mecc alte

Totally Focused. Totally Independent.

Technical Guide

RPa: 9 ; P

C-TYPE

DDS
Dynamic Data Support

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

c w 5;

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)

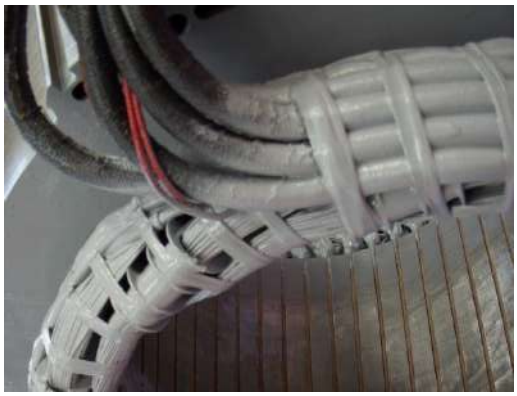
- 6 wire reconnectable:
  50Hz – 380V to 440V and 220V to 240V (de-rates may apply at certain voltages)
  60Hz – 380V to 480V and 220V to 240V (de-rates may apply at certain voltages)

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 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+ 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 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. 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.

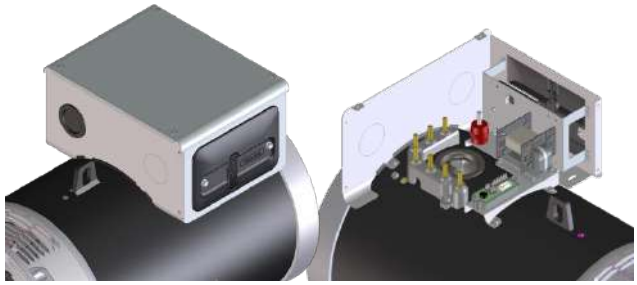
Info: https://www.meccalte.com/downloads/MA0605_Bulletin_IP.pdf

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 posible 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

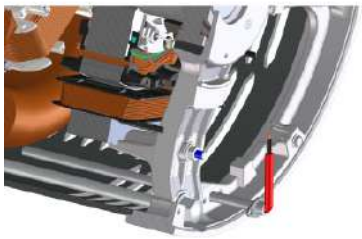
The Mecc Alte PMG is available on ECP28, ECP32, ECP34 and ECO38 as factory-fitted option; alternatively, only the predisposition for the retrofit, for subsequent assembly, is available on option. On series ECO40 is available as a factory-fitted or retro-fitted options.

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

	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*
Istantaneous	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.

o

a w tw	;	V s ° us	U
azs w tw	:	a wu ° us	\a9:
] tw x °w	89	] QR Ows ° y w	@ 7C49c d
R wu °	O z w	QR Ows ° y w	@ 8949c d
c wy s w	Qdc	[s ° ^ w www	99=7
h ° v° y °uz	96:	N ° vw	748777
P vw syw wwww uw	e7; 7=d:	Os s u° y	\d^ 8C; 748

NEp

gN6 h Mew 5c ° w6N t°w P475BaS																				
	deN] QOk48@ 69A				deN] QOk48=76; 7				U489=6; 7				S487=6; 7				O4B76; 7			
dw°w d s 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
as s wd s kk	8C7g	977g	97Bg	997g	8C7g	977g	97Bg	997g	8C7g	977g	97Bg	997g	8C7g	977g	97Bg	997g	8C7g	977g	97Bg	997g
dw°w Qw s Δ	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
as s w Qw s ΔΔ	887g	88=g	897g	89Ag	887g	88=g	897g	89Ag	887g	88=g	897g	89Ag	887g	88=g	897g	89Ag	887g	88=g	897g	89Ag
WS k	41	**41**	41	33	39	**39**	39	31,6	37,5	**37,5**	37,5	30	35	**35**	35	28	30	**30**	30	24
	32,8	**32,8**	32,8	26,4	31,2	**31,2**	31,2	25,3	30	**30**	30	24	28	**28**	28	22,4	24	**24**	24	19,2
WV k	50	**50**	49,5	37,5	48,7	**48,7**	48,7	36	45	**45**	45	34	41	**41**	41	33	36	**36**	36	27
	40	**40**	39,6	30	39,0	**39,0**	39,0	28,8	36	**36**	36	27,2	32,8	**32,8**	32,8	26,4	28,8	**28,8**	28,8	21,6
WS k	55	**55**	55	44	52,5	**52,5**	52,5	42	50	**50**	50	40	48	**48**	48	38	40	**40**	40	32
	44	**44**	44	35,2	42	**42**	42	33,6	40	**40**	40	32	38,4	**38,4**	38,4	30,4	32	**32**	32	25,6
WV k	68,8	**68,8**	68,8	52	65	**65**	65	49,5	62,5	**62,5**	62,5	47,5	59,5	**59,5**	59,5	42,6	50	**50**	50	38
	55,0	**55,0**	55,0	41,6	52	**52**	52	39,6	50	**50**	50	38	47,6	**47,6**	47,6	34,1	40	**40**	40	30,4
WS k	82,5	**82,5**	82,5	77	78	**78**	78	73	75	**75**	75	70	67	**67**	67	62	60	**60**	60	56
	66	**66**	66	61,6	62,4	**62,4**	62,4	58,4	60	**60**	60	56	53,6	**53,6**	53,6	49,6	48	**48**	48	44,8
WV k	91	**91**	91	85	85	**85**	85	79	82,5	**82,5**	82,5	77	73,2	**73,2**	73,2	68	66	**66**	66	62
	72,8	**72,8**	72,8	68	68	**68**	68	63,2	66	**66**	66	61,6	58,6	**58,6**	58,6	54,4	52,8	**52,8**	52,8	49,6

PEp

gN6 h Mew 5c ° w6N t°w P475BaS																				
	deN] QOk48@ 69A				deN] QOk48=76; 7				U489=6; 7				S487=6; 7				O4B76; 7			
dw°w d s k	; 8=g	; ; 7g	; @7g	; B7g	; 8=g	; ; 7g	; @7g	; B7g	; 8=g	; ; 7g	; @7g	; B7g	; 8=g	; ; 7g	; @7g	; B7g	; 8=g	; ; 7g	; @7g	; B7g
as s wd s kk	97Bg	997g	9: 7g	9; 7g	97Bg	997g	9: 7g	9; 7g	97Bg	997g	9: 7g	9; 7g	97Bg	997g	9: 7g	9; 7g	97Bg	997g	9: 7g	9; 7g
dw°w Qw s Δ	9; 7g	9=; g	9@=g	9AAg	9; 7g	9=; g	9@=g	9AAg	9; 7g	9=; g	9@=g	9AAg	9; 7g	9=; g	9@=g	9AAg	9; 7g	9=; g	9@=g	9AAg
as s w Qw s ΔΔ	897g	89Ag	8 : g	8 Bg	897g	89Ag	8 : g	8 Bg	897g	89Ag	8 : g	8 Bg	897g	89Ag	8 : g	8 Bg	897g	89Ag	8 : g	8 Bg
WS k	43,5	47	49,5	**49,5**	42	45	47	**47**	39,5	43	45	**45**	37	41	43	**43**	31,6	34,4	36	**36**
	34,8	37,6	39,6	**39,6**	33,6	36	37,6	**37,6**	31,6	34,4	36	**36**	29,6	32,8	34,4	**34,4**	25,3	27,5	28,8	**28,8**
WV k	52	55	59	**59**	50	53	57	**57**	47	50	54	**54**	43	48	52	**52**	37,6	40	43,2	**43,2**
	41,6	44	47,2	**47,2**	40	42,4	45,6	**45,6**	37,6	40	43,2	**43,2**	34,4	38,4	41,6	**41,6**	30,1	32	34,6	**34,6**
WS k	60,5	66	66	**66**	58	63	63	**63**	55	60	60	**60**	53	58	58	**58**	44	48	48	**48**
	48,4	52,8	52,8	**52,8**	46,4	50,4	50,4	**50,4**	44	48	48	**48**	42,4	46,4	46,4	**46,4**	35,2	38,4	38,4	**38,4**
WV k	76	80	82,5	**82,5**	71	74	77,5	**77,5**	69	72,5	75	**75**	63	70	71,5	**71,5**	55,2	58	60	**60**
	60,8	64	66	**66**	56,8	59	62	**62**	55,2	58	60	**60**	50,4	56	57,2	**57,2**	44,2	46	48	**48**
WS k	86	90	99	**99**	81	86	93,7	**93,7**	78	82	90	**90**	73	80	83	**83**	62,4	65,6	72	**72**
	68,8	72	79,2	**79,2**	64,8	68,8	75	**75,0**	62,4	65,6	72	**72**	58,4	64	66,4	**66,4**	49,9	52,5	57,6	**57,6**
WV k	97	106	110	**110**	90	98	102	**102**	88	96	100	**100**	81	89	92	**92**	70,4	76,8	80	**80**
	77,6	84,8	88	**88**	72	78,4	81,6	**81,6**	70,4	76,8	80	**80**	64,8	71,2	73,6	**73,6**	56,3	61,4	64	**64**

2 Ai p DMEE

f s s vw / vw5R] @7 7: ; 4; 0			RPa: 9 8d; P	RPa: 9 9d; P	RPa: 9 8[; P	RPa: 9 9[; P	RPa: 9 8Z; P	RPa: 9 9Z; P
Xd	Q° wu 4s ° uz wsu s uw	%	316,7	339,3	316,3	276,3	368,2	376
X'd	Q° wu 4s ° s °w wsu s uw	%	15,6	15,9	14,8	13,8	17,3	16,8
X"d	Q° wu 4s ° t s °w wsu s uw	%	11	11,9	8,7	8,1	10,1	8,7
Xq	b sv s w4s ° uz wsu s uw	%	101,7	110,5	123	113,9	142,9	147,9
X'q	b sv s w4s ° s °w wsu s uw	%	101,7	110,5	123	113,9	142,9	147,9
X"q	b sv s w4s ° t s °w wsu s uw	%	33,7	34	34,9	33,8	42,2	43,1
X_2	] wys ° w4 w w uw wsu s uw	%	21,8	22,4	21,2	20,4	25,6	25,3
X_0	l w w w uw wsu s uw	%	2,89	3,04	3,33	3,21	4,39	4,11
ds s vw								
Xd	Q° wu 4s ° uz wsu s uw	%	269,2	288,4	268,9	234,9	313	319,6
X'd	Q° wu 4s ° s °w wsu s uw	%	13,3	13,5	12,6	11,7	14,7	14,3
X"d	Q° wu 4s ° t s °w wsu s uw	%	9,35	10,1	7,4	6,88	8,58	7,4
Xq	b sv s w4s ° uz wsu s uw	%	86,4	93,9	104,6	96,8	121,5	125,7
X'q	b sv s w4s ° s °w wsu s uw	%	86,4	93,9	104,6	96,8	121,5	125,7
X"q	b sv s w4s ° t s °w wsu s uw	%	28,6	28,9	29,7	28,7	35,9	36,6
X_2	] wys ° w4 w w uw wsu s uw	%	18,5	19	18	17,3	21,8	21,5
X_0	l w w w uw wsu s uw	%	2,89	3,04	3,33	3,21	4,39	4,11
Kcc	dz u° u ° s °		0,37	0,35	0,37	0,43	0,32	0,31
T'd	e s °w ° wu s	sec	0,056	0,059	0,062	0,055	0,081	0,074
T"d	d t s °w ° wu s	sec	0,012	0,014	0,014	0,011	0,016	0,016
T'do	^ w u° u ° ° wu s	sec	1,14	1,26	1,31	1,1	1,73	1,67
Ta	N s w ° wu s	sec	0,013	0,016	0,018	0,016	0,022	0,022

g Ai p DMEE

Io	R u° s ° u w s sv	A	0,6	0,8	0,7	0,7	0,7	0,6
Ic	R u° s ° u w s x sv	A	2,7	2,8	2,5	2,6	2,9	2,9
^ w sv					4			
^ w sv w 97 wu5		,			300			
Uws v° ° s °		W	4247	5096	5300	5928	6741	7333
ewv z wUs °uSsu 4eUS		%	<2	<2	<2	<2	<2	<2
h s wx Q° 5/eUQ0x sv ZZ6Z]		%	2,8 / 2,8	1,9 / 2	1,8 / 1,9	2,1 / 2,1	2,2 / 2,2	2,9 / 2,9
h s wx Q° 5/eUQ0 sv ZZ6Z]		%	3 / 3,1	2,7 / 2,6	2,6 / 2,6	2,7 / 2,7	2,9 / 2,9	2,5 / 2,5

2 Ai p DMRE

f s s vw / vw5R] @77: ; 4 0			RPa: 9 8d; P	RPa: 9 9d; P	RPa: 9 8[; P	RPa: 9 9[; P	RPa: 9 8Z; P	RPa: 9 9Z; P
Xd	Q° wu 4s ° uz wsu s uw	%	316,7	339,3	316,3	276,3	368,2	379,8
X'd	Q° wu 4s ° s °w wsu s uw	%	15,6	15,9	14,8	13,8	17,3	17
X"d	Q° wu 4s ° t s °w wsu s uw	%	11	11,9	8,7	8,1	10,1	8,79
Xq	b sv s w4s ° uz wsu s uw	%	101,7	110,5	123	113,9	142,9	149,4
X'q	b sv s w4s ° s °w wsu s uw	%	101,7	110,5	123	113,9	142,9	149,4
X"q	b sv s w4s ° t s °w wsu s uw	%	33,7	34	34,9	33,8	42,2	43,5
X_2	] wys ° w4 w w uw wsu s uw	%	21,8	22,4	21,2	20,4	25,6	25,6
X_0	l w w w uw wsu s uw	%	2,89	3,04	3,33	3,21	4,39	4,15
ds s vw								
Xd	Q° wu 4s ° uz wsu s uw	%	269,2	288,4	268,9	234,9	313	322,8
X'd	Q° wu 4s ° s °w wsu s uw	%	13,3	13,5	12,6	11,7	14,7	14,4
X"d	Q° wu 4s ° t s °w wsu s uw	%	9,35	10,1	7,4	6,88	8,58	7,47
Xq	b sv s w4s ° uz wsu s uw	%	86,4	93,9	104,6	96,8	121,5	127
X'q	b sv s w4s ° s °w wsu s uw	%	86,4	93,9	104,6	96,8	121,5	127
X"q	b sv s w4s ° t s °w wsu s uw	%	28,6	28,9	29,7	28,7	35,9	37
X_2	] wys ° w4 w w uw wsu s uw	%	18,5	19	18	17,3	21,8	21,8
X_0	l w w w uw wsu s uw	%	2,89	3,04	3,33	3,21	4,39	4,15
Kcc	dz u° u ° s °		0,37	0,35	0,37	0,43	0,32	0,31
T'd	e s °w ° wu s	sec	0,056	0,059	0,062	0,055	0,081	0,074
T"d	d t s °w ° wu s	sec	0,012	0,014	0,014	0,011	0,016	0,016
T'do	^ w u° u ° ° wu s	sec	1,14	1,26	1,31	1,1	1,73	1,67
Ta	N s w ° wu s	sec	0,013	0,016	0,018	0,016	0,022	0,022

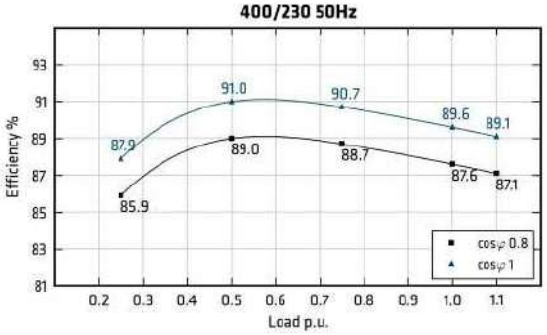
g Ai p DMRE

Io	R u° s ° u w s sv	A	0,6	0,8	0,7	0,7	0,7	0,6
Ic	R u° s ° u w s x sv	A	2,7	2,8	2,5	2,6	2,9	2,9
^ w sv						4		
^ w sv w 97 wu5		,				300		
Uws v° ° s °		W	5096	6171	5691	6519	7295	8106
ewvv z wV wxws uwSsu 4e\5			<45	<45	<45	<45	<45	<45
h s wx Q° 5/eUQ0x sv ZZ6Z]		%	2,8 / 2,8	1,9 / 2	1,8 / 1,9	2,1 / 2,1	2,2 / 2,2	2,9 / 2,9
h s wx Q° 5/eUQ0 sv ZZ6Z]		%	3 / 3,1	2,7 / 2,6	2,6 / 2,6	2,7 / 2,7	2,9 / 2,9	2,5 / 2,5

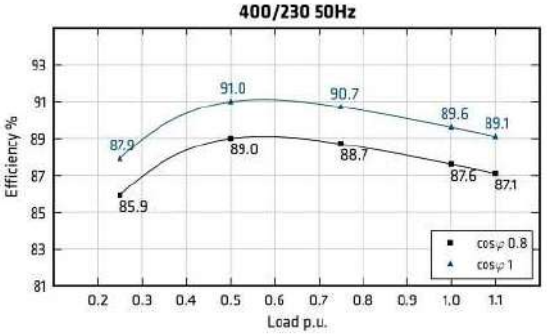
m f NEp

[vw		: B7g =7U					; 77g =7U					; 8=g =7U					; ; 7g =7U				
		75B=	75=	75A=	8	88B	75B=	75=	75A=	8	88B	75B=	75=	75A=	8	88B	75B=	75=	75A=	8	88B
RPa: 9 8d; P	%	85,9	88,9	88,7	87,7	87,2	85,9	89,0	88,7	87,6	87,1	85,7	88,9	88,7	87,4	87,0	85,5	88,9	88,2	86,9	86,4
RPa: 9 9d; P	%	85,9	88,9	88,7	87,7	87,2	85,9	89,0	88,7	87,6	87,1	85,9	89,0	88,7	87,6	87,1	85,5	88,9	88,2	86,9	86,4
RPa: 9 8[; P	%	89,1	89,5	89,2	88,2	87,8	89,6	89,7	89,5	88,3	87,8	89,3	89,5	89,3	88,0	87,6	88,6	88,9	88,7	87,5	86,9
RPa: 9 9[; P	%	90,7	91,5	90,5	89,3	88,8	90,6	91,7	90,7	89,4	88,8	90,3	91,4	90,3	89,2	88,6	89,6	90,6	89,5	88,3	87,7
RPa: 9 8Z; P	%	91,5	91,6	90,8	89,9	89,4	91,4	91,8	91,0	89,9	89,4	91,2	91,7	90,9	89,6	89,0	90,8	91,6	90,5	89,3	88,7
RPa: 9 9Z; P	%	91,8	91,9	90,9	89,9	89,4	91,7	92,1	91,2	90,0	89,5	91,3	91,9	91,0	89,6	89,0	91,0	91,9	90,6	89,3	88,7

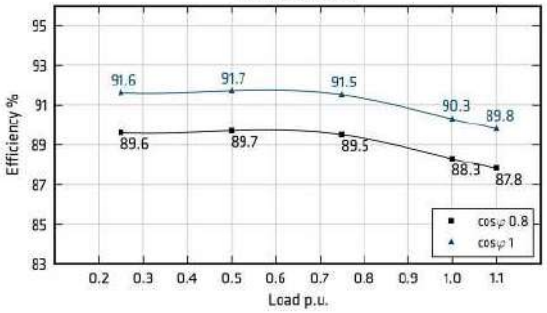
WS k
400/230 50Hz



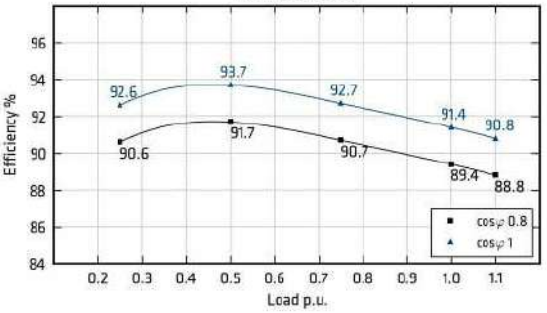
WV k
400/230 50Hz



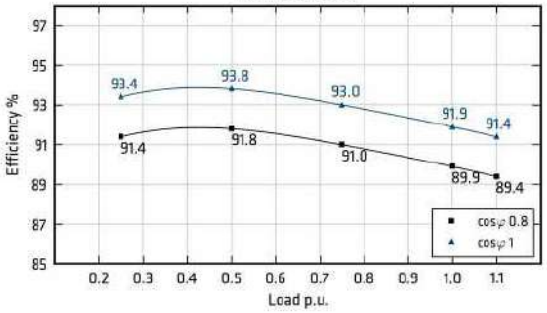
WS k
400/230 50Hz



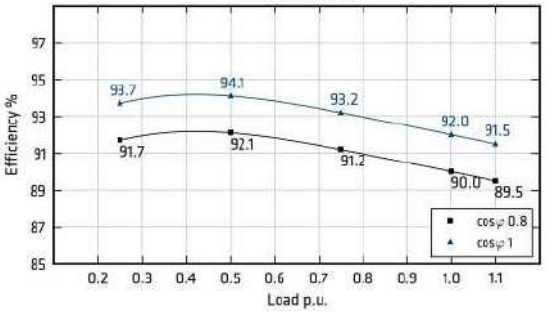
WV k
400/230 50Hz



WS k
400/230 50Hz



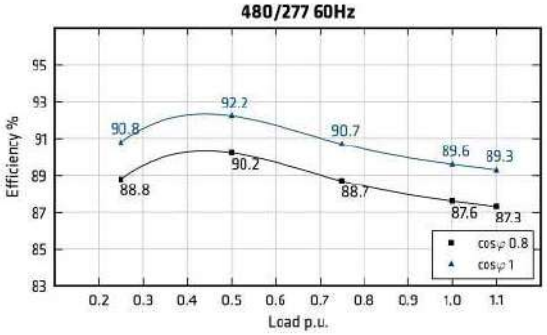
WV k
400/230 50Hz



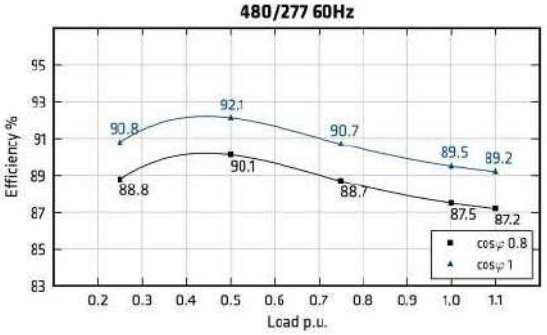
m f PEp

[vw		; 8=g @7U					; ; 7g @7U					; @7g @7U					; B7g @7U				
		75B=	75=	75A=	8	88B	75B=	75=	75A=	8	88B	75B=	75=	75A=	8	88B	75B=	75=	75A=	8	88B
RPa: 9 8d; P	%	87,6	89,2	87,8	86,5	86,1	88,4	89,7	88,3	87,0	86,6	88,8	90,2	88,7	87,4	87,1	88,8	90,2	88,7	87,6	87,3
RPa: 9 9d; P	%	87,6	89,1	87,7	86,5	86,0	88,4	89,6	88,3	87,1	86,6	88,8	90,1	88,7	87,6	87,1	88,8	90,1	88,7	87,5	87,2
RPa: 9 8[; P	%	88,4	89,6	89,6	87,5	86,7	88,5	89,7	89,9	88,9	88,2	88,5	89,9	90,3	89,2	88,6	88,6	90,2	90,5	89,4	88,9
RPa: 9 9[; P	%	90,5	91,2	90,5	89,5	89,1	90,9	91,5	90,7	89,7	89,2	91,1	91,6	91,0	90,0	89,5	91,5	92,0	91,3	90,2	89,8
RPa: 9 8Z; P	%	91,3	91,9	91,1	90,1	89,5	91,4	92,0	91,3	90,5	90,1	91,4	92,1	91,6	90,7	90,2	91,1	92,2	91,8	90,8	90,3
RPa: 9 9Z; P	%	91,5	92,0	91,2	90,1	89,7	91,5	92,1	91,4	90,5	90,2	91,4	92,1	91,6	90,7	90,4	91,3	92,3	91,8	90,8	90,4

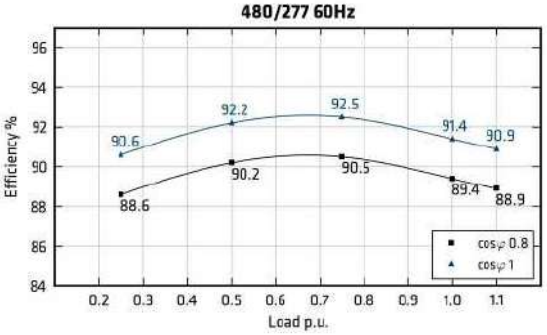
WS k
480/277 60Hz



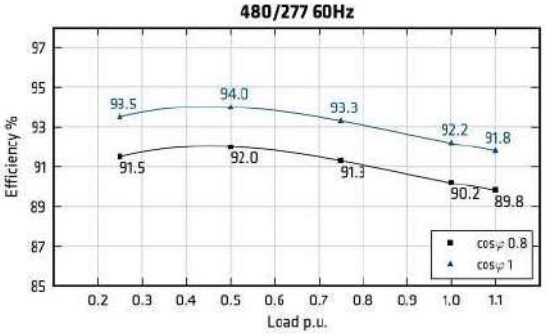
WV k
480/277 60Hz



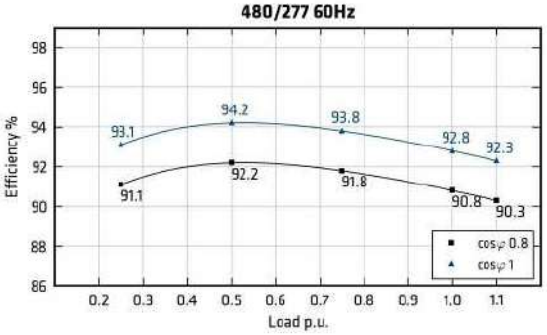
WS k
480/277 60Hz



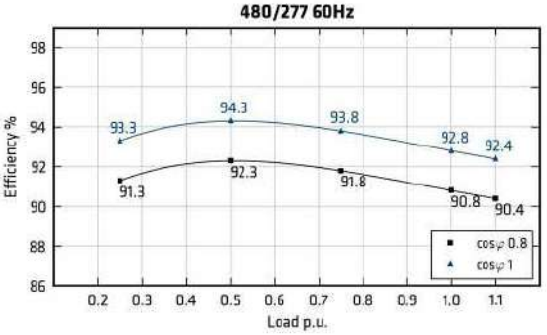
WV k
480/277 60Hz



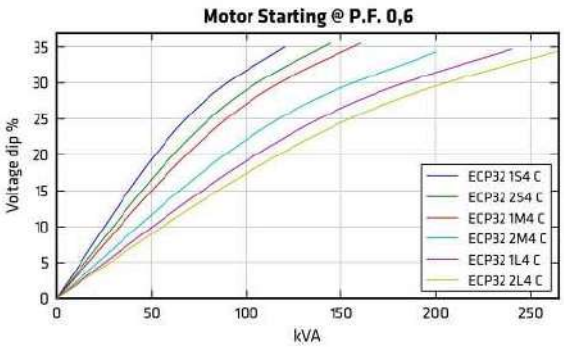
WS k
480/277 60Hz



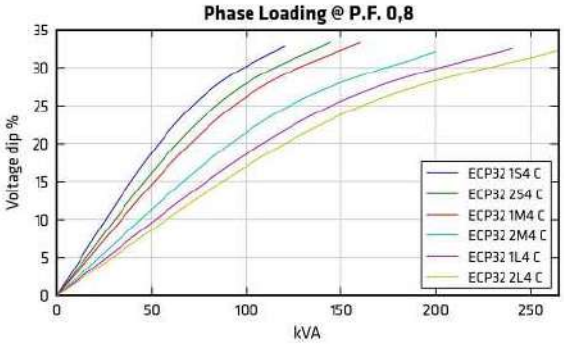
WV k
480/277 60Hz

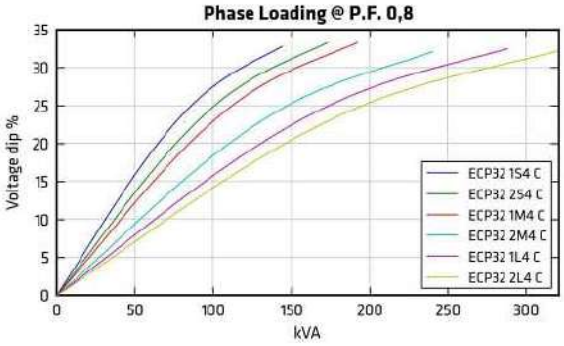


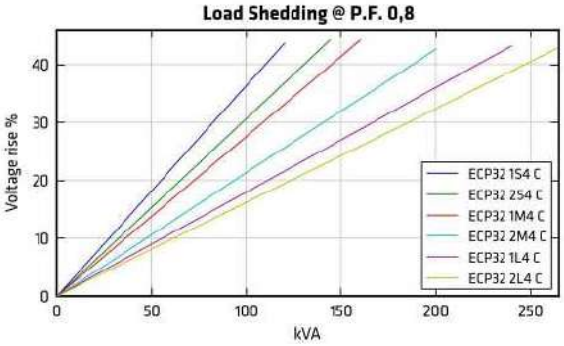
kPP HzP

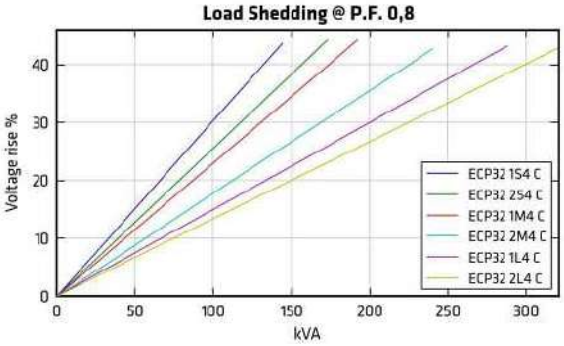


k P H P









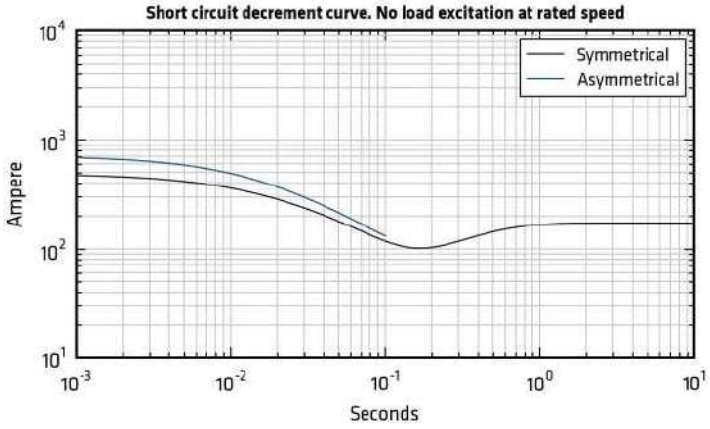
V vw us w s °w u w s s x u ° xs w xsu syw°x ° v°us ww3 ws w uwww s x D

a w Ssu u wx°u°w u wu /aSPPCB t w ww w xsu 75@u w D
aSPPH ° /Nc Pu /aS w 00675B
R s w5ezwaSPP s w xsu 75 ° 888C9 maSPPH ° /Nc Pu /75 00675B c5ez° ws zs zw sywxs s s y° w w s x75 ° w ° s w zw w zs us t w wsv zw x75@u w°x zw sv ° u °vwww 888C9 ° w t°yyw /8C, z°yzw s w5C5
V z° w s w8s 877 gN sv ° w ° s x75 ° w ° s w ° sywxs s 88C gN sv ° w ° s x75@5

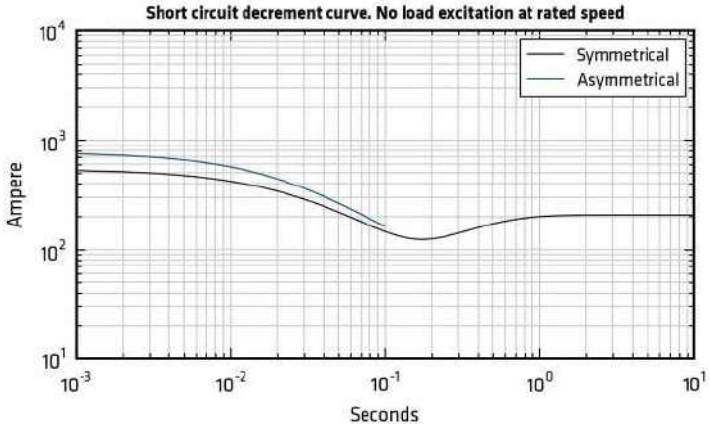
g sywu wx°u°w u wu /gPPCD
gPPH/; 776g w CB °x=7 U EgPPH/; B76g w CB °x@7 U
R s w5gPP s ; 8=g @7 U ° 85 : B mgPPH/; B76; 8=Cp9c5ez° ws zs zw sywxs s s y° w w s ; 8=g ° w ° s w zw w zs us t w wsv zw w xsu 75@u w°x zw sv ° u °vwww 85 : B ° w t°yyw /: : , z°yzw s w5C5
V z° w s w8s 877 gN sv ° w ° s ; 8=g ° w ° s w ° sywxs s 8: gN sv ° w ° s ; B7g5

NEp Ax

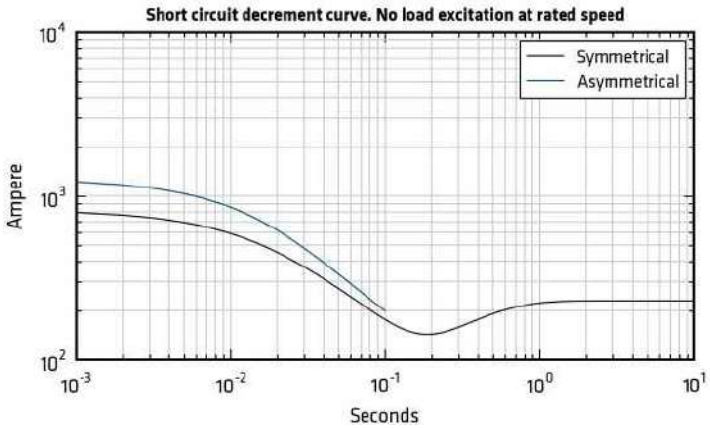
RPa: 9 8d; P



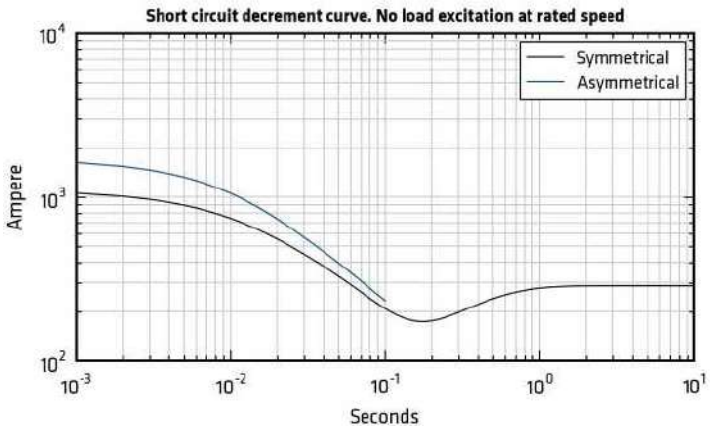
RPa: 9 9d; P



RPa: 9 8[; P



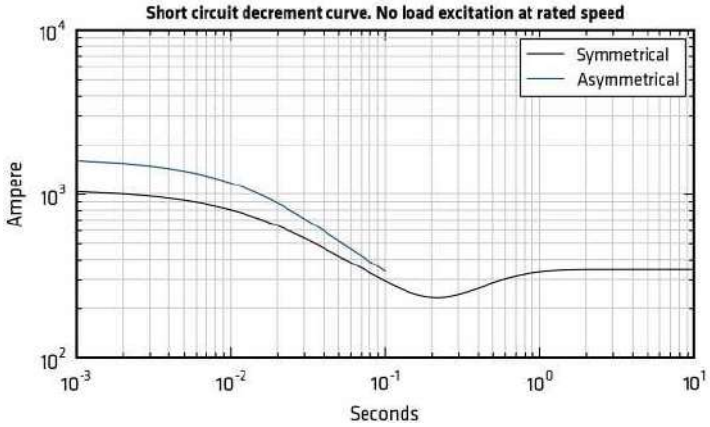
RPa: 9 9[; P



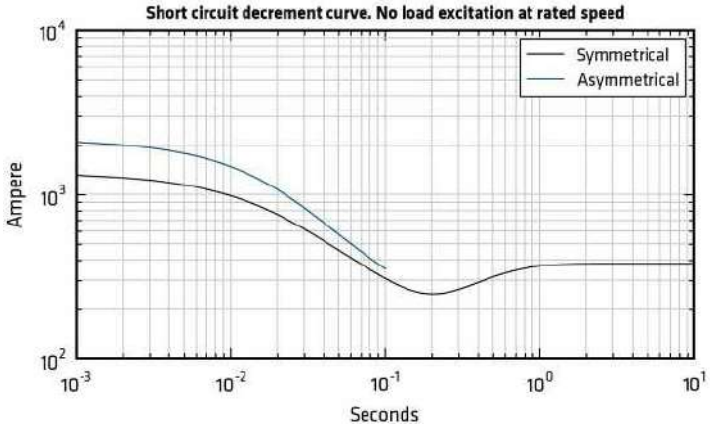
1a ws w ww st w s syw@

NEp Ax

RPa: 9 8Z; P



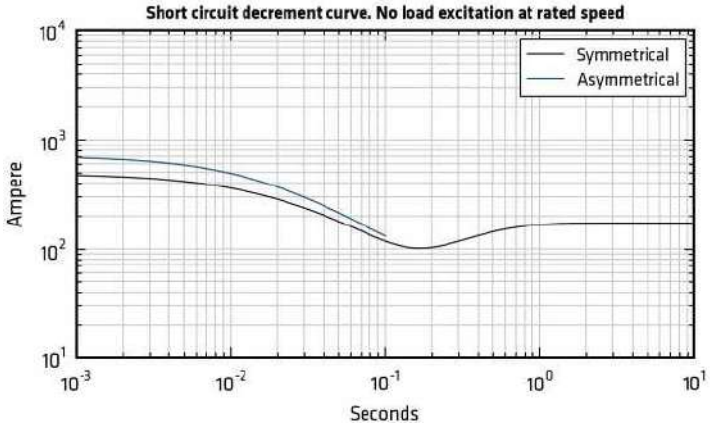
RPa: 9 9Z; P



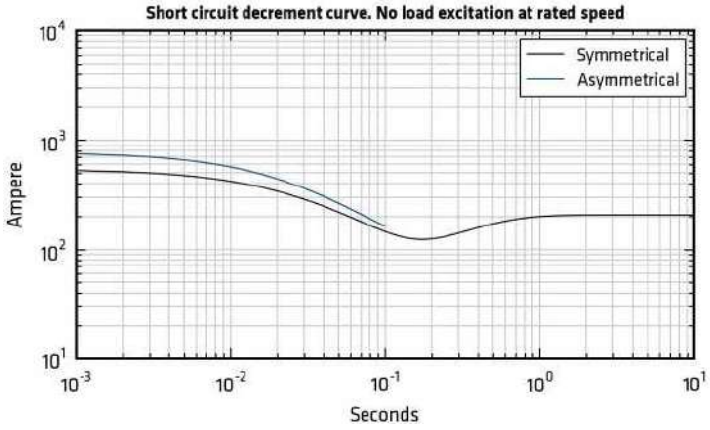
1a ws w wkw st w s syw@

PEp Ax

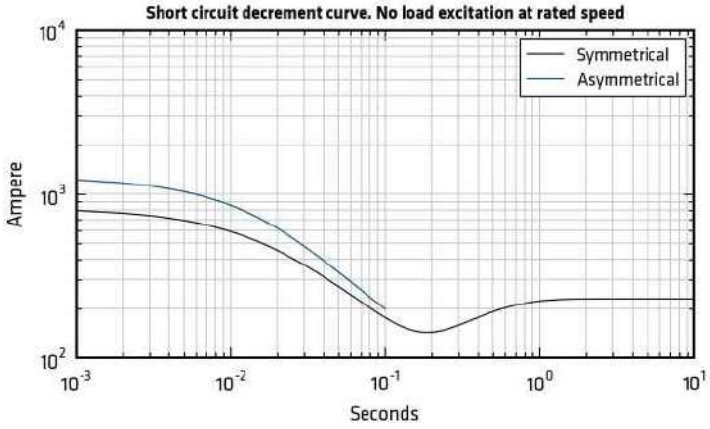
RPa: 9 8d; P



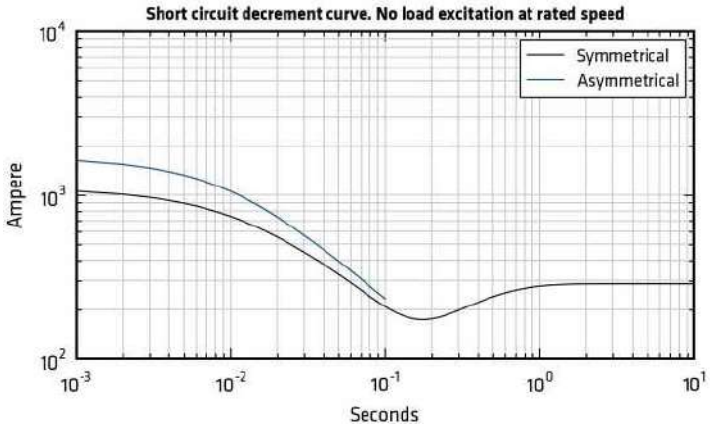
RPa: 9 9d; P



RPa: 9 8[; P



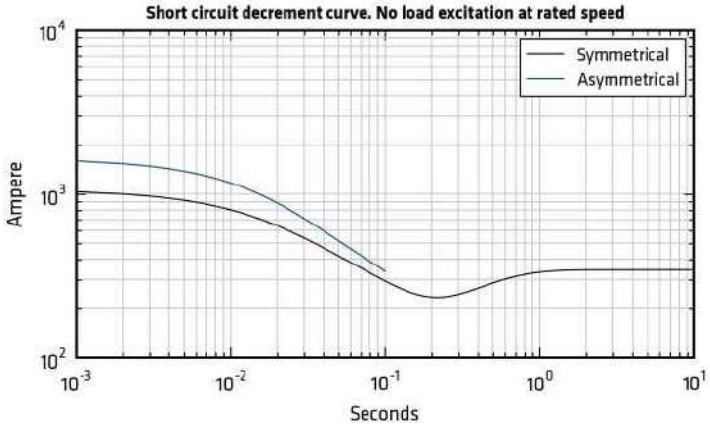
RPa: 9 9[; P



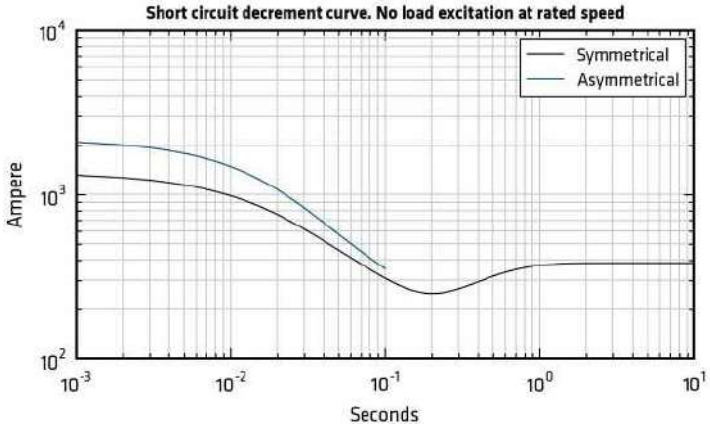
1a ws w ww st w s syw@

PEp Ax

RPa: 9 8Z; P



RPa: 9 9Z; P

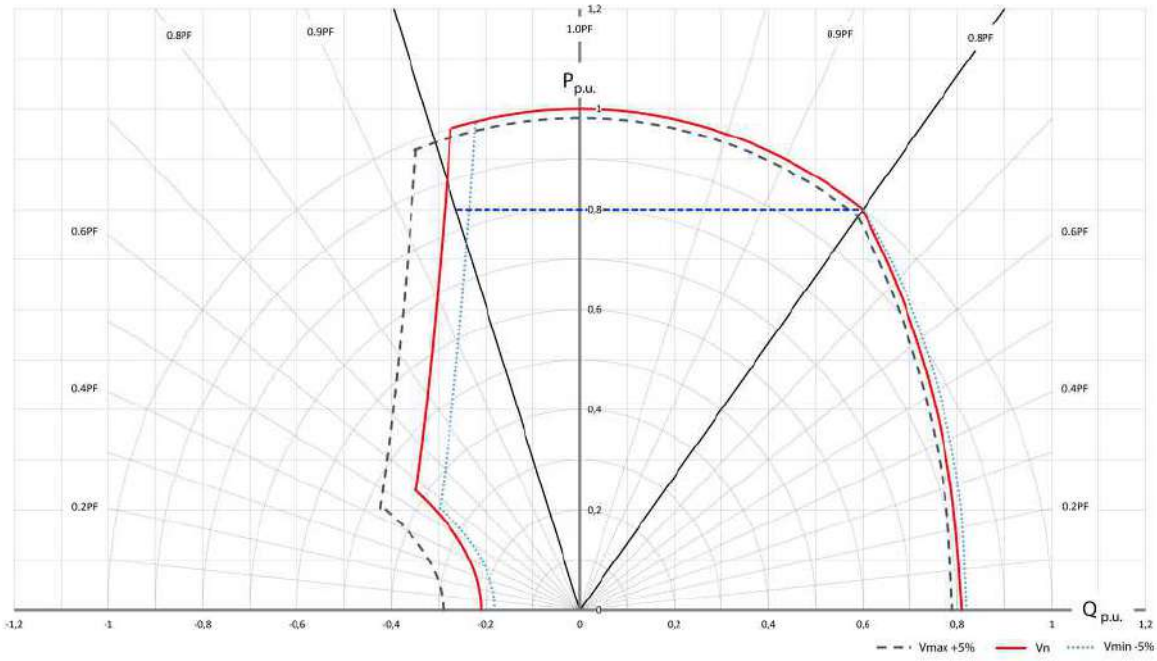


1a ws w wkw st w s syw@

g i

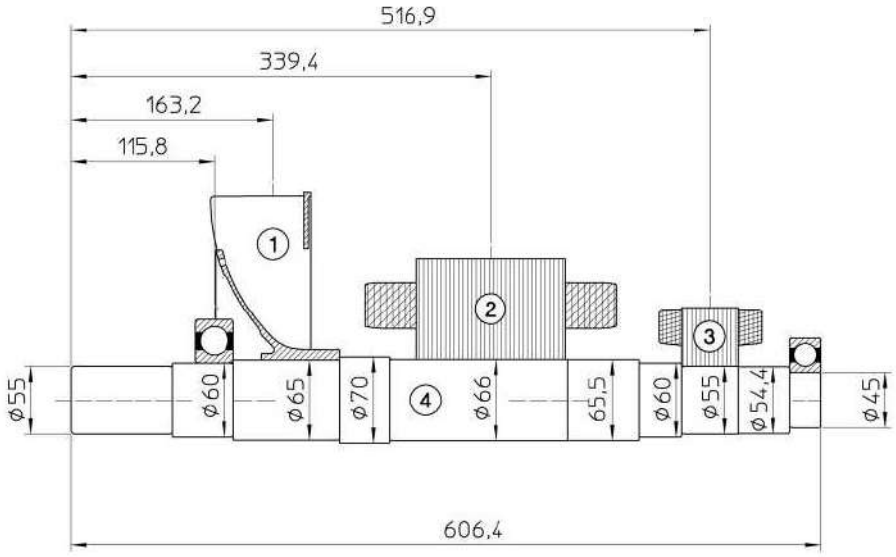
Qs s		RPa: 9 8d; P		RPa: 9 9d; P		RPa: 9 8[; P		RPa: 9 9[; P		RPa: 9 8Z; P		RPa: 9 9Z; P	
		=7U	@7U	=7U	@7U	=7U	@7U	=7U	@7U	=7U	@7U	=7U	@7U
Qs w usyw		N ° °											
d s h ° v° y c w ° s uw/97 P0	Ω	0,117		0,08		0,059		0,053		0,039		0,035	
c h ° v° y c w ° s uw/97 P0	Ω	1,067		1,159		1,275		1,576		1,668		1,715	
d s R u° w c w ° s uw/97 P0	Ω	10,6		10,6		10,6		10,6		10,6		10,6	
c R u° w c w ° s uw/97 P0	Ω	0,417		0,417		0,417		0,417		0,417		0,417	
h wŷz xu wwyw ws	kg	153,0		165,0		186,0		212,0		244,0		252,0	
f t s s uw sy w°u	kN/mm	4,5		4,5		4,6		4,6		4,9		5,2	
N° x	m^3/min	15,7	18,5	15,7	18,5	15,7	18,5	15,7	18,5	15,7	18,5	15,7	18,5
] ° w w s 8 6A	dB(A)	72/58	76/62	72/58	76/62	72/58	76/62	72/58	76/62	72/58	76/62	72/58	76/62

l



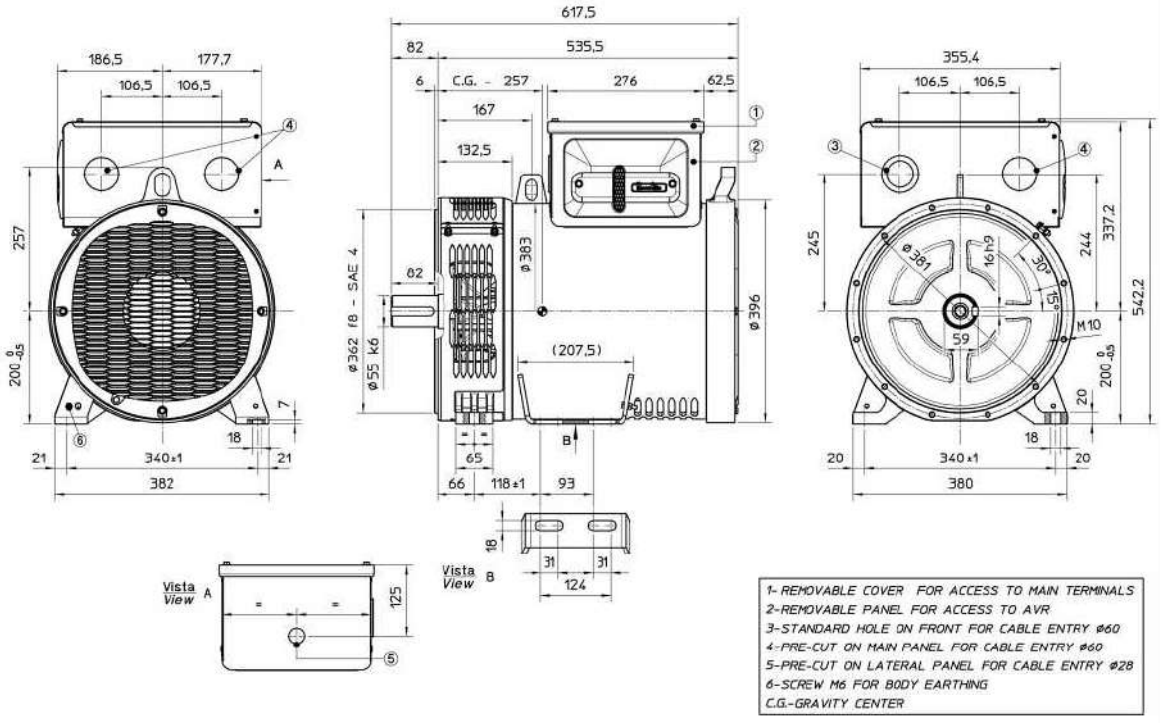
mi LHG Mi

TWO BEARING MOMENTS OF INERTIA



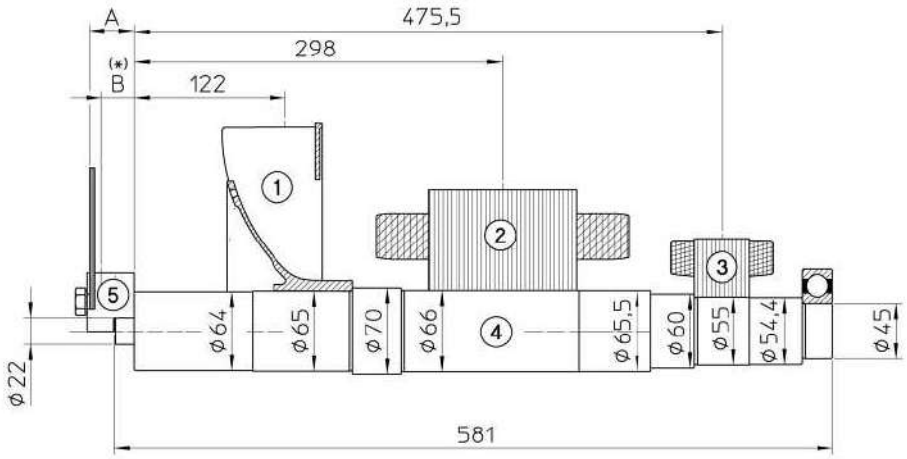
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	33.8	0.2268
3	EX. ROTOR	5.5	0.0172
4	SHAFT	13.7	0.0068
TOTAL		54.0	0.2622

TWO BEARING DIMENSIONS



mi LHG Mi

SINGLE BEARING MOMENTS OF INERTIA

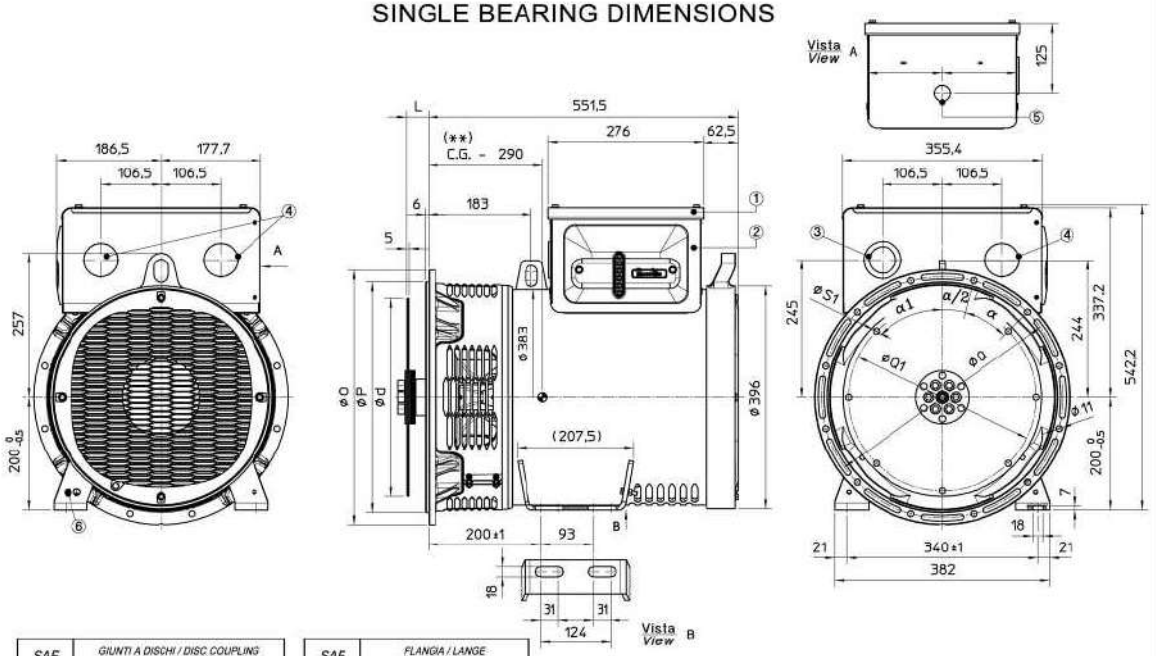


POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	33.8	0.2268
3	EX. ROTOR	5.5	0.0172
4	SHAFT	13.4	0.0068
TOTAL		53.7	0.2622

SAE	5 SHAFTS COUPLING FLEX PLATE			
N°	A	B	WEIGHT kg	J kgm^2
6 1/2	5	2.2	1.7	0.0084
7 1/2	5	2.2	2.1	0.0130
8	36.6	25.9	4.0	0.0203
10	28.6	21.6	4.5	0.0385
11 1/2	15	11.5	4.5	0.0590

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS



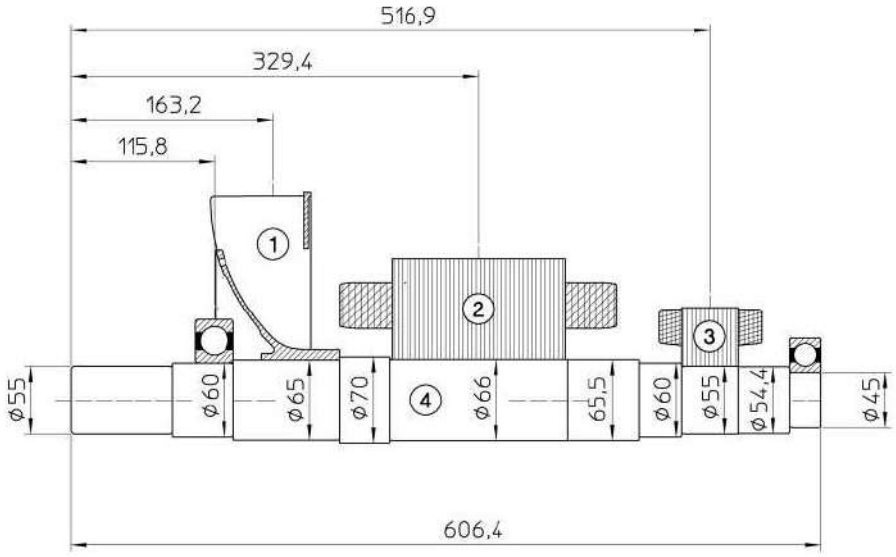
SAE N.	GIUNTI A DISCHI / DISC COUPLING DISCQUE DE MONOPALIER / SCHEIBENKUPPLUNG				
	d	L	Q1	S1	α1
6 1/2	215.9	30.2	200	9	60°
7 1/2	241.3	30.2	222.25	9	45°
8	263.52	62	244.47	11	60°
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°

SAE N.	FLANGIA / LANGE BRIDE / FLANSCH			
	O	P	Q	α
5	356	314.3	333.4	45°
4	402	362	381	30°
3	453	409.6	428.6	30°
2	490	447.7	466.7	30°
1	553	511.2	530.2	30°

1- REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2-REMOVABLE PANEL FOR ACCESS TO AVR
3-STANDARD HOLE ON FRONT FOR CABLE ENTRY ø48
4-PRE-CUT ON MAIN PANEL FOR CABLE ENTRY ø48
5-PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ø28
6-SCREW M6 FOR BODY EARTHING
(**)-GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11 1/2

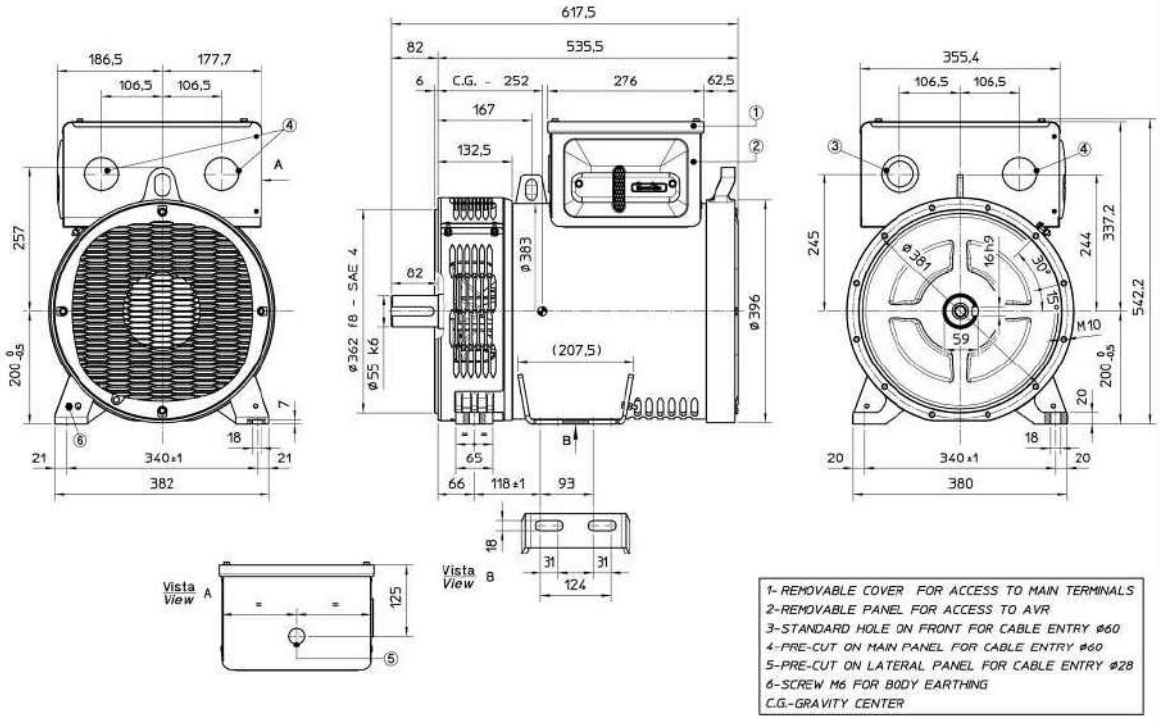
mi LHH Mi

TWO BEARING MOMENTS OF INERTIA



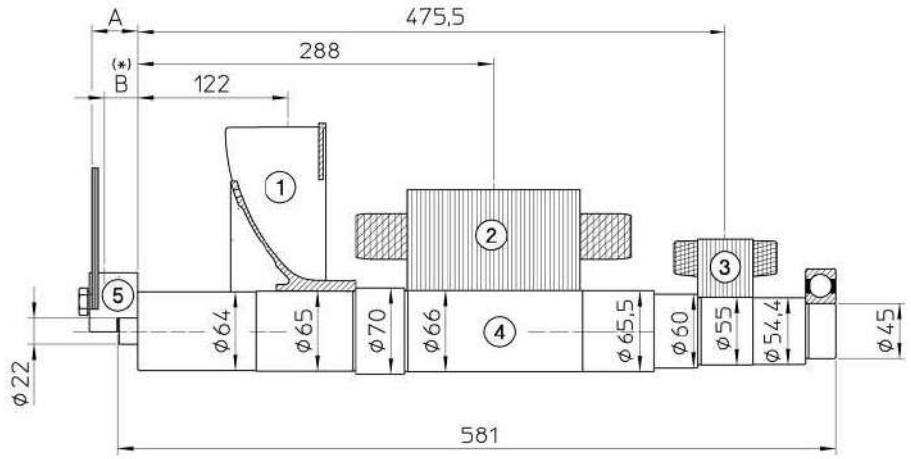
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	38.3	0.2567
3	EX. ROTOR	5.5	0.0172
4	SHAFT	13.7	0.0068
TOTAL		58.5	0.2921

TWO BEARING DIMENSIONS



mi LHH Mi

SINGLE BEARING MOMENTS OF INERTIA

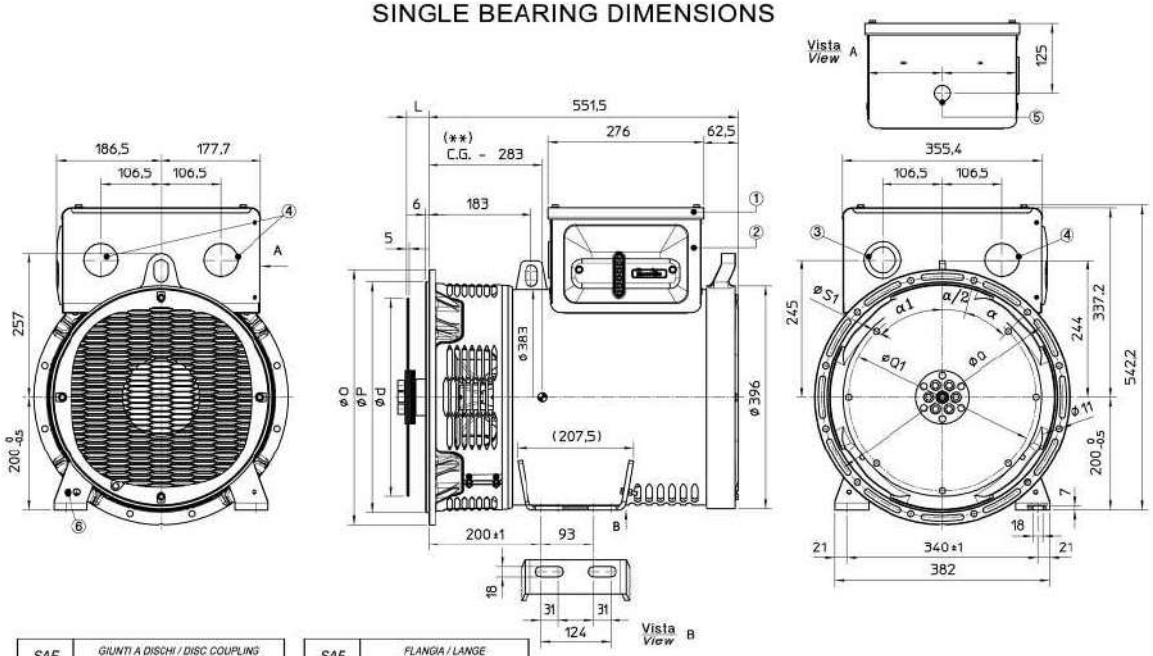


POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	38.3	0.2567
3	EX. ROTOR	5.5	0.0172
4	SHAFT	13.4	0.0068
TOTAL		58.2	0.2921

SAE N°	5 SHAFTS COUPLING FLEX PLATE A	B	WEIGHT kg	J kgm^2
6 1/2	5	2.2	1.7	0.0084
7 1/2	5	2.2	2.1	0.0130
8	36.6	25.9	4.0	0.0203
10	28.6	21.6	4.5	0.0385
11 1/2	15	11.5	4.5	0.0590

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS



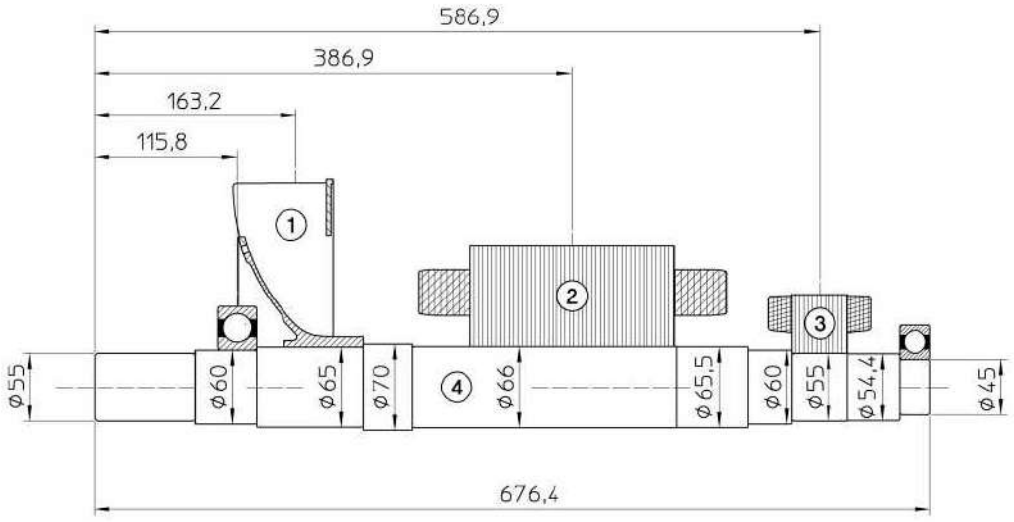
SAE N.	GIUNTI A DISCHI / DISC COUPLING DISCQUE DE MONOPALIER / SCHEIBENKUPPLUNG d	L	Q1	S1	α1
6 1/2	215.9	30.2	200	9	60°
7 1/2	241.3	30.2	222.25	9	45°
8	263.52	62	244.47	11	60°
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°

SAE N.	FLANGIA / LANGE BRIDE / FLANSCH O	P	Q	α
5	356	314.3	333.4	45°
4	402	362	381	30°
3	453	409.6	428.6	30°
2	490	447.7	466.7	30°
1	553	511.2	530.2	30°

1- REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2-REMOVABLE PANEL FOR ACCESS TO AVR
3-STANDARD HOLE ON FRONT FOR CABLE ENTRY ϕ60
4-PRE-CUT ON MAIN PANEL FOR CABLE ENTRY ϕ60
5-PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ϕ28
6-SCREW M6 FOR BODY EARTHING
(**)-GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11 1/2

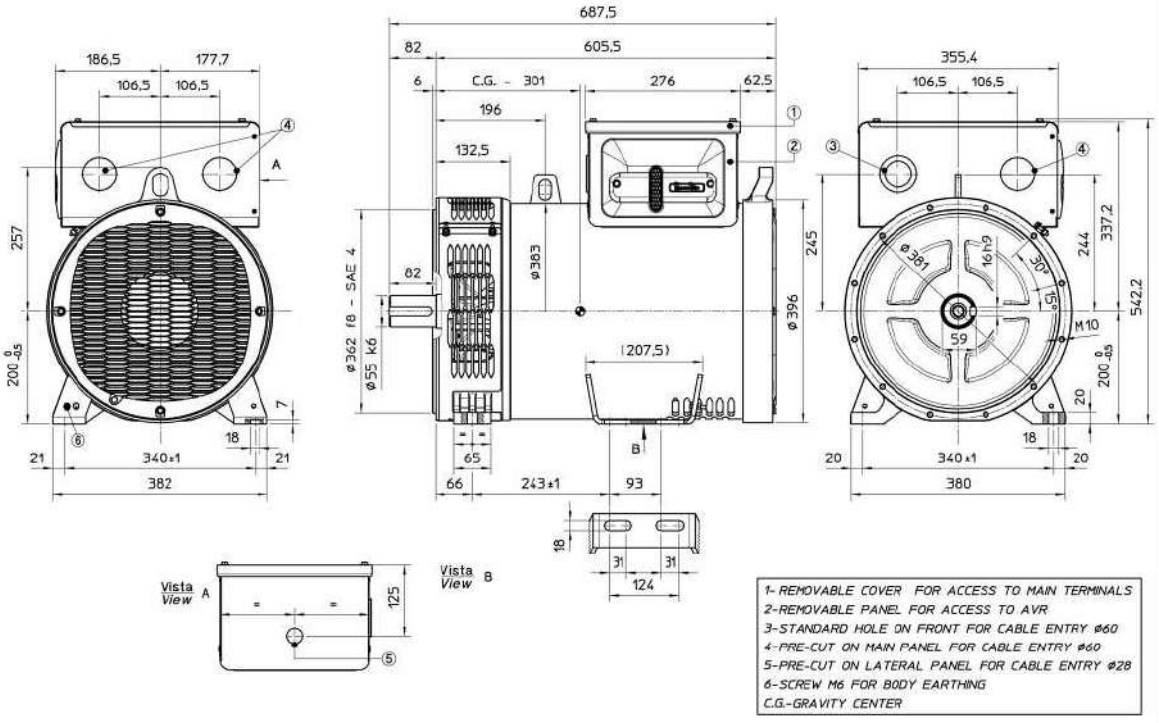
mi LHGv Mi

TWO BEARING MOMENTS OF INERTIA



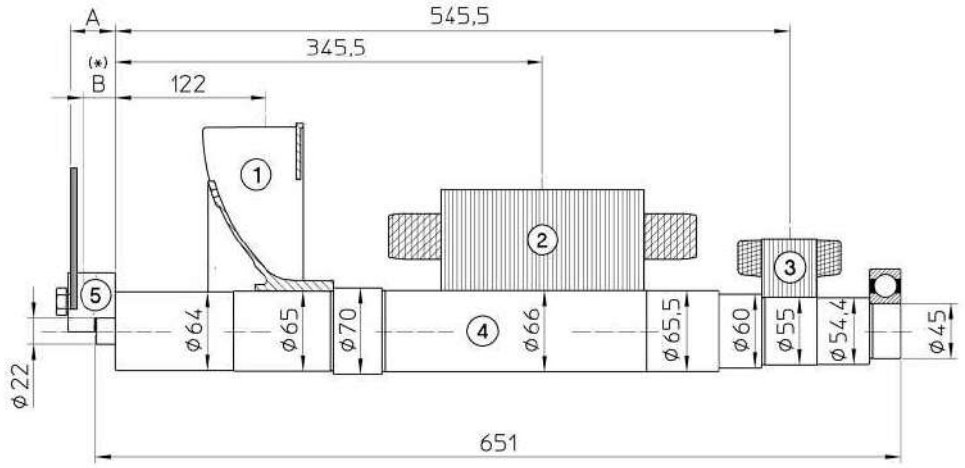
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	44.1	0.2955
3	EX. ROTOR	5.5	0.0172
4	SHAFT	15.5	0.0077
TOTAL		66.1	0.3318

TWO BEARING DIMENSIONS



mi LHGv Mi

SINGLE BEARING MOMENTS OF INERTIA

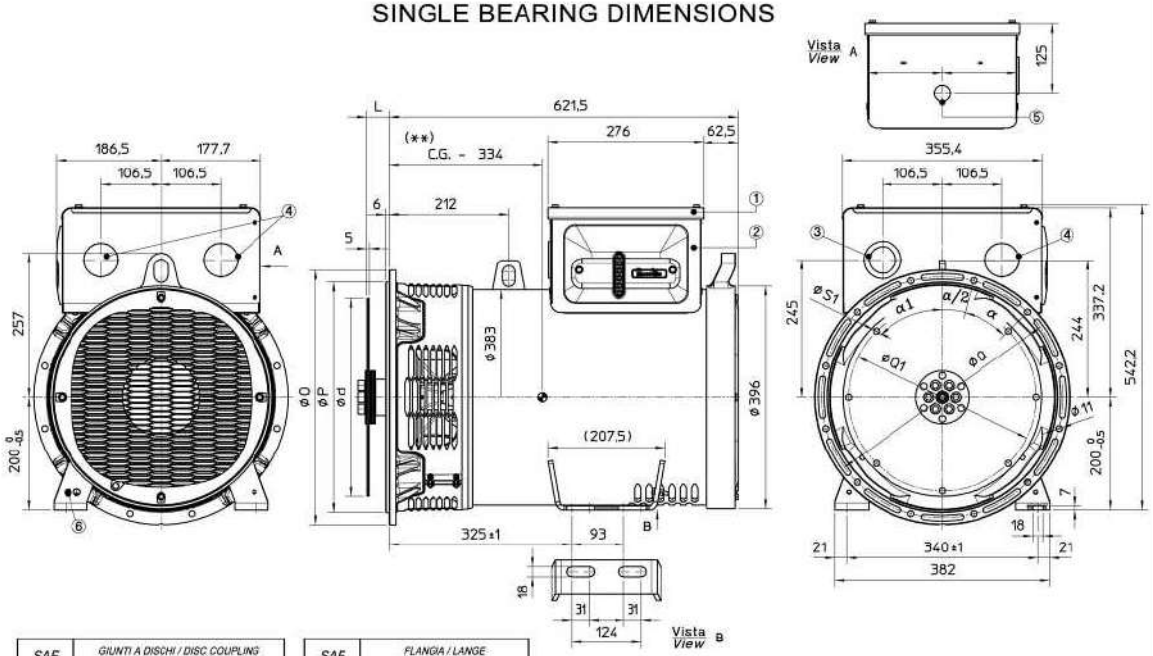


POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	44.1	0.2955
3	EX. ROTOR	5.5	0.0172
4	SHAFT	15.2	0.0078
TOTAL		65.8	0.3319

SAE	5 SHAFTS COUPLING FLEX PLATE			
N°	A	B	WEIGHT kg	J kgm^2
6 1/2	5	2.2	1.7	0.0084
7 1/2	5	2.2	2.1	0.0130
8	36.6	25.9	4.0	0.0203
10	28.6	21.6	4.5	0.0385
11 1/2	15	11.5	4.5	0.0590

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS



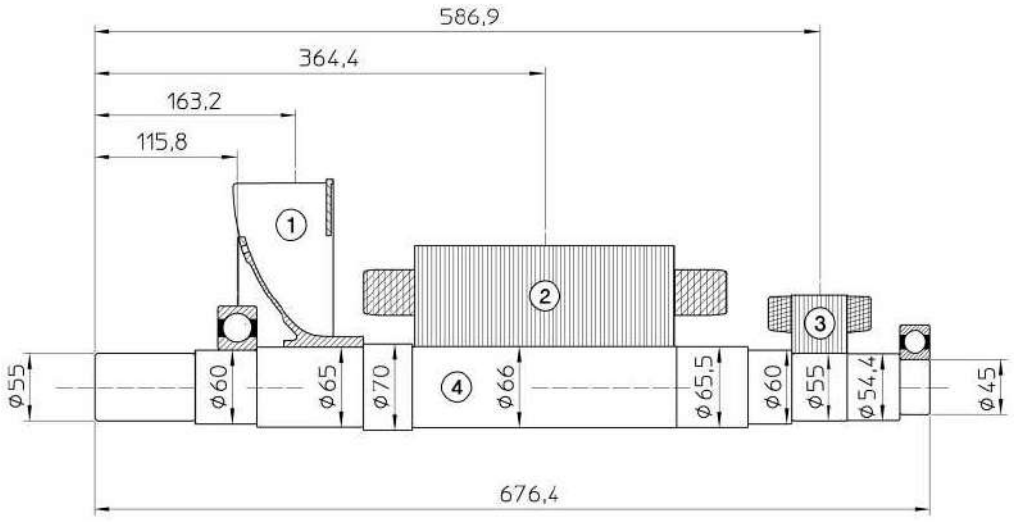
SAE N.	GIUNTI A DISCHI / DISC COUPLING DISCOUE DE MONOPALIER / SCHEIBENKUPPLUNG				
	d	L	Q1	S1	α1
6 1/2	215.9	30.2	200	9	60°
7 1/2	241.3	30.2	222.25	9	45°
8	263.52	62	244.47	11	60°
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°

SAE N.	FLANGIA / LANGE BRIDE / FLANSCH			
	O	P	Q	α
5	356	314.3	333.4	45°
4	402	362	381	30°
3	453	409.6	428.6	30°
2	490	447.7	466.7	30°
1	553	511.2	530.2	30°

1- REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2-REMOVABLE PANEL FOR ACCESS TO AVR
3-STANDARD HOLE ON FRONT FOR CABLE ENTRY ø60
4-PRE-CUT ON MAIN PANEL FOR CABLE ENTRY ø60
5-PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ø28
6-SCREW M6 FOR BODY EARTHING
(**)-GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11 1/2

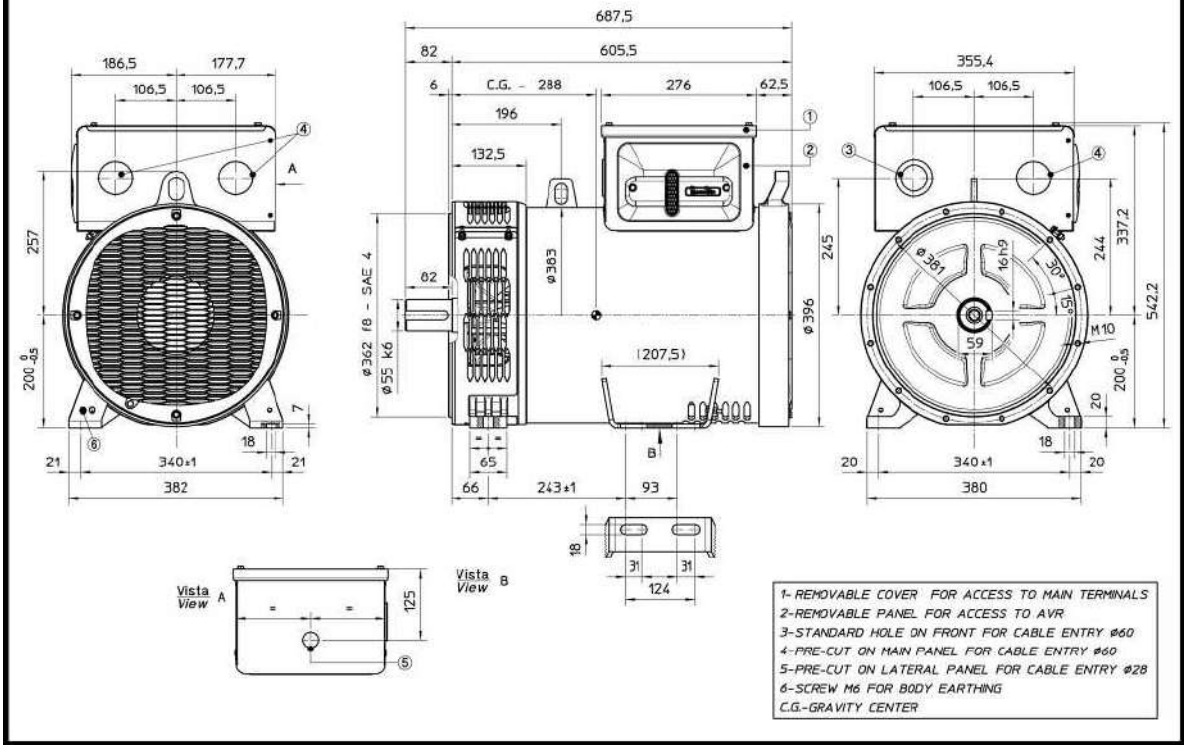
mi LHHv Mi

TWO BEARING MOMENTS OF INERTIA



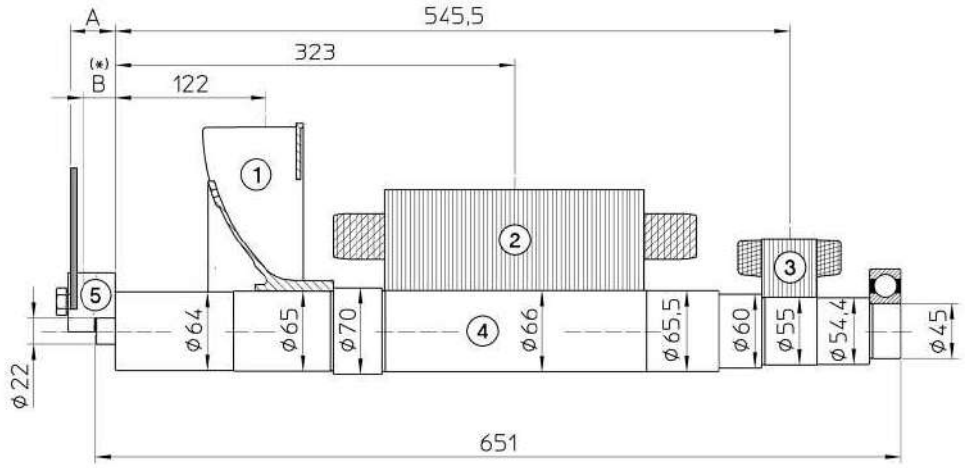
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	54.3	0.3629
3	EX. ROTOR	5.5	0.0172
4	SHAFT	15.5	0.0077
TOTAL		76.3	0.3992

TWO BEARING DIMENSIONS



mi LHHv Mi

SINGLE BEARING MOMENTS OF INERTIA

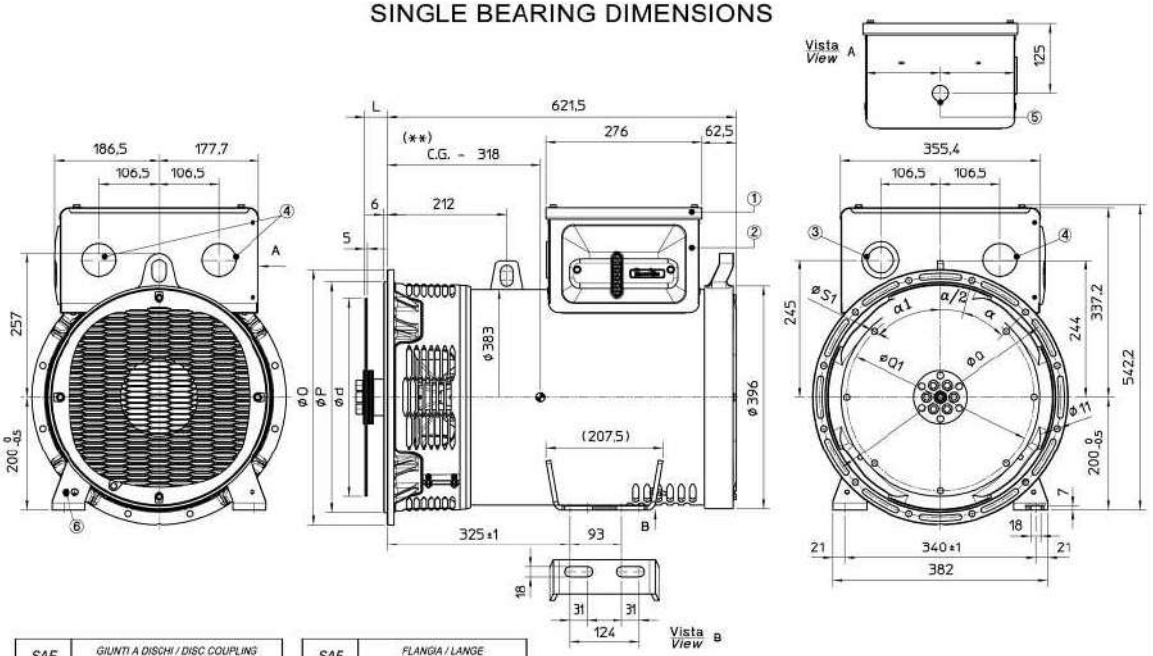


POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	54.3	0.3629
3	EX. ROTOR	5.5	0.0172
4	SHAFT	15.2	0.0078
TOTAL		76.0	0.3993

SAE	5 SHAFTS COUPLING FLEX PLATE			
N°	A	B	WEIGHT kg	J kgm^2
6 1/2	5	2.2	1.7	0.0084
7 1/2	5	2.2	2.1	0.0130
8	36.6	25.9	4.0	0.0203
10	28.6	21.6	4.5	0.0385
11 1/2	15	11.5	4.5	0.0590

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS



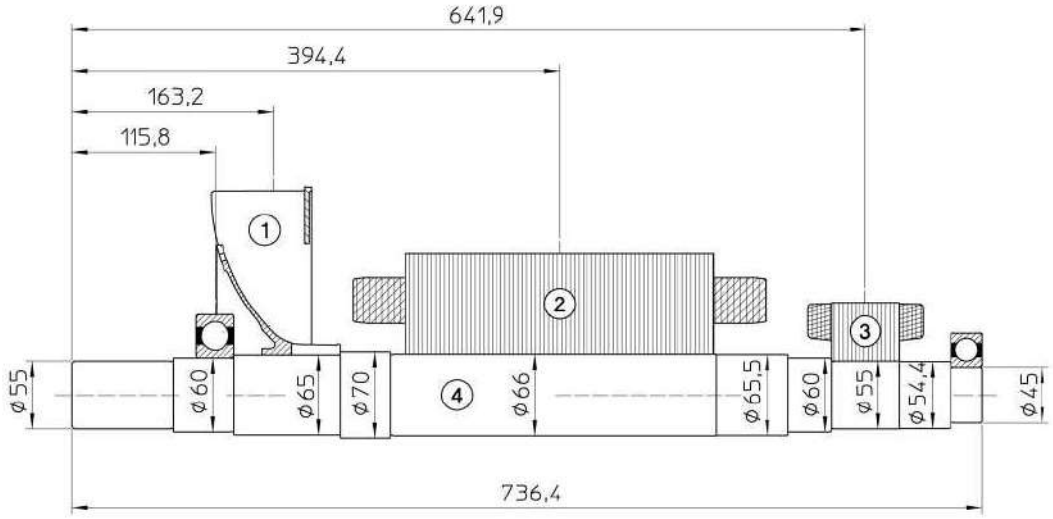
SAE N.	GIUNTI A DISCHI / DISC COUPLING DISCQUE DE MONOPALIER / SCHEIBENKUPPLUNG				
	d	L	Q1	S1	α1
6 1/2	215.9	30.2	200	9	60°
7 1/2	241.3	30.2	222.25	9	45°
8	263.52	62	244.47	11	60°
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°

SAE N.	FLANGIA / LANGE BRIDE / FLANSCH			
	O	P	Q	α
5	356	314.3	333.4	45°
4	402	362	381	30°
3	453	409.6	428.6	30°
2	490	447.7	466.7	30°
1	553	511.2	530.2	30°

1- REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2-REMOVABLE PANEL FOR ACCESS TO AVR
3-STANDARD HOLE ON FRONT FOR CABLE ENTRY ø60
4-PRE-CUT ON MAIN PANEL FOR CABLE ENTRY ø60
5-PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ø28
6-SCREW M6 FOR BODY EARTHING
(**)-GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11 1/2

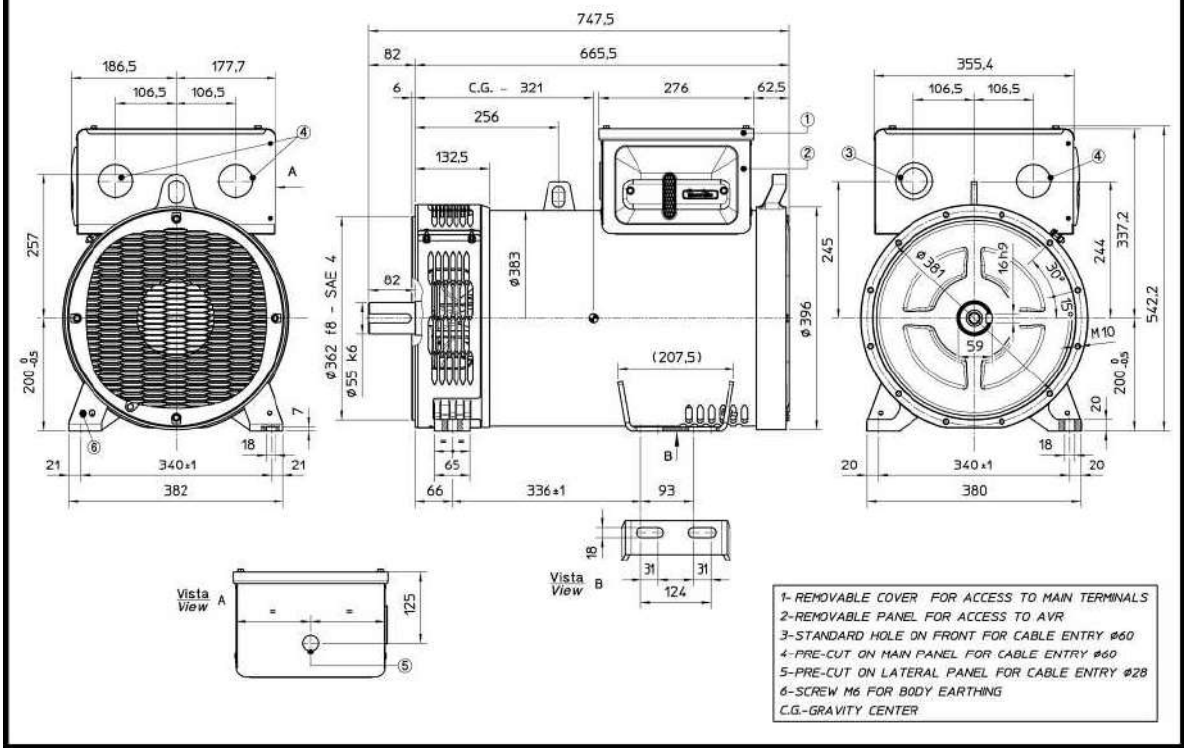
mi LHGuMi

TWO BEARING MOMENTS OF INERTIA



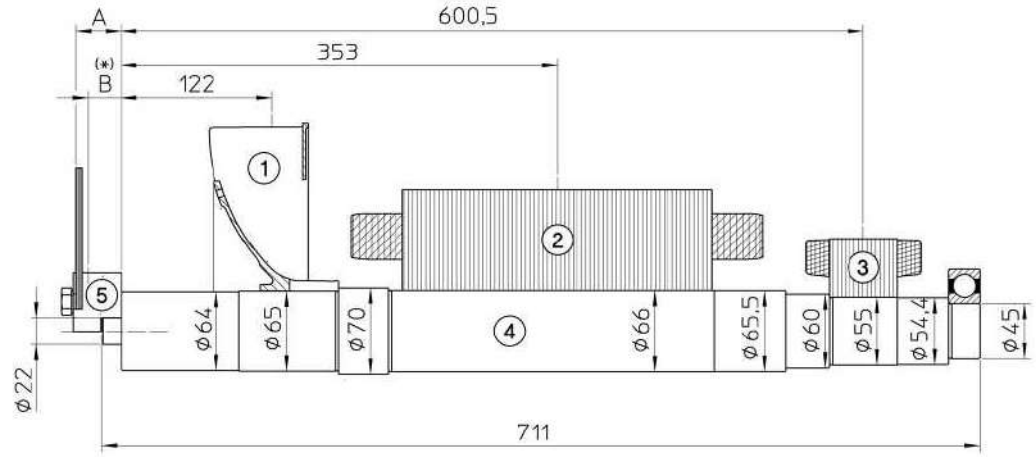
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	63.3	0.4225
3	EX. ROTOR	6.5	0.0203
4	SHAFT	17.0	0.0085
TOTAL		87.8	0.4267

TWO BEARING DIMENSIONS



mi LHGuMi

SINGLE BEARING MOMENTS OF INERTIA

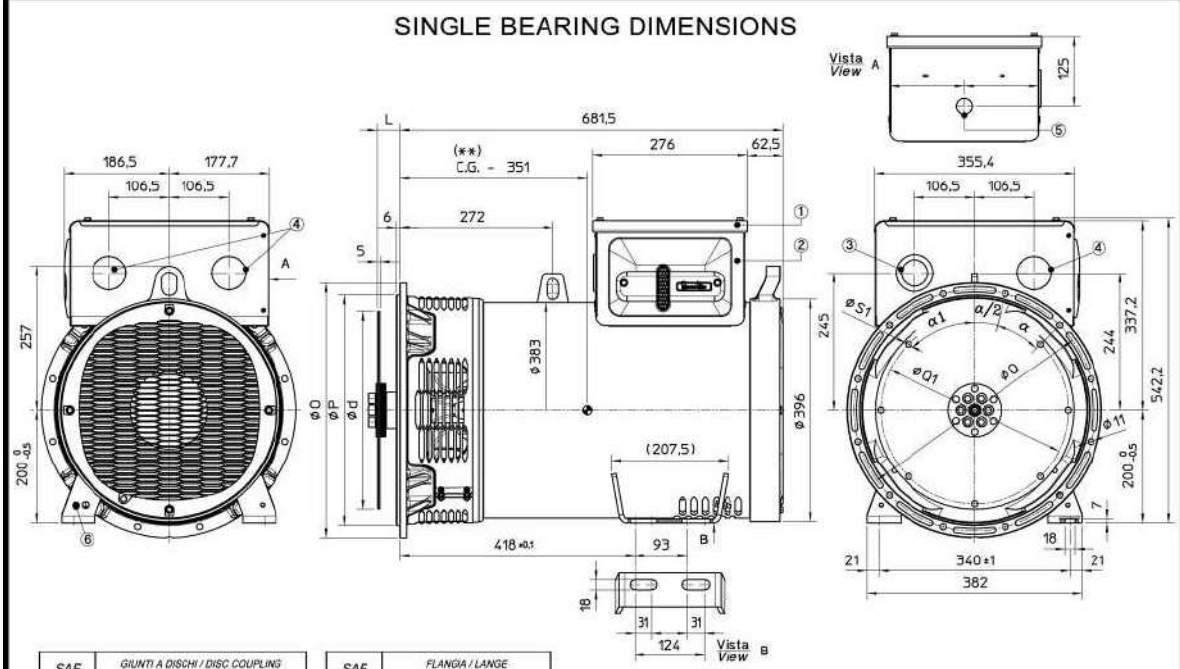


POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	63.3	0.4225
3	EX. ROTOR	6.5	0.0203
4	SHAFT	16.7	0.0086
TOTAL		87.5	0.4628

SAE	5 SHAFTS COUPLING FLEX PLATE			
N°	A	B	WEIGHT kg	J kgm^2
6 1/2	5	2.2	1.7	0.0084
7 1/2	5	2.2	2.1	0.0130
8	36.6	25.9	4.0	0.0203
10	28.6	21.6	4.5	0.0385
11 1/2	15	11.5	4.5	0.0590

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS



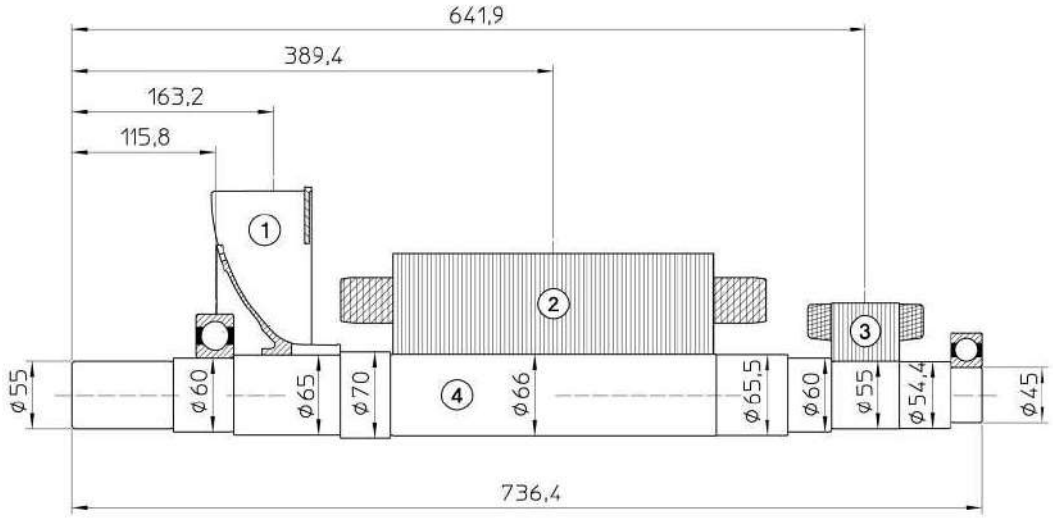
SAE N.	GIUNTI A DISCHI / DISC COUPLING DISCOUE DE MONOPALIER / SCHEIBENKUPPLUNG				
	d	L	Q1	S1	α1
6 1/2	215.9	30.2	200	9	60°
7 1/2	241.3	30.2	222.25	9	45°
8	263.52	62	244.47	11	60°
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°

SAE N.	FLANGIA / LANGE BRIDE / FLANSCH			
	O	P	Q	α
5	356	314.3	333.4	45°
4	402	362	381	30°
3	453	409.6	428.6	30°
2	490	447.7	466.7	30°
1	553	511.2	530.2	30°

1- REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2-REMOVABLE PANEL FOR ACCESS TO AVR
3-STANDARD HOLE ON FRONT FOR CABLE ENTRY ø60
4-PRE-CUT ON MAIN PANEL FOR CABLE ENTRY ø60
5-PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ø28
6-SCREW M6 FOR BODY EARTHING
(**)-GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11 1/2

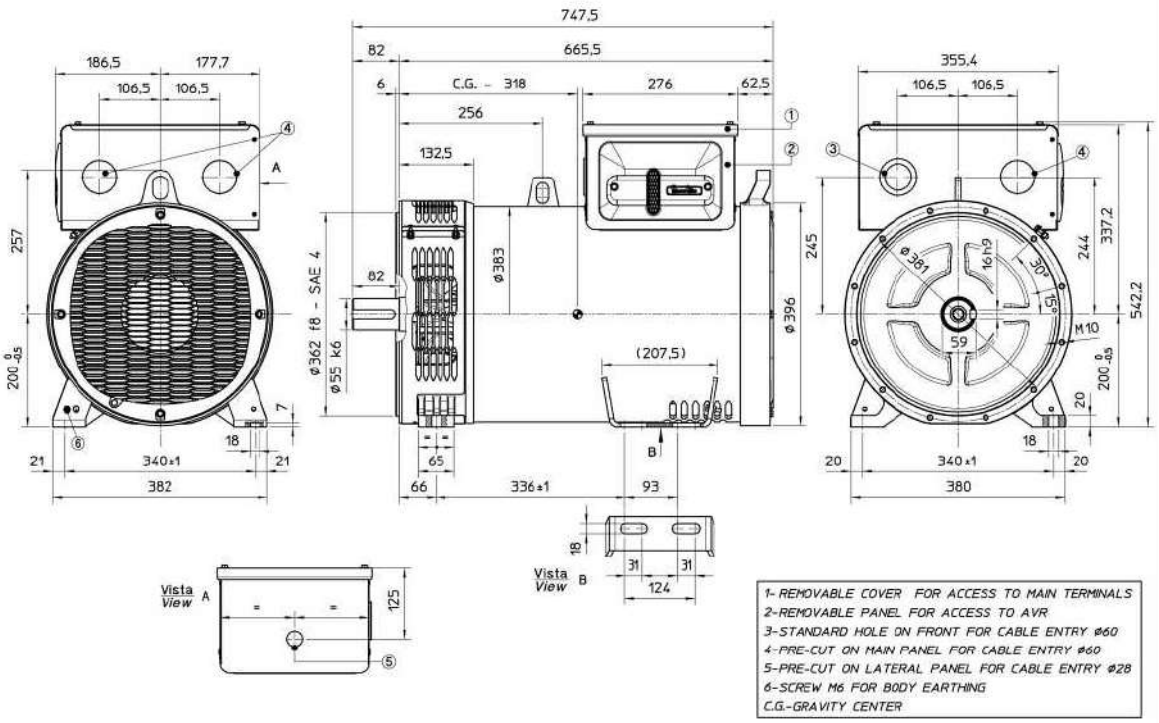
mi LH HuMi

TWO BEARING MOMENTS OF INERTIA



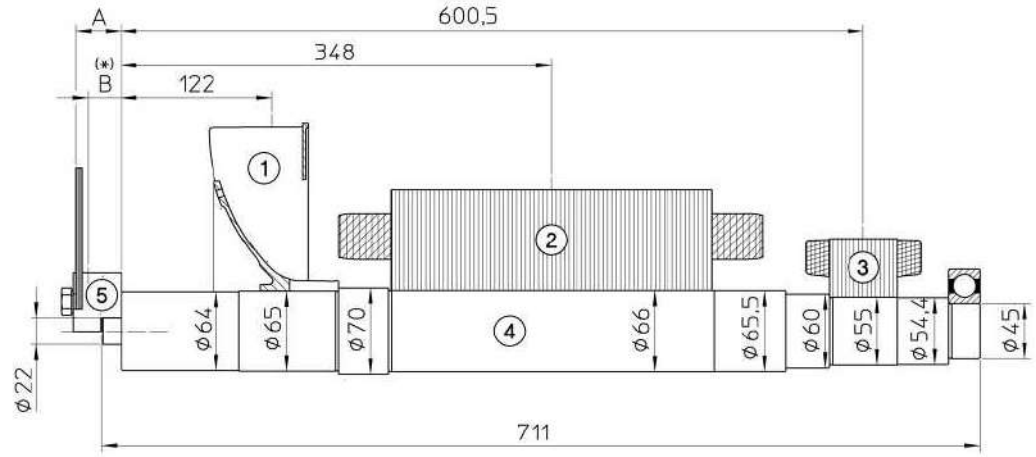
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	65.7	0.4387
3	EX. ROTOR	6.5	0.0203
4	SHAFT	17.0	0.0085
TOTAL		90.2	0.4789

TWO BEARING DIMENSIONS



mi LHHuMi

SINGLE BEARING MOMENTS OF INERTIA

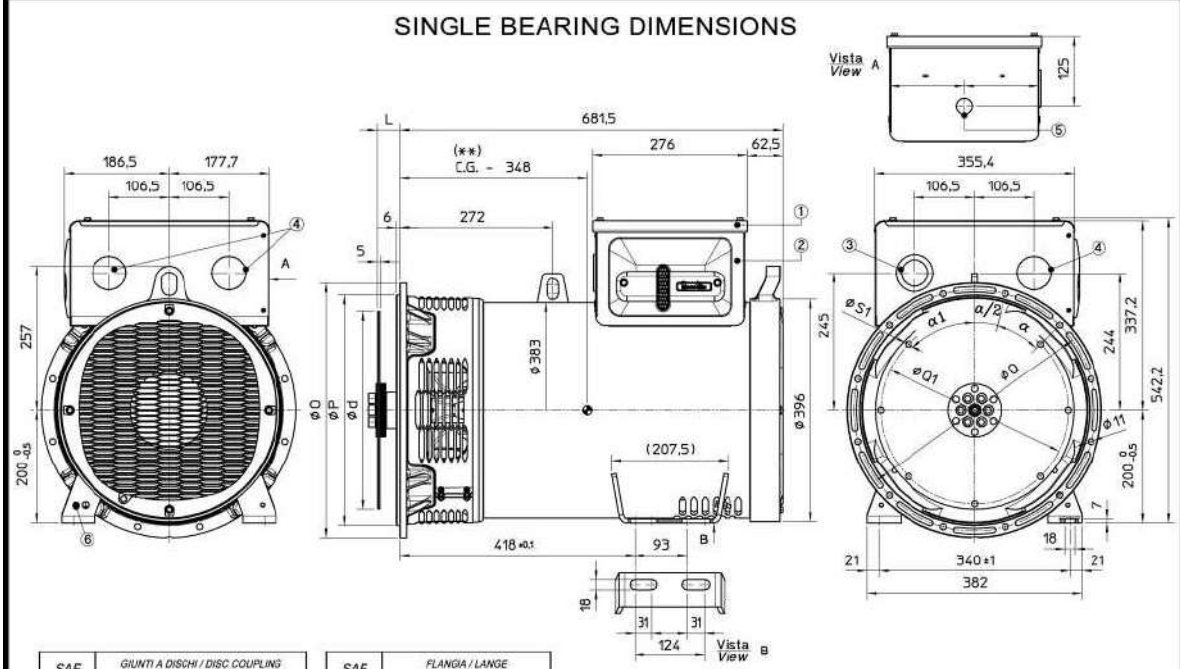


POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.0	0.0114
2	MAIN ROTOR	65.7	0.4387
3	EX. ROTOR	6.5	0.0203
4	SHAFT	16.7	0.0086
TOTAL		89.9	0.4790

SAE	5 SHAFTS COUPLING FLEX PLATE			
N°	A	B	WEIGHT kg	J kgm^2
6 1/2	5	2.2	1.7	0.0084
7 1/2	5	2.2	2.1	0.0130
8	36.6	25.9	4.0	0.0203
10	28.6	21.6	4.5	0.0385
11 1/2	15	11.5	4.5	0.0590

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS



SAE N.	GIUNTI A DISCHI / DISC COUPLING DISCOUE DE MONOPALIER / SCHEIBENKUPPLUNG				
	d	L	Q1	S1	α1
6 1/2	215.9	30.2	200	9	60°
7 1/2	241.3	30.2	222.25	9	45°
8	263.52	62	244.47	11	60°
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°

SAE N.	FLANGIA / LANGE BRIDE / FLANSCH			
	O	P	Q	α
5	356	314.3	333.4	45°
4	402	362	381	30°
3	453	409.6	428.6	30°
2	490	447.7	466.7	30°
1	553	511.2	530.2	30°

1- REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2-REMOVABLE PANEL FOR ACCESS TO AVR
3-STANDARD HOLE ON FRONT FOR CABLE ENTRY ø60
4-PRE-CUT ON MAIN PANEL FOR CABLE ENTRY ø60
5-PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ø28
6-SCREW M6 FOR BODY EARTHING
(**)-GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11 1/2

x

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