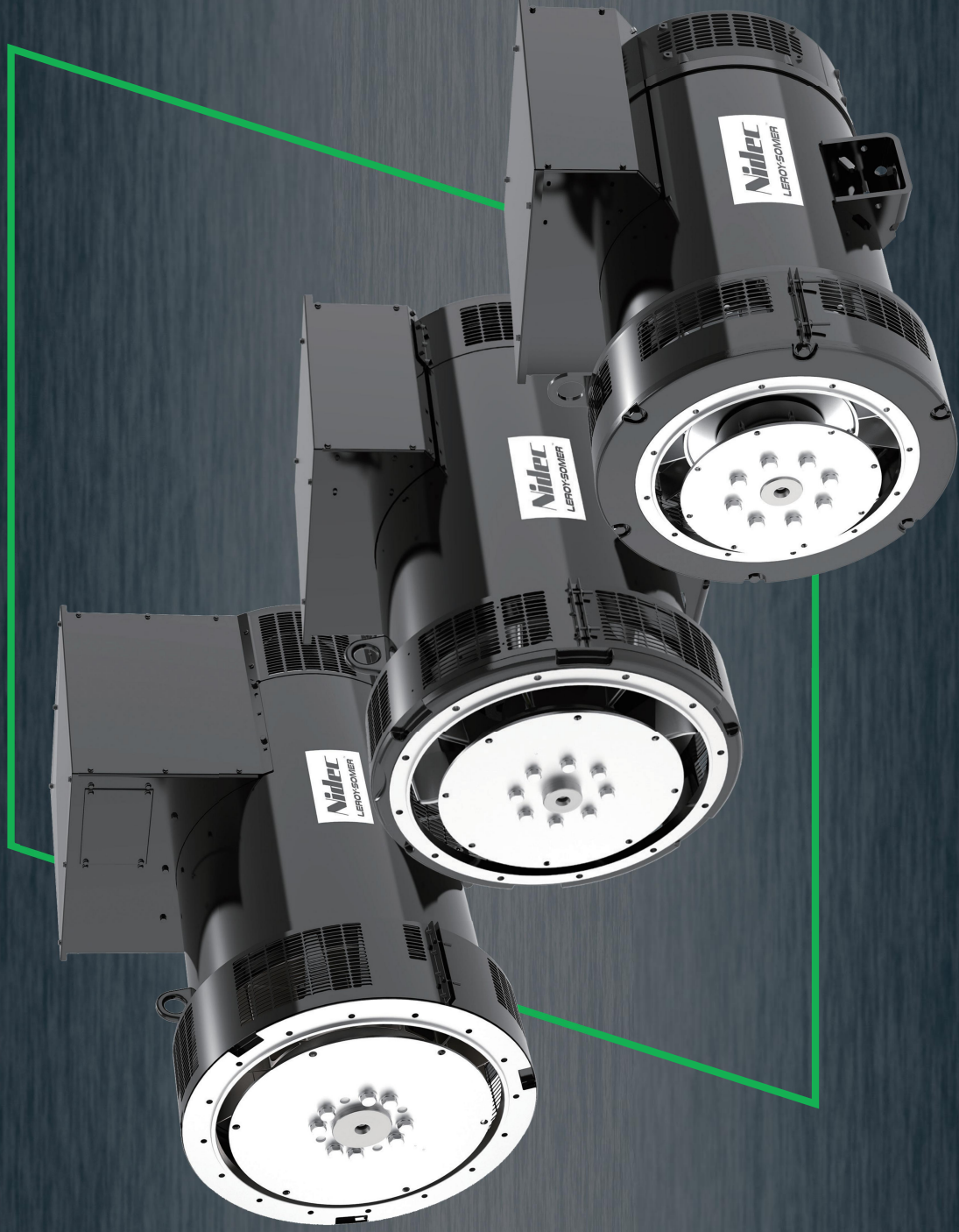


Nidec

Power



Low Voltage Alternators - 4 pole

TAL-A46 TAL-A473 TAL-A49

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

LEROY-SOMER™

Electrical and Mechanical data

Low Voltage Alternators - 4 pole

TAL-A46 TAL-A473 TAL-A49

Adapted to needs

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

Compliance with internationally recognized standards

4 Pole Alternators are in compliance to the main international standards and regulations: -IEC 60034, NEMA MG 1.32-33, VDE 0530, ISO 8528/3 on request and depending on voltages, marin regulations, etc.

It can be integrated into a CE marked generator.

Alternators are designed, manufactured and marketed in an ISO 9001 and ISO14001 environments.

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

Excitation and regulation system suited to the application

	Excitation system				Remote voltage potentiometer	C.T. for paralleling
	AVR	SHUNT	AREP+ (option)	PMG (option)		
Three-phase 6-wire	R150	Standard			√	
	R180		Standard	Standard	√	√
	D350	Option	Option	Option	√	√
	R150	Standard			√	
Three-phase 12-wire*	R250	Option			√	
	R180		Standard	Standard	√	√
	D350	Option	Option	Option	√	√

√ : Possible option *with larger terminal box

Compact terminal box

- Easy access to AVR and terminals
- Standard terminal box with possibility of mounting Measuring/ protection CT (Please consult Leroy Somer for CT type)
- 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 ≤ 95%

Available options

- AREP+ & PMG
- 12-lead
- Customized painting
- Two-bearing version
- Space heater
- Droop kit for alternator paralleling
- CE mark
- Stator sensors
- Measuring/Protection CT (Please consult Leroy Somer for CT type)
- Voltage trimmer
- Winding protection for harsh environments and relative humidity greater than 95% (system 2 - 4): TAL-A46:1 except 0,97 for TAL-A46H, TAL-A473:1 except 0,95 for TAL-A473-D&F, TAL-A49:1, (system 2 and above protection system will be proposed for rental application, prevented from potential hash environment)



TAL-A46 - 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	R150	R180
Altitude	≤ 1000 m	Voltage regulation (*)	± 0.8 %	± 0.5 %
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	
AREP+ Short-circuit current = 2.7 In: 5 seconds (*)		Waveform: I.E.C. = THF (**)	< 2%	

*D350: 2.7In 10 seconds

(*) 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			200V		220V		200V		220V		200V		220V		200V		220V
ΔΔ					230V				230V				230V				230V
TAL-A46-C	kVA	230	230	230	219	138	209	209	209	199	126	244	244	244	232	146	253
	kW	184.0	184.0	184.0	175.2	110.4	167.2	167.2	167.2	159.2	100.8	195.2	195.2	195.2	185.6	116.8	202.4
TAL-A46-D	kVA	240	250	250	238	150	218	228	228	217	137	254	265	265	252	159	264
	kW	192.0	200.0	200.0	190.4	120.0	174.4	182.4	182.4	173.6	109.6	203.2	212.0	212.0	201.6	127.2	211.2
TAL-A46-E	kVA	275	275	275	261	165	250	250	250	238	150	292	292	292	277	175	303
	kW	220.0	220.0	220.0	208.8	132.0	200.0	200.0	200.0	190.4	120.0	233.6	233.6	233.6	221.6	140.0	242.4
TAL-A46-F	kVA	290	300	300	285	180	264	273	273	259	164	307	318	318	302	191	319
	kW	232.0	240.0	240.0	228.0	144.0	211.2	218.4	218.4	207.2	131.2	245.6	254.4	254.4	241.6	152.8	255.2
TAL-A46-G	kVA	325	325	325	309	195	296	296	296	281	177	345	345	345	328	207	360
	kW	260.0	260.0	260.0	247.2	156.0	236.8	236.8	236.8	224.8	141.6	276.0	276.0	276.0	262.4	165.6	288.0
TAL-A46-H	kVA	350	365	365	347	210	318	332	332	316	191	371	387	387	368	223	385
	kW	280.0	292.0	292.0	277.6	168.0	254.4	265.6	265.6	252.8	152.8	296.8	309.6	309.6	294.4	178.4	308.0

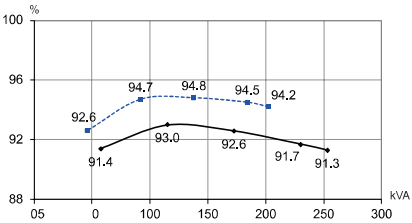
Ratings 60 Hz - 1800 R.P.M. - 6 & 12-wire

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			220V	240V			220V	240V			220V	240V		
YY			208V	220V	240V		208V	220V	240V		208V	220V	240V		208V	220V	240V
ΔΔ					240V				240V				240V				240V
TAL-A46-C	kVA	226	250	262	288	152	206	228	238	262	138	240	265	278	305	161	250
	kW	180.8	200.0	209.6	230.4	121.6	164.8	182.4	190.4	209.6	110.4	192.0	212.0	222.4	244.0	128.8	200.0
TAL-A46-D	kVA	245	265	280	313	165	223	241	255	285	150	260	281	297	332	175	270
	kW	196.0	212.0	224.0	250.4	132.0	178.4	192.8	204.0	228.0	120.0	208.0	224.8	237.6	265.6	140.0	216.0
TAL-A46-E	kVA	275	300	315	344	182	250	273	287	313	166	292	318	334	365	193	303
	kW	220.0	240.0	252.0	275.2	145.6	200.0	218.4	229.6	250.4	132.8	233.6	254.4	267.2	292.0	154.4	242.4
TAL-A46-F	kVA	290	315	340	360	200	264	287	309	328	182	307	334	360	382	212	320
	kW	232.0	252.0	272.0	288.0	160.0	211.2	229.6	247.2	262.4	145.6	245.6	267.2	288.0	305.6	169.6	256.0
TAL-A46-G	kVA	315	345	365	406	215	287	314	332	369	196	334	366	387	430	228	347
	kW	252.0	276.0	292.0	324.8	172.0	229.6	251.2	265.6	295.2	156.8	267.2	292.8	309.6	344.0	182.4	277.6
TAL-A46-H	kVA	345	375	400	438	231	314	341	364	399	210	366	398	424	464	245	380
	kW	276.0	300.0	320.0	350.4	184.8	251.2	272.8	291.2	319.2	168.0	292.8	318.4	339.2	371.2	196.0	304.0

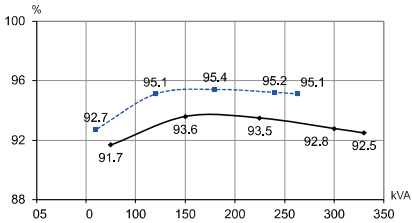
TAL-A46 - 180 to 410 kVA - 50 Hz / 225 to 512 kVA - 60 Hz

Low Voltage Alternators - 4 pole

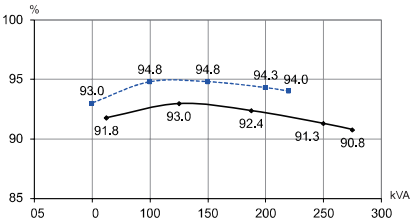
Efficiencies 400 V - 50 Hz (— P.F.: 0.8) (----- P.F.: 1) - 6 & 12-wire



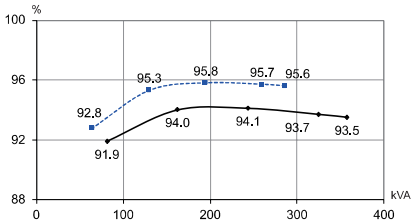
TAL-A46-C - 400V 50Hz



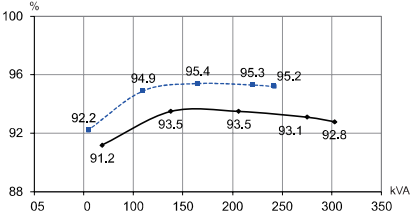
TAL-A46-F - 400V 50Hz



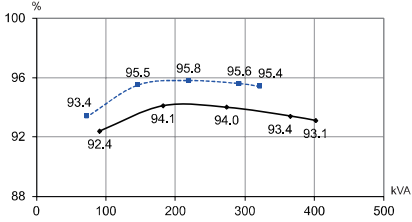
TAL-A46-D - 400V 50Hz



TAL-A46-G - 400V 50Hz



TAL-A46-E - 400V 50Hz

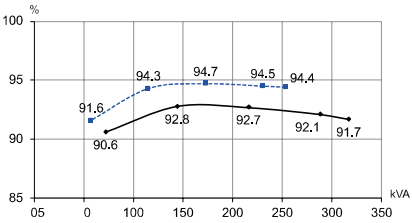


TAL-A46-H - 400V 50Hz

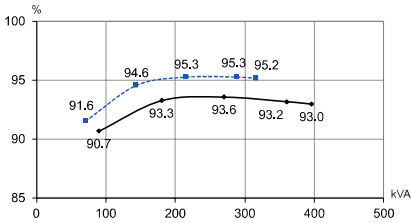
TAL-A46 - 180 to 410 kVA - 50 Hz / 225 to 512 kVA - 60 Hz

Low Voltage Alternators - 4 pole

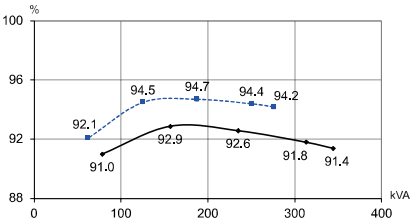
Efficiencies 480 V - 60 Hz (— P.F.: 0.8) (----- P.F.: 1) - 6 & 12-wire



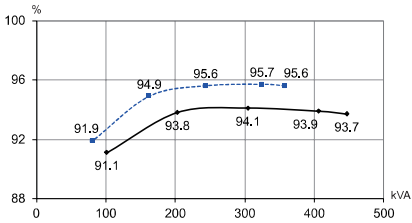
TAL-A46-C - 480V 60Hz



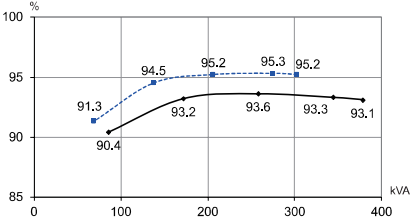
TAL-A46-F - 480V 60Hz



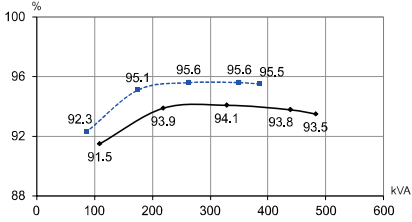
TAL-A46-D - 480V 60Hz



TAL-A46-G - 480V 60Hz



TAL-A46-E - 480V 60Hz



TAL-A46-H - 480V 60Hz

Low Voltage Alternators - 4 pole

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

		C	D	E	F	G	H
Kcc	Short-circuit ratio	0.37	0.34	0.49	0.45	0.48	0.43
Xd	Direct-axis synchro. reactance unsaturated	340	370	278	303	270	303
Xq	Quadrature-axis synchro. reactance unsaturated	173	188	142	154	137	154
T'do	No-load transient time constant	1983	1983	2049	2049	2093	2093
X'd	Direct-axis transient reactance saturated	17,1	18,6	13,5	14,8	12,9	14,5
T'd	Short-circuit transient time constant	100	100	100	100	100	100
X''d	Direct-axis subtransient reactance saturated	13,7	14,9	10,8	11,8	10,3	11,6
T''d	Subtransient time constant	10	10	10	10	10	10
X''q	Quadrature-axis subtransient reactance saturated	17,4	18,9	13,5	14,7	12,6	14,2
Xo	Zero sequence reactance	0,71	0,77	0,56	0,61	0,53	0,6
X2	Negative sequence reactance saturated	15,58	16,94	12,19	13,3	11,49	12,9
Ta	Armature time constant	15	15	15	15	15	15

Other class H / 400 V data

io (A)	No-load excitation current SHUNT/AREP+	1.01	1.01	1.14	1.14	1.06	1.06
ic (A)	On-load excitation current SHUNT/AREP+	3.84	4.14	3.5	3.76	3.3	3.63
uc (V)	On-load excitation voltage SHUNT/AREP+	37.4	40.2	40.6	43.5	38.2	41.9
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*	372	371	496	495	742	741
kVA	Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) AREP+*	524	525	687	688	856	854
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 _{LAD}	18	19.1	16.7	17.7	14.2	15.4
%	Transient ΔU (on-load 4/4) AREP+ - P.F.: 0.8 _{LAD}	14.2	15	13.3	14.1	12.8	13.9
W	No-load losses	3299	3299	4328	4328	4750	4750
W	Heat dissipation	16579	18888	16242	18374	17367	20482

* P.F. = 0.6

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

		C	D	E	F	G	H
Kcc	Short-circuit ratio	0.36	0.33	0.47	0.45	0.46	0.43
Xd	Direct-axis synchro. reactance unsaturated	355	386	290	303	281	303
Xq	Quadrature-axis synchro. reactance unsaturated	181	197	148	154	143	154
T'do	No-load transient time constant	1983	1983	2049	2049	2093	2093
X'd	Direct-axis transient reactance saturated	17.9	19.4	14.1	14.8	13.4	14.5
T'd	Short-circuit transient time constant	100	100	100	100	100	100
X''d	Direct-axis subtransient reactance saturated	14.3	15.5	11.3	11.8	10.7	11.6
T''d	Subtransient time constant	10	10	10	10	10	10
X''q	Quadrature-axis subtransient reactance saturated	18.1	19.7	14	14.7	13.1	14.2
Xo	Zero sequence reactance	0.74	0.81	0.59	0.61	0.56	0.6
X2	Negative sequence reactance saturated	16.26	17.67	12.71	13.3	11.96	12.9
Ta	Armature time constant	15	15	15	15	15	15

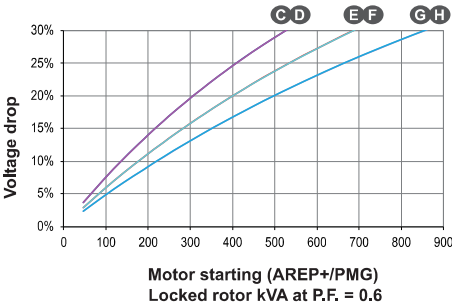
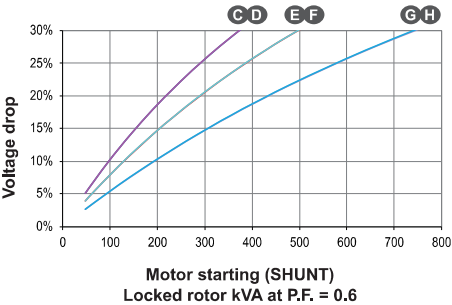
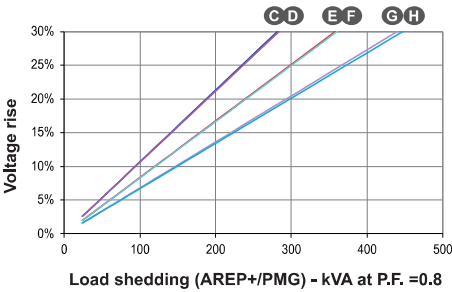
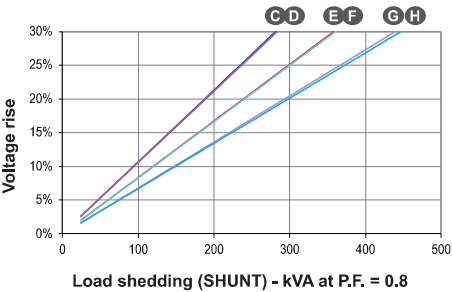
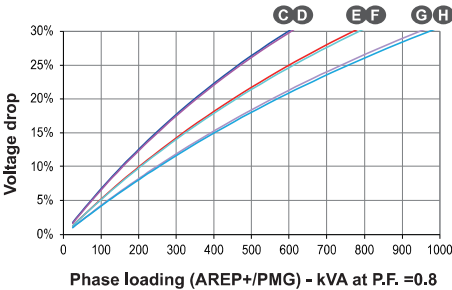
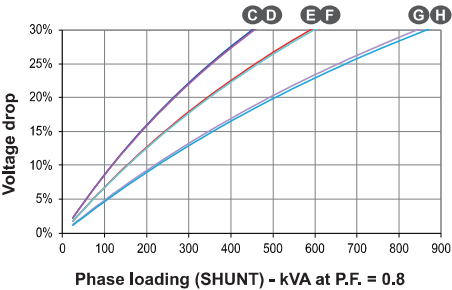
Other class H / 480 V data

io (A)	No-load excitation current SHUNT/AREP+	1.01	1.01	1.14	1.14	1.06	1.06
ic (A)	On-load excitation current SHUNT/AREP+	3.91	4.21	3.56	3.69	3.35	3.56
uc (V)	On-load excitation voltage SHUNT/AREP+	38.3	41.1	41.5	43	38.9	41.3
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*	446	448	594	593	888	889
kVA	Start ($\Delta U = 20\%$ cont. or $\Delta U = 30\%$ trans.) AREP+*	627	629	828	826	1024	1025
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 _{LAD}	18.5	19.6	17.2	17.7	14.6	15.4
%	Transient ΔU (on-load 4/4) AREP+ - P.F.: 0.8 _{LAD}	14.6	15.5	13.7	14.1	13.2	13.9
W	No-load losses	4960	4960	6365	6365	6978	6978
W	Heat dissipation	19692	22264	19530	20731	20941	23137

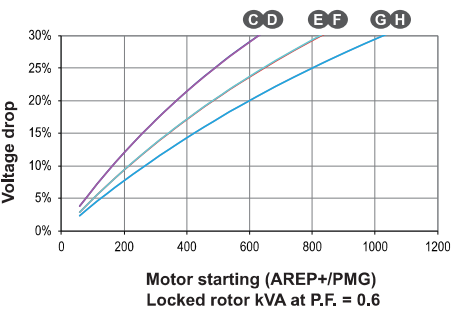
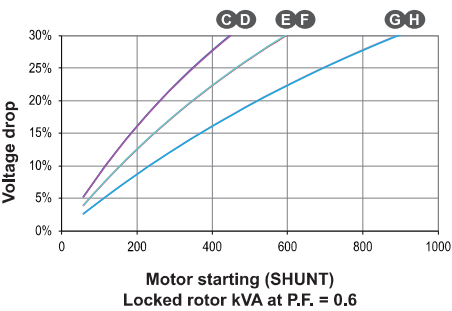
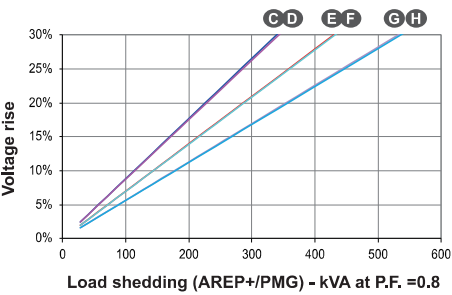
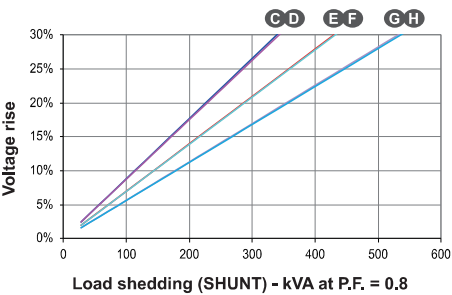
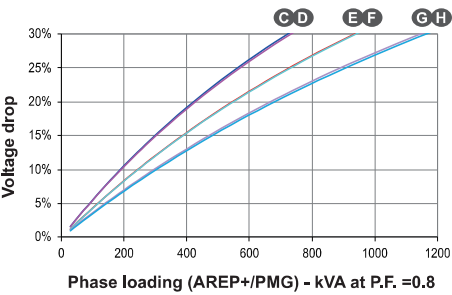
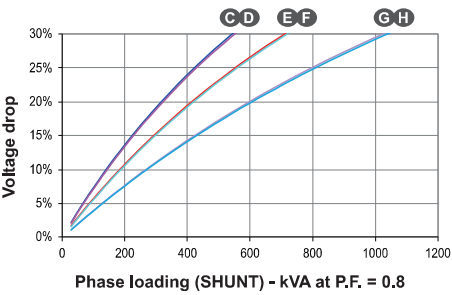
* P.F. = 0.6

Low Voltage Alternators - 4 pole

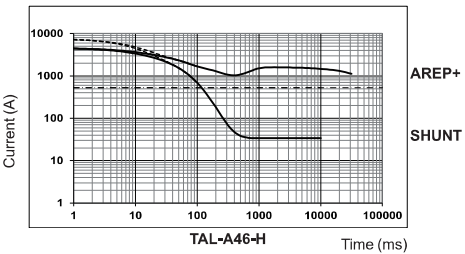
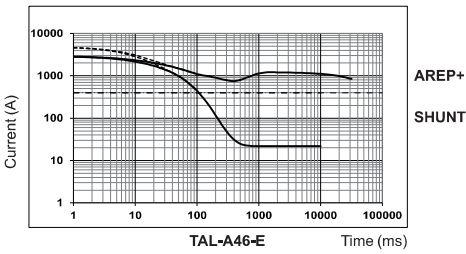
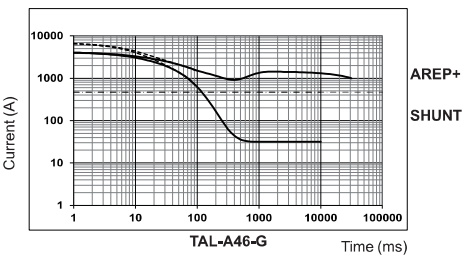
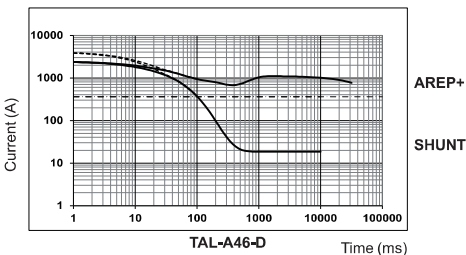
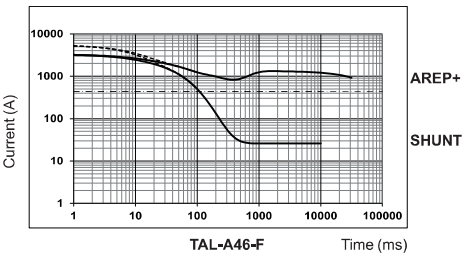
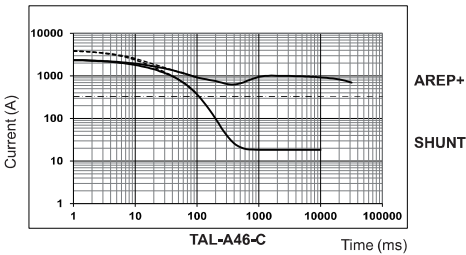
Transient voltage variation 400 V - 50 Hz - 6 & 12-wire



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



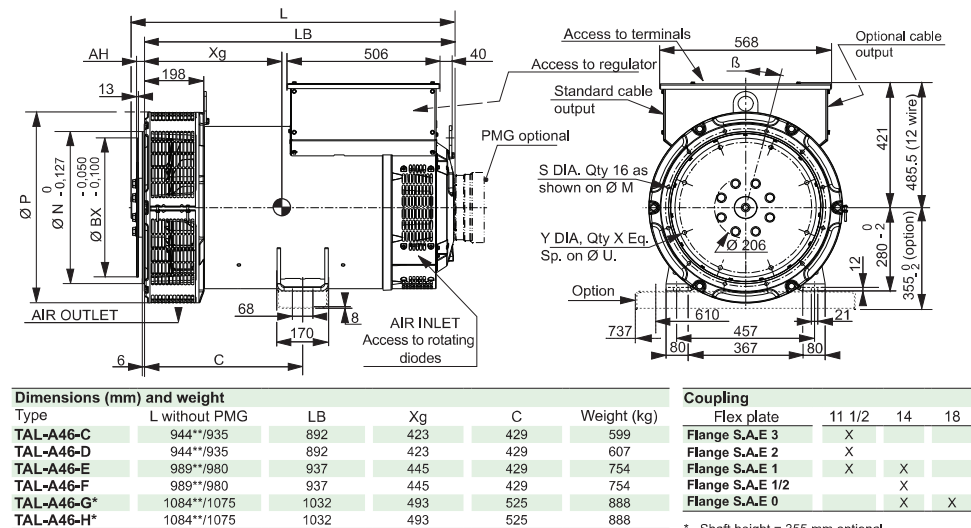
3-phase short-circuit curves at no load and rated speed (star connection Y) - 6 & 12-wire



Symmetrical _____
Asymmetrical - - - - -

Low Voltage Alternators - 4 pole

Single bearing general arrangement - 6 & 12-wire

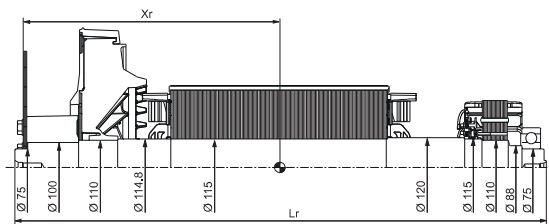


Flange (mm)					
S.A.E.	P	N	M	S	β °
3	600***/641	409.575	428.825	11	15°
2	600***/641	447.675	466.725	11	15°
1	600***/641	511.175	530.225	12	15°
1/2	648	584.2	619.125	14	15°
0	710	647.7	679.45	14	11° 15'

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

*** Specific dimension TAL A46C
**** 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 ½				Flex plate S.A.E. 14			
	Xr	Lr	M	J	Xr	Lr	M	J
TAL-A46-C	420	923	255	2,64	408	923	256	2,8
TAL-A46-D	420	923	255	2,64	408	923	256	2,8
TAL-A46-E	460	968	304	3,28	448	968	305	3,44
TAL-A46-F	460	968	304	3,28	448	968	305	3,44
TAL-A46-G	508	1063	358	3,97	497	1063	359	4,13
TAL-A46-H	508	1063	358	3,97	497	1063	359	4,13

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.

*Please contact us for the double bearing dimension

TAL-A473 - 410 to 660 kVA - 50 Hz / 510 to 825 kVA - 60 Hz

Low Voltage Alternators - 4 pole

General characteristics

Insulation class	H	Excitation system 6 wire	SHUNT	AREP+ / PMG
Winding pitch	2/3 (wind.6S - 6-wire / wind.6 - 12-wire)	AVR type	R150	R180
Number of wires	6 (12 option)	Excitation system 12-wire (option)	SHUNT	AREP+ / PMG
Protection	IP 23	AVR type	R150	R180
Altitude	≤ 1000 m	Voltage regulation (*)	± 0.8 %	± 0.5 %
Overspeed	2250 R.P.M.	Total Harmonic Distortion THD (**) in no-load		< 5 %
Air flow 50 Hz	0.9 m³/s	Total Harmonic Distortion THD (**) in linear load		< 5 %
Air flow 60 Hz	1.1 m³/s	Waveform: NEMA = TIF (**)		≤ 50
AREP+/PMG Short-circuit current = 2.7 In : 5 seconds (*)		Waveform: I.E.C. = THF (**)		< 2%

*D350: 2.7In 10 seconds

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

Ratings 50 Hz - 1500 R.P.M.

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	Δ	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V	380V	400V	415V	440V
YY (*)		220V	230V	240V		220V	230V	240V		220V	230V	240V		220V	230V	240V	
		200V			220V	200V			220V	200V			220V	200V			220V
TAL-A473-A	kVA	390	410	410	400	355	375	375	364	413	435	435	424	429	450	450	440
	kW	312.0	328.0	328.0	320.0	284.0	300.0	300.0	291.2	330.4	348.0	348.0	339.2	343.2	360.0	360.0	352.0
TAL-A473-B	kVA	455	455	455	445	415	415	415	405	480	480	480	472	500	500	500	490
	kW	364.0	364.0	364.0	356.0	332.0	332.0	332.0	324.0	384.0	384.0	384.0	377.6	400.0	400.0	400.0	392.0
TAL-A473-C	kVA	500	500	500	455	455	455	455	414	530	530	530	482	550	550	550	500
	kW	400.0	400.0	400.0	364.0	364.0	364.0	364.0	331.0	424.0	424.0	424.0	386.0	440.0	440.0	440.0	400.0
TAL-A473-D	kVA	525	550	550	540	478	500	500	491	557	585	585	572	578	600	600	594
	kW	420.0	440.0	440.0	432.0	382.4	400.0	400.0	392.8	445.6	468.0	468.0	457.6	462.4	480.0	480.0	475.2
TAL-A473-E	kVA	600	600	600	500	545	545	545	455	635	635	635	530	660	660	660	550
	kW	480.0	480.0	480.0	400.0	436.0	436.0	436.0	364.0	508.0	508.0	508.0	424.0	528.0	528.0	528.0	440.0
TAL-A473-F	kVA	645	660	660	630	587	600	600	573	684	700	700	668	710	730	730	693
	kW	516.0	528.0	528.0	504.0	469.6	480.0	480.0	458.4	547.2	560.0	560.0	534.4	568.0	584.0	584.0	554.4

(*) 12-wire option

Ratings 60 Hz - 1800 R.P.M.

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 Δ YY (*)		380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V
		220V	240V			220V	240V			220V	240V			220V	240V		
			208V	220V	240V		208V	220V	240V		208V	220V	240V		208V	220V	240V
TAL -A473-A	kVA	450	480	500	510	410	435	455	465	475	510	530	540	495	530	550	560
	kW	360.0	384.0	400.0	408.0	328.0	348.0	364.0	372.0	380.0	408.0	424.0	432.0	396.0	424.0	440.0	448.0
TAL-A473-B	kVA	475	510	530	570	430	465	480	520	505	540	560	605	525	560	585	625
	kW	380.0	408.0	424.0	456.0	344.0	372.0	384.0	416.0	404.0	432.0	448.0	480.0	424.0	448.0	468.0	500.0
TAL-A473-C	kVA	520	555	590	625	475	505	535	570	550	590	625	665	570	610	650	690
	kW	416.0	444.0	472.0	500.0	380.0	404.0	428.0	456.0	440.0	472.0	500.0	532.0	456.0	488.0	520.0	552.0
TAL-A473-D	kVA	560	610	630	690	510	555	575	630	595	645	670	730	615	670	695	750
	kW	448.0	488.0	504.0	552.0	408.0	444.0	460.0	504.0	476.0	516.0	536.0	584.0	492.0	536.0	556.0	600.0
TAL-A473-E	kVA	600	660	685	750	545	600	625	685	635	700	725	795	660	725	755	825
	kW	480.0	528.0	548.0	600.0	436.0	480.0	500.0	548.0	508.0	560.0	580.0	636.0	528.0	580.0	604.0	660.0
TAL-A473-F	kVA	650	715	755	825	590	650	685	750	690	760	800	875	720	785	830	910
	kW	520.0	572.0	604.0	660.0	472.0	520.0	548.0	600.0	552.0	608.0	640.0	700.0	576.0	628.0	664.0	728.0

(*) 12-wire option