

BEARINGLESS ELECTRICAL MOTOR

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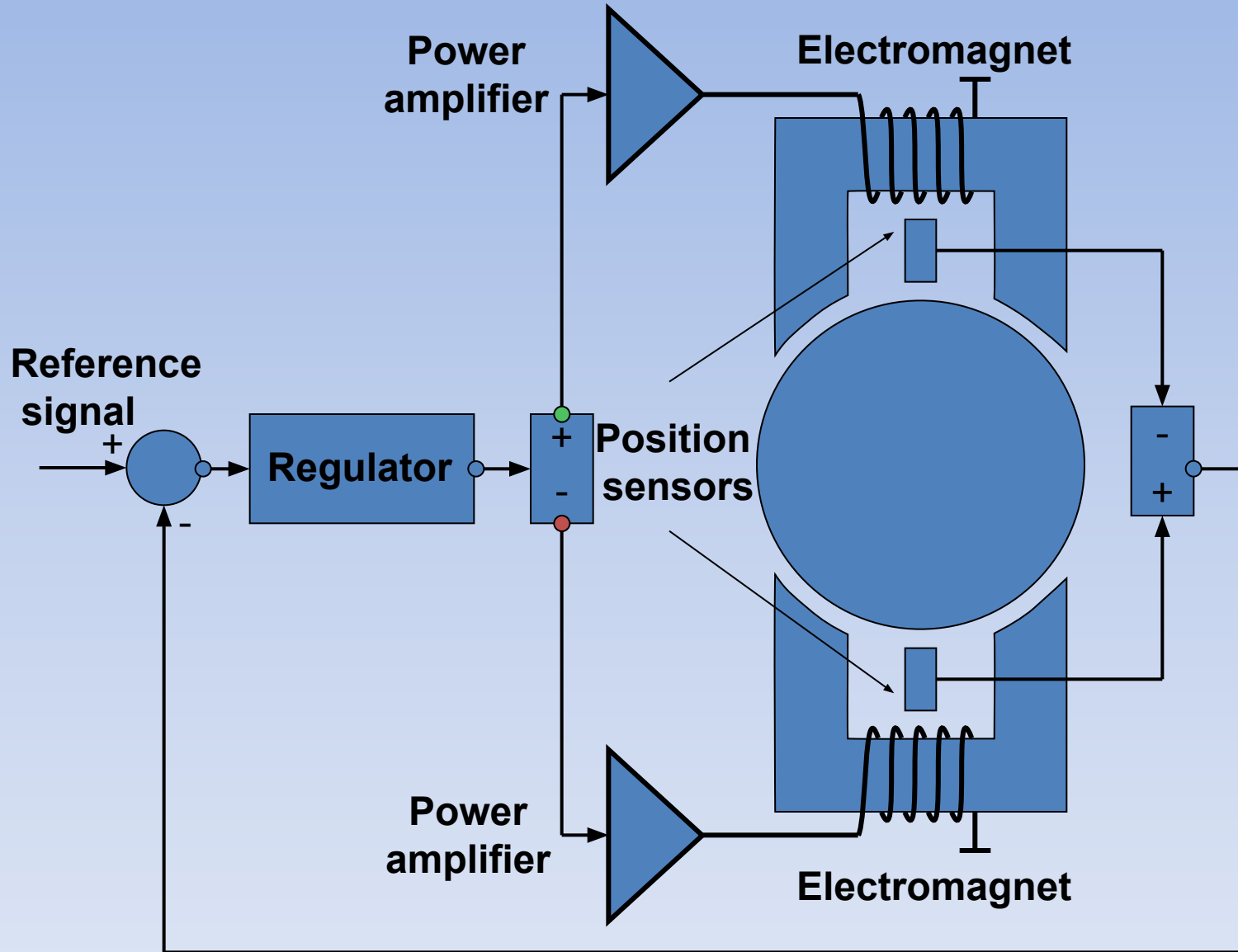
Problems of use mechanical bearing

Scope	Problems
High-speed motors Corrosion environment Ultrapure technologies and vacuum	Intens wear Corrosion of bearings Presence oil

Solution - contactless electromagnetic suspension

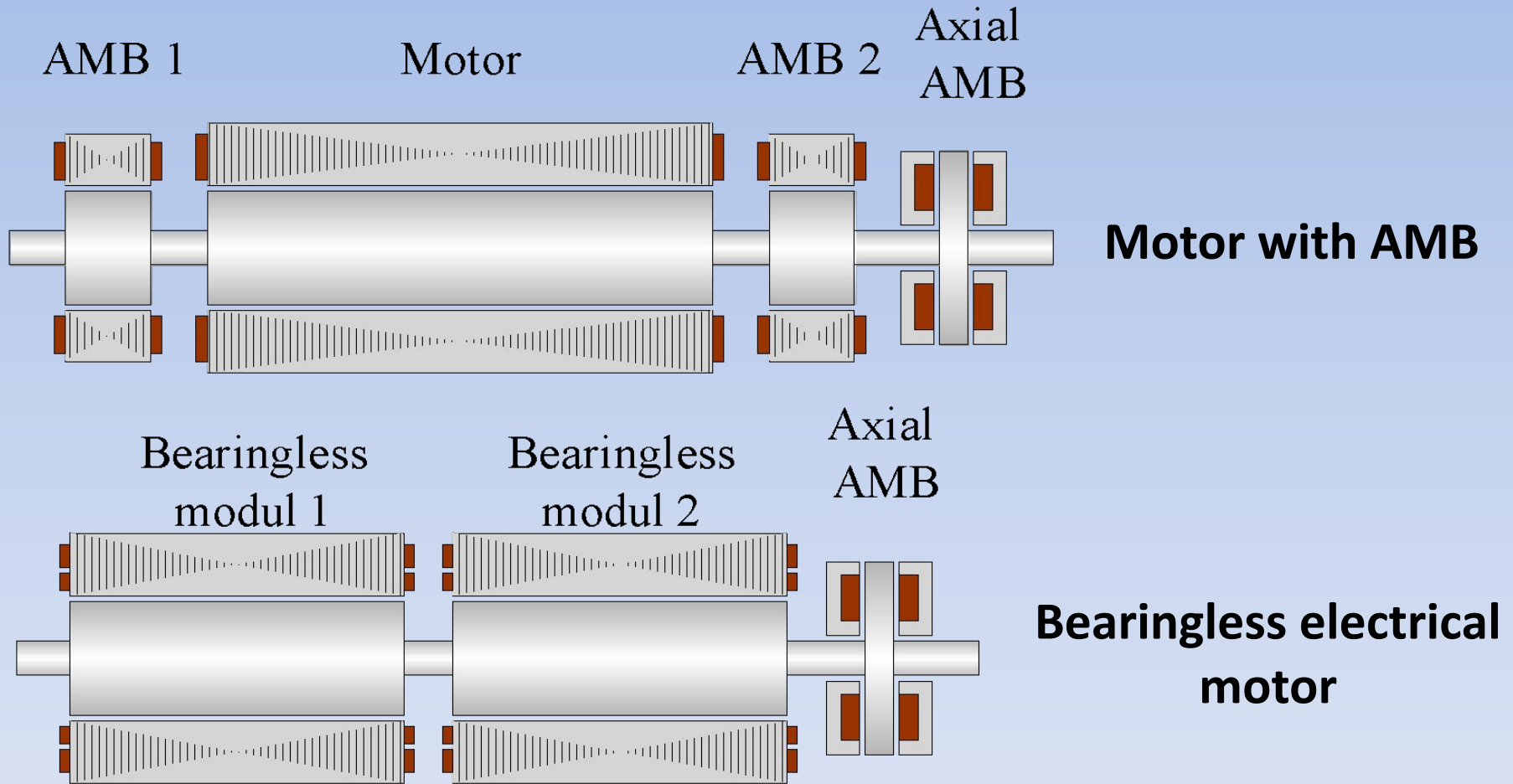
Advantages depend on absence mechanical contact	Advantages depend on control system
<ul style="list-style-type: none">*Absence wear (unlimited resource)*Possibility operation in extreme conditions (vacuum, low and high temperature, corrosion environment)*Absence oil (no oiling system)*Low energy consumption (energy saving, low heat from environment)	<ul style="list-style-type: none">*Rotor position control (creation microdisplacement of rotor into gap)*Controllability stiffness and damping suspension (crossing through critical speed)*Possibility use of sensor signal (control of load on active magnetic bearing , rotor out-of-balance)

Principle of operation of active magnetic bearing (AMB)

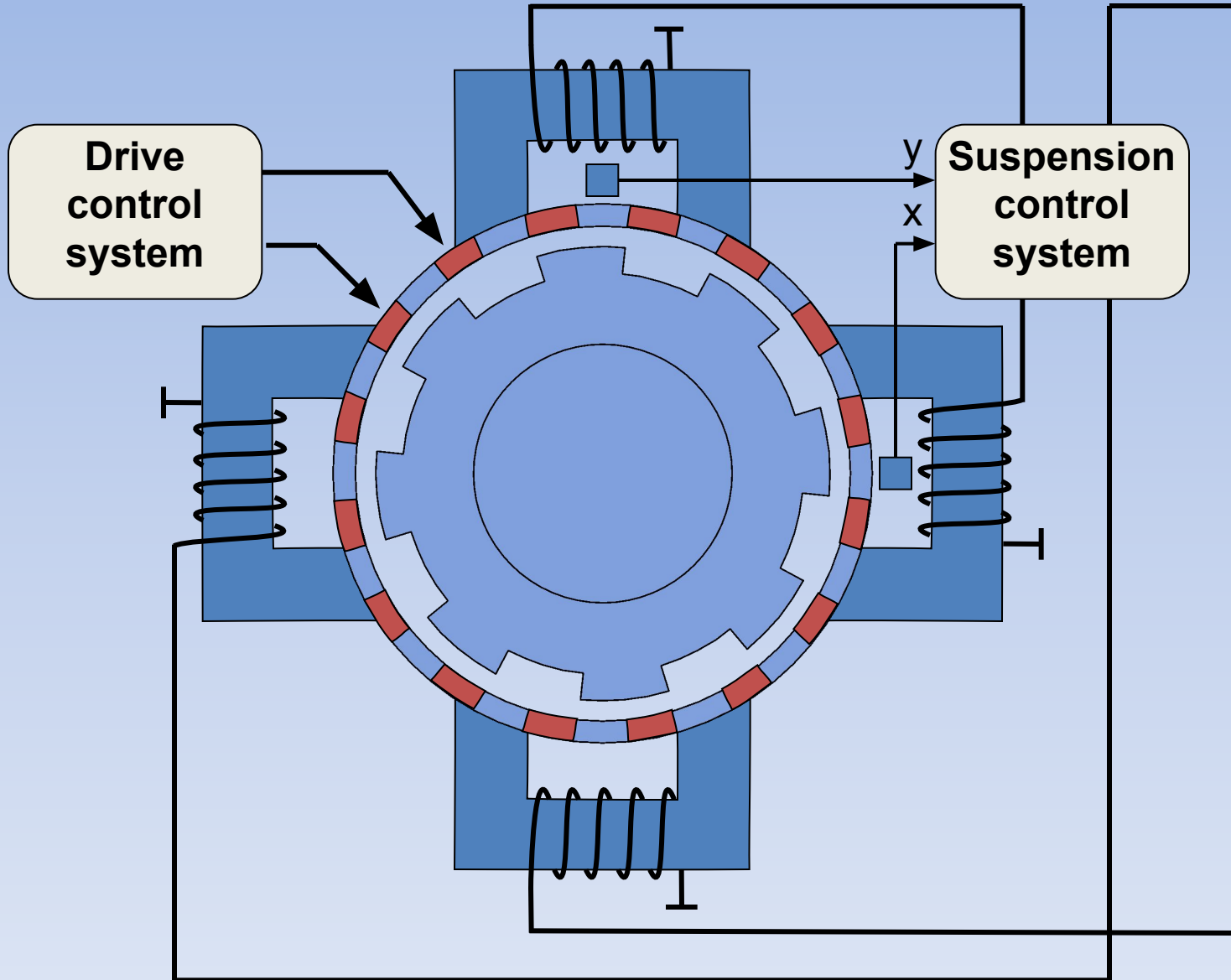


Spring up Position locator forces signal to the regulator
 Forces return rotor in central position
 Power amplifier rule by electromagnet

Versions of electrical machine with contactless rotor suspension



Principle of operation of bearingless modul



Drive control system provides torque for rotation, position-influencing, force regulation, etc. Suspension control system



Space-based processing



Compressor for cooling



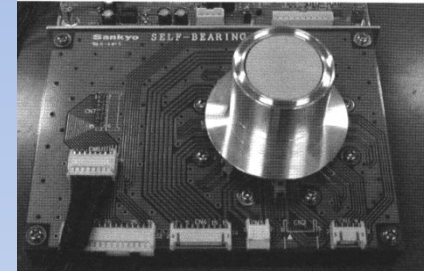
Cryogenic system



Compressors for natural gas



Compressors



Disk drive

Applications

Spindles

Work spindle

Turboexpander

Inertia accumulator

