Interconnection wiring diagram
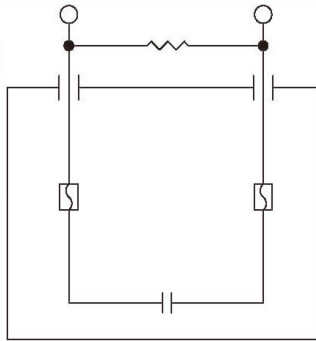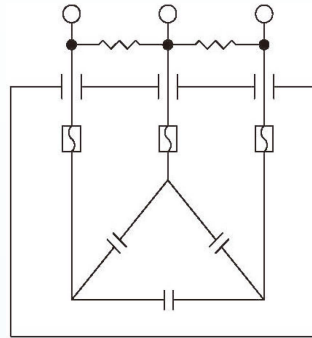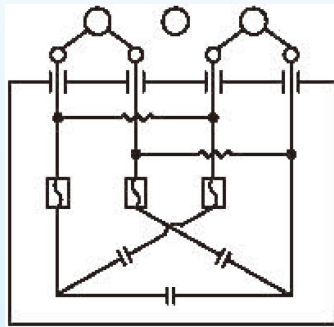
Single Phase
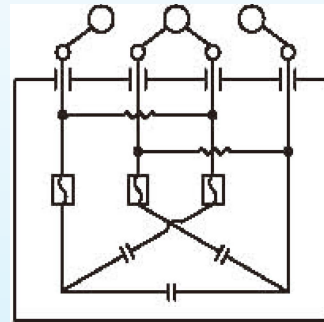
Three Phase

Fig 3 & Fig 4 Model Single/Three Phase Conversion Wiring Diagram

Single Phase

Three Phase

220v class N1 Type specification

Rated voltage (VAC)	Rated capacity (μF)	Type name	constant number (φ)	Rated current (A)	Dimensions (mm)				Fig
					A	B	C	D	
220	10	DLE−2B10S	1	0.83	53	81	70	95	1
		DLE−2B10T	3	0.48	53	81	70	95	
	15	DLE−2B15S	1	1.24	53	81	70	95	
		DLE−2B15T	3	0.72	53	81	70	95	
	20	DLE−2B20S	1	1.66	53	81	70	95	
		DLE−2B20T	3	0.96	53	81	70	95	
	30	DLE−2B30S	1	2.49	53	81	70	95	
		DLE−2B30T	3	1.44	53	81	100	125	
	40	DLE−2B40S	1	3.32	53	81	70	95	
		DLE−2B40T	3	1.92	53	81	100	125	
	50	DLE−2B50S	1	4.15	53	81	100	125	
		DLE−2B50T	3	2.39	53	81	100	125	

※ Specifications other than the above can be manufactured, and the specifications and
dimensions of the listed products are subject to change without notice, so be sure to check.

Fig 1

Fig 2

Earth Terminal
Fixed Hole (ø4.5)

66±2
80±3
90±4

46
13 13

N P

A±3
B±4

Fixed Hole (ø4.5)
ø63±2
Fixed Ho

NAME PLATE

A±1
B±2

C±2
D±3

Fig 3

125±2
148±3
160±4

45±2

2-ø4.5Hole

74
26 26

Earth Plug

N P

A±3
B±4

Fig 4

170±2
195±3
215±4

16
60±2

4-ø4.5Holes

74
26 26

Earth Plug

N P

A±3
B±4

Fig 5

(or 25±1)

(or 85±2)

60±1
90±2

240±2
266±3
286±4

4-5x8Holes

3-M12
65±5 65±5
Earth Plug

N P

A±3
B±4

Fig 6

(or 25±1)

80±1
120±2

300±2
320±3
340±4

4-5x8Holes

3-M12
80±5 80±5
Earth Plug

N P

A±3
B±4
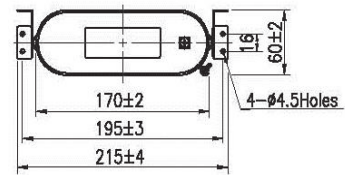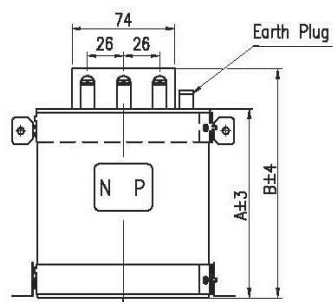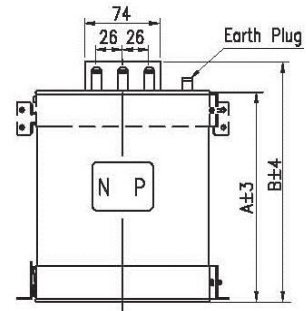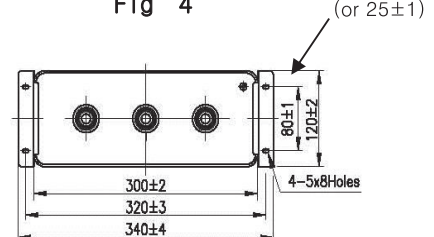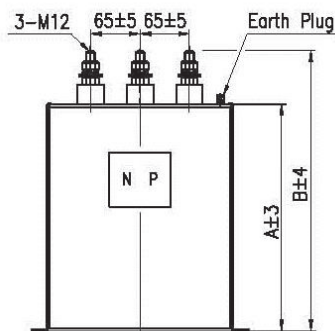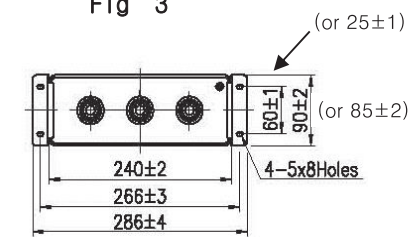
Specification (μF table)

Rated voltage (VAC)	Rated capacity (μF)	Type name	Rated current (A)		Dimensions (mm)		Fig	Note
			1φ	3φ	A	B		
220	75	DLE-2B75S	6.2		85	105	2	
	75	DLE-2B75T		3.6	125	145		
	100	DLE-2B100S	8.3		85	105		
	100	DLE-2B100T		4.8	125	145		
	150	DLE-2B150ST	12.4	7.2	120	140	3	
	175	DLE-2B175ST	14.5	8.4	130	150		
	200	DLE-2B200ST	16.6	9.6	130	150		
	250	DLE-2B250ST	20.7	12.0	120	140	4	
	300	DLE-2B300ST	24.9	14.4	145	165		
	400	DLE-2B400ST	33.2	19.1	165	185		
	500	DLE-2B500ST	41.4	23.9	185	205		
	600	DLE-2B600T	49.7	28.7	220	240		
	700	DLE-2B700T	58.0	33.5	250	270		
	800	DLE-2B800T	66.3	38.3	180	245	5	
	900	DLE-2B900T	74.6	43.1	200	265		
	1000	DLE-2B1000T	82.9	47.9	180	245		
380	10	DLE-3H10T	1.4	0.83	65	85	2	KS
	15	DLE-3H15T	2.1	1.2	65	85		
	20	DLE-3H20S	2.9		65	85		
	20	DLE-3H20T		1.7	85	105		
	30	DLE-3H30S	4.3		65	85		
	30	DLE-3H30T		2.5	125	145		
	40	DLE-3H40S	5.7		85	105		
	40	DLE-3H40T		3.3	125	145		
	50	DLE-3H50S	7.2		85	105		
	50	DLE-3H50T		4.1	125	145		
	75	DLE-3H75ST	10.7	6.2	120	140	3	
	100	DLE-3H100ST	14.3	8.3	140	160		
	150	DLE-3H150ST	21.5	12.4	120	140	4	
	200	DLE-3H200ST	28.6	16.5	165	185		
	250	DLE-3H250ST	35.8	20.7	185	205		
	300	DLE-3H300ST	43.0	24.8	220	240		
	400	DLE-3H400ST	57.3	33.1	250	270		
	500	DLE-3H500T	71.6	41.3	180	245	5	
440	10	DLE-4D10T	1.7	0.96	65	85	2	
	15	DLE-4D15S	2.5		65	85		
	15	DLE-4D15T		1.4	85	105		
	20	DLE-4D20S	3.3		65	85		
	20	DLE-4D20T		1.9	125	145		
	30	DLE-4D30S	5.0		85	105		
	30	DLE-4D30T		2.9	125	145		
	40	DLE-4D40S	6.6		85	105		
	40	DLE-4D40T		3.8	125	145		
	50	DLE-4D50ST	8.3	4.8	120	140	3	
	75	DLE-4D75ST	12.4	7.2	140	160		
	100	DLE-4D100ST	16.6	9.6	120	140	4	
	150	DLE-4D150ST	24.9	14.4	165	185		
	200	DLE-4D200ST	33.2	19.1	220	240		
	250	DLE-4D250ST	41.4	23.9	250	270		
	300	DLE-4D300T	49.7	28.7	180	245	5	
	400	DLE-4D400T	66.3	38.3	200	265		
	500	DLE-4D500T	82.9	47.9	220	285		

※ S:Single Phase, T:Three Phase, ST:Single Three Phase Both

※ Specifications other than the above can be manufactured, and the specifications and dimensions of the listed products are subject to change without notice, so be sure to check.
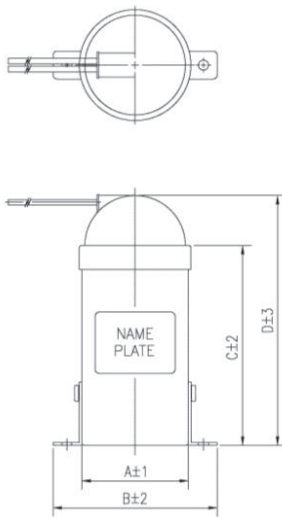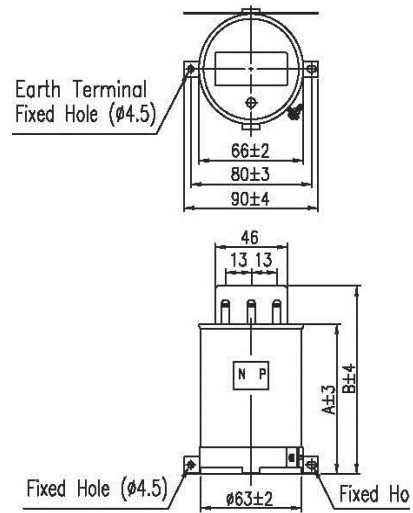
Specification (Kvar table)

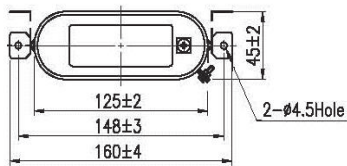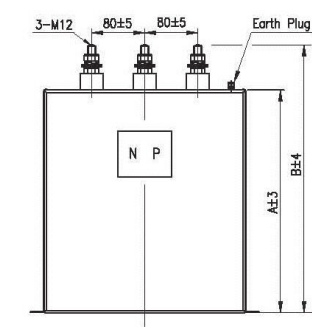| Rated Voltage	Rated capacity		Type name		Rated current (A)		Dimensions (㎜)		Fig	Note
(VAC)	KVAr	μF	1φ	3φ	1φ	3φ	A	B		
220	10	548.3	DLE−2B10K6S	DLE−2B10K6T	45.5	26.2	220	240	4	
	15	822.5	DLE−2B15K6S	DLE−2B15K6T	68.2	39.4	180	245	5	
	20	1096.7	DLE−2B20K6S	DLE−2B20K6T	90.9	52.5	220	285		
	25	1370.8	DLE−2B25K6S	DLE−2B25K6T	113.6	65.6	250	315		
	30	1645.0	DLE−2B30K6S	DLE−2B30K6T	136.4	78.7	260	325		
	35	1919.2	DLE−2B35K6S	DLE−2B35K6T	159.1	91.9	300	365		
	40	2193.3	DLE−2B40K6S	DLE−2B40K6T	181.8	105.0	330	395		
	45	2467.5	DLE−2B45K6S	DLE−2B45K6T	204.5	118.1	300	365	6	
	50	2741.7	DLE−2B50K6S	DLE−2B50K6T	227.3	131.2	300	365		
380	10	183.8	DLE−3H10K6S	DLE−3H10K6T	26.3	15.2	165	185	4	KS
	15	275.7	DLE−3H15K6S	DLE−3H15K6T	39.5	22.8	220	240		
	20	367.6	DLE−3H20K6S	DLE−3H20K6T	52.6	30.4	250	270		
	25	459.5	DLE−3H25K6S	DLE−3H25K6T	65.8	38.0	180	245	5	
	30	551.4	DLE−3H30K6S	DLE−3H30K6T	78.9	45.6	220	285		
	35	643.3	DLE−3H35K6S	DLE−3H35K6T	92.1	53.2	220	285		
	40	735.2	DLE−3H40K6S	DLE−3H40K6T	105.3	60.8	250	315		
	45	827.1	DLE−3H45K6S	DLE−3H45K6T	118.4	68.4	260	325		
	50	919.0	DLE−3H50K6S	DLE−3H50K6T	131.6	76.0	300	365		
	75	1378.4	DLE−3H75K6S	DLE−3H75K6T	197.4	114.0	300	365	6	
	100	1837	−	DLE−3H100K6T	_	151.9	400	465		
440	10	137.1	DLE−4D10K6S	DLE−4D10K6T	22.7	13.1	165	185	4	
	15	205.6	DLE−4D15K6S	DLE−4D15K6T	34.1	19.7	220	240		
	20	274.2	DLE−4D20K6S	DLE−4D20K6T	45.5	26.2	250	270		
	25	342.7	DLE−4D25K6S	DLE−4D25K6T	56.8	32.8	180	245	5	
	30	411.2	DLE−4D30K6S	DLE−4D30K6T	68.2	39.4	200	265		
	35	479.8	DLE−4D35K6S	DLE−4D35K6T	79.5	45.9	220	285		
	40	548.3	DLE−4D40K6S	DLE−4D40K6T	90.9	52.5	250	315		
	45	616.9	DLE−4D45K6S	DLE−4D45K6T	102.3	59.0	250	315		
	50	685.4	DLE−4D50K6S	DLE−4D50K6T	113.6	65.6	300	365		
	75	1028.1	DLE−4D75K6S	DLE−4D75K6T	170.5	98.4	300	365	6	
	100	1370	−	DLE−4D100K6T	_	131.2	400	465		

※ Specifications other than the above can be manufactured, and the specifications and dimensions of the listed products are subject to change without notice, so be sure to check.

■ Standard for Installation Capacitance by various capacitors

three phase induction motor

Rated output		applied capacity（60Hz）					
		220V		380V		440V	
KW	HP	μF	KVAr	μF	KVAr	μF	KVAr
*0.2	1/4	15	0.27		0.27	5	0.36
*0.4	1/2	20	0.36	5	0.41	5	0.36
*0.75	1	30	0.55	7.5	0.54	5	0.36
1	1.3	30	0.55	10	0.54	7.5	0.55
1.1	1.5	30	0.55	10	0.54	7.5	0.55
*1.5	2	50	0.91	10	0.54	10	0.73
2	2.5	50	0.91	15	0.82	10	0.73
*2.2	3	75	1.37	15	0.82	15	1.09
3	4	75	1.37	20	1.09	15	1.09
*3.7	5	100	1.82	20	1.09	20	1.46
4	5.5	100	1.82	30	1.63	20	1.46
5	7.0	100	1.82	40	2.18	30	2.19
*5.5	7.5	175	3.19	50	2.72	30	2.19
*7.5	10	200	3.65	75	4.08	40	2.92
10	13.5	250	4.56	100	5.44	50	3.65
*11	15	300	5.48	100	5.44	75	5.47
*15	20	400	7.3	100	5.44	75	5.47
19	25	500	9.13	130	7.08	100	7.30
20	26.5	500	9.13	150	8.17	100	7.30
*22	30	500	9.13	150	8.17	100	7.30
25	33.5	600	10.95	200	10.89	150	10.95
*30	40	800	14.60	200	10.89	150	10.95
*37	50	900	16.43	250	13.61	200	14.60
40	53.5	1000	18.25	250	13.61	200	14.60
45	60	1100	20.08	250	13.61	230	16.79
50	66.5	1200	21.90	250	13.61	250	18.25
55	75	1300	23.73	300	16.33	300	21.90

* The * mark in front of the rated output KW is a standard product.

220VAC arc welding machine

Rated input （KVA）	applied capacity（60Hz）	
	μF	KVAr
1	50	0.75
2	75	1.13
3	100	1.51
5	150	2.26
7.5	250	3.77
10	300	4.52
15	450	6.79
20	600	9.05
25	700	10.56
30	900	13.57
35	1000	15.08
40	1100	16.59
45	1300	19.6
50	1450	21.87

DC welding machine applies 1/2 of AC welding machine capacity

single phase induction motor

Rated output		applied capacity （60Hz）			
		110V		220V	
KW	HP	μF	KVAr	μF	KVAr
0.1	1/8	50	0.26	10	0.18
0.2	1/4	50	0.23	15	0.27
0.25		75	0.34	20	0.36
0.4		100	0.46	20	0.36
0.55	1/2	100	0.46	30	0.55
0.75		120	0.54	30	0.55
1		120	0.54	40	0.73

■ Table of Applied Wire by Capacity of Capacitor

Minimum thickness of electric wire (copper)				1.6mm²	2	3.5	8	14	22	30	38	50	60	80	100
Capacity of Switch （A）				30	30	30	30	60	100	100	100	200	200	200	200
Rated Current of Capacitor（A）				10	15	20	30	40	50	60	75	90	100	125	150
Capacity of Capacitor （μF）	60Hz	single phase	110V	240	360	480	720	960	1200	1450	1810	2200	2400	3000	3600
			220V	120	180	240	360	485	600	730	910	1100	1200	1500	1800
		three phase	220V	210	315	415	630	840	1015	1250	1550	1900	2100	2600	3150
			380V	120	180	240	360	485	600	730	910	1100	1200	1500	1800
			440V	105	155	210	310	420	520	630	780	940	1050	1300	1500

capacity calculation table

Cosθo \ Cosθ	1	0.99	0.98	0.97	0.96	0.95	0.94	0.93	0.92	0.91	0.9	0.875	0.85	0.825	0.8	0.775	0.75	0.725	0.7	0.675	0.65	0.625	0.6	0.575	0.55	0.525	0.5	0.475	0.45	0.425
0.4	230	216	210	205	201	197	194	190	187	184	182	175	168	161	155	149	142	135	128	121	113	105	96	88	78	68	57	45	32	17
0.425	213	198	192	188	184	180	176	173	170	167	164	157	151	144	138	131	124	118	111	104	96	88	79	71	61	51	40	27	15	
0.45	198	183	177	173	168	165	161	158	155	152	149	142	136	129	123	116	110	103	96	89	81	73	64	56	46	36	24	12		
0.475	185	171	165	161	156	153	149	146	143	140	137	130	123	116	110	104	98	91	84	76	68	60	52	44	33	25	12			
0.5	173	159	153	148	144	140	137	134	130	128	125	118	112	104	98	92	85	78	71	64	56	48	40	31	21	11				
0.525	162	148	142	137	133	129	128	122	119	117	114	107	100	93	87	81	74	67	60	53	45	37	29	20	10					
0.55	152	138	132	127	123	119	116	112	109	106	104	97	90	87	77	71	64	57	50	43	35	27	19	10						
0.575	142	128	122	117	114	110	106	103	99	96	94	87	80	74	67	60	54	47	40	33	25	17	8							
0.6	133	119	113	108	104	101	97	94	91	88	85	78	71	65	58	52	46	39	32	24	16	8.5								
0.625	125	111	105	100	96	92	89	85	82	79	77	70	63	56	50	44	37	30	23	16	8									
0.65	117	103	97	92	88	84	81	77	74	71	69	62	55	48	42	36	29	22	15	8										
0.675	109	95	89	84	80	76	73	70	66	64	61	54	47	40	34	28	21	14	7											
0.7	102	88	81	77	73	69	65	62	59	56	54	46	40	33	27	20	17	7												
0.725	95	81	75	70	66	62	59	55	52	49	46	39	33	26	20	13	7													
0.75	88	74	67	63	58	55	52	49	45	43	40	33	26	19	13	6.5														
0.775	81	67	61	57	52	49	45	42	39	36	33	26	19	12	6.5															
0.8	75	61	54	50	46	42	39	35	32	29	27	19	13	6																
0.825	69	54	48	44	40	36	33	29	26	23	21	14	7																	
0.85	62	48	42	37	33	29	26	22	19	16	14	7																		
0.875	55	41	35	30	29	23	19	16	13	10	7																			
0.9	48	34	28	23	19	16	12	9	6	2.8																				
0.91	45	31	25	21	16	13	9	6	2.8																					
0.92	43	28	22	18	13	10	6	3.1																						
0.93	40	25	19	15	10	7	3.3																							
0.94	36	22	16	11	7	3.6																								
0.95	33	18	12	8	3.5																									
0.96	29	15	9	4																										
0.97	25	11	5																											
0.98	20	6																												
0.99	14																													

Power Factor Before Improvement (Cosθo)

Note 1 For load 500KW, when trying to improve the power factor before improvement from Cosθo = 0.75 to Cosθ = 0.95, K55=55% 500KW X 0.55 = 275KVAr at the point where Cosθo = 0.75 and Cosθ = 0.95 meet

Note 2 For load KVA After calculating KW according to KW = KVAX Cosθo, calculate it as in 1)
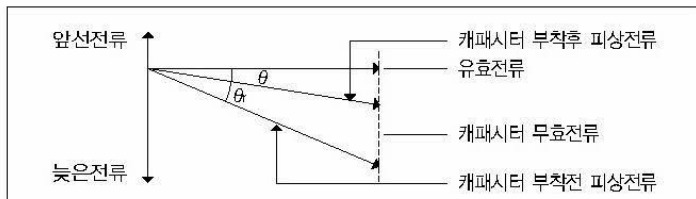
Power factor improvement calculation

캐패시터를 산출시 개선전의 역율(Cosθo)및 부하의 용량을 알고 있을 경우 아래와 같이 계산한다.

$$\theta_c = P_r(\tan\theta_o - \tan\theta) \text{ 또는}$$

$$\theta_c = P_r\left(\sqrt{\frac{1}{\cos^2\theta_o}-1} - \sqrt{\frac{1}{\cos^2\theta_o}-1}\right)$$

여기에서

θc = 캐패시터 용량(KAVr)   Pr = 부하의 유효전력(KW)
Cos θo = 개선전의 역율   Cos θ = 개선하고자 하는 역율

또한 부하가 KVA로 표기되어 있는 경우 KW(유효전력)로 환산식은 KW = KVA X Cosθo에 따른다.

Diagram labels: 앞선전류, θ, θ, 캐패시터 부착후 피상전류, 유효전류, 캐패시터 무효전류, 늦은전류, 캐패시터 부착전 피상전류

Calculation table of KVAr - MFD

정격전압	주파수	µF / KVAr	KVAr / µF
220	50	65.77	0.01521
220	60	54.81	0.01825
380	50	22.04	0.04536
380	60	18.37	0.05444
400	50	19.89	0.05027
400	60	16.58	0.06032
415	50	18.48	0.05411
415	60	15.40	0.06493
440	50	16.44	0.06082
440	60	13.70	0.07299
460	50	15.04	0.06648
460	60	12.54	0.07977

Relation between KVar and Capacity

$$KVAr = 2\pi fCE^2 \times 10^{-9} \qquad C = \frac{KVA}{2\pi fE^2 \times 10^{-9}}$$

Relation between Capacitor and Current

단상전류 $I = 2\pi fCE \times 10^{-6}$

or $I = \dfrac{KVA \times 10^{-6}}{E}$

삼상전류 $I = \dfrac{1}{\sqrt{3}} 2fCE \times 10^{-6}$

or $I = \dfrac{KVA \times 10^{-3}}{\sqrt{3} \times E}$

I : 전류(A)
f : 주파수(Hz)
C : 용량(µF)
E : 전압(V)