

PRODUCT SPECIFICATION
STANDARD TIMER CONNECTOR,
RAST 5mm, 2-12 POSITIONS

1. GENERAL:

1.2 Purpose and Scope:

This specification describes the structure, properties, design types as well as quality requirements for the standard timer connector, pitch 5 mm, single-rowed, with interior or exterior locking, which are listed under point 3.

1.2 General Testing Requirements:

All tests that are done on the testing samples, must comply with the guidelines.

- Amount of testing samples: unless otherwise specified min. 5 pcs.
- Testing samples should not have any visible damages
- Testing samples must be compliant with the latest drawing version
- For testing purposes, only parts from production are to be used

2. APPLICABLE SPECIFICATIONS:

The below mentioned regulations are part of this specification, as far as they are mentioned in detail. Should there be any discrepancies between specification and the named regulations, the specifications should be given priority.

2.1 DIN Regulations: DIN 17670 DIN 41640

2.2 VDE Regulations: VDE 0627 VDE 0110

2.3 AMP Specifications:

Product Specification RAST 5 tab array:	108-18050
Product Specification 6.3x0.8 FASTIN-FASTON tab connector:	108-18075
Product Specification STANDARD TIMER contact:	108-18054
Product Specification STANDARD POWER TIMER contact:	108-18025
Qualification Test Report:	501-18003
AMP Specification:	109-50

2.4 Other Specifications:

RAST 5 documents of the ZVEI

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A9	ECR-22-162221	FL	27Dec2022	DR		 AMP Deutschland GmbH D-63225 Langen		
A8	ECR-22-152560	FL	22Sep2022		R. Häfner			
A7	ECR-21-102725	FL	28Apr2021	CHK	K. Munz			
A6	Adjust 3.3.1. & 3.3.2.	FL	07Oct2020					
A5	New PN's added to item 3.3	FL	26NOV2019	APP	T. Klenner	NO	REV	LOC
A4	Added 3.4.5 section	FL	01OCT2018			108-18049-1	A11	AI
A3	Added 3.4.5 section	RR	2.12.16		PAGE	STANDARD TIMER CONNECTOR RASTER 5mm, 2-12 POSITIONS		
A11	Add 25A high current version	TL	03April202		TITLE			
LTR	REVISION RECORD	APP	DATE	1 OF 14				

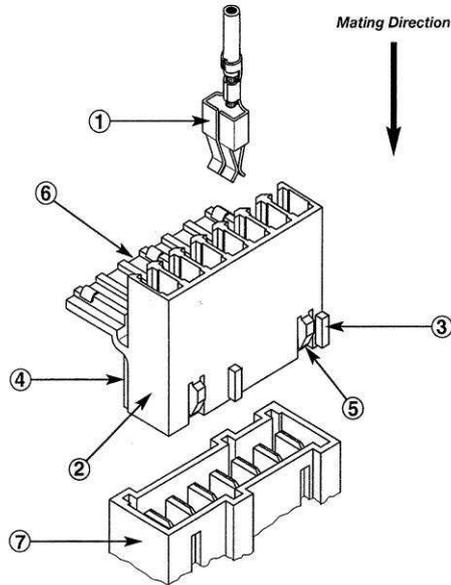
3. DESCRIPTION OF PRODUCT:

3.1 Product Exposure (Basic Sketch)

Interior Locking

Connection to the Components
according RAST 5 Standard

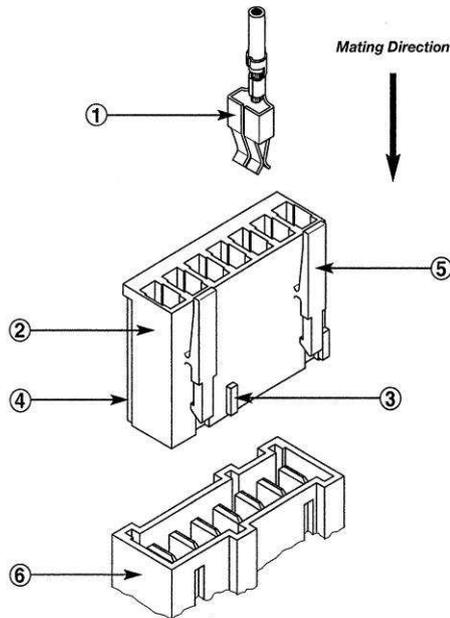
- 1 Connected Timer Contact
- 2 Standard Timer Housing
with Interior Locking
- 3 Keying
- 4 Polarisation
- 5 Locking Latch
- 6 Cover (Secondary Locking)
- 7 RAST 5 Tab Array



Exterior Locking

Connection to the Components
according RAST 5 Standard

- 1 Connected Timer Contact
- 2 Standard Timer Housing
with Exterior Locking
- 3 Keying
- 4 Polarisation
- 5 Locking Latch
- 6 RAST 5 Tab Array



3.2 System characteristics:

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The standard timer housings are used to accommodate the crimp contacts of standard timers and standard power timers. The housings are built up single rowed. The housings are available with either interior or exterior locking.

The housings with interior locking are fitted with an additional safety for contacts (Cover). For polarisation and keying purposes, keying ribs have been added to the part, which will then fit into the respective keying groove of the opposing connector.

The locking of the mating connectors results out of the locking latch and snap-window on the mating part, or due to a keying rib and a snap-latch on the mating part (only for housings with interior locking).

3.3 Overview of Product:

3.3.1 Variations of Housings:

The specification concerns the following housings:

a.) Standard Timer Housing with Exterior Locking

All 2-12 position housings with the AMP Part-No. (PN):

X-928 247-Y	X-964 983-Y	X-969 484-Y
X-964 702-Y	X-1241980-Y	X-1241817-Y
X-1241965-Y	X-2315717-Y	X-1241961-Y
X-2345754-Y	X-2322912-Y	X-1241983-Y
X-2345753-Y	X-2295787-Y	X-1241959-Y

X and Y stand for 0, 1, 2, ... 9; pos. number, keying, colour see drawing.
Material: PA (Polyamide)

b.) Standard Timer Housing with Interior Locking

All 2-12 position housings with the AMP Part-No. (PN):

X-927 740-Y	X-928 343-Y	X-928 268-Y
X-928 151-Y	X-928 344-Y	X-964 386-Y
X-928 154-Y	X-928 345-Y	X-964 768-Y
X-928 423-Y	X-964 951-Y	X-1241981-Y
X-1703059-Y	X-1241964-Y	X-1703060-Y

X and Y stand for 0, 1, 2, ... 9; pos. number, keying, colour see drawing.
Material: PA (Polyamide)

* Not exhaustive list

c.) High Current Version

2-4 position connectors with the AMP Part-No. (PN):

Standard Timer Housing X-2364000-Y

Accessory: TPA X-2364004-Y

Counter part: RAST Tab Header X-2364002-Y

X and Y stand for 0, 1, 2, ... 9; pos. number, keying, colour see drawing.
Housing Material: PA (Polyamide)

3.3.2 Types of Contacts:

The specification concerns the following contacts:

a.) Standard Timer Contacts

926965-1	928820-1	926973-1	964201-1
926965-2	928820-2	926973-2	964201-2

964202-1
964202-2

Material: -1 Brass, tin plated
 -2 Bronze, tin plated

b.) Standard Power Timer Contacts

964203-1	964204-1	1862006-1	2825197-1
964203-5	964204-5	1862006-5	

Material: Contact body is made of copper iron, tin plated
 Cover spring of steel

* Not exhaustive list

c.) High Current Version Contact

2364003-1

Material: Contact body is made of copper iron, tin plated
 Cover spring of steel

* Not exhaustive list

3.4 Usable mating parts:

3.4.1 General:

The Standard Timer Housings are mated with special designed tab headers. The geometrical dimensions and the design are specified according to RAST 5.

3.4.2 Direct Connection of Components:

The tabheader is integrated with a component e.g. level switch.

3.4.3 Coupling Connectors:

The specification concerns the following Tab Mating Connectors:

a.) 6.3x0.8 FASTIN-FASTON Tab Connector, RAST 5mm

927742	928121	928157	964492
928309	928122		964493
928230			
928149			

b.) Positive Mate Tab Connector

928257

928363

* Not exhaustive list

3.4.4 Indirect PCB Connection with Tabheader

For the indirect PCB connection the tabheader with following number is used: 928492 in connection with the following contacts 964016-2 and 964017-2.

3.4.5 Indirect PCB Connection with Selective- loaded Tab header (Improved housing locking strength version)

The application of the improved housing locking strength version needs to be evaluated by TE Connectivity engineer when mate with the selective-loaded tab header version. And below the related PNs of the improved housing locking strength version:

3-1241965-5	3-1241965-7	4-1241965-7	1-1241965-4
8-1241965-2	2-1241965-4	3-1241965-4	5-1241965-5
5-1241965-7			
1-1241961-9	7-1241961-7	5-1241961-7	

3.4.6 Indirect PCB Connection with Selective- loaded Tab header (for High Current Version)

See 3.3.1, C.)

4. Requirements:

4.1 Product Design and Dimensions:

Parts being used for following tests must correspond in form and dimension with the drawing.

4.2 Output Values:

4.2.1 Current Voltage:

400V AC for fully loaded, 600V AC for selectively loaded or comply with the allocation of air- and creeping stretch according to VDE 0110.

4.2.2 Max. Current Rating:

The maximal current ratings per contact for connectors loaded with standard timer or standard power timer contacts are dependant on ambient temperature, conductor cross section, pos. number etc... The operating temperature must be adhered to during the usage of the connector.
The maximal current rating for certain connector combinations can be derived from the diagrams 1 to 3.

4.2.3 Temperature Range:

-40° C to +105° C including current warming

4.3 Characteristics and Test Descriptions:

4.3.1 Testing Conditions: unless specified otherwise, all tests are to be executed under following conditions:

Temperature: +23° C +/-5° C
Relative Humidity: 45 to 75%
Atmospheric Pressure: 860 to 1070 mbar

4.3.2 Preparation of Samples:

The testing samples must be prepared in such a way that, function and form cannot be influenced in any way.

4.3.3 Electrical Properties and Testing Condition:

All tests that are featured below must be accomplished with 6.3x0.8 FASTIN-FASTON tab connectors and AMP RAST 5 tabheaders.

Test Description	Requirement	Procedure
Dimensional- and Visual Examination	The connector combination must comply with the latest drawing version.	IEC 60512-1-1 Optical, dimensional and functional examination
<u>ELECTRICAL INSPECTIONS</u>		
Measuring of Resistance in Contact Area	New part $\leq 1.5 \text{ m}\Omega$ A resistance increase of more than 50% or $\leq 5 \text{ m}\Omega$ compared to the new part is not allowed. The respectively greater value has to be accepted.	Measurement according to IEC 60512-2-2, Test voltage: 1V, and test current: 1A Measuring points, see annexe 6.1

Test Description	Requirement	Procedure
Voltage Proof	No break down or flashover	IEC 60512-4-1 Method C Test voltage ≥ 2500 V
Insulation Resistance	≥ 5 M Ω	DIN 41640 Part 7, Test 3a / IEC 60512-3-1 Voltage for testing = 250VDC After storing in a relative humidity of 91-95% and 20 – 30° C without dew for 48 h
Current Temperature Capability (Derating Curve)	Category temperature = +105° C Nominal Current: 4A for conductor 0.5 mm ² , 6A for conductor 0.75 mm ² , 10A for conductor 1 mm ² , 16A for conductor 1.5 mm ² and 2 mm ² , 25A for conductor 4.0 mm ² to 6 mm ²	See 6.2-6.4(Diagram 1-3) DIN 41640 Part 3 / IEC 60512-5-2, Test 5-2.
Temperature Rise Test	The upper category temperature of the testing sample not to be exceeded.	IEC 60512-5-1 / DIN VDE 0627 Testing samples are to be pinned on a testing length of 250 +/- 25mm. Ambient temperature: see 6.2-6.4

MECHANICAL INSPECTIONS

Insertion and withdraw forces	Insertion force: ≤ 12 N Withdraw force: 1.5N – 7N	IEC 60512-13-2 Measure force between contact and tab without plastic housing and without additional lubrication except remaining stamping oil Measure at a rate of 25mm/min. Test tab PN : 1719820-1
Contact Retention during usage	No visual observation of contact damage, and no displacement	IEC 60512-15-1, EIA-364-29 method A Retention force: 30 N. The force shall be maintained for min. 6 seconds +/- 1 second
Tensile Strength of Crimp Connection	Min. tensile strength acc. IEC 60352-2 table 1 pull out force of crimped connections For conductor 0.5 mm ² , min. tensile strength: 60 N For conductor 0.75 mm ² , min. tensile strength: 85 N For conductor 1.0 mm ² , min. tensile	IEC 60512-16-4 Measure at a rate of 25mm/min.

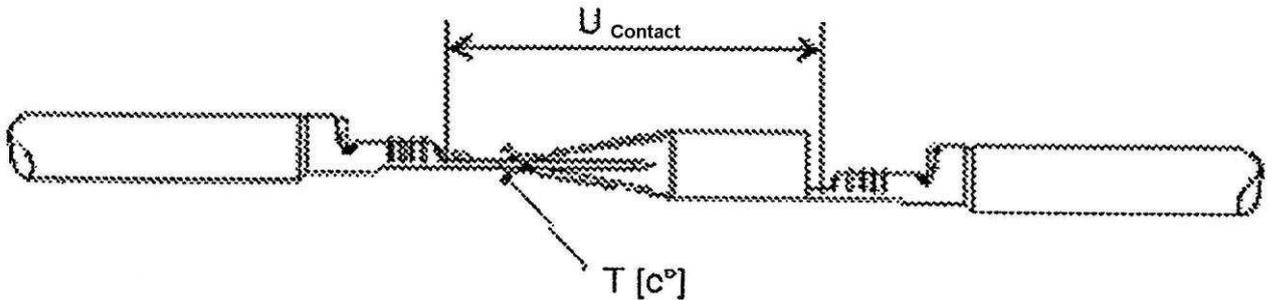
	<p>strength: 108 N</p> <p>For conductor 1.5 mm², min. tensile strength: 150 N</p> <p>For conductor 2.5 mm², min. tensile strength: 230 N</p> <p>For conductor 4 mm², min. tensile strength: 300 N</p> <p>For conductor 6 mm², min. tensile strength: 350 N</p>	
Housing Locking Strength mating Connectors	<p>Min. 10 N (Interior Locking)</p> <p>Min. 15 N (Exterior Locking)</p>	<p>AMP Specification 109-50</p> <p>(EIA-364-98-1997(R2009))</p> <p>Measure without contact.</p> <p>Measure at rate of 13mm/min.</p>
Housing Locking Strength mating with RAST 5 Tab header	<p>Min. 50 N / Per latch</p>	
(Only for 3-1241965-5, 3-1241965-7, 4-1241965-7, 1-1241965-4, 8-1241965-2, 2-1241965-4, 3-1241965-4, 5-1241965-5, 5-1241965-7, 1-1241961-9, 7-1241961-7, 5-1241961-7)	<p>Min. 30 N / Per latch (Only for 6-1241965-5)</p>	
<u>CLIMATIC INSPECTIONS</u>		
Dry Heat	No visible defects or deviations, no cracks on the isolating parts	<p>For the mating area acc. to IEC 60512-11-9 / DIN VDE 0627</p> <p>Inspect. Temp.: upper category temp. of sample +105° C</p> <p>Duration of Inspection: 168 h</p> <p>Testing samples are mated.</p>
Cold	No visible defects or deviations, no cracks on the isolating parts	<p>For the mating area acc. to IEC 60512-11-10</p> <p>Temperature: -40° C</p>
Saturated Atmosphere in the presence of sulphur dioxide	<p>Visual check acc. to IEC 60512-1-1</p> <p>No visible defects detectable with the naked eye</p>	<p>DIN 50018, KFW 0.2L S</p> <p>1 Cycle</p> <p>Testing samples are to be mated.</p>

4.4 Qualification Run:

Description	Test Group								
	1	2	3	4	5	6	7	8	9
	Test Sequence								
Dimensional- and Visual Examination	1	1	1	1	1	1	1	1	1
Measuring of Resistance in Contact Area						2/4	2/4	2/6	
Voltage Proof							5	7	
Insulation Resistance					2				
Current Temperature Capability				2			3		
Temperature Rise									2
Engaging- and Separating Forces						3			
Contact Retention during usage	2								
Tensile Strength of the crimp Connection		2							
Housing Locking Strength mating Connectors			2						
Dry Heat								4	
Cold								3	
Saturated Atmosphere								5	

6. Annexe:

6.1 Figure 1

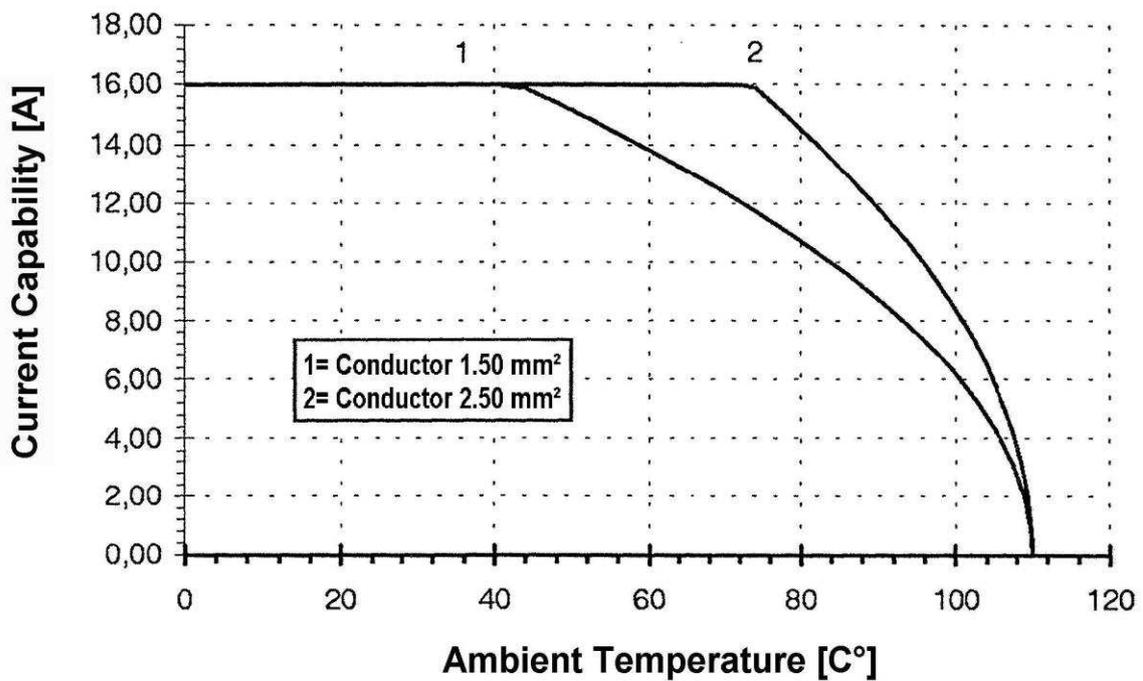


6.2 Diagram 1:

Standard Power Timer

Socket (PN)	:	PN's see item 3.3.2.b
Material	:	CuFe tinned
Conductor Cross Section (mm ²)	:	1.5/2.5
Application tooling	:	
Tab	:	Faston Tab 6.3x0.8 (964 016-2 / 964 017-2)
Material	:	CuZn tinned
Conductor Cross Section (mm ²)	:	soldered on printed circuit board (PCB)
Housing	:	12-pos.
Measurement Set-up	:	Housing fully loaded with contacts

Derating - Curve

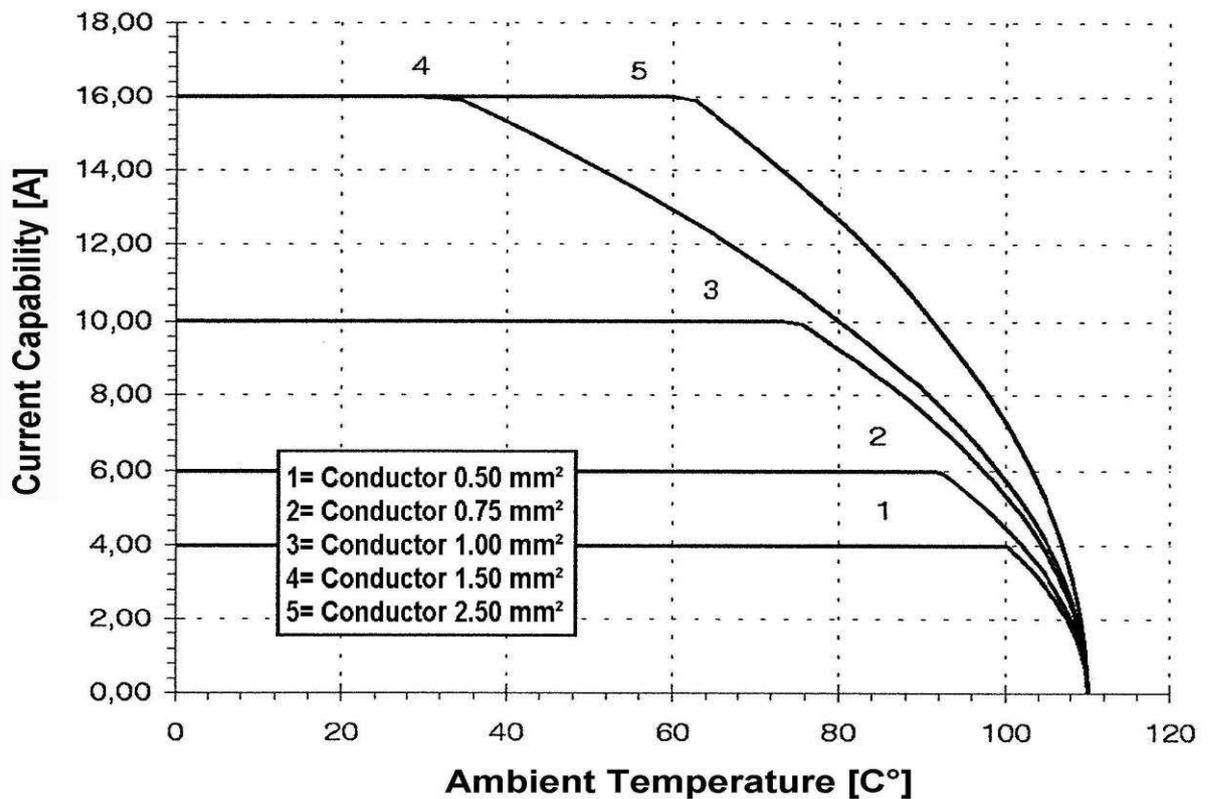


6.3 Diagram 2:

Standard Timer

Socket (PN)	:	PN's see item 3.3.2.a
Material	:	CuZn and CuSn tinned
Conductor Cross Section (mm ²)	:	0.5/0.75/1.0/1.5/2.5
Application tooling	:	
Tab	:	Fastin-Faston Tab (60294-2/42098-2)
Material	:	CuZn tinned
Conductor Cross Section (mm ²)	:	0.5/0.75/1.0/1.5/2.5
Housing	:	8-pos.
Measurement Set-up	:	Housing fully loaded with contacts

Derating - Curve

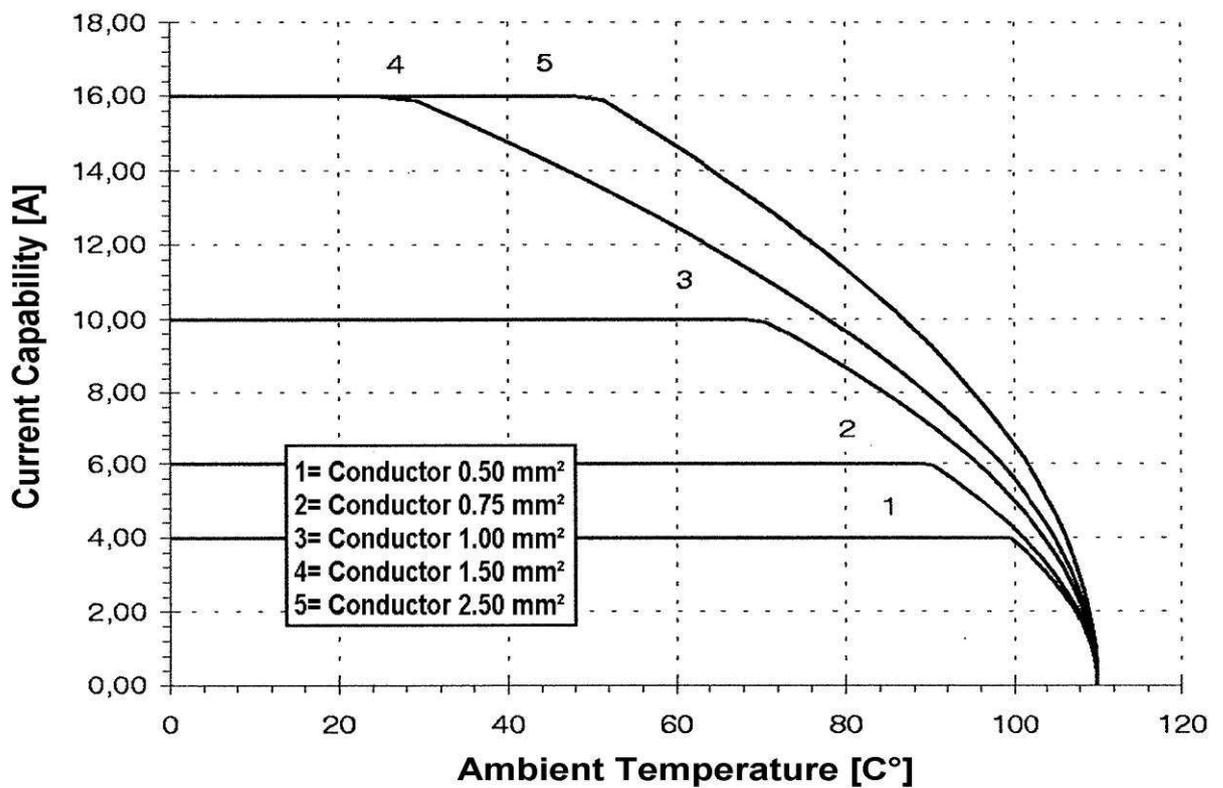


6.4 Diagram 3:

Standard Timer

Socket (PN)	:	PN's see item 3.3.2.a
Material	:	CuZn and CuSn tinned
Conductor Cross Section (mm ²)	:	0.5/0.75/1.0/1.5/2.5
Application tooling	:	
Tab	:	Faston Tab 6.3x0.8 (964 016-2 / 964 017-2)
Material	:	CuZn tinned
Conductor Cross Section (mm ²)	:	soldered onto printed circuit board (PCB)
Housing	:	12-pos.
Measurement Set-up	:	Housing fully loaded with contacts

Derating - Curve



6.4 Diagram 4:

Standard Timer

Socket (PN)	:	PN's see item 3.3.1.c
Material	:	CuFe tinned
Conductor Cross Section (mm ²)	:	5.0(10AWG)
Application tooling	:	
Tab	:	Tab 6.3x0.8 (2364002-4)
Material	:	CuZn tinned
Conductor Cross Section (mm ²)	:	Tab Header
Housing	:	4-pos.
Measurement Set-up	:	Housing fully loaded with contacts

