Managing DC Link Energy

Dynamic Energy Supply

DEV

Dynamic Energy Supply
DEV

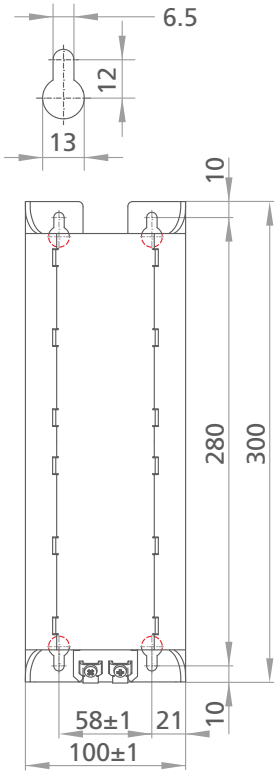
With regard to electric energy, companies place particular importance on two factors: guaranteed supply and low prices. Both are called into question with the implementation of the withdrawal of atomic energy. Broken down on electrical drives, power failures present a special challenge even today in developed nations. With the Dynamic Energy Supply for converters and drive controllers short-term power failures can be bridged and their consequences minimised.

Active supply module for DC links

> for single and multiple axes systems
> no buttons, displays, other controls
> provides support during power failures or interruptions
> with a digital interface

www.brakeenergy.com/dev

Installation dimensions and mounting-holes (mm)



Short-term UPS for drives

The Dynamic Energy Supply DEV acts as a short-term uninterruptable power supply for drives and servo controllers. The active capacity extension of the DC link of the inverter stores an amount of energy that is defined to the technical design. It serves to keep the voltage level of the DC link at a level which bridges over the downtime without trouble and/or brings the machine to a defined stop state in case of power failure. In each case, the objective is that the drive and all systems supplied by it either do not perceive the power failure at all or are brought into a defined state from which a restart is possible without any effort.

Gentle on the power grid and drives

The energy storage is charged after switching on the inverter for each charging routine, which acts very carefully not to overload the charging circuit and not to generate any negative circuit feedback either.

The DEV is fully ready for use after only eight seconds. It then supports the DC link every time that its voltage falls below 470 VDC.

With digital interface

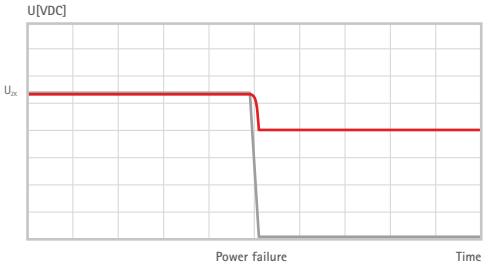
The Dynamic Energy Supply DEV is equipped with a digital interface with 24 Volt input. The evaluation of the signal takes over the control of the machine just like the initiation of the established measures.

Technical specifications DEV

Parameter	Value
Useful energy approx.	2,000 Ws
Continuous voltage of the DC link	800 VDC max.
Cycle time of use	30 minutes
Working voltage	470 VDC (other possible)
Output	18 kW max.
Digital interface	24 VDC (for function monitoring)
Built-in PTC discharge resistor	+
Dimensions H x W x D	300 x 100 x 201 mm
Weight approx.	6.9 kg
Protection class	IP 20

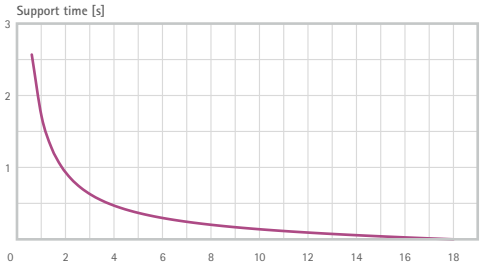
Voltage curve of the DC link with DEV

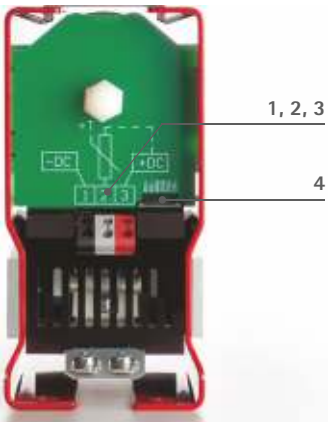
without DEV — with DEV



Support time according to power

The time which a unit can support a given power with two Kilowatt seconds of energy can be read from the diagram. For x units, the support time is extended by x times.

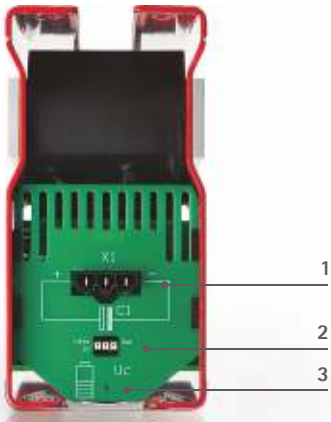




Simple connection I (Bottom side)

The DEV is extremely easy to connect with only two cables.

1. Negative terminal of the DC link
2. Discharge resistor
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

The small built-in PTC braking resistor in the DEV serves as discharge resistor

The ideal addition to the DEV: NEV

The 24 Volt emergency power supply ensures stable supply of a 24 V DC network to be secured as an option in combination with the DEV. 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 even with voltage fluctuations or power outages.

Control cabinet solutions

The Dynamic Energy Supplys required for the application are also offered as equipped ready-to-assemble and prewired, standardised control cabinets with the type designation KTS, which can take on up to ten devices.

Extension module
DEV + EM

When the capacity storage of the Dynamic Energy Supply DEV is insufficient extension modules can then be used. They can easily be connected via the accompanying cables with reverse-polarity protected plugs with the DEV. Done!

The storage is safely discharged via the discharge resistor built into the extension modules before the connection. The number of connected extension modules and thus the level of the stored energy is adapted to the requirements of the application.

Storage extension for the DEV

> Multiplying the stored energy
> simple connection using plugs
> neither configuration nor commissioning effort
> Discharge resistor on board

Technical specifications

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

Accompanying energies can very easily be implemented by the combinatorics with the extension modules

If the power of a DEV of max. 18 kW is not sufficient by itself, Dynamic Energy Storages can also be connected in parallel. The power is multiplied according to the number of devices connected in parallel.

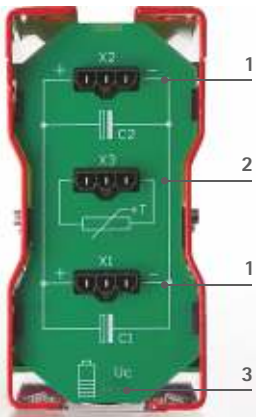
DEV + extension module

Required energy [kWs]	Module DEV 2.0B	Module EM2.0 A20	Module EM2.0 A2020	Space requirement/ total width [mm]
2	1	0	0	100
4	1	1	0	200
6	1	0	1	200
8	1	1	1	300
10	1	0	2	300
12	1	1	2	400
14	1	0	3	400
16	1	1	3	500
18	1	0	4	500

Required energy [kWs]	Module DEV 2.0F	Module EM2.0 A20	Module EM2.0 A2020	Space requirement/ total width [mm]
20	1	1	4	600
22	1	0	5	600
24	1	1	5	700
26	1	0	6	700
28	1	1	6	800
30	1	0	7	800
32	1	1	7	900
34	1	0	8	900
36	1	1	8	1000
38	1	0	9	1000

Simple connection I (Bottom side)

Ground terminals



Simple connection II (Top side)

1. Reverse polarity protected interface to connect to the DEV or from additional extension modules and NEV
2. Central reverse polarity protected interface. Discharge resistor
3. Safety-relevant LED: Blinks, as long as the storage is still charged

Dynamic Energy Supply
DEV 3.0

The DEV 3.0 is the first choice whenever the grid is too weak and the energetic support to the drive is being required very often or rather cyclic e.g. in very short intervals. Based on the technical details of your individual application and combined with our know-how, we will find the perfect solution for your requirements.

Active supply module for DC links

> for single and multiple axes systems
> no buttons, displays, other controls
> provides support during power failures or interruptions

Technical specifications DEV 3.0

Parameter	Value
Useful energy approx.	2,000 Ws
Continuous voltage of the DC link	800 VDC max.
Working voltage	470 VDC (other possible)
Output	18 kW max.
Built-in PTC discharge resistor	+
Dimensions H x W x D	300 x 100 x 201 mm
Weight approx.	6.9 kg
Protection class	IP 20

www.brakeenergy.com/dev3-0

The ideal addition to the DEV: NEV

The 24 Volt emergency power supply ensures stable supply of a 24 V DC network to be secured as an option in combination with the DEV. 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 even with voltage fluctuations or power outages.

Control cabinet solutions

The Dynamic Energy Supplys required for the application are also offered as equipped ready-to-assemble and prewired, standardised control cabinets with the type designation KTS, which can take on up to ten devices.

24 Volt Emergency Power Supply
NEV

The NEV is used to supply the 24 V DC circuit with mains independent electrical voltage. For this purpose, the NEV makes use of the energy of a supply unit, namely the dynamic energy supply DEV or the dynamic energy storage combination DEK.

Under severe voltage fluctuations or when power fails, the NEV provides energy to its secured 24 volt circuit. The time depends primarily on the load and the available energy from the supply unit. The settings of the supply unit also have an impact on the duration of the supply of electrical energy.

However, the NEV is not designed for continuous operation. The power supply that provides the continuous supply is normally connected as a power source to the NEV. The consumers on the circuit to be secured are connected to the NEV. This is automatically used to teach The NEV about the externally connected voltage and thus to support the voltage level.

Active 24-Volt support power supply

> space-saving
> without further manual configuration
> no keys
> provides support when power failures or -interruptions occur

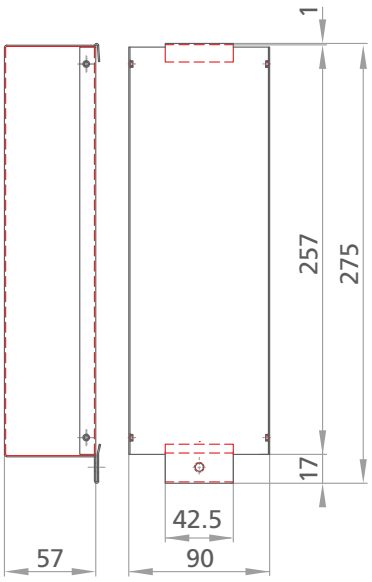
www.brakeenergy.com/nev

RoHS

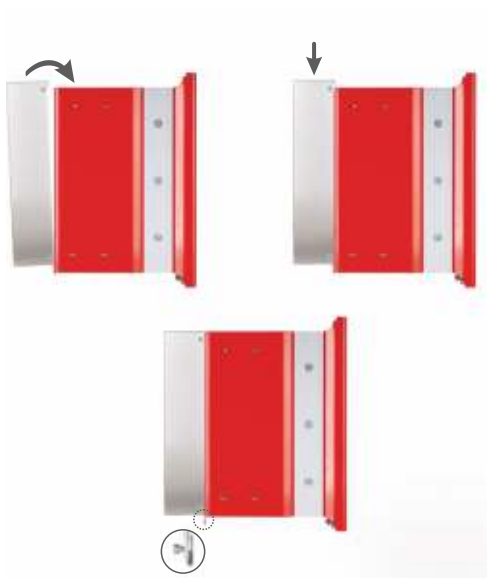
Technical Specifications NEV

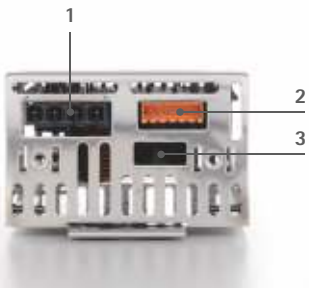
Parameters	Value
Electrical power ratings	
Input voltage (terminal X2)	22 VDC...26 VDC
Rated current	6A (up to 150VA) for failure operation 5A (up to 120VA) for mains operation
Standby power dissipation	< 1 W
Overvoltage category	III (altitude up to 2000 m above sea level) II (altitude about 2000 m above sea level)
Immunity to interference	Industries in accordance with EN 6100-6-2-205 and EN 6100-6-4-2007
Dimensions and weight	
Dimensions H x W x D	275 x 90 x 60 mm
Weight	appr. 1.0 kg
Environmental conditions	
Environmental temperature	-10° C to +85° C (transport, storage) 0° C to +40° C (operation)
Relative humidity	≤ 95% (transport, storage) ≤ 85% (operation)
Cooling type	Air cooled (convection)
Protection level	housing IP20
Degree of pollution installation location	2

Installation dimensions and holes (mm)



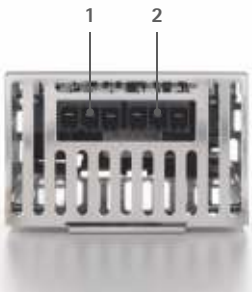
Simple to install on the supply unit





Simple connections I (bottom)

1. Connection of external power supply and the 24-volt circuit (X2) that must be secured
2. Signal terminals (X3)
3. Interface RS 422 (optional)

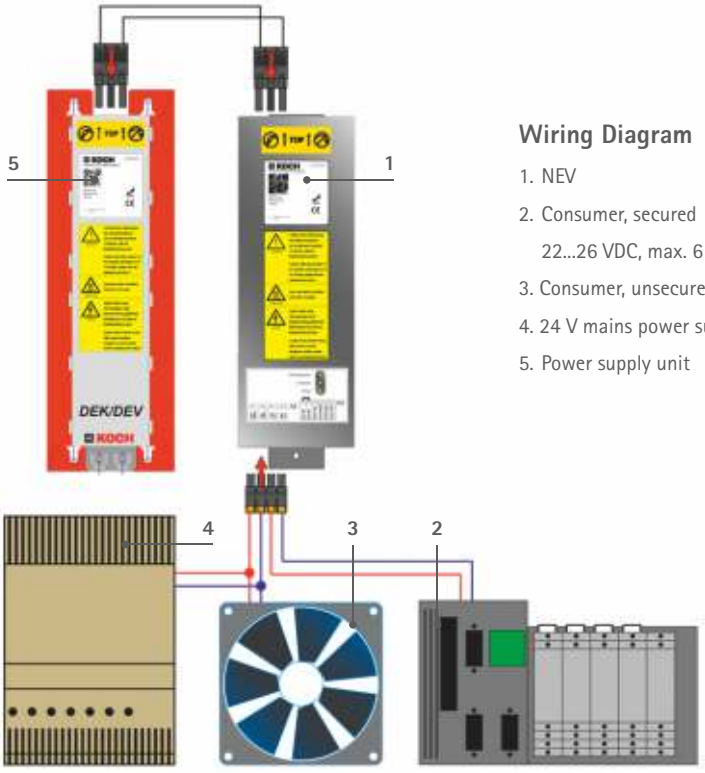


Simple connections II (top)

1. Reverse polarity secured interface to connect the power supply unit (X1)
2. Reverse polarity secured interface to connect another NEV (X1)

Labelling (front)

1. Installation position
2. Type label
3. Hazard notice
4. Pin assignment/device status



Wiring Diagram

1. NEV
2. Consumer, secured
   22...26 VDC, max. 6 A (150 VA)
3. Consumer, unsecured
4. 24 V mains power supply
5. Power supply unit

Connect two or more NEV to a DEV / DEK, an EM or a combination thereof

Several NEV units may also be connected to one unit or the combination by using an extension. For this purpose, each additional NEV is connected by means of connector X1 of the NEV using the connection cable.

No further EM may be connected to plug XI of the NEV.
Important to note! The NEV-outputs must not be connected in parallel!
Ensure that no device is loaded with more than 6A/150VA.

Managing DC Link Energy

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

www.brakeenergy.com

www.facebook.com/michaelkochgmbh

blog.bremsenergie.de

www.xing.com/companies/michaelkochgmbh

www.newsletter.bremsenergie.de

www.youtube.com/user/MichaelKochGmbH

Appstore

www.linkedin.com/company/michael-koch-gmbh

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!

KOCH

Michael Koch GmbH, Zum Grenzgraben 28, D-76698 Ubstadt-Weiher
Phone (+49) 7251 / 96 26 20, Fax (+49) 7251 / 96 26 21
www.brakeenergy.com, mail@brakeenergy.com

Subject to technical changes. MK_PRO_DEV_ENG_R00_0

Großer Preis des Mittelstandes

EMAS D-138-00051

Qualitätsmanagement ISO 9001:2008 DEKRA