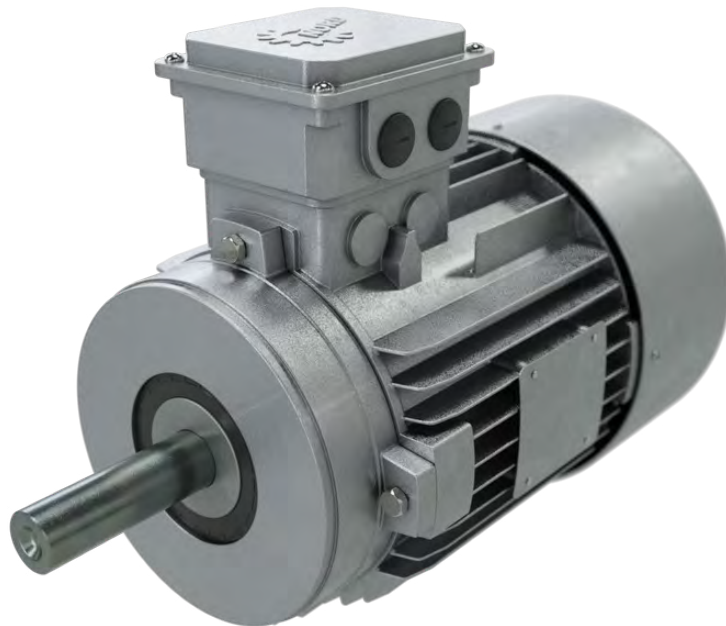


REPLACEMENT & AFTERMARKET

SYNCHRONOUS AC MOTORS



Collaborate / Create / Convey

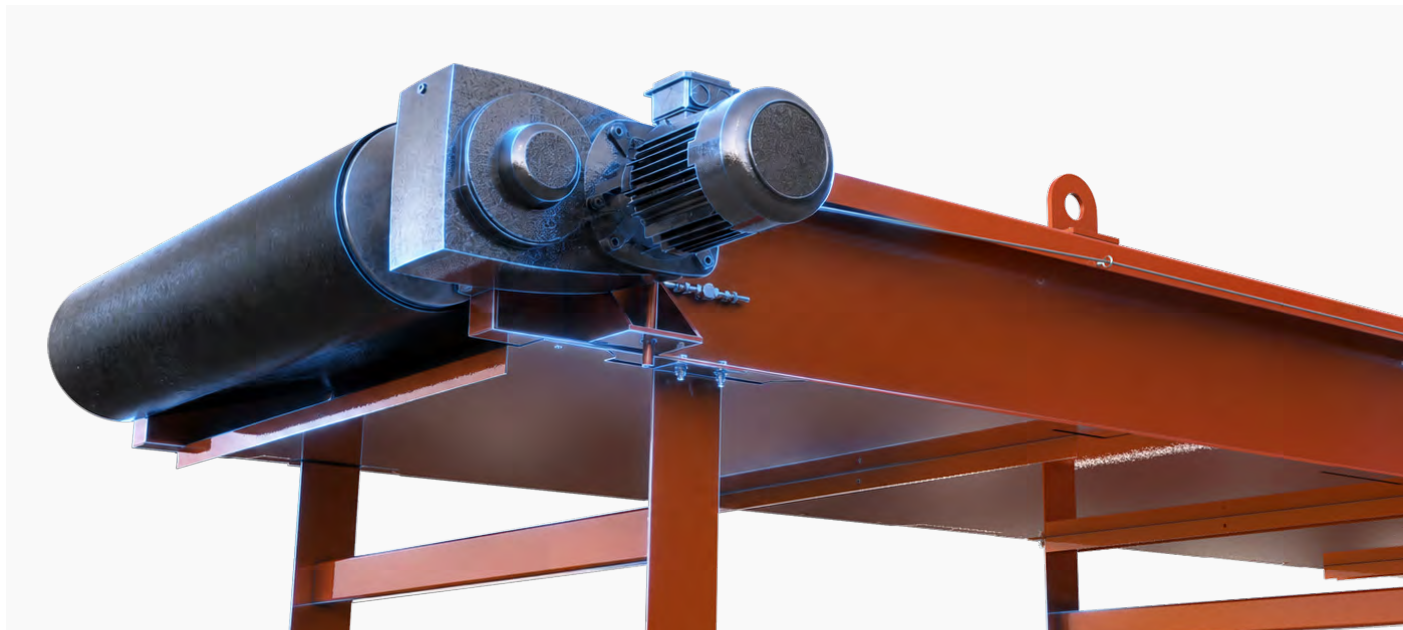
TABLE OF CONTENTS

Synchronous Ac Motors	02	Product specifications	05
Applications	03	The Engineering Advantage	07
Key Features	04	Contact Information	08

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SYNCHRONOUS AC MOTORS



Synchronous Ac Motors

Conveyor systems operating continuously or in partial-load accumulation zones experience excessive energy consumption and thermal stress. Asynchronous motors running below full capacity suffer from significant efficiency drops and slip, leading to increased operational costs in variable-speed applications. Unmitigated energy losses compound rapidly in 24/7 material handling environments.

Permanent magnet synchronous motors lock the rotor to the stator's rotating field, eliminating slip and maintaining constant efficiency across wide speed ranges. Configured in IE4 and IE5+ classifications, these units are enclosed in TEFC or TENV housings with optional IP69K ratings for severe environments. Integrated with pre-engineered helical or worm gear reducers, the continuous-duty drive assemblies drop directly into existing footprints with higher power density than standard induction equivalents.

APPLICATIONS



Recycling & Material Recovery Facilities

High-tonnage trough idler conveyors operate continuously under variable loads and harsh environmental conditions. Synchronous motors provide constant torque and maintain premium efficiency during partial load fluctuations typical of erratic waste streams.



Distribution Centers

Sortation and accumulation zones require precise speed regulation across multiple indexing stages. Integrated incremental encoders deliver continuous position feedback to the variable frequency drive for exact commutation control.



Aggregate Operations

Rock and mineral processing demands continuous 24/7 runtime where energy consumption dominates lifecycle expenses. High power density stators operate continuously above 6,000 annual hours, driving payback periods down through absolute energy reduction.



Food Processing

Sanitization protocols subject drive components to high-pressure, high-temperature steam cleaning. IP69K sealed enclosures combined with NXD tuPH surface treatments resist bacterial adhesion and internal water ingress.

KEY FEATURES

01

Permanent Magnet Rotor:

Locks magnetically to the stator field to eliminate slip and maintain synchronous speed regardless of load fluctuations.

02

Pre-Engineered Gearmotor Integration:

Couples the synchronous motor directly to helical bevel, parallel shaft, or worm drives for a verified thermal and mechanical match.

03

IP69K Enclosure Configuration:

Seals the internal winding and connection components against high-pressure, high-temperature steam jets in extreme washdown environments.

04

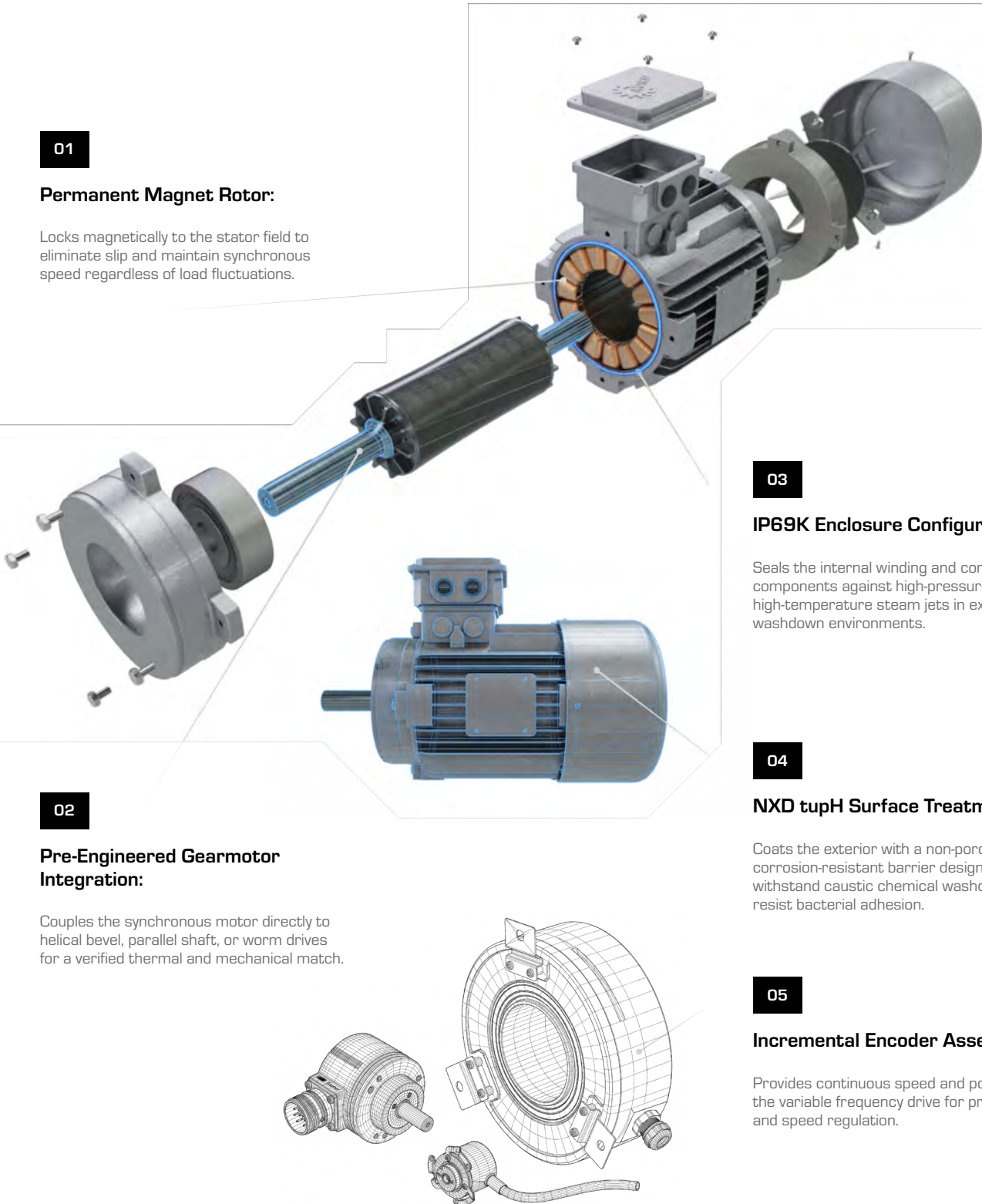
NXD tupH Surface Treatment:

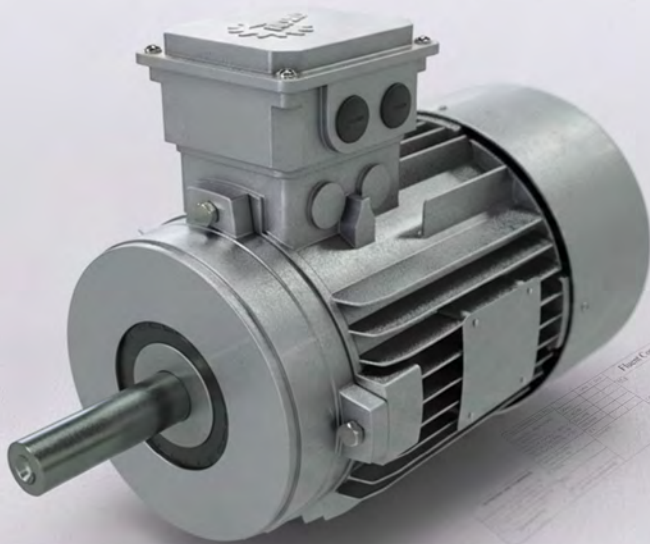
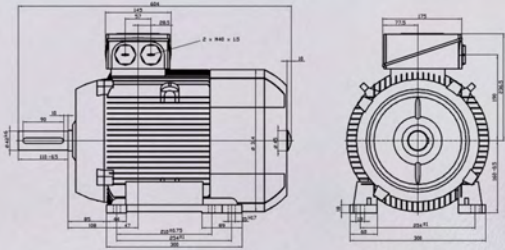
Coats the exterior with a non-porous, corrosion-resistant barrier designed to withstand caustic chemical washdowns and resist bacterial adhesion.

05

Incremental Encoder Assembly:

Provides continuous speed and position feedback to the variable frequency drive for precise commutation and speed regulation.





SYNCHRONOUS AC MOTORS

SPECIFICATIONS

Parameter	Standard Specification
Motor Type	Three-phase synchronous (permanent magnet)
Motor Variants	IE5+ (TEFC), IE5+ (TENV), IE4
Power Range	0.48 – 7.37 HP (0.36 – 5.5 kW)
Efficiency Classes	IE4, IE5+
Voltage	230/460V, 575V
Frequency	50/60 Hz
Enclosure	TEFC, TENV, IP55 (standard), IP66, IP69K, explosion-proof
Mounting	NEMA footed (B3), IEC footed, NEMA C-flange, flange (B5/B14)
Speed control	VFD-required
Constant torque ranges	Wide speed ranges with constant efficiency at partial load
Certifications	Worldwide approvals including CE, UL, CSA

Consult engineering for extended voltages outside standard 230/460V and 575V ranges. Variable frequency drive (VFD) is mandatory for synchronous motor operation.

Drive Options

Component option	Mechanical function
Motor brakes	Provides holding torque to prevent rollback on inclined conveyors or during emergency stops.
Incremental encoders	Delivers speed feedback for precise speed regulation and position control (standard on IE5+ models).
External fans	Supplies independent cooling for prolonged low-speed operation below 30 Hz.

SYNCHRONOUS AC MOTORS SPECIFICATIONS

Protection Options

Component option	Mechanical function
Temperature sensors (TF)	PTC or RTD monitoring with early warning of overheating.
Thermostats (TW)	Enables on/off switching at preset temperature thresholds.
Space heaters (SH)	Provides anti-condensation heating for humid environments.

Enclosure Ratings

Component option	Mechanical function
IP55 (standard)	Prevents dust ingress and provides low-pressure water jet protection for indoor applications.
IP66 (washdown)	Delivers complete dust sealing and powerful water jet protection for outdoor or washdown environments.
IP69K (steam cleaning)	Resists high-pressure, high-temperature steam for food processing sanitization.

Mounting Styles

Component option	Mechanical function
NEMA footed (B3)	Standard foot mounting to flat surfaces.
IEC footed	International standard foot mounting.
NEMA C-flange	Direct mounting to North American gearboxes.
Flange (B5/B14)	Direct mounting to IEC gearboxes.

Connection Options

Component option	Mechanical function
Motor plug connections	Quick-disconnect wiring for rapid component replacement.
Sealed terminal boxes	Enhances environmental protection at the connection point.

Surface Treatment

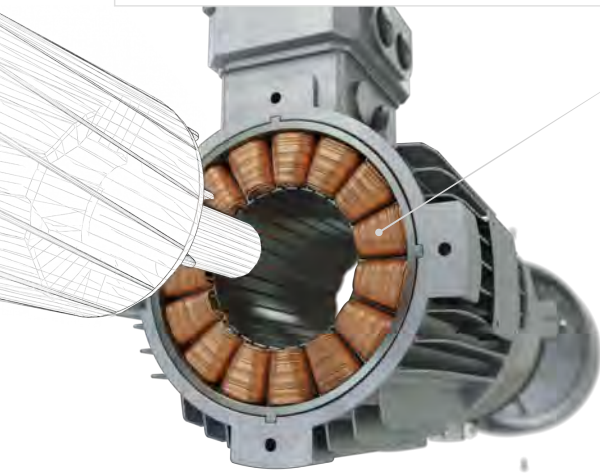
Component option	Mechanical function
NXD tpuH coating	Food-safe corrosion protection and non-porous surface that resists bacterial adhesion.

THE ENGINEERING ADVANTAGE

This section outlines the core power transmission methodology behind Synchronous AC Motors, covering thermal management and mechanical integration to ensure exact system compatibility.

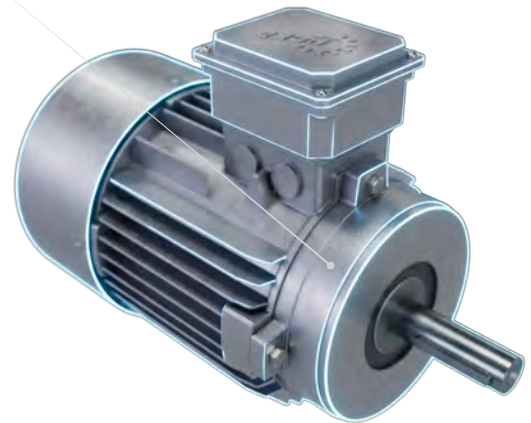
Power Density Optimization:

Replaces bulky asynchronous stators with high-efficiency permanent magnet architecture to reduce the required frame size for a given horsepower rating.



Constant Efficiency Curve:

Maintains flat IE4 or IE5+ energy ratings across partial load and low-speed zones where standard induction motors experience thermal degradation.



Application-Verified Sizing:

Calculates necessary starting torque, service factors, and gear ratio requirements against specific CEMA belt speeds and material loads before factory assembly.



Thermal Protection Integration:

Embeds PTC or RTD sensors directly into the stator windings alongside optional space heaters to prevent condensation and provide early warning of critical temperature thresholds.

CONTACT INFORMATION

OUR ENGINEERS WILL SPEC THE EXACT PART FOR YOUR SYSTEM

For product specifications, engineering support, or order inquiries, please contact our team using the information provided below. Our specialists are available to ensure accurate recommendations and efficient service for your application requirements.

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