

TAL 046 - TAL 047 - TAL 049

Low Voltage Alternators - 4 pole

180 to 1000 kVA - 50 Hz / 225 to 1250 kVA - 60 Hz

Electrical and mechanical data

LEROY-SOMER[™]

Nidec
All for dreams

TAL 046 - TAL 047 - TAL 049

Low Voltage Alternators - 4 pole

Adapted to needs

The TAL alternator range is designed to meet the specific needs of telecommunications, commercial & industrial markets, as well as stand-by and prime power applications.

Compliant with international standards

The TAL range complies with international standards and regulations: IEC 60034 and derivative. The range is designed, manufactured and marketed in an ISO 9001 and 14001 environment. It can be integrated into a CE market generator set.

Electrical design

- Class H insulation
- Low voltage winding
- 6-terminal plate (adapted plate for 6 & 12 wires machine)
- Possibility of star and delta connection
- Optimized performance

Robust design

- Compact and rugged assembly to withstand engine vibrations
- Steel frame
- Cast iron flanges and shields
- Single bearing design to be suitable with most diesel engines
- Sealed for life bearing
- Direction of rotation clockwise

Compact terminal box

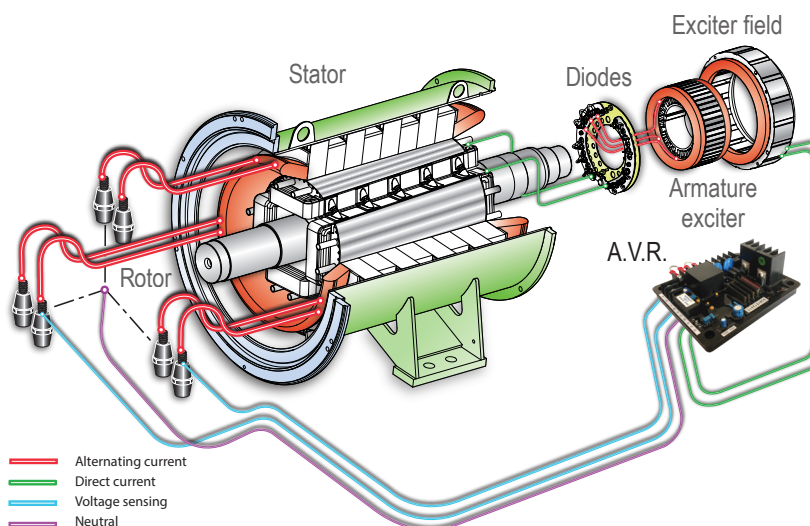
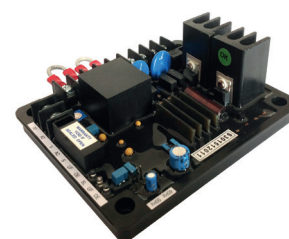
- Easy access to AVR and terminals
- Standard terminal box with possibility of mounting measurement CTs
- Possibility of current transformer for parallel operation

Environment and protection

- The alternators are IP 23
- Standard winding protection for non-harsh environments with relative humidity $\leq 95\%$

Available options

- AREP & PMG
- UL / CSA
- Customized painting
- Space heaters
- Droop kit for alternator paralleling
- Stator sensors
- Winding 8 for voltage 380V - 416 V / 60 Hz
- Winding protection for harsh environments and relative humidity greater than 95% (system 2 - 4): possible derating ratio according to the following table



Type	50 Hz			60 Hz
	380 V	400 V	415 V	All voltages
TAL 046	1 except 0.97 for TAL 046 H	1 except 0.97 for TAL 046 H	1 except 0.97 for TAL 046 H	1 except 0.97 for TAL 046 H
TAL 047	1 except 0.97 for TAL 047 F	1 except 0.97 for TAL 047 F	1 except 0.97 for TAL 047 F	1 except 0.97 for TAL 047 F
TAL 049	1	1	1	1

TAL 046 - 180 to 410 kVA - 50 Hz / 225 to 512 kVA - 60 Hz

Low Voltage Alternators - 4 pole

General characteristics - 6 & 12-wire

Insulation class	H	Excitation system 6 wire	SHUNT	AREP / PMG
Winding pitch	2/3 (Winding 6 or 6S)	AVR type	R150	R180
Number of wires	6 or 12	Excitation system 12 wire	SHUNT	AREP / PMG
Protection	IP 23	AVR type	R250	R180
Altitude	≤ 1000 m	Voltage regulation (*)	± 1 %	
Overspeed	2250 R.P.M.	Total Harmonic distortion THD (**) in no-load	< 3.5 %	
Air flow (m³/s)	0.48	Total Harmonic distortion THD (**) in linear load	< 5 %	
Air flow (m³/s)	0.58	Waveform: NEMA = TIF (**)	< 50	
		Waveform: I.E.C. = THF (**)	< 2%	

(*) Steady state (**) Total harmonic distortion between phases, no-load or on-load (non-distorting)

Ratings 50 Hz - 1500 R.P.M. - 6 & 12-wire

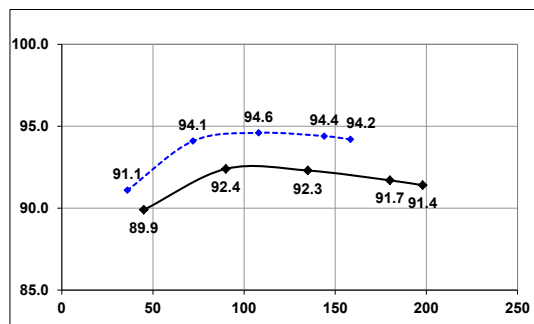
kVA / kW - P.F. = 0.8																					
Duty / T° C	Continuous / 40 °C				Continuous / 40 °C				Stand-by / 40 °C				Stand-by / 27 °C								
Class / T° K	H / 125° K				F / 105° K				H / 150° K				H / 163° K								
Phase	3 ph.		1 ph.		3 ph.		1 ph.		3 ph.		1 ph.		3 ph.		1 ph.						
Y	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V					
Δ	220V	230V	240V		220V	230V	240V		220V	230V	240V		220V	230V	240V						
YY				220V				220V				220V				220V					
ΔΔ				230V				230V				230V				230V					
TAL 046 A	kVA	180	180	180	171	108	164	164	164	156	98	191	191	191	181	114	200	200	200	188	120
	kW	144	144	144	137	86	131	131	131	124	78	153	153	153	145	91	160	160	160	150	96
TAL 046 B	kVA	200	200	200	190	120	182	182	182	173	109	212	212	212	201	127	220	220	220	209	132
	kW	160	160	160	152	96	146	146	146	138	87	170	170	170	161	102	176	176	176	167	106
TAL 046 C	kVA	230	230	230	219	138	209	209	209	200	126	244	244	244	232	146	253	253	253	240	152
	kW	184	184	184	175	110	167	167	167	160	101	195	195	195	186	117	202	202	202	192	122
TAL 046 D	kVA	240	250	250	238	150	218	228	228	216	137	254	265	265	252	159	264	275	275	261	165
	kW	192	200	200	190	120	174	182	182	173	110	204	212	212	202	127	211	220	220	209	132
TAL 046 E	kVA	275	275	275	261	165	250	250	250	238	150	292	292	292	277	175	303	303	303	287	182
	kW	220	220	220	209	132	200	200	200	190	120	234	234	234	222	140	242	242	242	230	146
TAL 046 F	kVA	290	300	300	285	180	264	273	273	259	164	307	318	318	302	191	319	330	330	313	200
	kW	232	240	240	228	144	211	218	218	207	131	246	254	254	242	153	255	264	264	250	160
TAL 046 G	kVA	325	325	325	309	195	300	300	300	281	177	345	345	345	327	207	360	360	360	340	215
	kW	260	260	260	247	156	240	240	240	225	142	276	276	276	262	166	286	286	286	272	172
TAL 046 H	kVA	350	365	365	347	210	319	332	332	316	191	371	387	387	368	225	385	400	400	380	231
	kW	280	292	292	277	168	255	266	266	253	153	297	310	310	294	180	308	320	320	304	185
TAL 046 J	kVA	400	410	410	390	246	364	373	373	355	224	424	435	435	413	261	440	450	450	430	270
	kW	320	328	328	312	197	291	298	298	284	179	339	348	348	330	209	352	360	360	344	216

Ratings 60 Hz - 1800 R.P.M. - 6 & 12-wire

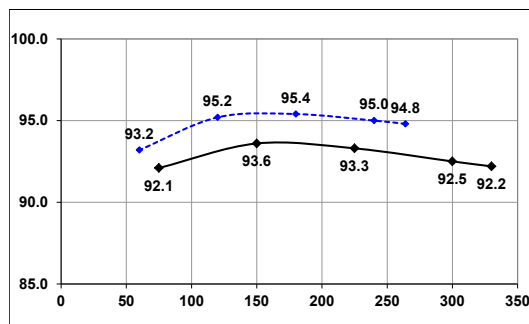
kVA / kW - P.F. = 0.8																					
Duty / T° C	Continuous / 40 °C				Continuous / 40 °C				Stand-by / 40 °C				Stand-by / 27 °C								
Class / T° K	H / 125° K				F / 105° K				H / 150° K				H / 163° K								
Phase	3 ph.		1 ph.		3 ph.		1 ph.		3 ph.		1 ph.		3 ph.		1 ph.						
Y	380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V					
Δ	220V	240V	240V		220V	240V	240V		220V	240V	240V		220V	240V	240V						
YY		208V	220V	240V		208V	220V	240V		208V	220V	240V		208V	220V	240V					
ΔΔ				240V				240V				240V				240V					
TAL 046 A	kVA	180	195	210	225	120	164	177	191	205	108	191	207	223	239	126	200	215	229	250	131
	kW	144	156	168	180	96	131	142	153	164	86	153	166	178	191	101	160	172	183	200	105
TAL 046 B	kVA	200	215	230	250	132	182	196	209	228	120	212	228	244	265	140	220	237	253	275	145
	kW	160	172	184	200	106	146	157	167	182	96	170	182	195	212	112	176	190	202	220	116
TAL 046 C	kVA	226	250	262	288	152	206	227	238	262	138	240	264	278	305	161	250	274	288	316	167
	kW	181	200	210	230	122	165	182	190	210	110	192	211	222	244	129	200	219	230	253	134
TAL 046 D	kVA	245	265	280	313	165	223	241	255	284	150	260	281	297	331	175	270	292	308	344	182
	kW	196	212	224	250	132	178	193	204	227	120	208	225	238	265	140	216	234	246	275	146
TAL 046 E	kVA	275	300	315	344	182	250	273	287	313	165	292	318	334	364	192	303	330	347	378	200
	kW	220	240	252	275	146	200	218	230	250	132	234	254	267	291	154	242	264	278	302	160
TAL 046 F	kVA	290	315	340	375	200	264	287	309	337	180	307	334	360	395	210	319	347	375	412	218
	kW	232	252	272	300	160	211	230	247	270	144	246	267	288	316	168	255	278	300	330	174
TAL 046 G	kVA	315	345	365	406	215	287	314	332	370	195	334	366	387	431	227	347	380	402	447	236
	kW	252	276	292	325	172	230	251	266	296	156	267	293	310	345	182	278	304	322	358	189
TAL 046 H	kVA	345	375	400	456	231	314	341	364	415	210	366	398	424	483	250	380	413	440	502	254
	kW	276	300	320	365	185	251	273	291	332	168	293	318	339	386	200	304	330	352	402	203
TAL 046 J	kVA	450	480	500	512	282	410	437	455	466	257	477	509	530	543	300	500	530	550	581	320
	kW	360	384	400	410	226	328	350	364	373	206	382	407	424	434	240	400	424	440	465	256

Low Voltage Alternators - 4 pole

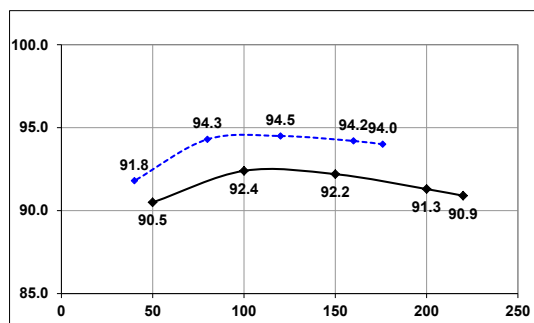
Efficiencies 400 V - 50 Hz (— P.F.: 0.8) (----- P.F.: 1) - 6 & 12-wire



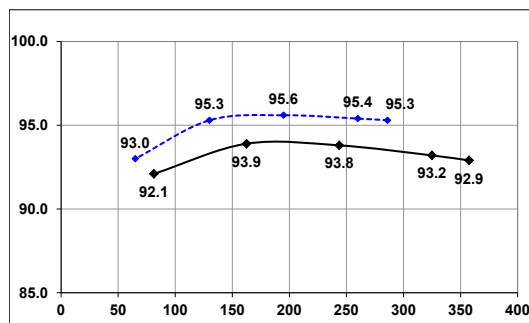
TAL 046 A - 400V 50Hz



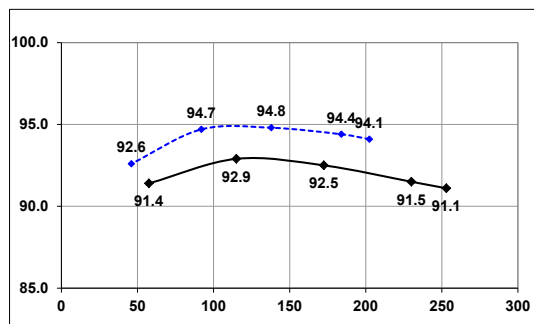
TAL 046 F - 400V 50Hz



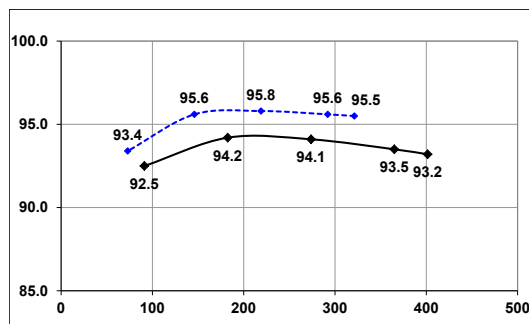
TAL 046 B - 400V 50Hz



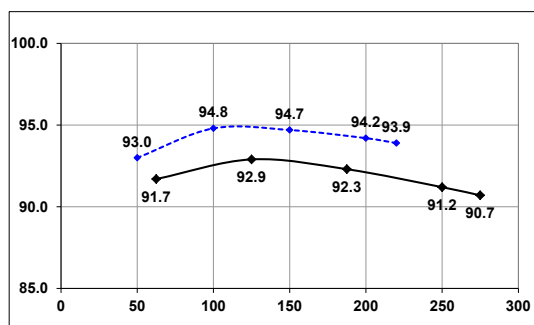
TAL 046 G - 400V 50Hz



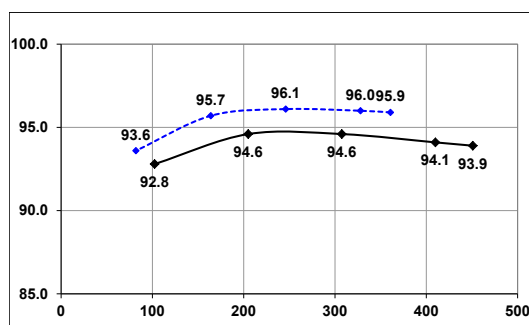
TAL 046 C - 400V 50Hz



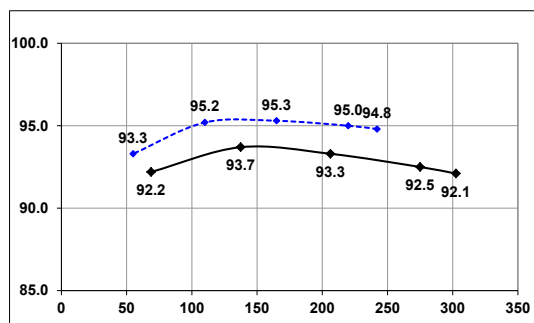
TAL 046 H - 400V 50Hz



TAL 046 D - 400V 50Hz



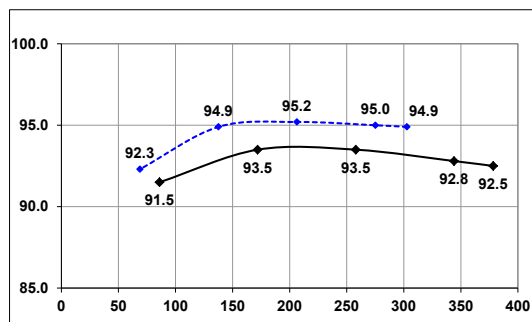
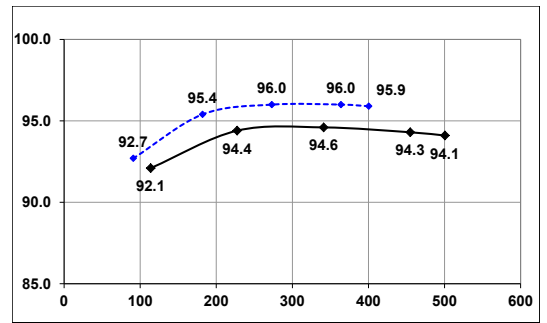
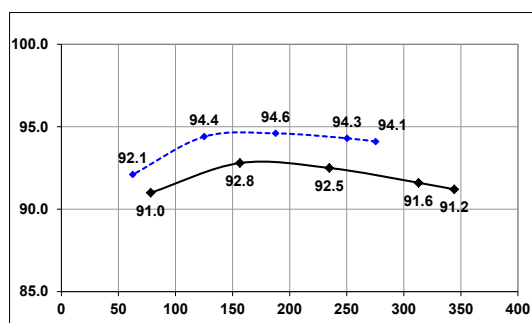
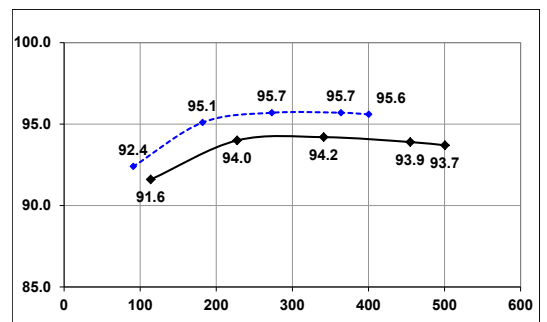
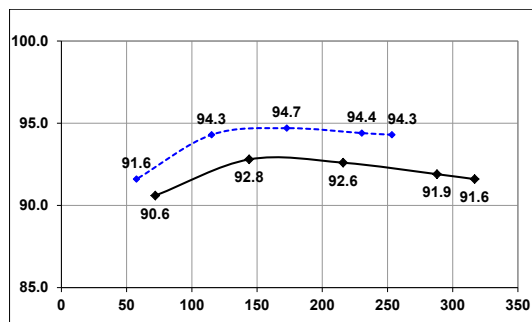
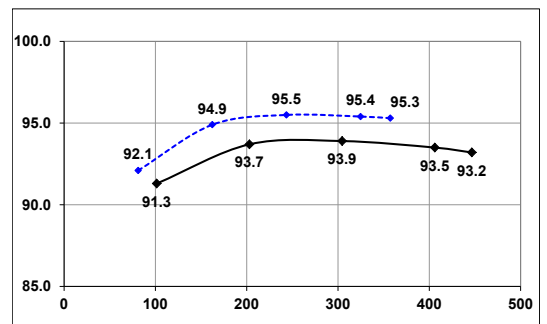
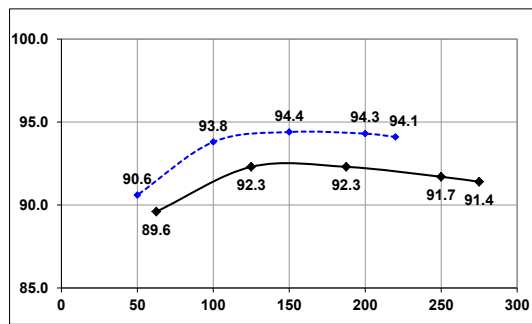
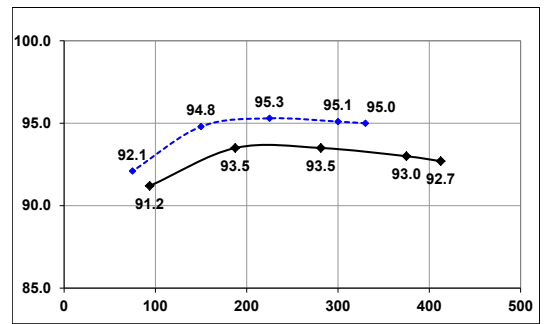
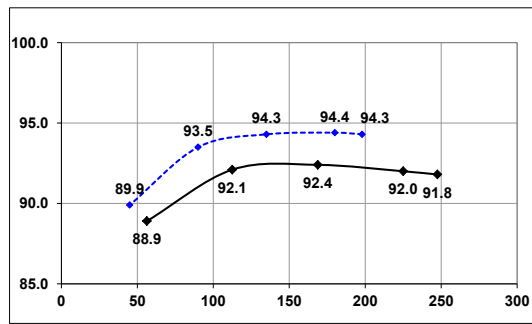
TAL 046 J - 400V 50Hz



TAL 046 E - 400V 50Hz

Low Voltage Alternators - 4 pole

Efficiencies 480 V - 60 Hz (— P.F.: 0.8) (----- P.F.: 1) - 6 & 12-wire



TAL 046 - 180 to 410 kVA - 50 Hz / 225 to 512 kVA - 60 Hz

Low Voltage Alternators - 4 pole

Reactances (%). Time constants (ms) - Class H / 400 V - 6 & 12-wire

	A	B	C	D	E	F	G	H	J
Kcc Short-circuit ratio	0.46	0.42	0.37	0.34	0.37	0.4	0.45	0.43	0.46
Xd Direct-axis synchro. reactance unsaturated	292	325	340	370	347	335	297	303	291
Xq Quadrature-axis synchro. reactance unsaturated	149	165	173	188	177	171	151	154	148
T'do No-load transient time constant	1937	1937	1983	1983	2018	2033	2072	2093	2113
X'd Direct-axis transient reactance saturated	15.1	16.7	17.1	18.6	17.1	16.5	14.3	14.5	13.7
T'd Short-circuit transient time constant	100	100	100	100	100	100	100	100	100
X''d Direct-axis subtransient reactance saturated	12	13.4	13.7	14.9	13.7	13.2	11.4	11.6	11
T''d Subtransient time constant	10	10	10	10	10	10	10	10	10
X''q Quadrature-axis subtransient reactance saturated	15.5	17.2	17.4	18.9	17.2	16.4	14.1	14.2	13.4
Xo Zero sequence reactance unsaturated	0.62	0.69	0.71	0.77	0.71	0.68	0.59	0.6	0.57
X2 Negative sequence reactance saturated	13.82	15.35	15.58	16.94	15.51	14.84	12.81	12.9	12.2
Ta Armature time constant	15	15	15	15	15	15	15	15	15

Other class H / 400 V data

io (A) No-load excitation current SHUNT/AREP	0.9	0.9	1.01	1.01	0.82	0.88	0.88	0.85	1.09
ic (A) On-load excitation current SHUNT/AREP	3.53	3.95	3.84	4.14	4.07	3.94	3.64	3.72	4.04
uc (V) On-load excitation voltage SHUNT/AREP	46	50.9	35.8	38.4	34.2	39.2	36	36.4	58
ms Response time ($\Delta U = 20\%$ transient)	500	500	500	500	500	500	500	500	500
kVA Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) SHUNT*	297.6	300.1	372.9	375.3	412.4	449.8	487.3	547.3	614.8
kVA Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) AREP*	355	360	445	450	495	540	585	660	740
% Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 _{LAG}	18.7	20.2	19	20.1	20.2	20.2	20.2	20.2	20.2
% Transient ΔU (on-load 4/4) AREP - P.F.: 0.8 _{LAG}	16.5	17.5	16.5	17.5	17.5	17.5	17.5	17.5	17.5
W No-load losses	3247	3247	3297	3297	3560	3955	4483	4697	5269
W Heat dissipation	12955	15115	16884	19248	17730	19240	18846	20042	20247

* P.F. = 0.6

Reactances (%). Time constants (ms) - Class H / 480 V - 6 & 12-wire

	A	B	C	D	E	F	G	H	J
Kcc Short-circuit ratio	0.45	0.4	0.36	0.33	0.35	0.4	0.43	0.43	0.44
Xd Direct-axis synchro. reactance unsaturated	304	338	355	386	361	335	309	303	303
Xq Quadrature-axis synchro. reactance unsaturated	155	172	181	197	184	171	157	154	154
T'do No-load transient time constant	1937	1937	1983	1983	2018	2033	2072	2093	2113
X'd Direct-axis transient reactance saturated	15.7	17.4	17.9	19.4	17.9	16.5	14.9	14.5	14.3
T'd Short-circuit transient time constant	100	100	100	100	100	100	100	100	100
X''d Direct-axis subtransient reactance saturated	12.5	13.9	14.3	15.5	14.3	13.2	11.9	11.6	11.4
T''d Subtransient time constant	10	10	10	10	10	10	10	10	10
X''q Quadrature-axis subtransient reactance saturated	16.2	18	18.1	19.7	18	16.4	14.7	14.2	14.2
Xo Zero sequence reactance unsaturated	0.65	0.72	0.74	0.81	0.74	0.68	0.62	0.6	0.59
X2 Negative sequence reactance saturated	14.39	15.99	16.26	17.67	16.17	14.84	13.34	12.9	12.71
Ta Armature time constant	15	15	15	15	15	15	15	15	15

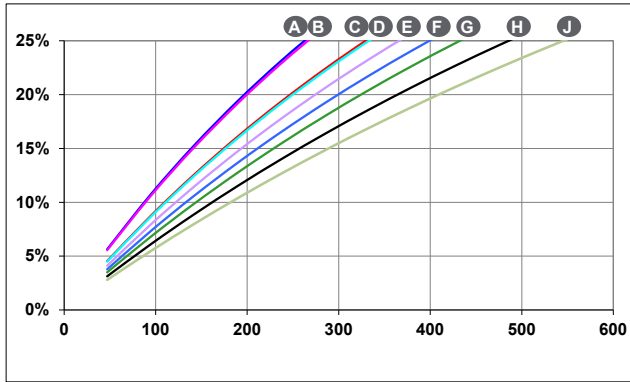
Other class H / 480 V data

io (A) No-load excitation current SHUNT/AREP	0.89	0.89	1.01	1.01	0.81	0.87	0.87	0.84	1.08
ic (A) On-load excitation current SHUNT/AREP	3.43	3.83	3.91	4.21	3.92	3.67	3.52	3.43	3.99
uc (V) On-load excitation voltage SHUNT/AREP	45.6	50.3	36.6	39.3	33.8	37.4	35.6	34.5	58
ms Response time ($\Delta U = 20\%$ transient)	500	500	500	500	500	500	500	500	500
kVA Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) SHUNT*	372	375.1	466.9	469.9	515.8	562.3	608.8	682.3	767.7
kVA Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) AREP*	445	450	560	565	620	675	730	820	920
% Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 _{LAG}	18.7	20.2	19	20.1	20.2	20.2	20.2	20.2	20.2
% Transient ΔU (on-load 4/4) AREP - P.F.: 0.8 _{LAG}	16.5	17.5	16.5	17.5	17.5	17.5	17.5	17.5	17.5
W No-load losses	4877	4877	4958	4958	5347	5877	6616	6925	7738
W Heat dissipation	15504	17904	20040	22678	21064	21511	22517	22683	24404

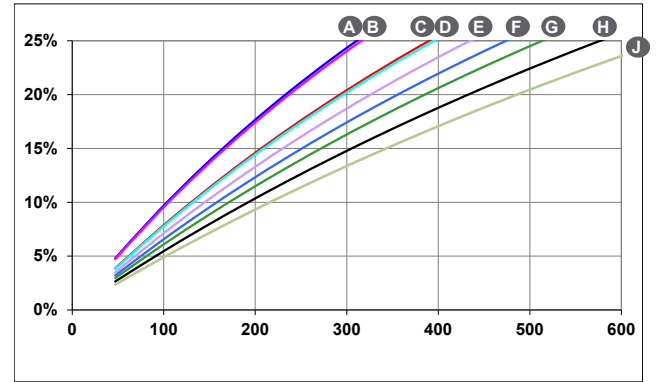
* P.F. = 0.6

Low Voltage Alternators - 4 pole

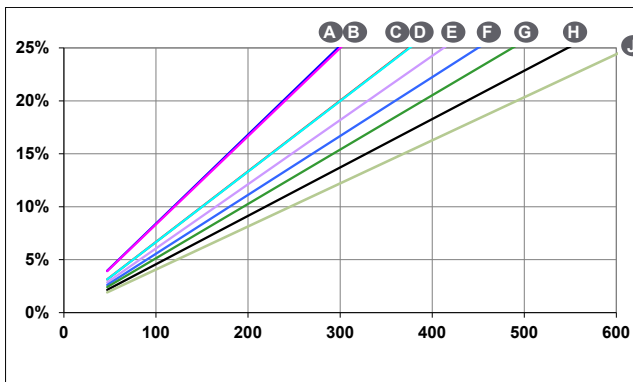
Transient voltage variation 400 V - 50 Hz - 6 & 12-wire



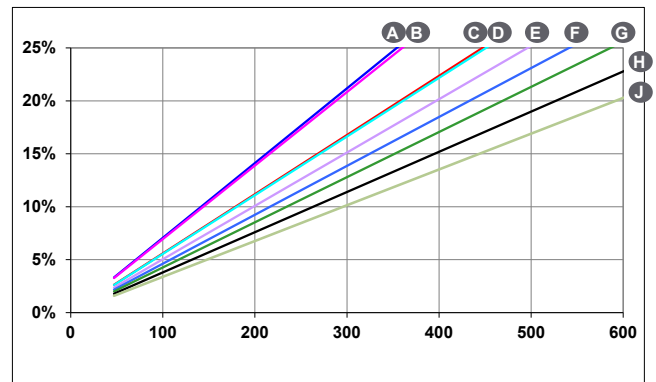
Phase loading (SHUNT) - kVA at 0.8 P.F.



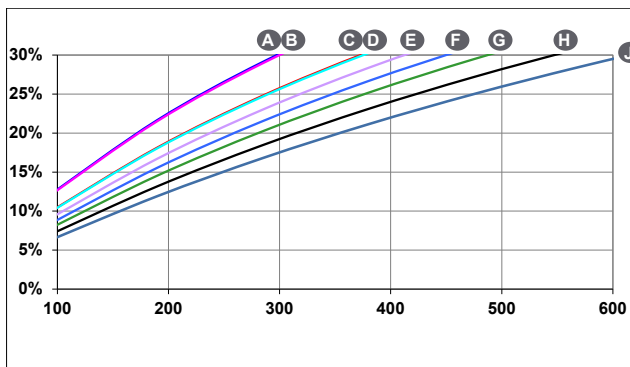
Phase loading (AREP) - kVA at 0.8 P.F.



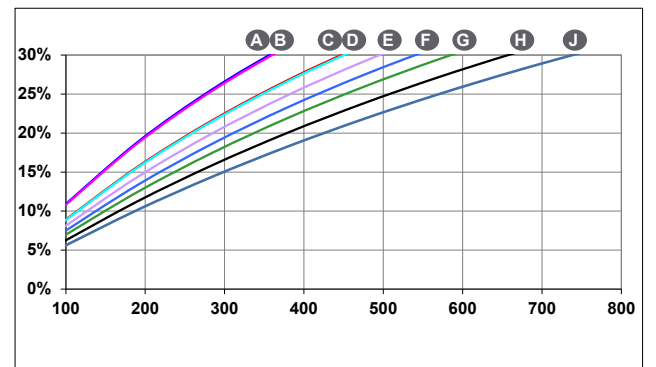
Load shedding (SHUNT) - kVA at 0.8 P.F.



Load shedding (AREP) - kVA at 0.8 P.F.



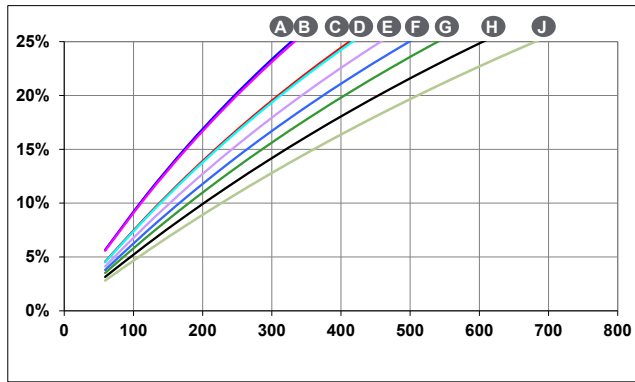
Motor starting (SHUNT) - Locked rotor kVA at 0.6 P.F.



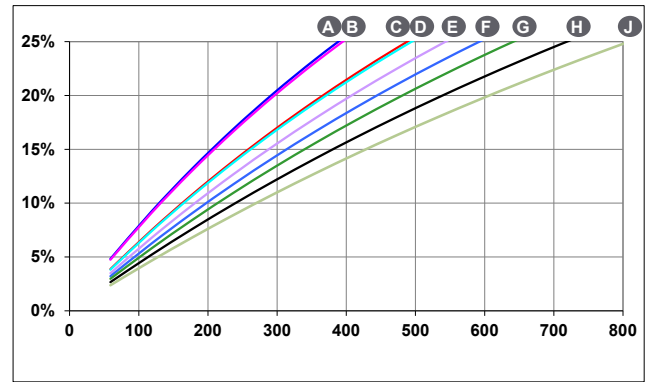
Motor starting (AREP) - Locked rotor kVA at 0.6 P.F.

Low Voltage Alternators - 4 pole

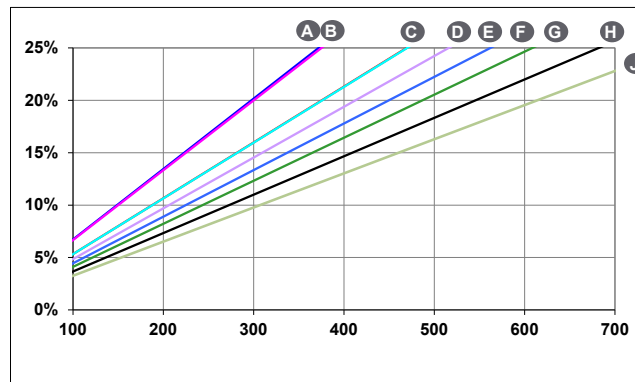
Transient voltage variation 480 V - 60 Hz - 6 & 12-wire



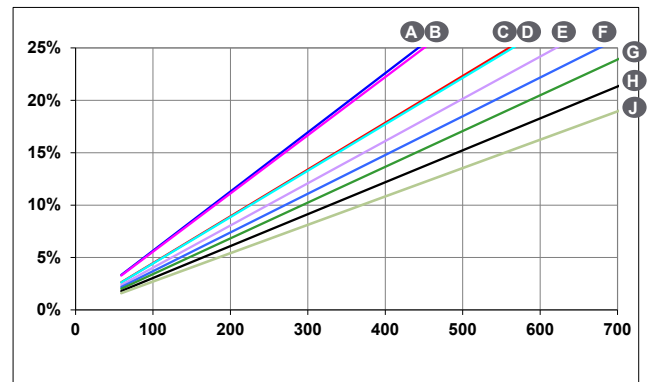
Phase loading (SHUNT) - kVA at 0.8 P.F.



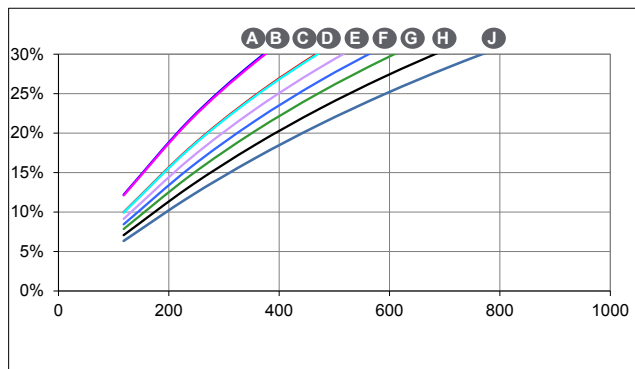
Phase loading (AREP) - kVA at 0.8 P.F.



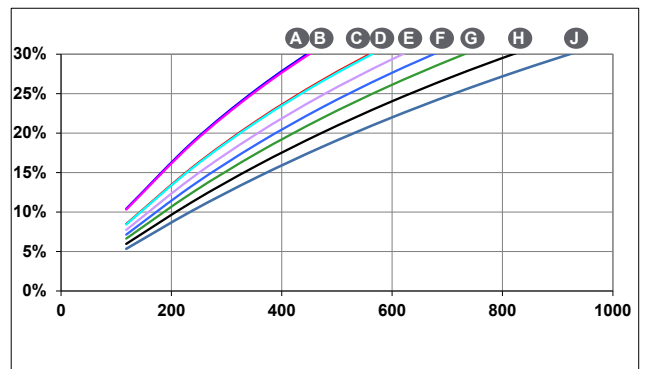
Load shedding (SHUNT) - kVA at 0.8 P.F.



Load shedding (AREP) - kVA at 0.8 P.F.



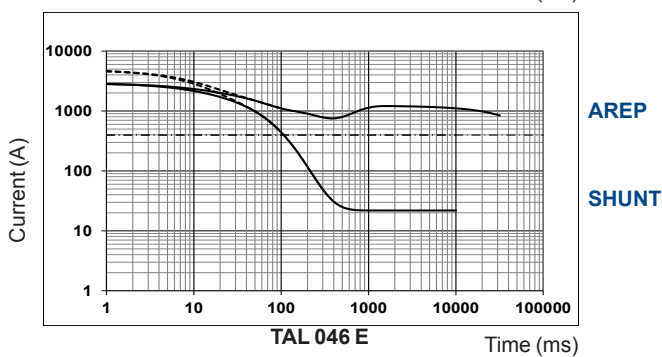
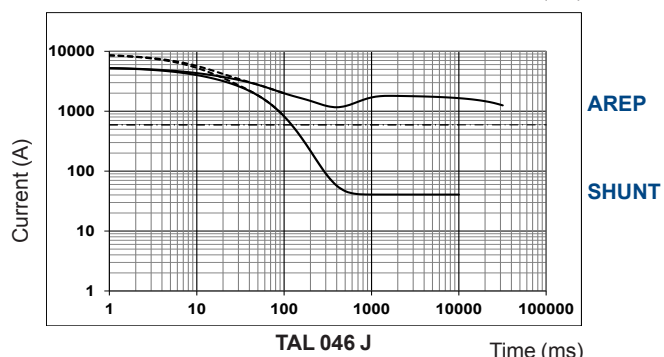
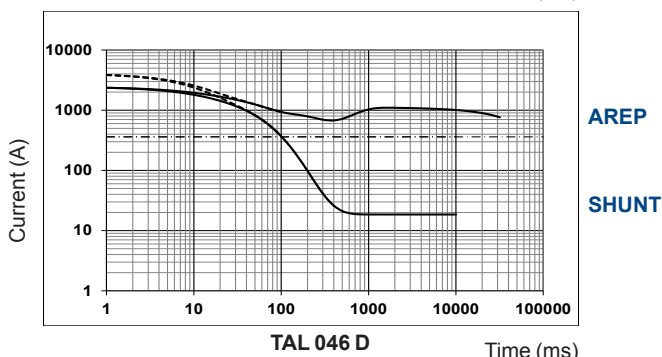
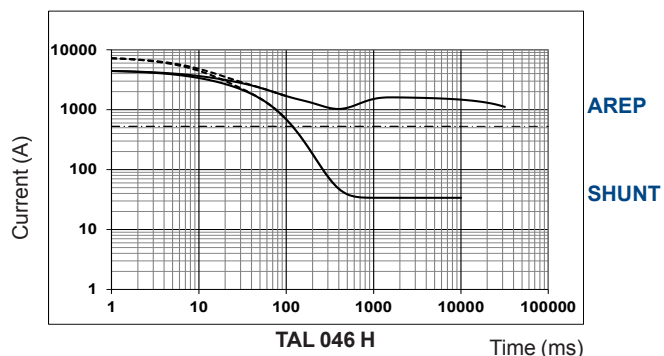
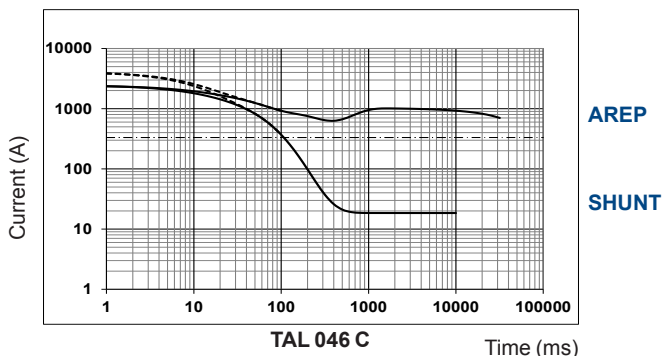
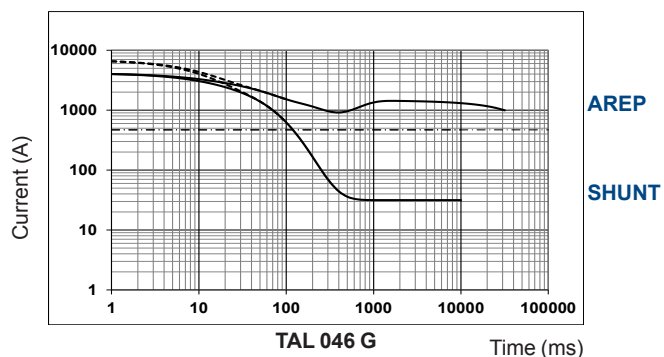
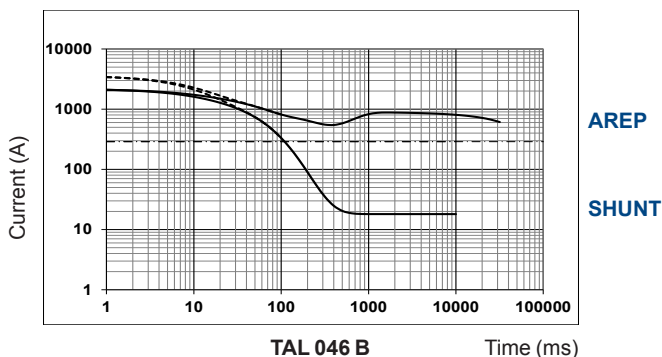
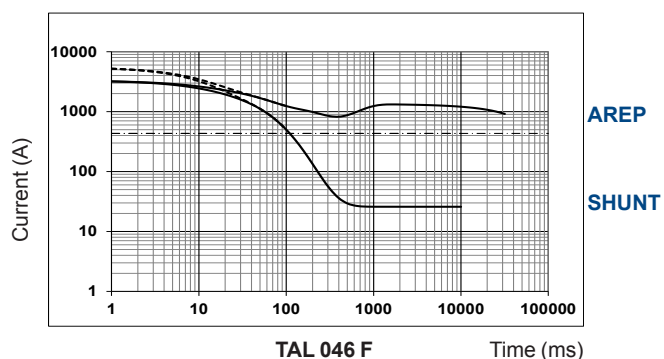
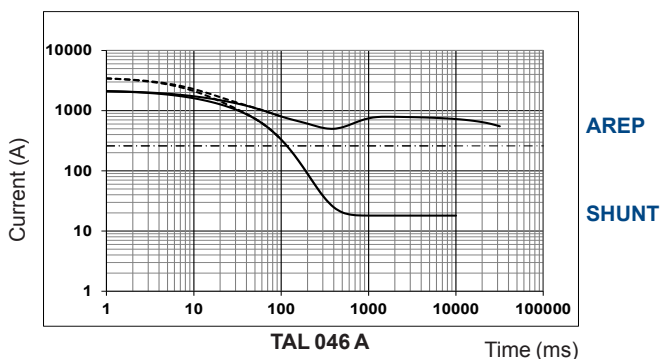
Motor starting (SHUNT) - Locked rotor kVA at 0.6 P.F.



Motor starting (AREP) - Locked rotor kVA at 0.6 P.F.

Low Voltage Alternators - 4 pole

3-phase short-circuit curves at no load and rated speed (star connection Y) - 6 & 12-wire

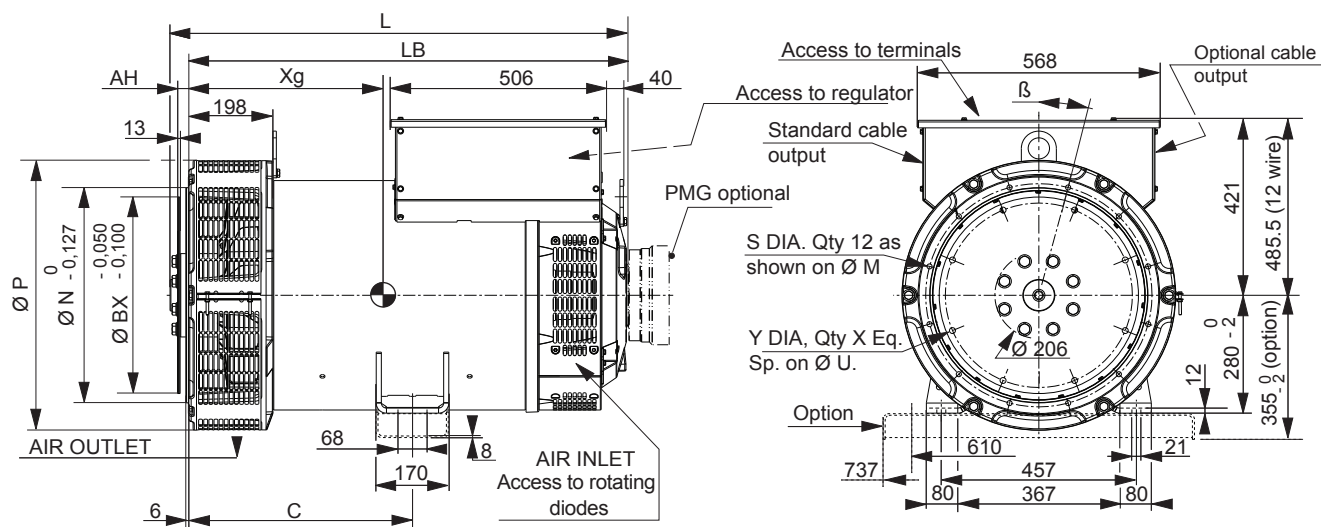


Symmetrical _____
Asymmetrical - - - - -

TAL 046 - 180 to 410 kVA - 50 Hz / 225 to 512 kVA - 60 Hz

Low Voltage Alternators - 4 pole

Single bearing general arrangement - 6 & 12-wire



Dimensions (mm) and weight

Type	L without PMG	LB	Xg	C	Weight (kg)
TAL 046 A	944**/935	892	408	429	569
TAL 046 B	944**/935	892	414	429	599
TAL 046 C	944**/935	892	423	429	674
TAL 046 D	944**/935	892	423	429	682
TAL 046 E	989**/980	937	445	429	754
TAL 046 F	989**/980	937	445	429	754
TAL 046 G*	1084**/1075	1032	493	525	888
TAL 046 H*	1084**/1075	1032	493	525	888
TAL 046 J***	-	-	-	-	-

Coupling

Flex plate	11 1/2	14	18
Flange S.A.E 3	X		
Flange S.A.E 2	X		
Flange S.A.E 1	X	X	
Flange S.A.E 1/2		X	
Flange S.A.E 0		X	X

* Shaft height = 355 mm optional
 ** Dimensions with SAE 11 1/2
 *** Available soon (please order TAL 047 A)

Flange (mm)

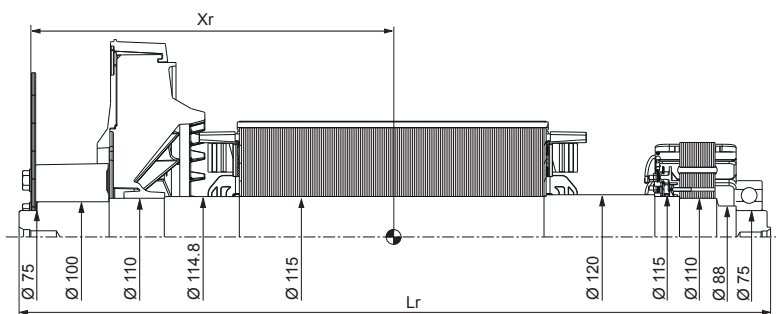
S.A.E.	P	N	M	S	β °
3	641	409.575	428.625	11	15°
2	641	447.675	466.725	11	15°
1	641 (713 : J)	511.175	530.225	12	15°
1/2	713	584.2	619.125	14	15°
0	713	647.7	679.45	14	11° 15'

Flex plate (mm)

S.A.E.	BX	U	X	Y	AH
11 1/2	352.42	333.38	8	11	39.6
14	466.72	438.15	8	14	25.4
18****	571.5	542.92	6	17	15.7

**** Optional

Torsional analysis data



Centre of gravity: Xr (mm), Rotor length: Lr (mm), Weight: M (kg), Moment of inertia: J (kgm²): (4J = MD²)

Type	Flex plate S.A.E. 11 1/2				Flex plate S.A.E. 14			
	Xr	Lr	M	J	Xr	Lr	M	J
TAL 046 A	413	923	243	2.46	401	923	244	2.62
TAL 046 B	413	923	243	2.46	401	923	244	2.62
TAL 046 C	420	923	255	2.64	408	923	256	2.8
TAL 046 D	420	923	255	2.64	408	923	256	2.8
TAL 046 E	460	968	304	3.28	448	968	305	3.44
TAL 046 F	460	968	304	3.28	448	968	305	3.44
TAL 046 G	508	1063	358	3.97	497	1063	359	4.13
TAL 046 H	508	1063	358	3.97	497	1063	359	4.13
TAL 046 J***	-	-	-	-	-	-	-	-

***Available soon (please order TAL 047 A)

NOTE : Dimensions are for information only and may be subject to modifications. Contractual 2D drawings can be downloaded from the Leroy-Somer site, 3D drawing files are available upon request.

TAL 046 - 180 to 410 kVA - 50 Hz / 225 to 512 kVA - 60 Hz

Low Voltage Alternators - 4 pole

TAL 047 - 410 to 660 kVA - 50 Hz / 570 to 825 kVA - 60 Hz

Low Voltage Alternators - 4 pole

General characteristics - 6 & 12-wire

Insulation class	H	Excitation system 6 wire	SHUNT	AREP / PMG
Winding pitch	2/3 (Winding 6 or 6S)	AVR type	R150	R180
Number of wires	6 or 12	Excitation system 12 wire	SHUNT	AREP / PMG
Protection	IP 23	AVR type	R250	R180
Altitude	≤ 1000 m	Voltage regulation (*)	± 1 %	
Overspeed	2250 R.P.M.	Total Harmonic distortion THD (**) in no-load	< 3.5 %	
Air flow (m³/s)	0.9	Total Harmonic distortion THD (**) in linear load	< 5 %	
Air flow (m³/s)	1.1	Waveform: NEMA = TIF (**)	< 50	
		Waveform: I.E.C. = THF (**)	< 2%	

(*) Steady state (**) Total harmonic distortion between phases, no-load or on-load (non-distorting)

Ratings 50 Hz - 1500 R.P.M. - 6 & 12-wire

kVA / kW - P.F. = 0.8																	
Duty / T° C		Continuous / 40 °C				Continuous / 40 °C				Stand-by / 40 °C				Stand-by / 27 °C			
Class / T° K		H / 125° K				F / 105° K				H / 150° K				H / 163° K			
Phase		3 ph.				3 ph.				3 ph.				3 ph.			
Y		380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V
Δ		220V	230V	240V		220V	230V	240V		220V	230V	240V		220V	230V	240V	
YY					220V				220V				220V				220V
TAL 047 A	kVA	390	410	410	385	355	375	375	350	415	435	435	410	430	450	450	425
	kW	310	330	330	310	285	300	300	280	330	350	350	330	345	360	360	340
TAL 047 B	kVA	430	455	455	430	390	415	415	390	455	480	480	455	475	500	500	475
	kW	345	365	365	345	315	330	330	315	365	385	385	365	380	400	400	380
TAL 047 C	kVA	475	500	500	460	430	455	455	420	505	530	530	490	525	550	550	505
	kW	380	400	400	370	345	365	365	335	405	425	425	390	420	440	440	405
TAL 047 D	kVA	525	550	550	535	480	500	500	485	555	585	585	565	580	605	605	590
	kW	420	440	440	430	380	400	400	390	445	465	465	455	460	485	485	470
TAL 047 E	kVA	585	600	600	570	530	545	545	520	620	635	635	605	645	660	660	625
	kW	470	480	480	455	425	435	435	415	495	510	510	485	515	530	530	500
TAL 047 F	kVA	645	660	660	620	585	600	600	565	685	700	700	655	710	725	725	680
	kW	515	530	530	495	470	480	480	450	545	560	560	525	570	580	580	545

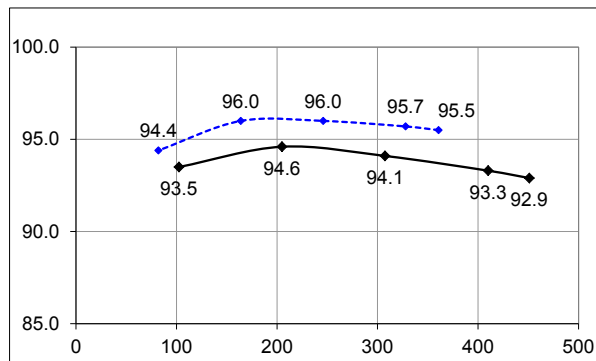
Ratings 60 Hz - 1800 R.P.M. - 6 & 12-wire

kVA / kW - P.F. = 0.8																	
Duty / T° C		Continuous / 40 °C				Continuous / 40 °C				Stand-by / 40 °C				Stand-by / 27 °C			
Class / T° K		H / 125° K				F / 105° K				H / 150° K				H / 163° K			
Phase		3 ph.				3 ph.				3 ph.				3 ph.			
Y		380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V
Δ		220V	240V	240V		220V	240V	240V		220V	240V	240V		220V	240V	240V	
YY			208V	220V	240V		208V	220V	240V		208V	220V	240V		208V	220V	240V
TAL 047 A	kVA	450	480	500	512	396	442	442	465	475	513	533	550	500	530	550	581
	kW	360	384	400	410	317	354	354	372	380	410	426	440	400	424	440	465
TAL 047 B	kVA	475	510	531	570	441	473	493	518	503	543	566	592	527	562	585	625
	kW	380	408	425	456	353	378	394	414	402	434	453	474	422	450	468	500
TAL 047 C	kVA	520	555	590	625	473	505	537	569	551	588	625	663	570	610	650	690
	kW	416	444	472	500	379	404	430	455	441	471	500	530	455	490	520	550
TAL 047 D	kVA	562	610	630	690	523	566	587	632	600	651	672	729	615	671	695	750
	kW	450	488	504	552	418	453	470	506	480	521	538	583	490	537	555	600
TAL 047 E	kVA	602	661	685	750	556	609	634	675	643	707	734	780	660	725	755	825
	kW	482	529	548	600	445	487	507	540	514	566	587	624	528	580	605	660
TAL 047 F	kVA	650	715	755	825	592	650	687	750	689	758	800	875	720	785	830	910
	kW	526	572	604	660	474	496	550	600	551	607	640	700	576	628	664	728

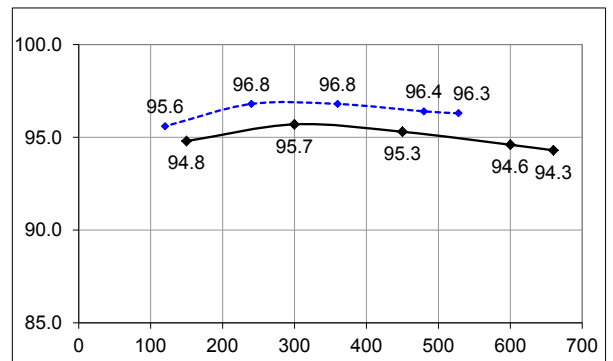
TAL 047 - 410 to 660 kVA - 50 Hz / 570 to 825 kVA - 60 Hz

Low Voltage Alternators - 4 pole

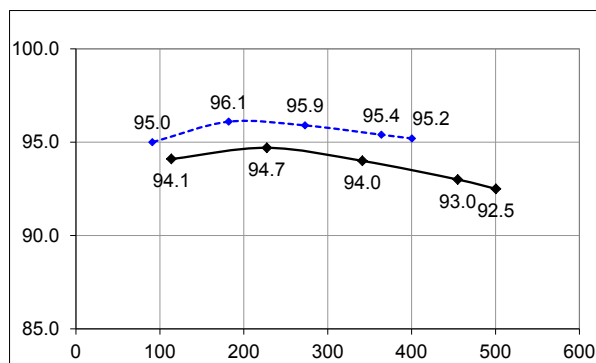
Efficiencies 400 V 50 Hz (— P.F.: 0.8) (----- P.F.: 1) - 6 & 12-wire



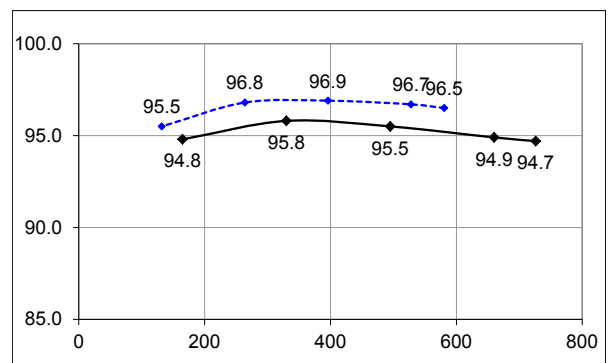
TAL 047 A - 400V 50 Hz



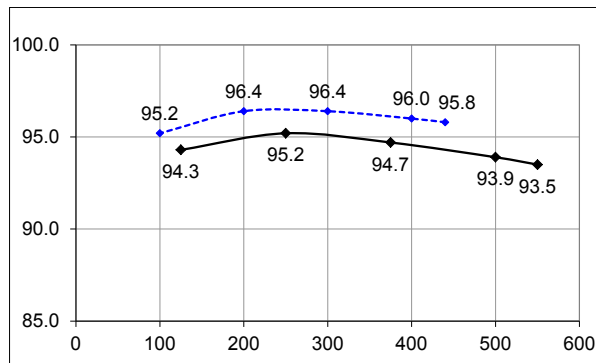
TAL 047 E - 400V 50 Hz



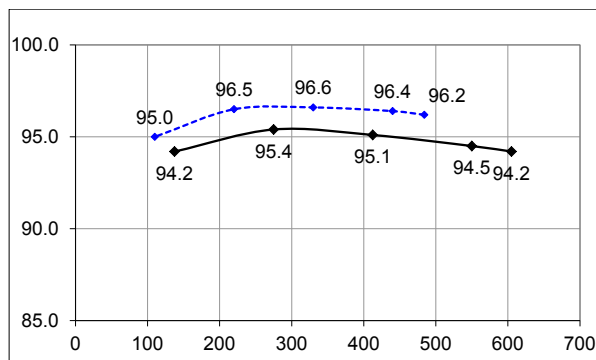
TAL 047 B - 400V 50 Hz



TAL 047 F - 400V 50 Hz



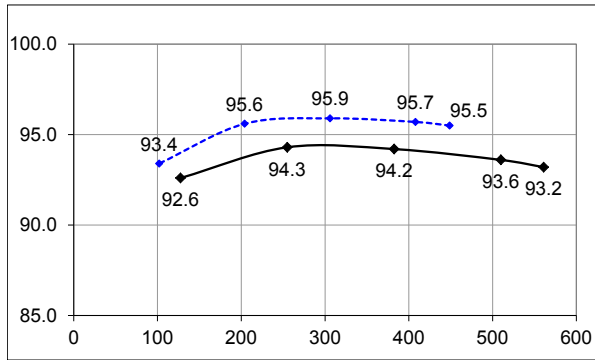
TAL 047 C - 400V 50 Hz



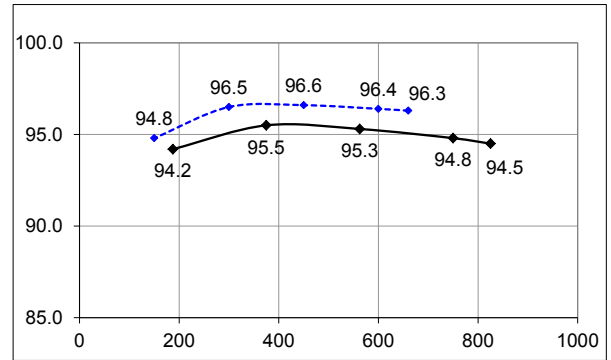
TAL 047 D - 400V 50 Hz

Low Voltage Alternators - 4 pole

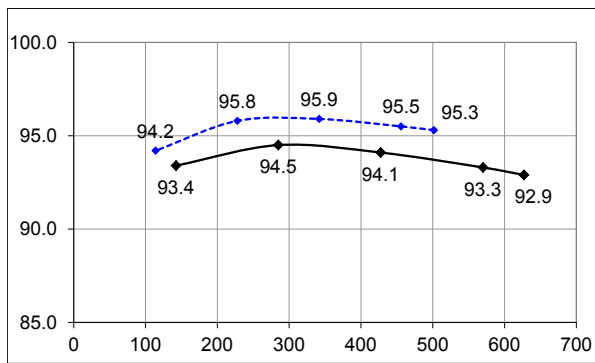
Efficiencies 480 V - 60 Hz (— P.F.: 0.8) (----- P.F.: 1) - 6 & 12-wire



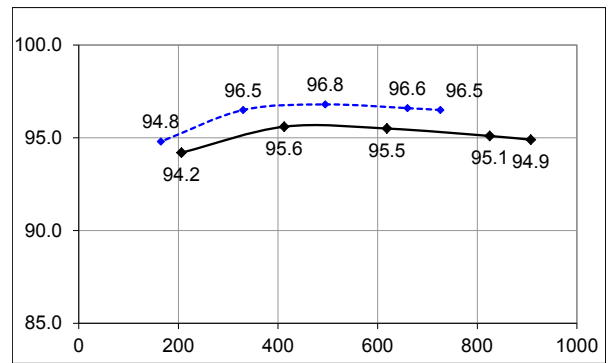
TAL 047 A - 480V 60 Hz



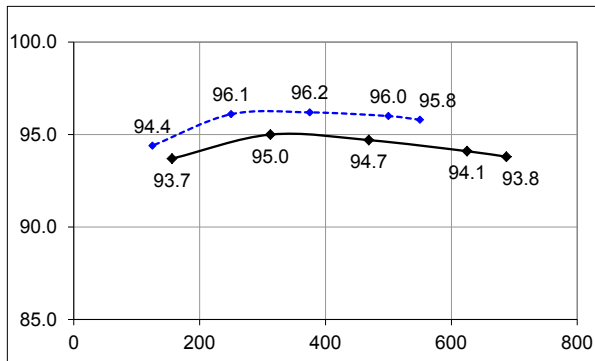
TAL 047 E - 480V 60 Hz



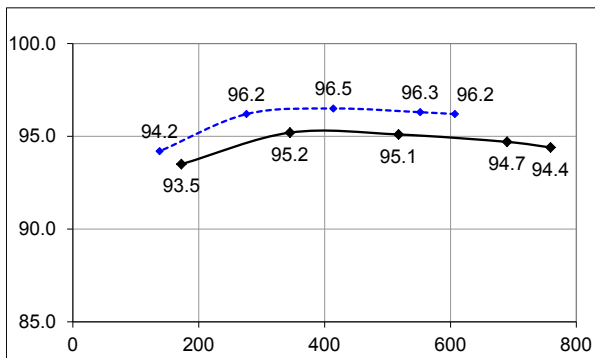
TAL 047 B - 480V 60 Hz



TAL 047 F - 480V 60 Hz



TAL 047 C - 480V 60 Hz



TAL 047 D - 480V 60 Hz

TAL 047 - 410 to 660 kVA - 50 Hz / 570 to 825 kVA - 60 Hz

Low Voltage Alternators - 4 pole

Reactances (%). Time constants (ms) - Class H / 400 V - 6 & 12-wire

		A	B	C	D	E	F
Kcc	Short-circuit ratio	0.35	0.28	0.31	0.39	0.32	0.36
Xd	Direct-axis synchro. reactance unsaturated	347	410	372	310	361	328
Xq	Quadrature-axis synchro. reactance unsaturated	177	209	189	158	184	167
T'do	No-load transient time constant	1601	1631	1705	1773	1797	1832
X'd	Direct-axis transient reactance saturated	21.6	25.1	21.8	17.5	20	17.9
T'd	Short-circuit transient time constant	100	100	100	100	100	100
X''d	Direct-axis subtransient reactance saturated	15.1	17.6	15.2	12.2	14	12.5
T''d	Subtransient time constant	10	10	10	10	10	10
X''q	Quadrature-axis subtransient reactance saturated	16.6	20.1	19.1	16.5	19.5	18
Xo	Zero sequence reactance unsaturated	0.9	1.04	0.9	0.72	0.83	0.74
X2	Negative sequence reactance saturated	15.91	18.88	17.21	14.41	16.8	15.31
Ta	Armature time constant	15	15	15	15	15	15

Other class H / 400 V data

io (A)	No-load excitation current SHUNT/AREP	0.97	0.85	0.87	0.97	0.85	0.93
ic (A)	On-load excitation current SHUNT/AREP	4.23	4.39	4.06	3.8	3.89	3.87
uc (V)	On-load excitation voltage SHUNT/AREP	44.1	45.7	42.2	39.4	40.3	40.1
ms	Response time ($\Delta U = 20\%$ transient)	500	500	500	500	500	500
kVA	Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) SHUNT*	615.3	705	750	825	900	990
kVA	Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) AREP*	739	844.3	900	990.4	1080.4	1188.4
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 _{LAG}	20.1	19.5	20	20	20	20
%	Transient ΔU (on-load 4/4) AREP - P.F.: 0.8 _{LAG}	17.5	17.1	17.5	17.5	17.5	17.5
W	No-load losses	4261	4004	4376	5192	4831	5487
W	Heat dissipation	23446	27263	25923	25409	27042	27875

* P.F. = 0.6

Reactances (%). Time constants (ms) - Class H / 480 V - 6 & 12-wire

		A	B	C	D	E	F
Kcc	Short-circuit ratio	0.34	0.27	0.3	0.37	0.3	0.35
Xd	Direct-axis synchro. reactance unsaturated	359	428	387	324	376	342
Xq	Quadrature-axis synchro. reactance unsaturated	183	218	197	165	191	174
T'do	No-load transient time constant	1601	1631	1705	1773	1797	1832
X'd	Direct-axis transient reactance saturated	22.4	26.2	22.7	18.3	20.9	18.6
T'd	Short-circuit transient time constant	100	100	100	100	100	100
X''d	Direct-axis subtransient reactance saturated	15.7	18.4	15.9	12.8	14.6	13
T''d	Subtransient time constant	10	10	10	10	10	10
X''q	Quadrature-axis subtransient reactance saturated	17.2	21	19.9	17.3	20.3	18.8
Xo	Zero sequence reactance unsaturated	0.93	1.09	0.94	0.76	0.87	0.77
X2	Negative sequence reactance saturated	16.5	19.71	17.92	15.07	17.5	15.95
Ta	Armature time constant	15	15	15	15	15	15

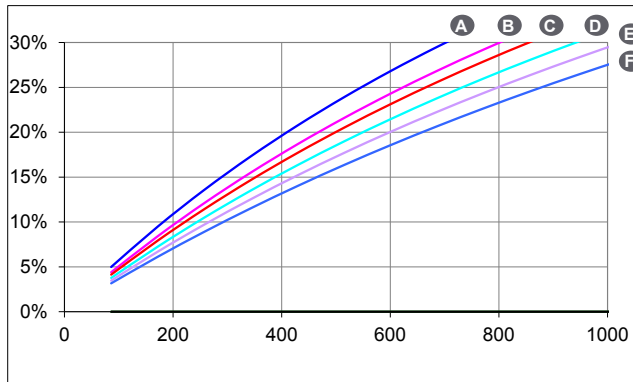
Other class H / 480 V data

io (A)	No-load excitation current SHUNT/AREP	0.97	0.85	0.87	0.97	0.85	0.93
ic (A)	On-load excitation current SHUNT/AREP	4.31	4.51	4.15	3.88	3.97	3.94
uc (V)	On-load excitation voltage SHUNT/AREP	45.1	47.1	43.3	40.5	41.3	41
ms	Response time ($\Delta U = 20\%$ transient)	500	500	500	500	500	500
kVA	Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) SHUNT*	765.4	880	940	1085	1125	1240
kVA	Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) AREP*	919.3	1057.7	1125	1242.5	1350.5	1485.6
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 _{LAG}	20.1	20	19.5	20	20	20
%	Transient ΔU (on-load 4/4) AREP - P.F.: 0.8 _{LAG}	17.5	17.1	17.5	17.5	17.5	17.5
W	No-load losses	6583	6247	6766	7888	7408	8312
W	Heat dissipation	27873	32539	31057	30808	32559	33674

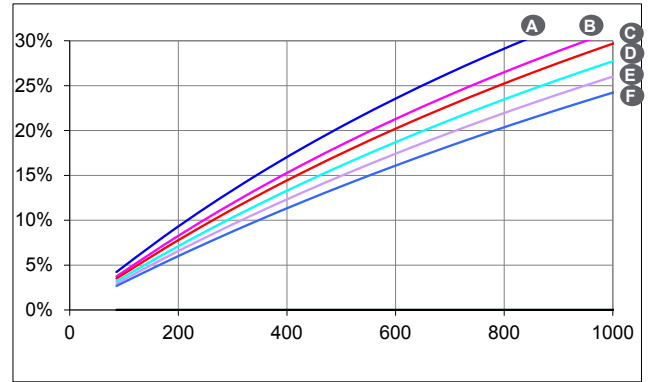
* P.F. = 0.6

Low Voltage Alternators - 4 pole

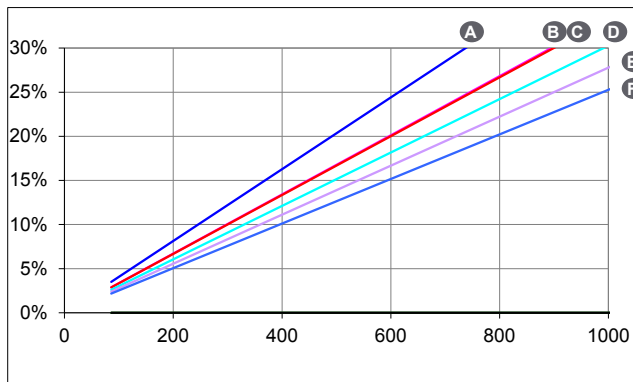
Transient voltage variation 400 V - 50 Hz - 6 & 12-wire



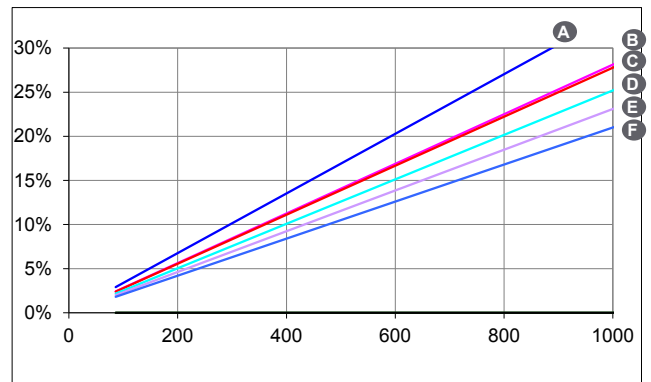
Phase loading (SHUNT) - kVA at 0.8 P.F.



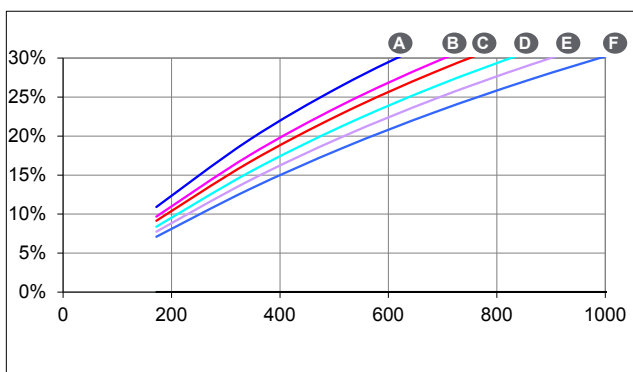
Phase loading (AREP) - kVA at 0.8 P.F.



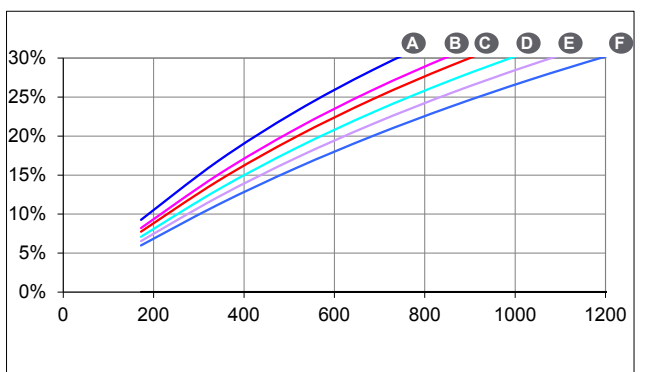
Load shedding (SHUNT) - kVA at 0.8 P.F.



Load shedding (AREP) - kVA at 0.8 P.F.



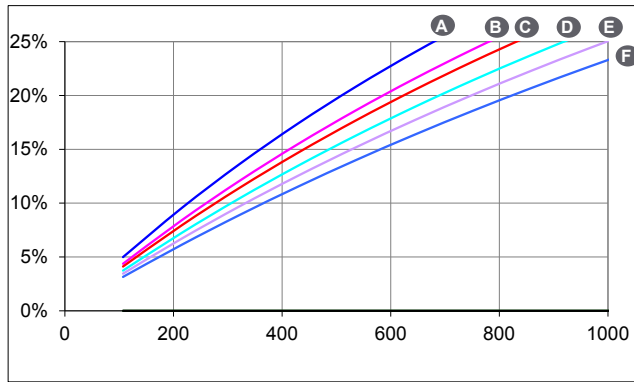
Motor starting (SHUNT) - Locked rotor kVA at 0.6 P.F.



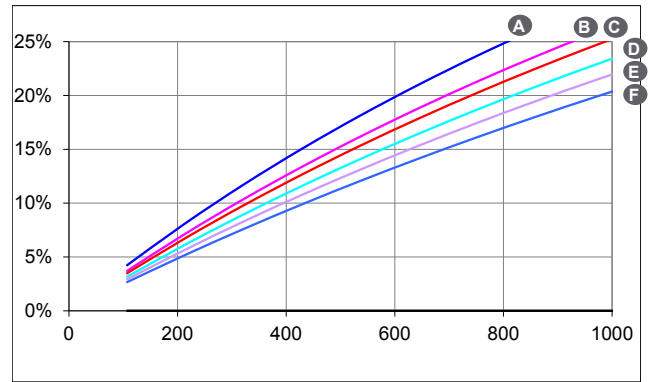
Motor starting (AREP) - Locked rotor kVA at 0.6 P.F.

Low Voltage Alternators - 4 pole

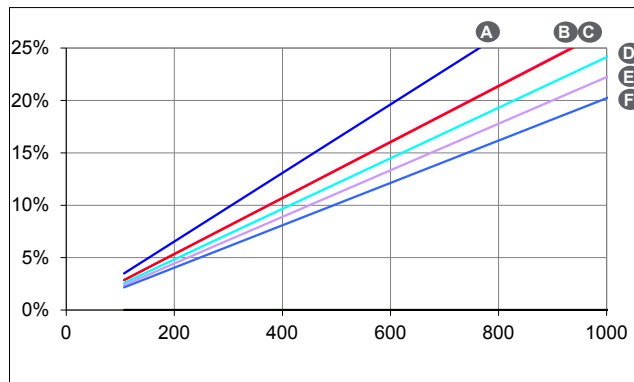
Transient voltage variation 480 V - 60 Hz - 6 & 12-wire



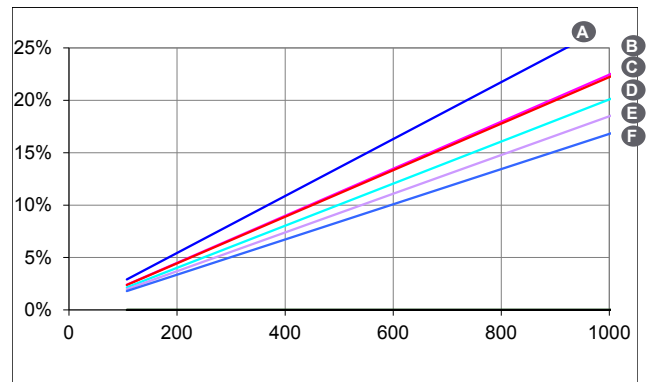
Phase loading (SHUNT) - kVA at 0.8 P.F.



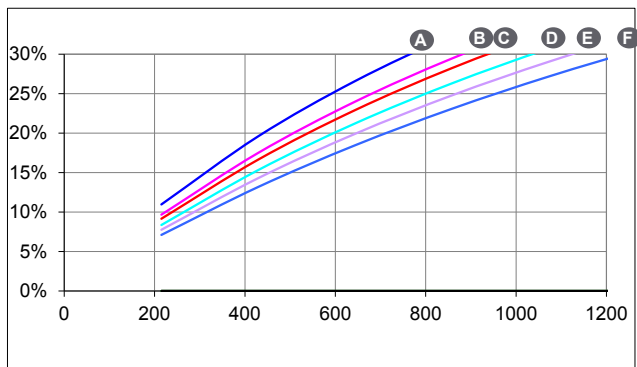
Phase loading (AREP) - kVA at 0.8 P.F.



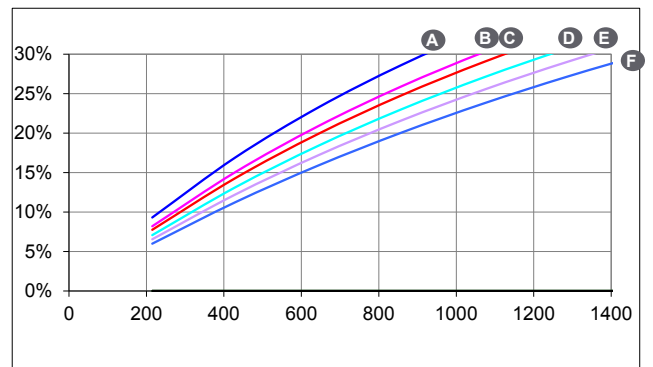
Load shedding (SHUNT) - kVA at 0.8 P.F.



Load shedding (AREP) - kVA at 0.8 P.F.



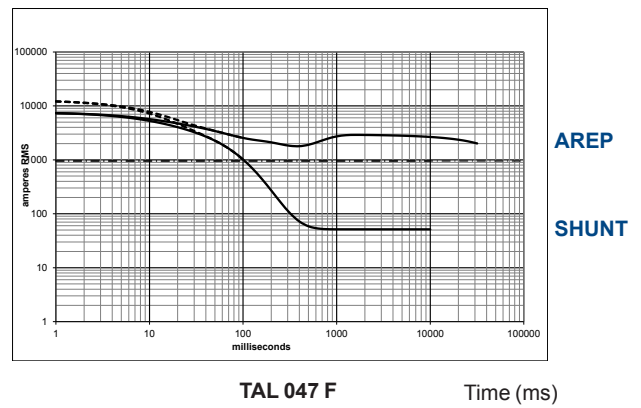
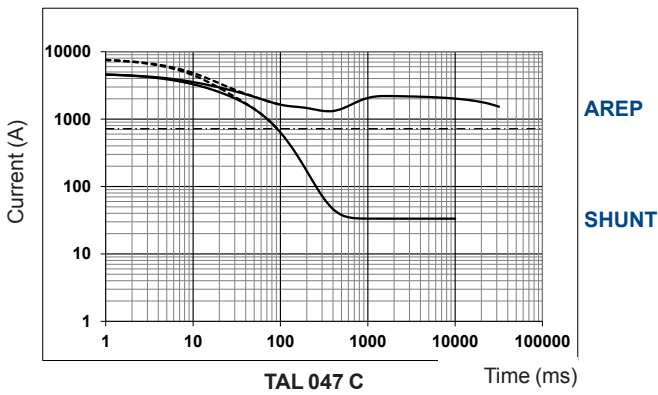
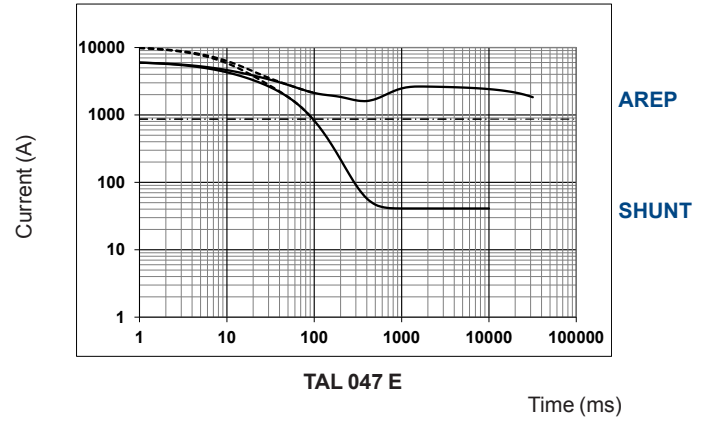
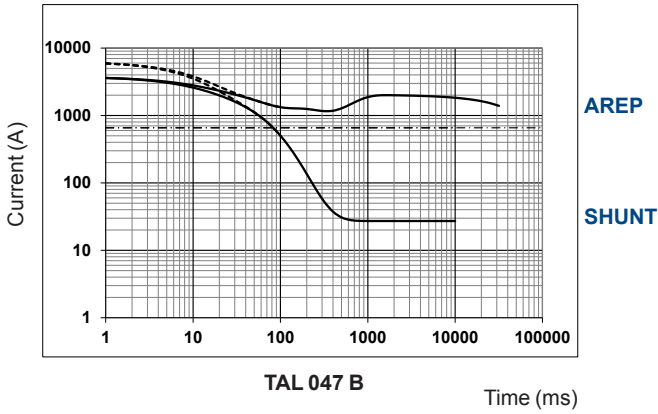
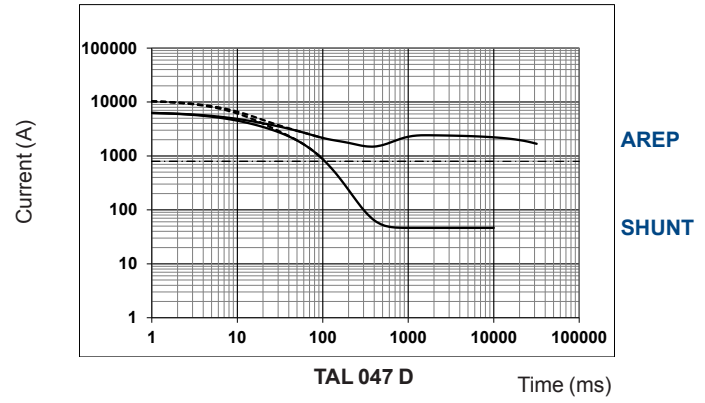
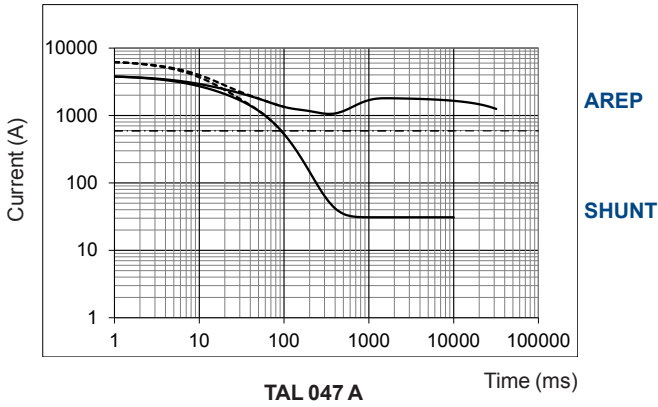
Motor starting (SHUNT) - Locked rotor kVA at 0.6 P.F.



Motor starting (AREP) - Locked rotor kVA at 0.6 P.F.

Low Voltage Alternators - 4 pole

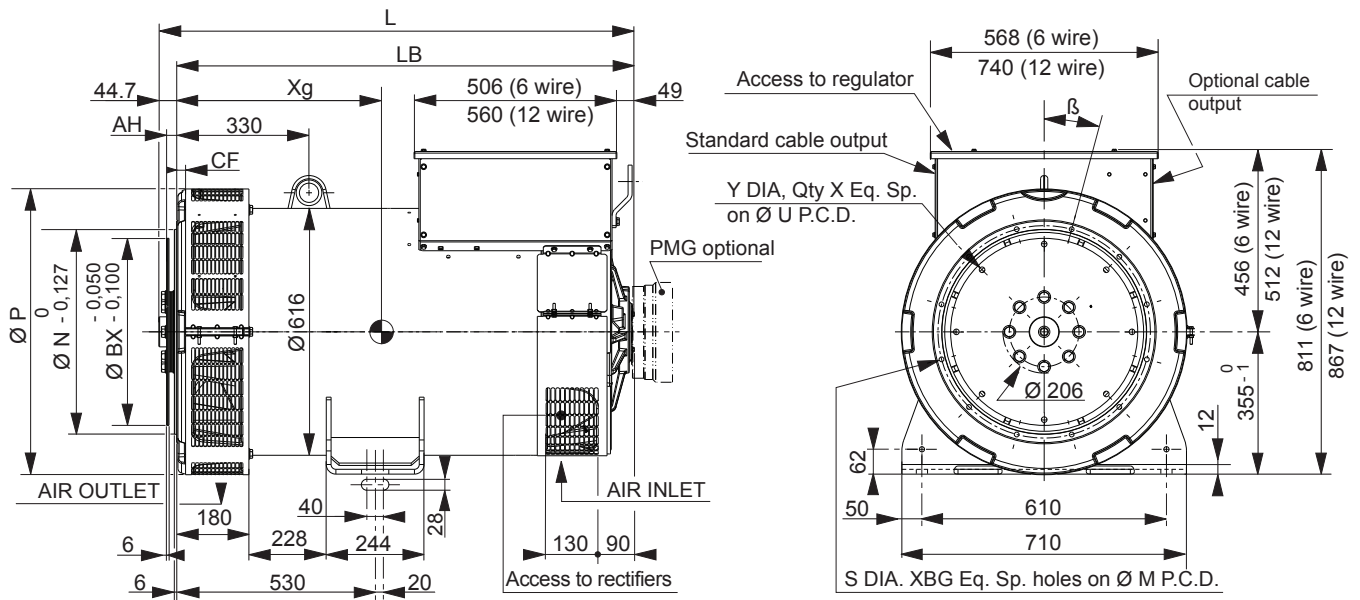
3-phase short-circuit curves at no load and rated speed (star connection Y) - 6 & 12-wire



TAL 047 - 410 to 660 kVA - 50 Hz / 570 to 825 kVA - 60 Hz

Low Voltage Alternators - 4 pole

Single bearing general arrangement - 6 & 12-wire



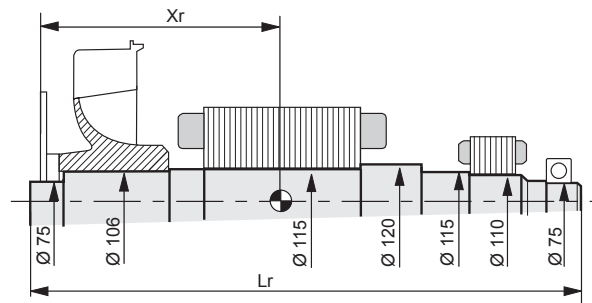
Dimensions (mm) and weight				
Type	L without PMG	LB	Xg	Weight (kg)
TAL 047 A	1041	996	437	976
TAL 047 B	1101	1056	471	1113
TAL 047 C	1101	1056	471	1113
TAL 047 D	1201	1156	511	1240
TAL 047 E	1201	1176	520	1289
TAL 047 F	1221	1176	545	1372

Coupling		
Flex plate	14	18
Flange S.A.E 1	X	
Flange S.A.E 1/2	X	
Flange S.A.E 0	X	X

Flange (mm)							
S.A.E.	P	N	M	XBG	S	β°	CF
1	713	511.175	530.225	12	12	15°	15
1/2	713	584.2	619.125	12	14	15°	22
0	713	647.7	679.45	16	14	11° 15'	42

Flex plate (mm)					
S.A.E.	BX	U	X	Y	AH
11 1/2	352.42	333.38	8	11	39.6
14	466.72	438.15	8	14	25.4
18	571.5	542.92	6	17	15.7

Torsional analysis data



Centre of gravity: Xr (mm), Rotor length: Lr (mm), Weight: M (kg), Moment of inertia: J (kgm ²): (4J = MD ²)								
Type	Flex plate S.A.E. 14				Flex plate S.A.E. 18			
	Xr	Lr	M	J	Xr	Lr	M	J
TAL 047 A	418.3	1020	374.9	5.92	408.5	1020	376	6.18
TAL 047 B	456	1080	426.6	6.77	446	1080	427.7	7.03
TAL 047 C	456	1080	426.6	6.77	446	1080	427.7	7.03
TAL 047 D	496	1180	477	7.5	486	1180	478.1	7.76
TAL 047 E	507	1180	493.8	7.8	497	1180	494.9	8.06
TAL 047 F	528	1200	525.2	8.32	518	1200	526.3	8.58

NOTE : Dimensions are for information only and may be subject to modifications. Contractual 2D drawings can be downloaded from the Leroy-Somer site, 3D drawing files are available upon request.

TAL 049 - 730 to 1000 kVA - 50 Hz / 915 to 1250 kVA - 60 Hz

Low Voltage Alternators - 4 pole

General characteristics - 6 & 12-wire

Insulation class	H	Excitation system 6 wire	SHUNT	AREP / PMG
Winding pitch	2/3 (Winding 6S or 6)	AVR type	R150	R180
Number of wires	6 or 12	Excitation system 12 wire	SHUNT	AREP / PMG
Protection	IP 23	AVR type	R250	R180
Altitude	≤ 1000 m	Voltage regulation (*)	± 1 %	
Overspeed	2250 R.P.M.	Total Harmonic distortion THD (**) in no-load	< 3.5 %	
Air flow (m³/s)	1	Total Harmonic distortion THD (**) in linear load	< 5 %	
Air flow (m³/s)	1.2	Waveform: NEMA = TIF (**)	< 50	
		Waveform: I.E.C. = THF (**)	< 2%	

(*) Steady state (**) Total harmonic distortion between phases, no-load or on-load (non-distorting)

Ratings 50 Hz - 1500 R.P.M. - 6 & 12-wire

kVA / kW - P.F. = 0.8																
Duty / T° C	Continuous / 40 °C				Continuous / 40 °C				Stand-by / 40 °C				Stand-by / 27 °C			
Class / T° K	H / 125° K				F / 105° K				H / 150° K				H / 163° K			
Phase	3 ph.				3 ph.				3 ph.				3 ph.			
Y	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V
Δ	220V	230V	240V		220V	230V	240V		220V	230V	240V		220V	230V	240V	
YY				220V				220V				220V				220V
TAL 049 B kVA	-	730	-	665	-	660	-	600	-	780	-	730	-	805	-	765
kW	-	584	-	532	-	528	-	480	-	624	-	584	-	644	-	612
TAL 049 C kVA	-	820	-	810	-	760	-	710	-	910	-	885	-	910	-	925
kW	-	656	-	648	-	608	-	568	-	728	-	708	-	728	-	740
TAL 049 D kVA	-	910	-	820	-	820	-	740	-	1000	-	920	-	1010	-	965
kW	-	728	-	656	-	656	-	592	-	800	-	736	-	808	-	772
TAL 049 E kVA	-	1000	-	950	-	900	-	840	-	1085	-	1030	-	1130	-	1080
kW	-	800	-	760	-	720	-	672	-	868	-	824	-	904	-	864

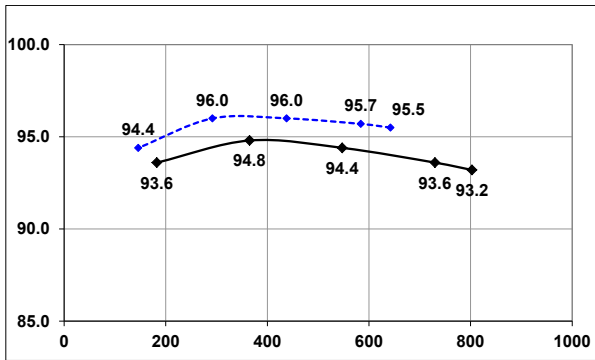
Ratings 60 Hz - 1800 R.P.M. - 6 & 12-wire

kVA / kW - P.F. = 0.8																
Duty / T° C	Continuous / 40 °C				Continuous / 40 °C				Stand-by / 40 °C				Stand-by / 27 °C			
Class / T° K	H / 125° K				F / 105° K				H / 150° K				H / 163° K			
Phase	3 ph.				3 ph.				3 ph.				3 ph.			
Y	380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V
Δ	220V	240V			220V	240V			220V	240V			220V	240V		
YY		208V	220V	240V		208V	220V	240V		208V	220V	240V		208V	220V	240V
TAL 049 B kVA	725	795	840	915	655	715	760	825	770	845	890	970	800	875	925	1005
kW	580	636	672	732	524	572	608	660	616	676	712	776	640	700	740	804
TAL 049 C kVA	815	890	940	1025	735	805	850	925	865	945	1000	1090	895	980	1040	1130
kW	652	712	752	820	588	644	680	740	692	756	800	872	716	784	832	904
TAL 049 D kVA	905	990	1045	1140	815	895	940	1025	960	1050	1110	1210	1000	1090	1155	1255
kW	724	792	836	912	652	716	752	820	768	840	888	968	800	872	924	1004
TAL 049 E kVA	990	1083	1146	1250	891	975	1031	1125	1049	1148	1215	1325	1089	1192	1260	1375
kW	792	866	917	1000	713	780	825	900	839	918	972	1060	871	954	1008	1100

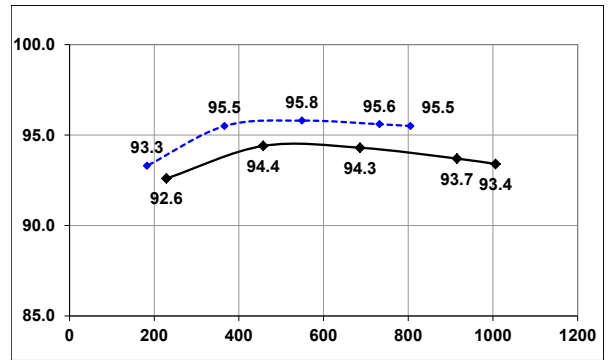
TAL 049 - 730 to 1000 kVA - 50 Hz / 915 to 1250 kVA - 60 Hz

Low Voltage Alternators - 4 pole

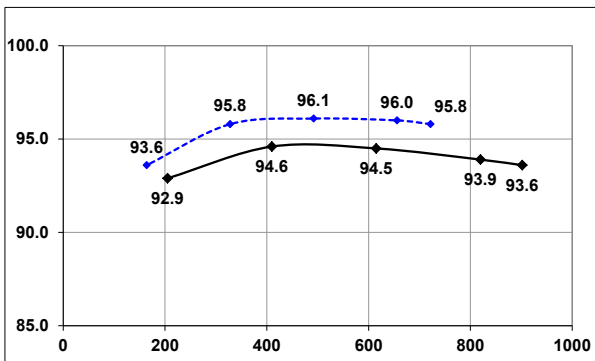
Efficiencies 400 V 50 Hz & 480 V - 60 Hz (— P.F.: 0.8) (----- P.F.: 1) - 6 & 12-wire



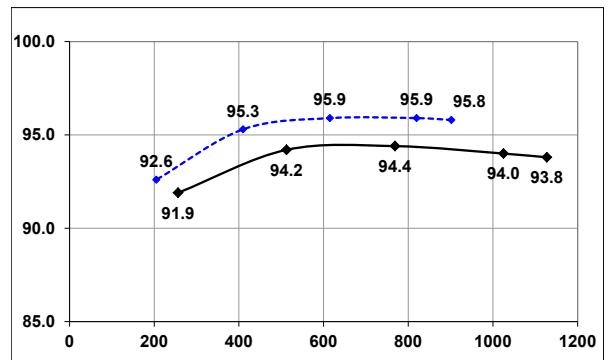
TAL 049 B - 400V 50 Hz



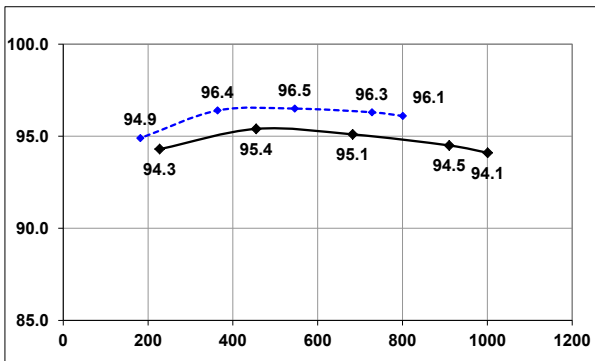
TAL 049 B - 480V 60 Hz



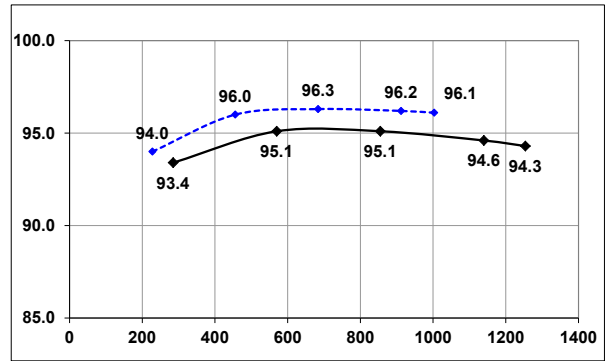
TAL 049 C - 400V 50 Hz



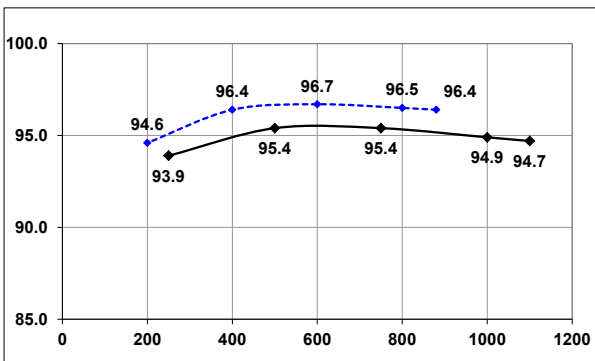
TAL 049 C - 480V 60 Hz



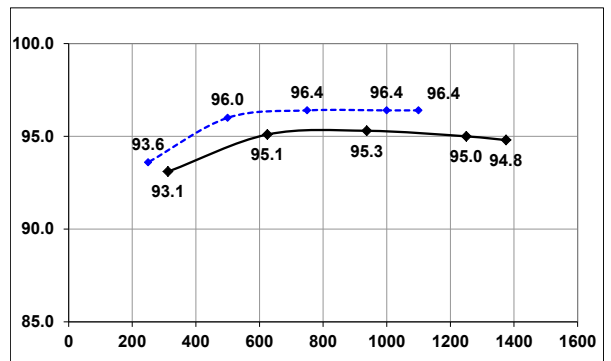
TAL 049 D - 400V 50 Hz



TAL 049 D - 480V 60 Hz



TAL 049 E - 400V 50 Hz



TAL 049 E - 480V 60 Hz

Low Voltage Alternators - 4 pole

Reactances (%). Time constants (ms) - Class H / 400 V - 6 & 12-wire

		B	C	D	E
Kcc	Short-circuit ratio	0.28	0.37	0.28	0.38
Xd	Direct-axis synchro. reactance unsaturated	403	330	402	348
Xq	Quadrature-axis synchro. reactance unsaturated	205	168	205	177
T'do	No-load transient time constant	2028	2074	2108	2153
X'd	Direct-axis transient reactance saturated	19.8	15.9	19	16.1
T'd	Short-circuit transient time constant	100	100	100	100
X''d	Direct-axis subtransient reactance saturated	15.9	12.7	15.2	12.9
T''d	Subtransient time constant	10	10	10	10
X''q	Quadrature-axis subtransient reactance saturated	18.3	14.4	16.9	14.1
Xo	Zero sequence reactance unsaturated	0.82	0.66	0.79	0.67
X2	Negative sequence reactance saturated	17.12	13.59	16.11	13.53
Ta	Armature time constant	15	15	15	15

Other class H / 400 V data

io (A)	No-load excitation current SHUNT/AREP	0.81	1.13	0.83	1.01
ic (A)	On-load excitation current SHUNT/AREP	4.15	4.75	4.15	3.92
uc (V)	On-load excitation voltage SHUNT/AREP	47.1	53.8	46.9	44.2
ms	Response time ($\Delta U = 20\%$ transient)	500	500	500	500
kVA	Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) SHUNT*	1095.5	1230.6	1365.7	1500.7
kVA	Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) AREP*	1315	1475	1640	1800
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 _{LAG}	20.1	20.1	20.1	20.1
%	Transient ΔU (on-load 4/4) AREP - P.F.: 0.8 _{LAG}	17.5	17.5	17.5	17.5
W	No-load losses	7774	10303	8702	10583
W	Heat dissipation	39606	41957	42307	42151

* P.F. = 0.6

Reactances (%). Time constants (ms) - Class H / 480 V - 6 & 12-wire

		B	C	D	E
Kcc	Short-circuit ratio	0.27	0.36	0.27	0.36
Xd	Direct-axis synchro. reactance unsaturated	421	344	419	363
Xq	Quadrature-axis synchro. reactance unsaturated	214	175	214	185
T'do	No-load transient time constant	2028	2074	2108	2153
X'd	Direct-axis transient reactance saturated	20.7	16.6	19.9	16.8
T'd	Short-circuit transient time constant	100	100	100	100
X''d	Direct-axis subtransient reactance saturated	16.6	13.2	15.9	13.4
T''d	Subtransient time constant	10	10	10	10
X''q	Quadrature-axis subtransient reactance saturated	19.1	15	17.7	14.7
Xo	Zero sequence reactance unsaturated	0.86	0.69	0.82	0.7
X2	Negative sequence reactance saturated	17.89	14.16	16.82	14.1
Ta	Armature time constant	15	15	15	15

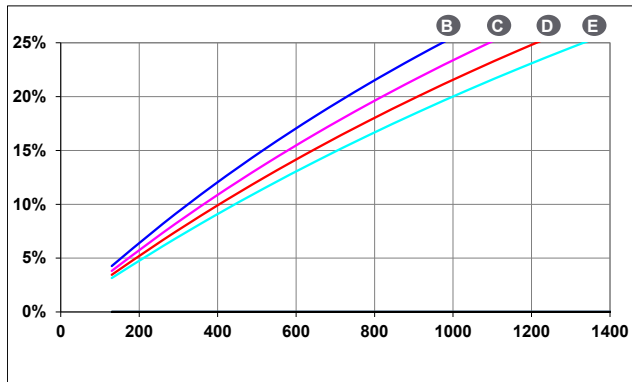
Other class H / 480 V data

io (A)	No-load excitation current SHUNT/AREP	0.81	1.13	0.82	1.01
ic (A)	On-load excitation current SHUNT/AREP	4.28	4.86	4.26	3.99
uc (V)	On-load excitation voltage SHUNT/AREP	48.6	55.2	48.3	45.2
ms	Response time ($\Delta U = 20\%$ transient)	500	500	500	500
kVA	Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) SHUNT*	1373.2	1538.3	1710.9	1875.9
kVA	Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) AREP*	1650	1845	2050	2250
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 _{LAG}	20.1	20.1	20.1	20.1
%	Transient ΔU (on-load 4/4) AREP - P.F.: 0.8 _{LAG}	17.5	17.5	17.5	17.5
W	No-load losses	12224	15725	13536	16134
W	Heat dissipation	48497	51438	51942	51990

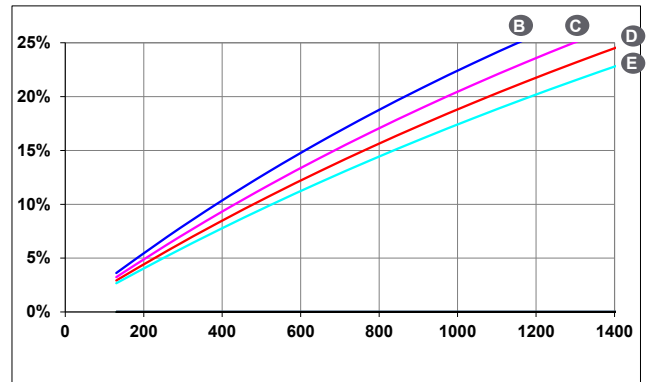
* P.F. = 0.6

Low Voltage Alternators - 4 pole

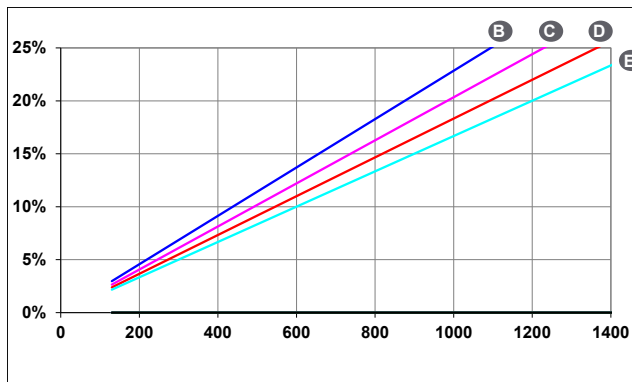
Transient voltage variation 400 V - 50 Hz - 6 & 12-wire



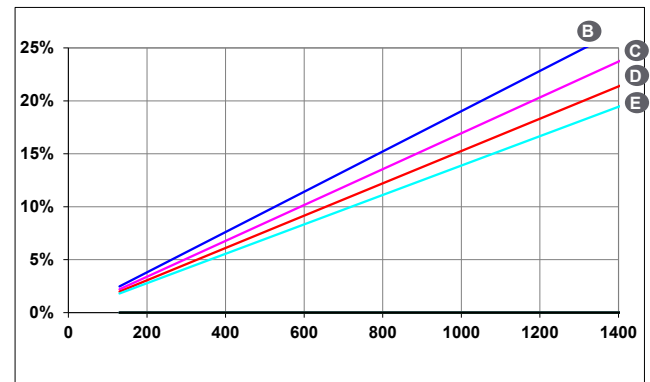
Phase loading (SHUNT) - kVA at 0.8 P.F.



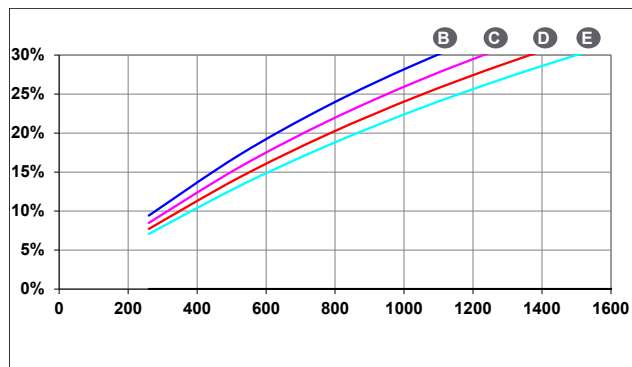
Phase loading (AREP) - kVA at 0.8 P.F.



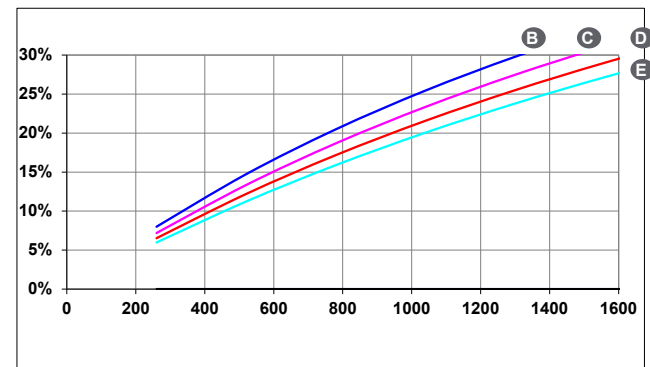
Load shedding (SHUNT) - kVA at 0.8 P.F.



Load shedding (AREP) - kVA at 0.8 P.F.



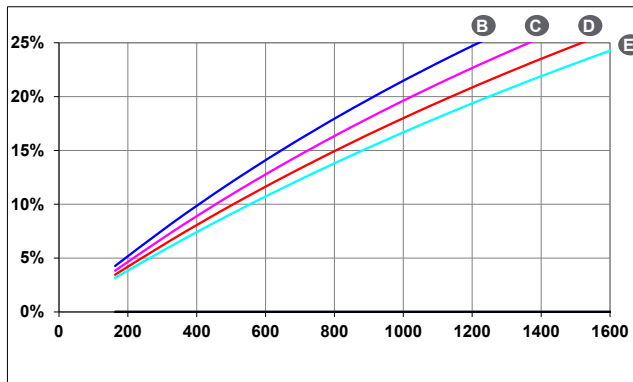
Motor starting (SHUNT) - Locked rotor kVA at 0.6 P.F.



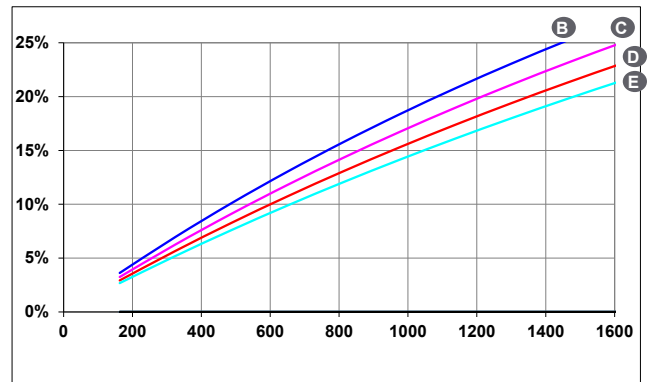
Motor starting (AREP) - Locked rotor kVA at 0.6 P.F.

Low Voltage Alternators - 4 pole

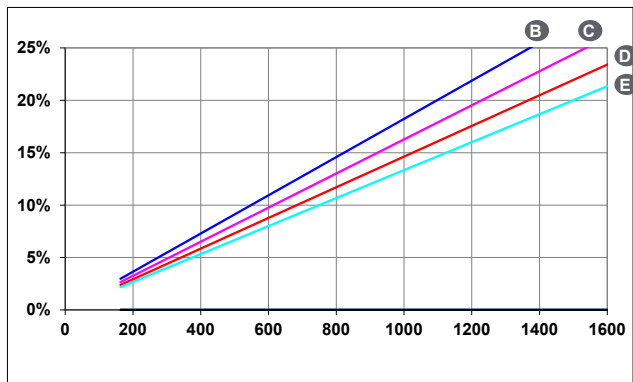
Transient voltage variation 480 V - 60 Hz - 6 & 12-wire



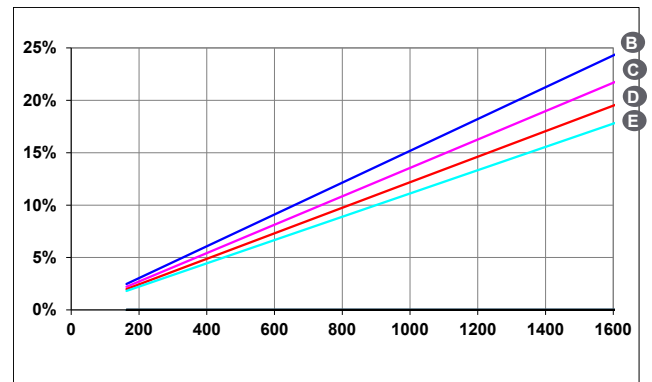
Phase loading (SHUNT) - kVA at 0.8 P.F.



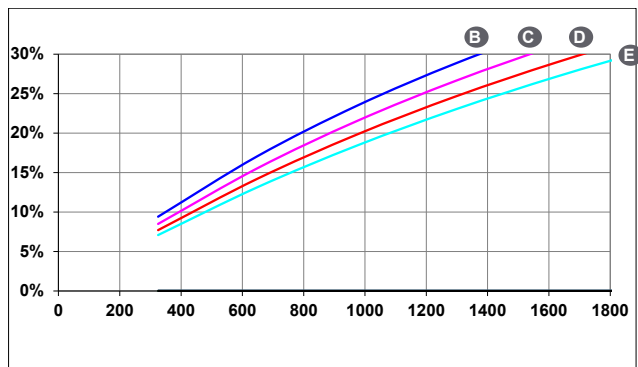
Phase loading (AREP) - kVA at 0.8 P.F.



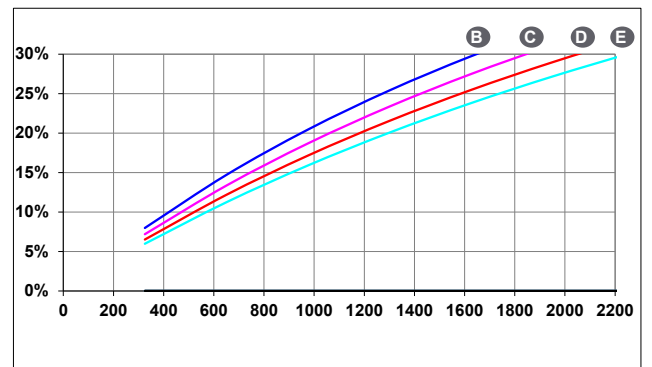
Load shedding (SHUNT) - kVA at 0.8 P.F.



Load shedding (AREP) - kVA at 0.8 P.F.



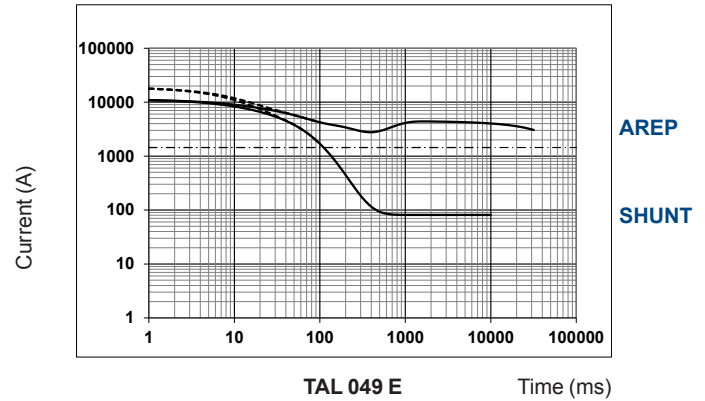
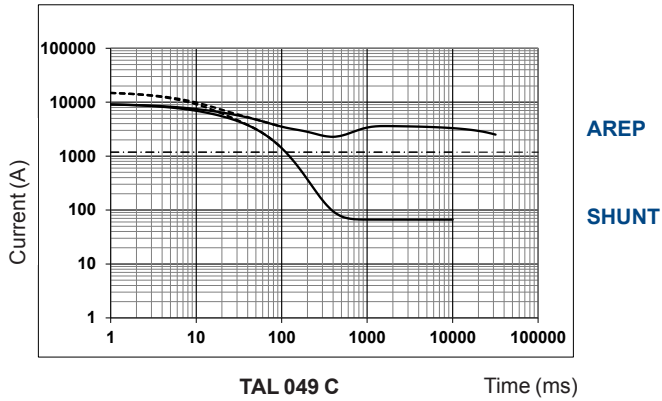
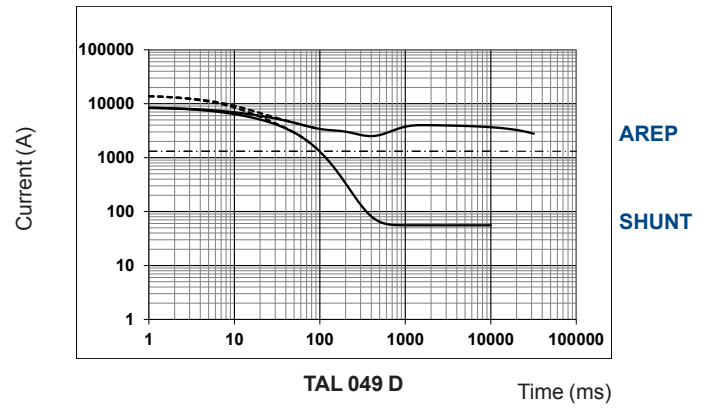
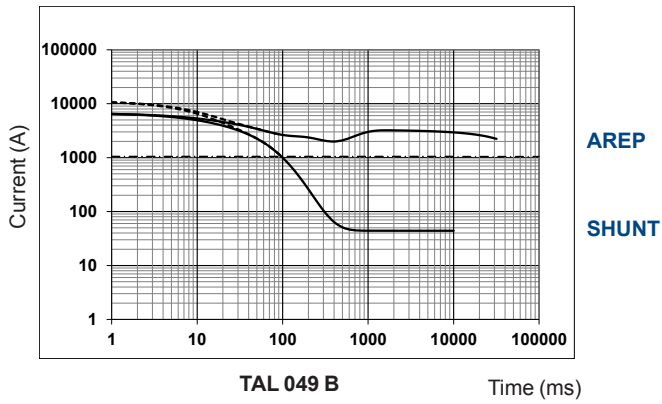
Motor starting (SHUNT) - Locked rotor kVA at 0.6 P.F.



Motor starting (AREP) - Locked rotor kVA at 0.6 P.F.

Low Voltage Alternators - 4 pole

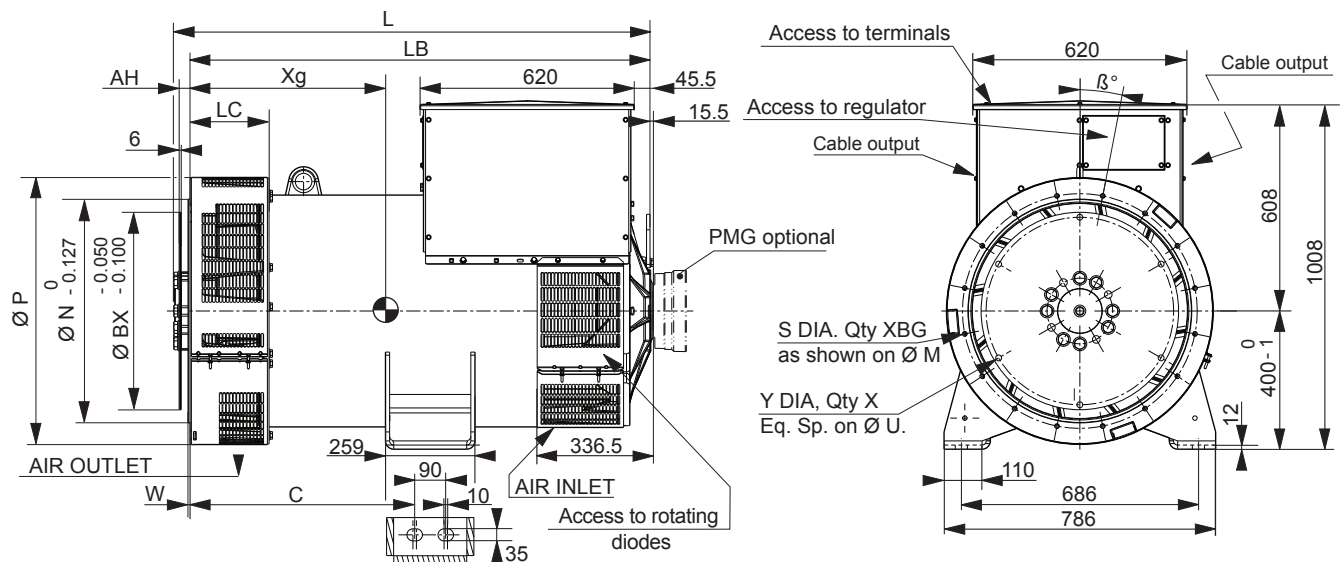
3-phase short-circuit curves at no load and rated speed (star connection Y) - 6 & 12-wire



Symmetrical _____
Asymmetrical -----

Low Voltage Alternators - 4 pole

Single bearing general arrangement - 6 & 12-wire



Dimensions (mm) and weight

Type	L without PMG	LB	C	Xg	Weight (kg)
TAL 049 B	1372	1331	650	629	1574
TAL 049 C	1372	1331	650	636	1635
TAL 049 D	1462	1421	650	673	1788
TAL 049 E	1462	1421	650	681	1837

Coupling

Coupling	14	18
Flex plate	X	X
Flange S.A.E 1	X	
Flange S.A.E 1/2	X	
Flange S.A.E 0	X	X
Flange S.A.E 00		X

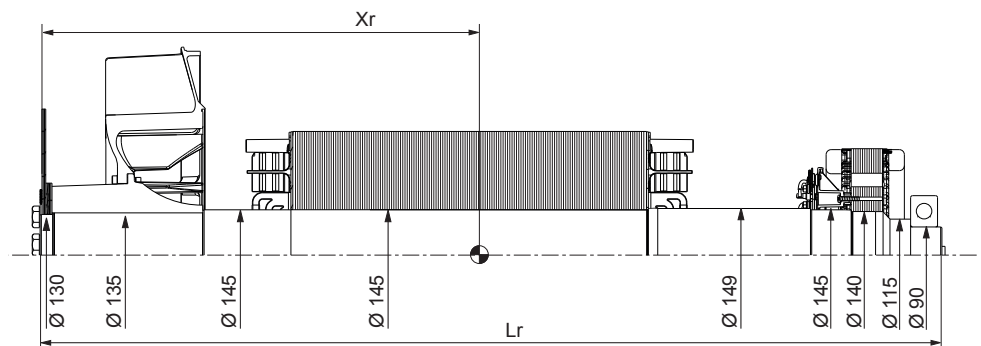
Flange (mm)

S.A.E.	P	N	M	LC	XBG	W	β°
1	773	511.175	530.225	228.5	12	6	15°
1/2	773	584.2	619.125	228.5	12	6	15°
0	773	647.7	679.45	228.5	16	6	11° 15'
00	883	787.4	850.9	245	16	7	11° 15'

Flex plate (mm)

S.A.E.	BX	U	X	Y	AH
14	466.7	438.15	8	14	25.4
18	571.5	542.92	6	17	15.7

Torsional analysis data



Centre of gravity: Xr (mm), Rotor length: Lr (mm), Weight: M (kg), Moment of inertia: J (kgm²): (4J = MD²)

Flex plate	Flex plate S.A.E. 14				Flex plate S.A.E. 18			
	Xr	Lr	M	J	Xr	Lr	M	J
TAL 049 B	626	1345	602	9.61	614	1345	604	9.87
TAL 049 C	634	1345	628	10.16	622	1345	630	10.42
TAL 049 D	671	1435	684	11.12	659	1435	686	11.38
TAL 049 E	681	1435	701	11.48	669	1435	703	11.74

NOTE : Dimensions are for information only and may be subject to modifications. Contractual 2D drawings can be downloaded from the Leroy-Somer site, 3D drawing files are available upon request.

LEROY-SOMER[™]

www.leroy-somer.com/epg

[Twitter.com/EPG_Alternators](https://twitter.com/EPG_Alternators)
[Facebook.com/LeroySomer.EPG](https://facebook.com/LeroySomer.EPG)
[Youtube.com/LeroySomerOfficiel](https://youtube.com/LeroySomerOfficiel)



Nidec
All for dreams

© Nidec 2017. Les informations fournies dans la présente brochure sont données à titre indicatif uniquement et ne constituent en aucun cas une clause d'un quelconque contrat. Nidec n'offre aucune garantie concernant l'exactitude de ces informations étant donné son processus de développement continu et se réserve le droit de modifier les caractéristiques des produits décrits sans préavis.

Moteurs Leroy-Somer SAS. Siège : Bd Marcellin Leroy, CS 10015, 16915 Angoulême Cedex 9, France.
Capital social : 65 800 512 €, RCS Angoulême 338 567 258.