MANUAL FUNCTIONAL INTEGRITY

11TH EDITION

DATWYLER

Contents

Please note: The optional installation techniques only apply to Datwyler cable types with Datwyler installation systems.
When multiple cables and/or functional integrity classes are combined in a single installation, the lowest values apply!

Assembly instructions

FAQ

SAFETY CONCEPTS FOR BUILDINGS

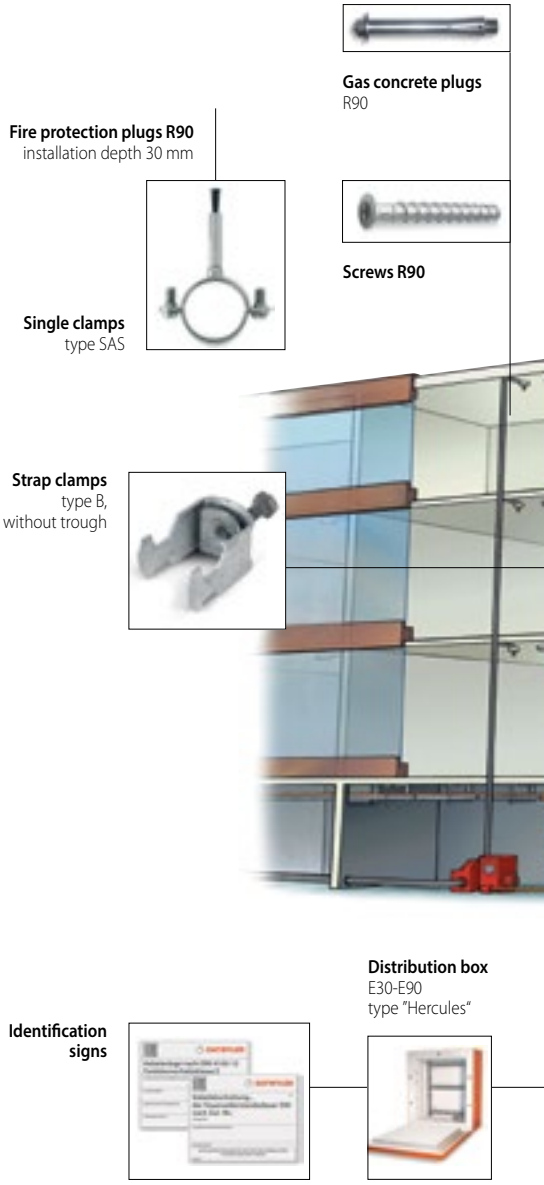
Proven quality

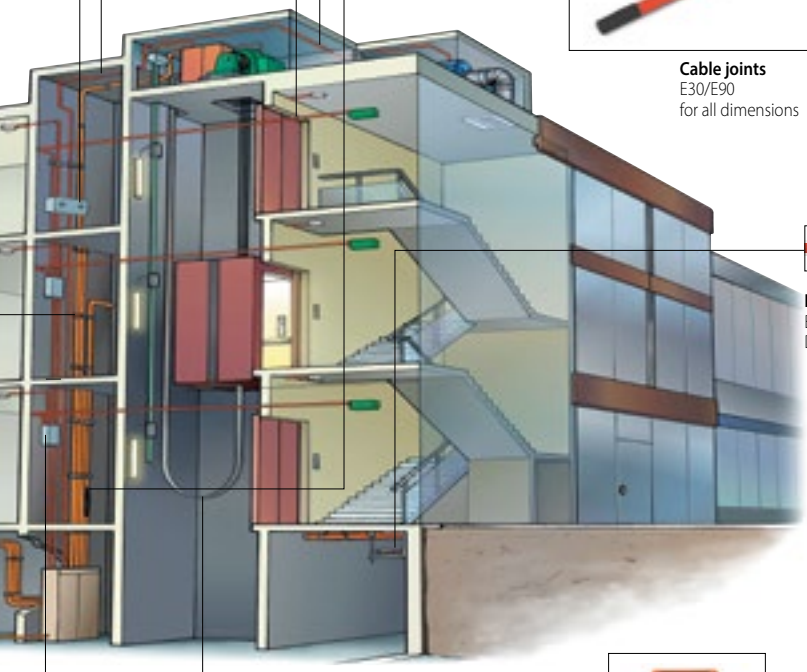
Datwyler IT Infra is the first European manufacturer to develop a complete system solution that meets the demands of today's industry for reliable power supply and data transmission in the event of fire. Datwyler cables and our approved cabling system components are the result of many years of intensive development in coordination with the relevant standardisation bodies.

Selected raw materials and special compounds in combination with unique installation methods are what give a Datwyler system its high quality and maximum guaranty of safety in the event of fire.

Datwyler cables and safety system components are used wherever people, machinery and equipment are endangered by fire and smoke emission: in buildings with high density of occupants as well as in facilities containing large concentrations of valuable property.

Our safety cable systems have to be highly reliable when it comes to practical operations. This is why Datwyler measures each and every product against strict quality standards before it leaves the company. Specifically, this means that all processes are integrated into the comprehensive management system in accordance with ISO 9001 and ISO 14001. Beyond this, additional application-specific inspection and test methods ensure that Datwyler cables and safety cable systems exceed the requirements of our customers as well as the stringent standards specified by the various countries in which our products are used.





WUM
Effective support mount

Safety cables
E90 Keram

Safety cables
E30-E60 Keram

Safety cables
E90 Keram

Cable joints
E30/E90
for all dimensions

Fibre optic safety cable
E30 with reference to DIN 4102-12, 30 minutes

Multi cable support
"Hermann" clamp E30/E90
spacing ≤ 600/800 mm

Elevator travelling cables

Connection/ terminal box
E30-E90

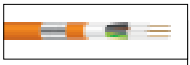
SAFETY CONCEPTS FOR TUNNELS

Fire protection plugs R90
30 mm installation depth

Single clamps
type SAS V4A

Gas concrete plugs R90

Screws R90



Safety cables
E30-E60 Keram

Identification signs

Distribution boxes
E30/E90

Multi cable support
"Hermann" clamp E30/E90

Safety cables
E30-E90 Keram

Fibre optic safety cable
E30 with reference to
DIN 4102-12, 30 minutes

Fibre optic safety cable
E30 with reference to
DIN 4102-12, 30 minutes

Safety cables
E30/E90 Keram

Cable joints E30/E90
for all dimensions

Distribution box
E30-E90
type "Hercules"

Strap clamps
type B,
without trough

Data centre online configuration

The configurator for our Smart Modular Data Centres (SMDC) offers you the opportunity to easily plan and design the desired IT infrastructure solution – from small and medium-sized to large data centres.
It includes racks, UPS, intelligent power distribution, air conditioning, cabling, leak detection, fire alarm, fire suppression, access control and environmental monitoring – with SMS and email notification.

Configure your Smart Modular Data Centre based on your individual needs.

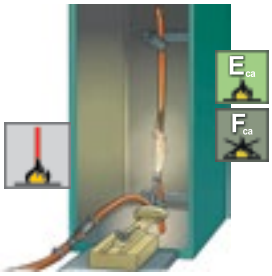
TESTING METHODS

Relevant fire behaviour / fire performance standards

International / European	European Construction Products Regulation as per EN 13501-6 and EN 50575*

Flame propagation test for a single insulated cable

IEC 60332-1-2
EN 60332-1-2



EN 60332-1-2
serves to classify cables for Euroclasses E_{ca} and F_{ca}.
Passing this test is prerequisite for tests in the higher Euroclasses D_{ca} up to B_{ca}.

Fire behaviour test for cable bundles with determination of flaming droplets / particles

IEC 60332-3-22 up to 26 Cat A-D
EN 60332-3-22 up to 26 Cat A-D

EN 50399
serves to classify cables for
- Euroclasses D_{ca} up to $B2_{ca}$
- Additional criteria:
  - flaming droplets/particles d2 up to d0
  - smoke generation s3 up to s1 (with EN 61034-2)

Smoke density test

IEC 61034-1 and IEC 61034-2
EN 61034-1 and EN 61034-2

EN 61034-2
serves to classify cables for the additional criterion smoke density (transmittance) s1a + s1b
(with EN 50399)

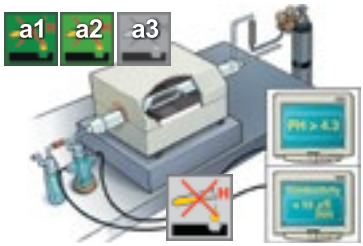
* EN 50575 does not apply to cables with fire resistance. Therefore, cables with fire resistance were excluded from the Construction Products Regulation at the time of printing this manual. To date, the European Union did not publish classification standards for cables with fire resistance according to EN 50577, EN 50200 or similar.

Relevant fire behaviour / fire performance standards

International / European	European Construction Products Regulation as per EN 13501-6 and EN 50575

Acidity and corrosive flue gases test

IEC 60754-1 and IEC 60754-2
EN 60754-1 and EN 60754-2



EN 60754-2
serves to classify cables
for the additional criterion
acidity a3 up to a1

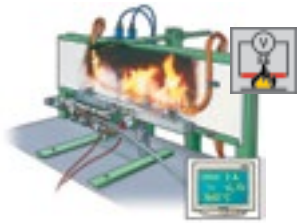
Relevant fire resistance standards

International / European	Future European standard: Construction Products Regulation (EN 13501-3 - Classification)

Circuit integrity of an unprotected single cable (50 cm) during and after exposure to a fire

Cables < 20 mm:
IEC 60331-2
EN 50200
Cables > 20 mm:
IEC 60331-1
EN 50362

In metal:
IEC 60331-3
Copper data cables:
EN 50289-4-16
Fibre optic cables:
IEC 60331-25
EN 50582



EN 50200
PH_{ca} 15 - PH_{ca} 120

System Circuit Integrity / Functional Integrity

DIN 4102 part 12 (E30-E90)
Better than standard!
Today, this test is the only reliable global standard for ensuring the functional integrity or system circuit integrity (E30-E90) of an entire electrical cable system together with fastening components under real-life conditions.

EN 50577
P_{ca} 15 - P_{ca} 120
This is no full system test - it serves to classify cables only. Therefore EN 50577 cannot replace the system circuit integrity test in accordance with DIN 4102-12.

DATWYLER ICONS FOR FIRE PROPERTIES

Flame propagation

These Datwyler cables use a flame retardant material that is self-extinguishing.

IEC 60332-1-2
EN 60332-1-2

Euroclasses under the CPR according to EN 50575

Flame spread

These Datwyler cables are flame resistant and prevent the propagation of a fire from one location to another.

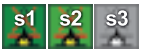
IIEC 60332-3-22 up to 26 Cat. A-D,
EN 60332-3-22 up to 26 Cat. A-D,
up to 26 Cat. A-D
EN 50399

Euroclasses under the CPR according to EN 50575

Smoke density

These Datwyler cables emit minimum smoke in the event of fire. Exit routes and fire brigade access are not restricted.

IEC 61034-1 and
IEC 61034-2,
EN 61034-1 and
EN 61034-2,
EN 50399



Euroclasses under the CPR according to EN 50575

Flaming droplets / particles

Exposed to fire these Datwyler cables have no or short-term flaming falling off particles.

EN 50399

Euroclasses under the CPR according to EN 50575

DATWYLER ICONS FOR FIRE PROPERTIES

Zero halogen, non corrosive gases

These Datwyler cables are halogen free and reduce possible damage to health or material to a minimum.

IEC 60754-1 and IEC 60754-2, EN 60754-1 and EN 60754-2

Euroclasses under the CPR according to EN 50575

Flame propagation (FE / PH)

These Datwyler cables with circuit integrity guarantee the function of a single cable for a defined duration. (FE = flame time and influence time)

IEC 60331-1 IEC 60331-2 and Part 21,23, 25
IEC 60331-3
EN 50200 (P_{ca} 15 - P_{ca} 120)
EN 50200 Annex E
EN 50362
EN 50289-4-16

System Circuit Integrity [E30-E90]

These Datwyler cables together with certified Datwyler fixing systems guarantee enhanced circuit integrity of the complete electrical cable installation for a defined time. (E30=30 minutes, E60=60 minutes, E90=90 minutes)

DIN 4102-12 (E30-E90)
Similar standards, however, without reference to laying systems
EN 50577* (P_{ca} 15 - P_{ca} 120)

* EN 50575 does not apply to cables with fire resistance. At the time of printing, cables with fire resistance were therefore excluded from the Construction Products Regulation. The future classification standard for cables with fire resistance EN 50577, EN 13501-3 does not include installation systems, so it cannot replace national standards such as DIN 4102-12.

EUROPEAN CONSTRUCTION PRODUCTS REGULATION (CPR)
EU 305/2011

Since 1st July 2017 cable manufacturers have been obliged to test power cables and lines as well as control and communication cables permanently incorporated in construction works (fixed installation) for reaction to fire performance requirements in accordance with the new harmonised Standard EN 50575, and to classify and market them with a Declaration of Performances (DoP). The import of products from countries outside Europe makes the importer - according to the CPR - a manufacturer who is responsible for the correct product certification and for putting it on the market.

The EU Commission has approved European test laboratories as notified bodies to test and evaluate the reaction to fire performance of cables for this additional task. The product characteristics of a "construction product" cable must be determined and confirmed by a notified body. By the same token the manufacturer's production facility must be subject to ongoing production control by the notified body.

Following product assessment and production monitoring the notified body authorises the manufacturer to deliver his products with the CE mark and to issue a DoP.

The following criteria are evaluated when testing is carried out in compliance with EN 50575:

- Heat of combustion
- Thermal release
- Vertical flame propagation
- Smoke generation
- Flaming droplets/particles of plastics materials which can contribute to fire propagation
- Acidity

The results of this test should be assigned to the following seven cable classes (Euroclasses):

Main class	Description
A_{ca}	Non-flammable, no contribution to fire; products such as mineral-insulated cables and lines
$B1_{ca}$	Low flammability, very limited contribution to fire
$B2_{ca}$, C_{ca}	Very limited or limited contribution to fire; cables/ lines without continuous flame propagation; limited fire development and thermal release rate
D_{ca}	Acceptable contribution to fire; products with continuous fire propagation; moderate fire development and thermal release rate
E_{ca}	Normally flammable; cables and lines with acceptable fire behaviour which have flame-retardant characteristics when exposed to a small pilot flame
F_{ca}	Easily flammable; this cable can ignite when exposed to a small flame

Additional classifications are to be determined for classes $B1_{ca}$ to D_{ca}. The fire-critical parameters have been identified as smoke generation, flaming droplets of cable material and the acidity of the combustion gases:

Additional classes for acidity in cables:	
a1	slightly corrosive flue gases
a2	moderately corrosive flue gases
a3	severely corrosive flue gases

Additional classes for smoke generation in cables:	
s1	slight smoke generation
s2	moderate smoke generation
s3	severe smoke generation

Additional classes for flaming droplets/particles in cables:	
d0	no flaming droplets
d1	short-lived flaming droplets
d2	persistent flaming droplets

You will find up-to-date information on the classification of our relevant cables and lines in the product data sheets. Declarations of Performance have been provided with the delivery documentation since 1st July 2017. If a copy of the Declaration of Performances (DoP) is needed it can be requested via the Datwyler contact address of the relevant country. Declarations of Performance are also available for downloading on the Datwyler website..

The European Construction Products Regulation (CPR) regulates the placing of construction products on the European market – but not their use in construction work. The selection and use of construction products are the responsibility of the European Member States. The requirements governing which fire protection class is specified for which location therefore differ from country to country. Installers and specialist planners must check and comply with the relevant local regulations.

Furthermore, according to EN 50575, the following cables and wires are not part of the standard: cables and wires intended for electricity supply, communication, fire detection and alarm in buildings and other structures where it is essential to ensure the continuity of power and/or signal supply to safety devices such as alarms, signposts and extinguishing systems.

In the future (as things currently stand) Functional Integrity cables will be tested in accordance with EN 50577 and classified with class P_{ca} in accordance with EN 13501-3. A CE marking of Functional Integrity cables according to the Construction Products Regulation in classes A_{ca} bis F_{ca} is an improper use according to Regulation (EC) No. 765/2008, Art. 30 II.

Due to the national regulations of some member states, Euroclasses according to EN 13501-6 are also required for Functional Integrity cables, in some cases even class $B2_{ca}$ s1,d1,a1. These $B2_{ca}$ s1,d1,a1 cables can only be tested and are not subject to production monitoring. Therefore, neither a DoP may be created nor the CE marking may be applied in accordance with the current Construction Products Regulation. Cables with the German VDE designation NHX… and JE-H(St)… are better tested and monitored according to VDE than according to the Construction Products Regulation (which only relates to fire behavior). The CE marking continues to be carried out in accordance with the Low Voltage Directive.

Functional integrity of electrical wiring systems in the event of fire
as of 3rd September 2020

General:
Resistance to fire (IEC 60364-4-42:2010/A1:2014)
Low voltage electrical installations - Part 4-42: Protection for safety - Protection against thermal effects

4-42.2 Conditions of evacuation in an emergency condition
BD2: Low density occupation, difficult conditions of evacuation
BD3: High density occupation, easy conditions of evacuation
BD4: High density occupation, difficult conditions of evacuation
(according to Table 51A of IEC 60364-5-51:2005).

NOTE: Authorities responsible for building construction, public gatherings, fire prevention, etc. may specify which BD condition is applicable. If conditions BD2, BD3 and BD4, wiring systems that are supplying safety circuits shall have a resistance to fire rating of either the time authorised by regulations for building elements or 1 h in the absence of such a regulation.

5.1 Basic requirements

5.1.1 The electrical wiring systems for safety systems prescribed by building regulations must be designed or separated by components in such a way that the safety systems remain functional for a sufficient period of time in the event of fire (functional integrity). This functional integrity must be guaranteed in the event of possible interaction with other systems or their parts.

5.1.2 Other safety systems required for operation may also be connected to the distributors of the electrical wiring systems for safety systems prescribed by the building regulations. It must be ensured that the safety systems prescribed by the building authorities are not impaired.

5.2 Functional integrity

5.2.1 The functional integrity of the electrical wiring systems is guaranteed if the cables
a) meet the test requirements of DIN 4102-12:1998-11 (functional integrity class E30 to E90) or are classified as equivalent or
b) on bare ceilings below the floor screed with a thickness of at least 30 mm or
c) are laid in the ground.

5.2.2 Distributors of electrical cable systems with functional integrity in accordance with Section 5.3 must
a) be housed in separate rooms not used for other purposes, which are separated from other rooms by walls, ceilings and doors with a fire resistance corresponding to the necessary duration of functional integrity and - with the exception of the doors - made of non-combustible building materials,
b) are separated by enclosures for which the function of the electrical installations of the distribution board in the event of fire has been verified by a building authority certificate of usability for the necessary duration of functional integrity or
c) are surrounded by components (including their terminations) which have a fire resistance corresponding to the necessary duration of functional integrity and - with the exception of the terminations - are made of non-combustible building materials, whereby it must be ensured that the function of the electrotechnical installations of the distributor is guaranteed in the event of fire for the duration of functional integrity; proof of functional integrity of the electrotechnical installations must be documented.

5.3 Duration of functional integrity

5.3.1 The duration of the functional integrity of the pipe systems must be at least 90 minutes for
a) automatic fire extinguishing systems and water pressure boosting systems for the supply of extinguishing water,
b) mechanical smoke extraction systems and pressurized ventilation systems for necessary stairwells in high-rise buildings and for special buildings for which such systems are required in individual cases; in deviation from this, a duration of 30 minutes is sufficient for pipe systems that are installed within these stairwells,
c) bed elevators in hospitals and other buildings with a corresponding purpose and fire department elevators; this does not apply to cable systems that are located within the lift shafts or engine rooms.

GERMAN ELECTRICAL CIRCUIT SYSTEMS DIRECTIVE
(Muster-Leitungsanlagen-Richtlinie - MLAR-2015)

5.3.2 The duration of the functional integrity of the cable systems must be at least 30 minutes for

a) safety lighting systems; this does not apply to cable systems within a fire compartment on one floor or within a stairwell that are used exclusively to supply the safety lighting systems in these areas; the floor area per fire compartment may not exceed 1,600 m^2,
b) Passenger elevators with fire control; this does not apply to cable systems that are located within the elevator shafts or the machine rooms,
c) fire alarm systems including the associated transmission systems; excluded are cable systems .
   - which are monitored by automatic fire detectors,
   - in areas without automatic fire detectors, if all fire detectors connected to this cable system remain functional in the event of a short circuit or cable interruption,
d) alarm systems, insofar as these systems must be effective in the event of fire; this does not apply to cable systems within a fire compartment on one floor or within a stairwell that serve exclusively to supply the alarm systems in these areas; the floor area per fire compartment may not exceed 1,600 m^2,
e) natural smoke extraction systems (smoke extraction by thermal buoyancy); this does not apply to systems that open automatically in the event of a power supply failure, or to duct systems in rooms that are monitored by automatic fire detectors and where the activation of a fire detector by smoke causes the system to open automatically,
f) mechanical smoke extraction systems and pressurized ventilation systems in cases other than those specified in Section 5.3.1.

VOLTAGE DROP

General

It should not be ignored that the electrical resistance of a cable increases when exposed to flames.

The test standard DIN 4102-12 Appendix A states, for example:
"For cable systems with integrated Functional Integrity, the fire room temperatures should be approximately taken as the conductor temperatures at the time of loss of function, unless special evidence is provided."

This would mean that at 30 minutes the conductor temperature is approx. 830 °C, and at 90 minutes it is even over 1000 °C. Measurements proved that the values are significantly different.

During two tests, the increase in temperature on various cables was measured directly on the conductor using thermocouples. The change in resistance due to an increase in temperature on the conductor was also determined over a period of 100 minutes using a precision measuring bridge. 50% of the cable lengths were in the test room and were therefore directly exposed to temperatures according to the uniform-temperature-time-curve (UTTC). The other half of the cables were outside the test room at an ambient temperature of approx. 17 °C. The cables in the test room only measured a conductor temperature of approx. 420 °C after 30 minutes and a conductor temperature of approx. 870 °C after 90 minutes. Based on the values determined, tables could be created which enable the electrical planner and installer to select the required cross section. This ensures that the necessary safety devices remain functional over the required period of time.

The following conversion table results from the practical values we determined:

Practical table

V	F (E30)	F (E90)	V	F (E30)	F (E90)
90:10	1.16	1.34	40:60	1.95	3.01
80:20	1.32	1.67	30:70	2.11	3.34
70:30	1.48	2.01	20:80	2.26	3.68
60:40	1.63	2.34	10:90	2.42	4.01
50:50	1.79	2.67	0:100	2.57	4.34

Experts have agreed on a uniform calculation method. We have therefore abandoned our practical assessment procedure, which was based on resistance and temperature measurements during fire tests. We have adjusted the calculation method in favor of the "worst case" analysis: the temperature towards the end of the classification period is assumed to be the conductor temperature. The Wiedemann-Franz rule is used to increase resistance.

"Worst case" table

V	F (E30)	F (E90)	V	F (E30)	F (E90)
90:10	1.37	1.45	40:60	3.23	3.72
80:20	1.74	1.91	30:70	3.60	4.17
70:30	2.11	2.36	20:80	3.97	4.62
60:40	2.48	2.81	10:90	4.34	5.08
50:50	2.85	3.26	0:100	4.71	5.53

All factors from the fire test, such as heat dissipation through the ceiling tile when laying the clamps or through the cable trays, are ignored. That is why the factor for increasing the resistance increases significantly, especially in the E30 range. Nevertheless, the actual cross section hardly increases at all in applications E30 to E90. Experts clearly point out that the voltage drop limits according to IEC 60364-5-52 or DIN VDE 0100-520 do not apply in the event of a fire. In the event of a fire, the only decisive factor is that the connected consumers still function as intended. IEC 60038 DIN EN 60038 VDE 0175-1:2012-04 specifies a voltage drop of more than 10% for device manufacturers. This means that the previous calculations using the "old" method are not called into question. In the end, what is decisive for the cross section is not the rated current (when considering the voltage drop), but rather the rated current of the fuse. For smoke extraction fans, the operating current and the motor protection in the control cabinet are crucial. For other drives (elevators, sprinkler pumps, smoke pressure systems, etc.), control cabinet protection and the actual nominal current of the system are necessary. (Note: Pumps or fans should be adequately protected, as long standstill times or contamination can generate higher load currents and longer starting currents.) We therefore recommend first determining the cross section for "normal operation". With the resulting cross section you then go to our voltage drop calculation program (see our website). A voltage drop of up to 10% can still be sufficient.

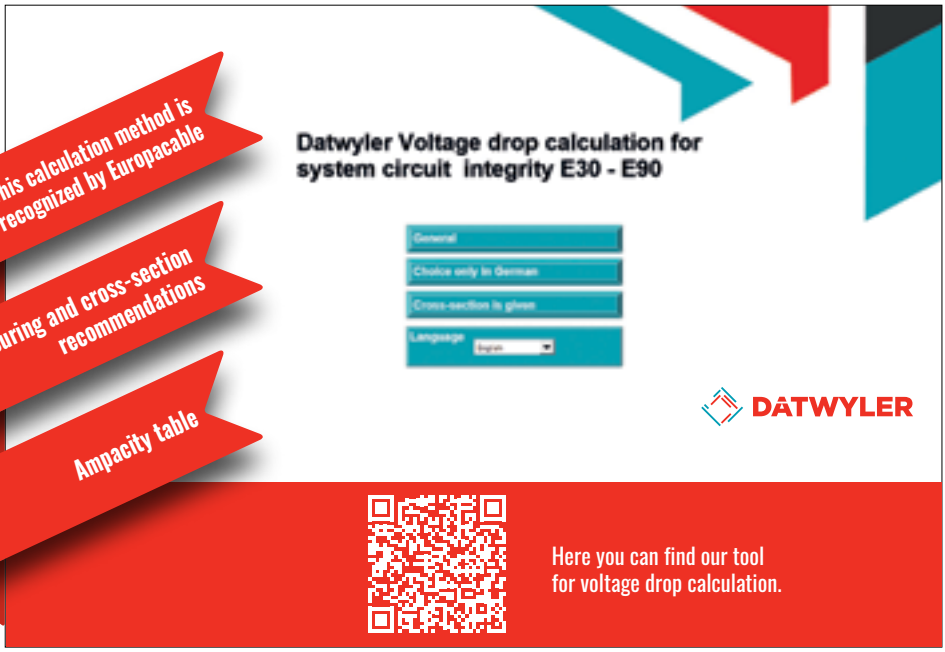
Excerpt from VdS* CEA Guideline 4001 for sprinkler systems - VdS CEA 2021-01 (07)

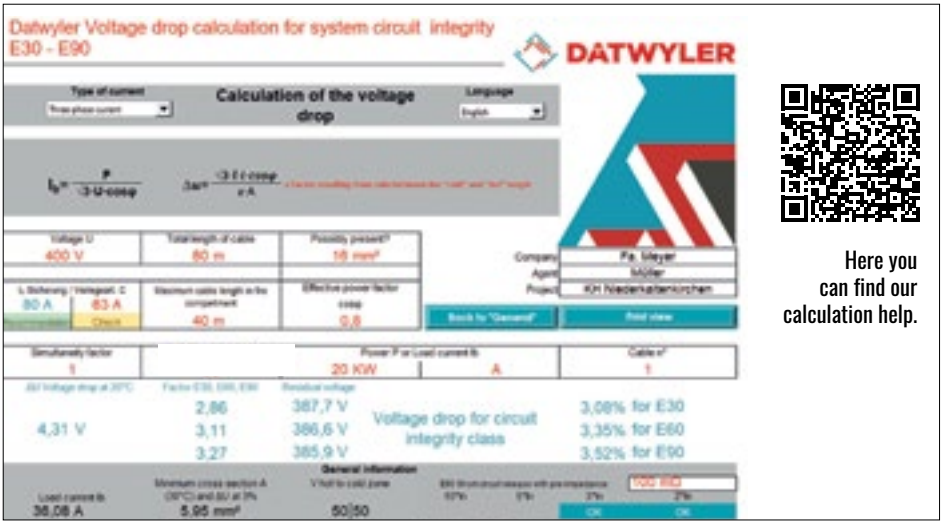
9.8.4.1 The current for calculating the cable dimensioning corresponds to at least 1.5 times the rated load current. Depending on the system structure, several pumps can be in operation at the same time. When starting and operating the pumps at maximum flow rate (Qmax), the permissible nominal voltage ranges of the pump control cabinets must be adhered to. The permissible ampacity of the cables as well as the maximum permissible voltage drop in the event of fire exposure in the largest expected fire area must be taken into account. When choosing fuses, it must be taken into account that their rated currents are greater than the operating currents of the circuit. Fuses must be able to maintain the starting current of the sprinkler pump for at least 20 s.

* VdS is a German independent testing institution which executes certification for products (components, equipment and systems) in the areas of fire protection and safety technology.

PLANNING TOOLS

The easiest way to calculate the voltage drop is with our software.





These tools only apply for Datwyler safety cables.

Core colour-coding in accordance with CENELEC and SEV standards.

Core colour-coding in accordance with DIN VDE 0293 - 308 : 01/2003 (CENELEC HD 308 10/2001)

No. of cores	1(-0)		1(-J)	2(-0)	2(-J)	3(-0)	3(-J)	4(-0)	4(-J)	5(-0)	5(-J)
Conductor function	L	N	PE	LN	LPE	3L	LNPE	3LN	3LPE	4LN	3LNPE
Brown (L)	■			■	■	■	■	■	■	■	■
Blue (N)		■		■			■	■		■	■
Black (L)	■					■		■	■	■ ■	■
Grey (L)	■					■		■	■	■	■
Yellow-green (PE)			■		■		■		■		■

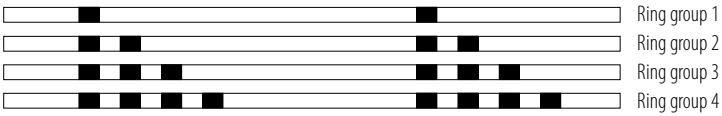
L = external conductor
N = neutral conductor
PE = protective conductor

Core markings for cables ≥ 6 conductors
External conductor = black with white printed digits
Protective conductor = yellow-green

Conductors marked in accordance with VDE 0815 for industrial electronics cable JE-H(ST)H…Bd (2 twin-wires: star quad; othwise: 4 pairs in bundles)

Pair	Conductor A	Conductor B
1	■	■
2	■	■
3	■	■
4	□	■

Each bundle is assigned to a ring group. All conductors in a bundle are marked with coloured rings and the order of the specific coloured rings in groups, or they are marked by a printed bundle number. When counting the groups, start with the innermost one.



Bundle markings

Bundle number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ring colour																				
Ring group for bundle: 4 conductors	I	I	II	II																
Ring group for bundle: 8 conductors or 4 pairs	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
Tape coil																				

Only applies for Datwyler safety cables

FUNCTIONAL INTEGRITY

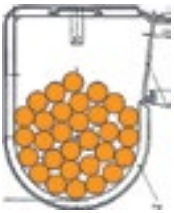
Vertical installation

In order to install cable systems vertically while maintaining functional integrity (system circuit integrity), DIN 4102-12 prescribes the following measures:

The placement and classification of functionally integral cables installed separately beneath a ceiling applies to both horizontal and vertical cable lines along walls and ceilings. When cables are installed horizontally on a wall using profile rails and clamps, the clamps used for seperately installed cables must be fastened in such a manner that a slippage of clamps will be prevented.
If the cable installation is entirely vertical (rising lines or separately installed cables, for example), you must install effective support mounts (spacing a ≤ 3500 mm), for example, a Datwyler WUM.
For vertical cable systems, the same placement and classification applies as with separately installed cables along a ceiling using single clamps. A certified bracket clamp can be used as alternative means of fastening the cables. The spacing of the bracket clamp is the same as the spacing used to install cables separately using single clamps.

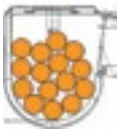
Multi-cable supports

Other comparable systems offer only a fraction of the capacity of a Hermann clamp!



30 pcs. Datwyler Keram (N)HXH FE180/E30-E60 3x1.5 mm² cable in a Hermann clamp

15 pcs. Datwyler Keram (N)HXH FE180/ E30-E60 3x1.5 mm² cable in a Hermann clamp "S"



Furthermore:
When installing a Hermann clamp in acc. with MLAR for "cables without functional integrity" above a fireproof ceiling, it is possible to install a linear cable weight of 15 kg/m with a clamp spacing of 600 mm.

E0 multi-cable support
For wall and ceiling installations in accordance with MLAR 2015

Article No.	Name	Interior dimensions mm x mm x mm	Exterior dimensions mm x mm x mm	Units / pcs.
3800086	E0 multi-cable supports	approx. 80 x 45 x 33	approx. 87 x 60 x 33	25
3800087	E0 S multi-cable supports	approx. 55 x 35 x 33	approx. 63 x 45 x 33	50

To speed up installation times for the E0 multi-cable support, we recommend using the Datwyler SWM-SM 50 setting tool.

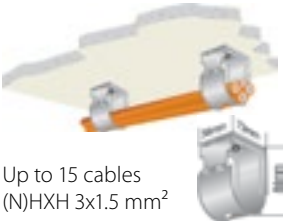
System description:
For fire-safe installation of multiple cables or lines along ceilings or walls above fireproof ceilings in accordance with MLAR 2015 (not for functional integrity!).

Excerpt from MLAR 2015 3.5.3.:
The special requirements pertaining to fireproof fasteners for lines installed in the area between floor slabs and suspended ceilings must be observed.

Installation spacing (cm)	30	40	50	60	70	80
Cable weight (kg/m)	6	4.5	3.6	3	2.6	2.3

Only applies for Datwyler safety cables

Multi-cable support, type E30-E90 for Hermann clamp S
for horizontal wall and ceiling installations



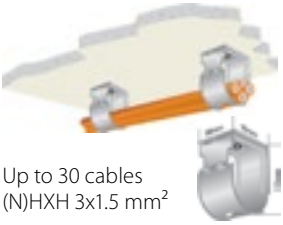
Up to 15 cables
(N)HXH 3x1.5 mm²

The cable with the highest weight must be placed in the multi-cable support beneath the cables with a lower weight.

Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E60			maximum load: 3 kg/m
(N)HXH	800	E30-E60	
(N)HXCH	800	E30-E60	
FE180 / E90			maximum load: 3 kg/m
(N)HXH	800	E90	
(N)HXCH	800	E90	
FE180 / E30-E90			maximum load: 3 kg/m
JE-H(ST)H…Bd	800	E30-E60	*
JE-H(ST)H…Bd	600	E30-E90	
JE-H(ST)HRH…Bd	800	E30-E60	
JE-H(ST)HRH…Bd	600	E30-E90	

* JE-H(ST)H…Bd FE180/E30L classified in same manner as with E30.

Multi-cable support, type E30-E90 for Hermann clamp (large)
for horizontal wall and ceiling lines



Up to 30 cables
(N)HXH 3x1.5 mm²

The cable with the highest weight must be placed in the multi-cable support beneath the cables with a lower weight.

Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E60			maximum load: 6 kg/m
(N)HXH	800	E30-E60	
(N)HXCH	800	E30-E60	
FE180 / E90			maximum load: 6 kg/m
(N)HXH	800	E90	
(N)HXCH	800	E90	
FE180 / E30-E90			maximum load: 6 kg/m
JE-H(ST)H…Bd	800	E30-E60	*
JE-H(ST)H…Bd	600	E30-E90	
JE-H(ST)HRH…Bd	800	E30-E60	
JE-H(ST)HRH…Bd	600	E30-E90	

* JE-H(ST)H…Bd FE180/E30L classified in same manner as with E30.

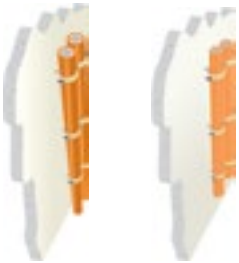
SINGLE CLAMP

Separate and bundle installation using type SAS or TSD single clamps
(stainless steel tunnel clamp) for horizontal wall and ceiling lines

Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E60			bundles without limits (number / weight)
(N)HXH	600	E30-E60	
	1200	E30	
(N)HXCH	600	E30-E60	
	1200	E30	
FE180 / E90			bundles without limits (number / weight)
(N)HXH	600	E90	
(N)HXCH	600	E90	
FE180 / E30-E90		bundle	maximum load: 2.5 kg/m
JE-H(ST)H…Bd	600	E90	
	1200	E30-E60	*
JE-H(ST)HRH…Bd	600	E90	
	1200	E30-E60	

* JE-H(ST)H…Bd FE180/E30L classified in same manner as with E30.

Separate and bundle installation using type SAS or TSD single clamps
(stainless steel tunnel clamp) for vertical installation



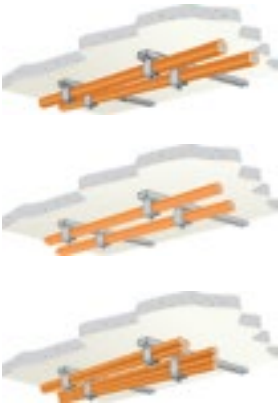
Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E60			bundles without limits (number / weight)
(N)HXH	600	E30-E60	
	1200	E30	
(N)HXCH	600	E30-E60	
	1200	E30	
FE180 / E90			bundles without limits (number / weight)
(N)HXH	600	E90	
(N)HXCH	600	E90	
FE180 / E30-E90		bundle	maximum load: 2.5 kg/m
JE-H(ST)H…Bd	600	E90	
	1200	E30-E60	*
JE-H(ST)HRH…Bd	600	E90	
	1200	E30-E60	

* JE-H(ST)H…Bd FE180/E30L classified in same manner as with E30.

Note: For vertical installations >3.5 m between fire bulkheads on floor slabs, the cable system must be installed using an effective support mount (Datwyler WUM, for example).

Only permitted with Datwyler safety cables

Separate and bundle installation using type B...D strap clamps without troughs
for horizontal wall and ceiling installation

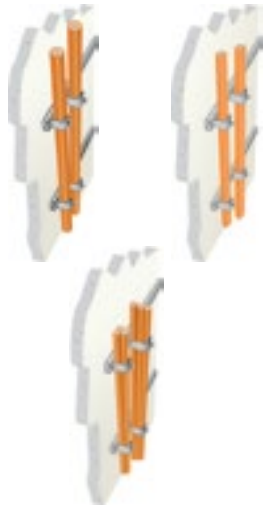


Strap clamps with troughs can also be used.

Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E60			bundles without limits (number / weight)
(N)HXH	800	E30-E60	
	1200	E30	
(N)HXCH	800	E30-E60	
	1200	E30	
FE180 / E90			bundles without limits (number / weight)
(N)HXH	800	E90	
(N)HXCH	800	E90	
FE180 / E30-E90		bundle	maximum load: 2.5 kg/m
JE-H(ST)H…Bd	800	E90	
	1200	E30-E60	*
JE-H(ST)HRH…Bd	800	E90	
	1200	E30-E60	
FO Universal Safety Cables			according to DIN 4102-12
ZGGFR	600	30 min.	2-12 fibres
wbGGFR	600	30 min.	24-60 fibres

* JE-H(ST)H…Bd FE180/E30L classified in same manner as with E30.

Separate and bundle installation using type B...D strap clamps without troughs
for vertical installation



Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E60			bundles without limits (number / weight)
(N)HXH	800	E30-E60	
	1200	E30	
(N)HXCH	800	E30-E60	
	1200	E30	
FE180 / E90			bundles without limits (number / weight)
(N)HXH	800	E90	
(N)HXCH	800	E90	
FE180 / E30-E90		bundle	maximum load: 2.5 kg/m
JE-H(ST)H…Bd	800	E90	
	1200	E30-E60	*
JE-H(ST)HRH…Bd	800	E90	
	1200	E30-E60	

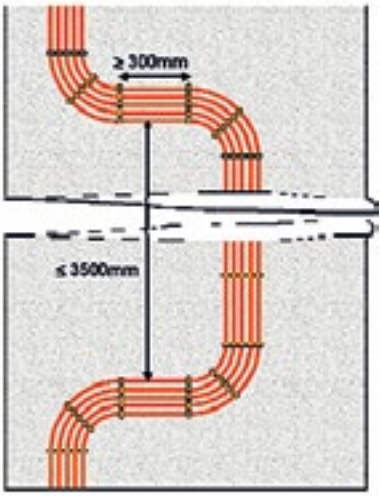
* JE-H(ST)H…Bd FE180/E30L classified in same manner as with E30.

Note: For vertical installations >3.5 m between fire bulkheads on floor slabs, the cable system must be installed using an effective support mount (Datwyler WUM, for example).

WUM

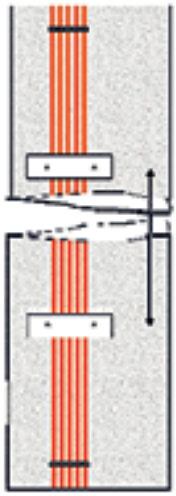
WUM - Effective support mount

in accordance with DIN 4102-12



"With riser lines, this classification only applies when effective support mounts (spacing ≤ 3,500 mm) are installed for the cables."

Datwyler WUM



Only permitted with Datwyler safety cables

In-wall installation

horizontally / vertically along wall or ceiling

(Mineral-based wall covering on cable ≥ 15 mm)

Datwyler Keram	Spacing (mm)	Functional integrity	
FE180 / E30-E60			
(N)HXH		E30	
(N)HXCH		E30	
FE180 / E90			
(N)HXH		E90	
(N)HXCH		E90	
FE180 / E30-E90			
JE-H(ST)H…Bd		E30-E90	*
JE-H(ST)HRH…Bd		E30-E90	

* JE-H(ST)H…Bd FE180/E30L classified in same manner as with E30.

STEEL-ARMOURED CONDUITS

Separate and bundle installation in type Stapa DN to M steel armoured conduit

without troughs with type SAS / TSD single clamps or type B...D strap clamps
for horizontal wall and ceiling installations

(≤ M63, filling factor ≤ 60 %)

Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E60			bundles without limits (number / weight)
(N)HXH	1200	E30	
(N)HXCH	1200	E30	
FE180 / E30-E90		bundle	maximum load: 2.5 kg/m
JE-H(ST)H…Bd	1200	E30-E60	
JE-H(ST)HRH…Bd	1200	E30-E60	

* JE-H(ST)H…Bd FE180/E30L classified in same manner as with E30.

Maximum line length without fasteners between ends of conduit: ≤ 1,200 mm

In accordance with DIN 4102-12, a "slip-off protection" is necessary for horizontal wall installations using strap clamps.

PROTECTIVE CONDUITS

Separate and bundle installation in zero-halogen protective conduit

with type SAS / TSD single clamps for horizontal wall and ceiling installation

[1] also in aluminium protective conduit

Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E60			bundles without limits (number / weight)
(N)HXH	600	E30-E60[1]	
	1200	E30[1]	
(N)HXCH	600	E30-E60[1]	
	1200	E30[1]	
FE180 / E90			bundles without limits (number / weight)
(N)HXH	600	E90	
(N)HXCH	600	E90	
FE180 / E30-E90		bundle	maximum load: 2.5 kg/m
JE-H(ST)H…Bd	600	E90[1]	
	1200	E30-E60[1]	*
JE-H(ST)HRH…Bd	600	E90[1]	
	1200	E30-E60[1]	

* JE-H(ST)H…Bd FE180/E30L classified in same manner as with E30.

Separate and bundle installation in zero-halogen protective conduit

with strap clamps for horizontal wall and ceiling installations

Strap clamps with troughs can also be used.

[1] also in aluminium protective conduit

Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E60			bundles without limits (number / weight)
(N)HXH	800	E30-E60[1]	
	1200	E30[1]	
(N)HXCH	800	E30-E60[1]	
	1200	E30[1]	
FE180 / E90			bundles without limits (number / weight)
(N)HXH	800	E90	
(N)HXCH	800	E90	
FE180 / E30-E90		bundle	maximum load: 2.5 kg/m
JE-H(ST)H…Bd	800	E90[1]	
	1200	E30-E60[1]	*
JE-H(ST)HRH…Bd	800	E90[1]	
	1200	E30-E60[1]	

* JE-H(ST)H…Bd FE180/E30L classified in same manner as with E30.

In accordance with DIN 4102-12, a "slip-off protection" is necessary for horizontal wall installation using strap clamps.

Only permitted with Datwyler safety cables

Bundle installation in protective cable duct (LLK 60.100 + holding piece LHS 100)

for horizontal wall and ceiling lines

Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E60			maximum load: 3.1 kg/m ceiling installation; 7.0 kg/m wall installation
(N)HXH	500	E30	from 1.5 mm² to 16 mm²
FE180 / E30-E90			maximum load: 3.1 kg/m ceiling installation; 7.0 kg/m wall installation
JE-H(ST)H…Bd	500	E30	*
JE-H(ST)HRH…Bd	500	E30	

Bundle installation in protective cable duct (LLK 26.030)

for horizontal wall and ceiling lines

Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E90			maximum load: 0.3 kg/m
JE-H(ST)H…Bd	500	E30	*
JE-H(ST)HRH…Bd	500	E30-E60	

Bundle installation in wire mesh cable duct

Lanz Oensingen AG (CH), G-duct with G-post or hooked rail
for horizontal wall and ceiling lines

Datwyler Keram	Spacing (mm)	Functional integrity	Note
FE180 / E30-E60			G-… ≤ 50x75 mm ≤ 3 kg/m
(N)HXH	1250	E30	from 1.5 mm² to 16 mm²
(N)HXCH	1250	E30	from 1.5 mm² to 16 mm²
FE180 / E30-E90			G-… ≤ 50x75 mm ≤ 3 kg/m
JE-H(ST)H…Bd	1250	E30	*
JE-H(ST)HRH…Bd	1250	E30-E60	
FE180 / E30-E60			G-… ≤ 75x100 mm ≤ 7,5 kg/m
(N)HXH	1250	E30	no restrictions
(N)HXCH	1250	E30	no restrictions
FE180 / E30-E90			G-… ≤ 75x100 mm ≤ 7,5 kg/m
JE-H(ST)H…Bd	1250	E30	*
JE-H(ST)HRH…Bd	1250	E30-E60	

* JE-H(ST)H…Bd FE180/E30L classified in same manner as with E30.

UNLIMITED FUNCTIONAL INTEGRITY

Standard installation techniques are not practical and more expensive

Datwyler "Keram" safety cables for high- and low-voltage applications with integrated functional integrity in accordance with DIN 4102-12 allow for installation techniques that fulfil nearly all requirements in contemporary building applications. They are also highly affordable.

Cables with integrated functional integrity are used in applications requiring special protection against fire and hazards to persons and property, and where building safety laws and provisions must be complied with.

The highly limited standard installation techniques are not able to comply with the demands in construction work and architecture. As a result, costly and time-intensive building site approvals are required on a case-by-case basis together with even more expensive correctional measures.

The installation itself is costly in terms of materials and time when performed in the "normal" manner.

Installation type	Standard installation techniques in accordance with DIN 4102-12 (Nov. 1998)	Installation techniques with Datwyler Keram cable in acc. with DIN 4102-12	Savings fastening system
Cable ladder	With threaded rod suspension	Without threaded rod suspension	Approx. 20%
	Support spacing: up to 1200 mm	Support spacing: up to 1500 mm	
	Width: up to 400 mm	Width: up to 400 mm	
	Load capacity: up to 20 kg/m	Load capacity: up to 20 kg/m	
Cable tray	With threaded rod suspension	Without threaded rod suspension	More than 50% for cable loads larger than 10 kg/m
	Support spacing: up to 1200 mm	Support spacing: up to 1500 mm	
	Width: up to 300 mm	Width: up to 400 mm	
	Load capacity: up to 10 kg/m	Load capacity: up to 30 kg/m	
Strap clamp	With trough Fastener spacing up to 600 mm	Without trough Fastener spacing up to 1.2 m (E30); 800 mm (E60 + E90) Bundling up to 2.5 kg/m	Approx. 60 % for separately installed cables, more than 90 % for cable bundles
Single clamp	Line spacing: up to 300 mm	Fastener spacing up to 1.2 m (E30); 600 mm (E60 + E90) only limited for JE-H(St)H / HRH cables Bundling up to 2.5 kg/m	Approx. 50 - 60 % for separately installed cables, more than 90 % for cable bundles
Multi-cable supports	(Bundled lines only on cable tray / cable ladder)	Bundle lines in multi-cable support Fastener spacing up to 800 mm (E30); 600 mm (E60 + E90) only limited for JE-H(St)H / HRH cables Up to 3 or 6 kg/m cable weight	More than 90%
Conduit / duct	Not possible	Installation in zero-halogen plastic conduit / aluminium protective conduit / steel-armoured conduit / sheet steel ducts	

Wire mesh trays for horizontal wall and ceiling installation

	Width ≤ mm	Load capacity ≤ kg/m	Fastener spacing ≤ m	OBO Menden: (N)HXH E30 (N)HXH E90	OBO Menden: (N)HXCH E30 (N)HXCH E90	OBO Menden: JE-H(S)H	OBO Menden: JE-H(S)HRH	PUK POHLCON Berlin: (N)HXH E30 (N)HXH E90	PUK POHLCON Berlin: (N)HXCH E30 (N)HXCH E90	PUK POHLCON Berlin: JE-H(S)H	PUK POHLCON Berlin: JE-H(S)HRH
				Datwyler Keram				Datwyler Keram			
	400	20	1.5					**E30** E90	**E30** E90		
	400	10	1.25					**E30** E90	**E30** E90		
	300	10	1.2					**E30** E90	**E30** E90		
Ceiling with threaded rod	300 stainless steel	30	1.5	**E30** E90	**E30** E90	**E30**	**E30**				
	400	20	1.5					**E30** E90	**E30** E90		
	400	10	1.25					**E30** E90	**E30** E90		
Wall with threaded rod	300	10	1.2					**E30** E90	**E30** E90		

Errors and omissions excepted.
The General Appraisal Certificates (ABP) or approvals for assessing standard-compliant cable trays according to DIN 4102-12 from the support system manufacturers apply to the execution.

	Width ≤ mm	Load capacity ≤ kg/m	Fastener spacing ≤ m	Niedax Linz/Rhein: (N)HXH E30-E60 (N)HXH E90	(N)HXCH E30-E60 (N)HXCH E90	JE-H(ST)H E30-E90	JE-H(ST)HRH E30-E90	FO Universal ZGGFR Safety
				Dätwyler Keram				
	400	15	1.5	**E30**	**E30** E90	**E30**		
	= 400	15	1.5	**E30** E90	**E30** E90	**E30** E60		
Wall without threaded rod	100	15	1.5				**E30**	
Wall with threaded rod	300	10	1.2					**30 min.**
	400	15	1.5	**E30**	**E30** E90	**E30**		
	= 400	15	1.5	**E30** E90	**E30** E90	**E30** E60		
Ceiling without threaded rod	100	15	1.5				**E30**	
Wall with threaded rod	300	10	1.2					**30 min.**

Only permitted with Datwyler safety cables

CABLE TRAYS

Cable trays for horizontal ceiling installation

	Width ≤ mm	Load capacity ≤ kg/m	Fastener spacing ≤ m	PUK POHLCON Berlin (N)HXH E30-E60 (N)HXH E90	PUK POHLCON Berlin (N)HXCH E30-E60 (N)HXCH E90	PUK POHLCON Berlin JE-H(ST)H E30-E90	PUK POHLCON Berlin JE-H(ST)HRH E30-E90	Vergokan B- Oudenaarde (N)HXH E30-E60 (N)HXH E90	Vergokan B- Oudenaarde (N)HXCH E30-E60 (N)HXCH E90	Vergokan B- Oudenaarde JE-H(ST)H E30-E90	Vergokan B- Oudenaarde JE-H(ST)HRH E30-E90
				Datwyler Keram				Datwyler Keram			
	400	30	1,50	E30 E90	E30 E90	E30					
	400	25	1,50	E30 E90	E30 E90	E30					
Ceilings without threaded rod	400	20	1,50	E30 E90	E30 E90	E30	E30	E30 E90	E30 E90	E30	E30
				Datwyler Keram				Datwyler Keram			
	400	30	1,50	E30 E90	E30 E90	E30					
	400	25	1,50	E30 E90	E30 E90	E30					
Wall without threaded rod	400	20	1,50	E30 E90	E30 E90	E30	E30	E30 E90	E30 E90	E30	E30
				Datwyler Keram				Datwyler Keram			
Standard in acc. with DIN 4102-12	300	10	1,20	E30 E90	E30 E90	E30 E90	E30 E90	E30 E90	E30 E90	E30 E90	E30 E90

Errors and omissions excepted.
Please see the cable tray vendor´s General Appraisal Certificates (ABP) and approvals for assessing standard-compliant cable trays (in accordance with DIN 4102-12).

Special fastening with clamps is permitted with standard-compliant cable trays if there is just a non-significant deviation from the General Appraisal Certificate (ABP).

Only permitted with Datwyler safety cables

	Niedax Linz/Rhein					**Rico** Kirchheim/Teck				**OBO** - Menden			
	(N)HXH E30-E60 (N)HXH E90	(N)HXCH E30-E60 (N)HXCH E90	JE-H(ST)H E30-E90	JE-H(ST)HRH E30-E90	FO Universal Safety ZGGFR 2-12 Fasern wbGGFR 24-60 Fasern	(N)HXH E30-E60 (N)HXH E90	(N)HXCH E30-E60 (N)HXCH E90	JE-H(ST)H E30-E90	JE-H(ST)HRH E30-E90	(N)HXH E30-E60 (N)HXH E90	(N)HXCH E30-E60 (N)HXCH E90	JE-H(ST)H E30-E90	JE-H(ST)HRH E30-E90
	Datwyler Keram					Datwyler Keram				Datwyler Keram			
	E30 E90	**E30** E90	**E30**			**E30** E90	**E30** E90	**E30**					
	E30 E90	**E30** E90	**E30**	**E30**	**E30**	**E30** E90	**E30** E90	**E30**	**E30**	**E30** E90	**E30** E90	**E30**	**E30**

	Datwyler Keram					Datwyler Keram				Datwyler Keram			
	E30 E90	**E30** E90	**E30**			**E30** E90	**E30** E90	**E30**					
	E30 E90	**E30** E90	**E30**	**E30**		**E30** E90	**E30** E90	**E30**	**E30**	**E30** E90	**E30** E90	**E30**	**E30**

	Datwyler Keram					Datwyler Keram				Datwyler Keram			
	E30 E90	**E30** E90	**E30** E90	**E30** E90	**30 Min.**	**E30** E90	**E30** E90	**E30** E90	**E30** E90	**E30** E90	**E30** E90	**E30** E90	**E30** E90

Only permitted with Datwyler safety cables

LOW-VOLTAGE CABLE E30-E60

Datwyler (N)HXH FE180 / E30-E60 Keram

all dimensions

Installation spacing

Datwyler fastener	horizontal and vertical		Note
Type SAS / TSD single clamp	E30 1.2 m	E60 60 cm	Bundles without limits
Type B…D strap clamp	E30 1.2 m	E60 80 cm	
on profile rail			Horizontal also possible with conduits
In-wall installation	E30-E60 covered with ≥ 15 mm mineral plaster		

Datwyler fastener	horizontal	Note
Hermann clamp S, small	E30-E60 80 cm	Maximum load: 3 kg/m (e.g. up to 15 cables 3 x 1.5 mm^2)
Hermann clamp, large	E30-E60 80 cm	Maximum load: 6 kg/m (e.g. up to 30 cables 3 x 1.5 mm^2)

Installation spacing

Datwyler fastener	horizontal	Note
Aluminium pipe **with type SAS / TSD single clamp** **with type B…D strap clamp** **on profile rail**	E30 1.2 m E60 60 cm E60 80 cm	Bundles without limits
Zero-halogen **plastic armoured conduit** **with type SAS / TSD single clamp** **with type B…D strap clamp** **on profile rail**	E30 1.2 m E60 60 cm E60 80 cm	Bundles without limits Separately installed cables 1.5 mm^2 to 16 mm^2
Steel-armoured conduit **with type SAS / TSD single clamp** **with type B…D strap clamp** **on profile rail**	E30 1.2 m	≤ M63, filling factor ≤ 60% Bundles without limits Maximum line length w/o fasteners between ends of conduit: ≤ 1.2 m
G-duct 50 x 75 mm **with G-post or hooked rail**	E30 1.25 m	Maximum load: 3 kg/m up to 16 mm^2
G-duct ≤ 75 x 100 mm **with G-post or with hooked rail**	E30 1.25 m	Maximum load: 7.5 kg/m
Protective cable duct 60 x 100 mm	E30 50 cm	Maximum of 16 mm^2 Maximum load: 3.1 kg/m ceiling installations 7 kg/m wall installations
Cable tray 60 x ≤ 400 mm **without threaded rod suspension**	E30-E60 1.5 m	Maximum load: 20 kg/m Wall and ceiling installations

Cable support systems also without threaded rod	dependent on manufacturer		
Wire mesh cable tray	≤ 400 mm	1.50 m	20 kg/m or more
Tray	≤ 400 mm	1.50 m	20 kg/m or more
Ladder	≤ 400 mm	1.50 m	20 kg/m or more

If a Hermann clamp is used to support multiple cables with varying cross-sections, the cable with the largest cross-section must be installed below the smaller ones. When installed horizontally, the installation is the same for walls and ceilings. However, riser lines (directly fastened, using only single or bracket clamps) require the installation of an appropriate fireproof bulkhead or WUM (effective support mount) at a spacing of every 3.5 m. Any certified steel fastening bolts or certified fireproof plugs from other manufacturers can be used.

In accordance with DIN 4102-12, a "slip-off protection" is necessary for horizontal wall installation using strap clamps.

LOW-VOLTAGE CABLE E30-E60

Datwyler (N)HXCH FE180 / E30-E60 Keram

all dimensions

Installation spacing

Datwyler fastener	horizontal and vertical		Note
Type SAS / TSD single clamp	E30 1.2 m	E60 60 cm	Bundles without limits
Type B…D strap clamp on profile rail	E30 1.2 m	E60 80 cm	Horizontal also possible with conduits
In-wall installation	E30-E60 covered with ≥ 15 mm mineral plaster		

Datwyler fastener	horizontal	Note
Hermann clamp S, small	E30-E60 80 cm	Maximum load: 3 kg/m (e.g. up to 15 cables 3 x 1.5 mm^2)
Hermann clamp, large	E30-E60 80 cm	Maximum load: 6 kg/m (e.g. up to 30 cables 3 x 1.5 mm^2)

Installation spacing

Datwyler fastener	horizontal	Note
Aluminium pipe **with type SAS / TSD single clamp** **with type B…D strap clamp** **on profile rail**	E30 1.2 m E60 60 cm E60 80 cm	Bundles without limits
Zero-halogen **plastic armoured conduit** **with type SAS / TSD single clamp** **with type B…D strap clamp** **on profile rail**	E30 1.2 m E60 60 cm E60 80 cm	Bundles without limits
Steel-armoured conduit **with type SAS / TSD single clamp** **with type B…D strap clamp** **on profile rail**	E30 1.2 m	≤ M63, filling factor ≤ 60% Bundles without limits Maximum line length w/o fasteners between ends of conduit: ≤ 1.2 m
G-duct 50 x 75 mm **with G-post or hooked rail**	E30 1.25 m	Maximum load: 3 kg/m up to 16 mm^2
G-duct ≤ 75 x 100 mm **with G-post or hooked rail**	E30 1.25 m	Maximum load: 7.5 kg/m
Protective cable duct 60 x 100 mm	E30 50 cm	Maximum of 16 mm^2 Maximum load: 3.1 kg/m ceiling installations 7 kg/m wall installations
Cable tray 60 x ≤ 400 mm **without threaded rod suspension**	E30-E60 1.5 m	Maximum load: 20 kg/m Wall and ceiling installations

Cable support systems also without threaded rod	dependent on manufacturer		
Wire mesh cable tray	≤ 400 mm	1.50 m	20 kg/m or more
Tray	≤ 400 mm	1.50 m	20 kg/m or more
Ladder	≤ 400 mm	1.50 m	20 kg/m or more

If a Hermann clamp is used to support multiple cables with varying cross-sections, the cable with the largest cross-section must be installed below the smaller ones. When installed horizontally, the installation is the same for walls and ceilings. However, riser lines (directly fastened, using only single or bracket clamps) require the installation of an appropriate fireproof bulkhead or WUM (effective support mount) at a spacing of every 3.5 m. Any certified steel fastening bolts or certified fireproof plugs from other manufacturers can be used.

In accordance with DIN 4102-12, a "slip-off protection" is necessary for horizontal wall installation using strap clamps.

LOW-VOLTAGE CABLE E90

Datwyler (N)HXH FE180 / E90 Keram
all dimensions

Datwyler (N)HXCH FE180 / E90 Keram
all dimensions

Installation spacing

Datwyler fastener	horizontal and vertical	Note
Type SAS or TSD single clamp	60 cm	Bundles without limits
Type B…D strap clamp on profile rail	80 cm	Horizontal also possible with plastic armoured conduits
In-wall installation	covered with ≥ 15 mm mineral plaster	

Datwyler fastener	horizontal	Note
Hermann clamp S, small	80 cm	Maximum load: 3 kg/m (e.g. up to 15 cables 3 x 1.5 mm^2)
Hermann clamp, large	80 cm	Maximum load: 6 kg/m (e.g. up to 30 cables 3 x 1.5 mm^2)

Installation spacing

Datwyler fastener	horizontal	Note
Zero-halogen plastic armoured conduit with type SAS / TSD single clamp	60 cm	Bundles up to 2.5 kg/m without limits
Zero-halogen plastic armoured conduit with type B…D strap clamp on profile rail	80 cm	
Cable tray 60 x ≤ 400 mm without threaded rod suspension	1.5 m	Maximum load: 20 kg/m Wall and ceiling installations

Cable support systems also without threaded rod	dependent on manufacturer		
Wire mesh cable tray	≤ 400 mm	1.50 m	maximum 20 kg/m
Tray	≤ 400 mm	1.50 m	maximum 30 kg/m
Ladder	≤ 400 mm	1.50 m	maximum 20 kg/m

If a Hermann clamp is used to support multiple cables with varying cross-sections, the cable with the largest cross-section must be installed below the smaller ones. When installed horizontally, the installation is the same for walls and ceilings. However, riser lines (directly fastened, using only single or bracket clamps) require the installation of an appropriate fireproof bulkhead or WUM (effective support mount) at a spacing of every 3.5 m. Any certified steel fastening bolts or certified fireproof plugs from other manufacturers can be used.

In accordance with DIN 4102-12, a "slip-off protection" is necessary for horizontal wall installation using strap clamps.

JE-H(ST)H E30-E90

Datwyler Keram

Datwyler JE-H(ST)H...Bd FE180/E30-E90 Keram

Colour: red, with inscription for fire alarm cable

Datwyler JE-H(ST)H...Bd FE180/E30 L Keram

Colour: red, with inscription for fire alarm cable

Datwyler JE-H(ST)H...Bd FE180/E30-E90 Keram

Colour: orange

Datwyler JE-H(ST)H...Bd FE180/E30 L Keram

Colour: orange

Datwyler JE-H(ST)HRH...Bd FE180/E30-E90 Keram

Colour: red, with inscription for fire alarm cable

Installation spacing

Datwyler fastener	horizontal and vertical	Note
Type SAS / TSD single clamp	E30-E60 1.2 m E90 60 cm	Bundles up to 2.5 kg/m
Type B…D strap clamp on profile rail	E30-E60 1.2 m E90 80 cm	Horizontal also possible with conduits
In-wall installation	covered with ≥ 15 mm mineral plaster	

Datwyler fastener	horizontal	Note
Hermann clamp S, small	E30-E60 80 cm E90 60 cm	Maximum load: 3 kg/m
Hermann clamp, large	E30-E60 80 cm E90 60 cm	Maximum load: 3 kg/m

Installation spacing

Datwyler fastener	horizontal	Note
Aluminium pipe **with type SAS / TSD single clamp** **with type B…D strap clamp** **on profile rail**	E30-E60 1.2 m E90 60 cm E90 80 cm	Bundles up to 2.5 kg/m
Zero-halogen **plastic armoured conduit** **with type SAS / TSD single clamp** **with type B…D strap clamp** **on profile rail**	E30-E60 1.2 m E90 60 cm E90 80 cm	Bundles up to 2.5 kg/m
Steel-armoured conduit **with type SAS / TSD single clamp** **with type B…D strap clamp** **on profile rail**	E30-E60 1.2 m	≤ M63, filling factor ≤ 60% Maximum load: 2,5 kg/m Maximum line length w/o fasteners between ends of conduit: 1.2 m
G-duct 50 x 75 mm **with G-post or hooked rail**	E30 1.25 m	Maximum load: 3 kg/m
G-duct ≤ 75 x 100 mm with G-post **or with hooked rail**	E30 1.25 m	Maximum load: 7.5 kg/m
Protective cable duct 60 x 100 mm	E30 50 cm	Maximum load: 3.1 kg/m ceiling installations, 7 kg/m wall installations
Protective cable duct 26 x 30 mm	E30 50 cm	Maximum load: 0.3 kg/m Wall and ceiling installations

Cable support systems also without threaded rod	dependent on manufacturer		
Wire mesh cable tray	≤ 400 mm	1.50 m	20 kg/m or more
Tray	≤ 400 mm	1.50 m	20 kg/m or more
Ladder	≤ 400 mm	1.50 m	20 kg/m or more

When installed horizontally, the installation is the same for walls and ceilings. However, riser lines (directly fastened using only single or bracket clamps) require the installation of an appropriate fireproof bulkhead or WUM (effective support mount) at a spacing of every 3.5 m. Any certified steel fastening bolts or certified fireproof plugs from other manufacturers can be used.
For cable constructions ... E30 L: classifiactions apply only up to E30.
In accordance with DIN 4102-12, a "slip-off protection" is necessary for horizontal wall installation using strap clamps.

FIBRE OPTIC SAFETY CABLE

Functional integrity for 30 minutes according to DIN 4102-12 (E30)
"Functional integrity" in accordance with IEC 60331-25 FE 90 (90 minutes at 750 °C)
"Functional integrity" in accordance with EN 50200 PH90

FO Universal ZGGFR Safety

U-DQ(ZN)BH 1 x m		Fibres	Article No.	Article No.	Article No.
Description		number	E9/125 G.652.D	G50/125 OM3	G50/125 OM4
ZGGFR Safety	1 x 4	4	187288	190604	193447
ZGGFR Safety	1 x 6	6	191867	191851	193448
ZGGFR Safety	1 x 8	8	196130	196120	193449
ZGGFR Safety	1 x 12	12	190719	191796	193450

FO Universal wbGGFR Safety

U-DQ(ZN)BH n x m		Fibres	Article No.	Article No.	Article No.
Description		number	E9/125 G.652.D	G50/125 OM3	G50/125 OM4
wbGGFR Safety	2 x 12	24	190223	187360	193454
wbGGFR Safety	3 x 12	36	190224	on request	193455
wbGGFR Safety	4 x 12	48	190225	191191	193456
wbGGFR Safety	5 x 12	60	190226	190605	193457

FIBRE OPTIC SAFETY CABLE

Functional integrity for 30 minutes according to DIN 4102-12 (E30)

Features

Metal-free fibre optic safety cable with up to 12 fibres or up to 60 fibres.
The optimal combination of flame retardant fibre coating and flame-inhibiting stabilizing elements ensures enhanced functional integrity (System Circuit Integrity) in case of fire for 30 minutes.
(Proof of transmission of audio, video and 1 Gbit/s signals in the form of a certified test report).

Application

Safety applications in tunnels, underground railways, banks, insurance companies, large-scale industry.
LAN backbones.
Indoor and outdoor cabling.
Can be installed in cable platforms, trays, ducts and vertical shafts.
Can be spliced in fibre optic distribution housings.

* The functional integrity depends on the installation technique. Special clamps and cable laying systems are required for functional integrity in accordance with the test report.

Installation spacing

Datwyler fastener	horizontal	vertical	
Strap clamp on profile rail	60 cm		

Cable support systems also without threaded rod	dependent on manufacturer		
Wire mesh cable tray	≤ 300 mm	1.20 m	maximum 10 kg/m
Tray	≤ 300 mm	1.20 m	maximum 10 kg/m

EXTENDED ARTICLE NUMBERS

The key to the 10-digit article number:

1 8 2 9 2 4 0 0 C K

Master Number

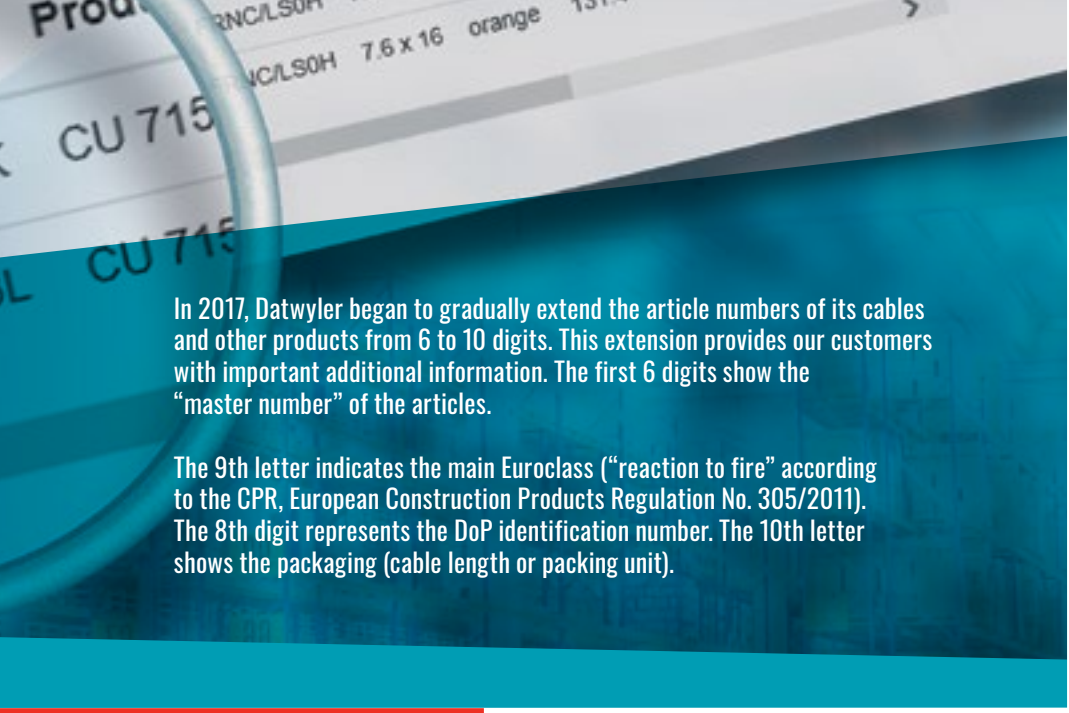
Placeholder

CPR classification*

0-9 = DoP identification number character for the main Euroclasses $B2_{ca}$, C_{ca} , D_{ca}

B = Euroclass $B2_{ca}$
C = Euroclass C_{ca}
D = Euroclass D_{ca}
E = Euroclass E_{ca}
F = Euroclass F_{ca}
Z = not classified

* Testing in accordance with EN 50575



In 2017, Datwyler began to gradually extend the article numbers of its cables and other products from 6 to 10 digits. This extension provides our customers with important additional information. The first 6 digits show the "master number" of the articles.

The 9th letter indicates the main Euroclass ("reaction to fire" according to the CPR, European Construction Products Regulation No. 305/2011). The 8th digit represents the DoP identification number. The 10th letter shows the packaging (cable length or packing unit).

Length/packing unit (PU)

Z	=	cut-to-length	reel/drum
K	=	1000 m	reel/drum
L	=	500 m	reel/drum
M	=	200 m	reel/drum
N	=	100 m	reel/drum
P	=	305 m Cu	PullQuick box
	=	250 m Fire Safety	PullQuick box
Q	=	300 m	reel/drum
S	=	305 m	reel in box
R	=	cut-to-length	coil
T	=	100 m	coil
U	=	10 pieces	
F	=	12 pieces	
V	=	25 pieces	
W	=	50 pieces	
X	=	100 pieces	
Y	=	1 piece	

Note:
Our cables are not available in any CPR classification and any length or packing unit (PU) mentioned above. Please refer to our website for the different versions on offer.
Here you can also find the Declarations of Performances (DoP) as PDF files for download.

LOW-VOLTAGE CABLES with reaction to fire in accordance with DIN VDE 0266 and EN 13501-6: $B2_{ca}$-s1,d1,a1. Functional integrity cables are not subject to the Construction Products Regulation (CPR)

(N)HXH FE180 / E30-E60 Keram $B2_{ca}$ Keram

(N)HXCH FE180 / E30-E60 $B2_{ca}$ Keram

(N)HXH FE180 / E90 $B2_{ca}$ Keram

(N)HXCH FE180 / E90 $B2_{ca}$ Keram

Technical data

Nominal voltage	0.6/1 kV
Testing voltage	4000 V, 50 Hz
Operating temperature	-45 °C to +90 °C

DC voltage test according to DIN VDE 0276-604 A5.4 von 5.6 kV and 8 kV;
min. 5 minutes - max. 30 minutes

Application

Datwyler safety cables with improved reaction to fire properties and with integrated functional integrity can be installed indoors. When installed outdoors, they must be protected against direct sunlight (orange sheath). It is only permitted to install them directly into earth or water when a protective conduit is used. These cables fulfil the requirements for functional integrity E30-E60 or E90 in accordance with DIN 4102-12. Functional integrity is guaranteed for operating voltages up to 400 V.

Reaction to fire

DIN VDE 0266; EN 13501-6 ($B2_{ca}$-s1,d1,a1)

Application in accordance with DIN VDE 0266 (regardless of functional integrity)

Permissible application areas:

Cables compliant with this standard may only be installed indoors, in the air or in concrete. These cables are not intended for installations in earth or water. However, it is permissible to install them in protective conduits as long as measures are implemented to prevent water from gathering in the conduits.

Application

Cable end seal:
The cable ends must be fitted with waterproof seals during shipping, storage and installation

Installation

In general:
Cables must be installed and operated in such a manner as to ensure that their properties are not compromised.
Amongst other aspects, observe the following points:

a) Operating conditions such as grouping of cables, effects from external heat sources and protection against direct sunlight must be taken into consideration when choosing the cable type.
b) Stray currents and corrosion
c) Vibrations (machine foundations, bridges), vibrations
d) To prevent mechanical damage, choose an installation procedure suitable for the type of external sheathing.
e) Protection against external agents, e.g., chemical solvents
f) Loads from short-circuit surge currents (dynamic)

Cables must be protected against mechanical damage after installation.
The interior diameter of cable conduits and ducts must be at least 1.5 times larger than the cable diameter.
We recommend PE counter trays for profile rails and professional cable pulling technology for 'heavy' cables.

Lowest permissible installation temperature
The lowest permissible installation temperature is -5 °C.
This temperature applies for the cable itself but not for the surroundings. If the temperature of the cables is too low, warm them up.
Make sure that the temperature does not drop below the lowest permissible temperature during the entire installation process.

Tensile load:
When pulling copper cables using a cable tensioning device, the maximum tension is 50 N/mm^2 per conductor.
(except for concentric conductors.)

Bending radius:
During the installation, the bending radius must not fall below the following values:
15 times cable diameter for single-core cables
12 times cable diameter for multicore cables
When bent only once in the proper manner using the bending template and by heating the cable to 30 °C, it is permissible to reduce the bending radius by 50%.

Assembly:
In horizontal installations, never exceed a spacing of 80 cm for fasteners or supports.
In vertical installations, never exceed a fastener spacing of 150 cm.
When installing single-core cables, use clips made of plastic or non-magnetic metals.
Steel clips may only be used if the magnetic circuit is not closed or when the cable is bundled triangularly.
To maintain functional integrity, only use system-certified fasteners compliant with DIN 4102-12.
Fasten cables and groups of cables so that they will not become damaged by pressure points resulting from thermal expansion.
We recommend PE counter trays for profile rails.

(N)HXH FE180 / E30-E60 $B2_{ca}$

Datwyler Keram

Low-voltage cable 0.6/1kV

Based on DIN VDE 0266
Zero halogen content, improved fire properties
Insulation integrity FE180 i.a.w. DIN VDE 0472-814, IEC 60331
Functional integrity E30-E60* i.a.w. DIN 4102-12

General Appraisal Certificate P-MPA-E-03-043

Reaction to fire in acc. with DIN VDE 0266 and EN 13501-6: $B2_{ca}$-s1a,d1,a1
Functional inegrity cables are not subject to the CPR

Article No.	No. cores x cross-section n x mm²		Construction	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXH FE180 / E30-E60 $B2_{ca}$ Keram							
18628000BZ	2 x 1.5	RE	LN	29	175	11	0.441
19257200BZ	2 x 1.5	RE	2L	29	174	11	0.441
18692100BZ	2 x 2.5	RE	LN	48	212	11.8	0.495
19258200BZ	2 x 2.5	RE	2L	48	212	11.8	0.495
18692200BZ	2 x 4	RE	LN	77	267	12.8	0.565
18692300BZ	2 x 6	RE	LN	115	329	13.8	0.636
18692400BZ	2 x 10	RE	LN	192	449	15.4	0.754
18695200BZ	2 x 16	RE	LN	307	652	18.2	0.98
19040400BZ	2 x 25	RM	LN	480	937	21.2	1.281
18692500BZ	3 x 1.5	RE	LNPE	43	196	11.5	0.488
18692600BZ	3 x 2.5	RE	LNPE	72	245	12.4	0.551
18692700BZ	3 x 4	RE	LNPE	115	315	13.5	0.63
18692800BZ	3 x 6	RE	LNPE	173	395	14.6	0.71
18692900BZ	3 x 10	RE	LNPE	288	549	16.3	0.836
18696300BZ	3 x 120 + 1 x 70	RM	3LPE	4098	5222	42.6	4.419
18696400BZ	3 x 150 + 1 x 70	RM	3LPE	4992	6320	46.6	5.244
18695300BZ	3 x 16	RM	LNPE	461	804	19.3	1.076
18696500BZ	3 x 185 + 1 x 90	RM	3LPE	6240	7903	52	6.505
18695500BZ	3 x 25	RM	LNPE	720	1174	22.6	1.634
18695400BZ	3 x 25 + 1 x 16	RM	3LPE	874	1352	23.9	1.576
18695700BZ	3 x 35	RM	LNPE	1008	1516	24.9	1.634
18695600BZ	3 x 35 + 1 x 16	RM	3LPE	1162	1681	25.9	1.787
18695900BZ	3 x 50	RM	LNPE	1440	2009	28.2	2.081
18695800BZ	3 x 50 + 1 x 25	RM	3LPE	1680	2295	29.9	2.312
18696100BZ	3 x 70	RM	LNPE	2016	2789	32.7	2.613
18696000BZ	3 x 70 + 1 x 35	RM	3LPE	2352	3120	34	2.807
18696200BZ	3 x 95 + 1 x 20	RM	3LPE	3216	4193	39.3	3.893
18693000BZ	4 x 1.5	RE	3LPE	58	230	12.4	0.572
18693100BZ	4 x 2.5	RE	3LPE	96	290	13.4	0.634
18693200BZ	4 x 4	RE	3LPE	154	377	14.6	0.724
18693300BZ	4 x 6	RE	3LPE	230	481	15.8	0.831
18693400BZ	4 x 10	RE	3LPE	384	682	17.8	0.992
18696700BZ	4 x 16	RM	3LPE	614	1001	21.1	1.277
18696800BZ	4 x 25	RM	3LPE	960	1473	24.8	1.695

*) The functional integrity depends on the installation technique used.

Article No.	No. cores x cross-section n x mm^2	Construction		Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXH FE180 / E30-E60 B2$_{ca}$ Keram							
18696900BZ	4 x 35	RM	3LPE	1344	1916	27.4	1.951
18697000BZ	4 x 50	RM	3LPE	1920	2580	31.5	2.604
18697100BZ	4 x 70	RM	3LPE	2688	3554	36.2	3.199
18697200BZ	4 x 95	RM	3LPE	3648	4752	41.7	4.357
18753200BZ	4 x 95	RM	3LN	3648	4752	41.7	4.357
18697300BZ	4 x 120	RM	3LPE	4608	5800	44.6	4.831
18697400BZ	4 x 150	RM	3LPE	5760	7313	50	6.103
18754800BZ	4 x 185	RM	3LPE	7104	9008	55.3	7.404
18707700BZ	4 x 240	RM	3LPE	9216	11787	62.9	9.4
18693500BZ	5 x 1.5	RE	3LNPE	72	273	13.4	0.665
18693600BZ	5 x 2.5	RE	3LNPE	120	346	14.5	0.754
18693700BZ	5 x 4	RE	3LNPE	192	453	15.8	0.863
18693800BZ	5 x 6	RE	3LNPE	288	579	17.2	0.983
18693900BZ	5 x 10	RE	3LNPE	480	819	19.3	1.164
18697500BZ	5 x 16	RM	3LNPE	768	1216	23.1	1.525
18697600BZ	5 x 25	RM	3LNPE	1200	1800	27.2	2.055
18697700BZ	5 x 35	RM	3LNPE	1680	2371	30.5	2.45
18697800BZ	5 x 50	RM	3LNPE	2400	3173	34.8	2.974
18697900BZ	5 x 70	RM	3LNPE	3360	4366	40	3.65
19058700BZ	5 x 95	RM	3LNPE	4560	5890	46.6	5.035
17127200BZ	7 x 1.5	RE	6LPE	101	327	14.4	0.758
17127300BZ	7 x 2.5	RE	6LPE	168	419	15.6	0.857
17127900BZ	12 x 1.5	RE	11LPE	173	506	18.3	1.128
17128000BZ	12 x 2.5	RE	11LPE	288	663	20	1.288

(N)HXCH FE180 / E30-E60 $B2_{ca}$

Datwyler Keram

Low-voltage cable 0.6/1kV

Based on DIN VDE 0266
Zero halogen content, improved fire properties
Insulation integrity FE180 i.a.w. DIN VDE 0472-814, IEC 60331
Functional integrity E30-E60* i.a.w. DIN 4102-12

General Appraisal Certificate P-MPA-E-03-043

Reaction to fire in acc. with DIN VDE 0266 and EN 13501-6: $B2_{ca}$-s1a,d1,a1
Functional inegrity cables are not subject to the CPR

Article No.	No. cores x cross-section n x mm²	Construction		Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXCH FE180 / E30-E60 $B2_{ca}$ Keram							
18694300BZ	2 x 1.5/1.5	RE	LN	52	221	12.7	0.551
18694400BZ	2 x 2.5/2.5	RE	LN	80	269	13.5	0.612
18723200BZ	2 x 4/4	RE	LN	123	350	14.9	0.706
18723400BZ	2 x 6/6	RE	LN	182	428	16	0.79
18694500BZ	3 x 1.5/1.5	RE	3L	66	246	13.2	0.599
18723800BZ	3 x 16/16	RM	3L	624.7	1027	21.3	1.348
18694600BZ	3 x 2.5/2.5	RE	3L	104	303	14.1	0.784
18723900BZ	3 x 25/16	RM	3L	902	1433	25	1.799
18724000BZ	3 x 35/16	RM	3L	1190	1799	37.3	2.096
18724100BZ	3 x 50/25	RM	3L	1723	2450	31.7	2.689
18724200BZ	3 x 70/35	RM	3L	2410	3342	36	3.32
18698500BZ	3 x 95/50	RM	3L	3296	4445	41.1	4.416
18698600BZ	3 x 120/70	RM	3L	4236	5524	44.5	5.002
18698700BZ	3 x 150/70	RM	3L	5100	6730	49.2	6.114
18698800BZ	3 x 240/120	RM	3L	8242	10908	61.5	9.391
18694700BZ	4 x 1.5/1.5	RE	3LN	81	280	14.1	0.677
18694800BZ	4 x 2.5/2.5	RE	3LN	128	350	15.1	0.754
18694900BZ	4 x 4/4	RE	3LN	200	464	16.7	0.87
18695000BZ	4 x 6/6	RE	3LN	297	612	18.1	1.051
18695100BZ	4 x 10/10	RE	3LN	504	858	20.1	1.25
18698900BZ	4 x 16/16	RM	3LN	796	1245	23.4	1.494
18699000BZ	4 x 25/16	RM	3LN	1142	1742	27.2	2.106
18699100BZ	4 x 35/16	RM	3LN	1526	2197	29.8	2.432
18699200BZ	4 x 50/25	RM	3LN	2203	3026	34.8	3.298
18699300BZ	4 x 70/35	RM	3LN	3082	4128	39.5	3.968
18699400BZ	4 x 95/50	RM	3LN	4208	5503	45.2	5.298
18699500BZ	4 x 120/70	RM	3LN	5388	6863	49.1	6.051
18699600BZ	4 x 150/70	RM	3LN	6540	8399	54.3	6.971
18699700BZ	4 x 185/95	RM	3LN	8159	10470	59.8	9.075
18699800BZ	4 x 240/120	RM	3LN	10546	13600	67.9	11.41
18724402BZ	7 x 1.5/2.5	RE	7L	133	390	16.1	0.884

*) The functional integrity depends on the installation technique used.

Low-voltage cable 0.6/1kV

Based on DIN VDE 0266
Zero halogen content, improved fire properties
Insulation integrity FE180 i.a.w. DIN VDE 0472-814, IEC 60331
Functional integrity E90 i.a.w. DIN 4102-12

General Appraisal Certificate P-MPA-E-03-043
Reaction to fire in acc. with DIN VDE 0266 and EN 13501-6: $B2_{ca}$-s1a,d1,a1
Functional inegrity cables are not subject to the CPR

Article No.	No. cores x cross-section n x mm²	Construction		Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXH FE180 / E90 $B2_{ca}$ Keram							
18614100BZ	1 x 16	RM	L	154	243	10.2	0.326
18614200BZ	1 x 25	RM	L	240	347	11.7	0.406
18614300BZ	1 x 35	RM	L	336	449	12.8	0.457
18614400BZ	1 x 50	RM	L	480	589	14.3	0.545
18614500BZ	1 x 70	RM	L	672	801	16.1	0.633
18614600BZ	1 x 95	RM	L	912	1074	18.5	0.801
18614700BZ	1 x 120	RM	L	1152	1308	19.6	0.854
18614800BZ	1 x 150	RM	L	1440	1635	21.8	1.043
18614900BZ	1 x 185	RM	L	1776	2011	24	1.252
18615000BZ	1 x 240	RM	L	2304	2619	27.2	1.539
18615100BZ	1 x 300	RM	L	2880	3112	29.6	1.802
18835900BZ	2 x 1.5	RE	LN	29	174	11	0.441
19256300BZ	2 x 1.5	RE	2L	29	174	11	0.441
18724700BZ	2 x 2.5	RE	LN	48	212	11.8	0.495
19397400BZ	2 x 2.5	RE	2L	48	212	11.8	0.495
18617400BZ	3 x 1.5	RE	LNPE	43	196	11.5	0.488
18617700BZ	3 x 2.5	RE	LNPE	72	245	12.4	0.551
18618200BZ	3 x 4	RE	LNPE	115	315	13.5	0.63
18618600BZ	3 x 6	RE	LNPE	173	395	14.6	0.71
18618900BZ	3 x 10	RE	LNPE	288	549	16.3	0.836
18615200BZ	3 x 16	RM	LNPE	461	870	20.2	1.155
18615300BZ	3 x 25	RM	LNPE	720	1286	24	1.556
18615400BZ	3 x 35	RM	LNPE	1008	1648	26.4	1.791
19106900BZ	3 x 35+16	RM	3LPE	1162	1820	27.4	1.92
18620700BZ	3 x 50	RM	LNPE	1440	2169	29.8	2.234
19100200BZ	3 x 50+25	RM	3LPE	1680	2444	31.3	2.436
19100300BZ	3 x 70+35	RM	3LPE	2352	3313	35.6	3.02
19100400BZ	3 x 95+50	RM	3LPE	3216	4408	40.7	3.787
19100500BZ	3 x 120+70	RM	3LPE	4128	5454	44	4.283
19100600BZ	3 x 150+70	RM	3LPE	4992	6578	48	5.088
19106800BZ	3 x 185+95	RM	3LPE	6240	8189	53.4	6.236

*) The functional integrity depends on the installation technique used.

(N)HXH FE180 / E90 B2$_{ca}$

Datwyler Keram

Article No.	No. cores x cross-section n x mm²		Construction	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXH FE180 / E90 B2$_{ca}$ Keram							
18617500BZ	4 x 1.5	RE	3LPE	58	230	12.4	0.572
18617800BZ	4 x 2.5	RE	3LPE	96	290	13.4	0.634
18618300BZ	4 x 4	RE	3LPE	154	377	14.6	0.724
18618700BZ	4 x 6	RE	3LPE	230	481	15.8	0.831
19633700BZ	4 x 6	RE	3LN	230	482	15.8	0.831
19633800BZ	4 x 10	RE	3LN	384	682	17.8	0.992
18615500BZ	4 x 16	RM	3LPE	614	1083	22.1	1.367
19633100BZ	4 x 16	RE	3LN	614	1083	22.1	1.367
18615600BZ	4 x 25	RM	3LPE	960	1604	26.3	1.843
19633200BZ	4 x 25	RM	3LN	960	1604	26.3	1.843
18615700BZ	4 x 35	RM	3LPE	1344	2068	29	2.131
19633300BZ	4 x 35	RM	3LN	1344	2068	29	2.131
18615800BZ	4 x 50	RM	3LPE	1920	2734	32.8	2.679
19633400BZ	4 x 50	RM	3LN	1920	2734	32.8	2.679
18615900BZ	4 x 70	RM	3LPE	2688	3739	37.6	3.169
19633500BZ	4 x 70	RM	3LN	2688	3739	37.6	3.169
18616000BZ	4 x 95	RM	3LPE	3648	4996	43.1	4.241
19633600BZ	4 x 95	RM	3LN	3648	4996	43.1	4.241
18727400BZ	4 x 120	RM	3LPE	4608	6054	46	4.691
19633000BZ	4 x 120	RM	3LN	4608	6054	46	4.691
18616100BZ	4 x 150	RM	3LPE	5760	7566	51.2	5.787
19049300BZ	4 x 240	RM	3LPE	9216	12100	64.1	8.784
18617600BZ	5 x 1.5	RE	3LNPE	72	273	13.4	0.665
18617900BZ	5 x 2.5	RE	3LNPE	120	346	14.5	0.754
18618400BZ	5 x 4	RE	3LNPE	192	453	15.8	0.863
18618800BZ	5 x 6	RE	3LNPE	288	578	17.2	0.983
18619100BZ	5 x 10	RE	3LNPE	480	819	19.3	1.164
18616200BZ	5 x 16	RM	3LNPE	768	1357	24.8	1.717
18616300BZ	5 x 25	RM	3LNPE	1200	1951	28.8	2.216
18616400BZ	5 x 35	RM	3LNPE	1680	2539	32	2.63
18616500BZ	5 x 50	RM	3LNPE	2400	3370	36.5	3.347
18727700BZ	5 x 70	RM	3LNPE	3360	4585	41.5	4.08
19584700BZ	5 x 95	RM	3LNPE	4560	6140	47.9	5.228
18527100BZ	7 x 1.5	RE	6LPE	101	326	14.4	0.758
18618000BZ	7 x 2.5	RE	6LPE	168	419	15.6	0.857
18618500BZ	7 x 4	RE	6LPE	269	559	17.1	0.986
18699900BZ	7 x 6	RE	6LPE	403	721	18.6	1.112
18725300BZ	10 x 2.5	RE	9LPE	240	582	19.4	1.163
18527200BZ	12 x 1.5	RE	11LPE	173	506	18.3	1.128
18618100BZ	12 x 2.5	RE	11LPE	288	663	20	1.288

Low-voltage cable 0.6/1kV

Based on DIN VDE 0266
Zero halogen content, improved fire properties
Insulation integrity FE180 i.a.w. DIN VDE 0472-814, IEC 60331
Functional integrity E90 i.a.w. DIN 4102-12

General Appraisal Certificate P-MPA-E-03-043
Reaction to fire in acc. with DIN VDE 0266 and EN 13501-6: $B2_{ca}$-s1a,d1,a1
Functional inegrity cables are not subject to the CPR

Article No.	No. cores x cross-section n x mm²		Construction	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXCH FE180 / E90 $B2_{ca}$ Keram							
18607100BZ	3 x 1.5/1.5	RE	3L	66	246	13.2	0.599
18619500BZ	3 x 2.5/2.5	RE	3L	104	303	14.1	0.784
18619700BZ	3 x 4/4	RE	3L	161	400	15.6	0.771
18727800BZ	3 x 6/6	RE	3L	240	521	16.9	0.921
17241700BZ	3 x 35/16	RM	3L	1190	1941	29	2.267
18740800BZ	3 x 50/25	RM	3L	1723	2545	32.5	2.729
18740900BZ	3 x 70/35	RM	3L	2410	3536	37.6	3.542
18741000BZ	3 x 95/50	RM	3L	3296	4598	41.9	4.285
18741100BZ	3 x 120/70	RM	3L	4236	5688	45.3	5.112
18741200BZ	3 x 150/70	RM	3L	5100	6911	50	5.889
18607200BZ	4 x 1.5/1.5	RE	3LN	81	280	14.1	0.677
18619600BZ	4 x 2.5/2.5	RE	3LN	128	350	15.1	0.754
18619800BZ	4 x 4/4	RE	3LN	200	464	16.7	0.87
18619900BZ	4 x 6/6	RE	3LN	297	612	18.1	1.051
18620000BZ	4 x 10/10	RE	3LN	504	858	20.1	1.25
18613100BZ	4 x 16/16	RM	3LN	796	1396	25.3	1.772
18613200BZ	4 x 25/16	RM	3LN	1142	1895	28.9	2.568
18613300BZ	4 x 35/16	RM	3LN	1526	2378	31.6	2.568
18613400BZ	4 x 50/25	RM	3LN	2203	3245	36.7	3.374
18613500BZ	4 x 70/35	RM	3LN	3082	4371	41.3	4.08
18613600BZ	4 x 95/50	RM	3LN	4208	5731	46.4	5.179
18613700BZ	4 x 120/70	RM	3LN	5388	7078	50.1	5.858
18613800BZ	4 x 150/70	RM	3LN	6540	8631	55.3	7.11
18613900BZ	4 x 185/95	RM	3LN	8159	10727	60.8	8.61
18614000BZ	4 x 240/120	RM	3LN	10546	13949	69.2	10.885
18607302BZ	7 x 1.5/2.5	RE	7L	133	390	16.1	0.884
19109602BZ	7 x 2.5/2.5	RE	7L	200	484	17.3	0.994
18741502BZ	12 x 1.5/2.5	RE	12L	205.8	589	20.2	1.308

INSTALLATIONSKABEL with reaction to fire in accordance with DIN VDE 0815 and EN 13501-6: $B2_{ca}$-s1,d1,a1. Functional integrity cables are not subject to the Construction Products Regulation (CPR)

JE-H(ST)H...Bd FE180 / E30-E90 $B2_{ca}$-s1a,d1,a1 Keram

JE-H(ST)H...Bd FE180 / E30-E90 $B2_{ca}$-s1a,d1,a1 Keram

JE-H(ST)HRH...Bd FE180 / E30-E90 $B2_{ca}$-s1a,d1,a1 Keram

Technical data

Nominal voltage	maximum = 225 V
Testing voltage	500 V, 50 Hz conductor/conductor 2000 V, 50 Hz conductor/shield
Installation temperature:	-5 °C to +50 °C
Operating temperature:	-30 °C to +70 °C

Application

Datwyler safety cables are used whenever extra protection is required against fires and to reduce hazards for humans and property, and also when strict safety regulations must be complied with.
They may be installed indoors. These cables comply with functional integrity requirements E30-E90* in accordance with DIN 4102-12. Functional integrity is guaranteed for operating voltages up to 110 V, for signal and control applications, fire detection systems, electroacustic alarm systems and SHE, for example. When installed outdoors, the cables must be protected against direct sunlight (orange sheath; fire alarm cables BMK: red sheath).
Permissible operating temperature at conductor: +70 °C.

Reaction to fire

DIN VDE 0266; EN 13501-6 ($B2_{ca}$-s1,d1,a1)

Installation cable, maximum 225 V

Compliant with DIN VDE 0815, zero halogen content, improved fire properties
Insulation integrity FE180 i.a.w. DIN VDE 0472-814, IEC 6031,
Functional integrity E30-E90* i.a.w. DIN 4102-12.

General Appraisal Certificate P-MPA-E-06-030
Reaction to fire in acc. with DIN VDE 0266 and EN 13501-6: $B2_{ca}$-s1a,d1,a1
Functional inegrity cables are not subject to the CPR

Article No.	No. cores x cross-section n x 2 x mm	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
JE-H(ST)H...BD FE180 / E30-E90 $B2_{ca}$ KERAM					
18809200BZ	1 x 2 x 0.8	15	43	5.6	0.11
18809700BZ	2 x 2 x 0.8	25	60	6.3	0.14
18809900BZ	4 x 2 x 0.8	45	103	9.0	0.23
18810200BZ	8 x 2 x 0.8	85	222	13.9	0.53
18810400BZ	12 x 2 x 0.8	126	282	14.8	0.61
18810600BZ	16 x 2 x 0.8	166	327	16.6	0.64
18810800BZ	20 x 2 x 0.8	206	423	18.8	0.85

Fire alarm cable, maximum 225 V

Compliant with DIN VDE 0815, zero halogen content, improved fire properties
Insulation integrity FE180 i.a.w. DIN VDE 0472-814, IEC 60331
Functional integrity E30-E90* i.a.w. DIN 4102-12

General Appraisal Certificate P-MPA-E-06-030
Reaction to fire in acc. with DIN VDE 0266 and EN 13501-6: $B2_{ca}$-s1a,d1,a1
Functional inegrity cables are not subject to the CPR

Article No.	No. cores x cross-section n x 2 x mm	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
JE-H(ST)H...BD FE180 / E30-E90 $B2_{ca}$ BMK red KERAM					
18809300BZ	1 x 2 x 0.8	15	43	5.6	0.11
18809800BZ	2 x 2 x 0.8	25	60	6.3	0.14
18810100BZ	4 x 2 x 0.8	45	103	9.0	0.23
18810300BZ	8 x 2 x 0.8	85	222	13.9	0.53
18810500BZ	12 x 2 x 0.8	126	282	14.8	0.61
18810700BZ	16 x 2 x 0.8	166	327	16.6	0.64
18810900BZ	20 x 2 x 0.8	206	423	18.8	0.85

Fire alarm cable, maximum 225 V

Compliant with DIN VDE 0815, zero halogen content, improved fire properties
Insulation integrity FE180 i.a.w. DIN VDE 0472-814, IEC 60331
Functional integrity E30-E90* i.a.w. DIN 4102-12

General Appraisal Certificate P-MPA-E-06-030
Reaction to fire in acc. with DIN VDE 0266 and EN 13501-6: $B2_{ca}$-s1a,d1,a1
Functional inegrity cables are not subject to the CPR

Article No.	No. cores x cross-section n x 2 x mm	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
JE-H(ST)HRH...BD FE180 / E30-E90 $B2_{ca}$ BMK red KERAM					
19388400BZ	1 x 2 x 0.8	15	104	8.8	0.26
18811900BZ	2 x 2 x 0.8	25	124	9.3	0.30
18812000BZ	4 x 2 x 0.8	45	194	12.2	0.44
18812700BZ	8 x 2 x 0.8	85	419	18.4	0.97
18812800BZ	12 x 2 x 0.8	126	491	19.3	1.08
18812900BZ	20 x 2 x 0.8	206	680	23.3	1.42
18834600BZ	32 x 2 x 0.8	326	913	26.9	1.81

*) The functional integrity depends on the installation technique used.

Z = cut-to-length

LOW-VOLTAGE CABLES

(N)HXH FE180 / E30-E60 Keram

(N)HXCH FE180 / E30-E60 Keram

(N)HXH FE180 / E90 Keram

(N)HXCH FE180 / E90 Keram

Technical data

Nominal voltage	0.6/1 kV
Testing voltage	4000 V, 50 Hz
Operating temperature	-45 °C bis +90 °C

DC voltage test according to DIN VDE 0276-604 A5.4 von 5,6 kV and 8 kV;
min. 5 minutes - max. 30 minutes

Application

Datwyler safety cables with improved reaction to fire properties and with integrated functional integrity can be installed indoors. When installed outdoors, they must be protected against direct sunlight (orange sheath). It is only permitted to install them directly into earth or water when a protective conduit is used. These cables fulfil the requirements for functional integrity E30-E60 or E90 in accordance with DIN 4102-12. Functional integrity is guaranteed for operating voltages up to 400 V.

Application in accordance with DIN VDE 0266 (regardless of functional integrity)

Permissible application areas:

Cables compliant with this standard may only be installed indoors, in the air or in concrete. These cables are not intended for installations in earth or water. However, it is permissible to install them in protective conduits as long as measures are implemented to prevent water from gathering in the conduits.

Application

Cable end seal:
The cable ends must be fitted with waterproof seals during shipping, storage and installation

Installation

In general:
Cables must be installed and operated in such a manner as to ensure that their properties are not compromised.
Amongst other aspects, observe the following points:

a) Operating conditions such as grouping of cables, effects from external heat sources and protection against direct sunlight must be taken into consideration when choosing the cable type.
b) Stray currents and corrosion
c) Vibrations (machine foundations, bridges), vibrations
d) To prevent mechanical damage, choose an installation procedure suitable for the type of external sheathing.
e) Protection against external agents, e.g., chemical solvents
f) Loads from short-circuit surge currents (dynamic)

Cables must be protected against mechanical damage after installation.
The interior diameter of cable conduits and ducts must be at least 1.5 times larger than the cable diameter.

Lowest permissible installation temperature
The lowest permissible installation temperature is -5 °C.
This temperature applies for the cable itself but not for the surroundings. If the temperature of the cables is too low, warm them up.
Make sure that the temperature does not drop below the lowest permissible temperature during the entire installation process.

Tensile load:
When pulling copper cables using a cable tensioning device, the maximum tension is 50 N/mm^2 per conductor.
(except for concentric conductors.)

Bending radius:
During the installation, the bending radius must not fall below the following values:
15 times cable diameter for single-core cables
12 times cable diameter for multicore cables
When bent only once in the proper manner using the bending template and by heating the cable to 30 °C, it is permissible to reduce the bending radius by 50%.

Assembly:
In horizontal installations, never exceed a spacing of 80 cm for fasteners or supports.
In vertical installations, never exceed a fastener spacing of 150 cm.
When installing single-core cables, use clips made of plastic or non-magnetic metals.
Steel clips may only be used if the magnetic circuit is not closed or when the cable is bundled triangularly.
To maintain functional integrity, only use system-certified fasteners compliant with DIN 4102-12.
Fasten cables and groups of cables so that they will not become damaged by pressure points resulting from thermal expansion.
We recommend PE counter trough for profile rails.

Ampacity of copper cables and wires (maximum operating temperature 90 °C)

Installation type B2				
Installation in electrical conduits or ducts on or in the wall				
mm²	2 conductors	fuse	3 conductors	fuse
1.5 mm²	Iz 22 A	In 20.0 A	Iz 19.5 A	In 16.0 A
2.5 mm²	Iz 30 A	In 25.0 A	Iz 26 A	In 25.0 A
4 mm²	Iz 40 A	In 35.0 A	Iz 35 A	In 35.0 A
6 mm²	Iz 51 A	In 50.0 A	Iz 44 A	In 35.0 A
10 mm²	Iz 69 A	In 63.0 A	Iz 60 A	In 50.0 A
16 mm²	Iz 91 A	In 80.0 A	Iz 80 A	In 80.0 A
25 mm²	Iz 119 A	In 100.0 A	Iz 105 A	In 100.0 A
35 mm²	Iz 146 A	In 125.0 A	Iz 128 A	In 125.0 A
50 mm²	Iz 175 A	In 160.0 A	Iz 154 A	In 125.0 A
70 mm²	Iz 221 A	In 200.0 A	Iz 194 A	In 160.0 A
95 mm²	Iz 265 A	In 250.0 A	Iz 233 A	In 224.0 A
120 mm²	Iz 305 A	In 300.0 A	Iz 268 A	In 250.0 A
150 mm²	Iz 334 A	In 315.0 A	Iz 300 A	In 300.0 A
185 mm²	Iz 384 A	In 315.0 A	Iz 340 A	In 315.0 A
240 mm²	Iz 459 A	In 400.0 A	Iz 398 A	In 315.0 A
300 mm²	Iz 532 A		Iz 455 A	In 400.0 A

Quelle: DIN VDE 0298-4 June 2013 table 5; 90 °C conductor temperature; 30 °C ambient temperature

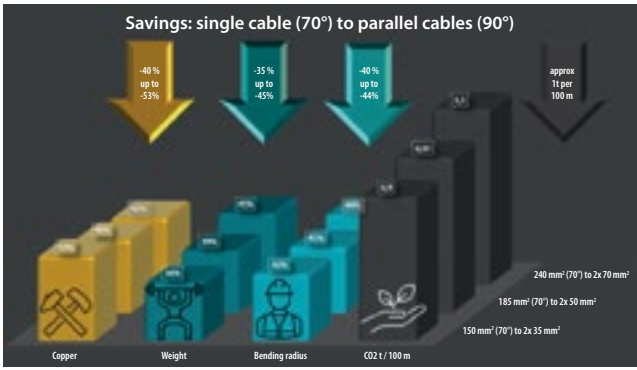
For cables: **NHXH / NHXCH** according to DIN VDE 0266 and DIN VDE 0276-604

Permissible short-circuit temperature and rated short-circuit current densities								
Permissible short-circuit temperature	Conductor temperature at the beginning of the short circuit							
	90 °C	80 °C	70 °C	60 °C	50 °C	40 °C	30 °C	20 °C
	Rated short-circuit current density for a rated short-circuit duration of 1 s							
250°C	143 A/mm²	149 A/mm²	154 A/mm²	159 A/mm²	165 A/mm²	170 A/mm²	176 A/mm²	181 A/mm²

Save 45% copper with system circuit integrity cables

Using the Datwyler software for voltage drop calculation, the division of large cross-sections and Tables 5 and 6 of DIN VDE 0298-4, 45% copper can be saved in cabling systems with functional integrity for the following cross-sections.

In addition to the associated reduction in environmental poisoning of water, forests, ecosystems and the health risk to residents and workers, one ton of carbon dioxide is saved for every 100 meters of safety cable (recycling included).



Installation type C				Short-circuit current density 1s 50 °C	Conductor resistance EN 60228 20 °C
Direct installation on or in walls/ceilings or in cable trays					
2 conductors	fuse	3 conductors	fuse		
Iz 24 A	In 20.0 A	Iz 22 A	In 20.0 A	0.25 kA	12.100 Ωkm
Iz 33 A	In 25.0 A	Iz 30 A	In 25.0 A	0.41 kA	7.410 Ωkm
Iz 45 A	In 35.0 A	Iz 40 A	In 35.0 A	0.66 kA	4.610 Ωkm
Iz 58 A	In 50.0 A	Iz 52 A	In 50.0 A	0.99 kA	3.080 Ωkm
Iz 80 A	In 80.0 A	Iz 71 A	In 63.0 A	1.65 kA	1.830 Ωkm
Iz 107 A	In 100.0 A	Iz 96 A	In 80.0 A	2.64 kA	1.150 Ωkm
Iz 138 A	In 125.0 A	Iz 119 A	In 100.0 A	4.13 kA	0.727 Ωkm
Iz 171 A	In 160.0 A	Iz 147 A	In 125.0 A	5.78 kA	0.524 Ωkm
Iz 209 A	In 200.0 A	Iz 179 A	In 160.0 A	8.25 kA	0.387 Ωkm
Iz 269 A	In 250.0 A	Iz 229 A	In 224.0 A	11.55 kA	0.268 Ωkm
Iz 328 A	In 315.0 A	Iz 278 A	In 250.0 A	15.68 kA	0.193 Ωkm
Iz 382 A	In 315.0 A	Iz 322 A	In 315.0 A	19.80 kA	0.153 Ωkm
Iz 441 A	In 400.0 A	Iz 371 A	In 315.0 A	24.75 kA	0.124 Ωkm
Iz 506 A		Iz 424 A	In 400.0 A	30.53 kA	0.099 Ωkm
Iz 599 A		Iz 500 A		39.60 kA	0.075 Ωkm
Iz 693 A		Iz 576 A		49.50 kA	0.060 Ωkm

Likewise, the smaller cross-sections - even in total, used as parallel cables - result in less weight, more space and bending radii that are approximately half as large. The following cable dimensions are interesting:

NHXCH 4x240/120, NHXCH 4x185/95 und NHXCH 4x150/70

Conventionally planned (ampacity 70° table)	Replaced by parallel cables (ampacity 90° table)	Ampacity	Rated fuse current	Cu saving	Weight	Bending radius
NHXCH 4x240/120	2x NHXCH 4x70/35	403 / 448 A	400 / 440 A	42%	14 / 8.9 kg/m	84/49 cm
NHXCH 4x185/95	2x NHXCH 4x50/25	341 / 358 A	300 / 315 A	46%	10,8 / 6.6 kg/m	73/43 cm
NHXCH 4x240/120 and 4x185/95: Fastening in cost-effective clamps or cable trays is not possible.						
NHXCH 4x150/70	2x NHXCH 4x35/16	299 / 294 A	250 / 250 A	53%	8.7/4.8 kg/m	66/37 cm
NHXCH 4x150/70: Fastening in cost-effective clamps or cable trays is not possible.						

Basis for cable dimensioning

Voltage drop in acc. with DIN VDE 0100-520: 3% for lighting and 5% for other consumers, or 8% for generators. In the event of a fire, even 10% is safe. Power losses of the cables do not play a role in functional integrity systems with infrequent use.

Ampacity in accordance with DIN VDE 0298-4: compared to the usual tables 3 and 4 for 70° cables, the safety cables according to tables 5 and 6 have a 20% higher load capacity.

Ampacity in accordance with DIN VDE 0298-4: due to the larger surface area of the "thin" cables in relation to the "thick" cables, they can carry an additional 30% higher load. (4x240/120 mm^2 - 2A per mm^2, 4x70/35 mm^2 - 3.2 A per mm^2)

Loop impedance: circuit breakers should generally be used for these current sizes.

(N)HXH FE180 / E30-E60

Datwyler Keram

Low-voltage cable 0.6/1kV

Based on DIN VDE 0266
Zero halogen content, improved fire properties
Insulation integrity FE180 i.a.w. DIN VDE 0472-814, IEC 60331
Functional integrity E30-E60* i.a.w. DIN 4102-12

General Appraisal Certificate
P-MPA-E-03-043

Article No.	No. cores x cross-section n x mm²		Construction	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXH FE180 / E30-E60 Keram							
171290	1 x 6	RE	L	59	112	7.6	0.23
171291	1 x 10	RE	L	96	156	8.4	0.27
171370	1 x 16	RM	L	154	227	9.8	0.34
171377	1 x 25	RM	L	240	329	11.3	0.43
171386	1 x 35	RM	L	336	428	12.4	0.48
171394	1 x 50	RM	L	480	565	13.9	0.58
171429	1 x 70	RM	L	672	773	15.7	0.68
170842	1 x 95	RM	L	912	1035	18.1	0.91
170845	1 x 120	RM	L	1152	1270	19.2	0.97
170850	1 x 150	RM	L	1440	1590	21.4	1.2
170855	1 x 185	RM	L	1776	1961	23.6	1.46
170858	1 x 240	RM	L	2304	2563	26.8	1.81
170860	1 x 300	RM	L	2880	3051	29.2	2.13
186280	2 x 1.5	RE	LN	29	177	11	0.48
192572	2 x 1.5	RE	2L	29	177	11	0.48
192582	2 x 2.5	RE	2L	48	216	11.8	0.54
186921	2 x 2.5	RE	LN	48	216	11.8	0.54
186922	2 x 4	RE	LN	77	271	12.8	0.62
186923	2 x 6	RE	LN	115	335	13.8	0.7
186924	2 x 10	RE	LN	192	455	15.4	0.83
186952	2 x 16	RE	LN	307	660	18.2	1.09
190404	2 x 25	RM	LN	480	950	21.2	1.42
18692500ZZ	3 x 1.5	RE	LNPE	43	199	11.5	0.53
18692500ZL	3 x 1.5	RE	LNPE	43	200	11.5	0.53
18692500ZK	3 x 1.5	RE	LNPE	43	200	11.5	0.53
18692600ZZ	3 x 2.5	RE	LNPE	72	250	12.4	0.6
18692600ZL	3 x 2.5	RE	LNPE	72	250	12.4	0.6
18692600ZK	3 x 2.5	RE	LNPE	72	250	12.4	0.6
186927	3 x 4	RE	LNPE	115	319	13.5	0.68
186928	3 x 6	RE	LNPE	173	400	14.6	0.77
186929	3 x 10	RE	LNPE	288	554	16.3	0.91
186953	3 x 16	RM	LNPE	461	809	19.3	1.19
186955	3 x 25	RM	LNPE	720	1182	22.6	1.56
186957	3 x 35	RM	LNPE	1008	1529	24.9	1.8
186959	3 x 50	RM	LNPE	1440	2026	28.2	2.24
186961	3 x 70	RM	LNPE	2016	2814	32.7	32.7
186963	3 x 120+70	RM	3LPE	4098	5255	42.6	4.74
186964	3 x 150+70	RM	3LPE	4992	6361	46.6	5.63

*) The functional integrity depends on the installation technique used.

Article No.	No. cores x cross-section n x mm²		Construction	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXH FE180 / E30-E60 Keram							
186965	3 x 185+95	RM	3LPE	6240	7954	52	6.99
186954	3 x 25+16	RM	3LPE	874	1357	23.9	1.73
186956	3 x 35+16	RM	3LPE	1162	1693	25.9	1.93
186958	3 x 50+25	RM	3LPE	1680	2311	29.9	2.52
186960	3 x 70+35	RM	3LPE	2352	3146	34	3.07
186962	3 x 95+50	RM	3LPE	3216	4222	39.3	4.18
186930	4 x 1.5	RE	3LPE	58	233	12.4	0.61
186931	4 x 2.5	RE	3LPE	96	290	13.4	0.69
186932	4 x 4	RE	3LPE	154	381	14.6	0.78
186933	4 x 6	RE	3LPE	230	486	15.8	0.9
186934	4 x 10	RE	3LPE	384	688	17.8	1.07
186967	4 x 16	RM	3LPE	614	1005	21.1	1.4
186968	4 x 25	RM	3LPE	960	1479	24.8	1.86
186969	4 x 35	RM	3LPE	1344	1929	27.4	2.15
186970	4 x 50	RM	3LPE	1920	2598	31.5	2.79
186971	4 x 70	RM	3LPE	2688	3578	36.2	3.38
186972	4 x 95	RM	3LPE	3648	4785	41.7	4.68
187532	4 x 95	RM	3LN	3648	4785	41.7	4.68
186973	4 x 120	RM	3LPE	4608	5837	44.6	5.19
186974	4 x 150	RM	3LPE	5760	7361	50	6.52
187548	4 x 185	RM	3LPE	7104	9066	55.3	7.98
187077	4 x 240	RM	3LPE	9216	11863	62.9	10.05
186935	5 x 1.5	RE	3LNPE	72	276	13.4	0.71
186936	5 x 2.5	RE	3LNPE	120	346	14.5	0.81
186937	5 x 4	RE	3LNPE	192	457	15.8	0.93
186938	5 x 6	RE	3LNPE	288	584	17.2	1.05
186939	5 x 10	RE	3LNPE	480	824	19.3	1.25
186975	5 x 16	RM	3LNPE	768	1220	23.1	1.67
186976	5 x 25	RM	3LNPE	1200	1803	27.2	2.22
186977	5 x 35	RM	3LNPE	1680	2385	30.5	2.66
186978	5 x 50	RM	3LNPE	2400	3191	34.8	3.41
186979	5 x 70	RM	3LNPE	3360	4391	40	4.26
190587	5 x 95	RM	3LNPE	4560	5925	46.6	5.89
196283	6 x 10	RE	5LPE	576	973	21	1434
171272	7 x 1.5	RE	6LPE	101	329	14.4	0.81
171273	7 x 2.5	RE	6LPE	168	419	15.6	0.92
191080	7 x 6	RE	5LNPE	403	725	18.6	1.17
171279	12 x 1.5	RE	11LPE	173	512	18.3	1.2
171280	12 x 2.5	RE	11LPE	288	671	20	1.37
171283	19 x 1.5	RE	18LPE	274	714	21.2	1.63
171284	19 x 2.5	RE	18LPE	456	947	23.2	1.83
171285	24 x 1.5	RE	23LPE	346	900	24.6	1.99
171286	24 x 2.5	RE	23LPE	576	1199	27	2.27
171287	30 x 1.5	RE	29LPE	432	1056	26	2.28
171288	30 x 2.5	RE	29LPE	720	1430	28.8	2.68

(N)HXCH FE180 / E30-E60

Datwyler Keram

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Functional integrity E30-E60* i.a.w. DIN 4102-12

General Appraisal Certificate
P-MPA-E-03-043

Article No.	No. cores x cross-section n x mm²		Construction	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXCH FE180 / E30-E60 Keram							
186943	2 x 1.5/1.5	RE	LN	52	222	12.7	0.60
186944	2 x 2.5/2.5	RE	LN	80	272	13.5	0.66
187232	2 x 4/4	RE	LN	123	353	14.9	0.78
187234	2 x 6/6	RE	LN	182	431	16	0.86
186945	3 x 1.5/1.5	RE	3L	66	246	13.2	0.65
186946	3 x 2.5/2.5	RE	3L	104	306	14.1	0.72
187238	3 x 16/16	RM	3L	624.7	1028	21.3	1.63
187239	3 x 25/16	RM	3L	902	1435	25	1.90
187240	3 x 35/16	RM	3L	1190	1804	37.3	2.20
187241	3 x 50/25	RM	3L	1723	2454	31.7	2.84
187242	3 x 70/35	RM	3L	2410	3351	36	3.52
186985	3 x 95/50	RM	3L	3296	4458	41.1	4.50
186986	3 x 120/70	RM	3L	4236	5538	44.5	5.30
186987	3 x 150/70	RM	3L	5100	6748	49.2	6.00
186988	3 x 240/120	RM	3L	8242	10937	61.5	9.93
186947	4 x 1.5/1.5	RE	3LN	81	281	14.1	0.73
186948	4 x 2.5/2.5	RE	3LN	128	352	15.1	0.82
186949	4 x 4/4	RE	3LN	200	467	16.7	0.96
186950	4 x 6/6	RE	3LN	297	616	18.1	1.13
186951	4 x 10/10	RE	3LN	504	863	20.1	1.33
186989	4 x 16/16	RM	3LN	796	1253	23.4	1.70
186990	4 x 25/16	RM	3LN	1142	1752	27.2	2.20
186991	4 x 35/16	RM	3LN	1526	2218	29.8	2.56
186992	4 x 50/25	RM	3LN	2203	3050	34.8	3.41
186993	4 x 70/35	RM	3LN	3082	4138	39.5	4.18
186994	4 x 95/50	RM	3LN	4208	5516	45.2	5.58
186995	4 x 120/70	RM	3LN	5388	6879	49.1	6.37
186996	4 x 150/70	RM	3LN	6540	8418	54.3	7.83
186997	4 x 185/95	RM	3LN	8159	10493	59.8	9.55
186998	4 x 240/120	RM	3LN	10546	13629	67.9	12.00
187244	7 x 1.5/2.5	RE	7L	133	391	16.1	0.94
187245	30 x 1.5/6	RE	30L	499	1239	28.4	2.67

Low-voltage cable 0.6/1kV

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Insulation integrity FE180 i.a.w. DIN VDE 0472-814, IEC 60331
Functional integrity E90 i.a.w. DIN 4102-12

General Appraisal Certificate
P-MPA-E-03-043

Article No.	No. cores x cross-section n x mm²		Construction	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXH FE180 / E90 Keram							
186141	1 x 16	RM	L	154	243	10.2	0.35
186142	1 x 25	RM	L	240	347	11.7	0.43
186143	1 x 35	RM	L	336	449	12.8	0.49
186144	1 x 50	RM	L	480	589	14.3	0.58
186145	1 x 70	RM	L	672	801	16.1	0.67
186146	1 x 95	RM	L	912	1074	18.5	0.85
186147	1 x 120	RM	L	1152	1308	19.6	0.91
186148	1 x 150	RM	L	1440	1635	21.8	1.11
186149	1 x 185	RM	L	1776	2011	24	1.32
186150	1 x 240	RM	L	2304	2619	27.1	1.63
186151	1 x 300	RM	L	2880	3111	29.6	1.91
191561	1 x 400	RM	L	3840	4012	32.9	2.278
188359	2 x 1.5	RE	LN	29	177	11	0.48
192563	2 x 1.5	RE	2L	29	177	11	0.48
187247	2 x 2.5	RE	LN	48	216	11.1	0.54
193974	2 x 2.5	RE	2L	48	216	11.8	0.54
186174	3 x 1.5	RE	LNPE	43	199	11.5	0.53
186177	3 x 2.5	RE	LNPE	72	248	12.4	0.60
186182	3 x 4	RE	LNPE	115	319	13.5	0.68
186186	3 x 6	RE	LNPE	173	400	14.6	0.77
186189	3 x 10	RE	LNPE	288	554	16.3	0.91
186152	3 x 16	RM	LNPE	461	878	20.2	1.29
186153	3 x 25	RM	LNPE	720	1299	24	1.75
186154	3 x 35	RM	LNPE	1008	1664	26.4	2.02
191069	3 x 35+16	RM	3LPE	1162	1835	27.4	2.13
186207	3 x 50	RM	LNPE	1440	2183	29.8	2.51
191002	3 x 50+25	RM	3LPE	1680	2460	31.3	2.69
191003	3 x 70+35	RM	3LPE	2352	3339	35.6	3.34
191004	3 x 95+50	RM	3LPE	3216	4442	40.7	4.24
191005	3 x 120+70	RM	3LPE	4128	5492	44	4.82
191006	3 x 150+70	RM	3LPE	4992	6623	48	5.70
191068	3 x 185+95	RM	3LPE	6240	8244	53.4	7.00
186175	4 x 1.5	RE	3LPE	58	233	12.4	0.61
186178	4 x 2.5	RE	3LPE	96	290	13.4	0.69
186183	4 x 4	RE	3LPE	154	381	14.6	0.78
186187	4 x 6	RE	3LPE	230	486	15.1	0.90

*) The functional integrity depends on the installation technique used.

(N)HXH FE180 / E90

Datwyler Keram

Article No.	No. cores x cross-section n x mm²		Construction	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXH FE180 / E90 Keram							
196337	4 x 6	RE	3LN	230	485	15.8	0.90
186190	4 x 10	RE	3LPE	384	688	17.8	1.07
196338	4 x 10	RE	3LN	384	688	17.8	1.07
186155	4 x 16	RM	3LPE	614	1089	22.1	1.54
196331	4 x 16	RE	3LN	614	1092	22.1	1.54
186156	4 x 25	RM	3LPE	960	1618	26.1	2.05
196332	4 x 25	RM	3LN	960	1618	26.3	2.05
186157	4 x 35	RM	3LPE	1344	2083	29	2.36
196333	4 x 35	RM	3LN	1344	2086	29	2.36
186158	4 x 50	RM	3LPE	1920	2745	32.8	2.97
196334	4 x 50	RM	3LN	1920	2756	32.8	2.97
186159	4 x 70	RM	3LPE	2688	3767	37.6	3.55
196335	4 x 70	RM	3LN	2688	3767	37.6	3.55
186160	4 x 95	RM	3LPE	3648	5033	43.1	4.75
196336	4 x 95	RM	3LN	3648	5033	43.1	4.75
187274	4 x 120	RM	3LPE	4608	6095	46	5.27
196330	4 x 120	RM	3LN	4608	6100	46	5.27
186161	4 x 150	RM	3LPE	5760	7617	51.2	6.49
190493	4 x 240	RM	3LPE	9216	12180	64.1	9.85
186176	5 x 1.5	RE	3LNPE	72	276	13.4	0.71
186179	5 x 2.5	RE	3LNPE	120	346	14.5	0.81
186184	5 x 4	RE	3LNPE	192	457	15.8	0.93
186188	5 x 6	RE	3LNPE	288	584	17.2	1.05
186191	5 x 10	RE	3LNPE	480	824	19.3	1.25
186162	5 x 16	RM	3LNPE	768	1361	24.8	1.86
186163	5 x 25	RM	3LNPE	1200	1960	28.8	2.42
186164	5 x 35	RM	3LNPE	1680	2547	32	2.86
186165	5 x 50	RM	3LNPE	2400	3377	36.5	3.68
187277	5 x 70	RM	3LNPE	3360	4614	41.5	4.51
195847	5 x 95	RM	3LNPE	4560	6178	47.9	5.88
185271	7 x 1.5	RE	6LPE	101	329	14.4	0.81
186180	7 x 2.5	RE	6LPE	168	419	15.6	0.92
186185	7 x 4	RE	6LPE	269	562	17.1	1.05
186999	7 x 6	RE	6LPE	403	725	18.6	1.17
187253	10 x 2.5	RE	9LPE	240	590	19.4	1.24
185272	12 x 1.5	RE	11LPE	173	512	18.3	1.20
186181	12 x 2.5	RE	11LPE	288	671	20	1.37

Low-voltage cable 0.6/1kV

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Functional integrity E90 i.a.w. DIN 4102-12

General Appraisal Certificate
P-MPA-E-03-043

Article No.	No. cores x cross-section n x mm²			Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
(N)HXCH FE180 / E90 Keram							
186071	3 x 1.5/1.5	RE	3L	66	246	13.2	0.65
186195	3 x 2.5/2.5	RE	3L	104	306	14.1	0.72
186197	3 x 4/4	RE	3L	161	403	15.6	0.84
187278	3 x 6/6	RE	3L	240	524	16.9	0.94
187279	3 x 10/10	RE	3L	408	727	18.6	1.15
196386	3 x 16/16	RM	3L	643	1144	24.4	1.64
172417	3 x 35/16	RM	3L	1190	1946	29	2.25
187408	3 x 50/25	RM	3L	1723	2556	32.5	2.90
187409	3 x 70/35	RM	3L	2410	3539	37.6	3.42
187410	3 x 95/50	RM	3L	3296	4612	41.9	4.50
187411	3 x 120/70	RM	3L	4236	5703	45.3	5.02
187412	3 x 150/70	RM	3L	5100	6931	50	6.00
187414	3 x 240/120	RM	3L	8242	11183	62.4	9.08
186072	4 x 1.5/1.5	RE	3LN	81	281	14.1	0.73
186196	4 x 2.5/2.5	RE	3LN	128	352	15.1	0.82
186198	4 x 4/4	RE	3LN	200	467	16.7	0.96
186199	4 x 6/6	RE	3LN	297	616	18.1	1.13
186200	4 x 10/10	RE	3LN	504	863	20.1	1.33
186131	4 x 16/16	RM	3LN	796	1400	25.3	1.81
186132	4 x 25/16	RM	3LN	1142	1898	28.9	2.28
186133	4 x 35/16	RM	3LN	1526	2380	31.6	2.60
186134	4 x 50/25	RM	3LN	2203	3247	36.7	3.49
186135	4 x 70/35	RM	3LN	3082	4375	41.3	4.25
186136	4 x 95/50	RM	3LN	4208	5746	46.4	5.53
186137	4 x 120/70	RM	3LN	5388	7094	50.1	6.25
186138	4 x 150/70	RM	3LN	6540	8651	55.3	7.58
186139	4 x 185/95	RM	3LN	8159	10751	60.8	9.18
186140	4 x 240/120	RM	3LN	10546	13980	69.2	11.60
186073	7 x 1.5/2.5	RE	7L	133	391	16.1	0.94
187402	24 x 1.5/6	RE	24L	413	1072	27	2.32
187403	24 x 2.5/10	RE	24L	696	1426	29.6	2.69
187404	30 x 1.5/6	RE	30L	499	1239	28.4	2.67

INSTALLATION CABLES

JE-H(ST)H...Bd FE180 / E30-E90 Keram

JE-H(ST)H...Bd FE180 / E30 L Keram

JE-H(ST)H...Bd FE180 / E30-E90 Keram

JE-H(ST)H...Bd FE180 / E30 L Keram

JE-H(ST)HRH...Bd FE180 / E30-E90 Keram

General Appraisal Certificate
P-MPA-E-06-030

Technical data

Nominal voltage	maximum = 225 V
Testing voltage	500 V, 50 Hz conductor/conductor 2000 V, 50 Hz conductor/shield
Operating temperature	-30 °C to +70 °C

Application

Datwyler safety cables are used whenever extra protection is required against fire and to reduce hazards for humans and property, and also when strict safety regulations must be complied with. They may be installed indoors. These cables comply with functional integrity requirements E30-E90* in accordance with DIN 4102-12. Functional integrity is guaranteed for operating voltages up to 110 V, for signal and control applications, fire detection systems, electroacustic alarm systems and SHE, for example. When installed outdoors, the cables must be protected against direct sunlight (orange sheath; fire alarm cables BMK: red sheath).
Permissible operating temperature at conductor: +70 °C.

Installation cable, maximum 225 V

Compliant with DIN VDE 0815, zero halogen content,
improved fire properties, insulation integrity FE180 i.a.w.
DIN VDE 0472-814, IEC 6033, functional integrity E30-E90* i.a.w. DIN 4102-12.

Article No.	No. cores x cross-section n x 2 x mm	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
JE-H(ST)H...Bd FE180 / E30-E90 Keram					
188092	1 x 2 x 0.8	15	42	5.6	0.095
18809700ZK	2 x 2 x 0.8	25	57	6.1	0.123
18809700ZL	2 x 2 x 0.8	25	57	6.1	0.123
18809700ZZ	2 x 2 x 0.8	25	57	6.1	0.123
188099	4 x 2 x 0.8	45	101	9.0	0.210
188102	8 x 2 x 0.8	85	221	13.9	0.520
188104	12 x 2 x 0.8	126	280	14.8	0.580
188106	16 x 2 x 0.8	166	324	16.6	0.690
188108	20 x 2 x 0.8	206	421	18.8	0.800
188111	32 x 2 x 0.8	326	589	22.0	1.020
188113	40 x 2 x 0.8	407	760	25.5	1.380
188115	52 x 2 x 0.8	529	932	27.8	1.590
JE-H(ST)H...Bd FE180 / E30 L Keram					
188376	1 x 2 x 0.8	15	42	5.6	0.095
18831800ZK	2 x 2 x 0.8	25	57	6.1	0.123
18831800ZL	2 x 2 x 0.8	25	57	6.1	0.123
18831800ZZ	2 x 2 x 0.8	25	57	6.1	0.123
188325	4 x 2 x 0.8	45	102	9	0.210

Fire alarm cable, maximum 225 V

Compliant with DIN VDE 0815, zero halogen content,
improved fire properties, insulation integrity FE180 i.a.w.
DIN VDE 0472-814, IEC 60331, functional integrity E30-E90* i.a.w. DIN 4102-12

JE-H(ST)H...Bd FE180 / E30-E90 BMK red Keram					
188093	1 x 2 x 0.8	15	42	5.6	0.095
188098	2 x 2 x 0.8	25	59	6.3	0.123
188101	4 x 2 x 0.8	45	101	9.0	0.210
188103	8 x 2 x 0.8	85	221	13.9	0.520
188105	12 x 2 x 0.8	126	281	14.8	0.580
188107	16 x 2 x 0.8	166	325	16.6	0.690
188109	20 x 2 x 0.8	206	421	18.8	0.800
188112	32 x 2 x 0.8	326	589	22.0	1.020
188114	40 x 2 x 0.8	407	761	25.5	1.380
188116	52 x 2 x 0.8	529	933	27.8	1.590
JE-H(ST)H...Bd FE180 / E30 L BMK red Keram					
18837400ZK	2 x 2 x 0.8	25	59	6.1	0.123
18837400ZL	2 x 2 x 0.8	25	59	6.1	0.123
18837400ZZ	2 x 2 x 0.8	25	60	6.3	0.123
188375	4 x 2 x 0.8	45	102	9.0	0.210

*) The functional integrity depends on the installation technique used.

Z = cut to length; K = 1000 m reel/drum; L = 500 m reel/drum

JE-H(ST)H...BD FE180 / E30 L KERAM

Datwyler Keram

Fire alarm cable, maximum 225 V

Compliant with DIN VDE 0815
Zero halogen content, improved fire properties
Insulation integrity FE180 in accordance with DIN VDE 0472-814, IEC 60331
Functional integrity E30-E90* in accordance with DIN 4102-12

Article No.	No. cores x cross-section n x 2 x mm	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
JE-H(ST)H...Bd FE180 / E30 L BMK red Keram 250 m in PullQuick box					
18837700ZP	1 x 2 x 0.8	15	40	5.4	0.123
18837400ZP	2 x 2 x 0.8	25	60	6.1	0.123

JE-H(ST)HRH...BD FE180 / E30-E90

Datwyler Keram

Fire alarm cable with steel-wire braiding

(maximum 225 V)
Compliant with DIN VDE 0815
Zero halogen content, improved fire properties
Insulation integrity FE180 in accordance with DIN VDE 0472-814, IEC 60331
Functional integrity E30-E90* in accordance with DIN 4102-12

Article No.	No. cores x cross-section n x 2 x mm	Cu number kg/km	Weight kg/km	Diameter approx. mm	Fire load kWh/m
JE-H(ST)HRH...Bd FE180 / E30-E90 Keram					
188119	2 x 2 x 0.8	25	125	9.2	0.26
188120	4 x 2 x 0.8	45	194	12.0	0.39
188127	8 x 2 x 0.8	85	418	18.2	0.93
188128	12 x 2 x 0.8	126	489	19.1	1.01
188129	20 x 2 x 0.8	206	679	22.5	1.32
188346	32 x 2 x 0.8	326	911	26.7	1.72

*) The functional integrity depends on the installation technique used.

FO Universal ZGGFR Safety

FO Universal wbGGFR Safety

Application

Fibre optic safety cables for indoor and outdoor applications, metal-free central core design with up to 12 fibres and 5 bundles. The optimised fibre coating and flame-retardant stabilisers enable functional integrity (system circuit integrity) for more than 30 minutes when using Datwyler installation systems.

FO Universal ZGGFR Safety

Safety cables for indoor and outdoor applications
Metal-free, watertight along longitudinal axis, anti-rodent, flame-retardant
Compliant with IEC 60332.1 and IEC 60332.3 C, functional integrity for 30 minutes according to DIN 4102-12 (E30), "functional integrity" in accordance with IEC 60331-25 FE 90 (90 minutes at 750 °C)

U-DQ(ZN)BH 1xm		Fibres	Article No.	Article No.	Article No.
Name		Number	E9/125 G.652.D	G50/125 OM3	G50/125 OM4
ZGGFR Safety	1 x 4	4	187288	190604	193447
ZGGFR Safety	1 x 6	6	191867	191851	193448
ZGGFR Safety	1 x 8	8	196130	196120	193449
ZGGFR Safety	1 x 12	12	190719	191796	193450

FO Universal wbGGFR Safety

Safety cables for indoor and outdoor applications
Metal-free, watertight along longitudinal axis, anti-rodent, flame-retardant
Compliant with IEC 60332.1 and IEC 60332.3 C, functional integrity for 30 minutes according to DIN 4102-12 (E30), "functional integrity" in accordance with IEC 60331-25 FE 90 (90 minutes at 750 °C)

U-DQ(ZN)BH nxm		Fibres	Article No.	Article No.	Article No.
Name		Number	E9/125 G.652.D	G50/125 OM3	G50/125 OM4
wbGGFR Safety	2 x 12	24	190223	187360	193454
wbGGFR Safety	3 x 12	36	190224	on request	193455
wbGGFR Safety	4 x 12	48	190225	191191	193456
wbGGFR Safety	5 x 12	60	190226	190605	193457

CLAMP ASSIGNMENT

Clamp assignment for single cable and multiple cable installation

The clamps listed refer to mean values (no guarantee)

Datwyler Keram (N)HXH FE180 / E30-E60	Datwyler clamp for single cable and multiple cable installation					
	Type SAS single clamp					
No. of cores x cross-section n x mm²	single cable installation	maximum number of cables up to 3 cables	up to 4 cables	up to 9 cables	up to 17 cables	from 18 cables
1 x 4 RE* (round, solid)	SAS 8 D** 1300956	SAS 14 D 1300020	SAS 18 D 1300022	SAS 22 D 1300024	SAS 28 D 1300027	SAS 38 DN 1300251
1 x 95 RM* (round, stranded)	SAS 18 D 1300022					
1 x 120 RM*	SAS 20 D 1300023					
1 x 150 RM*	SAS 22 D 1300024					
1 x 185 RM*	SAS 24 D 1300025					
1 x 240 RM*	SAS 30 D 1300028					
3 x 1,5 RE	SAS 12 D** 1300957	SAS 24 D 1300025	SAS 30 D 1300028	SAS 38 DN 1300251	SAS 47 DN 1300252	
3 x 2,5 RE	SAS 12 D** 1300957	SAS 24 D 1300025	SAS 30 D 1300028	SAS 38 DN 1300251	SAS 47 DN 1300252	
4 x 1,5 RE	SAS 12 D** 1300957	SAS 24 D 1300025	SAS 30 D 1300028	SAS 38 DN 1300251	SAS 47 DN 1300252	
4 x 2,5 RE	SAS 14 D** 1300958	SAS 26 D 1300026	SAS 38 DN 1300251	SAS 38 DN 1300251		
5 x 1,5 RE	SAS 14 D** 1300958	SAS 26 D 1300026	SAS 38 DN 1300251	SAS 38 DN 1300251		
5 x 2,5 RE	SAS 14 D** 1300958	SAS 28 D 1300027	SAS 38 DN 1300251	SAS 47 DN 1300252		
5 x 4 RE	SAS 16 D** 1300959	SAS 38 DN 1300251	SAS 38 DN 1300251	SAS 47 DN 1300252		
5 x 6 RE	SAS 18 D 1300022	SAS 38 DN 1300251	SAS 47 DN 1300252			
5 x 10 RE	SAS 20 D 1300023	SAS 47 DN 1300252				
5 x 16 RM	SAS 24 D 1300025					

*) Bundeling in three-phase current installation / Single cable installation not permitted for alternating current

**) pre-assembled with fire protection plug for concrete

Only applies for Datwyler safety cables

Clamp assignment for single cable and multiple cable installation

The clamps listed refer to mean values (no guarantee)

Type B…D strap clamp					
single cable installation	**maximum number of cables** up to 3 cables	up to 4 cables	up to 9 cables	up to 17 cables	from 18 cables
B 12 D 1300043	B 14 D 1300044	B 18 D 1300046	B 22 D 1300047	B 30 D 1300049	B 38 D 1300051
B 18 D 1300046	B 38 D 1300051	B 46 D 1300053			
B 22 D 1300047	B 38 D 1300051	B 50 D 1300054			
B 22 D 1300047	B 46 D 1300053	B 54 D 1300055			
B 26 D 1300048	B 50 D 1300054	B 64 D 1300057			
B 30 D 1300049	B 54 D 1300055	B 70 D 1300058			
B 12 D 1300043	B 26 D 1300048	B 30 D 1300049	B 38 D 1300051	B 46 D 1300053	B 54 D 1300055
B 12 D 1300043	B 26 D 1300048	B 30 D 1300049	B 38 D 1300051	B 38 D 1300051	B 54 D 1300055
B 12 D 1300043	B 26 D 1300048	B 30 D 1300049	B 38 D 1300051	B 38 D 1300051	B 54 D 1300055
B 14 D 1300044	B 26 D 1300048	B 34 D 1300050	B 38 D 1300051	B 46 D 1300053	B 54 D 1300055
B 14 D 1300044	B 26 D 1300048	B 34 D 1300050	B 38 D 1300051	B 46 D 1300053	B 54 D 1300055
B 14 D 1300044	B 30 D 1300049	B 38 D 1300051	B 46 D 1300053		
B 16 D 1300045	B 34 D 1300050	B 42 D 1300052	B 46 D 1300053		
B 18 D 1300046	B 34 D 1300050	B 46 D 1300053			
B 22 D 1300047	B 42 D 1300052				
B 26 D 1300048					

CLAMP ASSIGNMENT

Clamp assignment for single cable and multiple cable installation

The clamps listed refer to mean values (no guarantee)

Datwyler Keram (N)HXCH FE180 / E30-E60	Datwyler clamp for single cable and multiple cable installation				
	Type SAS single clamp				
No. of cores x cross-section n x mm²	single cable installation	maximum number of cables up to 3 cables	up to 4 cables	up to 9 cables	up to 17 cables
4 x 25 RM/16 (round, solid)	SAS 28 D 1300027				
4 x 35 RM/16 (round, stranded)	SAS 30 D 1300028				
4 x 50 RM/25	SAS 38 DN 1300251				
4 x 70 RM/35	SAS 47 DN 1300252				
4 x 95 RM/50					
4 x 120 RM/70					
4 x 150 RM/70					
4 x 185 RM/95					
4 x 240 RM/120					

Only applies for Datwyler safety cables

Clamp assignment for single cable and multiple cable installation

The clamps listed refer to mean values (no guarantee)

	Type B…D strap clamp				
	single cable installation	**maximum number of cables** up to 3 cables	up to 4 cables	up to 9 cables	up to 17 cables
	B 30 D 1300049				
	B 30 D 1300049				
	B 38 D 1300051				
	B 46 D 1300053				
	B 50 D 1300054				
	B 54 D 1300055				
	B 58 D 1300056				
	B 64 D 1300057				
	B 70 D 1300058				

Only applies for Datwyler safety cables

CLAMP ASSIGNMENT

Clamp assignment for single cable and multiple cable installation

The clamps listed refer to mean values (no guarantee)

Datwyler Keram (N)HXH FE180 / E90	Datwyler clamp for single cable and multiple cable installation				
	Type SAS single clamp				
No. cores x cross-section n x mm²	single cable installation	maximum number of cables up to 3 cables	up to 4 cables	up to 9 cables	up to 17 cables
1 x 16 RM*	SAS 10 D 1300018	SAS 20 D 1300023	SAS 26 D 1300026	SAS 30 D 1300028	SAS 38 DN 1300251
1 x 25 RM*	SAS 12 D** 1300957	SAS 24 D 1300025	SAS 30 D 1300028	SAS 38 DN 1300251	
1 x 35 RM*	SAS 14 D** 1300958	SAS 26 D 1300026	SAS 38 DN 1300251		
1 x 50 RM*	SAS 14 D** 1300958	SAS 28 D 1300027	SAS 38 DN 1300251		
1 x 70 RM*	SAS 16 D** 1300959				
1 x 95 RM*	SAS 20 D 1300023				
1 x 120 RM*	SAS 20 D 1300023				
1 x 150 RM*	SAS 22 D 1300024				
1 x 185 RM*	SAS 24 D 1300025				
1 x 240 RM*	SAS 30 D 1300028				
1 x 300 RM*	SAS 30 D 1300028				
3 x 1,5 RE	SAS 12 D** 1300957	SAS 24 D 1300025	SAS 30 D 1300028	SAS 38 DN 1300251	SAS 47 DN 1300252
3 x 2,5 RE	SAS 12 D** 1300957	SAS 24 D 1300025	SAS 30 D 1300028	SAS 38 DN 1300251	SAS 47 DN 1300252
4 x 1,5 RE	SAS 12 D** 1300957	SAS 24 D 1300025	SAS 30 D 1300028	SAS 38 DN 1300251	SAS 47 DN 1300252
4 x 2,5 RE	SAS 14 D** 1300958	SAS 26 D 1300026	SAS 38 DN 1300251	SAS 38 DN 1300251	
5 x 1,5 RE	SAS 14 D** 1300958	SAS 26 D 1300026	SAS 38 DN 1300251	SAS 38 DN 1300251	
5 x 2,5 RE	SAS 16 D** 1300959	SAS 30 D 1300028	SAS 38 DN 1300251	SAS 47 DN 1300252	
5 x 4 RE	SAS 16 D** 1300959	SAS 38 DN 1300251	SAS 38 DN 1300251	SAS 47 DN 1300252	
5 x 6 RE	SAS 18 D 1300022	SAS 38 DN 1300251	SAS 47 DN 1300252		
5 x 10 RE	SAS 20 D 1300023	SAS 38 DN 1300251			
5 x 16 RM	SAS 26 D 1300026				

*) Bundeling in three-phase current installation / Single cable installation not permitted for alternating current
**) pre-assembled with fire protection plug for concrete

Only applies for Datwyler safety cables

Clamp assignment for single cable and multiple cable installation

The clamps listed refer to mean values (no guarantee)

Type B…D strap clamp				
single cable installation	**maximum number of cables** up to 3 cables	up to 4 cables	up to 9 cables	up to 17 cables
B 12 D 1300043	B 22 D 1300047	B 26 D 1300048	B 30 D 1300049	B 34 D 1300050
B 12 D 1300043	B 26 D 1300048	B 30 D 1300049	B 38 D 1300051	
B 14 D 1300044	B 26 D 1300048	B 34 D 1300050	B 38 D 1300051	
B 14 D 1300044	B 30 D 1300049	B 38 D 1300051		
B 16 D 1300045	B 34 D 1300050	B 38 D 1300051		
B 22 D 1300047	B 38 D 1300051	B 50 D 1300054		
B 22 D 1300047	B 42 D 1300052	B 50 D 1300054		
B 22 D 1300047	B 46 D 1300053	B 54 D 1300055		
B 26 D 1300048	B 50 D 1300054	B 64 D 1300057		
B 30 D 1300049	B 54 D 1300055	B 70 D 1300058		
B 30 D 1300049	B 64 D 1300057	B 76 D 1300059		
B 12 D 1300043	B 26 D 1300048	B 30 D 1300049	B 38 D 1300051	B 46 D 1300053
B 12 D 1300043	B 26 D 1300048	B 30 D 1300049	B 38 D 1300051	B 46 D 1300053
B 12 D 1300043	B 26 D 1300048	B 30 D 1300049	B 38 D 1300051	B 46 D 1300053
B 14 D 1300044	B 26 D 1300048	B 34 D 1300050	B 38 D 1300051	B 46 D 1300053
B 14 D 1300044	B 26 D 1300048	B 34 D 1300050	B 38 D 1300051	B 46 D 1300053
B 16 D 1300045	B 30 D 1300049	B 38 D 1300051	B 46 D 1300053	B 54 D 1300055
B 16 D 1300045	B 34 D 1300050	B 38 D 1300051	B 46 D 1300053	
B 18 D 1300046	B 34 D 1300050	B 42 D 1300052		
B 22 D 1300047	B 38 D 1300051			
B 26 D 1300048				

Only applies for Datwyler safety cables

CLAMP ASSIGNMENT

Clamp assignment for single cable and multiple cable installation

The clamps listed refer to mean values (no guarantee)

Datwyler Keram (N)HXCH FE180 / E90	Datwyler clamp for single cable and multiple cable installation				
	Type SAS single clamp				
No. of cores x cross-section n x mm²	single cable installation	maximum number of cables up to 3 cables	up to 4 cables	up to 9 cables	up to 17 cables
4 x 25 RM/16	SAS 28 D 1300027				
4 x 35 RM/16	SAS 38 DN 1300251				
4 x 50 RM/25	SAS 38 DN 1300251				
4 x 70 RM/35	SAS 47 DN 1300252				
4 x 95 RM/50					
4 x 120 RM/70					
4 x 150 RM/70					
4 x 185 RM/95					
4 x 240 RM/120					

Only applies for Datwyler safety cables

Clamp assignment for single cable and multiple cable installation

The clamps listed refer to mean values (no guarantee)

	Type B…D strap clamp				
	single cable installation	**maximum number of cables** up to 3 cables	up to 4 cables	up to 9 cables	up to 17 cables
	B 30 D 1300049				
	B 34 D 1300050				
	B 38 D 1300051				
	B 46 D 1300053				
	B 50 D 1300054				
	B 54 D 1300055				
	B 58 D 1300056				
	B 64 D 1300057				
	B 70 D 1300058				

Only applies for Datwyler safety cables

CLAMP ASSIGNMENT

Clamp assignment for single cable and multiple cable installation

The clamps listed refer to mean values (no guarantee)

Datwyler Keram JE-H(St)H…Bd FE 180 / E30-E90		Datwyler clamp for single cable and multiple cable installation					
		Type SAS single clamp					
No. of cores x cross-section n x 2 x mm	max. number	single cable installation	maximum number of cables up to 3 cables	up to 4 cables	up to 9 cables	up to 17 cables	from 18 cables
2 x 2 x 0,8	**44**	SAS 6 D 1300016	SAS 12 D 1300019	SAS 14 D 1300020	SAS 20 D 1300023	SAS 26 D 1300026	SAS 38 DN 1300251
4 x 2 x 0,8	**26**	SAS 8 D* 1300956	SAS 16 D 1300021	SAS 22 D 1300024	SAS 26 D 1300026	SAS 38 DN 1300251	SAS 47 DN 1300251
8 x 2 x 0,8	**11**	SAS 14 D* 1300958	SAS 26 D 1300026	SAS 38 DN 1300251	SAS 47 DN 1300252	SAS 47 DN 1300252	
12 x 2 x 0,8	**9**	SAS 14 D* 1300958	SAS 30 D 1300028	SAS 38 DN 1300251	SAS 47 DN 1300252		
16 x 2 x 0,8	**7**	SAS 16 D* 1300959	SAS 38 DN 1300251	SAS 38 DN 1300251	SAS 47 DN 1300252		
20 x 2 x 0,8	**6**	SAS 18 D 1300022	SAS 38 DN 1300251	SAS 47 DN 1300252	SAS 47 DN 1300252		
32 x 2 x 0,8	**4**	SAS 22 D 1300024	SAS 47 DN 1300252	SAS 55 DN 1300234			
40 x 2 x 0,8	**3**	SAS 26 D 1300026	SAS 55 DN 1300234				
52 x 2 x 0,8	**1**	SAS 28 D 1300027					

*) pre-assembled with fire protection plug for concrete

Only applies for Datwyler safety cables

Clamp assignment for single cable and multiple cable installation

The clamps listed refer to mean values (no guarantee)

Type B…D strap clamp					
single cable installation	**maximum number of cables** up to 3 cables	up to 4 cables	up to 9 cables	up to 17 cables	from 18 cables
B 12 D 1300043	B 12 D 1300043	B 14 D 1300044	B 22 D 1300047	B 26 D 1300048	B 38 D 1300051
B 12 D 1300043	B 16 D 1300045	B 22 D 1300047	B 26 D 1300048	B 38 D 1300051	B 46 D 1300053
B 14 D 1300044	B 26 D 1300048	B 38 D 1300051	B 46 D 1300053	B 46 D 1300053	
B 14 D 1300044	B 30 D 1300049	B 38 D 1300051	B 46 D 1300053		
B 16 D 1300045	B 34 D 1300050	B 38 D 1300051	B 46 D 1300053		
B 18 D 1300046	B 38 D 1300051	B 46 D 1300053	B 46 D 1300053		
B 22 D 1300047	B 46 D 1300053	B 54 D 1300055			
B 26 D 1300048	B 54 D 1300055				
B 30 D 1300049					

Only applies for Datwyler safety cables

CLAMPS

Single clamp E30-E90 - type SAS

Fixing distance ≤ 1200 / 600 mm[1)], also for cable bundles

[1)] depending on the cable type

Article No.	Name	Clamp type	Cable Ø [mm]	Information	PU
Type SAS single clamp, fixing distance					
1300016	Single clamp	SAS 6 D	5 - 6		100 pcs.
1300017	Single clamp	SAS 8 D	7 - 8		100 pcs.
1300018	Single clamp	SAS 10 D	9 - 10		100 pcs.
1300019	Single clamp	SAS 12 D	11 - 12		100 pcs.
1300020	Single clamp	SAS 14 D	13 - 14		100 pcs.
1300021	Single clamp	SAS 16 D	15 - 16		100 pcs.
1300022	Single clamp	SAS 18 D	17 - 18		100 pcs.
1300023	Single clamp	SAS 20 D	19 - 20		100 pcs.
1300024	Single clamp	SAS 22 D	21 - 22		100 pcs.
1300025	Single clamp	SAS 24 D	23 - 24		100 pcs.
1300026	Single clamp	SAS 26 D	25 - 26		100 pcs.
1300027	Single clamp	SAS 28 D	27 - 28		100 pcs.
1300028	Single clamp	SAS 30 D	29 - 30		100 pcs.
1300251	Single clamp	SAS 38 DN	29 - 38		25 pcs.
1300252	Single clamp	SAS 47 DN	38 - 47		20 pcs.
1300234	Single clamp	SAS 55 DN	47 - 55		20 pcs.
1300250	Single clamp	SAS 60 DN	55 - 60		20 pcs.
Type SAS V4A single clamp, material 1.4571					
3800141	Single clamp	SAS 19 D V4A	15 - 19		50 pcs
3800142	Single clamp	SAS 24 D V4A	19 - 24		50 pcs
3800145	Single clamp	SAS 29 D V4A	24 - 29		50 pcs
3800148	Single clamp	SAS 38 D V4A	29 - 38		25 pcs
3800149	Single clamp	SAS 47 D V4A	38 - 47		20 pcs
3800150	Single clamp	SAS 55 D V4A	47 - 55		20 pcs
3800152	Single clamp	SAS 63 D V4A	55 - 63		20 pcs
1301190	KDM/E /Stainless steel plugs				100 pcs

Type SAS single clamp E30-E90, pre-assembled with type K6x5 fire protection plugs

Fixing distance ≤ 1200 / 600 mm [1)], also for cable bundles

[1)] Depending on type of cable

Article No.	Name	Clamp type	Cable Ø [mm]	Information	PU
Type SAS single clamp, pre-assembled with fire protection plugs (type K6x5, 30 mm)					
1300956	Single clamp	SAS 8 D - K6x5	7 - 8	pre-assembled with type K6x5, 30 mm	100 pcs.
1300957	Single clamp	SAS 12 D - K6x5	11 - 12	pre-assembled with type K6x5, 30 mm	100 pcs.
1300958	Single clamp	SAS 14 D - K6x5	13 - 14	pre-assembled with type K6x5, 30 mm	100 pcs.
1300959	Single clamp	SAS 16 D - K6x5	15 - 16	pre-assembled with type K6x5, 30 mm	100 pcs.

Only in combination with Datwyler safety cables

Strap clamp E30-E90 - type B without trough

Fixing distance ≤ 1200 / 800 mm [1]
also for cable bundles

[1] depending on the cable type

Counter trough for type B strap clamp

Plastic, polyethylene, grey

Article No.	Clamp type	Cable Ø [mm]	PU	Article No.	Type	PU
Strap clamp				**Counter trough**		
1300043	B 12 D	6 - 12	100 pcs.	13001100ZX	GW12	100 pcs.
1300044	B 14 D	10 - 14	100 pcs.	13001110ZX	GW14	100 pcs.
1300045	B 16 D	12 - 16	100 pcs.	13001120ZX	GW16	100 pcs.
1300046	B 18 D	14 - 18	100 pcs.	13001130ZX	GW18	100 pcs.
1300047	B 22 D	18 - 22	100 pcs.	13001140ZX	GW22	100 pcs.
1300048	B 26 D	22 - 26	100 pcs.	13001150ZX	GW26	100 pcs.
1300049	B 30 D	26 - 30	100 pcs.	13001160ZX	GW30	100 pcs.
1300050	B 34 D	30 - 34	100 pcs.	13001170ZX	GW34	100 pcs.
1300051	B 38 D	34 - 38	100 pcs.	13001180ZW	GW38	50 pcs.
1300052	B 42 D	38 - 42	100 pcs.	13001190ZW	GW42	50 pcs.
1300053	B 46 D	42 - 46	100 pcs.	13001200ZW	GW46	50 pcs.
1300054	B 50 D	46 - 50	50 pcs.	13001210ZW	GW50	50 pcs.
1300055	B 54 D	50 - 54	50 pcs.	13001220ZW	GW54	50 pcs.
1300056	B 58 D	54 - 58	50 pcs.	13001230ZW	GW58	50 pcs.
1300057	B 64 D	58 - 64	50 pcs.	13001240ZW	GW64	50 pcs.
1300058	B 70 D	64 - 70	50 pcs.	13001250ZW	GW70	50 pcs.
1300059	B 76 D	70 - 76	50 pcs.	13001260ZV	GW76	25 pcs.
1300060	B 82 D	76 - 82	50 pcs.	13001270ZV	GW82	25 pcs.
1300061	B 90 D	82 - 90	50 pcs.	13001280ZV	GW90	25 pcs.
1300062	B 100 D	90 - 100	25 pcs.	13001290ZV	GW100	25 pcs.
1300063	B 110 D	100 - 110	25 pcs.	13001300ZV	GW 110	25 pcs.
1300064	C-shaped rail, 2970 / 25LD / 2 m, slit width 16 mm					1 pc. = 2m

A short overview of products and installation / laying techniques

Only in combination with Datwyler safety cables

MULTI-CABLE SUPPORTS

Multi-cable support E30-E90 - type Hermann clamp

for wall and ceiling installation
Fixing distances ≤ 800 mm/≤ 600 mm[1]

Multi-cable support E30-E90
Type Hermann clamp

Multi-cable support E30-E90
Type Hermann clamp S (small)

For laying multiple cables on ceilings or walls.
System circuit integrity is achieved for
Datwyler Keram cable types
(N)HXH/(N)HXH CL/(N)HXCH FE180/E30-E60,
(N)HXH/(N)HXCH FE180/E90,
JE-H(St)H FE180/E30-E90 and
JE-H(St)HRH FE180/E30-E90.

Article No.	Name	Information		PU
38002060ZU	Hermann clamp	for wall and ceiling installation	incl. KDM plug	10 pcs.
38002060ZW	Hermann clamp	for wall and ceiling installation	incl. KDM plug	50 pcs.
38002060ZX	Hermann clamp	for wall and ceiling installation	incl. KDM plug	100 pcs.
38002060ZZ	Hermann clamp	for wall and ceiling installation	in wire-mesh box w/o plugs	750 pcs.
38002000ZU	Hermann clamp S	for wall and ceiling installation	incl. KDM plug	10 pcs.
38002000ZW	Hermann clamp S	for wall and ceiling installation	incl. KDM plug	50 pcs.
38002000ZX	Hermann clamp S	for wall and ceiling installation	incl. KDM plug	100 pcs.
38002000ZZ	Hermann clamp S	for wall and ceiling installations	in wire-mesh box w/o plugs	1750 pcs.

*) depending on type of cable

Accessories

KDM
30 mm embedment depth

SWM-SM 50

SDS 1 32 mm

Article No.	Name	Information	PU
1300954	Plug set KDM	Single/spacer clamps and Hermann clamp with dowels and drill bit	200 pcs.
1300962	SDS 1 drill bit	Required for type K6x5 plug and KDM	1 pc.
1300860	SWM-SM 50 setting tool	Required for Hermann clamp (drill hammer) and C-shaped rail	1 pc.

Only in combination with Datwyler safety cables

E0 multi-cable support incl. KDM plug
for wall and ceiling installation in accordance with MLAR 09-2020 3.5.3

Article No.	Name	Interior dimensions mm x mm x mm	Exterior dimensions mm x mm x mm	PU
38000860ZW	E0 multi-cable support	approx. 80 x 45 x 33	~ 87 x 60 x 33	50 pcs.
3800087	E0 S multi-cable support	approx. 55 x 35 x 33	~ 63 x 45 x 33	50 pcs.

To speed up installation times for the E0 multi-cable support, we recommend using the Datwyler SWM-SM 50 setting tool.

System description:
For fire-safe installation of multiple cables or lines along ceilings or walls above fireproof ceilings in accordance with MLAR 09-2020 3.5.3 (not for functional integrity!)

Excerpt from MLAR 2015 3.5.3.:
The special requirements pertaining to fireproof fasteners for lines installed in the area between floor slabs and suspended ceilings must be observed.

Installation spacing (cm)	30	40	50	60	70	80
Cable weight (kg/m)	6	4,5	3,6	3	2,6	2,3

Cable joint E30-E90

For connecting two Datwyler Keram cable types: (N)HXH/(N)HXH CL/(N)HXCH FE180/E30-E60 and (N)HXH/(N)HXCH FE180/E90. The cable joint provides the relevant circuit integrity of the cables.

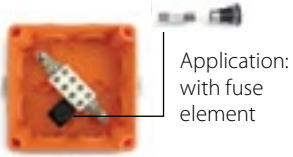
Cable joint

Article No.	Name	Dimensions [n x mm²]	PU
1300310	Cable joint SMH4	4 x 1.5 - 4 x 4	1 pc.
1300311	Cable joint SMH4	4 x 6 - 4 x 10	1 pc.
1300312	Cable joint SMH4	4 x 16 - 4 x25	1 pc.
1300313	Cable joint SMH4	4 x 35 - 4 x 50	1 pc.
1300314	Cable joint SMH4	4 x 70 - 4 x 95	1 pc.
1300315	Cable joint SMH4	4 x 120 - 4 x150	1 pc.
1300316	Cable joint SMH4	4 x 185 - 4 x 240	1 pc.
1300317	Cable joint SMHC4	4 x 1.5/1.5- 4 x 4/4	1 pc.
1300318	Cable joint SMHC4	4 x 6/6 - 4 x10/10	1 pc.
1300319	Cable joint SMHC4	4 x 16/16 - 4 x 25/16	1 pc.
1300320	Cable joint SMHC4	4 x 35/16 - 4 x 50/25	1 pc.
1300321	Cable joint SMHC4	4 x 70/35 - 4 x95/50	1 pc.
1300322	Cable joint SMHC4	4 x 120/70 - 4 x 150/70	1 pc.
1300323	Cable joint SMHC4	4 x 185/95 - 4 x 240/120	1 pc.

Only in combination with Datwyler safety cables

CONNECTION BOX / TERMINAL BOX

Connection box / terminal box E30-E90



1. VAD 3 4x6 PE
2. VAD 3 3x6 PE plus
3. VAD 3 6x6 PE

Article No.	Fig.	Name	Exterior dimensions [mm]	PU
301391	1	VAD 3 4x6 PE E30-E90	100 x 100 x 50	1 pc.
301392	2	VAD 3 3x6 PE plus E30-E90	100 x 100 x 50	1 pc.
301393	3	VAD 3 6x6 PE E30-E90	175 x 150 x 80	1 pc.
66030300ZY		Fuse element 2A for VAD 3		

Terminals assembly

Type	Fig.	Terminals assembly	Terminal Type	Dimensions
VAD 3 4x6 PE E30-E90	1	4 pc. KR6 and 2 pc. PE 16mm²	KR6 	4 cores up to 2,5mm² 2 cores 4 up to 6 mm²
VAD 3 6x6 PE E30-E90	3	6 pc. KR6 and 2 pc. PE 16mm²		
VAD 3 3x6 PE plus E30-E90	2	3 pc. KR6.4 and 2 pc. PE 16mm²	KR6.4 	8 cores up to 2,5mm²

Further equipment variants and terminal ranges up to 16 mm² on request.

Only in combination with Datwyler safety cables

High-current distribution box, type Hercules, E30-E90

Hercules distribution box
E30-E90

Hercules cover AHD
E30-E90

Article No.	Type	Interior dimensions [mm]	Information	PU
301382	AHD 263013 E90	260 x 300 x 130	(empty, without base)	1 set
301375	HS 263013 E30-E90	260 x 300 x 130	with top hat rail 35 x 7,5 mm 1-row	1 set
301376	HS 353013 E30-E90	350 x 300 x 130	with top hat rail 35 x 7,5 mm 2-rows	1 set
301377	HS 523013 E30-E90	520 x 300 x 130	with top hat rail 35 x 7,5 mm 3-rows	1 set
301378	HI 263013 E30-E90	260 x 300 x 130	with QSA trough for 6 strips	1 set
301379	HI 353013 E30-E90	350 x 300 x 130	with QSA trough for 11 strips	1 set
301380	HI 523013 E30-E90	520 x 300 x 130	with QSA trough for 13 strips	1 set
Replacement firestop mastic (if the provided firestop mastic is not sufficient)				
1300467	SP cartridge	Firestop mastic 310 ml		400 g cartridge

CONCRETE PLUGS

Fire protection plugs

K 6x5
30 mm embedment depth

K 6x265
K 6x110
K 6x80

KDM
30 mm embedment depth

Article No.	Name	Information / fastening of	PU
1300953	Plug set K6x5	SAS single clamps	200 plugs & drill bit
1300954	Plug set KDM	Single/distance clamps and Hermann clamp	200 plugs & drill bit
1300954	Plug set KDM	C-shaped rail	200 plugs & drill bit
38554650ZX	Plugs K6x80	On insulated ceilings and walls up to 75 mm	100 pcs.
38554640ZX	Plugs K6x110	On insulated ceilings and walls up to 105 mm	100 pcs.
38001360ZX	Plugs K6x265	On insulated ceilings and walls up to 260 mm	100 pcs.

Insulation bridging set (U set)

Mounting screw

Joint

Threaded rod

Nuts

Article No.	Name	Information / fastening of	PU
4000738	Ü-Set 400 mm Bridging set up to 400 mm insulation	100 sets = 100x mounting screws, 100x joint, 300x nuts, 50x threaded rod M6 1 m (100 x 0.5 m)	100 sets

Only in combination with Datwyler safety cables

Fire protection plugs - accessories

EWA 6x5-SM

SWM-SM

SWM-SM 50

SMu 6 SM

SDS 1 32 mm

Article No.	Name	Information / fastening of	PU
1300962	SDS 1 drill bit	Required for type K6x5 plug and KDM	1 pc.
1300961	SWM-SM setting tool	Required for KDM plug (drill hammer)	1 pc.
1300963	SMu 6 SM setting tool	Required for "pre-assembled clamp" (drill hammer)	1 pc.
1300860	SWM-SM 50 setting tool	Required for Hermann clamp (drill hammer) and C-shaped rail	1 pc.
1300462	EWA 6x5-SM setting tool	For direct mounting of type K6x5 plug	1 pc.
1300560	EWA 6x80-SM setting tool	For direct mounting of type K6x80 plug	1 pc.
1300851	EWA 6x110-SM setting tool	For direct mounting of type K6x110 plug	1 pc.

Only in combination with Datwyler safety cables

SPECIAL PLUGS / IDENTIFICATION SIGNS

Special plugs and accessories

MMS+ MS 7,5/45
only in concrete
35 mm embed-
ment depth

MMS+ MS 7,5/60
55 mm embed-
ment depth

MMS+ St 6/55
35 mm embed-
ment depth

Gas concrete plug
PBD M 6x10

Article No.	Name	Information / fastening of	PU
Gas concrete plugs			
1301301	PBD M6x10 plug	Gas concrete plugs for spacer clamps, profile rail, Hermann clamp, light cable support	25 pcs.
1301306	PBD M10x10 plug	Gas concrete plugs for heavy cable support	25 pcs.
Accessories			
1301302	EWP 6x10 SDS setting tool	Required for PBD 6x10 plug (drill hammer)	
1301307	EWP 10x10 SDS setting tool	Required for PBD 10x10 plug (drill hammer)	
Mounting screws			
1300461	Mounting screws MMS+ MS 7,5/45	for G-shaped rail 2970/2 SLD, Hermann clamps, only on concrete	100 pcs.
1304900ZW	Mounting screws MMS+ MS 7,5/60	for G-shaped rail 2970/2 SLD and Hermann clamps	50 pcs.
3800097	Mounting screws MMS+ St 6/55	for SAS single clamps	100 pcs.

Identification sign

Article No.	Name	Information / fastening of	PU
Identification sign			
1300479	Identification sign	Cabling system	10 pcs.

WUM - effective support mount for vertical cable installation

Effective support mount for vertical installation of
safety cables with intrinsic fire resistance using the C-shaped rail 2970 SLD.
Meandering cable laying is not necessary if the WUM is used (intervals: up to 3.5 m).

Article No.	Name	Exterior dimensions	for C-shaped rail 2970 SLD (width)
13012760ZY	WUM 300 E30	100 x 370 x 135 mm	300 mm
13012780ZY	WUM 400 E30	100 x 470 x 135 mm	400 mm
13012770ZY	WUM 500 E30	100 x 570 x 135 mm	500 mm
13012750ZY	WUM 300 E90	200 x 470 x 185 mm	300 mm
13012740ZY	WUM 400 E90	200 x 570 x 185 mm	400 mm
13012730ZY	WUM 500 E90	200 x 670 x 185 mm	500 mm

Replacement firestop mastic (if the provided firestop mastic is not sufficient)

1300467	SP cartridge	Firestop mastic 310 ml	400 g cartridge

SAS
Assembly instructions

SAS single clamp

The **K6x5** plugs can be used to fasten Datwyler SAS clamps to concrete.
Tools: drill hammer, SDS 1 drill bit, SMu 6 SM setting tool.

To mount Datwyler SAS clamps on concrete or bricks **mounting screws** can be used.
Tools: drill with 5 mm concrete/brick drill bit and screwdriver with 10 mm socket

Fastening with mounting screw MMS+ ST

Mounting screws can be used to mount Datwyler SAS clamps to concrete or stone.
Tools: drill with 5 mm concrete/stone drill bit and screwdriver with 10 mm nut

Using K6x5 plugs
By using drill bit SDS1, the hole for K6x5 plugs is drilled to an exact depth of 32 mm. To achieve this depth, drill the hole as far as it will go.
Also refer to assembly instructions for K6x5 plug on page 100.

Fastening with mounting screw MMS+ ST
Drill hole diameter: 5 mm. The drill hole depth is at least 40 mm.
See also installation instructions for mounting screw on page 102

Blow out the drilled holes with compressed air to clean them.

Using K6x5 plugs
The SMu 6 SM setting tool is required for the installation.
The K6x5 plug is screwed into the SAS clamp prior to the installation.
Make sure that the plug bolts do not protrude into the cable area.
Insert the clamp with the bolted plug into the drilled hole.
Place the setting tool onto the SDS 1 drill bit.
Use the drill hammer to drive the plug deeper into the drilled hole and splay it apart.
Also refer to assembly instructions for K6x5 plug on page 100.

Fastening with mounting screw MMS+ ST
Screw in with 10 mm nut.
See also installation instructions for mounting screw on page 102.

Depending on the cable type, a fastener spacing of up to 1200 mm is required to maintain the functional integrity of the SAS clamps.

DIN VDE 0100-520 522.6.:
Cable and line systems must be chosen and installed in such a manner to minimise any physical damage (such as impact, penetration or pressure) that occurs during installation, operation and maintenance.

DIN VDE 0276 - 604 5.5 - Cable fasteners:
Reference value for clamp spacing with non-armoured cables: 20 times the cable diameter. The spacing should not exceed 80 cm horizontally and 1.5 m vertically.

The cable system must be provided with a permanent identification sign.

STRAP CLAMP

Assembly instructions

C-rail for strap clamp

The **KDM plugs** can be used to fasten Datwyler 2970/2 SLD C-rails to concrete.
Tools: drill hammer, SDS 1 drill bit, SWM-SM or SWM-SM 50 setting tool

The **MMS+ MS mounting screws** can be used to fasten Datwyler 2970/2 SLD C-rails to concrete, sand-lime bricks and solid bricks.
Tools: drill with 6 mm concrete / masonry drill bit and power screwdriver with T-Drive "T30"

Fastening points for SL2970/2 SLD C-rail.
The required number of fastening points also depends on the load to be fastened and the extraction force of the plug type. A hole spacing of maximum 300 mm is required to maintain functional integrity.
No functional integrity cables may be fastened outside of the plug groups.

Depending on the cable type, a fastener spacing of up to 1200 mm is required to maintain the functional integrity of the strap clamps.

Using KDM plugs
By using drill bit SDS1, the hole for KDM plugs is drilled to an exact embedment depth of 32 mm.
To achieve this depth, drill the hole as far as it will go.
Also refer to assembly instructions for KDM plug on page 101.

Using MMS+ MS mounting screws
Hole diameter is 6.0 mm. The minimum hole depth is 45 mm.
Also refer to assembly instructions for mounting screws on page 103.

Blow out the drilled holes with compressed air to clean them.

Using KDM plugs
The SWM-SM or SWM-SM 50* setting tool is required for the installation. Insert the KDM plug through the rail into the drilled hole. Do not remove the pre-assembled nut and washer.
Place the setting tool onto the SDS 1 drill bit.
Use the drill hammer to drive the plug deeper into the drilled hole and splay it apart.
Also refer to assembly instructions for KDM plug on page 101.

* also suitable for fastening Datwyler Hermann clamp

Using MMS+ MS mounting screws
Screw in using T-drive "30".
Also refer to assembly instructions for mounting screws on page 103.

The cable system must be provided with a permanent identification sign.

For horizontally fastened cables, the clamps must be secured against slippage in case of fire (using a sliding nut, for example).

DIN VDE 0100-520 522.6.:
Cable and line systems must be chosen and installed in such a manner to minimise any physical damage (such as impact, penetration or pressure) that occurs during installation, operation and maintenance.

DIN VDE 0276 - 604 5.5 - Cable fasteners:
Reference value for clamp spacing with non-armoured cables: 20 times the cable diameter. The spacing should not exceed 80 cm horizontally and 1.5 m vertically.

MULTI-CABLE SUPPORT

Assembly instructions

Type Hermann clamp / Hermann clamp S

The **KDM plug** can be used to fasten Hermann clamps to concrete.
Tools: drill hammer, SDS 1 drill bit, SWM-SM 50 setting tool

The **MMS+ MS mounting screws** can be used to fasten Hermann clamps to concrete, sand-lime bricks and solid bricks.
Tools: drill with 6 mm concrete / masonry drill bit, power screwdriver with T-Drive "T30" and drill bit extension of at least 110 mm for ceiling installations

The universal Hermann clamp can be installed on walls or ceilings.
The cover is always situated on the side and the rounded cable support surface always faces downwards.
An assembly opening is provided on the clip to allow for ceiling installations.

Using KDM plugs
By using drill bit SDS1, the hole for KDM plugs is drilled to an exact embedment depth of 32 mm. To achieve this depth, drill the hole as far as it will go.
Also refer to assembly instructions for KDM plug on page 100.

Using MMS+ MS mounting screws
Hole diameter is 6.0 mm. The minimum hole depth is 45 mm.
Also refer to assembly instructions for mounting screws on page 103.
Blow out the holes with compressed air to clean them.

Using KDM plugs
The SWM 50 SM setting tool is required for the installation.
Insert the KDM plug through the fastening hole into the drilled hole.
Do **not** remove the pre-assembled nut and washer!
Place the setting tool onto the SDS 1 drill bit.
Use the drill hammer to drive the plug deeper into the hole and splay it apart.
Also refer to assembly instructions for KDM plugs on page 100.

Using MMS+ MS mounting screws
Screw in using T-drive "30".
Also refer to assembly instructions for mounting screws on page 103.

Cables can be easily inserted through the large opening into the Hermann clamp.
Make sure to install cables with higher weight below those of lower weight.

After installing the cables, close the Hermann clamp using the integrated folding mechanism.
Cables can be easily re-inserted into the clip at any time.
Depending on the cable type, a fastener spacing of up to up to 800 mm is required to maintain the functional integrity of the strap clamps.

The cable system must be provided with a permanent identification sign.

The Hermann clamp:

- Unsurpassed performance
- Enormous savings: minimum of material and time expenditures
- Does not require anti-slippage elements

Furthermore:
When installing a Hermann clamp in accordance with MLAR 2015 for "cables without functional integrity" above a fireproof ceiling, it is possible to install a linear cable weight of 15 kg/m with a clip spacing of 600 mm.

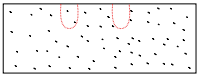
WUM
Assembly instructions

WUM - support measure

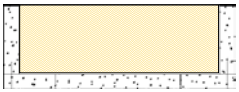
Application
Effective support mount in accordance with DIN 4102-12 for vertical installation of safety cables with integrated functional integrity onto 2970 SLD profile rails.
A meander-shaped cable line can be avoided when installing WUMs at a spacing of up to 3.5 m.

Riser lines consisting of Datwyler 2970/2 SLD C-rails must be fastened to walls using Datwyler fireproof plugs in accordance with the General Appraisal Certificates (ABPs) from building authorities.
Datwyler safety cables with integrated functional integrity are fastened onto walls using Datwyler type B…D strap clamps onto Datwyler 2970/2 SLD C-rails.

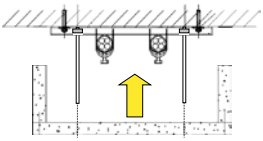
The threaded bolts are fastened using sliding nuts onto Datwyler 2970/2 SLD C-rails. Use the same spacing as the holes provided on the WUM. **There is only one fastening point for WUM 300 located in the centre.**



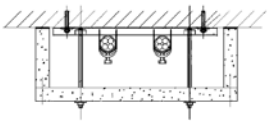
Cut cable feedthroughs into the WUM…



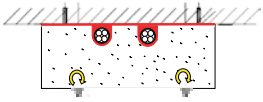
… and fill the inside with mineral wool.



Push the WUM onto the threaded bolts…



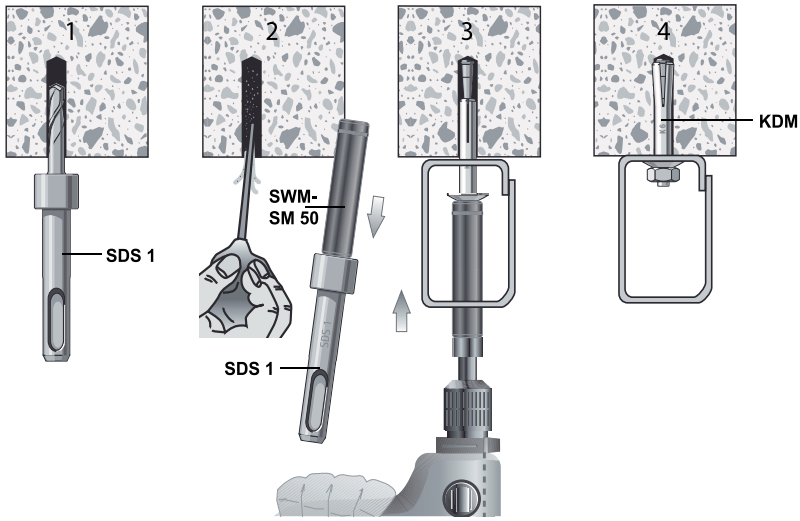
… and fasten it there using a nut and washer tightened by about 2 turns.



The cable inlets are sealed using mineral wool and Datwyler S100 SM-K firestop mastic. The gap between the WUM and the wall is also filled with S100 SM-K firestop mastic.

Assembly instructions for EO multi-cable supports

The KDM plug can be used to fasten Datwyler E0 multi-cable supports to concrete.
Tools: drill hammer, SDS 1 drill bit, SWM-SM 50 setting tool.
The MMS+MS 7.5/45 mounting screws can be used to fasten the Datwyler E0 multi-cable supports to concrete, sand-lime bricks and solid bricks.
Tools: drill with 6 mm concrete/masonry drill bit, power screwdriver with T-Drive "T40" and drill bit extension of at least 110 mm for ceiling installations.
The universal E0 multi-cable support can be installed on walls or ceilings. The cover is always situated on the side at the top. For ceiling installation, an assembly opening is situated on the bottom to provide access for the assembly tools.



Using KDM plugs
By using drill bit SDS1, the hole for KDM plugs is drilled to an exact seat depth of 32 mm.
To achieve this depth, drill the hole as far as it will go (also refer to assembly instructions for KDM plug).
Blow out the drilled holes with compressed air to clean them.
The SWM 50 SM setting tool is required for the installation.
The KDM plugs are inserted through the fastening hole into the drilled hole.
Do not remove the pre-assembled nut and washer!
Place the setting tool onto the SDS 1 drill bit.
Use the drill hammer to drive the plug deeper into the drilled hole and splay it apart.

E0 MULTI-CABLE SUPPORT

Assembly instructions

Assembly instructions for multi-cable supports

Using MMS+MS mounting screws

Drill bit diameter is 6 mm, drill hole depth is > 55 mm, tighten bolts using T-Drive "30"
(also refer to assembly instructions for mounting screw).
Blow out the drilled holes with compressed air to clean them.
Cables can be easily inserted through the large opening into the E0 multi-cable support.
E0 multi-cable supports can hold, for example, 30 NYM 3 x 1.5 mm^2 cables.
E0 multi-cable support of type "S" can hold, for example, 15 NYM 3 x 1.5 mm^2 cables.
This clip is only intended for compliance with the special requirements with respect to fireproof fasteners above suspended ceilings in accordance with MLAR 2015 section 3.5.3 and does not fulfil the functional integrity requirements given in section 5.2.1.
Close the E0 multi-cable support after the cables were installed.
Cables can be easily re-inserted into the clip at any time.
The load on E0 clips in cases of fire depends on the fastener spacing.

Installation spacing (cm)	30	40	50	60	70	80
Cable weight (kg/m)	6	4.5	3.6	3	2.6	2.3

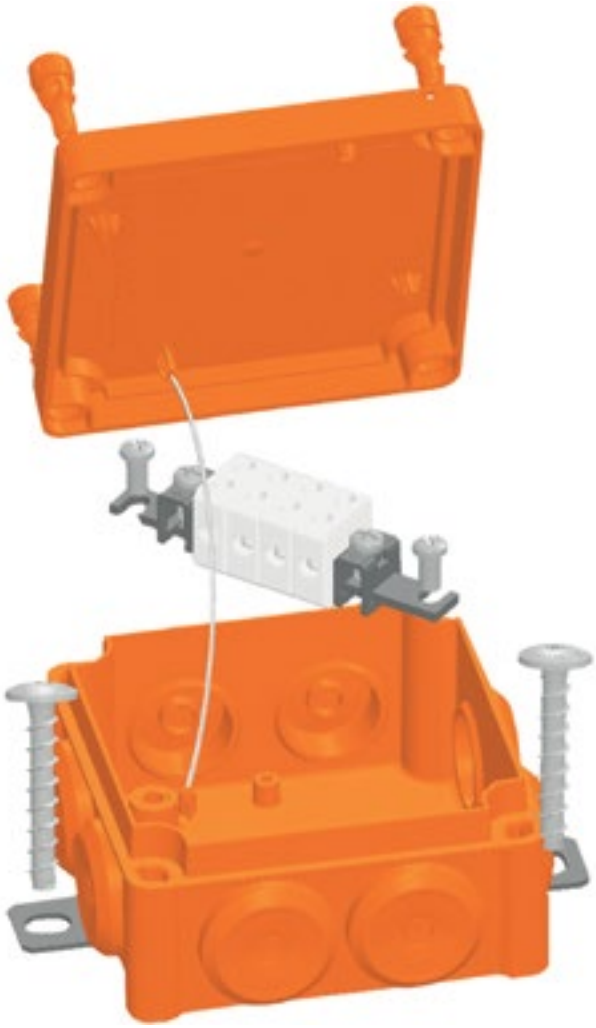
(Not for functional integrity!)

For higher load requirements, the Datwyler Hermann clamp can be used.
(for assembly instructions, see page 90)

Installation spacing (cm)	60	80
Cable weight (kg/m)	15	11.25

(Not for functional integrity!)

Assembly instructions for VAD socket E30-E90



Drill the holes:
drill bit diameter is 6 mm,
embedment depth is > 45 mm.
Blow out the drilled holes
with compressed air to clean them.

Fix the Box:
with the standard mounting screws
and T-Drive „30".
The VAD 3 box is mounted on the
approved mounting surface.
Unscrew the lid and secure it against
falling with the lid loop.
The cable entries are made by piercing
the existing dowels.
Make cable connections according to
test certificate.
Close cover and provide the cable
system with an identification sign.

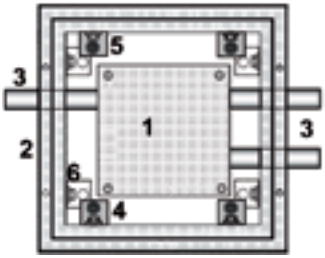
The mounting screws are certified
for concrete, full bricks, masonry,
perforated sand lime bricks and
solid sand lime bricks.

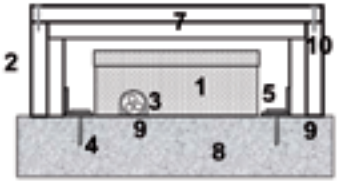
General Appraisal Certificate
P-MPA-06-030

HERCULES COVER

Assembly instructions

Cable connections using AHD E30-E90 Hercules cover



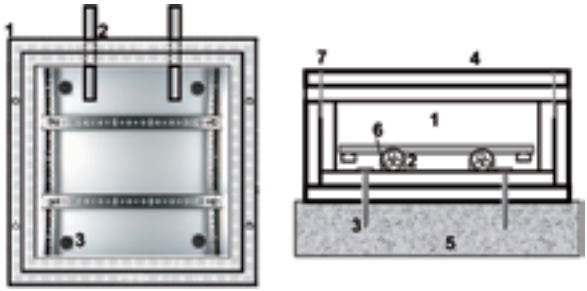


1	Junction box	6	Anchor bolt
2	AHD E30-E90 Hercules cover	7	Lid
3	Cable inlet	8	Wall
4	Anchor screws	9	Firestop mastic
5	Fastening bracket	10	Lid bolt

1. Cable connections or junctions can be installed using a conventional junction box (1) made of poly-carbonate and terminals made of polyamide 6.6.
2. Cut openings into the bottom of the AHD E30-E90 Hercules cover (2) for the cable inlets (3).
3. Drill the plug holes for the fasteners (4).
4. Fasten the 4 brackets (5) to the intended anchor bolts (6), depending on your space requirements
5. Clean the assembly surface, remove the lid from the AHD E30-E90 Hercules cover (7) and fasten the enclosure using the correct anchor screws (4) until there is a gap of approx. 5 mm between the enclosure (2) and wall (8). Fill this gap and the cable inlets using S 100 SM-K firestop mastic (9). Next, tighten the enclosure into place using the anchor screws (4). Scrape away or smoothen any protruding fire-stop mastic (can be washed away or thinned using water during the workability period).
6. Close the lid on the AHD E30-E90 Hercules cover (7) using the correct lid bolts (10). (Do not seal the cover using firestop mastic!))

Note: The spacing between the side walls of the AHD E30-E90 Hercules cover and the junction boxes must be at least 35 mm and 10 mm between the lids.

Cable connections using AHD E30-E90 Hercules terminal box



1	AHD E30-E90 Hercules teminal box	5	Wall
2	Cable inlet	6	Firestop mastic
3	Anchor screws	7	Lid screw
4	Lid		

1. Drill the plug holes for the anchor screws (3).
2. Clean the mounting surface, remove the lid from the AHD E30-E90 Hercules terminal box (4) and fasten the enclosure using the corresponding anchor screws (4).
3. Drill cable inlets into the enclosure large enough for the diameters of the cables.
4. After inserting the cables, generously fill the gap using S 100 SM-K fire-stop mastic (6) with enough material to cover the entire thickness of the enclosure walls. Scrape away or smoothen any protruding firestop mastic (can be washed away or thinned using water during the work period).
5. Fit conventional terminals or LSA+ onto the standard support rail and connect the wires.
6. Check that the cable inlets (2) are sufficiently sealed using fire-stop mastic (6) and add more if necessary.
7. Close the lid on the AHD E30-E90 Hercules terminal box (4) using the correct lid bolts (7). (Do not seal the cover using firestop mastic!)

ASSORTED PLUGS

Basic information on plugs

Fastening surface: concrete ≥ B25

Application area	Plug type	Drill bit	Setting tool	Load (kN) R90	
				Central tension	Tranverse load
Single clamp SAS	K6x5	SDS 1	EWA6x5 SM	0.3	0.3
Single clamp SAS pre-assembled	SAS…D-K6x5	SDS 1	SMu 6 SM	0.3	0.3
Tunnel clamp TSD	KDM	SDS 1	SWM-SM	0.3	0.3
G-rail	KDM	SDS 1	SWM-SM	0.3	0.3
Protective cable duct	KDM	SDS 1	SWM-SM	0.3	0.3
G-duct	KDM	SDS 1	SWM-SM	0.3	0.3
Cable rails, light	KDM	SDS 1	SWM-SM	0.3	0.3
Hermann clamp	KDM	SDS 1	SWM-SM 50	0.3	0.3

Note: Clean the drilled hole with compressed air before inserting the plug.

Fastening surface:
cracked and uncracked concrete ≥ C20/25 up to C50/60
MMS+ P / MMS+ St embedment debth: ≥ 35 mm

Solid brick MZ, dimensions ≥ 240x115x71 mm, compressive strengh ≥ 28
Stone KS, dimensions ≥ 240x115x71 mm, compressive strengh ≥ 12
Perforated brick KS L, dimensions ≥ 240x175x113 mm, compressive strengh ≥ 12
Solid stone KS XL, dimensions ≥ 248x175x498 mm, compressive strengh ≥ 20

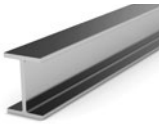
Application area	Plug type	Drill bit ø / min. emb. depth (mm)	Setting tool	Load (kN) R90*
Single clamp SAS	MMS+ St 6/55	5/45	M10	0.15
Tunnel clamp TSD	MMS+ St 6/55	5/45	M10	0.15
G-rail*	MMS+MS 7,5/60	6/55	Torx "30	0.15
Protective cable duct	MMS+MS 7,5/60	6/55	Torx "30	0.15
Hermann clamp	MMS+MS 7,5/60	6/55	Torx "30	0.15

Note: clean the drilled hole with compressed air before inserting the plug.

* depending on the stone, the load can be higher.

Fastening surface:
Gas concrete with strength class ≥ 4

Application area	Plug type		Setting tool	Load (kN) R90 Central tension	Load (kN) R90 Tranverse load
Single clamp SAS	PBD M6x10	Do not drill! Use the setting tool for the installation.	EWP 6x10 SDS	0.35	0.35
Tunnel clamp TSD	PBD M6x10		EWP 6x10 SDS	0.35	0.35
C-rail	PBD M6x10		EWP 6x10 SDS	0.35	0.35
Protective cable duct	PBD M6x10		EWP 6x10 SDS	0.35	0.35
G-duct	PBD M6x10		EWP 6x10 SDS	0.35	0.35
Cable rails, light	PBD M6x10		EWP 6x10 SDS	0.35	0.35
Hermann clamp	PBD M6x10		EWP 6x10 SDS	0.35	0.35
Cable rails, heavy (M10)	PBD M10x10		EWP 10x10 SDS	0.80	0.80



Fastening to steel supports*
As an alternative to using plug fasteners, the profile rails, single clamps, multi-cable supports or protective cable ducts can also be fastened using spring steel clips.
Spring steel clips may only be loaded to a maximum of 25 N.
With respect to functional integrity duration, the steel support must be protected by at least the same degree as the cables.

Fastening to wooden beams*
As an alternative to using plug fasteners, the profile rails, single clamps, multi-cable supports or protective cable ducts can also be fastened to wooden beams using steel woodscrews. With respect to fire requirements, the minimum cross-section dimensions of the wooden beams must be properly dimensioned according to the functional integrity duration of the cable. The screw-in depths and edge spacings must be increased for E30 by 30 mm and by 90 mm for E90.

Fastening to post-and-beam/drywall constructions?
Unfortunately, this is not possible since drywalls can break and fall down on the side facing the fire.

* The latest General Appraisal Certificates (ABPs) must no longer include expert's opinion on fastening to steal supports or wooden beams. Please see the previous MPA Appraisal Certificates which can still be found on our website for your evaluations.

K6X5 / KDM PLUG

Assembly instructions

Assembly instructions for K6x5 plugs with type SAS ... D single clamp

Drilling
Embedment depth: 32 mm
Drill bit: SDS1
Purge the drilled hole.
Insert the pre-assembled clamp and plug into the drilled hole.

Driving in
Place the setting tool "SMu 6-SM" or "SDS1" onto the "SDS1" drill bit.
Drive the plug into the drilled hole using the drill hammer.

Assembly instructions for KDM plug with Hermann clamp

Drilling
Embedment depth: 32 mm
Drill bit: SDS1. Purge the drilled hole.
Insert the plug with a nut and washer through the Hermann clamp and into the drilled hole.

Driving in
Place the setting tool "SWM-SM 50" onto the "SDS1" drill bit.
Drive the plug into the drilled hole using the drill hammer.

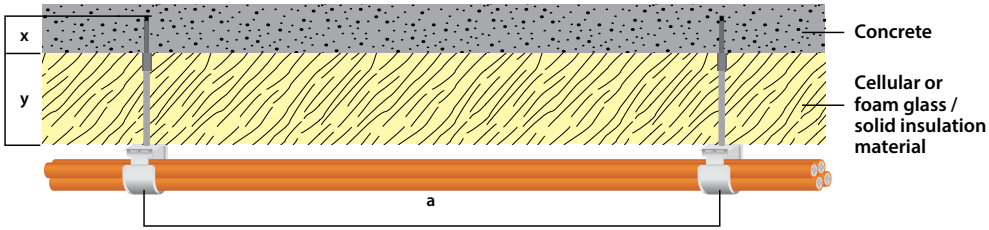
Assembly instructions for KDM plug with 2970/2 SLD profile rail

Drilling
Embedment depth: 32 mm
Drill bit: SDS1
Purge the drilled hole.
Insert the plug with a nut and washer through the profile rail and into the drilled hole.

Driving in
Place the setting tool "SWM-SM" or "SWM-SM 50" onto the "SDS1" drill bit.
Drive the plug into the drilled hole using the drill hammer.

Assembly instructions for insulation bridging set for insulated ceilings, thickness > 100 mm

Embedment depth in concrete (x): minimum of 45 mm,
plus thickness of non-flammable insulation (y). Borehole depth = x+y.
Drill diameter: 5 mm for MMS+ ST.



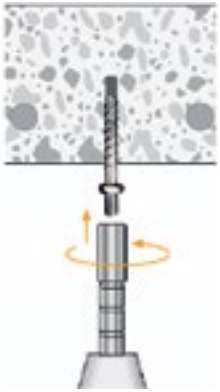
x = Embedment depth in concrete
y = Thickness of insulation
a = Distance between Hermann clamps, SAS clamps, other:
see pages 34 to 43.
The distances are the same as for direct mounting on ceilings (or walls).

MMS+ST / MMS-KS MOUNTING SCREW

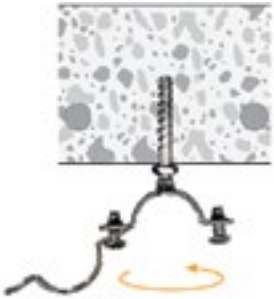
Assembly instructions

Assembly instructions for MMS+St mounting screw and type SAS ... D single clamps

Drilling
Embedment depth: > 45 mm
Drill diameter: 5 mm
Drill hole depth: > 55 mm
Purge the drilled hole!



Driving in
with M10 socket wrench



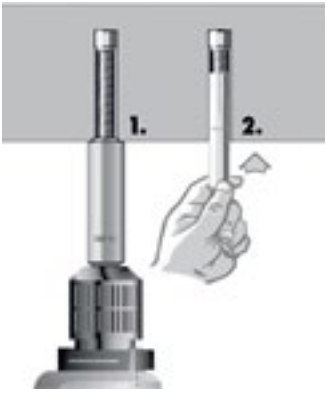
Screw on
the clamp

Assembly instructions for MMS+MS mounting screw and Hermann clamp / profile rail

Drilling
Embedment depth: > 55 mm
Drill diameter: 6 mm
Drill hole depth: > 65 mm
Purge the drilled hole!
Insert MMS+MS bolt through Hermann clamp / profile rail up to the drilled hole.

Driving in
with T-Drive „30"

Assembly instructions for PBD gas concrete plugs (wall thickness: ≥ 175 mm)



1. Use the setting tool and hammering mode of the drill hammer to drive the tapered bolts into the gas concrete.
   Do not pre-drill.
2. Insert the splaying sleeve.
3. Use the setting tool and hammer mode of the drill hammer to drive the splaying sleeve into place.
4. Tighten the component into place until the blue marking becomes visible.

NOT THAT WAY!

Assembly instructions

Pay attention to surrounding components

Anti-slip protection is missing

Strain relief with clamps outside

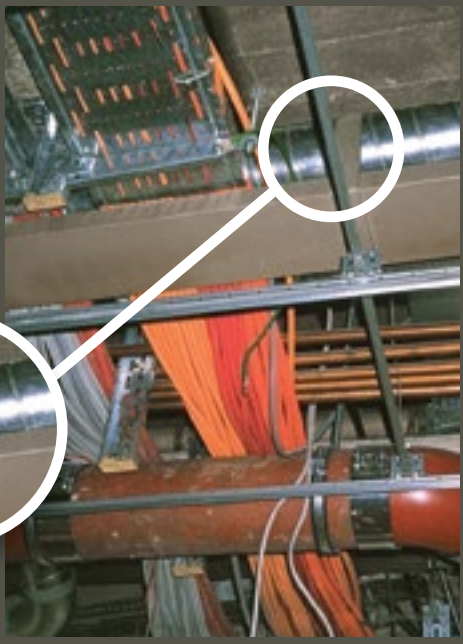
Do not replace clamps!

Use a fuse for branches

Only use a sleeve if you can't use a box

Only use crack-proof fastening systems on concrete ceilings

(at a loss for words)



Pay attention to surrounding components

Do not overload the trays

Separate installation!

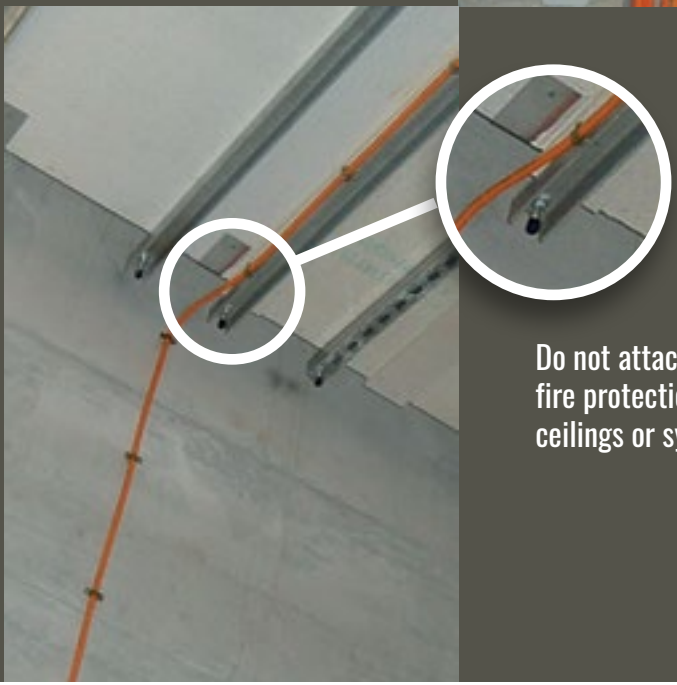
Only on approved installation systems

NOT THAT WAY!

Assembly instructions

Pay attention to surrounding components

An effective support mount is required every 3.5 meters



Do not attach to other fire protection walls, ceilings or systems

In plaster or in walls? This is not a solution for maintaining functional integrity.

Adhere to bending radii.
Cables must not get any pressure points. Use counter troughs.

FAQ

Can cables with functional integrity be installed directly in the earth?

The standards pertaining to the installation of cables of these types is given in DIN VDE 0276-604 and DIN VDE 0266.
Neither DIN VDE 0276-604 nor DIN VDE 0266 contains provisions for installing these cables directly in the earth or in water. However, it is permitted to install them in cable conduits as long as no water can collect in the conduits.

Are cables with functional integrity also resistant to UV light?

The UV light resistance of a cable chiefly depends on the colour of the external sheathing.
Cables that are conceived for outdoors applications and exposure to sunlight are generally fitted with a black sheathing. Datwyler cables with red or orange sheathing are UV-stabilised but not protected against excessive exposure to sunlight. They should be protected using a duct, conduit (with consideration of the general test certificate) or coated externally using water-soluble dispersion paint.

Is it possible to repair the external sheathing of any of the following halogen-free cables or lines, or cables with functional integrity?

Just as with PVC-insulated cables and lines, zero-halogen cables and lines can be repaired using blow-out patches. Datwyler Keram cables with integrated functional integrity did not exhibit premature failure in tests using connecting joints.
Since the cable sheathing, filling material and parts of the conductor insulators are destroyed by fire and only the ceramic coating directly on the copper wire insulates it against fire, the external sheathing of Datwyler Keram cables can be repaired using blow-out patches.
Any metallic components of the blow-out patch must be removed after the tubing has shrunk into place.
However, it makes sense to use a zero-halogen blow-out patch.

Do zero-halogen cables or lines, or cables with integrated functional integrity have better fire load properties than PCV-insulated cables?

No.
Depending on the manufacturer, cable type and standard, there may be fluctuations.
When comparing similar types of cables, the fire-load values of zero-halogen cables is even usually quite a bit lower.
The largest differences can be observed when comparing various cables with functional integrity. Since ceramics are used in the Datwyler cables, their fire load characteristics are up to 50% lower than those of comparable cables.

The confusion pertaining to the supposed higher fire load properties of zero-halogen cables originated in a VdS data sheet (VdS 2134:1999-01 and its predecessor). Since the zero-halogen sheathing cable NHXMH was not included with this data sheet, readers mistakenly compared the PVC-sheathed cable of type NYM with the zero-halogen cable of type NHXHX with 0.6/1 kV (intended for containment applications in nuclear power plants).
The correct comparison here would have been between cables such as NYM 3x1.5 mm^2 (fire load: 0.44 kWH/m) and Datwyler NHXMH 3x1.5 mm^2 (fire load: 0.33 kWH/m).

What is the maximum tensile loading capacity for zero-halogen cables/lines or for cables with functional integrity?

NHXMH	acc. to DIN VDE 0298 - 3:	50 N / mm^2 core cross-section
N2XH/CH, (N)HXH/CH E30-E60, (N)HXH/CH E90	acc. to DIN VDE 0276-604:	50 N / mm^2 core cross-section
J-H(St)H...BD, JE-H(St)H…BD FE180 E30-90	acc. to DIN VDE 0891 - 5:	depending on number of cores, span length and temperature

What is the maximum permissible operating temperature at the cable for zero-halogen cables/lines or cables with functional integrity?

(N)HXSLHXÖ-J	acc. to Datwyler specifications:	- 25 °C to + 90 °C moving air
	acc. to Datwyler specifications:	- 40 °C to + 90 °C stationary air
NHXMH, H07Z-U/R, H05 / H07Z-K	acc. to DIN VDE 0298 - 3:	+ 5 °C to + 70 °C moving air
	acc. to DIN VDE 0298 - 3:	- 40 °C to + 70 °C stationary air
N2XH/CH, (N)HXH/CH E30-E60, (N)HXH/CH E90	acc. to DIN VDE 0276-604:	- 5 °C to + 90 °C moving air
	acc. to Datwyler specifications:	- 25 °C to + 90 °C stationary air
Dätwyler FE 180/E30-CL Keram	acc. to Datwyler specifications:	- 5 °C to + 90 °C moving air
	acc. to Datwyler specifications:	- 25 °C to + 90 °C stationary air
J-H(St)H..., JE-H(St)H… E30-E90	acc. to DIN VDE 0891 - 5:	- 5 °C to + 50 °C moving air
	acc. to DIN VDE 0891 - 5:	- 30 °C to + 70 °C stationary air

The installation temperatures are the same as the temperatures for moving air. These temperatures apply for the cable itself but not for the surroundings. If the temperature of the cables is low, warm them up. Make sure that the temperature never drops below the lowest permissible temperature during the entire installation.

How does safety cable behave in tunnels or subterranean garages?

Given that the following auxiliary conditions are met, the functionality of our zero-halogen cables and lines will not be compromised or negatively affected by the effects of water or water-salt solutions (road salt) nor from acids resulting from automotive exhaust gases:

- There is no damage to the cable sheath.
- No water can penetrate into the cable in the longitudinal direction.
- The cables have been installed in a protected state (e.g., in a closed concrete duct with a sand bed so that the cables are not permanently surrounded by water or situated in pipe systems where water can flow).

Datwyler can guarantee the full range of functions for its cables if the cables are stored in the following media or under the following conditions:

- Storage at almost 100% air humidity
- Storage in stagnant water, temperature range: + 5 °C up to a maximum of +50 °C.

FAQ

How is it possible that a terminal lug / crimped connector with the same cross-section as a given conductor is actually too large for the conductor?

For multicore copper cables with diameters larger than 16 mm^2, the round copper wires are deformed (compressed) and fill out the intermediary spaces between the cores. Thus, the cable diameter decreases effectively. However, the cable cross-section is not changed and remains equivalent to the sum of the cross-sections of the various copper cores.
For this reason, the terminal lugs or crimped connectors should be dimensioned according to the diameter of compressed copper cable or suitable reducers should be used.

Is it possible to install high-current cables together with low-current cables?

According to DIN 4102-12, the functional integrity is not affected by combining high-current and low-current cables in an installation. However, the regulations given in the DIN VDE provisions apply.

Is it permissible to apply coatings to Datwyler safety cables?

Datwyler safety cables can be coated with water-thinnable dispersion paint. For cables with functional integrity or fire detector cables, it is recommended to confer first with the responsible authorities since the orange or red signal colour may be concealed.

Is it permissible to install safety cables directly in concrete?

According to DIN VDE 0276 Part 604 Appendix A Section 3.1 (contains regulations pertaining to the application areas for low voltage cables with improved fire properties), safety cables may installed indoors, in the air or embedded in concrete. According to HD 604 Part 5 Section 5.1.2, the cables also have to be protected against mechanical damage.
Functional integrity can only be achieved as part of a "non-essential deviation" if the cable has a functional integrity approval for the installation under plaster.

Is the C-conductor of a concentric cable [(N)HXCH] a shield?

The concentric conductor in cables is not a shield in the electrical sense and thus not comparable with telecommunications or IT applications. It only provides a mild shielding effect. This concentric conductor is defined in DIN VDE 0276 Part 604 Section 5 Item 3.3.5.

Functional integrity under plaster or in concrete?

NHXH E30/NHXCH E30 and NHXH E90/NHXCH E90 may be installed indoors, in the air or in concrete (DIN VDE 0276 Part 604 Annex A Section 3.1). However, the cables must be protected against mechanical damage.
The laying in concrete can only be deduced within the scope of a "non-significant deviation" if the cable has a functional integrity approval for the installation under plaster.
The installation under plaster or in concrete does not per se constitute a measure of the functional integrity.

Can zero-halogen cables and lines be fitted with joints?

Zero-halogen cables and lines can be fitted with joints just as with PVC-insulated cables and lines. However, it makes sense to use a zero-halogen joint. Certified Datwyler joints are available for Datwyler Keram cables with functional integrity.

Can zero-halogen cables and lines be connected to PVC-insulated cables and lines?

Seen from a purely electrical viewpoint, yes. However, the resultant cable will not fulfil the requirements in DIN VDE 0482-267 for zero-halogen cabling. It will no longer be possible to guarantee minimal fire propagation in accordance with DIN VDE 0482-266 and minimal smoke density inaccordance with DIN VDE 0482-1034.

What does “NHMH or zero-halogen cable without improved behaviour in cases of fire” mean? (Datwyler: NHXMH)

In contrast to NHXMH, NHMH cables do not fulfil the test criteria for minimal fire propagation in accordance with DIN VDE 0482-266-2-4, nor do they comply with the requirements for low smoke density as stipulated by DIN VDE 0482 Part 1034. The danger with this cable type is that it can exhibit a fuse effect and produce dense smoke.
NHMH is therefore not suitable for applications requiring compliance with DIN VDE 0100-482 in rooms or locations containing irreplaceable goods of high value nor in areas where people congregate as stipulated in the pertinent VdS loss prevention provision (VdS 2025 – Cable and Line Systems).

What is the difference between flame-retardant and minimal flame propagation, or, in other words, what does “improved behaviour in cases of fire” mean? Datwyler: J-H(St)H, NHXMH, N2XH/CH Datwyler Keram: JE-H(St)H/HRH...BD FE180 E30-E90, (N)HXH/CH E30-E60 / E90

When one speaks of a “flame-retardant cable”, this means that this cable can, depending on its diameter, self-extinguish any flames within one minute after the fire source moves or is moved away (DIN VDE 0482-332-1). DIN VDE defines this as “flame resistant”.
However, since “flame-resistant” cables may still have very high fire propagation properties, this laboratory test on its own is not particularly relevant for real-world applications and says nothing of the actual fire properties of the given cable.
On the other hand, minimal fire propagation indicates that the fire source will not propagate even after 20 or more minutes of exposure to the fire (DIN VDE 0482-266-2-4). Furthermore, groups of cables containing a specific volume of non-metallic materials (in VDE 0482-266-2-4 = 1.5 l) with a length of 360 cm are tested under real-world conditions.

What is the meaning of E30 or E90 functional integrity?

This refers to functional integrity as stipulated in DIN 4102 -12. Since functional integrity is only maintained when the functionality of both the cable and installation system remains integral, this test always applies to the entire system.
On their own, neither the cable or installation system offer functional integrity.
Furthermore, it is essential to use certified plugs and bolts.

FAQ

Is it permitted to re-use cables with functional integrity following a fire? Datwyler JE-H(St)H/HRH...BD FE180 E30-E90 Keram, (N)HXH/CH E30-E60 / E90 Keram

All safety cables must be replaced following any type of exposure to a fire.
Cable systems with functional integrity must be re-certified from a qualified appraiser.
Cables with functional integrity are by no means absolutely fireproof.

What happens when cables with functional integrity are exposed to high-pressure water in sprinkler systems during fire? Datwyler (N)HXCH E90 Keram

Datwyler safety cables (N)HXCH E90 Keram of size 16 mm^2 and above have been tested in accordance with VdS Provision 2344 (1999-02) for this application and have been certified by VdS.

Are cables with functional integrity suitable for applications where the surrounding temperatures are permanently > 100 °C?

No. Cables offering functional integrity are not silicon lines and cannot be compared with them.
The permissible temperature range with stationary air for conductors is
-25 °C to + 90 °C for (N)HXH FE180/E30-E60 and
-30 °C to + 70 °C for JE-H(ST)H…Bd FE180/E30-E90

What is the proper method of installing vertical lines of cables with functional integrity that extend across multiple storeys?

According to DIN 4102 Part 12, this type of installation requires that cables are supported at a spacing of up to 3500 mm. This can be done by installing "meandering" lines, using S90 ceiling fire bulkheads or encasing the lines in WUM clips.

What does the "G" number indicate with respect to functional integrity?

For supply lines to sprinkler pump motors, the VdS provision for spinkler systems (VdS CEA 4001 9.8.2.2 f) stipulates an additional test of the functionality of the cable when exposed to water during a fire (VdS Provision 2344).
If a cable passes this test, it is assigned an approval code that begins with G.
Datwyler (N)HXCH E90 Keram 16 mm^2 and larger: Approval code G-4980024.

How should cable systems be assessed following flood damage?

With the exception of buried cables with longitudinal waterproofing, we suggest the following recommendations for our cable types:

Transverse watertightness:
If the cable is submerged in water for approx. 1 month, this is considered to be a short-term exposure. According to DIN VDE, this is not equivalent to being installed under water. With respect to the transverse watertightness, as long as the cable sheath is not damaged, there is no need to suspect that the cable has been compromised. Important: exposure to chemical substances (e.g., oil) from neighbouring rooms must be considered separately.
Longitudinal watertightness:
As with NYY, our cables are not watertight in the longitudinal direction! As a result of the capillary effect, water can penetrate the cable to a point that is even above the effective water level.
It is not possible to fully remove this water from the cable.
However, the positive results of an insulation measurement that was performed indicate that the cable can still be used.
It is not possible to reach any further conclusions with respect to the product life.

E30-E90 systems with functional integrity:
With respect to transverse watertightness, the same applies as for the cable types given above.

With respect to longitudinal watertightness, the functional integrity (JE-H(St)H E30-E90, NHXH/CH E30, NHXH/CH E90) may be heavily compromised. In areas where water collects in cables, the cable may burst open as a result of boiling/vapourising water and thus cause a short circuit.
To continue to ensure safety in these functional integrity classes, we recommend replacing the cable. (Furthermore: This hazard also exists in electrical ducts containing conventional cables since fire temperatures of above 100 °C are permitted here.)

What does ABP mean?

ABP is a German abbreviation for a "General Appraisal Certificate" from building authorities. According to building laws and regulations, cable systems with integrated functional integrity must be supplied with a "General Appraisal Certificate". Otherwise, approval is required on a case-by-case basis from the highest building authority.

FAQ

What is the bending radius for zero-halogen cables/lines or for cables with functional integrity?

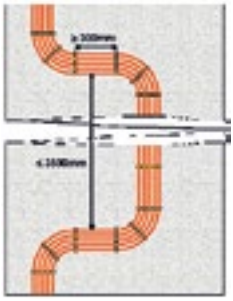
NHXMH	acc. to DIN VDE 0298 - 3	4 x external diameter
N2XH/CH, (N)HXH/CH E30-E60 / E90	acc. to DIN VDE 0276-604	15 x external diameter (single core) 12 x external diameter (multi-core)
J-H(St)H…, JE-H(St)H… E30-E90	acc. to DIN VDE 0891 5:	7.5 x external diameter
(N)HXSLHXÖ ≤ 12 mm	permanently installed	3 x external diameter
(N)HXSLHXÖ > 12 mm	permanently installed	4 x external diameter
	When bent once	
(N)HXSLHXÖ ≤ 8 mm	permanently installed	2 x external diameter
(N)HXSLHXÖ > 8 -12 mm	permanently installed	3 x external diameter
(N)HXSLHXÖ > 12 mm	permanently installed	4 x external diameter

The prerequisite here is that the cable is bent evenly without any kinks.

What is the proper method of installing vertical lines of cables with functional integrity that extend across multiple storeys? Meander-shaped installation or effective support mounts WUM

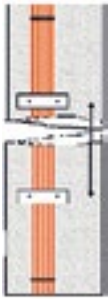
According to DIN 4102-12 Section 8.3, the classification of functional integrity only applies when effective support mounts (spacing ≤ 3,500 mm) are installed for the cables. An example of an effective support mount is shown in the figure below (right side). Another method is to use an appropriately classified ceiling fire bulkhead or a tested and certified clip construction. Only authorised test institutes are permitted to evaluate mount designs that differ from the one shown in the figure below (left side).

The figure below (left) displays a meander-shaped cable installation, with the cable system leading horizontally every 3500 mm and fastened by two clips at a spacing of max. 300 mm. The cable must run for at least 300 mm in the horizontal direction. The bending radii must be included in the calculation.
When using Datwyler WUMs (effective support mounts), it is possible to eliminate the need for the horizontal cable routing since this has been certified by a recognised test institute.



"With riser lines, this classification only applies when effective support mounts (spacing ≤ 3500 mm) are installed for the cables."

Datwyler WUM



Installation using only single or strap clamps:
According to DIN 4102-12 Section 8.3, the only test results that apply to vertical cable systems are those for separately installed cables on ceilings using single clips. A certified strap clamp can be used as alternative means of fastening the cables. The spacing of the strap clamps is the same as the spacing used to install cables separately using single clips. (Using standard installation techniques, this corresponds to a fastener spacing of 300 mm).
Using Datwyler, SAS single clips or strap clamps of type B…D, it is possible to achieve fastener spacings of up to 1.2 m with bundled cable weights of up to 2.5 kg/m. For more information, refer to our "Optional Installation Techniques".

How does DIN 4102-12 stipulate fastening single-core high-current cables with integrated functional integrity?

The cable is subject to DIN VDE 0266 and this standard refers to DIN VDE 0276-604 for applications. According to section 5.5.3, single-core cables may only be installed separately or in bundled systems (L1,L2,L3). A system of bundled cables can be treated in the same manner as multicore cables. When installing single-core cables, only use clips made of plastic or non-magnetic metals. Steel clips may only be used if the magenetic circuit is not closed.
According to DIN 4102-12, only the systems listed in the "General Test Certificate" may be used.

Due to their low melting points, clips made of plastic or aluminium are not approved for applications requiring functional integrity.
Our Datwyler (N)HXH/CH E30-E60 / E90 Keram safety cable has been approved for three-phase cable group installations and is expressly listed in the general test certificate.

Along escape routes, LAR (German code of practice) stipulates that fire-safe fasteners must be fitted for lines installed between floor slabs and suspended ceilings. Which products are suitable for this application?

Datwyler Hermann clips and E0 multi-cable supports combine the simple yet flexible assembly of multi-cable supports with the high requirements of fire-safe installations. For these applications, Hermann clips can be subjected to cable weights of up to 10 kg/m with a fastener spacing of 600 mm. In contrast to functional integrity applications, if the distance is shortened, the cable weight can be increased accordingly. On the other hand, fastener spacings of up to 800 mm are possible with reduced loads. The fireproof plugs are used as the fasteners in these applications.

DIN 4102-12 provides information on the thermal effects that cause the electrical resistance to increase in copper lines. How should this be taken into account when dimensioning cables?

For cable systems with integrated functional integrity, DIN 4102-12 stipulates that, if no special measurements are performed, the conductor temperature can be approximated as the fire room temperature for the purpose of choosing an appropriate cable size. (E30: 860 °C and E90: 1000 °C)
In measurements of the copper conductors in cables, Datwyler has determined that the actual temperatures in the copper conductors are significantly lower. For Datwyler cables we have therefore developed a simple calculation program for the line voltage drop that also takes the fire compartments into consideration. The max. permissible line voltage drop also has a large effect, since during fires it depends only on the electrical consumers and can amount to 5% or more. (Doubling the voltage drop halves the cross-section!)

Please download our cross-section calculation tool.

FAQ

Table with material stabilities at room temperature

Materials	Stability at room temperature of 23 °C
5% + 30% formaldehyde	Good to very good over short term
5% + 30% acetic acid	Good to very good over short term
Methanol	Good to very good over short term
20% soda brine	Good to very good over short term
NaCl 10% common salt solution	Good
Chlorine water 3%	Conditional to good
Ammonia (gaseous/aqueous)	Average to good/The material is not destroyed
Hydrocarbon	Conditional to average over short term
Water resistance	
(water bath storage at 70 °C)	Average
Water resistance	
(water bath storage at 23 °C)	Good to very good
Storage with air humidity close to 100%	Very good

Fore more extensive information and aids such as calculating tools, manuals, forums, MLAR, approvals and more, visit us at ITinfra.datwyler.com!

Typos:

Dear reader,
After extensive changes in this manual very likely a few typos will have crept into this document. We would be very glad to receive any feedback from you on typos or other mistakes that you may have found!

Subject to change without prior notice.

Your Datwyler team.

Preventive fire protection and system circuit integrity

The co-ordinated and licensed Datwyler products enable optimal system approaches and guarantee quality, cost-efficiency, saving of time and security.

300 mm

Standard laying technics with single clamp (of different manufacturers)

600 mm

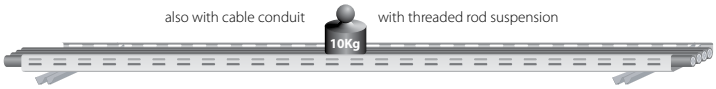
Standard laying technics with strap clamp with trough (of different manufacturers)

600 / 800 mm

Hermann clamp: **bundling, e.g. 30 cables 3x1.5mm²**

600 / 800 / 1200 mm

Single clamp
Strap clamp



1200 mm

Standard cable tray (of different manufacturers)

1500 mm

Datwyler cable tray without threaded rod suspension for wall and ceiling installation.
Optional laying techniques with different cable tray manufacturers.

Datwyler E30-E90 support systems

SYSTEM CIRCUIT INTEGRITY E30-E60 / E90 ACC. TO DIN 4102-12

SAS single clamp

Art. No.:	Type	Ømm	PU/pcs.
1300016	SAS 6 D	5-6	100
1300017	SAS 8 D	7-8	100
1300018	SAS 10 D	9-10	100
1300019	SAS 12 D	11-12	100
1300020	SAS 14 D	13-14	100
1300021	SAS 16 D	15-16	100
1300022	SAS 18 D	17-18	100
1300023	SAS 20 D	19-20	100
1300024	SAS 22 D	21-22	100
1300025	SAS 24 D	23-24	100
1300026	SAS 26 D	25-26	100
1300027	SAS 28 D	27-28	100
1300028	SAS 30 D	29-30	100
1300251	SAS 38 D	29-38	25
1300252	SAS 47 D	38-47	20
1300234	SAS 55 D	47-55	20
1300250	SAS 60 D	55-60	20

SAS single clamp, pre-assembled with fire protection plug

Art. No.:	Type	
1300956	SAS	8 D - K6x5 S
1300957	SAS	12 D - K6x5 S
1300958	SAS	14 D - K6x5 S
1300959	SAS	16 D - K6x5 S

Single clamp - type SAS accessories:

Plug set, 200 pcs., with SDS1 drill bit

Art. No.:	Type
1300953	Plug set K6x5 S

Drill bit

Art. No.:	Type
1300962	SDS1 drill bit

Setting tool

Art. No.:	Type
1300963	SMu 6 SM setting tool

Mounting screws for red bricks and lime-sand bricks:

Stair bolt, 100 pcs., for brickwork

Art. No.:	Type
3800097	MMS+ St 6/55

dentification sign 10 pcs.

Art. No.:	Type
1300479	Cabling system

WUM
support mount for vertical cable installation

Art. No.:	Type	
1301276	WUM 300 E30	100 x 370 x 135 mm
1301278	WUM 400 E30	100 x 470 x 135 mm
1301277	WUM 500 E30	100 x 570 x 135 mm
1301275	WUM 300 E90	200 x 470 x 185 mm
1301274	WUM 400 E90	200 x 570 x 185 mm
1301273	WUM 500 E90	200 x 670 x 185 mm

Datwyler Keram
installation cables E30–E90

Fire alarm cable, red
JE-H(St)H...Bd FE180 E30–E90
JE-H(St)H...Bd FE180 E30 L

Fire alarm cable, red
with steel wire braiding
JE-H(St)HRH...Bd FE180 E30–E90

Wiring cable, orange
JE-H(St)H...Bd FE180 E30–E90
JE-H(St)H...Bd FE180 E30 L

Datwyler Keram
low-voltage cable, E30–E60 / E90

with protective earth conductor green / yellow
(N)HXH FE180 E30–E60
(N)HXH FE180 E90
(N)HXH FE180 E30–E60 $B2_{ca}$
(N)HXH FE180 E90 $B2_{ca}$

with concentric protective conductor
(N)HXCH FE180 E30–E60
(N)HXCH FE180 E90
(N)HXCH FE180 E30–E60 $B2_{ca}$
(N)HXCH FE180 E90 $B2_{ca}$

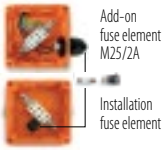
with VdS certification for ≥ 16 mm²
(N)HXCH FE180 E90 VDS

Single-core cable
with VdS certification for ≥ 16 mm²
(N)HXH FE180 E90 VDS

Mounting screws for lime-sand bricks:

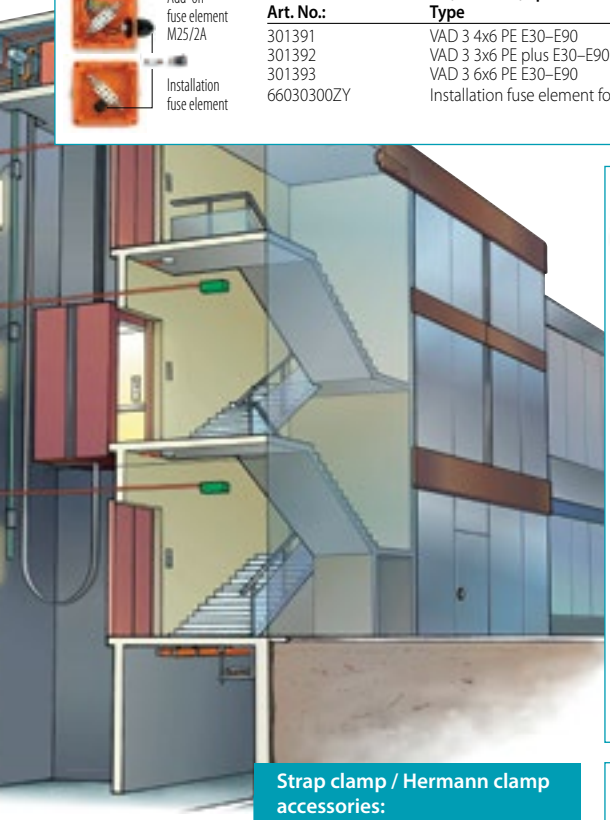
Distribution box for power current - type Hercules, E30–E90, 1 pc.

Art. No.:	Type	Inner dimensions	
301382	AHD 263013 E90	260 x 300 x 130 mm	(empty, without base)
301375	HS 263013 E30-E90	260 x 300 x 130 mm	with top hat rail 35 x 7.5 mm 1-row
301376	HS 353013 E30-E90	350 x 300 x 130 mm	with top hat rail 35 x 7.5 mm 2-rows
301377	HS 523013 E30-E90	520 x 300 x 130 mm	with top hat rail 35 x 7.5 mm 3-rows
301378	HI 263013 E30-E90	260 x 300 x 130 mm	with QSA trough for 6 strips
301379	HI 353013 E30-E90	350 x 300 x 130 mm	with QSA trough for 11 strips
301380	HI 523013 E30-E90	520 x 300 x 130 mm	with QSA trough for 13 strips



Connection / terminal box, E30–E90, 1pc.

Art. No.:	Type	Outer dimensions (mm)
301391	VAD 3 4x6 PE E30–E90	100 x 100 x 50
301392	VAD 3 3x6 PE plus E30–E90	100 x 100 x 50
301393	VAD 3 6x6 PE E30–E90	175 x 150 x 80
66030300ZY	Installation fuse element for VAD E30-E90	40 x 20 x 20



Strap clamp, E30 – E90

Art. No.:	Type	Ø mm	PU/pcs.
1300043	B12D	6-12	100
1300044	B14D	10-14	100
1300045	B16D	12-16	100
1300046	B18D	14-18	100
1300047	B22D	18-22	100
1300048	B26D	22-26	100
1300049	B30D	26-30	100
1300050	B34D	30-34	100
1300051	B38D	34-38	100
1300052	B42D	38-42	100
1300053	B46D	42-46	100
1300054	B50D	46-50	50
1300055	B54D	50-54	50
1300056	B58D	54-58	50
1300057	B64D	58-64	50
1300058	B70D	64-70	50
1300059	B76D	70-76	50
1300060	B82D	76-82	50
1300061	B90D	82-90	50
1300062	B100D	90-100	25
1300063	B110D	100-110	25

Accessories:
Counter trough for type B strap clamp

C-shaped rail

Art. No.:	Type	
1300064	2970/2 SLD	1 pc. = 2 m

Strap clamp / Hermann clamp accessories:

Plug set, 200 pcs., with SDS1 drill bit

1300954 KDM plug set

Drill bit

1300962 SDS1 drill bit

Setting tool

1300860 SWM-SM50 setting tool

Multi-cable support with plugs - Hermann clamp

Art. No.:	Type
3800206	Hermann clamp
3800200	Hermann clamp S

E0 multi-cable support
in accordance with MLAR 02/2015 3.5.3

Art. No.:	Type	PU/pcs.
3800086	E0	25
3800087	E0 S	50

red bricks and

Panhead screw, 100 pcs., for masonry

Art. No.:	Type
3800309ZX	MMS+ MS 7,5/60 for multi-cable support and C-shaped rail

DATWYLER E30 / E60 / E90 PRODUCT FINDER

SAS single clamp

SAS single clamp, pre-assembled with fire protection plug

SAS clamp accessories:

Plug set

Drill bit

Setting tool

Mounting screws for red bricks and lime-sand brick

Datwyler Keram installation cables E30–E90

Fire alarm cable, red JE-H(St)H...Bd FE180

E30–E90 E30 L

Wiring cable, orange JE-H(St)H...Bd FE180

E30–E90 E30 L

Fire alarm cable, red with steel wire braiding JE-H(St)HRH...Bd FE180

E30–E90

WUM - effective support measure for vertical cable installation

Identification sign

Datwyler Keram low-voltage cable, E30–E60 / E90

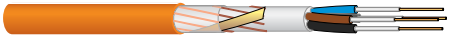
with protective earth conductor green / yellow (N)HXH FE180

E30–E60 E90

E30–E60 B2ca E90 B2ca

Single-core cable (N)HXH FE180 E90 VDS with VdS certification for ≥ 16 mm²

with concentric protective conductor (N)HXCH FE180 E30–E60



E30–E60 E90

E30–E60 B2ca E90 B2ca

(N)HXCH FE180 E90 VDS with VdS certification for ≥16 mm²

Distribution box for power current - type Hercules, E30–E90

Connection / terminal box, E30–E90

Strap clamp E30–E90

C-shaped rail

Counter trough

Multi-cable support with plugs - Hermann clamp

E0 multi-cable support
in accordance with
MLAR 02/2015 3.5.3

Strap clamp / Hermann clamp accessories:

Plug set

Drill bit

Setting tool

Mounting screws
for bricks and KS stone

NOTES

NOTES

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