Welcome to BU Motors and Generators product overview e-learning.
This course is part of the AVP introduction training program, and it is now time to introduce our products. The goal of the course is to increase your knowledge of the product scope in BU Motors and Generators. You will discover the main product lines from each of our Product Groups.

Upon completion of this course, you will be able to Outline the main product lines in BU Motors and Generators, and Relate product features with customer values.
BU DMMG Product offering
Here is the main menu of the course. Start your studies by choosing one of the product groups to learn more about our product offering. Once you have studied all the material, click next to continue.
PG IEC LV Motors offering
PG IEC Low voltage motors
Product portfolio for any industry, any application

ABB’s IEC low voltage motors are suitable for all industries, and all applications.

ABB has always been a forerunner when it comes to efficiency and today's motors are no different with standard series reaching as high as IE4, and concept motors of IE6.

IEC low voltage motors come with outputs up to 1,000 kW in frame sizes from 56 to 450.

http://new.abb.com/motors-generators

PG IEC Low voltage motors offer a wide range of motors for any industry and practically any application. And as the name of the product group apply all motors made are according to the IEC standards where applicable.

ABB has always been a forerunner when it comes to efficiency and today's motors are no different with standard series reaching as high as IE4 and beyond while the latest concept motors reach an efficiency of IE6.

IEC low voltage motors come with outputs up to 1,000 kW in frame sizes from 56 to 450.
The general performance motors have a robust and simple design to meet the general requirements for a electrical motor. The motors are offered in both cast iron and aluminum housing based on the application requirements. The motors are available in IE1, IE2 and IE3 execution. The biggest users of these motors are OEMs dealing with pumps, fans and compressors they are also used in other applications and segments like for instance utilities.

The general performance motors are designed for the less demanding applications but still offers a wide variety of modifications.

Global of the shelf availability is one the other values this product line offers.
The process performance motor is the real work horse of PG IEC LV Motors. It is designed to last in the most demanding environments and applications you could imagine.

This product line is also offered in both aluminum and cast iron housing, with slightly different target groups. Both come in a variety of executions, and are tailored for the segment or application for which it’s intended.

One of the benefits in the flexibility of this product line is that it enables continues monitoring of windings, bearings, speed etc. to spot any irregularities in the process.

This product line is offered as IE2, IE3 and IE4 and meets all MEPS requirement as of today, also has it been registered for most local MEPS schemes.

The standard execution of this product line is an asynchronous induction motor but a part of the range can also be offered as a synchronous reluctance motor suitable for direct on line duty with an efficiency class of IE4 or IE5.
When it comes to explosive atmospheres safety is number one. PG IEC LV Motors offer flame proof, increase safety, non sparking and dust ignition proof motors according to the IEC standards. It is based on the same design philosophy as the process performance motor so it’s designed to last in the most demanding environments and applications you could imagine, with outstanding finish on painting etc.

Most of these motors are to be used in the Oil, Gas or petrochemical industry but also a lot of other industries are using these motors where flammable gases or dusts are present, like in food and beverage, the wood processing industry, mining and so on.

Globally there are a lot of local certification requirements in addition to IEC, like ATEX, INMETRO, Kosha etc. ABB can offer our products to most of these local certificate requirements. In addition to the sales organization ABB also has a global network of certified repair shops that is able to service our products after the warranty period has expired.
Standard induction motors can be used also in variable speed applications. However motors optimized for VSD applications offer even better performance characteristics.

Synchronous reluctance motors are suitable for all industrial applications. The advantage is that this motor doesn’t have rotor losses at all, which is why it can reach higher efficiency or more compact construction compared to induction motor. Other benefits are cooler running – higher reliability, better partial load efficiency and quiet operation. A drive with dedicated control software is needed to run this motor type.

HDP motor is an induction motor, which is substantially more compact compared to traditional IP55 induction motor with corresponding output. This gives the motor a low inertia, which in turn enables good dynamic characteristics. The most compact version of this motor type is IP23, so typically intended for indoor use. Typical applications are extruders, wire drawing machines and test benches.

Low speed/High torque permanent magnet motors are suitable for applications with nominal speeds 100-600rpm. Torque range is from 1000 Nm to 44 000Nm. The idea with these motors is to simplify the drive system by eliminating the need of a gear box. This motor type has been very successful in paper machine drives but can be used for any low speed direct drive applications. A drive with dedicated control software is needed to run these motors.
The special application motors are all designed with the application in focus. There are smoke extraction motors built to withstand temperatures up to 400 degrees, roller table motors built to accelerate, run and reverse, open deck motors to withstand the waves of the Atlantic, break motors, water cooled motors, air cooler motors and many more.

As these are all built for purpose the all bring unique values to the application and do not compromise the reliability of the application.
PG Large Motors and Generators
ABB has what it takes to help every industry and application reach new levels of efficiency and energy savings even under the most demanding conditions. Combining the best available materials with superior technology, the electric motors and generators are designed to operate reliably no matter how challenging the process or application is. With ABB’s wide product portfolio in Large Motors and Generators ABB is supporting various industries such as mining, oil and gas and petrochemicals, power, water, and food and beverage industry to reach higher efficiency and energy saving requirements. ABB’s goal is to become the preferred partner providing the best value proposition.

ABB provides different types of motors and generators for different applications and industries: Rib cooled motors, Modular induction motors, Flameproof motors, Slip-ring motors, Synchronous motors, Permanent magnet motors and low voltage induction motors using form wound coils. From generator side ABB can provide induction and synchronous wind power generators, diesel and gas engines, and steam and gas turbines belong to ABB’s product portfolio.

With manufacturing locations in all parts of the world: Asia, Europe as well as Americas, ABB is a truly global supplier of motors and generators.
ABB’s induction motors wide product offering includes cast iron motors, modular induction motors, flame
proof motors and slip-ring motors.

Power range in HV induction motors is from 14 kW to 23 MW.

- Rib cooled motors NXR and HXR
- Process performance rib cooled motor M3
- Flame proof motors Exd – AMD, AMD-T
- Modular induction motor AMI, AMA, NMI
- Modular Slip-ring motors AMK / AML

Key Values:
- Customization according to customer needs
- Reliability of ABB’s insulation and bearing system

ABB’s induction motors wide product offering includes cast iron motors, modular induction motors, flame
proof motors and slip-ring motors.

Power range in HV induction motors is from 14 kW to 23 MW.

High voltage rib cooled motors NXR and HXR are engineered individually according to requirements,
and withstand in demanding environment. NXR motors are lightweight compact designs
with rigid cast iron frame construction and high efficiency. ABB NXR motor is ideal motor for pumps, fans
and compressors used in mining, cement, power, water, oil, gas and petrochemical industries.

ABB flame proof Exd motors fulfill the requirements of demanding process applications: onshore or
offshore, oil and gas pipelines, refineries and petrochemical plants, floating production storage and
offloading oil platforms.

AMI High voltage modular induction motors are engineered according to customer requirements and are
used in most industries and applications including compressors, pumps, fans, blowers, conveyors, mills,
crushers, refiners and ship thrusters.

The NMI motor, rated from 315 to 8,000 kW, in frame sizes 400 to 630, packs more power per kilogram
which means the power required is achieved in a smaller frame size. The NMI modular induction motor’s
pre-engineered platform ensures ABB can meet customer requirements for short delivery times and on-
time delivery.
Synchronous motors from ABB are based on a modular design and offer easy configurability for different applications and customer requirements. They are built to the strictest manufacturing standards for the highest efficiency, performance and reliability. As a global player, ABB can design its products to meet local and regional regulations in all parts of the world. Synchronous motors are widely used to drive compressors and pumps in the oil and gas industry, as well as extruders in the chemical industry and in mining industry solutions. Synchronous motors are typically preferred when higher power and torque are required. Synchronous motors also offer adjustable power factor.
ABB has supplied more than 30,000 generators over the last 35 years to leading wind turbine customers all over the world.

ABB has solutions for all the main drivetrain concepts from direct drive to medium and high speed. The main concepts are doubly-fed (DF) and full converter (FC), using gearless low speed or geared medium or high speed generator solutions. There is no single optimum solution and the ideal choice will always be a perfect compromise chosen according to market factors and wind conditions.

In offshore wind power, proven ABB generators offer the highest efficiency and reliability. In fact, the majority of the offshore turbines now operating rely on ABB generators. Reliability means availability, and it is realized by using proven components. ABB has supplied generators to majority of the leading wind turbine manufacturers around the world.
ABB’s LV generators are typically used to supply continuous or standby power for facilities like schools, hospitals, offices and factories, and for demanding applications like mines, telecommunications, and transportation. ABB can also provide generators for special requirement areas, like for plants that use renewable sources of energy such as solar thermal power, geothermal energy, energy recovery expanders, generators for explosive atmospheres, ocean energy and small hydro, and generators for railway application.

ABB standard 4-pole generators have proven themselves in demanding marine applications. Other advantages of ABB’s LV marine generators are robust design for harsh marine environment. It is compatible to all marine classifications. Also wide range of application specific accessories, both standard and optional are available. The AMG LV Marine generators are designed to operate reliably on vibrating environment caused by the piston engine.
Our range of synchronous generators is one of the widest in the market, covering all land-based and marine applications.

ABB supplies low voltage (LV) marine generators for use in main, auxiliary or emergency power generation. These products can be incorporated into diesel generating sets, or operated as shaft generators. They are found in many different vessel types, including cruisers, ferries, ice-breakers, multi-purpose tankers, LNG tankers, ice-going vessels, supply vessels and drilling rigs.

ABB high voltage (HV) generators are in use all over the world, producing power in electric utilities and district heating plants, industrial plants, the marine and offshore sectors, and similar applications.

ABB is an independent manufacturer. Many competitors are bound to some engine maker or genset manufacturer ABB is interested in any business where generators are required. ABB has a long track-record of building reliable high performance generators to the most demanding standards for even the biggest gensets with common base frames.
ABB is a leading supplier of synchronous turbine-driven generators to power utilities, paper mills, sugar plants, oil and gas installations, and many other sectors. Our broad selection of turbine-driven 4-pole generators enables us to supply the right products for many different customer needs.

The world’s gas and steam turbine markets are dominated by few players.

ABB generators have optimal cooling designs. One of the factors that determine the lifetime of a generator is temperature. ABB’s pre-engineered generators use a symmetrical cooling principle that allows uniform cooling within the generator. ABB designs and manufactures generators that are engineered to meet the highest demands for efficiency, performance and reliability.
A synchronous condenser is a device that supports network voltage by providing reactive power compensation and additional short circuit power capacity. Fundamentally, a synchronous condenser is a synchronous generator operating without a prime mover. Generation/consumption of reactive power is achieved by regulating the excitation current.

Synchronous condensers from ABB ensure efficient and reliable operation of power grids through reactive power compensation and additional short circuit power capacity. ABB can tailor synchronous condenser modules to match system performance requirements and site conditions, and deliver optimum cost-efficiency. To ensure enduring and reliable operation, ABB synchronous condensers are designed for high reliability, durability and the capability to operate for a long time between service intervals. ABB synchronous condensers are carefully designed for minimum losses, noise levels, vibrations and weights.
PG MPT offering
The PG MPT Dodge mechanical power transmission product family offers the widest range of mounted bearings, enclosed gearing, conveyor components, and mechanical drive components available.

All Dodge products are designed to improve output, decrease downtime and enhance system value.
Mounted ball bearings offers a broad product line suitable for all applications. Bore sizes range from 17 mm to 85 mm or 1/2” to 3-1/2” inches. Mounted ball bearings are found in bulk material handling; HVAC; unit & baggage handling and food & beverage industries. Dodge mounted ball bearings use superior sealing systems for longer bearing life and proven shaft attachment methods for fast removal without damage to the shaft.
Mounted Roller Bearings are appropriate for Heavy Duty Applications. Bore sizes 30 – 360 mm dependent upon style selection.

Mounted roller bearings are used in a variety of industries such as bulk material handling, paper and water/wastewater industries.

Dodge mounted roller bearings use superior sealing for longer bearing life and proven shaft attachment methods for fast removal without damage to the shaft.
Mounted plain bearings are engineered for harsh environments. Mounted plain bearings are available in 20 mm to 70 mm (3/4” – 3”) bore sizes with pillow block and flange housing types.

Mounted plain bearings are appropriate in high temperature applications and in the air handling industry. Benefits include different shaft attachments, secure sealing systems and reduced maintenance.

Dodge mounted plain bearings feature patented technologies that reduce maintenance and ensure long service life in harsh conditions.
In the selection of shaft mounted speed reducers Torque Arm II (TAII) for horsepower through 300 kilowatt or 400 horse and the Motorized Torque Arm (MTA) 1.5 -75 kw (3-100 Hp)

TAII and MTA are best suited for use in Bulk material handling.

Shaft Mounted speed reducers offer premium harsh duty oil seals, twin tapered bushing system of easy install/removal; Industry leading backstop design; Meet AGMA standards; ATEX certified;

This powerful line of ATEX certified, highly efficient shaft mounted speed reducers offers unparalleled torque ratings in industry proven designs.
PG MPT offers a variety of small gearing options. Quantis in-line, right-angle or motorized shaft mount ranging from 0.18 – 55 kW or 1/4-75 HP.

These gear reducers service the food & beverage, unit & baggage handling and packaging industries. Features include a twin tapered bushing system for easy install/removal; and superior sealing systems.

Quantis speed reducers are designed for greater torque, efficiency and flexibility in compact housings.
In the large gearing portfolio, Dodge offers a heavy duty line of large gearing products that provide reliability in tough applications. These offerings include the Maxum XTR, Magnagear XTR, Vertical Gearmotor, and Controlled Start Transmission (CST). Large gearing offerings are appropriate in bulk material handling, power generation and paper industries.

The Magnagear, Vertical Gearmotor, CST and Maxum offer power dense designs and superior harsh duty sealing.

Dodge large gearing products offer power dense designs for optimum power and performance under strenuous loads.
Dodge offers both an elastomeric and metallic coupling line to meet all industry needs. The bore size and torque capabilities vary by the coupling product selected.

Dodge elastomeric couplings are designed to dampen vibration, accommodate shaft misalignment, extend life, and put an end to unexpected downtime.
Dodge Conveyor Component product line offers high performing conveyor pulleys for any application.

Mine duty extra pulleys offer an integral hub, profiled, turbine and T-section end disc designs, vulcanized lagging, Mine and Heavy duty meet CEMA dimensions.

Dodge conveyor components are engineered to exceed the demands of the industry on conveyor pulleys.
Mechanical drive components connect one driven shaft to another and are utilized in all industries in variety of applications. Synchronous drives offer high torque and are energy efficient.
Dodge offers both bearings and gearing products that are designed for superior protection in harsh washdown environments.

Washdown products are filled with H1 good grade lubricant and have superior sealing for ingress protection.
PG NEMA Motors
ABB offers the broadest line of energy-efficient Baldor-Reliance NEMA motors to meet any application need.

Designed and built with reliability and lowest total cost of ownership at the forefront, motors meet or exceed NEMA energy-efficiency levels.

http://new.abb.com/motors-generators/nema-low-voltage-ac-motors

ABB offers the broadest line of energy-efficient Baldor-Reliance NEMA motors to meet any application need.

These NEMA motor are designed and built with reliability and the lowest total cost of ownership for the customer.

These motors meet or exceed NEMA energy-efficiency levels.
General Purpose motors are designed for use in safe and moderately dry environments.

The General purpose line includes Three phase motors rated from 0.09 to 1,100 kilowatts or 1/6 to 1500 Horsepower.

General purpose motors are suitable for use in all industry applications that need an energy efficient motor with high starting torque and overload capability.

The General purpose motor is designed to meet or exceed energy efficiency requirements while providing performance and reliability.
Severe Duty motors are designed for applications requiring extra protection against severe environmental operating conditions.

These motors are rated from 0.4 - 2200 kilowatt or ½ - 3,000 horsepower for Low Voltage up to 11,000 kilowatt or 15,000 horsepower for Medium Voltage.

Severe Duty motors are suitable for use in the Chemical, Oil & Gas, Bulk Material Handling and Paper Industries.

These motors offer high starting and peak torques, overload capabilities and ingress protection.

Severe Duty motors are designed to protect against contamination, moisture, vibration. Severe duty motors meet IP55 while IEEE 841 motors meet IP56 protection.
Washdown duty motors are used when high-pressure cleaning and sanitation is critical for the application. They are rated from 0.18 – 15 kilowatt or ¼ - 20 Horsepower.

Washdown motors are suitable for Food & Beverage and Pharmaceutical applications.

These motors offer multiple seals on the drive end, encapsulation on stainless steel motors, fully welded conduit box and feet to prevent contaminate build-up.

Washdown motors are offered in painted or stainless steel to meet the demands of washdown conditions with proper sealing to protect the motor.
Explosion proof motors are used when environmental conditions are considered hazardous and there is a need for safety and protection in hazardous situations.

Explosion proof motors are available with ratings from 0.18 - 600 kilowatt or ¼ - 800 Horsepower.

Explosion proof motors are found in the Chemical Oil and Gas industry.

These motors meet UL and CSA standards for Division based hazardous locations. ATEX and IEC Ex are available. They are also certified for hazardous locations or potentially hazardous locations where combustible gases, vapors, dust and fibers may be present.
Pump motors are designed for specific mounting configurations and motors capable of running while submerged in water.

- 0.75 – 335 Kw or 1/3 – 450 Hp
- Chemical, oil & gas, food & beverage, water & wastewater
- Meet NEMA Premium® efficiency, inverter ready, with a wide torque speed range

Pump motors are designed for specific mounting configurations, both horizontal and vertical, and are capable of running while submerged in water.

Pump motors are rated for 0.75 – 335 Kw or 1/3 – 450 Hp. These motors are applicable for the chemical oil & gas, food and beverage and water & wastewater industries.

Pump motors meet NEMA Premium® efficiency rating, are inverter ready and offer a wide torque speed range.
HVAC motors are specifically designed to offer efficiency and performance in the air handling industry. HVAC motors are available with 0.75 – 298 kilowatt or ¼ - 400 Horsepower rating.

Air Handling

Low noise vibration dampening bases, dynamically balanced rotor for extended bearing life, vertical solid shaft with low, medium and high thrust.

Specifically designed the air handling industry for smooth, quiet operation for total system reliability and performance.

HVAC motors offer a smooth, quiet operation for total system reliability and performance for the air handling industry.
Farm duty motors are designed for reliability and performance in all types of environmental conditions. These motors range from 0.25 – 75 kW or 1/3 – 100 Hp. Farm duty motors are most often used in the food & beverage and farm industries. They are coated with an corrosion resistant epoxy finish, and have optimized windings to protect against voltage drop and phase shift.
Definite purpose motors offer a solution to unique application and industries that do not fall in other product lines. These motors are used in all industries but offer unique selling points and differentiators for very specific applications.

These motors range from 0.35 – 187 kW or ½ - 250 Hp.

The Definite Purpose family of motors covers the challenges presented by specific industries. Each motor line in this family has unique characteristics to meet the definite purpose of the industry it was designed for.
Variable speed AC motors are designed to run on inverter power, offering optimized performance and efficiency.

These motors are available in 0.2 to 11000 Kilowatt or 1/3 – 15000 Horsepower and are suitable for the chemical, oil & gas, unit handling, mining, paper & forest industries.

The Variable speed AC motors offer constant torque across the entire operating speed range in traditional NEMA and IEC designs.
Large AC motors are used when the application calls for large amounts of power and are available in general purpose designs to the most critical, highly specified designs. Large AC motors are offered in sizes up to 22000 kW or 30,000 Hp.

These motors are utilized in the chemical, oil & gas, water & wastewater, aggregate & mining, paper & forest industries.

Large AC motors offer low vibration, cast iron construction with a 1.15 Service Factor as standard and a V-Ring slinger for increased bearing protection.
Direct current, or DC, motors are still being used today as drop-in replacement motors, offering a competitive solution to expensive rewinds and AC conversions in applications.

DC motors are available ratings from 0.18-0.75 kW (0.25 – 1 Hp); Integral – 0.75 kW -2200 kW (1-3000 HP)

They are most commonly found in the processing, paper & forest, plastics and machine tool industries.

DC motors offer a power dense package; extended speed range capabilities; Reduced maintenance.

DC motors offer a power dense design that offers a flexible, cost effective, drop-in replacement with improved reliability and reduced maintenance.
Most customers are interested in minimizing total cost of ownership for their equipment. Our service solutions supports our customers to do just that. We offer installation and commissioning service to get the motor or generator safely up and running, we offer different maintenance solutions and spareparts to minimize costly production stops and we support our customers with upgrades to reduce running costs and increase product lifetime.

- We offer service solutions that supports our customers to improve productivity, usability, reliability, safety, cost and energy efficiency throughout the life cycle of the products.

The very first services that a new motor or generator requires are the installation and commissioning. Every motor and generator requires these services and this is a good opportunity to build a long lasting new customer relationship between ABB and the customer. It is extremely important that installation and commissioning are done in a proper way to avoid future problems. It is highly recommended that ABB offers installation and commissioning services along with the new motor or generator every time.
Customers have different approach for doing maintenance and sometimes it is a mix of different strategies. It is important to understand the reasons for their selected maintenance strategy and how we can support with a solution that will minimize costly productions stops and increase product lifetime.

ABB’s offering for the maintenance services are preventive maintenance, life cycle assessments, on-site condition monitoring and remote condition monitoring.
ABB provides Extensions, upgrades and retrofits for motors and generators. Updating older motors and generators with the latest technology provides higher performance and availability.

The benefits apart from an extended product lifetime, is improved reliability and reduced operating and maintenance costs.
Customers buy motors because they need to run the process. Standstills are normally not acceptable and typically incurs high standstill costs. Having spare parts at the customer site may reduce the downtime significantly when something breaks.

We can provide expert support in part and capital spares identification based on motors and generators condition and criticality and help customers to rationalize on-site spare part stocks.
For critical applications the consequences of an equipment failure and an unplanned production stop can be extremely costly. To support our customers ABB has a wide network of service centers with fast response and competence. ABB offers a range of repair services, warranty or non-warranty, to provide customers with a choice depending on the situation and exact financial and operation needs. The services include on-site repair by ABB or its certified partners. If an immediate on-site repair is not required or not possible a repair can be carried out at ABB’s or its service partners workshop facilities.
At some point the end user have to replace an existing motor or generator with a new product. We have three main alternatives for the customer. Depending on the customer situation and needs, the options are to offer a new standard motor or generator, a new standard motor or generator type, but with special electrical or mechanical design, or make an exact replica of the existing product.
A service contract is an efficient way to manage the total life cycle of motors and generators and minimize the risk of customer production. One or more services can be combined to achieve best possible solution for each customer.

Advanced services includes ABB Replacement Savings Analysis which is a tool that evaluates energy savings and reliability improvements for direct online induction motors replacement. ABB Performance evaluation program analyzes your motors’ actual operating characteristics.

In addition ABB offers customer trainings to maximize the value they get from their assets, develop competence in defining the correct maintenance strategy and first-line troubleshooting.
Power and productivity for a better world™