

1. Scope:

1.1 Contents

This specification covers the requirements for product performance, test methods and quality assurance provisions of 0.64Ⅲ/1.0Ⅲ I/O Connector.

Applicable product description and part numbers are as shown in Appendix 1, Applicable mating connector and part numbers are as shown in Appendix 2.

2. Applicable Documents:

The following documents form a part of this specification to the extent specified herein. In the event of conflict between the requirements of this specification and the product drawing, the product drawing shall take precedence. In the event of conflict between the requirements of this specification and the referenced documents, this specification shall take precedence.

2.1 AMP Specifications:

- A. 109-5000 : Test Specification, General Requirements for Test Methods
- B. 114-5217 : Application Specification
Crimping 1.0Ⅲ Series Unsealed Receptacle Contact
- C. 114-5329 : Application Specification
Crimping of 0.64Ⅲ Receptacle Contact
- D. 501-5956 : Test Report

2.2 Commercial Standards and Specifications

- A. JASO D605 : Multi-pole Connector for automobiles
- B. JASO D7101 : Test Methods for Plastic Molded Parts
- C. JIS C3406 : Low-Voltage Wires and Cables for Automobiles
- D. JIS D0203 : Method of Moisture, Rain and Spray Test for Automobile Parts
- E. JIS D0204 : Method of High and Low Temperature Test for Automobile Parts
- F. JIS D1601 : Vibration Testing Method for Automobile Parts
- G. JIS R5210 : Portland Cement

3. Requirements:

3.1 Design and Construction:

Product shall be of the design, construction and physical dimensions specified on the applicable product drawing.

3.2 Material:

A. Contact:

Description	Material	Finish
Receptacle (Female)	Copper Alloy	Selective Gold plating over Ni under plating, or Pre-Tinned.

Fig.1

B. Housing : PBT

3.3 Ratings:

A. Voltage Rating : 12VDC

B. Temperature Rating : -30°C to 105°C

3.4 Performance Requirements and Test Descriptions:

The product shall be designed to meet the electrical, mechanical and environmental performance requirements specified in Fig.2 and Fig.3. All tests shall be performed in the room temperature, unless otherwise specified.

3.5 Test Requirements and Procedures Summary:

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Para.	Test Items	Requirements			Procedures
3.5.1	Confirmation of Product	Meet requirements of product drawing and AMP Specification 114-5217, 114-5329.			Visually, dimensionally and functionally inspected per applicable quality inspection plan.
Electrical Requirements					
3.5.2	Termination Resistance (Low Level)	0.64III	8mΩ Max.(Initial)		Subject mated contacts assembled in housing to 20mV Max. open circuit at 10mA. Fig.4 AMP Spec. 109-5311-1
			16mΩ Max.(Final)		
		1.0III	3mΩ Max.(Initial)		
			10mΩ Max. (Final)		
3.5.3	Termination Resistance (Specified Current)	0.64III	8mV/A Max.(Initial)		Measure mill volt drop of contact in mated connectors, open circuit at 1A. Fig.4 AMP Spec. 109-5311-2
			16mV/A Max.(Final)		
		1.0III	3mV/A Max.(Initial)		
			10mV/A Max. (Final)		
3.5.4	Dielectric Withstanding Voltage	No creeping discharge nor flashover shall occur.			Impressed voltage 1kVAC for 1 min. Mated connector. Fig.5 AMP Spec. 109-5301
3.5.5	Insulation Resistance	100MΩ Min.			Impressed voltage 500VDC Mated connector Fig.5 AMP Spec.109-5302
3.5.6	Current Leakage	1mA Max.			Impressed voltage 14VDC Fig.6 AMP Spec.109-5312
3.5.7	Temperature Rise	Wire Size (mm ²)	Current (A)	Max. Rise(°C)	Measure temperature rising at wire crimped by applied current to all positions. AMP Spec.109-5310
		0.5	2.2	60	
		1.25	3.8		
3.5.8	Over current Loading	No ignition is allowed during the test.			Apply the current to only one position. Applied Current:Fig.7
Physical Requirements					
3.5.9	Vibration (High Frequency)	No electrical discontinuity greater than 1 μ sec. Shall occur. Satisfy requirements of test item on the “3.6 sequence”.			Vibration Frequency: 20→200→20Hz/3min. Acceleration:44.1m/s ² Vibration Direction: X,Y,Z Duration:3hours each Mounting:Fig.8

Fig.2(To be continued)

Para.	Test Items	Requirements		Procedures
3.5.10	Shock	Resistance should not be over 7 Ω greater than 1 μ sec.		Acceleration: 980m/s ² Waveform: Half sine wave Duration: 6msec. Velocity: 3.75 m/s Number of drops: 6 drops each directions of X,Y,and Z axes, total 18 drops Fig.8 AMP Spec.:109-5208-D
3.5.11	Connector Mating Force	70N Max.		Operation Speed: 25~100mm/min Measure the force required to mate connectors. AMP Spec. 109-5206-A
3.5.12	Connector Unmating force	70N Max.		Operation Speed: 25~100mm/min Measure the force required to unmate connectors. (without housing lock) AMP Spec. 109-5206-A
3.5.13	Connector Locking Strength	100N Min.		Operation Speed : 100mm/min Apply an axial pull-off load to one of the mated housing, measure locking strength. AMP Spec. 109-5210
3.5.14	Contact Insertion Force	10N Max. per contact		Measure the force required to insert contact into housing. AMP Spec. 109-5211
3.5.15	Contact Retention Force (Lance only)	Contact	Tensile Strength (N) Min.	Operation Speed : 100 mm/min. Apply an axial pull-off load to crimped wire.
		0.64III	30	
		1.0III	40	
3.5.16	Contact Retention Force (Secondary Lock)	100N Min.		Measure contact retention force with secondary lock set it effect. Operation Speed: 100mm/min.
3.5.17	Crimp Tensile Strength	Wire Size (mm ²)	Tensile Strength (N) Min.	Apply an axial pull-off load to crimped wire of contact secured on the tester. Operation speed: 100mm/min AMP Spec. 109-5205 Condition B
		0.5	80(Initial)	
			50(Final)	
		1.25	175(Initial)	
			130(Final)	

Fig.2(To be continued)

Para.	Test Items	Requirements	Procedures
3.5.18	Resistance to "Kojiri"	Satisfy requirements of test item on the "3.6 sequence"	This test may be alternatively performed manually. See Fig.9 AMP Spec. 109-5215
3.5.19	Handling Ergonomics	No abnormalities allowed in manual mating/unmating Handling.	Manually operated
Environmental Requirements			
3.5.20	Thermal Shock	Satisfy requirements of test item on the "3.6 sequence"	Mated connector. -40°C/30min., 100°C/30min. Making this a cycle. Repeat 1000 cycles.
3.5.21	Humidity, Steady State	Current Leakage 1mA Max.	Mated connector. 90~95% R.H. 60±5°C 96 hours 14V applied. Fig. 6
3.5.22	Industrial Gas(SO ₂)	Satisfy requirements of test item on the "3.6 sequence"	Unmated connector SO ₂ Gas: 25ppm, 75% R.H. 25°C, 96 hours
3.5.23	Temperature Life (Heat Aging)	Satisfy requirements of test item on the "3.6 sequence"	Mated connector, 120°C, 120 hours AMP Spec. 109-5104-5 Condition B
3.5.24	Resistance to Cold	Satisfy requirements of test item on the "3.6 sequence"	Mated connector, -40±3°C, 120 hours AMP Spec.109-5108 Condition D
3.5.25	Humidity-Temperature Cycling	Satisfy requirements of test item on the "3.6 sequence"	Mated connector Condition: Fig.9 10cycles
3.5.26	Dust Bombardment	Satisfy requirements of test item on the "3.6 sequence"	Mated connector Subject JIS R5210 cement blow of 1.5kg per 10 seconds in 15 minutes intervals for 8 cycles, with Unmate/Re-mating per 2 cycles AMP Spec. 109-5110
3.5.27	Compound Environment Resistance	Resistance should not be over 7 Ω greater than 1 μ sec.	Temperature: 80°C Vibration frequency: 20→200→20Hz/3min.(log) Accelerated Velocity: 44.1m/s ² Vibration Direction: X,Y,Z Duration: 300 hours Test Current: Fig.10 Mounting: Fig.8

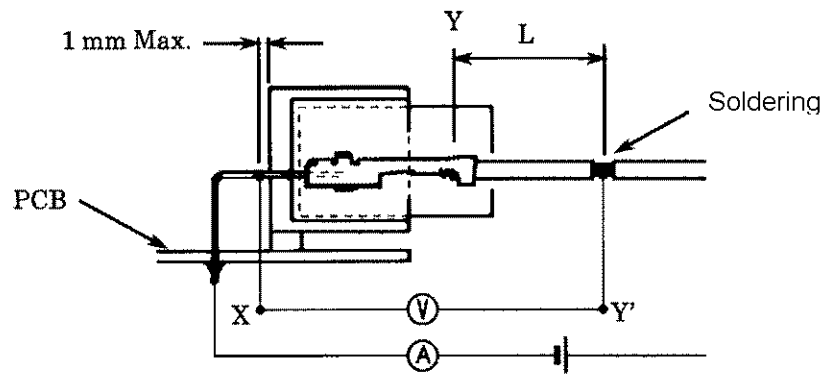
Fig.2(End)

3.6 Product Qualification Test Sequence

Test Examination	Test Group												
	1	2	3	4	5	6	7	8	9	10	11	12	13
	Test Sequence*												
Examination of Product	1	1,5	1,6	1,3	1,5	1,5	1,5	1,6	1,5	1,6	1,6	1,5	1,5
Termination Resistance (Low Level)	4	2,6	2,7		2,6	2,6	2,6	2,7	2,6	2,7	2,7	2,6	2,6
Termination Resistance (Rated Current)	5	3,7	3,8		3,7	3,7	3,7	3,8	3,7	3,8	3,8	3,7	3,7
Dielectric with standing Voltage	7					9	9						
Insulation Resistance	6					8	8						
Current Leakage							4						
Temperature Rising	8		4,9										4
Over Current Loading												4	
Vibration (High Frequency)										5			8
Physical Shock											5		
Connector Mating Force	3												
Connector Unmating Force	9												
Connector Locking Strength	10		11	5	9	11	11						
Contact Insertion Force	2												
Contact Retention Force	11												
Contact Retention Force (Double Lock)	12		12	6	10	12	12						
Crimp Tensile Strength	13		13		11				8				
Resistance to "Kojiri"		4											
Handling Ergonomics	14		10	4	8	10	10						
Thermal Shock					4								
Humidity(Steady State)							4						
Industrial SO ₂ Gas									4				
Temperature Life (Heat Aging)			5					4		4	4		
Resistance to Cold				2									
Humidity-Temperature Cycling						4							
Dust Bombardment								5					
Compound Environment Resistance													4

* Numbers indicate sequence in which tests are performed.

Fig. 3



Deduct resistance of Y-Y'(wire "L") from X-Y'

Fig.4

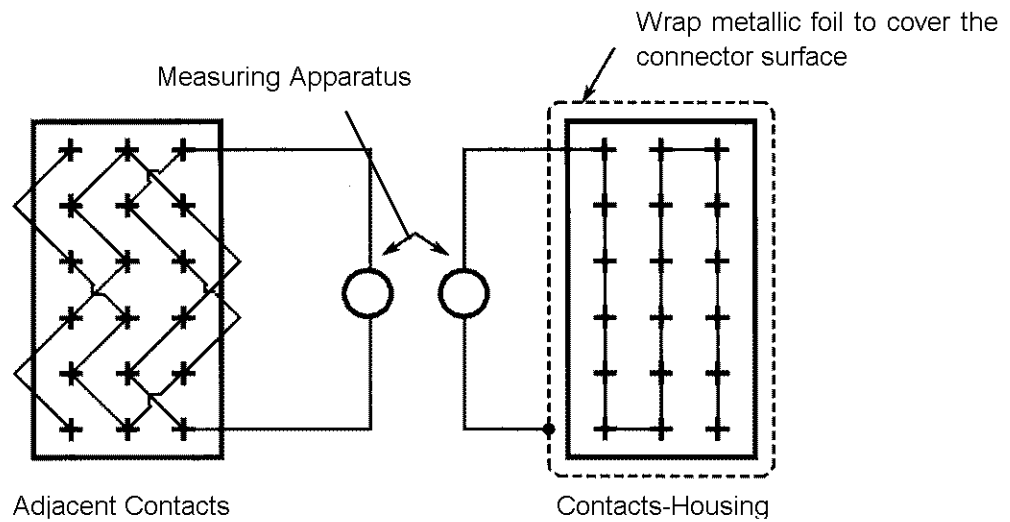


Fig.5

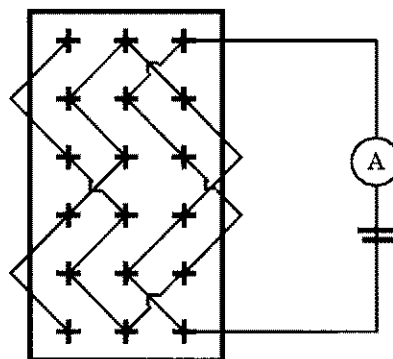


Fig.6

Wire size(mm ²)	Sequence	Test Current(A)	Duration
0.5	①	16.5	60 minutes
	②	20.2	200 sec.
	③	22.5	5 sec.
	④	30.0	1 sec.
1.25	①	16.5	60 minutes
	②	20.2	200 sec.
	③	22.5	5 sec.
	④	30.0	1 sec.

Fig. 7 Over current loading

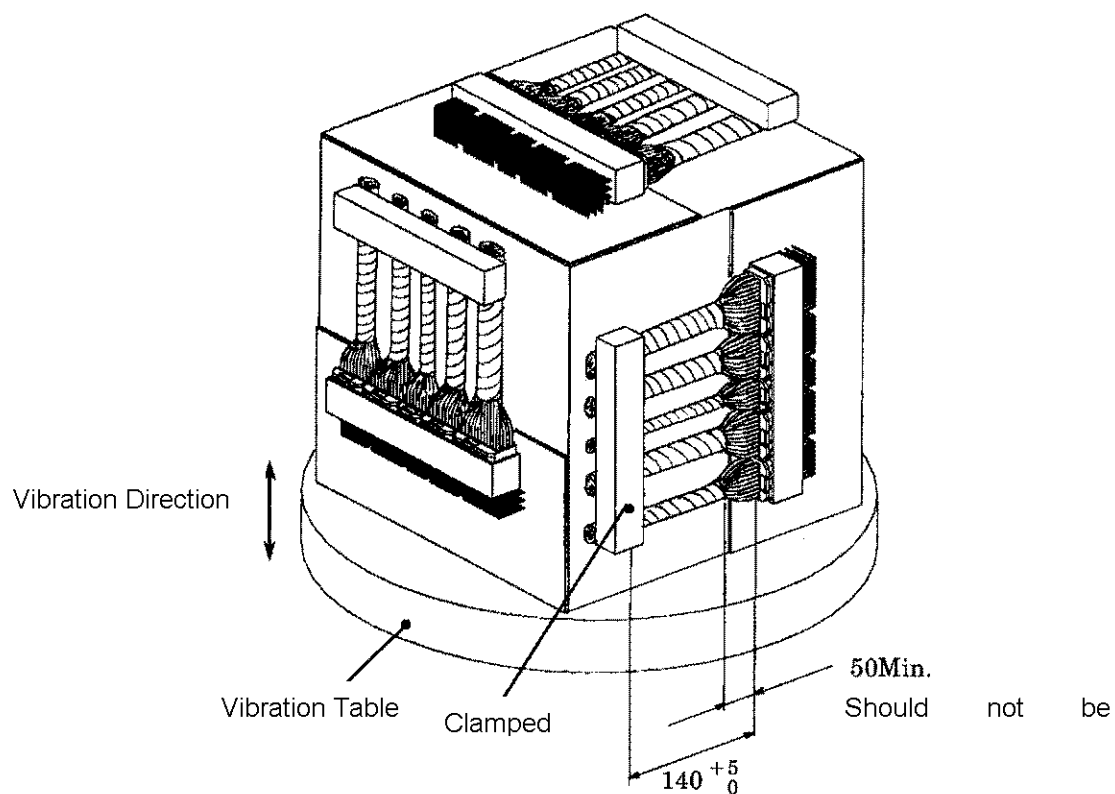


Fig. 8

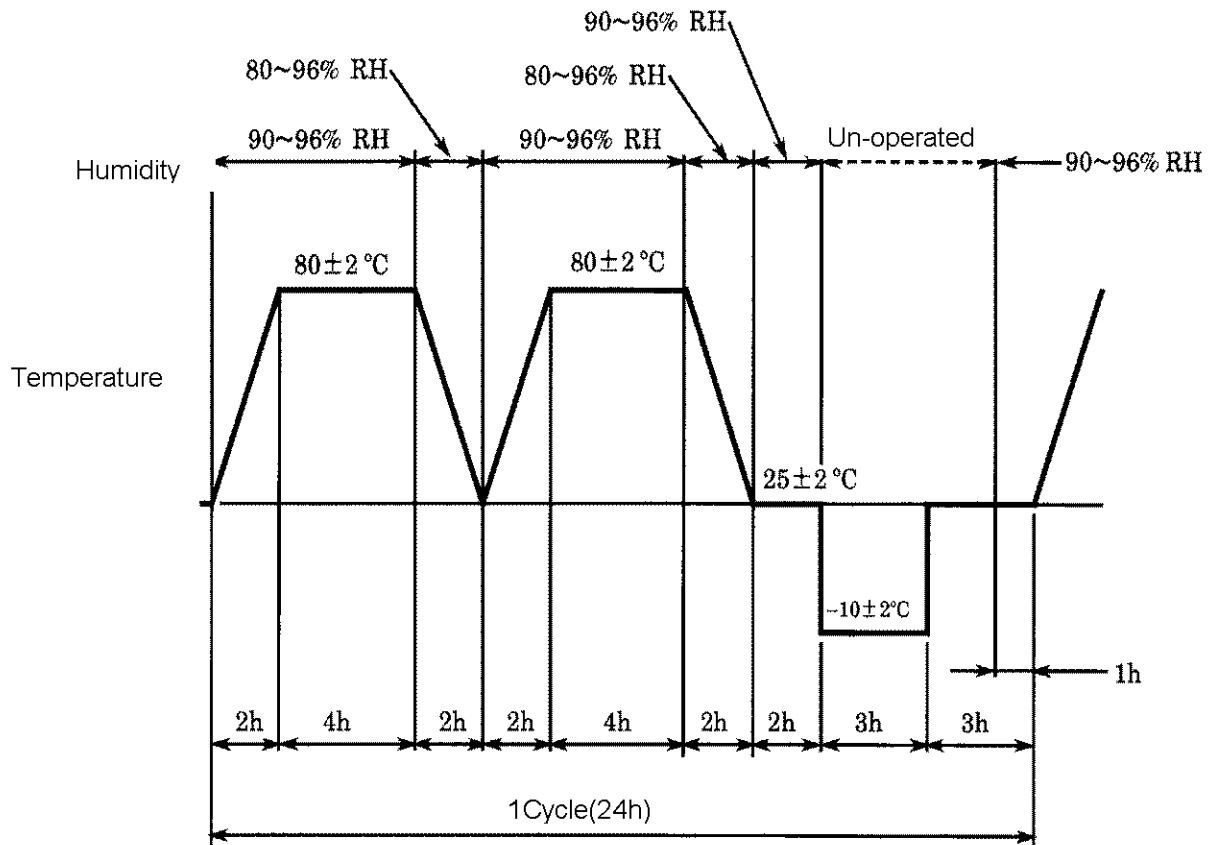


Fig. 9 Humidity-Temperature Cycling

Terminal Type		Wire Size	Testing Method	
Tab Size	Finish		Test Current	Procedures
1.0	Tin-Plating	1.25 mm ²	2 A	45 min : ON 15 min : OFF 300 Cycles
	Selective Gold	0.5 mm ²	10 mA	
0.64	Tin-Plating	0.5 mm ²	1.2 A	
	Selective Gold	0.5 mm ²	10 mA	

Fig.10 Compound Environment Test Current

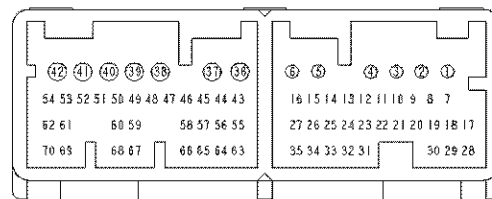


Fig.11 70 Position Circuit Layout

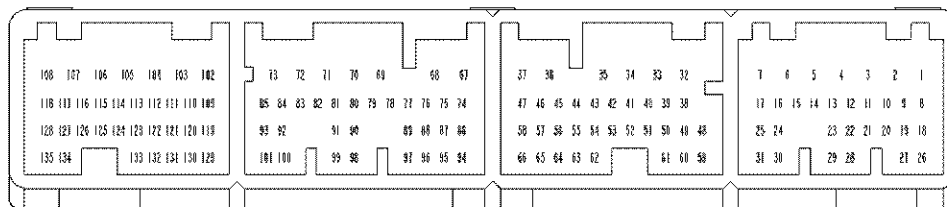


Fig.12 135 Position Circuit Layout

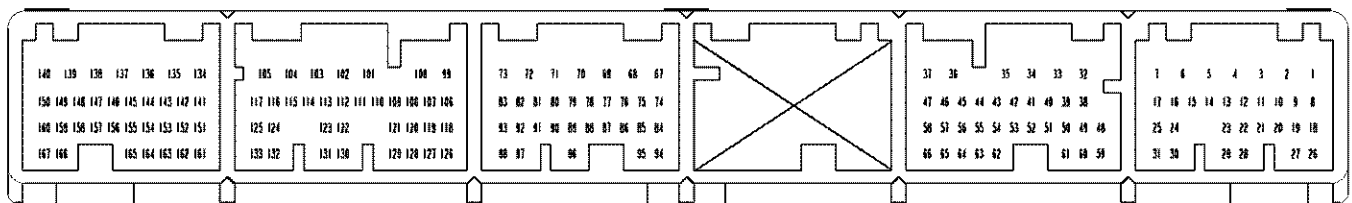


Fig.13 167 Position Circuit Layout

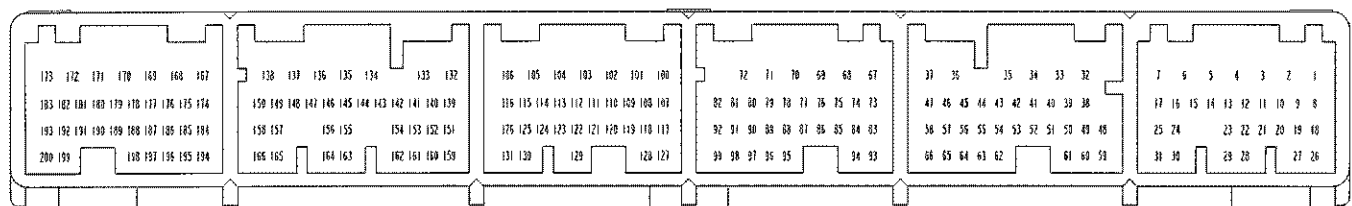


Fig.14 200 Position Circuit Layout

The applicable product descriptions and part numbers are as shown in Appendix. 1

Product Part No.★	Description
1674919	0.64 III/1.0 III I/O Connector 31Pos. Plug Housing Assembly
1674922	0.64 III/1.0 III I/O Connector 32Pos. Plug Housing Assembly
1827617-1	0.64 III/1.0 III I/O Connector 33Pos. Plug Housing Assembly
1674925	0.64 III/1.0 III I/O Connector 34Pos. Plug Housing Assembly
1674558	0.64 III/1.0 III I/O Connector 35Pos (A) Plug Housing Assembly
1674928	0.64 III/1.0 III I/O Connector 35Pos (B) Plug Housing Assembly
1674311-1	0.64 III Receptacle Contact(Sn)
1674311-2	0.64 III Receptacle Contact(Au)
316836	1.0 III Receptacle Contact(S) (Sn)
316837	1.0 III Receptacle Contact(S) (Au)
316838-1	1.0 III Receptacle Contact(M) (Sn)
316838-2	1.0 III Receptacle Contact(M) (Au)
1674769	1.0 III Receptacle Contact(ML) (Sn)

Appendix 1

The applicable mating connector and part numbers are as shown in Appendix. 2

Product Part No.★	Description	Applicable Product Spec.
1473649	0.64/1.0 I/O Connector 200Pos. Cap Housing Assembly	108-5674
1318813	0.64/1.0 I/O Connector 167Pos. Cap Housing Assembly	108-5674
1612435	0.64/1.0 I/O Connector 167Pos. Cap Housing Assembly (Standard Type)	108-5674
1376430	0.64/1.0 I/O Connector 135Pos. Cap Housing Assembly	108-5674
1473193	0.64/1.0 I/O Connector 70Pos. Cap Housing Assembly	108-5674

Appendix 2

★Note : Part number is consisted from listed base number and 1 digit numeric prefix and Suffix with dash. Refer to catalog or customer drawing for specific part numbers for each base number. When prefix is zero, zero and dash are omitted.