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## CROSS-LINKED POLYETHYLENE INSULATION MEDIUM VOLTAGE CABLES

Engineering Data for Copper and  
Aluminium Conductors

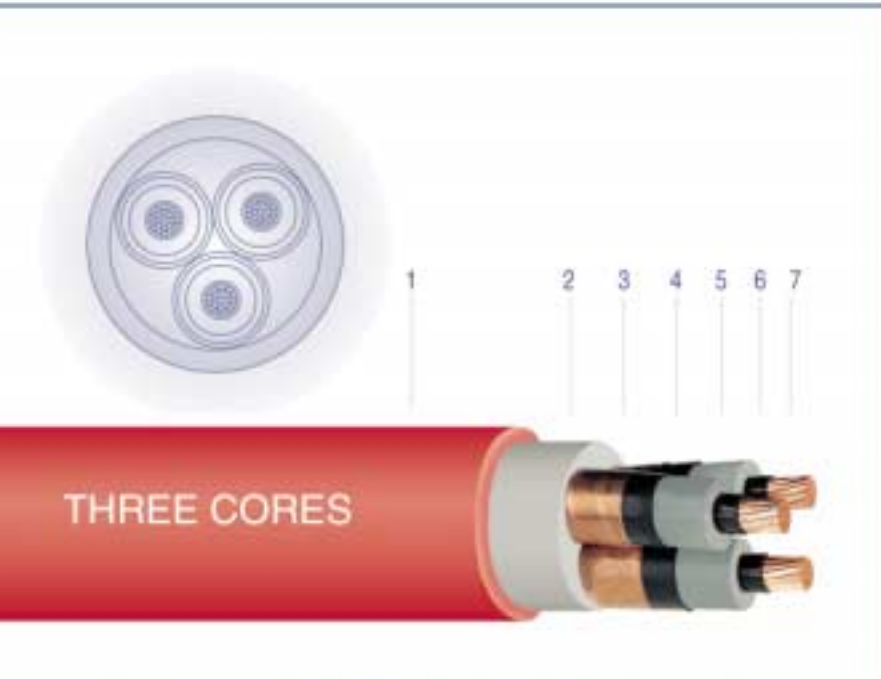
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- 1 PVC OVERSHEATH
- 2 COPPER WIRES SCREEN
- 3 EXTRUDED SEMI-CONDUCTING LAY
- 4 XLPE INSULATION
- 5 EXTRUDED SEMI-CONDUCTING LAY
- 6 COPPER OR ALUMINIUM CIRCULAR STRANDED CONDUCTOR



- 1 PVC OVERSHEATH
- 2 NON HYGROSCOPIC FILLER
- 3 COPPER TAPES SCREEN
- 4 EXTRUDED SEMI-CONDUCTING LAY
- 5 XLPE INSULATION
- 6 EXTRUDED SEMI-CONDUCTING LAY
- 7 COPPER OR ALUMINIUM CIRCULAR STRANDED CONDUCTOR



- 1 PVC OVERSHEATH
- 2 GALVANIZED STEEL FLAT WIRE ARMOUR
- 3 NON HYGROSCOPIC FILLER
- 4 COPPER TAPES SCREEN
- 5 EXTRUDED SEMI-CONDUCTING LAY
- 6 XLPE INSULATION
- 7 EXTRUDED SEMI-CONDUCTING LAY
- 8 COPPER OR ALUMINIUM CIRCULAR STRANDED CONDUCTOR



This booklet is designed to help engineers in the selection of conductors sizes and help in the installation of cables system.

The information provide general conductor cross sectional area, outside diameter weight and bending radius. Besides you can select the ampacity of a cable and various correction factors are given for any installation condition varying from those for which the tables were calculated.

Further and more detailed informations may be requested directly to our customer's assistance service.

## CONDITIONS FOR CURRENT RATINGS

Current ratings values stated in the following schedules have been calculated in compliance with CEI 20-21 and IEC 287 standards.

Current ratings values refer to the following conditions:

Conductor maximum temperature	90° C
Ambient temperature for installation in open air	30° C
Ambient temperature for underground installation	20° C

*Thermal resistivity ( $R_f$ )*

ground	100 and 200° C · cm/W
HEPR insulation	450° C · cm/W
PVC oversheath	500° C · cm/W

The metallic screen, jointed together, are connected to earth.

*Laying depths*

mt. 0.8	for voltages	U = 3.0÷10kV
mt. 1.0	for voltages	U = 15÷30kV
mt. 1.2	for voltages	U = 45kV

## SELECTION OF CABLES FOR ALTERNATIVE CURRENT SYSTEM

Three-phases system characteristics				Insulation rating cables	
nominal tension U (kV)	maximum tension Um (kV)	class	maximum time for each test with grounded phase (*)	with screen on the single core Uo (kV)	without screen on the single-core Uo/U kV
3	3,6	B	over 8 h	1.8	1.8/3
6	7.2	A B	up to 8 h over 8 h	3.6 6	3.6/6 -
10	12	A B	up to 8 h over 8 h	6 8.7	- -
15	17.5	A B	up to 8 h over 8 h	8.7 12	- -
20	24	A B	up to 8 h over 8 h	12 15	- -
30	36	A B	up to 8 h over 8 h	18 26	- -
45	52	A B	up to 8 h over 8 h	26 30	- -

Uo = relates to the nominal tension between a conductor and earth

U = relates to the nominal tension between the conductors of the cable

Um = maximum tension for which the cable is suitable

(\*) The whole annual period must be established in consideration of the environmental conditions

# RANGE AND DIMENSIONS

## SINGLE-CORE RE4H1R-3.6/6 kV - ARE4H1R-3.6/6 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
1x 35	7.0	2.5	21.0	22.0	744	–	310
1x 50	8.2	2.5	22.2	22.2	909	594	320
1x 70	9.9	2.5	23.9	24.9	1133	692	350
1x 95	11.5	2.5	25.5	26.5	1397	799	370
1x120	12.9	2.5	27.0	28.0	1664	909	390
1x150	14.2	2.5	28.5	29.5	1980	1035	410
1x185	16.2	2.5	30.5	31.5	2347	1182	440
1x240	18.2	2.6	33.0	34.0	2927	1416	470
1x300	21.2	2.8	36.6	37.6	3599	1710	530
1x400	23.4	3.0	39.3	40.3	4602	2083	560
1x500	27.3	3.2	44.0	45.0	5694	2545	630
1x630	30.5	3.2	47.4	48.4	6995	3028	670

## THREE-CORE RE4H10R-3.6/6 kV - ARE4H10R-3.6/6 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 35	7.0	2.5	41.0	42.5	2726	–	590
3x 50	8.2	2.5	43.8	45.3	3337	2393	630
3x 70	9.9	2.5	47.7	49.2	4181	2859	690
3x 95	11.5	2.5	51.3	52.8	5147	3352	740
3x120	12.9	2.5	54.5	56.0	6100	3832	780
3x150	14.2	2.5	57.4	58.9	7174	4340	820
3x185	16.2	2.5	62.2	63.7	8562	5067	890
3x240	18.2	2.6	67.4	68.9	10571	6037	960

## ARMoured THREE-CORE RE4H10ZR-3.6/6 kV - ARE4H10ZR-3.6/6 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 35	7.0	2.5	46.1	47.6	3865	–	670
3x 50	8.2	2.5	48.9	50.4	4335	3590	706
3x 70	9.9	2.5	53.0	54.5	5536	4214	760
3x 95	11.5	2.5	56.6	58.1	6600	4805	810
3x120	12.9	2.5	59.8	61.3	7646	5379	860
3x150	14.2	2.5	62.7	64.2	8773	5939	900
3x185	16.2	2.5	67.5	69.0	10312	6817	970
3x240	18.2	2.6	72.7	74.2	12437	7903	1040

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying								air laying			
	$R_t=100\text{ °C cm/W}$				$R_t=200\text{ °C cm/W}$							
	mm <sup>2</sup>	Cu ... Al		Cu .. Al		Cu ... Al		Cu .. Al		Cu ... Al		Cu .. Al
1x 35	195	150	185	–	151	–	141	–	208	152	173	–
1x 50	232	182	220	172	175	139	166	130	240	190	199	151
1x 70	286	221	268	209	216	167	203	156	300	240	242	194
1x 95	341	256	322	250	257	201	242	188	380	290	314	231
1x120	388	302	368	285	289	230	272	214	430	334	360	270
1x150	430	339	411	327	325	255	306	245	498	398	415	327
1x185	487	385	467	364	365	289	341	270	585	450	495	368
1x240	565	442	540	416	421	327	400	307	683	525	579	469
1x300	640	508	610	477	473	376	450	352	790	630	672	527
1x400	726	580	692	548	535	426	511	402	905	730	770	613
1x500	815	652	764	617	597	478	569	450	1019	857	817	725
1x630	913	745	873	711	667	551	640	522	1200	1000	1020	847

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying				air laying	
	$R_t=100\text{ °C cm/W}$		$R_t=200\text{ °C cm/W}$			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 35	187	150	140	–	182	146
3x 50	221	172	170	133	219	174
3x 70	273	210	212	162	275	213
3x 95	322	250	249	193	335	259
3x120	363	285	280	220	362	298
3x150	405	320	313	248	430	330
3x185	469	359	363	275	495	380
3x240	520	415	399	329	583	450

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying				air laying	
	$R_t=100\text{ °C cm/W}$		$R_t=200\text{ °C cm/W}$			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 35	180	150	149	–	186	145
3x 50	220	163	182	131	223	170
3x 70	259	208	209	169	260	210
3x 95	307	239	247	193	320	243
3x120	350	268	280	212	360	298
3x150	405	310	327	249	430	330
3x185	450	348	362	282	490	380
3x240	528	400	428	322	560	437

# RANGE AND DIMENSIONS

## SINGLE-CORE RE4H1R-6/10 kV - ARE4H1R-6/10 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
1x 35	7.0	3.4	22.8	23.8	819	–	330
1x 50	8.2	3.4	24.0	25.0	993	678	350
1x 70	9.9	3.4	25.7	26.7	1237	796	370
1x 95	11.5	3.4	27.3	28.3	1506	908	390
1x120	12.9	3.4	29.0	30.0	1798	1043	420
1x150	14.2	3.4	30.3	31.3	2113	1168	440
1x185	16.2	3.4	32.5	33.5	2508	1343	470
1x240	18.2	3.4	34.7	35.7	3088	1577	500
1x300	21.2	3.4	37.9	38.9	3802	1913	540
1x400	23.4	3.4	40.3	41.3	4806	2286	580
1x500	27.3	3.4	44.4	45.4	5871	2722	630
1x630	30.5	3.4	47.8	48.8	7187	3220	680

## THREE-CORE RE4H10R-6/10 kV - ARE4H10R-6/10 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 35	7.0	3.4	45.2	46.2	3106	–	640
3x 50	8.2	3.4	47.9	48.9	3739	2795	680
3x 70	9.9	3.4	51.8	52.8	4614	3292	740
3x 95	11.5	3.4	55.5	56.5	5611	3817	790
3x120	12.9	3.4	58.9	59.9	6620	4353	840
3x150	14.2	3.4	61.9	62.9	7722	4887	880
3x185	16.2	3.4	66.4	67.4	9115	5620	940
3x240	18.2	3.4	71.1	72.1	11108	6574	1010

## ARMoured THREE-CORE RE4H10ZR-6/10 kV - ARE4H10ZR-6/10 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 35	7.0	3.4	50.4	51.4	4358	–	720
3x 50	8.2	3.4	53.1	54.1	5079	4135	760
3x 70	9.9	3.4	57.0	58.0	6055	4732	810
3x 95	11.5	3.4	60.7	61.7	7151	5356	860
3x120	12.9	3.4	63.9	64.9	8222	5955	910
3x150	14.2	3.4	66.9	67.9	9416	6582	950
3x185	16.2	3.4	71.6	72.6	10979	7484	1020
3x240	18.2	3.4	76.1	77.1	13042	8508	1080

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying								air laying			
	R <sub>t</sub> =100 °C cm/W				R <sub>t</sub> =200 °C cm/W							
	mm <sup>2</sup>	Cu . . . . Al		Cu . . . Al		Cu . . . . Al		Cu . . . Al		Cu . . . . Al		Cu . . . Al
1x 35	194	151	182	–	149	–	141	–	209	152	195	–
1x 50	233	179	219	168	181	137	169	127	241	193	204	163
1x 70	283	223	268	213	217	166	203	156	320	243	285	205
1x 95	340	265	318	249	256	201	245	186	370	302	311	256
1x120	384	302	366	284	292	229	275	212	444	340	380	288
1x150	431	340	409	318	325	256	307	240	493	395	420	337
1x185	486	382	462	358	365	287	344	267	580	465	497	412
1x240	564	443	540	430	423	328	398	309	686	550	594	475
1x300	631	503	604	479	474	380	449	356	795	620	688	528
1x400	720	575	690	545	635	434	509	406	925	720	804	616
1x500	809	653	780	631	605	493	572	461	1001	820	864	700
1x630	905	739	879	719	674	554	648	527	1208	970	1065	954

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying				air laying	
	R <sub>t</sub> =100 °C cm/W		R <sub>t</sub> =200 °C cm/W			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 35	181	151	143	–	185	146
3x 50	219	170	174	132	224	172
3x 70	270	213	212	167	279	214
3x 95	325	249	255	195	337	250
3x120	364	283	284	218	373	287
3x150	413	318	318	246	430	334
3x185	455	350	356	270	499	380
3x240	530	418	411	326	583	453

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying				air laying	
	R <sub>t</sub> =100 °C cm/W		R <sub>t</sub> =200 °C cm/W			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 35	183	150	150	–	189	146
3x 50	215	171	174	139	220	173
3x 70	250	200	199	156	275	210
3x 95	273	243	258	193	315	252
3x120	352	281	281	224	373	291
3x150	402	272	318	209	419	329
3x185	450	345	457	273	500	380
3x240	519	410	410	327	550	450

# RANGE AND DIMENSIONS

## SINGLE-CORE RE4H1R-8.7/15 kV - ARE4H1R-8.7/15 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
1x 35	7.0	4.5	25.0	26.0	920	–	360
1x 50	8.2	4.5	26.5	27.3	1106	700	380
1x 70	9.9	4.5	28.2	29.2	1360	902	410
1x 95	11.5	4.5	29.8	30.8	1579	981	430
1x120	12.9	4.5	31.4	32.4	1936	1180	450
1x150	14.2	4.5	32.7	33.7	2254	1310	470
1x185	16.2	4.5	34.9	35.9	2660	1495	503
1x240	18.2	4.5	37.1	38.1	3246	1735	530
1x300	21.2	4.5	40.3	41.3	3920	2031	580
1x400	23.4	4.5	42.5	43.5	4904	2385	610
1x500	27.3	4.5	46.8	47.8	6000	2852	670
1x630	30.5	4.5	50.2	51.2	7321	3354	717

## THREE-CORE RE4H10R-8.7/15 kV - ARE4H10R-8.7/15 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 35	7.0	4.5	50.0	51.0	3596	–	710
3x 50	8.2	4.5	52.8	53.8	4254	3310	750
3x 70	9.9	4.5	56.7	57.7	5170	3848	810
3x 95	11.5	4.5	60.3	61.3	6195	4400	860
3x120	12.9	4.5	63.5	64.5	7212	4945	903
3x150	14.2	4.5	66.5	67.5	8338	5504	940
3x185	16.2	4.5	71.2	72.2	9812	6317	1010
3x240	18.2	4.5	75.6	76.6	11813	7279	1070

## ARMoured THREE-CORE RE4H10ZR-8.7/15 kV - ARE4H10ZR-8.7/15 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 35	7.0	4.5	55.1	56.1	4975	–	780
3x 50	8.2	4.5	57.9	58.9	5723	4779	820
3x 70	9.9	4.5	61.8	62.8	6739	5416	880
3x 95	11.5	4.5	65.4	66.4	7906	6112	930
3x120	12.9	4.5	68.8	69.8	9000	6733	980
3x150	14.2	4.5	71.8	72.8	10224	7390	1020
3x185	16.2	4.5	76.3	77.3	11770	8275	1082
3x240	18.2	4.5	81.0	82.0	13957	9423	1140

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying								air laying			
	R <sub>t</sub> =100 °C cm/W				R <sub>t</sub> =200 °C cm/W							
	mm <sup>2</sup>	Cu ... Al		Cu .. Al		Cu ... Al		Cu .. Al		Cu ... Al		Cu .. Al
1x 35	194	150	183	–	151	–	142	–	211	158	186	–
1x 50	228	178	217	168	177	138	168	129	250	193	190	183
1x 70	277	219	263	207	213	169	201	156	311	243	294	231
1x 95	333	261	315	246	254	199	239	186	382	298	333	280
1x120	381	299	363	282	293	227	277	213	439	320	383	327
1x150	427	332	406	314	326	253	308	236	505	382	462	363
1x185	484	378	461	357	368	286	349	268	560	420	550	418
1x240	556	437	530	415	420	330	399	311	694	543	621	494
1x300	630	495	602	469	473	373	449	351	796	615	711	574
1x400	709	574	679	545	527	431	508	407	905	702	832	689
1x500	803	638	775	619	601	478	582	453	1030	740	975	876
1x630	894	735	873	715	670	556	654	531	1500	950	1375	917

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying				air laying	
	R <sub>t</sub> =100 °C cm/W		R <sub>t</sub> =200 °C cm/W			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 35	184	145	145	–	190	150
3x 50	219	170	177	134	224	173
3x 70	259	205	208	160	273	215
3x 95	319	243	251	189	338	253
3x120	350	274	277	213	373	300
3x150	400	318	318	250	439	340
3x185	451	350	353	271	498	385
3x240	535	413	416	327	585	459

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying				air laying	
	R <sub>t</sub> =100 °C cm/W		R <sub>t</sub> =200 °C cm/W			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 35	180	144	147	–	181	151
3x 50	215	169	174	138	223	170
3x 70	253	200	203	162	270	215
3x 95	310	240	247	191	329	253
3x120	349	273	279	221	362	293
3x150	400	305	322	243	415	329
3x185	430	349	341	281	500	360
3x240	510	402	407	321	585	453

# RANGE AND DIMENSIONS

## SINGLE-CORE RE4H1R-12/20 kV - ARE4H1R-12/20 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
1x 25	6.0	5.5	26.0	27.0	892	–	380
1x 35	7.0	5.5	27.1	28.1	1021	–	390
1x 50	8.2	5.5	28.5	29.5	1216	902	410
1x 70	9.9	5.5	30.2	31.2	1464	1024	440
1x 95	11.5	5.5	32.0	33.0	1769	1171	460
1x120	12.9	5.5	33.4	34.4	2052	1297	480
1x150	14.2	5.5	34.9	35.9	2391	1447	500
1x185	16.2	5.5	37.1	38.1	2805	1640	530
1x240	18.2	5.5	39.1	40.1	3381	1870	560
1x300	21.2	5.5	42.3	43.3	4065	2176	600
1x400	23.4	5.5	44.7	45.7	5077	2553	640
1x500	27.3	5.5	48.8	49.8	6166	3017	700
1x630	30.5	5.5	52.4	53.4	7526	3559	750

## THREE-CORE RE4H10R-12/20 kV - ARE4H10R-12/20 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 25	6.0	5.5	52.4	53.4	3611	–	750
3x 35	7.0	5.5	54.5	55.5	4083	–	770
3x 50	8.2	5.5	57.4	58.4	4771	3826	810
3x 70	9.9	5.5	61.2	62.2	5714	4392	870
3x 95	11.5	5.5	65.0	66.0	6810	5015	920
3x120	12.9	5.5	68.2	69.2	7847	5580	970
3x150	14.2	5.5	71.2	72.2	9000	6166	1010
3x185	16.2	5.5	75.6	76.6	10481	6986	1070
3x240	18.2	5.5	80.5	82.0	12700	8200	1140

## ARMoured THREE-CORE RE4H10ZR-12/20 kV - ARE4H10ZR-12/20 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 25	6.0	5.5	57.5	58.5	5045	–	820
3x 35	7.0	5.5	59.8	60.8	5630	–	850
3x 50	8.2	5.5	62.7	63.7	6381	5436	890
3x 70	9.9	5.5	66.5	67.5	7450	6128	940
3x 95	11.5	5.5	70.1	71.1	8614	6820	990
3x120	12.9	5.5	73.5	74.5	9780	7513	1040
3x150	14.2	5.5	76.3	77.3	10962	8128	1080
3x185	16.2	5.5	80.9	81.9	12611	9116	1140
3x240	18.2	5.5	85.5	86.5	14792	10258	1210

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying								air laying			
	$R_t=100\text{ °C cm/W}$				$R_t=200\text{ °C cm/W}$							
	mm <sup>2</sup>	Cu ... Al		Cu .. Al		Cu ... Al		Cu .. Al		Cu ... Al		Cu .. Al
1x 25	160	125	154	125	126	101	118	96	173	130	154	119
1x 35	191	151	185	146	148	115	141	111	210	160	189	147
1x 50	227	175	220	169	176	135	169	131	250	193	224	169
1x 70	277	218	271	213	214	169	209	173	312	243	277	215
1x 95	333	258	319	248	255	196	247	190	383	301	340	265
1x120	380	297	364	284	290	225	280	218	437	342	386	300
1x150	426	330	414	319	324	251	316	243	500	393	441	343
1x185	482	375	466	364	366	285	356	275	572	458	506	404
1x240	557	429	540	416	421	323	410	312	675	520	600	462
1x300	620	491	604	478	466	370	455	360	773	615	589	539
1x400	715	565	695	551	538	427	523	416	890	703	798	620
1x500	785	639	770	623	585	473	576	466	1020	825	914	727
1x630	890	738	874	724	664	452	655	545	1182	948	1078	859

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying				air laying	
	$R_t=100\text{ °C cm/W}$		$R_t=200\text{ °C cm/W}$			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 25	153	124	130	104	155	125
3x 35	185	144	145	117	190	150
3x 50	216	172	172	138	222	175
3x 70	263	200	207	157	272	209
3x 95	319	243	254	190	330	253
3x120	354	274	279	216	375	300
3x150	405	310	323	244	430	339
3x185	445	349	351	275	500	383
3x240	529	413	414	325	590	454

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying				air laying	
	$R_t=100\text{ °C cm/W}$		$R_t=200\text{ °C cm/W}$			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 25	159	124	128	103	160	125
3x 35	180	143	142	114	184	150
3x 50	220	171	174	136	222	174
3x 70	263	202	207	159	270	215
3x 95	320	249	254	196	334	260
3x120	359	280	284	222	362	300
3x150	410	310	326	242	439	319
3x185	452	342	355	268	502	373
3x240	525	405	413	317	583	465

# RANGE AND DIMENSIONS

## SINGLE-CORE RE4H1R-18/30 kV - ARE4H1R-18/30 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
1x 50	8.2	8.0	33.7	34.7	1512	1198	486
1x 70	9.9	8.0	35.6	36.6	1792	1350	512
1x 95	11.5	8.0	37.4	38.4	2114	1516	538
1x120	12.9	8.0	38.8	39.8	2406	1650	558
1x150	14.2	8.0	40.1	41.1	2742	1798	576
1x185	16.2	8.0	42.3	43.3	3176	2010	606
1x240	18.2	8.0	44.5	45.5	3788	2277	640
1x300	21.2	8.0	47.7	48.7	4502	2613	680
1x400	23.4	8.0	49.8	50.8	5534	3015	710
1x500	27.3	8.0	54.2	55.2	6662	3513	710
1x630	30.5	8.0	55.4	57.4	7820	3953	775

## THREE-CORE RE4H10R-18/30 kV - ARE4H10R-18/30 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 50	8.2	8.0	68.9	69.9	6273	5328	980
3x 70	9.9	8.0	72.8	73.8	7319	5997	1030
3x 95	11.5	8.0	76.5	77.5	8469	6674	1080
3x120	12.9	8.0	79.7	80.7	9575	7308	1130
3x150	14.2	8.0	82.7	83.7	10806	7972	1170
3x185	16.2	8.0	87.4	88.4	12420	8925	1240
3x240	18.2	8.0	91.9	92.9	14563	10030	1300

## ARMOURED THREE-CORE RE4H10ZR-v - ARE4H10ZR-18/30 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 50	8.2	8.0	74.2	75.2	8212	7267	1050
3x 70	9.9	8.0	78.1	79.1	9360	8038	1100
3x 95	11.5	8.0	81.8	82.8	10610	8815	1160
3x120	12.9	8.0	85.0	86.0	11812	9545	1200
3x150	14.2	8.0	88.0	89.0	13136	10302	1240
3x185	16.2	8.0	92.7	93.7	14890	11395	1310
3x240	18.2	8.0	97.2	98.2	17166	12630	1370

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying								air laying			
	$R_t=100\text{ °C cm/W}$				$R_t=200\text{ °C cm/W}$							
	mm <sup>2</sup>	Cu ... Al		Cu .. Al		Cu ... Al		Cu .. Al		Cu ... Al		Cu .. Al
1x 50	227	179	220	173	178	139	173	137	250	195	225	174
1x 70	278	213	269	208	216	166	210	160	310	243	278	119
1x 95	330	258	318	247	255	198	247	191	380	300	341	268
1x120	374	291	363	281	287	221	279	214	430	341	386	304
1x150	425	330	414	319	327	253	318	245	470	380	418	349
1x185	487	379	473	361	375	285	365	276	573	443	513	394
1x240	552	429	438	417	423	326	411	317	670	525	604	471
1x300	635	489	622	474	488	372	477	361	763	603	691	539
1x400	705	553	692	540	537	419	527	409	882	698	801	627
1x500	803	631	788	618	608	477	599	467	1020	795	933	715
1x630	899	719	890	704	680	539	675	532	1152	906	1072	829

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying				air laying	
	$R_t=100\text{ °C cm/W}$		$R_t=200\text{ °C cm/W}$			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 50	219	169	177	137	220	170
3x 70	260	205	206	167	268	215
3x 95	319	243	254	192	325	252
3x120	369	285	297	228	380	299
3x150	402	313	323	250	440	333
3x185	450	355	359	284	495	382
3x240	528	412	420	327	570	448

## CONTINUOUS CURRENT RATINGS (ampere)

nominal area conductor	ground laying				air laying	
	$R_t=100\text{ °C cm/W}$		$R_t=200\text{ °C cm/W}$			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 50	220	173	177	139	225	175
3x 70	263	203	209	162	275	210
3x 95	315	249	251	200	330	249
3x120	350	282	277	227	365	290
3x150	403	305	321	241	435	335
3x185	450	355	357	282	500	377
3x240	513	415	407	330	583	450

# RANGE AND DIMENSIONS

## SINGLE-CORE RE4H1R-26/45 kV - ARE4H1R-26/45 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
1x 70	9.9	10	37.7	40.0	1929	1510	560
1x 95	11.5	10	39.3	41.6	2224	1659	570
1x120	12.9	10	41.1	43.4	2558	1834	590
1x150	14.2	9	40.4	43.0	2729	1831	580
1x185	16.2	9	42.4	45.0	3140	2221	600
1x240	18.2	9	44.4	47.0	3681	2237	640
1x300	21.2	9	47.8	50.3	4410	2583	680
1x400	23.4	9	50.0	52.5	5427	2950	720
1x500	27.3	9	54.3	56.8	6441	3359	790
1x630	30.5	9	58.0	60.5	7879	4006	820

## THREE-CORE RE4H10R-26/45 kV - ARE4H10R-26/45 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 70	9.9	10	81.0	84.0	8615	7393	1136
3x 95	11.5	10	84.8	87.8	9711	8152	1188
3x120	12.9	10	87.8	90.8	11012	8915	1230
3x150	14.2	9	86.3	89.3	11359	8798	1210
3x185	16.2	9	90.6	93.6	12694	9596	1270

## ARMoured THREE-CORE RE4H10ZR-26/45 kV - ARE4H10ZR-26/45 kV

nominal area conductor	conductor diameter	insulation thickness	nominal overall diameter	maximum overall diameter	approximate cable weight kg/km		minimum bending radius
					Cu	Al	
mm <sup>2</sup>	mm.	mm.	mm.	mm.			mm.
3x 70	9.9	10	87.0	90.0	10660	9425	1220
3x 95	11.5	10	90.3	93.3	11863	10187	1265

**CONTINUOUS CURRENT RATINGS (ampere)**

nominal area conductor	ground laying								air laying			
	R <sub>t</sub> =100 °C cm/W				R <sub>t</sub> =200 °C cm/W							
	mm <sup>2</sup>	Cu . . . . Al		Cu . . . Al		Cu . . . . Al		Cu . . . Al		Cu . . . . Al		Cu . . . Al
1x 70	266	210	260	205	208	166	203	160	320	250	287	224
1x 95	320	253	310	248	250	199	244	192	386	304	349	275
1x120	358	284	340	279	283	225	280	215	447	350	401	316
1x150	408	320	397	312	310	245	306	241	505	401	453	360
1x185	455	363	448	355	353	278	348	271	580	460	520	409
1x240	530	420	520	414	408	320	404	314	680	537	615	485
1x300	591	474	583	465	449	360	444	352	772	668	704	553
1x400	678	540	670	530	507	402	505	398	886	715	815	645
1x500	750	612	745	602	569	455	565	450	1020	829	942	749
1x630	905	802	895	780	648	524	642	517	1185	971	1078	873

**CONTINUOUS CURRENT RATINGS (ampere)**

nominal area conductor	ground laying				air laying	
	R <sub>t</sub> =100 °C cm/W		R <sub>t</sub> =200 °C cm/W			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 70	247	194	199	159	261	205
3x 95	295	231	235	186	314	247
3x120	333	263	267	212	361	282
3x150	374	294	300	234	407	320
3x185	422	332	335	263	465	366

**CONTINUOUS CURRENT RATINGS (ampere)**

nominal area conductor	ground laying				air laying	
	R <sub>t</sub> =100 °C cm/W		R <sub>t</sub> =200 °C cm/W			
	mm <sup>2</sup>	Cu	Al	Cu	Al	Cu
3x 70	249	195	199	157	270	210
3x 95	296	233	235	186	323	254

# APPARENT ELECTRIC RESISTANCE OF THE CONDUCTOR (Ohm/Km) AT 50Hz AND AT 90°C



## Single-core cables

nominal area conductor mm <sup>2</sup>	copper conductors				aluminium conductors			
	3.6/6 kV	6/10 kV 8.7/15 kV	12/20 kV 15/20 kV 18/30 kV	26/45 kV	3.6/6 kV	6/10 kV 8.7/15 kV	12/20 kV 15/20 kV 18/30 kV	26/45 kV
25	0.937	0.936	0.936	–	–	–	–	–
35	0.674	0.676	0.676	–	–	–	–	–
50	0.500	0.499	0.499	–	0.818	0.818	0.818	–
70	0.345	0.345	0.345	0.345	0.566	0.566	0.566	0.566
95	0.249	0.248	0.248	0.248	0.409	0.409	0.409	0.409
120	0.198	0.197	0.197	0.197	0.323	0.323	0.323	0.323
150	0.161	0.161	0.161	0.161	0.263	0.263	0.263	0.263
185	0.127	0.127	0.127	0.127	0.210	0.210	0.210	0.210
240	0.0984	0.0983	0.0982	0.0981	0.160	0.160	0.161	0.161
300	0.0789	0.0787	0.0788	0.0786	0.130	0.130	0.130	0.129
400	0.0624	0.0624	0.0623	0.0622	0.102	0.102	0.102	0.102
500	0.0496	0.0495	0.0494	0.0491	0.0812	0.0810	0.0812	0.0805
630	0.0395	0.0394	0.0393	0.0391	0.0649	0.0646	0.0649	0.0645



## Single-core cables



## Three-core cables

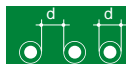
nominal area conductor mm <sup>2</sup>	all voltages		nominal area conductor mm <sup>2</sup>	all voltages	
	copper cond.	aluminium cond.		copper cond.	aluminium cond.
25	0.936	–	25	0.937	–
35	0.675	–	35	0.675	–
50	0.499	0.818	50	0.499	0.818
70	0.345	0.566	70	0.344	0.565
95	0.250	0.409	95	0.250	0.410
120	0.197	0.322	120	0.198	0.325
150	0.162	0.265	150	0.163	0.264
185	0.130	0.211	185	0.130	0.213
240	0.0995	0.163	240	0.100	0.164
300	0.0805	0.133	300	0.0815	0.134
400	0.0644	0.106	400	0.0658	0.108
500	0.0521	0.0853	500	0.0536	0.0879
630	0.0429	0.0704			

## CAPACITY VALUES AT 50 Hz (µF/Km)

nominal area conductor mm <sup>2</sup>	copper and aluminium conductors				6/10 kV	8.7/15 kV	12/20 kV	18/30 kV	26/45 kV
	screened	armoured	screened	armoured					
25	0.24	0.22	0.19	0.17	0.19	0.16	0.13	–	–
35	0.26	0.24	0.20	0.17	0.21	0.19	0.15	0.12	–
50	0.30	0.28	0.24	0.20	0.25	0.20	0.17	0.13	–
70	0.35	0.32	0.26	0.21	0.27	0.21	0.20	0.15	0.12
95	0.39	0.35	0.27	0.22	0.30	0.26	0.22	0.17	0.14
120	0.43	0.39	0.30	0.24	0.34	0.28	0.24	0.19	0.16
150	0.47	0.43	0.34	0.26	0.37	0.30	0.26	0.20	0.18
185	0.51	0.47	0.36	0.28	0.39	0.33	0.28	0.21	0.20
240	0.54	0.50	0.38	0.30	0.42	0.36	0.30	0.23	0.22
300	0.56	0.52	0.40	0.31	0.48	0.40	0.33	0.26	0.24
400	0.58	0.54	0.42	0.32	0.53	0.44	0.36	0.27	0.26
500	0.63	0.54	0.45	0.34	0.60	0.48	0.41	0.30	0.28
630	0.70	–	0.50	–	0.69	0.55	0.46	0.34	0.31

# PHASE REACTANCE VALUES AT 50 Hz (0hm/km)

## Single-core cables (average value)



nominal area conductor mm <sup>2</sup>	3.6/6 kV	6/10 kV	8.7/15 kV	12/20 kV	18/30 kV	26/45 kV
25	0.18	0.19	0.20	0.21	–	–
35	0.18	0.19	0.19	0.20	0.21	–
50	0.17	0.18	0.19	0.19	0.20	–
70	0.17	0.17	0.18	0.19	0.20	0.21
95	0.16	0.17	0.17	0.18	0.19	0.20
120	0.16	0.16	0.17	0.18	0.18	0.19
150	0.16	0.16	0.17	0.17	0.18	0.19
185	0.15	0.16	0.16	0.17	0.18	0.18
240	0.15	0.16	0.16	0.16	0.17	0.18
300	0.15	0.15	0.16	0.16	0.17	0.17
400	0.15	0.15	0.15	0.16	0.16	0.17
500	0.14	0.15	0.15	0.15	0.16	0.17
630	0.14	0.15	0.15	0.15	0.16	0.16

## Single-core cables



nominal area conductor mm <sup>2</sup>	3.6/6 kV	6/10 kV	8.7/15 kV	12/20 kV	18/30 kV	26/45 kV
25	0.13	0.14	0.14	0.15	–	–
35	0.12	0.13	0.14	0.14	0.16	–
50	0.11	0.12	0.13	0.13	0.15	–
70	0.11	0.12	0.12	0.13	0.14	0.15
95	0.10	0.11	0.12	0.12	0.13	0.14
120	0.10	0.11	0.11	0.12	0.13	0.14
150	0.098	0.10	0.11	0.11	0.12	0.13
185	0.094	0.10	0.11	0.11	0.12	0.12
240	0.091	0.097	0.10	0.11	0.11	0.12
300	0.089	0.095	0.098	0.10	0.11	0.12
400	0.087	0.091	0.096	0.098	0.11	0.11
500	0.083	0.089	0.092	0.096	0.10	0.11
630	0.082	0.087	0.090	0.093	0.098	0.10

## Three-core cables



nominal area conductor mm <sup>2</sup>	3.6/6 kV	6/10 kV	8.7/15 kV	12/20 kV	18/30 kV	26/45 kV
25	0.11	0.12	0.13	0.14	–	–
35	0.10	0.11	0.12	0.13	0.14	–
50	0.096	0.11	0.12	0.12	0.13	–
70	0.092	0.10	0.11	0.11	0.13	0.14
95	0.088	0.097	0.10	0.10	0.12	0.13
120	0.086	0.094	0.10	0.10	0.12	0.13
150	0.084	0.091	0.097	0.10	0.11	0.12
185	0.082	0.087	0.094	0.097	0.11	0.11
240	0.079	0.085	0.090	0.094	0.10	–
300	0.077	0.084	0.088	0.092	0.10	–
400	0.075	0.082	0.086	–	–	–
500	0.074	0.078	–	–	–	–

# GROUP RATING FACTORS

## AMBIENT TEMPERATURE DIFFERENT FROM STANDARD CONDITIONS

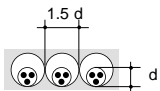
Ambient temperature °C	15	20	25	30	35	40	45	50	55	60	65
Ground laying cables	1.04	1.00	0.96	0.92	0.88	0.84	0.80	–	–	–	–
Air Cables*	–	1.09	1.09	1.00	0.95	0.90	0.85	0.79	0.74	0.67	0.60

\* Not exposed to direct sunlight

## THREE-CORE CABLES (OR SINGLE-CORE CABLES ENCLOSED IN TREFOIL) GROUNDED LAYING

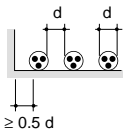
Number of cables or trefoil-set (horizontally)		2	3	4	6
	7 cm	0.84	0.74	0.67	0.60
Space between cables or trefoil-sets	25 cm	0.86	0.78	0.74	0.69

## THREE-CORE CABLES (OR SINGLE-CORE CABLES ENCLOSED IN TREFOIL) GROUNDED PIPE LAYING

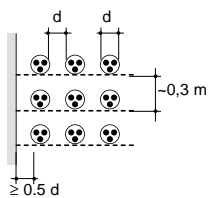


Number of cables (horizontally)	1	2	3
	0.82	0.69	0.61

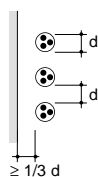
## THREE-CORE CABLES AIR LAYING



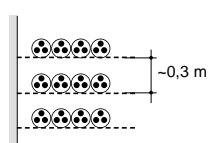
Number of cables (horizontally)	1	2	3	6
	0.95	0.90	0.88	0.85



Number of cables (horizontally)	1	2	3	6	
Number of layers (vertically)	1	1.00	0.98	0.96	0.93
	2	1.00	0.95	0.93	0.90
	3	1.00	0.94	0.90	0.87



Number of cables (vertically)	1	2	3	6
	1.00	0.93	0.90	0.87

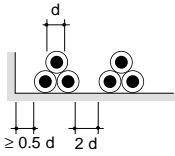


Number of cables (horizontally)	1	2	3	6	
Number of layers (vertically)	1	0.95	0.84	0.80	0.75
	2	0.95	0.80	0.76	0.71
	3	0.95	0.78	0.74	0.70

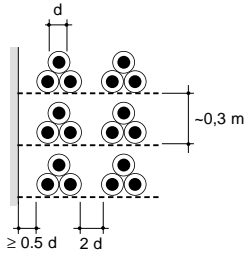


Number of cables (vertically)	1	2	3	6
	0.95	0.78	0.73	0.68

## SINGLE-CORE CABLES TREFOIL AIR LAYING

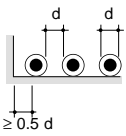


Number of trefoil sets (horizontally)	1	2	3	4
	0.95	0.90	0.88	0.87

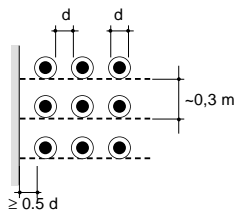


Number of trefoil sets (horizontally)	1	2	3	
Number of layers (vertically)	1	1.00	0.98	0.96
	2	1.00	0.95	0.93
	3	1.00	0.94	0.90

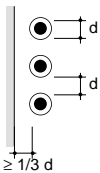
## SINGLE-CORE CABLES AIR LAYING HORIZONTALLY AND VERTICALLY SPACED OUT



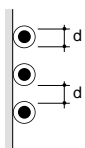
Number of trefoil sets (horizontally)	1	2	4
	0.92	0.89	0.97



Number of trefoil sets (horizontally)	1	2	
Number of layers (vertically)	1	1.00	0.97
	2	0.97	0.94
	3	0.96	0.93



Number of trefoil sets (vertically)	1	2
	0.94	0.91



Number of trefoil sets (vertically)	1	2
	0.89	0.86

## PHASE LAY-OUT FOR SINGLE-CORE CABLES CONNECTED IN PARALLEL TO PROVIDE CORRECT CURRENT SPLITTING

### Trefoil laying cables

Number of trefoil sets in the same layer*	2	3	4
	T RS T SR	T RS T SR T RS	T RS T SR T RS T SR

### Horizontally or vertically spaced-out cables

Number of trefoil sets in the same layer*	2	4
	RST TSR	RST TSR RST TSR

\*When cables are installed on several layers their lay-out must be repeated for each layer.

## SHORT CIRCUIT RATING

The maximum short circuit current allowed for short period of time (few seconds) for copper or aluminium conductors can be calculated by the following formula:

$$I_{cc} = \frac{K \cdot S}{\sqrt{t}} \text{ (A)}$$

where:

- $I_{cc}$  = short circuit current (A)
- $K$  = factor of the conducting material which obtained from the difference between starting and final temperature of short circuit;  
 K copper = 143  
 K aluminium = 92
- $S$  = area conductor (mm<sup>2</sup>)
- $t$  = duration of short circuit (sec.)

### K factor (final temperature = 250°C)

Material Conductor	Starting temperature		
	50	70	90
copper	165	154	143
aluminium	107	100	92

To calculate the current allowed in the screen you can use the same formula indicated above for the conductor with the factor  $K = 180^\circ\text{C}$ .

The following table reports the values in KA of the current calculated for the starting temperature of 90°C and for the duration of 1 second.

Area conductor mm <sup>2</sup>	Copper	Aluminium
25	3.6	2.3
35	5.0	3.2
50	7.1	4.6
70	10	6.4
95	14	8.7
120	17	11
150	21	14
185	26	17
240	34	22
300	43	28
400	57	37
500	72	46
630	90	58

## VOLTAGE DROP

The voltage drop can be calculated by the following formula for connections in alternating current:

$$\Delta V = K \cdot L \cdot I (R \cdot \cos\phi + X \cdot \sin\phi)$$

where:

- $\Delta V$  = voltage drop (V)
- $K$  = 1,73 for three-phase system
- $K$  = 2 for single-phase system
- $L$  = connection length (km)
- $I$  = current rating (A)
- $R$  = conductor resistance at using temperature (Ohm/km)
- $X$  = phase reactance (Ohm/km)
- $\cos\phi$  = power factor

For connection in direct current  $\cos\phi = 1$

### Comparison between rated voltages and insulation rate

Insulation rate	Nominal voltage kV U <sub>0</sub> /U	Maximum voltage kV U <sub>m</sub>
8	1.8/3	3.6
11	3.6/6	7.2
17	6/10	12
24	8.7/15	17.5
32	12/20	24
47	18/30	36
67	26/45	52

$U_0$  = relates to the nominal tension between a conductor and earth

$U$  = relates to the nominal tension between the conductors of the cable

$U_m$  = maximum tension for which the cable is suitable

## FINAL TESTS

The final tests to which the **Medium Voltage** cables are subjected are in compliance with CEI 20-13 standards.

### Electrical tests on:

- high-voltage test
- power factor ( $\tan\delta$ ) measurement
- electrical resistance of conductor and screen
- insulation resistance measurement
- partial discharge test (for tension  $U_0 \geq 6kV$ )

### Tests on cable samples:

- check of dimensions
- bending test
- life test
- impulse withstand test
- moisture resistance test

### Tests on material samples:

- tests for determining the mechanical properties of insulation before and after ageing
- tests for determining the mechanical properties of sheaths before and after ageing
- sheath thermoplastic characteristics
- characteristics of wires, tapes, and steel flat wires of armouring (if applicable)

### Electrical tests after installation:

- before the final connection of equipments we recommend to carry out an high-voltage test to verify if the cables have been damaged during the installation, in compliance with CEI 11-17 standards

Insulation rated voltage $U_0$ kv	Electrical tests after installation in c.c. for 15' kv
3.6	10.8
6.0	18
8.7	26.1
12	36
18	54

## INSTALLATION

Surveys show that all types of cables are damaged during installation because of carelessness, inexperience and lack of simple precautions.

For the benefit of the many new workers involved in electrical work and in the interests of eliminating such preventable causes of electrical shutdowns and loss of production, we suggest the following norms which govern the installation CEI 11-17 «Generation, transmission and distribution systems of electric power – Cable installation».

We summarize some rules to be observed during the installation of cables for fixed laying.

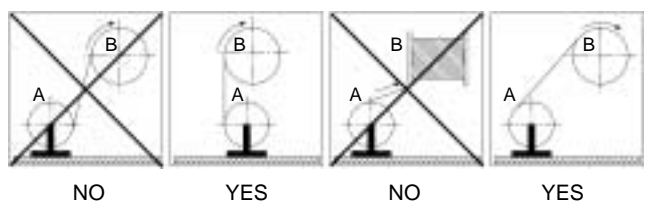
Installation minimum temperature: 0°C referred to the cables so it's necessary to begin and finish the installation in suitable environmental conditions so that the cable temperature does not go below 0°C.

Bending radius: please see the values listed in «Range and Dimension» calculated according to CEI 11-17 standards.

Installation: it's advisable to apply the pool force, which is necessary to the installation, only to the conductors being careful not to exceed **6 kg/mm<sup>2</sup>** of total area conductor for copper cables and **5 kg/mm<sup>2</sup>** for aluminium cables.

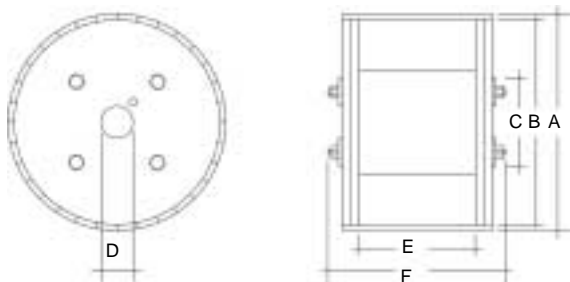
The pool force by steel braid is advisable only for limited efforts.

## WOODEN DRUMS HANDLING



# PACKAGING

## DRUMS DIMENSION



- A - Flange diameter including circumference batten
- B - Flange diameter without circumference batten
- C - Inner barrel diameter
- D - Axis hole
- E - Inner width
- F - External width

DRUM TYPE	A mm	B mm	C mm	D mm	E mm	F mm	Weight Kg.	Volume m <sup>3</sup>
60	690	630	315	80	315	435	30	0,19
70	770	710	355	80	400	515	35	0,28
80	960	800	400	80	450	575	40	0,39
90	960	900	450	80	450	575	50	0,45
90D	960	900	450	80	500	620	50	0,45
100	1.060	1.000	500	80	560	685	60	0,77
120	1.310	1.250	630	80	630	760	100	1,27
140	1.460	1.400	710	80	750	920	140	1,76
160	1.660	1.600	900	80	900	1.070	250	2,80
180	1.860	1.800	1.120	80	1.120	1.320	300	4,2
200	2.060	2.000	1.250	125	1.120	1.320	400	5,2
220	2.300	2.240	1.400	125	1.120	1.320	450	6,3
250	2.510	2.450	1.500	125	1.120	1.320	500	8,2

## DRUM CAPACITIES METERS

Cable diameter mm	DRUM TYPE								
	60	80	100	120	160	180	200	220	250
11	400	1000	2000	—	—	—	—	—	—
14	250	650	1350	—	—	—	—	—	—
17	—	450	900	1400	—	—	—	—	—
20	—	—	650	1100	—	—	—	—	—
23	—	—	500	850	1750	—	—	—	—
26	—	—	—	650	1400	—	—	—	—
29	—	—	—	510	1100	—	—	—	—
34	—	—	—	400	800	1200	1450	—	—
40	—	—	—	—	575	800	1050	1420	—
46	—	—	—	—	435	605	790	1075	1405
52	—	—	—	—	340	470	620	840	1100
58	—	—	—	—	275	380	500	675	885
64	—	—	—	—	225	310	410	555	725
70	—	—	—	—	—	260	340	465	605
76	—	—	—	—	—	220	290	390	515
82	—	—	—	—	—	—	250	340	440
88	—	—	—	—	—	—	215	290	385
94	—	—	—	—	—	—	—	255	335
100	—	—	—	—	—	—	—	225	295

## QUALITY SYSTEM

Our Quality System management includes to certificates:  
Basec (UK) and Aenor (E), in accordance to ISO 9001 covering  
the production, purchasing of raw materials design and final test  
including various documents typologies.

Tratos Quality System management is under constant control by  
inspectors working for the certifying bodies.



Tratos Cavi S.p.A. reserves the right to modify at any time technical, dimensional and weight characteristics shown in this catalogue anyhow always in accordance to the mentioned Standards in case it improves the features of its products.

There is no responsibility of the manufacturer for damages to persons and property in case of improper use and/or neglecting the recommendations for using cables and norms contained in this catalogue.

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