

Thrust Generation in Space using electric power

[without using conventional reaction mass],

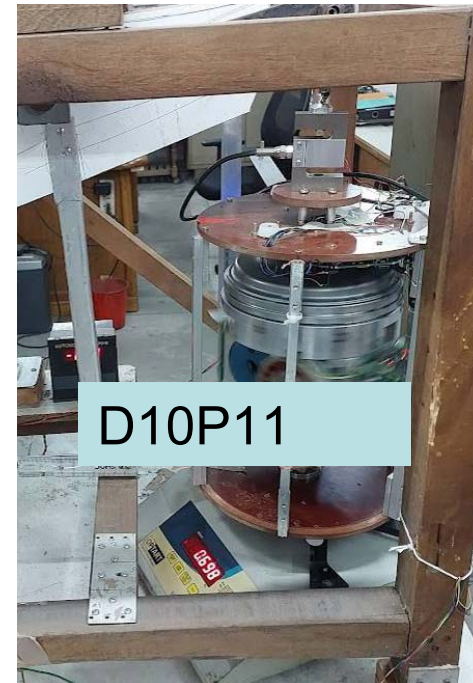
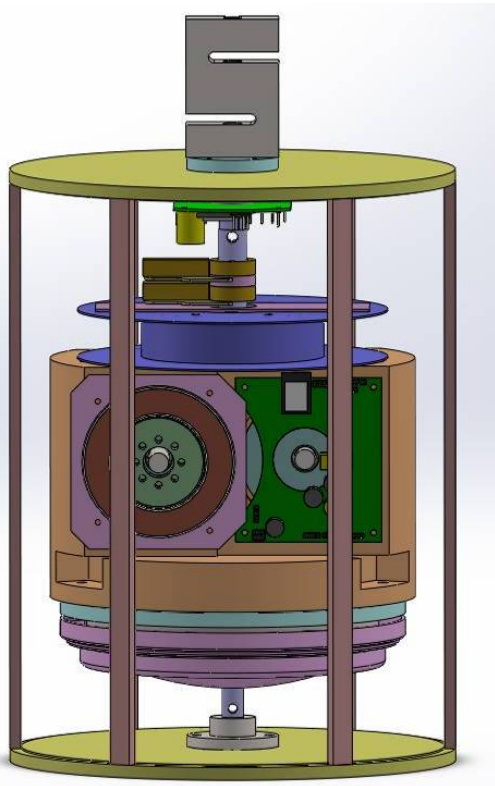
Includes Scientific research, Applied research, Product development

Synopsis

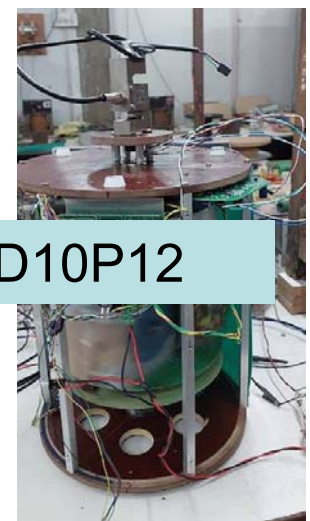
Presently, the space transportation is very expensive, unsafe and uncomfortable even after 50 years continuing space technology.

*This Technology will simplify the space transportation.
A small amount of thrust can be used for **satellite attitude control** etc.*

**Specifications, Test results,
Application and Theory is included
Two Protos are ready for Demo**



D10P11



D10P12

The Issue Addressed:

- Attitude control in Satellites is currently done by firing thrusters to obtain reaction. This limits the life as it is dependent of quantity of fuel.
- Reaction mass in form of burning of fuel is also used for space exploration.

Our Solution:



- SKD has devised an apparatus to generate thrust without any reaction mass.
- 0.1N reaction thrust in form of 10 grams weight reduction obtained from just 100W electrical power consumption.

**Prototype
Ready**



**More Saving due to
longer life as it will be
powered by Solar**

**Low Cost
compared to Fuel
based thruster**



***Break-through technology and a major
Innovation in Space Thrust Generation***



Thrust Generation in Space

Specifications of present prototype:

Proto code name: D10P11

Thrust - 10 gram force (0.1 N)

Operating voltage - 48V DC

Power consumption - < 100 W

Proto mass - 15 kg

Dimension - 280mm dia x 340 mm height

present proto is designed for lab use

History of development:

Research was started in Y1977. Origin of Gravitation was discovered in Y1985. Prototypes started in Y1997. First successful proto D4P14 was operative in Y2000.

Ether and its related two experiments was conducted with successful results in Y2001. Application of fluid mechanics wave equation was derived in Y2004.

Gyration effects were explained in Y2008 and its proto D7P4 for torque generation was successfully tested. Next design for thrust generation was D10P10 in Y2010 and latest design is D10P11 in Y2023. Successful results were obtained in Sept 2023.

SKD is ready to **Demonstrate and supply commercial grade proto.**



Thrust Generation in Space

Present Status and Roadmap:

Stage-1:

Present status T-0,(Oct 2023): Two prototypes are been created and further improvements are being made. These are available for demonstration.

T-1 (Dec 2023): Reliable and repeatable demonstration will be available for **validation** of specs using SKD's internal resources and prototypes can be supplied to interested customers.

Stage-2:

T-2 : Next generation commercial proto will be designed and fabricated with improved specs- Thrust 0.15 N, power < 80 W, weight < 12 kg

This will be built in partnership and financial support from customer.

Stage-3:

T-3 : Space grade prototype for actual test and qualification, including test in vacuum chamber, etc.. This can be made by SKD, or by customer with SKD's technical support.

This will be built in partnership and financial support from customer.

Stage-4:

Future roadmap: To be drafted after obtaining test results of stage-3 product in space.

Target: To have a product qualifying stage-3 quickly.

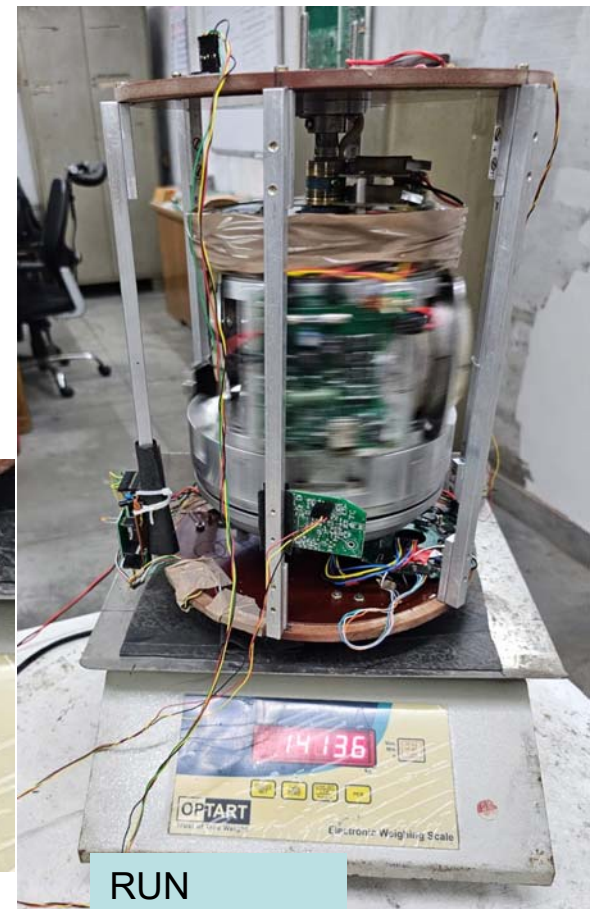
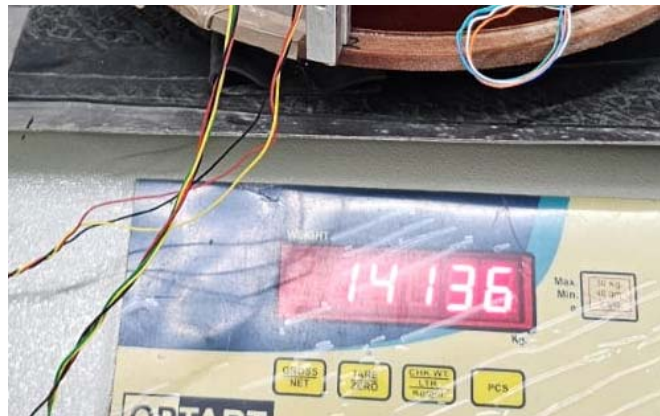
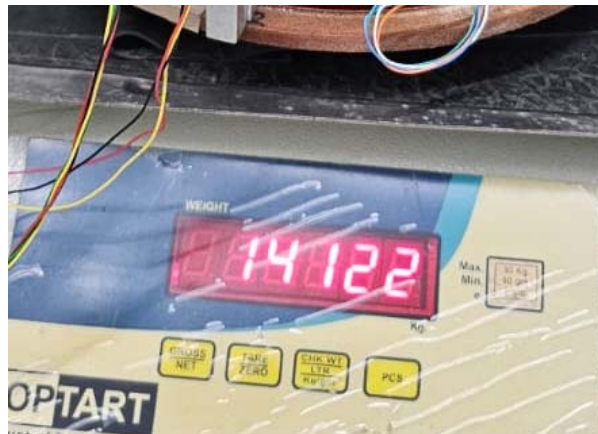
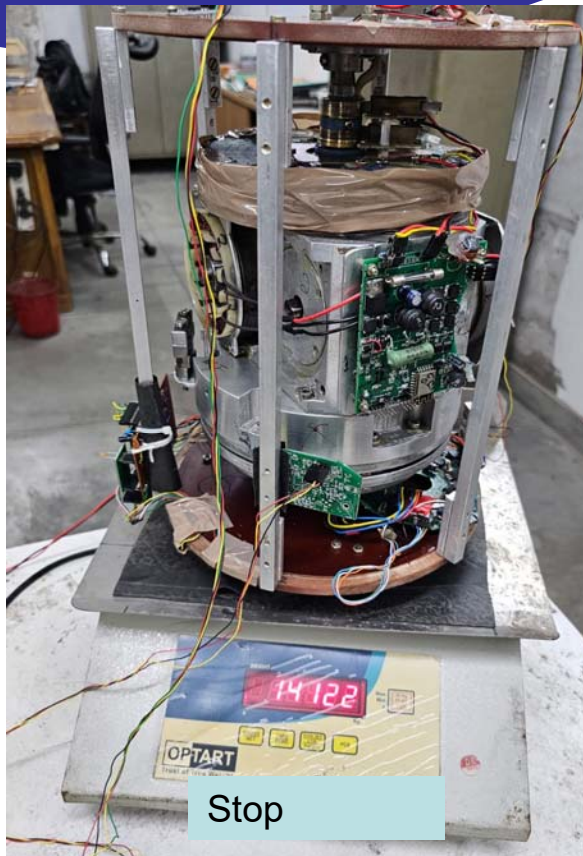
Test Results:

02-08-23, D10P11 ,

Rot body 100 rpm, gyros 1100 rpm,
CI Freq 10 khz, Pizeo 25 KHz

Vin 48V, Power < 55 W

Thrust > **10 gram** on weight m/c -**not confirmed**

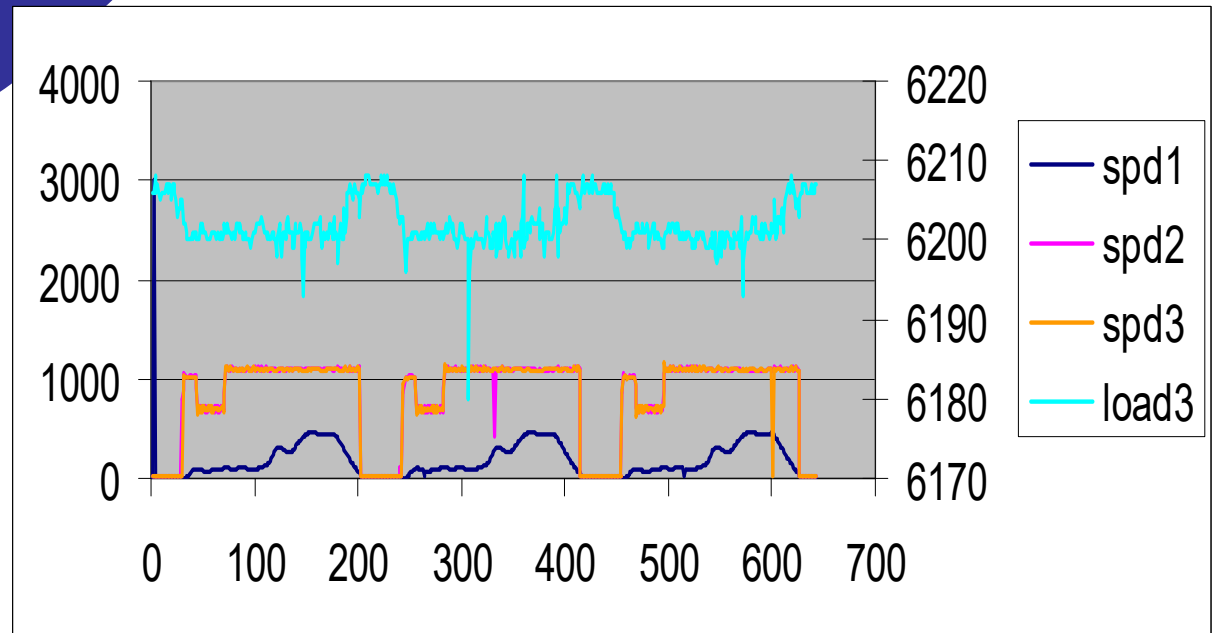
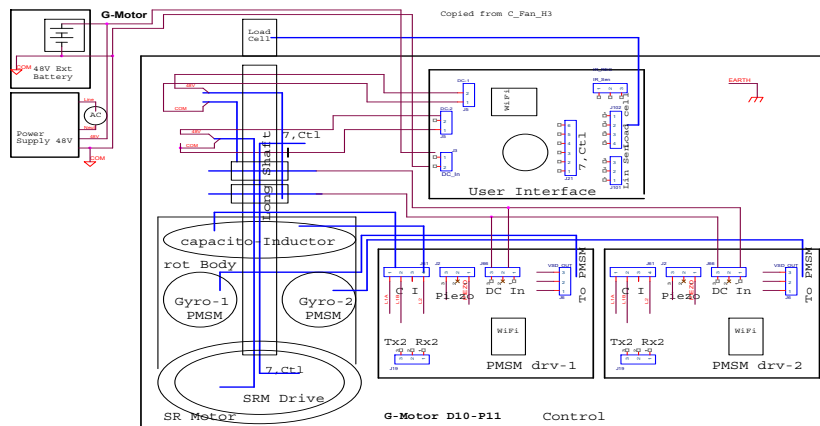


Test Results:

D10P12 ,, From xls to graph

SRM direction Reverse (Top CW)

Block Diagram



Result- 16-10-23, SN_12,

Rot bodyramp, 0 to 440 rpm,
gyros 0 to 1200 rpm

Thrust: 10 gram (0.1N) on Load cell

Load cell counts 6206 at stop, 6196 at run,

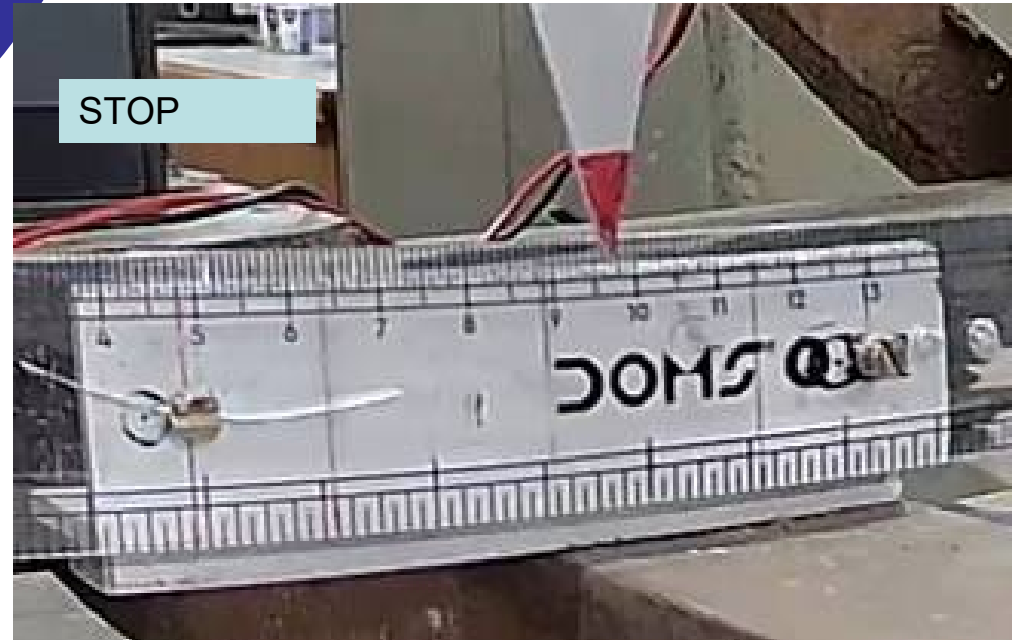
D10P11 , status -**Test results**, D10P11 ,
pics from mp4 etc

Scale calibration: 5 gram/mm, show 2 mm
approx shift- 10 gram



Result- 21-09-23, SN_11,
Rot body 440 rpm, gyros 1000-2000 rpm
Thrust: 10 gram (0.1N) on hang balance
Direction Reverse (Top CW)

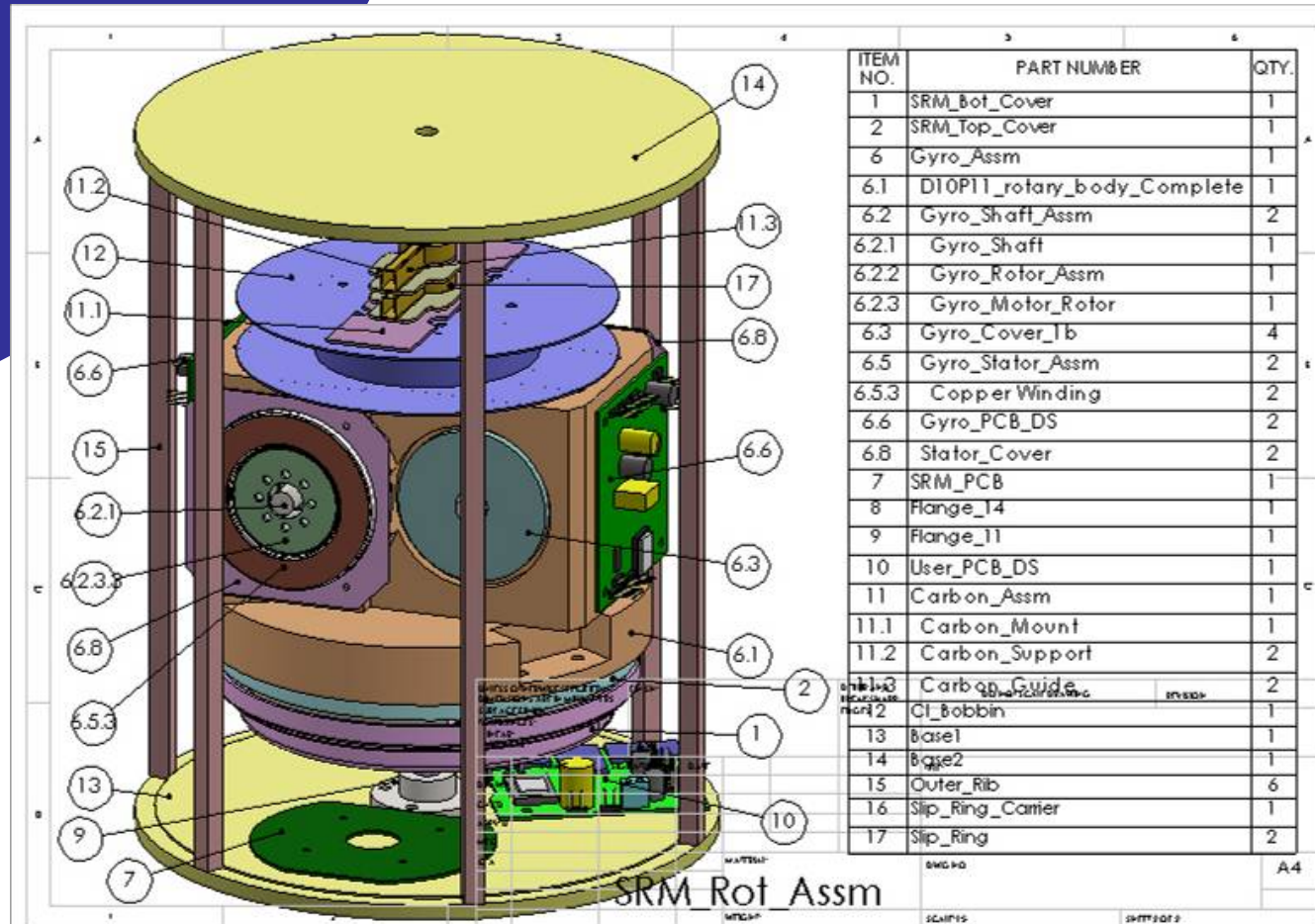
Test Results:



Construction details – Parts List:

Fabrication details:

- A long shaft supported on 3 bearings are use in Switched Reluctance Notor (SRM) for body rotation.
- PMSM based two gyros are used with magnets on gyro wheel surface.
- Capacito-Inductor coil is mounted on gyro assembly.
- Two slip rings are used to transfer power to rotating body , which power gyro PMSM etc.
- WiFi communication is used for monitoring and control from PMSM and SRM.
- User interface handles accelerometers , Load cell, Linear Hall sensor etc.



GUI:

For monitoring and control
Display and log essential parameters





Theory of Operation (optional):

Two gyros with surface magnets make ether drift velocity, spin disengage ether. Body rotation makes energy change and guide flow of ether. Cap-Ind (CI) vibration release ether. Piezo is also used for vibration in ether. This finally generates thrust by reaction from released ether.

To understand the theory behind this proto, we have out theory supported by math and experiments. However, alternate theory can be assumed. Our focus is to have a product and not our theory.

1 All **universe and empty space is filled** with a different category of matter named as **ether (M4)**. The ether (M4) is transparent for other forms of matter, viz. Solid (M1), Liquid (M2) & Gas (M3).

2 Ether is a media for EM wave propagation. The EM waves propagate transversely in ether.

3 Ether can flow like other fluids, and some laws of Fluid Mechanics are applicable on ether.

4 Magnetic flux is flow of Ether (supported by '**The Laser Drift Experiment**').

5 Inertia is the property generated by magnetic induction due to acceleration and retardation in matter. Ether is associated with the objects and moves or drags as the object moves. However, there is a relative motion between the object and its associated ether during acceleration or deceleration process, which is responsible for inertia (supported by '**The Stone Impact Experiment**').

6 Velocity of Transverse wave propagation in ether is equivalent to the speed of light. This shows that ether has very low density and very high elasticity (bulk modulus).

7 Gravitational force is generated by motion of charge in matter. It is resultant force of the electrostatic force vector and magnetic force vector between atoms. Gravitational field is a form of complex magnetic induction, which synchronizes motion of electrons in other matter and generates force of attraction.

8 Ether contains huge energy in the form of flow and vibrations. A combination of magnetic flux, velocity, and vibration in ether can generate force in space by taking reaction from ether. This force is similar to gravitational force.

Booklet with details on this theory is available on <https://www.skdynamics.com/downloads.htm>

9 The relative motion between object and its associated ether requires both acceleration and displacement in the same direction which is applicable in linear motion. A rotary motion has centrifugal acceleration in radial direction, but there is no displacement in that direction. Therefore, the ether associated with object does not leak in constant speed rotary motion. However, the inertia property is applicable while applying angular acceleration as both angular acceleration and angular displacement are present at that time and ether leaks during angular acceleration.

10 Turning a spinning wheel to 180 deg by precession motion in any of the remaining 2 direction requires torque for sufficient duration which is exactly equal to the torque and duration in the spin axis required to achieve the same speed in reverse direction. Therefore the ether leaks in presence of both precession motion and spin motion of a gyro / spin wheel.

Self-funded breakthrough research on thrust generation carried out for almost 3 decades

About SKD: S K Dynamics Pvt. Ltd. (SKD) was established in 1992 with sole purpose of pursuing R&D projects in the area of Electromechanical Engineering, Digital Signal processing, Power Electronics and System engineering. Since 1995 SKD is recognized by Department of Scientific and Industrial Research (DSIR), Ministry of Science and Technology

Achievements: Around **2 Million** Household appliances in the USA, Japan, Europe and China are working using SKD Embedded (Motor) Control Technology. Developed advanced products for Defense and Aerospace applications.

Heritage: Developed more than 50 products / technologies in past 39 years. We cover wide range of motors from 10 W to 18 KW

Credentials: Some of them are- DSIR National Award 2000 for Technology Export of Motor control. EEPC Award 2000 and 2001 for Services Export. ESC Award for Services Export in the years 1998, 1999 and 2001.

Core Competence: Motors and Motor controls. Digital signal processing & processors, Microprocessors & Micro controllers

About us

SKD



About key persons



Rakesh Goel
(Director)

Director in S K Dynamics Pvt Ltd since incorporation



Ankur Goel
(Director)

Director in S K Dynamics Pvt Ltd from **19 years**

THANK YOU!

Prototype and technology is ready and can be
supplied Please contact –

S K Dynamics P. Ltd.

B5 Industrial Estate, Roorkee-247667 India

Ph : +91-9897779555

rakesh.goel@skdynamics.com

ankur.goel@skdynamics.com

www.skdynamics.com