

AC VOLTMETER

VT-181/VT-181E SERVICE MANUAL

KENWOOD

KENWOOD TMI CORPORATION

© 1998-4/B51-1132-00 (K/K)

HANDLE : (K01-0564-08)
HANDLE COVER : (B09-0410-08)

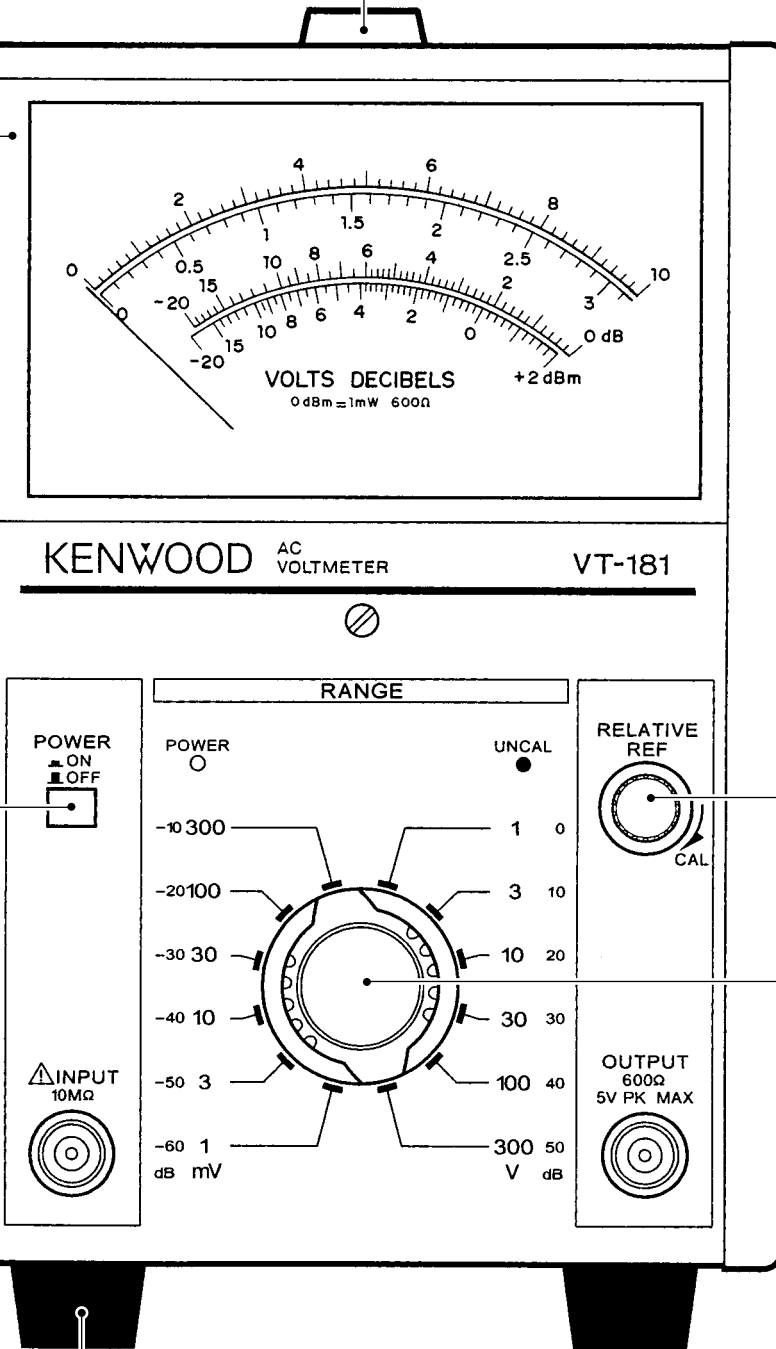
FRONT PANEL
VT-181 : (A63-0301-08)
VT-181E : (A63-0316-08)

SIDE FRAME
(A13-2254-08)

PUSH KNOB
(K24-3015-08)

KNOB
(K21-0959-08)

ROTARY KNOB
(K21-0961-08)



RUBBER FOOT
(J02-0543-08)

VT-181/VT-181E

WARNING

The following instructions are for use by qualified personnel only. To avoid electric shock, do not perform any servicing other than contained in the operating instructions unless you are qualified to do so.

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VT-181/VT-181E

SPECIFICATIONS

Item	VT-181	VT-181E
Meter Section		
Measurable Voltage	1mV to 300mV in 12 ranges:1,3,10,30,100,300mV,1,3,10,30,100,300V full scale.	0.3mV to 100mV in 12 ranges:0.3,1,3,10,30,100,300mV,1,3,10,30,100V full scale.
dB	-80 to +50dB(0dB=1V)	-90 to +40dB(0dB=1V)
dBm	-80 to +52dBm(0dBm=1mW at 600Ω)	-90 to +42dBm(0dBm=1mW at 600Ω)
Error	Within ±3% of full scale at 1kHz	
Frequency response	±10% at 5Hz to 1Mhz, ±5% at 10Hz to 500kHz and ±2% at 20Hz to 100kHz as reference to 1kHz response.	
Input impedance	10MΩ ±5%, with less than 50pF parallel capacitance.	
Durable input voltage	500V (DC +AC peak) 1V to 300V range 100V (DC +AC peak) 1mV to 300mV range	500V (DC +AC peak) 1V to 300mV range 100V (DC +AC peak) 0.3mV to 300mV range
Stability	Within ±0.5% of full scale for ±10 line voltage fluctuation	
Residual voltage	Less than 20uV with input shorted on 1mV range	Less than 30uV with input shorted on 0.3mV range
Amplifier Section		
Gain	60dB ±1dB(Approx.70dB)	
Output voltage	1Vrms ±20%	
Output resistance	600Ω±20% at 1kHz	
Frequency response	Within±3dB at 5Hz to 500kHz	
Distortion	Less than 1% at full scale (Rated by signal-noise ratio in 1mV and 1V range)	Less than 1% at full scale (Rated by signal-noise ratio in 0.3mV,1mV and 1V ranges)
Signal to noise ratio	Over 40dB at full scale	Over 30dB at 0.3mV range
Environmental		
Within specifications temp./ hum.range	10 to 40°C / 80% RH or less	
Full operation temp./ hum.range	0 to 50°C / 80% RH or less	
Indoor Use Only Altitude up to 2000m OVERVOLTAGE CATEGORY II POLLUTION DEGREE2		
Power Supply Section		
Line voltage	100/120/220/230/ Vac ±10% 50/60Hz	
Power consumption	Max.6.9W	
Dimensions WXHxD(mm)	128(128)X190(210)X239(259) Value in () include protrusions	
Net Weight	2.8kg	
Accessories		
Power cable	1pc	
Input cable	CA-41p 1pc	
Replacement fuse	1pc	
Instruction manual	1copy	
Adjust driver	1pc	

VT-181/VT-181E

SAFETY

SAFETY

Before connecting the instrument to a power source, carefully read the following information, then verify that the proper power cord is used and the proper line fuse is installed for power source. The specified voltage is shown on the rear panel. If the power cord is not applied for specified voltage, there is always a certain amount of danger from electric shock.

Line voltage

This instrument operates using ac-power input voltages that 100/120/220/230 V at frequencies from 50 Hz to 60Hz.

Power cord

The ground wire of the 3-wire ac power plug places the chassis and housing of the instrument at earth ground. Do not attempt to defeat the ground wire connection or float the instrument ; to do so may pose a great safety hazard. The appropriate power cord is supplied by an option that is specified when the instrument is ordered.

The optional power cords are shown as follows in Fig.1

Line fuse

The fuse holder is located on the rear panel and contains the line fuse. Verify that the proper fuse is installed by replacing the line fuse.

Voltage conversion

This instrument may be operated from either a 100 to 230V, 50/60Hz power source.

Use the following procedure to change from 100 to 230V operation or vice verse.

1. Remove the fuse holder.
2. Replace fuse F1 with a fuse of appropriate value.
3. Reinsert it for appropriate voltage range.
4. When performing the reinsertion of fuse holder for the voltage conversion, the appropriate power cord should be used. (See fig.1)

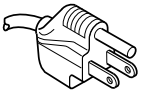
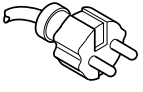

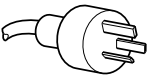
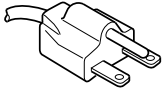

Plug configuration	power cord and plug type	Factory installed instrument fuse	Line cord plug fuse	Parts No. for power cord
	North American 120 volt/60 Hz Rated 15 amp (12 amp max ; NEC)	0.2A, 250V slow blow 5x20mm	None	E30-1983-08
	Universal Europe 230 volt/50 Hz Rated 16 amp	0.1A, 250V slow blow 5x20 mm	None	E30-1982-08
	U.K. 230 volt/50 Hz Rated 5 amp	0.1A, 250V slow blow 5x20 mm	5A Type C	E30-1985-08
	Australian 240 volt/50 Hz Rated 10 amp	0.1A, 250V slow blow 5x20 mm	None	E30-1986-08
	North American 240 volt/60 Hz Rated 15 amp (12 amp max ; NEC)	0.2A, 250V slow blow 5x20mm	None	—
	Switzerland 230 volt/50Hz Rated 10 amp	0.3A, 250V slow blow 5x20 mm	None	—

Fig.1 Power Input Voltage Configuration

CIRCUIT DESCRIPTION

The voltage or sentence in parentheses is applicable in case of the "VT-181E".
In studying the operation of each circuit in voltmeter please refer to "BLOCK DIAGRAM".

General

A Signal voltage to be measured, which is input from the INPUT connector, is passed through the First Attenuator and is converted to a low impedance by the Impedance Converter. The impedance-converted signal is normalized, or further attenuated in proportion to 1mVrms fullscale value through the Second and Third Attenuator. The normalized signal is magnified 20-fold by the Main Amplifier and is fed to the Output Amplifier and the Absolute-Mean Value Detector.

The Output Amplifier magnifies the signal 50-fold and feeds to the OUTPUT connector. The Absolute-Mean Value Detector converts the signal from the Main Amplifier to DC current in proportion to the absolute mean value. The converted signal activates the Meter.

The Attenuator Control encodes the signal led from the RANGE selector to generate an Attenuator Control signal. This signal controls the First, Second and Third attenuator to set the sensitivity corresponding to each range.

The Power Supply feeds to the functional circuit $\pm 5V$ DC voltages stabilized by its IC regulator.

Description of Functional Circuit

1) First Attenuator

A potential divider act as a attenuator. The amount of attenuation is switched in tow steps by relay contacts:0dB and -60dB.

2) Impedance Converter

A FET differential input Amplifier act as a impedance converter with 0dB(10dB) gain. Which converts the First Attenuator output signal to a sufficiently low impedance and feeds of the Second Attenuator.

3) Second Attenuator

A resistance divider act as a attenuator. The amount of attenuation is switch in two steps by relay contacts:0dB and -30dB.

4) Third Attenuator

A resistance divider network act as a attenuator. The amount of attenuation is switched in four steps by FET switch:0dB,-10dB,-20dB,and -30dB.

5) Main Amplifier

A wideband,non-inverting differential amplifier act as the main amplifier. Which has high input impedance,low output impedance and 20-fold gain. This output signal level is 20mVrms for the fullscale read on the Meter.

6) Output Amplifier

A wideband,non-inverting differential amplifier act as a output amplifier. Which has 50-fold gain and 600Ω output impedance. The output signal level is 1Vrms for fullscale read on the Meter,and works stable even for capacitive loads.

7) Absolute-Mean Value Detector

An absolute-mean value detector comprised of a high through-rate and high gain amplifier. Which has a very good linearity by negative feedback from the current flowing through the Meter load. In switching, this provides a sufficiently wide frequency band so that the high frequency phase compensation circuit is reset.

8) Attenuator Control

A logic control circuit comprised of a diode matrix and output buffer transistors. This encodes a 12-bit signal from the RANGE selector switch to 6-bit signals,which control the First,Second and Third Attenuator. The remote control connector is connected to this circuit.

9) Rotary Switch

A 12 contacts rotary switch which design the operation range. For different range,different attenuation ratio are activated.

10) Gain Control

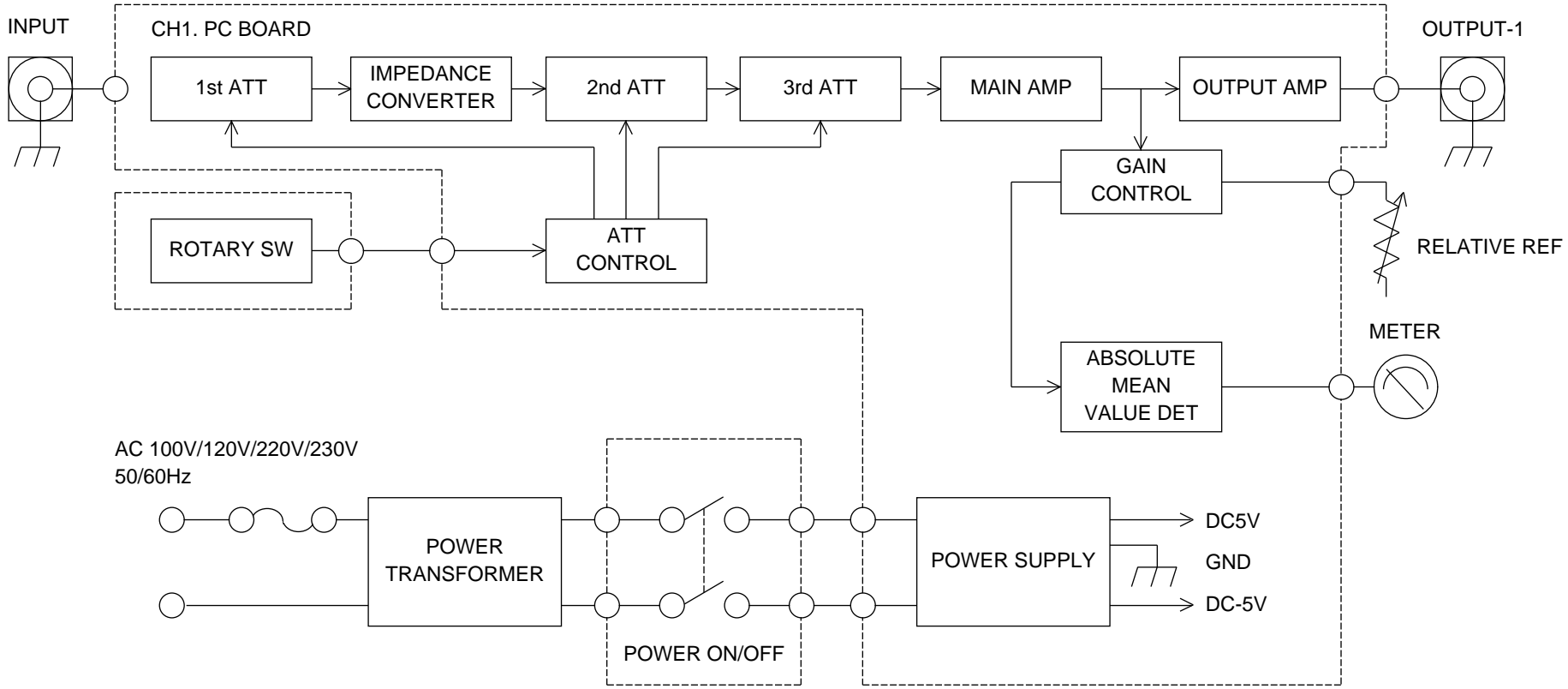
To using the dB scale to measure relative voltage, you may get a reference reading by change the gain control. (relative ref.) Which capable to vary 0 to 10dB.

11) Power Supply

The power source circuit supply $\pm 5V$ DC from the AC input. Which contain a silicon diode bridge for full-wave rectification,high-capacitance electrolytic capacitors for smoothing,and an IC regulator stabilization.

VT-181/WT-181E

BLOCK DIAGRAM



VT-181/VT-181E

ADJUSTMENT

To obtain the best performance, periodically calibrate the unit. Sometimes, only one mode need be calibrated, while at other times, all modes should be calibrated. When one mode is calibrated, it must be noted that the other modes may be affected. When calibrating all modes, perform the calibration in the specified sequence.

The following calibration required an accurate measuring instrument and an insulated adjusting flat blade screwdriver. If they are not available, contact your dealer. For optimum adjustment, turn the power on and warm up the scope sufficiently (more than 30 minutes) before starting.

Before calibrating the unit, check the power supply voltage.

TEST EQUIPMENT REQUIRED

The following instrument or their equivalent should be used for making adjustment.

Test Equipment	Model	Maker
Digital Multimeter	DL-712	KENWOOD
Frequency Counter	FC-756	KENWOOD
Oscilloscope	CS-6010	KENWOOD

Test Equipment	Model	Maker
Calibrator	5100B	FLUKE
CR Oscillator	AG-203	KENWOOD
Attenuator	RA-920	KENWOOD
Q-Meter	4343B	YHP
Distortion Meter	885	Shibasoku
Insulation Meter	SM-5	TOA
50Ω Termination	TA-57	KENWOOD

PREPARATION FOR ADJUSTMENT

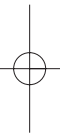
Control Settings

The control settings listed below must be used for each adjustment procedure.

Exceptions to these settings will be noted as they occur. After completing a adjustment, return the controls to the following settings.

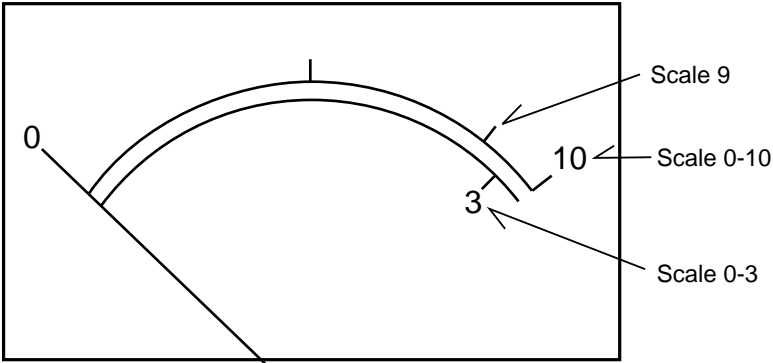
NAME OF KNOBS	POSITION
RANGE	VT-181 : 300V VT-181E : 100V
RELATIVE REF	CAL

ITEM	ADJUSTMENT POINT	PROCEDURE
300mV range	VR102	<div style="text-align: center;"> </div> <p>(Unless otherwise specified, the above connection should be used as to the following items.)</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin: 10px 0;">RANGE: 300 mV</div> <ol style="list-style-type: none"> 1) Input a 1 kHz (or 400 Hz), 300 mVrms sine wave, and set the pointer to 3.0 of the 0-3 scale. Check that the variable range is less than 98% and more than 102% with respect to 3.0 (full-scale). 2) Waveforms shown on the oscilloscope shall not be deformed. <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;"> <p>OK</p> </div> <div style="text-align: center;"> <p>NG</p> </div> <div style="text-align: center;"> <p>NG</p> </div> </div>



VT-181/VT-181E

ADJUSTMENT

ITEM	ADJUSTMENT POINT	PROCEDURE
1V range	VR101	<p data-bbox="574 277 721 310">RANGE: 1V</p> <ol data-bbox="574 344 1474 499" style="list-style-type: none">1) Input 1kHz (or 400 Hz), 1 Vrms sine wave, and set the pointer to 10.0 V of the 0-10 scale. Check that the variable range is less than 98% and more than 102% with respect to 10.0 (full-scale).2) Waveforms shown on the oscilloscope shall not be deformed.
100 kHz frequency characteristics	TC101	<p data-bbox="574 554 721 588">RANGE: 1V</p> <ol data-bbox="574 621 1474 777" style="list-style-type: none">1) Input a 1kHz (or 400 Hz), 1 Vrms sine wave, and adjust the oscillator output so that the pointer of the set points at 9.0.2) Adjust the TC so that the pointer points at 9.0 when the frequency is changed to 100 kHz while the oscillator output remains unchanged.  <p>The diagram shows a semi-circular scale with three different markings. The outermost scale is labeled 'Scale 0-10' and has a '10' marking at the right end. The inner scale is labeled 'Scale 0-3' and has a '3' marking at the right end. A third scale is labeled 'Scale 9' and has a '9' marking at the right end. A pointer is shown at the top of the scale, pointing to the '9' marking on the 'Scale 9'.</p>

* New Parts

Parts without **Parts No.** are not supplied.
Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.
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①

Ref. No	Add-ress	Parts No.	Description
VT-181 (Y80-2050-00)			
		A01-4087-08 A01-4088-08 A13-2254-08 A22-1344-08 A63-0301-08	CASE;TOP CASE;BOTTOM FRAME SUB PANEL PANEL
		A83-0150-08 B09-0410-08 B31-0778-08 B42-6147-08 B42-6146-08	REAR PANEL CAP METER LABEL;KENWOOD S/NO.LABEL
		B63-0304-08 E04-0503-08 E04-0504-08 E23-1533-08 E30-1984-08	INSTRUCTION MANUAL; JAP./ENG./CHIN BNC RECEPTACLE BNC RECEPTACLE EARTH LUG JIS POWER CORD
		E30-1982-08 E30-1986-08 E30-1983-08 E30-1985-08 E68-0626-08	CEE POWER CORD SAA POWER CORD UL/CSA POWER CORD BS POWER CORD AC INLET
		F50-0129-08 F50-0130-08 F15-0785-08 F11-1528-08 J02-0543-08	FUSE(5*20) FUSE(5*20) BLIND PLATE SHIELD CASE RUBBER FOOT
		J21-8927-08 J11-0513-08 K01-0564-08 K21-0959-08 K21-0961-08	BRACKET CLAMPER HANDLE KNOB KNOB
		L07-1552-08 R31-0810-05 N09-4530-08 N09-4531-08 N09-4532-08	POWER TRANSFORMER V.R. SCREW,SEMS BINDING M3.5X12 SCREW,TRUSS TAPTITE M3x6 SCREW,FLAT HD M4X15
		N10-2030-41 N10-2040-41 N14-0644-08 N15-1030-41 N19-0755-08	HEXAGON NUT M3 HEXAGON NUT M4 FLANGE NUT M3.5 PLAIN WASHER WASHER
		N19-0754-08 N16-0030-41 N16-0040-41 N30-2606-41 N30-3012-41	WASHER WASHER SPRING WASHER SCREW,PAN HD M2.6X6 SCREW,PAN HD M3X12
		N30-3006-41 N16-0030-41 N32-2606-41 N32-3006-41 N66-3008-41 H53-0232-08	SCREW,PAN HD M3X6 SPRING WASHER SCREW,FLAT HD M 2.6X6 SCREW,FLAT HD M3X6 SCREW,SEMS PAN HD M3X8 CARTON BOX
		H10-2894-08 H20-1750-08 W02-2355-08 W02-2368-08 W02-2365-08 W01-0522-08	FOAMED STYREN PAD VINYL COVER MAIN UNIT PANEL UNIT RANGE UNIT ACCESSORIES

L : Scandinavia K : USA P : Canada R : Mexico
Y : PX(Far East, Hawaii) T : Europe E : Europe G : Germany
Y : AAFES(Europe) X : Australia M : Other Areas

⚠ indicates safety critical components.

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Ref. No	Add-ress	Parts No.	Description
VT-181E (Y80-2060-00)			
		A01-4087-08 A01-4088-08 A13-2254-08 A22-1344-08 A63-0316-08	CASE;TOP CASE;BOTTOM FRAME SUB PANEL PANEL
		A83-0150-08 B09-0410-08 B31-0778-08 B42-6147-08 B42-6146-08	REAR PANEL CAP METER LABEL;KENWOOD S/NO.LABEL
		B63-0304-08 E04-0503-08 E04-0504-08 E23-1533-08 E30-1984-08	INSTRUCTION MANUAL; JAP./ENG./CHIN BNC RECEPTACLE BNC RECEPTACLE EARTH LUG JIS POWER CORD
		E30-1982-08 E30-1986-08 E30-1983-08 E30-1985-08 E68-0626-08	CEE POWER CORD SAA POWER CORD UL/CSA POWER CORD BS POWER CORD AC INLET
		F50-0129-08 F50-0130-08 F15-0785-08 F11-1528-08 J02-0543-08	FUSE(5*20) FUSE(5*20) BLIND PLATE SHIELD CASE RUBBER FOOT
		J21-8927-08 J11-0513-08 K01-0564-08 K21-0959-08 K21-0961-08	BRACKET CLAMPER HANDLE KNOB KNOB
		L07-1552-08 R31-0810-05 N09-4530-08 N09-4531-08 N09-4532-08	POWER TRANSFORMER V.R. SCREW,SEMS BINDING M3.5X12 SCREW,FLAT HD M4X15 HEXAGON NUT M3
		N10-2030-41 N10-2040-41 N14-0644-08 N15-1030-41 N19-0755-08	HEXAGON NUT M4 FLANGE NUT M3.5 PLAIN WASHER WASHER WASHER
		N19-0754-08 N16-0030-41 N16-0040-41 N30-2606-41 N30-3012-41	WASHER SPRING WASHER SPRING WASHER SCREW,PAN HD M2.6X6 SCREW,PAN HD M3X12
		N30-3006-41 N16-0030-41 N32-2606-41 N32-3006-41 N66-3008-41 H53-0233-08	SCREW,PAN HD M3X6 SPRING WASHER SCREW,FLAT HD M 2.6X6 SCREW,FLAT HD M3X6 SCREW,SEMS PAN HD M3X8 CARTON BOX
		H10-2894-08 H20-1750-08 W02-2355-08 W02-2368-08 W02-2365-08 W01-0522-08	FOAMED STYREN PAD VINYL COVER MAIN UNIT PANEL UNIT RANGE UNIT ACCESSORIES

L : Scandinavia K : USA P : Canada R : Mexico
Y : PX(Far East, Hawaii) T : Europe E : Europe G : Germany
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PARTS LIST VT-181/VT-181E

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Ref. No	Add-ress	Parts No.	Description			
MAIN UNIT (W02-2355-08)						
		J73-0539-08	PCB(UNMOUNTED)			
		F11-1527-08	SHIELD CASE			
		F01-2356-08	HEAT SINK			
		N30-3006-41	SCREW,PAN HD			
		K24-3015-08	PUSH KNOB			
C101		C91-0501-05	CAP. FILM	0.047U	630	-
C102		CQ93M1H332J	CAP. PLASTIC	3300P	50	J
C103		CC45FCH2H222K	CAP. CERAMIC	2200P	500	K
C104		CC45FCH2H222K	CAP. CERAMIC	2200P	500	K
C105		CE04EW1C331Z	CAP. ELECTRO	330U	16	Z
C106		CE04EW1C331Z	CAP. ELECTRO	330U	16	Z
C107		CC45FCH1H070D	CAP. CERAMIC	7P	50	D
C108		CE04EW1C331Z	CAP. ELECTRO	330U	16	Z
C110		CE04EW1E100Z	CAP. ELECTRO	10U	25	Z
C111		CC45FCH1H010C	CAP. CERAMIC	1P	50	C
C112		CC45FCH1H020C	CAP. CERAMIC	2P	50	C
C113		CE04EW1C331Z	CAP. ELECTRO	330U	16	Z
C114		CE04EW1C331Z	CAP. ELECTRO	330U	16	Z
C115		CE04EW1C331Z	CAP. ELECTRO	330U	16	Z
C116		CC45FCH1H120J	CAP. CERAMIC	12P	50	J
C117		CC45FCH1H120J	CAP. CERAMIC	12P	50	J
C118		CE04EW1C331Z	CAP. ELECTRO	330U	16	Z
C119		CE04EW1C101Z	CAP. ELECTRO	100U	16	Z
C121		CE04EW1C470Z	CAP. ELECTRO	47U	16	Z
C122		CE04EW1A471Z	CAP. ELECTRO	470U	10	Z
C123		CE04EW1C470Z	CAP. ELECTRO	47U	16	Z
C124		CC45FCH1H220J	CAP. CERAMIC	22P	50	J
C126		CE04EW1C331Z	CAP. ELECTRO	330U	16	Z
C129		CE04HW1H010Z	CAP. ELECTRO	1U	50	Z
C130		CE04HW1H010Z	CAP. ELECTRO	1U	50	Z
C132		CE04EW1C470Z	CAP. ELECTRO	47U	16	Z
C133		CE04EW1C470Z	CAP. ELECTRO	47U	16	Z
C134		CE04EW1C102M	CAP. ELECTRO	1000U	16	M
C135		CE04EW1C102M	CAP. ELECTRO	1000U	16	M
C136		CQ92FM1H104J	CAP. PLASTIC	0.1U	50	J
C137		CQ92FM1H104J	CAP. PLASTIC	0.1U	50	J
C138		CQ92FM1H104J	CAP. PLASTIC	0.1U	50	J
C139		CQ92FM1H104J	CAP. PLASTIC	0.1U	50	J
C140		CC45FCH2H222K	CAP. CERAMIC	2200P	500	K
C141		CF93AN2E104K	CAP. METALIZED	0.1U	250	K
C142		CC45FCH1H120J	CAP. CERAMIC	12P	50	J
C143		CC45FCH1H070D	CAP. CERAMIC	7P	50	D
C147		CQ92FM1H103J	CAP. PLASTIC	0.01U	50	J
C148		CC45FCH1H100J	CAP. CERAMIC	10P	50	J
C150		CQ92BP1H122K	CAP. PLASTIC	1200P	50	K
C152		CE04EW1A471Z	CAP. ELECTRO	470U	10	Z
C153		CC45FCH1H010C	CAP. CERAMIC	1P	50	C
D101		1N4148	DIODE			
D102		1N4148	DIODE			
D103		1N4148	DIODE			
D106		1N4148	DIODE			
D107		1N4148	DIODE			
D108		1N4148	DIODE			
D109		1N4148	DIODE			
D110		1N4148	DIODE			

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②

Ref. No	Add-ress	Parts No.	Description
D111		1N4148	DIODE
D112		1N4148	DIODE
D114		1N4148	DIODE
D115		1N4148	DIODE
D117		1N4148	DIODE
D118		1N4148	DIODE
D119		1N4148	DIODE
D120		1N4148	DIODE
D121		1N4148	DIODE
D122		1N4148	DIODE
D123		1N4148	DIODE
D124		1N4148	DIODE
D125		1N4148	DIODE
D126		1N4148	DIODE
D127		1N4148	DIODE
D128		1N4148	DIODE
D129		1N4148	DIODE
D130		1N4148	DIODE
D131		1N4148	DIODE
D132		1N4148	DIODE
D133		1N4148	DIODE
D134		W02	DIODE, BRIDGE
J1		E38-1758-08	JUMPING WIRE
J2		E38-1758-08	JUMPING WIRE
J3		E38-1759-08	JUMPING WIRE
J102		E38-1758-08	JUMPING WIRE
J103		E38-1759-08	JUMPING WIRE
J104		E38-1758-08	JUMPING WIRE
J106		E38-1758-08	JUMPING WIRE
J107		E38-1758-08	JUMPING WIRE
J108		E38-1758-08	JUMPING WIRE
J109		E38-1758-08	JUMPING WIRE
J110		E38-1758-08	JUMPING WIRE
J111		E38-1758-08	JUMPING WIRE
J112		E38-1758-08	JUMPING WIRE
J113		E38-1759-08	JUMPING WIRE
J114		E38-1758-08	JUMPING WIRE
J115		E38-1758-08	JUMPING WIRE
J116		E38-1759-08	JUMPING WIRE
J117		E38-1758-08	JUMPING WIRE
J119		E38-1759-08	JUMPING WIRE
J122		E38-1759-08	JUMPING WIRE
J124		E38-1759-08	JUMPING WIRE
J125		E38-1759-08	JUMPING WIRE
J126		E38-1759-08	JUMPING WIRE
J127		E38-1759-08	JUMPING WIRE
J128		E38-1759-08	JUMPING WIRE
K101		S51-1503-05	RELAY
K102		S51-1503-05	RELAY
P1		E40-7602-08	CONNECTOR 2P
2		E40-7604-08	CONNECTOR 2P
P3		E40-7606-08	CONNECTOR 4P
P4		E40-7604-08	CONNECTOR 2P
P5		E40-7604-08	CONNECTOR 2P
P6		E40-7605-08	CONNECTOR 3P

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PARTS LIST (ELECTRICAL)

VT-181/VT-181E

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Ref. No	Add-ress	Parts No.	Description			
P9		E40-7606-08	CONNECTOR 4P			
P11		E40-7604-08	CONNECTOR 2P			
P101		E40-7603-08	CONNECTOR 15P			
P102		E40-7601-08	CONNECTOR 8P			
P103		E40-7601-08	CONNECTOR 8P			
Q101		2SK163(K)	FET			
Q102		2SK163(K)	FET			
Q103		2SA970(GR)	TR.SI,PNP			
Q104		2SC1923(O)	TR.SI,NPN			
Q105		2SA1015(GR)	TR.SI,PNP			
Q106		2SA1015(GR)	TR.SI,PNP			
Q107		2SA1015(GR)	TR.SI,PNP			
Q108		2SA1015(GR)	TR.SI,PNP			
Q109		2SA1015(GR)	TR.SI,PNP			
Q110		2SA1015(GR)	TR.SI,PNP			
Q111		2SC1815(GR)	TR.SI,NPN			
Q112		2SA970(GR)	TR.SI,PNP			
Q113		2SA970(GR)	TR.SI,PNP			
Q114		2SC1923(O)	TR.SI,NPN			
Q115		2SC1923(O)	TR.SI,NPN			
Q116		2SA970(GR)	TR.SI,PNP			
Q117		2SA970(GR)	TR.SI,PNP			
Q118		2SC1923(O)	TR.SI,NPN			
Q119		2SA970(GR)	TR.SI,PNP			
Q120		2SA970(GR)	TR.SI,PNP			
Q121		2SK30A(Y)	FET			
Q122		2SC1923(O)	TR.SI,NPN			
Q123		2SC1923(O)	TR.SI,NPN			
Q124		2SK30A(Y)	FET			
R101		RN14BK2H1005F	RES. METAL FILM	-	-	-
R102		RN14BK2B9531F	RES. METAL FILM	9.53K	0.125	-
R103		R92-1450-05	RESISTOR	6.8K	1	-
R104		RD14BB2B681J	RES. CARBON FILM	680	0.125	-
R106		RD14BB2B335J	RES. CARBON FILM	-	-	-
R107		RD14BB2B472J	RES. CARBON FILM	4.7K	0.125	-
R108		RD14BB2B201J	RES. CARBON FILM	-	-	-
R109		RD14BB2E102J	RES. CARBON FILM	1K	0.25	-
R110		RD14BB2E750J	RES. CARBON FILM	75	0.25	-
R111		RN14BK2B1100D	RES. METAL FILM	110	0.125	-
R112		RN14BK2B1561D	RES. METAL FILM	1.56K	0.125	-
R113		RN14BK2B60R0D	RES. METAL FILM	60	0.125	-
R114		RN14BK2B2780D	RES. METAL FILM	278	0.125	-
R115		RN14BK2B2780D	RES. METAL FILM	278	0.125	-
R116		RN14BK2E1910D	RES. METAL FILM	191	0.25	-
R117		RD14BB2B151J	RES. CARBON FILM	150	0.125	-
R118		RN14BK2B4120D	RES. METAL FILM	412	0.125	-
R119		RN14BK2B4120D	RES. METAL FILM	412	0.125	-
R120		RN14BK2B4120D	RES. METAL FILM	412	0.125	-
R121		RD14BB2B150J	RES. CARBON FILM	15	0.125	-
R122		RD14BB2B472J	RES. CARBON FILM	4.7K	0.125	-
R123		RD14BB2B472J	RES. CARBON FILM	4.7K	0.125	-
R124		RD14BB2B472J	RES. CARBON FILM	4.7K	0.125	-
R125		RD14BB2B472J	RES. CARBON FILM	4.7K	0.125	-
R126		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R127		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-

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R128		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R129		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R130		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R131		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R132		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R133		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R134		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R135		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R136		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R137		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R138		RD14BB2B334J	RES. CARBON FILM	330K	0.125	-
R139		RD14BB2B683J	RES. CARBON FILM	68K	0.125	-
R140		RD14BB2E432J	RES. CARBON FILM	4.3K	0.25	-
R141		RD14BB2B121J	RES. CARBON FILM	120	0.125	-
R142		RD14BB2E432J	RES. CARBON FILM	4.3K	0.25	-
R143		RD14BB2B272J	RES. CARBON FILM	2.7K	0.125	-
R144		RN14BK2B6191F	RES. METAL FILM	6.19K	0.125	-
R145		RD14BB2B681J	RES. CARBON FILM	680	0.125	-
R146		RN14BK2B2940F	RES. METAL FILM	294	0.125	-
R147		RD14BB2B121J	RES. CARBON FILM	120	0.125	-
R148		RD14BB2E3R3J	RES. CARBON FILM	3.3	0.25	-
R149		RD14BB2E432J	RES. CARBON FILM	4.3K	0.25	-
R150		RD14BB2B390J	RES. CARBON FILM	39	0.125	-
R151		RD14BB2E432J	RES. CARBON FILM	4.3K	0.25	-
R152		RD14BB2B220J	RES. CARBON FILM	22	0.125	-
R154		RD14BB2B220J	RES. CARBON FILM	22	0.125	-
R155		RD14BB2B272J	RES. CARBON FILM	2.7K	0.125	-
R156		RD14BB2E3R3J	RES. CARBON FILM	3.3	0.25	-
R157		RD14BB2B681J	RES. CARBON FILM	680	0.125	-
R158		RN14BK2B1692F	RES. METAL FILM	16.9K	0.125	-
R159		RN14BK2B3010F	RES. METAL FILM	301	0.125	-
R160		RD14BB2B681J	RES. CARBON FILM	680	0.125	-
R161		RN14BK2B5230F	RES. METAL FILM	523	0.125	-
R162		RD14BB2B472J	RES. CARBON FILM	4.7K	0.125	-
R163		RN14BK2B3010F	RES. METAL FILM	301	0.125	-
R164		RN14BK2B3480F	RES. METAL FILM	348	0.125	-
R165		RD14BB2E432J	RES. CARBON FILM	4.3K	0.25	-
R166		RD14BB2E432J	RES. CARBON FILM	4.3K	0.25	-
R167		RD14BB2B390J	RES. CARBON FILM	39	0.125	-
R168		RD14BB2B681J	RES. CARBON FILM	680	0.125	-
R169		RD14BB2B114J	RES. CARBON FILM	110K	0.125	-
R170		RD14BB2B683J	RES. CARBON FILM	68K	0.125	-
R171		RD14BB2B331J	RES. CARBON FILM	330	0.125	-
R172		RD14BB2B331J	RES. CARBON FILM	330	0.125	-
R173		RN14BK2B10R0F	RES. METAL FILM	10	0.125	-
R174		RD14BB2B331J	RES. CARBON FILM	330	0.125	-
R177		RD14BB2B472J	RES. CARBON FILM	4.7K	0.125	-
R178		RD14BB2B472J	RES. CARBON FILM	4.7K	0.125	-
R179		RD14BB2B331J	RES. CARBON FILM	330	0.125	-
R180		RD14BB2B472J	RES. CARBON FILM	4.7K	0.125	-
R181		RD14BB2B201J	RES. CARBON FILM	-	-	-
R186		RD14BB2B161J	RES. CARBON FILM	160	0.125	-
TC101		C05-0707-08	CAP. TRIMMER			
U101		MC14066BCP	IC, QUAD ANALOG SWITCH/MPX			
U102		LM7805	IC, FIXED VOLTAGE REGULATOR			

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VT-181/VT-181E

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Ref. No	Add-ress	Parts No.	Description			
U103		LM7905	IC, FIXED VOLTAGE REGULATOR			
VR101		R12-1545-05	RES. SEMI FIXED	1K	0.1	-
VR102		R12-0575-05	RES. SEMI FIXED	100	0.1	-
MAIN UNIT (W02-2356-08)						
		J73-0539-08	PCB(UNMOUNTED)			
		F11-1527-08	SHIELD CASE			
		F01-2356-08	HEAT SINK			
		N30-3006-41	SCREW,PAN HD			
		K24-3015-08	PUSH KNOB			
C101		C91-0501-05	CAP. FILM	0.047U	-	630V
C102		CQ93M1H332J	CAP. PLASTIC	3300P	J	50V
C103		CC45FCH2H222K	CAP. CERAMIC	2200P	K	500V
C104		CC45FCH2H222K	CAP. CERAMIC	2200P	K	500V
C105		CE04EW1C331Z	CAP. ELECTRO	330U	Z	16V
C106		CE04EW1C331Z	CAP. ELECTRO	330U	Z	16V
C107		CC45FCH1H330J	CAP. CERAMIC	33P	J	50V
C108		CE04EW1C331Z	CAP. ELECTRO	330U	Z	16V
C110		CE04EW1E100Z	CAP. ELECTRO	10U	Z	25V
C111		CC45FCH1H010C	CAP. CERAMIC	1P	C	50V
C112		CC45FCH1H020C	CAP. CERAMIC	2P	C	50V
C113		CE04EW1C331Z	CAP. ELECTRO	330U	Z	16V
C114		CE04EW1C331Z	CAP. ELECTRO	330U	Z	16V
C115		CE04EW1C331Z	CAP. ELECTRO	330U	Z	16V
C116		CC45FCH1H120J	CAP. CERAMIC	12P	J	50V
C117		CC45FCH1H120J	CAP. CERAMIC	12P	J	50V
C118		CE04EW1C331Z	CAP. ELECTRO	330U	Z	16V
C119		CE04EW1C101Z	CAP. ELECTRO	100U	Z	16V
C121		CE04EW1C470Z	CAP. ELECTRO	47U	Z	16V
C122		CE04EW1A471Z	CAP. ELECTRO	470U	Z	10V
C123		CE04EW1C470Z	CAP. ELECTRO	47U	Z	16V
C124		CC45FCH1H220J	CAP. CERAMIC	22P	J	50V
C126		CE04EW1C331Z	CAP. ELECTRO	330U	Z	16V
C129		CE04HW1H010Z	CAP. ELECTRO	1U	Z	50V
C130		CE04HW1H010Z	CAP. ELECTRO	1U	Z	50V
C132		CE04EW1C470Z	CAP. ELECTRO	47U	Z	16V
C133		CE04EW1C470Z	CAP. ELECTRO	47U	Z	16V
C134		CE04EW1C102M	CAP. ELECTRO	1000U	M	16V
C135		CE04EW1C102M	CAP. ELECTRO	1000U	M	16V
C136		CQ92FM1H104J	CAP. PLASTIC	0.1U	J	50V
C137		CQ92FM1H104J	CAP. PLASTIC	0.1U	J	50V
C138		CQ92FM1H104J	CAP. PLASTIC	0.1U	J	50V
C139		CQ92FM1H104J	CAP. PLASTIC	0.1U	J	50V
C140		CC45FCH2H222K	CAP. CERAMIC	2200P	K	500V
C141		CF93AN2E104K	CAP. METALIZED	0.1U	K	250V
C142		CC45FCH1H120J	CAP. CERAMIC	12P	J	50V
C143		CC45FCH1H070D	CAP. CERAMIC	7P	D	50V
C147		CQ92FM1H103J	CAP. PLASTIC	0.01U	J	50V
C148		CC45FCH1H100J	CAP. CERAMIC	10P	J	50V
C150		CQ92BP1H122K	CAP. PLASTIC	1200P	K	50V
C152		CE04EW1A471Z	CAP. ELECTRO	470U	Z	10V
C153		CC45FCH1H010C	CAP. CERAMIC	1P	C	50V
D101		1N4148	DIODE			
D102		1N4148	DIODE			
D103		1N4148	DIODE			

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Ref. No	Add-ress	Parts No.	Description
D106		1N4148	DIODE
D107		1N4148	DIODE
D108		1N4148	DIODE
D109		1N4148	DIODE
D110		1N4148	DIODE
D111		1N4148	DIODE
D112		1N4148	DIODE
D114		1N4148	DIODE
D115		1N4148	DIODE
D117		1N4148	DIODE
D118		1N4148	DIODE
D119		1N4148	DIODE
D120		1N4148	DIODE
D121		1N4148	DIODE
D122		1N4148	DIODE
D123		1N4148	DIODE
D124		1N4148	DIODE
D125		1N4148	DIODE
D126		1N4148	DIODE
D127		1N4148	DIODE
D128		1N4148	DIODE
D129		1N4148	DIODE
D130		1N4148	DIODE
D131		1N4148	DIODE
D132		1N4148	DIODE
D133		1N4148	DIODE
D134		W02	DIODE BRIDGE
J1		E38-1758-08	JUMPING WIRE
J102		E38-1758-08	JUMPING WIRE
J103		E38-1759-08	JUMPING WIRE
J104		E38-1758-08	JUMPING WIRE
J106		E38-1758-08	JUMPING WIRE
J107		E38-1758-08	JUMPING WIRE
J108		E38-1758-08	JUMPING WIRE
J109		E38-1758-08	JUMPING WIRE
J110		E38-1758-08	JUMPING WIRE
J111		E38-1758-08	JUMPING WIRE
J112		E38-1758-08	JUMPING WIRE
J113		E38-1759-08	JUMPING WIRE
J114		E38-1758-08	JUMPING WIRE
J115		E38-1758-08	JUMPING WIRE
J116		E38-1759-08	JUMPING WIRE
J117		E38-1758-08	JUMPING WIRE
J119		E38-1759-08	JUMPING WIRE
J122		E38-1759-08	JUMPING WIRE
J124		E38-1759-08	JUMPING WIRE
J125		E38-1759-08	JUMPING WIRE
J126		E38-1759-08	JUMPING WIRE
J127		E38-1759-08	JUMPING WIRE
J128		E38-1759-08	JUMPING WIRE
J2		E38-1758-08	JUMPING WIRE
J3		E38-1759-08	JUMPING WIRE
K101		S51-1503-05	RELAY
K102		S51-1503-05	RELAY
P1		E40-7602-08	CONNECTOR 2P

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P101		E40-7603-08	CONNECTOR 15P
P102		E40-7601-08	CONNECTOR 8P
P103		E40-7601-08	CONNECTOR 8P
P11		E40-7604-08	CONNECTOR 2P
P2		E40-7604-08	CONNECTOR 2P
P3		E40-7606-08	CONNECTOR 4P
P4		E40-7604-08	CONNECTOR 2P
P5		E40-7604-08	CONNECTOR 2P
P6		E40-7605-08	CONNECTOR 3P
P9		E40-7606-08	CONNECTOR 4P
Q101		2SK163(K)	FET
Q102		2SK163(K)	FET
Q103		2SA970(GR)	TR.SI,PNP
Q104		2SC1923(O)	TR.SI,NPN
Q105		2SA1015(GR)	TR.SI,PNP
Q106		2SA1015(GR)	TR.SI,PNP
Q107		2SA1015(GR)	TR.SI,PNP
Q108		2SA1015(GR)	TR.SI,PNP
Q109		2SA1015(GR)	TR.SI,PNP
Q110		2SA1015(GR)	TR.SI,PNP
Q111		2SC1815(GR)	TR.SI,NPN
Q112		2SA970(GR)	TR.SI,PNP
Q113		2SA970(GR)	TR.SI,PNP
Q114		2SC1923(O)	TR.SI,NPN
Q115		2SC1923(O)	TR.SI,NPN
Q116		2SA970(GR)	TR.SI,PNP
Q117		2SA970(GR)	TR.SI,PNP
Q118		2SC1923(O)	TR.SI,NPN
Q119		2SA970(GR)	TR.SI,PNP
Q120		2SA970(GR)	TR.SI,PNP
Q122		2SC1923(O)	TR.SI,NPN
Q123		2SC1923(O)	TR.SI,NPN
Q121		2SK30A(Y)	FET
Q124		2SK30A(Y)	FET
R101		RN14BK2H1005F	RES. METAL FILM 10M F 1/2W
R102		RN14BK2B9531F	RES. METAL FILM 9.53K F 1/8W
R103		R92-1450-05	RESISTOR 6.8K - 1W
R104		RD14BB2B681J	RES.CARBON FILM 680 J 1/8W
R106		RD14BB2B335J	RES.CARBON FILM 3.3M J 1/8W
R107		RD14BB2B472J	RES.CARBON FILM 4.7K J 1/8W
R108		RD14BB2B201J	RES.CARBON FILM 200 J 1/8W
R109		RD14BB2E102J	RES.CARBON FILM 1K J 1/4W
R110		RD14BB2E750J	RES.CARBON FILM 75 J 1/4W
R111		RN14BK2B1241D	RES. METAL FILM 1.24K D 1/8W
R112		RN14BK2B4300D	RES. METAL FILM 430 D 1/8W
R113		RN14BK2B60R0D	RES. METAL FILM 60 D 1/8W
R114		RN14BK2B2780D	RES. METAL FILM 278 D 1/8W
R115		RN14BK2B2780D	RES. METAL FILM 278 D 1/8W
R116		RN14BK2E1910D	RES. METAL FILM 191 D 1/4W
R117		RD14BB2B151J	RES.CARBON FILM 150 J 1/8W
R118		RN14BK2B4120D	RES. METAL FILM 412 D 1/8W
R119		RN14BK2B4120D	RES. METAL FILM 412 D 1/8W
R120		RN14BK2B4120D	RES. METAL FILM 412 D 1/8W
R121		RD14BB2B150J	RES.CARBON FILM 15 J 1/8W
R122		RD14BB2B472J	RES.CARBON FILM 4.7K J 1/8W

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Ref. No	Add-ress	Parts No.	Description
R123		RD14BB2B472J	RES.CARBON FILM 4.7K J 1/8W
R124		RD14BB2B472J	RES.CARBON FILM 4.7K J 1/8W
R125		RD14BB2B472J	RES.CARBON FILM 4.7K J 1/8W
R126		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R127		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R128		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R129		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R130		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R131		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R132		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R133		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R134		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R135		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R136		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R137		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R138		RD14BB2B334J	RES.CARBON FILM 330K J 1/8W
R139		RD14BB2B683J	RES.CARBON FILM 68K J 1/8W
R140		RD14BB2E432J	RES.CARBON FILM 4.3K J 1/4W
R141		RD14BB2B121J	RES.CARBON FILM 120 J 1/8W
R142		RD14BB2E432J	RES.CARBON FILM 4.3K J 1/4W
R143		RD14BB2B272J	RES.CARBON FILM 2.7K J 1/8W
R144		RN14BK2B6191F	RES. METAL FILM 6.19K F 1/8W
R145		RD14BB2B681J	RES.CARBON FILM 680 J 1/8W
R146		RN14BK2B2940F	RES. METAL FILM 294 F 1/8W
R147		RD14BB2B121J	RES.CARBON FILM 120 J 1/8W
R148		RD14BB2E3R3J	RES.CARBON FILM 3.3 J 1/4W
R149		RD14BB2E432J	RES.CARBON FILM 4.3K J 1/4W
R150		RD14BB2B390J	RES.CARBON FILM 39 J 1/8W
R151		RD14BB2E432J	RES.CARBON FILM 4.3K J 1/4W
R152		RD14BB2B220J	RES.CARBON FILM 22 J 1/8W
R154		RD14BB2B220J	RES.CARBON FILM 22 J 1/8W
R155		RD14BB2B272J	RES.CARBON FILM 2.7K J 1/8W
R156		RD14BB2E3R3J	RES.CARBON FILM 3.3 J 1/4W
R157		RD14BB2B681J	RES.CARBON FILM 680 J 1/8W
R158		RN14BK2B1692F	RES. METAL FILM 16.9K F 1/8W
R159		RN14BK2B3010F	RES. METAL FILM 301 F 1/8W
R160		RD14BB2B681J	RES.CARBON FILM 680 J 1/8W
R161		RN14BK2B5230F	RES. METAL FILM 532 F 1/8W
R162		RD14BB2B472J	RES.CARBON FILM 4.7K J 1/8W
R163		RN14BK2B3010F	RES. METAL FILM 301 F 1/8W
R164		RN14BK2B3480F	RES. METAL FILM 348 F 1/8W
R165		RD14BB2E432J	RES.CARBON FILM 4.3K J 1/4W
R166		RD14BB2E432J	RES.CARBON FILM 4.3K J 1/4W
R167		RD14BB2B390J	RES.CARBON FILM 39 J 1/8W
R168		RD14BB2B681J	RES.CARBON FILM 680 J 1/8W
R169		RD14BB2B114J	RES.CARBON FILM 110K J 1/8W
R170		RD14BB2B683J	RES.CARBON FILM 68K J 1/8W
R171		RD14BB2B331J	RES.CARBON FILM 330 J 1/8W
R172		RD14BB2B331J	RES.CARBON FILM 330 J 1/8W
R173		RN14BK2B10R0F	RES. METAL FILM 10 F 1/8W
R174		RD14BB2B331J	RES.CARBON FILM 330 J 1/8W
R177		RD14BB2B472J	RES.CARBON FILM 4.7K J 1/8W
R178		RD14BB2B472J	RES.CARBON FILM 4.7K J 1/8W
R179		RD14BB2B331J	RES.CARBON FILM 330 J 1/8W
R180		RD14BB2B472J	RES.CARBON FILM 4.7K J 1/8W

L : Scandinavia K : USA P : Canada R : Mexico
Y : PX(Far East, Hawaii) T : Europe E : Europe G : Germany
Y : AAFES(Europe) X : Australia M : Other Areas

⚠ indicates safety critical components.

VT-181/VT-181E

PARTS LIST

9

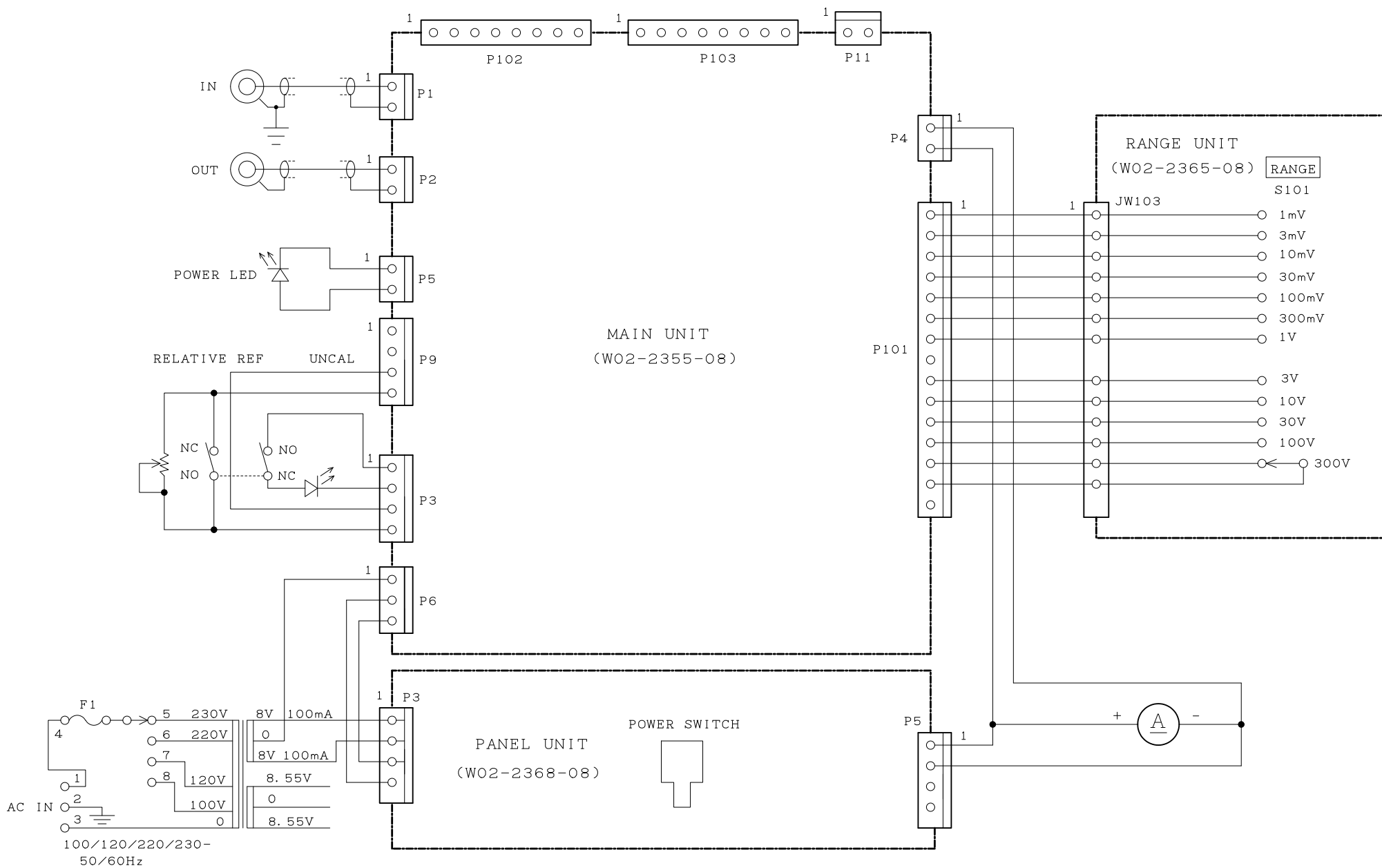
* New Parts
 Parts without **Parts No.** are not supplied.
 Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.
 Teile ohne **Parts No.** werden nicht geliefert.

Ref. No	Add-ress	Parts No.	Description
R181		RD14BB2B201J	RES.CARBON FILM 200 J 1/8W
R182		RN14BK2B2871F	RES. METAL FILM 2.87K F 1/8W
R186		RD14BB2B161J	RES.CARBON FILM 160 J 1/8W
TC101		C05-0707-08	CAP.TRIMMER
U101		MC14066BCP	IC, QUAD ANALOG SWITCH/MPX
U102		LM7805	IC, FIXED VOLTAGE REGULATOR
U103		LM7905	IC, FIXED VOLTAGE REGULATOR
VR101		R12-1545-05	RES. SEMI FIXED 1K - 1/10W
VR102		R12-0575-05	RES. SEMI FIXED 100 - 1/10W
VT-181 RANGE UNIT (W02-2365-08)			
		J73-0540-08	PCB(UNMOUNTED)
		E40-7609-08	CONNECTOR 4P
		S60-0628-08	ROTARY SWITCH S101
VT-181E RANGE UNIT (W02-2366-08)			
		J73-0540-08	PCB(UNMOUNTED)
		E40-7609-08	CONNECTOR 4P JW103
		S60-0628-08	ROTARY SWITCH S101
PANEL UNIT (W02-2368-05)			
		J73-0545-08	PCB(UNMOUNTED)
		E40-7604-08	CONNECTOR 5P
		E40-7606-08	CONNECTOR 3P
		S40-6501-05	PUSH SWITCH

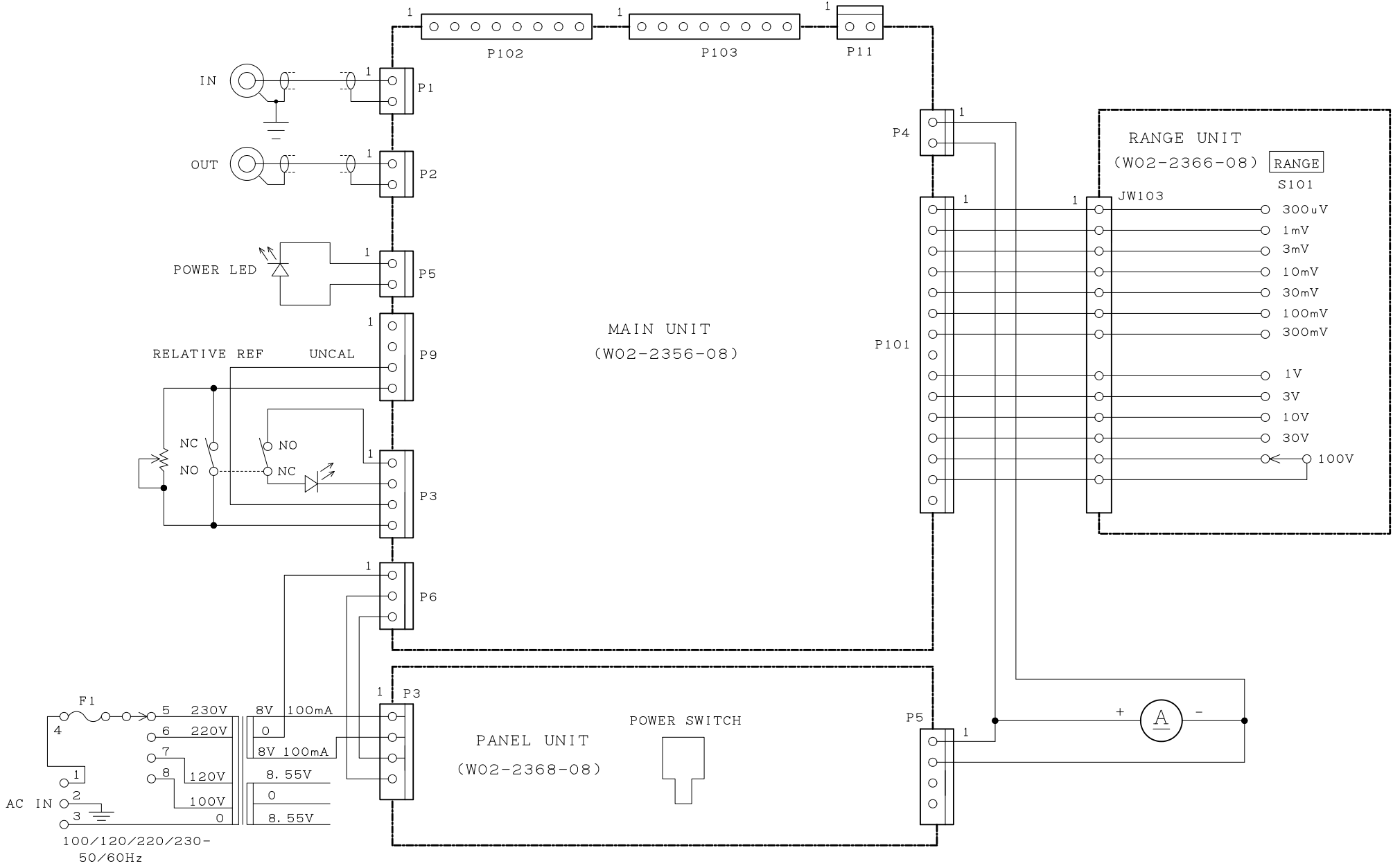
L : Scandinavia K : USA P : Canada R : Mexico
 Y : PX(Far East, Hawaii) T : Europe E : Europe G : Germany
 Y : AAFES(Europe) X : Australia M : Other Areas

⚠ indicates safety critical components.

VT-181 SCHEMATIC DIAGRAM

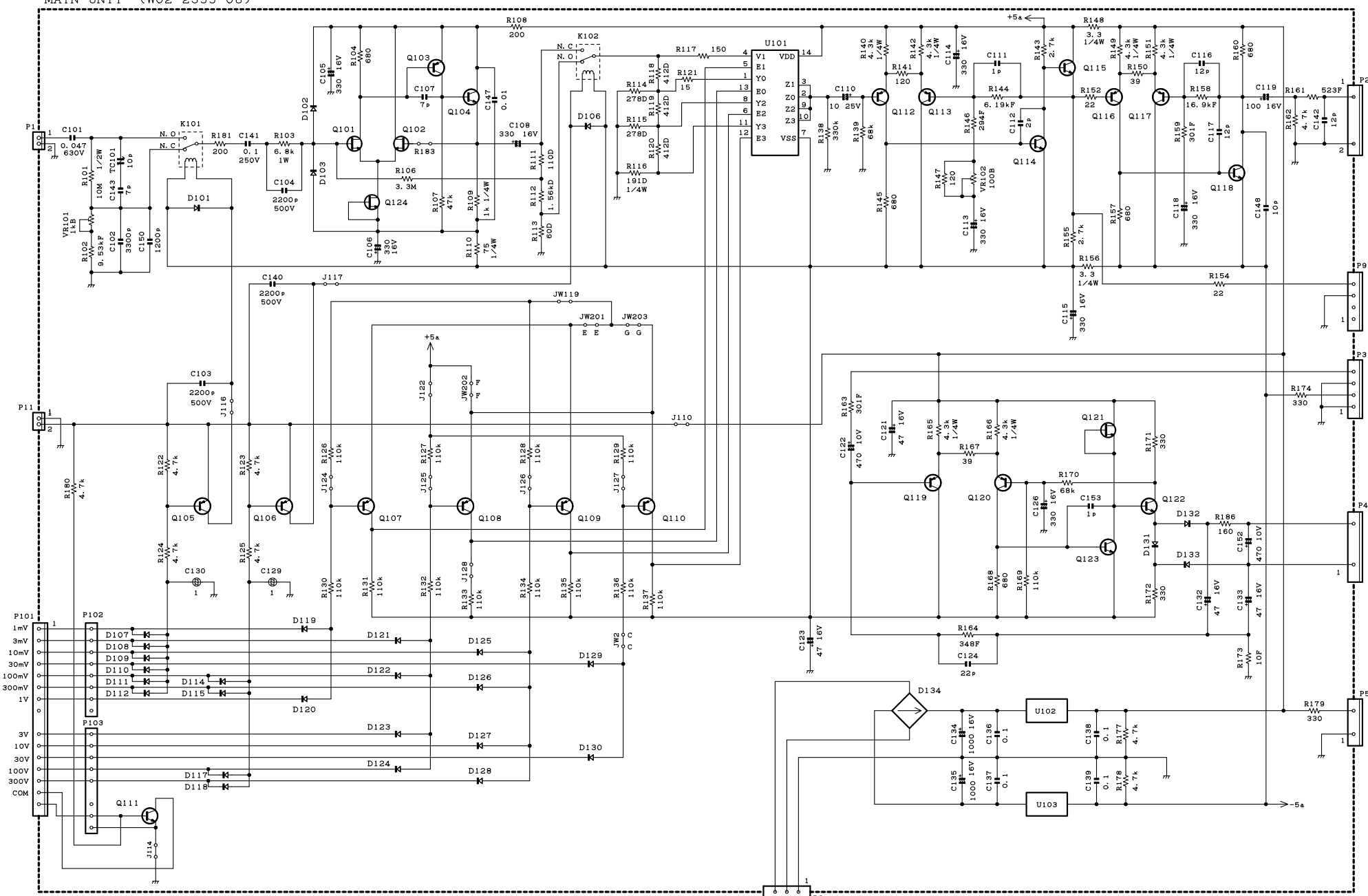


VT-181E SCHEMATIC DIAGRAM



VT-181 SCHEMATIC DIAGRAM

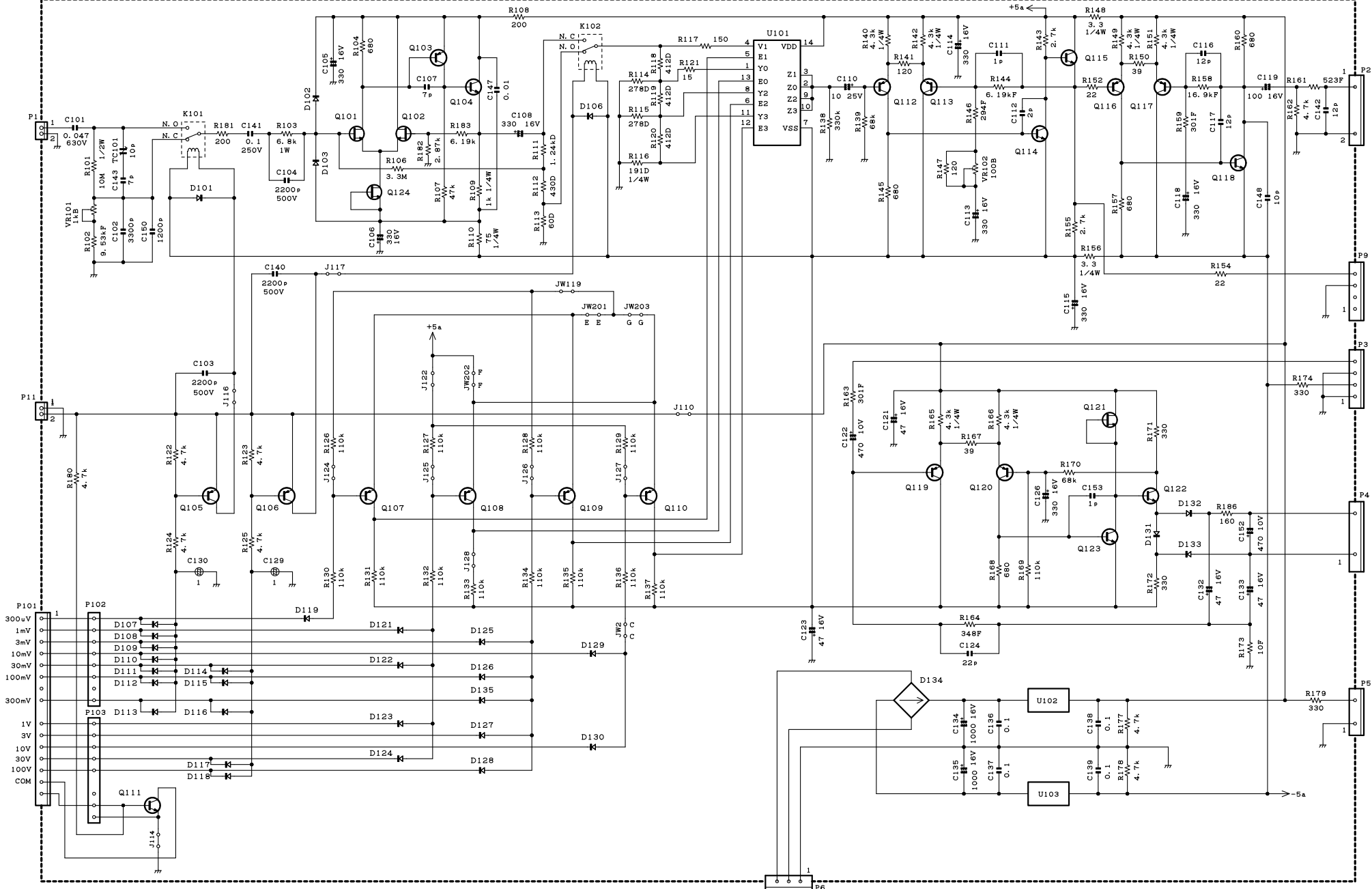
MAIN UNIT (W02-2355-08)



- | | | |
|---|------------------------|-------------------|
| Q101, 102 : 2SK163(K) | Q111 : 2SC1815(GR) | U101 : MC14066BCP |
| Q103, 112, 113, 116, 117, 119, 120 : 2SA970(GR) | Q121, 124 : 2SK30A(Y) | U102 : LM7805 |
| Q104, 114, 115, 118, 122, 123 : 2SC1923(O) | Q105-110 : 2SA1015(GR) | U103 : LM7905 |
-
- | | | |
|--|-------------|--|
| D101-103, 106-112, 114, 115, 117-133 : N4148 | D134 : W-02 | |
|--|-------------|--|

VT-181E SCHEMATIC DIAGRAM

MAIN UNIT (W02-2356-08)



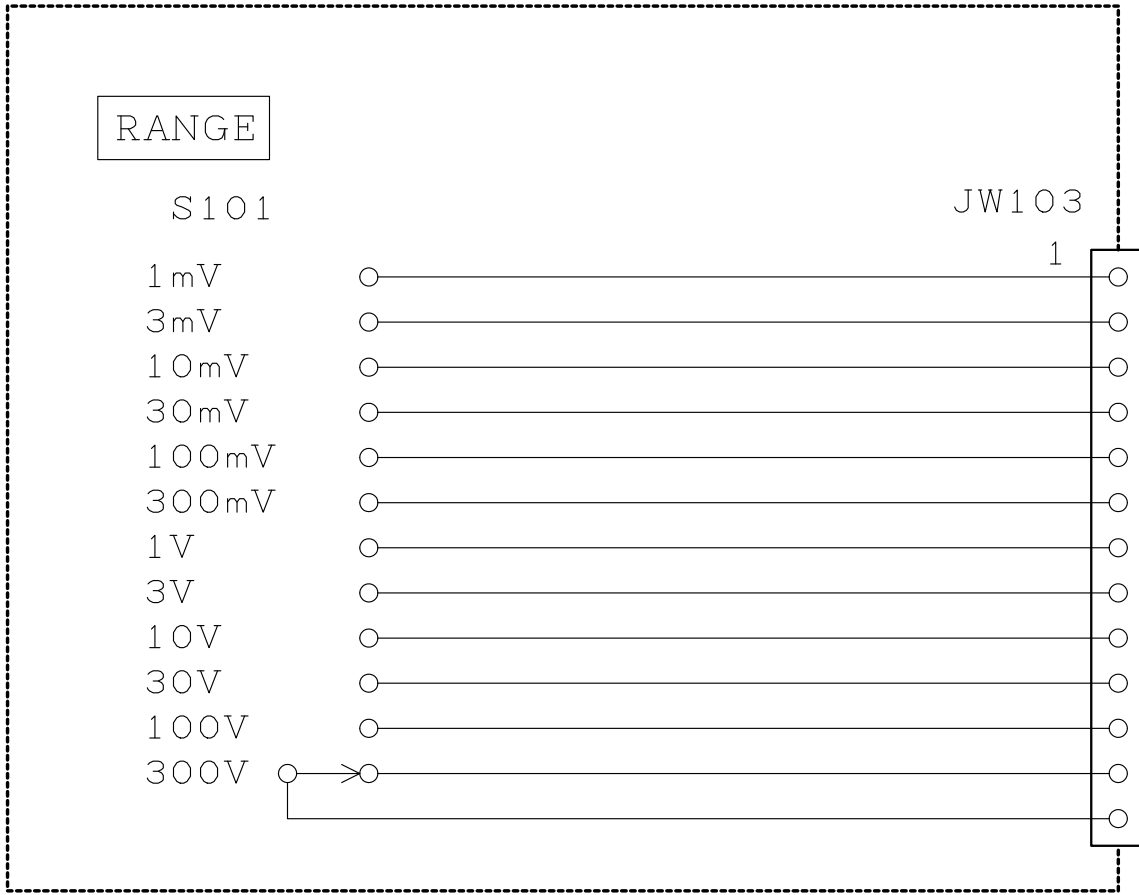
Q101, 102 : 2SK163(K)
 Q103, 112, 113, 116, 117, 119, 120 : 2SA970(GR)
 Q104, 114, 115, 118, 122, 123 : 2SC1923(O)

Q111 : 2SC1815(GR)
 Q121, 124 : 2SK30A(Y)
 Q105-110 : 2SA1015(GR)

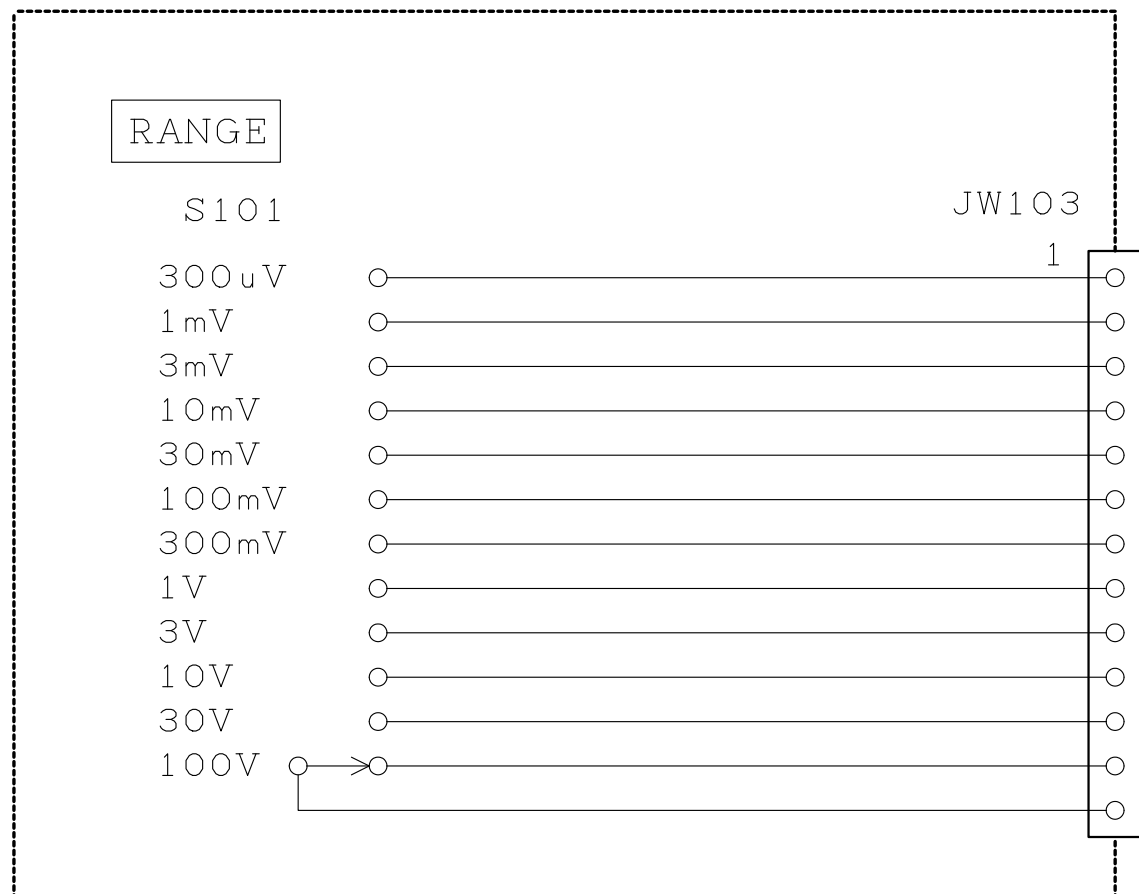
U101 : MC14066BCP
 U102 : LM7805
 U103 : LM7905

D101-103, 106-112, 114, 115, 117-133 : N4148
 D134 : W-02

VT181 RANGE UNIT (W02-2365-08)



VT181E RANGE UNIT (W02-2366-08)



1
2
3
4
5
6
7

1

2

3

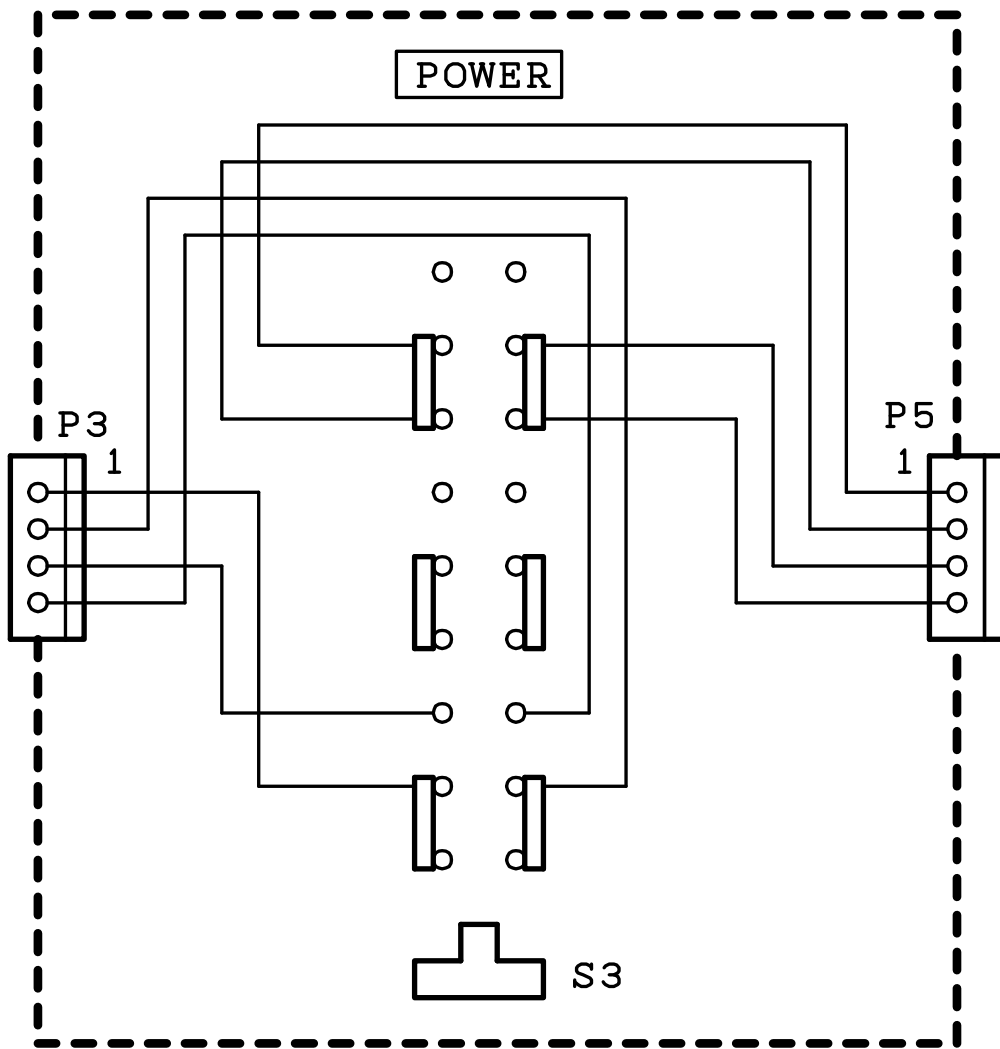
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5

6

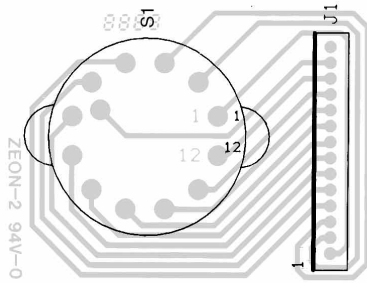
7

PANEL UNIT (W02-2368-08)

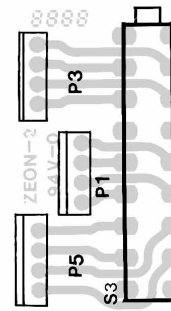


PC BOARD (Component side view)

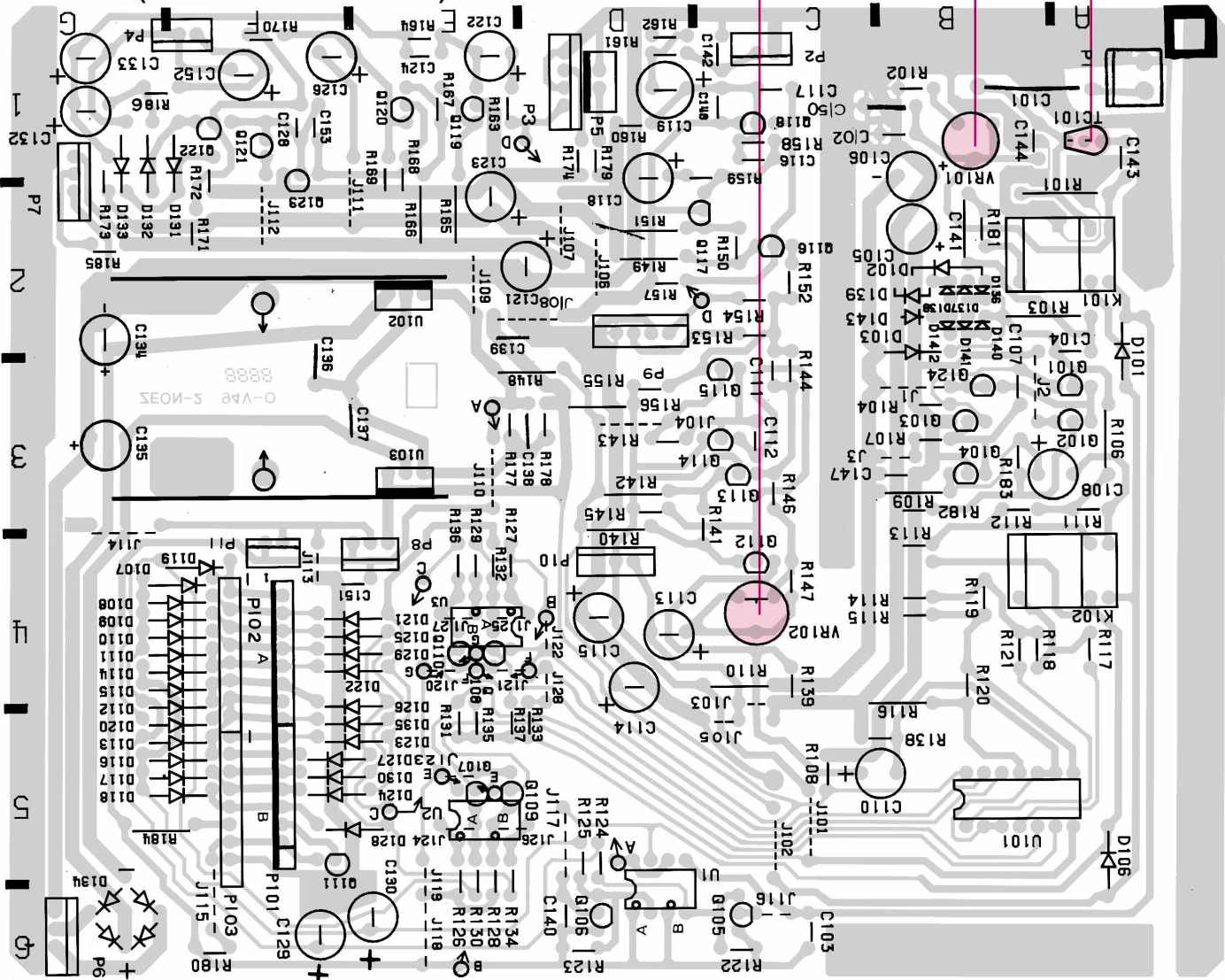
RANGE UNIT
(W02-2365-08/W02-2366-08)
Pattern side view



PANEL UNIT(W02-2368-08)
Pattern side view



MAIN UNIT(W02-2355-08/W02-2356-08)



Refer to the schematic diagram for the values of resistors and capacitors.

VT-181/VT-181E

A product of

KENWOOD TMI CORPORATION

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