

CTR 1129
July 17, 2020
Commscope.com

Customer Test Report on SEC 100 outdoor aerial wall

terminal box

This test report details the results of mechanical and environmental tests carried out on (Product name).

Testing is done according to:

Specifications

RUD 5580 A: TS for SEC 100 outdoor aerial wall terminal box

An overview table gives summarized results. Detailed test results and sample descriptions are described further in this document.

Conclusions

All performed tests were done according to the above-mentioned specifications and were completed with positive results

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1 Test results overview

Detailed results are given in sections 2, 3 and 4
 Section 2: sealing performance results
 Section 3: optical performance results
 Section 4: polymeric material performance results
 Section 5: storage and transportation

1.1 Overview sealing performance results

Test Details	Test Name	Number of samples	Result
2.01	Protection against ingress of dust IP 5x	Clip 3 Closure with low cover 1 Closure with high cover 1	Pass
2.02	Protection against water ingress IPx5	Clip 26 Closure with low cover 3 Closure with high cover 3	Pass
2.03	Visual Examination	All samples	Pass
2.04	Assembly / Disassembly	Clip 9 Closure with low cover 3 Closure with high cover 3	Pass
2.05	Cable retention Wall terminal	Closure with low cover 3 Closure with high cover 3	Pass
2.06	Cable retention Cable clip	Clip 3	Pass
2.07	Cable bending	2	Pass
2.08	Cable torsion	2	Pass
2.09	Impact	Clip 3 Closure with low cover 3 Closure with high cover 3	Pass
2.10	Vibration	Clip 2	Pass
2.11	Change of Temperature	Clip 3 Closure with low cover 3 Closure with high cover 3	Pass
2.12	Salt Mist	Clip 3 Closure with low cover 1 Closure with high cover 1	Pass

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1.2 Overview optical performance results

Test Details	Test Name	Number of samples	Result
3.01	Change in attenuation	All samples	Pass
3.02	Transient loss (and residual loss)	All samples	Pass
3.03	Visual Examination	All samples	Pass
3.04	Cable retention	2	Pass
3.05	Cable bending	2	Pass
3.06	Cable torsion	2	Pass
3.07	Reconfiguration 1	2	Pass
3.08	Reconfiguration 2	2	Pass
3.09	Shock	2	Pass
3.10	Vibration	2	Pass
3.11	Change of temperature	2	Pass

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1.3 Overview polymeric material performance results

Test Details	Test Name	Number of samples	Result
4.01	Chemical resistance to solvents and contaminating fluids.	All materials	Pass
4.02	UV resistance of outer polymeric materials	All materials	Pass
4.03	Fungus resistance (Mould growth) ISO 846	All materials	Pass

1.4 Overview storage and transportation results

Test Details	Test Name	Number of samples	Result
5.01	Cold	3	Pass
5.02	Dry heat	3	Pass
5.03	Damp heat (steady state)	3	Pass

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2 Detailed test results for sealing performance

2.1 Protection against ingress of dust IP 5x

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions		Requirements
Protection against ingress of dust IP 5x IEC 60529	Dust type:	Talcum powder	Ingress of dust should not cause functional problem like preventing access to or handling of fibers and components.
	Dust density:	2 kg/m ³	
	Pressure:	No pressure differences	
	Duration:	8 hrs	

Results

Number of samples:	3	Pass	clip
Number of samples:	1	Pass	Closure with low cover
Number of samples:	1	Pass	Closure with high cover

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2.2 Protection against water ingress IPx5

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Protection against ingress of water IP x5 IEC 60529	Spray medium: Tap water at ambient temperature Internal Ø nozzle: 6.3 mm Flow rate: 12.5 l/minute ± 5% Water pressure: Adjusted to get specified flow rate Core of water stream: Diameter 40 mm at 2.5 m distance. Distance nozzle/sample: Between 2.5 m and 3 m Sample position : Vertical wall mounted, 1.5 meters above ground, cables below. Locations : All practicable accessible sides Duration: 1 minute / m ² of the wall box surface, but in total at least 3 minutes	Water sprays against the box from any practicable direction shall not cause water ingress exceeding 1% of the inner volume of the box

Results

Number of samples:	17	Pass	Clip
Number of samples:	9	Pass	Clip
Number of samples:	3	Pass	Closure with low cover
Number of samples:	3	Pass	Closure with high cover

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2.3 Visual Examination

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions		Requirements
Visual examination IEC 61300-3-1	Examination of product with naked eye.	Inspection with the naked eye for flaws, defects, cracks, signs of corrosion or impurities that could impair functionality.	No defects which would adversely affect product performance

Results

Number of samples:	17	Pass	clip
Number of samples:	12	Pass	clip
Number of samples:	All Samples	Pass	Closure with low cover
Number of samples:	All Samples	Pass	Closure with high cover

2.4 Assembly / Disassembly

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions		Requirements
Assembly/ Disassembly IEC 61300-2-33	Number re-entries: Aging between each re-entry: Temperature cycle: Dwell time: Transition:	5 times one temperature cycle -40°C/+65°C 4 hrs 1 °C/minute	Visual examination Protection against ingress of dust (IP 5x) Protection against ingress of water (IP x5)

Results

Number of samples:	9	Pass	clip
Number of samples:	3	Pass	Closure with low cover
Number of samples:	3	Pass	Closure with high cover

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2.5 Cable retention Wall terminal

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Cable retention Wall Terminal Box IEC 61300-2-4	Test temperature: (-15 ± 2)°C and (+45 ± 2)°C Force: Ø cable (mm) x 10N for feeder cables Rate: 25 N for drop cables Duration: Load smoothly applied in 15 sec Feeder cable: 1 h Drop cable: 1 minute	Visual examination Protection against ingress of dust (IP 5x) Protection against ingress of water (IP x5)

Results

Number of samples:	3	Pass	Closure with low cover / drop cables
Number of samples:	3	Pass	Closure with high cover / main cable

2.6 Cable retention Cable clip

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Cable retention Cable Clip IEC 61300-2-4	Test temperature: (-15 ± 2)°C and (+45 ± 2)°C Force: 25 N Rate: 0-full load in 15 sec Duration: Feeder cable: 1 h Drop cable: 1 minute	Visual examination Protection against ingress of dust (IP 5x) Protection against ingress of water (IP x5)

Results

Number of samples:	3	Pass
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2.7 Cable bending

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Cable bending (only drop cables) IEC 61300-2-37	Test temperatures: (-15 ± 2)°C and (+45 ± 2)°C Bending angle: -30° and +30° Duration at each extreme position: 5 minutes Point of application: 400 mm from end of cable seal Number of cycles: 5 cycles per cable and per test temperature	Visual examination Protection against ingress of dust (IP 5x) Protection against ingress of water (IP x5)

Results

Number of samples:	2	Pass
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Not applicable for clip

2.8 Cable torsion

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Cable torsion (only drop cables) IEC 61300-2-5	Test temperature: (-15 ± 2)°C and (+45 ± 2)°C Torsion angle: -90° and +90° Point of application: 400 mm from end of cable seal Duration at each extreme position: 5 minutes Tensile load: None Number of cycles: 5 per cable and per test temperature	Visual examination Protection against ingress of dust (IP 5x) Protection against ingress of water (IP x5)

Results

Number of samples:	2	Pass
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Not applicable for clip

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2.9 Impact

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Impact IEC 61300-2-12 Method B	Test temperature: (-15 ± 2)°C and (+45 ± 2)°C Impact tool: Steel ball Mass: 0.5 kg Drop height: 0.2 meter Location: In the middle on front side Number of impacts: 1	Visual examination Protection against ingress of dust (IP 5x) Protection against ingress of water (IP x5)

Results

Number of samples:	3	Pass	clip
Number of samples:	3	Pass	Closure with low cover
Number of samples:	3	Pass	Closure with high cover

2.10 Vibration

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Vibration IEC 61300-2-1	Frequency: 10 Hz Cycle: Sinusoidal Amplitude: 3 mm Cable clamping: 500 mm from end of base Duration: 28 h or 1 000 000 cycles	Visual examination Protection against ingress of dust (IP 5x) Protection against ingress of water (IP x5)

Results

Number of samples:	2	Pass	clip
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2.11 Change of Temperature

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Change of temperature IEC 61300-2-22	Lowest temperature: $(-40 \pm 2)^{\circ}\text{C}$ Highest temperature: $(+65 \pm 2)^{\circ}\text{C}$ Dwell time: 4 hr Transition: $1^{\circ}\text{C}/\text{minute}$ Number of cycles: 12	Visual examination Protection against ingress of dust (IP 5x) Protection against ingress of water (IP x5)

Results

Number of samples:	3	Pass	clip
Number of samples:	3	Pass	Closure with low cover
Number of samples:	3	Pass	Closure with high cover

2.12 Salt Mist

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Salt mist IEC 61300-2-26	Temperature: $(+35 \pm 2)^{\circ}\text{C}$ Salt solution: 5 % NaCl (pH 6,5-7,2) Duration: 5 days Test sample: Closed box	Visual appearance: no corrosion of metal parts, color change due to passivation is allowed.

Results

Number of samples:	3	Pass	clip
Number of samples:	1	Pass	Closure with low cover
Number of samples:	1	Pass	Closure with high cover

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3 Detailed test results optical

3.1 Change in attenuation

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Change in attenuation (for climatic test) IEC 61300-3-3	Source wavelength: 1310 nm , 1550 nm and 1625 nm Sampling period: At least every 10 minutes	For each incoming fiber (Note 1): Splice only: $\delta \leq 0.2$ dB during test $\delta \leq 0.1$ dB after test Splice and patch (1 connection): $\delta \leq 0.3$ dB during test $\delta \leq 0.2$ dB after test

Results

Number of samples:	All samples	Pass
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3.2 Transient loss (and residual loss)

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Transient loss (for mechanical tests) IEC 61300-3-28	Source wavelength: 1550 nm and 1625 nm Sampling period: < 1 ms	For each circuit with live incoming fibers (Note 2): $\delta \leq 0.5$ dB during test $\delta \leq 0.2$ dB after test

Results

Number of samples:	All samples	Pass
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3.3 Visual Examination

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions		Requirements
Visual examination IEC 61300-3-1	Examination of product with naked eye.	Inspection with the naked eye for flaws, defects, cracks or impurities that could impair functionality.	No defects which would adversely affect product performance or functionality

Results

Number of samples:	All samples	Pass
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3.4 Cable retention

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions		Requirements
Cable retention IEC 61300-2-4	Test temperature: Force: Rate: Duration:	(+23 ± 5)°C Ø cable (mm) x 10N for feeder cable 0-full load in 15 sec 10 minutes	Visual examination Transient loss

Results

Number of samples:	2	1 main cable	Pass
		2 drop cables	Pass

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3.5 Cable bending

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Cable bending (only drop cables) IEC 61300-2-37	Test temperature: (+23 ± 5)°C Bending angle: -30° and +30° Duration at each extreme position: 5 minutes Point of application: 400 mm from end of cable seal Number of cycles: 5 cycles per cable and per test temperature	Visual examination Transient loss

Results

Number of samples:	2	Pass
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3.6 Reconfiguration 1

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Cable torsion (only drop cables) IEC 61300-2-5	Test temperature: (+23 ± 5)°C Torsion angle: - 90° and +90° Point of application: 400 mm from end of cable seal Duration at each extreme position: 5 minutes Tensile load: None Number of cycles: 5 per cable and per test temperature	Visual examination Transient loss

Results

Number of samples:	2	Pass
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3.7 Reconfiguration 2

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Reconfiguration 1 IEC 61300-2-33	Open box and get access to fiber management system Hinge all trays 100 x between extreme positions Secure fiber management system and close box	Visual examination Transient loss
		Reconfiguration 1 IEC 61300-2-33

Results

Number of samples:	2	Pass
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3.8 Shock 2

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Reconfiguration 2 IEC 61300-2-33	Following handling operations are done: Open box and get access to fiber management system Add new drop cable and splice/connect it. Secure fiber management system and close box	Transient loss <u>after test</u> in active circuit Reconfiguration 2 IEC 61300-2-33

Results

Number of samples:	2	Pass
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3.9 Vibration

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Shock IEC 61300-2-9	Wave form: Acceleration: Duration: Number of shocks: Axes:	Half sine 150 m/s ² 11 milliseconds In total 18 shocks. 3 shocks per axis and per direction of the axis. 3 mutually perpendicular

Results

Number of samples:	2	Pass
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3.10 Change of temperature

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Vibration IEC 61300-2-1	Sweep range: 5-500 Hz Freq. change: 1 octave/minute Crossover freq.: 9 Hz - below 9 Hz: Amplitude 3.5 mm - above 9 Hz: 10 m/s ² (~ 1 g) Axes: 3 mutually perpendicular Duration: 10 cycles/axis	Visual examination Transient loss

Results

Number of samples:	2	Pass
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3.11 Vibration

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	May 2020

Test & Standard ref.	Method & conditions	Requirements
Change of temperature IEC 61300-2-22	Lowest temperature: (-40 ± 2)°C Highest temperature: (+65 ± 2)°C Dwell time: 4 hrs Transition: 1°C/minute Number of cycles: 12	Visual examination Change in attenuation for climatic test

Results

Number of samples:	2	Pass
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4 Detailed materials test results

4.1 Chemical resistance to solvents and contaminating fluids.

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	April 2019

Test & Standard ref.	Method & conditions	Requirements
Resistance to solvents and contaminating fluids IEC 61300-2-34	Test temperature: (+23 ± 5)°C Media: pH2 (HCl) pH12 (NaOH) Test time: 5 days	Visual examination No swelling, no cracking of polymer materials

Results

Number of samples:	All materials	Pass
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4.2 UV resistance of outer polymeric materials

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	April 2019

Test & Standard ref.	Method & conditions	Requirements
UV resistance of outer polymeric materials ISO 4892-3	UV source: Lamp type 1A Fluorescent lamps (UVA 340 nm) Exposure cycles: - UV: - Condensation: Exposure time: Cycle 1: Alternating UV and condensation cycle 8 h at (+60 ± 3)°C, light 4 h at (+50 ± 3)°C; dark Minimum 2160 h	Visual examination Reduction in mechanical properties (tensile strength and elongation at yield) not more than 20%

Results

Number of samples:	All materials	Pass
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4.3 Chemical resistance to solvents and contaminating fluids.

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	April 2019

Test & Standard ref.	Method & conditions	Requirements
Fungus resistance (Mould growth) ISO 846 or IEC 60068-2-10	Strains: As specified in IEC 60068-2-10 Test J Inoculation conditions: Temperature: (29 ± 1)°C Relative humidity: > 90% Time: 28 days	Visual examination: No support of fungus growth A minor change in color is allowed after cleaning the test samples The average of the visual rating for 5 samples shall be less than 1. Reduction in mechanical properties (tensile strength and elongation at yield) not more than 20%

Results

Number of samples:	All materials	Pass
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5 Detailed Storage and transportation test results

5.1 Cold

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	April 2020

Test & Standard ref.	Method & conditions	Requirements
Cold IEC 61300-2-17	Temperature: (-40 ± 2)°C Duration: 96 hrs	Visual examination No defects which would adversely affect product performance or functionality after installation

Results

Number of samples:	3	Pass	Clip
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5.2 Dry heat

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	April 2020

Test & Standard ref.	Method & conditions	Requirements
Dry heat IEC 61300-2-18	Temperature: (+70 ± 2)°C Humidity: Uncontrolled Duration: 96 hrs	Visual examination No defects which would adversely affect product performance or functionality after installation

Results

Number of samples:	3	Pass	Clip
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5.3 Damp heat (steady state)

General

Product	SEC 100 outdoor aerial wall terminal box
Date of testing	April 2020

Test & Standard ref.	Method & conditions	Requirements
Damp heat (steady state) IEC 61300-2-19	Temperature: (+40 ± 2)°C Humidity: (93 ± 3)%RH Duration: 96 hrs	Visual examination No defects which would adversely affect product performance or functionality after installation

Results

Number of samples:	3	Pass	Clip
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6 Test sample description

6.1 Sealing performance test samples

- The test samples are installed according to the CommScope installation instruction.



Product with LOW cover
760243419 SEC4-A5A1B1BA000 (low cover – 1 splice tray))



Product with HIGH cover
760245504 SEC4-A5A1D1BA000 (high cover - 3 splice trays)

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MAIN CABLE:

760248049 C-024-RD-8F-M24BK-08D Commscope Retractable Façade Cable
 Outer Diameter 9.2 mm / 24 Fibers G657.A1 / LSZH jacket

DROP CABLE:

1452138 REALFLEX5, 5MM INDOOR/OUTDOOR FLEXIBLE D CABLE
 Outer Diameter 5.2 mm / 1 Fiber G657.A2

Clip



In stalled on standard CS façade cable dia. 9 mm (length ± 50 cm)

760248049 C-024-RD-8F-M24BK-08D
 CommScope Retractable Façade Cable
 Outer Diameter 9 mm / 24 Fibers G657.A1 / LSZH jacket

6.2 Optical performance test samples

3 samples :

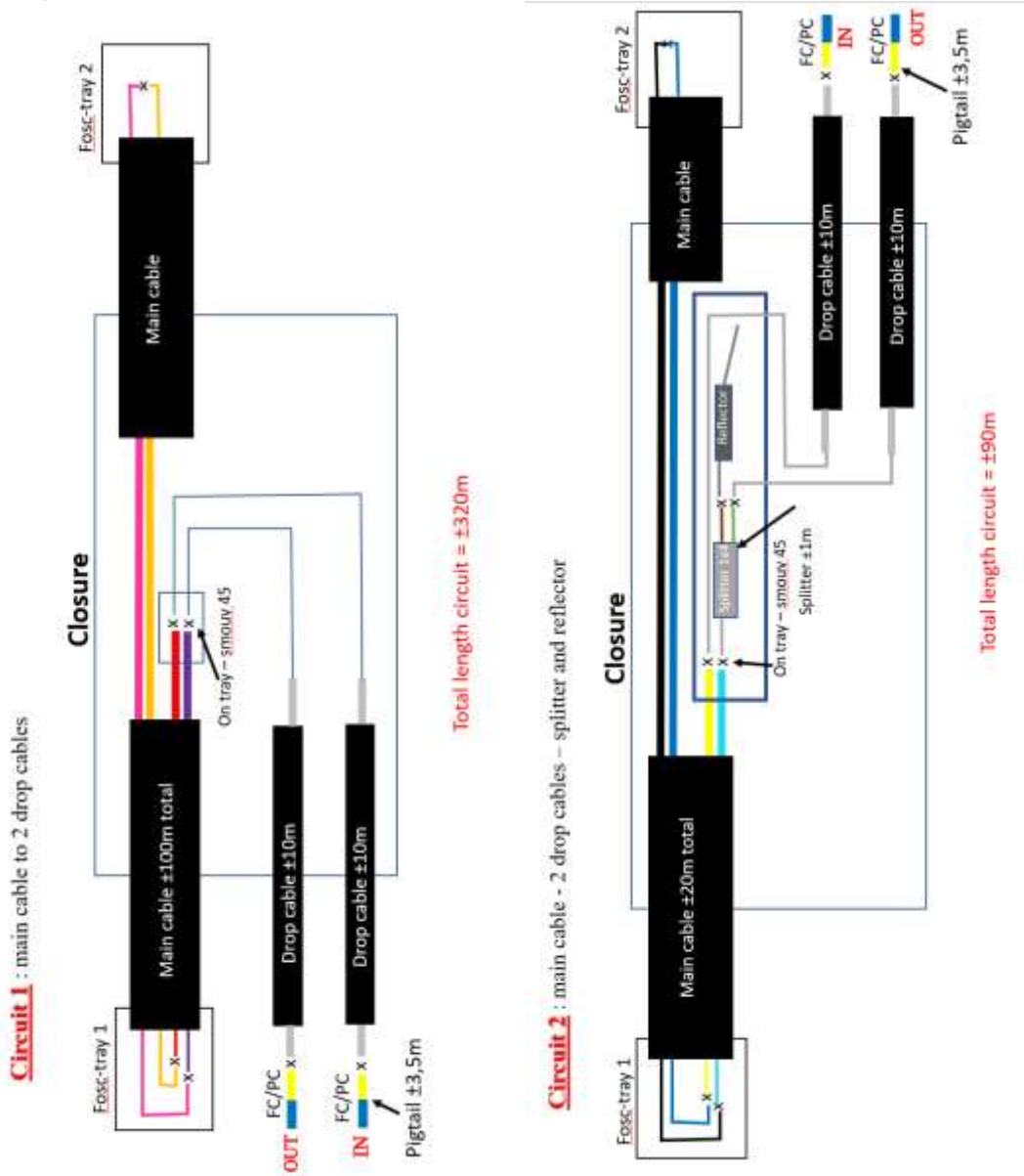
- Sample 1 with low cover + clip / 4 drop cables and splitter
- Sample 2 with high cover and track joint
- Sample 3 with low cover + 2 drop cables and 100m cable

Used cables

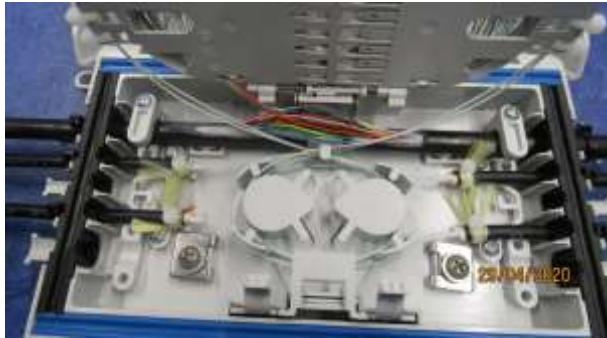
Main cable : COMMSCOPE GB 24 XG.657.A1 RETRACTABLE
 Drop cable : COMMSCOPE GB 2018 1F.O. 10.D-7 A2 EXT TELEFONICA

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Splice and routing scheme:
 Sample 1

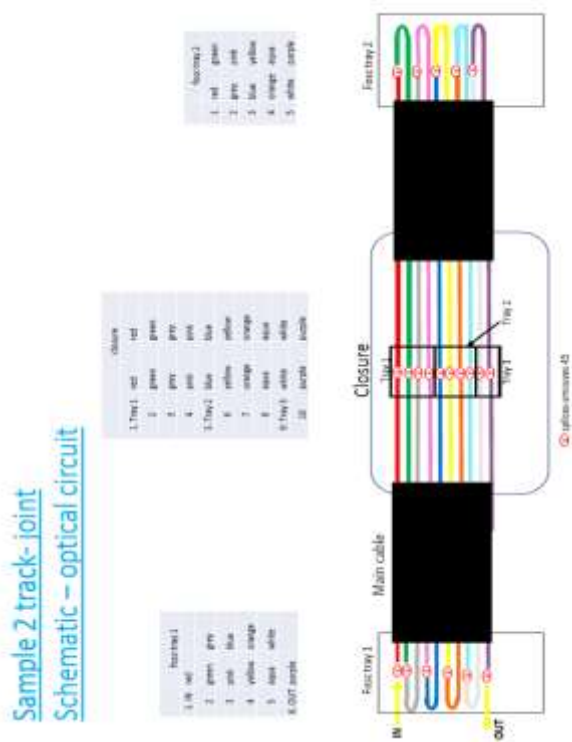


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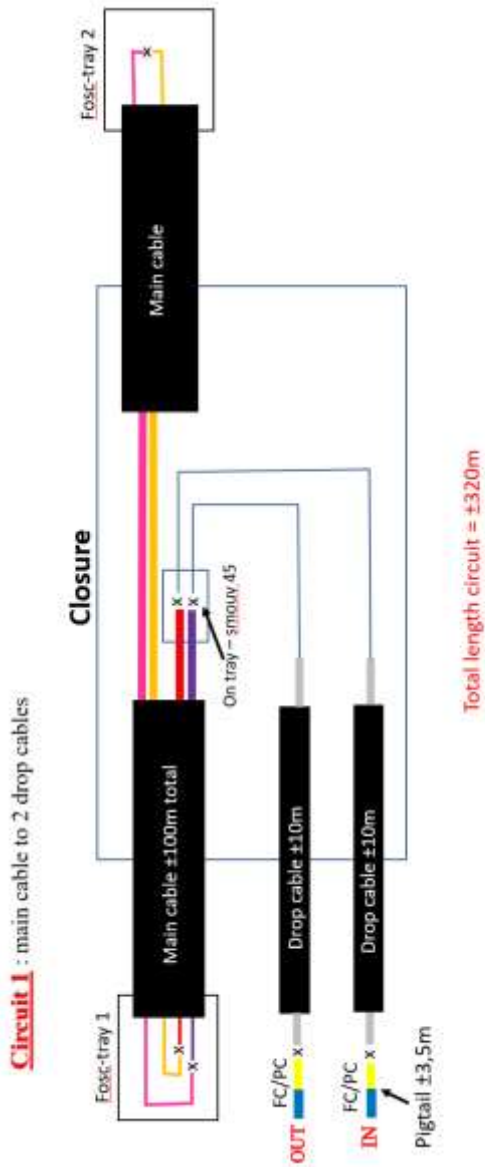
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Splice and routing scheme:
 Sample 2

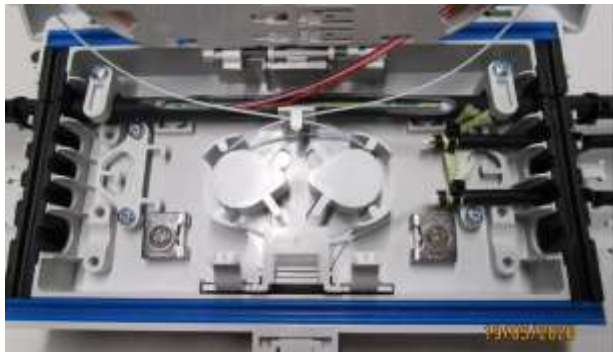


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Splice and routing scheme:
 Sample 3



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7 Test set-ups

7.1 Sealing performance testing

Protection against ingress of dust IP 5xProtection against ingress of dust IP 5x



Samples in dust chamber



Clip after test



Closure after test



Open closure after test

Visual Examination



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7.2 Optical performance testing

Reconfiguration1



Reconfiguration 2



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Bending and torsion



Cable retention



Vibration – Shock



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Change of temperature



Cycles 1 – 6 : cables OUT of the climatic test chamber



Cycles 7 – 12 : cables IN the climatic test chamber

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8 Equipment and calibration

All equipment used for the testing was within calibration period.
Detailed information can be provided on request.

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9 Trade-marks

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