



Totally Focused. Totally Independent.

Technical Guide

ECP34 4 C
C-TYPE



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).

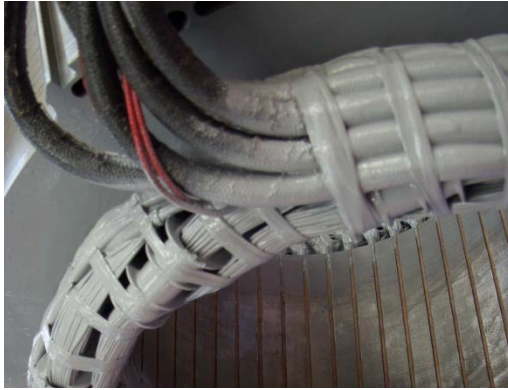
- ▶ 12 wire reconnectable:
 - 50Hz – 380V to 440V and 220/110V to 240/120V (de-rates may apply at certain voltages)
 - 60Hz – 380V to 480V and 220/110V to 240/120V (de-rates may apply at certain voltages)
- ▶ 6 wire reconnectable:
 - 50Hz – 380V to 440V and 220V to 240V (de-rates may apply at certain 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 and ECP32	-	Std	Option	Option	Option
NPE32, 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 optionably retrofittable in the overall ECP32 to ECO 46 range, in order to comply to the most strict marine regulations.

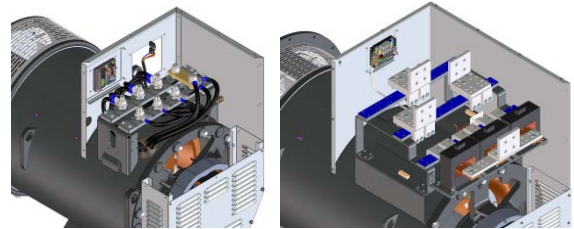


Construction

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: FEPI2 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.

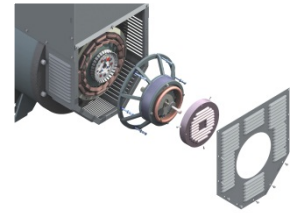
Excitation Systems	DSR	DER1	DER2
ECP3 to ECO38	Std	Option	Option
ECO40 to ECO46	-	Std	Option
Parallel Operation	√	√	√
Mains Parallel	√	√	√
3 Phase Sensing (rms)	-	√	√
Accuracy	+/-1%	+/-0.5%	+/-0.5%
Remote Voltage Control	√	√	√
Alarm Log	√	√	√
Analogue and Digital Configurable	√	√	√
LAMS (Load Acceptance 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, IP43 and IP45 protections, marine IP23 + protection for SOLAS requirements and many others.

Deration coefficients

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

Notes on short circuit curves

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

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

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

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

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

General characteristics

Pole number	4	Insulation class	H
Phase number	3	Protection class	IP23
Number of wires	12	NDE Bearing type	6311.2RS
Execution	Brushless	DE Bearing type	6314.2RS
Regulator type	DSR	Maximum Overspeed	2250
Winding pitch	2/3	Altitude	0-1000
Code voltage reference	T0405S3	Balancing	ISO1940-1

Ratings 50Hz

kVA / kW @ Temp. Rise / Ambient °C - 0.8 PF		STANDBY-163/27				STANDBY-150/40				H-125/40				F-105/40				B-80/40			
Series		380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V
Parallel Star YY		190V	200V	208V	220V	190V	200V	208V	220V	190V	200V	208V	220V	190V	200V	208V	220V	190V	200V	208V	220V
Series Delta Δ		220V	230V	240V	254V	220V	230V	240V	254V	220V	230V	240V	254V	220V	230V	240V	254V	220V	230V	240V	254V
Parallel Delta ΔΔ		110V	115V	120V	127V	110V	115V	120V	127V	110V	115V	120V	127V	110V	115V	120V	127V	110V	115V	120V	127V
ECP34 1S4 C	kVA	96	96	96	79	93	93	93	77	87,5	87,5	87,5	72	79	79	79	65	70	70	70	58
	kW	77	77	77	63	74	74	74	62	70	70	70	58	63	63	63	52	56	56	56	46
ECP34 2S4 C	kVA	110	110	110	88	105	105	105	86	100	100	100	80	90	90	90	72	80	80	80	64
	kW	88	88	88	70	84	84	84	69	80	80	80	64	72	72	72	58	64	64	64	51
ECP34 1M4 C	kVA	137	137	137	117	132	132	132	112	125	125	125	106	112	112	112	96	100	100	100	85
	kW	110	110	110	94	106	106	106	90	100	100	100	85	90	90	90	77	80	80	80	68
ECP34 2M4 C	kVA	148	148	148	125	143	143	143	120	135	135	135	114	121	121	121	103	108	108	108	91
	kW	118	118	118	100	114	114	114	96	108	108	108	91	97	97	97	82	86	86	86	73
ECP34 1L4 C	kVA	165	165	165	137	158	158	158	131	150	150	150	125	136	136	136	113	120	120	120	100
	kW	132	132	132	110	126	126	126	105	120	120	120	100	109	109	109	90	96	96	96	80
ECP34 2L4 C	kVA	176	181	181	170	169	174	174	163	160	165	165	155	144	149	149	139	128	132	132	124
	kW	141	145	145	136	135	139	139	130	128	132	132	124	115	119	119	111	102	106	106	99

Ratings 60Hz

kVA / kW @ Temp. Rise / Ambient °C - 0.8 PF		STANDBY-163/27				STANDBY-150/40				H-125/40				F-105/40				B-80/40			
Series		415V	440V	460V	480V	415V	440V	460V	480V	415V	440V	460V	480V	415V	440V	460V	480V	415V	440V	460V	480V
Parallel Star YY		208V	220V	230V	240V	208V	220V	230V	240V	208V	220V	230V	240V	208V	220V	230V	240V	208V	220V	230V	240V
Series Delta Δ		240V	254V	265V	277V	240V	254V	265V	277V	240V	254V	265V	277V	240V	254V	265V	277V	240V	254V	265V	277V
Parallel Delta ΔΔ		120V	127V	133V	138V	120V	127V	133V	138V	120V	127V	133V	138V	120V	127V	133V	138V	120V	127V	133V	138V
ECP34 1S4 C	kVA	108	115	115	115	104	111	111	111	98	105	105	105	88	95	95	95	78	84	84	84
	kW	86	92	92	92	83	89	89	89	78	84	84	84	70	76	76	76	62	67	67	67
ECP34 2S4 C	kVA	120	132	132	132	114	126	126	126	110	120	120	120	99	109	109	109	88	96	96	96
	kW	96	106	106	106	91	101	101	101	88	96	96	96	79	87	87	87	70	77	77	77
ECP34 1M4 C	kVA	143	154	165	165	137	147	159	159	130	140	150	150	116	125	135	135	104	112	120	120
	kW	114	123	132	132	110	118	127	127	104	112	120	120	93	100	108	108	83	90	96	96
ECP34 2M4 C	kVA	154	165	178	178	148	159	172	172	140	150	162	162	125	135	146	146	112	120	130	130
	kW	123	132	142	142	118	127	138	138	112	120	130	130	100	108	117	117	90	96	104	104
ECP34 1L4 C	kVA	165	187	198	198	158	178	189	189	150	170	180	180	132	150	163	163	120	136	144	144
	kW	132	150	158	158	126	142	151	151	120	136	144	144	106	120	130	130	96	109	115	115
ECP34 2L4 C	kVA	187	210	218	218	179	201	208	208	170	191	198	198	155	165	178	178	136	153	158	158
	kW	150	168	174	174	143	161	166	166	136	153	158	158	124	132	142	142	109	122	126	126

Reactance & Time constants- Class H / 400V

Unsaturated (ref. EN60034-4)			ECP34 1S4 C	ECP34 2S4 C	ECP34 1M4 C	ECP34 2M4 C	ECP34 1L4 C	ECP34 2L4 C
X_d	Direct-axis synchronous reactance	%	324	241,2	281,3	327,6	225,3	220,4
X'_d	Direct-axis transient reactance	%	22,3	18,4	21,5	22,8	13,9	18,2
X''_d	Direct-axis subtransient reactance	%	7,4	6	7	11,1	5,8	7,7
X_q	Quadrature-axis synchronous reactance	%	170,2	157	183,2	200,9	114,8	150,3
X'_q	Quadrature-axis transient reactance	%	170,2	157	183,2	200,9	114,8	150,3
X''_q	Quadrature-axis subtransient reactance	%	29,5	32,7	38,2	41,5	24,9	32,6
X₂	Negative-sequence reactance	%	17,8	18,8	22	25,7	14,8	19,5
X₀	Zero sequence reactance	%	3,59	3,67	4,29	3,97	2,35	3,12
Saturated								
X_d	Direct-axis synchronous reactance	%	275,4	205	239,1	278,5	191,5	187,3
X'_d	Direct-axis transient reactance	%	19	15,6	18,3	19,4	11,8	15,5
X''_d	Direct-axis subtransient reactance	%	6,29	5,1	5,95	9,43	4,93	6,54
X_q	Quadrature-axis synchronous reactance	%	144,7	133,4	155,7	170,8	97,6	127,8
X'_q	Quadrature-axis transient reactance	%	144,7	133,4	155,7	170,8	97,6	127,8
X''_q	Quadrature-axis subtransient reactance	%	25,1	27,8	32,5	35,3	21,2	27,7
X₂	Negative-sequence reactance	%	15,1	16	18,7	21,8	12,6	16,6
X₀	Zero sequence reactance	%	3,59	3,67	4,29	3,97	2,35	3,12
K_{cc}	Short circuit ratio		0,36	0,49	0,42	0,36	0,52	0,53
T'_d	Transient time constant	sec	0,056	0,059	0,069	0,085	0,053	0,073
T''_d	Subtransient time constant	sec	0,012	0,014	0,017	0,019	0,011	0,014
T'_{do}	Open circuit time constant	sec	0,82	0,77	0,9	1,22	0,86	0,88
T_a	Armature time constant	sec	0,016	0,018	0,021	0,026	0,017	0,02

Additional information - Class H / 400V

I₀	Excitation current at no load	A	0,5	0,7	0,7	0,4	0,6	0,5
I_c	Excitation current at full load	A	2,5	2,4	2,4	2,7	2,6	3,0
Overload			1 hour in a 6 hours period 110% rated load					
Overload per 20 sec.		%	300					
Heat dissipation		W	5922	6957	8342	8254	8755	10088
Telephone Harmonic Factor - THF		%	<2	<2	<2	<2	<2	<2
Waveform Distors.(THD) full load LL/LN		%	2,3 / 2,3	2,2 / 2,3	2 / 2,2	1,8 / 2	1,8 / 1,9	1,9 / 2
Waveform Distors.(THD) no load LL/LN		%	2,5 / 2,9	2,9 / 3	2,8 / 3	2,7 / 3	2,7 / 2,9	2,7 / 2,9

Reactance & Time constants- Class H / 480V

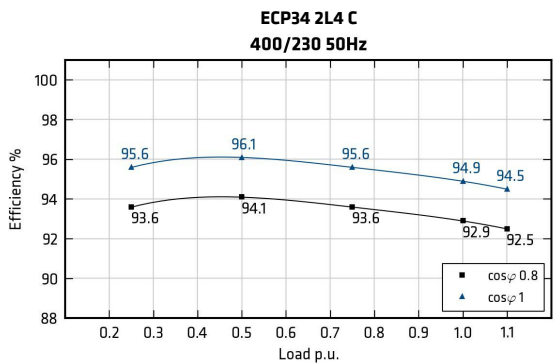
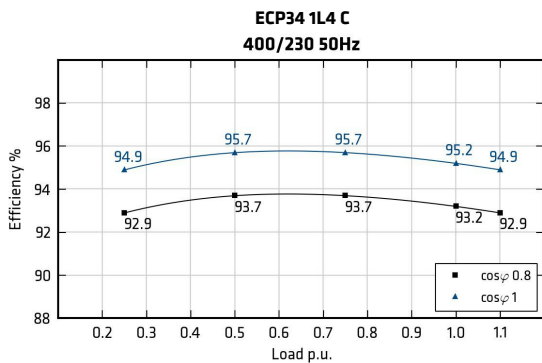
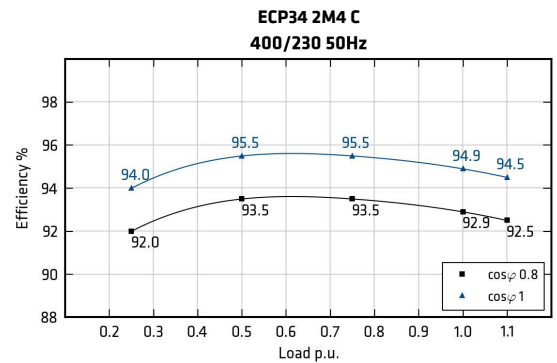
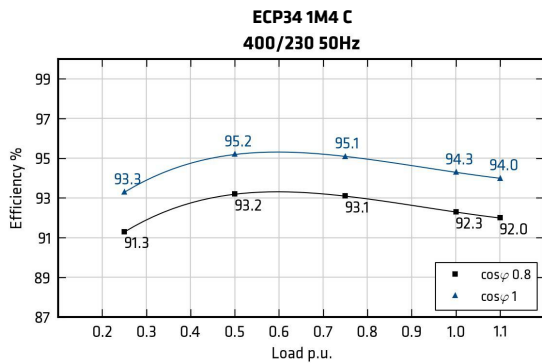
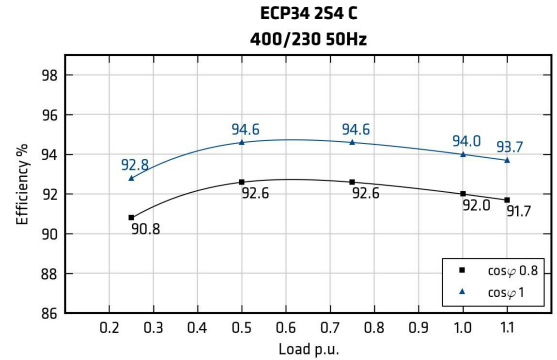
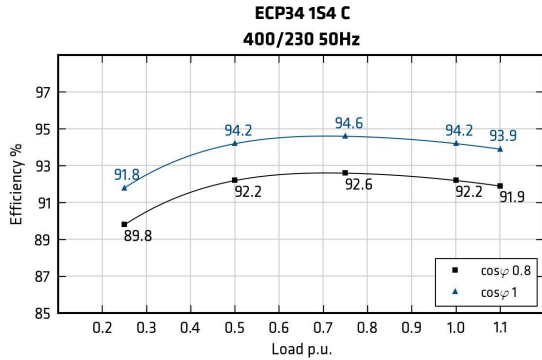
Unsaturated (ref. EN60034-4)			ECP34 1S4 C	ECP34 2S4 C	ECP34 1M4 C	ECP34 2M4 C	ECP34 1L4 C	ECP34 2L4 C
X_d	Direct-axis synchronous reactance	%	324	241,2	281,3	327,6	225,3	227,3
X'_d	Direct-axis transient reactance	%	22,3	18,4	21,5	22,8	13,9	18,8
X''_d	Direct-axis subtransient reactance	%	7,4	6	7	11,1	5,8	7,94
X_q	Quadrature-axis synchronous reactance	%	170,2	157	183,2	200,9	114,8	155
X'_q	Quadrature-axis transient reactance	%	170,2	157	183,2	200,9	114,8	155
X''_q	Quadrature-axis subtransient reactance	%	29,5	32,7	38,2	41,5	24,9	33,6
X₂	Negative-sequence reactance	%	17,8	18,8	22	25,7	14,8	20,1
X₀	Zero sequence reactance	%	3,59	3,67	4,29	3,97	2,35	3,22
Saturated								
X_d	Direct-axis synchronous reactance	%	275,4	205	239,1	278,5	191,5	193,2
X'_d	Direct-axis transient reactance	%	19	15,6	18,3	19,4	11,8	16
X''_d	Direct-axis subtransient reactance	%	6,29	5,1	5,95	9,43	4,93	6,75
X_q	Quadrature-axis synchronous reactance	%	144,7	133,4	155,7	170,8	97,6	131,8
X'_q	Quadrature-axis transient reactance	%	144,7	133,4	155,7	170,8	97,6	131,8
X''_q	Quadrature-axis subtransient reactance	%	25,1	27,8	32,5	35,3	21,2	28,6
X₂	Negative-sequence reactance	%	15,1	16	18,7	21,8	12,6	17,1
X₀	Zero sequence reactance	%	3,59	3,67	4,29	3,97	2,35	3,22
K_{cc}	Short circuit ratio		0,36	0,49	0,42	0,36	0,52	0,52
T'_d	Transient time constant	sec	0,056	0,059	0,069	0,085	0,053	0,073
T''_d	Subtransient time constant	sec	0,012	0,014	0,017	0,019	0,011	0,014
T'_{do}	Open circuit time constant	sec	0,82	0,77	0,9	1,22	0,86	0,88
T_a	Armature time constant	sec	0,016	0,018	0,021	0,026	0,017	0,02

Additional information - Class H / 480V

I₀	Excitation current at no load	A	0,5	0,7	0,7	0,4	0,6	0,5
I_c	Excitation current at full load	A	2,5	2,4	2,4	2,7	2,6	3,0
Overload			1 hour in a 6 hours period 110% rated load					
Overload per 20 sec.		%	300					
Heat dissipation		W	7603	8121	9730	9905	9846	10111
Telephone Interference Factor - TIF			<40	<40	<40	<40	<40	<40
Waveform Distors.(THD) full load LL/LN		%	2,3 / 2,3	2,2 / 2,3	2 / 2,2	1,8 / 2	1,8 / 1,9	1,9 / 2
Waveform Distors.(THD) no load LL/LN		%	2,5 / 2,9	2,9 / 3	2,8 / 3	2,7 / 3	2,7 / 2,9	2,7 / 2,9

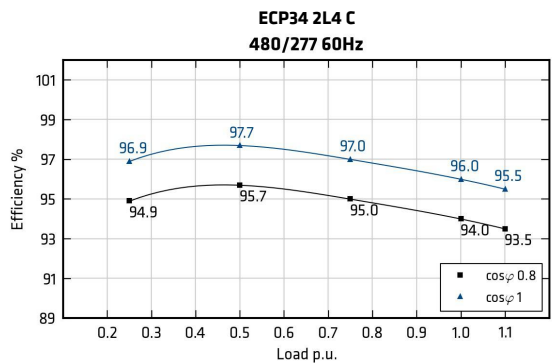
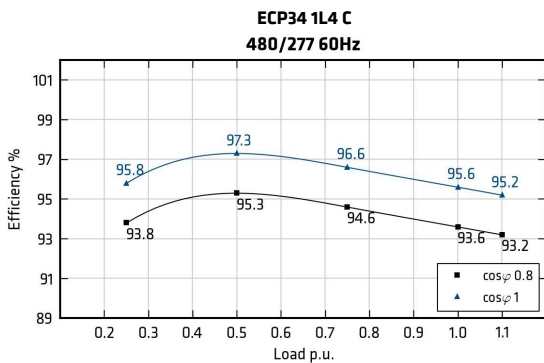
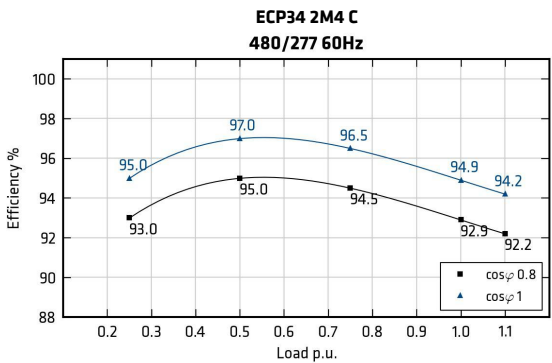
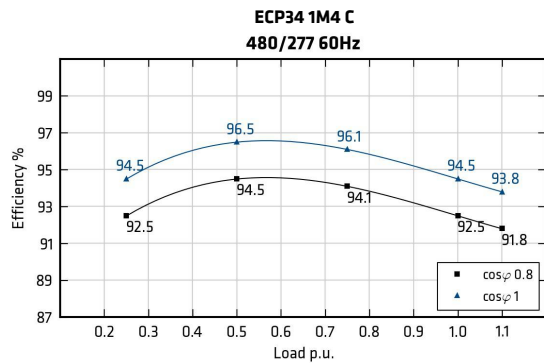
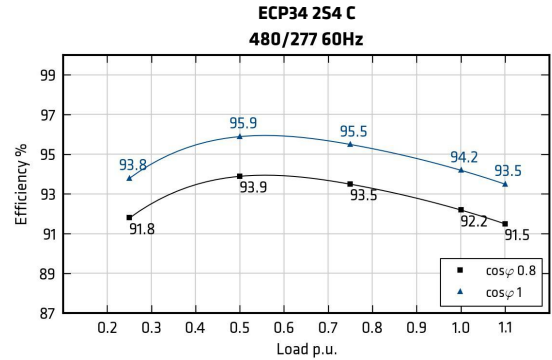
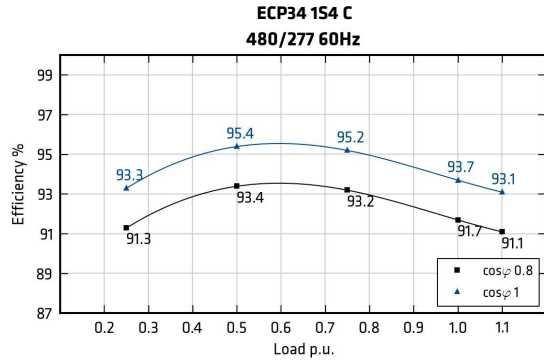
Efficiencies @ 50Hz

Models		380V 50Hz					400V 50Hz					415V 50Hz					440V 50Hz				
		0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1
ECP34 1S4 C	%	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
ECP34 2S4 C	%	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
ECP34 1M4 C	%	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
ECP34 2M4 C	%	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
ECP34 1L4 C	%	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
ECP34 2L4 C	%	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

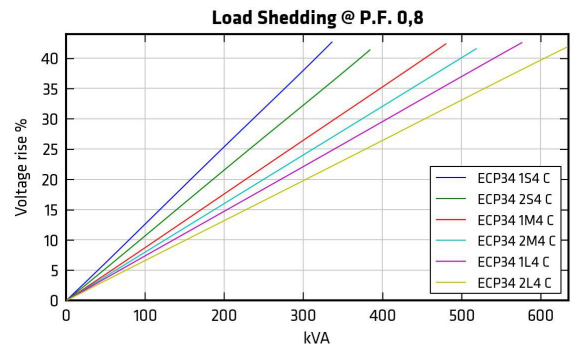
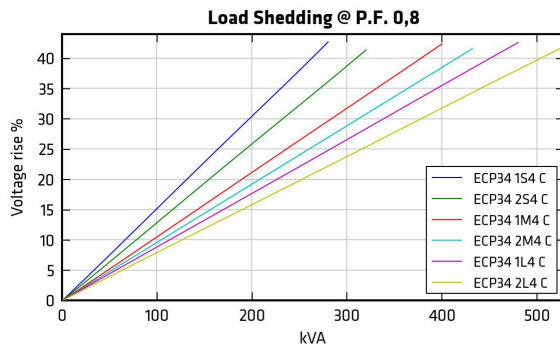
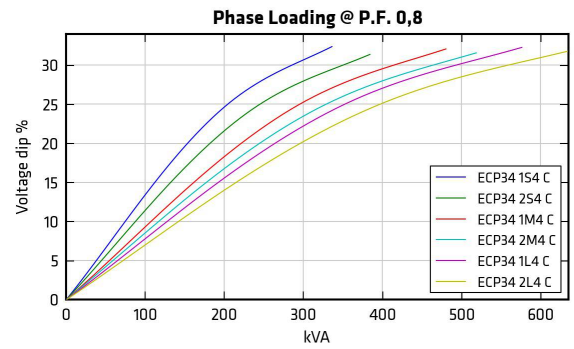
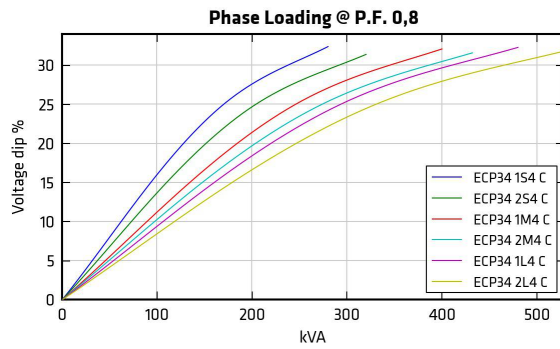
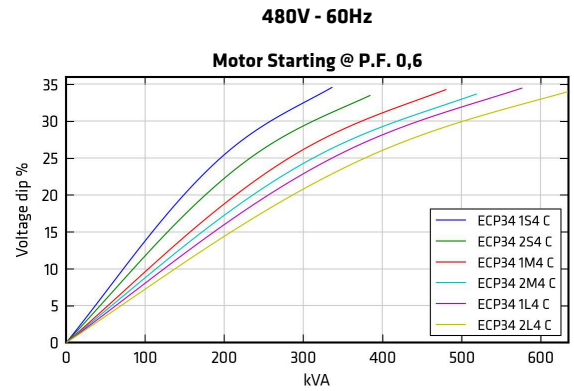
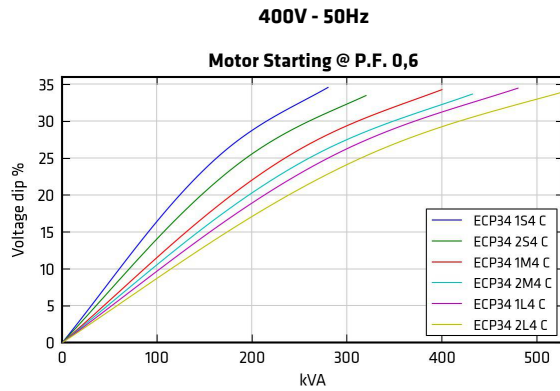


Efficiencies @ 60Hz

Models		415V 60Hz					440V 60Hz					460V 60Hz					480V 60Hz					
		0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1	0.25	0.5	0.75	1	1.1	
ECP34 1S4 C	%	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	91,1
ECP34 2S4 C	%	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	91,5
ECP34 1M4 C	%	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	91,8
ECP34 2M4 C	%	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	92,2
ECP34 1L4 C	%	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	93,2
ECP34 2L4 C	%	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	93,5



Transients voltage



In order to scale transient curves as a function of a power factor or voltage if not indicated, please proceed as follows:

Power Factor coefficient corrector (PFCC), to be used on power factor 0.6 curves:

$$PFCC = \sin(\text{ARCCos}(PF_{\text{new}})) / 0.8$$

Example. The PFCC at power factor 0.3 is 1.192 [$PFCC = \sin(\text{ARCCos}(0.3)) / 0.8$]. This means that the voltage fall at a given power at pf 0.3 is equivalent to the one that can be read on the pf 0.6 curve if the load is considered 1.192 times bigger (19% higher value.).

In this example, a 100 kVA load insertion at pf 0.3 is equivalent in voltage fall to a 119kVA load insertion at pf 0.6.

Voltage coefficient corrector (VCC):

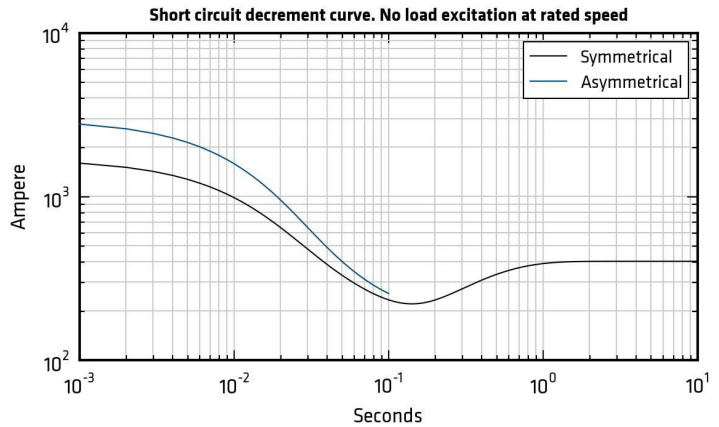
$$VCC = (400/V_{\text{new}})^2 \text{ if } 50 \text{ Hz}; VCC = (480/V_{\text{new}})^2 \text{ if } 60 \text{ Hz}$$

Example. VCC at 415V 60 Hz is 1.338 [$VCC = (480/415)^2$]. This means that the voltage fall at a given power at 415V is equivalent to the one that can be read on the power factor 0.6 curve if the load is considered 1.338 times bigger (33% higher value.).

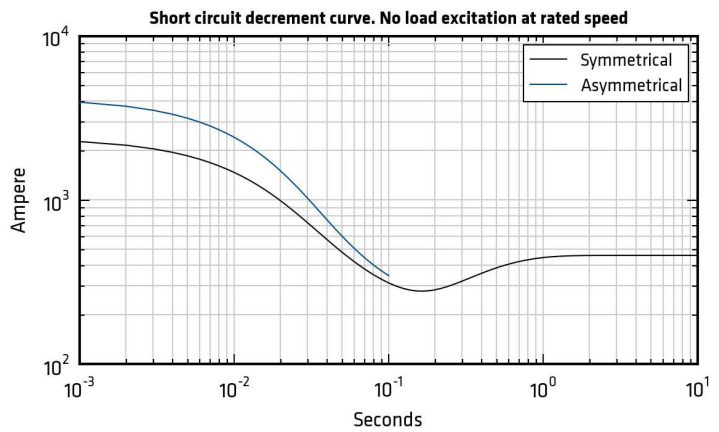
In this example, a 100 kVA load insertion at 415V is equivalent in voltage fall to a 133kVA load insertion at 480V.

50Hz Short circuit decrement curves - No load excitation at rated speed

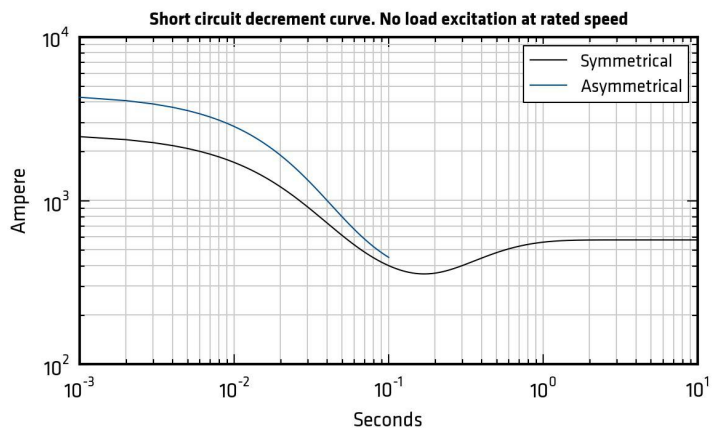
ECP34 1S4 C



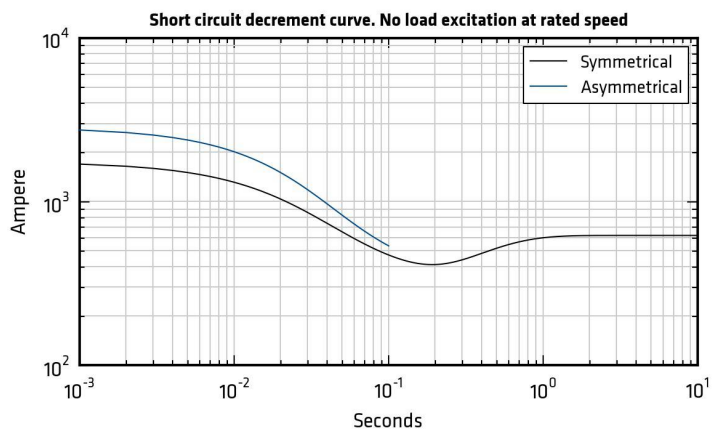
ECP34 2S4 C



ECP34 1M4 C



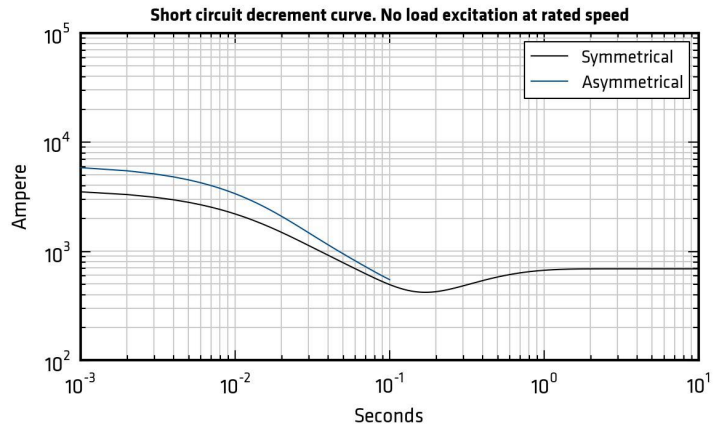
ECP34 2M4 C



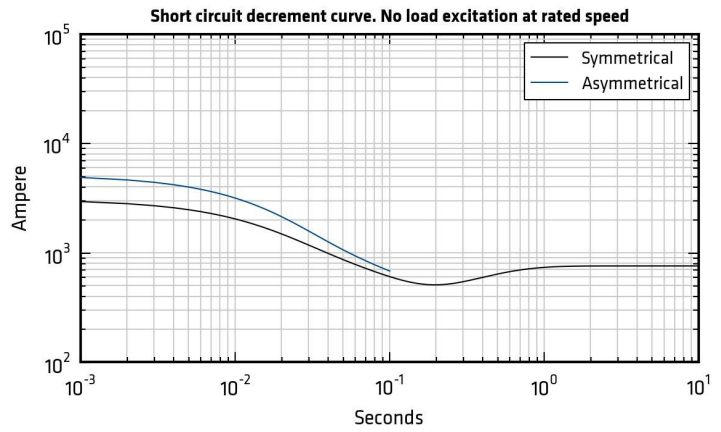
*Please refer to tables at page 6

50Hz Short circuit decrement curves - No load excitation at rated speed

ECP34 1L4 C



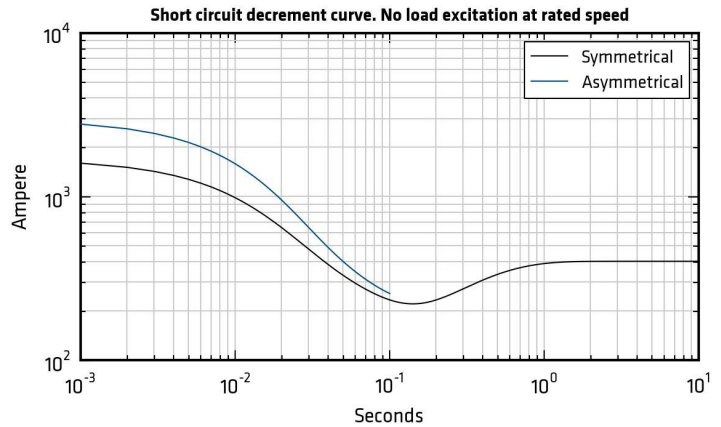
ECP34 2L4 C



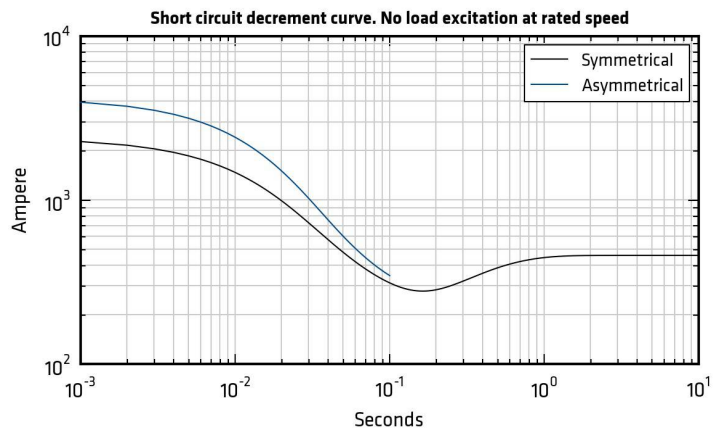
*Please refer to tables at page 6

60Hz Short circuit decrement curves - No load excitation at rated speed

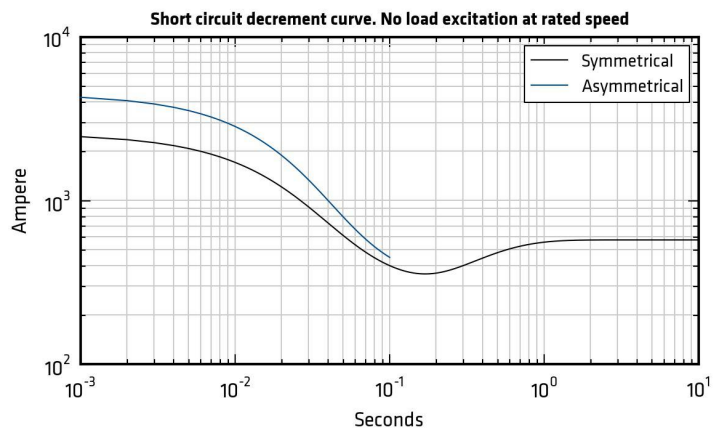
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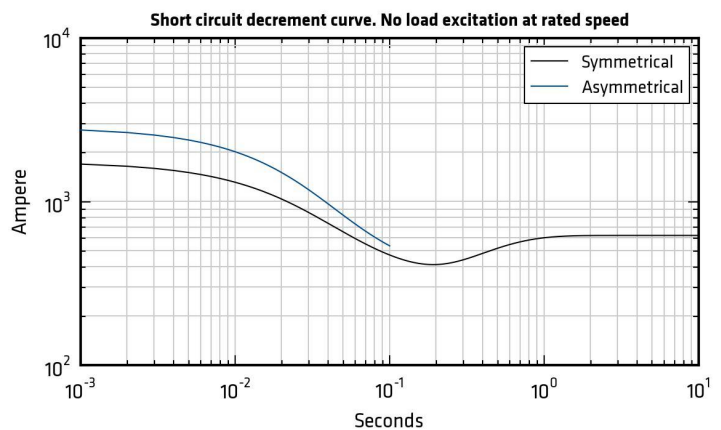
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ECP34 1M4 C



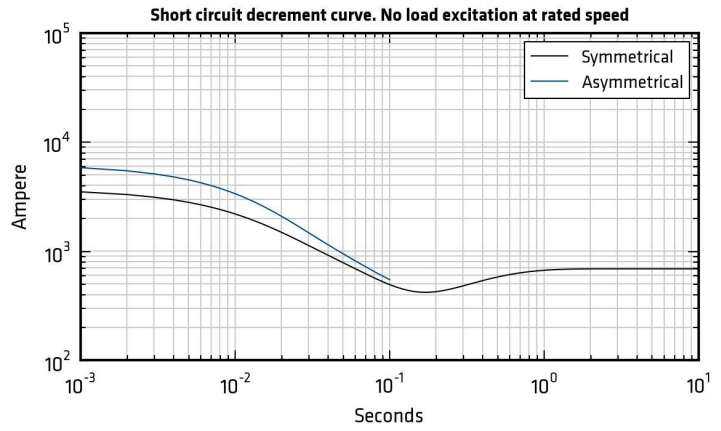
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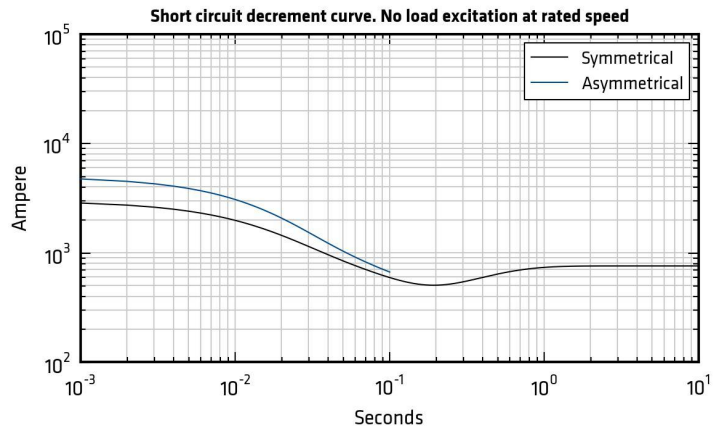
*Please refer to tables at page 6

60Hz Short circuit decrement curves - No load excitation at rated speed

ECP34 1L4 C



ECP34 2L4 C

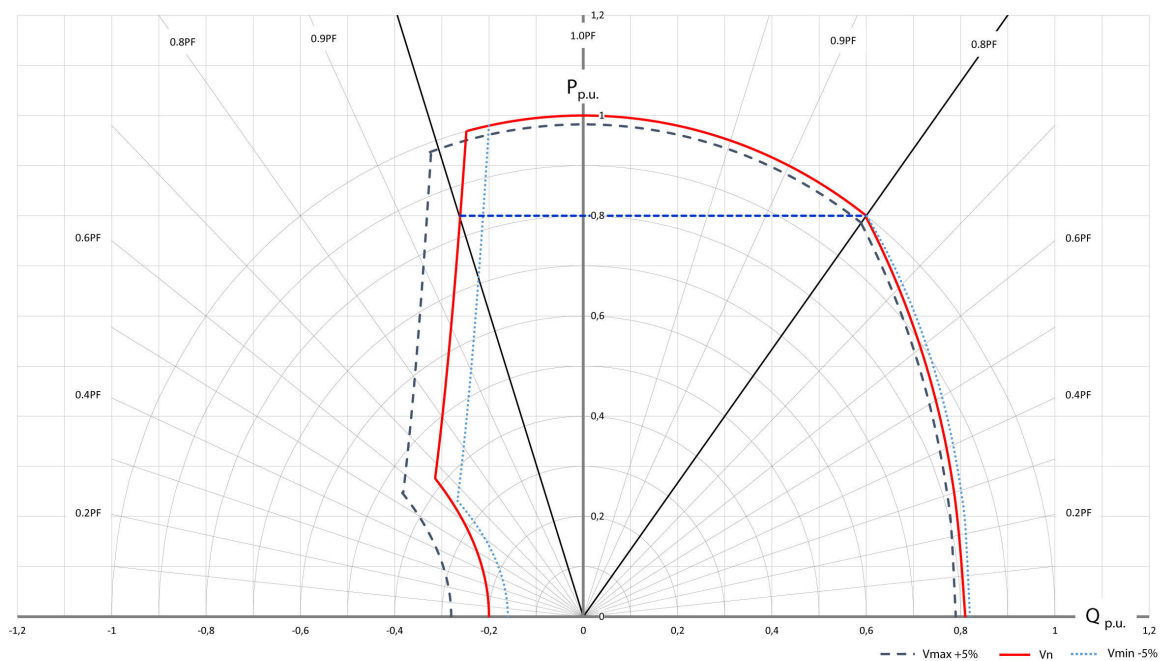


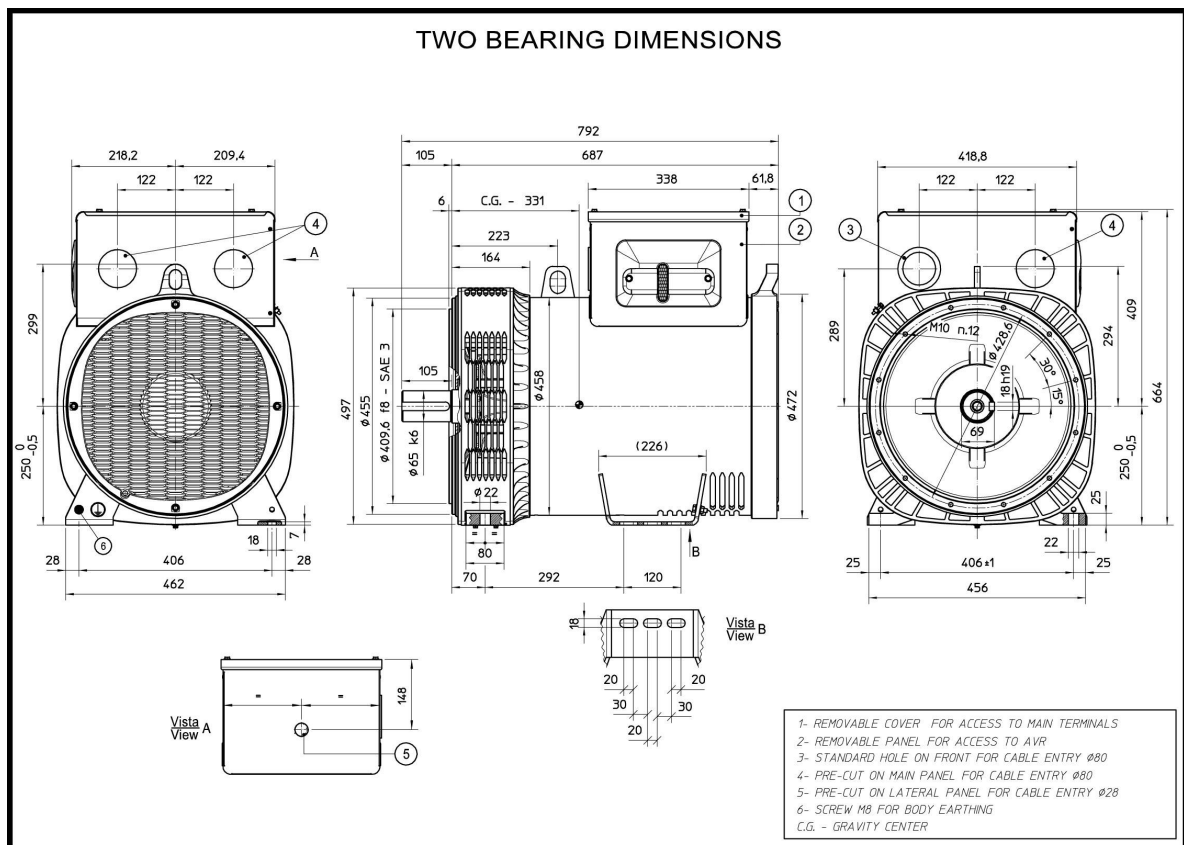
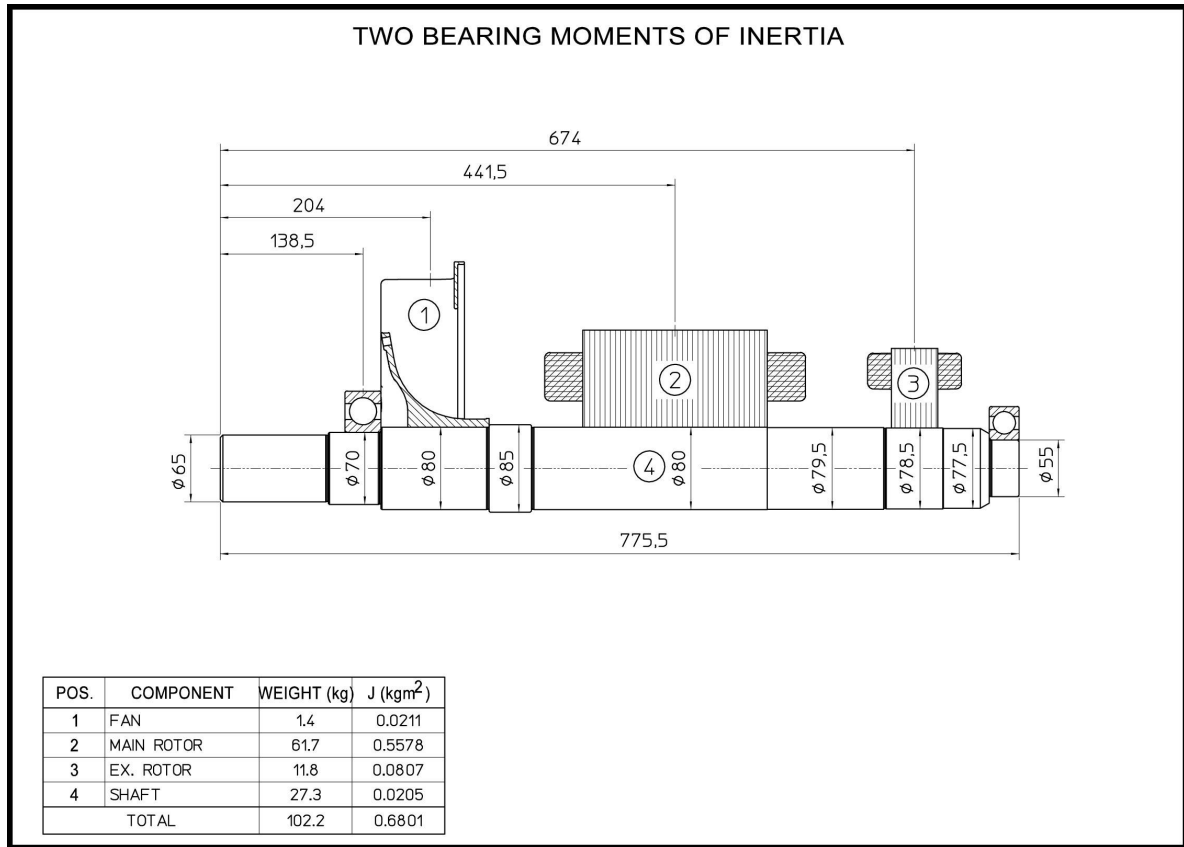
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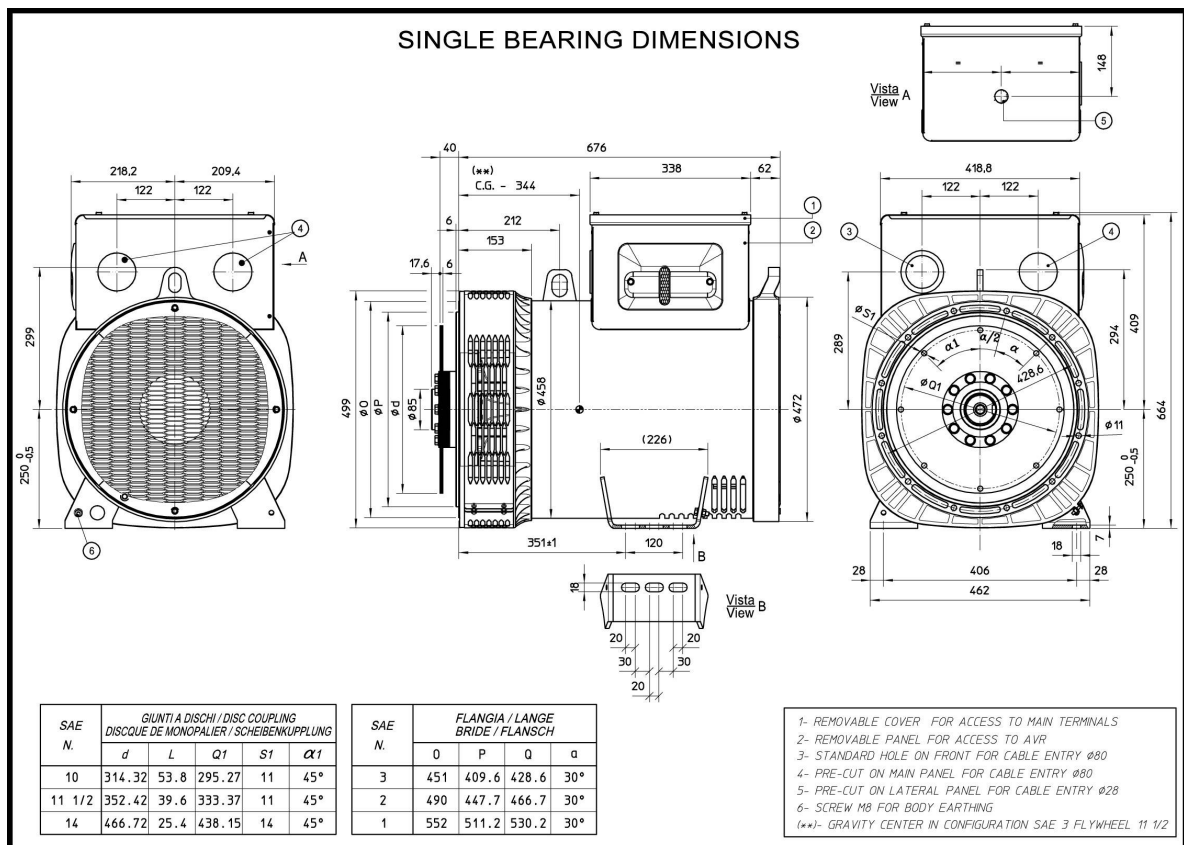
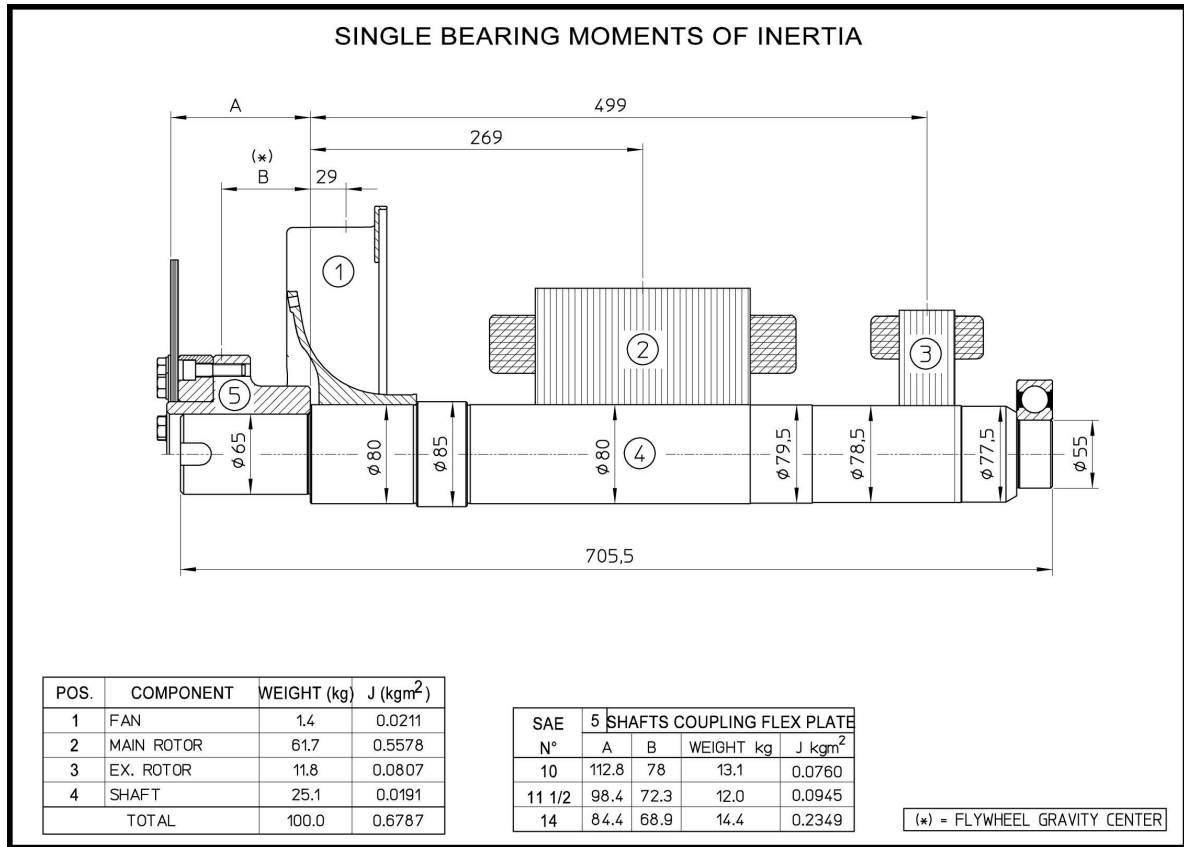
Additional Characteristics

Data	ECP34 1S4 C		ECP34 2S4 C		ECP34 1M4 C		ECP34 2M4 C		ECP34 1L4 C		ECP34 2L4 C		
	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	
Damper cage	Aluminium												
Stator Winding Resistance (20°C)	Ω	0,033		0,027		0,021		0,02		0,014		0,015	
Rotor Winding Resistance (20°C)	Ω	2,392		2,844		3,09		3,172		3,467		3,624	
Stator Exciter Resistance (20°C)	Ω	15,28		15,28		15,28		15,28		15,28		15,28	
Rotor Exciter Resistance (20°C)	Ω	0,41		0,41		0,41		0,41		0,41		0,41	
Weight of complete generator	kg	302,0		349,0		385,0		388,0		423,0		440,0	
Unbalanced magnetic pull	kN/mm	4,8		5,1		5,3		5,4		5,5		5,4	
Air flow	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
Noise level at 1m/7m	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

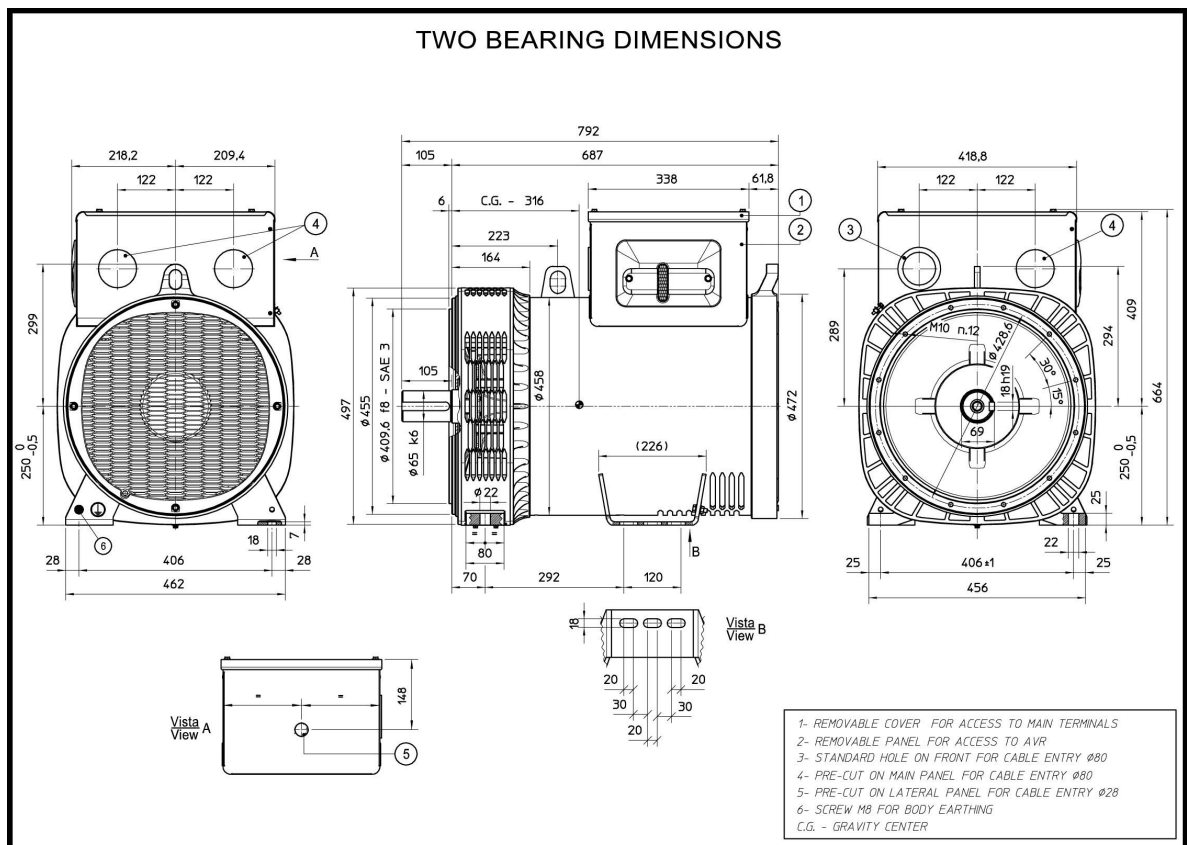
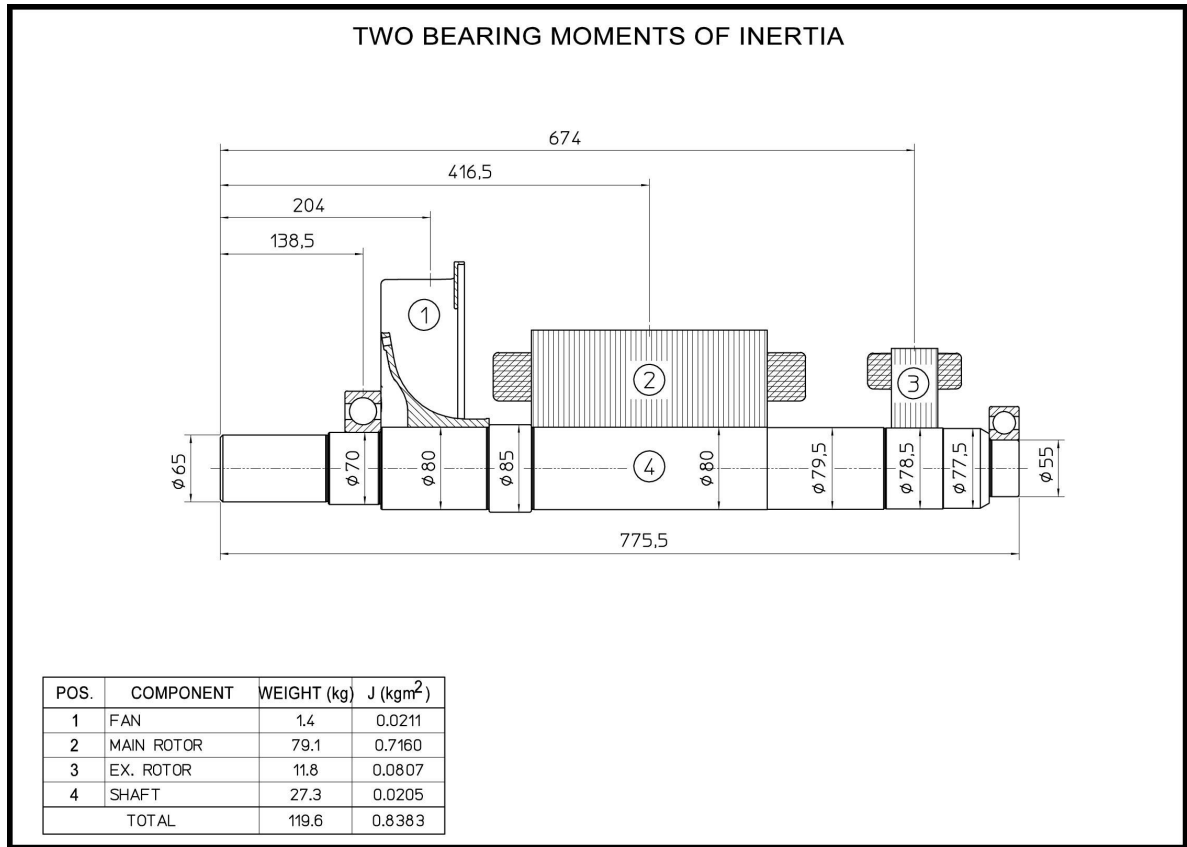
PQ Diagram



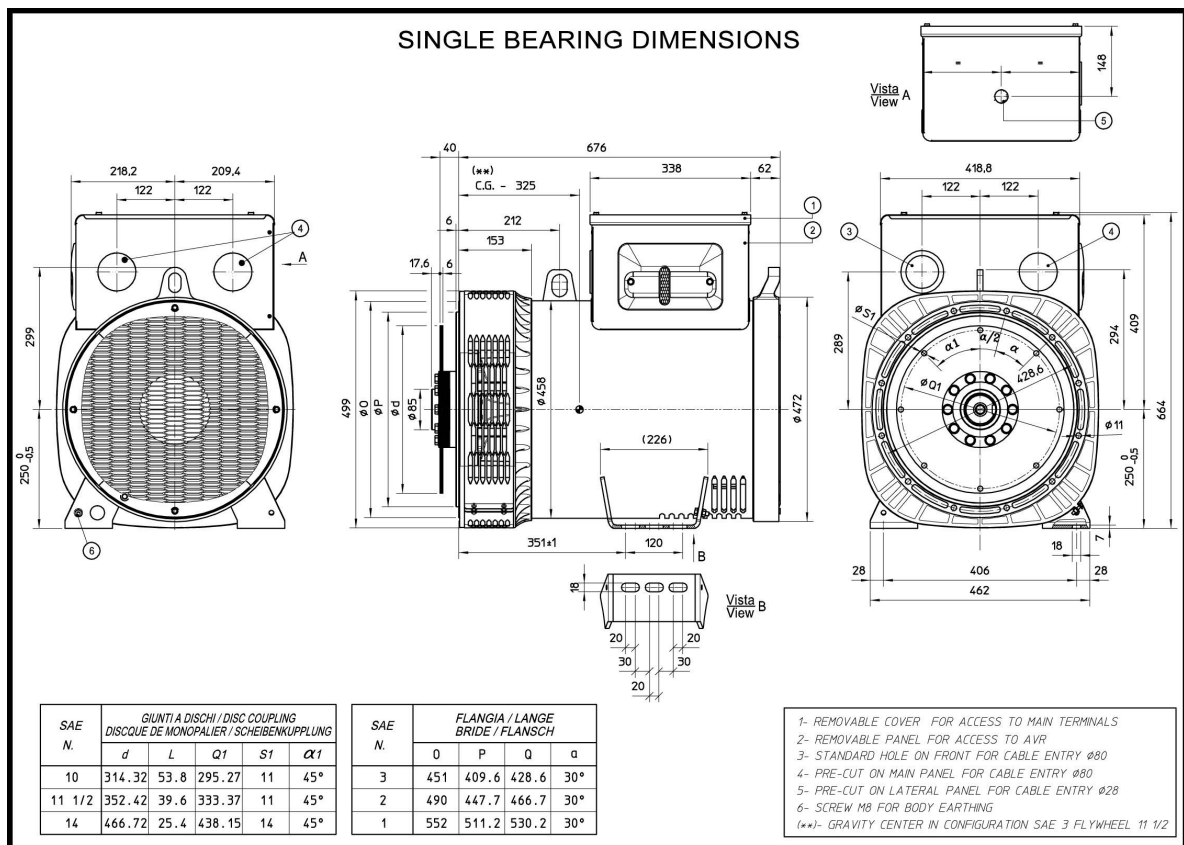
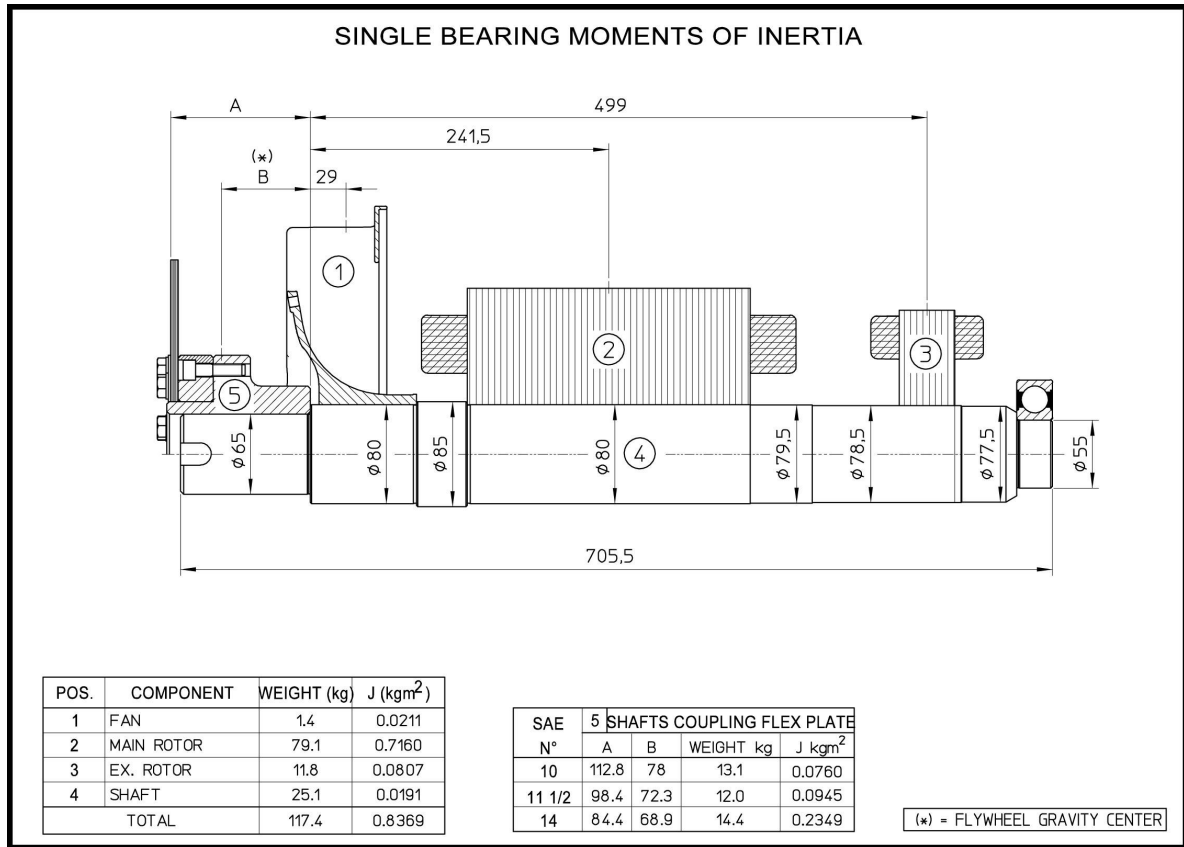




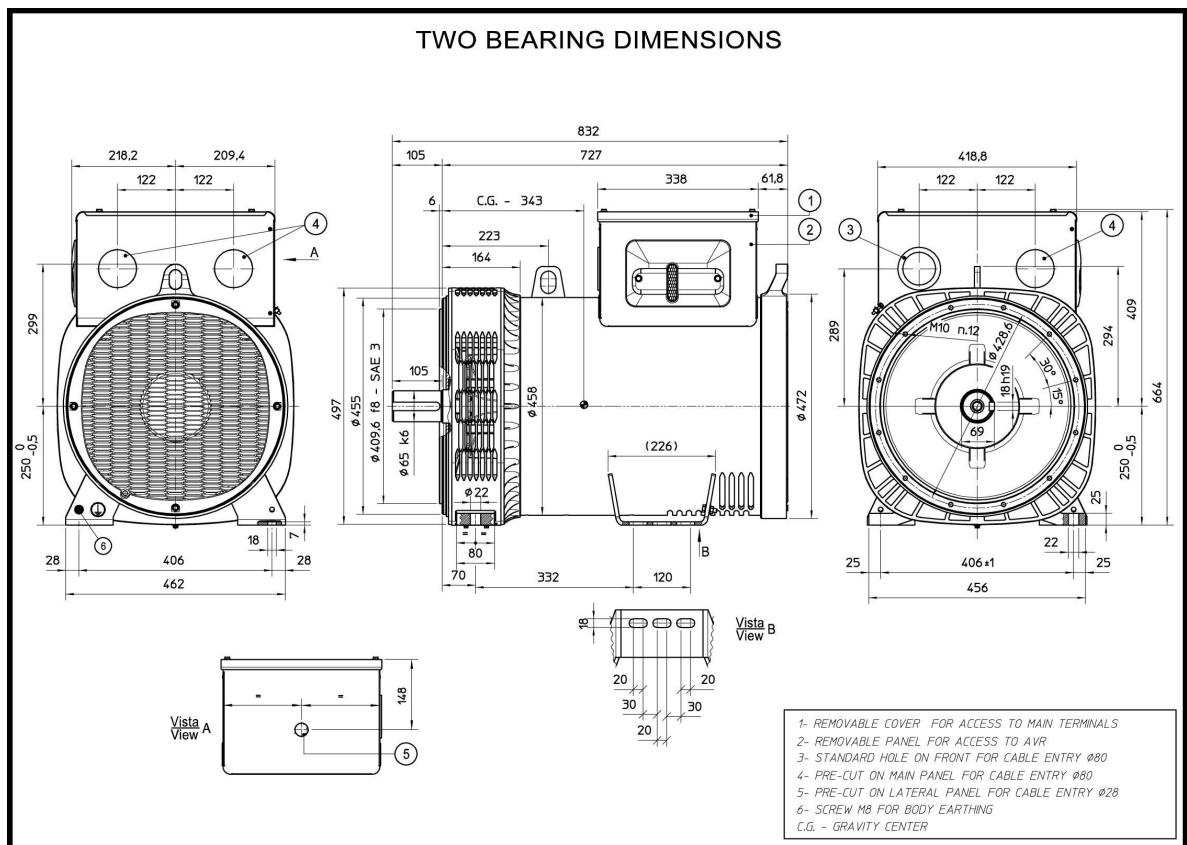
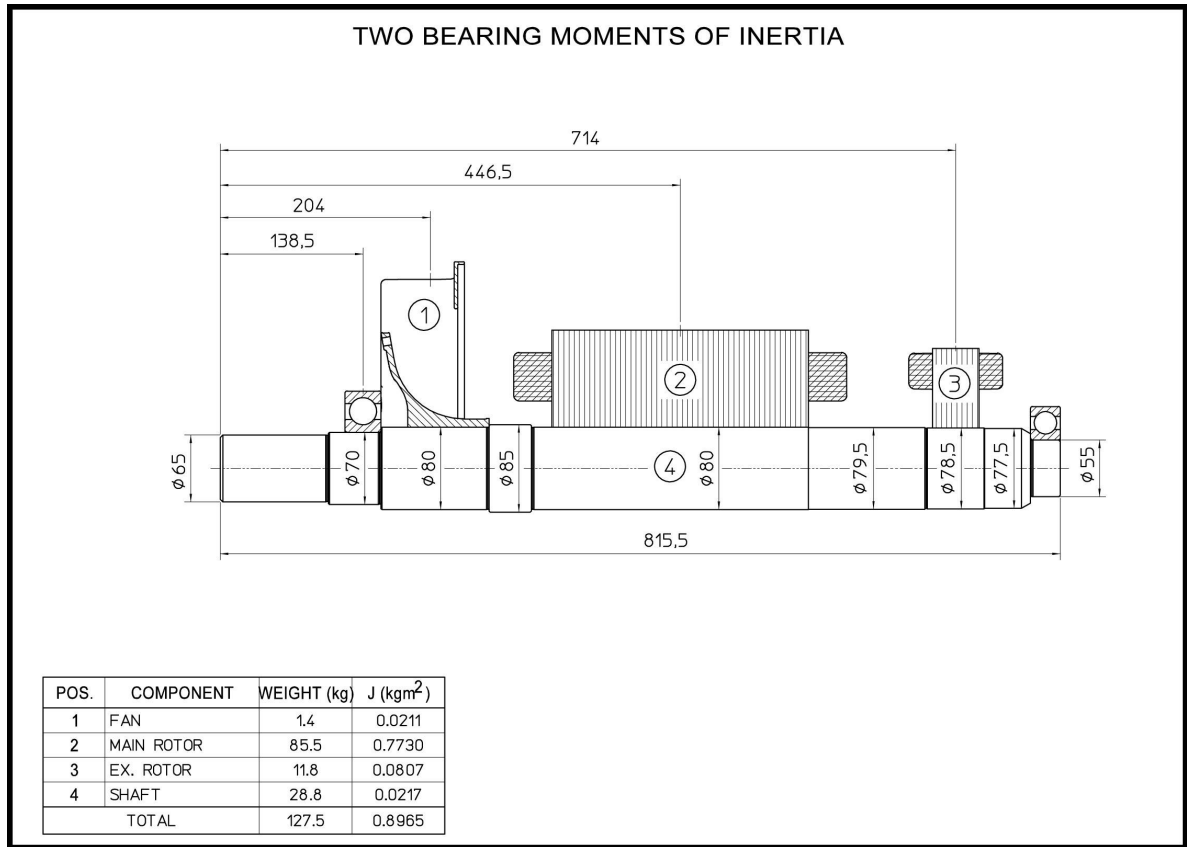
ECP34 2S4 C



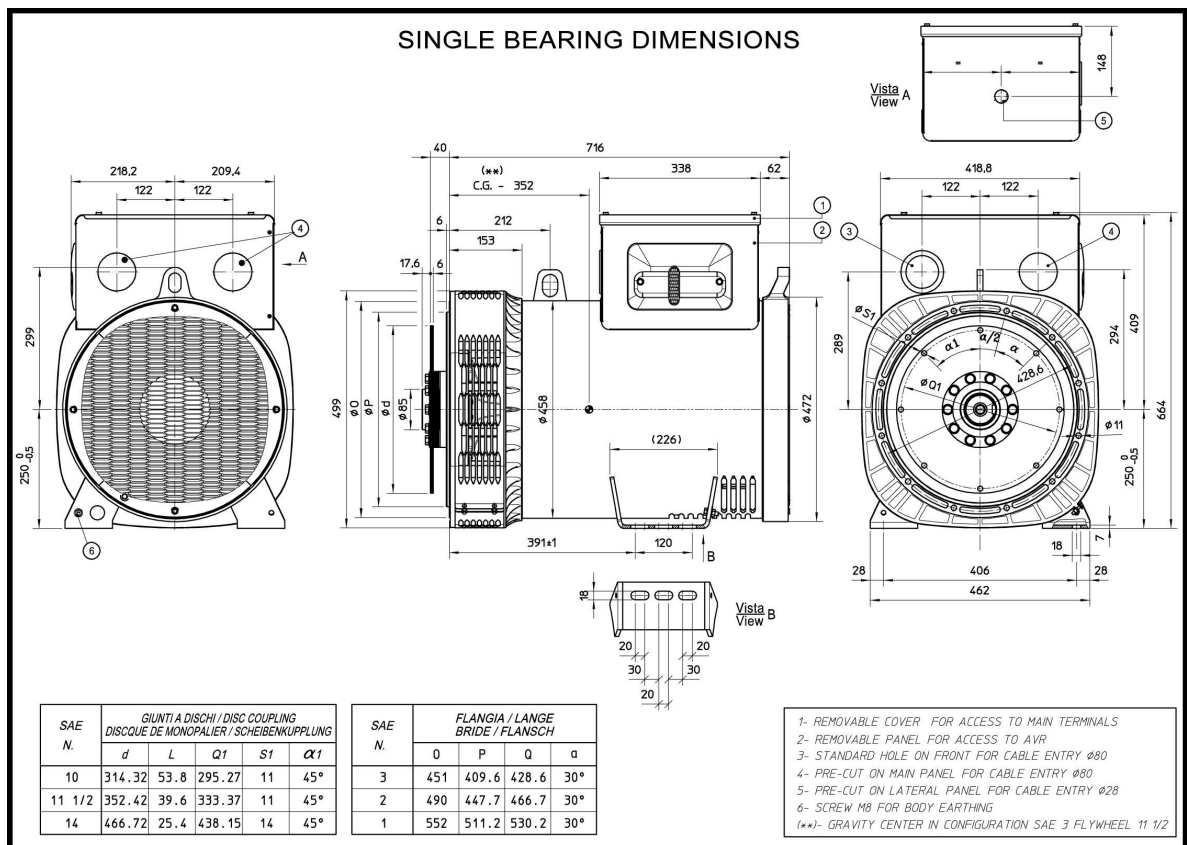
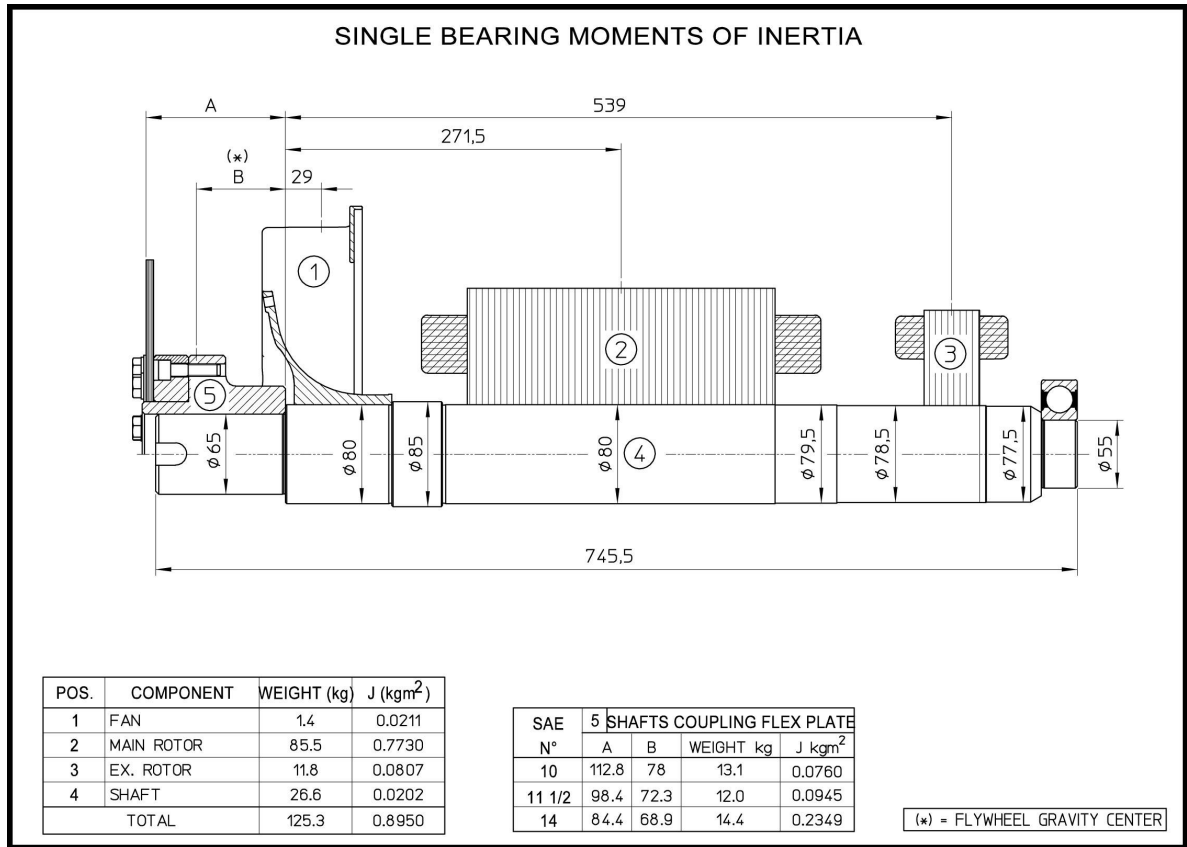
ECP34 2S4 C



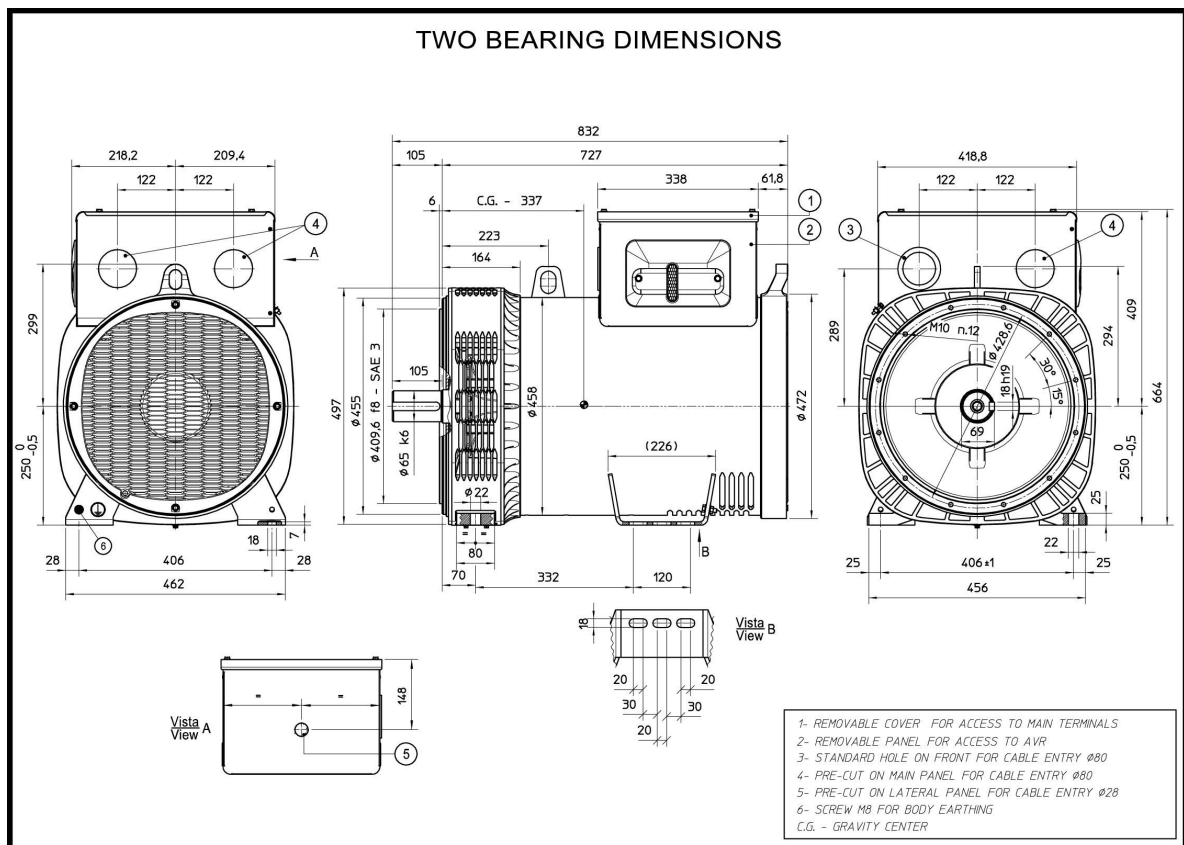
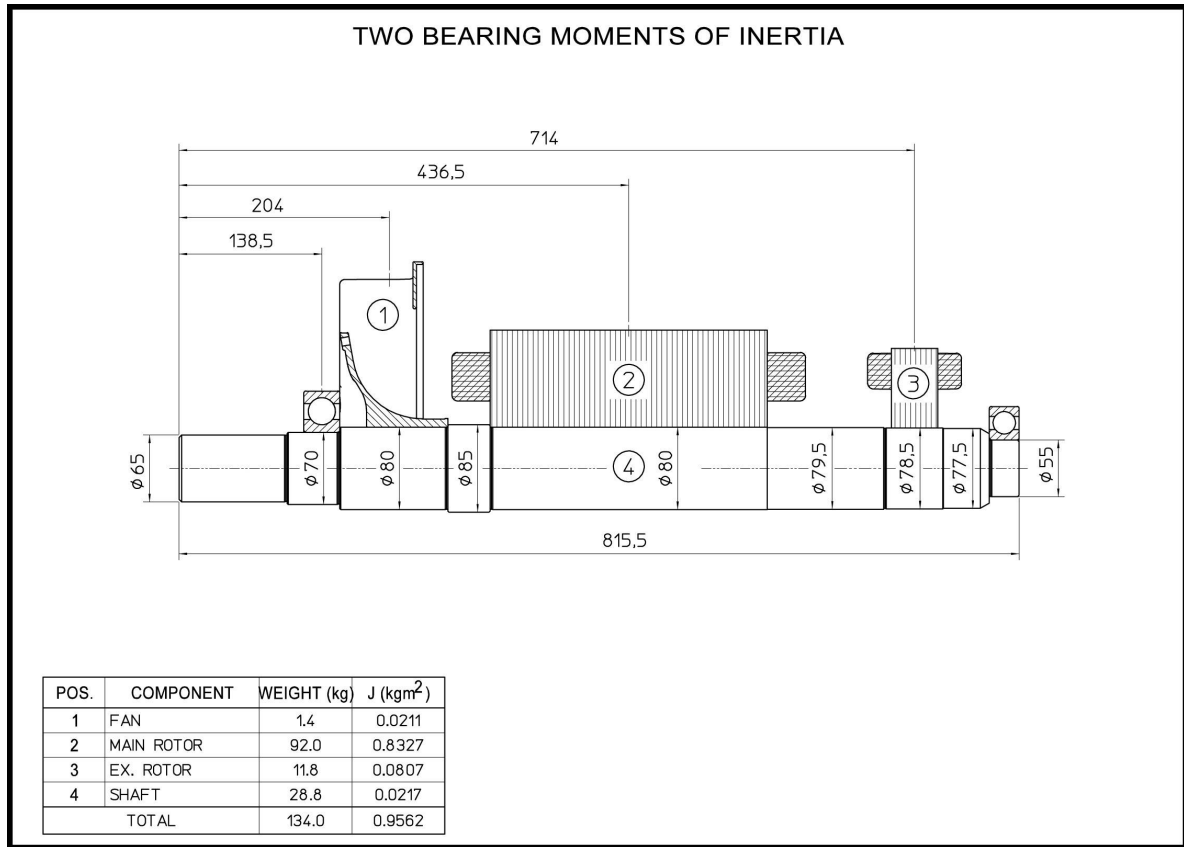
ECP34 1M4 C



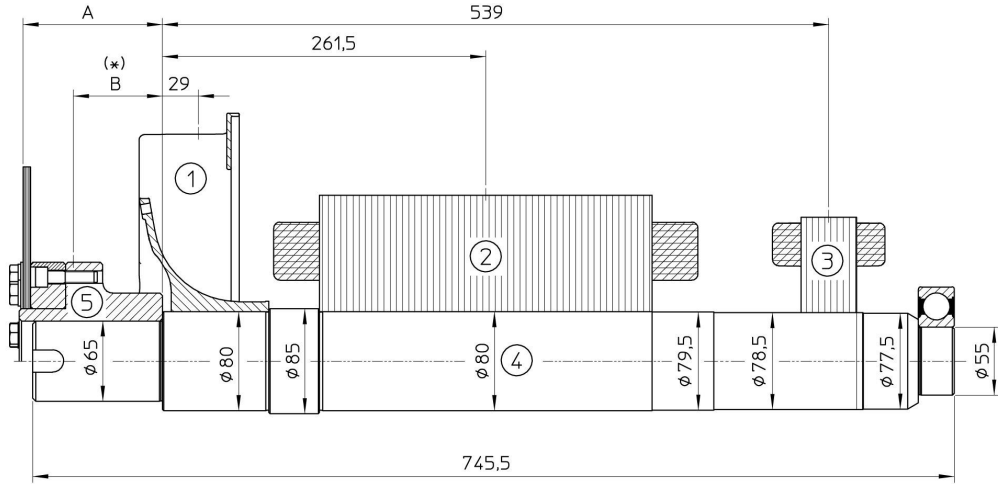
ECP34 1M4 C



ECP34 2M4 C



SINGLE BEARING MOMENTS OF INERTIA

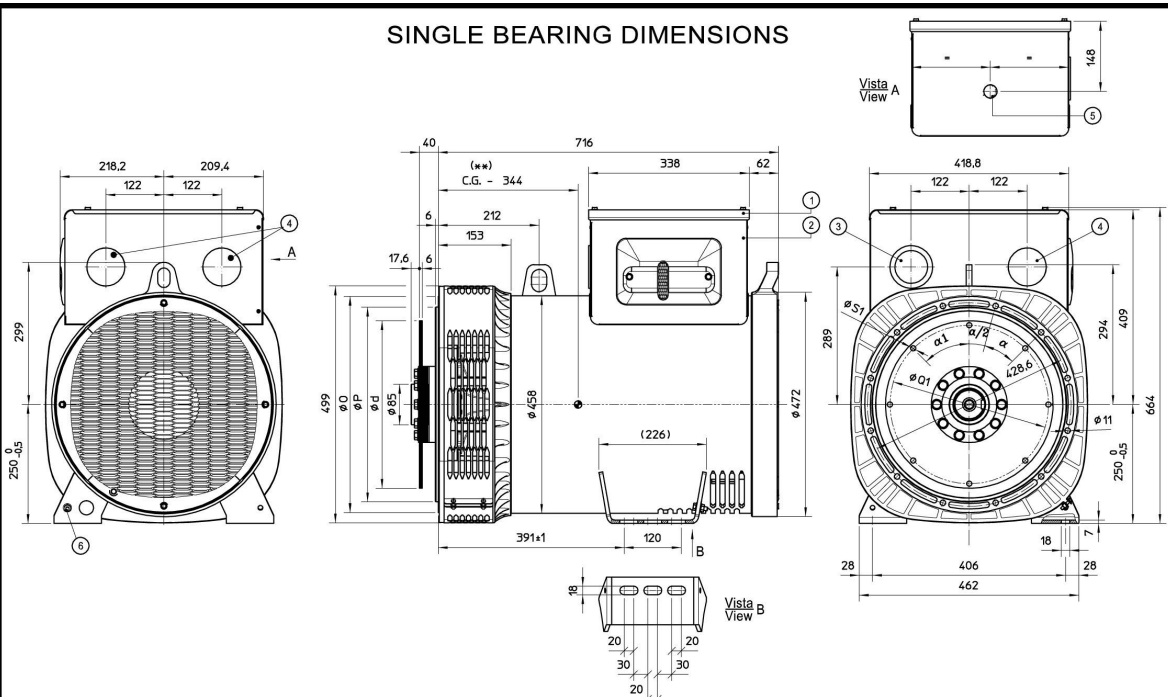


POS.	COMPONENT	WEIGHT (kg)	J (kgm ²)
1	FAN	1.4	0.0211
2	MAIN ROTOR	92.0	0.8327
3	EX. ROTOR	11.8	0.0807
4	SHAFT	26.6	0.0202
TOTAL		131.8	0.9547

SAE 5 SHAFTS COUPLING FLEX PLATE				
N°	A	B	WEIGHT kg	J kgm ²
10	112.8	78	13.1	0.0760
11 1/2	98.4	72.3	12.0	0.0945
14	84.4	68.9	14.4	0.2349

(*) = FLYWHEEL GRAVITY CENTER

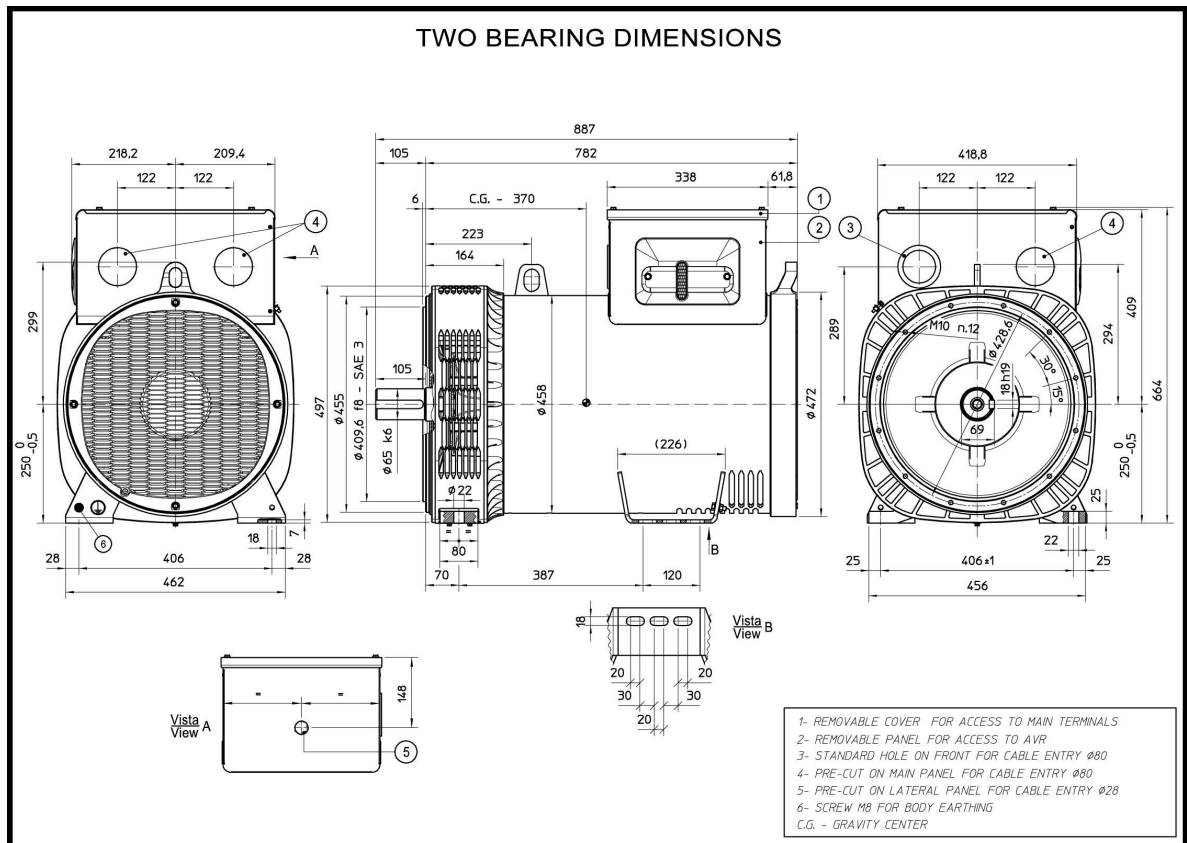
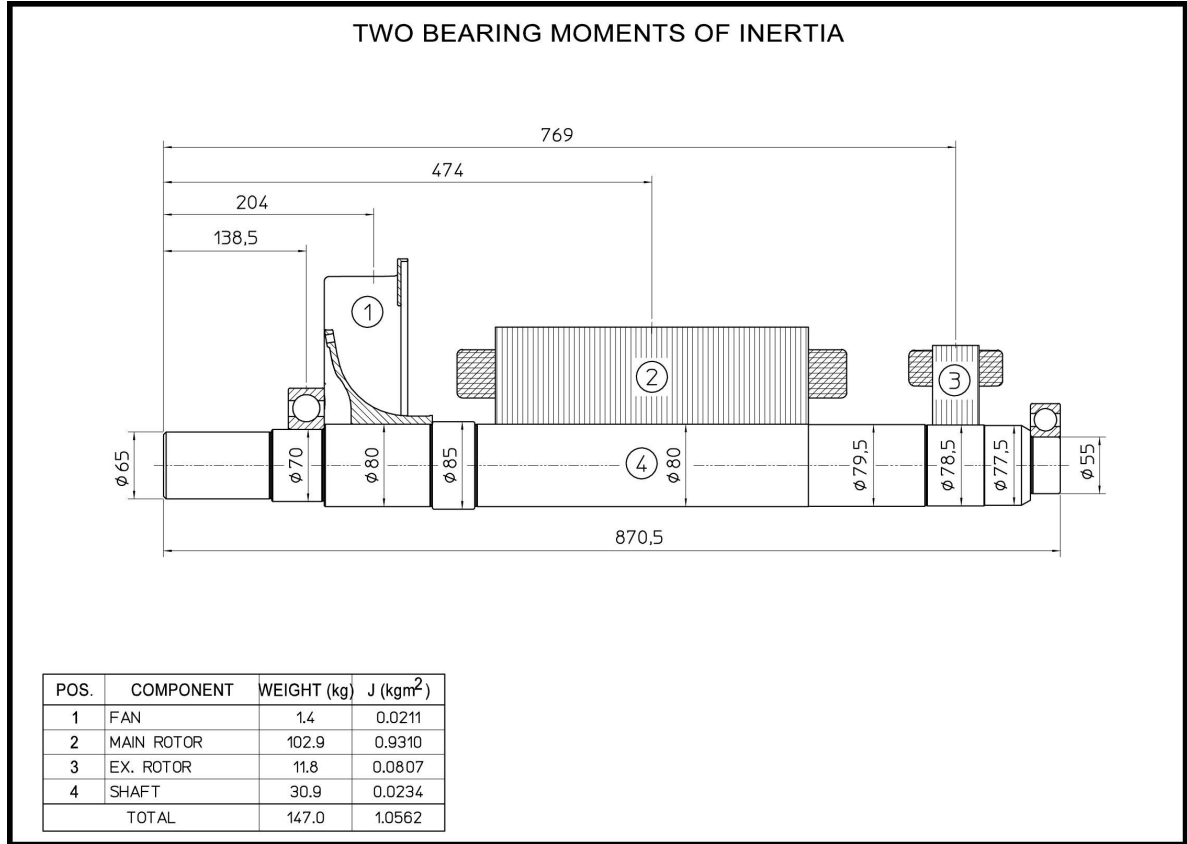
SINGLE BEARING DIMENSIONS



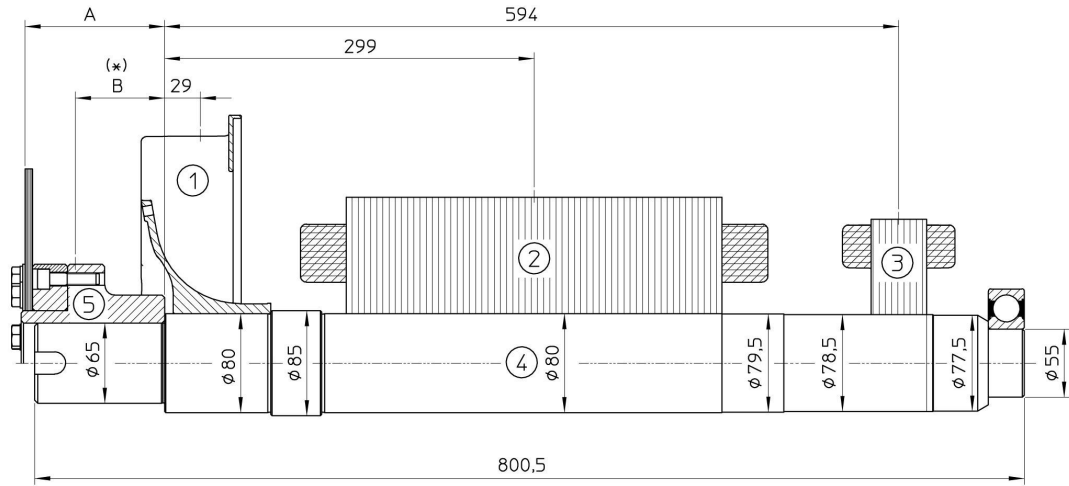
SAE N.	GIUNTI A DISCHI / DISC COUPLING / DISQUE DE MONOPALIER / SCHEIBENKUPPLUNG				
	d	L	Q1	S1	α1
10	314.32	53.8	295.27	11	45°
11 1/2	352.42	39.6	333.37	11	45°
14	466.72	25.4	438.15	14	45°

SAE N.	FLANGIA / LANGE BRIDE / FLANSCH			
	0	P	Q	α
3	451	409.6	428.6	30°
2	490	447.7	466.7	30°
1	552	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 Ø80
- 4- PRE-CUT ON MAIN PANEL FOR CABLE ENTRY Ø80
- 5- PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY Ø28
- 6- SCREW M8 FOR BODY EARTHING
- (**)- GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11 1/2



SINGLE BEARING MOMENTS OF INERTIA

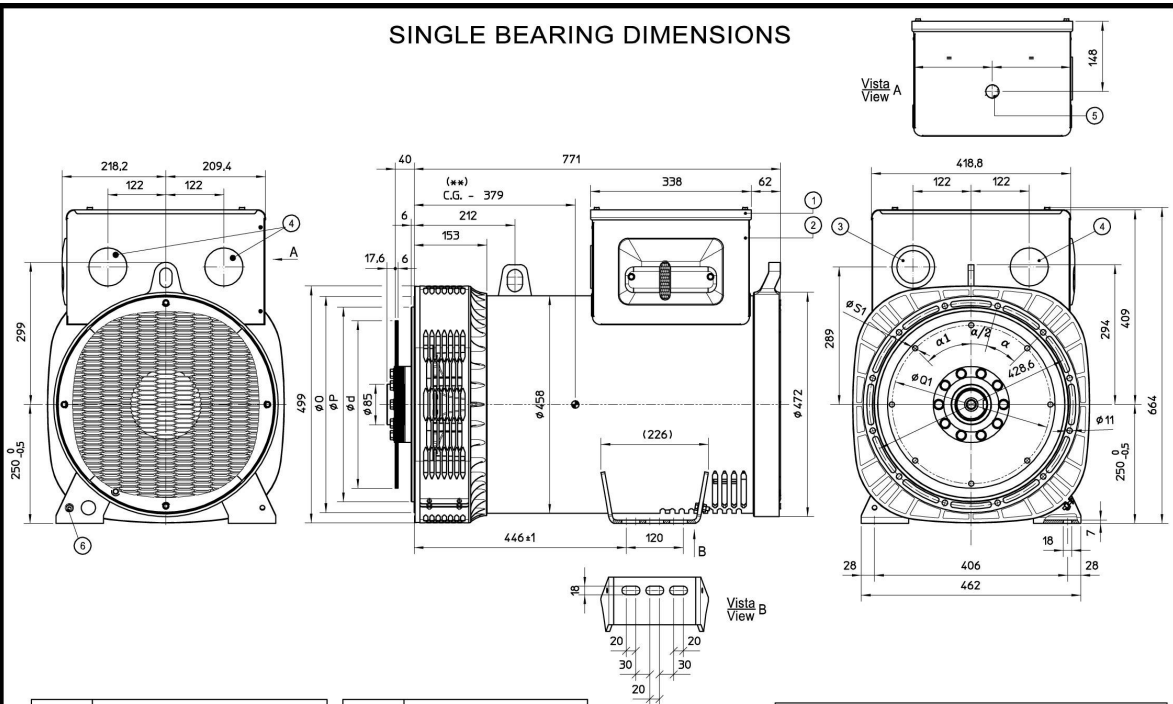


POS.	COMPONENT	WEIGHT (kg)	J (kgm ²)
1	FAN	1.4	0.0211
2	MAIN ROTOR	102.9	0.9310
3	EX. ROTOR	11.8	0.0807
4	SHAFT	28.7	0.0219
TOTAL		144.8	1.0547

SAE 5 SHAFTS COUPLING FLEX PLATE				
N°	A	B	WEIGHT kg	J kgm ²
10	112.8	78	13.1	0.0760
11 1/2	98.4	72.3	12.0	0.0945
14	84.4	68.9	14.4	0.2349

(*) = FLYWHEEL GRAVITY CENTER

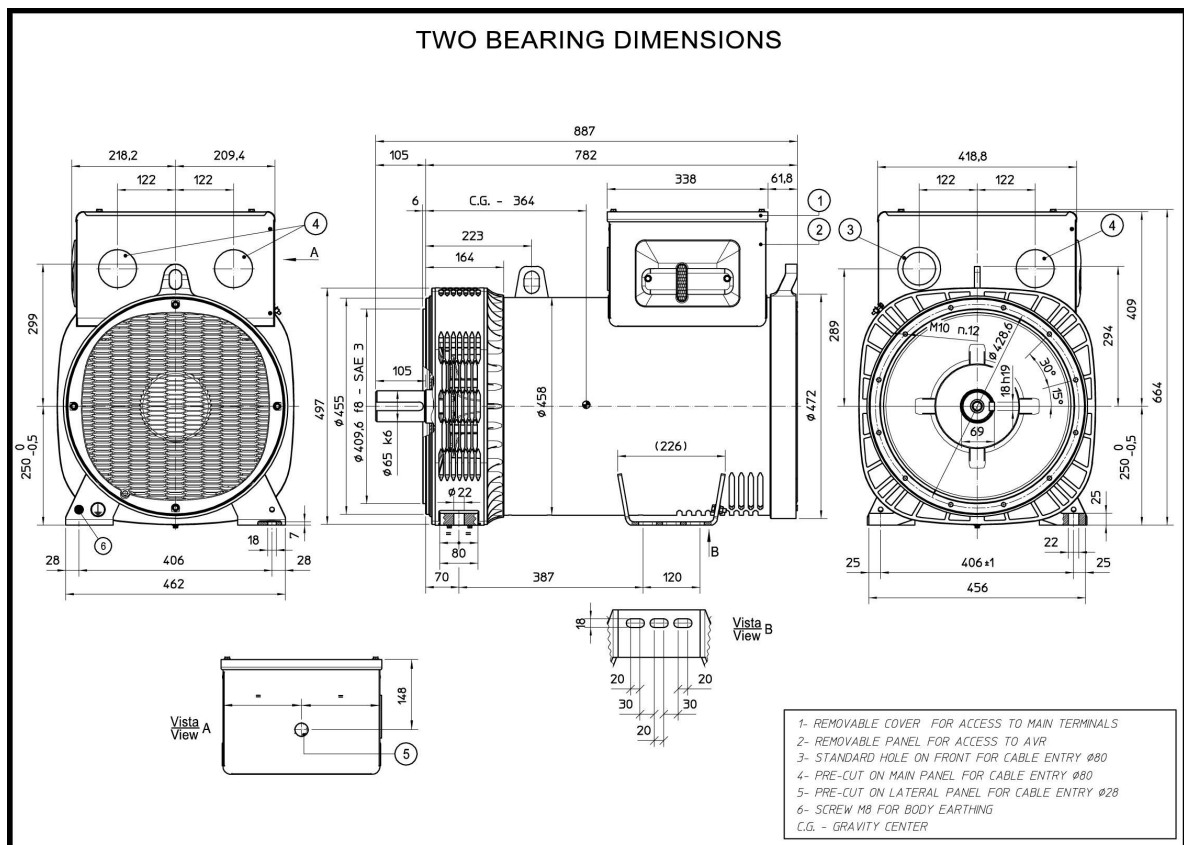
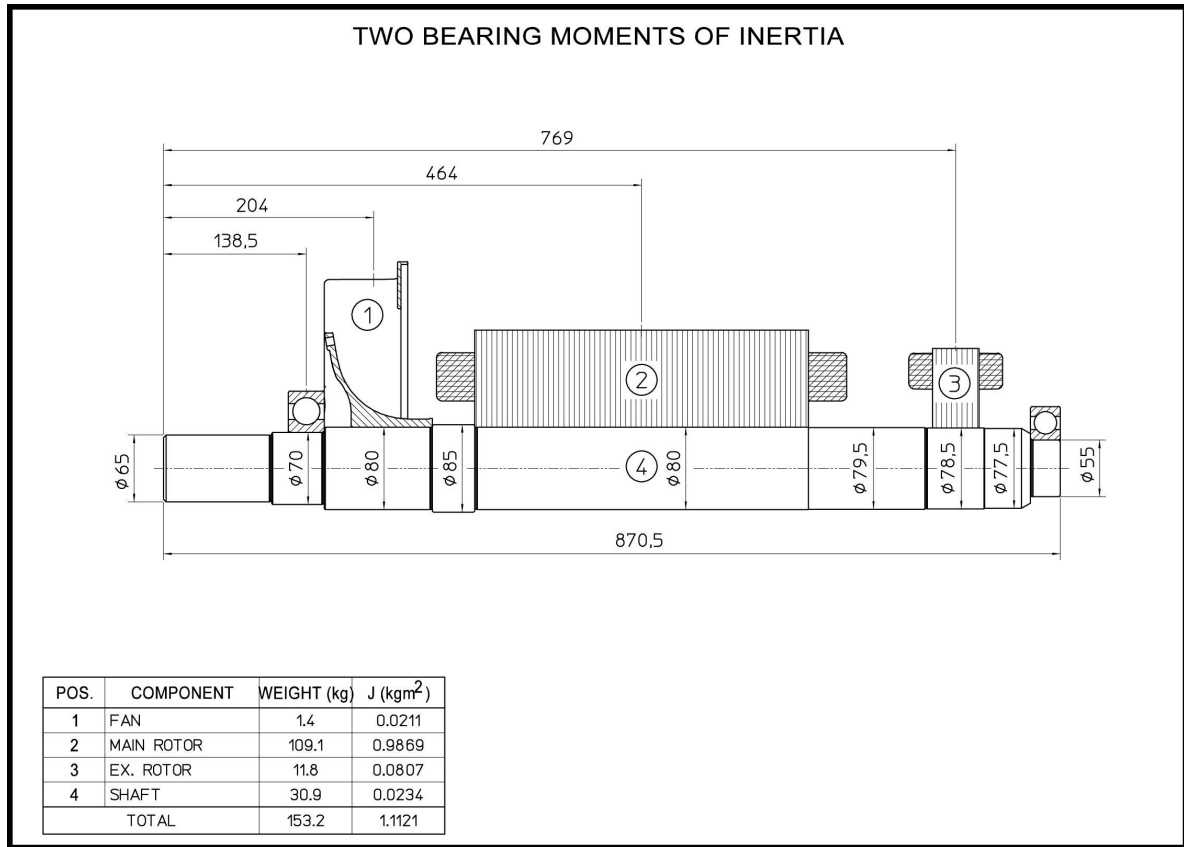
SINGLE BEARING DIMENSIONS



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°

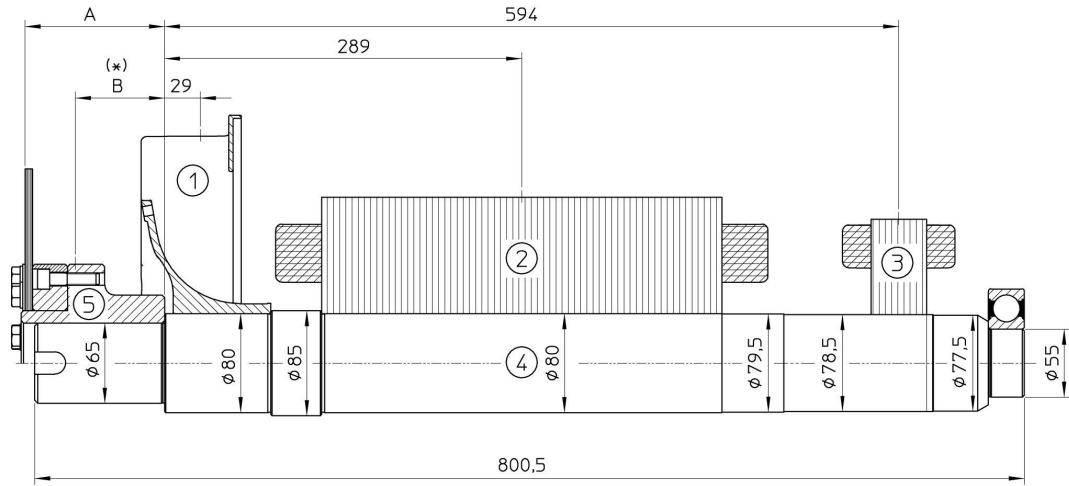
SAE N.	FLANGIA / LANGE BRIDE / FLANSCH			
	0	P	Q	α
3	451	409.6	428.6	30°
2	490	447.7	466.7	30°
1	552	511.2	530.2	30°

- 1- REMOVABLE COVER FOR ACCESS TO MAIN TERMINALS
- 2- REMOVABLE PANEL FOR ACCESS TO AVR
- 3- STANDARD HOLE ON FRONT FOR CABLE ENTRY Ø80
- 4- PRE-CUT ON MAIN PANEL FOR CABLE ENTRY Ø80
- 5- PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY Ø28
- 6- SCREW M8 FOR BODY EARTHING
- (**) - GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11 1/2



ECP34 2L4 C

SINGLE BEARING MOMENTS OF INERTIA

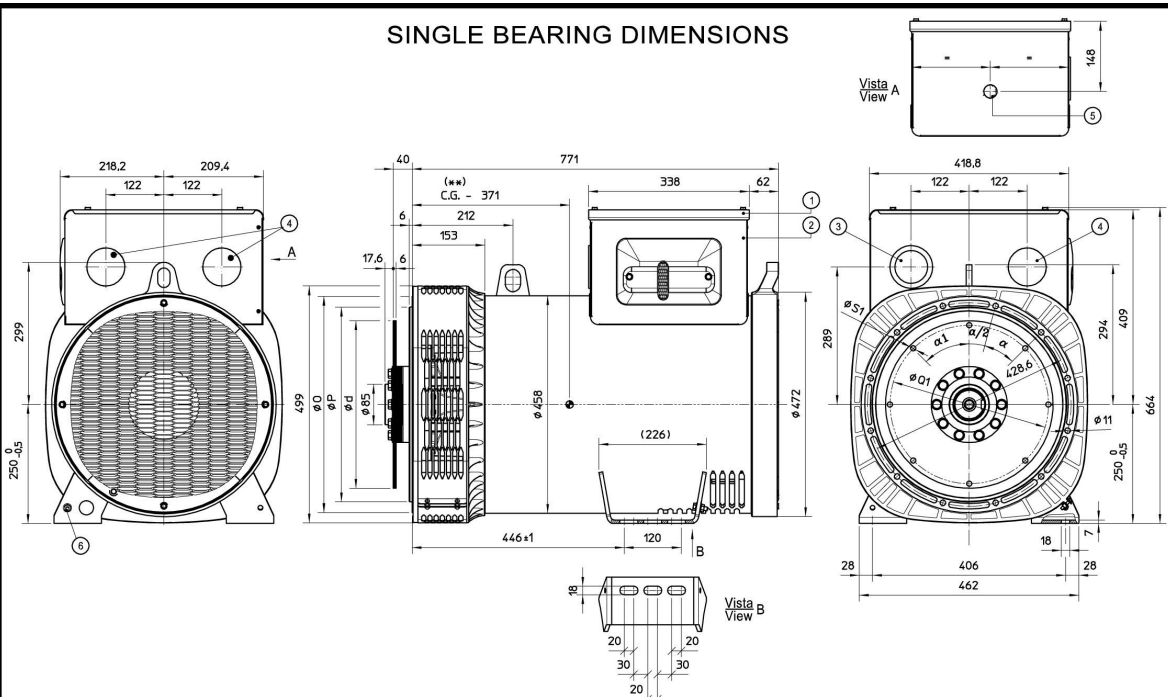


POS.	COMPONENT	WEIGHT (kg)	J (kgm ²)
1	FAN	1.4	0.0211
2	MAIN ROTOR	109.1	0.9869
3	EX. ROTOR	11.8	0.0807
4	SHAFT	28.7	0.0219
TOTAL		151.0	1.1106

SAE 5 SHAFTS COUPLING FLEX PLATE				
N°	A	B	WEIGHT kg	J kgm ²
10	112.8	78	13.1	0.0760
11 1/2	98.4	72.3	12.0	0.0945
14	84.4	68.9	14.4	0.2349

(*) = 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 / LANGE BRIDE / FLANSCH			
	0	P	Q	α
3	451	409.6	428.6	30°
2	490	447.7	466.7	30°
1	552	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 Ø80
- 4- PRE-CUT ON MAIN PANEL FOR CABLE ENTRY Ø80
- 5- PRE-CUT ON LATERAL PANEL FOR CABLE ENTRY Ø28
- 6- SCREW M8 FOR BODY EARTHING
- (**) - GRAVITY CENTER IN CONFIGURATION SAE 3 FLYWHEEL 11 1/2

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