eMotion.
Electric Drives and Systems.

Linde Hydraulics

eMotion. The Core of Your Machine.

Linde Hydraulics. Turning Power into Motion.

Linde Hydraulics, well known for world-class hydraulic drives also possesses competence in electric drives. We offer you a large selection of electric and electronic products, along with profound application know-how and decades of experience.
By taking a holistic view of your application, we are positioned to provide you with a working system, not just components.

Your Benefits. Single Source Fulfillment.

Our product range and the ability for fast customization offers you

>> Proven product quality
>> Low development risk
>> Short time to market

Our experience and system know-how grants you

>> Outstanding machine performance
>> Fuel efficiency
>> Low lifecycle costs

Experience. Quality proven in series production.

Since 1920 we have gathered experience and know-how with electric drives by developing products for material handling applications. Linde today produces 350 000 electromechanical components each year. A total of around 3.5 million AC and DC drives in the market best states the high quality of our products and provides economy of scale.

Services. Providing expertise at every step.

Linde is your partner for electric and hydraulic drives. You can rely on our support when it comes to designing your drive system, dimensioning and selecting the right components for your individual application. Furthermore you can benefit from our services, such as software engineering, diagnosis and supervision of series production and after market sales.

Integration. Adding value by intelligent combination.

There are many ways to increase the efficiency of your machine

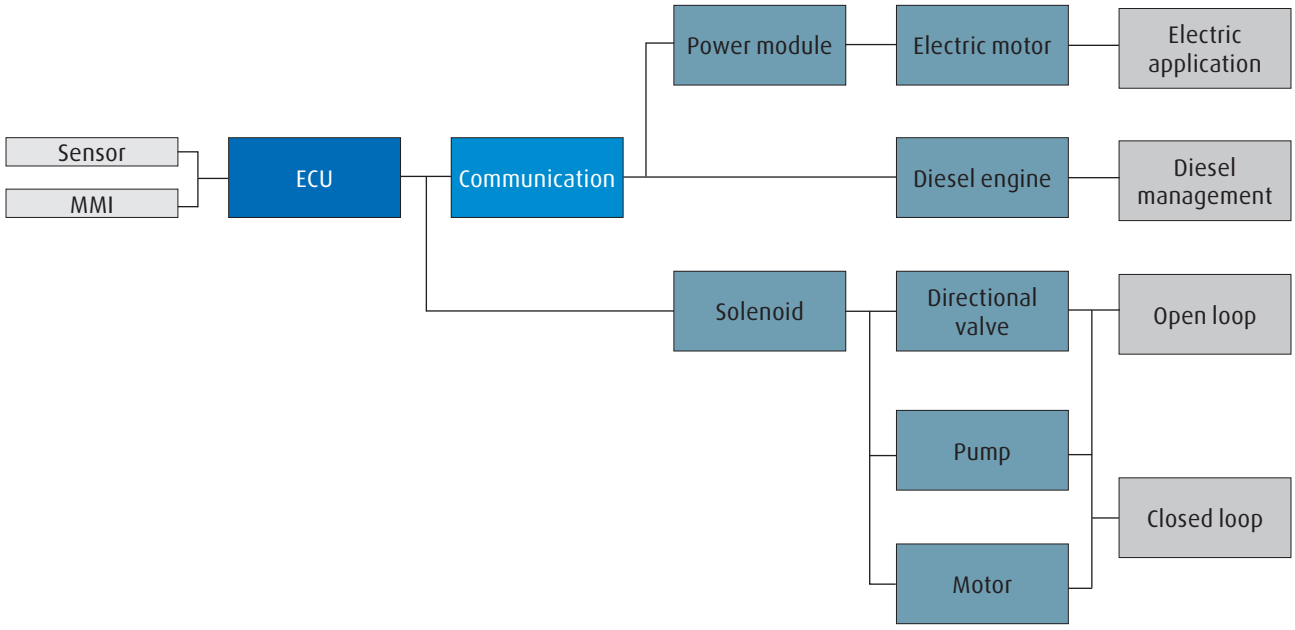
>> Combine single electric products to powerful systems and subsystems for medium power machines.

>> Apply hydraulic drives for higher power demands.

>> Combine a powerful hydrostatic drive system with electric auxiliary drives to meet TIER4 regulations.

Systems. Not just components.

A drive system consists of more than just the sum of its components. Battery, power modules and electric motors, diesel engines, hydraulic pump-motor combinations and the connections between these components represent only the necessary hardware. Modern machines require intelligence and a sophisticated design. Linde Hydraulics offers all components from a single source together with profound expertise in vehicle layout and equipment to realize your idea of a machine.



1 Electric Drives. Motors and Axles.

Linde electric motors feature smooth low speed operation and offer high starting torque. They are available in several AC- and DC-designs in different power classes. They all stem from series applications and are used for driving wheels or hydraulic pumps. Thus they provide standardized flanges and shafts for the intended use. Optional equipment like sensors and cooling devices complete these compact units.

Linde axles provide everything the power train needs. They combine AC motors, power modules, reduction gears, mechanical brakes, sensors and cooling devices to the most compact drive unit. Some axles can be separated to fit in special gauges.

Motors

>> DC brushless
>> ASM, PSM
>> 24 ... 80 V battery voltage
>> 14 ... 50 V phase voltage
>> 0.25 ... 40 kW nominal power
>> 0.5 ... 280 Nm nominal torque
>> S2-60 min, S3-15%, 20%, 40% - modes

AC Drive Axles

>> 48 or 80 V battery voltage
>> 28 or 48 V phase voltage
>> 2 x 4.5 ... 2 x 12 kW nominal power rating

2 Power Modules.

Power modules use the DC voltage of the battery to provide AC voltage for the motors. Their sophisticated design efficiently and dynamically delivers the demanded current and recovers energy gained from braking or lowering a load. Together with a basic ECU, some power modules just need to be connected to the motor, the battery and a joystick to set up a basic drive system. Using a CAN Bus offers options to create advanced systems.

Mounted directly to the axles in some applications, Linde power modules prove that they are built to resist shocks in both cyclic- and continuous operation.

>> Vector control
>> Field-oriented control (4Q)
>> For 24, 36, 48, 72 or 80 V battery voltage
>> Up to 600 A
>> Single module with 1 AC output
>> Twin module with 2 AC outputs
>> Dual module with one AC, one DC output
>> Integrated ECU and CAN Bus

3 Electronic Control Units.

Linde ECUs are available in two versions with different numbers of connectors. Mechanically and electrically robust, these reliable ECUs are used as stand-alone units or in combination with one another for electric and hydraulic drive systems and combinations of both. Cross monitoring between function controller and safety controller allows safe machine operation at all times and meets global legal standards.

The LinDiag® Software uses the RS232 or USB interface of a PC and offers fast configuration of the ECUs and diagnostics features for the drive system.

>> Safety controller
>> High EMC resistance
>> Protection class IP 67
>> Digital, analog and frequency inputs
>> Switching and PWM outputs
>> Sensor supply voltage
>> CAN Bus

4 Integrated Sub-Systems.

Matching the best combination of motor and power module, combined with a gearbox, sensors and an electronic control, results in an optimized drive solution. Built in inline or U-shape design, these systems perfectly match the demands of compact, powerful drives used in steering and many other servo applications.

>> Electric motor (DC brushless or AC)
>> Gearbox (i=59 or 71 as standard)
>> Incremental speed sensor
>> Power module
>> ECU
>> 0.5 ... 1 kW
>> steer-by-wire

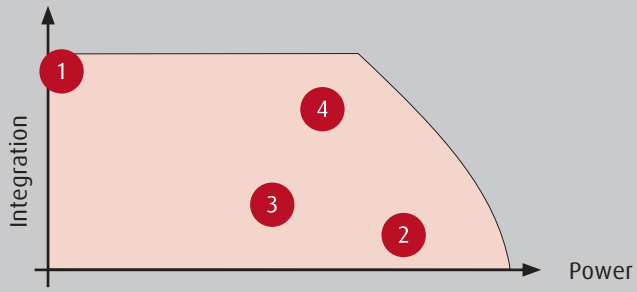
5 Peripherial Equipment.

Systems are completed using a wide variety of peripheral equipment. Sensors measure values like speed, pressure, voltage, current, temperature and angle, then communicate them to the ECU. Joysticks, switches, pedals and displays form the man-machine interface. We provide devices produced to high Linde quality standards that are proven in many applications.

>> Sensors in different designs
>> Switches, joysticks and pedals
>> Power distribution units
>> DC-DC converter

Power and Integration.

Find the best solution for your application. Below are some examples, showing you how powerful and adaptable Linde's Electric Drive Systems are.



1 Servo Drive Unit

Consisting of motor, gearbox, speed and angle sensors and control unit.
For the use as a compact steering unit and many other servo applications.
48 V DC, 500 W, 88 Nm (nominal torque), CAN Bus,
326 x 140 x 140 mm, 10 kg

2 Electric Motor

ASM motor with integrated speed and temperature sensor.
As an option to a small Diesel engine.
ASM IEC 132, B5 flange, 3 x 45 V AC phase voltage, 22 kW S3-15%,
73 Nm @ 2900 rpm, 397 x 300 x 320 mm, 58 kg

3 Power Module

Providing AC Power for motors from DC battery voltage.
Single module for one electric motor from 3 to 18 kW.
Input voltage 48 V DC, output voltage 3 x 28 V AC,
400 A, MOSFET Driver, vector control, CAN Bus, 270 x 162 x 162, 2.3 kg

4 Drive Axle

Consisting of two drive motors with gearboxes, integrated disk brakes and wheel flanges, one pump motor, power modules, sensors and cooling devices.
For use in municipal or construction machinery 48 V DC battery voltage,
3 x 28 V AC phase voltage, 2 x 5 kW S2-60 Min + 1 x 11 kW S3-15%, 2200 Nm max. axle torque, 225 rpm max. wheel speed, 323 x 368 x 1037 mm, 224 kg

Turning Power into Motion.

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