



M18

CONT 16 kVA



THREE-PHASE SYNCHRONOUS GENERATOR

Datasheet for 4 poles -50Hz @ 1500rpm/ 60Hz @ 1800rpm

Ambient Temperature	40°C	Method of Cooling	Air cooling	
Temperature Rise	125°C	Direction of Rotation	Clockwise	
Insulation Class	H	Maximum Over-speed	2250r/min	
Power Factor	0.8	Degree of Protection / Enclosure	IP23	
Excitation	Brushless	Altitude	1000m	
Winding Pitch	2/3	Stator winding	DLL	
Pole	4	Number of Terminal	12	
Duty	S1- Continuous	Rotor	With damping cage	
Waveform	TIF<50		THF<2%	
Waveform distortion	BS EN 61000-6-2&BS EN 61000-6-4,VDE 0875G,VDE0874N			
Radio interference	Noload<1.5%,Non-distorting balanced linear load<5%			
AVR MODEL AVR	Standard	Selection		PMG
	SX460	AS440	KRS440	
Voltage Regulation - in steady state condition	±1.0	±1.0	±1.0	
Short Circuit Current Capacity	Control does not sustain a short circuit current			

Electrical Characteristic

Frequency	Hz	50				60			
Voltage (series star) Y	V	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
Voltage (parallel star) YY	V	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
Voltage (series delta) Δ	V	220	230	240	254	240	254	266	277
Rated power at Class H (125° C) temperature rise	kVA	16	16	16	13.5	18.9	20	20	20
	kW	12.8	12.8	12.8	10.8	15.1	16.0	16.0	16.0
Efficiency at Class H (P.F.=0.8)	4/4%	81	81.8	82	82.6	81.1	81.3	82	82.5
	3/4%	84	84.1	84.4	84.7	84	84	84.5	84.8
	2/4%	85.1	85.1	85.1	85.1	85.1	85.2	85.3	85.3
Efficiency at Class H (P.F.=1.0)	4/4%	84.9	85.4	85.9	86.2	85	85	85.7	86
	3/4%	87.1	87.7	87.9	88	87.1	87.3	87.8	88
	2/4%	88.5	88.5	88.5	88.4	88.2	88.4	88.5	88.6

Reactances (%) at Class H

Direct axis synchronous reactance unsaturated	Xd	1.921	1.734	1.611	1.698	2.272	2.149	1.966	1.806
Direct axis transient reactance saturated	X'd	0.196	0.177	0.164	0.173	0.231	0.219	0.2	0.184
Direct axis subtransient reactance saturated	X''d	0.123	0.111	0.103	0.109	0.146	0.138	0.126	0.116
Quadrature axis synchronous reactance unsaturated	Xq	0.954	0.861	0.8	0.844	1.129	1.068	0.977	0.897
Quadrature axis subtransient reactance saturated	X''q	0.22	0.199	0.185	0.194	0.26	0.246	0.225	0.207
Leakage reactance	X1	0.078	0.07	0.065	0.068	0.092	0.087	0.079	0.073
Negative sequence reactance saturated	X2	0.184	0.166	0.154	0.162	0.218	0.206	0.188	0.173
Zero sequence reactance unsaturated	X0	0.083	0.075	0.07	0.073	0.098	0.093	0.085	0.078
Short-circuit ratio	Kcc	0.5206	0.5767	0.6207	0.5889	0.4401	0.4653	0.5086	0.5537

Short-circuit transient time constant (sec.)	T'd	0.018							
Subtransient time constant (sec.)	T''d	0.0045							
Open circuit time constant (sec.)	T'do	0.35							
Armature time constant (sec.)	Ta	0.0055							
Stator Winding Resistance (20 °C)	ohm	0.645							
Rotor Winding Resistance (20 °C)	ohm	0.56							
Exciter Stator Resistance (20 °C)	ohm	19							
Exciter Rotor Phase resistance	ohm	0.13							
No load excitation current	io (A)	0.56	0.62	0.64	0.62	0.55	0.57	0.62	0.65
Full load excitation current	ic(A)	1.95	1.9	1.95	1.9	1.88	1.9	1.92	1.92
Cooling air requirement	m ³ /sec	0.071m ³ /s 150cfm				0.09m ³ /s 191cfm			

Mechanical Characteristic

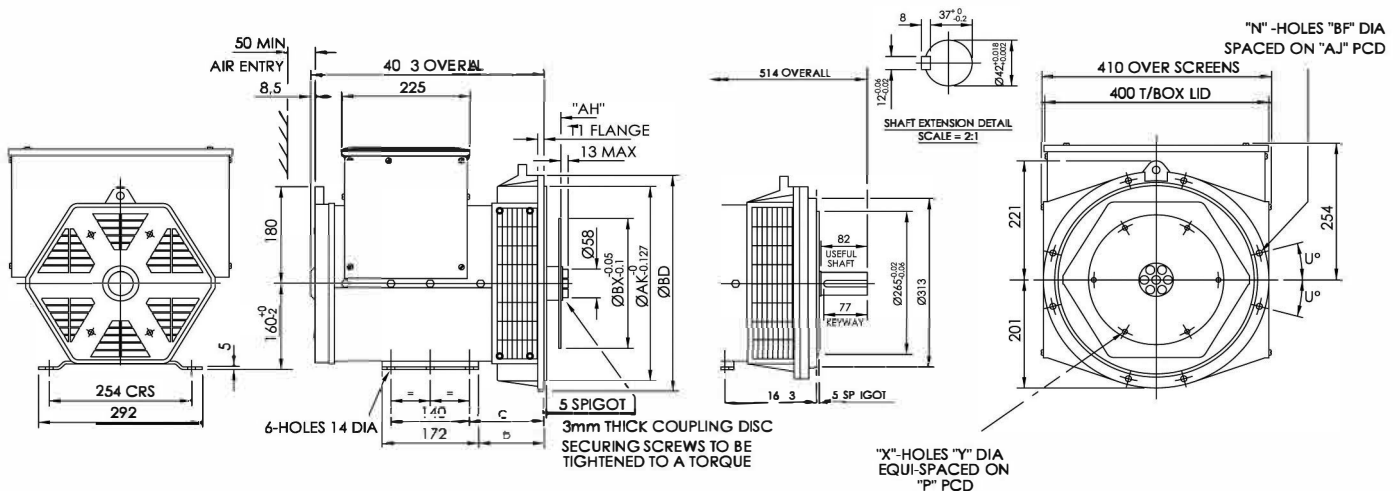
Configuration	Single Bearing	Double Bearing
Type of Construction	B2-SAE	IM B34
Total Weight - kgs	108	113
Weight wound stator - kgs	33	33
Weight wound rotor - kgs	33.72	34.5
Inertia (J) [kgm ²]	0.1278kgm ²	0.1279kgm ³
Drive end bearing / Lubrication		BALL.6309-2RS(ISO)
Non-drive end bearing / Lubrication	BALL.6306-2RS(ISO)	BALL.6306-3RS(ISO)
Packing crate size (cm)	49X45X58	58X45X57

Winding 311 / 0.8 Power Factor

RATINGS

Class - Temp Rise		Cont. F - 105/40°C				Cont. H - 125/40°C				Standby - 150/40°C				Standby - 163/27°C			
50 Hz	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	15.0	15.0	15.0	12.7	16.0	16.0	16.0	13.5	N/A				N/A			
kW	12.0	12.0	12.0	10.2	12.8	12.8	12.8	10.8									
Efficiency (%)	81.8	82.4	82.8	83.2	81.0	81.7	82.1	82.6									
kW Input	14.7	14.6	14.5	14.4	15.8	15.7	15.6	15.5									
60 Hz	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
	Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	17.8	18.8	18.8	18.8	18.9	20.0	20.0	20.0	N/A				N/A			
	kW	14.2	15.0	15.0	15.0	15.1	16.0	16.0	16.0								
Efficiency (%)	82.0	82.2	82.7	83.2	81.3	81.4	82.0	82.5									
kW Input	17.4	18.3	18.2	18.1	18.6	19.7	19.5	19.4									

DIMENSIONS



COUPLING DISC					
SAE	BX	P	X	Y	AH
11.5	352.42	333.38	8	11	39.6
10	314.32	295.28	8	11	53.8
8	263.52	244.48	6	11	62
7.5	241.3	222.25	8	9	30.2
6.5	215.9	200.02	6	9	30.2

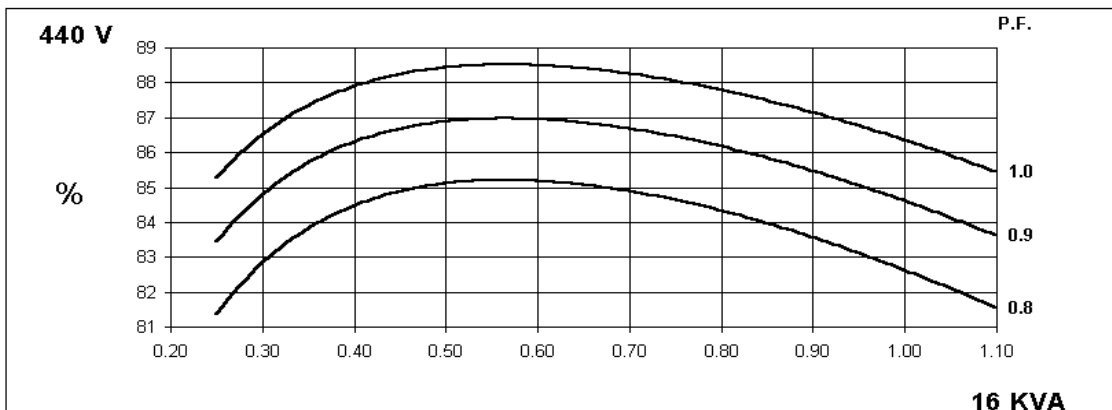
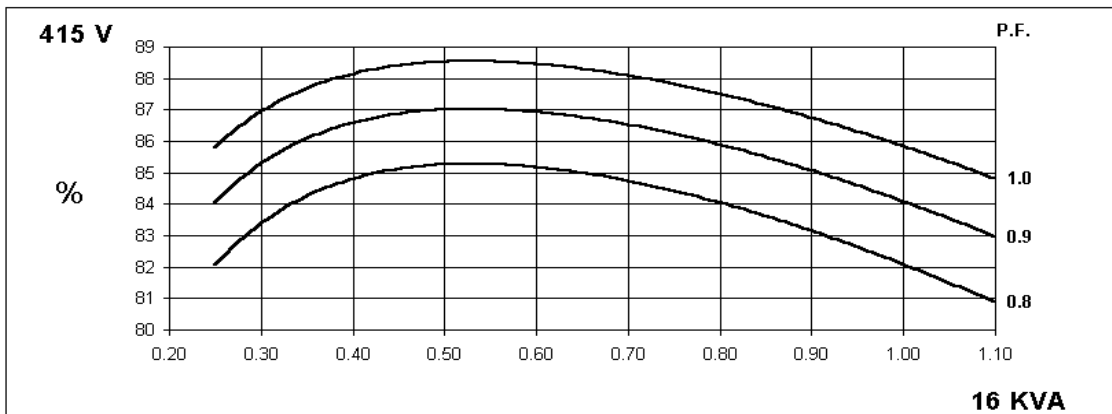
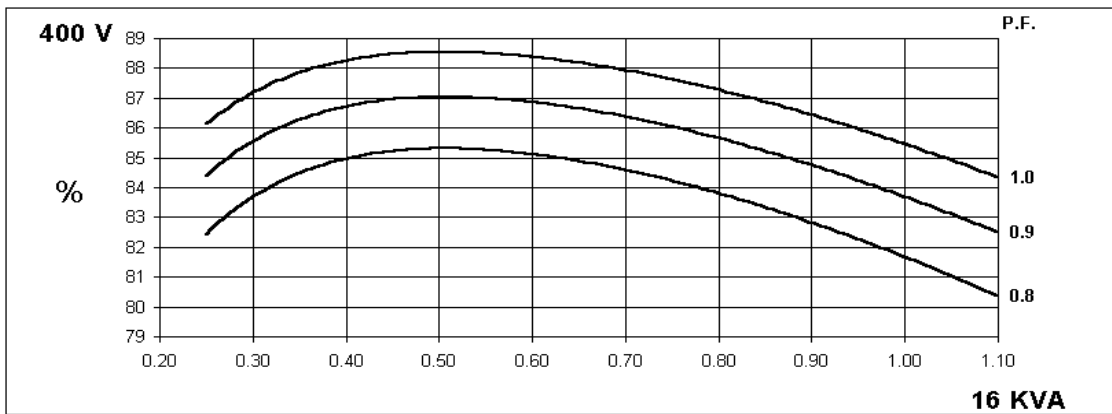
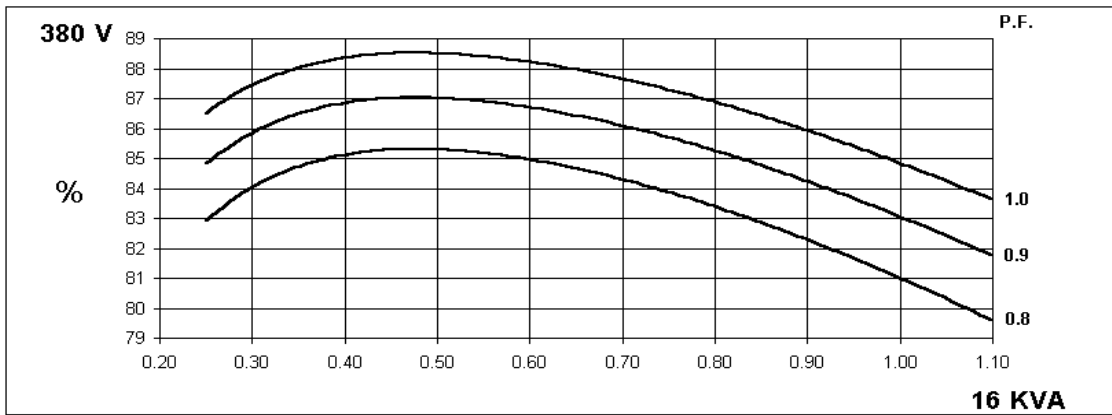
FLANGE(mm)								
	BD	AK	AJ	U°	BF	n	C	D
SAE5	356	314.32	333.38	22.5	11	8	133	117
SAE4	402	361.95	381	15	11	8	133	117
SAE3	451	409.58	428.62	15	11	8	145	129
SAE2	489	447.68	466.72	15	11	12	172	156

1:1	
A2	
Ver	MOD
Design	APP
CHK	Date
	2018/01

**50
Hz**

Winding 311

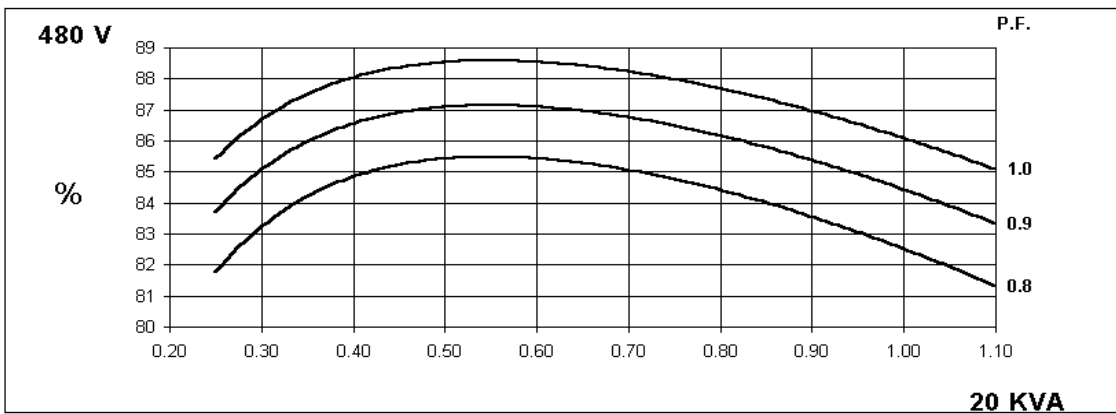
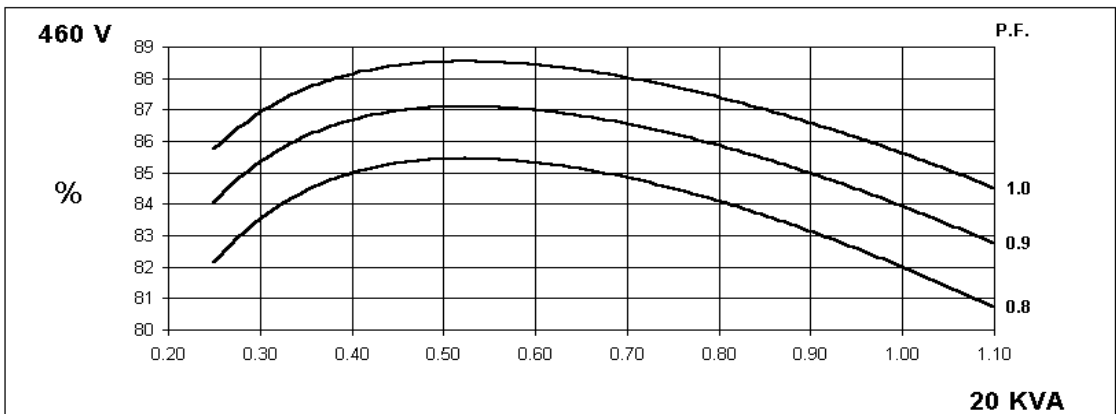
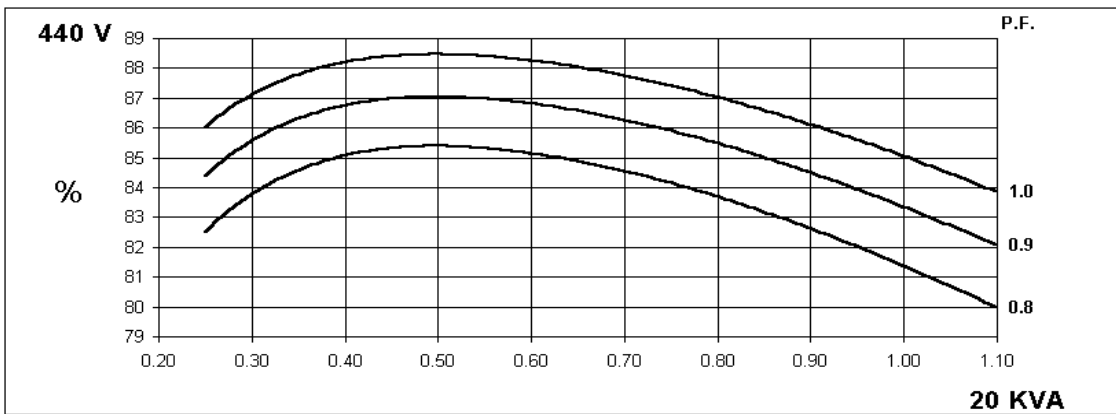
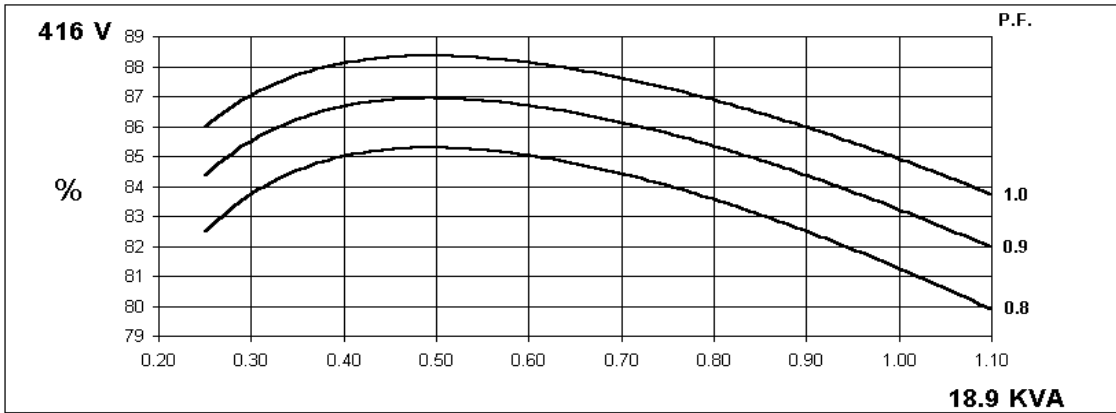
THREE PHASE EFFICIENCY CURVES

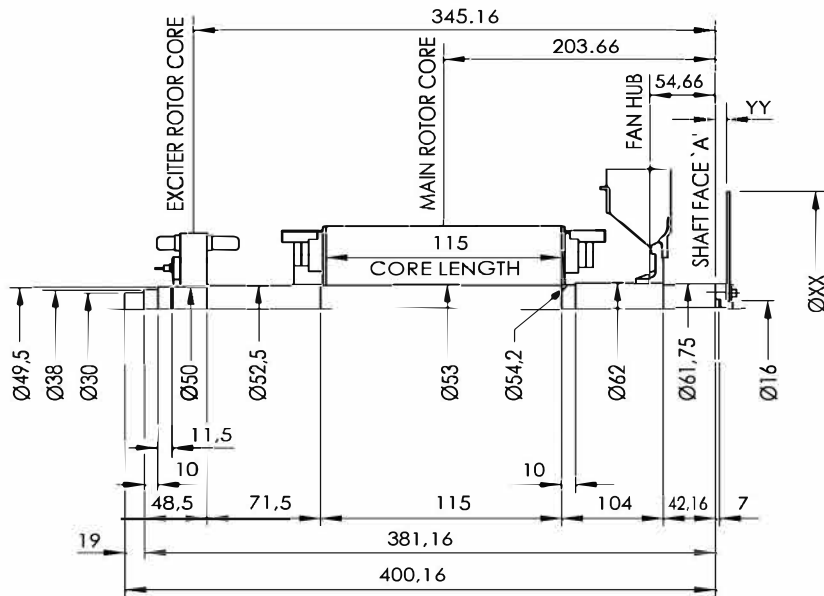


Winding 311

**60
Hz**

THREE PHASE EFFICIENCY CURVES

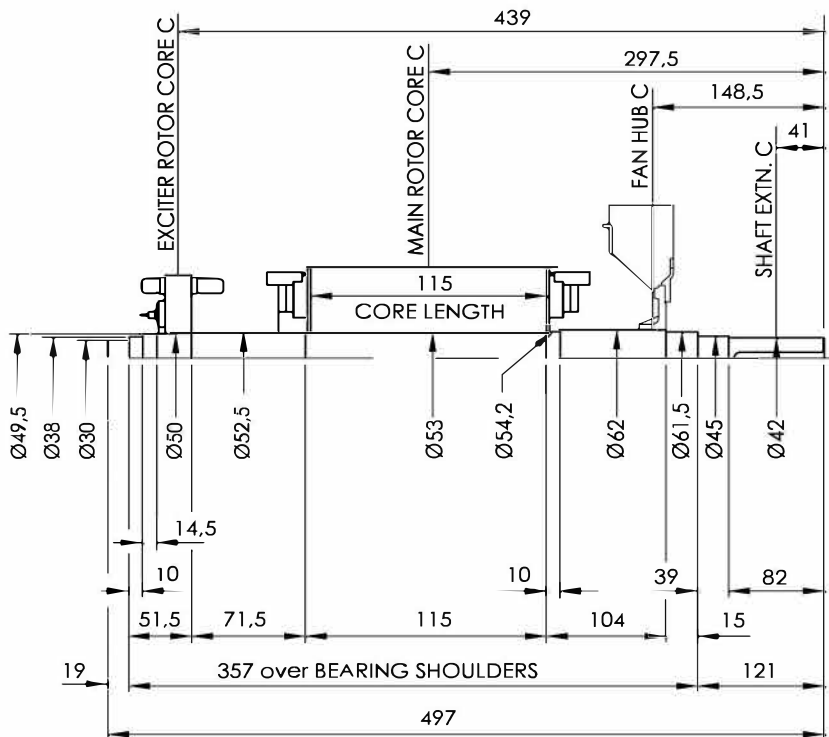




COMPONENT	Wt kg	J kgm ²
EX. ROTOR	4,300	0,0170
MAIN ROTOR	21,280	0,1018
FAN	0,744	0,0061
SHAFT	7,391	0,0029
TOTAL	33,715	0,1278

ADAPTOR SAE No.	COUPLING SAE No.	COUPLING DIMENSIONS		COUPLING ASSEMBLY WEIGHT kg	COUPLING DISC J kgm ²
		XX	YY		
6	7½	241,2	31,7	1,810	0,0078
4/5	7½	241,2	0	1,071	0,0078
4/5	8	263	31,7	2,018	0,0111
4	10	314	23,8	2,377	0,0225
3	10	314	35,8	2,657	0,0225
3	1½	352	21,5	2,793	0,0356

VER	MOD	DRW	Date	
Design		APP		
CHK		Date	2018.01	
				mm



COMPONENT	Wt kg	J kgm ²
EX. ROTOR	4,300	0,0170
MAIN ROTOR	21,280	0,1018
FAN	0,744	0,0061
SHAFT	8,174	0,0030
TOTAL	34,498	0,1279

				1:1
VER	MOD	DRW	Date	
Design		APP		
CHK		Date	2018.01	
				mm

