Our product have been setting standards for years and meet the most demanding requirements. Our knowledge of our customers’ requirements during development, our expertise in choosing materials and our production skills are all reflected in our products. The success of these products shows that we are right. Our brakes and clutches speak for themselves: they stand for quality, sophisticated technology and innovation.

In the field of stacker drives, INTORQ brakes have already proven their worth a thousand times over in DC-driven electric vehicles.

And for new vehicles developed using AC technology, we are able to supply brake systems that are tailored to the new requirements. As a result, our customers benefit from standard solutions based on the expertise we have built up over years and from our skills in devising project solutions.

The latest development is an inductive speed measurement system that is integrated into the brake. This solution creates conditions that are ideal for using compact brake systems.
INTORQ brakes are used in these types of vehicle
- Electric fork-lift pallet truck with and without driver’s platform
- Electric standing/seated fork-lift truck
- Electric pallet stacker with wheel support
- Electric side-seat stacker with wheel support
- Electric reach fork lift truck
- Horizontal picking truck
- Vertical picking truck
- High-bay stacker

Long maintenance intervals and high holding torques
Our brakes may be combined with different friction linings to suit the application (noise-reduced versions also available).
The right brake for every application

INTORQ spring-applied brakes are suitable for use as parking brakes and as emergency stop and operating brakes. For dynamic deceleration, defined control of the braking torque is also possible. In this way, the vehicle decelerates in the ideal way for the conditions of use.

The versatile modular system
INTORQ BFK458

Our modular system forms the basis for a product range that offers versions tailored for almost any task. The BFK458 spring-applied brake, as a standard product, can be used anywhere, but its modular structure also meets the requirements of specific industries. Its strength lies in its versatility.

Characteristics
- Braking torques: 1.5–600Nm
- 9 sizes in CSA-CUS version
- DC voltages: 12, 20, 24, 42, 70, 103, 180, 205 V
- Thermal class F (155 °C)
- Preset air gap
- Braking torque can be reduced (model E)
- Long, low-wear rotor/hub guide
- Manual release devices for all sizes
- Optional air gap and wear monitoring

Applications
- Industrial trucks, brake motors, cranes, warehouse equipment, woodworking machinery, stage machinery, vehicles for disabled persons and escalators

Compact and easily fitted
INTORQ BFK457

Often, the brake is only required to perform its basic function. The BFK457 is ideal for these situations. The speed of fitting with integral fixing screws and fixed air gap make this spring-applied brake even more attractive.

Characteristics
- Braking torques: 0.12–125Nm
- 9 sizes
- DC voltages: 20, 24, 42, 70, 205 V
- Thermal class F (155 °C)
- Compact construction with rotor and flange
- Integral fixing screws for quick and easy assembly
- Fixed air gap
- Double spring-applied brake version is noise-reduced <50dB(A)

Applications
- Industrial trucks, small motors, vehicles for disabled persons, woodworking machinery, automation systems and general engineering
Spring-applied brake for pallet trucks
INTORQ BFK457-10 with flat design

The spring-applied brake BFK457-10 is designed for wheel hub drives in hand-controlled lifting trucks. Adapted to match the envelope radius, a compact and flat design with high braking torque has been developed.

Characteristics
- BFK457-10 modified, $M_a = 20$ Nm
- Particularly suitable for horizontal installation
- Compact, flat design, adapted to the envelope radius
- Closed design

Versions
- Friction plate
- Low-noise and/or low-wear rotor
- Plug matched to the connecting cable
- Emergency manual release

Acts as a load-dependent
2-stage spring-applied brake
INTORQ BFK442

Characteristics
- Sizes 12 – 16
- Braking torques 25 – 80 Nm
- DC voltages: 20, 42 und 70 V
- In the partial load range, only the outer armature plate is engaged. The inner armature plate is switched off at standstill
- For full loads, both brake stages work synchronously
- Both stages are released at the same time
- The two braking torque stages can be set individually
- The inner armature plate is guaranteed to hold safely, regardless of the temperature
- Long service life due to wear-resistant linings
- Brake can be adjusted several times if worn

![Graph showing braking torque over time](image-url)
The right brake for every application

Brake with hydraulic support
INTORQ BFK457-12

for load-dependent braking on fork-lift pallet trucks

Characteristics
- Normal is regenerative
- The electro-hydraulic control only takes over braking in an emergency
- INTORQ BFK457-12 with braking torques of 12 Nm – 45 Nm with hydraulic support
- The emergency stop function can be activated by moving the forks into the vertical position
- The specially-matched halves of the friction lining conform fully with the legally-required deceleration for no load, partial load and full load operation, regardless of the driving direction
- The basic torque is ensured because the spring force is factory-set with high precision. This also determines the emergency braking from the no load range
- An optimised magnetic circuit gives the brake a large working air gap
- A wear-resistant rotor can also be used to double the time before the air gap has to be adjusted

M_t

Start of braking          Stopped          Full load

Full load

stopped

no load

Time
Load wheel electromagnetic brake
EMB 115.20

With the INTORQ load wheel electromagnetic brake, old hydraulic or multiple disk brakes are replaced by an electromagnetic braking system. The addition of controlled braking of the load wheel offers better deceleration of the vehicle. At the same time, wear to the drive wheel is minimised and safety is improved when transporting large loads. The CAN bus allows complete system integration.

Characteristics
- The braking torque is controlled via the brake pedal and the operating current
- High braking torques in a small space, where the brake is fully integrated into the load wheel
- Simple structure, no subsequent adjustment of the air gap required
- Long service life due to large wear distances
- Spring-loaded studs integrated in the armature plate ensure disengagement free of residual torque (no wearing of the armature plate on the stator)
- Easy detection of wear from outside without the need for disassembly
- Noise-reduced design
The mechatronic brake system
INTORQ Control

Characteristics
- Used for controlled braking of battery-driven vehicles for stacker applications
- The combination of spring-applied brake with an intelligent control optimises the load-dependent braking torque control (load-independent stopping distance)
- The control range is 20% to 100% of the characteristic torque
- The INTORQ Control parameters are set using the Windows user interface – although they can be supplied pre-programmed for your application
- The following operating modes are available:
  - Pedal-controlled braking
  - Ramp-controlled braking
  - Pedal ramp-controlled braking
  - Sensor-controlled braking
  - Speed-controlled braking
- INTORQ Control communicates with the vehicle controller via the integral CAN bus
- INTORQ Control boasts a range of integral safety prompts. For example:
  - wear, temperature and operating voltage are monitored and locking of the driving wheel is detected (quasi ABS function)
- The operating voltage ranges between 24 V and 48 V
- Required for operation:
  - INTORQ Control drive, starter kit with software, connectors and contacts
- The INTORQ Control can be used for:
  - Spring-applied brakes INTORQ BFK458-N, sizes 08 – 16
  - Electromagnetic brakes 14.115, sizes 06 – 20
The mechatronic brake system

INTORQ Control

Example of a brake concept for a reach fork lift truck

To be able to decelerate harder than accelerate, a supporting and dynamically-acting braking torque that can be metered (regulated) on all three wheels is needed. The interaction between the brakes and the regenerative braking effect of the motor requires the brake control to cooperate fully with the onboard drive concept.

Operating mode

- The motor control generally allows regenerative braking
- The INTORQ brake system consists of two working current load wheel brakes and one fail-safe spring-applied brake mounted on the traction drive
- The load wheel brakes are easy to control, so they can be used as working brakes
- The spring-applied brake acting on the drive motor is used as a parking brake with emergency stop function
- The ease of use can be further increased by using the INTORQ Control circuit
- INTORQ Control allows the vehicle to be braked, regardless of the load and direction of travel – the driving wheel does not lock up (quasi ABS function)
- Even without INTORQ Control, the brake concept can be used as a partly controlled system (current control)

![Diagram of brake system](image-url)

Example of a completely controlled brake system
Pyroban for explosion-proof areas

Pyroban is the market leader in the production of explosion protection upgrade equipment for industrial trucks. Vehicles and INTORQ spring-applied brakes can be upgraded via Pyroban in the Netherlands. All the important advantages and characteristics of INTORQ spring-applied brakes will be retained.
INTORQ BFEX58
The explosion-proof spring-applied brake

Suitable for use in:
- Potentially explosive atmospheres in zones 1 and 2
- The petrochemical and pharmaceutical industries, for example for manufacturing paints, solvents, cosmetics, ammunition and explosives

Applications
- e.g. controlled drives in processing facilities and industrial trucks

Other characteristics:
- Thermal sensor in both armature plate and flange
- Connecting cable with explosion-proof screwed connection
- Non-sparking brake pads with wear monitoring

Technical data:
- Tested in accordance with the EU Directive (ATEX) for explosion-proof equipment
- Certificate: KEMA 01 ATEX 2123X
- Type of protection: Increased safety EEx e II T4
- Degree of protection: IP65
INTORQ – Sales and Service around the world

INTORQ customers can reach us at any time and from anywhere in the world. Our Key Account Sales Team looks after key account customers and project business.

In addition, we co-operate with Lenze’s global sales organisation. You can contact us via Lenze Service by calling the 24-hour helpline (008000 24 46177).

INTORQ GmbH & Co. KG

PO Box 1103
D-31849 Aerzen, Germany

Wülmser Weg 5
D-31855 Aerzen, Germany

Tel.: +49 (0) 5154 95 39 01
Fax: +49 (0) 5154 95 39 10
E-mail: info@intorq.de
www.intorq.de

setting the standard
www.intorq.de