



Totally Focused. Totally Independent.

Technical Guide

RP[^]; 7; P

C-TYPE



Dynamic Data Support

The world's largest
independent producer of
alternators 1 – 5,000kVA

Standards

Alternators are designed and produced within an ISO 9001 environment. The entire series is manufactured according to, and complies with, the most common specifications such as CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530, BS 4999-5000, NF 51.111, NEMA MG 1-2011, ISO 8528-3. They also comply with other specific standards such as UL1446, UL 1004/4 and /B and CAN/CSA-C22.2 No14-95-No100-95.

Windings and Performances

All windings are 2/3rds pitch to eliminate triplen harmonics within the voltage waveform and to avoid excessive neutral currents in certain parallel operating conditions. A fully interconnected aluminium or copper damper cage is supplied on the rotor of all models (excluding the ECP3 series).

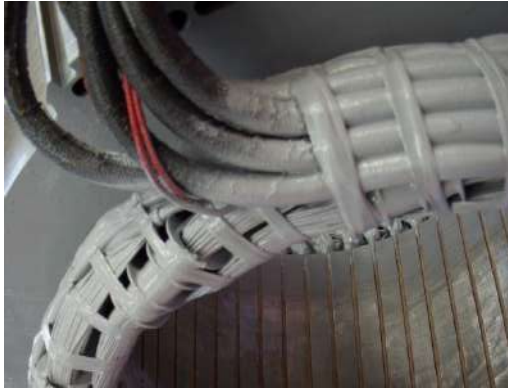
- ▶ 12 wire reconnectable:
 - 50Hz – 380V to 440V and 220/110V to 240/120V (de-rates may apply at certain voltages)
 - 60Hz – 380V to 480V and 220/110V to 240/120V (de-rates may apply at certain voltages)
- ▶ 6 wire reconnectable:
 - 50Hz – 380V to 440V and 220V to 240V (de-rates may apply at certain voltages)
 - 60Hz – 380V to 480V and 220V to 240V (de-rates may apply at certain voltages)

Winding Configurations	Standard		Special (dedicated)			
	12 wire Reconnectable	6 wire Reconnectable	380V and 600V 60Hz	690V 50/60Hz	220-240V 1ph 50Hz	220-240V 1ph 60Hz
ECP3 to ECO38	Std	Option	Option	Option	Option	Option
ECO40	Std	Option	Option	Option	Option (to ECO40)	Option (to ECO40)
Insulation materials	Class H	Class H	Class H	Class H	Class H	Class H
High efficiency	Std	Std	Std	Std	Std	Std
High motor starting	>300%	>300%	>300%	>300%	>300%	>300%
THD (Total Harmonic Distortion)	Typically <3.5% full load L-L	Typically <3.0% full load L-L	Typically <3.5% full load L-L	Typically <3.5% full load L-L	Typically <4.5% full load L-N	Typically <4.5% full load L-N
Interference suppression	VDE 0875 C/N/K, EN61000-6-3, EN61000-6-2, others available on request					

Winding Protection

There are various degrees of protection for the windings following the standard impregnation process, as can be seen here. The TOTAL+ epoxy black coating is recommended for arduous applications.

Winding Protection:	STANDARD	STANDARD+	GREY	GREY+	TOTAL+
ECP3	Std	Option	Option	Option	Option
ECP28 and ECP32	-	Std	Option	Option	Option
NPE32, ECP34 to ECO40	-	-	Std	Option	Option



Grey treatment (marinization) on the left, TOTAL+ treatment shown on the right. The EG43 grey varnish, is a high temperature insulating enamel that forms a tough and flexible film, with excellent moisture and chemical protection. It is water and oil proof, and also protects windings from abrasion. It is applied spraying an over coating layer over the impregnated winding, or dipping the stator in a varnish barrel for superior treatments

The TOTAL+ is a protection system that makes Mecc Alte special. It is the ultimate winding treatment that offers truly superior performances when the environment is really harsh, or the application very demanding. The TOTAL+ is also extremely resistant to the particle abrasion as it adsorbs the impacts.

Protection for Environment

In addition to protection on the windings themselves, the alternators can have increased degree of protection. Standard level is IP23 but the following solutions are also available: IP23 DP with inlet filters, IP23 with only terminal box in IP45, IP43 and IP45. Derates may be applied.

Info: https://www.meccalte.com/downloads/MA0605_Bulletin_IP.pdf

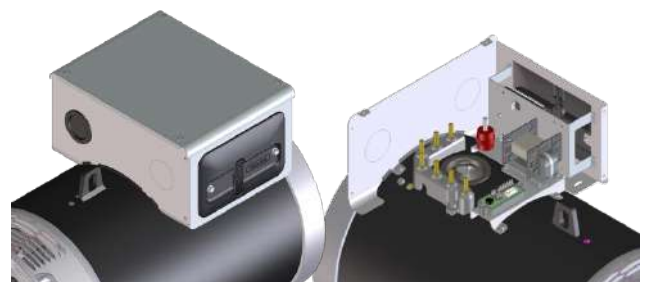


Construction

The robust mechanical structure withstands up to 5G in any direction and 9G vertically and its design permits easy access to the connections and components during routine maintenance check-ups. The mechanical design has used the most advanced FEM techniques. The materials used are: FEP12 steel for the frame, C45 steel for the shaft and cast iron or aluminum pressure die cast for the end-brackets: fans are aluminum die casted either nylon fiber glass loaded, UL compliant materials. Rotors are dynamically balanced according grades 6.3 (up to series 32) or 2.5 (from series 34 onwards) of ISO 1940-1.

Terminals and Terminal Box

Easy access to regulators is possible due to a new AVR panel. Terminal boards have been redesigned into a special L configuration, specifically to ease customer connections; with this kind of terminal board it is possible to place a second terminal board in order to get 12 available terminals. Current transformers are available as an option on series ECO38 with single or dual output.



Excitation and Regulation Systems

All ECP/ECO series have MAUX auxiliary winding to power the digital regulator. Both DSR and the DER1 are available to connect to PC through the DxR2 USB interface and DxR TERMINAL software to interrogate/download alarms & settings for analysis or for cloning other regulators. DER2 has got an integrated USB connection and can be connected to the PC without any optional connection boards. More settings such as LAMS, digital RAM based synchronous external control and soft start are obtainable through the DxR connection. Simple analogue potentiometers are available for the more usual adjustments.

Excitation Systems	DSR	DER1	DER2
ECP3 to ECO38	Std	Option	Option
ECO40	-	Std	Option
Parallel Operation	√	√	√
Mains Parallel	√	√	√
3 Phase Sensing (rms)	-	√	√
Accuracy	+/-1%	+/-0.5%	+/-0.5%
Remote Voltage Control	√	√	√
Alarm Log	√	√	√
Analogue and Digital Configurable	√	√	√
LAMS (Load Acceptance V/f)	√	√	√
APO (Active Protection Output)	√	√	√
Soft Start	√	√	√
High dynamic response	-	-	√
USB connection without external boards	-	-	√

For a given motor start duty a smaller machine may be selected – also enhanced by low sub-transient reactance values for non-linear loads. The whole range is capable of >300% sustained short circuit current for up to 20 seconds.

Optional PMG

The Mecc Alte PMG is available on ECP28, ECP32, ECP34 and ECO38 as factory-fitted option; alternatively, only the predisposition for the retrofit, for subsequent assembly, is available on option. On series ECO40 is available as a factory-fitted or retro-fitted options.

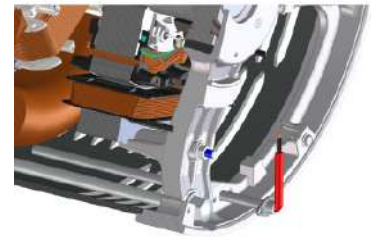
The complete AVR range is fully compatible with both MAUX and PMG systems; this minimises spare parts management and flexibility of stock as one AVR suits all applications.

The PMG is delivering the same amount of kVA available with the MAUX.



Dew Heater

Our whole range can be fitted with anti-condensation heaters of adequate power sized to alternator kVA. Voltage for heaters must be specified when ordering. New cylindrical cartridge style heaters are available on request and it can be retrofitted.



Accessories

Additional optionals can be fit on our alternator series, such as PTC thermistors or PT100 both on windings and bearings, dew heaters, high and low profile of terminal boxes (on most series), parallel devices (standard from ECO38), current and voltage transformers, air filters, IP43 and IP45 protections and many others.

For more info visit: <https://www.meccalte.com/en/products/alternators/accessories/c-type-accessories>

Deration coefficients

Altitude (meters)	Ambient temperature (Celsius)					
	25	40	45	50	55	60
≤ 1000	1.07	1	0.96	0.93	0.91	0.89
$> 1000 \leq 1500$	1.01	0.96	0.92	0.89	0.87	0.84
$> 1500 \leq 2000$	0.96	0.91	0.87	0.84	0.83	0.79
$> 2000 \leq 3000$	0.9	0.85	0.81	0.78	0.76	0.73

Notes on short circuit curves

The indicated coefficients have to be used to correct the three phase short circuit curves values as a function of the rated voltage.

The indicated coefficient have to be used to correct the three phase short circuit curves values as a function of the type of short circuit voltage.

50 Hz		60 Hz	
Voltage	Factor	Voltage	Factor
380	0.93X	415	0.85X
400	1X	440	0.90X
415	1.04X	460	0.95X
440	1.10X	480	1X

	3 phase	2 phase L-L	1 phase L-N
<i>Istantaneous</i>	1X	0.87X	1.30X
<i>Minimum</i>	1X	1.80X	3.20X
<i>Sustained</i>	1X	1.50X	2.50X
<i>Max Duration</i>	20 sec.	10 sec.	4 sec.

All the curves are shown for series or parallel star connection at 400V 50 Hz or 480V 60 Hz. If the unit is reconnected from series to parallel star, the additional coefficient is 2X. From series star to series delta, it is 1.72X. From series star to parallel delta, it is 3.44X.

O

a w tw	:	V s ° us	U
azs w tw	:	a wu ° us	U9:
] tw x ° w	88] QRQvs ° y w	@ 889c d
R wu °	O z w	QRQvs ° y w	@ 99
c w y s w	QRc 486N	[s ° ^ w w w	99=7
h ° v ° y ° uz	96:	N ° v w	748777
P v w syw w w w w w	e7; 7=a:	Os s u° y	U° 8; 748

OE_p

gN6 h Mew 5c° w6N t°w P479a5																				
deN] Q0k48@ 69A				deN] Q0k48-7; 7				U487=6; 7				S487=6; 7				O4876; 7				
dw°w d s k	A@°g	B77g	B: 7g	BB7g	A@°g	B77g	B: 7g	BB7g	A@°g	B77g	B: 7g	BB7g	A@°g	B77g	B: 7g	BB7g	A@°g	B77g	B: 7g	BB7g
as s w d s k k	: B7g	: 77g	: 8-g	: ; 7g	: B7g	: 77g	: 8-g	: ; 7g	: B7g	: 77g	: 8-g	: ; 7g	: B7g	: 77g	: 8-g	: ; 7g	: B7g	: 77g	: 8-g	: ; 7g
dw°w Qw s Δ	: ; 7g	: @°g	: B7g	=7Bg	: ; 7g	: @°g	: B7g	=7Bg	: ; 7g	: @°g	: B7g	=7Bg	: ; 7g	: @°g	: B7g	=7Bg	: ; 7g	: @°g	: B7g	=7Bg
as s w Qw s ΔΔ	997g	9: 7g	9: 7g	9=: g	997g	9: 7g	9: 7g	9=: g	997g	9: 7g	9: 7g	9=: g	997g	9: 7g	9: 7g	9=: g	997g	9: 7g	9: 7g	9=: g
zSV z	440	440	440	404	417	417	417	386	400	400	400	370	370	370	370	342	320	320	320	296
	352	352	352	323	334	334	334	309	320	320	320	296	296	296	296	273	256	256	256	237
zSWz	491	491	491	393	468	468	468	375	450	450	450	360	410	410	410	330	360	360	360	288
	393	393	393	314	374	374	374	300	360	360	360	288	328	328	328	264	288	288	288	230
zSk z	546	546	546	503	521	521	521	479	500	500	500	460	450	450	450	414	400	400	400	368
	437	437	437	402	417	417	417	383	400	400	400	368	360	360	360	331	320	320	320	294
zSV z	601	601	590	546	567	567	557	515	550	550	540	500	500	500	490	454	440	440	432	400
	481	481	472	437	454	454	446	412	440	440	432	400	400	400	392	363	352	352	346	320
zSWz	675	675	675	616	645	645	645	588	625	625	625	570	564	564	564	515	500	500	500	456
	540	540	540	493	516	516	516	470	500	500	500	456	451	451	451	412	400	400	400	365
zSk z	735	735	735	560	700	700	700	535	680	680	680	520	630	630	630	483	544	544	544	416
	588	588	588	448	560	580	580	428	544	544	544	416	504	504	504	386	435	435	435	333
zS z	825	825	825	740	777	777	777	700	750	750	750	680	690	690	690	630	600	600	600	544
	660	660	660	592	622	622	622	560	600	600	600	544	552	552	552	504	480	480	480	435

PE_p

gN6 h Mew 5c° w6N t°w P479a5																				
deN] Q0k48@ 69A				deN] Q0k48-7; 7				U487=6; 7				S487=6; 7				O4876; 7				
dw°w d s k	B: 7g	BB7g	C97g	C@°g	B: 7g	BB7g	C97g	C@°g	B: 7g	BB7g	C97g	C@°g	B: 7g	BB7g	C97g	C@°g	B: 7g	BB7g	C97g	C@°g
as s w d s k k	: 8-g	: ; 7g	: @°g	: B7g	: 8-g	: ; 7g	: @°g	: B7g	: 8-g	: ; 7g	: @°g	: B7g	: 8-g	: ; 7g	: @°g	: B7g	: 8-g	: ; 7g	: @°g	: B7g
dw°w Qw s Δ	: B7g	=7; g	=: 7g	=:; g	: B7g	=7; g	=: 7g	=:; g	: B7g	=7; g	=: 7g	=:; g	: B7g	=7; g	=: 7g	=:; g	: B7g	=7; g	=: 7g	=:; g
as s w Qw s ΔΔ	9: 7g	9=: g	9@°g	9A@°g	9: 7g	9=: g	9@°g	9A@°g	9: 7g	9=: g	9@°g	9A@°g	9: 7g	9=: g	9@°g	9A@°g	9: 7g	9=: g	9@°g	9A@°g
zSV z	459	492	525	525	438	469	500	500	420	450	480	480	383	410	440	440	336	360	384	384
	367	394	420	420	350	375	400	400	336	360	384	384	306	328	352	352	269	288	307	307
zSWz	524	557	590	590	500	532	563	563	480	510	540	540	435	460	490	490	384	408	432	432
	419	446	472	472	400	426	450	450	384	408	432	432	348	368	392	392	307	326	346	346
zSk z	590	634	656	656	563	604	625	625	540	580	600	600	484	520	540	540	432	464	480	480
	472	507	525	525	450	483	500	500	432	464	480	480	387	416	432	432	346	371	384	384
zSV z	623	669	722	722	587	649	680	680	570	630	660	660	515	570	600	600	456	504	528	528
	498	535	578	578	470	519	544	544	456	504	528	528	412	456	480	480	365	403	422	422
zSWz	720	762	810	810	688	730	775	775	665	705	750	750	605	636	677	677	532	564	600	600
	576	610	648	648	550	584	620	620	532	564	600	600	484	509	542	542	426	451	480	480
zSk z	778	843	882	882	741	803	840	840	720	780	816	816	665	720	756	756	576	624	653	653
	622	674	706	706	593	642	672	672	576	624	653	653	532	576	604	604	461	499	522	522
zS z	930	970	970	970	885	925	925	925	860	900	900	900	790	830	830	830	688	720	720	720
	744	776	776	776	708	740	740	740	688	720	720	720	632	664	664	664	550	576	576	576

2 Ai p DNEE

f s s vw / wSR] @7.; 4 0	RP^; 7 8d; P	RP^; 7 9d; P	RP^; 7 : d; P	RP^; 7 8Z; P	RP^; 7 9Z; P	RP^; 7 : Z; P	RP^; 7 gZ; P
Xd Q° wu 4s ° uz w6u s uw %	286,7	240,1	258,7	246,3	270	234,9	175,9
X'd Q° wu 4s ° s 'w w6u s uw %	23,3	22,1	21,7	20,1	19,8	18,7	16,7
X''d Q° wu 4s ° t s 'w w6u s uw %	14,7	12,5	11,8	10,6	10,5	9,52	9
Xq b sv s w4s ° uz w6u s uw %	115,9	110,7	111,8	115,9	157,1	145,9	122,1
X'q b sv s w4s ° s 'w w6u s uw %	115,9	110,7	111,8	115,9	157,1	145,9	122,1
X''q b sv s w4s ° t s 'w w6u s uw %	29,2	28,4	27,3	24,9	24	16,8	14,8
X2] wv s ° w4 w w uw w6u s uw %	19,1	18,2	17,3	13	12,4	14,6	12,5
X0 l w w w uw w6u s uw %	3,62	3,21	3,1	2,9	2,9	2,48	2,28
ds s vw							
Xd Q° wu 4s ° uz w6u s uw %	238	199,3	214,7	204,4	224,1	195	146
X'd Q° wu 4s ° s 'w w6u s uw %	19,3	18,4	18	16,7	16,4	15,5	13,8
X''d Q° wu 4s ° t s 'w w6u s uw %	12,2	10,4	9,79	8,76	8,72	7,9	7,47
Xq b sv s w4s ° uz w6u s uw %	96,2	91,9	92,8	96,2	130,4	121,1	101,4
X'q b sv s w4s ° s 'w w6u s uw %	96,2	91,9	92,8	96,2	130,4	121,1	101,4
X''q b sv s w4s ° t s 'w w6u s uw %	24,2	23,5	22,7	20,7	19,9	13,9	12,3
X2] wv s ° w4 w w uw w6u s uw %	15,8	15,1	14,4	10,8	10,3	12,1	10,4
X0 l w w w uw w6u s uw %	3,62	3,21	3,1	2,9	2,9	2,48	2,28
Kcc dz u° u ° s °	0,36	0,5	0,4	0,49	0,45	0,44	0,59
T'd e s 'w ° wu s sec	0,16	0,13	0,14	0,14	0,15	0,18	0,18
T''d d t s 'w ° wu s sec	0,019	0,019	0,021	0,021	0,019	0,019	0,015
T'do ^ w u° u ° wu s sec	2,55	2,7	2,8	2,9	3,1	3,1	3,7
Ta N s w ° wu s sec	0,017	0,03	0,031	0,04	0,04	0,052	0,071

g Ai p DNEE

lo R u° s ° u w s sv A	0,9	0,9	0,5	0,8	0,9	0,7	0,7
lc R u° s ° u w s x sv A	4,1	3,7	3,4	3,7	4,3	4,2	4,3
^ w sv 8z ° s @z w° v 887, s vw sv							
^ w sv w 97 w4s , 300							
Uw6 v ° s ° W	19703	21356	22833	24135	26316	28632	30915
eww z wUs 'u Ssu 4eUS %	<2	<2	<2	<2	<2	<2	<2
h s wx Q° 5eUQ0x sv ZZ6Z] %	2,6 / 2,6	2,7 / 2,8	2,4 / 2,5	2,5 / 2,5	2,2 / 2,4	2,1 / 2,1	2,2 / 2,2
h s wx Q° 5eUQ0 sv ZZ6Z] %	2,9 / 2,9	2,5 / 2,6	2,6 / 2,5	2,3 / 2,4	2,4 / 2,5	2,4 / 2,4	2,5 / 2,5

2 Ai p DNRE

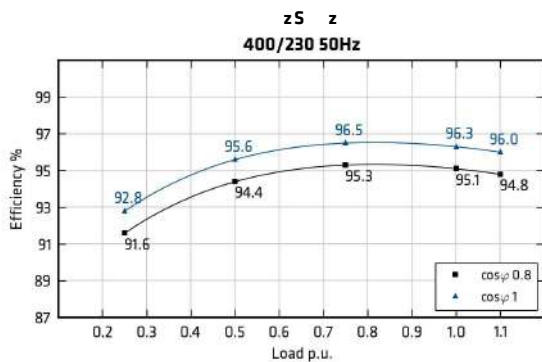
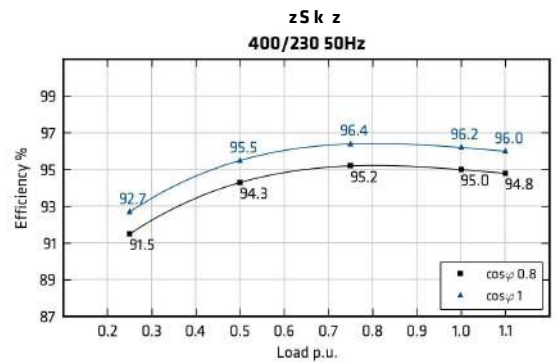
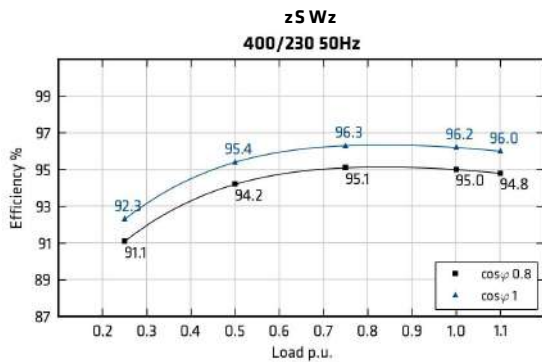
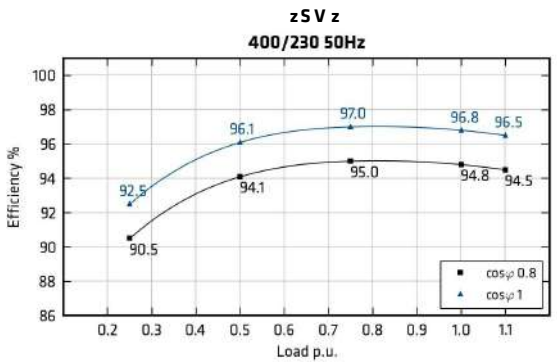
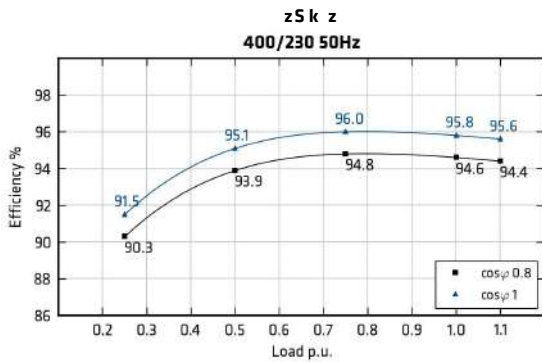
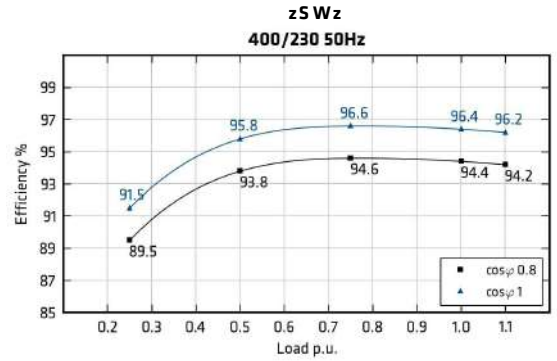
f s s vw / wSR] @7:; 4 0	RP^; 7 8d; P	RP^; 7 9d; P	RP^; 7 : d; P	RP^; 7 8Z; P	RP^; 7 9Z; P	RP^; 7 : Z; P	RP^; 7 gZ; P
Xd Q° wu 4s ° uz w6u s uw %	286,7	240,1	258,7	246,3	270	234,9	175,9
X'd Q° wu 4s ° s 'w w6u s uw %	23,3	22,1	21,7	20,1	19,8	18,7	16,7
X''d Q° wu 4s ° t s 'w w6u s uw %	14,7	12,5	11,8	10,6	10,5	9,52	9
Xq b sv s w4s ° uz w6u s uw %	115,9	110,7	111,8	115,9	157,1	145,9	122,1
X'q b sv s w4s ° s 'w w6u s uw %	115,9	110,7	111,8	115,9	157,1	145,9	122,1
X''q b sv s w4s ° t s 'w w6u s uw %	29,2	28,4	27,3	24,9	24	16,8	14,8
X2] wps ° w4 w w uw w6u s uw %	19,1	18,2	17,3	13	12,4	14,6	12,5
X0 l w w w uw w6u s uw %	3,62	3,21	3,1	2,9	2,9	2,48	2,28
ds s vw							
Xd Q° wu 4s ° uz w6u s uw %	238	199,3	214,7	204,4	224,1	195	146
X'd Q° wu 4s ° s 'w w6u s uw %	19,3	18,4	18	16,7	16,4	15,5	13,9
X''d Q° wu 4s ° t s 'w w6u s uw %	12,2	10,4	9,79	8,76	8,72	7,9	7,47
Xq b sv s w4s ° uz w6u s uw %	96,2	91,9	92,8	96,2	130,4	121,1	101,3
X'q b sv s w4s ° s 'w w6u s uw %	96,2	91,9	92,8	96,2	130,4	121,1	101,3
X''q b sv s w4s ° t s 'w w6u s uw %	24,2	23,5	22,7	20,7	19,9	13,9	12,3
X2] wps ° w4 w w uw w6u s uw %	15,8	15,1	14,4	10,8	10,3	12,1	10,4
X0 l w w w uw w6u s uw %	3,62	3,21	3,1	2,9	2,9	2,48	2,28
Kcc dz u° u ° s °	0,36	0,5	0,4	0,49	0,45	0,44	0,59
T'd e s 'w ° wu s sec	0,16	0,13	0,14	0,14	0,15	0,18	0,18
T''d d t s 'w ° wu s sec	0,019	0,019	0,021	0,021	0,019	0,019	0,015
T'do ^ w u° u ° wu s sec	2,55	2,7	2,8	2,9	3,1	3,1	3,7
Ta N s w ° wu s sec	0,017	0,03	0,031	0,04	0,04	0,052	0,071

g Ai p DNRE

lo R u° s ° u w s sv A	0,9	0,9	0,5	0,8	0,9	0,7	0,7
lc R u° s ° u w s x sv A	4,1	3,7	3,4	3,7	4,3	4,2	4,3
^ w sv 8z ° s @z w ° v 887, s vw sv							
^ w sv w 97 w45 , 300							
Uw6 v ° s ° W	19361	21305	22092	23148	23701	24386	25342
eww z wV wxw s uwSsu 4eV5	<40	<40	<40	<40	<40	<40	<40
h s wx Q° 5eUQ0x sv ZZ6Z] %	2,6 / 2,6	2,7 / 2,8	2,4 / 2,5	2,5 / 2,5	2,2 / 2,4	2,1 / 2,1	2,2 / 2,2
h s wx Q° 5eUQ0 sv ZZ6Z] %	2,9 / 2,9	2,5 / 2,6	2,6 / 2,5	2,3 / 2,4	2,4 / 2,5	2,4 / 2,4	2,5 / 2,5

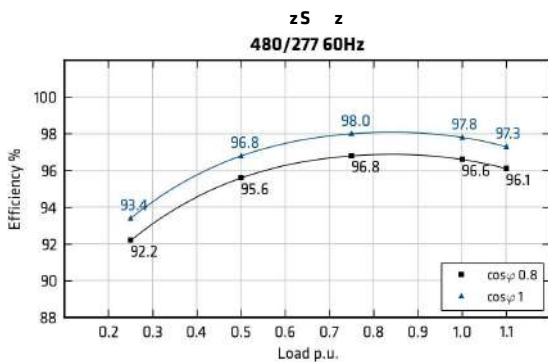
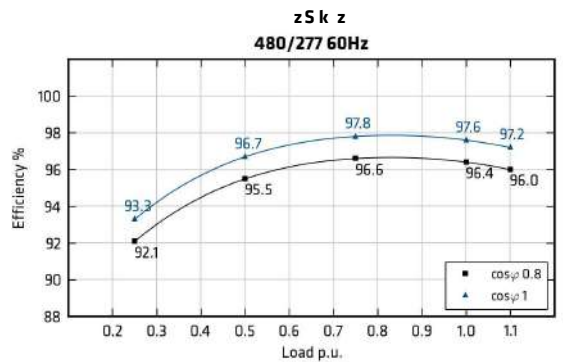
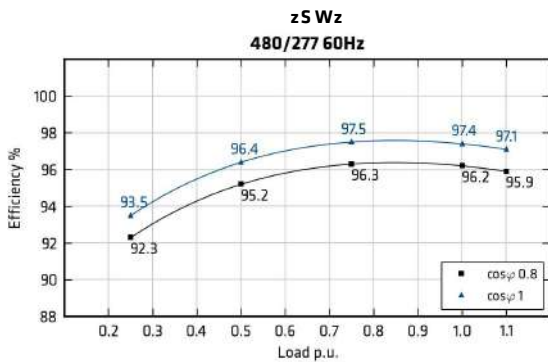
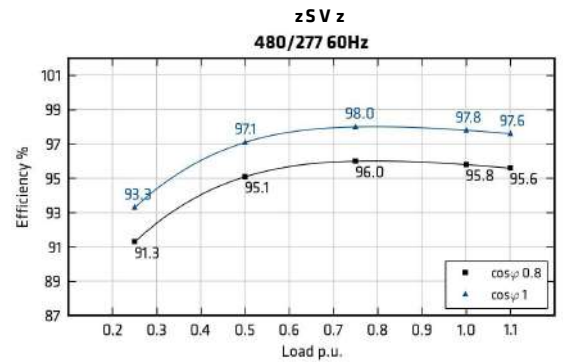
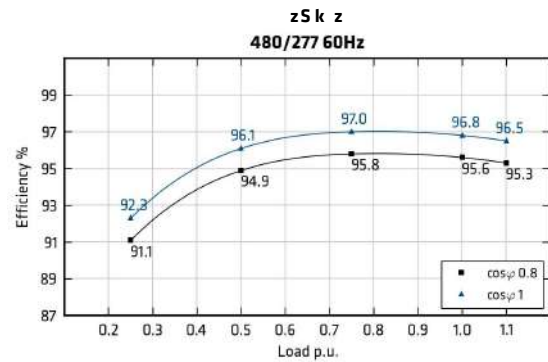
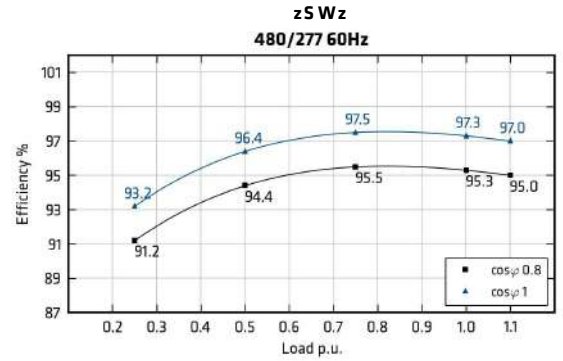
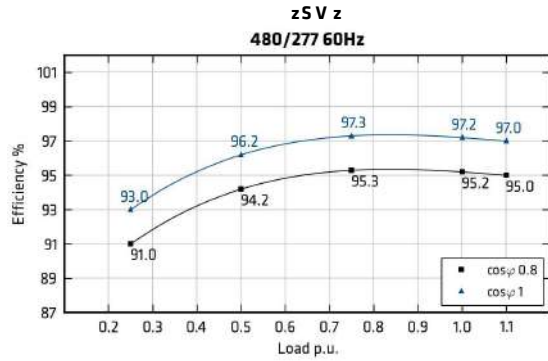
m f OE_p

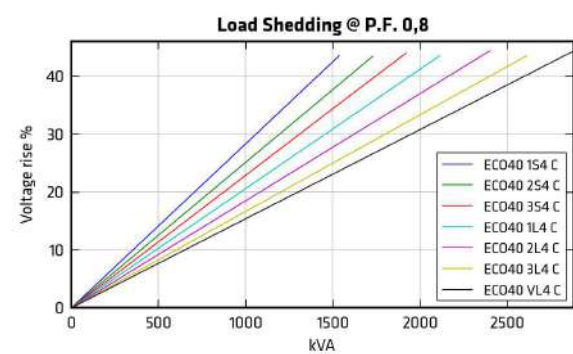
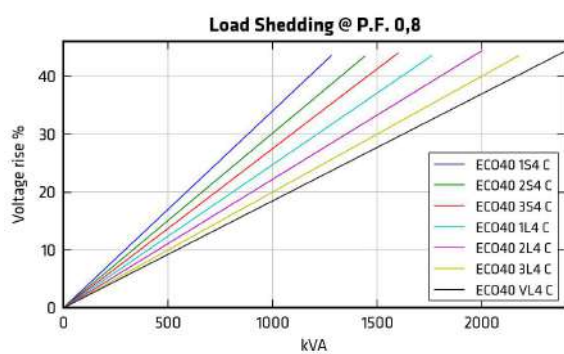
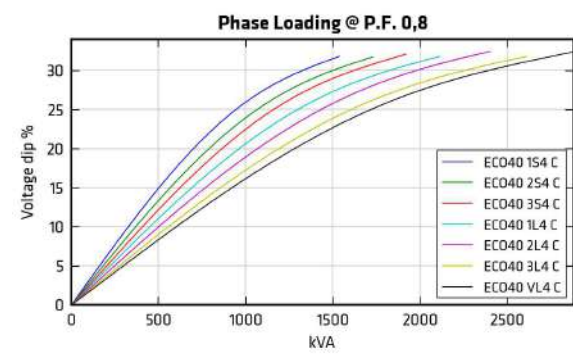
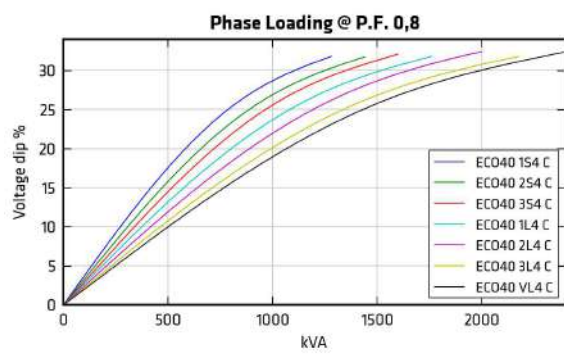
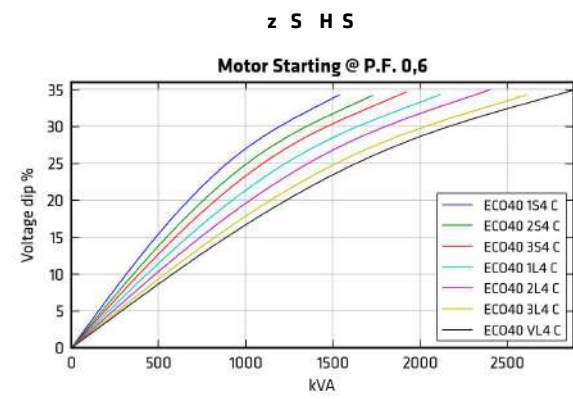
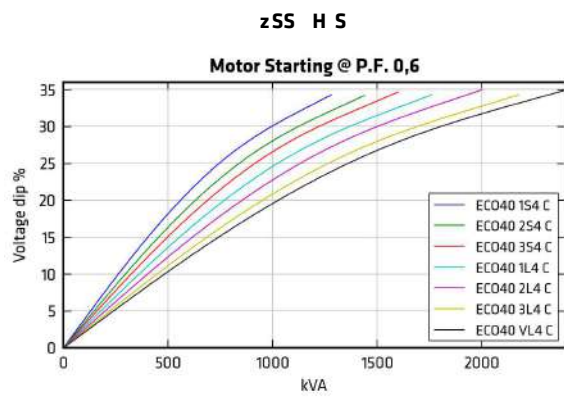
[vw	: 87g =7U					; 77g =7U					; 8-g =7U					; ; 7g =7U					
	79=	75=	75A=	8	88	79=	75=	75A=	8	88	79=	75=	75A=	8	88	79=	75=	75A=	8	88	
RP ^A ; 7 8i; P	%	89,1	93,3	94,2	94,1	93,9	89,3	93,5	94,4	94,2	93,9	89,2	93,3	94,1	94,0	93,7	89,0	93,1	93,9	93,8	93,5
RP ^A ; 7 9d; P	%	89,4	93,5	94,3	94,1	93,9	89,5	93,8	94,6	94,4	94,2	89,4	93,7	94,5	94,2	93,9	89,2	93,5	94,1	93,9	93,7
RP ^A ; 7 : d; P	%	90,2	93,7	94,6	94,4	94,3	90,3	93,9	94,8	94,6	94,4	90,1	93,7	94,7	94,5	94,3	89,8	93,4	94,4	94,2	94,0
RP ^A ; 7 8Z; P	%	90,5	94,0	94,9	94,7	94,5	90,5	94,1	95,0	94,8	94,5	90,3	94,0	94,9	94,6	94,2	90,0	93,8	94,5	94,4	94,2
RP ^A ; 7 9Z; P	%	91,0	94,1	94,9	94,8	94,6	91,1	94,2	95,1	95,0	94,8	91,1	94,1	94,9	94,7	94,4	90,5	94,0	94,6	94,4	94,2
RP ^A ; 7 : Z; P	%	91,4	94,1	95,0	94,8	94,6	91,5	94,3	95,2	95,0	94,8	91,3	94,2	95,0	94,7	94,4	90,8	93,8	94,4	94,5	94,4
RP ^A ; 7 gZ; P	%	91,5	94,2	95,1	94,8	94,5	91,6	94,4	95,3	95,1	94,8	91,4	94,2	95,1	94,9	94,6	90,8	93,7	94,6	94,4	94,2



m f PEp

[vw	; 8-g @U					; 7g @U					; @g @U					; B7g @U					
	79=	75=	75A=	8	88	79=	75=	75A=	8	88	79=	75=	75A=	8	88	79=	75=	75A=	8	88	
RP ^A ; 7 8i; P	%	90,4	93,3	94,5	94,4	94,2	90,6	93,8	94,9	94,8	94,7	90,8	94,0	95,2	95,1	94,9	91,0	94,2	95,3	95,2	95,0
RP ^A ; 7 9d; P	%	90,6	93,5	94,6	94,5	94,3	90,9	94,0	95,1	95,0	94,8	91,1	94,2	95,3	95,2	94,9	91,2	94,4	95,5	95,3	95,0
RP ^A ; 7 : d; P	%	90,5	93,9	95,2	95,0	94,7	90,7	94,5	95,5	95,3	95,1	90,9	94,7	95,7	95,5	95,3	91,1	94,9	95,8	95,6	95,3
RP ^A ; 7 8Z; P	%	91,0	94,7	95,5	95,3	95,1	91,1	94,8	95,7	95,6	95,5	91,1	94,9	95,8	95,7	95,6	91,3	95,1	96,0	95,8	95,6
RP ^A ; 7 9Z; P	%	92,1	94,8	95,6	95,5	95,1	92,1	94,9	96,0	95,9	95,6	92,2	95,0	96,1	96,0	95,7	92,3	95,2	96,3	96,2	95,9
RP ^A ; 7 : Z; P	%	91,4	94,8	95,8	95,7	95,3	91,5	95,0	96,1	96,0	95,7	91,7	95,2	96,4	96,2	95,9	92,1	95,5	96,6	96,4	96,0
RP ^A ; 7 gZ; P	%	91,4	94,8	95,9	95,8	95,4	91,7	95,1	96,3	96,1	95,8	92,0	95,4	96,7	96,5	96,2	92,2	95,6	96,8	96,6	96,1





V vw us ws w u ws sx u° xs w xsu sywx ° v'us w3 ws w uww s x D

a w Ssu u wx'w u wu /aSPPB tw w w xsu 75@u w D

aSPPH ° /Nc Pu /aS w 0679B

R s v6ezwaSPPs w xsu 75 ° 88C9 maSPPH ° /Nc Pu /75 0679B 6ez° ws zs zw sywxs s sy° w ws x75 ° w ° s w zw

w zs us tw wsv zw x75@u w'x zw sv° u 'vwvw 88C9 ° w t'yyw /8C, z'yzw s v605

V z° ws v8s 87 gN sv° w° s x75 ° w ° s w ° sywxs s 88C gN sv° w° s x75@5

g sywu wx'w u wu /g PPD

gPPH; 776g w 0'x=7 U EgPPH; B76g w 0'x@ U

R s v6gPPs ; 8-g @ U ° 88 : B ngPPH; B76; 8=0p96ez° ws zs zw sywxs s sy° w ws ; 8-g° w ° s w zw w zs us tw wsv

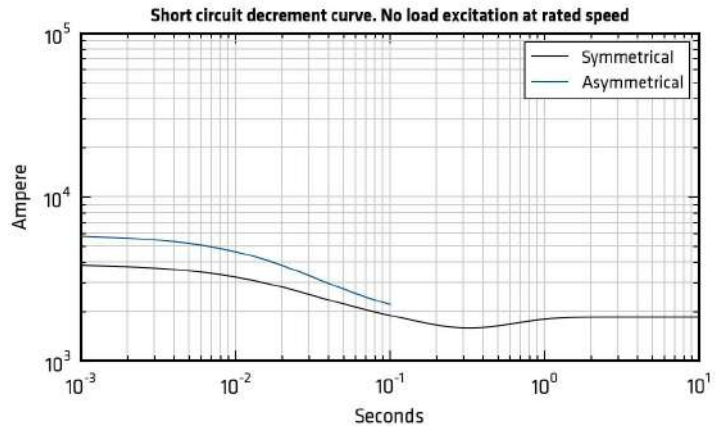
zw w xsu 75@u w'x zw sv° u 'vwvw 88 : B ° w t'yyw /: , z'yzw s v605

V z° ws v8s 87 gN sv° w° s ; 8-g° w ° s w ° sywxs s 88 : gN sv° w° s ; B765

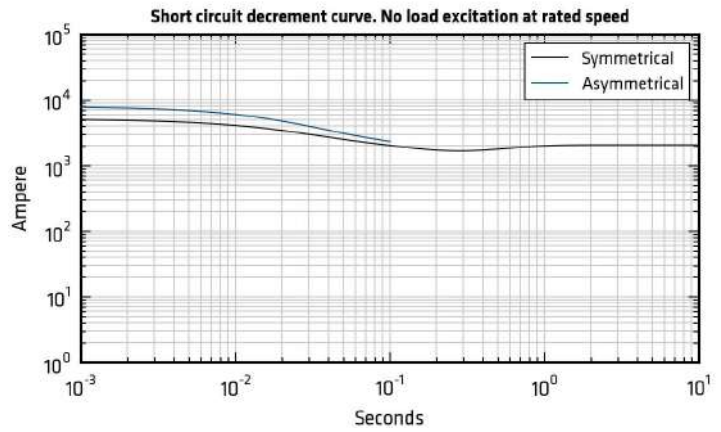
OE_p

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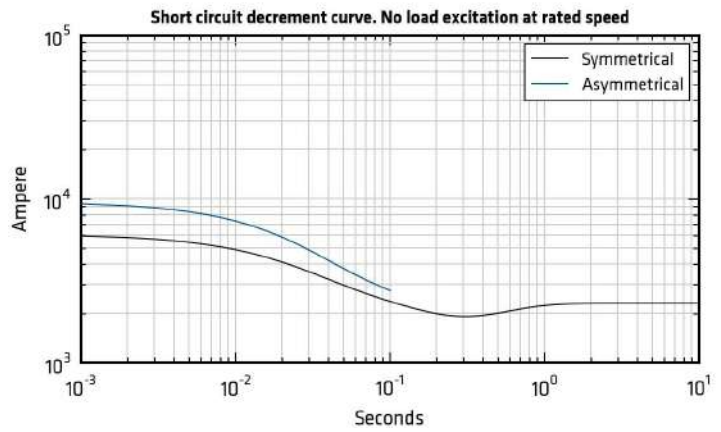
RP[^]; 7 &d; P



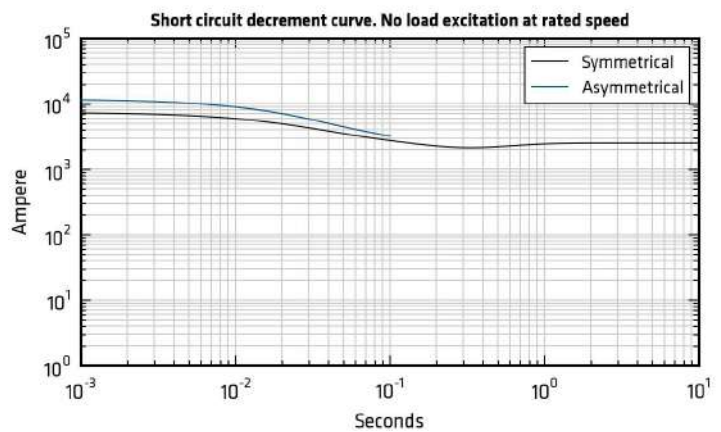
RP[^]; 7 9d; P



RP[^]; 7 : d; P



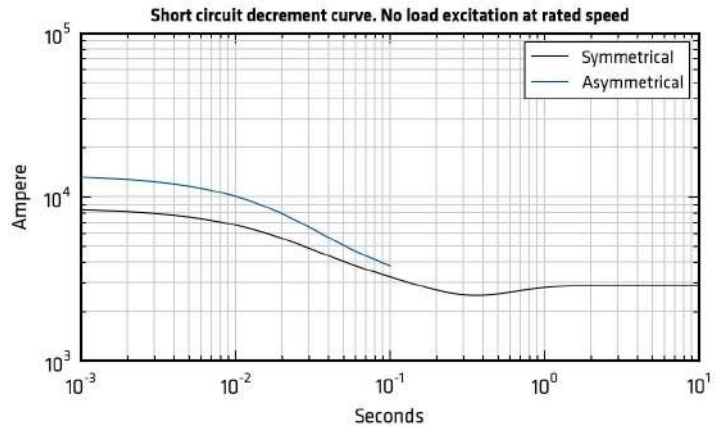
RP[^]; 7 &Z; P



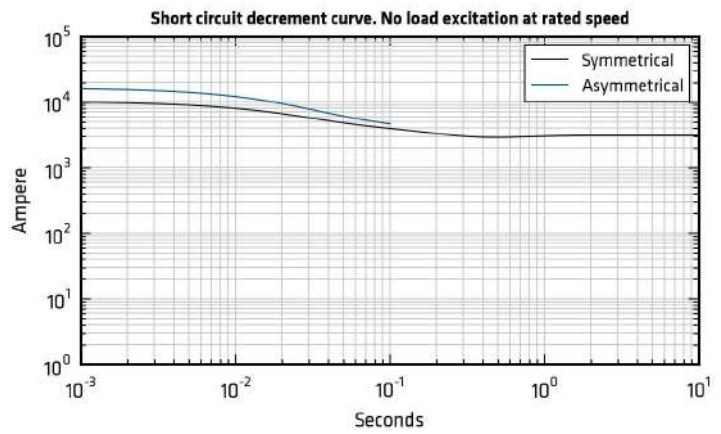
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A_x

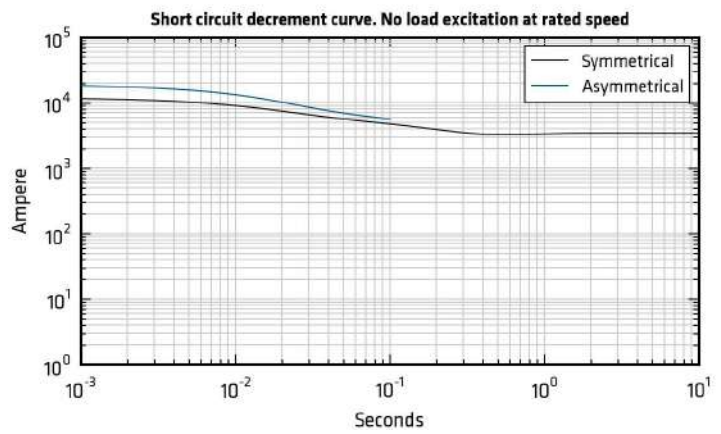
RP[^]; 7 9Z; P



RP[^]; 7 : Z; P



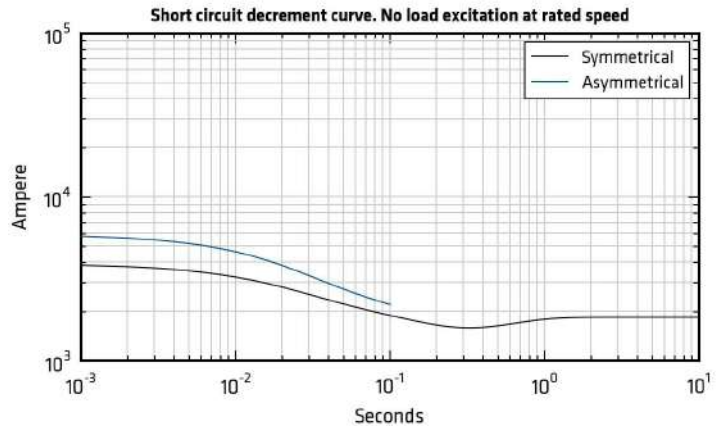
RP[^]; 7 gZ; P



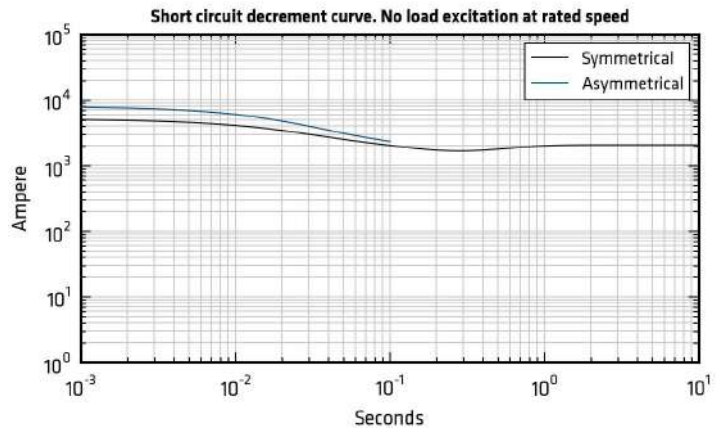
PEp

Ax

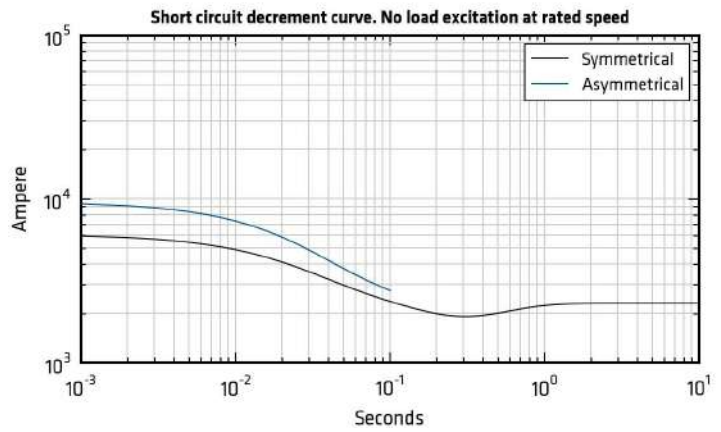
RP^; 7 &d; P



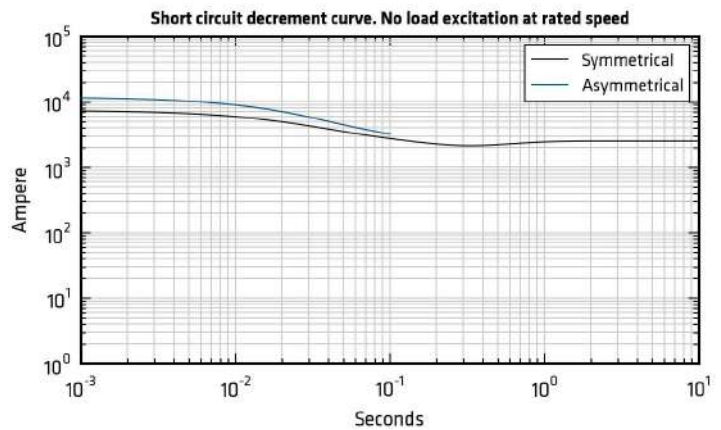
RP^; 7 9d; P



RP^; 7 : d; P



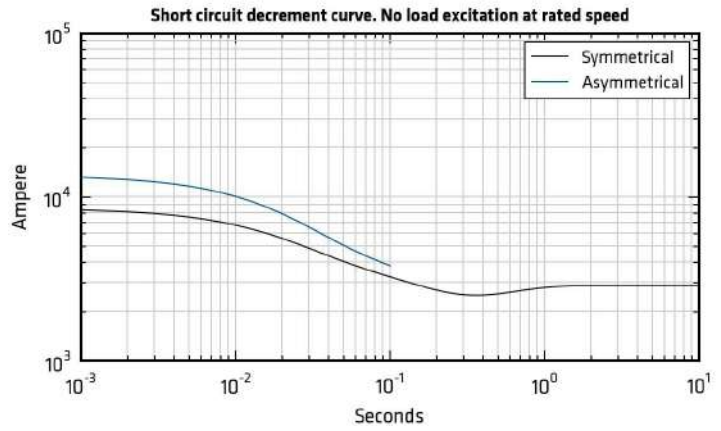
RP^; 7 &Z; P



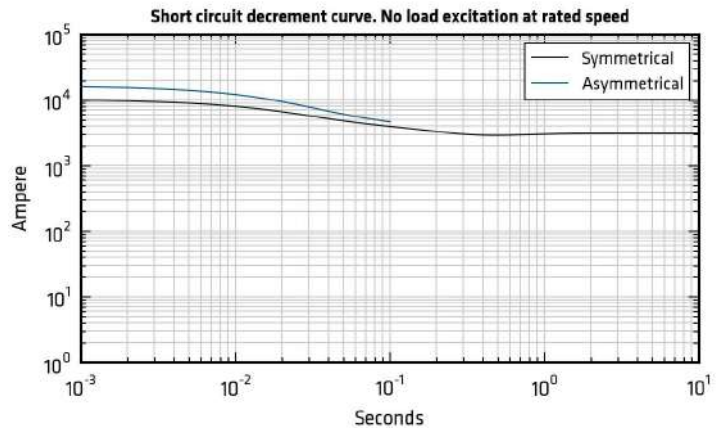
PEp

Ax

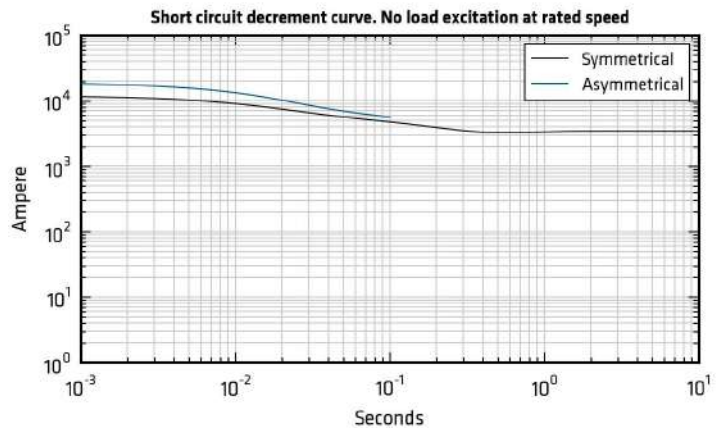
RP^; 7 9Z; P



RP^; 7 : Z; P



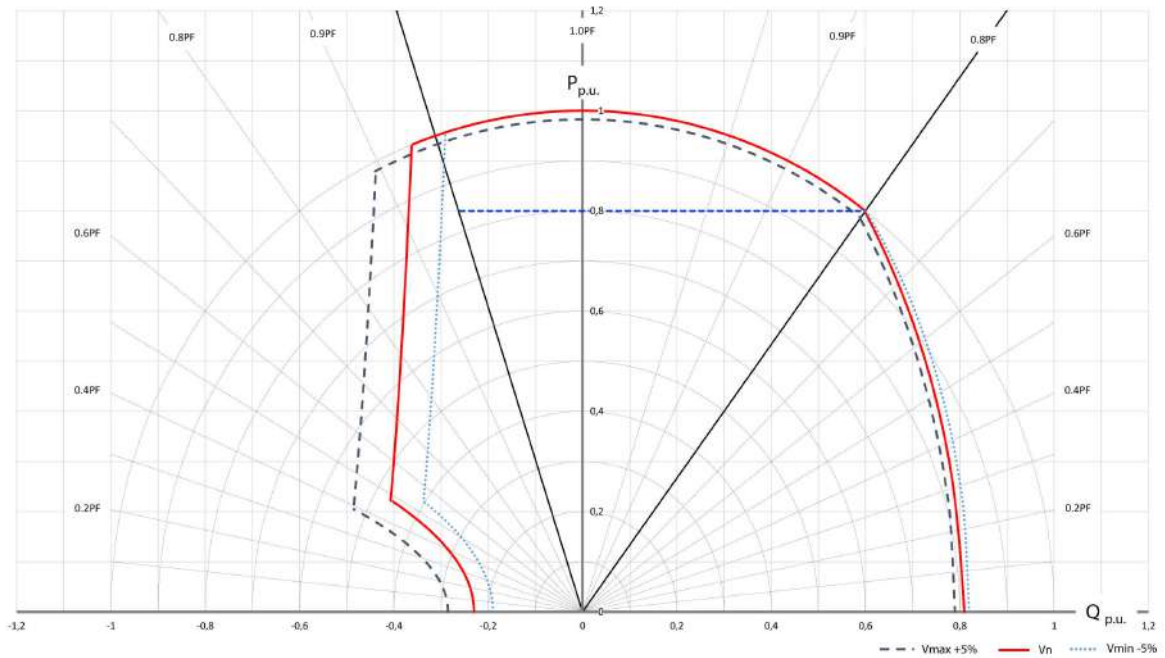
RP^; 7 gZ; P

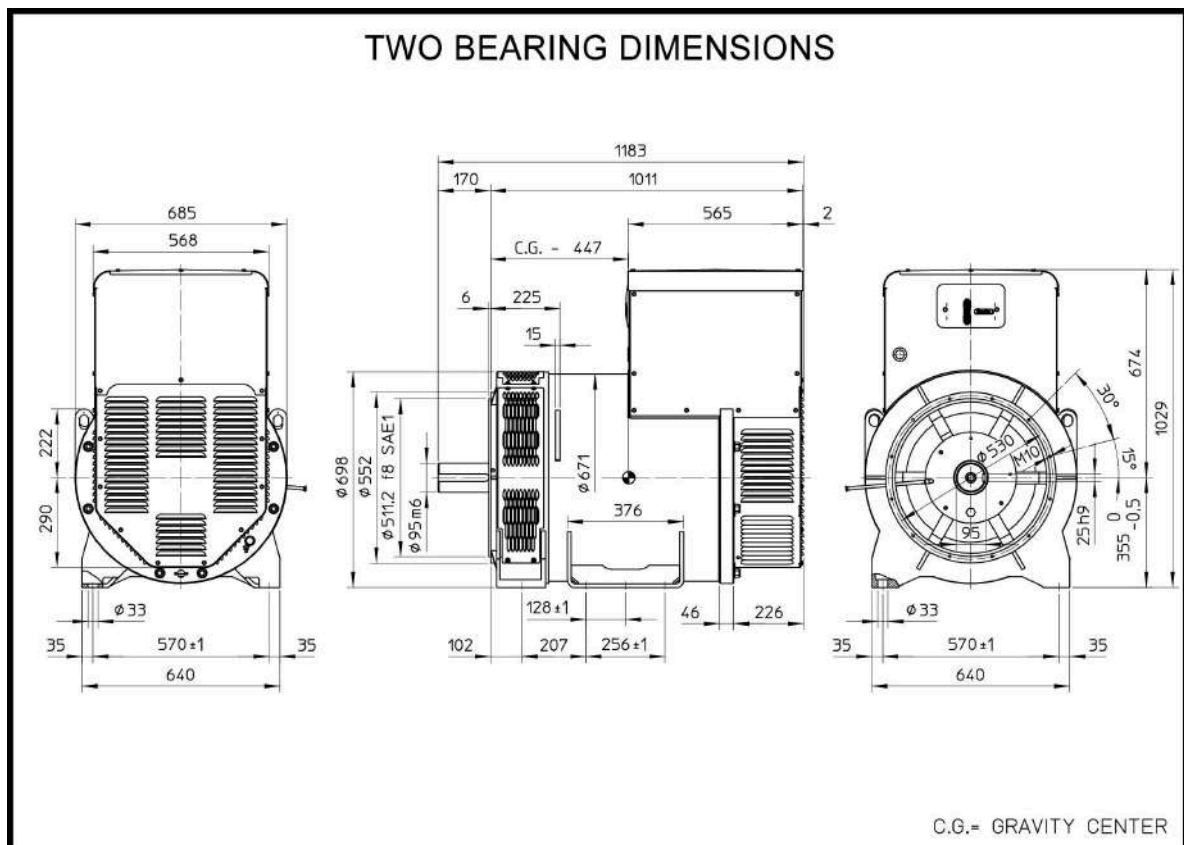
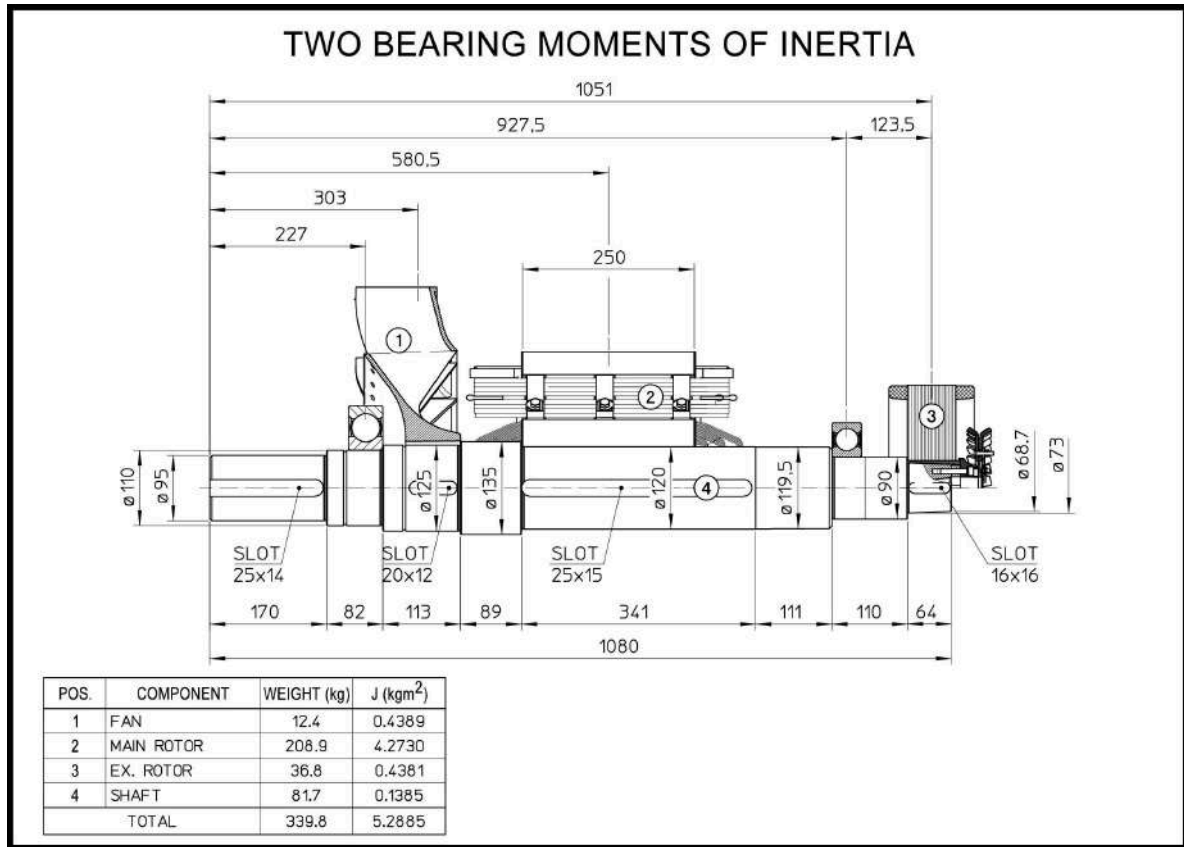


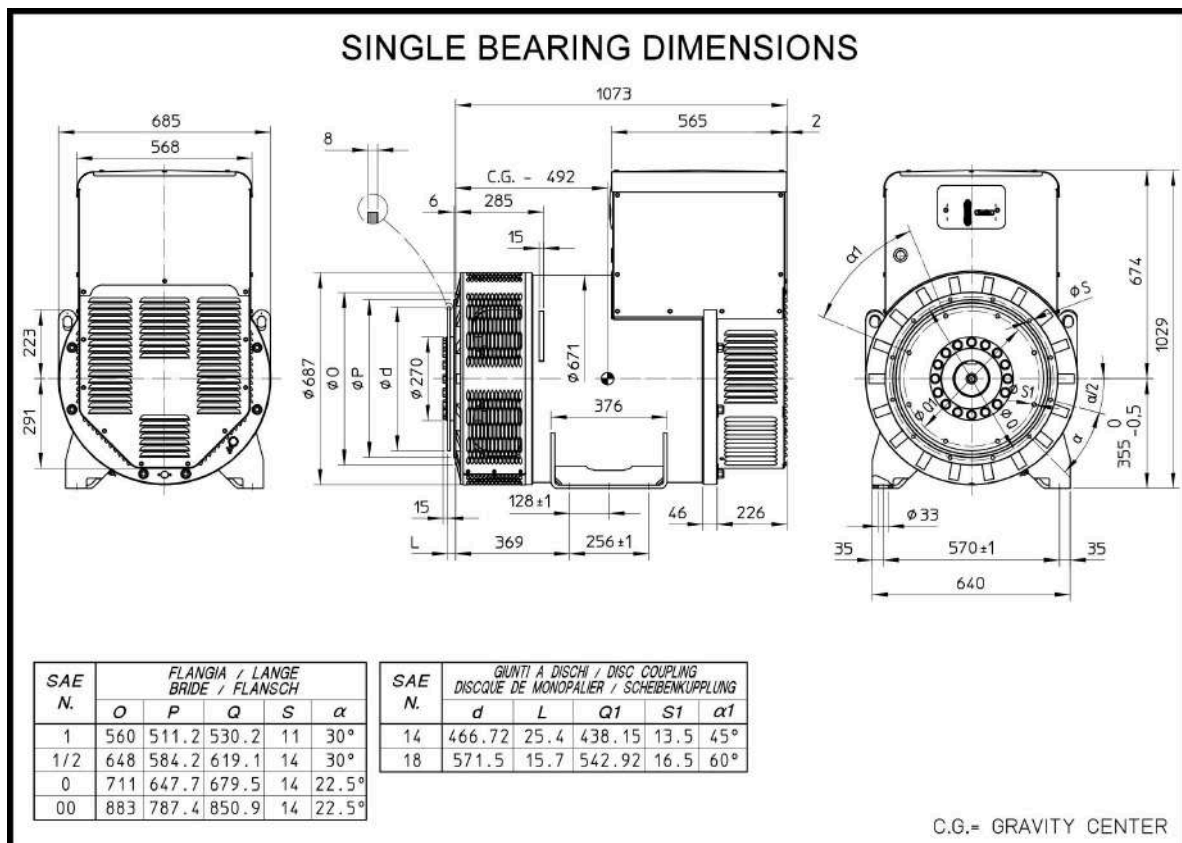
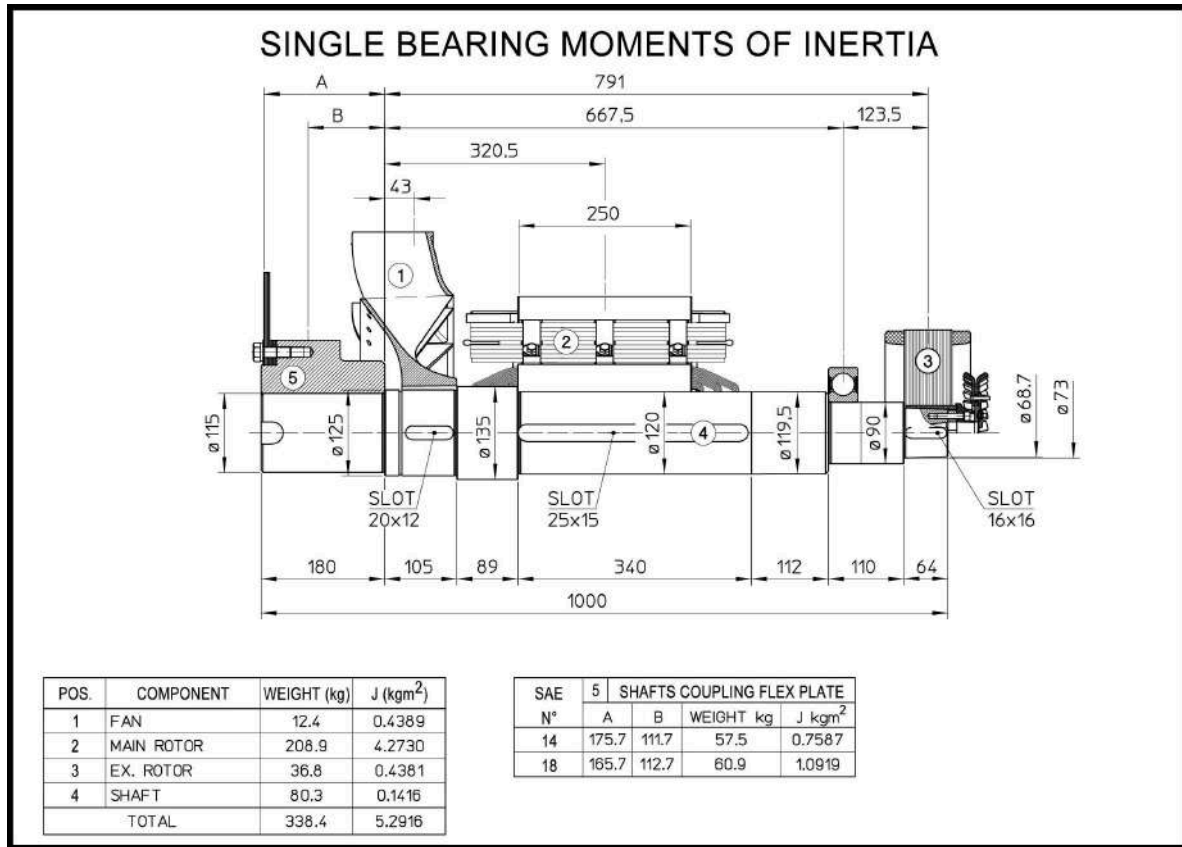
g i

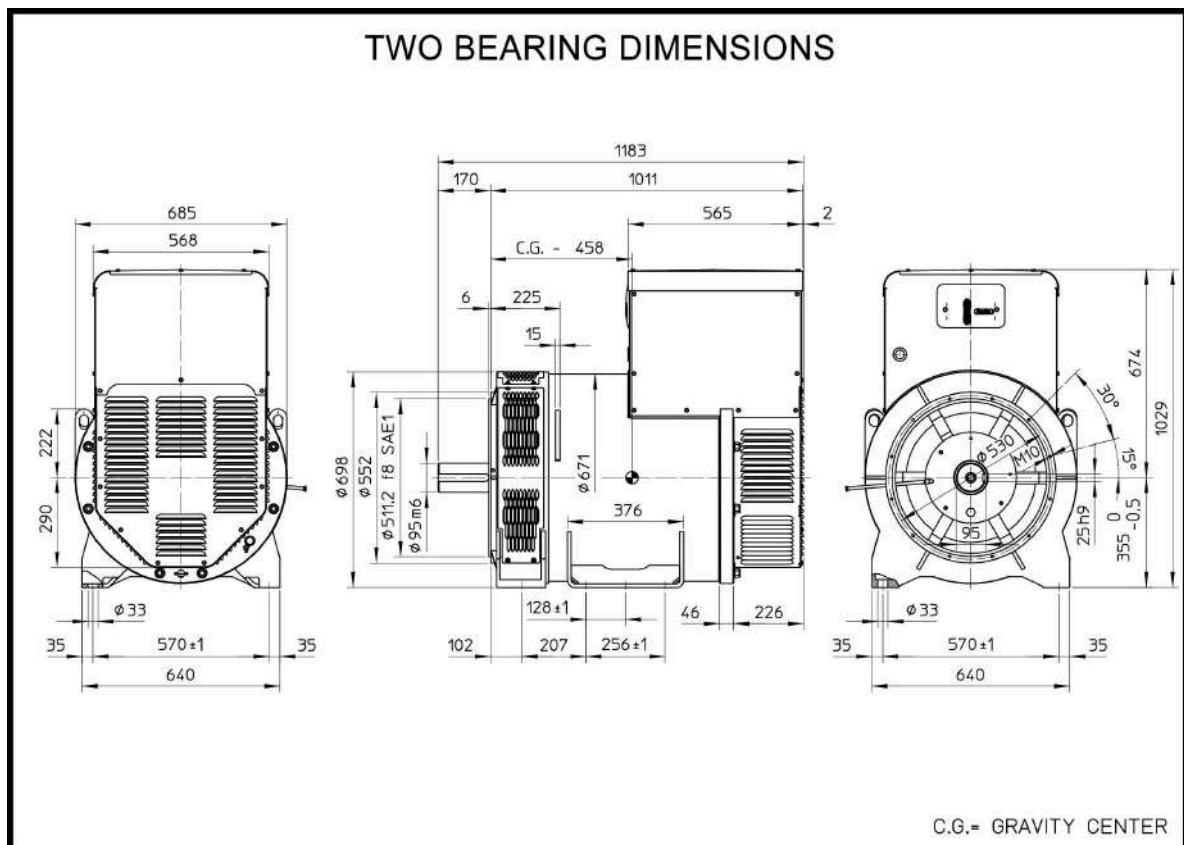
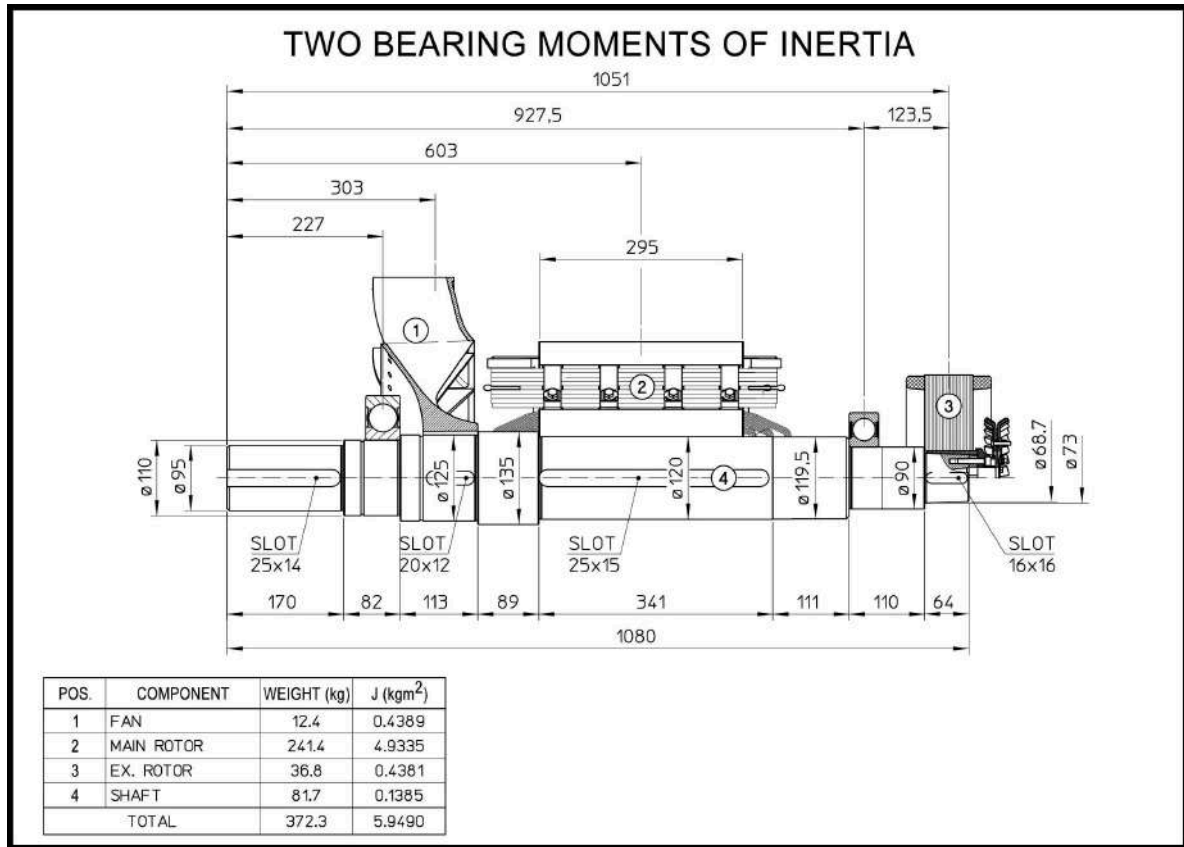
Qs s	RP^; 7 8d; P		RP^; 7 9d; P		RP^; 7 : d; P		RP^; 7 8Z; P		RP^; 7 9Z; P		RP^; 7 : Z; P		RP^; 7 g Z; P		
	=7U	@U	=7U	@U	=7U	@U	=7U	@U	=7U	@U	=7U	@U	=7U	@U	
Qs w usyw	P w														
d s h ° v° y c w ° s uw/97 P0	Ω	0,017		0,013		0,014		0,01		0,009		0,009		0,008	
c h ° v° y c w ° s uw/97 P0	Ω	4,488		4,881		5,176		6,025		1,376		1,5		1,592	
d s R Ź w c w ° s uw/97 P0	Ω	8,85		8,85		8,85		8,85		8,85		8,85		8,85	
c R Ź w c w ° s uw/97 P0	Ω	0,317		0,317		0,317		0,317		0,05		0,05		0,05	
h w y z x u w w y w w s	kg	1047,0		1131,0		1206,0		1321,0		1456,0		1534,0		1750,0	
f t s s u w s y w Ź u	kN/mm	5,0		5,9		6,5		6,1		6,5		6,8		6,9	
N° x	m³/min	54,0	64,8	54,0	64,8	54,0	64,8	54,0	64,8	54,0	64,8	54,0	64,8	54,0	64,8
] ° w w w s 8 6A	dB(A)	94/82	98/88	94/82	98/88	94/82	98/88	94/82	98/88	94/82	98/88	94/82	98/88	94/82	98/88

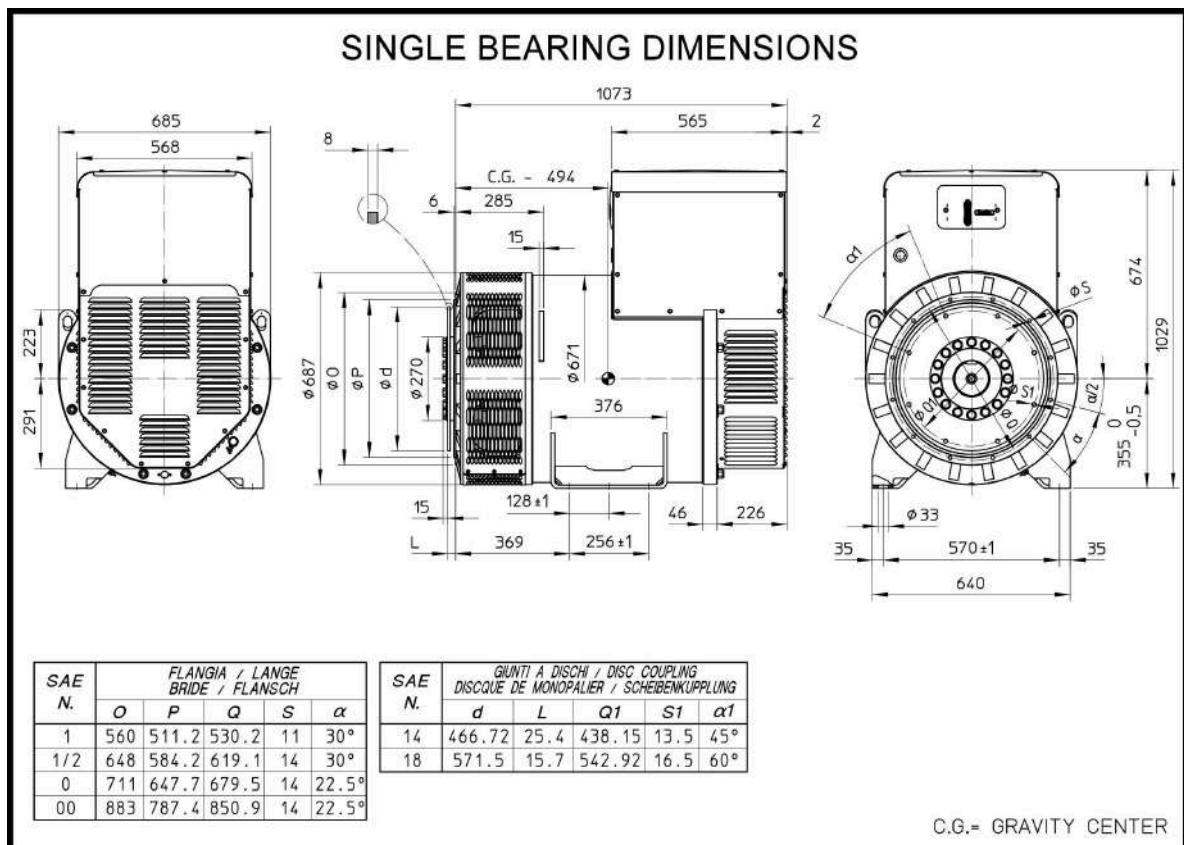
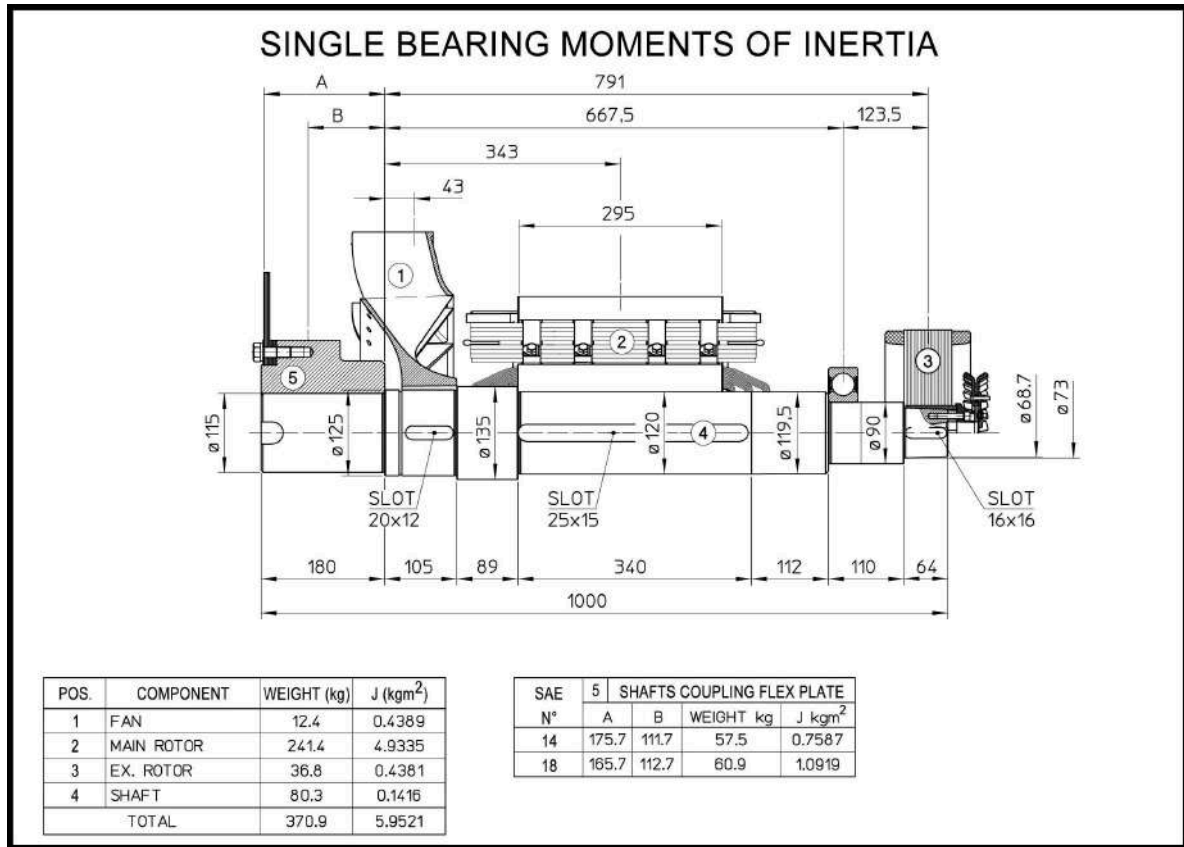
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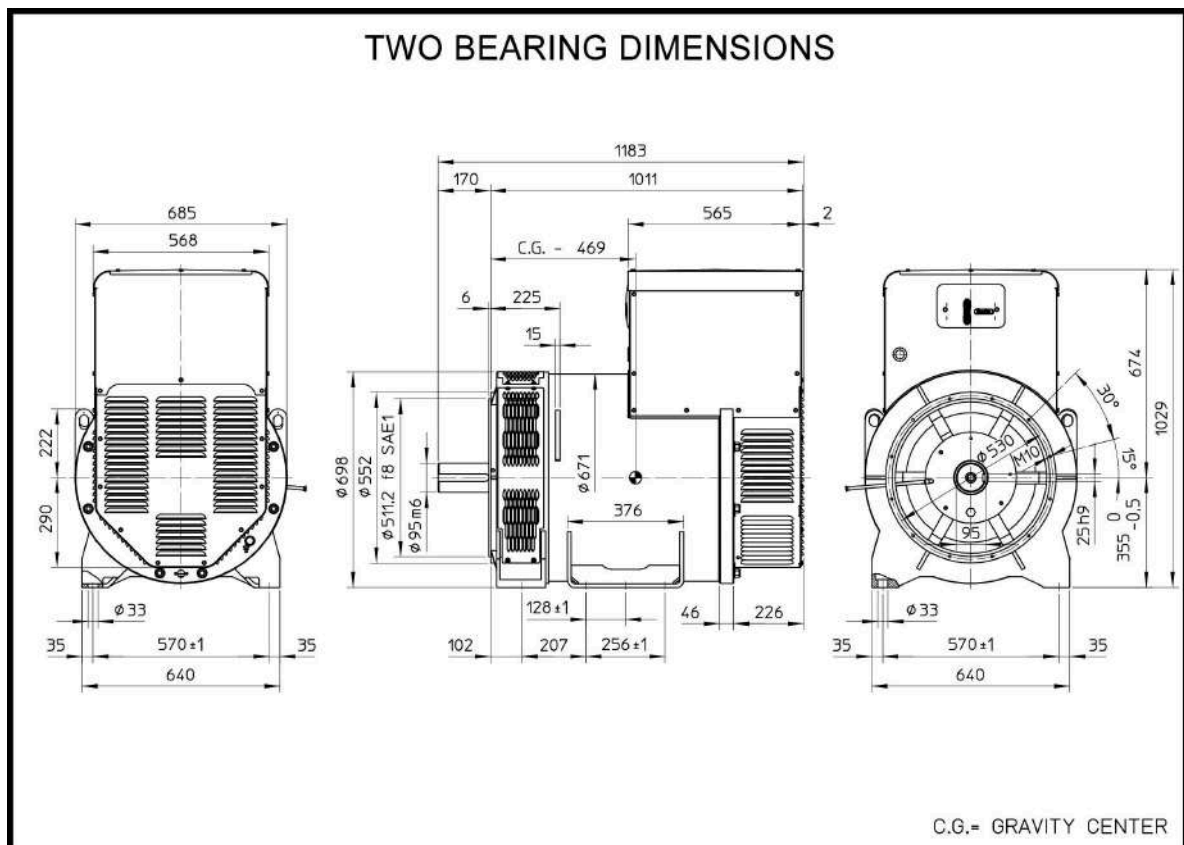
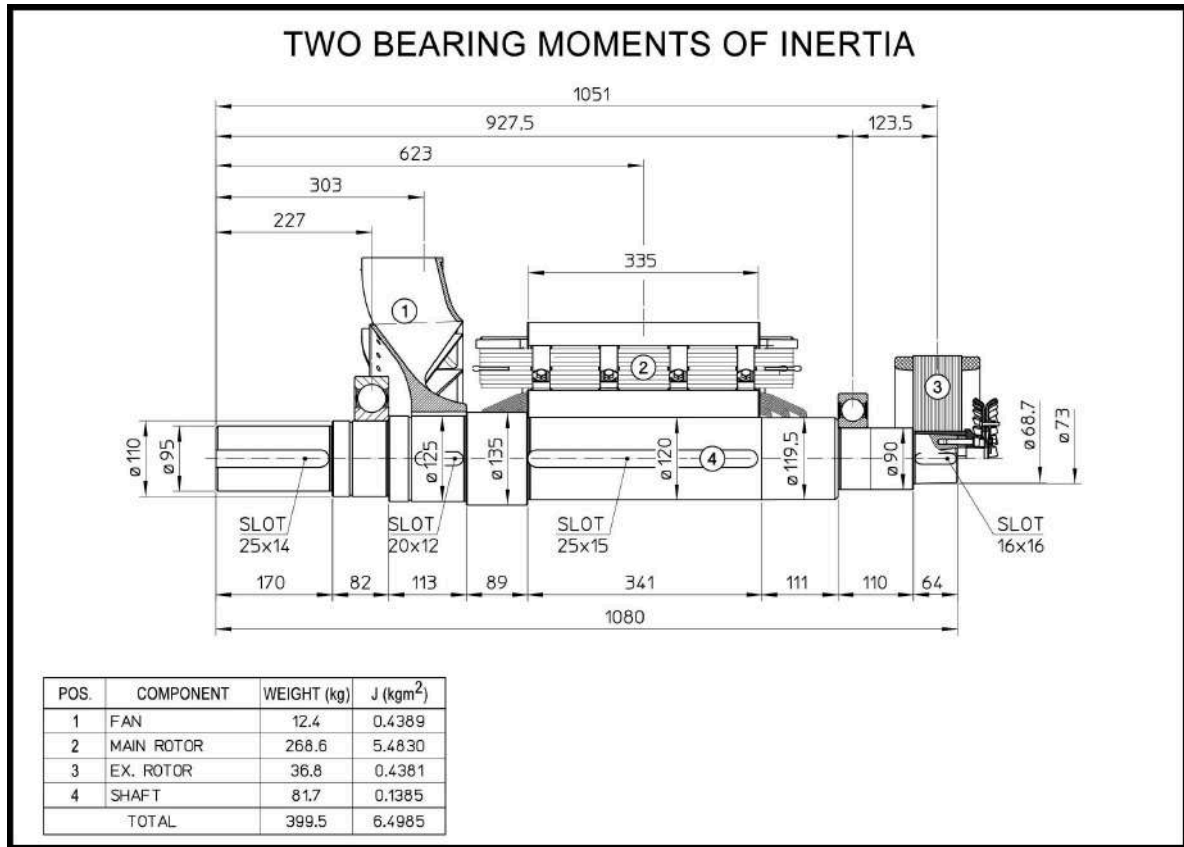


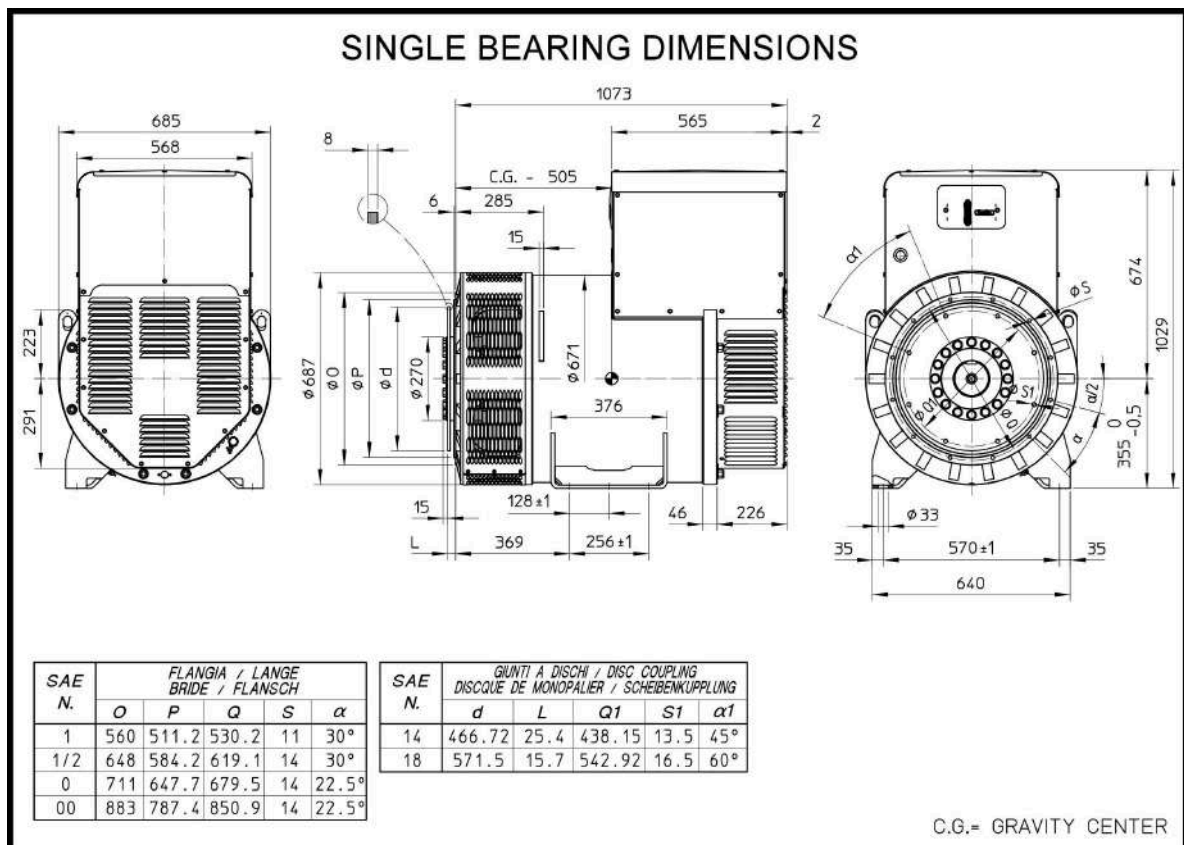
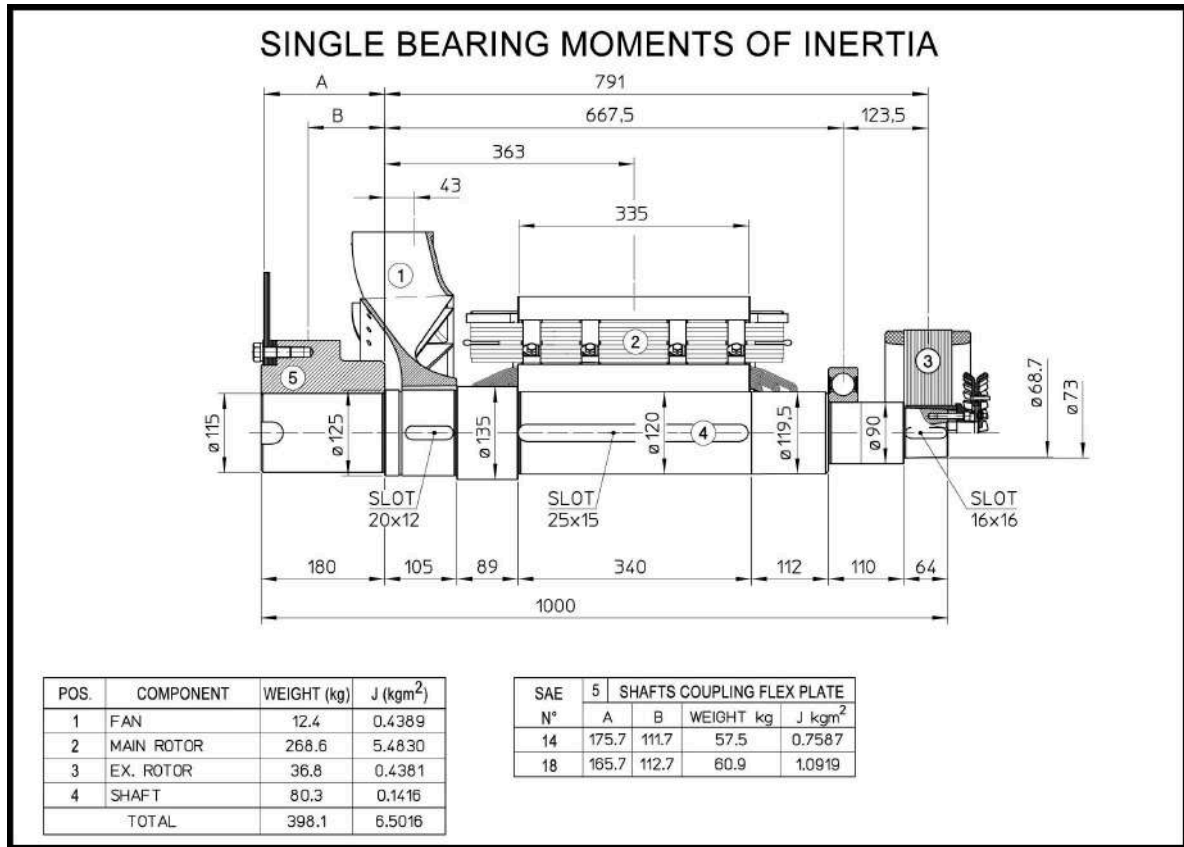


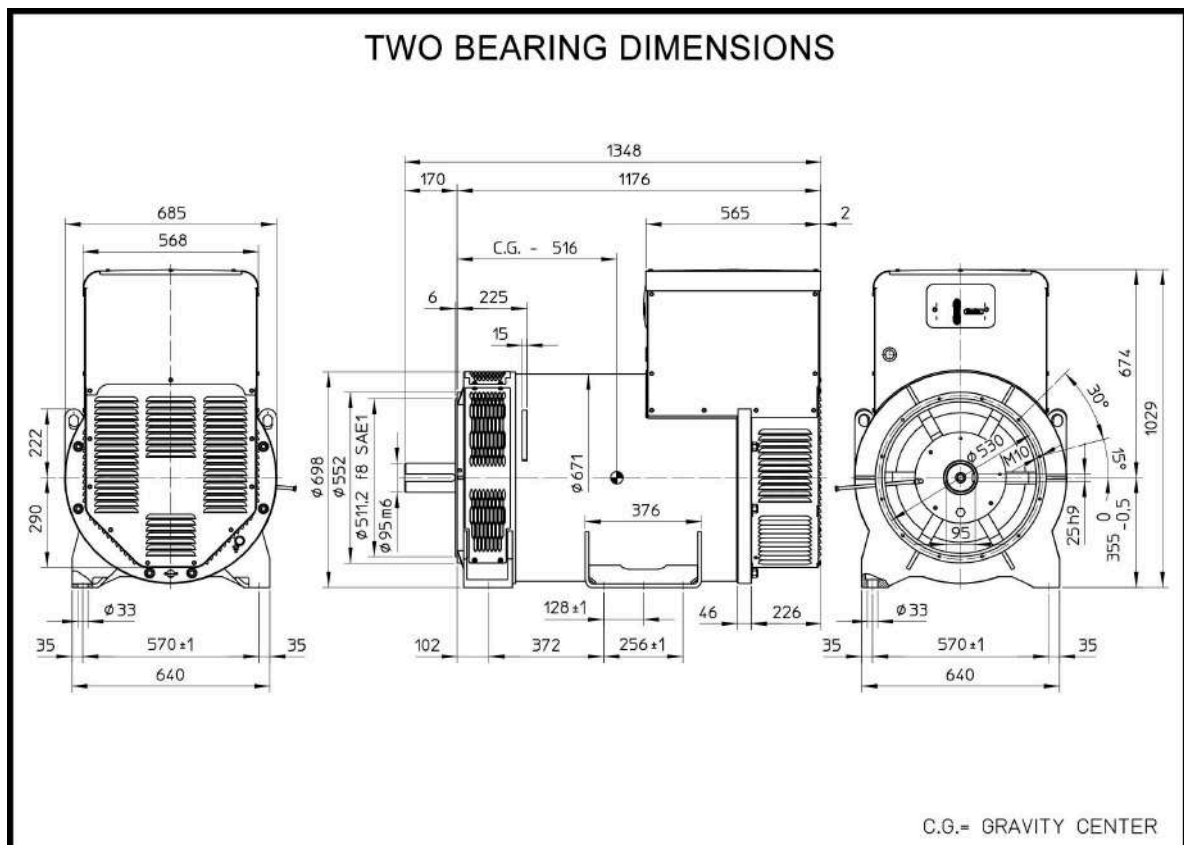
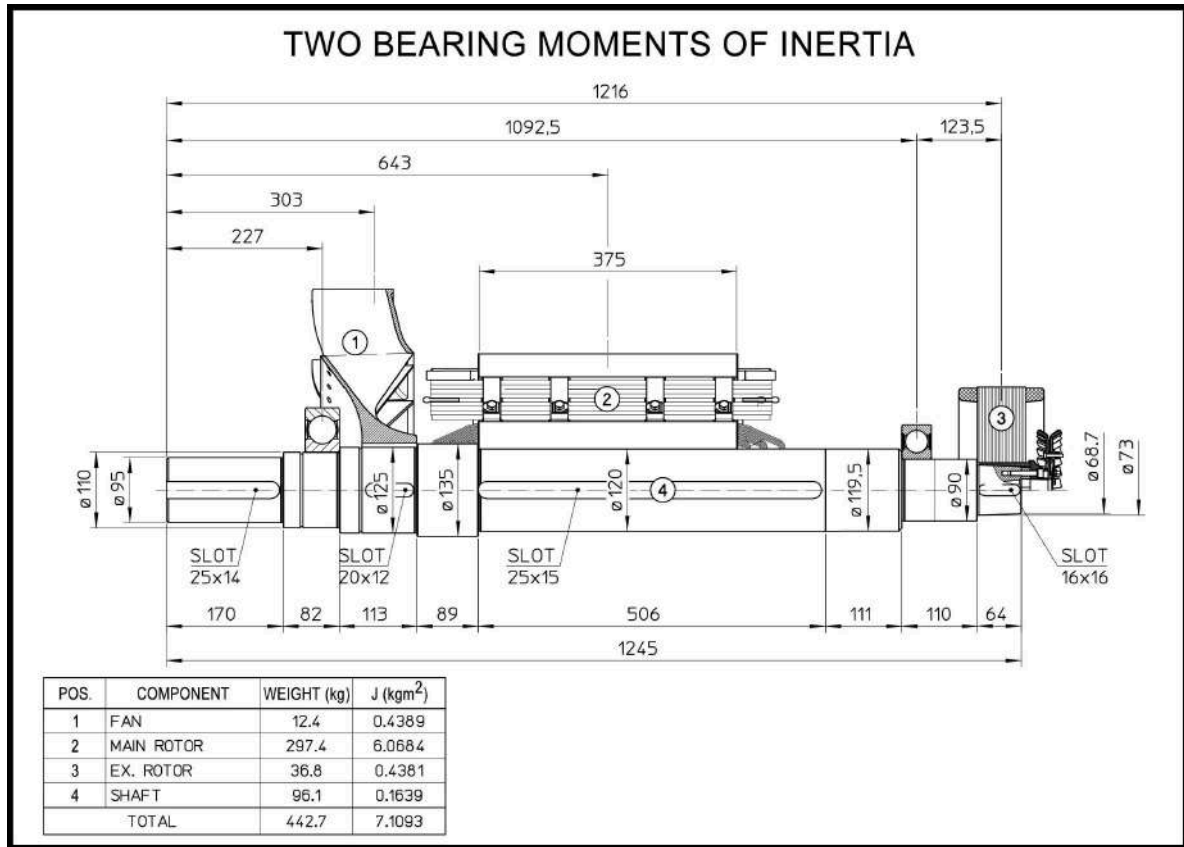


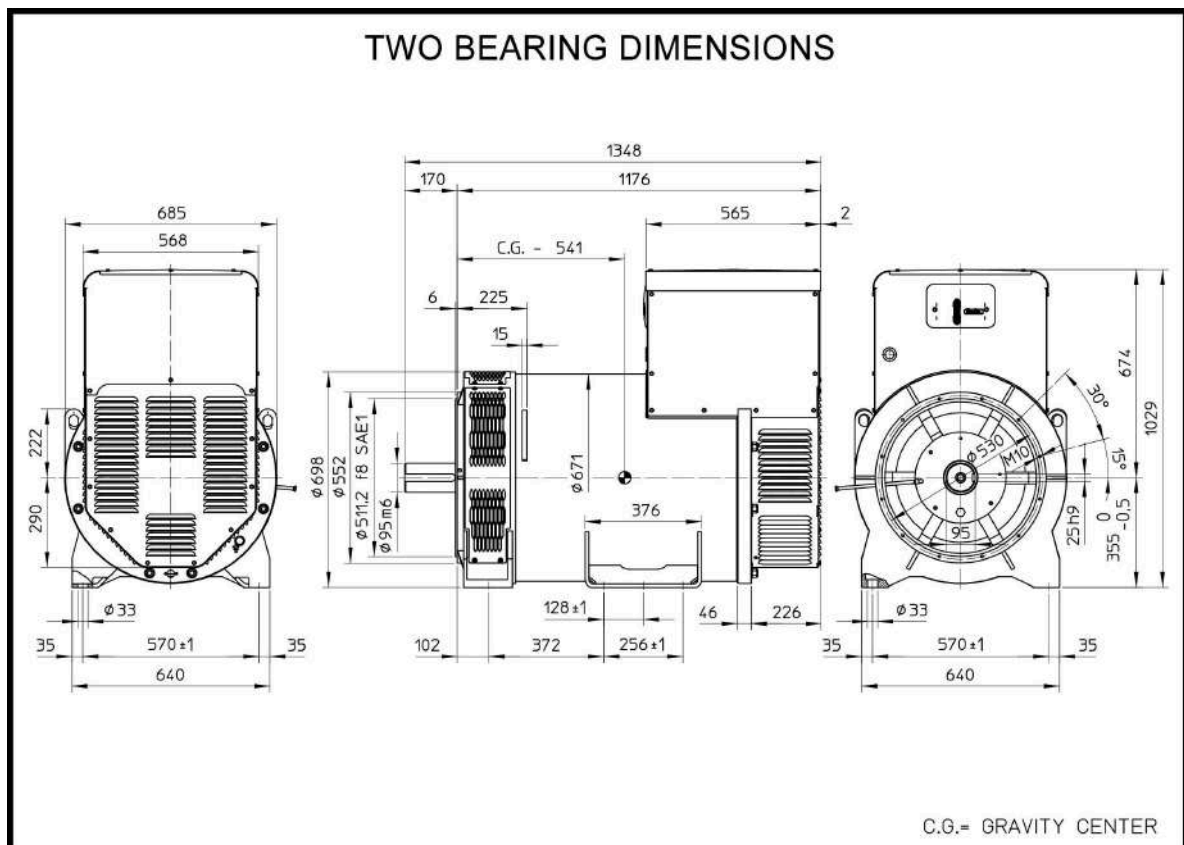
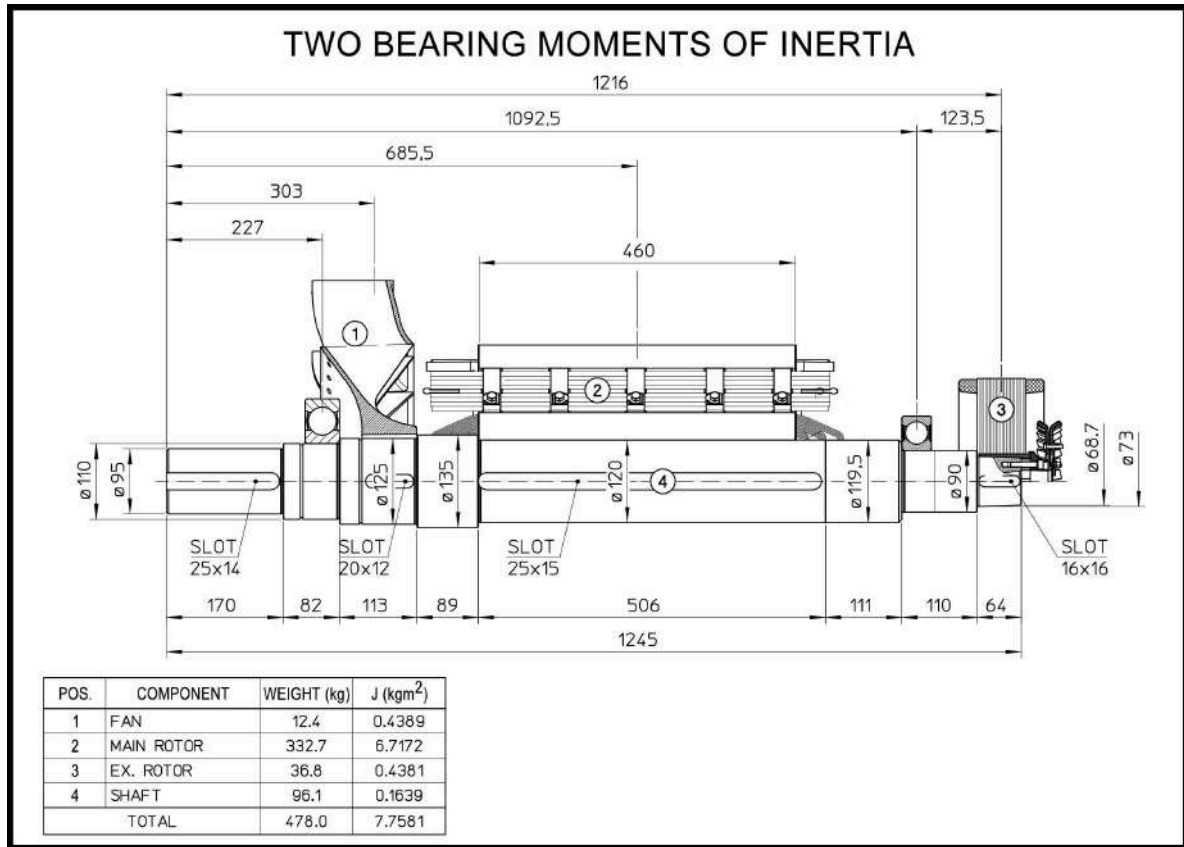


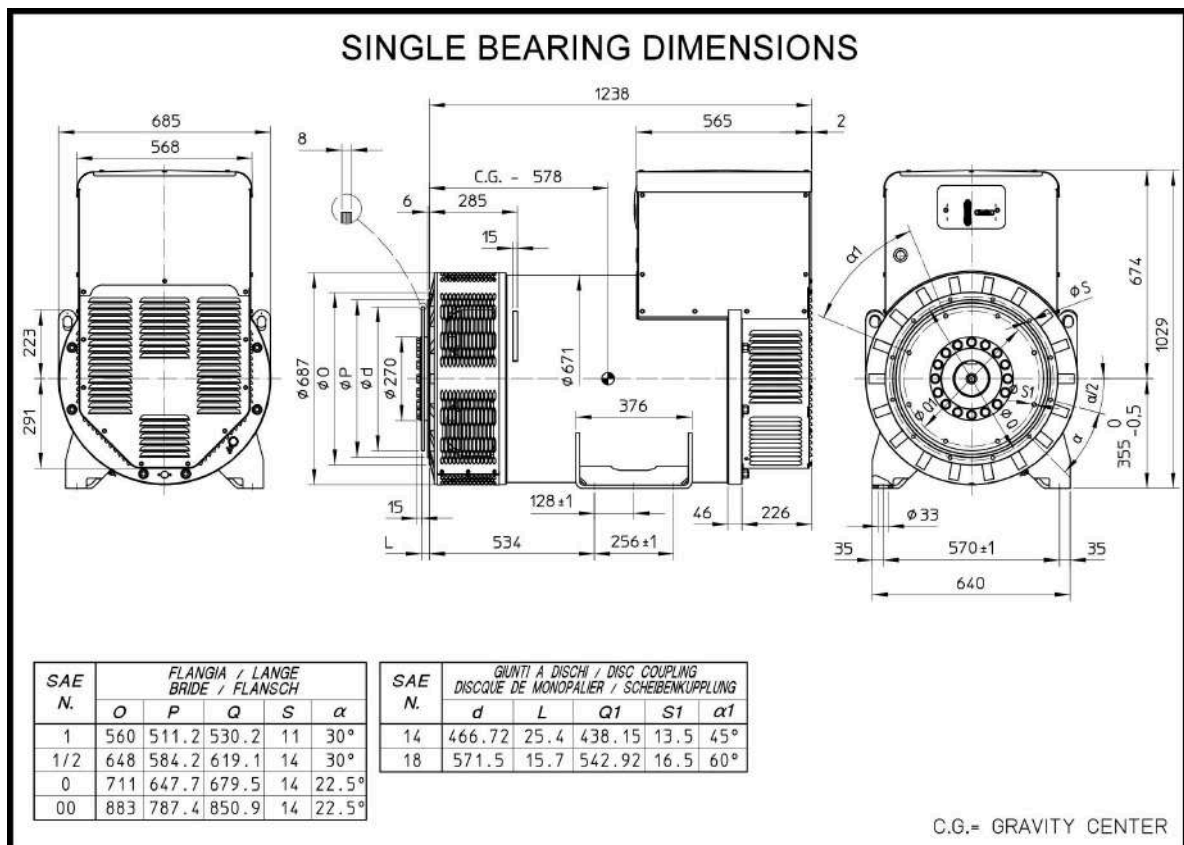
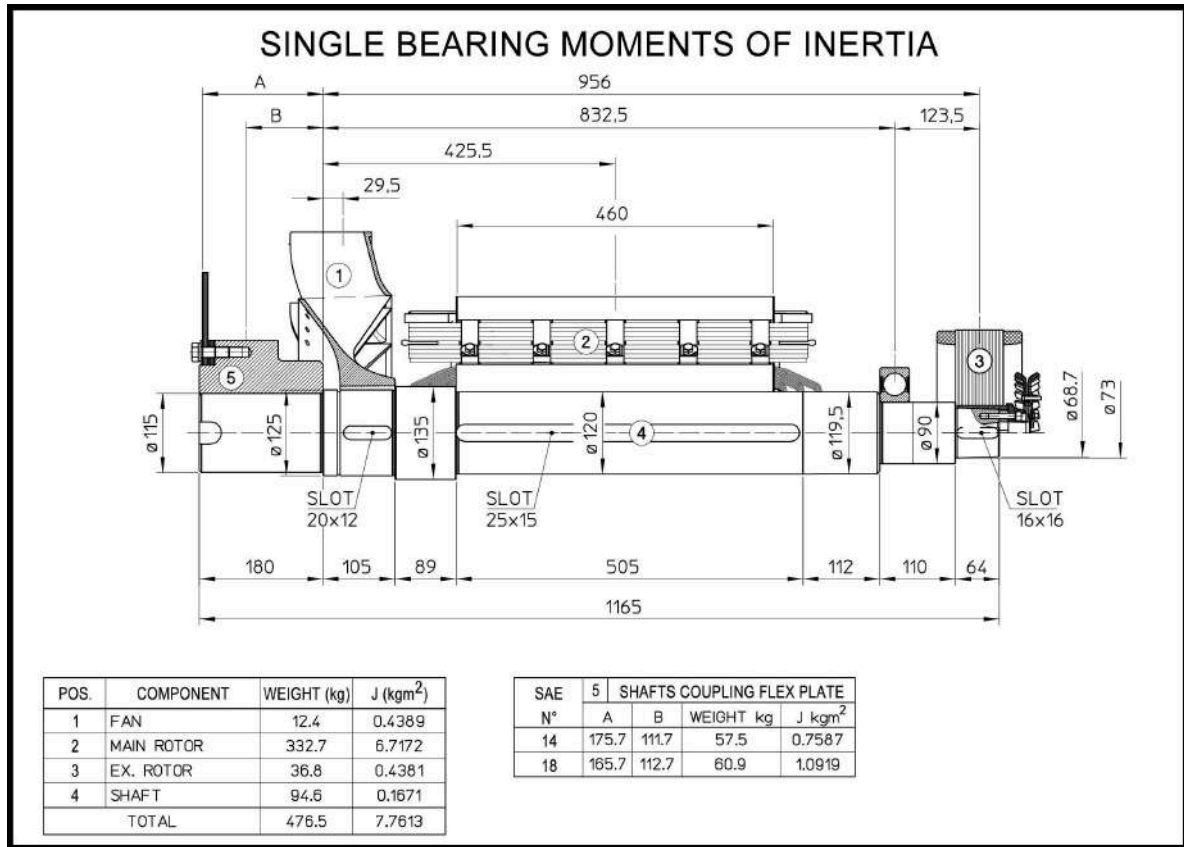


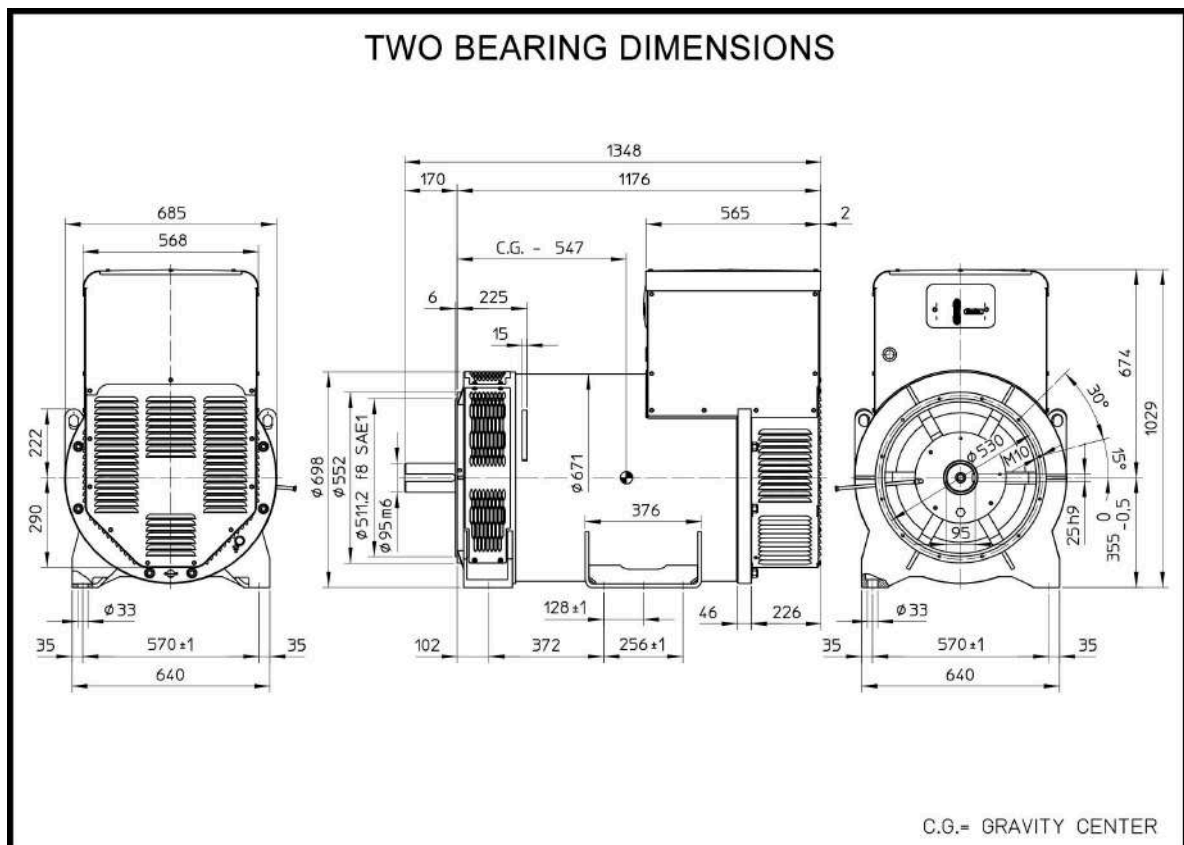
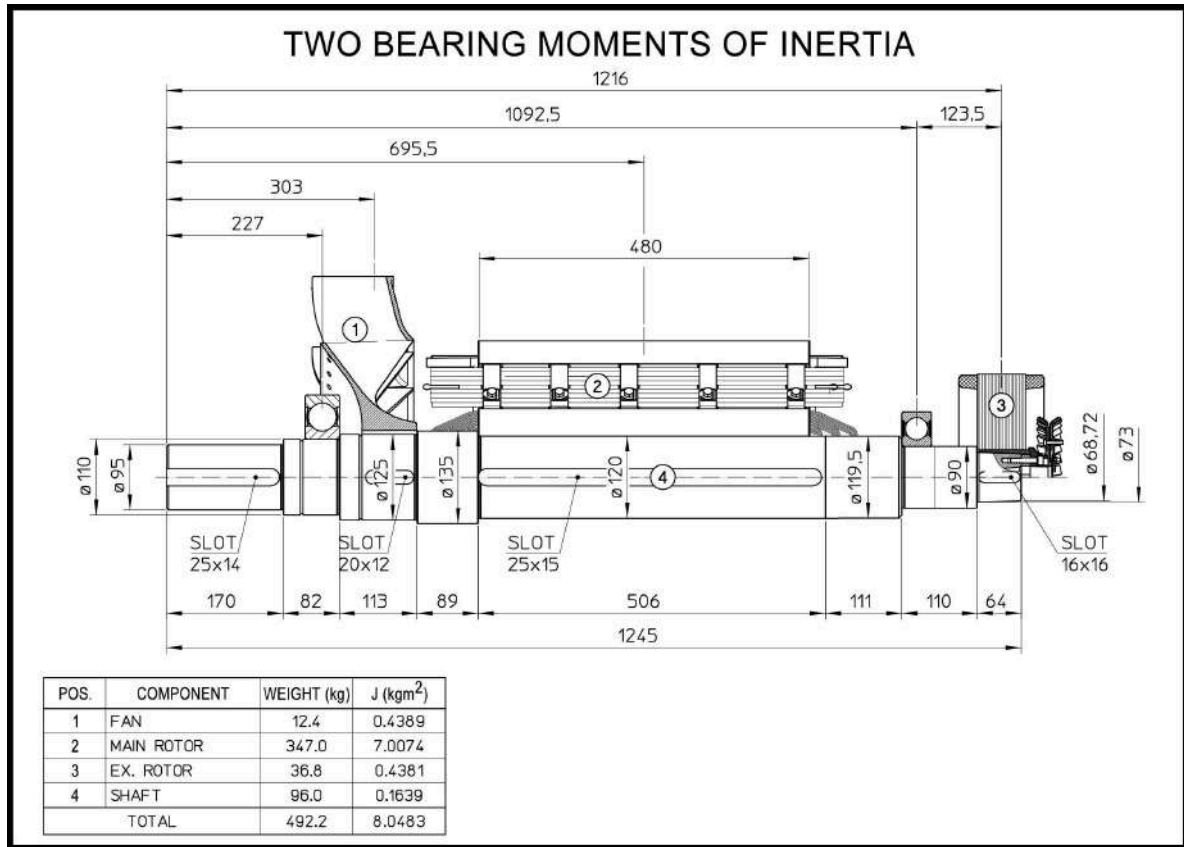


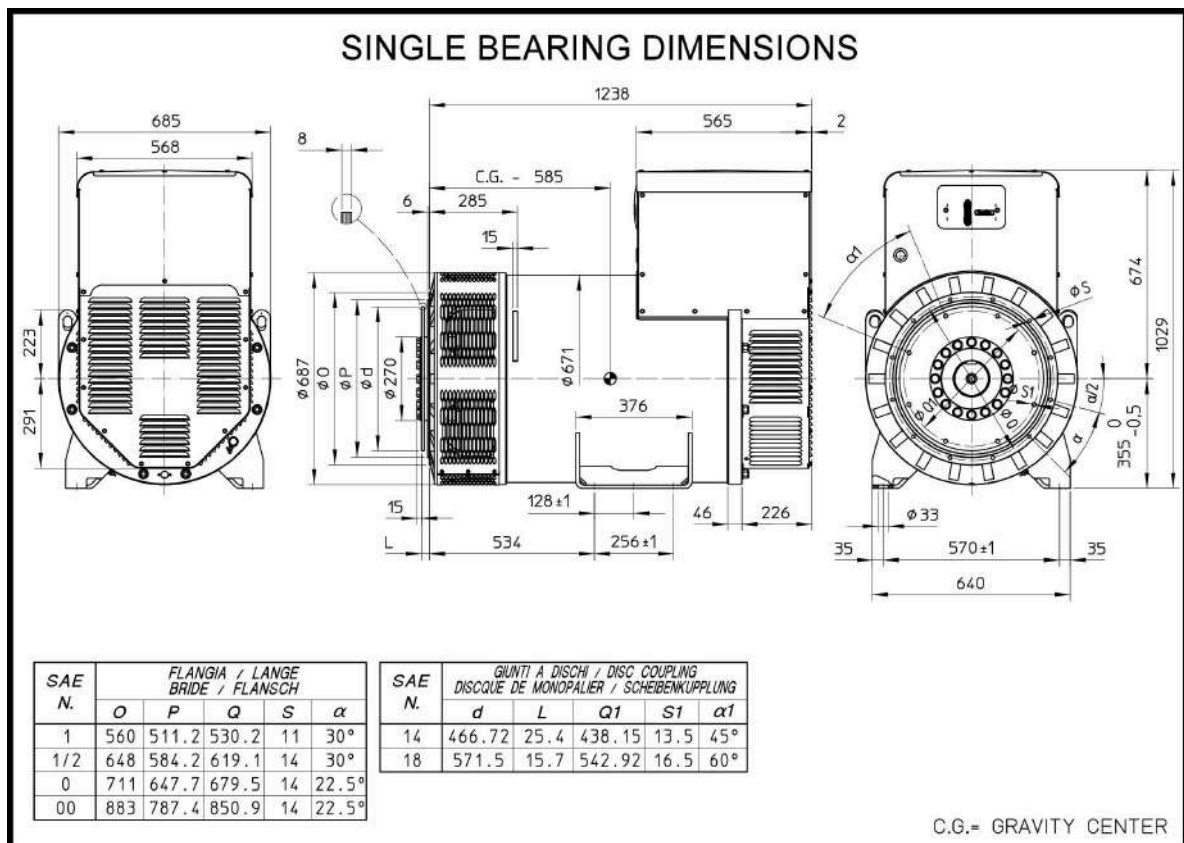
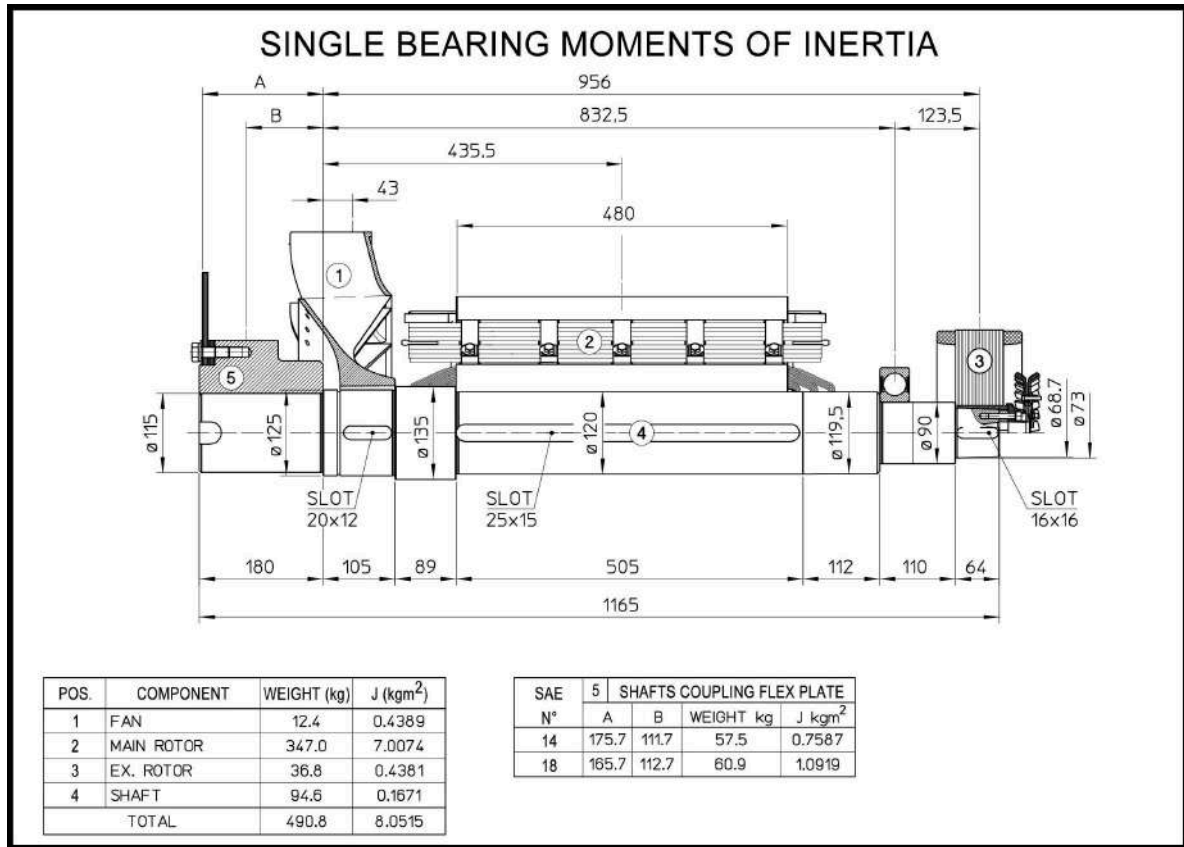


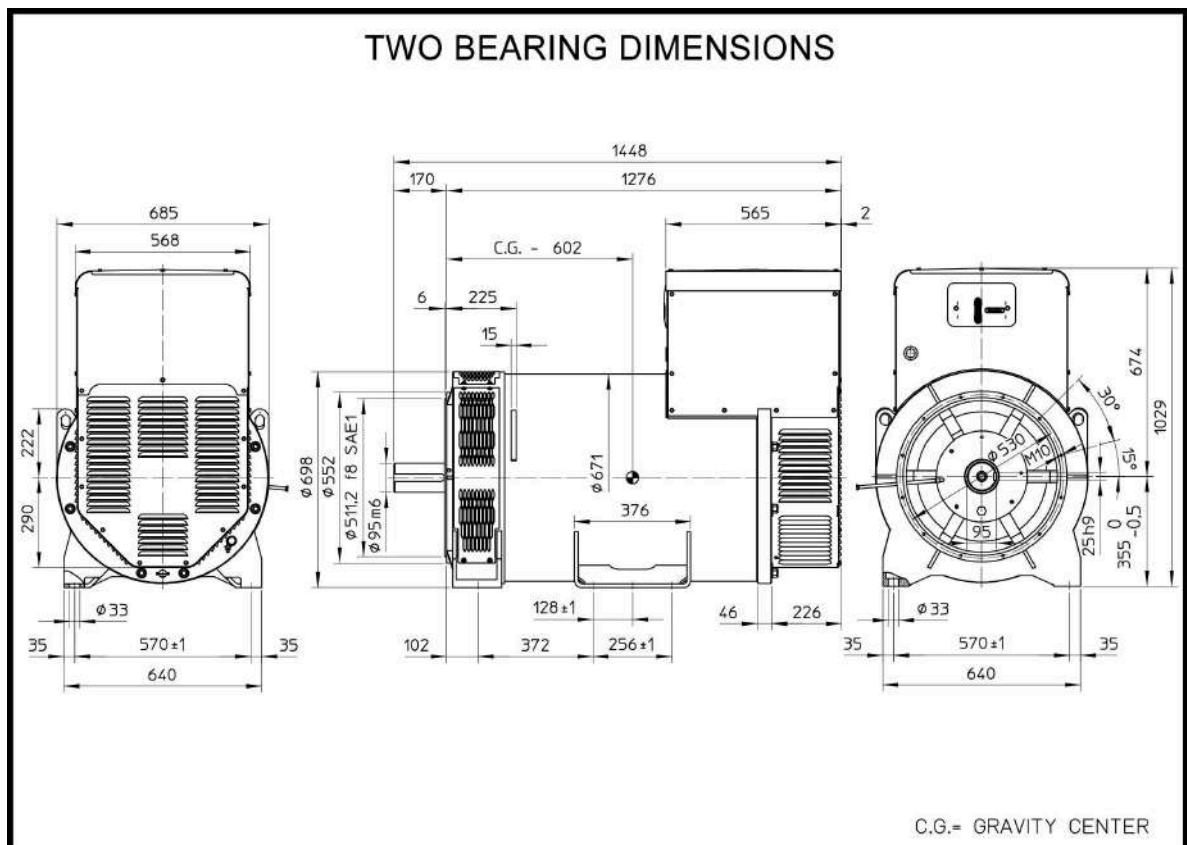
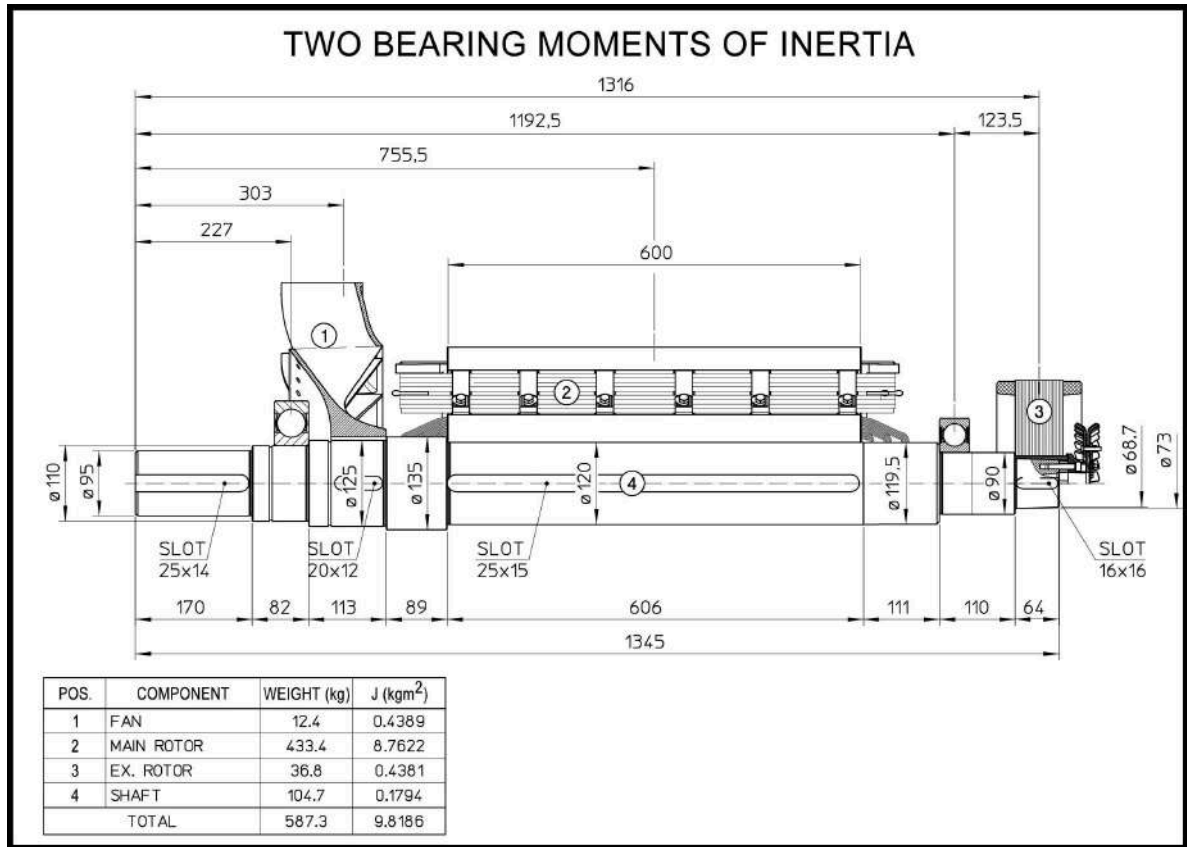


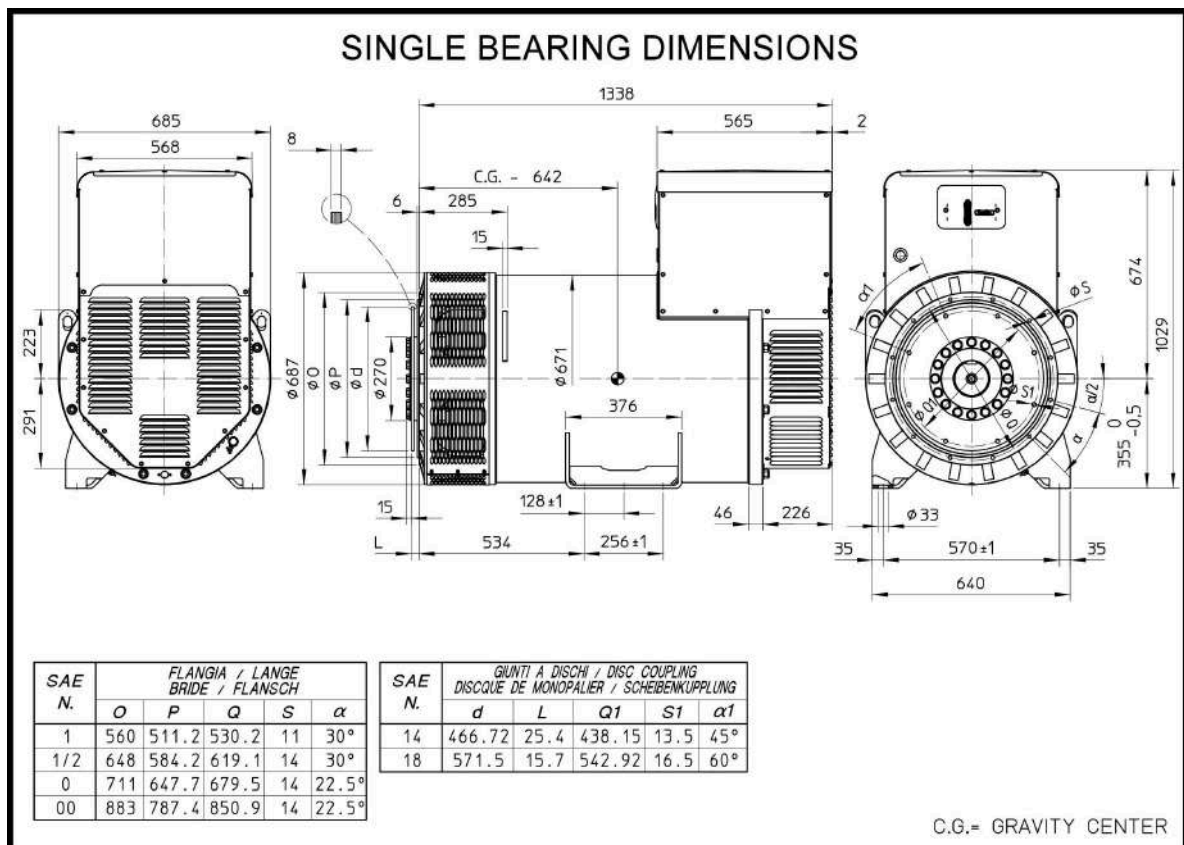
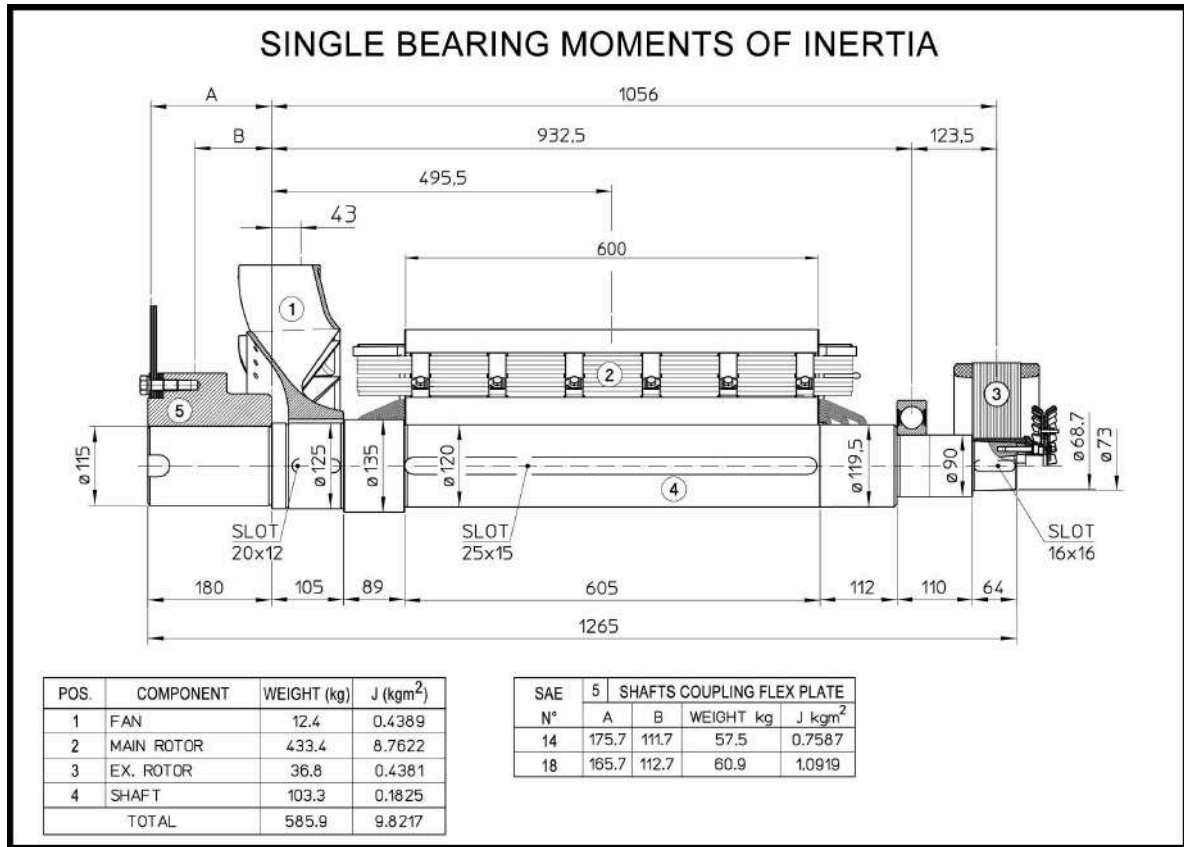












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