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Technical Guide

Shaft Stiffness

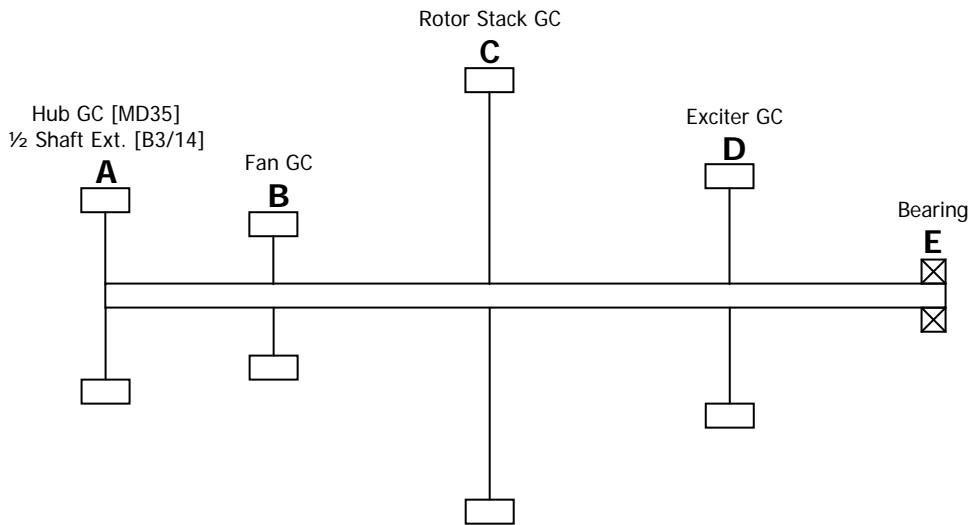
Guida Tecnica

Rigidezza Degli Alberi

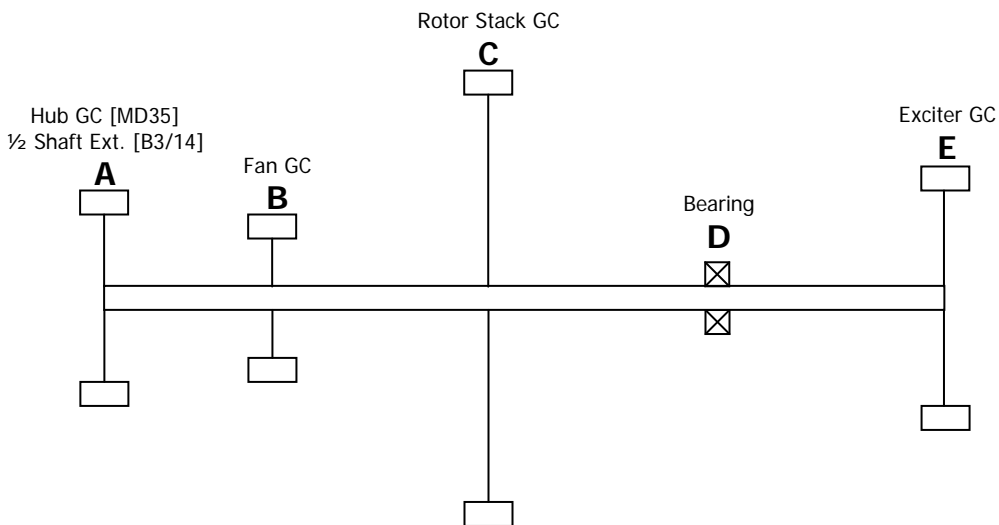


The world's largest independent
producer of synchronous
alternators 1 – 5,000kVA

ECP32B 4 MD35-B3/14
ECP34A 4 MD35-B3/14



ECO38A 4 MD35-B3/14
ECO40B 4 MD35-B3/14
ECO43A 4 MD35-B3/14
ECO46A 4 MD35-B3/14



Shaft steel main characteristic:

Steel grade:	C45 according to UNI EN 10083/1
Elasticity Module [Kg/mm]	8600
Maximum allowable shaft stress [N/mm ²]	50

ECP32B 4 B3/B14

Model	A - B	B - C	C - D	D - E	A - C
ECP32 2S4 B	8,26304E+05	1,01377E+06	6,32627E+05	7,90709E+05	4,55243E+05
ECP32 3S4 B	8,26304E+05	9,34995E+05	6,67732E+05	7,90709E+05	4,38648E+05
ECP32 1M4 B	8,26304E+05	8,43262E+05	5,51045E+05	7,90709E+05	4,17348E+05
ECP32 2M4 B	8,26304E+05	7,48807E+05	6,00547E+05	7,90709E+05	3,92824E+05
ECP32 3L4 B	8,26304E+05	6,64388E+05	5,07483E+05	7,49982E+05	3,68276E+05
ECP32 4L4 B	8,26304E+05	6,49980E+05	5,16224E+05	7,49982E+05	3,63806E+05

All values are given in Nm/Rad.

ECP34A 4 B3/B14

Model	A - B	B - C	C - D	D - E	A - C
ECP34 1S4 A	1,32220E+06	1,71718E+06	1,06381E+06	1,50862E+06	7,47011E+05
ECP34 2S4 A	1,32220E+06	1,49060E+06	1,17440E+06	1,50862E+06	7,00679E+05
ECP34 1L4 A	1,32220E+06	1,39835E+06	9,58508E+05	1,50862E+06	6,79603E+05
ECP34 2L4 A	1,32220E+06	1,26760E+06	1,03144E+06	1,50862E+06	6,47160E+05
ECP34 3L4 A	1,32220E+06	1,26760E+06	1,03144E+06	1,50862E+06	6,47160E+05

All values are given in Nm/Rad.

ECO38A 4 B3/14

Model	A - B	B - C	C - D	D - E	A - C
ECO38 1S4 A	3,35674E+06	2,75013E+06	2,25880E+06	1,22522E+06	1,51165E+06
ECO38 2S4 A	3,35674E+06	2,64231E+06	2,33713E+06	1,22522E+06	1,47849E+06
ECO38 3S4 A	3,35674E+06	2,49554E+06	2,46538E+06	1,22522E+06	1,43139E+06
ECO38 1L4 A	3,35674E+06	2,32347E+06	1,45445E+06	1,22522E+06	1,37306E+06
ECO38 2L4 A	3,35674E+06	2,09912E+06	1,55874E+06	1,22522E+06	1,29149E+06
ECO38 3L4 A	3,35674E+06	1,79690E+06	1,78120E+06	1,22522E+06	1,17038E+06

All values are given in Nm/Rad.

ECO40B 4 B3/14

Model	A - B	B - C	C - D	D - E	A - C
ECO40 1S4 B	4,56961E+06	7,31710E+06	4,34435E+06	3,20864E+06	2,81291E+06
ECO40 2S4 B	4,56961E+06	6,67705E+06	4,60653E+06	3,20864E+06	2,71294E+06
ECO40 3S4 B	4,56961E+06	6,19534E+06	4,86764E+06	3,20864E+06	2,62986E+06
ECO40 1L4 B	4,56961E+06	5,77846E+06	3,44989E+06	3,20864E+06	2,55171E+06
ECO40 1.5L4 B	4,56961E+06	5,05556E+06	3,77189E+06	3,20864E+06	2,40016E+06
ECO40 2L4 B	4,56961E+06	4,77448E+06	3,94518E+06	3,20864E+06	2,33490E+06
ECO40 VL4 B	4,56961E+06	4,19183E+06	3,53874E+06	3,20864E+06	2,18629E+06

All values are given in Nm/Rad.

ECO43A 4 B3/14

Model	A - B	B - C	C - D	D - E	A - C
ECO43 1S4 A	6,63553E+06	8,04157E+06	6,34885E+06	5,57601E+06	3,63560E+06
ECO43 2S4 A	6,63553E+06	7,38744E+06	6,82605E+06	5,57601E+06	3,49566E+06
ECO43 1M4 A	6,34431E+06	7,32686E+06	5,61036E+06	5,31917E+06	3,40014E+06
ECO43 2M4 A	6,63553E+06	6,68797E+06	5,12134E+06	5,57601E+06	3,33083E+06
ECO43 2L4 A	6,63553E+06	5,99429E+06	5,61930E+06	5,57601E+06	3,14932E+06
ECO43 VL4 A	6,63553E+06	5,75030E+06	4,97716E+06	5,57601E+06	3,08064E+06

All values are given in Nm/Rad.

ECO46A 4 B3/14

Model	A - B	B - C	C - D	D - E	A - C
ECO46 1S4 A	1,48962E+07	1,74870E+07	9,76883E+06	4,32992E+06	8,04398E+06
ECO46 1.5S4 A	1,48962E+07	1,56993E+07	1,04325E+07	4,32992E+06	7,64360E+06
ECO46 2S4 A	1,48962E+07	1,50170E+07	1,07572E+07	4,32992E+06	7,47818E+06
ECO46 1L4 A	1,48962E+07	1,35453E+07	8,72097E+06	4,32992E+06	7,09433E+06
ECO46 1.5L4 A	1,48962E+07	1,25605E+07	9,18459E+06	4,32992E+06	6,81450E+06
ECO46 2L4 A	1,48962E+07	1,31585E+07	9,50025E+06	4,32992E+06	6,98677E+06
ECO46 VL4 A	1,47791E+07	9,86388E+06	7,93133E+06	4,56382E+06	5,91565E+06

All values are given in Nm/Rad.

ECP32B 4 MD35

Model	SAE Disk	A - B	B - C	C - D	D - E	A - C
ECP32 2S4 B	6,5	8,13155E+05	1,01377E+06	6,32627E+05	7,90709E+05	4,51223E+05
	7,5	8,13092E+05	1,01377E+06	6,32627E+05	7,90709E+05	4,51204E+05
	8	7,89137E+05	1,01377E+06	6,32627E+05	7,90709E+05	4,43729E+05
	10	8,09744E+05	1,01377E+06	6,32627E+05	7,90709E+05	4,50171E+05
	11,5	7,69535E+05	1,01377E+06	6,32627E+05	7,90709E+05	4,37463E+05
ECP32 3S4 B	6,5	8,13155E+05	9,34995E+05	6,67732E+05	7,90709E+05	4,34915E+05
	7,5	8,13092E+05	9,34995E+05	6,67732E+05	7,90709E+05	4,34896E+05
	8	7,89137E+05	9,34995E+05	6,67732E+05	7,90709E+05	4,27948E+05
	10	8,09744E+05	9,34995E+05	6,67732E+05	7,90709E+05	4,33937E+05
	11,5	7,69535E+05	9,34995E+05	6,67732E+05	7,90709E+05	4,22117E+05
ECP32 1M4 B	6,5	8,13155E+05	8,43262E+05	5,51045E+05	7,90709E+05	4,13968E+05
	7,5	8,13092E+05	8,43262E+05	5,51045E+05	7,90709E+05	4,13951E+05
	8	7,89137E+05	8,43262E+05	5,51045E+05	7,90709E+05	4,07651E+05
	10	8,09744E+05	8,43262E+05	5,51045E+05	7,90709E+05	4,13082E+05
	11,5	7,69535E+05	8,43262E+05	5,51045E+05	7,90709E+05	4,02357E+05
ECP32 2M4 B	6,5	8,13155E+05	7,50675E+05	5,99351E+05	7,90709E+05	3,90334E+05
	7,5	8,13092E+06	7,50675E+06	5,99351E+06	7,90709E+06	3,90319E+05
	8	7,89137E+05	7,50675E+05	5,99351E+05	7,90709E+05	3,84713E+05
	10	8,09744E+05	7,50675E+05	5,99351E+05	7,90709E+05	3,89546E+05
	11,5	7,69535E+05	7,50675E+05	5,99351E+05	7,90709E+05	3,79994E+05
ECP32 3L4 B	6,5	8,13155E+05	6,64388E+05	5,07483E+05	7,49982E+05	3,65641E+05
	7,5	8,13092E+05	6,64388E+05	5,07483E+05	7,49982E+05	3,65628E+05
	8	7,89137E+05	6,64388E+05	5,07483E+05	7,49982E+05	3,60705E+05
	10	8,09744E+05	6,64388E+05	5,07483E+05	7,49982E+05	3,64950E+05
	11,5	7,69535E+05	6,64388E+05	5,07483E+05	7,49982E+05	3,56553E+05
ECP32 4L4 B	6,5	8,13155E+05	6,49980E+05	5,16224E+05	7,49982E+05	3,61234E+05
	7,5	8,13092E+05	6,49980E+05	5,16224E+05	7,49982E+05	3,61222E+05
	8	7,89137E+05	6,49980E+05	5,16224E+05	7,49982E+05	3,56415E+05
	10	8,09744E+05	6,49980E+05	5,16224E+05	7,49982E+05	3,60560E+05
	11,5	7,69535E+05	6,49980E+05	5,16224E+05	7,49982E+05	3,52362E+05

All values are given in Nm/Rad.

ECP34A 4 MD35

Model	SAE Disk	A - B	B - C	C - D	D - E	A - C
ECP34 1S4 A	10	1,07334E+06	1,71718E+06	1,06381E+06	1,50862E+06	6,60491E+05
	11,5	1,07178E+06	1,71718E+06	1,06381E+06	1,50862E+06	6,59901E+05
	14	1,07334E+06	1,71718E+06	1,06381E+06	1,50862E+06	6,60491E+05
ECP34 2S4 A	10	1,07334E+06	1,49060E+06	1,17440E+06	1,50862E+06	6,24008E+05
	11,5	1,07178E+06	1,49060E+06	1,17440E+06	1,50862E+06	6,23481E+05
	14	1,07334E+06	1,49060E+06	1,17440E+06	1,50862E+06	6,24008E+05
ECP34 1L4 A	10	1,07334E+06	1,39835E+06	9,58508E+05	1,50862E+06	6,07237E+05
	11,5	1,07178E+06	1,39835E+06	9,58508E+05	1,50862E+06	6,06738E+05
	14	1,07334E+06	1,39835E+06	9,58508E+05	1,50862E+06	6,07237E+05
ECP34 2L4 A	10	1,07334E+06	1,26760E+06	1,03144E+06	1,50862E+06	5,81203E+05
	11,5	1,07178E+06	1,26760E+06	1,03144E+06	1,50862E+06	5,80746E+05
	14	1,07334E+06	1,26760E+06	1,03144E+06	1,50862E+06	5,81203E+05
ECP34 3L4 A	10	1,07334E+06	1,26760E+06	1,03144E+06	1,50862E+06	5,81203E+05
	11,5	1,07178E+06	1,26760E+06	1,03144E+06	1,50862E+06	5,80746E+05
	14	1,07334E+06	1,26760E+06	1,03144E+06	1,50862E+06	5,81203E+05

All values are given in Nm/Rad.

ECO38A 4 MD35

Model	SAE Disk	A - B	B - C	C - D	D - E	A - C
ECO38 1S4 A	11,5	3,24819E+06	2,75013E+06	2,25880E+06	1,22522E+06	1,48924E+06
	14	3,44509E+06	2,75013E+06	2,25880E+06	1,22522E+06	1,52932E+06
ECO38 2S4 A	11,5	3,24819E+06	2,64231E+06	2,33713E+06	1,22522E+06	1,45704E+06
	14	3,44509E+06	2,64231E+06	2,33713E+06	1,22522E+06	1,49538E+06
ECO38 3S4 A	11,5	3,24819E+06	2,49554E+06	2,46538E+06	1,22522E+06	1,41128E+06
	14	3,44509E+06	2,49554E+06	2,46538E+06	1,22522E+06	1,44722E+06
ECO38 1L4 A	11,5	3,24819E+06	2,32347E+06	1,45445E+06	1,22522E+06	1,35455E+06
	14	3,44509E+06	2,32347E+06	1,45445E+06	1,22522E+06	1,38762E+06
ECO38 2L4 A	11,5	3,24819E+06	2,09912E+06	1,55874E+06	1,22522E+06	1,27510E+06
	14	3,44509E+06	2,09912E+06	1,55874E+06	1,22522E+06	1,30436E+06
ECO38 3L4 A	11,5	3,24819E+06	1,79690E+06	1,78120E+06	1,22522E+06	1,15690E+06
	14	3,44509E+06	1,79690E+06	1,78120E+06	1,22522E+06	1,18094E+06

All values are given in Nm/Rad.

ECO40B 4 MD35

Model	SAE Disk	A - B	B - C	C - D	D - E	A - C
ECO40 1S4 B	14	1,01655E+07	7,31710E+06	4,34435E+06	3,20864E+06	4,25463E+06
	18	1,00947E+07	7,31710E+06	4,34435E+06	3,20864E+06	4,24217E+06
ECO40 2S4 B	14	1,01655E+07	6,67705E+06	4,60653E+06	3,20864E+06	4,03001E+06
	18	1,00947E+07	6,67705E+06	4,60653E+06	3,20864E+06	4,01883E+06
ECO40 3S4 B	14	1,01655E+07	6,19534E+06	4,86764E+06	3,20864E+06	3,84936E+06
	18	1,00947E+07	6,19534E+06	4,86764E+06	3,20864E+06	3,83916E+06
ECO40 1L4 B	14	1,01655E+07	5,77846E+06	3,44989E+06	3,20864E+06	3,68421E+06
	18	1,00947E+07	5,77846E+06	3,44989E+06	3,20864E+06	3,67486E+06
ECO40 1.5L4 B	14	1,01655E+07	5,05556E+06	3,77189E+06	3,20864E+06	3,37639E+06
	18	1,00947E+07	5,05556E+06	3,77189E+06	3,20864E+06	3,36854E+06
ECO40 2L4 B	14	1,01655E+07	4,77448E+06	3,94518E+06	3,20864E+06	3,24866E+06
	18	1,00947E+07	4,77448E+06	3,94518E+06	3,20864E+06	3,24139E+06
ECO40 VL4 B	14	1,01655E+07	4,19183E+06	3,53874E+06	3,20864E+06	2,96796E+06
	18	1,00947E+07	4,19183E+06	3,53874E+06	3,20864E+06	2,96190E+06

All values are given in Nm/Rad.

ECO43A 4 MD35

Model	SAE Disk	A - B	B - C	C - D	D - E	A - C
ECO43 1S4 A	14	1,22834E+07	8,50144E+06	5,92371E+06	5,31917E+06	5,02417E+06
	18	1,21789E+07	8,50144E+06	5,92371E+06	5,31917E+06	5,00660E+06
	21	1,23719E+10	8,50144E+09	5,92371E+09	5,31917E+09	5,03891E+09
ECO43 2S4 A	14	1,22834E+07	7,77441E+06	6,33661E+06	5,31917E+06	4,76105E+06
	18	1,21789E+07	7,77441E+06	6,33661E+06	5,31917E+06	4,74527E+06
	21	1,23719E+07	7,77441E+06	6,33661E+06	5,31917E+06	4,77429E+06
ECO43 1M4 A	14	1,22834E+07	7,32686E+06	5,61036E+06	5,31917E+06	4,58937E+06
	18	1,21789E+07	7,32686E+06	5,61036E+06	5,31917E+06	4,57470E+06
	21	1,23719E+07	7,32686E+06	5,61036E+06	5,31917E+06	4,60167E+06
ECO43 2M4 A	14	1,22834E+07	7,00428E+06	5,81544E+06	5,31917E+06	4,46069E+06
	18	1,21789E+07	7,00428E+06	5,81544E+06	5,31917E+06	4,44684E+06
	21	1,23719E+07	7,00428E+06	5,81544E+06	5,31917E+06	4,47231E+06
ECO43 2L4 A	14	1,22834E+07	6,26630E+06	5,27112E+06	5,31917E+06	4,14947E+06
	18	1,21789E+07	6,26630E+06	5,27112E+06	5,31917E+06	4,13748E+06
	21	1,23719E+07	6,26630E+06	5,27112E+06	5,31917E+06	4,15952E+06
ECO43 VL4 A	14	1,228342E+07	5,689270E+06	5,033474E+06	5,319174E+06	3,888327E+06
	18	1,217890E+07	5,689270E+06	5,033474E+06	5,319174E+06	3,877792E+06
	21	1,237190E+07	5,689270E+06	5,033474E+06	5,319174E+06	3,897150E+06

All values are given in Nm/Rad.

ECO46A 4 MD35

Model	SAE Disk	A - B	B - C	C - D	D - E	A - C
ECO46 1S4 A	18	2,24299E+07	1,74870E+07	9,76883E+06	4,32992E+06	9,82621E+06
	21	2,10625E+07	1,74870E+07	9,76883E+06	4,32992E+06	9,55447E+06
ECO46 1.5S4 A	18	2,24299E+07	1,56993E+07	1,04325E+07	4,32992E+06	9,23528E+06
	21	2,10625E+07	1,56993E+07	1,04325E+07	4,32992E+06	8,99484E+06
ECO46 2S4 A	18	2,24299E+07	1,50170E+07	1,07572E+07	4,32992E+06	8,99486E+06
	21	2,10625E+07	1,50170E+07	1,07572E+07	4,32992E+06	8,76663E+06
ECO46 1L4 A	18	2,24299E+07	1,35453E+07	8,72097E+06	4,32992E+06	8,44525E+06
	21	2,10625E+07	1,35453E+07	8,72097E+06	4,32992E+06	8,24375E+06
ECO46 1.5L4 A	18	2,24299E+07	1,25605E+07	9,18459E+06	4,32992E+06	8,05166E+06
	21	2,10625E+07	1,25605E+07	9,18459E+06	4,32992E+06	7,86829E+06
ECO46 2L4 A	18	2,24299E+07	1,31585E+07	9,50025E+06	4,32992E+06	8,29326E+06
	21	2,10625E+07	1,31585E+07	9,50025E+06	4,32992E+06	8,09885E+06
ECO46 VL4 A	18	2,23880E+07	9,86388E+06	7,71553E+06	3,94915E+06	6,84712E+06
	21	2,22006E+07	9,86388E+06	7,71553E+06	3,94915E+06	6,82949E+06

All values are given in Nm/Rad.

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