mecc alte

Totally Focused. Totally Independent.

Technical Specification

ECO43 4 A

DDS
Dynamic Data Support

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

Rev. 4

All electrical and mechanical data contained in this document is provided for reference only and represents typical values under optimal operating conditions.
Actual performances may be subjected to cumulative tolerances or variances due to materials, construction or other specific operating and loading conditions, in accordance with IEC 60034.

Mecc Alte S.p.A. reserves the right to change specifications without notice.
The information contained in this document does not constitute a guarantee of performance for any specific application. For specific technical information, please contact your local Mecc Alte office.

Regulations and Certifications

The alternators are designed, built and tested in accordance with **ISO 9001**, within a certified quality management system. The entire range meets the most common international specifications, including:

- **CEI 2-3, IEC 34-1, EN 60034-1, VDE 0530**
- **BS 4999-5000, NF 51.111, NEMA MG 1-2011**
- **ISO 8528-3**

In addition, they comply with specific regulations for particular markets, such as:

- **UL 1446, UL 1004-4, UL 1004-B**
- **CAN/CSA-C22.2 No14-95 / No100-95**

The ECP and ECO series comply with EEC directives **2006/42/EC (Machinery Directive), 2014/35/EC (Low Voltage Directive), 2014/30/EC (Electromagnetic Compatibility Directive), 2011/65/EC (RoHS 2) and 2015/863 (RoHS 3).**

Windings and performance

All alternators are equipped with **reduced pitch windings (2/3).** This configuration allows:

- The elimination of triple harmonics in the voltage waveform
- Reduction of neutral currents in parallel operation

All models, except the **ECP3 series**, are equipped with an aluminum or copper **cushioning cage** to ensure greater stability during load transients.

- 12 reconnectable wires:
  50 Hz - from 380 V to 440 V and from 220/110 V to 240/120 V (with possible derating)
  60 Hz - from 380 V to 480 V and from 220/110 V to 240/120 V (with possible derating)
- 6 reconnectable wires:
  50 Hz - from 380 V to 440 V and from 220 V to 240 V (with possible derating)
  60 Hz - from 380 V to 480 V and from 220 V to 240 V (with possible derating)

Winding configurations	Standard		Special (dedicated)			
	12 reconnectable wires	6 reconnectable wires	380 V and 600 V 60 Hz	690V 50/60Hz	220-240V 1ph 50Hz	220-240V 1ph 60Hz
ECP3 to ECO38 & (NPE)	●	○	○	○	○	○
ECO40 to ECO46	○	●	○	○	○ *	○ *
ECO47	● 4 wires		○	○	–	-
THD (Total Harmonic Distortion)	Typically <3.5% at full load L-L	Typically <3.0% at full load L-L	Typically <3.5% at full load L-L	Typically <3.5% at full load L-L	Typically <4.5% at full load L-N	Typically <4.5% at full load L-N
Interference suppression	VDE 0875 G/N/K, EN61000-6-3, EN61000-6-2, others available on request					

* Only up to ECO40 series ● Standard ○ Optional

Insulating Materials and Electrical Performance

- **Insulation Class:** H on the entire range
- **Efficiency:** High efficiency as standard
- **Motor Start:** Inrush current >300% for 20 seconds
- **THD (Total Harmonic Distortion):**
    - <3.5% L-L typical (three-phase windings)
    - <4.5% L-N typical (single-phase windings)

Winding protection

Winding protection is crucial to ensure the longevity of the generator based on environmental conditions and electrical stress.

Protection Level	Standard	Standard+	Grey	Grey+	Total+	V-Type
Treated Components	Active parts	Exciter stator	Main stator + exciter	Stator + Exciter	Stator + Exciter + Rotor	Complete system
Type of Treatment	Impregnation resin only	Resin + Grey paint EG43	Grey paint EG43	Stator (EG43) + Exciter (Black severe ep.)	Black protection (stators) + EG43 (rotating parts)	Double VPI, Anti-Corona Wire, Double Layer Black
Series/Typical Application	ECP3, ECP4 (Standard Use)	ECP28, 30, 32	Marine Applications / NPE, ECO, HCP	Harsh industrial environments	Extreme/abusive conditions	Harsh Environments (Extended Warranty)

Detail of specific treatments

- **Grey paint EG43:** Standard protection against moisture and contaminants.
- **Black Protection:** Advanced physical barrier against chemicals and high humidity.
- **V-Type Treatment:** Includes vacuum impregnation (VPI), internal stator insulation, and corona-resistant materials for maximum reliability.

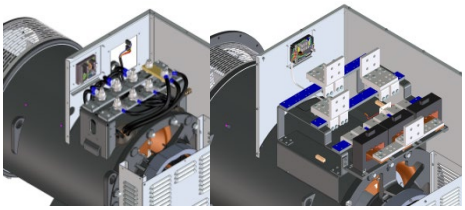
For more information visit: Insulation_System_Guide

Construction

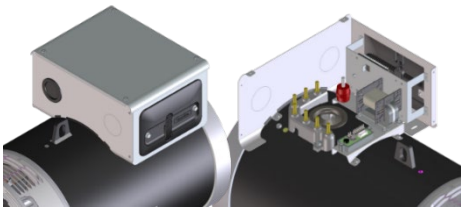
The robust mechanical structure withstands up to 5G in any direction and 9G vertically, and its design allows easy access to connections and components during routine maintenance checks. The mechanical design used the most advanced FEM techniques. The materials used are: DD12 steel for the frame, C45 steel for the shaft and cast iron or die-cast aluminum for the end brackets: the fans are made of die-cast aluminum and nylon reinforced with fiberglass, UL compliant materials. The rotors are dynamically balanced according to ISO 1940-1 grades 6.3 (up to series 32) or 2.5 (series 34 onwards).

Terminals and terminal blocks

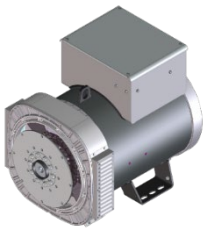
Easy access to the regulators is ensured by a pull-out drawer or drop-down panel to allow for safer adjustment. Large terminal blocks allow easy access of power cables, in the higher power ranges ECO43 and ECO46 terminals allow convenient choice of power cable or busbar connection with input and connection versatility. Current transformers are available as an option on the ECO 40, 43, 46 and 47 series with single or dual output.



A new AVR panel has been installed on the Type-C family. The terminal blocks have been redesigned in a special "L" configuration, specifically to facilitate connections with customers; With this type of terminal block, a second terminal block can be positioned in order to obtain 12 terminals available. Current transformers are available as an option on the ECO38 series with single or dual output.



Protection for the environment



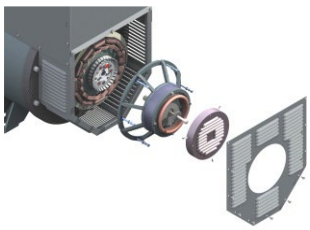
In addition to the protection on the windings themselves, alternators can have a higher degree of protection. The standard level is IP23 but the following solutions are also available: IP23 DP with ingress filters, IP23 with terminal box only in IP45, IP43 and IP45. Downgrades may apply.
For more information visit: Bulletin_IP

Optional PMG

The MeccAlte PMG is optionally available factory-fitted on ECP28, ECP30, ECP32, ECP34 and ECO38; Alternatively, only the preparation for future mounting is optional.

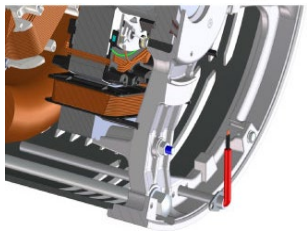
On the ECO 40, 43 and 46 series it is optionally available factory-fitted or retrofitted. On the ECO47 the PMG is standard.

The entire AVR range is fully compatible with MAUX and PMG systems, minimizing spare parts management and inventory flexibility, as one AVR adapts to all applications. The PMG delivers the same amount of kVA as the MAUX.



Anti-condensation heater

Our entire range can be equipped with anti-condensation heaters of adequate power and sized to the alternator. The voltage for heaters must be specified when ordering. New cylindrical cartridge heaters are available on request and can be retrofitted.



Accessories

Additional optional can be mounted on our alternator series, such as PTC or PT100 thermistors on both windings and bearings, anti-condensation heaters, high and low profile terminal blocks (on most series), parallel devices, current and voltage transformers, air filters, IP43 and IP45 protections and many more. For more information visit: C-type-accessories

Excitation and regulation systems

All ECP/ECO series are equipped with MAUX auxiliary winding to power the digital controller.

DxR

Both the DSR and DER1 are available for PC connection via the DxR2 USB interface and DxR TERMINAL software to query/download alarms and settings for analysis or for cloning other controllers. DER2 has a built-in USB connection and can be connected to your PC without any optional connection card. Through the DxR connection, other settings such as LAMS, synchronous external control based on digital RAM, and soft start can be achieved. Simple analog potentiometers are available for the most common adjustments.

MxK

The digital controllers of the MxK series (M2K, M2KS, M3K, M3KS, M3KSHD) are configurable via the MeccAlte App for PC or mobile devices, using the USB2MxK (USB) or MxKonnect (Wi-Fi) accessories. The M3KSHD model integrates a USB port for direct connection to the PC, without the need for optional cards. The M2KS, M3KS and M3KSHD models also support CAN Bus communication (SAE J-1939) for integration with MeccAlte GC controllers. Software-accessible features include LAMS, external voltage control (±10V), soft start, and PID autotuning. The controller records up to 64 alarms in E2PROM memory and provides the current status via A ALARMS address. There are analog potentiometers for VOLT, STAB, AMP, and DROOP (the latter on M3K, M3KS, and M3KSHD models only). The M3KSHD includes High Dynamic Response (HDR) for a quick rush of excitement. All MxK regulators are equipped with protections against over/under excitation, overcurrent, V/f, short circuit and power overvoltage.

Regulator	M2K	M2Ks	M3K	M3Ks	M3KsHD	DSR	DER1	DER2
ECP3 to ECO38 & (NPE)	●	○	○	○	○	○	○	○
ECO40 to ECO46	○	○	●	○	○	○	○	○
ECO47	○	○	○	○	●	○	○	○
Parallel operation	-	-	√	√	√	√	√	√
Network Parallel	-	-	√	√	√	√	√	√
Reference 3 phase (rms)	-	-	√	√	√	-	√	√
Accuracy	+/-0.5%	+/-0.5%	+/-0.5%	+/-0.5%	+/-0.5%	+/-1%	+/-0.5%	+/-0.5%
Remote voltage control	√	√	√	√	√	√	√	√
Alarm log	√	√	√	√	√	√	√	√
Analog and digital configurable	√	√	√	√	√	√	√	√
LAMS (Load Acceptance V/f)	√	√	√	√	√	√	√	√
APO (Active Protection Output)	-	-	-	-	√	√	√	√
Soft start	√	√	√	√	√	√	√	√
High Dynamic Response	-	-	-	-	√	-	-	√
USB connection without external cards	-	-	-	-	√	-	-	√

● Standard ○ Optional √ Available

Derating coefficients

	Ambient temperature (Celsius)							
Altitude (meters)	25	40	45	50	55	60	65	70
≤ 1000	1.07	1	0.96	0.93	0.91	0.89	0.85	0.82
> 1000 ≤ 1500	1.01	0.96	0.92	0.89	0.87	0.84	0.81	0.77
> 1500 ≤ 2000	0.96	0.91	0.87	0.84	0.83	0.79	0.77	0.73
> 2000 ≤ 3000	0.90	0.85	0.81	0.78	0.76	0.73	0.71	0.68
> 3000 ≤ 4000	0.84	0.78	0.75	0.73	0.70	0.68	0.66	0.62
> 4000 ≤ 5000	0.78	0.72	0.69	0.67	0.65	0.62	0.59	0.56
> 5000 ≤ 6000	0.70	0.65	0.63	0.61	0.58	0.55	0.53	0.50

Notes on short-circuit curves

The coefficients indicated must be used to correct the values of the three-phase short-circuit curves as a function of the nominal 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 must be used to correct the values of the three-phase short-circuit curves as a function of the type of short-circuit voltage.

	3 Steps	*2 L-L phases*	*1 L-N phase*
Instant	1x	0.87x	1.30x
Minimum	1x	1.80x	3.20x
Supported	1x	1.50x	2.50x
Maximum duration	20 s	10 s	4 s

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

A smaller generator can be selected for a given engine starting service, as it has lower subtransient reactance values for nonlinear loads. The entire range from 6.5 to 3400 kVA is capable of delivering a sustained short-circuit current of >300% for up to 20 seconds.

MeccAlte Tools

This section provides direct access to professional tools developed to support alternator selection, sizing and configuration. These tools ensure solutions that are aligned with the electrical and mechanical requirements of each project.

Key features

With a data-driven approach, you can optimize performance and reduce scaling risks:

- **Targeted Selection:** Identify the ideal alternator based on load profiles and operating conditions.
- **Power Calculations**: performs the sizing of the engine and alternator respecting the electrical constraints.
- **Parameter Verification**: Controls engine starting capability and handling of unbalanced and distorted loads.
- **PMG Configuration**: Configure permanent magnet alternators for AC/DC outputs or battery chargers.

For more information visit: MeccAlte Tools

General characteristics

Pole number	4	Insulation class	H
Phase number	3	Protection class	IP23
Number of wires	12	NDE Bearing type	6322.2RS
Execution	Brushless	DE Bearing type	6324.2RS
Regulator type	M3K	Maximum Overspeed	2250
Winding pitch	2/3	Altitude	0-1000
Code voltage reference	T0405P3	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 Star Y		760V	800V	830V	880V	760V	800V	830V	880V	760V	800V	830V	880V	760V	800V	830V	880V	760V	800V	830V	880V
Parallel Star YY		380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V
Series Delta Δ		440V	460V	480V	508V	440V	460V	480V	508V	440V	460V	480V	508V	440V	460V	480V	508V	440V	460V	480V	508V
Parallel Delta ΔΔ		220V	230V	240V	254V	220V	230V	240V	254V	220V	230V	240V	254V	220V	230V	240V	254V	220V	230V	240V	254V
ECO43 1S4 A	**kVA**	900	**900**	900	825	860	**860**	860	800	820	**820**	820	760	750	**750**	750	690	655	**655**	655	615
	kW	720	**720**	720	660	688	**688**	688	640	656	**656**	656	608	600	**600**	600	552	524	**524**	524	492
ECO43 2S4 A	**kVA**	1016	**1016**	1016	907	975	**975**	975	870	930	**930**	930	830	850	**850**	850	770	744	**744**	744	664
	kW	813	**813**	813	726	780	**780**	780	696	744	**744**	744	664	680	**680**	680	616	595	**595**	595	531
ECO43 1M4 A	**kVA**	1038	**1125**	1125	1093	992	**1070**	1070	1044	950	**1025**	1025	1000	870	**950**	950	910	760	**820**	820	800
	kW	830	**900**	900	874	794	**856**	856	835	760	**820**	820	800	696	**760**	760	728	608	**656**	656	640
ECO43 2M4 A	**kVA**	1250	**1250**	1140	983	1200	**1200**	1096	940	1150	**1150**	1050	900	1050	**1050**	960	820	920	**920**	840	720
	kW	1000	**1000**	912	786	960	**960**	877	752	920	**920**	840	720	840	**840**	768	656	736	**736**	672	576
ECO43 2L4 A	**kVA**	1420	**1420**	1420	1349	1358	**1358**	1358	1290	1300	**1300**	1300	1235	1200	**1200**	1200	1140	1040	**1040**	1040	988
	kW	1136	**1136**	1136	1079	1086	**1086**	1086	1032	1040	**1040**	1040	988	960	**960**	960	912	832	**832**	832	790
ECO43 VL4 A	**kVA**	1540	**1540**	1540	-	1500	**1500**	1500	-	1400	**1400**	1400	-	1280	**1280**	1280	-	1120	**1120**	1120	-
	kW	1232	**1232**	1232	-	1200	**1200**	1200	-	1120	**1120**	1120	-	1024	**1024**	1024	-	896	**896**	896	-

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 Star Y		830V	880V	920V	960V	830V	880V	920V	960V	830V	880V	920V	960V	830V	880V	920V	960V	830V	880V	920V	960V
Parallel Star YY		415V	440V	460V	480V	415V	440V	460V	480V	415V	440V	460V	480V	415V	440V	460V	480V	415V	440V	460V	480V
Series Delta Δ		480V	504V	530V	554V	480V	504V	530V	554V	480V	504V	530V	554V	480V	504V	530V	554V	480V	504V	530V	554V
Parallel Delta ΔΔ		240V	254V	265V	277V	240V	254V	265V	277V	240V	254V	265V	277V	240V	254V	265V	277V	240V	254V	265V	277V
ECO43 1S4 A	**kVA**	990	1080	1080	**1080**	945	1030	1030	**1030**	900	985	985	**985**	820	900	900	**900**	720	790	790	**790**
	kW	792	864	864	**864**	756	824	824	**824**	720	788	788	**788**	656	720	720	**720**	576	632	632	**632**
ECO43 2S4 A	**kVA**	1115	1159	1220	**1220**	1069	1111	1170	**1170**	1020	1060	1116	**1116**	935	969	1020	**1020**	816	850	893	**893**
	kW	892	927	976	**976**	855	889	936	**936**	816	848	893	**893**	748	775	816	**816**	653	680	714	**714**
ECO43 1M4 A	**kVA**	1147	1200	1290	**1365**	1117	1144	1227	**1300**	1050	1100	1180	**1250**	960	1000	1080	**1140**	840	880	944	**1000**
	kW	918	960	1032	**1092**	894	915	982	**1040**	840	880	944	**1000**	768	800	864	**912**	672	704	755	**800**
ECO43 2M4 A	**kVA**	1300	1420	1525	**1525**	1250	1357	1450	**1450**	1200	1300	1400	**1400**	1090	1200	1300	**1300**	960	1040	1120	**1120**
	kW	1040	1136	1220	**1220**	1000	1086	1160	**1160**	960	1040	1120	**1120**	872	960	1040	**1040**	768	832	896	**896**
ECO43 2L4 A	**kVA**	1585	1618	1700	**1700**	1516	1550	1630	**1630**	1451	1482	1560	**1560**	1339	1368	1440	**1440**	1161	1186	1248	**1248**
	kW	1268	1618	1360	**1360**	1213	1240	1304	**1304**	1161	1186	1248	**1248**	1071	1094	1152	**1152**	929	949	998	**998**
ECO43 VL4 A	**kVA**	1736	1824	1824	**1824**	1680	1765	1765	**1765**	1600	1700	1700	**1700**	1450	1540	1540	**1540**	1280	1360	1360	**1360**
	kW	1389	1459	1459	**1459**	1344	1412	1412	**1412**	1280	1360	1360	**1360**	1160	1232	1232	**1232**	1024	1088	1088	**1088**

Reactance & Time constants- Class H / 400V

Unsaturated (ref. EN60034-4)			ECO43 1S4 A	ECO43 2S4 A	ECO43 1M4 A	ECO43 2M4 A	ECO43 2L4 A	ECO43 VL4 A
Xd	Direct-axis synchronous reactance	%	367	431	396,5	377	391	359,3
X'd	Direct-axis transient reactance	%	20	19,1	19,1	21,2	18,5	18,2
X"d	Direct-axis subtransient reactance	%	10,3	8,99	9,68	11	8,7	8,53
Xq	Quadrature-axis synchronous reactance	%	157	177,5	173	160,4	181	120,3
X'q	Quadrature-axis transient reactance	%	157	177,5	173	160,4	181	120,3
X"q	Quadrature-axis subtransient reactance	%	22	22,3	21,3	21,2	19,9	19,1
X_2	Negative-sequence reactance	%	16,2	15,7	15	16	14,2	12
X_0	Zero sequence reactance	%	3,4	4,26	4,02	3,83	4,06	3,74
Saturated								
Xd	Direct-axis synchronous reactance	%	304,6	357,7	329,1	312,9	324,5	298,2
X'd	Direct-axis transient reactance	%	16,6	15,8	15,8	17,6	15,4	15,1
X"d	Direct-axis subtransient reactance	%	8,55	7,46	8,04	9,11	7,22	7,08
Xq	Quadrature-axis synchronous reactance	%	130,3	147,3	143,6	133,1	150,2	99,8
X'q	Quadrature-axis transient reactance	%	130,3	147,3	143,6	133,1	150,2	99,8
X"q	Quadrature-axis subtransient reactance	%	18,3	18,5	17,7	17,6	16,5	15,8
X_2	Negative-sequence reactance	%	13,4	13	12,5	13,3	11,8	9,93
X_0	Zero sequence reactance	%	3,4	4,26	4,02	3,83	4,06	3,74
Kcc	Short circuit ratio		0,5	0,33	0,26	0,35	0,38	0,29
T'd	Transient time constant	sec	0,225	0,234	0,24	0,245	0,271	0,31
T"d	Subtransient time constant	sec	0,018	0,017	0,017	0,018	0,018	0,022
T'do	Open circuit time constant	sec	7,7	8,3	8,2	8,1	8,9	9,5
Ta	Armature time constant	sec	0,02	0,022	0,023	0,024	0,026	0,032

Additional information - Class H / 400V

Io	Excitation current at no load	A	0,9	1,1	0,8	1,5	1,2	0,8
Ic	Excitation current at full load	A	3,5	4,1	3,5	4,3	3,9	3,3
Overload					-			
Overload per 20 sec. PRP or 10 sec. COP		%			300			
Heat dissipation		W	32976	35874	38639	41338	43333	44241
Telephone Harmonic Factor - THF		%	<2	<2	<2	<2	<2	<2
Waveform Distors.(THD) full load LL/LN		%	2,8 / 2,6	2 / 2,3	1,9 / 2,2	1,5 / 1,7	1,5 / 1,5	1,7 / 1,6
Waveform Distors.(THD) no load LL/LN		%	3,1 / 3	2,7 / 2,9	2,5 / 2,7	2,1 / 2,1	2,4 / 2,4	2,6 / 2,5

Reactance & Time constants- Class H / 480V

Unsaturated (ref. EN60034-4)			ECO43 1S4 A	ECO43 2S4 A	ECO43 1M4 A	ECO43 2M4 A	ECO43 2L4 A	ECO43 VL4 A
Xd	Direct-axis synchronous reactance	%	367	431	434,8	382,4	391	363,6
X'd	Direct-axis transient reactance	%	20	19,1	20,9	21,5	18,5	18,4
X"d	Direct-axis subtransient reactance	%	10,3	8,99	10,6	11,1	8,7	8,63
Xq	Quadrature-axis synchronous reactance	%	157	177,5	189,7	162,7	181	121,7
X'q	Quadrature-axis transient reactance	%	157	177,5	189,7	162,7	181	121,7
X"q	Quadrature-axis subtransient reactance	%	22	22,3	23,4	21,5	19,9	19,3
X_2	Negative-sequence reactance	%	16,2	15,7	16,5	16,3	14,2	12,1
X_0	Zero sequence reactance	%	3,4	4,26	4,4	3,89	4,06	3,78
Saturated								
Xd	Direct-axis synchronous reactance	%	304,6	357,7	360,9	317,4	324,5	301,8
X'd	Direct-axis transient reactance	%	16,6	15,8	17,3	17,9	15,4	15,3
X"d	Direct-axis subtransient reactance	%	8,55	7,46	8,81	9,24	7,22	7,16
Xq	Quadrature-axis synchronous reactance	%	130,3	147,3	157,5	135,1	150,2	101
X'q	Quadrature-axis transient reactance	%	130,3	147,3	157,5	135,1	150,2	101
X"q	Quadrature-axis subtransient reactance	%	18,3	18,5	19,4	17,9	16,5	16
X_2	Negative-sequence reactance	%	13,4	13	16,7	13,5	11,8	10,1
X_0	Zero sequence reactance	%	3,4	4,26	4,4	3,89	4,06	3,78
Kcc	Short circuit ratio		0,5	0,33	0,25	0,35	0,38	0,29
T'd	Transient time constant	sec	0,225	0,234	0,24	0,245	0,271	0,31
T"d	Subtransient time constant	sec	0,018	0,017	0,017	0,018	0,018	0,022
T'do	Open circuit time constant	sec	7,7	8,3	8,2	8,1	8,9	9,5
Ta	Armature time constant	sec	0,02	0,022	0,023	0,024	0,026	0,032

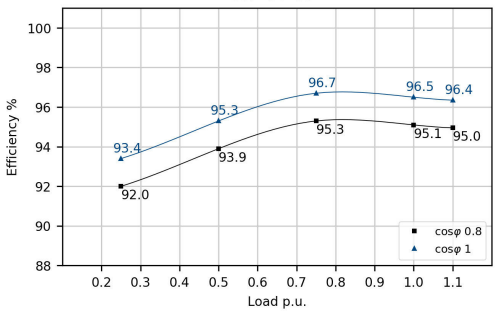
Additional information - Class H / 480V

Io	Excitation current at no load	A	0,9	1,1	0,8	1,5	1,2	0,8
Ic	Excitation current at full load	A	3,5	4,1	3,5	4,3	3,9	3,3
Overload					-			
Overload per 20 sec. PRP or 10 sec. COP		%			300			
Heat dissipation		W	37876	39150	42753	46667	46606	47867
Telephone Interferance Factor - TIF			<40	<40	<40	<40	<40	<40
Waveform Distors.(THD) full load LL/LN		%	2,8 / 2,6	2 / 2,3	1,9 / 2,2	1,5 / 1,7	1,5 / 1,5	1,7 / 1,6
Waveform Distors.(THD) no load LL/LN		%	3,1 / 3	2,7 / 2,9	2,5 / 2,7	2,1 / 2,1	2,4 / 2,4	2,6 / 2,5

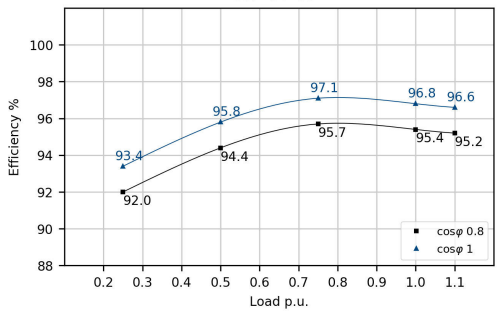
Efficiencies @ 50Hz

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
ECO43 1S4 A	%	92,0	94,0	95,6	95,2	95,0	92,0	93,9	95,3	95,1	95,0	91,8	93,9	95,4	94,9	94,5	90,9	93,3	95,0	94,5	94,2
ECO43 2S4 A	%	92,0	94,5	95,8	95,5	95,3	92,0	94,4	95,7	95,4	95,2	91,8	94,3	95,5	95,2	95,0	91,3	94,1	95,6	95,0	94,7
ECO43 1M4 A	%	92,2	94,7	95,9	95,6	95,3	92,3	94,6	95,8	95,5	95,3	91,9	94,5	95,6	95,3	95,0	91,4	94,3	95,7	95,1	94,7
ECO43 2M4 A	%	92,0	94,9	96,3	95,8	95,5	92,0	94,8	96,0	95,7	95,5	91,8	94,9	96,1	95,5	95,2	91,3	94,5	95,9	95,3	94,9
ECO43 2L4 A	%	92,0	95,1	96,5	96,1	95,8	92,0	95,0	96,2	96,0	95,8	91,8	94,9	96,2	95,8	95,5	91,3	94,6	96,1	95,6	95,3
ECO43 VL4 A	%	92,1	95,4	96,7	96,3	96,0	92,1	95,3	96,4	96,2	96,0	91,8	95,2	96,3	96,0	95,7	-	-	-	-	-

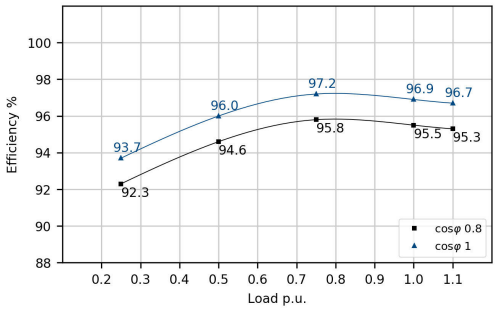
ECO43 1S4 A
400/230 50Hz



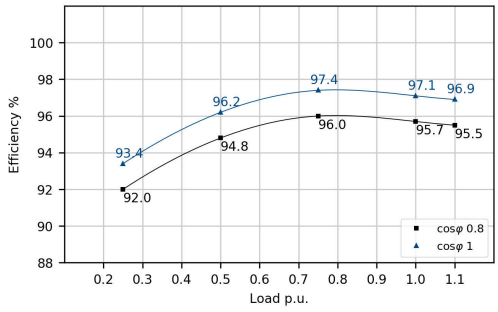
ECO43 2S4 A
400/230 50Hz



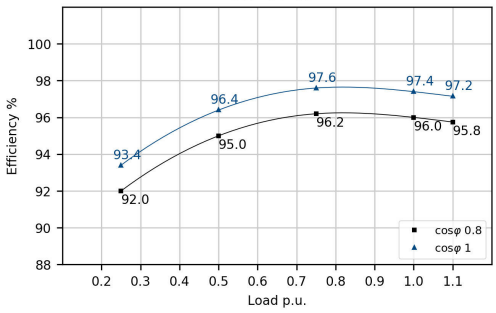
ECO43 1M4 A
400/230 50Hz



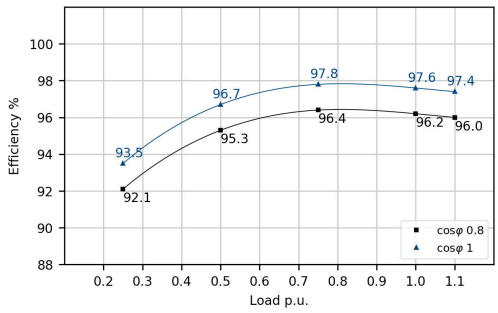
ECO43 2M4 A
400/230 50Hz



ECO43 2L4 A
400/230 50Hz



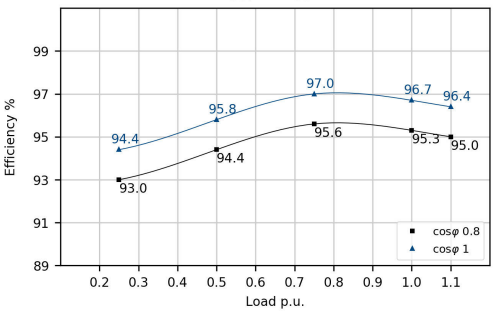
ECO43 VL4 A
400/230 50Hz



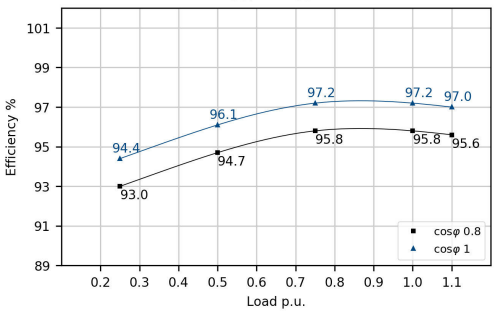
Efficiencies @ 60Hz

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
ECO43 1S4 A	%	92,9	94,2	95,3	94,7	94,5	93,0	94,3	95,5	95,2	94,6	93,0	94,5	95,9	95,4	95,1	93,0	94,4	95,6	95,3	95,0
ECO43 2S4 A	%	93,0	94,5	95,4	95,2	95,0	93,0	94,6	95,6	95,7	95,6	93,0	94,8	96,0	95,9	95,8	93,0	94,7	95,8	95,8	95,6
ECO43 1M4 A	%	93,1	94,6	95,5	95,4	95,1	93,2	94,7	95,8	95,9	95,7	93,5	94,9	96,2	96,1	95,9	93,4	94,8	96,0	95,9	95,7
ECO43 2M4 A	%	93,0	94,9	95,8	95,5	95,3	93,0	95,0	96,1	96,0	95,8	93,0	95,2	96,3	96,2	96,0	93,0	95,1	96,1	96,0	95,8
ECO43 2L4 A	%	92,5	95,0	96,1	95,8	95,5	92,5	95,1	96,3	96,3	96,1	92,5	95,3	96,7	96,5	96,2	92,5	95,2	96,5	96,4	96,2
ECO43 VL4 A	%	92,4	95,2	96,3	96,0	95,7	92,4	95,3	96,5	96,5	96,3	92,4	95,5	96,9	96,7	96,4	92,4	95,4	96,7	96,6	96,4

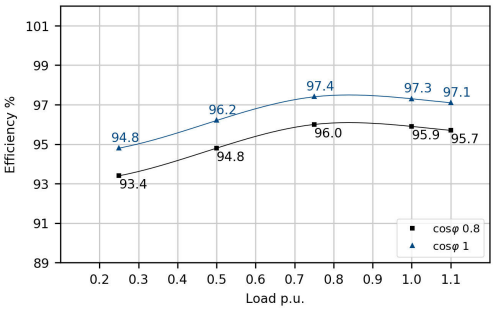
ECO43 1S4 A
480/277 60Hz



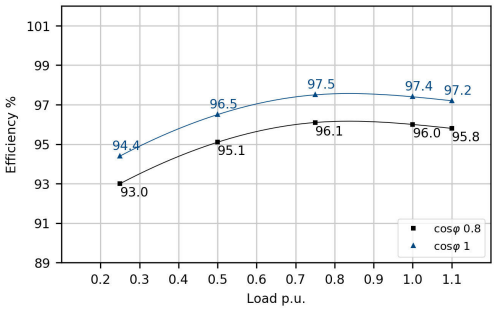
ECO43 2S4 A
480/277 60Hz



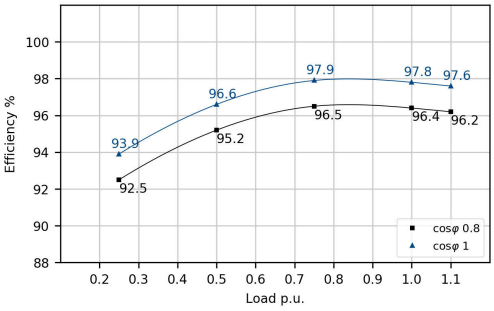
ECO43 1M4 A
480/277 60Hz



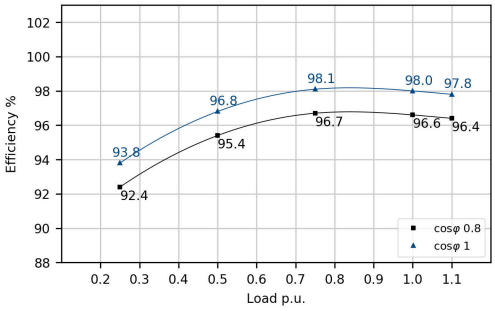
ECO43 2M4 A
480/277 60Hz



ECO43 2L4 A
480/277 60Hz

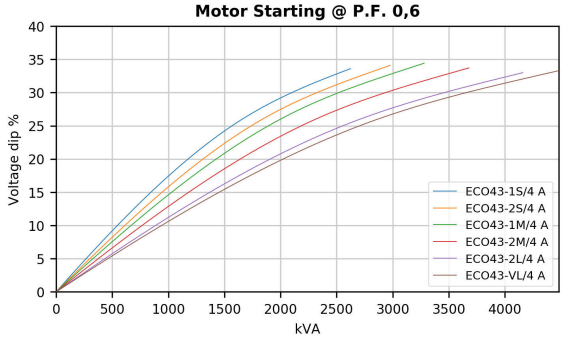


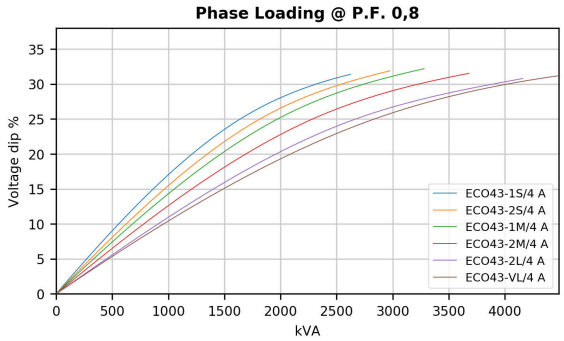
ECO43 VL4 A
480/277 60Hz

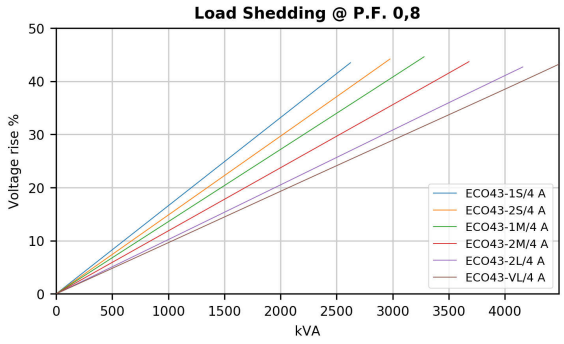


Transients voltage

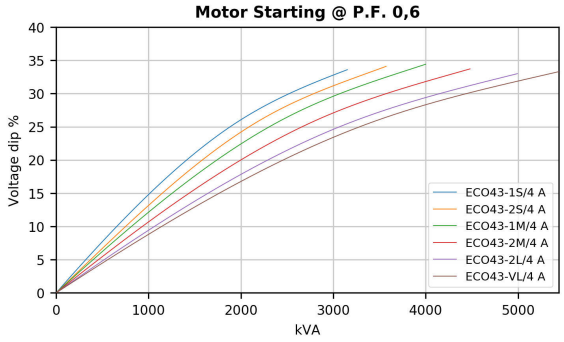
400V - 50Hz

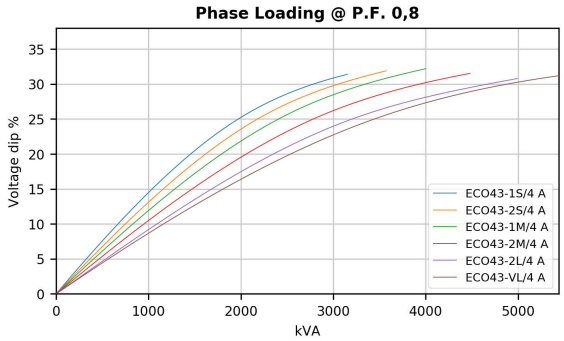


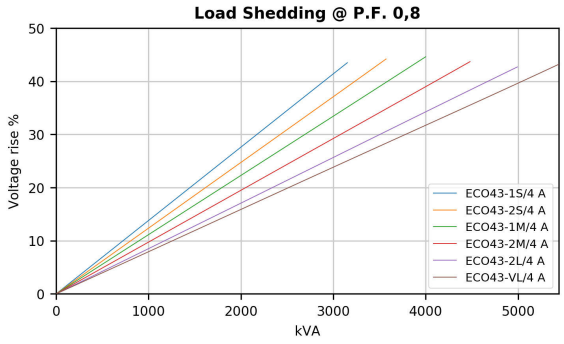




480V - 60Hz







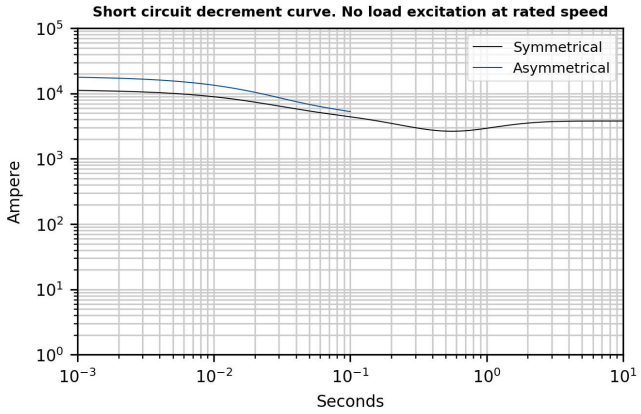
In order to scale transient curves as a function of a power factor or voltage if not indicated, please proceed as follows:

Power Factor coefficient corrector (PFCC), to be used on power factor 0.6 curves:
PFCC=sin(ARCcos (PFnew))/0.8
Example. The PFCC at power factor 0.3 is 1.192 [PFCC= sin(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.

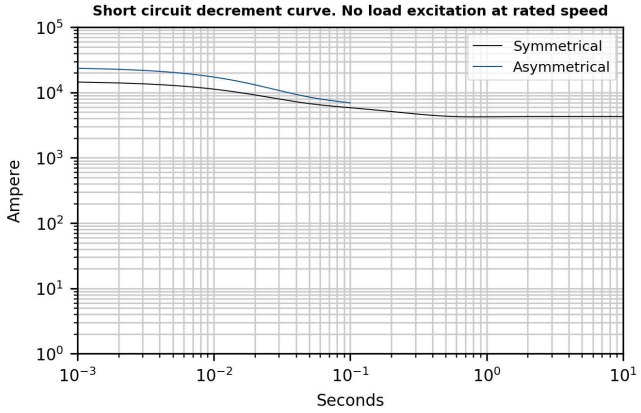
Voltage coefficient corrector (VCC):
VCC=(400/Vnew)2 if 50 Hz; VCC=(480/Vnew)2 if 60 Hz
Example. VCC at 415V 60 Hz is 1.338 [VCC=(480/415)^2]. This means that the voltage fall at a given power at 415V is equivalent to the one that can be read on the power factor 0.6 curve if the load is considered 1.338 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

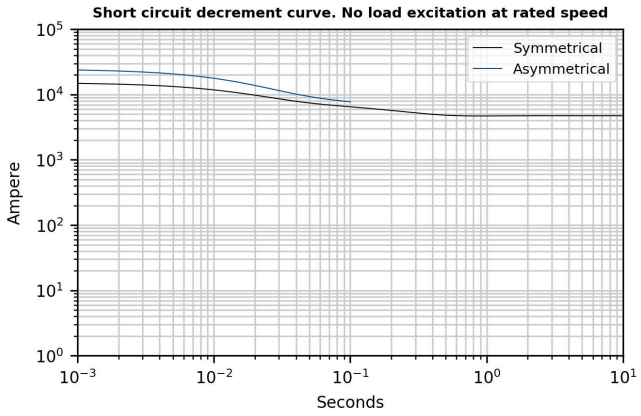
ECO43 1S4 A



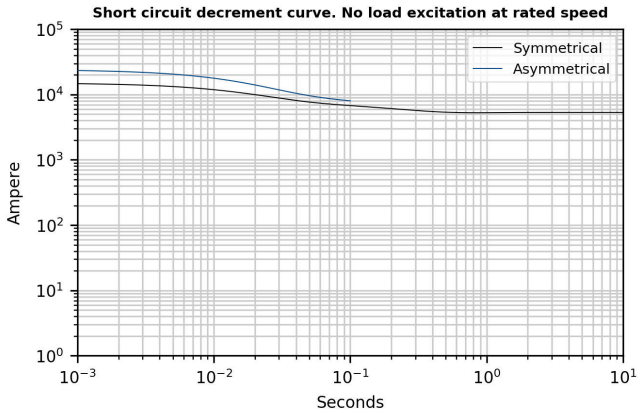
ECO43 2S4 A



ECO43 1M4 A



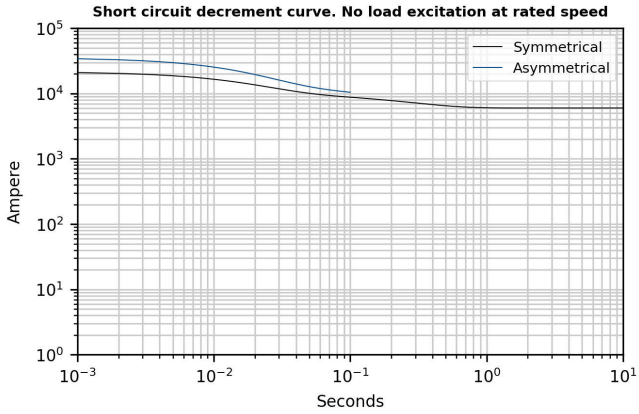
ECO43 2M4 A



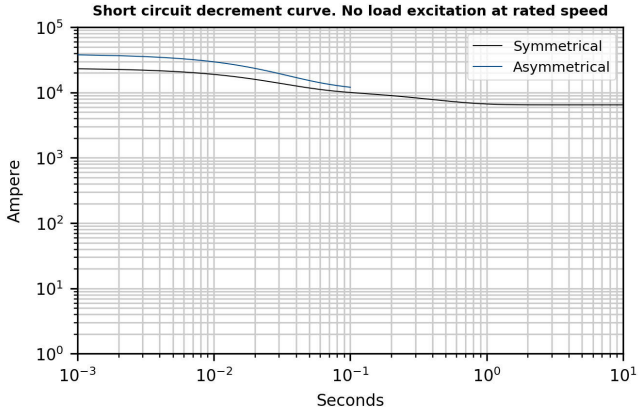
*Please refer to tables at page 6

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

ECO43 2L4 A



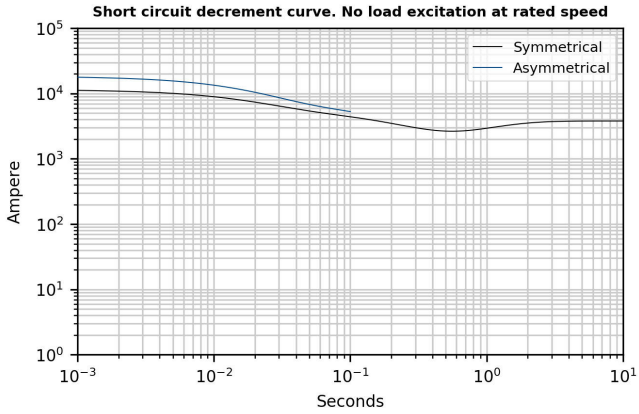
ECO43 VL4 A



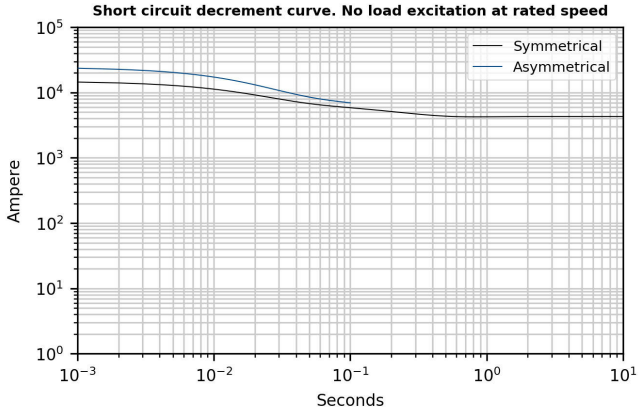
*Please refer to tables at page 6

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

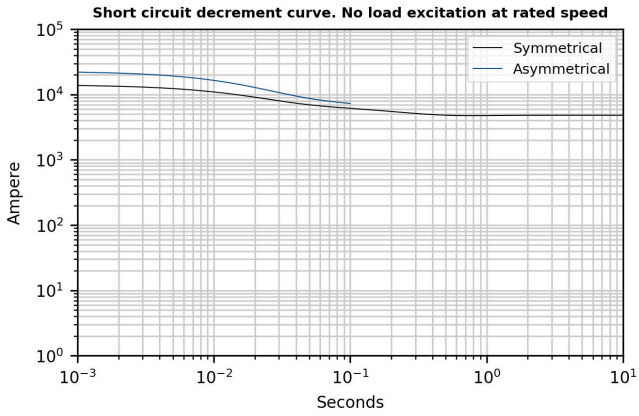
ECO43 1S4 A



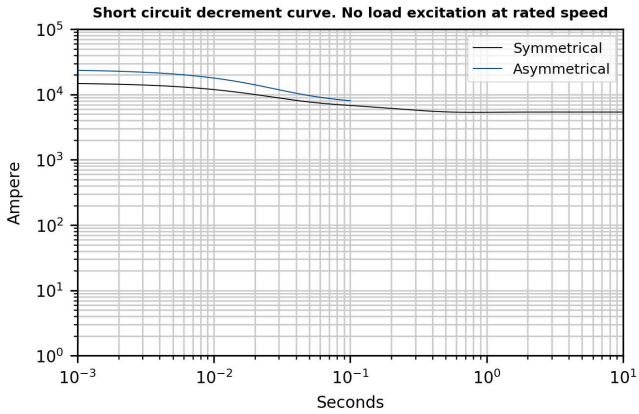
ECO43 2S4 A



ECO43 1M4 A



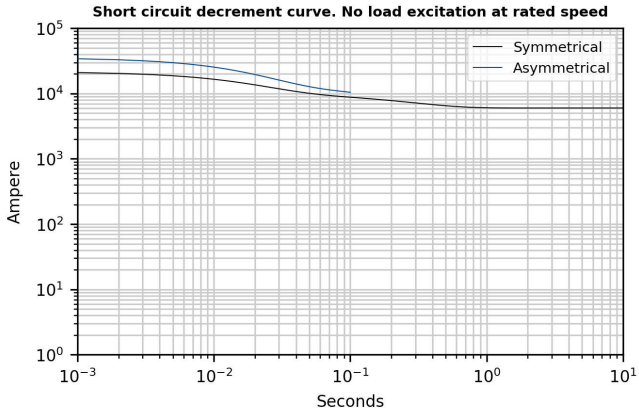
ECO43 2M4 A



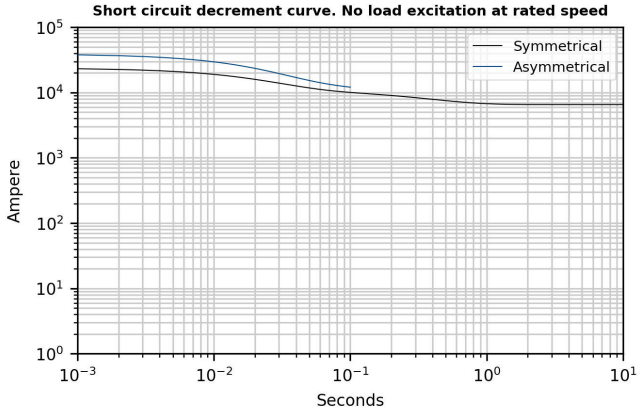
*Please refer to tables at page 6

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

ECO43 2L4 A



ECO43 VL4 A

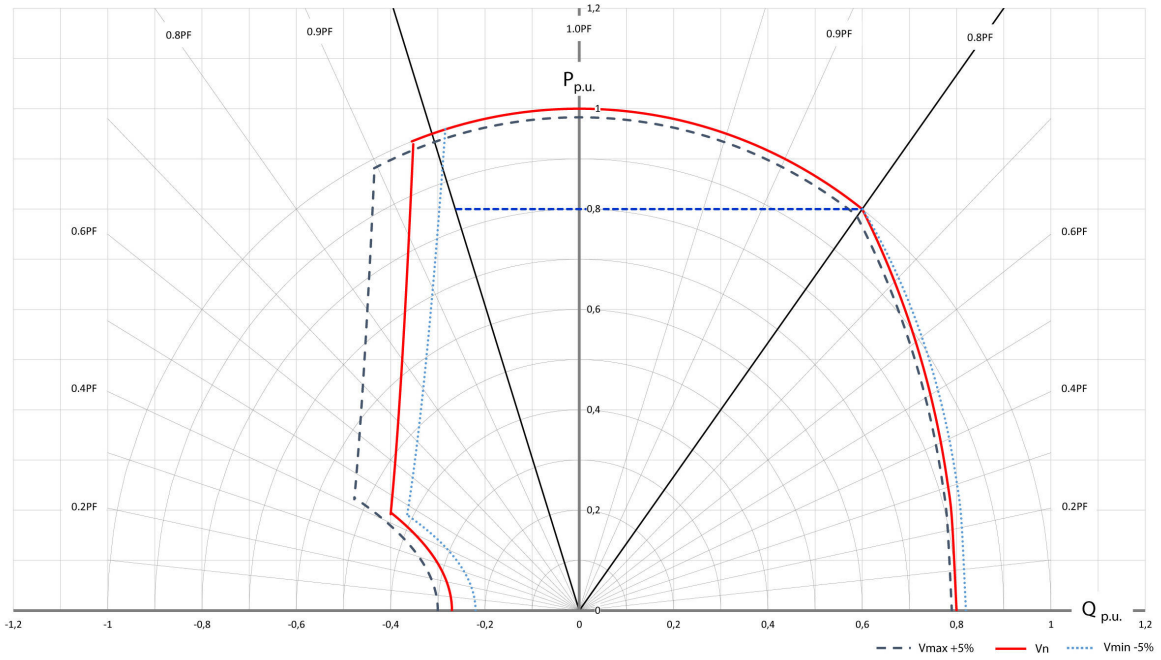


*Please refer to tables at page 6

Additional Characteristics

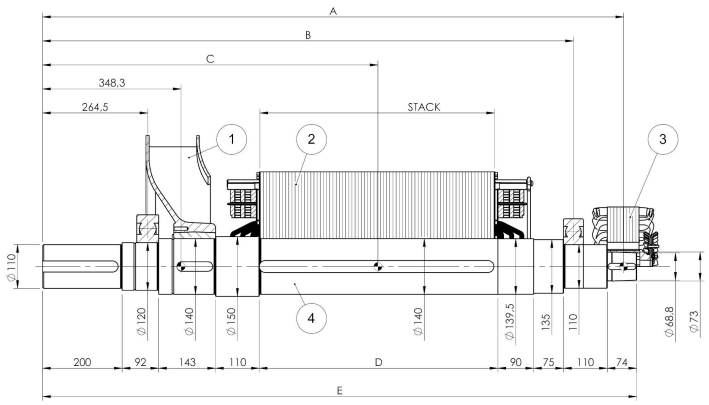
Data		ECO43 1S4 A		ECO43 2S4 A		ECO43 1M4 A		ECO43 2M4 A		ECO43 2L4 A		ECO43 VL4 A	
		50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz	50Hz	60Hz
Damper cage		Copper											
Single stator coil resistance (20°C)	Ω	0,01181		0,00962		0,01015		0,0077		0,00624		0,00642	
Rotor Winding Resistance (20°C)	Ω	2,1		2,3		2,325		2,5		2,8		2,886	
Stator Exciter Resistance (20°C)	Ω	10,63		10,63		10,63		10,63		10,63		10,63	
Rotor Exciter Resistance (20°C)	Ω	0,13		0,13		0,13		0,13		0,13		0,13	
Auxiliary Winding Resistance (20°C)	Ω	0,44		0,413		0,492		0,713		0,677		0,4	
Weight of complete generator	kg	1920,0		2140,0		2275,0		2370,0		2700,0		2980,0	
Unbalanced magnetic pull	kN/mm	5,0		5,7		5,4		5,0		5,9		6,1	
Air flow	m^3/min	90,0	108,0	90,0	108,0	90,0	108,0	90,0	108,0	90,0	108,0	90,0	108,0
Noise level at 1m/7m	dB(A)	95/84	99/89	95/84	99/89	95/84	99/89	95/84	99/89	95/84	99/89	95/84	99/89

PQ Diagram



* The PQ diagram above refers to three-phase application only.

MOMENTS OF INERTIA - DOUBLE BEARING



TYPE	COMPONENT 1 FAN Weight [kg]	1 FAN J [kg*m²]	2 MAIN ROTOR Weight [kg]	2 MAIN ROTOR J [kg*m²]	3 EXCITER ROTOR Weight [kg]	3 EXCITER ROTOR J [kg*m²]	4 SHAFT* Weight [kg]	4 SHAFT* J [kg*m²]	TOTAL Weight [kg]	TOTAL J [kg*m²]
ECO43 1S/4A	26.4	1.0138	474.7	13.7472	41.0	0.4847	146.2	0.3359	688.3	15.5816
ECO43 2S/4A			552.0	15.9980					765.6	17.8324
ECO43 1M/4A			598.3	17.3056			157.2	0.3637	823.0	19.1677
ECO43 2M/4A			638.2	18.4455					862.8	20.3077
ECO43 2L/4A			748.8	21.6184			170.7	0.3976	986.9	23.5145
ECO43 VL/4A			850.2	24.5337			183.0	0.4284	1100.6	26.4606

TYPE	A [mm]	B [mm]	C [mm]	D [mm]	E [mm]
ECO43 1S/4A	1371.3	1245	763.5	510	1404
ECO43 2S/4A			798.4		
ECO43 1M/4A	1461.3	1335	823.4	600	1494
ECO43 2M/4A			843.4		
ECO43 2L/4A	1571.3	1445	898.3	710	1604
ECO43 VL/4A	1671.3	1545	948.3	810	1704

* Shaft mass and inertia also include rotor keys

REV.	DATE	REVIEWS	DESIGN BY	APPROVED BY
00	02/02/2026	FIRST ISSUE	Berdin G.	Luise F.

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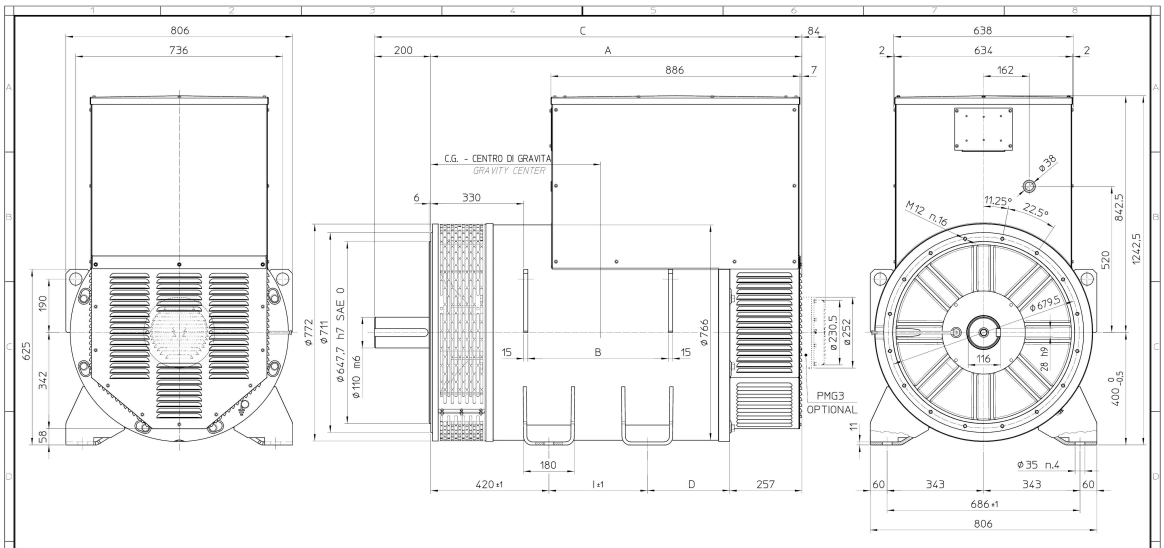
DESCRIPTION: MOMENTS OF INERTIA - DOUBLE BEARING ECO43A

FORMAT	SCALE	REF.DOC.	PART N.	MODEL REV.	DRW REV.
A4	1:20	PP00729	D00451	00	00



TIPO/TYPE/TYP	C.G. Standard version	C.G. PMG3 version	A	B	C	D	I
ECO43-1S/4A	588	600	1320	500	1520	293	350
ECO43-2S/4A	606	615					
ECO43-1M/4A	636	645	1410	700	1610	183	550
ECO43-2M/4A	649	658					
ECO43-2L/4A	715	722	1520	700	1720	293	550
ECO43-VL/4A	755	762	1600	780	1800	323	550

QUOTE SENZA INDICAZIONE DI TOLLERANZA RIFERIRSI WITHOUT TOLERANCE: MOLTO GROSSOLANO UNI EN 22768-1

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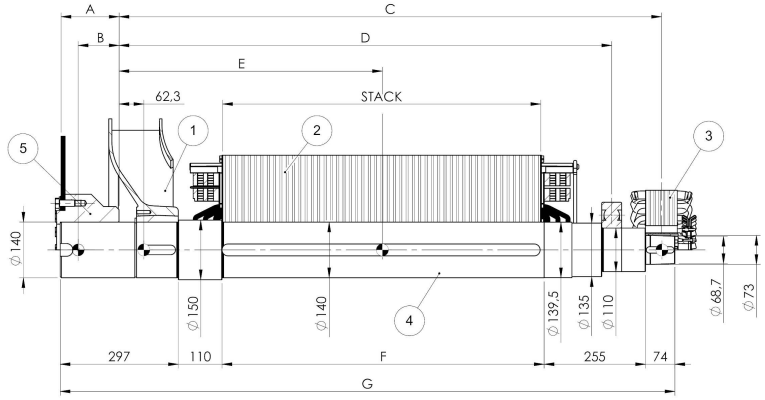
DIMENSIONI DI INGOMBRO FORMA B3B14
B3B14 COUPLING OVERALL DIMENSIONS

ALTERNATORE - ALTERNATOR
ECO 43
A

SCALA-SCALE	CODICE DISEGNO - DESIGN CODE	REV.	Rif. doc. - Ref. doc.
1:10	A9179	01	PP00072 CLP00115

DESIGNATO - DESIGNED BY: 16/10/2014 M. BORGATO
CONTROLLATO - CHECKED BY: 27/10/2015 A. CELIO
APPROVATO - APPROVED BY: 27/10/2015 L. ZERBATO

MOMENTS OF INERTIA - SINGLE BEARING



* Shaft mass and inertia also include rotor keys

TYPE	COMPONENT 1 FAN Weight [kg]	1 FAN J [kgm²]	2 MAIN ROTOR Weight [kg]	2 MAIN ROTOR J [kgm²]	3 EXCITER ROTOR Weight [kg]	3 EXCITER ROTOR J [kgm²]	4 SHAFT* Weight [kg]	4 SHAFT* J [kgm²]	TOTAL Weight [kg]	TOTAL J [kgm²]
ECO43 1S/4A	26.3	1.0132	474.7	13.7472	41.0	0.4847	142.1	0.3450	684.1	15.5901
ECO43 2S/4A			552.0	15.9980					761.4	17.8409
ECO43 1M/4A			598.3	17.3056			153.1	0.3728	818.7	19.1762
ECO43 2M/4A			638.2	18.4455					858.6	20.3162
ECO43 2L/4A			748.8	21.6184			166.6	0.4067	982.7	23.5229
ECO43 VL/4A			850.2	24.5337			176.5	0.4317	1094.0	26.4633

SAE N.	5 | SHAFTS COUPLING FLAX PLATE A	B	Weight [kg]	J [kgm²]
18	145.7	102.8	56.4	1.2288
21	130	100.4	64.8	2.2253

TYPE	C [mm]	D [mm]	E [mm]	F [mm]	G [mm]
ECO43 1S/4A	1084	959	477.5	510	1266
ECO43 2S/4A			512.4		
ECO43 1M/4A	1174	1049	537.4	600	1356
ECO43 2M/4A			557.4		
ECO43 2L/4A	1284	1159	612.3	710	1466
ECO43 VL/4A	1364	1239	662.3	810	1566

REV.	DATE	REVIEWS	DESIGN BY	APPROVED BY
01	19/02/2026	UPDATED DATA	Berdin G.	Luise F.
00	27/03/2025	FIRST ISSUE	Riello A.	Trevisan M.

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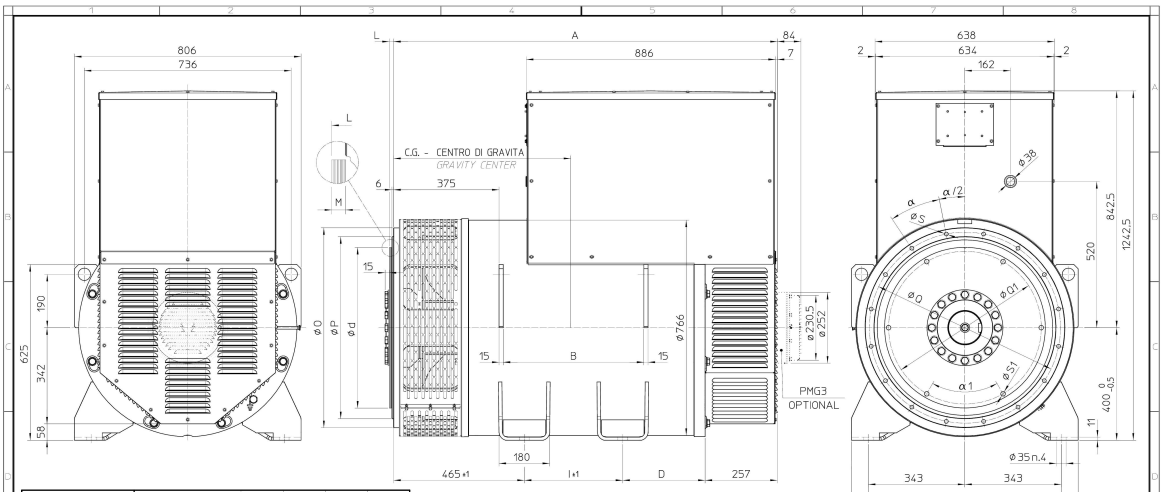
DESCRIPTION: MOMENTS OF INERTIA - SINGLE BEARING ECO43A

FORMAT	SCALE	REF.DOC	PART N.	MODEL REV.	DRW REV.
A4	1:10	ECR00089	D00392	00	01



TIPO/TYPE/TYP	C.G. Standard version	C.G. PMG3 version	A	B	D	I
ECO43-1S/4A	627	635	1365	500	293	350
ECO43-2S/4A	650	659				
ECO43-1M/4A	679	687	1455	700	183	550
ECO43-2M/4A	692	700				
ECO43-2L/4A	750	757	1565	700	293	550
ECO43-VL/4A	797	806	1645	780	373	550

SAE N.	FLANGIA / LANGE BRIDE / FLANSCH O	P	Q	S	α
1	711	511.2	530.2	12	30°
0	711	647.7	679.5	14	22.5°
00	883	787.4	850.9	14	22.5°

SAE N.	GIUNTI A DISCHI / DISC COUPLING DISCQUE DE MONOPALIER / SCHEIBENKUPPLUNG d	L	M	Q1	S1	α1
14	466.72	25.4	10	438.15	13.5	45°
18	571.5	15.7	10	542.92	16.5	60°
21	673.1	0	12	641.35	16.5	30°

QUOTE SENZA INDICAZIONE DI TOLLERANZA PER UNI EN 22768/1-2 v-L
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DIMENSIONI DI INGOMBRO FORMA MD35
MD35 COUPLING OVERALL DIMENSIONS

ALTERNATORE - ALTERNATOR
ECO 43
A

mm.	SCALA-SCALE	CODICE DISEGNO - DESIGN CODE	REV.	Rif. doc. - Ref. doc.
	1:10	A9065	02	PP00072 CLP00115

DISEGNATO - DESIGNED BY: 25/07/2014 S. SAORIN
CONTROLLATO - CHECKED BY: 07/10/2016 D. HOANG
APPROVATO - APPROVED BY: 07/10/2016 R. MANFRIN

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