



High Voltage Induction and
Synchronous Motors Oil & Gas Applications



ATB Laurence Scott motors are distinguished by performance characteristics configured to suit individual application needs, leading to excellent product reliability and long in-service life. Our Norwich factory can offer asynchronous induction machines or four pole synchronous machines, either as project specific designs or direct repeats of original designs utilising modern developments based on technological improvements generated by well-respected design teams.

All application-specific machines are developed from standard base designs. The complexity of variations available means that this brochure only describes the basic features of our machines, with detailed information about specific aspects or particular applications being available against your enquiry/tender documents.

Hazardous area electrical machines are an ATB LS speciality, where ATB LS has produced advanced designs for use on offshore platforms and rigs, Floating Production, Storage and Offloading vessels (FPSO) and onshore oil and gas facilities.

As standard, machines have provision for air-purging, which can be extended to encompass Exe, -n and -p certification.

Turbo Compressor Drives



Photo courtesy of Dresser Rand

An ATB LS compressor drive for the Petrobras FPSO, Cidade de Angra dos Reis MV22.

ATB LS Frame PL 710
5450kW 7300HP, 4pole
TEWAC/CACW IP56
11.0kV 60Hz

In standard form, ATB LS machines are manufactured in accordance with IEC 60034-1. Where specified, however, machines can be supplied to meet NEMA, API and other national and international standards, as well as contractors' and end users' specifications.

Machines can be supplied for nominal power 150kW to 25MW, voltages from 2.3 to 15kV, and 2 to 20 pole, complete with air or water-cooling systems where required. As standard, machines are designed for Class B rise using Class F insulation. Noise levels as standard are typically 80–82 dB(A) MSPL @ 1m no load. Specific machines can be offered for variations on these values or performance characteristics, after consultation with ATB LS Engineering Dept.





ATB LS Frame PL 560
4400kW, 5900HP
2pole 11kV 3ph 60Hz
TEWAC/CACW IP56
Exn II T3

Pump Packages



ATB LS Frame PL1000
11566kW, 15500HP
4pole 11kV 3ph 60Hz
TEWAC/CACW IP56 Ex
e px II T3 Designed for
300% Starting Current

Typically standard design machines are steel fabrications, with 450 to 710 frames of box construction design and 900 to 1400 frames of unit/base plate construction. These can be arranged as horizontal foot or vertical flange mounting designs.

The stator core is assembled from varnish insulated laminations produced at the same time as rotor laminations on an automated lamination punching & notching line, thus ensuring the best electrical and mechanical compatibility for rotor/stator packs. Lamination packs are assembled with endplates under pressure before welding to produce a 'tight build'.

The stator winding system is Vacuum Pressure Impregnation (VPI) Class F insulation. Stator windings are formed from pre-insulated copper strip and secured into the open slots of the core.

The end windings are securely blocked and braced for excellent mechanical strength against electromagnetic forces, and the whole assembly consolidated through impregnation under vacuum and pressure. The stator core is finally baked at high temperature under rolling conditions to set and fully consolidate the insulation system.

All bearing configurations are available to suit output, duty, ambient conditions or customer specifications, Sleeve Bearings are specified either as self-contained oil lubricated or force lubricated with associated pipe work appropriate to requirements.

Anti-Friction Bearings are typically deep groove ball and/or roller bearings with grease escape valve and L10 > 40,000 hours. NDE bearings are electrically-insulated from frame unless otherwise specified.

Vertical machines are provided with angular contact or spherical roller anti-friction bearings to accommodate axial thrust.

Engineered Solutions



Photo courtesy of Clyde Union Pumps

ATB LS Frame PA630
2950kW, 3950HP
2 pole 13.8kV 3ph
60Hz IP56
Ex e px II T3
Clyde Union Pumps
offshore Angola

Preparation of a
9500kW 12730HP
4 pole compressor
motor designed for
290% starting current



Low Starting Current Applications

ATB LS has designed and manufactured some of the largest motors with reduced starting current. Applications of low starting current designs have been installed on many offshore platforms and FPSO's and are becoming increasingly chosen by clients where the power generation is limited and reduced floor space and low weight is paramount. Use of DOL low starting current designs can provide cost-effective solutions removing the need for expensive electronic variable frequency starters or other forms of soft starters.

A typical cage induction motor having standard performance will achieve a starting current in the order of 6 times full load current. In conjunction with the system designer and the driven equipment designer, motors with starting currents down to 240% of full load current have been produced which minimise the impact on the line during starting of the motors but with sufficient torque to accelerate the driven equipment up to full speed.

Typically most applications are in the region of 300 to 350%, which provides an acceptable value of pull out torque allowing sufficient margin for the motor to ride through momentary voltage depression. Designs with starting current below 270% are generally not offered due to the low value of pull out torque.

At the time of writing ATB LS has manufactured over 500 motors with starting current of 450% or less, which have been commissioned for operation around the world.





Four Pole Synchronous Motors

ATB LS machines are manufactured in accordance with IEC 60034. Where specified, however, machines can be supplied to meet NEMA, API and other national and international standards, as well as contractors' and end users' specifications.

Synchronous machines can be supplied for nominal power 10MW to 30MW, voltages from 2.3 to 15kV, and 1800 rpm, complete with air or water-cooling systems. As standard, machines are designed for Class B rise using Class F insulation (IEC 60034-1).

Variable speed machines are a requirement for many compressor and pump packages, and ATB LS has vast experience of these applications.

Electronic drives (inverters) allow conventional motors to be operated at variable speeds, VSD synchronous motor packages are available from ATB LS. The motor electrical design can be optimised to suit the specific inverter operation and driven requirement.

Balance rig with
7500kW, 10000HP,
4pole variable
speed rotor prior
to final assembly

WOLONG

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