

<b>DUCATI</b> energia	<b>THREE PHASE PFC CAPACITORS</b> <b>CAPACITORS TYPE TEST REPORT ACCORDING</b> <b>TO IEC 60831</b>	Class. : PT 024 Ed :
	RS/CON 12/01/2015	PN 416465375 - Modulo XD Page : 1/5

**Type test on capacitors PN:** 416465375 , production lot from week W40/14

**Rated values:** Qn=45kvar, Un=550V, Fn=50Hz, Cn=3x158uF

The tests have been performed at the DUCATI energia facilities in Bologna, Italy.

**Drawing:**

**CHARACTERISTICS**

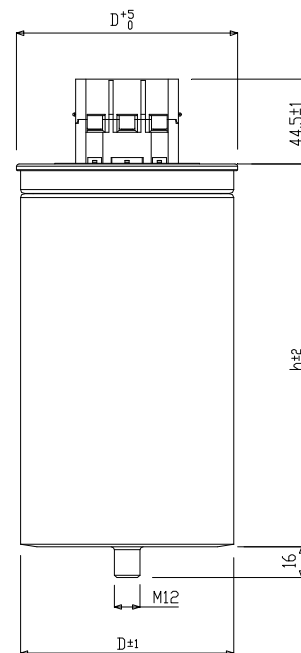
Power	45	kVar
Rated Capacitance	3x158	µF
Capacitance Tolerance	-5+10%	
Rated Voltage Un	550	V
Rated frequency	50	Hz
Rated Current (In)	47	A
Dielectric	PPM film	Self healing
Dielectric losses	<=0.2	W/kVar
Connection	D	
Overpressure safety device		
Aluminium case		
Dry resin filled		

**Equipment**

Discharge resistor box	75V/3min
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**MAXIMUM RATINGS**

Overvoltage	1,1 Un	8 hours/day
	1,15 Un	30min/day
	1,2 Un	5min/200times
	1,3 Un	1min/200times
Overcurrent:	3 In	
Inrush current:	100 In	
Voltage raise of rise (dV/dt)	100	V/µs



**TEST DATA**

AC Test voltage terminal to terminal	2.15Un	Vac (2 sec)
AC test voltage terminal to case	3000	Vac (10 sec)

**CLIMATIC CATEGORY**

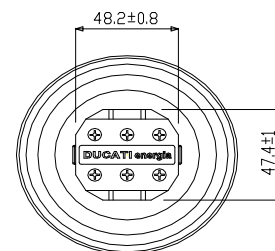
Temperature class	-25/D	(max 55°C)
Storage temperature	-40 +75	°C
Altitude maximum	2000m	a.s.l.

Failure quota	300/10E9
Expected life (Ln)	110000h

**Standards:** EN60831-1  
EN60831-2

**Degree of protection:** IP20 indoor mounting


Humidity category	in accord. with DIN 40040	F
Self-extinguishing	in accord. with UL 492	
Vibration resistance	in accord. with EIA STAND. RS-186-7E	



Fixing Stud : M12  
Case materials: Aluminium

Ø (mm)	H (mm)
116 ± 1	370 ± 2

Total elongation is about 15 mm after the overpressure disconnecter release.  
Don't use rigid connections.

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### §. 1 External check

N° Cap.	Visual exams	Marking	Dimensional exams
1	OK	OK	OK
2	OK	OK	OK
3	OK	OK	OK
4	OK	OK	OK
5	OK	OK	OK

### §. 2 Electrical measurements (according to IEC831 7./8.)

According to the reference standard, capacitance and losses are measured

N° Cap.	Measurements @ 550Vac 50 Hz					
	C1 (uF)	TanD1 (E-4)	C2 (uF)	TanD2 (E-4)	C3 (uF)	TanD3 (E-4)
1	160,34	8,85	160,36	8,57	160,27	8,27
2	160,15	7,79	160,82	8,28	161,18	8,58
3	160,82	8,24	160,22	8,57	160,07	8,54
4	160,52	8,49	160,73	8,42	160,29	8,29
5	160,87	8,41	160,81	8,71	160,55	8,84

### §. 3 Voltage type test (according to IEC831 9.2)

According to the standard, the capacitors are voltage tested between terminals at 2,15xUn per 10s and between terminals to case at 3kV per 60s.

N° Cap.	Electrical test	
	Vt-t 1182 Vac 50 Hz 10s	Vt-c 3000Vac 50 Hz 60"s
	OK / FAULT	OK / FAULT
1	OK	OK
2	OK	OK
3	OK	OK
4	OK	OK
5	OK	OK

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#### **§. 4 Electrical measurements (according to IEC831 7./8.)**

The units are measured to check they passed the voltage tests, all values are still in tolerance, the units passed the test.

N° Cap.	Measurements @ 550Vac 50 Hz					
	C1 (uF)	TanD1 (E-4)	C2 (uF)	TanD2 (E-4)	C3 (uF)	TanD3 (E-4)
1	160,39	8,82	160,37	8,55	160,31	8,24
2	160,21	7,76	160,85	8,27	161,22	8,57
3	160,84	8,23	160,23	8,54	160,09	8,54
4	160,59	8,49	160,73	8,41	160,33	8,22
5	160,92	8,35	160,84	8,68	160,58	8,83

#### **§. 5 Discharge test (according to IEC831 16.)**

The units are subjected to five discharge from a DC voltage of 2xUnVdc. After that a test voltage between terminals is performed

N° Cap.	V disch.	N° discharge	Test T/T
1	1100	5	OK
2	1100	5	OK

#### **§. 6 Electrical measurements (according to IEC831 7./8.)**

The units are measured to check they passed the discharge test, the units passed the test.

N° Cap.	Misura a 550Vac 50 Hz					
	C1 (uF)	TanD1 (E-4)	C2 (uF)	TanD2 (E-4)	C3 (uF)	TanD3 (E-4)
1	160,35	8,71	160,32	8,24	160,27	8,21
2	160,15	7,72	160,81	8,25	161,19	8,49

#### **§. 7 Self healing test (according to IEC831 18.)**

The units are subjected to at least 5 self healing discharge, according to the standard.

N° Cap.	Discharge Voltage from 990V up to 1550V		
	N° of disch.		
3	5		
4	5		

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### §. 8 Electrical measurements (according to IEC831 7./8.)

The units are measured to check the self healing test, they passed the test.

N° Cap.	Misura a 550Vac 50 Hz					
	C1 (uF)	TanD1 (E-4)	C2 (uF)	TanD2 (E-4)	C3 (uF)	TanD3 (E-4)
3	160,83	8,21	160,22	8,51	160,07	8,52
4	160,56	8,45	160,72	8,40	160,32	8,21

### §. 9 Thermal stability test (according to IEC831 13.)

A thermal stability test is performed on a unit energized at 1,44xQn in an ambient at 55°C.

N° Cap.	Voltage test 660V					
	Tamb	Tcase				
3	55	67,3				

### §. 10 Electrical measurements (according to IEC831 14.)

The unit is measured to check the thermal stability test, it passed the test.

N° Cap.	Misura a 550Vac 50 Hz					
	C1 (uF)	TanD1 (E-4)	C2 (uF)	TanD2 (E-4)	C3 (uF)	TanD3 (E-4)
3	159,65	7,98	159,51	8,14	159,87	8,23

### §. 11 Aeging test (according to IEC831 17.)

The aeging test is performed on two units at 2,15xUn=690VacVac, the total duration is of 1500h plus 1000 discharge at 750h, according to the IEC 831 standard.

N° Cap.	Test Voltage 690V plus 1000 discharge					
	OK (No interruption, flash over or short circuit)					
1	OK					
5	OK					

### §. 12 Electrical measurements (according to IEC831 7./8.)

The units are measured to check the aeging test, they passed the test.

N° Cap.	Misura a 550Vac 50 Hz					
	C1 (uF)	TanD1 (E-4)	C2 (uF)	TanD2 (E-4)	C3 (uF)	TanD3 (E-4)
1	156,24	9,57	157,49	10,18	157,33	10,23
5	157,84	10,23	158,16	9,81	158,41	9,91

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### **§. 13 Destruction test (according to IEC831 19.)**

The destruction test has been performed on three units according to the relevant standard.  
The capacitors passed the test.

N° Cap.	N° rep.	Icc (mA)	Vcc (v) short	Vac	Time	T-C test
2	1	250	6100	715	2"	OK
3	1	250	6300	715	2"	OK
4	1	250	6300	715	2'	OK

### **§. 14 Lighting impulse test (according to IEC831 15.)**

The capacitors passed the test.

N° Cap.	Rep. pos.	Rep. neg.	Vpeak	Wave form
1	3	3	8kV	1,2/50us
5	3	3	8kV	1,2/50us