

Table 12-1: Power rating

Of wires & cables having nominal voltage up to 1000 V and heat resistant wire & cables, ambient temperature +30 °C

Cable or lead category			
Method of installation	A Single core cable • rubber insulated • PVC insulated • TPE insulated • heat resistant	B Multi core cables and cords for home- and portable apparatus • rubber insulated • PVC insulated • TPE insulated	
Number of current carrying conductors	1 ³⁾	2	3
Nominal cross section in mm ²	Current rating in A	Current rating in A	
0.08 ¹⁾	1,5	-	-
0.14 ¹⁾	3	-	-
0.25 ¹⁾	5	-	-
0.34 ¹⁾	8	-	-
0.5	12 ²⁾	3	3
0.75	15	6	6
1.0	19	10	10
1.5	24	16	16
2.5	32	25	20
4	42	32	25
6	54	40	-
10	73	63	-
16	98	-	-
25	129	-	-
35	158	-	-
50	198	-	-
70	245	-	-
95	292	-	-
120	344	-	-
150	391	-	-
185	448	-	-
240	528	-	-
300	608	-	-
400	726	-	-
500	830	-	-
Sources of current ratings of Table 12-1:	DIN VDE 0298-4, 2003-08 Table 11 Column 2	DIN VDE 0298-4, 2003-08 Table 11 Column 3 + 4	

Table 12-1: Power rating

Of wires & cables having nominal voltage up to 1000 V and heat resistant wire & cables, ambient temperature +30 °C

Cable or lead category			
Method of installation	C Multicore cables + cords, excl. home- + portable apparatus • rubber insulated • PVC insulated • TPE- insulated • heat resistant	D Multicore heavy duty rubber cables ≤ 0.6/1kV Single core special rubber cables 0.6/1kV or 1.8/3kV	
Number of current carrying conductors	2 or 3	3	1 ³⁾
Nominal cross section in mm ²	Current rating in A	Current rating in A	
0.08 ¹⁾	1	-	-
0.14 ¹⁾	2	-	-
0.25 ¹⁾	4	-	-
0.34 ¹⁾	6	-	-
0.5	9 ²⁾	-	-
0.75	12	-	-
1.0	15	-	-
1.5	18	23	30
2.5	26	30	41
4	34	41	55
6	44	53	70
10	61	74	98
16	82	99	132
25	108	131	176
35	135	162	218
50	168	202	276
70	207	250	347
95	250	301	416
120	292	-	488
150	335	-	566
185	382	-	644
240	453	-	775
300	523	-	898
400	-	-	-
500	-	-	-
Sources of current ratings of Table 12-1:	DIN VDE 0298-4, 2003-08 Table 11 Column 5	DIN VDE 0298-4, 2003-08 Table 15 Column 4 + 2	

Note:

Design of Tables 12 to 13 deviates from VDE 0298-4 design. In case of doubt, appliance of the current issue of the DIN VDE 0298-4 is obligatory. Table 12-1 values have to be taken into consideration of further applicable converting/derating factors:

- Other ambient temperatures: Table 12-2
- more than 3 current carrying cores of multiconductor cables up to 10 mm²: Table 12-3
- Ambient temperatures > 50 °C of heat resistant wire & cables: Table 12-4
- for winded, spooled cables: Table 12-5
- Grouping of single core & multi core cables in conduits, raceways, wire ways, floor & ceiling: Table 12-6
- Grouping of multi core cables in cable trays: Table 12-7
- Grouping of single core cables in cable trays: Table 12-8

**Table 12-1 Column A – D,
Cable Categories:**

A: Single cores: LiY, LiYCY-EA, H05V-K, H07V-K, H07V2-K, H07Z-K, Multi-standard wiring cable, ÖLFLEX® HEAT 105, -145, ÖLFLEX® HEAT 180 and ÖLFLEX® HEAT 205/260 wires/single core cables.

B: Multicore cables & service cords for home- and portable apparatus: ÖLFLEX® CLASSIC 100, H05VV-F, 450 P, 500 P 540 P, H05RR-F, H05RN-F, H05BQ-F, H07BQ-F

C: Multi core power and control cables excluding home and portable apparatus: All ÖLFLEX®, ÖLFLEX® CRANE-, ÖLFLEX® HEAT-, ÖLFLEX® HEAT 180-, ÖLFLEX® HEAT 205/260- cables,

D: Multi core heavy duty rubber cables U0/U ≤ 0.6/1kV: ÖLFLEX® CRANE NSHTÖU, ÖLFLEX® CRANE VS, NSHTÖU, NSSHÖU, ÖLFLEX® HEAT-Multicore cables. Single core special rubber cable U0/: 0.6/1kV or 1.8/3 kV: NSGA FÖU, NSHXAFÖU; ÖLFLEX® HEAT® 145 single core cables.

**Current (power) ampacity
of other cables:**

Copper earthing cable ESUY see VDE 0105 part 1

H07RN-F/A 07RN-F/H07BQ-F for industrial use: see Catalogue Table T12-9. Welding cable H01N2-D see Catalogue Table T12-10.

Cables for building wiring: NYM, NHX-MH, NY, NYCY, NYCWY, NHXHX see VDE 0298-4, 2003-08, Table 3 & 4.

Cables & wires in machines: see DIN EN 60204-1/VDE 0113-1 Cables & wires in machines for USA: see National Electrical Code & NFPA 79, Table 13

¹⁾ VDE 0891-1 -borrowed current ratings for conductor sizes < 0.5mm² (0.08 - 0.34 mm²)

²⁾ In terms of VDE 0298-4, 2003-08, Table 11 column 2 extended range for size 0.5 mm².

³⁾ Clustering of single core cables in touch to each other or bundled cables:

- on surfaces: Current rating values of Table 12-1 column A or D, - for 1~A.C. or - or D.C.-circuits a derating factor of 0.76 - for 3~A.C. circuits a derating factor of 0.67 have to be applied before applying conversion factor of Table 12-6

- free in air or on cable trays: Current rating values of Table 12-1 column A or D, - for 1~A.C. - or D.C. circuits a derating factor of 0.8 - for 3~A.C. circuits a derating factor of 0.7 have to be applied before applying conversion factor of Table 12-8

- Attention: Single cores (wires) installed in conduits or pipes in or attached to walls (Installation Methode A1 or B1) in buildings see VDE 0298, Tables 3 or 5, column 2, 3, 6, or 7 & Table 21

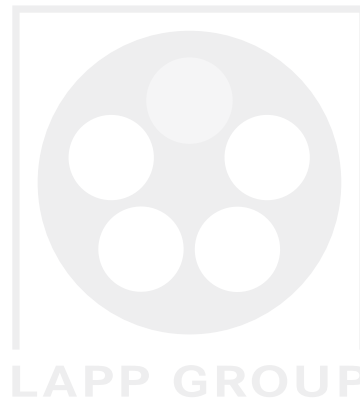


Table 12-2: Correction Factors

For ambient temperatures different to 30 °C. For heat resistant cables and wires see Table T12-4 (in accordance to DIN VDE 0298-4, 2003-08, Table 17).

Rated temperature of the conductor of wire or cable (See product page of the Catalogue, Technical Data, Temperature range: upper value for static and/or flexing)					
	60 °C	70 °C	80 °C	85 °C	90 °C
Ambient temperature in °C	Correction factor, applicable to current value of T12-1				
10	1.29	1.22	1.18	1.17	1.15
15	1.22	1.17	1.14	1.13	1.12
20	1.15	1.12	1.10	1.09	1.08
25	1.08	1.06	1.05	1.04	1.04
30	1.00	1.00	1.00	1.00	1.00
35	0.91	0.94	0.95	0.95	0.96
40	0.82	0.87	0.89	0.90	0.91
45	0.71	0.79	0.84	0.85	0.87
50	0.58	0.71	0.77	-	0.82
55	0.41	0.61	0.71	-	0.76
60	-	0.50	0.63	-	0.71
65	-	0.35	0.55	-	0.65
70	-	-	0.45	-	0.58
75	-	-	0.32	-	0.50
80	-	-	-	-	0.41
85	-	-	-	-	0.29

Table 12-3: Correction Factors

for multiconductor cables and cords, having conductor size up to 10 mm² (DIN VDE 0298-4, 2003-08, Table 26).

Number of current carrying conductors	Correction factors for cables in free air	Correction factors for cables in earth (burial)
5	0.75	0.70
7	0.65	0.60
10	0.55	0.50
14	0.50	0.45
19	0.45	0.40
24	0.40	0.35
40	0.35	0.30
61	0.30	0.25

Table 12-4: Correction factors of heat resistant cables and wires

Cables and wires classified according to its rated temperature of the conductor (See product page of the Catalogue "Technical Data, Temperature Range, for upper value for static and/or flexing use").				
	ÖLFLEX® HEAT 105 H07V2-K ÖLFLEX®-FD ROBUST H07Z-K 90 °C	Halogen free single core H07Z-K 110 °C	ÖLFLEX® HEAT 145	ÖLFLEX® HEAT 180 Silicone rubber
Ambient temperature in °C	Correction factors, applying to current value of Table 12-1, column A, C or D for heat resistant wires and cables (Source: DIN VDE 0298-4, 2003-08, Table 18)			
up to 50	1.00	1.00	1.00	1.00
55	0.94	1.00	1.00	1.00
60	0.87	1.00	1.00	1.00
65	0.79	1.00	1.00	1.00
70	0.71	1.00	1.00	1.00
75	0.61	1.00	1.00	1.00
80	0.50	1.00	1.00	1.00
85	0.35	0.91	1.00	1.00
90	-	0.82	1.00	1.00
95	-	0.71	1.00	1.00
100	-	0.58	0.94	1.00
105	-	0.41	0.87	1.00
110	-	-	0.79	1.00
115	-	-	0.71	1.00
120	-	-	0.61	1.00
125	-	-	0.50	1.00
130	-	-	0.35	1.00
135	-	-	-	1.00
140	-	-	-	1.00
150	-	-	-	1.00
155	-	-	-	0.91
160	-	-	-	0.82
165	-	-	-	0.71
170	-	-	-	0.58
175	-	-	-	0.41

Table 12-5: Correction factors

of spooled/winded cables (DIN VDE 0298-4, 2003-8, Table 27)

Number of layers on spool, reel or drum	1	2	3	4	5
Correction factor	0.80	0.61	0.49	0.42	0.38

For helix-type coiled/winded cables (spiral in one layer) the correction factor is 0.8.

Table 12-6: Correction factors

Grouping on the wall, floor, ceiling in accordance to DIN VDE 0298-4, 2003-08, conduits or closed wire ways (in accordance to Table 21).

Number of current-carrying multicore cables or number of groups of 2- or 3-phase A.C. circuits single core cables								
Type of installation (method)	1	2	3	4	5	6	7	8
On floors or walls with contact between each other bunched directly as well as in conduits or in wireways.	1.00	0.80	0.70	0.65	0.60	0.57	0.54	0.52
In touch between each other, directly attached to walls or floors in one layer.	1.00	0.85	0.79	0.75	0.73	0.72	0.72	0.71
With clearance of "d" between each other, directly attached to walls or floors in one layer.	1.00	0.94	0.90	0.90	0.90	0.90	0.90	0.90
In touch between each other, directly attached to ceilings.	0.95	0.81	0.72	0.68	0.66	0.64	0.63	0.62
With clearance of "d" between each other, directly attached to ceilings in one layer.	0.95	0.85	0.85	0.85	0.85	0.85	0.85	0.85

Number of current-carrying multicore cables or number of groups of 2- or 3-phase A.C. circuits single core cables							
Type of installation (method)	9	10	12	14	16	18	20
On floors or walls with contact between each other bunched directly as well as in conduits or in wireways.	0.50	0.48	0.45	0.43	0.41	0.39	0.38
In touch between each other, directly attached to walls or floors in one layer.	0.70	0.70	0.70	0.70	0.70	0.70	0.70
With clearance of "d" between each other, directly attached to walls or floors in one layer.	0.90	0.90	0.90	0.90	0.90	0.90	0.90
In touch between each other, directly attached to ceilings.	0.61	0.61	0.61	0.61	0.61	0.61	0.61
With clearance of "d" between each other, directly attached to ceilings in one layer.	0.85	0.85	0.85	0.85	0.85	0.85	0.85

○ = Symbol of one single core or one multicore cable.

Notice: Correction factors can be applied only to similar loaded cables of a similar type of installation (wiring methode) and nominal cross sections differ one step only.

Table 12-7: Correction factors

for grouping/clustering of multi-conductor cables in cable trays (in accordance to DIN VDE 0298-4, 2003-08, Table 22).

dance to DIN VDE 0298-4, 2003-08, Table 22).

Cable arrangement	Number of cable trays	Number of multi conductor cables						
		1	2	3	4	6	9	
Cable tray, non-punched	in touch	1	0.97	0.84	0.78	0.75	0.71	0.68
		2	0.97	0.83	0.76	0.72	0.68	0.63
		3	0.97	0.82	0.75	0.71	0.66	0.61
		6	0.97	0.81	0.73	0.69	0.63	0.58
Cable tray, punched (ventilated)	in touch	1	1.00	0.88	0.82	0.79	0.76	0.73
		2	1.00	0.87	0.80	0.77	0.73	0.68
		3	1.00	0.86	0.79	0.76	0.71	0.66
		6	1.00	0.84	0.77	0.73	0.68	0.64
	with space	1	1.00	1.00	0.98	0.95	0.91	-
		2	1.00	0.99	0.96	0.92	0.87	-
		3	1.00	0.98	0.95	0.91	0.85	-
	in touch	1	1.00	0.88	0.82	0.78	0.73	0.72
		2	1.00	0.88	0.81	0.76	0.71	0.70
	with space	1	1.00	0.91	0.89	0.88	0.87	-
		2	1.00	0.91	0.88	0.87	0.85	-
	Cable tray, ladder type	in touch	1	1.00	0.87	0.82	0.80	0.79
		2	1.00	0.86	0.81	0.78	0.76	0.73
		3	1.00	0.85	0.79	0.76	0.73	0.70
		6	1.00	0.83	0.76	0.73	0.69	0.66
with space		1	1.00	1.00	1.00	1.00	1.00	-
		2	1.00	0.99	0.98	0.97	0.96	-
	3	1.00	0.98	0.97	0.96	0.93	-	

Note: Correction factors are applicable to similar loaded cables of a similar type of installation (wiring method) of groups of cables, lying in one-layer only, as shown at this page. Correction factors are not applicable to cables lying on top to each other as well as if minimum distance required according that Table is not guaranteed. In such cases correction factors of this Table have to be additional corrected too. I.e. according table 12-6.

Table 12-8: Correction factors

for grouping/clustering of single core cables in cable trays. Applicable to current values of Table 12-1 (Origin of

T12-8 = DIN VDE 0298-4 2003-08, Table 23).

Cable arrangement	Number of cable trays	Number of 3-phase circuits comprising single core cables			Applicable as a multiplier of the rated values of:	
		1	2	3		
Cable tray, punched (ventilated)	in touch	1	0.98	0.91	0.87	three cables, horizontal array, one-layer configuration
		2	0.96	0.87	0.81	
		3	0.95	0.85	0.78	
Cable tray, ladder type	in touch	1	1.00	0.97	0.96	three cables, horizontal array, one-layer configuration
		2	0.98	0.93	0.89	
Cable tray, punched (ventilated)	in touch	1	1.00	0.98	0.96	three cables, horizontal array, delta-configuration
		2	0.97	0.93	0.89	
		3	0.96	0.92	0.86	
Cable tray, ladder type	in touch	1	1.00	0.91	0.89	three cables, vertical array, delta-configuration
		2	1.00	0.90	0.86	
Cable tray, ladder type	in touch	1	1.00	1.00	1.00	three cables, horizontal array, delta-configuration
		2	0.97	0.95	0.93	
		3	0.96	0.94	0.90	

Note: Correction factors are applicable to similar loaded cables of a similar type of installation (wiring method) of groups of single core cables, lying in one-layer or delta configuration only, as shown at this page. Conversion factors are not applicable to cables lying on top to each other as well as if minimum distance required according that Table is not guaranteed. In such cases correction factors of this Table have to be additional corrected too. I.e. according Table 12-6. In cases where a splitting into certain numbers of parallel groups of cables is needed, each group of 3 current carrying cables is considered as being one entire circuit.

Table 12-9: Power rating of rubber cables

H07RN-F and A07RN-F in industrial application usage (in accordance with | DIN VDE 0298-4, Aug. 2003 Table 13).

Rated temperature at the conductor	60 °C			
	30 °C			
Ambient-temperature				
Installation-methode				
Free in air				
Number of current carrying conductors	2	3	2	2
Conductors nominal cross-section in mm ²	Current rating in A			
1	-	-	15	15,5
1.5	19	16,5	18,5	19,5
2.5	26	22	25	26
4	34	30	34	35
6	43	38	43	44
10	60	53	60	62
16	79	71	79	82
25	104	94	105	109
35	129	117	-	135
50	162	148	-	169
70	202	185	-	211
95	240	222	-	250
120	280	260	-	292
150	321	300	-	335
185	363	341	-	378
240	433	407	-	447
300	497	468	-	509
400	586	553	-	-
500	970	634	-	-
630	784	742	-	-
Correction factors for:				
Other ambient temperatures	see Table T 12-2			
Grouping/Clustering	-	T12-8		
Spooled/winded cables	-	-		
Multi conductor cables			-	

Table 12-9: Power rating of rubber cables

H07RN-F and A07RN-F in industrial application usage (in accordance with | DIN VDE 0298-4, Aug. 2003 Table 13).

Rated temperature at the conductor	60 °C		
	30 °C		
Ambient-temperature			
Installation-methode			
Free in air			
Number of current carrying conductors	3	3	3
Conductors nominal cross-section in mm ²	Current rating in A		
1	12,5	13	13,5
1.5	15,5	16	16,5
2.5	21	22	23
4	29	30	30
6	36	37	38
10	51	52	54
16	67	69	71
25	89	92	94
35	110	114	-
50	138	143	-
70	172	178	-
95	204	210	-
120	238	246	-
150	273	282	-
185	309	319	-
240	365	377	-
300	415	430	-
400	-	-	-
500	-	-	-
630	-	-	-
Correction factors for:			
Other ambient temperatures	see Table T 12-2		
Grouping/Clustering	T12-7		
Spooled/winded cables	T12-5		
Multi conductor cables	T12-3		-

■ **Table 12-10: Power ratings & conditions of arc-welding cables**

H01N2-D and H01N2-E (in accordance to DINVDE 0298-4, 2003-08, Table 16)

Rated temperature at the conductor		85 °C						
Ambient temperature		30 °C						
Applying condition of the cable		in free air						
Number of current carrying conductors		1						
Mode of operation		Continuous		Interrupt				
Operating periode		5 min						
Operating factor OF		100 %	85 %	80 %	60 %	35 %	20 %	8 %
Nom. cross section copper conductor mm ²		Rating in A						
10	96	97	98	102	114	137	198	
16	130	132	134	142	166	204	301	
25	173	179	181	196	234	293	442	
35	216	226	229	250	304	384	584	
50	274	287	293	323	398	508	779	
70	341	360	368	409	510	655	1011	
95	413	438	448	502	632	816	1266	
120	480	511	523	588	745	966	1502	
150	557	594	609	687	875	1137	1771	
185	638	683	700	793	1012	1319	2059	
Mode of operation		Continuous		Interrupt				
Operating periode		10 min						
Operating factor OF		100 %	85 %	80 %	60 %	35 %	20 %	8 %
Nom. cross section copper conductor mm ²		Rating in A						
10	96	96	96	97	102	113	152	
16	130	131	131	133	144	167	233	
25	173	175	176	182	204	244	351	
35	216	220	222	233	268	324	477	
50	274	281	284	303	356	439	654	
70	341	352	358	387	463	578	872	
95	413	430	438	478	582	734	1117	
120	480	503	513	564	692	880	1348	
150	557	586	597	661	819	1046	1609	
185	638	674	688	765	955	1226	1892	
Other ambient temperatures		Table T12-2						

■ **Table 13-1: Power ampacity to single core and multi core cables acc. to NEC (USA)**

Abstract of NEC Tabelle 310-16

Allowable ampacity (in Ampere) of insulated conductors, rated 0 – 2000 Volts, 60 °C to 90 °C, (140 °F to 194 °F). NOT MORE THAN THREE CONDUCTORS in raceway or cable ore Earth (direct burial), based on ambient temperature of 30 °C (86 °F).

Abstract of NEC Tabelle 310-17

Allowable Ampacity (in Ampere) of SINGLE INSULATED CONDUCTORS, rated 0 – 2000 Volts, in free air, based on ambient temperature of 30 °C.

Conductor size AWG or kcmil (MCM)	Temperature Rating of Conductor			Conductor size AWG or kcmil (MCM)	Temperature Rating of Conductor		
	60 °C (140 °F)	75 °C (167 °F)	90 °C (194 °F)		60 °C (140 °F)	75 °C (167 °F)	90 °C (194 °F)
18	–	–	14	18	–	–	18
16	–	–	18	16	–	–	24
14	20*	20*	25*	14	25*	30*	35*
12	25*	25*	30*	12	30*	35*	40*
10	30	35*	40*	10	40*	50*	55*
8	40	50	55	8	60	70	80
6	55	65	75	6	80	95	105
4	70	85	95	4	105	125	140
3	85	100	110	3	120	145	165
2	95	115	130	2	140	170	190
1	110	130	150	1	165	195	220
1/0	125	150	170	1/0	195	230	260
2/0	145	175	195	2/0	225	265	300
3/0	165	200	225	3/0	260	310	350
4/0	195	230	260	4/0	300	360	405
250	215	255	290	250	340	405	455
300	240	285	320	300	375	445	505
350	260	310	350	350	420	505	570
400	280	355	380	400	455	545	615
500	320	380	430	500	515	620	700
600	355	420	475	600	575	690	780

* **Note:** Unless otherwise specifically permitted elsewhere in the NEC, the overcurrent protection for conductor types marked with an * shall not exceed 15 amperes for AWG 14, 20 amperes for AWG 12 and 30 amperes for AWG 10, after any correction factors for ambient temperature and numbers of conductors have been applied.

T13 Technical Tables

T13: Power Rating according to the National Electrical Code of the USA

Table 13-1: Power ampacity to single core and multi core cables acc. to NEC (USA)

Correction factors for ambient temperatures other than 30 °C				Correction factors for more than three current-carrying conductors in a raceway or cable	
Ambient temperature in °C	60 °C	75 °C	90 °C	Number of current-carrying conductors	Correction factor
21 – 25	1.08	1.05	1.04	4 up to 6	0.80
26 – 30	1.00	1.00	1.00	7 up to 9	0.70
31 – 35	0.91	0.94	0.96	10 up to 20	0.50
36 – 40	0.82	0.88	0.91	21 up to 30	0.45
41 – 45	0.71	0.82	0.87	31 up to 40	0.40
46 – 50	0.58	0.75	0.82	41 and more	0.35
51 – 55	0.41	0.67	0.76		
56 – 60	-	0.58	0.71		
61 – 70	-	0.33	0.58		
71 – 80	-	-	0.41		

Note: Power ampacity of cables & wires in industrial machinery, see chapter 12 of the NFPA 79 Edition 2007.



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