DCL-50

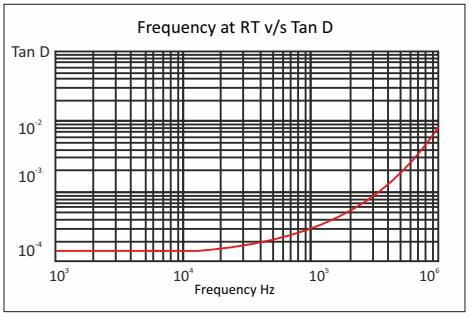
Highlights

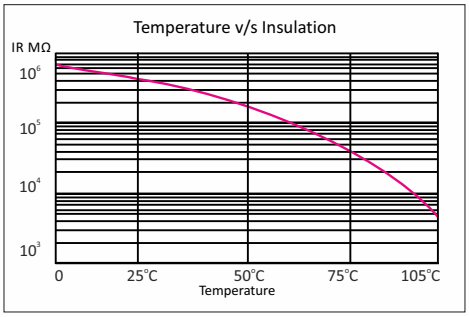
- Self-Inductance as low as 30nH
- ESR as low as 0.5 mΩ
- Low profile
- High thermal conductivity
- Life expectancy as high as 100 Khrs
- Axial stud terminals
- Flame retardant UL94 - V0, ROHS compliant

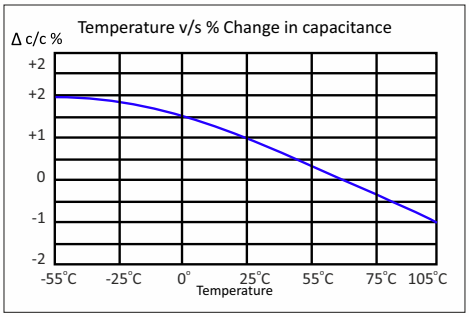
Construction

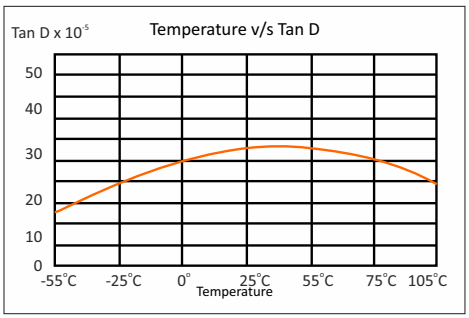
Applications

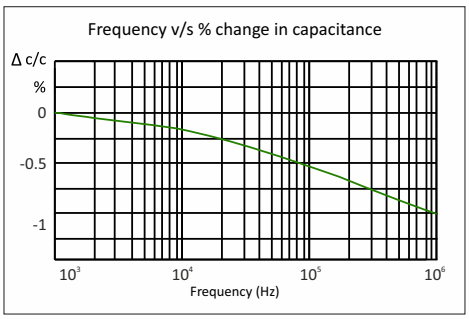
- DC filtering
- Wind power inverters
- Solar power inverters
- Induction heaters
- Electric vehicle inverters
- Motor drives











DCL-50

Technical Specifications

Physical Characteristics

▪ Electrode material	Metallized polypropylene film
▪ Winding construction	Polypropylene film, metallized polypropylene film
▪ Enclosure	UL 94-V0 Polyester tape wrap and epoxy filled
▪ Terminals	Nickel plated brass

Electrical Characteristics

▪ Capacitance range	20 µF to 265µF
▪ Capacity tolerance	±5%(J), ±10%(K)
▪ Rated voltage VDC	700, 800, 900, 1000, 1200, 1400, 1600, 1800
▪ Test voltage between terminals	1.3 x rated voltage VDC for 60 seconds (not to be repeated)
▪ Test voltage terminal to case	3KVAC at 50Hz for 60 seconds
▪ Dissipation factor (Tan d)	≤0.0015 at 100Hz and 25°C
▪ Temperature range	-55°C to +105°C
▪ Insulation resistance MΩ x µF	≥5,000 S at 25°C (S = MΩ x µF)
▪ Reference Standard	IEC 61071 and IEC 60068

Marking on Capacitors

Each capacitor will have the following information printed on it, sequentially:

- The Company name in words ALCON
- The capacitor grade viz DCL-50
- The capacitance value MFD
- The rated voltage VDC
- The max current Arms
- Capacity tolerance and manufacturing code
- Part number on non-standard capacitors

DCL-50

Standard Capacitors Values

Rated voltage VDC	Nominal Capacitance MFD at 1 KHz	Case size ϕ x Lmm	Case Code	Typical ESR mΩ at Fr* KHz	Fr* KHz	Rise in core temperature per watt dissipated °C	Ripple current rating Irms at 10 KHz to 100KHz					Ordering Code
							25°C	45°C	65°C	85°C	105°C	
700	90	85 x 51	Y2	0.65	156	14.2	60	52	44	30	7	SD000900700AP0Y2_ _ _ _K01
	145	85 x 63	Y5	0.75	105	12.3	64	55	46	32	8	SD001450700AP0Y5_ _ _ _K01
	200	85 x 76	Y6	0.95	71	10.8	58	50	42	29	7	SD002000700AP0Y6_ _ _ _K01
	265	85 x 91	Y7	1.65	61	8.9	51	45	37	26	6	SD002650700AP0Y7_ _ _ _K01
900	85	85 x 51	Y2	0.58	168	14.2	56	48	39	27	5	SD000850900AP0Y2_ _ _ _K01
	120	85 x 63	Y5	0.78	98	12.3	62	54	47	34	8	SD001200900AP0Y5_ _ _ _K01
	160	85 x 76	Y6	0.97	73	10.8	57	51	43	30	9	SD001600900AP0Y6_ _ _ _K01
	200	85 x 91	Y7	1.70	69	8.9	50	43	35	25	5	SD002000900AP0Y7_ _ _ _K01
1000	55	85 x 51	Y2	0.80	176	14.2	57	49	41	25	7	SD000551000AP0Y2_ _ _ _K01
	70	85 x 51	Y2	1.00	182	14.2	58	50	42	29	7	SD000701000AP0Y2_ _ _ _K01
	100	85 x 63	Y5	0.80	136	12.3	59	51	43	30	7	SD001001000AP0Y5_ _ _ _K01
	130	85 x 76	Y6	1.18	91	10.8	52	45	37	27	6	SD001301000AP0Y6_ _ _ _K01
	150	85 x 91	Y7	2.21	75	8.9	46	40	33	23	5	SD001501000AP0Y7_ _ _ _K01
1200	60	85 x 51	Y2	1.05	254	14.2	48	41	35	25	6	SD000601200AP0Y2_ _ _ _K01
	80	85 x 63	Y5	1.19	179	12.3	49	43	35	25	6	SD000801200AP0Y5_ _ _ _K01
	110	85 x 76	Y6	1.46	116	10.8	46	40	33	23	5	SD001101200AP0Y6_ _ _ _K01
	122	85 x 91	Y7	2.80	96	8.9	38	33	27	19	5	SD001221200AP0Y7_ _ _ _K01
1400	30	85 x 51	Y2	1.28	294	14.2	42	37	30	21	5	SD000301400AP0Y2_ _ _ _K01
	45	85 x 63	Y5	1.47	218	12.3	43	37	31	22	5	SD000451400AP0Y5_ _ _ _K01
	60	85 x 76	Y6	1.87	143	10.8	41	35	29	21	5	SD000601400AP0Y6_ _ _ _K01
	75	85 x 91	Y7	3.81	124	8.9	35	30	25	18	4	SD000751400AP0Y7_ _ _ _K01
1600	28	85 x 51	Y2	1.48	352	14.2	41	36	30	21	5	SD000281600AP0Y2_ _ _ _K01
	40	85 x 63	Y5	1.71	260	12.3	41	36	30	21	5	SD000401600AP0Y5_ _ _ _K01
	50	85 x 76	Y6	2.18	171	10.8	39	34	28	20	5	SD000501600AP0Y6_ _ _ _K01
	60	85 x 91	Y7	4.56	151	8.9	32	28	23	16	4	SD000601600AP0Y7_ _ _ _K01
1800	20	85 x 51	Y2	1.69	460	14.2	38	33	27	19	5	SD000201800AP0Y2_ _ _ _K01
	28	85 x 63	Y5	1.86	336	12.3	39	33	28	20	5	SD000281800AP0Y5_ _ _ _K01
	40	85 x 76	Y6	2.81	226	10.8	33	29	24	17	4	SD000401800AP0Y6_ _ _ _K01
	46	85 x 91	Y7	5.63	185	8.9	29	25	21	15	3	SD000461800AP0Y7_ _ _ _K01

Custom designed capacitors are available on request
* Fr =Typical resonant frequency (Tol.±30%)

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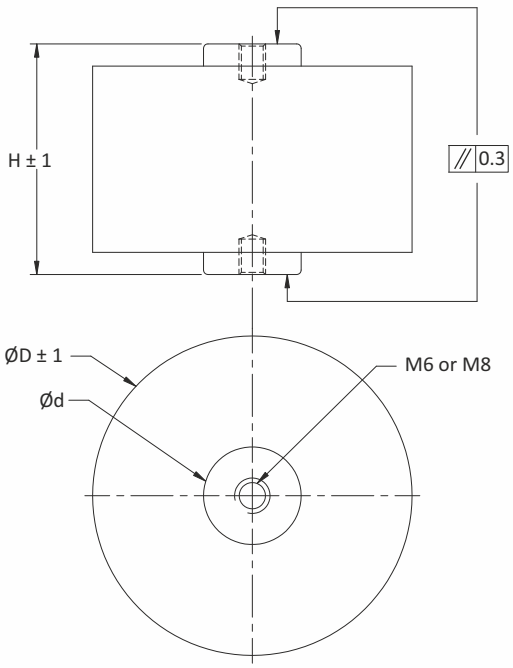
Capacitor Drawing and Terminal Styles



Terminal Style : STD

Tightening torque 6Nm max.

Dimensions in mm

DCL-50

Life Expectancy

Table 1

Can size D x H	Rth °C/Watt
85 x 51	14.2°C
85 x 63	12.3°C
85 x 76	10.8°C
85 x 91	8.9°C

Steps to calculate Hotspot Temperature

- Locate the capacitor and the ESR from the electrical specifications
- Dissipated heat = ($Irms^2$ x ESR)
- Get the value from table 1 for Rth (°C/watt)
- Calculate internal temperature rise = ($Irms^2$ x ESR) x Rth (°C/watt)
- Hotspot temperature of capacitor = T Ambient + ($Irms^2$ x ESR) x Rth (°C/watt)
- From the graph given below expected life can be obtained
- Ensure that the voltage and current specification are not exceeded

Example: If 120 MFD/900 VDC is being used at 50 Arms in a 45°C Ambient; then ESR from the table (on page 4) = 0.00078Ω and the case size is Ø85 x 51mm
The dissipated wattage = 50 x 50 x 0.00078Ω = 1.95 watts
Temperature rise = 1.95 x 12.3°C/Watt = 23.98°C say 24
The hotspot core temperature inside the capacitor = 45°C (Ambient) + 24 (Rise) = **69 say 70°C**
From the graph below: If the capacitor is being used at 75% of Vrdc then the expected life will be approx 105,000 hours