



Totally Focused. Totally Independent.

## Technical Guide

RP<sup>^</sup> ; 7 ; 0



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, CAN/CSA-C22.2 No14-95-No100-95, NEMA MG 1-2011, ISO 8528-3. Other standards such as UL1446, UL 1004/4 and /B are available on request.

## 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 to ECO46	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 G/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+ butadienic black flexible coating is recommended for arduous applications.

Winding Protection:	STANDARD	STANDARD+	GREY	GREY+	TOTAL+ (3% de-rate may apply on certain models)
ECP3	Std	Option	Option	Option	Option
ECP28,NPE32 and ECP32	-	Std	Option	Option	Option
ECP34 to ECO46	-	-	Std	Option	Option



Grey treatment (marinization) on the left, TOTAL+ treatment shown on the right. The EG43 grey varnish, is an 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. It is a rubbery protection treatment, used to replace epoxies and silicones winding encapsulation. The TOTAL+ flexible black compound cures to a tough, resilient, glossy black thick coating that seals the copper against moisture and chemical attacks. Due to its encapsulation capability and flexibility, is also extremely resistant to the particle abrasion as it adsorbs the impacts. Moreover, the high flexibility leads to a long-trouble less life protection, as the compound follows elastically the thermal expansion cycles of the windings from the cold to the hot condition and vice versa without forming any cracks.

## Protection for Environment

In addition to protection on the windings themselves, the alternators can have increased ingress protection. Standard levels are IP23 with further upgrades available to include inlet filters, IP43 and IP45: 7% de-rates apply on inlet filters and IP43 protection. 20-30% de-rates apply for IP45 depending on alternator model.

Additional air exit louvres (called IP23+) are optionally retrofittable in the overall ECP32 to ECO 46 range, in order to comply to the most strict marine regulations.



## 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 grade 2.5 of ISO 1940-1.

## Terminals and Terminal Box

Easy access to regulators is assured through a pull out drawer or a drop down panel to allow safer adjustment. Large terminal boxes allow easy access of power cables, in the ECO43 and ECO46 higher power ranges the terminal allow the convenient choice of power cable or busbar connection with versatility of entry and connection. Current transformers are available as an option on series ECO 40, 43 and 46 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 to ECO46	-	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 from 6.5 to 3400kVA is capable of >300% sustained short circuit current for up to 20 seconds.

## Optional PMG3

PMG3 can be retro fit or factory fit on ECO 40, 43 and 46 series. This smart MeccAlte design allows an easy fix kit, through a tapered cone coupling and a simple replacement of the rear air louvre. PMG3 is also available on ECO 38, when ordered from the factory.

The complete AVR range is fully compatible with both MAUX and PMG3 systems, this minimises spare part management and flexibility of stock as one AVR suits all applications. The PMG3 is delivering the same amount of kVA available with the MAUX.



## Accessories

Additional optionals can be fit on our alternator series, such as PTC thermistors or PT100 both on windings and bearings, space heaters, high and low profile of terminal boxes (on most series), air filter clogging sensors, rotating diode bridge failure sensor (RBD), power factor controller for parallel operation (PFR/2), parallel devices (standard from ECO 40), air filters, IP44 and IP45 protections, marine IP23 + protection for SOLAS requirements and many others.

## Deration coefficients

		Ambient temperature (Celsius)					
Altitude (meters)		25	40	45	50	55	60
≤ 1000		1.07	1	0.96	0.93	0.91	0.89
> 1000 ≤ 1500		1.01	0.96	0.92	0.89	0.87	0.84
> 1500 ≤ 2000		0.96	0.91	0.87	0.84	0.83	0.79
> 2000 ≤ 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.

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

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.

	3 phase	2 phase L-L	1 phase L-N
Instantaneous	1X	0.87X	1.30X
Minimum	1X	1.80X	3.20X
Sustained	1X	1.50X	2.50X
Max Duration	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.

## m

a w tw	;	V s ° us	U
azs w tw	:	a vu ° us	149:
] tw x °w	89	] QR Ows ° y w	@ 889c d
R vu °	O z w	QR Ows ° y w	@ 99
c wy s w	QRc 485N	[ s ° ^ w vw	99=7
h ° v° y °uz	96:	N ° vv	748777
P vw syw vwww uw	e7; 7=a:	Os s u° y	1d^ 8C; 748

## LCn

gN6 h Mew 5c ° w6N t'w P47Ba5	deN] Q0k48@ 69A	deN] Q0k48-76; 7	U489-6; 7	S487-6; 7	04B76; 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	A@g B77g B:7g BB7g
as s w d s kk :B7g ;7g ;8-g ;7g					
dw'w Qw s Δ ;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					
<b>WL OW</b> 440 <b>440</b> 440 404 417 <b>417</b> 417 386 400 <b>400</b> 400 370 370 <b>370</b> 370 342 320 <b>320</b> 320 296					
352 <b>352</b> 352 323 334 <b>334</b> 334 309 320 <b>320</b> 320 296 296 <b>296</b> 296 273 256 <b>256</b> 256 237					
<b>WL SW</b> 491 <b>491</b> 491 393 468 <b>468</b> 468 375 450 <b>450</b> 450 360 410 <b>410</b> 410 330 360 <b>360</b> 360 288					
393 <b>393</b> 393 314 374 <b>374</b> 374 300 360 <b>360</b> 360 288 328 <b>328</b> 328 264 288 <b>288</b> 288 230					
<b>WL VW</b> 546 <b>546</b> 546 503 521 <b>521</b> 521 479 500 <b>500</b> 500 460 450 <b>450</b> 450 414 400 <b>400</b> 400 368					
437 <b>437</b> 437 402 417 <b>417</b> 417 383 400 <b>400</b> 400 368 360 <b>360</b> 360 331 320 <b>320</b> 320 294					
<b>WL OW</b> 601 <b>601</b> 590 546 567 <b>567</b> 557 515 550 <b>550</b> 540 500 500 <b>500</b> 490 454 440 <b>440</b> 432 400					
481 <b>481</b> 472 437 454 <b>454</b> 446 412 440 <b>440</b> 432 400 400 <b>400</b> 392 363 352 <b>352</b> 346 320					
<b>WL Ok W</b> 675 <b>675</b> 675 616 645 <b>645</b> 645 588 625 <b>625</b> 625 570 564 <b>564</b> 564 515 500 <b>500</b> 500 456					
540 <b>540</b> 540 493 516 <b>516</b> 516 470 500 <b>500</b> 500 456 451 <b>451</b> 451 412 400 <b>400</b> 400 365					
<b>WL SW</b> 735 <b>735</b> 735 560 700 <b>700</b> 700 535 680 <b>680</b> 680 520 630 <b>630</b> 630 483 544 <b>544</b> 544 416					
588 <b>588</b> 588 448 560 <b>580</b> 580 428 544 <b>544</b> 544 416 504 <b>504</b> 504 386 435 <b>435</b> 435 333					
<b>WL W</b> 825 <b>825</b> 825 740 777 <b>777</b> 777 700 750 <b>750</b> 750 680 690 <b>690</b> 690 630 600 <b>600</b> 600 544					
660 <b>660</b> 660 592 622 <b>622</b> 622 560 600 <b>600</b> 600 544 552 <b>552</b> 552 504 480 <b>480</b> 480 435					

## NCn

gN6 h Mew 5c ° w6N t'w P47Ba5	deN] Q0k48@ 69A	deN] Q0k48-76; 7	U489-6; 7	S487-6; 7	04B76; 7
dw'w d s k B:7g BB7g C97g C@g					
as s w d s kk :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 =7; g ==; g					
as s w Qw s ΔΔ 9;7g 9=:g 9@g 9Ag					
<b>WL OW</b> 459 492 525 <b>525</b> 438 469 500 <b>500</b> 420 450 480 <b>480</b> 383 410 440 <b>440</b> 336 360 384 <b>384</b>					
367 394 420 <b>420</b> 350 375 400 <b>400</b> 336 360 384 <b>384</b> 306 328 352 <b>352</b> 269 288 307 <b>307</b>					
<b>WL SW</b> 524 557 590 <b>590</b> 500 532 563 <b>563</b> 480 510 540 <b>540</b> 435 460 490 <b>490</b> 384 408 432 <b>432</b>					
419 446 472 <b>472</b> 400 426 450 <b>450</b> 384 408 432 <b>432</b> 348 368 392 <b>392</b> 307 326 346 <b>346</b>					
<b>WL VW</b> 590 634 656 <b>656</b> 563 604 625 <b>625</b> 540 580 600 <b>600</b> 484 520 540 <b>540</b> 432 464 480 <b>480</b>					
472 507 525 <b>525</b> 450 483 500 <b>500</b> 432 464 480 <b>480</b> 387 416 432 <b>432</b> 346 371 384 <b>384</b>					
<b>WL OW</b> 623 669 722 <b>722</b> 587 649 680 <b>680</b> 570 630 660 <b>660</b> 515 570 600 <b>600</b> 456 504 528 <b>528</b>					
498 535 578 <b>578</b> 470 519 544 <b>544</b> 456 504 528 <b>528</b> 412 456 480 <b>480</b> 365 403 422 <b>422</b>					
<b>WL Ok W</b> 720 762 810 <b>810</b> 688 730 775 <b>775</b> 665 705 750 <b>750</b> 605 636 677 <b>677</b> 532 564 600 <b>600</b>					
576 610 648 <b>648</b> 550 584 620 <b>620</b> 532 564 600 <b>600</b> 484 509 542 <b>542</b> 426 451 480 <b>480</b>					
<b>WL SW</b> 778 843 882 <b>882</b> 741 803 840 <b>840</b> 720 780 816 <b>816</b> 665 720 756 <b>756</b> 576 624 653 <b>653</b>					
622 674 706 <b>706</b> 593 642 672 <b>672</b> 576 624 653 <b>653</b> 532 576 604 <b>604</b> 461 499 522 <b>522</b>					
<b>WL W</b> 930 970 970 <b>970</b> 885 925 925 <b>925</b> 860 900 900 <b>900</b> 790 830 830 <b>830</b> 688 720 720 <b>720</b>					
744 776 776 <b>776</b> 708 740 740 <b>740</b> 688 720 720 <b>720</b> 632 664 664 <b>664</b> 550 576 576 <b>576</b>					

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n BHCC

f s s vw / w5R] @7: ; 4 0	RP^; 7 8d; 0	RP^; 7 9d; 0	RP^; 7 : d; 0	RP^; 7 8Z; 0	RP^; 7 85-Z; 0	RP^; 7 9Z; 0	RP^; 7 gZ; 0
Xd Q° vw 45 ° uz w6us uw %	286,7	240,1	258,7	246,3	270	234,9	175,9
X'd Q° vw 45 ° s 'w w6us uw %	23,3	22,1	21,7	20,1	19,8	18,7	16,7
X"d Q° vw 45 ° t s 'w w6us uw %	14,7	12,5	11,8	10,6	10,5	9,52	9
Xq b sv s w45 ° uz w6us uw %	115,9	110,7	111,8	115,9	157,1	145,9	122,1
X'q b sv s w45 ° s 'w w6us uw %	115,9	110,7	111,8	115,9	157,1	145,9	122,1
X"q b sv s w45 ° t s 'w w6us uw %	29,2	28,4	27,3	24,9	24	16,8	14,8
X2 ] w5s ° w4 w w uw w6us uw %	19,1	18,2	17,3	13	12,4	14,6	12,5
Xo l w w w uw w6us uw %	3,62	3,21	3,1	2,9	2,9	2,48	2,28

ds s vw							
Xd Q° vw 45 ° uz w6us uw %	238	199,3	214,7	204,4	224,1	195	146
X'd Q° vw 45 ° s 'w w6us uw %	19,3	18,4	18	16,7	16,4	15,5	13,8
X"d Q° vw 45 ° t s 'w w6us uw %	12,2	10,4	9,79	8,76	8,72	7,9	7,47
Xq b sv s w45 ° uz w6us uw %	96,2	91,9	92,8	96,2	130,4	121,1	101,4
X'q b sv s w45 ° s 'w w6us uw %	96,2	91,9	92,8	96,2	130,4	121,1	101,4
X"q b sv s w45 ° t s 'w w6us uw %	24,2	23,5	22,7	20,7	19,9	13,9	12,3
X2 ] w5s ° w4 w w uw w6us uw %	15,8	15,1	14,4	10,8	10,3	12,1	10,4
Xo l w w w uw w6us 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

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n BHCC

Io R u' s ° u w s sv A	0,8	0,6	0,7	0,7	0,73	0,7	0,6
Ic R u' s ° u w s x sv A	3,6	3,4	3,5	3,3	3,2	4,4	3,2
<sup>^</sup> w sv							
8z ° s @z w° v 887, s vw sv							
Uws v° ° s ° W	19703	21356	22833	24135	26316	28632	30915
eww z wUs ^uSsu 4eUS %	<2	<2	<2	<2	<2	<2	<2
hs vw Q° 5eUQ0 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
hs vw 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

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@g

n B HPC

f s s vw / w5R] @7: ; 4 0	RP^; 7 8d; 0	RP^; 7 9d; 0	RP^; 7 : d; 0	RP^; 7 8Z; 0	RP^; 7 85-Z; 0	RP^; 7 9Z; 0	RP^; 7 gZ; 0
Xd Q° vw 45 ° uz w6us uw %	286,7	240,1	258,7	246,3	270	234,9	175,9
X'd Q° vw 45 ° s 'w w6us uw %	23,3	22,1	21,7	20,1	19,8	18,7	16,7
X"d Q° vw 45 ° t s 'w w6us uw %	14,7	12,5	11,8	10,6	10,5	9,52	9
Xq b sv s w45 ° uz w6us uw %	115,9	110,7	111,8	115,9	157,1	145,9	122,1
X'q b sv s w45 ° s 'w w6us uw %	115,9	110,7	111,8	115,9	157,1	145,9	122,1
X"q b sv s w45 ° t s 'w w6us uw %	29,2	28,4	27,3	24,9	24	16,8	14,8
X2 ] w5s ° w4 w w uw w6us uw %	19,1	18,2	17,3	13	12,4	14,6	12,5
Xo l w w w uw w6us uw %	3,62	3,21	3,1	2,9	2,9	2,48	2,28
<b>ds s vw</b>							
Xd Q° vw 45 ° uz w6us uw %	238	199,3	214,7	204,4	224,1	195	146
X'd Q° vw 45 ° s 'w w6us uw %	19,3	18,4	18	16,7	16,4	15,5	13,9
X"d Q° vw 45 ° t s 'w w6us uw %	12,2	10,4	9,79	8,76	8,72	7,9	7,47
Xq b sv s w45 ° uz w6us uw %	96,2	91,9	92,8	96,2	130,4	121,1	101,3
X'q b sv s w45 ° s 'w w6us uw %	96,2	91,9	92,8	96,2	130,4	121,1	101,3
X"q b sv s w45 ° t s 'w w6us uw %	24,2	23,5	22,7	20,7	19,9	13,9	12,3
X2 ] w5s ° w4 w w uw w6us uw %	15,8	15,1	14,4	10,8	10,3	12,1	10,4
Xo l w w w uw w6us 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

e

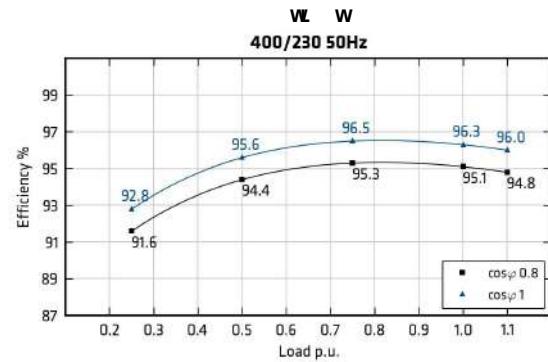
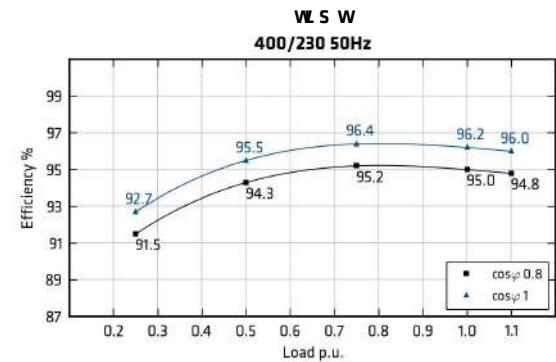
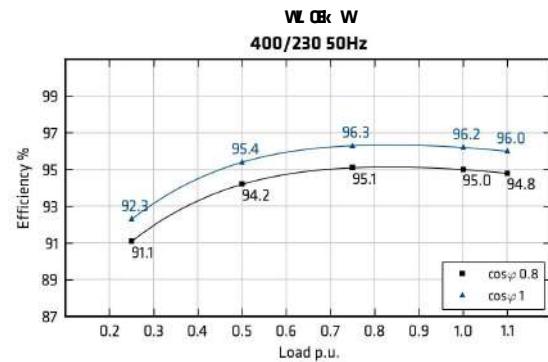
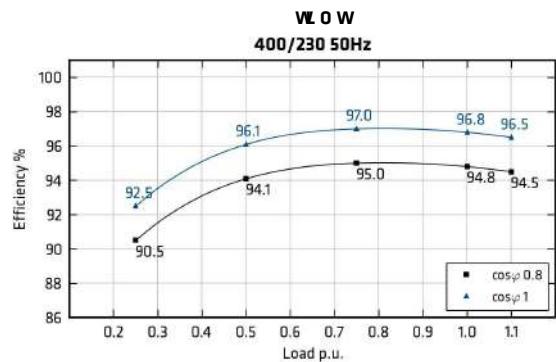
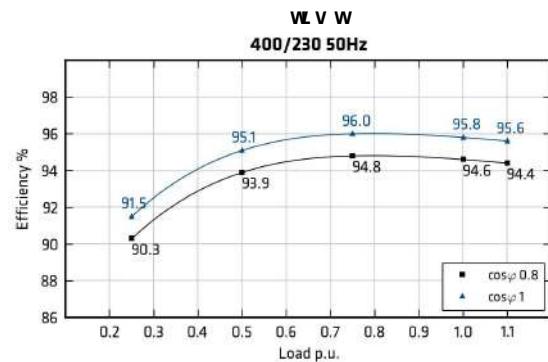
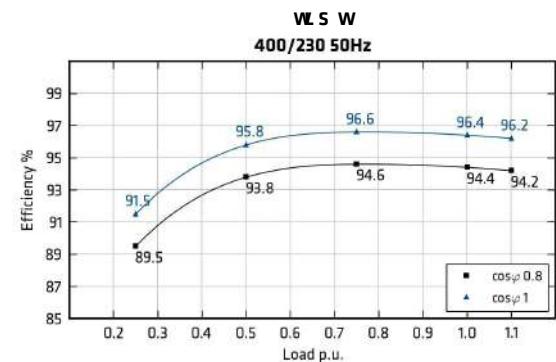
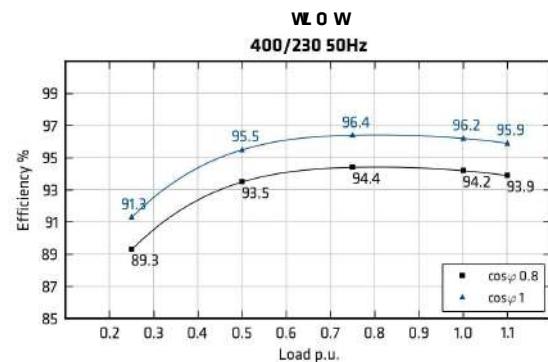
@g

n B HPC

Io R u' s ° u w s sv A	0,8	0,6	0,7	0,7	0,66	0,7	0,6
Ic R u' s ° u w s x sv A	3,5	3,2	3,4	3,2	3,1	3,9	3,2
<sup>^</sup> w sv							
<sup>^</sup> w sv w 97 vw5 , 300							
Uw v ° s ° W	19361	21305	22092	23148	23701	24386	25342
eww z wV wxxws uw5su 4e5 <40	<40	<40	<40	<40	<40	<40	<40
h s vw Q° 5eUQ0 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 vw 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

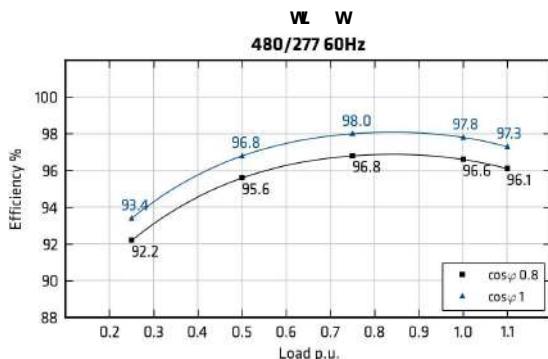
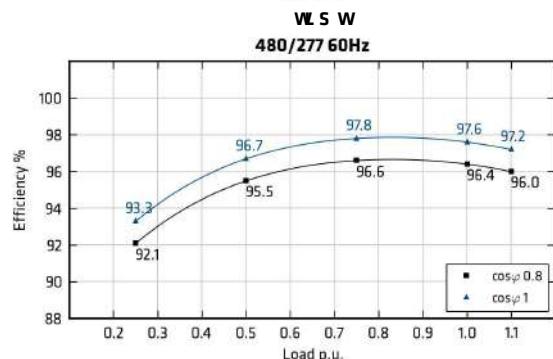
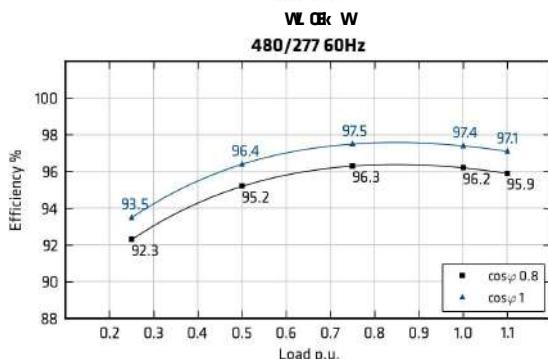
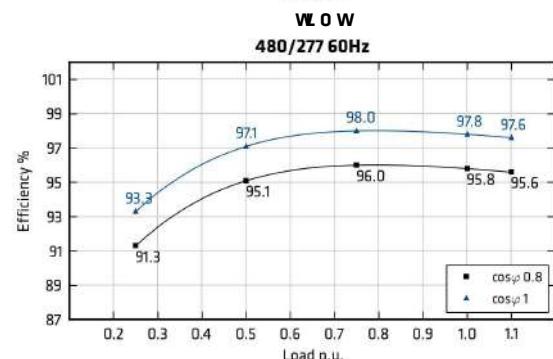
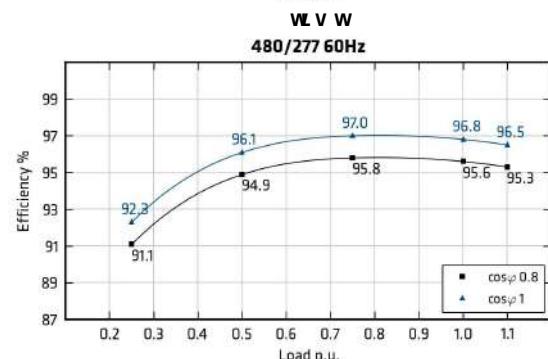
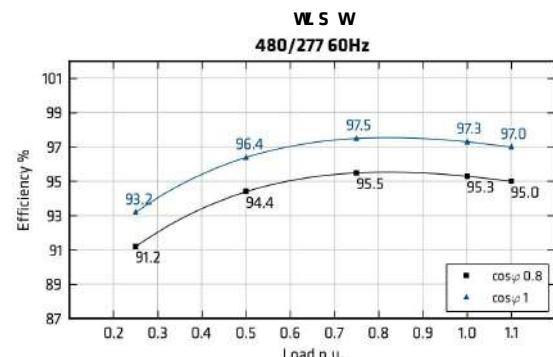
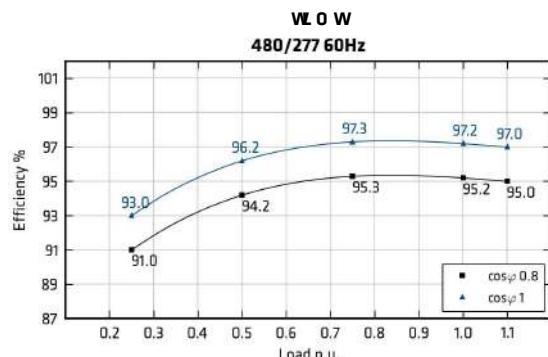
## i d LCn

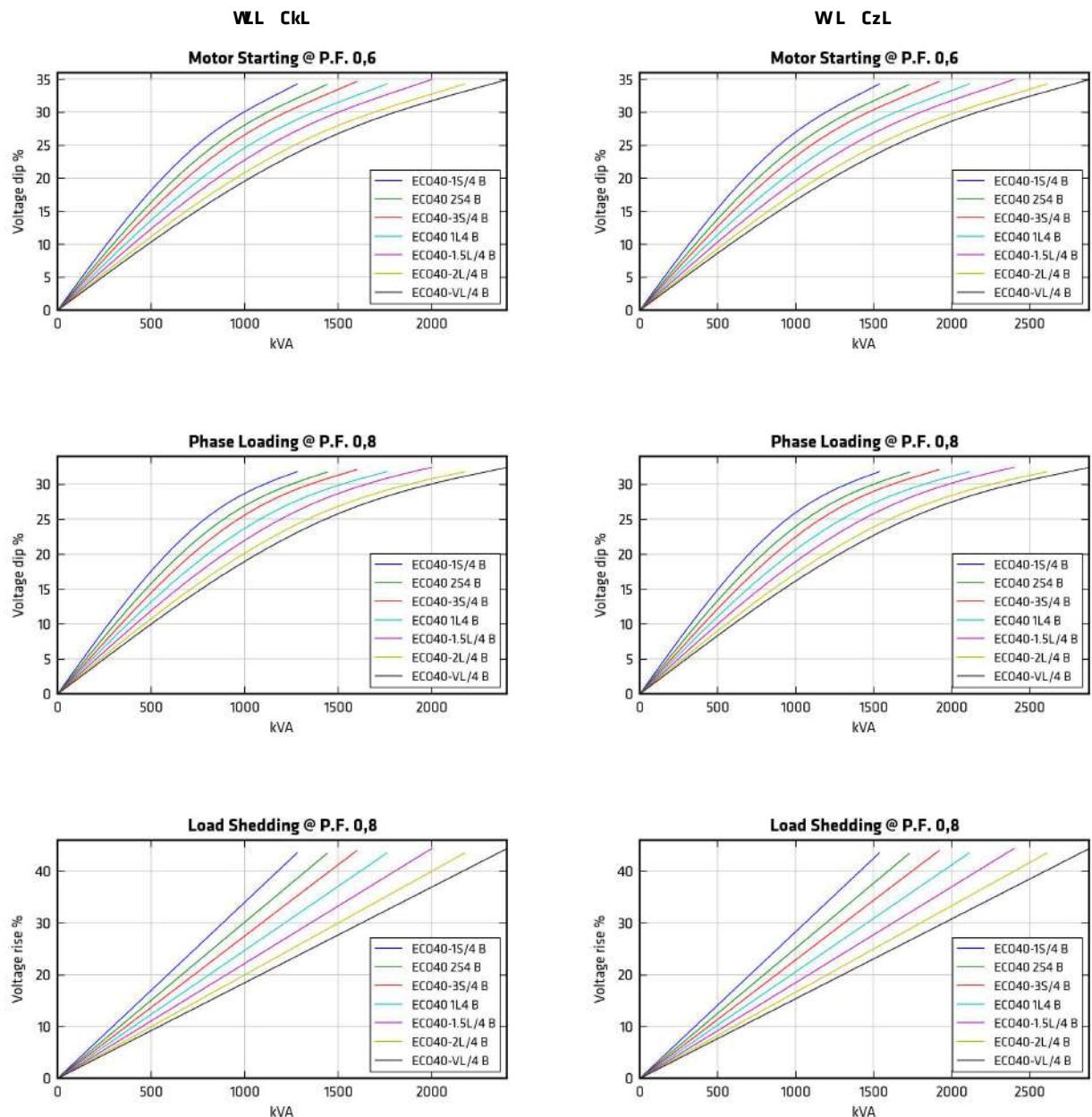
[ v w		; B7 g =7U				; 77 g =7U				; 8=g =7U				; ; 7 g =7U							
		7 9=	7 5=	7 9=	8	8 8	7 9=	7 5=	7 9=	8	8 8	7 9=	7 5=	7 9=	8	8 8	7 9=	7 5=	7 9=	8	8 8
RP^; 7 8d; 0	%	89,1	93,3	94,2	94,1	93,9	89,3	93,5	94,4	94,2	93,9	89,2	93,3	94,1	94,0	93,7	89,0	93,1	93,9	93,8	93,5
RP^; 7 9d; 0	%	89,4	93,5	94,3	94,1	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^; 7 : d; 0	%	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^; 7 8Z; 0	%	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^; 7 85Z; 0	%	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^; 7 9Z; 0	%	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^; 7 gZ; 0	%	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



## i d NCn

[ v w		; 8-g @ U				; ; 7g @ U				; @ g @ U				; B7g @ U							
		7 9=	7 5-	7 5=	8	8 8	7 9=	7 5-	7 5=	8	8 8	7 9=	7 5-	7 5=	8	8 8	7 9=	7 5-	7 5=	8	8 8
RP^; 7 8d; 0	%	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^; 7 9d; 0	%	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^; 7 : d; 0	%	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^; 7 8Z; 0	%	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^; 7 8E; 0	%	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^; 7 9Z; 0	%	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^; 7 gZ; 0	%	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



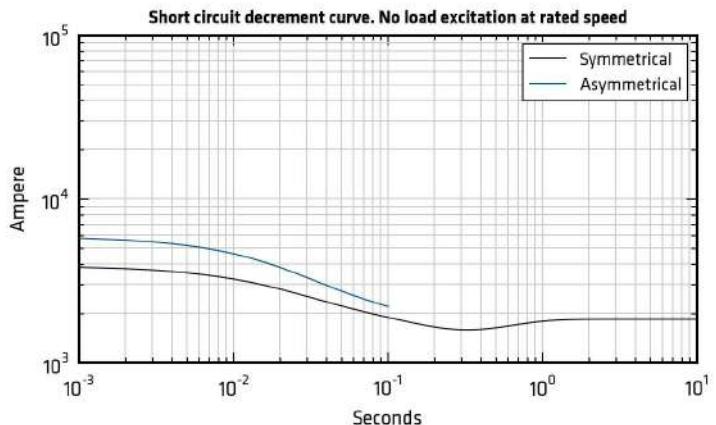


V vw us w s °w u w s s x u ° xs w xsu sywx ° v°us w3 ws w uw s x D  
 a w Ssu u wx°uw u wu /aSPP08 tw vw w xsu 75°u w D  
 aSPPH °/Nc Pu /aS w 067B  
 R s w6ezwaSPP s w xsu 75 ° 88C9 mSPPH °/Nc Pu /75 067B 6ez° ws z5 zw sywx s s y° w w s x75 ° w ° s w zw  
 w z s us tw wsv zw x75°u w x zw sv ° u °vww 88C9 ° w t°yw /C, z°yw s w65  
 V z° w s w8s 877 gN sv ° w ° s x75 ° w ° s w ° sywx s 88C gN sv ° w ° s x75°  
 g sywu wx°uw u wu /gPP0  
 gPPH/; 776g w °x=7 U EgPPH/; B76g w °x@ U  
 R s w6gPP s ;8=g @ U ° 85 : B ngPPH/; B76; 8-096ez° ws z5 zw sywx s s y° w w s ;8=g ° w ° s w zw w z s us tw wsv  
 zw w xsu 75@u w x zw sv ° u °vww 85 : B ° w t°yw /:, z°yw s w65  
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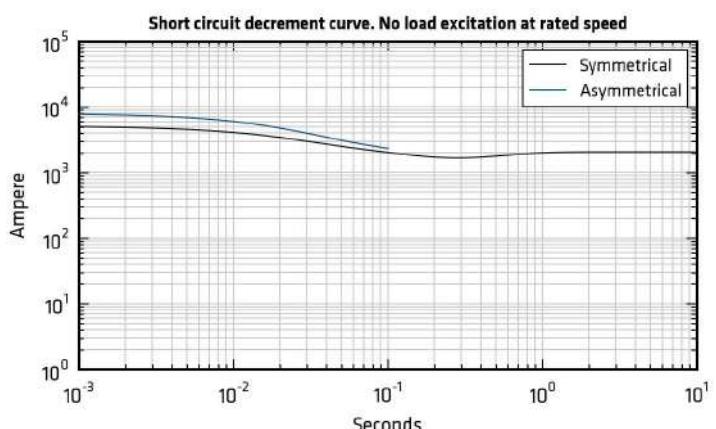
LCn

@U

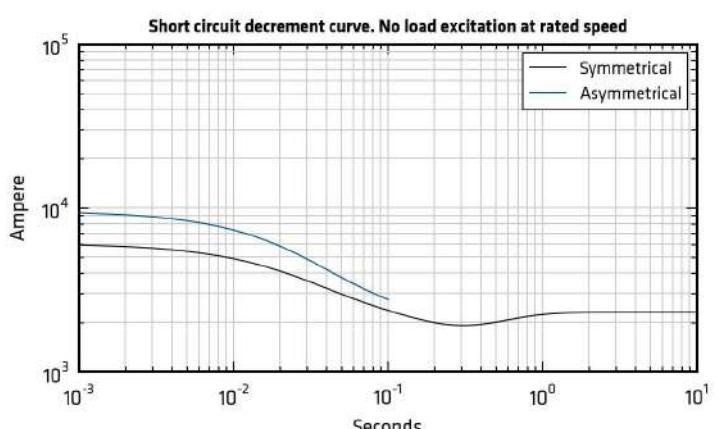
RP^ ; 7 8d; 0



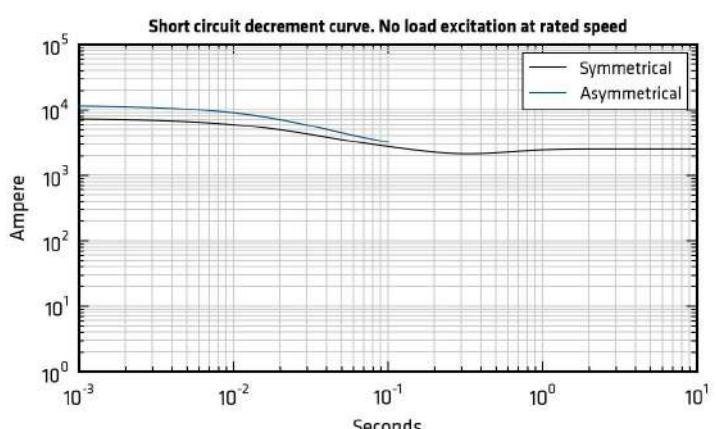
RP^ ; 7 9d; 0



RP^ ; 7 : d; 0



RP^ ; 7 8Z; 0

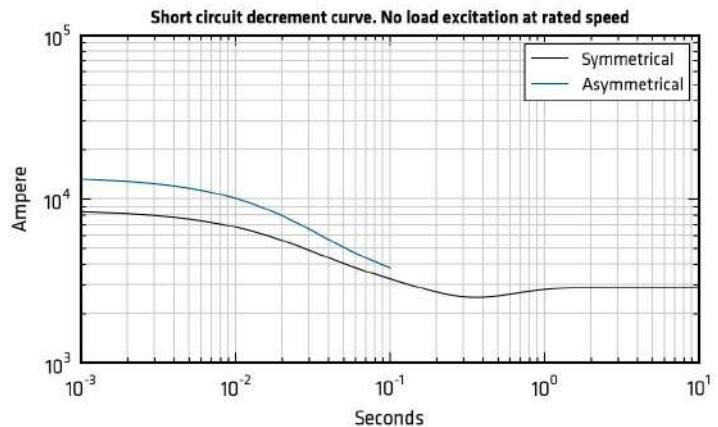


1a w6 w www st w s syw@

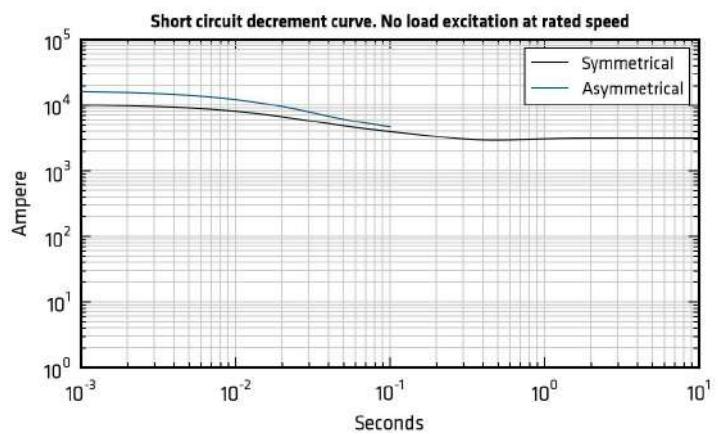
LCn

@U

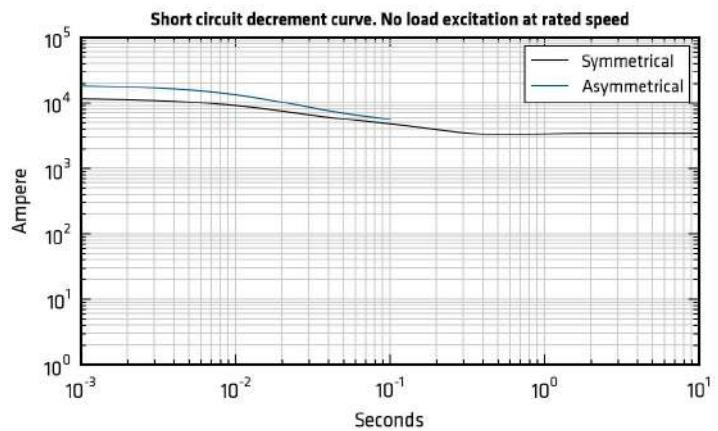
RP^ ; 7 85-Z; 0



RP^ ; 7 9Z; 0



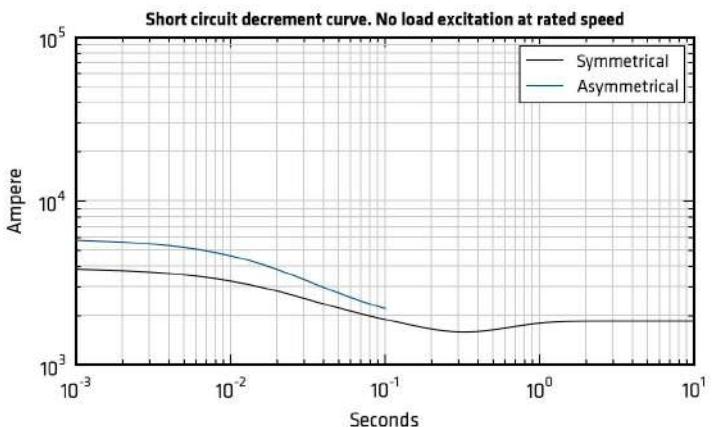
RP^ ; 7 gZ; 0



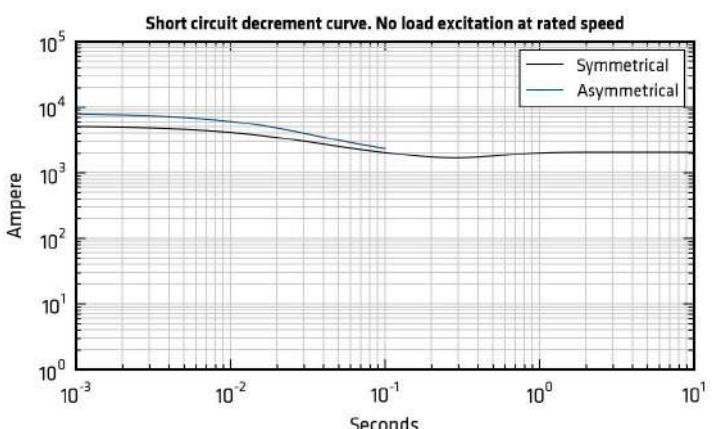
NCn

@U

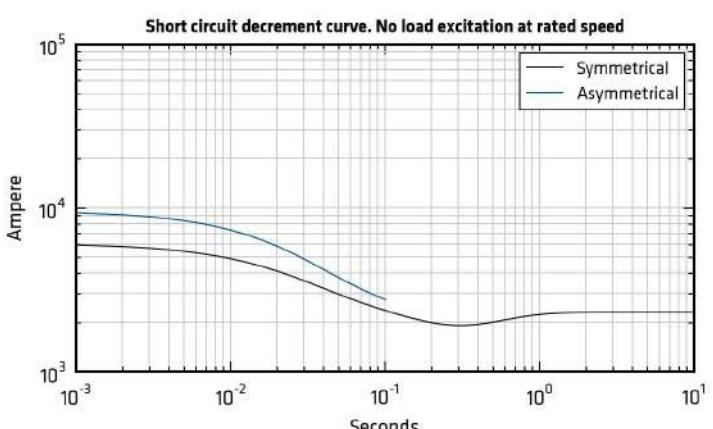
RP^ ; 7 8d; 0



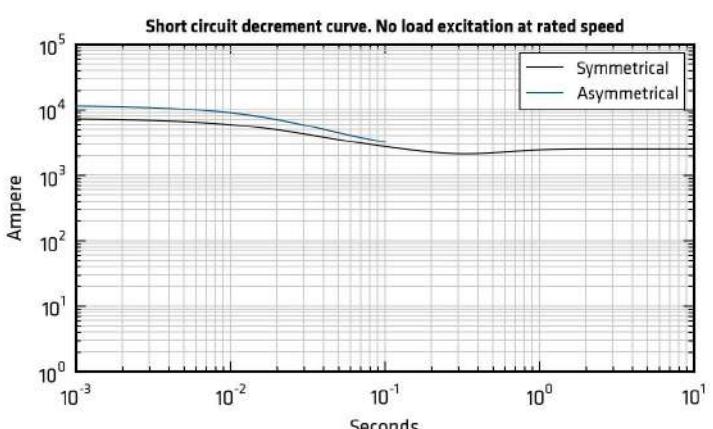
RP^ ; 7 9d; 0



RP^ ; 7 : d; 0



RP^ ; 7 8Z; 0

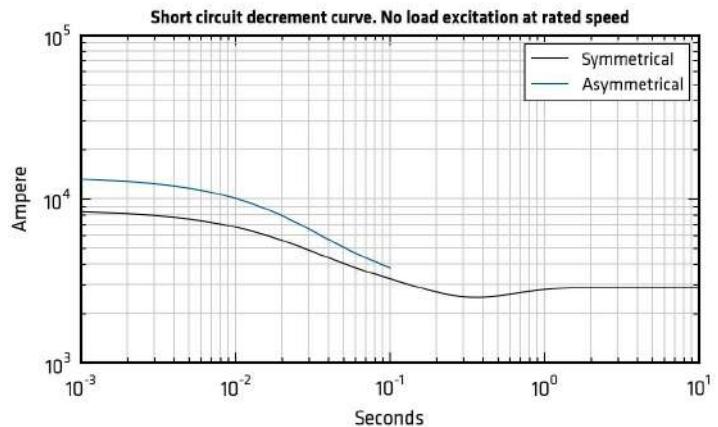


1a w6 w www st w s syw@

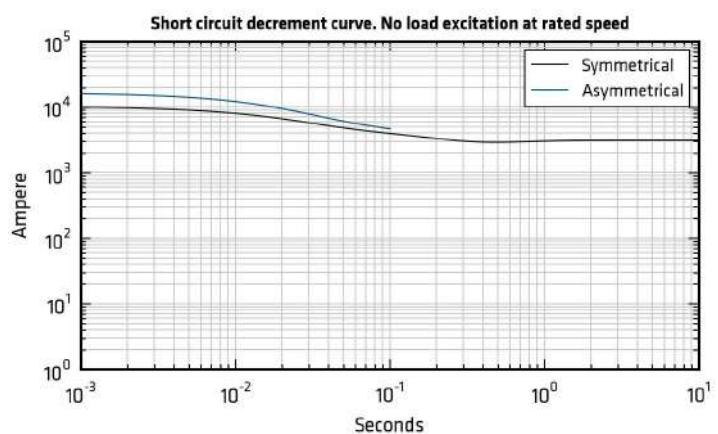
NCn

@U

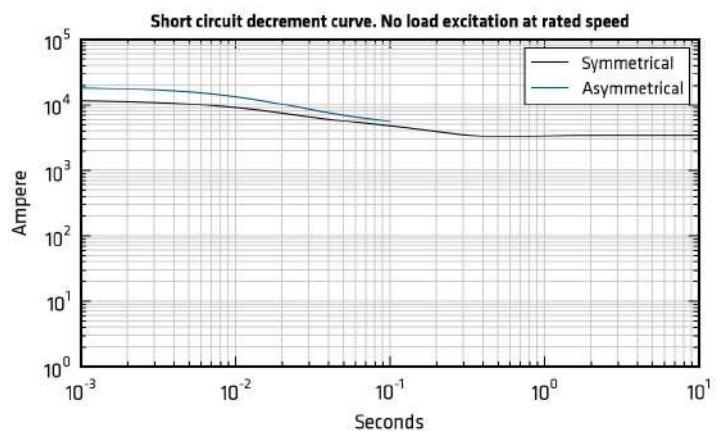
RP^ ; 7 85-Z; 0



RP^ ; 7 9Z; 0



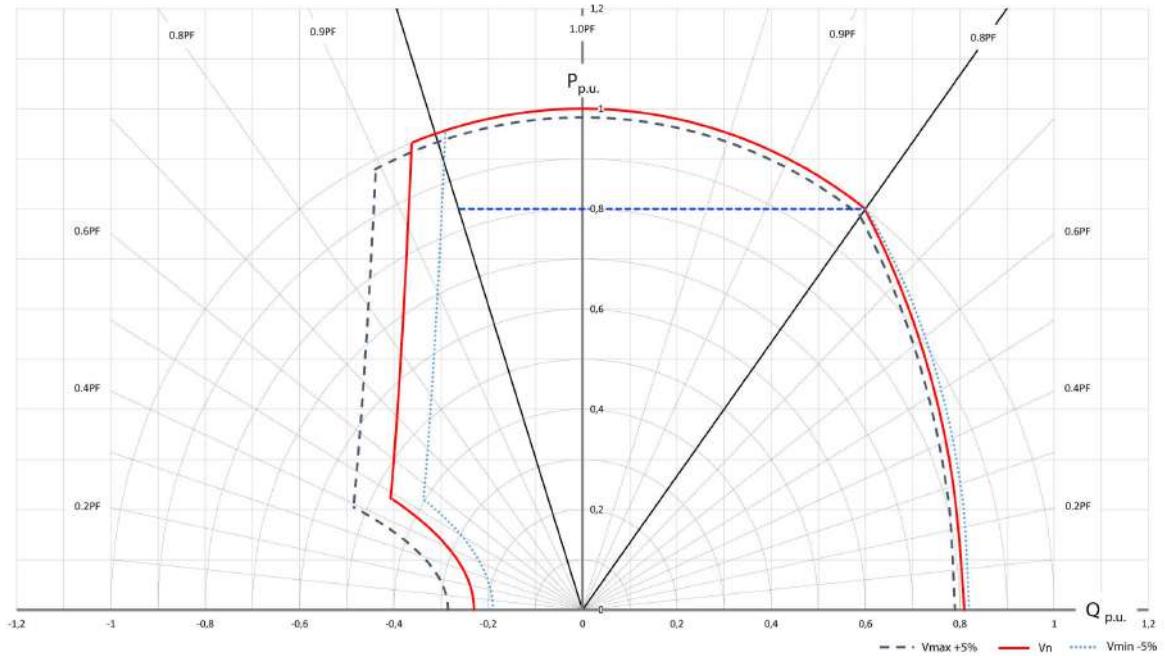
RP^ ; 7 gZ; 0

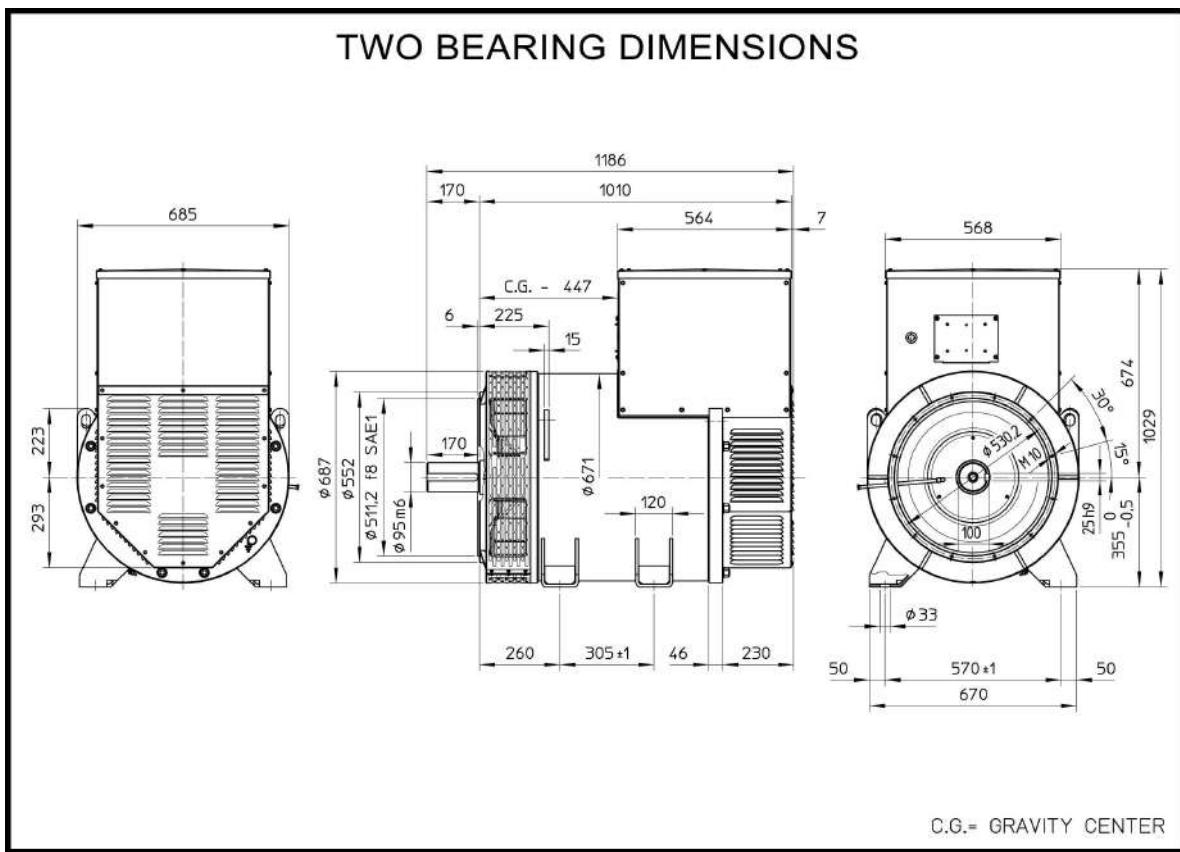
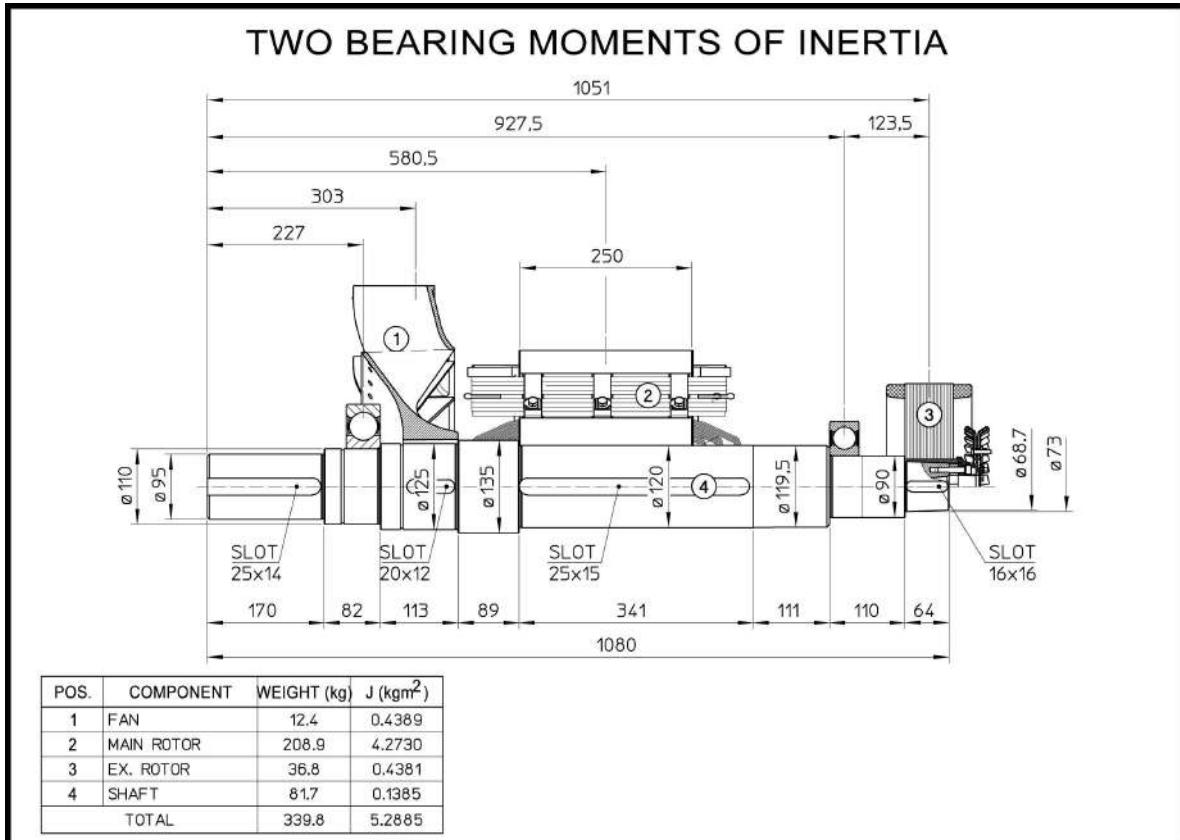


e g

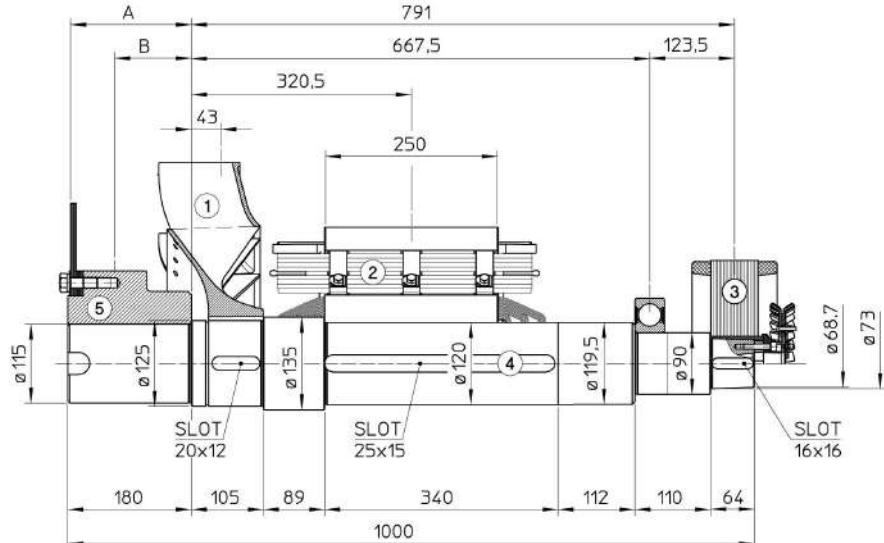
Qs s	RP^; 7 8d; 0		RP^; 7 9d; 0		RP^; 7 : d; 0		RP^; 7 8Z; 0		RP^; 7 85-Z; 0		RP^; 7 9Z; 0		RP^; 7 gZ; 0	
	=7U	@U	=7U	@U	=7U	@U	=7U	@U	=7U	@U	=7U	@U	=7U	@U
Qs w usyw	P w													
d s h ° v° y c w° s uw/97 P0 Ω	0,017		0,013		0,014		0,01		0,009		0,009		0,008	
c h ° v° y c w° s uw/97 P0 Ω	4,488		4,881		5,176		6,025		1,376		1,5		1,592	
d s R u' w c w° s uw/97 P0 Ω	8,85		8,85		8,85		8,85		8,85		8,85		8,85	
c R u' w c w° s uw/97 P0 Ω	0,317		0,317		0,317		0,317		0,05		0,05		0,05	
h wyz xu wwwws kg	1049,0		1133,0		1208,0		1323,0		1458,0		1536,0		1752,0	
f t s uw sy w'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
] ° wwws 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

xz h





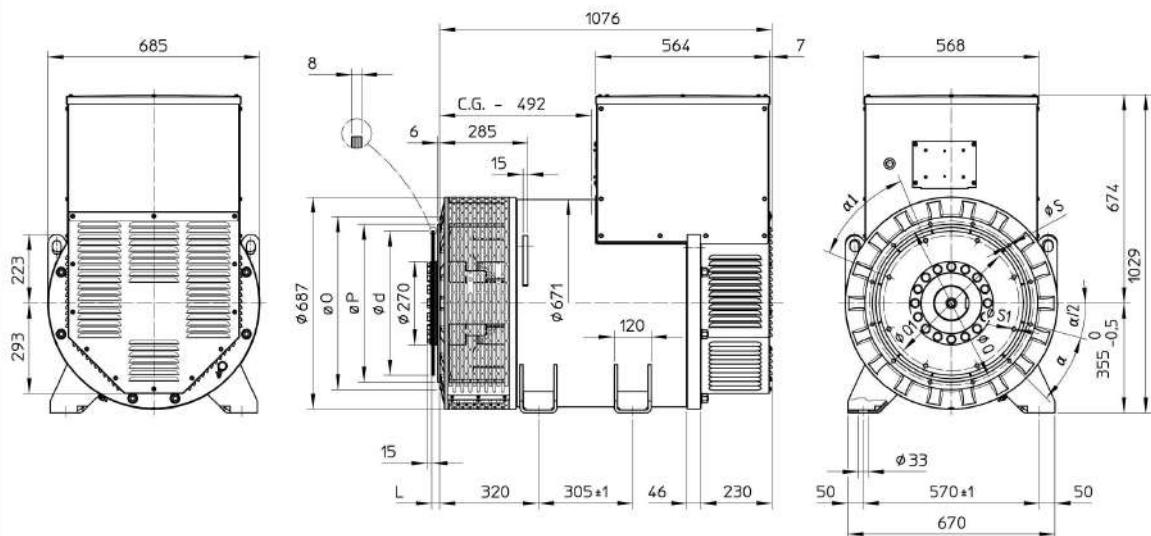
### SINGLE BEARING MOMENTS OF INERTIA



POS.	COMPONENT	WEIGHT (kg)	$J \text{ kgm}^2$
1	FAN	12.4	0.4389
2	MAIN ROTOR	208.9	4.2730
3	EX. ROTOR	36.8	0.4381
4	SHAFT	80.3	0.1416
TOTAL		338.4	5.2916

SAE N°	SHAFTS COUPLING FLEX PLATE			
	A	B	WEIGHT kg	$J \text{ kgm}^2$
14	175.7	111.7	57.5	0.7587
18	165.7	112.7	60.9	1.0919

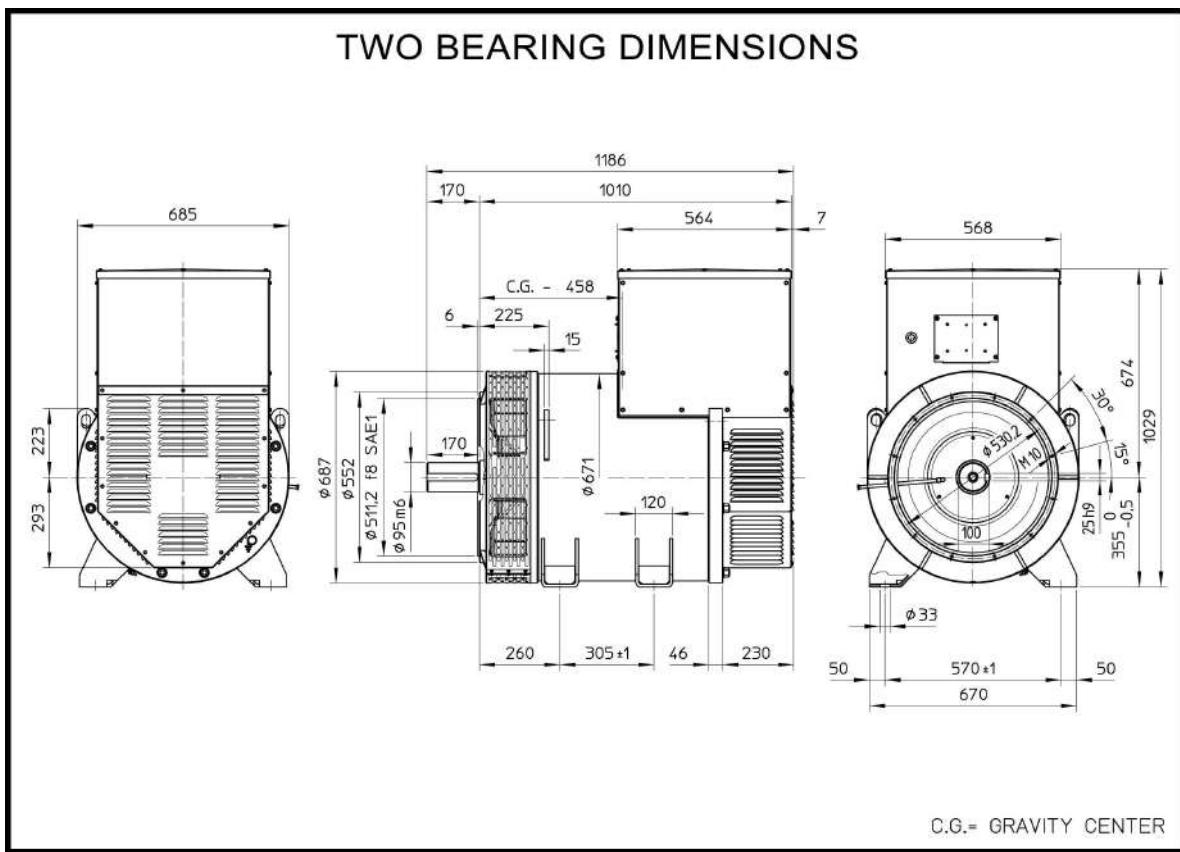
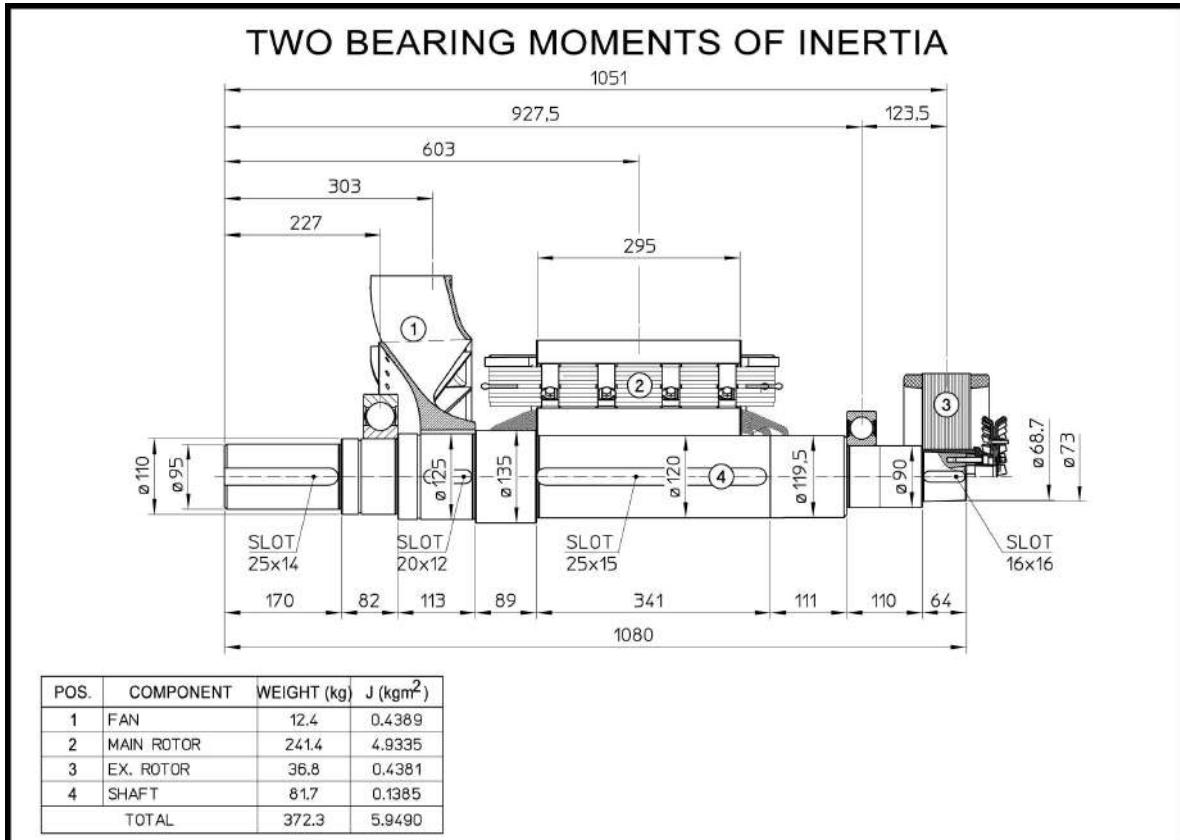
### SINGLE BEARING DIMENSIONS



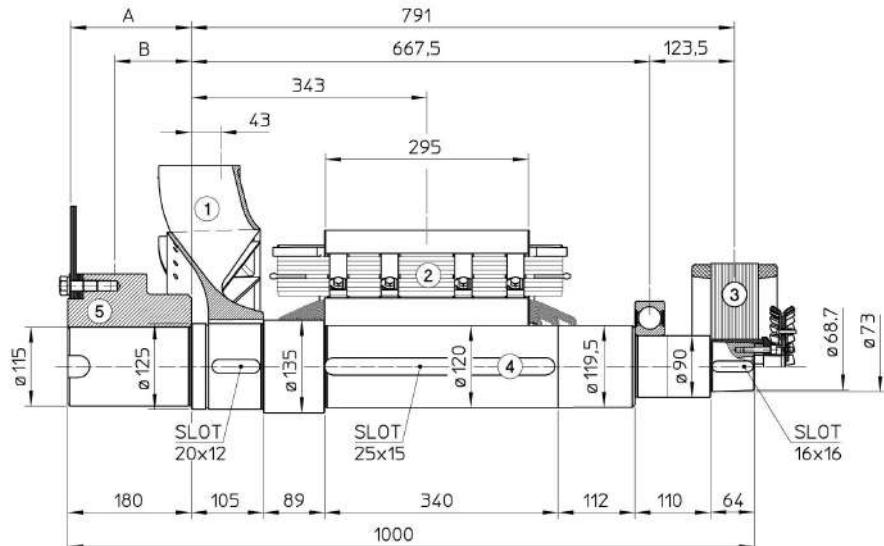
SAE N.	FLANGIA / LANGE BRIDE / FLANSCH				
	O	P	Q	S	$\alpha$
1	560	511.2	530.2	11	30°
1/2	648	584.2	619.1	14	30°
0	711	647.7	679.5	14	22.5°
00	883	787.4	850.9	14	22.5°

SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEBENKUPPLUNG				
	d	L	Q1	S1	$\alpha_1$
14	466.72	25.4	438.15	13.5	45°
18	571.5	15.7	542.92	16.5	60°

C.G.= GRAVITY CENTER



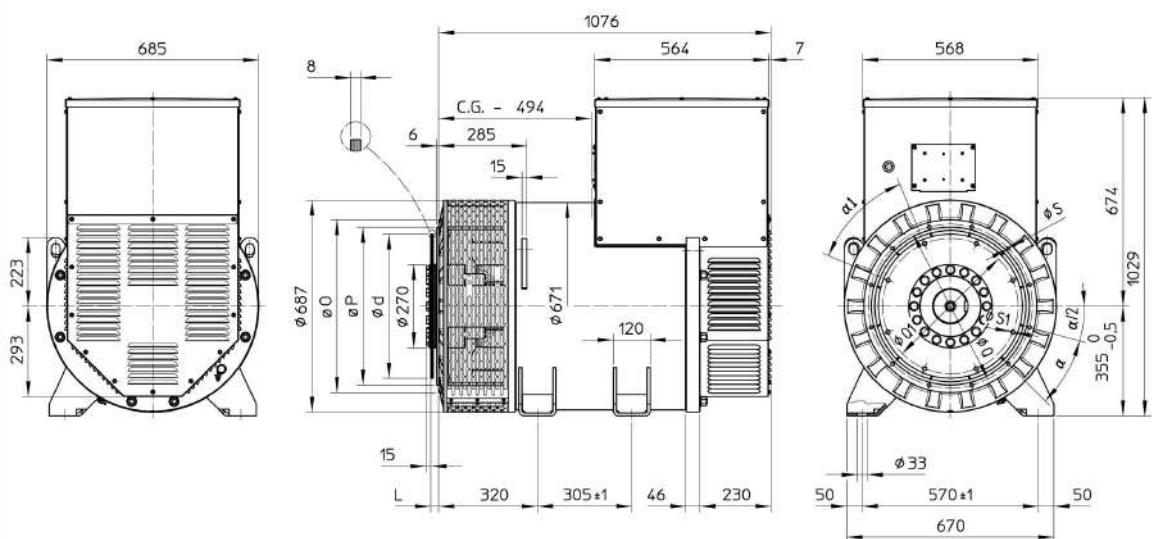
### SINGLE BEARING MOMENTS OF INERTIA



POS.	COMPONENT	WEIGHT (kg)	J (kgm <sup>2</sup> )
1	FAN	12.4	0.4389
2	MAIN ROTOR	241.4	4.9335
3	EX. ROTOR	36.8	0.4381
4	SHAFT	80.3	0.1416
TOTAL		370.9	5.9521

SAE N°	SHAFTS COUPLING FLEX PLATE			
	A	B	WEIGHT kg	J kgm <sup>2</sup>
14	175.7	111.7	57.5	0.7587
18	165.7	112.7	60.9	1.0919

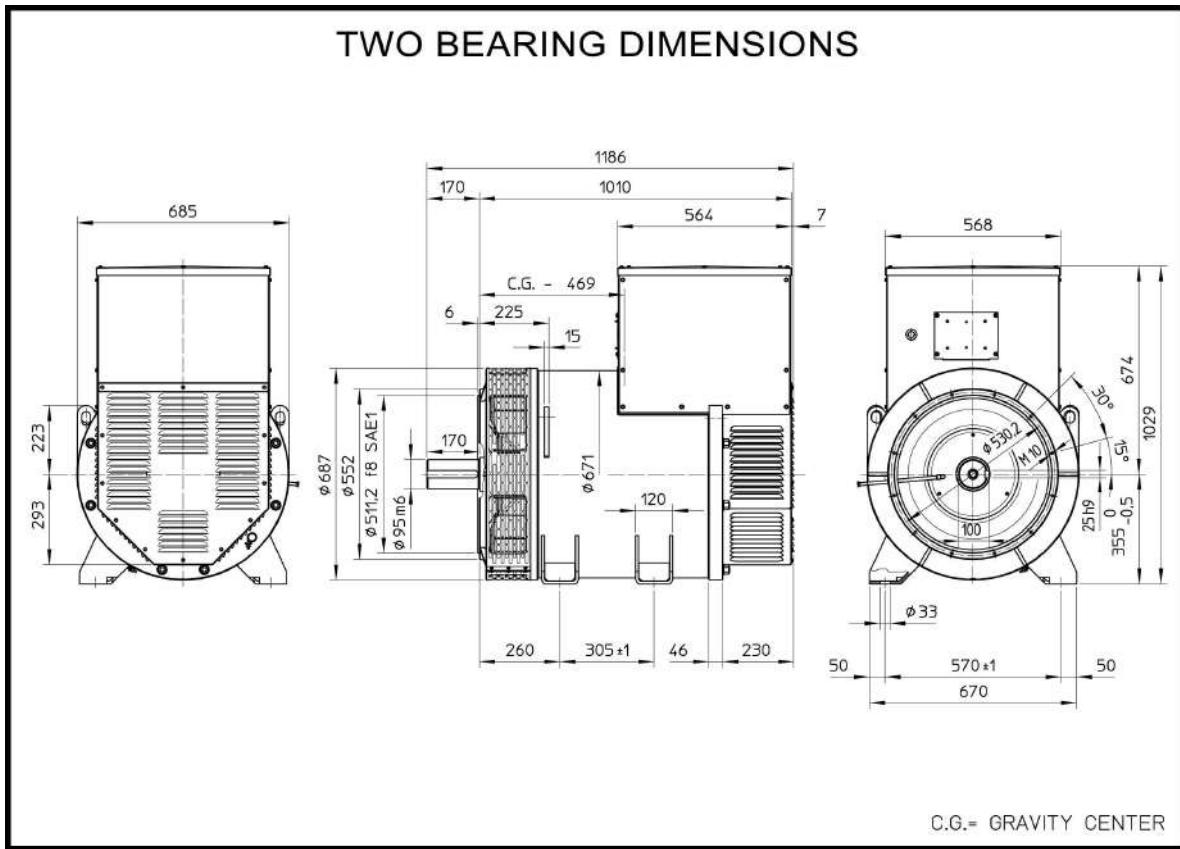
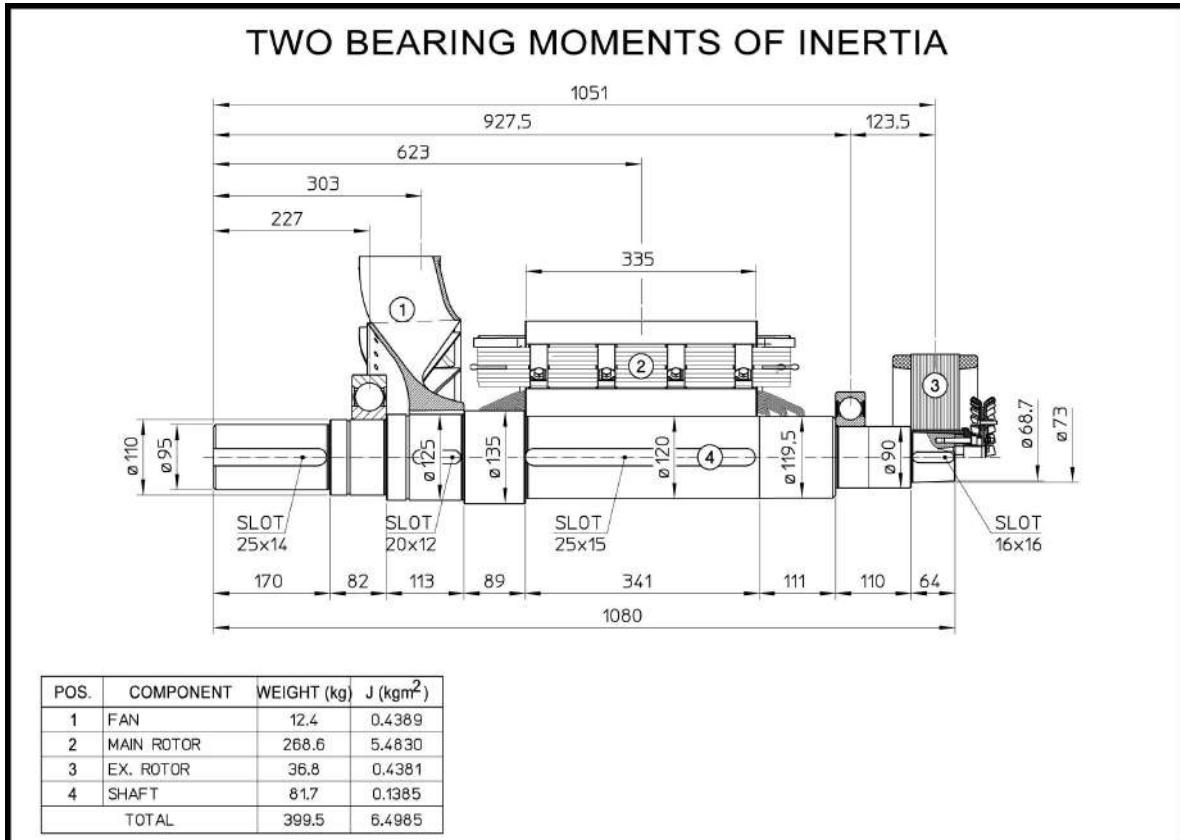
### SINGLE BEARING DIMENSIONS



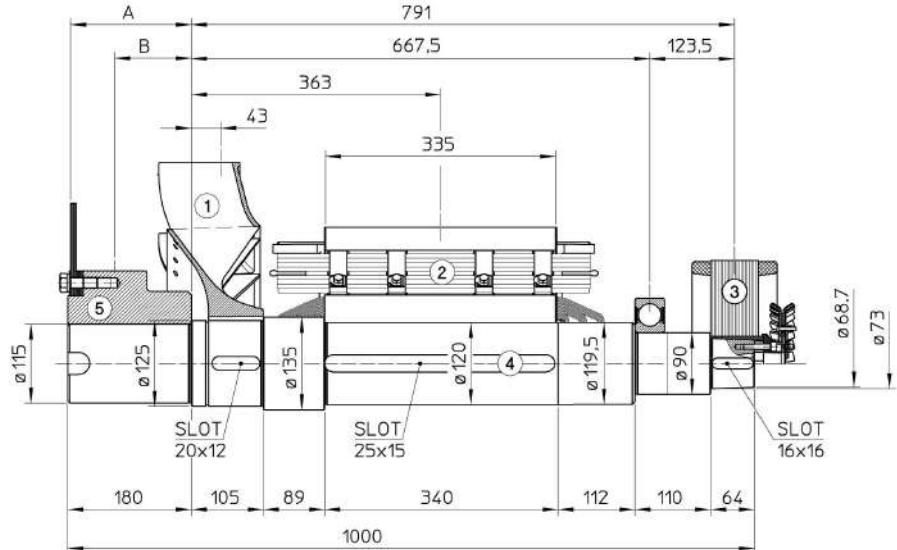
SAE N.	FLANGIA / LANGE BRIDE / FLANSCH				
	O	P	Q	S	$\alpha$
1	560	511.2	530.2	11	30°
1/2	648	584.2	619.1	14	30°
0	711	647.7	679.5	14	22.5°
00	883	787.4	850.9	14	22.5°

SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEBENKUPPLUNG				
	d	L	Q1	S1	$\alpha_1$
14	466.72	25.4	438.15	13.5	45°
18	571.5	15.7	542.92	16.5	60°

C.G.= GRAVITY CENTER



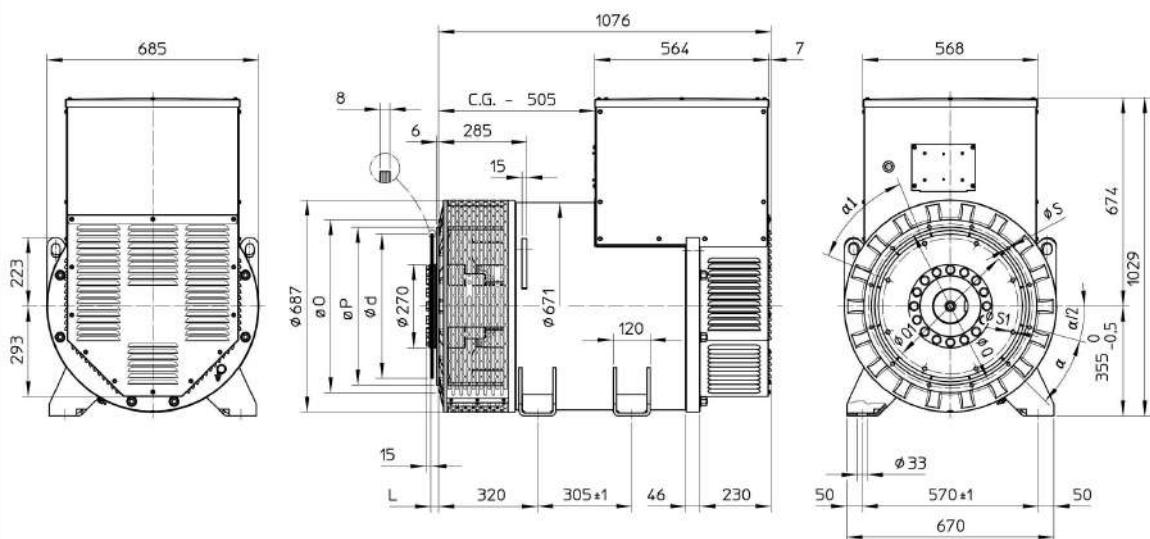
### SINGLE BEARING MOMENTS OF INERTIA



POS.	COMPONENT	WEIGHT (kg)	$J \text{ kgm}^2$
1	FAN	12.4	0.4389
2	MAIN ROTOR	268.6	5.4830
3	EX. ROTOR	36.8	0.4381
4	SHAFT	80.3	0.1416
TOTAL		398.1	6.5016

SAE N°	SHAFTS COUPLING FLEX PLATE			
	A	B	WEIGHT kg	$J \text{ kgm}^2$
14	175.7	111.7	57.5	0.7587
18	165.7	112.7	60.9	1.0919

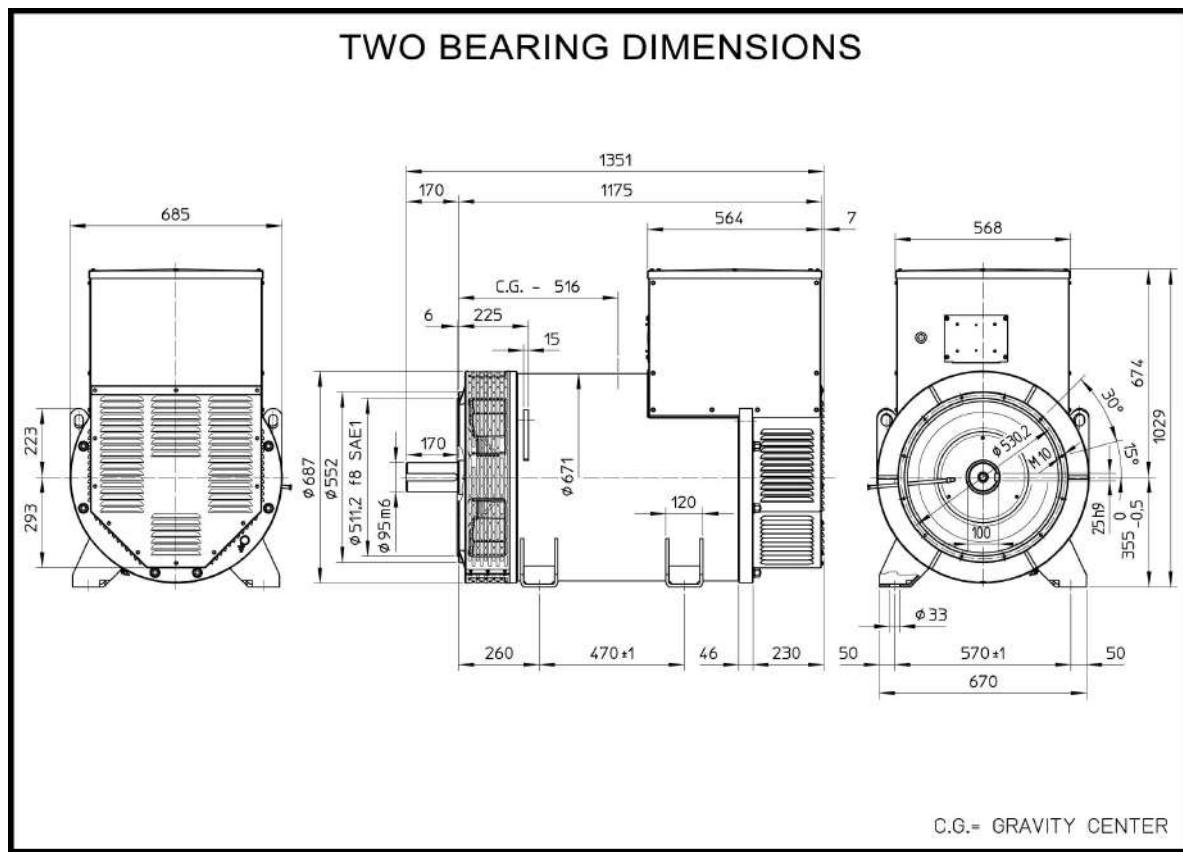
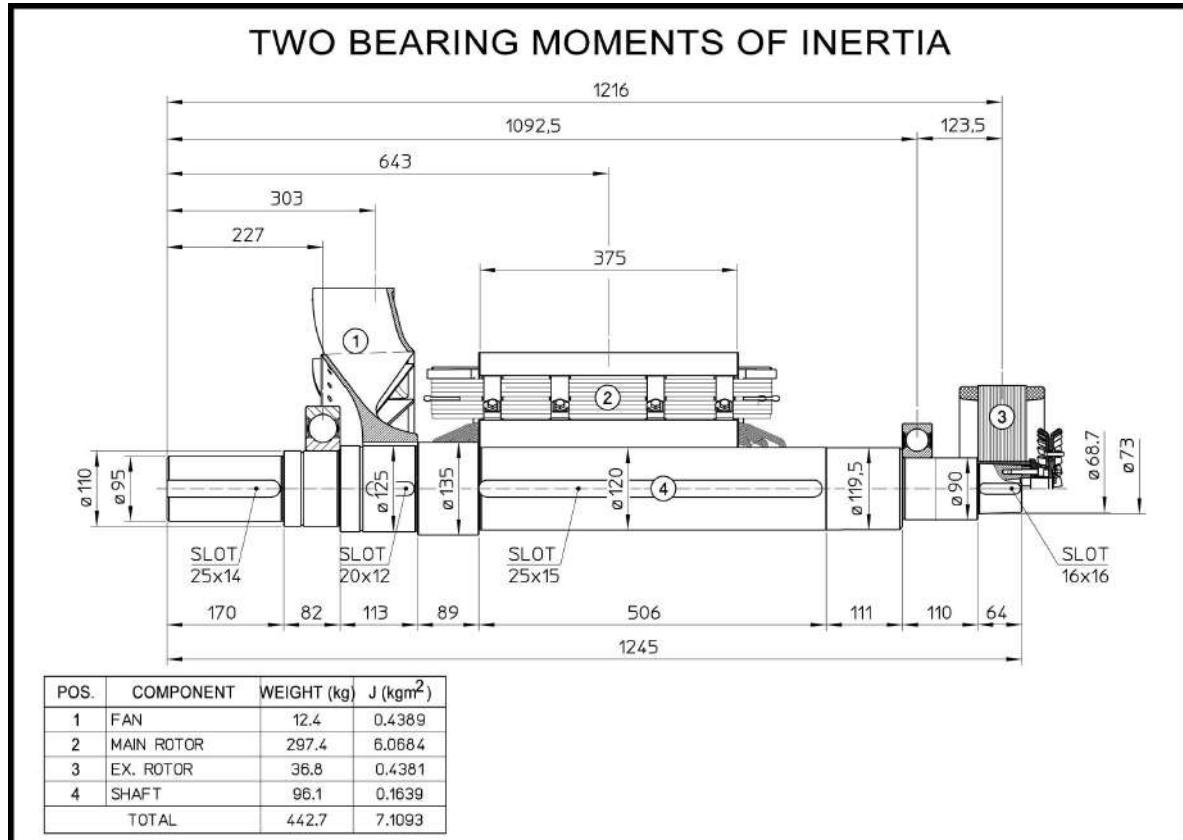
### SINGLE BEARING DIMENSIONS



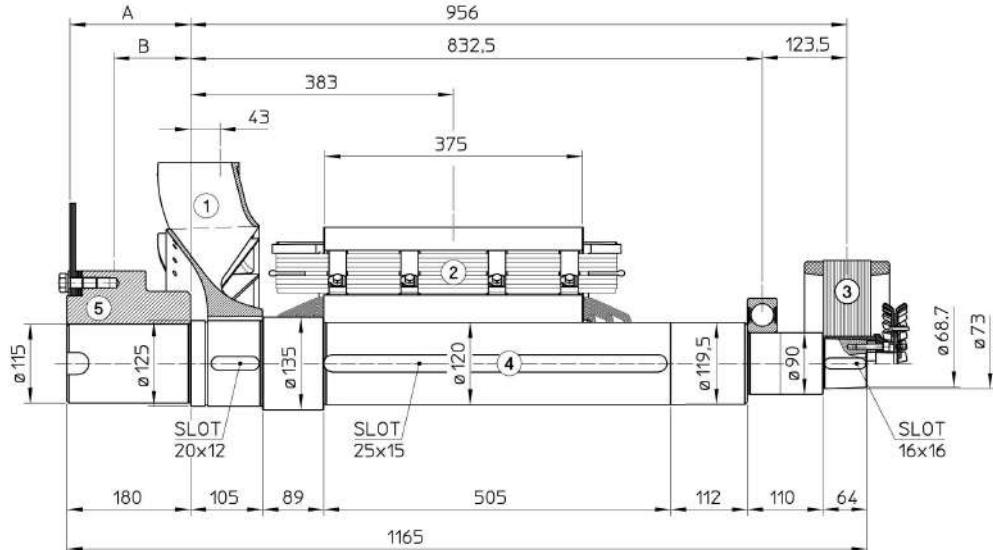
SAE N.	FLANGIA / LANGE BRIDE / FLANSCH				
	O	P	Q	S	$\alpha$
1	560	511.2	530.2	11	30°
1/2	648	584.2	619.1	14	30°
0	711	647.7	679.5	14	22.5°
00	883	787.4	850.9	14	22.5°

SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEBENKUPPLUNG				
	d	L	Q1	S1	$\alpha_1$
14	466.72	25.4	438.15	13.5	45°
18	571.5	15.7	542.92	16.5	60°

C.G.= GRAVITY CENTER



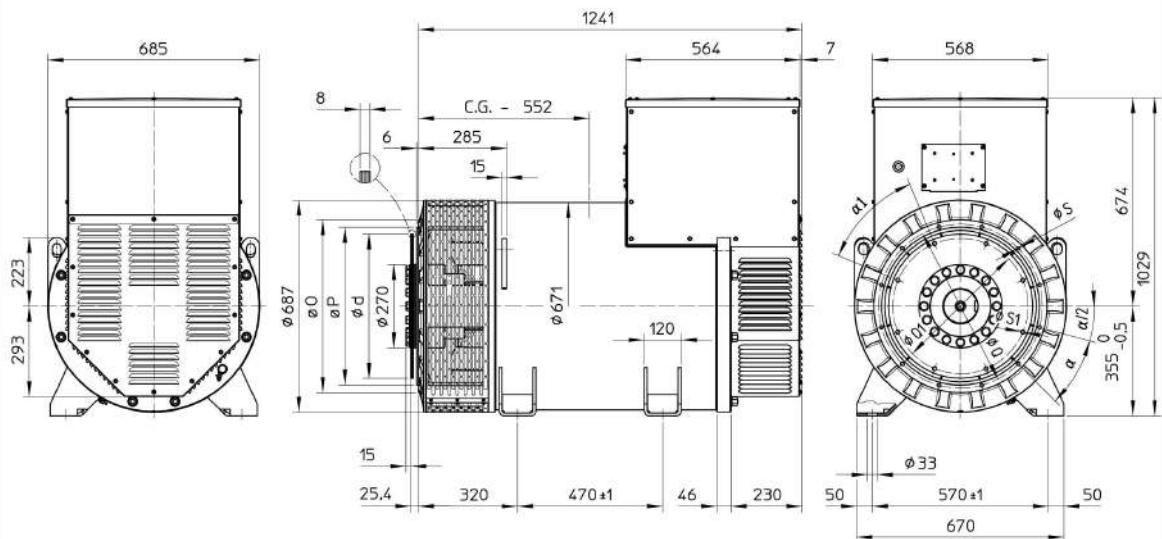
### SINGLE BEARING MOMENTS OF INERTIA



POS.	COMPONENT	WEIGHT (kg)	J ( $\text{kgm}^2$ )
1	FAN	12.4	0.4389
2	MAIN ROTOR	297.4	6.0684
3	EX. ROTOR	36.8	0.4381
4	SHAFT	94.6	0.1671
TOTAL		441.2	7.1125

SAE N°	SHAFTS COUPLING FLEX PLATE			
	A	B	WEIGHT kg	J $\text{kgm}^2$
14	175.7	111.7	57.5	0.7587
18	165.7	112.7	60.9	1.0919

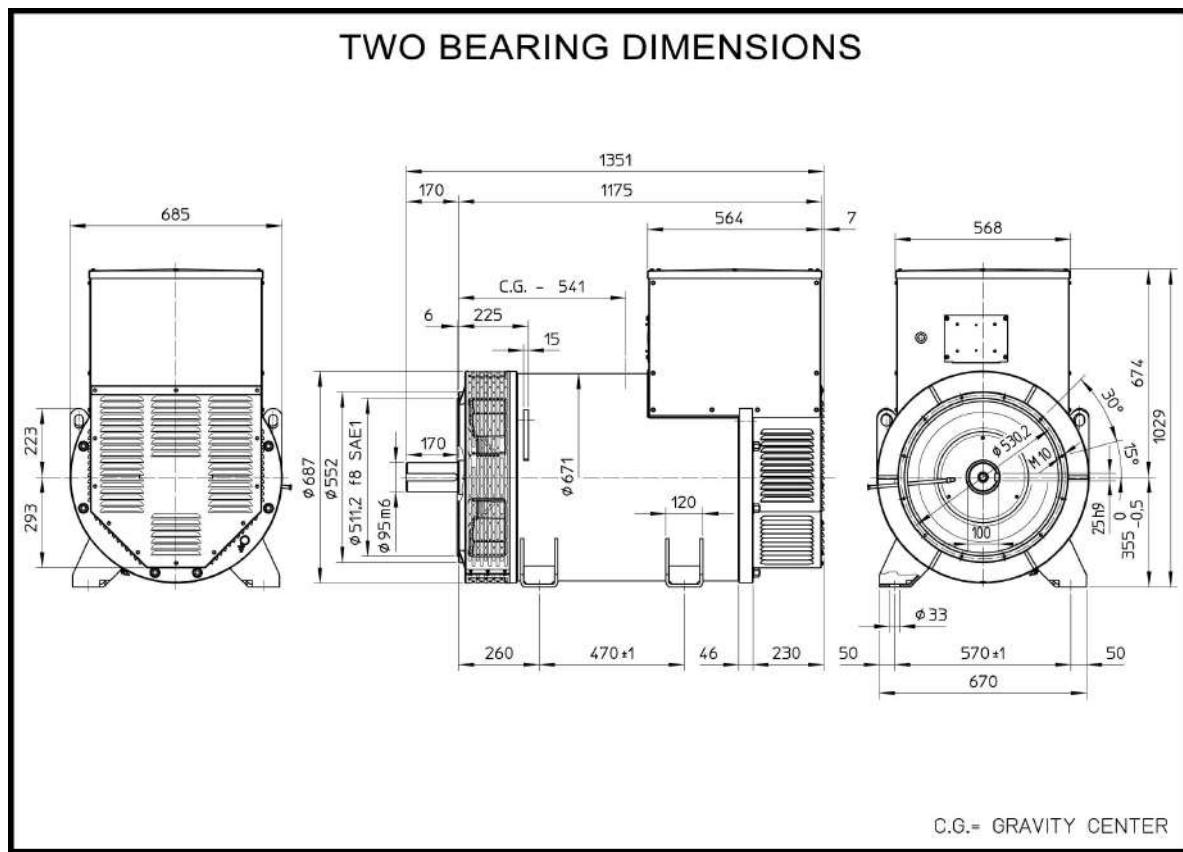
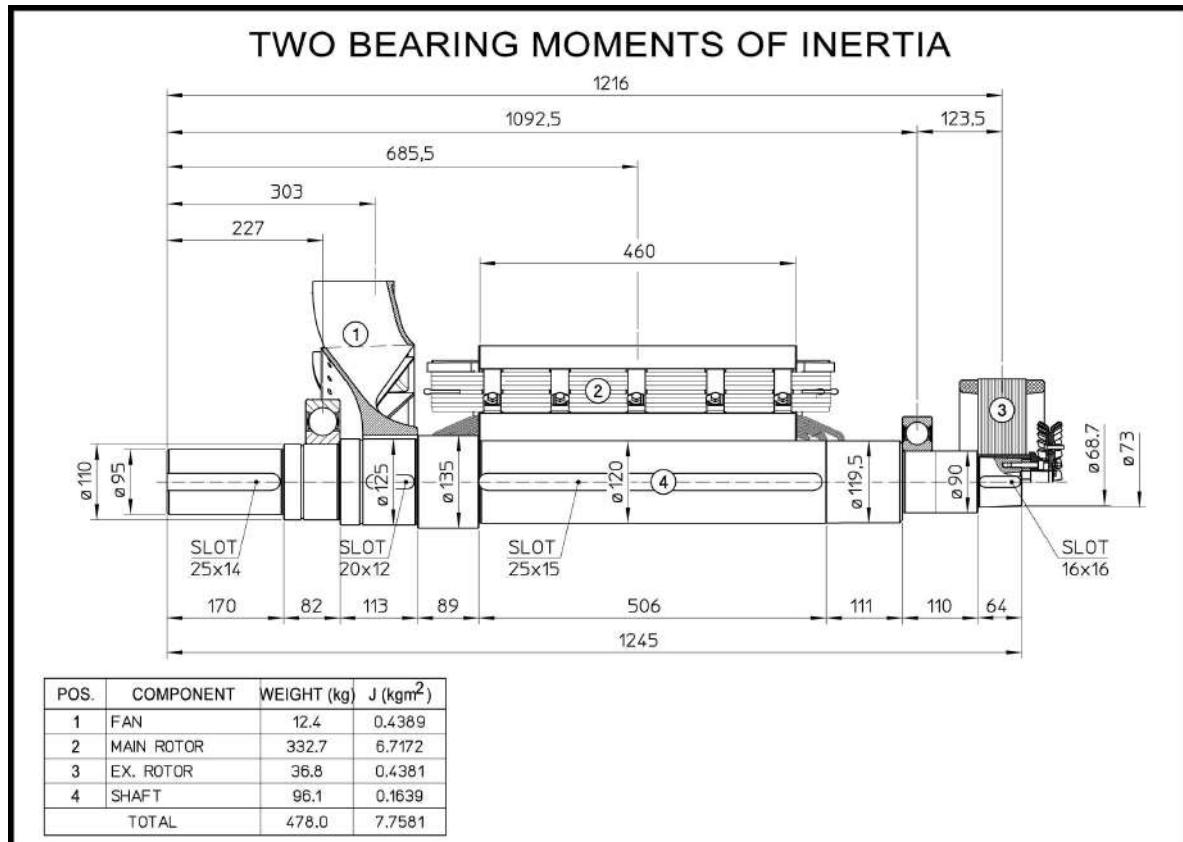
### SINGLE BEARING DIMENSIONS



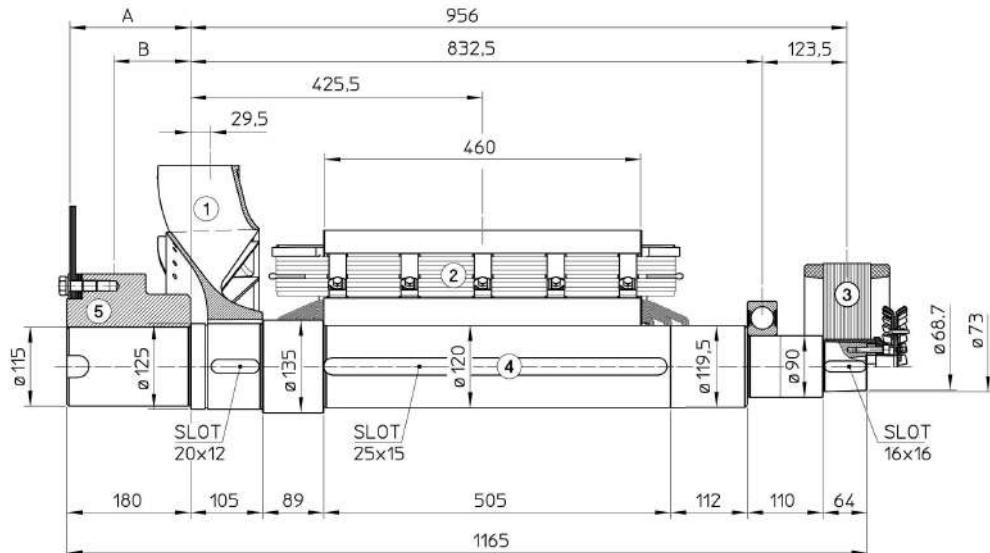
SAE N.	FLANGIA / LANGE BRIDE / FLANSCH				
	O	P	Q	S	α
1	560	511.2	530.2	11	30°
1/2	648	584.2	619.1	14	30°
0	711	647.7	679.5	14	22.5°
00	883	787.4	850.9	14	22.5°

SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEBENKUPPLUNG				
	d	L	Q1	S1	α1
14	466.72	25.4	438.15	13.5	45°
18	571.5	15.7	542.92	16.5	60°

C.G.= GRAVITY CENTER



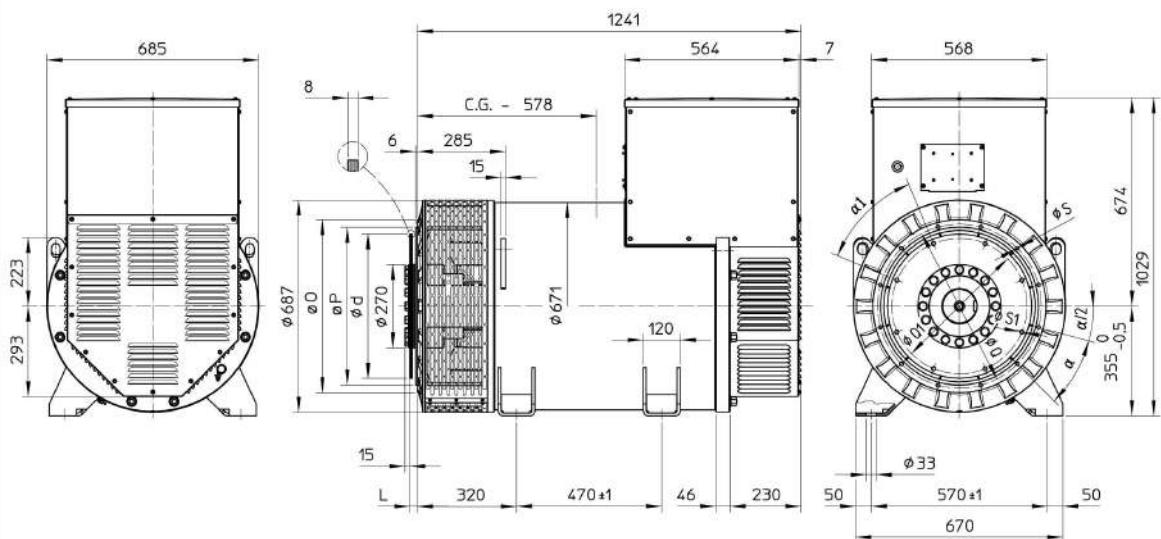
### SINGLE BEARING MOMENTS OF INERTIA



POS.	COMPONENT	WEIGHT (kg)	J ( $\text{kgm}^2$ )
1	FAN	12.4	0.4389
2	MAIN ROTOR	332.7	6.7172
3	EX. ROTOR	36.8	0.4381
4	SHAFT	94.6	0.1671
TOTAL		476.5	7.7613

SAE N°	SHAFTS COUPLING FLEX PLATE			
	A	B	WEIGHT kg	J $\text{kgm}^2$
14	175.7	111.7	57.5	0.7587
18	165.7	112.7	60.9	1.0919

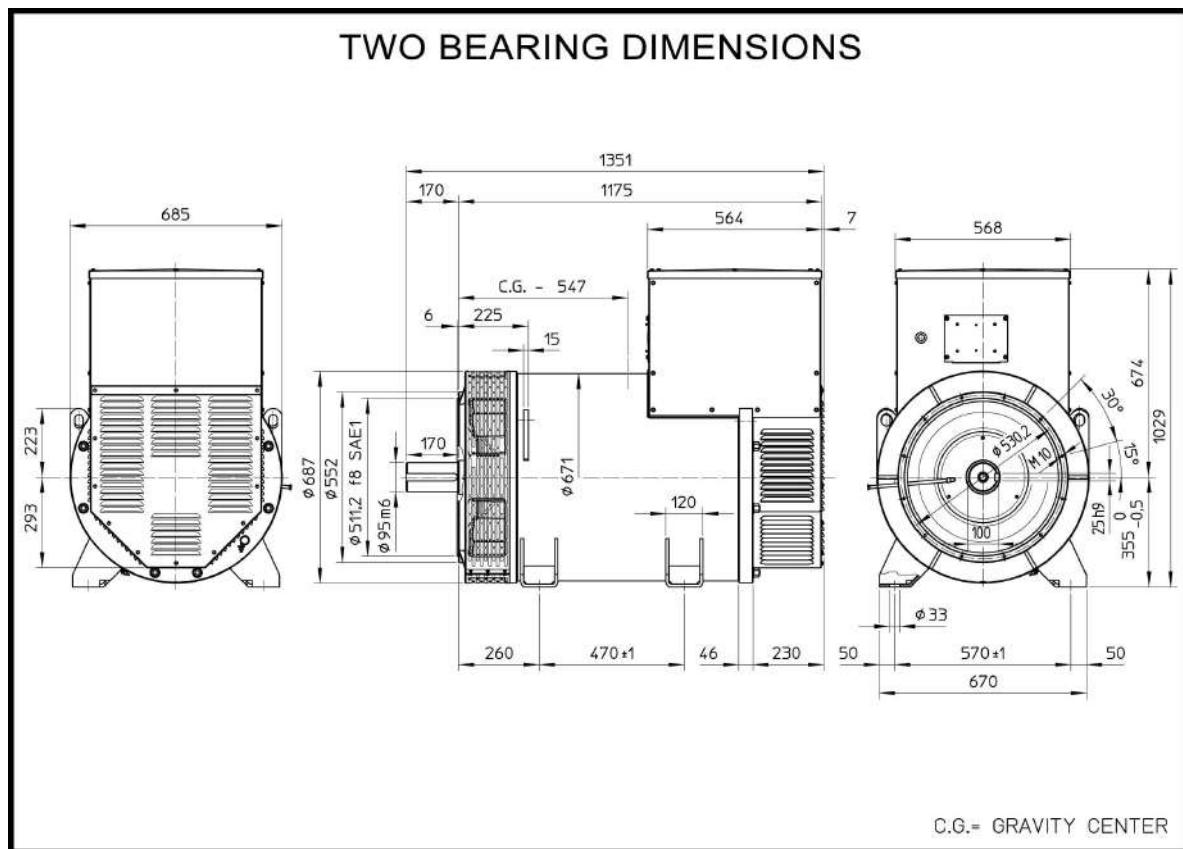
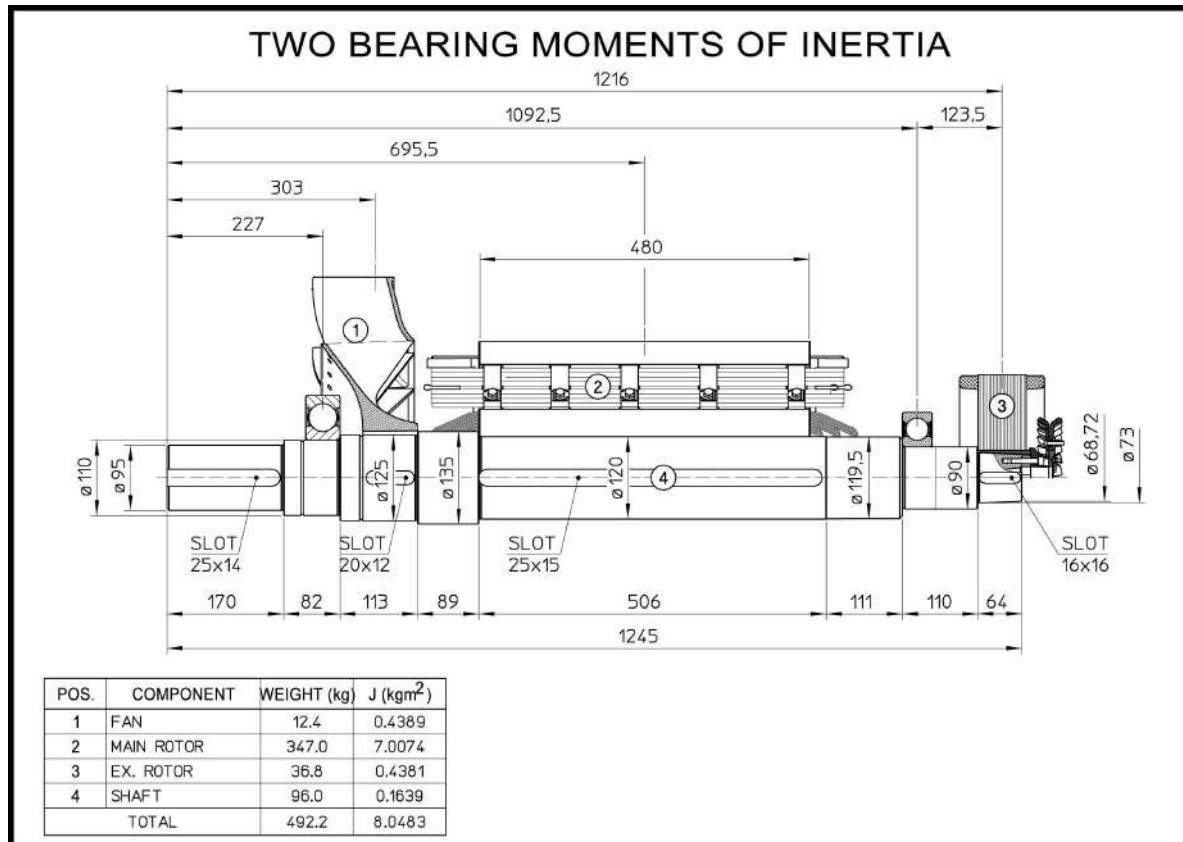
### SINGLE BEARING DIMENSIONS



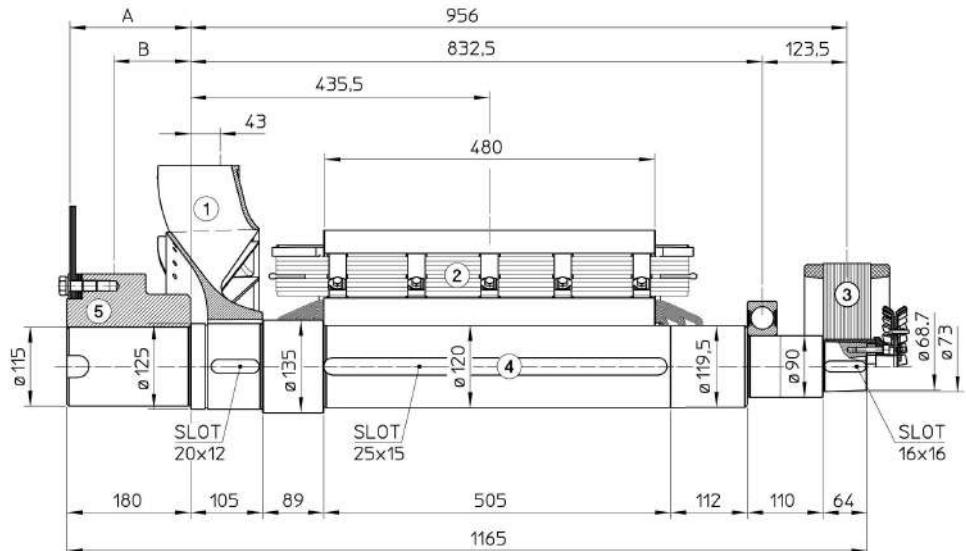
SAE N.	FLANGIA / LANGE BRIDE / FLANSCH				
	O	P	Q	S	$\alpha$
1	560	511.2	530.2	11	30°
1/2	648	584.2	619.1	14	30°
0	711	647.7	679.5	14	22.5°
00	883	787.4	850.9	14	22.5°

SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEBENKUPPLUNG				
	d	L	Q1	S1	$\alpha_1$
14	466.72	25.4	438.15	13.5	45°
18	571.5	15.7	542.92	16.5	60°

C.G.= GRAVITY CENTER



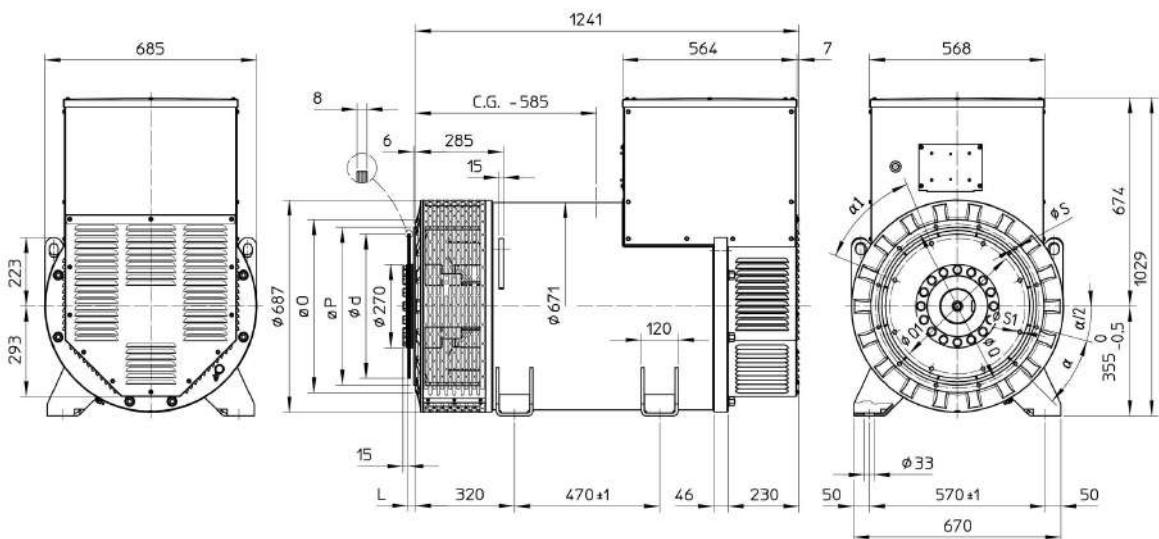
### SINGLE BEARING MOMENTS OF INERTIA



POS.	COMPONENT	WEIGHT (kg)	J (kgm <sup>2</sup> )
1	FAN	12.4	0.4389
2	MAIN ROTOR	347.0	7.0074
3	EX. ROTOR	36.8	0.4381
4	SHAFT	94.6	0.1671
TOTAL		490.8	8.0515

SAE N°	SHAFTS COUPLING FLEX PLATE			
	A	B	WEIGHT kg	J kgm <sup>2</sup>
14	175.7	111.7	57.5	0.7587
18	165.7	112.7	60.9	1.0919

### SINGLE BEARING DIMENSIONS

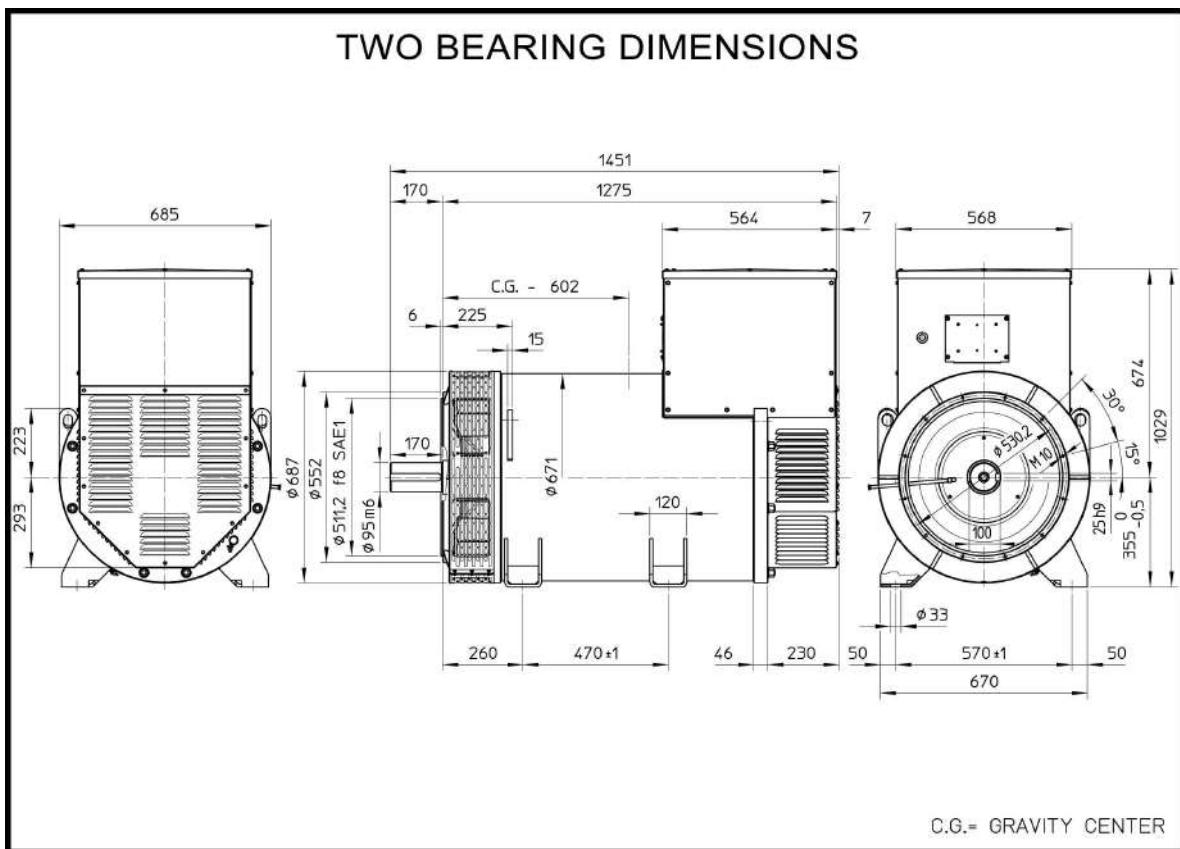
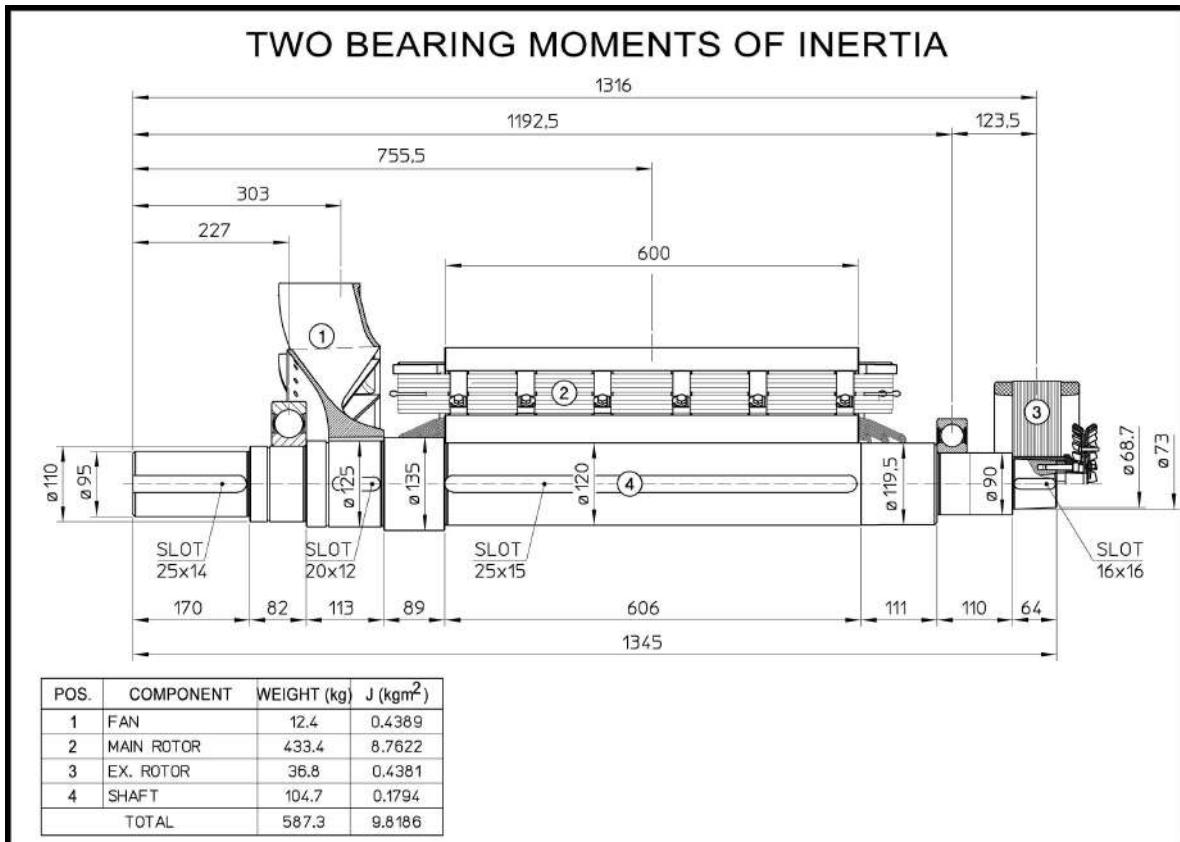


SAE N.	FLANGIA / LANGE BRIDE / FLANSCH				
	O	P	Q	S	$\alpha$
1	560	511.2	530.2	11	30°
1/2	648	584.2	619.1	14	30°
0	711	647.7	679.5	14	22.5°
00	883	787.4	850.9	14	22.5°

SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEBENKUPPLUNG				
	d	L	Q1	S1	$\alpha_1$
14	466.72	25.4	438.15	13.5	45°
18	571.5	15.7	542.92	16.5	60°

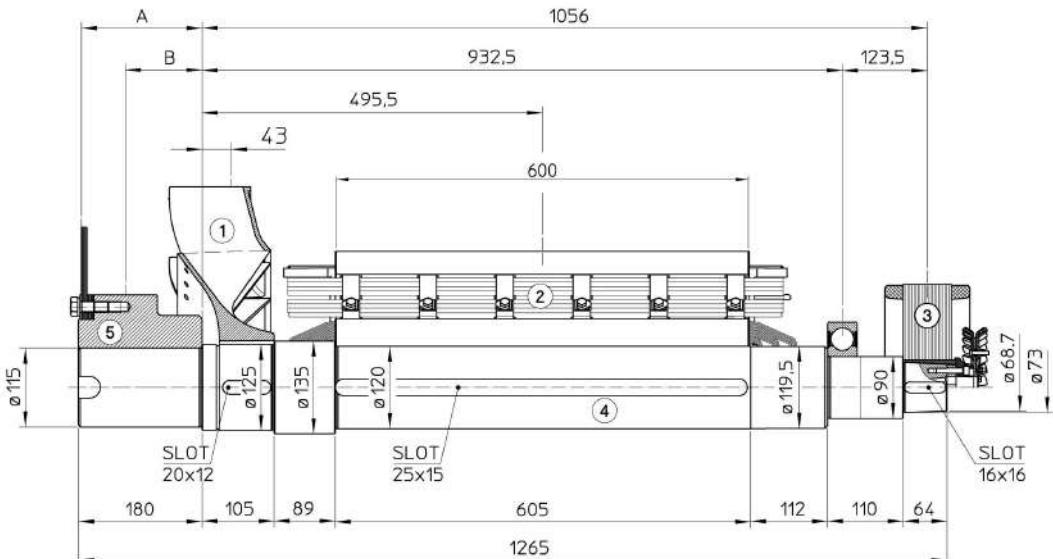
C.G.= GRAVITY CENTER

i gv HC sHf



i gv HC sHf

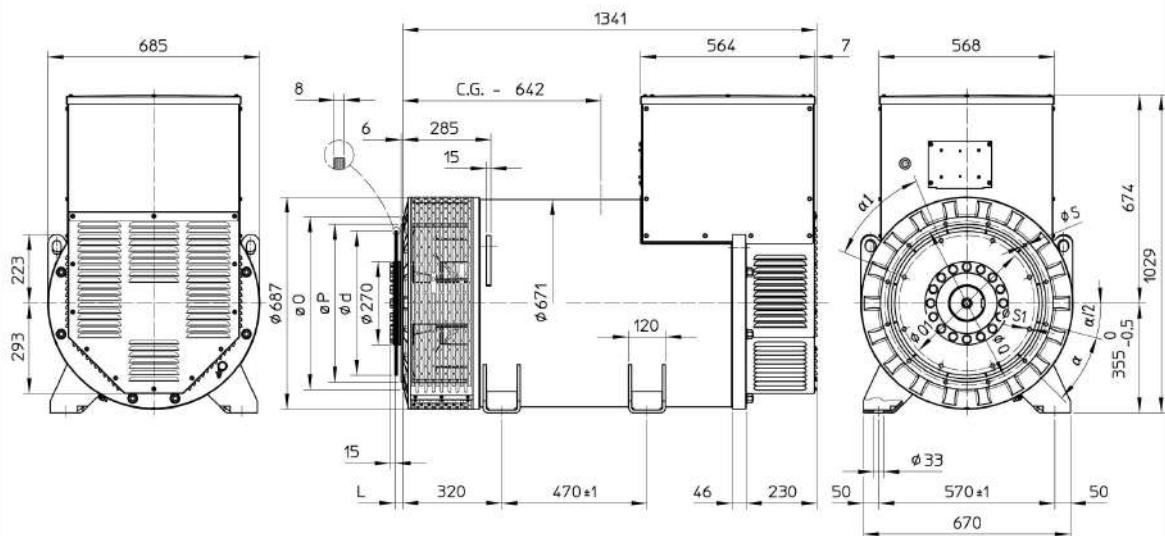
### SINGLE BEARING MOMENTS OF INERTIA



POS.	COMPONENT	WEIGHT (kg)	$J (\text{kgm}^2)$
1	FAN	12.4	0.4389
2	MAIN ROTOR	433.4	8.7622
3	EX. ROTOR	36.8	0.4381
4	SHAFT	103.3	0.1825
TOTAL		585.9	9.8217

SAE N°	5 SHAFTS COUPLING FLEX PLATE			
	A	B	WEIGHT kg	$J \text{kgm}^2$
14	175.7	111.7	57.5	0.7587
18	165.7	112.7	60.9	1.0919

### SINGLE BEARING DIMENSIONS



SAE N.	FLANGIA / LANGE BRIDE / FLANSCH				
	O	P	Q	S	$\alpha$
1	560	511.2	530.2	11	30°
1/2	648	584.2	619.1	14	30°
0	711	647.7	679.5	14	22.5°
00	883	787.4	850.9	14	22.5°

SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEBENKUPPLUNG				
	d	L	Q1	S1	$\alpha 1$
14	466.72	25.4	438.15	13.5	45°
18	571.5	15.7	542.92	16.5	60°

C.G.= GRAVITY CENTER

i gv HC H f



u

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The logo for Mecc Alte features the brand name in a bold, sans-serif font. The letters 'm', 'e', 'c', 'c', 'a', 'l', 't', and 'e' are each enclosed within a small, white, curved rectangular frame that has a slight shadow or glow effect.

[www.meccalte.com](http://www.meccalte.com)