6 Position Micro-Timer 2 Female Housing (Sealed Version)

Content

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1 SCOPE

1.1 Content

This specification describes the features, tests and Qualification requirements for the 6position Micro-Timer2 Receptacle Housing (sealed).

The 6pos. Micro-Timer2 Rec. Housing is developed for the using in the automotive section.

This is a Micro-Timer2 Rec. Housing fits to a 1.6mm Tab header.

The 6pos. Micro-Timer2 Rec. Housing has a slide for mating assistance, working together with the nubs of the header.
2nd terminal locking is realized by an additional part.

The following contacts with conductor sections could be used:
Micro Timer 2
0.5mm² to 1.0mm², FLR
Insulation diameter max. 2,1mm.

1.2 Qualification

When tests are performed the following specified specifications and standards shall be used. All inspections shall be performed using the applicable inspection plan and product drawing.

2 APPLICABLE DOCUMENTS

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

2.1 AMP Documents

A. Customer drawings:

929264 / 929271	6pos. Female Housing MT2
929268	2nd Terminal Locking

The customer drawing number for the contacts are to be inferred from the appropriate housing drawing.

B. AMP Product-Spesification:

108-18055-0	Micro Timer 2 Contact

C. Application Specification:

114-18081-0	Application Spec. for Micro Timer 2 Contact
114-18022-0	General guidelines for application of contacts with open crimp barrels
114-18272-1	Application Spec. for 6pos. MT2 Female Housing on Tab-Header.

2.2 Other Documents

A.	GMI 12590 (April 1996)	Electrical Connectors
B.	GME 60208 (01/84)	Test Procedure Stress-Corrosion Cracking Test
C.	GME 60202 (01/81)	Testing to High Humidity Environments
D.	GME 60206 (04/86)	Test Procedure Salt Spray Fog Testing
E.	GME 60261 (01/85)	Determining the Flammability of Interior Trim Materials
F.	DIN /IEC 512 (04/94)	Electromechanical components for electronic equipment; basic testing procedures and measuring methods
G.	DIN/IEC 68-2-14 (06/87)	Basic environmental testing procedures; Change of temperature
H.	DIN/IEC 68-2-34 (1973)	Random vibration wide band - General Requirements
J.	DIN/IEC 68-2-36 (1973)	Random vivration wide band - Reproducibility Medium
K.	DIN 40050, Teil 9 (08/91)	degrees of protection (IP-code)

3 REQUIREMENTS

3.1 Draft and design

Product must be of the design, construction and physical dimensions specified on the applicable production drawing..

3.2 Materials

Description of Material according product drawing.
Materials are free of Cadmium (tolerably max. 75ppm).
Materials are free of asbestos.

3.3 Ratings

A.	Voltage:	14V DC	
B.	Current Carrying Capacity:	Single Contact:	see AMP-Spec. 108-18055-0 (Derating graph)
		Connector:	see AMP-Spec. 108-18633-1 (Derating graphs of this spec., Fig. 8)
C.	Temperature:	-40 to +85°C	
D.	Max. Temperature for terminals:	tinned Version: 130°C	
E.	Max. Connection cycles:	10	

3.4 Performance and Test Description

The product is designed to meet the electrical, mechanical and environmental performance requirements specified in Para. 3.5. All tests are performed at ambient environmental conditions per IEC 512 unless otherwise specified.

3.5 Requirements and Examinations

GENERAL EXAMINATIONS		
DESCRIPTION	**REQUIREMENT**	**EXAMINATION**
1. General	Marking of the chambers available, clearly and durably marked manufacturer characters available	Visual Check DIN/INTERNATIONAL Electronical Commission 512-2, examination 1a
2. Visual and Dimensional Inspection	Parts without errors or damage mass according to the product design	Visual Check and EMPB (= first sample test report) DIN/INTERNATIONAL Electronical Commission 512-2 examination 1a and 1b

MECHANICAL EXAMINATIONS		
DESCRIPTION	**REQUIRMENT**	**EXAMINATION**
3. Mating Force of the connector (Mating assistance has to be used) TEST NOT REQUIRED	Mating: $F_{close} \leq 80N$ cycles: min. 10	Opel GMI 12590 Section. 5.3.1.1 inspection temperature: T=23°C±5K Test speed: v=75mm/min. ±25mm/min. Force application has to be in the middle of the mating assistance. Housings are lying exposed in putting in direction.
4. Unmating Forece of the connector (Mating assistance has to be used) TEST NOT REQUIRED	Unmating: $F_{open} \leq 80N$ cycles: min. 10	Opel GMI 12590 Section. 5.3.1.1 inspection temperature: T=23°C±5K Test speed: v=75mm/min. ±25mm/min. Force application has to be in the middle of the mating assistance. Housings are lying exposed in putting in direction.
5. Tensile strength of the crimped connection (opened insulation crimp) TEST NOT REQUIRED	0.5mm² : $F_{Taking\ off} \geq 70N$ 0.75mm² : $F_{Taking\ off} \geq 90N$ 1.0mm² : $F_{Taking\ off} \geq 115N$	Opel GMI 12590 Section. 5.3.2 inspection temperature: T=23°C±5K Test speed: v=75mm/min. ±25mm/min. Axially pulled on the individual wire

6. Contact retention forces (effective 2ndary Locking device)	Contact holds in chamber with a strength of F Taking off Micro Timer 2 ≥ 60N	Opel GMI 12590 Section. 5.3.4 inspection temperature: T=23°C±5K Test speed: v=75mm/min. ±25mm/min. Axially pulled on the individual wire, strength measured in the way s = 1mm.
7. Polarization method a) Timer housing mated in a 180° rotated position related to Counter Part TEST NOT REQUIRED	a) Housing is not mateable in a 180° rotated position b) Housing not mateable into any slot	DIN/IEC 512-7, Examination 13e: Housing on counterpart with a load of strength (F) after Rate of change: v = ≤10N/s up to max. 150N, thereafter 150N hold for 10s
8. Drop test TEST NOT REQUIRED	No physical damage. Housing is mateable and lockable with proper counter part. All Contact pairs are in an electrical proper working condition.	After DIN/IEC 512-5, examination 7b wire size range: 0.5mm² head: 1000mm cycles: 3 Housing full equiped.

ELECTRICAL EXAMINATION		
DESCRIPTION	**REQUIREMENT**	**EXAMINATION**
9. Derating Graph Current Carrying Capacity TEST NOT REQUIRED	See Deratinggraph (fig. 8) for: Micro Timer 2: a) 0.5mm² b) 0.75mm² c) 1.0mm²	Opel GMI 12590 Section. 5.4.1 (min. 3 Current values) Micro Timer 2 : $I_{max\ 0.5mm²}$ = 5A $I_{max\ 0.75mm²}$ = 8A $I_{max\ 1.0mm²}$ = 10A Each cavity of every terminals system is to be loaded with the same testing wire size
10. Termination Resistance TEST NOT REQUIRED	$U_{Crimp} \leq 5mV$	Opel GMI 12590 Section. 5.4.2 current destiny: 5 A/mm² Inspection temperature: 23°C ±5K Test set-up and situation of the measuring points in accordance with fig.5 Measurement when new

11. Contact Resistance TEST NOT REQUIRED	$R_{Contact} \leq 5m\Omega$	Current destiny: 5A/mm² Inspection temperature: T=23°C±5K Test set-up and situation of the measuring points in accordance with fig.6 Measurement when new
12. Total Resistance TEST NOT REQUIRED	Unused: $R_{total} \leq 10m\Omega$ After Test max. increase: 200%	Current destiny: 5A/mm² Inspection temperature: T=23°C±5K Test set-up and situation of the measuring points in accordance with fig.7
13. Insulation resistance TEST NOT REQUIRED	$R_{Isolation} \geq 200\ M\Omega$	GMI 12590 Section. 5.5.1 Measuring voltage: 100V±10V Humidity 65%±5% a) Measurement between all switched together terminals and a metal foil surrounding the housing (grounded). b) Measurement between each adjacent terminals, housing not mated.

14. Dielectic with standing voltage TEST NOT REQUIRED	No Disruptive Discharge	GMI 12590 Section. 5.5.2 Measuring voltage: 2000Veff. 50Hz, Continuance 60s Humidity 65%±5% a) Measurement between all terminals switched together and a metal foil surrounding the housing (grounded). b) Measurement between each neighboring pair of terminals, housing not mated.
15. Current carrying capacity TEST NOT REQUIRED	Contact temperature at its hottest position: $T_{Contact} \leq 80°C$ Temperature of the connector's handled area: $T_{Connector} \leq 65°C$	GMI 12590 Section. 5.6.1 Examination time: 60min. and/or up to reaching the temperature equilibrium Wire size range: 1mm² Micro Timer 2 Contact: examining current: 10A/mm² (limited due to design) Wire length: 300mm±20mm Ambient temperature: 23°C±5K

THERMAL EXAMINATIONS		
DESCRIPTION	**REQUIREMENT**	**EXAMINATION**
16. Temperature constancy	Parts are functional over the entire temperature range and during the entire test duration. All contact requirements concerning contact retention in the housing and total resistance must be fulfilled after examination. The housing may not exhibit deformations, rifts or breaks.	GMI 12590 Section. 5.6.2 Cycle according fig. 1 Current stress: 5A/mm² Micro Timer 2: Wire size range: 1mm² T min = -40°C ± 3K T max. = +85°C± 3K 1 Cycles: 4h Quantity: 36 Cycle Total Test Duration: 144h
17. Temperature alternation test	After this examination all requirements must be fulfilled concerning contact retention in the housing and total conductance.	GMI 12590 Section. 5.6.3 Cycle according: fig. 2 T min = -40°C ± 3K T max. = +105°C± 3K 1 Cycle: 14h Quantity: 12 Cycles Total Test Duration: 168h

18. Missing

ENVIRONMENTAL CHECKS AND VARIOUS EXAMINATIONS		
DESCRIPTION	**REQUIREMENT**	**EXAMINATION**
19. Stress in condensed water climatic Chamber (constant) TEST NOT REQUIRED	After this examination all requirements must be fulfilled concerning contact resting in the housing and total conductance. No deformations, rifts or breaks.	GME 60202-D3-Stufe 3 Inspection Temperature: T = +40°C±3K relatively air moisture: ≈100% Continuance: 72h +15min. Current: 5ª/mm² Micro Timer 2: Wire size range: 1mm² Variation during the continuance of 72h: 10 min. EIN 10 min. AUS
20. Salt fog TEST NOT REQUIRED	After this test all requirements with regard to terminal retention in Housing and over all resistance must be fulfilled. No deformations, rifts or breaks.	GME 60206 Duration for Connector applications in engine Compartment: 1 week-cycle Preparation of the tested parts 1h at +80°C+/-2,5K Cycle (1 Week) 24h storage in salt spray fog 6h storage in test chamber at +40°C+/-2.5K 18h storage in salt spray fog 6h storage in test chamber at +40°C+/-2.5K 18h storage in salt spray fog 6h storage in test chamber at +40°C+/-2.5K 24h storage in salt spray fog 65h storage in test chamber at +40°C +/-2.5K

21.Water protection (water-protected)	No water shall be in the connection after test a and b	GMI 12590 Section. 5.10.1 Housing with minimum and maximum wire size range. Detection: Water detection paste Test sequence: 30 Examination on water protection according to DIN 40050, part of 9, IPX 4K b) Aging in the temperature cabinet with +90°C±3K for 250h±5h, afterwards examination after a)
22. Water protection (water-protected) TEST NOT REQUIRED	No water in the connector. Leakage current < 5μA	GMI 12590 Section. 5.10.2 Housing equips with minimum and maximum wire diameter. Test sequence: 30 Test specimen dipped into water (with 5 thread % NaCl and 0,1g/Liter wetting agent transferred de-ionized). Water temperature: 23°C±3K Test Specimen 1h±15min. dipped into water. Testing voltage: 14±0,5V Measurement between each contact and the electrode and between each adjacent contacts. b) Aging in the temperature cabinet with +90°C±3K for 250h±5h, afterwards examination after a) fig. 9 and fig. 10

23. Water protection (High pressure protected) TEST NOT REQUIRED	No water shall be in the connection after test a and b	GMI 12590 Section. 5.10.3 Housing with minimum and maximum wire size range. Detection: Water detection paste Test sequence: 30 Examination on water protection according to DIN 40050, part of 9, IPX 9K b) Aging in the temperature cabinet with +90°C±3K for 250h±5h, afterwards examination after a)
24. Vibration test (Random vibration wide band with temperature superposition) TEST NOT REQUIRED	No exceed of the over all resistance of 25Ω for a duration > 1μs No deformation, crack or breaking shall be visible at the housing.	GMI 12590 Section. 5.11 Test unit acc. Fig. 3 IEC 68-2-14 Nb IEC 68-2-34 Fd IEC 68-2-36 Fdb Parameters: Frequency range F = 10Hz to 1kHz Power spectral destiny: 8.7 m²/s³ at 10Hz 8.7 m²/s³ at 25Hz 0.22m²/s³ at 1 kHz Total acceleration (RMS): 30 m/s² Testing time for each of the three mutually perpendicular directions: 22h+2h Reproducibility: medium Superposed Temperature Cycle: see Fig. 4 T_{max} = +105°C±3K T_{min} = -40°C±3K Current stress Testing current I = 100mA

25. Missing

OTHER TESTS		
DESCRIPTION	**REQUIREMENT**	**EXAMINATION**
26. Retention force of 2nd Locking Rec. Housing TEST NOT REQUIRED	5N ≤ F ≤ 10N	Inspection Temperature: T=23°C±5K Test speed: v=75mm/min. ±25mm/min. Force has to be applied in the middle of the mating assistance. Rec. housing without terminals.
27. Retention force of slide in pre lock position TEST NOT REQUIRED	20N ≤ F ≤ 40N	Inspection Temperature: T=23°C±5K Test speed: v=75mm/min. ±25mm/min. Force has to be applied in the middle of the mating assistance.

3.6 Qualifications- and Requalification Testings

EXAMINATION		TEST GROUP													
		A	B	C	D	E	F	G	H	J	K	L	M	N	O
		TEST SEQUENCE													
(01)	General			1				1							
(02)	Visual Examination and Dimensional Control			2,4				2							
(03)	Mating Force of the Connector														
(04)	Unmating Force of the Connector														
( )	Mating Cycles (10 times)														
(05)	Tensile Strength of the Crimped Connection														
(06)	Contact Retention Forces			3											
(07)	Polarization Method														
(08)	Drop Down Test														
(09)	Derating Curve														
(10)	Voltage Drop at the Crimp														
(11)	Contact resistance														
(12)	Measuring of Resistance														
(13)	Insulation Resistance														
(14)	Dielectrical with Standing Voltage														
(15)	Current-temperature Capability														
(16)	Temperature Test														
(17)	Temperature Cycling Test														
(19)	Condensate														
(20)	Corrosion Performance (Salt Fog)														
(21)	Water Protection (Level=protected)							3							
(22)	Water Protection (Level=sealed)														
(23)	Water Protection (Level=high pressure protected)														
(24)	Vibration Test														
(26)	Retention Terminal Locking														
(27)	Retention Force Pre Lock Position of Slide														
	Test Report			6-929265-1,Rev.C 00-A-444				6-929264-1,Rev.C 99-A-541 6-929271-1,Rev.A 00-A-475							

Number of specimen see chapter 4.1
The numbers indicate the order, in which the checks are carried out.

4 QUALITY ASSURANCE MEASURES

4.1 Qualification Inspection

A. Selection of the Test Specimens

The test specimens must correspond to the design documents and be taken by coincidence of current production. The number of test specimens builds itself up as follows:

For the test group C: 6 piece
test group G: 6 peace

B. Test Groups

The examinations must in accordance with under Section. 3.6 specified test groups to be accomplished.

4.2 Requalification Examinations

If changes significantly affeting form, fit or function are made to the product or to the manufacturing process, AMP shall coordinate requalification testing, consisting of all or part of the original testing sequence as determined by product development.

4.3 Acceptance

Acceptance is based on verification that the product meets the requirements of Para 3.5. Failures attributed to equipment, test setup, or operator deficiencies shall not disqualify the product. When product failure occurs, corrective actions shall be taken and samples resubmitted for qualification. Testing to confirm corrective action is required before re-submittal.

4.4 Examination and Conformity

The applicable AMP inspection plan will specify the sampling acceptable quality level to be used.
Dimensional and functional requirements shall be in accordance with the applicable product drawing and this specification.

5 APPENDIX

Fig. 1 : Test Cycle for Temperature Resistance

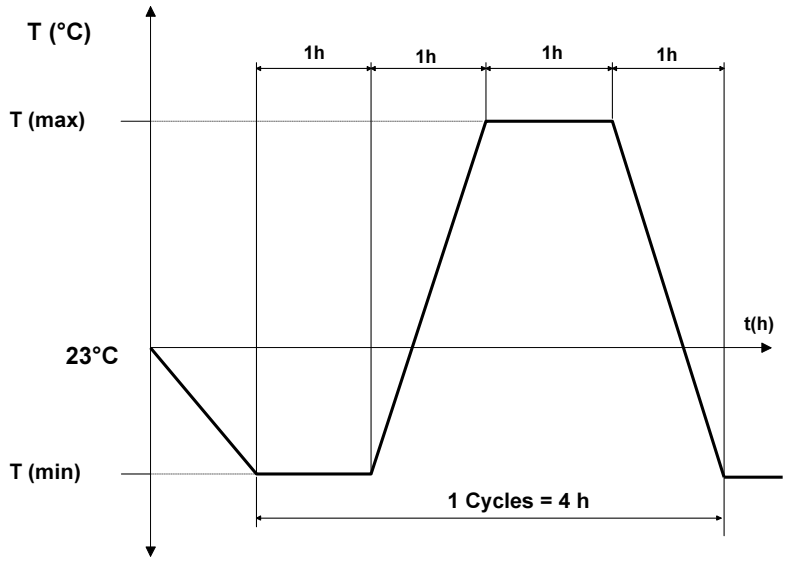


Fig. 2 : Test Cycle Temperature Alternation Test

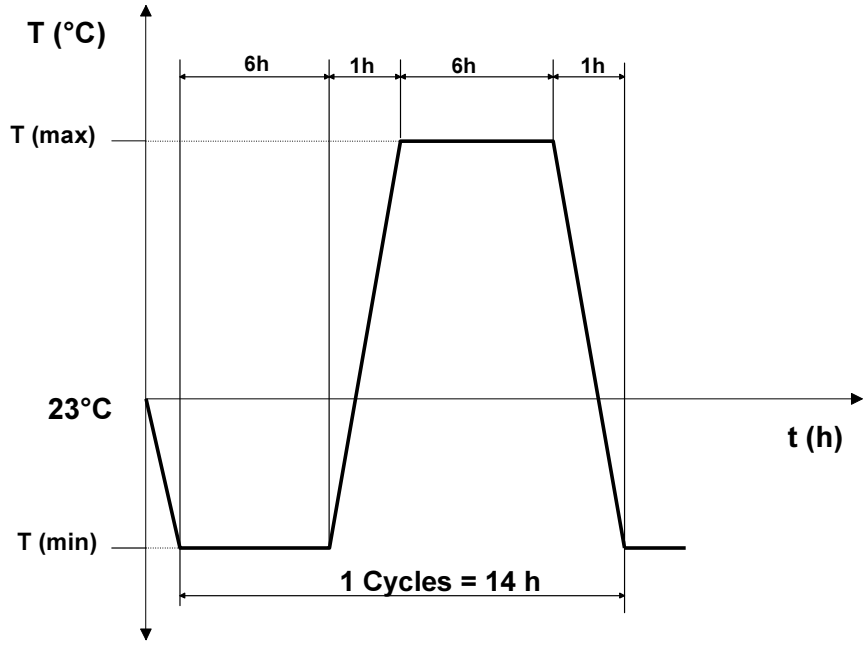


Fig. 3 : Test Unit Vivration Test

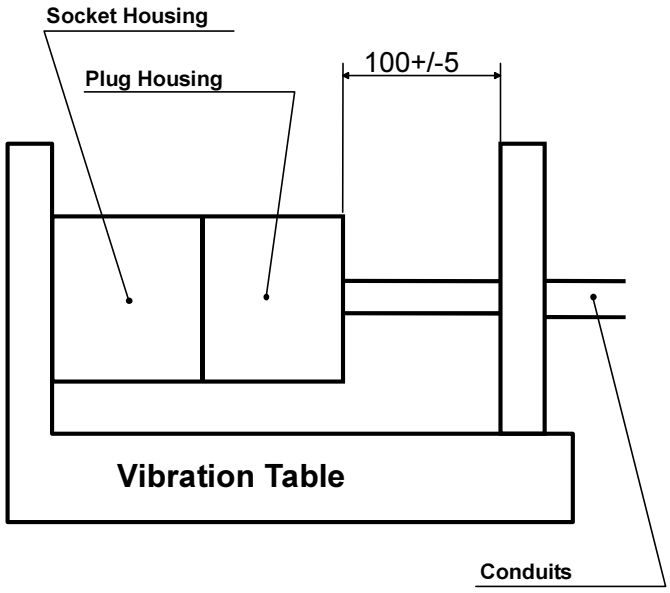


Fig. 4 : Temperature Cycle during Vibration Test

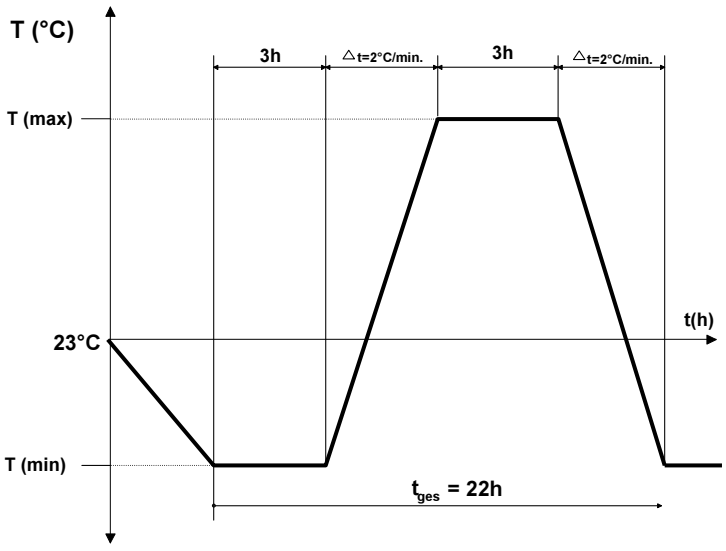
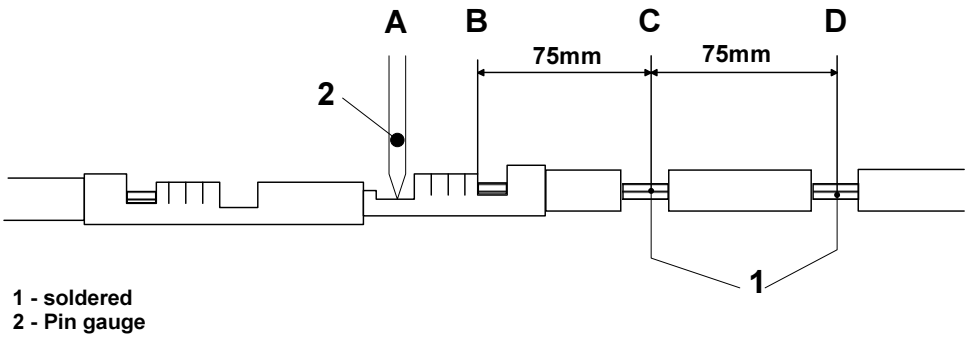


Fig. 5 : Test Unit Termination Resistance



1 - soldered
2 - Pin gauge

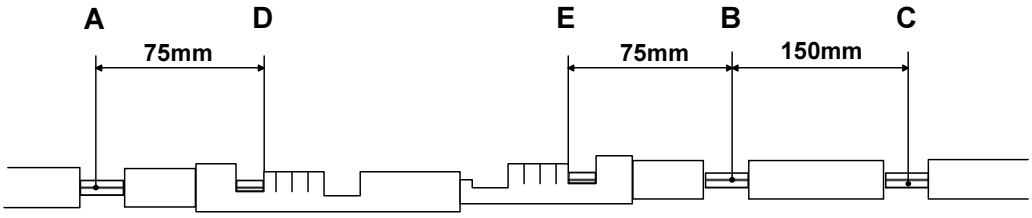
$$U_{Crimp} = U_{AB} = U_{AC} - U_{CD}$$

Fig. 6 : Test Unit Contact Resistance

see Fig. 5 and 7

$$U_{Contact} = U_{Total} - 2x\ U_{Crimp}$$

Fig. 7 : Test Unit Measuring of Resistance



$$U_{total} = U_{DE} = U_{AB} - U_{BC}$$

Fig. 8 : Derating Graphs