Zepco Technologies

A Mobility & Power Electronics company

Zepco Technologies is a core power electronics company that is founded by a team of engineers, product builders, and marketers with a collective experience of 350+ years in the space in which we operate. It is a Gen-Z Electric Propulsion-focused COmpany (ZEPCO). Our goal is to build a world-class electronics product company based out of Bengaluru, with global aspirations.

We are today focused on building high-power electronic products like inverters, rectifiers, amplifiers, converters, AC/DC & DC/DC power supplies, and various subsystems like drone / EV motors & motor drives, battery systems, BMS & onboard chargers. Zepco Technologies serves the world with its base in Bengaluru, India. It has a team of 32+ design engineers and 80+ in manufacturing.

ZEPCO TECHNOLOGIES

Registered office and R&D Centre, Bengaluru

- High-power R&D lab and facility (5,500 sqft) setup in Bangalore
- Team: 35 members strong technical org
- Associate EMS company (Micron EMS). 43,000 sqft built-up facility & 3 SMT lines
- Design high-power products + manufacture + test + box build
- Systems: ERP, CRM, and HRM processes

Zepco's World record payload lift: 30kg @ 19,024 ft

Zepco's "Made-in-India" motors set the world record at Umling La Pass (Ladakh, India, the highest motorable road in the world) by lifting a 30kg payload at 19,024 feet with a maximum takeoff weight (MTOW) of 100kg.

https://www.youtube.com/watch?v=_HbOOn9nt2Y

Manufactuting & EMS facility, Bengaluru

- Micron EMS is an Associate Company of Zepco
- 15-year-old reputed EMS facility with a 43,000 sqft. that is used for full PCB assembly, cable harness & box-build
- ISO-certified EMS with the following certifications: ISO 9001-2015, IATF 16949 2016, EN ISO 13485 2016 & A9100 D. Ongoing effort on OHSAS 18001 & EMS ISO14000
- 80+ people with experience in procurement, development of electromechanical components, defense-grade mechanical enclosure, and full PCB manufacturing process expertise

Drone Motors

- Range of Drone motors from 300W to 40kW with compact size and best-in-class power density
- Self-cooled aerodynamic design that perfectly fits the needs of the drone applications
- Optimized light-weight motors across all power ranges that vastly improves the payload performances of the drone

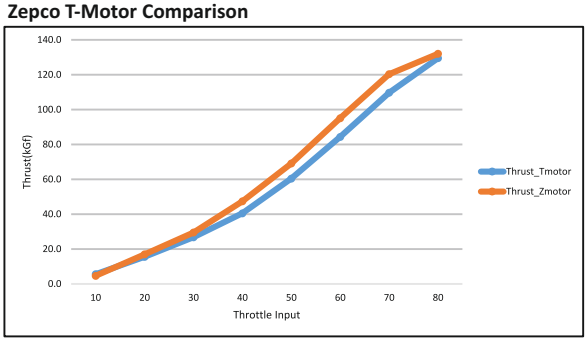
Motor P/N	PRV-040-400*	PRV-016-100LA /100HA	PRV-007-100LA /100HA	PRV-007-052	PRV-002-044
Rated DC voltage	400Vdc	100Vdc	100Vdc	52Vdc	44Vdc
Continuous power (S2-60 minute)	25 to 30kW	5kW	3kW	3kW	1kW
kV rating	10	43 / 65	65 / 95	105	220
Peak power (S2-2 minute)	40kW	16kW	6.72kW	7.35kW	1.955kW
Rotor poles	60	42	42	28	28
Stator slots	45	36	36	24	24
Maximum no load speed	4000rpm	4300rpm / 6500rpm	6500rpm / 9500rpm	5460rpm	9680rpm
Efficiency	>92%	>92%	>92%	>92%	>92%
Storage ambient temperature	-30°C to +75°C	-30°C to +75°C	-30°C to +75°C	-30°C to +75°C	-30°C to +75°C
Operating ambient temperature	-30°C to +60°C	-30°C to +60°C	-30°C to +60°C	-30°C to +60°C	-30°C to +60°C
Motor dimension	L: 30mm, Dia: 267mm	L: 124mm Dia: 152.7mm	L: 60mm Dia: 100mm	L: 77.2mm Dia: 109mm	L: 56.3mm Dia: 62mm
Weight	8.5Kg	4.2Kg	0.975Kg	1.2Kg	0.4Kg
Cooling mechanism	Air	Natural convection	Natural convection	Natural convection	Natural convection

16kW Drone motor – High altitude logistics variant (world record set at 19,000 feet lifting 30Kg)

"Made-in-India" drone motor with Indian magnets

16kW low altitude logistics variant

Zepco T-Motor Comparison



Z-Motor provides more (10% to 18%) thrust per throttle compared to T-Motor

- **Back-to-back connected 12-motor drone setup**
- **Propeller Span: 47inch, Width: 4.5inch**

Electronic Speed Controller (ESC)

- Feature rich controllers which are designed to perform best with Zepco designed motors.
- Optimized performance with Max Torque per Amp
- Compact size with best-in-class power density
- Fast dynamic response to change in PWM/FOC input to maintain stable operation during sudden air-turbulence and gusts during flight operation. Also has active regenerative braking during deceleration for quick stop
- Smart Limp-Home Temperature foldback scheme above 85°C Heat-sink temperature & Over-Temperature Protection above 100°C Heat-sink Temperature
- CAN 2.0 Compliant to communicate with flight controllers

Electronic Speed Controller Table

Controller P/N	PRV-016-100-TC	PRV-007-100-VC
Control mechanism[1]	BLDC Trapezoidal control	Vector Sine control
Rotor position sensing	Sensor-less	Sensor-less
Input voltage range	36V ~ 90V (12S – 28S LFP)	36V ~ 90V (12S – 28S LFP)
Battery current - DC	50A	160A
PVM frequency	10-20KHz (configurable)	10-20KHz (configurable)
Fundamental Frequency range	0 – 2000Hz	0 – 2000Hz
Efficiency	>95%	>95%
Storage ambient temperature	-40°C to +75°C	-40°C to +75°C
Operating ambient temperature	-30°C to +60°C	-30°C to +60°C
Ingress protection	IP54	IP54
Weight	650gm	375gm
Thermal cutback	Controller linearly derate maximum current limit when baseplate temperature rises from 80 to 90°C. Thermal cutback occurs above 90°C and below -30°C	Controller linearly derate maximum current limit when baseplate temperature rises from 80 to 90°C. Thermal cutback occurs above 90°C and below -30°C
Dimension (W x L x H)	155mm x 70mm x 49mm	50mm x 107mm x 26mm

Electronic Speed Controller

[1] Optional BLDC Trapezoidal control version is also available. Contact us for more details.

Defense Electronics

- Range of custom power electronics products being supplied to BEL, DRDO/RCI and other defence labs
- Compact size and best in class power density
- Full power delivery in extreme ambient conditions by utilizing high grade materials
- IP67 environmental protection as per IEC 60529 AC

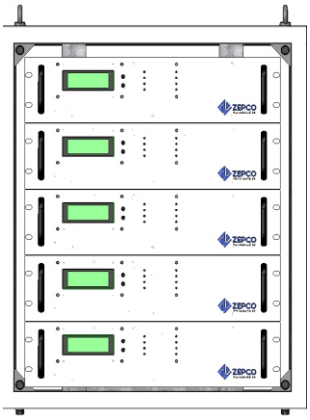
Supplied to Defense lab

Brief Specs	
Armature AC Power Supply	
O/P voltage	120V AC RMS single phase
O/P current	2000A
O/P frequency	2Hz – 4.5Hz
Isolation	Galvanically isolated from I/P AC
Field DC Power Supply	
O/P voltage	0 – 300V DC
O/P current	0 – 400A DC
Isolation	Galvanically isolated from I/P AC
Degauss DC Power Supply	
O/P voltage	0 – 500V DC
O/P current	0 – 10A DC
Isolation	Galvanically isolated from I/P AC
Fully automated control using PLC control system	

360kW Shaker power supply

Power supply for defense

Section	Parameters	Specifications
Output	DC Voltage max	28, +/-5% Vdc
	Power module	10kW
	Current/module	358 Amps
	Ripple & noise	1% peak to peak
	Line & load regulation	+/- 1%
	Transient response	<5% for 10 to 90% load jump
	Transient recovery	100 ms
	Parallel operation	Up to 5 units at output
	Construction	Backplane blind mate
Input	Voltage range	3 phase 3 wire, delta connected, 415, +/-15%
	Frequency range	50/60Hz, auto range, 45 to 65 Hz
	Power factor	Power factor corrected (Passive PFC)
	Power factor range	> 0.8
	Efficiency (Typ.)	> 85%
Protection	Overload	105% of rated power
	Overload trip	110% of output power
	Output protection	Short circuit, over current, Under Voltage & over voltage
	Input Over/under voltage	< +/- 15% of input voltage
	Short circuit protection	At output
	Surge protection	Provided
	Over temperature	Trip output power, restart after temperature fallback
User Interface	Input	MCB – Turn OFF/ON
	Sequence ON	Push button in front panel
	Display	Display all states of the unit, alarm notifications & measurable parameters
	Fault alarm	Input over/Under voltage, Output short circuit, Over temperature
	Communication	Ethernet LAN - UDP protocol (User Datagram Protocol)
	Coolant connection	One inlet & one outlet
Environment	Operating temperature	-20 to +55°C
	Storage temperature	-30 to +70°C
	Humidity	20 to 95% non-condensing
	Altitude	4160 m
	Type of cooling	Liquid cooled
	L x W x H (Module)	504 x 480 x 112 mm
	L x W x H (5 Modules in pack)	650 x 700 x 650 mm
	Weight per module	25 Kgs
Physical	Weight (5 modules in pack)	270 Kgs
Parameters	Accessibility	Front
	Construction	Modular rack assembly – blind mate
Others	EMC immunity	Meet MIL-STD-461E
	EMC emission	Meet MIL-STD-461E
	Warranty	3



10kW water cooled power supply

We are focussed on power electroinics products in the following areas:

- Programmable Power Supplies
- Rack mounted power supplies
- Rectifiers
- AC/DC, DC/DC and other type of converters
- Military grade and avionics grade power products
- Tethered drone power supplies

Electric Vehicle (EV) Motors

- PMSM motors in the range of 4 kW to 250 kW of Indigenously developed product range
- Compact size and best in class power density at highest efficiency
- Full power delivery in extreme ambient conditions by utilizing high grade materials
- IP67 environmental protection as per IEC 60529 AC

Motor P/N	KSH-012-060	KSH-012-072	KSH-012-096	KSH-012-384
Rotor position sensing	Sine/Cosine analog encoder	Sine/Cosine analog encoder	Sine/Cosine analog encoder	Sine/Cosine analog encoder
Rated DC voltage	60Vdc	72Vdc	96Vdc	384Vdc
Continuous power (S2-60 minute)	8kW	8kW	8kW	8kW
Continuous line current (S2-60 minute)	118.3Arms	96.5Arms	75.6Arms	18.1Arms
Peak power (S2-2 minute)	12kW	12kW	12kW	12kW
Rotor poles	10	10	10	10
Stator slots	12	12	12	12
Maximum no load speed	6000rpm	6000rpm	6000rpm	6000rpm
Efficiency	>92%	>92%	>92%	>92%
Storage ambient temperature	-30°C to +75°C	-30°C to +75°C	-30°C to +75°C	-30°C to +75°C
Operating ambient temperature	-20°C to +60°C	-20°C to +60°C	-20°C to +60°C	-20°C to +60°C
Motor dimension (L x D)	291mm x 161mm	291mm x 161mm	291mm x 161mm	291mm x 161mm
Shaft diameter & length	Configurable as per end application	Configurable as per end application	Configurable as per end application	Configurable as per end application
Ingress protection	IP67	IP67	IP67	IP67
Weight	15Kg	15Kg	15Kg	15Kg
Cooling mechanism	Natural convection	Natural convection	Natural convection	Natural convection

EV Motor

Electric Vehicle (EV) Controller

- Feature rich controllers which are designed to perform best with Zepco designed motors
- Max Torque Per Amp Vector Control & efficient flux weakening algorithm
- Advance Space Vector modulation PWM scheme with Synchronous rectification
- Built-in vehicle ECU for on-road eV 3W Passenger (3 & 4W Cargos (L5N & N1), Off-road golf-carts & e-tractors etc.
- Regeneration on Brake and at Zero Throttle
- Hill-Hold for 10s, thereafter controlled roll-off hill assist ease out drivability in up & down gradients
- Functional Safety as per ARAI AIS-038 & Smart protection feature- Stall and Over-Speed Protection, Over-current & Under Voltage Protection
- Smart Limp-Home Temperature foldback scheme above 85°C Heat-sink temperature & Over-Temperature Protection above 100°C Heat-sink Temperature
- CAN 2.0 Compliant

Controller P/N	KSH-012-048-VC	KSH-012-072-VC	KSH-012-096-VC
Control mechanism	Vector control with advance space vector modulation	Vector control with advance space vector modulation	Vector control with advance space vector modulation
Rotor position sensing	Sine/Cosine analog encoder	Sine/Cosine analog encoder	Sine/Cosine analog encoder
Input voltage range	36V ~ 60V	60V ~ 80V	84V ~ 110V
Continuous line current (S2-60 Minute)	190 Arms	125 Arms	95 Arms
Peak line current (S2 – 2 Minute)	340 Arms	225 Arms	175 Arms
PVM frequency	10KHz Nominal (Configurable)	10KHz Nominal (Configurable)	10KHz Nominal (Configurable)
Fundamental frequency range	0 ~ 400Hz	0 ~ 400Hz	0 ~ 400Hz
Efficiency	>95%	>95%	>95%
Storage ambient temperature	-30°C to +75°C	-30°C to +75°C	-30°C to +75°C
Operating ambient temperature	-20°C to +60°C	-20°C to +60°C	-20°C to +60°C
Thermal cutback	Controller linearly derates maximum current limit when baseplate temperature raises from 80 to 90°C. Thermal cutback occurs above 90°C & below -30°C	Controller linearly derates maximum current limit when baseplate temperature raises from 80 to 90°C. Thermal cutback occurs above 90°C & below -30°C	Controller linearly derates maximum current limit when baseplate temperature raises from 80 to 90°C. Thermal cutback occurs above 90°C & below -30°C
Ingress protection	IP65	IP65	IP65
Withstand voltage between heatsink & DC/AC power terminals	500V DC/Resistance >=7 MΩ as per IS 18590:2024	500V DC/Resistance >=7 MΩ as per IS 18590:2024	500V DC/Resistance >=7 MΩ as per IS 18590:2024
Isolation resistance between heatsink & DC/AC power terminals	500Ω/Volt of the working voltage, as per AIS-038/IS 18590:2024	500Ω/Volt of the working voltage, as per AIS-038/IS 18590:2024	500Ω/Volt of the working voltage, as per AIS-038/IS 18590:2024
EMC	ECE R10/AIS-004 Part-2 Immunity & Part-3 Emission	ECE R10/AIS-004 Part-2 Immunity & Part-3 Emission	ECE R10/AIS-004 Part-2 Immunity & Part-3 Emission
Functional safety	As per AIS-038/IS 18590:2024	As per AIS-038/IS 18590:2024	As per AIS-038/IS 18590:2024
Vibration	IEC 60068-2-6, 5G 10-500Hz, 3 Axes	IEC 60068-2-6, 5G 10-500Hz, 3 Axes	IEC 60068-2-6, 5G 10-500Hz, 3 Axes
Weight	4Kg	4Kg	4Kg
Dimension (W x L x H)	155mm x 212mm x 86mm	155mm x 212mm x 86mm	155mm x 212mm x 86mm
Power connector	5 x M8	5 x M8	5 x M8
Signal interface	35 POS Ampseal connector	35 POS Ampseal connector	35 POS Ampseal connector
Communication	2 independent channels for standard CAN & CANFD	2 independent channels for standard CAN & CANFD	2 independent channels for standard CAN & CANFD

EV Controller

To learn more about us and our product and service offerings, please reach us at: info@zepcotek.com

www.zepcotek.com info@zepcotek.com
Zepco Technologies Pvt Ltd, Ground Floor, Brigade-MLR Centre, 50, Vanivilas Road, Basavanagudi, Bengaluru – 560004. Mobile: (91) 96864 50281