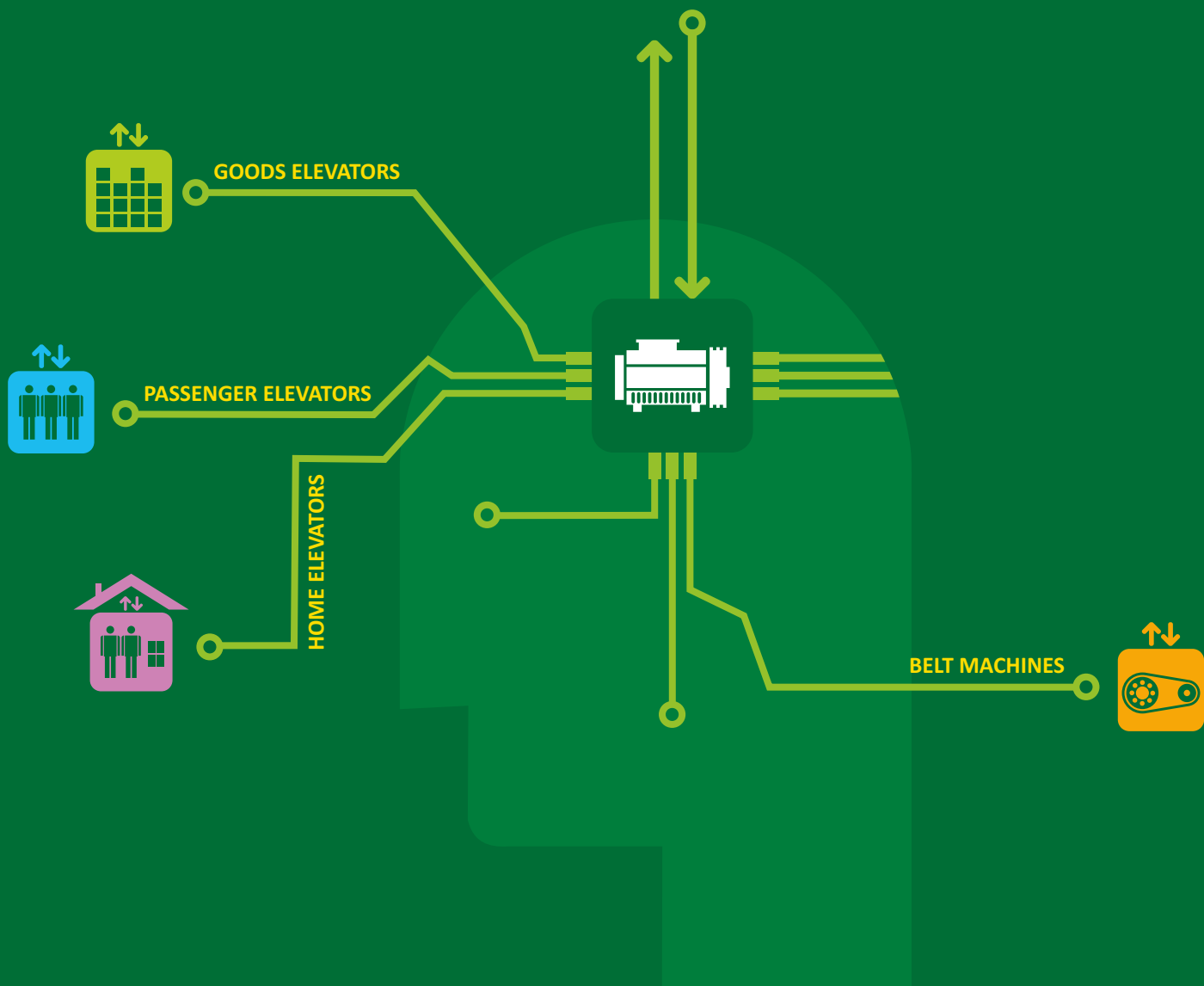
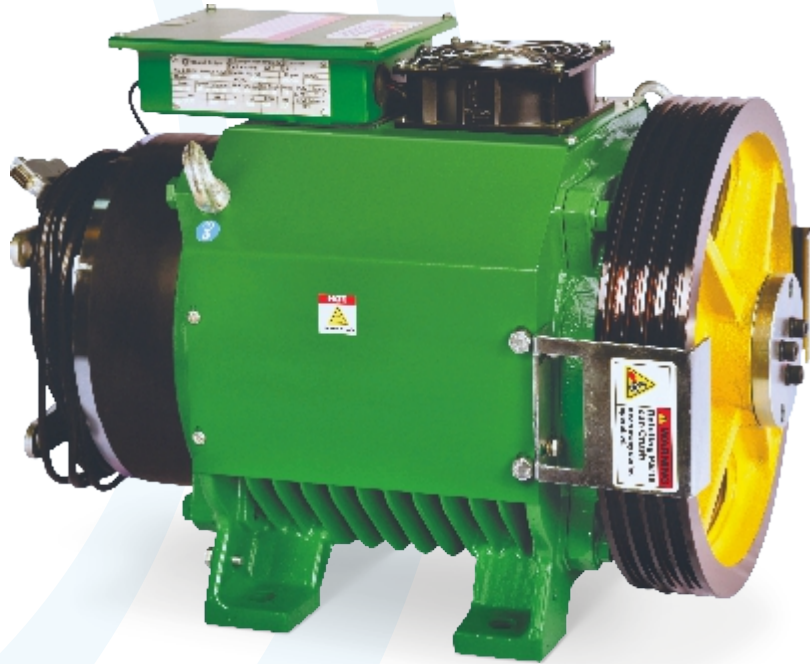


PERMANENT MAGNET MACHINES FOR ELEVATORS

WORKS SMARTER





GreenStar

GreenStar from Bharat Bijlee is a new-generation gearless machine for elevators powered by a permanent magnet synchronous motor. Compact modular design, light weight and low operating noise levels make it especially suitable for machine room-less applications. GreenStar has

outstanding torque and cogging characteristics and no oil spillage problems. Real savings in energy consumption, space and routine maintenance, contribute to a significant reduction in cost of ownership.

Technology Partners with **PERMAGSA**



NO MACHINE ROOM



GEARLESS



LOW NOISE







SIGNIFICANT ENERGY SAVING



COMPACT DESIGN

CAPACITY FOR GREENSTAR SERIES

	Series	Rated Load	Rated Speed
	GreenStar	6 to 26 passengers	0.7 to 2.5 m/s
	GreenStarMAX	1500 to 5000 kg	1.5 m/s
	GreenStarmini	Upto 6 passengers	0.32 to 0.5 m/s
	GreenStarBELT	4 to 20 passengers	0.32 to 1.0 m/s

GC 06 TECHNICAL SPECIFICATIONS

Model	GC-06-320-100	GC-06-320-125	GC-06-320-150	GC-06-200-070	GC-06-200-100		GC-06-240-100	
Duty Load (kg)	408	408	408	408	408		408	
Passenger Capacity	6	6	6	6	6		6	
Speed upto (m/s)	1	1.25	1.5	0.7	1		1	
Sheave Diameter (mm)	320	320	320	200	200		240	
Rope Diameter (mm)	8	8	8	6.5	6.5	8	6.5	8
No. of Ropes	4	4	4	4	4	4	4	4
Roping Ratio	2:1	2:1	2:1	2:1	2:1		2:1	
RPM	120	150	180	133	190		160	
Rated Frequency (Hz)	12	15	18	13.3	19		16	
Rated Torque (Nm)	215	215	215	135	135		150	
Rated Output Power (kW)	2.7	3.4	4	1.88	2.68		2.5	
Rated Output Power (HP)	3.6	4.5	5.4	2.5	3.59		3.35	
Rated Current (Amp)	8.5	10	11.5	7	8.5		7	
Starts/Hour	120	120	180	90	120		120	
Static Load (kg)	1300	1300	1300	1300	1300		1300	
Machine weight (kg)	125	125	140	120	120		135	

GC 08 TECHNICAL SPECIFICATIONS

Model	GC-08-320-100	GC-08-320-125	GC-08-320-150	GC-08-320-175	GC-08-320-200	GC-08-320-225	GC-08-320-250	GC-08-200-070	GC-08-200-100	GC-08-240-070	GC-08-240-100	GCN-08-320-100		
Duty Load (kg)	544	544	544	544	544	544	544	544	544	544	544	544		
Passenger Capacity	8	8	8	8	8	8	8	8	8	8	8	8		
Speed upto (m/s)	1	1.25	1.5	1.75	2	2.25	2.5	0.7	1	0.7	1	1		
Sheave Diameter (mm)	320	320	320	320	320	320	320	200	200	240	240	320		
Rope Diameter (mm)	8	8	8	8	8	8	8	6.5	6.5	8	6.5	6.5	8	8
No. of Ropes	4	4	4	4	4	4	4	6	6	4	6	6	4	4
Roping Ratio	2:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1
RPM	120	150	180	208	240	270	300	133	190	111	160	120		
Rated Frequency (Hz)	12	15	18	20.8	24	27	30	13.3	19	11.1	16	12		
Rated Torque (Nm)	270	270	270	270	270	270	270	180	180	215	215	270		
Rated Output Power (kW)	3.4	4.2	5.1	5.88	6.78	7.63	8.48	2.5	3.5	2.4	3.6	3.4		
Rated Output Power (HP)	4.5	5.6	6.8	7.88	9.09	10.23	11.36	3.4	4.69	3.2	4.83	4.5		
Rated Current (Amp)	10.7	12	13	18.5	18.5	19	19	6.5	8	8.2	9.7	10.7		
Starts/Hour	120	120	180	180	180	180	180	90	120	90	120	120		
Static Load (kg)	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300		
Machine weight (kg)	150	150	190	190	190	190	190	145	145	145	145	140		

GC 10 TECHNICAL SPECIFICATIONS

Model	GC-10-400-100	GC-10-320-100	GC-10-320-125	GC-10-320-150	GC-10-320-175	GC-10-320-200	GC-10-320-225	GC-10-320-250	GC-10-240-100
Duty Load (kg)	680	680	680	680	680	680	680	680	680
Passenger Capacity	10	10	10	10	10	10	10	10	10
Speed upto (m/s)	1	1	1.25	1.5	1.75	2	2.25	2.5	1
Sheave Diameter (mm)	400	320	320	320	320	320	320	320	240
Rope Diameter (mm)	10	8	8	8	8	8	8	8	6.5
No. of Ropes	5	6	6	6	6	6	6	6	8
Roping Ratio	2:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1
RPM	96	120	150	180	208	240	270	300	160
Rated Frequency (Hz)	9.6	12	15	18	20.8	24	27	30	16
Rated Torque (Nm)	460	335	335	335	335	335	335	335	250
Rated Output Power (kW)	4.62	4.2	5.2	6.3	7.3	8.4	9.47	10.52	4.2
Rated Output Power (HP)	6.20	5.6	7	8.4	9.8	11.3	12.69	14.10	5.6
Rated Current (Amp)	16	14	15	19	24	24	23	23	11
Starts/Hour	120	120	120	180	180	180	180	180	120
Static Load (kg)	2300	2300	2300	2300	2300	2300	2300	2300	1300
Machine weight (kg)	225	190	190	200	200	200	200	200	160

GC 13 TECHNICAL SPECIFICATIONS

Model	GC-13-320-100	GC-13-320-125	GC-13-320-150	GC-13-320-175	GC-13-320-200	GC-13-320-225	GC-13-320-250
Duty Load (kg)	884	884	884	884	884	884	884
Passenger Capacity	13	13	13	13	13	13	13
Speed upto (m/s)	1	1.25	1.5	1.75	2	2.25	2.5
Sheave Diameter (mm)	320	320	320	320	320	320	320
Rope Diameter (mm)	8	8	8	8	8	8	8
No. of Ropes	6	6	6	6	6	6	6
Roping Ratio	2:1	2:1	2:1	2:1	2:1	2:1	2:1
RPM	120	150	180	208	240	270	300
Rated Frequency (Hz)	12	15	18	20.8	24	27	30
Rated Torque (Nm)	435	435	435	435	435	435	435
Rated Output Power (kW)	5.4	6.8	8.1	9.47	10.93	12.30	13.66
Rated Output Power (HP)	7.2	9.1	10.8	12.7	14.65	16.48	18.31
Rated Current (Amp)	17.5	20	23.5	30	30	31	31
Starts/Hour	120	120	180	180	180	180	180
Static Load (kg)	2300	2300	2300	2300	2300	2300	2300
Machine weight (kg)	200	200	250	250	250	250	250

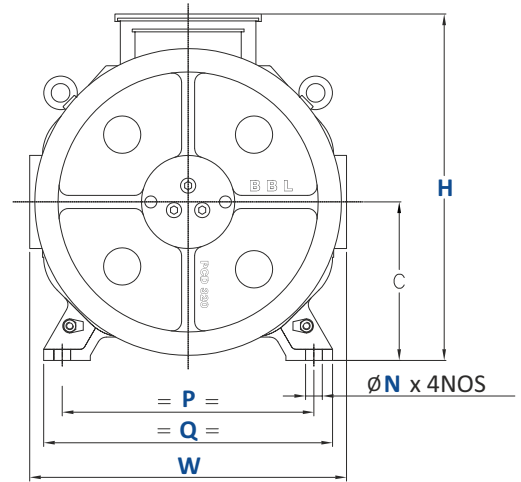
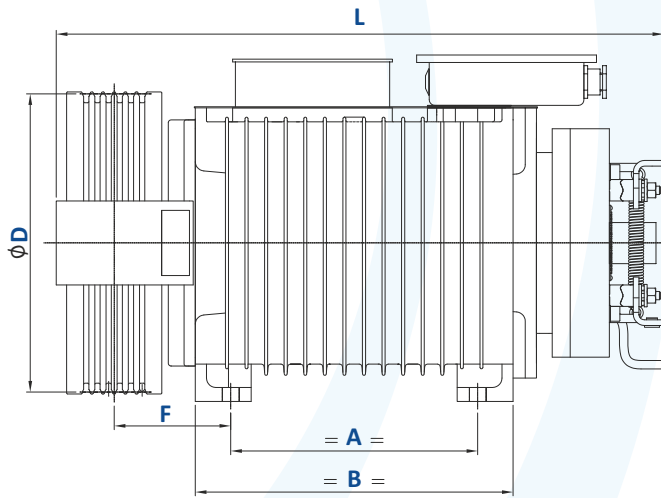
GC 16 TECHNICAL SPECIFICATIONS

Model	GC-16-320-100	GC-16-320-125	GC-16-320-150	GC-16-320-175	GC-16-320-200	GC-16-320-225	GC-16-320-250
Duty Load (kg)	1088	1088	1088	1088	1088	1088	1088
Passenger Capacity	16	16	16	16	16	16	16
Speed upto (m/s)	1	1.25	1.5	1.75	2	2.25	2.5
Sheave Diameter (mm)	320	320	320	320	320	320	320
Rope Diameter (mm)	8	8	8	8	8	8	8
No. of Ropes	8	8	8	8	8	8	8
Roping Ratio	2:1	2:1	2:1	2:1	2:1	2:1	2:1
RPM	120	150	180	208	240	270	300
Rated Frequency (Hz)	12	15	18	20.8	24	27	30
Rated Torque (Nm)	535	535	535	535	535	535	535
Rated Output Power (kW)	6.7	8.4	10.1	11.6	13.4	15.12	16.80
Rated Output Power (HP)	8.9	11.3	13.4	15.6	18.0	20.26	22.52
Rated Current (Amp)	21.5	23	30	38	38	38	38
Starts/Hour	120	120	180	180	180	180	180
Static Load (kg)	3500	3500	3500	3500	3500	3500	3500
Machine weight (kg)	250	250	250	250	250	250	250

GC 20 AND GSH 26 TECHNICAL SPECIFICATIONS

Model	GC-20-320-100	GC-20-320-125	GC-20-320-150	GC-20-320-175	GC-20-320-200	GC-20-320-225	GC-20-320-250	GSH-26-320-100	GCH-26-320-150
Duty Load (kg)	1360	1360	1360	1360	1360	1360	1360	1768	1768
Passenger Capacity	20	20	20	20	20	20	20	26	26
Speed upto (m/s)	1	1.25	1.5	1.75	2	2.25	2.5	1	1.5
Sheave Diameter (mm)	320	320	320	320	320	320	320	320	320
Rope Diameter (mm)	8	8	8	8	8	8	8	8	8
No. of Ropes	8	8	8	8	8	8	8	10	10
Roping Ratio	2:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1	2:1
RPM	120	150	180	208	240	270	300	120	180
Rated Frequency (Hz)	12	15	18	20.8	24	27	30	18	27
Rated Torque (Nm)	670	670	670	670	670	670	670	900	900
Rated Output Power (kW)	8.4	10.5	12.6	14.59	16.83	18.94	21.04	11.3	17
Rated Output Power (HP)	11.2	14.1	16.8	19.56	22.57	25.38	28.20	15.16	22.797
Rated Current (Amp)	26.5	30	38	45	45	45	45	30	39
Starts/Hour	120	120	180	180	180	180	180	120	180
Static Load (kg)	3500	3500	3500	3500	3500	3500	3500	5000	5000
Machine weight (kg)	250	250	280	280	280	280	280	355	410

DIMENSIONS



Model	A	B	C	D	P	Q	F	L	W	H	N
GC-06-200-070	165	231	170	200	270	310	111.5	555	335	385	18
GC-06-200-100								560			
GC-08-200-070	200	266	170	240	270	310	114	585	335	385	18
GC-08-200-100								600			
GC-08-240-070	165	231	170	320	270	310	97	565	340	385	18
GC-08-240-100								560			
GC-10-240-100	200	266	170	320	270	310	97	595	340	385	18
GC-06-240-100								560			
GC-06-320-100	165	231	170	320	270	310	97	560	340	385	18
GC-06-320-125								575			
GC-06-320-150	210	280	170	320	270	310	97	560	340	385	18
GCN-08-320-100								560			
GC-08-320-100	200	266	170	320	270	310	97	595	340	385	18
GC-08-320-125								560			
GC-08-320-150	265	341	170	320	270	310	125	660	340	385	18
GC-08-320-175								695			
GC-08-320-200	265	341	170	320	270	310	125	716	420	435	18
GC-08-320-225								695			
GC-08-320-250	265	341	170	320	270	310	125	660	340	385	18
GC-10-320-100								695			
GC-10-320-125	340	416	170	320	270	310	125	740	340	395	18
GC-10-320-150								775			
GC-10-320-175	340	416	170	320	270	310	125	740	340	395	18
GC-10-320-200								820			
GC-10-320-225	365	450	175	320	270	342	139	795	360	420	M20
GC-10-320-250								820			
GC-10-400-100	400						132	716	420	435	
GC-13-320-100	265	341	170	320	270	310	125	660	340	385	18
GC-13-320-125								695			
GC-13-320-150	265	341	170	320	270	310	125	660	340	385	18
GC-13-320-175								695			
GC-13-320-200	340	416	170	320	270	310	125	740	340	395	18
GC-13-320-225								775			
GC-13-320-250	340	416	170	320	270	310	125	740	340	395	18
GC-16-320-100								820			
GC-16-320-125	340	416	170	320	270	310	125	740	340	395	18
GC-16-320-150								820			
GC-16-320-175	340	416	170	320	270	310	125	740	340	395	18
GC-16-320-200								820			
GC-16-320-225	340	416	170	320	270	310	125	740	340	395	18
GC-16-320-250								820			
GC-20-320-100	340	416	170	320	270	310	125	740	340	395	18
GC-20-320-125								820			
GC-20-320-150	340	416	170	320	270	310	125	740	340	395	18
GC-20-320-175								820			
GC-20-320-200	340	416	170	320	270	310	125	740	340	395	18
GC-20-320-225								820			
GC-20-320-250	340	416	170	320	270	310	125	740	340	395	18
GC-26-320-100								820			
GSH-26-320-100	365	450	175	320	270	342	139	795	360	420	M20
GCH-26-320-150	430	511	200	320	295	380	148.5	880	400	460	22



GreenStarMAX

GreenStar Max extends our range of PMSM gearless solutions to carrying capacities of up to 5000 kg: the right machine for your Goods, Stretcher and Car elevators.

Technology Partners with **PERMAGSA** ELEVATOR DIVISION

Features

- Outstanding torque
- Capacity up to 3000 kg with 2:1 roping
- Static load up to 6000 kg
- Cantilever design

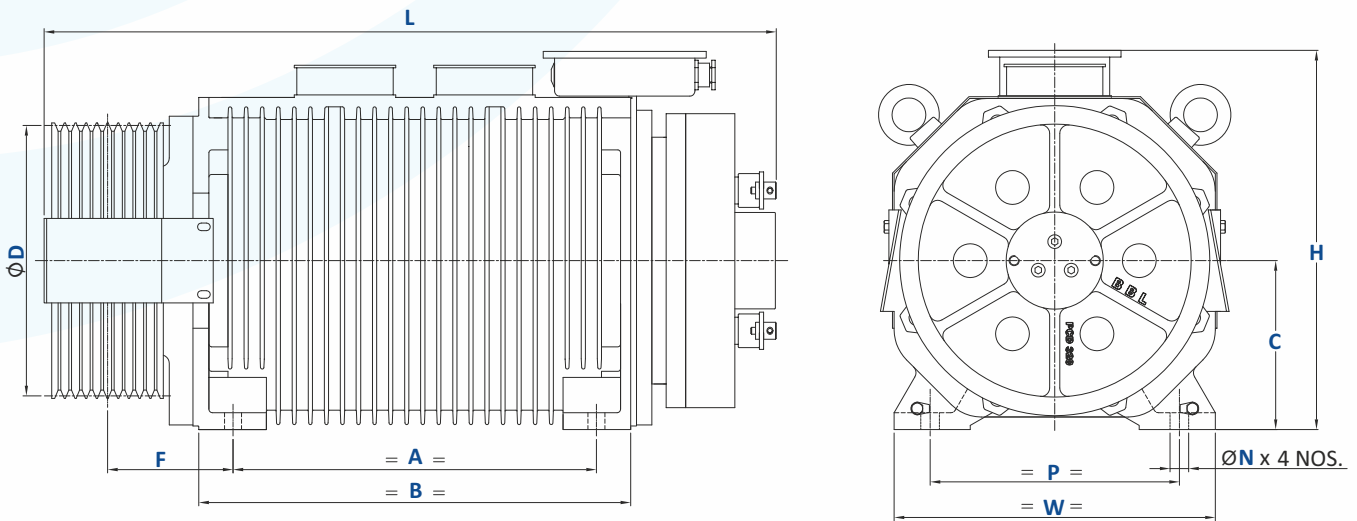
GCH 1.6T TO 2.5T TECHNICAL SPECIFICATIONS

Model	GC-1.6T-400-100	GCH-1.6T -320-100	GCH-2.0T -320-100	GCH-2.0T-320-150	GCH-2.5T-320-100	GSH-1.6T-320-100	GSH-2.0T-400-100	GSH-2.5T-400-100
Duty Load (kg)	1600	1600	2000	2000	2500	1600	2000	2500
Speed (m/s)	1	1	1	1.5	1.0	1	1	1
Sheave Diameter (mm)	400	320	320	320	320	320	400	400
Rope Diameter (mm)	10	8	8	8	8	8	10	10
No. of Ropes	4	10	10	10	10	10	4	5
Roping Ratio	4:1	2:1	2:1	2:1	2:1	2:1	4:1	4:1
RPM	191	120	120	180	120	120	191	191
Rated Frequency (Hz)	19.1	18	18	27	18	18	28.6	28.6
Rated Torque (Nm)	572	800	1000	1000	1200	800	688	860
Rated Output Power (kW)	11.43	10.1	12.5	18.84	15.1	10.1	13.76	17.2
Rated Output Power (HP)	15.3	13.54	16.75	25.3	20.24	13.54	18.5	23.1
Rated Current (Amp)	42	25.0	33.0	52	39.0	25	35	45
Starts/Hour	120	120	120	180	120	120	120	120
Static load (kg)	3500	6000	6000	6000	6000	3500	3500	3500
Machine weight (kg)	250	400	450	370	450	438	360	360

3T TO 5T TECHNICAL SPECIFICATIONS

Model	GCH-3T-320-050	GCH-3T-320-100	GCH-3T-400-050	GCH-4T-320-100	GCH-5T-320-100
Duty Load (kg)	3000	3000	3000	4000	5000
Speed (m/s)	0.5	1	0.5	1	1
Sheave Diameter (mm)	320	320	400	320	320
Rope Diameter (mm)	8	8	10	8	8
No. of Ropes	12	12	6	10	12
Roping Ratio	2:1	2:1	4:1	4:1	4:1
RPM	60	120	95	240	240
Rated Frequency (Hz)	9	18	14.2	36	36
Rated Torque (Nm)	1500	1500	1032	1062	1350
Rated Output Power (kW)	9.5	19	10.32	26.68	34
Rated Output (HP)	12.7	25.5	13.8	35.8	45.6
Rated Current (Amp)	34	50	34	60	100
Starts/Hour	90	120	90	120	120
Static load (kg)	6000	6000	6000	6000	6000
Machine weight (kg)	500	500	430	450	780

DIMENSIONS



Model	A	B	C	D	P	F	L	W	H	N						
GC-1.6T-400-100	340	416	220	400	270	147.5	755	424	445	18						
GCH-1.6T-320-100	430	511	200	320	295	148.5	880	400	460	22						
GCH-2.0T-320-100						179					1000	465				
GCH-2.0T-320-150						230					400	420	147.5	880	460	495
GCH-3T-320-050						200					320	295	148.5	870	400	460
GCH-3T-320-100						175					320	270	140.5	780	350	420
GCH-3T-400-050						220					400	270	147.5	785	424	465
GCH-4T-320-100	365	450	220	400	270	147.5	785	424	465	M20						
GSH-1.6T-320-100						140.5					780	350	420			
GSH-2.0T-400-100						147.5					785	424	465			
GSH-2.5T-400-100																



GreenStarmini

GreenStar Mini is a gearless PMSM ideal for home elevators i.e. bungalows and penthouses. It is compact and facilitates elevators with a minimum of space and civil work.

Technology Partners with **PERMAGSA** ELEVATOR DIVISION

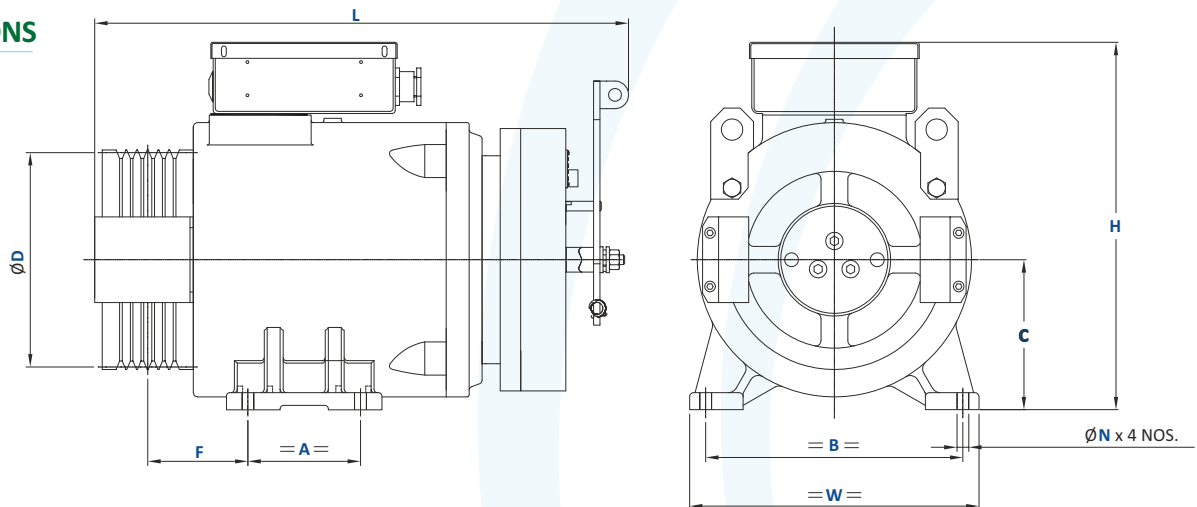
Features

- Lifts loads up to 300 kg and travels up to 15 meters
- Operates on single-phase 230V Drive domestic power supply
- Manual release for brake provided
- Insulation class F with thermistor for thermal protection

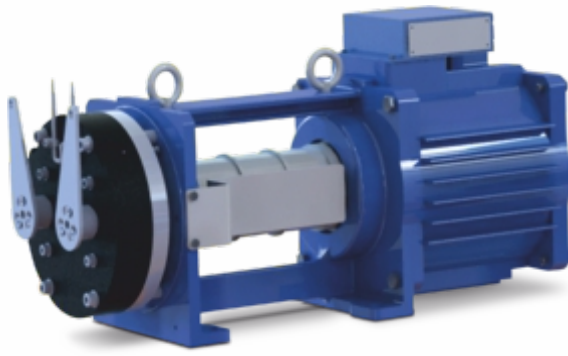
GH 04, GS 04 AND GC 06 TECHNICAL SPECIFICATIONS

Model	GH-04-200-032	GS-04-160-050	GC-06-200-050
Duty Load (kg)	300	300	408
Passenger Capacity	4	4	6
Speed upto (m/s)	0.32	0.5	0.5
Sheave Diameter (mm)	200	160	200
Rope Diameter (mm)	6	6.5	6.5
No. of Ropes	4	4	4
Roping Ratio	2:1	2:1	2:1
RPM	60	120	96
Rated Frequency (Hz)	6	12	9.6
Rated Torque (Nm)	100	80	135
Rated Output Power (kW)	0.62	1	1.35
Rated Output Power (HP)	0.84	1.34	1.81
Rated Current (Amp)	4	5.5	7
Rated Voltage (Volts)	230	230	230
Starts/Hour	90	90	90
Static Load (kg)	1300	1300	1300
Machine weight (kg)	90	94	106

DIMENSIONS



Model	A	B	C	D	F	L	W	H	N
GH-04-200-032	105	240	140	200	77	455	270	329	11
GS-04-160-050	140	220	135	160	98.5	475	270	340	M16
GC-06-200-050	105	240	140	200	94	500	270	345	11



GreenStarBELT

This range of GreenStar machines is especially suited for elevators with belts that ensure a smooth ride and minimal noise. They can be used for home elevators as well as commercial elevators.

Technology Partners with **PERMAGSA**

Features

Deploys Polyurethane coated steel belts for suspension

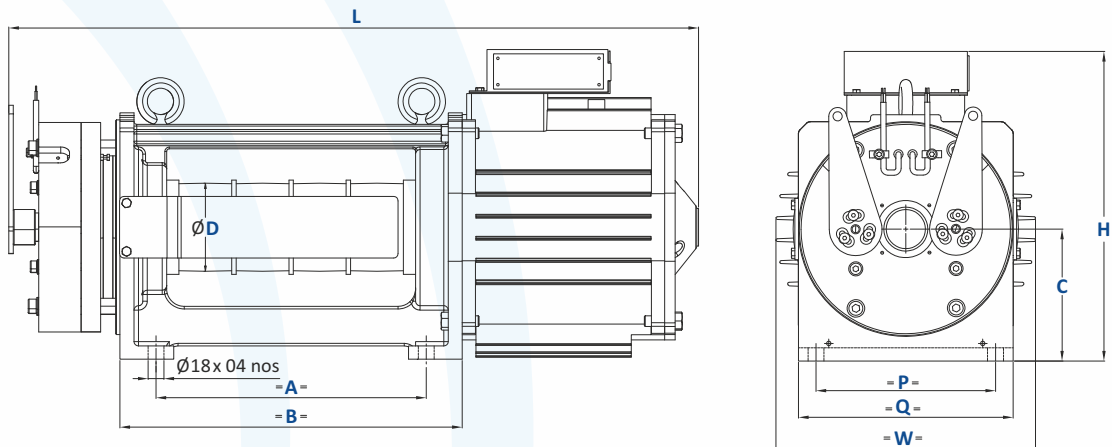
Manual release for brake provided

Insulation class F with thermistors for thermal protection

TECHNICAL SPECIFICATIONS

Model	GB-04-100-032	GB-06-100-100	GB-08-100-100	GB-10-100-100	GB-13-100-100	GB-16-100-100	GB-20-100-100
Duty Load (kg)	300	408	544	680	884	1088	1360
Passenger Capacity	4	6	8	10	13	16	20
Speed upto (m/s)	0.32	1	1	1	1	1	1
Sheave Dia. (mm)	100	100	100	100	100	100	100
Belt width (mm)	30	30	30	30	30	30	30
No. of Belt grooves provided		3			4		5
No. of Belt grooves to be used	2		3		4		5
RPM	123	384	384	384	384	384	384
Rated frequency (Hz)	12.3	38.4	38.4	38.4	38.4	38.4	38.4
Rated Torque (Nm)	52	72	92	115	145	175	220
Rated Output Power (kW)	0.67	2.90	3.70	4.62	5.83	7.04	8.84
Rated Output Power (HP)	0.90	3.90	5.0	6.20	7.82	9.43	11.85
Rated current (Amp)	4.0	6.0	8.0	10	13	16	19.50
Rated voltage (volts)	230	400	400	400	400	400	400
Starts / Hour	120	120	120	120	120	120	120
Static Load (kg)	2500	2500	2500	2500	3000	3000	3500
Approx. weight of machine (kg)	125	125	125	140	160	160	180

DIMENSIONS



Model	A	B	C	D	P	Q	L	W	H
GB-04-100-032	242	324	150	100	204	244	720	295	352
GB-06-100-100							785		
GB-08-100-100							820		
GB-10-100-100	307	389	150	100	204	244	820	295	352
GB-13-100-100							820		
GB-16-100-100	372	454	150	100	204	244	925	295	352
GB-20-100-100							925		

SynchroTorq™

SynchroTorq™ is a range of high torque Permanent Magnet Technology machines for passenger elevators. It can also be used for direct drive applications.



Features

20 pole motor

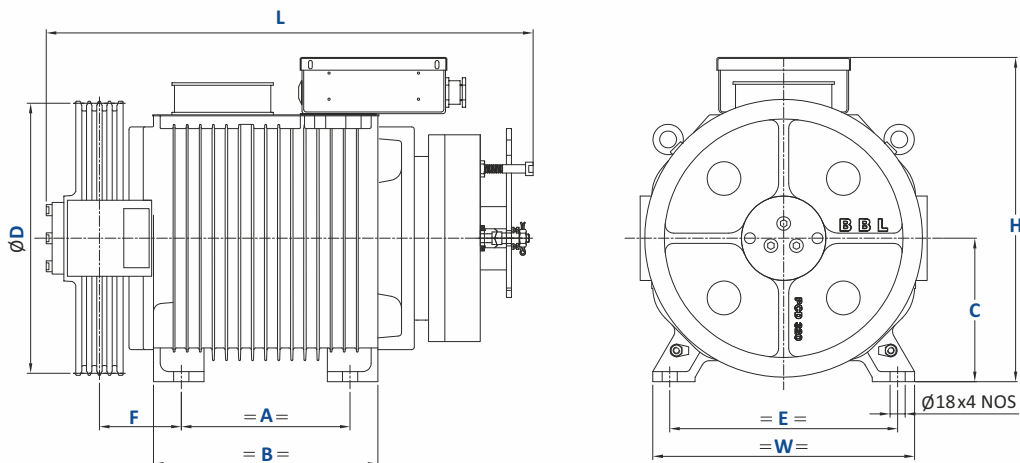
Manual release for brake provided

Insulation class F with thermistor for thermal protection

TECHNICAL SPECIFICATIONS

Model	STES-06-320-100	STES-08-320-100
Duty Load (kg)	408	544
Passenger Capacity	6	8
Speed upto (m/s)	1	1
Sheave Diameter (mm)	320	320
Rope Diameter (mm)	8	8
No. of Ropes	4	4
Roping Ratio	2:1	2:1
RPM	120	120
Rated Frequency (Hz)	20	20
Rated Torque (Nm)	215	270
Rated Output Power (kW)	2.7	3.4
Rated Output Power (HP)	3.6	4.5
Rated Current (Amp)	8.5	10
Starts/Hour	120	120
Static Load (kg)	1300	1300
Machine weight (kg)	125	155

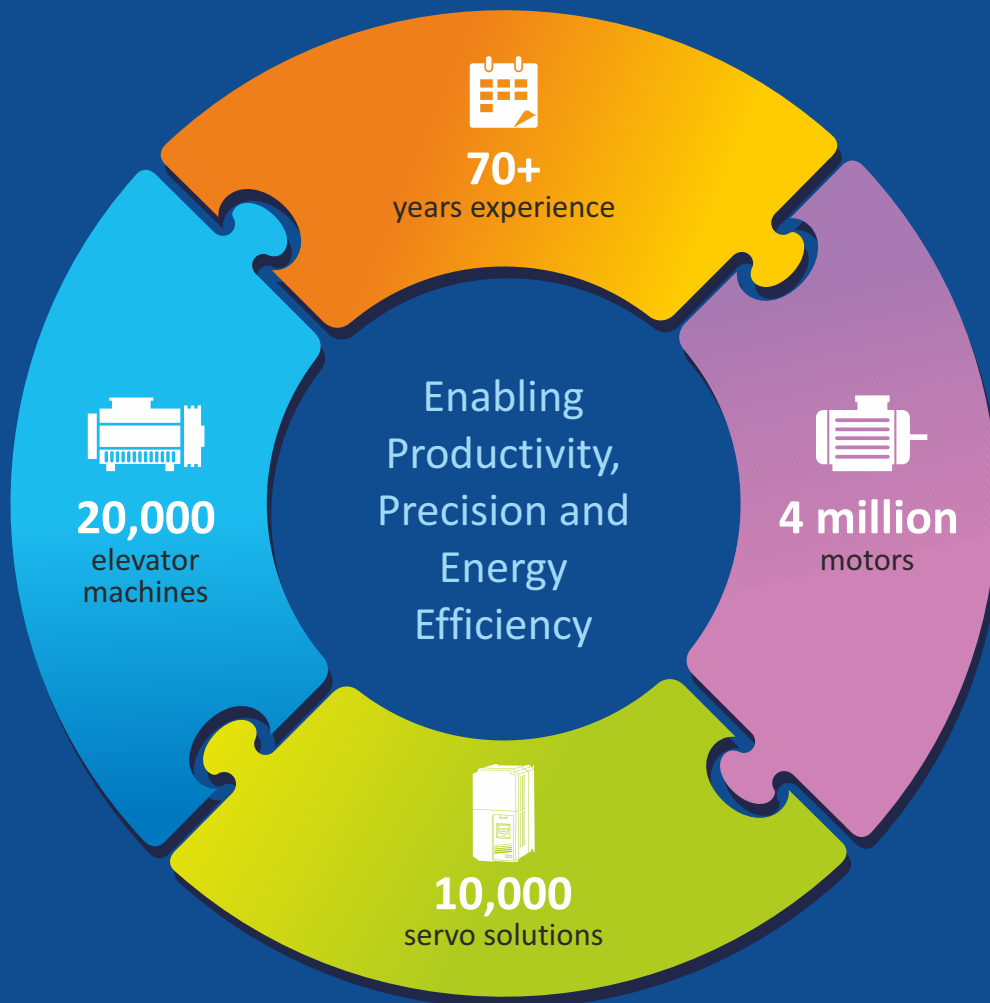
DIMENSIONS



Model	A	B	C	D	E	F	L	W	H
STES-06-320-100	165	231	170	320	270	97	525	310	385
STES-08-320-100	200	266	170	320	270	97	560	310	385

Notes:

- Wrap Angle- Minimum 175 degrees • Shaft efficiency - > 85% • No. of poles: GC, GH, GS & GB series = 12, GSH & GCH series = 18, STES series = 20
- Duty cycle - S3 40% • Brake Voltage - 220/110 VDC
- Assumed Car weight - 1.2 X duty load • Compensating Chain necessary for travel more than 20m
- Encoder - SinCos, PPR - 2048, Voltage - 5 VDC
- Please contact Bharat Bijlee representative for using these machines with different roping combinations than specified.
- Product Development is a continuous process and technical information herein is subject to change.



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