

Nidec

Power



Low Voltage Alternators - 4 pole

TAL-A42

Electrical and mechanical data

30 to 63 kVA - 50 Hz / 36 to 75.6 kVA - 60 Hz

LEROY-SOMER[™]

Product Feature

Features and Benefits

Quick & efficient service

- Global manufacturing facilities for local delivery – short lead time
- Unequalled service organization

Global Service

Compact Machine

Leroy-Somer TAL A Series

Easy genset maintenance

- Easy access to cables and diode bridges
- ControlReg option

Easy Installation & Maintenance

Easy genset installation

- Optimized coupling with engines
- Interchangeable with LSA
- Flying leads option

Less footprint Cost-effective

Reliability

- One of the shortest products
- Low vibration level



Optimized
Electrical
Performance

Optimized genset power outputs, matching available engines

- Adapted power outputs to reach power nodes with existing engines
- Optimized performance vs Application

Optimal
Mechanical
Design

Compact
Terminal
Box

Easy access to regulator

- Simplified design

Low Voltage Alternators - 4 pole

TAL-A42

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, BS 5000 Part 99, 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
- 4-terminal plate
- Optimized performance

Robust design

- Compact and rugged assembly to withstand engine vibrations
- Steel frame
- Aluminum 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 Except TAL A40)		
Three-phase 6-wire	R120	Standard				
	R150	Option			√	
	R180		Standard	Standard	√	√
	D350	Option	Option	Option	√	√
Three-phase 12-wire*	R120	Standard				
	R250				√	
	R180		Standard	Standard	√	√
Single-phase	D350	Option	Option	Option	√	√
	R121	Standard			√	
	R221	Option			√	

√ : Possible option

Compact terminal box

- Easy access to AVR and terminals

Environment and protection

- The alternators are IP 23
- Standard winding protection for non-harsh environment with relative humidity ≤ 95%

Available options

- AREP+ & PMG
- 12-lead
- Customized painting
- Space heater
- Droop kit for alternator paralleling (AVR upgrade to R150)
- CE mark
- Voltage trimmer (AVR upgrade to R150)
- Winding protection for harsh environments and relative humidity greater than 95% (system 2 - 4): de-rating ratio according to 3% (system 2 and above protection system will be proposed for rental application, prevented from potential hash environment)

Low Voltage Alternators - 4 pole

TAL-A42 - Three-phase 30 to 63 kVA - 50 Hz / 36 to 75.6 kVA - 60 Hz

General characteristics - 6 & 12-wire

Insulation class	H	Excitation system 6 wires	SHUNT	AREP+/PMG
Winding pitch	2/3 (wind.6S - 6-wire / wind.6 -12-wire)	AVR type	R120	R180
Number of wires	6 or 12	Excitation system 12 wires	SHUNT	AREP+/PMG
Protection	IP 23	AVR type	R120	R180
Altitude	≤ 1000 m	Voltage regulation (*)	± 1 %	± 0.5 %
Overspeed	2250 R.P.M.	Total Harmonic distortion THD (**) in no-load	< 3.5 %	
Air flow 50 Hz (m³/s)	0.12	Total Harmonic distortion THD (**) in linear load	< 5 %	
Air flow 60 Hz (m³/s)	0.15	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:125K				F:105K				H:150K				H:163K			
Phase		3ph.		1ph.		3ph.		1ph.		3ph.		1ph.		3ph.		1ph.	
Y		380V	400V	415V		380V	400V	415V		380V	400V	415V		380V	400V	415V	
Δ		220V	230V	240V		220V	230V	240V		220V	230V	240V		220V	230V	240V	
YY		190V	200V	208V		190V	200V	208V		190V	200V	208V		190V	200V	208V	
ΔΔ		230V				230V				230V				230V			
TAL-A42-C	kVA	29	30	30	18	26	27	27	16	30	31.5	31.5	19	31	33	33	19.8
	kW	23.2	24.0	24.0	14.4	20.8	21.6	21.6	12.8	24.0	25.2	25.2	15.2	24.8	26.4	26.4	15.8
TAL-A42-E	kVA	36	38	38	22.8	32.5	34.5	34	20.5	38	40	40	24	40	42	42	25.6
	kW	28.8	30.4	30.4	18.2	26.0	27.6	27.2	16.4	30.4	32.0	32.0	19.2	32.0	33.6	33.6	20.5
TAL-A42-F	kVA	43	45	45	25	38.5	40.5	40.5	22.5	45	47	47	26	48	50	50	28
	kW	34.4	36.0	36.0	20.0	30.8	32.4	32.4	18.0	36.0	37.6	37.6	20.8	38.4	40.0	40.0	22.4
TAL-A42-G	kVA	48	50	50	27	43	45	45	24	50	52.5	52.5	28	52	55	55	30
	kW	38.4	40.0	40.0	21.6	34.4	36.0	36.0	19.2	40.0	42.0	42.0	22.4	41.6	44.0	44.0	24.0
TAL-A42-H	kVA	60	63	63	36	54	57	57	32.5	63	66	66	38	67	70	70	40
	kW	48.0	50.4	50.4	28.8	43.2	45.6	45.6	26.0	50.4	52.8	52.8	30.4	53.6	56.0	56.0	32.0

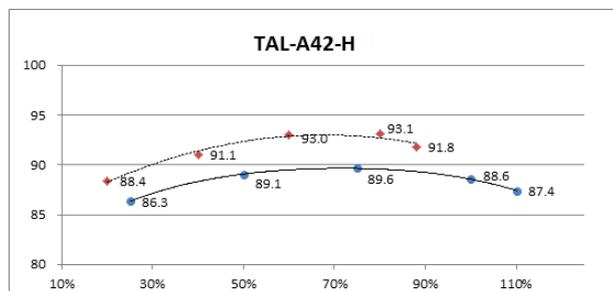
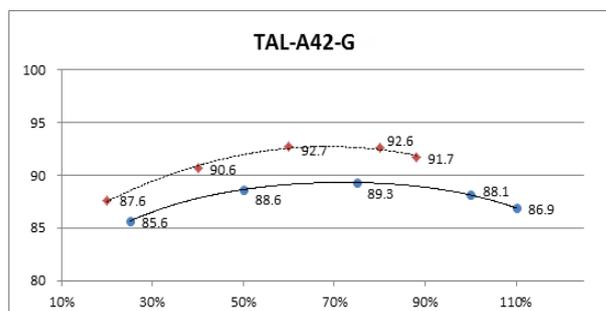
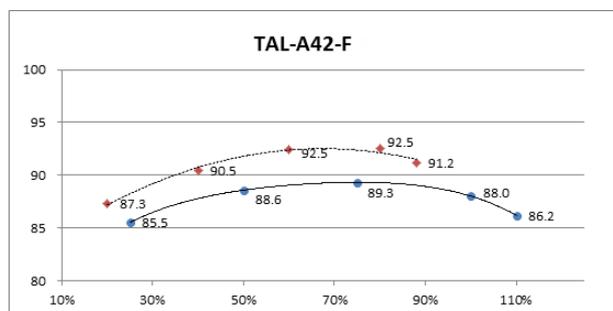
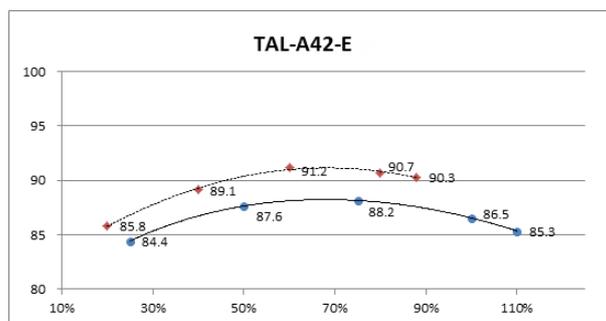
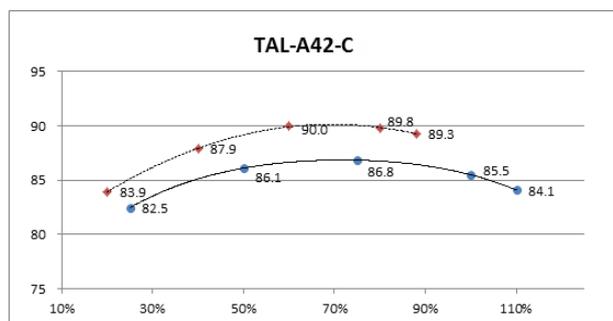
Ratings 60 Hz - 1800 R.P.M. - 6 & 12-wire

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:125K				F:105K				H:150K				H:163K			
Phase		3ph.		1ph.		3ph.		1ph.		3ph.		1ph.		3ph.		1ph.	
Y		380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V	380V	416V	440V	480V
Δ		220V	240V	254V	277V	220V	240V	254V	277V	220V	240V	254V	277V	220V	240V	254V	277V
YY		190V	208V	220V	240V	190V	208V	220V	240V	190V	208V	220V	240V	190V	208V	220V	240V
ΔΔ		240V				240V				240V				240V			
TAL-A42-C	kVA	28	31	32.5	36	21.5	25.5	28	29	32.5	19.4	30	32.5	34	38	22.6	31
	kW	22.4	24.8	26.0	28.8	17.2	20.4	22.4	23.2	26.0	15.5	24.0	26.0	27.2	30.4	18.1	24.8
TAL-A42-E	kVA	36	39.5	41.4	45.5	25	32.5	35.5	37	41	23	38	41.5	43.5	48	26.4	39.5
	kW	28.8	31.6	33.1	36.4	20.0	26.0	28.4	29.6	32.8	18.4	30.4	33.2	34.8	38.4	21.1	31.6
TAL-A42-F	kVA	43	46.5	49	54	28	38.5	42	44	49	25	45	48.5	51.5	56.5	29	47
	kW	34.4	37.2	39.2	43.2	22.4	30.8	33.6	35.2	39.2	20.0	36.0	38.8	41.2	45.2	23.2	37.6
TAL-A42-G	kVA	47	52	54.5	60	30.5	43	47	49	54	27.5	50	54.5	57	63	32	52
	kW	37.6	41.6	43.6	48.0	24.4	34.4	37.6	39.2	43.2	22.0	40.0	43.6	45.6	50.4	25.6	41.6
TAL-A42-H	kVA	60	65.5	68.5	75.6	39	54	59	62	68	35	63	68.5	72	79	41	66
	kW	48.0	52.4	54.8	60.5	31.2	43.2	47.2	49.6	54.4	28.0	50.4	54.8	57.6	63.2	32.8	52.8

Low Voltage Alternators - 4 pole

TAL-A42 - Three-phase 30 to 63 kVA - 50 Hz / 36 to 75.6 kVA - 60 Hz

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



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

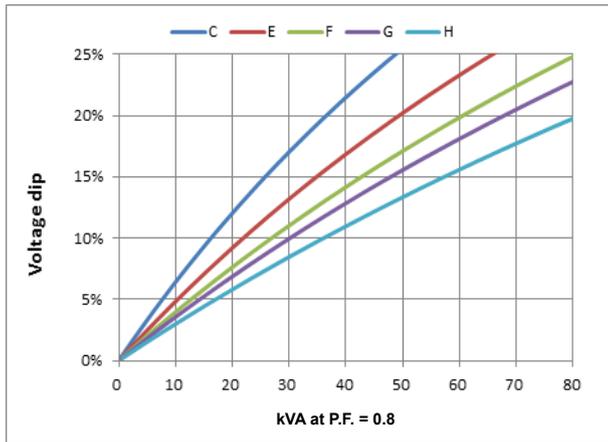
	TAL-A42-C	TAL-A42-E	TAL-A42-F	TAL-A42-G	TAL-A42-H
Kcc Short-circuit ratio	0.45	0.49	0.43	0.47	0.42
Xd Direct-axis synchro.reactance unsaturated	278	259	275	265	297
Xq Quadrature-axis synchro.reactance unsaturated	167	155	165	159	178
T'do No-load transient time constant	805	861	918	933	962
X'd Direct-axis transient reactance saturated	16.7	15.0	14.1	13.9	15.2
T'd Short-circuit transient time constant	50	50	50	50	50
X''d Direct-axis subtransient reactance saturated	9.0	8.1	7.6	7.5	8.2
T''d Subtransient time constant	5.0	5.0	5.0	5.0	5.0
X''q Quadrature-axis subtransient reactance saturated	12.7	11.4	10.7	10.6	11.5
Xo Zero sequence reactance saturated	0.9	0.9	0.9	0.9	11
X2 Negative sequence reactance saturated	10.8	9.8	9.1	9.0	9.9
Ta Armature time constant	8	8	8	8	8

Other class H/400V data	TAL-A42-C	TAL-A42-E	TAL-A42-F	TAL-A42-G	TAL-A42-H
ms Response time ($\Delta U=20\%$)	500	500	500	500	500
W No-load losses	749	840	923	1080	1176
W Heat dissipation	4070	4745	4909	5403	6337

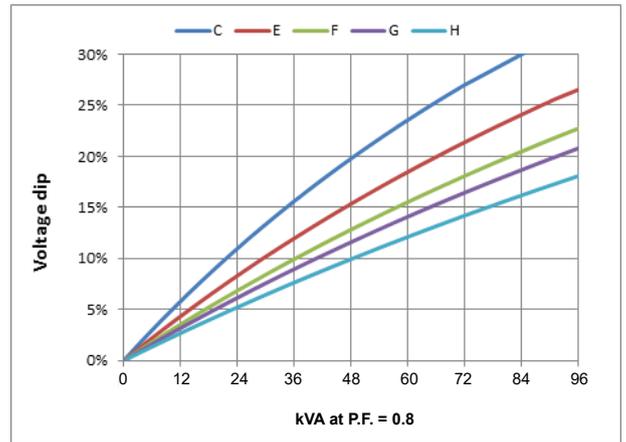
Low Voltage Alternators - 4 pole

TAL-A42 - Three-phase 30 to 63 kVA - 50 Hz / 36 to 75.6 kVA - 60 Hz

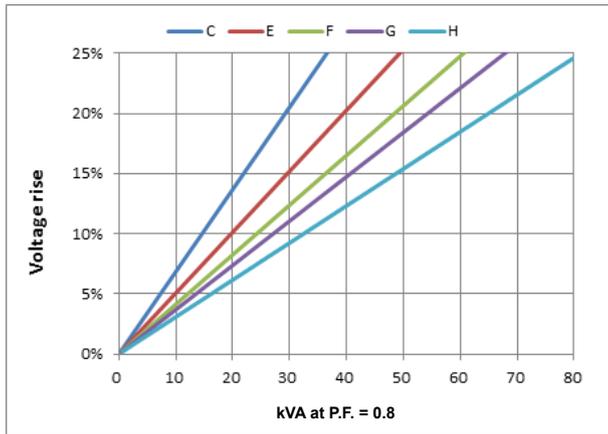
Transient voltage variation 400V - 50 Hz - 12-wire



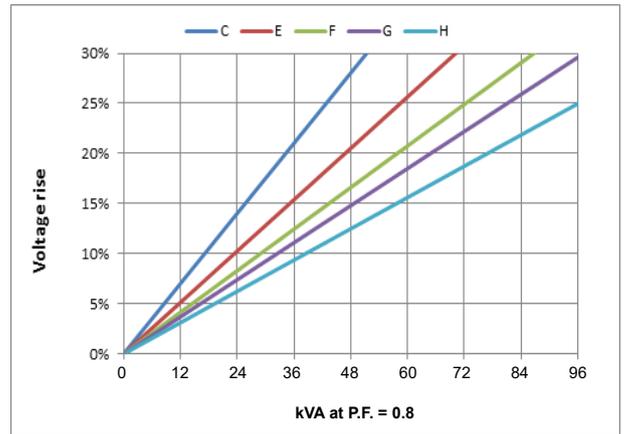
Phase loading (SHUNT) - kVA at P.F. = 0.8



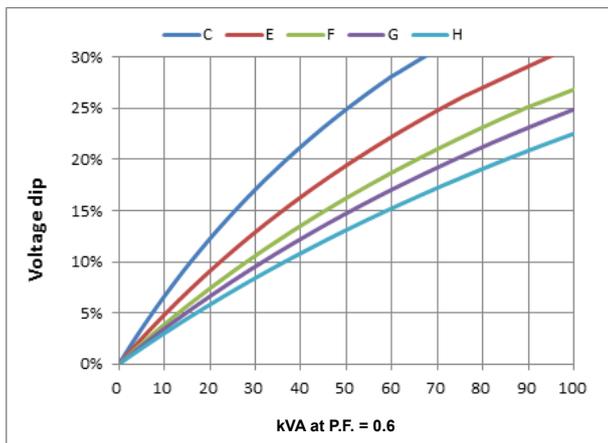
Phase loading (AREP+/PMG) - kVA at P.F. = 0.8



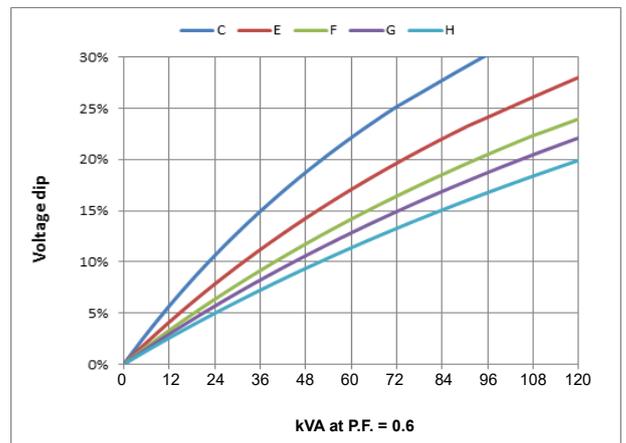
Load shedding (SHUNT) - kVA at P.F. = 0.8



Load shedding (AREP+/PMG) - kVA at P.F. = 0.8



**Motor starting (SHUNT)
- locked rotor kVA at P.F. = 0.6**



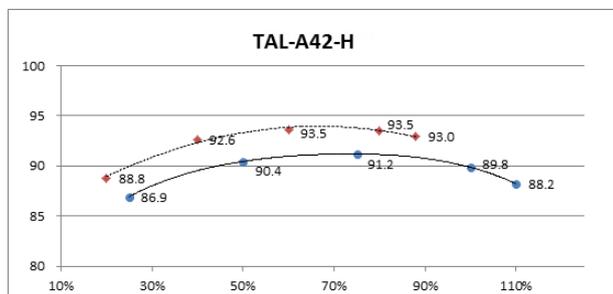
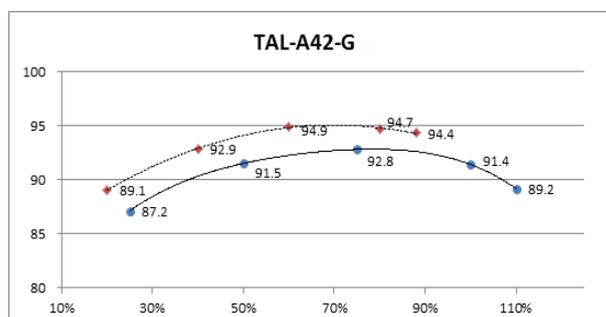
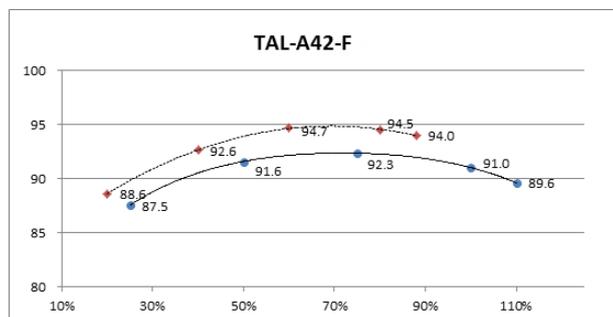
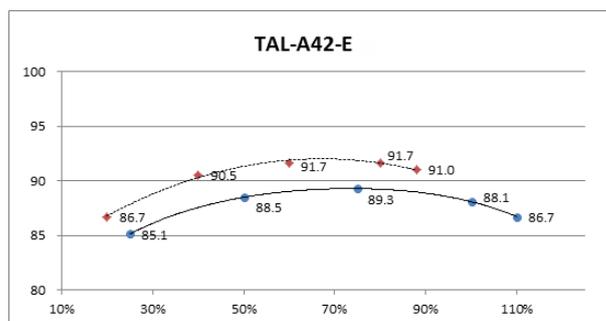
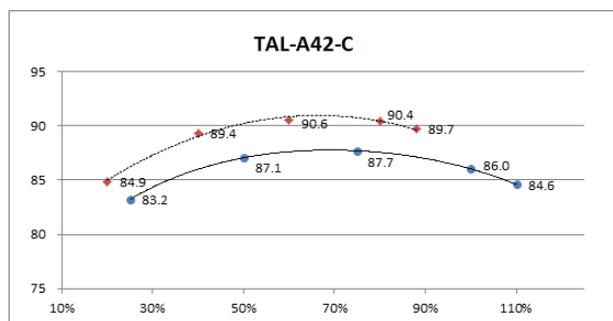
**Motor starting (AREP+/PMG)
- locked rotor kVA at P.F. = 0.6**

- 1) For a starting P.F. other than 0.6, the starting kVA must be multiplied by $K = \text{Sine P.F.} / 0.8$
- 2) For voltages other than 400V (Y), 230V (Δ) at 50 Hz, then kVA must be multiplied by $(400/U)^2$ or $(230/U)^2$.

Low Voltage Alternators - 4 pole

TAL-A42 - Three-phase 30 to 63 kVA - 50 Hz / 36 to 75.6 kVA - 60 Hz

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



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

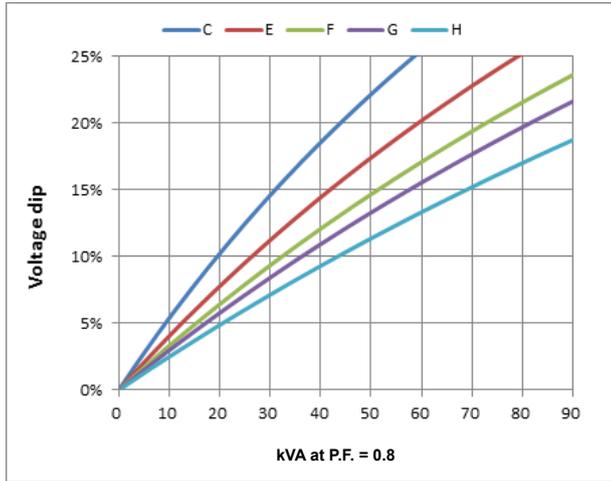
	TAL-A42-C	TAL-A42-E	TAL-A42-F	TAL-A42-G	TAL-A42-H
Kcc Short-circuit ratio	0.45	0.49	0.43	0.47	0.42
Xd Direct-axis synchro.reactance unsaturated	278	259	275	265	297
Xq Quadrature-axis synchro.reactance unsaturated	167	155	165	159	178
T'do No-load transient time constant	805	861	918	933	962
X'd Direct-axis transient reactance saturated	16.7	15.0	14.1	13.9	15.2
T'd Short-circuit transient time constant	50	50	50	50	50
X''d Direct-axis subtransient reactance saturated	9.0	8.1	7.6	7.5	8.2
T''d Subtransient time constant	5.0	5.0	5.0	5.0	5.0
X''q Quadrature-axis subtransient reactance saturated	12.7	11.4	10.7	10.6	11.5
Xo Zero sequence reactance saturated	0.9	0.9	0.9	0.9	11
X2 Negative sequence reactance saturated	10.8	9.8	9.1	9.0	9.9
Ta Armature time constant	8	8	8	8	8

Other class H/480V data	TAL-A42-C	TAL-A42-E	TAL-A42-F	TAL-A42-G	TAL-A42-H
ms Response time ($\Delta U=20\%$)	500	500	500	500	500
W No-load losses	1078	1210	1329	1556	1693
W Heat dissipation	4688	4917	4273	4516	6870

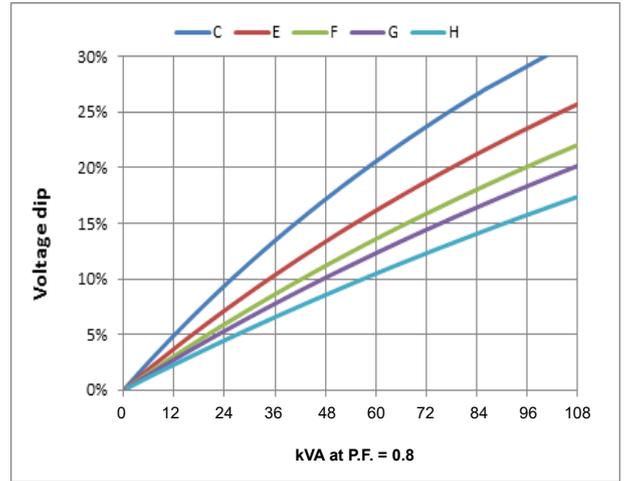
Low Voltage Alternators - 4 pole

TAL-A42 - Three-phase 30 to 63 kVA - 50 Hz / 36 to 75.6 kVA - 60 Hz

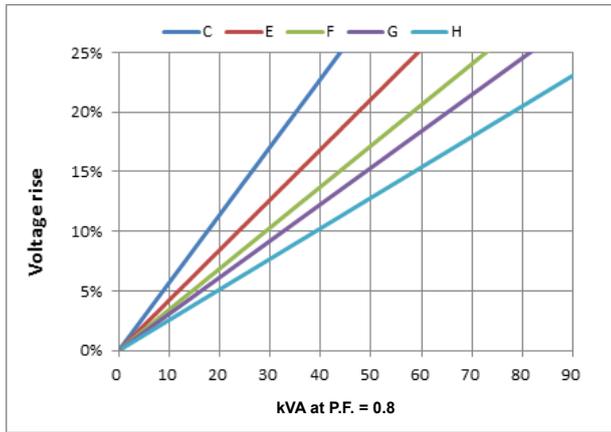
Transient voltage variation 480V - 60 Hz - 6-wire



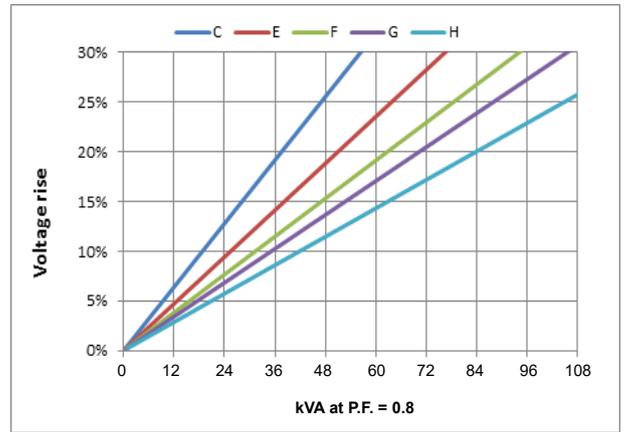
Phase loading (SHUNT) - kVA at P.F. = 0.8



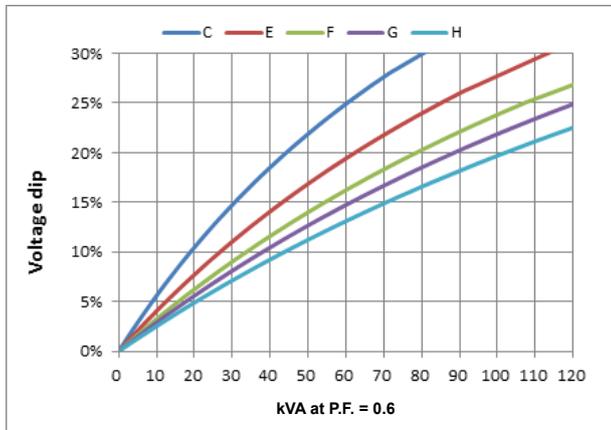
Phase loading (AREP+/PMG) - kVA at P.F. = 0.8



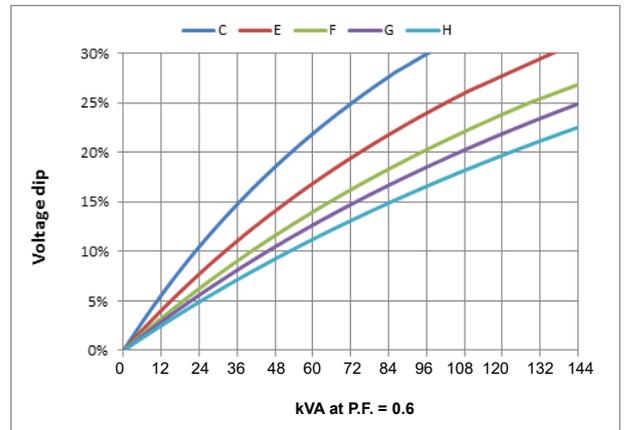
Load shedding (SHUNT) - kVA at P.F. = 0.8



Load shedding (AREP+/PMG) - kVA at P.F. = 0.8



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



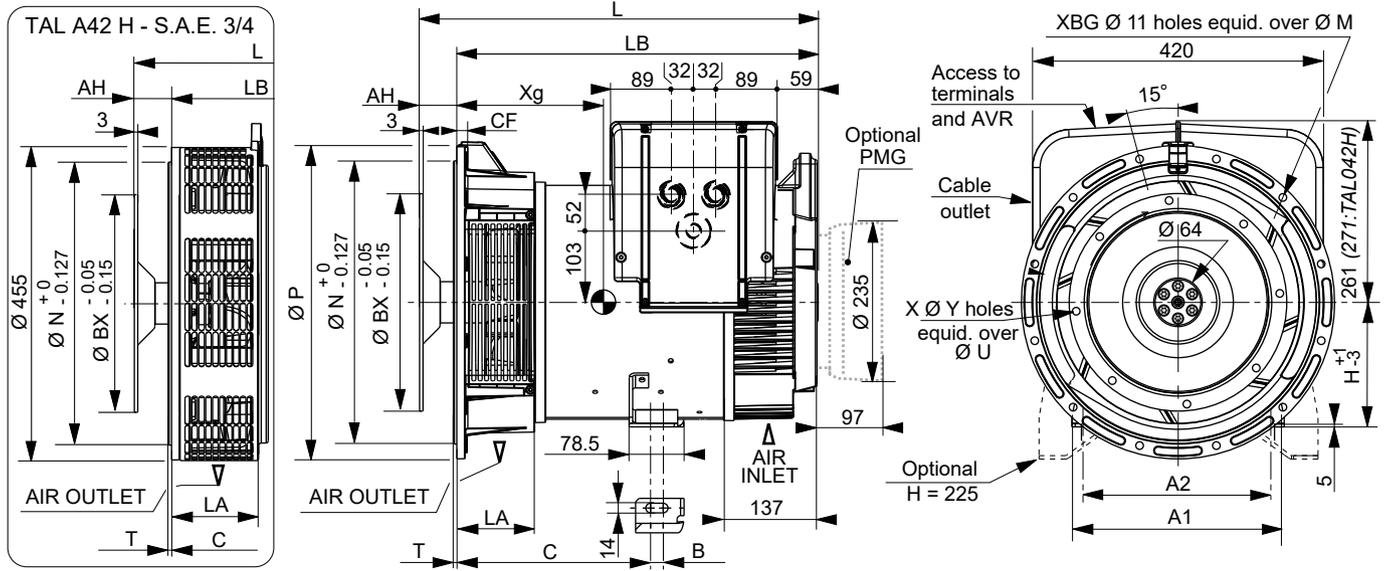
Motor starting (AREP+/PMG)
- locked rotor kVA at P.F. = 0.6

- 1) For a starting P.F. other than 0.6, the starting kVA must be multiplied by $K = \text{Sine P.F.} / 0.6$
- 2) For voltages other than 480V (Y), 277V (Δ), 240V (YY) at 60 Hz, then kVA must be multiplied by $(480/U)^2$ or $(277/U)^2$ or $(240/U)^2$.

Low Voltage Alternators - 4 pole

TAL-A42 - Three-phase 30 to 63 kVA - 50 Hz / 36 to 75.6 kVA - 60 Hz

Single bearing general arrangement - 4, 6 & 12-wire

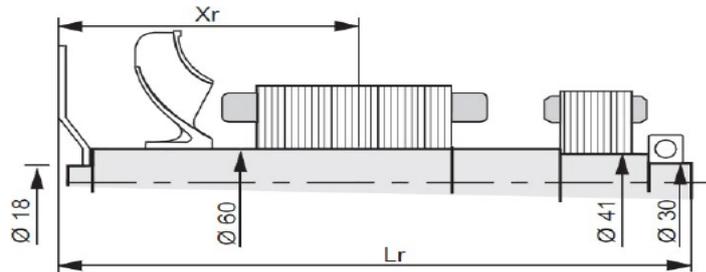


Dimensions (mm) and weight (kg)			DISC 11 1/2	DISC 10	DISC 8	DISC 7 1/2	
Type	LB	Xg	Mass (kg)	J (kgm ²)			
TAL-A42-C	503	242	120	0.2681	0.2561	0.2444	0.2407
TAL-A42-E	523	263	142	0.3324	0.3204	0.3087	0.305
TAL-A42-F	588	287	171	0.3835	0.3715	0.3598	0.3561
TAL-A42-G	588	295	177	0.3957	0.3837	0.372	0.3683
TAL-A42-H	618	310	186	0.4415	0.4295	0.4178	0.4141

Flex plate (mm)							
S.A.E	P	N	M	XBG	T	LA	CF
4	455	361.95	381	12	5	122	16
3	452	409.58	428.62	12	5	105.3	12
2	490	447.675	466.725	12	6	111	12

Flex plate (mm)					
S.A.E.	BX	U	X	Y	AH
11 1/2	352.42	333.38	8	11	39.6
10	314.32	295.28	8	11	53.8
8	263.52	244.48	6	11	62
7 1/2	241.3	222.25	8	9	30.2

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 SAE7 1/2				Flex Plate SAE8				Flex Plate SAE10				Flex Plate SAE11 1/2			
	Xr	Lr	M	J	Xr	Lr	M	J	Xr	Lr	M	J	Xr	Lr	M	J
TAL-A42-C	278.97	526.2	47.77	0.2407	308.13	558	48.09	0.2444	288.095	549.8	48.53	0.2561	280.91	535.6	49.03	0.2681
TAL-A42-E	290.53	526.2	57.87	0.305	320.08	558	58.19	0.3087	299.416	549.8	58.63	0.3204	293.5	535.6	59.13	0.3324
TAL-A42-F	321.11	611.2	67.82	0.3561	350.85	643	68.14	0.3598	340.644	634.8	68.58	0.3715	324.45	620.6	69.08	0.3835
TAL-A42-G	326.09	611.2	70.82	0.3753	355.9	643	71.14	0.379	345.742	634.8	71.58	0.3907	329.6	620.6	72.08	0.4027
TAL-A42-H	340.91	641.2	77.49	0.4141	370.82	673	77.81	0.4178	360.747	664.8	78.25	0.4295	344.67	650.6	78.75	0.4415

NOTE : Dimensions are for information only and may be subject to modifications. Contractual 2D/3D drawings can be downloaded from the Leroy-Somer site. The torsional analysis of the transmission is imperative. All values are available upon request.

Low Voltage Alternators - 4 pole

TAL-A42 - S Dedicated single-phase 18 to 42 kVA - 50 Hz / 23 to 53 kVA - 60 Hz

General characteristics

Insulation class	H	Excitation system	SHUNT
Winding pitch	2/3 (wind. M 50 Hz, M1 60 Hz)	AVR type	R121
Number of wires	4	Voltage regulation (*)	± 1 %
Protection	IP 23	Total Harmonic Distortion THD (**) in no-load	< 3.5 %
Altitude	≤ 1000 m	Total Harmonic Distortion THD (**) in linear load	< 5 %
Overspeed	2250 R.P.M.	Waveform: NEMA = TIF (**)	< 100
Air flow (m³/s)	50 Hz: 0.10 - 60 Hz: 0.13	Waveform: I.E.C. = THF (**)	< 2 %

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

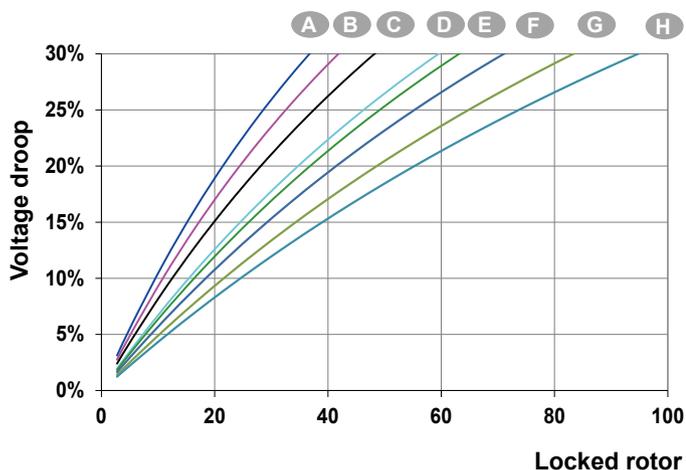
Ratings / Efficiencies 50 Hz - 1500 R.P.M. - Winding M

kVA / kW - P.F. = 1 (P.F. 0.8 : derating 15%)						
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		
Serie (SE) 	230 V	η %	230 V	230 V	230V	η %
Parallel (PA) 	115 V	η %	115 V	115 V	115 V	η %
TAL-A42-A-S	18	88.1	16.5	19	20	87.4
TAL-A42-B-S	20.5	88.1	18.5	21.5	22.5	87.4
TAL-A42-C-S	22.5	89	20.5	24	25	88.4
TAL-A42-D-S	25	90.6	23	26.5	27.5	90.2
TAL-A42-E-S	28	90.1	25.5	29.5	31	89.6
TAL-A42-F-S	31.5	90.3	28.5	33.5	34.5	89.8
TAL-A42-G-S	35	90.4	32	37	38.5	89.9
TAL-A42-H-S	42	90.5	38	44.5	46	90

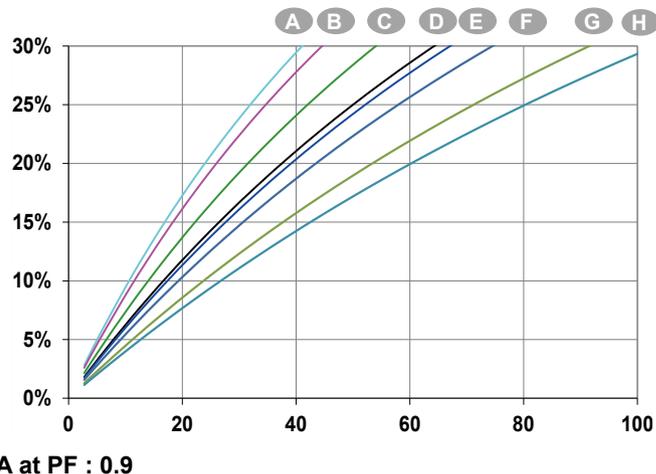
Ratings / Efficiencies 60 Hz - 1800 R.P.M. - Winding M1

kVA / kW - P.F. = 1 (P.F. 0.8 : derating 15%)						
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		
Serie (SE) 	240 V	η %	240 V	240 V	240V	η %
Parallel (PA) 	120 V	η %	120 V	120 V	120 V	η %
TAL-A42-A-S	23	88.3	21	24.5	25.5	87.7
TAL-A42-B-S	26	88.3	23.5	27.5	28.5	87.6
TAL-A42-C-S	29	89	26	30.5	32	88.5
TAL-A42-D-S	31.5	90.4	28.5	33.5	34.5	90
TAL-A42-E-S	36	89.8	33	38	39.5	89.2
TAL-A42-F-S	40	90	36.5	42.5	44	89.5
TAL-A42-G-S	47	90	43	50	51	89.5
TAL-A42-H-S	53	90.5	48	56	58	90

Starting motor 230V - 50Hz



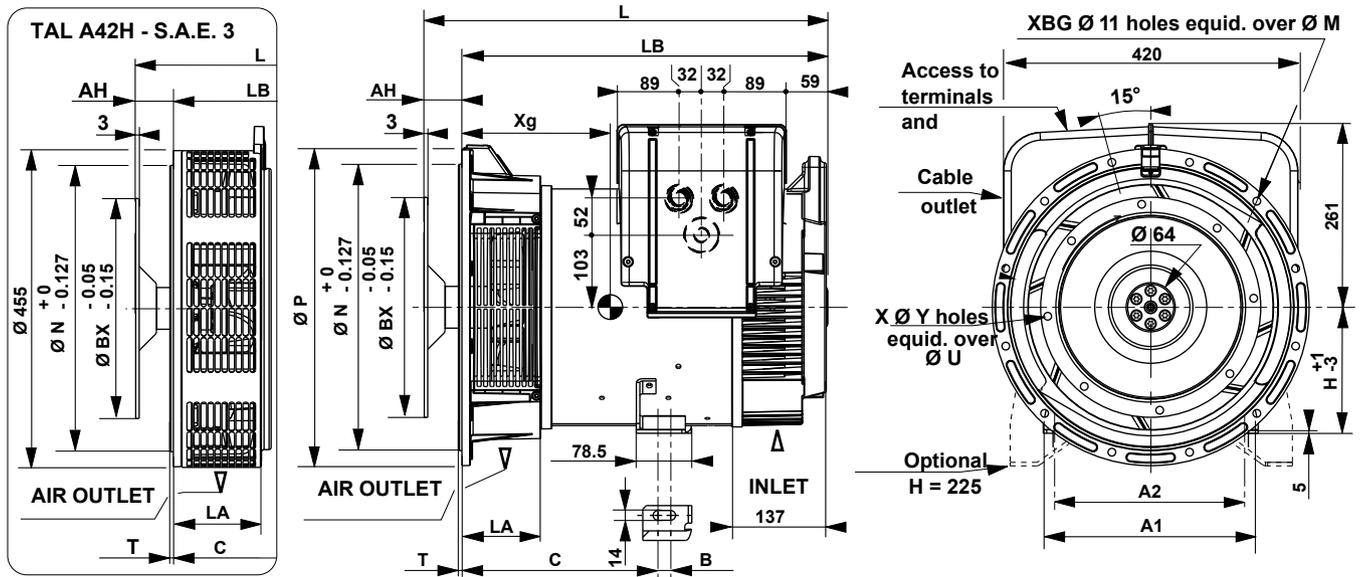
Starting motor 240V - 60Hz



Low Voltage Alternators - 4 pole

TAL-A42 - S Dedicated single-phase

Single bearing general arrangement



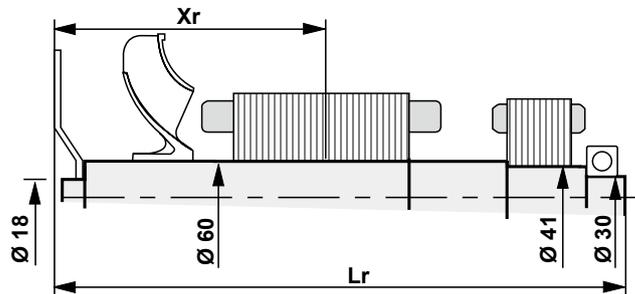
Dimensions (mm) and weight (kg)				
Type	L maxi	LB	Xg	Weight (kg)
TAL-A42-A-S	565	503	237	117
TAL-A42-B-S	565	503	242	122
TAL-A42-C-S	565	503	252	133
TAL-A42-D-S	610	548	275	165
TAL-A42-E-S	610	548	275	165
TAL-A42-F-S	650	588	287	181
TAL-A42-G-S	650	588	295	186
TAL-A42-H-S	680	618	310	187

Shaft height (mm)			Coupling		
	Standard	Option	Flange	3	4
H	180	225	Flex plate		
Feet length			11 1/2	x	-
C	260	299 (A, B, C) / 312.5	10	x	x
B	18	23	8	-	x
A1	307	400	7 1/2	-	x
A2	279	356			

Flange (mm)						
S.A.E.	P	N	M	XBG	T	LA
4	406	361.95	381	12	6	122
3	452	409.58	428.62	12	5	105.3
-	-	-	-	-	-	-

Flex plate (mm)					
S.A.E.	BX	U	X	Y	AH
11 1/2	352.42	333.38	8	11	39.6
10	314.32	295.28	8	11	53.8
8	263.52	244.48	6	11	62
7 1/2	241.3	222.25	8	9	30.2

Torsional data



Centre of gravity: Xr (mm), Rotor length: Lr (mm), Weight: M (kg), Moment of inertia: J (kgm ²): (4J = MD ²)																
Flex plate	S.A.E. 7 1/2				S.A.E. 8				S.A.E. 10				S.A.E. 11 1/2			
	Type	Xr	Lr	M	J	Xr	Lr	M	J	Xr	Lr	M	J	Xr	Lr	M
TAL-A42-A-S	279	526.2	44.1	0.216	277	558	44.4	0.220	274	549.8	44.9	0.211	272	535.6	45.4	0.244
TAL-A42-B-S	282	526.2	46.1	0.229	280	558	46.4	0.233	277	549.8	46.9	0.224	274	535.6	47.4	0.257
TAL-A42-C-S	287	526.2	50.1	0.255	286	558	50.5	0.258	283	549.8	50.9	0.249	281	535.6	51.4	0.282
TAL-A42-D-S	310	571.2	60.2	0.312	308	603	60.6	0.316	306	594.8	61	0.307	304	580.6	61.5	0.340
TAL-A42-E-S	310	571.2	60.2	0.312	308	603	60.6	0.316	306	594.8	61	0.307	304	580.6	61.5	0.340
TAL-A42-F-S	325	611.2	66.2	0.344	323	643	66.5	0.348	321	634.8	66.9	0.339	319	620.6	67.4	0.372
TAL-A42-G-S	330	611.2	69.2	0.364	328	643	69.5	0.367	326	634.8	69.9	0.358	324	620.6	70.4	0.391
TAL-A42-H-S	344	641.2	77.5	0.414	342	673	77.8	0.418	340	664.8	78.2	0.430	338	650.6	78.8	0.442

NOTE : Dimensions are for information only and may be subject to modifications. The torsional analysis of the transmission is imperative. All values are available upon request.



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