	
RIKEN KEIKI		理研計測株式会社		機密情報 / CONFIDENTIAL	



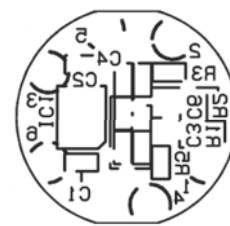
SILK PRINT FOR PARTS SIDE



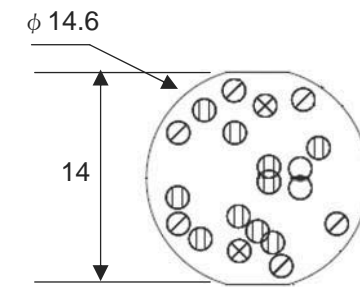
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

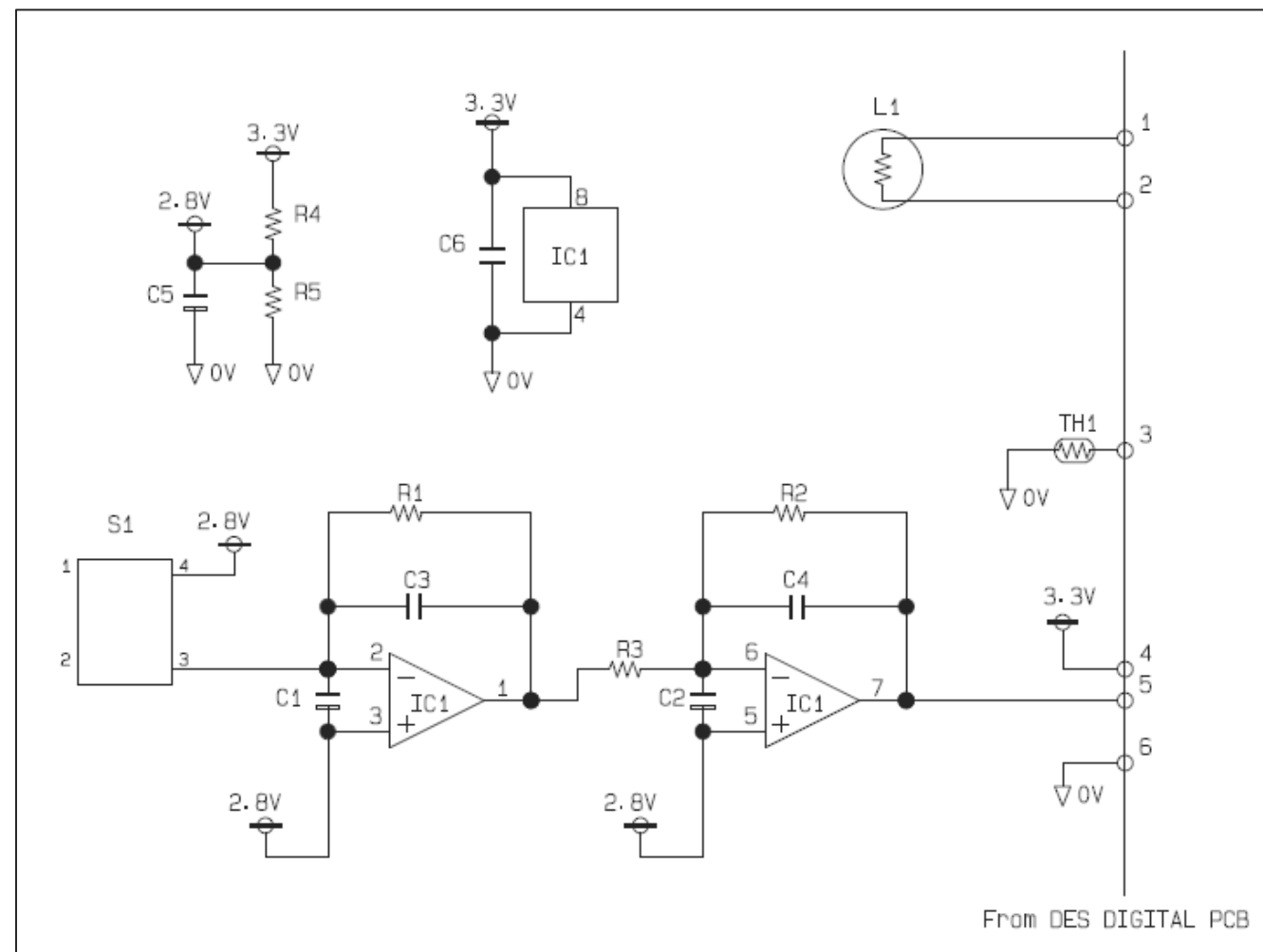
MARK	DIAGRAM	HOLE
①	φ 0.3	TH
○	φ 0.5	TH
⊙	φ 0.8	TH
⊗	φ 1.7	NTH

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

All drawings are view of parts side

SCALE 2:1



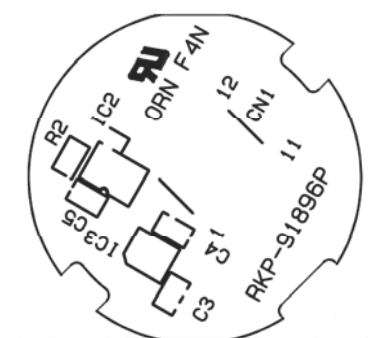
SCHEMATIC

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 marked parts are mounted or not

注 記 NOTES		改版担当 REV. BY	改版日 REV. DATE	Presafe® DNV Nemko Presafe AS Org. no. 997067401 mva DES SENSOR PCB
改版回数 REV.	0	総頁数 PAGES	1	
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 3 - 6 9 9 1 - 5 3 8 5 - 9 0 - 0 1 K
RIKEN KEIKI		理研計器株式会社		機密情報 / CONFIDENTIAL



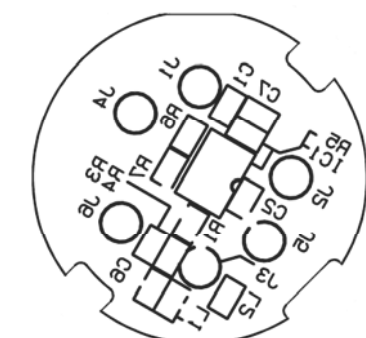
SILK PRINT FOR PARTS SIDE



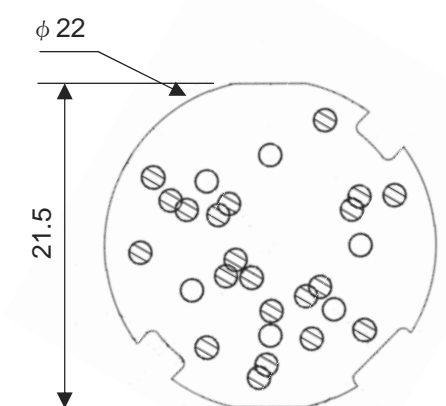
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

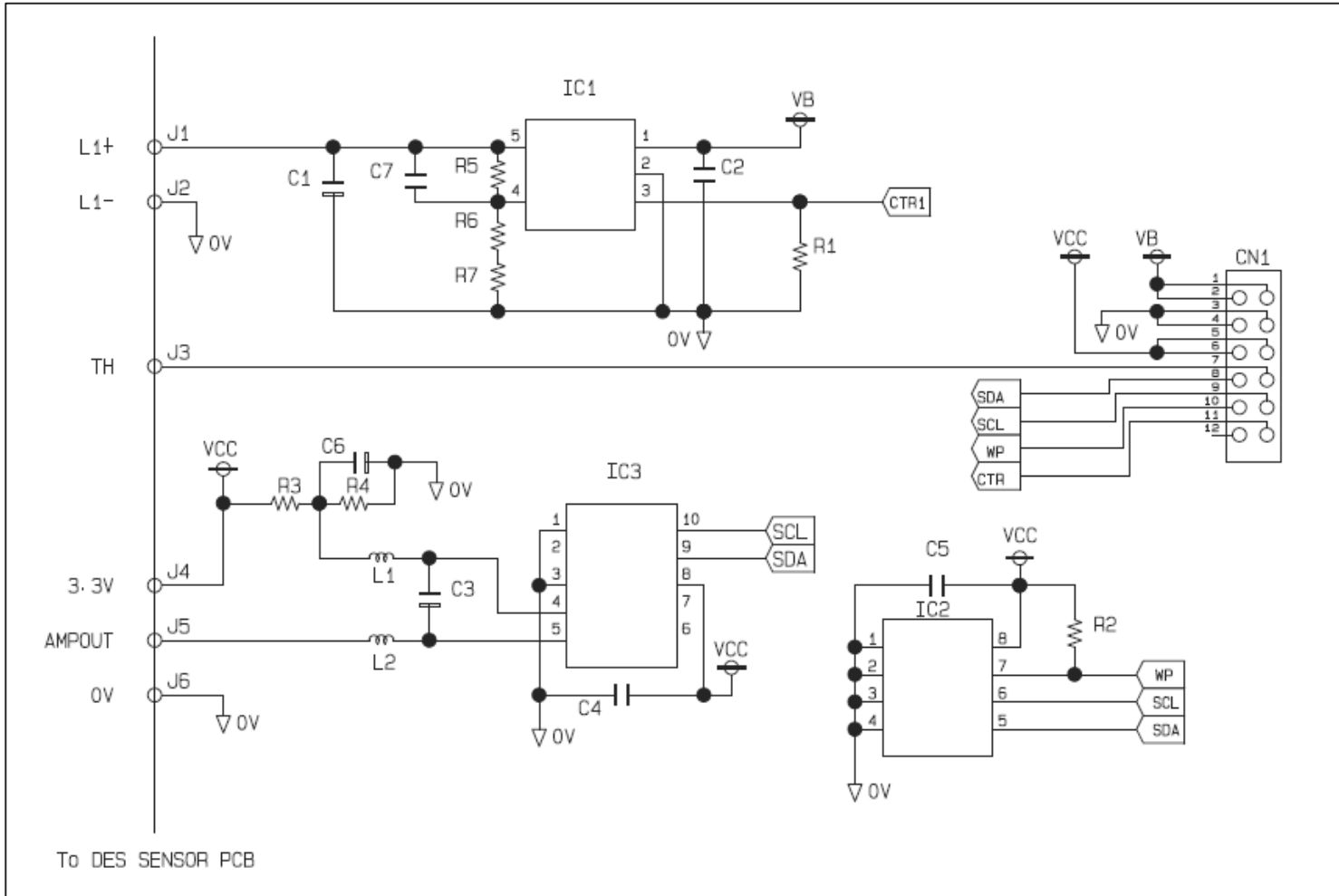
MARK	DIAGRAM	HOLE
⊙	φ 0.3	TH
○	φ 0.9	TH

SPECIFICATION FOR PCB

- ・PCB No. : RKP-91896P
- ・Material : Glass epoxy
- ・Thickness : 1.2mm
- ・Layer number : 2
- ・Thickness copper film : 35um
- ・Minimum conductor width : 0.3mm
- ・CTI : 100 above

All drawings are view of parts side

SCALE 2:1



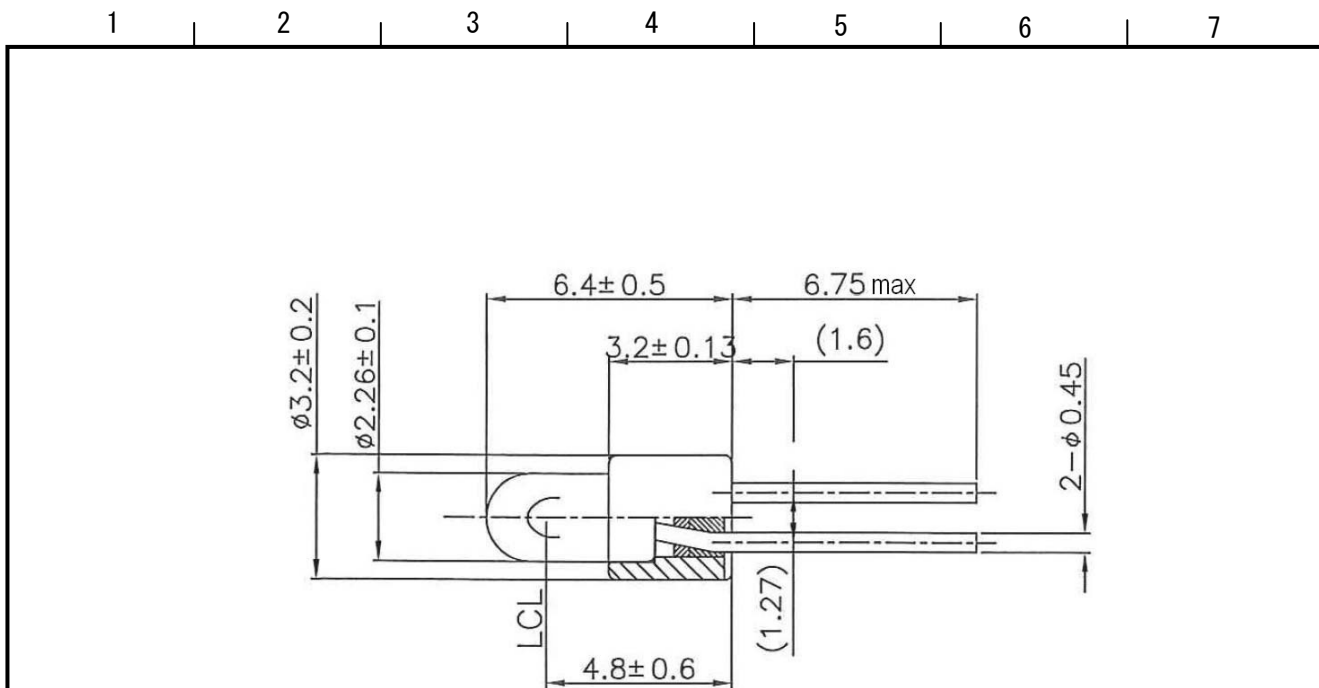
SCHEMATIC

PARTS LIST

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Voltage regulator)	TPS73201DBV	m
IC2	IC (EEPROM)	S-24C16CI-I8T1	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

注 記 NOTES		C1、C2 change		改版担当者 REV. BY	改版日 REV. DATE	Presafe® DNV Nemko Presafe AS Org. n° 997 067 401 mva DES DIGITAL PCB	
改版回数 REV.	1	総頁数 PAGES	1	小野圭	2015.2.24		
承認 APPROVED	石橋勝	検討 CHECKED	北村正英	製図 DRAWN	小野圭	作成日 DATE	2014.7.14
				図番 DWG. NO.		E 3 - 6 9 9 1 - 5 3 8 6 - 6 0 - 0 1 K	



SCALE : 5/1 UNIT : mm

Model : OL-8270BPA  
 Design Voltage : 5V  
 Design Current : 115mA±10%  
 Brightness (MSCP): 0.15MSCP±25%  
 Filament Shape : C-2R  
 Base color : WHITE  
 Manufacturer : Oshino Lamps Limited



**DNV Nemko Presafe AS**  
 Org. no: 997 067 401 mva  
 T- 3/4 BPA LAMP

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	OL-8270BPA
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	2012. 2. 24	E 4 - 6 9 9 1 - 5 1 2 9 - 6 0 - 0 1 K



VOC GAS SENSOR  
MINI PID 3PIN  
Ion Science Ltd.  
IDENTIFICATION  
II 1G Ex ia IIC T4 (-40℃≤Ta≤+55℃)  
0.1W limitation  
CERTIFICATE  
Baseefa 07ATEX0060U  
IECEx BAS 07.0030U

28.6

24.5

minimum 2.5

SENSOR BODY  
MATERIAL: ABS

~~PID~~  $\Delta$   
PIS SENSOR PCB

EPOXY RESIN

~~PID~~  $\Delta$   
PIS DIGITAL PCB

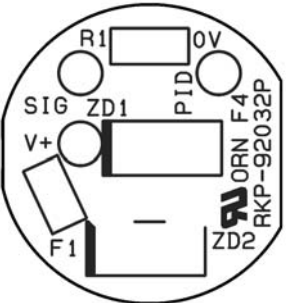
CAP  
MATERIAL: ABS

1991. 9. CAD A4


1234567

A

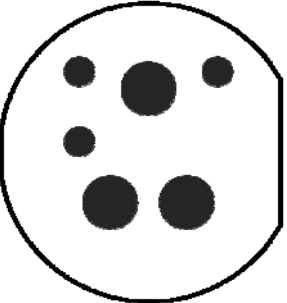
B



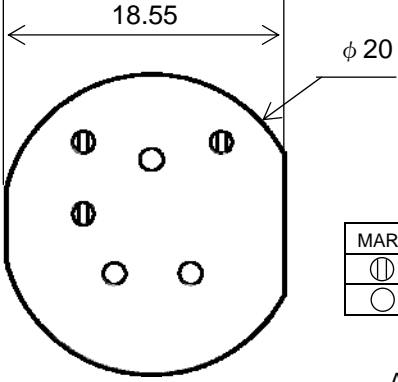
SILK PRINT FOR PARTS SIDE



PARTS SIDE



SOLDERING SIDE



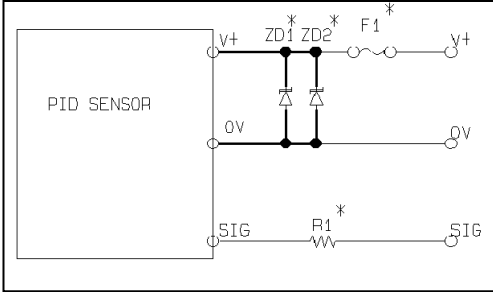
THROUGH HOLE DATA

**SPECIFICATION FOR PCB**

- PCB No. : RKP-92032P
- Material : Glass epoxy
- Thickness : 0.8mm
- Layer number : 2
- Thickness copper film : 35um
- Minimum conductor width : 1.0mm
- CTI : 100 above

MARK	DIAGRAM	HOLE
⊕	φ 0.6	TH
○	φ 1.8	TH

All drawings are view of parts side      SCALE 2:1




SCHMATIC

PARTS LIST

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
PID SENSOR	VOC GAS SENSOR	MINI PID 3PIN, Ion Science Ltd. IECEX BAS 07.0030U	Ex comp.
F1	Fuse	MCF2 125mAR08B4, SOC In=250mA, DC72V	Safety comp.
ZD1,ZD2	Zener diode	1SMB5917B,ON Semiconductor Vz = 4.46 – 4.94 V, 3W	Safety comp.
R1	Chip fixed resistor	1k ohm / 1%, 0.25W (3216)	Safety comp.


注 記 NOTES

改版回数 REV.	2	総頁数 PAGES	1	改版担当者 REV. BY	小野圭
承認 APPROVED	石橋勝	検討 CHECKED	北村正英	製図 DRAWN	小野圭



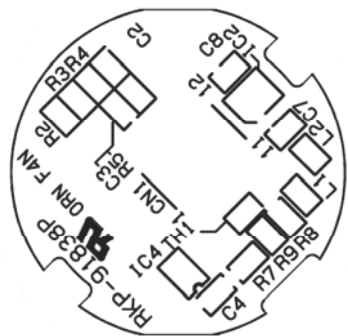
**DNV Nemko Presafe AS**  
Org. no: 997 067 401 mva  
**PIS SENSOR PCB**

改版日 REVISED	2015.3.25	名称 NAME	
作成日 DATE	2014.7.14	図番 DWG. NO.	E 4 - 6 9 9 1 - 5 3 8 7 - 3 0 - 0 1 K



**理研計器株式会社**

機密情報 / CONFIDENTIAL



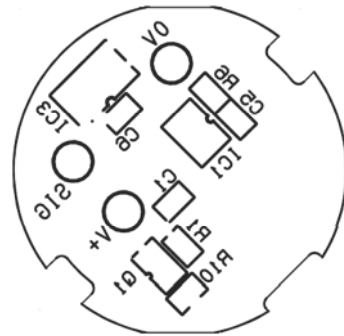
SILK PRINT FOR PARTS SIDE



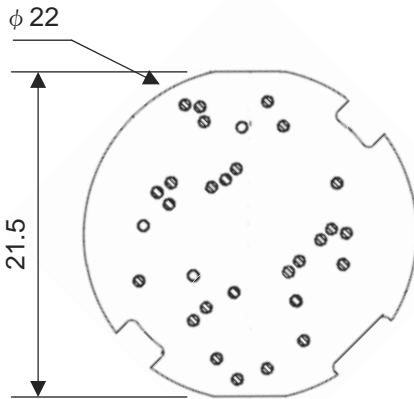
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

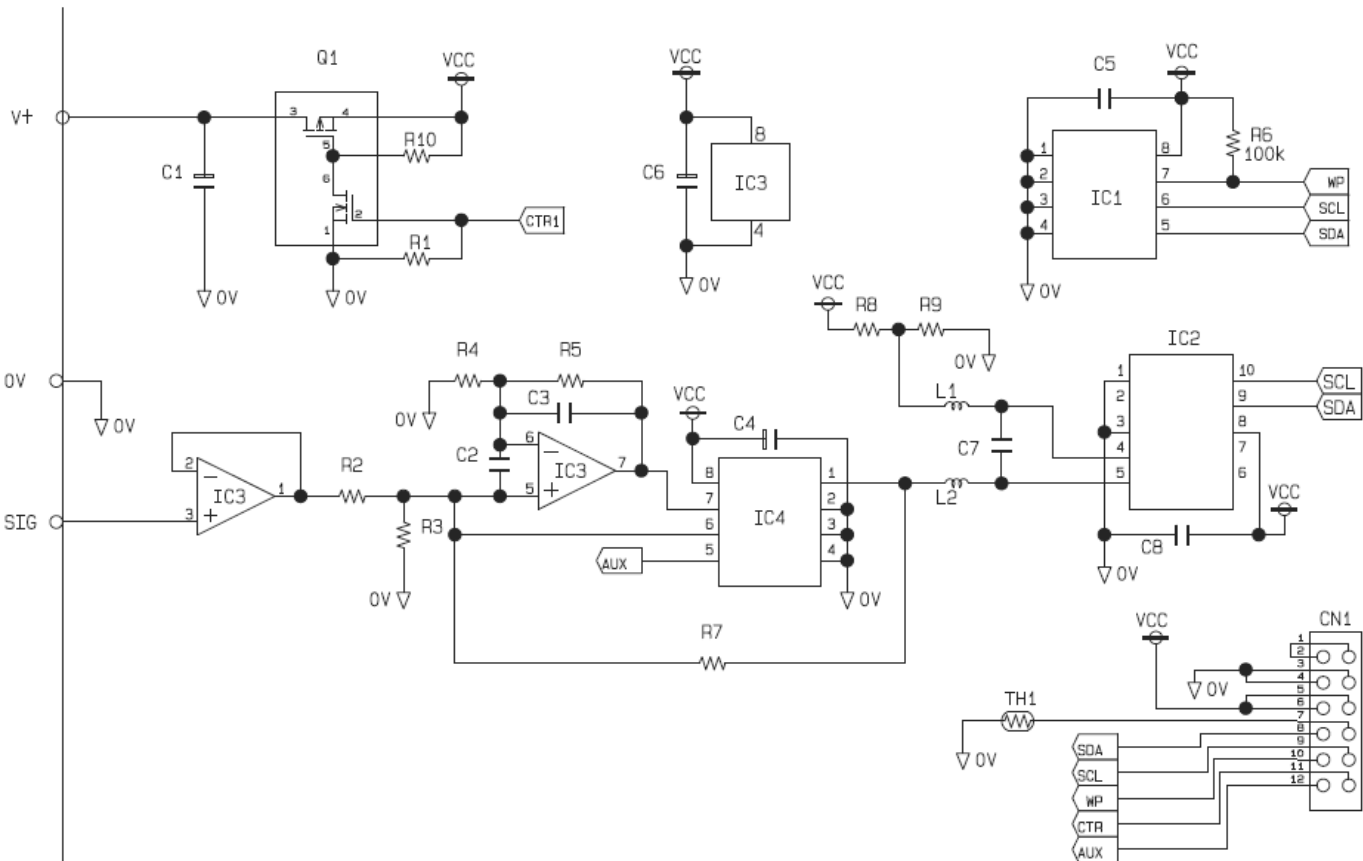
MARK	DIAGRAM	HOLE
⊙	φ 0.3	TH
○	φ 1.0	TH

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



To PID SENSOR PCB

SCHEMATIC

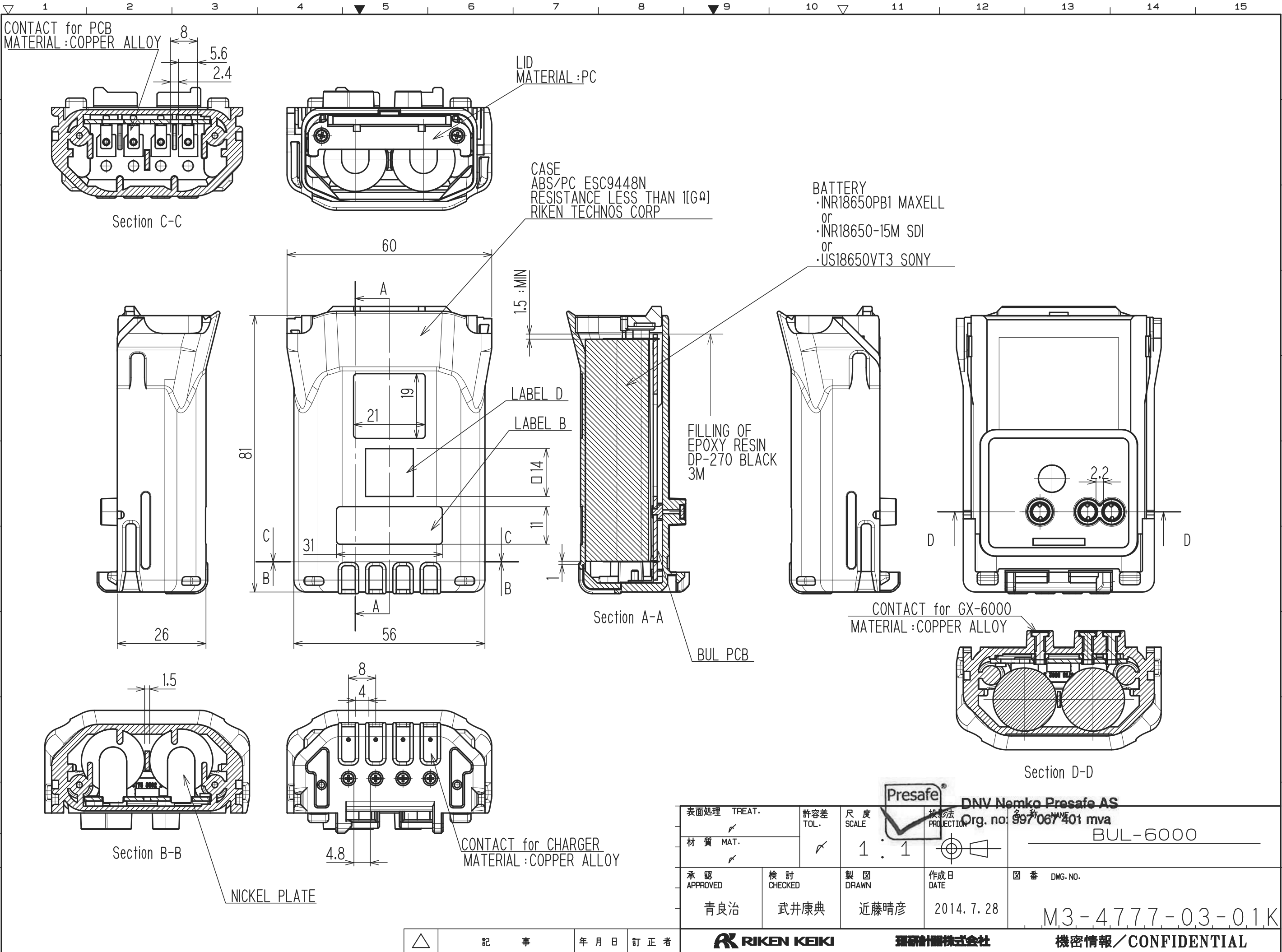
PARTS LIST

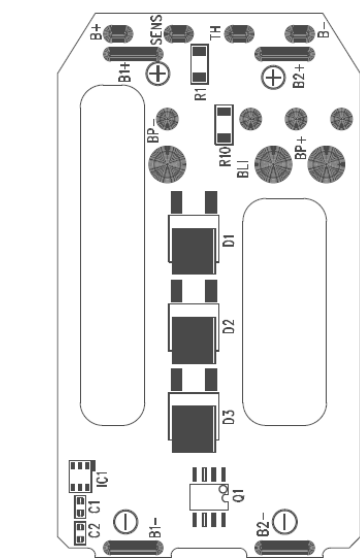
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (EEPROM)	S-24C16CI-I8T1	m
IC2	IC (A/D Converter)	ADS1114IRU	m
IC3	IC(OPAMP)	OPA2378AIDCN	m
Q1	N+P-ch FET	EM6M2	m
TH1	Chip thermistor	Rt25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	m
R1-10	Chip fixed resistor or Chip jumper	10 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

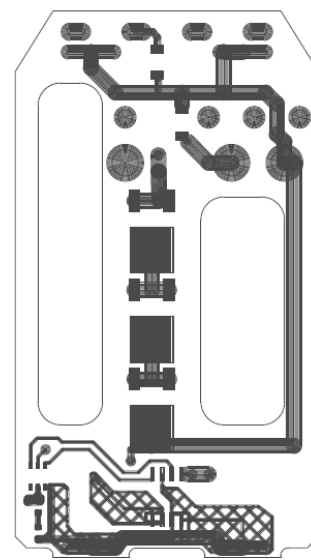
注 記 NOTES		改版担当 小野圭		改版日 2015.3.25		Presafe® DNV Nemko Presafe AS Org. no. 997 067 401 mva PIS DIGITAL PCB	
改版回数 REV.	0	総頁数 PAGES	1	製 図 DRAWN	小野圭	作成日 DATE	2014.7.14
承認 APPROVED	石橋勝	検 討 CHECKED	北村正英	製 図 DRAWN	小野圭	図 番 DWG. NO.	E 3 - 6 9 9 1 - 5 3 8 8 - 1 0 - 0 1 K
RIKEN KEIKI				理研計器株式会社		機密情報 / CONFIDENTIAL	

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

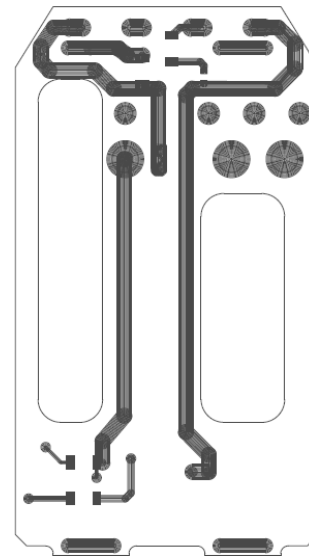




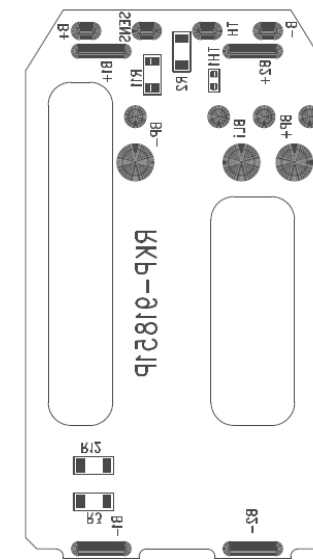
SILK PRINT FOR PARTS SIDE



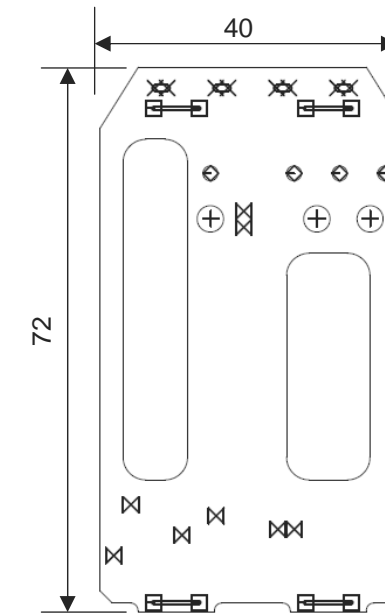
PARTS SIDE



SOLDERING SIDE








SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

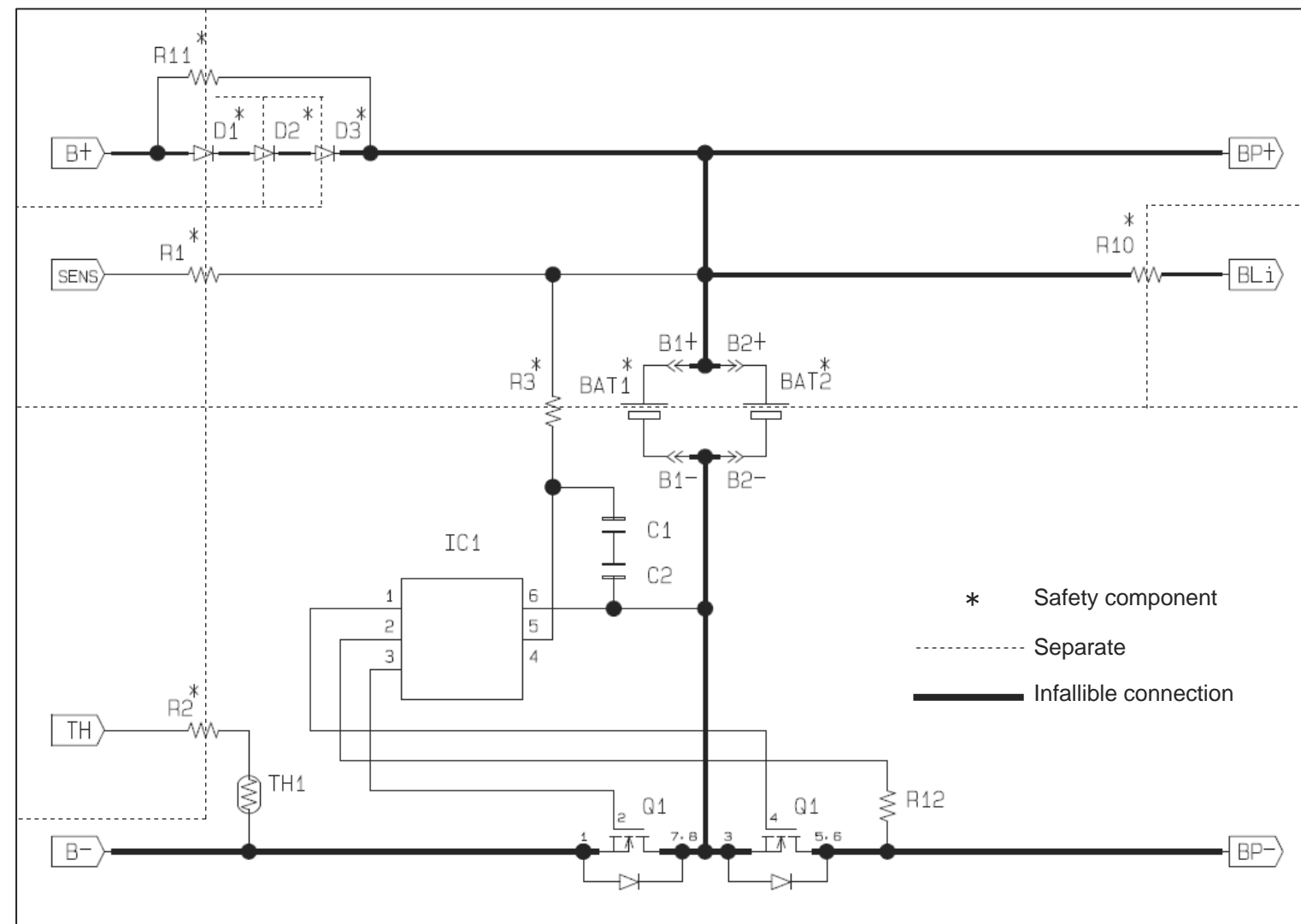
### SPECIFICATION FOR PCB

- PCB No. : RKP-91851P
- Material : Glass epoxy
- Thickness : 1.6mm
- Layer number : 2
- Thickness copper film : 35um
- Minimum conductor width : 0.3mm
- CTI : 100 above

MARK	DIAGRAM	HOLE
	3.5	TH
	0.8×6.5	TH
	0.5×6.5	TH
	2	TH
	0.8	TH

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	200Ω-10kΩ / 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

Presafe

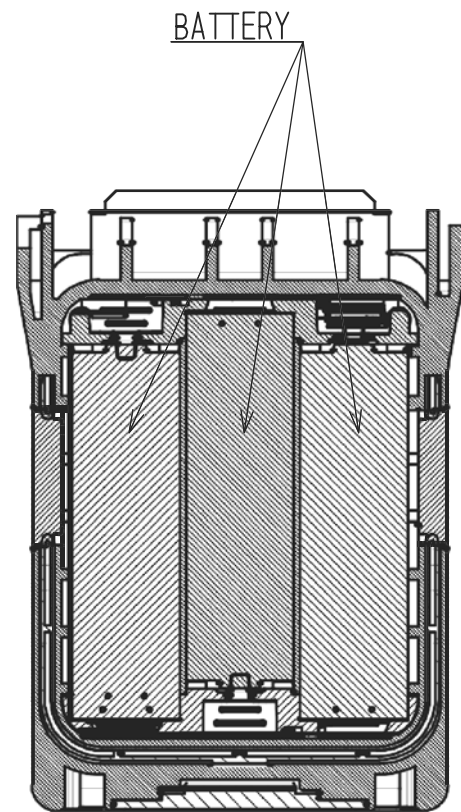
**DNV Nemko Presafe AS**

REV. Org. n° 997 067 401 mva

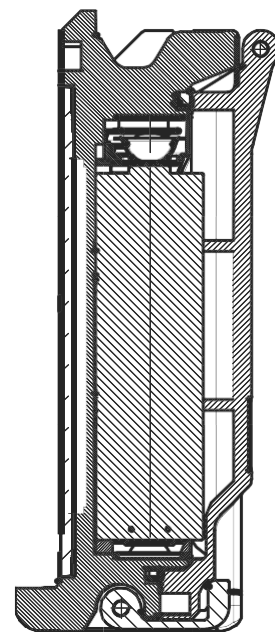
**BUL PCB**

注 記 NOTES		改版担当者 REV. BY	改版日 REV. DATE	Org. n° 997067 401 mva BUL PCB
改版回数 REV.	1	総頁数 PAGES	1	小野圭 2014.9.5
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 3 - 6 9 9 1 - 5 3 8 9 - 8 0 - 0 1 K

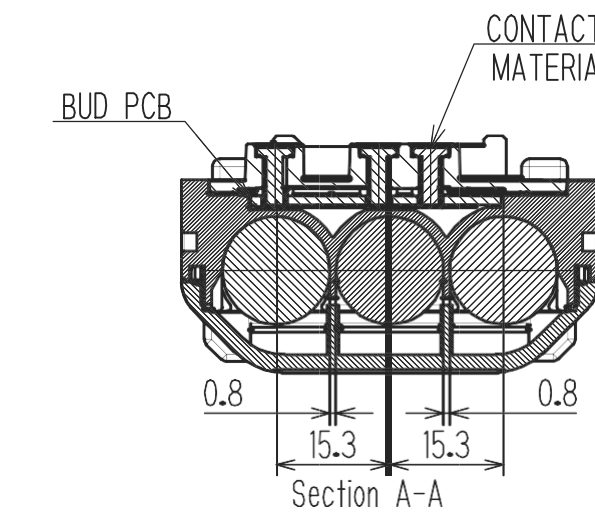
寸法	精度	中級	粗級
1000以上	0.7	1.2	2.5
500以上1000未満	0.5	1.0	2.0
260以上500未満	0.4	0.8	1.6
120以上260未満	0.3	0.6	1.2
50以上120未満	0.2	0.4	0.8
18以上50未満	0.15	0.3	0.6
18未満	0.1	0.2	0.4
寸法	精度	中級	粗級



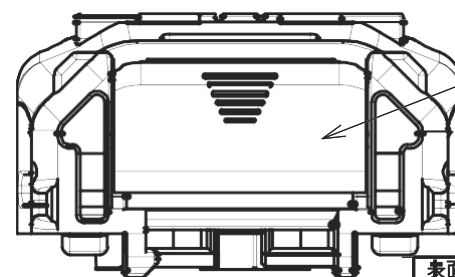
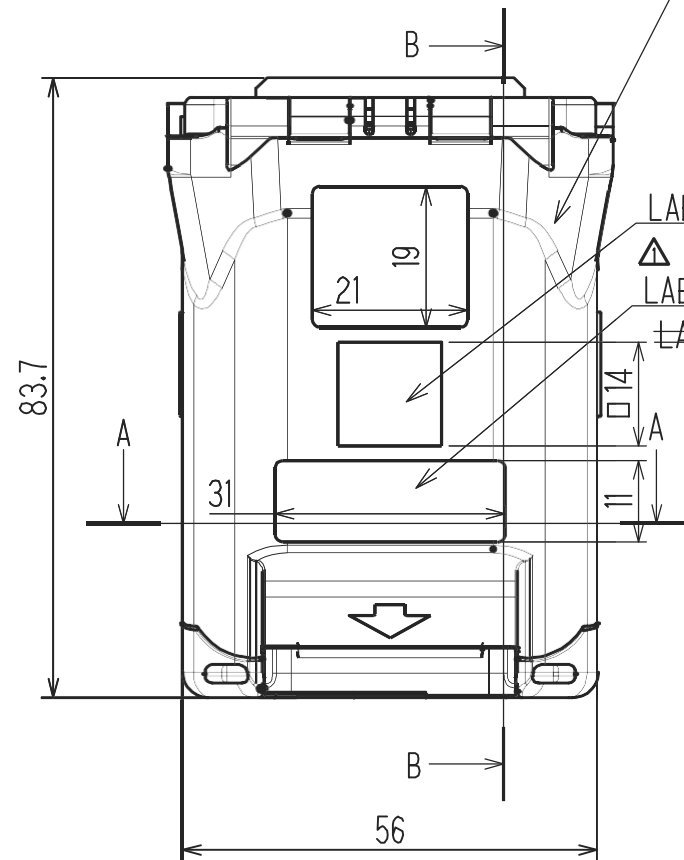
Section C-C



Section B-B



Section A-A



LID  
ABS/PC ESC9448N  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP

CASE  
ABS/PC ESC9448N  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP

LID  
MATERIAL:PC

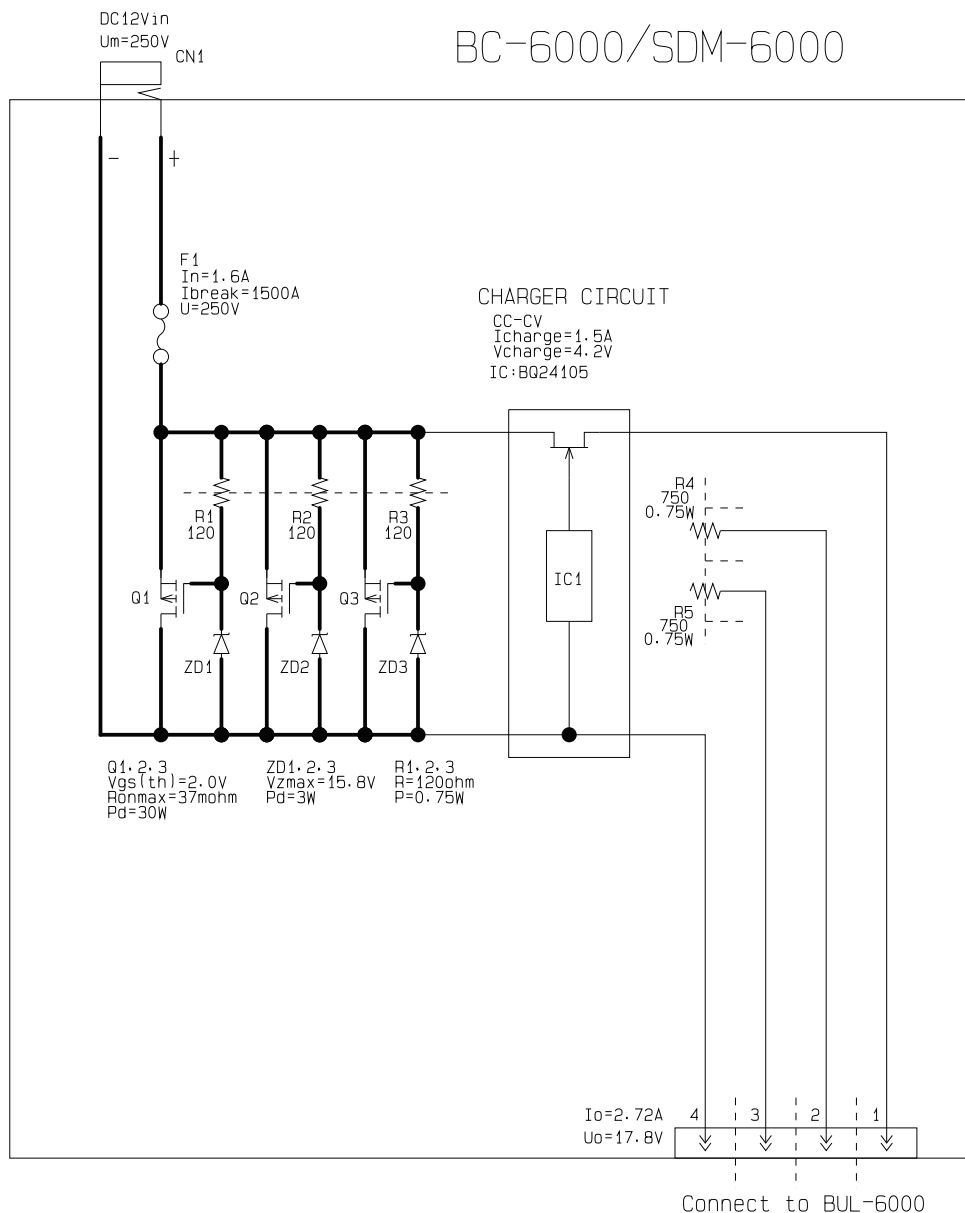
LOCK PLATE  
ABS/PC ESC9448N  
RESISTANCE LESS THAN 1[GΩ]  
RIKEN TECHNOS CORP

表面処理 TREAT.	許容差 TOL.	尺度 SCALE	投影法 PROJECTION	製図人 NAME
材質 MAT.		1 : 1		近藤晴彦
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	M3-4777-04-01K
<div> <div>REVISION E9</div> <div>2015.3.6</div> <div>海野裕作</div> </div> <div> <div>記 事</div> <div>年 月 日</div> <div>訂 正 者</div> </div>				
<div> <div>RIKEN KEIKI</div> <div>近藤計器株式会社</div> </div> <div>機密情報 / CONFIDENTIAL</div>				



# BATTERY CHARGER

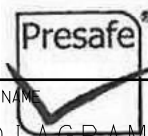
## BC-6000/SDM-6000



(MEMO)

1. - - - - marks means SEPARATE

2. ——— marks means INFALLIBLE CONNECTION



DNV Nemko Presafe AS  
Org. no: 997 067 401 mva

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
総頁数 PAGES	1			FOR MODEL BC-6000/SDM-6000
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



1

2

3

4

5

6

7

1000以上

500以上400未満

250以上500未満

120以上250未満

50以上120未満

18以上50未満

18未満

2.5

2.0

1.6

1.2

0.8

0.4

0.3

0.2

0.15

0.1

0.05

0.025

0.0125

0.00625

0.003125

0.0015625

0.00078125

0.000390625

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GX-6000(LABEL A)

MODEL GX-6000

INST.No.

RIKEN KEIKI CO.,LTD

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

BUL-6000(LABEL B)

MODEL BUL-6000

INST.NO.

RIKEN KEIKI Co.,Ltd./2-7-6Azusawa.

Itabasi-ku,Tokyo 174-8744,Japan

WARNING

Do not charge battery in haz.loc.

BUD-6000(LABEL C)

MODEL BUD-6000

INST.NO.

RIKEN KEIKI Co.,Ltd./2-7-6Azusawa.

Itabasi-ku,Tokyo 174-8744,Japan

WARNING

Use only battery types:LR6 TOSHIBA

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

CE

1180

II 1G Ex ia IIC T4 Ga

Presafe15ATEX6171

IECEX PRE 15.0011

-20℃≤Ta≤+50℃

WARNING

Read manual for safety info.

Do not open in haz.loc.

Ex

REVISION

2015.3.18

海野裕作

REVISION

2015.3.6

海野裕作

Presafe

事

年月日

訂正者

DNV Nemko Presafe AS

Org. no: 997 067 401 mva

LABEL

表面処理 TREAT.

材 質 MAT.

承認 APPROVED

青良治

許容差 TOL.

検 討 CHECKED

近藤晴彦

尺 度 SCALE

4 : 1

製 図 DRAWN

海野裕作

投影法 PROJECTION

作成日 DATE

2014. 7. 25

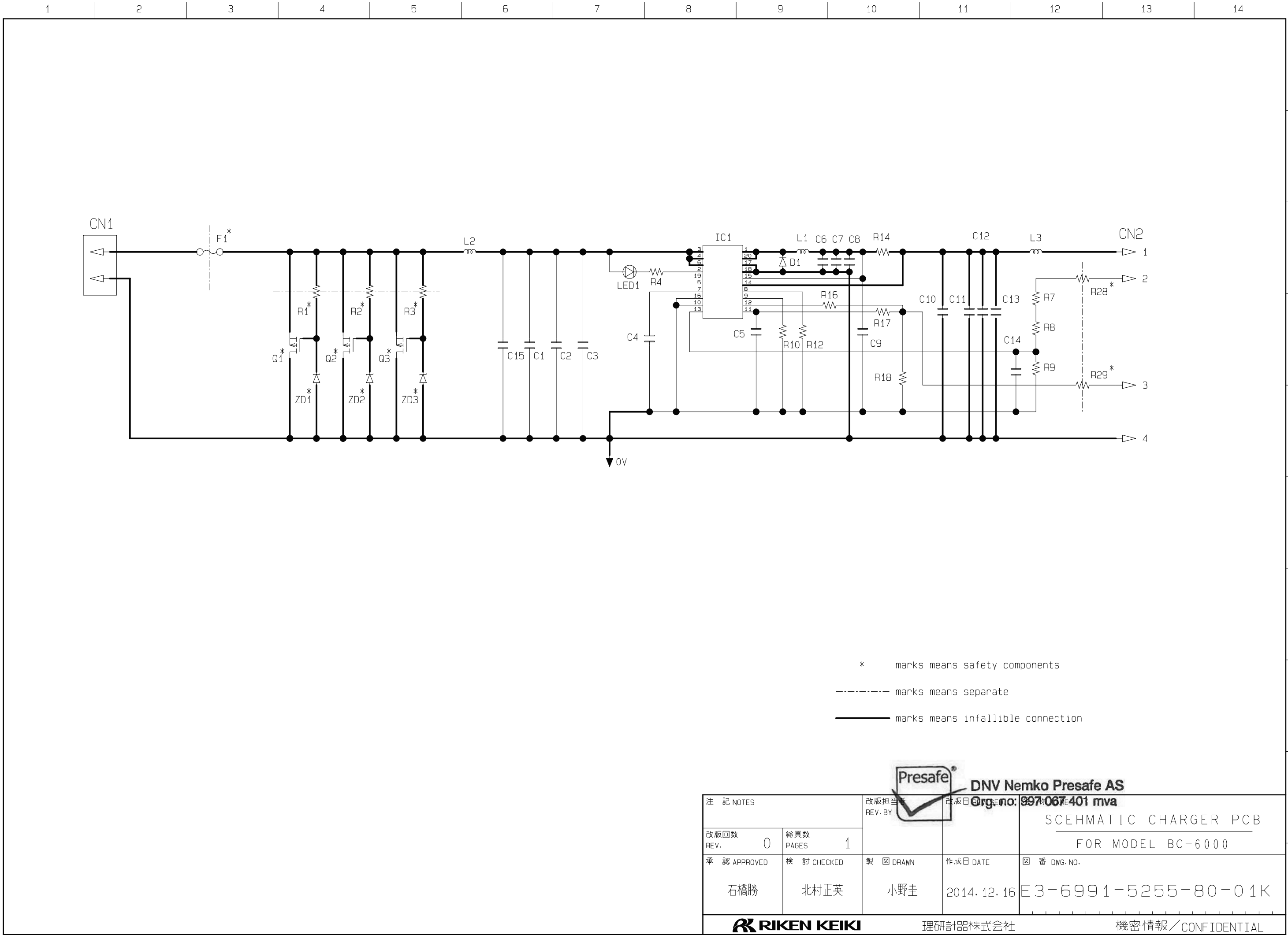
名 称 NAME

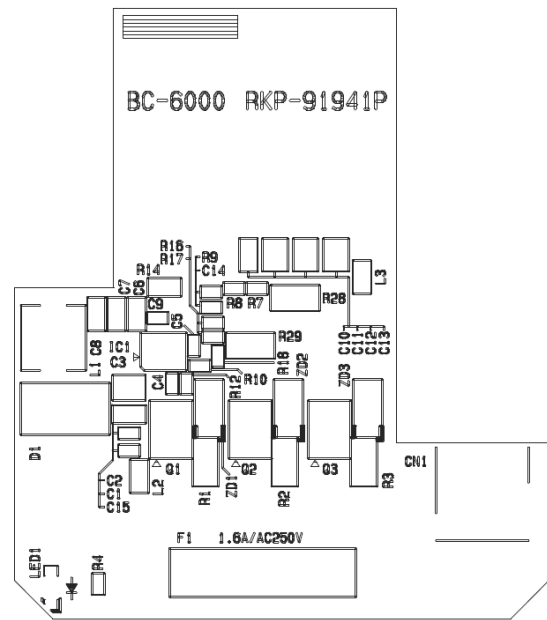
図 番 DWG. NO.

M4-4777-01-01K

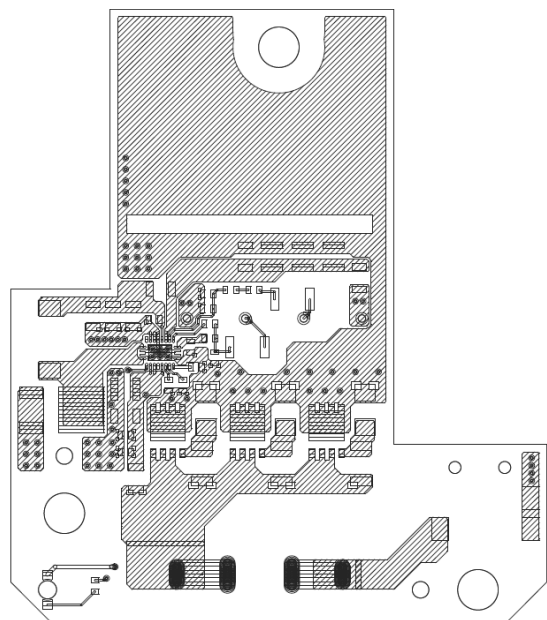
機密情報 / CONFIDENTIAL



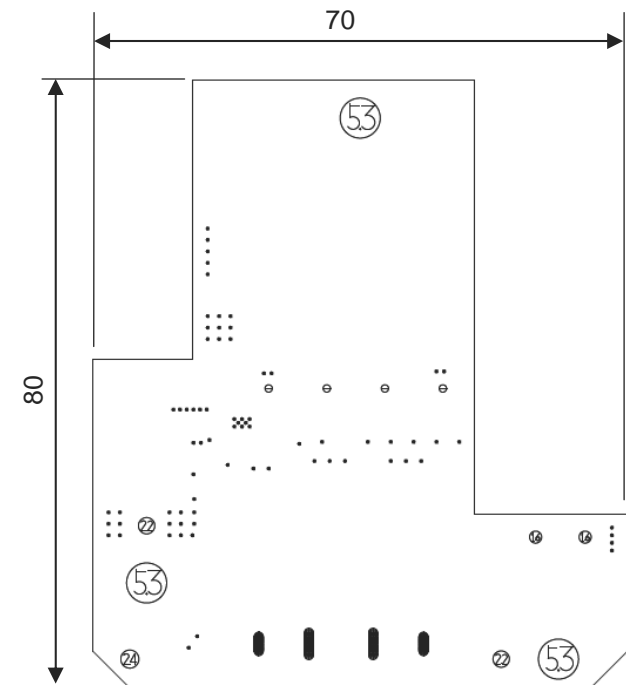




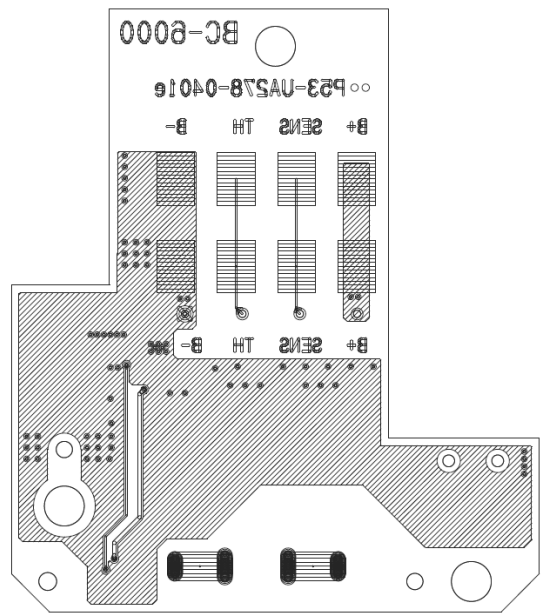
SILK PRINT FOR PARTS SIDE



PARTS SIDE



VIA HOLES



SOLDERING SIDE

All drawings are view of parts side  
SCALE 1:1

MARK	DIAGRAM	HOLE
⊗	Φ0.3	TH
⊖	Φ1.0	TH
⊕	Φ1.2	TH
⑬	Φ1.6	NTH
⑰	Φ2.2	NTH
⑳	Φ2.4	NTH
㉓	Φ5.3	NTH

SPECIFICATION FOR PCB

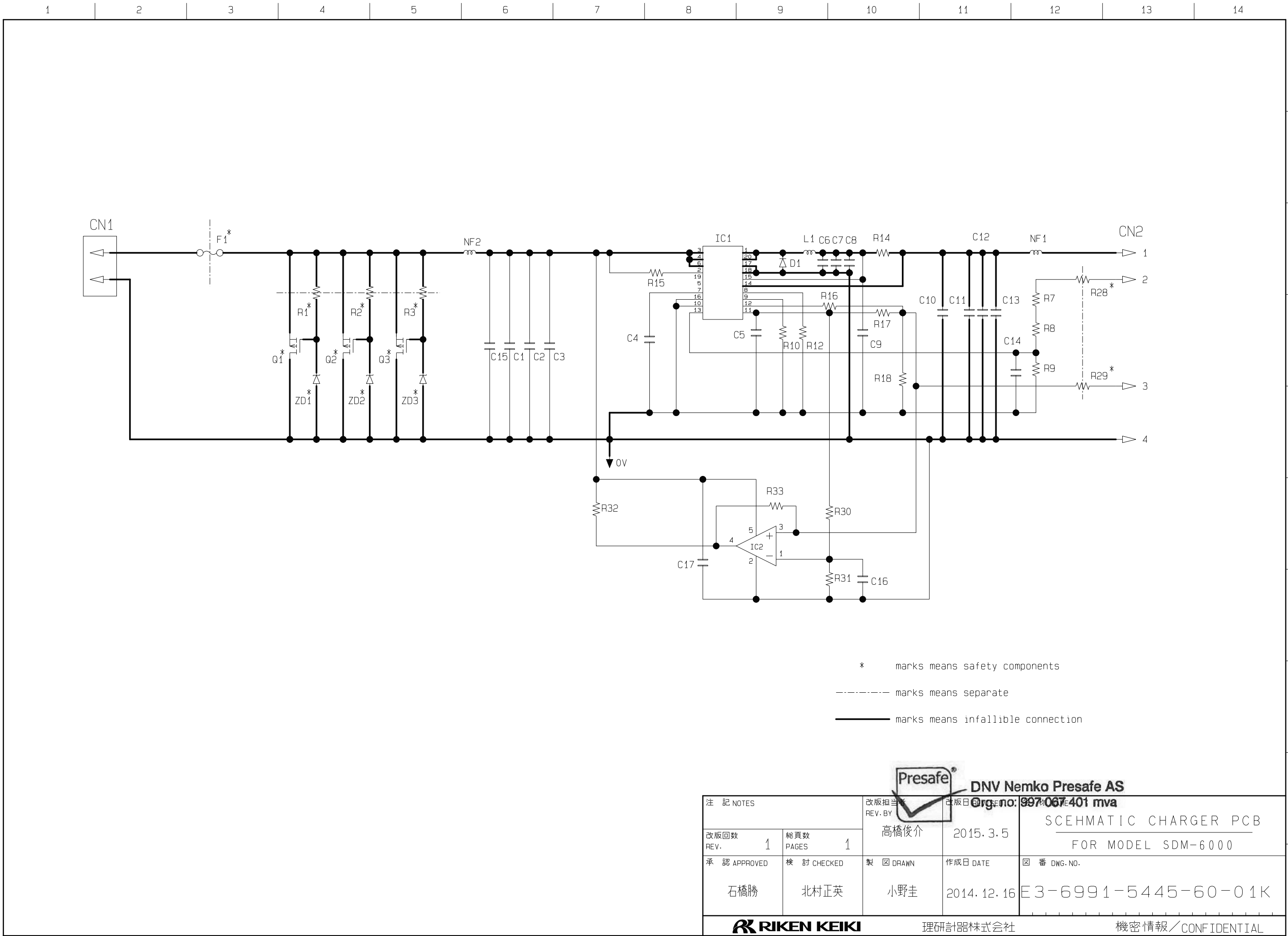
- PCB No. : RKP-91941P
- Material : Glass epoxy
- Thickness : 1.6mm
- Layer number : 2
- Thickness copper film : 35um
- Copper thickness of the via's : 35um above.
- Minimum conductor width : 0.3mm
- CTI : 175 above

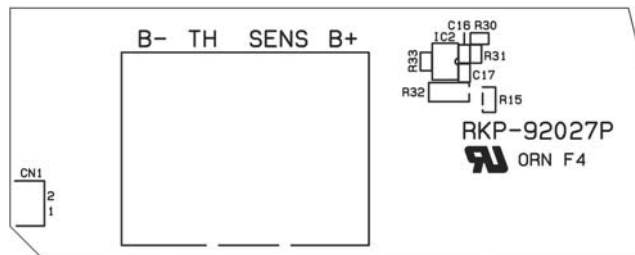
PARTS LIST

Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Battery charger)	BQ24105RHLR	
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	*
R4,R7,R8,R9,R10, R12,R16,R17,R18	Chip fixed resistor or Chip jumper	100Ω - 1MΩ/1% , 0.1W (1608) or 50mΩ max ,1A	m
R14	Chip fixed resistor	0.068Ω - 0.2Ω/1% , 0.25W (3216)	
R28,R29	Chip fixed resistor	RK73HW2H_7500F KOA 750Ω/1% ,0.75W	*
C1	Chip multilayer capacitor	1uF / 10% , 50V	m
C2,C6,C7,C8,C10	Chip multilayer capacitor	10uF / 10% , 25V	m
C3	Chip multilayer capacitor	22uF / 10% , 25V	m
C4	Chip multilayer capacitor	0.068uF / 10% , 50V	m
C5,C9,C15	Chip multilayer capacitor	0.1uF / 10% , 50V	m
C1,C12,C13	Chip multilayer capacitor	47uF / 10% , 16V	m
C14	OPEN	OPEN	
L1	Inductor	10uH / 20%	
L2,L3	Chip ferrite beads	BLM31PG391	m
LED1	LED Lamp	SML-811U	m

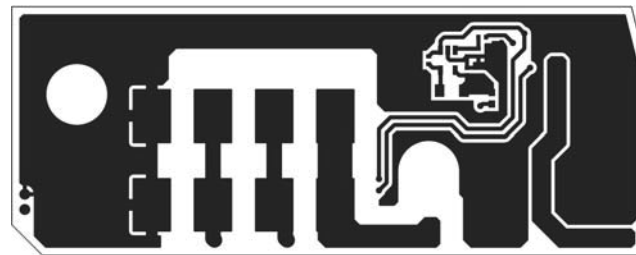
\* marked parts are for safety  
m marked parts are mounted or not

注 記 NOTES		改版担当者 REV. BY		改版日 REV. DATE Org. no. 997067 401 mva	
改版回数 REV. 0		総頁数 PAGES 1		CHARGER PCB FOR MODEL BC-6000	
承認 APPROVED		検 討 CHECKED		製 図 DRAWN	
石橋勝		北村正英		小野圭	
				作成日 DATE	
				2014.12.16	
				図 番 DWG. NO.	
				E 3 - 6 9 9 1 - 5 2 5 5 - 8 0 - 0 1 A	
<div>RIKEN KEIKI 理研計器株式会社 機密情報 / CONFIDENTIAL</div>					

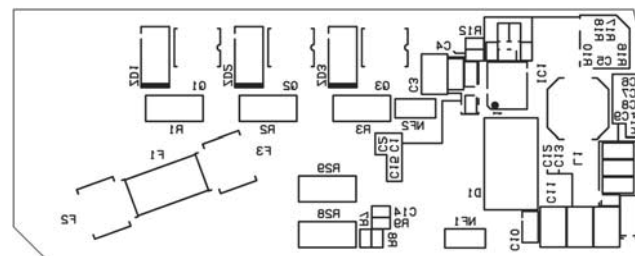




SILK PRINT FOR SOLDERING SIDE



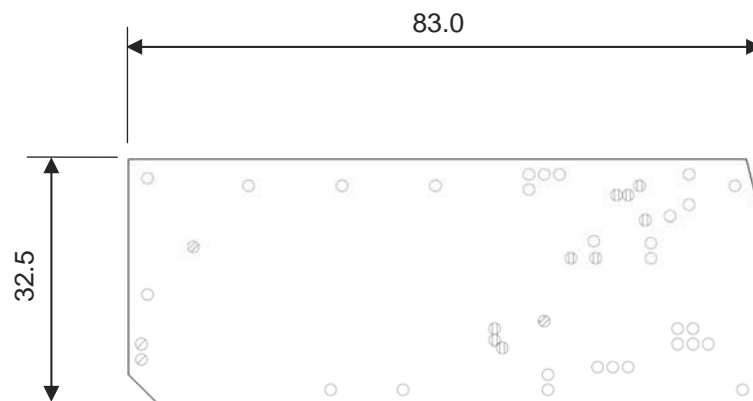
SOLDERING SIDE



SILK PRINT FOR PARTS SIDE



PARTS SIDE



All drawings are view of soldering side

SCALE 1:1

VIA HOLES

MARK	DIAGRAM	HOLE
⊙	Φ0.4	TH
○	Φ0.7	TH
⊗	Φ0.8	TH
⊘	Φ5.6	NTH

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

PARTS LIST

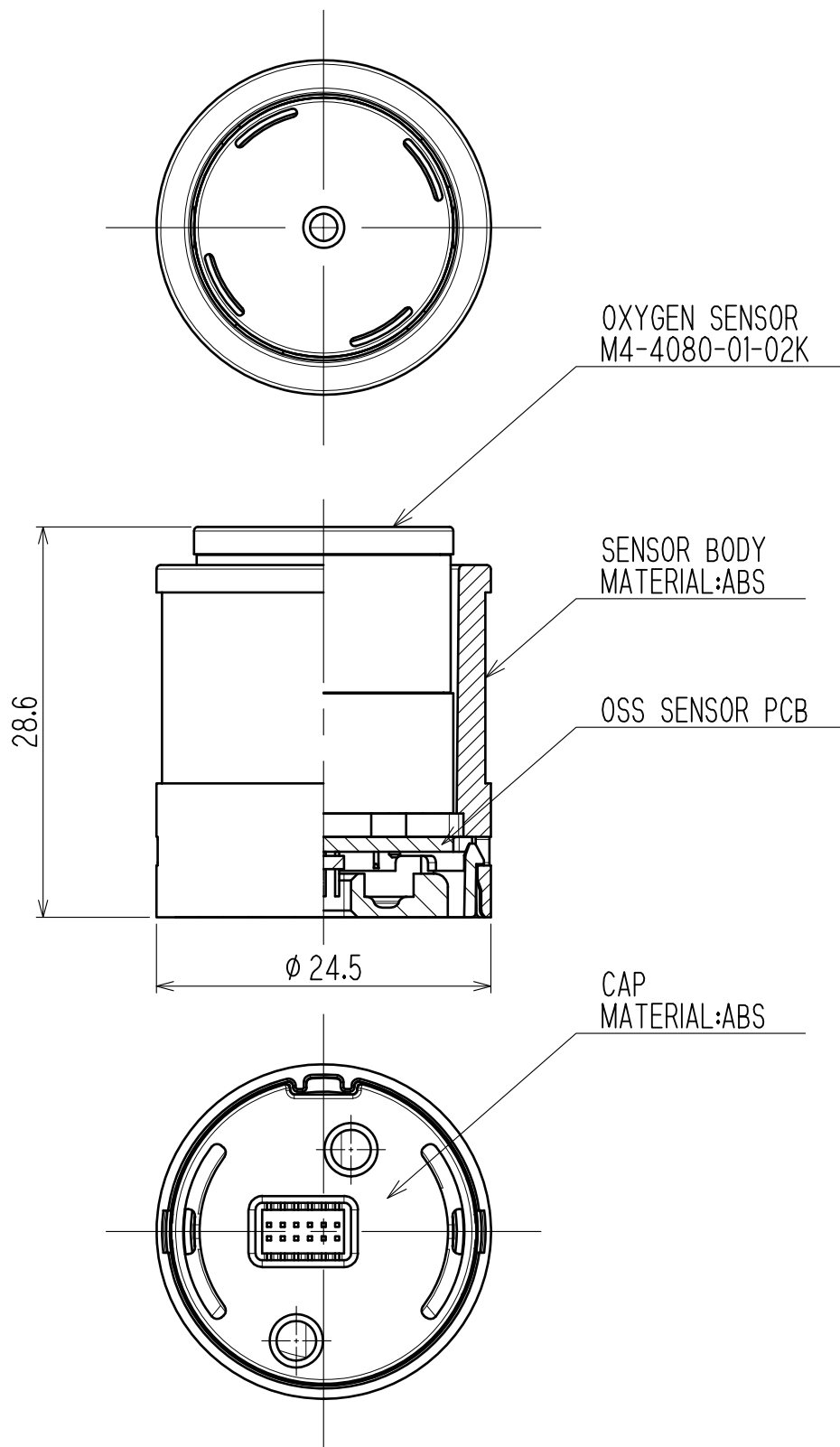
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Battery charger)	BQ24105RHLR	
IC2	IC(Comparator)	TL331	
D1	Schottky barrier diode	MBRD1045	
F1	Fuse	021601.6P Littelfuse In=1.6A, Ibreak=1500A@250Vac	*
Q1,Q2,Q3	P-ch MOSFET	TPCA8507-H TOSHIBA Ron_max=37mΩ , Pd=30W	*
ZD1,ZD2,ZD3	1SMB5929B	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
C4,C5,C9,C15,C16, C17	Chip multilayer capacitor	0.1uF / 10%, 25V	m
C2,C6,C7,C8,C10	Chip multilayer capacitor	10uF / 10%, 16V	m
C14	OPEN	OPEN	
L1	Inductor	10uH / 20%	
NF1,NF2	Chip ferrite beads	BLM31PG391	m



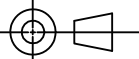
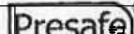

\* marked parts are for safety


m marked parts are mounted or not

注 記 NOTES		改版担当 REV. BY		改版日 REV. DATE	
改版回数 REV.		総頁数 PAGES		高橋俊介	
承認 APPROVED		検 討 CHECKED		製 図 DRAWN	
石橋勝		北村正英		小野圭	
				作成日 DATE	
				2014.12.15	
				図 番 DWG. NO.	
				E 3 - 6 9 9 1 - 5 4 4 5 - 6 0 - 0 1 A	

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									
精級	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	0.4	0.8	1.6	0.5	1.0	2.0	0.7	1.2	2.5

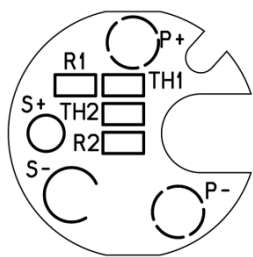


表面处理 TREAT. 		許容差 TOL. 	尺度 SCALE 2 : 1	投影法 PROJECTION 	<div> <div>  <div>           事 業 年 月 日 訂 正 者            DNV Nemko Presafe AS            Org. no: 997 067 401 mva            SMART SENSOR            Type-OSS         </div> </div> </div>
材質 MAT. 			承認 APPROVED 青良治	検査 CHECKED 武井康典	
					図番 DWG. NO. M4-4080-01-01K

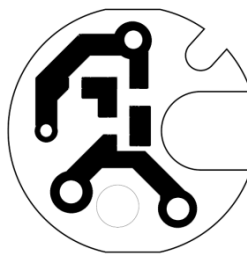

**RIKEN KEIKI**

**理研計測株式会社**

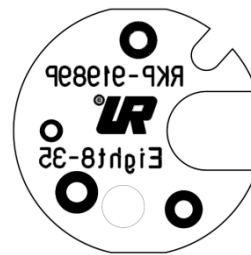
**機密情報 / CONFIDENTIAL**



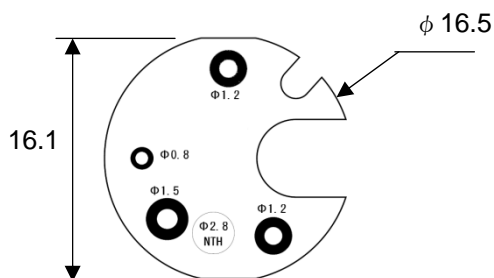
SILK PRINT FOR PARTS SIDE



PARTS SIDE



SOLDERING SIDE



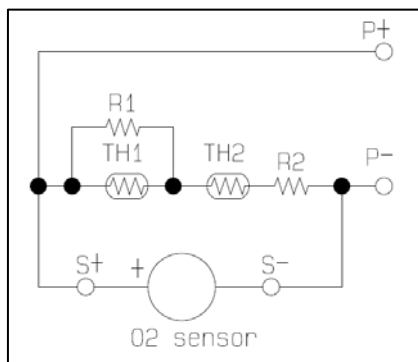
THROUGH HOLE DATA

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

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

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

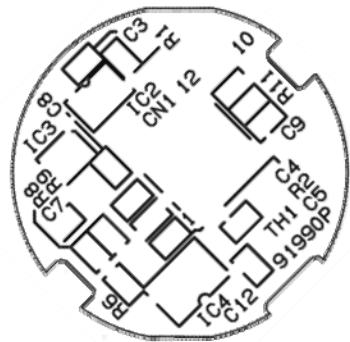
2015.2.24

E 4 - 6 9 9 1 - 5 4 5 7 - 0 0 - 0 1 K

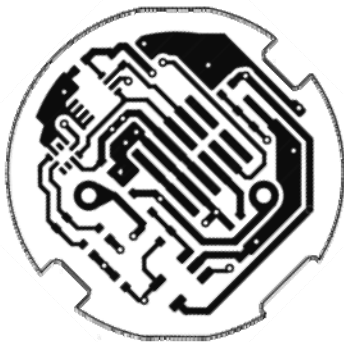


DNV Nemko Presafe AS  
Org. no: 997 067 401 mva  
OSS SENSOR PCB





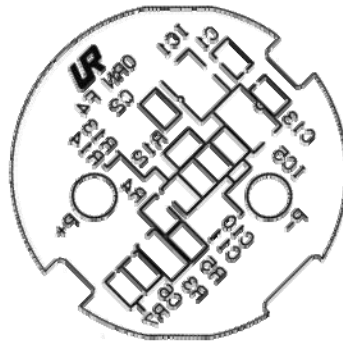
SILK PRINT FOR PARTS SIDE



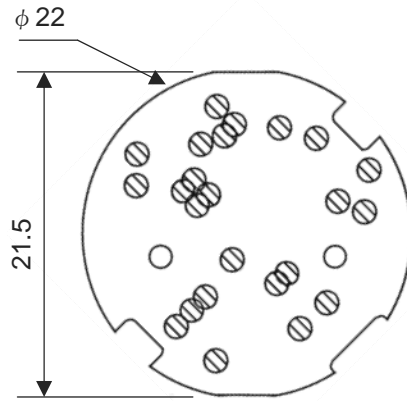
PARTS SIDE



SOLDERING SIDE



SILK PRINT FOR SOLDERING SIDE



THROUGH HOLE DATA

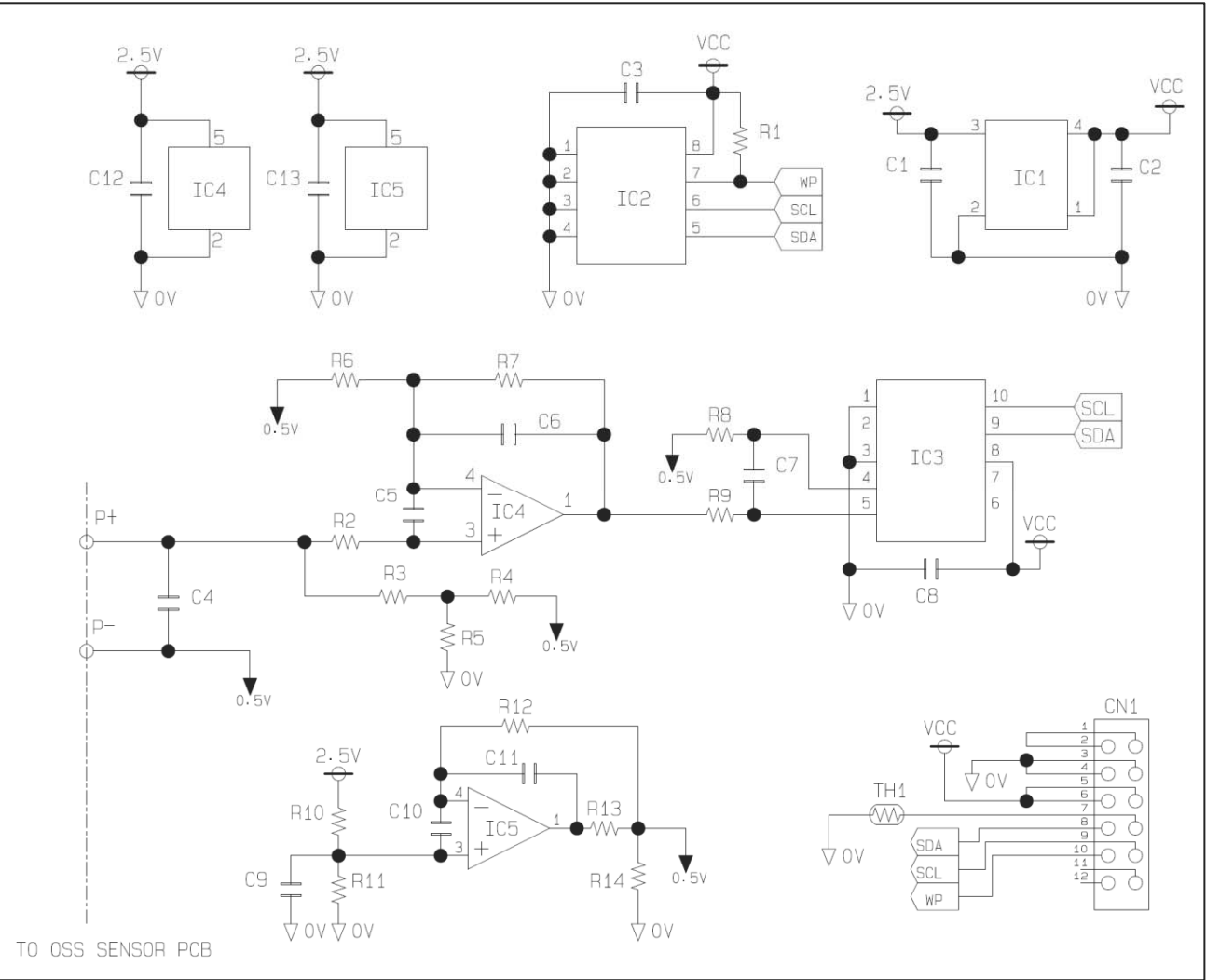
MARK	DIAGRAM	HOLE
⊙	φ 0.3	TH
○	φ 1.0	TH

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

All drawings are view of parts side

SCALE 2:1



SCHEMATIC

PARTS LIST

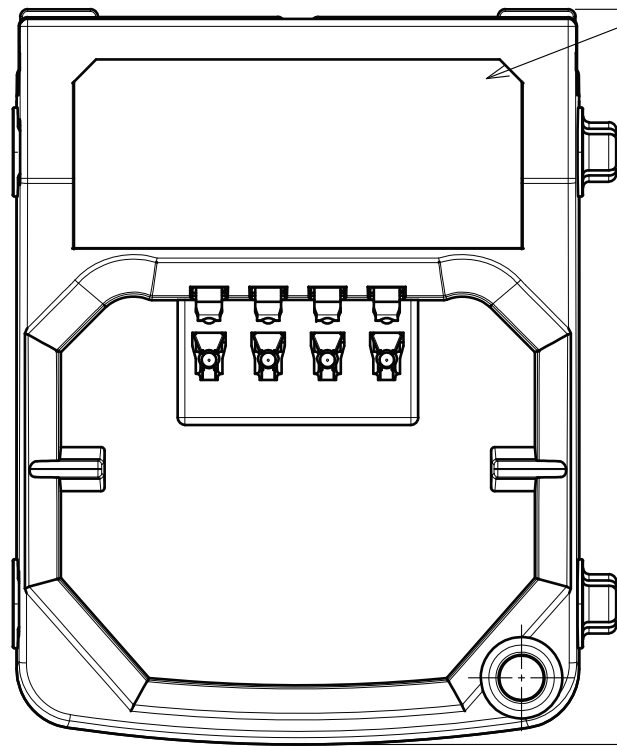
Mark of drawing	Kind of parts	Rating / Model of parts	Remarks
IC1	IC (Voltage regulator)	S-1313D25-N4T1	m
IC2	IC (EEPROM)	S-24C16CI-I8T1	m
IC3	IC (A/D Converter)	ADS1114IRU	m
IC4	IC(OPAMP)	OPA333AIDBV	m
IC5	IC(OPAMP)	AD8500AKS	m
TH1	Chip thermistor	Rt25 = 470 ohm -100 k ohm / 5%, B=3000K-5000K (1005)	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

m marked parts are mounted or not

注 記 NOTES		改版担当 改版日 REV. BY		Presafe® DNV Nemko Presafe AS Org. n° 997 067 401 mva OSS DIGITAL PCB	
改版回数 REV.	0	総頁数 PAGES	1	承認 APPROVED	図 番 DWG. NO.
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	
RIKEN KEIKI		理研計器株式会社		機密情報 / CONFIDENTIAL	



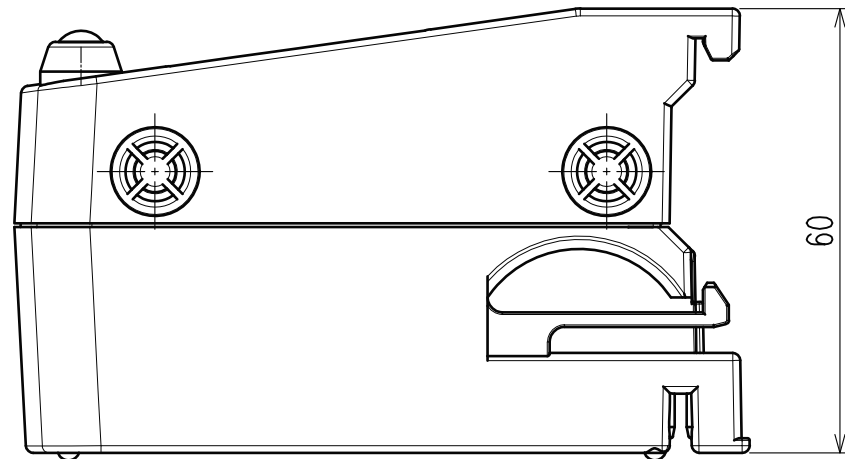
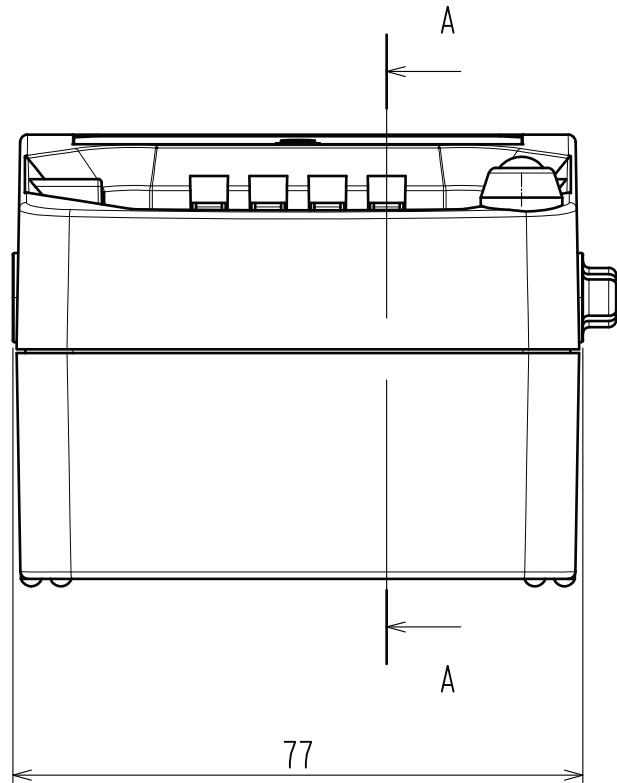
寸法	精度	中級	粗級
1000以上	0.7	1.2	2.5
500以上1000未満	0.5	1.0	2.0
260以上500未満	0.4	0.8	1.6
120以上260未満	0.3	0.6	1.2
50以上120未満	0.2	0.4	0.8
18以上50未満	0.15	0.3	0.6
18未満	0.1	0.2	0.4
寸法	精度	中級	粗級



LABEL

WARNING

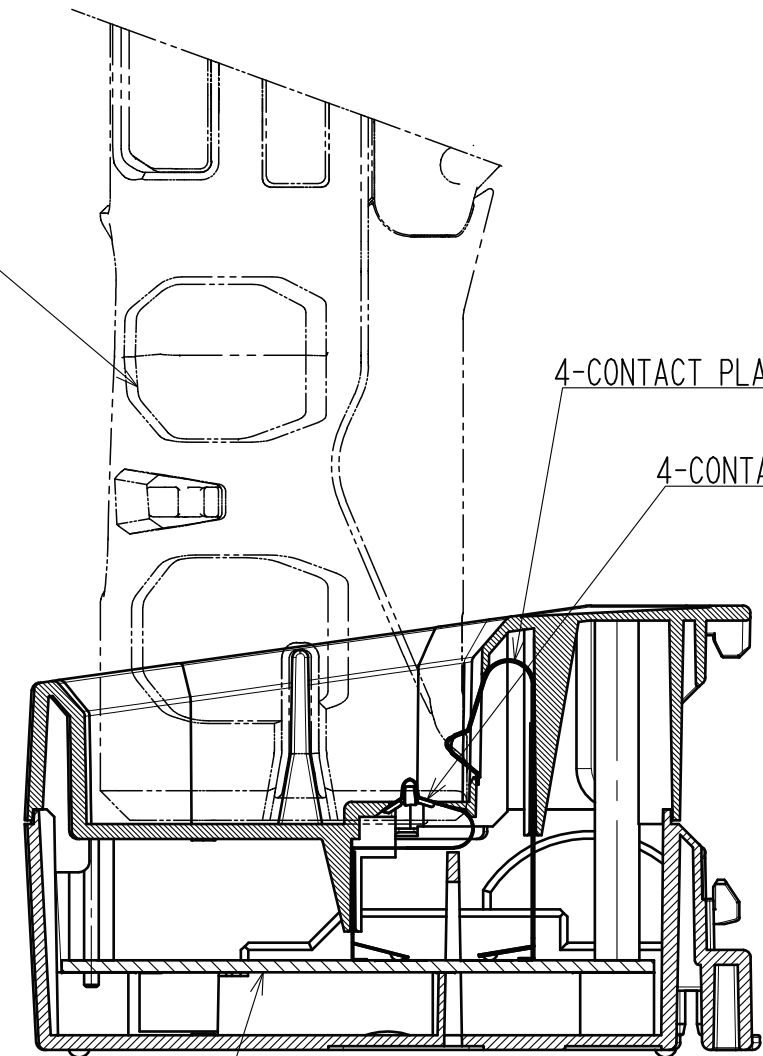
- ・Not for use in hazardous area.
  - ・Use only with exclusive AC adaptor.
- Um=250V



GX-6000

4-CONTACT PLATE(B)

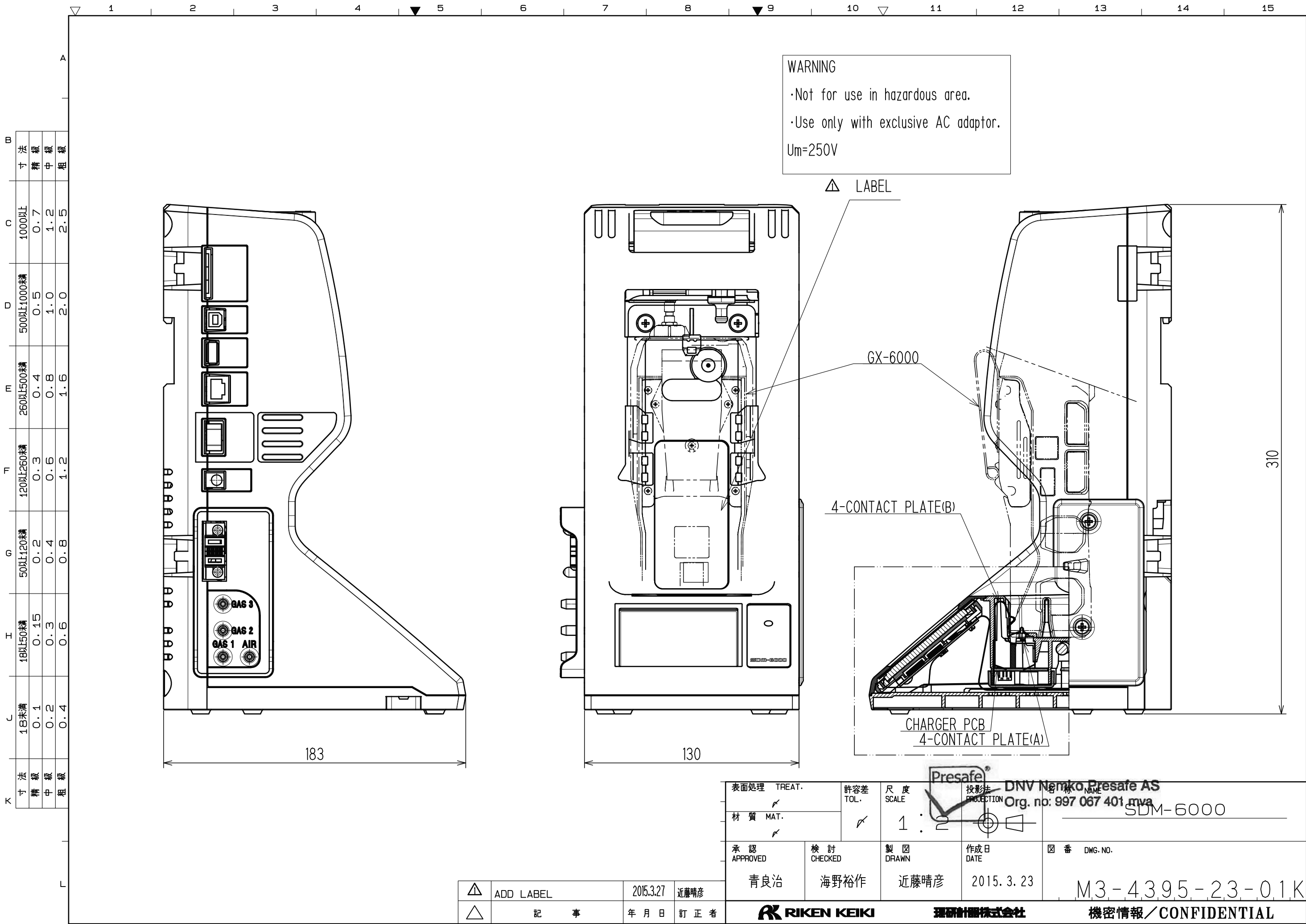
4-CONTACT PLATE(A)



CHARGER PCB

断面 A-A

表面処理 TREAT.	許容差 TOL.	尺度 SCALE	投影法 PROJECTION	Presafe® DNV Namko Presafe AS Org. no: 997 067 401 mya
材質 MAT.		1 : 1		BC-6000
承認 APPROVED	検討 CHECKED	製図 DRAWN	作成日 DATE	図番 DWG. NO.
青良治	海野裕作	近藤晴彦	2015. 3. 24	M3-4777-02-01K
<div> <div>△ ADD LABEL</div> <div>2015.3.27 近藤晴彦</div> <div>△ 記事</div> <div>年月日 訂正者</div> </div> <div> <div>RIKEN KEIKI</div> <div>理研計器株式会社</div> <div>機密情報 / CONFIDENTIAL</div> </div>				



表面処理 TREAT.	許容差 TOL.	尺度 SCALE	投影法 PROJECTION	製図人 NAME
材質 MAT.		1 : 2		近藤晴彦
承認 APPROVED	検討 CHECKED	製図 DRAWN	作成日 DATE	図番 DWG. NO.
青良治	海野裕作	近藤晴彦	2015. 3. 23	M3-4395-23-01K
RIKEN KEIKI 理研計器株式会社 機密情報 / CONFIDENTIAL				

△ ADD LABEL	2015.3.27	近藤晴彦
△ 記事	年月日	訂正者