

Managing DC Link Energy



Dynamic
Energy Storage
Combination

DEK

Dynamic Energy Storage Combination DEK

The dynamic energy storage combination DEK is optimal, when the energy supply for the drives has to be ensured and at the same time the braking energy for the system can be regenerated. DEK is the optimal combination of the Dynamic Energy Storage Unit DES and the Dynamic Power Supply Unit DEV. A part of the installed energy storage - to be defined individually, but at least 50% - is reserved for the UPS case, the remaining part is used for intermediate storage of braking energy. This part helps make the investment in the UPS functionality cheaper due to the possible energy savings.

Active supply module for DC links

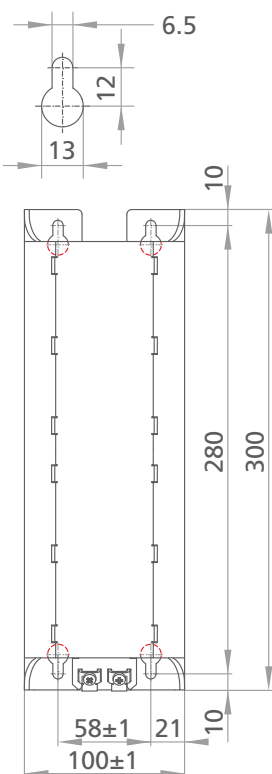
- > for single axis and multi axes systems
- > buffers braking energy for use in the system
- > no buttons, display indicators, other controls
- > provides support during power failures or interruptions
- > with a digital interface



www.brakeenergy.com/dek



Dimensions and mounting holes (mm)



Combined optimally: Buffer with UPS-function

DEK can both store braking energy as well as compensate for voltage fluctuations and power failures. This is enabled by the division of the storage into one area for braking energy and one for the short-term UPS energy, where the UPS area is allocated at least half of the energy storage. The exact division of the amount of energy available is thus the result of application engineering.

Starting with an example where it applies that 500 Joules of energy are stored temporarily, the remaining 1,500 Joules are stored for the UPS case.

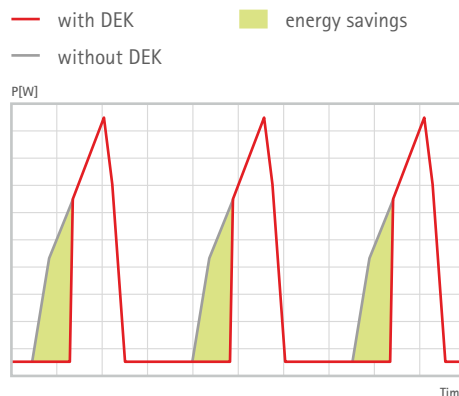
Connecting the DEK to the machine is very easily done by three strands via "Plug&Play". The device then works without any further actions. Based on its concept the DEK can easily be tested in an existing system as a retrofit solution. At the same time a braking resistor can be installed in the converter of the drive system. After a few cycles the collected data in the processor can be read out and evaluated. Based on the analysis of these data the suitable DEK solution can be chosen - Can it get any easier than this?

DEK is available in several power classes. Besides the basic variant 2.0, which is offered in two power classes, variant 3.0 offers another energy boost, it can thus be loaded higher in case of factor power multiplied by time. The higher load capacities for the isometric devices are achieved by changed electronics and active cooling. For the Dynamic Energy Storage Unit, this means the same amount of energy with short cycles, for the Dynamic Power Supply Unit, very large amounts of energy with unplanned, or in the other case the same amount of energy with commonly planned, power failure.

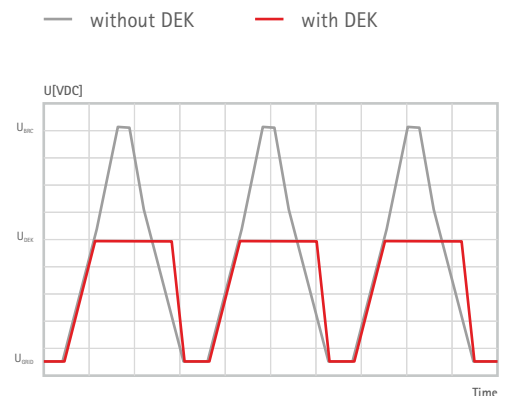
Technical Specifications DEK

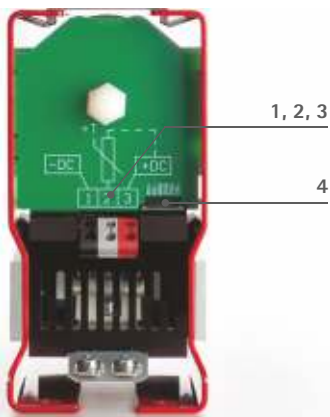
Parameter	Value
Available storage capacity, up to	2,000 Ws
Continuous voltage DC link Output power	max. 800 VDC
Output	max. 18 kW
Digital interface	24 VDC (for function monitoring)
Built-in PTC braking resistor	+
Dimensions H x W x D	300 x 100 x 201 mm
Weight approx.	6.9 kg
Protection Class	IP 20

Energy savings with the DEK



Voltage curve of the DC link

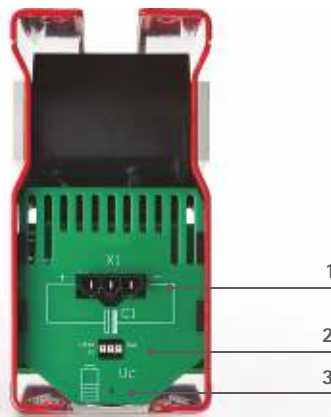




Simple connections I (bottom side)

With only three cables, the DEK is extremely easy to connect.

1. Negative terminal of the DC link
2. Braking transistor (braking chopper)
3. Positive terminal of the DC link
4. Connection of the RS422 interface



Simple connection II (Top side)

1. Interface secured against polarity reversal for connecting extension modules and NEV
2. Digital interface for function monitoring
3. Safety-relevant LED: Flashes, as long as the storage unit is charged



A PTC braking resistor is built into the DEK to determine the braking chopper voltage.

Ideal addition to the DEK: the NEV

The NEV in combination with the DEK is used to supply the 24 V DC circuit with mains independent electrical voltage.

With at most 6 Amperes (150 VA), the self-learning device is strong enough to support control units and other peripheral devices of the drive. Simply plugged into a basic device and connected via plugs, the NEV keeps the 24 Volt appliance active in case of voltage fluctuations or power failure.



Control cabinet solutions

If (e.g. in case of retrofitting) the control cabinet of the machine does not provide enough space, we can also supply equipped, standardised control cabinets ready for mounting and connection. Individual solutions are possible.



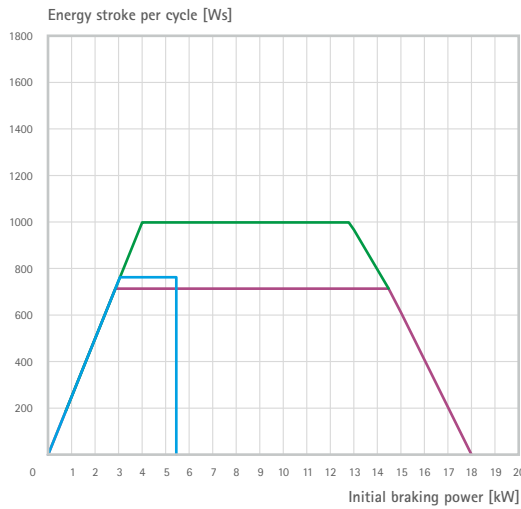
DEK Maximum Energy Stroke/ Initial Braking Power

The diagrams show the capability of the most common DEK types DEK 2.0B, DEK 2.0F and DEK 3.0F for braking ramps and braking blocks in relation with cycle times of 1, 2 and 4 seconds. The term cycle time defines the process time that is required

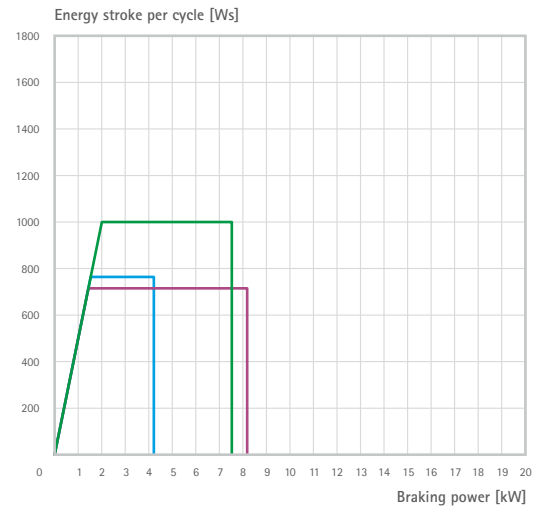
DEK
 $U_{BRCmax} = 800\text{ VDC}$
1s-cycle

- DEK 2.0B
- DEK 2.0F
- DEK 3.0F

Braking ramp

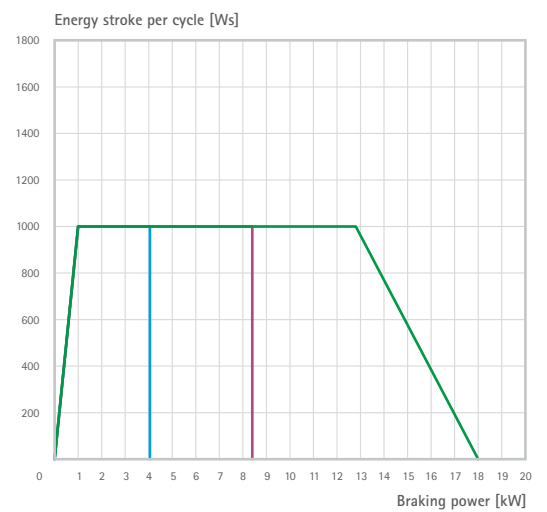
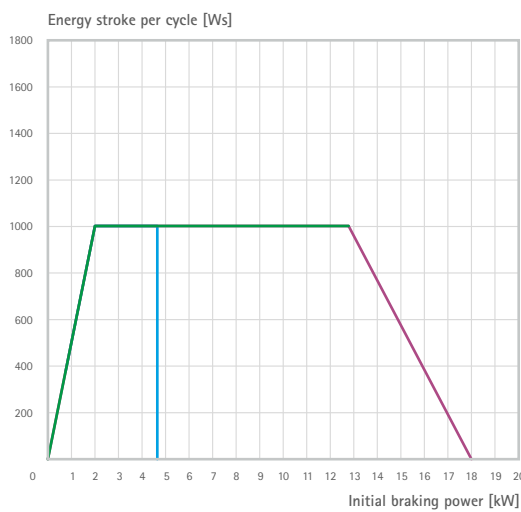


Braking block



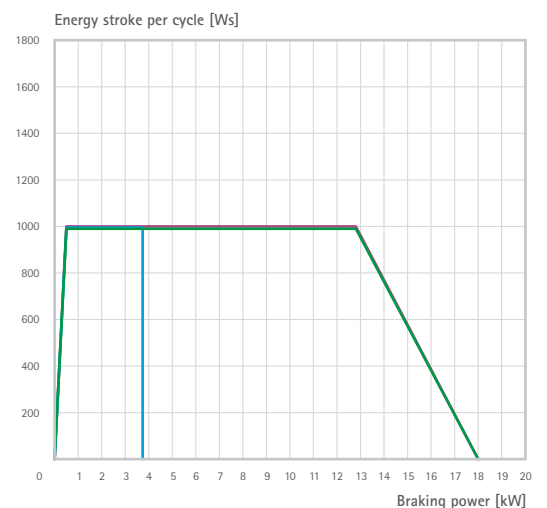
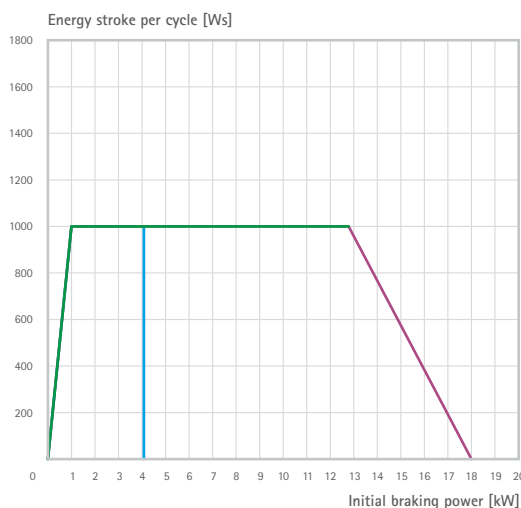
DEK
 $U_{BRCmax} = 800\text{ VDC}$
2s-cycle

- DEK 2.0B
- DEK 2.0F
- DEK 3.0F



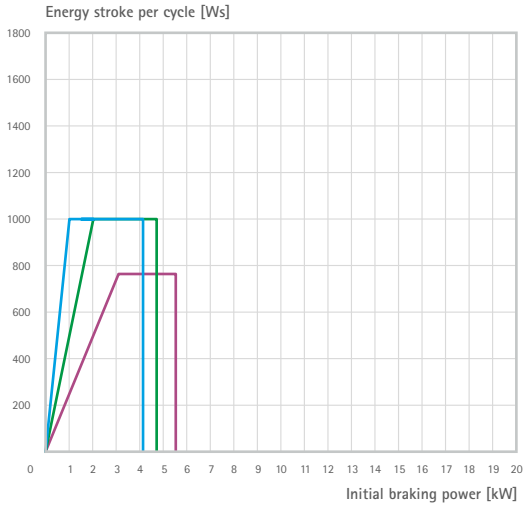
DEK
 $U_{BRCmax} = 800\text{ VDC}$
4s-cycle

- DEK 2.0B
- DEK 2.0F
- DEK 3.0F

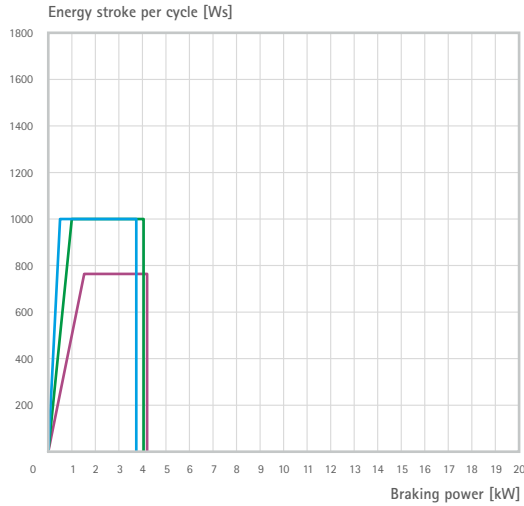


to absorb and release the stated energy by the device (energy stroke). We can design a system that suits your requirements based on accurate application data (initial braking power, form and duration of braking, cycle time and voltage level in the DC link). Please contact our sales team for this purpose.

Braking ramp

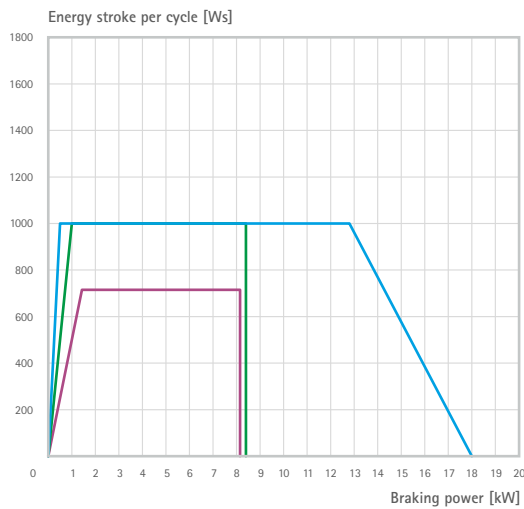
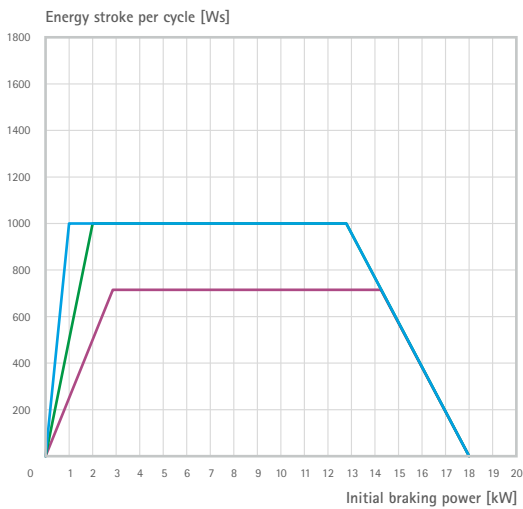


Braking block



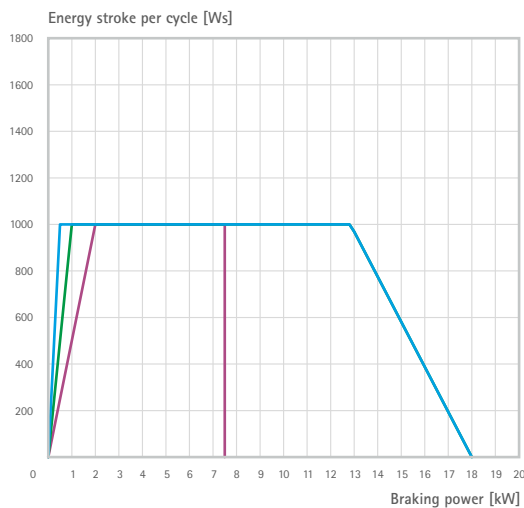
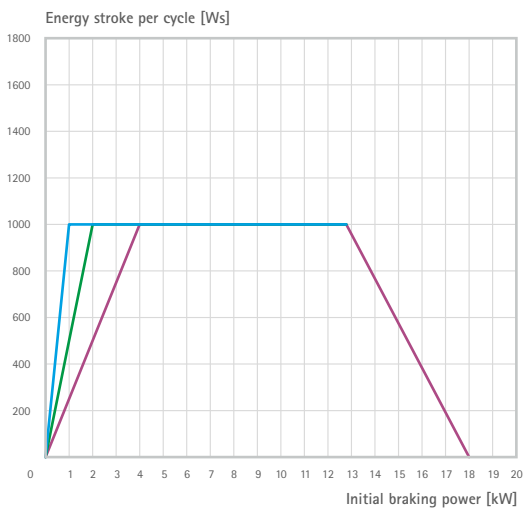
DEK 2.0B
 $U_{BRCmax} = 800 \text{ VDC}$

- 1s-cycle
- 2s-cycle
- 4s-cycle



DEK 2.0F
 $U_{BRCmax} = 800 \text{ VDC}$

- 1s-cycle
- 2s-cycle
- 4s-cycle



DEK 3.0F
 $U_{BRCmax} = 800 \text{ VDC}$

- 1s-cycle
- 2s-cycle
- 4s-cycle

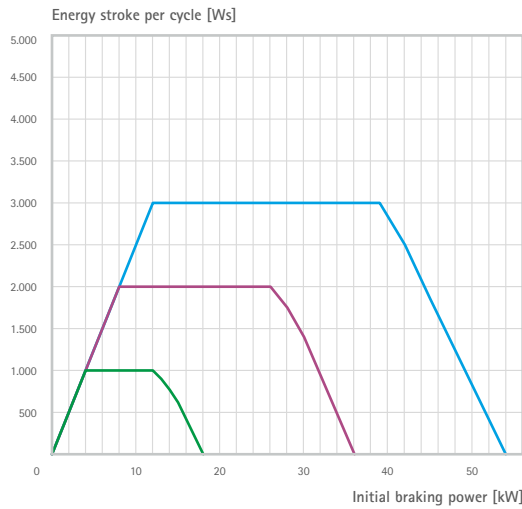
DEK Maximum Energy Stroke/ Initial Braking Power with parallel connection

Dynamic Energy Storage Combinations can easily be connected in parallel since they synchronise independently due to their self-learning feature. When connecting devices in parallel, higher initial braking powers or currents can be processed. The number of devices connected in parallel is not limited. The following diagrams show the characteristics of a single DES as well as two and three devices connected in parallel for ramp and block braking.

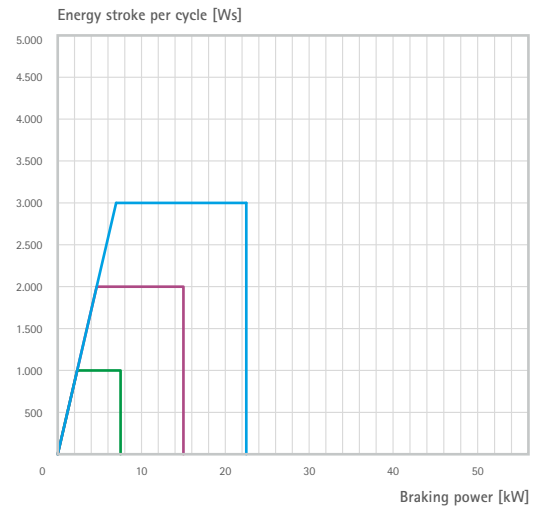
DEK 3.0F
 $U_{BRCmax} = 800\text{ V}$
1s-cycle

- 3 DEK 3.0F devices in parallel
- 2 DEK 3.0F devices in parallel
- DEK 3.0F

Braking ramp



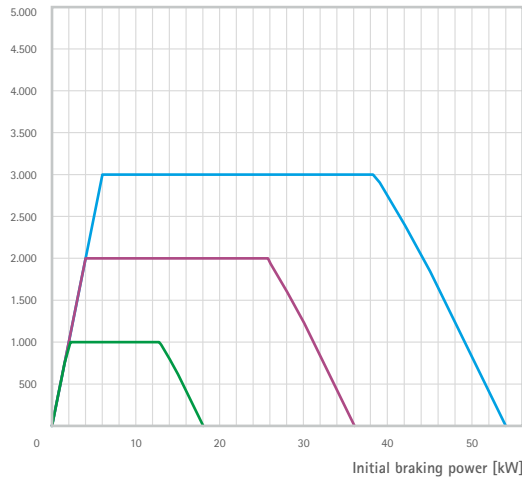
Braking block



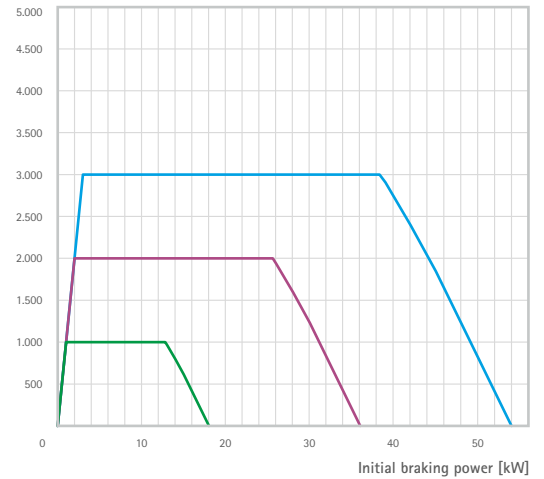
DEK 3.0F
 $U_{BRCmax} = 800\text{ V}$
2s-cycle

- 3 DEK 3.0F devices in parallel
- 2 DEK 3.0F devices in parallel
- DEK 3.0F

Braking ramp



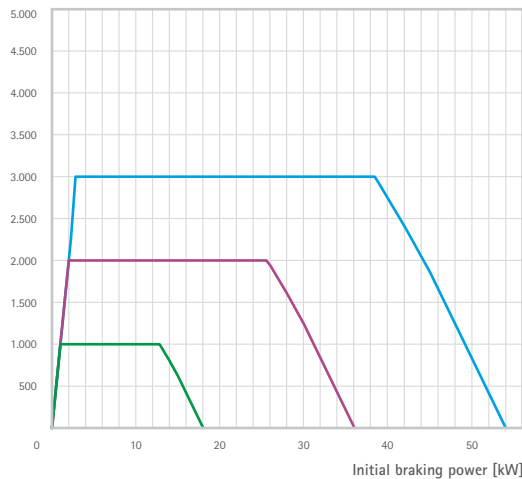
Braking block



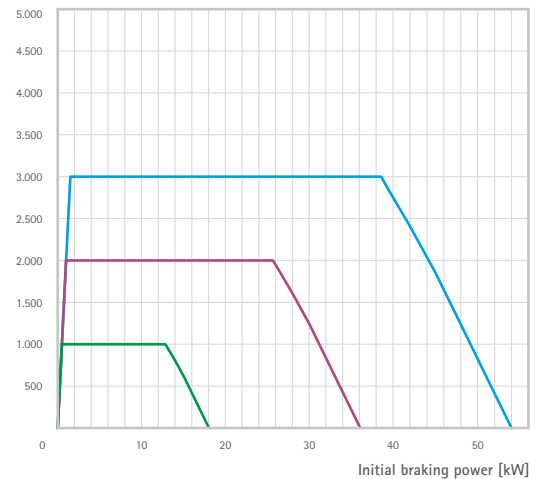
DEK 3.0F
 $U_{BRCmax} = 800\text{ V}$
4s-cycle

- 3 DEK 3.0F devices in parallel
- 2 DEK 3.0F devices in parallel
- DEK 3.0F

Braking ramp



Braking block



Extension module DEK + EM

If the storage of the DEK is not sufficient it can easily be increased with Extension Modules. Those modules only need to be connected with the DEK via the accompanying cable with polarity protected plugs.

Before connecting with the DEK the capacitors of the EM are safely discharged via the internal discharge resistor in the extension modules. The number of connected extension modules and thus the level of the storable energy is adapted to the requirements of the application.



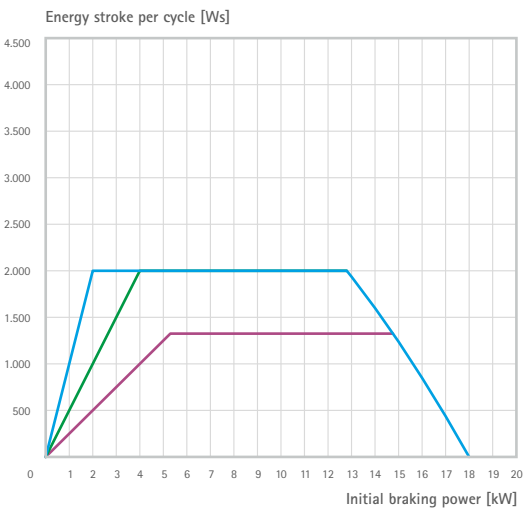
Storage extension for the DEK

- > Multiplying the stored energy
- > easiest connection via plugs
- > neither configuration nor commissioning effort required
- > Integrated discharge resistor

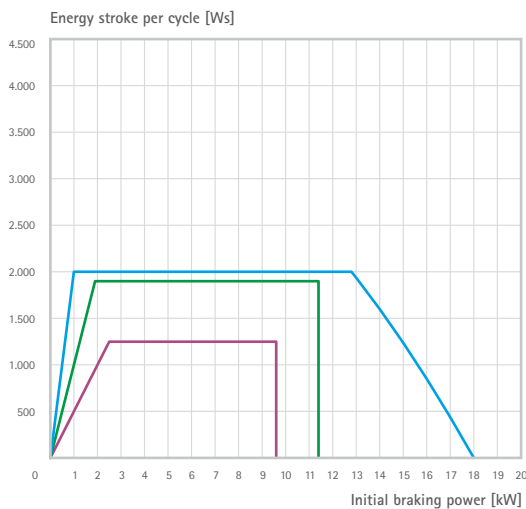
Technical specifications

Parameter	EM 2.0A20	EM 2.0A2020
Usable storage capacity up to	2,000 Ws	4,000 Ws
Built-in PTC discharge resistor	+	+
Dimensions H x W x D mm	300 x 100 x 201	300 x 100 x 201
Weight approx.	4.1 kg	6.2 kg
Protection Class	IP 20	IP 20

Braking ramp

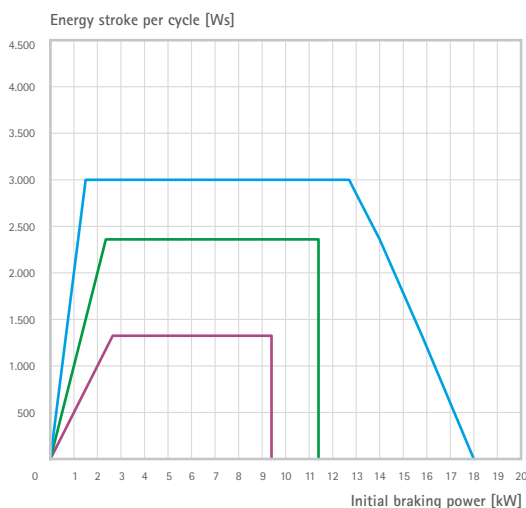
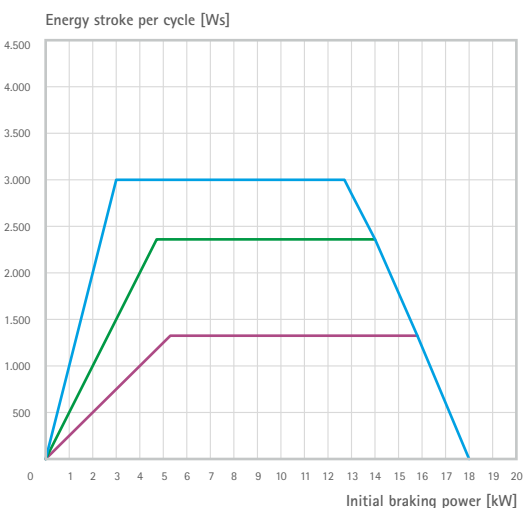


Braking block



**DEK 3.0F
with EM2.0A20**
 $U_{BRCmax} = 800 V$

- 1s-cycle
- 2s-cycle
- 4s-cycle



**DEK 3.0F
with EM2.0A2020**
 $U_{BRCmax} = 800 V$

- 1s-cycle
- 2s-cycle
- 4s-cycle

Managing DC Link Energy

Energy storage solutions and safe brake resistors in wire-wound and PTC technology

We offer:

- **Tested product quality**
- **Certified processes**
 - we undergo regular inspections by third parties
- **Individual application support**
 - owing to our modular system we can offer more than 60.000 solutions
- **Machine-specific implementation**
 - we match our products with your machines
- **High reaction rate**
 - we provide you with a suitable offer in the shortest possible time
- **Short delivery times**
 - all components are in stock
- **On-time deliveries every time**
 - we deliver on schedule in optimal lot sizes
- **Reliable partner**
 - we strive for long-term business relationships
- **Direct customer relationships**

www.brakeenergy.com

We look forward to hearing from you!



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