mecc alte

Totally Focused. Totally Independent.

Technical Guide

RPa: ; ; P

C-TYPE

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

c w 5;

General Data

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)

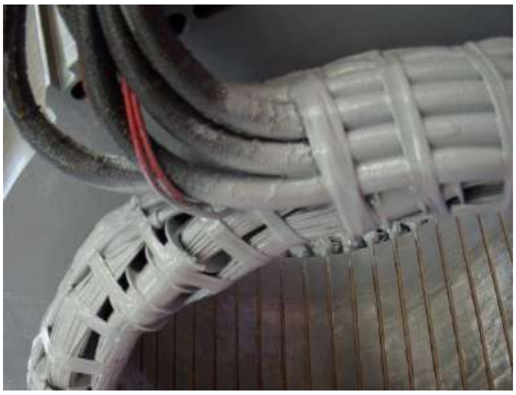
- 6 wire reconnectable:
  50Hz – 380V to 440V and 220V to 240V (de-rates may apply at certain voltages)
  60Hz – 380V to 480V and 220V to 240V (de-rates may apply at certain voltages)

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.

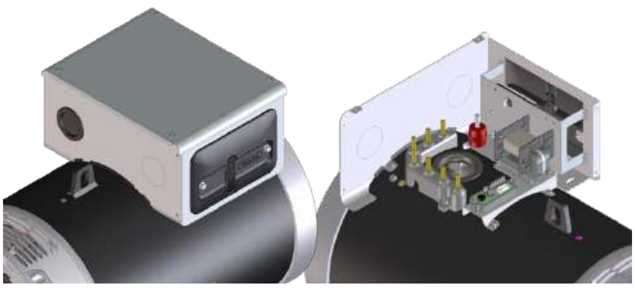
Info: https://www.meccalte.com/downloads/MA0605_Bulletin_IP.pdf

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

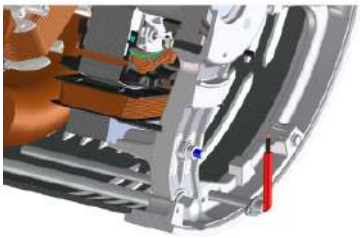
The Mecc Alte PMG is available on ECP28, ECP32, ECP34 and ECO38 as factory-fitted option; alternatively, only the predisposition for the retrofit, for subsequent assembly, is available on option. On series ECO40 is available as a factory-fitted or retro-fitted options.

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	Va9:
] tw x °w	88	] QROws ° y w	@889c d
R wu °	O z w	QROws ° y w	@8,59c d
cwy s w	Qdc	[s ° ^ w ww	99=7
h ° v° y °uz	96:	N ° vw	748777
P vw syw wwww uw	e7;7=d:	Os s u° y	Vd^8C;748

NEp

gN6 h Mew 5c° w6N t'w P475BaS																				
	deN] QOk48@ 69A				deN] QOk48=76; 7				U489=6; 7				S487=6; 7				04B76; 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 w d 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	887g	88Ag	887g	88=g	887g	88Ag	887g	88=g	887g	88Ag	887g	88=g	887g	88Ag	887g	88=g	887g	88Ag
WkS k	96	**96**	96	79	93	**93**	93	77	87,5	**87,5**	87,5	72	79	**79**	79	65	70	**70**	70	58
	77	**77**	77	63	74	**74**	74	62	70	**70**	70	58	63	**63**	63	52	56	**56**	56	46
WkV k	110	**110**	110	88	105	**105**	105	86	100	**100**	100	80	90	**90**	90	72	80	**80**	80	64
	88	**88**	88	70	84	**84**	84	69	80	**80**	80	64	72	**72**	72	58	64	**64**	64	51
WkS k	137	**137**	137	117	132	**132**	132	112	125	**125**	125	106	112	**112**	112	96	100	**100**	100	85
	110	**110**	110	94	106	**106**	106	90	100	**100**	100	85	90	**90**	90	77	80	**80**	80	68
WkV k	148	**148**	148	125	143	**143**	143	120	135	**135**	135	114	121	**121**	121	103	108	**108**	108	91
	118	**118**	118	100	114	**114**	114	96	108	**108**	108	91	97	**97**	97	82	86	**86**	86	73
WkS k	165	**165**	165	137	158	**158**	158	131	150	**150**	150	125	136	**136**	136	113	120	**120**	120	100
	132	**132**	132	110	126	**126**	126	105	120	**120**	120	100	109	**109**	109	90	96	**96**	96	80
WkV k	176	**181**	181	170	169	**174**	174	163	160	**165**	165	155	144	**149**	149	139	128	**132**	132	124
	141	**145**	145	136	135	**139**	139	130	128	**132**	132	124	115	**119**	119	111	102	**106**	106	99

PEp

gN6 h Mew 5c° w6N t'w P475BaS																				
	deN] QOk48@ 69A				deN] QOk48=76; 7				U489=6; 7				S487=6; 7				04B76; 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 w d 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	887g	88Ag	8:g	8Bg	887g	88Ag	8:g	8Bg	887g	88Ag	8:g	8Bg	887g	88Ag	8:g	8Bg	887g	88Ag	8:g	8Bg
WkS k	108	115	115	**115**	104	111	111	**111**	98	105	105	**105**	88	95	95	**95**	78	84	84	**84**
	86	92	92	**92**	83	89	89	**89**	78	84	84	**84**	70	76	76	**76**	62	67	67	**67**
WkV k	120	132	132	**132**	114	126	126	**126**	110	120	120	**120**	99	109	109	**109**	88	96	96	**96**
	96	106	106	**106**	91	101	101	**101**	88	96	96	**96**	79	87	87	**87**	70	77	77	**77**
WkS k	143	154	165	**165**	137	147	159	**159**	130	140	150	**150**	116	125	135	**135**	104	112	120	**120**
	114	123	132	**132**	110	118	127	**127**	104	112	120	**120**	93	100	108	**108**	83	90	96	**96**
WkV k	154	165	178	**178**	148	159	172	**172**	140	150	162	**162**	125	135	146	**146**	112	120	130	**130**
	123	132	142	**142**	118	127	138	**138**	112	120	130	**130**	100	108	117	**117**	90	96	104	**104**
WkS k	165	187	198	**198**	158	178	189	**189**	150	170	180	**180**	132	150	163	**163**	120	136	144	**144**
	132	150	158	**158**	126	142	151	**151**	120	136	144	**144**	106	120	130	**130**	96	109	115	**115**
WkV k	187	210	218	**218**	179	201	208	**208**	170	191	198	**198**	155	165	178	**178**	136	153	158	**158**
	150	168	174	**174**	143	161	166	**166**	136	153	158	**158**	124	132	142	**142**	109	122	126	**126**

2 Ai p DMEE

f s s w / w5R] @7:; 4; 0			RPa:; 8d; P	RPa:; 9d; P	RPa:; 8[; P	RPa:; 9[; P	RPa:; 8Z; P	RPa:; 9Z; P
Xd	Q° wu 4s ° uz wsu s uw	%	324	241,2	281,3	327,6	225,3	220,4
X'd	Q° wu 4s ° s 'w wsu s uw	%	22,3	18,4	21,5	22,8	13,9	18,2
X''d	Q° wu 4s ° t s 'w wsu s uw	%	7,4	6	7	11,1	5,8	7,7
Xq	b sv s w4s ° uz wsu s uw	%	170,2	157	183,2	200,9	114,8	150,3
X'q	b sv s w4s ° s 'w wsu s uw	%	170,2	157	183,2	200,9	114,8	150,3
X''q	b sv s w4s ° t s 'w wsu s uw	%	29,5	32,7	38,2	41,5	24,9	32,6
X_2	] wys ° w4 w w uw wsu s uw	%	17,8	18,8	22	25,7	14,8	19,5
X_0	l w w w uw wsu s uw	%	3,59	3,67	4,29	3,97	2,35	3,12
ds s w								
Xd	Q° wu 4s ° uz wsu s uw	%	275,4	205	239,1	278,5	191,5	187,3
X'd	Q° wu 4s ° s 'w wsu s uw	%	19	15,6	18,3	19,4	11,8	15,5
X''d	Q° wu 4s ° t s 'w wsu s uw	%	6,29	5,1	5,95	9,43	4,93	6,54
Xq	b sv s w4s ° uz wsu s uw	%	144,7	133,4	155,7	170,8	97,6	127,8
X'q	b sv s w4s ° s 'w wsu s uw	%	144,7	133,4	155,7	170,8	97,6	127,8
X''q	b sv s w4s ° t s 'w wsu s uw	%	25,1	27,8	32,5	35,3	21,2	27,7
X_2	] wys ° w4 w w uw wsu s uw	%	15,1	16	18,7	21,8	12,6	16,6
X_0	l w w w uw wsu s uw	%	3,59	3,67	4,29	3,97	2,35	3,12

Kcc	dz u°u ° s °		0,36	0,49	0,42	0,36	0,52	0,53
T'd	e s 'w ° wu s	sec	0,056	0,059	0,069	0,085	0,053	0,073
T''d	d t s 'w ° wu s	sec	0,012	0,014	0,017	0,019	0,011	0,014
T'do	^ w u°u ° ° wu s	sec	0,82	0,77	0,9	1,22	0,86	0,88
Tα	N s w ° wu s	sec	0,016	0,018	0,021	0,026	0,017	0,02

g Ai p DMEE

Io	R u°s ° u w s sv	A	0,7	0,5	0,6	0,5	0,7	0,6
Ic	R u°s ° u w s x sv	A	2,7	2,4	2,7	2,6	2,9	2,8
^ w sv			8z ° s @z w° v 887, s w sv					
^ w sv w 97 wu5		,	300					
Uws v° ° s °		W	5922	6957	8342	8254	8755	10088
eww z wUs °uSsu 4eUS		%	<2	<2	<2	<2	<2	<2
h s wx Q° 5/eUQ0x sv ZZ6Z]		%	2,3 / 2,3	2,2 / 2,3	2 / 2,2	1,8 / 2	1,8 / 1,9	1,9 / 2
h s wx Q° 5/eUQ0 sv ZZ6Z]		%	2,5 / 2,9	2,9 / 3	2,8 / 3	2,7 / 3	2,7 / 2,9	2,7 / 2,9

2 Ai p DMRE

f s s w / wx5R] @7:; 4; 0			RPa:; 8d; P	RPa:; 9d; P	RPa:; 8[; P	RPa:; 9[; P	RPa:; 8Z; P	RPa:; 9Z; P
Xd	Q°wu4s° uz wsus uw	%	324	241,2	281,3	327,6	225,3	227,3
X'd	Q°wu4s° s 'w wsus uw	%	22,3	18,4	21,5	22,8	13,9	18,8
X''d	Q°wu4s° t s 'w wsus uw	%	7,4	6	7	11,1	5,8	7,94
Xq	b svs w4s° uz wsus uw	%	170,2	157	183,2	200,9	114,8	155
X'q	b svs w4s° s 'w wsus uw	%	170,2	157	183,2	200,9	114,8	155
X''q	b svs w4s° t s 'w wsus uw	%	29,5	32,7	38,2	41,5	24,9	33,6
X_2	] wys° w4 w w uw wsus uw	%	17,8	18,8	22	25,7	14,8	20,1
X_0	l w w w uw wsus uw	%	3,59	3,67	4,29	3,97	2,35	3,22
ds s w								
Xd	Q°wu4s° uz wsus uw	%	275,4	205	239,1	278,5	191,5	193,2
X'd	Q°wu4s° s 'w wsus uw	%	19	15,6	18,3	19,4	11,8	16
X''d	Q°wu4s° t s 'w wsus uw	%	6,29	5,1	5,95	9,43	4,93	6,75
Xq	b svs w4s° uz wsus uw	%	144,7	133,4	155,7	170,8	97,6	131,8
X'q	b svs w4s° s 'w wsus uw	%	144,7	133,4	155,7	170,8	97,6	131,8
X''q	b svs w4s° t s 'w wsus uw	%	25,1	27,8	32,5	35,3	21,2	28,6
X_2	] wys° w4 w w uw wsus uw	%	15,1	16	18,7	21,8	12,6	17,1
X_0	l w w w uw wsus uw	%	3,59	3,67	4,29	3,97	2,35	3,22

Kcc	dz u°u° s°		0,36	0,49	0,42	0,36	0,52	0,52
T'd	es 'w ° wu s	sec	0,056	0,059	0,069	0,085	0,053	0,073
T''d	dt s 'w ° wu s	sec	0,012	0,014	0,017	0,019	0,011	0,014
T'do	^ w u°u° ° wu s	sec	0,82	0,77	0,9	1,22	0,86	0,88
Tα	N s w° wu s	sec	0,016	0,018	0,021	0,026	0,017	0,02

g Ai p DMRE

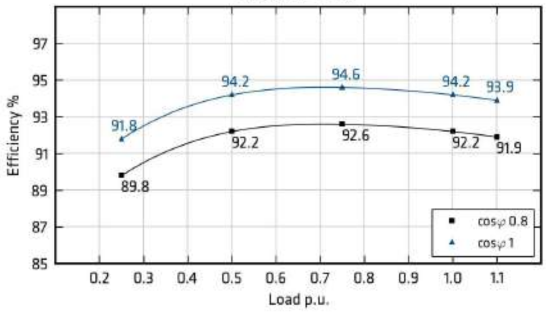
Io	Ru°s° u w s sv	A	0,7	0,5	0,6	0,5	0,7	0,6
Ic	Ru°s° u w s x sv	A	2,7	2,4	2,7	2,6	2,9	2,8
^ w sv			8z ° s @z w° v 887, s w sv					
^ w sv w 97 wu5		,	300					
Uws v° °s°		W	7603	8121	9730	9905	9846	10111
eww z wV wxws uwSsu 4e\5			<40	<40	<40	<40	<40	<40
hs wx Q° 5/eUQ0x sv ZZ6Z]		%	2,3 / 2,3	2,2 / 2,3	2 / 2,2	1,8 / 2	1,8 / 1,9	1,9 / 2
hs wx Q° 5/eUQ0 sv ZZ6Z]		%	2,5 / 2,9	2,9 / 3	2,8 / 3	2,7 / 3	2,7 / 2,9	2,7 / 2,9

m f NEp

[vw		: B7g =7U					; 77g =7U					; 8=g =7U					; ; 7g =7U				
		7 59=	7 5=	7 5A=	8	858	7 59=	7 5=	7 5A=	8	858	7 59=	7 5=	7 5A=	8	858	7 59=	7 5=	7 5A=	8	858
RPa: ; 8d; P	%	90,1	92,2	92,5	92,3	92,1	89,8	92,2	92,6	92,2	91,9	89,6	92,2	92,6	92,0	91,7	89,5	91,9	92,1	91,6	91,3
RPa: ; 9d; P	%	91,1	92,6	92,5	92,1	91,9	90,8	92,6	92,6	92,0	91,7	90,6	92,6	92,6	91,8	91,4	90,5	92,3	92,1	91,4	91,1
RPa: ; 8[; P	%	91,2	93,0	92,8	92,2	92,0	91,3	93,2	93,1	92,3	92,0	91,1	93,1	92,9	92,0	91,7	90,8	92,8	92,4	91,5	91,2
RPa: ; 9[; P	%	91,9	93,3	93,2	92,8	92,5	92,0	93,5	93,5	92,9	92,5	91,8	93,4	93,3	92,6	92,2	91,7	93,2	92,9	92,2	91,8
RPa: ; 8Z; P	%	93,0	93,5	93,5	93,1	92,8	92,9	93,7	93,7	93,2	92,9	92,5	93,5	93,5	92,8	92,5	92,5	93,3	93,1	92,5	92,2
RPa: ; 9Z; P	%	93,9	94,1	93,5	92,9	92,5	93,6	94,1	93,6	92,9	92,5	93,4	94,1	93,5	92,6	92,2	93,3	93,8	93,1	92,3	91,9

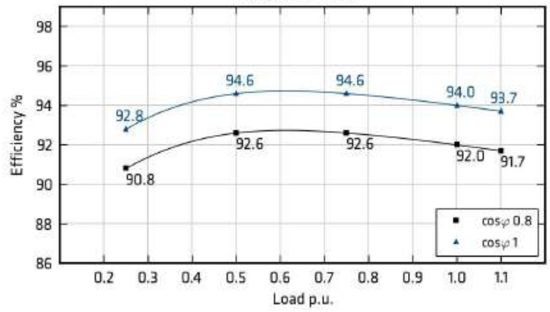
Wk S k

400/230 50Hz



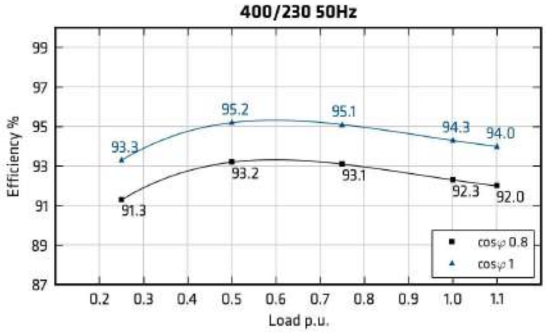
Wk V k

400/230 50Hz



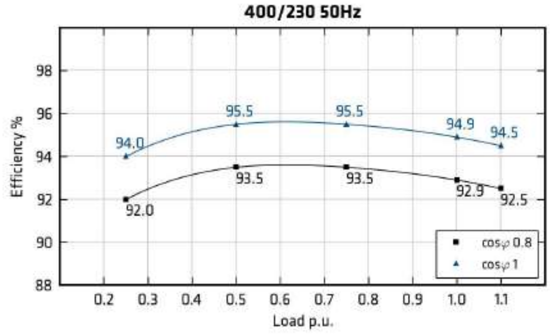
Wk S k

400/230 50Hz



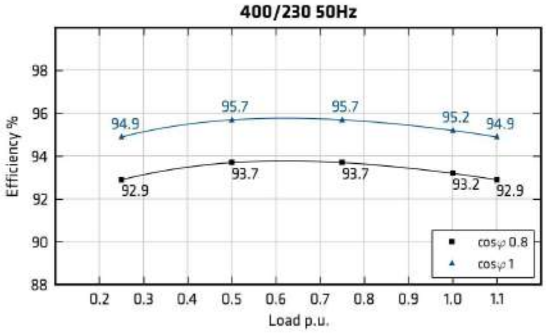
Wk V k

400/230 50Hz



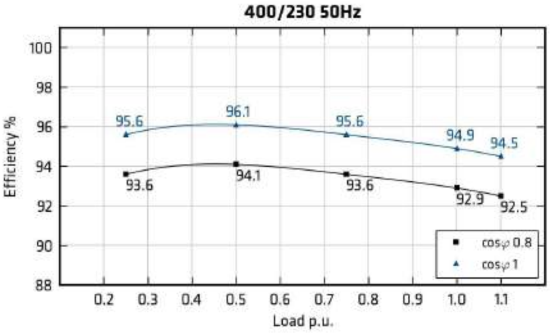
Wk S k

400/230 50Hz



Wk V k

400/230 50Hz



mi LMMi

m f PEp

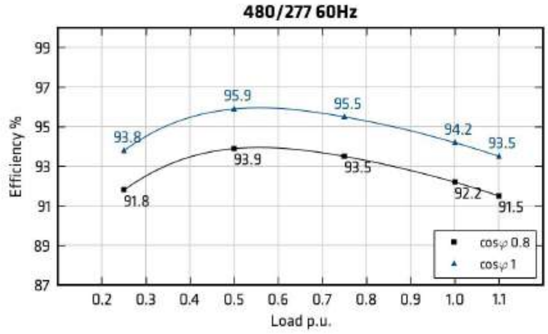
[vw		; 8=g @7U					; ; 7g @7U					; @7g @7U					; B7g @7U				
		7 59=	7 5=	7 5A=	8	858	7 59=	7 5=	7 5A=	8	858	7 59=	7 5=	7 5A=	8	858	7 59=	7 5=	7 5A=	8	858
RPa: ; 8d; P	%	91,6	93,2	92,8	91,1	90,3	91,6	93,3	92,9	91,5	91,0	91,6	93,4	93,2	91,8	91,3	91,3	93,4	93,2	91,7	91,1
RPa: ; 9d; P	%	92,1	93,7	93,1	91,6	90,6	92,1	93,8	93,2	92,1	91,4	92,1	93,9	93,5	92,3	91,5	91,8	93,9	93,5	92,2	91,5
RPa: ; 8[; P	%	92,5	94,0	93,3	91,7	91,0	92,6	94,2	93,7	92,1	91,2	92,6	94,3	94,0	92,4	91,7	92,5	94,5	94,1	92,5	91,8
RPa: ; 9[; P	%	92,9	94,4	93,6	92,0	91,3	93,1	94,7	94,1	92,5	91,8	93,1	94,8	94,4	92,8	92,0	93,0	95,0	94,5	92,9	92,2
RPa: ; 8Z; P	%	94,0	95,0	94,1	92,9	92,5	94,0	95,1	94,4	93,3	92,9	93,9	95,1	94,4	93,5	93,1	93,8	95,3	94,6	93,6	93,2
RPa: ; 9Z; P	%	95,2	95,5	94,6	93,4	92,8	95,2	95,6	94,8	93,8	93,3	95,2	95,7	94,9	94,0	93,4	94,9	95,7	95,0	94,0	93,5

Wk S k

480/277 60Hz

Wk V k

480/277 60Hz

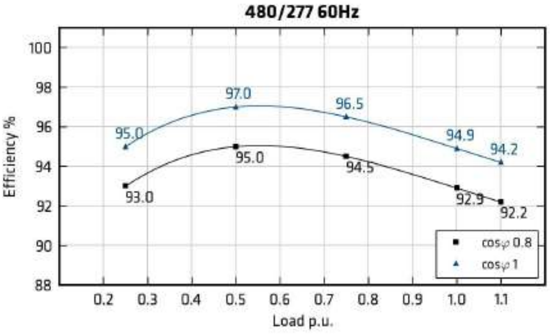


Wk S k

480/277 60Hz

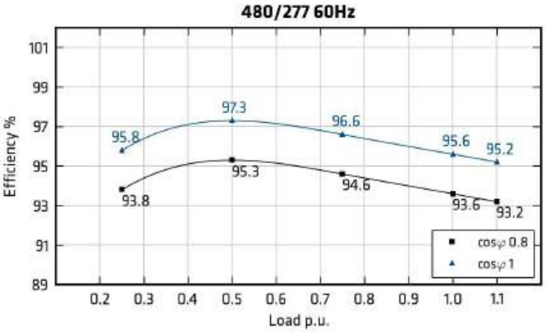
Wk V k

480/277 60Hz



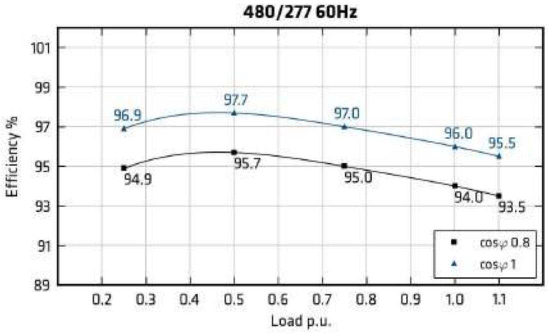
Wk S k

480/277 60Hz

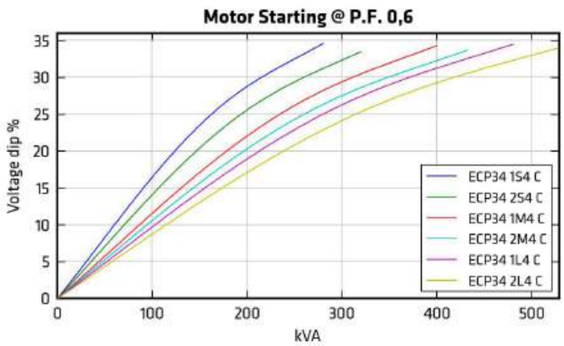


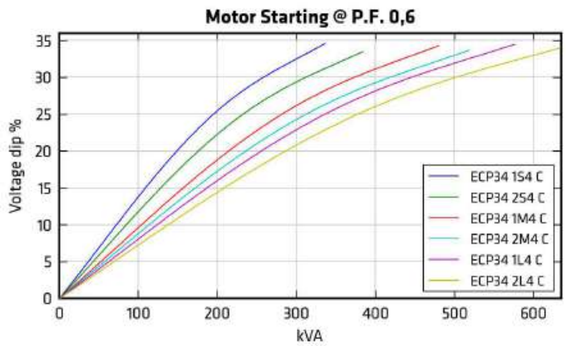
Wk V k

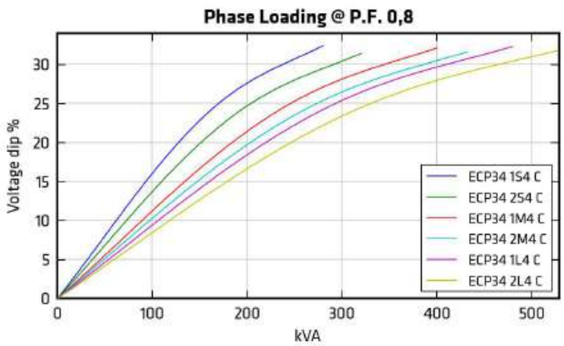
480/277 60Hz

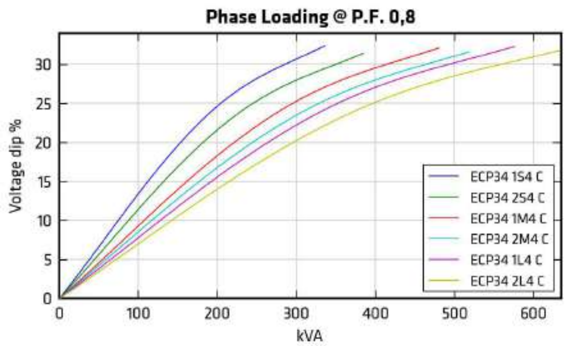


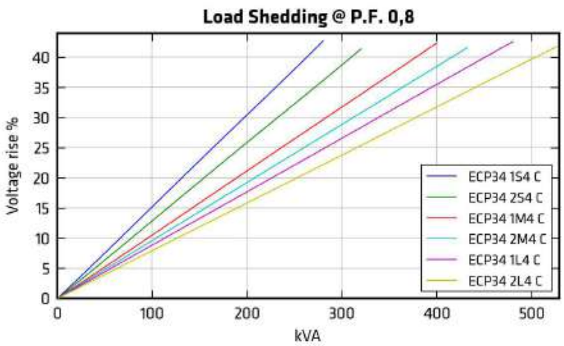
kPP HzP	k P H P

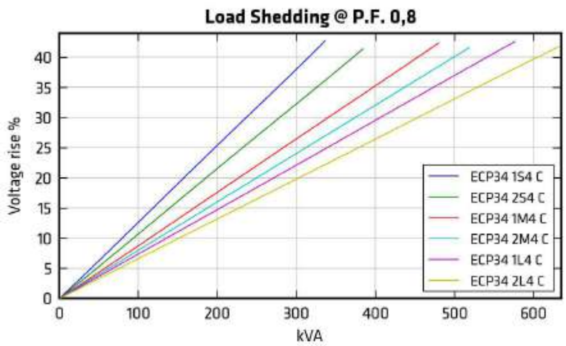












V vw us w s °w u w s s x u ° x s w xsu syw°x ° v°us ww3 ws w uwwws x D

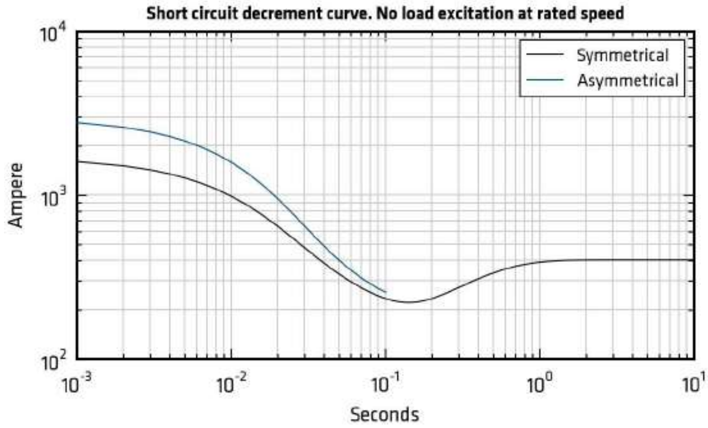
a w Ssu u wx°u°w u wu /aSPP0B tw ww w xsu 75@u w D
aSPPH ° /Nc Pu /aS w 00675B
R s w6ezwaSPP s w xsu 75 ° 888C9 maSPPH ° /Nc Pu /75 00675B o6ez° ws zs zw sywxs s sy° w w s x75 ° w ° s w zw
w zs us tw wsv zw x75@u w°x zw sv° u °vww 888C9 ° w t°yyw /8C, z°yzw s w50G
V z° w s w3s 877 gN sv° w ° s x75 ° w ° s w ° sywxs s 88C gN sv° w ° s x75@5

g sywu wx°u°w u wu /gPP0D
gPPH/; 776g w 0B °x=7 U EgPPH/; B76g w 0B °x@7 U
R s w6gPP s ; 8=g @7 U ° 85 : B mgPPH/; B76; 8=0p9o6ez° ws zs zw sywxs s sy° w w s ; 8=g ° w ° s w zw w zs us tw wsv
zw w xsu 75@u w°x zw sv° u °vww 85 : B ° w t°yyw /: : , z°yzw s w50G
V z° w s w3s 877 gN sv° w ° s ; 8=g ° w ° s w ° sywxs s 8 : gN sv° w ° s ; B7g5

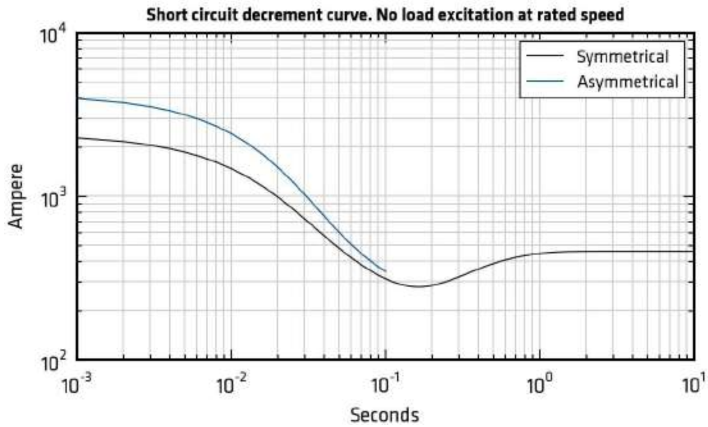
NEp

Ax

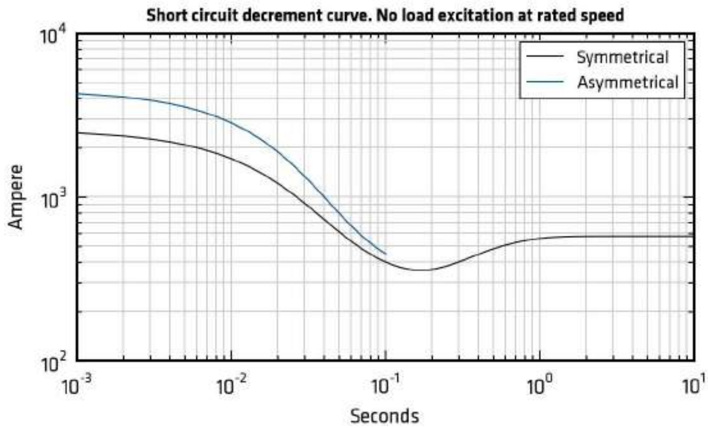
RPa: ; 8d; P



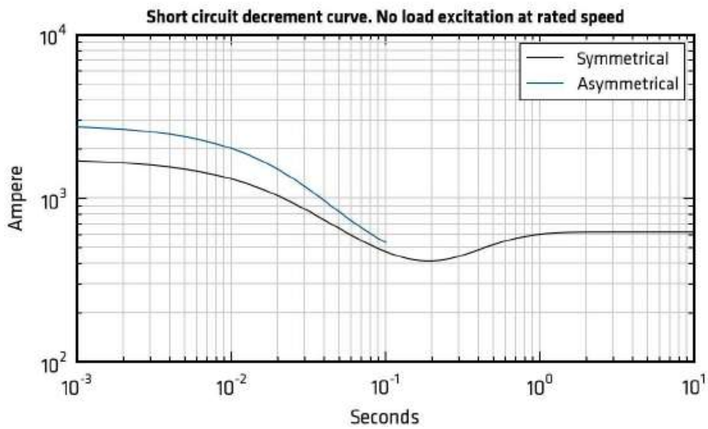
RPa: ; 9d; P



RPa: ; 8[; P



RPa: ; 9[; P

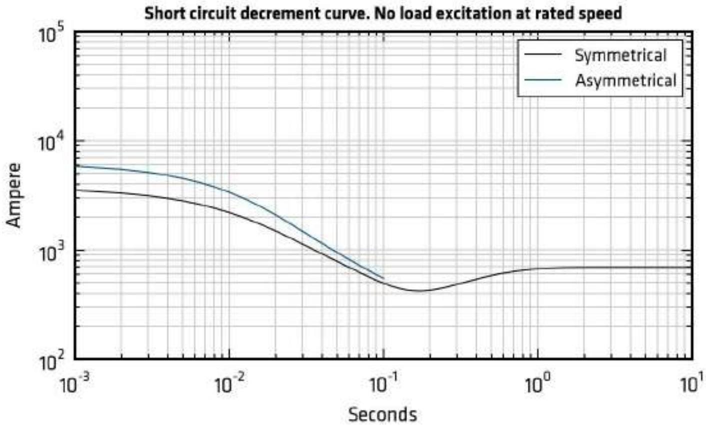


1a ws w wkw st w s syw@

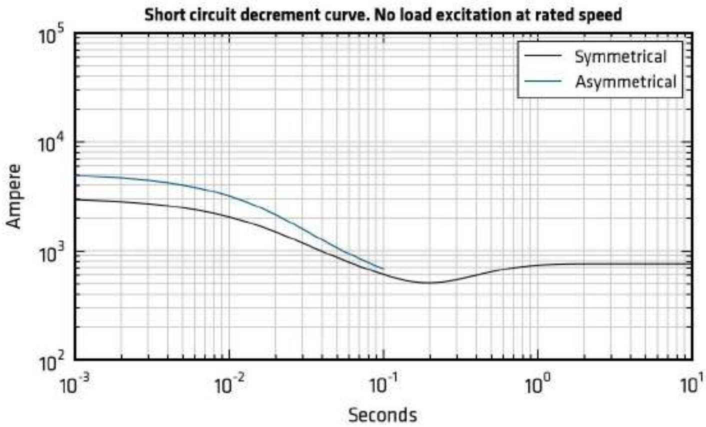
NEp

Ax

RPa: ; 8Z; P



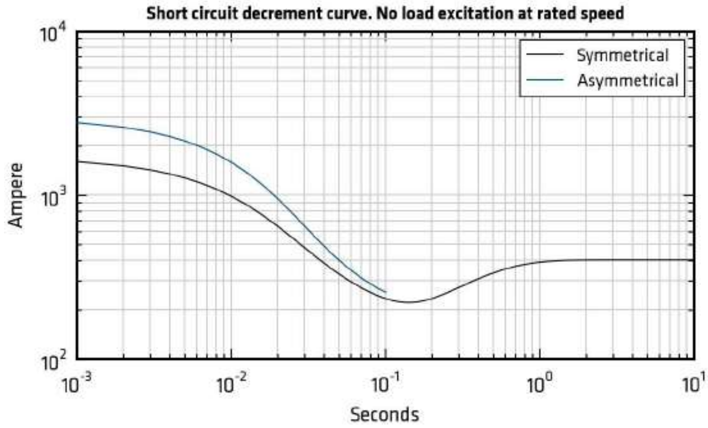
RPa: ; 9Z; P



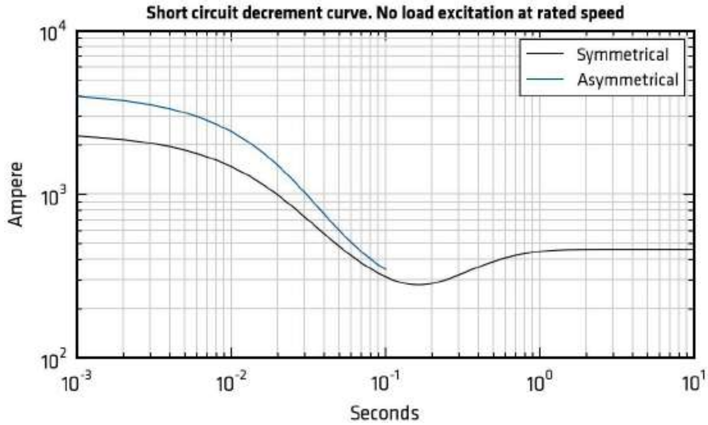
PEp

Ax

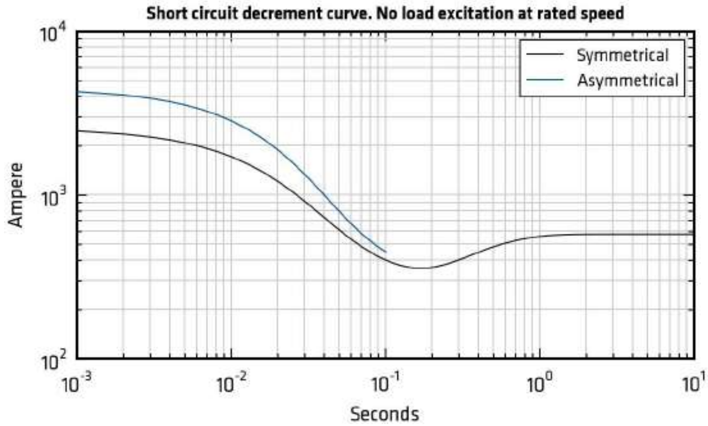
RPa: ; 8d; P



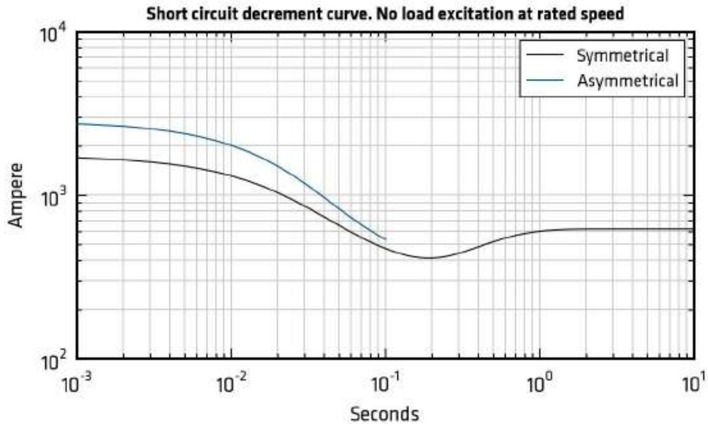
RPa: ; 9d; P



RPa: ; 8[; P



RPa: ; 9[; P

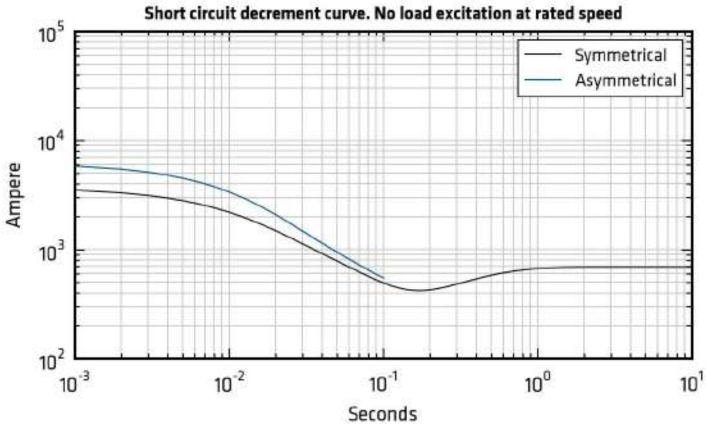


1a ws w wkw st w s syw@

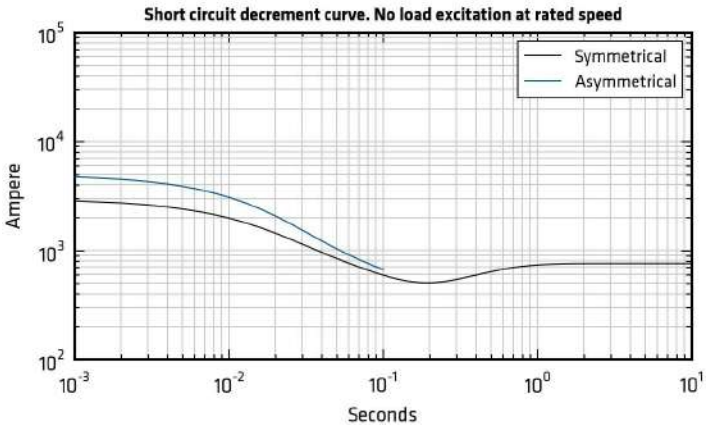
PEp

Ax

RPa: ; 8Z; P



RPa: ; 9Z; P

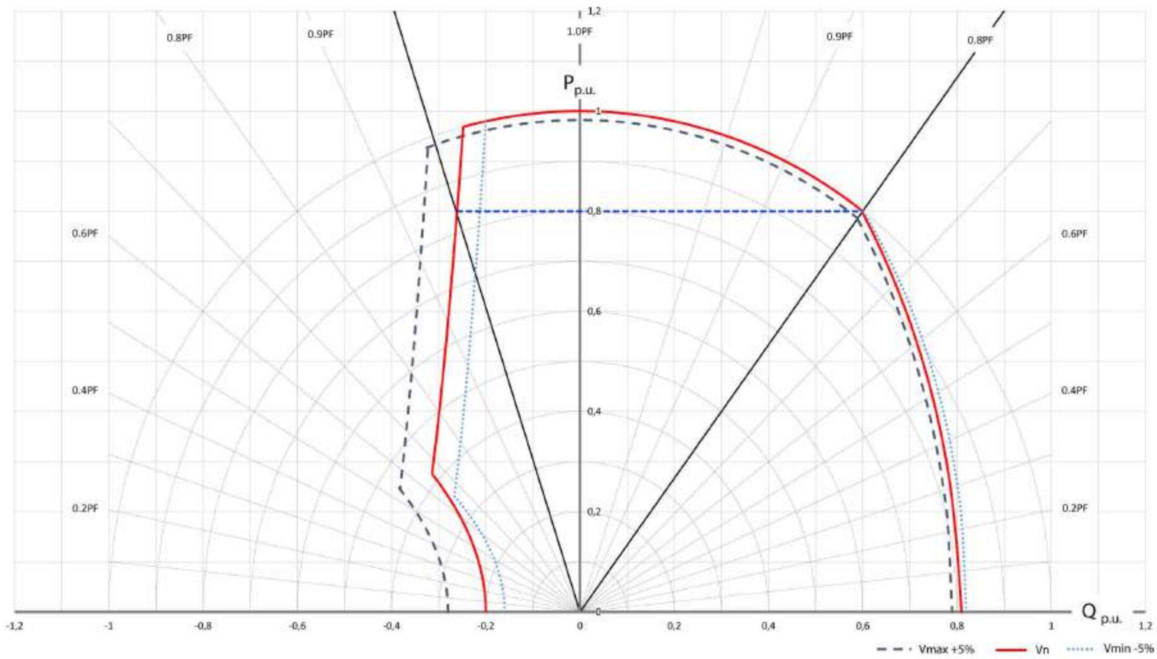


1a ws w wxw st w s syw@

g i

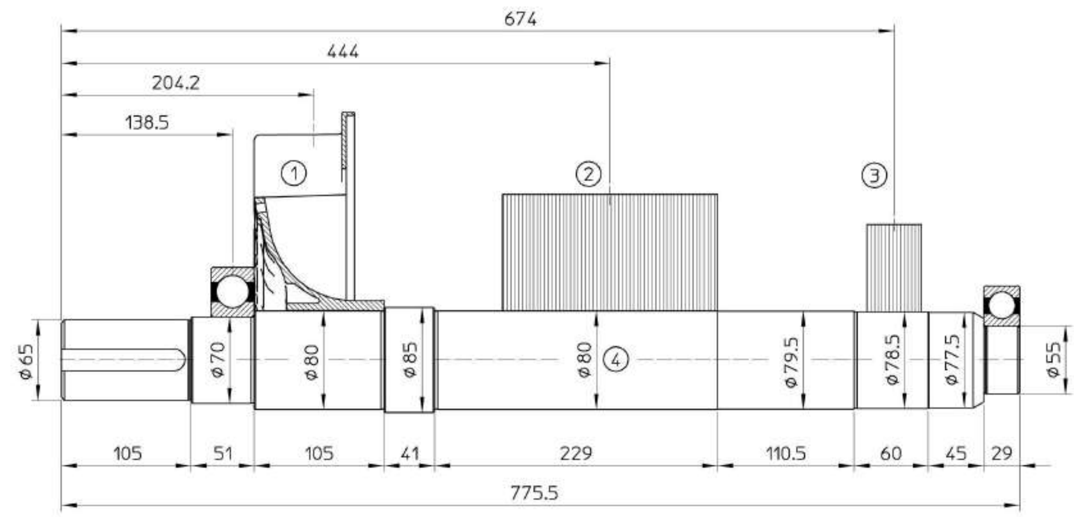
Qs s		RPa: ; 8d; P		RPa: ; 9d; P		RPa: ; 8[; P		RPa: ; 9[; P		RPa: ; 8Z; P		RPa: ; 9Z; P	
		=7U	@7U	=7U	@7U	=7U	@7U	=7U	@7U	=7U	@7U	=7U	@7U
Qs w usyw		N ° °											
d s h ° v° y c w ° s uw/97 P0	Ω	0,033		0,027		0,021		0,02		0,014		0,015	
c h ° v° y c w ° s uw/97 P0	Ω	2,392		2,844		3,09		3,172		3,467		3,624	
d s R u° w c w ° s uw/97 P0	Ω	13,47		13,47		13,47		13,47		13,47		13,47	
c R u° w c w ° s uw/97 P0	Ω	0,36		0,36		0,36		0,36		0,36		0,36	
h w°yz x u w wyw w s	kg	302,0		349,0		385,0		388,0		423,0		440,0	
f t s s uw sy w °u	kN/mm	4,8		5,1		5,3		5,4		5,5		5,4	
N° x	m^3/min	29,2	34,4	29,2	34,4	29,2	34,4	29,2	34,4	29,2	34,4	29,2	34,4
] ° w w w s 8 6A	dB(A)	79/65	83/69	79/65	83/69	79/65	83/69	79/65	83/69	79/65	83/69	79/65	83/69

l



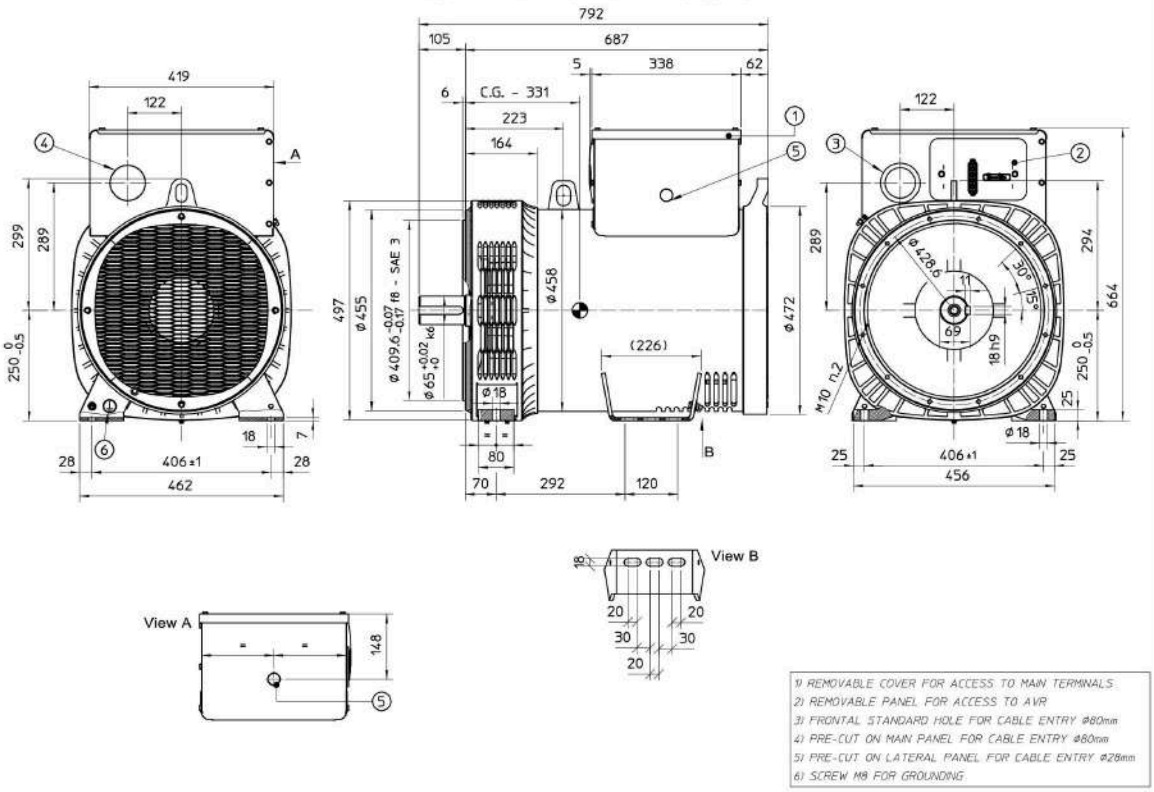
mi LMG Mi

TWO BEARING MOMENTS OF INERTIA

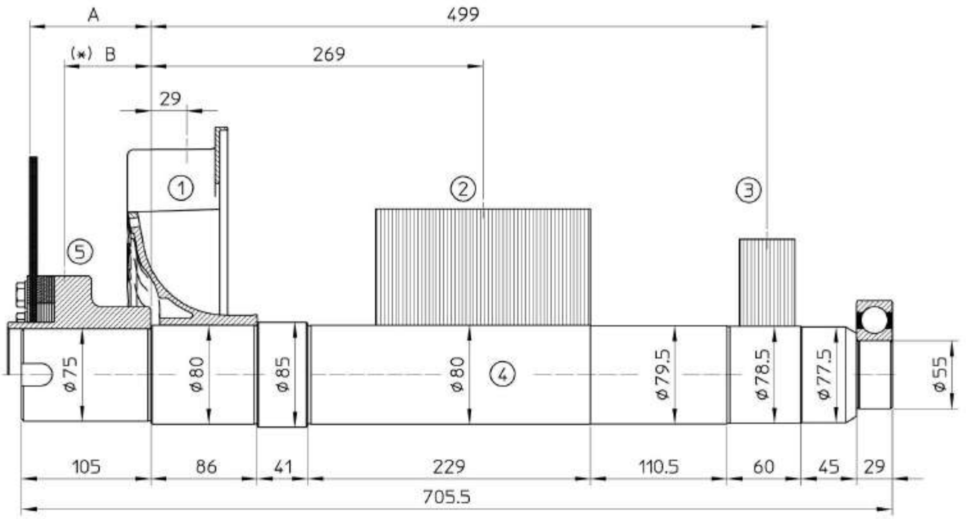


POS.	COMPONENT	WEIGHT (kg)	J (kgm²)
1	FAN	1.4	0.0211
2	MAIN ROTOR	61.7	0.5625
3	EX. ROTOR	11.7	0.0798
4	SHAFT	27.8	0.0213
	TOTAL	102.6	0.6847

TWO BEARING DIMENSIONS



SINGLE BEARING MOMENTS OF INERTIA

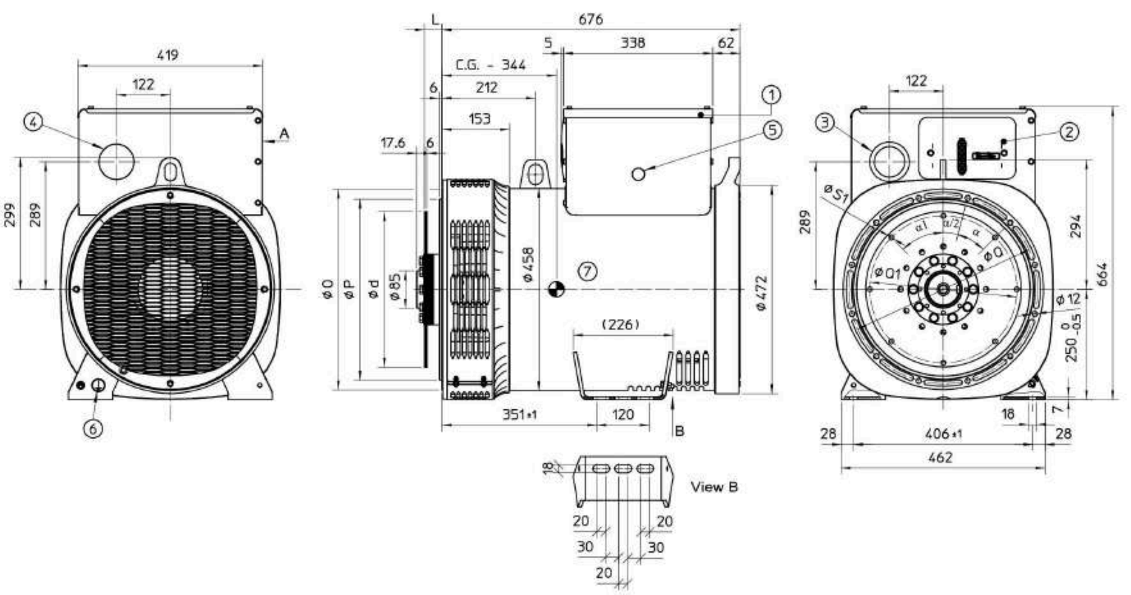


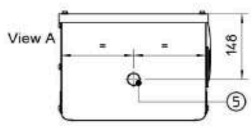
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.4	0.0211
2	MAIN ROTOR	61.7	0.5625
3	EX. ROTOR	11.7	0.0798
4	SHAFT	26.5	0.0209
	TOTAL	101.3	0.6843

SAE N°	5 SHAFTS COUPLING FLEX PLATE			
	A	B	WEIGHT kg	J kgm^2
10	112.8	79.9	12.1	0.0747
11 1/2	98.4	73.6	11.0	0.0932
14	84.4	70.0	13.4	0.2336

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS





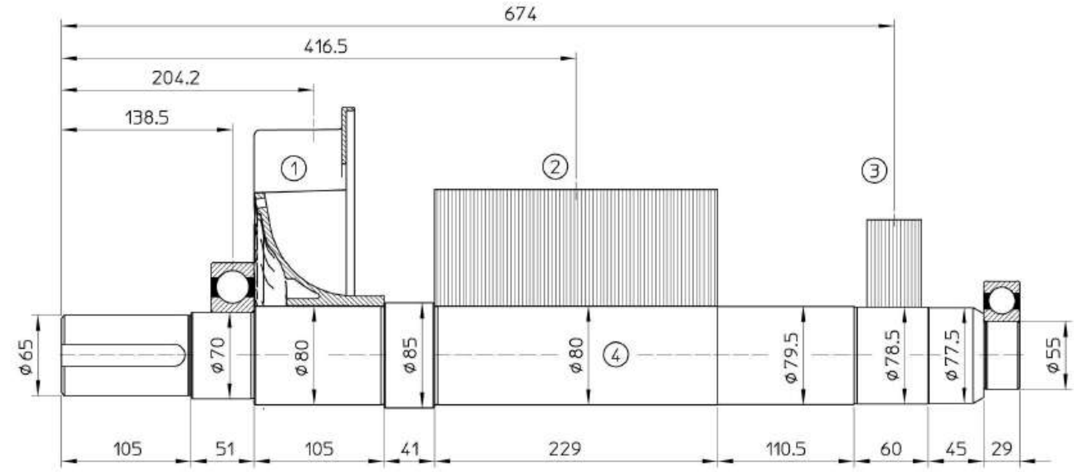
SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEIBENKUPPLUNG				
	d	L	Q1	S1	α1
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°
14	466.72	25.4	438.15	14	45°

SAE N.	FLANGIA/FLANGE BRIDE/FLANSCH			
	O	P	Q	α
3	455	409.6	428.6	30°
2	492	447.7	466.7	30°
1	555	511.2	530.2	30°

1) REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2) REMOVABLE PANEL FOR ACCESS TO AVR
3) FRONTAL STANDARD HOLE FOR CABLE ENTRY ø80mm
4) PRE-CUT ON MAIN PANEL FOR CABLE ENTRY ø80mm
5) PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ø28mm
6) SCREW M8 FOR GROUNDING
7) GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11.5

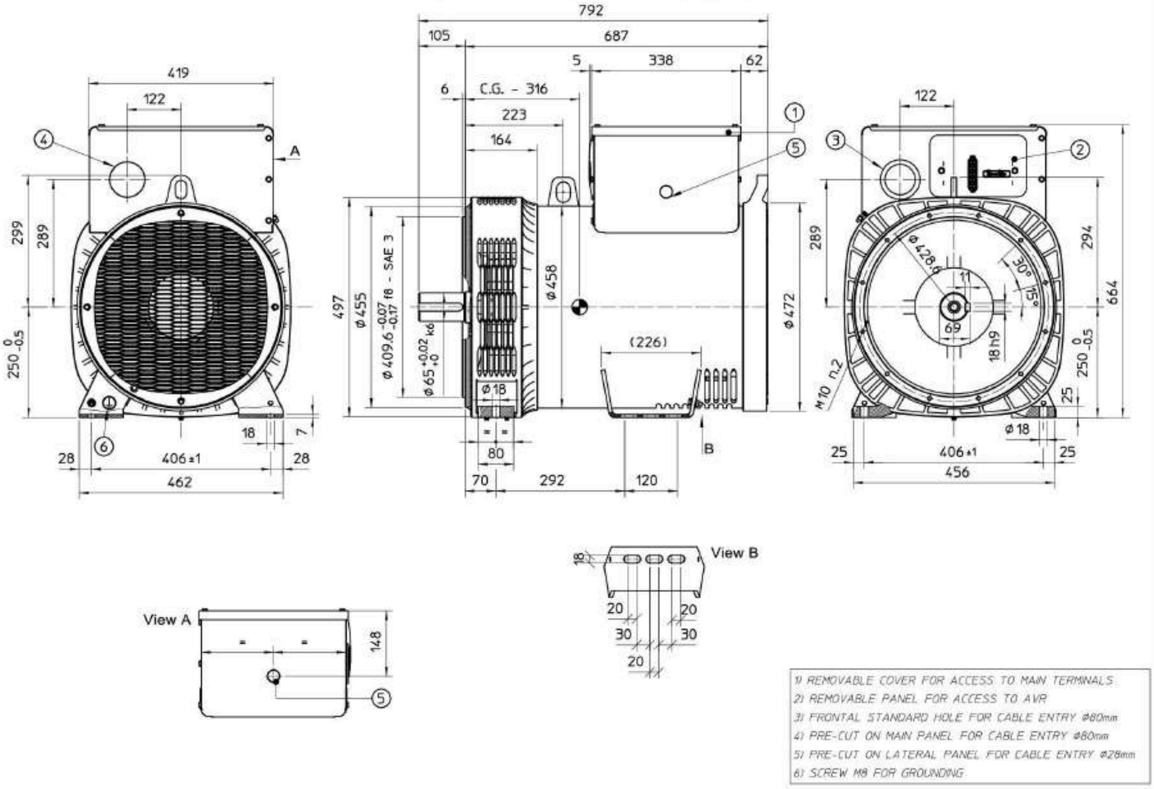
mi LMH Mi

TWO BEARING MOMENTS OF INERTIA



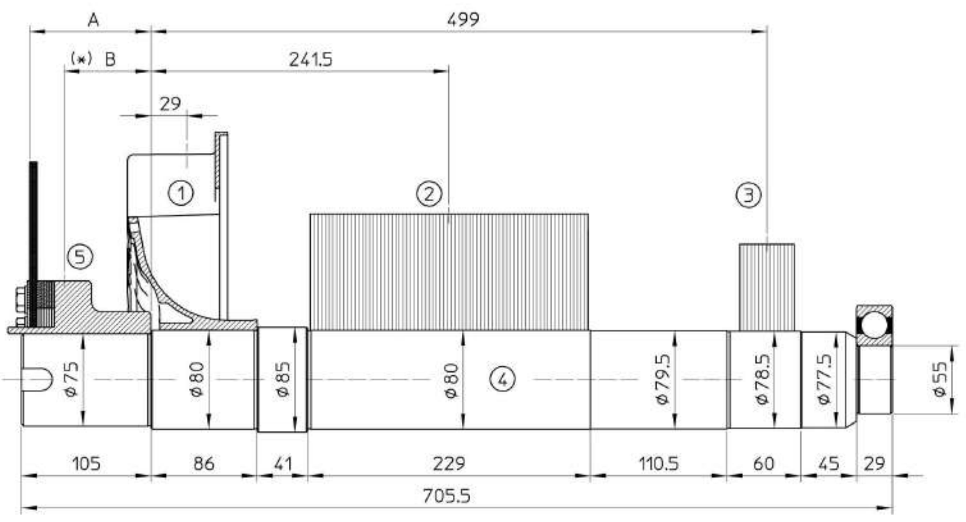
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.4	0.0211
2	MAIN ROTOR	78.6	0.7148
3	EX. ROTOR	11.7	0.0798
4	SHAFT	27.8	0.0213
	TOTAL	119.5	0.8370

TWO BEARING DIMENSIONS



mi LMH Mi

SINGLE BEARING MOMENTS OF INERTIA

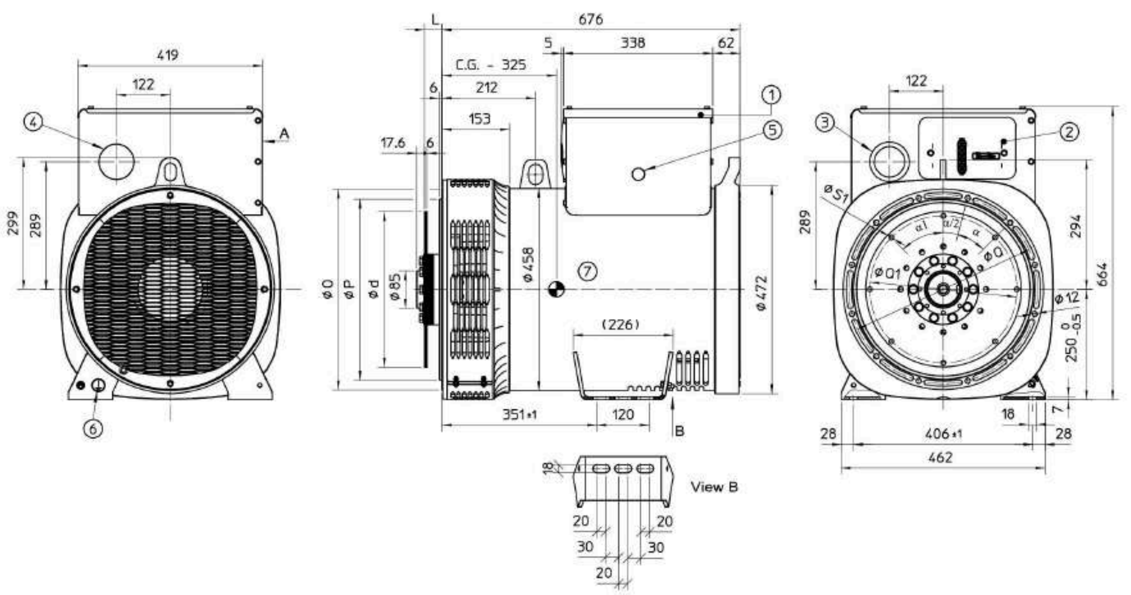


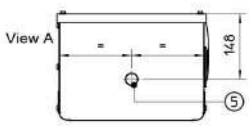
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.4	0.0211
2	MAIN ROTOR	78.6	0.7148
3	EX. ROTOR	11.7	0.0798
4	SHAFT	26.5	0.0209
	TOTAL	118.2	0.8366

SAE N°	5 SHAFTS COUPLING FLEX PLATE			
	A	B	WEIGHT kg	J kgm^2
10	112.8	79.9	12.1	0.0747
11 1/2	98.4	73.6	11.0	0.0932
14	84.4	70.0	13.4	0.2336

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS





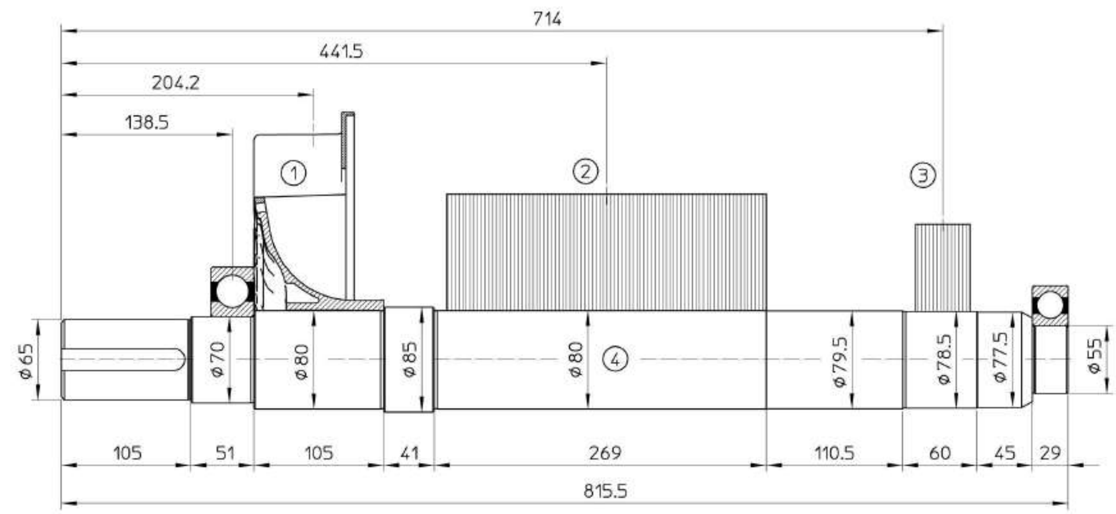
SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEIBENKUPPLUNG				
	d	L	Q1	S1	α1
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°
14	466.72	25.4	438.15	14	45°

SAE N.	FLANGIA/FLANGE BRIDE/FLANSCH			
	O	P	Q	α
3	455	409.6	428.6	30°
2	492	447.7	466.7	30°
1	555	511.2	530.2	30°

1) REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2) REMOVABLE PANEL FOR ACCESS TO AVR
3) FRONTAL STANDARD HOLE FOR CABLE ENTRY Ø80mm
4) PRE-CUT ON MAIN PANEL FOR CABLE ENTRY Ø80mm
5) PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY Ø28mm
6) SCREW M8 FOR GROUNDING
7) GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11.5

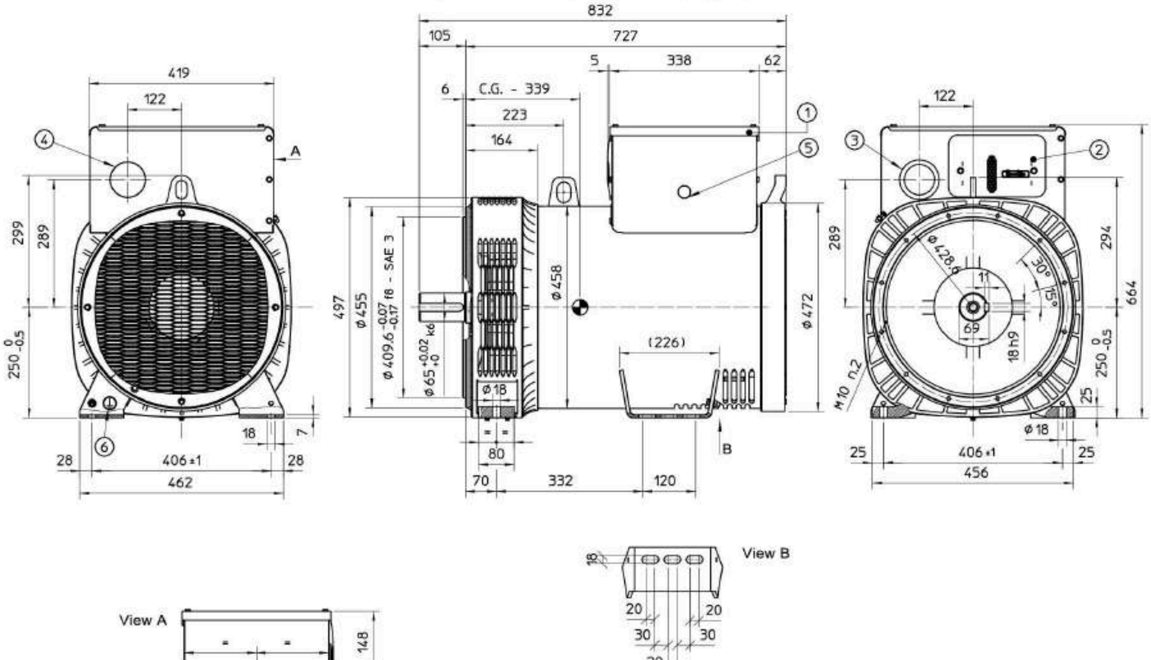
mi LMGv Mi

TWO BEARING MOMENTS OF INERTIA



POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.4	0.0211
2	MAIN ROTOR	88.1	0.8009
3	EX. ROTOR	11.7	0.0798
4	SHAFT	29.4	0.0226
	TOTAL	130.6	0.9244

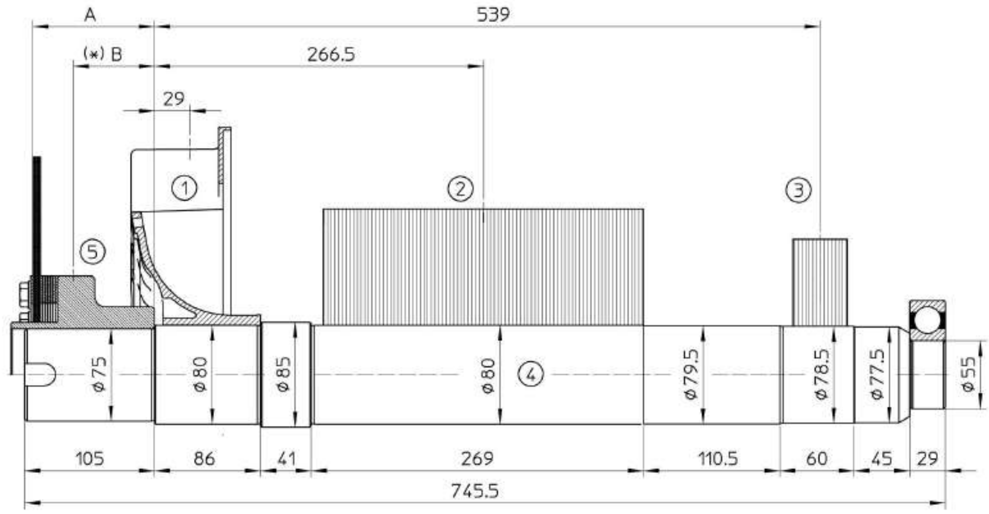
TWO BEARING DIMENSIONS



1) REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2) REMOVABLE PANEL FOR ACCESS TO AVR
3) FRONTAL STANDARD HOLE FOR CABLE ENTRY ø80mm
4) PRE-CUT ON MAIN PANEL FOR CABLE ENTRY ø80mm
5) PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ø28mm
6) SCREW M8 FOR GROUNDING

mi LMGv Mi

SINGLE BEARING MOMENTS OF INERTIA

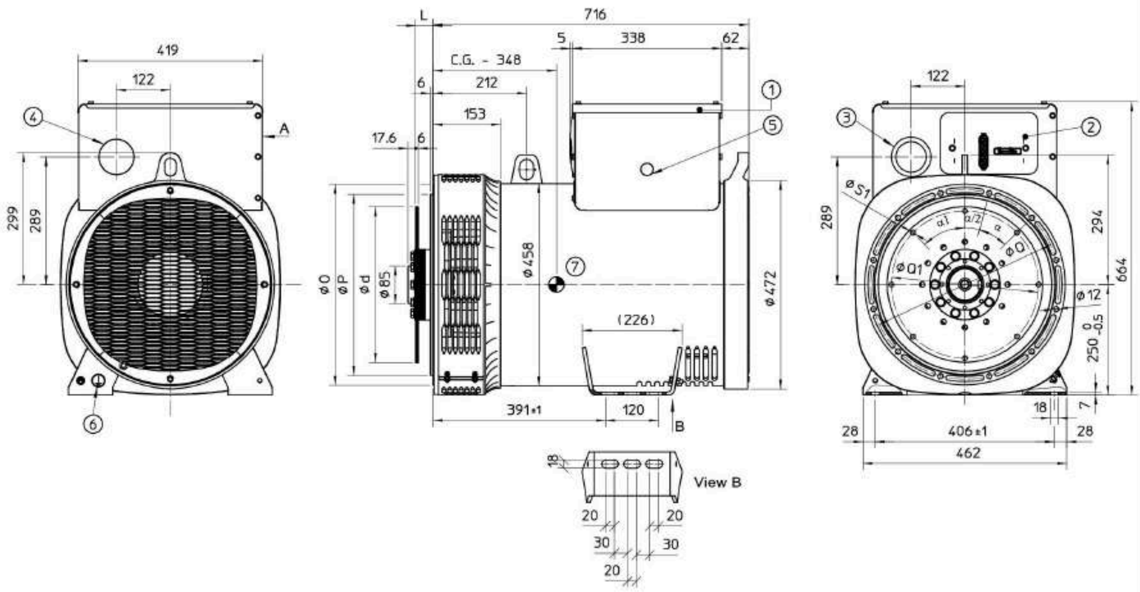


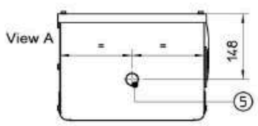
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.4	0.0211
2	MAIN ROTOR	88.1	0.8009
3	EX. ROTOR	11.7	0.0798
4	SHAFT	28.1	0.0222
	TOTAL	129.3	0.9240

SAE	5 SHAFTS COUPLING FLEX PLATE			
N°	A	B	WEIGHT kg	J kgm^2
10	112.8	79.9	12.1	0.0747
11 1/2	98.4	73.6	11.0	0.0932
14	84.4	70.0	13.4	0.2336

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS





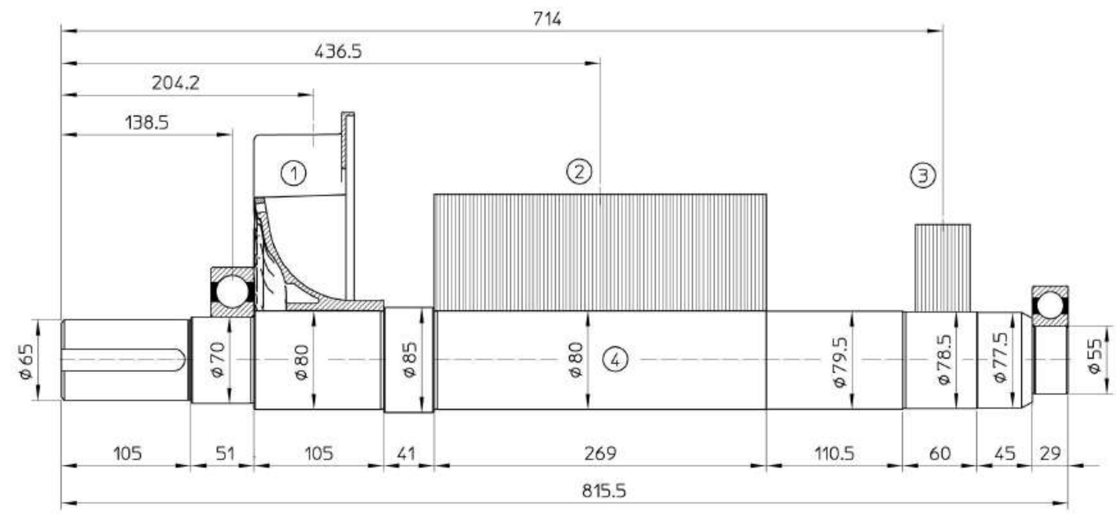
SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEIBENKUPPLUNG				
	d	L	Q1	S1	α1
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°
14	466.72	25.4	438.15	14	45°

SAE N.	FLANGIA/FLANGE BRIDE/FLANSCH			
	O	P	Q	α
3	455	409.6	428.6	30°
2	492	447.7	466.7	30°
1	555	511.2	530.2	30°

1) REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2) REMOVABLE PANEL FOR ACCESS TO AVR
3) FRONTAL STANDARD HOLE FOR CABLE ENTRY ø80mm
4) PRE-CUT ON MAIN PANEL FOR CABLE ENTRY ø80mm
5) PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ø28mm
6) SCREW M8 FOR GROUNDING
7) GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11.5

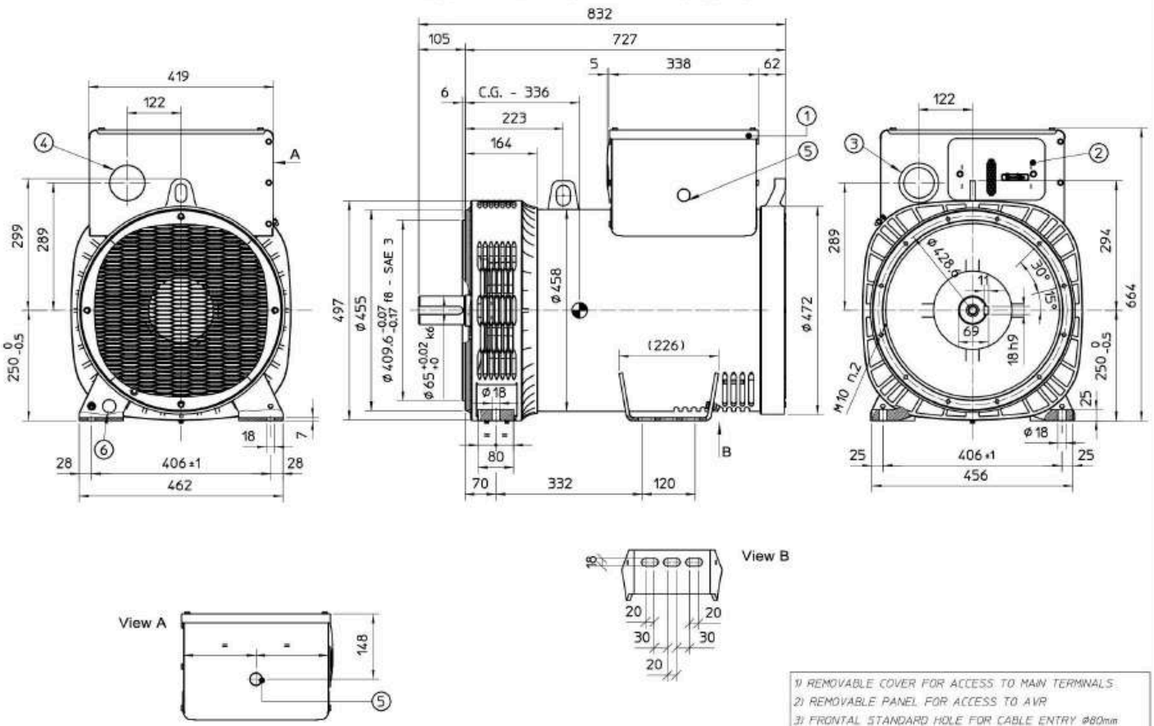
mi LMHv Mi

TWO BEARING MOMENTS OF INERTIA



POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.4	0.0211
2	MAIN ROTOR	91.4	0.8311
3	EX. ROTOR	11.7	0.0798
4	SHAFT	29.4	0.0226
	TOTAL	133.9	0.9546

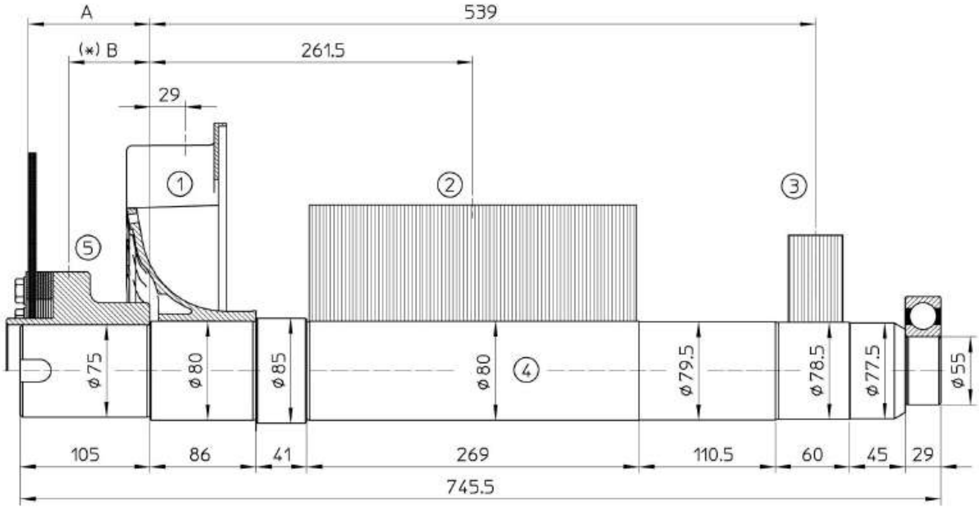
TWO BEARING DIMENSIONS



1) REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2) REMOVABLE PANEL FOR ACCESS TO AVR
3) FRONTAL STANDARD HOLE FOR CABLE ENTRY ø80mm
4) PRE-CUT ON MAIN PANEL FOR CABLE ENTRY ø80mm
5) PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ø28mm
6) SCREW M8 FOR GROUNDING

mi LMHv Mi

SINGLE BEARING MOMENTS OF INERTIA

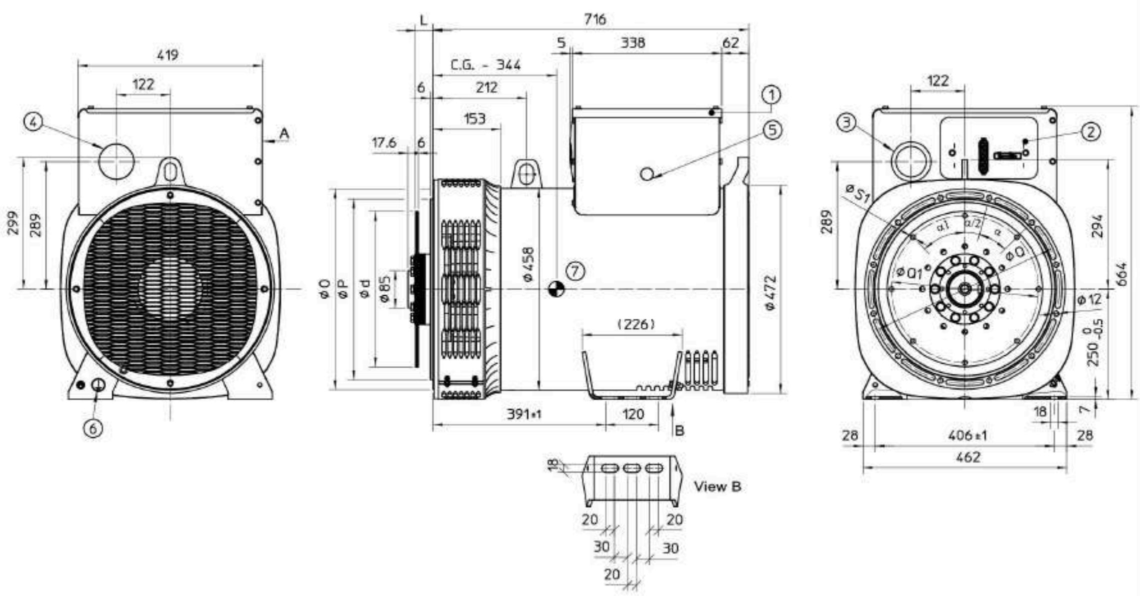


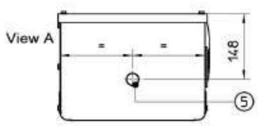
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.4	0.0211
2	MAIN ROTOR	91.4	0.8311
3	EX. ROTOR	11.7	0.0798
4	SHAFT	28.1	0.0222
	TOTAL	132.6	0.9542

SAE N°	5 SHAFTS COUPLING FLEX PLATE A	B	WEIGHT kg	J kgm^2
10	112.8	79.9	12.1	0.0747
11 1/2	98.4	73.6	11.0	0.0932
14	84.4	70.0	13.4	0.2336

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS





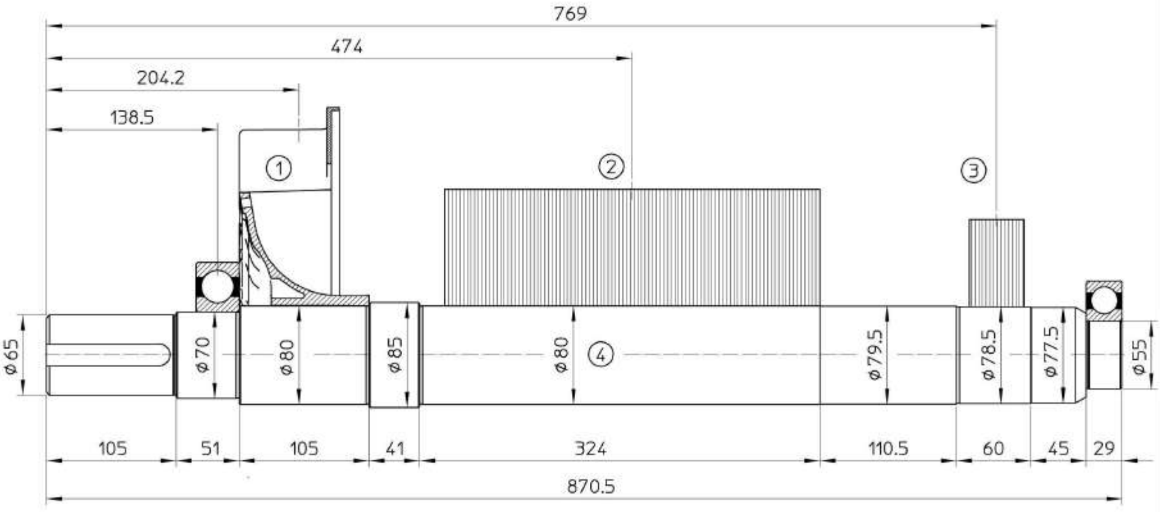
SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEIBENKUPPLUNG d	L	Q1	S1	α1
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°
14	466.72	25.4	438.15	14	45°

SAE N.	FLANGIA/FLANGE BRIDE/FLANSCH O	P	Q	α
3	455	409.6	428.6	30°
2	492	447.7	466.7	30°
1	555	511.2	530.2	30°

1) REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
2) REMOVABLE PANEL FOR ACCESS TO AVR
3) FRONTAL STANDARD HOLE FOR CABLE ENTRY ø80mm
4) PRE-CUT ON MAIN PANEL FOR CABLE ENTRY ø80mm
5) PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ø28mm
6) SCREW M8 FOR GROUNDING
7) GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11.5

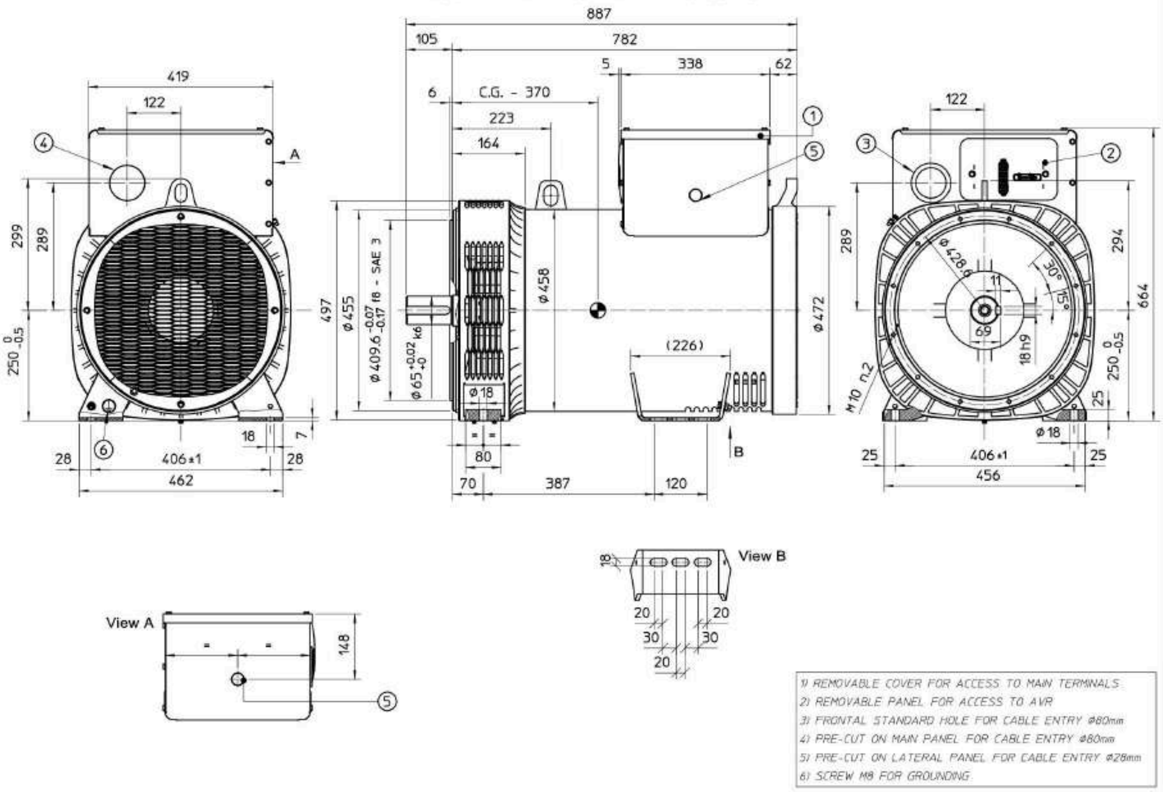
mi LMGuMi

TWO BEARING MOMENTS OF INERTIA



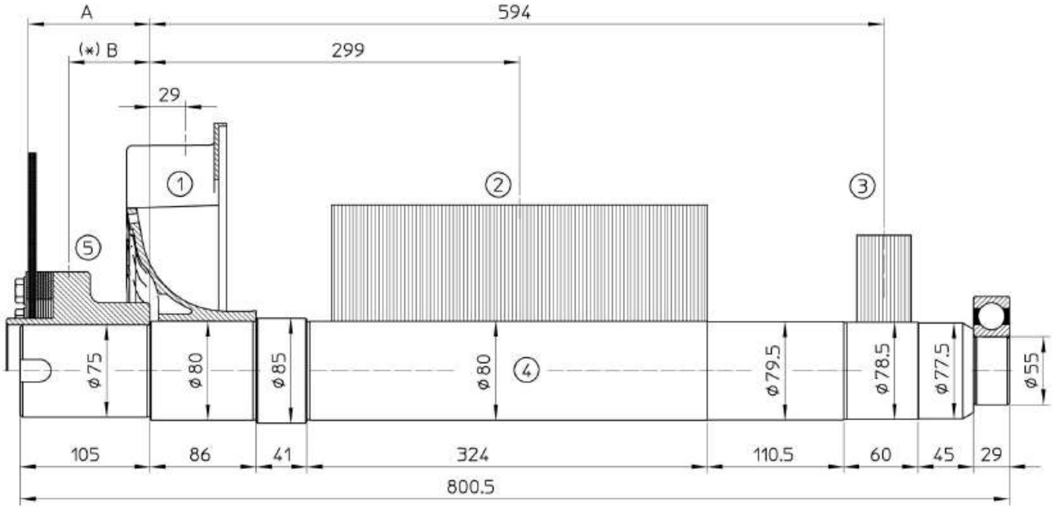
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.4	0.0211
2	MAIN ROTOR	102.3	0.9293
3	EX. ROTOR	11.7	0.0798
4	SHAFT	31.6	0.0244
	TOTAL	147.0	1.0546

TWO BEARING DIMENSIONS



mi LMGuMi

SINGLE BEARING MOMENTS OF INERTIA

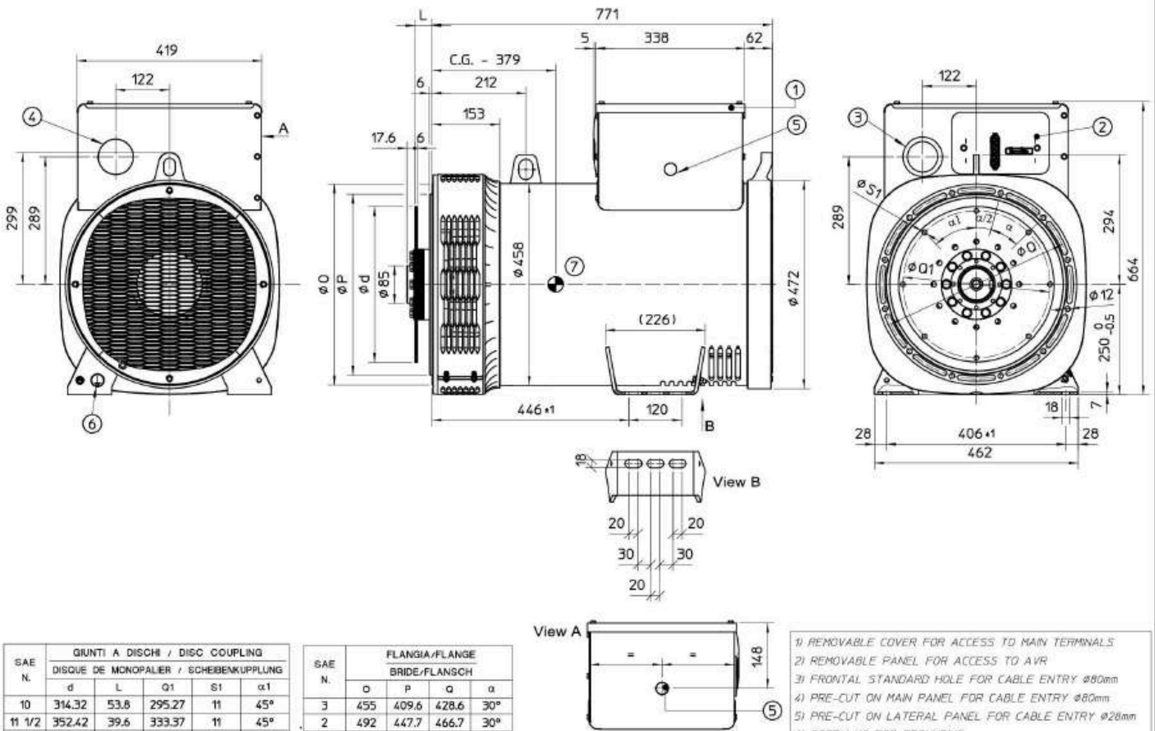


POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.4	0.0211
2	MAIN ROTOR	102.3	0.9293
3	EX. ROTOR	11.7	0.0798
4	SHAFT	30.3	0.0240
	TOTAL	145.7	1.0542

SAE N°	5 SHAFTS COUPLING FLEX PLATE A	B	WEIGHT kg	J kgm^2
10	112.8	79.9	12.1	0.0747
11 1/2	98.4	73.6	11.0	0.0932
14	84.4	70.0	13.4	0.2336

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS



SAE N.	GIUNTI A DISCHI / DISC COUPLING — DISQUE DE MONOPALIER / SCHEIBENKUPPLUNG d	L	Q1	S1	α1
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°
14	466.72	25.4	438.15	14	45°

SAE N.	FLANGIA/FLANGE — BRIDE/FLANSCH O	P	Q	α
3	455	409.6	428.6	30°
2	492	447.7	466.7	30°
1	555	511.2	530.2	30°

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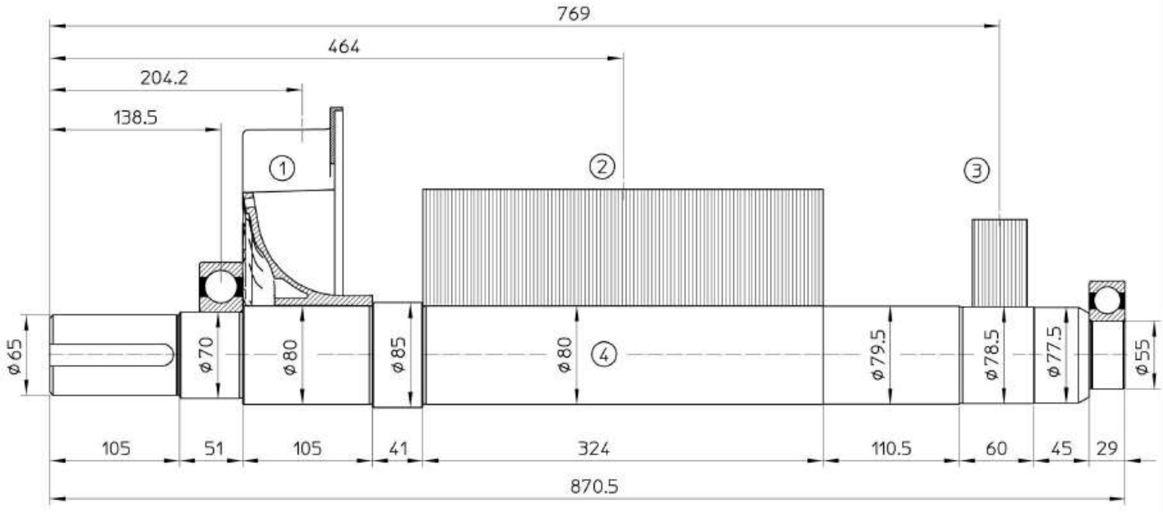
5) PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY ø28mm
6) SCREW M8 FOR GROUNDING
7) GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11.5

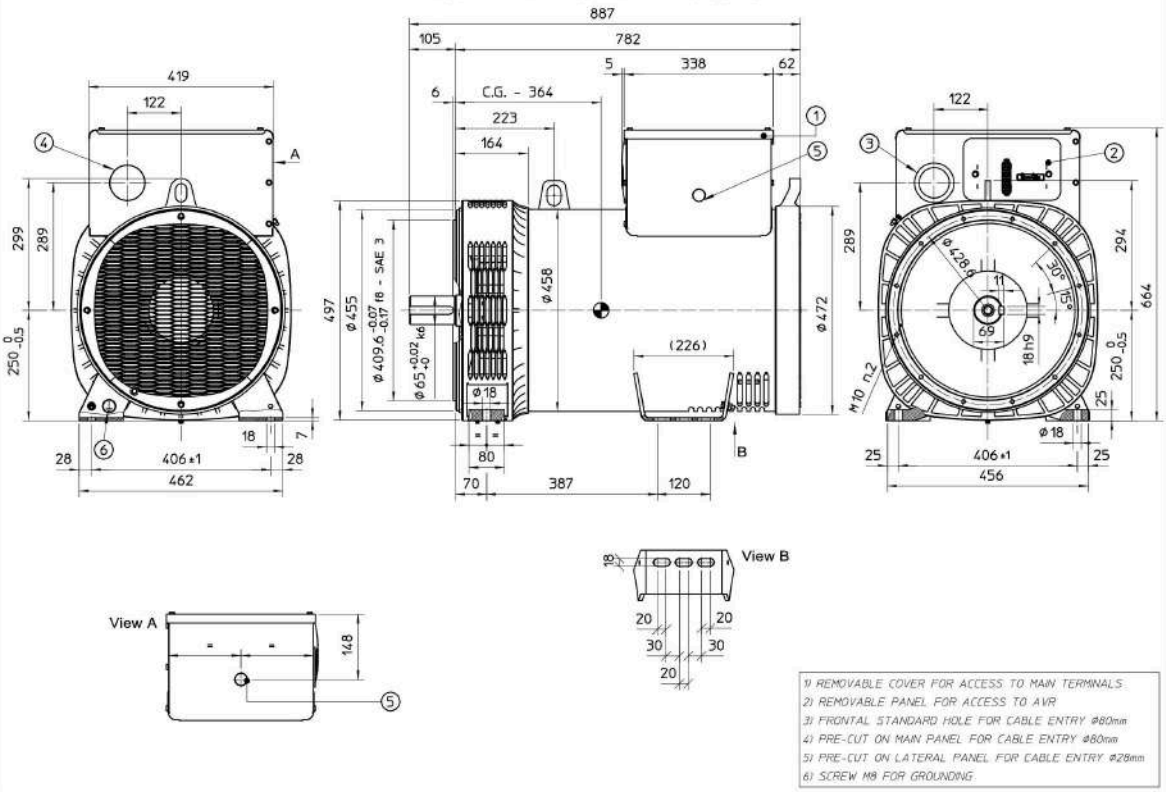
mi LMHuMi

TWO BEARING MOMENTS OF INERTIA



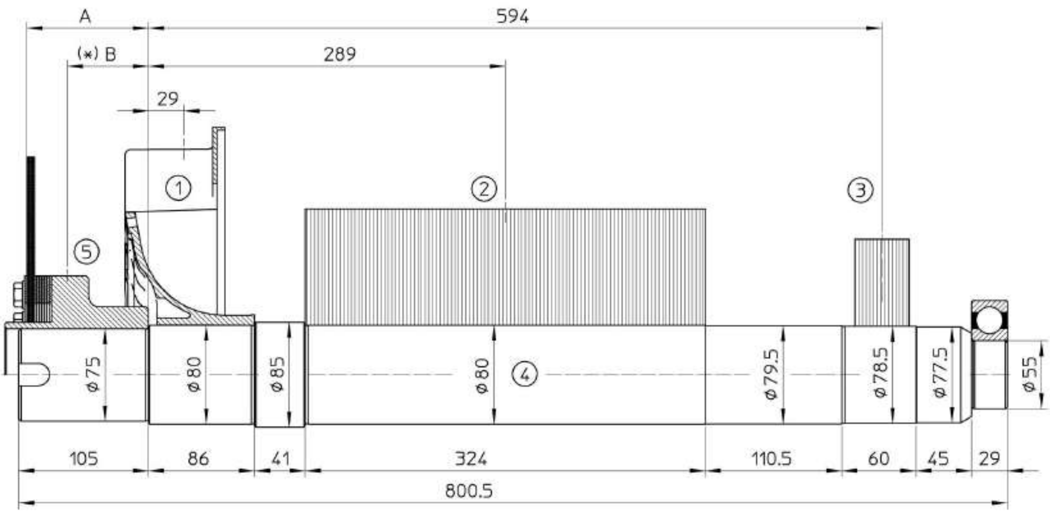
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.4	0.0211
2	MAIN ROTOR	108.5	0.9851
3	EX. ROTOR	11.7	0.0798
4	SHAFT	31.6	0.0244
	TOTAL	153.2	1.1104

TWO BEARING DIMENSIONS



mi LMHuMi

SINGLE BEARING MOMENTS OF INERTIA

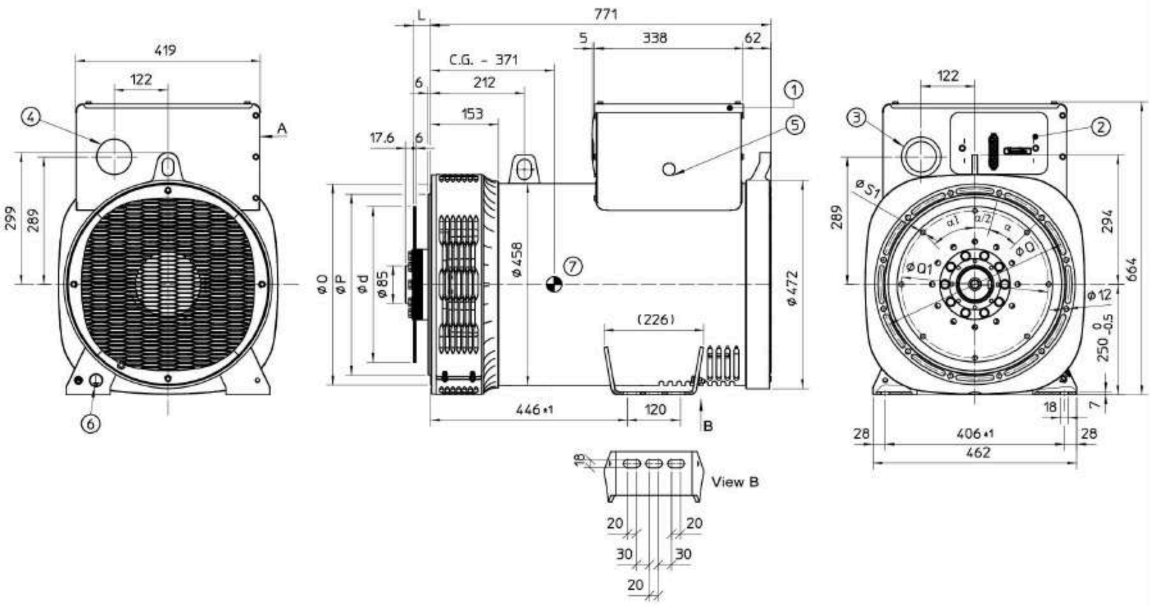


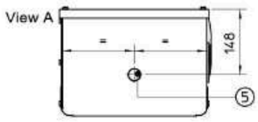
POS.	COMPONENT	WEIGHT (kg)	J (kgm^2)
1	FAN	1.4	0.0211
2	MAIN ROTOR	108.5	0.9851
3	EX. ROTOR	11.7	0.0798
4	SHAFT	30.3	0.0240
	TOTAL	151.9	1.1100

SAE	5 SHAFTS COUPLING FLEX PLATE			
N°	A	B	WEIGHT kg	J kgm^2
10	112.8	79.9	12.1	0.0747
11 1/2	98.4	73.6	11.0	0.0932
14	84.4	70.0	13.4	0.2336

(*) = FLYWHEEL GRAVITY CENTER

SINGLE BEARING DIMENSIONS





SAE N.	GIUNTI A DISCHI / DISC COUPLING DISQUE DE MONOPALIER / SCHEIBENKUPPLUNG				
	d	L	Q1	S1	α1
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°
14	466.72	25.4	438.15	14	45°

SAE N.	FLANGIA/FLANGE BRIDE/FLANSCH			
	O	P	Q	α
3	455	409.6	428.6	30°
2	492	447.7	466.7	30°
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6) SCREW M8 FOR GROUNDING
7) GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11.5

X

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