

MINIFLEX® 5-BFN II
LONG ACTUATOR TYPE

Part No. 20586-0**E-01

Test Report

Product Specification no. PRS-2056

5	T22009	January 7, 2022	S.Shigekoshi	M.Muro	H.Ikari
4	T19118	October 3, 2019	Y. Sasa	T. Masunaga	H. Ikari
3	T17148	September 4, 2017	H. Aoki	-	Y. Shimada
2	T17040	March 2, 2017	H. Aoki	M. Muro	H. Ikari
Rev.	ECN	Date	Prepared by	Checked by	Approved by

1. Purpose

To evaluate the performance of MINIFLEX 5-BFN II LONG ACT TYPE Connector in accordance with PRS-2056.

2. Specimen

(1) MINIFLEX 5-BFN II LONG ACT TYPE (Part No. 20586-0**E-01)

(2) FPC : Made by Taiyo Industrial Co.,Ltd.

Thickness Lead : $t=0.3\pm0.03$ (Actual measurement : 0.29~0.30mm)

Made by NIPPON MECTRON, Ltd.

Thickness Lead : $t=0.3\pm0.03$ (Actual measurement : 0.29~0.30mm)

3. Test Sequence

All the evaluations were performed in accordance with Table 1. Test Sequence.

4. Result

See Table 2-1 to 2-4, Graph 1 to 14. For the details of the testing conditions and requirements, see PRS-2056.

The "n" in the tables show the number of measurement points.

5. Conclusion

All the specimens met the requirements of PRS-2056.

MINIFLEX 5-BFN II LONG ACT TYPE Test Report

Document No.
TR-15070-05EN

Table 1 Test Sequence

Test Items	Group															
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R
C/T Resistance	2,7			1,3,5,	1,3	1,3	1,3	1,5	1,5	1,3	1,3	1,3	1,3			
D.W.Voltage								2,6	2,6							
Insulation Resistance								3,7	3,7							
Temp. rising																1
Act Locking Force	1,5															
Act Un-locking Force	3,6															
FPC Retention Force		1,3														
Durability	4	2														
C/T Retention Force			1													
H/D Retention Force			2													
Vibration				2												
Shock				4												
Fretting Corrosion					2											
Thermal Shock						2										
High Temp. Life							2									
High Temp & High Hum energizing								4								
High Temp & High Hum Life									4							
Cold Temp. Life										2						
Gas (H ₂ S)											2					
Gas (SO ₂)												2				
Salt Water Spray													2			
Solderability														1		
Soldering Heat Resist.															1	
Specimen Quantity.	10 pcs.	10 pcs.	20 pos.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.	10 pcs.

※Numbers indicate sequence in which tests are performed.

MINIFLEX 5-BFN II LONG ACT TYPE Test Report

Document No.
TR-15070-05EN

Table 2-1 Test Result

Test Item	Contents of Measurement		Specifications	Sample q'ty	n	Data					Judge	
						AVE.(X)	MAX.	MIN.	s	X±3s		
A Group Durability	Contact Resistance (mΩ)	Initial		40mΩ MAX.	10	320	26.351	29.80	22.20	1.874	31.973	Pass
		After 20th		ΔR=20mΩ MAX.			0.270	3.46	-2.79	1.858	5.844	Pass
	Act Locking Force(N)	32P	Initial	13.76N MAX. (0.43N/Pos.x32P)	10	10	3.588 (0.112)	3.85 (0.12)	3.41 (0.11)	0.154 (0.005)	4.050 (0.127)	Pass
			20th cycles				2.703 (0.084)	2.82 (0.09)	2.54 (0.08)	0.093 (0.003)	2.982 (0.093)	Pass
		34P	Initial	14.62N MAX. (0.43N/Pos.x34P)	10	10	3.818 (0.112)	4.04 (0.12)	3.62 (0.11)	0.144 (0.004)	4.250 (0.125)	Pass
			20th cycles				2.879 (0.085)	3.00 (0.09)	2.61 (0.08)	0.114 (0.003)	3.221 (0.095)	Pass
		40P	Initial	17.20N MAX. (0.43N/Pos.x40P)	10	10	4.388 (0.110)	4.62 (0.12)	4.21 (0.11)	0.132 (0.003)	4.784 (0.120)	Pass
			20th cycles				3.293 (0.082)	3.45 (0.09)	3.10 (0.08)	0.118 (0.003)	3.647 (0.091)	Pass
		50P	Initial	21.50N MAX. (0.43N/Pos.x50P)	10	10	4.793 (0.096)	4.97 (0.10)	4.61 (0.092)	0.134 (0.003)	5.195 (0.104)	Pass
			20th cycles				3.717 (0.074)	3.86 (0.077)	3.56 (0.071)	0.126 (0.003)	4.095 (0.082)	Pass
		54P	Initial	23.22N MAX. (0.43N/Pos.x54P)	10	10	5.261 (0.097)	5.42 (0.10)	4.96 (0.09)	0.174 (0.003)	5.783 (0.107)	Pass
			20th cycles				3.993 (0.074)	4.14 (0.08)	3.83 (0.07)	0.096 (0.002)	4.281 (0.079)	Pass
	Act Un-Locking Force(N)	32P	Initial	0.80N MIN. (0.025N/Pos.x32P)	10	10	2.087 (0.065)	2.18 (0.07)	1.98 (0.06)	0.066 (0.002)	1.889 (0.059)	Pass
			20th cycles				1.826 (0.057)	1.97 (0.06)	1.71 (0.05)	0.097 (0.003)	1.535 (0.048)	Pass
		34P	Initial	0.85N MIN. (0.025N/Pos.x34P)	10	10	2.205 (0.065)	2.27 (0.07)	1.98 (0.06)	0.095 (0.003)	1.920 (0.056)	Pass
			20th cycles				1.850 (0.054)	1.92 (0.06)	1.68 (0.05)	0.066 (0.003)	1.652 (0.049)	Pass
		40P	Initial	1.00N MIN. (0.025N/Pos.40P)	10	10	2.644 (0.066)	2.91 (0.07)	2.46 (0.06)	0.166 (0.004)	2.146 (0.054)	Pass
			20th cycles				2.132 (0.053)	2.18 (0.05)	2.06 (0.05)	0.045 (0.001)	1.997 (0.050)	Pass
		50P	Initial	1.25N MIN. (0.025N/Pos.x50P)	10	10	3.353 (0.067)	3.54 (0.07)	3.17 (0.06)	0.136 (0.002)	2.945 (0.059)	Pass
			20th cycles				2.883 (0.058)	3.00 (0.06)	2.76 (0.06)	0.071 (0.001)	2.670 (0.053)	Pass
		54P	Initial	1.35N MIN. (0.025N/Pos.x54P)	10	10	3.502 (0.065)	3.67 (0.07)	3.35 (0.06)	0.107 (0.002)	3.181 (0.059)	Pass
			20th cycles				2.955 (0.055)	3.05 (0.06)	2.85 (0.05)	0.071 (0.001)	2.742 (0.051)	Pass

MINIFLEX 5-BFN II LONG ACT TYPE Test Report

Document No.
TR-15070-05EN

Table 2-2 Test Result

Test Item	Contents of Measurement			Specifications	Sample q'ty	n	Data					Judge		
							AVE.(X)	MAX.	MIN.	s	X±3s			
B Group FPC Retention Force(N)		32P	Initial	4.80N MIN. (0.15N/Pos.×32P)	10	10	11.426 (0.357)	11.78 (0.37)	11.13 (0.35)	0.240 (0.008)	10.706 (0.335)	Pass		
			20th cycles				9.984 (0.312)	10.25 (0.32)	9.60 (0.30)	0.226 (0.007)	9.306 (0.291)	Pass		
		34P	Initial	5.10N MIN. (0.15N/Pos.×34P)	10	10	11.972 (0.352)	12.37 (0.36)	11.58 (0.34)	0.208 (0.006)	11.348 (0.334)	Pass		
			20th cycles				10.468 (0.308)	11.17 (0.33)	10.03 (0.30)	0.373 (0.011)	9.349 (0.275)	Pass		
		40P	Initial	6.00N MIN. (0.15N/Pos.×40P)	10	10	14.173 (0.354)	14.54 (0.36)	13.81 (0.35)	0.285 (0.007)	13.318 (0.333)	Pass		
			20th cycles				12.543 (0.314)	13.02 (0.33)	12.02 (0.30)	0.410 (0.010)	11.313 (0.283)	Pass		
		50P	Initial	7.50N MIN. (0.15N/Pos.×50P)	10	10	17.398 (0.348)	17.62 (0.35)	17.18 (0.34)	0.159 (0.003)	16.921 (0.338)	Pass		
			20th cycles				15.181 (0.304)	15.44 (0.31)	14.92 (0.30)	0.175 (0.004)	14.656 (0.293)	Pass		
		54P	Initial	8.10N MIN. (0.15N/Pos.×54P)	10	10	18.638 (0.345)	19.20 (0.36)	18.07 (0.33)	0.293 (0.005)	17.759 (0.329)	Pass		
			20th cycles				16.820 (0.311)	17.36 (0.32)	16.23 (0.30)	0.422 (0.008)	15.554 (0.288)	Pass		
		C Group Retention Force		C/T		0.5N MIN.	10	20	1.294	1.35	1.20	0.041	1.171	Pass
				H/D		0.5N MIN.	10	20	0.883	0.97	0.81	0.050	0.733	Pass
D Group Vibration Shock	Contact Resistance (mΩ)	Initial		40mΩ MAX.	10	320	26.623	29.98	23.22	1.142	30.049	Pass		
		After Vibration		ΔR=20mΩ MAX.			-1.431	0.62	-2.64	0.782	0.915	Pass		
		After Shock					-1.008	1.70	-2.98	1.115	2.337	Pass		
	Discontinuity	During Vibration		1μsec. MAX.	10	10	No Discontinuity					Pass		
		During Shock					No Discontinuity					Pass		
	Appearance	After Vibration		No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass		
		After Vibration					No Abnormality					Pass		

MINIFLEX 5-BFN II LONG ACT TYPE Test Report

Document No.
TR-15070-05EN

Table 2-3 Test Result

Test Item	Contents of Measurement		Specifications	Sample q'ty	n	Data					Judge
						AVE.(X)	MAX.	MIN.	s	X±3s	
E Group Fretting Corrosion	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.279	29.70	22.27	1.523	30.848	Pass
		After Test	ΔR=20mΩ MAX.			-1.640	1.86	-4.08	1.387	2.521	Pass
	Discontinuity	In Test	1μsec. MAX.	10	10	No Discontinuity					Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
F Group Thermal Shock	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.702	29.03	23.88	0.990	29.672	Pass
		After Test	ΔR=20mΩ MAX.			-1.310	1.37	-3.55	1.100	1.990	Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
G Group High Temp. Life	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	25.864	29.39	22.20	1.293	29.743	Pass
		After Test	ΔR=20mΩ MAX.			1.797	7.49	-4.04	2.219	8.454	Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
H Group High Temp. & High Hum. energizing	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	25.991	29.64	22.28	1.370	30.101	Pass
		After Test	ΔR=20mΩ MAX.			1.738	5.46	-2.22	1.831	7.231	Pass
	D.W.Voltage	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur	10	100	No Abnormality					Pass
		After Test				No Abnormality					Pass
	Insulation Resistance (MΩ)	Initial	100MΩ MIN	10	100	MIN. 2.0×10 ⁴ MΩ					Pass
		After Test				MIN. 3.0×10 ³ MΩ					Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
J Group High Temp. & High Hum. Life	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.399	29.64	22.81	1.251	30.152	Pass
		After Test	ΔR=20mΩ MAX.			1.990	5.76	-2.40	1.746	7.228	Pass
	D.W.Voltage	Initial	No abnormalities such as creeping discharge, flashover, insulator breakdown occur	10	100	No Abnormality					Pass
		After Test				No Abnormality					Pass
	Insulation Resistance (MΩ)	Initial	100MΩ MIN	10	100	MIN. 2.0×10 ⁴ MΩ					Pass
		After Test				MIN. 2.5×10 ³ MΩ					Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass

(※1.) The results for Group F (Thermal shock) and Group G (high temperature life) were obtained using FPC made by Made by Taiyo Industrial Co.,Ltd., while the results for the other groups were obtained using FPC made by Made by NIPPON MECTRON, Ltd..

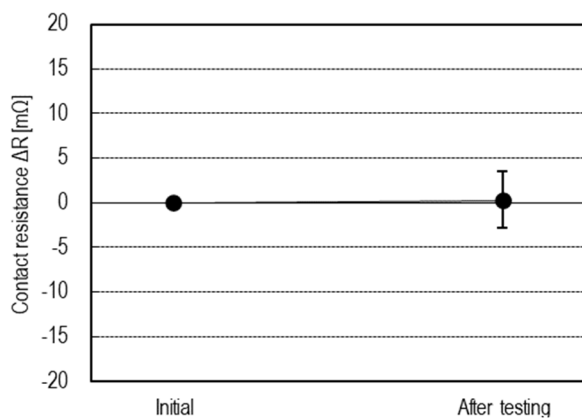
MINIFLEX 5-BFN II LONG ACT TYPE Test Report

Document No.
TR-15070-05EN

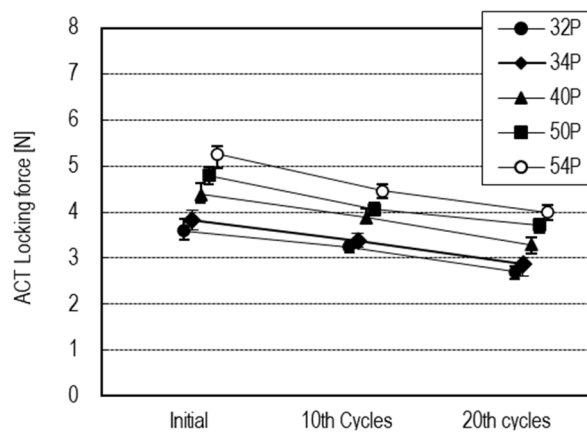
Table 2-4 Test Result

Test Item	Contents of Measurement		Specifications	Sample q'ty	n	Data					Judge
						AVE.(X)	MAX.	MIN.	S	X±3s	
K Group Cold Temp. Life	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.365	29.45	22.88	1.224	30.037	Pass
		After Test	ΔR=20mΩ MAX.			0.043	2.99	-2.98	1.476	4.471	Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
L Group Gas(H ₂ S)	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.433	29.40	23.05	1.134	29.835	Pass
		After Test	ΔR=20mΩ MAX.			0.223	3.90	-2.71	1.398	4.417	Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
M Group Gas(SO ₂)	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.624	30.15	23.04	1.242	30.350	Pass
		After Test	ΔR=20mΩ MAX.			0.359	3.84	-3.19	1.716	5.507	Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
N Group Salt Water Spray	Contact Resistance (mΩ)	Initial	40mΩ MAX.	10	320	26.312	29.28	22.50	1.317	30.263	Pass
		After Test	ΔR=20mΩ MAX.			1.219	5.64	-2.50	2.006	7.237	Pass
	Appearance	After Test	No abnormality adversely affecting the performance shall occur	10	10	No Abnormality					Pass
P Group Solderability	Zerex Time (sec.)	C/T	3sec. MAX	10	10	MAX. 0.1sec.					Pass
		H/D		10	10	MAX. 0.2sec.					Pass
	Appearance	C/T	Wetness 95% MIN.	10	10	95%MIN.was wet.					Pass
		H/D		10	10	95%MIN.was wet.					
Q Group Soldering Heat Resistance	Reflow twice		No Abnormality	10	10	No Abnormality					Pass
	Soldering iron										
R Group Temp. rising	0.5A/Contact 7.0A/Connector		ΔT=30℃ MAX.	10	10	MAX. 26.2℃					Pass

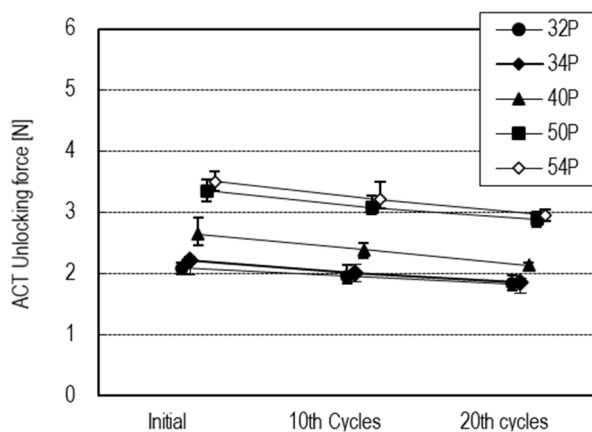
* To evaluate about Temp. Rising Test with FPC made by Taiyo Industrial Co.,Ltd (Thickness Lead : t=0.3mm, Length : L=70mm). It is a result of when applied ratings current (0.5A/Contact) between the neighboring contacts for 14pos. (With the whole connector 7.0A).



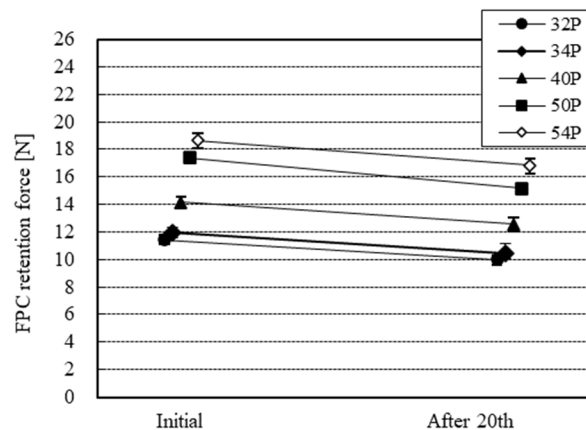
Graph 1. A change of Contact Resistance
A group : Durability



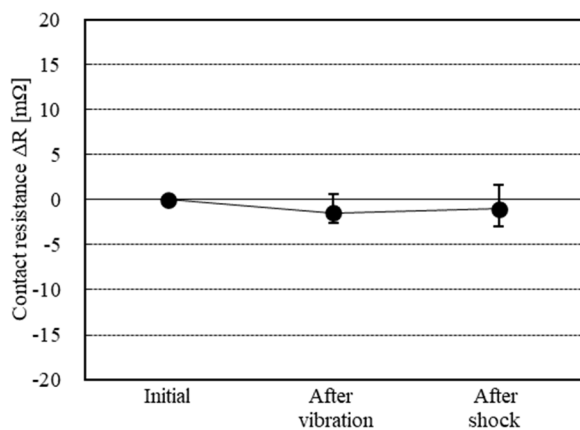
Graph 2. A change of Locking Force
A group : Durability



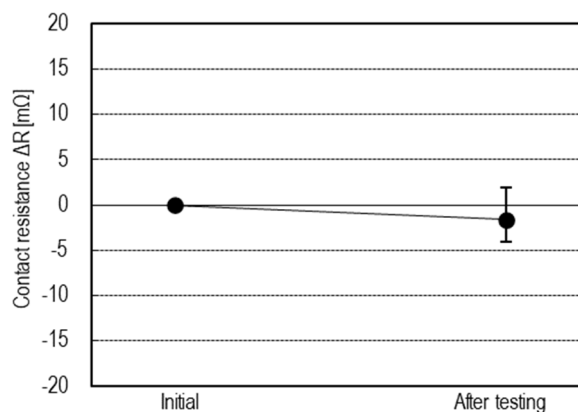
Graph 3. A change of Un-locking Force
A group : Durability



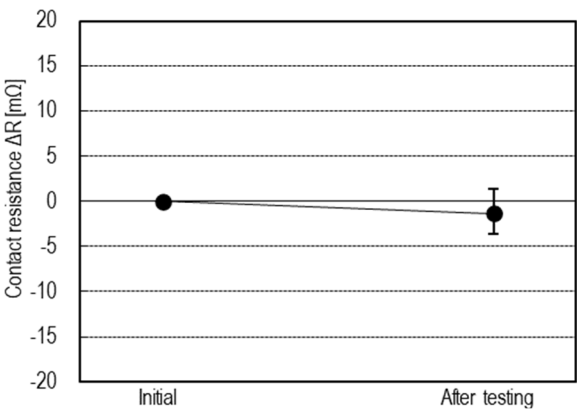
Graph 4. A change of FPC Retention Force
B group : FPC Retention Force



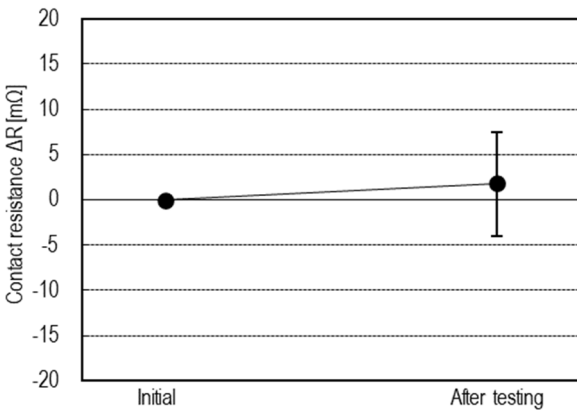
Graph 5. A change of Contact Resistance
D group : Vibration / Shock



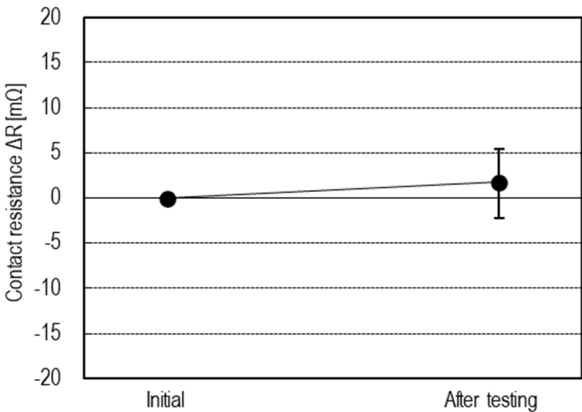
Graph 6. A change of Contact Resistance
E group : Fretting Corrosion



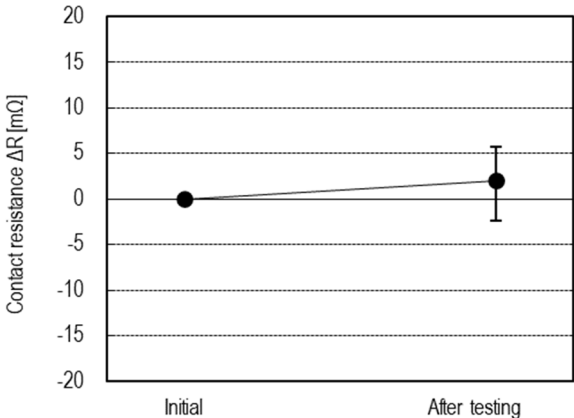
Graph 7. A change of Contact Resistance
F group : Thermal Shock



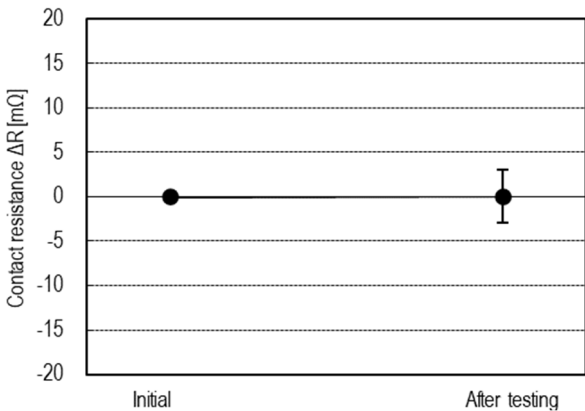
Graph 8. A change of Contact Resistance
G group : High Temp. Life



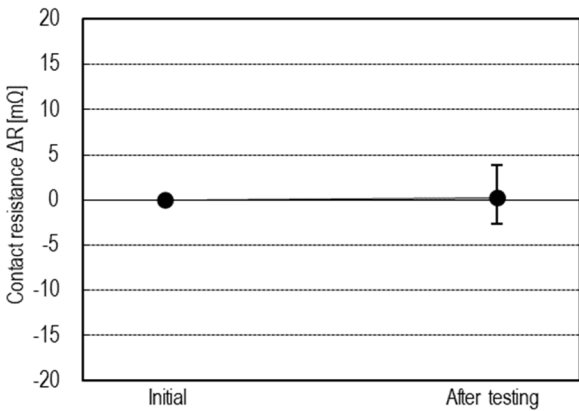
Graph 9. A change of Contact Resistance
H group : High Temp. & High Hum. Energizing



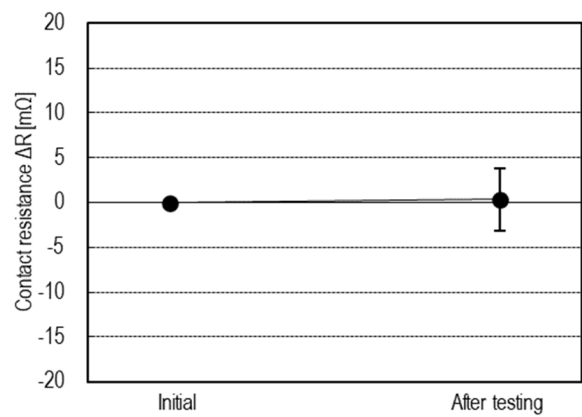
Graph 10. A change of Contact Resistance
J group : High Temp. & High Hum. Life



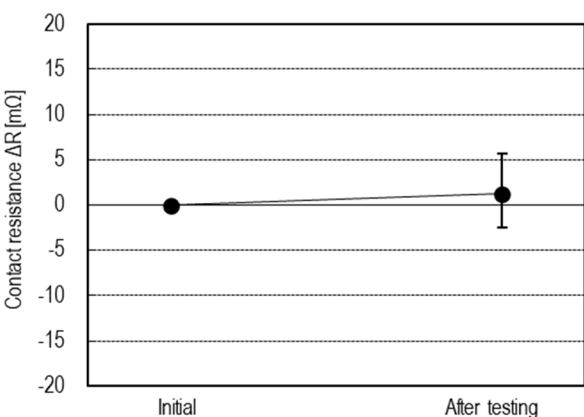
Graph 11. A change of Contact Resistance
K group : Cold Temp. Life



Graph 12. A change of Contact Resistance
L group : Gas (H₂S)



Graph 13. A change of Contact Resistance
M group : Gas (SO2)



Graph 14. A change of Contact Resistance
N group : Salt Water Spray