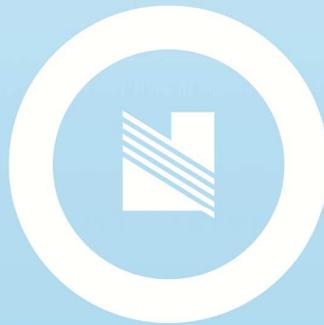




Manufacturer
& designer
of interconnect
solutions

World leader
in micro-connectors



DMM

Self declaration of conformity

The DMM micro-connectors specifications are measured under MIL-DTL-83513G and EIA test procedures

Manufacturer: NICOMATIC SA

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F-74890 BONS-EN-CHABLAIS

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<http://www.nicomatic.fr> – Email : nicomatic@nicomatic.fr

- We declare that the product(s) involved:

-DMM series

- Have been tested according to the following items of the MIL-DTL-83513G Standard:

See Auto Declaration Annex

- And comply with the level of performance required, provided that the product is applied for its intended use and conforms to the specifications of the manufacturer, and that the installation conforms to the relevant standards.

Please refer to the Annex herewith: List of QUALIFICATION TESTS “MIL” for Reports numbers, titles and test results (specification data).

Place and date of issue: Bons-en-Chalais December 30th, 2015

Written by: MOREL Freddy (Laboratory)

Approved by: PERARDEL Nicolas (DMM project manager)

Signature and stamp of the Company:

PERARDEL Nicolas


MOREL Freddy




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AUTO DECLARATION ANNEX
LIST OF QUALIFICATION TESTS “MIL”

Designation	PROCEDURE #	page
Magnetic permeability	ASTM A342/A342M	4
Dielectric withstanding voltage sea level	EIA-364-20C	4
Dielectric withstanding voltage high altitude (70 000 ft)	EIA 364-20C	5
Insulation resistance	EIA 364-21C	5
Contact resistance	EIA 364-06C	6
Contact engagement and separation forces	EIA 364-37B	7
Mating and unmating force	EIA 364-13D	8
Temperature cycling	EIA 364-32D condition 1	9
Humidity	EIA 364-31B Method IV	10
Vibration	EIA 364-28E TEST CONDITION III&IV	11
Shock	EIA 364-27B TEST CONDITION G	12
Durability	MIL-DTL-83513G §4,5,16	12
Salt spray (corrosion)	364-26B TEST CONDITION A	15
Fluid immersion	MIL-DTL-83513G §4,5,18	16
Insert retention	MIL-DTL-83513G §4,5,19	18
Crimp tensile strenght	EIA 364-08	20
Thermal vacuum outgassing	ASTM E595 (ECSS-Q-ST-70-02C)	20
Solderability	MIL STD 202 Method 208	20
Resistance to soldering heat	EIA 364-29C	21
Marking performance	MIL-STD-202, method 215	22



LIST OF QUALIFICATION TESTS “NICOMATIC SPEC. SHEETS”

Designation	PROCEDURE #	page
Derating (Current carrying capacity)	IEC 60512-5-2 Test 5b	23
Fixing Hardware M2.5 max torque	MO.04-0-16.A	24
Insert retention force max	MIL-DTL-83513G §4,5,19	24
Contact replacement	EIA 364-29C	25



1_MAGNETIC PERMEABILITY

REPORT TITLE: MAGNETIC PERMEABILITY According to “MIL-DTL-83513G §3.5.3” & ASTM A342/A342M standard”

REPORT CONCLUSION:

The DMM are qualified regarding magnetic permeability according to MIL DTL 83513G standard.

SPECIFICATION DATA:

Relative magnetic permeability $<2.0 \mu$

2_Dielectric Withstanding Voltage Sea Level

REPORT TITLE: DIELECTRIC WITHSTANDING VOLTAGE TEST (Sea Level) according to MIL-DTL-83513G & EIA/ECA-364-20C test procedure.

REPORT CONCLUSION:

The DMM are qualified regarding WITHSTANDING VOLTAGE AT SEA LEVEL according to MIL DTL 83513G.

SPECIFICATIONS DATA:

LF contacts: Withstanding voltage=600 VRMS Rated Voltage=200 VRMS

HP contacts: 30 series Withstanding voltage=800 VRMS Rated Voltage=267 VRM



3_Dielectric Withstanding Voltage at High Altitude (70 000 ft)

REPORT TITLE: DIELECTRIC WITHSTANDING VOLTAGE TEST at high altitude (At 70000 ft) According to MIL-DTL-83513G & EIA/ECA-364-20C test procedure.

REPORT CONCLUSION:

The DMM are qualified regarding WITHSTANDING VOLTAGE at high altitude (70 000 ft) according to MIL DTL 83513G.

SPECIFICATIONS DATA:

LF contacts: Withstanding voltage=150 VRMS Rated Voltage=50 VRMS
HP contacts: 30 series Withstanding voltage=150 VRMS Rated Voltage=50 VRMS

4_Insulation Resistance

REPORT TITLE: INSULATION RESISTANCE TEST According to MIL-DTL-83513G& EIA/ECA-364-21C test procedure.

REPORT CONCLUSION:

The DMM are qualified regarding INSULATION RESISTANCE according to MIL DTL 83513G standard .

SPECIFICATIONS DATA:

LF & HP Contacts (all series):

Insulation resistance > 5 Gohm



5_Contact resistance (initial)

REPORT TITLE: CONTACT RESISTANCE TEST INITIAL MEASUREMENTS according to MIL-DTL-83513G & EIA/ECA-364-06C test procedure

REPORT CONCLUSION:

The DMM are qualified regarding Contact Resistance according to MIL-DTL-83513G standard.

SPECIFICATION DATA

LF contacts: Contact resistance @ 3A = 7.63 mΩ max

HP contacts: Contact resistance @ 3A = 1.17 mΩ max



6_Contact engagement and separation forces (initial)

REPORT TITLE:

DMM Connector with only contacts LF: CONTACTS LF ENGAGEMENT AND SEPARATION FORCES TEST According to MIL DTL 83513G & EIA/ECA-364-37B test procedure

DMM Connector containing contacts HP: CONTACTS HP ENGAGEMENT AND SEPARATION FORCES TEST According to NICOMATIC SPEC. SHEETS & EIA/ECA-364-37B test procedure

REPORT CONCLUSION:

The DMM Connector with only contacts LF are qualified regarding CONTACTS ENGAGEMENT AND SEPARATION FORCES TEST according to MIL DTL 83513G.

The DMM Connector containing contacts HP are qualified regarding CONTACTS ENGAGEMENT AND SEPARATION FORCES TEST according NICOMATIC SPEC. SHEETS.

SPECIFICATION DATA:

<u>LF contacts:</u>	Engagement Force= 1.7 N max
	Separation Force= 0,2 N min
<u>HP contacts: 30 series:</u>	Engagement Force= 5 N max
	Separation Force= 0,5 N min



7_Mating & Un-mating Forces (initial)

REPORT TITLE:

DMM Connector with only contacts LF: MATING & UNMATING FORCE TEST (initial for LF contacts) According to MIL-DTL-83513G & EIA/ECA-364-13D test procedure

DMM Connector containing contacts HP: MATING & UNMATING FORCE TEST (initial for HP contacts) According to NICOMATIC SPEC. SHEETS & EIA/ECA-364-13D test procedure

REPORT CONCLUSION:

The DMM Connector with only contacts LF are qualified regarding Mating & Un-mating according to MIL-DTL-83513G standard.

The DMM Connector containing contacts HP are qualified regarding Mating & Un-mating according NICOMATIC SPEC. SHEETS.

SPECIFICATIONS DATA:

Mating/unmating force /contact:

	Mating & Un-mating force specification			
	LF Contacts		HP Contacts	
	Mating force	Unmating force	Mating force	Unmating force
initial				
After temperature cycling, humidity, vibration, shock tests and 500 cycles	2.781 N max	0.2 N min	9.733 N max	1 N min
After salt spray				
After fluid immersion				

(Mating & Un-mating forces are initially measured as a reference in order to check the mating & un-mating evolution after durability, vibration, salt spray, temperature cycling tests)



8_Temperature cycling

REPORT TITLE: Thermal cycling test according to “MIL-DTL-83513G §3.5.8 & 4.5.10” & “EIA-364-32D thermal shock (temperature cycling) test procedure”

REPORT CONCLUSION:

The DMM are qualified regarding thermal cycling test according to MIL-DTL-85513G standard.

SPECIFICATIONS DATA:

Temperature cycling severity:

five cycles -55°C/125°C

(EIA-364-32, condition I, 5 cycles (except that the maximum temperature shall be 125°C +3°C,-0°C)



9_Humidity

REPORT TITLE: Humidity test according to “MIL-DTL-83513G §3.5.9 & 4.5.11” & “EIA-364-31B humidity test procedure”

REPORT CONCLUSION:

The DMM are qualified regarding humidity test according to MIL-DTL-85513G standard.

SPECIFICATIONS DATA:

Humidity cycling severity: Ten cycles, cycle duration: 24 hours. EIA-364-31B method IV (except steps 7a and 7b).

Dielectric withstanding voltage sea level after Humidity: 360 Vrms.

Insulation resistance after Humidity: 1 Mohm minimum.



10_Vibration

REPORT TITLE:

DMM Connector with only contacts LF: VIBRATION TEST 20G (LF contacts) according to “MIL-DTL-83513G §3.5.12 & 4.5.14” & “EIA/ECA-364-28E test procedure”

DMM Connector containing contacts HP: VIBRATION TEST_15G after climatic tests according to NICOMATIC SPEC. SHEET & “EIA/ECA-364-28E test procedure”

REPORT CONCLUSION:

The DMM Connector with only contacts LF are qualified regarding vibration test according to MIL-DTL-85513G standard.

The DMM Connector containing contacts HP are qualified regarding vibration test according to NICOMATIC SPEC. SHEET.& “EIA/ECA-364-28E test procedure”condition III : 15G. (Internal requirement for HP connector).

SPECIFICATIONS DATA:

Vibration severity:

DMM Connector with only contacts LF: MIL-DTL-8313G Test Condition IV [196.1 m/s² (20 gn) peak]

DMM Connector containing contacts HP: MIL-DTL-8313G Test Condition III [147.1 m/s² (15 gn) peak]

It is recommended to use the locking fixing hardware (screws) with the HP and mixed contacts instead of the floating fixing hardware for vibrating applications.



11_Mechanical Shock

REPORT TITLE: MECHANICAL SHOCK TEST according to “MIL-DTL-83513G § 3.5.13 & 4.5.14.1” & “EIA-364-27B test procedure”

REPORT CONCLUSION:

The DMM are qualified regarding mechanical shock test according to MIL-DTL-85513G standard.

SPECIFICATIONS DATA:

Shock severity: MIL-DTL-85513G test condition G: Peak acceleration:100 g / Normal duration: 6 ms / Waveform: Saw tooth

12_ Durability (contact life) at ambient condition of use

REPORT TITLE:

DMM Connector with only contacts LF: CONTACTS LIFE TEST (500 cycles) according to MIL-DTL-83513G § 4.5.16 test procedure & EIA/ECA-364-13D (Mating and Unmating force test procedure) & EIA/ECA-364-06C (Contact resistance test procedure & low level contact resistance test procedure)

DMM Connector containing contacts HP: CONTACTS LIFE TEST (500 cycles) according to NICOMATIC SPEC. SHEET & EIA/ECA-364-13D (Mating and Unmating force test procedure) & EIA/ECA-364-06C (Contact resistance test procedure & low level contact resistance test procedure)

REPORT CONCLUSION:

The DMM Connector with only contacts LF are qualified regarding CONTACTS LIFE TEST (500 cycles) according to MIL-DTL-83513G standard.

The DMM Connector containing contacts HP are qualified regarding CONTACTS LIFE TEST (500 cycles) according NICOMATIC SPEC. SHEETS.



SPECIFICATIONS DATA:**LF & HP Contacts :**

Durability at ambient condition of use: 500 cycles of mating/unmating

Contacts résistance after durability: <25 mOhms.

Contacts engagements and separation force after durability:**LFcontacts:**

Engagement force max. 1.7N

Separation force: 0.2 N min per contact

HP contacts:

0,5N < Engagement force < 7N

0,5N < Separation force < 5N



Mating and unmating forces after durability:

Mating & Un-mating force specification					
		LF Contacts		HP Contacts	
		Mating force	Unmating force	Mating force	Unmating force
initial					
After temperature cycling, humidity, vibration, shock tests and 500 cycles		2.781 N max	0.2 N min	9.733 N max	1 N min
After salt spray					
After fluid immersion					

Insert retention after durability:

insert retention force specification		
	LF Contacts	HP Contacts
After 500 cycles, vibration and shock tests	50 pounds per square inch (222N per sq.inch)	50 pounds per square inch (222N per sq.inch)
After salt spray		
After fluid immersion		
After resistance to soldering heat		



13_Salt Spray

REPORT TITLE: SALT SPRAY TEST according to “MIL-DTL-83513G §3.5.15 & 4.5.17 & EIA/ECA-364-26B test procedure”

REPORT CONCLUSION:

The DMM are qualified regarding Salt Spray test according to MIL-DTL-85513G standard.

SPECIFICATIONS DATA:

Duration: 96 hours (condition A).

Contact resistance (@3A): <25 mOhms.

Low level contact resistance (@100mA): <25 mOhms.

Mating and unmating forces after salt spray:

	Mating & Un-mating force specification			
	LF Contacts		HP Contacts	
	Mating force	Unmating force	Mating force	Unmating force
initial				
After temperature cycling, humidity, vibration, shock tests and 500 cycles	2.781 N max	0.2 N min	9.733 N max	1 N min
After salt spray				
After fluid immersion				



Insert retention after salt spray:

insert retention force specification		
	LF Contacts	HP Contacts
After 500 cycles, vibration and shock tests	50 pounds per square inch (222N per sq.inch)	50 pounds per square inch (222N per sq.inch)
After salt spray		
After fluid immersion		
After resistance to soldering heat		

15_Fluid immersion

REPORT TITLE: FLUID IMMERSION according to “MIL-DTL-83513G standard §4.5.18

REPORT CONCLUSION:

The DMM connectors are qualified regarding fluid immersion test according to MIL-DTL-83513G standard.

SPECIFICATIONS DATA:Fluid:

- a. Lubricating oil Aircraft turbine engines, synthetic base: 20 hours.
- b. Coolant-dielectric fluid synthetic silicate ester base lubricant (coolanol 25) 1 hour +/- 1 minute.



Mating and unmating forces after fluid immersion:

Mating & Un-mating force specification					
		LF Contacts		HP Contacts	
		Mating force	Unmating force	Mating force	Unmating force
initial					
After temperature cycling, humidity, vibration, shock tests and 500 cycles		2.781 N max	0.2 N min	9.733 N max	1 N min
After salt spray					
After fluid immersion					

Insert retention after fluid immersion:

insert retention force specification		
	LF Contacts	HP Contacts
After 500 cycles, vibration and shock tests	50 pounds per square inch (222N per sq.inch)	50 pounds per square inch (222N per sq.inch)
After salt spray		
After fluid immersion		
After resistance to soldering heat		



14_Insert retention Forces

REPORT TITLE: INSERT RETENTION FORCE TEST FOR ELECTRICAL CONNECTORS AND SOCKETS According to MIL-DTL-83513G.

REPORT CONCLUSION:

The connectors are qualified regarding INSERT RETENTION FORCE TEST according to MIL-DTL-83513G.

SPECIFICATIONS DATA:

Insert retention force /area:

	insert retention force specification	
	LF Contacts	HP Contacts
After 500 cycles, vibration and shock tests	50 pounds per square inch (222N per sq.inch)	50 pounds per square inch (222N per sq.inch)
After salt spray		
After fluid immersion		
After resistance to soldering heat		



17_Crimp Tensile Strength

REPORT TITLE: CRIMP TENSILE STRENGTH TEST QUALIFICATION FOR ELECTRICAL CONNECTORS according to NICOMATIC SPEC. SHEETS.

REPORT CONCLUSION:

The LF and HP contacts are qualified according to NICOMATIC SPEC. SHEETS, regarding the crimp tensile strength test.

SPECIFICATIONS DATA:

Crimp Tensile Strength:

Contacts crimped with Hand crimp tool MH800			
	Contacts reference	Minimal force Requirements (N)	Wire size (AWG)
LF contacts	12960	53.3	22
	12969	35.6 - 22.3 - 13.4	24 - 26 - 28
	C13064-P	53.4	22
	C12468	35.6 - 22.3 - 13.4	24 - 26 - 28
Contacts crimped with Hand crimp tool Daniels HX3			
HP contacts serie 30	30-4308	142	30-4308
	30-3308	142	14929



18_ Thermal vacuum outgassing

REPORT TITLE: Thermal vacuum outgassing test according to ASTM E595 (ECSS-Q-ST-70-02C)

REPORT CONCLUSION:

The DMM are qualified regarding Thermal vacuum outgassing test according to ASTM E595 (ECSS-Q-ST-70-02C) standard.

SPECIFICATION DATA:

Total mass loss : TML < 1% of the original specimen mass

Maximum volatile condensable material: CVCM < 0.1% of the original specimen mass

15_Solderability

REPORT TITLE: Solderability test according to “MIL-DTL-83513G §MIL-STD-202”

REPORT CONCLUSION:

The DMM are qualified regarding solderability test according to MIL-DTL-83513G standard and MIL-STD-202.

SPECIFICATIONS DATA:

Solder bath temperature: +245°C ± 5°C

Dwell time: 5sec ± 0.3sec



16_Resistance to soldering heat

REPORT TITLE: Resistance to soldering heat test according to NICOMATIC SPEC. SHEETS. & EIA/ECA-364 - 29C test procedure.

REPORT CONCLUSION:

The DMM connectors are qualified regarding to resistance to soldering heat test according to NICOMATIC SPEC. SHEETS.

SPECIFICATIONS DATA:

Bath solder T°: @250°C

Contacts retention after resistance to soldering tests:

LF contacts: >22.27 N.

HP contacts: >10 N.

Insert retention after resistance to soldering tests:

insert retention force specification		
	LF Contacts	HP Contacts
After 500 cycles, vibration and shock tests	50 pounds per square inch (222N per sq.inch)	50 pounds per square inch (222N per sq.inch)
After salt spray		
After fluid immersion		
After resistance to soldering heat		



16_Marking performance

REPORT TITLE: MARKING PERFORMANCE QUALIFICATION TEST with TO/51 02 inks according to “MIL-DTL-83513G §3.6 & §4.5.23” & “MIL-STD-202, method 215 test procedure”

REPORT CONCLUSION:

The DMM connectors are qualified regarding marking performance test according to MIL-DTL-83513G standard.

SPECIFICATIONS DATA:

Solvent1: Isopropyl alcohol, Kerosene (Petroleum ether), Ethylbenzene.

Solvent2: Bioact EC-7R

Solvent 3: Ethanolamine, 1-methoxy-2-propanol, Water.



17_Derating (Current carrying capacity)

REPORT TITLE: DERATING CURVES (Current carrying capacity) According to “IEC 60512-5-2 Test 5b”

REPORT CONCLUSION:

The DMM are qualified regarding Rated Current according to IEC 60512-5-2 Test 5b Derating curves (Current carrying capacity) test procedure and NICOMATIC SPEC. SHEETS.

SPECIFICATIONS DATA:

DMM LF contacts:

Max temperature elevation at 3A @ 25°C: 67°C

Max temperature elevation at 2.5A @ 85°C: 28°C.

DMM HP contacts:

Max temperature elevation at 20A @ 25°C: 61°C

Max temperature elevation at 20A @ 85°C: 29°C



18_Fixing Hardware M2.5 max torque

REPORT TITLE: Fixing hardware D51L & D53 torque resistance according to internal requirements.

REPORT CONCLUSION:

The fixing hardware DMM : D53, D51 are qualified regarding torque resistance test according to internal requirements.

SPECIFICATIONS DATA:

DMM Fixing hardware D51 : 0.4 N/m

DMM Fixing hardware D53 : 0.3 N/m

19_Insert retention force max

REPORT TITLE: INSERT RETENTION FORCE MAXIMUM PELAGE FORCE AFTER GROUP 1 & 2 TESTS

REPORT CONCLUSION:

The DMM are qualified regarding insert retention force max and pelage force according to NICOMATIC SPEC. SHEETS.

SPECIFICATIONS DATA:

Maximun insert force:

Maximum force before destruction : 973 N

Minimum force before destruction : 378 N.

Average force: 796.6 N

Pelage force:

Maximum force: 115 N

Minimum force: 29.5 N.

Average force : 62.77 N.



20_Contact replacement

REPORT TITLE: Contact replacement

REPORT CONCLUSION:

The DMM are qualified regarding contact replacement according to NICOMATIC SPEC. SHEETS.

SPECIFICATIONS DATA:

Minimum contact retention force for LF contacts:

_initial: 19.74 N

_after 3 replacements: 6.83 N

HP contacts: retention after 5 replacements: 22.27 N according to MIL-DTL-83513G standard

