

General information

Electrical specifications and definitions

Rated voltage V_n

The rms value of the sinusoidal AC voltage which can be applied to the capacitor in normal working conditions.

Rated current I_n

The value of the current flowing through the capacitor of rated capacitance at the rated voltage and frequency.

Duty frequency range

The capacitors can be used at a frequency range of 50-60Hz. Use at higher frequencies is possible provided the voltage, current, temperature and power limits are complied with.

Operating temperature class

Minimum temperature -25°C .

Maximum temperature $+70^{\circ}\text{C}$ or $+85^{\circ}\text{C}$.

In accordance with the reference standards, these temperatures are those measured on the surface of the capacitor.

Storage temperature

$-40^{\circ}\dots + 85^{\circ}\text{C}$

Capacitance tolerance

Rated tolerance $\pm 5\%$

Different tolerance values are available on request.

Loss angle $\tan\delta$

The value of the tangent of the loss factor measured at 50 Hz, 20°C at the rated voltage is:

$$\tan\delta \leq 20 \cdot 10^{-4}$$

Maximum permissible overloads

The capacitors can operate in the following overload conditions throughout the temperature class range:

$$I_{\max} = 1.3 I_n$$

$$V_{\max} = 1.1 V_n$$

The overload deriving from the simultaneous presence of voltage and current above the rated values, even if within the stated limits, must be such that the apparent power P_a ($I_{\text{rms}} \times V_{\text{rms}}$) absorbed by the capacitor is:

$$P_a \leq 1.35 \cdot 2\pi f \cdot C \cdot V_n^2$$

Pulsed stress

The capacitors are capable of withstanding steep wavefronts with a maximum voltage variation speed of $20 \text{ V} / \mu\text{s}$.

Insulation resistance between terminals and case

Measured at 500 Vdc, 20°C after 30 seconds.

$$R_i > 1000 \text{ Mohm}$$

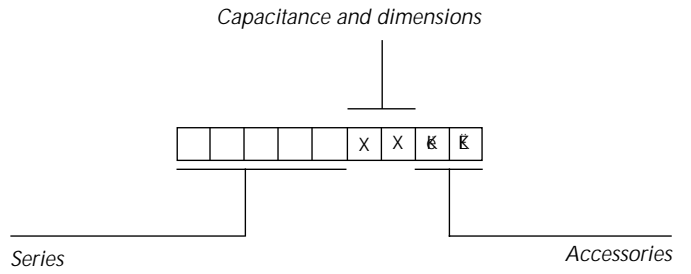
Direct current operation

These capacitors can be used with a DC voltage not exceeding the peak value of the rated voltage.

$$V_{\text{dc}} \leq \sqrt{2} V_n$$

Capacitors for higher DC voltages are available on request.

Part number composition



Mechanical specifications

Mounting:

The capacitors may be provided with stud M8 and M12 for mounting:

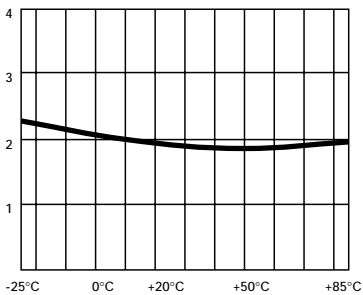
The maximum torque is: 5 Nm for M8
12 Nm for M12

Vibrations:

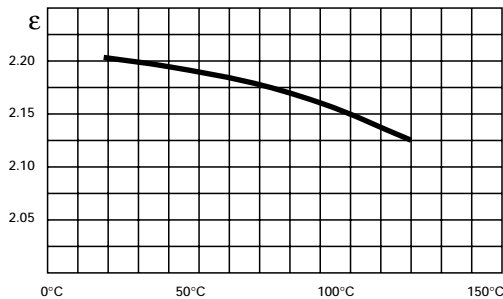
In accordance with IEC 68-2-6 standards, the capacitors pass the test with a frequency range from 10 to 55 Hz, acceleration amplitude 10 g and duration 6 h.

Typical performance of electrical characteristics of metallized polypropylene film vs. temperature

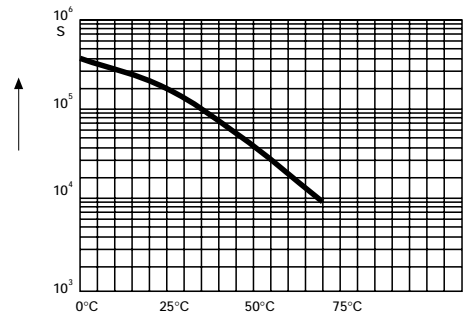
Dissipation factor



Dielectric constant



Insulation resistance



Protection degrees according to IEC publication 529 (IPXY)

1st code letter X	Protection degree
0	Not protected
1	Protected against solid objects greater than 50 mm
2	Protected against solid objects greater than 12 mm
3	Protected against solid objects greater than 2.5 mm
4	Protected against solid objects greater than 1.0 mm
5	Dust-protected
2nd code letter Y	Protection degree
0	Not protected
1	Protected against dripping water
2	Protected against dripping water when tilted up to 15°
3	Protected against spraying water
4	Protected against splashing water
5	Protected against water jets

Operating classes (DIN 40040)

According to DIN 40040 (ed. Feb. 1973), operating classes are identified by 5 letters which are defined consecutively: lower temperature, upper temperature, relative humidity, expected life, failure rate.

1 2 3 4 5		1 2 3 4 5	
1st letter	Temperature lower limit (°C)	2nd letter	Temperature upper limit (°C)
F	−55	M	+100
G	−40	P	+85
H	−25	S	+70
J	−10	U	+60

1 2 3 4 5		
4th and 5th letter	Expected life (3) (ore/hours)	Failure % max
QV	1.000	3
PU	3.000	
NT	10.000	
MS	30.000	

1 2 3 4 5	Relative humidity (%)		Acceptable condensation
3rd letter	1 Maximum value	Year average	
F (1)	95 (2)	≤75	no

(1) Room temperature = 35° C;

(2) For 30 days/year max; then max RH = 85%;

(3) On rated service and at upper temperature limit.

Operating classes and climatic categories IEC/EN 60252

Operating classes of capacitors for single phase motors are identified as follows:

a) Life expectancy

	30.000 h class A	10.000 h class B	3.000 h class C	1.000 h class D
failure % max	3%	3%	3%	3%

b) Climatic category

25	/	85	/	21
min. permissible temperature		max. permissible temperature		damp heat days

c) Class of safety protection

P0	No safety protection
P1	Safety achievable by external means (fuse)
P2	With internal safety protect

QUALITY



The great attention to the product quality and to the customer service are constants and these are main factors which contribute to its success all over the world.

The capacitor division, as described in Quality Manual, has been one of the first in Italy to be approved by CSQ according to ISO 9001

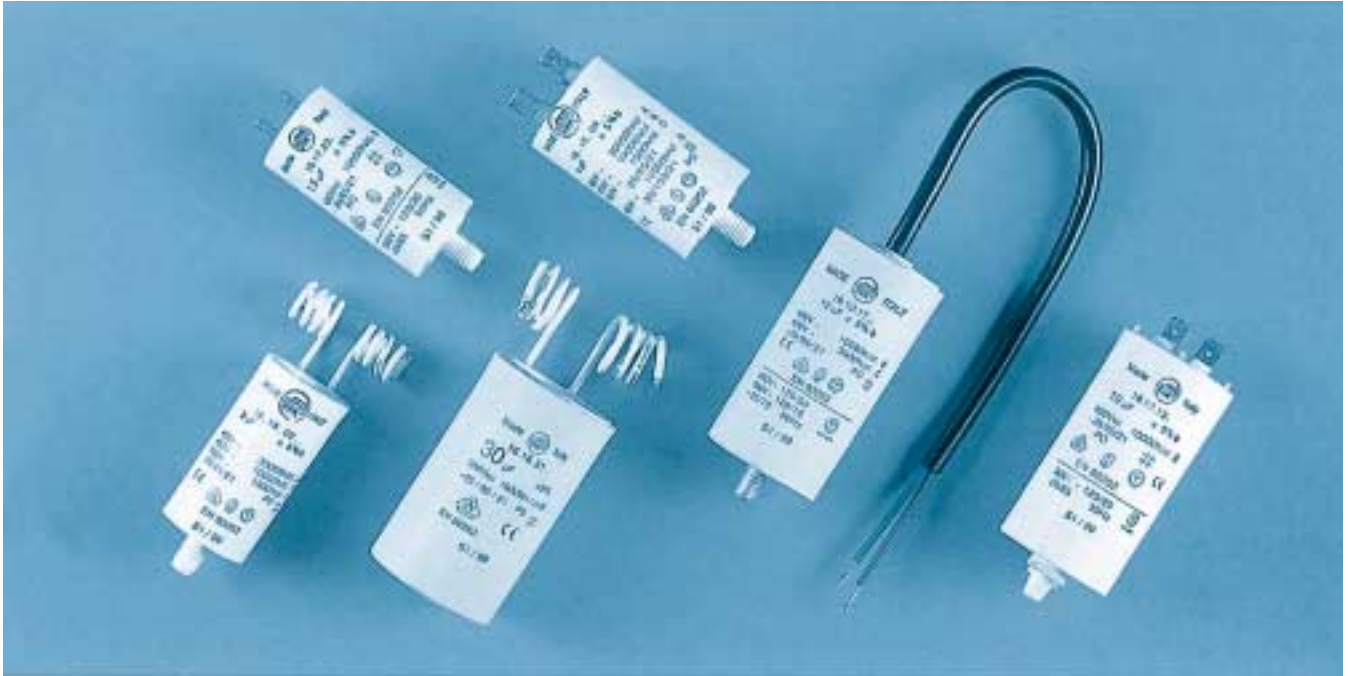
All is garanted thanks to fully automated and integrated processes, to completely new and innovative machines and technologies, to methodologies of the productive processes control based on accurate specifications and on responsible operator.

The averent series are certified according to the new European EN 60252 standard.

Warning!

Misapplication, such as exceeding the design limits, use for applications different from those indicated in the catalogue or use for applications inappropriate for the characteristics of the type of capacitor used, may result in failure of the capacitor or in expulsion of the capacitor element from the case. Normal end of life failure is characterized by loss of capacitance increase in dissipation factor and/or permanent open circuit. The user is therefore cautioned to provide whatever additional protection or enclosure is necessary to avoid possible damage or injury in case of failure.

*Metallized polypropylene film
capacitors in plastic case
series 4.16.18/.10/.17/.15*






The dielectric is polypropylene film, the electrodes consist of an extremely thin metal coating obtained by vacuum evaporation. Case and cover are made with self-extinguishing plastic material, the capacitive element is sealed with polyurethanic resin.

The main characteristics of these capacitors are:

- Low losses non-inductive winding*
- Self-healing property avoiding short circuits*
- Small size and limited weight*
- No leakage risk.*
- Class of safety protection: P0*

Series 4.16.18

Series 4.16.18	Approvals	
	EN 60252	  
	Voltage 250 V ~	10000 h cl.B 25/85/21
	Approved range 1 ± 70 µF	Part number 4.16.18.XX.KK
C (µF)	DxH (mm)	
1	25x50	4.16.18.01.KK
1,5	"	.02.
2	"	.03.
2,5	"	.04.
3	"	.05.
3,15	"	.06.
3,5	"	.07.
4	"	.08.
4,5	"	.09.
5	25x55	.10.
6	"	.11.
6,3	30x55	.12.
7	"	.13.
7,5	"	.14.
8	"	.15.
9	"	.16.
10	"	.17.
11	"	.18.
12	36x58	.19.
12,5	"	.20.
13	"	.21.
13,5	"	.22.
14	"	.23.
15	"	.24.
16	"	.25.
17,5	36x70	.26.
18	"	.27.
20	"	.28.
22	"	.29.
25	40x70	.30.
30	"	.31.
31,5	40x92	.32.
35	"	.33.
40	"	.34.
45	"	.35.
50	45x92	.36.
55	"	.37.
60	45x117	.38.
70	"	.39.
80	"	.40.
90	50x117	.41.
100	"	.42.



UL recognition
File E192559
250V~ Available on request





Series 4.16.10

Approvals							
Series 4.16.10	<div style="display: flex; justify-content: space-around; align-items: center;"> EN 60252 </div> <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 45%;"> <p><i>Voltage</i></p> <p>400 V ~ 10000 h cl.B 25/85/21</p> <p>425 V ~ 10000 h cl.B 25/85/21</p> <p>450 V ~ 3000 h cl.C 25/85/21</p> <p>475 V ~ 3000 h cl.C 25/85/21</p> <p>500 V ~ 1000 h cl.D SI120/20</p> </div> <div style="width: 45%; text-align: right;"> <p><i>Approved range</i></p> <p>45 ÷ 60 µF</p> <p>2 ÷ 40 µF</p> <p>45 ÷ 60 µF</p> <p>2 ÷ 40 µF</p> <p>2 ÷ 60 µF</p> </div> </div>						
	C (µF)	DxH (mm)	Part number 4.16.10.XX.KK	DxH** (mm)	Part number 4.16.10.XX.KK	DxH** (mm)	Part number 4.16.10.XX.KK
	2	25x49	4.16.10.31.KK	28x55	4.16.10.01.KK	30x56	4.16.10.73.KK
2,5	25x49	.32.	28x55	.02.			
3	25x49	.33.	28x55	.03.	30x56	.74.	
3,15	25x49	.34.	28x55	.04.			
3,5	25x55	.35.	28x55	.05.			
4	25x55	.37.	28x55	.06.	30x56	.38.	
4,5	30x56	.39.	28x55	.07.			
5	30x56	.76.	28x55	.08.			
5,5	30x56	.41.					
6	30x56	.82.	32x55	.09.			
6,3	30x56	.83.	32x55	.10.			
7	30x56	.85.	32x55	.12.			
7,5	36x58	.44.	32x55	.89.			
8	36x58	.81.	32x55	.13.	30x70	.52.	
9	36x58	.14.					
10	36x58	.15.	30x70	.47.			
11	36x58	.16.					
12	36x70	.17.					
12,5	36x70	.18.					
13	36x70	.19.					
14	36x70	.21.					
15	36x70	.22.					
16	40x70	.23.					
18	40x70	.24.					
20	40x70	.25.					
22	40x92	.68.					
25	40x92	.26.					
30	40x92	.70.					
31,5	45x92	.27.					
32	45x92	.72.					
35	45x92	.28.					
36	45x92	.65.					
40	45x92	.29.					
45	45x117	.63.					
50	45x117	.30.					
55	45x117	.64.					
60	50x117	.61.					
70	50x117	.67.					
80	55x120	.87.					





UL recognition
 File E192559
330V~/450V~ Available on request

** Alternative dimensions

Series 4.16.17

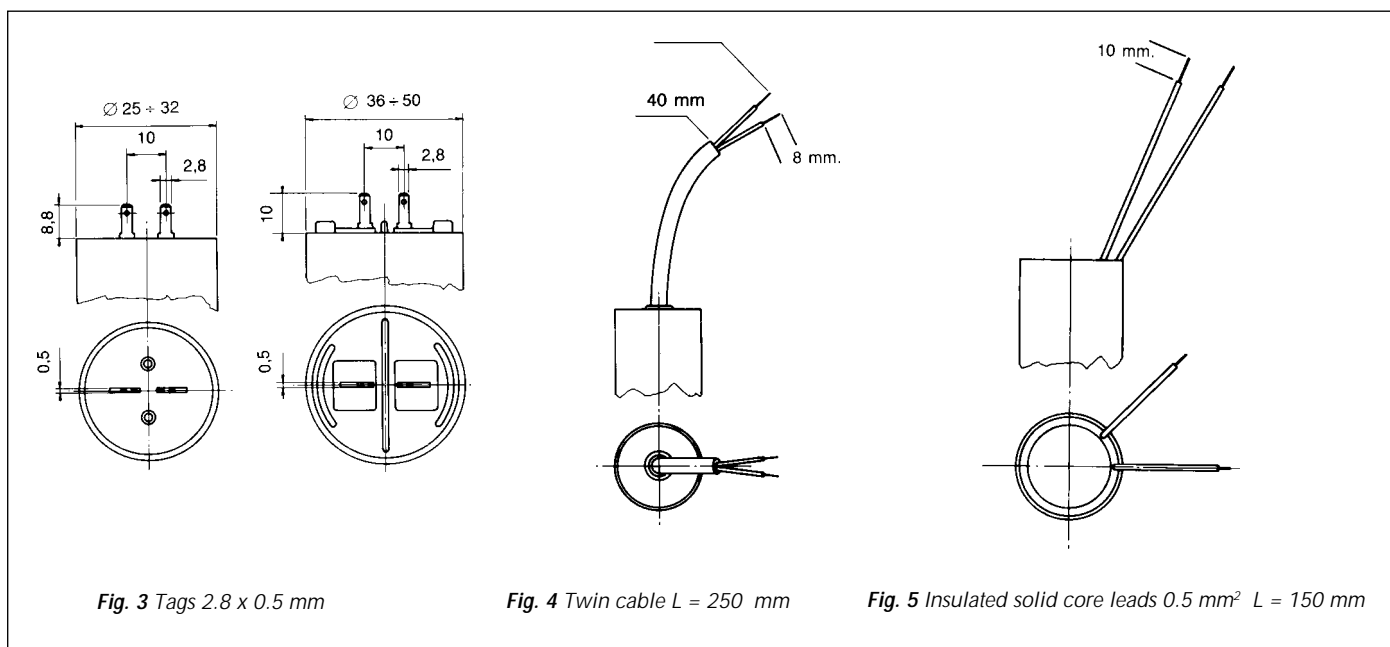
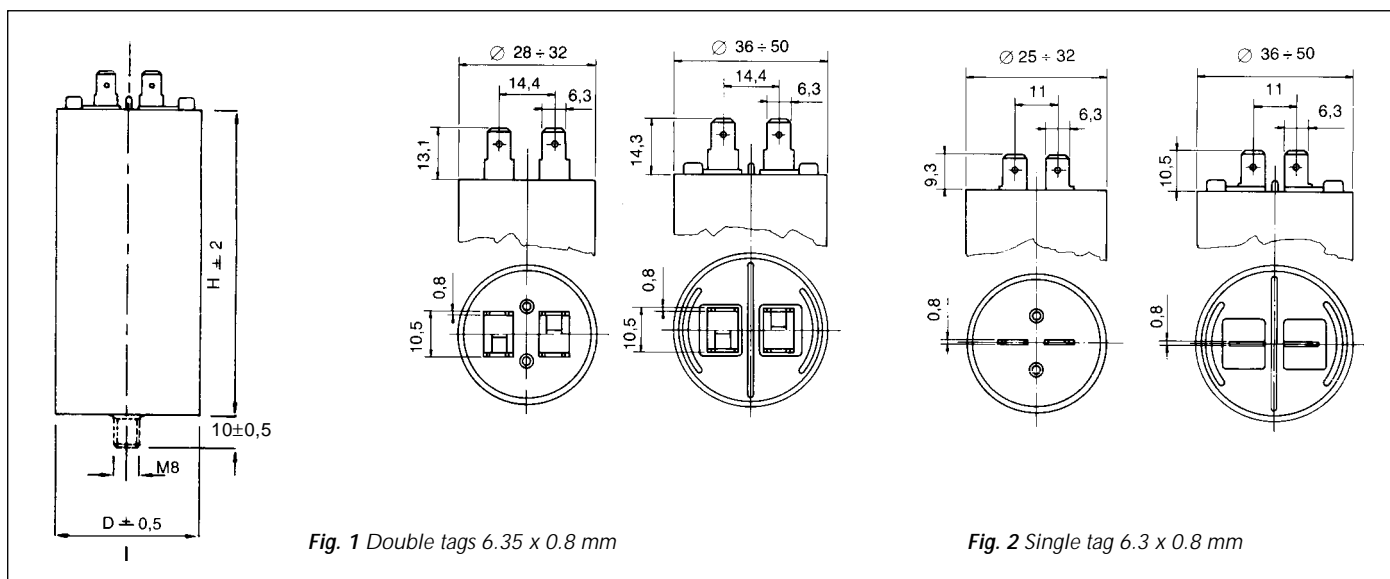
<i>Approvals</i>				
Series 4.16.17	EN 60252    VDE IMQ ASE			
	<i>Voltage</i>		<i>Approved range</i>	
	400 V~	30000 h cl.A	25/85/21	1 ÷ 45 µF
	425 V~	30000 h cl.A	25/85/21	1 ÷ 45 µF
450 V~	10000 h cl.B	25/85/21	1 ÷ 45 µF	
475 V~	10000 h cl.B	25/85/21	1 ÷ 70 µF	
500 V~	3000 h cl.C	25/85/21	1 ÷ 25 µF	
C (µF)	DxH (mm)	Part number 4.16.17.XX.KK	DxH (mm)	Part number 4.16.17.XX.KK
1	25x49	4.16.17.71.KK	28x55	4.16.17.01.KK
1,5	25x49	.73.	28x55	.23.
2	25x49	.74.	28x55	.02.
2,5	25x55	.75.	28x55	.03.
3	25x55	.77.	28x55	.04.
3,15			28x55	.05.
3,5			28x55	.06.
4	30x56	.81.	28x55	.07.
4,5	30x56	.82.		
5	30x56	.83.	32x55	.08.
6	36x58	.99.	32x55	.09.
6,3	36x58	.93.	32x55	.10.
7	36x58	.11.		
7,5	36x58	.97.		
8	36x58	.12.		
9	36x70	.24.		
10	36x70	.13.		
12	40x70	.29.		
12,5	40x70	.30.		
14	40x70	.15.		
15	40x70	.26.		
16	40x92	.54.		
17,5	40x92	.59.		
18	40x92	.17.		
20	40x92	.18.		
22	40x92	.19.		
25	45x92	.25.		
30	45x92	.21.		
32	50x92	.22.		
35	50x92	.57.		
40	45x117	.27.		
50	50x117	.28.		
60	55x120	.56.		
70	60x120	.62.		
 UL recognition File E192559 370V~/450V~				
<i>Available on request</i>				

Series 4.16.15




Series 4.16.15		Approvals			
		EN 60252	 VDE	 IMQ	 ASE
		<i>Voltage</i>		<i>Approved range</i>	
		400 V ~	10000 h cl.B	25/100/21	0.5 ÷ 7,5µF
		425 V ~	30000 h cl.A	25/85/21	0,5 ÷ 40 µF
		475 V ~	10000 h cl.B	25/85/21	0.5 ÷ 40 µF
		500 V ~	3000 h cl.C	25/85/21	0.5 ÷ 40 µF
C (µF)	DxH (mm)	Part number 416.15.XX.KK	DxH** (mm)	Part number 416.15.XX.KK	
0,8	25x49	4.16.15.47.KK	28x55	4.16.15.30.KK	
1	25x49	.48.	28x55	.69.	
1,5	25x49	.50.	28x55	.67.	
2	25x55	.84.	28x55	.01.	
2,5	25x55	.85.	28x55	.28.	
3	30x56	.53.	28x55	.02.	
3,15	30x56	.54.	28x55	.66.	
3,5	30x56	.87.	32x55	.03.	
4	30x56	.88.	32x55	.04.	
4,5			32x55	.05.	
5	36x58	.06.	30x70	.98.	
6	36x70	.07.	30x70	.41.	
6,3	36x70	.29.			
7	36x70	.08.			
7,5	36x70	.09.			
8	40x70	.10.			
9	40x70	.11.			
10	40x70	.12.			
11	40x70	.13.			
12	40x92	.14.			
12,5	40x92	.15.			
13	40x92	.16.			
14	40x92	.17.			
15	40x92	.18.			
16	40x92	.19.			
17,5	40x92	.20.			
18	45x92	.21.			
20	45x92	.22.			
22	45x92	.65.			
25	45x117	.23.			
30	45x117	.24.			
31,5	45x117	.27.			
35	50x117	.25.			
40	50x117	.26.			
45	55x120	.74.			
50	55x120	.90.			
55	60x120	.94.			
60	60x120	.36.			
 UL recognition File E192559 400V~/500V~		<i>Available on request</i>			

** Alternative dimensions

Mechanical configuration



Accessories kk *

Fig.	Description	Series 4.16.18/.10/.17/.15		
		 without stud	 with stud	 fast fix
1	6,3 mm double tag	60	64	71
2	6,3 mm single tag	26	27	72
3	2,8 mm plug-in	00	40	
4	twin cable L = 250 mm	10	14	
5	unipolar leads L = 150 mm	06	46	
Ø 28 e 32 Plastic stud M8				
Ø 25, 30, 36 ÷ 60 Metallic stud M8				

* For UL recognized capacitors, different KK.

TECHNICAL CHARACTERISTIC

- Capacitance tolerance : $\pm 5\%$
- Working frequency range : $50 \div 60$ Hz
- Individual test voltage : Between terminals: $2.15 V_n$ for 2 sec.;
between terminals and case: 3KV for 2 sec.
- Dissipation factor $\tan \delta$: $< 20 \cdot 10^{-4}$ @ 20°C $V=V_n$, 50Hz
- Protection : Case and cover in self - extinguishing plastic material, grade V2 according to UL 94
- Terminals : Faston «terminals» 6.3 mm single, double, 2.8 mm plug-in, twin cable, unipolar leads
- Protection degree : with terminals: IP00; with twin cable IP55.
- Cover : Ball pressure test (IEC 309-1): 125°C
Glow wire test (IEC 695-2-1): 850°C
Tracking resistance (IEC 309-1): $\geq 250\text{V}$
- Threaded fixing bolt : Max torque: 5 N m

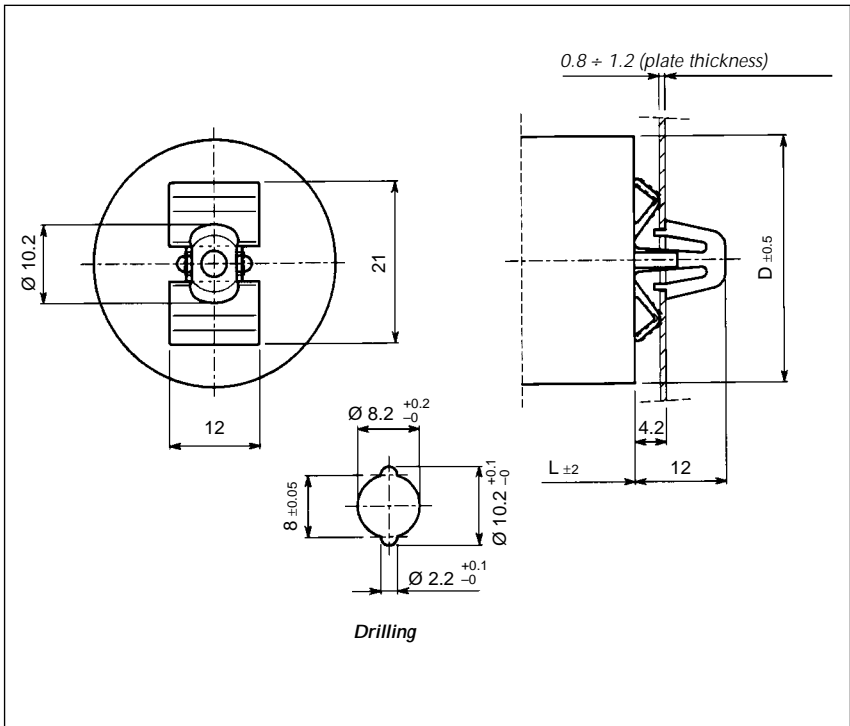


Fig. 6 Fast fix for dia 28, 32, 36, 40 only.

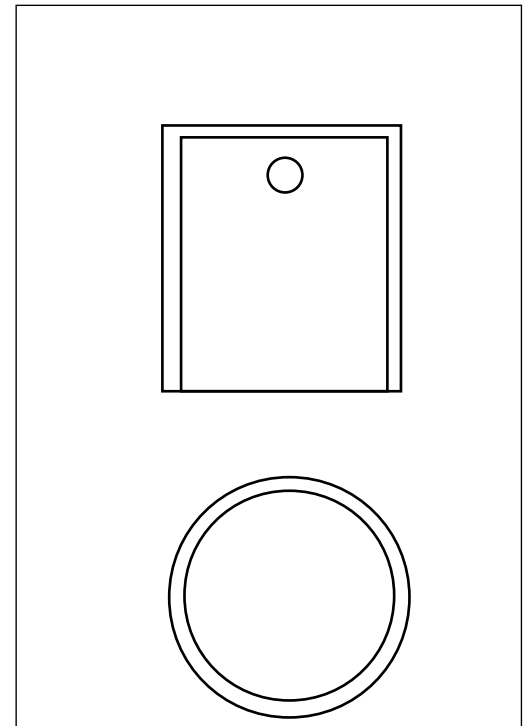


Fig. 7 Protective cap.

"FAST FIX" mounting system

The "FAST FIX" system (patent No UD 92A000164 registration date 3/11/1992) allows a quick mounting of the capacitors on the equipment and it is suitable for plates which thickness is between 0.8 and 1.2 mm. The required drilling allows, anyway, the alternative standard mounting by means thread stud.

Ø D	H	Ø d	P/n
28	50	8.5	316.23.0930
32	50	8.5	316.23.0940
36	50	8.5	316.23.0950
40	50	8.5	316.23.0960
45	50	8.5	316.23.0860

Metallized polypropylene film capacitors in metallic case series 4.16.27/.25/.33/.26



The dielectric is polypropylene film, the electrodes consist of an extremely thin metal coating obtained by vacuum evaporation. The capacitor has no risks of leakage.

The cases are metallic, the covers are in self extinguishing plastic (class V2 to UL-94 standards).

The capacitor is sealed by an edging of the case on the cover, ensuring air-tight closure.





The use of an-insulating container between the capacitive element and the metal case, combined with the blocking of the capacitive element in resin, make the capacitor extremely safe both from the electric point of view (earthing insulation) and in terms of resistance to vibrations.

Series 16.25/.26/.27 capacitors are equipped with a safety device in accordance with VDE 0560-8/A1 and UL 810 standard. (Fig. 6).





The capacitors are certified according to CSA 22.2 N. 190-M1985.

– Class of safety protection: P2





Series 4.16.27

Approvals						
Series 4.16.27	EN 60252				 ASE	 File E102953
	<i>Voltage</i>		<i>Approved range</i>		<i>Voltage</i>	
	330V~	10000h cl. B	25/85/21	2 ÷ 60uF	240V~ 60Hz 4÷100uF 10.000 AFC -25 +70°C	
	<i>Class of safety protection: P2</i>					
C (µF)	DxH (mm)	Part number 416.27.XX.KK	DxH (mm)	Part number 416.27.XX.KK		
2	25x60	4.16.27.33.KK				
2,5	25x60	.34.				
3	25x60	.35.				
3,15	25x60	.36.				
3,5	25x60	.37.				
4	25x60	.38.	35x60	416.27.01.KK.		
4,5	25x60	.39.				
5	30x60	.40.	35x60	.02.		
6	30x60	.41.	35x60	.03.		
6,3	30x60	.42.	35x60	.04.		
7	30x60	.43.	35x60	.05.		
7,5	30x60	.60.	35x60	.06.		
8	30x60	.44.	35x60	.07.		
9	35x60	.45.				
10	35x60	.08.				
12	35x60	.32.				
12,5	35x60	.09.				
13	35x60	.10.				
13,5	35x60	.11.				
14	35x72	.12.				
15	35x72	.13.				
16	35x72	.14.				
18	35x72	.15.				
20	40x72	.16.	35x77	.56.		
22	40x72	.17.				
25	40x72	.18.				
30	40x98	.19.				
31,5	40x98	.20.				
35	40x98	.21.				
40	40x98	.22.				
45	45x98	.23.				
50	45x98	.24.				
55	45x122	.25.				
60	45x122	.26.				
65	45x122	.27.				
70	45x122	.28.				
75	50x122	.29.				
80	50x122	.30.				
100	55x122	.31.				
110	55x122	.59.				





Series 4.16.25

Approvals						
Series 4.16.25	EN 60252					 File E102953
			ASE			
	<i>Voltage</i>		<i>Approved range</i>		<i>Voltage</i>	
	425V~	10000h cl. B	25/85/21	1 ÷ 35uF	370V~	
400V~	10000h cl. B	25/85/21	1 ÷ 60uF	60Hz 4÷70uF		
450V~	3000h cl. C	25/85/21	40 ÷ 60uF	10.000 AFC		
475V~	3000h cl. C	25/85/21	1 ÷ 35uF	-25 +70°C		
500V~	1000h cl. D	25/85/21 120/10	1 ÷ 25uF			
<i>Class of safety protection: P2</i>						
C (µF)	DxH (mm)	Part number 4.16.25.XX.KK	DxH (mm)	Part number 4.16.25.XX.KK	DxH (mm)	Part number 4.16.25.XX.KK
1	25x60	4.16.25.01.KK				
1,5	25x60	.02.	30x60	4.16.25.42.KK.		
2	25x60	.03.	30x60	.41.		
2,5	25x60	.04.	30x60	.43.		
3	25x60	.33.	30x60	.44.		
3,15	30x60	.34.				
4	30x60	.35.	25x72	.62.	35x60	4.16.25.05.KK
4,5	30x60	.36.	25x72	.63.		
5	30x60	.37.	25x72	.64.	35x60	.06.
6	30x60	.38.			35x60	.07.
6,3	35x60	.08.				
7	35x60	.09.				
7,5	35x60	.10.				
8	35x60	.11.	30x72	.40.		
9	35x60	.39.				
10	35x72	.12.				
12	35x72	.72.				
12,5	35x72	.13.				
13	35x72	.14.				
13,5	35x77	.81.	40x72	.15.		
14	35x77	.75.	40x72	.16.		
15	40x72	.17.				
16	40x72	.18.				
17,5	40x72	.83.				
18	40x72	.19.				
20	40x98	.20.				
22	40x98	.21.				
22,5	40x98	.82.				
25	40x98	.22.				
30	40x98	.23.				
31,5	45x98	.24.				
35	45x98	.25.				
40	45x122	.26.	50x98	.85.		
45	45x122	.27.				
50	45x122	.28.				
55	50x122	.29.				
60	50x122	.30.				
65	55x122	.31.				
70	55x122	.32.				

Series 4.16.33

Approvals					
Series 4.16.33	EN 60252    ASE		 File E102953		
	<i>Voltage</i> 425V~ 30000h cl. A 25/85/21 475V~ 10000h cl. B 25/85/21 500V~ 3000h cl. C 25/85/21		<i>Approved range</i> 0,8÷70uF		<i>Voltage</i> 400V~ 60Hz 0,8÷60uF 10.000 AFC -25 +70°C
	<i>Class of safety protection: P2</i>				
C (μF)	DxH (mm)	Part number 416.33.XX.KK	DxH (mm)	Part number 416.33.XX.KK	
0,8	25x60	4.16.33.01.KK.			
1	25x60	.02.			
1,5	25x60	.03.			
2	25x60	.04.			
2,5	25x60	.05.			
3	30x60	.09	25x72	4.16.33.06.KK.	
3,15	30x60	.10	25x72	.07.	
3 5	30x60	.11	25x72	.08.	
4	30x60	.12.			
4 5	30x60	.13.			
5	30x72	.15	35x60	.17.	
6	30x72	.16	35x60	.18.	
6,3	35x60	.19.			
7	35x60	.20.			
7,5	35x72	.21			
8	35x72	.22			
9	35x72	.23			
10	35x77	.27	40x72	.28.	
12	40x72	.29.			
12,5	40x72	.30.			
13	40x72	.31.			
13,5	40x98	.38.			
14	40x98	.39.			
15	40x98	.40.			
16	40x98	.41.			
17,5	40x98	.42.			
18	40x98	.43.			
20	40x98	.44.			
22	45x98	.45.			
25	45x98	.46.			
30	45x122	.50	50x98	.47.	
31,5	45x122	.51	50x98	.48.	
35	45x122	.52	50x98	.49.	
40	50x122	.53.			
45	50x122	.55.			
50	55x122	.56.			
55	55x122	.57.			
60	55x122	.58.			

Series 4.16.26

Approvals						
Series 4.16.26	EN 60252					 File E102953
			ASE			
	<i>Voltage</i>		<i>Approved range</i>		<i>Voltage</i>	
	425V~	30000h cl. A	25/85/21	30 ÷ 40uF	440V~	
450V~	30000h cl. A	25/85/21	0,8 ÷ 25uF	60Hz 0,8÷60uF		
475V~	10000h cl. B	25/85/21	30 ÷ 40uF	10.000 AFC		
500V~	3000h cl. C	25/85/21	0,8 ÷ 25uF	-25 +70°C		
			30 ÷ 40uF			
<i>Class of safety protection: P2</i>						
C (µF)	DxH (mm)	Part number 4.16.26.XX.KK	DxH (mm)	Part number 4.16.26.XX.KK	DxH (mm)	Part number 4.16.26.XX.KK
0,8	25x60	4.16.26.29.KK				
1	25x60	.30.			35x60	.71.
1,25	25x60	.58.				
1,5	25x60	.31.	30x60	.72.	35x60	.65.
1,8	25x60	.62.				
2	25x60	.32.	30x60	4.16.26.73.KK	35x60	4.16.26.01.KK.
2,5	30x60	.35.	25x72	.33.	35x60	.60.
3	30x60	.36.	25x72	.34	35x60	.02.
3,15	30x60	.42.			35x60	.70.
3,5	30x72	.37.			35x60	.03.
4	30x72	.38.			35x60	.04.
4,5	30x72	.39.			35x60	.40.
5	35x60	.05.	30x77	.61.		
6	35x72	.06.				
6,3	35x72	.66.				
7	35x72	.07.				
7,5	35x72	.08.				
8	40x72	.09.	35x77	.56.		
9	40x72	.41.				
10	40x72	.10.				
12	40x98	.11.				
12,5	40x98	.12.				
13	40x98	.13.				
14	40x98	.14.				
15	40x98	.15.				
16	40x98	.16.				
17,5	45x98	.17.				
18	45x98	.18.				
20	45x98	.19.				
22	45x122	.55.				
22,5	45x122	.51.				
25	45x122	.20.	50x98	.52.		
30	50x122	.50.	55x98	.53.		
31,5	50x122	.22.				
35	50x122	.23.	55x98	.54.		
40	55x122	.24.				
45	55x132	.25.				
50	55x132	.26.				
55	60x132	.27.				
60	60x132	.28.				

Mechanical configuration

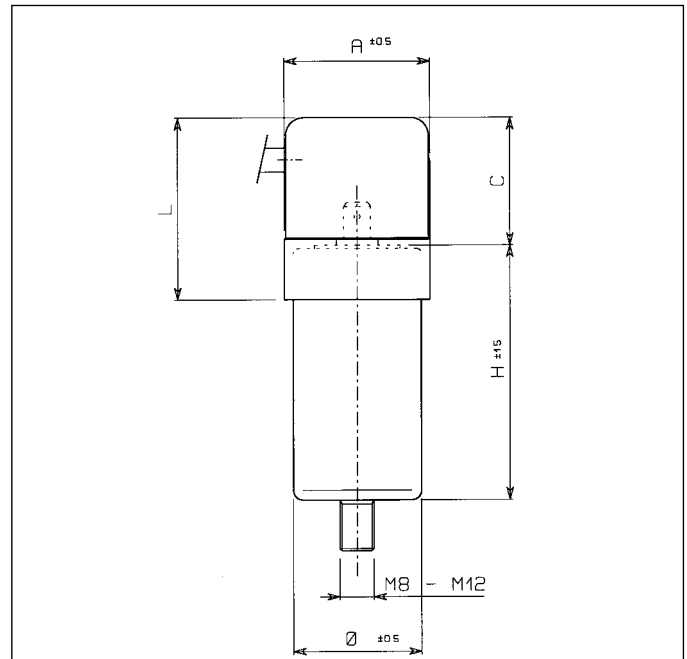
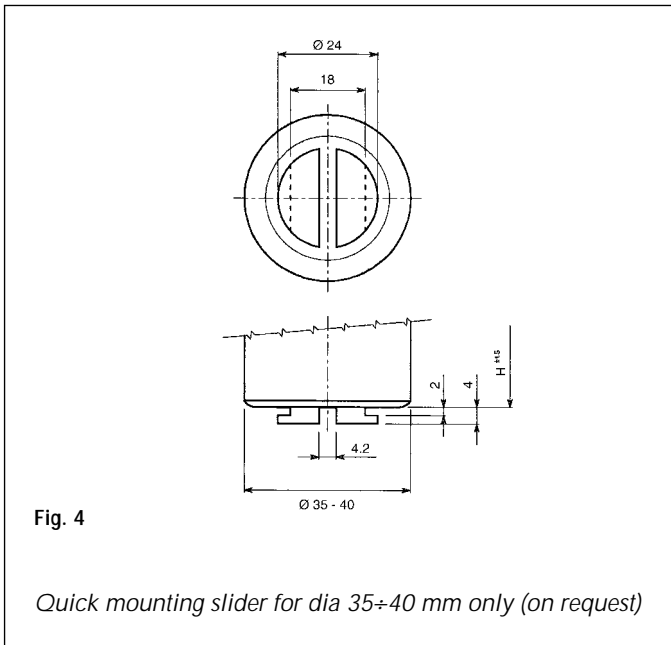
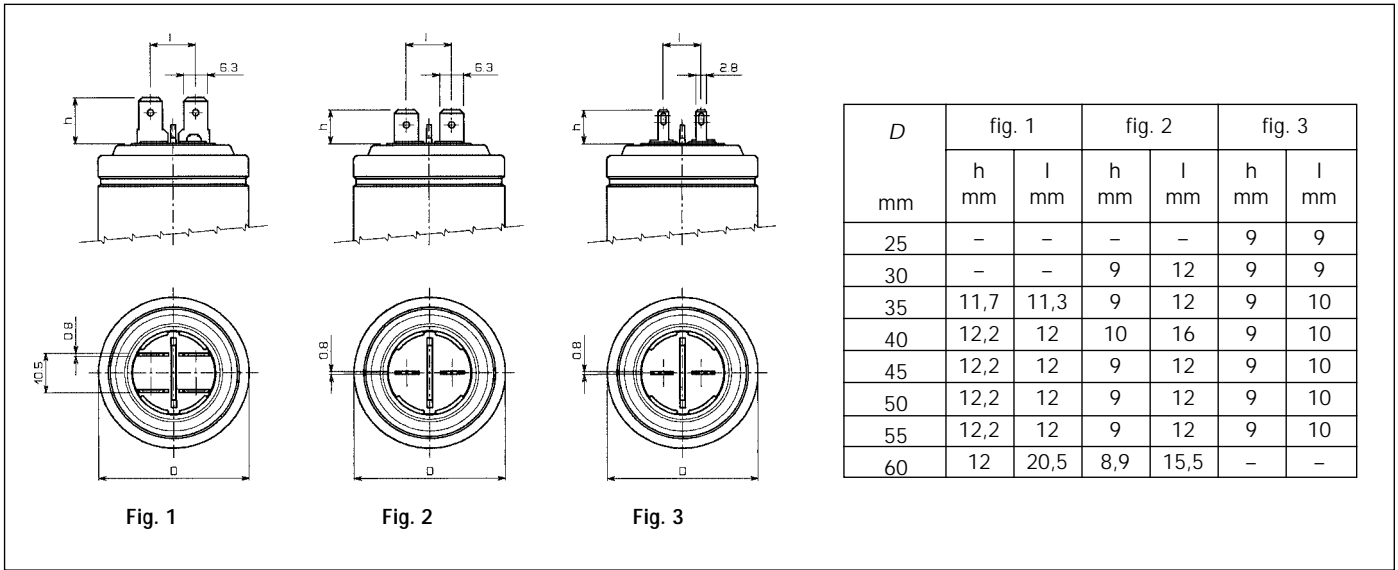




Fig. 5

Plastic cap - IP55 with twin cable.

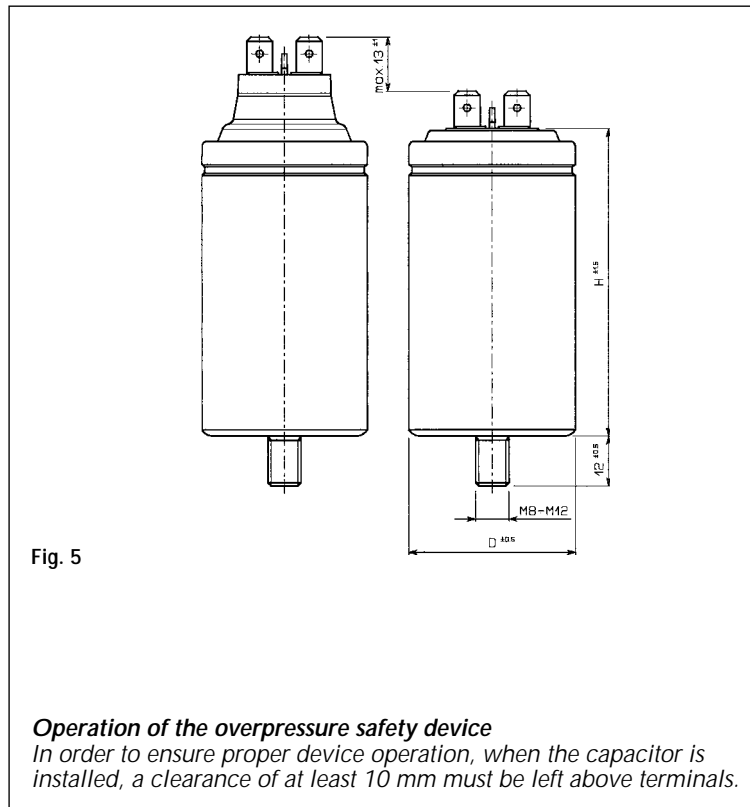
Ø	A	C	L	Part number
30	34,5	32	45,5	316.23.1030
35	39	32	52	316.23.1020
40	44	32	58	316.23.1040
45	49	32	58	316.23.1050

Accessories kk

Fig.	Description	Series 4.16.27/.25/.33/.26	
		 without stud	 with stud
1	6,3 mm double tag	60	64
2	6,3 mm single tag	28	29
3	2.8 plug in	00	40
Ø25-30-40-45-50 M8 stud			
Ø 55-60 M12 stud			

TECHNICAL CHARACTERISTIC

Capacitance tolerance	: $\pm 5\%$
Working frequency	: 50/60 Hz
Individual test voltage	: Between terminals: $2.15 V_n$ for 2 sec.; between terminals and case: $3kV$ for 2 sec.
Dissipation factor $\tan \delta$: $\leq 20 \cdot 10^{-4}$ @ $20^\circ C$ $V=V_n$, 50 Hz
Protection	Aluminium case with plastic self extinguishing sealing cover, according to UL 94 Standard, Grade V2
Terminals	: Faston terminals 6.3 mm single, double 2.8 mm plug-in. Twin cable
Protection degree	: With terminals: IP00
Cover	: Ball pressure test (IEC 309-1): $125^\circ C$ Glow wire test (IEC 695-2-1): $960^\circ C$ Tracking resistance (IEC 309-1): $\geq 250V$
Threaded fixing bolt	: Max screwing torque: M8 = 5 N m; M12 = 12 N m
Safety device	: overpressure (Fig. 6)

**Operation of the overpressure safety device**

In order to ensure proper device operation, when the capacitor is installed, a clearance of at least 10 mm must be left above terminals.

This protection is provided by a special construction technology (patented) which breaks both the connections in case of breakdown, without affecting case insulation, preventing the capacitor from exploding or burning.

In case of permanent short-circuit, the current causes the dielectric to decompose, forming gas: the resulting pressure pushes up the part of the lid where the terminals are mounted, thus breaking the internal connections and stopping the current flow. (Fig. 6)

The device is designed in different sizes for each size of capacitor for the most effective, fastest intervention with both high and low short-circuit currents (up to 10.000 A).

In order to ensure proper operation of the device when the capacitor are installed, an empty space of at least 10 mm must be left above the terminals.

Because the new patented safety device is acting in the central part of the plastic deck only (see Fig. 5), it is possible to fix the capacitor with the system in use in the U.S.A. (Dog-house Clamps).

Single phase motor starting electrolytic capacitors series 4.12.80



Electrolytic capacitors are normally employed in single-phase induction motors in order to increase the value of their starting torque.

It is necessary that such starting should take place in a fraction of a second or at the most in a few seconds and with the contribution of an high reactive power.

Because of its reduced size, high capacitance value, the electrolytic capacitor is the suitable capacitor for this type of application.

Of course, once the motor has been started, the capacitor must be disconnected from the circuit.

The capacitive element is made of aluminium foils «treated» and separated by a leaf of impregnated paper as the electrolyte. Cases moulded in thermoplastic material, terminals tinned soldering and flat plug type.

Series 4.12.80

Standard duty series for general application

Capacitance μF C min C max Cn. (Toll.)	110V ~		125V ~		165V ~		220V ~		250V ~		280V ~		330V ~	
	Dim.	Part number 4.12.80.y.xxx	Dim.	Part number 4.12.80.y.xxx	Dim.	Part number 4.12.80.y.xxx	Dim.	Part number 4.12.80.y.xxx	Dim.	Part number 4.12.80.y.xxx	Dim.	Part number 4.12.80.y.xxx	Dim.	Part number 4.12.80.y.xxx
21±25	A	4.12.80.y.201	A	4.12.80.y.251	A	4.12.80.y.301	A	4.12.80.y.351	A	4.12.80.y.401	A	4.12.80.y.501	A	4.12.80.y.451
25±30	»	.202	»	.252	»	.302	»	.352	»	.402	»	.502	»	.452
30±36	»	.203	»	.253	»	.303	»	.353	»	.403	»	.503	»	.453
36±43	»	.204	»	.254	»	.304	»	.354	»	.404	»	.504	»	.464
43±52	»	.205	»	.255	»	.305	»	.355	»	.405	»	.505	»	.472
47±56	»	.206	»	.256	»	.306	»	.356	»	.406	»	.506	B	.456
53±64	»	.207	»	.257	»	.307	»	.357	»	.418	»	.523	»	.457
64±77	»	.208	»	.258	»	.308	»	.370	»	.427	B	.508	»	.458
72±86	»	.209	»	.259	»	.309	»	.376	B	.409	»	.509	»	.459
88±106	»	.210	»	.260	»	.310	B	.360	»	.410	»	.510	»	.465
108±130	»	.211	»	.261	»	.311	»	.361	»	.411	»	.518	C	.461
124±149	»	.212	»	.262	»	.334	»	.362	»	.419	»	.533	»	.462
130±156	»	.213	»	.263	»	.335	»	.371	»	.420	»	.534	»	.463
145±174	»	.214	»	.264	»	.336	»	.372	»	.421	»	.535	»	.469
161±193	»	.215	»	.265	B	.315	»	.373	»	.422	C	.515	»	.468
189±227	»	.216	»	.266	»	.316	»	.377	»	.424	»	.520		
216±260	»	.217	»	.267	»	.317	»	.378	C	.417				
233±280	»	.218	»	.268	»	.318	C	.368						
243±292	»	.219	»	.275	»	.319	»	.369						
270±324	»	.227	B	.270	»	.337	»	.375						
324±389	B	.221	»	.271	»	.338								
340±408	»	.222	»	.272	»	.339								
378±454	»	.223	»	.273	»	.340								
400±480	»	.224	»	.274	C	.333								
430±516	»	.225	»	.276										
460±552	»	.226	»	.284										
550±650	»	.228	»	.285										

Heavy duty series for industrial applications

VDE



560-8

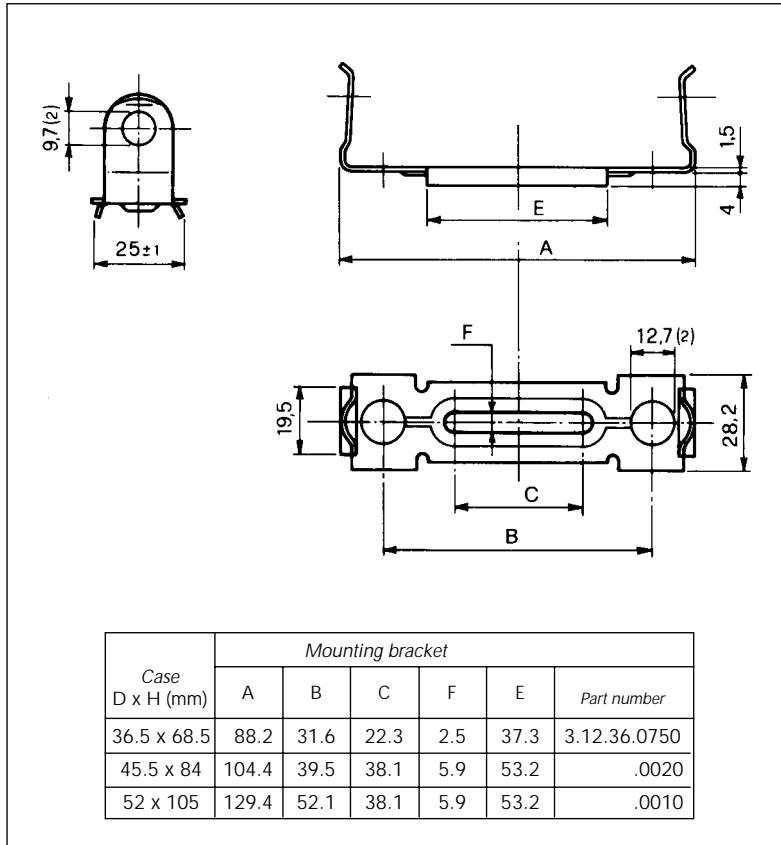
Approved

Capacitance μF	250 V ~		330 V ~	
	DIM.	Part number 4.12.80.y.xxx	DIM.	Part number 4.12.80.y.xxx
24 ± 10%	A	4.12.80.y.107	A	4.12.80.y.121
48 ± 10%	»	.112	»	.133
56 ± 10%	»	.109	B	.101
59 ± 10%	»	.110	»	.102
71 ± 10%	»	.105	»	.124
80 ± 10%	B	.114	»	.126
98 ± 10%	»	.106	»	.134
120 ± 10%			C	.165
140 ± 10%	»	.117	»	.120
160 ± 10%	»	.118		

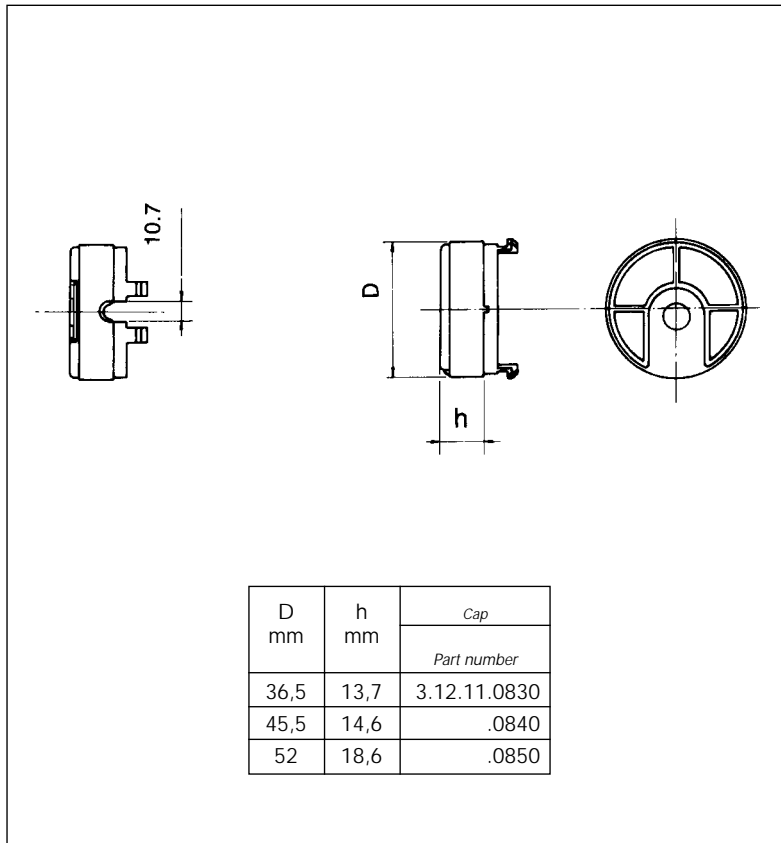
Dimensions
 A = 36,5 x 68,5 mm
 B = 45,5 x 84 mm
 C = 52 x 105 mm

Series 4.12.80

Mounting bracket



Protective cap



Packages

Series 4.16.18/.10/.17/.15

Plastic case

D x H (mm) Capacitor's dimensions	With tags	D*	With leads		With cables	
			L < 200 mm.	D*	L ≥ 200 mm.	D*
25 x 49	250 pz.	A	250 pz.	A	200 pz.	A
25 x 55	250 pz.	»	200 pz.	»	125 pz.	B
28 x 55	250 pz.	»	200 pz.	»	125 pz.	»
30 x 56.5	200 pz.	»	200 pz.	»	125 pz.	»
30 x 70	125 pz.	B	125 pz.	B	100 pz.	A
32 x 55	200 pz.	A	125 pz.	»	100 pz.	»
36 x 58	125 pz.	»	125 pz.	A	100 pz.	»
36 x 70	100 pz.	»	100 pz.	»	50 pz.	B
40 x 70	100 pz.	»	50 pz.	B	50 pz.	A
40 x 92	50 pz.	B	50 pz.	A	50 pz.	»
45 x 68	50 pz.	»	50 pz.	»	50 pz.	»
45 x 92	50 pz.	A	25 pz.	B	25 pz.	»
45 x 117	25 pz.	B	25 pz.	»	25 pz.	B
50 x 92	25 pz.	»	25 pz.	»	25 pz.	»
50 x 117	25 pz.	A	25 pz.	A	25 pz.	A
55 x 120	25 pz.	»	25 pz.	»	25 pz.	»
60 x 120	20 pz.	»	20 pz.	»	20 pz.	»
Peso / Weight	8 ÷ 9 Kg.		6,5 ÷ 8 Kg.		7 ÷ 8 Kg.	

All of the capacitors dimensions are packet in bulk.

Series 4.16.27/.25/.33/.26

Metallic case

Capacitor's dimensions D x H (mm)	With tags	D*
25 x 53	250	A
25 x 60	250	A
25 x 72	200	B
30 x 60	200	A
30 x 72	200	A
35 x 60	125	B
35 x 72	100	B
35 x 77	100	B
40 x 72	100	A
40 x 98	50	B
45 x 98	50	A
45 x 122	50	A
45 x 132	25	B
50 x 122	25	B
55 x 122	25	A
55 x 132	25	A
60 x 98	25	A
60 x 132	25	A

Series 4.12.80

D x H (mm) Capacitor's dimensions	36,5 x 68,5	45,5 x 84	52 x 105	Peso / Weight
With tags	100 pz.	50 pz.	50 pz.	6 ÷ 7 Kg.
Dimensions box *	B	A	A	

* Standard box dimensions: A = mm 195 x 390 x 255 B = mm 195 x 390 x 200