



**21-L series :** Combining over 100 years experience with innovative new technology makes the **21-L** series the right choice for the demanding needs of today's industry.

# Superior electrical performance benefits, unsurpassed reliability :

The 21-L series three-phase high-voltage motors are at the leading edge of motor technology.

- Designs up to 18,500 KW (25,000HP)
- Wide variety of enclosures
- Rugged, high quality fabricated steel construction
- Frame sizes from 450mm-900mm
- Designed to meet worldwide standards

## **Features / Benefits :**

## **Excellent electrical performance**

- Higher efficiency
- Higher power factor
- Superior starting characteristics

## **Unique Modular Construction**

 Easy motor enclosure conversion ODP, WP1, WP2, CACA (TEAAC), CACW (TEWAC)

## New compact design derived through

- Extensive electrical magnetic field analysis
- Heat transfer analysis
- Improved ventilation

### Lower noise & lower vibration

- Advanced techniques in core/frame construction

### **Advanced VPI insulation system**

- Higher surge withstanding capability

## **Excellent Quality Control**

- Low operating and maintenance costs
- High reliability
- Extended re-greasing intervals

## Design for all applications and industries Compatible on Variable Frequency Drive applications Fabricated copper bar rotor construction

## **Features of 21-L Series Motors**

**Reliability & Easy Operation / Maintenance** 



#### **Air housing**

- NEMA WPII top-hood construction prevents intrusion of rain water and foreign matter.
- IP 55 protection is standard on CACA and CACW type:

## **Stator coil**

Utilizes highly reliable , vacuum pressured impregnation (VPI) insulation system which provides firm fixing of coil ends and ability to withstand most environments.

#### **Rotor bar**

Copper rotor bars are shaped to provide excellent torque characteristics and mechanical strength and are retained firmly in the slots.

#### **Bearing**

Antifriction & sleeve bearings have easily maintainable construction with excellent lubrication system.

## **Enclosures of 21-L Series Motors**

#### 21-L Series

Output

Voltage

: 50Hz 450~16500KW(600~22000HP) 60Hz 450~18500KW(600~25000HP) : 2300V~13800V Insulation Class : F Class Apply Standards : IEC, NEMA, BS, AS ...

#### **NEMA Weather-protected Type-II**

The open-outdoor type motor(IP24W,IC01) is a motor used for outdoor that incorporates an air housing in accordance with NEMA WPII.It includes three right angled turns for air inlet and inlet air duct has a section where wind velocity falls below 3 m/sec (600ft/min.), dripping water,dust,and foreign matters. A section is provided in which air may blow through without being forced into the motor.

#### **Totally-enclosed Fan-cooled Type** (CACA)

In an environment containing corrosive or harmful gas, a totally-enclosed fan-cooled motor (IP55,IC611) is generally used. The external fan mounted on the opposite drive end directs fresh air into the pipes of the air housing located on the upper part of the motor. The pipes constitute a heat exchanger in which fresh air passing through the pipes cools motor inside hot air.



## Type (CACW)

motor ambient. the motor.

### **Drip Proof Type**

A drip proof type motor (IP22,IC01) is a common choice for a well ventilated room. Cooling air intake and hot air exhaust windows are located at top hood portion. The ducts are windows provide with separate braid at inside and screens at outside to prevent intrusion of water drips and other foreign matters into the motor inside(NEMA WP-I requirements).



5



## **Totally-enclosed Air-Water-cooled**

This type of motor (IP55,IC81W) is especially useful in a location where low noise operation is required or where it is desired to remove heat from the

The motor accommodates an air to water heat exchanger in the air housing in the upper part of

A drain in the air housing protects the motor proper from damage caused by water leakage.



#### **Fundamental**

IC01,IC61 and IC81W per IEC Standard constructions are available by changing top hood construction, in addition to the four type where described here. Main terminal box can be changed every 90 degree angle. Main terminal box size is large enough to connect cable easily. And also provided shaft current protection insulator at none

drive end bearing portion.



## **21-L Series in detail**



## **Details of Bearing Arrangement**

#### Rolling type bearing (two bearings)



Part No.	Part Name
1	Bearing Bracket
2	Bearing
3	Outside Oil Seal
4	Inside Oil Seal
5	Insulated Bearing Seat
6	Grease Valve
7	Bearing Nut
8	Bearing Washer
9	Packing
10	Cover

#### Rolling type bearing (three bearings)





Part No.	Part Name
1	Bearing Bracket
2	Bearing
3	Outside Oil Seal
4	Inside Oil Seal
5	Insulated Bearing Seat
6	Grease Valve
7	Bearing Nut
8	Bearing Washer
9	Packing
10	Cover

#### Forced lubricated type Sleeve bearing



Part No.	Part Name
1	Bearing Housing
2	Bearing Bracket
3	Bearing Metal
4	Oil Ring
5	Outside Oil Seal
6	Inside Oil Seal
7	Machine Seal
8	Oil Inlet Pipe
9	Oil Outlet Pipe
10	Sight Glass

## **Main terminal box**



## Accessories





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