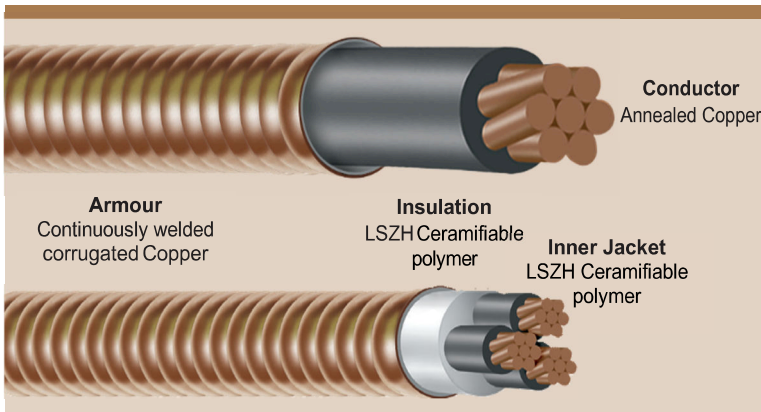




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VITALink® MC-metric 2-Hour Fire Rated Cable



UL 2196

BS 6387 CWZ

AS/NZS 3013

Voltage rating 0.6/1kV

Continuous temperature rating 150°C

Type MC

UL System FHIT120M

Applications

- Life Safety and Firefighting systems: Emergency lighting, smoke extraction fans and shutters, pressurization fans, fireman's lift submains, fire hydrant and sprinkler pumps, fire alarms and evacuation systems.

Features

- Fire resistance to UL 2196, AS/NZS 3013 - 2 hr. FRR
- Fire Resistance to BS 6387 CWZ - 3 hr. FRR
- Superior resistance to flame propagation
- Tested and certified for Vertical and Horizontal installation
- Halogen free, low toxicity, low smoke, low fuel element
- Only conventional tools required to install and terminate
- Commercially available earthing glands
- Printed number coding allows for easy identification
- Labor savings on termination, installation and handling
- Made in USA
- Superior impact & crush resistance
- Welded armor forms an impervious barrier to water, contaminants and rodents
- Flexible and easy to install. No special tools or training required
- Full range of cable sizes with long continuous lengths available
- No Insulation Resistance issues when terminating in humid environments
- VFD cable available with 3 split earth conductors
- Copper sheath exceeds code requirements for equipment grounding conductor

Performance Standards

- UL 2196 – Listed as a 2-hour fire rated Electrical Circuit Integrity System FHIT 120M of the UL Fire Resistance Directory
- IEEE 1202/FT4 vertical flame test; ST1 limited smoke
- Constructed to UL 1569 – Listed as Type MC
- Copper metric conductors to IEC 60228 cl.2
- BS 6387 CWZ (circuit integrity: Fire, fire + water, fire + mechanical shock)
- IEC 61034-2 (measurement of smoke density)
- IEC 60754-1 (Halogen acid gas), IEC 60754-2 (acid pH)
- IEC 60332-3-22/24 (Flame propagation)
- Bending radius 7 x cable O/D. Installation: 10x cable O/D

VITALink® MC-metric is a 2-hour fire rated cable system listed to UL2196 and 3-hour fire rated cable to BS 6387.

When installed in accordance with the listed system components and instructions, VITALink® MC-metric meets local code requirements for Fire Rated Circuits, Electrical Circuit Integrity Systems, Survivability, and Circuit Integrity.

The cables' copper armour serves as the earth grounding conductor and is terminated with commercially available MC grounding glands. The cables are installed without the need for splicing or special tools.

VITALink® MC-metric cables offer significantly higher performance and reliability over other fire rated cables with ease of installation advantages.

VITALink® MC-metric is not susceptible to moisture ingress through leaky seals or faulty storage and can be installed in wet dry, humid and aggressive environments.

VITALink® MC-metric is mechanically robust and highly resistant to impact, cut through and crush. Can be used in class 1 and class 2 hazardous locations with flameproof Exe / Exd glands



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VC02/1.8.21

VITALink® MC-metric Single Conductor 2-Hour Fire Rated Power Cable

Product Code	Size (mm ²)	No. of Conductor	Nom. Core Dia. (mm)	Nom. Armor Dia. (mm)	Net Weight Kg per mtr	Ampacity ¹ 90 deg C conductor	Ampacity ² 110 Deg C conductor
VM01050-500	50	1	16.2	25.9	1.15	207	246
VM01070-500	70	1	17.8	26.5	1.29	268	311
VM01095-500	95	1	19.5	29.3	1.58	328	388
VM01120-500	120	1	21.9	30.9	1.87	383	452
VM01150-500	150	1	23.5	33.0	2.21	444	520
VM01185-500	185	1	25.2	34.3	2.55	510	603
VM01240-500	240	1	27.6	35.8	3.08	607	721
VM01300-500	300	1	30.7	40.3	3.75	703	835
VM01400-500	400	1	34.1	43.9	4.72	823	974
VM01500-500	500	1	-	-	-	946	1127

Ampacities for 90°C conductor from BS 7671-2018 table 4E1A (single core) at 30°C ambient for trefoil group in free air. ¹Table 4E1A column 10 ²Table 9 column 4
 Ampacities for 110°C conductor from AS/NZS3008:2017-1-2 table 9 (single core) at 30°C ambient for trefoil group in free air.

VITALink® MC-metric Multi Conductor 2-Hour Fire Rated Power Cable

Product Code	Size (mm ²)	No. of Conductor	Nom. Core Dia. (mm)	Nom. Armor Dia. (mm)	Net Weight Kg per mtr	Ampacity ³ 90 deg c conductor	Ampacity ⁴ 110 Deg C conductor
VM022X5-500	2.5	2	12.78	20.83	0.58	36	44
VM02004-500	4	2	13.84	23.37	0.73	49	59
VM02006-500	6	2	14.96	24.51	0.89	63	74
VM02010-500	10	2	17.75	26.49	0.93	86	102
VM02016-500	16	2	19.82	29.34	1.15	115	135
VM032X5-500	2.5	3	13.56	22.35	0.68	32	37
VM03004-500	4	3	14.71	22.50	0.71	42	50
VM03006-500	6	3	15.92	23.88	0.88	54	63
VM03010-500	10	3	18.93	27.31	1.06	75	87
VM03016-500	16	3	21.15	29.34	1.31	100	114
VM03025-500	25	3	24.26	32.99	1.73	127	154
VM03035-500	35	3	26.29	35.81	2.10	158	189
VM03050-500	50	3	31.88	42.42	2.84	192	231
VM03070-500	70	3	35.36	45.59	3.57	246	291
VM03095-500	95	3	39.09	49.53	4.45	298	361
VM03120-500	120	3	44.58	57.35	5.55	346	418
VM03150-500	150	3	48.08	62.74	6.78	399	478
VM03185-500	185	3	51.75	62.99	7.69	456	551
VM03240-500	240	3	56.90	68.83	9.51	538	654
VM03300-500	300	3	64.44	79.45	11.84	621	750
VM042X5-500	2.5	4	14.88	24.51	0.68	32	37
VM04004-500	4	4	16.18	25.91	0.71	42	50
VM04006-500	6	4	17.52	25.50	0.88	54	63
VM04010-500	10	4	20.89	29.34	1.06	75	87
VM04016-500	16	4	23.39	31.37	1.31	100	114
VM04025-500	25	4	26.87	35.81	1.73	127	154
VM04035-500	35	4	29.14	38.10	2.10	158	189
VM04050-500	50	4	35.39	45.59	2.84	192	231
VM04070-500	70	4	39.30	49.53	3.57	246	291
VM04095-500	95	4	44.00	57.15	4.45	298	361
VM04120-500	120	4	49.58	64.77	5.55	346	418
VM04150-500	150	4	53.50	68.83	6.78	399	478
VM04240-500	185	4	57.61	71.63	7.69	456	551
VM04300-500	240	4	64.16	81.81	9.51	538	654
VM052X5-500	2.5	4 cores + Earth	16.34	25.91	0.89	32	37
VM05004-500	4	4 cores + Earth	17.78	26.49	0.94	42	50
VM05006-500	6	4 cores + Earth	19.29	27.31	1.17	54	63
VM05010-500	10	4 cores + Earth	23.06	31.37	1.45	75	87
VM05016-500	16	4 cores + Earth	25.85	35.81	1.91	100	114
VM05025-500	25	4 cores + Earth	29.75	40.26	2.35	127	154
VM072X5-500	2.5	7	17.9	26.5	0.91	23	30
VM102X5-500	2.5	10	22.9	31.4	1.22	21	26
VM122X5-500	2.5	12	23.7	33.0	1.32	20	25

³Ampacities for 90°C conductor based on BS 7671-2018 table 4E2A (3&4 core) at 30°C ambient in free air.

³Table 4E2A col. 8/9 ⁴Table 12/15 col. 2

⁴Ampacities for 110°C conductor based on AS/NZS3008:2017-1-2 tables 12/15 (multicore) at 30°C ambient in free air.



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VITALink® MC-metric Three Phase Voltage Drop (V_c) at 50 Hz

SINGLE CORE insulated & sheathed cables with copper conductors in trefoil

1	2	3	4	5	6	7	8	9	10	11
Conductor size mm ²	Three Phase voltage drop (V _c) at 50 Hz mV/A.m									
	Conductor Temperature °C									
	45		60		75		90		110	
	max	0.8 p.f.	max	0.8 p.f.	max	0.8 p.f.	max	0.8 p.f.	max	0.8 p.f.
1.5	25.9	—	27.3	—	28.6	—	30	—	31.9	—
2.5	14.1	—	14.9	—	15.6	—	16.4	—	17.4	—
4	8.77	—	9.24	—	9.71	—	10.2	—	10.8	—
6	5.86	—	6.18	—	6.49	—	6.81	—	7.23	—
10	3.49	—	3.67	—	3.86	—	4.05	—	4.3	—
16	2.2	—	2.31	—	2.43	—	2.55	—	2.7	—
25	1.4	—	1.47	—	1.54	—	1.62	—	1.72	—
35	1.01	—	1.07	—	1.12	—	1.17	—	1.24	—
50	0.757	—	0.795	—	0.834	—	0.872	—	0.924	—
70	0.537	—	0.563	—	0.589	—	0.615	—	0.65	—
95	0.402	—	0.42	—	0.439	—	0.457	—	0.481	—
120	0.332	—	0.345	—	0.359	—	0.373	—	0.392	—
150	0.284	—	0.295	—	0.305	—	0.316	—	0.331	—
185	0.245	0.245	0.253	0.253	0.261	—	0.269	—	0.28	—
240	0.211	0.208	0.216	0.214	0.221	0.22	0.227	0.226	0.235	0.234
300	0.191	0.185	0.195	0.19	0.198	0.195	0.202	0.199	0.208	0.206
400	0.175	0.166	0.178	0.169	0.181	0.173	0.183	0.176	0.187	0.181
500	0.165	0.15	0.166	0.153	0.168	0.156	0.17	0.158	0.172	0.162

MULTICORE 3 & 4 core cables with circular with copper conductors

1	2	3	4	5	6	7	8	9	10	11
Conductor size mm ²	Three Phase voltage drop (V _c) at 50 Hz mV/A.m									
	Conductor Temperature °C									
	45		60		75		90		110	
	max	0.8 p.f.	max	0.8 p.f.	max	0.8 p.f.	max	0.8 p.f.	max	0.8 p.f.
1.5	25.9	—	27.3	—	28.6	—	30	—	31.9	—
2.5	14.1	—	14.9	—	15.6	—	16.4	—	17.4	—
4	8.77	—	9.24	—	9.71	—	10.2	—	10.8	—
6	5.86	—	6.18	—	6.49	—	6.8	—	7.22	—
10	3.49	—	3.67	—	3.86	—	4.05	—	4.29	—
16	2.19	—	2.31	—	2.43	—	2.55	—	2.7	—
25	1.39	—	1.47	—	1.54	—	1.61	—	1.71	—
35	1.01	—	1.06	—	1.11	—	1.17	—	1.24	—
50	0.751	—	0.79	—	0.829	—	0.868	—	0.92	—
70	0.53	—	0.556	—	0.583	—	0.609	—	0.645	—
95	0.394	—	0.413	—	0.431	—	0.45	—	0.475	—
120	0.323	—	0.337	—	0.351	—	0.366	—	0.385	—
150	0.274	—	0.285	—	0.296	—	0.307	—	0.322	—
185	0.234	—	0.242	—	0.251	—	0.259	—	0.271	—
240	0.198	0.198	0.204	0.204	0.21	0.21	0.216	0.216	0.224	—
300	0.178	0.175	0.182	0.18	0.186	0.185	0.19	0.189	0.196	0.196

The V_c values given above are based on a balanced three-phase circuit where no current flows in the neutral conductor.

For single phase V_c the current in the neutral must be considered. Multiply the three-phase values by: $\frac{2}{\sqrt{3}} = 1.155$



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- a) VITALink® MC-metric cables are supplied with bare corrugated copper sheath as standard or with Low Smoke Halogen Free jacket or PVC jacket if required.
- b) VITALink® MC-metric cables with an outer sheath, the standard color is Black but can be supplied with Red if requested.
- c) VITALink® MC-metric cables core colors are Black with White numbers. If the cable is ordered with internal ground conductor this will be Yellow/Green.
- d) VITALink® MC-metric cables are manufactured to UL 1596 – Ed.5 2018 for a voltage rating of 2kV.
- e) VITALink® MC-metric cables comply with UL 2196:2018 for a 2-hour fire rating. (UL 2196:2018 is a 600V test standard).
- f) VITALink® MC-metric 3 core cables can be supplied with 3 split earth conductors for Variable Speed Drive applications.
- g) VITALink® MC-metric cables have a minimum bending radius of 10 x outer cable diameter. Please see separate Installation instructions.
- h) VITALink® MC-metric cables are suitable for direct burial. It is recommended to use a protective outer jacket in areas where corrosive chemicals might degrade the copper armor.
- i) VITALink® MC-metric cables corrugated copper jacket is designed to be used as the ground conductor. As such, the cable jacket must be securely connected to cable entry gland plates or terminations with suitable grounding connectors. Marmon Electrical recommends American Connectors WT-NI series or equivalent. Refer VITALink installation instructions.
- j) VITALink® MC-metric cables corrugated copper jacket can be used in Earth Sheath Return systems for the combined Earth Neutral conductor and in such cases is subject to the same regulations as other metallic sheathed cables used in ESR systems.
- k) VITALink® MC-metric cables current ratings are based on BS 7671-2018 tables 4E1A single core and 4E2A multicore for a 90°C conductor temperature in a 30°C ambient. These ratings are the same as given in IEC 60364-5-52 tables A.52-12 (for single and multicore in a 30°C ambient).
 - i) For current ratings using a conductor temperature of 110°C we recommend reference to AS/NZS 3008:2017.1.2 (for 30°C ambient) or AS/NZS 3008:2017-1.1 (for 40°C ambient).
 - ii) It is also acceptable to use the current ratings and respective voltage drop data for armored cables in BS 7671:2018 tables 4E3A (single core with non-magnetic armor) and table 4E4A (multicore armored)
 - iii) Whichever international standard is used for the current ratings, the same standard should be used for derating factors, for other installation methods, for derating of groups and for different ambient temperatures.

NOTE 1: Where any fire rated cables are directly exposed to fire, copper conductors will see a significant increase in temperature which will increase the conductor resistivity. This effect can increase voltage drop, reduce current carrying capacity and affect the fault current of the circuit. Reference to British Standard BS 8519:2020 should be made: Clause 13, Annex F and G, or contact the cable manufacturer for further information.

NOTE 2: Where using ampacities which in a maximum ambient could result in conductors operating up to 110°C there are factors which should be taken into consideration:

- Touch temperatures and fire protective clearances.
- Watt losses (I^2R) caused by higher conductor resistances at 110°C and associated energy cost. See also the provisions of AS/NZS 3008:2017.1.1/2 clause 2.6 “Determination of cable size based on economic optimization”.
- Termination device temperature rating should match conductor temperature rating.



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