phelps dodge International Corp

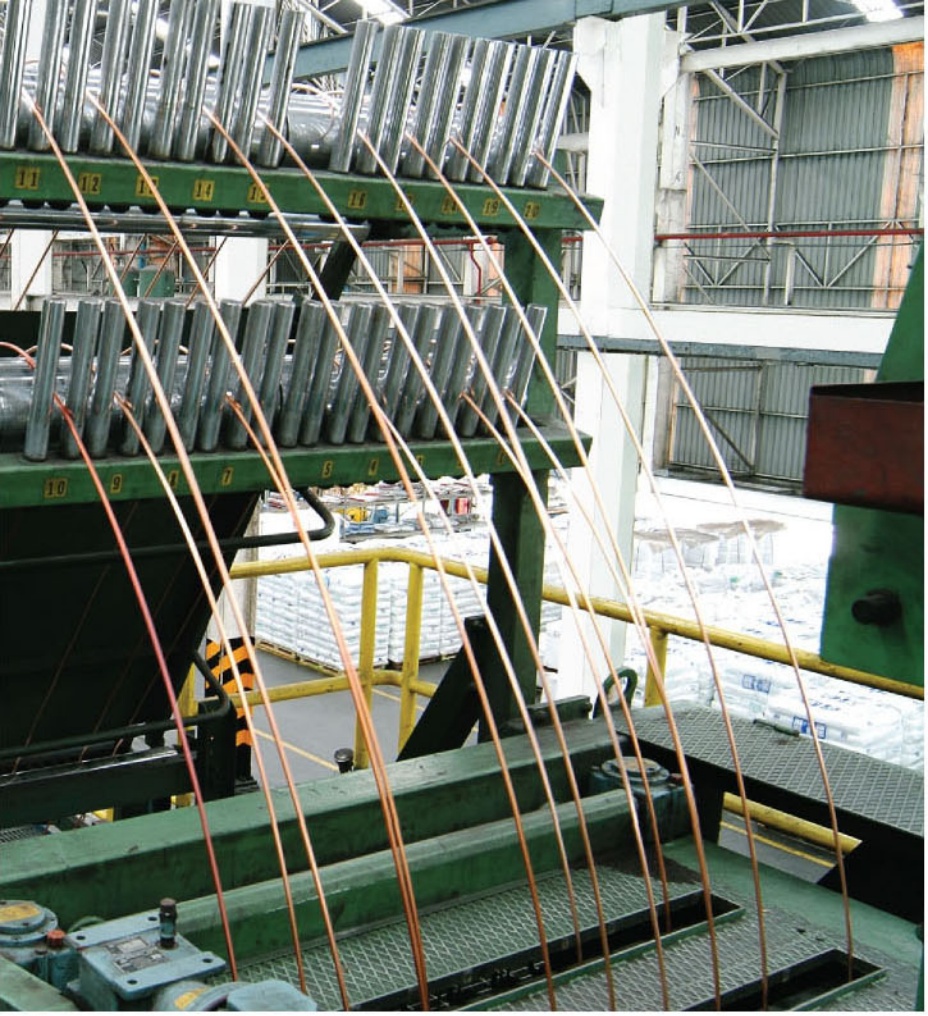
LOW VOLTAGE POWER AND CONTROL CABLES

A World Leader in
Wire And Cable Technology

Phelps Dodge International (Thailand) Limited (PDITL) was established in 1968 as a joint-venture between an existing Thai firm and Phelps Dodge Corporation. We have been a pioneer in the local industry and were the first company to introduce the majority of new processes, products and technology related to wire and cable manufacturing.

PDITL is the only supplier in Thailand with complete in-house facilities for testing power cable up to 400 kV. PDITL has got its certification type test from International Independent Laboratories such as KEMA, Cable Technology Lab, etc. for LSFOH cable, fire resistant cable, medium voltage, high voltage and extra high voltage XLPE cables up to 245 kV cables. PDITL manufactures world-class quality wire and cable, not only for the local market but also for international markets, complying with strict international standards. It is proud of its customer services and long term relationship.

PDITL has a team of about 700 employees, which are most important assets. We promote safety, health and environmental protection both within the company and in the community where we operate.



QUALITY

Our commitment to quality is assured by a number of systems, standards, practices and processes:

PDITL spares no effort when it comes to quality. Every stage of production is closely monitored to ensure highest standards. Indeed, PDITL's quality commitment begins with the careful scrutiny of raw materials and continues to the testing of final products, where every finished length of cable undergoes a series of rigorous tests to meet their specification criteria before being shipped to customers. Furthermore, PDITL is the only wire & cable supplier in Thailand that boasts complete in-house facilities for testing power cable up to 400 kV.

A natural result of unwavering dedication to quality, PDITL has obtained the prestigious ISO 9001:2008 certification as well as other top-quality certifications from internationally-renowned independent laboratories such as KEMA, and Technology Lab.

Product Quality: The design, material selection, process control and optimized production involved in the development of our products ensures a total quality performance that meets our customers' exacting needs.

SAFETY

WORKING SAFER BY WORKING TOGETHER Safety is at the very core of our manufacturing excellence, and is an integral part of our industry leadership and performance.
We know a safe and healthy environment for associates around the world is critical. The best way to provide it? By working together to eliminate or manage all conditions and behaviors that could lead to personal injury or occupational illness.

In the past, we have focused primarily on preventing injuries by engineering solutions to address inherent risks such as reel handling assist devices, revamped machine guards, sound abatement and eliminating open-blade knife use. While we continue to evaluate engineering solutions to reduce risks, we are also training our associates on "consequence thinking" to further enhance our safety culture and remind associates to reduce unintended consequences by eliminating unsafe behaviors. We continue to encourage all associates to take individual responsibility for their decisions and actions, and to be role models of safety excellence for co-workers, families and communities. We strive for ongoing improvement in safety while complying with all applicable health and safety laws and regulations. We believe this combined approach to safety will allow us to achieve **our safety vision of Zero & Beyond** — because nothing else is acceptable.

สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
กระทรวงอุตสาหกรรม

รางวัลผู้รักษามาตรฐานดีเด่น

จากกระทรวงอุตสาหกรรม และ สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

The Prime Minister's Industry Award

From Ministry of Industry Thailand and Thai Industrial Standards Institute

Bangplee Factory located in Samutprakarn province is the only wire & cable manufacturer in Thailand that supply high voltage and extra high voltage XLPE POWER CABLE upto 245 kv and having complete in-house facilities for testing power cable upto 400kV

CONTENT

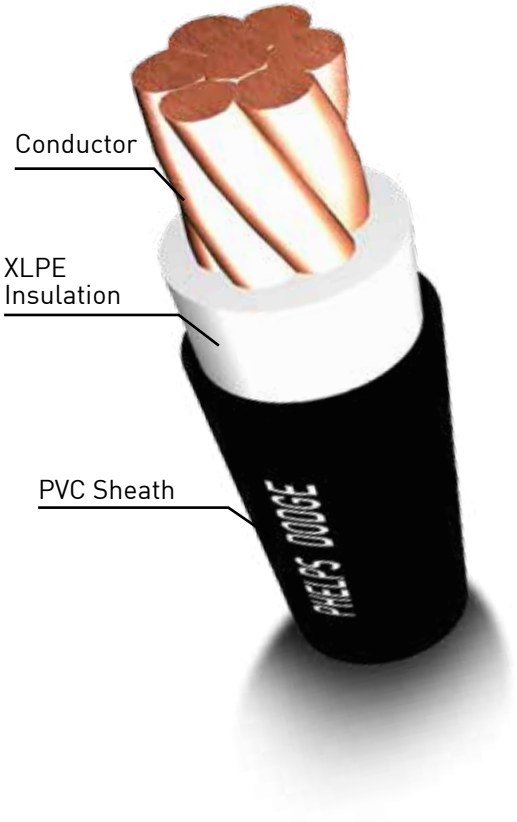
The growing need of people and building safety requires the usage in many installations of low voltage cables with reduced electromagnetic interferences, physical extra-protection, improved fire behavior or else. Phelps Dodge offers a wide range of different construction of low voltage power cables to ensure safety of people and premises.

Low Voltage Power Cables :

- **Flame retardant properties are optional**

PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), SINGLE CORE



CONSTRUCTION

Conductor	:	Concentric stranded annealed copper (1.5 up to 6 mm^2) or Compact round stranded annealed copper (10 up to 630 mm^2)
Insulation	:	Cross-linked polyethylene (XLPE) Color : Natural
Sheath	:	Polyvinyl chloride (PVC/ST2) Color : Black Optional : Polyethylene (PE/ST7), Flame retardant polyvinyl chloride (FR-PVC) in accordance with IEC 60332-3

Application	:	For general purpose power distribution in wet or dry locations, installed in air, conduit, duct, trench, cable tray or direct burial in ground.

Rated voltage U_0/U (U_m)	:	0.6/1 (1.2) kV 600 Volts between conductor and earth 1000 Volts between conductors 1200 Volts maximum system voltage
Maximum conductor temperature	:	90 ^{O}C (Normal operation)
Voltage test	:	3.5 kVac or 8.4 kVdc / 5 minutes
Reference standard	:	IEC 60502-1

PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), SINGLE CORE

Nominal sectional area mm²	Number of wire (min)	Diameter of Conductor (approx.) mm	Nominal Thickness of Insulation mm	Diameter of Insulation (approx.) mm	Nominal Thickness of Sheath mm	Overall Diameter (approx.) mm	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
1.5	7	1.6	0.7	3.3	1.4	8	54	32	0.11	500/R
2.5	7	2.0	0.7	3.7	1.4	8	67	32	0.18	500/R
4	7	2.6	0.7	4.3	1.4	9	87	36	0.28	500/R
6	7	3.1	0.7	4.8	1.4	9	111	36	0.42	500/R
10	6	3.7	0.7	5.5	1.4	10	148	40	0.70	500/R
16	6	4.7	0.7	6.4	1.4	11	209	44	1.12	500/R
25	6	5.9	0.9	8.1	1.4	12	309	48	1.76	500/R
35	6	7.0	0.9	9.2	1.4	13	406	52	2.46	500/R
50	6	8.1	1.0	10.4	1.4	15	529	60	3.51	500/R
70	12	9.7	1.1	12.3	1.4	16	739	64	4.92	500/R
95	15	11.4	1.1	14.0	1.5	18	1,002	72	6.67	500/R
120	18	12.8	1.2	15.6	1.5	20	1,241	80	8.43	500/R
150	18	14.2	1.4	17.5	1.6	22	1,529	88	10.53	500/R
185	30	15.9	1.6	19.7	1.6	24	1,893	96	12.99	500/R
240	34	18.2	1.7	22.4	1.7	27	2,459	135	16.85	500/R
300	34	20.3	1.8	24.6	1.8	30	3,060	150	21.07	500/R
400	53	23.0	2.0	27.8	1.9	33	3,887	165	28.09	300/R
500	53	26.1	2.2	31.5	2.0	37	4,956	185	35.11	300/R
630	53	29.9	2.4	35.8	2.2	41	6,391	205	44.24	300/R

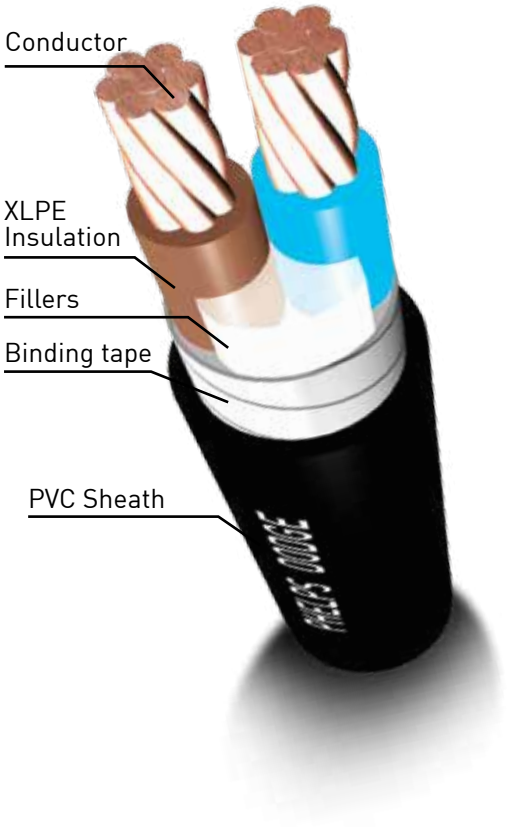
PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), SINGLE CORE

Nominal sectional area	Maximum DC. Resistance of Cdr. at 20°C	Minimum insulation resistance at 20°C	AC Resistance at 90°C		Inductance		Zero Sequence Impedance Ω / km				Voltage Drop PF = 0.8		Ampacities direct burial at 25°C ground temp. A RHO 120 Dept. 1 m A		Ampacities in free air at 40°C ambient A	
							Flat		Trefoil							
mm²	Ω / km	MΩ-km	Ω / km		mH/km						V/A/km					
			Flat	Trefoil	Flat	Trefoil	Ro	Xo	Ro	Xo	Flat	Trefoil	Flat	Trefoil	Flat	Trefoil
1.5	12.1	1,021	15.43	15.43	0.450	0.519	15.577	2.415	15.577	2.362	24.856	24.882	33	32	27	23
2.5	7.41	842	9.45	9.45	0.414	0.484	9.597	2.384	9.597	2.332	15.274	15.300	43	42	36	31
4	4.61	698	5.88	5.88	0.383	0.453	6.027	2.353	6.027	2.301	9.550	9.576	56	54	47	40
6	3.08	591	3.93	3.93	0.359	0.428	4.076	2.326	4.076	2.273	6.419	6.445	70	67	60	51
10	1.83	511	2.33	2.33	0.340	0.410	2.482	2.301	2.482	2.249	3.862	3.888	91	88	81	69
16	1.15	419	1.47	1.47	0.317	0.387	1.615	2.267	1.615	2.214	2.466	2.492	117	113	108	92
25	0.727	426	0.927	0.927	0.304	0.374	1.076	2.224	1.076	2.171	1.598	1.624	150	144	146	124
35	0.524	369	0.668	0.668	0.291	0.360	0.817	2.197	0.817	2.144	1.179	1.205	180	172	180	153
50	0.387	351	0.494	0.494	0.281	0.351	0.643	2.167	0.643	2.114	0.896	0.922	213	204	220	187
70	0.268	327	0.342	0.342	0.272	0.341	0.491	2.135	0.491	2.082	0.650	0.676	259	248	279	237
95	0.193	282	0.247	0.247	0.264	0.333	0.396	2.104	0.396	2.052	0.495	0.521	310	296	347	294
120	0.153	275	0.196	0.196	0.259	0.329	0.345	2.081	0.345	2.029	0.412	0.437	352	336	405	343
150	0.124	287	0.160	0.159	0.259	0.329	0.309	2.057	0.308	2.005	0.353	0.379	394	376	469	397
185	0.0991	293	0.128	0.128	0.256	0.326	0.277	2.034	0.276	1.981	0.302	0.327	443	424	544	461
240	0.0754	272	0.099	0.098	0.252	0.321	0.248	2.005	0.247	1.953	0.253	0.278	512	489	655	552
300	0.0601	260	0.080	0.079	0.249	0.319	0.229	1.983	0.228	1.931	0.222	0.246	576	549	760	638
400	0.0470	256	0.064	0.063	0.247	0.316	0.213	1.956	0.212	1.904	0.196	0.220	649	620	890	744
500	0.0366	248	0.052	0.050	0.244	0.314	0.201	1.929	0.199	1.877	0.176	0.199	730	697	1046	866
630	0.0283	237	0.043	0.041	0.242	0.312	0.192	1.900	0.189	1.848	0.160	0.182	818	779	1233	1007

PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), TWO CORES



CONSTRUCTION

Conductor	:	Concentric stranded annealed copper (1.5 up to 6 mm^2) or Compact round stranded annealed copper (10 up to 400 mm^2)
Insulation	:	Cross-linked polyethylene (XLPE)
Color	:	Brown and Light Blue
Filler	:	Polypropylene filament or suitable material
Binding tape	:	Non-hygroscopic tape
Sheath	:	Polyvinyl chloride (PVC/ST2) Color : Black Optional : Polyethylene (PE/ST7), Flame retardant polyvinyl chloride (FR-PVC) in accordance with IEC 60332-3

Application	:	For general purpose power distribution in wet or dry locations, installed in air, conduit, duct, trench, cable tray or direct burial in ground.

Rated voltage U_0/U (U_m)	:	0.6/1 (1.2) kV 600 Volts between conductor and earth 1000 Volts between conductors 1200 Volts maximum system voltage
Maximum conductor temperature	:	90 °C (Normal operation)
Voltage test	:	3.5 kVac or 8.4 kVdc / 5 minutes
Reference standard	:	IEC 60502-1

PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), TWO CORES

Nominal sectional area mm²	Number of wire (min)	Diameter of Conductor (approx.) mm	Nominal Thickness of Insulation mm	Diameter of Insulation (approx.) mm	Nominal Thickness of Sheath mm	Overall Diameter (approx.) mm	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
1.5	7	1.6	0.7	3.3	1.8	11	124	44	0.21	500/R
2.5	7	2.0	0.7	3.7	1.8	12	154	48	0.35	500/R
4	7	2.6	0.7	4.3	1.8	13	198	52	0.56	500/R
6	7	3.1	0.7	4.8	1.8	14	252	56	0.84	500/R
10	6	3.7	0.7	5.5	1.8	16	335	64	1.40	500/R
16	6	4.7	0.7	6.4	1.8	18	470	72	2.25	500/R
25	6	5.9	0.9	8.1	1.8	21	697	84	3.51	500/R
35	6	7.0	0.9	9.2	1.8	23	909	92	4.92	500/R
50	6	8.1	1.0	10.4	1.8	25	1,180	100	7.02	500/R
70	12	9.7	1.1	12.3	1.8	30	1,643	150	9.83	500/R
95	15	11.4	1.1	14.0	1.9	33	2,212	165	13.34	500/R
120	18	12.8	1.2	15.6	2.0	37	2,751	185	16.85	500/R
150	18	14.2	1.4	17.5	2.2	41	3,405	205	21.07	500/R
185	30	15.9	1.6	19.7	2.3	45	4,233	225	25.98	300/R
240	34	18.2	1.7	22.4	2.5	51	5,497	306	33.71	300/R
300	34	20.3	1.8	24.6	2.6	55	6,806	330	42.14	300/R
400	53	23.0	2.0	27.8	2.9	62	8,682	372	44.48	300/R

PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), TWO CORES

Nominal sectional area	Maximum DC. Resistance of Cdr. at 20°C	Minimum insulation resistance at 20 °C	AC Resistance at 90°C	Inductance mH/km	Positive - Negative Sequence Impedance Ω/km		Zero Sequence Impedance Ω/km		Voltage Drop PF = 0.8 V/A/km 1 Phase	Ampacities direct burial at 25 °C ground temp. A "RHO 120 1 m. depth"	Ampacities in free air at 40°C ambient
					R	X	Ro	Xo			
mm²	Ω/km	MΩ - km	Ω/km 1 Phase								A
1.5	12.1	1,021	15.43	0.317	15.429	0.100	15.577	2.516	24.805	35	20
2.5	7.41	842	9.45	0.294	9.449	0.092	9.597	2.475	15.229	46	27
4	4.61	698	5.88	0.276	5.878	0.087	6.027	2.435	9.509	59	36
6	3.08	591	3.93	0.263	3.927	0.083	4.076	2.399	6.383	74	45
10	1.83	511	2.33	0.253	2.334	0.079	2.482	2.368	3.829	98	61
16	1.15	419	1.47	0.241	1.466	0.076	1.615	2.324	2.437	126	81
25	0.727	426	0.927	0.242	0.927	0.076	1.076	2.271	1.575	162	110
35	0.524	369	0.669	0.235	0.668	0.074	0.817	2.239	1.158	194	136
50	0.387	351	0.494	0.233	0.494	0.073	0.643	2.204	0.878	230	166
70	0.268	327	0.342	0.230	0.342	0.072	0.491	2.167	0.634	281	211
95	0.193	282	0.247	0.224	0.247	0.070	0.396	2.135	0.480	334	259
120	0.153	275	0.196	0.223	0.196	0.070	0.345	2.109	0.398	379	302
150	0.124	287	0.16	0.225	0.159	0.071	0.308	2.084	0.340	426	350
185	0.0991	293	0.128	0.225	0.128	0.071	0.277	2.058	0.290	478	403
240	0.0754	272	0.099	0.223	0.098	0.070	0.247	2.028	0.242	553	481
300	0.0601	260	0.080	0.221	0.079	0.070	0.229	2.005	0.211	618	550
400	0.0470	256	0.064	0.221	0.063	0.069	0.213	1.976	0.186	698	640

PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), THREE CORES

CONSTRUCTION

Conductor	:	Concentric stranded annealed copper (1.5 up to 6 mm^2) or Compact round stranded annealed copper (10 up to 400 mm^2)
Insulation	:	Cross-linked polyethylene (XLPE) Color : Brown Black and Grey
Filler	:	Polypropylene filament or suitable material
Binding tape	:	Non-hygroscopic tape
Sheath	:	Polyvinyl chloride (PVC/ST2) Color : Black Optional : Polyethylene (PE/ST7), Flame retardant polyvinyl chloride (FR-PVC) in accordance with IEC 60332-3

Application	:	For general purpose power distribution in wet or dry locations, installed in air, conduit, duct, trench, cable tray or direct burial in ground.

Rated voltage U_0/U (U_m)	:	0.6/1 (1.2) kV 600 Volts between conductor and earth 1000 Volts between conductors 1200 Volts maximum system voltage
Maximum conductor temperature	:	90 °C (Normal operation)
Voltage test	:	3.5 kVac or 8.4 kVdc / 5 minutes
Reference standard	:	IEC 60502-1

PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), THREE CORES

Nominal sectional area mm²	Number of wire (min)	Diameter of Conductor (approx.) mm	Nominal Thickness of Insulation mm	Diameter of Insulation (approx.) mm	Nominal Thickness of Sheath mm	Overall Diameter (approx.) mm	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
1.5	7	1.6	0.7	3.3	1.8	12	147	48	0.32	500/R
2.5	7	2.0	0.7	3.7	1.8	13	187	52	0.53	500/R
4	7	2.6	0.7	4.3	1.8	14	247	56	0.84	500/R
6	7	3.1	0.7	4.8	1.8	15	322	60	1.26	500/R
10	6	3.7	0.7	5.5	1.8	16	437	64	2.11	500/R
16	6	4.7	0.7	6.4	1.8	18	626	72	3.37	500/R
25	6	5.9	0.9	8.1	1.8	22	942	88	5.27	500/R
35	6	7.0	0.9	9.2	1.8	24	1,243	96	7.37	500/R
50	6	8.1	1.0	10.4	1.8	27	1,628	135	10.53	500/R
70	12	9.7	1.1	12.3	1.9	32	2,301	160	14.75	500/R
95	15	11.4	1.1	14.0	2.0	36	3,115	180	20.01	500/R
120	18	12.8	1.2	15.6	2.1	39	3,881	195	25.28	300/R
150	18	14.2	1.4	17.5	2.3	43	4,801	215	31.60	300/R
185	30	15.9	1.6	19.7	2.4	48	5,977	240	38.98	300/R
240	34	18.2	1.7	22.4	2.6	54	7,774	324	44.48	300/R
300	34	20.3	1.8	24.6	2.7	59	9,652	354	44.48	300/R
400	53	23.0	2.0	27.8	3.0	66	12,312	396	44.48	300/R

PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), THREE CORES

Nominal sectional area	Maximum DC. Resistance of Cdr. at 20°C	Minimum insulation resistance at 20 °C	AC Resistance at 90°C	Inductance mH/km	Positive - Negative Sequence Impedance Ω/km		Zero Sequence Impedance Ω/km		Voltage Drop PF = 0.8 V/A/km	Ampacities direct burial at 25 °C ground temp. A "RHO 120 1 m. depth"	Ampacities in free air at 40°C ambient
mm²	Ω/km	MΩ - km	Ω/km 3 Phase		R	X	Ro	Xo	3 Phase		A
1.5	12.1	1,021	15.43	0.317	15.429	0.100	15.577	2.516	21.482	29	22
2.5	7.41	842	9.45	0.294	9.449	0.092	9.597	2.475	13.188	38	30
4	4.61	698	5.88	0.276	5.878	0.087	6.027	2.435	8.235	50	39
6	3.08	591	3.93	0.263	3.927	0.083	4.076	2.399	5.528	62	50
10	1.83	511	2.33	0.253	2.334	0.079	2.482	2.368	3.316	82	67
16	1.15	419	1.47	0.241	1.467	0.076	1.615	2.324	2.111	105	89
25	0.727	426	0.927	0.242	0.927	0.076	1.076	2.271	1.364	136	120
35	0.524	369	0.669	0.235	0.669	0.074	0.817	2.239	1.003	163	147
50	0.387	351	0.494	0.233	0.494	0.073	0.643	2.204	0.761	193	179
70	0.268	327	0.343	0.230	0.343	0.072	0.491	2.167	0.550	234	224
95	0.193	282	0.247	0.224	0.247	0.070	0.396	2.135	0.416	280	277
120	0.153	275	0.197	0.223	0.197	0.070	0.346	2.109	0.346	319	323
150	0.124	287	0.160	0.225	0.160	0.071	0.309	2.084	0.295	356	368
185	0.0991	293	0.129	0.225	0.129	0.071	0.278	2.058	0.252	402	427
240	0.0754	272	0.100	0.223	0.100	0.070	0.248	2.028	0.211	463	504
300	0.0601	260	0.081	0.221	0.081	0.070	0.230	2.005	0.185	520	578
400	0.0470	256	0.065	0.221	0.066	0.069	0.214	1.976	0.163	589	672

PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), FOUR CORES

CONSTRUCTION

Conductor	:	Concentric stranded annealed copper (1.5 up to 6 mm^2) or Compact round stranded annealed copper (10 up to 400 mm^2)
Insulation	:	Cross-linked polyethylene (XLPE)
Color	:	Brown, Black, Grey and Light Blue
Filler	:	Polypropylene filament or suitable material
Binding tape	:	Non-hygroscopic tape
Sheath	:	Polyvinyl chloride (PVC/ST2) Color : Black Optional : Polyethylene (PE/ST7), Flame retardant polyvinyl chloride (FR-PVC) in accordance with IEC 60332-3

Application	:	For general purpose power distribution in wet or dry locations, installed in air, conduit, duct, trench, cable tray or direct burial in ground.

Rated voltage U_0/U (U_m)	:	0.6/1 (1.2) kV 600 Volts between conductor and earth 1000 Volts between conductors 1200 Volts maximum system voltage
Maximum conductor temperature	:	90 °C (Normal operation)
Voltage test	:	3.5 kVac or 8.4 kVdc / 5 minutes
Reference standard	:	IEC 60502-1

PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), FOUR CORES

Nominal sectional area mm²	Number of wire (min)	Diameter of Conductor (approx.) mm	Nominal Thickness of Insulation mm	Diameter of Insulation (approx.) mm	Nominal Thickness of Sheath mm	Overall Diameter (approx.) mm	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
1.5	7	1.6	0.7	3.3	1.8	13	174	52	0.42	500/R
2.5	7	2.0	0.7	3.7	1.8	14	226	56	0.70	500/R
4	7	2.6	0.7	4.3	1.8	15	303	60	1.12	500/R
6	7	3.1	0.7	4.8	1.8	16	399	64	1.69	500/R
10	6	3.7	0.7	5.5	1.8	18	551	72	2.81	500/R
16	6	4.7	0.7	6.4	1.8	20	796	80	4.49	500/R
25	6	5.9	0.9	8.1	1.8	24	1,208	96	7.02	500/R
35	6	7.0	0.9	9.2	1.8	27	1,601	135	9.83	500/R
50	6	8.1	1.0	10.4	1.8	30	2,107	150	14.05	500/R
70	12	9.7	1.1	12.3	2.0	35	3,006	175	19.66	300/R
95	15	11.4	1.1	14.0	2.1	39	4,073	195	26.69	300/R
120	18	12.8	1.2	15.6	2.3	43	5,102	215	33.71	300/R
150	18	14.2	1.4	17.5	2.4	48	6,284	240	42.14	300/R
185	30	15.9	1.6	19.7	2.6	53	7,854	318	44.48	300/R
240	34	18.2	1.7	22.4	2.8	60	10,215	360	44.48	300/R
300	34	20.3	1.8	24.6	3.0	66	12,723	396	44.48	300/R
400	53	23.0	2.0	27.8	3.3	74	16,220	444	44.48	300/R

PHELPS DODGE CABLE TYPE CV

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES (TYPE CV), FOUR CORES

Nominal sectional area	Maximum DC. Resistance of Cdr. at 20°C	Minimum insulation resistance at 20 °C	AC Resistance at 90°C	Inductance mH/km	Positive - Negative Sequence Impedance Ω/km		Zero Sequence Impedance Ω/km		Voltage Drop PF = 0.8 V/A/km	Ampacities direct burial at 25 °C ground temp. A "RHO 120 1 m. depth"	Ampacities in free air at 40°C ambient
					R	X	Ro	Xo			
mm²	Ω/km	MΩ - km	Ω/km 3 Phase						3 Phase		A
1.5	12.1	1,021	15.43	0.340	15.429	0.107	15.577	2.498	21.490	26	22
2.5	7.41	842	9.45	0.317	9.449	0.100	9.597	2.458	13.196	34	30
4	4.61	698	5.88	0.299	5.878	0.094	6.027	2.417	8.243	44	39
6	3.08	591	3.93	0.286	3.927	0.090	4.076	2.381	5.535	55	50
10	1.83	511	2.33	0.276	2.334	0.087	2.482	2.350	3.323	72	67
16	1.15	419	1.47	0.264	1.467	0.083	1.615	2.307	2.118	93	89
25	0.727	426	0.927	0.265	0.927	0.083	1.076	2.253	1.371	120	120
35	0.524	369	0.669	0.258	0.669	0.081	0.817	2.221	1.011	144	147
50	0.387	351	0.494	0.256	0.494	0.080	0.643	2.187	0.768	170	179
70	0.268	327	0.343	0.253	0.343	0.079	0.491	2.150	0.557	207	224
95	0.193	282	0.247	0.247	0.247	0.078	0.396	2.117	0.423	248	277
120	0.153	275	0.197	0.246	0.197	0.077	0.345	2.091	0.353	280	323
150	0.124	287	0.160	0.248	0.160	0.078	0.309	2.066	0.302	315	368
185	0.0991	293	0.129	0.248	0.129	0.078	0.277	2.040	0.259	356	427
240	0.0754	272	0.099	0.246	0.099	0.077	0.248	2.010	0.218	410	504
300	0.0601	260	0.080	0.244	0.081	0.077	0.229	1.987	0.191	462	578
400	0.0470	256	0.065	0.244	0.065	0.077	0.213	1.959	0.169	520	672

PHELPS DODGE CABLE TYPE CV-AWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH ALUMINUM WIRE ARMOUR (TYPE CV-AWA), SINGLE CORE

CONSTRUCTION

Conductor	:	Concentric stranded annealed copper (1.5 up to 6 mm^2) or Compact round stranded annealed copper (10 up to 630 mm^2)
Insulation	:	Cross-linked polyethylene (XLPE) Color : Natural
Inner sheath	:	Polyvinyl chloride (PVC) Color : Black
Armour	:	Aluminum wires
Binding tape	:	Non-hygroscopic tape
Outer sheath	:	Polyvinyl chloride (PVC/ST2) Color : Black Optional : Polyethylene (PE/ST7), Flame retardant polyvinyl chloride (FR-PVC) in accordance with IEC 60332-3

Application	:	For general purpose power distribution in wet or dry locations, installed in air, conduit, duct, trench, cable tray or direct burial in ground. With metallic armour, the cable is suitable for installation in areas where special mechanical protection is required.

Rated voltage U_0/U (U_m)	:	0.6/1 (1.2) kV 600 Volts between conductor and earth 1000 Volts between conductors 1200 Volts maximum system voltage
Maximum conductor temperature	:	90 ^oC (Normal operation)
Voltage test	:	3.5 kVac or 8.4 kVdc / 5 minutes
Reference standard	:	IEC 60502-1

PHELPS DODGE CABLE TYPE CV-AWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH ALUMINUM WIRE ARMOUR (TYPE CV-AWA), SINGLE CORE

Nominal Sectional Area mm²	Number of wire (min)	Diameter of Conductor (approx.) mm	Nominal Thickness of Insulation mm	Diameter of Insulation (approx.) mm	Approx. Thickness of Inner Sheath mm	Diameter Over Inner Sheath (approx.) mm	Nominal Diameter of Aluminum wire armour mm	Nominal Thickness of Sheath mm	Overall Diameter (approx.) mm	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
1.5	7	1.6	0.7	3.3	1.0	5.8	0.80	1.4	11	136	132	0.11	500/R
2.5	7	2.0	0.7	3.7	1.0	6.2	0.80	1.4	11	153	132	0.18	500/R
4	7	2.6	0.7	4.3	1.0	6.8	0.80	1.4	12	177	144	0.28	500/R
6	7	3.1	0.7	4.8	1.0	7.3	0.80	1.4	12	206	144	0.42	500/R
10	6	3.7	0.7	5.5	1.0	8.0	0.80	1.4	13	254	156	0.70	500/R
16	6	4.7	0.7	6.4	1.0	8.9	0.80	1.4	14	327	168	1.12	500/R
25	6	5.9	0.9	8.1	1.0	10.6	0.80	1.4	15	447	180	1.76	500/R
35	6	7.0	0.9	9.2	1.0	11.7	0.80	1.4	17	555	204	2.46	500/R
50	6	8.1	1.0	10.4	1.0	13.1	1.25	1.5	19	756	228	3.51	500/R
70	12	9.7	1.1	12.3	1.0	15.1	1.25	1.5	21	989	252	4.92	500/R
95	15	11.4	1.1	14.0	1.0	16.6	1.25	1.6	23	1267	276	6.67	500/R
120	18	12.8	1.2	15.6	1.0	18.3	1.60	1.7	26	1593	312	8.43	500/R
150	18	14.2	1.4	17.5	1.0	20.3	1.60	1.7	28	1903	336	10.53	500/R
185	30	15.9	1.6	19.7	1.0	22.2	1.60	1.8	30	2310	360	12.99	500/R
240	34	18.2	1.7	22.4	1.0	25.1	1.60	1.9	33	2929	396	16.85	300/R
300	34	20.3	1.8	24.6	1.0	27.3	1.60	1.9	35	3542	420	21.07	300/R
400	53	23.0	2.0	27.8	1.2	31.0	2.00	2.1	40	4658	480	28.09	300/R
500	53	26.1	2.2	31.5	1.2	34.6	2.00	2.2	44	5813	528	35.11	300/R
630	53	29.9	2.4	35.8	1.2	39.0	2.00	2.3	48	7344	576	44.24	300/R

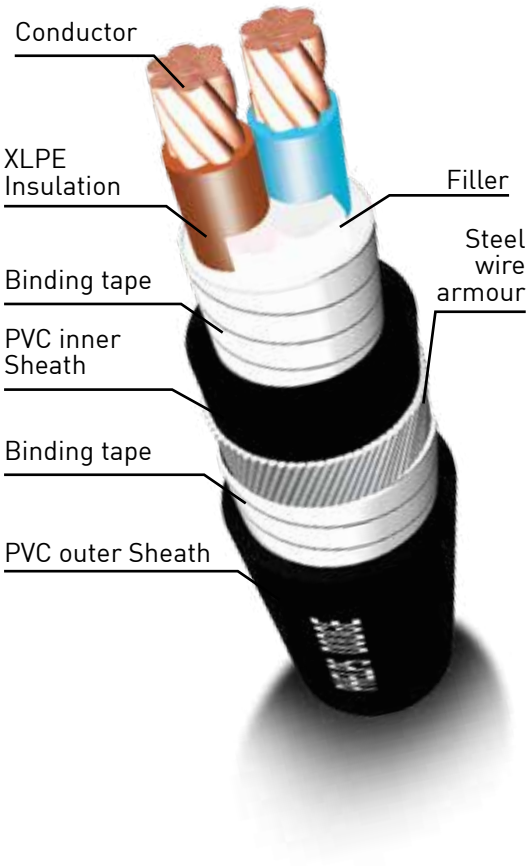
PHELPS DODGE CABLE TYPE CV-AWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH ALUMINUM WIRE ARMOUR (TYPE CV-AWA), SINGLE CORE

Nominal sectional area	Maximum DC. Resistance of Cdr. at 20°C	Minimum insulation resistance at 20°C	AC Resistance at 90°C		Inductance		Zero Sequence Impedance Ω / km				Voltage Drop PF = 0.8		Ampacities direct burial at 25 °C ground temp. A RHO 120 Dept. 1 m		Ampacities in free air at 40°C ambient	
			Ω / km		mH/km		Flat		Trefoil		V/A/km		A		A	
mm²	Ω / km	MΩ-km	Flat	Trefoil	Flat	Trefoil	Ro	Xo	Ro	Xo	Flat	Trefoil	Flat	Trefoil	Flat	Trefoil
1.5	12.1	1,021	15.43	15.43	0.553	0.623	15.58	2.34	15.58	2.28	24.89	24.92	33	32	31	27
2.5	7.41	842	9.45	9.45	0.512	0.581	9.60	2.31	9.60	2.26	15.31	15.34	43	41	41	36
4	4.61	698	5.88	5.88	0.475	0.544	6.03	2.28	6.03	2.23	9.58	9.61	55	53	54	47
6	3.08	591	3.93	3.93	0.445	0.514	4.08	2.26	4.08	2.21	6.45	6.48	68	66	68	59
10	1.83	511	2.33	2.33	0.409	0.478	2.48	2.25	2.48	2.20	3.89	3.91	90	87	91	79
16	1.15	419	1.47	1.47	0.390	0.460	1.62	2.21	1.62	2.16	2.49	2.52	116	111	120	104
25	0.727	426	0.927	0.927	0.368	0.437	1.08	2.18	1.08	2.12	1.62	1.65	148	143	159	137
35	0.524	369	0.668	0.668	0.349	0.418	0.817	2.152	0.817	2.100	1.20	1.23	178	170	194	167
50	0.387	351	0.493	0.493	0.347	0.416	0.643	2.117	0.642	2.065	0.921	0.947	209	201	240	207
70	0.268	327	0.342	0.342	0.331	0.400	0.491	2.090	0.491	2.038	0.672	0.698	256	245	301	260
95	0.193	282	0.246	0.246	0.317	0.386	0.396	2.064	0.395	2.012	0.514	0.540	306	293	366	317
120	0.153	275	0.196	0.195	0.316	0.385	0.345	2.039	0.345	1.986	0.433	0.458	348	332	426	371
150	0.124	287	0.159	0.158	0.309	0.378	0.308	2.020	0.308	1.967	0.371	0.397	391	372	485	424
185	0.0991	293	0.1279	0.1274	0.304	0.373	0.277	1.998	0.276	1.946	0.319	0.344	441	419	551	484
240	0.0754	272	0.0982	0.0976	0.294	0.364	0.247	1.973	0.246	1.921	0.268	0.293	513	484	650	575
300	0.0601	260	0.0790	0.0785	0.287	0.356	0.228	1.955	0.227	1.902	0.235	0.260	579	544	736	655
400	0.0470	256	0.0633	0.0622	0.289	0.358	0.212	1.925	0.211	1.872	0.210	0.235	659	614	830	754
500	0.0366	248	0.0510	0.0500	0.282	0.351	0.200	1.901	0.198	1.849	0.188	0.212	751	691	940	862
630	0.0283	237	0.0416	0.0399	0.275	0.344	0.190	1.875	0.189	1.823	0.170	0.194	856	775	1058	980

PHELPS DODGE CABLE TYPE CV-SWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH STEEL WIRE ARMOUR (TYPE CV-SWA), TWO CORES



CONSTRUCTION

Conductor	:	Concentric stranded annealed copper (1.5 up to 6 mm^2) or Compact round stranded annealed copper (10 up to 400 mm^2)
Insulation	:	Cross-linked polyethylene (XLPE) Color : Brown and Light Blue
Filler	:	Polypropylene filament or suitable material
Inner sheath	:	Polyvinyl chloride (PVC) Color : Black
Armour	:	Galvanized steel wires
Binding tape	:	Non-hygroscopic tape
Outer sheath	:	Polyvinyl chloride (PVC/ST2) Color : Black Optional : Polyethylene (PE/ST7), Flame retardant polyvinyl chloride (FR-PVC) in accordance with IEC 60332-3

Application	:	For general purpose power distribution in wet or dry locations, installed in air, conduit, duct, trench, cable tray or direct burial in ground. With metallic armour, the cable is suitable for installation in areas where special mechanical protection is required.

Rated voltage U_0/U (U_m)	:	0.6/1 (1.2) kV 600 Volts between conductor and earth 1000 Volts between conductors 1200 Volts maximum system voltage
Maximum conductor temperature	:	90 °C (Normal operation)
Voltage test	:	3.5 kVac or 8.4 kVdc / 5 minutes
Reference standard	:	IEC 60502-1

PHELPS DODGE CABLE TYPE CV-SWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH STEEL WIRE ARMOUR (TYPE CV-SWA), TWO CORES

Nominal Sectional Area mm²	Number of wire (min)	Diameter of Conductor (approx.) mm	Nominal Thickness of Insulation mm	Diameter of Insulation (approx.) mm	Approx. Thickness of Inner Sheath mm	Diameter Over Inner Sheath (approx.) mm	Nominal Diameter of Steel wire armour mm	Nominal Thickness of Sheath mm	Overall Diameter (approx.) mm	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
1.5	7	1.6	0.7	3.3	1.0	9.0	0.80	1.8	15	335	180	0.21	500/R
2.5	7	2.0	0.7	3.7	1.0	10.0	0.80	1.8	16	384	192	0.35	500/R
4	7	2.6	0.7	4.3	1.0	11.0	0.80	1.8	17	451	204	0.56	500/R
6	7	3.1	0.7	4.8	1.0	12.0	0.80	1.8	18	528	216	0.84	500/R
10	6	3.7	0.7	5.5	1.0	13.0	1.25	1.8	20	768	240	1.40	500/R
16	6	4.7	0.7	6.4	1.0	15.0	1.25	1.8	22	955	264	2.25	500/R
25	6	5.9	0.9	8.1	1.0	19.0	1.60	1.8	26	1,408	312	3.51	500/R
35	6	7.0	0.9	9.2	1.0	21.0	1.60	1.8	29	1,701	348	4.92	500/R
50	6	8.1	1.0	10.4	1.0	23.0	1.60	1.8	31	2,072	372	7.02	500/R
70	12	9.7	1.1	12.3	1.0	27.0	1.60	2.0	35	2,694	420	9.83	500/R
95	15	11.4	1.1	14.0	1.2	31.0	2.00	2.1	40	3,690	480	13.34	500/R
120	18	12.8	1.2	15.6	1.2	34.0	2.00	2.2	44	4,397	528	16.85	500/R
150	18	14.2	1.4	17.5	1.2	38.0	2.00	2.3	47	5,199	564	21.07	500/R
185	30	15.9	1.6	19.7	1.4	42.0	2.50	2.5	54	6,757	648	25.98	500/R
240	34	18.2	1.7	22.4	1.4	48.0	2.50	2.7	60	8,333	720	33.71	300/R
300	34	20.3	1.8	24.6	1.6	53.0	2.50	2.8	65	9,965	780	42.14	300/R
400	53	23.0	2.0	27.8	1.6	59.0	2.50	3.1	72	12,262	864	44.48	300/R

PHELPS DODGE CABLE TYPE CV-SWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH STEEL WIRE ARMOUR (TYPE CV-SWA), TWO CORES

Nominal sectional area	Maximum DC. Resistance of Cdr. at 20°C	Minimum insulation resistance at 20 °C	AC Resistance at 90°C	Inductance mH/km	Positive - Negative Sequence Impedance Ω/km		Zero Sequence Impedance Ω/km		Voltage Drop PF = 0.8 V/A/km	Ampacities direct burial at 25 °C ground temp. A "RHO 120 1 m. depth"	Ampacities in free air at 40°C ambient
					R	X	Ro	Xo			
mm²	Ω/km	MΩ - km	Ω/km 3 Phase						3 Phase		A
1.5	12.1	1,021	15.43	0.317	15.429	0.100	15.577	2.516	24.805	34	22
2.5	7.41	842	9.45	0.294	9.449	0.092	9.597	2.475	15.229	45	29
4	4.61	698	5.88	0.276	5.878	0.087	6.027	2.435	9.509	58	38
6	3.08	591	3.93	0.263	3.927	0.083	4.076	2.399	6.383	73	49
10	1.83	511	2.33	0.253	2.334	0.079	2.482	2.368	3.829	96	66
16	1.15	419	1.47	0.241	1.466	0.076	1.615	2.324	2.437	124	87
25	0.727	426	0.927	0.242	0.927	0.076	1.076	2.271	1.575	161	118
35	0.524	369	0.669	0.235	0.668	0.074	0.817	2.239	1.158	192	144
50	0.387	351	0.494	0.233	0.494	0.073	0.643	2.204	0.878	226	174
70	0.268	327	0.342	0.230	0.342	0.072	0.491	2.167	0.634	275	218
95	0.193	282	0.247	0.224	0.247	0.070	0.396	2.135	0.480	326	267
120	0.153	275	0.196	0.223	0.196	0.070	0.345	2.109	0.398	368	308
150	0.124	287	0.160	0.225	0.159	0.071	0.308	2.084	0.340	409	350
185	0.0991	293	0.128	0.225	0.128	0.071	0.277	2.058	0.290	458	404
240	0.0754	272	0.099	0.223	0.098	0.070	0.247	2.028	0.242	520	470
300	0.0601	260	0.080	0.221	0.079	0.070	0.229	2.005	0.211	572	527
400	0.0470	256	0.064	0.221	0.063	0.069	0.213	1.976	0.186	629	595

PHELPS DODGE CABLE TYPE CV-SWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH STEEL WIRE ARMOUR (TYPE CV-SWA), THREE CORES

CONSTRUCTION

Conductor	:	Concentric stranded annealed copper (1.5 up to 6 mm^2) or Compact round stranded annealed copper (10 up to 400 mm^2)
Insulation	:	Cross-linked polyethylene (XLPE) Color : Brown , Black and Grey
Filler	:	Polypropylene filament or suitable material
Inner sheath	:	Polyvinyl chloride (PVC) Color : Black
Armour	:	Galvanized steel wires
Binding tape	:	Non-hygroscopic tape
Outer sheath	:	Polyvinyl chloride (PVC/ST2) Color : Black Optional: Polyethylene (PE/ST7), Flame retardant polyvinyl chloride (FR-PVC) in accordance with IEC 60332-3

Application	:	For general purpose power distribution in wet or dry locations, installed in air, conduit, duct, trench, cable tray or direct burial in ground. With metallic armour, the cable is suitable for installation in areas where special mechanical protection is required.

Rated voltage U_0/U (U_m)	:	0.6/1 (1.2) kV 600 Volts between conductor and earth 1000 Volts between conductors 1200 Volts maximum system voltage
Maximum conductor temperature	:	90 ^{O}C (Normal operation)
Voltage test	:	3.5 kVac or 8.4 kVdc / 5 minutes
Reference standard	:	IEC 60502-1

PHELPS DODGE CABLE TYPE CV-SWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH STEEL WIRE ARMOUR (TYPE CV-SWA), THREE CORES

Nominal Sectional Area	Number of wire (min)	Diameter of Conductor (approx.)	Nominal Thickness of Insulation	Diameter of Insulation (approx.)	Approx. Thickness of Inner Sheath	Diameter Over Inner Sheath (approx.)	Nominal Diameter of Steel wire armour	Nominal Thickness of Sheath	Overall Diameter (approx.)	Cable weight (approx.)	Minimum bending radius	Maximum pulling tension	Standard packing
mm^2		mm	mm	mm	mm	mm	mm	mm	mm	kg / km	mm	kN	m
1.5	7	1.6	0.7	3.3	1.0	10.0	0.80	1.8	15	365	180	0.32	500/R
2.5	7	2.0	0.7	3.7	1.0	11.0	0.80	1.8	16	428	192	0.53	500/R
4	7	2.6	0.7	4.3	1.0	12.0	0.80	1.8	17	512	204	0.84	500/R
6	7	3.1	0.7	4.8	1.0	13.0	0.80	1.8	18	610	216	1.26	500/R
10	6	3.7	0.7	5.5	1.0	14.0	1.25	1.8	20	886	240	2.11	500/R
16	6	4.7	0.7	6.4	1.0	16.0	1.25	1.8	22	1,140	264	3.37	500/R
25	6	5.9	0.9	8.1	1.0	20.0	1.60	1.8	26	1,714	312	5.27	500/R
35	6	7.0	0.9	9.2	1.0	22.0	1.60	1.8	29	2,098	348	7.37	500/R
50	6	8.1	1.0	10.4	1.0	25.0	1.60	1.9	31	2,585	372	10.53	500/R
70	12	9.7	1.1	12.3	1.2	29.0	2.00	2.0	35	3,704	420	14.75	500/R
95	15	11.4	1.1	14.0	1.2	33.0	2.00	2.2	40	4,703	480	20.01	500/R
120	18	12.8	1.2	15.6	1.2	36.0	2.00	2.3	44	5,645	528	25.28	500/R
150	18	14.2	1.4	17.5	1.4	41.0	2.50	2.5	47	7,243	564	31.60	500/R
185	30	15.9	1.6	19.7	1.4	45.0	2.50	2.6	54	8,683	648	38.98	500/R
240	34	18.2	1.7	22.4	1.6	51.0	2.50	2.8	60	10,903	720	44.48	300/R
300	34	20.3	1.8	24.6	1.6	56.0	2.50	3.0	65	13,137	780	44.48	300/R
400	53	23.0	2.0	27.8	1.6	63.0	2.50	3.2	72	16,165	864	44.48	300/R

PHELPS DODGE CABLE TYPE CV-SWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH STEEL WIRE ARMOUR (TYPE CV-SWA), THREE CORES

Nominal sectional area	Maximum DC. Resistance of Cdr. at 20°C	Minimum insulation resistance at 20 °C	AC Resistance at 90°C	Inductance mH/km	Positive - Negative Sequence Impedance Ω/km		Zero Sequence Impedance Ω/km		Voltage Drop PF = 0.8 V/A/km	Ampacities direct burial at 25 °C ground temp. A "RHO 120 1 m. depth"	Ampacities in free air at 40°C ambient
mm²	Ω/km	MΩ - km	Ω/km 3 Phase		R	X	Ro	Xo	3 Phase		A
1.5	12.1	1,021	15.43	0.317	15.429	0.100	15.577	2.516	21.482	29	23
2.5	7.41	842	9.45	0.294	9.449	0.092	9.597	2.475	13.188	38	31
4	4.61	698	5.88	0.276	5.878	0.087	6.027	2.435	8.235	49	41
6	3.08	591	3.93	0.263	3.927	0.083	4.076	2.399	5.528	61	51
10	1.83	511	2.33	0.253	2.334	0.079	2.482	2.368	3.316	81	70
16	1.15	419	1.47	0.241	1.467	0.076	1.615	2.324	2.111	104	92
25	0.727	426	0.927	0.242	0.927	0.076	1.076	2.271	1.364	135	124
35	0.524	369	0.669	0.235	0.669	0.074	0.817	2.239	1.003	161	151
50	0.387	351	0.494	0.233	0.494	0.073	0.643	2.204	0.761	191	184
70	0.268	327	0.343	0.230	0.343	0.072	0.491	2.167	0.550	232	230
95	0.193	282	0.247	0.224	0.247	0.070	0.396	2.135	0.416	278	282
120	0.153	275	0.197	0.223	0.197	0.070	0.346	2.109	0.346	315	326
150	0.124	287	0.160	0.225	0.160	0.071	0.309	2.084	0.295	351	372
185	0.0991	293	0.129	0.225	0.129	0.071	0.278	2.058	0.252	395	427
240	0.0754	272	0.100	0.223	0.100	0.070	0.248	2.028	0.211	452	499
300	0.0601	260	0.081	0.221	0.081	0.070	0.230	2.005	0.185	505	568
400	0.0470	256	0.065	0.221	0.066	0.069	0.214	1.976	0.163	565	650

PHELPS DODGE CABLE TYPE CV-SWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH STEEL WIRE ARMOUR (TYPE CV-SWA), FOUR CORES

CONSTRUCTION

Conductor	:	Concentric stranded annealed copper (1.5 up to 6 mm^2) or Compact round stranded annealed copper (10 up to 400 mm^2)
Insulation	:	Cross-linked polyethylene (XLPE)
Color	:	Brown , Black, Grey and Light Blue
Filler	:	Polypropylene filament or suitable material
Inner sheath	:	Polyvinyl chloride (PVC) Color : Black
Armour	:	Galvanized steel wires
Binding tape	:	Non-hygroscopic tape
Outer sheath	:	Polyvinyl chloride (PVC/ST2) Color : Black Optional : Polyethylene (PE/ST7), Flame retardant polyvinyl chloride (FR-PVC) in accordance with IEC 60332-3

Application	:	For general purpose power distribution in wet or dry locations, installed in air, conduit, duct, trench, cable tray or direct burial in ground. With metallic armour, the cable is suitable for installation in areas where special mechanical protection is required.

Rated voltage U_0/U (U_m)	:	0.6/1 (1.2) kV 600 Volts between conductor and earth 1000 Volts between conductors 1200 Volts maximum system voltage
Maximum conductor temperature	:	90 °C (Normal operation)
Voltage test	:	3.5 kVac or 8.4 kVdc / 5 minutes
Reference standard	:	IEC 60502-1

PHELPS DODGE CABLE TYPE CV-SWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH STEEL WIRE ARMOUR (TYPE CV-SWA), FOUR CORES

Nominal Sectional Area mm²	Number of wire (min)	Diameter of Conductor (approx.) mm	Nominal Thickness of Insulation mm	Diameter of Insulation (approx.) mm	Approx. Thickness of Inner Sheath mm	Diameter Over Inner Sheath (approx.) mm	Nominal Diameter of Steel wire armour mm	Nominal Thickness of Sheath mm	Overall Diameter (approx.) mm	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
1.5	7	1.6	0.7	3.3	1.0	10.0	0.80	1.8	16	408	192	0.42	500/R
2.5	7	2.0	0.7	3.7	1.0	11.0	0.80	1.8	18	484	216	0.70	500/R
4	7	2.6	0.7	4.3	1.0	13.0	0.80	1.8	19	590	228	1.12	500/R
6	7	3.1	0.7	4.8	1.0	14.0	1.25	1.8	21	846	252	1.69	500/R
10	6	3.7	0.7	5.5	1.0	16.0	1.25	1.8	23	1,048	276	2.81	500/R
16	6	4.7	0.7	6.4	1.0	18.0	1.60	1.8	26	1,489	312	4.49	500/R
25	6	5.9	0.9	8.1	1.0	22.0	1.60	1.8	30	2,043	360	7.02	500/R
35	6	7.0	0.9	9.2	1.0	25.0	1.60	1.9	33	2,556	396	9.83	500/R
50	6	8.1	1.0	10.4	1.0	27.0	1.60	2.0	36	3,186	432	14.05	500/R
70	12	9.7	1.1	12.3	1.2	32.0	2.00	2.2	42	4,592	504	19.66	500/R
95	15	11.4	1.1	14.0	1.2	37.0	2.00	2.3	46	5,834	552	26.69	500/R
120	18	12.8	1.2	15.6	1.4	41.0	2.50	2.5	52	7,548	624	33.71	300/R
150	18	14.2	1.4	17.5	1.4	45.0	2.50	2.6	57	8,991	684	42.14	300/R
185	30	15.9	1.6	19.7	1.4	50.0	2.50	2.8	62	10,879	744	44.48	300/R
240	34	18.2	1.7	22.4	1.6	57.0	2.50	3.0	70	13,725	840	44.48	300/R
300	34	20.3	1.8	24.6	1.6	62.0	2.50	3.2	75	16,576	900	44.48	300/R
400	53	23.0	2.0	27.8	1.8	70.0	3.15	3.5	85	21,598	1,020	44.48	300/R

PHELPS DODGE CABLE TYPE CV-SWA

0.6/1 kV XLPE INSULATED AND PVC SHEATHED POWER CABLES WITH STEEL WIRE ARMOUR (TYPE CV-SWA), FOUR CORES

Nominal sectional area	Maximum DC. Resistance of Cdr. at 20°C	Minimum insulation resistance at 20 °C	AC Resistance at 90°C	Inductance mH/km	Positive - Negative Sequence Impedance Ω/km		Zero Sequence Impedance Ω/km		Voltage Drop PF = 0.8 V/A/km	Ampacities direct burial at 25 °C ground temp. A "RHO 120 1 m. depth"	Ampacities in free air at 40°C ambient
mm²	Ω/km	MΩ - km	Ω/km 3 Phase		R	X	Ro	Xo	3 Phase		A
1.5	12.1	1,021	15.43	0.340	15.429	0.107	15.577	2.498	21.490	25	23
2.5	7.41	842	9.45	0.317	9.449	0.100	9.597	2.458	13.196	33	31
4	4.61	698	5.88	0.299	5.878	0.094	6.027	2.417	8.243	43	41
6	3.08	591	3.93	0.286	3.927	0.090	4.076	2.381	5.535	54	51
10	1.83	511	2.33	0.276	2.334	0.087	2.482	2.350	3.323	71	70
16	1.15	419	1.47	0.264	1.467	0.083	1.615	2.307	2.118	92	92
25	0.727	426	0.927	0.265	0.927	0.083	1.076	2.253	1.371	119	124
35	0.524	369	0.669	0.258	0.669	0.081	0.817	2.221	1.011	142	151
50	0.387	351	0.494	0.256	0.494	0.080	0.643	2.187	0.768	169	184
70	0.268	327	0.343	0.253	0.343	0.079	0.491	2.150	0.557	205	230
95	0.193	282	0.247	0.247	0.247	0.078	0.396	2.117	0.423	245	282
120	0.153	275	0.197	0.246	0.197	0.077	0.345	2.091	0.353	277	326
150	0.124	287	0.160	0.248	0.160	0.078	0.309	2.066	0.302	311	372
185	0.0991	293	0.129	0.248	0.129	0.078	0.277	2.040	0.259	350	427
240	0.0754	272	0.099	0.246	0.099	0.077	0.248	2.010	0.218	401	499
300	0.0601	260	0.080	0.244	0.081	0.077	0.229	1.987	0.191	448	568
400	0.0470	256	0.065	0.244	0.065	0.077	0.213	1.959	0.169	499	650

It is essential to ensure that operations will not be stopped or malfunctioned unexpectedly. Phelps Dodge's control cables are elaborately designed, produced and tested to ensure best functioning of machinery and equipment with highest reliablity.

Control Cables

PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) IEC 60502-1

CONSTRUCTION

Conductor	:	Concentric stranded annealed copper Optional : Flexible or solid annealed copper
Insulation	:	Polyvinyl chloride (PVC) Color : Black with core number marking
Filler	:	Polypropylene filament or suitable material
Binding tape	:	Non-hygroscopic tape
Outer sheath	:	Polyvinyl chloride (PVC/ST2) Color : Black Optional : Flame retardant polyvinyl chloride (FR-PVC) in accordance with IEC 60332-3

Application	:	For supervisory electrical equipment, station control circuits. Suitable for indoor and outdoor installation in wet or dry locations, in conduit, duct, trench and cable tray.

Rated voltage	:	600 Volts
Maximum conductor temperature	:	70 ^{O}C (Normal operation)
Voltage test	:	3.5 kVac or 8.4 kVdc / 5 minutes
Reference standard	:	IEC 60502-1

PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Nominal Thickness of Sheath mm	Overall diameter (approx.) mm	Maximum DC. Resist-ance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
2	1.5	7	1.6	0.8	1.8	12	12.10	11.05	138	48	0.21	1,000/R
	2.5	7	2.0	0.8	1.8	13	7.41	9.19	169	52	0.35	1,000/R
	4	7	2.6	1.0	1.8	15	4.61	9.23	234	60	0.56	1,000/R
	6	7	3.1	1.0	1.8	16	3.08	7.84	292	64	0.84	1,000/R
3	1.5	7	1.6	0.8	1.8	12	12.10	11.05	166	48	0.32	1,000/R
	2.5	7	2.0	0.8	1.8	13	7.41	9.19	207	52	0.53	1,000/R
	4	7	2.6	1.0	1.8	15	4.61	9.23	293	60	0.84	1,000/R
	6	7	3.1	1.0	1.8	17	3.08	7.84	373	68	1.26	1,000/R
4	1.5	7	1.6	0.8	1.8	13	12.10	11.05	198	52	0.42	1,000/R
	2.5	7	2.0	0.8	1.8	14	7.41	9.19	252	56	0.70	1,000/R
	4	7	2.6	1.0	1.8	16	4.61	9.23	361	64	1.12	1,000/R
	6	7	3.1	1.0	1.8	18	3.08	7.84	465	72	1.69	1,000/R
5	1.5	7	1.6	0.8	1.8	14	12.10	11.05	233	56	0.53	1,000/R
	2.5	7	2.0	0.8	1.8	15	7.41	9.19	300	60	0.88	1,000/R
	4	7	2.6	1.0	1.8	18	4.61	9.23	432	72	1.40	1,000/R
	6	7	3.1	1.0	1.8	19	3.08	7.84	559	76	2.11	1,000/R
6	1.5	7	1.6	0.8	1.8	15	12.10	11.05	266	60	0.63	1,000/R
	2.5	7	2.0	0.8	1.8	16	7.41	9.19	348	64	1.05	1,000/R
	4	7	2.6	1.0	1.8	19	4.61	9.23	506	76	1.69	1,000/R
	6	7	3.1	1.0	1.8	21	3.08	7.84	658	84	2.53	1,000/R
7	1.5	7	1.6	0.8	1.8	15	12.10	11.05	286	60	0.74	1,000/R
	2.5	7	2.0	0.8	1.8	16	7.41	9.19	378	64	1.23	1,000/R
	4	7	2.6	1.0	1.8	19	4.61	9.23	553	76	1.97	1,000/R
	6	7	3.1	1.0	1.8	21	3.08	7.84	725	84	2.95	1,000/R

PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Nominal Thickness of Sheath mm	Overall diameter (approx.) mm	Maximum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
8	1.5	7	1.6	0.8	1.8	16	12.10	11.05	322	64	0.84	1,000/R
	2.5	7	2.0	0.8	1.8	17	7.41	9.19	428	68	1.40	1,000/R
	4	7	2.6	1.0	1.8	20	4.61	9.23	628	80	2.25	1,000/R
	6	7	3.1	1.0	1.8	22	3.08	7.84	825	88	3.37	1,000/R
9	1.5	7	1.6	0.8	1.8	17	12.10	11.05	360	68	0.95	1,000/R
	2.5	7	2.0	0.8	1.8	19	7.41	9.19	479	76	1.58	1,000/R
	4	7	2.6	1.0	1.8	22	4.61	9.23	706	88	2.53	1,000/R
	6	7	3.1	1.0	1.8	24	3.08	7.84	929	96	3.79	1,000/R
10	1.5	7	1.6	0.8	1.8	18	12.10	11.05	404	72	1.05	1,000/R
	2.5	7	2.0	0.8	1.8	20	7.41	9.19	537	80	1.76	1,000/R
	4	7	2.6	1.0	1.8	24	4.61	9.23	793	96	2.81	1,000/R
	6	7	3.1	1.0	1.8	26	3.08	7.84	1,044	130	4.21	1,000/R
11	1.5	7	1.6	0.8	1.8	18	12.10	11.05	423	72	1.16	1,000/R
	2.5	7	2.0	0.8	1.8	20	7.41	9.19	566	80	1.93	1,000/R
	4	7	2.6	1.0	1.8	24	4.61	9.23	840	96	3.09	1,000/R
	6	7	3.1	1.0	1.8	26	3.08	7.84	1,110	130	4.63	1,000/R
12	1.5	7	1.6	0.8	1.8	19	12.10	11.05	453	76	1.26	1,000/R
	2.5	7	2.0	0.8	1.8	21	7.41	9.19	608	84	2.11	1,000/R
	4	7	2.6	1.0	1.8	24	4.61	9.23	904	96	3.37	1,000/R
	6	7	3.1	1.0	1.8	27	3.08	7.84	1,198	135	5.06	1,000/R
13	1.5	7	1.6	0.8	1.8	20	12.10	11.05	488	80	1.37	1,000/R
	2.5	7	2.0	0.8	1.8	22	7.41	9.19	658	88	2.28	1,000/R
	4	7	2.6	1.0	1.8	25	4.61	9.23	980	100	3.65	1,000/R
	6	7	3.1	1.0	1.8	29	3.08	7.84	1,299	145	5.48	1,000/R

PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Nominal Thickness of Sheath mm	Overall diameter (approx.) mm	Maximum DC. Resist-ance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
14	1.5	7	1.6	0.8	1.8	20	12.10	11.05	508	80	1.47	1,000/R
	2.5	7	2.0	0.8	1.8	22	7.41	9.19	688	88	2.46	1,000/R
	4	7	2.6	1.0	1.8	25	4.61	9.23	1,027	100	3.93	1,000/R
	6	7	3.1	1.0	1.8	29	3.08	7.84	1,366	145	5.90	1,000/R
15	1.5	7	1.6	0.8	1.8	20	12.10	11.05	548	80	1.58	1,000/R
	2.5	7	2.0	0.8	1.8	23	7.41	9.19	740	92	2.63	1,000/R
	4	7	2.6	1.0	1.8	27	4.61	9.23	1,108	135	4.21	1,000/R
	6	7	3.1	1.0	1.8	30	3.08	7.84	1,473	150	6.32	1,000/R
16	1.5	7	1.6	0.8	1.8	20	12.10	11.05	567	80	1.69	1,000/R
	2.5	7	2.0	0.8	1.8	23	7.41	9.19	770	92	2.81	1,000/R
	4	7	2.6	1.0	1.8	27	4.61	9.23	1,155	135	4.49	1,000/R
	6	7	3.1	1.0	1.8	30	3.08	7.84	1,539	150	6.74	1,000/R
17	1.5	7	1.6	0.8	1.8	21	12.10	11.05	607	84	1.79	1,000/R
	2.5	7	2.0	0.8	1.8	24	7.41	9.19	825	96	2.98	1,000/R
	4	7	2.6	1.0	1.8	29	4.61	9.23	1,238	145	4.78	1,000/R
	6	7	3.1	1.0	1.8	32	3.08	7.84	1,650	160	7.16	1,000/R
18	1.5	7	1.6	0.8	1.8	21	12.10	11.05	627	84	1.90	1,000/R
	2.5	7	2.0	0.8	1.8	24	7.41	9.19	854	96	3.16	1,000/R
	4	7	2.6	1.0	1.8	29	4.61	9.23	1,285	145	5.06	1,000/R
	6	7	3.1	1.0	1.8	32	3.08	7.84	1,716	160	7.58	1,000/R
19	1.5	7	1.6	0.8	1.8	21	12.10	11.05	647	84	2.00	1,000/R
	2.5	7	2.0	0.8	1.8	24	7.41	9.19	884	96	3.34	1,000/R
	4	7	2.6	1.0	1.8	29	4.61	9.23	1,332	145	5.34	1,000/R
	6	7	3.1	1.0	1.8	32	3.08	7.84	1,783	160	8.01	1,000/R

PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Nominal Thickness of Sheath mm	Overall diameter (approx.) mm	Maximum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
20	1.5	7	1.6	0.8	1.8	22	12.10	11.05	688	88	2.11	1,000/R
	2.5	7	2.0	0.8	1.8	25	7.41	9.19	940	100	3.51	1,000/R
	4	7	2.6	1.0	1.8	30	4.61	9.23	1,418	150	5.62	1,000/R
	6	7	3.1	1.0	1.9	33	3.08	7.84	1,913	165	8.43	1,000/R
21	1.5	7	1.6	0.8	1.8	22	12.10	11.05	708	88	2.21	1,000/R
	2.5	7	2.0	0.8	1.8	25	7.41	9.19	970	100	3.69	1,000/R
	4	7	2.6	1.0	1.8	30	4.61	9.23	1,465	150	5.90	1,000/R
	6	7	3.1	1.0	1.9	33	3.08	7.84	1,979	165	8.85	1,000/R
22	1.5	7	1.6	0.8	1.8	23	12.10	11.05	750	92	2.32	1,000/R
	2.5	7	2.0	0.8	1.8	26	7.41	9.19	1,027	130	3.86	1,000/R
	4	7	2.6	1.0	1.9	32	4.61	9.23	1,568	160	6.18	1,000/R
	6	7	3.1	1.0	2.0	35	3.08	7.84	2,112	175	9.27	1,000/R
23	1.5	7	1.6	0.8	1.8	23	12.10	11.05	770	92	2.42	1,000/R
	2.5	7	2.0	0.8	1.8	26	7.41	9.19	1,057	130	4.04	1,000/R
	4	7	2.6	1.0	1.9	32	4.61	9.23	1,615	160	6.46	1,000/R
	6	7	3.1	1.0	2.0	35	3.08	7.84	2,178	175	9.69	1,000/R
24	1.5	7	1.6	0.8	1.8	25	12.10	11.05	819	100	2.53	1,000/R
	2.5	7	2.0	0.8	1.8	28	7.41	9.19	1,123	140	4.21	1,000/R
	4	7	2.6	1.0	1.9	33	4.61	9.23	1,715	165	6.74	1,000/R
	6	7	3.1	1.0	2.0	37	3.08	7.84	2,311	185	10.11	1,000/R
25	1.5	7	1.6	0.8	1.8	25	12.10	11.05	839	100	2.63	1,000/R
	2.5	7	2.0	0.8	1.8	28	7.41	9.19	1,152	140	4.39	1,000/R
	4	7	2.6	1.0	1.9	33	4.61	9.23	1,763	165	7.02	1,000/R
	6	7	3.1	1.0	2.0	37	3.08	7.84	2,378	185	10.53	1,000/R

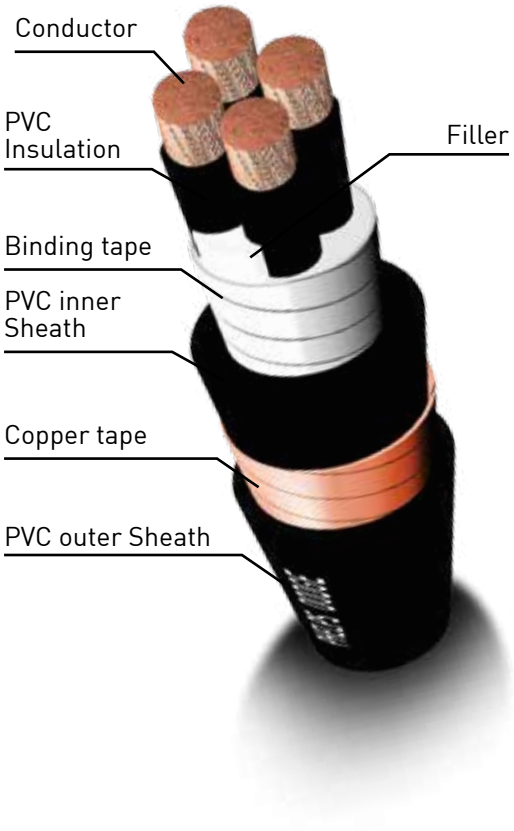
PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Nominal Thickness of Sheath mm	Overall diameter (approx.) mm	Maximum DC. Resist-ance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
26	1.5	7	1.6	0.8	1.8	25	12.10	11.05	859	100	2.74	1,000/R
	2.5	7	2.0	0.8	1.8	28	7.41	9.19	1,182	140	4.56	1,000/R
	4	7	2.6	1.0	1.9	33	4.61	9.23	1,810	165	7.30	1,000/R
	6	7	3.1	1.0	2.0	37	3.08	7.84	2,444	185	10.96	1,000/R
27	1.5	7	1.6	0.8	1.8	25	12.10	11.05	891	100	2.84	1,000/R
	2.5	7	2.0	0.8	1.8	28	7.41	9.19	1,226	140	4.74	1,000/R
	4	7	2.6	1.0	1.9	34	4.61	9.23	1,879	170	7.58	1,000/R
	6	7	3.1	1.0	2.0	38	3.08	7.84	2,539	190	11.38	1,000/R
28	1.5	7	1.6	0.8	1.8	26	12.10	11.05	931	130	2.95	1,000/R
	2.5	7	2.0	0.8	1.8	29	7.41	9.19	1,282	145	4.92	1,000/R
	4	7	2.6	1.0	2.0	35	4.61	9.23	1,980	175	7.87	1,000/R
	6	7	3.1	1.0	2.1	40	3.08	7.84	2,672	200	11.80	1,000/R
29	1.5	7	1.6	0.8	1.8	26	12.10	11.05	951	130	3.05	1,000/R
	2.5	7	2.0	0.8	1.8	29	7.41	9.19	1,311	145	5.09	1,000/R
	4	7	2.6	1.0	2.0	35	4.61	9.23	2,028	175	8.15	1,000/R
	6	7	3.1	1.0	2.1	40	3.08	7.84	2,738	200	12.22	1,000/R
30	1.5	7	1.6	0.8	1.8	26	12.10	11.05	971	130	3.16	1,000/R
	2.5	7	2.0	0.8	1.8	29	7.41	9.19	1,340	145	5.27	1,000/R
	4	7	2.6	1.0	2.0	35	4.61	9.23	2,076	175	8.43	1,000/R
	6	7	3.1	1.0	2.1	40	3.08	7.84	2,805	200	12.64	1,000/R

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) IEC 60502-1



CONSTRUCTION

Conductor	:	Concentric stranded annealed copper Optional : Flexible or solid annealed copper
Insulation	:	Polyvinyl chloride (PVC) Color : Black with core number marking
Filler	:	Polypropylene filament or suitable material
Binding tape	:	Non-hygroscopic tape
Inner sheath	:	Polyvinyl chloride (PVC) Color : Black
Shield	:	Annealed copper tape
Outer sheath	:	Polyvinyl chloride (PVC/ST2) Color : Black Optional : Flame retardant polyvinyl chloride (FR-PVC) in accordance with IEC 60332-3

Application : For supervisory electrical equipment, station control circuits. Suitable for indoor and outdoor installation in wet or dry locations, in conduit, duct, trench and cable tray. With Copper tape shield, the cable is suitable for installation in the places where special electrical interference protection is required.

Rated voltage	:	600 Volts
Maximum conductor temperature	:	70 ^{O}C (Normal operation)
Voltage test	:	3.5 kVac or 8.4 kVdc / 5 minutes
Reference standard	:	IEC 60502-1

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Approx. Thickness of inner mm	Nominal Thickness of Sheath mm	Overall diameter (approx.) mm	Maxi-mum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
2	1.5	7	1.6	0.8	1.0	1.8	14	12.10	11.05	216	168	0.21	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	15	7.41	9.19	253	180	0.35	1,000/R
	4	7	2.6	1.0	1.0	1.8	17	4.61	9.23	330	204	0.56	1,000/R
	6	7	3.1	1.0	1.0	1.8	18	3.08	7.84	393	216	0.84	1,000/R
3	1.5	7	1.6	0.8	1.0	1.8	14	12.10	11.05	246	168	0.32	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	15	7.41	9.19	294	180	0.53	1,000/R
	4	7	2.6	1.0	1.0	1.8	17	4.61	9.23	393	204	0.84	1,000/R
	6	7	3.1	1.0	1.0	1.8	19	3.08	7.84	477	228	1.26	1,000/R
4	1.5	7	1.6	0.8	1.0	1.8	15	12.10	11.05	284	180	0.42	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	16	7.41	9.19	344	192	0.70	1,000/R
	4	7	2.6	1.0	1.0	1.8	19	4.61	9.23	467	228	1.12	1,000/R
	6	7	3.1	1.0	1.0	1.8	20	3.08	7.84	575	240	1.69	1,000/R
5	1.5	7	1.6	0.8	1.0	1.8	16	12.10	11.05	325	192	0.53	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	17	7.41	9.19	398	204	0.88	1,000/R
	4	7	2.6	1.0	1.0	1.8	20	4.61	9.23	547	240	1.40	1,000/R
	6	7	3.1	1.0	1.0	1.8	21	3.08	7.84	678	252	2.11	1,000/R
6	1.5	7	1.6	0.8	1.0	1.8	17	12.10	11.05	367	204	0.63	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	18	7.41	9.19	453	216	1.05	1,000/R
	4	7	2.6	1.0	1.0	1.8	21	4.61	9.23	628	252	1.69	1,000/R
	6	7	3.1	1.0	1.0	1.8	23	3.08	7.84	784	276	2.53	1,000/R
7	1.5	7	1.6	0.8	1.0	1.8	17	12.10	11.05	386	204	0.74	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	18	7.41	9.19	482	216	1.23	1,000/R
	4	7	2.6	1.0	1.0	1.8	21	4.61	9.23	675	252	1.97	1,000/R
	6	7	3.1	1.0	1.0	1.8	23	3.08	7.84	848	276	2.95	1,000/R

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Approx. Thickness of inner mm	Nominal Thickness of Sheath mm	Overall diameter (approx.) mm	Maxi-mum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
8	1.5	7	1.6	0.8	1.0	1.8	18	12.10	11.05	429	216	0.84	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	20	7.41	9.19	538	240	1.40	1,000/R
	4	7	2.6	1.0	1.0	1.8	23	4.61	9.23	759	276	2.25	1,000/R
	6	7	3.1	1.0	1.0	1.8	24	3.08	7.84	958	288	3.37	1,000/R
9	1.5	7	1.6	0.8	1.0	1.8	19	12.10	11.05	474	228	0.95	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	21	7.41	9.19	596	252	1.58	1,000/R
	4	7	2.6	1.0	1.0	1.8	24	4.61	9.23	845	288	2.53	1,000/R
	6	7	3.1	1.0	1.0	1.8	26	3.08	7.84	1070	312	3.79	1,000/R
10	1.5	7	1.6	0.8	1.0	1.8	20	12.10	11.05	525	240	1.05	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	22	7.41	9.19	663	264	1.76	1,000/R
	4	7	2.6	1.0	1.0	1.8	26	4.61	9.23	943	312	2.81	1,000/R
	6	7	3.1	1.0	1.0	1.8	28	3.08	7.84	1195	336	4.21	1,000/R
11	1.5	7	1.6	0.8	1.0	1.8	20	12.10	11.05	544	240	1.16	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	22	7.41	9.19	692	264	1.93	1,000/R
	4	7	2.6	1.0	1.0	1.8	26	4.61	9.23	989	312	3.09	1,000/R
	6	7	3.1	1.0	1.0	1.8	28	3.08	7.84	1260	336	4.63	1,000/R
12	1.5	7	1.6	0.8	1.0	1.8	21	12.10	11.05	577	252	1.26	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	23	7.41	9.19	736	276	2.11	1,000/R
	4	7	2.6	1.0	1.0	1.8	26	4.61	9.23	1056	312	3.37	1,000/R
	6	7	3.1	1.0	1.0	1.8	29	3.08	7.84	1350	348	5.06	1,000/R
13	1.5	7	1.6	0.8	1.0	1.8	22	12.10	11.05	619	264	1.37	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	23	7.41	9.19	791	276	2.28	1,000/R
	4	7	2.6	1.0	1.0	1.8	28	4.61	9.23	1139	336	3.65	1,000/R
	6	7	3.1	1.0	1.0	1.8	30	3.08	7.84	1458	360	5.48	1,000/R

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Approx. Thickness of inner mm	Nominal Thickness of Sheath mm	Overall diameter (approx.) mm	Maxi-mum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
14	1.5	7	1.6	0.8	1.0	1.8	22	12.10	11.05	638	264	1.47	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	23	7.41	9.19	820	276	2.46	1,000/R
	4	7	2.6	1.0	1.0	1.8	28	4.61	9.23	1185	336	3.93	1,000/R
	6	7	3.1	1.0	1.0	1.8	30	3.08	7.84	1522	360	5.90	1,000/R
15	1.5	7	1.6	0.8	1.0	1.8	23	12.10	11.05	683	276	1.58	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	25	7.41	9.19	879	300	2.63	1,000/R
	4	7	2.6	1.0	1.0	1.8	29	4.61	9.23	1273	348	4.21	1,000/R
	6	7	3.1	1.0	1.0	1.8	32	3.08	7.84	1636	384	6.32	1,000/R
16	1.5	7	1.6	0.8	1.0	1.8	23	12.10	11.05	702	276	1.69	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	25	7.41	9.19	908	300	2.81	1,000/R
	4	7	2.6	1.0	1.0	1.8	29	4.61	9.23	1318	348	4.49	1,000/R
	6	7	3.1	1.0	1.0	1.8	32	3.08	7.84	1700	384	6.74	1,000/R
17	1.5	7	1.6	0.8	1.0	1.8	23	12.10	11.05	719	276	1.79	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	26	7.41	9.19	929	312	2.98	1,000/R
	4	7	2.6	1.0	1.0	1.8	31	4.61	9.23	1348	372	4.78	1,000/R
	6	7	3.1	1.0	1.0	1.9	34	3.08	7.84	1757	408	7.16	1,000/R
18	1.5	7	1.6	0.8	1.0	1.8	23	12.10	11.05	742	276	1.90	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	26	7.41	9.19	963	312	3.16	1,000/R
	4	7	2.6	1.0	1.0	1.8	31	4.61	9.23	1401	372	5.06	1,000/R
	6	7	3.1	1.0	1.0	1.9	34	3.08	7.84	1831	408	7.58	1,000/R
19	1.5	7	1.6	0.8	1.0	1.8	23	12.10	11.05	765	276	2.00	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	26	7.41	9.19	996	312	3.34	1,000/R
	4	7	2.6	1.0	1.0	1.8	31	4.61	9.23	1455	372	5.34	1,000/R
	6	7	3.1	1.0	1.0	1.9	34	3.08	7.84	1905	408	8.01	1,000/R

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Approx. Thickness of inner mm	Nominal Thickness of Sheath mm	Overall diameter (approx.) mm	Maxi-mum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
20	1.5	7	1.6	0.8	1.0	1.8	24	12.10	11.05	805	288	2.11	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	27	7.41	9.19	1049	324	3.51	1,000/R
	4	7	2.6	1.0	1.0	1.9	32	4.61	9.23	1547	384	5.62	1,000/R
	6	7	3.1	1.0	1.2	2.0	36	3.08	7.84	2059	432	8.43	1,000/R
21	1.5	7	1.6	0.8	1.0	1.8	24	12.10	11.05	828	288	2.21	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	27	7.41	9.19	1082	324	3.69	1,000/R
	4	7	2.6	1.0	1.0	1.9	32	4.61	9.23	1601	384	5.90	1,000/R
	6	7	3.1	1.0	1.2	2.0	36	3.08	7.84	2133	432	8.85	1,000/R
22	1.5	7	1.6	0.8	1.0	1.8	25	12.10	11.05	868	300	2.32	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	28	7.41	9.19	1135	336	3.86	1,000/R
	4	7	2.6	1.0	1.0	1.9	34	4.61	9.23	1679	408	6.18	1,000/R
	6	7	3.1	1.0	1.2	2.0	37	3.08	7.84	2236	444	9.27	1,000/R
23	1.5	7	1.6	0.8	1.0	1.8	25	12.10	11.05	891	300	2.42	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	28	7.41	9.19	1168	336	4.04	1,000/R
	4	7	2.6	1.0	1.0	1.9	34	4.61	9.23	1732	408	6.46	1,000/R
	6	7	3.1	1.0	1.2	2.0	37	3.08	7.84	2310	444	9.69	1,000/R
24	1.5	7	1.6	0.8	1.0	1.8	27	12.10	11.05	935	324	2.53	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	30	7.41	9.19	1225	360	4.21	1,000/R
	4	7	2.6	1.0	1.2	2.0	36	4.61	9.23	1869	432	6.74	1,000/R
	6	7	3.1	1.0	1.2	2.1	39	3.08	7.84	2440	468	10.11	1,000/R
25	1.5	7	1.6	0.8	1.0	1.8	27	12.10	11.05	959	324	2.63	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	30	7.41	9.19	1259	360	4.39	1,000/R
	4	7	2.6	1.0	1.2	2.0	36	4.61	9.23	1923	432	7.02	1,000/R
	6	7	3.1	1.0	1.2	2.1	39	3.08	7.84	2514	468	10.53	1,000/R

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Approx. Thickness of inner mm	Nominal Thickness of Sheath mm	Overall diameter (approx.) mm	Maxi-mum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
26	1.5	7	1.6	0.8	1.0	1.8	27	12.10	11.05	982	324	2.74	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	30	7.41	9.19	1292	360	4.56	1,000/R
	4	7	2.6	1.0	1.2	2.0	36	4.61	9.23	1977	432	7.30	1,000/R
	6	7	3.1	1.0	1.2	2.1	39	3.08	7.84	2588	468	10.96	1,000/R
27	1.5	7	1.6	0.8	1.0	1.8	28	12.10	11.05	1013	336	2.84	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	30	7.41	9.19	1335	360	4.74	1,000/R
	4	7	2.6	1.0	1.2	2.0	37	4.61	9.23	2043	444	7.58	1,000/R
	6	7	3.1	1.0	1.2	2.1	40	3.08	7.84	2678	480	11.38	1,000/R
28	1.5	7	1.6	0.8	1.0	1.8	28	12.10	11.05	1051	336	2.95	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	31	7.41	9.19	1385	372	4.92	1,000/R
	4	7	2.6	1.0	1.2	2.0	38	4.61	9.23	2119	456	7.87	1,000/R
	6	7	3.1	1.0	1.2	2.1	42	3.08	7.84	2777	504	11.80	1,000/R
29	1.5	7	1.6	0.8	1.0	1.8	28	12.10	11.05	1074	336	3.05	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	31	7.41	9.19	1418	372	5.09	1,000/R
	4	7	2.6	1.0	1.2	2.0	38	4.61	9.23	2173	456	8.15	1,000/R
	6	7	3.1	1.0	1.2	2.1	42	3.08	7.84	2851	504	12.22	1,000/R
30	1.5	7	1.6	0.8	1.0	1.8	28	12.10	11.05	1097	336	3.16	1,000/R
	2.5	7	2.0	0.8	1.0	1.8	31	7.41	9.19	1452	372	5.27	1,000/R
	4	7	2.6	1.0	1.2	2.0	38	4.61	9.23	2226	456	8.43	1,000/R
	6	7	3.1	1.0	1.2	2.1	42	3.08	7.84	2925	504	12.64	1,000/R

PHELPS DODGE CABLE TYPE CVV-SWA

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH STEEL WIRE ARMOUR (TYPE CVV-SWA) IEC 60502-1

CONSTRUCTION

Conductor	:	Concentric stranded annealed copper Optional : Flexible or solid annealed copper
Insulation	:	Polyvinyl chloride (PVC) Color : Black with core number marking
Filler	:	Polypropylene filament or suitable material
Binding tape	:	Non-hygroscopic tape
Inner sheath	:	Polyvinyl chloride (PVC) Color : Black
Armour	:	Galvanized steel wires
Outer sheath	:	Polyvinyl chloride (PVC/ST2) Color : Black Optional : Flame retardant polyvinyl chloride (FR-PVC) in accordance with IEC 60332-3

Application	:	For supervisory electrical equipment, station control circuits. Suitable for indoor and outdoor installation in wet or dry locations, in conduit, duct, trench and cable tray. With metallic armour, the cable is suitable for installation in areas where special mechanical protection is required.

Rated voltage	:	600 Volts
Maximum conductor temperature	:	70 ^{O}C (Normal operation)
Voltage test	:	3.5 kVac or 8.4 kVdc / 5 minutes
Reference standard	:	IEC 60502-1

PHELPS DODGE CABLE TYPE CVV-SWA

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH STEEL WIRE ARMOUR (TYPE CVV-SWA) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Approx. Thickness of Inner sheath mm	Dia. of Steel wire (Nom.) mm	Nominal Thickness of Outer sheath mm	Overall diameter (approx.) mm	Maximum DC. resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
2	1.5	7	1.6	0.8	1.0	0.80	1.8	16	12.10	11.25	353	192	0.21	1,000/R
	2.5	7	2.0	0.8	1.0	0.80	1.8	17	7.41	9.33	402	204	0.35	1,000/R
	4	7	2.6	1.0	1.0	0.80	1.8	19	4.61	9.23	507	228	0.56	1,000/R
	6	7	3.1	1.0	1.0	1.25	1.8	21	3.08	7.89	720	252	0.84	1,000/R
3	1.5	7	1.6	0.8	1.0	0.80	1.8	17	12.10	11.25	390	204	0.32	1,000/R
	2.5	7	2.0	0.8	1.0	0.80	1.8	18	7.41	9.33	452	216	0.53	1,000/R
	4	7	2.6	1.0	1.0	1.25	1.8	21	4.61	9.23	709	252	0.84	1,000/R
	6	7	3.1	1.0	1.0	1.25	1.8	22	3.08	7.89	825	264	1.26	1,000/R
4	1.5	7	1.6	0.8	1.0	0.80	1.8	18	12.10	11.25	439	216	0.42	1,000/R
	2.5	7	2.0	0.8	1.0	0.80	1.8	19	7.41	9.33	518	228	0.70	1,000/R
	4	7	2.6	1.0	1.0	1.25	1.8	22	4.61	9.23	814	264	1.12	1,000/R
	6	7	3.1	1.0	1.0	1.25	1.8	23	3.08	7.89	954	276	1.69	1,000/R
5	1.5	7	1.6	0.8	1.0	0.80	1.8	18	12.10	11.25	491	216	0.53	1,000/R
	2.5	7	2.0	0.8	1.0	0.80	1.8	20	7.41	9.33	587	240	0.88	1,000/R
	4	7	2.6	1.0	1.0	1.25	1.8	23	4.61	9.23	922	276	1.40	1,000/R
	6	7	3.1	1.0	1.0	1.25	1.8	25	3.08	7.89	1,089	300	2.11	1,000/R
6	1.5	7	1.6	0.8	1.0	0.80	1.8	19	12.10	11.25	548	228	0.63	1,000/R
	2.5	7	2.0	0.8	1.0	1.25	1.8	22	7.41	9.33	788	264	1.05	1,000/R
	4	7	2.6	1.0	1.0	1.25	1.8	25	4.61	9.23	1,034	300	1.69	1,000/R
	6	7	3.1	1.0	1.0	1.60	1.8	27	3.08	7.89	1,377	324	2.53	1,000/R
7	1.5	7	1.6	0.8	1.0	0.80	1.8	19	12.10	11.25	567	228	0.74	1,000/R
	2.5	7	2.0	0.8	1.0	1.25	1.8	22	7.41	9.33	818	264	1.23	1,000/R
	4	7	2.6	1.0	1.0	1.25	1.8	25	4.61	9.23	1,082	300	1.97	1,000/R
	6	7	3.1	1.0	1.0	1.60	1.8	27	3.08	7.89	1,444	324	2.95	1,000/R

PHELPS DODGE CABLE TYPE CVV-SWA

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH STEEL WIRE ARMOUR (TYPE CVV-SWA) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Approx. Thickness of Inner sheath mm	Dia. of Steel wire (Nom.) mm	Nominal Thickness of Outer sheath mm	Overall diameter (approx.) mm	Maximum DC. resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
8	1.5	7	1.6	0.8	1.0	1.25	1.8	21	12.10	11.25	749	252	0.84	1,000/R
	2.5	7	2.0	0.8	1.0	1.25	1.8	23	7.41	9.33	904	276	1.40	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.8	27	4.61	9.23	1,330	324	2.25	1,000/R
	6	7	3.1	1.0	1.0	1.60	1.8	29	3.08	7.89	1,587	348	3.37	1,000/R
9	1.5	7	1.6	0.8	1.0	1.25	1.8	22	12.10	11.25	822	264	0.95	1,000/R
	2.5	7	2.0	0.8	1.0	1.25	1.8	24	7.41	9.33	981	288	1.58	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.8	29	4.61	9.23	1,465	348	2.53	1,000/R
	6	7	3.1	1.0	1.0	1.60	1.8	31	3.08	7.89	1,749	372	3.79	1,000/R
10	1.5	7	1.6	0.80	1.00	1.25	1.8	24	12.10	11.25	891	288	1.05	1,000/R
	2.5	7	2.0	0.80	1.00	1.25	1.8	25	7.41	9.33	1,086	300	1.76	500/R
	4	7	2.6	1.00	1.00	1.60	1.8	30	4.61	9.23	1,612	360	2.81	1,000/R
	6	7	3.1	1.00	1.00	1.60	1.8	33	3.08	7.89	1,941	396	4.21	1,000/R
11	1.5	7	1.6	0.8	1.0	1.25	1.8	24	12.10	11.25	911	288	1.16	1,000/R
	2.5	7	2.0	0.8	1.0	1.25	1.8	25	7.41	9.33	1,116	300	1.93	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.8	30	4.61	9.23	1,660	360	3.09	1,000/R
	6	7	3.1	1.0	1.0	1.60	1.8	33	3.08	7.89	2,009	396	4.63	1,000/R
12	1.5	7	1.6	0.8	1.0	1.25	1.8	24	12.10	11.25	963	288	1.26	1,000/R
	2.5	7	2.0	0.8	1.0	1.25	1.8	26	7.41	9.33	1,170	312	2.11	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.8	31	4.61	9.23	1,745	372	3.37	1,000/R
	6	7	3.1	1.0	1.0	1.60	1.8	34	3.08	7.89	2,118	408	5.06	1,000/R
13	1.5	7	1.6	0.8	1.0	1.25	1.8	25	12.10	11.25	1,024	300	1.37	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.8	28	7.41	9.33	1,392	336	2.28	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.8	32	4.61	9.23	1,861	384	3.65	1,000/R
	6	7	3.1	1.0	1.0	1.60	1.9	35	3.08	7.89	2,292	420	5.48	1,000/R

PHELPS DODGE CABLE TYPE CVV-SWA

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH STEEL WIRE ARMOUR (TYPE CVV-SWA) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Approx. Thickness of Inner sheath mm	Dia. of Steel wire (Nom.) mm	Nominal Thickness of Outer sheath mm	Overall diameter (approx.) mm	Maximum DC. resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
14	1.5	7	1.6	0.8	1.0	1.25	1.8	25	12.10	11.25	1,043	300	1.47	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.8	28	7.41	9.33	1,422	336	2.46	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.8	32	4.61	9.23	1,909	384	3.93	1,000/R
	6	7	3.1	1.0	1.0	1.60	1.9	35	3.08	7.89	2,360	420	5.90	1,000/R
15	1.5	7	1.6	0.8	1.0	1.25	1.8	26	12.10	11.25	1,106	312	1.58	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.8	29	7.41	9.33	1,514	348	2.63	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.8	34	4.61	9.23	2,045	408	4.21	1,000/R
	6	7	3.1	1.0	1.0	1.60	1.9	37	3.08	7.89	2,509	444	6.32	1,000/R
16	1.5	7	1.6	0.8	1.0	1.25	1.8	26	12.10	11.25	1,127	312	1.69	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.8	29	7.41	9.33	1,544	348	2.81	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.8	34	4.61	9.23	2,093	408	4.49	1,000/R
	6	7	3.1	1.0	1.0	1.60	1.9	37	3.08	7.89	2,577	444	6.74	1,000/R
17	1.5	7	1.6	0.80	1.00	1.60	1.8	28	12.10	11.25	1,339	336	1.79	1,000/R
	2.5	7	2.0	0.80	1.00	1.60	1.8	30	7.41	9.33	1,637	360	2.98	1,000/R
	4	7	2.6	1.00	1.00	1.60	1.9	35	4.61	9.23	2,230	420	4.78	1,000/R
	6	7	3.1	1.00	1.00	1.60	2.0	38	3.08	7.89	2,760	456	7.16	1,000/R
18	1.5	7	1.6	0.8	1.0	1.60	1.8	28	12.10	11.25	1,358	336	1.90	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.8	30	7.41	9.33	1,667	360	3.16	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.9	35	4.61	9.23	2,282	420	5.06	1,000/R
	6	7	3.1	1.0	1.0	1.60	2.0	38	3.08	7.89	2,822	456	7.58	1,000/R
19	1.5	7	1.6	0.8	1.0	1.60	1.8	28	12.10	11.25	1,378	336	2.00	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.8	30	7.41	9.33	1,697	360	3.34	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.9	35	4.61	9.23	2,330	420	5.34	1,000/R
	6	7	3.1	1.0	1.0	1.60	2.0	38	3.08	7.89	2,889	456	8.01	1,000/R

PHELPS DODGE CABLE TYPE CVV-SWA

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH STEEL WIRE ARMOUR (TYPE CVV-SWA) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Approx. Thickness of Inner sheath mm	Dia. of Steel wire (Nom.) mm	Nominal Thickness of Outer sheath mm	Overall diameter (approx.) mm	Maximum DC. resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
20	1.5	7	1.6	0.8	1.0	1.60	1.8	29	12.10	11.25	1,440	348	2.11	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.8	31	7.41	9.33	1,792	372	3.51	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.9	37	4.61	9.23	2,470	444	5.62	1,000/R
	6	7	3.1	1.0	1.2	2.00	2.1	41	3.08	7.89	3,380	492	8.43	1,000/R
21	1.5	7	1.6	0.8	1.0	1.60	1.8	29	12.10	11.25	1,461	348	2.21	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.8	31	7.41	9.33	1,822	372	3.69	1,000/R
	4	7	2.6	1.0	1.0	1.60	1.9	37	4.61	9.23	2,515	444	5.90	1,000/R
	6	7	3.1	1.0	1.2	2.00	2.1	41	3.08	7.89	3,450	492	8.85	1,000/R
22	1.5	7	1.6	0.8	1.0	1.60	1.8	30	12.10	11.25	1,541	360	2.32	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.8	33	7.41	9.33	1,918	396	3.86	1,000/R
	4	7	2.6	1.0	1.0	2.00	2.0	39	4.61	9.23	2,903	468	6.18	1,000/R
	6	7	3.1	1.0	1.2	2.00	2.1	43	3.08	7.89	3,630	516	9.27	500/R
23	1.5	7	1.6	0.8	1.0	1.60	1.8	30	12.10	11.25	1,561	360	2.42	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.8	33	7.41	9.33	1,948	396	4.04	1,000/R
	4	7	2.6	1.0	1.0	2.00	2.0	39	4.61	9.23	2,950	468	6.46	1,000/R
	6	7	3.1	1.0	1.2	2.00	2.1	43	3.08	7.89	3,700	516	9.69	500/R
24	1.5	7	1.6	0.80	1.00	1.60	1.8	31	12.10	11.25	1,649	372	2.53	1,000/R
	2.5	7	2.0	0.80	1.00	1.60	1.9	34	7.41	9.33	2,069	408	4.21	1,000/R
	4	7	2.6	1.00	1.20	2.00	2.1	42	4.61	9.23	3,190	504	6.74	1,000/R
	6	7	3.1	1.00	1.20	2.00	2.2	45	3.08	7.89	3,945	540	10.11	500/R
25	1.5	7	1.6	0.8	1.0	1.60	1.8	31	12.10	11.25	1,668	372	2.63	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.9	34	7.41	9.33	2,099	408	4.39	1,000/R
	4	7	2.6	1.0	1.2	2.00	2.1	42	4.61	9.23	3,240	504	7.02	1,000/R
	6	7	3.1	1.0	1.2	2.00	2.2	45	3.08	7.89	4,013	540	10.53	500/R

PHELPS DODGE CABLE TYPE CVV-SWA

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH STEEL WIRE ARMOUR (TYPE CVV-SWA) IEC 60502-1

Number of core	Nominal sectional area mm²	Number of wire	Diameter of Conductor (approx.) mm	Nominal Thickness of insulation mm	Approx. Thickness of Inner sheath mm	Dia. of Steel wire (Nom.) mm	Nominal Thickness of Outer sheath mm	Overall diameter (approx.) mm	Maximum DC. resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
26	1.5	7	1.6	0.8	1.0	1.60	1.8	31	12.10	11.25	1,689	372	2.74	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.9	34	7.41	9.33	2,129	408	4.56	1,000/R
	4	7	2.6	1.0	1.2	2.00	2.1	42	4.61	9.23	3,289	504	7.30	1,000/R
	6	7	3.1	1.0	1.2	2.00	2.2	45	3.08	7.89	4,075	540	10.96	500/R
27	1.5	7	1.6	0.8	1.0	1.60	1.8	32	12.10	11.25	1,739	384	2.84	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.9	35	7.41	9.33	2,193	420	4.74	1,000/R
	4	7	2.6	1.0	1.2	2.00	2.1	42	4.61	9.23	3,390	504	7.58	1,000/R
	6	7	3.1	1.0	1.2	2.00	2.2	46	3.08	7.89	4,202	552	11.38	500/R
28	1.5	7	1.6	0.8	1.0	1.60	1.8	33	12.10	11.25	1,817	396	2.95	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.9	36	7.41	9.33	2,287	432	4.92	1,000/R
	4	7	2.6	1.0	1.2	2.00	2.1	44	4.61	9.23	3,535	528	7.87	500/R
	6	7	3.1	1.0	1.2	2.00	2.2	47	3.08	7.89	4,382	564	11.80	500/R
29	1.5	7	1.6	0.8	1.0	1.60	1.8	33	12.10	11.25	1,837	396	3.05	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.9	36	7.41	9.33	2,317	432	5.09	1,000/R
	4	7	2.6	1.0	1.2	2.00	2.1	44	4.61	9.23	3,580	528	8.15	500/R
	6	7	3.1	1.0	1.2	2.00	2.2	47	3.08	7.89	4,450	564	12.22	500/R
30	1.5	7	1.6	0.8	1.0	1.60	1.8	33	12.10	11.25	1,857	396	3.16	1,000/R
	2.5	7	2.0	0.8	1.0	1.60	1.9	36	7.41	9.33	2,347	432	5.27	1,000/R
	4	7	2.6	1.0	1.2	2.00	2.1	44	4.61	9.23	3,631	528	8.43	500/R
	6	7	3.1	1.0	1.2	2.00	2.2	47	3.08	7.89	4,513	564	12.64	500/R

PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) JIS C3401

CONSTRUCTION

Conductor	:	Flexible annealed copper Optional : Concentric stranded or solid annealed copper
Insulation	:	Polyvinyl chloride (PVC) Color : Black with core number marking
Filler	:	Polypropylene filament or suitable material
Binding tape	:	Non-hygroscopic tape
Outer sheath	:	Polyvinyl chloride (PVC) Color : Black

Application	:	For supervisory electrical equipment, station control circuits. Suitable for indoor and outdoor installation in wet or dry locations, in conduit, duct, trench and cable tray.

Rated voltage	:	600 Volts
Maximum conductor temperature	:	70 ^{O}C (Normal operation)
Voltage test	:	4 kVac / 1 minutes
Reference standard	:	JIS C 3401

PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) JIS C3401

Number o f core	Nominal sectional area	Maximum diameter of wire	Diameter of Conductor (approx.)	Minimum Thickness of insulation	Minimum Thickness of sheath	Overall diameter (approx.)	Maximum DC. Resist-ance of Cdr. at 20°C	Minimum insulation resistance at 20°C	Cable weight (approx.)	Minimum bending radius	Maximum pulling tension	Standard packing
	mm²	mm	mm	mm	mm	mm	Ω / km	MΩ-km	kg / km	mm	kN	m
2	1	0.21	1.31	0.72	1.35	10	19.50	50	90	40	0.14	1,000/R
	1.5	0.26	1.59	0.72	1.35	10	13.30	50	104	40	0.21	1,000/R
	2.5	0.26	2.05	0.72	1.35	11	7.98	50	133	44	0.35	1,000/R
	4	0.31	2.50	0.72	1.35	12	4.95	50	170	48	0.56	1,000/R
	6	0.31	3.06	0.90	1.35	14	3.30	50	237	56	0.84	1,000/R
3	1	0.21	1.31	0.72	1.35	10	19.50	50	108	40	0.21	1,000/R
	1.5	0.26	1.59	0.72	1.35	11	13.30	50	127	44	0.32	1,000/R
	2.5	0.26	2.05	0.72	1.35	12	7.98	50	166	48	0.53	1,000/R
	4	0.31	2.50	0.72	1.35	13	4.95	50	217	52	0.84	1,000/R
	6	0.31	3.06	0.90	1.35	15	3.30	50	308	60	1.26	1,000/R
4	1	0.21	1.31	0.72	1.35	11	19.50	50	130	44	0.28	1,000/R
	1.5	0.26	1.59	0.72	1.35	12	13.30	50	154	48	0.42	1,000/R
	2.5	0.26	2.05	0.72	1.35	13	7.98	50	204	52	0.70	1,000/R
	4	0.31	2.50	0.72	1.35	14	4.95	50	270	56	1.12	1,000/R
	6	0.31	3.06	0.90	1.35	17	3.30	50	386	68	1.69	1,000/R
5	1	0.21	1.31	0.72	1.35	12	19.50	50	154	48	0.35	1,000/R
	1.5	0.26	1.59	0.72	1.35	13	13.30	50	183	52	0.53	1,000/R
	2.5	0.26	2.05	0.72	1.35	14	7.98	50	245	56	0.88	1,000/R
	4	0.31	2.50	0.72	1.35	15	4.95	50	326	60	1.40	1,000/R
	6	0.31	3.06	0.90	1.35	18	3.30	50	470	72	2.11	1,000/R
6	1	0.21	1.31	0.72	1.35	13	19.50	50	178	52	0.42	1,000/R
	1.5	0.26	1.59	0.72	1.35	14	13.30	50	213	56	0.63	1,000/R
	2.5	0.26	2.05	0.72	1.35	15	7.98	50	286	60	1.05	1,000/R
	4	0.31	2.50	0.72	1.35	17	4.95	50	383	68	1.69	1,000/R
	6	0.31	3.06	0.90	1.35	20	3.30	50	555	80	2.53	1,000/R

R = Packing in reel

PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) JIS C3401

Number of core	Nominal sectional area	Maximum diameter of wire	Diameter of Conductor (approx.)	Minimum Thickness of insulation	Minimum Thickness of sheath	Overall diameter (approx.)	Maximum DC. Resistance of Cdr. at 20°C	Minimum insulation resistance at 20°C	Cable weight (approx.)	Minimum bending radius	Maximum pulling tension	Standard packing
	mm²	mm	mm	mm	mm	mm	Ω / km	MΩ-km	kg / km	mm	kN	m
7	1	0.21	1.31	0.72	1.35	13	19.50	50	191	52	0.49	1,000/R
	1.5	0.26	1.59	0.72	1.35	14	13.30	50	230	56	0.74	1,000/R
	2.5	0.26	2.05	0.72	1.35	15	7.98	50	312	60	1.23	1,000/R
	4	0.31	2.50	0.72	1.35	17	4.95	50	442	68	1.97	1,000/R
	6	0.31	3.06	0.90	1.35	20	3.30	50	614	80	2.95	1,000/R
8	1	0.21	1.31	0.72	1.35	14	19.50	50	216	56	0.56	1,000/R
	1.5	0.26	1.59	0.72	1.35	14	13.30	50	261	56	0.84	1,000/R
	2.5	0.26	2.05	0.72	1.35	16	7.98	50	355	64	1.40	1,000/R
	4	0.31	2.50	0.72	1.35	18	4.95	50	480	72	2.25	1,000/R
	6	0.31	3.06	0.90	1.35	21	3.30	50	702	84	3.37	1,000/R
9	1	0.21	1.31	0.72	1.35	14	19.50	50	242	56	0.63	1,000/R
	1.5	0.26	1.59	0.72	1.35	15	13.30	50	292	60	0.95	1,000/R
	2.5	0.26	2.05	0.72	1.35	18	7.98	50	399	72	1.58	1,000/R
	4	0.31	2.50	0.72	1.35	19	4.95	50	541	76	2.53	1,000/R
	6	0.31	3.06	0.90	1.35	23	3.30	50	792	92	3.79	1,000/R
10	1	0.21	1.31	0.72	1.35	15	19.50	50	272	60	0.70	1,000/R
	1.5	0.26	1.59	0.72	1.35	17	13.30	50	328	68	1.05	1,000/R
	2.5	0.26	2.05	0.72	1.35	19	7.98	50	448	76	1.76	1,000/R
	4	0.31	2.50	0.72	1.35	21	4.95	50	609	84	2.81	1,000/R
	6	0.31	3.06	0.90	1.44	25	3.30	50	901	100	4.21	1,000/R
11	1	0.21	1.31	0.72	1.35	15	19.50	50	285	60	0.77	1,000/R
	1.5	0.26	1.59	0.72	1.35	17	13.30	50	346	68	1.16	1,000/R
	2.5	0.26	2.05	0.72	1.35	19	7.98	50	474	76	1.93	1,000/R
	4	0.31	2.50	0.72	1.35	21	4.95	50	647	84	3.09	1,000/R
	6	0.31	3.06	0.90	1.44	25	3.30	50	961	100	4.63	1,000/R

R = Packing in reel

PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) JIS C3401

Number o f core	Nominal sectional area	Maximum diameter of wire	Diameter of Conductor (approx.)	Minimum Thickness of insulation	Minimum Thickness of sheath	Overall diameter (approx.)	Maximum DC. Resist-ance of Cdr. at 20°C	Minimum insulation resistance at 20°C	Cable weight (approx.)	Minimum bending radius	Maximum pulling tension	Standard packing
	mm²	mm	mm	mm	mm	mm	Ω / km	MΩ-km	kg / km	mm	kN	m
12	1	0.21	1.31	0.72	1.35	16	19.50	50	304	64	0.84	1,000/R
	1.5	0.26	1.59	0.72	1.35	18	13.30	50	372	72	1.26	1,000/R
	2.5	0.26	2.05	0.72	1.35	20	7.98	50	511	80	2.11	1,000/R
	4	0.31	2.50	0.72	1.35	21	4.95	50	698	84	3.37	1,000/R
	6	0.31	3.06	0.90	1.53	26	3.30	50	1,048	130	5.06	1,000/R
13	1	0.21	1.31	0.72	1.35	17	19.50	50	330	68	0.91	1,000/R
	1.5	0.26	1.59	0.72	1.35	18	13.30	50	402	72	1.37	1,000/R
	2.5	0.26	2.05	0.72	1.35	20	7.98	50	553	80	2.28	1,000/R
	4	0.31	2.50	0.72	1.35	22	4.95	50	757	88	3.65	1,000/R
	6	0.31	3.06	0.90	1.53	27	3.30	50	1,138	135	5.48	1,000/R
14	1	0.21	1.31	0.72	1.35	17	19.50	50	343	68	0.98	1,000/R
	1.5	0.26	1.59	0.72	1.35	18	13.30	50	419	72	1.47	1,000/R
	2.5	0.26	2.05	0.72	1.35	20	7.98	50	580	80	2.46	1,000/R
	4	0.31	2.50	0.72	1.35	22	4.95	50	796	88	3.93	1,000/R
	6	0.31	3.06	0.90	1.53	27	3.30	50	1,198	135	5.90	1,000/R
15	1	0.21	1.31	0.72	1.35	18	19.50	50	370	72	1.05	1,000/R
	1.5	0.26	1.59	0.72	1.35	19	13.30	50	452	76	1.58	1,000/R
	2.5	0.26	2.05	0.72	1.35	21	7.98	50	625	84	2.63	1,000/R
	4	0.31	2.50	0.72	1.35	24	4.95	50	858	96	4.21	1,000/R
	6	0.31	3.06	0.90	1.53	29	3.30	50	1,292	145	6.32	1,000/R
16	1	0.21	1.31	0.72	1.35	18	19.50	50	383	72	1.12	1,000/R
	1.5	0.26	1.59	0.72	1.35	19	13.30	50	470	76	1.69	1,000/R
	2.5	0.26	2.05	0.72	1.35	21	7.98	50	650	84	2.81	1,000/R
	4	0.31	2.50	0.72	1.44	24	4.95	50	907	96	4.49	1,000/R
	6	0.31	3.06	0.90	1.62	29	3.30	50	1,364	145	6.74	1,000/R

R = Packing in reel

PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) JIS C3401

Number of core	Nominal sectional area	Maximum diameter of wire	Diameter of Conductor (approx.)	Minimum Thickness of insulation	Minimum Thickness of sheath	Overall diameter (approx.)	Maximum DC. Resistance of Cdr. at 20°C	Minimum insulation resistance at 20°C	Cable weight (approx.)	Minimum bending radius	Maximum pulling tension	Standard packing
	mm²	mm	mm	mm	mm	mm	Ω / km	MΩ-km	kg / km	mm	kN	m
17	1	0.21	1.31	0.72	1.35	19	19.50	50	387	76	1.19	1,000/R
	1.5	0.26	1.59	0.72	1.35	20	13.30	50	475	80	1.79	1,000/R
	2.5	0.26	2.05	0.72	1.35	23	7.98	50	661	92	2.98	1,000/R
	4	0.31	2.50	0.72	1.44	25	4.95	50	925	100	4.78	1,000/R
	6	0.31	3.06	0.90	1.62	31	3.30	50	1,390	155	7.16	1,000/R
18	1	0.21	1.31	0.72	1.35	19	19.50	50	404	76	1.26	1,000/R
	1.5	0.26	1.59	0.72	1.35	20	13.30	50	496	80	1.90	1,000/R
	2.5	0.26	2.05	0.72	1.35	23	7.98	50	692	92	3.16	1,000/R
	4	0.31	2.50	0.72	1.44	25	4.95	50	970	100	5.06	1,000/R
	6	0.31	3.06	0.90	1.62	31	3.30	50	1,458	155	7.58	1,000/R
19	1	0.21	1.31	0.72	1.35	19	19.50	50	420	76	1.33	1,000/R
	1.5	0.26	1.59	0.72	1.35	20	13.30	50	517	80	2.00	1,000/R
	2.5	0.26	2.05	0.72	1.35	23	7.98	50	723	92	3.34	1,000/R
	4	0.31	2.50	0.72	1.44	25	4.95	50	1,014	100	5.34	1,000/R
	6	0.31	3.06	0.90	1.62	31	3.30	50	1,527	155	8.01	1,000/R
20	1	0.21	1.31	0.72	1.35	20	19.50	50	442	80	1.40	1,000/R
	1.5	0.26	1.59	0.72	1.35	21	13.30	50	544	84	2.11	1,000/R
	2.5	0.26	2.05	0.72	1.35	24	7.98	50	761	96	3.51	1,000/R
	4	0.31	2.50	0.72	1.44	26	4.95	50	1,068	130	5.62	1,000/R
	6	0.31	3.06	0.90	1.62	32	3.30	50	1,608	160	8.43	1,000/R
21	1	0.21	1.31	0.72	1.35	20	19.50	50	458	80	1.47	1,000/R
	1.5	0.26	1.59	0.72	1.35	21	13.30	50	565	84	2.21	1,000/R
	2.5	0.26	2.05	0.72	1.35	24	7.98	50	792	96	3.69	1,000/R
	4	0.31	2.50	0.72	1.44	26	4.95	50	1,113	130	5.90	1,000/R
	6	0.31	3.06	0.90	1.62	32	3.30	50	1,677	160	8.85	1,000/R

R = Packing in reel

PHELPS DODGE CABLE TYPE CVV

600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) JIS C3401

Number o f core	Nominal sectional area	Maximum diameter of wire	Diameter of Conductor (approx.)	Minimum Thickness of insulation	Minimum Thickness of sheath	Overall diameter (approx.)	Maximum DC. Resist-ance of Cdr. at 20°C	Minimum insulation resistance at 20°C	Cable weight (approx.)	Minimum bending radius	Maximum pulling tension	Standard packing
	mm²	mm	mm	mm	mm	mm	Ω / km	MΩ-km	kg / km	mm	kN	m
22	1	0.21	1.31	0.72	1.35	21	19.50	50	481	84	1.54	1,000/R
	1.5	0.26	1.59	0.72	1.35	22	13.30	50	593	88	2.32	1,000/R
	2.5	0.26	2.05	0.72	1.35	25	7.98	50	831	100	3.86	1,000/R
	4	0.31	2.50	0.72	1.44	28	4.95	50	1,167	140	6.18	1,000/R
	6	0.31	3.06	0.90	1.62	34	3.30	50	1,758	170	9.27	1,000/R
23	1	0.21	1.31	0.72	1.35	21	19.50	50	497	84	1.62	1,000/R
	1.5	0.26	1.59	0.72	1.35	22	13.30	50	614	88	2.42	1,000/R
	2.5	0.26	2.05	0.72	1.35	25	7.98	50	862	100	4.04	1,000/R
	4	0.31	2.50	0.72	1.44	28	4.95	50	1,212	140	6.46	1,000/R
	6	0.31	3.06	0.90	1.62	34	3.30	50	1,827	170	9.69	1,000/R
24	1	0.21	1.31	0.72	1.35	22	19.50	50	521	88	1.69	1,000/R
	1.5	0.26	1.59	0.72	1.35	23	13.30	50	643	92	2.53	1,000/R
	2.5	0.26	2.05	0.72	1.44	26	7.98	50	913	130	4.21	1,000/R
	4	0.31	2.50	0.72	1.62	30	4.95	50	1,293	150	6.74	1,000/R
	6	0.31	3.06	0.90	1.62	35	3.30	50	1,911	175	10.11	1,000/R
25	1	0.21	1.31	0.72	1.35	22	19.50	50	537	88	1.76	1,000/R
	1.5	0.26	1.59	0.72	1.35	23	13.30	50	644	92	2.63	1,000/R
	2.5	0.26	2.05	0.72	1.44	26	7.98	50	944	130	4.39	1,000/R
	4	0.31	2.50	0.72	1.62	30	4.95	50	1,338	150	7.02	1,000/R
	6	0.31	3.06	0.90	1.62	35	3.30	50	1,980	175	10.53	1,000/R
26	1	0.21	1.31	0.72	1.35	22	19.50	50	554	88	1.83	1,000/R
	1.5	0.26	1.59	0.72	1.35	23	13.30	50	685	92	2.74	1,000/R
	2.5	0.26	2.05	0.72	1.44	26	7.98	50	975	130	4.56	1,000/R
	4	0.31	2.50	0.72	1.62	30	4.95	50	1,383	150	7.30	1,000/R
	6	0.31	3.06	0.90	1.62	35	3.30	50	2,049	175	10.96	1,000/R

R = Packing in reel

PHELPS DODGE CABLE TYPE CVV

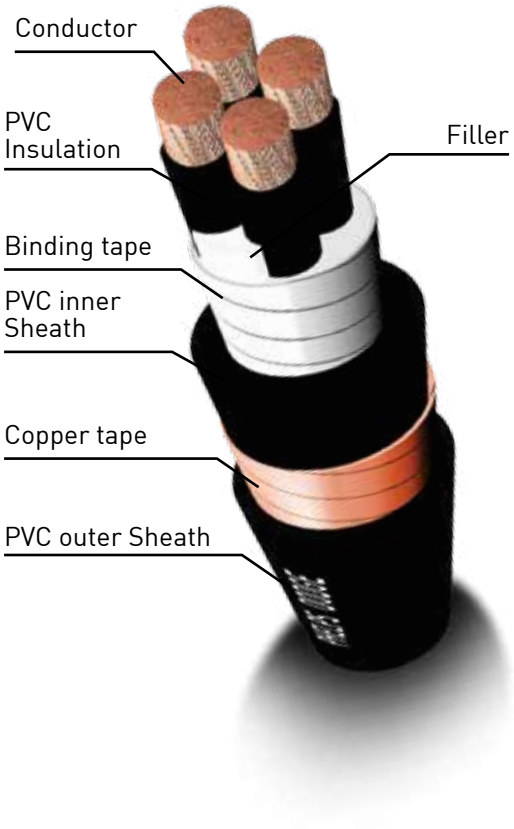
600V PVC INSULATED AND SHEATHED CONTROL CABLES (TYPE CVV) JIS C3401

Number o f core	Nominal sectional area mm²	Maximum diameter of wire mm	Diameter of Conductor (approx.) mm	Minimum Thickness of insulation mm	Minimum Thickness of sheath mm	Overall diameter (approx.) mm	Maximum DC. Resist-ance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
27	1	0.21	1.31	0.72	1.35	22	19.50	50	573	88	1.90	1,000/R
	1.5	0.26	1.59	0.72	1.35	24	13.30	50	709	96	2.84	1,000/R
	2.5	0.26	2.05	0.72	1.53	28	7.98	50	1,021	140	4.74	1,000/R
	4	0.31	2.50	0.72	1.62	30	4.95	50	1,433	150	7.58	1,000/R
	6	0.31	3.06	0.90	1.62	36	3.30	50	2,124	180	11.38	1,000/R
28	1	0.21	1.31	0.72	1.35	23	19.50	50	594	92	1.97	1,000/R
	1.5	0.26	1.59	0.72	1.35	25	13.30	50	735	100	2.95	1,000/R
	2.5	0.26	2.05	0.72	1.53	28	7.98	50	1,059	140	4.92	1,000/R
	4	0.31	2.50	0.72	1.62	32	4.95	50	1,486	160	7.87	1,000/R
	6	0.31	3.06	0.90	1.62	38	3.30	50	2,203	190	11.80	1,000/R
29	1	0.21	1.31	0.72	1.35	23	19.50	50	611	92	2.04	1,000/R
	1.5	0.26	1.59	0.72	1.35	25	13.30	50	756	100	3.05	1,000/R
	2.5	0.26	2.05	0.72	1.53	28	7.98	50	7,090	140	5.09	1,000/R
	4	0.31	2.50	0.72	1.62	32	4.95	50	1,531	160	8.15	1,000/R
	6	0.31	3.06	0.90	1.62	38	3.30	50	2,272	190	12.22	1,000/R
30	1	0.21	1.31	0.72	1.44	23	19.50	50	636	92	2.11	1,000/R
	1.5	0.26	1.59	0.72	1.44	25	13.30	50	787	100	3.16	1,000/R
	2.5	0.26	2.05	0.72	1.53	28	7.98	50	1,121	140	5.27	1,000/R
	4	0.31	2.50	0.72	1.62	32	4.95	50	1,576	160	8.43	1,000/R
	6	0.31	3.06	0.90	1.62	38	3.30	50	2,340	190	12.64	1,000/R

R = Packing in reel

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) JIS C3401



CONSTRUCTION

Conductor	:	Flexible annealed copper Optional : Concentric stranded or solid annealed copper
Insulation	:	Polyvinyl chloride (PVC) Color : Black with core number marking
Filler	:	Polypropylene filament or suitable material
Binding tape	:	Non-hygroscopic tape
Inner sheath	:	Polyvinyl chloride (PVC) Color : Black
Shield	:	Annealed copper tape
Outer sheath	:	Polyvinyl chloride (PVC)

Application : For supervisory electrical equipment, station control circuits. Suitable for indoor and outdoor installation in wet or dry locations, in conduit, duct, trench and cable tray. With Copper tape shield, the cable is suitable for installation in the places where special electrical interference protection is required.

Rated voltage	:	600 Volts
Maximum conductor temperature	:	70 ^{O}C (Normal operation)
Voltage test	:	4 kVac / 1 minutes
Reference standard	:	JIS C 3401

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) JIS C3401

Number of core	Nominal sectional area mm²	Maximum diameter of wire mm	Diameter of Conductor (approx.) mm	Minimum Thickness of insulation mm	Minimum Thickness of inner sheath mm	Minimum Thickness of outor sheath mm	Overall diameter (approx.) mm	Maximum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
2	1	0.21	1.31	0.72	1.0	1.35	12	19.50	50	153	144	0.14	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	13	13.30	50	170	156	0.21	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	14	7.98	50	203	168	0.35	1,000/R
	4	0.31	2.50	0.72	1.0	1.35	15	4.95	50	243	180	0.56	1,000/R
	6	0.31	3.06	0.90	1.0	1.35	17	3.30	50	317	204	0.84	1,000/R
3	1	0.21	1.31	0.72	1.0	1.35	13	19.50	50	175	156	0.21	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	13	13.30	50	197	156	0.32	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	14	7.98	50	241	168	0.53	1,000/R
	4	0.31	2.50	0.72	1.0	1.35	15	4.95	50	296	180	0.84	1,000/R
	6	0.31	3.06	0.90	1.0	1.35	17	3.30	50	396	204	1.26	1,000/R
4	1	0.21	1.31	0.72	1.0	1.35	13	19.50	50	202	156	0.28	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	14	13.30	50	229	168	0.42	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	15	7.98	50	285	180	0.70	1,000/R
	4	0.31	2.50	0.72	1.0	1.35	16	4.95	50	355	192	1.12	1,000/R
	6	0.31	3.06	0.90	1.0	1.35	19	3.30	50	482	228	1.69	1,000/R
5	1	0.21	1.31	0.72	1.0	1.35	14	19.50	50	229	168	0.35	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	15	13.30	50	263	180	0.53	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	16	7.98	50	330	192	0.88	1,000/R
	4	0.31	2.50	0.72	1.0	1.35	17	4.95	50	416	204	1.40	1,000/R
	6	0.31	3.06	0.90	1.0	1.35	20	3.30	50	570	240	2.11	1,000/R
6	1	0.21	1.31	0.72	1.0	1.35	15	19.50	50	257	180	0.42	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	16	13.30	50	297	192	0.63	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	17	7.98	50	376	204	1.05	1,000/R
	4	0.31	2.50	0.72	1.0	1.35	19	4.95	50	478	228	1.69	1,000/R
	6	0.31	3.06	0.90	1.0	1.35	21	3.30	50	659	252	2.53	1,000/R

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) JIS C3401

Number of core	Nominal sectional area mm²	Maximum diameter of wire mm	Diameter of Conductor (approx.) mm	Minimum Thickness of insulation mm	Minimum Thickness of inner sheath mm	Minimum Thickness of outer sheath mm	Overall diameter (approx.) mm	Maximum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
7	1	0.21	1.31	0.72	1.0	1.35	15	19.50	50	273	180	0.49	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	16	13.30	50	317	192	0.74	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	17	7.98	50	406	204	1.23	1,000/R
	4	0.31	2.50	0.72	1.0	1.35	19	4.95	50	522	228	1.97	1,000/R
	6	0.31	3.06	0.90	1.0	1.35	21	3.30	50	727	252	2.95	1,000/R
8	1	0.21	1.31	0.72	1.0	1.35	16	19.50	50	302	192	0.56	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	17	13.30	50	351	204	0.84	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	18	7.98	50	492	216	1.40	1,000/R
	4	0.31	2.50	0.72	1.0	1.35	20	4.95	50	584	240	2.25	1,000/R
	6	0.31	3.06	0.90	1.0	1.35	23	3.30	50	817	276	3.37	1,000/R
9	1	0.21	1.31	0.72	1.0	1.35	17	19.50	50	330	204	0.63	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	18	13.30	50	386	216	0.95	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	19	7.98	50	498	228	1.58	1,000/R
	4	0.31	2.50	0.72	1.0	1.35	21	4.95	50	646	252	2.53	1,000/R
	6	0.31	3.06	0.90	1.0	1.35	24	3.30	50	907	288	3.79	1,000/R
10	1	0.21	1.31	0.72	1.0	1.35	18	19.50	50	362	216	0.70	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	19	13.30	50	423	228	1.05	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	21	7.98	50	548	252	1.76	1,000/R
	4	0.31	2.50	0.72	1.0	1.35	23	4.95	50	712	276	2.81	1,000/R
	6	0.31	3.06	0.90	1.0	1.44	26	3.30	50	1,013	312	4.21	1,000/R
11	1	0.21	1.31	0.72	1.0	1.35	18	19.50	50	378	216	0.77	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	19	13.30	50	444	228	1.16	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	21	7.98	50	579	252	1.93	1,000/R
	4	0.31	2.50	0.72	1.0	1.35	23	4.95	50	757	276	3.09	1,000/R
	6	0.31	3.06	0.90	1.0	1.44	26	3.30	50	1,081	312	4.63	1,000/R

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) JIS C3401

Number of core	Nominal sectional area	Maximum diameter of wire	Diameter of Conductor (approx.)	Minimum Thickness of insulation	Minimum Thickness of inner sheath	Minimum Thickness of outer sheath	Overall diameter (approx.)	Maximum DC. Resistance of Cdr. at 20°C	Minimum insulation resistance at 20°C	Cable weight (approx.)	Minimum bending radius	Maximum pulling tension	Standard packing
	mm^2	mm	mm	mm	mm	mm	mm	Ω / km	MΩ-km	kg / km	mm	kN	m
12	1	0.21	1.31	0.72	1.0	1.35	18	19.50	50	400	216	0.84	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	19	13.30	50	472	228	1.26	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	21	7.98	50	618	252	2.11	1,000/R
	4	0.31	2.50	0.72	1.0	1.35	23	4.95	50	810	276	3.37	1,000/R
	6	0.31	3.06	0.90	1.0	1.53	28	3.30	50	1,172	336	5.06	1,000/R
13	1	0.21	1.31	0.72	1.0	1.35	19	19.50	50	427	228	0.91	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	20	13.30	50	504	240	1.37	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	22	7.98	50	661	264	2.28	1,000/R
	4	0.31	2.50	0.72	1.0	1.44	24	4.95	50	869	288	3.65	1,000/R
	6	0.31	3.06	0.90	1.0	1.53	29	3.30	50	1,260	348	5.48	1,000/R
14	1	0.21	1.31	0.72	1.0	1.35	19	19.50	50	443	228	0.98	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	20	13.30	50	524	240	1.47	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	22	7.98	50	692	264	2.46	1,000/R
	4	0.31	2.50	0.72	1.0	1.44	24	4.95	50	914	288	3.93	1,000/R
	6	0.31	3.06	0.90	1.0	1.53	29	3.30	50	1,328	348	5.90	1,000/R
15	1	0.21	1.31	0.72	1.0	1.35	20	19.50	50	471	240	1.05	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	21	13.30	50	558	252	1.58	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	23	7.98	50	737	276	2.63	1,000/R
	4	0.31	2.50	0.72	1.0	1.44	25	4.95	50	975	300	4.21	1,000/R
	6	0.31	3.06	0.90	1.0	1.53	30	3.30	50	1,417	360	6.32	1,000/R
16	1	0.21	1.31	0.72	1.0	1.35	20	19.50	50	487	240	1.12	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	21	13.30	50	578	252	1.69	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	23	7.98	50	768	276	2.81	1,000/R
	4	0.31	2.50	0.72	1.0	1.44	25	4.95	50	1,030	300	4.49	1,000/R
	6	0.31	3.06	0.90	1.0	1.62	31	3.30	50	1,498	372	6.74	1,000/R

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) JIS C3401

Number of core	Nominal sectional area mm²	Maximum diameter of wire mm	Diameter of Conductor (approx.) mm	Minimum Thickness of insulation mm	Minimum Thickness of inner sheath mm	Minimum Thickness of outer sheath mm	Overall diameter (approx.) mm	Maximum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
17	1	0.21	1.31	0.72	1.0	1.35	21	19.50	50	515	252	1.19	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	22	13.30	50	612	264	1.79	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	24	7.98	50	813	288	2.98	1,000/R
	4	0.31	2.50	0.72	1.0	1.44	27	4.95	50	1,092	324	4.78	1,000/R
	6	0.31	3.06	0.90	1.0	1.62	32	3.30	50	1,589	384	7.16	1,000/R
18	1	0.21	1.31	0.72	1.0	1.35	21	19.50	50	531	252	1.26	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	22	13.30	50	633	264	1.90	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	24	7.98	50	844	288	3.16	1,000/R
	4	0.31	2.50	0.72	1.0	1.44	27	4.95	50	1,136	324	5.06	1,000/R
	6	0.31	3.06	0.90	1.0	1.62	32	3.30	50	1,657	384	7.58	1,000/R
19	1	0.21	1.31	0.72	1.0	1.35	21	19.50	50	547	252	1.33	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	22	13.30	50	654	264	2.00	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	24	7.98	50	874	288	3.34	1,000/R
	4	0.31	2.50	0.72	1.0	1.44	27	4.95	50	1,181	324	5.34	1,000/R
	6	0.31	3.06	0.90	1.0	1.62	32	3.30	50	1,725	384	8.01	1,000/R
20	1	0.21	1.31	0.72	1.0	1.35	21	19.50	50	576	252	1.40	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	23	13.30	50	688	276	2.11	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	25	7.98	50	920	300	3.51	1,000/R
	4	0.31	2.50	0.72	1.0	1.44	28	4.95	50	1,243	336	5.62	1,000/R
	6	0.31	3.06	0.90	1.2	1.62	34	3.30	50	1,850	408	8.43	1,000/R
21	1	0.21	1.31	0.72	1.0	1.35	21	19.50	50	592	252	1.47	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	23	13.30	50	709	276	2.21	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	25	7.98	50	951	300	3.69	1,000/R
	4	0.31	2.50	0.72	1.0	1.44	28	4.95	50	1,288	336	5.90	1,000/R
	6	0.31	3.06	0.90	1.2	1.62	34	3.30	50	1,918	408	8.85	1,000/R

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) JIS C3401

Number of core	Nominal sectional area mm²	Maximum diameter of wire mm	Diameter of Conductor (approx.) mm	Minimum Thickness of insulation mm	Minimum Thickness of inner sheath mm	Minimum Thickness of outer sheath mm	Overall diameter (approx.) mm	Maximum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
22	1	0.21	1.31	0.72	1.0	1.35	22	19.50	50	620	264	1.54	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	24	13.30	50	743	288	2.32	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	26	7.98	50	997	312	3.86	1,000/R
	4	0.31	2.50	0.72	1.0	1.44	30	4.95	50	1,350	360	6.18	1,000/R
	6	0.31	3.06	0.90	1.2	1.62	35	3.30	50	2,011	420	9.27	1,000/R
23	1	0.21	1.31	0.72	1.0	1.35	22	19.50	50	637	264	1.62	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	24	13.30	50	764	288	2.42	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.35	26	7.98	50	1,028	312	4.04	1,000/R
	4	0.31	2.50	0.72	1.0	1.44	30	4.95	50	1,394	360	6.46	1,000/R
	6	0.31	3.06	0.90	1.2	1.62	35	3.30	50	2,079	420	9.69	1,000/R
24	1	0.21	1.31	0.72	1.0	1.35	23	19.50	50	668	276	1.69	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	25	13.30	50	801	300	2.53	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.44	28	7.98	50	1,090	336	4.21	1,000/R
	4	0.31	2.50	0.72	1.0	1.62	31	4.95	50	1,488	372	6.74	1,000/R
	6	0.31	3.06	0.90	1.2	1.62	37	3.30	50	2,179	444	10.11	1,000/R
25	1	0.21	1.31	0.72	1.0	1.35	23	19.50	50	684	276	1.76	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	25	13.30	50	822	300	2.63	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.44	28	7.98	50	1,121	336	4.39	1,000/R
	4	0.31	2.50	0.72	1.0	1.62	31	4.95	50	1,533	372	7.02	1,000/R
	6	0.31	3.06	0.90	1.2	1.62	37	3.30	50	2,247	444	10.53	1,000/R
26	1	0.21	1.31	0.72	1.0	1.35	23	19.50	50	700	276	1.83	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	25	13.30	50	843	300	2.74	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.44	28	7.98	50	1,151	336	4.56	1,000/R
	4	0.31	2.50	0.72	1.0	1.62	31	4.95	50	1,577	372	7.30	1,000/R
	6	0.31	3.06	0.90	1.2	1.62	37	3.30	50	2,315	444	10.96	1,000/R

PHELPS DODGE CABLE TYPE CVV-S

600V PVC INSULATED AND SHEATHED CONTROL CABLES WITH COPPER TAPE SHIELD (TYPE CVV-S) JIS C3401

Number of core	Nominal sectional area mm²	Maximum diameter of wire mm	Diameter of Conductor (approx.) mm	Minimum Thickness of insulation mm	Minimum Thickness of inner sheath mm	Minimum Thickness of outer sheath mm	Overall diameter (approx.) mm	Maximum DC. Resistance of Cdr. at 20°C Ω / km	Minimum insulation resistance at 20°C MΩ-km	Cable weight (approx.) kg / km	Minimum bending radius mm	Maximum pulling tension kN	Standard packing m
27	1	0.21	1.31	0.72	1.0	1.35	24	19.50	50	723	288	1.90	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	25	13.30	50	870	300	2.84	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.53	29	7.98	50	1,202	348	4.74	1,000/R
	4	0.31	2.50	0.72	1.2	1.62	32	4.95	50	1,631	384	7.58	1,000/R
	6	0.31	3.06	0.90	1.2	1.62	38	3.30	50	2,395	456	11.38	1,000/R
28	1	0.21	1.31	0.72	1.0	1.35	24	19.50	50	749	288	1.97	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	26	13.30	50	902	312	2.95	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.53	30	7.98	50	1,247	360	4.92	1,000/R
	4	0.31	2.50	0.72	1.2	1.62	33	4.95	50	1,724	396	7.87	1,000/R
	6	0.31	3.06	0.90	1.2	1.62	39	3.30	50	2,485	468	11.80	1,000/R
29	1	0.21	1.31	0.72	1.0	1.35	24	19.50	50	766	288	2.04	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.35	26	13.30	50	923	312	3.05	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.53	30	7.98	50	1,277	360	5.09	1,000/R
	4	0.31	2.50	0.72	1.2	1.62	33	4.95	50	1,768	396	8.15	1,000/R
	6	0.31	3.06	0.90	1.2	1.62	39	3.30	50	2,553	468	12.22	1,000/R
30	1	0.21	1.31	0.72	1.0	1.44	25	19.50	50	792	300	2.11	1,000/R
	1.5	0.26	1.59	0.72	1.0	1.44	26	13.30	50	955	312	3.16	1,000/R
	2.5	0.26	2.05	0.72	1.0	1.53	30	7.98	50	1,308	360	5.27	1,000/R
	4	0.31	2.50	0.72	1.2	1.62	33	4.95	50	1,813	396	8.43	1,000/R
	6	0.31	3.06	0.90	1.2	1.62	39	3.30	50	2,621	468	12.64	1,000/R

APPENDIX

This appendix provides guidance for equipment manufacturers, installers and end-users on the properties of low-voltage electric cables, and the limitations that are deemed to be necessary in order to safeguard life, buildings and goods.

The information is given in the form of limiting values and is illustrated by examples which are not exhaustive but which indicate ways in which safety can be obtained. Additional information on installation practice is given in the IEC 60227 series

1. Normative reference

IEC 62440, Electric cables with a rated voltage not exceeding 450/750 V –Guide to use

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2. Selection and installation

2.1 All conductors and cables shall be selected so as to be suitable for the voltages and currents likely to occur, and under all conditions which are anticipated in the equipment or installations or for the part in which they are to be used.

2.2 Cables shall be so constructed, installed, protected, used and maintained as to prevent danger so far as it is reasonably practicable.

2.3 Cables shall be selected so that they are suitable for the intended operating conditions and equipment classification. Examples of operation conditions include:

a) Voltage

b) Current

c) Protective measures

d) Grouping of cables

e) Method of installationv

f) Accessibility

2.4 Cables shall be supported adequately. The recommended maximum spacing of supports is given in Table 1. In deciding the actual spacing, the mass of the cable between the supports shall be taken into account so that the limiting value of tension (see 4.2) is not exceeded. The cable shall not be damaged by any mechanical restraint used for its support.

In the case of single-core cables, the spacing also depends on the dynamic forces due to a short-circuit current; the manufacturer's recommendations shall be observed.

Cables which have been in use can be damaged if they are disturbed. This can arise from the effect of natural

Table 1 – Spacing of supports for non-armored cables in accessible positions

Overall diameter (D) of cable [a] mm	Maximum spacing of supports [b] (mm)			
	General		In caravans	
	Horizontal	Vertical	Horizontal	Vertical
$D \leq 9$	250	400	150	150
$9 < D \leq 15$	300	400	150	150
$15 < D \leq 20$	350	450	150	150
$20 < D \leq 40$ [c]	400	550	-	-

[a] For flat cables this is taken as the measurement of the major axis.

[b] The spacings stated for horizontal runs may also be applied to runs at an angle of more than 30^{o} from the vertical. For runs at an angle of 30^{o} or less than the vertical, the vertical spacings are applicable.

[c] For the spacing of supports for cables of overall diameter exceeding 40 mm, and for single core cables having conductors of cross-sectional area 300 mm2 and larger, the manufacturer's recommendations shall be observed.

ageing on the physical properties of the materials used for cable insulation and sheathing which can ultimately result in hardening of these materials.

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3. Limiting conditions

3.1 Voltage

APPENDIX

The rated voltage of a cable is the reference voltage for which the cable is designed.

The rated voltage in an alternating current system, is expressed by the combination of two values U0 /U, expressed in volts, where:

a) U0 is the r.m.s. value between any insulated conductor and "earth" (metal covering of the cable or the surrounding medium);

b) U is the r.m.s. value between any two phase conductors of a multicore cable or of a system of single core cables.

In an alternating current system, the rated voltage of a cable or cord shall be at least equal to the nominal voltage of the system for which it is intended. This condition applies to the values of both U0 and U.

In a direct current system, the maximum permanent operating voltage of the system is stated in Table 2.

Table 2 – Examples of maximum permitted voltages against rated voltage of cable

Rated voltage of cable	Maximum permanent permitted operating voltage of the system			
	a.c.	3-phase a.c.	d.c.	
U_0/U	Conductor-earth	Conductor-conductor	Conductor-earth	Conductor-conductor
V	U_0 max (V)	U max (V)	V	V
300/300	320	320 [a]	410	410
300/500	320	550	410	820
450/750	480	825	620	1240

a Single phase power system only.

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4. Mechanical stress

4.1 General

In assessing the potential risk of mechanical damage to cables, account shall be taken of any mechanical strains likely to be imposed during the normal process of installation of cables.

4.2 Tension

The tension applied to a cable shall not exceed the following values of tensile stress per conductor, subject to a total maximum tensile force of 1000 N, unless otherwise agreed by the cable manufacturer:

a) 50 N/mm2 for non-flexible cables during installation;

b) 15 N/mm2 for flexible cables under static tensile stress, and for non-flexible cables in service in fixed circuits.

NOTE: A mass of 1 kg is approximately equal to 10 N.

In circumstances where a stress exceeding these values would result, a separate stress-bearing member or device shall be used. The method of attaching such a member or device to the cable shall be such that the cable is not damaged.

In circumstances where flexible cables are under dynamic stress (including those due to inertia, e.g. reeling drums) the permissible tensions or fatigue life shall be agreed between the design engineer and the cable manufacturer.

Where cables are installed vertically, without intermediate support, and are inaccessible and unlikely to be moved or disturbed, they shall be supported at the top of the run such that the internal radius of the resultant bend is not less than the appropriate minimum bending radius for normal use according to Table 3. The unsupported vertical length shall not exceed 5 m.

4.3 Bending

The internal bending radii (R) (as shown in Figure 1) for different types of cable shall, under normal circumstances, be not less than those given in Table 3.

Care shall be taken when stripping the insulation to ensure that no damage occurs to the conductor, since this will severely affect the bending radii.

The bending radii (R) recommended are for ambient temperatures of (20 ± 10) oC. For temperatures outside these limits, the cable manufacturer's recommendations shall be followed.

For flexible cables and cords, particularly at terminations and at the point of entry of moveable appliances, it can be necessary to use a device which ensures that the cable is not bent to an internal bend radius less than that recommended in Table 3. It is necessary to prevent the cable being flexed significantly too close to any internal and/or external anchorage point. If a cord guard or other device is used, it shall not prevent internal movement of the cores of the cable within the device.

NOTE: R is internal bending radius.

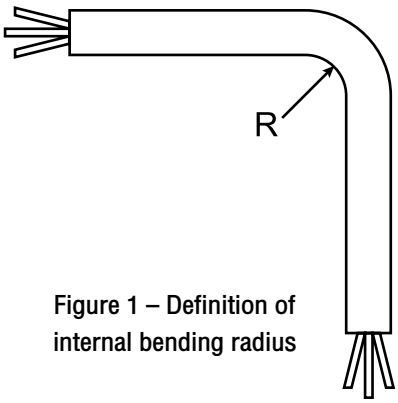

Figure 1 – Definition of internal bending radius

APPENDIX

Table 3 – Minimum recommended bending radii at cable temperatures of (20 ± 10) C

Cable type	Minimum bending radius			
	Cable diameter mm ⩽ 8	Cable diameter mm >8 ⩽ 12	Cable diameter mm >12 ⩽ 20	Cable diameter mm >20
Cable for fixed installations:				
Normal use	4D	5D	6D	6D
Careful bending at termination	2D	3D	4D	4D
Flexible cables (thermoplastic, e.g. PVC):				
Fixed installation	3D	3D	4D	4D
Free movement	5D	5D	6D	6D
At inlet of portable appliance or mobile equipment [a]	5D	5D	6D	6D
Under mechanical load [b]	9D	9D	9D	10D
Festooned [c]	10D	10D	11D	12D
Repeated reeling [b]	7D	7D	8D	8D
Deflected by pulleys [b]	10D	10D	10D	10D
Flexible cables (thermosetting, e.g. rubber):				
Fixed installation	3D	3D	4D	4D
Free movement	4D	4D	5D	6D
At inlet of portable appliance or mobile equipment [a]	4D	4D	5D	6D
Under mechanical load [b]	6D	6D	6D	8D
Festooned [c]	6D	6D	6D	8D
Repeated reeling [b]	6D	6D	6D	8D
Deflected by pulleys [b]	6D	6D	6D	8D

D = the overall diameter of round cables or the smaller dimension of flat cables.

a No mechanical load on the cable.

b See 3.2 with regard to dynamic stress.

c As in gantry cranes.

5. Drum Handling

1. As received at stores or site, check the cable drums for any physical damages to the drum and outer wooden laggings. Also check that the cable end cover are proper and in position.

2. Loading/unloading of the drum to or from truck should be done by crane or use of a ramp. Do not drop the drum or throw from the truck since this is not only damage the drum, the cable may also be damaged. Follows the picture in next page.

3. Flanges shall be kept always in up-right position during storage and handling and paying off or during transportation of drum. Use pair of jacks with stand and shaft for mounting cable drums before paying off. Spindles of adequate size will be selected depending on the weight and size of the cable drum.

4. After removal of the drum lagging, a thorough physical inspection of the cable shall be carried out.

5. Roll the drum only in the direction of painted arrow on the drum flanges and only for short distances.

6. Keep a man stationed near the drum with a plank wedged against the flange so that overrunning of the drum could be prevented if rolling stops.

7. Cable end shall be taken out from the top side of the mounted drum of cable, and never from the bottom side.

8. Do not lay the damaged cables before repair and testing.

6. Storage

Cable should be stored in a dry place with roof in order to prevent the premature rotten of the wooden drum or lagging. The floor should be concrete or firm enough to prevent the drum from sinking. Chocks must be used to prevent the movement of the drum. The cable drum should be kept in a place where security and fire damage are protected during storage.

CERTIFICATE

CERTIFICATE

Phelps Dodge International (Thailand) Limited

ISO 9001 : 2008

Annex to Certificate
Registration No. 438873 QM08

Phelps Dodge International (Thailand) Limited

CERTIFICATE

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ISO 14001 : 2004

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BS OHSAS 18001 : 2007

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Phelps Dodge International (Thailand) Limited

NOTE

Why Phelps Dodge

Raw material

Each of raw materials is elaborately selected from specialized and reliable suppliers by concisely selection criteria and incoming inspection.

Copper

Phelps Dodge International Thailand (PDITL) possesses state-of-the-art technology of copper melting furnace producing high purity oxygen free copper rod.
PDITL's copper rod provides high conductivity of conductor and ensures best quality of wires and cables.

Insulation

Because of best-in-class raw materials and manufacturing process, insulation employed on PDITL's wires and cables are ensured highest level of safety and quality over lifetime.

Testing

PDITL's quality commitment begins with the careful scrutiny of raw materials and continues to the testing of final products, where finish length of cable undergoes a series of rigorous tests to meet their specification criteria before being shipped to customers.

Technical service

PDITL's is willing to provide pre-purchased and post-purchased technical service by well-trained human resource with strong background and solid experience.

Customer

No wonder PDITL's products are chosen by various leading organizations in Thailand and worldwide, including; EGAT PEA MEA TOT PTT. Indeed, PDITL's industry-wide reputation speaks for itself.

Distribution center

PDITL and its business partners own entirely distribution and transportation facilities countrywide to offer superior delivery service to customer premises.

Safety

Safety is at the very core of our manufacturing excellence, and is an integral part of our industry leading and performance. Not only safety concern in internal manufacturing processes, but also concern safety in use of our products.

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