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1. SCOPE

This specification defines the general characteristics as well as the electrical and mechanical performance of the 12-position MQS connectors whose covers, ensuring the interlock function, have been removed.

2. CONNECTOR DESCRIPTION

2.1. Housings

2.1.1. Composition

The 12-position receptacle housing is composed of a module holder with a built-in module interlock function, a receptacle module and a mating latch.

	Color	0° outlet (no cable clamp)	90° cable clamp outlet
MQS 12-P module holder	Brown	1379095-1	1379096-1
	Blue	1379095-2	1379096-2
MQS 12-P receptacle housing module	Black	1379219-1	1379219-1

2.1.2. Overall dimensions, without contacts

	90° version	0° version
Length	43 mm	35 mm
Width	18 mm	18 mm
Height	29 mm	29 mm

2.1.3. Material

The material used is PBT 20% FV for all components.

2.2. Functions performed

2.2.1. Polarization

There are three sorts of polarization:

- contact / module
- module / module holder
- receptacle housing / counterpart

Written by:	Date:	Approved by:	Date:
M. POLIFONTE	02 May 2001	J.J. REVIL	08 February 2002

2.2.2. Keying

There are two sorts of keying:

- module / module holder: mechanical keying
- connector / counterpart: mechanical and visual keying

2.2.3. Module holder

The geometry of the 12-position MQS module holder differs with the orientation of the cables, with a cable clamp integrated or not:

- 0°: no cable clamp
- 90°: cable output at 90° relative to contacts with a cable clamp.

2.2.4. Mating

To mate the connector onto the receptacle, set the latch from the pre-locked to the locked position. (The latch is actuated to set the connector to the final position).

2.2.5. Locking

There are two locking levels:

- Contacts / cavity
  - The primary locking is ensured by the lance of the MQS contact's cage.
  - The secondary locking (double lock) is ensured by a plastic form located on the module holder and going behind the contact's cage as the module is inserted into the module holder.
- Module / module holder
  - Locking ensured by a small tab located on the side of the module holder and a pin located on the module.

2.2.6. Fastening (screw holes - Board Locks)

No specific fastening required for the receptacle housing.

REMARK The module holder and the latch are fitted with two ears for lead seals.

2.3. Contacts

Type : crimp MQS clip

P/N 144969-1 : tin-plated

P/N 144969-3 : gold-plated

2.4. Conductor wires

Gauges:	0.6 mm^2	0.35 mm^2
Insulation diameter (mm)	1.76 min	1.28 min
	1.90 max	1.40 max

2.5. Application hand tool

3. REFERENCE DOCUMENTS

- PSA Standard B21-7050
- STE 96.269.436.99

4. GENERAL OPERATING CONDITIONS

4.1. Temperature

Class	Environment temperature	Testing temperature
T 2	-40 +100°C	125°C

4.2. Vibrations

Class	Connector position	Frequency	Motion amplitude (mm)	Acceleration amplitude
1	Device on a chassis	10 to 25	12	-
		25 to 500	-	30

4.3. Tightness

Class	Requirement level
0	Not tight

4.4. Nominal voltage

≤ 16 V.

4.5. Nominal current

The nominal current of a contact is defined as the amperage corresponding to a temperature rise of 40°C on a single contact positioned in a connector representing a typical cavity and connected to a type 3 conductor with the maximum gauge supported by the contact and a length of 500 mm.

The current measurement takes place in the test conditions set forth in Standard NF C 93-400, Test 5a.

Nominal current = 13A per MQS contact, 0.6 mm^2 wire in the above-mentioned conditions.

4.6. Number of operations

20 operations.

5. GENERAL TEST CONDITIONS

Except otherwise stated, all tests are carried out in the following conditions:

- Temperature = 23 ± 5°C
- Relative humidity = 45 to 75%
- Atmospheric pressure = 860 to 1 060 hPa
- Power supply voltage = 13.5 ± 0.1 V.

6. TESTS

All tests are carried out in accordance with Standard B21-7050.

OVERALL INSPECTION			
Tests	**Ref.**	**Procedure**	**Result**
Visual inspection		Inspection with the naked eye	Aspect: no defect that would impair normal operation

ELECTRICAL TESTING			
Tests	**Ref.**	**Procedure**	**Result**
Contact resistance	8.1		
	8.1.1	Millivolt method. Test voltage: 20 mVdc Test current: 100 mA max Nominal current method: The test takes place at a given nominal current value	Rc ini < 10 mΩ Δ Rc < 10 mΩ Rc final av./Rc ini av. < 2
	8.1.2	Test voltage between 1 and 16 V	Rc ini < 10 mΩ Δ Rc < 10 mΩ Rc final av./Rc ini av. < 2
Insulation resistance	8.2	Test voltage: 100 Vcc for 60 s Between one contact and all other grounded contacts	Ri > 100 MΩ
Dielectric strength	8.3	Test voltage: 1000 V 50 Hz for 60 s Between one contact and all other grounded contacts	No breakdown, no arcing

MECHANICAL TESTING			
Tests	**Ref.**	**Procedure**	**Result**
Of the components	9.1		
Insertion force of the contacts into the module	9.1.2.1.1	Secondary lock disabled	5 N max
	9.1.2.1.2	Secondary lock enabled	Not applicable
Insertion force of the modules into the module holder	9.1.2.2.1	Wires folded into position	20 N max
	9.1.2.2.2	Secondary lock enabled	Not applicable
Retention force of contacts inside the module	9.1.3.1	Secondary lock disabled	40 N min
		Secondary lock enabled (module inside the module holder)	60 N min
Retention force of the modules into the module holder	9.1.3.2	Secondary lock enabled, locking tab in place	100 N min
Component polarization	9.1.4		
Contact/module polarization	9.1.4.1	Insert the contact into the cavity other than in the proper direction	50 N min
Module/module holder polarization	9.1.4.2	Insert the module into its housing in every possible manner but the good one	80 N min
Component keying	9.1.5		
Module/module holder keying	9.1.5.1	Insert the module by a lower number of position in the good direction	80 N min
Of the connectors	9.2		
Mating force (receptacle housing/ counterpart)	9.2.1		
Module correctly locked	9.2.1	Apply a force perpendicularly to the latch arm	80 N max
		Apply a force in the mating direction onto the recpeptacle housing without operating the latch (latch in the pre-installed position or any other position)	80 N min No electrical contact
Module not or badly locked		Apply a force in the mating direction onto the recpeptacle housing without operating the latch	150 N min or module set back into position
Unmating force (receptacle housing/counterpart)	9.2.2	Apply a force perpendicularly to the latch arm while retracting the locking tab	80 N max

MECHANICAL TESTING			
Tests	**Ref.**	**Procedure**	**Result**
Resistance of locked connectors	9.2.3	Please refer to Standard B21-7050	100 N min
Connector polarization	9.2.4	Try to insert the module holder into the counterpart in every possible manner but the correct one	150 N min
Connector keying	9.2.5	Please refer to Standard B21-7050	150 N min
Force applicable onto the secondary lock device	9.4		
Pull-off resistance in the pre-installed position	9.4.1	Not applicable	
Force required to change the module from the pre-installed position to the installed position	9.4.2		
All contacts correctly positioned	9.4.2.1	See "Insertion force of the module into the module holder"	See 9.1.2.2.1
One or more contacts badly positioned	9.4.2.2	Apply a 50 N force onto the module with a contact badly inserted (module holder not positioned in the cabling support or a file)	Insertion impossible
Force required to change from the locked position to the pre-installed position	9.4.3	Not applicable	
Force applicable to the housing mating device	9.5		
Pull-off resistance in the unlocked position	9.5.1	Apply a 100 N force perpendicular to the rotation axis of the latch	No deterioration
Lever resistance in the locked position	9.5.2	Apply a 20 N force in the latch unlocking direction, when in the mated position	No unlocking
Force required to change from the unlocked position to the locked position	9.5.3		
All contacts or modules correctly locked	9.5.3.1	Apply onto the latch a force perpendicular to its arm	12 < F < 25 N without any punctual value > 30 N
All contacts or modules not or badly locked	9.5.3.2	Not applicable	
Force required to change from the locked position to the unlocked position	9.5.4	Apply a force perpendicular to the deflection motion of the tab, in the latch unlocking direction	20 N max

MECHANICAL TESTING			
Tests	**Ref.**	**Procedure**	**Result**
Resistance to shocks	9.7	One-meter fall of the connector components as delivered onto a concrete block	No deterioration
Resistance to vibrations	9.8	Device on a chassis: 10 to 2,000 Hz. Total time: 64 hours (16 hours along each of the three axes and 16 hours under acceleration) A 100 mA current on 12 V flows through the contacts	No cut exceeding 1 µs. No mechanical deterioration
Resistance to thermal shocks	10.3	100 cycles (-40, +125°C) as defined in Appendix 5 to Standard B21-7050	ΔRc < 5 mΩ No mechanical deterioration
Resistance to fluctuating atmospheric conditions	10.4	5 cycles as defined in Appendix 6 to Standard B21-7050	ΔRc < 5 mΩ No mechanical deterioration
Durability	11.1		
Mating and unmating durability	11.1.1	The connector should undergo 20 cycles	No deterioration impairing normal operation
Current cycling durability	11.2	Please refer to Standard Testing temperature 100°C Gauge 0.6 mm^2 - Current 13 A	ΔRc < 5 mΩ
Temperature/humidity durability	11.3	Temperature: 360 cycles in Class 2 Humidity: 3 test sequences 24 cycles at 85°C in an atmosphere with 95 to 99% relative humidity 24 hours at 23°C without current cycling	The contact resistances should be in accordance with Section 8.1