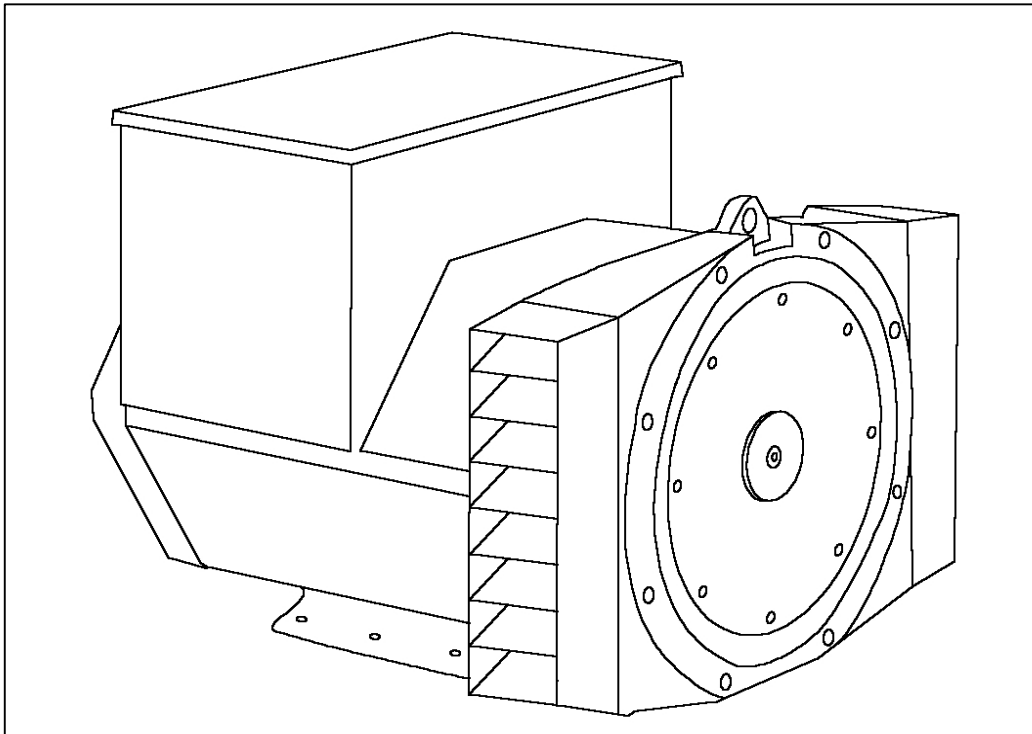


**BCM184F - Technical Data Sheet**



# BCM184F

## SPECIFICATIONS & OPTIONS



### STANDARDS

Marine generators may be certified to Lloyds, DnV, Bureau Veritas, ABS, Germanischer-Lloyd or RINA. Other standards and certifications can be considered on request.

### VOLTAGE REGULATORS

#### SA465 AVR - STANDARD

With this self excited control system the main stator supplies power, from an auxiliary winding, via the Automatic Voltage Regulator (AVR) to the exciter stator. The high efficiency semiconductors of the AVR ensure positive build-up from initial low level.

The exciter rotor output is fed to the main rotor through a three phase full wave bridge rectifier. This rectifier is protected by a surge suppressor against surges caused, for example, by short circuit or out of phase paralleling.

Additionally, this AVR will support a range of electronic accessories, such as a 'droop' Current Transformer (CT) to permit parallel operation with other ac generators.

### TERMINALS & TERMINAL BOX

Standard generators are 3-phase reconnectable with 12 ends brought out to the terminals, which are mounted on a cover at the non-drive end of the generator. A sheet steel terminal box contains the AVR and provides ample space for the customers' wiring and gland arrangements. It has removable panels for easy access.

### SHAFT & KEYS

All generator rotors are dynamically balanced to better than BS6861:Part 1 Grade 2.5 for minimum vibration in operation. Two bearing generators are balanced with a half key.

### INSULATION/IMPREGNATION

The insulation system is class 'H'.

All wound components are impregnated with materials and processes designed specifically to provide the high build required for static windings and the high mechanical strength required for rotating components.

### QUALITY ASSURANCE

Generators are manufactured using production procedures having a quality assurance level to BS EN ISO 9001.

The stated voltage regulation may not be maintained in the presence of certain radio transmitted signals. Any change in performance will fall within the limits of Criteria 'B' of EN 61000-6-2:2001. At no time will the steady-state voltage regulation exceed 2%.

*NB Continuous development of our products entitles us to change specification details without notice, therefore they must not be regarded as binding.*

*Front cover drawing typical of product range.*

**BCM184F**  
**WINDING 71**

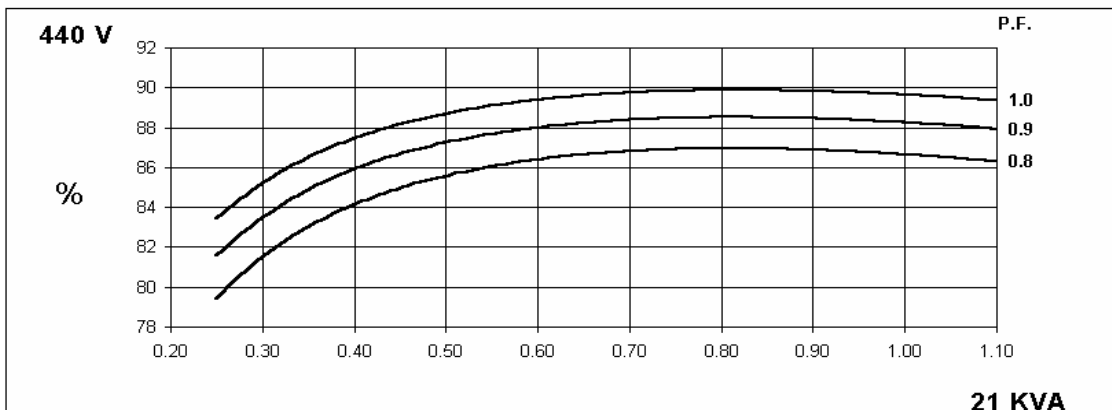
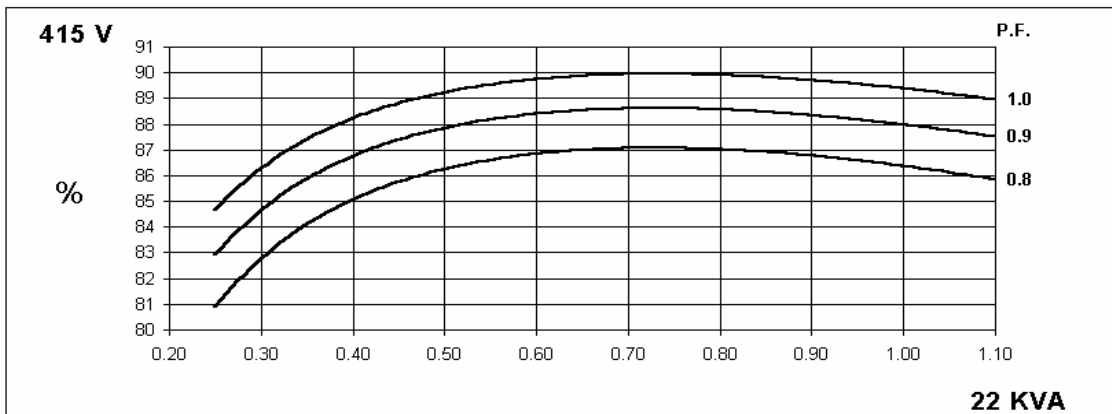
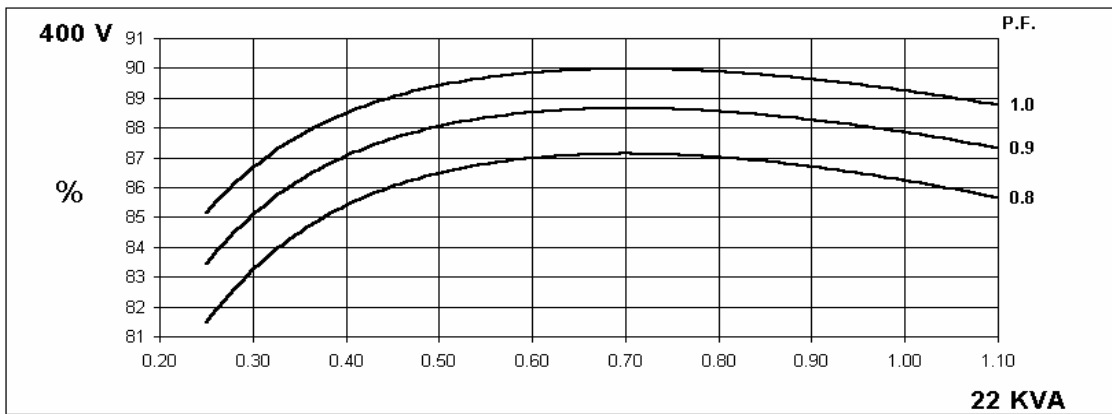
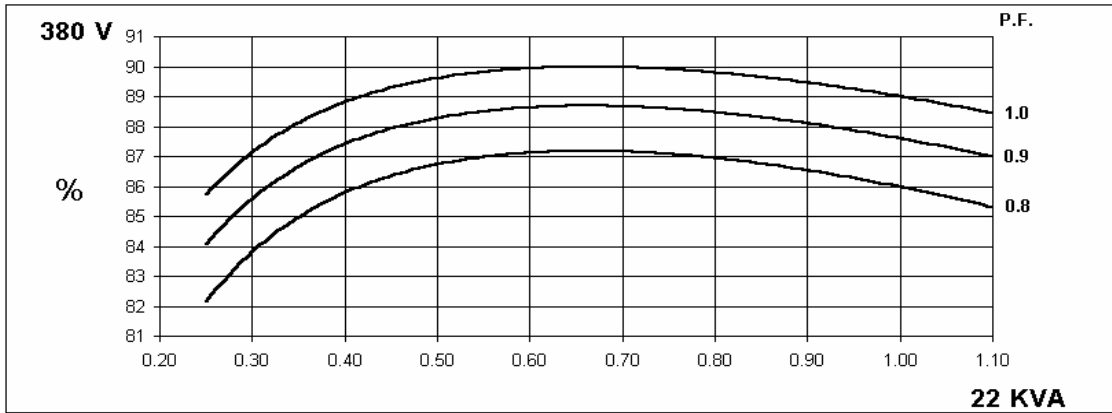
CONTROL SYSTEM	AUXILLIARY WINDING							
A.V.R.	SA465							
VOLTAGE REGULATION	± 1.0 %							
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)							
INSULATION SYSTEM	CLASS H							
PROTECTION	IP23							
RATED POWER FACTOR	0.8							
STATOR WINDING	DOUBLE LAYER CONCENTRIC							
WINDING PITCH	TWO THIRDS							
WINDING LEADS	12							
STATOR WDG. RESISTANCE	0.26 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED							
ROTOR WDG. RESISTANCE	0.74 Ohms at 22°C							
EXCITER STATOR RESISTANCE	8 Ohms at 22°C							
EXCITER ROTOR RESISTANCE	0.115 Ohms PER PHASE AT 22°C							
R.F.I. SUPPRESSION	BS EN 61000-6-2 & BS EN 61000-6-4, VDE 0875G, VDE 0875N. refer to factory for others							
WAVEFORM DISTORTION	NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%							
MAXIMUM OVERSPEED	2250 Rev/Min							
BEARING DRIVE END	BALL. 6309 - 2RS. (ISO)							
BEARING NON-DRIVE END	BALL. 6300 - 2RS. (ISO)							
	1 BEARING				2 BEARING			
WEIGHT COMP. GENERATOR	151 kg				154 kg			
WEIGHT WOUND STATOR	55 kg				55 kg			
WEIGHT WOUND ROTOR	49.74 kg				50.52 kg			
WR <sup>2</sup> INERTIA	0.1909 kgm <sup>2</sup>				0.1909 kgm <sup>2</sup>			
SHIPPING WEIGHTS in a crate	161 kg				164 kg			
PACKING CRATE SIZE	84 x 59 x 75 (cm)				84 x 59 x 75 (cm)			
	50 Hz				60 Hz			
TELEPHONE INTERFERENCE	THF<2%				TIF<50			
COOLING AIR	0.095 m <sup>3</sup> /sec 200 cfm				0.119 m <sup>3</sup> /sec 250 cfm			
VOLTAGE SERIES STAR	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
VOLTAGE PARALLEL STAR	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
VOLTAGE SERIES DELTA	220/110	230/115	240/120	254/127	240/120	254/127	266/133	277/138
KVA BASE RATING FOR REACTANCE VALUES	22	22	22	21	25.4	27	27	27
X <sub>d</sub> DIR. AXIS SYNCHRONOUS	1.474	1.331	1.236	1.050	1.761	1.673	1.531	1.406
X' <sub>d</sub> DIR. AXIS TRANSIENT	0.148	0.134	0.124	0.106	0.178	0.169	0.155	0.142
X'' <sub>d</sub> DIR. AXIS SUBTRANSIENT	0.096	0.087	0.080	0.068	0.112	0.107	0.098	0.090
X <sub>q</sub> QUAD. AXIS REACTANCE	0.732	0.661	0.614	0.521	0.872	0.828	0.758	0.696
X'' <sub>q</sub> QUAD. AXIS SUBTRANSIENT	0.166	0.150	0.139	0.118	0.197	0.187	0.171	0.157
X <sub>L</sub> LEAKAGE REACTANCE	0.059	0.054	0.050	0.042	0.071	0.068	0.062	0.057
X <sub>2</sub> NEGATIVE SEQUENCE	0.139	0.126	0.117	0.099	0.160	0.152	0.139	0.128
X <sub>0</sub> ZERO SEQUENCE	0.063	0.057	0.053	0.045	0.076	0.072	0.066	0.060
REACTANCES ARE SATURATED VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED								
T' <sub>d</sub> TRANSIENT TIME CONST.	0.02 s							
T'' <sub>d</sub> SUB-TRANSTIME CONST.	0.005 s							
T' <sub>do</sub> O.C. FIELD TIME CONST.	0.4 s							
T <sub>a</sub> ARMATURE TIME CONST.	0.006 s							
SHORT CIRCUIT RATIO	1/X <sub>d</sub>							

**50  
Hz**

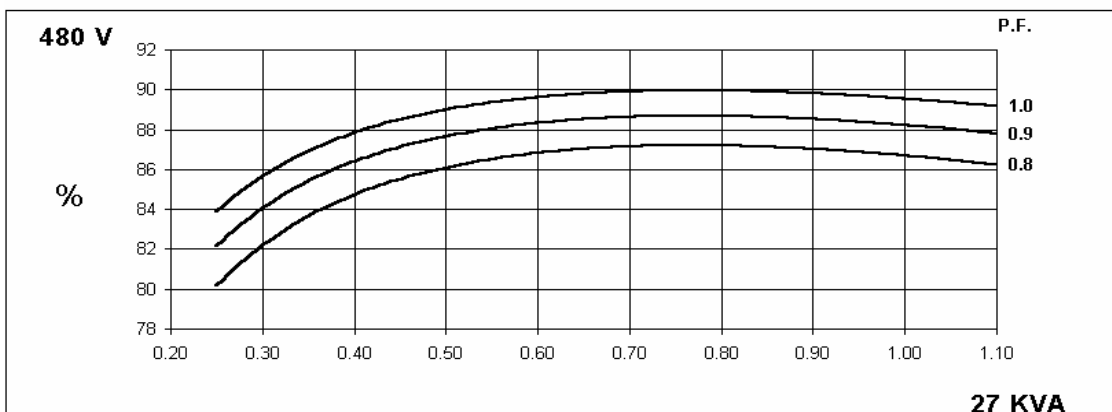
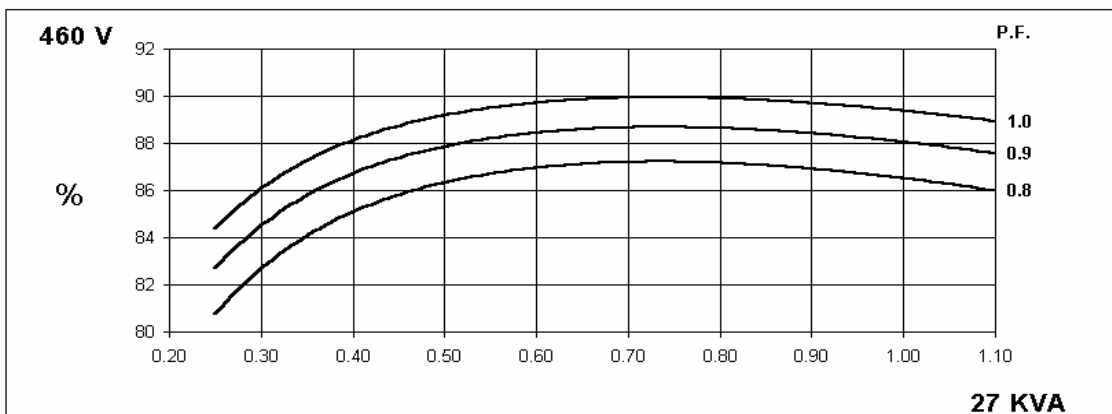
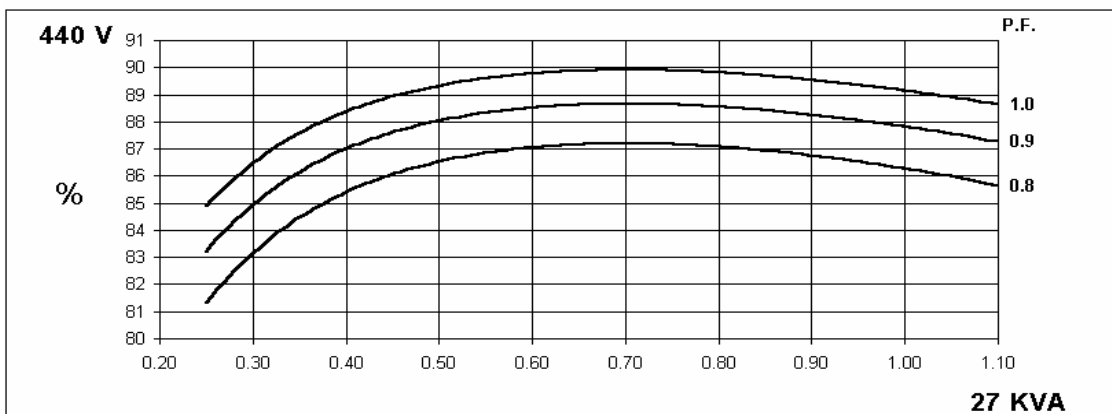
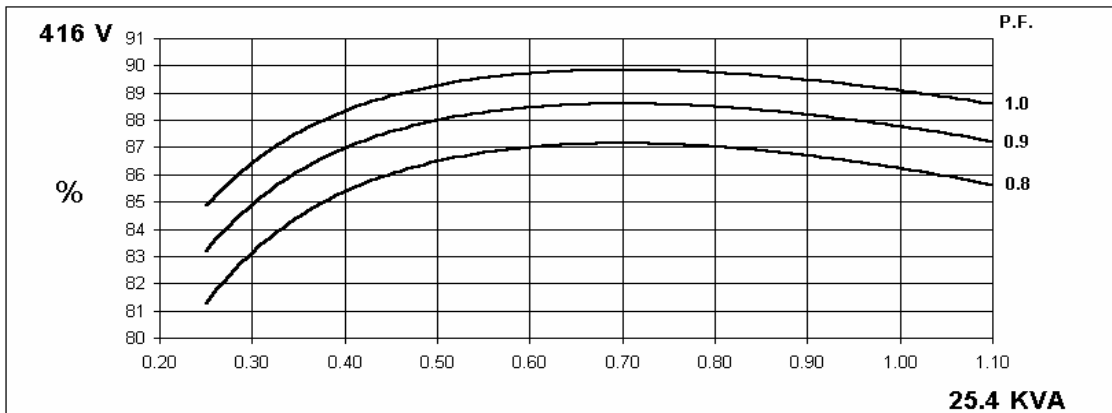
**BCM184F**  
Winding 71



**THREE PHASE EFFICIENCY CURVES**



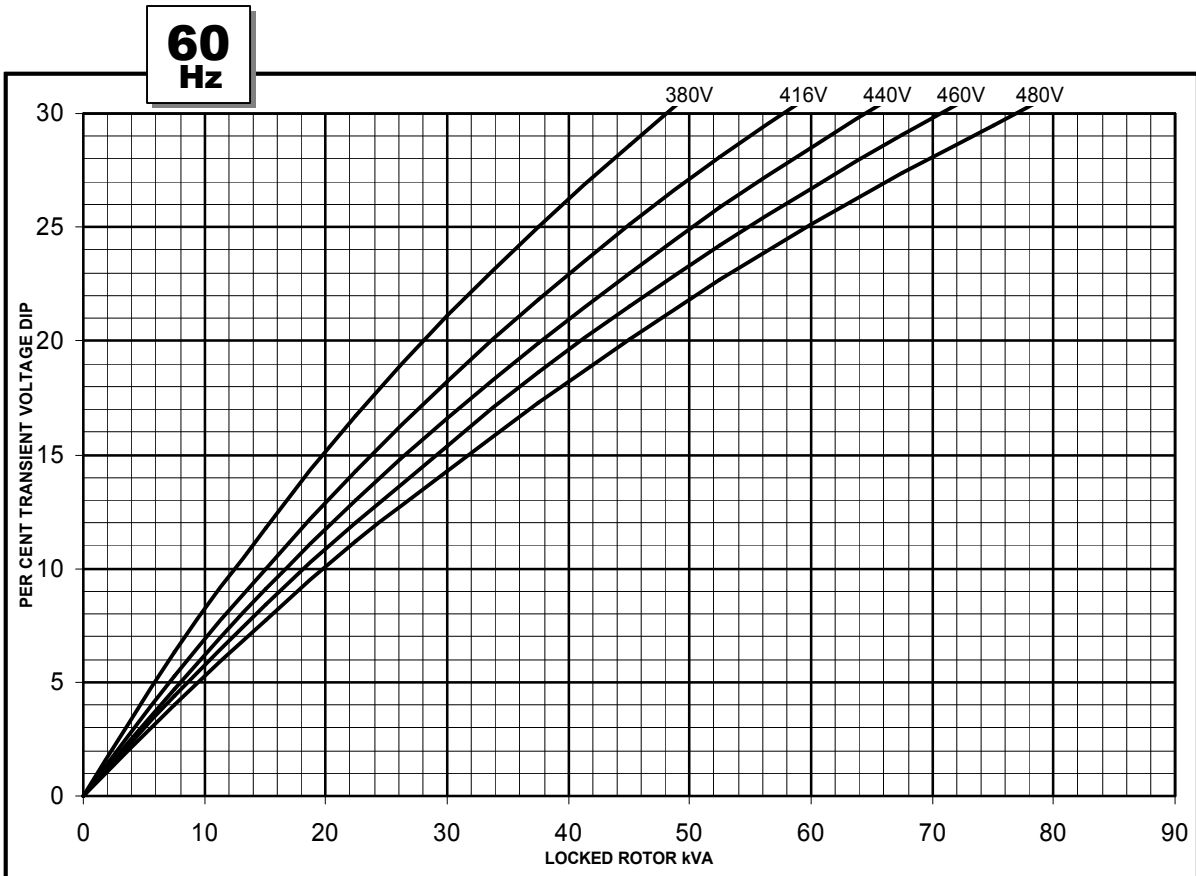
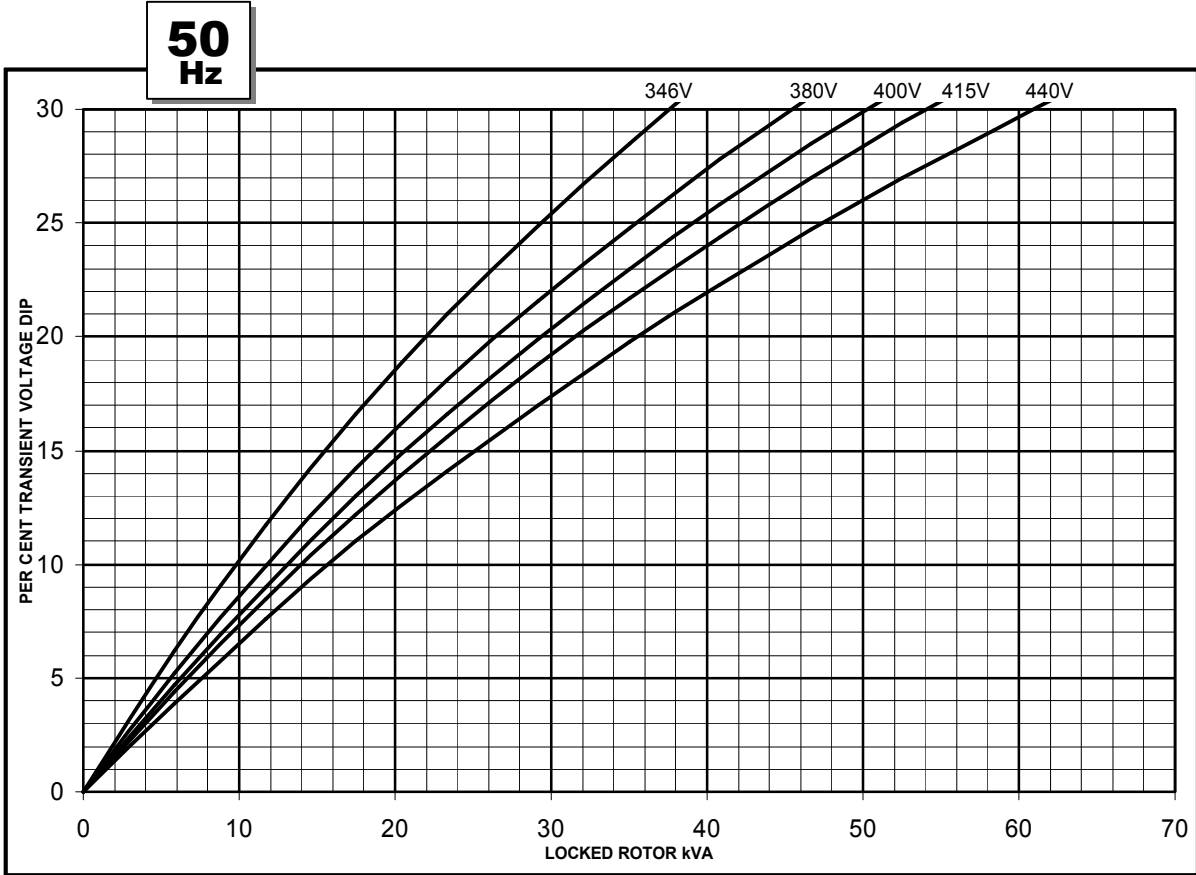
**THREE PHASE EFFICIENCY CURVES**



**BCM184F**  
Winding 71

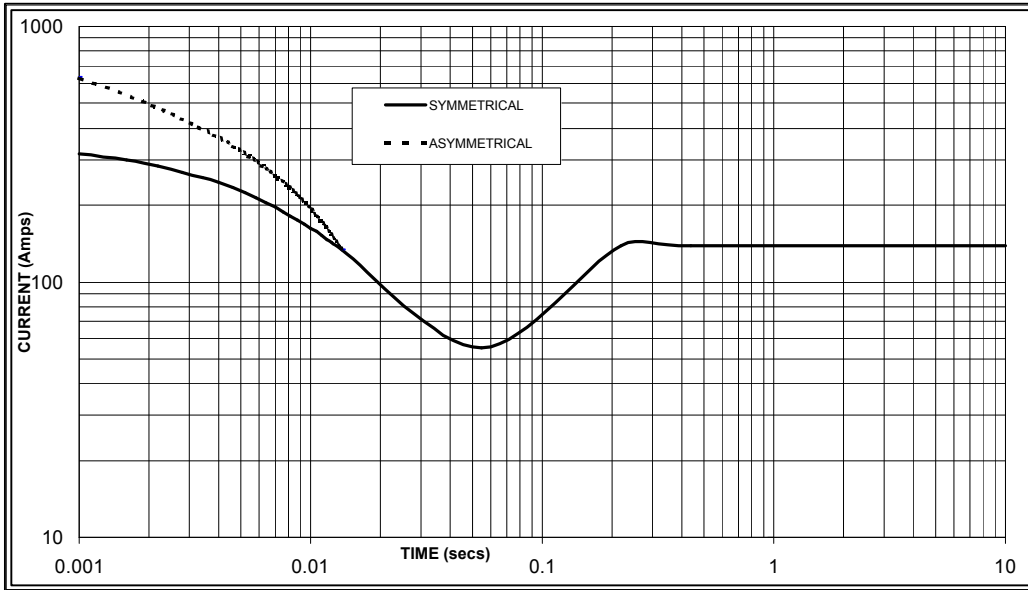


**Locked Rotor Motor Starting Curve**



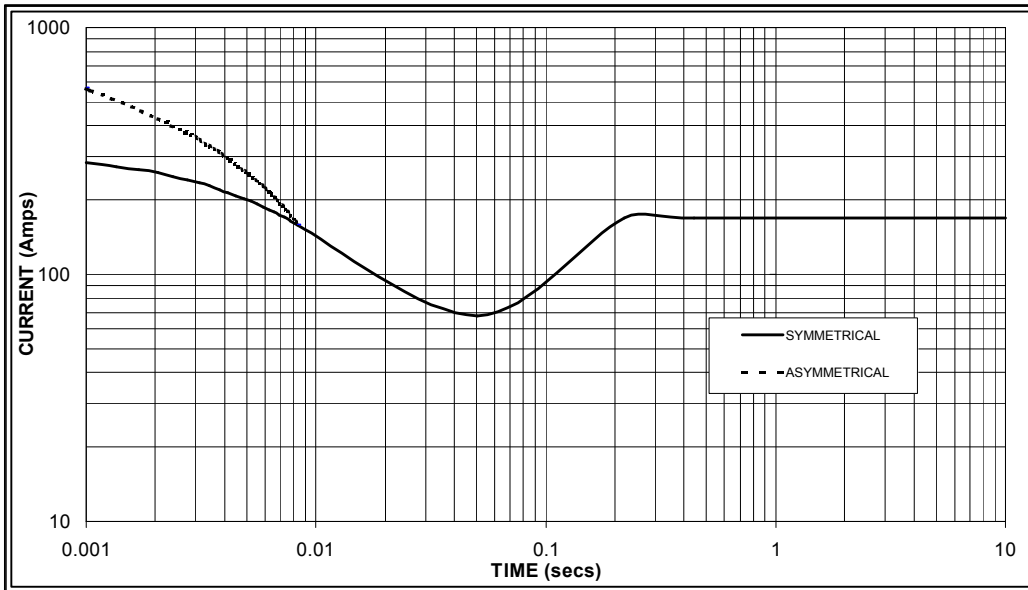
**Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed  
Based on star (wye) connection.**

**50  
Hz**



Sustained Short Circuit = 138 Amps

**60  
Hz**



Sustained Short Circuit = 170 Amps

**Note 1**

The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

50Hz		60Hz	
Voltage	Factor	Voltage	Factor
380v	X 1.00	416v	X 1.00
400v	X 1.07	440v	X 1.07
415v	X 1.12	460v	X 1.12
440v	X 1.18	480v	X 1.18

The sustained current value is constant irrespective of voltage level

**Note 2**

The following multiplication factor should be used to convert the values calculated in accordance with NOTE 1 to those applicable to the various types of short circuit :

	3-phase	2-phase L-L	1-phase L-N
Instantaneous	x 1.00	x 0.87	x 1.30
Minimum	x 1.00	x 1.80	x 3.20
Sustained	x 1.00	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged

**Note 3**

Curves are drawn for Star (Wye) connected machines. For other connection the following multipliers should be applied to current values as shown :

Parallel Star = Curve current value X 2

Series Delta = Curve current value X 1.732

# BCM184F

Winding 71 / 0.8 Power Factor

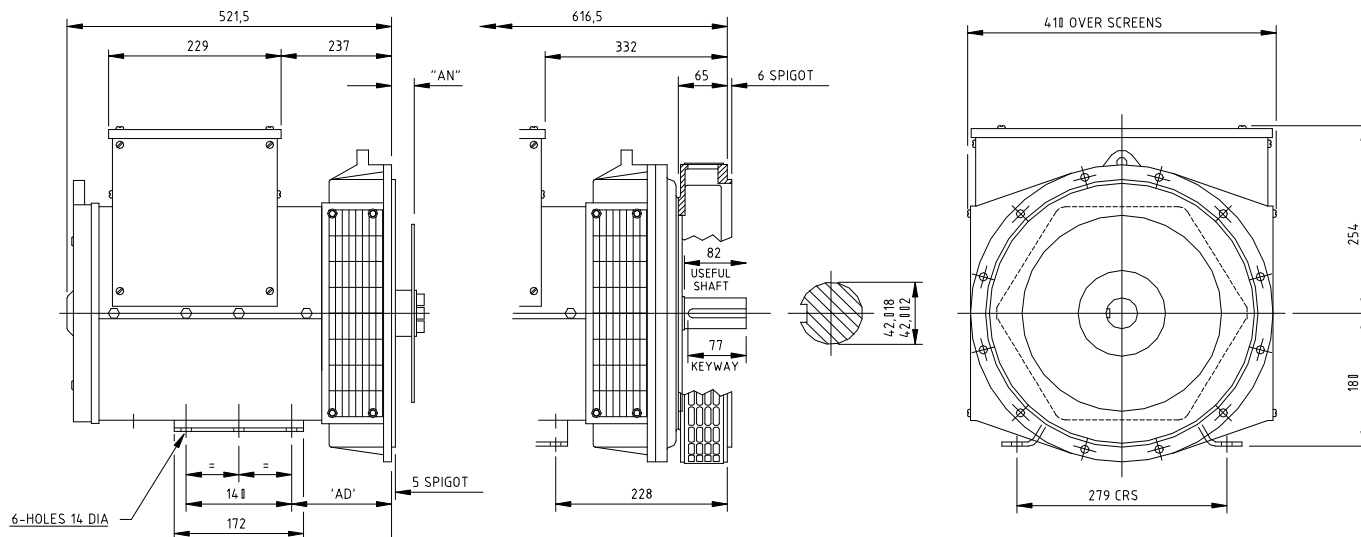


## RATINGS

Class - Temp Rise	Cont. E - 65/50°C				Cont. B - 70/50°C				Cont. F - 90/50°C				Cont. H - 110/50°C				
<b>50 Hz</b>	Series Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	Parallel Star (V)	190	200	208	220	190	200	208	220	190	200	208	220	190	200	208	220
	Series Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
kVA	16.9	16.9	16.9	n/a	17.5	17.5	17.5	n/a	20.0	20.0	20.0	n/a	22.0	22.0	22.0	n/a	
kW	13.5	13.5	13.5	n/a	14.0	14.0	14.0	n/a	16.0	16.0	16.0	n/a	17.6	17.6	17.6	n/a	
Efficiency (%)	87.8	87.9	87.9	n/a	87.8	87.8	87.9	n/a	87.4	87.6	87.6	n/a	86.9	87.2	87.3	n/a	
kW Input	15.4	15.4	15.4	n/a	15.9	15.9	15.9	n/a	18.3	18.3	18.3	n/a	20.3	20.2	20.2	n/a	

<b>60 Hz</b>	Series Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel Star (V)	208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240
	Series Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
kVA	19.5	20.8	20.8	20.8	20.3	21.5	21.5	21.5	23.1	24.5	24.5	24.5	25.4	27.0	27.0	27.0	
kW	15.6	16.6	16.6	16.6	16.2	17.2	17.2	17.2	18.5	19.6	19.6	19.6	20.3	21.6	21.6	21.6	
Efficiency (%)	87.8	87.9	87.9	88.0	87.7	87.8	87.9	88.0	87.4	87.5	87.7	87.8	87.1	87.2	87.4	87.6	
kW Input	17.8	18.9	18.9	18.9	18.5	19.6	19.6	19.5	21.1	22.4	22.3	22.3	23.3	24.8	24.7	24.7	

## DIMENSIONS



COUPLING DISC	"AN"
SAE 7,5	30,16
SAE 8	61,9
SAE 10	53,98

ADAPTOR	"AD"
SAE 2	172
SAE 3	145
SAE 4	133
SAE 5	133
SAE 6	164,7

8 HOLES SPACED AS 12

ACHIEVED WITH SPACER PLATE 31,7mm THICK



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