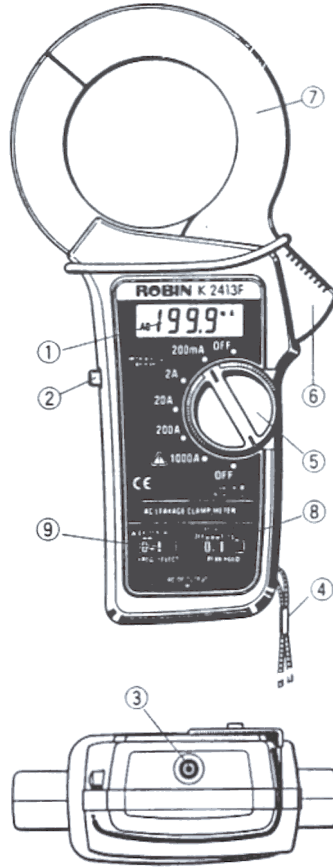


K2413F

DIGITAL CLAMP METER



1. LCD. 2. Data Hold Button. 3. Analogue Output Terminal. 4. Safety hand Strap. 5. Power Function / Range Switch. 6. Jaw Trigger. 7. Transformer Jaws. 8. Peak Hold Selector Switch. 9. Frequency Selector Switch.

	Components of the product supplied. Description.	Visually inspect for clean unmarked appearance and for the following.
1.	K2413F Digital Clamp Meter. Packed in clear plastic bag with protective foam sheet.	Calibration accuracy within the Lo and Hi 70% limits detailed on page 2. Operational integrity.
2.	Certificate of Conformity.	Standard Robin form with correct serial number.
3.	Instruction Manual.	Correct Instruction Manual.
4.	6F22 (PP3) 9 Volt Battery (sealed).	Correct Battery with seal intact.
5.	Grey, PVC Pouch with Zip Closure containing all of the above.	Correct pouch. Check Zip function.
6.	Warranty Registration Card.	Standard Robin Warranty Registration Card.
7.	Carton.	Correct carton with current address, logos and references

K2413F Digital AC Leakage Clamp Meter

Range	Tol %	+Dig	Applied	Tol +/-	Lo Limit	Hi Limit	Lo 70%	Hi 70%
AC Current								
200mA	1	2	190.00 mA 50Hz	2.1	187.9	192.1	188.5	191.5
	3	2	190.00 mA 1kHz	5.9	184.1	195.9	185.9	194.1
2A	1	2	0.5000 A 50Hz	0.007	0.493	0.507	0.495	0.505
			1.0000 A 50Hz	0.012	0.988	1.012	0.992	1.008
			1.9000 A 50Hz	0.021	1.879	1.921	1.885	1.915
20A	3	2	1.9000 A 1kHz	0.059	1.841	1.959	1.859	1.941
			19.000 A 50Hz	0.21	18.79	19.21	18.85	19.15
200A	3	2	19.000 A 1kHz	0.59	18.41	19.59	18.59	19.41
			190.00 A 50Hz	4.9	185.1	194.9	186.0	194.0
1000A	1.5	2	490.0 A 50Hz	9	481	499	484	496
			800.0 A 50Hz	40	760	840	772	828

CHECK:

DATA HOLD FUNCTION

Authorised



 Service Manager

Date 11/01/2000

Calibration Procedures for Model 2413F

<u>Calibration Steps</u>	<u>Calibration Point</u>
1. AC Output Adjustment Using Variable Resistor VR2	190mA AC
2. Display Adjustment Using Variable Resistor VR7	190mA AC
3. 2A AC Range Calibration Using Variable Resistor VR3	1.9A AC
4. Frequency Filter Sensitivity Adjustment Using Variable Resistor VR4	1.0A AC
5. Peak Hold Offset Adjustment Using Variable Resistor VR6	0.0A AC
6. Peak Hold Sensitivity Adjustment Using Variable Resistor VR5	1.9A AC
7. 20A, 200A, 1000A AC Range Sensitivity Adjustment Using Variable Resistor VR1	19A, 190A, 500A AC

Calibration Equipment

- a. AC Current Generator
(50, 60, 250Hz) Output Range from 10mA to
1000A AC
- b. 1, 10 & 100 Ampere Turn Coil
- c. DC Power Supply (Variable from 6V to 9V)
- d. DMM's x 2 (AC Millivoltmeter &
DC Millivoltmeter)

e. Model 7073 Output Cord

f. Screwdriver

Calibration Methods

- 1 As shown in Fig. 1, connect the DC power supply to the battery hook, output cord Model 7073 to DMM's and output terminal of Model 2413F.

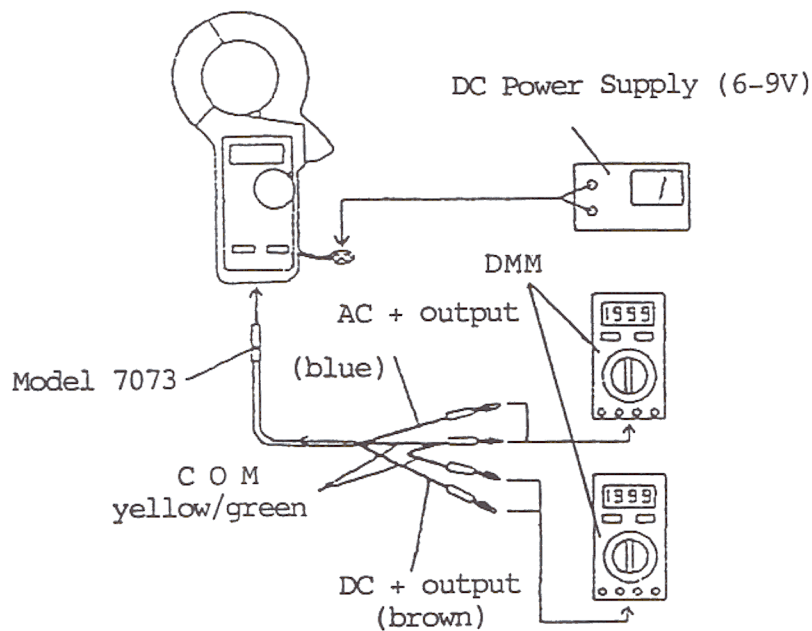


Fig. 1

1. AC Output Adjustment (at 50Hz)

With the frequency selector switch set to the WIDE position, and the range selector switch to 200mA AC position, clamp on a conductor carrying 190mA AC available from the AC current generator and the coil. Adjust VR2 so that the AC millivolt output of the DMM becomes $190.0\text{mV} \pm 2\%$ of rdg. Check that DC millivolt output of OUTPUT terminal becomes $190.0\text{mV DC} \pm 3\%$ rdg.

AC Current Generator (50/60/250Hz)

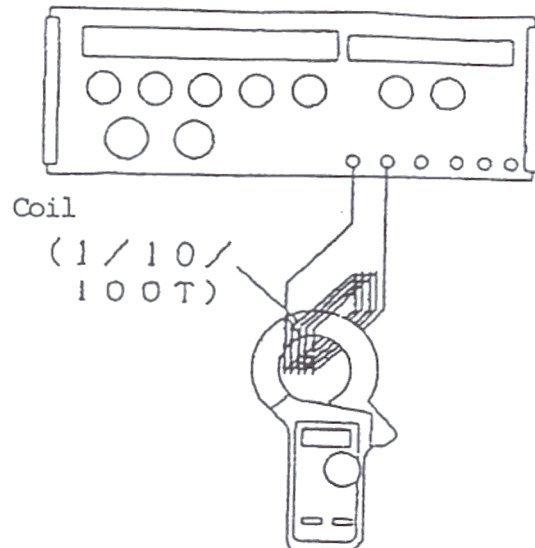


Fig. 2

2. Display Adjustment

Adjust VR7 (B-5K Ω) so that the display reads 190.0mA AC.

3. 2A AC Range Calibration

With the range switch set to 2A AC range, adjust VR3 (B-100 Ω) so that the display reads 1.900A AC when the instrument is clamped on a 1.9A AC carrying conductor.

4. Frequency Filter Sensitivity Adjustment (at 55Hz)

With the frequency selector switch set to the 50/60Hz position, adjust VR4 (B-5K Ω) so that the display reads 1.900A AC and check the reading against 60Hz input. Also, check that the display reading at 250Hz is about one tenth of that at 50Hz or 60Hz.

5. Peak Hold Offset Adjustment

With the peak hold selector switch set to the 100mS position, adjust VR6 (B-20K Ω) so that the display reads .000A AC when the range selector switch is at 2A AC position and no input is applied. Then, set the peak hold selector switch to OFF position and check that the display reads .000A AC when it is reset to 100mS and 10mS positions. (Turn VR6 slightly to left before the peak hold offset adjustment).

6. Peak Hold Sensitivity Adjustment (at 50Hz)

With the range selector switch set to the 2A AC position and frequency selector switch to 100mS or 10mS position, clamp on a 1.0A AC carrying conductor and adjust VR5 (B-20K Ω) so that the display reads 1.000A AC. Without applying any input check that the instrument is in the peak hold mode and set the peak hold selector switch to off position and reset it to the 100mS or 10mS position. Make certain that the peak hold functions normally when 1.9A AC is applied.

7 20A, 200A, 1000A AC Range Sensitivity Adjustment

With the frequency selector switch set to the 20A AC position, clamp on a 19A AC carrying conductor and adjust VR1 (B-5K Ω) so that the display reads 19.00A AC. Check the sensitivity on the 200A AC and 1000A AC ranges. If the readings are not within specified accuracy adjust the two ranges using VR1.

Refer to Fig. 3 for location of the variable resistors, peak hold selector switch and frequency selector switch.

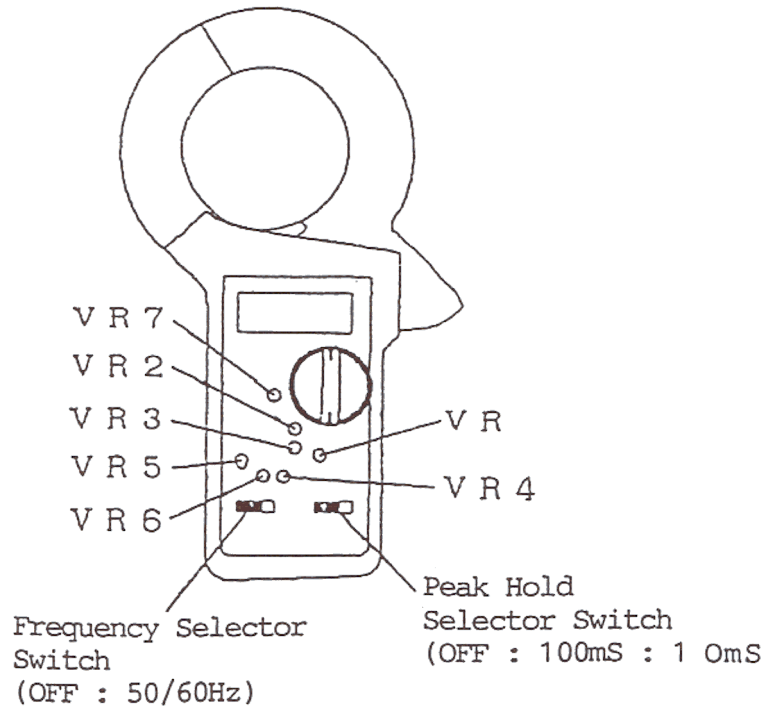
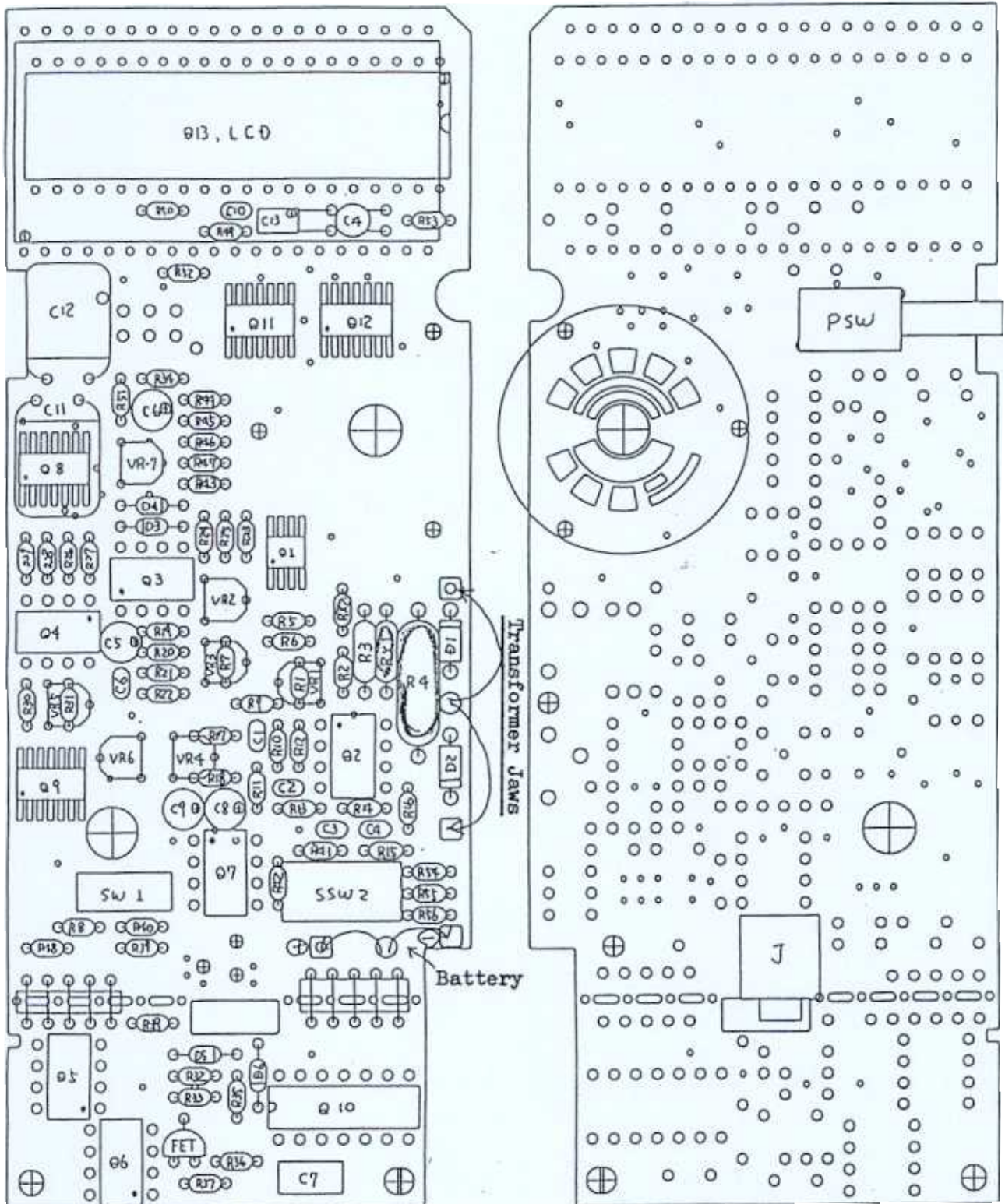


Fig. 3

OK *AM*

P.C.B. Layout Drawing for Model 2413F, P.C.B. No. 50-1222B

LAY 00064



Circuit Diagram No. 00-1744D

CODE	SYMBOL	DESCRIPTION	QTY	REV.
5574	50-1222B	P.C.B.	1	
3257	Q13	LSI TSC7116CPL	1	
3258	LCD	LCD KLC-700PN	1	
3259	Q6	IC ICL7611DCPA	1	
5475	Q1	IC LT1097S8	1	
3418	Q2,3	IC NJM022	2	
1105	Q7	IC NJM2904	1	
2534	Q4,5	IC OP-07	2	
3732	Q11,12	IC uPD4030BG	2	
1106	Q10	IC uPD4066BP	1	
4305	Q8,9	IC uPD4066BG	2	
1096	FET	FET 2SK30AO	1	
1061	D1,2	Silicon Diode 1N4003	2	
1068	D3,4,5,6	Silicon Diode 1N4448-TP	4	
3322	VR5,6	Variable Res. KVSF-637AO B-20k ohm	2	
4135	VR4,7	" " " B-5k ohm	2	
4020	VR1	" " " B-500 ohm	1	
1527	VR2	" " " B-200 ohm	1	
1528	VR3	" " " B-100 ohm	1	
		Electrolytic Cap. MS5 33uF16V	3	
		" " " MS5 10uF16V	1	
		" " " MS5 1uF50V	1	
		Metalized Polyester Film Capacitor	1	
		MKT 1uF 63V		
2542	C13	Metalized Polyester Film Capacitor	1	
		MKT 0.47uF 63V		
2543	C12	Metalized Polyester Film Capacitor	1	
		MKT 0.22uF 63V		
5327	C6	Multi-Layer Capacitor D25E1H104M	1	
5542	C1-4,11	" " D22R1H103K	5	
1778	C15	Ceramic Capacitor 100pF 50V	1	
-	78-1086	Jumper Lead Wire 5X25	2	
1529	J	Jack HSJ1102-01-510	1	
3842	74-1539A	Range Switch Shaft	1	
3844	74-1514	Lock Pin	3	
3843	74-1540	Range Switch Shaft Stopper	1	
3847	73-1569	Rotor	2	
2898	PSW	Push Switch SPJ-222	1	
3757	SSW2	Slide Switch SSSS9-2-3	1	
3785	SW1	Slide Switch SSSS9-1-2	1	
1531	CT	Complete Transformer Jaws	1	
1534	30-1577B	Front Panel	1	
1535	30-1578	Back Case	1	
3088	74-1479	Range Switch Knob	1	
1536	30-1583	Battery Cover	1	
1613	75-5132	Cushion for Battery	1	
1537	74-1593	Push Switch Knob	1	
1637	74-1596	Output Terminal Guide	1	
3766	74-1543	Slide Switch Knob	2	
5735		Name Plate(R)	1	
3509	75-1085	Hand Strap	1	
0014		Battery Holder I-150	1	
1540		Carrying Case Model 9064	1	

PA 00064

1636	70-5118	Fastening Screw +3X8	1
1304		Fastening Screw +N3X10	2
1632		Fastening Screw +N3X30	1
3017		Fastening Screw +N3X25	1
5737	92-1237	Instruction Manual	1
1933		Battery 006P	1
5821	45-1588	Serial Number Label	1
1284		Plastic Insert	2
1291		Vinyl Bag	1
5736	90-1163	Outer Cardboard Box	1
1545	R4	Wire Wound Res. 1/2PF 0.23 ohm	1
3323	R3	Metal Film Res. 1/4WF 1.98 ohm	1
"	R9,10,	" " 1/6WF 120k ohm	2
"	R13,14	" " " "	2
"	R16	" " " 124k ohm	1
"	R11,15,22	" " " 100k ohm	3
"	R23,26-29	" " " "	5
"	R31,53	" " " "	2
"	R17	" " " 59k ohm	1
"	R30,50	" " " 47k ohm	2
"	R42	" " " 40k ohm	1
"	R18	" " " 36k ohm	1
"	R51	" " " 27k ohm	1
"	R41	" " " 25.5k ohm	1
"	R40	" " " 20k ohm	1
"	R12	" " " 15.2k ohm	1
"	R39	" " " 10k ohm	1
"	R5,24,25	" " " 2.1k ohm	3
"	R37	" " " 2k ohm	1
"	R1	" " " 1.98k ohm	1
"	R20,21	" " " 1.87k ohm	2
"	R52	" " " 1k ohm	1
"	R6	" " " 210 ohm	1
"	R7,36	" " " 100 ohm	2
"	R2	" " " 19.8 ohm	1
"	R19	Carbon Film Res. 1/6WJ 2.2M ohm	1
"	R35,38,49	" " " 1M ohm	3
"	R43-47	" " " "	5
"	R54,55,56	" " " 150k ohm	3
"	R32,33,34	" " " 10k ohm	3
"	R8,48	" " " 1k ohm	2
	Cal. Res.	Metal Film Res. 1/6WF 560 ohm	1
	" "	" " 1/4WF 7.5 ohm	1