

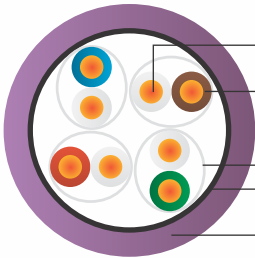
CABLING SYSTEM SOLOUTIONS

**CATALOGUE
2022 - 23**

CONTENTS

COPPER CABLE	2
C7 S/FTP Solid Cable-600MHZ	4
C6A S/FTP Solid Cable-500MHZ	5
C6 SF/UTP Solid Cable-250MHZ	6
C6 F/UTP Solid Cable-250MHZ	7
C6 U/UTP Solid Cable-250MHZ	8
C5e U/UTP Solid Cable-100MHZ	9
COPPER Accessories	10
Patch Panel •C6A Data Patch Panel - FTP	12
Patch Panel •Multimedia Patch Panel	13
Keystone Jack •Tool free - CW18F series	14
Keystone Jack •Tool free - CW15 series	15
Work Area Outlet •French Faceplate & Modular Insert	16
Patch Cord •Cat5e, Cat6, Cat6A	17
FIBER CABLES	18
Fiber optic cables and systems	20
Fiber Optic data cables	22
Jacketing material for optical cables	24
Rodent protection for fiber optic cables	25
Handling and safety notices •When using optical cables	26
Indoor cable, duplex fig 8 •Type KL-I-V(ZN)H 2 G/E	27
Indoor cable, mini breakout •Type KL-I-V(ZN)H n G/E	28
Breakout cable •Type KL-I-V(ZN)HH n G/E	29
Universal cable, mini breakout 800 N •Type KL-U-VQ(ZN)H n G/E	30
Outdoor cable, central 1750 N •Type KL-A-DQ(ZN)B2Y 1xn G/E	31
FIBER ACCESSORIES	32
Fiber Adaptor •ST / FC Adaptor	34
Fiber Adaptor •LC Adaptor	35
Patch cord AND Pigtails	36
Fiber Distribution System •Fiber Sliding Patch Panel	38
Fiber Distribution System •Fiber Accessory	39
MANAGEMENT DEVICE	40
Cable Management •CW11/R series	42
Cable Management •CW11B/CW series	43
Cable Management •CWR series	44

COPPER CABLES



Conductor	Bare copper wire, AWG23/1
Insulation	Skin/Foam/Skin PE insulation
Twisting element	nominal value 1.6 mm Pair
Individual shielding	Aluminium-bonded polyester foil, metal side outside (PIMF)
Twisting	4 pairs
Overall shielding	Tinned copper braiding
Outer sheath	Halogen-free, flame-retardant compound

C7 S/FTP SOLID CABLE-600MHZ

Structure

23 AWG solid copper conductors
Skin/foam/skin PE insulation
Aluminum foil around each pair
Braid around four pairs
PVC/PE/LSZH jacket

Standard

ANSI/TIA/EIA -568-C.2-10 (600 MHz)
ISO/IEC 61156-5
EN 50173
EN 50288-4-1
ISO/IEC 11801

Applications:

Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition)
Ideal for all applications of classes D up to F Multimedia (TV, Video, Data, Voice) >10 GbE acc. IEEE 802.3 an, cable sharing, VOIP, PoE

Fire behavior

Flame retardant: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034
Calorific value (MJ/m): 0.6(Sx) /1.2(Dx) (approx.)

Mechanical characteristics

Bending radius: During installation: 8 x overall Diameter (min.) &after installation: 4 x overall Diameter (min.)
Tensile strength: 110 (max.), Crush (N/100 mm): 1,000
Impact (number of shocks): 10

Chemical characteristics

Free of hazardous substances acc. to RoHS 2002/95/EG

Thermal characteristics

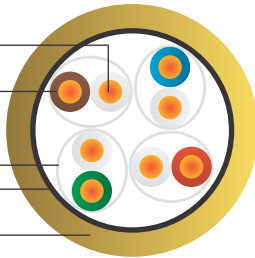
Temperature range for fixed installation: -20°C up to +60°C
Temperature range for mobile operation: 0°C up to +50°C

Frequency	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 7 max.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*	typ.	Cat. 7 min.*
1	1.9	2	102	80	99	77	101	78	98	75	109	80	106	77	25.4	23
10	4.8	5.7	102	80	99	77	98	74	95	71	108	74	105	71	31.1	25
100	16.4	18.5	102	72	99	69	86	54	83	51	93	54	90	51	33.2	20.1
200	24.5	26.8	102	68	99	65	78	41	75	38	85	48	82	45	33.2	18
250	27.8	30.2	102	66	99	63	75	36	72	33	82	46	79	43	33.4	17.3
450	36.1	41.6	97	63	94	60	61	21	58	18	72	41	69	38	31.4	17.3
500	38.2	44.1	97	62	94	59	59	18	56	15	68	40	65	37	30.5	17.3
600	42.9	48.9	92	61	89	58	49	12	46	9	62	38	59	35	27.6	17.3

Part Number	Size	Jacket type	AWG	Reel	Color sheath
CC70003	4P	PVC	23	500m	PURPLE
CC70013	4P	LSZH	23	500m	PURPLE
CC70023	4P	PE	23	500m	PURPLE

COPPER CABLES

Conductor	Bare copper wire, AWG23/1
Insulation	Skin/Foam/Skin PE insulation
Twisting element	nominal value 1.6 mm Pair
Individual shielding	Aluminium-bonded polyester foil, metal side outside (PIMF)
Twisting	4 pairs
Overall shielding	Tinned copper braiding
Outer sheath	Halogen-free, flame-retardant compound



C6A S/FTP SOLID CABLE-500MHZ

Structure

23 AWG solid copper conductors
Skin/foam/skin PE insulation
Aluminum foil around each pair
Braid around four pairs
PVC/PE/LSZH jacket

Standard

ANSI/TIA/EIA -568-C.2 (500 MHz)
ISO/IEC 61156-5
EN 50173
EN 50288-4-1
ISO/IEC 11801

Applications:

Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition)
Ideal for all applications of classes D up to EA
Up to 10 GbE acc. IEEE 802. 3an, Cable sharing, VoIP, PoE

Fire behavior

Flame retardant: acc. to IEC 60332-3-24
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034, Calorific value (MJ/m): 0.6(Sx) /1.2(Dx) (approx.)

Mechanical characteristics

Bending radius: During installation: 8 x overall Diameter (min.) &after installation: 4 x overall Diameter (min.)
Tensile strength: 110 (max.), Crush (N/100 mm): 1,000
Impact (number of shocks): 10

Chemical characteristics

Free of hazardous substances acc. to RoHS 2002/95/EG

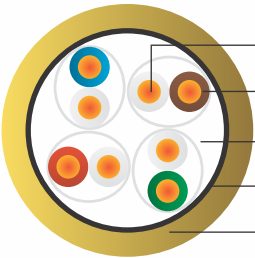
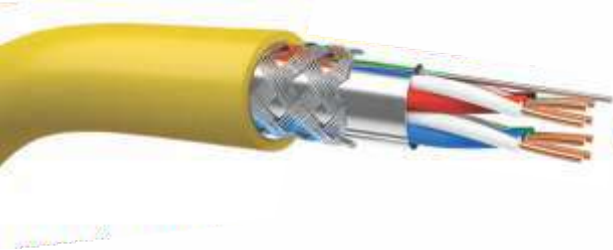
Thermal characteristics

Temperature range for fixed installation: -20°C up to +60°C
Temperature range for mobile operation: 0°C up to +50°C

Frequency	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	1.9	2	95	66	92	64	93	64	90	62	91	66	88	63	25.1	-
10	5.2	5.9	90	59	87	57	85	53	82	51	96	57	93	54	35.2	25
100	17.7	19	75	44	72	42	57	25	54	23	90	42	87	39	37.2	20.1
200	26.4	27.5	68	40	65	38	42	12	39	10	78	38	75	35	31.1	18
250	29.9	31	66	38	63	36	36	7	33	5	75	36	72	33	29.5	17.3
300	31.9	34.2	65	37	62	35	33	3	30	1	72	35	69	32	28.3	17.3
450	38.9	42.7	63	35	60	33	24	-8	21	-10	69	33	66	30	26.7	17.3
500	41.2	45.3	61	34	58	32	20	-11	17	-13	66	32	63	29	26.3	17.3

Part Number	Size	Jacket type	AWG	Reel	Color sheath
CC6A0003	4P	PVC	23	500m	YELLOW
CC6A0013	4P	LSZH	23	500m	YELLOW
CC6A0023	4P	PE	23	500m	YELLOW

COPPER CABLES



Conductor	Bare copper wire, AWG23/1
Insulation	Cellular-PE, core-diameter: nominal value 1.6 mm
Twisting element	Pair
shielding	4 pair separated by a cross
Twisting	4 pairs
Overall shielding	Tinned copper braiding
	Aluminium-bonded polyester
Outer sheath	Halogen-free, flame-retardant compound

C6 SF/UTP SOLID CABLE-250MHZ

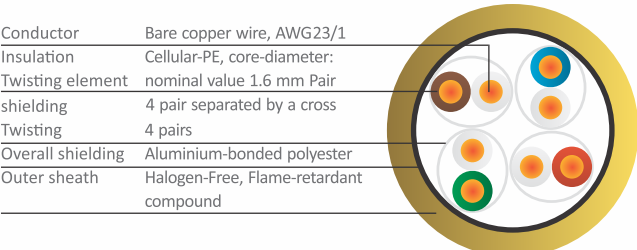
Structure
23 AWG solid copper conductors PE insulation Overall aluminum foil Braid around four pairs FR PVC/PE/LSZH jacket
Standard
ANSI/TIA/EIA -568-C.2 (250 MHZ) ISO/IEC 61156-5 EN 50173 EN 50288-5-1 ISO/IEC 11801
Applications:
Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) Ideal for all applications of classes D up to E up to 1 GbE acc. IEEE802.3 ab, VoIP, PoE

Fire behavior
Flame retardant: acc. to IEC 60332-1-2 Halogen acid gas emission: acc. to IEC 60754-2 Smoke density: acc. to IEC 61034, Calorific value (MJ/m): 0.65(approx.)
Mechanical characteristics
Bending radius: During installation: 8 x overall Diameter (min.) &after installation: 4 x overall Diameter (min.) Tensile strength: 110 (max.), Crush (N/100 mm): 1,000 Impact (number of shocks): 10
Chemical characteristics
Free of hazardous substances acc. to RoHS 2002/95/EG
Thermal characteristics
Temperature range for fixed installation: -20°C up to +60°C Temperature range for mobile operation: 0°C up to +50°C

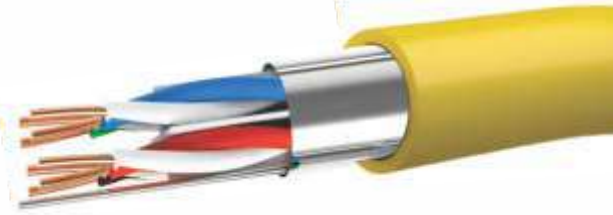
Frequency	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	1.8	2.1	93	66	90	64	91	64	88	62	103	66	100	64	24.6	-
4	2.9	3.8	87	65	84	63	84	61	81	59	95	58	92	55	30.8	23
10	5.1	6	80	59	77	57	75	53	72	51	85	50	82	47	36.7	25
16	7	7.6	75	56	72	54	68	49	65	47	78	46	75	43	38.4	25
32.25	10	10.9	71	52	68	50	61	41	58	39	71	40	68	37	37.9	23.6
62.5	13.5	15.5	67	47	64	45	53	32	50	30	65	34	62	31	35.5	21.5
100	17.8	19.9	63	44	60	42	45	24	42	22	60	30	57	27	31.9	20.1
155	22.4	25.3	59	41	56	39	37	16	34	14	53	26	50	23	28.7	18.8
200	26.8	29.1	57	40	54	38	30	11	27	9	48	24	45	21	25.9	18
250	30.4	33	56	38	53	36	26	5	23	3	44	22	41	19	25.5	17.3

Part Number	Size	Jacket type	AWG	Reel	Color sheath
CC600003	4P	PVC	23	305m	YELLOW, BLUE
CC600012	4P	LSZH	23	305m	YELLOW, BLUE
CC600022	4P	PE	23	305m	YELLOW, BLUE

COPPER CABLES



Conductor	Bare copper wire, AWG23/1
Insulation	Cellular-PE, core-diameter: nominal value 1.6 mm
Twisting element	Pair
shielding	4 pair separated by a cross
Twisting	4 pairs
Overall shielding	Aluminium-bonded polyester
Outer sheath	Halogen-Free, Flame-retardant compound



C6 F/UTP SOLID CABLE-250MHZ

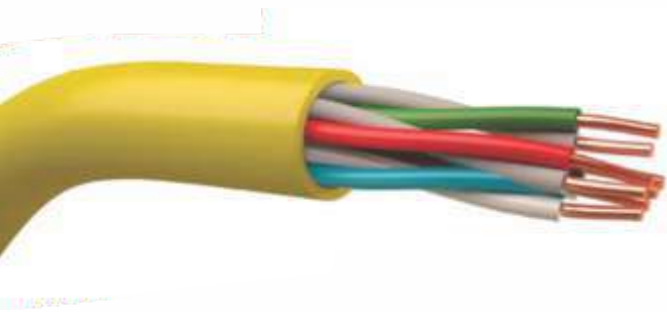
Structure
23 AWG solid copper conductors PE insulation Overall aluminum foil FR PVC/PE/LSZH jacket
Standard
ANSI/TIA/EIA -568-C.2 (250 MHZ) ISO/IEC 61156-5 EN 50173 EN 50288-5-1 ISO/IEC 11801
Applications:
Installation cable For generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition) Ideal For all applications of classes D up to E up to 1 GbE acc. IEEE802.3 ab, VoIP, PoE

Fire behavior
Flame retardant: acc. to IEC 60332-1-2 Halogen acid gas emission: acc. to IEC 60754-2 Smoke density: acc. to IEC 61034, Calorific value (MJ/m): 0.65(approx.)
Mechanical characteristics
Bending radius: During installation: 8 x overall Diameter (min.) &aFter installation: 4 x overall Diameter (min.) Tensile strength: 110 (max.), Crush (N/100 mm): 1,000 Impact (number of shocks): 10
Chemical characteristics
Free of hazardous substances acc. to RoHS 2002/95/EG
Thermal characteristics
Temperature range ForFxed installation: -20°C up to +60°C Temperature range For mobile operation: 0°C up to +50°C

Frequency	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	1.8	2.1	93	66	90	64	91	64	88	62	103	66	100	64	24.6	-
4	2.9	3.8	87	65	84	63	84	61	81	59	95	58	92	55	30.8	23
10	5.1	6	80	59	77	57	75	53	72	51	85	50	82	47	36.7	25
16	7	7.6	75	56	72	54	68	49	65	47	78	46	75	43	38.4	25
32.25	10	10.9	71	52	68	50	61	41	58	39	71	40	68	37	37.9	23.6
62.5	13.5	15.5	67	47	64	45	53	32	50	30	65	34	62	31	35.5	21.5
100	17.8	19.9	63	44	60	42	45	24	42	22	60	30	57	27	31.9	20.1
155	22.4	25.3	59	41	56	39	37	16	34	14	53	26	50	23	28.7	18.8
200	26.8	29.1	57	40	54	38	30	11	27	9	48	24	45	21	25.9	18
250	30.4	33	56	38	53	36	26	5	23	3	44	22	41	19	25.5	17.3

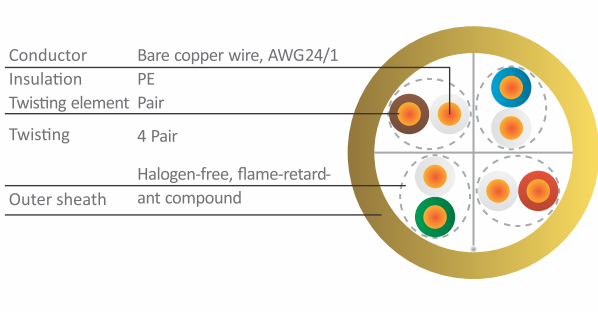
Part Number	Size	Jacket type	AWG	Reel	Color sheath
CC600003	4P	PVC	23	305m	YELLOW, BLUE
CC600012	4P	LSZH	23	305m	YELLOW, BLUE
CC600022	4P	PE	23	305m	YELLOW, BLUE

COPPER CABLES

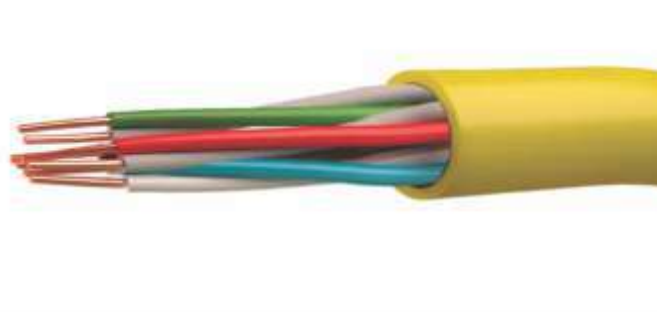


Bare copper wire, AWG 23/1	Conductor
PE	Insulation
Pair	Twisting element
4 pairs separated by a cross element	Twisting
Halogen-free, flame-retardant compound	Outer sheath

COPPER CABLES



Conductor	Bare copper wire, AWG24/1
Insulation	PE
Twisting element	Pair
Twisting	4 Pair
Outer sheath	Halogen-free, flame-retardant compound



C6 U/UTP SOLID CABLE-250MHZ

Structure

23 AWG solid copper conductors
PE insulation
PE central cross
PVC/PE/LSZH jacket

Fire behavior

Flame retardant: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034, Calorific value (MJ/m): 0.65(approx.)

Standard

ANSI/TIA/EIA -568-C.2 (250 MHZ)
ISO/IEC 61156-5
EN 50173
EN 50288-6-1
ISO/IEC 11801

Mechanical characteristics

Bending radius: During installation: 8 x overall Diameter (min.) &after installation: 4 x overall Diameter (min.)
Tensile strength: 110 (max.), Crush (N/100 mm): 1,000
Impact (number of shocks): 10

Applications:

Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition)
Ideal for all applications of classes D up to E up to 1 GbE acc. IEEE802.3 ab, VoIP, PoE

Chemical characteristics

Free of hazardous substances acc. to RoHS 2002/95/EG

Thermal characteristics

Temperature range for fixed installation: -20°C up to +60°C
Temperature range for mobile operation: 0°C up to +50°C

Frequency	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 6 max.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*	typ.	Cat. 6 min.*
1	1.8	2.1	93	66	90	64	91	64	88	62	103	66	100	64	24.6	-
4	2.9	3.8	87	65	84	63	84	61	81	59	95	58	92	55	30.8	23
10	5.1	6	80	59	77	57	75	53	72	51	85	50	82	47	36.7	25
16	7	7.6	75	56	72	54	68	49	65	47	78	46	75	43	38.4	25
32.25	10	10.9	71	52	68	50	61	41	58	39	71	40	68	37	37.9	23.6
62.5	13.5	15.5	67	47	64	45	53	32	50	30	65	34	62	31	35.5	21.5
100	17.8	19.9	63	44	60	42	45	24	42	22	60	30	57	27	31.9	20.1
155	22.4	25.3	59	41	56	39	37	16	34	14	53	26	50	23	28.7	18.8
200	26.8	29.1	57	40	54	38	30	11	27	9	48	24	45	21	25.9	18
250	30.4	33	56	38	53	36	26	5	23	3	44	22	41	19	25.5	17.3

Part Number	Size	Jacket type	AWG	Reel	Color sheath
CC600003	4P	PVC	23	305m	YELLOW, BLUE
CC600012	4P	LSZH	23	305m	YELLOW, BLUE
CC600021	4P	PE	23	305m	YELLOW, BLUE

C5e U/UTP SOLID CABLE-100MHZ

Structure

24 AWG solid copper conductors
PE insulation
PVC/PE/LSZH jacket

Fire behavior

Flame retardant: acc. to IEC 60332-1-2
Halogen acid gas emission: acc. to IEC 60754-2
Smoke density: acc. to IEC 61034, Calorific value (MJ/m): 0.6(Sx) /1.2(Dx) (approx.)

Standard

ANSI/TIA/EIA -568-C.2 (100 MHZ)
ISO/IEC 61156-5
EN 50173
EN 50288-3-1
ISO/IEC 11801

Mechanical characteristics

Bending radius: During installation: 8 x overall Diameter (min.) &after installation: 4 x overall Diameter (min.)
Tensile strength: 85 (max.), Crush (N/100 mm): 1,000
Impact (number of shocks): 10

Applications:

Installation cable for generic cabling systems acc. ISO/IEC 11801 and EN 50173 (2. edition)
Ideal for all applications of classes D up to 1 GbE acc. IEEE802.3 ab, VoIP, PoE

Chemical characteristics

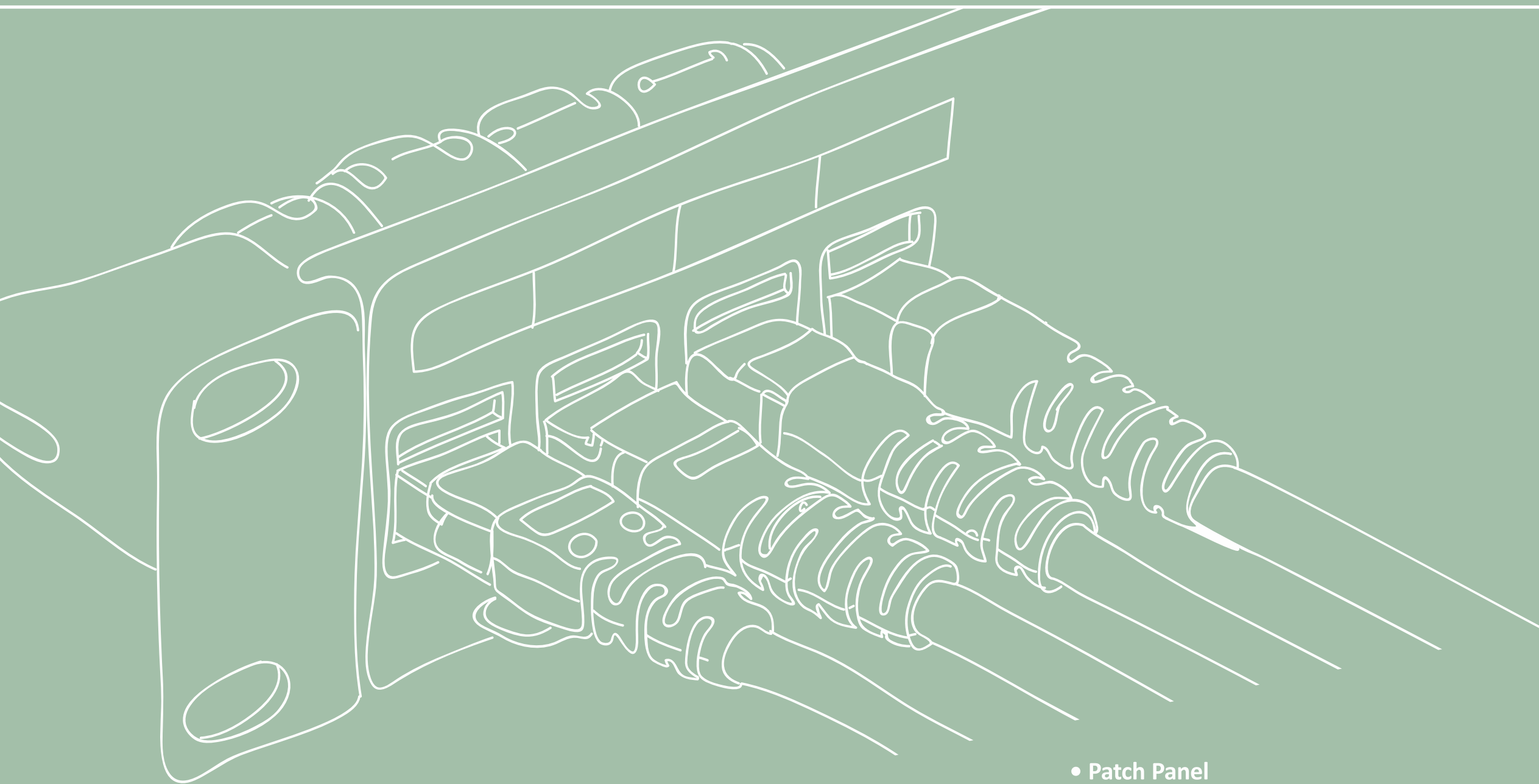
Free of hazardous substances acc. to RoHS 2002/95/EG

Thermal characteristics

Temperature range for fixed installation: -20°C up to +60°C
Temperature range for mobile operation: 0°C up to +50°C

Frequency	Attenuation dB/100m		NEXT dB		PS-NEXT dB		ACR dB@100m		PS-ACR dB@100m		EL-FEXT dB@100m		PS-ELFEXT dB@100m		RL dB	
	typ.	Cat. 5 max.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*	typ.	Cat. 5 min.*
1	2	2.1	75	65	72	62	73	63	70	60	89	64	86	61	24.8	-
4	3.1	4	69	56	66	53	66	52	63	49	84	52	81	49	28.6	23
10	5.1	6.3	62	50	59	47	57	44	54	41	76	44	73	41	33.3	25
16	7	8	58	47	55	44	51	39	48	36	70	40	67	37	34.3	25
31.25	9.7	11.4	53	43	50	40	44	31	41	28	63	34	60	31	33.9	23.6
62.5	13.2	16.5	49	38	46	35	36	22	33	19	58	28	55	25	31.3	21.5
100	17.6	21.3	45	35	42	32	28	14	25	11	52	24	49	21	27.7	20.1

Part Number	Size	Jacket type	AWG	Reel	Color sheath
CC5E0001	4P	PVC	24	305m	YELLOW, BLUE
CC5E0021	4P	LSZH	24	305m	YELLOW, BLUE
CC5E0031	4P	PE	24	305m	YELLOW, BLUE



- Patch Panel
- Keystone Jack
- Work Area Outlet
- Patch Cord

COPPER ACCESSORIES

COPPER ACCESSORIES



Patch Panel

C6A Data Patch Panel - FTP

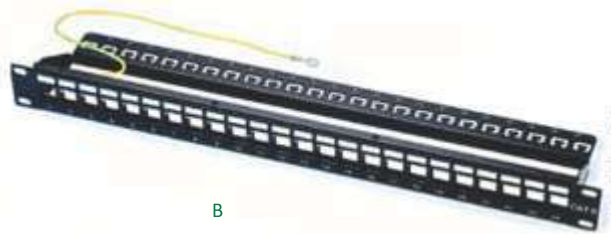
- With cable management bar for improved management
- Staggered 24 port panel in 1U
- Mounts in standard EIA 19-inch racks
- Feasible solution for lower interference and eliminate alien crosstalk
- 3pcertified Cat.6A shielded connecting hardware

Part description	Part Number	Std. Ctn. Qty.
C6A 24 Port Keystone Panel, Keystone Loaded	PP6A0012	14
C6A 24 Port Keystone Panel, Keystone Unload	PP6A0002	14

COPPER ACCESSORIES









A



B

Patch Panel

Multimedia Patch Panel

Drawing	Part description	Part Number	Std. Ctn. Qty.
A			
 [1.75" H x 19.0" W]	16-Port, 1U, with cable management bar	PPM0A161	15
 [1.75" H x 19.0" W]	24-Port, 1U, with cable management bar	PPM0A241	15
 [3.5" H x 19.0" W]	48-Port, 2U, with cable management bar	PPM0A482	9
B			
 [1.75" H x 19.0" W]	16-Port, 1U, grounded, with cable management bar	PPM0B161	15
 [1.75" H x 19.0" W]	24-Port, 1U, grounded, with cable management bar	PPM0B241	15
 [3.5" H x 19.0" W]	48-Port, 2U, grounded, with cable management bar	PPM0B482	9

[A] Cable management bar available as optional part
[B] Offer grounding solution, cable management bar included

COPPER ACCESSORIES



A

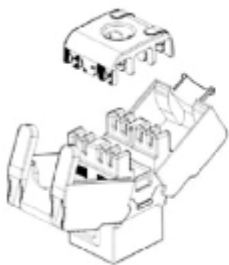


B

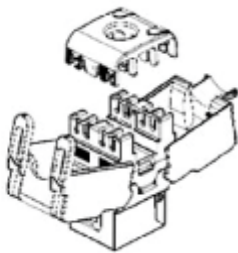
Keystone Jack
Tool free - CW18F series

- RJ45 8P 8C 50u “ Jack
- Terminating 4 pairs, 23-24 AWG cable
- Universal labels color-coded for T568A and T568B wiring schemes
- Fitting 1U 24 port High-Density Keystone panel
- 3P verified unshielded C6 connecting hardware
- Delta verified shielded C6 connecting hardware

Part Description		Part Number	Std. Ctn. Qty.
A	Unshielded, C5E, Black	CS5E0101	500
	Unshielded, C5E, White	CS5E0111	500
	Unshielded, C6, Black	CS600001	500
	Unshielded, C6, White	CS600111	500
B	Full Shielded, C5E	CS5E0103	500
	Full Shielded, C6	CS600103	500



A



B

COPPER ACCESSORIES



A



B

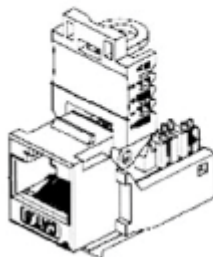


C

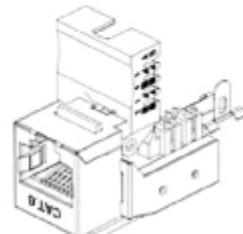
Keystone Jack
Tool free - CW15 series

- RJ45 8P 8C 50u “ Jack
- Terminating 4 pairs, 23-24 AWG cable
- Universal labels color-coded for T568A and T568B wiring schemes

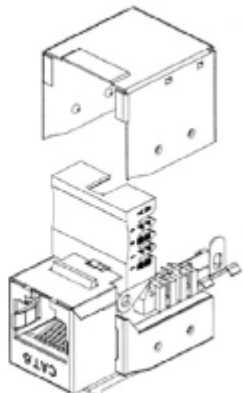
Part Description		Part Number	Std. Ctn. Qty.
A	Unshielded, C5E, Black	CS5E0201	500
	Unshielded, C5E, White	CS5E0211	500
	Unshielded, C6, Black	CS600201	500
	Unshielded, C6, White	CS600211	500
	Unshielded, C6, White	CS600211	500
B	Full Shielded, C5E	CS5E0203	500
	Full Shielded, C6	CS600203	500
C	Half Shielded, C5E	CS5E0202	500
	Half Shielded, C6	CS600202	500



A



B








C

COPPER ACCESSORIES



Work Area Outlet

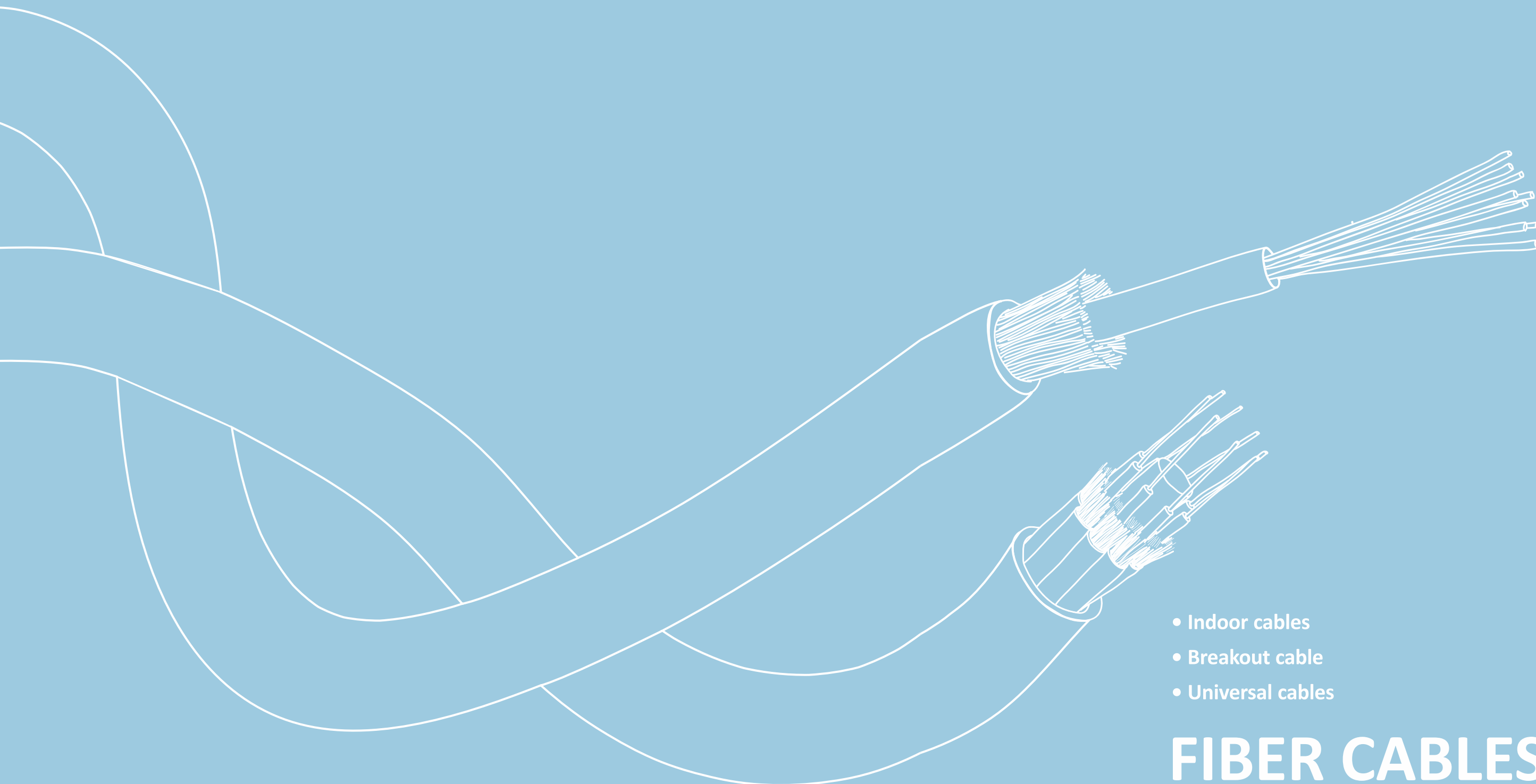
French Faceplate & Modular Insert

Drawing	Part Description	Part Number	Std. Ctn. Qty.
RJ45 Frame			
	80×80mm, with a [45×45mm] window, white	FP000001	300
RJ45 Modular Insert, with jack shutter			
	45×45 mm, white	MI000002	1000
	22.5×45 mm, white	MI000001	1000
RJ45 Angle Modular Insert, with jack shutter			
	45×45 mm, 1-port, white	MI000012	1000
	45×45 mm, 2-port, white	MI000022	1000

COPPER ACCESSORIES

Patch cord

CAT5E STRANDED MOLDED PATCH CORD (PVC Coating)	TYPE	1M	2M	3M	5M
	U/UTP	PC5E0011	PC5E0021	PC5E0031	PC5E0051
	F/UTP	PC5E0012	PC5E0022	PC5E0032	PC5E0052
	SF/UTP	PC5E0013	PC5E0023	PC5E0033	PC5E0053
CAT5E STRANDED MOLDED PATCH CORD (LSZH Coating)	TYPE	1M	2M	3M	5M
	U/UTP	PC5E1011	PC5E1021	PC5E1031	PC5E1051
	F/UTP	PC5E1012	PC5E1022	PC5E1032	PC5E1052
	SF/UTP	PC5E1013	PC5E1023	PC5E1033	PC5E1053
CAT6 STRANDED MOLDED PATCH CORD (PVC Coating)	TYPE	1M	2M	3M	5M
	U/UTP	PC600011	PC600021	PC600031	PC600051
	F/UTP	PC600012	PC600022	PC600032	PC600052
	SF/UTP	PC600013	PC600023	PC600033	PC600053
CAT6 STRANDED MOLDED PATCH CORD (LSZH Coating)	TYPE	1M	2M	3M	5M
	U/UTP	PC601011	PC601021	PC601031	PC601051
	F/UTP	PC601012	PC601022	PC601032	PC601052
	SF/UTP	PC601013	PC601023	PC601033	PC601053
CAT6A STRANDED MOLDED PATCH CORD (PVC Coating)	TYPE	1M	2M	3M	5M
	U/UTP	PC6A0011	PC6A0021	PC6A0031	PC6A0051
	F/UTP	PC6A0012	PC6A0022	PC6A0032	PC6A0052
	SF/UTP	PC6A0013	PC6A0023	PC6A0033	PC6A0053
CAT6A STRANDED MOLDED PATCH CORD (LSZH Coating)	TYPE	1M	2M	3M	5M
	U/UTP	PC6A1011	PC6A1021	PC6A1031	PC6A1051
	F/UTP	PC6A1012	PC6A1022	PC6A1032	PC6A1052
	SF/UTP	PC6A1013	PC6A1023	PC6A1033	PC6A1053



- Indoor cables
- Breakout cable
- Universal cables

FIBER CABLES

FIBER OPTIC CABLES

Calwatt® Fiber optic cables and systems

Enhanced Fiber Technology
The system for glass fibers
Loose tube systems

As the degree of automation increases in industry and the information density rises in office communication, higher and higher demands are made on the transmission of analog and digital data. In this situation, conventional links based on copper cable engineering often reach the limits of their performance.

The cables
Calwatt® fiber optic cables use Enhanced Fiber technology which makes them go far beyond the specifications

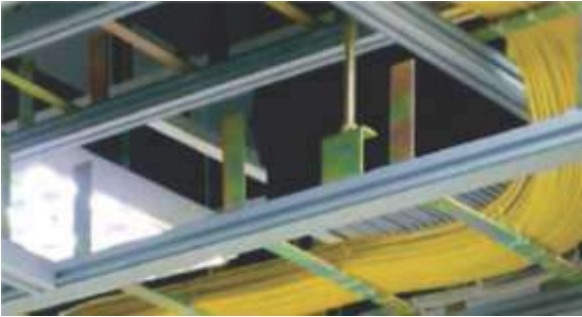
Fiber optic solutions
Cables and systems for LAN, MAN, WAN and SAN

The system for glass fibers
The constant increase in Internet and Intranet traffic, multimedia applications and the implementation of so-called SANs or Storage

Area Networks in companies has led to fundamental changes in the traffic and load distribution in the networks. Also, new media require new passive network infrastructures. On the basis of EN 50173, Calwatt® has introduced the new classes of Multimode fiber optic to link lengths for 10 GbE and GbE.

Calwatt® systems engineering is based on pre-terminated ready-to-connect units. The ready-made cables guarantee rapid, reliable and economic installation. The quality of the link is ensured by matching system components. The installation times are short and easy to calculate.

Enhanced fiber optic technology
In conjunction with multimode fibers and single-mode fibers, Calwatt® fiber optic cables offer reserves which go far beyond the specifications of the standard. Following the fiber categories OM1, OM2, OM3 and OS1 according to EN 50173, Calwatt offers the quality grades OM1e, OM2e, OM3e and OS1e with optimized transmission characteristics.



The fiber
The steady increase in Internet and intranet traffic, multimedia applications and the establishment of central storage networks (SAN or Storage Area Networks) in companies have fundamentally changed the traffic and load distribution in networks. New media require new, more powerful passive network infrastructures.

Calwatt® offers a future-proof cabling system with reserves well beyond those stipulated in the standards.

Comparison of requirements for Standard	Fiber category OM1 G62.5/125		Fiber category OM1 G62.5/125	
	at 850 nm		at 1,300 nm	
	Standard OM1	Calwatt® OM1e 62.5/125 M	Standard OM1	Calwatt® OM1e 62.5/125 M
Attenuation	3.5 dB/km	3.0 dB/km	1.5 dB/km	0.8 dB/km
Modal bandwidth	200 MHz x km	250 MHz x km	500 MHz x km	800 MHz x km
Gigabit Ethernet segment length	275 m	500 m	550 m	1,000 m
10 Gigabit Ethernet segment length	32 m	65 m	300 m	450 m

FIBER OPTIC CABLES

Comparison of requirements for Standard	Fiber category OM2 50/125			Fiber category OM2 50/125		
	at 850 nm			at 1,300 nm		
	Standard OM2	Calwatt® OM2 Standard 50/125	Calwatt® OM2e High Performance 50/125	Standard OM2	Calwatt® OM2 Standard 50/125	Calwatt® OM2e High Performance 50/125
Attenuation	3.5 dB/km	2.7 dB/km	2.5 dB/km	1.5 dB/km	0.8 dB/km	0.7 dB/km
Modal bandwidth	500 MHz x km	500 MHz x km	600 MHz x km	500 MHz x km	500 MHz x km	1,200 MHz x km
Gigabit Ethernet segment length	550 m	550 m	750 m	550 m	550 m	2,000 m
10 Gigabit Ethernet segment length	82 m	82 m	150 m	300 m	300 m	700 m

The right fiber
Calwatt® offers a comprehensive range of optical fibers tailored to the various network requirements such as future-proof high-performance transmission in Data centers, reliable office networks and stable industrial networks.

Calwatt® Multimode fibers
Calwatt® 62.5/125 and 50/125 are the reliable and proven fibers for network technology in industrial applications and in office cabling in the categories OM1 and OM2.

	OM1	OM2	OM3	OM4
LAN Data Center				
LAN Office				
LAN Industry				

FIBER OPTIC CABLES

Calwatt® Fiber Optic data cables
For LAN, WAN and SAN

The use of fiber optic data cables is especially recommended if...

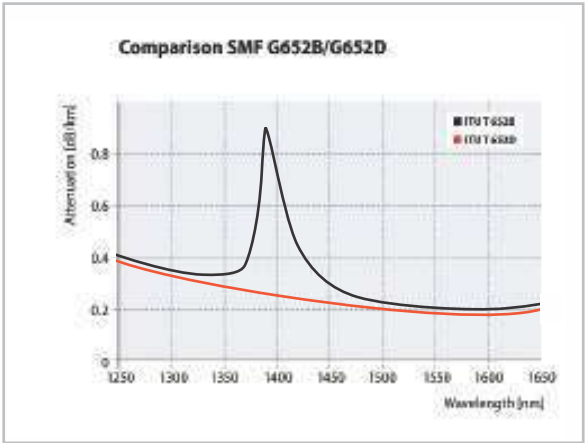
- Electromagnetic influences can occur
- Reliable potential isolation is required
- A wide transmission bandwidth is required
- Low attenuation and therefore long transmission links are required
- Crosstalk is not permitted
- Sparking (for areas subject to explosion hazards) is not permitted
- Low weight and small dimensions are an advantage
- Increased security against interception is required

The product range at a glance:

- Easy-to-assemble indoor cables with compact buffered fiber technology for the patch and horizontal areas
- Universal cables for the backbone area indoors and outdoors
- Outdoor cables for LAN and WAN applications
- A wide range of designs such as outdoor cables with
 - corrugated steel cladding
 - Steel band or steel wire armor
 - Additional lead covering as protection against chemicals

Gigabit, 10, 40 and 100 Gigabit Ethernet – strictest requirements for the quality of the fiber optic cabling.

The Ethernet protocol is the state of the art today in every area of structured cabling. The corresponding standards for transmission rates from 1 Gigabit/s to 100 Gigabit/s are defined in IEEE 802.3ba.



The process used to manufacture the fibers has been optimized in such a way that the profile of the multimode fiber is extremely precise and disturbances in the fiber core are virtually eliminated. As differential mode delay does not occur under these circumstances, mode-conditioning patch cords are not necessary.

For more than ten years now, the standard versions of fiber optic cables with an improved gradient fiber 50/125 from the category “OM2e” have provided bandwidth-length products of 600 MHz x km in the first window (850 nm) and 1,200 MHz x km in the second window (1,300 nm) as well as Gigabit Ethernet segment lengths of 750/2,000 m.

Calwatt® fiber optic cables with OM3 and OM4 fibers are the optimum transmission medium, whatever the future might hold.

Using the OM4 fibers with a laser bandwidth of 4,700 MHz x km in the first window enables segment lengths of up to 550 m with 10 GbE, up to 300 m with 16 GB/s Fiber channel or up to 150 m with 40 and 100 GbE. This in turn enables cost-effective realization of 10 GbE in the backbone of a building in nearly all cases.

Single mode fibers must be used over long distances. The single mode fibers exceed the current requirements of the OS2 standard according to EN 50173-1 with attenuation of just 0.36 dB/km at 1,310 nm and less than 0.22 dB/km at 1,550 nm.

This means that the wavelength ranges around 1,383 nm can also be used to increase the transmission capacity. The graph shows the steadily dropping attenuation curve from 1,300 nm to 1,625 nm for all single mode fibers. These characteristics and the PMD link design value of just 0.06 ps/ km guarantee large reserves for faster transmission rates over very long distances and WDM transmission systems.

The use of high-quality optical fibers is the key to managing future data volumes. Calwatt® fiber optic data cables are the first step in careful planning and implementation of a passive network infrastructure.

FIBER OPTIC CABLES

Calwatt® Fiber qualities

Fiber specifications	OM1e	OM2	OM2e	OM3	OM4	OS2	OS2
IEC 11801/EN 50173	62.5/125	50/125	50/125	50/125	50/125	9/125	OS2 low bend B6_a
IEC 60793-2	OM1e	OM2	OM2e	OM3	OM4	B1.3	G.657.A
ITU-T		A1a.1	A1a.1	A1a.2	A1a.3	G.652.D	

Attenuation coefficient

dB/km at 850 nm	max. 3.0	max. 2.7	max. 2.5	max. 2.5	max. 2.5		
dB/km at 1,300 nm	max. 0.7	max. 0.8	max. 0.7	max. 0.7	max. 0.7		
dB/km at 1,310 nm						max. 0.36	max. 0.36
dB/km at 1,383 nm						max. 0.40	max. 0.40
dB/km at 1,550 nm						max. 0.23	max. 0.23
dB/km at 1,625 nm						max. 0.23	max. 0.23

Bandwidth

MHz x km at 850 nm	min. 250	min. 500	min. 600	min. 1,500	min. 3,500		
MHz x km at 1,300 nm	min. 800	min. 500	min. 1,200	min. 500	min. 500		

Laser bandwidth

MHz x km at 850 nm				min. 2,000	min. 4,700		
--------------------	--	--	--	------------	------------	--	--

Segment length with Gigabit Ethernet

at 850 nm (1000 BASE-SX)	500 m	550 m	750 m	900 m	1,000 m		
at 1,300 nm (1000 BASE-LX)	1,000 m	550 m	2,000 m	550 m	550 m	5,000 m	5,000 m

Segment length with 10 Gigabit Ethernet

at 850 nm (10G BASE-SR/SW)	65 m	82 m	150 m	300 m	550 m		
at 1,300 nm (10G BASE-LX4)	450 m	300 m	700 m	300 m	300 m	10,000 m	10,000 m
at 1,550 nm (10G BASE-ER/EW)						40,000 m	40,000 m

Segment length with 40/100 Gigabit Ethernet

at 850 nm 40/100 GBASE-SR4/SR10				100 m	150 m		
at 1,310 nm 40/100 GBASE-LR4						10,000 m	10,000 m

FIBER OPTIC CABLES

Jacketing material for optical cables

Balancing application and fire prevention criteria
The sheath around the cable protects the optical fiber from the effects of mechanical, thermal and chemical action as well as the ingress of moisture. In the event of a fire, however, the cable sheath should prevent a fire from spreading and stop toxic and corrosive gases from being produced.
The use of halogen-free, flame-retardant materials is advisable in order to protect equipment and buildings but above all to protect people. In harsh environments, PUR and PVC, in particular, are used owing to their high resistance to oils and their abrasion resistance. PE is also commonly used as a sheath material for outdoor applications.

Material characteristics	Cable sheath material			
	FRNC	PUR	PVC	PE
Resistance to aging	+	+	+	+
Halogen-free	+	+	--	+
Flame retardant	+	●	+	--/●
Elasticity	-	+	●	-
Abrasion resistance	-	++	+	+/-
Low smoke gas generation	++	●	-	--/●
Low emission of corrosive gases	++	●	--	+/●
Low smoke gas toxicity	++	●	--	+/●
No toxicological risk	++	●	-	+/●

General resistance to	Cable sheath material			
	FRNC	PUR	PVC	PE
UV light	1	1	1	1
Water absorption	-	-	+	+
Gas diffusion	-	2	-	●
Fuels	-	+	+/-	+
Petroleum/lubricants	-	++	●	+
Organic solvents	-	+ 3	-	+ 4
Alcohol	-	-	+	+
Oxidants	-	-	+	-
Acids	+	--	+	++
Alkaline solutions	+	--	+	+
Saline solutions	+	-	+	+

However, it is often extremely difficult to meet all the requirements using just one sheath material. To best satisfy the prevailing local operating conditions, Calwatt® offers a choice of different materials. Please contact us if the criteria for your particular application are not met by the cable constructions in this catalogue. Additional requirements can often be met through customized measures when making the sheath (e.g. aluminum tape or special mixtures of sheaths).

- ++ Excellent
- + Good
- depends on recipe
- Weak
- Inadequate

- 1) UV resistance can be increased by adding black Color pigments UV stabilizers
- 2) Permeation depends on the type of gas, e.g. Ar, CH4, N2, O2 low gas permeation, CO2, H2, He higher gas permeation
- 3) Low swelling in saturated hydrocarbons; significant swelling in aromatic hydrocarbons. Aliphatic esters cause swelling, highly polar organic solvents dissolve under the effect of extreme swelling
- 4) Swelling in aliphatic and aromatic hydrocarbons and in chlorinated hydrocarbons

FIBER OPTIC CABLES



Rodent protection for fiber optic cables

Fiber optic cables are relatively thin and therefore very susceptible to rodent damage. Depending on the application it is important that fiber optic cables can offer protection against this type of damage. There are no national or indeed international standards or test specifications covering the corresponding requirement for rodent protection.

The following construction has been customary in the market in Europe (particularly in Germany, Austria and Switzerland) since the early 1990s:

For outdoor cables, the usual aramid yarns for strain relief are replaced with glass roving. These glass yarns shatter and get into the mouth and throat of the rodents. The animals associate gnawing on cables with pain and usually stop.

The general rule is:
The more glass roving, the greater the protection for the cable.

The overall diameter should also be as large as possible. Constructions with stranded loose tubes give even less favorable leverage in combination with the larger core diameter. The cable then acts like a gag bit. Before the rodent reaches the glass roving, however, it first has to gnaw through the outer sheath. Constructions with an additional polyamide sheath (thickness 0.5 mm) have also proven themselves here as polyamide is very hard and smooth.

This combination of plastic, glass and moisture-absorbing swelling material has to be gnawed through before rodent reaches the loose tubes containing the internal optical fibers. Metal armoring must be recommended as rodent protection for all applications where rodent damage is to be expected. This is the case, for example, with installation in shafts or conduits with a correspondingly large diameter, e.g. along railway lines or motorways.

The following types of metal armoring are available:

- **Corrugated steel cladding**
The most common metal armoring is the 0.155 mm thick corrugated steel cladding due to its very good flexibility.
- **Steel wire armor**
The steel wire armor made from wires with a thickness of up to 1.25 mm is very robust.
- **Steel band**
Steel band sheathing consists of two overlapping layers of steel band that are wound around the cable.

In the case of cables with two sheaths with sheathing between them, the ingress of water into the cable core is also prevented provided the internal sheath is not damaged.

Despite all precautions, however, damage to the outer sheath can never be fully ruled out.

FIBER OPTIC CABLES



Handling and safety notices
When using optical cables

Please note the following when installing optical fibers:

- Valid installation regulations for optical fibers
- Valid industrial safety guidelines for handling optical fibers
- VDE regulations (DIN EN 50174 Parts 1 to 3, cabling installation)

The following regulations also apply:

- The drums must always be stored and transported standing on their flanges
- Please note the limit values specified in the respective data sheet
- Do not remove the protective packaging from the cable ends during installation
- Do not go below the permitted bending radius (see data sheet)
- Avoid soiling and mechanical loading of the assembled connectors
- Do not exceed the maximum tensile load of the cable in axial direction during and after installation (use suitable aids)
- The maximum tensile load only applies in conjunction with adhesion with the strain relief elements
- Installation is not permitted if the ambient temperature is exceeded or gone below (specific value in the data sheet)
- Cable runs must be selected so as to avoid mechanical loads as far as possible and also minimize future loads
- Mechanical stresses, for example caused by movement, must be prevented, even during provisional installation
- Compression of the outer sheath, for example by cable ties, must be avoided when securing the cables
- After installation: carefully free the cable ends from the packaging/ pull tool

- All cable ends must be protected from the ingress of moisture before, during and after installation
- Immersion with water must be avoided – the fibers and connectors must not come into contact with water
- Optical fibers must be unwound from the coil or ring without torsion so that no kinks or twists can occur
- Install optical cables with extreme care. Please make sure that the fibers are neither overstretched nor compressed – in addition to immediate damage, this also poses the threat of problems with the long-term behavior
- When installing in protective conduits, please make sure that these have no sharp edges and that kinks are avoided
- The attenuation of each cable must be checked immediately after installation using a suitable calibrated meter, otherwise warranty claims may arise
- Body and eye protection must be worn when handling bare fibers from glass optical fibers, including if the cable is damaged
- please note all regulations relating to eye safety

FIBER OPTIC CABLES



Calwatt® Indoor cable, duplex fig 8
Type KL-I-V(ZN)H 2 G/E

Description

Connection cable and patch cord for structured cabling acc. to ISO/IEC 11801 and EN 50173 (2nd edition).

In keeping with the fiber type ideal for all applications from classes OF 300 to OF 10000. Suitable for direct connector assembly.

Installation in dry areas, in cable ducts. On cable trays Or in conduits.

Construction

Two single cables (2,8 mm with 900 µm semi-tight buffered loose tubes) with strain relief in figure 8 sheath with separator

Strain relief Non-metallic (aramid yarns)

Cable sheath Halogen-free, flame-retardant compound

Sheath color OS2 ● Yellow
OM1e/OM2e ● Orange
OM3 ● Aqua
OM4 ● Heather violet

Thermal characteristics

Transport/storage –25 °C up to +70 °C
Installation –5 °C up to +50 °C
Operating temperature –10 °C up to +60 °C

Mechanical characteristics

Min. bending radius static 30 mm
 Dynamic 60 mm
Max. crush strength long-term 600 N/dm
 short-term 1000 N/dm

Fire performance

Smoke density IEC 61034
Halogen free IEC 60754-1
Flame retardant IEC 60332-1-2, IEC 60332-3-24

Fiber number	Buffered Fiber type	Overall diam. approx.	Weight approx.	Max. strain relief	Fire load approx.		Order no.				
	µ	mm	kg/km	N	MJ/m	kWh/m	OM1e 62.5/125	OM2e 50/125	OM3 50/125	OM4 50/125	OS2 E9...10/125
2	900	2.8x5.7	15.8	600	0.36	0.10	FCM12001	FCM14001	FCM15001	FCM16001	FCS12001
2	600	1.8x3.7	7	400	0.14	0.04	FCM12002	FCM14002	FCM15002	FCM16002	FCS12002

FIBER OPTIC CABLES



Calwatt® Indoor cable, mini breakout
Type KL-I-V(ZN)H n G/E

Description		Thermal characteristics	
Campus/backbone cabling, suitable for direct connector assembly. Connection cable and patch cord for structured cabling acc. to ISO/IEC 11801 and EN 50173 (2nd edition). In keeping with the fiber type ideal for all applications from classes OF 300 to OF 10000.		Transport/storage	–25 °C up to +70 °C
		Installation	–5 °C up to +50 °C
		Operating temperature	–10 °C up to +70 °C
Construction		Mechanical characteristics	
Up to 12 semi-tight buffered fibers (900 µm) stranded under One outer sheath		Min. bending radius static	10 x overall diameter
Strain relief	Non-metallic (aramid yarns)	Dynamic	15 x overall diameter
Cable sheath	Halogen-free, flame-retardant compound	For single elements	30 mm
Sheath color	OS2 • Yellow	Max. tensile force long-term	600 N
	OM1e/OM2e • Orange	Max. crush strength long-term	500 N/dm
	OM3 • Aqua	short-term	1000 N/dm
	OM4 • Heather violet		
		Fire performance	
		Smoke density	IEC 61034
		Halogen free	IEC 60754-1
		Flame retardancy	IEC 60332-1-2, IEC 60332-3-24
		Further characteristics:	
		Cable bending	IEC 60794-1-2 E11

Fiber number	Overall diam. approx.	Weight approx.	Max. strain relief	Fire load approx.		Order no.				
	mm	kg/km	N	MJ/m	kWh/m	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OM4 G50/125	OS2 E9...10/125
2	4.2	14	800	0.45	0.13	FCM12101	FCM14101	FCM15101	FCM16101	FCS12101
4	4.8	21	800	0.47	0.13	FCM12102	FCM14102	FCM15102	FCM16102	FCS12102
6	5.9	25	800	0.50	0.14	FCM12103	FCM14103	FCM15103	FCM16103	FCS12103
8	6.1	30	800	0.52	0.14	FCM12104	FCM14104	FCM15104	FCM16104	FCS12104
10	7.0	38	800	0.53	0.14	FCM12105	FCM14105	FCM15105	FCM16105	FCS12105
12	7.0	38	800	0.55	0.15	FCM12106	FCM14106	FCM15106	FCM16106	FCS12106



FIBER OPTIC CABLES



Calwatt® Breakout cable
Type KL-I-V(ZN)HH n G/E

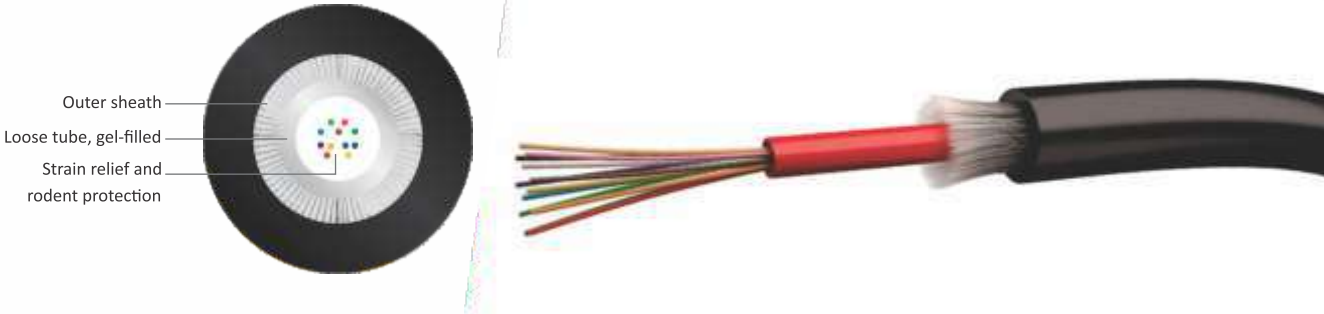
Description		Thermal characteristics	
Connection cable and patch cord for structured cabling acc. to ISO/IEC 11801 and EN 50173 (2nd edition). In keeping with the fiber type ideal for all applications from classes OF 300 to OF 10000. Suitable for direct connector assembly. Installation in dry areas, in cable ducts, on cable trays or in conduits.		Transport/storage	–25 °C up to +70 °C
		Installation	–5 °C up to +50 °C
		Operating temperature	–10 °C up to +70 °C
Construction		Mechanical characteristics	
Up to 12 single cables with strain relief as breakout elements (2.1 mm with 900 µm semi-tight buffered fibers) stranded under One outer sheath		Min. bending radius static	15 x overall diameter
Strain relief	Non-metallic (aramid yarns)	Dynamic	20 x overall diameter
Cable sheath	Halogen-free, flame-retardant compound	For single elements	30 mm
Sheath color	OS2 • Yellow	Max. crush strength long-term	1000 N/dm
	OM1e/OM2e • Orange	short-term	1500 N/dm
	OM3 • Aqua		
	OM4 • Heather violet		
		Fire performance	
		Smoke density	IEC 61034
		Halogen free	IEC 60754-1
		Flame retardancy	IEC 60332-1-2, IEC 60332-3-24
		Further characteristics:	
		Cable bending	IEC 60794-1-2 E11

Fiber number	Overall diam. approx.	Weight approx.	Max. strain relief	Fire load approx.		Order no.				
	mm	kg/km	N	MJ/m	kWh/m	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OM4 G50/125	OS2 E9...10/125
2	7.0	40	800	1.10	0.30	FCM12201	FCM14201	FCM15201	FCM16201	FCS12201
4	7.0	45	800	1.10	0.30	FCM12202	FCM14202	FCM15202	FCM16202	FCS12202
6	8.2	65	1000	1.18	0.32	FCM12203	FCM14203	FCM15203	FCM16203	FCS12203
8	9.6	95	1000	1.31	0.36	FCM12204	FCM14204	FCM15204	FCM16204	FCS12204
10	11.0	135	1000	1.42	0.39	FCM12205	FCM14205	FCM15205	FCM16205	FCS12205
12	12.5	155	1000	1.57	0.44	FCM12206	FCM14206	FCM15206	FCM16206	FCS12206



FIBER OPTIC CABLES

FIBER OPTIC CABLES



Calwatt® Universal cable, mini breakout 800 N
Type KL-U-VQ(ZN)H n G/E

Description

Campus/backbone cabling, suitable for direct connector assembly. Connection cable and patch cord for structured cabling acc. to ISO/IEC 11801 and EN 50173 (2nd edition). In keeping with the fiber type ideal for all applications from classes OF 300 to OF 10000. House connections possible without additional interconnection points (splices).

Installation indoors and outdoors in dry conduits, on covered cable trays or in cable ducts. Mechanical pulling in with winches is only permitted in conjunction with force measuring devices with a logging feature.

Construction

Up to 24 tight buffered fibers (900 µm) stranded under one outer sheath
Buffered fiber color code acc. To EIA/TIA598C
Strain relief Non-metallic (aramid yarns)
Cable sheath Halogen-free, flame-retardant compound
Sheath color Yellow

Thermal characteristics

Transport/storage -25 °C up to +70 °C
Installation -5 °C up to +50 °C
Operating temperature -25 °C up to +60 °C

Mechanical characteristics

Min. bending radius static 10 x overall diameter
Dynamic 15 x overall diameter
For single elements 30 mm
Max. crush strength long-term 300 N/dm
short-term 500 N/dm

Fire performance

Smoke density IEC 61034
Halogen free IEC 60754-1
Flame retardant IEC 60332-1-2, IEC 60332-3-24

Further characteristics:

Longitudinal watertightness IEC 60794-1-2 F5
Cable bending IEC 60794-1-2 E11

Fiber number	Overall diam. approx.	Weight approx.	Max. strain relief	Fire load approx.		Order no.				
	mm			MJ/m	kWh/m	OM1e G62.5/125	OM2e G50/125	OM3 G50/125	OM4 G50/125	OS2 E9...10/125
6	5.9	25	800	0.50	0.14	FCM22101	FCM24101	FCM25101	FCM26101	FCS22101
12	7.0	38	800	0.55	0.15	FCM22102	FCM24102	FCM25102	FCM26102	FCS22102
24	9.4	72	800	0.92	0.25	FCM22103	FCM24103	FCM25103	FCM26103	FCS22103

Calwatt® Outdoor cable, central 1750 N
Type KL-A-DQ(ZN)B2Y 1xn G/E

Description

Outdoor cable for direct installation in the ground, in conduits and where there is a risk of rodent damage in MAN (city networks) and LAN (campus/backbone). Suitable for structured cabling acc. to ISO/IEC 11801 and EN 50173 (2nd edition). In keeping with the fiber type ideal for all applications from Classes OF 300 to OF 10000. Easy to install thanks to grease free, dry cable core. Suitable for splicing.

Installation indoors, in conduits, on covered cable trays, in cable ducts or directly in the ground. Mechanical pulling in with winches is only permitted in conjunction with force measuring devices with a logging feature.

Construction

Central filled loose tube with up to 24 fibers Fiber color code acc. to IEC 60304
Loose tube color: Yellow (E9/125), green (G50/125), blue (G62.5/125)
Strain relief Non-metallic (glass roving)
Cable sheath Resistant to PE, UV rays
Sheath color ● Black

Thermal characteristics

Transport/storage -25 °C up to +70 °C
Installation -5 °C up to +50 °C
Operating temperature -25 °C up to +60 °C

Mechanical characteristics

Min. bending radius static 15 x overall diameter
dynamic 20 x overall diameter
Max. crush strength long-term 1500 N/dm
short-term 2500 N/dm

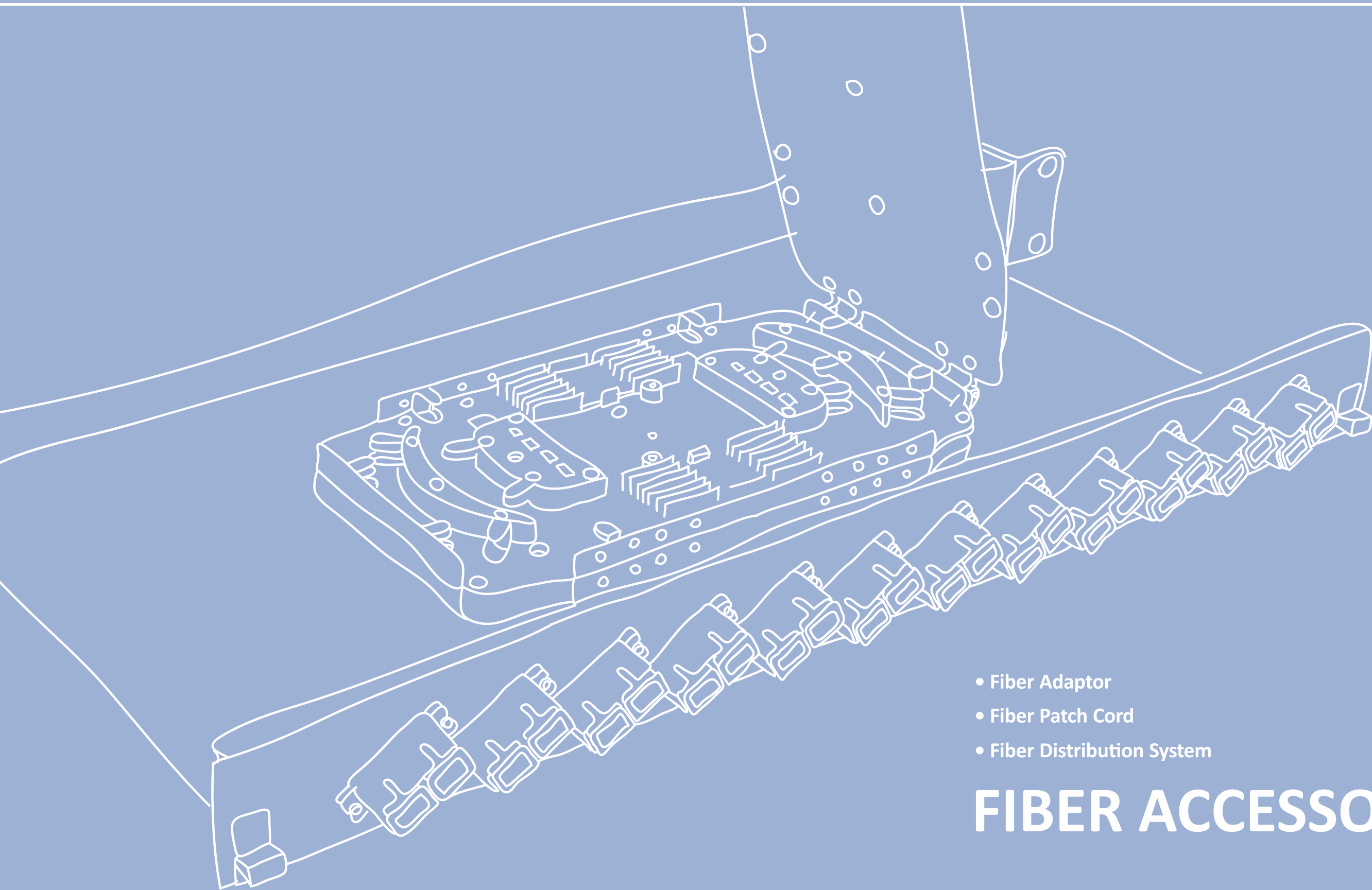
Fire performance

Halogen free IEC 60754-1

Further characteristics:

Longitudinal water tightness IEC 60794-1-2 F5
Impact resistance IEC 60794-1-2 E4
Cable bending IEC 60794-1-2 E11

Fiber number	Overall diam. approx.	Weight approx.	Max. strain relief	Fire load approx.		Order no.				
	mm			MJ/m	kWh/m	OM1e 62.5/125	OM2e 50/125	OM3 50/125	OM4 50/125	OS2 9...10/125
1x2	7.4	39	1750	1.21	0.34	FCM32101	FCM34101	FCM35101	FCM36101	FCS32101
1x4	7.4	39	1750	1.21	0.34	FCM32102	FCM34102	FCM35102	FCM36102	FCS32102
1x6	7.4	39	1750	1.21	0.34	FCM32103	FCM34103	FCM35103	FCM36103	FCS32103
1x8	7.4	39	1750	1.21	0.34	FCM32104	FCM34104	FCM35104	FCM36104	FCS32104
1x10	7.4	39	1750	1.21	0.34	FCM32105	FCM34105	FCM35105	FCM36105	FCS32105
1x12	7.4	39	1750	1.21	0.34	FCM32106	FCM34106	FCM35106	FCM36106	FCS32106
1x16	7.8	45	1750	1.39	0.39	FCM32107	FCM34107	FCM35107	FCM36107	FCS32107
1x20	7.8	45	1750	1.39	0.39	FCM32108	FCM34108	FCM35108	FCM36108	FCS32108
1x24	7.8	45	1750	1.39	0.39	FCM32109	FCM34109	FCM35109	FCM36109	FCS32109



- Fiber Adaptor
- Fiber Patch Cord
- Fiber Distribution System

FIBER ACCESSORIES

FIBER OPTIC ACCESSORIES

Fiber Adaptor
ST / FC Adaptor

Calwatt standard adapters are available in ST, FC, SC, LC, MTRJ and MPO styles. Use the adapters to maximum fiber density and the flexibility to adapt to every installation.

Adaptor Type	Type	Part Description	Part Number	Std. Ctn. Qty.
ST Adaptor				
	Simplex-Thread	MM with PB Sleeve SM with Zr. sleeve	FAM10011 FAS10011	1,000 1,000
	Simplex-Flange	MM with PB Sleeve, Ivory SM with Zr. Sleeve, Blue	FAM10012 FAS10012	1,000 1,000
	Duplex-Flange	MM with PB Sleeve, Ivory SM with Zr. Sleeve, Blue	FAM10051 FAS10051	1,000 1,000
FC Adapter				
	Simplex-Square	MM with PB Sleeve SM with Zr. sleeve	FAM20011 FAS20011	1,000 1,000
	Simplex-D shape	MM with PB Sleeve SM with Zr. sleeve	FAM20012 FAS20012	1,000 1,000
	Simplex-Flange	MM with PB Sleeve, Ivory SM with Zr. Sleeve, Blue	FAM20013 FAS20013	1,000 1,000

FIBER OPTIC ACCESSORIES

Fiber Adaptor
LC Adaptor

Adaptor Type	Type	Part Description	Part Number	Std. Ctn. Qty.
LC Adaptor				
	Simplex	MM with PB sleeve, Ivory	FAM40011	1,000
		10G with PB Sleeve, Aqua	FAG40011	1,000
		SM with Zr. Sleeve, Blue	FAS40011	1,000
		SM/APC with Zr. Sleeve, Green	FAS40012	1,000
	Duplex-Square	MM with PB sleeve, Ivory	FAM40021	500
		10G with PB Sleeve, Aqua	FAG40021	500
		SM with Zr. Sleeve, Blue	FAS40021	500
		SM/APC with Zr. Sleeve, Green	FAS40022	500
	Duplex-SC Footprint	MM with PB sleeve, Ivory	FAM40022	1,000
		10G with PB Sleeve, Aqua	FAG40022	1,000
		SM with Zr. Sleeve, Blue	FAS40023	1,000
		SM/APC with Zr. Sleeve, Green	FAS40024	1,000
	Quad-SC Footprint	MM with PB sleeve, Ivory	FAM40031	500
		10G with PB Sleeve, Aqua	FAG40031	500
		SM with Zr. Sleeve, Blue	FAS40031	500
		SM/APC with Zr. Sleeve, Green	FAS40032	500

PATCH CORD AND PIGTAILS



FIBER OPTIC ACCESSORIES



Patch Cord Jumper

- Fiber optic patch cord
- SC/FC/LC/DIN
- Fiber type: Multi-mode 50/125, Single-mode: 9/125
- Simplex mode, duplex mode on request
- Fiber diameter: 3.0mm/2.0mm/0.9mm
- Fiber length: 0.5~999m on request
- Color: blue/green/red/orange or on request

Feature

- All patch cords & pigtails 100% tested, 3D test data can be provided.
- Different boot colors for option
- Simplex or duplex can be specified
- Low insertion loss & high reflection loss
- Strong environment & high temperature stability, comply with Telcordia standard, pass TLC approval

Applications

- Long distance and local light transmission network
- Data Transmission network
- CATV network
- Various kinds of testing and self-control system

Order Information

Pigtail													
Index 3			SM / MM	Connector Type		Fiber Type		Meter		Fiber Diameter		Simplex/Duplex	
P	G	F	S	Res	0	SM	0	0	0	0.9	0	Sx	0
P	G	F	M	SC	1	OM2	1	1	1	2	1	Dx	1
				ILCc	2	OM3	2	2	2	3	2		
				FC	3	OM4	3	3	3				
				DIN	4			4	4				
								5	5				
								6	6				
								7	7				
								8	8				
								9	9				

Order Information

Patch Cord													
Fixed			SM / MM	Connector Type		Fiber Type		Meter		Fiber Diameter		Simplex/Duplex	
P	C	F	S	DIN/SE	0	SM	0	0	0	0.9	0	Sx	0
			M	DIN/DIN	1	OM2	1	1	1	2	1	Dx	1
				SC/SC	2	OM3	2	2	2	3	2		
				LC/LC	3	OM4	3	3	3				
				FC/FC	4			4	4				
				SC/LC				5	5				
				FC/LC				6	6				
				FC/SC				7	7				
				DIN/FC				8	8				
				DIN/LC				9	9				

FIBER OPTIC ACCESSORIES



Fiber Distribution System

Fiber Sliding Patch Panel

Feature

- Movable Fiber Adaptor Panel supply flexibility as needs and demands change
- Front Cover - Avoid the Dust & Brand Prints
- Hinged Tray Design - Easy to Use

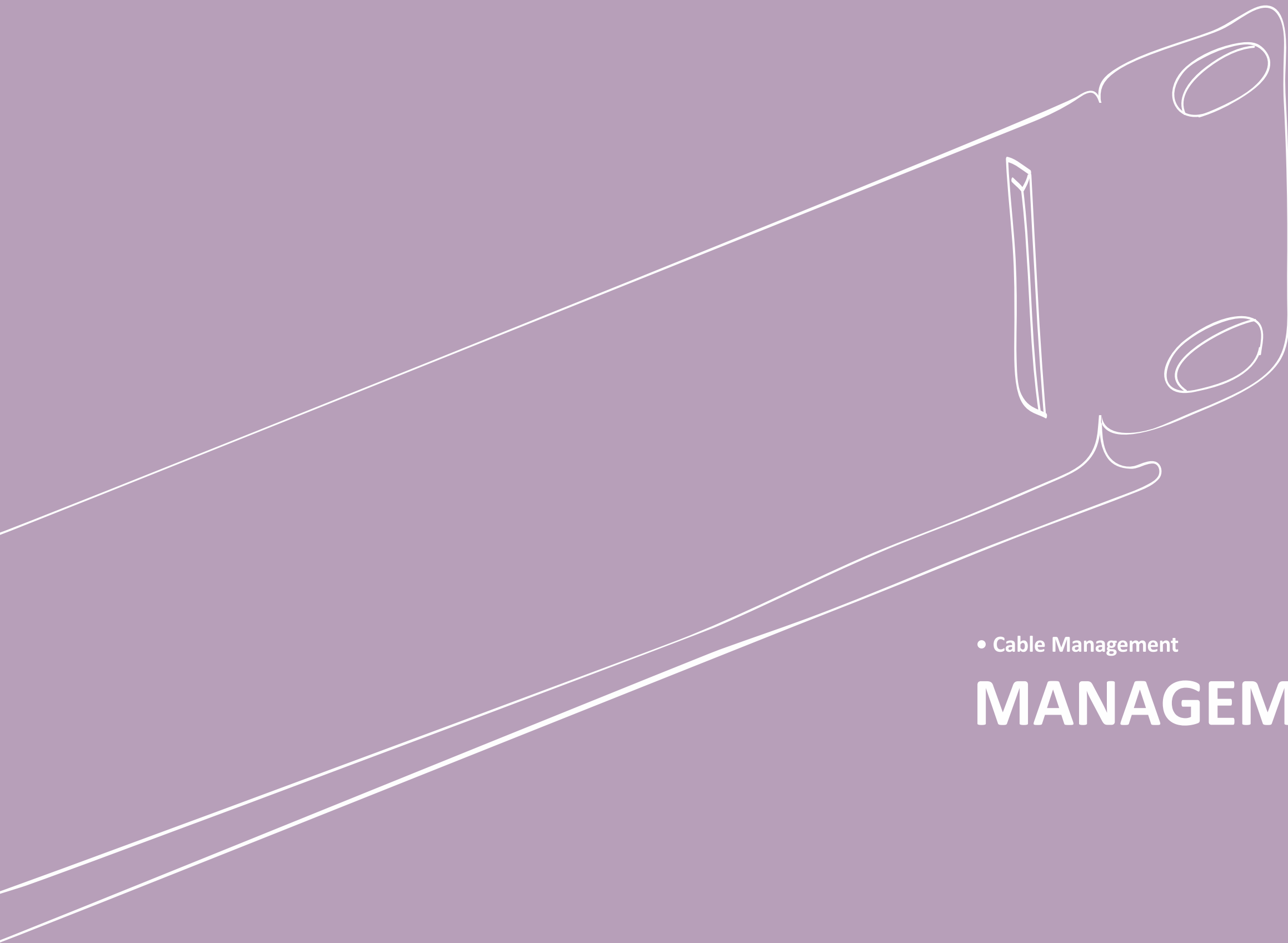
Options	Part Description	Part Number	Std. Ctn. Qty.
Fiber Sliding Patch Panel			
w/o Splice Tray,w/o Adaptor Panel	1U Patch Panel	PPF00000	3
With Adaptor Panel unloaded, w/o Splice Tray	18 Port,3 pcs Adaptor Panel, SC Simplex Flange Type	PPF02018	3
	24 Port, 3 pcs Adaptor Panel, FC D Type	PPF04124	3
	24 Port, 3 pcs Adaptor Panel, ST thread Type	PPF01224	3
	24 Port, 3pcs Adaptor Panel, SC Duplex Flange Type	PPF02324	3
	48 Port, 3 pcs Adaptor Panel, LC Duplex Square Type	PPF03348	3
With Adaptor Panel unloaded, with Splice Tray	18 Port,3 pcs Adaptor Panel, SC Simplex Flange Type	PPF02518	3
	24 Port, 3 pcs Adaptor Panel, FC D Type	PPF04624	3
	24 Port, 3 pcs Adaptor Panel, ST thread Type	PPF01724	3
	24 Port, 3pcs Adaptor Panel, SC Duplex Flange Type	PPF02824	3
	48 Port, 3 pcs Adaptor Panel, LC Duplex Square Type	PPF03948	3
Adaptor Panel, Unload	Blind Type	PPFA0000	200
	6 Port, SC Duplex Flange Type	PPFA2206	200
	8 Port, FC D Type	PPFA4308	200
	8 Port, ST Thread Type	PPFA1408	200
	8 Port, SC Duplex Flange Type	PPFA2208	200
	16 Port, LC Simplex Square Type	PPFA3116	200

FIBER OPTIC ACCESSORIES

Fiber Distribution System

Fiber Accessory

Accessory	Part Description	Part Number	Std. Ctn. Qty.
Fiber Accessory			
	Splice Tray & Spool Cable Routing, Ivory	FACC0001	120
	Splice Tray & Spool Cable Routing, Black	FACC0002	120
	Fusion Splice Protector Sleeve, length2.3, Diameter 0.0625	FACC0051	10,000
	Spool cable routing takes 2pcs/setfull moon cable, Ivory	FACC0101	400
	Spool cable routing takes 2pcs/setfull moon cable, Black	FACC0102	400
	Splice plastic holder for 6 fiber, Ivory	FACC0151	500
	Splice plastic holder for 6 fiber, Black	FACC0152	500
	Splice tray with 2 sets of splice plastic holder, Ivory	FACC0201	70
	Splice tray with 2 sets of splice plastic holder, Black	FACC0202	70

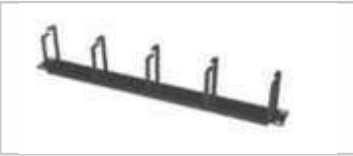





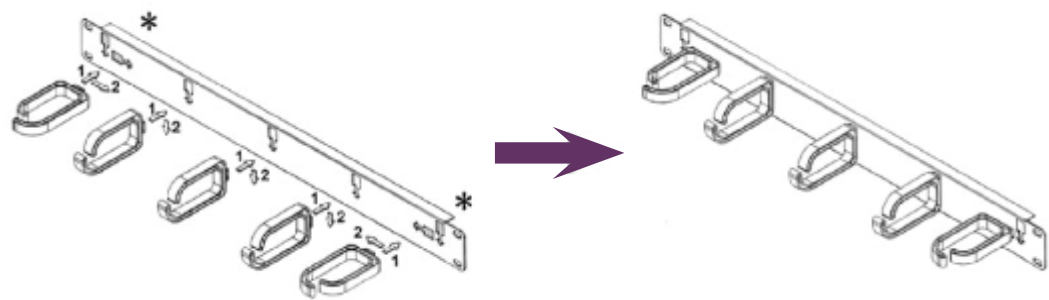
- Cable Management

MANAGEMENT DEVICE

MANAGEMENT DEVICE

Cable Management

	Description	Part Number	Std. Ctn. Qty.
19" CW11 series			
	1U, with metallic holder	CM19M101	50
	2U, with metallic holder	CM19M102	30
19" CW11R series - removable holder			
	1U with plastic holder	CM19P101	50
	2U, with plastic holder	CM19P102	30



Holder installation:

1. Put the cable holder into the panel's whole.
2. Push out onto the correct location


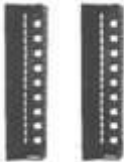

* The holder can be installed horizontally or vertically, depending on the user's need.

MANAGEMENT DEVICE

Cable Management

	Description	Part Number	Std. Ctn. Qty.
19" CW11B series			
	1U Brush Panel, without Cable management Bar	CM19B101	40
	1U Brush Panel, with Cable management Bar	CM19B151	15
19" CWB series			
	1U blind Panel	CM190001	50
	2U blind Panel	CM190002	25
	3U blind Panel	CM190003	15
	4U blind Panel	CM190004	20

Cable Management

	Description	Part Number	Std. Ctn. Qty.
CWR series - Vertical & Horizontal Cable Management			
	Vertical, fits 48" height rack	CM48V001	1
	Vertical, fits 77" height rack, 2 pieces type	CM77V001	1
	1U, Horizontal, Ducting type	CM19D001	16
	2U, Horizontal, Ducting type	CM19D002	15