

Water Cable Catalogue

For drinking, waste and hot water application



Linking the future

As the worldwide leader in the cable industry, Prysmian Group believes in the effective, efficient and sustainable supply of energy and information as a primary driver in the development of communities. With this in mind, we provide major global organisations in many industries with best-in-class cable solutions, based on state-of-the-art technology.

Through two renowned commercial brands - Prysmian and Draka - based in almost 50 countries, we're constantly close to our customers, enabling them to further develop the world's energy and telecoms infrastructures and achieve sustainable and profitable growth.

For our energy business, we design, produce, distribute and install cables and systems for the transmission and distribution of power at low, medium, high and extra-high voltage. For telecoms, the Group is a leading manufacturer of all types of copper and fibre cables, systems and accessories for voice, video and data transmission.

Drawing on over 130 years' experience and continuously investing in R&D, we apply excellence, understanding and integrity to everything we do, meeting and exceeding the needs of our customers across all continents - while at the same time shaping the evolution of our industry.





Linking product expertise to the flow of water

To keep cities and industry running, water and other critical fluids must flow. For fluids to flow they must be pumped. And for these pumps to operate continually, cables are critical.

From farm fields and your garden's irrigation equipment, to municipal water systems, industrial wastewater disposal systems, water conditioning systems and more; all require the use of electrical pumps, installed in extreme environmental conditions.

Whether for a high power pumping system or a portable pump, Prysmian offers a complete range of high performance and reliable solutions that ensure

- A long lifetime
- Compliance with current standards
- Resistance towards aggressive chemical and environmental agents

Revision of the EU Drinking Water Directive

History of legislation

The European Union currently has no common guidelines for quality assurance of products that are in direct contact with drinking water. As the EAS European Acceptance Scheme was abandoned in 2006.

National Standards

However, since 2007 four Member States (France, the Netherlands, Great Britain and Germany) have voluntarily agreed to follow a testing system for the assessment of products in direct contact with the drinking water supply, commonly referred to as the 4MS Initiative.

Since 2014, the industry and authorities in four Scandinavian countries (Denmark, Finland, Norway and Sweden) through the MailD project have also cooperated to promote innovation and develop common Nordic rules for products in direct contact with the drinking water supply.

Industry Association

European Drinking Water (EDW) is a trade union for European trade unions that supplies products and materials for drinking water supplies. Their mission is to argue for a lack of harmonization of EU legal requirements and to achieve a common EU harmonized system for requirements and assessment of products and materials for drinking water supplies.

EU Mandate to Revise Standard M / 136

DWD - Drinking Water Directive

In October 2017 the European Commission issued new mandates to replace M / 136 CEN / CENELEC in order to harmonize standards for products in contact with drinking water.

EU Environmental Committee Proposal

The European Parliament's Environment Committee (ENVI Committee) responsible for the revision of the Drinking Water Directive voted on its amendments to the Commission proposal on 10 September 2018.

EU Parliament Vote

Following this the EU Parliament will vote on the recast of the Drinking Water Directive in its plenary meeting on October 23rd, 2018.

Next Steps

Now the European Parliament will be prepared to open negotiations with the Council (EU national governments) on a compromise text, which will be formally adopted by both EU chambers, becoming EU legislation.

This should be finalized by the end of 2018.

Outcome of European Parliament vote

The members of the European Parliament backed plans on October 23, 2018 to harmonise rules for materials and products in contact with drinking water across Europe under the Drinking Water Directive. The European Parliament position will help overcome the current fragmentation of regulations. This is good for public health, competitiveness and innovation.

Tap Water

The European Parliament wants to improve consumers' trust in drinking water from the tap, which is much cheaper and cleaner for the environment compared to bottled water. The legislation tightens the maximum limits for certain pollutants such as lead (to be reduced by half), harmful bacteria, and introduces new caps for certain endocrine disruptors. It also puts levels of microplastics, an emerging concern, under monitoring.

Water Access

Member states should also take measures to provide universal access to clean water in the EU and improve water access in cities and public places, by setting up free fountains where technically feasible and proportionate. They should also encourage tap water to be provided in restaurants, canteens and catering services for free or for a low service fee.

Right to Water

MEPs reiterate, following-up on their resolution on the citizens' initiative Right2Water, that member states should focus on the needs of vulnerable groups in society. They should identify people without access, or with limited access to water, including vulnerable and marginalised groups, and assess ways to improve their access. They should also inform them clearly about how to connect to the distribution network or about alternative means to have access to such water.

Vote

The report was adopted with 300 votes to 98 and 274 abstentions.

Background

According to the European Commission, lower consumption of bottled water could help EU households save more than €600 million per year. If confidence in tap water improves, citizens can also contribute to reducing plastic waste from bottled water, including marine litter. Plastic bottles are one of the most common single use plastic items found on European beaches.

Water Cable Approvals



Water Regulation Advisory Scheme (WRAS)

WRAS approval is required for many drinking water treatment devices and other products sold in the U.K. and Northern Ireland. The WRAS is in effect to prevent the waste, misuse, undue consumption, contamination or erroneous measurement of water. The scheme consists of two portions of testing: material safety testing and mechanical testing.

The material safety testing is performed in accordance with the British Standard 6920. It is comprised of five individual tests and its purpose is to ensure that the product does not impart any negative odor or flavor, leach anything harmful to a consumer's health or promote the growth of microorganisms. Mechanical testing ensures a product is watertight and properly identified.

After materials and mechanical testing is successfully completed, the information is sent to the Test and Assessment Group (TAG) for review. The TAG meets at scheduled dates throughout the year to review the submitted information. Upon review and acceptance, WRAS approval is issued. Approval is valid for five years



Elastomerleitlinie of Umwelt Bundesamt (ELL)

The German Drinking Water Elastomer Guideline was notified to the EU under no. 2013/471/D, pursuant to Directive 98/34/EEC. The valid version was published 16th March 2016.

This guideline govern the allowed list of substances used for organic materials in contact with drinking water with respect to evaluation criterias.

For some materials the formula-specific requirements concerning migration into drinking water can be computed mathematically by using the Modelling Guideline, rather than being substantiated analytically.



Kunststoff und Trinkwasser (KTW)

DVGW (Deutscher Vereinigung des Gas & Wasserfaches) regulates the German gas and water supply with products certified according to KTW guidelines.

KTW guidelines for hygienic assessment of organic materials in contact with drinking water, was notified to the European Commission under no. 2013/470/D, pursuant to Directive 98/34/EEC.

The KTW guideline contains test protocols and safety requirements for plastics and silicones that come into contact with drinking water.

For some materials the formula specific requirements concerning migration into drinking water can be computed mathematically, by using the Modelling Guideline, rather than being substantiated analytically. The Minimis Guideline can additionally be used as a basis for formula testing for substances that are used in small amounts and that have specific technological functions.



Attestation de Conformité Sanitaire (ACS)

To establish and maintain health compliance for products in contact with water for human consumption, the French health authorities in 1999 developed a system of Attestation of Sanitary Compliance (ACS).

Certifications may only be issued by a laboratory authorized by the Minister for Health pursuant to Article R 1321-52 of the Public Health Code. The validity period of an ACS is fixed to a five year period.

To date, certificate is applicable to organic materials and objects as well as accessories and accessory sub-assemblies consisting of at least one organic component coming into contact with water.

Water cable catalogue



Products

WASTE WATER CABLES RUBBER SHEATHED

Flexible 0,6/1 kV

OZOFLEX (PLUS) H07RN8-F	12
TECWATER S1BN8-F	16

Tinned CU screen 0,6/1 kV

TECWATER EMC-FC S1BC4N8-F	20
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Robust flexible 0,6/1 kV

PROTOMONT NSSHOEU	22
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Robust flexible 3,6/6 kV

MS-TECWATER (N)TSW0EU	26
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DRINKING WATER CABLES ELL & ACS APPROVED

450/750 V UP TO 60°C

HYDROFIRM (T) S07BB-F ROUND	30
HYDROFIRM (T) S07BBH2-F FLAT	34

0,6/1 kV UP TO 60°C

HYDROFIRM (T) S1BB-F ROUND	36
HYDROFIRM (T) S1BBH2-F FLAT	40
HYDROFIRM (T) EMC-FC S1BC4B-F ROUND	42
TLM ROUND TYPE B	44
TLM FLAT TYPE B	46
POTAFLEX ROUND	48

3,6/6 kV UP TO 60°C

MS-HYDROFIRM (T) (N)TSW ROUND	50
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HOT WATER CABLES 450/750 V

Maximum temperature 130°C

HYDROFIRM TGSH ROUND	54
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Maximum temperature 150°C

HYDROFIRM TGSH2G ROUND	56
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Water cable catalogue



WASTE WATER CABLES

Designation	Standard	Fire performance	Resistance to oil	Approvals
OZOFLEX (PLUS) H07RN8-F	DIN EN 50525-2-21	DIN EN 60332-1-2	DIN EN 60811-404	VDE
TECWATER S1BN8-F	Based on DIN EN 50525-2-21	DIN EN 60332-1-2	DIN EN 60811-404	VDE
TECWATER EMC-FC S1BC4N8-F	Based on DIN EN 50525-2-21	DIN EN 60332-1-2	DIN EN 60811-404	VDE
PROTOMONT NSSH0EU	DIN VDE 0250-812	DIN EN 60332-1-2	DIN EN 60811-404	VDE Gost K, Gost B MSHA P-189-3
MS-TECWATER (N)TSW0EU	Based on DIN VDE 0250-813	DIN EN 60332-1-2	DIN EN 60811-404	

OZOFLEX(PLUS) H07RN8-F



Application

OZOFLEX(PLUS) rubber-sheathed cables H07RN8-F are intended for connection of electrical equipment in contaminated water and for medium mechanical stresses. Due to the various substances in the contaminated water, the cables may be used only in easily accessible areas that can be inspected (installation depth of approx. 10 m, as normally used in sewage water tanks). These cables are also suitable for use in process water, cooling water, mine surface water, rainwater and combined waste water. They further can be used in groundwater and seawater; less stringent specifications in terms of accessibility and inspection can be imposed (in such cases the cables can be used at depths up to 2000 m). Water types are defined in accordance with DIN 4045 and DIN 4046. If the water concerned is aggressive or composed of special substances, the cable's resistance properties should be examined.

These cables can be used indoors, outdoors, in explosion-hazard areas to DIN VDE 0165, in fire-hazard locations, on construction sites in accordance with DIN VDE 0100 Part 704, in open-cast mining and in quarries in accordance with DIN VDE 0168, in industry and in agriculture. They can also be permanently installed, e.g. on plaster, on excavators or on hoisting gear. If they are permanently installed in protective conduits or equipment, or e.g. in well installations or are used as rotor circuit cables for motors, the cables may be operated with an AC voltage of up to 1000 V or a DC voltage to earth of up to 750 V.

Permissible AC test voltage in connection with motor tests is 3 kV, max. test duration of 3 minutes. The insulating and sheath materials used allow a max. conductor temperature of 90 °C. Thanks to this characteristic, which is verified by a report from the VDE Test and Certification Institute, cables may be used according to the specifications of Federal Testing Laboratories (PTB) for explosion-protected pumps. In other respects the specifications of DIN EN 50565-2 apply.

Global data

Brand	OZOFLEX(PLUS)
Type designation	H07RN8-F
Standard	EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Copper, finely stranded, class 5 in accordance with DIN EN 60228 / IEC 60228; tinned up to and including 6 mm ²
Insulation	Vulcanized rubber compound, basis EPR, compound EI7 in accordance with DIN EN 50363-1
Color code	up to 5 cores: colored in accordance with DIN VDE 0293-308 from 6 cores: acc. to EN 50525-1 Annex D
Inner sheath	for multicore cables with wall thickness of sheath > 2,4 mm and control cables: vulcanized rubber compound, basis EPR, compound EM6 in accordance with DIN EN 50363-2-1 Colour of sheath: light
Outer sheath	Vulcanized rubber compound, basis CPE, compound EM7 in accordance with DIN EN 50363-2-1
Outer Sheath Colour	Black

Electrical parameters

Rated voltage	450/750V
Max. permissible operating voltage AC	0.476/0.825 kV
Max. permissible operating voltage DC	0.619/1.238 kV
AC Test Voltage	2.5 kV (15 Min.)

Chemical parameters

Flame propagation	DIN EN 60332-1-2
Resistance to oil	DIN EN 60811-404
Water resistance	DIN EN 50525-2-21

Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	40 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-40 °C
Ambient temp. in fully flex. operation min.	-25 °C

Mechanical parameters

Max. tensile load on the conductor	15 N/mm ²
Min. bending radius	Acc. to DIN VDE 0298 part 3

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
1x1,5	20008093	5DH1001	5.6	6.4	19	19	49	23	33	40	0.21
1x2,5		5DH1002	6.3	7	21	21	50	38	43	52	0.36
1x4	20003613	5DH1003	7.3	8.1	24	32	92	60	59	70	0.57
1x6	20148843	5DH1004	7.9	8.7	26	35	115	90	76	91	0.86
1x10	20148844	5DH1005	9.8	11	33	44	186	150	106	127	1.43
1x16	20148845	5DH1006	10.6	11.8	35	47	257	240	142	170	2.29
1x25	20064587	5DH1007	12.9	14.1	56	71	371	375	188	225	3.58
1x35	20003614	5DH1008	14.3	15.5	62	78	476	525	232	278	5.01
1x50	20003615	5DH1010	16.5	18	72	90	667	750	289	347	7.15
1x70	20003616	5DH1011	18.6	20.1	80	101	879	1050	358	429	10.01
1x95	20003617	5DH1012	21.9	23.4	94	117	1180	1425	431	517	13.59
1x120	20003618	5DH1013	23.4	24.9	100	125	1423	1800	504	605	17.16
1x150	20003688	5DH1260	26.3	28.5	114	143	1804	2250	578	694	21.45
1x185	20003683	5DH1252	28.5	30.7	123	154	2175	2775	660	792	26.46
1x240	20003687	5DH1258	31.8	34	136	170	2804	3600	783	940	34.32
1x300	20003684	5DH1253	35.1	37.3	149	187	3407	4500	906	1087	42.9
2x1	20156716	5DH1238	7.7	8.7	26	35	94	30	19	23	0.14
2x1,5	20041045	5DH1074	8.6	9.6	29	38	116	45	24	29	0.21
2x2,5	20163164	5DH1075	10	11.6	35	46	169	75	32	38	0.36
2x4	20163165	5DH1076	11.9	13.5	54	68	239	120	43	52	0.57
2x6	20163811	5DH1077	13.5	15.1	60	76	314	180	56	67	0.86
3G1	20003620	5DH1014	8.2	9.2	28	37	107	45	19	23	0.14
3G1,5	20003621	5DH1015	9.4	10.4	31	42	142	68	24	29	0.21
3G2,5	20007343	5DH1016	10.9	12.5	50	63	207	113	32	38	0.36
3G4		5DH1017	12.8	14.4	58	72	289	180	43	52	0.57
3G6		5DH1018	14.4	16.4	66	82	384	270	56	67	0.86
3G10	20172908	5DH1020	19.9	21.9	88	110	712	450	78	93	1.43
3x1,5		5DH1045	9.4	10.4	31	42	142	68	24	29	0.21
3x2,5		5DH1046	10.9	12.5	50	63	207	113	32	38	0.36
3x4		5DH1047	12.8	14.4	58	72	289	180	43	52	0.57
3x6		5DH1048	14.4	16.4	66	82	384	270	56	67	0.86
3x10	20113319	5DH1050	19.9	21.9	88	110	690	450	78	93	1.43
3x16	20113320	5DH1051	23.5	25.5	102	128	994	720	104	125	2.29
3x25	20114481	5DH1052	26.8	29.8	119	149	1373	1125	138	165	3.58
3x35	20016655	5DH1053	30.3	33.3	133	167	1840	1575	171	205	5.01
3x50	20003634	5DH1054	34.4	37.4	150	187	2412	2250	213	255	7.15
3x70	20003635	5DH1055	39.1	42.1	168	211	3322	3150	263	316	10.01
3x95	20151270	5DH1056	44.7	47.7	191	239	4150	4275	317	380	13.59
3x120	20041913	5DH1057	47	51	204	255	5200	5400	371	445	17.16
4G1	20003681	5DH1245	9.3	10.3	31	41	139	60	19	23	0.14
4G1,5	20003622	5DH1021	10.2	11.8	35	47	177	90	24	29	0.21
4G2,5	20003623	5DH1022	12	13.6	54	68	251	150	32	38	0.36
4G4	20003624	5DH1023	13.8	15.4	62	77	344	240	43	52	0.57
4G6	20003625	5DH1024	16.1	18.1	72	91	481	360	56	67	0.86
4G10	20003626	5DH1025	21.2	23.2	93	116	841	600	78	93	1.43
4G16	20003627	5DH1026	25.3	28.3	113	142	1256	960	104	125	2.29
4G25	20003628	5DH1027	29.9	32.9	132	165	1812	1500	138	165	3.58
4G35	20003629	5DH1028	33.7	36.7	147	184	2312	2100	171	205	5.01

x = without ye/gn core; G = with ye/gn core

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
4G50	20003630	5DH1030	38.6	41.6	166	208	3011	3000	213	255	7.15
4G70	20003631	5DH1031	43.7	46.7	187	234	4230	4200	263	316	10.01
4G95	20003632	5DH1032	50.3	54.3	217	272	5536	5700	317	380	13.59
4G120	20003633	5DH1033	54.6	58.6	234	293	6724	7200	371	445	17.16
5G1	20172298	5DH1247	10.1	11.7	35	47	168	75	19	23	0.14
5G1,5	20003682	5DH1246	11.1	12.7	51	64	210	113	24	29	0.21
5G2,5	20007386	5DH1250	13.3	14.9	60	75	303	188	32	38	0.36
5G4	20156864	5DH1061	15.6	17.6	70	88	437	300	43	52	0.57
5G6	20065655	5DH1062	16.6	18.6	74	93	550	450	56	67	0.86
5G10		5DH1063	23.6	26.6	106	133	1036	750	78	93	1.43
5G16	20182416	5DH1064	28.3	31.3	125	157	1524	1200	104	125	2.29
6G1,5	20003671	5DH1224	13.6	15.2	61	76	297	135	24	29	0.21
7G1,5	20003678	5DH1082	15.2	17.2	69	86	362	158	24	29	0.21
8G1,5	20188803	5DH1083	17.5	19.5	78	98	452	180	24	29	0.21
10G1,5	20003680	5DH1084	18	20	80	100	477	225	24	29	0.21
11G1,5		5DH1255	18.1	20.1	80	101	490	248	24	29	0.21
12G1,5	20003668	5DH1221	17.2	19.2	77	96	480	270	24	29	0.21
7G2,5	20003672	5DH1227	17.5	19.5	78	98	500	263	32	38	0.36
8G2,5	20014373	5DH1228	18.7	20.7	83	104	563	300	32	38	0.36
10G2,5	20003675	5DH1234	21	22.8	91	114	647	375	32	38	0.36
12G2,5	20003669	5DH1222	21.1	23.1	92	116	708	450	32	38	0.36

Current carrying capacity in water: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient water temperature, two or three cores loaded, multi-core cables all cores loaded (cable compete immersed in water).

(2) Current carrying capacity free in air: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient temperature, two or three cores loaded, multi-core cables all cores loaded (see also DIN VDE 298-4).

x = without ye/gn core; G = with ye/gn core

NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

TECWATER S1BN8-F 0.6/1kV



Application

TECWATER rubber-sheathed cables S1BN8-F are intended for connection of electrical equipment in contaminated water and for medium mechanical stresses. Due to the various substances in the contaminated water, the cables may be used only in easily accessible areas that can be inspected (installation depth of approx. 10 m, as normally used in sewage water tanks). These cables are also suitable for use in process water, cooling water, mine surface water, rainwater and combined waste water. They further can be used in groundwater and seawater; less stringent specifications in terms of accessibility and inspection can be imposed (in such cases the cables can be used at depths up to 2000 m). Water types are defined in accordance with DIN 4045 and DIN 4046.

If the water concerned is aggressive or composed of special substances, the cable's resistance properties should be examined. These cables can be used indoors, outdoors, in explosion-hazard areas to DIN VDE 0165, in fire-hazard locations, on construction sites in accordance with DIN VDE 0100 Part 704, in open-cast mining and in quarries in accordance with DIN VDE 0168, in industry and in agriculture. They can also be permanently installed, e.g. on plaster, on excavators or on hoisting gear. In other respects the specifications of DIN EN 50565-2 apply.

Global data

Brand	TECWATER
Type designation	S1BN8-F
Standard	Based on EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Plain copper, finely stranded class 5 in accordance with DIN EN 60228 / IEC 60228
Insulation	Ozone, water and weather resistant insulation compound, base EPR (Ethylene-Propylene Rubber)
Color code	up to 5 cores: colored in accordance with DIN VDE 0293-308 from 6 cores: more than 5 cores: Cores light, printed with black numbers 4G4+2X0,75: green-yellow, brown, black, grey; control cores light with black numbers; 7G..+5X1,5: green-yellow, other cores black with white numbers; control cores light with black numbers;
Inner sheath	For all multi core cables with cross-section more than 6mm ² and all cables with more than 5 cores: Inner layer of CPE special compound; color: blue
Outer sheath	Special rubber compound based on CPE, water and oil-resistant
Outer Sheath Colour	Black

Electrical parameters

Rated voltage	0.6/1 kV (600/1000V)
Max. permissible operating voltage AC	0.7/1.2 kV
Max. permissible operating voltage DC	0.9/1.8 kV
AC Test Voltage	3.5 kV (5 Min.)

Chemical parameters

Flame propagation	DIN EN 60332-1-2
Resistance to oil	DIN EN 60811-404
Water resistance	DIN EN 50525-2-21

Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	40 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-40 °C
Ambient temp. in fully flex. operation min.	-25 °C

Mechanical parameters

Max. tensile load on the conductor	15 N/mm ²
Min. bending radius	Acc. to DIN VDE 0298 part 3

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
1X1,5		5DH8302	5.8	6.6	20	20	53	23	33	40	0.21
1X2,5		5DH8303	6.3	7	21	21	65	38	43	52	0.36
1X4		5DH8304	6.7	7.5	23	23	82	60	59	70	0.57
1X6		5DH8305	7.2	8	24	24	103	90	76	91	0.86
1X10		5DH8306	8.3	9.1	27	36	160	150	106	127	1.43
1X16		5DH8307	9.1	10.1	30	40	210	240	142	170	2.29
1X25		5DH8308	10.8	12.4	50	62	315	375	188	225	3.58
1X35		5DH8309	12.3	13.9	56	70	421	525	232	278	5.01
1X50	20026648	5DH8310	14.1	15.7	63	79	577	750	289	347	7.15
1X70		5DH8311	16.3	18.3	73	92	808	1050	358	429	10.01
1X95	20014613	5DH8312	18.8	20.3	81	102	1024	1425	431	517	13.59
1X120		5DH8313	20.9	22.9	92	115	1314	1800	504	605	17.16
1X150	20036145	5DH8314	23.2	25.2	101	126	1627	2250	578	694	21.45
1X185	20026006	5DH8315	26	28.3	113	142	1982	2775	660	792	26.46
1X240		5DH8316	28.9	31.2	125	156	2548	3600	783	940	34.32
1X300	20035987	5DH8317	32.1	34.4	138	172	3151	4500	906	1087	42.9
1X400		5DH8318	36.3	38.6	154	193	4087	6000	1045	1254	57.2
1X500		5DH8319	40.4	42.7	171	214	5160	7500	1203	1443	71.5
2X1		5DH8321	8	9	27	36	94	30	19	23	0.14
2X1,5		5DH8322	8.6	9.6	29	38	111	45	24	29	0.21
2X2,5		5DH8323	9.4	10.4	31	42	141	75	32	38	0.36
2X4		5DH8324	10.2	11.8	35	47	182	120	43	52	0.57
2X6		5DH8325	11.2	12.8	51	64	239	180	56	67	0.86
2X10		5DH8326	15	17	68	85	420	300	78	93	1.43
2X16		5DH8327	17.6	19.6	78	98	597	480	104	125	2.29
2X25		5DH8328	21.6	23.6	94	118	890	750	138	165	3.58
3G1		5DH8331	8.4	9.5	29	38	104	45	19	23	0.14
3G1,5	20026138	5DH8332	9.1	10.1	30	40	125	68	24	29	0.21
3G2,5		5DH8333	9.6	11.2	34	45	162	113	32	38	0.36
3G4		5DH8334	10.6	12.2	49	61	216	180	43	52	0.57
3X1		5DH8381	8.4	9.5	29	38	104	45	19	23	0.14
3X1,5		5DH8382	9.1	10.1	30	40	125	68	24	29	0.21
3X2,5		5DH8383	9.6	11.2	34	45	162	113	32	38	0.36
3X4		5DH8384	10.6	12.2	49	61	216	180	43	52	0.57
3X6	20066348	5DH8385	12.1	13.7	55	69	292	270	56	67	0.86
3X10		5DH8386	16.3	18.3	73	92	514	450	78	93	1.43
3X16		5DH8387	19.1	21.1	84	106	740	720	104	125	2.29
3X25		5DH8388	23.1	25.1	100	126	1094	1125	138	165	3.58
3X35		5DH8389	25.6	28.6	114	143	1459	1575	171	205	5.01
3X50		5DH8390	29.9	32.9	132	165	2018	2250	213	255	7.15
3X70		5DH8391	35.4	38.4	154	192	2808	3150	263	316	10.01
3X95		5DH8392	39	42	168	210	3547	4275	317	380	13.59
3X120		5DH8393	44.4	47.4	190	237	4542	5400	371	445	17.16
3X150		5DH8394	49	53	212	265	5627	6750	425	510	21.45
3X185		5DH8395	54.2	58.2	233	291	6819	8325	485	582	26.46
3X240		5DH8396	61.4	65.4	262	327	8645	10800	576	691	34.32
4G1	20036387	5DH8351	9.1	10.1	30	40	123	60	19	23	0.14
4G1,5	20026055	5DH8352	9.5	11.1	33	44	148	90	24	29	0.21

x = without ye/gn core; G = with ye/gn core

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
4G2,5	20026139	5DH8353	10.5	12.1	48	61	201	150	32	38	0.36
4G4	20026048	5DH8354	11.8	13.4	54	67	276	240	43	52	0.57
4G6	20026128	5DH8355	13.6	15.2	61	76	378	360	56	67	0.86
4G10	20025842	5DH8356	17.8	19.8	79	99	464	600	78	93	1.43
4G16	20026004	5DH8357	20.9	22.9	92	115	934	960	104	125	2.29
4G25	20026081	5DH8358	25.3	28.3	113	142	1418	1500	138	165	3.58
4G35	20036142	5DH8359	28.3	31.3	125	157	1877	2100	171	205	5.01
4G50	20026158	5DH8360	33.2	36.2	145	181	2613	3000	213	255	7.15
4G70	20025843	5DH8361	38.7	41.7	167	209	3638	4200	263	316	10.01
4G95	20026007	5DH8362	43.7	47.7	191	239	4643	5700	317	380	13.59
4G120	20036143	5DH8363	48.7	52.7	211	264	5833	7200	371	445	17.16
4G150	20016293	5DH8364	54.5	58.5	234	293	7222	9000	425	510	21.45
4G185		5DH8365	60.6	64.6	258	323	8830	11100	485	582	26.46
4G240		5DH8366	68.2	72.2	289	361	11457	14400	576	691	34.32
4G300		5DH8367	77	81	324	405	14368	18000	666	800	42.9
5G1,5	20068720	5DH8372	10.4	12	36	48	186	113	24	29	0.21
5G2,5		5DH8373	11.6	13.2	53	66	250	188	32	38	0.36
5G4		5DH8374	12	13.6	54	68	340	300	43	52	0.57
5G6		5DH8375	14.6	15.3	61	77	480	450	56	67	0.86
5G10		5DH8376	19.9	21.9	88	110	810	750	78	93	1.43
5G16		5DH8377	23.2	25.2	101	126	1192	1200	104	125	2.29
5G25		5DH8378	28	31	124	155	1810	1875	138	165	3.58
5G70			42.5	46.5	186	233	4500	5250	263	316	10.01
7G1,5	20026053	5DH8403	12.9	14.5	58	73	276	158	24	29	0.21
8G1,5	20026049	5DH8404	14.5	16.5	66	83	305	180	24	29	0.21
10G1,5	20026054	5DH8406	15.6	17.6	70	88	376	225	24	29	0.21
11G1,5	20026207	5DH8407	16	18	72	90	400	248	24	29	0.21
12G1,5	20026051	5DH8408	16	18	72	90	413	270	24	29	0.21
7G2,5	20036709	5DH8413	14.7	16.7	67	84	381	263	32	38	0.36
8G2,5		5DH8414	16.3	18.3	73	92	410	300	32	38	0.36
10G2,5	20025847	5DH8416	17.4	19.4	78	97	480	375	32	38	0.36
12G2,5	20102524	5DH8418	17.9	19.9	80	100	555	450	32	38	0.36
4G4+2X0,75ST	20026080	5DH8103	15.3	17.3	69	104	386	240	43	52	0.57
7G4+5X1,5ST	20039852	5DH8120	21.2	22.8	91	137	698	420	43	52	0.57
7G6+5X1,5ST	20039853	5DH8121	24.5	26.1	104	157	909	630	56	67	0.86
7G10+5X1,5ST	20039854	5DH8122	25.3	26.8	107	161	1174	1050	78	93	1.43

Current carrying capacity in water: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient water temperature, two or three cores loaded, multi-core cables all cores loaded (cable complete immersed in water).

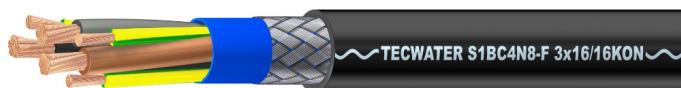
(2) Current carrying capacity free in air: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient temperature, two or three cores loaded, multi-core cables all cores loaded (see also DIN VDE 298-4).

x = without ye/gn core; G = with ye/gn core

NOTES

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TECWATER EMC-FC S1BC4N8-F



Application

TECWATER EMV-FC rubber-sheathed cables S1BC4N8-F are intended for connection of electrical equipment in contaminated water and for medium mechanical stresses, e.g. submersible pumps in sewage disposal and treatment as well as submersible mixer. Especially for frequency converter controlled AC drives and if considerable demands in respect of electromagnetic compatibility (EMC) according to the EMC directive imposes. For an effective shielding both ends of cable must have a good shield contact to ground. Due to the various substances in the contaminated water, the cables may be used only in easily accessible areas that can be inspected (installation depth of approx. 10 m, as normally used in sewage water tanks). These cables are also suitable for use in process water, cooling water, mine surface water, rainwater and combined waste water. They further can be used in groundwater and seawater; less stringent specifications in terms of accessibility and inspection can be imposed (in such cases the cables can be used at depths up to 2000 m). Water types are defined in accordance with DIN 4045 and DIN 4046. If the water concerned is aggressive or composed of special substances, the cable's resistance properties should be examined. These cables can be used indoors, outdoors, in explosion-hazard areas to DIN VDE 0165, in fire-hazard locations, on construction sites in accordance with DIN VDE 0100 Part 704, in open-cast mining and in quarries in accordance with DIN VDE 0168, in industry and in agriculture. They can also be permanently installed, e.g. on plaster, on excavators or on hoisting gear. In other respects the specifications of DIN EN 50565-2 apply.

Global data

Brand	TECWATER
Type designation	S1BC4N8-F
Standard	Based on EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Plain copper, finely stranded class 5 in accordance with DIN EN 60228 / IEC 60228
Insulation	Ozone, water and weather resistant insulation compound, base EPR (Ethylene-Propylene Rubber)
Color code	colored in accordance with DIN VDE 0293-308
Inner sheath	For all multi core cables with cross-section more than 6mm ² : Inner layer of CPE special compound; color: blue
Screen over inner sheath	Braid of tinned copper wires Maximum transfer impedance 30Ω/km at 30MHz
Outer sheath	Special rubber compound based on CPE, water and oil-resistant
Outer Sheath Colour	Black

Electrical parameters

Rated voltage	0.6/1 kV (600/1000V)
Max. permissible operating voltage AC	0.7/1.2 kV
Max. permissible operating voltage DC	0.9/1.8 kV
AC Test Voltage	5 kV (5 Min.)
Peak voltage	2400 V

Chemical parameters

Flame propagation	DIN EN 60332-1-2
Resistance to oil	DIN EN 60811-404
Water resistance	DIN EN 50525-2-21

Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	40 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-40 °C
Ambient temp. in fully flex. operation min.	-25 °C

Mechanical parameters

Max. tensile load on the conductor	15 N/mm ²
Min. bending radius	Acc. to DIN VDE 0298 part 3

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
3X1,5/1,5KON		5DH8702	9.5	11.1	33	44	174	67	24	29	0.21
3X2,5/2,5KON		5DH8703	10.5	12.1	48	61	230	112	32	38	0.36
3X4/4KON		5DH8704	11.8	13.4	54	67	310	180	43	52	0.57
3X6/6KON	20025844	5DH8705	13.6	15.2	61	76	389	270	56	67	0.86
3X10/10KON	20026052	5DH8706	17.8	19.8	79	99	693	450	78	93	1.43
3X16/16KON	20025845	5DH8707	20.9	22.9	92	115	1037	720	104	125	2.29
3X25+3G16/3	20025846	5DH8708	25.3	28.3	113	142	1477	1125	138	165	3.58
3X35+3G16/3	20026360	5DH8709	28.3	31.3	125	157	1883	1575	171	205	5.01
3X50+3G25/3	20036144	5DH8710	33.2	36.2	145	181	2635	2250	213	255	7.15
3X70+3G35/3	20026361	5DH8711	38.7	41.7	167	209	3633	3150	263	316	10.01
3X95+3G50/3	20066958	5DH8712	43.7	47.7	191	239	4652	4275	317	380	13.59
3X120+3G70/3	20058130	5DH8713	48.8	51.8	207	259	5933	5400	371	445	17.16

(2) Nominal current carrying capacity for multicore cable or three single-core cables in trefoil in permanent operation with DC or AC with 50 up to 60 Hz at 30°C ambient temperature, free in air, three cores loaded. (see also VDE 0298-4)
Current carrying capacity in water: The values are valid for a multicore cable or three single-core cables in trefoil in permanent operation with DC or AC with 50 up to 60 Hz at 30°C ambient water temperature, three cores loaded.

PROTOMONT NSSHOEU 1kV Flexible Rubber Cables



Application

For flexible use and fixed installation open-cast mining applications, in quarries, on construction sites and similar applications, with heavy mechanical stresses. The cables can be used indoors as well as outdoors, in explosion-hazard areas, in industry and in agriculture. They can be used permanently in waste water up to 40°C at a depth of max. 2000 m and in industrial water, cooling water, surface water, rainwater and mixed water - and in groundwater and seawater to a more limited extent. The requirements for accessibility and inspection depend on the consistency of the water. In aggressive water or composed of special substances, the cable's resistance properties should be tested. In other respects the specifications of DIN VDE 0298 part 3 applies.

Global data

Brand	PROTOMONT
Type designation	NSSHOEU
Standard	DIN VDE 0250-812
Certifications / Approvals	MA – China MSHA P-189-3 Fire Certificate of Russian Federation TR-Certificate GOST K GOST B

Notes on installation

Notes on installation	Maximum submersing depth 2000 meters
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Design features

Conductor	Copper, tinned, finely stranded (class 5) in accordance with DIN EN 60228 / IEC 60228
Insulation	PROTOLON, Basic material: EPR, Compound type: 3GI3 in accordance with DIN EN 50363
Core identification	Up to 5 cores: colored in gray, black, brown, blue, green/yellow from 6 cores: light gray with black digits
Core arrangement	Three main conductors laid-up together with the protective-earth conductor, from 50 mm ² with protective-earth conductor split into three in the outer interstices
Inner sheath	Vulcanized rubber compound, Basic material: EPR, Compound type: GM1B in accordance with DIN EN 50363 (not for single-core cables)
Outer sheath	Vulcanized rubber compound, synthetic elastomer compound e.g. CPE, Compound: 5GM5 in accordance with DIN EN 50363, Color: Yellow

Electrical parameters

Rated voltage	0.6/1 kV (600/1000V)
Max. permissible operating voltage AC	0.7/1.2 kV
Max. permissible operating voltage DC	0.9/1.8 kV
AC test voltage	3 kV
Duration of AC test voltage	5 min.

Chemical parameters

Resistance to fire	DIN EN 60332-1-2
Resistance to oil	DIN EN 60811-404
Weather resistance	Unrestricted use outdoors and indoors, resistant to ozone and moisture
Water resistance	DIN EN 50525-2-21

Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	40 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-40 °C
Ambient temp. in fully flex. operation min.	-25 °C
Ambient temp. in fully flex. operation max.	60 °C

Mechanical parameters

Max. tensile load of cable	15 N/mm ²
Torsional stress	100 °/m
Min. bending radius	Acc. to DIN VDE 0298 part 3

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Net weight approx. kg/km	Permissible tensile force max. N	Nominal operating capacitance µF/km	Inductance nom. mH/km	Current carrying capacity (1) A	Short Circuit Current (conductor) kA
PROTOMONT NSSHÖU-O 1x...										
1x16	20004811	5DL1112	10.6	11.6	235	240	0.42	0.26	103	2.29
1x25	20008654	5DL1113	12.8	13.7	355	375	0.42	0.26	137	3.58
1x35	20004812	5DL1114	13.9	14.8	450	525	0.49	0.25	169	5.01
1x50	20004813	5DL1115	15.6	16.6	610	750	0.51	0.25	211	7.15
1x70	20004814	5DL1116	17.8	18.8	825	1050	0.59	0.24	261	10.01
1x95	20004815	5DL1117	19.7	20.7	1050	1425	0.6	0.24	314	13.59
1x120	20004816	5DL1118	22.4	23.4	1360	1800	0.69	0.23	367	17.16
1x150	20004817	5DL1120	24.4	25.4	1640	2250	0.69	0.23	422	21.45
1x185	20069571	5DL1121	27.2	28.8	2040	2775	0.68	0.23	481	26.46
1x240	20004818	5DL1122	30.4	32	2600	3600	0.73	0.23	571	34.32
1x300	20004819	5DL1123	34.5	36.8	3270	4500	0.76	0.23	681	42.9
PROTOMONT NSSHÖU-O 2x...										
2x1,5	20004826	5DL1204	10.8	11.9	160	45	0.22	0.33	23	0.21
2x2,5	20008593	5DL1205	12	13	205	75	0.23	0.32	30	0.36
2x4		5DL1206	14.5	15.5	295	120	0.26	0.31	41	0.57
PROTOMONT NSSHÖU-O 3x...										
3x1,5		5DL1756	11.3	12.3	180	68	0.22	0.33	23	0.21
3x2,5	20004872	5DL1751	12.5	13.6	230	113	0.23	0.32	30	0.36
3x4		5DL1760	15.1	16.2	340	180	0.26	0.31	41	0.57
3x6		5DL1946	16.2	17.3	415	270	0.3	0.29	53	0.86
3x10		5DL1944	20	21.1	650	450	0.32	0.28	74	1.43
3x16		5DL1311	23.1	24.2	890	720	0.42	0.26	99	2.29
3x25		5DL1964	26.8	28.5	1300	1125	0.42	0.26	131	3.58
3x35	20004837	5DL1391	30.9	32.5	1730	1575	0.49	0.25	162	5.01
3x50	20148227	5DL1320	35.2	38.3	2400	2250	0.39	0.27	202	7.15
PROTOMONT NSSHÖU-J 3x...										
3x1,5	20004827	5DL1304	11.3	12.3	180	68	0.22	0.33	23	0.21
3x2,5	20004828	5DL1305	12.5	13.6	230	113	0.23	0.32	30	0.36
3x4	20007174	5DL1306	15.2	16.2	340	180	0.26	0.31	41	0.57
3x6		5DL1914	16.2	17.3	415	270	0.3	0.29	53	0.86
PROTOMONT NSSHÖU-J 4x...										
4x1,5	20004838	5DL1404	12	13.1	210	90	0.22	0.33	23	0.21
4x2,5	20004839	5DL1405	14.6	15.7	310	150	0.23	0.32	30	0.36
4x4	20004840	5DL1406	16.2	17.3	410	240	0.26	0.31	41	0.57
4x6	20004841	5DL1407	17.4	18.5	500	360	0.3	0.29	53	0.86
4x10	20004842	5DL1410	21.8	22.9	800	600	0.32	0.28	74	1.43
4x16	20004843	5DL1412	25.9	27.6	1160	960	0.42	0.26	99	2.29
4x16+4x2,5	20004871	5DL1749	27.1	30.1	1433	960	0.42	0.26	99	2.29
4x25	20004844	5DL1413	30.6	32.3	1700	1500	0.42	0.26	131	3.58
4x35	20004845	5DL1414	33.4	35.1	2150	2100	0.49	0.25	162	5.01
4x50	20004846	5DL1415	38.2	41.2	2980	3000	0.51	0.25	202	7.15
4x70	20004847	5DL1416	42.4	45.5	3910	4200	0.59	0.24	250	10.01
4x95	20004848	5DL1417	48.2	52.3	5120	5700	0.6	0.24	301	13.59
4x120	20016763	5DL1418	54.7	58.8	6570	7200	0.69	0.23	352	17.16

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Net weight approx. kg/km	Permissible tensile force max. N	Nominal operating capacitance µF/km	Inductance nom. mH/km	Current carrying capacity (1) A	Short Circuit Current (conductor) kA
4x150	20023637	5DL1420	60.2	64.2	7990	9000	0.7	0.23	404	21.45
4x185	20007494	5DL1421	67.3	71.3	9820	11100	0.71	0.23	461	26.46
4x240	20060343	5DL1422	72.1	76.4	12100	14400	0.73	0.23	547	34.32
PROTOMONT NSSHÖU-J 3x.../...										
3x50/25	20004863	5DL1715	38.2	41.2	2820	2250	0.51	0.25	202	7.15
3x70/35	20004864	5DL1716	42.4	45.5	3670	3150	0.59	0.24	250	10.01
3x95/50	20004865	5DL1717	48.2	52.3	4840	4275	0.6	0.24	301	13.59
3x120/70	20004866	5DL1718	54.7	58.8	6250	5400	0.69	0.23	352	17.16
3x150/70	20004868	5DL1722	60.2	64.2	7500	6750	0.7	0.23	404	21.45
3x185/95	20004867	5DL1721	67.3	71.3	9290	8325	0.71	0.23	461	26.46
PROTOMONT NSSHÖU-J 3x... + 3x.../3										
3x185 + 3x95/3		5DL1973	60.7	64.7	8690	8325	0.71	0.23	461	26.46
PROTOMONT NSSHÖU-J 5x...										
5x1,5	20004855	5DL1504	12.9	14	245	113	0.22	0.33	23	0.21
5x2,5	20004856	5DL1505	15.7	16.7	360	188	0.23	0.32	30	0.36
5x4	20004857	5DL1506	17.4	18.5	475	300	0.26	0.31	41	0.57
5x6	20004858	5DL1507	19.6	20.6	625	450	0.3	0.29	53	0.86
5x10	20004859	5DL1510	23.5	24.5	955	750	0.32	0.28	74	1.43
5x16	20004860	5DL1512	28	29.7	1380	1200	0.42	0.26	99	2.29
5x25	20004861	5DL1513	33.1	34.8	2030	1875	0.42	0.26	131	3.58
5x35	20006970	5DL1514	37	40.1	2700	2625	0.49	0.25	162	5.01
PROTOMONT NSSHÖU-J ...x1,5										
7x1,5	20004891	5DL1933	15.9	16.9	365	158	0.22	0.33	15	0.21
8x1,5	20004890	5DL1931	17.1	18.1	410	180	0.22	0.33	14	0.21
10x1,5	20004886	5DL1879	17.7	19.7	455	225	0.22	0.33	13	0.21
24x1,5	20088402	5DL1907	24.3	27.3	920	540	0.22	0.33	9	0.21
PROTOMONT NSSHÖU-J ...x2,5										
7x2,5	20004887	5DL1911	18	18.9	485	263	0.24	0.32	19	0.36
10x2,5	20174408	5DL1748	20.4	21.4	630	375	0.24	0.32	16	0.36
12x2,5	20004874	5DL1755	21.7	22.7	725	450	0.24	0.32	16	0.36
18x2,5	20004892	5DL1937	25.6	27.5	1035	675	0.24	0.32	13	0.36
24x2,5		5DL1842	28.6	30.2	1320	900	0.23	0.32	12	0.36
PROTOMONT NSSHÖU-J ...x4										
7x4	20059552	5DL1750	21	22	685	420	0.26	0.31	17	0.57
12x4	20040505	5DL1957	24.9	26.5	1030	720	0.26	0.31	12	0.57
PROTOMONT NSSHÖU-J ...x10										
7x10+5x1,5ST	20004896	5DL1962	26	29	1420	1050	0.33	0.28	28	1.43
7x4+5x1,5ST	20004893	5DL1938	24.1	26.1	901	420	0.26	0.31	17	0.57

(1) Nominal current carrying capacity for multicore cable or three single-core cables in trefoil in permanent operation with DC or AC with 50 up to 60 Hz at 30°C ambient temperature, free in air, three cores loaded. (see also VDE 0298-4)

NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

MS-TECWATER (N)TSWOEU



Application

MS-TECWATER rubber-sheathed cables (N)TSWOEU are intended for connection of electrical equipment in contaminated water and for heavy mechanical stresses, e.g. submersible pumps in sewage disposal and treatment as well as submersible mixer. Due to the various substances in the contaminated water, the cables may be used only in easily accessible areas that can be inspected (installation depth of approx. 10 m, as normally used in sewage water tanks). These cables are also suitable for use in process water, cooling water, mine surface water, rainwater and combined waste water. They further can be used in groundwater and seawater; less stringent specifications in terms of accessibility and inspection can be imposed (in such cases the cables can be used at depths up to 2000 m). Water types are defined in accordance with DIN 4045 and DIN 4046. If the water concerned is aggressive or composed of special substances, the cable's resistance properties should be examined. These cables can be used indoors, outdoors, in explosion-hazard areas. In other respects the specifications of DIN VDE 0298 part 3 apply.

Global data

Brand	TECWATER
Type designation	(N)TSWOEU
Standard	Based on EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Plain copper, finely stranded class 5 in accordance with DIN EN 60228 / IEC 60228
Insulation	Ozone, water and weather resistant insulation compound, base EPR (Ethylene-Propylene Rubber)
Electrical field control	Inner layer of semiconductive rubber compound
Color code	Cores light, printed with black numbers
Inner sheath	For all multi core cables with cross-section more than 6mm ² : Inner layer of CPE special compound; color: blue
Outer sheath	Special rubber compound based on CPE, water and oil-resistant
Outer Sheath Colour	Black

Electrical parameters

Rated voltage	3.6/6 kV
Max. permissible operating voltage AC	4.2/7.2 kV
Max. permissible operating voltage DC	5.4/10.8 kV
AC Test Voltage	11 kV (5 Min.)

Chemical parameters

Flame propagation	DIN EN 60332-1-2
Resistance to oil	DIN EN 60811-404
Water resistance	DIN EN 50525-2-21

Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	40 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-40 °C
Ambient temp. in fully flex. operation min.	-25 °C

Mechanical parameters

Max. tensile load on the conductor	15 N/mm ²
Min. bending radius	Acc. to DIN VDE 0298 part 3

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A
1x16		5DK3130	15.7	17.2	103	172	390	240	142	170
1x25		5DK3131	16.5	18	108	180	480	375	188	225
1x35		5DK3132	17.7	19.2	115	192	600	525	232	278
1x50		5DK3133	19.1	20.6	124	206	750	750	289	347
1x70		5DK3134	21.7	23.2	139	232	1010	1050	358	429
3x16		5DK3137	29.1	32.1	193	321	1330	720	104	125
3x25		5DK3138	31.8	34.8	209	348	1710	1125	138	165
3x35		5DK3139	34.4	37.4	224	374	2120	1575	171	205
3x50		5DK3140	38.8	41.8	251	418	2790	2250	213	255
3x70		5DK3141	42.5	45.5	273	455	3550	3150	263	316
3x16 /16		5DK3147	33.3	36.3	218	363	1730	720	104	125
3x25 /25		5DK3148	35	38	228	380	2110	1125	138	165
3x35 /35		5DK3149	39.1	42.1	253	421	2730	1575	171	205
3x50 /50	20038161	5DK3150	42.7	45.7	274	457	3470	2250	213	255
3x70 /70		5DK3151	46.8	49.8	299	498	4450	3150	263	316
3x25 + 3x25/3	20004484	5DK3156	31.8	34.8	209	348	1860	1125	138	165
3x35 + 3x25/3		5DK3157	34.4	37.4	224	374	2260	1575	171	205
3x50 + 3x25/3		5DK3158	38.8	41.8	251	418	2930	2250	213	255
3x70 + 3x35/3		5DK3159	42.5	45.5	273	455	3770	3150	263	316

Current carrying capacity in water: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient water temperature, two or three cores loaded, multi-core cables all cores loaded (cable complete immersed in water).

(2) Current carrying capacity free in air: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient temperature, two or three cores loaded, multi-core cables all cores loaded (see also DIN VDE 298-4).

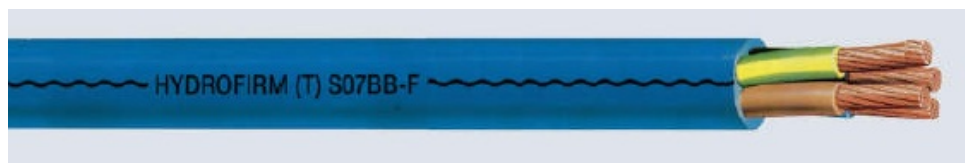
Water cable catalogue



DRINKING WATER - CABLES

Designation	Standard	Model	Rated Voltage	Water temp. max.	Approvals
HYDROFIRM(T) S07BB-F	based on DIN EN 50525-2-21	round	450/750 V	60°C	Elastomerleit- linie (ELL), ACS
HYDROFIRM(T) S07BBH2-F	based on DIN EN 50525-2-21	flat	450/750 V	60°C	Elastomerleit- linie (ELL), ACS
HYDROFIRM(T) S1BB-F	based on DIN EN 50525-2-21	round	0.6/1 kV	60°C	Elastomerleit- linie (ELL), ACS
HYDROFIRM(T) S1BBH2-F	based on DIN EN 50525-2-21	flat	0.6/1 kV	60°C	Elastomerleit- linie (ELL), ACS
HYDROFIRM(T) EMV-FC S1BC4B-F	based on DIN EN 50525-2-21	round	0.6/1 kV	60°C	Elastomerleit- linie (ELL), ACS
TML	based on DIN EN 50525-2-21	round / flat	0.6/1 kV	60°C	Elastomerleit- linie (ELL), ACS
MS- HYDROFIRM(T) (N)TSW	based on DIN VDE 0250-813	round	3.6/6 kV	60°C	Elastomerleit- linie (ELL), ACS

HYDROFIRM(T) S07BB-F



Application

HYDROFIRM(T) rubber-sheathed cables S07BB-F are intended for connection of electrical equipment in water and for medium mechanical stresses, e.g. submersible pumps, lowering of water level and booster plants. These cables are also suitable for use in drinking water, cooling water, surface water, rainwater. They further can be used in groundwater and seawater (salt water) up to 2000 m water depth. The outer sheath fulfills the requirements of health according to the "Elastomerleitlinien (ELL)" of the German "Umwelt Bundesamt" and the Attestation de Conformité Sanitaire (ACS) according to the French law. When corrosive water is involved, or water of some other special compositions must be investigated in each individual case. They may not be used in water containing more than 0,5 mg/l of chlorine.

These cables can be used indoors, outdoors, in industrial and agricultural plant, but not in explosion-hazard areas.

For protected, fixed installation within equipment, pipes or wells, as well as for rotor connections, these cables may be operated with an AC voltage to 1000 V or a DC voltage to 750 V with respect to earth. The permissible AC voltage for motor tests is 3 kV for a maximum duration of 3 minutes. In other respects the specifications of DIN EN 50565-2 apply.

Global data

Brand	HYDROFIRM (T)
Type designation	S07BB-F
Standard	Based on EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Plain copper, finely stranded class 5 in accordance with DIN EN 60228 / IEC 60228
Insulation	Ozone, water and weather resistant insulation compound, base EPR (Ethylene-Propylene Rubber)
Color code	up to 5 cores: colored in accordance with DIN VDE 0293-308 more than 5 cores: DIN EN 50525-1 Annex D
Outer sheath	EPR special compound type EM6 according to DIN EN 50363-2-1; water resistant; Compound 3G357
Outer Sheath Colour	Blue

Electrical parameters

Rated voltage	450/750V
Max. permissible operating voltage AC	0.476/0.825 kV
Max. permissible operating voltage DC	0.619/1.238 kV
AC Test Voltage	2.5 kV (15 Min.)

Chemical parameters

Compatibility to drinking water	ACS - France
Compatibility to drinking water	ELL - (Elastomerleitlinie of Umwelt Bundesamt) Germany
Water resistance	DIN EN 50525-2-21

Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	60 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-50 °C
Ambient temp. in fully flex. operation min.	-50 °C

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
1x1,5	20003697	5DH1302	5.7	6.4	19	19	50	23	33	40	0.21
1x6		5DH1305	8.2	8.9	27	36	116	90	76	91	0.86
1x10	20003698	5DH1306	9.8	11	33	44	173	150	106	127	1.43
1x16	20003699	5DH1307	11.5	12.7	51	64	265	240	142	170	2.29
1x25	20003700	5DH1308	13.2	14.4	58	72	375	375	188	225	3.56
1x35	20003701	5DH1310	14.9	16.4	66	82	485	525	232	278	5
1x50	20003702	5DH1311	17	18.5	74	93	670	750	289	347	7.15
1x70	20003703	5DH1312	18.6	20.1	80	101	859	1050	358	429	10
1x95	20003704	5DH1313	21.9	23.4	94	117	1141	1425	431	517	13.59
1x120	20003705	5DH1314	24.1	25.6	102	128	1436	1800	504	605	17.16
1x150	20003706	5DH1315	26.4	28.6	114	143	1777	2250	578	694	21.45
1x240	20003707	5DH1317	31.5	34	136	170	2900	3600	783	940	34.32
1x300	20014333	5DH1318	34.5	37.5	150	188	3500	4500	906	1087	42.9
1x400	20038391	5DH1319	38.5	41.9	168	210	4550	6000	1045	1254	57.2
1G50	20064586	5DH1661	17.5	18.5	74	93	700	750	289	347	7.15
1G70	20064585	5DH1662	19	20	80	100	950	1050	358	429	10
1G95	20064584	5DH1663	21.9	23.4	94	117	1200	1425	431	517	13.59
1G120	20064583	5DH1664	24.3	26	104	130	1500	1800	504	605	17.16
3x1,5		5DH1332	9.4	10.4	31	42	130	68	24	29	0.21
3x2,5	20003708	5DH1333	10.9	12.5	50	63	187	113	32	38	0.36
3x4	20003709	5DH1334	12.5	14.1	56	71	252	180	43	52	0.57
3x6	20003710	5DH1335	14	15.6	62	78	334	270	56	67	0.86
3x10	20007854	5DH1336	19.8	21.8	87	109	665	450	78	93	1.43
3x16	20003711	5DH1337	23.6	25.6	102	128	968	720	104	125	2.29
3x25	20003712	5DH1338	27	30	120	150	1352	1125	138	165	3.56
3x35	20003713	5DH1340	30.5	33.5	134	168	1707	1575	171	205	5
3x50	20003714	5DH1341	35.6	38.6	154	193	2421	2250	213	255	7.15
3x70	20003715	5DH1342	39.7	42.7	171	214	3289	3150	263	316	10
3x95	20007182	5DH1343	45.6	48.6	194	243	4300	4275	317	380	13.59
3x120	20008893	5DH1344	48.2	51.2	205	256	5300	5400	371	445	17.16
3G1,5	20003716	5DH1352	9.4	10.4	31	42	137	68	24	29	0.21
3G2,5		5DH1353	10.9	12.5	50	63	197	113	32	38	0.36
3G4		5DH1354	12.5	14.1	56	71	269	180	43	52	0.57
4G1,5	20003717	5DH1362	10.1	11.7	35	47	157	90	24	29	0.21
4G2,5	20003718	5DH1363	12	13.6	54	68	235	150	32	38	0.36
4G4	20003719	5DH1364	14.2	15.8	63	79	335	240	43	52	0.57
4G6	20003720	5DH1365	15.5	17.5	70	88	428	360	56	67	0.86
4G10	20003721	5DH1366	20.9	22.9	92	115	746	600	78	93	1.43
4G16	20003722	5DH1367	24.5	27.5	110	138	1124	960	104	125	2.29
4G25	20003723	5DH1368	29.9	32.9	132	165	1668	1500	138	165	3.56
4G35	20003724	5DH1370	33.6	36.6	146	183	2184	2100	171	205	5
4G50	20003725	5DH1371	39.5	42.5	170	213	3034	3000	213	255	7.15
4G70	20003726	5DH1372	43.5	46.5	186	233	3975	4200	263	316	10
4G95	20001433	5DH1373	50.6	54.6	218	273	5529	5700	317	380	13.59
4G120	20003727	5DH1374	55.1	59.1	236	296	6771	7200	371	445	17.16
4G150	20023159	5DH1375	59.6	63.6	254	318	8250	9000	425	510	21.45
5x2,5	20040515	5DH1423	13.4	14.4	58	72	310	188	32	38	0.36
7G1,5		5DH1402	15.2	16.7	67	84	353	158	24	29	0.21

x = without ye/gn core; G = with ye/gn core

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
7G2,5	20003729	5DH1412	17.2	18.9	76	95	494	263	32	38	0.36
7G4		5DH1422	20.7	22.7	91	114	714	420	43	52	0.57

Current carrying capacity in water: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient water temperature, two or three cores loaded, multi-core cables all cores loaded (cable complete immersed in water).

(2) Current carrying capacity free in air: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient temperature, two or three cores loaded, multi-core cables all cores loaded (see also DIN VDE 298-4).

x = without ye/gn core; G = with ye/gn core

NOTES

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HYDROFIRM(T) S07BBH2-F



Application

HYDROFIRM(T) rubber-sheathed cables S07BBH2-F are intended for connection of electrical equipment in water and for medium mechanical stresses, e.g. submersible pumps, lowering of water level and booster plants. These cables are also suitable for use in drinking water, cooling water, surface water, rainwater. They further can be used in groundwater and seawater (salt water) up to 2000 m water depth. The outer sheath fulfills the requirements of health according to the "Elastomerleitlinien (ELL)" of the German "Umwelt Bundesamt" and the Attestation de Conformité Sanitaire (ACS) according to the French law. When corrosive water is involved, or water of some other special compositions must be investigated in each individual case. They may not be used in water containing more than 0,5 mg/l of chlorine.

These cables can be used indoors, outdoors, in industrial and agricultural plant, but not in explosion-hazard areas.

For protected, fixed installation within equipment, pipes or wells, as well as for rotor connections, these cables may be operated with an AC voltage to 1000 V or a DC voltage to 750 V with respect to earth. The permissible AC voltage for motor tests is 3 kV for a maximum duration of 3 minutes. In other respects the specifications of DIN EN 50565-2 apply.

Global data

Brand	HYDROFIRM (T)
Type designation	S07BBH2-F
Model	Flat
Standard	DIN EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Plain copper, finely stranded class 5 in accordance with DIN EN 60228 / IEC 60228
Insulation	Ozone, water and weather resistant insulation compound, base EPR (Ethylene-Propylene Rubber)
Color code	up to 5 cores: colored in accordance with DIN VDE 0293-308 more than 5 cores: DIN EN 50525-1 Annex D
Outer sheath	EPR special compound type EM6 according to DIN EN 50363-2-1; water resistant; Compound 3G357
Outer Sheath Colour	Blue

Electrical parameters

Rated voltage	450/750V
Max. permissible operating voltage AC	0.476/0.825 kV
Max. permissible operating voltage DC	0.619/1.238 kV
AC Test Voltage	2.5 kV (15 Min.)

Chemical parameters

Compatibility to drinking water	ELL - (Elastomerleitlinie of Umwelt Bundesamt) Germany ACS - France
Water resistance	DIN EN 50525-2-21

Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	60 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-50 °C
Ambient temp. in fully flex. operation min.	-50 °C

Number of cores x cross section	Part number	MLFB Number	Min. Height (for flat cable) mm	Max. Height (for flat cable) mm	Min. Width (for flat cable) mm	Max. Width (for flat cable) mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
3x1,5	20055073	5DH1502	6	7.5	12.5	14	23	23	120	68	24	29	0.21
3x2,5	20003747	5DH1503	7	8.5	14.5	16.5	26	34	185	113	32	38	0.36
3x4	20003748	5DH1504	8	9.5	17	19	29	38	260	180	43	52	0.57
3x6	20007918	5DH1505	9	10.5	19	21.5	32	42	333	270	56	67	0.86
3x10	20003750	5DH1506	12.5	14.5	25	28	58	73	581	450	78	93	1.43
3x16	20003751	5DH1507	14.5	17	31	34	68	85	863	720	104	125	2.29
3x25	20003752	5DH1508	17	19	36.5	40	76	95	1300	1125	138	165	3.56
3x35	20003753	5DH1510	19	21.5	42	45.5	86	108	1643	1575	171	205	5
3x50	20003754	5DH1511	22	24	48.5	53	96	120	2245	2250	213	255	7.15
3x70	20003755	5DH1512	24	26.5	54.5	59	106	133	2990	3150	263	316	10
3x95	20041041	5DH1513	25.4	27.9	57	61.5	112	140	3740	4275	317	380	13.59
3x120	20003756	5DH1514	27.6	30.1	62.4	66.9	120	151	4530	5400	371	445	17.16
3x240		5DH1517	38.3	40.3	87	92	161	202	8904	10800	576	691	34.32
4G1,5	20003758	5DH1522	6	7.5	16	18.5	23	23	167	90	24	29	0.21
4G2,5	20003759	5DH1523	7	8.5	19	21.5	26	34	240	150	32	38	0.36
4G4	20003760	5DH1524	8	9.5	22.5	25.5	29	38	337	240	43	52	0.57
4G6	20003761	5DH1525	9.5	10.5	25.5	29	32	42	448	360	56	67	0.86
4G10	20003762	5DH1526	12.5	14.5	33	36.5	58	73	791	600	78	93	1.43
4G16	20003763	5DH1527	14.5	17	41	44.5	68	85	1162	960	104	125	2.29
4G25	20003764	5DH1528	17.5	20	49	53.5	80	100	1698	1500	138	165	3.56
4G35	20003765	5DH1530	19.5	22	56.5	60.5	88	110	2293	2100	171	205	5
4G50	20003766	5DH1531	22.5	25	66.5	69.5	100	125	3054	3000	213	255	7.15
4G70	20003767	5DH1532	25	28	73	77.5	112	140	4200	4200	263	316	10
4G95	20008720	5DH1533	27.5	29.5	78	82	118	148	5260	5700	317	380	13.59
4G150	20048350	5DH1535	32	35	96	100	140	175	8550	9000	425	510	21.45

(2) Current carrying capacity free in air: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient temperature, two or three cores loaded, multi-core cables all cores loaded (see also DIN VDE 298-4).

Current carrying capacity in water: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient water temperature, two or three cores loaded, multi-core cables all cores loaded (cable complete immersed in water).

x = without ye/gn core; G = with ye/gn core

HYDROFIRM(T) S1BB-F



Application

HYDROFIRM(T) rubber-sheathed cables S1BB-F are intended for connection of electrical equipment in water and for medium mechanical stresses, e.g. submersible pumps, lowering of water level and booster plants. These cables are also suitable for use in drinking water, cooling water, surface water, rainwater. They further can be used in groundwater and seawater (salt water) up to 2000 m water depth. The outer sheath fulfills the requirements of health according to the "Elastomerleitlinien (ELL)" of the German "Umwelt Bundesamt" and the Attestation de Conformité Sanitaire (ACS) according to the French law. When corrosive water is involved, or water of some other special compositions must be investigated in each individual case. They may not be used in water containing more than 0,5 mg/l of chlorine. These cables can be used indoors, outdoors, in industrial and agricultural plant, but not in explosion-hazard areas. In other respects the specifications of DIN EN 50525-2 apply.

Global data

Brand	HYDROFIRM (T)
Type designation	S1BB-F
Model	Round
Standard	Based on EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Plain copper, finely stranded class 5 in accordance with DIN EN 60228 / IEC 60228
Insulation	Ozone, water and weather resistant insulation compound, base EPR (Ethylene-Propylene Rubber)
Color code	up to 5 cores: colored in accordance with DIN VDE 0293-308 more than 5 cores: DIN EN 50525-1 Annex D
Outer sheath	EPR special compound type EM6 according to DIN EN 50363-2-1; water resistant; Compound 3G357
Outer Sheath Colour	Blue

Electrical parameters

Rated voltage	0.6/1 kV (600/1000V)
Max. permissible operating voltage AC	0.7/1.2 kV
Max. permissible operating voltage DC	0.9/1.8 kV
AC Test Voltage	3 kV (15 Min.)

Chemical parameters

Compatibility to drinking water	ACS - France ELL - (Elastomerleitlinie of Umwelt Bundesamt) Germany
Water resistance	DIN EN 50525-2-21

Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	60 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-50 °C
Ambient temp. in fully flex. operation min.	-50 °C

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
1x1,5	20007599	5DH8502	5.8	6.6	20	20	53	23	33	40	0.21
1x2,5		5DH8503	6.3	7	21	21	65	38	43	52	0.36
1x4		5DH8504	6.7	7.5	23	23	82	60	59	70	0.57
1x6		5DH8505	7.2	8	24	32	103	90	76	91	0.86
1x10		5DH8506	8.3	9.1	27	36	152	150	106	127	1.43
1x16	20159153	5DH8507	9.1	10.1	30	40	212	240	142	170	2.29
1x25	20119154	5DH8508	10.8	12.4	50	62	316	375	188	225	3.58
1x35	20004336	5DH8509	12.3	13.9	56	70	422	525	232	278	5.01
1x50	20004337	5DH8510	14.1	15.7	63	79	579	750	289	347	7.15
1x70	20004338	5DH8511	16.3	18.3	73	92	808	1050	358	429	10.01
1x95	20004339	5DH8512	18.8	20.3	81	102	1026	1425	431	517	13.59
1x120	20004340	5DH8513	20.9	22.9	92	115	1317	1800	504	605	17.16
1x150	20004341	5DH8514	23.2	25.2	101	126	1629	2250	578	694	21.45
1x185	20197815	5DH8515	26	28.3	113	142	1986	2775	660	792	26.46
1x240	20149227	5DH8516	28.9	31.2	125	156	2553	3600	783	940	34.32
1x300		5DH8517	32.1	34.4	138	172	3157	4500	906	1087	42.9
1x400		5DH8518	36.3	38.6	154	193	4094	6000	1045	1254	57.2
1x500		5DH8519	40.4	42.7	171	214	5168	7500	1203	1443	71.5
2x1	20025585	5DH8521	8	9	27	36	90	30	19	23	0.14
2x1,5		5DH8522	8.6	9.6	29	38	106	45	24	29	0.21
2x2,5		5DH8523	9.4	10.4	31	42	135	75	32	38	0.36
2x4	20182383	5DH8524	10.2	11.8	35	47	175	120	43	52	0.57
2x6		5DH8525	11.2	12.8	51	64	230	180	56	67	0.86
2x10		5DH8526	15	17	68	85	399	300	78	93	1.43
2x16		5DH8527	17.6	19.6	78	98	570	480	104	125	2.29
2x25		5DH8528	21.6	23.6	94	118	850	750	138	165	3.58
3G1,5	20014826	5DH8532	9.1	10.1	30	40	125	68	24	29	0.21
3G2,5	20112501	5DH8533	9.6	11.2	34	45	162	113	32	38	0.36
3G4	20014829	5DH8534	10.6	12.2	49	61	216	180	43	52	0.57
3x1		5DH8581	8.4	9.5	29	38	104	45	19	23	0.14
3x1,5		5DH8582	9.1	10.1	30	40	125	68	24	29	0.21
3x2,5		5DH8583	9.6	11.2	34	45	162	113	32	38	0.36
3x4		5DH8584	10.6	12.2	49	61	216	180	43	52	0.57
3x6		5DH8585	12.1	13.7	55	69	292	270	56	67	0.86
3x10		5DH8586	16.3	18.3	73	92	514	450	78	93	1.43
3x16	20197816	5DH8587	19.1	21.1	84	106	740	720	104	125	2.29
3x25	20197817	5DH8588	23.1	25.1	100	126	1094	1125	138	165	3.58
3x35	20197818	5DH8589	25.6	28.6	114	143	1459	1575	171	205	5.01
3x50	20114018	5DH8590	29.9	32.9	132	165	2018	2250	213	255	7.15
3x70	20148842	5DH8591	35.4	38.4	154	192	2808	3150	263	316	10.01
3x95	20052793	5DH8592	39	42	168	210	3547	4275	317	380	13.59
3x120	20197813	5DH8593	44.4	47.4	190	237	4542	5400	371	445	17.16
3x150	20197814	5DH8594	49	53	212	265	5627	6750	425	510	21.45
3x185	20197819	5DH8595	54.2	58.2	233	291	6819	8325	485	582	26.46
3x240	20197820	5DH8596	61.4	65.4	262	327	8645	10800	576	691	34.32
3x300		5DH8597	68.4	72.9	292	365	11081	13500	666	800	42.9
4G1		5DH8551	9.1	10.1	30	40	123	60	19	23	0.14
4G1,5	20004342	5DH8552	9.5	11.1	33	44	148	90	24	29	0.21

x = without ye/gn core; G = with ye/gn core

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
4G2,5	20004343	5DH8553	10.5	12.1	48	61	201	150	32	38	0.36
4G4	20004344	5DH8554	11.8	13.4	54	67	276	240	43	52	0.57
4G6	20004345	5DH8555	13.6	15.2	61	76	378	360	56	67	0.86
4G10	20004346	5DH8556	17.8	19.8	79	99	646	600	78	93	1.43
4G16	20004347	5DH8557	20.9	22.9	92	115	934	960	104	125	2.29
4G25	20004348	5DH8558	25.3	28.3	113	142	1418	1500	138	165	3.58
4G35	20004349	5DH8559	28.3	31.3	125	157	1877	2100	171	205	5.01
4G50	20004350	5DH8560	33.2	36.2	145	181	2613	3000	213	255	7.15
4G70	20004351	5DH8561	38.7	41.7	167	209	3638	4200	263	316	10.01
4G95	20004352	5DH8562	43.7	47.7	191	239	4643	5700	317	380	13.59
4G120	20130848	5DH8563	48.7	52.7	211	264	5833	7200	371	445	17.16
4G150	20141938	5DH8564	54.5	58.5	234	293	7222	9000	425	510	21.45
4G185		5DH8565	60.6	64.6	258	323	8830	11100	485	582	26.46
4G240	20149226	5DH8566	68.2	72.2	289	361	11457	14400	576	691	34.32
4G300		5DH8567	77	81	324	405	14368	18000	666	800	42.9

(2) Current carrying capacity free in air: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient temperature, two or three cores loaded, multi-core cables all cores loaded (see also DIN VDE 298-4).

Current carrying capacity in water: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient water temperature, two or three cores loaded, multi-core cables all cores loaded (cable compete immersed in water).

x = without ye/gn core; G = with ye/gn core

NOTES

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

HYDROFIRM(T) S1BBH2-F



Application

HYDROFIRM(T) rubber-sheathed cables S1BBH2-F are intended for connection of electrical equipment in water and for medium mechanical stresses, e.g. submersible pumps, lowering of water level and booster plants. These cables are also suitable for use in drinking water, cooling water, surface water, rainwater. They further can be used in groundwater and seawater (salt water) up to 2000 m water depth. The outer sheath fulfills the requirements of health according to the "Elastomerleitlinien (ELL)" of the German "Umwelt Bundesamt" and the Attestation de Conformité Sanitaire (ACS) according to the French law. When corrosive water is involved, or water of some other special compositions must be investigated in each individual case. They may not be used in water containing more than 0,5 mg/l of chlorine. These cables can be used indoors, outdoors, in industrial and agricultural plant, but not in explosion-hazard areas. In other respects the specifications of DIN EN 50525-2 apply.

Global data

Brand	HYDROFIRM (T)
Type designation	S1BBH2-F
Model	Flat
Standard	Based on EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Plain copper, finely stranded class 5 in accordance with DIN EN 60228 / IEC 60228
Insulation	Ozone, water and weather resistant insulation compound, base EPR (Ethylene-Propylene Rubber)
Color code	up to 5 cores: colored in accordance with DIN VDE 0293-308 more than 5 cores: DIN EN 50525-1 Annex D
Outer sheath	EPR special compound type EM6 according to DIN EN 50363-2-1; water resistant; Compound 3G357
Outer Sheath Colour	Blue

Electrical parameters

Rated voltage	0.6/1 kV (600/1000V)
Max. permissible operating voltage AC	0.7/1.2 kV
Max. permissible operating voltage DC	0.9/1.8 kV
AC Test Voltage	3 kV (15 Min.)

Chemical parameters

Compatibility to drinking water	ELL - (Elastomerleitlinie of Umwelt Bundesamt) Germany ACS - France
Water resistance	DIN EN 50525-2-21

Thermal parameters

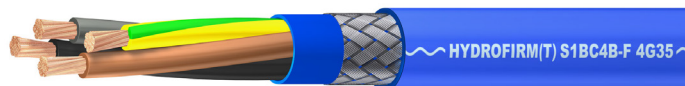
Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	60 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-50 °C
Ambient temp. in fully flex. operation min.	-50 °C

Number of cores x cross section	Part number	MLFB Number	Min. Height (for flat cable) mm	Max. Height (for flat cable) mm	Min. Width (for flat cable) mm	Max. Width (for flat cable) mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
3x1,5		5DH8602	5.3	6.3	11.3	12.2	19	19	117	68	24	29	0.21
3x2,5		5DH8603	6	7.5	12.5	14	23	23	161	113	32	38	0.36
3x4		5DH8604	7	8.3	14.5	16.6	25	33	223	180	43	52	0.57
3x6		5DH8605	8	9.5	17	19	29	38	300	270	56	67	0.86
3x10		5DH8606	9	10.5	19	21.5	32	42	461	450	78	93	1.43
3x16		5DH8607	12.5	14.5	25	28	58	73	767	720	104	125	2.29
3x25		5DH8608	14.5	17	31	34	68	85	1117	1125	138	165	3.58
3x35	20161286	5DH8609	17	19	36.5	40	76	95	1493	1575	171	205	5.01
3x50	20008473	5DH8610	19	21.5	42	45.5	86	108	2043	2250	213	255	7.15
3x70	20161595	5DH8611	22	24	48.5	53	96	120	2803	3150	263	316	10.01
3x95	20182905	5DH8612	23.5	26	52	56.5	104	130	3536	4275	317	380	13.59
3x120	20153436	5DH8613	26.4	29.4	59	63	118	147	4547	5400	371	445	17.16
3x150		5DH8614	29.1	32.1	66.4	70.9	128	161	5614	6750	425	510	21.45
3x185		5DH8615	32	35	73	78	140	175	6804	8325	485	582	26.46
4G1,5		5DH8622	6	7.5	16	18.5	23	23	174	90	24	29	0.21
4G2,5		5DH8623	6	7.5	16	18.5	23	23	214	150	32	38	0.36
4G4	20180659	5DH8624	7	8.5	19	21.5	26	34	301	240	43	52	0.57
4G6	20025268	5DH8625	8	9.5	22.5	25.5	29	38	411	360	56	67	0.86
4G10	20151819	5DH8626	9.5	10.5	25.5	29	32	42	623	600	78	93	1.43
4G16	20151820	5DH8627	12.5	14.5	33	36.5	58	73	1044	960	104	125	2.29
4G25	20119298	5DH8628	14.5	17	41	44.5	68	85	1514	1500	138	165	3.58
4G35	20007173	5DH8629	17.5	20	49	53	80	100	2102	2100	171	205	5.01
4G50	20007116	5DH8630	19.5	22	56.5	60.5	88	110	2840	3000	213	255	7.15
4G70	20096282	5DH8631	22.5	25	66.5	69.5	100	125	3896	4200	263	316	10.01
4G95	20119299	5DH8632	24	27	70.7	74.7	108	135	4867	5700	317	380	13.59
4G120		5DH8633	27.6	30.6	79.9	85.9	122	153	6291	7200	371	445	17.16
4G150		5DH8634	29.9	32.9	88.6	94.6	132	165	7678	9000	425	510	21.45

(2) Current carrying capacity free in air: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient temperature, two or three cores loaded, multi-core cables all cores loaded (see also DIN VDE 298-4).
Current carrying capacity in water: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient water temperature, two or three cores loaded, multi-core cables all cores loaded (cable compete immersed in water).

x = without ye/gn core; G = with ye/gn core

HYDROFIRM(T) EMC-FC S1BC4B-F



Application

HYDROFIRM(T) rubber-sheathed cables S1BC4B-F are intended for connection of electrical equipment in water and for medium mechanical stresses, e.g. submersible pumps, lowering of water level and booster plants. Especially for frequency converter controlled AC drives and if considerable demands in respect of electromagnetic compatibility (EMC) according to the EMC directive imposes. For an effective shielding both ends of cable must have a good shield contact to ground. These cables are also suitable for use in drinking water, cooling water, surface water, rainwater. They further can be used in groundwater and seawater (salt water) up to 2000 m water depth. The outer sheath fulfills the requirements of health according to the "Elastomerleitlinien (ELL)" of the German "Umwelt Bundesamt" and the Attestation de Conformité Sanitaire (ACS) according to the French law. When corrosive water is involved, or water of some other special compositions must be investigated in each individual case. They may not be used in water containing more than 0,5 mg/l of chlorine.

These cables can be used indoors, outdoors, in industrial and agricultural plant, but not in explosion-hazard areas.

In other respects the specifications of DIN EN 50565-2 apply.

Global data

Brand	HYDROFIRM (T)
Type designation	S1BC4B-F
Standard	Based on EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Plain copper, finely stranded class 5 in accordance with DIN EN 60228 / IEC 60228
Insulation	Ozone, water and weather resistant insulation compound, base EPR (Ethylene-Propylene Rubber)
Color code	up to 5 cores: colored in accordance with DIN VDE 0293-308 more than 5 cores: DIN EN 50525-1 Annex D
Screen	Braid of tinned copper wires Maximum transfer impedance 30Ω/km at 30MHz
Outer sheath	EPR special compound type EM6 according to DIN EN 50363-2-1:2006-10; water resistant; Compound 3G357
Outer Sheath Colour	Blue

Electrical parameters

Rated voltage	0.6/1 kV (600/1000V)
Max. permissible operating voltage AC	0.7/1.2 kV
Max. permissible operating voltage DC	0.9/1.8 kV
AC Test Voltage	5 kV (5 Min.)

Chemical parameters

Compatibility to drinking water	ELL - (Elastomerleitlinie of Umwelt Bundesamt) Germany ACS - France
Water resistance	DIN EN 50525-2-21

Thermal parameters

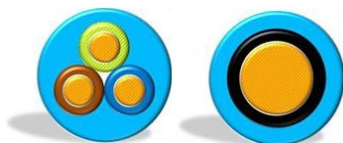
Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	60 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-50 °C
Ambient temp. in fully flex. operation min.	-50 °C

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
3x1,5/1,5 KON		5DH8742	9.5	11.1	33	44	171	67	24	29	0.21
3x2,5/2,5 KON	20026461	5DH8743	10.5	12.1	48	61	225	112	32	38	0.36
3x4/4 KON	20040091	5DH8744	11.8	13.4	54	67	304	180	43	52	0.57
3x6/6 KON	20006934	5DH8745	13.6	15.2	61	76	382	270	56	67	0.86
3x10/10 KON		5DH8746	17.8	19.8	79	99	680	450	78	93	1.43
3x16/16 KON	20006935	5DH8747	20.9	22.9	92	115	1016	720	104	125	2.29
3x25+3G16/3		5DH8748	25.3	28.3	113	142	1448	1125	138	165	3.58
3x35+3G16/3	20036153	5DH8749	28.3	31.3	125	157	1845	1575	171	205	5.01
3x50+3G25/3	20194972	5DH8750	33.2	36.2	145	181	2582	2250	213	255	7.15
3x70+3G35/3	20169250	5DH8751	38.7	41.7	167	209	3560	3150	263	316	10.01
3x95+3G50/3	20096401	5DH8752	43.7	47.7	191	239	4560	4275	317	380	13.59
3x120+3G70/3	20157144	5DH8753	48.8	51.8	207	259	5685	5400	371	445	17.16

Current carrying capacity in water: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient water temperature, two or three cores loaded, multi-core cables all cores loaded (cable complete immersed in water).

(2) Current carrying capacity free in air: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient temperature, two or three cores loaded, multi-core cables all cores loaded (see also DIN VDE 298-4).

TML round type B



Application

TML rubber-sheathed cables are intended for connection of electrical equipment in water and for medium mechanical stresses, e.g. submersible pumps, lowering of water level and booster plants. These cables are also suitable for use in drinking water, cooling water, surface water, airwater. They further can be used in groundwater and seawater (salt water) up to 2000 m water depth. The outer sheath fulfills the requirements of health according to the "Elastomerleitlinien (ELL)" of the German "Umwelt Bundesamt" and the Attestation de Conformité Sanitaire (ACS) according to the French law. When corrosive water is involved, or water of some other special compositions must be investigated in each individual case. They may not be used in water containing more than 0,5 mg/l of chlorine. These cables can be used indoors, outdoors, in industrial and agricultural plant, but not in explosion-hazard areas. In other respects the specifications of DIN EN 50565-2 apply.

Global data

Brand	TML
Model	Round
Standard	Based on EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	plain annealed copper, flexible class 5 acc. to DIN EN 60228 / IEC 60228
Insulation	Ozone, water and weather resistant insulation compound, base EPR (Ethylene-Propylene Rubber)
Color code	up to 5 cores: colored in accordance with DIN VDE 0293-308 more than 5 cores: DIN EN 50525-1 Annex D
Outer sheath	EPR special compound type EM6 according to DIN EN 50363-2-1; water resistant; Compound 3G357
Outer Sheath Colour	Blue

Electrical parameters

Rated voltage	0.6/1 kV (600/1000V)
Max. permissible operating voltage AC	0.7/1.2 kV
Max. permissible operating voltage DC	0.9/1.8 kV
AC Test Voltage	3 kV (5 Min.)

Chemical parameters

Compatibility to drinking water	ACS - France ELL - (Elastomerleitlinie of Umwelt Bundesamt) Germany
Water resistance	EN 50525-2-21

Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	60 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-40 °C
Ambient temp. in fully flex. operation min.	-25 °C

Mechanical parameters

Min. bending radius	Acc. to DIN VDE 0298 part 3
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Number of cores x cross section	Part number	Outer diameter nom. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
1x1,5	20006530	6	24	36	50	23	33	40	0.21
1x2,5		6.6	26.4	39.6	65	38	43	52	0.36
1x4		7.5	30	45	90	60	59	70	0.57
1x6		8.3	33.2	49.8	120	90	76	91	0.86
1x10		10.1	40.4	60.6	185	150	106	127	1.43
1x16	20024982	11.3	45.2	67.8	255	240	142	170	2.29
1x25	20006531	13.5	54	81	365	375	188	225	3.58
1x35	20006532	15.2	60.8	91.2	490	525	232	278	5.01
1x50	20006533	17.5	70	105	690	750	289	347	7.15
1x70	20006534	20.3	81.2	121.8	920	1050	358	429	10
1x95	20006535	22.7	90.8	136.2	1210	1425	431	517	13.6
1x120	20006536	24.5	98	147	1455	1800	504	605	17.2
1x150	20006537	28	112	168	1825	2250	578	694	21.5
1x185	20006538	30	120	180	2160	2775	660	792	26.5
2x1	20055241	8.2	32.8	49.2	95	30	19	23	0.14
3x0,75	20006540	8	32	48	90	34	16	19	0.11
3x1,5	20006541	9.7	38.8	58.2	135	68	24	29	0.21
3x2,5		11.4	45.6	68.4	210	113	32	38	0.36
3x4		13	52	78	280	180	43	52	0.57
3x6		14.5	58	87	370	270	56	67	0.86
3x10	20006546	20	80	120	650	450	78	93	1.43
3x16	20006547	24	96	144	940	720	104	125	2.29
3x25	20006548	27.7	110.8	166.2	1320	1125	138	165	3.58
3x35	20006549	31	124	186	1730	1575	171	205	5.01
3x50		36	144	216	2440	2250	213	255	7.15
4G1,5	20006551	10.7	42.8	64.2	165	90	24	29	0.21
4G2,5	20006552	12.6	50.4	75.6	235	150	32	38	0.36
4G4	20006553	14.4	57.6	86.4	335	240	43	52	0.57
4G6	20006554	16.2	64.8	97.2	460	360	56	67	0.86
4G10	20006555	21.9	87.6	131.4	800	600	78	93	1.43
4G16	20006556	26.2	104.8	157.2	1165	960	104	125	2.29
4G25	20006557	30.2	120.8	181.2	1650	1500	138	165	3.58
4G35	20006558	34.5	138	207	2200	2100	171	205	5.01
4G50	20006559	41.4	165.6	248.4	3260	3000	213	255	7.15
4G70	20006560	45.7	182.8	274.2	4149	4200	263	316	10

(2) Current carrying capacity free in air: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient temperature, two or three cores loaded, multi-core cables all cores loaded (see also DIN VDE 298-4).

Current carrying capacity in water: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient water temperature, two or three cores loaded, multi-core cables all cores loaded (cable complete immersed in water).

x = without ye/gn core; G = with ye/gn core

TML flat type B



Application

TML rubber-sheathed cables are intended for connection of electrical equipment in water and for medium mechanical stresses, e.g. submersible pumps, lowering of water level and booster plants. These cables are also suitable for use in drinking water, cooling water, surface water, airwater. They further can be used in groundwater and seawater (salt water) up to 2000 m water depth. The outer sheath fulfills the requirements of health according to the "Elastomerleitlinien (ELL)" of the German "Umwelt Bundesamt" and the Attestation de Conformité Sanitaire (ACS) according to the French law. When corrosive water is involved, or water of some other special compositions must be investigated in each individual case. They may not be used in water containing more than 0,5 mg/l of chlorine. These cables can be used indoors, outdoors, in industrial and agricultural plant, but not in explosion-hazard areas. In other respects the specifications of DIN EN 50565-2 apply.

Global data

Brand	TML
Model	Flat
Standard	Based on EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Plain copper, finely stranded class 5 in accordance with DIN EN 60228 / IEC 60228
Insulation	Ozone, water and weather resistant insulation compound, base EPR (Ethylene-Propylene Rubber)
Color code	up to 5 cores: colored in accordance with DIN VDE 0293-308 more than 5 cores: DIN EN 50525-1 Annex D
Outer sheath	EPR special compound type EM6 according to DIN EN 50363-2-1; water resistant; Compound 3G357
Outer Sheath Colour	Blue

Electrical parameters

Rated voltage	0.6/1 kV (600/1000V)
Max. permissible operating voltage AC	0.7/1.2 kV
Max. permissible operating voltage DC	0.9/1.8 kV
AC Test Voltage	3 kV (5 Min.)

Chemical parameters

Compatibility to drinking water	ELL - (Elastomerleitlinie of Umwelt Bundesamt) Germany ACS - France
Water resistance	DIN EN 50525-2-21

Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	60 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-40 °C
Ambient temp. in fully flex. operation min.	-25 °C

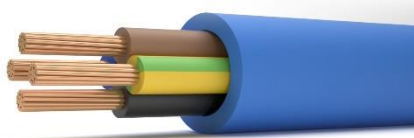
Number of cores x cross section	Part number	Min. Height (for flat cable) mm	Max. Height (for flat cable) mm	Min. Width (for flat cable) mm	Max. Width (for flat cable) mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
3G1,5	20006584	6.3	6.7	12.9	13.5	140	68	24	29	0.21
3x1,5		6.3	6.7	12.9	13.5	140	68	24	29	0.21
3x2,5	20006585	7.1	7.5	15	15.6	190	113	32	38	0.36
3x4	20006586	8	9	17.3	18.3	270	180	43	52	0.57
3x6	20006587	9	10	19	20	360	270	56	67	0.86
3x10	20006588	11	12	24	25	570	450	78	93	1.43
3x16	20006589	11.7	12.7	28.3	29.3	760	720	104	125	2.29
3x25	20006590	15.5	16.5	37	38	1250	1125	138	165	3.58
3x35	20006591	15.5	17.5	37.5	39.5	1500	1575	171	205	5.01
3x50		18.5	20.5	45.5	47.5	2180	2250	213	255	7.15
4G1,5	20006592	6.3	6.7	15.9	16.5	170	90	24	29	0.21
4G2,5	20006593	6.8	7.2	18.7	19.3	240	150	32	38	0.36
4G4	20006594	7.7	8.7	22.5	23.5	350	240	43	52	0.57
4G6	20006595	8.5	9.5	24.5	25.5	450	360	56	67	0.86
4G10	20006596	10	11	29.5	30.5	690	600	78	93	1.43
4G16	20024741	12.3	13.3	37.5	38.5	1040	960	104	125	2.29
4G25	20051064	13.7	15.3	43.5	45.1	1490	1500	138	165	3.58
4G35	20006597	15.5	17.5	47.5	49.5	1970	2100	171	205	5.01

Current carrying capacity in water: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient water temperature, two or three cores loaded, multi-core cables all cores loaded (cable complete immersed in water).

(2) Current carrying capacity free in air: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient temperature, two or three cores loaded, multi-core cables all cores loaded (see also DIN VDE 298-4).

x = without ye/gn core; G = with ye/gn core

POTAFLEX



Application:

- Power cable for submersible potable water pumps
- Designed for outdoor use
- Suitable for permanent submersion in water for water depths up to 150 meters

Construction:

Conductor: bare stranded copper Class 5
Insulation: poly vinyl chloride (PVC)
Stranding: 3 or 4 cores
Outer sheath: polyethylene (PE)
Wire colors:
3 cores: green/yellow, blue, brown
4 cores: green/yellow, brown, black, grey

Standards / references:

KTW certificate including W270 for contact with drinking water

Properties:

- Safe for drinking water application
- Lead free
- Halogen free polyethylene water impermeable outer sheath

Electrical properties:

Nominal voltage: 0,6/1 kV
Test voltage: 3,5 kV

Fire properties:

Halogen free:	No
Low smoke:	No
Self-extinguishing acc. IEC 60332-1:	No
Flame retardant acc. IEC 60332-3:	No

Other properties:

Minimum installation temperature:	0 °C
Maximum conductor temperature:	+70 °C
Environment temperature:	min. -40 °C, max. +50 °C
Sheath color:	bright blue
Approvals:	KTW approval
Delivery:	reels

Number of cores x cross section	Part number	Nom. insulation diameter mm	Nominal outer diameter mm	Approx. weight kg/km	Maximum tensile strength (N)
3G1,5	132815WA	3,1	10,1	113	67
4G1,5	833821WA	3,1	11,1	141	90
3G2,5	833822WA	3,6	11,5	157	110
4G2,5	833824WA	3,6	12,6	196	150

MS-HYDROFIRM(T) (N)TSW



Application

MS- HYDROFIRM(T) rubber-sheathed cables (N)TSW are intended for connection of electrical equipment in water and for medium mechanical stresses, e.g. submersible pumps, lowering of water level and booster plants. These cables are also suitable for use in drinking water, cooling water, surface water, rainwater. They further can be used in groundwater and seawater (salt water) up to 2000 m water depth. The outer sheath fulfills the requirements of health according to the "Elastomerleitlinien (ELL)" of the German "Umwelt Bundesamt" and the Attestation de Conformité Sanitaire (ACS) according to the French law.

When corrosive water is involved, or water of some other special compositions must be investigated in each individual case. They may not be used in water containing more than 0,5 mg/l of chlorine.

These cables can be used indoors, outdoors, in industrial and agricultural plant, but not in explosion-hazard areas.

In other respects the specifications of DIN VDE 0298-3 apply.

Global data

Brand	HYDROFIRM (T)
Type designation	(N)TSW
Standard	DIN VDE 0298-4 Based on DIN VDE 0250-813

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Plain copper, finely stranded class 5 in accordance with DIN EN 60228 / IEC 60228
Insulation	Ozone, water and weather resistant insulation compound, base EPR (Ethylene-Propylene Rubber)
Electrical field control	Inner layer of semiconductive rubber compound
Color code	Power cores: light color with black numbering; PE core: green-yellow
Outer sheath	EPR special compound type EM6 according to DIN EN 50363-2-1; water resistant; Compound 3G357
Outer Sheath Colour	Blue

Electrical parameters

Rated voltage	3.6/6 kV
Max. permissible operating voltage AC	4.2/7.2 kV
Max. permissible operating voltage DC	5.4/10.8 kV
AC Test Voltage	11 kV (5 Min.)

Chemical parameters

Compatibility to drinking water	ELL - (Elastomerleitlinie of Umwelt Bundesamt) Germany ACS - France
Water resistance	DIN EN 50525-2-21

Thermal parameters

Max. permissible temperature at conductor	90 °C
Max. short circuit temperature of the conductor	250 °C
Max. permissible water temperature	60 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-40 °C
Ambient temp. in fully flex. operation min.	-25 °C

Number of cores x cross section	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity free in air (2) A	Current carrying capacity in water A	Short Circuit Current (conductor) kA
1x16		5DK3164	15.7	17.2	103	172	382	240	142	170	2.29
1x25		5DK3165	16.5	18	108	180	470	375	188	225	3.56
1x35		5DK3166	17.7	19.2	115	192	588	525	232	278	5
1x50		5DK3167	19.1	20.6	124	206	735	750	289	347	7.15
1x70		5DK3168	21.7	23.2	139	232	990	1050	358	429	10
3x16		5DK3171	29.1	32.1	193	321	1305	720	104	125	2.29
3x25		5DK3172	31.8	34.8	209	348	1675	1125	138	165	3.56
3x35		5DK3173	34.4	37.4	224	374	2079	1575	171	205	5
3x50		5DK3174	38.8	41.8	251	418	2735	2250	213	255	7.15
3x70		5DK3175	42.5	45.5	273	455	3480	3150	263	316	10
3x16/16		5DK3181	33.3	36.3	218	363	1695	960	104	125	2.29
3x25/25	20025998	5DK3182	35	38	228	380	2110	1500	138	165	3.56
3x35/35		5DK3183	39.1	42.1	252	421	2675	2100	171	205	5
3x50/50		5DK3184	42.7	45.7	274	457	3400	3000	213	255	7.15
3x70/70		5DK3185	46.8	49.8	299	498	4365	4200	263	316	10
3x25+3x25/3		5DK3190	31.8	34.8	209	348	1823	1125	138	165	3.56
3x35+3x25/3		5DK3191	34.4	37.4	224	374	2215	1575	171	205	5
3x50+3x25/3		5DK3192	38.8	41.8	251	418	2875	2250	213	255	7.15
3x70+3x35/3		5DK3193	42.5	45.5	273	455	3695	3150	263	316	10

(2) Current carrying capacity free in air: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient temperature, two or three cores loaded, multi-core cables all cores loaded (see also DIN VDE 298-4).

Current carrying capacity in water: The values are valid for permanent operation with DC or AC with 50 up to 60 Hz at 30 °C ambient water temperature, two or three cores loaded, multi-core cables all cores loaded (cable complete immersed in water).

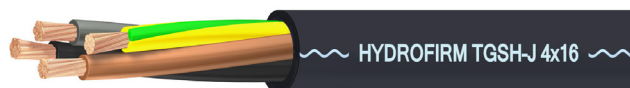
Water cable catalogue



HOT WATER CABLES

Designation	Standard	Model	Conductor temp. max.	Water temp. max.	Outer sheath
HYDROFIRM TGS	dimensions based on DIN EN 50525-2-21	round	130°C	110°C	HEPR
HYDROFIRM TGS2G	dimensions based on DIN EN 50525-2-21	round	150°C	120°C	SiR

HYDROFIRM TGSB



Application

HYDROFIRM rubber-sheathed cables TGSB are intended for connection of electrical equipment in hot water and for medium mechanical stresses. These cables are also suitable for use in industrial water, cooling water, surface water, rainwater, groundwater and seawater (salt water) up to 2000 m water depth. When corrosive water is involved, or water of some other special compositions must be investigated in each individual case. These cables can be used indoors, outdoors, in industrial and agricultural plant, but not in explosion-hazard areas. For protected, fixed installation within equipment, pipes or wells, as well as for rotor connections, these cables may be operated with an AC voltage to 1000 V or a DC voltage to 750 V with respect to earth. The permissible AC voltage for motor tests is 3 kV for a maximum duration of 3 minutes. In other respects the specifications of DIN EN50565-2 apply.

Global data

Brand	HYDROFIRM
Type designation	TGSB
Standard	Based on EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Copper, tinned, finely stranded, class 5 according to DIN EN 60228 / IEC 60228
Insulation	Ozone, weather, heat and water resistant insulation compound, base SIR
Color code	up to 5 cores: colored in accordance with DIN VDE 0293-308 more than 5 cores: DIN EN 50525-1 Annex D
Outer sheath	Special compound, base HEPR
Outer Sheath Colour	Black

Electrical parameters

Rated voltage	450/750V
Max. permissible operating voltage AC	0.476/0.825 kV
Max. permissible operating voltage DC	0.619/1.238 kV
AC test voltage	2.5 kV
Duration of AC test voltage	15 min.

Chemical parameters

Water resistance	DIN EN 50525-2-21
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Thermal parameters

Max. short circuit temperature of the conductor	350 °C (max. 5 s)
Max. permissible water temperature	110 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-50 °C
Ambient temp. in fully flex. operation min.	-50 °C

Number of cores x cross section	Art. Des. O/J	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity (1) A	Short Circuit Current (conductor) kA
1 x 1.5	-O		5DH1	5.7	6.4	19	19	50	22.5	14	0.23
1 x 6	-O		5DH1	8.2	8.9	36	27	116	90	32	0.93
1 x 10	-O		5DH1	9.8	11	44	33	173	150	45	1.55
1 x 16	-O		5DH1	11.5	12.7	64	51	265	240	60	2.48
1 x 25	-O	20182903	5DH1	13.2	14.4	72	58	375	375	79	3.88
1 x 35	-O		5DH1	14.9	16.4	82	66	485	525	98	5.43
1 x 50	-O		5DH1	17	18.5	93	74	670	750	122	7.75
1 x 70	-O	20203102	5DH1	18.6	20.1	101	80	859	1050	151	10.85
3 x 1.5	-O		5DH1	9.4	10.4	42	31	130	67.5	13	0.23
3 x 2.5	-O	20163258	5DH1	10.9	12.5	63	50	187	112.5	17	0.39
3 x 4	-O		5DH1	12.5	14.1	71	56	252	180	24	0.62
3 x 6	-O		5DH1	14	15.6	78	62	334	270	31	0.93
3 x 10	-O		5DH1	19.8	21.8	109	87	665	450	43	1.55
3 x 16	-O		5DH1	23.6	25.6	128	102	968	720	57	2.48
3 x 25	-O		5DH1	27	30	150	120	1352	1125	76	3.88
3 x 35	-O		5DH1	30.5	33.5	168	134	1707	1575	94	5.43
3 x 50	-O		5DH1	35.6	38.6	193	154	2421	2250	117	7.75
3 x 70	-O		5DH1	39.7	42.7	214	171	3289	3150	145	10.85
3 x 1.5	-J		5DH1	9.4	10.4	42	31	137	67.5	13	0.23
3 x 2.5	-J		5DH1	10.9	12.5	63	50	197	112.5	17	0.39
3 x 4	-J		5DH1	12.5	14.1	71	56	269	180	24	0.62
4 x 1.5	-J		5DH1	10.1	11.7	47	35	157	90	13	0.23
4 x 2.5	-J	20180136	5DH1	12	13.6	68	54	235	150	17	0.39
4 x 4	-J		5DH1	14.2	15.8	79	63	335	240	24	0.62
4 x 6	-J		5DH1	15.5	17.5	88	70	428	360	31	0.93
4 x 10	-J	20180135	5DH1	20.9	22.9	115	92	746	600	43	1.55
4 x 16	-J	20160190	5DH1	24.5	27.5	138	110	1124	960	57	2.48
4 x 25	-J	20162061	5DH1	29.9	32.9	165	132	1668	1500	76	3.88
4 x 35	-J		5DH1	33.6	36.6	183	146	2184	2100	94	5.43
4 x 50	-J		5DH1	39.5	42.5	213	170	3034	3000	117	7.75
4 x 70	-J		5DH1	43.5	46.5	233	186	3975	4200	145	10.85

The values are valid for a multicore cable or three singlecore cables in trefoil in permanent operation with DC or AC with 50 up to 60 Hz at 110 °C ambient temperature, touching a surface, three cores loaded
-O = without green/yellow core, -J = with green/yellow core

HYDROFIRM TGSH2G



Application

HYDROFIRM rubber-sheathed cables TGSH2G are intended for connection of electrical equipment in hot water and for medium mechanical stresses. These cables are also suitable for use in industrial water, cooling water, surface water, rainwater, groundwater and seawater (salt water) up to 2000 m water depth. When corrosive water is involved, or water of some other special compositions must be investigated in each individual case. These cables can be used indoors, outdoors, in industrial and agricultural plant. Use in workshops having an explosive atmosphere. When a cable is to be used in the presence of explosive or flammable atmospheres, guidance should be sought by reference to EN 60079 series of specifications and guidance should be sought in selecting suitable cables. For protected, fixed installation within equipment, pipes or wells, as well as for rotor connections, these cables may be operated with an AC voltage to 1000 V or a DC voltage to 750 V with respect to earth. The permissible AC voltage for motor tests is 3 kV for a maximum duration of 3 minutes. In other respects the specifications of DIN EN 50565-2 apply.

Global data

Brand	HYDROFIRM
Type designation	TGSH2G
Standard	Based on EN 50525-2-21

Notes on installation

Maximum Submersing Depth	2000 Meter
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Design features

Conductor	Copper, tinned, finely stranded, class 5 according to DIN EN 60228 / IEC 60228
Insulation	Ozone, weather, heat and water resistant insulation compound, base SIR
Color code	up to 5 cores: colored in accordance with DIN VDE 0293-308
Outer sheath	Ozone, weather, heat, and water resistant special compound, base SIR
Outer Sheath Colour	Black

Electrical parameters

Rated voltage	450/750V
Max. permissible operating voltage AC	0.476/0.825 kV
Max. permissible operating voltage DC	0.619/1.238 kV
AC test voltage	2.5 kV
Duration of AC test voltage	15 min.

Chemical parameters

Water resistance	DIN EN 50525-2-21
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Thermal parameters

Max. short circuit temperature of the conductor	350 °C (max. 5 s)
Max. permissible water temperature	120 °C (At higher water temperatures, a shortened cable service life is to be expected)
Ambient temperature for fix installation min.	-50 °C
Ambient temp. in fully flex. operation min.	-50 °C

Number of cores x cross section	Art. Des. O/J	Part number	MLFB Number	Outer diameter min. mm	Outer diameter max. mm	Bending radius fixed min. mm	Bending radius free moving min. mm	Weight (approx.) kg/km	Permissible tensile force max. N	Current carrying capacity (1) A	Short Circuit Current (conductor) kA
3 x 25	-O		5DH1	27	30	150	120	1352	1125	93	3.65
1 x 10	-O		5DH1	9.8	11	44	33	173	150	55	1.46
3 x 16	-O		5DH1	23.6	25.6	128	102	968	720	70	2.34
1 x 6	-O		5DH1	8.2	8.9	36	27	116	90	39	0.88
3 x 10	-O		5DH1	19.8	21.8	109	87	665	450	53	1.46
1 x 1.5	-O		5DH1	5.7	6.4	19	19	50	23	17	0.22
3 x 6	-O		5DH1	14	15.6	78	62	334	270	38	0.88
1 x 50	-O		5DH1	17	18.5	93	74	670	750	150	7.3
3 x 4	-O		5DH1	12.5	14.1	71	56	252	180	29	0.58
1 x 35	-O		5DH1	14.9	16.4	82	66	485	525	120	5.11
3 x 2.5	-O		5DH1	10.9	12.5	63	50	187	113	21	0.37
1 x 25	-O		5DH1	13.2	14.4	72	58	375	375	97	3.65
3 x 1.5	-O		5DH1	9.4	10.4	42	31	130	68	16	0.22
1 x 16	-O		5DH1	11.5	12.7	64	51	265	240	73	2.34
1 x 70	-O		5DH1	18.6	20.1	101	80	859	1050	185	10.22
4 x 2.5	-J		5DH1	12	13.6	68	54	235	150	21	0.37
4 x 1.5	-J		5DH1	10.1	11.7	47	35	157	90	16	0.22
3 x 4	-J		5DH1	12.5	14.1	71	56	269	180	29	0.58
3 x 2.5	-J		5DH1	10.9	12.5	63	50	197	113	21	0.37
3 x 1.5	-J		5DH1	9.4	10.4	42	31	137	68	16	0.22
3 x 70	-O		5DH1	39.7	42.7	214	171	3289	3150	178	10.22
3 x 50	-O		5DH1	35.6	38.6	193	154	2421	2250	143	7.3
3 x 35	-O		5DH1	30.5	33.5	168	134	1707	1575	115	5.11
4 x 50	-J		5DH1	39.5	42.5	213	170	3034	3000	143	7.3
4 x 70	-J		5DH1	43.5	46.5	233	186	3975	4200	178	10.22
4 x 25	-J		5DH1	29.9	32.9	165	132	1668	1500	93	3.65
4 x 35	-J		5DH1	33.6	36.6	183	146	2184	2100	115	5.11
4 x 10	-J		5DH1	20.9	22.9	115	92	746	600	53	1.46
4 x 16	-J	20162333	5DH1	24.5	27.5	138	110	1124	960	70	2.34
4 x 4	-J		5DH1	14.2	15.8	79	63	335	240	29	0.58
4 x 6	-J		5DH1	15.5	17.5	88	70	428	360	38	0.88

-O = without green/yellow core, -J = with green/yellow core

The values are valid for a multicore cable or three singlecore cables in trefoil in permanent operation with DC or AC with 50 up to 60 Hz at 120 °C ambient temperature, touching a surface, three cores loaded

Linking the future

Prysmian Group Denmark A/S
Roskildevej 22
2620 Albertslund
Denmark

Sales

+45 60 39 27 39
+45 60 39 26 29

dk-ti-sales@prysmiangroup.com

www.prysmiangroup.dk

Prysmian Group Finland Oy
Kaapelitie 68
02490 Pikkala

Johdintie 5
90620 Oulu

Sales

+35 010 5661

fi-info@prysmiangroup.com

www.prysmiangroup.fi

Prysmian Group Sweden AB
Vallgatan 5
57141 Nässjö
Sweden

Sales

+46 38 055 42 09
+46 38 055 42 08

info.se@prysmiangroup.com
order.se@prysmiangroup.com
offert.se@prysmiangroup.com

www.draka.se

Prysmian Group Norway AS
Postboks 369 Bragerne
3001 Drammen
Norway

Sales

+47 32 24 90 00

no-kundesenter@
prysmiangroup.com

www.prysmiangroup.no

Prysmian Group Estonia AS
Paldiski mnt. 31
76606 Keila
Estonia

Sales

+371 9272 731 (Latvia)
+370 6 187 4 384 (Lithuania)

info.keila@prysmiangroup.com

www.drakakeila.ee