TeSys contactors
For lighting circuits

General

The operating conditions of lighting circuits have the following characteristics:
- continuous duty: the switching device can remain closed for several days or even months
- a dispersion factor of 1: all luminaires in the same group are switched on or off simultaneously
- a relatively high temperature around the device due to the enclosure, the presence of fuses, or an unventilated control panel location.

This is why the operational current for lighting is lower than the value given for AC-1 duty.

Protection

The continuous duty current drawn by a lighting circuit is constant. In fact:
- it is unlikely that the number of luminaires of an existing circuit will be modified
- this type of circuit cannot create an overload of long duration.

It is therefore only necessary to provide short-circuit protection.
This can be provided by:
- gG type fuses, or
- modular circuit breakers.

Nevertheless, it is always possible and sometimes more economical (smaller cable size) to protect the circuit by a thermal overload relay and associated aM type uses.

Distribution system

Single-phase circuit, 220/240 V

The tables on pages A6/39 to A6/43 are based on a single-phase 220/240 V circuit and can therefore be applied directly in this case.

3-phase circuit, 380/415 V (with neutral)

The total number of lamps (N) to be switched simultaneously is divided into three equal groups, each connected between one phase and neutral. The contactor can then be selected from the 220/240 V single-phase tables for a number of lamps equal to $\frac{N}{3}$ lamps.

3-phase circuit, 220/240 V

The total number of lamps (N) to be switched simultaneously is divided into three equal groups, each connected between 2 phases (L1-L2), (L2-L3), (L3-L1).
The contactor can then be selected from the 220/240 V single-phase table for a number of lamps equal to $\frac{N}{\sqrt{3}}$ lamps.

Contactor selection tables

For the different types of lamps, the tables on pages A6/39 to A6/43 give the maximum number of lamps of unit power P (in Watts), which can be switched simultaneously for each size of contactor.
They are based on:
- a 220/240 V single-phase circuit
- an ambient temperature of 55 °C (1), taking into account the operating conditions (see General paragraph)
- an electrical life of more than 10 years (200 days' operation per year).

They take into account:
- the total current drawn (including ballast)
- transient phenomena which occur at switch-on
- the starting currents and their duration
- the circulation of any harmonics which may be present.

Lamps with compensating capacitor C (µF) connected in parallel

Parallel connected compensating capacitors **C** cause a current peak at the moment of switch-on. To ensure that the value of this current peak remains compatible with the making characteristics of the contactors, the unit value of the capacitance must not exceed the following:

Switching contactor rating	LC1 K09	LP1 K09	LC1 D09	LC1 D12	LC1 D18	LC1 D25	LC1 D32	LC1 D38	LC1 D40A	LC1 D50A	LC1 D65A	LC1 D80
Maximum unit value C (µF) of parallel connected compensating capacitor	7	3	18	18	25	60	96	96	120	120	240	240

Switching contactor rating	LC1 D95	LC1 D115	LC1 D150	LC1 F185	LC1 F225	LC1 F265	LC1 F330	LC1 F400	LC1 F500	LC1 F630	LC1 F800
Maximum unit value C (µF) of parallel connected compensating capacitor	240	300	360	800	1200	1700	2500	4000	6000	9000	10800

This value is independent of the number of lamps switched by the contactor.

(1) For an ambient temperature of 40 °C, multiply the number by 1.2.

Characteristics: pages B8/55 to B8/60
References: pages B8/2 to B8/7
Dimensions, Schemes: pages B8/67 to B8/72

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Usual values

The tables show the following values:
- IB: value of current drawn by each lamp at its rated voltage,
- C: unit capacitance for each lamp,

corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

Incandescent and halogen lamps

P (W)	60	75	100	150	200	300	500	750	1000	
IB (A)	0.27	0.34	0.45	0.68	0.91	1.40	2.30	3.40	4.60	LC1
Max. no. of lamps according to P (W)	35	28	21	14	10	6	4	2	2	K09
	59	47	35	23	17	11	7	4	3	D09, D12
	77	61	46	30	23	15	9	6	4	D18
	92	73	55	36	27	18	11	7	5	D25
	129	103	77	51	38	25	15	10	7	D32, D38
	163	129	97	64	48	31	19	13	9	D40A
	207	164	124	82	62	40	24	16	12	D50A, D65A
	296	235	177	117	88	57	34	23	17	D80, D95
	430	340	256	170	126	82	50	34	24	D115
	466	370	280	184	138	90	54	36	26	D150
	710	564	426	282	210	136	82	56	40	F185
	770	610	462	304	228	148	90	60	44	F225
	888	704	532	352	262	170	104	70	52	F265
	1006	800	604	400	298	194	118	80	58	F330
	1274	1010	764	504	378	244	148	100	74	F400
	1718	1364	1030	682	508	330	200	136	100	F500
	2328	1850	1396	924	690	448	272	184	136	F630
	2776	2204	1666	1102	824	534	326	220	162	F800

Mixed lighting lamps

P (W)	100	160	250	500	1000	
IB (A)	0.45	0.72	1.10	2.30	4.50	LC1
Max. no. of lamps according to P (W)	21	13	8	4	2	K09
	35	22	14	7	3	D09, D12
	46	29	18	9	4	D18
	55	36	23	11	5	D25
	77	48	30	15	7	D32, D38
	97	61	38	19	9	D40A
	124	77	49	24	12	D50A, D65A
	177	111	70	34	17	D80, D95
	256	160	104	50	26	D115
	280	174	114	54	28	D150
	426	266	174	82	42	F185
	462	288	188	90	46	F225
	532	332	218	104	52	F265
	604	378	246	118	60	F330
	764	478	312	150	76	F400
	1030	644	422	202	102	F500
	1398	874	572	272	140	F630
	1666	1040	680	326	166	F800

Characteristics: pages B8/55 to B8/60
References: pages B8/2 to B8/7
Dimensions, Schemes: pages B8/67 to B8/72

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Usual values

The tables show the following values:
- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp

corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

Fluorescent lamps with starter. Single fitting

	Non corrected				With parallel correction						
P (W)	20	40	65	80	110	20	40	65	80	110	
IB (A)	0.39	0.45	0.70	0.80	1.2	0.17	0.26	0.42	0.52	0.72	
C (µF)	–	–	–	–	–	5	5	7	7	16	LC1
Max. no. of lamps according to P (W)	24	21	13	12	8	56	36	22	18	–	K09
	41	35	22	20	13	94	61	38	30	22	D09, D12
	53	46	30	26	17	123	80	50	40	29	D18
	66	57	37	32	21	152	100	61	50	36	D25
	89	77	50	43	29	205	134	83	67	48	D32, D38
	112	97	62	55	36	258	169	104	84	61	D40A
	143	124	80	70	46	329	215	133	107	77	D50A, D65A
	205	177	114	100	66	470	367	190	153	111	D80, D95
	410	354	228	200	132	940	614	380	306	222	D115, D150
	492	426	274	240	160	1128	738	456	368	266	F185
	532	462	296	260	172	1224	800	490	400	288	F225
	614	532	342	300	200	1412	922	570	462	332	F265
	696	604	388	340	226	1600	1046	648	522	378	F330
	882	764	490	430	286	2024	1322	818	662	478	F400
	1190	1030	662	580	386	2728	1724	1104	892	644	F500
	1612	1398	698	786	524	3700	2418	1498	1210	874	F630, F800

Fluorescent lamps with starter. Twin fitting

	Non corrected					With series correction					
P (W)	2x20	2x40	2x65	2x80	2x110	2x20	2x40	2x65	2x80	2x110	
IB (A)	2x0.22	2x0.41	2x0.67	2x0.82	2x1.1	2x0.13	2x0.24	2x0.39	2x0.48	2x0.65	LC1
Max. no. of lamps according to P (W)	2x21	2x11	2x7	2x5	2x4	2x36	2x20	2x12	2x10	2x7	K09
	2x36	2x18	2x10	2x8	2x6	2x60	2x32	2x20	2x16	2x12	D09, D12
	2x46	2x24	2x14	2x12	2x8	2x80	2x42	2x26	2x20	2x16	D18
	2x58	2x30	2x18	2x14	2x10	2x100	2x54	2x32	2x26	2x20	D25
	2x78	2x42	2x26	2x20	2x14	2x134	2x72	2x44	2x36	2x26	D32, D38
	2x100	2x52	2x32	2x26	2x18	2x168	2x90	2x56	2x44	2x32	D40A
	2x126	2x68	2x40	2x34	2x24	2x214	2x116	2x70	2x58	2x42	D50A, D65A
	2x180	2x96	2x58	2x48	2x36	2x306	2x166	2x102	2x82	2x60	D80, D95
	2x360	2x194	2x118	2x96	2x72	2x614	2x332	2x204	2x166	2x122	D115, D150
	2x436	2x234	2x142	2x116	2x86	2x738	2x400	2x246	2x200	2x148	F185
	2x472	2x254	2x154	2x126	2x94	2x800	2x432	2x266	2x216	2x160	F225
	2x544	2x292	2x178	2x146	2x108	2x922	2x500	2x308	2x250	2x184	F265
	2x618	2x332	2x202	2x166	2x124	2x1046	2x566	2x348	2x282	2x208	F330
	2x782	2x420	2x256	2x210	2x156	2x1322	2x716	2x440	2x358	2x264	F400
	2x1054	2x566	2x346	2x282	2x210	2x1784	2x966	2x594	2x482	2x356	F500
	2x1430	2x766	2x468	2x384	2x286	2x2418	2x1310	2x806	2x654	2x484	F630, F800

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References: pages B8/2 to B8/7
Dimensions, Schemes: pages B8/67 to B8/72

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Usual values

The tables show the following values:
- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp

corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

Fluorescent lamps without starter. Single fitting

	Non corrected					With parallel correction					
P (W)	20	40	65	80	110	20	40	65	80	110	
IB (A)	0.43	0.55	0.80	0.95	1.4	0.19	0.29	0.46	0.57	0.79	
C (µF)	–	–	–	–	–	5	5	7	7	16	LC1
Max. no. of lamps according to P (W)	22	17	12	10	6	50	33	20	16	–	K09
	37	29	20	16	11	84	55	34	28	20	D09, D12
	48	38	26	22	15	110	72	45	36	26	D18
	60	47	32	27	18	136	89	56	45	32	D25
	97	63	43	36	25	184	101	76	61	44	D32, D38
	102	80	55	46	31	231	151	95	77	55	D40A
	130	101	70	58	40	294	193	121	98	70	D50A, D65A
	186	145	100	84	57	421	275	173	140	101	D80, D95
	372	290	200	168	114	842	550	346	280	202	D115, D150
	446	348	240	202	136	1010	662	416	336	242	F185
	484	378	260	218	148	1094	716	452	364	262	F225
	558	436	300	252	170	1262	828	522	420	304	F265
	632	494	340	286	194	1432	938	590	476	344	F330
	800	624	430	362	246	1810	1186	748	604	434	F400
	1078	844	580	488	330	2442	1600	1008	814	586	F500
	1462	1144	786	662	448	3310	2168	1366	1104	796	F630, F800

Fluorescent lamps without starter. Twin fitting

	Non corrected					With series correction					
P (W)	2x20	2x40	2x65	2x80	2x110	2x20	2x40	2x65	2x80	2x110	
IB (A)	2x0.25	2x0.47	2x0.76	2x0.93	2x1.3	2x0.14	2x0.26	2x0.43	2x0.53	2x0.72	LC1
Max. no. of lamps according to P (W)	2x19	2x10	2x6	2x5	2x3	2x34	2x18	2x11	2x9	2x6	K09
	2x32	2x16	2x10	2x8	2x6	2x56	2x30	2x18	2x14	2x10	D09, D12
	2x42	2x22	2x12	2x10	2x8	2x74	2x40	2x24	2x18	2x14	D18
	2x52	2x26	2x16	2x12	2x10	2x92	2x50	2x30	2x24	2x18	D25
	2x70	2x36	2x22	2x18	2x12	2x124	2x66	2x40	2x32	2x24	D32, D38
	2x88	2x46	2x28	2x22	2x16	2x156	2x84	2x50	2x40	2x30	D40A
	2x112	2x58	2x36	2x30	2x20	2x200	2x106	2x64	2x52	2x38	D50A, D65A
	2x160	2x84	2x52	2x42	2x30	2x234	2x152	2x92	2x74	2x54	D80, D95
	2x320	2x170	2x104	2x86	2x60	2x570	2x306	2x186	2x150	2x110	D115, D150
	2x384	2x204	2x126	2x102	2x74	2x686	2x368	2x222	2x180	2x132	F185
	2x416	2x220	2x136	2x112	2x80	2x742	2x400	2x242	2x196	2x144	F225
	2x480	2x254	2x158	2x128	2x92	2x856	2x462	2x278	2x226	2x166	F265
	2x544	2x288	2x178	2x146	2x104	2x970	2x522	2x316	2x256	2x188	F330
	2x688	2x366	2x226	2x184	2x132	2x1228	2x662	2x400	2x324	2x238	F400
	2x928	2x494	2x304	2x248	2x178	2x1656	2x892	2x540	2x438	2x322	F500
	2x1258	2x668	2x414	2x338	2x242	2x2246	2x1210	2x730	2x592	2x436	F630, F800

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Dimensions, Schemes: pages B8/67 to B8/72

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Usual values

The tables show the following values:
- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp

corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

Low pressure sodium vapour lamps

	Non corrected							With parallel correction							
P (W)	35	55	90	135	150	180	200	35	55	90	135	150	180	200	
IB (A)	1.2	1.6	2.4	3.1	3.2	3.3	3.4	0.3	0.4	0.6	0.9	1	1.2	1.3	
C (µF)	–	–	–	–	–	–	–	17	17	25	36	36	36	36	LC1
Max. no. of lamps according to P (W)	6	5	3	2	2	2	2	–	–	–	–	–	–	–	K09
	10	7	5	3	3	3	3	40	30	–	–	–	–	–	D09, D12
	12	9	6	4	4	4	4	50	37	25	–	–	–	–	D18
	15	11	7	6	5	5	5	63	47	31	21	19	15	14	D25
	21	16	10	8	8	7	7	86	65	43	28	26	21	20	D32, D38
	27	20	13	10	10	10	9	110	82	55	36	33	27	25	D40A
	35	26	17	13	13	12	12	140	105	70	46	42	35	32	D50A, D65A
	50	37	25	19	18	18	17	200	150	100	66	60	50	46	D80, D95
	100	75	50	38	36	36	34	400	300	200	132	120	100	92	D115, D150
	140	104	70	54	52	50	48	560	420	280	186	168	140	128	F185
	152	114	76	58	56	54	54	606	454	302	202	182	152	140	F225
	174	130	88	68	66	64	62	700	524	350	232	210	174	162	F265
	198	148	98	76	74	72	70	792	594	396	264	238	198	182	F330
	250	188	124	96	94	90	88	1002	752	502	334	300	250	252	F400
	338	254	168	130	126	122	118	1352	1014	676	450	406	338	312	F500
	496	372	248	192	186	180	174	1982	1488	992	660	594	496	458	F630, F800

High pressure sodium vapour lamps

	Non corrected					With parallel correction					
P (W)	150	250	400	700	1000	150	250	400	700	1000	
IB (A)	1.9	3.2	5	8.8	12.4	0.84	1.4	2.2	3.9	5.5	
C (µF)	–	–	–	–	–	20	32	48	96	120	LC1
Max. no. of lamps according to P (W)	4	2	1	–	–	–	–	–	–	–	K09
	6	3	2	1	–	–	–	–	–	–	D09, D12
	7	4	3	1	1	17	–	–	–	–	D18
	10	5	3	2	1	22	13	8	–	–	D25
	13	8	5	2	2	30	18	11	6	–	D32, D38
	17	10	6	3	2	39	23	15	8	6	D40A
	22	13	8	4	3	50	30	19	10	7	D50A, D65A
	31	18	12	6	4	71	42	27	15	10	D80, D95
	62	36	24	12	8	142	84	54	30	20	D115, D150
	88	52	34	18	14	200	120	76	42	30	F185
	96	56	36	20	16	216	130	82	46	32	F225
	110	66	42	24	18	250	150	94	54	38	F265
	124	74	48	26	20	282	170	108	60	42	F330
	158	94	60	34	24	358	214	136	76	54	F400
	214	126	80	46	32	482	290	184	104	74	F500
	312	186	118	68	48	708	424	270	152	108	F630, F800

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Selection

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Usual values

The tables show the following values:
- IB: value of current drawn by each lamp at its rated voltage
- C: unit capacitance for each lamp

corresponding to the values normally quoted by lamp manufacturers.

These values are given for an ambient temperature of 55 °C (for 40 °C, multiply the number by 1.2).

High pressure mercury vapour lamps

	Non corrected							With parallel correction							
P (W)	50	80	125	250	400	700	1000	50	80	125	250	400	700	1000	
IB (A)	0.54	0.81	1.20	2.30	4.10	6.80	9.90	0.3	0.45	0.67	1.3	2.3	3.8	5.5	
C (µF)	–	–	–	–	–	–	–	10	10	10	18	25	40	60	LC1
Max. no. of lamps according to P (W)	14	9	6	3	1	–	–	–	–	–	–	–	–	–	K09
	22	14	9	5	2	1	1	40	26	17	9	–	–	–	D09, D12
	27	18	12	6	3	2	1	50	33	22	11	6	–	–	D18
	35	23	15	8	4	2	1	63	42	28	14	8	5	3	D25
	48	32	21	11	6	3	2	86	57	38	20	11	6	4	D32, D38
	61	40	27	14	8	4	3	110	73	49	25	14	8	6	D40A
	77	51	34	17	10	6	4	140	93	62	32	18	11	7	D50A, D65A
	111	74	49	26	14	8	6	200	133	89	46	26	15	10	D80, D95
	222	148	100	52	28	16	12	400	266	178	92	52	30	20	D115, D150
	310	206	140	72	40	24	17	560	372	250	128	72	44	30	F185
	336	224	152	78	44	26	18	606	404	272	140	78	48	32	F225
	388	258	174	90	50	30	20	700	466	312	162	90	54	38	F265
	440	294	198	102	58	34	24	792	528	354	182	102	62	42	F330
	556	372	250	130	72	44	30	1002	668	448	232	130	78	54	F400
	752	500	338	176	98	60	40	1352	902	606	312	176	106	74	F500
	1102	734	496	258	144	88	60	1982	1322	888	458	258	156	108	F630, F800

Metal iodine vapour lamps

	Non corrected				With parallel correction				
P (W)	250	400	1000	2000	250	400	1000	2000	
IB (A)	2.5	3.6	9.5	20	1.4	2	5.3	11.2	
C (µF)	–	–	–	–	32	32	64	140	LC1
Max. no. of lamps according to P (W)	3	2	–	–	–	–	–	–	K09
	4	3	1	–	–	–	–	–	D09, D12
	6	4	1	–	–	–	–	–	D18
	7	5	2	–	13	9	–	–	D25
	10	7	2	1	18	13	4	–	D32, D38
	13	9	3	1	23	16	6	–	D40A
	16	11	4	2	30	21	7	–	D50A, D65A
	24	16	6	3	42	30	11	5	D80, D95
	48	32	12	6	84	60	22	10	D115, D150
	66	46	18	8	120	84	32	14	F185
	72	50	20	10	130	90	34	16	F225
	84	58	22	12	150	104	40	18	F265
	94	66	24	14	170	118	44	20	F330
	120	84	32	16	214	150	56	26	F400
	162	112	42	20	290	202	76	36	F500
	238	164	62	30	424	298	112	52	F630, F800

Characteristics: pages B8/55 to B8/60
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