

Qualification Test Report



Q18001

STRAIGHT VERSION QUALIFICATION ACCORDING TO EN 50467 FXP 2

PRJ-16-000908122

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1 INTRODUCTION

1.1 AIM OF THE TESTS

The aim of the type tests is to qualify the connector FXP2 according to the standard EN50467. The FXP series is designed to fulfil the standard EN50467 and consequently section 7 of this standard which defined the type tests, specimens, sequence, ratings and measurements to be performed by the product in tests.

Unless otherwise specified, severity of the service conditions shall be those per EN50467, table B.1, for on board rolling stock locations 4-5-6. Testing AC voltage frequency is 50 Hz.

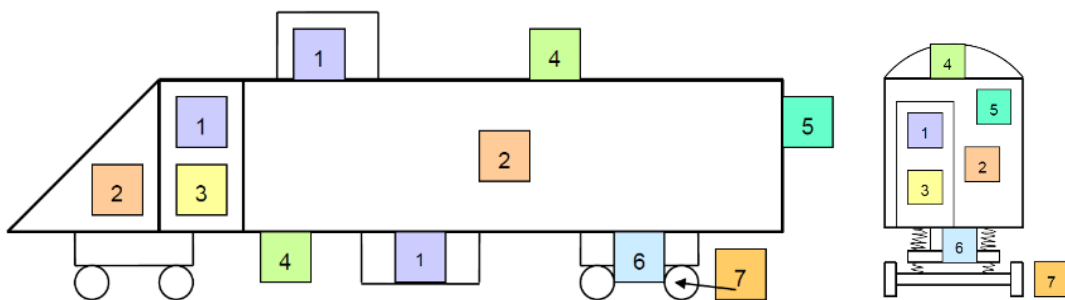


Figure 1 – Typical connector locations on board rolling stock (EN50467, fig. 3)



1.2 APPLICABLE DOCUMENTS

1.2.1 TE Connectivity documents

Connectors:

- 212678_DEUTSCH - Straight female receptacle for contacts to be crimped cal.20
- 212679_DEUTSCH - Straight male plug for contacts to be crimped cal.20
- 114-157007 - Implementation and wiring procedure of FXP2 range
- 108-157009 - FXP2 series, straight version, Product Specification
- 409-157000 - FXP series Maintenance Manual
- 502-157074 – Current-temperature derating and breakdown voltage

Contacts:

- 212689_DEUTSCH - S/A female contact cal.20 to be crimped 120 to 240mm²
- 212919_DEUTSCH - S/A male contact cal.20 to be crimped 120 to 240mm²

Other / Download documents:

- <http://www.te.com/>

1.2.2 Normative documents

The following referenced standards are applicable, as well as the standards listed therein as applicable standards. For undated references, the last standard version in effect at the test date has been used.

- EN 45545-2+A1:2016 – Railway applications – Fire protection on railway vehicles – Part 2: Requirements for fire behavior of materials and components
- EN 50467:2012 - Railway applications – Rolling stock – Electrical connectors, requirements and test methods
- EN 50124-1/A2:2005 - Railway applications – Insulation coordination – Part 1: Basic requirements – Clearances and creepage distances for all electrical and electronic equipment
- EN 60068-1:2014 - Environmental testing – Part 1: general guidance
- EN 60068-2-1:2007 - Environmental testing – Part 2-1: Tests – Test A: Cold
- EN 60068-2-2:2007 - Environmental testing – Part 2-2: Tests – Test B: Dry heat
- EN 60068-2-11:1999 - Environmental testing – Part 2: Tests – Test Ka: Salt mist
- EN 60512-1:2001 - Connectors for electronic equipment – Tests and measurements – Part 1: General
- EN 60512-1-1:2002 - Connectors for electronic equipment – Tests and measurements – Part 1-1: General examination – Test 1a: Visual examination
- EN 60512-1-2:2002 - Connectors for electronic equipment – Tests and measurements – Part 1-2: General examination – Test 1b: Examination of dimension and mass
- EN 60512-2-1:2002 - Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2a: Contact resistance – Millivolt level method
- EN 60512-2-2:2003 - Connectors for electronic equipment – Tests and measurements – Part 2-1: Electrical continuity and contact resistance tests – Test 2b: Contact resistance – Specified test current method

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- EN 60512-2-5:2003 - Connectors for electronic equipment – Tests and measurements – Part 2-5: Electrical continuity and contact resistance tests – Test 2e: Contact disturbance
 - EN 60512-3-1:2002 – Connectors for electronic equipment – Tests and measurements – Part 3-1: Insulation tests – Test 3a: Insulation resistance
 - EN 60512-4-1:2003 - Connectors for electronic equipment – Tests and measurements – Part 4-1: Voltage stress tests – Test 4a: Voltage proof
 - EN 60512-5-1:2002 – Connectors for electronic equipment – Tests and measurements – Part 5-1: Current-carrying capacity tests – Test 5a: Temperature rise
 - EN 60512-7-2:2012 - Connectors for electronic equipment – Tests and measurements – Part 7-2: Impact tests (free connectors) – Test 7b: Mechanical strength impact
 - EN 60512-9-1:2010 - Connectors for electronic equipment – Tests and measurements – Part 9-1: Endurance tests – Test 9a: Mechanical operation
 - EN 60512-11-6:2002 - Connectors for electronic equipment – Tests and measurements – Part 11-6: Climatic tests – Test 11f: Corrosion, salt mist
 - EN 60512-11-9:2002 - Connectors for electronic equipment – Tests and measurements – Part 11-9: Climatic tests – Test 11i: Dry heat
 - EN 60512-11-10:2002 - Connectors for electronic equipment – Tests and measurements – Part 11-10: Climatic tests – Test 11j: Cold
 - EN 60512-13-1:2006 - Connectors for electronic equipment – Tests and measurements – Part 13-1: Mechanical operation tests – Test 13a: Engaging and separating force
 - EN 60512-13-5:2006 - Connectors for electronic equipment – Tests and measurements – Part 13-5: Mechanical operation tests – Test 13e: Polarizing and keying method
 - EN 60512-15-1:2008 - Connectors for electronic equipment – Tests and measurements – Part 15-1: Connector tests (mechanical) – Test 15a: Contact retention in insert
 - EN 60512-15-2:2008 - Connectors for electronic equipment – Tests and measurements – Part 15-2: Connector tests (mechanical) – Test 15b: Insert retention in housing (axial)
 - NFF 00-363:1995 – Rolling stock – Products to be crimped for electrical connections
 - EN 60529:1991+A1:2000 – Degree of protection procured by enclosures (IP code)
 - EN 61373:1999 – Railway applications – Rolling stock equipment – Shock and vibrations tests
 - ISO 1431-1:2004 – Rubber, vulcanized or thermoplastic – Resistance to ozone cracking – Part 1: Static and dynamic strain testing
- Assembly drawings ([see appendix 1](#)):
- C-212678_DEUTSCH: Female socket, 3x caliber 20, 120 up to 240 mm², 3x M40
 - C-212679_DEUTSCH: Male mobile plug, 3x caliber 20, 120 up to 240 mm², 3x M40
 - C-212689_DEUTSCH: S/A female contact caliber 20 to be crimped, 120 up to 240 mm²
 - C-212919_DEUTSCH: S/A male contact caliber 20 to be crimped, 120 up to 240 mm²



1.3 SAMPLING

Sample No.	Reference	Quantity per sample	Description	Drawing
1 to 12	FXP2RS-3M40-S	1	FEMALE RECEPTACLE	C-212678_DEUTSCH
	FXP2PS-3M40-P	1	MALE PLUG	C-212679_DEUTSCH
	FXP-CS20-M240S-CU	3	FEMALE CONTACT	C-212689_DEUTSCH
	FXP-CS20-M240P-CU	3	MALE CONTACT	C-212919_DEUTSCH
	0401-0391AS	3	CABLE GLAND	/

The connectors under test are shown below:

FXP size2 - Straight female receptacle:



FXP size2 - Female contact for receptacle:

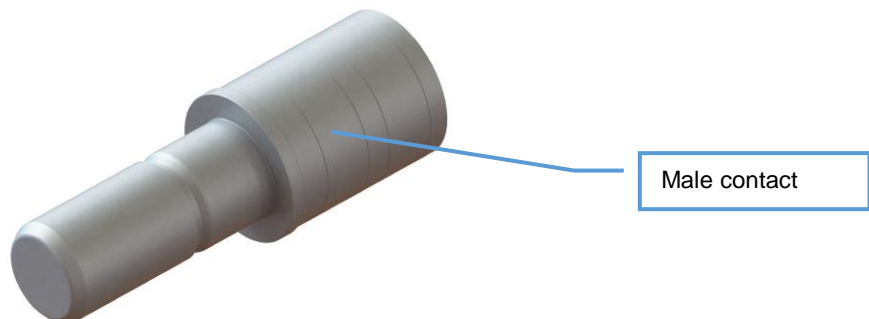




FXP size2 - Straight male plug:



FXP size2 - Female contact for plug:



The contacts are assembled in the insulators by clips.
The link between the male and female contacts is done with a diabolo (spring lamellas technology).
The cross section of termination chooses for the qualification is the big size (240 mm²).



1.4 TESTS SEQUENCE

The samples are submitted to the tests in the table here-after:

Group		Test description	EN 60512	EN 50467	Sample number
0	01	Visual & dimensional examination	1a,1b		2 to 12
	02	Conformity of marking	1a		2 to 12
	03	Contact resistance	2b		1, 5, 7 to 12
	04	Insulation resistance	3a		1 to 12
	05	Dielectric strength	4a		1 to 12
A	A1	Visual & dimensional examination	1a, 1b		1
	A3	Polarization	13e, 1a		
	A6	Contact retention in insert	15a, 1a		
	A8	Mechanical strength impact	7b, 1a		
B	B1	Initial measurement	2b		2 to 4
	B2	Mechanical operation	9a, 1a	7.9	
	B3	Final measurement	2b, 4a	7.12	
C	C1	Temperature rise	5a	7.8	5
D	D1	Initial measurement	2b		6
	D2	Cold	11j, 1a	6.18	
	D3	Dry heat	11i, 1a	6.18	
	D4	Salt mist test	11f, 1a	7.14	
	D5	Final measurement	2b		
	D6	Dielectric strength	4a	7.12	
E	E3	Degree of protection IP code		7.7	7 & 8
	E4	Dielectric strength	4a	7.12	
F	F1	Simulated long life random vibration at increased levels	2e, 1a	EN61373	9
	F2	Shock	1a	EN61373	
	F3	Random vibration test	2e, 1a	EN61373	
	F4	Dielectric strength	4a	7.12	
G	G1	Fluid resistance	19c		10 to 12
	G2	Engaging and separating force	13a		
	G3	Contact resistance	2b		
	G4	Insulation resistance	3a		
	G5	Dielectric strength	4a	7.12	
	G6	Contact retention in insert	15a		
	G7	Insert retention in housing (axial)	15b		
	G8	Visual examination	1a		
		Fire behavior of materials and components		6.22	
		Resistance to ozone		6.24	



1.5 SAMPLES IMPLEMENTATION

For each test, except particular conditions:

- Preconditioning of the samples at least 24 hours, at (23 ± 5) °C and at 45% to 75% of HR
- Samples are completely assembled according to manufacturer's specifications

Each sample for testing is composed of a pair of connectors: a plug and a receptacle, equipped of contacts and cable glands.



Products are prepared and wired according to the application specifications below:

- 114-157007: Implementation and wiring procedure of FXP2 range

The cable and crimping tools used are:

Cable section	Cable designation	CRIMPING TOOL			
		Pump	Cylinders	Flexible	Dies
240 mm ²	OMERIN 369 EN50382-2 3600V 1X240 F 120°C – 1701748 – 15/2017	PA133K	SU210K	F4622K	TN 240V20

1.6 SAMPLES WORKING ORDERS

WO No.	DESCRIPTION	CATALOGUE No.
200217499675	CONTACT FEMALE CAL. 20, 240MM2	FXP-CS20-M240S-CU
200217515802	CONTACT MALE CAL.20, 240MM2 - FXP	FXP-CS20-M240P-CU
200218548214 200218625025 200218642716	PLUG STRAIGHT 3XCAL 20 SIZE 2 - FXP	FXP2PS-3M40-P
200218548242 200218625027	RECEPTACLE STRAIGHT 3XCAL20 SIZE 2 - FXP	FXP2RS-3M40-S



1.7 TESTS DEVICES

Description	TE No.	Calibration dates	
		Current	Next
Caliper MITUTOYO	6131	2018/10	2019/10
Caliper MOORE & WRIGHT	5143	2018/10	2019/10
Height measuring instrument MAHR	5420	2018/06	2019/06
Buffer P/NP M40x1.5 – 6H	5504	2018/09	2020/09
Scale PCM BE6001	6689	2018/01	2019/01
Ohmmeter MEGGER DLRO600	6257	2018/10	2019/10
Insulation tester MEGGER BM25	2231	2017/11	2018/11
Traction / compression machine ADAMEL LHOMARGY DY36	1118	2017/04	2019/04
High voltage generator + SCHNEIDER ELECTRIC voltage control	6687	2017/04	2019/04
Comparator Mitutoyo	6626	2018/06	2019/06
Dynamometric key FACOM	7604	2017/11	2019/11
Datalogger AGILENT 34970A	1868	2018/05	2019/05
Current generator ZENONE model GI2000GL	7054	2018/05	2019/05
AC current probe CHAUVIN ARNOUX MA100	7570	2018/05	2019/05
Climatic chamber CLIMATS 220T60/4R	6500	2018/11	2019/11
Climatic chamber FRANCE ETUVES XU250	6019	2018/05	2019/05
Salt spray chamber DYCOMETAL type SSC-400	7574	2018/05	2019/05
Digital torque meter GEORGE RENAULT CD4005	1914	2018/04	2020/04
Flowmeter PUISI/COGETIL	7365	2017/05	2019/05
Discontinuity tester Mertronics DM600-10A	614-1	2019/01	2021/01
Vibration system ETS MPA714	SH1308329	2018/06	2020/06
VibPilot VP8 M+P International	B130054	2018/06	2020/06
Acc. Meter 50 Meas-specialities 7120A-0050	A117793	2018/07	2020/07
Thermostatic bath PRECISTERM	/	/	/
Thermometer HANNA	6831	2018/10	2019/10

2 CONCLUSION

General, Group 0 (non-normative)					Sample No.												Compliance
Test	Test description	Standard	Test ratings	Requirements	1	2	3	4	5	6	7	8	9	10	11	12	
01	Visual and dimensional examination	EN60512-1-1 EN60512-1-2	Customer drawing	Dimension shall comply with the drawings		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
02	Conformity of marking	EN50467, 6.2	Customer drawing	Supplier's name, manufacture date, sample reference and contact locating numbers		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
03	Contact resistance	EN60512-2-2	600 A	CR ≤ 0.15 mΩ	✓				✓		✓	✓	✓	✓	✓	✓	✓
04	Insulation resistance	EN60512-3-1	1000 V DC 60s	IR ≥ 5 000 MΩ	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
05	Dielectric strength	EN60512-4-1	12 kV / AC 50Hz	No breakdown nor flashover	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Mechanical tests, Group A (per EN 50467, tab. 5)					Sample No.												Compliance
Test	Test description	Standard	Test ratings	Requirements	1	2	3	4	5	6	7	8	9	10	11	12	
A1	Visual and dimensional examination	EN60512-1-1 EN60512-1-2	Customer drawing	Dimension shall comply with the drawings	✓												✓
A3	Polarization	EN60512-13-5	540 N	No damage likely to impair function	✓												✓
A6	Contact retention in insert	EN60512-15-1	170 N / 10 s	No axial displacement likely to impair normal operation	✓												✓
A8	Mechanical strength impact	EN 60512-7-2	Dropping Height: 500 mm	Parts used for protection against electric shock shall not be damaged. Reduction of clearance and creepage distances is not allowed	✓												✓

Service Life Tests, Group B (per EN 50467, tab. 6)					Sample No.												Compliance
Test	Test description	Standard	Test ratings	Requirements	1	2	3	4	5	6	7	8	9	10	11	12	
B1	Initial measurement	EN60512-2-2	600 A	CR initial, reference value		✓	✓	✓									✓
B2	Mechanical operation	EN60512-9-1	500 cycles	No damage shall occur which could impair normal use		✓	✓	✓									✓
B3	Final measurement	EN60512-2-2 EN60512-4-1	600 A 12 kV / AC 50 Hz	≤ CR initial + 50% No breakdown nor flashover		✓	✓	✓									✓

Thermal Tests, Group C (per EN 50467, tab. 7)					Sample No.												Compliance
Test	Test description	Standard	Test ratings	Requirements	1	2	3	4	5	6	7	8	9	10	11	12	
C1	Temperature rise	EN60512-5-1 EN50467, 7.8	50K 60K 100°C	The upper limiting temperature specified shall not be exceeded					✓								✓

Climatic Tests, Group D (per EN 50467, tab. 8)					Sample No.												Compliance
Test	Test description	Standard	Test ratings	Requirements	1	2	3	4	5	6	7	8	9	10	11	12	
D1	Initial measurement	EN60512-2-2	600 A	CR initial, reference value						✓							✓
D2	Cold	EN60512-11-10 EN50467, 6.18	-55°C / 2 h	No damage shall occur which could impair normal use						✓							✓
D3	Dry heat	EN60512-11-9 EN50467, 6.18	+100°C / 168 h	No damage shall occur which could impair normal use						✓							✓
D4	Salt mist test	EN60512-11-6 EN50467, 7.14	500 h	No damage shall occur which could impair normal use						✓							✓
D5	Final measurement	EN60512-2-2	600 A	≤ CR initial + 50%						✓							✓
D6	Dielectric strength	EN50467, 7.12 EN60512-4-1	12 kV / AC 50 Hz	No breakdown nor flashover						✓							✓

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Degree of Protection Tests, Group E (per EN 50467, tab. 9)					Sample No.												Compliance	
Test	Test description	Standard	Test ratings	Requirements	1	2	3	4	5	6	7	8	9	10	11	12		
E3	Degree of protection IP code	EN50467, 7.7	Dust test	IP6X							✓	✓					✓	
			Water jet test	IPX6								✓	✓					
			Immersion 1m / 30min	IPX7									✓	✓				
			-0.5 bar / 30min	IPX8									✓	✓				
E4	Dielectric strength	EN50467, 7.12 EN60512-4-1	12 kV / AC 50 Hz	No breakdown nor flashover							✓	✓					✓	

Vibrations and Shock Tests, Group F (per EN 50467, tab. 10)					Sample No.												Compliance
Test	Test description	Standard	Test ratings	Requirements	1	2	3	4	5	6	7	8	9	10	11	12	
F1	Simulated long life random vibration at increased levels	EN61373: 1999, clause 9	Cat.2 ≤ 1 μs	Micro interruption ≤ 1 μs No damage likely to impair function									✓				✓
F2	Shock	EN61373: 1999, clause 10	Cat.2	No damage likely to impair function									✓				✓
F3	Random vibration test	EN61373: 1999, clause 8	Cat.2 ≤ 1 μs	Micro interruption ≤ 1 μs No damage likely to impair function									✓				✓
F4	Dielectric strength	EN50467, 7.12 EN60512-4-1	12 kV / AC 50 Hz	No breakdown nor flashover									✓				✓

Resistance of Fluids, Group G (per EN 50467, tab. 11)					Sample No.												Compliance
Test	Test description	Standard	Test ratings	Requirements	1	2	3	4	5	6	7	8	9	10	11	12	
G1	Fluid resistance	EN60512-19-3	HCl: 23°C NaOH: 23°C IRM902 oil: 50°C Ageing: 65°C	No damage likely to impair function and maintain legible marking										✓	✓	✓	✓
G2	Engaging and separating force	EN60512-13-1	Insertion/extraction forces	No damage likely to impair function										✓	✓	✓	✓
G3	Contact resistance	EN60512-2-2	600 A	≤ CR initial + 50%										✓	✓	✓	✓
G4	Insulation resistance	EN60512-3-1	1000 V DC / 60 s	IR ≥ 500 MΩ										✓	✓	✓	✓
G5	Dielectric strength	EN50467, 7.12 EN60512-4-1	12 kV / AC 50 Hz	No breakdown nor flashover										✓	✓	✓	✓
G6	Contact retention in insert	EN60512-15-1	200 N / 10 s	Axial displacement after the test ≤ 0.5 mm										✓	✓	✓	✓
G7	Insert retention in housing	EN60512-15-2	360 N / 1 min	No displacement or damage likely to impair function										✓	✓	✓	✓
G8	Mated and unmated sample	EN60512-1-1	visual	No damage likely to impair function										✓	✓	✓	✓

Tests on raw materials (per EN 50467, tab. 13)				Sample No.												Compliance
Test description	Standard	Test ratings	Requirements													
Fire behaviour of materials and components	EN 45545-2	R22 / R23	HL2 mini	HL3												✓
Resistance to ozone	ISO 1431-1	Method B: 24h / 500 ppb / 40°C / elongation 20%	No cracks shall appear	✓												✓

- ✓ Test realized and compliant result
- ✗ Test realized and no compliant result

The FXP size 2 connector's, straight version, fully satisfy to the EN50467 requirements for on board rolling stock locations 4-5-6 (EN50467, table B.1).



3 APPENDICES

APPENDIX 1: Drawings	14
<i>C-211678_DEUTSCH: Female receptacle 3x caliber 20 to be crimped, 120 up to 240 mm², 3x M40</i>	14
<i>C-212679_DEUTSCH: Male plug 3x caliber 20 to be crimped, 120 up to 240 mm², 3x M40</i>	15
<i>C-212689_DEUTSCH: S/A female contact caliber 20 to be crimped, 120 up to 240 mm²</i>	16
<i>C-212919_DEUTSCH: S/A male contact caliber 20 to be crimped, 120 up to 240 mm²</i>	17



APPENDIX 1: Drawings

C-211678_DEUTSCH: Female receptacle 3x caliber 20 to be crimped, 120 up to 240 mm², 3x M40

COUPE A-A

(3x) M40x1.5-6H

φ60

φ51

φ48

22640.70

(4x) Ø6,5±0,15

φ66,60

φ5,50

(44420,50)

φ8,50

φ8,50

Project NR: PRJ-16-00098122

REV	DESCRIPTION	DATE	BY	CHK
A	Diffusion 33249			
B	Ny calibration des caractéristiques 33249			
C	Insulation 33249			

- () : cotes pour information / dimensions for information
- () : cotes de contrôle / inspection dimensions
- Instructions de mise en oeuvre à appliquer par le client
Customer instructions to be applied by the customer
- Spécification de packaging = 107-157006
Packaging spec = 107-157006
- Marquage laser :
TE + FXPRS-3M40-S + Année-Semaine
Laser marking :
TE + FXPRS-3M40-S + Year-Week
- Marquage laser :
Lignes de conducteurs (III, II, I)
Laser marking :
Conductor lines (III, II, I)
- Isolant compatible avec les contacts :
Contact femelle calibre 20 mm à sertir de 120 à 240mm²
(plan 2126899)
Insulator available for contacts :
Female contacts caliber 20mm to be crimped from 120 up to 240mm² (drawing 2126899)
- Lignes de conducteur repérées de moulage (III, II, I)
Conductor lines marking milled on insulator (III, II, I)
- Pion débrantage (rep.5) à monter par le client
Keying pin (item 5) to be mounted by the customer
- Logements pour pion de débrantage (rep.5)
Slots for keying pin (item.5)
- Borne de masse Ø6.5 pour reprise de masse par cosse.
Ground terminal Ø6.5, for earthing terminal lug
- Couple de verrouillage 10 ±1 Nm
Locking torque 10±1 Nm
- Référence de l'outil de démontage des contacts :
DUTEXT12751
Contact extraction tool reference: DUTEXT12751

Service voltage (V)	1500V	3000V	4000V
Over-voltage category	DV3	DV3	DV2
Pollution degree	PD3	PD3	PD3

REPERES	DESCRIPTION	UNITE	REMARQUE
1	Boîte	mm	
2	Carton	mm	
3	Plastique	mm	
4	Inox	mm	
5	FTMP 653	mm	
6	FTMP 874	mm	
7	Inox	mm	
8	FTMP 457	mm	
9	Aluminium	mm	

Observations	Remarks
	Protection Picking

12 Références de l'outil de démontage des contacts :
DUTEXT12751
Contact extraction tool reference: DUTEXT12751

13

Service voltage (V)	1500V	3000V	4000V
Over-voltage category	DV3	DV3	DV2
Pollution degree	PD3	PD3	PD3

14 Manuel client : 409-157000
Customer manual : 409-157000

15

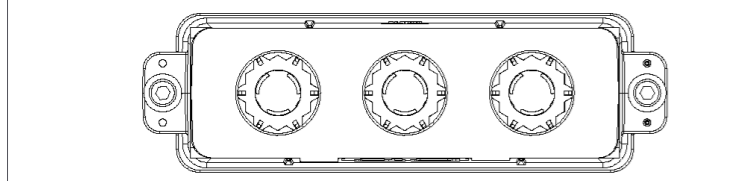
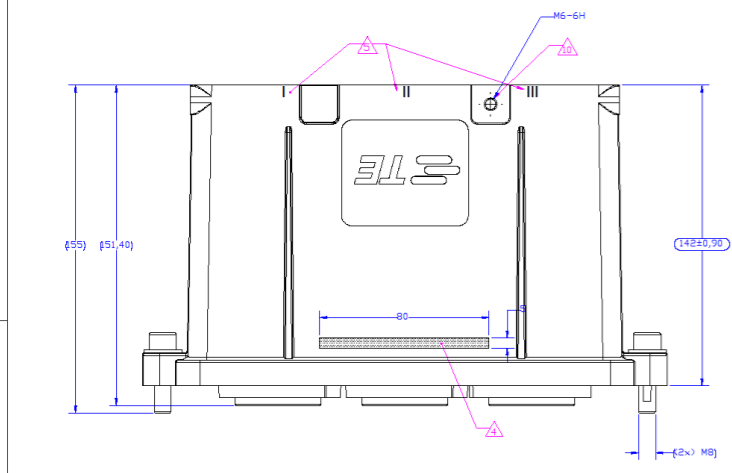
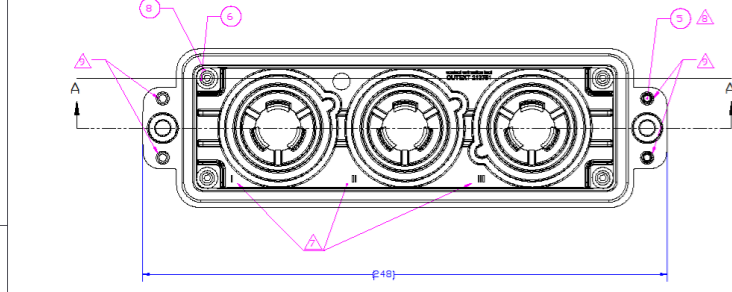
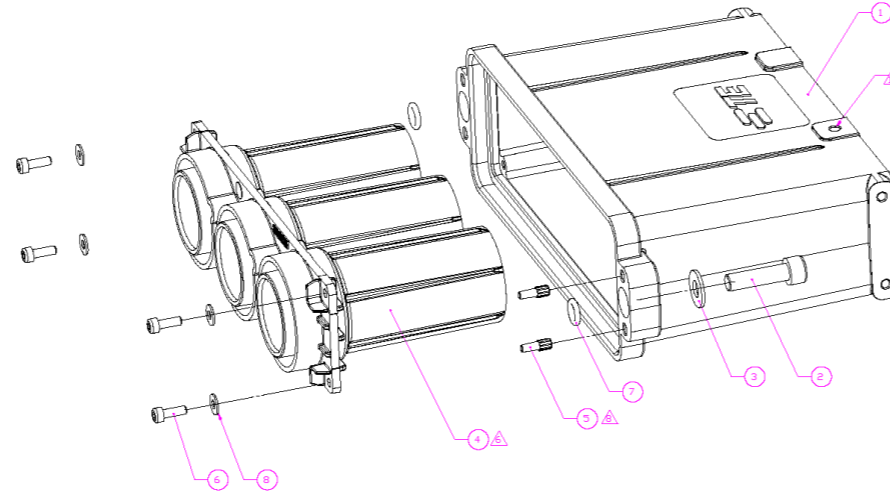
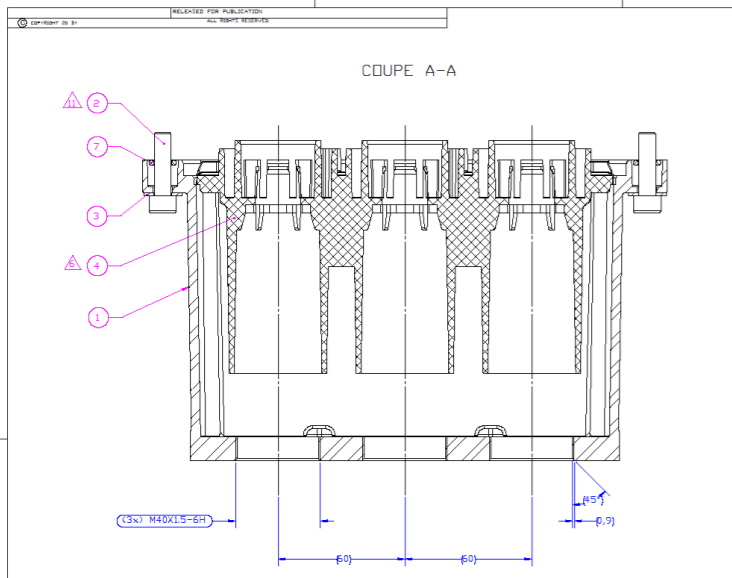
REPERES	DESCRIPTION	UNITE	REMARQUE
1	Boîte	mm	
2	Carton	mm	
3	Plastique	mm	
4	Inox	mm	
5	FTMP 653	mm	
6	FTMP 874	mm	
7	Inox	mm	
8	FTMP 457	mm	
9	Aluminium	mm	

Qualification Test Report

CLASS 1- Public



C-212679_DEUTSCH: Male plug 3x caliber 20 to be crimped, 120 up to 240 mm², 3x M40



QTY	DESCRIPTION	MATERIAL	WEIGHT (g)	UNIT	REF	ITEM
1	Boîte	Carton	9.00	1	Y00000-0206-0346AS	11
1	Sachet déshydratant	Carton	1.50	1	0206-0329AS	10
1	Sachet ZIP	Plastique	0.80	1	Y000000000-EMB030	9
4	Rondelle plate Ø4	Inox	0.38	4	MJ-04-1	8
2	Joint torique	Elastomère	0.16	2	0301-0111AS	7
2	Vis CHC M4x12	Inox	2.26	2	Y0000-CHCM4x12-IG	6
2	Pion	FTMP 653	0.21	2	YD-KA-210840A-0M00	5
2	Isolant mâle taille 2 pour 3 cal. 20	Polyamide	324.14	2	YK-KC-212682A-PN00	4
2	Male insulator size 2 for 3cal. 20	Polyamide	324.14	2	FTMP 457	4
2	Plain washer	Inox	2.56	2	MJ-08-1	3
2	Vis CHC	Inox	19.23	2	CHCM08x30-1	2
1	Corps de fiche droite taille 2	Aluminium	1193.93	1	YF-KC-212687A-JD7A	1
1	Straight plug shell size 2	Aluminium	1193.93	1	YF-KC-212687A-JD7A	1
	Designation	Matériau	Masse (g)	Nbr	Codification	Designation
	Designation	Material	Weight (g)	Dty	Part number	Designation

REVISIONS		DATE	BY	CHK
A	Diffusion 332491		inovevsi_JFG	MV
B	Suppression de marquage laser de l'isolant		inovevsi_JFG	MV
C	Suppression des caractéristiques BNF 33805		inovevsi_JFG	MV

- () : cotes pour information / dimensions for information
() : cotes de contrôle / inspection dimensions
- Instructions de mise en œuvre à appliquer par le client
Customer instructions to be applied by the customer
- Marquage laser :
TE + FXPPS-3M40-P + Année-Semaine
Laser marking
TE + FXPPS-3M40-P + Year-Week
- Marquage laser :
Lignes de conducteurs (I, II, III)
Conductor lines (I, II, III)
- Isolant compatible avec les contacts :
Contact mâle calibre 20 nm à sertir de 120 à 240mm²
(plan 212919)
Insulator available for contacts :
Male contacts caliber 20mm to be crimped from 120 up to 240mm²
(drawing 212919)
- Lignes de conducteur repérées de noulage (I, II, III)
Conductor lines marking holded on insulator (I, II, III)
- Pion détronpage (rep.5) à monter par le client
Keying pin (item 5) to be mounted by the customer
- Logements pour pion de détronpage (rep.5)
Slots for keying pin (item 5)
- Borne de masse, filetage M6, lg= 10 mm, pour reprise de masse par câble. Couple de serrage = 3,5 Nm suivant NF F61-021 tableau 2.
Ground terminal, M6 thread, lg= 10 mm for earthing terminal lug. Tightening torque = 3.5 Nm according to NF F61-021 table 2.
- Couple de verrouillage 10 ±1 Nm
Locking torque 10 ±1 Nm
- Specification de packaging : 107-157006
Packaging spec : 107-157006
- Référence de l'outil de démontage des contacts : DUTEXT212751
Contact extraction tool reference: DUTEXT212751
- Kit tôles de bridage pour fiche disponible, à commander séparément; ref. con. : FXP-B32 suivant plan C-212988
Frames kit available for plug available, to order separately; con. ref. : FXP-B32 according to C-212988

Service voltage according to EN50124-1/A2:2005	
Service voltage (V)	1500V 3000V 4000V
Over-voltage category	DV3 DV3 DV2 DV3
Pollution degree	PD3 PD3 PD3 PD3

REPERES	DESCRIPTION	REPERES	DESCRIPTION
1	Boîte	1	Boîte
2	Sachet déshydratant	2	Sachet déshydratant
3	Sachet ZIP	3	Sachet ZIP
4	Rondelle plate Ø4	4	Rondelle plate Ø4
5	Joint torique	5	Joint torique
6	Vis CHC M4x12	6	Vis CHC M4x12
7	Pion	7	Pion
8	Isolant mâle taille 2 pour 3 cal. 20	8	Isolant mâle taille 2 pour 3 cal. 20
9	Male insulator size 2 for 3cal. 20	9	Male insulator size 2 for 3cal. 20
10	Plain washer	10	Plain washer
11	Vis CHC	11	Vis CHC
12	Corps de fiche droite taille 2	12	Corps de fiche droite taille 2
13	Straight plug shell size 2	13	Straight plug shell size 2

Reference commerciale / Commercial reference : FXPPS-3M40-P

Part No: TE-NC-88879A-000

THIS DRAWING IS A CONTROLLED DOCUMENT

REV. 01

DATE: 2017-07-07

TE Connectivity

Part No: TE-NC-88879A-000

Part No: TE-NC-88879A-000

Part No: TE-NC-88879A-000



C-212689_DEUTSCH: S/A female contact caliber 20 to be crimped, 120 up to 240 mm²

COUPE A-A
ECHELLE 1 : 1

Project NR				REVISIONS			
PRJ-16-000908122							
F	LR	DESCRIPTION	DATE	SVN	APVS		
	A	Suppression des ref. tatton, creation des ref. cuivre Diffusion 332491	26JUL2017	JFG	MV		

1 () : cotes pour information / dimensions for information
 1 : cotes de controle / inspection dimensions

2 Specification de packaging : 107-157006
 Packaging spec : 107-157006

3

Sections du cable Cable cross sections	Dutis de sertissage hydrauliques (Mécattraction) Hydraulic crimping tools			
	Pompe Pump	Vérins Jacks	Flexibles Flex hoses	Matrices Dies
120 mm ²	PA 133 K	SUI33K ou SUE10K Chape ouverte/ Opened shell ou / or VF133K ou VF210K Chape fermée/ Closed shell	F 4622K Longueur/Length 1,80 m	TN120V13 TN120V20 (1 crimping)
150 mm ²			TN150V13 TN150V20 (1 crimping)	
185 mm ²			F 4623K Longueur/Length 3,00 m	TN185V20 (1 crimping)
240 mm ²				TN240V20 (2 crimping)

4 Longueur de dénudage de la gaine du câble = L2+1mm
 Cable stripping length = L2+1mm

5 Zone de sertissage
 Mandatory crimping area

6 Repérage de la position du sertissage sur la pièce
 référencée YC-KC-212689A-CD1A
 Marking position for crimping on the part referenced
 YC-KC-212689A-CD1A

7 Repérage pour la position du sertissage sur les
 pièces référencées YC-KC-212689B/C/D-CD1A
 Marking position for the crimping on the contacts
 referenced YC-KC-212689B/C/D-CD1A

8 Dutil de démontage des contacts : DUTEXT 212751A
 Contact disassembly tool reference: DUTEXT 212751A

9 Manuel client: 409-157000
 Customer manual: 409-157000

-	-	-	-	1	1	0206-0329AS	Sachet déshydratant Deshydrating bag	4	X	X	X	X							
-	-	-	Plastique Plastic	1	1	Y0000000000-EMB040	Sachet bulle 80 x 100 mm Bubble bag 80 x 100 mm	3	X	X	X	X							
-	Argenture Silver plating	-	Cuivre béryllium Beryllium copper	2,4	1	16866-000A4	Diabolo calibre 20 Diabolo caliber 20	2	X	X	X	X							
-	Argenture Silver plating	FMME2005	Cuivre Copper	105,03	1	YC-KC-212690D-CD1A	Contact femelle cal.20, section 120 mm ² Female contact cal.20, section 120mm ²	1											X
-	Argenture Silver plating	FMME2005	Cuivre Copper	112,13	1	YC-KC-212690C-CD1A	Contact femelle cal.20, section 150 mm ² Female contact cal.20, section 150 mm ²	1					X						
-	Argenture Silver plating	FMME2005	Cuivre Copper	120,81	1	YC-KC-212690B-CD1A	Contact femelle cal.20, section 185 mm ² Female contact cal.20, section 185 mm ²	1		X									
-	Argenture Silver plating	FMME2005	Cuivre Copper	151,75	1	YC-KC-212690A-CD1A	Contact femelle cal.20, section 240 mm ² Female contact cal.20, section 240 mm ²	1	X										

Observations Remarks	Protection Plating	Fiche matière Data sheet	Matériau Material	Masse (g) Weight (g)	Nbr Qty	Codification Part number	Désignation Designation	REP Item

Commercial references	Cross-section (mm ²)	Dimensions (mm)					Weight (g)
		L1	L2	L3	D1	D2	
FXP-CS20-M240S-CU	240	62.9	33	/	29	23	158.33
FXP-CS20-M185S-CU	185	55.9	26	16	26	20.5	133.06
FXP-CS20-M150S-CU	150	55.9	26	15	23	18	123.98
FXP-CS20-M120S-CU	120	54.9	25	15	21	16.5	116.55

Référence commerciale / Commercial reference : Voir nomenclature / See bill of material

THIS DRAWING IS A CONTROLLED DOCUMENT.		Rev: JFGALIPAUD 26JUL2017	TE Connectivity	
DIMENSIONS		Rev: M BONNIN 26JUL2017	PART NO	
TOLERANCES UNLESS OTHERWISE SPECIFIED		Rev: R VIMARD 26JUL2017		
0 PLC	++	NAME	S/E contact femelle cal.20 à sertir 120 à 240 mm ²	
1 PLC	++	PRODUCT SPEC	S/A Female contact cal.20 to be crimped, 120 up to 240 mm ²	
2 PLC	++	APPLICATION SPEC		
3 PLC	++	SIZE	A2	
4 PLC	++	WEIGHT	149,58 g	
ANGLES	++	SCALE	2:1	
MATERIAL		CUSTOMER DRAWING	SHEET 1 of 1	
FINISH		RESTRICTED TO	REV A	

Qualification Test Report

5375 (08/13)
501-157008

CLASS 1- Public

C-212919_DEUTSCH: S/A male contact caliber 20 to be crimped, 120 up to 240 mm²

COUPE A-A

Project NR		REVISIONS			
LTN	DESCRIPTION	DATE	BY	APPV	
A	Suppression des ref. taillon, création des ref. cuivre Diffusion 332421	16NOV2017	JFG	MV	

1 () : cotes pour information / dimensions for information
: cotes de controle / inspection dimensions

2 Manuel client : 409-157000
Customer manual: 409157000

Sections du câble Cable cross sections	Dutils de sertissage hydrauliques (Métrocontraction) Hydraulic crimping tools			
	Pompe Pump	Vérins Jacks	Flexibles Flex hoses	Matrices Dies
120 mm ²	PA 133 K	SUI33K ou SUE10K Chape ouverte/ Open shell ou / or VF133K ou VF210K Chape fermée/ Closed shell	F 4622K Longueur/Length 1,80 n ou / or F 4623K Longueur/Length 3,00 n	TN120V13 TN120V20 (1 crimping)
150 mm ²				TN150V13 TN150V20 (1 crimping)
185 mm ²				TN185V20 (1 crimping)
240 mm ²				TN240V20 (2 crimping)

4 Longueur de dénudage de la gaine du câble = L2+1mm
Cable stripping length = L2+1mm

5 Zone de sertissage
Mandatory crimping area

6 Repérage pour la position du sertissage pièce référencée FXP-CS20-M240P-CU
Marking position for crimping on the part referenced FXP-CS20-M240P-CU

7 Repérage pour la position du sertissage sur les pièces référencées FXP-CS20-M120/150/185P-CU
Marking position for crimping on the parts referenced FXP-CS20-M120/150/185P-CU

8 Dutil de démontage des contacts : DUTEXT 212751A
Contact disassembly tool reference: DUTEXT 212751A

9 Specification de packaging : 107-157006
Packaging spec : 107-157006

Observations Remarks	Protection Plating	Fiche matière Data sheet	Matière Material	Masse (g) Weight (g)	Nbr Qty	Codification Part number	Désignation Designation	REP Item
-	-	-	-	1	1	0206-0329AS	Sachet déshydratant Dehydrating bag	3
-	-	-	Plastique Plastic	1	1	Y0000000000-EMB041	Sachet bulle Bubble bag	2
-	Argenture Silver plating	FMME 2005	Cuivre Copper	179,18	1	YC-KC-212681D-CD1A	Contact mâle cal. 20 à sertir, 120 mm ² Male contact cal. 20 to be crimped, 120 mm ²	1
-	Argenture Silver plating	FMME 2005	Cuivre Copper	186,92	1	YC-KC-212681C-CD1A	Contact mâle cal. 20 à sertir, 150 mm ² Male contact cal. 20 to be crimped, 150 mm ²	1
-	Argenture Silver plating	FMME 2005	Cuivre Copper	196,51	1	YC-KC-212681B-CD1A	Contact mâle cal. 20 à sertir, 185 mm ² Male contact cal. 20 to be crimped, 185 mm ²	1
-	Argenture Silver plating	FMME 2005	Cuivre Copper	229,19	1	YC-KC-212681A-CD1A	Contact mâle cal. 20 à sertir, 240 mm ² Male contact cal. 20 to be crimped, 240 mm ²	1

Commercial references	Cross-section (mm ²)	Dimensions (mm)					Weight (g)
		L1	L2	L3	D1	D2	
FXP-CS20-M240P-CU	240	86	33	/	29	23	231.19
FXP-CS20-M185P-CU	185	77.5	26	16	26	20.5	198.53
FXP-CS20-M150P-CU	150	77.5	26	15	23	18	188.94
FXP-CS20-M120P-CU	120	76.5	25	15	21	16.5	181.21

Référence commerciale / Commercial reference : FXP-CS20-M240P-CU

THIS DRAWING IS A CONTROLLED DOCUMENT.		26JUL2017 JF GALIPAUD 26JUL2017 M BONNIN 26JUL2017 M VIMARD	S/E Contact mâle cal. 20 à sertir de 120 à 240 mm ² S/A male contact cal. 20 to be crimped, 120 up to 240 mm ²
DIMENSIONS mm 	TOLERANCES UNLESS OTHERWISE SPECIFIED 0 PLC .. 1 PLC .. 2 PLC .. 3 PLC .. 4 SPC .. 5 FILED ..	NAME PRODUCT SPEC 108-157009 APPLICATION SPEC 114-157007 WEIGHT 230.69 g CUSTOMER DRAWING	PART NO TE Connectivity SIZE A2 CAGE CODE DRAWING NO C-212919 RESTRICTED TO SCALE 1:1 SHEET 1 of 1 REV A