

GigaLine[®] FO CABLING SYSTEMS

for Data centre · Office · Industry · @home



Data centre



Office



Industry



@home

WELCOME TO THE MEGA STORE FOR CABLE AND SYSTEM SOLUTIONS



GigaLine® CABLING SYSTEMS

Whenever broadband data transmission in combination with large transmission lengths in LAN or MAN is required, fibre optic cable and connection technology is the best choice.

With **GigaLine®** FO cables and **GigaLine®** FO connection technology, KERPEN offers high-speed data highways for backbone networks.

KERPEN products and solutions are used wherever the highest reliability, quality and durability are a must – even in harsh and unfavourable conditions.

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All necessary planning documentation available online:

www.kerpen-data.com

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Safety instructions

Cables are to be used for the designated applications only.

Waiver

The specifications in this document are provided to the best of our knowledge at the time of writing. However, these specifications must not be understood as an assurance of specific properties or suitability for specific purposes as regards the respective products. Such specifications must not be interpreted as an inducement to violate property rights or as an assurance of a corresponding licence. Product suitability for specific applications must be verified beforehand with our specialists. Our policy is one of continuous material and product development. We therefore reserve the right to offer alternatives consistent with our manufacturing programme at the time of enquiry.

Specifications of material properties, fire behaviour, construction, electrical and technical data, prices, etc. are provided to the best of our knowledge and are non-binding. Dimensions and weights are indicative only. Specifications may be changed at any time without notice.

General conditions of sale and delivery

Please refer to our current "General Terms of Sale and Delivery", which we will be pleased to supply upon request.

COMPANY PROFILE

KERPEN DATACOM

INTELLIGENT SOLUTIONS FOR ENERGY AND DATA MANAGEMENT



Building on the activities of the Kerpenwerk, founded in Stolberg in 1919 and taken over by LEONI AG in 2006, KERPEN DATACOM GmbH started on 1 July 2021 with the production and trading of passive data network components, such as copper or fibre optic data cables, RJ45 connectors, patch cables and data centre equipment. Complete passive cabling systems are offered for high-end data rate, reliability and processability requirements. KERPEN DATACOM is one of the top 3 providers in Germany in this field.

The application of the product range spans from building infrastructure to Industry 4.0.

LAN office, LAN industry and data centre with the common denominator Ethernet and Internet Protocol (IP) are growing together and changing the communication landscape. KERPEN DATACOM GmbH also produces PVC compounds for the cable industry.



For further information see:

www.kerpen-data.com

STRONG BRANDS,
GREAT SERVICE

MegaLine®

COPPER CABLES AND PASSIVE SYSTEM
COMPONENTS

GigaLine®

FIBRE OPTIC CABLES AND PASSIVE
SYSTEM COMPONENTS

VarioLine®

MODULAR SYSTEM PERIPHERALS

Our commitment to developing innovative products shows we take our responsibilities seriously. In conjunction with our consulting services, we establish trust as we help our partners accomplish maximum safety for people and infrastructure in their projects.

Installers and retail receive their cabling, connectivity and complete cabling solutions from a single source. Including system solutions for copper and fibre optic technology, and halogen-free energy cables with optional total system integrity. Continuous innovations in safety, environmental compatibility and energy efficiency complete the list of customer benefits.

A local consulting services at all stages of a project, plus a wealth of project experience and far-reaching synergy effects inside and outside KERPEN DATACOM make us one of the most highly regarded international partners in the field of building and infrastructure cabling.



FOR MAXIMUM DATA INTEGRITY AND BANDWIDTH

From the very beginning of the digital data era, we have fulfilled data networking requirements for both the short term and the far future by using great innovation and a forward-looking approach. Whether in structured building cabling systems for industry, data centres and offices – the sustainable copper and glass fibre cables of our own production are among the safest and most innovative products in the primary to tertiary cabling market.

COMBINING INNOVATION WITH SUSTAINABILITY.

THIS IS ONE OF OUR COMPANY'S MOST
IMPORTANT GOALS.

Our vision is to create sustainable connections in technological harmony with the natural resources. The natural cycle offers us the perfect model to emulate here. It is our duty to learn from nature – to use its resources even as we conserve them for future generations. As natural resources grow scarcer and the burden on the environment increases, a rethink is required at all levels of our society. For

KERPEN DATACOM, sustainability is therefore an integral part of our corporate policy.

While trends such as globalisation, mobility and urbanisation are crucial for market movements, our core principles are sustainability and global responsibility. This is why we have set ourselves the goal of becoming an innovative producer of cables for ecotechnology. Another point of vital interest for us is to identify the needs and requirements of tomorrow today, and to supply the markets of the future with future-proof and sustainable solutions. We also view it as our responsibility to take on an active role in shaping the markets for environmentally-friendly energy production – such as solar thermal technology.

KERPEN DATACOM stands for the resource-conserving and low-emission production of sustainable quality cables made with low-pollution elements. We constantly work at optimising the efficiency with which resources are used in the manufacturing

process by deploying energy-efficient machines or taking heat recovery measures. That's why we are environmentally certified according to the ISO 14001 standard, among others.

As a leading European supplier of wires, optical fibre, cables and cable systems for communication and infrastructure projects, it is our responsibility to continuously optimise the sustainability and durability of our products, system solutions and services so as to reduce their impact on the environment. We have to increase the amount of environmentally compatible raw materials in our cable products as well as the recyclability of processed materials or components, thereby creating end products that have been developed today for the environmental standards of tomorrow.

Together with ecological compatibility, future technologies are measured in terms of efficiency, service life, emission reduction and the conservation of natural resources. Innovative cable products and systems, integrated solutions and maximum performance in project management make up the added value that we offer to our customers and business partners. These are also our cornerstones for strong connections into the future.



REACH › There are various environmental directives in the European Union (EU). Directive 2012/19/EU WEEE (Waste Electrical and Electronic Equipment) regulates the disposal of electrical and electronic equipment and components.

The use of certain hazardous substances in electrical and electronic equipment is regulated by Directive 2011/65/EU RoHS 2 (Restriction of Hazardous Substances).

Chemicals and substances in general are covered by Regulation 1907/2006/EC REACH (Registration, Evaluation, Authorisation and Restriction of Chemicals).

REACH

This means avoiding substances such as:

- ▶ Polybrominated diphenyl ether (PBDE)
- ▶ Decabromodiphenyl ether (DecaBDE)
- ▶ Perfluorooctane sulfonate (PFOS)
- ▶ Pentabromodiphenyl ether (PentaBDE)
- ▶ Octabromodiphenyl ether (OctaBDE)
- ▶ Lead (Pb)
- ▶ Mercury (Hg)
- ▶ Cadmium (Cd)
- ▶ Hexavalent chromium (Cr VI)
- ▶ Polybrominated biphenyls (PBB)

Cables, wiring and their associated connectors are governed by the EU WEEE Directive (2012/19/EU) only if they are an internal part of the equipment and components listed.

Cables and conductors have been regulated separately in 2011/65/EU RoHS 2 since 2013 (category 11 or defined as an internal component of the respective product). This does not pertain to optical fibre cable, energy cable (> 250 V) and cable with fixed installation, e.g. in buildings. The only permissible marking according to RoHS 2 is the CE marking, which is printed on the product package.

- ▶ EU Directive 2012/19/EU on waste electrical and electronic equipment.
- ▶ EU Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- ▶ EU Regulation 1907/2006/EC (REACH) – the EU chemicals regulation.

What does REACH mean?

REACH stands for Registration, Evaluation, Authorisation and Restriction of Chemicals.

REACH represents a fundamental harmonisation and simplification of previous chemicals law and applies in all EU Member States.

REACH introduced a 'candidate list' for materials known as Substances of Very High Concern (SVHC): certain duties of providing information apply to SVHCs and the aim is to phase them out in favour of other materials in the future. The list of candidate substances is updated twice yearly by the European Chemicals Agency (ECHA) in Helsinki.

FIRE PROTECTION CABLE IN ACCORDANCE WITH THE EU CONSTRUCTION PRODUCTS REGULATION

HIGHEST SAFETY WITH B2_{ca} CABLES FROM KERPEN DATACOM

Fire provides warmth, light and a sense of security. Fire can also be life-threatening and cause extensive destruction in the event of a fire.

SAFETY IN THE EVENT OF A FIRE

Where fires occur



One third of all fires occur in buildings. Numerous deaths due to gas and smoke poisoning are the consequence.

The average length of time from the development of a fire until the rollover (pyrolysis gases) has decreased drastically in recent years.

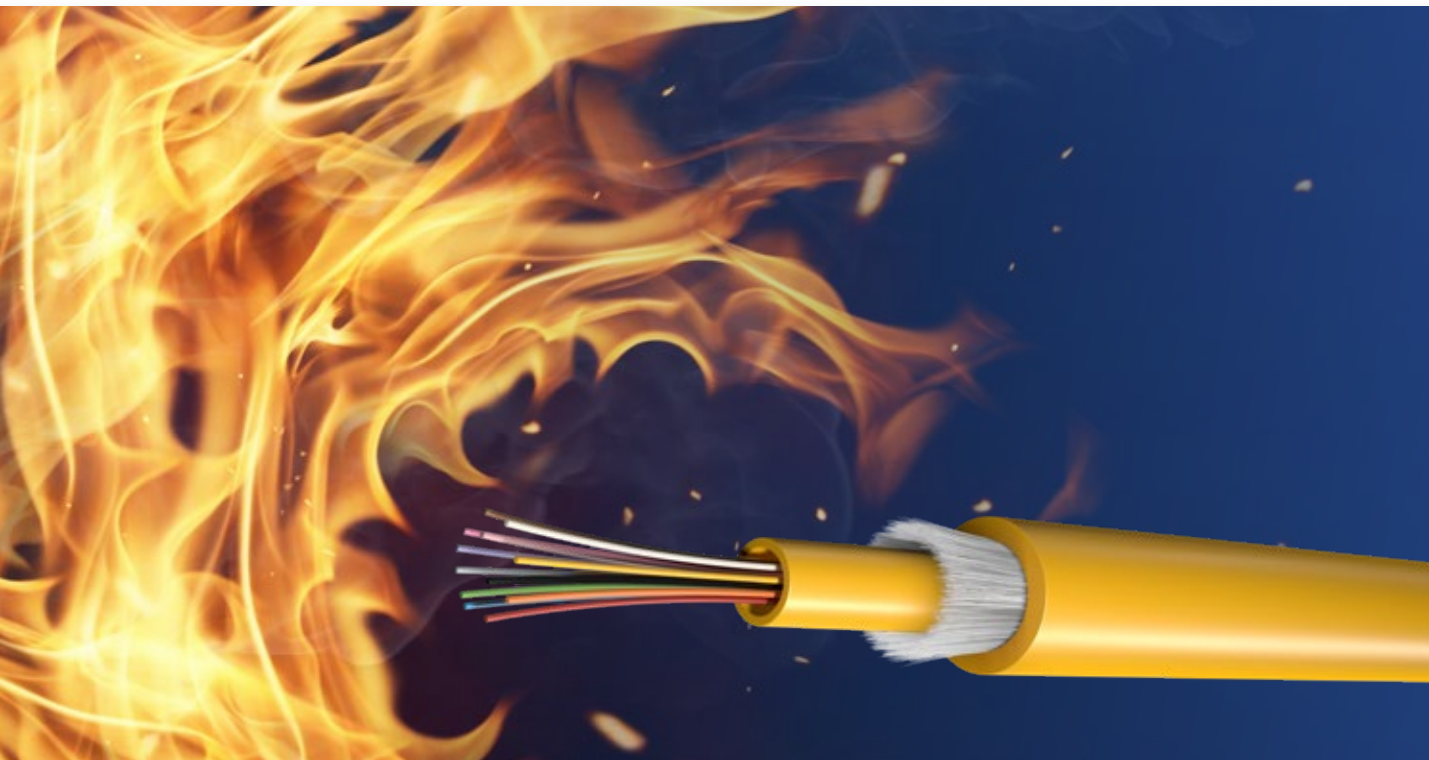
- ▶ 1950: 15 minutes
- ▶ 1985: 5 minutes
- ▶ 2010: 3 minutes

As a result, the available time for a possible escape from the building has also been drastically reduced.

This situation has prompted construction material manufacturers to produce increasingly better and more flame-retardant products.

FIRE SAFETY OF CABLE SYSTEMS

Save lives, impede fires, minimise consequential damage



Saving lives, impeding fires and minimising consequential damages are the priorities when fires break out. Electrical and optical cables must also play their part here, especially given the fact that cable density in modern buildings is constantly increasing. How can cables contribute to a positive behaviour in the event of a fire and/or what dangers are posed by obsolete, insufficiently fire-resistant cables? These questions can be assigned to three categories:

1. Cable may not make a significant contribution to fire propagation. In particular, it must not propagate the fire from one storey to the next. It must also be ensured that there are no droplets and particles that contribute to fire propagation.

2. Smoke and toxic gases must be avoided, because they make safe building evacuation and impede the efforts of rescue or make them impossible. Most cases of death in the event of a fire can be traced to smoke and toxic gases, not to the fire itself. Therefore, this aspect should actually be given top priority.

3. The rebuilding phase comes after the fire. This is complicated when large quantities of corrosive combustion gases have developed from the fire, because these gases build corrosive acids (e.g. hydrochloric acid) when combined with extinguishing water. Such acids are finely dispersed well beyond the location of the fire throughout the entire building, causing damage to all metallic objects. Potential examples include: structural steel, metal constructions, electrical installations, electronics and IT systems.

SAVE
LIVES

IMPEDE
FIRES

MINIMISE
CONSEQUENTIAL
DAMAGE

These three requirements have been incorporated in the fire classification of the new EU Construction Products Regulation.

CE MARKING AND DECLARATION OF PERFORMANCE

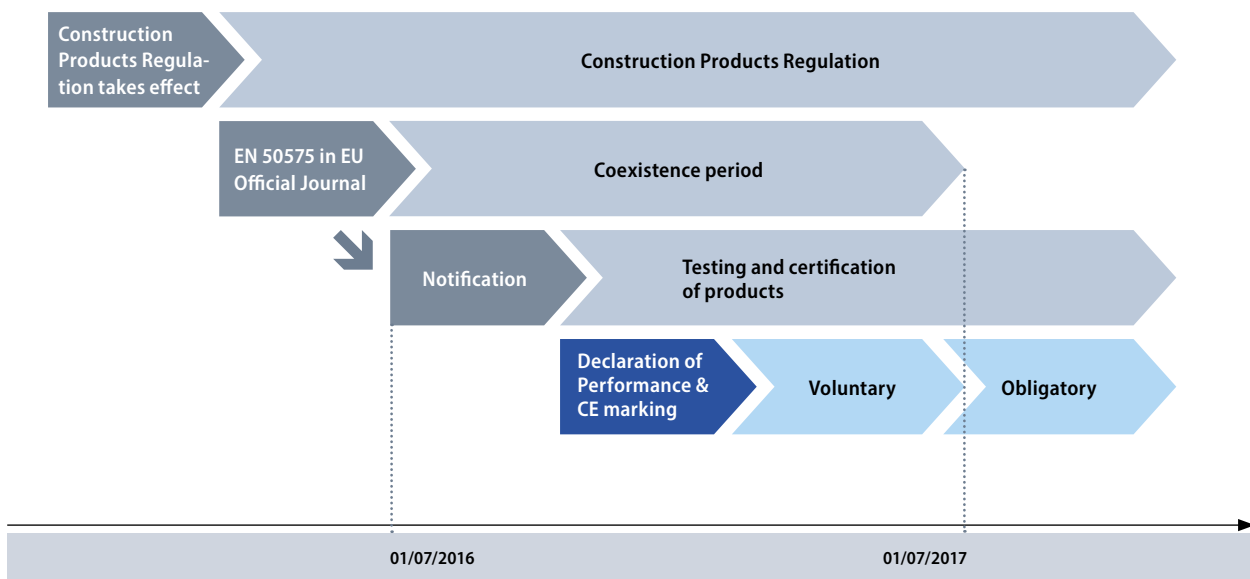
EU Construction Products Regulation

Power, control and communication cables that are permanently installed in structures fall under EU Regulation 305/2011 (Construction Products Regulation). Excluded from this: lift cables, cables inside machinery and cables for use in industrial plants.

The EU Construction Products Regulation defines the conditions for the CE marking and requires a declaration of performance of the manufacturer on the following essential product features derived from the protective goals: fire safety (flame propagation, heat development, smoke production, acid formation, flaming droplets) and the absence of harmful substances. In addition, the Construction Products Regulation specifies how conformity with the requirements is permanently ensured.

With the publication of the harmonised standard EN 50575:2014 in the Official Journal of the European Union, the requirement for implementation of the Construction Products Regulation has now been established for all market participants. This standard states the following: 'Power, control and communication cables, cables for general applications in construction works terms of fire behaviour requirements'. Effective 01 July 2016, a cable manufacturer must provide a CE marking on their products that have been tested and certified by a notified body and issue a corresponding Declaration of Performance.

After the lapse of the coexistence period, which is one year, the CE marking and creation of a Declaration of Performance are mandatory.



The Declaration of Performance certifies compliance with the fire classes defined below and is thus a requirement for use of the cable for the applications defined by the EU Member States.

Note: Cable with insulation and total system integrity (resistance to fire) are handled separately in a different standard to be harmonised in the future. They are therefore not subject to current implementation of the Construction Products Regulation. Application of the Construction Products Regulation for these cables is not expected prior to 2017.

FIRE CLASSIFICATIONS AND PROOF OF CONFORMITY

EU Construction Products Regulation

The classes of fire behaviour are summarised in the following table, wherein a classification of the requirements from A_{ca} (non-flammable) to B1_{ca} or B2_{ca} (very high) to C_{ca} (high), D_{ca} (moderate),

E_{ca} (low) and F_{ca} (no requirement) is provided.

This classification from A to F applies in general to all construction products. The index 'ca' stands for cable.

Classes of fire behaviour of electrical cabins according to DIN EN 13501-6

Test procedure	Parameter	Classification						
		A _{ca}	B1 _{ca}	B2 _{ca}	C _{ca}	D _{ca}	E _{ca}	F _{ca}
EN ISO 1716	PCS (MJ/kg)	≤ 2.0	–	–	–	–	–	–
EN 60332-1	H (mm)	–	≤ 425	≤ 425	≤ 425	≤ 425	≤ 425	–
EN 50399	Flame source (kW)	–	30	20.5	20.5	20.5	–	–
EN 50399	FS (m)	–	≤ 1.75	≤ 1.5	≤ 2.0	–	–	–
EN 50399	THR (MJ)	–	≤ 10	≤ 15	≤ 30	≤ 70	–	–
EN 50399	Max. HRR (kW)	–	≤ 20	≤ 30	≤ 60	≤ 400	–	–
EN 50399	FIGRA (W/s)	–	≤ 120	≤ 150	≤ 300	≤ 1300	–	–

Test procedure	Parameter	Additional classification						
		A _{ca}	B1 _{ca}	B2 _{ca}	C _{ca}	D _{ca}	E _{ca}	F _{ca}
EN 50399/EN 61034	Smoke development	–	s1, s1a, s1b, s2, s3	s1, s1a, s1b, s2, s3	s1, s1a, s1b, s2, s3	s1, s1a, s1b, s2, s3	No	No
EN 60754-2	corrosiveness	–	a1, a2, a3	a1, a2, a3	a1, a2, a3	a1, a2, a3	No	No
EN 50399	Flaming droplets	–	d0, d1, d2	d0, d1, d2	d0, d1, d2	d0, d1, d2	No	No

H: Flame Spread, vertical flame propagation (mm)
FS: Flame Spread, vertical flame propagation (m)
PCS: Pouvoir Calorifique Supérieur, gross calorific value

THR: Total Heat Release (MJ)
HRR: Heat Release Rate, maximum heat release rate (kW)
FIGRA: Fire Growth Rate, index of heat release rate (W/s)

TSP: Total smoke production, total smoke development (m²)
SPR: Smoke Production Rate, max. value of smoke production (m²/s)

Explanation

- s1** = TSP ≤ 50 m² and max. SPR ≤ 0.25 m²/s
- s1a** = **s1** and transmission value according to EN 61034-2 ≥ 80 %
- s1b** = **s1** and transmission value according to EN 61034-2 ≥ 60 % < 80 %
- s2** = TSP ≤ 400 m² and max. SPR ≤ 1.5 m²/s
- s3** = neither s1 nor s2

- d0** = no flaming droplets/particles
- d1** = no flaming droplets/particles for longer than 10 s
- d2** = neither d0 nor d1

EN 60754-2:

- a1** = electrical conductivity < 2.5 μS/mm and pH value > 4.3
- a2** = electrical conductivity < 10 μS/mm and pH value > 4.3
- a3** = neither a1 nor a2. No data = no performance determined.

Conformity monitoring is also set out in detail in the Construction Products Regulation and defined by EN 50575.

The following is a simplified summary of the obligations for the notified approval body and the manufacturer:

Class of fire behaviour	A _{ca}	B1 _{ca}	B2 _{ca}	C _{ca}	D _{ca}	E _{ca}	F _{ca}
System of conformity monitoring	1+				3		4
Obligations of the notified body	Sample testing and recurring factory auditing with random sampling				Sample testing		–
Obligations of the manufacturer	Production monitoring				Production monitoring		–

OVERVIEW OF FIRE TESTING

These are the goals when using safety cables.

1. ►► SAVE LIVES
2. ►► IMPEDE FIRES
3. ►► MINIMISE CONSEQUENTIAL DAMAGE

The fire test according to EN 50399 covers Goals 1 and 2

Because reduced fire propagation, smoke and flaming droplets make an essential contribution to fire safety.

The cables (number used dependent on cable diameter) are mounted onto a ladder in a vertical tube furnace and a flame is applied to them for 20 minutes using an air gas burner (20.5 kW/30 kW). The flue gases are collected with a defined air current (nominal value 8000 l/min) and conducted into an exhaust air duct in which the speed of the air current, the oxygen and CO₂ content, the light absorption and the temperature are measured. This allows the above values to be determined. As many parameters differ from those occurring in the test according to IEC 60332-3, the results cannot be transferred. In particular, the installation of the cable with the distance and elevated air current make the fire scenario more demanding than in IEC 60332-3.

The test according to EN 50399 clearly demonstrates the difference between a cable with high fire safety (below) and a cable of lower quality. The fire propagation, smoke and flaming droplets (above) are observed.

Fire classes according to the Construction Products Regulation

Cables for energy, control and communication technology for fixed installation in buildings are analysed and classified with respect to their fire behaviour according to EU Regulation 305/2011. For this purpose, heat release and flame spread are measured using the above test method according to EN 50399 and evaluated to classify the cables according to the relevant fire class. The cables can also achieve additional classification according to the Construction Products Regulation if smoke production, flaming droplets and acidity are determined.

The test according to EN 50399 allows flame propagation, heat release, smoke production and flaming droplets/particles to be determined.



The majority of the parameters required for cables in the Construction Products Regulation are determined by means of the test according to EN 50399.

A strongly burning cable with increased smoke and flaming droplets/particles.



A cable that fulfils requirements B2_{ca}s1 d1 a1.

Smoke production in the test according to EN 61034: This fire test was carried out with a heavily smoking cable.



EN 61034

Smoke production in the test according to EN 61034: This fire test was carried out on a cable that meets the requirements.



EN 61034

Flame test on individual cable according to EN 60332-1, the basic requirement.



EN 60332-1

Smoke production is subject to especially strict evaluation in the test according to EN 61034.

Reduced smoke production is a key feature for Goal 1 for the evacuation of buildings a high density of occupants and can impede evacuation conditions. The evaluation of corrosivity and/or acidity (EN 50267) is important for the avoidance of consequential damages due to corrosion (Goal 3) and especially for avoidance of toxic effects on people (Goal 2) who are trying to escape from the fire to safety.

The flame test on the individual cable according to EN 60332-1 serves as a basis for less-demanding requirements.

These objectives are met by the Construction Products Regulation in that the safety levels defined by the fire tests are applied in relation to the building in question. The German Electrical and Electronic Manufacturers' Association (ZVEI) has drafted a proposal for the effective application of these safety levels. This is presented below and on the following pages.

Depending on the safety requirement in buildings, the ZVEI recommends the use of fire-resistant cables. Using Class B_{2ca} cables is beneficial in buildings with very high safety requirements. Using cables in line with Class C_{ca} is beneficial in buildings with high safety requirements. A recommendation for the building classification according to the German Model Building Code (MBO) was also drafted on this basis. These recommendations are incorporated into the new versions of the construction regulations for communication and energy systems (DIN EN 50174 part 1-3, DIN VDE 0100-520 and DIN VDE 0100-420).

CABLE TYPES WITH EUROCLASS B2_{ca} s1a d1 a1

Overview of the areas of application

Recommendation of the ZVEI for the fire classes to be applied for cable under the Construction Products Regulation

Fire classes				Safety requirement in the building
Flame propagation Heat development	Smoke production/ density	Flaming droplets	Acid production/ corrosivity	
A _{ca}	–	–	–	Very high
B1 _{ca}	–	–	–	Very high
B2 _{ca}	s1	d1	a1	Very high
C _{ca}	s1	d1	a1	High
D _{ca}	s2	d2	a1	Moderate
E _{ca}	–	–	–	Low
F _{ca}	–	–	–	None

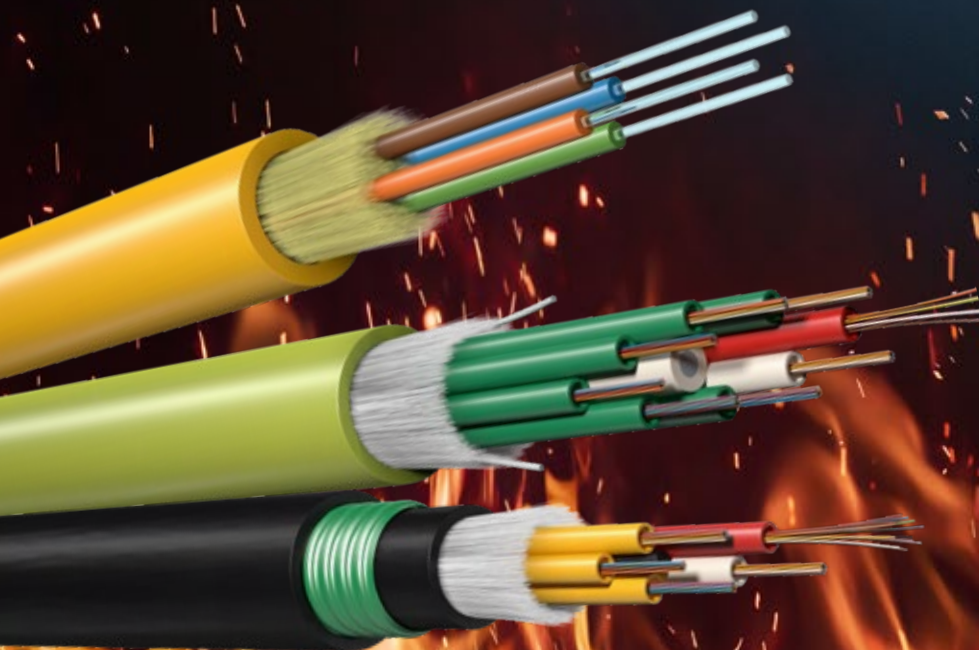
Proposal of the ZVEI for building classification

Building classes according to the German Model Building Code				ZVEI proposal	
Class	Description			Minimum requirement	
				Building (except for escape route)	Escape route
1	Isolated building and isolated building for agricultural or forestry use	Up to 7 m high	no more than 400 m ²	E _{ca}	–
2	Building	Up to 7 m high	no more than 400 m ²	E _{ca}	–
3	Other buildings	Up to 7 m high	–	E _{ca}	B2 _{ca} s1 d1 a1
4	Other buildings	Up to 13 m high	up to n × 400 m ²	E _{ca}	B2 _{ca} s1 d1 a1
5	Other buildings including underground buildings	–	–	C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1

Special structures				ZVEI proposal	
S1	High-rise buildings	Higher than 22 m		C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S2	Construction systems	Higher than 30 m		C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S3	Building	More than 1600 m ² largest storey, excluding residential buildings and garages		C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S4	Retail buildings	Larger than 800 m ²		C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S5	Office/administration	Rooms larger than 400 m ²		C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S6	Building with rooms	Individual rooms for use by more than 100 persons		C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S7	Assembly buildings	More than 200 persons		C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S8	Restaurants/hotels	occupancy of more than 40 guests in buildings, more than 12 beds, amusement halls larger than 150 m ²		C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S9	Buildings with units for care or dependants	More than 6 persons, intensive care requirement		B2 _{ca} s1 d1 a1	B2 _{ca} s1 d1 a1
S10	Hospitals			B2 _{ca} s1 d1 a1	B2 _{ca} s1 d1 a1
S11	Other facilities for accommodation of persons as well as residences			C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S12	Day care facilities for children, disabled and elderly persons			B2 _{ca} s1 d1 a1	B2 _{ca} s1 d1 a1
S13	Schools, universities and similar facilities			C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S14	Correctional facilities / involuntary treatment			C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S16	Leisure / amusement parks			C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
S18	Warehouse with top edge of loaded goods higher than 7.5 m			E _{ca}	B2 _{ca} s1 d1 a1
S19	Construction systems for storage of materials with an elevated risk of fire			B2 _{ca} s1 d1 a1	B2 _{ca} s1 d1 a1

Additional specified structures		ZVEI proposal	
Manufacturing		C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1
Server rooms		B2 _{ca} s1 d1 a1	B2 _{ca} s1 d1 a1
Road tunnels		B2 _{ca} s1 d1 a1	B2 _{ca} s1 d1 a1
Railway tunnels		B2 _{ca} s1 d1 a1	B2 _{ca} s1 d1 a1
Underground garages		C _{ca} s1 d2 a1	B2 _{ca} s1 d1 a1

ON THE SAFE SIDE WITH KERPEN DATACOM



KERPEN DATACOM currently offers the best data cable technology available for fire protection.

In addition to standard cables corresponding to the fire classes D_{ca} or E_{ca}, the company can also provide fire class B2_{ca} cables. Euroclass B2_{ca} s1 d1 a1 fire protection cable offers the highest safety with:

- ▶ **Reduced fire propagation**
- ▶ **Reduced heat development**
- ▶ **Low smoke density**
- ▶ **Low acid production**
- ▶ **Reduced droplet formation**

The quality of these cable products is assured by:

- ▶ **Conformity verification 1+**
- ▶ **Declaration of Performance**
- ▶ **CE mark**

SHEATH COLOUR CODE FOR FO CABLES

The sheath colour of the **GigaLine**® indoor cables indicates the fibre category and shows its transmission properties.

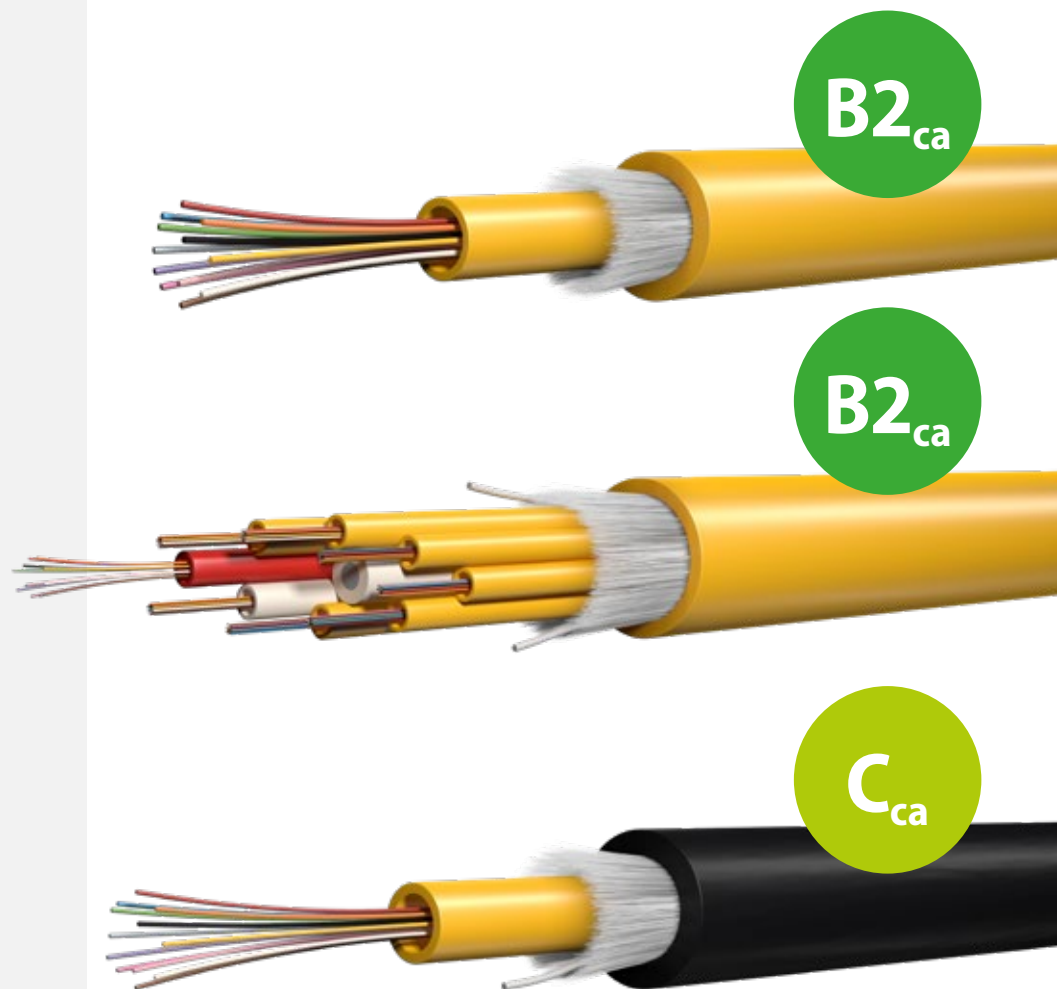
As such, a marking or distinction between fire classes cannot be indicated by a sheath colour code.

Examples:

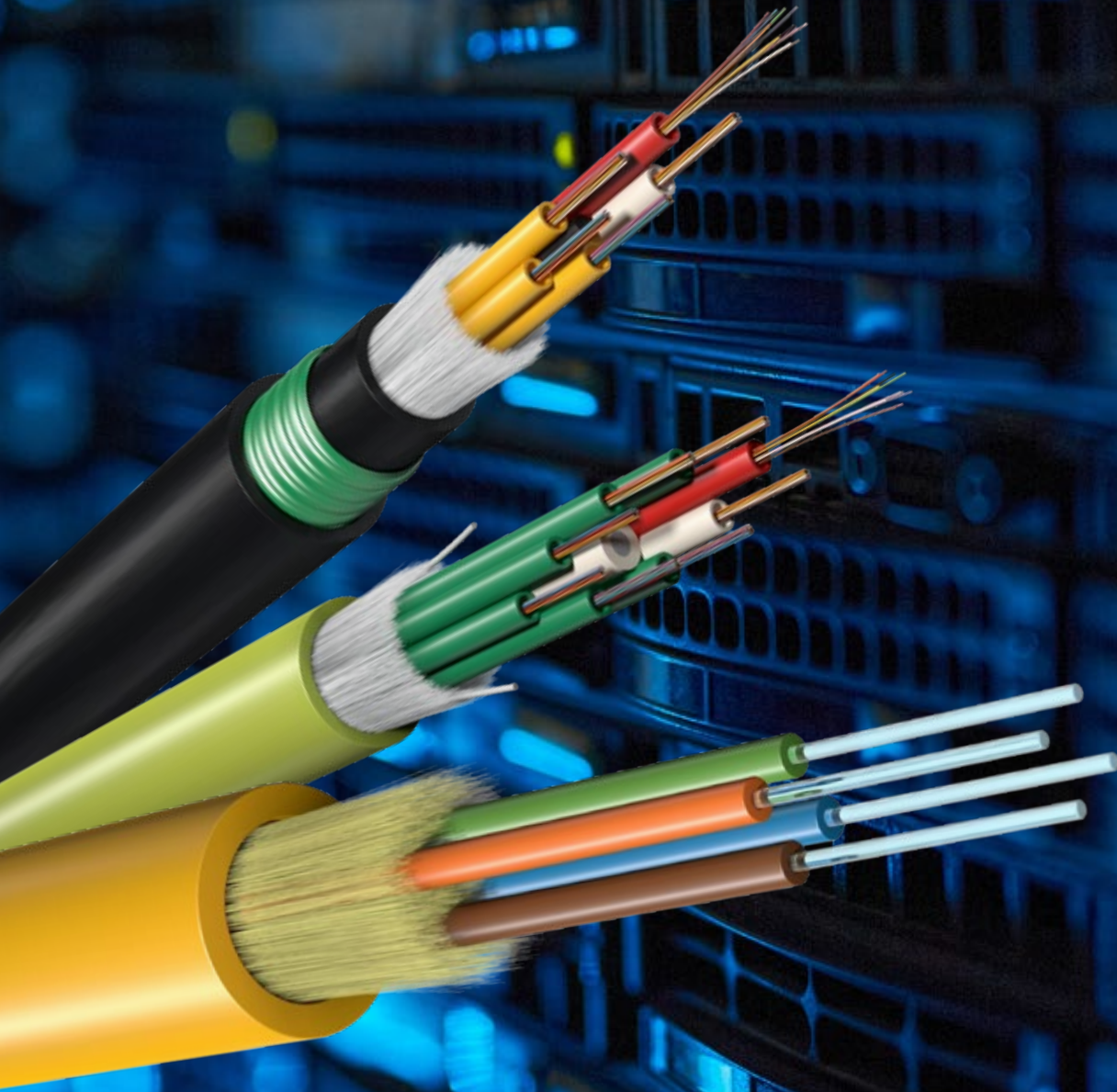
GigaLine® I-B(ZN)BH central B2_{ca}


















GigaLine® I-B(ZN)BH stranded B2_{ca}

GigaLine® U-DQ(ZN)BH central C_{ca}



GigaLine® FO DATA CABLES



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	GigaLine® universal cable, central 3500N	KL-U-DQ(ZN)BH 1xn G/E	Class D _{ca} 36
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	GigaLine® "fire secured" universal cable, central with CI	KL-U-D(ZN)BH 1xn G/E 90 min system integrity	Class D _{ca} 40
	GigaLine® "fire secured" universal cable, central with CI	KL-U-DQ(ZN)H(SR)H 1xn G/E 180 min circuit integrity	Class C _{ca} 41
	GigaLine® outdoor cable, central 1750N	KL-A-DQ(ZN)B2Y 1xn G/E	42
	GigaLine® outdoor cable, stranded 5000N	KL-A-DQ(ZN)B2Y nxm G/E	43



Office cables



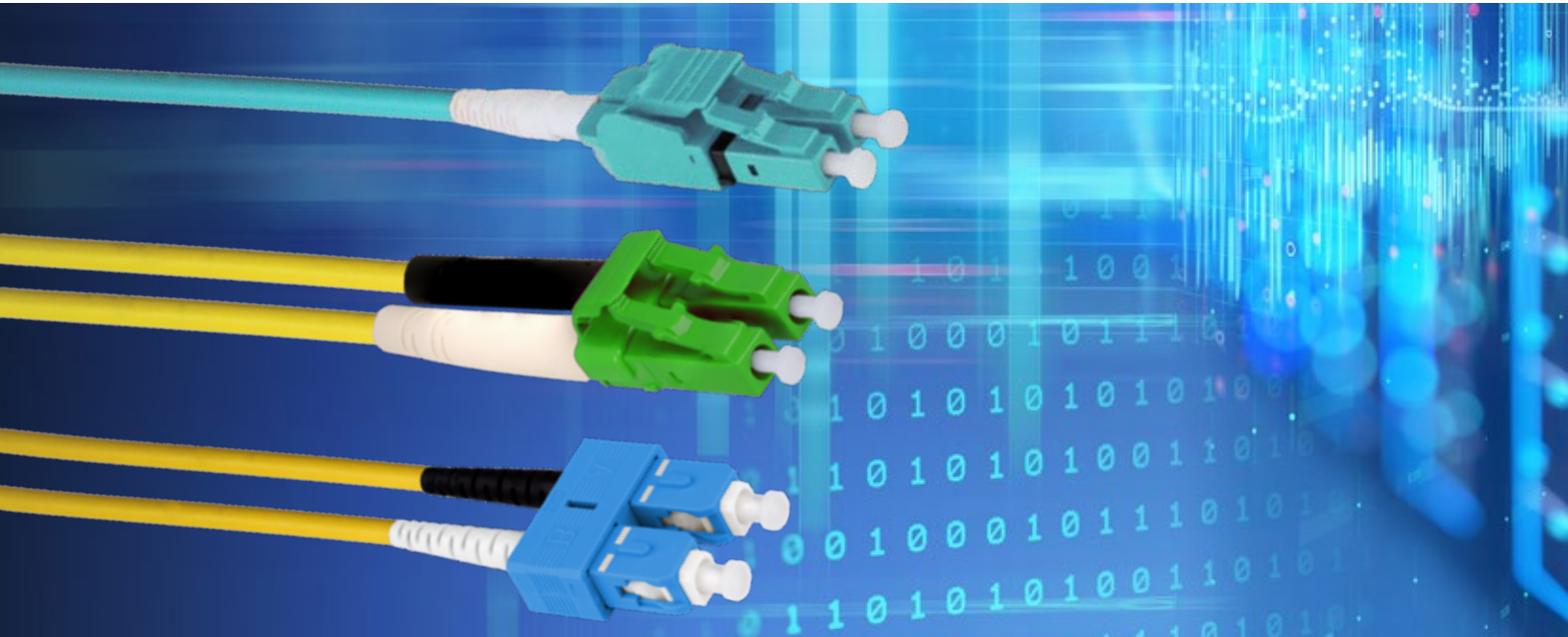
Data centre cables



Industrial cables

GigaLine® FO DATA CABLES

The fibre



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.

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

THE RIGHT FIBRE

KERPEN DATACOM offers a comprehensive range of optical fibres tailored to the various network requirements such as future-proof high-performance transmission in data centres, low-cost office networks and stable industrial networks.

OM5 FUTURE-PROOF WITHOUT COMPROMISE

The bend-insensitive OM5 multimode fibre fulfils the requirements of the OM4 standard for the serial transmission of 10 Gbit/s and 25 Gbit/s with an EMB of 4,700 MHz x km over 550 m. The fibre has been optimised for applications with 850 nm VCSEL and offers the possibility of use at transmission rates of 40 Gbit/s or 100 Gbit/s going into the future. OM5 is the first choice when speed and high data rates are important.

BEND-INSENSITIVE OM3 FOR 10 GBE NETWORKS

The sophisticated IT cabling in data centres and office buildings, with a 10 Gigabit Ethernet-compatible network, is based on the laser-optimised OM3 fibre.

The optimum multimode fibre for every application:

	OM3	OM4	OM5	OS2
LAN Industry				
LAN Office				
LAN Industry				

OM5 – THE NEW MULTIMODE FIBRE GENERATION

100 Gbit/s over one fibre or one fibre pair with SWDM

The new multimode fibre OM5 opens up a whole new range of possibilities to increase data rates. 100 Gbit/s can be transmitted using the well-established LC connector technology over one fibre, for example.

WHAT IS AN OM5 FIBRE?

OM5 is not simply a better version of OM4. OM5 is a broadband multi-mode fibre with usable optical properties up to 953 nm.

The optical and mechanical specifications are the same as those of OM4, with additional specifications of effective modal bandwidth (EMB) and attenuation at 953 nm.

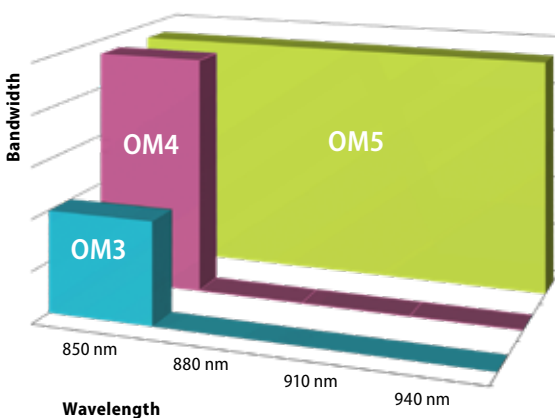
OM5 is designed for operation with VCSEL transmitters across the entire wavelength range from 846 nm to 953 nm.

WHAT IS THE DIFFERENCE BETWEEN OM5 AND OM4?

- ▶ Geometrically and mechanically the same as OM4
- ▶ Attenuation and bandwidth at 850 nm and 1300 nm, additionally specified at 953 nm
- ▶ EMB at 850 nm, additionally specified at 953 nm
- ▶ More rigorous values for chromatic dispersion
- ▶ Full backward compatibility with OM3 and OM4

▶▶ ALL THE BENEFITS OF OM4 AND COMPARABLE PROPERTIES EVEN AT HIGHER WAVELENGTHS

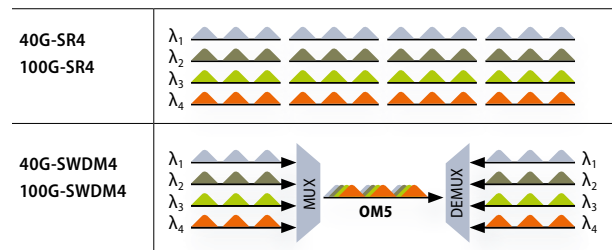
BANDWIDTHS COMPARED



WHAT ARE THE ADVANTAGES OF THE OM5 FIBRE?

This can be used for SWDM systems (Shortwave Wavelength Division Multiplexing). Based on low-cost VCSELs, this technology can be used with an OM5 fibre for parallel transmission of four

wavelengths with up to 25 Gbit/s on a single fibre. This means that 100 Gbit/s can be transmitted on one fibre pair instead of eight (2x4) fibres.



WHAT COLOUR ARE THE OM5 CABLES?

In February 2017, TIA TR-42 defined lime green as the outer sheath colour for OM5 cables.

WHAT APPLICATIONS ARE CONCEIVABLE IN THE FUTURE?

SWDM and OM5 technology opens a whole range of unprecedented possibilities. For example, systems up to 400 Gbit/s are possible with the already commonly available 12/8-fibre MPO technology. What is more, this paves the way for the next generations, e.g. 1.6 Tbit/s with 2x16 fibres.

OVERVIEW OF TECHNICAL SPECIFICATIONS

OM5 fibre, bend-insensitive G50/125 2.5B3500/0.7F500 j-BendAble complies with IEC 60793-2-10 type A1a.4b and ITU G651.1

Optical fibre G50/125 µm		
Structure	Fibre core	Ø 50 µm ± 2.5 µm
	Cladding	Ø 125 µm ± 1 µm
	Primary coating	Ø 242 µm ± 7 µm
Attenuation coefficient	at 850 nm	2.3 dB/km (unwired) 2.5 dB/km (wired)
	at 953 nm	1.7 dB/km (unwired) 1.8 dB/km (wired)
	at 1,300 nm	0.6 dB/km (unwired) 0.7 dB/km (wired)
Bandwidth	at 850 nm	min. 3,500 MHz x km
	at 953 nm	min. 1,850 MHz x km
	at 1,300 nm	min. 500 MHz x km
Laser bandwidth	at 850 nm	min. 4,700 MHz x km
	at 953 nm	min. 2,470 MHz x km
Refraction index	at 850 nm	1.483
	at 953 nm	1.478

SUMMARY

- ▶ Designed for SWDM4
- ▶ 100 Gbit/s on one fibre or one fibre pair
- ▶ Backward compatible with OM4 and OM3
- ▶ The OM5 fibre is bend-insensitive
- ▶ Cable colour: Lime green

GigaLine® FIBRE QUALITIES

Fibre specifications	G50/125	G50/125	G50/125	E9/125	E9/125	E9/125
IEC 11801 / EN 50173	OM3	OM4	OM5	OS2	OS2	OS2 low bend
IEC 60793-2	A1a.2	A1a.3	A1a.4b	B1.3		B6_a
ITU-T	G651	G651	G651.1	G652.D	G652.D + G657.A1	G657.A2
Attenuation coefficient						
dB/km at 850 nm	max. 2.5	max. 2.5	max. 2.5	—	—	—
dB/km at 953 nm			max. 1.8			
dB/km at 1,300 nm	max. 0.7	max. 0.7	max. 0.7			
dB/km at 1,310 nm				max. 0.36	max. 0.36	max. 0.36
dB/km at 1,383 nm	—	—	—	max. 0.36	max. 0.36	max. 0.36
dB/km at 1,550 nm				max. 0.23	max. 0.23	max. 0.23
dB/km at 1,625 nm				max. 0.23	max. 0.23	max. 0.23
Bandwidth						
MHz x km at 850 nm	min. 1,500	min. 3,500	min. 3,500	—	—	—
MHz x km at 953 nm	—	—	min. 1,850	—	—	—
MHz x km at 1300 nm	min. 500	min. 500	min. 500	—	—	—
Laser bandwidth						
MHz x km at 850 nm	min. 2,000	min. 4,700	min. 4,700	—	—	—
MHz x km at 953 nm	—	—	min. 2,470	—	—	—
Dispersion						
at 1,310 nm	—	—	—	max. 3.5 ps/nm x km	max. 3.5 ps/nm x km	max. 3.5 ps/nm x km
at 1,550 nm	—	—	—	max. 18 ps/nm x km	max. 18 ps/nm x km	max. 18 ps/nm x km
Zero-dispersion wavelength	—	—	—	$1,302 \leq \lambda_0 \leq 1,322$	$1,302 \leq \lambda_0 \leq 1,322$	$1,302 \leq \lambda_0 \leq 1,322$
Zero-dispersion slope	—	—	—	$\leq 0.092 \text{ ps/nm}^2 \times \text{km}$	$\leq 0.092 \text{ ps/nm}^2 \times \text{km}$	$\leq 0.092 \text{ ps/nm}^2 \times \text{km}$
PMD						
Fibres	—	—	—	$< 0.1 \text{ ps}/\sqrt{\text{km}}$	$< 0.1 \text{ ps}/\sqrt{\text{km}}$	$< 0.1 \text{ ps}/\sqrt{\text{km}}$
Link	—	—	—	$< 0.06 \text{ ps}/\sqrt{\text{km}}$	$< 0.06 \text{ ps}/\sqrt{\text{km}}$	$< 0.06 \text{ ps}/\sqrt{\text{km}}$
Segment length with Gigabit Ethernet						
at 850 nm (1000 BASE SX)	900 m	1000 m	1000 m	—	—	—
at 1300 nm (1000 BASE LX)	550 m	550 m	550 m	5000 m	5000 m	5000 m
Segment length with 10 Gigabit Ethernet						
at 850 nm (10G BASE-SR/SW)	300 m	550 m	550 m	—	—	—
at 1,300 nm (10G BASE-LX4)	300 m	300 m	300 m	10,000 m	10,000 m	10,000 m
at 1,550 nm (10G BASE-ER/EW)	—	—	—	40,000 m	40,000 m	40,000 m
Segment length with 40 Gigabit Ethernet						
at 850 nm 40 GBASE-SR4	100 m	150 m	150 m	—	—	—
at 1310 nm 40 GBASE-LR4	—	—	—	10,000 m	10,000 m	10,000 m
at 850 nm – 953 nm 40G-SWDM4*	240 m	350 m	440 m	—	—	—
Segment length with 100 Gigabit Ethernet						
at 850 nm 100 GBASE-SR10	100 m	150 m	150 m	—	—	—
at 1310 nm 100 GBASE-LR4	—	—	—	10,000 m	10,000 m	10,000 m
100 GBASE-ER4	—	—	—	40,000 m	40,000 m	40,000 m
at 850 nm – 953 nm 100G-SWDM4**	75 m	100 m	150 m	—	—	—
Numerical aperture						
Nominal value	0.20	0.20	0.20	0.12	0.12	0.12
Refractive index (nominal value)						
at 850 nm	1.483	1.483	1.483	—	—	—
at 1,300 nm	1.478	1.478	1.478	—	—	—
at 1,310 nm	—	—	—	1.467	1.467	1.467
at 1,550 nm	—	—	—	1.467	1.467	1.467
Proof load						
	$\geq 100 \text{ kpsi}$ $\geq 8.8 \text{ N}$	$\geq 100 \text{ kpsi}$ $\geq 8.8 \text{ N}$	$\geq 100 \text{ kpsi}$ $\geq 8.8 \text{ N}$	$\geq 100 \text{ kpsi}$ $\geq 8.8 \text{ N}$	100 kpsi $\geq 8.8 \text{ N}$	100 kpsi $\geq 8.8 \text{ N}$

* Source: 40G SWDM4 MSA Technical Specifications Rev 2, Table 2-2: 100G-SWDM4 operating range

** Source: 100G SWDM4 MSA Technical Specifications Rev 2, Table 2-2: 100G-SWDM4 operating range

JACKETING MATERIAL FOR FIBRE OPTIC CABLES

GigaLine® COLOUR CODES

BALANCING APPLICATION AND FIRE PREVENTION CRITERIA

The sheath around the cable protects the optical fibres 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. However, it is often extremely difficult to meet all the requirements using just one sheath material. To best satisfy the prevailing local operating conditions, KERPEN DATACOM 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 customised measures when making the sheath, e.g. aluminium tape or special mixtures of sheaths.

Cable sheath material

Material characteristics	FRNC	PUR	PVC	PE
Resistance to ageing	+	+	+	+
Halogen content	+	+	--	+
Flame resistance	+	•	+	--/•
Elasticity	-	+	•	-
Abrasion resistance	-	++	+	+/-
Low smoke gas generation	++	•	-	--/•
Low emission of corrosive gases	++	•	--	+/•
Low smoke gas toxicity	++	•	--	+/•
Toxicological safety	++	•	-	+/•

Cable sheath material

General resistance to	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	+	-	+	+

++ excellent

+ good

• depends on recipe

- weak

-- unsatisfactory

1) Increased resistance due to the addition of black colour pigments/UV stabilisers

2) Permeation dep. on the gas type, 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

COLOUR CODES

Wires (with stranded loose tubes)		Mini-breakout cable EIA/TIA 598C		Fibres (in loose tubes) IEC 60304			
		Fibre no.	Colour	Fibre no.	Colour	Fibre no.	Colour
Counting wire	Red	1	Blue	1	Red	13	Red/black
Counting direction wire	white	2	Orange	2	Green	14	Green/black
Other wires	Green for G50/125	3	Green	3	Blue	15	Blue/black
	Blue for G62,5/125	4	Brown	4	Yellow	16	Yellow/black
	Yellow for E9/125	5	Grey	5	white	17	White/black
Blind elements	Natural colours	6	white	6	Grey	18	Grey/black
		7	Red	7	Brown	19	Brown/black
		8	Black	8	Violet	20	Violet/black
		9	Yellow	9	Turquoise	21	Turquoise/black
		10	Violet	10	Black	22	Natural/black
		11	Pink	11	Orange	23	Orange/black
		12	Turquoise	12	Pink	24	Pink/black

GigaLine® TYPE CODES

for easy assignment of the construction elements in fibre optic cables

		GigaLine®								
		1	2	3	4	5	6	7	8	9
Cable type										
Communication cable	KL									
Applications										
Indoor cable	I									
Universal cable	U									
Outdoor cable	A									
Breakout outdoor cable	AT									
Core type										
Buffered loose tube	V									
Gel-filled loose tube	D									
Dry loose tube	B									
Constructional composition										
Swelling material, dry, longitudinally watertight	Q									
Water-blocking gel-filled, longitudinally watertight	F									
Non-metallic strain relief	(ZN)									
Steel strain relief	(ZS)									
Armouring	B									
Corrugated steel tape	(SR)									
Cable sheath										
PE Polyethylene sheath	2Y									
Al + PE coated aluminium sheath	(L)2Y									
FRNC Halogen-free/flame-retardant sheath	H									
PVC Polyvinyl chloride sheath	Y									
PA Polyamide sheath	4Y									
PUR Polyurethane sheath	11Y									
Fibre number and fibre bundling										
Number of fibres	n									
Number of loose tubes x number of fibres per tube	nxm									
Miscellaneous										
n Field diameter/sheath diameter in...	E9/125									
n Core diameter/sheath diameter in...	G50/125									
Wavelength										
850 nm	B									
1,300/1,310 nm	F									
1550 nm	H									
Bandwidth/dispersion coefficient										
in MHz km with multi-mode fibres										
in ps/nm-km with single-mode fibres										

RODENT PROTECTION IN FO CABLES / PICTOGRAMS

Fibre optic cables are relatively thin and therefore very susceptible to rodent damage. Depending on the application it can be important for fibre optic cables to be able to offer protection from 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 rovings. 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 rovings, 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 favourable leverage in combination with the larger core diameter. The cable then acts like a gag bit. Before the rodent reaches the glass rovings, however, it first has to gnaw through the outer sheath. Constructions with an additional polyamide sheath (thickness 0.5 mm) have also proven effective 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 fibres. Metal armoring is highly 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 armour

The steel wire armour 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.

Overview of pictograms



Flame-retardant and halogen-free sheath

The outer sheath of the cable is self-extinguishing and does not propagate fire. The halogen-free sheath material forms neither toxic nor corrosive combustion gases in the event of fire.



Chemical resistance

Generally good resistance to oil, petrol, acids and alkaline solutions



Rodent protection

The cable core is protected from damage by rodents by means of glass rovings.

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



Rodent protection

The cable core is more heavily protected against damage by rodents with two sheaths and metal armoring.

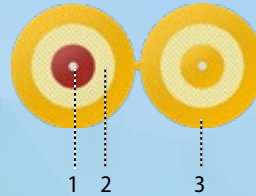
Note: Despite all the precautions, damage to the outer sheath can never be fully ruled out.



The cable outer sheath

is resistant to UV rays.

GigaLine® INDOOR CABLE, DUPLEX FIG 8



Benefits

- ▶ low space requirements
- ▶ very flexible
- ▶ fibre type indicated by sheath colour

Type KL-I-V(ZN)H 2 G/E

Use

Connection cable and patch cord for structured cabling acc. to ISO/IEC 11801 and EN 50173.

Ideal for all applications from Class OF 300 to OF 10000 according to fibre type. Suitable for direct connector assembly using adhesive technology. Not suitable for crimp connector assembly.

Installation in dry rooms, in cable ducts, on cable trays or in conduits.

Structure

- ① Two single cables (2.8 mm with 900 µm semi-light buffered loose tubes) with strain relief in fig. 8 sheath with separator
- ② Strain relief Non-metallic (aramid yarns)
- ③ Cable sheath Halogen-free, flame-retardant compound

Sheath colour	OS2	◆ Yellow
	OM3	◆ Aqua
	OM4	◆ Heather violet
	OM5	◆ Lime green

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-10 °C up to +70 °C

Mechanical characteristics

Min. bending radius	static	30 mm
	(over flat side) dynamic	60 mm
Max. crush strength	long-term	600 N/dm
	short-term	1000 N/dm

Fire behaviour

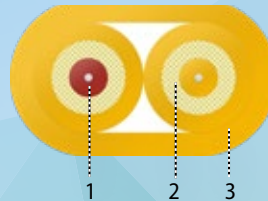
Smoke density	IEC 61034
Halogen free	IEC 60754-1
Flame retardancy	IEC 60332-1-2, IEC 60332-3-22, Cat. A

Fibre count	Core type	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.		
	µ	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OS2 G652.D+G657.A1 E9/125
2	900	2.8x5.7	15.8	600	0.36	LKD8DA520000000	LKD8DA720000000	LKD8DC720010000
2	600	1.8x3.7	7	400	0.14	LKD8XA520130000	LKD8XA700130000	LKD8XC700130000

GigaLine® INDOOR CABLE, DUPLEX FIG 0



CPR

D_{ca}

Benefits

- ▶ Robust construction
- ▶ fibre type indicated by sheath colour

Type KL-I-V(ZN)HH 2 G/E

Use

Connection cable and patch cord for structured cabling acc. to ISO/IEC 11801 and EN 50173.

Ideal for all applications from Class OF 300 to OF 10000 according to fibre type. Suitable for direct connector assembly using adhesive technology. Not suitable for crimp connector assembly.

Installation in dry rooms, in cable ducts, on cable trays or in conduits.

Structure

- 1 Two single cables with strain relief (2.1 mm with semi-light buffered loose tubes 900 µm) in parallel under a sheath
 - 2 Strain relief Non-metallic (aramid yarns)
 - 3 Cable sheath Halogen-free, flame-retardant compound
- | | | |
|---------------|-----|------------------|
| Sheath colour | OS2 | ◆ Yellow |
| | OM3 | ◆ Aqua |
| | OM4 | ◆ Heather violet |
| | OM5 | ◆ Lime green |

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-10 °C up to +70 °C

Mechanical characteristics

Min. bend radius	static	35 mm
	dynamic	65 mm
	for single elements	30 mm
Max. pulling force		600 N
Max. crush strength	long-term	500 N/dm
	short-term	750 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Flame retardancy	IEC 60332-1-2, IEC 60332-3-22, Cat. A
Class	D _{ca} s2 d2 a2 in accordance with EN 50575 / EN 50390
DoP	CDESK0000081

Other characteristics

Cable bending	IEC 60794-1-2 E11
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Certificates and approvals

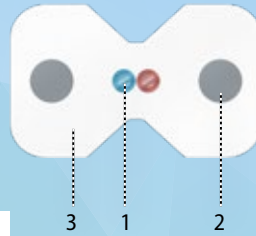
Compliant with Construction Products Regulation (EU/305/2011):

Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.			
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 G652.D+G657.A1 E9/125
2	3.2x5.2	19	600	0.63	LKD8DA520010000	LKD8DA720050000	LKD8DA920010000	LKD8DC700100000

GigaLine® INDOOR CABLE, DROPCABLE

for GPON/FTTH applications

CPR

E_{ca}

Type KL- I-F(ZN)H 2 E9/125

Description

FO indoor cable with two fibres and two strain relief elements.
Halogen free, flame-retardant.
Properties/applications
For GPON applications and direct connector assembly.

Routing

Indoors, in cable ducts, conduits or on cable trays.

Structure

- ① Fibre quality E9/125 0.36F4/0.22H18-Low bend OS2
Core single elements with fibres and strain relief
- ② Strain relief Non-metallic, aramid
- ③ Cable sheath Halogen-free, flame-retardant compound
Sheath colour ◇ White

Thermal properties

Transport/storage -25 °C up to +70 °C
Routing -5 °C up to +50 °C
Operating temp. -10 °C up to +70 °C

Mechanical characteristics

Min. bend radius	static	15 x outer Ø
	dynamic	20 x outer Ø
Max. crush strength	Single element	30 mm
	long-term	300 N/dm
	short-term	1000 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Acidity of combustion gases	IEC 60754-2
Flame retardancy	IEC 60332-1-2
Class	E _{ca} in accordance with EN 50575 / EN 50390

Certificates and approvals

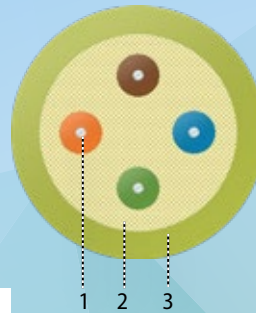
Compliant with Construction Products Regulation
(EU/305/2011): **CE**

Fibre count	Weight approx.	Cable dimensions (WxH)	Order no.
	kg/km		
2	9.0	2x3	OS2 ITU-T G657.A2 LKD8BC220050000

GigaLine® INDOOR CABLE, MINI BREAKOUT



CPR

D_{ca}

Benefits

- ▶ low space requirements
- ▶ very flexible
- ▶ bendable in every direction
- ▶ fibre type indicated by sheath colour

Type KL-I-V(ZN)H n G/E

Use

Campus/backbone cabling, suitable for direct connector assembly using adhesive technology. Not suitable for crimp connector assembly. Connection cable and patch cord for structured cabling according to ISO/IEC 11801 and EN 50173. Ideal for all applications from Class OF 300 to OF 10000 according to fibre type. Installation in dry rooms, in cable ducts, on cable trays or in conduits.

Structure

max. 12 semi-light buffered loose tubes (900 µm) stranded

- ◆ under an outer sheath Colour code ▶ blue, orange, green, brown, grey, white, red, black, yellow, violet, pink, turquoise
- Strain relief Non-metallic (aramid yarns)
- ◆ Cable sheath Halogen-free, flame-retardant compound
- ◆ Sheath colour

OS2	◆ Yellow
OM3	◆ Aqua
OM4	◆ Heather violet
OM5	◆ Lime green

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-5 °C up to +70 °C

Mechanical characteristics

Min. bend radius	static	10 x outer Ø
	dynamic	15 x outer Ø
Max. pulling force	for single elements 30 mm	
		800 N
Max. crush strength	long-term	500 N/dm
	short-term	1000 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Flame retardancy	IEC 60332-1-2, IEC 60332-3-22, Cat. A
Class	D _{ca} s2 d2 a2 in accordance with EN 50575 / EN 50390
DoP	CDESK0000083

Other characteristics

Cable bending	IEC 60794-1-2 E11
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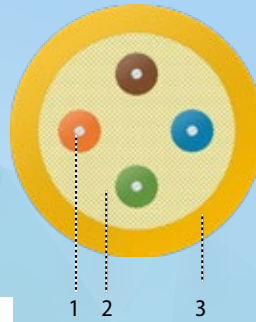
Certificates and approvals

Compliant with Construction Products Regulation (EU/305/2011): **CE**

Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.			
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 G652.D+G657.A1 E9/125
4	5.6	21	800	0.47	LKD8MA520120000	LKD8MA700120000	LKD8MA900120000	LKD8MC700120000
6	5.9	25	800	0.50	LKD8MA520130000	LKD8MA700130000	LKD8MA900130000	LKD8MC700130000
8	6.1	30	800	0.52	LKD8MA520140000	LKD8MA700140000	LKD8MA900140000	LKD8MC700140000
10	6.5	34	800	0.53	LKD8MA520150000	LKD8MA700150000	LKD8MA900150000	LKD8MC700150000
12	7.0	38	800	0.55	LKD8MA520160000	LKD8MA700160000	LKD8MA900160000	LKD8MC700160000

GigaLine® UNIVERSAL CABLE, MINI-BREAKOUT 800N

CPR

E_{ca}

Benefits

- ▶ robust, non-crushable
- ▶ each fibre is strain-relieved
- ▶ longitudinally watertight

Type KL-U-VQ(ZN)H

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). Ideal for all applications from Class OF 300 to OF 10000 according to fibre type. House connections possible without additional interconnection points (splices).

Routing

Installation indoors and outdoors in cable ducts, in dry conduits, or on covered cable trays.

Mechanical pulling in with winches is only permitted using force measuring devices with a logging function.

Structure

- 1 max. 24 fixed tubes (900µm) stranded under an outer sheath
Tube colour code in accordance with EIA/TIA598C
- 2 Strain relief Non-metallic, aramid
- 3 Cable sheath Halogen-free, flame-retardant compound
Sheath colour ◆ Yellow

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-25 °C up to +60 °C

Mechanical characteristics

Min. bend radius	static	10 x outer Ø
	dynamic	15 x outer Ø
	Single element	30 mm
Max. crush strength	long-term	300 N/dm
	short-term	500 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-2
Flame retardancy	IEC 60332-1-2, IEC 60332-3-24
Class	E _{ca} in accordance with EN 50575 / EN 50390 DoP CDESK0000098

Other characteristics

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

Certificates and approvals

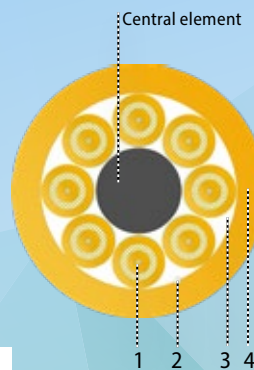
Compliant with Construction Products Regulation (EU/305/2011): **CE**

Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.		Order no.		
	mm	kg/km		N	MJ/m	kWh/m	OM3 G50/125	OM4 G50/125
6	5.9	25	800	0.50	0.14	LKD8NA510030000	LKD8NA710030000	LKD8NC710030000
12	7.0	38	800	0.55	0.15	LKD8NA510060000	LKD8NA710060000	LKD8NC710060000
24	9.4	72	800	0.92	0.25	LKD8NA510090000	LKD8NA710090000	LKD8NC710090000

GigaLine® INDOOR CABLE, BREAKOUT



CPR

E_{ca}

Benefits

- ▶ robust, non-crushable
- ▶ each fibre is strain-relieved
- ▶ fibre type indicated by sheath colour

Type KL-I-V(ZN)HH n G/E

Use

Connection cable and patch cord for structured cabling acc. to ISO/IEC 11801 and EN 50173.

Ideal for all applications from Class OF 300 to OF 10000 according to fibre type. Suitable for direct connector assembly using adhesive technology. Not suitable for crimp connector assembly. Installation in dry rooms, in cable ducts, on cable trays or in conduits.

Structure

- Max. 12 strain-relieved single cables as breakout elements (2.1 mm with semi-light buffered loose tubes 900 µm) stranded under an outer sheath
- Tear thread under the outer sheath
- Strain relief Non-metallic (aramid yarns)
- Cable sheath Halogen-free, flame-retardant compound

Sheath colour	OS2	◆ Yellow
	OM3	◆ Aqua
	OM4	◆ Heather violet
	OM5	◆ Lime green

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-5 °C up to +70 °C

Mechanical characteristics

Min. bend radius	static	10 x outer Ø
	dynamic	15 x outer Ø
	for single elements	30 mm
Max. crush strength	long-term	1000 N/dm
	short-term	1500 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Flame retardancy	IEC 60332-1-2, IEC 60332-3-22, Cat. A
Class	E _{ca} according to EN 50575 / EN 50390
DoP	CDESK0000085

Certificates and approvals

Compliant with Construction Products Regulation (EU/305/2011): **CE**

Other characteristics

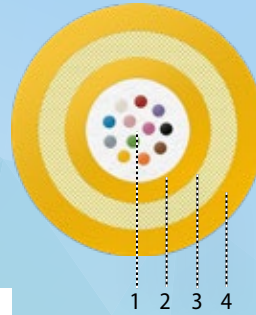
Cable bending	IEC 60794-1-2 E11
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Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.		
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OS2 G652.D+G657.A1 E9/125
2	7.0	40	800	1.10	LKD8BA520110000	LKD8BA700110000	LKD8BC700110000
4	7.0	45	800	1.10	LKD8BA520120000	LKD8BA700120000	LKD8BC700120000
6	8.2	65	1000	1.18	LKD8BA520130000	LKD8BA700130000	LKD8BC700130000
8	9.8	95	1000	1.31	LKD8BA520140000	LKD8BA700140000	LKD8BC700140000
10	11.0	135	1000	1.42	LKD8BA520150000	LKD8BA700150000	LKD8BC700150000
12	12.5	155	1000	1.57	LKD8BA520160000	LKD8BA700160000	LKD8BC700160000

GigaLine® INDOOR CABLE, CENTRAL



CPR

B2_{ca}

Benefits

- ▶ meets highest level of fire safety
- ▶ low space requirements
- ▶ fibre type indicated by sheath colour

Type KL-I-B(ZN)BH 1 x n G/E

Use

FO indoor cable, central loose tube, unfilled, with non-metallic armouring (rodent protection).

Ideal for applications from Class OF 300 to OF 10000. Suitable for splicing. Installation in dry areas, in cable ducts, on cable trays or in conduits.

Structure

- 1 Fibre: Single-mode fibre E9/125 µm, bend-insensitive multi-mode fibre G50/125, Colour code: DIN VDE 0888-3 red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
- 2 Dry loose tube Ø 3.0 mm
Colour code: yellow (E9/125), green (G50/125), blue (G62.5/125)
- 3 Strain relief Glass rovings
- 4 Cable sheath Halogen-free, flame-retardant compound
Sheath colour OS2 ◆ Yellow
OM3 ◆ Aqua
OM4 ◆ Heather violet
OM5 ◆ Lime green

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-25 °C up to +60 °C

Mechanical characteristics

Min. bend radius	static	15 x outer Ø
	dynamic	20 x outer Ø
Max. crush strength	long-term	1500 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Flame retardancy	IEC 60332-1-2, IEC 60332-3-24 Cat. C
Class	B2 _{ca} s1a d0 a1 according to EN 50575 / EN 50390
DoP	CDESK0000087

Certificates and approvals

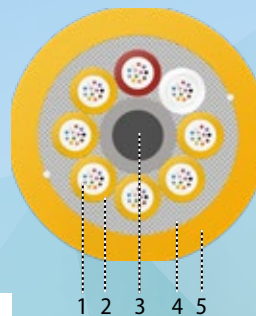
Compliant with Construction Products Regulation (EU/305/2011): **CE**

Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.			
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 G652.D+G657.A1 E9/125
1x6	6.5	46	1500	0.62	LKD8IA5B0Q30000	LKD8IA7B0Q30000	LKD8IA9B0Q30000	LKD8IC3B0Q30000
1x8	6.5	46	1500	0.62	LKD8IA5B0Q40000	LKD8IA7B0Q40000	LKD8IA9B0Q40000	LKD8IC3B0Q40000
1x12	6.5	46	1500	0.62	LKD8IA5B0Q60000	LKD8IA7B0Q60000	LKD8IA9B0Q60000	LKD8IC3B0Q60000
1x24	7	51	1500	0.68	LKD8IA5B0Q90000	LKD8IA7B0Q90000	LKD8IA9B0Q90000	LKD8IC3B0Q90000

GigaLine® INDOOR CABLE, STRANDED



CPR

B2_{ca}

Benefits

- ▶ meets highest level of fire safety
- ▶ low space requirements
- ▶ fibre type indicated by sheath colour

Type KL-I-B(ZN)BH n x m G/E

Use

FO indoor cable, stranded loose tube, unfilled, with non-metallic armouring (rodent protection).

Ideal for all applications from Class OF 300 to OF 10000. Suitable for splicing. Installation in dry rooms, in cable ducts, on cable trays or in conduits.

Structure

- 1 Fibre: Single-mode fibre E9/125 µm, bend-insensitive multi-mode fibre G50/125, colour code: DIN VDE 0888-3 red, green, blue, yellow, white, grey, brown, violet, turquoise, black, orange, pink
 - 2 Dry loose tube Ø 1.6 mm
Colour code: yellow (E9/125), green (G50/125), blue (G62.5/125)
 - 3 Central glass fibre-reinforced supporting element
 - 4 Strain relief Glass rovings
 - 5 Cable sheath Halogen-free, flame-retardant compound
- Sheath colour
- | | |
|-----|------------------|
| OS2 | ◆ Yellow |
| OM3 | ◆ Aqua |
| OM4 | ◆ Heather violet |
| OM5 | ◆ Lime green |

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-10 °C up to +70 °C

Mechanical characteristics

Min. bend radius	static	10 x outer Ø
	dynamic	15 x outer Ø
Max. crush strength	long-term	1000 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Flame retardancy	IEC 60332-1-2, IEC 60332-3-22 Cat. A
Class	B2 _{ca} s1a d1 a1 according to EN 50575 / EN 50390
DoP	CDESK0000095

Certificates and approvals

Compliant with Construction Products Regulation (EU/305/2011): **CE**

Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.			
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 G652.D+G657.A1 E9/125
4x12	8.3	75	3000	0.78	LKD8IA5BQ080000	LKD8IA7BQ080000	LKD8IA9BQ080000	LKD8IC3BQ080000
6x12	8.6	80	3000	0.86	LKD8IA5BQ100000	LKD8IA7BQ100000	LKD8IA9BQ100000	LKD8IC3BQ100000
8x12	9.9	105	3000	1.09	LKD8IA5BQ110000	LKD8IA7BQ110000	LKD8IA9BQ110000	LKD8IC3BQ110000
12x12	11.4	140	3000	1.57	LKD8IA5BQ130000	LKD8IA7BQ130000	LKD8IA9BQ130000	LKD8IC3BQ130000

GigaLine® UNIVERSAL CABLE, CENTRAL 2500N

CPR

C_{ca}

Benefits

- ▶ very good fire protection properties
- ▶ low space requirements
- ▶ can be laid in the ground
- ▶ for universal use
- ▶ longitudinally watertight

Type KL-U-DQ(ZN)BH 1xn G/E

Use

For use in buildings with high fire protection requirements such as schools, dormitories and high-rise buildings, etc. For campus/backbone cabling and for use in structured cabling in accordance with ISO/IEC 11801 and EN 50173 (2nd issue). House connections possible without additional interconnection points (splices).

Routing

Indoors and outdoors in conduits, on covered cable trays or directly in the ground (sand bed). Mechanical pulling in with winches is only permitted using force measuring devices with a logging function.

Structure

- ▶ Fibre colour code acc. to IEC 60304
- ▶ Central filled loose tube with max. 24 fibres, loose tube colour: Yellow (E9/125), green (G50/125)
- ▶ Strain relief Non-metallic (glass rovings) and swellable threads
- ▶ Cable sheath Halogen-free, flame-retardant compound
Sheath colour ◆ Black

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-25 °C up to +60 °C

Mechanical characteristics

Min. bend radius	static	15 x outer Ø
	dynamic	20 x outer Ø
Max. crush strength	long-term	2000 N/dm
	short-term	3000 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Acidity of combustion gases	IEC 60754-2
Flame retardancy	IEC 60332-1-2
Class	C _{ca} s1b d1 a1 according to EN 50575 / EN 50390
DoP	CDESK0000094

Certificates and approvals

Compliant with Construction Products Regulation (EU/305/2011): **CE**

Fibre count	Outside Ø	Weight approx.	Max. strain relief	Fire load approx.	Order no.			
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 G652.D+G657.A1 E9/125
1x12	8.2	75	2500	1.05	LKD8UA5C0M60000	LKD8UA7C0M60000	LKD8UA9C0M60000	LKD8UC3C0M60000
1x24	8.6	80	2500	1.15	LKD8UA5C0M90000	LKD8UA7C0M90000	LKD8UA9C0M90000	LKD8UC3C0M90000

GigaLine® UNIVERSAL CABLE, CENTRAL 1750N

CPR

D_{ca}

Benefits

- ▶ economical solution
- ▶ good fire protection profile
- ▶ low space requirements
- ▶ for universal use
- ▶ longitudinally watertight

Type KL-U-DQ(ZN)BH 1xn G/E

Use

For campus/backbone cabling and for use in structured cabling according to ISO/IEC 11801 and EN 50173. Ideal for all applications from Class OF 300 to OF 10000 according to fibre quality. House connections possible without additional interconnection points (splices).

Routing

Indoors and outdoors, in conduits, on covered cable trays. Mechanical pulling in with winches is only permitted using force measuring devices with a logging function.

Structure

- 1 Fibre colour code acc. to IEC 60304
- 2 Central filled loose tube with max. 24 fibres, loose tube colour: Yellow (E9/125), green (G50/125)
- 3 Strain relief Non-metallic (glass rovings) and swellable threads
- 4 Cable sheath Halogen-free, flame-retardant compound
Sheath colour ◆ Black

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-25 °C up to +60 °C

Mechanical characteristics

Min. bend radius	static	15 x outer Ø
	dynamic	20 x outer Ø
Max. crush strength	long-term	1500 N/dm
	short-term	2000 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Acidity of combustion gases	IEC 60754-2
Flame retardancy	IEC 60332-1-2 and 60332-3-24 Cat. C
Class	D _{ca} s2 d2 a1 according to EN 50575 / EN 0390
DoP	CDESK0000084

Certificates and approvals

Compliant with Construction Products Regulation (EU/305/2011): **CE**

Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.			
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 G652.D+G657.A1 E9/125
1x4	7	55	1750	0.71	LKD8UA500P20000	LKD8UA700P20000	LKD8UA900P20000	LKD8UC300P20000
1x8	7	55	1750	0.71	LKD8UA500P40000	LKD8UA700P40000	LKD8UA900P40000	LKD8UC300P40000
1x12	7	55	1750	0.71	LKD8UA500P60000	LKD8UA700P60000	LKD8UA900P60000	LKD8UC300P60000
1x24	7.5	60	1750	0.79	LKD8UA500P90000	LKD8UA700P90000	LKD8UA900P90000	LKD8UC300P90000

GigaLine® UNIVERSAL CABLE, CENTRAL 3500 N



CPR

D_{ca}

Benefits

- ▶ good fire protection profile
- ▶ low space requirements
- ▶ can be laid in the ground
- ▶ for universal use
- ▶ longitudinally watertight

Type KL-U-DQ(ZN)BH 1xn G/E

Use

Installation cable suitable for campus/backbone cabling and structured cabling according to ISO/IEC 11801 and EN 50173. Ideal for all Class OF 300, OF 500, OF 2000, OF5000 and OF 10000 applications. Suitable for indoor installation in applications involving more rigorous mechanical requirements as well as risk of rodent damage. Suitable for splicing. House connections possible without additional interconnection points (splices).

Installation indoors and outdoors in conduits, on covered cable trays, in cable ducts or directly in the ground (in a sand bed). Mechanical pulling in with winches is only permitted using force measuring devices with a logging function.

Structure

- 1 Fibre colour code according to IEC 60304
- 2 Central filled loose tube with max. 24 fibres,
loose tube colour: Yellow (E9/125), green (G50/125)
- 3 Strain relief Non-metallic (glass rovings) and swellable threads
- 4 Cable sheath Halogen-free, flame-retardant compound
Sheath colour ◆ Black

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-25 °C up to +60 °C

Mechanical characteristics

Min. bend radius	static	15 x outer Ø
	dynamic	20 x outer Ø
Max. crush strength	long-term	1500 N/dm
	short-term	3000 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Flame retardancy	IEC 60332-1-2
Class	D _{ca} s2 d2 a1 according to EN 50575 / EN 50390
DoP	CDESK0000038

Certificates and approvals

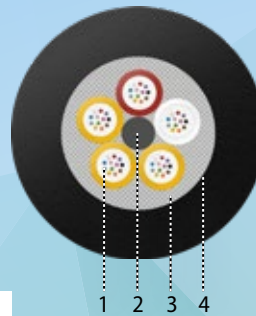
Compliant with Construction Products Regulation (EU/305/2011): **CE**

Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.			
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 E9/125
1x4	7.7	65	3500	0.95	LKD8UA500M20000	LKD8UA700M20000	LKD8UA900M20000	LKD8UC700M20000
1x6	7.7	65	3500	0.95	LKD8UA500M30000	LKD8UA700M30000	LKD8UA900M30000	LKD8UC700M30000
1x8	7.7	65	3500	0.95	LKD8UA500M40000	LKD8UA700M40000	LKD8UA900M40000	LKD8UC700M40000
1x12	7.7	65	3500	0.95	LKD8UA500M60000	LKD8UA700M60000	LKD8UA900M60000	LKD8UC700M60000
1x24	8.1	72	3500	1.06	LKD8UA500M90000	LKD8UA700M90000	LKD8UA900M90000	LKD8UC700M90000

GigaLine® UNIVERSAL CABLE, STRANDED 5000 N



CPR

B2_{ca}

Benefits

- ▶ good fire protection profile
- ▶ low space requirements
- ▶ can be laid in the ground
- ▶ for universal use
- ▶ longitudinally watertight

Type KL-U-DQ(ZN)BH nxm G/E

Use

Universal cable, for fixed installation. For use in highly sensitive buildings with very high fire protection requirements such as escape routes, care and support facilities, hospitals, etc. For campus/backbone cabling and for use in structured cabling in accordance with ISO/IEC 11801 and EN 50173. House connections possible without additional interconnection points (splices). Particularly suitable for mounting dividers for pre-assembled trunks and splicing technology.

Installation indoors and outdoors in conduits, on covered cable trays or directly in the ground (sand bed). Mechanical pulling in with winches is only permitted using force measuring devices with a logging function.

Structure

- ❖ Stranded filled loose tubes with max. 12 fibres and dummy elements Fibre colour code according to IEC 60304
Loose tube colour: Counting wire red, counting direction wire white, Yellow (E9/125), green (G50/125), blue (G62.5/125)
- ❖ Central glass fibre-reinforced supporting element
- ❖ Strain relief Non-metallic (glass rovings) and swellable threads
- ❖ Cable sheath Halogen-free, flame-retardant compound
Sheath colour ◆ Black

Thermal properties

Transport/storage	-40 °C up to +80 °C
Routing	-5 °C up to +60 °C
Operating temp.	-40 °C up to +80 °C

Mechanical characteristics

Min. bend radius	static	15 x outer Ø
	dynamic	20 x outer Ø
Max. crush strength	long-term	3000 N/dm
	short-term	4000 N/dm

Fire behaviour

Halogen free	IEC 60754-1
Flame retardancy	IEC 60332-1-2, IEC 60332-3-22 Cat. A
Fire class	B2 _{ca} s1 d1 a1 according to EN 50575 / 50399
DoP	CDESK0000092

Certificates and approvals

Compliant with Construction Products Regulation (EU/305/2011): **CE**

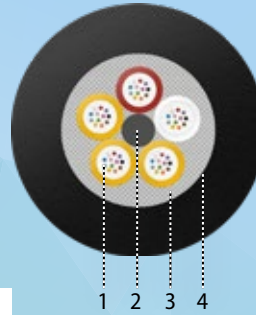
Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.			
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 G652.D+G657.A1 E9/125
2x12	11.2	136	5000	1.9	LKD8UA5BK060000	LKD8UA7BK060000	LKD8UA9BK060000	LKD8UC3BK060000
4x12	11.2	136	5000	1.9	LKD8UA5BK080000	LKD8UA7BK080000	LKD8UA9 BK080000	LKD8UC3BK080000
8x12	13.1	182	5000	2.8	LKD8UA5BK110000	LKD8UA7BK110000	LKD8UA9BK110000	LKD8UC3BK110000
12x12	16	250	5000	4.6	LKD8UA5BK130000	LKD8UA7BK130000	LKD8UA9BK130000	LKD8UC3BK130000

other types on request

GigaLine® UNIVERSAL CABLE, STRANDED 5000 N



CPR

E_{ca}

Benefits

- ▶ good fire protection profile
- ▶ low space requirements
- ▶ can be laid in the ground
- ▶ for universal use
- ▶ longitudinally watertight

Type KL-U-DQ(ZN)BH nxm G/E

Use

Installation cable suitable for campus/backbone cabling and structured cabling according to ISO/IEC 11801 and EN 50173. Ideal for applications from Class OF 300 to OF 10000. Suitable for installation in applications involving more rigorous mechanical requirements as well as risk of rodent damage. Suitable for splicing. House connections possible without additional interconnection points (splices).

Installation indoors and outdoors in conduits, on covered cable trays, in cable ducts or directly in the ground (in a sand bed). Mechanical pulling in with winches is only permitted using force measuring devices with a logging function.

Structure

- Stranded filled loose tubes with max. 12 fibres and dummy elements
Fibre colour code according to IEC 60304
Loose tube colour: Counting wire red, counting direction wire white, yellow (E9/125), green (G50/125), blue (G62.5/125)
- Central glass fibre-reinforced supporting element
- Strain relief Non-metallic (glass rovings) and swellable threads
- Cable sheath Halogen-free, flame-retardant compound
Sheath colour ◆ Black

Thermal properties

Transport/storage	-40 °C up to +80 °C
Routing	-20 °C up to +60 °C
Operating temp.	-40 °C up to +80 °C

Mechanical characteristics

Min. bend radius	static	15 x outer Ø
	dynamic	20 x outer Ø
Max. crush strength	long-term	3000 N/dm
	short-term	4000 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Flame retardancy	IEC 60332-1-2
Class	E _{ca} according to EN 50575 / EN 50390
DoP	CDESK0000037

Certificates and approvals

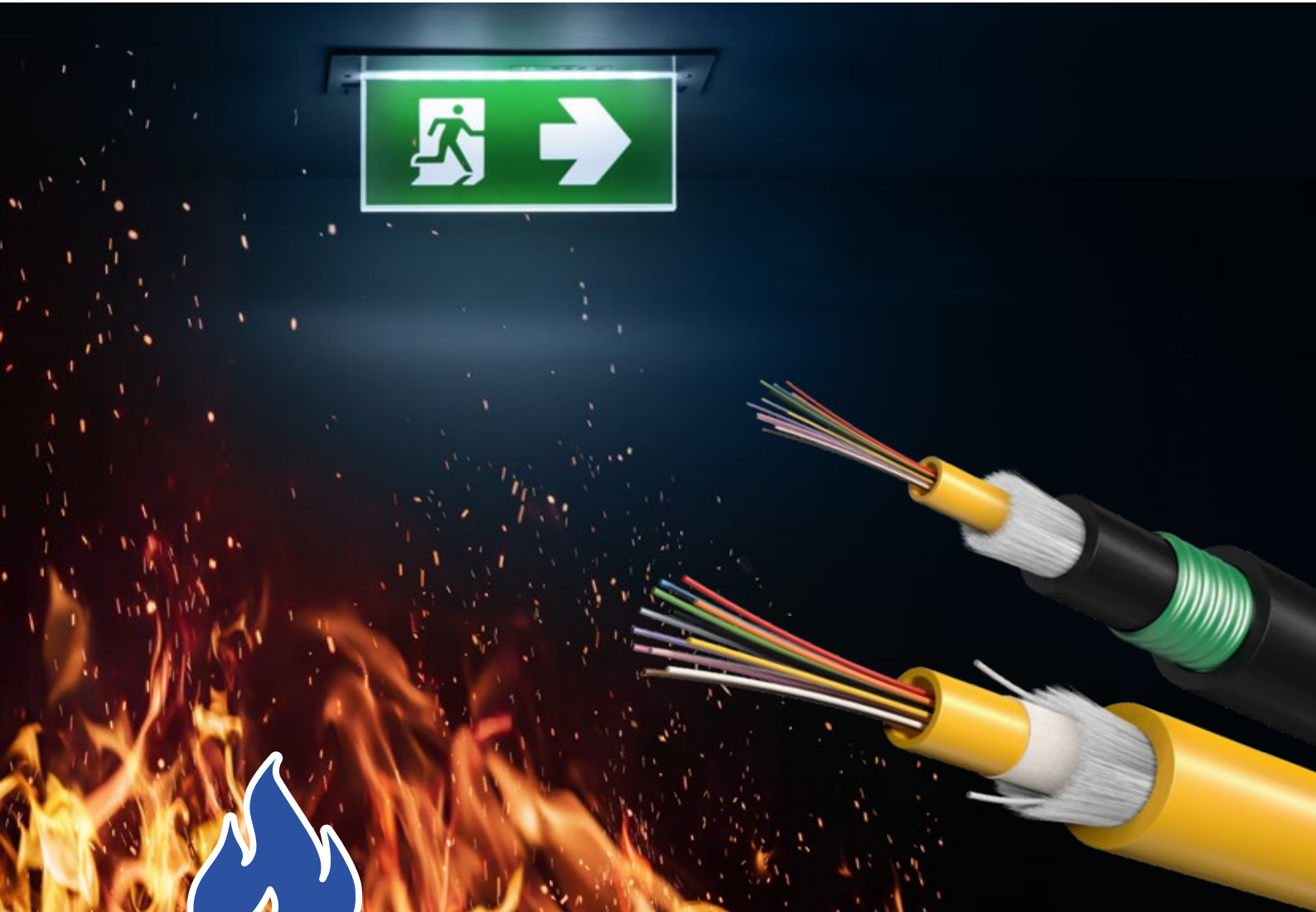
Compliant with Construction Products Regulation (EU/305/2011): **CE**

Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.			
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 E9/125
2x12	11.2	130	5000	1.7	LKD8UA51K060000	LKD8UA71K060000	LKD8UA91K060000	LKD8UC71K060000
4x12	11.2	130	5000	1.7	LKD8UA51K080000	LKD8UA71K080000	LKD8UA91K080000	LKD8UC71K080000
8x12	13.1	175	5000	2.2	LKD8UA51K110000	LKD8UA71K110000	LKD8UA91K110000	LKD8UC71K110000
12x12	16	240	5000	3.8	LKD8UA51K130000	LKD8UA71K130000	LKD8UA91K130000	LKD8UC71K130000

other types on request

KERPEN "FIRE SECURED" FO DATA CABLE

with a fire barrier to protect the fibres in the event of a fire



A functioning communication system is of vital importance in the event of a fire. It is therefore vital for a fibre optic cable to maintain its system integrity. The results of fire testing confirm that the "fire secured" FO data cable provides system and circuit integrity in the event of a fire for the duration of 90 or 180 minutes.

In particular in public facilities and buildings where large numbers of people gather (e.g. tunnels, airports, hotels, etc.), fire alarm, SOS telephone and video monitoring systems are used to coordinate rescue measures and fire fighting efforts as efficiently as possible. Also in industrial facilities, processes have to be terminated in a controlled manner in order to avoid more extensive secondary damage to people and the environment.

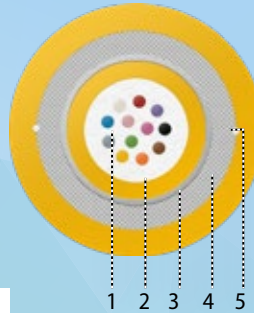
Modern communication systems are increasingly using optical data transmission systems for transmitting data. These are often the only option given the high requirements for data rates and transmission paths.

With its "fire secured" universal cables, KERPEN DATACOM offers products which are tested according to IEC 60331-25 and EN 50200 and protect the fibres from exposure to fire thanks to their special construction with a fire barrier.

GigaLine® "FIRE SECURED" UNIVERSAL CABLE, CENTRAL WITH CI



CPR

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Benefits

- ▶ good fire protection profile
- ▶ low space requirements
- ▶ for universal use

Total system integrity in
the event of fire for at least

90 minutes

Type KL-U-D(ZN)BH 1xn G/E

Use

Installation cable suitable for campus/backbone cabling and structured cabling according to ISO/IEC 11801 and EN 50173. Ideal for all applications from Class OF 300 to OF 10000. Suitable for installation in applications involving more rigorous mechanical requirements as well as risk of rodent damage. Suitable for splicing. House connections possible without additional interconnection points (splices).

Installation in dry rooms, in cable ducts, on cable trays or in conduits.

Structure

- 1 Fibre colour code acc. to IEC 60304
 - 2 Central filled loose tube with max. 24 fibres, up to 12 fibres Ø 3.5 mm, up to 24 fibres Ø 4.0 mm, loose tube colour: Yellow (E9/125), green (G50/125), blue (G62.5/125)
 - 3 Fire barrier
 - 4 Strain relief Non-metallic (glass rovings)
 - 5 Cable sheath Halogen-free, flame-retardant compound with tear threads under the sheath
- Sheath colour ◆ Yellow

Thermal properties

Transport/storage	-40 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-40 °C up to +60 °C

Mechanical characteristics

Min. bend radius	static	15 x outer Ø
	dynamic	20 x outer Ø
Max. crush strength	long-term	3000 N/dm
	short-term	4500 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Flame retardancy	IEC 60332-1-2, IEC 60332-3-22 Cat. A
Class	D _{ca} s2 d2 a1 according to EN 50575 / EN 50390
DoP	CDESK0000082

Certificates and approvals

Compliant with Construction Products Regulation (EU/305/2011): **CE**

Other characteristics

System and	according to IEC 60331-11 and -25
Circuit integrity	EN 50200 / DIN VDE 0482 Part 1 (90 minutes) Max. attenuation change 3.0 dB

Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.			
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 G652.D+G657.A1 E9/125
1x4	10.3	127	2500	1.03	LKD8UA500B20000	LKD8UA700B20000	LKD8UA900B20000	LKD8UC700B20000
1x6	10.3	127	2500	1.03	LKD8UA500B30000	LKD8UA700B30000	LKD8UA900B30000	LKD8UC700B30000
1x8	10.3	127	2500	1.03	LKD8UA500B40000	LKD8UA700B40000	LKD8UA900B40000	LKD8UC700B40000
1x12	10.3	127	2500	1.03	LKD8UA500B60000	LKD8UA700B60000	LKD8UA900B60000	LKD8UC700B60000
1x24	10.8	134	2500	1.28	LKD8UA500B90000	LKD8UA700B90000	LKD8UA900B90000	LKD8UC700B90000

GigaLine® "FIRE SECURED" UNIVERSAL CABLE, CENTRAL WITH CI



CPR

C_{ca}

Benefits

- ▶ optimum rodent armouring
- ▶ longitudinal and transverse waterproofing
- ▶ good fire protection profile
- ▶ low space requirements
- ▶ for universal use

Circuit integrity in the event of fire
in accordance with EN 50200:2006

180 minutes

Type KL-U-DQ(ZN)H(SR)H 1xn G/E 180

Use

Universal cable, for fixed installation, can be laid underground in a UV-resistant manner. Longitudinal and transverse waterproofing with highly effective rodent protection. For campus/backbone cabling and for use in structured cabling according to ISO/IEC 11801 and EN 50173. Ideal for all applications from Class OF 300 to OF 10000 according to fibre quality. House connections possible without additional interconnection points (splices). Installation indoors and outdoors in conduits, on covered cable trays or directly in the ground (in a sand bed). Mechanical pulling in with winches is only permitted using force measuring devices with a logging function.

Structure

- Central filled loose tube with max. 24 fibres, fibre colour code acc. to IEC 60304, loose tube colour: Yellow (E9/125), green (G50/125), blue (G62.5/125)
 - Strain relief Non-metallic (glass rovings)
 - Inner sheath Halogen-free, flame-retardant compound
 - Armour Ribbed steel jacket as fire barrier and rodent protection
 - Cable sheath Halogen-free, flame-retardant compound, UV-resistant
- Sheath colour ◆ Black

Thermal properties

Transport/storage -25 °C up to +70 °C
Routing -5 °C up to +50 °C
Operating temp. -20 °C up to +70 °C

Mechanical characteristics

Min. bend radius	static	15 x outer Ø
	dynamic	20 x outer Ø
Max. crush strength	long-term	2500 N/dm
	short-term	3500 N/dm

Fire behaviour

Smoke density	IEC 61034
Halogen free	IEC 60754-1
Flame retardancy	IEC 60332-1-2, IEC 60332-3-22 Cat. A
Class	C _{ca} s1a d1 a1 according to EN 50575/EN 50390
DoP	CDESK0000090

Certificates and approvals

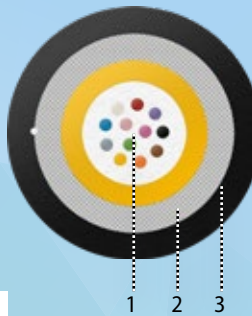
Compliant with Construction Products Regulation (EU/305/2011): **CE**

Other characteristics

Circuit integrity in the event of fire for use in emergency circuits with unprotected installation in accordance with EN 50200:2006 (830 +40/ -0°C, 180 min):
max. attenuation change
max. 1.0 dB at 1310 nm
max. 1.0 dB at 1550 nm
(VDE test report: 5005019-9601-0001/260492-TL6-1 to -9)

Fibre count	Outside Ø approx. mm	Weight approx. kg/km	Max. strain relief N	Fire load approx. MJ/m	Order no.			
					OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 G652.D+G657.A1 E9/125
1x4	12.5	218	2500	2.80	LKD8UA5C1K20000	LKD8UA7C1K20000	LKD8UA9C1K20000	LKD8UC7C1K20000
1x6	12.5	218	2500	2.80	LKD8UA5C1K30000	LKD8UA7C1K30000	LKD8UA9C1K30000	LKD8UC7C1K30000
1x8	12.5	218	2500	2.80	LKD8UA5C1K40000	LKD8UA7C1K40000	LKD8UA9C1K40000	LKD8UC7C1K40000
1x12	12.5	218	2500	2.80	LKD8UA5C1K60000	LKD8UA7C1K60000	LKD8UA9C1K60000	LKD8UC7C1K60000
1x24	12.5	218	2500	2.80	LKD8UA5C1K90000	LKD8UA7C1K90000	LKD8UA9C1K90000	LKD8UC7C1K90000

GigaLine® OUTDOOR CABLE, CENTRAL 1750 N



Benefits

- ▶ economical solution
- ▶ for outdoor installation
- ▶ longitudinally watertight
- ▶ low space requirements

Type KL-A-DQ(ZN)B2Y 1xn G/E

Use

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 use in structured cabling according to ISO/IEC 11801 and EN 50173. Ideal for all applications from Class OF 300 to OF 10000 according to fibre type. Easy to install due to grease-free, dry cable core. Suitable for splicing.

Installation indoors and outdoors in conduits, on covered cable trays or directly in the ground. Mechanical pulling in with winches is only permitted using force measuring devices with a logging function.

Structure

- 1 Central filled loose tube with max. 24 fibres
Fibre colour code according to IEC 60304
Loose tube colour: Yellow (E9/125), green (G50/125), blue (G62.5/125)
- 2 Strain relief Non-metallic (glass rovings)
- 3 Cable sheath PE, UV-resistant
Sheath colour ◆ Black

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temp.	-25 °C up to +60 °C

Mechanical characteristics

Min. bend radius	static	15 x outer Ø
	dynamic	20 x outer Ø
Max. crush strength	long-term	1500 N/dm
	short-term	3000 N/dm

Fire behaviour

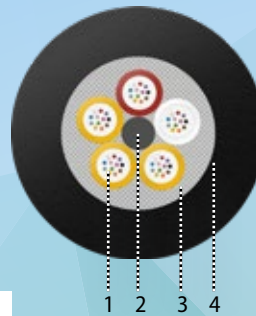
Halogen free	IEC 60754-1
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Other characteristics

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

Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.		
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OS2 E9/125
1x4	7.1	39	1750	1.21	LKD8AA500A20000	LKD8AA700A20000	LKD8AC700A20000
1x6	7.1	39	1750	1.21	LKD8AA500A30000	LKD8AA700A30000	LKD8AC700A30000
1x8	7.1	39	1750	1.21	LKD8AA500A40000	LKD8AA700A40000	LKD8AC700A40000
1x12	7.1	39	1750	1.21	LKD8AA500A60000	LKD8AA700A60000	LKD8AC700A60000
1x24	7.3	45	1750	1.39	LKD8AA500A90000	LKD8AA700A90000	LKD8AC700A90000

GigaLine® OUTDOOR CABLE, STRANDED 5000 N



Benefits

- ▶ economical solution
- ▶ for outdoor installation
- ▶ longitudinally watertight
- ▶ low space requirements

Type KL-A-DQ(ZN)B2Y nxm G/E

Use

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 use in structured cabling according to ISO/IEC 11801 and EN 50173. Ideal for all applications from Class OF 300 to OF 10000 according to fibre type. Easy to install due to grease-free, dry cable core. Suitable for splicing.

Installation indoors and outdoors in conduits, on covered cable trays or directly in the ground. Mechanical pulling in with winches is only permitted using force measuring devices with a logging function.

Structure

- ◆ Stranded filled loose tubes with max. 12 fibres and dummy elements
Fibre colour code according to IEC 60304
Loose tube colour: Counting wire red, counting direction wire white, yellow (E9/125), green (G50/125), blue (G62.5/125)
- ◆ Central supporting element
- ◆ Strain relief Non-metallic (glass rovings) and swellable threads
- ◆ Cable sheath PE, UV-resistant
Sheath colour ◆ Black

Thermal properties

Transport/storage	-40 °C up to +70 °C
Routing	-15 °C up to +50 °C
Operating temp.	-40 °C up to +60 °C

Mechanical characteristics

Min. bend radius	static	15 x outer Ø
	dynamic	20 x outer Ø
Max. crush strength	long-term	3000 N/dm
	short-term	5000 N/dm

Fire behaviour

Halogen free	IEC 60754-1
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Other characteristics

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

Fibre count	Outside Ø approx.	Weight approx.	Max. strain relief	Fire load approx.	Order no.		
	mm	kg/km	N	MJ/m	OM3 G50/125	OM4 G50/125	OS2 E9/125
2x12	11.2	105	5000	2.4	LKD8AA50K060000	LKD8AA70K060000	LKD8AC70K060000
4x12	11.2	105	5000	2.4	LKD8AA50K080000	LKD8AA70K080000	LKD8AC70K080000
8x12	13.1	145	5000	3.1	LKD8AA50K110000	LKD8AA70K110000	LKD8AC70K110000
12x12	16.0	200	5000	4.9	LKD8AA50K130000	LKD8AA70K130000	LKD8AC70K130000

other types on request

GigaLine® FO PATCH CORD

GigaLine® FO patch cord			Page
GigaLine® FO patch cord			44
	FO patch cord LC duplex-Uniboot	<ul style="list-style-type: none"> • OS2 • OM3 • OM4 • OM5 	KL-I-V(ZN)H 46
	FO patch cord LC/PC Uniboot HD	<ul style="list-style-type: none"> • OS2 • OM3 • OM4 • OM5 	KL- I-V(ZN)H 47
	FO patch cord Fig. 0		KL-I-V(ZN)HH 48
	FO patch cord Fig. 8		KL-I-V(ZN)H 49
	FO patch cord MPO	<ul style="list-style-type: none"> • 1x12 • 2x12 	KL-I-F(ZN)H 50
	FO patch cord LC-MPO	<ul style="list-style-type: none"> • 1x12 • 1x8 	KL-I-F(ZN)H 51



Office



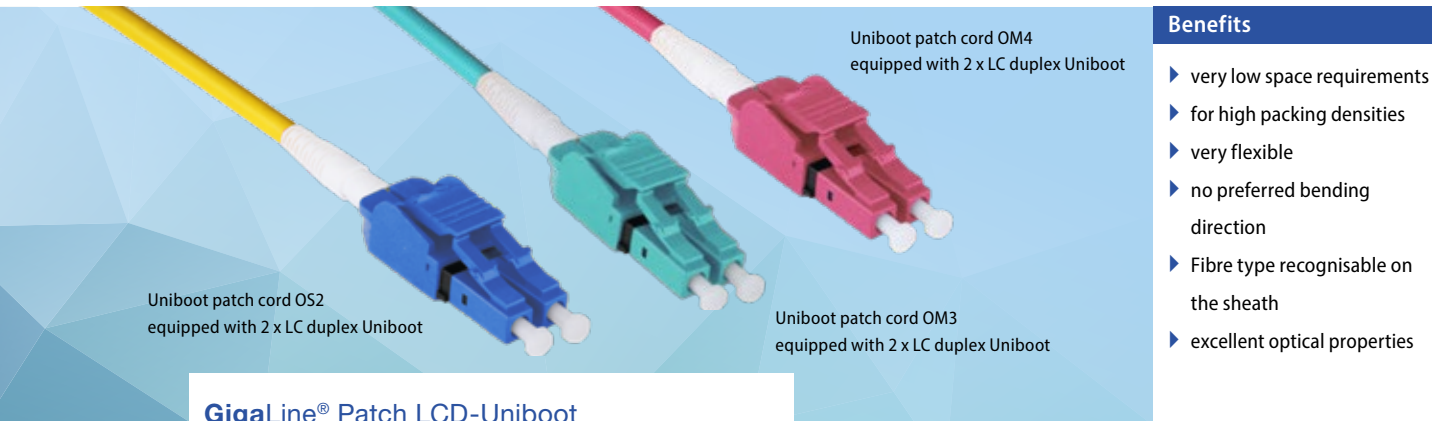
Data centre



Industry

GigaLine® FO PATCH CORD LC DUPLEX-UNIBOOT

Type KL-I-V(ZN)H



Benefits

- ▶ very low space requirements
- ▶ for high packing densities
- ▶ very flexible
- ▶ no preferred bending direction
- ▶ Fibre type recognisable on the sheath
- ▶ excellent optical properties

GigaLine® Patch LCD-Uniboot

Description

Ready-to-use pre-assembled **GigaLine®** patch cord with LC duplex Uniboot connectors. The LCDU connector is specially designed for panels with very high packing density.

Structure

Cable type	KL-I-V(ZN)H	
Core	two fibres under common sheath (round)	
strain relief	Aramid	
Cable sheath	halogen-free, flame-retardant compound	
Sheath colour	OS2	◆ Yellow
	OM3	◆ Aqua
	OM4	◆ Heather violet
	OM5	◆ Lime green
Cable diameter	2.1 mm	
Assignment	A to B	

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temperature	-10 °C up to +70 °C

Mechanical characteristics

Bending radius	static	30 mm
	dynamic	60 mm
Tensile strength	300 N	

Optical characteristics

Insertion loss	< 0.25 dB	0.15 dB (typical)
Return loss	OS2	> 50 dB (PC)
		> 65 dB (APC)
	OM3/OM4/OM5	> 35 dB

Fire behaviour

Flame resistance	IEC 60332-1 / IEC 60332-3-22, Cat. A
Halogen content	IEC 60754-1
Smoke density	IEC 61034

Configuration

LC duplex Uniboot

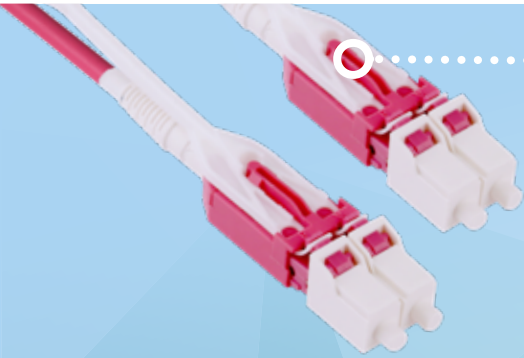
Cable length

see table, other connector types and lengths on request

Configuration	Length m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 G652.D+G657.A1 E9/125
2 x LC duplex Uniboot	1.0	LKD9A1998LL0010	LKD9A1998MM0010	LKD9A1999CC0010	LKD9A1998KK0010
	2.0	LKD9A1998LL0020	LKD9A1998MM0020	LKD9A1999CC0020	LKD9A1998KK0020
	3.0	LKD9A1998LL0030	LKD9A1998MM0030	LKD9A1999CC0030	LKD9A1998KK0030
	5.0	LKD9A1998LL0050	LKD9A1998MM0050	LKD9A1999CC0050	LKD9A1998KK0050
	7.5	LKD9A1998LL0075	LKD9A1998MM0075	LKD9A1999CC0075	LKD9A1998KK0075
	10.0	LKD9A1998LL0100	LKD9A1998MM0100	LKD9A1999CC0100	LKD9A1998KK0100

GigaLine® PATCH CORD LC DUPLEX UNIBOOT HD

LC duplex Uniboot or LC duplex Uniboot High Density with release flap



GigaLine® Patch LCD-Uniboot HD

The release flap enables the connectors to be pulled out even with high packing densities

Patch cord equipped with 2xLC duplex-Uniboot High Density with release flap

Benefits

- ▶ very low space requirements
- ▶ for very high packing densities
- ▶ very flexible
- ▶ no preferred bending direction
- ▶ fibre type recognisable on the sheath
- ▶ excellent optical properties

Description

Ready-to-use pre-assembled **GigaLine®** patch cord with LC duplex Uniboot HD connectors.

The LCDU HD connector is specially designed for panels with very high packing density. The 64 mm long integrated release flap enables the connectors to be pulled out even when the connectors are very densely packed.

Structure

Cable type	KL-I-F(ZN)H		
Core	two fibres under common sheath (round Ø)		
strain relief	Aramid		
Cable sheath	halogen-free, flame-retardant compound		
Sheath colour	OS2	◆ Yellow	
	OM3	◆ Aqua	
	OM4	◆ Heather violet	
	OM5	◆ Lime green	
Cable diameter	2.1 mm		
Assignment	A to B		

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temperature	-10 °C up to +70 °C

Mechanical characteristics

Bending radius	static	30 mm
	dynamic	60 mm
Tensile strength	300 N	

Optical characteristics

Insertion loss	< 0.25 dB	0.15 dB (typical)
Return loss	OS2	> 50 dB (PC)
		> 65 dB (APC)
	OM3/OM4/OM5	> 35 dB

Fire behaviour

Flame resistance	IEC 60332-1 / IEC 60332-3-22, Cat. A
Halogen content	IEC 60754-1
Smoke density	IEC 61034

Configuration

LC duplex Uniboot HD

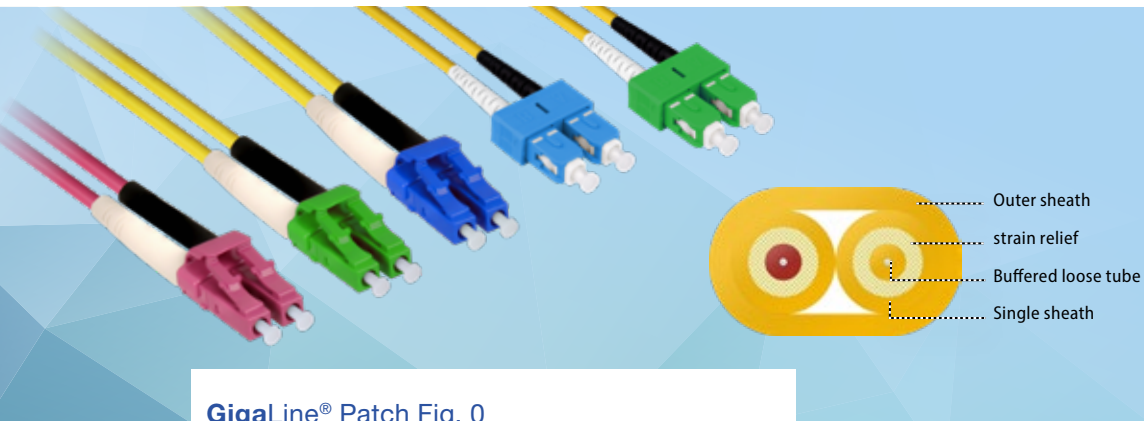
Cable length

see table, other connector types and lengths on request

Configuration	Length m	OM3 G50/125	OM4 G50/125	OM5 G50/125	OS2 G652.D+G657.A1 E9/125
GigaLine® Patch LCDU HD with 2 LC duplex Uniboot HD connectors with tab 64 mm (logically crossed)	1.0	LKD9A1118720000	LKD9A1117960000	LKD9A1999EE0010	LKD9A1316140000
	2.0	LKD9A1118730000	LKD9A1117970000	LKD9A1999EE0020	LKD9A1316150000
	3.0	LKD9A1118740000	LKD9A1117980000	LKD9A1999EE0030	LKD9A1316160000
	5.0	LKD9A1118750000	LKD9A1118700000	LKD9A1999EE0050	LKD9A1316170000
	10.0	LKD9A1118760000	LKD9A1118710000	LKD9A1999EE0100	LKD9A1316180000

GigaLine® FO PATCH CORD FIG. 0

Type KL-I-V(ZN)HH



Benefits

- ▶ robust with dual cable sheath
- ▶ fibre type recognisable on the sheath
- ▶ excellent optical properties

GigaLine® Patch Fig. 0

Structure

Core	Two compact cores with strain relief as breakout elements (Ø 2.1 mm), in parallel under one outer sheath
strain relief	Aramid
Cable sheath	halogen-free, flame-retardant compound
Sheath colour	OS2 ◆ Yellow OM3 ◆ Aqua OM4 ◆ Heather violet OM5 ◆ Lime green
Dimensions	Outer cable diameter 3.1 x 5.2 mm
Assignment	A to B

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temperature	-10 °C up to +70 °C

Mechanical characteristics

Bending radius	static	35 mm
(over flat side)	dynamic	65 mm
	Single element	30 mm

Optical characteristics (typical)

Insertion loss	< 0.25 dB	0.15 dB (typical)
Return loss	OS2	> 50 dB (PC)
		> 65 dB (APC)
	OM3/OM4/OM5	> 35 dB

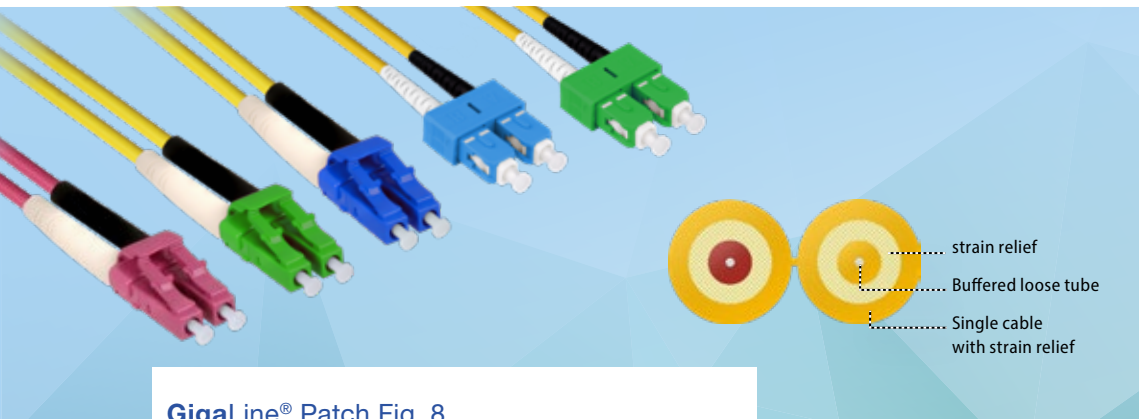
Fire behaviour

Flame resistance	IEC 60332-1
Halogen content	IEC 60754-1
Smoke density	IEC 61034

Configuration	Length m	OM3 – G50/125 µm	OM4 – G50/125	OM5 – G50/125	OS2 G652.D+G657.A1 – E9/125
LC duplex–SC duplex (IEC 61754-20 / IEC 61754-4)	1.0	LKD9A111290000	LKD9A1112780000	LKD9A2299DM0010	LKD9A1310610000
	2.0	LKD9A1112910000	LKD9A1111580000	LKD9A2299DM0020	LKD9A1316590000
	3.0	LKD9A1111200000	LKD9A1111590000	LKD9A2299DM0030	LKD9A1316550000
	5.0	LKD9A1111710000	LKD9A1112790000	LKD9A2299DM0050	LKD9A1316570000
	7.5	LKD9A1113420000	LKD9A1115700000	LKD9A2299DM0750	LKD9A1316500000
	10.0	LKD9A1112530000	LKD9A1111610000	LKD9A2299DM0100	LKD9A1316650000
LC duplex–LC duplex (IEC 61754-20)	1.0	LKD9A1110510000	LKD9A1111030000	LKD9A2299DD0010	LKD9A1307590000
	2.0	LKD9A1110530000	LKD9A1111050000	LKD9A2299DD0020	LKD9A1307610000
	3.0	LKD9A1110550000	LKD9A1111070000	LKD9A2299DD0030	LKD9A1307630000
	5.0	LKD9A1110560000	LKD9A1111080000	LKD9A2299DD0050	LKD9A1307640000
	7.5	LKD9A1110570000	LKD9A1111090000	LKD9A2299DD0075	LKD9A1307650000
	10.0	LKD9A1110580000	LKD9A1111100000	LKD9A2299DD0100	LKD9A1307660000
SC duplex–SC duplex (IEC 61754-4)	1.0	LKD9A1110420000	LKD9A1111100000	LKD9A2299DM0010	LKD9A1307680000
	2.0	LKD9A1110440000	LKD9A1111130000	LKD9A2299DM0020	LKD9A1307700000
	3.0	LKD9A1110460000	LKD9A1111150000	LKD9A2299DM0030	LKD9A1307720000
	5.0	LKD9A1110470000	LKD9A1111160000	LKD9A2299DM0050	LKD9A1307730000
	7.5	LKD9A1110480000	LKD9A1111170000	LKD9A2299DM0750	LKD9A1307740000
	10.0	LKD9A1110490000	LKD9A1111180000	LKD9A2299DM0100	LKD9A1307750000

GigaLine® FO PATCH CORD FIG. 8

Type KL-I-V(ZN)H



Benefits

- ▶ fibre type recognisable on the sheath
- ▶ for standard applications

GigaLine® Patch Fig. 8

Structure

Core	Two compact cores with strain relief as breakout elements (Ø 2.1 mm), in parallel under one outer sheath
strain relief	Aramid
Cable sheath	halogen-free, flame-retardant compound
Sheath colour	OS2 ◆ Yellow OM3 ◆ Aqua OM4 ◆ Heather violet OM5 ◆ Lime green
Dimensions	Outer cable diameter 2.8 x 5.7 mm
Assignment	A to B

Thermal properties

Transport/storage	-25 °C up to +70 °C
Routing	-5 °C up to +50 °C
Operating temperature	-10 °C up to +70 °C

Mechanical characteristics

Bending radius	static	35 mm
(over flat side)	dynamic	65 mm
	Single element	30 mm

Optical characteristics (typical)

Insertion loss	< 0.25 dB	0.15 dB (typical)
Return loss	OS2	> 50 dB (PC)
		> 65 dB (APC)
	OM3/OM4/OM5	> 35 dB

Fire behaviour

Flame resistance	IEC 60332-1
Halogen content	IEC 60754-1
Smoke density	IEC 61034

Configuration	Length m	OM3 – G50/125	OM4 – G50/125	OM5 – G50/125	OS2 G652.D+G657.A1 - E9/125 - PC
LC duplex–SC duplex (IEC 61754-20 / IEC 61754-4)	1.0	LKD9A18977H0010	LKD9A1897850010	LKD9A1899DM0010	LKD9A18976G0010
	2.0	LKD9A18977H0020	LKD9A1897850020	LKD9A1899DM0020	LKD9A18976G0020
	3.0	LKD9A18977H0030	LKD9A1897850030	LKD9A1899DM0030	LKD9A18976G0030
	5.0	LKD9A18977H0050	LKD9A1897850050	LKD9A1899DM0050	LKD9A18976G0050
	7.5	LKD9A18977H0075	LKD9A1897850075	LKD9A1899DM0075	LKD9A18976G0075
	10.0	LKD9A18977H0100	LKD9A1897850100	LKD9A1899DM0100	LKD9A18976G0100
LC duplex–LC duplex (IEC 61754-20)	1.0	LKD9A1897770010	LKD9A1897880010	LKD9A1899DD0010	LKD9A1897660010
	2.0	LKD9A1897770020	LKD9A1897880020	LKD9A1899DD0020	LKD9A1897660020
	3.0	LKD9A1897770030	LKD9A1897880030	LKD9A1899DD0030	LKD9A1897660030
	5.0	LKD9A1897770050	LKD9A1897880050	LKD9A1899DD0050	LKD9A1897660050
	7.5	LKD9A1897770075	LKD9A1897880075	LKD9A1899DD0075	LKD9A1897660075
	10.0	LKD9A1897770100	LKD9A1897880100	LKD9A1899DD0100	LKD9A1897660100
SC duplex–SC duplex (IEC 61754-4)	1.0	LKD9A1897HH0010	LKD9A1897550010	LKD9A1899MM0010	LKD9A1897GG0010
	2.0	LKD9A1897HH0020	LKD9A1897550020	LKD9A1899MM0020	LKD9A1897GG0020
	3.0	LKD9A1897HH0030	LKD9A1897550030	LKD9A1899MM0030	LKD9A1897GG0030
	5.0	LKD9A1897HH0050	LKD9A1897550050	LKD9A1899MM0050	LKD9A1897GG0050
	7.5	LKD9A1897HH0075	LKD9A1897550075	LKD9A1899MM0075	LKD9A1897GG0075
	10.0	LKD9A1897HH0100	LKD9A1897550100	LKD9A1899MM0100	LKD9A1897GG0100

GigaLine® PATCH CORD MPO

1 fold or 2 fold, MPO/f – MPO/f



For data rates
**40 / 100 / 400
Gbit/s**

GigaLine® Patch MPO 1x12 GigaLine® Patch MPO 2x12

Description

Ready-to use pre-assembled **GigaLine®** MPO patch cord with 1x12 or 2x12 MPO/f – MPO/f. Pre-assembled at both ends with 1 or 2 MPO female connectors for configuring transmission links with **DClink** MPO modules and trunks for 10, 25, 40 or 100 Gbit/s applications.

Applications

For cabling in data centres and office applications acc. to ISO/IEC 11801 and EN 50173.

Optical characteristics

Insertion loss	0.10 dB (typ.)
	0.30 dB (max.)
Return loss	> 60 dB (SM APC)
	> 30 dB (MM)

Structure

Cable type	GigaLine® I-F(ZN)H 1x12
	GigaLine® I-F(ZN)H 2x12
Sheath colour/	OS2 ◆ Yellow/◆ Green (APC)
	Plug colour
Plug colour	OM3 ◆ Aqua
	OM4 ◆ Heather violet
	OM5 ◆ Lime green
Assignment	KBG00004 / TIA-568-B.1-7 Type B

Article	Fibre category	PU	Order no.
GigaLine® Patch MPO 1x12 1xMPO/f – 1xMPO/f	OS2 (APC)	1 pc.	LKD9SPM2FB0XXXX*
	OM3	1 pc.	LKD9SPM3DB0XXXX*
	OM4	1 pc.	LKD9SPM4DB0XXXX*
	OM5	1 pc.	LKD9SPM5DB0XXXX*
GigaLine® Patch MPO 2x12 2xMPO/f – 2xMPO/f	OS2 (APC)	1 pc.	LKD9SPM2FC0XXXX*
	OM3	1 pc.	LKD9SPM3DC0XXXX*
	OM4	1 pc.	LKD9SPM4DC0XXXX*
	OM5	1 pc.	LKD9SPM5DC0XXXX*

* XXX = length in dm (from plug to plug) Example: 1.5 m = 015

GigaLine® PATCH CORD LC-MPO

6xLC duplex-Uniboot – 1xMPO/f

4xLC duplex-Uniboot – 1xMPO/f

For data rates
10 / 25 / 40 / 100
Gbit/s

For data rates
4 x 10/25 Gbit/s
(SFF-8436/EIA 964)

GigaLine® Patch LCDU-MPO 1x12

GigaLine® Patch LCDU-MPO 1x8

Description

Ready-to-use pre-assembled **GigaLine®** patch cord with a divider for LC connectors on one MPO female connector. For the simple adaptation of MPO cabling (12-fibre systems) to cabling ≤10 Gbit/s (6 Duplex fibre systems). Both a dividing patch cord 1:1 and X-X are required to set up of complete links.

Structure

Connection	on D Clink module 8x MPO ½ HP
Cable type	GigaLine® I-F(ZN)H 1x12
Sheath colour	OS2 ◆ Yellow OM3 ◆ Aqua OM4 ◆ Heather violet OM5 ◆ Lime green

Applications

For cabling in data centres and office applications acc. to ISO/IEC 11801 and EN 50173.

Optical characteristics
















MPO insertion loss	0.10 dB (typ.)	
	0.30 dB (max.)	
MPO return loss	> 60 dB (SM APC)	> 30 dB (MM)
LC insertion loss	0.25 dB (typ.) (SM PC)	
	0.35 dB (max.) (SM PC)	
	0.25 dB (typ.) (MM)	
	0.40 dB (max.) (MM)	
LC return loss	> 50 dB (SM PC)	> 35 dB (MM)

Article	Configuration	Category	Assignment	PU	Order no.
GigaLine® Patch LC-MPO 1x8 4xLC duplex – 1xMPO/f	4xLCDx – 1xMPO/f APC	OS2	KBG00011 SFF-8436/EIA 964	1 pc.	LKD9SPW2BA20XXX*
	4xLCDx – 1xMPO/f	OM3			LKD9SPW3AA20XXX*
	4xLCDx – 1xMPO/f	OM4			LKD9SPW4AA20XXX*
	4xLCDx – 1xMPO/f	OM5			LKD9SPW5AA20XXX*
GigaLine® Patch LC-MPO 1x8 4xLC duplex-Uniboot – 1xMPO/f	4xLCDU – 1xMPO/f APC	OS2			LKD9SPW2BA00XXX*
	4xLCDU – 1xMPO/f	OM3			LKD9SPW3AA00XXX*
	4xLCDU – 1xMPO/f	OM4			LKD9SPW4AA00XXX*

* XXX = length in dm (from plug to plug) Example: 1.5 m = 015

GigaLine® FO CONNECTIVITY



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GigaLine® FO CABLING SYSTEMS

High-performance components for building a fibre optic infrastructure



GigaLine® IS A PERFECTLY COORDINATED SYSTEM MADE UP OF COMPONENTS OPTIMISED FOR PERFORMANCE AND QUALITY.

The interplay of high-quality fibres and skilfully crafted connectors ensures maximum performance and range for the respective application.

The requirements for fibres and connectors differ depending on the field of application.

	OM3	OM4	OM5	OS2	
Industry				OS2	SC, ST
Office	OM3				LC, SC
Data centre	OM3	OM4	OM5		LC, MTP/MPO
Campus				OS2	LC, SC

The system components are optimised to meet the requirements in terms of both distance and data rate.

The appropriate **GigaLine®** components are available to meet the requirements of each application.

	GigaLine® wall outlets	GigaLine® Wall distributors	GigaLine® Trunk and splice boxes	GigaLine® DClink	GigaLine® Compact
Industry			Trunk and splice boxes		Compact
Office	Wall outlets	Wall distributors	Trunk and splice boxes		Compact
Data centre			Trunk and splice boxes	DClink	
Campus			Trunk and splice boxes		Compact

This is why KERPEN consistently uses its own j-fibre fibres (cables, pigtailed, patch cords). The **GigaLine®** system is determined by the application, required link length and transmission protocol.

The table below shows the protocol-dependent attenuation budget according to EN 50173-1 for the 10 Gigabit Ethernet protocol. From this is derived the number of possible connections based on the overall link. The following harmonised components were taken into consideration when putting together the system:

- ▶ **Fibre optic cables (GigaLine®) with laser/dispersion-optimised gradient fibres with corresponding power reserves (for fibre specifications, see GigaLine® FO data cables)**
- ▶ **Fibre optic connectors with low insertion losses and high return losses**

Maximum transmission lengths for 10 Gigabit Ethernet system solutions.

	OM3	OM4	OM5	OS2
max. link length*	300	550	550	10,000
Attenuation budget**	2.6 dB	2.6 dB	2.6 dB	6.2 dB
max. fibre attenuation	0.75 dB	1.37 dB	1.37 dB	3.6 dB
possible number of connectors	8	6	6	12
Recommended Connectors	LC, MPO, SC	LC, MPO, SC	LC, MPO, SC	LC, SC

* based on 10 GbE

** all specifications are based on 850 nm or 1310 nm

The high-quality fibres and connectors in KERPEN DATACOM systems lead to reserves that go beyond the requirements of the cabling standards EN 50173 and IEC 11801.

THE KEY ADVANTAGES OF THESE SYSTEM RESERVES ARE:

- ▶ **Larger transmission lengths in certain applications (100 Mbps, 1 GbE, 10 GbE, 40 GbE, 100 GbE)**
- ▶ **The option to insert more patch cords or splices**
- ▶ **Additional attenuation caused by ageing processes can be curtailed**
- ▶ **Network extensions can be realised with ease and a certain level of assurance within the link lengths**

GigaLine® SYSTEM COMPONENTS AND BEND-INSENSITIVE MULTIMODE FIBRES - THE PERFECT COMBINATION

GigaLine® fibre optic cables as well as patch and trunk cables are equipped with bend-insensitive OM3, OM4 and OM5 fibres. This means significant added value for you:

- ▶ **Greater reliability with higher packing density and installation in constricted areas due to the low bending loss.**
- ▶ **Low-risk patching in operation - the data transmission remains constantly stable despite significant bending.**
- ▶ **Maximum security for a mix and match with fibres of other manufacturers due to minimal transition damping.**

QUALITY IS OUR BENCHMARK

Assembly of fibre optic connectors involves both adjustment of the fibres in the ferrule as well as time-consuming grinding and polishing. The goal is to machine the connector with such precision using optimised processes that the insertion loss and reflections are kept to a minimum. The so-called PC cut (PC = physical contact) is used for this purpose. Spherical polishing of the ferrule spring mounted in the connector housing produces a fibre/fibre transition at the end faces. In other words when two connectors are plugged into one coupling, the spring pressure pushes out all the air between the mating fibres of both connectors. The glass/glass transition then has very low reflections and low attenuation.

To maximise the performance of a PC connector, the surface parameters of the connectors must be carefully checked during the polishing process. The interferometer is an indicative measuring instrument for this. The overlaps of coherent light waves are used to measure the quality of optical surfaces (ferrule surfaces).

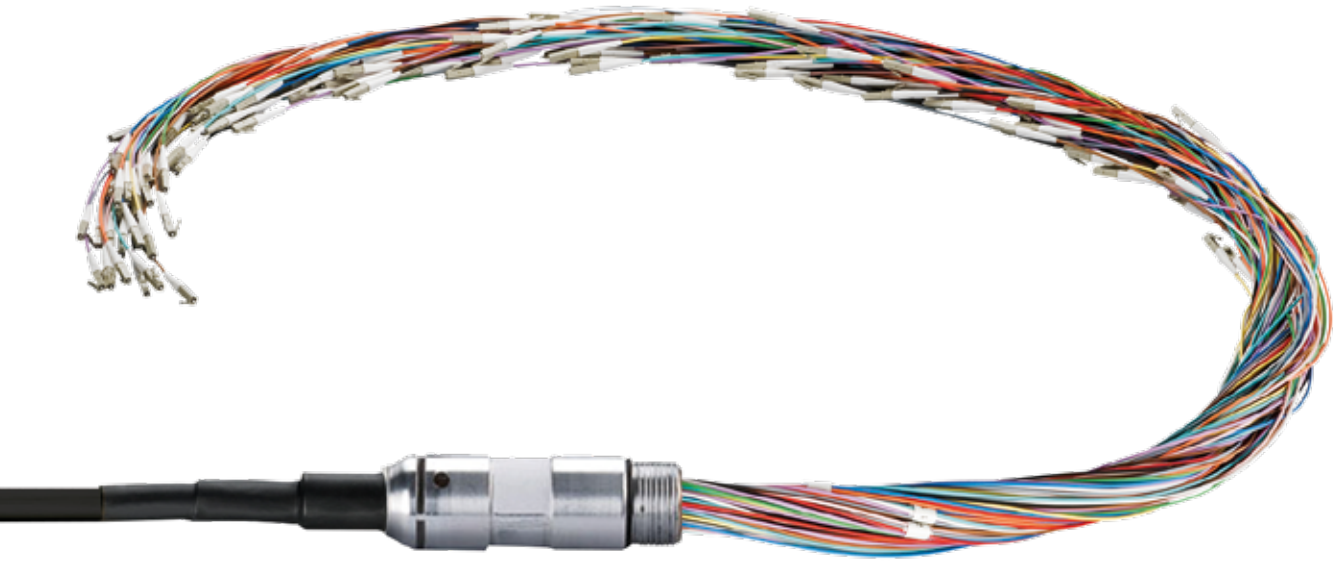
THE MOST IMPORTANT PARAMETERS ARE:

- ▶ **Apex offset (offset between the highest point and the centre of the fibre)**
- ▶ **Radius of the connector interface (fibre/ferrule)**
- ▶ **Fibre height (undercut, protrusion)**

These parameters determine the long-term behaviour and therefore the quality of a fibre optic connector.

Insertion loss of the connectors used in GigaLine® system components.

Fibre type		Insertion loss Typ.	Return loss
G50/125	OM3	0.15 dB	> 35 dB
G50/125	OM4	0.15 dB	> 35 dB
G50/125	OM5	0.15 dB	> 35 dB
E9/125	OS2	0.15 dB	> 50 dB
E9/125	OS2 APC	0.15 dB	> 65 dB



GigaLine® TRUNK – PRE-ASSEMBLED DATA CABLES

Safely through "thick and thin"

Ready-to-connect units are at the heart of our fibre optic system technology. The pre-assembled cables (**GigaLine®** trunk cables) guarantee rapid, reliable and economical installation. The quality of the pathway is assured by the careful coordination of the system components used. Installation times can be readily calculated.

A LASTING SOLUTION

Conditions are often unfavourable during on-site installation. Moisture, dirt and poorly accessible areas are by no means uncommon. That's why we use a corrugated tube with protection class IP 67 for our **GigaLine®** trunk cables with universal cable. Thanks to their particularly strong construction with an encapsulated cable divider including screwed-on corrugated tube, our trunk cables are protected from water spray and are non-crush. They are ideal for harsh construction site environments and outdoor cabling systems. Indoor cables are fitted with dust protection without strain relief to prevent soiling of the plugs.

GigaLine® trunk cables are designed to ensure that ambient conditions do not affect the quality of the transmission lines – either during or after installation. The cable pull is flexible and has a small cross-section. This enables pre-assembled trunk cables to be easily fed into tight, twisty manholes and installation channels. A frictional connection is formed with the divider head. It acts on the strain relief elements and the sheaths. The fibres thereby remain free of tension. The distribution head design guarantees the stability of the physical parameters while also ensuring a long service life.

TIME IS MONEY

GigaLine® trunk cables offer reliable and calculable installation. Installation times are short. All **GigaLine®** 19" trunk cable housings have recesses on the back in which the divider head is mounted to prevent rotation. The fast assembly minimises any downtime e.g. as a result of temporary IT system shutdown. On-site cable splicing and connector fitting, which often has to be performed under adverse conditions, is not required. Customers also save the cost of buying in splicing machinery and deploying specially-trained personnel. **GigaLine®** trunk cables can also be pre-assembled at one end.

FIELDS OF APPLICATION

GigaLine® trunk cables are ideal for backbone cabling in the primary and secondary segments as well as for collapsed backbone cabling.

QUALITY MEANS MAXIMUM SAFETY

The plugs are assembled with high quality ceramic ferules under clean conditions. The plug faces are polished to the highest standard, thereby ensuring outstanding plug transitions in reproducible quality (input and return attenuation). A test certificate with the attenuation readings of each fibre is supplied with the product. There is also the option of having OTDR measurements carried out.

GigaLine® FIBRE OPTIC TRUNK CABLE UNIVERSAL

Type KL-U-DQ(ZN)BH, pre-assembled at both ends



GigaLine® Trunk U-DQ(ZN)BH IP67

Benefits

- ▶ robust design
- ▶ easy assembly
- ▶ high crush resistance and tensile strength
- ▶ excellent optical properties

Structure

Single elements	up to 144 buffered fibres with strain relief under one sheath, diameter 1.8 mm	
Colour code	Acc. to IEC 60304	
strain relief	Non-metallic (glass rovings)	
Cable sheath	Halogen-free, flame-retardant compound Colour: Black	
Divider head	Aluminium	
Protection class	acc. to IP67	
strain relief	600 N	
Patch element	Ø 1.8 mm, assorted colours acc. to IEC 60304, shortest patch element 50 cm, Gradation 4 cm	
strain relief	100 N	
Dust protection	Protective tube	
Diameter pull tool	up to 12 fibres	34 mm
max.	up to 48 fibres	52 mm
	up to 144 fibres	68 mm

Thermal properties

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

Optical characteristics

Insertion loss typ.	for all fibre types	0.15 dB	
Return loss	G50/125	OM3	> 35 dB
	G50/125	OM4	> 35 dB
	E9/125	OS2	> 50 dB
	E9/125	OS2 APC	> 65 dB

Mechanical characteristics

Bending radius	static	15 x outer Ø
	dynamic	20 x outer Ø

Fire behaviour

Flame resistance	IEC 60332-1 / IEC 60332-3-24 Cat. C
Halogen content	IEC 60754-1
Smoke density	IEC 61034

Other characteristics

Longitudinal watertightness	IEC 60794-1-2 F5
-----------------------------	------------------

Fibre/number	SC/APC	SC/PC	LSH(E2000) / APC	LSH(E2000) / PC	LC/APC	LC/PC
OS2						
12	LKD9Vxxx6260000	LKD9Vxxx61Q0000	LKD9Vxxx6220000	LKD9Vxxx61W0000	LKD9Vxxx69B0000	LKD9Vxxx60L0000
24	*	LKD9Vxxx61R0000	LKD9Vxxx6230000	LKD9Vxxx61X0000	LKD9Vxxx69I0000	LKD9Vxxx60M0000
48	LKD9Vxxx6390000	LKD9Vxxx61S0000	LKD9Vxxx6240000	LKD9Vxxx61Y0000	*	LKD9Vxxx60N0000

Fibre/number		SC		LSH(E2000)		LC
OM3						
12	—	LKD9Vxxx61D0000	—	LKD9VxxxU6I0000	—	LKD9Vxxx6180000
24	—	LKD9Vxxx61E0000	—	*	—	LKD9Vxxx6190000
48	—	LKD9Vxxx61F0000	—	*	—	LKD9Vxxx60A0000
OM4						
12	—	LKD9Vxxx60X0000	—	—	—	LKD9Vxxx6120000
24	—	LKD9Vxxx60Y0000	—	—	—	LKD9Vxxx6140000
48	—	*	—	—	—	LKD9Vxxx6130000

xxx = Length in metres, measured from plug side A to plug side B

* On request

Further plug types and fibre numbers on request



GigaLine® TRUNK AND SPLICE BOXES

Multifunctional housing technology, 19"

GigaLine® trunk and splice boxes can be used in all areas of building data cabling. The construction of the components ensures speed and reliability during initial installation, maintenance and extension.

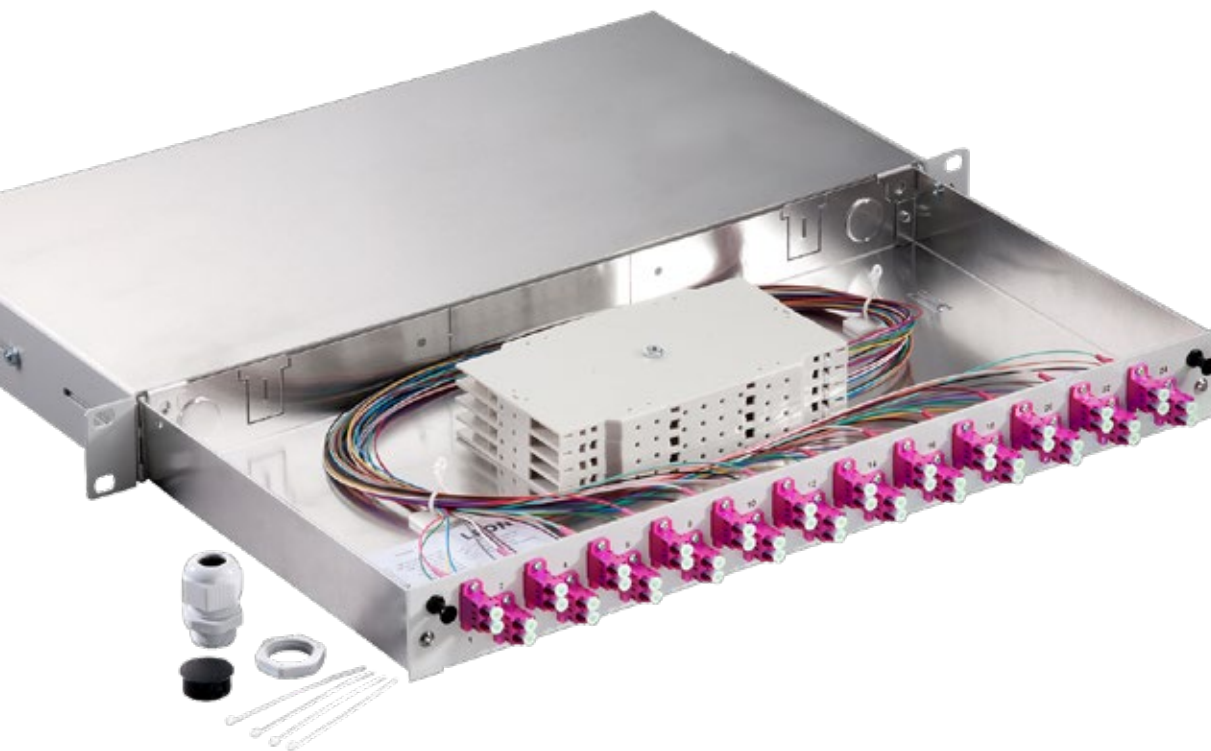
All boxes are pre-assembled ready to install and constructed so that two cables can be inserted via cable glands or two divider heads can be inserted from above. A breakout panel to which the cables can be secured using cable ties is available as an alternative.

Your guarantee for quick and reliable installation:

- ▶ The box body is made of aluminium and therefore very light
- ▶ The boxes are assembled ready to install
- ▶ The permissible bending radii as well as ease of installation are guaranteed even with high packing densities
- ▶ The pull out version offers the advantage that all components are easily accessible for testing and maintenance work

GigaLine® trunk and splice boxes:

- ▶ Boxes with one rack unit for fixed installation or as a pull-out version
- ▶ Boxes with two rack units are always pull out
- ▶ The front panel is made of galvanised steel panel and light grey, RAL 7035, powder-coated
- ▶ A rack unit can be equipped with max. 24 x SC- duplex, 24 x LC quad, 24 x LC- duplex, 24 x MT-RJ, 24 x E 2000, 24 x ST, 24 x FC couplings



GigaLine® FO SPLICE BOX

Box 19" / 1 RU, pull out



Benefits

- ▶ extremely light
- ▶ easy to install
- ▶ excellent optical properties

GigaLine® splice box pull out

Description

Pull out fibre optic patch panel for max. 48 optical fibres.
For terminating fibre optic transmission links with pigtails.

Structure

housing	Aluminium, with dust protection cover pull out and removable drawer Depth continuously adjustable by up to 50 mm
Front panel and mounting bracket	Galvanised steel panel, powder coated, colour: Grey, RAL 7035
Pigtails	Pigtails ready for splicing and plugged in (colours acc. to DIN IEC 60304)
Labelling	Channel 1–12 / 1–24 (screen printing) A/B coding with SC/ST/FC configuration
Dimensions	19" / 1 RU, 44 x 483 x 220 mm (HxWxD)
Weight	approx. 1.8 kg

Optical characteristics

Insertion loss	for all fibre types	0.15 dB (typ.)
Return loss	G50/125 OM3	> 35 dB
	G50/125 OM4	> 35 dB
	G50/125 OM5	> 35 dB
	E9/125 OS2	> 50 dB
	E9/125 OS2 APC	> 65 dB

Configuration

Equipment	available with up to 24 slots
Couplings	SC duplex, FC, ST, E2000/E2000 HRL, LC duplex

Accessories

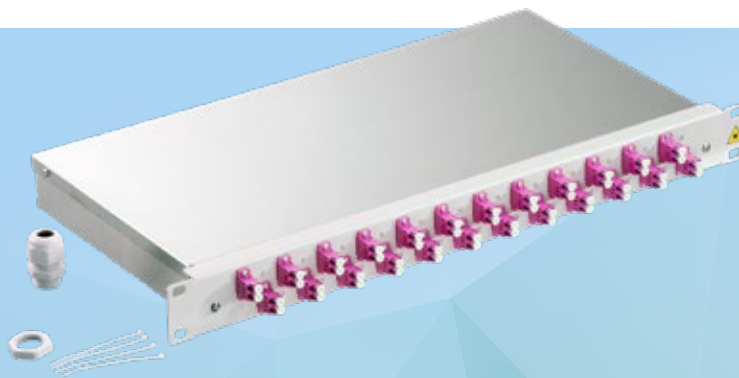
1 x M20 cable gland, splice cassette, crimp splice protective holder
optional › Breakout panel for attaching cables with cable ties
(Order no. LKD9D600000000)

Number of fibres		SC/APC duplex	LSH(E2000)/APC Compact duplex	LSH(E2000)/APC simplex	LC/APC duplex
12	Singlemode E/9/125	LKD9D31A4990000	LKD9D31A2500000	LKD9D31A0220000	LKD9D31A4690000
24		LKD9D31A3200000	LKD9D31A4700000	LKD9D31A0230000	LKD9D31A3110000
48		LKD9D31A5000000	LKD9D31A4930000	—	LKD9D31A5080000
		SC/PC duplex	LSH(E2000)/PC Compact duplex	LSH(E2000)/PC simplex	LC/PC duplex
12	Singlemode E/9/125	LKD9D31A0040000	LKD9D31A1440000	LKD9D31A0190000	LKD9D31A0150000
24		LKD9D31A0050000	LKD9D31A1910000	LKD9D31A2730000	LKD9D31A0160000
48		LKD9D31A0060000	LKD9D31A1370000	—	LKD9D31A0170000
		SC duplex	LSH(E2000) compact duplex	LSH(E2000) simplex	LC duplex
12	Multimode G50/125	LKD9D31A0430000	LKD9D31A4730000	LKD9D31A0580000	LKD9D31A1990000
24		LKD9D31A0440000	LKD9D31A4740000	LKD9D31A0590000	LKD9D31A1860000
48		LKD9D31A0450000	LKD9D31A3360000	—	LKD9D31A2810000
		SC duplex	LSH(E2000) compact duplex	LSH(E2000) simplex	LC duplex
12	Multimode G50/125	LKD9D31A0610000	LKD9D31A4750000	LKD9D31A0760000	LKD9D31A2950000
24		LKD9D31A1190000	LKD9D31A4760000	LKD9D31A0770000	LKD9D31A3290000
48		LKD9D31A2860000	*	—	LKD9D31A3270000
		SC duplex	LSH(E2000) compact duplex	LSH(E2000) simplex	LC duplex
12	Multimode G50/125	*	*	*	LKD9D31A5520000
24		*	*	*	LKD9D31A5530000
48		*	*	—	LKD9D31A5540000

* On request

GigaLine® FO SPLICE BOX

Box 19" / 1 RU, fixed



Benefits

- ▶ extremely light
- ▶ easy to install
- ▶ excellent optical properties

GigaLine® splice box fixed

Description

Fibre optic patch panel, for max. 48 glass fibres.
For terminating fibre optic transmission links with pigtails.

Structure

housing	Aluminium, with dust protection cover
Front panel	galvanised steel panel, colour: Grey, RAL 7035
Pigtails	Pigtails ready for splicing and plugged in (colours acc. to DIN IEC 60304)
Labelling	Channel 1–12 / 1–24 (screen printing) A/B coding with SC/ST/FC configuration
Dimensions	19" / 1 RU 44 mm x 483 mm x 220 mm (HxWxD)
Weight	approx. 1.5 kg

Optical characteristics

Insertion loss	for all fibre types	0.15 dB (typ.)
Return loss	G50/125 OM3	> 35 dB
	G50/125 OM4	> 35 dB
	G50/125 OM5	> 35 dB
	E9/125 OS2	> 50 dB
	E9/125 OS2 APC	> 65 dB

Configuration

Equipment	available with up to 24 slots
Couplings	SC duplex, FC, ST, E2000/E2000 HRL, LC duplex

Accessories

1 x M20 cable gland, splice cassette, crimp splice protective holder
optional › Breakout panel for attaching cables with cable ties
(Order no. LKD9D6000000000)

Number of fibres		SC/APC duplex	LSH(E2000)/APC Compact duplex	LSH(E2000)/APC simplex	LC/APC duplex
12	Singlemode E/9/125 OS2	LKD9D41A2450000	LKD9D41A2660000	LKD9D41A0220000	LKD9D41A3140000
24		LKD9D41A3230000	LKD9D41A2670000	LKD9D41A0230000	LKD9D41A3150000
48		—	LKD9D41A1920000	—	LKD9D41A3080000
		SC/PC duplex	LSH(E2000)/PC Compact duplex	LSH(E2000)/PC simplex	LC/PC duplex
12	Singlemode E/9/125 OS2	LKD9D41A0040000	LKD9D41A2640000	LKD9D41A0190000	LKD9D41A0150000
24		LKD9D41A0050000	LKD9D41A2650000	LKD9D41A0200000	LKD9D41A0160000
48		LKD9D41A2120000	*	—	LKD9D41A1650000
		SC duplex	LSH(E2000) compact duplex	LSH(E2000) simplex	LC duplex
12	Multimode G50/125 OM3	LKD9D41A0060000	LKD9D41A2700000	LKD9D41A0480000	LKD9D41A2300000
24		LKD9D41A0100000	LKD9D41A2710000	LKD9D41A0490000	LKD9D41A2310000
48		LKD9D41A2220000	*	—	LKD9D41A2320000
		SC duplex	LSH(E2000) compact duplex	LSH(E2000) simplex	LC duplex
12	Multimode G50/125 OM4	LKD9D41A0510000	LKD9D41A2720000	LKD9D41A0630000	LKD9D41A2380000
24		LKD9D41A0520000	LKD9D41A2730000	LKD9D41A0640000	LKD9D41A2330000
48		LKD9D41A2490000	*	—	LKD9D41A2340000
		SC duplex	LSH(E2000) compact duplex	LSH(E2000) simplex	LC duplex
12	Multimode G50/125 OM5	*	*	*	LKD9D41A3090000
24		*	*	*	LKD9D41A3100000
48		*	*	—	LKD9D41A3110000

* On request

GigaLine® FO SPLICE BOX

Box 19"/1 RU, with telescopic pull out



Benefits

- ▶ pull out
- ▶ removable
- ▶ resettable
- ▶ easy to install

GigaLine® splice box with telescopic pull out

Description

Pull out FO patch panel with pull out extension, for max. 48 glass fibres. For terminating fibre optic transmission links with pigtails. Including 2x PG16 screw connections, splice cassettes, cover, crimp and shrink splice holders and cable ties. Eight stamped strain reliefs on each side for fastening cables using cable ties

Structure

housing	Sheet steel, powder coated Colour: Grey RAL 7035 In 10 mm steps up to 110 mm resettable pull out and removable drawer
Front panel and mounting bracket	Sheet steel, powder coated Colour: Grey, RAL 7035

Pigtails

ready for splicing and plugged in (colours acc. to DIN IEC 60304)

Labelling

Channel 1–12 / 1–24 (screen printing)

Dimensions

19" / 1 RU, 44 x 483 x 230 mm (HxWxD)

Weight

approx. 3.3 kg

Optical characteristics

Insertion loss	for all fibre types	0.15 dB (typ.)
Return loss	G50/125 OM3	> 35 dB
	G50/125 OM4	> 35 dB
	G50/125 OM5	> 35 dB
	E9/125 OS2	> 50 dB
	E9/125 OS2 APC	> 65 dB

Configuration

Equipment	available with up to 24 slots
Couplings	LC duplex, SC duplex, LSH (E2000)

Accessories (optional)

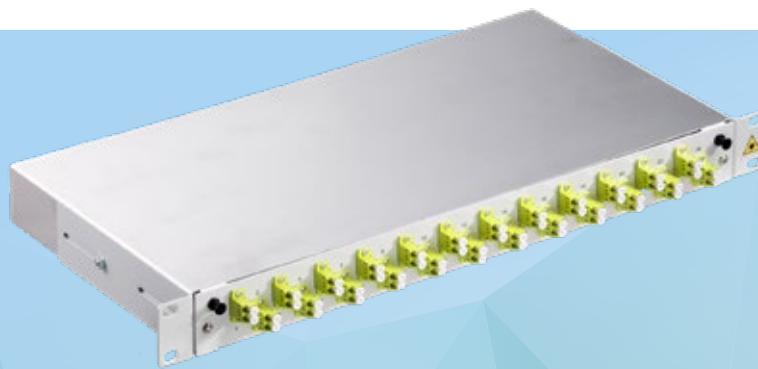
1 x M 20 cable gland, splice cassette, crimp splice protection holder

Number of fibres		LC/APC duplex	LSH/APC simplex	LSH/APC compact (duplex)	SC/APC duplex
12	OS2	LKD9D3104140001	*	*	*
24		LKD9D3104150001	*	*	LKD9D3104300001
36		LKD9D3104160001	—	*	*
48		LKD9D3104170001	—	*	LKD9D3104300001
		LC/PC duplex	LSH/PC simplex	LSH/PC compact (duplex)	SC/PC duplex
12	OS2	LKD9D3104180001	*	*	*
24		LKD9D3104190001	*	*	LKD9D3104320001
36		LKD9D3104200001	—	*	*
48		LKD9D3104210001	—	*	LKD9D3104330001
		LC duplex	LSH simplex	LSH compact (duplex)	SC duplex
12	OM3	LKD9D3104220001	*	*	*
24		LKD9D3104230001	*	*	*
36		LKD9D3104240001	—	*	*
48		LKD9D3104250001	—	*	*
		LC duplex	LSH simplex	LSH compact (duplex)	SC duplex
12	OM4	LKD9D3104260001	*	*	*
24		LKD9D3104270001	*	*	LKD9D3104340001
36		LKD9D3104280001	—	*	*
48		LKD9D3104290001	—	*	LKD9D3104350001
		LC duplex	LSH simplex	LSH compact (duplex)	SC duplex
12	OM5	*	*	*	*
24		LKD9D3104360001	*	*	LKD9D3104380001
36		*	—	*	*
48		LKD9D3104370001	—	*	LKD9D3104380001

* On request

GigaLine® FO TRUNK BOX

Box 19" / 1 RU, pull out



Benefits

- ▶ extremely light
- ▶ easy to install

GigaLine® trunk box pull out

Description

Pull out fibre optic patch panel for pre-assembled trunk cables. Suitable for termination of up to 48 glass fibres.

Structure

housing	Aluminium, with dust protection cover pull-out and removable drawer, depth continuously adjustable by up to 50 mm
Front panel and mounting bracket	Galvanised steel panel, powder coated Colour: Grey RAL 7035
Capacity	Installation of up to 2 trunk cables
Labelling	Channel 1–12 / 1–24 (screen printing) A/B coding with SC/ST/FC configuration
Dimensions	19"/1 RU, 44mm x 483mm x 220mm (HxWxD)
Weight	approx. 1.7 kg

Configuration

Equipment	available with up to 24 slots
Couplings	SC duplex, FC, ST E2000/E2000 HRL, LC duplex

Accessories (optional)

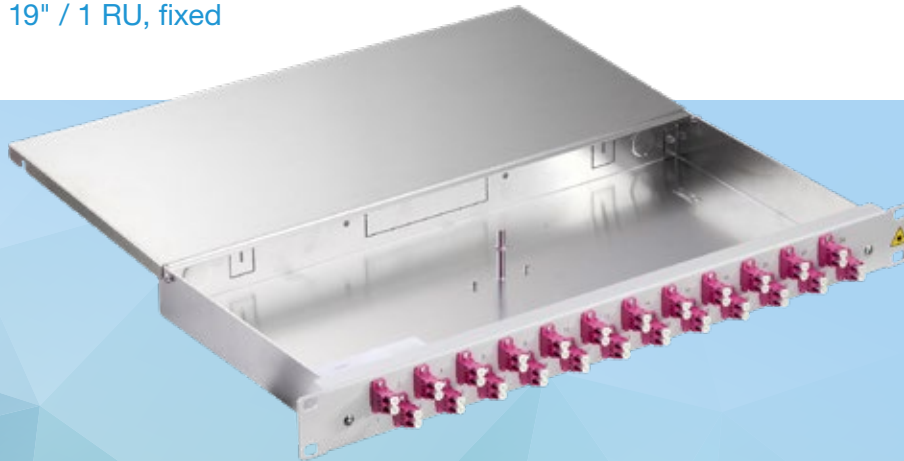
Breakout panel for attaching cables with cable ties
(Order no. LKD9D6000000000)

Number of fibres		SC/APC duplex	LSH(E2000)/APC Compact duplex	LC/APC duplex
12	Singlemode E/9/125 OS2	LKD9D32A2270000	LKD9D32A1860000	LKD9D32A2280000
24		*	LKD9D32A2070000	LKD9D32A2180000
48		*	LKD9D32A2260000	*
		SC/PC duplex	LSH(E2000)/PC Compact duplex	LC/PC duplex
12	Singlemode E/9/125 OS2	LKD9D32A0040000	LKD9D32A2050000	LKD9D32A0150000
24		LKD9D32 A0050000	LKD9D32A2060000	LKD9D32A0010000
48		LKD9D32A0060000	*	LKD9D32A0160000
		SC duplex	LSH(E2000) compact duplex	LC duplex
12	Multimode G50/125 OM3	LKD9D32A2140000	LKD9D32A2100000	LKD9D32A1790000
24		LKD9D32A2150000	LKD9D32A2110000	LKD9D32A1800000
48		LKD9D32A2010000	*	LKD9D32A1770000
		SC duplex	LSH(E2000) compact duplex	LC duplex
12	Multimode G50/125 OM4	LKD9D32A2160000	LKD9D32A2120000	LKD9D32A1820000
24		LKD9D32A2170000	LKD9D32A2130000	LKD9D32A1830000
48		LKD9D32A2040000	*	LKD9D32A1840000
		SC duplex	LSH(E2000) compact duplex	LC duplex
12	Multimode G50/125 OM5	*	*	*
24		*	*	*
48		*	*	*

* On request

GigaLine® FO TRUNK BOX

Box 19" / 1 RU, fixed



Benefits

- ▶ extremely light
- ▶ easy to install

GigaLine® trunk box fixed

Description

FO distributor box for pre-assembled trunk cables.
Suitable for termination of up to 48 glass fibres.

Structure

housing	Aluminium, with dust protection cover
Front panel	Galvanised steel panel, powder coated Colour: Grey RAL 7035
Capacity	Installation of up to 2 trunk cables
Labelling	Channel 1–12 / 1–24 (screen printing) A/B coding with SC/ST/FC configuration
Dimensions	19" / 1 RU 44 mm x 483 mm x 220 mm (HxWxD)
Weight	approx. 1.4 kg

Configuration

Equipment	available with up to 24 slots
Couplings	SC duplex, FC, ST E2000/E2000 HRL, LC duplex

Accessories (optional)

Breakout panel for attaching cables with cable ties
(Order no. LKD9D6000000000)

Number of fibres		SC/APC duplex	LSH(E2000)/APC Compact duplex	LC/APC duplex
12	Singlemode	—	LKD9D42A1380000	*
24	E/9/125	—	LKD9D42A1390000	*
48	OS2	—	*	*
		SC/PC duplex	LSH(E2000)/PC Compact duplex	LC/PC duplex
12	Singlemode	LKD9D42A0040000	LKD9D42A1360000	LKD9D42A0130000
24	E/9/125	LKD9D42A0050000	LKD9D42A1370000	LKD9D42A0330000
48	OS2	LKD9D42A1460000	*	LKD9D42A0010000
		SC duplex	LSH(E2000) compact duplex	LC duplex
12	Multimode	LKD9D42A1300000	LKD9D42A1420000	LKD9D42A1140000
24	G50/125	LKD9D42A1310000	LKD9D42A1430000	LKD9D42A1150000
48	OM3	LKD9D42A1320000	*	LKD9D42A1160000
		SC duplex	LSH(E2000) compact duplex	LC duplex
12	Multimode	LKD9D42A1330000	LKD9D42A1440000	LKD9D42A1180000
24	G50/125	LKD9D42A1340000	LKD9D42A1450000	LKD9D42A1190000
48	OM4	LKD9D42A1350000	*	LKD9D42A1200000
		SC duplex	LSH(E2000) compact duplex	LC duplex
12	Multimode	*	*	*
24	G50/125	*	*	*
48	OM5	*	*	*

* On request

GigaLine® FO TRUNK BOX

Box 19"/1 RU, with telescopic pull out



Benefits

- ▶ pull out
- ▶ removable
- ▶ resettable
- ▶ easy to install

NEW

GigaLine® trunk box with telescopic pull out

Description

Pull-out FO patch panel with pull out extension for pre-assembled **GigaLine®** trunk cables. Suitable for max. 48 glass fibres. Two entry holes for trunking. An angled mount for a **GigaLine®** trunk cable. Eight stamped strain reliefs on each side for fastening cables using cable ties.

Front panel and mounting bracket

Capacity

Labelling

Dimensions

Weight

Sheet steel, powder coated

Colour: Grey RAL 7035

Installation of up to 2 trunk cables

Channel 1–12 / 1–24 (screen printing)

19" / 1 RU, 44 x 483 x 230 mm (WxHxD)

approx. 3 kg

Structure

housing

Sheet steel, powder coated

Colour: Grey RAL 7035

Resettable in 10 mm increments up to 110 mm

pull out and removable drawer

Configuration

Equipment

available with up to 24 slots

Couplings

LC duplex, SC duplex, LSH (E2000)

Number of fibres		LC/APC duplex	LSH/APC simplex	LSH/APC compact (duplex)	SC/APC duplex
12	OS2	*	*	*	*
24		*	*	*	*
36		*	—	*	*
48		*	—	*	*
		LC/PC duplex	LSH/PC simplex	LSH/PC compact (duplex)	SC/PC duplex
12	OS2	*	*	*	*
24		LKD9D3203400001	*	*	LKD9D3203420001
36		*	—	*	*
48		LKD9D3203410001	—	*	LKD9D3203430001
		LC duplex	LSH simplex	LSH compact (duplex)	SC duplex
12	OM3	*	*	*	*
24		*	*	*	*
36		*	*	*	*
48		*	*	*	*
		LC duplex	LSH simplex	LSH compact (duplex)	SC duplex
12	OM4	*	*	*	*
24		LKD9D3203440001	*	*	LKD9D3203460001
36		*	—	*	*
48		LKD9D3203450001	—	*	LKD9D3203470001
		LC duplex	LSH simplex	LSH compact (duplex)	SC duplex
12	OM5	*	*	*	*
24		*	*	*	*
36		*	*	*	*
48		*	*	*	*

* On request



GigaLine® COMPACT – FIBRE OPTIC DISTRIBUTION SYSTEM

for maximum packing density and flexibility

GigaLine® Compact is a user-friendly fibre optic distribution system that can be configured with up to 144 fibres with conventional couplings such as SC, ST, E 2000 and even 288 fibres with LC Duplex couplings.

Despite being compact, the system offers optimum FO management. **GigaLine® Compact** is used where space is limited and maximum flexibility is required.

GigaLine® Compact module rack with excess-length drawer 3+1 RU

- ▶ Width: 19" / 84 HP
- ▶ Height 4 RU
(3 RU rack + 1 RU excess-length drawer)
- ▶ can be fitted with up to 12 modules
- ▶ Excess-length drawer blade can be pulled out to the rear, for holding loose tube reserves and securing FO cables, alternatively: with cable glands up to 6 pre-assembled trunk cables can be attached with up to 48 fibres
- ▶ Marshalling panel for patch cord routing and adherence to bending radii

GigaLine® Compact module 3 RU / 7 HP

- ▶ for up to 24 fibres
- ▶ available with up to 12 couplings
- ▶ equipped with SC duplex, ST, E2000, FC or LC duplex couplings
- ▶ Front panel: Aluminium, with mounting screws
- ▶ including splice cassette and excess-length cassette
- ▶ Buffered fibre pigtails are inserted, stripped and coloured (primary and secondary coating) acc. to the DIN IEC 60304 colour code ready for splicing for fast and secure installation
- ▶ Fibre qualities: OM2e, OM3, OM4, OM5 and OS2
- ▶ The couplings can be retrofitted at any time



GigaLine® rack with excess-length drawer 3+1 RU



GigaLine® Compact module 3 RU, 7 HP

GigaLine® COMPACT FO RACK

with mounted excess-length drawer 3+1 RU



Loose tube guide plate

GigaLine® Compact rack

Benefits

- ▶ for high packing densities
- ▶ clearly laid out cable management

Description

Rack 19" / 4 RU with 84 HP. The excess-length drawer for the loose tubes can be pulled out to the rear. Max. 6 trunk cables with 48 fibres each can be inserted from above or up to 12 loose tube cables with max. 288 fibres can be inserted from the front.

Structure

housing	Aluminium with permanently installed runners for the built-in modules
Excess-length drawer	for clear organisation of the loose tube reserves and securing, can be pulled out to the rear with 6 mounts for GigaLine® trunks with max. 48 fibres or cable entry holes for 10x PG16 and 2x PG21
Dimensions	176 mm x 483 mm x 295 mm (HxWxD)

Accessories (optional)

Loose tube guide plate	To protect the loose tubes on the rear, especially in open racks
Dummy front panel 7HP	To close off unused module slots

Accessories

Patch cord routing with 5 cable brackets



Rack – rear view



Rack for **GigaLine®** trunk cables – rear

Name	Order no.
GigaLine® Compact rack with mount for 12 screw connections or for 6 GigaLine® trunks	LKD9D5000000000
Loose tube guide plate	LKD9D5000050000
Dummy front panel 7HP	LKD9D5000040000

GigaLine® COMPACT FO MODULE

Installation module for splicing solutions



Benefits

- ▶ excellent optical properties

GigaLine® Compact splice module

Description

Installation module, available with 3, 6 and 12 slots. Including splice cassette and excess-length cassette. The buffered fibre pigtailed are inserted, stripped and coloured (primary and secondary coating) acc. to the DIN IEC 60304 colour code ready for splicing for fast and secure installation.

Structure

Module rack	Aluminium
Front panel	Aluminium, with mounting screws
Pigtails	Up to 24 pigtailed ready for splicing and plugged in (colours acc. to DIN IEC 60304)
Dimensions	7 HP / 1 RU 128 mm x 35 mm x 240 mm (HxWxD)

Optical characteristics

Insertion loss	for all fibre types	0.15 dB (typ.)
Return loss	G50/125 OM3	> 35 dB
	G50/125 OM4	> 35 dB
	G50/125 OM5	> 35 dB
	E9/125 OS2	> 50 dB
	E9/125 OS2 APC	> 65 dB
	E9/125 OS2 APC	> 65 dB

Configuration

couplings	The couplings can be retrofitted at any time
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Accessories

Labelling strips, cable ties for fastening the loose tube, crimp splice protective holder, 90 cm protective tube for loose tube diameters up to 2.4 mm

Single-mode OS2 E9/125				Single-mode OS2 E9/125		
Fibre count	SC/PC duplex blue, plastic/cer	LC/PC duplex blue, plastic/cer	LSH(E2000)/PC simplex blue, plastic/cer	LC/PC quad blue, plastic/cer	SC/APC duplex green, plastic/cer	LC/APC quad green, plastic/cer
12	LKD9D5100850000	LKD9D5100110000	LKD9D5100150000	—	LKD9D5100240000	LKD9D5101190000
24	—	LKD9D5100120000 (LC quad)	—	LKD9D5100120000	—	LKD9D5101170000

Multi-mode OM3 G50/125			Multi-mode OM4 G50/125			
Fibre count	SC duplex aqua, plastic/cer	LC duplex aqua, plastic/cer	LC quad aqua, plastic/cer	SC duplex Heather violet, plastic/cer	LC duplex Heather violet, plastic/cer	LC quad Heather violet, plastic/cer
12	LKD9D5100400000	LKD9D5100920000	—	LKD9D5100560000	LKD9D5100620000	LKD9D5101140000
24	—	—	LKD9D5100920000	—	—	LKD9D5100930000

other configurations available on request

GigaLine® COMPACT FO MODULE

Installation module for pre-assembled trunk cables, 3 RU / 7 HP



GigaLine® Compact splice module

GigaLine® Compact trunk module

Description

Installation module, available with 3, 6 and 12 slots.
Includes excess length cassette.

Structure

Module rack	Aluminium
Front panel	Aluminium, with mounting screws
Capacity	for up to 24 fibres
Dimensions	7 HP / 1 RU 128 mm x 35 mm x 240 mm (HxWxD)

Configuration

couplings	SC duplex, ST, E2000, FC, LC duplex, LC quad
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Accessories

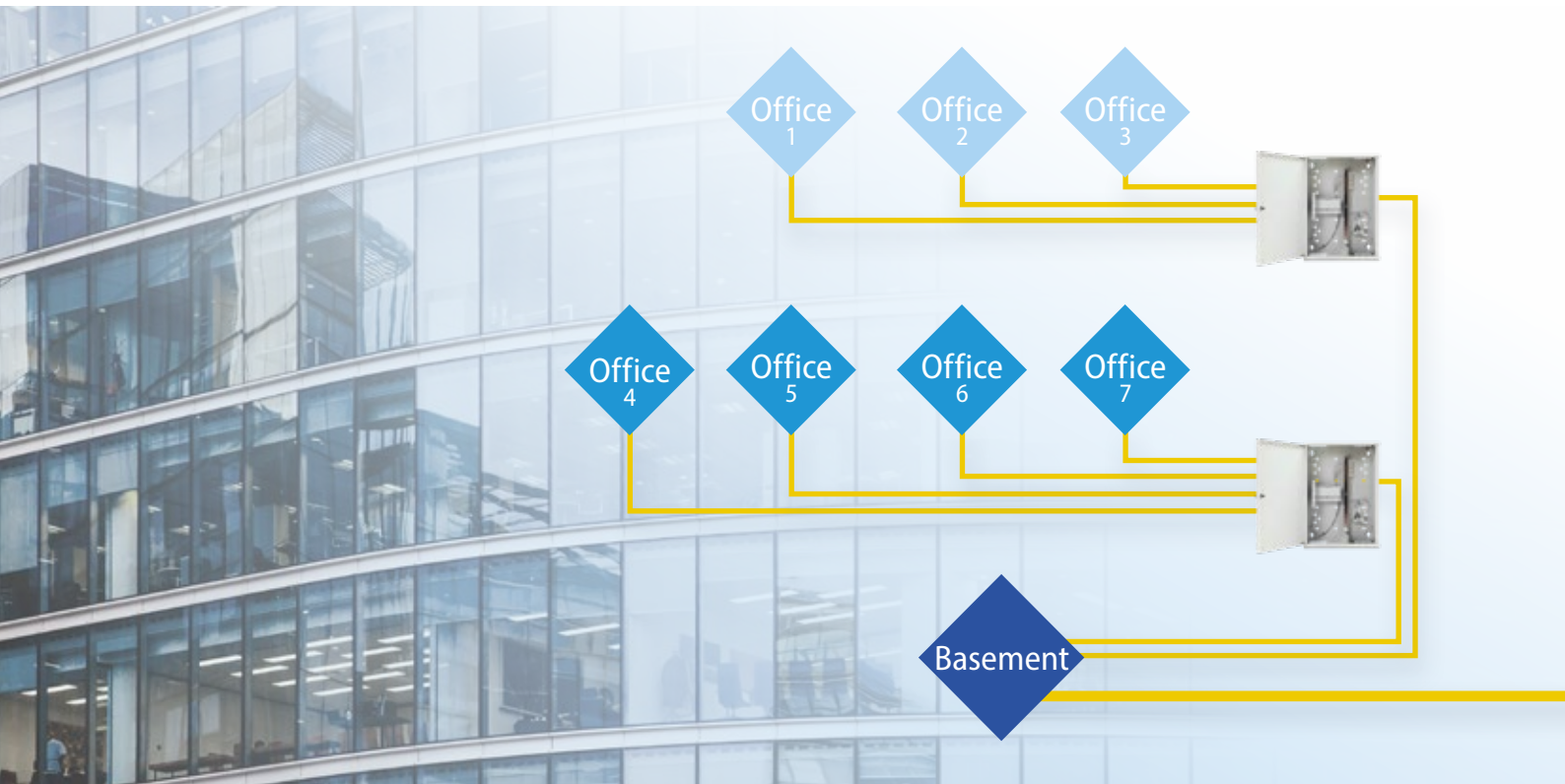
Labelling strips
Cable ties

Singlemode	OS2 E9/125			
Number of fibres	SC/PC duplex blue, plastic/cer	LC/PC duplex blue, plastic/cer	LSH(E2000)/PC simplex, blue, plastic/cer	LC/PC quad blue, plastic/cer
12	LKD9D5200010000	LKD9D5200090000	LKD9D5200120000	—
24	—	—	—	LKD9D5200100000
Multimode	OM3 G50/125			
Number of fibres	SC duplex aqua, plastic/cer	LC duplex aqua, plastic/cer	LC quad aqua, plastic/cer	
12	LKD9D5200420000	LKD9D5200380000		
24			LKD9D5200360000	
Multimode	OM4 G50/125			
Number of fibres	SC duplex Heather violet, plastic/cer	LC duplex Heather violet, plastic/cer	LC quad Heather violet, plastic/cer	
12	LKD9D5200440000	LKD9D5200500000		
24			LKD9D5200370000	

other connectors available on request

GigaLine® OFFICE AND FLOOR DISTRIBUTORS

Multifunctional housing for FTTD/FTTO cabling



Network installations are increasingly being implemented with disturbance-proof fibre optic systems technology with future capabilities. This allows EMC problems as well as different earthing potentials to be avoided for cabling across whole buildings.

When a fibre optic cabling system with a star structure is used in a building, the long ranges involved make it possible to dispense with active components on the individual floors. 19" distributor cabinets and separate security areas (rooms) including the associated power supply are no longer necessary.

The space-saving office and floor distributors are perfectly suited for the transitions from high-fibre backbone cables to breakout cables for workplace cabling. They are easy to install and offer space-saving organisation as well as optimum protection for fibre optic systems engineering.

GigaLine® provides a high degree of flexibility:

- ▶ GigaLine® office and floor distributors can be optionally equipped with splice cassettes and/or distributor plates for holding fibre optical couplings
- ▶ Later modifications to the components used are possible at any time
- ▶ Can hold up to 288 fibres
- ▶ The buffered fibre pigtails are coloured acc. to the DIN IEC 60304 colour code for fast and reliable installation
- ▶ The pigtail buffered fibres in the splice cassette are stripped and ready for splicing
- ▶ The incoming and outgoing fibre optic cables are fixed to a strain relief strip in the housing
- ▶ The cable entries are sealed via brush strips or PG cable glands
- ▶ Housings have one removable/lockable swing door
- ▶ Housing colour: Light grey, RAL 7035

GigaLine® office and floor distributors

- ▶ are tailored to the customer's requirements and supplied fully assembled
- ▶ available in 2 sizes

GigaLine® FIBRE OPTIC OFFICE AND FLOOR DISTRIBUTORS

Wall distributor for up to 4 or 24 splice cassettes



Benefits

- ▶ space-saving
- ▶ universal use

GigaLine® wall distributor size A

Application

Space-saving distributor cabinets for Fibre-To-The-Office or Fibre-To-The-Desk cabling systems. Suitable for distributing up to 24 channels (48 fibres).

Performance

For up to 4 splice cassettes with a total of 48 fibres. The buffered fibre pigtailed are inserted, stripped and coloured (primary and secondary coating) acc. to the DIN IEC 60304 colour code ready for splicing for fast and secure installation.

Structure

- ▶ Powder-coated steel panel, colour: Light grey RAL 7035
- ▶ Cable entry from above and below possible
- ▶ 4 cable entries
- ▶ Door with lock

Dimensions

Size A 330 mm x 330 mm x 90 mm (HxWxD)

Configuration

Optionally with couplings for pre-assembled trunks only, purely as a splice box or combined

Accessories

Up to 4 splice cassettes with crimp splice protective holder, buffered fibre strain relief and cover max. 24 couplings: LCD, SCD or E2000

Number of fibres		LC/APC duplex	LSH/APC simplex	SC/APC duplex	SC/APC simplex	
12	OS2	LKD9D71S0150000	LKD9D71S0110000	*	*	*
24		LKD9D71S0160000	LKD9D71S0100000	*	LKD9D71S0040000	*
36		LKD9D71S0170000	—	*	—	*
48		LKD9D71S0180000	—	*	—	*
		LC/PC duplex	LSH/PC simplex	SC/PC duplex	SC/PC simplex	
12	OS2	LKD9D71S0190000	*	*	*	*
24		LKD9D71S0030000	*	LKD9D71S0060000	*	*
36		LKD9D71S0200000	—	LKD9D71S0070000	—	*
48		LKD9D71S0210000	—	—	—	*
		LC duplex	LSH simplex	SC duplex	SC simplex	ST duplex
12	OM3	LKD9D71S0220000	*	*	*	—
24		LKD9D71S0230000	*	*	*	LKD9D71S0010000
36		LKD9D71S0240000	—	*	—	*
48		LKD9D71S0250000	—	—	—	*
		LC duplex	LSH simplex	SC duplex	SC simplex	
12	OM4	LKD9D71S0120000	*	*	*	*
24		LKD9D71S0020000	*	*	*	*
36		LKD9D71S0130000	—	*	—	*
48		LKD9D71S0140000	—	*	—	*
		LC duplex	LSH simplex	SC duplex	SC simplex	
12	OM5	*	*	*	*	*
24		*	*	*	*	*
36		*	—	*	—	*
48		*	—	*	—	*

* On request



Benefits

- ▶ space-saving
- ▶ universal use

GigaLine® wall distributor size B

Application

Space-saving distributor cabinets for Fibre-To-The-Office or Fibre-To-The-Desk cabling systems. Suitable for distributing up to 144 channels (288 fibres).

Performance

For up to 24 splice cassettes for up to 288 fibres. The buffered fibre pigtailed are inserted, stripped and coloured (primary and secondary coating) acc. to the DIN IEC 60304 colour code ready for splicing for fast and secure installation.

Structure

- ▶ Powder-coated steel panel, colour: Light grey RAL 7035
- ▶ Cable entry from above and below possible
- ▶ 4 cable entries either as M20 / M25 or brush strip
- ▶ **Door** with lock or bolt
- ▶ Weight approx. 7 kg

Dimensions

Size B 600 mm x 425 mm x 220 mm (H x W x D)

Configuration

See distributor A

Accessories

Up to 24 splice cassettes with crimp splice protective holder, buffered fibre strain relief and cover or max. 96 SCSx or LCD couplings or up to 48 SCD couplings with the corresponding number of splice cassettes

Name	Order no.
GigaLine® wall distributor, size B with 12 splice cassettes, 4 strip brushes and an insertion plate	LKD9D7101630000

additional equipment on request



GigaLine® FIBRE-TO-THE-DESK (FTTD) WALL OUTLETS

COMPACT FIBRE OPTIC CONNECTIVITY – HIGH PERFORMANCE, IMMUNITY TO DISTURBANCES, FUTURE CAPABILITIES

Of course, the **GigaLine®** system also includes comprehensive solutions for Fibre-To-The-Desk. Here, customers can choose from a wide range of connection boxes, together with corresponding installation materials for wall mounting and installation in dado ducts.

As a result of the specific outlet design, bending never goes below the admissible bending radii of the fibres. This ensures the fibre retains its full functionality even in the long term:

- ▶ A defined bending radius for the fibre ensures the service life
- ▶ An effective strain relief for cables and pigtails and clean guidance within the outlet ensure minimum strain on the fibre and preservation of the physical characteristics
- ▶ The dimensions of the outlets are as small as possible

GigaLine® FLUSH-MOUNTED OUTLET

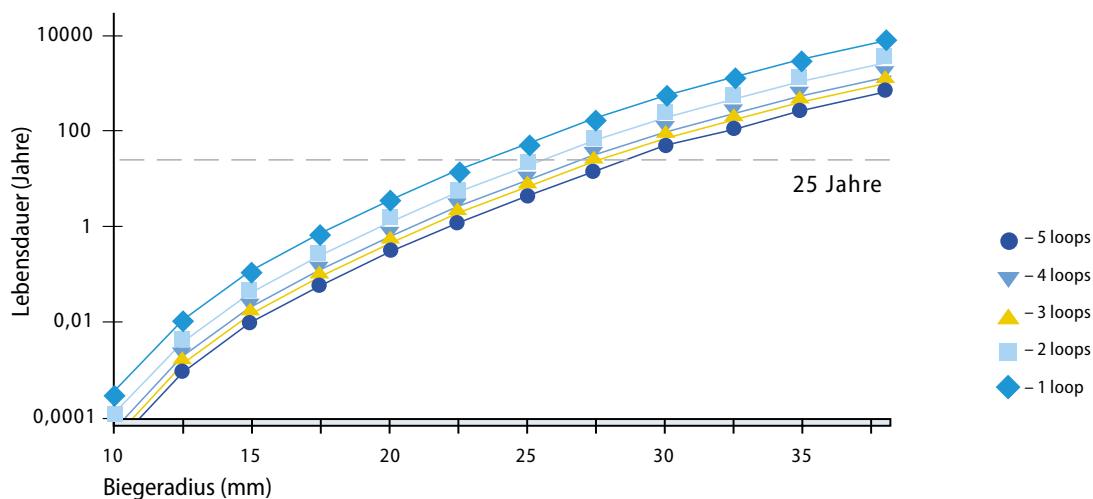
The flush-mounted outlet can be installed in ducts or, as the name suggests, mounted flush.

Special features:

- ▶ Can be equipped with up to two duplex or four simplex couplings
- ▶ Possible types of coupling:
 - SC duplex, ST-simplex, E 2000, LC duplex
- ▶ The bending radius of the fibre of at least 30 mm is ensured by the cable reservoir and the cable guide
- ▶ The outlet has a downward inclination of 10 degrees, thereby ensuring optimum protection from mechanical stress
- ▶ The universal carrying frame is compatible with usual mounting cups
- ▶ All current connecting techniques are supported:
 - ▶ On-site assembly of fibre optic connectors
 - ▶ Use of pre-assembled cables
 - ▶ Splicing of buffered fibre pigtails



GigaLine® flush-mounted outlet



GigaLine® FTTD WALL OUTLETS

for surface/flush mounting



GigaLine® surface-mounted outlet

Performance

Wall outlet for surface mounting.

- ▶ Downward outlet direction
- ▶ Splice storage for 4 splices
- ▶ for 2 SC duplex or LC quad coupling
- ▶ Cover with screw as access protection
- ▶ Cable entry for 3–10 mm cables
- ▶ Adherence to the bending radii of approx. 30 mm thanks to guided fibre paths

Optical characteristics

Insertion loss	G50/125	OM3/4/5	0.15 dB (typ.)
Return loss	G50/125	OM3/4/5	> 35 dB (typ.)

Dimensions

120 mm x 80 mm x 25 mm (H x W x D)

Accessories

Cable ties, coupling protection, wall mounting set

Name	Configuration	Order no.	
		OS2 E9/125	OM3 G50/125
GigaLine® surface-mounted outlet (1 pc.)	SC duplex plastic/cer	LKD9D7100200000	LKD9D7100210000
	LC quad plastic/cer	LKD9D7100220000	LKD9D7100230000
without pigtails			
GigaLine® wall outlet for surface mounting (1 pc.)	SC duplex plastic/cer, blue	LKD9D7200200000	
	SC duplex plastic/cer, beige	LKD9D7200210000	
	LC quad plastic/cer, blue	LKD9D7200220000	
	LC quad plastic/cer, beige	LKD9D7200230000	

additional equipment on request



GigaLine® flush-mounted outlet

Performance

Wall outlet for mounting in ducts and for underfloor mounting.

- ▶ Downward outlet direction (at an angle of 10°)
- ▶ Termination of up to 4 fibres
- ▶ Bending radius > 30 mm in combination with cable reservoir KR or cable guide KF
- ▶ Colour: Pure white, RAL 9010
- ▶ New outlets

Optical characteristics

Insertion loss	G50/125	OM3/4/5	0.15 dB (typ.)
Return loss	G50/125	OM3/4/5	> 35 dB (typ.)

Dimensions

114 mm x 85 mm x 41 mm (H x W x D)

Scope of delivery

Equipped with 2 fibre optic couplings

With labelling insert (enclosed)

Name	Configuration	Order no.
GigaLine® flush-mounted outlet (1 pc.)	2 SC duplex met /cer	LKD9FK030060000
	2 LC quad, OM4, plastic/cer	LKD9FK030520000

GigaLine® FTTD WALL OUTLETS

Cable reservoir/splice tray



GigaLine® cable reservoir KR

Performance

For flush-mounted outlet to hold excess cable lengths in the duct and/or safety reserves (up to 4 x 1 m for an overall diameter of 3 mm).

- ▶ Min. bend radius > 30 mm
- ▶ Direction-independent cable entry with cable tie strain relief on entry and exit side
- ▶ Colour oyster white, RAL 1013

Dimensions

76 mm x 151 mm x 50 or 55 mm (H x B x D)

50 mm installation depth (KR50), 55 mm installation depth (KR55)

Name	Order no.
GigaLine® cable reservoir KR50 (1 pc.)	LKD9FK030070000
GigaLine® cable reservoir KR55 (1 pc.)	LKD9FK030080000

GigaLine® splice tray for cable reservoir KR

Performance

For storing fibre optic splices when splicing plug pigtails. By keeping the splicing and working reserve physically separate, optimum protection is ensured for the sensitive splice area.

- ▶ Can be equipped with one or two splice holders for 4 fusion splices or mechanical splice connectors
- ▶ Can be snapped into cable reservoir KR

Name	Order no.
GigaLine® splice tray for cable reservoir KR (1 pc.)	LKD9FK030290000

GigaLine® FTTD WALL OUTLETS

for surface/flush mounting



GigaLine® surface-mounted outlet

Description

Outlet box for flush mounting with central plate
50 mm x 50 mm, labelling field and surface-mounted housing
Outlet direction diagonal ahead
Colour: Pure white

Properties/applications

Equipped with two couplings each, see table
For mounting pre-assembled cables, for FTTO or FTTD applications.

Scope of delivery

FO wall outlet, central plate 50x50
Cover frame, FO couplings, surface-mounted housing.

Surface-mounted housing

Number of fibres		LC/APC duplex	SC/APC duplex	SC/APC simplex
4	OS2	*	*	*
		LC/PC duplex	SC/PC duplex	SC/PC simplex
		LKD9FK031070000	LKD9FK031080000	*
4	OM3	LC duplex	SC duplex	SC simplex
		*	*	*
		LC duplex	SC duplex	SC simplex
4	OM4	LKD9FK031030000	LKD9FK031030000	*
		LC duplex	SC duplex	SC simplex
		*	*	*
4	OM5	*	*	*

* On request



GigaLine® flush-mounted outlet

Description

Outlet box for flush mounting with central plate
50 mm x 50 mm and labelling field
Outlet direction diagonal ahead
Colour: Pure white

Properties/applications

Equipped with two couplings each, see table
For mounting pre-assembled cables, for FTTO or FTTD applications.

Scope of delivery

FO wall outlet, central plate 50x50
Cover frame, FOC couplings.

Flush-mounted housing

Number of fibres		LC/APC duplex	SC/APC duplex	SC/APC simplex
4	OS2	*	*	*
		LC/PC duplex	SC/PC duplex	SC/PC simplex
		LKD9FK031050000	LKD9FK031060000	*
4	OM3	LC duplex	SC duplex	SC simplex
		*	*	*
		LC duplex	SC duplex	SC simplex
4	OM4	LKD9FK031010000	LKD9FK031020000	*
		LC duplex	SC duplex	SC simplex
		*	*	*
4	OM5	*	*	*

* On request

GigaLine® ACCESSORIES

Cable glands



GigaLine® cable glands/counter nuts

Description

- ▶ Cable glands
Cone cable glands, for use as cable entry in splice boxes.
- ▶ Counter nuts
For fastening the aforementioned cable glands in the box wall.

Structure

Material	Polystyrene
Colour	Light grey
	8 - 13 mm (M20)
Cable diameter	11 - 17 mm (M25)

Name	Order no.
Cable gland M20	LKD9D0003010000
Cable gland M25	LKD9D0003020000
Counter nut M20	LKD9D0003030000
Counter nut M25	LKD9D0003040000

GigaLine® crimp splice protectors

Description

- ▶ Crimp splice protection consisting of a V-shaped aluminium carrier coated with a permanently elastic compound.
Made in Germany
Dimensions (HxWxD): 3.3 x 30 x 1.2 mm

- ▶ Tested according to TS0338/96 of Deutsche Telekom

PU: 150 pieces (5 blister strips of 30 pcs.)

- ▶ Shrink splice protection 2 mm x 40 mm (100 pcs. = 1 PU)
- ▶ Shrink splice protection 3 mm x 40 mm (100 pcs. = 1 PU)
- ▶ Splice holder for 12 crimp splice protectors
- ▶ Splice holder for shrink splice protectors for 6 x 3 mm or 12 x 2 mm shrink splice protectors

Name	Order no.
Crimp splice protection (150 units = 1 PU)	LKD9D0003050000
Shrink splice protection 2mm x 40mm	LKD9D0003090000
Shrink splice protection 3mm x 40mm	LKD9D0003080000
Splice holder for 12 crimp splice protectors	LKD9D0001460000
Splice holder for shrink splice protectors	LKD9D0002580000

GigaLine®

DClink SOLUTIONS

Modern data centres are very complex

entities which are subject to constant changes in both their technical and organisational environments. The focal requirements are availability, flexibility and future-proofing at increasingly higher data rates. At the same time, planners and operators have to manage a growing system density as server and storage systems are generally installed in small spaces.

Hyperscale, cloud and other virtualised data centres are causing a constant increase in data transfer rates. New switch generations for 25, 40, 50, 100 and 400 GbE (**Gigabit Ethernet**) are now available or are being planned and demand correspondingly high-performance cable systems.

Requirements for data centre IT cabling are set out in the DIN EN 50173-5 and ISO/IEC 11801-5 standards. The base requirement here is for structured and generic cabling. In terms of standards, a response has already been made to the increasing data rates with new Ethernet standards for 40 and 100 Gbit/s, such as IEEE 802.3ba. Further standards, such as 25 and 50 GbE for passive network infrastructure, are being planned.

Additionally, switches and servers with fibre optic and copper ports for 25, 40 and 50 GbE will also be increasingly deployed. With cabling, hybrid solutions are required which are also capable of migration. Only upgradable systems can ensure permanent transmission with future generations of active components.

There is now a trend towards pre-assembled systems for copper and glass fibre. Plug&Play solutions are tested under laboratory conditions before shipment and can be quickly and safely used in data centres. Complex and error-prone assembly on site is not necessary.

RANGE OF PRODUCTS AND SERVICES

KERPEN is there for you right from the very beginning

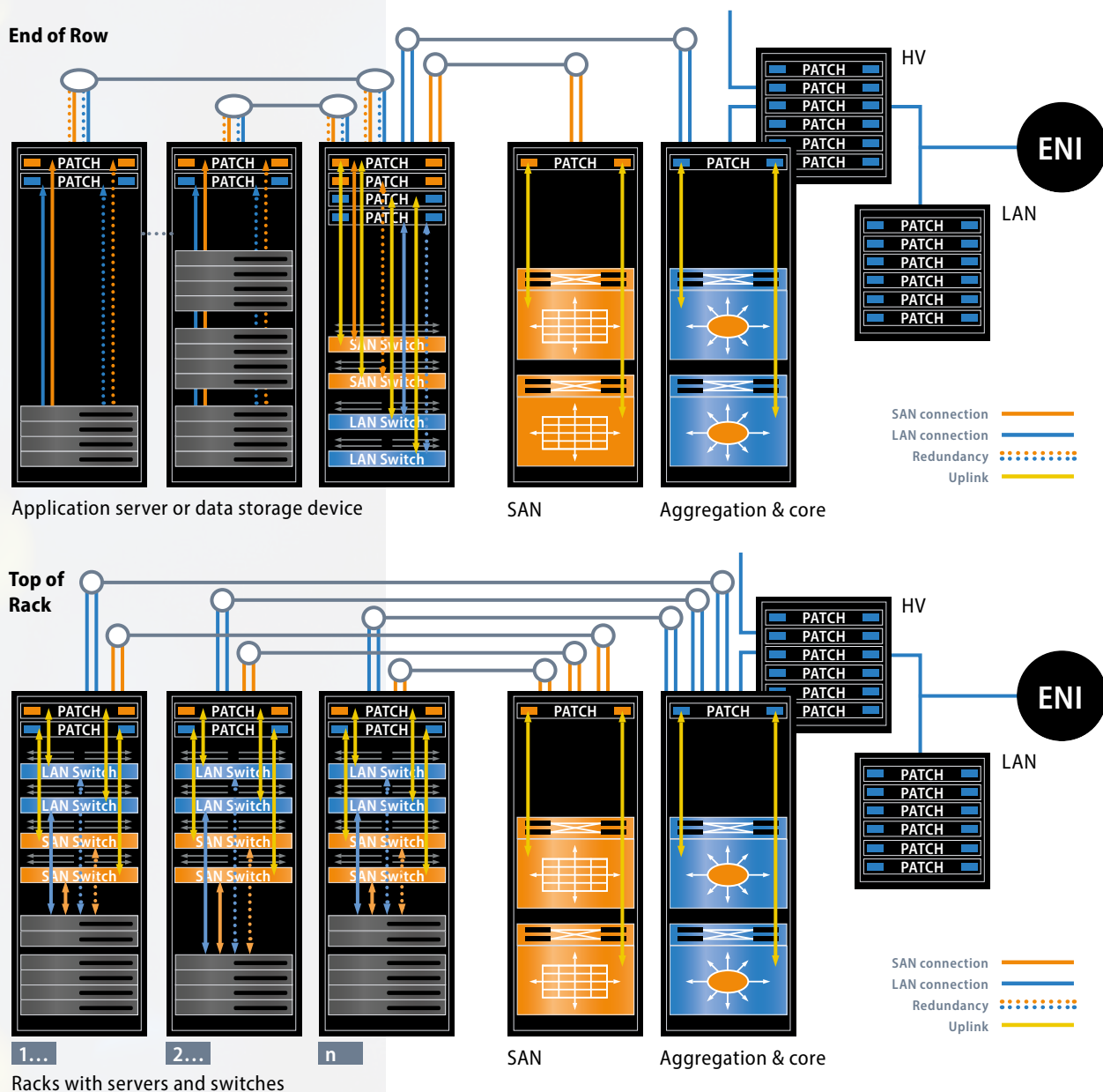
KERPEN offers coherent, future-orientated concepts for cabling infrastructure requirements in data centres. The services offered range from advice for the planning of data centres to standardised and customised cabling systems as well as after-sales services. With KERPEN's high-performance and migration-capable DClick Plug&Play solutions, data centres are ready to cope with the management of complex server and storage environments both today and into the future.

KERPEN supports you in the selection and installation of high-performance cable solutions for your IT topologies. You benefit not only from the KERPEN specialist expertise but also

from tried-and-tested cabling systems that can be continually adapted to increasing data rates. Straightforward handling for all higher system densities is a fundamental requirement of all KERPEN developments.

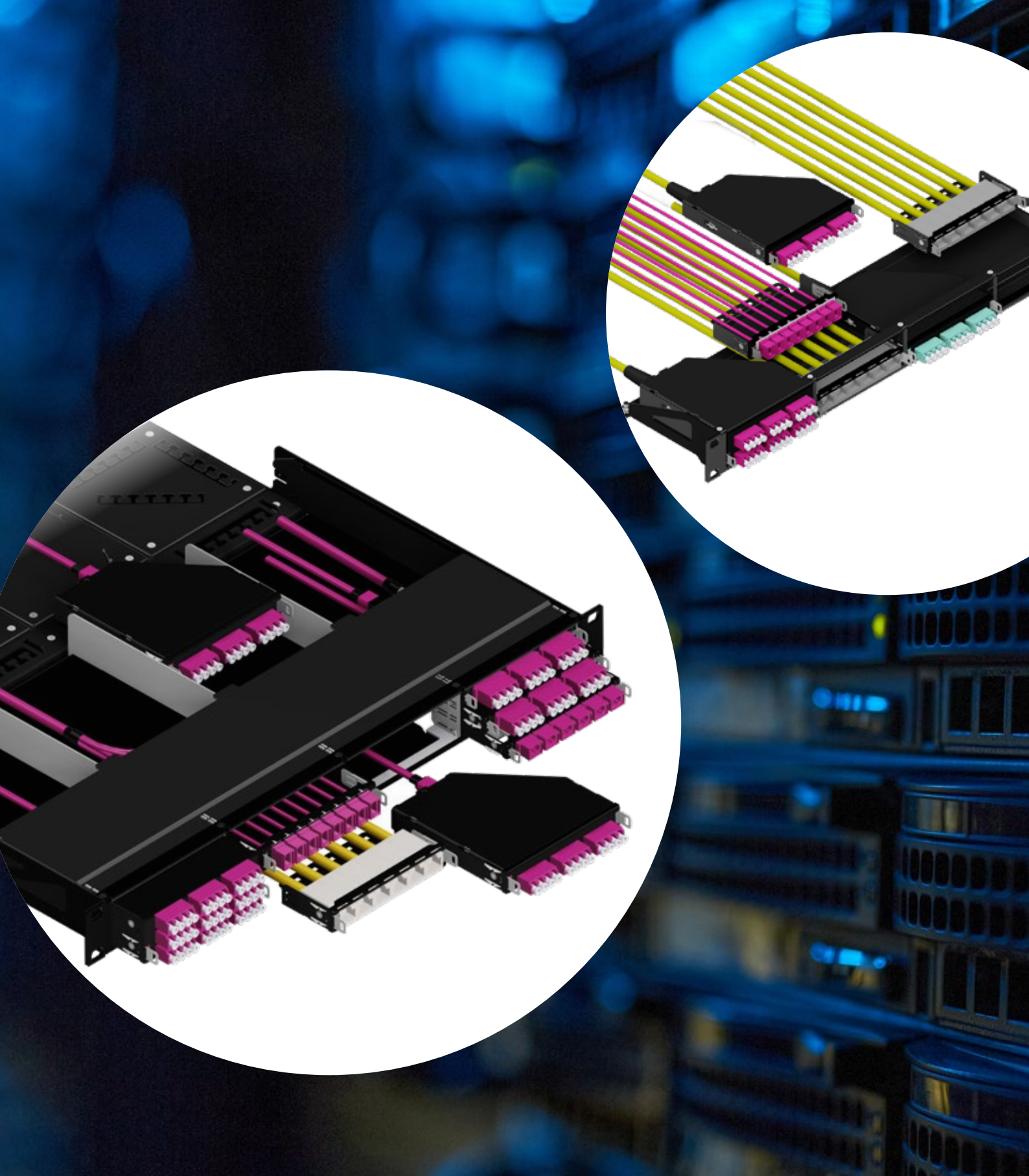
KERPEN's DClick Plug&Play solutions are easy to scale and are thus oriented towards the expansion and migration of IT infrastructures in the long term. This therefore gives you a high level of investment protection.

Whether End-of-Row or Top-of-Rack – DClick Plug&Play solutions combine technologically-advanced fibre optic and copper systems to ensure that data centres are able to meet the full spectrum of requirements for structured cabling.



DClink – THE REAL PLUG & PLAY SOLUTION

Cabling systems with guaranteed future-proofing





WITH THE **DClink** PLUG&PLAY SOLUTIONS, KERPEN OFFERS THE HIGHEST LEVEL OF SECURITY, FUNCTIONALITY AND FLEXIBILITY FOR THE CABLING OF MODERN AND FUTURE-PROOF DATA CENTRES.

DClink products ensure a high system/port density and thus optimum use of space. **DClink** firstly allows both glass fibre and copper cabling to be installed in one rack unit, and secondly the LC Uniboot patch cords contained have a maximum cable diameter of 2.8 mm.

With the **DClink** solutions, LEONI provides pre-assembled, pre-tested and ready-to-connect transmission links that merely need to be laid and then "clicked" the pre-installed frames. Optimum handling simplicity ensures minimum installation times. Not only are moves, adds and changes (MACs) easier, **DClink** Plug&Play solutions also enable simple migration up to 400 Gbit/s.

These accessories supplement KERPEN's **DClink** product range:

- ▶ **DClink cable guide trough with removable front**
- ▶ **Various labelling fields**
- ▶ **Rear-mounted cable trays**
- ▶ **Document drawers**
- ▶ **CP housing for two 7/2 HP modules**
- ▶ **CP housing for three 7/3 HP modules**
- ▶ **CP housing for one 7 HP module**

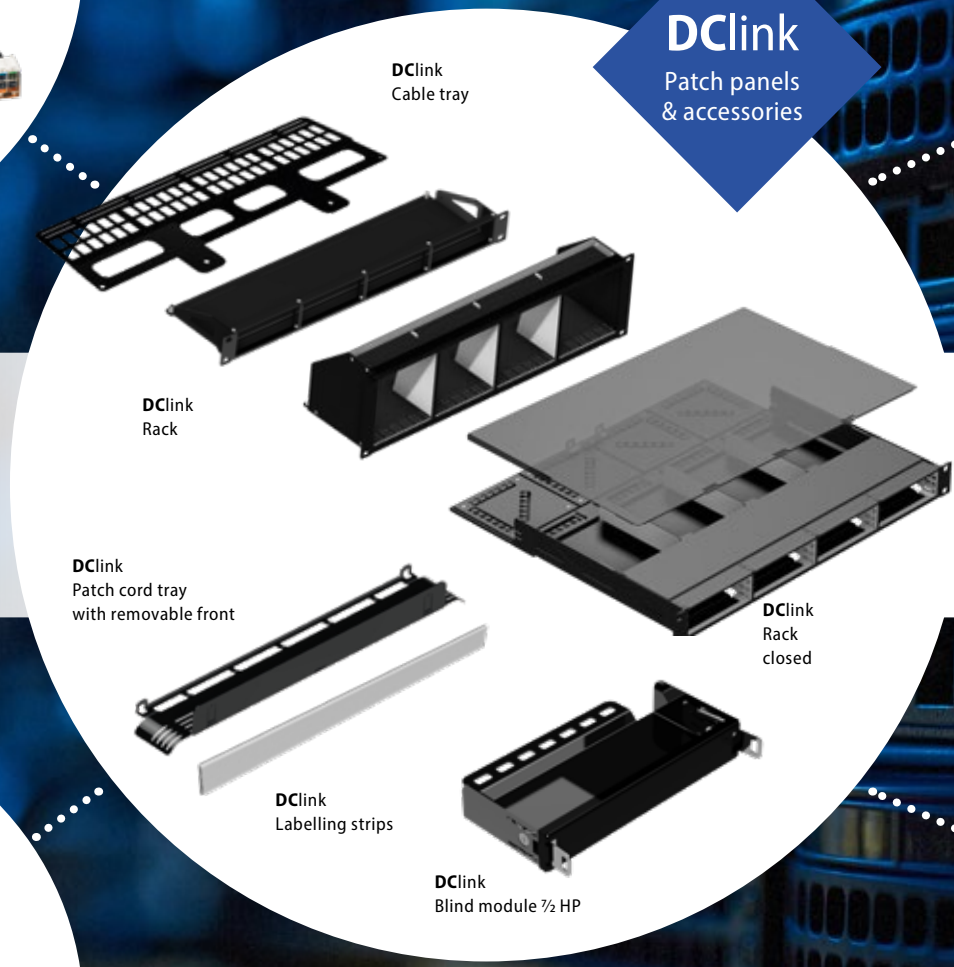
THE SOLUTION FOR YOUR CHALLENGES

DClint guarantees true future-proofing in data centres and storage area networks.



MegaLine® Connect100
trunk cables

MegaLine®
Copper
trunk cables



DClint
Patch panels
& accessories

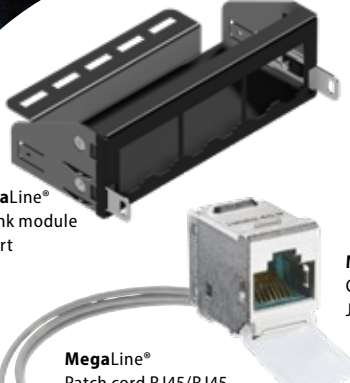
for data rates up to ...



GigaLine® DClint
Trunk cable MPO/m

GigaLine®
FO
trunk cables

MPO: we use MTP® plugs for our MPO assemblies. MTP® is a registered trademark of USConec Ltd.




MegaLine®
Copper systems technology

MegaLine®
DClink module
6-port

MegaLine®
Connect100
Jack module RJ45

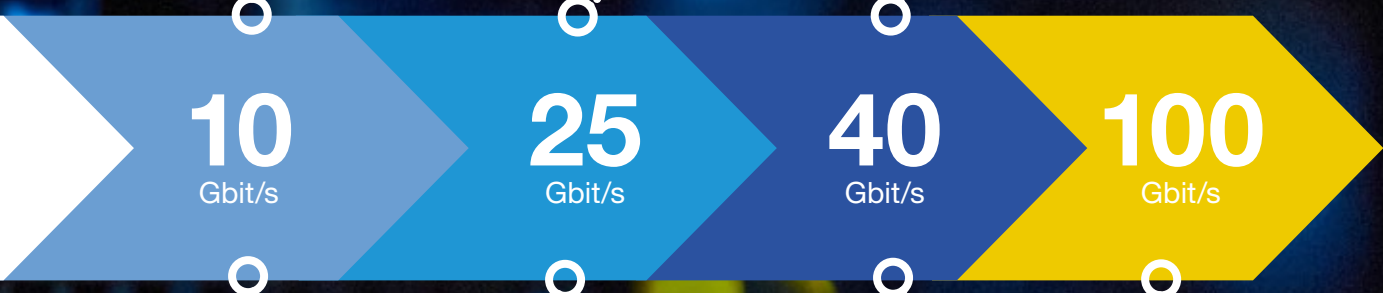
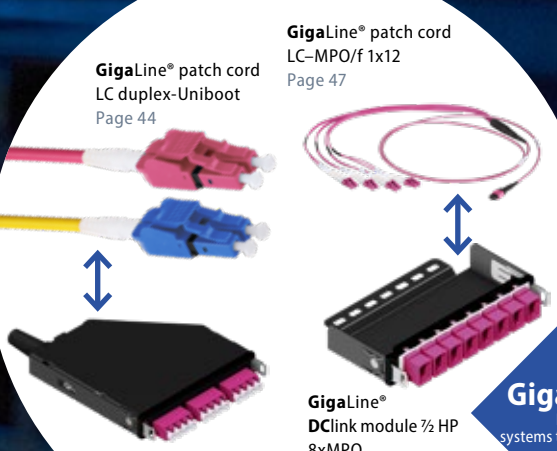
MegaLine®
Patch cord RJ45/RJ45



MegaLine®
Copper systems technology

MegaLine®
DClink module
6-port

MegaLine®
Connect100
Interface

GigaLine® patch cord
LC-MPO/f 1x12
Page 47

GigaLine® patch cord
LC duplex-Uniboot
Page 44

GigaLine®
DClink module ½ HP
8xMPO

GigaLine®
FO systems technology

GigaLine®
DClink module ½ HP
LC quad-MPO














GigaLine®
Trunk cable MPO/m

GigaLine®
Module MPO ½ HP

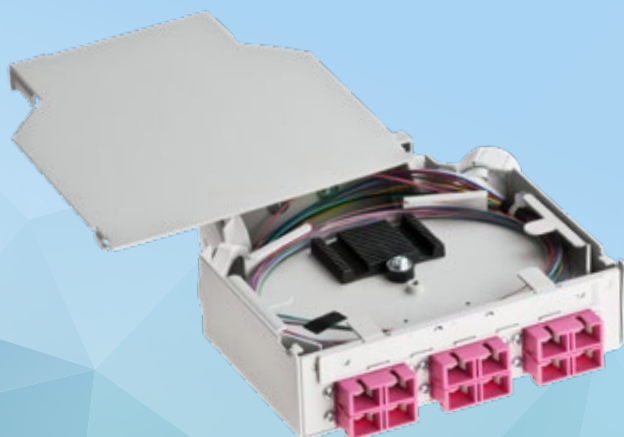
GigaLine®
FO systems technology

VarioLine® MODULAR SYSTEM PERIPHERY



VarioLine® modular system periphery		Page
Line® CP – Consolidation Point programme		
	DIN rail housing	90
	Consolidation Point housing	<ul style="list-style-type: none"> • with DIN rail clip • for 6, 12, 24-port module panel
		91
VarioLine® UF – underfloor systems		
	System overview	based on GigaLine® couplings
	Support plates for underfloor systems	<ul style="list-style-type: none"> • for installation of wall boxes • for installation of adapter plates
	Adapter plates for underfloor systems	for installation in VarioLine® UF support plates
	Excess-length module for underfloor systems	99
	Splice storage for underfloor systems	99
	Office	
	Data centre	
	Industry	

VarioLine® DIN RAIL HOUSING



Assembly example:
housing with mounted
rail clip

VarioLine® DIN rail housing

Application

For mounting on 34 mm DIN rails in industrial, office and home applications.

Performance

The buffered fibre pigtails are coloured acc. to the DIN IEC 60304 colour code. Up to 12 SC simplex, LSH simplex, 6 SC duplex or 3 LC quad couplings.

Optical characteristics

Insertion loss typ.	for all fibre types		0.15 dB
Return loss typ.	G50/125	OM3	> 35 dB
	G50/125	OM4	> 35 dB
	G50/125	OM5	> 35 dB
	E9/125	OS2	> 50 dB

Structure

- ▶ Powder-coated steel panel, colour: Light grey RAL 7035
- ▶ Cable entry PG11 (Ø 6 – 9 mm) possible from above and below

Dimensions

125 mm x 34 mm x 132.5 mm (H x W x D)
(from DIN rail, without coupling)

Accessories

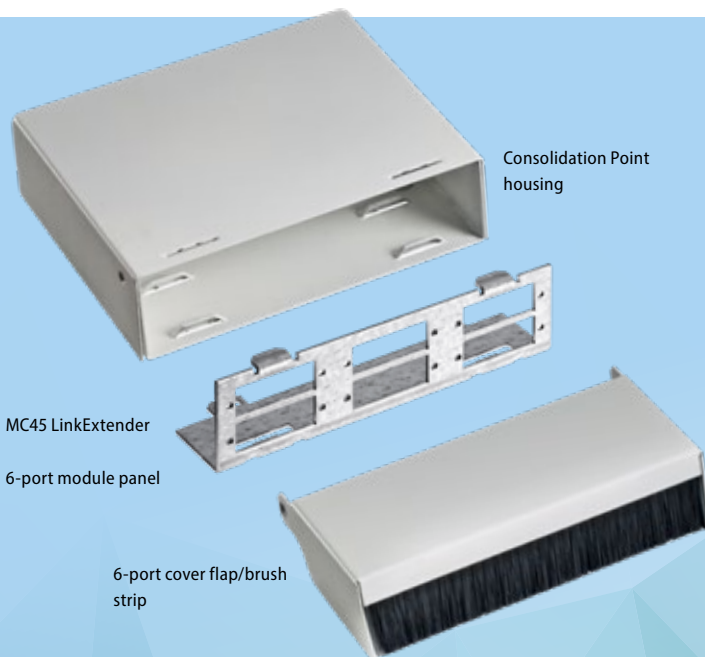
- ▶ 1 splice cassette
- ▶ 1 crimp splice protective holder
- ▶ 1 PG cable gland
- ▶ 1 strain relief set
- ▶ 1 installation clip for DIN rail

Name	Fibre type	Configuration			Order no.
VarioLine® DIN rail housing (1 pc.)	G50/125 OM4	6 SC duplex	Heather violet	plastic/cer 12xpigtailes 1x PG11	LKD9D7000230000
	G50/125 OM3		Aqua		LKD9D7000200000
	E9/125 OS2 PC		Blue		LKD9D7000260000
	G50/125 OM4	3 LC quad	Heather violet	plastic/cer 12xpigtailes 1x PG11	LKD9D7000290000
	G50/125 OM3		Aqua		LKD9D7000XX0000
	E9/125 OS2 PC		Blue		LKD9D7000210000
	E9/125 OS2 APC		Green		LKD9D7000310000

additional equipment on request

VarioLine® CONSOLIDATION POINT HOUSING

with DIN rail clip



Assembly example:
housing with mounted
rail clip

VarioLine® CPx-B	Consolidation Point housing
VarioLine® CPLx-B	module panel SC duplex/LC quad
VarioLine® CPx-B	cover flap/brush strip

Description

For installation in a double floor or false ceiling.
CP housing with strain relief using cable ties (not included in the scope of delivery). Can be equipped with SC duplex or LC quad couplings.

A cover flap with integrated brush strip can be optionally used on the patch side.

- ▶ **Modular (exchangeable module panel)**
- ▶ **Optionally available with 6, 12 or 24 ports**
- ▶ **Rugged housing, powder-coated steel panel, colour: White**
- ▶ **Free of hazardous substances**

Assembly

- ▶ **The CP housing is attached by a DIN rail clip (compatible clip included)**
- ▶ **Alternative attachment using screws or impact dowels (not included in the scope of delivery)**
- ▶ **Module panel is attached by snapping into housing**
- ▶ **Couplings are attached to the module panel by means of screws**

housing	Cover flap/ brush strip	Module panel for SC duplex/LC quad couplings

Number Couplings	Dimensions (LxWxH)	Order no.	Dimensions (LxWxH)	Order no.	Order no.
6	34.5 x 121 x 100 mm	LKD9ZE610070000	34.5 x 121 x 51 mm	LKD9ZE610080000	LKD9ZE610950000
12	34.5 x 233 x 100 mm	LKD9ZE610740000	34.5 x 233 x 51 mm	LKD9ZE610730000	—
24	34.5 x 455 x 100 mm	LKD9ZE610750000	34.5 x 455 x 51 mm	LKD9ZE610760000	—



VarioLine® UF – UNDERFLOOR SYSTEMS

Support plate solution – modular & universal

The "VarioLine® UF" underfloor systems (floor outlet solutions) offer an efficient and low-cost solution for completing copper and FO systems.

They provide a high degree of flexibility in offices. Workplaces can be connected to the energy and IT grid without the usual cable tangle. The modular and universal support plate solutions are available for all commonly available underfloor systems (e.g. Ackermann or Electraplan).

The support plate replaces the device carrier, so it provides maximum space for cable feed. The slanted feed and exit ensures secure cable guidance even in very low intermediate floors.


The use of adapter plates allows low-cost, efficient installation of the entire range of KERPEN DATACOM connection technology in both copper and FO technology.



Example of an underfloor solution from KERPEN DATACOM for OBO Bettermann floor outlet

VarioLine® UF – UNDERFLOOR SYSTEMS/FLOOR OUTLET SOLUTIONS

System overview based on GigaLine® couplings



GigaLine®
FO couplings

GigaLine®
LC quad


GigaLine®
SC duplex



VarioLine®
Adapter plate

Blind cover for **VarioLine®** UF support plates
Page 90

VarioLine®
UF AP4-SCD for max. 4 couplings
Page 90



GigaLine®
SC simplex

GigaLine®
LC duplex

GigaLine®
LSH(E2000) simplex

GigaLine®
FO couplings



VarioLine®
UF AP4-LCD for max. 4 couplings
Page 90

VarioLine®
Adapter plate

VarioLine®
support plate and strain relief

VarioLine® UF TA2
for Ackermann
GES 2, 4, 6, R4, R7
Page 89

VarioLine® UF TA3
for Ackermann
GES 9, R7, R9
Page 89

VarioLine® UF TEK3
for Electraplan KDR series
(old design)
Page 89

VarioLine® UF TEV3
for Electraplan VQ12,
VR12, VR10
Page 89

VarioLine® UF K1

VarioLine® UF K2

VarioLine®
Excess-length module
with splice storage

VarioLine® UF O2
for support plates T2
Page 91

VarioLine® UF-SC2
for excess-length module
UM2
Page 91

Support plate solution

VarioLine® UF O3
for support plates T3
Page 91

VarioLine®
Excess-length module
with splice storage

VarioLine® UF-SC3
for excess-length module
UM3
Page 91

The excess-length module with splice storage is optional.

VarioLine® SUPPORT PLATES

for underfloor systems, for installation of wall boxes



Fig. 1
Support plate **VarioLine®** UF TOA2-2
for Ackermann GES 2, 4, 6, R4, R7

Fig. 2
Support plate **VarioLine®** UF TOA3-2
for Ackermann GES 9, R7, R9



Fig. 3
Support plate **VarioLine®** UF TOA3-3
for Ackermann GES 9, R7, R9

VarioLine® UF TOA2-2 / UF TOA3-2

Description

UF TOA2-2 ▶ for installation of max. 2 wall boxes with central plate 50 mm x 50 mm and side attachment or one wall box with surrounding ring.

UF TOA3-2 ▶ for installation of max. 2 wall boxes with central plate 50 mm x 50 mm and side attachment or two wall boxes with surrounding ring.

▶ For installation in Ackermann device inserts.

housing

Support plate	Powder-coated sheet metal, 1.5 mm
Colour	Jet black, RAL 9005

VarioLine® UF TOA3-3

Description

For installation of max. three wall boxes with central plate 50 mm x 50 mm and side attachment or two wall box with surrounding ring.

▶ For installation in Ackermann device inserts.

housing

Support plate	Powder-coated sheet metal, 1.5 mm
Colour	Jet black, RAL 9005

Fig.	Name	Order no.
1	VarioLine® UF TOA2-2 (1 pc.)	LKD9ZE600140000
2	VarioLine® UF TOA3-2 (1 pc.)	LKD9ZE600120000

Fig.	Name	Order no.
3	VarioLine® UF TOA3-3 (1 pc.)	LKD9ZE600130000

VarioLine® SUPPORT PLATES

for underfloor systems, for installation of adapter plates

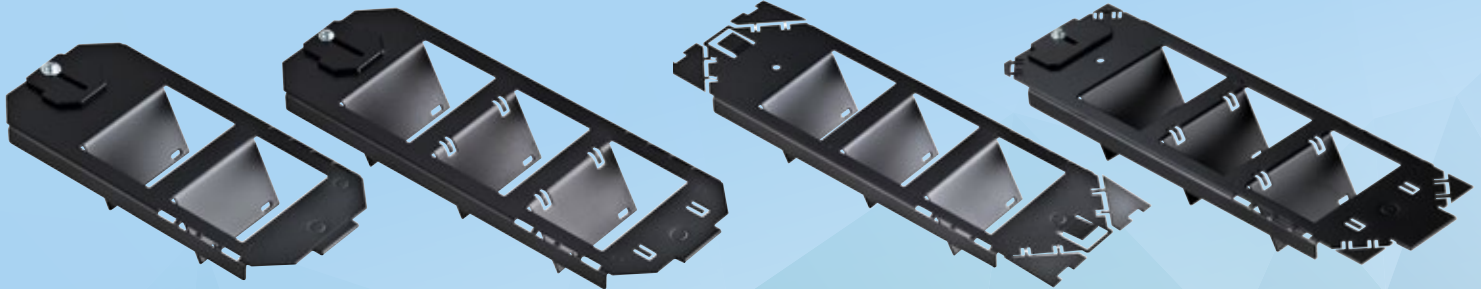


Fig. 1
Support plate **VarioLine®** UF TA2
for OBO Bettermann
GES 2, 4, 6, R4, R7

Fig. 2
Support plate **VarioLine®** UF TA3
for OBO Bettermann
GES 9, R7, R9

Fig. 1
Support plate **VarioLine®** UF TEK3
for Electraplan KDR series
(old design)

Fig. 2
Support plate **VarioLine®** UF TEV3
for Electraplan
VQ12, VR12, VR10

VarioLine® UF TA2 / UF TA3

Description

For installation of max. 2 or 3 adapter plates.

- ▶ For installation in OBO Bettermann device inserts

Compatibility

UF TA2	OBO Bettermann GES 2, 4, 6, R4, R7
UF TA3	OBO Bettermann GES 9, R7, R9

housing

Support plate	Powder-coated sheet metal, 1.5 mm
Colour	Jet black, RAL 9005

Accessories (optional)

Cable tray **VarioLine®** UF K1 / **VarioLine®** UF K2
Adjustable cable strain relief for up to 9 individual cables

Fig.	Name	Order no.
1	VarioLine® UF TA2 (1 pc.)	LKD9ZE600010000
2	VarioLine® UF TA3 (1 pc.)	LKD9ZE600020000

VarioLine® UF TEK3 / UF TEV3

Description

For installation of max. 3 adapter plates.

- ▶ For installation in Electraplan device inserts

Compatibility

UF TEK3	Electraplan KDR series (old design)
UF TEV3	Electraplan VQ12, VR12, VR10

Housing

Support plate	Powder-coated sheet metal, 1.5 mm
Colour	Jet black, RAL 9005

Accessories (optional)

Cable tray **VarioLine®** UF K1 / **VarioLine®** UF K2
Adjustable cable strain relief for up to 9 individual cables

Fig.	Name	Order no.
1	VarioLine® UF TEK3 (1 pc.)	LKD9ZE600080000
2	VarioLine® UF TEV3 (1 pc.)	LKD9ZE600420000

VarioLine® ADAPTER PLATES

for underfloor systems, for installation in VarioLine® UF support plates

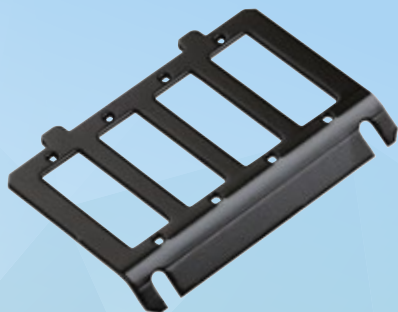


Fig. 1
Adapter plate VarioLine® UF AP4-SCD
for max. 4 SC duplex couplings



Fig. 2
Adapter plate VarioLine® UF AP4-LCD
for max. 4 LC duplex couplings

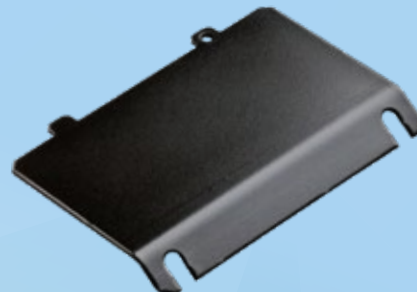


Fig. 3
Blind cover VarioLine® UF BP-T

VarioLine® UF AP4-SCD/UF AP4-LCD

Description

Adapter plate for installation in VarioLine® UF support plates.
For installation of max. 4 SC or LC duplex couplings and blind cover.

- ▶ With self-adhesive labelling strips for personal labelling
- ▶ 2 nut and washer assemblies incl.

Compatibility

UF AP4-SCD	for max. 4 SC duplex or SC duplex/ST couplings
UF AP4-LCD	for max. 4 LC duplex, SC simplex or E-2000 couplings
UF BP-T	blind cover

Structure

Adapter plate	sheet metal, 1.5 mm
Surface	ZN – black, conductive

Matching sockets	GigaLine® SC duplex	GigaLine® LC quad	GigaLine® SC simplex	GigaLine® LC duplex	GigaLine® LSH (E2000) simplex
VarioLine® UF AP4-SCD					
VarioLine® UF AP4-LCD					

Fig.	Name	Order no.
1	VarioLine® UF AP4-SCD (1 pc.)	LKD9FZZ00780000
2	VarioLine® UF AP4-LCD (1 pc.)	LKD9FZZ00790000
3	VarioLine® UF BP-T (1 pc.)	LKD9ZE600500000

VarioLine® EXCESS-LENGTH MODULE & SPLICE TRAY

for underfloor systems



Fig. 1
Excess-length module
for support plates T2

Fig. 2
Excess-length module
for support plates T3



Fig. 3
Splice storage
for excess-length module UM2

Fig. 4
Splice storage
for excess-length module UM3

VarioLine® UF O2 VarioLine® UF O3

Description

Excess-length module for mounting on **VarioLine®** UF support plates. Can be mounted without tools.

Compatibility / dimensions (available in two sizes)

UF O2	for support plates T2 61 mm x 75 mm x 135 mm (H x W x D)
UF O3	for support plates T3 61 mm x 75 mm x 176 mm (H x W x D)

Housing

Excess-length module	Powder-coated sheet metal, 1.5 mm Jet black, RAL 9005
Colour	

Accessories (optional)

A cable tray is required for installation of the excess-length module.

Fig.	Name	Order no.
1	VarioLine® UF O2 (1 pc.)	LKD9FZZ00800000
2	VarioLine® UF O3 (1 pc.)	LKD9FZZ00180000

VarioLine® UF SC2 VarioLine® UF SC3

Description

Splice storage with cover and splice holder for 12 crimp splices. For installation on the bottom of the appropriate excess-length module.

Compatibility / dimensions (available in two sizes)

UF SC2	for excess-length module UM2 10 mm x 75 mm x 113 mm (H x W x D)
UF SC3	for excess-length module UM3 10 mm x 75 mm x 154 mm (H x W x D)

Housing

Splice storage	Powder-coated sheet metal, 1.5 mm
Colour	Jet black, RAL 9005

Fig.	Name	Order no.
3	VarioLine® UF SC2 (1 pc.)	LKD9FZZ00200000
4	VarioLine® UF SC3 (1 pc.)	LKD9FZZ00810000



ACCEPTANCE MEASUREMENT

of the GigaLine® cabling systems

Acceptance measurement of GigaLine® cabling systems is carried out in accordance with the requirements of ISO/IEC 11801 and EN 50173. Details of how the measurements are carried out are stipulated by ISO/IEC 14763-3.

Particular attention must be paid to the inspection of all connector faces in accordance with EN 61300-3-35 before inserting a connection – the cleaning of connector faces is described in IEC/TR 62627-01.

Acceptance involves determining insertion loss per transmission link by means of a performance measurement. A measurement setup under Encircled Flux excitation conditions according to IEC 61280-4-1 is preferred.

In addition, an OTDR measurement can be carried out with appropriate leader and trailer fibres which document the progress of attenuation along the entire transmission link. Here it is necessary to apply a bidirectional measurement so as to avoid or eliminate measurement errors due to differing backscatter coefficients if the link as a whole is made up of several spliced or patched sections.

The measurement range must be set at twice the transmission link to be measured. The pulse width of the OTDR measuring device should be selected as short as possible, so that the dead zones of reflective events are kept to a minimum.



Attenuation devices and fibre inspection



OTDR



Fibre identifier

Both attenuation devices and OTDR are indispensable for professional fibre optic installation. Together with a video microscope with certification function to evaluate the connector faces and using suitable cleaning equipment, it is possible to carry out a fibre optic installation in compliance with the standards. When measuring attenuation, particular care must be taken to use high-quality measuring cords.

Largest supported transmission link insertion loss and length for network applications with multimode fibre optic cables

850nm		OM3	OM4	OM5
1000BASE-SX	Attenuation [dB]	3.56	3.56	3.56
	Length [m]	550	550	550
10GBASE-SR/SW	Attenuation [dB]	2.6	2.9	2.9
	Length [m]	300	400	400
40GBASE-SR4	Attenuation [dB]	1.9	1.5	1.5
	Length [m]	100	150	150
100GBASE-SR10	Attenuation [dB]	1.9	1.5	1.5
	Length [m]	100	150	150
100GBASE-SR4	Attenuation [dB]	1.8	1.9	1.9
	Length [m]	70	100	100

Largest supported transmission link insertion loss and length for network applications with singlemode fibre optic cables

1300 and 1550 nm		OS1a	OS2
10GBASE-LR/LW 1310 nm	Attenuation [dB]	8.3	8.3
	Length [m]	6,300	10,000
100GBASE-LR4 1310 nm	Attenuation [dB]	6.2	6.2
	Length [m]	4,200	10,000
10GBASE-LX4 1310 nm	Attenuation [dB]	6.2	6.2
	Length [m]	4,200	10,000
10GBASE-FR 1550 nm	Attenuation [dB]	10.9	10.9
	Length [m]	8,900	22,250
40GBASE-FR 1550 nm	Attenuation [dB]	10.9	10.9
	Length [m]	2,000	2,000
100GBASE-ER4 1550 nm	Attenuation [dB]	18.00	18.00
	Length [m]	16,000	40,000

OFFICE SCOPE OF APPLICATION

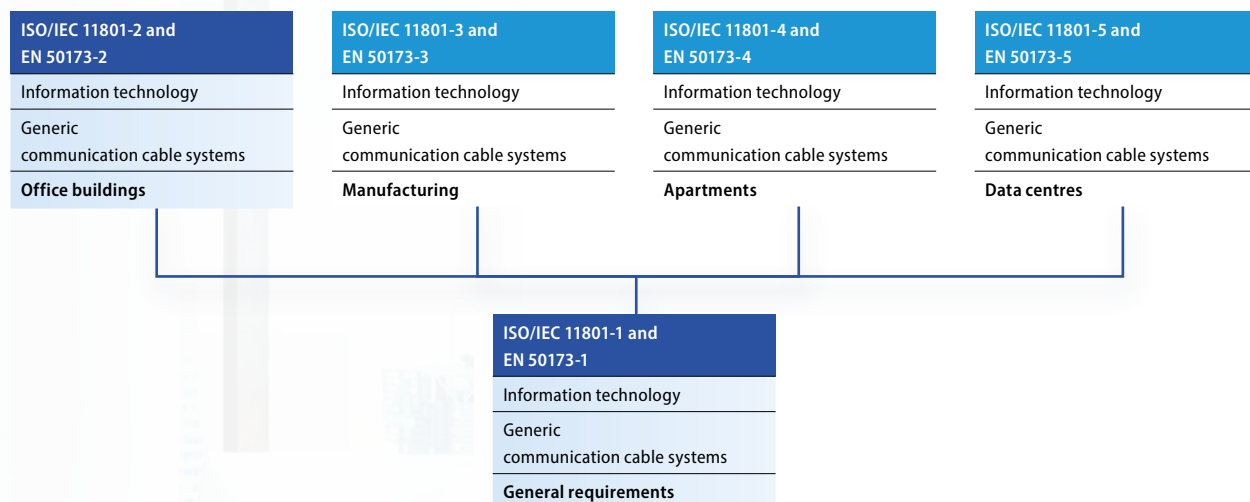
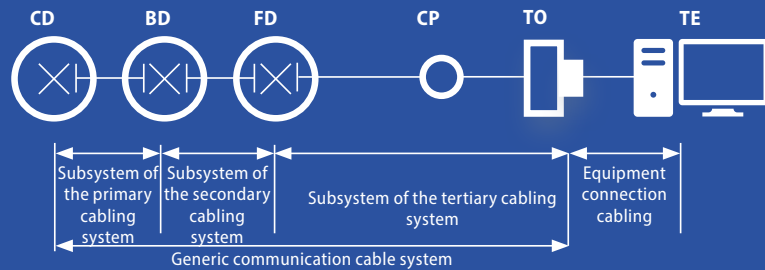


GENERIC CABLING IN OFFICE BUILDINGS

The complete cable system – from distribution equipment to workstation

Structure of a generic communication cable system ISO/IEC 11801 and DIN EN 50173-1/2

CD	Campus distributor
BD	Building distributor
FD	Floor distributor
CP	Consolidation point
TO	Telecommunications outlet
TE	Terminal equipment



A company's future success is now heavily dependent on having a reliable and modern data processing infrastructure.

Rapid increases in data transfer rates and application diversity require a network infrastructure offering maximum flexibility and performance that is still capable of fulfilling the requirements that will apply 10 years down the road.

High-quality generic IT networks form the backbone of the business in research & development, banks, insurance companies, universities, hospitals, hotels, airports and many other sectors, providing smooth operation and financial success.

The smart use of fibre optics in the backbone and copper data technology to the user enables cost-effective networking of standard resources such as PCs and printers, with an extension to IP telephony and multimedia applications. Other applications, such as Power-over-Ethernet (PoE), support the powering of devices such as web cameras, wireless LAN access points, IP phones and laptops via the structured copper data cabling.

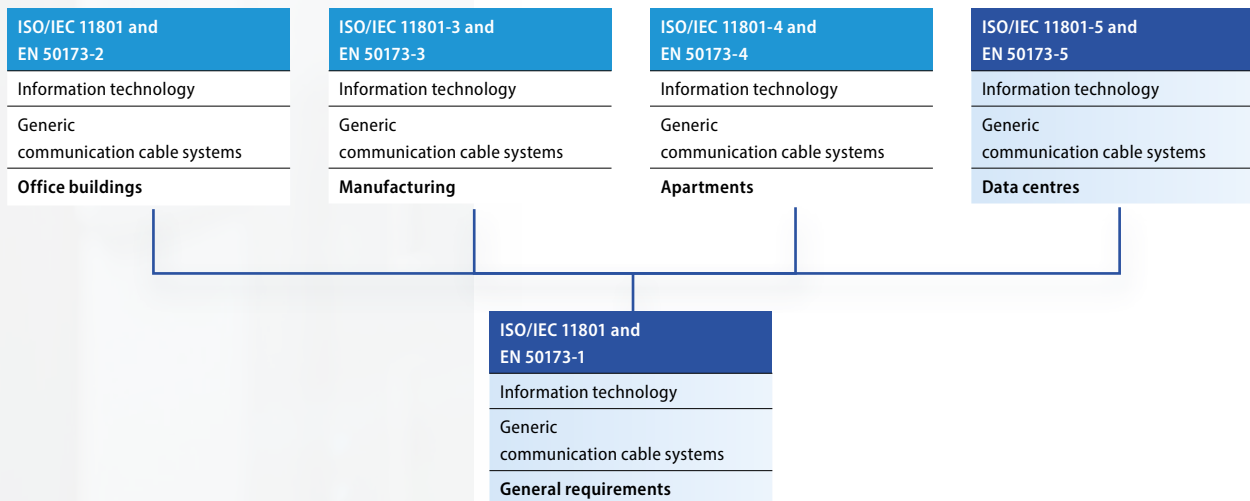
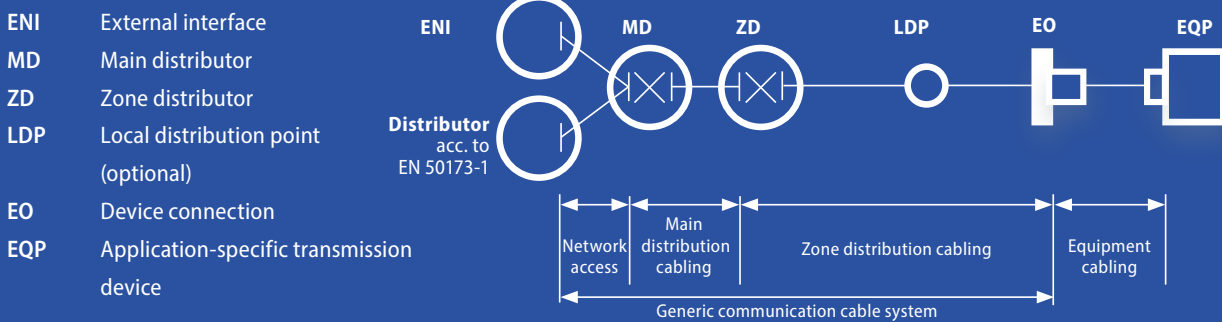
These structured, application-neutral communication cable systems have been harmonised in the international and European ISO/IEC 11801 or DIN EN 50173 standards.

DATA CENTRE SCOPE OF APPLICATION



GENERIC CABLING IN DATA CENTRES

Structure of a generic communication cable system



STRUCTURE

The maximum extension is 2,000 metres. In data centres the main distribution cabling is frequently designed using fibre optic technology, while in smaller networks the external network interface (ENI) is connected directly to the zone distributor (ZD). The standards describe different models for flexible and fixed connections in and between the subsystems.

According to ISO/IEC 11801-5, cabling of the main and zone distribution must meet the requirements of Class E_x for copper technology and transmission classes OF-300, OF-500 and OF-2000 for FO technology as a minimum.

STANDARDS

Generic communication cable systems are defined in the standards EN 50173-1 and ISO/IEC 11801.

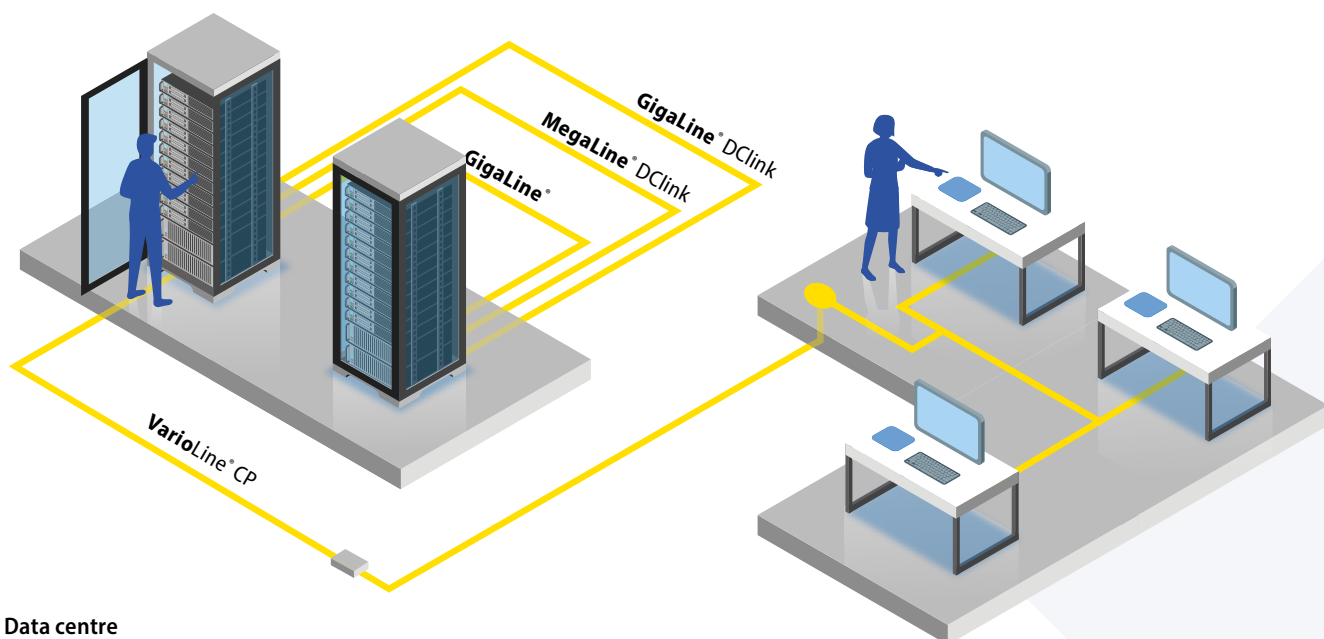
In addition, specific requirements for data centres are defined in EN 50173-5 and ISO/IEC 11801-5.

The cabling used in data centres consists of three subsystems:

- ▶ **Network access cabling**
- ▶ **Main distribution cabling**
- ▶ **Zone distribution cabling**

REQUIREMENTS AND SOLUTIONS

Fast – high-quality – cost-optimised



Data centre

The data centre – the heart of a business – controls production and administrative processes. Failure here can have catastrophic consequences, so the availability of a data centre must be guaranteed more or less round the clock. The cabling system is a key factor in terms of operational reliability.

Performance requirements for modern data centres

- ▶ max. availability, zero downtime ▶▶ max. reliability
- ▶ Short installation times
- ▶ Maximum performance
- ▶ Minimal space requirement – high packing density
- ▶ Cost efficiency
- ▶ Environmental compatibility – Green IT

The diverse requirements for data centres cannot be considered separately. Optimising environmental performance can lead to a reduction in cost, for example. Investing in industrially pre-assembled components usually involves higher costs but enables installation and testing times to be reduced, thereby cutting the costs incurred by downtime.

▶ High quality

Product quality at KERPEN is factory tested, performance and safety are already built in.

▶ Minimised downtime

Both installation and commissioning are done in flash with no need for special tools or assembly skills. This keeps downtime to a minimum.

Benefits

KERPEN is able to offer a high-quality product range that far exceeds the current valid standards and the usual requirements in data centres:

FO CABLING SYSTEMS WITH KERPEN CABLES OFFER ENORMOUS RESERVES IN TERMS OF ATTENUATION AND BANDWIDTH.

Installation

Plug & Play solutions for copper and FO applications comprise ready-to-use pre-assembled links or **DClink** modules with the appropriate MPO trunks and **DClink** racks in the sizes 1RU and 3RU. The **DClink** modules can be inserted at the front or rear and audibly click into place.

DClink system solutions

DClink allows the use of FO, copper or mixed set-ups in different categories. This makes on-site assembly entirely superfluous.

Environmentally aware cabling

Environmentally-friendly materials and production methods, the possibility of recycling or ecologically viable recovery and, last but not least, the reusability of products if required – these are the factors that guarantee maximum environmental compatibility. Our cables and components are free of hazardous substances.

KERPEN DATACOM LATEST NEWS

Further catalogues on the topics of **MegaLine®**, **GigaLine®** and **VarioLine®** connection systems can be found online.

With current information services like the KERPEN DATACOM newsletter, we keep you updated on the latest developments at KERPEN DATACOM and in the market.

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KERPEN DATACOM

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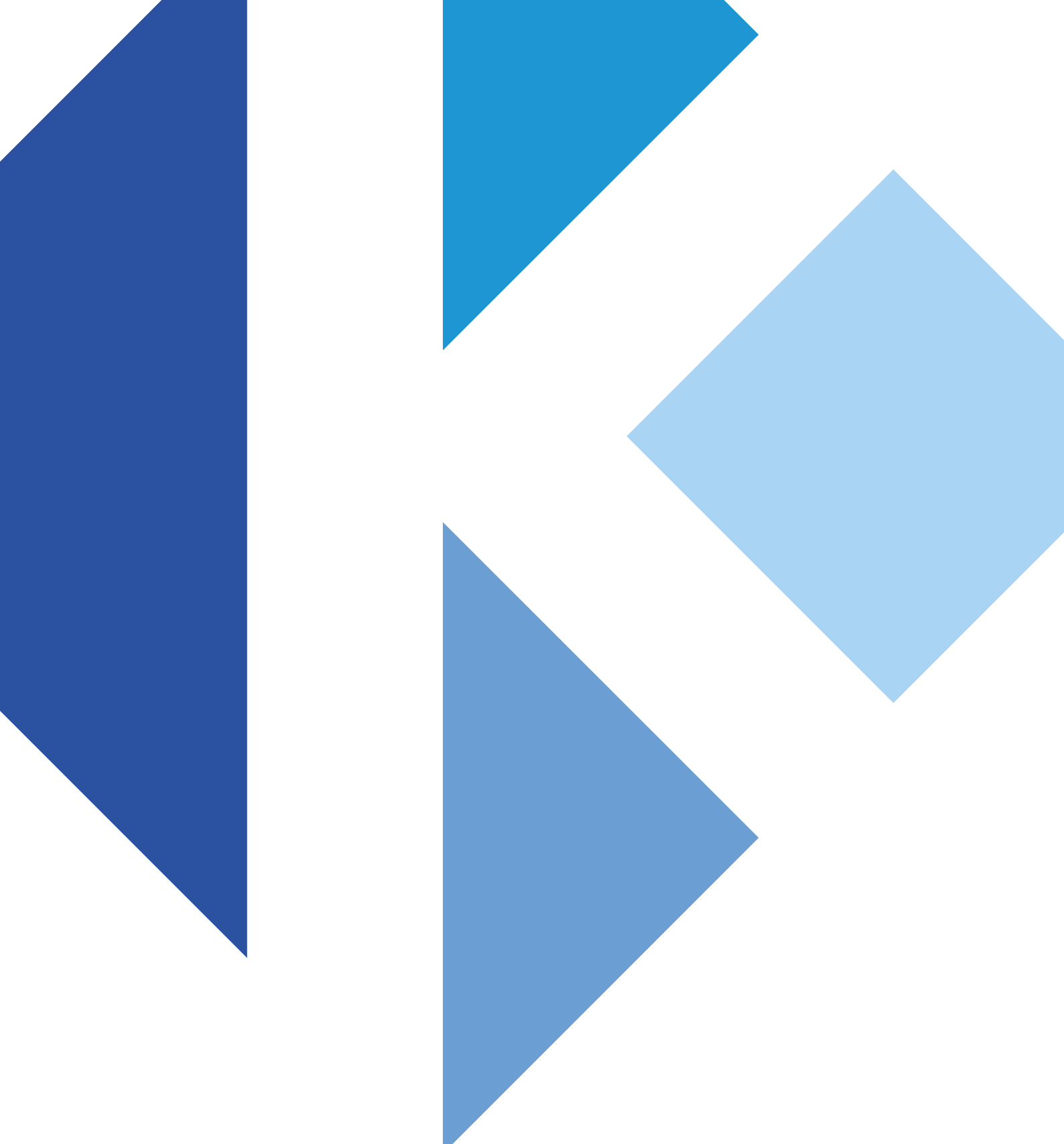
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