PALMERA

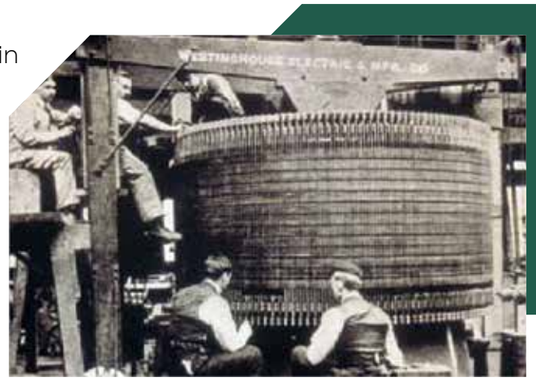
TECO Westinghouse

Motors | Drives | Soft Starters

PALMERA

Palmera, the authorized TECO Group sales partner in the MENA region, brings over 20 years of expertise in delivering electric motors for major industrial projects, offering full support for new installations, replacements, sapre parts, Engineering and after-sales services.

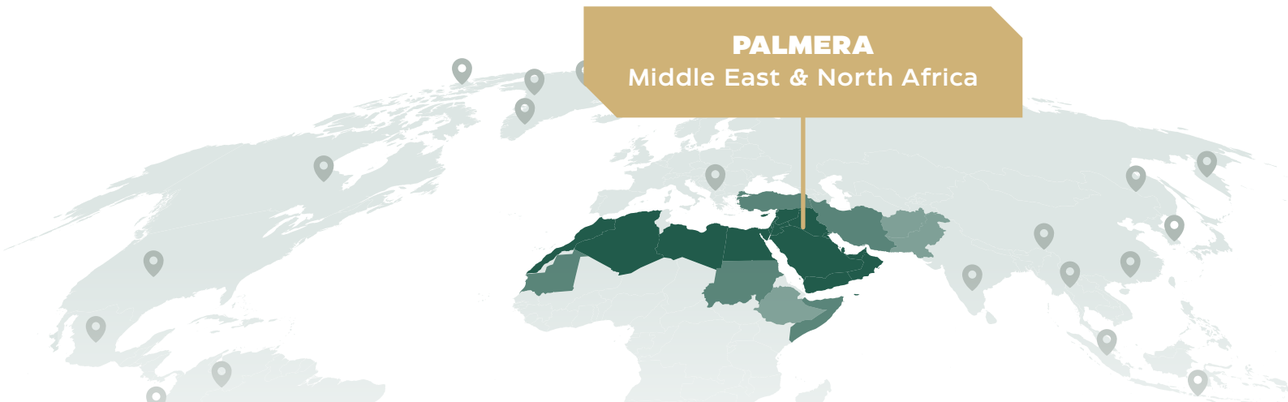
TECO-Westinghouse



TECO Electric & Machinery Co., Ltd., founded in 1956 in Taiwan, is a global leader in electric motor manufacturing, industrial automation, and energy solutions. TECO serves key industries such as oil & gas, water, steel, and infrastructure across more than 40 countries. Known for quality and innovation, TECO delivers efficient and reliable motor solutions from LV to MV and HV applications.

TECO-Westinghouse Motor Company (TWMC), based in Texas, USA, is a strategic subsidiary of TECO Group. It carries forward the legacy of Westinghouse Electric Corporation, originally established by George Westinghouse in 1888, a pioneer in AC power development and a contemporary of Thomas Edison. In the 1990s, TECO acquired Westinghouse's motor division, combining advanced American engineering with TECO's global manufacturing scale.

Together, TECO and TWMC offer complete motor solutions backed by decades of expertise, high-performance design, and a global support network.



Market Approach

We offer our services in three different ways.

New Projects
Engineered from the Ground up

Replacements
Seamless Drop-in Solutions

Industries We Power

- Power
- Water Desalination
- Mining
- Oil & Gas
- Water
- Marine
- Steel
- Chemical
- Wastewater
- Pulp & Paper
- Cement
- Petro Chemical

REPLACEMENT

Seamless Drop-in Solutions

No downtime. No surprises. "

Upgrading aging, or Obsolete motors? Palmera, in partnership with TECO, offers engineered Drop-In Replacements designed to match your existing setup — bolt for bolt, shaft for shaft, and box for box Our solutions eliminate the need for major modifications,reducing installation time and avoiding costly shutdowns.

- Drop-in design & retrofit engineering
- On-site surveys & dimension verification
- Efficiency upgrades with modern technology
- Expedited delivery for critical applications
- Fully compatible with other motor brands and intrnational standards

Reliable replacements. Ready spares. Zero disruption.

Major Considerations for Replacing an Electric Motor

1 Mechanical Compatibility

Ensure drop-in fit to avoid costly site modifications

2 Electrical Matching

Align with the existing starter, protection system, and load.

3 Performance Characteristics

Match or improve the performance of the original motor.

4 Application-Specific Requirements

Load type & Torsional Analysis Survey , Duty cycle, Starting frequency,

5 Environmental & Certification Requirements

Hazardous area classifications,
Compliance with IEC, NEMA, API, UL, CSA, ..etc .

6 Cooling & Enclosure Type

Proper cooling to ensure thermal stability.

7 Instrumentation & Monitoring

Interface compatibility with plant existing systems.

8 Lead Time & Logistics

Align with the existing starter, protection system, and load.

9 Spare Parts & Serviceability

Availability of spare motors or components

Strong Collaboration with OEMs

Palmera maintains close working relationships with leading original equipment manufacturers (OEMs) of driven machinery — including Flowserve, Sulzer, Ebara, and others — ensuring that our motor solutions are perfectly matched to pump, compressor, and fan applications. This cooperation allows for smoother integration, faster approvals, and technically optimized replacements.

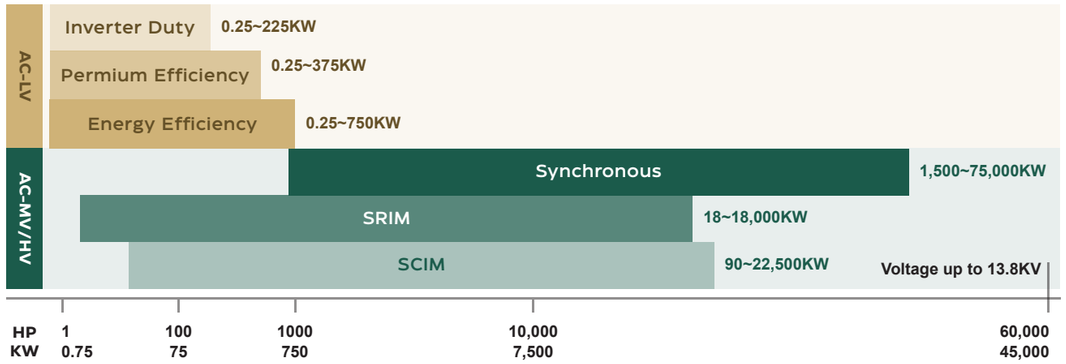
Clinets

We are dedicated to being the premier independent provider of large electric motors, drives, and soft starters. Our mission is to deliver outstanding professional service and support, customized to address the specific needs of clients in various industries such as oil & gas, water & power, mining, etc. By consistently exceeding expectations and offering value-focused solutions, we strive to build enduring partnerships and ensure complete customer satisfaction

Motors

OUR Motors

We offer various types of Motors, from low voltage to high voltage



Certificate & Standars

Clinets

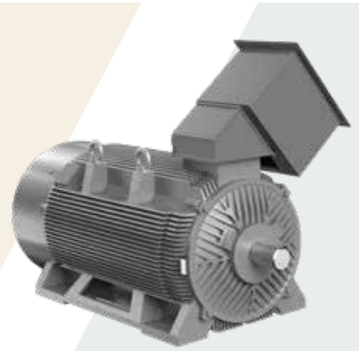
TECO-Westinghouse

TECO's position as a World Leader in the design and manufacturing of large induction motors is secured by an unfailing commitment to engineering excellence and techno-logical innovation. For half a century TECO motors have been recognised as industry leaders in dependability and quality. We have worked with Teco from the very start and they are a key strategic partner for both retro-fit and project business. With their wide range of products, global acceptance and high level of engineering experience, they give us the ability to deliver a high quality engineered to solution to our clients.

Low Voltage Motors

Main Features are:

- Output Power: 1/4~2500 HP
- Rated Voltage: 200~690 V
- Poles: 2~24
- Hazardous Certification: ATEX, IECEX, UL, CSA, GB, CNS
- Available in Safe Area, Exd, Exec (Exn), Exeb (Exe), Class I & II
- Efficiency: IE 2 , IE 3 & IE 4 , IE 5
- Cast Iron, Fabricated Stainless Steel & Aluminium Frames
- Special Designs Available



Medium & High Voltage Motors

Main Features are:

- Output Power: 75~30000 HP
- Rated Voltage: 1000~14500 V
- Poles: 2~42
- Enclosures: TEFC, TEAAC, TEWAC, ODP, WPI WPII
- Available in Both IEC & NEMA Frames and Specification
- Vertical & Horizontal Mountings
- Available in EXD, EXE, EXP Types ATEX IEC & CSA UL Certification
- VFD Compatible
- Full range of bearing types available
- All branded hardware and accessories

VFDs

Our Variable Frequency Drives

We offer various types of Variable Frequency Drives, from low voltage to high voltage

MV510

Rated Power: 250~10000 kW
Rated Voltage: 2.4~13.8 kV

Main Features are:

- Vast range of heavy-duty & demanding applications
- High Quality Power Input
- The Features of Nearly Perfect Power Output
- In Compliance with stringent international standards
- HMI with Powerful Function
- Flexible and easy installation
- Excellent serviceability
- Protection functions

Soft Starters

Our Soft Starters

We offer various types of Soft Starters, from low voltage to high voltage

MVCPLUS
MEDIUM VOLTAGE

Main Features are:

- Range of applications: pumps, fans, blowers, conveyors, compressors, etc.
- Advanced motor protection relay and ramp features.
- Fiber optically isolated LV compartment.
- Built-in120 V control transformer; voltage and current metering.
- Load-break/fault-make rated disconnect switch.
- Visible grounding bar for safe operation
- Coordinated motor fuses with blown fuse indicators.
- Line isolation vacuum contactor.
- Fully rated bypass contactor.
- RTD Option accepts up to12 RTD inputs.
- Heavy duty SCR stack assemblies with ring transformer isolation for reliable SCR gate firing.

Replacement Procedure

Step-by-Step Procedure for Electric Motor Replacement Projects

Step1 Initial Assessment and Site Evaluation

- Receiving Inquiry (Technical)
- Site Visit
- Existing Motor Data Logging & Measuring
- Existing Motor Problems Listed & Historic Monitoring Data Collected
- Data Logging & Data Analyzing

Step2 Design and Technical Proposal

- Technical Proposal and Data Sheet
- Design and Manufacturing of the New Motor

Step3 Design Finalization and Manufacturing

- Finalizing the Design in KOM (Kick-Off Meeting) in the Factory and Starting the Manufacturing Procedure
- Design and Manufacturing of the New Motor

Step4 FAT,Delivery and Commissioning

- Loading, Shipment, and Commissioning at Site
- Factory Acceptance Test

Step5 After-Sales Services

- After-Sales Service During Warranty and Post-Warranty Period
- Supply of Spare Parts

CASE STUDY

Case Study – Gas Pressure Boost Station | Replacement of Turbine-Compressor with Electric Motor-Driven Compressor

Situation

A major gas company sought to modernize its gas pressure boost station by replacing an outdated turbine-driven compressor with a high-efficiency electric motor-driven compressor system. While gas turbines were traditionally used, this project aimed to transition to an electric motor solution, offering superior efficiency, lower maintenance, and better operational control—critical for supporting a long-term cross-country gas export contract

Challenge

The shift from a turbine-compressor set to an electric motor + compressor configuration introduced several technical and logistical challenges:

- Performance & Reliability: Ensuring the electric motor system could match the turbine's output while improving uptime.
- Hazardous Area Compliance: Meeting Exp IIA T3 certification and technical requirements.
- Tight Timeline: Completing engineering, manufacturing, FAT, and commissioning within the project schedule.

Solution

TECO supplied an 8400 kW,11 kV, 4-pole squirrel-cage induction motor (IMB3, IC81W, IP55) designed for Zone 2 (Exp IIA T3) environments. The solution involved close collaboration with:

- MAN Diesel & Turbo (Compressor OEM)
- Voith (Gearbox Supplier)
- Motortronics (Soft Starter Provider)

Replacing the turbine-compressor with an electric motor-driven system reduced maintenance and outages, simplified operation, and improved safety and compliance.

Financial Illustration

- CAPEX Savings: Eliminated turbine-related infrastructure (fuel systems, exhaust, etc.), reducing upfront costs
- OPEX Reduction: Lower maintenance frequency and parts replacement led to long-term cost savings.
- Energy Efficiency Gains: Improved motor efficiency directly reduced energy consumption per unit of compressed gas, enhancing profitability.

Project Overview

Industry

Gas Pressure Boost Station

Driven Machine

Centrifugal Gas Compressor

Motor Type

3-Phase Squirrel Cage Induction Motor

Operational Improvements

The replacement delivered significant benefits over the conventional turbine setup:

- Higher Efficiency
- Lower Maintenance Costs
- Reduced CAPEX & OPEX
- Enhanced Reliability & Uptime
- Simplified Control

CASE STUDY

Case Study – DRI Steel Plant, Fan Application (Replacement of Siemens Motor)

Situation

A Direct Reduced Iron (DRI) steel plant faced major reliability issues with its existing Siemens motor used in fan applications. The motor exhibited high winding temperatures and severe vibration levels, especially during hot summer months, causing frequent tripping and forcing a reduction in plant load and production capacity.

Challenge

- Excessive winding temperature rise (up to 110°C) in an ambient temperature of 55 °C, leading to repeated operational trips.
- High vibration levels reaching up to 8 mm/s, threatening motor integrity.
- Inefficient cooling system mismatched to the harsh ambient conditions.
- The client resorted to unsafe cooling practices like water spraying to keep the motor operational.
- To prevent failure, the motor load was reduced during summers, directly affecting the steel plant's productivity.

Solution

TECO supplied a 1700 kW, 6.6 kV, 4-pole SCIM motor (IMB3, IC616, IP55) tailored as a form-fit-function replacement for the existing Siemens motor. Key design solutions included:

- Upgraded cooling system from IC411 to IC616, designed for 1.15 service factor operation at 55°C ambient, limiting temperature rise to 65 °C.
- Shaft and mounting dimensions matched exactly to the original motor, ensuring a drop-in replacement.
- Terminal boxes for both main and auxiliary connections were identically located, allowing reuse of existing cabling.
- Same bearing types were used to allow compatibility with the client's existing inventory.

Financial Illustration

- Eliminated unplanned shutdowns, improving overall plant availability and reducing lost revenue.
- No need for additional investment in mounting/coupling modifications or new cable routing
- Long-term savings in maintenance and reduced equipment stress thanks to better vibration control and cooling system efficiency.

Project Overview

Industry

Steel DIR plant

Driven Machine

Dedusting Centrifugal Fan

Motor Type

3-Phase Squirrel Cage Induction Motor

Operational Improvements

- The new motor design allowed full-load operation even in 55 °C ambient temperature without overheating.
- Vibration levels were significantly reduced to less than 1.5 mm/s, improving reliability.
- The plant eliminated unsafe cooling methods and returned to normal production rates.
- The drop-in replacement eliminated the need for mechanical or electrical modifications, ensuring minimal downtime.

CASE STUDY

Case Study – Cement Factory, Mill Application (Replacement of Elin Motor)

Situation

A major cement factory experienced repeated failures in its original Elin motor, used in mill operations. The motor shaft suffered from wear due to high shaft voltage, and winding and bearing temperatures regularly exceeded operational limits, leading to significant production interruptions and losses

Challenge

- Shaft damage at Drive End (DE) due to high shaft voltage
- Inefficient cooling system (IC 511), not suitable for the region's extreme summer temperatures (up to 77 °C on-site).
- Winding overheating caused frequent trips and operational instability
- Persistent bearing failures within the first 6 months due to design flaws in the shaft and housing, resulting in high bearing temperatures and daily production stops
- Difficulties in disassembling the original shrink-type coupling.
- Overall system inefficiency with only 95.1 % rated efficiency.

Solution

TECO Westinghouse provided a 5600 kW, 6.3 kV, 6-pole SRIM motor (IMB 3 , IC 611, IP55) as a direct replacement. Key technical improvements included:

- Cooling system improved from IC 511 to IC 611
- Shaft design modified to address previous voltage-induced damage
- Shaft coupling upgraded from shrink type to key type for ease of installation and maintenance.
- Bearing housing improved to eliminate premature failures
- Slip ring chamber protection increased to IP 55 (totally enclosed).

Financial Illustration

- Avoided production loss due to reduced shutdowns, improving plant throughput.
- Increased motor efficiency reduced energy consumption and operating expenses.
- Long-term maintenance costs lowered thanks to reliable cooling and bearing systems.

Project Overview

Industry

Cement Industry

Driven Machine

Ball Mill

Motor Type

3-Phase Wound Rotor Induction Motor

Operational Improvements

- Enhanced motor reliability, eliminating shaft and bearing failures.
- Cooling system upgraded to IC 611 to manage thermal conditions at ambient 55 °C.
- Efficiency improved from 95.1 % to 96.7 %, contributing to energy savings.
- Motor design updated to allow easy installation and improved maintainability
- Daily shutdowns due to overheating were eliminated, stabilizing mill operations.

CASE STUDY

Copper Mine Plant, Condensation Unit, Slurry Pump Drive Replacement of Alstom Motor

Situation

The project involved the replacement of an Alstom electric motor used to drive a slurry pump in the Condensation Unit of a Copper Mine Plant. The original motor, operating in a harsh environment with slurry splashes and high mechanical stress, was experiencing significant operational issues, resulting in frequent trips and unreliable performance.

Challenge

The existing motor faced multiple challenges :

- Overheating and frequent temperature trips
- Inadequate cooling — the IC 511 system clogged due to slurry splashes.
- High harmonics and voltage imbalance from the Alsthom VFD, causing insulation stress and motor heating.
- Original motor was not optimized for slurry pump application or VFD operation.

Solution

TECO manufactured a 800 kW, 690 V, 8 -Pole, TEAAC induction motor for drop-in replacement of existing Alsthom motor without any modification in foundation, coupling and cabling conditions. The implemented solution included:

- Conducted site assessment and re-designed the motor.
- Changed from 6 to 8 poles for improved motor + VFD performance.
- Reduced stator and starting currents
- Designed with high-grade spike-resistant insulation and VFD compatibility.
- Added service factor 1.2 to handle slurry pump load variations.
- Factory testing showed superior thermal performance (Max Temp Rise 66.1 K vs. 90 K spec).

Financial Illustration

- Energy savings due to improved efficiency.
- Reduced downtime and production losses.
- Lower maintenance and longer motor life.
- Cost-effective solution by avoiding the need for a larger motor.

Project Overview

Industry

Copper Mine Plant

Driven Machine

Slurry Pump Drive

Motor Type

3-Phase Squirrel Cage Induction Motor

Operational Improvements

- Improved reliability and reduced downtime.
- Higher efficiency, lowering energy consumption.
- Extended motor lifespan with advanced insulation and better cooling
- Reduced maintenance frequency and associated costs.
- No need to increase motor size, thanks to intelligent design.

CASE STUDY

Copper Mine Plant, Vertical Pump Application
Replacement of GE Motor

Situation

At a Copper Mine Plant, a vertical pump driven by a GE motor was in operation under challenging site conditions. The plant is located at high altitude, which significantly impacts motor thermal performance. The application required a motor with high thrust capability and robust design to ensure continuous and reliable operation of the vertical pump. The existing GE motor was experiencing persistent issues that were affecting plant efficiency and operational reliability.

Challenge

- The site's high altitude was not considered in the original motor's design. No appropriate derating was applied to compensate for reduced air density at altitude, leading to excessive motor temperature rise.
- The original motor's cooling system was insufficient, particularly for the upper bearing. This caused high temperatures at the upper bearing, increasing wear and reducing bearing life.
- The motor exhibited vibration levels exceeding IEC 60034-14 limits, which posed a risk to both motor and driven equipment. High vibration can lead to early failure of bearings, mechanical components, and pump misalignment.

Solution

TECO supplied five 570 kW, 6600 V, -pole, IC611, IP55 vertical hollow-shaft motors to replace GE units on Goulds and KSB pumps. The motors were custom-designed to meet site-specific needs in close collaboration with the client.

- Conducted an on-site assessment with the client's operations and maintenance team.
- Designed a custom High Thrust (IMV1) motor with:
  - Hollow shaft
  - 25,000lbs down thrust capacity
  - Improved cooling and vibration control.
- Factory Acceptance Test (FAT) confirmed thermal performance and full compliance with client requirements.

Financial Illustration

- Minimized unplanned downtime and production losses.
- Reduced maintenance and extended motor + pump service life.
- Avoided costs of repeated repairs and early motor replacement.
- Optimized investment through a custom-engineered, future-proof solution.

Project Overview

Industry

Copper Mine Plant

Driven Machine

Vertical Pump Application

Motor Type

3-Phase Wound Rotor Induction Motor

Operational Improvements

- Improved cooling and thermal management for reliable high-altitude operation
- Reduced vibration, enhancing pump and motor longevity.
- Tailor-made motor design ensured long-term, trouble-free performance
- Extended equipment life and reduced maintenance costs.

Mining References

New Project

Steel DRI Plant

Application:

Compressor Drive (Kobelco)

Fan Drive (Venti Oelde)

Motor Information:

Motor Type: SCIM
Power: 2000 kW ,3650 kW
4200 kW ,4900 kW
Voltage: 11000 V

Description

The total installed power of the electric motors in the Steel DRI Plant is about 35 MW, including: procurement, documentation, FAT, shipment and commissioning services.

Replacement

DRI Steel Plant

Application:

Fan Application

Motor Information:

Motor Type: SCIM
Power: 1700 kW
Voltage: 6600 V

Description

The existing motor's high temperature and vibration caused frequent tripping and reduced plant capacity. The new motor features an improved cooling system and controlled temperature rise. Mounting, shaft dimensions, and terminal box positions are designed for easy replacement.

Replacement

Cement Factory

Application:

Mill Application

Motor Information:

Motor Type: SRIM
Power: 5600 kW
Voltage: 6300 V

Description

The shaft of original motor had been weared from DE side because of high shaft Voltage. Also the winding temperature goes too high due to weak cooling system (IC511) and high losses (95.1% efficiency). To solve the problem the cooling sytem has been improved to IC611and the efficiency has been improved to 96.7 %.

Oil & Gas & Petrochemical References

Replacement

Refining Company

Application:

Gas Compressor

Motor Information:

Motor Type: SCIM
Power: 110 HP
Voltage: 400 V

Description

The existing motor was experiencing overload issues and high winding temperatures. The newly designed replacement motor features a special [illegible]-pole design, with mounting and shaft dimensions matched

Replacement

Petrochemical Company

Application:

API Pump Drive

Motor Information:

Motor Type: SCIM
Power: 255 kW
Voltage: 6000 V

Description

The new motor has been designed and delivered with the same mounting, shaft dimensions, and terminal box position as the existing one, while increasing the output power from 185 kW to 255 kW and meeting the Exec IIB T3 certification.

Replacement

Petrochemical Company

Application:

Gas Compressor Drive

Motor Information:

Motor Type: SCIM
Power: 5500 kW
Voltage: 6000 V

Description

The customer decided to provide a spare for existing compressor motor with hazardous classification zone 2 .So we provided a drop-in replacement solution considering all performance and dimensional requirements with CSA, Class I, Div.2 certificate

Water & Power References

New Project

Water Transmission

Application:

Pump application

Motor Information:

Motor Type: SCIM
Power: 1700 kW , 1600 kW
Voltage: 6600 V

Description

Water transmission pump station including 5 No. medium voltage motors for KSB centrifugal pumps.

New Project

Water Desalination Plant

Application:

Water Desalination Plant

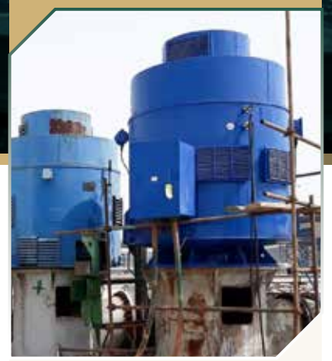
Motor Information:

Motor Type: SCIM
Power: 600 HP
Voltage: 400 V

Description

Supply of different rating of low voltagre squirrel cage induction motors for pump application in as water desalination plant.

Replacement



See Water Intake

Application:

Pump Application

Motor Information:

Motor Type: Synchronous
Power: 1500 HP
Voltage: 4160 V

Description

The end user decided to replace the existing Westinghouse synchro-nous motor after 6 de-cades but they didn't have any drawing. So TECO could gather the required info from his database and provide a compatible motor for driving the subject sea water intake pump.

District Cooling & Utilities

New Project

Water Transmission

Application:

Cooling Water Pump

Motor Information:

Motor Type: SCIM
Power: 5250 kW
Voltage: 11000 V

Description

Supply of MV special vertical totally enclosed air to air cooled squirrel cage motors for water intake pump applications.

New Project

District Cooling

Application:

CDWP

Motor Information:

Motor Type: SCIM
Power: 1563 kW
Voltage: 3300 V

Description

Several horizontal totally enclosed induction motors at medium and low voltage levels for condenser water pump application

New Project

RO Plant

Application:

Pump Application

Motor Information:

Motor Type: SCIM
Power: 1100 KW
Voltage: 11000 V

Description

A number of different power ratings at MV and LV level have been delivered for pump application in RO plant.

PALMERA

Palmera is a distinguished global engineering solutions firm with more than two decades of specialized experience in the Oil & Gas, Mining, Power Generation, Utilities, and Infrastructure sectors.

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