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FURUNO

INSTALLATION MANUAL

TRANSCEIVER UNIT

ETR-5D1/10D1

MODEL ETR-5D2/10D2

FURUNO ELECTRIC CO., LTD.
NISHINOMIYA, JAPAN

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© FURUNO ELECTRIC CO., LTD.

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Your Local Agent/Dealer

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(TENI) ETR-5D/10D

000806631 00

IME20200C00

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⚠ SAFETY INSTRUCTIONS

"**DANGER**", "**WARNING**" and "**CAUTION**" notices appear throughout this manual. It is the responsibility of the installer of the equipment to read, understand and follow these notices. If you have any questions regarding these safety instructions, please contact a FURUNO agent or dealer.

⚠ **DANGER**	This notice indicates a potentially hazardous situation which, if not avoided, will result in death or serious injury.
⚠ **WARNING**	This notice indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ **CAUTION**	This notice indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury, or property damage.

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⚠ WARNING



Hazardous voltage.
Can shock, burn or cause serious injury.

Do not work inside the equipment unless totally familiar with electrical circuits.

Turn off the power at the mains switchboard before beginning the installation.

Electrical shock or fire can result if the power is not turned off.

⚠ CAUTION



Ground the equipment to prevent electrical shock and mutual interference.

Confirm that the power supply voltage is compatible with the voltage rating of the equipment.

Connection to the wrong power supply an cause fire or equipment damage. The voltage rating appears on the label at the rear of the display unit.

Use the correct fuse.

Use of a wrong fuse can cause fire or equipment damage.

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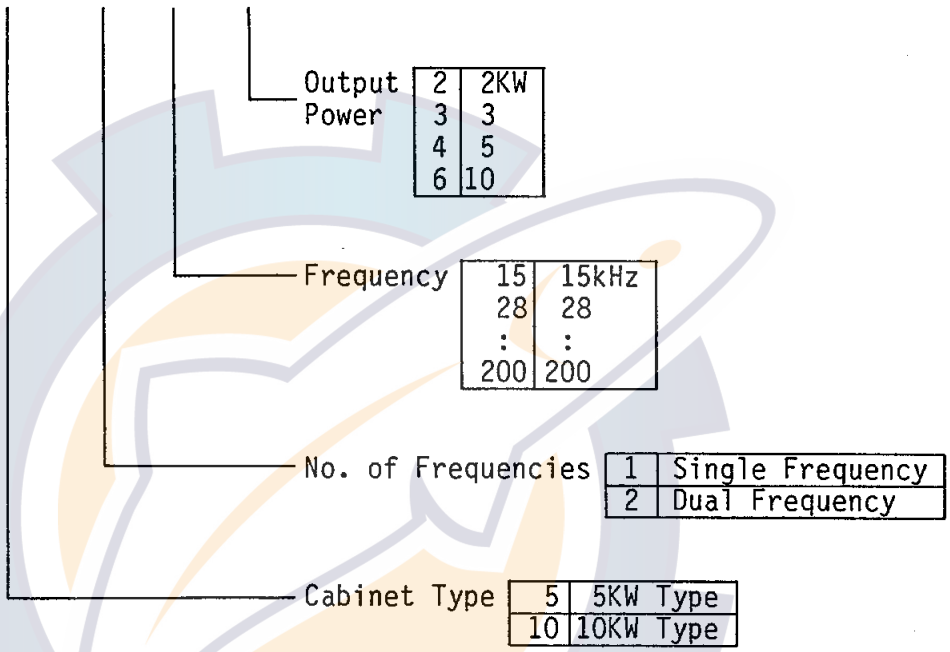
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SPECIFICATIONS

1. Type: ETR-[5] D [1]-[50]-[4]
*1 *2



NOTE *1. In case of a dual frequency transceiver, put numbers for two frequencies like ([28]/[50]).

*2. All available combinations of frequency and output power are listed below.

2. Frequency, Output Power, Transducer and Tank

.Single Frequency Type

Type	Frequency (kHz)	Output (KW)	Transducer	Transducer Tank		
				Steel	FRP	Wood
ETR-5D1	15	3	15F-10x2	T-671	T-671-F	T-671-W
	28	5	28F-38M	T-652	T-652-F	T-652-W
	50	5	50F-38	T-653	T-653-F	T-653-W
	88	5	88F-126H	T-618	T-618-F	———
		3	88B-10x2	T-505	T-505-F	*
	200	5	200B-12H	T-615	T-615-F	———
		2	200B-8B	T-608	T-608-F	T-608-W
ETR-10D1	28	10	28F-72	T-672	T-672-F	*
	50	10	50F-70	T-673	T-673-F	*

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.Dual Frequency Type

Type	Frequency (kHz)	Output (KW)	Transducer	Transducer Tank		
				Steel	FRP	Wood
ETR-5D2	15/200	3/5	15F-10x2 200B-12H	T-661	T-661-F	———
		3/2	15F-10x2 200B-8B	*	*	*
	28/50	5	28F-38M 50F-38	T-662	T-662-F	
	28/88	5	28F-38M 88F-126H	———	———	———
		5/3	28F-38M 88B-10x2	*	*	*
	28/200	5	28F-38M 200B-12H	———	———	———
		5/2	28F-38M 200B-8B	T-219	T-219-F	T-219-W
	50/88	5	50F-38 88F-126H	———	———	———
		5/3	50F-38 88B-10x2	*	*	*
	50/200	5	50F-38 200B-12H	———	———	———
		5/2	50F-38 200B-8B	T-211	T-211-F	T-211-W
	88/200	5	88F-126H 200B-12H	T-685	T-685-F	———
		3/2	88B-10x2 200B-8B	———	———	———
	200/200	5	200B-12Hx2	———	———	———
ETR-10D2	28/50	10	28F-72 50F-70	T-679	T-679-F	*
	28/88	10/5	28F-72 88F-126H	———	———	———
		10/3	28F-72 88B-10x2	*	*	*
	28/200	10/5	28F-72 200B-12H	———	———	———
		10/2	28F-72 200B-8B	T-209	T-209-F	*
	50/88	10/5	50F-70 88F-126H	———	———	———
		10/3	50F-70 88B-10x2	*	*	*
	50/200	10/5	50F-70 200B-12H	———	———	———
		10/2	50F-70 200B-8B	*	*	*

NOTE *1. ——— : to be supplied locally.
*2. * : to be designed and supplied by FURUNO on demand.
*3. Output power may vary within ±20%.

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3. Color Video Sounder to be : FCV-210T/220WT/221T
FCV-140, etc

4. Pulselength of Keying Pulse : Longer than 6ms
(Keying Pulse to be fed from the display unit)

5. Environmental Temperature : -10°C to +50°C

6. Installation Materials

. Interconnection Cable Assy : S02-6-10(24P), 10m, with one connector factory-fitted. 1pc.(2 pcs. in case of the dual frequency transceiver)

. Crimp-on Lug : FV1.25-3, red(3mm) 20pcs.
FV2-4, blue(4mm) 30pcs.

7. Spare Parts : FGBO, 5A 3pcs.

8. Coating Color : 2.5GY5/1.5

9. Power Supply : 100/110/115/220/230V, 50/60Hz, 1ø
(Voltage Allowance: -10 to +20%)

Power Consumption

ETR-5D1 : less than 150VA.
ETR-5D2/10D1 : less than 250VA.
ETR-10D2 : less than 350VA.

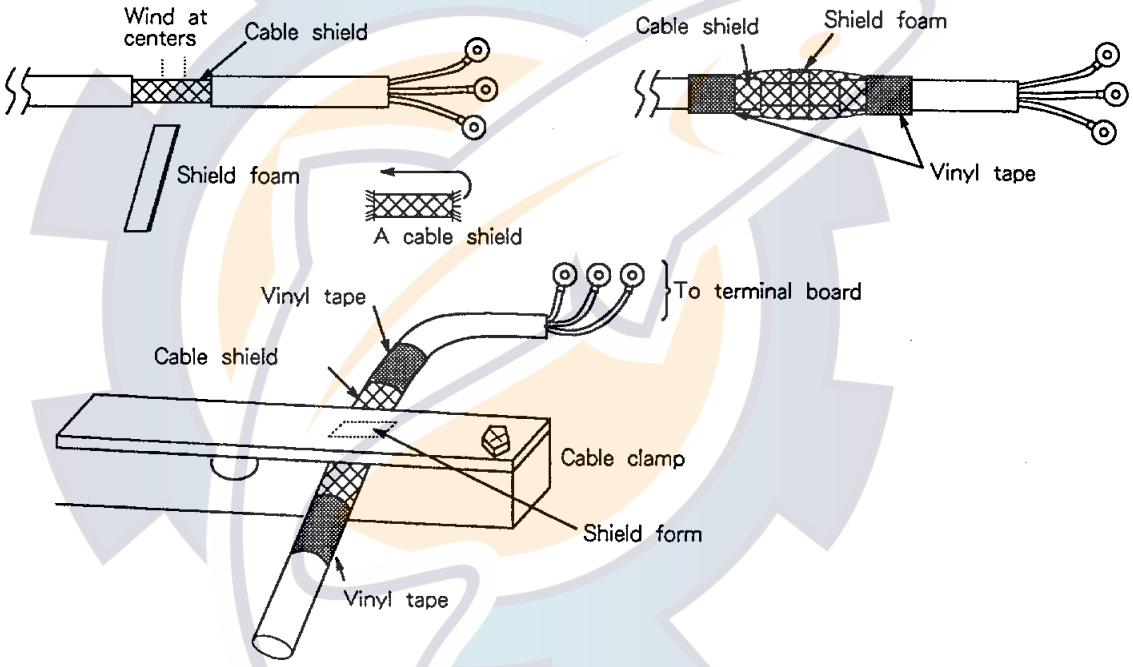
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INTERCONNECTION

Fablication of Cables

Transducer and power cables must be grounded through the cable clamp as below.

1. Remove the cable sheath about 30 mm at the location the cable is clamped.
2. Wind the shield foam supplied over the cable shield.
3. Pass the cable though a cable shield until it covers the foam.
4. Tape the both ends of the cable shield.

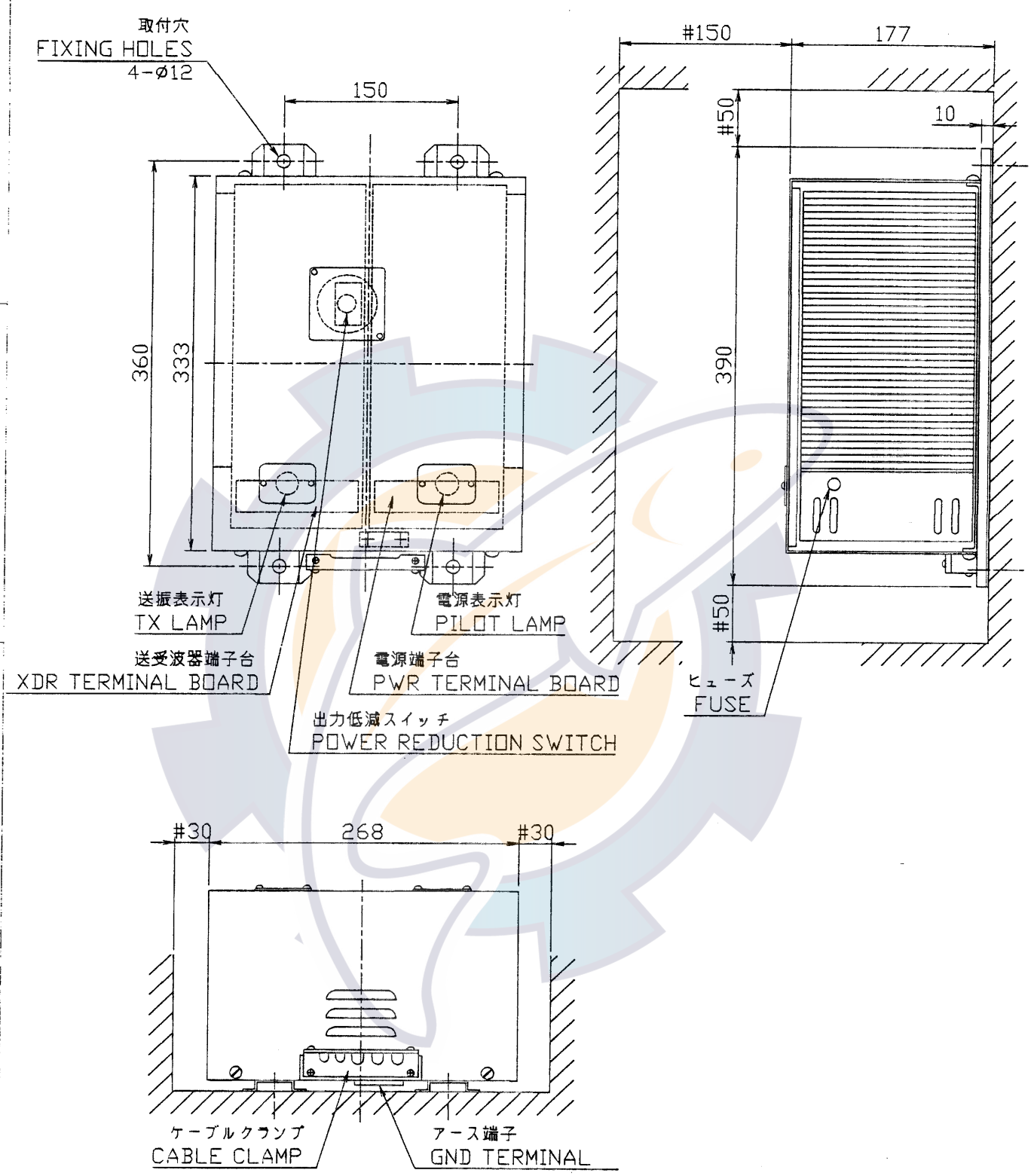


DIP Switch Setting

Refer to the Operator's Manual for the echosounder to be connected for DIP switch setting.

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注記
1）#：推奨する最小サービス空間寸法。

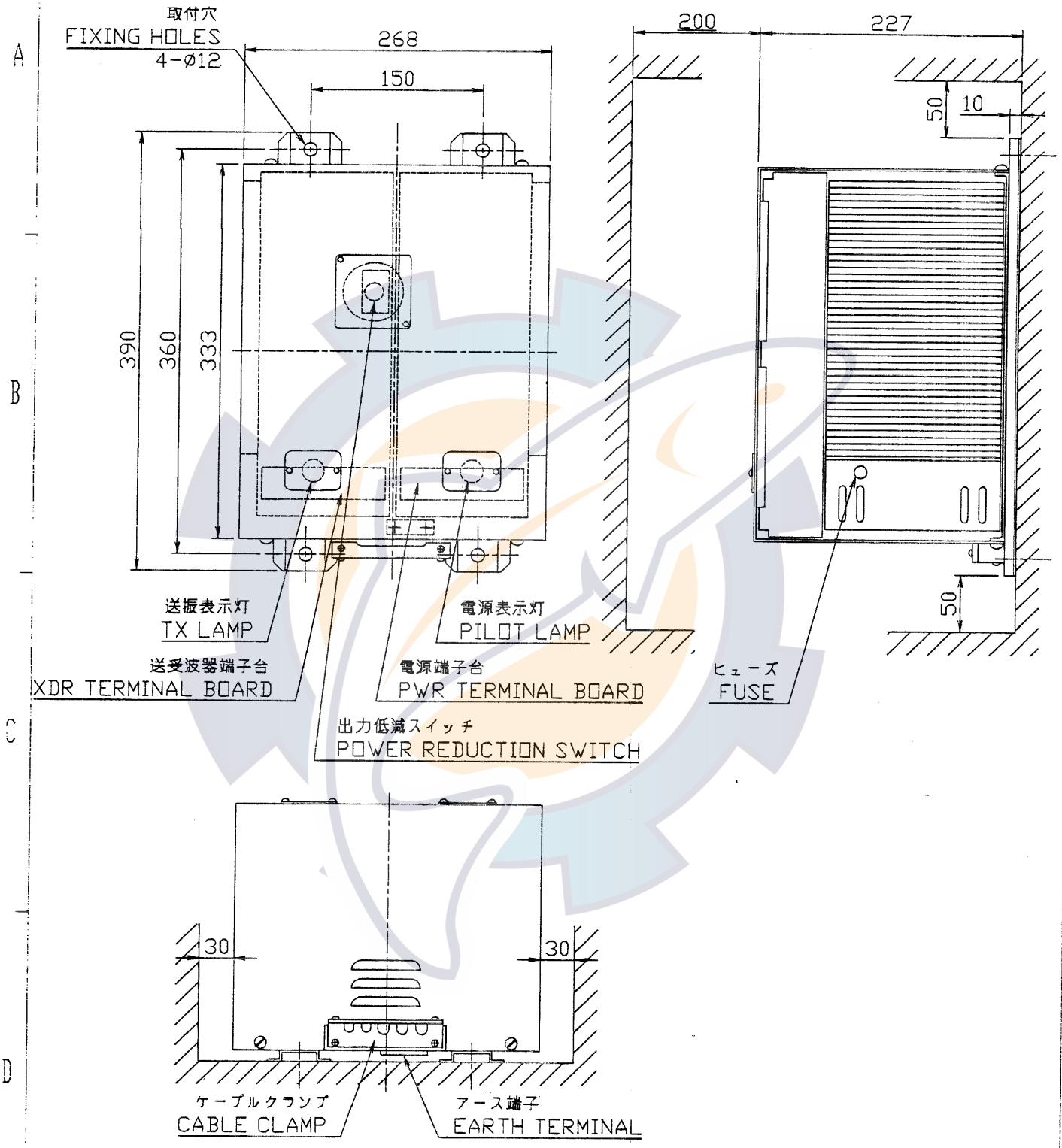
NOTE
1. #: RECOMMENDED SERVICE CLEARANCE.

DRAWN May 21 '01 T.YAMASAKI			TITLE ET-5A1 / ETR-5D1
CHECKED May 21 '01 Y.KIMURA			名称 外部発振器 / 送受信器
APPROVED May 21 '01 Y.KIMURA			外寸図
SCALE 1/5 MASS 12.3 ±10% kg			NAME TRANSMITTER UNIT / TRANSCEIVER UNIT
DWG.No. C2012-031- D			OUTLINE DRAWING

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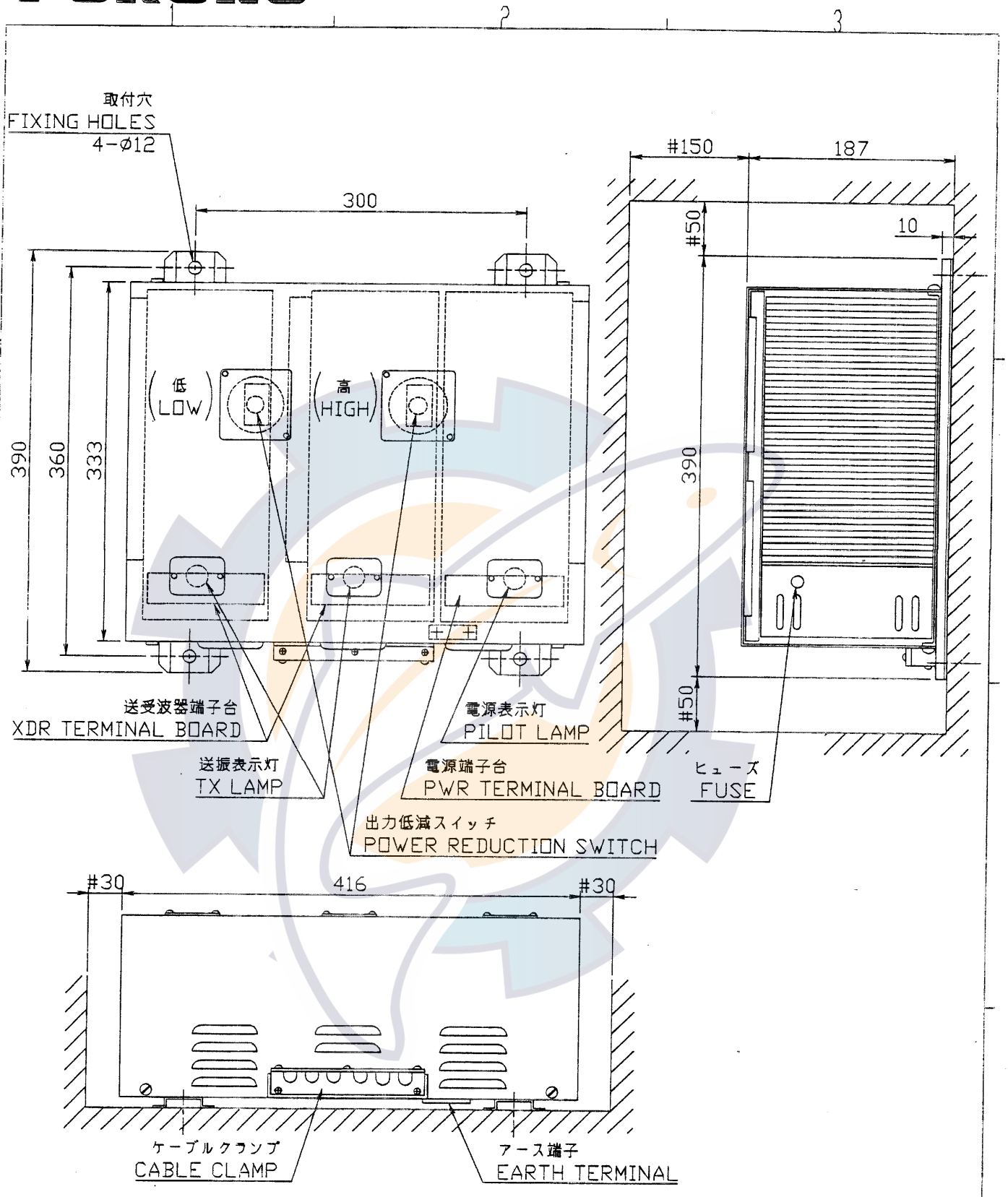
FURUNO



DRAWN May 21 '01 T.YAMASAKI			TITLE ET-10A1 / ETR-10D1
CHECKED May 21 '01 Y.KIMURA			名称 外部発振器 / 送受信器
APPROVED May 21 '01 Y.KIMURA			外寸図
SCALE 1/5 MASS 14.2 ±10% kg			NAME TRANSMITTER UNIT / TRANSCEIVER UNIT
DWG.No. C2012-033- D			OUTLINE DRAWING

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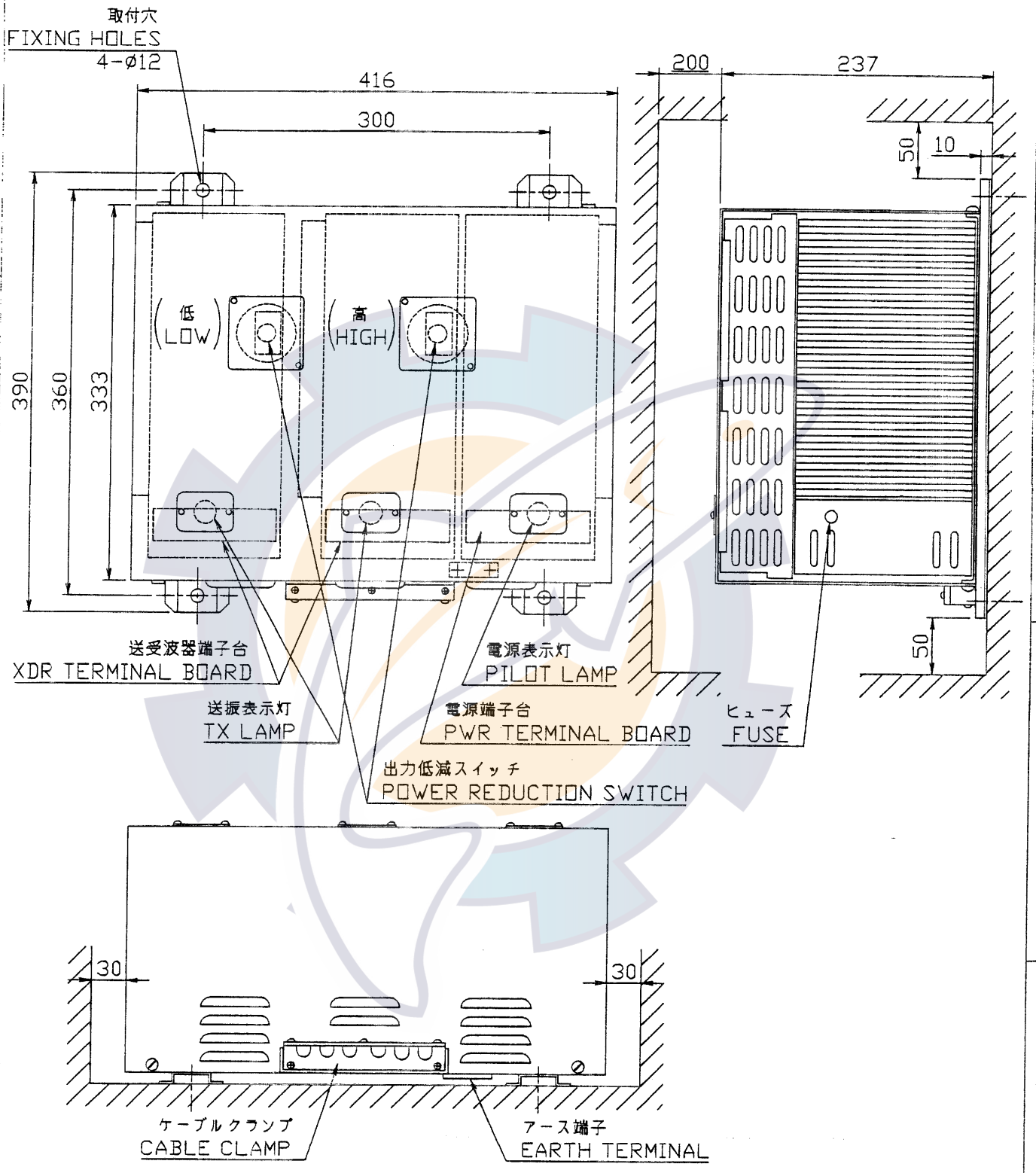
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DRAWN May 21 '01 T.YAMASAKI			TITLE ET-5A2 / ETR-5D2
CHECKED May 21 '01 Y.KIMURA			名称 外部発振器 / 送受信器
APPROVED May 21 '01 Y.KIMURA			外観図
SCALE 1/5	MASS 17.5 ±10% kg		NAME TRANSMITTER UNIT / TRANSCEIVER UNIT
DWG.No. C2012-032- D			OUTLINE DRAWING

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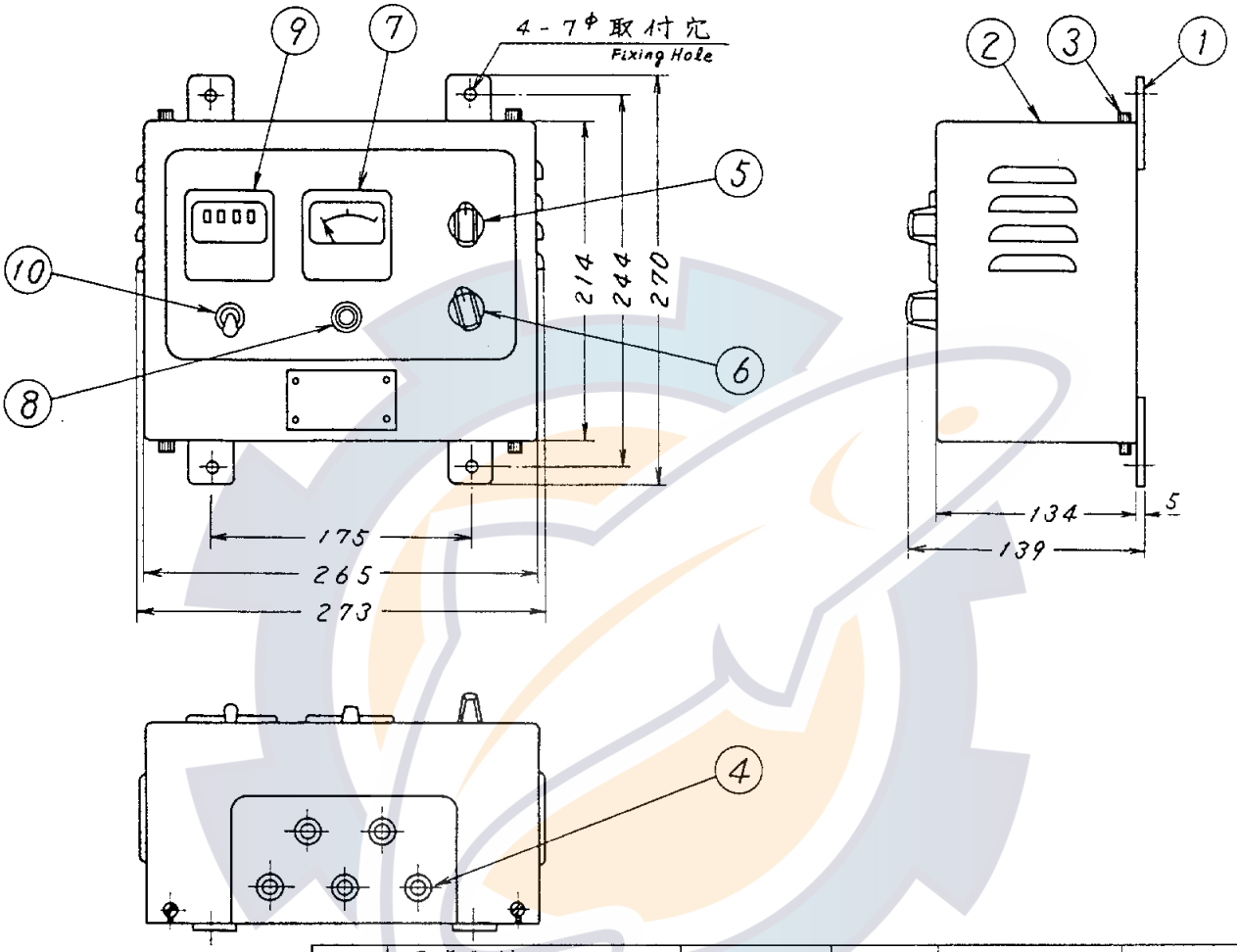
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DRAWN May 21 '01 T.YAMASAKI			TITLE ET-10A2 / ETR-10D2
CHECKED May 21 '01 Y.KIMURA			名称 外部発振器 / 送受信器
APPROVED May 21 '01 Y.KIMURA			外寸図
SCALE 1/5	MASS 20.6 ±10% kg		NAME TRANSMITTER UNIT / TRANSCEIVER UNIT
DWG.No. C2012-034- D			OUTLINE DRAWING

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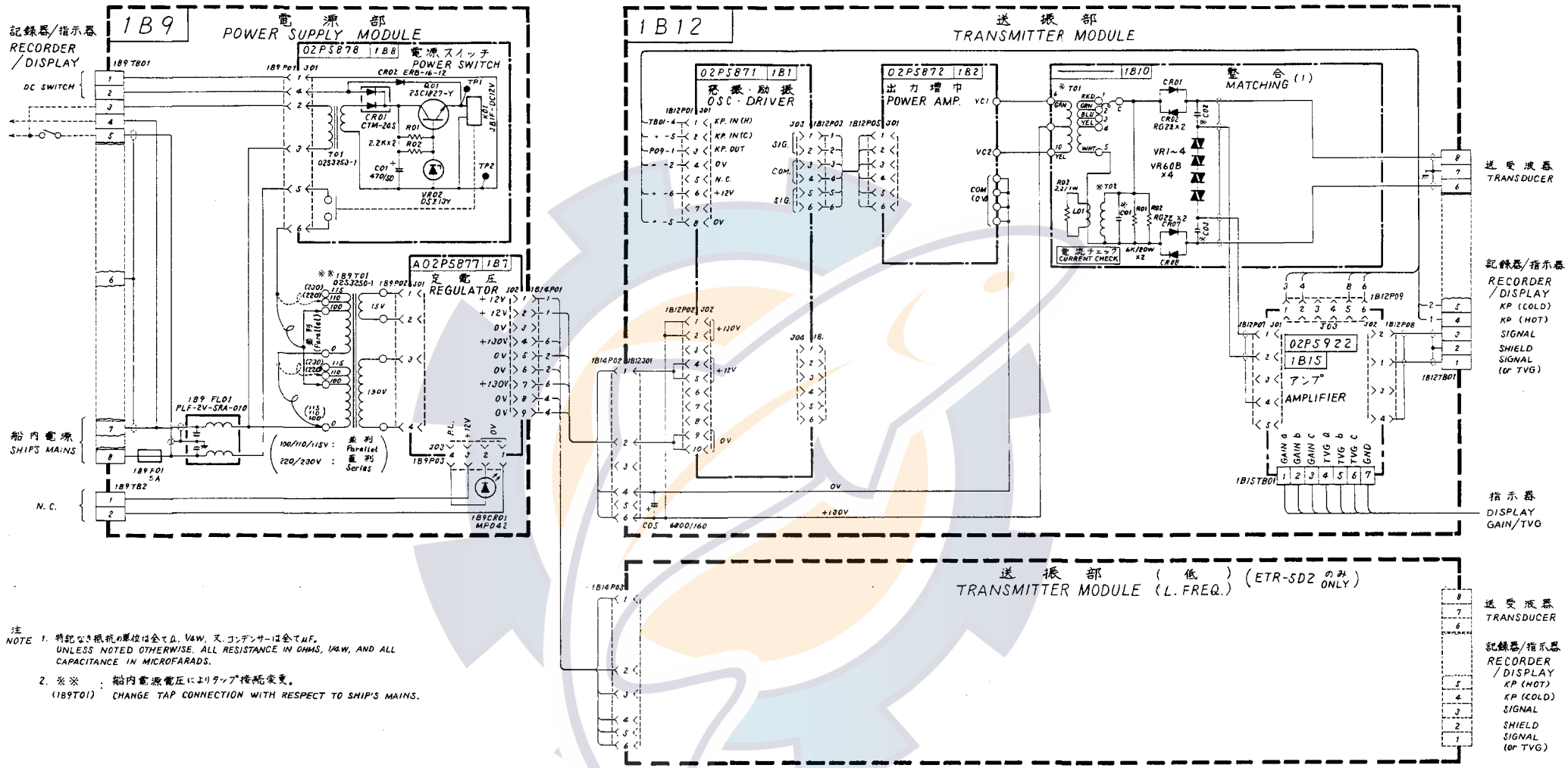


ITEM	NAME	MATERIAL	Q'TY	DWG. NO.	REMARK
10	周波数計スイッチ Frequency Meter SW.				
9	周波数計 Frequency Meter				
8	ヒューズ Fuse				
7	電源電圧計 Volt Meter				
6	電源開閉 Power SW.				
5	電源電圧調整 Voltage Control				
4	ゴムブッシュ Rubber Bush				
3	ケース蓋止めビス Biss For Fixing Case Cover				
2	ケース蓋 Case Cover				
1	ケース本体 Case				

課長 APPROVED	DEC. 16.'82	尺度 SCALE	1/5	名称 TITLE	F - 10A 10KW 交流電圧調整器 AC VOLTAGE CONTROL
検図 CHECKED	Dec. 16.82	図法 DRAWING	三角法 TRIGON		
製図 DRAWN	1.5.'79 A. Iwasaki	重量 WEIGHT	kg	図番 DWG. NO	C2004-008-A

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注 NOTE

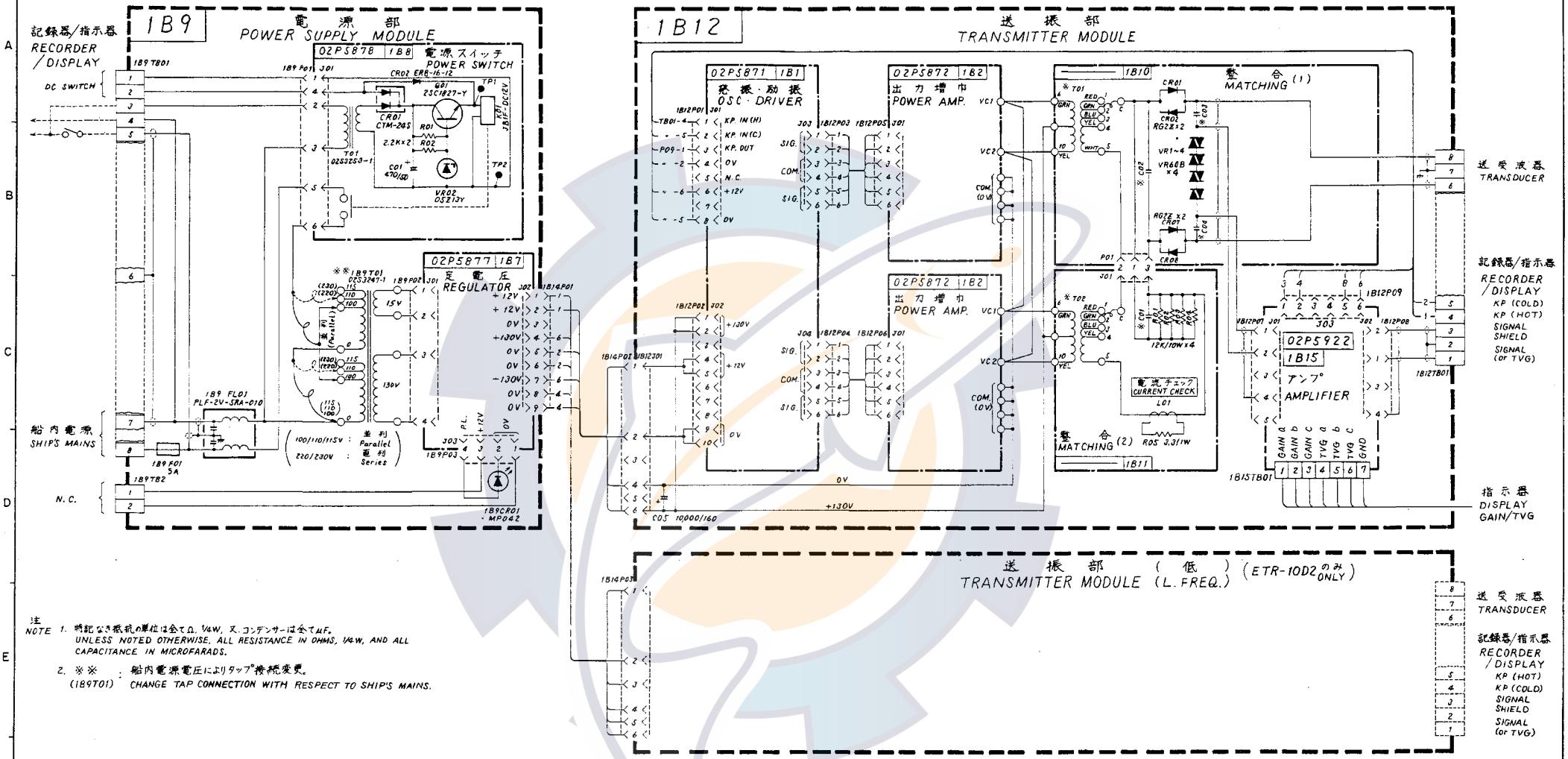
1. 特記なき抵抗の単位は全てΩ, 1/4W, 又, コンデンサーは全てμF。
   UNLESS NOTED OTHERWISE, ALL RESISTANCE IN OHMS, 1/4W, AND ALL CAPACITANCE IN MICROFARADS.
2. ※※ (1B9T01) : 船内電源電圧によりタップ接続変更。
   CHANGE TAP CONNECTION WITH RESPECT TO SHIP'S MAINS.
3. ※印の部品の定数或は型式は周波数により異なる。下表参照。
   ※ PARTS DIFFERENT ON SYSTEM FREQUENCY. SEE TABLE BELOW.

周波数 FREQUENCY	15 kHz	28 kHz	50 kHz	88 kHz		200 kHz	
送受波器 XDR	15F-10 x2	28F-38M	50F-38	88B-10 x2	88F-126H	200B-8B	200B-12H
C01	4700/35V x2	2200/35V	1000/35V	OPEN	.0047/10KV	OPEN	.0047/10KV
C02/C03	.015/3KV	.006B/5KV	.0033/8KV	.0022/8KV	.0022/8KV	.001/8KV	.001/8KV
T01	02S0722	02S0676	02S0677	02S0724	02S0724	02S0679	02S0679
T02	OPEN	OPEN	OPEN	02S0726-1	02S0726-1	02S0727	02S0727
T01 タップ接続 TAP CONNECTION	②—C	②—C	②—C	②—C	①—C	②—C	①—C
02PS871	A02PS871-15kHz	A02PS871-28kHz	A02PS871-50kHz	B02PS871-88kHz	A02PS871-88kHz	B02PS871-200kHz	A02PS871-200kHz
02PS922	02PS922-15kHz	02PS922-28kHz	02PS922-50kHz	02PS922-88kHz		02PS922-200kHz	

DRAWN 01/11/20 T.YAMASAKI		TYPE	ETR-5D1/5D2
CHECKED 01/11/20		名称	魚探用送受振機
APPROVED 01/11/20			回路図
SCALE	MASS	BLOCK No.	NAME TRANSCEIVER UNIT (GENERAL)
Dwg. No. C2020-014-C			SCHEMATIC DIAGRAM

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注
NOTE 1. 特記なき抵抗の単位は全てΩ, 1/4W, 又, コンデンサーは全てμF。
UNLESS NOTED OTHERWISE, ALL RESISTANCE IN OHMS, 1/4W, AND ALL CAPACITANCE IN MICROFARADS.

2. ※※ (1B9T01) : 船内電源電圧によりタップ接続変更。
CHANGE TAP CONNECTION WITH RESPECT TO SHIP'S MAINS.

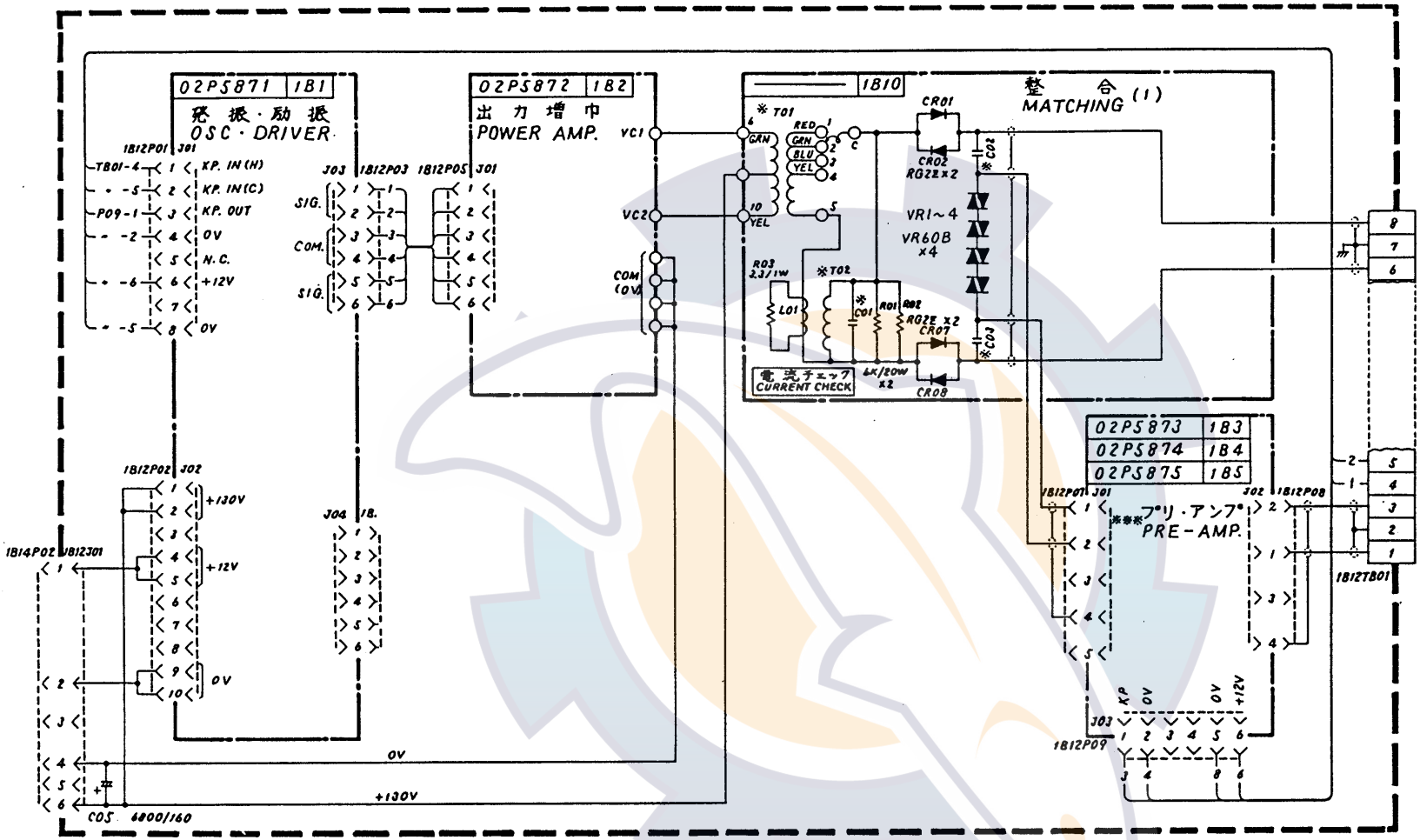
3. ※印の部品の定数或は型式は周波数により異なる。下表参照。
※ PARTS DIFFERENT ON SYSTEM FREQUENCY. SEE TABLE BELOW.

周波数 FREQUENCY	15 kHz	28 kHz	50 kHz	88 kHz		200 kHz	
送受波器 XDR		28F-72	50F-70	88B-10×2	88F-126H	200B-88	200B-12H
C01		.033/8KV ×2	.01/8KV ×2	OPEN	.0047/10KV	OPEN	.0047/10KV
C02		.033/8KV ×2	.033/8KV ×2				
C03/C04		.0068/8000	.0033/8000	.0022/8KV	.0022/8KV	.001/8KV	.001/8KV
T01		02S0673	02S0674	02S0724	02S0724	02S0679	02S0679
T02		02S0673	02S0674	02S0726-1	02S0726-1	02S0727	02S0727
T01/T02 タップ接続 TAP CONNECTION		②—C	②—C	②—C	①—C	②—C	①—C
02PS871		02PS871-28kHz	02PS871-50kHz	B02PS871-88kHz	A02PS871-88kHz	B02PS871-200kHz	A02PS871-200kHz
02PS922		02PS922-28kHz	02PS922-50kHz	02PS922-88kHz		02PS922-200kHz	

DRAWN 01/11/20 T.YAMASAKI		TYPE	ETR-10D1/10D2
CHECKED 01/11/20 T.K.		名称	魚探用送受振機
APPROVED 01/11/20 T.K.			回路図
SCALE	MASS	BLOCK No.	NAME TRANSCEIVER UNIT (GENERAL)
Dwg. No. C2020-015-C			SCHEMATIC DIAGRAM

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注 NOTE

1. ※印の部品の定数或は型式は周波数により異なる。下表参照。
※ PARTS DIFFERENT ON SYSTEM FREQUENCY. SEE TABLE BELOW.

周波数 FREQUENCY	88 kHz		200 kHz	
送受波器 XDR	88B-10×2	88F-12SH	200B-8B	200B-12H
C01	OPEN	.0047/10KV	OPEN	.0047/10KV
C02/C03	.0022/8KV	.0022/8KV	.001/8KV	.001/8KV
T01	02S0724	02S0724	02S0679	02S0679
T02	02S0726-1	02S0726-1	02S0727	02S0727
T01 タップ接続 TAP CONNECTION	②—ⓒ	①—ⓒ	②—ⓒ	①—ⓒ
02PS871	B02PS871-88kHz	A02PS871-88kHz	B02PS871-200kHz	A02PS871-200kHz
02PS873~75	02PS873 75 -88kHz		02PS873 75 -200kHz	

2. ※※ (1B9T01) : 船内電源電圧によりタップ接続変更。
CHANGE TAP CONNECTION WITH RESPECT TO SHIP'S MAINS.

3. ※※※ (PRE-AMP) : 接続される記録器の型式により異なる:
SHOULD BE SELECTED ACCORDING TO RECORDER AMONG:
型式 TYPE 1 - 02PS873 : FE-614/814/651/801/802/881/824/1224, FCV-201/201S
2 - 02PS874 : FUV/G, FWGT
3 - 02PS875 : FE-822S, FCV-121/161

4. 特記なき抵抗の単位は全てΩ, 1/4W, 又, コンデンサーは全てμF。
UNLESS NOTED OTHERWISE, ALL RESISTANCE IN OHMS, 1/4W, AND ALL CAPACITANCE IN MICROFARADS.

ITEM 品番	NAME 品名	MATERIAL 材質	Q TY 数量	DWG.NO. 図番	REMARKS 摘要

APPROVED 承認	Nov.22.'82	THIRD ANGLE PROJECTION 三角法	TITLE 名称
CHECKED 検図		SCALE 尺度	88, 200 kHz 送波部 TRANSMITTER MODULE
DRAWN 製図	Nov.22.'82 m.m	WEIGHT 重量 kg	DWG.NO. 図番 C2012-028-D

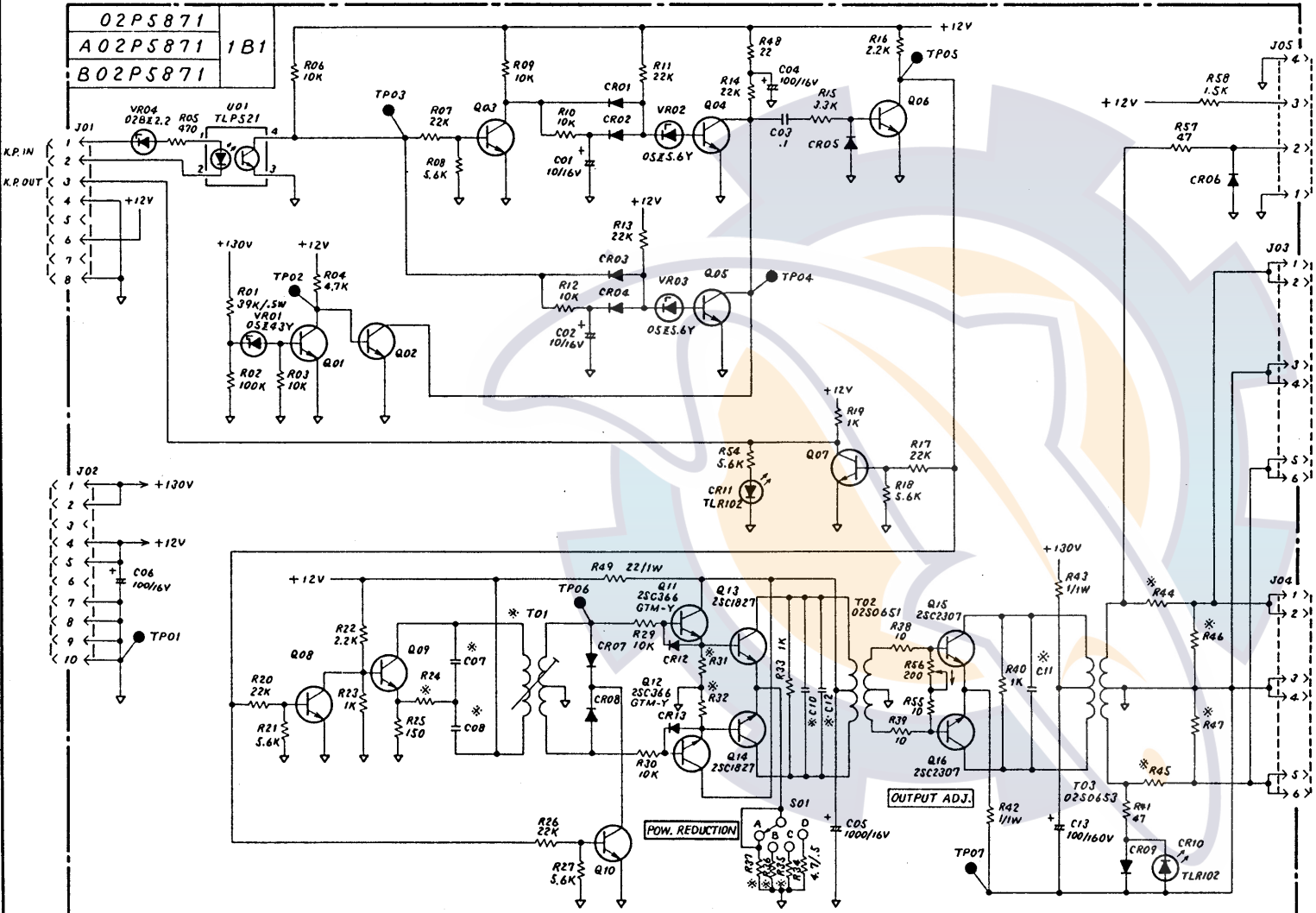
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S-13

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02PS871
A02PS871 1B1
B02PS871



NOTE:

1. 記名無きトランジスターは全て 2SC372GTM-Y.
   UNLESS NOTED OTHERWISE, ALL TRANSISTORS ARE 2SC372GTM-Y.
2. 記名無きダイオードは全て 1S1588.
   UNLESS NOTED OTHERWISE, ALL DIODES ARE 1S1588.
3. 特記無き抵抗の単位は全てΩ, 1/4W 又コンデンサーはμF.
   UNLESS NOTED OTHERWISE, ALL RESISTANCE IN OHMS, 1/4W, AND ALL CAPACITANCE IN MICROFARADS.
4. ※

周波数 FREQUENCY (KHz)		15	28	50	60	88	200
T01		02S0855	02S0470C	FD-0420B	FD-0421	FD-0420	FD-0422
C07		.1	.068	.033	.033	.01	.033
C08		.22	.15	.068	.068	.022	.068
C10		.33	.18	1.2	.047	.056	.039
C11		.033	.022	.015	.015	.0068	.0033
R24		100	220	220	220	220	75
C12		OPEN	OPEN	OPEN	OPEN	OPEN	OPEN
R35	○	—	82	100	—	—	—
	Ⓐ	47	12	12	—	12	15
	Ⓑ	—	—	—	12	12	15
R36	○	—	330	330	—	—	—
	Ⓐ	100	39	39	—	39	39
	Ⓑ	—	—	—	39	39	39
R37	○	—	18	18	—	—	—
	Ⓐ	18	18	18	—	18	12
	Ⓑ	—	—	—	18	18	12
R44 R45	○	—	.33/1W	.33/1W	—	—	—
	Ⓐ	.47/1W	.47/1W	.47/1W	—	.47/1W	.47/1W
	Ⓑ	—	—	—	.47/1W	.47/1W	.47/1W
R46 R47	○	—	OPEN	OPEN	—	—	—
	Ⓐ	.56/1W	1.5/1W	2.2/1W	—	2.2/1W	OPEN
	Ⓑ	—	—	—	.47/1W	.47/1W	.47/1W
送受波器 XDR	○	—	28F-72	50F-70	—	—	—
	Ⓐ	15F-10 x2	28F-38M	50F-38	—	88F-126M	200B-12M
	Ⓑ	—	—	—	60B-55	88B-10 x2	200B-8
R31 R32	○	—	150	150	—	—	—
	Ⓐ	150	75	75	—	75	150
	Ⓑ	—	—	—	75	75	150

○ : 02PS871 (ET-10A)
Ⓐ : A02PS871 } (ET-5A)
Ⓑ : B02PS871 }

ITEM	NAME	MATERIAL	Q'TY	DWG.NO	REMARKS

APPROVED	Sep. 24. '82	THIRD ANGLE PROJECTION	TITLE (A, B) 02PS871 発振・励振 OSC・DRIVER
CHECKED		SCALE	
DRAWN	Sep. 8. '82	WEIGHT	DWG.NO C2012-043-E

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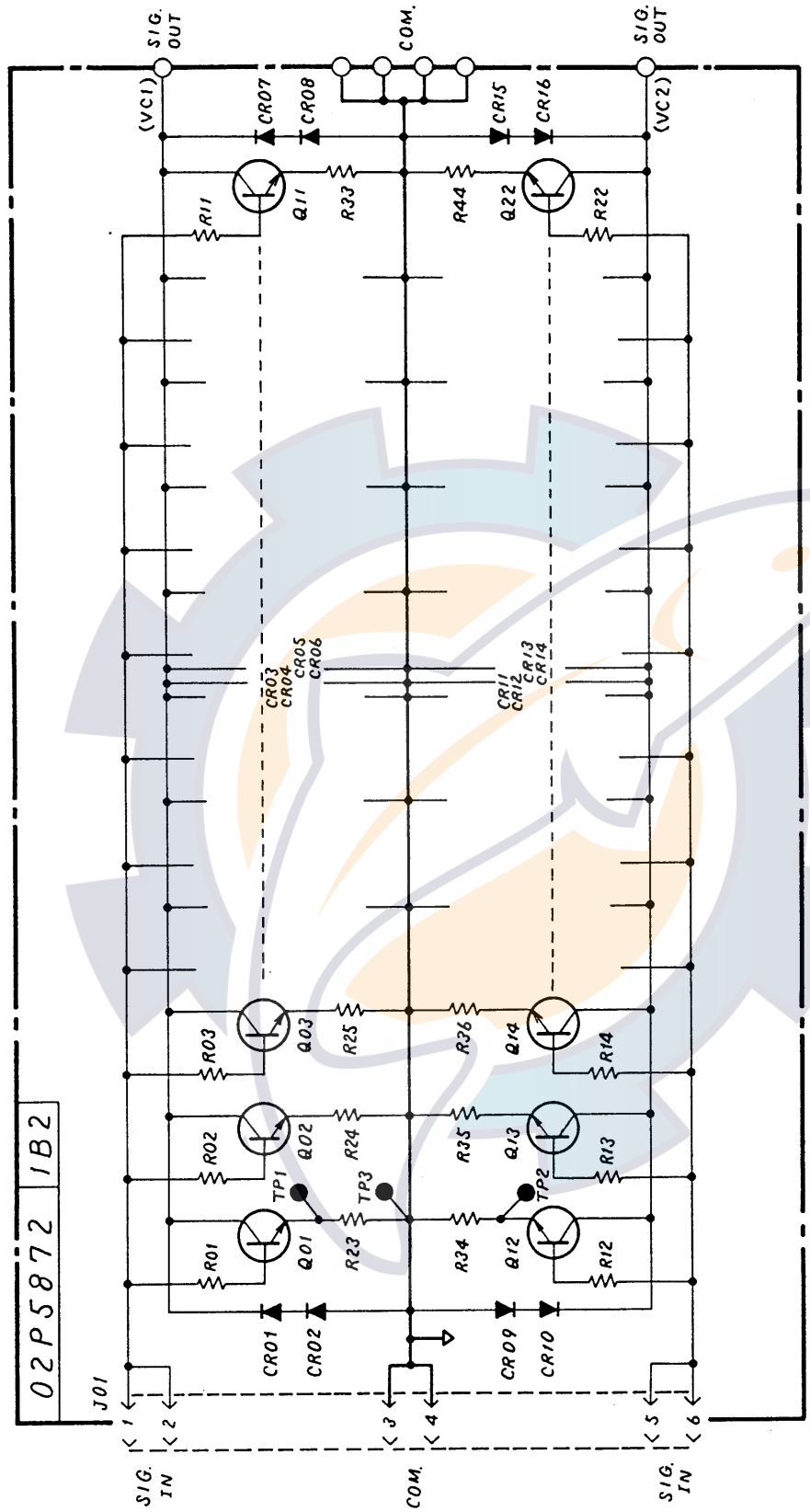
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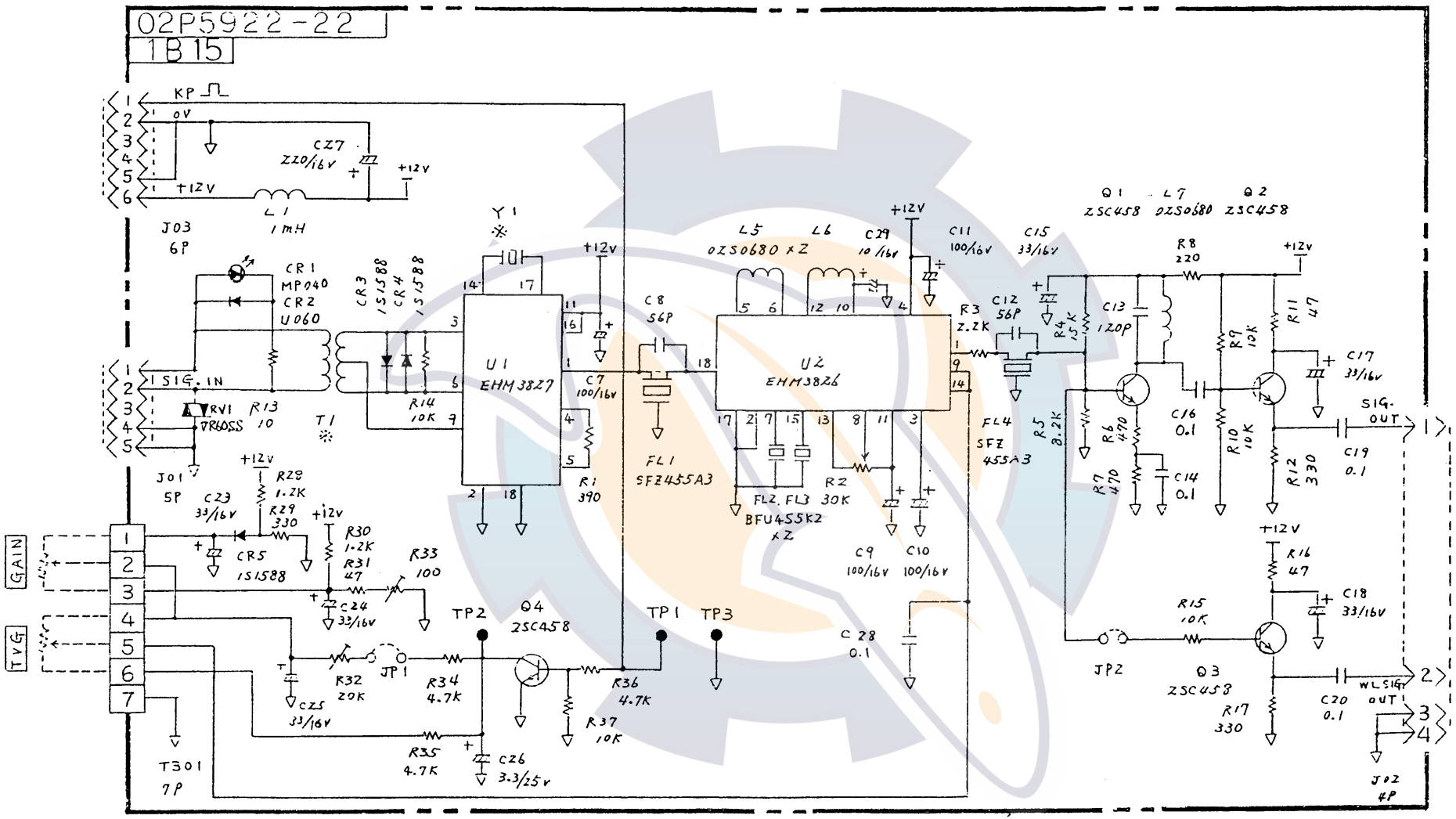
NOTE:
R01 ~ R22 : 4.7Ω/1W
R23 ~ R44 : .47Ω/1W
Q01 ~ Q22 : 2SC2307
CR01 ~ CR16 : SR-2M

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

承認 APPROVED	SEP. 24. '82	三角法 THIRD ANGLE PROJECTION		名称 TITLE	02P5872 出力増巾 POWER AMPLIFIER
検図 CHECKED	Sep. 5. '82	尺度 SCALE	/		
製図 DRAWN	Sept. 8. '82	重量 WEIGHT	kg	図番 DWG.NO.	C2012-038-A

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※印の部品は周波数により異なる。下表参照。

※PARTS DIFFERENT ON FREQUENCY. SEE TABLE BELOW.

FREQ	15kHz	28kHz	50kHz	88kHz	200kHz
Y1	470kHz	483.8kHz	505kHz	543kHz	655kHz
T1	02S0915-0	02S0916-0	02S0917-0	02S0918-0	02S0919-0

ETR-50/100

承認 APPROVED	T.NAKANO	名称 TITLE	02P5922 アンプ AMPLIFIER
検図 CHECKED	T. Kondo		
製図 DRAWN		図番 DWG.NO	C2020-016-A

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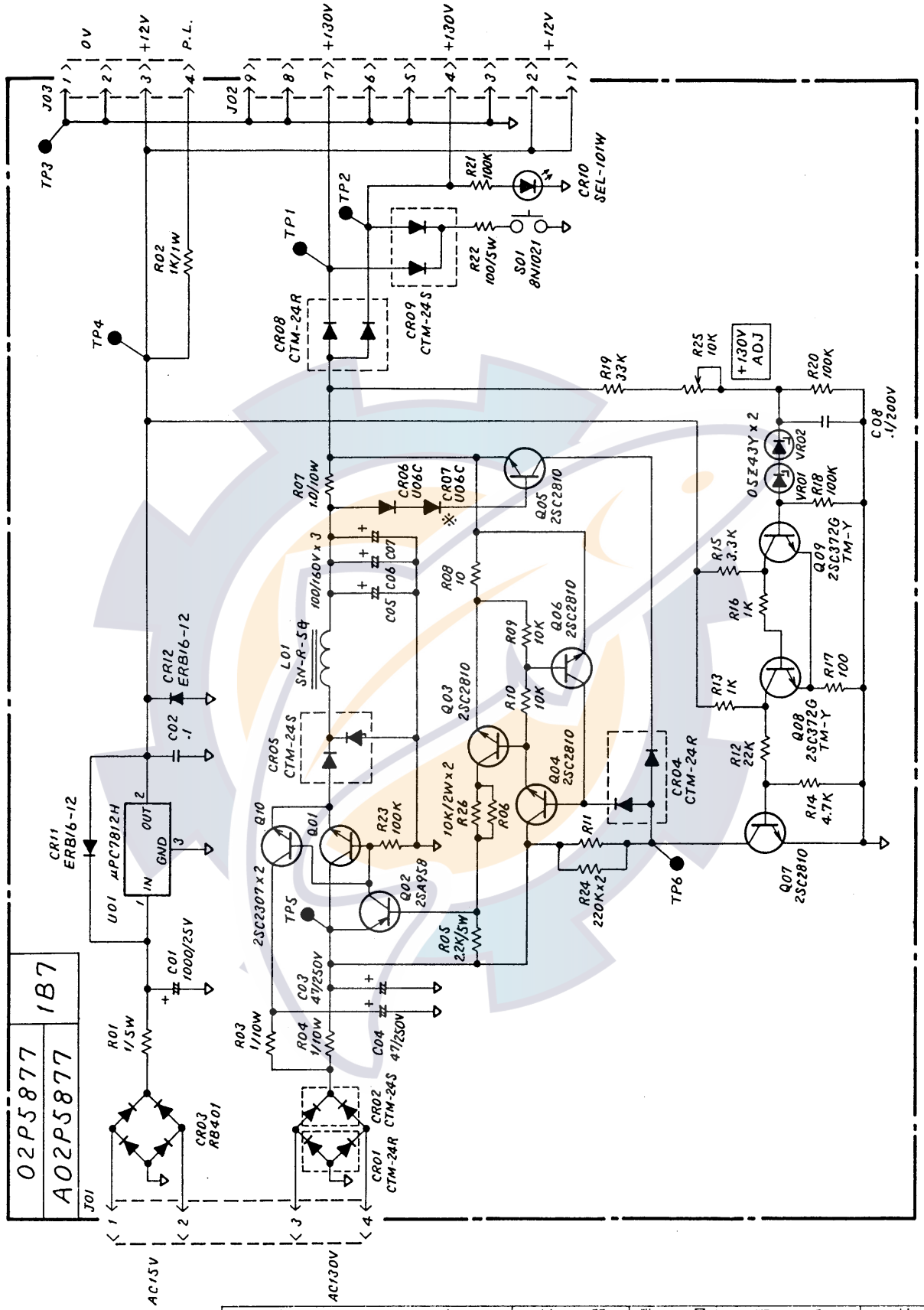
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NOTE :
1. 特記なき抵抗の単位は全てΩ、1/4W、Xコンデンサ-1μF。
UNLESS NOTED OTHERWISE, ALL RESISTANCE IN OHMS, 1/4W. AND ALL CAPACITANCE IN MICROFARADS.
2. 02P5877 : ET-10A , A02P5877 : ET-5A
3. ※ ------ FOR ET-10A ONLY.

02P5877 187
A02P5877

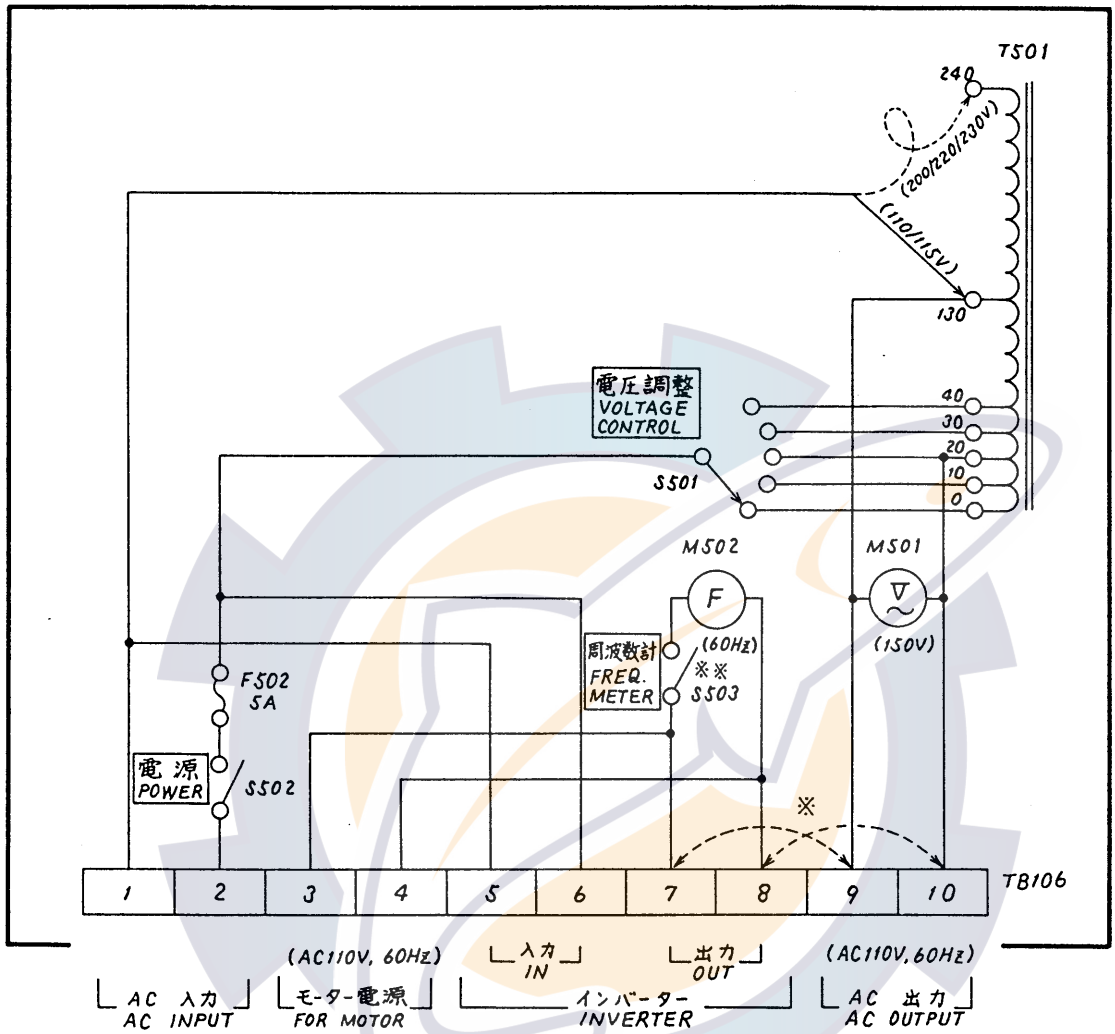
品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

承認 APPROVED	SEP. 24. '82	三角法 THIRD ANGLE PROJECTION	名称 TITLE (A) 02P5877 定電圧 REGULATOR
検図 CHECKED	Sep. 8. '82	尺度 SCALE	
製図 DRAWN	Sept. 8 '82	重量 WEIGHT kg	図番 DWG.NO. C2012-042-C

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注. NOTE

1. ※ インバータを使用しない時はジャンパーする。
CONNECT JUMPERS WHEN INVERTER IS NOT USED.

2. ※※ 周波数をチェックする時のみ入れる。
SWITCH ON ONLY WHEN READING FREQUENCY.

品番 ITEM	品名 NAME	材質 MATERIAL	数量 Q'TY	図番 DWG.NO.	摘要 REMARKS

承認 APPROVED	DEC.20.'82 K.Kaneko	三角法 THIRD ANGLE PROJECTION		名称 TITLE	F-10A 交流電圧調整器 AC VOLTAGE CONTROL
検図 CHECKED	Dec.20.'82 M.Kawamoto	尺度 SCALE	/		
製図 DRAWN	Dec.20.'82 M.M	重量 WEIGHT	kg	図番 DWG.NO.	C2004-010-A

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REVISION RECORD OF OPERATOR'S/INSTALLATION MANUAL

MODEL: ETR-501/1001/502/1002 PUBLICATION NO.: IME-20200-*

REV. NO.	DATE	REVISED PAGE	DETAILS	PERSON IN CHG.
A		———	First Edition	
	...	2-1	DIP Switch の ON と OFF の 訂正	平
B	'96.5	1Fページ	AITI96016 による 改訂	
		2-2~2-5	第1版	

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