EUTEX

CCW® MC-HL & VFD

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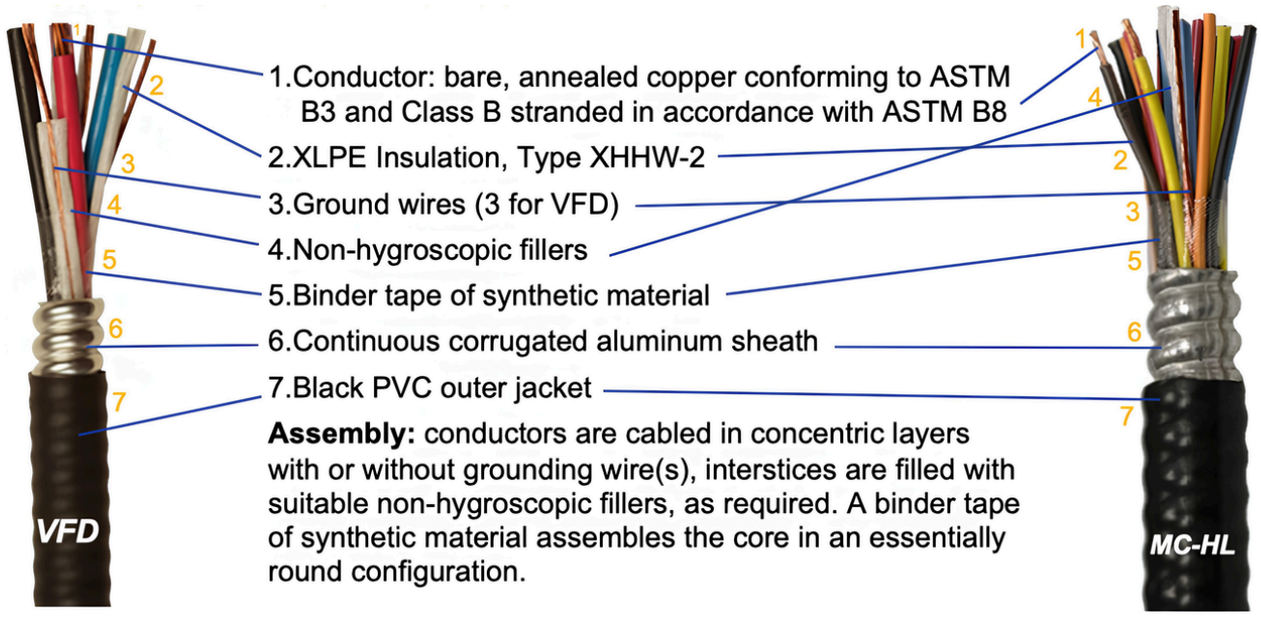
CCW ® MC-HL& VFD are armored power and control cables with exceptional fire ratings (as per appropriate specifications). They are impact-resistance, flexible and a continuously welded and corrugated aluminum sheath armor are key components of this design. They are self supporting, hand trainable, rated 600 V and suitable for 90ºC dry/wet locations and in cold weather down to -40ºC installations. CCW ® VFD has the optimum VFD cable design. It provides excellent shielding from high frequency noise that can interfere with data and control signals. CCW ® MC-HL & VFD are the preferred cable for hazardous locations.

APPLICATION STANDARD
Widerange of industrial, commercial and utility applications, including ALL hazardous locations
Chemical, oil and gas, and forestry industries, plus commercial or high-rise buildings
Services, feeders and branch circuits
Indoors or outdoors
Exposed or concealed
Cable tray & raceway
Direct burial
Concrete encasement

CONSTRUCTION



Conductor Identification:
Method #1-E2 per ICEA S-73-532 for all below

Multiple Conductor
- 2 to 37 Conductors – 14 AWG to 10 AWG

Composite Power and Control
- 3 Power Conductors – 10 AWG to 2 AWG
- 4 Control Conductors – 12 AWG

CCW VFD
- 3 Power Conductors – 14 AWG to 500 kcmil

Minimum Bending Radius:
Fixed Position: 7 × overall cable diameter
During Pull: 14 x overall cable diameter

MULTICONDUCTORS, WITH BARE GROUND(S) ELECTRICAL DATA

# of Cond.	Cond. Size AWG or k cm il	Ground Wire Size AWG	DC Resistance		AC Resistance 90ºC, 60 Hz Ω/kft	Inductive Reactance (Ω/kft@ 60Hz)	Voltage Drop V/(A.Kft)	Ampacities Note 1	
			20ºC Ω/kft	25ºC Ω/kft				75ºC	90ºC
3	14(7w)	3 x18(7w)	2.5553	2.6064	3.2583	0.0376	2.9489	15	15
4	14(7w)	14(7w)	2.5553	2.6064	3.2583	0.0376	2.9489	15	15
5	14(7w)	14(7w)	2.5553	2.6064	3.2583	0.0376	2.9489	15	15
7	14(7w)	14(7w)	2.5553	2.6064	3.2583	0.0376	2.9489	14	15
9	14(7w)	14(7w)	2.5553	2.6064	3.2583	0.0376	2.9489	14	15
12	14(7w)	14(7w)	2.5553	2.6064	3.2583	0.0376	2.9489	10	13
19	14(7w)	14(7w)	2.5553	2.6064	3.2583	0.0376	2.9489	10	13
3	12(7w)	3x16(7w)	1.6082	1.6404	2.0507	0.0353	1.8610	20	20
4	12(7w)	12(7w)	1.6082	1.6404	2.0507	0.0353	1.8610	20	20
7	12(7w)	12(7w)	1.6082	1.6404	2.0507	0.0526	1.8685	18	20
12	12(7w)	12(7w)	1.6082	1.6404	2.0507	0.0620	1.8726	13	15
3	10(7w)	3x14(7w)	1.0118	1.2902	1.2902	0.0332	1.1756	30	30
4	10(7w)	10(7w)	1.0118	1.2902	1.2902	0.0332	1.1756	28	30

Notes:

1) Ampacities are in accordance with NEC Table 310.15(B)(16) for conductors in raceway or direct buried at 30°C ambiant temperature and 90°C conductor temperature. The overcurrent protection shall not exceed 15 amperes for 14 AWG, 20 amperes for 12 AWG, and 30 amperes for 10 AWG copper conductors after any correction factors for ambient temperature and number of conductors have been applied NEC Article 240.4(D). For correction factors for different ambient temperatures and ampacities at different conductor temperatures, see NEC Table 310.15(B)(16). Ampacities for cables having more than three conductors have been derated per NEC Article 310.15(B)(3)(a).

2) Three conductor cables with 3 grounds are also suitable for VFD applications.

3 CONDUCTORS WITH 3 BARE GROUNDS ELECTRICAL DATA

Cond. Size AWG or kcmil	Ground Wire Size AWG	DC Resistance		AC Resistance 90ºC, 60 Hz Ω/kft	Inductive Reactance (Ω/kft@ 60Hz)	Voltage Drop V/(A.Kft)	Ampacities Note 1	
		20ºC Ω/kft	25ºC Ω/kft				75ºC	90ºC
8(7w)	3 x14(7w)	0.6361	0.6488	0.8111	0.0348	0.7452	50	55
6(7w)	3x12(7w)	0.4002	0.4082	0.5104	0.0329	0.4737	65	75
4(7w)	3x12(7w)	0.2516	0.2566	0.3209	0.0312	0.3025	85	95
2(7w)	3x10(7w)	0.1574	0.1605	0.2009	0.0299	0.1938	115	130
1/0(19w)	3x10(7w)	0.0999	0.1019	0.1278	0.0281	0.1272	150	170
2/0(19w)	3x10(7w)	0.0797	0.0813	0.1021	0.0280	0.1041	175	195
3/0(19w)	3x8(7w)	0.0629	0.0642	0.0808	0.0275	0.0847	200	225
4/0(19w)	3x8(7w)	0.0497	0.0507	0.0641	0.0271	0.0695	230	260
250(37w)	3x8(7w)	0.0424	0.0432	0.0584	0.0263	0.0608	255	290
350(37w)	3x6(7w)	0.0301	0.0307	0.0395	0.0263	0.0470	310	350
500(37w)	3x6(7w)	0.0212	0.0216	0.0290	0.0250	0.0367	380	430

4 CONDUCTORS WITH 1 BARE GROUND ELECTRICAL DATA

Cond. Size AWG or kcmil	Ground Wire Size AWG	DC Resistance		AC Resistance 90ºC, 60 Hz Ω/kft	Inductive Reactance (Ω/kft@ 60Hz)	Voltage Drop V/(A.Kft)	Ampacities Note 1	
		20ºC Ω/kft	25ºC Ω/kft				75ºC	90ºC
8(7w)	10(7w)	0.6361	0.6488	0.8111	0.0348	0.7472	50	55
6(7w)	8(7w)	0.4002	0.4082	0.5104	0.0329	0.4737	65	75
2/0(19w)	6(7w)	0.0791	0.0806	0.1011	0.0281	0.1033	175	195
4/0(19w)	4(7w)	0.0497	0.0507	0.0641	0.0271	0.0694	230	260

Notes:

1)Ampacities are based on NEC Table 310.15(B)(16) for not more than three current-carrying conductors in raceway, cable, or earth (direct buried), based on an ambient temperature of 30°C (86°F). Refer to NEC Table 310.15(B)(2) for the ampacity correction factors where the ambient temperature is other than 30°C (86°F).

2)Three conductor cables with 3 ground wires are also excellent for use with variable frequency drives. In addition to UL, these 3-conductor constructions are also certified to CSA C22.2 No. 123 and CSA C22.2 No. 174.

MULTICONDUCTORS, WITH BARE GOUND(S) PHYSICAL DATA

# of Cond.	Cond. Size AWG or kcmil	Insulation Thickness (inches)	Ground Wire Size AWG	Nominal Diameter over Core (in)	Nominal Diameter over Sheath (in)	Jacket Thickness (inches)	Nominal Diameter over Jacket (in)	Approx. Net Cable Weight (lb/ kft)
3	14(7w)	0.030	3x18(7w)	0.390	0.555	0.050	0.660	200
4	14(7w)	0.030	14(7w)	0.336	0.503	0.050	0.606	191
5	14(7w)	0.030	14(7w)	0.366	0.532	0.050	0.635	212
7	14(7w)	0.030	14(7w)	0.417	0.601	0.050	0.704	263
9	14(7w)	0.030	14(7w)	0.486	0.645	0.050	0.748	307
12	14(7w)	0.030	14(7w)	0.560	0.783	0.050	0.887	388
19	14(7w)	0.030	14(7w)	0.669	0.921	0.050	1.028	572
3	12(7w)	0.030	3x14(7w)	0.340	0.555	0.050	0.660	226
4	12(7w)	0.030	12(7w)	0.385	0.550	0.050	0.653	239
7	12(7w)	0.030	12(7w)	0.478	0.640	0.050	0.744	338
12	12(7w)	0.030	12(7w)	0.639	0.828	0.050	0.932	502
3	10(7w)	0.030	3x14(7w)	0.450	0.620	0.050	0.725	312
4	10(7w)	0.030	10(7w)	0.448	0.621	0.050	0.724	319

3 CONDUCTORS WITH 3 BARE GROUNDS - PHYSICAL DATA

# of Cond.	Cond. Size AWG or kcmil	Insulation Thickness (inches)	Ground Wire Size AWG	Nominal Diameter over Core (in)	Nominal Diameter over Sheath (in)	Jacket Thickness (inches)	Nominal Diameter over Jacket (in)	Approx. Net Cable Weight (lb/ kft)
3	8(7w)	0.045	3x14(7w)	0.520	0.750	0.050	0.838	413
3	6(7w)	0.045	3x12(7w)	0.600	0.802	0.050	0.905	542
3	4(7w)	0.045	3x12(7w)	0.700	0.937	0.050	1.039	735
3	2(7w)	0.045	3x10(7w)	0.830	1.127	0.050	1.232	1097
3	1/0(19w)	0.055	3x10(7w)	1.040	1.350	0.050	1.473	1592
3	2/0(19w)	0.055	3x10(7w)	1.126	1.422	0.050	1.510	1882
3	3/0(19w)	0.055	3x8(7w)	1.250	1.606	0.060	1.739	2400
3	4/0(19w)	0.055	3x8(7w)	1.360	1.734	0.060	1.867	2910
3	250(37w)	0.065	3x8(7w)	1.477	1.925	0.060	2.058	3316
3	350(37w)	0.065	3x6(7w)	1.685	2.028	0.060	2.162	4375
3	500(37w)	0.065	3x6(7w)	1.954	2.340	0.075	2.504	6026

4 CONDUCTORS WITH 1 BARE GROUND - PHYSICAL DATA

# of Cond.	Cond. Size AWG or kcmil	Insulation Thickness (inches)	Ground Wire Size AWG	Nominal Diameter over Core (in)	Nominal Diameter over Sheath (in)	Jacket Thickness (inches)	Nominal Diameter over Jacket (in)	Approx. Net Cable Weight (lb/ kft)
4	8(7w)	0.045	10(7w)	0.585	0.795	0.050	0.900	465
4	6(7w)	0.045	8(7w)	0.680	0.930	0.050	1.027	675
4	2/0(7w)	0.055	6(7w)	1.041	1.361	0.050	1.466	1628
4	4/0(7w)	0.055	4(7w)	1.134	1.427	0.050	1.525	1922

Per ICEA S-73-532-E3.4 Method 4 - Number Code

Conduct or	Cond. Size AWG or kcmil	Insulation Thickness (inches)	Ground Wire Size AWG
1st	“1-ONE -1” “2-	4th	“4-FOUR-4”
2nd	TWO-2” “3-	5th	“5-FIVE-5”
3rd	THREE-3”	6th	“6-SIX-6”

Per ICEA S-73-532-E3.1 Method 1 and Table E2 (formerly K2) Colored Insulation with/without Colored Stripe

Conductor	Insulation	Stripe	Conductor	Insulation	Stripe
1st	BLACK	-	19th	ORANGE	Blue
2nd	RED	-	20th	YELLOW	Blue
3rd	BLUE	-	21st	BROWN	Blue
4th	ORANGE	-	22nd	BLACK	Orange
5th	YELLOW	-	23rd	RED	Orange
6th	BROWN	-	24th	BLUE	Orange
7th	RED	Black	25th	YELLOW	Orange
8th	BLUE	Black	26th	BROWN	Orange
9th	ORANGE	Black	27th	BLACK	Yellow
10th	YELLOW	Black	28th	RED	Yellow
11th	BROWN	Black	29th	BLUE	Yellow
12th	BLACK	Red	30th	ORANGE	Yellow
13th	BLUE	Red	31st	BROWN	Yellow
14th	ORANGE	Red	32nd	BLACK	Brown
15th	YELLOW	Red	33rd	RED	Brown
16th	BROWN	Red	34th	BLUE	Brown
17th	BLACK	Blue	35th	ORANGE	Brown
18th	RED	Blue	36th	YELLOW	Brown