



# LIFT DRIVES

APPLICATION  
V-1.0 EN

The KEB logo consists of the letters "KEB" in a bold, white, sans-serif font, set against a solid red rectangular background.

## LIFT AND SOLUTIONS

- Drive controller
- Regen units
- Brakes

# KEB AUTOMATION SYSTEM SOLUTIONS - SYSTEM OVERVIEW

## Automation **with Drive**

stands as a synonym for optimally selected combinations of control and automation solutions with the drive level - at the end it is the key to successful machine concepts.

Let the following pages inspire you with regards to the diversity and performance of the KEB Lift features and let us helping you to find a solution that reliably meets your requirements.

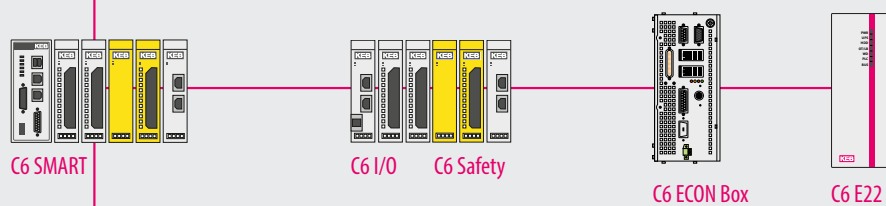
## SOFTWARE



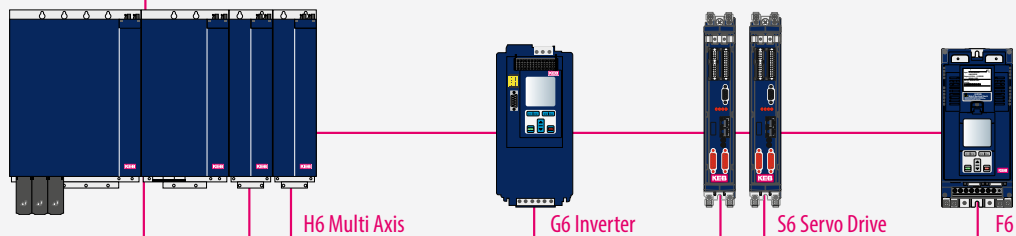
## HMI



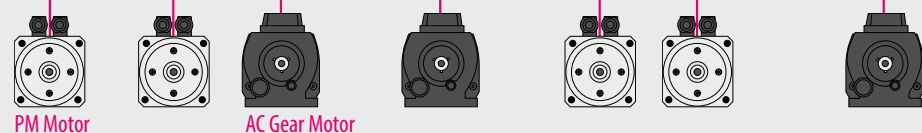
## CONTROL



## DRIVES



## MOTORS



## PARTNERSHIP - EXPERIENCE

### SYSTEM PARTNER FOR SOLUTIONS, DRIVES & COMPONENTS

Since 1986 KEB is working and developing for the lift industry. KEB offers its entire product range from its own 'in-house' production facilities. Large series providers can be served by KEB with manufacturer-specific hardware and software.

In addition KEB also offers components for customised solutions and open, flexible systems.



### HIGHLIGHTS

- Universal drive controller
- 230 V & 480 V class, AC & DC supply available
- Wide Power range 0.75 ... 900 kW
- All motors possible
- Regen solutions
- Filter & accessories

### LATEST DEVELOPMENTS ARE

- New plain text LCD operator with CANopen Lift DS417 & diagnosis interface
- Certification for NMC (No Motor Contactors)
- New inverter series COMBIVERT G6; made for open loop drive systems
- New high frequency EMC Filters COMBILINE E6 with extra low leakage current
- New Lift software in LCD operator with plain text in english, french, italian, spanish, portuguese & german. Units (speed, torque, distance, jerk, acceleration ...) switchable in imperial or metric
- AFE (Active Front End) series for energy feed back into the mains and boosted DC bus voltage
- Power limitation functions

### COMING UP NEXT

- Direct approach with floor levels stored inside the inverter
- 4-Q-inverters (combination of motor driver and regenerative unit)
- UCM compliant brake monitoring
- Energy storage & backup solutions



### HIGHLIGHTS

- The Open loop G6 drive controller
- 0.75 kW ... 30 kW
- 3ph. 400 VAC or DC input
- Integrated low leafage filter

# HARDWARE - FLEXIBILITY

## COMBIVERT F5 - THE UNIVERSAL LIFT DRIVE CONTROLLER

- For retrofit and new lift
- Open / closed loop
- For every 3ph. motor
- Various encoder interfaces for: TTL, HTL, SinCos, Hiperface, Resolver, EnDat, SSI, BISS, UVW
- Simple autotuning
- Internal positioning controller
- Ogival run

## NEW NMC-FUNCTIONALITY (NO MOTOR CONTACTORS)

- Motor contactors can be replaced by Functional Safety inside of the F5-K drive controller. Certificated according to EN81; ASME A17; ISO 13849; IEC 61508
- No wear and tear
- Noiseless operation
- Less installation costs, time and space
- Improved EMC emissions

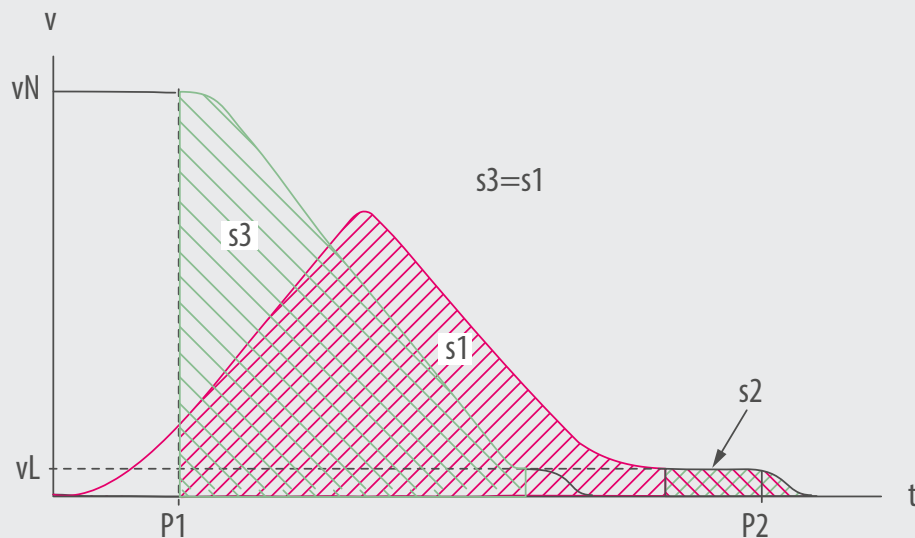
## PLUGGABLE LIFT OPERATOR

## LCD - CLEAR TEXT MENU

## I/O

8 programmable digital inputs  
2 programmable analog inputs  
2 programmable digital outputs  
2 programmable relay outputs  
2 programmable analog outputs  
2 x STO Terminals for NMC

## CAN & SERIAL INTERFACE



### SIMPLIFIED HANDLING

### SERIAL DIAGNOSTIC INTERFACE

### CONNECTION TERMINAL

connection 1-/3-phase 230 V  
and 3-phase 400 / 480 V,  
AC or DC supply in one unit  
integrated brake chopper GTR7

- Protection against environmental influences with varnished boards
- Low noise operation
- Perfect load transfer when brake opens
- Wide power range from 0.37 kW up to 900 kW with common user interface
- Thermostatic controlled fan: no noise, low wear, low stand-by-power
- Single phase 230 V AC supply possible for emergency run with UPS
- Detection of „easy direction“ for undersized UPS
- Wide power range 0.75 ... 900 kW / 400 VAC and 0.37 ... 75 kW / 230 VAC
- Switching frequencies up to 16 kHz
- All motors possible
- Motor temperature monitoring KTY / PTC / PT 1000
- Optional integrated EMC filter



### HIGHLIGHTS

- LCD keypad operator with CAN & serial interface
- CANopen Lift DS417 protocol
- Serial DIN 66019 protocol



## SOFTWARE & ACCESSORIES - SAFETY & DIAGNOSIS

### SPECIAL SAFETY FEATURES

- Encoder check
- Output phase check
- Speed deviation check
- Brake check & monitoring
- Main contactor check
- Speed limitation
- Acceleration prevention for: inspection, crawling and releveling
- Unintended movement check
- Protection against: over-current, over-load, under-voltage, over-voltage, over-speed
- Event memory with date-time-stamp

### COMBICONTROL C6 ROUTER

The C6 ROUTER offers secure remote maintenance using VPN with different password levels. The Ethernet and serial connection gives easy access to single or multiple drives as well as many other supported equipment like other drive or door controllers, control panel, etc.

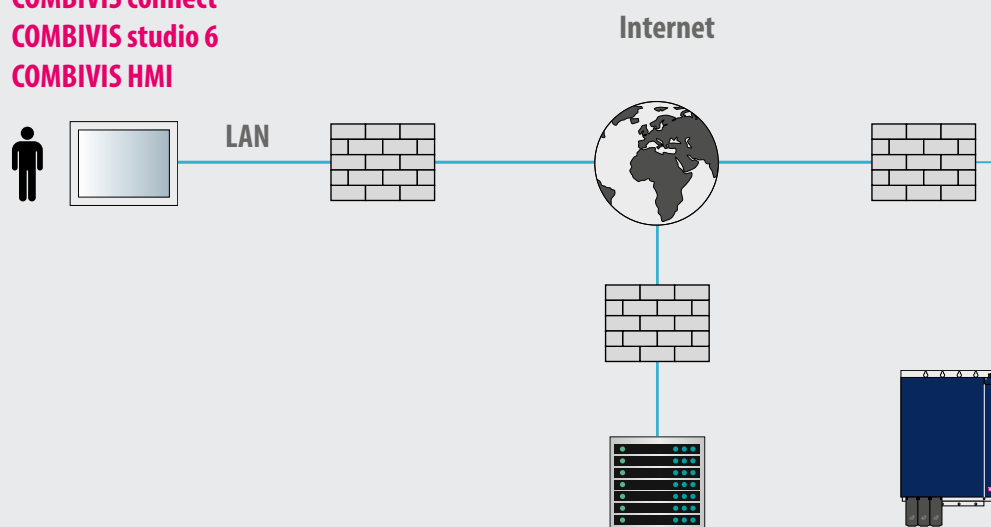
The C6 ROUTER is available with 2G/3G/3G+ modem and can also be extended with the COMBIVIS HMI function. The extension turns the router e.g. into a data logger. This open and flexible system offers many additional options, such as sending e-mails / SMS in the case of a fault in the drive.

DIAGNOSTIC SCREEN #1	
Inverter Status	Motor Current
no operation	0.0 A
DC Bus Voltage	Peak Motor Current
328 V	0.0 A
Peak DC BUS Voltage	Magnetizing Current
333 V	0.0 A
Home Prev Next Reset	

DIAGNOSTIC SCREEN #4	
Inverter Status	Parameter Set
no operation	0
Input Status	
<input type="radio"/> I1 <input type="radio"/> I2 <input checked="" type="radio"/> I3 <input type="radio"/> I4 <input type="radio"/> I5 <input type="radio"/> I6 <input type="radio"/> I7 <input type="radio"/> I8	
Output Status	
<input type="radio"/> O1 <input type="radio"/> O2 <input type="radio"/> RLY1 <input type="radio"/> RLY2	
Home Prev Next	

DIAGNOSTIC SCREEN LOG	
09/28/2011 17:07:42	
ERROR encoder 1	
09/28/2011 17:04:14	
ERROR Under Voltage	
09/28/2011 16:59:40	
ERROR Under Voltage	
Home Prev Next File	

**COMBIVIS connect**  
**COMBIVIS studio 6**  
**COMBIVIS HMI**





## COMBICONTROL HMI

C6 HMI provides the user a high quality Human Machine Interface for multi purpose use. These can be used for diagnosis, setup and maintenance as well as user display for general information, floor overview, advertising...

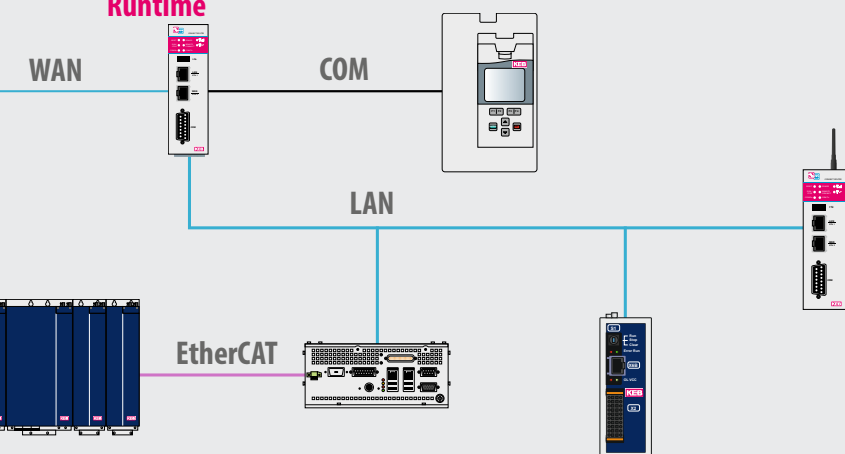
## DIAGNOSIS

With the COMBIVIS software adjustment and diagnosis becomes easy

- Monitoring and programming
- 16 channel storage oscilloscope
- Up- and download of complete parameter lists



## COMBIVIS connect Runtime



## ENERGY SAVING

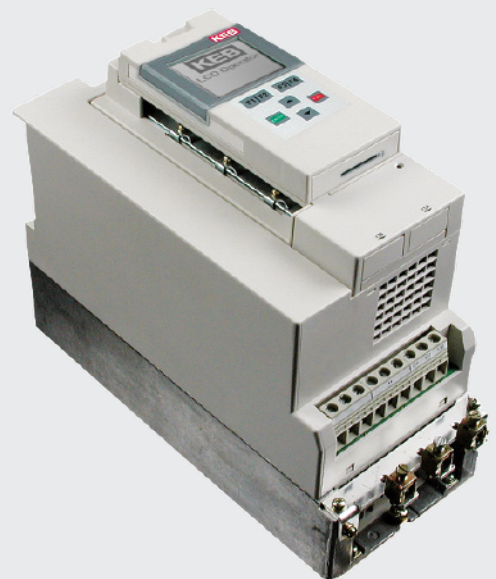


## REGENERATIVE UNITS

The physical principle of all lift is to change electrical energy into potential energy which is stored in the load which was lifted up. In 50 % of all rides the motor works as a generator and gives back the potential energy. Typically this energy is changed into heat with braking resistors.

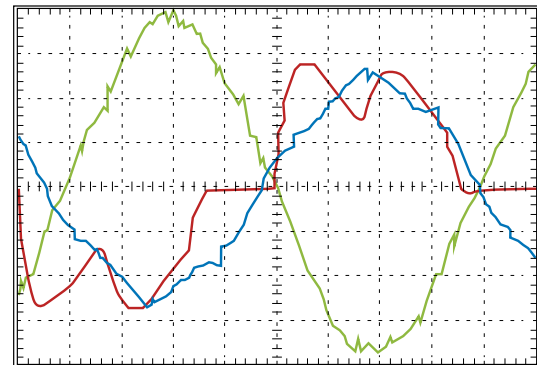
The heat is wasted in the machinery room and often needs additionally energy for air - condition.

With the KEB regeneration units this energy can be fed back into the mains and reused by other consumers instead of being wasted.



## SUPPLY- AND REGENERATION UNITS COMBIVERT R6 & AFE

- Central power supply & regeneration units for single drive controller or group of inverters
- Energy saving – generative energy is fed back into the mains
- Low noise operation
- Modular sizes for optimal initial costs and fast return of investment
- Elimination of the braking resistor
- Reduced HVAC (heating ventilation air conditioning)
- Usable also for inverters from competitors
- Easy to install
- User interface display and keypad for diagnostic, COMBIVIS software also can be used
- Energy counter for consumed and regenerated energy
- AFE (Active Front End) special features:
  - Boosted DC voltage can increase motor voltage → smaller motors
  - Active power factor correction for low harmonics and near-unity power factor ( $\cos \Phi = 1$ )



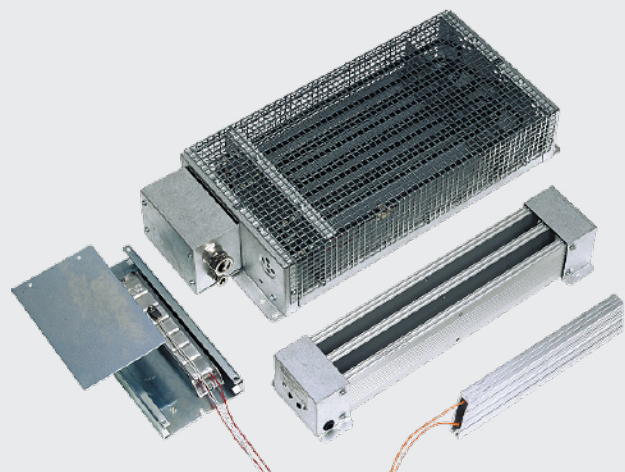
— Voltage

— Current with main choke

— Current with harmonic filter

## BRAKING RESISTORS

- Noiseless
- Low radiation
- With temperature sensor



## HIGHLIGHTS

- Universal supply and regen solution
- 230 V class up to 75 kVA
- 400 V class up to 1000 kVA





## SUPPORT - PARTNERSHIP

### WORLD WIDE SUPPORT

- Support by experienced application engineers
- Training, seminars
- Trouble shooting, service
- Companionship for EMC-certification
- Development of customized solutions
- Engineering, sizing of drives
- Complete solutions for retrofit jobs

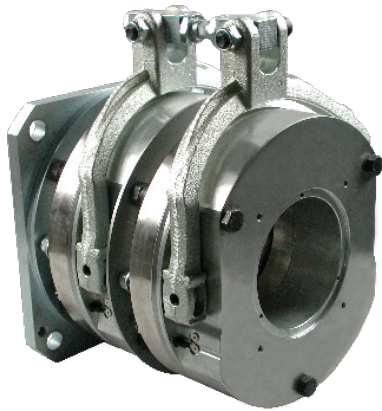
Please also ask for escalator drives !



## BRAKE SOLUTION

### Type 38.DDN – **DOUBLE BRAKE**

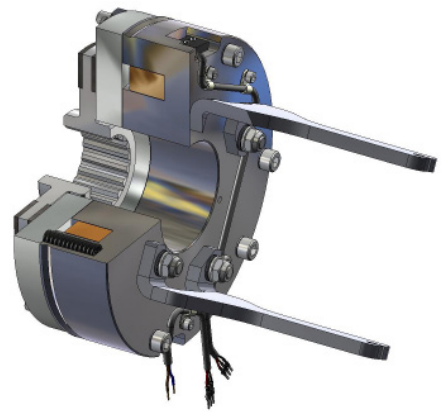
- Double safety solution with fully independent electrical and mechanical circles



### Type 38.DEN - **SINGLE BRAKE**

#### Type D8 - redundant single brake

- Electromagnetic spring applied brakes for lift and hoisting drives

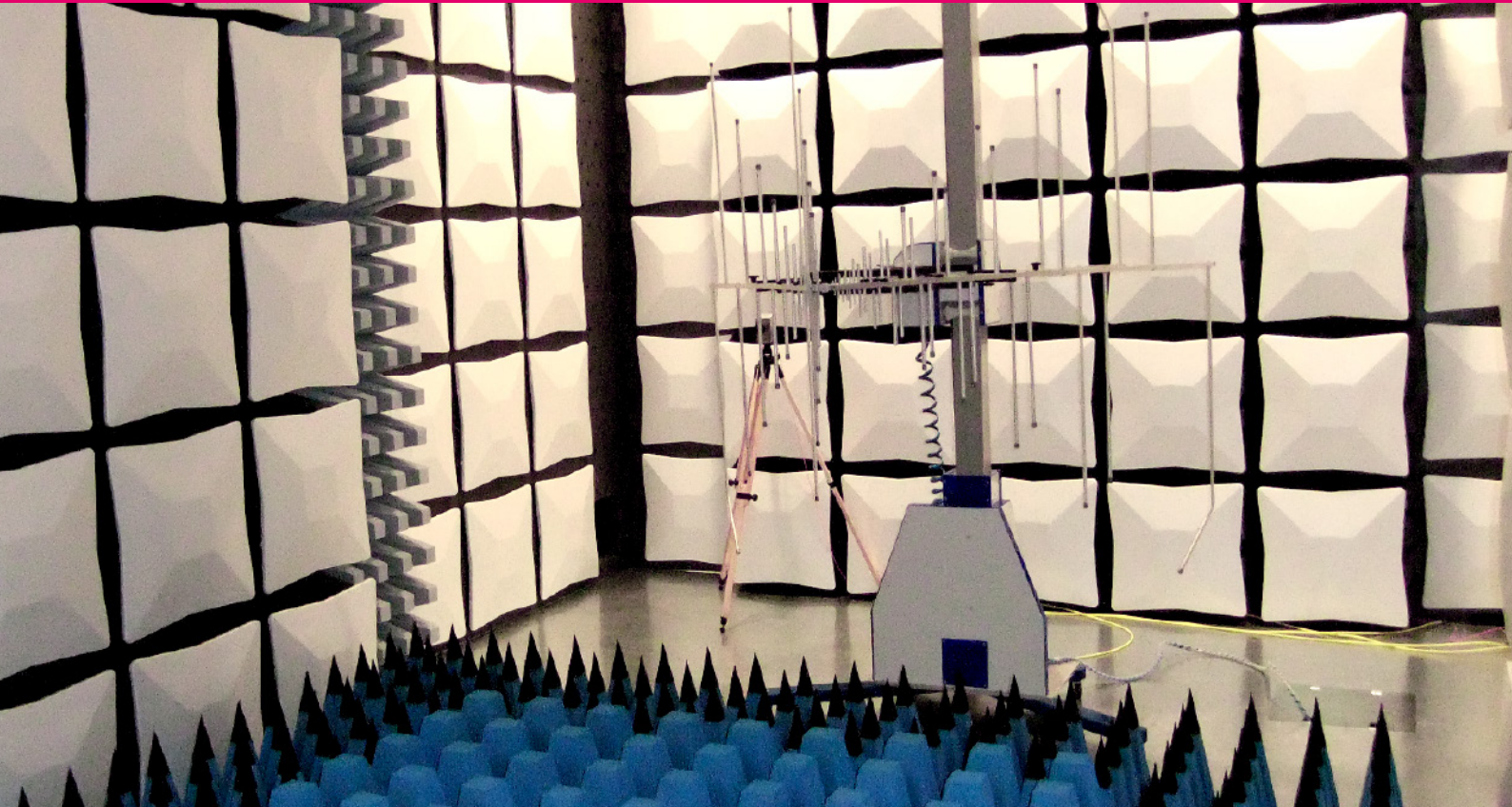


## HIGHLIGHTS

- Safety device for lift and hoist applications; TÜV-certificate according EN 81 possible
- To avoid safety gear in up direction together with gearless motors
- Low noise operation: less than 60 dB!
- Energy saving: much less inertia as a conventional drum brake
- IP40 - standard, IP 65 / IP 66 on request, coil IP 66
- Springs are corrosion protected, refined, steady stroke consistent > 10,000,000 strokes
- Options: flange, hand release, dust protection, terminal box, encoder adapter
- Micro switches for function check and wear check



## EMC COMPONENTS

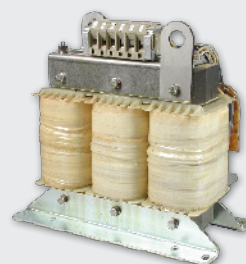
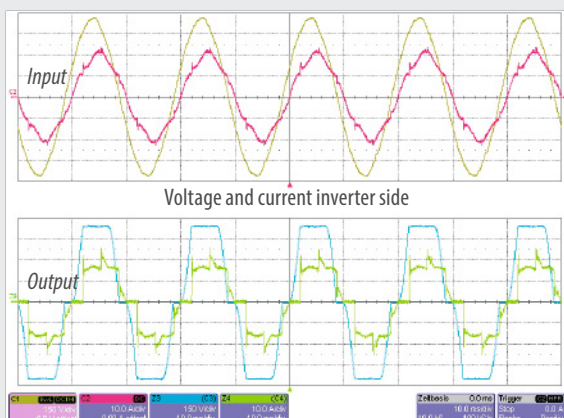


## EMC-SERVICE

- High frequency EMC Filters with low leakage current for usage with AC / DC sensitive RCCD type B or B+
- Low frequency filters & chokes
- Sine wave filters for long motor cables & motor protecting operation
- Harmonic filters according to EN 12015, IEEE 519
- Mobile assistance on job site
- Counsel during planning phase
- Analysis and improvement of existing systems

This is the support we give to lift producers to fulfill the demands of EU-guidelines 90/336/EWG. To carry out the installation of electrical plants according to EMC-regulation EN 12015/EN 12016.

### HARMONIC FILTERS MAINS CURRENT





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