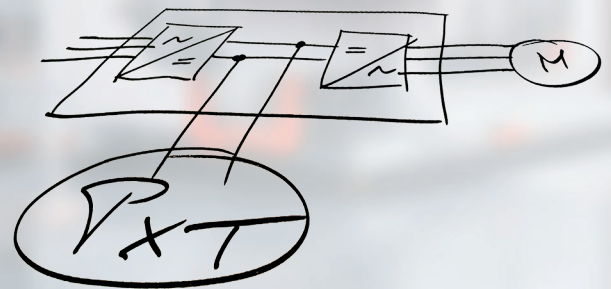
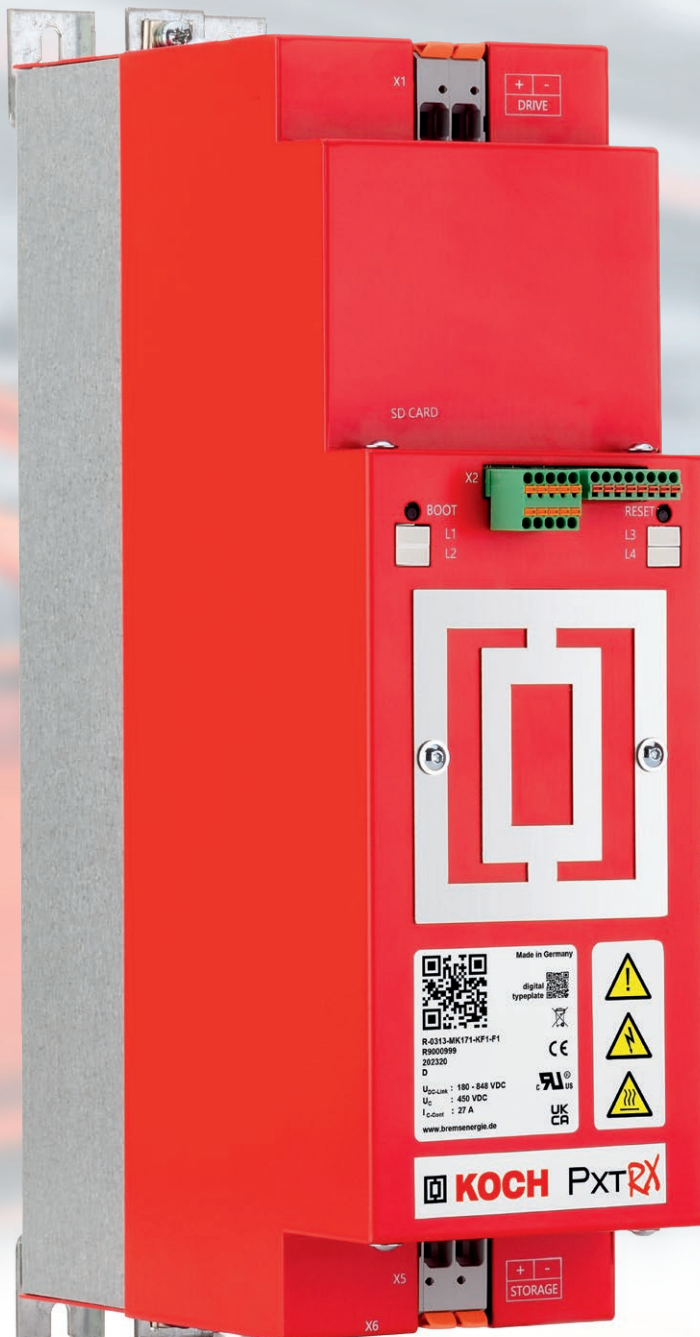
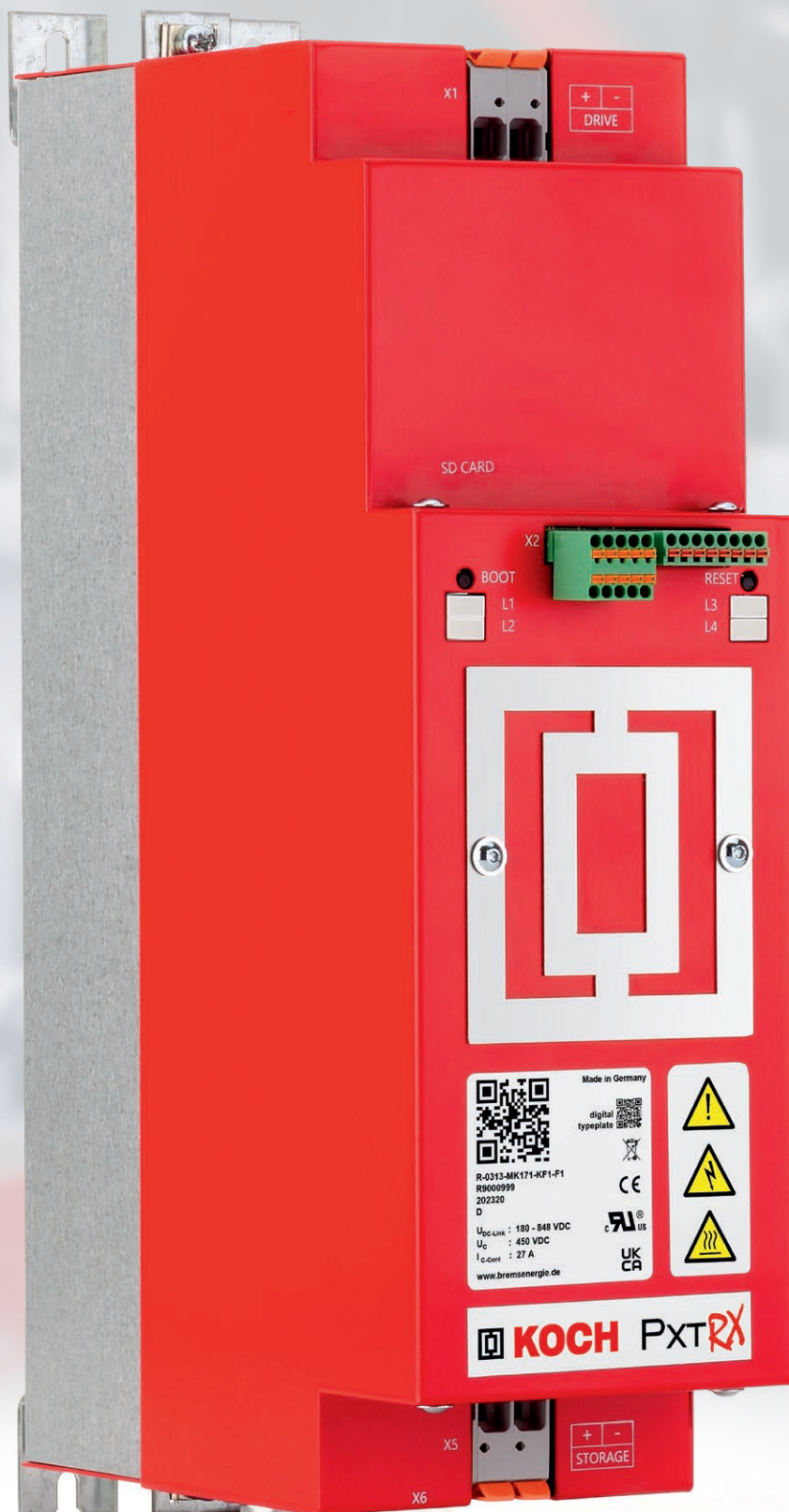


Active Energy Management Device for Electric Drive Technology



PXT **RX**



Product series PxtRX

$I_N = 30/27 \text{ A}$ (IEC/UL)

$I_{MAX} = 60 \text{ A}$

$U_z \leq 1,000/848 \text{ VDC}$ (IEC/UL)

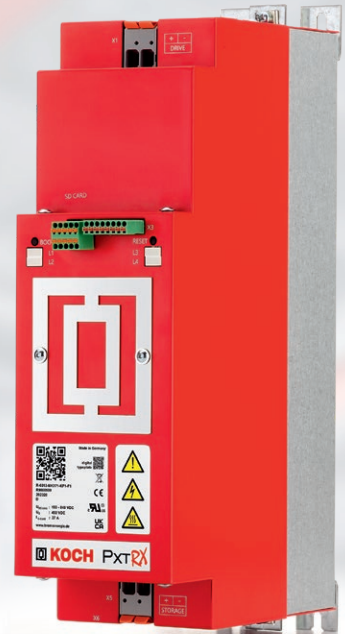
$U_C \leq 800/450 \text{ VDC}$ (IEC/UL)

Storage¹ up to several MJ



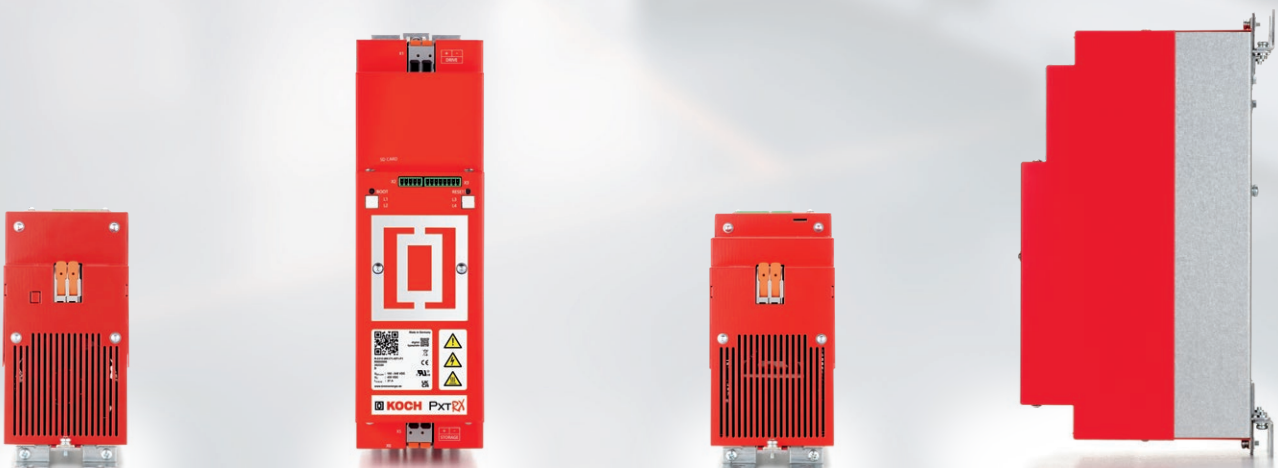
The new generation of
active energy management
devices for electric drives

PXT RX



Your benefits

- Recovering braking energy
- Increase productivity
- Bypassing power failures
- Compensate voltage dips
- Reduce load peaks
- Protect power quality
- Increase energy efficiency
- Controlled stops in case of power failure
- Mains-independent operation
- No heat from braking energy
- Modular system
- Save money



Key features of the PxtRX devices

Performance

- > 27 A (UL) / 30 A (IEC) continuous current
- > 60 A peak current for 45 seconds¹ ($I_{\text{eff}} = 30 \text{ A}$ at $t_{\text{Zyklus}} = 180\text{s}$)
- > 48 kW peak power

Wide voltage range

- > Min. Operating voltage level 180 VDC (Wake-Up-Phase: U_{ZStart} 48-180 VDC)
- > Max. Operating voltage level 848 VDC (UL) / 1,000 VDC (IEC)
- > Min. starting voltage level for the system (DC link or energy storage) approx. 45 VDC

Safety functions

- > Reverse polarity protection to DC link
- > Integrated precharge circuit
- > LSS charge protection switch: connection of charged energy storage modules possible
- > Integrated load monitoring on both sides
- > Internal fuses

Communication

- > 3 digital inputs / 3 digital outputs
- > K-Bus for operating data output
- > 4 LEDs
- > SD card
- > Reset button for restart
- > Boot button for boot loading from SD card
- > Option: PxtMX plug-on module for fieldbus communication etc.

¹ 25% duty cycle at 180s cycle time.



Connections and variants of the PxtRX devices

Top connections

- > DC link connections
- > 6 x digital I/Os, K-Bus (output only)
- > 24 VDC supply Input
- > Automatic BRC threshold detection: Plug & Play
- > SD Card for updates
- > Button Bootloading
- > Reset button (restart)
- > Operating conditions via 4 LEDs



Key data

- > 27 A (UL) / 30 A (IEC) continuous current
- > 60 A peak current for 45 s¹
- > Min. operating voltage level 180 VDC
- > Max. operating voltage level 848 VDC (UL) / 1000 VDC (IEC)
- > Max. storage voltage 450 VDC (UL) / 800 VDC (IEC)
- > Min. starting voltage level for the system (DC link or energy storage) approx. 45 VDC



Connections bottom

- > Connections storage extensions

¹ 25% duty cycle at 180s cycle time

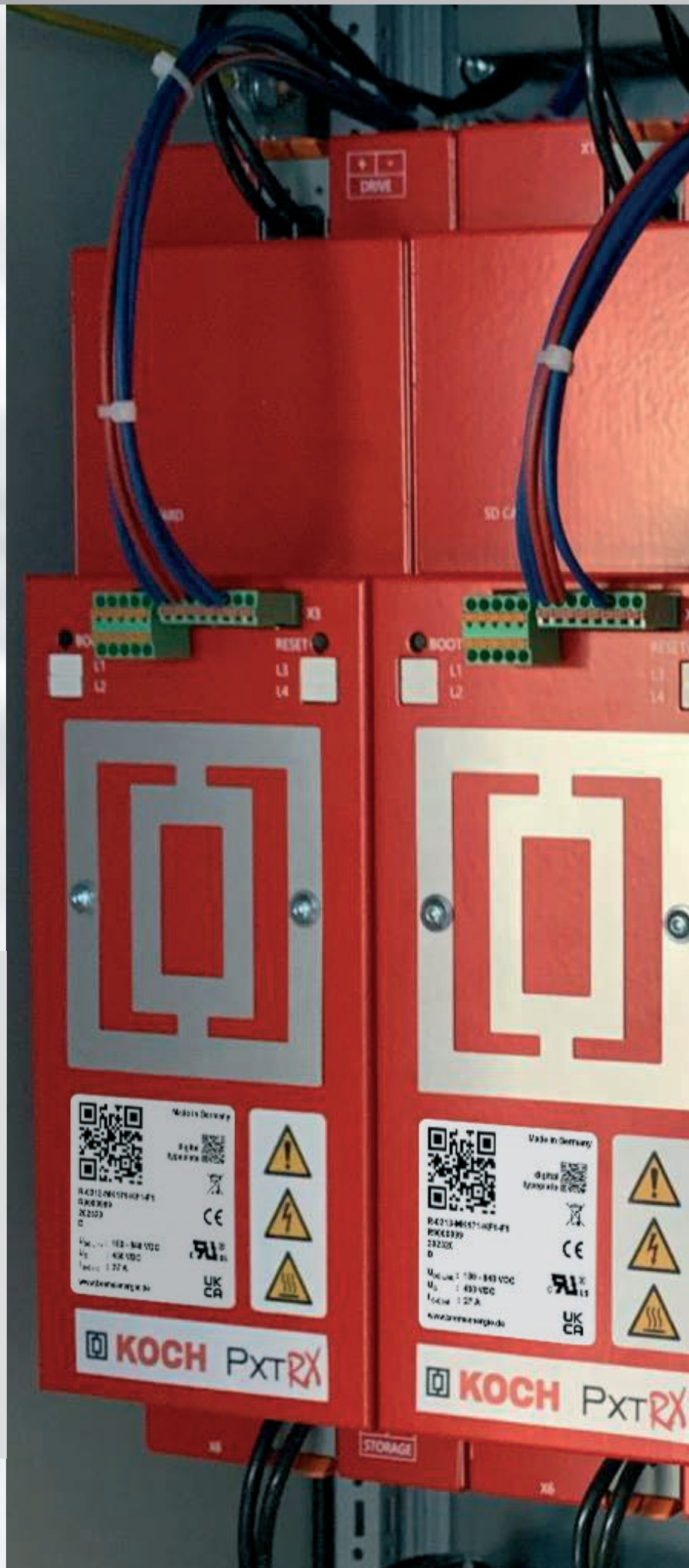
PxTRX - Full of power!

The PxTRX active energy management device is designed to handle higher currents for a longer period of time. 27 A (UL) / 30 A (IEC) is the value of the continuous current and the rms current, the latter calculated over a cycle time of 180 seconds. The maximum current is 60 amps for 45 seconds, or 25 percent duty cycle in the above cycle time. At the extremes of the permissible storage voltage, this results in a power range of 5.4 to 48 kilowatts.

But don't worry: If more power is required than a single device can supply, several PxTRXs are simply connected in parallel and the power is simply multiplied.

Essential for application engineering:

The storage voltage must always be lower than the DC link voltage. And since the storage voltage is dynamic, the sizing must be based on the worst case scenario, i.e. the minimum voltage of the storage medium in the travel cycle. The lowest permissible storage voltage therefore determines the performance of the system.






 Made in Germany
 digital typeplate
 R-0313-MK171-KF1-F1
 R9100193
 212320
 D
 U_{DC} : 180 - 848 VDC
 U_e : 450 VDC
 I_{DC} : 27 A
 www.bremser-energie.de



 **KOCH** PXT RX


 Made in Germany
 digital typeplate
 R-0313-MK171-KF1-F1
 R9000989
 202320
 D
 U_{DC} : 180 - 848 VDC
 U_e : 450 VDC
 I_{DC} : 27 A
 www.bremser-energie.de



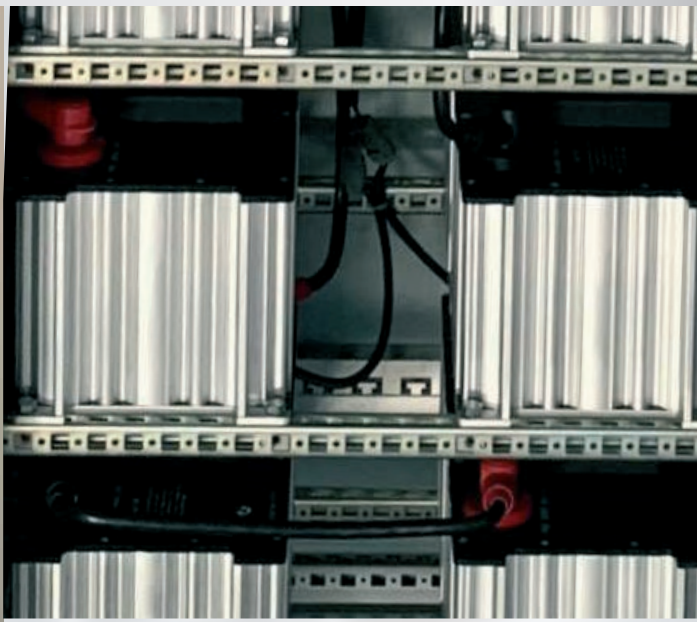
 **KOCH** PXT RX



PxtRX - Full of energy!

Double-layer capacitor modules are the natural partners of the active energy management device PxtRX. Various modules are tested and approved ex works. Energy quantities are available in fine gradations,

which can be put together to fit the machine or system exactly. Since the PxtRX allows long cable lengths in the direction of the drive as well as in the direction of the storage, extensive mechanical freedom is guaranteed.



The modular design is suitable for both small and large drives, for supplying energy for a few seconds or even for longer periods of time. Your application alone decides, the system around the PxtRX adapts flexibly. The combination of the PxtRX power units with the double-layer capacitor modules open up many new and helpful possibilities for entire machine series of different sizes and power ratings. And all this without any further complex adjustments.



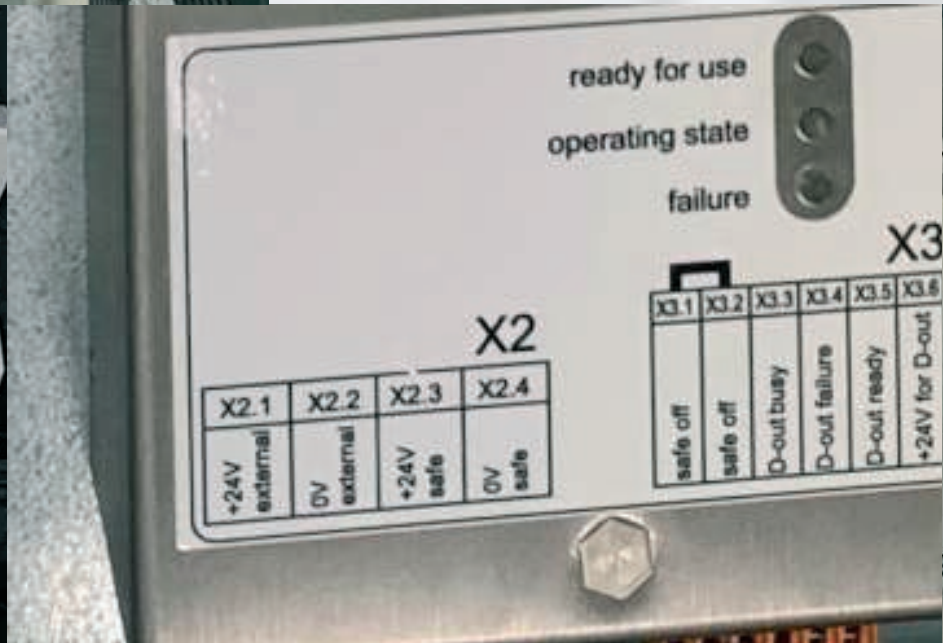
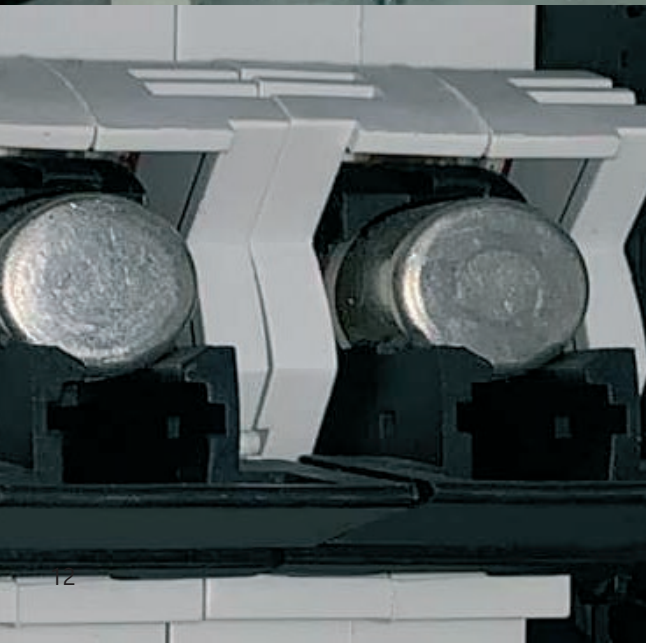


PxtRX - Full of details!

It is the many so-called small details around a system that are often decisive. The active energy management device PxtRX with the double-layer capacitor modules form the necessary core. And we offer useful additions.

The appropriate protection systems are just as much a part of an active energy management system as completely assembled, ready-to-connect control cabinet solutions with a wide range of monitoring features.

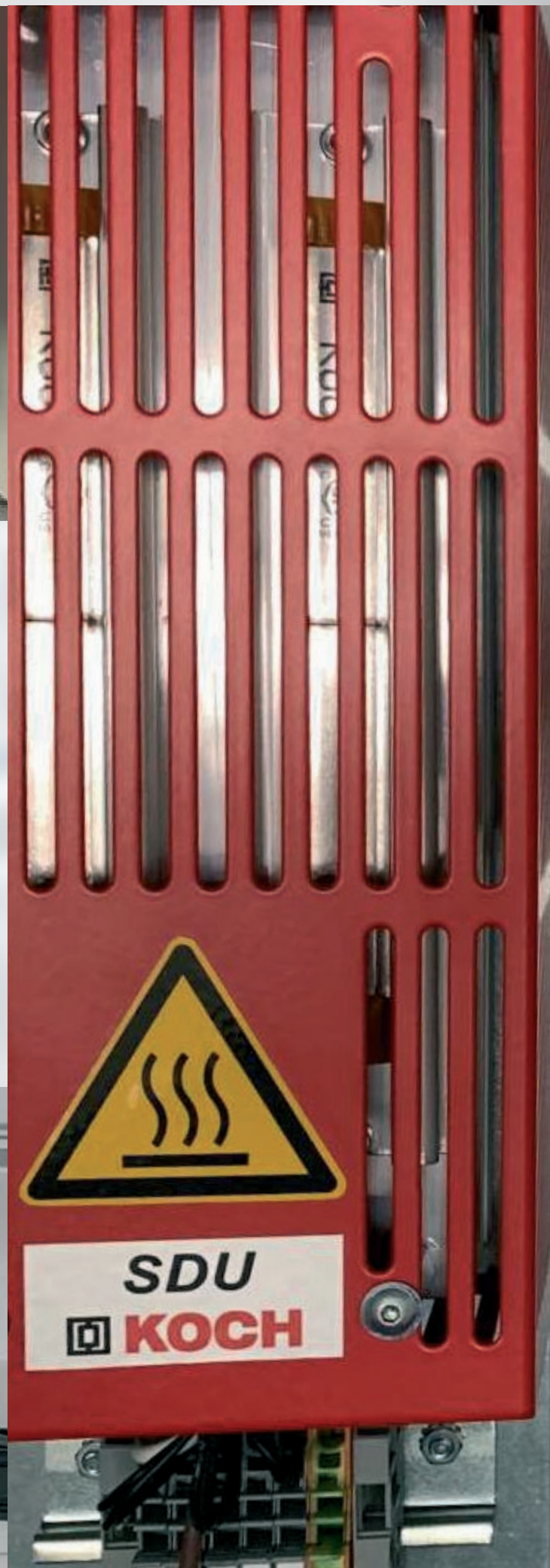
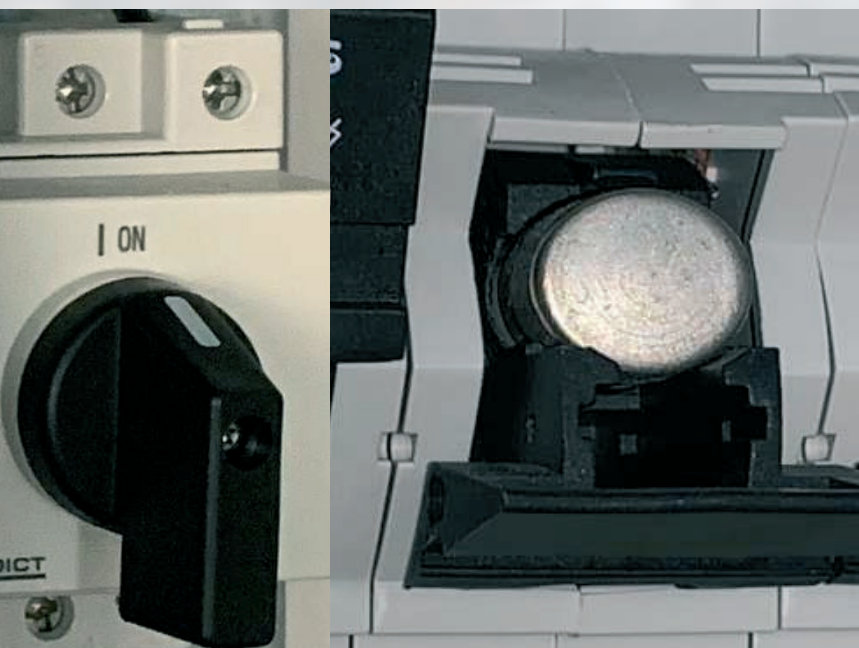
Connectible discharge resistors of the type SDU ensure that the high energies of the double-layer capacitor modules are safely discharged and thus the voltage level quickly falls to harmless levels.





Even faster is it with the Dynamic Discharge-Manager DDM, which, in conjunction with the PxtRX via an external safe braking resistor with a linear discharge curve, ensures that the energies of large double-layer capacitor systems are discharged in a very short time.

In the event of voltage dips or power failures, you can also supply the 24-volt networks for the peripherals of your machine or system from the active energy management system around the PxtRX using the NEV Emergency Power Supply.



Realize advantages!

Voltage dip or power failure

Goal: Power supply in case of voltage dip or power failure



Situation:

The critical drive with an output of 45 kW is not protected against voltage dips or power failures.

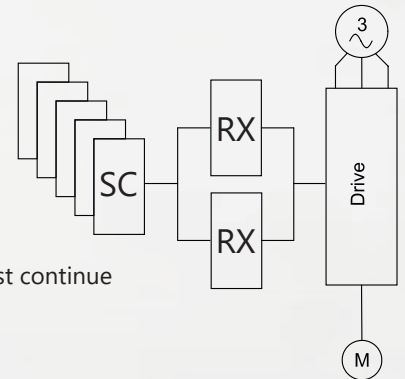
Problem:

In order to prevent the very expensive workpiece from being destroyed and thus to maintain the ability to deliver and to avoid penalties, the critical drive must continue to operate for a guaranteed minimum of 10 seconds in the event of a voltage dip or power failure.

Solution:

Two PxtRX connected in parallel with a correspondingly large energy storage system consisting of supercapacitor modules.

- > Controlled continuation of the machine during short voltage dips
- > Controlled stop of the machine in case of power failure
- > Bringing the machine into a defined state with complete preservation of the workpiece



Managing brake energy

Goal: Energy saving, avoidance of unplanned down times



Situation:

The machine brakes every second with an initial power of 20 kW within 0.4 seconds to 0. After 0.1 s pause the system speeds up again.

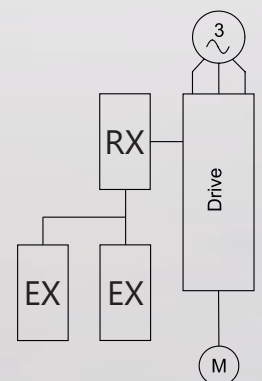
Problem:

Fast cycles and large masses lead to overloading of the drive electronics and thus to unplanned breakdowns. In addition, 2 kJ of electrical energy per cycle could be saved, i.e. around 2 kWh per operating hour.

Solution:

One PxtRX in combination with two PxtEX capacitor modules.

- > Power consumption reduced, saving 4 kJ per cycle or about 4 kWh per operating hour
- > Extension of the service life of the drive electronics
- > Possibly increase the number of cycles or increase productivity, mechanics permitting



Reduce power loads

Goal: Reduction of grid connection capacity, energy savings



Situation:

High costs due to high peak grid performance and high energy consumption.

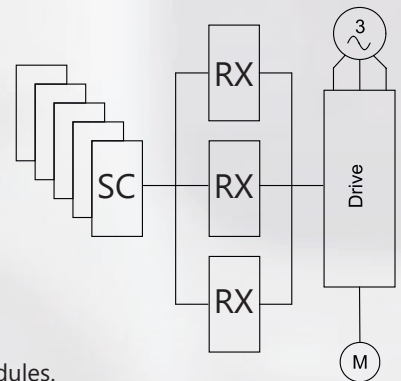
Problem:

The machine accelerates with a high load, resulting in high peak grid power. On the other hand, the braking energy is burned unused.

Solution:

Three PxT RX in combination with super capacitor modules.

- > Drastic reduction of the peak power required from the mains
- > Saving of the braking energy, which is buffered and made available to the system during acceleration



Independent operation from the mains

Goal: Existing system to be operated off-grid



Example:

Cross conveyor

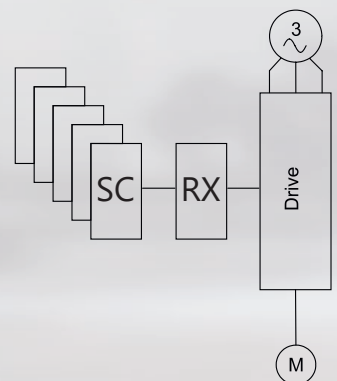
Problem:

Expenditure of time by the workers and the cable is interfering and wearing out.

Solution:

A PxT RX in combination with super capacitor modules.

- > The super capacitor modules are charged once and provide energy for the planned power cuts



Technical data PxTRX

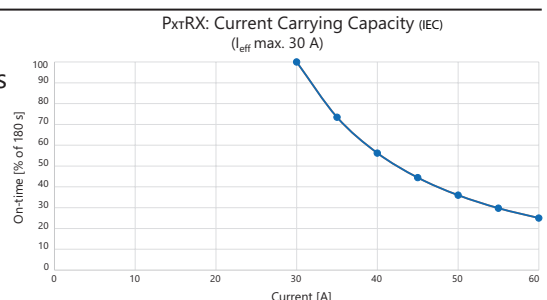
Version April 14, 2023



Criteria	PxTRX
Weight	10.0 kg
Dimensions H x W x D	380 x 105 x 217 mm
Protection class	IP 20
Ambient temperature	-10°C up to +65°C (transport, storage) 0°C up to +40°C (in operation)
Humidity	≤ 95% (transport, storage) ≤ 85% (in operation)
Cooling	Forced air cooling via fan. Operation in relation to heat sink temperature. Adjustable, e.g. for UPS application
Limitation for installations in elevated areas	<2000 m: No limitations / overvoltage category III >2000 m: reduction of performance / overvoltage category II
Min. starting voltage level for the system (DC link or Energy storage)	Approx. 45 VDC
Min. Operating voltage level U_{zmin}	180 VDC (Wake-up-phase: U_{zstart} 48-180 VDC)
Max. Operating voltage level U_{zmax}	848 VDC (UL) / 1000 VDC (IEC)
Max. Voltage level energy storage U_{Cmax}	450 VDC (UL) / 800 VDC (IEC)
Operation conditions	$U_z > U_c$. Otherwise immediate stop = safe separation of DC link from energy storage
24 VDC In	Galvanically isolated. For communication tasks with PxTRX without connecting it to DC link or energy storage, e.g. for setting parameters at the desk (Note: not protected against polarity reversal)
Energy of integrated capacities	0 kJ
External capacities ¹	PxTEX (UL) in steps of 2 kJ DLCM (Double-Layer Capacitor Module) Batteries No limitation of capacities

Max. Energy Storage current I_c

27 A (UL) continuous
30 A (IEC) continuous
60 A peak for 45s
($I_{eff} = 30$ A at
 $t_{cycle} = 180$ s)



¹ Data refer to connection to a DC link of a drive controller with 400 V AC supply voltage, , UL only with PxTEX. Other data on request.

Technical data PxTRX

Version April 14, 2023

Criteria	PxTRX
Ground rule for power flow	$P_c = P_z$
Max. Power P_{max}^1	13,5 kW (UL) / 24 kW (IEC) continuous 27,0 kW (UL) / 48 kW (IEC) peak
Operation frequency level	15 kHz, in operation load-dependent reduction down to 7.5 kHz Adjustable to 18 kHz (with power reduction)
Load monitoring	DC link side and energy storage side (in each case I^2t)
Connection DC link	Front, top
Connection Energy storage	Front, bottom
Communication	3 digital inputs 3 digital outputs K-Bus interface for operating data output 4 LEDs SD card Reset button for restart Boot button for boot loading from SD card Option: PxTMX plug-on module for fieldbus communication etc.
Firmware-Updates	On Koch company site (Fabrikle) or With SD-Card at customers site or Via PxTCC (USB K-Bus interface) with PC
Protection	Internal fuses. External capacities have to be fused separately.
Precharging circuit	Connection directly to DC link interference-free possible, independent from further precharging circuits
Reverse polarity protection	To DC link: In case connecting with reverse polarity PxTRX blocks and disconnects the DC link side from energy storage side
Charging protection	To DC link
Charging protection switch LSS	Connection of charged Energy storage modules interference-free possible (But: No protection against connecting with reverse polarity!)
Max. cable length to DC link	20 m
Max. cable length to energy storage modules	20 m
Parallel operation	Theoretically unlimited number of devices Self-adjusting Automated Master-/Slave-setting for communication

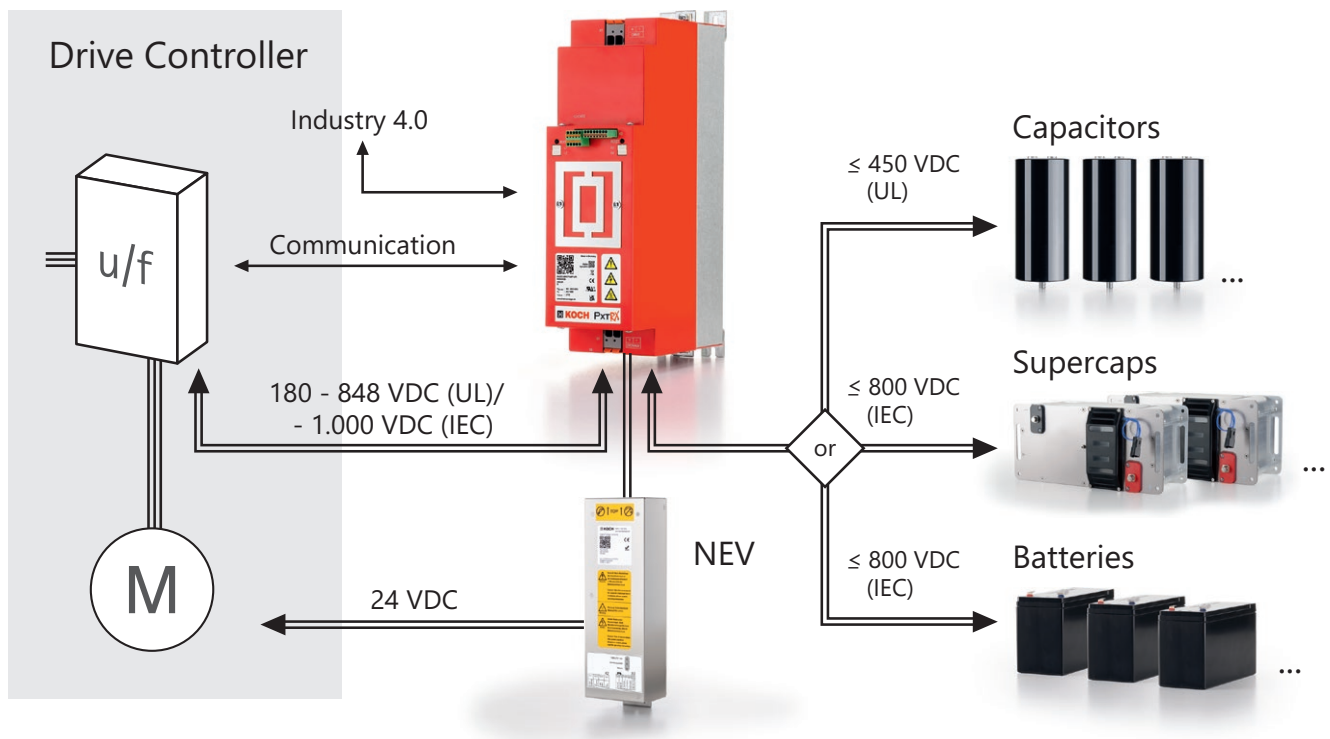
¹ Data refer to connection to a DC link of a drive controller with 400 V AC supply voltage. Other data on request.

Technical data PxTRX

Version April 14, 2023

Criteria	PxTRX
Retrofit	Can be retrofitted into existing systems
Typeplate/Device information	Electronic via QR-Code: Further device specific information Management-features
Internal digital storage	Operation hours meter
Capacity monitoring	Parameterizable

Schematic of PxTRX system



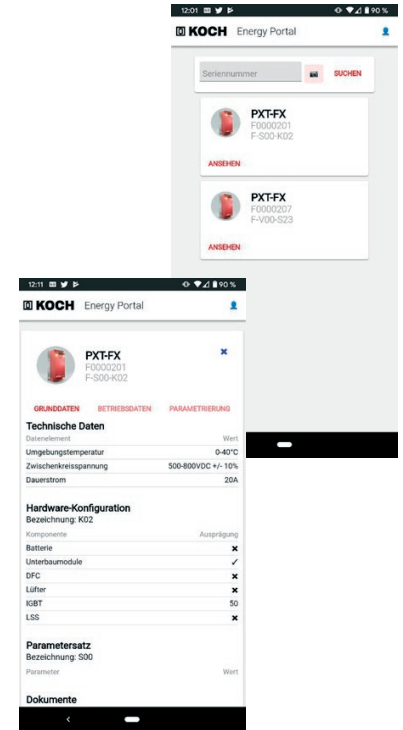
Get it done right:

Perfect sizing - use our support!

Any questions? Please call us: +49 7251 96 26-200.

PxT_{RX} - Digital type plate

Via scan of the QR code, device-specific information is available if an Internet connection is available. Management options for multiple devices are also available.



PxT_{RX} - PxT_{Terminal}

Make device and operating data visible!

Connected to a PC via the connection cable PxT_{CC}, the tool PxT_{Terminal} visualizes the device parameters and in real time also the most important operating data of the application such as DC link voltage, storage voltage and the power. This operating data can be easily recorded and conveniently analyzed externally.



Notes

What we offer:

- Tested product quality
- Certified processes
- Individual application support
- Machine specific design and sizing
- Rapid reaction
- Quick delivery times
- On-time delivery
- Reliable partner
- Long-term business relationship
- Direct customer relations

Use our communication channels:



Your specialist for:

- Active energy management devices and systems
- Safe brake resistors

for electric drive technology

We look forward
to hearing from you!



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www.brakeenergy.com, mail@bremsenergie.de

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