TAL 049

Low Voltage Alternator - 4 pole

730 to 1000 kVA - 50 Hz / 915 to 1250 kVA - 60 Hz
Electrical and mechanical data

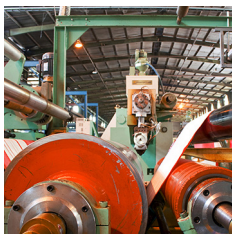
LEROY-SOMER™

Nidec
All for dreams

Adapted to needs

The TAL alternator range is designed to meet the needs of general applications such as prime power and stand-by.





Compliant with international standards

The TAL range complies with international standards and regulations: IEC 60034 and dérivative.
The range is designed, manufactured and marketed in an ISO 9001 and 14001 environment.

Electrical design

- Class H insulation
- Shunt excitation
- Low voltage winding:
  Three-phase 50 Hz: 380V - 400V - 415V - 440V / 220V - 230V - 240V
  60 Hz: 380V - 416V - 440V - 480V / 220V - 208V - 240V
- 6-terminal plates in 6-wire version or suitable for 12-wire option
- 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
- Standard direction of rotation: clockwise when looking at the drive end view (for anti-clockwise, derate the machine by 5%)

Excitation and regulation system suited to the application

	Excitation system				Regulation options		
	AVR	**SHUNT**	**AREP** (option)	**PMG** (option)	**UL$_{C/US}$**	**Remote voltage potentiometer**	**C.T. for paralleling**
Three-phase 6-wire	**R150**	Standard				√	
	R180		Standard	Standard		√	√
	D350	Option	Option	Option	√	√	√
Three-phase 12-wire	**R250**	Standard			√	√	
	R180		Standard	Standard		√	√
	D350		Option	Option	√	√	√

√ : Possible option

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

- IP Code IP 23
- Standard winding protection for non-harsh environments with relative humidity ≤ 95%

Available options

- Three-phase 12-wire with 7-terminal plates
- AREP or PMG excitation
- ULc/us
- Customized painting
- Space heaters
- Droop kit for alternator paralleling
- Stator sensors
- Winding 8 optimized for three-phase 380V - 416 V / 60 Hz
- Winding protection for harsh environments and relative humidity greater than 95% (system 2 - 4 without derating)

General characteristics

Insulation class	H
Winding pitch	2/3 (wind.6S - 6-wire / wind.6 - 12-wire)
Number of wires	6-wire (12-wire option)
Protection	IP 23
Altitude	≤ 1000 m
Overspeed	2250 R.P.M.
Air flow (m^3/s)	1
Air flow (m^3/s)	1.2
AREP Short-circuit current = 2.7 In : 5 second	

Excitation system 6-wire	SHUNT	AREP / PMG
AVR type	R150	R180
Excitation system 12-wire (option)	SHUNT	AREP / PMG
AVR type	R250	R180
Voltage regulation (*)	± 1 %	
Total Harmonic Distortion THD (**) in no-load	< 3.5 %	
Total Harmonic Distortion THD (**) in linear load	< 5 %	
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.

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	**730**	730	665	665	**665**	665	605	775	**775**	775	705	805	**805**	805	730
	kW	*584*	*584*	*584*	*532*	*532*	*532*	*532*	*484*	*620*	*620*	*620*	*564*	*644*	*644*	*644*	*584*
TAL 049 C	kVA	820	**820**	820	810	745	**745**	745	735	870	**870**	870	860	910	**910**	910	890
	kW	*656*	*656*	*656*	*648*	*596*	*596*	*596*	*588*	*696*	*696*	*696*	*688*	*728*	*728*	*728*	*712*
TAL 049 D	kVA	910	**910**	910	820	830	**830**	830	745	965	**965**	965	870	1010	**1010**	1010	900
	kW	*728*	*728*	*728*	*656*	*664*	*664*	*664*	*596*	*772*	*772*	*772*	*696*	*808*	*808*	*808*	*720*
TAL 049 E	kVA	1000	**1000**	1000	950	910	**910**	910	865	1060	**1060**	1060	1005	1100	**1100**	1100	1045
	kW	*800*	*800*	*800*	*760*	*728*	*728*	*728*	*692*	*848*	*848*	*848*	*804*	*880*	*880*	*880*	*836*

(*) 12-wire option

Ratings 60 Hz - 1800 R.P.M.

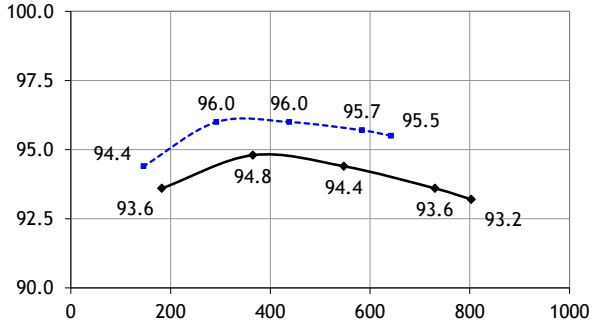
kVA / kW - P.F. = 0.8

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		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**	660	725	765	**835**	770	845	890	**970**	800	875	925	**1005**
	kW	*580*	*636*	*672*	*732*	*528*	*580*	*612*	*668*	*616*	*676*	*712*	*776*	*640*	*700*	*740*	*804*
TAL 049 C	kVA	815	890	940	**1025**	740	810	855	**935**	865	945	995	**1085**	895	980	1040	**1130**
	kW	*652*	*712*	*752*	*820*	*592*	*648*	*684*	*748*	*692*	*756*	*796*	*868*	*716*	*784*	*832*	*904*
TAL 049 D	kVA	905	990	1045	**1140**	825	900	950	**1035**	960	1050	1110	**1210**	1000	1090	1155	**1255**
	kW	*724*	*792*	*836*	*912*	*660*	*720*	*760*	*828*	*768*	*840*	*888*	*968*	*800*	*872*	*924*	*1004*
TAL 049 E	kVA	990	1083	1146	**1250**	900	985	1045	**1140**	1050	1150	1215	**1325**	1089	1192	1260	**1375**
	kW	*792*	*866*	*917*	*1000*	*720*	*788*	*836*	*912*	*840*	*920*	*972*	*1060*	*871*	*954*	*1008*	*1100*

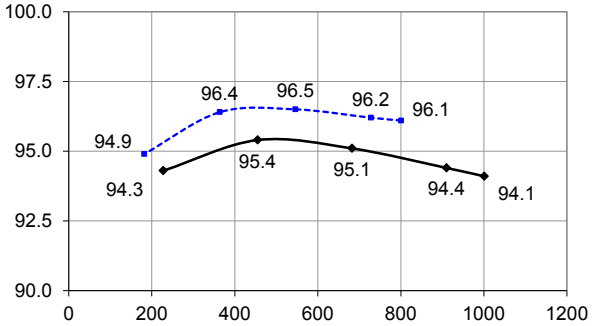
(*) 12-wire option

Efficiencies 400 V 50 Hz (— P.F.: 0.8) (····· P.F.: 1)

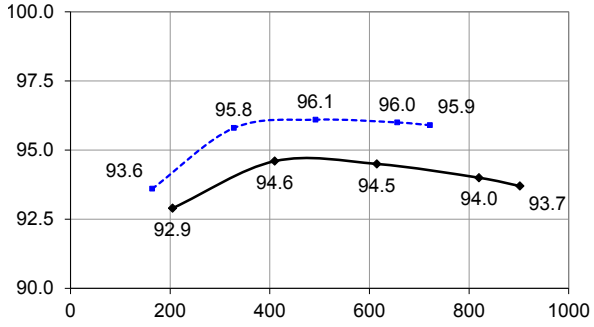
TAL 049B



TAL 049D



TAL 049C



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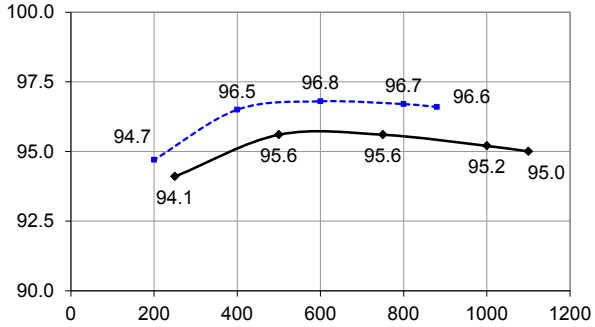


Reactances (%). Time constants (ms) - Class H / 400 V

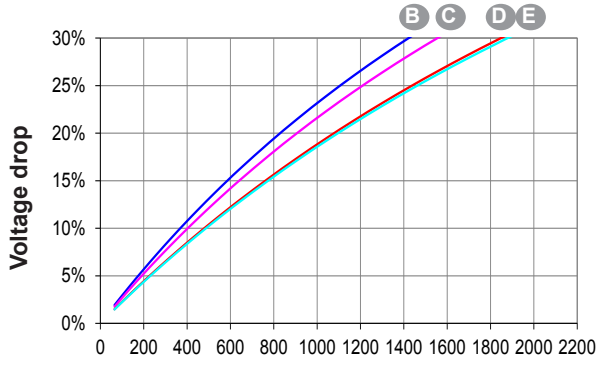
		B	C	D	E
Kcc	Short-circuit ratio	0.28	0.37	0.28	0.38
Xd	Direct-axis synchro. reactance unsaturated	403	330	402	348
Xq	Quadrature-axis synchro. reactance unsaturated	205	168	205	177
T'do	No-load transient time constant	2028	2074	2108	2153
X'd	Direct-axis transient reactance saturated	19.8	15.9	19	16.1
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	0.82	0.66	0.79	0.67
X2	Negative sequence reactance saturated	17.1	13.5	16.1	13.5
Ta	Armature time constant	15	15	15	15

Other class H / 400 V data

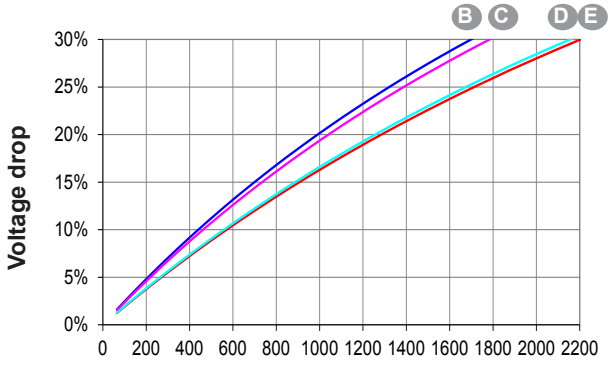
io (A)	No-load excitation current SHUNT/AREP	0.81	1.13	0.83	1.01
ic (A)	On-load excitation current SHUNT/AREP	4.15	4.76	4.15	3.9
uc (V)	On-load excitation voltage SHUNT/AREP	47.1	53.8	46.9	44.1
ms	Response time (ΔU = 20% transient)	500	500	500	500
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) SHUNT*	1084	1387	1412	1671
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) AREP*	1301	1664	1695	2002
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 $_{LAG}$	18.1	18.5	17.5	18.6
%	Transient ΔU (on-load 4/4) AREP - P.F.: 0.8 $_{LAG}$	16.3	16.6	15.7	16.7
W	No-load losses	7774	10303	8702	10355
W	Heat dissipation	39606	41702	42589	39986

* P.F. = 0.6

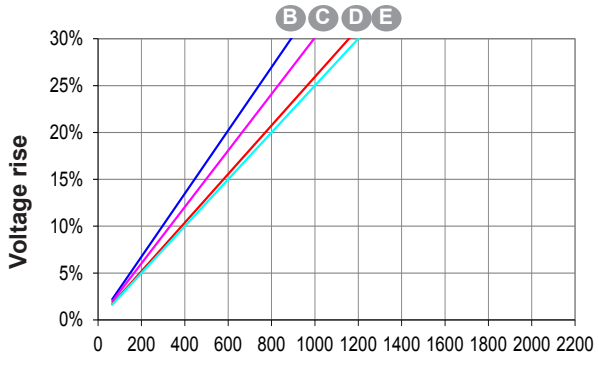
Transient voltage variation 400 V - 50 Hz



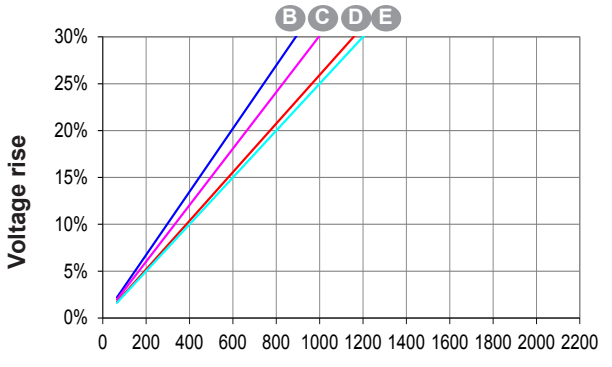
Phase loading (SHUNT) - kVA at P.F. = 0.8



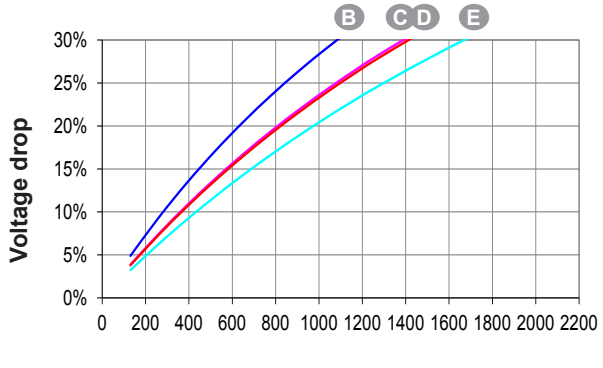
Phase loading (AREP) - kVA at P.F. = 0.8



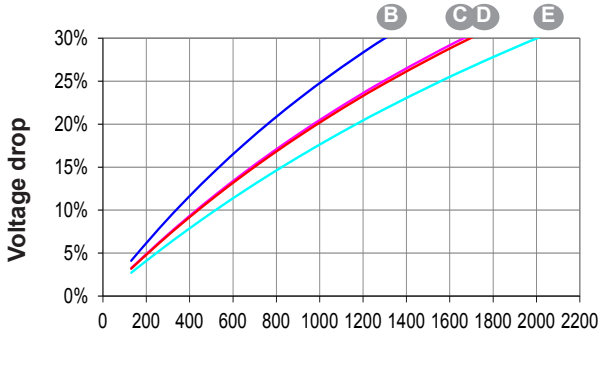
Load shedding (SHUNT) - kVA at P.F. = 0.8



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



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

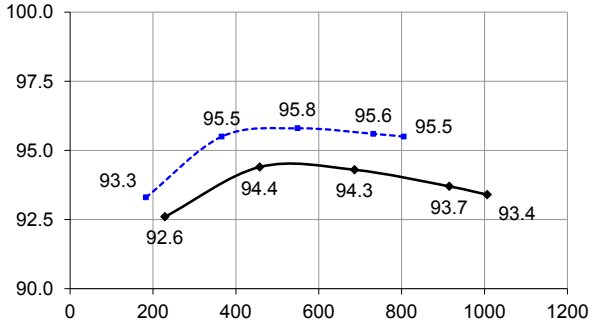


Motor starting (AREP)
Locked rotor kVA at P.F. = 0.6

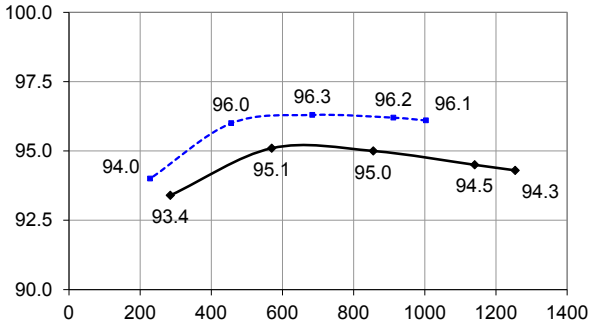
1) For a starting P.F. other than 0.6, the starting kVA must be multiplied by K = Sine P.F. / 0.8
2) For voltages other than 400V (Y), 230V (Δ) at 50 Hz, then kVA must be multiplied by $(400/U)^2$ or $(230/U)^2$.

Efficiencies 480 V - 60 Hz (— P.F.: 0.8) (····· P.F.: 1)

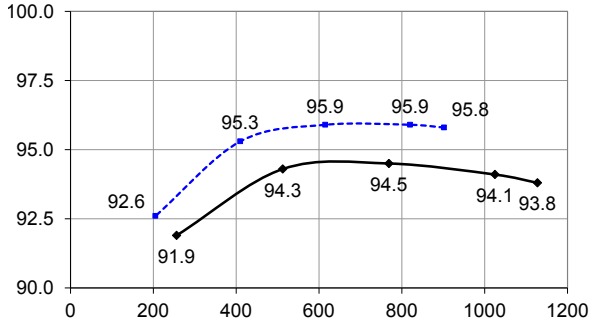
TAL 049B



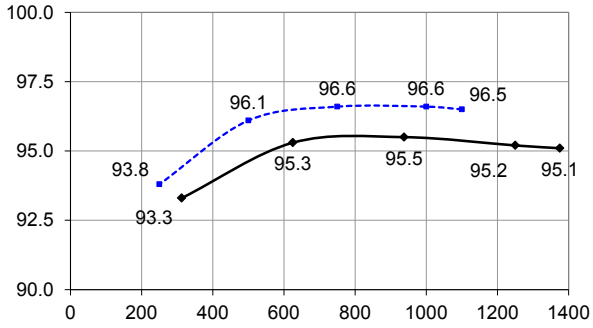
TAL 049D



TAL 049C



TAL 049E

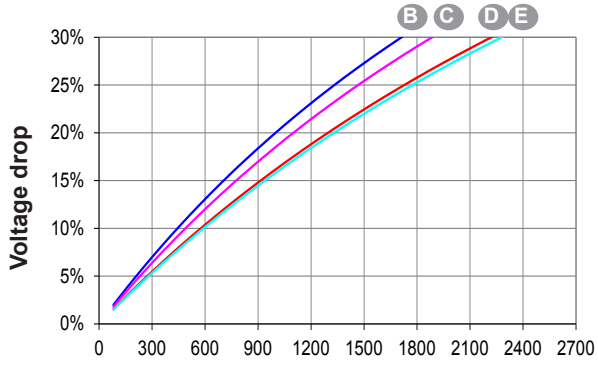


Reactances (%). Time constants (ms) - Class H / 480 V

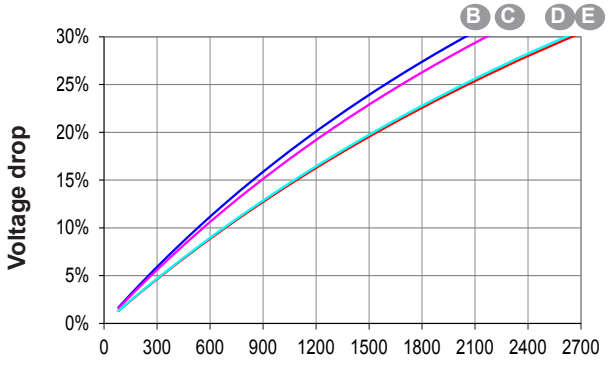
		B	C	D	E
Kcc	Short-circuit ratio	0.27	0.36	0.27	0.36
Xd	Direct-axis synchro. reactance unsaturated	421	344	419	363
Xq	Quadrature-axis synchro. reactance unsaturated	214	175	214	185
T'do	No-load transient time constant	2028	2074	2108	2153
X'd	Direct-axis transient reactance saturated	20.7	16.6	19.9	16.8
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	0.86	0.69	0.82	0.7
X2	Negative sequence reactance saturated	17.8	14.1	16.8	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	4.87	4.26	3.98
uc (V)	On-load excitation voltage SHUNT/AREP	48.6	55.3	48.3	45.1
ms	Response time (ΔU = 20% transient)	500	500	500	500
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) SHUNT*	1300	1673	1693	2002
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) AREP*	1560	2007	2031	2414
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 $_{LAG}$	18.7	18.9	18.1	19.1
%	Transient ΔU (on-load 4/4) AREP - P.F.: 0.8 $_{LAG}$	16.8	17	16.3	17.1
W	No-load losses	12224	15725	13536	15739
W	Heat dissipation	48497	51122	52250	49398

* P.F. = 0.6

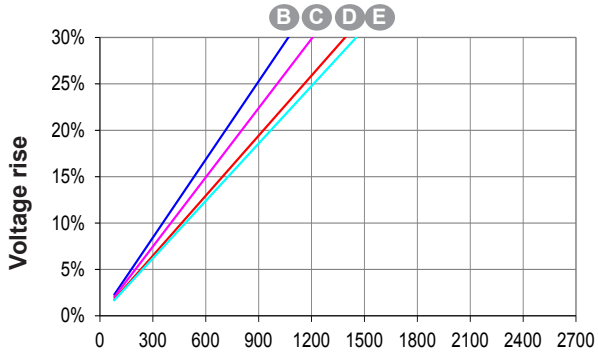
Transient voltage variation 480 V - 60 Hz



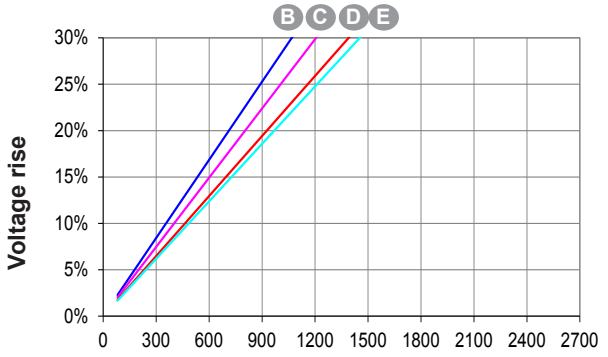
Phase loading (SHUNT) - kVA at P.F. = 0.8



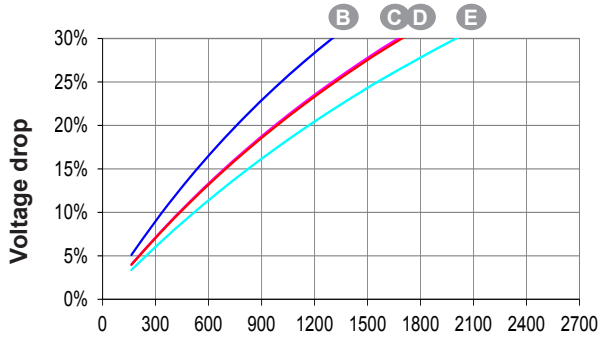
Phase loading (AREP) - kVA at P.F. = 0.8



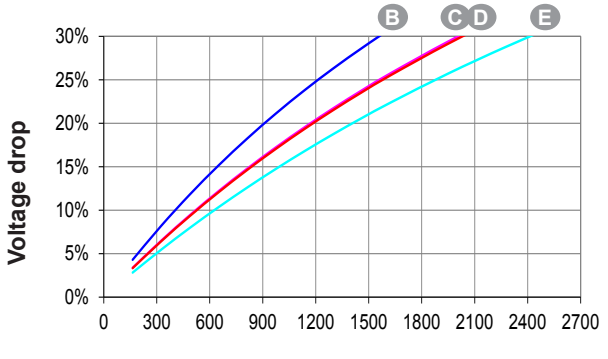
Load shedding (SHUNT) - kVA at P.F. = 0.8



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



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



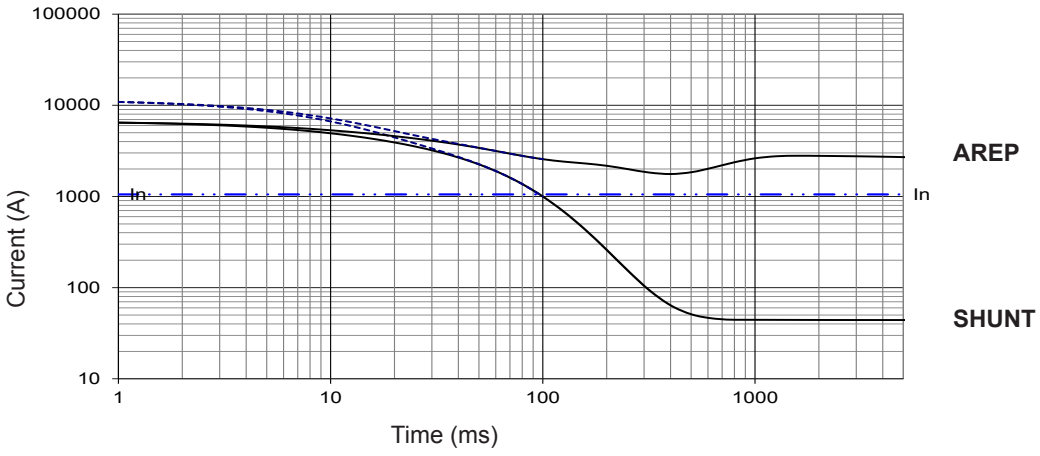
Motor starting (AREP)
Locked rotor kVA at P.F. = 0.6

1) For a starting P.F. other than 0.6, the starting kVA must be multiplied by K = Sine P.F. / 0.8
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 $(240/U)^2$.

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

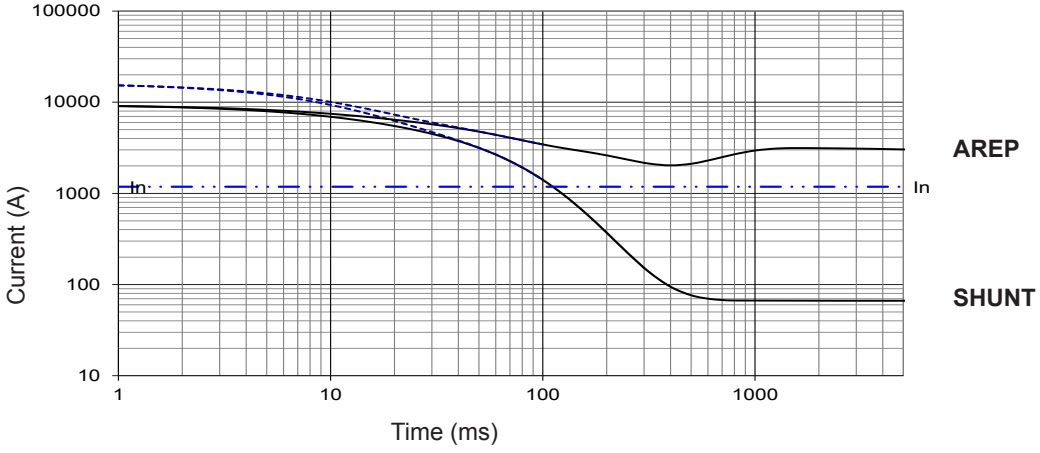
TAL 049 B

Symmetrical ——
Asymmetrical - - -



TAL 049 C

Symmetrical ——
Asymmetrical - - -

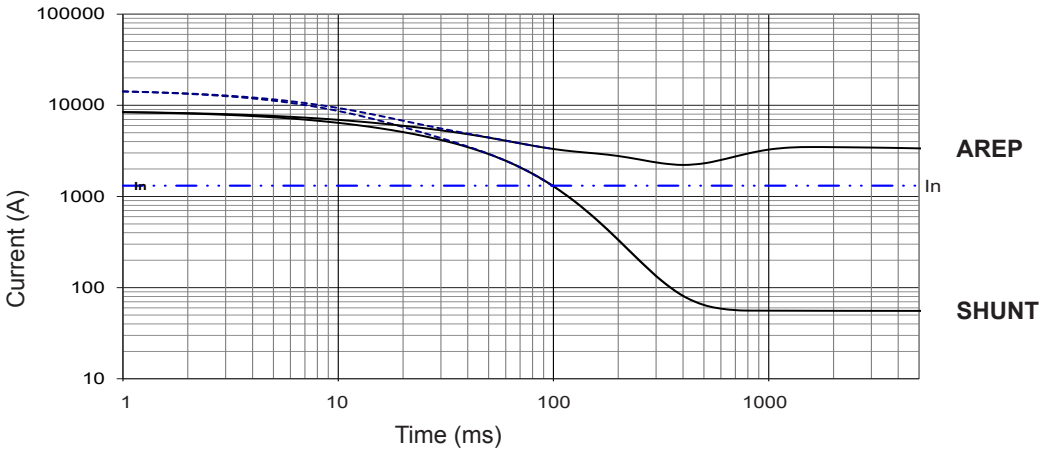


Influence due to connection
For (Δ) connection, use the following multiplication factor:
- Current value x 1.732.

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

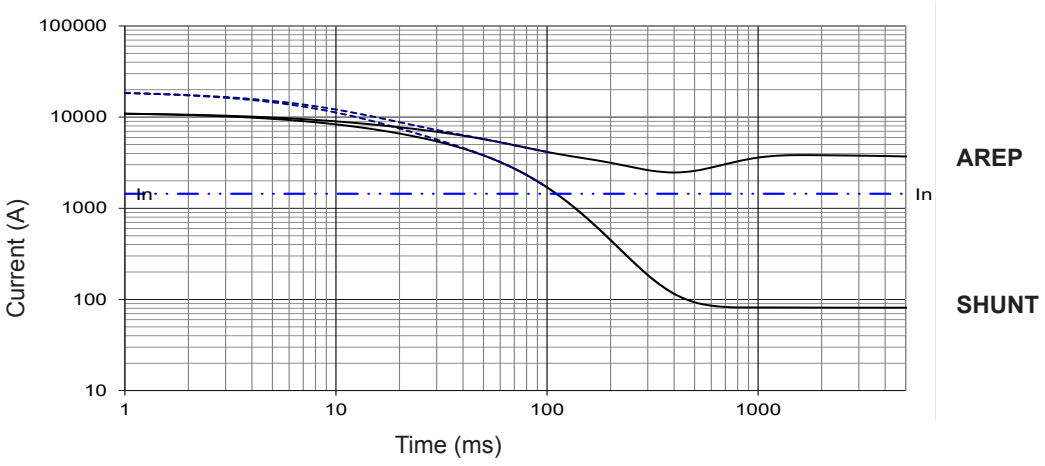
TAL 049 D

Symmetrical ——
Asymmetrical - - -



TAL 049 E

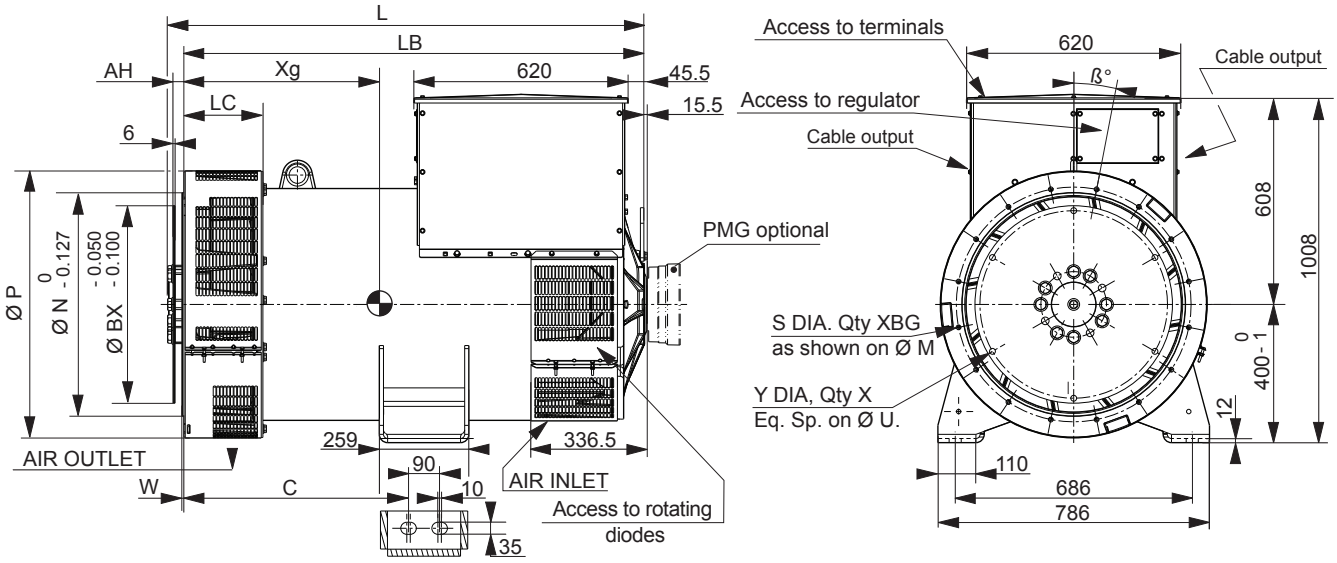
Symmetrical ——
Asymmetrical - - -



Influence due to short-circuit
Curves are based on a three-phase short-circuit.
For other types of short-circuit,
use the following multiplication factors.

	3 - phase	2 - phase L / L	1 - phase L / N
Instantaneous (max.)	1	0.87	1.3
Continuous	1	1.5	2.2
Maximum duration		1.5	

Single bearing general arrangement



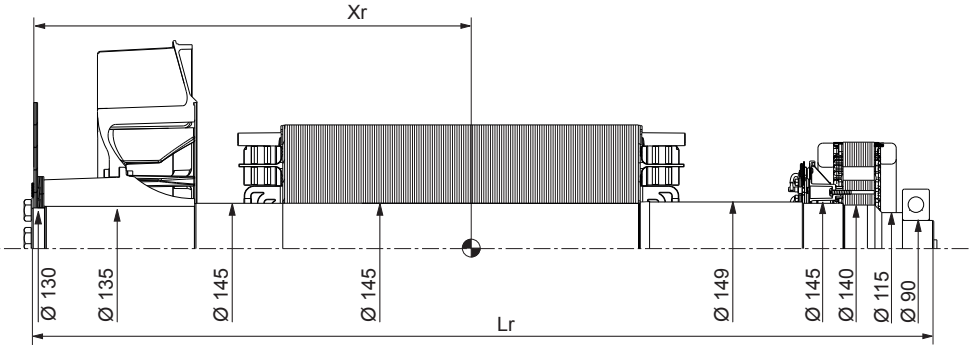
Dimensions (mm) and weight					
Type	L without PMG	LB	C	Xg	Weight (kg)
TAL 049 B	1372	1331	650	629	1574
TAL 049 C	1372	1331	650	636	1635
TAL 049 D	1462	1421	650	673	1788
TAL 049 E	1462	1421	650	681	1837

Coupling		
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 S.A.E 00		X

Flange (mm)							
S.A.E.	P	N	M	LC	XBG	W	ß°
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 data



Centre of gravity: Xr (mm), Rotor length: Lr (mm), Weight: M (kg), Moment of inertia: J (kgm²): (4J = MD²)								
Flex plate	S.A.E. 14				S.A.E. 18			
Type	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. The torsional analysis of the transmission is imperative. All values are available upon request.

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Capital social : 65 800 512 €, RCS Angoulême 338 567 258.

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