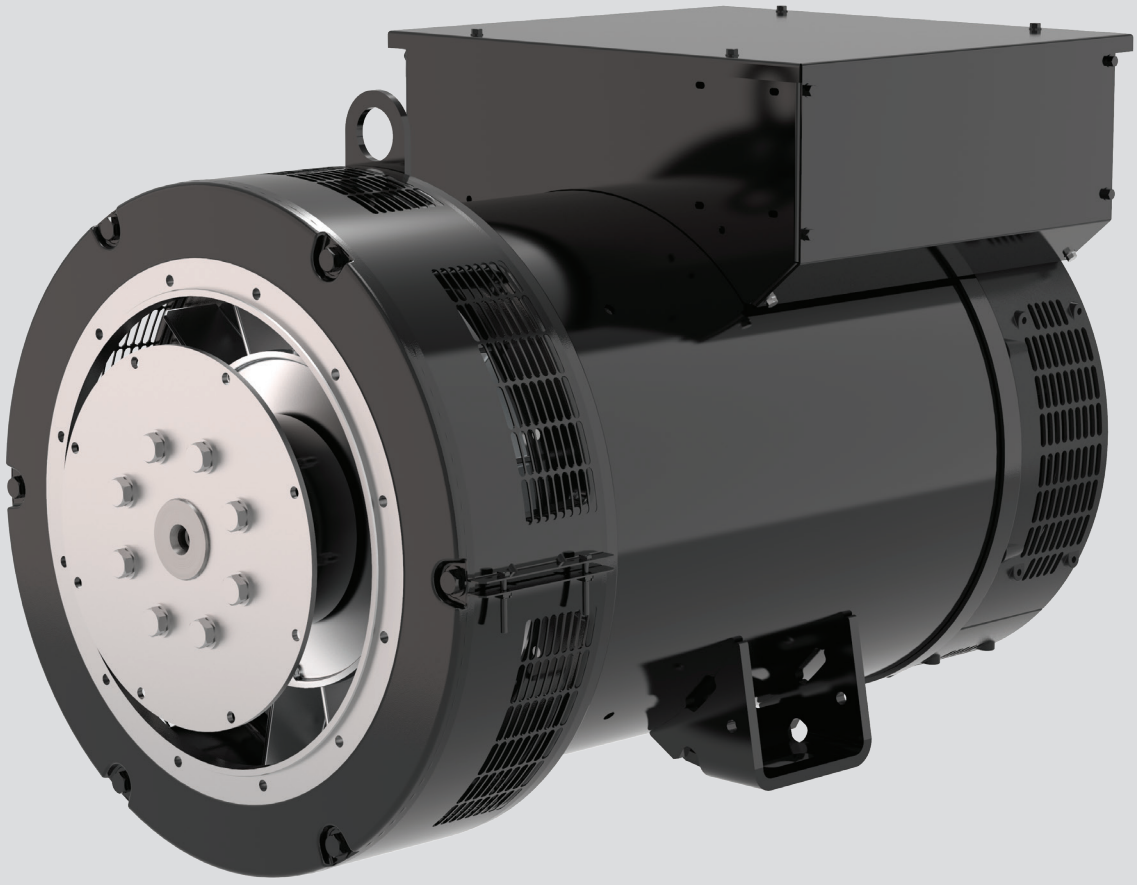


TAL 046

Low Voltage Alternator - 4 pole

230 to 365 kVA - 50 Hz / 288 to 438 kVA - 60 Hz
Electrical and mechanical data

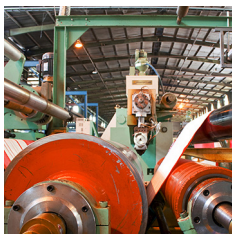
LEROY-SOMER™

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
- Direction of rotation: clockwise and counterclockwise without derating

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*	**R150**	Standard				√	
	R250	Option			√	√	√
	R180		Standard	Standard		√	√
	D350		Option	Option	√	√	√

√ : Possible option *with larger terminal box

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 9-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): for TAL 046 H apply a derating coefficient of 0.97

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 (m³/s)	0.48
Air flow (m³/s)	0.58
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	R150	R180
Voltage regulation (*)	± 1 %	
Total Harmonic Distortion THD (**) in no-load	< 2.5 %	
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.				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		230V	220V	230V	240V		230V	220V	230V	240V		230V	220V	230V	240V		230V
YY (*)			200V		220V			200V		220V			200V		220V			200V		220V	
ΔΔ (*)						230V					230V					230V					230V
TAL 046 C	kVA	230	**230**	230	219	138	209	**209**	209	199	126	244	**244**	244	232	146	253	**253**	253	241	152
	kW	*184*	*184*	*184*	*175*	*110*	*167*	*167*	*167*	*159*	*101*	*195*	*195*	*195*	*186*	*117*	*202*	*202*	*202*	*193*	*122*
TAL 046 D	kVA	240	**250**	250	238	150	218	**228**	228	217	137	254	**265**	265	252	159	264	**275**	275	262	165
	kW	*192*	*200*	*200*	*190*	*120*	*175*	*182*	*182*	*174*	*110*	*204*	*212*	*212*	*202*	*127*	*211*	*220*	*220*	*210*	*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	314	198
	kW	*232*	*240*	*240*	*228*	*144*	*211*	*218*	*218*	*207*	*131*	*246*	*254*	*254*	*242*	*153*	*255*	*264*	*264*	*251*	*158*
TAL 046 G	kVA	325	**325**	325	309	195	296	**296**	296	281	177	345	**345**	345	328	207	360	**360**	360	340	215
	kW	*260*	*260*	*260*	*247*	*156*	*237*	*237*	*237*	*225*	*142*	*276*	*276*	*276*	*262*	*166*	*288*	*288*	*288*	*272*	*172*
TAL 046 H	kVA	350	**365**	365	347	210	318	**332**	332	316	191	371	**387**	387	368	223	385	**400**	400	382	231
	kW	*280*	*292*	*292*	*278*	*168*	*255*	*266*	*266*	*253*	*153*	*297*	*310*	*310*	*294*	*178*	*308*	*320*	*320*	*306*	*185*

(*) 12-wire option

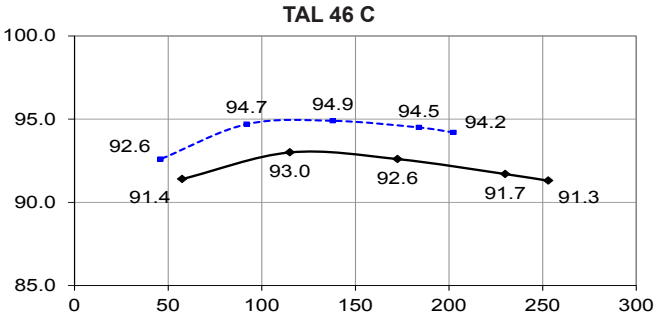
Ratings 60 Hz - 1800 R.P.M.

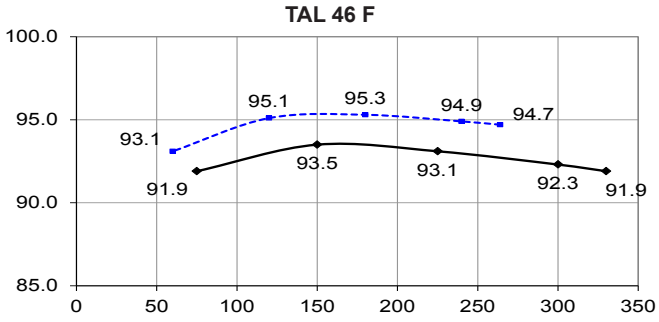
kVA / kW - P.F. = 0.8

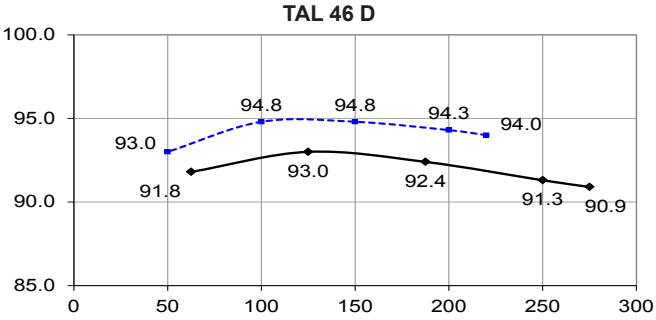
Duty / T° C		Continuous / 40 °C					Continuous / 40 °C					Stand-by / 40 °C					Stand-by / 27 °C				
Class / T° K		H / 125° K					F / 105° K					H / 150° K					H / 163° K				
Phase		3 ph.				1 ph.	3 ph.				1 ph.	3 ph.				1 ph.	3 ph.				1 ph.
Y		380V	416V	440V	480V		380V	416V	440V	480V		380V	416V	440V	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 C	kVA	226	250	262	**288**	152	206	228	238	**262**	138	240	265	278	**305**	161	250	275	288	**316**	167
	kW	*181*	*200*	*210*	*230*	*122*	*165*	*182*	*190*	*210*	*110*	*192*	*212*	*222*	*244*	*129*	*200*	*220*	*230*	*253*	*134*
TAL 046 D	kVA	245	265	280	**313**	165	223	241	255	**285**	150	260	281	297	**332**	175	270	292	308	**344**	182
	kW	*196*	*212*	*224*	*250*	*132*	*178*	*193*	*204*	*228*	*120*	*208*	*225*	*238*	*266*	*140*	*216*	*234*	*246*	*275*	*146*
TAL 046 E	kVA	275	300	315	**344**	182	250	273	287	**313**	166	292	318	334	**365**	193	303	330	347	**378**	200
	kW	*220*	*240*	*252*	*275*	*146*	*200*	*218*	*230*	*250*	*133*	*234*	*254*	*267*	*292*	*154*	*242*	*264*	*278*	*302*	*160*
TAL 046 F	kVA	290	315	340	**360**	200	264	287	309	**328**	182	307	334	360	**382**	212	320	347	374	**400**	220
	kW	*232*	*252*	*272*	*288*	*160*	*211*	*230*	*247*	*262*	*146*	*246*	*267*	*288*	*306*	*170*	*256*	*278*	*299*	*320*	*176*
TAL 046 G	kVA	315	345	365	**406**	215	287	314	332	**369**	196	334	366	387	**430**	228	347	380	402	**447**	237
	kW	*252*	*276*	*292*	*325*	*172*	*230*	*251*	*266*	*295*	*157*	*267*	*293*	*310*	*344*	*182*	*278*	*304*	*322*	*358*	*190*
TAL 046 H	kVA	345	375	400	**438**	231	314	341	364	**399**	210	366	398	424	**464**	245	380	413	440	**480**	254
	kW	*276*	*300*	*320*	*350*	*185*	*251*	*273*	*291*	*319*	*168*	*293*	*318*	*339*	*371*	*196*	*304*	*330*	*352*	*384*	*203*

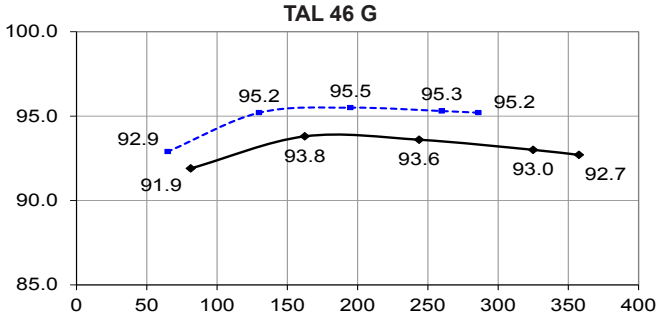
(*) 12-wire option

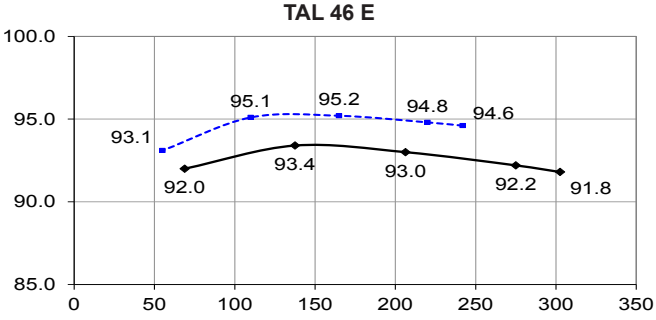
Efficiencies 400 V - 50 Hz (— P.F.: 0.8) (····· P.F.: 1)

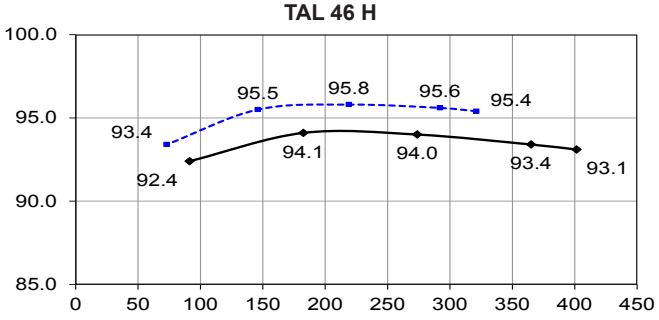












Reactances (%). Time constants (ms) - Class H / 400 V

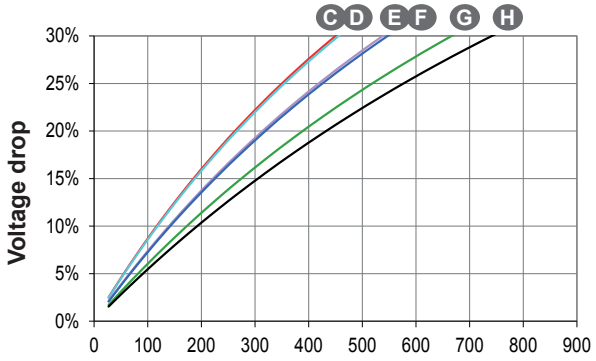
		C	D	E	F	G	H
Kcc	Short-circuit ratio	0.37	0.34	0.37	0.4	0.45	0.43
Xd	Direct-axis synchro. reactance unsaturated	340	370	347	335	297	303
Xq	Quadrature-axis synchro. reactance unsaturated	173	188	177	171	151	154
T'do	No-load transient time constant	1983	1983	2018	2033	2072	2093
X'd	Direct-axis transient reactance saturated	17.1	18.6	17.1	16.5	14.3	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	13.7	13.2	11.4	11.6
T"d	Subtransient time constant	10	10	10	10	10	10
X"q	Quadrature-axis subtransient reactance saturated	17.4	18.9	17.2	16.4	14.1	14.2
Xo	Zero sequence reactance	0.71	0.77	0.71	0.68	0.59	0.6
X2	Negative sequence reactance saturated	15.6	16.9	15.5	14.8	12.8	12.9
Ta	Armature time constant	15	15	15	15	15	15

Other class H / 400 V data

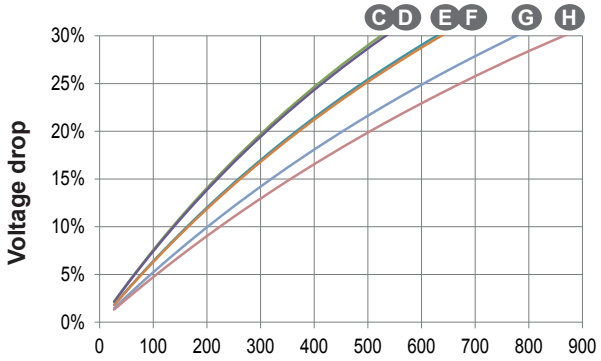
io (A)	No-load excitation current SHUNT/AREP	1.01	1.01	1.1	1.1	1.06	1.06
ic (A)	On-load excitation current SHUNT/AREP	3.84	4.14	3.99	3.64	3.63	3.63
uc (V)	On-load excitation voltage SHUNT/AREP	37.4	40.2	55.6	46.2	42.1	41.9
ms	Response time (ΔU = 20% transient)	500	500	500	500	500	500
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) SHUNT*	372	371	444	445	556	618
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) AREP*	446	447	533	534	667	741
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 $_{LAG}$	18	19.1	18	19.1	17.4	17.4
%	Transient ΔU (on-load 4/4) AREP - P.F.: 0.8 $_{LAG}$	15.8	16.8	16.2	17.2	17.3	15.4
W	No-load losses	3297	3297	3625	4013	4541	4750
W	Heat dissipation	16562	18869	18504	19800	19303	20484

* P.F. = 0.6

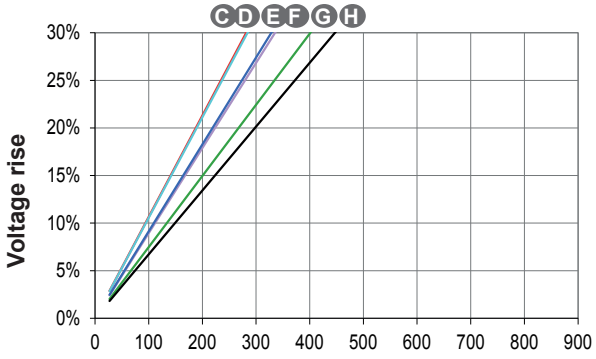
Transient voltage variation 400 V - 50 Hz



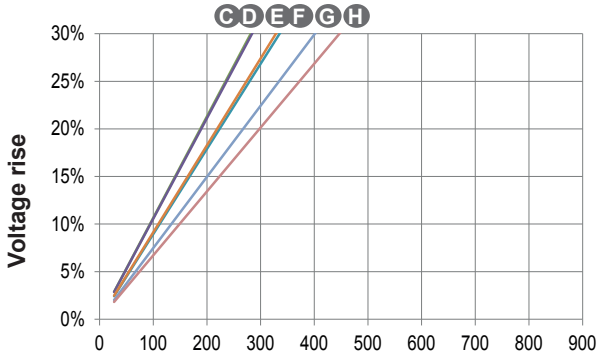
Phase loading (SHUNT) - kVA at P.F. = 0.8



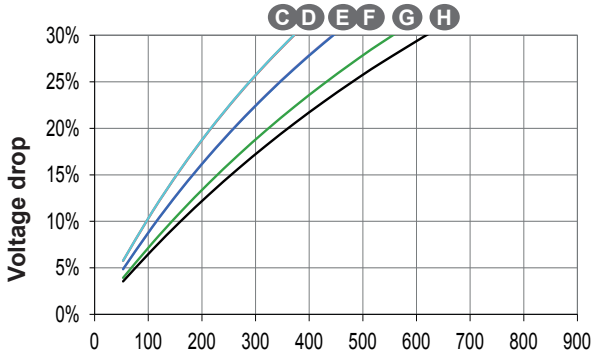
Phase loading (AREP) - kVA at P.F. = 0.8



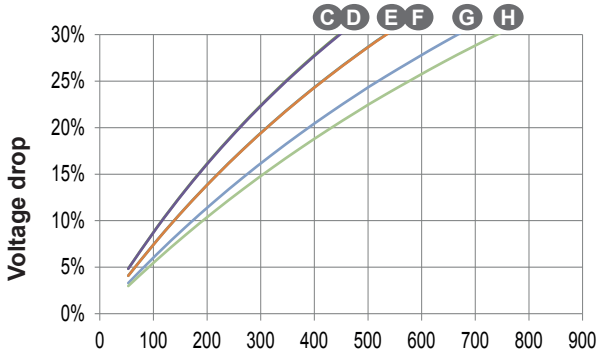
Load shedding (SHUNT) - kVA at P.F. = 0.8



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



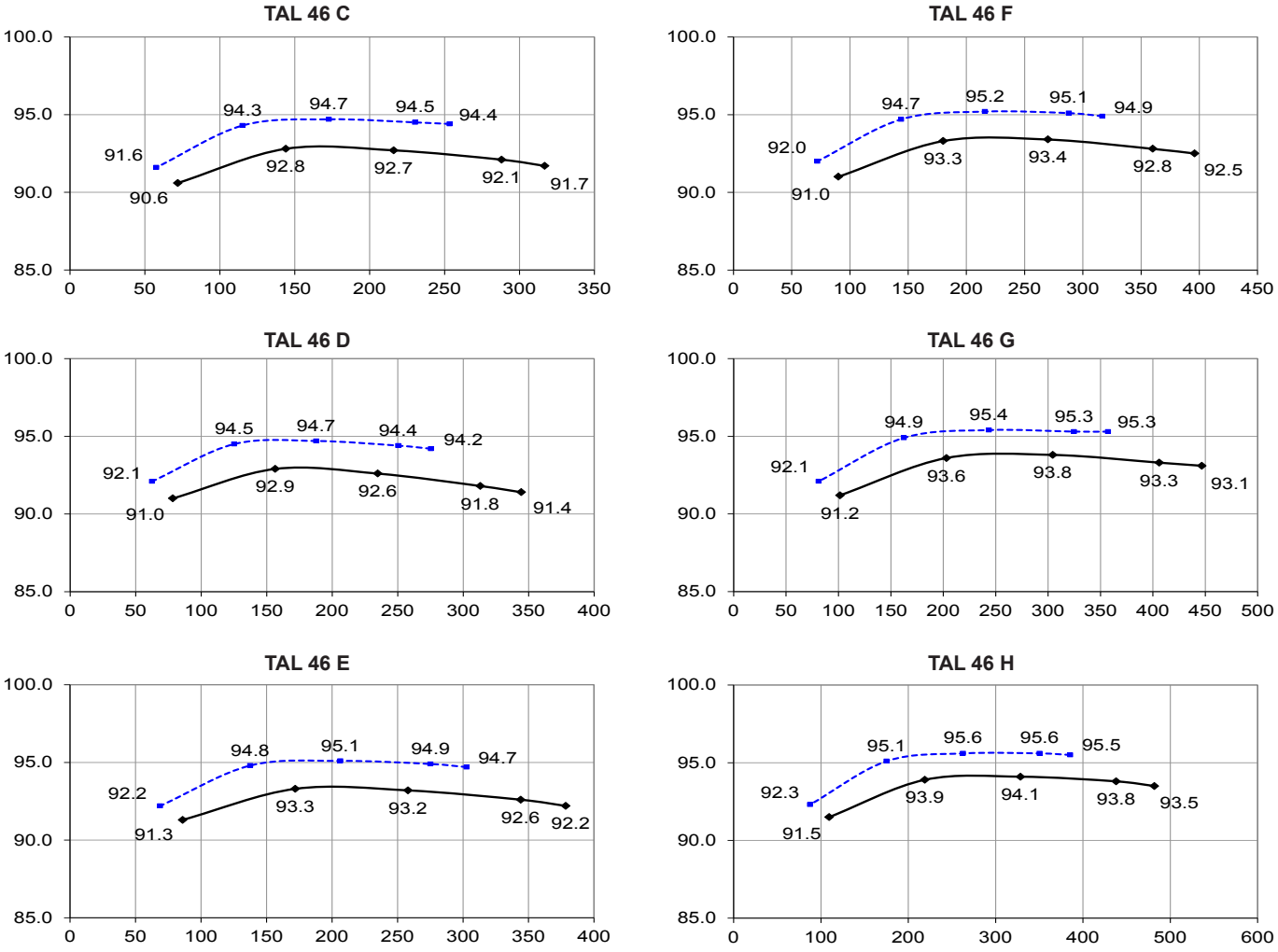
Motor starting (SHUNT)
Locked rotor kVA at P.F. = 0.6



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)



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

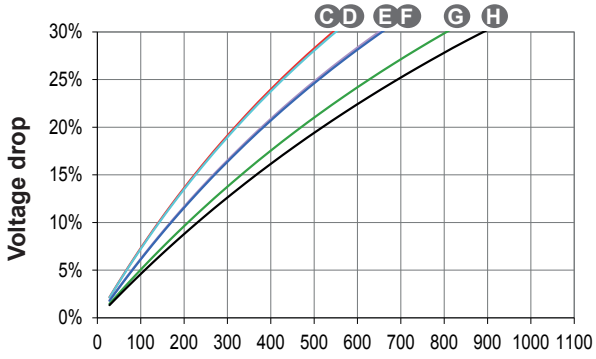
		C	D	E	F	G	H
Kcc	Short-circuit ratio	0.36	0.33	0.35	0.4	0.43	0.43
Xd	Direct-axis synchro. reactance unsaturated	355	386	361	335	309	303
Xq	Quadrature-axis synchro. reactance unsaturated	181	197	184	171	157	154
T'do	No-load transient time constant	1983	1983	2018	2033	2072	2093
X'd	Direct-axis transient reactance saturated	17.9	19.4	17.9	16.5	14.9	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	14.3	13.2	11.9	11.6
T"d	Subtransient time constant	10	10	10	10	10	10
X"q	Quadrature-axis subtransient reactance saturated	18.1	19.7	18	16.4	14.7	14.2
Xo	Zero sequence reactance	0.74	0.81	0.74	0.68	0.62	0.6
X2	Negative sequence reactance saturated	16.2	17.6	16.2	14.8	13.3	12.9
Ta	Armature time constant	15	15	15	15	15	15

Other class H / 480 V data

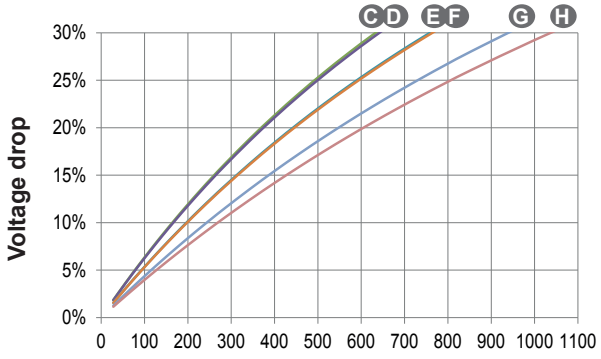
io (A)	No-load excitation current SHUNT/AREP	1.01	1.01	1.03	1.1	1.1	1.06
ic (A)	On-load excitation current SHUNT/AREP	3.91	4.21	4.03	3.91	3.69	3.56
uc (V)	On-load excitation voltage SHUNT/AREP	38.3	41.1	56.7	45.5	42.9	41.3
ms	Response time (ΔU = 20% transient)	500	500	500	500	500	500
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) SHUNT*	446	448	532	534	665	742
kVA	Start (ΔU = 20% cont. or ΔU = 30% trans.) AREP*	537	536	639	640	798	889
%	Transient ΔU (on-load 4/4) SHUNT - P.F.: 0.8 $_{LAG}$	18.5	19.6	18.5	19.1	17.8	17.4
%	Transient ΔU (on-load 4/4) AREP - P.F.: 0.8 $_{LAG}$	16.3	17.3	16.7	17.2	16	15.7
W	No-load losses	4958	4958	5412	5935	6673	6978
W	Heat dissipation	19674	22244	21910	22085	23012	23141

* P.F. = 0.6

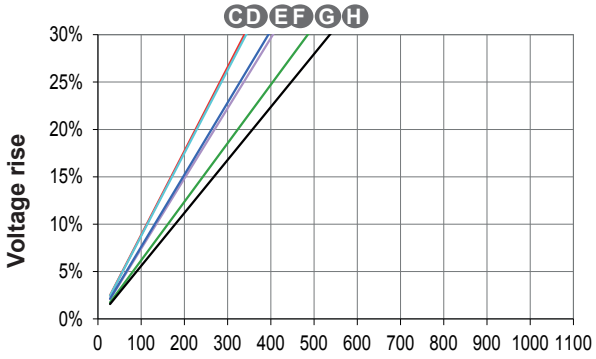
Transient voltage variation 480 V - 60 Hz



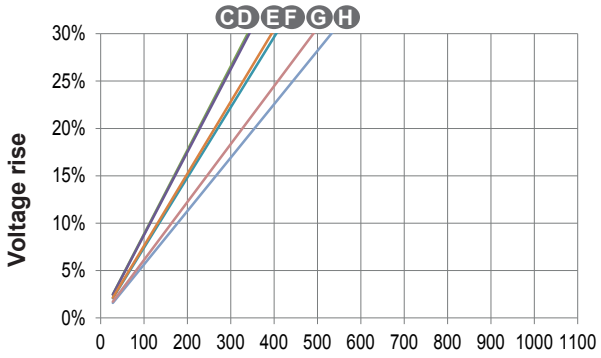
Phase loading (SHUNT) - kVA at P.F. = 0.8



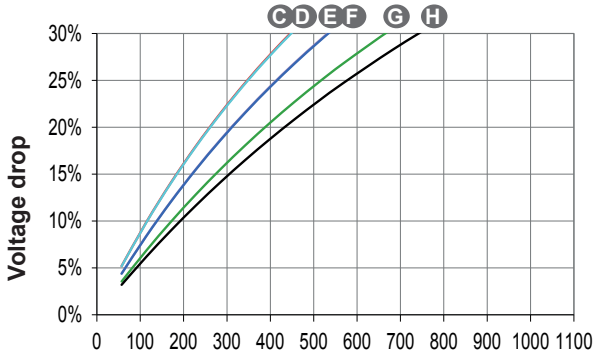
Phase loading (AREP) - kVA at P.F. = 0.8



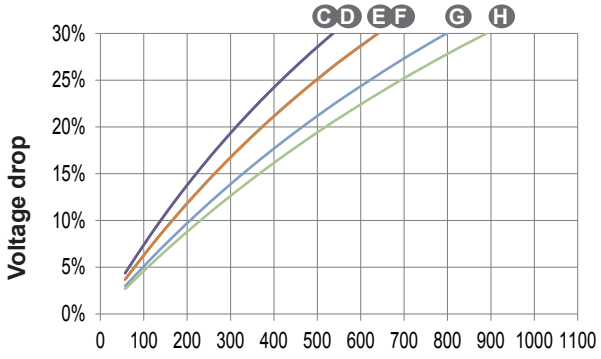
Load shedding (SHUNT) - kVA at P.F. = 0.8



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



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



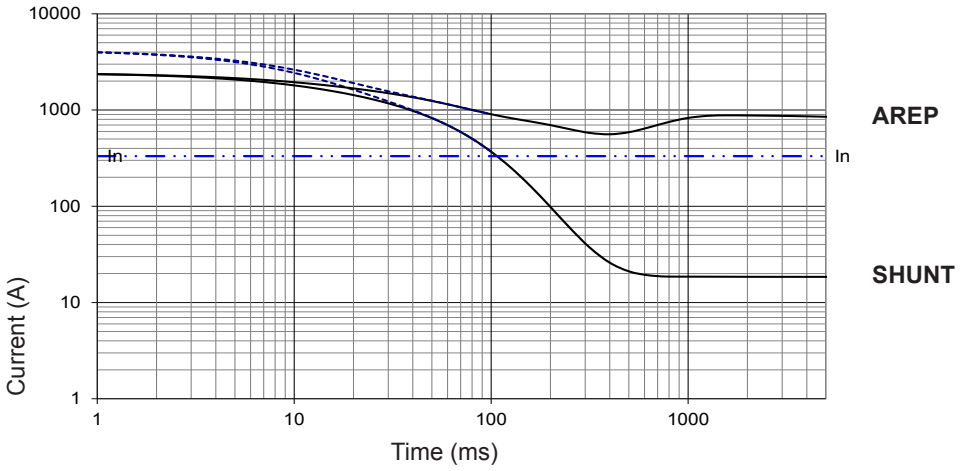
Motor starting (AREP)
Locked rotor kVA at P.F. = 0.6

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)

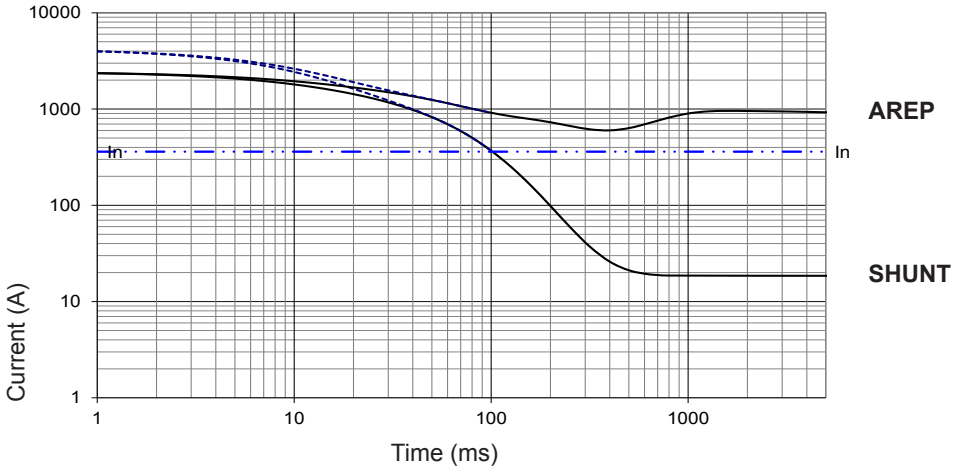
TAL 046 C

Symmetrical ——
Asymmetrical - - -



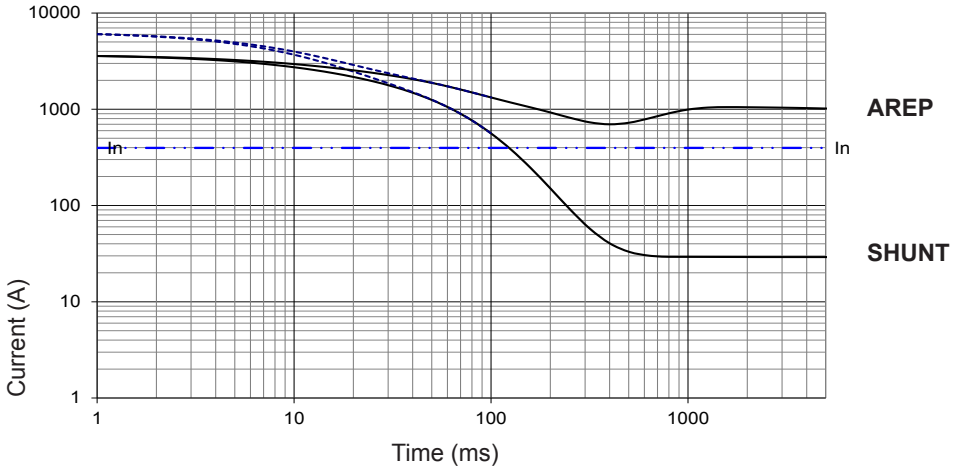
TAL 046 D

Symmetrical ——
Asymmetrical - - -



TAL 046 E

Symmetrical ——
Asymmetrical - - -

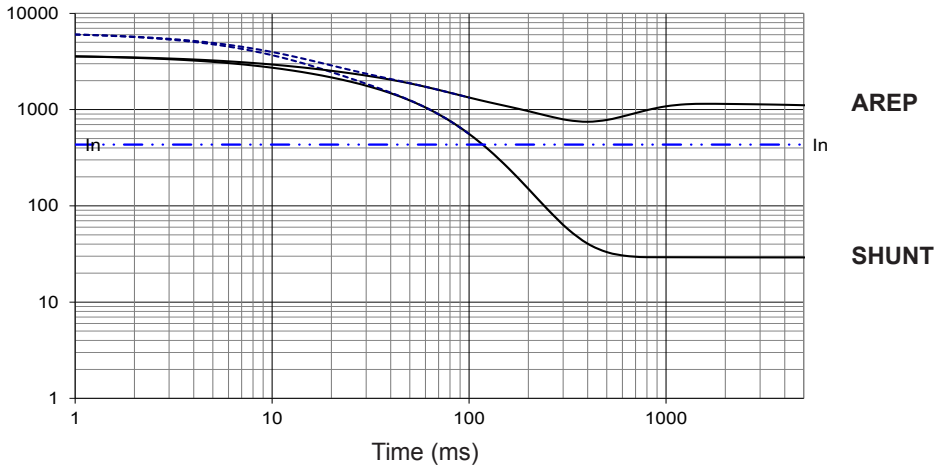


Influence due to connection
For (Δ) connection, use the following multiplication factor:
- Current value x 1.732.

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

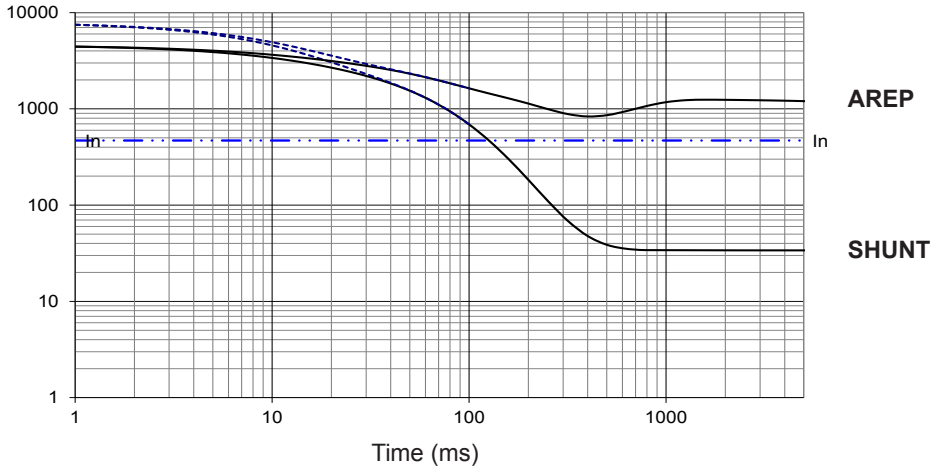
TAL 046 F

Symmetrical ——
Asymmetrical - - -



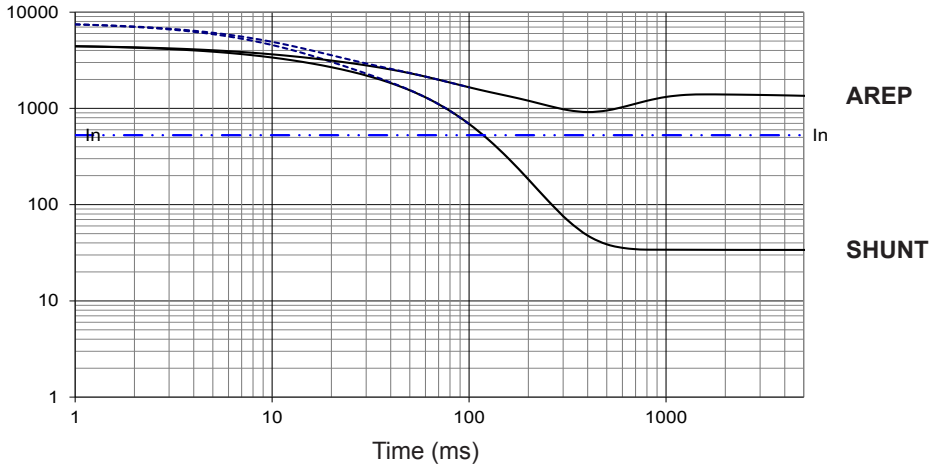
TAL 046 G

Symmetrical ——
Asymmetrical - - -



TAL 046 H

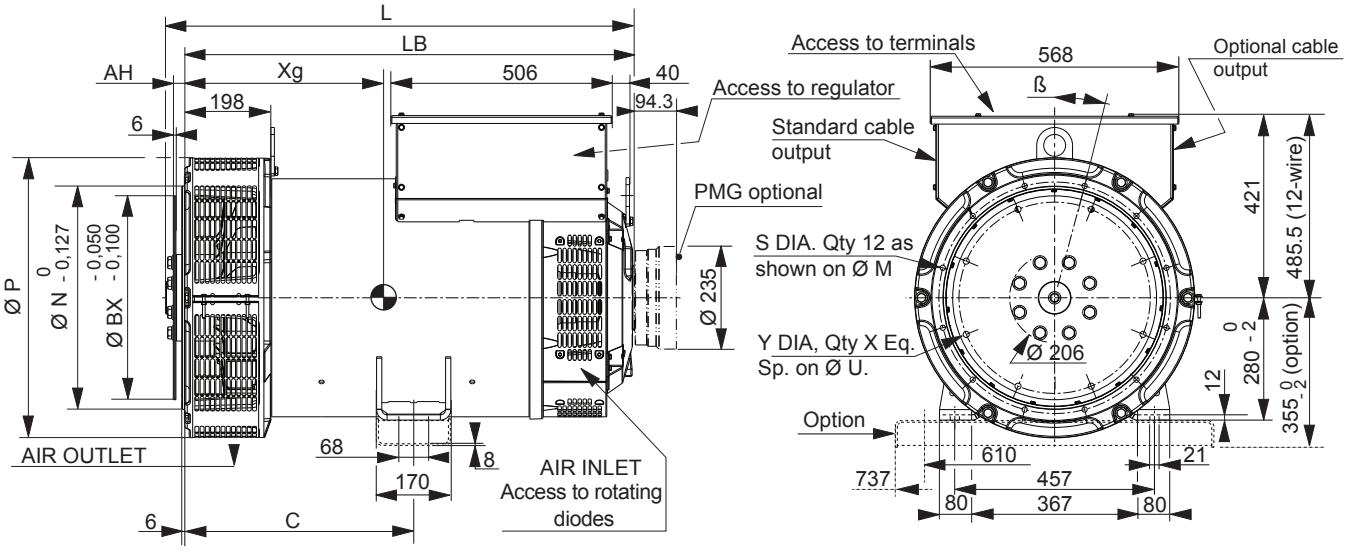
Symmetrical ——
Asymmetrical - - -



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	Xg	C	Weight (kg)
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

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

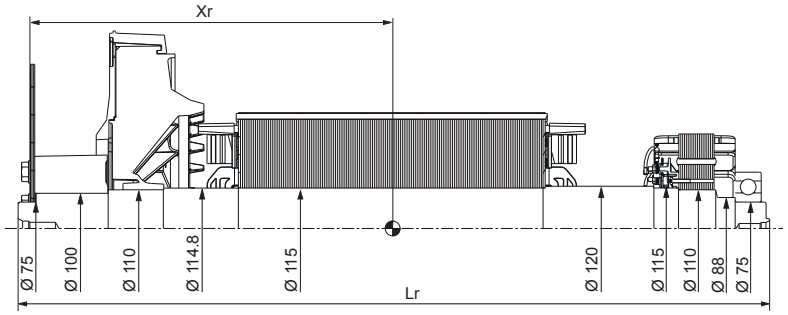
* Shaft height = 355 mm optional
** Dimensions with SAE 11 1/2

Flange (mm)					
S.A.E.	P	N	M	S	ß °
3	641	409.575	428.625	11	15°
2	641	447.675	466.725	11	15°
1	641	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

*** Option

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. 11 ½				S.A.E. 14			
Type	Xr	Lr	M	J	Xr	Lr	M	J
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

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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